

TABLE OF CONTENTS

1. CABIN	6-2		
1.1 Interior devices	6-2	4.8 Moisture intrusion into cooling cycle.....	6-26
1.2 Exterior devices	6-2	4.9 Poor recirculation of refrigerant	6-26
1.3 Cabin components	6-3	4.10 Cabin system inspection	6-27
1.3.1 Air conditioner controller	6-3	4.10.1 Leakage test	6-27
1.3.2 Wiper motor	6-5	4.10.2 When assembling.....	6-27
1.3.3 Washer tank.....	6-6	5. TROUBLESHOOTING	6-31
1.3.4 Wiper/Washer fluid switch	6-6	5.1 Visual and auditory inspection	6-31
1.3.5 Stereo (Bluetooth).....	6-6	5.2 Troubleshooting by symptoms	6-32
1.3.6 Antenna.....	6-6	5.3 Troubleshooting poor cooling/heating	
1.3.7 Speaker.....	6-6	performance	6-33
2. HEATING & COOLING SYSTEM	6-7	5.3.1 Poor cooling performance	6-33
2.1 Specifications.....	6-7	5.3.2 Poor heating	6-35
2.2 HVAC system flow diagram	6-7	6. EXPLODED VIEW	6-36
2.3 Components	6-8	6.1 LF1-G334001 Speaker antenna group	6-36
2.3.1 Compressor	6-8	6.2 LF1-G335501 Wiper motor group.....	6-37
2.3.2 Receiver-drier	6-9	6.3 LF1-G4A1001 Door group.....	6-38
2.3.3 Condenser	6-10	6.4 LF1-G4E1001 Wiper group	6-39
2.3.4 Air conditioner.....	6-11	6.5 LF1-G451001 Air conditioner drive group...	6-40
2.3.5 Air inlet/vent.....	6-18	6.6 LF1-G466001 Cabin support group.....	6-41
2.3.6 Electric fan motor.....	6-18	6.7 LF1-G491001 Cabin frame group	6-42
3. OPERATING PRINCIPLE	6-20	6.8 LF1-G4B1001 Air conditioner group	6-43
3.1 Cooling operation	6-20	6.9 LF1-G4B2001 Air conditioner duct group...	6-44
3.1.1 Cooling cycle	6-21	7. MAINTENANCE	6-45
3.1.2 Refrigerant and refrigeration oil	6-22	7.1 Opening the cabin (Lifting up)	6-45
4. INSPECTION AND ADJUSTMENT	6-23	7.2 Cabin removal	6-46
4.1 Inspection with gauge	6-23	7.3 Cabin components disassembly &	
4.2 Normal condition.....	6-23	Assembly	6-49
4.3 Insufficient refrigerant.....	6-23	7.4 Air conditioner & Heater disassembly.....	6-61
4.4 Excessive refrigerant and insufficient		7.5 Condenser disassembly.....	6-67
condenser cooling performance.....	6-24	7.6 Fan motor disassembly	6-69
4.5 Air intrusion into cycle.....	6-24	7.7 Compressor disassembly.....	6-69
4.6 Defective expansion valve	6-25	7.8 Compressor assembly	6-71
4.7 Poor compressor compression.....	6-25	7.9 Heat hose/air conditioner hose assembly...	6-72
		7.9.1 Heater hose	6-72
		7.9.2 A/C hose (Refrigerant)	6-72
		7.10 Wind shield assy kit.....	6-74

1. CABIN

1.1 INTERIOR DEVICES

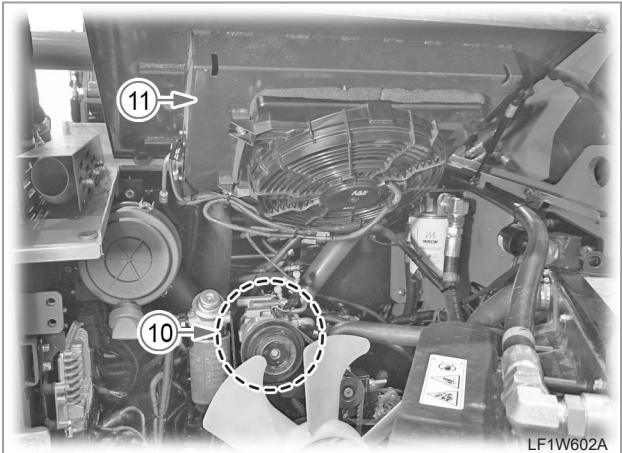


- (1) Front air vent (Duct)
- (2) Front air vent (Duct)
- (3) Air conditioner controller

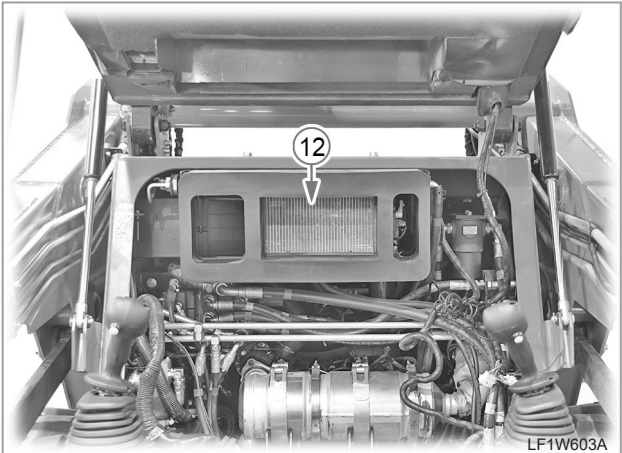
- (4) Speaker (LH)
- (5) Rear air vent (Duct)
- (6) Rear air vent (Duct)

- (7) Speaker (RH)
- (8) Stereo (Bluetooth)
- (9) Washer tank

1.2 EXTERIOR DEVICES



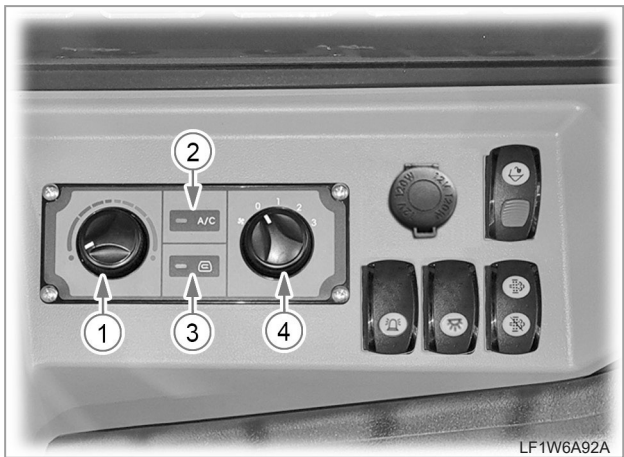
- (10) Compressor
- (11) Condenser



- (12) Air conditioner

1.3 CABIN COMPONENTS

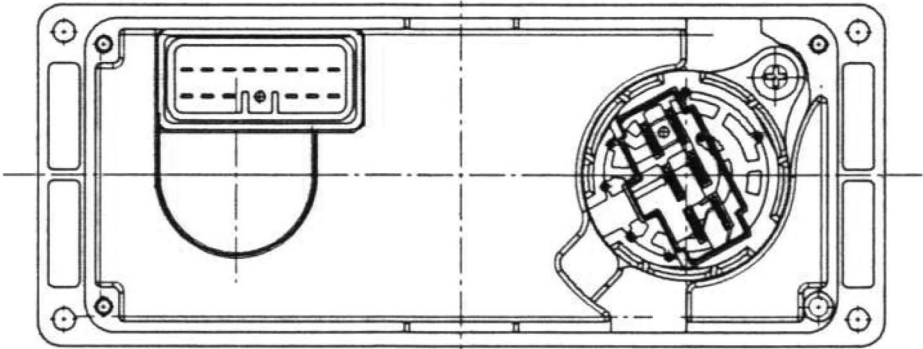
1.3.1 AIR CONDITIONER CONTROLLER



- (1) Temperature control dial
- (2) Air conditioner power button
- (3) Air vent conversion button
- (4) Fan speed control switch

The A/C controller, located at the upper left of the driver's seat, consists of a temperature control dial for selecting cooling and heating, an A/C power button, a recirculation button to switch between the recirculation mode and the fresh air mode, and a 3-stage blower motor control dial.

CONNECTOR & CIRCUIT



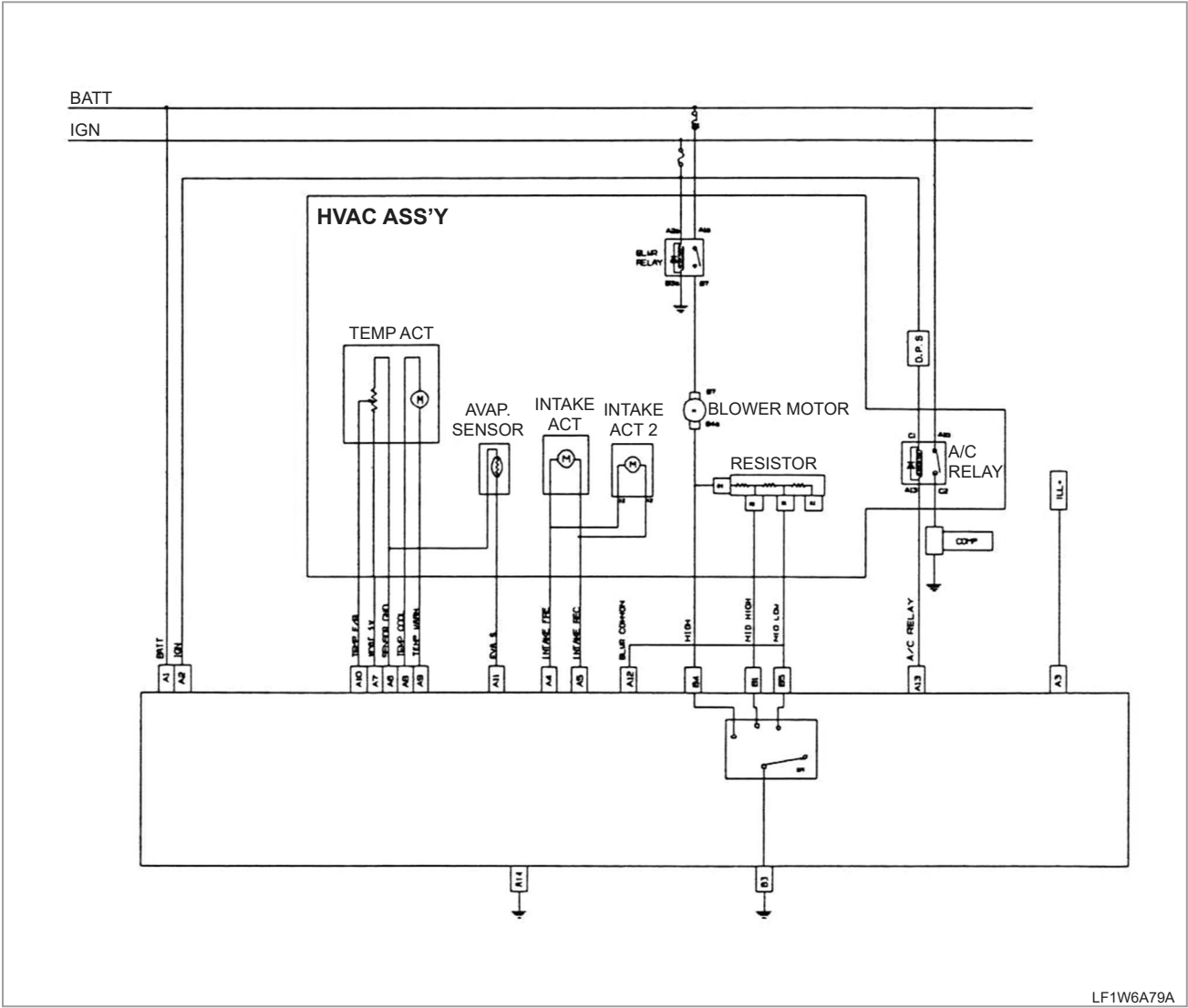
A1	A2	A3			A4	A5	A6
A7	A8	A9	A10	A11	A12	A13	A14

B1	B2	B3
B4	B5	B6

Pin No.	Function	Pin No.	Function
A1	BATT	A8	TEMP ACT (COOL)
A2	IGN	A9	TEMP ACT(WARM)
A3	TAIL LAMP	A10	TEMP ACT F/B
A4	INTAKE FRE	A11	EVAP. SENSOR
A5	INTAKE REC	A12	BLWR COMMON
A6	SENSOR GND	A13	A/C RELAY
A7	(5V)	A14	GND

Pin No.	Function
B1	MID HIGH
B2	N.C
B3	GND
B4	HIGH
B5	MID LOW
B6	N.C

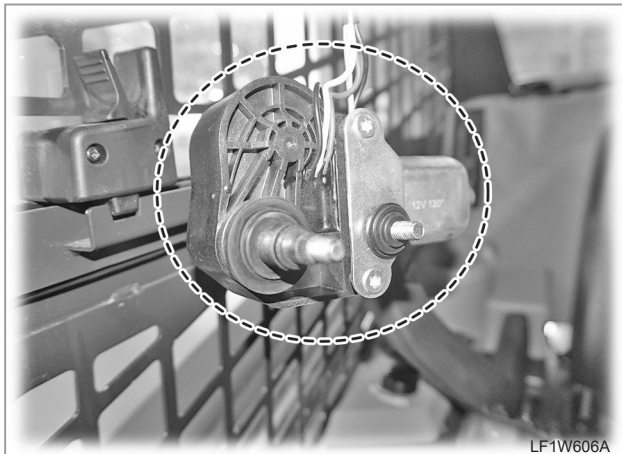
LF1W605A



1.3.2 WIPER NOTOR



LF1W605A



LF1W606A

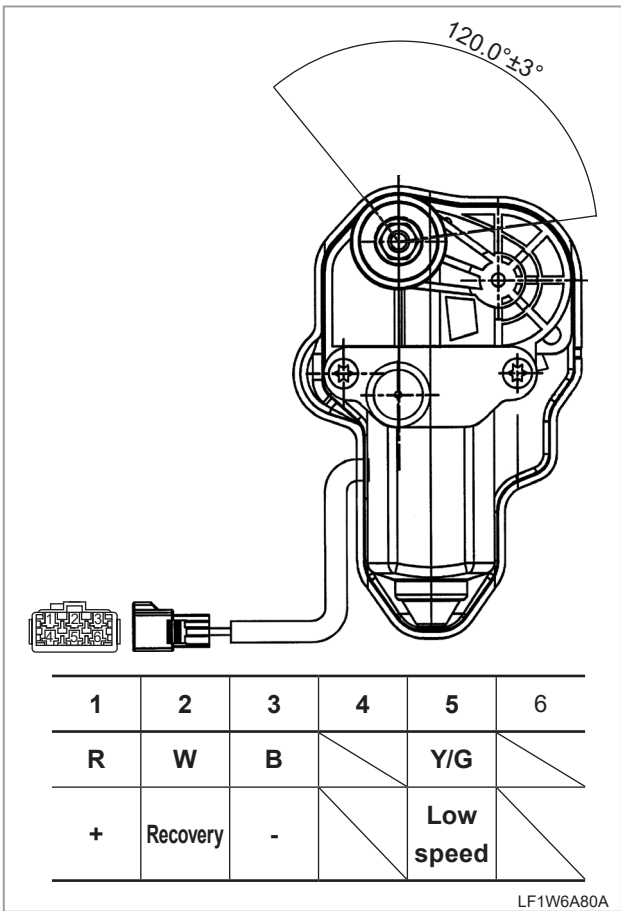


LF1W607A

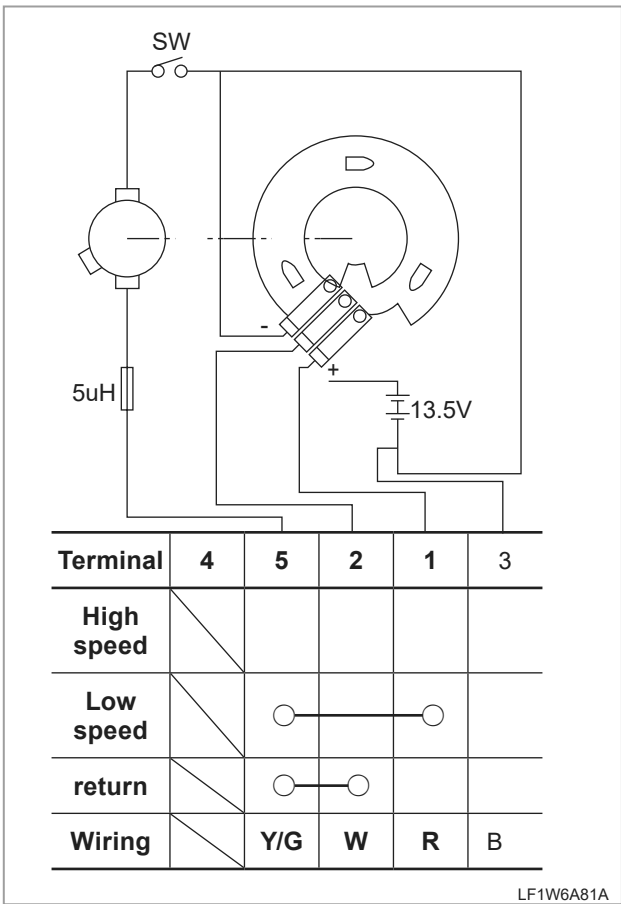
The wiper motor mounted in the front right of the front door of the cabin operates the wiper on the windshield of the door when the wiper switch is pressed.

