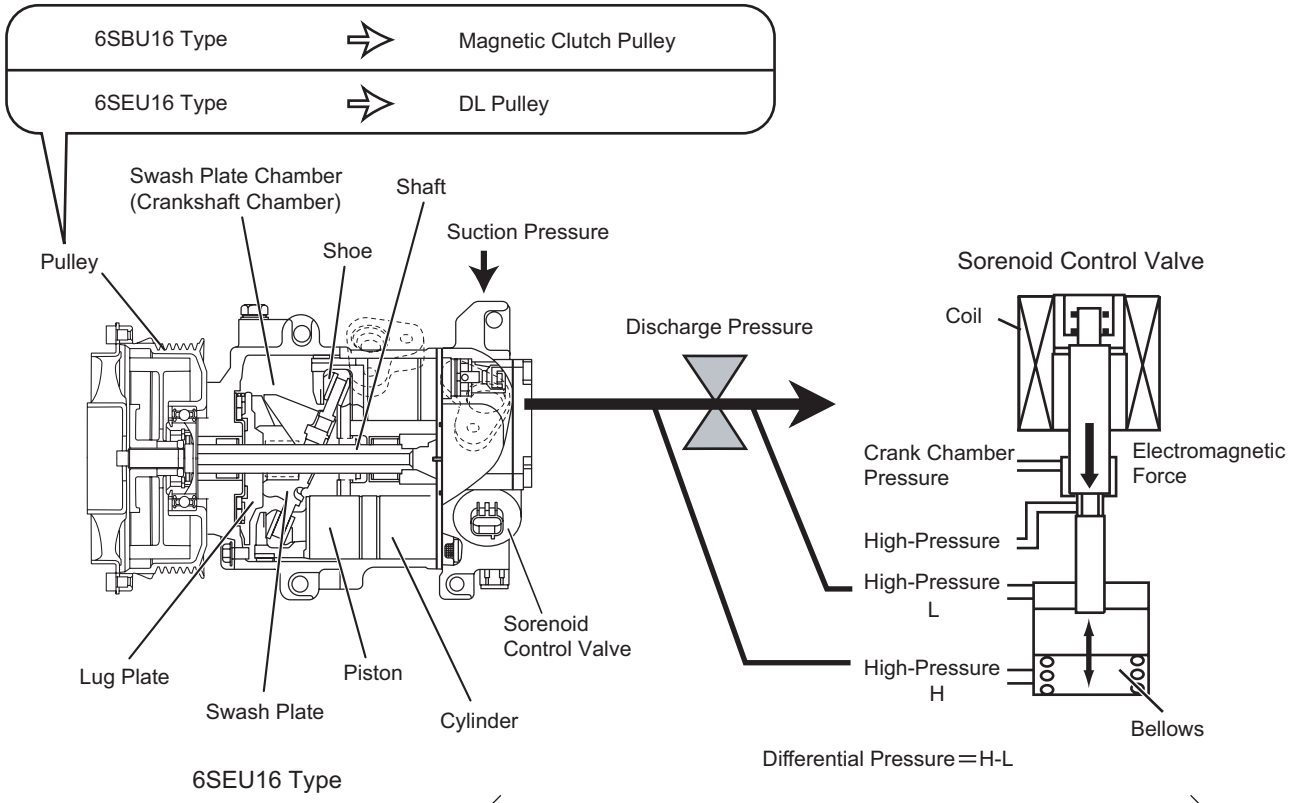
Compressor

● An external control-type continuous variable capacity compressor is used.6SEU16-type is used for the vehicle with 3UZ-FE engine,6SBU16-type is used for the vehicle with 3GR-FSE engine and 3GR-FE engine.

External Control-Type Continuous Variable Capacity Compressor Structure

• When 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 section, 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 regulate 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.Furthermore, by varying the control amperage applied to the solenoid control valve, the discharge capacity control range can be widened by steplessly varying the pressure in the low pressure side, in order to improve air conditioner performance and energy savings.



6SEU16 Type

The amperage (duty cycle value) that is applied to the coil of the flow volume control valve controls the electromagnetic force, which varies the internal pressure in the swash plate chamber by expanding or contracting the bellowss.

