

6.5 Air conditioning system

6.5.1 Air conditioner control panel

1. Pull air from the inside
2. Pull air from the outside
3. Fan speed control and air conditioner compressor control
4. Temperature control

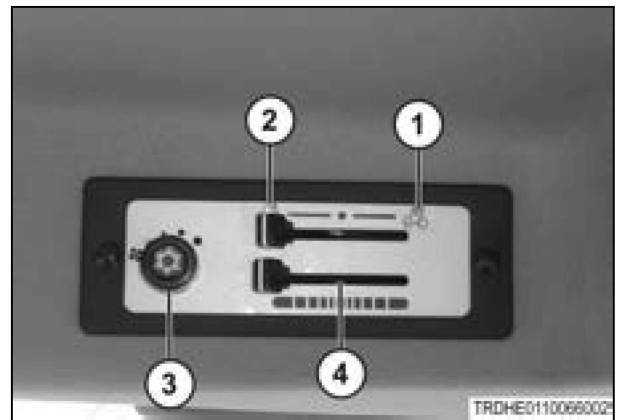


Fig. 50

The control panel fastens to the right upper frame, the air conditioner unit, and the inner roof (rear side).

The control panel fastens to the inner roof with screws and nuts.

- (1) The fastening point to the inner roof.

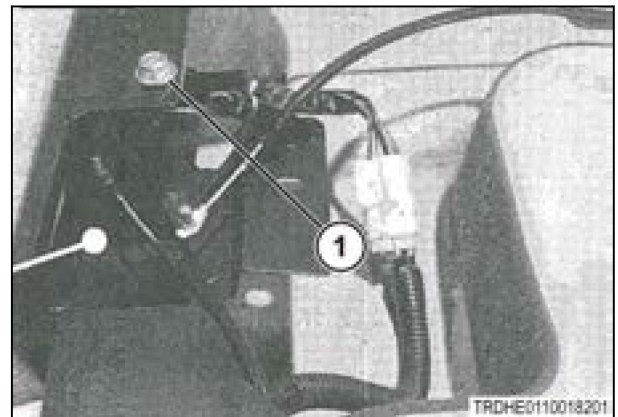


Fig. 51

6.5.2 Air conditioning dual pressure switch

The dual pressure switch (1) is installed on the rear right side of the roof.

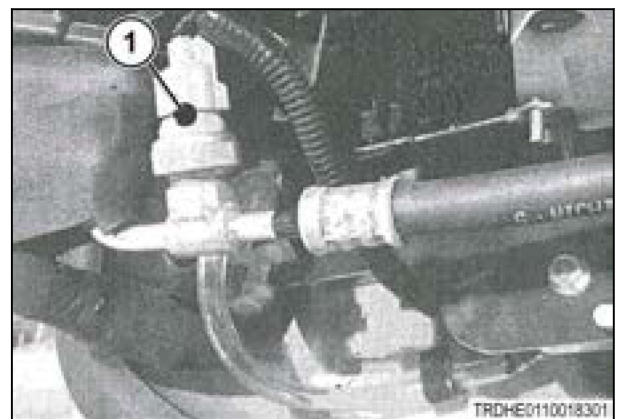


Fig. 52

6.5.3 Cab wire harness

The cab wire harness is supplied from the engine running through the dash panel, under the left floor into the left fender of the cab.

The cab wire harness runs from the left fender through the left pillar to both sides of the upper cab frame

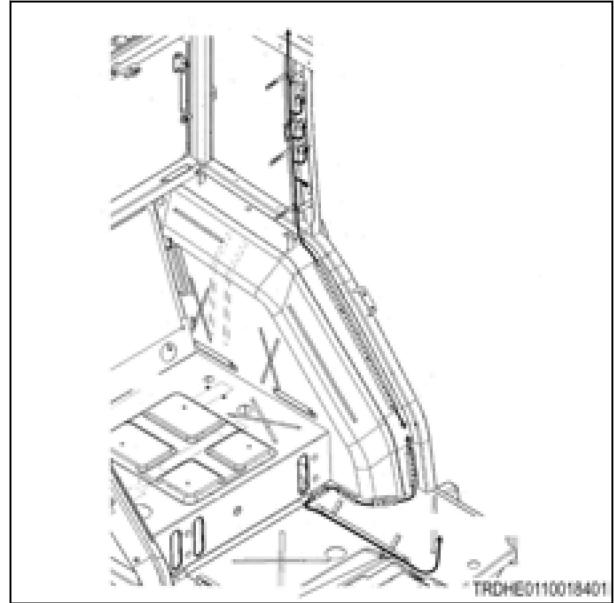


Fig. 53

6.5.4 Air conditioner hoses

Two air conditioner hoses connect to the right-hand side of the air conditioner unit, at the rear of the cab.