- Rated voltage : 12 VDC
- Operating voltage : 10 ~ 15 VDC
- Idle speed : 45 ± 5 rpm
- Rotation angle : $120^\circ \pm 3^\circ$

CONNECTOR & CIRCUIT



LF1W6A80A



LF1W6A81A

1.3.3 WASHER TANK



The washer fluid tank, located at the lower right of the driver's seat, stores the washer fluid that is ejected when the washer switch is pressed.

1.3.4 WIPER/WASHER FLUID SWITCH



The wiper/washer fluid switch is located on the switch panel at the upper right of the driver's seat.

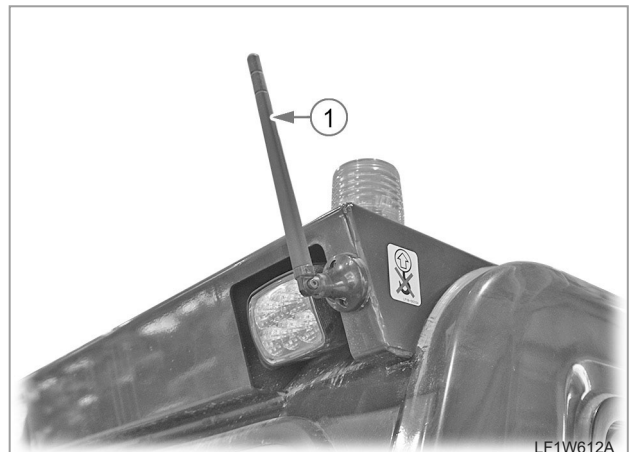
When the wiper switch is pressed once, the wiper is operated, and when it is pressed again, the washer fluid is ejected.

1.3.5 STEREO (BLUETOOTH)



The stereo, located the rear right of the driver's seat, is equipped with an audio/radio function and a Bluetooth player supporting short-range wireless communication.

1.3.6 ANTENNA



The antenna, mounted on the right edge of the cabin roof, is connected to the stereo body via the roof.

1.3.7 SPEAKER



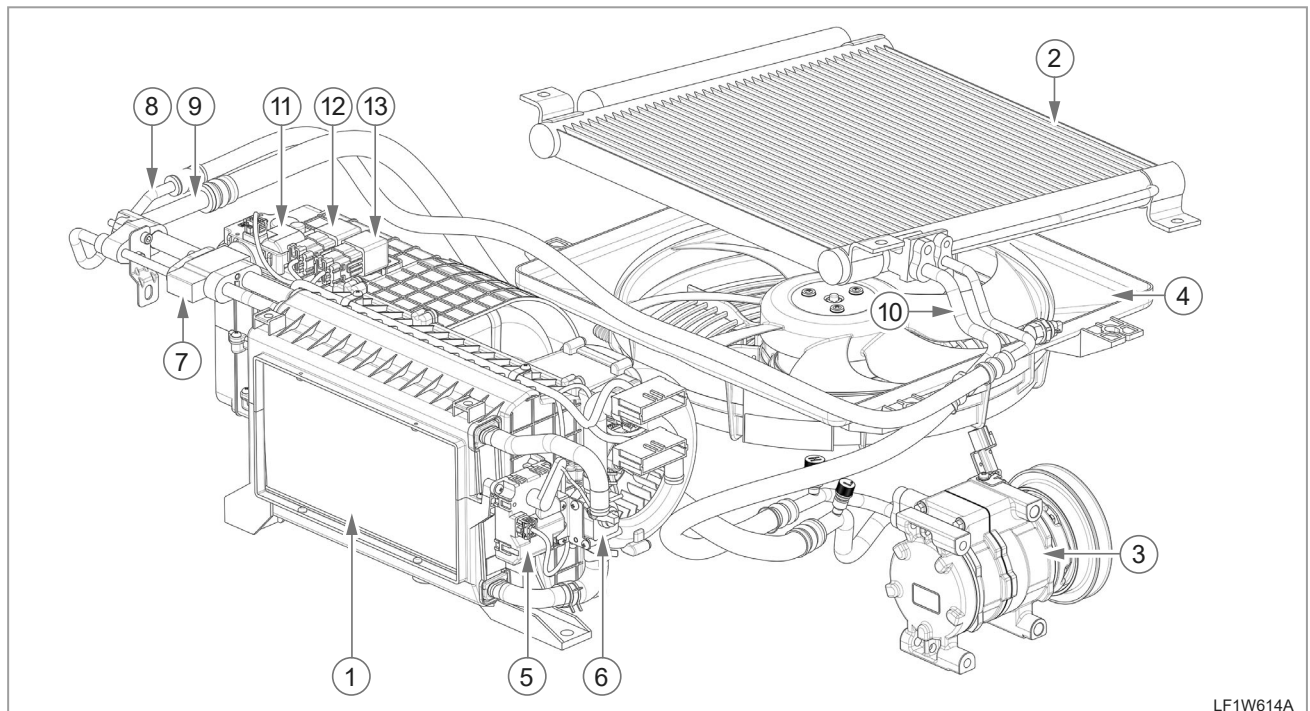
The speakers (1) are located on the left and right sides behind the driver's seat.

2. HEATING & COOLING SYSTEM

2.1 SPECIFICATIONS

ITEM	SPECIFICATION
Cooler	Standard cooling capacity : 3,900 kcal/h - 10% Min Standard blowing speed : 400 m³/h Refrigerant : R-134a Refrigerant capacity : 600 g (1.32 lbs)
Heater	Standard heating capacity : 4,400 kcal/h ±10% or more Standard blowing speed : 300 m³/h
Compressor	Displacement : 130 cc/rev Lubricant : PAG 30 Oil, 100cc Number of cylinders : 10
Condenser	Heat radiated : 6,100 kcal/h -10% Standard blowing speed : 5 m/s Receiver-drier integrated type
Thermocon	Operating temperature range : -30°C ~ 85°C (-22°F ~ 185°F)
Register	
Aircon/Heater controller	Mechanical (Motor type rotary switch) • Air direction control : Electric (Mode switch) • Temperature control: mechanical (COOL ↔ HOT) • Blowing speed control: Electric (3-stage) • A/C switch: Electric (ON/OFF)

2.2 HVAC SYSTEM FLOW DIAGRAM

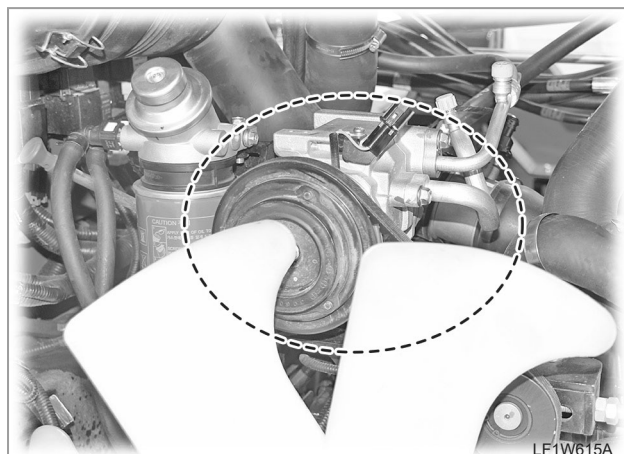


LF1W614A

- | | | |
|---|--------------------------|----------------------------|
| (1) Air conditioner
(Heater core+Evaporator) | (5) Actuator | (10) High pressure hose 2 |
| (2) Condenser | (6) Water pump | (11) Actuator |
| (3) Compressor | (7) Expansion valve | (12) Blower relay |
| (4) Fan motor | (8) High pressure hose 1 | (13) Air conditioner relay |
| | (9) Low pressure hose | |

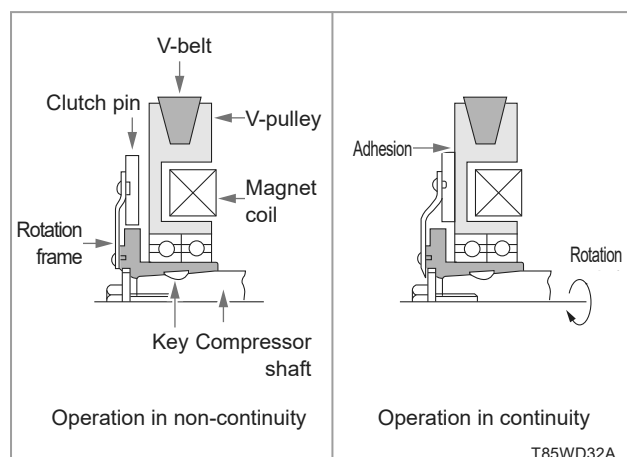
2.3 COMPONENTS

2.3.1 COMPRESSOR



The compressor rotates along with the engine crankshaft pulley through the driving belt.

As the compressor shaft rotates, the compressor compresses the refrigerant gas under low pressure which then turns into the state of high temperature and high pressure.



If the magnetic clutch is not supplied with power, the compressor clutch pulley rotates itself, not rotates with the compressor shaft. When the magnetic clutch is supplied with power, the clutch plate and the hub move back and are connected to the pulley. Then, the clutch plate is engaged with the pulley as a unit by magnetic force to rotate the compressor shaft. The rotating motion is passed from the engine to the V-pulley, clutch plate, rotation frame, key and then compressor shaft in order to operate the compressor.

When the compressor shaft rotates, the piston moves by the eccentric plate. As the angle of the swash plate changes due to pressure, the stroke of the piston changes as well and proper amount of refrigerant for certain load is sent out.

FOR HIGH COOLING LOAD

As the pressure on the inlet side rises, the high pressure relief valve operates to send the pressure from the crankcase to the inlet side.

Therefore, the pressure of the crankcase drops and the reaction from the internal pressure pushes the piston. Then, the swash plate is tilted to the max. output position where the piston stroke and the refrigerant output is increased.

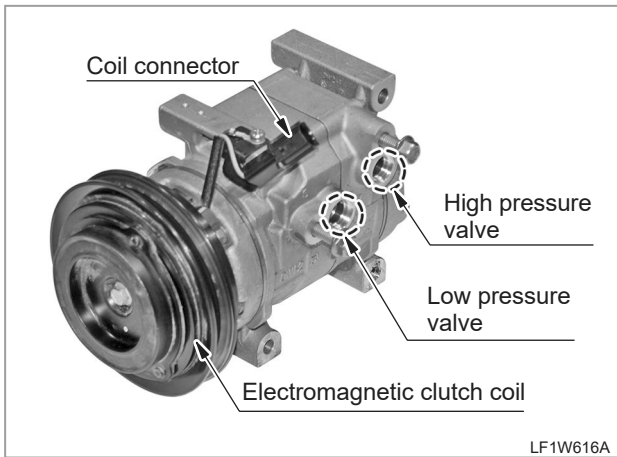
FOR LOW COOLING LOAD

As the pressure on the inlet side is low, the high pressure relief valve is disengaged and the pressure on the high pressure side moves to the crankcase. Therefore, the swash plate is pushed to the min. output position where the piston stroke and the refrigerant output is decreased.

If the compressor is not operated normally, its cause can be the electronic clutch coil, switch, fuse, relay, V-belt or other wiring connections. If the electronic clutch and the wiring harnesses are intact, malfunction of the compressor can be due to seized parts. If the pressure on the outlet of the compressor is low, its cause can be that the refrigerant is insufficient or the hose on the inlet is too narrow.

If the compressor itself is malfunctioning, measure the temperature of the air out from the center vent and the pressure on the inlet, and then compare them with the standard values.

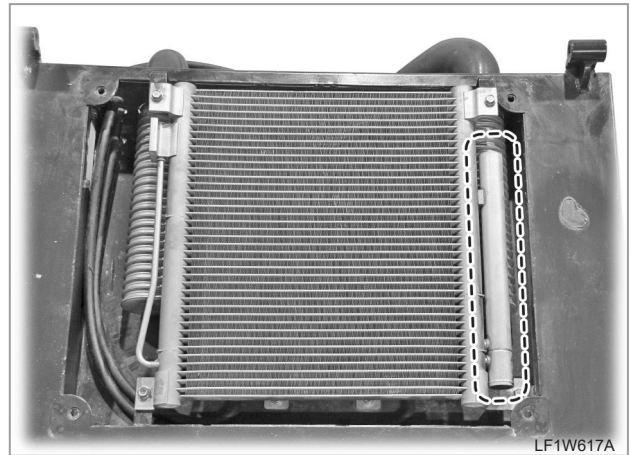
INSPECTION



It is possible to check if the amount of refrigerant is proper by comparing the temperature and the pressure. If the refrigerant loss is excessive, the oil level in the system should be checked.

1. The malfunction of the compressor can be divided into four categories; noise, seizure, leakage and poor compression. If irregular or vibrating noise is heard, apart from sympathetic sound, it could be because of excessive clearance due to a broken part or wear.
2. To check if the compressor is seized, cut off power supply to the clutch and check if the clutch driving plate rotates freely. If it does not rotate, it means that the compressor is seized.
3. Poor compression is due to the damaged seal in the compressor or clogged compressor. Also, its cause can be insufficient refrigerant or clogged circuit. Therefore, these should be checked before servicing the compressor.
4. If the compressor itself operates correctly and is not seized, check if the current going to the electronic clutch coil meets the specified value.
5. When checking oil level of the compressor, remove the check plug first.
6. If the oil is too dirty, change it with new oil.
7. To check the amount of oil for each part, turn on the air conditioner and set the fan speed to the maximum level. Run the engine at 1,000 rpm for over 20 minutes to set the system in normal operating condition. In this condition, the amount of oil for each component is as follows: (Compressor: approx. 60 cc, evaporator: 40 cc, condenser: approx. 20 cc, receiver-drier: approx. 20 cc)

2.3.2 RECEIVER-DRIER



STORING FUNCTION

It stores the liquid refrigerant which is sent to the evaporator depending on heat load.

BUBBLE SEPARATION FUNCTION

As there are some bubbles in the liquid refrigerant coming from the condenser, the bubbles keep gas refrigerant in.

The bubbles are separated from the liquid refrigerant and only the liquid refrigerant is sent to the expansion valve.

WATER SEPARATION FUNCTION

It removes moisture and foreign material from the refrigerant.

2.3.3 CONDENSER



The condenser is installed in front of the intercooler on the engine room upper cover.

When the refrigerant arrives from the compressor by the rotational force of the electric fan, the condenser changes the refrigerant from a gas state into a liquid by discharging heat from the refrigerant.

The condenser determines how much heat should be discharged from the refrigerant by the amount of heat absorbed by the evaporator and the operation of the compressor.

The performance of the condenser directly affects the cooling performance of the cooler. The refrigerant in the condenser is cooled down by the air flow from the cooling fan on the engine side and the natural air flow during driving.

