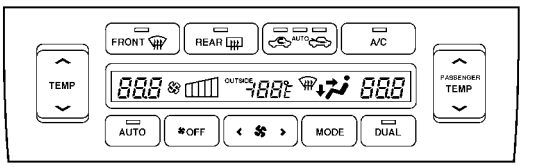
■CONSTRUCTION AND OPERATION

1. Heater Control Panel

Two types of heater control panels are provided.

- The models without a Lexus navigation system have adopted an easy-to-use push-button type heater control panel. This control panel uses an LCD (Liquid Crystal Display) panel to show the set temperature, air outlet mode, blower speed, and outside temperature to ensure excellent visibility.
- The models with a Lexus navigation system (European models only) have adopted a heater control panel, which consists of push switches located around the navigation system display and a touch switch that is operated by touching the display panel.
- The touch switch is used to turn the air conditioner ON/OFF and to select the air outlet modes and blower speeds. This control panel shows the set temperature and outside temperature on the display. The outside temperature can be shown on the display in two manners: continuous, or only in the air conditioner control screen.
- To ensure the ease of operation of the left/right independent control, a passenger temperature control switch is provided on the passenger side of the heater control panel. A “DUAL” switch is also provided to change from the left/right independent control to the linked control.
- An indicator is provided in the air inlet control switch to indicate that the automatic recirculation system is in operation.



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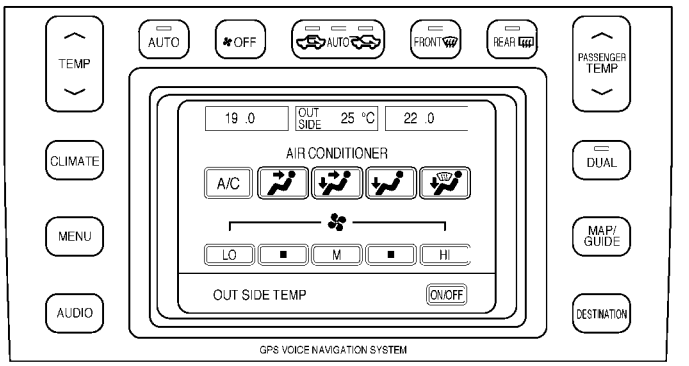
Models without Lexus Navigation System



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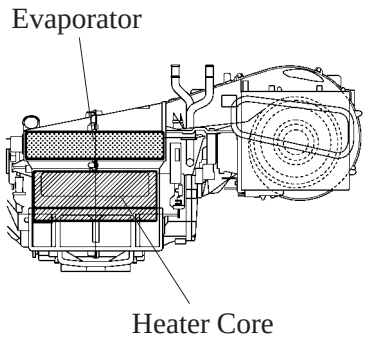
Models with Lexus Navigation System (European Models Only)

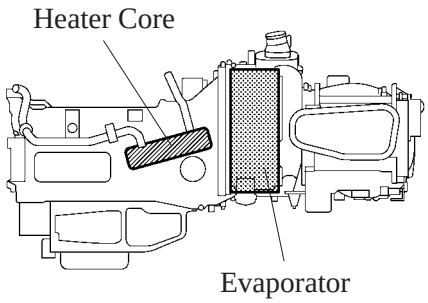
2. Air Conditioning Unit

A semi-center location air conditioning unit, in which the evaporator and heater core are placed in the vehicle's longitudinal direction, has been newly adopted. As a result, the air conditioning unit has been made more compact and lightweight than that of the previous model. In addition, a left/right independent temperature control system has been adopted to improve comfort.



152BE16

New

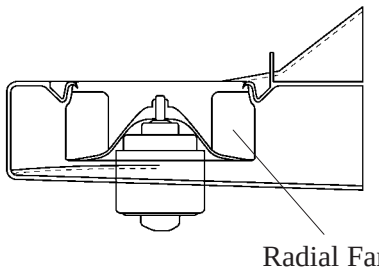


152BE15

Previous

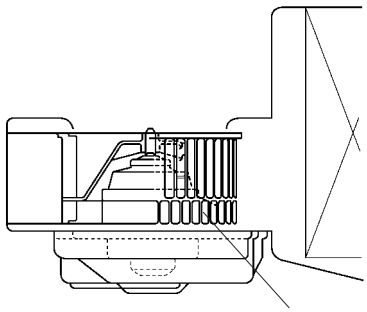
Blower Fan

A radial fan that has a larger diameter and narrower width than the sirocco fan of the previous model has been newly adopted to realize a more compact blower unit. In addition, the previous dual suction blower has been discontinued.