- In the front to the right front frame.
- In the rear to the right front frame.
- Below the right fender.

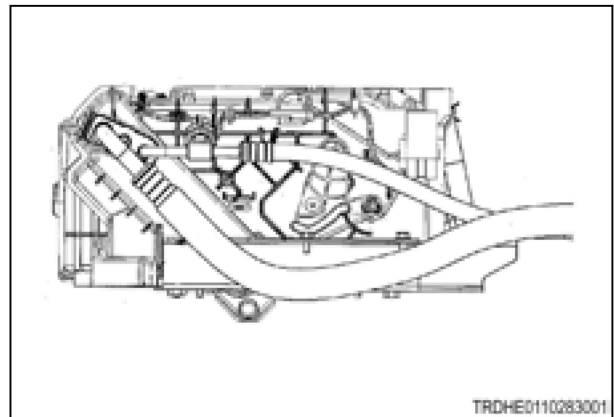


Fig. 54

- To the right side of the engine.

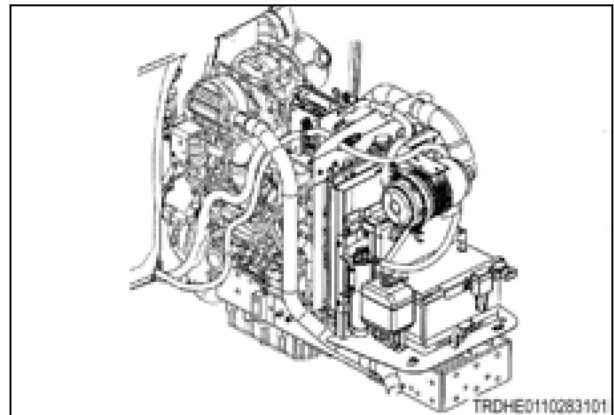


Fig. 55

- To the air conditioner compressor
- To the air conditioning condenser.

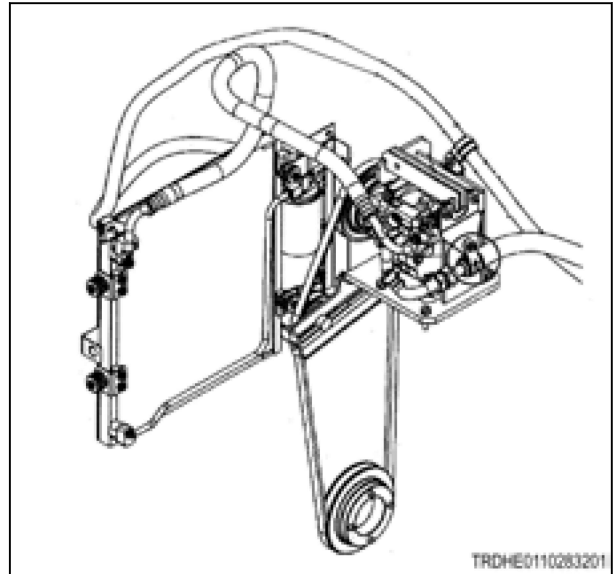


Fig. 56

6.5.5 Heater hoses

The heater hoses connect at the left hand side of heater core to the engine

- On the left side of heater core to front frame.
- Below the left-hand fender.

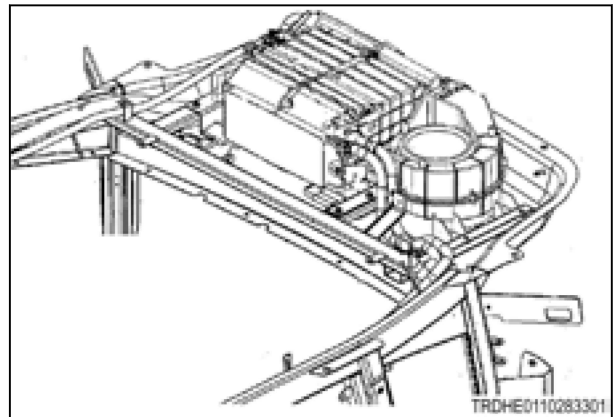


Fig. 57

- On the left hand side of the engine.
- Return to the engine.
- Supply to the heater core.