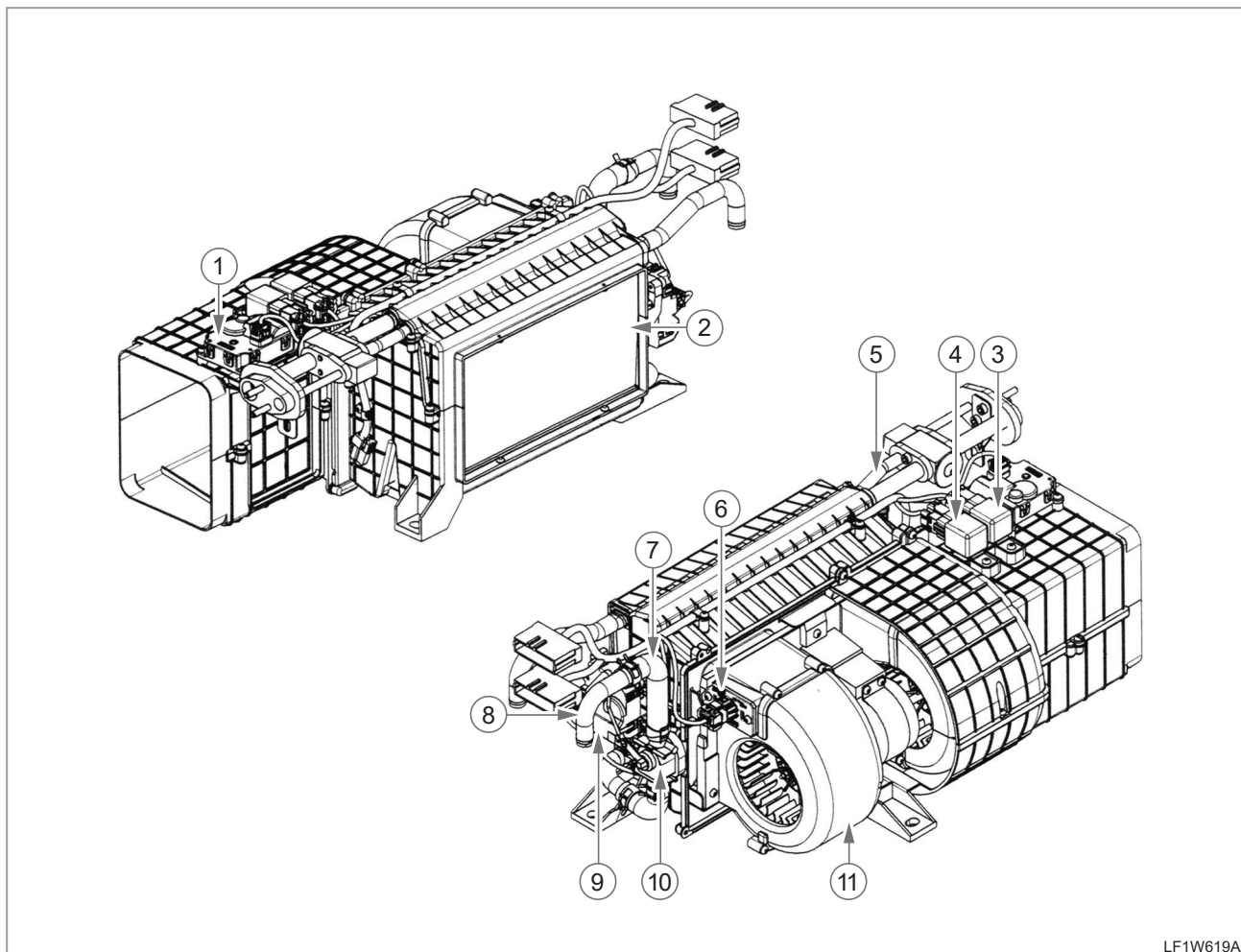
INSPECTION

1. If the outer surface of the condenser is clogged by foreign material or the fin is deformed or damaged, the amount of air flow is decreased and the pressure in the condenser rises to an abnormally high level. Therefore, the surface should always be kept clean and the fin should be straight.
2. There are two causes for the condenser malfunction: leakage and clogging. If the output pressure of the compressor is too high, the condenser can be clogged.

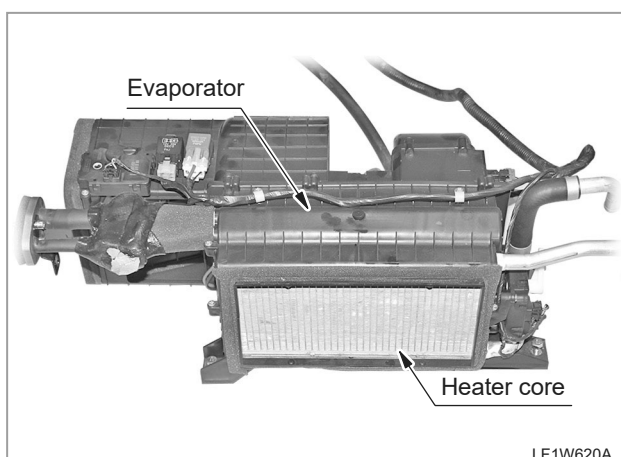
If only a portion of the condenser is clogged, the refrigerant expands as it passes through the clogged portion and frost or ice may form on that part. If air passing through the condenser or the radiator is blocked, the output pressure is increased abnormally.

In normal condition, the condenser's exhaust pipe is slightly cooler than the hydraulic pipe.

2.3.4 AIR CONDITIONER



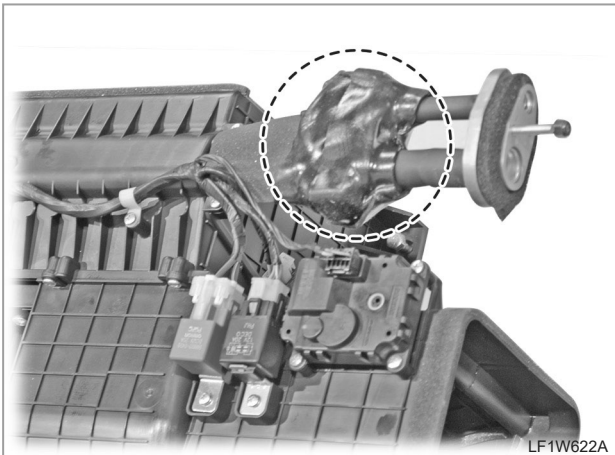
LF1W619A



LF1W620A

The diagram illustrates the electrical connections for the LF1W621A unit. The central component is the **Control panel**, which features a terminal block with 14 terminals labeled A1 through A14. A **Blower switch** is connected to terminals A13 and A14. A **Min connector** is connected to terminals A1, A2, A3, A4, A5, and A6. A **Blower register** is connected to terminals A7, A8, A9, and A10. A **Temperature actuator** is connected to terminals A11 and A12. An **EVA sensor** is connected to terminal A13. A **Blower relay** is connected to terminals A14, A1, A2, and A3. An **Air con relay** is connected to terminals A4, A5, A6, and A7. A **Blower motor** is connected to terminals A8, A9, and A10. An **Intake actuator** is connected to terminals A11 and A12.

EXPANSION VALVE



When the A/C system is in normal operation, the refrigerant is drawn into the expansion valve as a cool, high-pressure liquid. As it passes through the orifice valve, it becomes in a liquid state at low temperature and low pressure. Then, this liquid refrigerant absorbs heat in the air and vaporizes into gas. As this gas leaves the evaporator, its temperature rises a little compared to its temperature when it was liquid.

The amount of liquid refrigerant passing through the expansion valve depends on the temperature and pressure of the refrigerant.

The expansion valve controls the amount of refrigerant supplied to the evaporator as necessary.

► INSPECTION

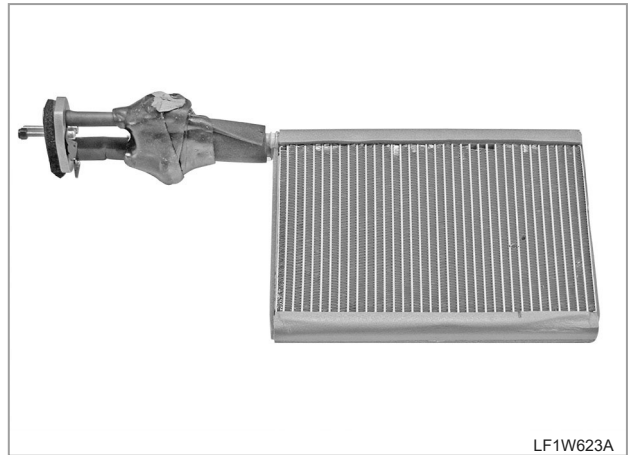
- If the expansion valve is malfunctioning, the inlet pressure and the outlet pressure increase as well as poor cooling performance. In this case, check the changes of the pressure using the manometer.

► SPECIFICATIONS

- Cooling capacity : 1.5 RT
- Performance

Sensitive heat tube	Performance (kg/cm ² G)
0°C	1.9 ±0.1
10°C	2.6 ±0.2

EVAPORATOR



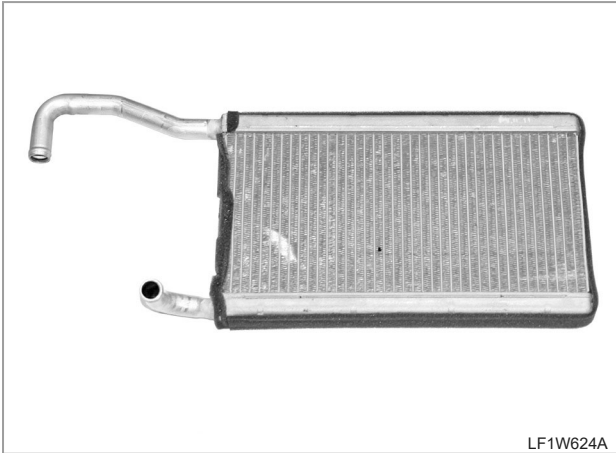
As the refrigerant passes through the expansion valve, it becomes low-pressure liquid. When this liquid refrigerant passes through the tube of the evaporator, it is evaporated by air blown from the blower fan. At this moment, as the tube fin is cooled down by the evaporation heat, the interior air is cooled down. Also, moisture in the air is condensed to a liquid and drained with dust, etc. to outside through the drain hose.

Heat exchange between the refrigerant and air is happened by the fin and the tube. Therefore, there should be no moisture or dust on surface where the air contacts with. If there are, ice or frost may be formed on the fin.

When warm air contacts with the fin, this air is cooled down below the dew point and water is formed on the fin. If the temperature of the fin is below 0°C in this case, this water can be frozen or moisture in the air can forms frost on the fin which can lead to poor cooling performance. To prevent the evaporator from freezing, the temperature control switch or the variable discharging compressor is used.

► INSPECTION

- If the surface of the evaporator core is deformed or accumulated with dust or foreign material, it can interfere with air flow. If the case is cracked or broken, the cooling power drops. Also, check if the drain hose is not bent or clogged since it is to drain water from the evaporator.

HEATER CORE

LF1W624A

The heater core is to supply warm air into the cabin by transferring heat from hot engine coolant to the air through the fan.

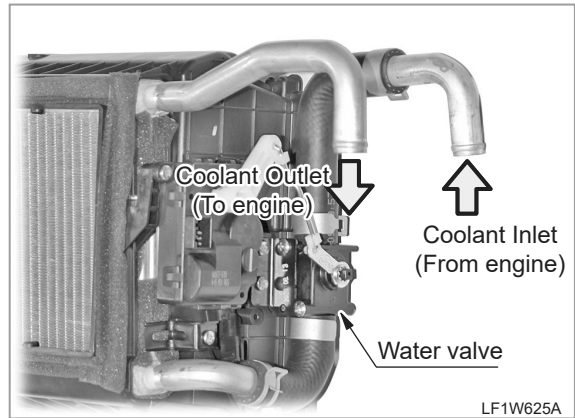
The amount of coolant passing through the heater core is controlled by the temperature switch of the controller. When this switch is set to "HOT" position, the max. amount of coolant flows.

► INSPECTION

- If the surface of the heater core is deformed or accumulated with dust or foreign material, it can interfere with air flow resulting in poor heating performance.
- If the heating performance is not satisfactory, check the above causes.

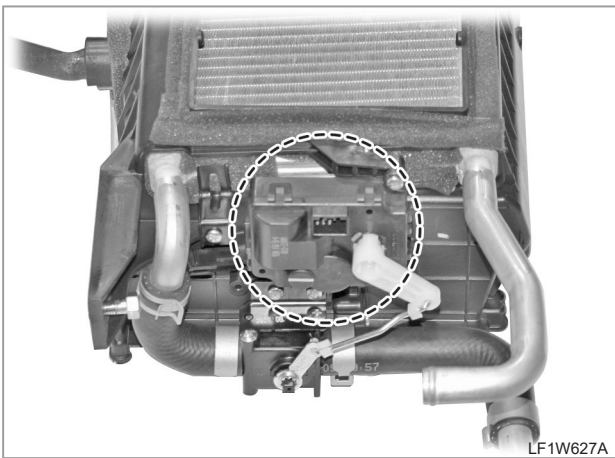
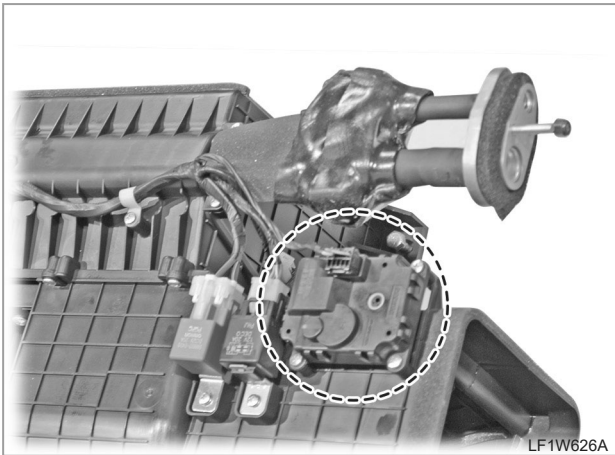
**REMARK**

- When the heater is in operation, the temperature is controlled mainly by the temp. door in the A/C assembly in the ceiling, but it is also additionally controlled by the water valve to control the hot water flow for optimal performance.

**REMARKS****WATER VALVE**

- The water valve is installed onto the pipe inlet of the heater core and acts as a switching valve to regulate the coolant inflow. According to the operating state of the A/C controller's temperature control switch, an electric signal controls the motor operation to control the hot water inflow variably, controlling the heater temperature freely.

ACTUATOR



- (1) Motor actuator (IN/OUT)
(2) Temperature motor actuator

The air source mode actuator, mounted on the top of the air intake pipe of the A/C, controls the inflow of air, while the temp motor actuator, located on the side of the evaporator, adjusts the intake air mixture of cold air and hot air by the operation displacement of the temperature control dial.

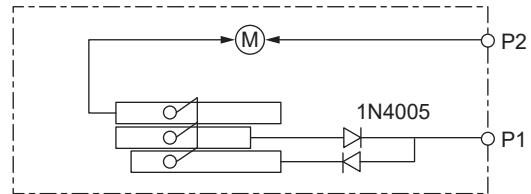
► SPECIFICATIONS

No.	Spec.	Mode mix ACT	Condition
1	Rated voltage	DC12V	-
2	Rated load	2.5 kgf-cm	-
3	Operating Time	4 (sec)	Rated
4	Rated current	Below 0.1 A	DC12V
5	LOCK current	Below 0.4 A	DC12V
6	Stop torque	Above 10 kgf-cm	Rated
7	Noise	Below 43 dB (A)	Rated
8	Voltage range	DC 10 ~ 15V	-
9	Temp. range	-40° ~ 80°C	-

► OPERATING DIAGRAM & TERMINAL ARRANGEMENT

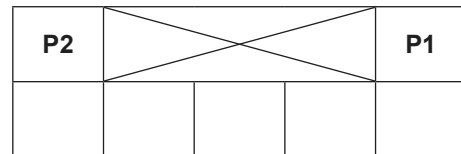
MOTOR ACTUATOR (IN/OUT)

• Operating diagram



When P1+, P2- : P2 → P1
When P1-, P2+ : P1 → P2

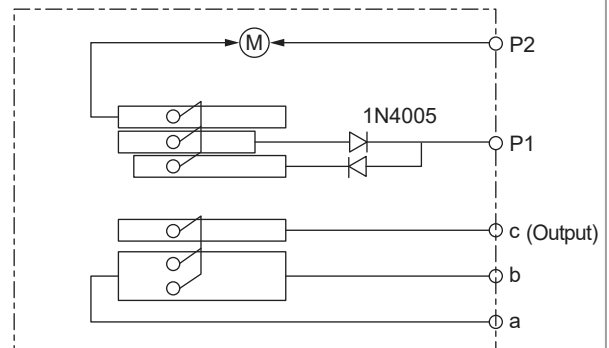
• Terminal arrangement



LF1W628A

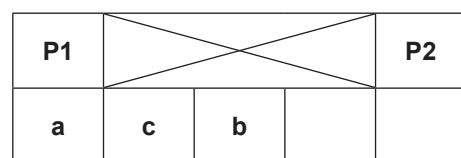
TEMP MOTOR ACTUATOR

• Operating diagram



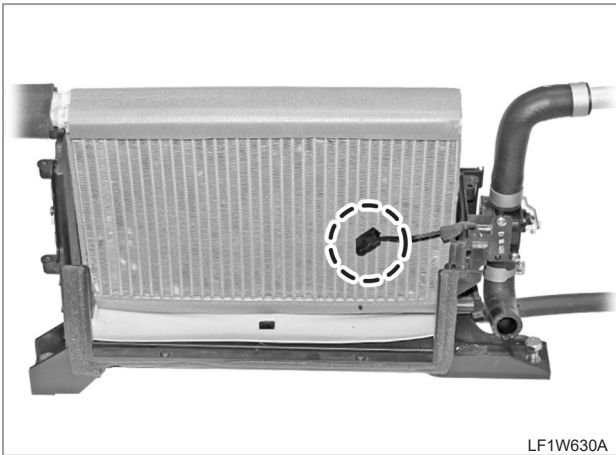
When P1+, P2-, P1 → P2
When P1-, P2+, P2 → P1

• Terminal arrangement



LF1W629A

EVAPORATOR SENSOR



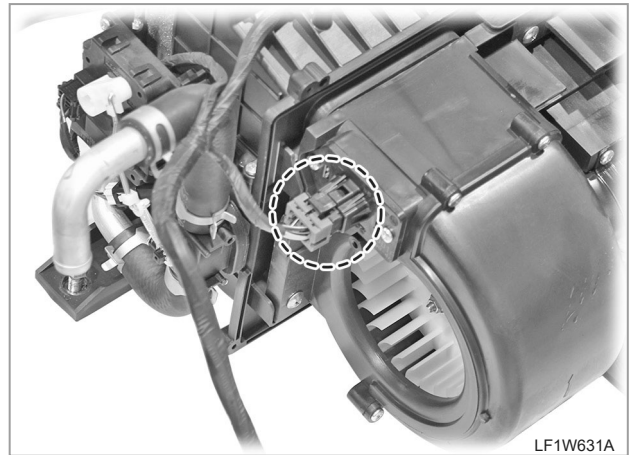
LF1W630A

The evaporator sensor is mounted on the evaporator to prevent the evaporator from freezing and the air conditioning system from damaging by sensing the temperature of the evaporator core. This sensor is integrated with a negative characteristic thermistor which increases its resistance for temperature decrease and decreases its resistance for temperature increase.