152BE18

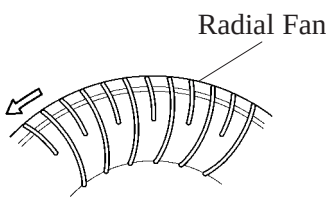
New



152BE17

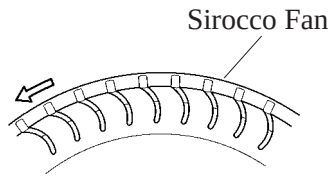
Previous

Blower Unit



152BE20

New



152BE19

Previous

Fan Configuration

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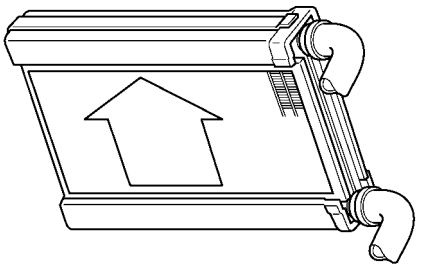
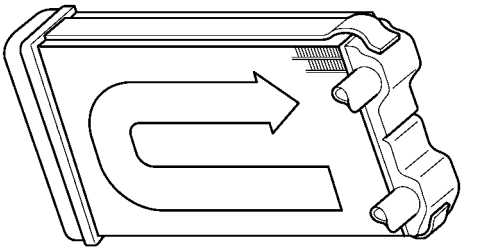
Heater Core

The flow of the heater water in the heater core has been changed from the previous U-turn flow to a full-path flow. Due to the resulting improvement in the heat exchanging efficiency of the heater core, the heater core itself could be made thinner. In addition, the heater core material has been changed from copper to aluminum.



152BE21

New

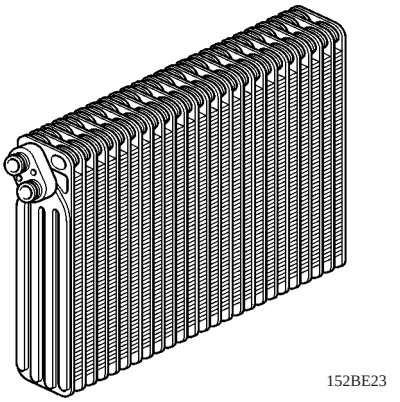


152BE22

Previous

Evaporator

By placing the tanks at the top and the bottom of the evaporator unit and by adopting an inner fin construction, the heat exchanging efficiency has been improved and the evaporator unit's temperature distribution has been made more uniform. As a result, it has become possible to realize a thinner evaporator construction.



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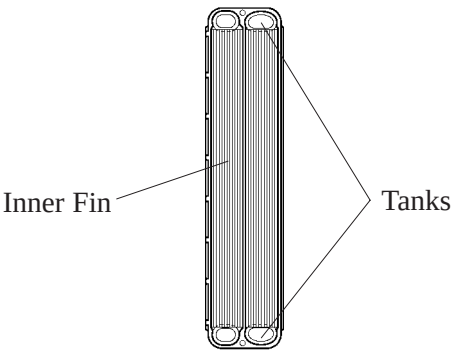
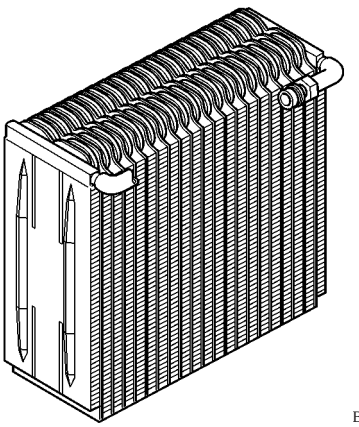


152BE24

New



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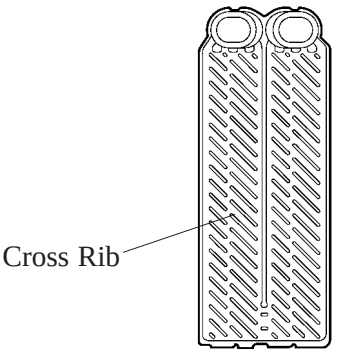