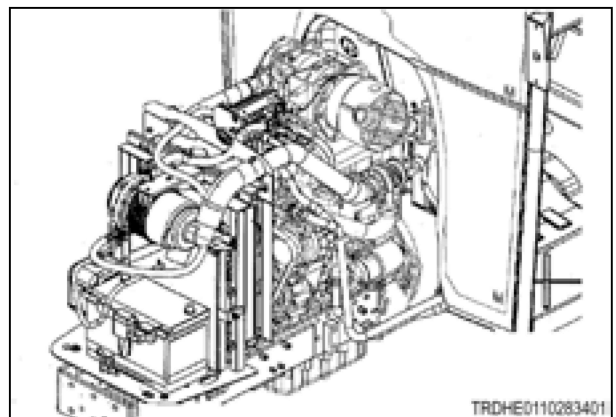


Fig. 58

6.5.6 Replacing the roof seal

Procedure

1. Remove the cab roof.

6. Cab

2. Remove the seal.
3. Clean the seal contact surface on the roof and the cab frame.
4. Install the seal (1).
5. Install the cab roof.

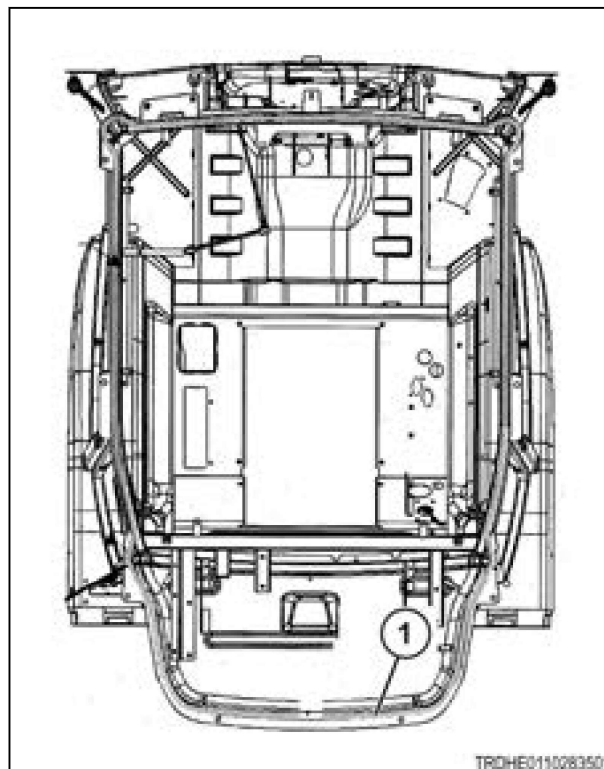


Fig. 59

6.5.7 Air conditioner outline

The tractor has a scroll type compressor that mounts to the engine and an air conditioning unit under the cab roof. A sliding lever on the air conditioner control panel inside the cab, controls the cab temperature. The temperature lever and three speed fan switch controls the cooling and heating inside the cab. Opening and closing the grille changes air delivery from the air ducts.

- (1) Condenser located in front of radiator.
- (2) Air conditioner unit
- (3) Fresh air filter
- (4) Compressor and belt



Fig. 60

6.5.8 Air conditioner system specifications

Item		Specification	Remarks
Performance	Air-cooling	3.2 kW, Airflow 350 cu m/h	Compressor speed: 2800 rpm
	Air-heating	4.0 kW, Airflow 290 cu m/h	Hot water circulation: 6 L/min (1.6 g/min)
Normal working voltage		12V	
Compressor	Model	SCSA06C	
	Delivery volume	60 cc/rev	
	Working speed	950 to 3000 rpm	
	Lubricant	ND-OIL8, 60 cc	
	Model	LC35 (double row)	
Magnetic clutch	Drive belt	Type A, single	
	Pulley effective diameter	120°	
	Power consumption	35W	
Condenser	Type	Multi-flow with louver	
receiver drier	Capacity	370 cc	
	Dehumidifying capacity	32 g (desiccant 290 g)	60° C (140° F), 90% in the air
	Evaporator	Corrugated fins, fin-pitch 3.0 mm	
Air conditioner unit	Heater core	Corrugated fins, fin-pitch 1.8 mm	
	Blower motor	62° ferrite magnet, power consumption 200 W	
	High-pressure relief	Relief pressure:3.4 to 4.14 MPa (493.13 to 600.46 psi)	
Pressure switch	Valve	Closing pressure: 2.75 MPa (398.85 psi)	
	High-pressure ON	3.14 MPa (455.42 psi)	
	Low-pressure OFF	0.196 MPa(28.43 psi)	
Water-tightness	Indoor	JISD0203-S2	
	Outdoor	JISD0203-M2	
Temperature control	Lever type		
Type of air conditioner	Air mix type		
Refrigerant to be applied R134a		900 to 1000 g (31.75 to 34.25 oz)	
Lubricant	ND-OIL8	60 cc (2.02 oz)	

6.5.9 Condenser

The condenser returns the liquid to the refrigerant gas. When the air-cooling efficiency of the condenser is poor, the condenser deteriorates the performance of the air conditioner.