Note: The illustration is depicted as image.

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Flow Volume Control Valve

- The conventional variable capacity compressor is controlled by detecting the suction pressure. However, the new flow volume control valve effects control by detecting the pressure differential before and after the discharge pressure restrictor. In contrast to the conventional control valve, which cannot control torque, the flow volume control valve can estimate and control torque because the pressure differential is proportionate to torque. Thus, the system can effect optimal engine control in accordance with the torque of the compressor.

Lock Sensor

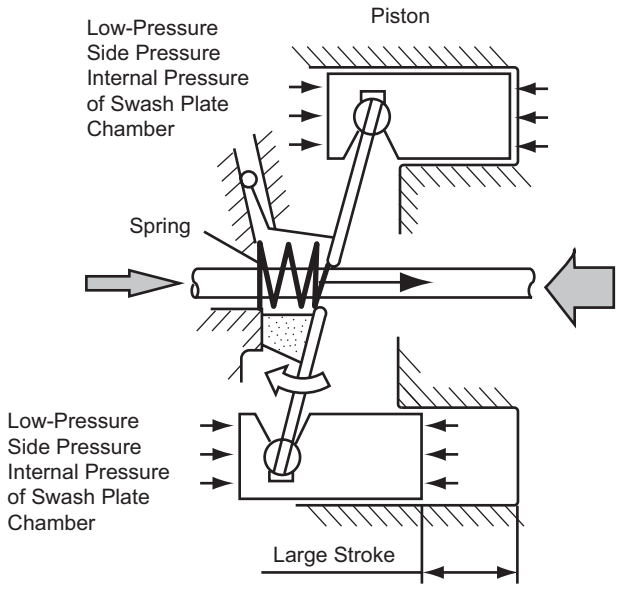
- A lock sensor that picks up the speed is incorporated in the 6SBU16 model. This enables the system to compare the crankshaft pulley speed and the compressor pulley speed. If the compressor pulley exceeds a predetermined slippage rate, the system controls the magnetic clutch to turn OFF.

DL Pulley

- The 6SEU16 type compressor uses a DL pulley. The DL pulley contains a damping mechanism and a limiter mechanism. The damping mechanism absorbs the torque fluctuations of the compressor, and the limiter mechanism protects the belt in case the compressor becomes locked. Consequently, the magnetic clutch that is used on the conventional system is no longer necessary.

When the cooling load is large(interior temperature is high), operating at100% capacity

- When the cooling load becomes large and the pressure in the low-pressure side increases, the air conditioner ECU outputs signals to the solenoid control valve in accordance with the signals from the evaporator temperature sensor. This causes the bellows to contract, the valve to close,and the valve to close between the high-pressure chamber and the swash plate chamber. As a result, the internal plessure 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, and the reaction force from the lug plate)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.



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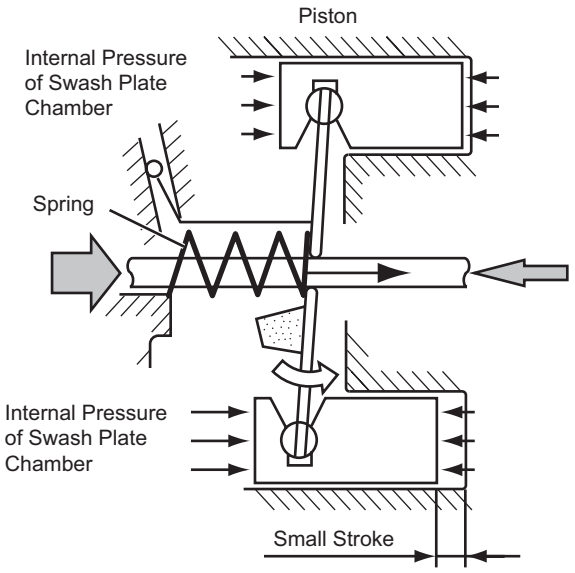
When the cooling load is small(interior temperature is low)

- When the cooling performance is low and the pressure of the low-pressure side decreases, the ECU outputs signals to the solenoid control valve in accordance with the signals from the evaporator temperature sensor. This causes the bellows to expand, the valve to open, and 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 and the reaction force from the lug plate)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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