► SPECIFICATIONS

Item		EVAP. sensor
Operating temperature		-30 °C ~ 85 °C
Non-operating temperature		-40 °C ~ 90 °C
Sensor characteristics	R	$R_o = 1.1, 36K\Omega \pm 1\%$
	B	$3,400K \pm 1\%$
Thermal time constant		MAX 10 SEC
Thermal dissipation constant		MIN 3mW/°C
Tensile Strength		Above 8kgf
Connector		AMP 174460-1 (B)

RESISTOR

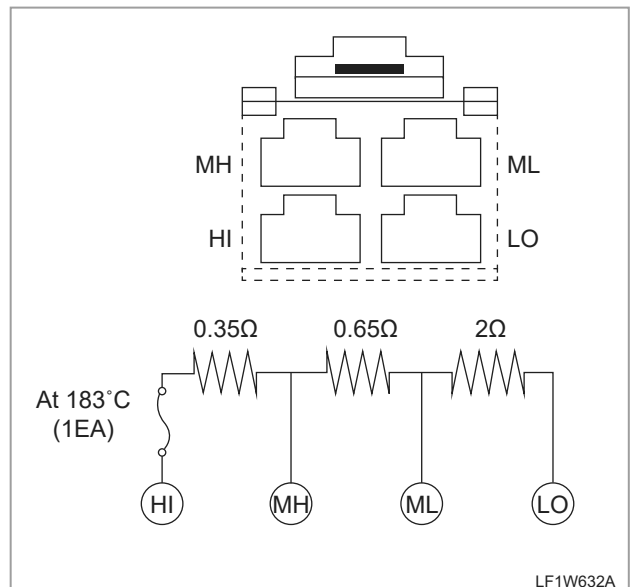


LF1W631A

It is attached to the top of the side of A/C blower fan. It is used to adjust the blower motor speed according to the speed set by the blower switch (1st to 3rd stage). It changes the voltage applied to the blower motor by its resistance values which are set by each stage in order to control the blower fan speed.

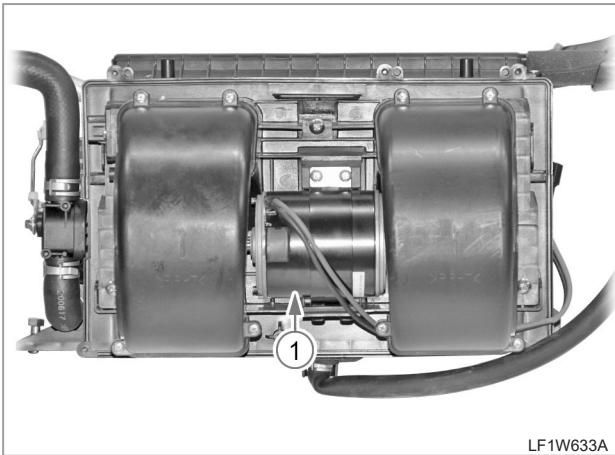
- Operating temperature range
- Melting point of the thermal fuse

► CIRCUIT AND TERMINAL ARRANGEMENT

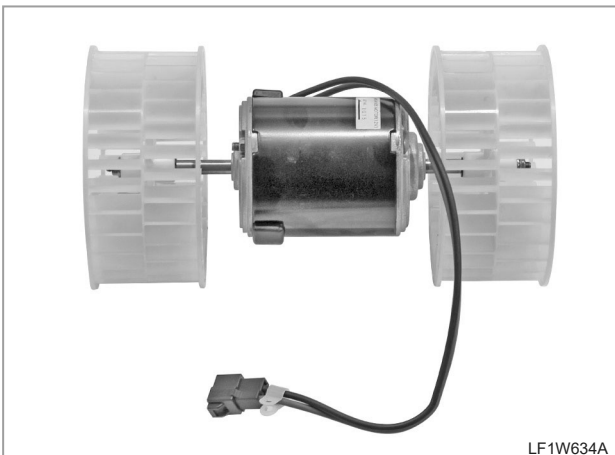


LF1W632A

BLOWER MOTOR



LF1W633A



LF1W634A

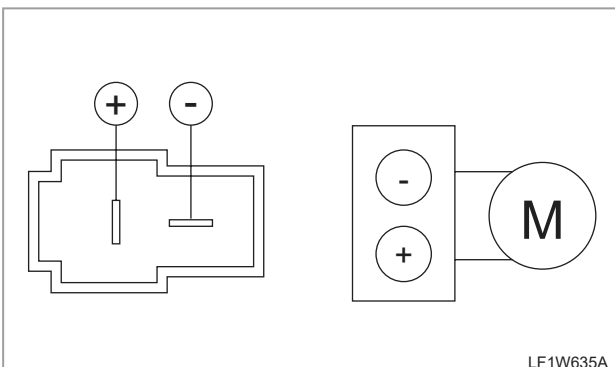
(1) Blower motor

The fan of the blower, located behind the A/C, is operated by the operation of the blower motor.

The blower motor control dial of the A/C controller allows the blowing speed to be adjusted in three stages.

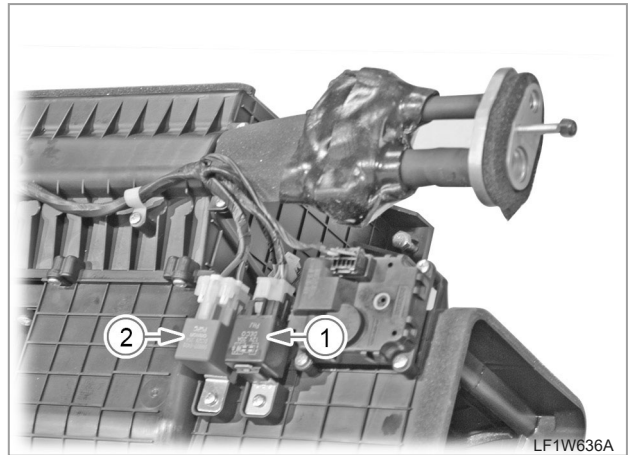
- Operating voltage : 3 ~ 13.5 VDC
- Operating temperature : -30 °C ~ 60 °C

► CONNECTOR



LF1W635A

RELAY



LF1W636A

(1) Blower relay

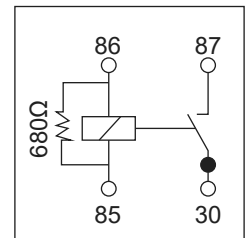
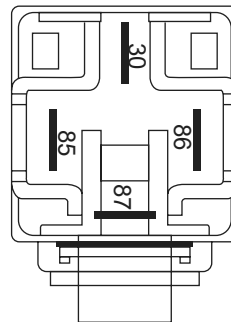
(2) Air conditioner relay

The blower relay supplies power to the blower motor and the A/C relay supplies power to the A/C controller.

- Blower relay (Rated) : DC 12 V, 25 A
- Air conditioner relay (Rated) : DC 12 V, 20 A

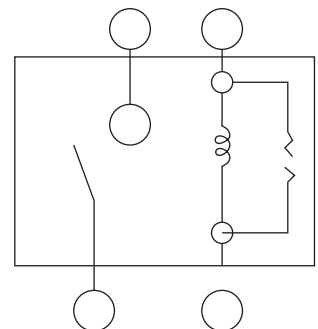
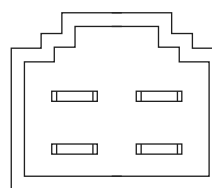
► CONNECTOR & CIRCUIT

BLOWER RELAY



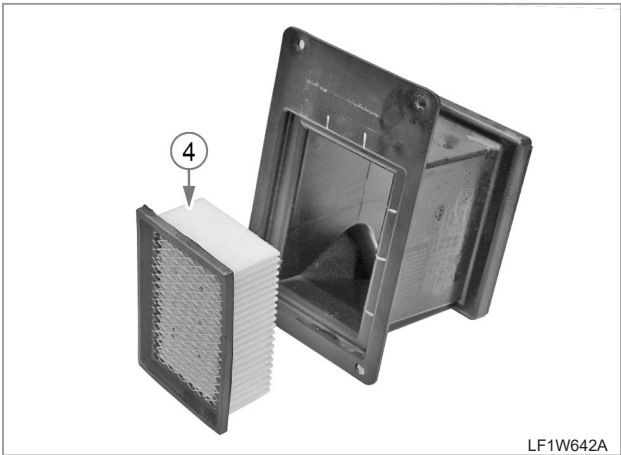
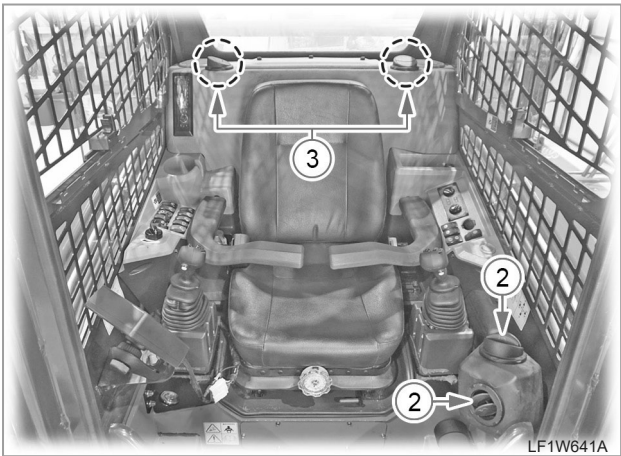
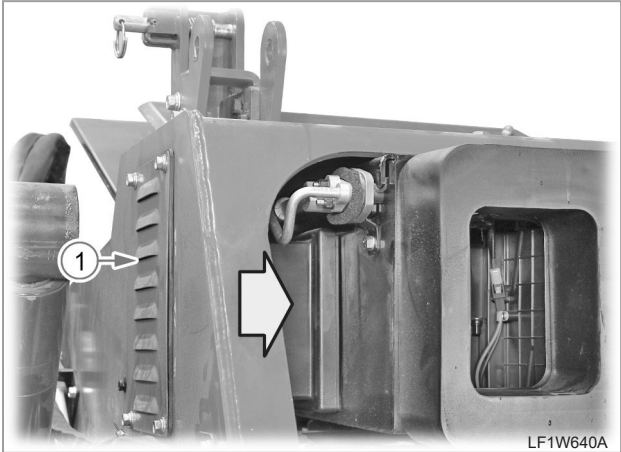
LF1W637A

AIR CONDITIONER RELAY



LF1W638A

2.3.5 AIR INLET/VENT

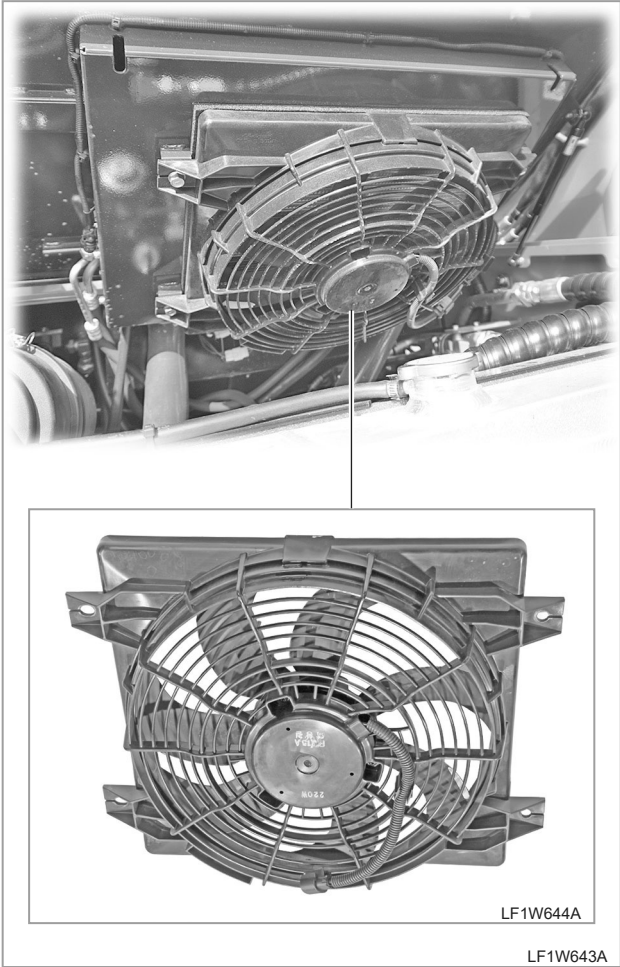


- (1) Exterior air inlet
(2) Front air vent
(3) Rear air vent
(4) Ambient air filter

When air comes in through the ambient air filter (4), it enters the A/C system through the duct. If the A/C is selected, this air is cooled down and dehumidified as it passes through the A/C / heater assembly. If the heater is selected, this air is heated as it passes through the assembly to provide warmth.

The A/C controller is used to switch between recirculation/fresh air, to adjust the air volume, and to switch between the A/C and heater.

2.3.6 ELECTRIC FAN MOTOR



The electric fan motor, mounted inside the top cover of the engine compartment, operates to cool the condenser under the cover.