- (1) Intake side
- (2) Delivery side

IMPORTANT: *When the condenser cores are stopped up, the air conditioner does not get cold at all and the refrigerant gas is pressurized too much. This can lead to the compressor seizing or belt slippage. Check the condenser daily and keep clean.*

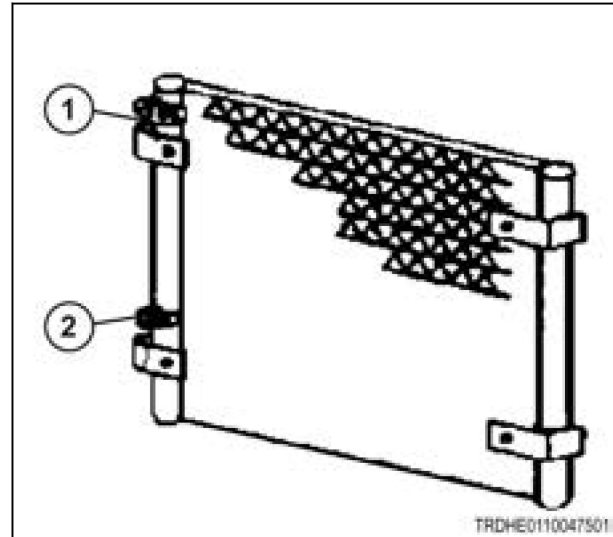


Fig. 61

6.5.10 Compressor

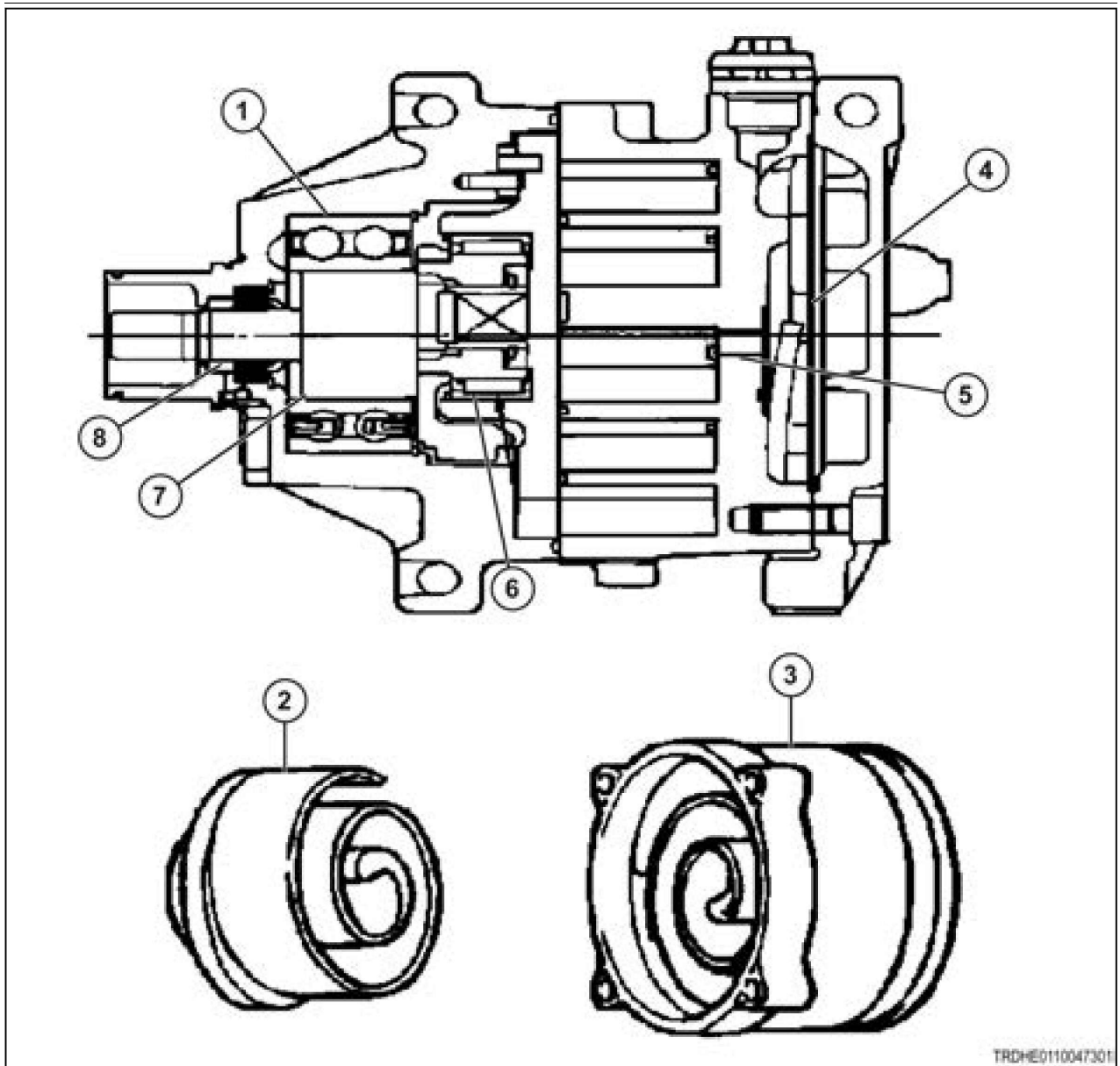


Fig. 62

The compressor pressurizes the gas refrigerant that has evaporated depriving the indoor heat in the evaporator and delivers the reffridgerant to the high-pressure circuit again.

The scroll type compressor is composed of a fixed scroll and a movable scroll. The movable scroll turns inside the fixed scroll and the capacity of the space partitioned by both scrolls change, and thus, refrigerant is inhaled and compressed. The lubrication of the compressor is done with the compressor oil contained in the gas refrigerant. Therefore, a pressure switch is provided in the circuit to shut off the magnetic clutch when refrigerant decreases in order to protect the compressor from seizure.

- (1) Ball bearing