152BE26

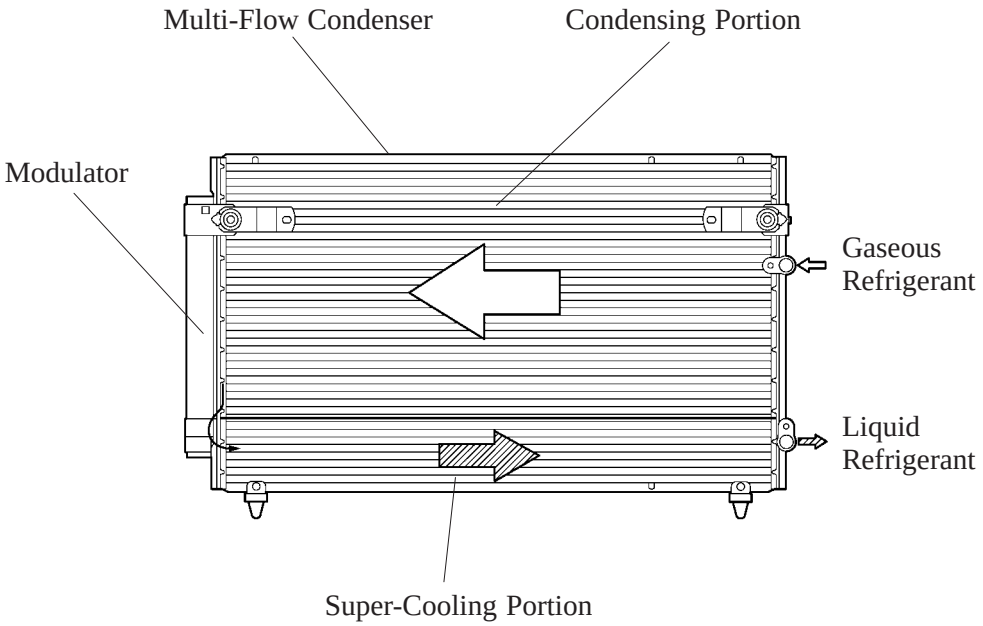
Previous

3. Condenser

The new model has newly adopted a sub-cool condenser in which a multi-flow condenser (consisting of two cooling portions: a condensing portion and a super-cooling portion) and a gas-liquid separator (modulator) have been integrated. This condenser has adopted the sub-cool cycle for its cooling cycle system to improve the heat exchanging efficiency.

Sub-Cool Cycle

The receiver cycle of the previous condenser could not convert the gaseous refrigerant that was sent by the compressor into a completely liquefied state in the condenser. Thus, a portion of the refrigerant remained in the gaseous state as it was sent to the evaporator.
In the sub-cool cycle of the sub-cool condenser that has been adopted on the new model, after the refrigerant passes through the condensing portion of the condenser, both the liquid refrigerant and the gaseous refrigerant that could not be liquefied are cooled again in the super-cooling portion. Thus, the refrigerant is sent to the evaporator in an almost completely liquefied state.



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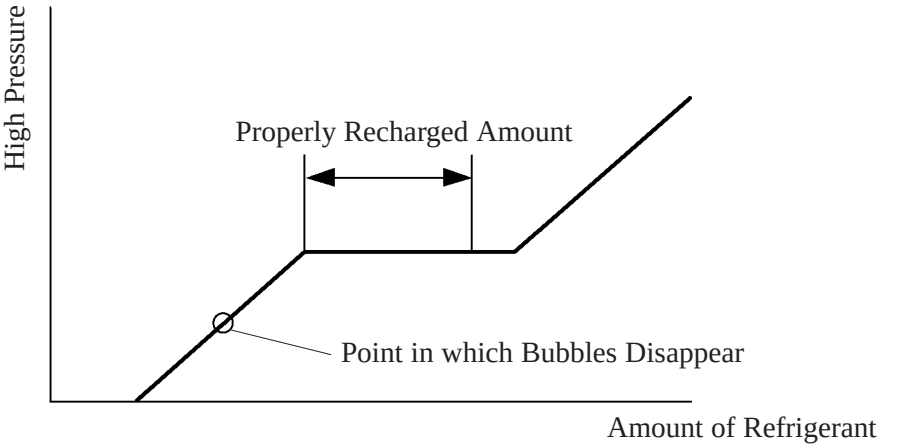
NOTE: The point at which the air bubbles disappear in the refrigerant of the sub-cool cycle is lower than the proper amount of refrigerant with which the system must be filled. Therefore, if the system is recharged with refrigerant based on the point at which the air bubbles disappear, the amount of refrigerant would be insufficient. As a result, the cooling performance of the system will be affected.
For the proper method of verifying the amount of the refrigerant and to recharge the system with refrigerant, see the GS300 Repair Manual (Pub. No. RM588E).