► CONNECTOR

1	BATT(+)	3.0	B/ W
2	GND(-)	3.0	B

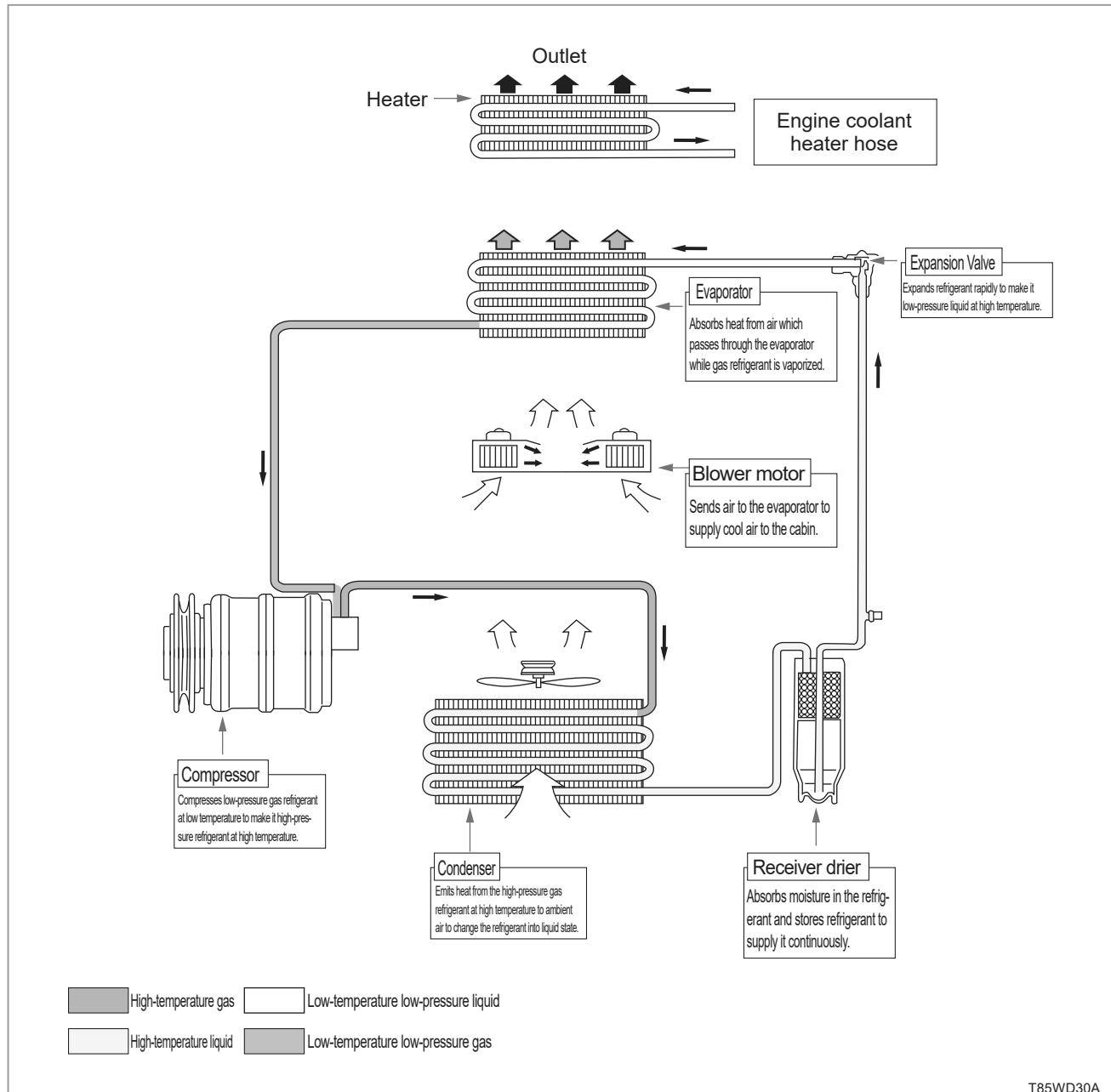
LF1W645A

► SPECIFICATIONS

ITEM		UNIT	PERFORMANCE SPECIFICATION (12V)
Fan type		-	PULLER
Fan speed control method		-	ON - OFF
Fan & Motor only	Wind volume	CMH	3,400 -8% MIN
	Number of rotations	RPM	2,120 ±8%
	Consumption current	A	14.5 +10% MAX

3. OPERATING PRINCIPLE

3.1 COOLING OPERATION

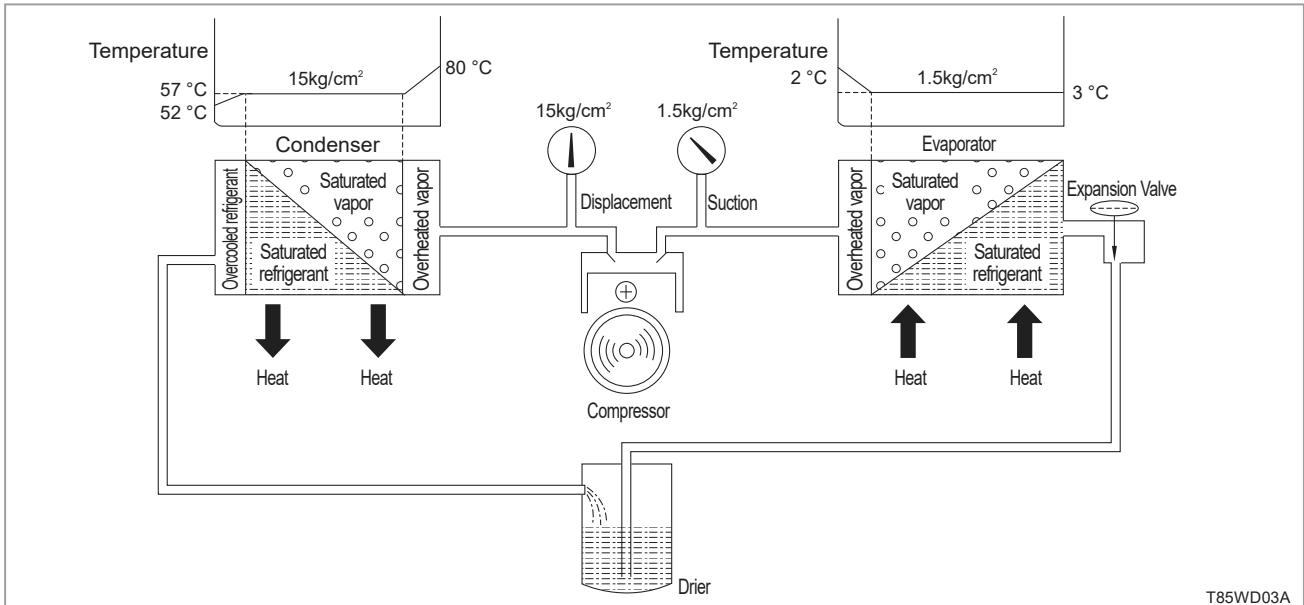


The system controls the temperature by applying pressure to the refrigerant (R134a gas) which circulates through the A/C system.

1. As the refrigerant passes through the evaporator, it turns into the gas. Then, it enters the compressor which compresses it. As the refrigerant gas passes through the condenser, it releases its heat to the surrounding air and condenses into liquid.
2. Then the refrigerant liquid passes through the receiver-drier which then removes particles and dries the refrigerant.

3. R134, liquid refrigerant under high pressure is led to the expansion valve controlling the flow rate, and its pressure will fall down here radically to vaporizable state.
4. This low-pressure fluid starts to lose its heat and vaporize in the heat exchanger, that is, the vaporizer. Hot and humid air in the cabin is drawn into the evaporator by the fan, cooled down and then flows to the cabin again.
Humidity in the air is condensed on the evaporator, and discharged in the state of water through the drainage hose attached to the A/C assembly, resulting in the reduction of humidity in the cabin.
5. Gaseous refrigerant returns to the compressor, which now completes the cycle.

3.1.1 COOLING CYCLE



The refrigerant circulates through the lines and components which are in close circuit.

The refrigerant continues to circulate through the circuit. This is called "Cooling Cycle". As the refrigerant circulates in the circuit, it is evaporated to gas and then is condensed into liquid.

The refrigerant gas is sucked and compressed in the compressor and escapes it under high pressure at high temperature (80 °C, 15 kg/cm²).

Then, this refrigerant enters the condenser and is cooled by the cooling fan, dropping its temperature down to approx. 50 °C.

The liquefied refrigerant enters the receiver-drier which removes moisture and dust from the refrigerant. Then the refrigerant flows into the expansion valve. The refrigerant under high pressure is expanded and vaporized into gas rapidly in the expansion valve. Then, it flows into the evaporator at low temperature under low pressure (-3 °C, 1.5 kg/cm²). This refrigerant loses its latent heat by air drawn into the evaporator. Then, as the air is cooled, the refrigerant is vaporized to gas and drawn into the compressor again. As the refrigerant continuously circulates the cooling cycle, the cooling process is repeated.

In general, vapor is liquefied when it is applied by pressure. However, vapor is liquefied more rapidly when it is applied by pressure and cooled down at the same time. This is why the compressor and the condenser are needed in the cooling system.

3.1.2 REFRIGERANT AND REFRIGERATION OIL

The refrigerant circulates through the cooling cycle to absorb and radiate heat.

CHARACTERISTICS

There are several types of refrigerants. R-12 (CFC: chlorofluorocarbon) Freon gas was largely used for the cooling system. However, it was proven to disrupt the ozone layer and was restricted by law. Nowadays, new refrigerant, R134a (HFC) is used in the cooling system.

CHARACTERISTICS OF R134A FREON GAS

► ADVANTAGES

- An alternative refrigerant for R-12 which does not have chlorine that disrupts the ozone layer.
- Chemically stable
- Has the most similar thermodynamic characteristics to R-12
- Noninflammable and nontoxic

► DISADVANTAGES

- Inferior performance than R-12 at the same condensation temperature (For the same performance, the temperature should be lowered.)
- Refrigeration oil should be changed since the refrigeration oil for R-12 is insoluble.
- Low absorptive power of R-134a refrigeration oil and material changes in rubber parts

REFRIGERATION OIL

The refrigeration oil is to lubricate the compressor which compresses the refrigerant. Since the characteristics of old and new refrigerants are different and the amount of refrigerant can affect the cooling performance, only specified amount of refrigerant should be supplied.

ITEM	MINERAL OIL	PAG OIL
Refrigerant	R-12 (CFC)	R-134a (HFC)
Polarity of molecule	Nonpolar	Polar
Lubrication	Superior	Good

4. INSPECTION AND ADJUSTMENT

4.1 INSPECTION WITH GAUGE

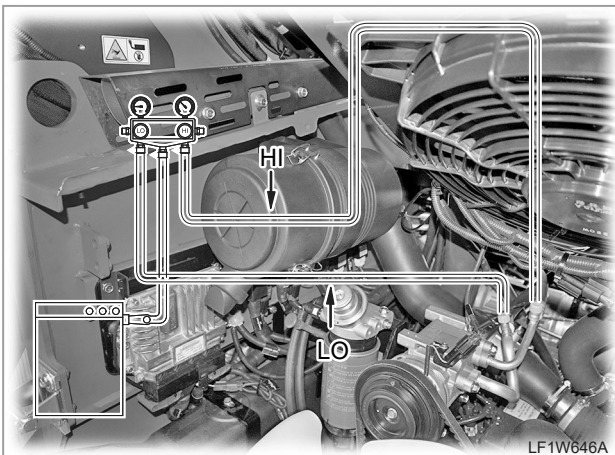
⚠ CAUTION

- Park the tractor on level ground, apply the parking brake and chock the wheels. Place all levers to the neutral position.

! IMPOARTANT

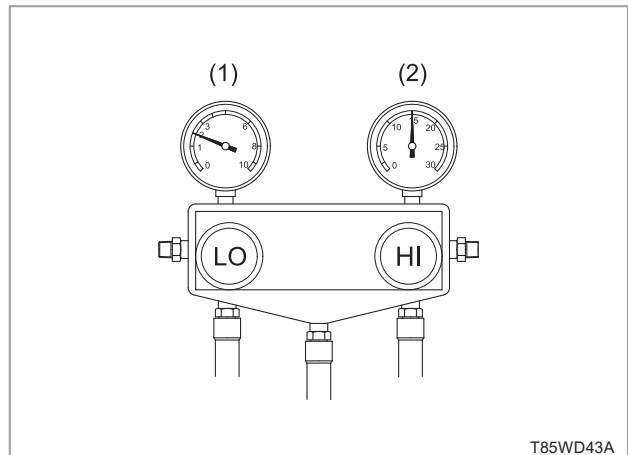
- The values measured by the manifold gauge are drawn under certain conditions as below. Therefore, the measured value may vary depending on the ambient temperature.

- Doors: open.
- Air source: recirculation
- Engine rpm: approx 1,500 rpm
- Fan speed: max.
- A/C switch: ON
- Temperature switch: lowest temperature
- Ambient temperature: 30SDgr~ 35SDgr



1. Open the rear cover.
2. Tighten up the valves on the high pressure and low pressure valves of the manifold gauge and install the gauge to the service valve.
3. Unscrew the low pressure valve a little to discharge air from the hose and tighten the valve. Repeat this for the high pressure valve.
4. Start the engine and run it at approx. 1,500 rpm.
5. Turn the A/C switch ON and set the fan speed to max. speed and the temperature to the coldest temperature using fan speed switches and temperature switches.

4.2 NORMAL CONDITION

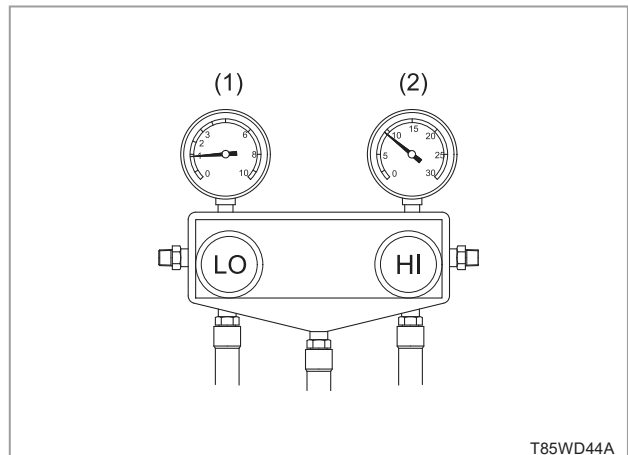


In a normal condition with A/C operated, the pressure shown on the gauges is as follows:

Low pressure side (blue) (1): 1.5 ~ 2.0 kg/cm²

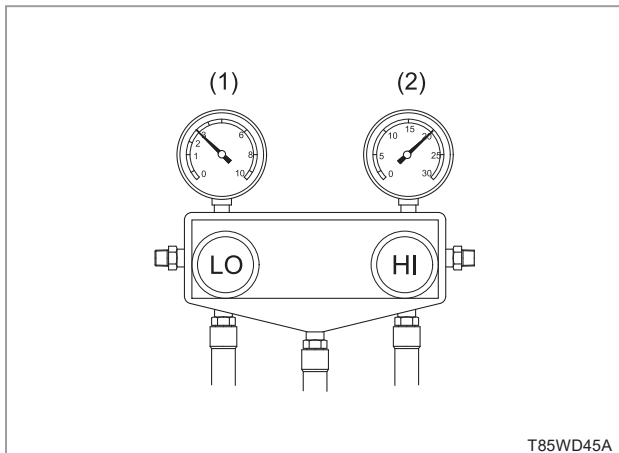
High pressure side (red) (2): 14.5 ~ 15 kg/cm²

4.3 INSUFFICIENT REFRIGERANT



1. Status: Not cool
2. Symptoms
 - The pressure of high/low pressure side is low.
Low pressure side (blue) (1): 0.8 kg/cm² or less
High pressure side (red) (2): 8 ~ 9 kg/cm²
 - Air blown through the vent does not get cold.
3. Cause: Refrigerant leakage
4. Action: Check with gas leak tester, repair the leaking part and add refrigerant to the specified level.

4.4 EXCESSIVE REFRIGERANT AND INSUFFICIENT CONDENSER COOLING PERFORMANCE



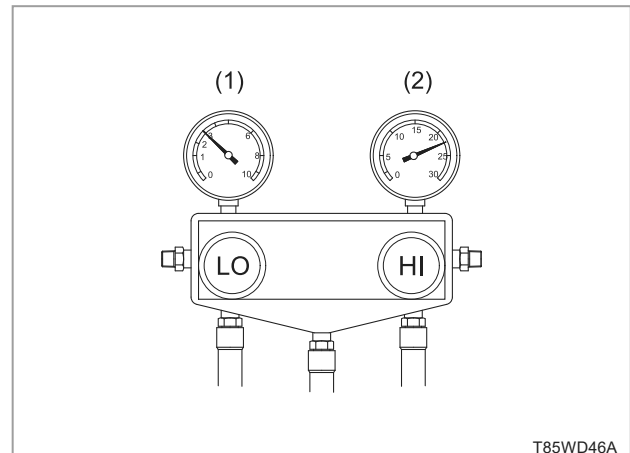
1. Symptom: Not cool
2. Symptoms: The pressure of high/low pressure side is high.
3. Cause
 - Increased pressure due to excessive charging of the refrigerant
 - Low pressure side (blue) (1): 2.5 kg/cm²
 - High pressure side (red) (2): 20 kg/cm²
 - Poor cooling performance of condenser
 - Loose A/C belt or fan belt
4. Solution
 - Clean the condenser
 - Check and adjust the fan belt and condenser motor
 - Check the refrigerant level



CAUTION

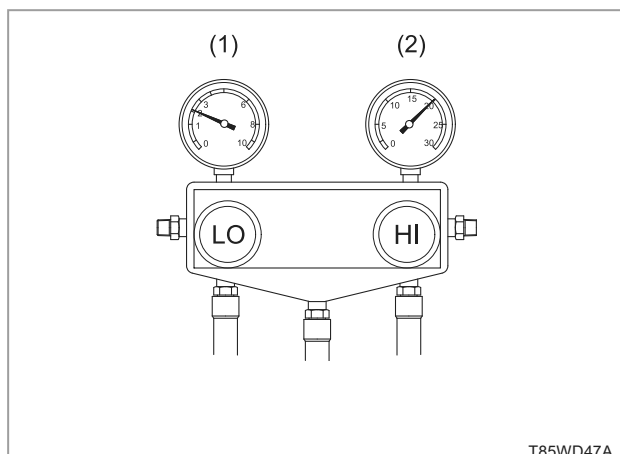
- Discharge the refrigerant slowly from the low pressure side of manifold gauge while checking the refrigerant level by monitoring the pressure gauge.
- This may caused by contamination of radiator.