- (2) Movable scroll
- (3) Fixed scroll
- (4) Delivery valve
- (5) Delivery port
- (6) Needle roller bearing
- (7) Shaft
- (8) Shaft seal

Magnetic clutch

The magnetic clutch (1) transmits or shuts off the engine power to the compressor while the engine is running and the air conditioner switch is on. The magnetic clutch stops the compressor when the indoor temperature has reached the specified level set by the control lever. The magnetic clutch then restarts the compressor when the temperature exceeds the specified level.

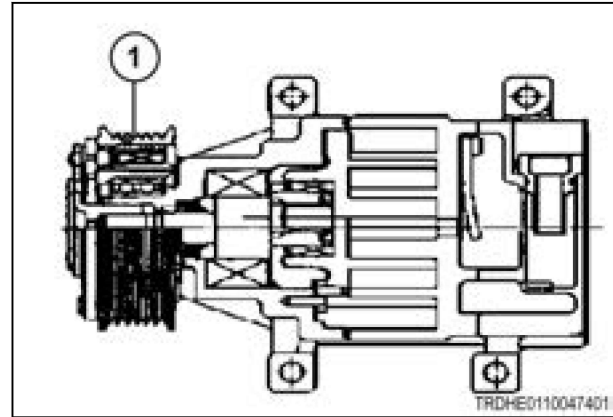


Fig. 63

Safety relief valve

The safety relief valve opens when the pressure on a high-pressure side of the refrigerating cycle rises abnormally, and a part of the refrigerant is discharged.

Opening pressure 3.43 to 4.17 MPa (497.50 to 604.80 psi)

Closing pressure

2.75 MPa (398.85 psi)

Opening pressure

2.75 MPa (398.85 psi)

Closing pressure

2.75 MPa (398.85 psi)

Opening pressure

6.5.11 Receiver dryer

Receiver tank

- (1) Refrigerant inlet
- (2) Refrigerant outlet
- (3) Desiccant
- (4) Strainer
- (5) Receiver tube
- (6) Receiver tank

