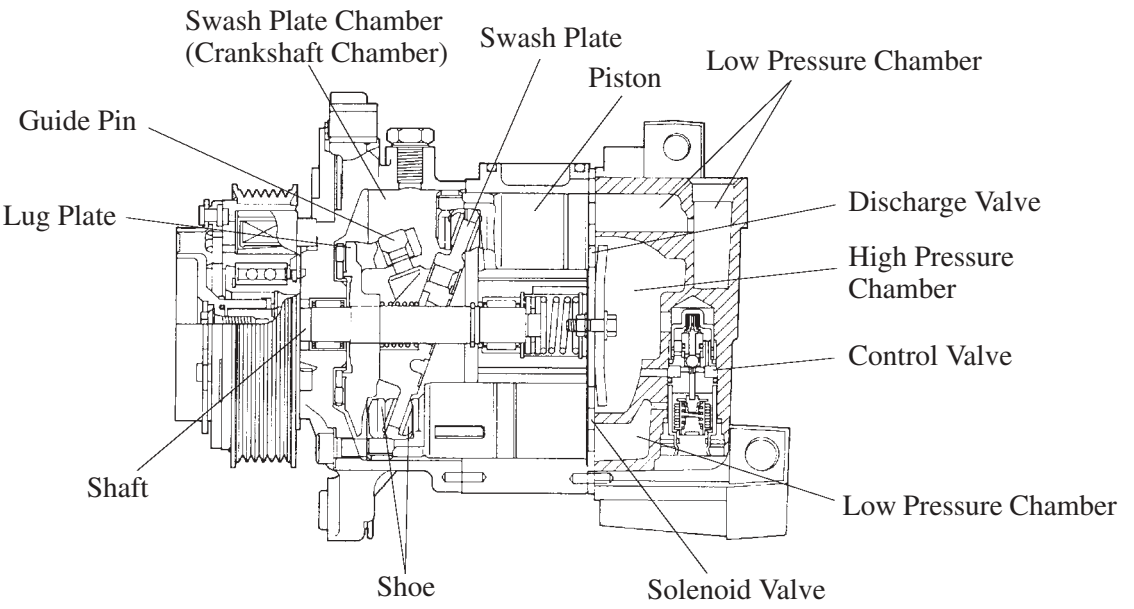
■ COMPRESSOR

1. General

- A continuously variable capacity type (7SBU16 type) compressor has been adopted.
- By varying the capacity of the compressor in accordance with the air conditioning load, the load the compressor applies on the engine has been reduced, thus improving fuel economy.

2. Construction

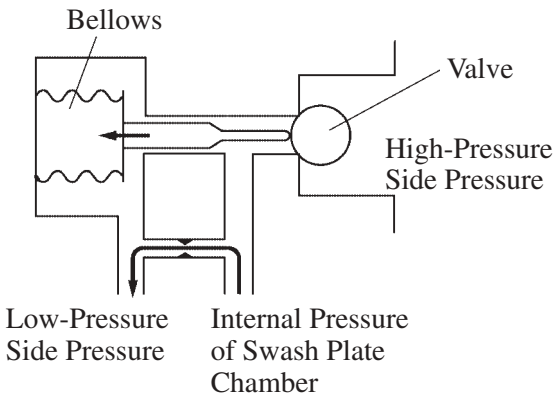
When the magnetic clutch is turned ON and the shaft rotates, this movement is transmitted via the lug plate that is connected to the shaft to rotate the swash plate. This rotational movement of the swash plate is transmitted via the shoe to the reciprocal movement of the piston in the cylinder, which 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.



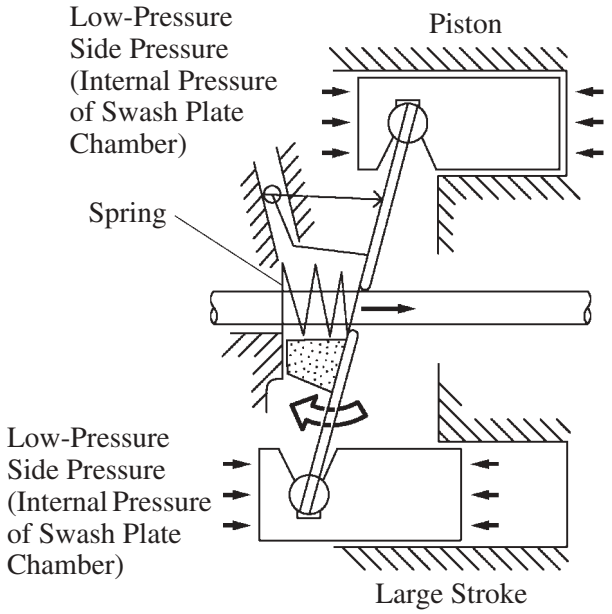
3. Operation

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.



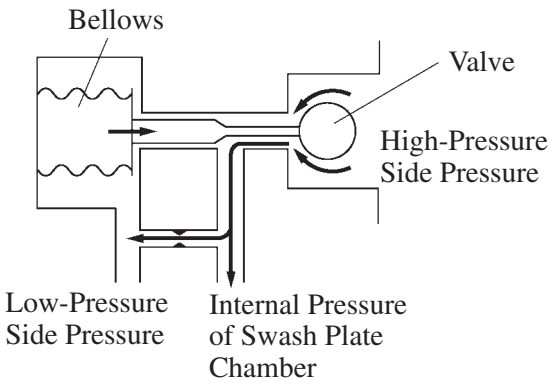
152BE30



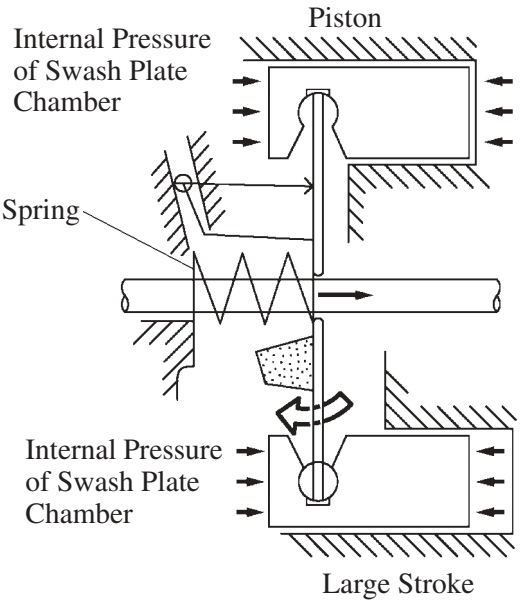
152BE31

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.



152BE32



152BE33