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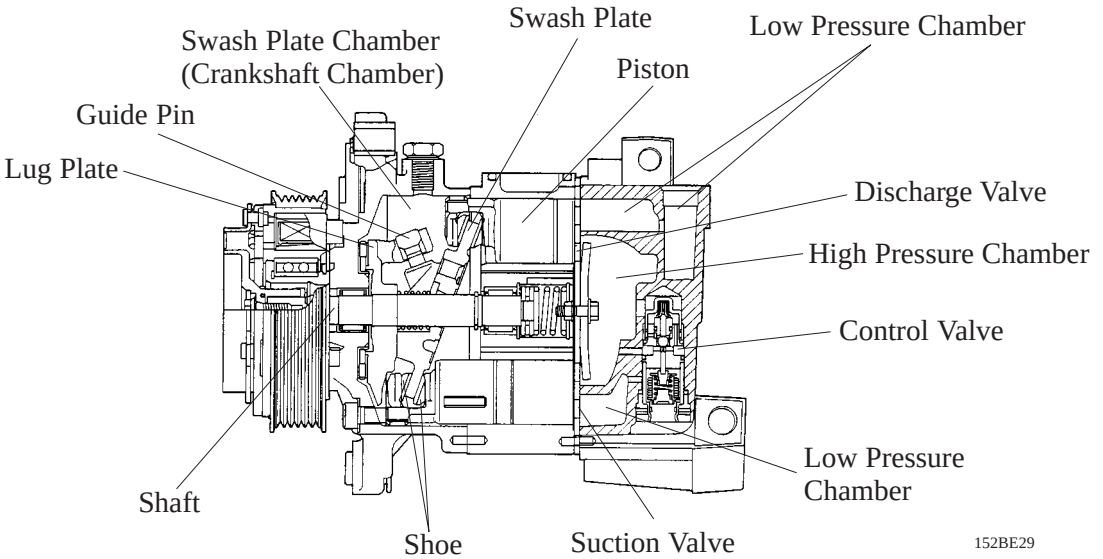
4. Compressor

A continuously variable capacity compressor that varies the capacity of the compressor according to the cooling load of the air conditioner has been adopted on models except G.C.C. Countries.

Construction

When the magnetic clutch is turned ON and the shaft rotates, this movement is transmitted via the lug plate that is connected to the shaft to rotate the swash plate. This rotational movement of the swash plate is transmitted via the shoe to the reciprocal movement of the piston in the cylinder, which performs the suction, compression, and discharge of the refrigerant.
The control for varying the compressor capacity is effected in the following manner: Based on the changes in pressure that occur in the low-pressure side in accordance with the cooling load, the control valve regulates the swash plate chamber's internal pressure to vary within the low- to medium pressure range. This change of pressure changes the swash plate angle, varies the piston stroke, and changes the amount of refrigerant that is discharged.