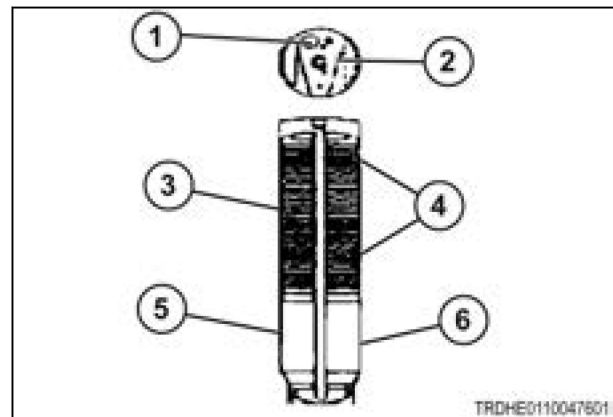


Fig. 64

In the air conditioner system, the compressor speed changes and the required volume of the refrigerant also changes as the engine speed changes. The receiver tank stores refrigerant to use when increase volume is required. When the cooling circuit does not require as much refrigerant, the tank stores the extra refrigerant. When the system requires more refrigerant, the receiver tube supplies the necessary volume to the circuit. The tanks holds extra refrigerant to supply the circuit when refrigerant is lost through the hoses because of osmosis.

Dryer (desiccant)

Moisture content in the cooling circuit will cause valve damage in the compressor. Moisture will also cause decrease lubricant performance, pitting of the metal surfaces in the circuit, and stopped-up circuit caused by freezing in the expansion valve. In the air conditioner system a synthetic zeolite is used as an approved desiccant to remove moisture content from the circuit. A frozen expansion valve shows that the desiccant has lost function to take in moisture content, so the receiver dryer must be replaced.

IMPORTANT: *When the cooling circuit is disassembled and left out for a long time, the desiccant will take in moisture that is in the air. This will decrease the desiccant life. This will cause the replacing the receiver dryer. When the cooling circuit is disassembled, make sure to close up the opening without fail.*

6.5.12 Air conditioner unit

The air conditioner unit is configured of the evaporator, heater core, expansion valve, blower motor, and the control system parts. The fins are cooled by gas refrigerant from the expansion valve low pressure and low temperature. The evaporator removes the heat and moisture from of the inside by use of air ventilation from the blower motor. The heater core located in front of the evaporator and is heated by the engine coolant. The warm engine coolant then heats up the air from the blower motor.

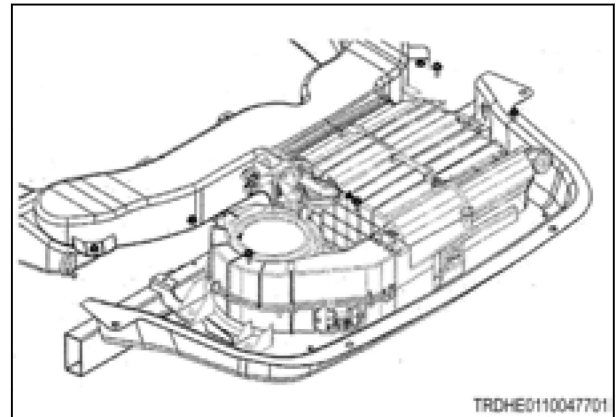


Fig. 65

6.5.13 Air conditioning dual pressure switch

The dual pressure switch protects the air conditioning system from damage if pressure is too high or too low. Pressure too low causes poor lubrication and will damage the compressor. The pressure switch installs in the high side of the air conditioner system. The dual pressure switch turns off the compressor when the high side pressure is more than 3.14 MPa (455.42 psi) or the less than 0.196 MPa (28.43 psi).

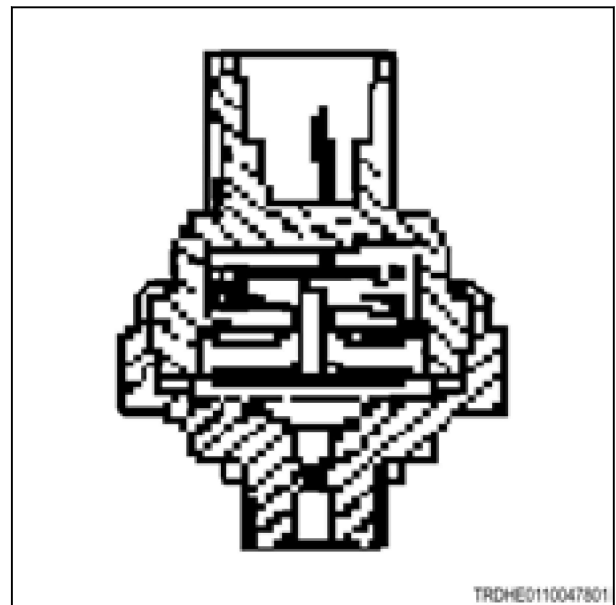


Fig. 66