4.5 AIR INTRUSION INTO CYCLE



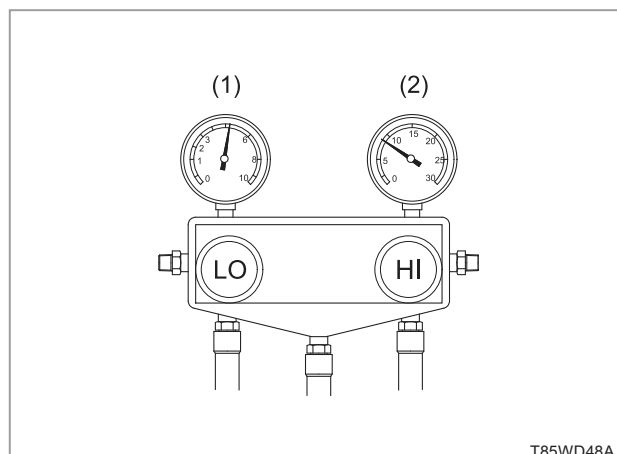
1. Status: Not cool
2. Symptoms
 - The pressure of high/low pressure side is high.
 - Low pressure side (blue) (1): 2.5 kg/cm²
 - High pressure side (red) (2): 23 kg/cm²
 - The low pressure pipe is not cold.
3. Cause: Air intrusion into cooling cycle
The measured value is shown in the above figure if vacuuming is not done.
4. Solution
 - Read the measured value in charging process while vacuuming.
 - Replace the receiver-drier after long operation with air intruded.
 - Check the contamination of refrigerant and oil.

4.6 DEFECTIVE EXPANSION VALVE



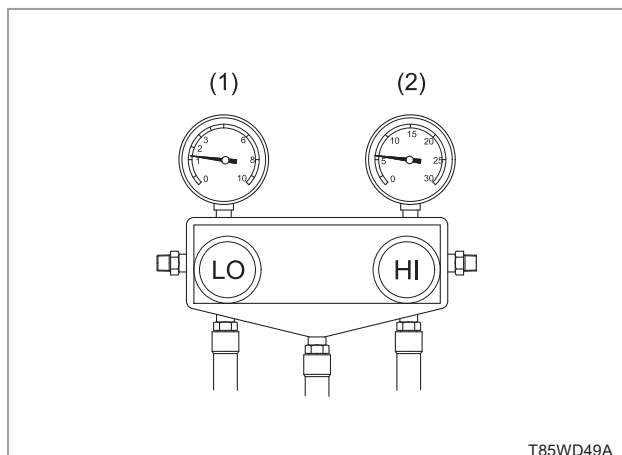
1. Symptom: Not cool
2. Symptoms: The pressure of high/low pressure side is high.
Low pressure side (blue) (1): 2.5 kg/cm²
High pressure side (red) (2): 19 ~ 20 kg/cm²
3. Cause: Defective expansion valve, poor refrigerant flow control due to improper assembly of thermal case
4. Action: Check the assembled conditions, position and adiabatic in thermal case. if normal, replace the expansion valve.

4.7 POOR COMPRESSOR COMPRESSION



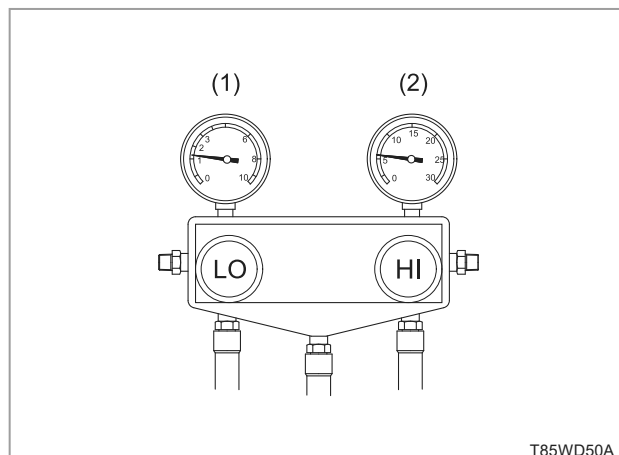
1. Symptom: Not cool
2. Symptoms:
 - The pressure of low pressure side is high while the pressure of high pressure side is very low.
 - Low pressure side (blue) (1): 4 ~ 6 kg/cm²
 - High pressure side (red) (2): 7 ~ 10 kg/cm²
 - When stopping the operation, the pressure of high/low pressure shall be the same immediately.
3. Cause: Poor compressor gasket, poor compressor performance caused by the broken suction valve.
4. Solution
 - Disassemble and repair the compressor.
 - Replace the compressor assembly.

4.8 MOISTURE INTRUSION INTO COOLING CYCLE



1. Symptom: Sometimes cool, sometimes not cool
2. Symptom: The pressure of low pressure side is sometimes negative or sometimes returning to normal.
Low pressure side (blue) (1): $0.5 \sim 1.5 \text{ kg/cm}^2$
High pressure side (red) (2): $7 \sim 15 \text{ kg/cm}^2$
3. Cause: The moisture inside cooling cycle is frozen which makes the cycle closed in the expansion valve. The condition is back to normal when ice is melt.
4. Action: Replace the receiver-drier.
Repeat vacuuming for 2 ~ 3 times.
Add the proper amount of refrigerant.

4.9 POOR RECIRCULATION OF REFRIGERANT



1. Symptom: Not cool (sometimes cool)
2. Symptom
 - The pressure of low pressure side is negative and the pressure of high pressure side shows pressure of $5 \sim 6 \text{ kg/cm}^2$.
 - Low pressure side (blue) (1): 0.76 kg/cm^2
 - High pressure side (red) (2): 6 kg/cm^2
3. Cause
 - The cycle is closed by frost or dust in cooling cycle.
 - The cycle is blocked due to the poor thermal case of expansion valve.
4. Solution
 - Stop the operation to check if the system is clogged by moisture or dust.
 - If moisture has been found, perform the vacuuming.
 - Detach the expansion valve and remove the dust by compressed air.

4.10 CABIN SYSTEM INSPECTION

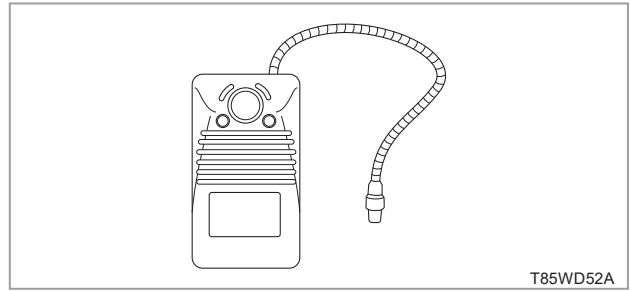
! WARNING

- Do not discharge the refrigerant to outside.
- Refilling work of air conditioner gas deals with high pressure gas, and for safety, it should only be performed by trained mechanics.
- To prevent accidents like the loss of sight during work, you must wear protective glasses, gloves etc.
- Store the service container in a cool and dry place, and do not drop or knock it.
- The air conditioner and equipment must exclusively use HFC-134a, and never use R12.
- Use the UCON 488 compressor oil.
- Do not work in a poor ventilated area.
- Air conditioner gas is non-hazardous and nontoxic, but if it is left at high temperature it breaks down and forms harmful substances.
- Over refilling of gas is a cause for poor cooling performance, overheating, etc.
- Do not turn the service container up side down.
- Each refill hose connections must be firmly attached by a hand. (Do not attach with pliers and the like)
- When you connect the refill hose to the service container, check for damages in the packing.

! IMPOARTANT

- When disassembling the pipe or hose of the cooler, gas leakages and dust penetration must be prevented by plug or cap mounting attachments. When connecting the pipe, compressor oil must be applied to the O ring.
- When replacing the condenser, evaporator, receiver-dryer, etc., the compressor oil must be replenished.

4.10.1 LEAKAGE TEST



1. Using a gas detector, check for leakages in each section.
2. If a gas leakage is detected, repair the leakage section as instructed.

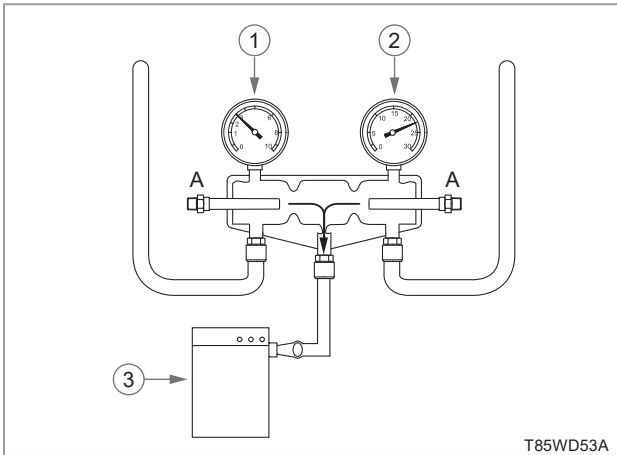
! IMPOARTANT

- When disassembling, the parts must be thoroughly cleaned and sealed.

4.10.2 WHEN ASSEMBLING

- Apply compressor oil to the O-rings of the connections.
- For gas vacuuming and refilling, refer to the section "Charging" on the next page and perform as outlined, and after checking for leakages complete the refilling.

DISCHARGING SYSTEM



- (1) Low pressure (3) Vacuum pump
(2) High pressure (A) Open (air)

! IMPOARTANT

- Do not discharge the refrigerant to outside.
- HFC-134a equipments must be used exclusively.
- Check if the service hose is properly connected.

! WARNING

- You must wear protective glasses and gloves.

1. Attach the manifold gauge and the recycling machine to the refrigerant lines as shown.

! CAUTION

- Be careful not to switch the connections for the low and high pressure valves.

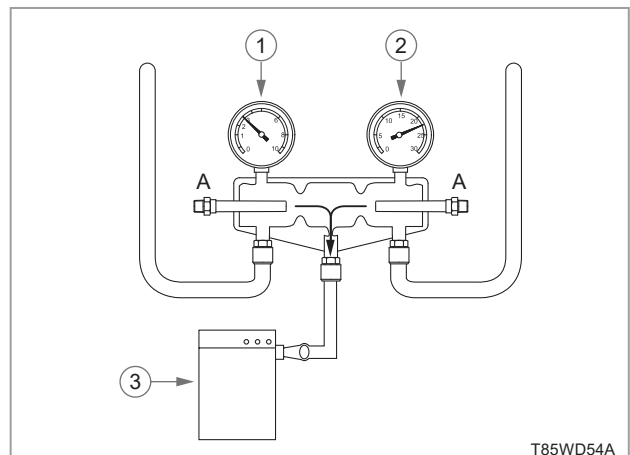
2. Open the high pressure valve slowly to release the refrigerant to the recycling machine.

! CAUTION

- Open the valve slowly, while checking to see that refrigerant is not leaking out.

3. When the value shown on the manifold gauge dial falls below 3.5 kg/cm² (50 psi), slowly open the low pressure valve.
4. Open both high and low pressure valves slowly until the manifold gauge dials indicates 0 kg/cm² (0 psi).

VACUUM



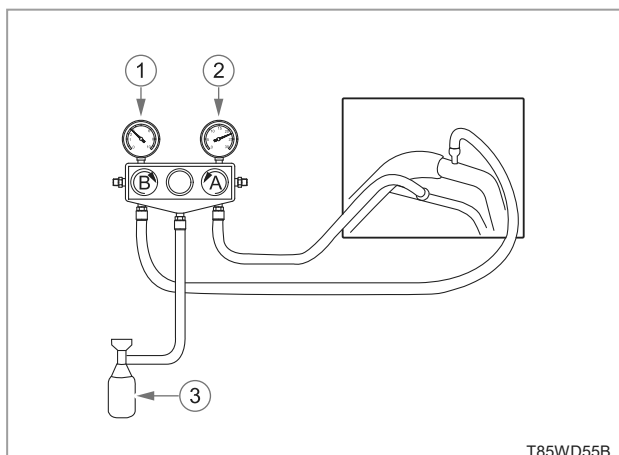
- (1) Low pressure (3) Vacuum pump
(2) High pressure (A) Open (air)

1. Connect the manifold low pressure service hose (blue) and the high pressure service hose (red) to the compressor low pressure end and high pressure end of the service valve.
2. Connect the manifold center hose (green) to the vacuum pump.
3. Open the low pressure & high pressure valves and operate the vacuum pump in accordance with the instructions to perform vacuuming.
4. Perform vacuuming for about 15 minutes. When the low pressure gauge indicates the lowest safe vacuum level (711.2 ~ 736.2 mmHg), stop the vacuum pump, close the manifold low pressure and high pressure valves, leave it for at least 5 minutes and check that the gauge does not reach 0.
 - The above vacuum level is obtained at sea level. As the altitude increases by 340 m (1000 feet), the vacuum level decreases by 25.4 mm (1 inch). Example) If the altitude is 1524 m (5000 feet), perform vacuuming until the vacuum level reaches 584.2 ~ 609.7 mmHg.
5. If the gauge reaches close to 0, there is a leak somewhere, so after checking and repairing the pipe connections, re-perform the vacuuming and check that there are no gas leakages.

! CAUTION

- When vacuum is built, tighten the high/low pressure gauge valves and stop the vacuum pump before disconnecting the hoses. If disconnecting the hoses earlier, foreign material can be sucked in.

CHARGING



- (1) Low pressure gauge (A) High pressure (open)
 (2) High pressure gauge (B) Low pressure (close)
 (3) Refrigerant

! IMPOARTANT

- Refill the gas after gas has been released and vacuuming has been performed.
- When refilling gas, do not start the engine and perform from the high pressure end first, and then start the engine and put in the prescribed amount.

! WARNING

- When refilling gas on the high pressure end, do not start the engine. This could cause rupture from the back flow and as there are no refrigerants it could cause damage to the compressor.

1. Open the high pressure valve and put in about 600g of refrigerant.
2. Close the high pressure valve and check for any gas leakages.

! WARNING

When replacing the service can, release the air from the charging hose (green).

3. After checking that the high pressure valve is closed, start the engine and take it to about 2,000rpm.
4. Open the interior door and adjust the temperature control lever to cool, and the fan switch to high.
5. Open the low pressure valve and add refrigerant.
6. When the refrigerant has been filled, close the low pressure valve and stop the engine.
7. Perform refrigerant leakage tests.
 - Refrigerant replenishment quantity: 600 g (1.32 lbs)
 - Manifold gauge pressure {when the exterior temperature in 30 degrees (86°F)}
 - High pressure: 14.5 ~ 15 kgf/cm² (1.42 ~ 1.47 Mpa, 206.2 ~ 213.3 psi)
 - Low pressure: 1.5 ~ 2.0 kgf/cm² (0.15 ~ 0.19 Mpa, 21.3 ~ 28.4 psi)

REFRIGERANT AMOUNT INSPECTION

**CAUTION**

- Park the tractor on level ground and chock the wheels.
- Place the shuttle, main gear shift and PTO levers to the neutral position (mechanical model).

The refrigerant amount can be checked by a pressure gauge.

Therefore, the A/C system should be inspected under the following conditions.

1. Operate air conditioner with the following status.
 - Ambient temperature: 20°C or higher
 - Engine speed: approx. 1,500 rpm
 - Temperature control lever: at the point of maximum cooling temperature
 - Blower control switch: high
 - Air conditioner switch: ON
2. Open the rear cover and check temperature difference between the high-pressure pipe and the low-pressure pipe.
 - Normal:

There is significant temperature difference between the high-pressure pipe and the low-pressure pipe. (The high-pressure pipe is hot and the low-pressure pipe is cold.)
 - Abnormal:
 - There is almost no temperature difference between the high-pressure and low-pressure pipes. - There is little or no refrigerant.
 - There is significant temperature between the high temperature pipe (too hot) and the low temperature pipe (too cold). - There is too much refrigerant.
 - Action:

Bleed the system if there is almost no refrigerant. Add the refrigerant and check for leakage. If excessive amount of the refrigerant is in the system, drain some to keep the specified volume.

5. TROUBLESHOOTING

5.1 VISUAL AND AUDITORY INSPECTION

NOISE CAUSED BY LOOSENED V-BELT

When the friction noise is generated by loosened or worn out V-belt, adjust the belt tension. Replace the worn belt.

ABNORMAL NOISE AROUND COMPRESSOR

Check if the compressor bolts and mounting bracket bolts are loosened and retighten them if needed.

ABNORMAL NOISE FROM COMPRESSOR

The abnormal noise inside the compressor results from the broken suction valve. Disassemble, Repair, or replace it.

MUD OR DUST ADHERED TO THE CONDENSER

As mud or dust reduces the radiation performance remarkably which affects the cooling capacity, it is required to wash out the mud or dust with water. Make sure not to damage the condenser fins.

CONTAMINATION ON THE CONNECTING AREA OF PIPING AND CONDENSER

The contaminated area by oil indicates the refrigerant leaks with oil. If a contaminated area is found, check with leak tester and retighten or replace the part as necessary. Carefully check the gasket, O-ring, and shaft seal in condenser.

NOISE FROM BLOWER FAN MOTOR

If the fan blower motor generates the noise or does not rotate properly, replace it with a new one.