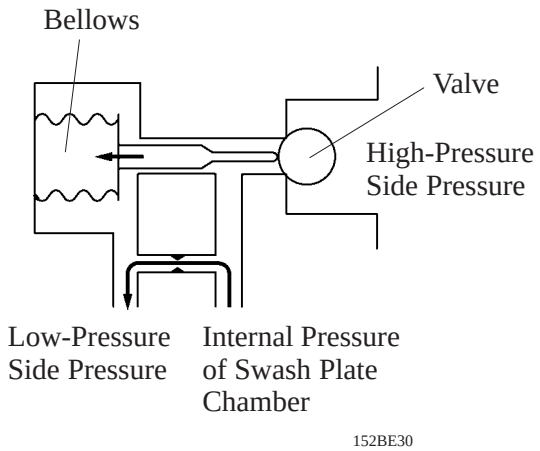
152BE29

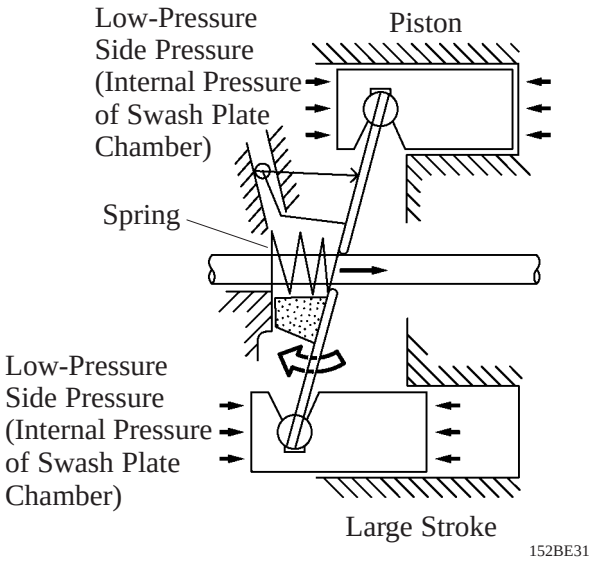
Operation

1) When the cooling load is large (interior temperature is high), operating at 100% capacity

When the cooling load becomes large and the pressure in the low-pressure side increases, the bellows in the control valve contracts, causing the valve to close between the high-pressure chamber and the swash plate chamber. As a result, the internal pressure in the swash plate decreases gradually, causing the internal pressure in the swash plate and the pressure of the low-pressure side to ultimately reach equilibrium.

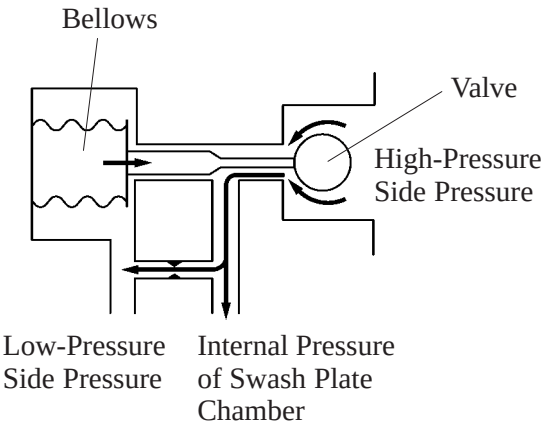
At this time, the compound force (consisting of the pressure of the low-pressure side, the reaction force from the lug plate, and the force of the spring) that is applied to the left side of the piston becomes lower than the internal pressure of the cylinder that is applied to the right side of the piston. Therefore, the piston moves towards the left, causing the tilt of the swash plate to increase. Accordingly, the amount of piston stroke increases, and when the piston stroke is at its maximum (when the tilt of the swash plate is at its maximum), the compressor operates at its 100% capacity.





2) When the cooling load is small (interior temperature is low)

When the cooling load becomes small and the pressure of the low-pressure side decreases, the bellows in the control valve expands, causing the valve between the high-pressure chamber and the swash plate chamber to open. As a result, the pressure of the high-pressure side is introduced into the swash plate chamber, causing the pressure in the swash plate chamber to increase.
Therefore, the compound force (consisting of the pressure in the swash plate chamber, the reaction force from the lug plate, and the spring force) that is applied to the left side of the piston becomes higher than the internal pressure of the cylinder that is applied to the right side of the piston. Then, the piston moves to the right, causing the tilt of the swash plate to decrease. As a result, the piston stroke becomes shorter and the amount of refrigerant that is discharged becomes smaller. As the rotational resistance decreases in this manner, the engine load is reduced and fuel economy is improved.



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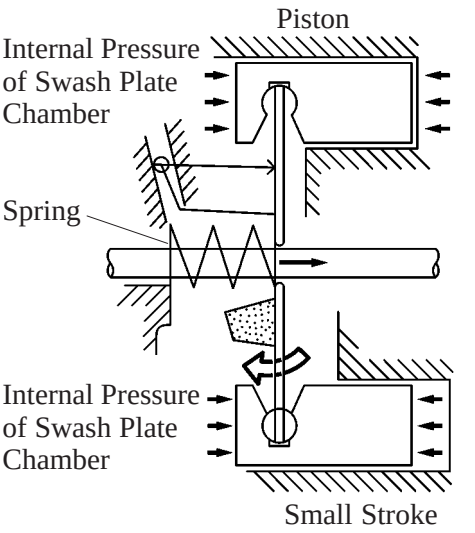

152BE33

5. Automatic Recirculation System (Models except G.C.C. Countries)

The automatic recirculation system uses an exhaust gas sensor, which detects CO and HC, to measure the amount of concentration of harmful elements such as CO and HC that are present in the air outside of the vehicle. This system automatically changes the air inlet mode based on the level of concentration of those gases.
The basic construction and operation of this system are the same as in the LS400.
For details, see the Lexus New Car Features Supplement (Pub. No. NCF144E).