Foreign materials inside the blower or insufficient tightening may cause this noise; so carefully check before starting repair work.

5.2 TROUBLESHOOTING BY SYMPTOMS



5.3 TROUBLESHOOTING POOR COOLING/HEATING PERFORMANCE

5.3.1 POOR COOLING PERFORMANCE

FAN MOTOR DOESN'T ROTATE

PROBABLE CAUSE	CHECKING METHODS	SOLUTION
Blown fuse	Check the A/C fuse	Replace
Open wiring or poor contact	Check its ground and missing key boss	Repair the failure or connect properly
Defective fan motor	Check the leads from motor with a circuit tester. Defective if no current is detected.	Replace
Faulty resistor	Check the continuity of resistor with circuit tester.	Replace
Defective fan switch	Check the fan revolution in each stage by operating the fan speed switch.	Replace

FAN MOTOR IS NORMAL BUT AIR FLOW IS NOT SUFFICIENT

PROBABLE CAUSE	CHECKING METHODS	SOLUTION
Obstacles in the inlet of suction of evaporator	Contamination of evaporator	Remove obstacles and clean
Air leakage	Check the assembly status of cooling unit case	Modify or adjust
Defective thermocon	Check whether the evaporator is frozen with a circuit tester	Replace

THE COMPRESSOR DOES NOT ROTATE OR HARD TO ROTATE

PROBABLE CAUSE	CHECKING METHODS	SOLUTION
Loosened belt	Belt vibrated too much	Adjust tension
Internal failure of compressor	Slippery belt	Repair or replace
Battery voltage drop	Slipping when rotating	Charge the battery
Layer short of coil	Slipping when rotating	Replace magnetic clutch
Oil intrusion into clutch surface	Slipping due to contaminated magnetic clutch area	Replace or clean the clutch surface
Too large clearance between clutch plate and clutch wheel	Contact with each other when pushing the clutch plate	Adjust the clearance or replace
Open coil	Does not contact when pushing the clutch and circuit tester doesn't indicate any value when checking the lead of ports.	Replace the compressor
Open wiring or poor contact to ground	Cannot contact regardless operation Check the ground and connecting area	Repair
Check the wiring parts	Check the continuity of pressure switch, thermistor and relay.	Replace

AIRFLOW IS SUFFICIENT AND COMPRESSOR RUNS NORMALLY BUT COOLING IS POOR

PROBABLE CAUSE		CHECKING METHODS	SOLUTION
Excessive/insufficient refrigerant		Touch the high and low pressure pipes by hand in 5~10 minutes after turning on A/C.	
Insufficient refrigerant		The difference of temperature between high and low pressure sides is too small.	Repair the leakage area and charge to specified level.
Excessive refrigerant		The high pressure is too high and air doesn't get cool even when cooling the condenser with water.	Adjust the refrigerant amount
Abnormal pressure on inlet or outlet of compressor		Normal pressure High pressure: 14 ~ 15 kg/cm ² Low pressure: 1.5 ~ 2.0 kg/cm ² Ambient temperature: 30 ~ 35 °C, Engine speed: approx. 2000 rpm	
Low pressure is too high	Defective thermocon	Magnetic clutch is off before the extracted air temperature fully falls down.	Adjust or replace
	Faulty compressor gasket or valve	When magnetic clutch is off, the high and low gauge pressure is balanced immediately.	Repair and replace the compressor.
	Poor contact of thermal case in expansion valve	Frost is formed on connecting area of compressor and its temperature is lower than that of outlet pipe.	Adhere the thermal case to low pressure pipe
	Too widely open expansion valve	Same as above. No changes in pressure regardless of thermal case's existence.	Replace
	Clogged compressor suction filter	The low pressure hose is not cold and only connecting area of compressor is cold.	Clean filter
Low pressure is too low	Insufficient refrigerant	Refer to "Insufficient refrigerant".	Add refrigerant
	Clogged receiver-drier	The difference of temperature between outlet ports is significant. Frost is formed on the tank.	Replace receiver-drier
	Clogged expansion valve	The inlet port of expansion valve is cold and frost is formed.	Replace expansion valve
	Gas leaks from thermal case in expansion valve	The outlet port of expansion valve is not cold and low pressure gauge indicates vacuum.	Replace expansion valve
	Clogged and deformed pipes	When the pipes are clogged, low pressure may be low or the gauge may indicate negative pressure.	Clean or replace pipes
	Defective thermocon	Frozen evaporator	Add refrigerant
The high pressure is too high	Poor cooling of condenser	Contaminated or clogged condenser, faulty cooling fan	Wash, repair or replace the fan
	Excessive refrigerant	Blown fuse, open wiring and poor contact	Adjust refrigerant level
	Air intrusion into cycle	Refer to "Excessive refrigerant"	Vacuuming, re-charge refrigerant
The high pressure is too low	Insufficient refrigerant	Refer to "Insufficient refrigerant".	Add refrigerant

5.3.2 POOR HEATING

FAN MOTOR DOESN'T ROTATE: REFER TO 2, 3 (A) 1**FAN MOTOR IS NORMAL BUT AIR FLOW IS NOT SUFFICIENT**

PROBABLE CAUSE	CHECKING METHODS	SOLUTION
Too large ventilation resistance	Check if the duct is clogged or damaged	Correct
Air leaks at duct connecting area	Check the duct connecting area Check the duct seal and assembled conditions	Correct

AIRFLOW IS SUFFICIENT BUT HOT AIR CANNOT BE GENERATED

PROBABLE CAUSE	CHECKING METHODS	SOLUTION
Too low coolant temperature	Check the coolant temperature after heating operation	Replace thermostat
Too low coolant level	Check the coolant level in radiator	Coolant Filling
Too small coolant circulating volume	Check if the coolant pipes and heater cut-valve are clogged	Bleed air, correct
No air passing through heater core	Check the operation of air mix door and seal condition	Adjust or replace control cable, check the seal

WATER DROPS

PROBABLE CAUSE	CHECKING METHODS	SOLUTION
Faulty seal	Check the leaks from heater core, core connecting area, hose, and pipings	Replace or repair
Too large play in connecting area	Same as above	Replace or repair
Porous heater core	Heater core	Replace

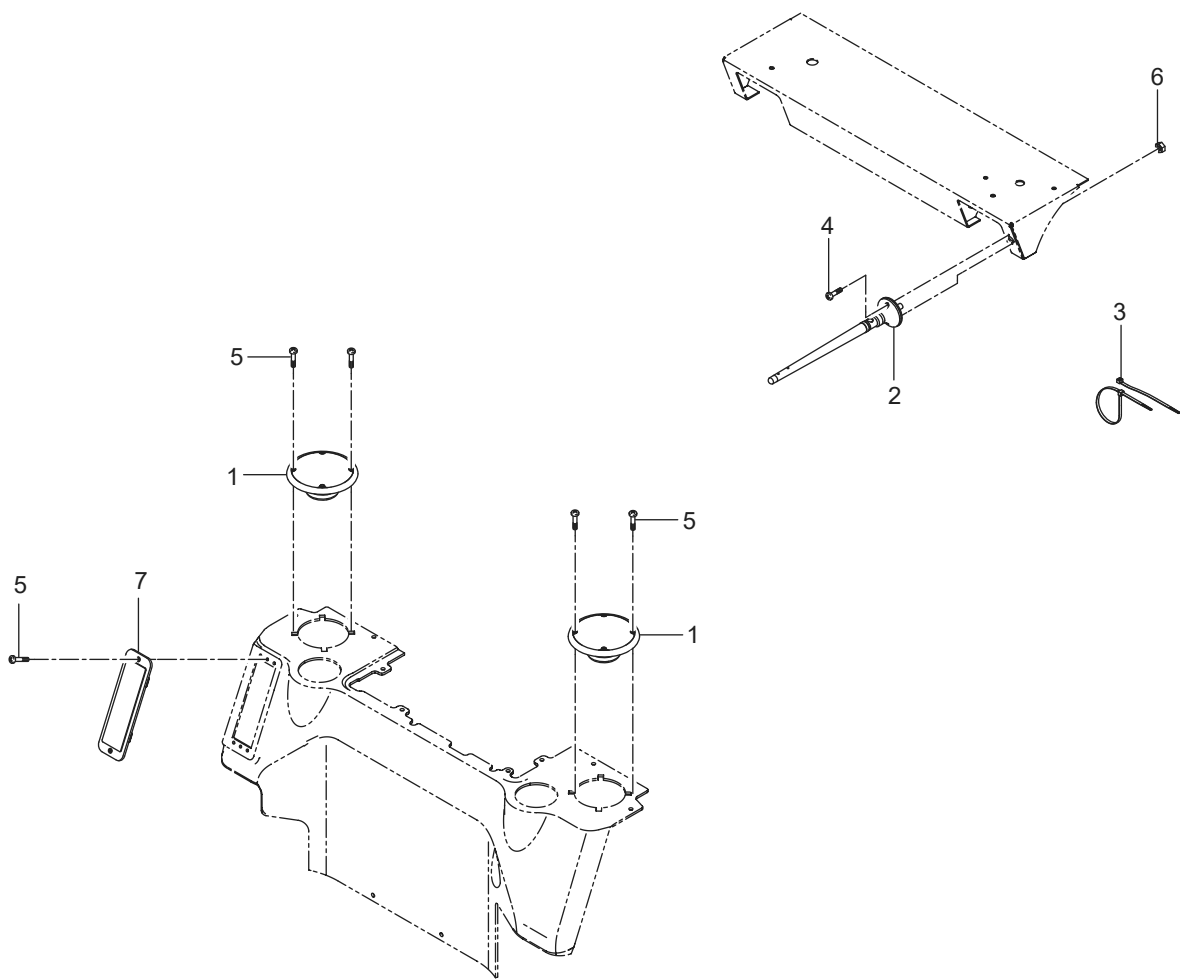
6. EXPLODED VIEW



REMARKS

- The manufacturing parts are subject to change without notice. Therefore, check the parts catalog or electronic manual for latest information.

6.1 LF1-G334001 SPEAKER ANTENNA GROUP

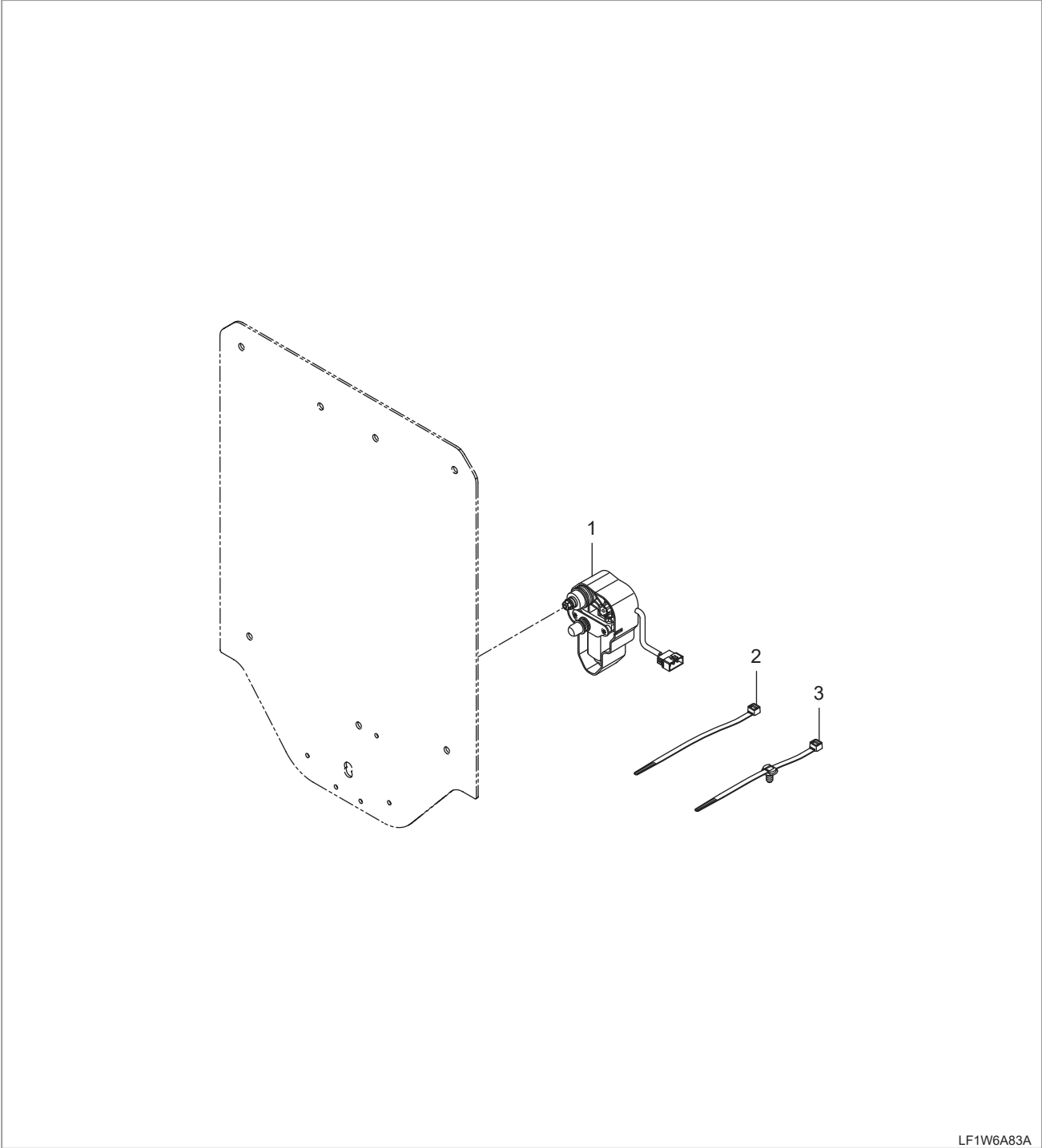


LF1W6A82A

COMPONENTS

- | | | |
|------------------|--------------|------------------|
| (1) Assy Speaker | (4) Screw | (7) Cover Stereo |
| (2) Antena Assay | (5) OB Screw | |
| (3) Cord Band | (6) Nut | |

6.2 LF1-G335501 WIPER MOTOR GROUP



COMPONENTS

(1) Motor, Wiper-Single ARM

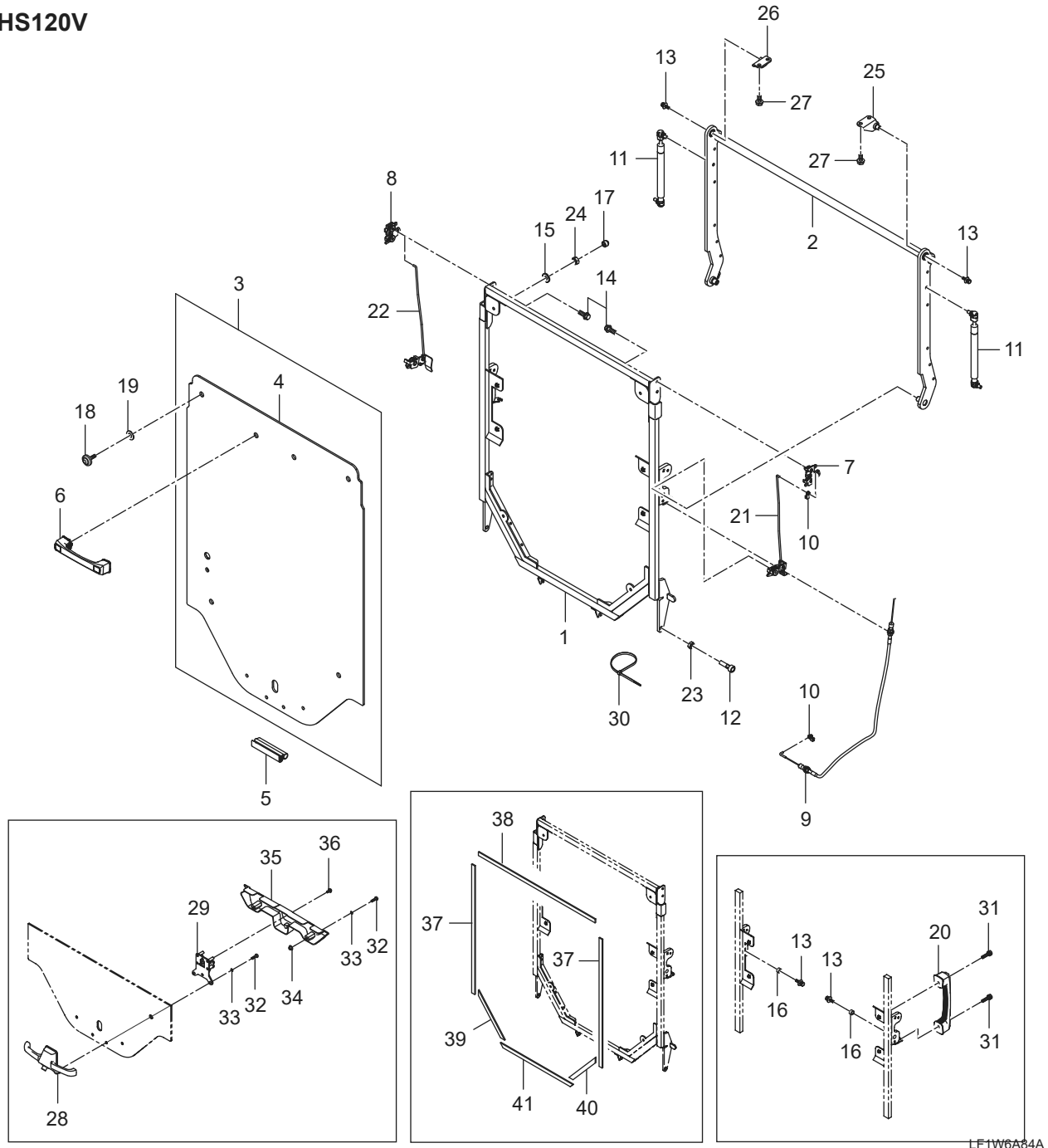
(2) Cord Band

(3) Band Cable

6.3 LF1-G4A1001 DOOR GROUP

* HS80V : Refer to parts manual.

HS120V



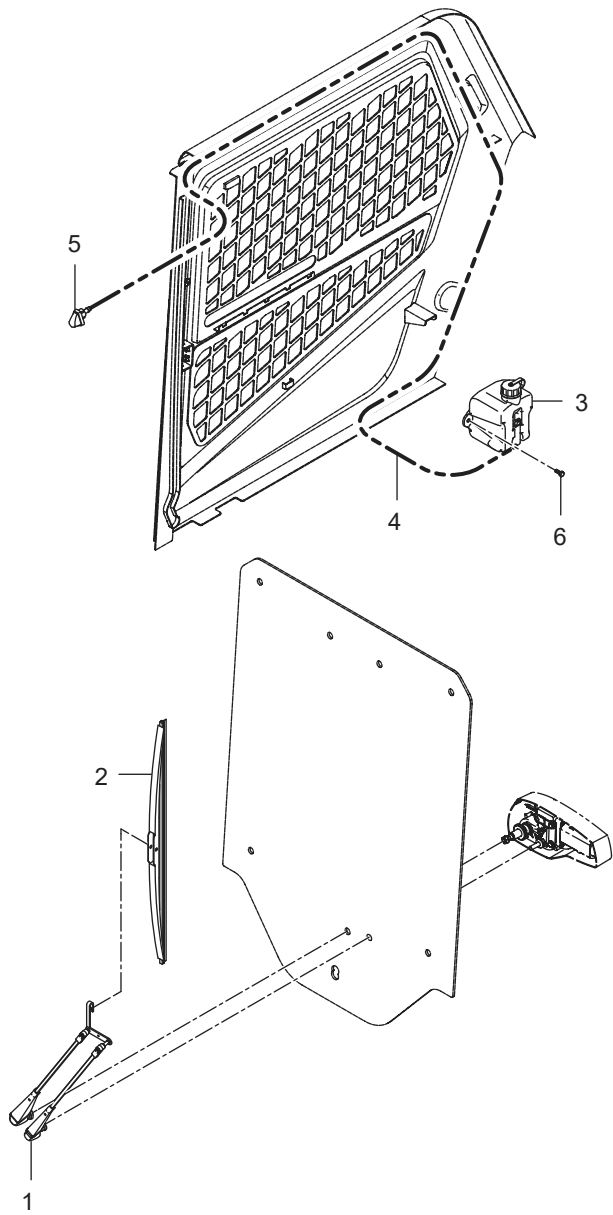
COMPONENTS

- | | | |
|------------------------------|--------------------------------|----------------------------|
| (1) Assy Bracket, Door | (15) Plain Washer, M8 | (29) Inner Handle-A |
| (2) Bracket, Door | (16) Hush Du | (30) Band,Cord |
| (3) Standard Glass Kit-Sgt01 | (17) Nut | (31) With washer bolt |
| (4) Glass, Door Entrance-FR | (18) Bolt, Cushion | (32) Screw, Washer |
| (5) Weatherstrip, Door-LWR | (19) Packing, 1 | (33) Washer, Plain |
| (6) Assy Handle, Door | (20) Handle, Door | (34) Bush-A(HVB) |
| (7) Assy Latch, Door-LH | (21) Assy Grip, Lever-LH | (35) Cover |
| (8) Assy Latch, Door-RH | (22) Assy Grip, Lever-RH | (36) Bolt-M4*L10 |
| (9) Cable | (23) Nut | (37) Sound Absorber-Door 1 |
| (10) Hook, Cable | (24) Nut, M8 | (38) Sound Absorber-Door 2 |
| (11) Assy Cylinder, Air Door | (25) Plate, Hinge-LH | (39) Sound Absorber-Door 3 |
| (12) Roller-LWR | (26) Plate, Hinge-RH | (40) Sound Absorber-Door 4 |
| (13) Bolt | (27) Hex Head Bolt With Washer | (41) Sound Absorber-Door 5 |
| (14) With washer bolt | (28) Handle-VB | |

6.4 LF1-G4E1001 WIPER GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W6A85A

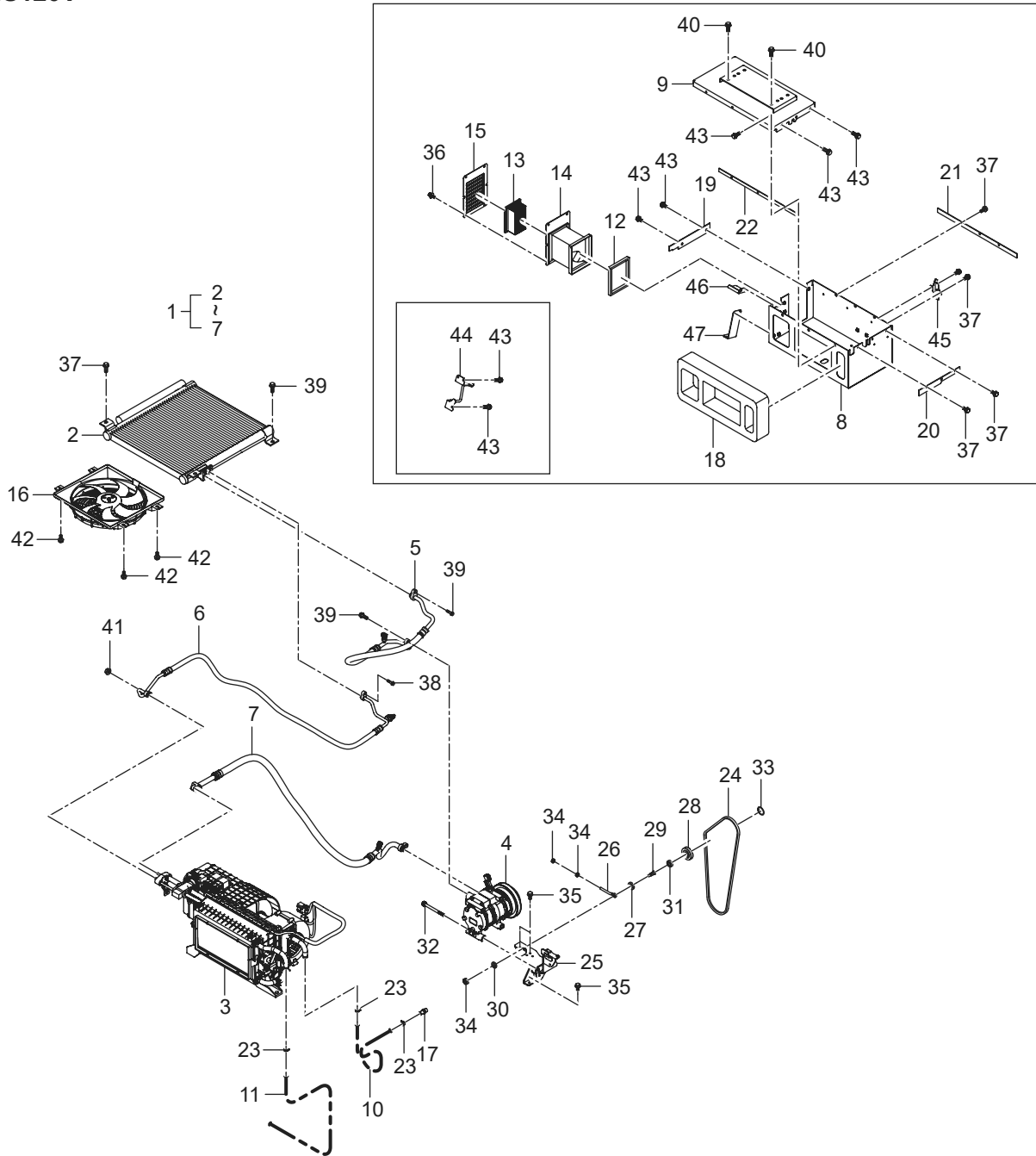
COMPONENTS

- | | | |
|--------------------------------------|------------------|------------------------|
| (1) Wiper, Arm | (3) Tank, Washer | (5) Nozzle, Wiper-Mist |
| (2) Blade, Wiperfront 16 In Dk55/45s | (4) Hose, Wiper | (6) With Washer Bolt |

6.5 LF1-G451001 AIR CONDITIONER DRIVE GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W6A86A

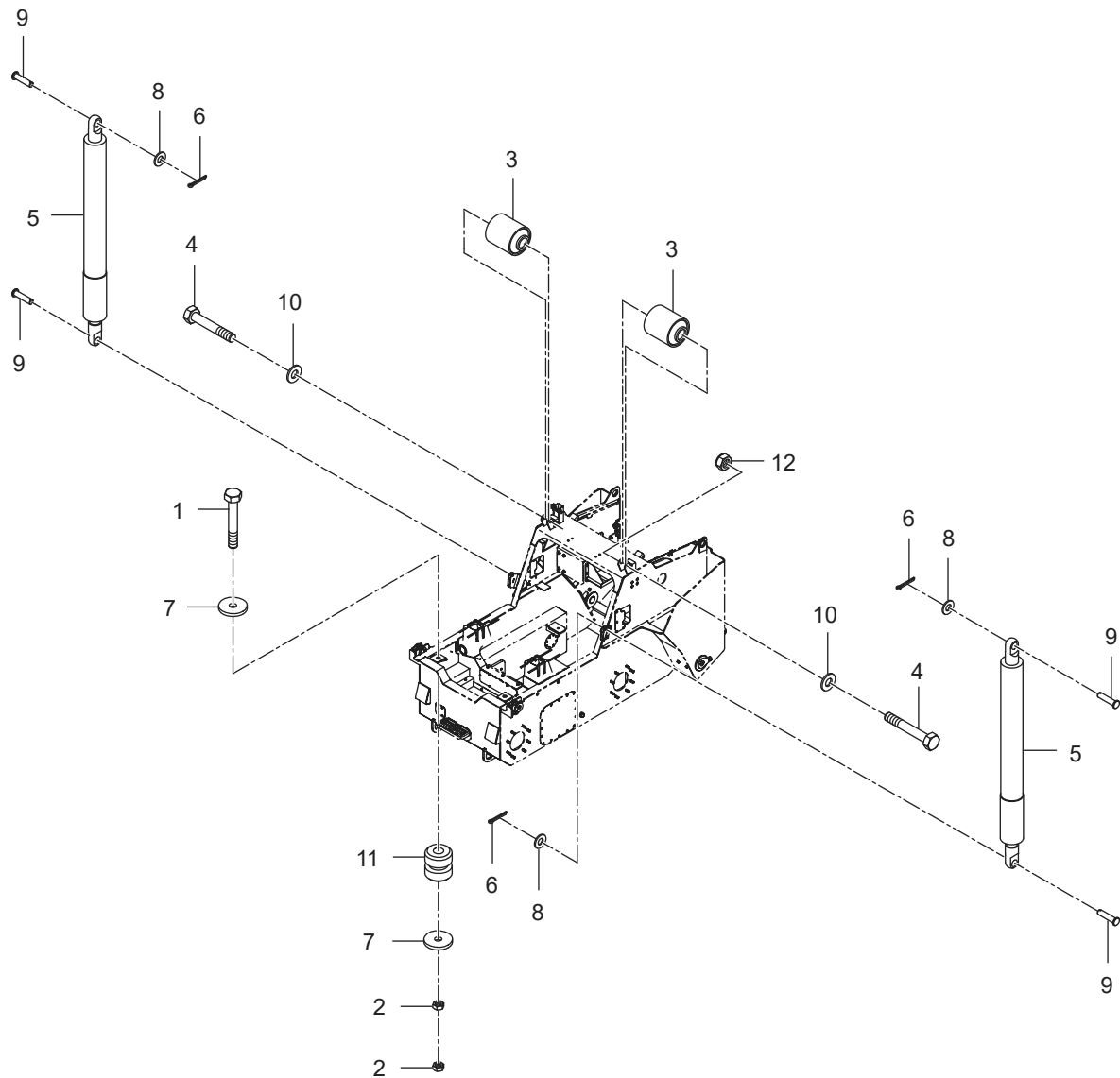
COMPONENTS

- | | | | |
|--------------------------|---------------------------|--------------------------|-----------------------|
| (1) Assy Air Conditioner | (13) Filter, External Air | (25) Bracket, Compressor | (37) Bolt, Washer |
| (2) Condenser | (14) Duct, External Air | (26) Bolt, Tension | (38) Bolt Flange |
| (3) Air Conditioner | (15) Cover, A/C | (27) Collar | (39) Flange Bolt |
| (4) Compressor | (16) Motor, Fan | (28) Pulley, Mid | (40) Washer Bolt |
| (5) Hose, A/C Hp 1 | (17) Connector, Coolant | (29) Shaft, Pulley | (41) Flang Nut |
| (6) Hose, A/C Hp 2 | (18) Tube, Duct | (30) Washer | (42) Bolt, Flange |
| (7) Hose, A/C Lp | (19) Pad, Sealing 1 | (31) Bearing, Ball | (43) Bolt, Washer |
| (8) Bracket, A/C | (20) Pad, Sealing 2 | (32) Bolt | (44) Guide, Harness |
| (9) Cover, A/C | (21) Pad, Sealing 3 | (33) Cir Clip, Internal | (45) Plate, Connector |
| (10) Hose, Heater HT | (22) Pad, Sealing 4 | (34) Nut | (46) Plate, Guide-1 |
| (11) Hose, Heater LT | (23) Clip, Hose | (35) With Washer Bolt | (47) Plate, Guide-2 |
| (12) Sponge | (24) Belt, Aircon | (36) Bolt, With Washer | |

6.6 LF1-G466001 CABIN SUPPORT GROUP

* HS80V : Refer to parts manual.

HS120V



COMPONENTS

- | | | |
|-----------------------|----------------------------|--|
| (1) Bolt | (5) Cylinder, Air | (9) Pin, Joint |
| (2) Nut | (6) Pin, Split | (10) Plain Washer |
| (3) Rubber, Dustproof | (7) Washer, Plain-14*50*6T | (11) Rubber, Vib Isolator Cabin Support - FR |
| (4) Bolt, Hexagon | (8) Plain Wahser | (12) Nut, U |

SAFETY FIRST

ENGINE

DRIVING & CHASSIS

HYDRAULIC SYSTEM

ELECTRIC SYSTEM

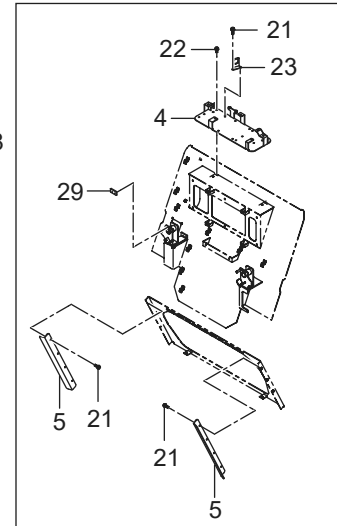
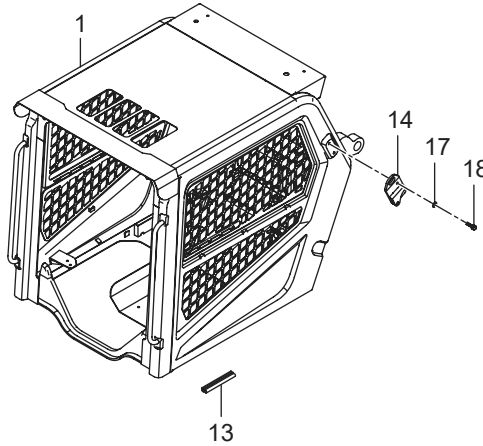
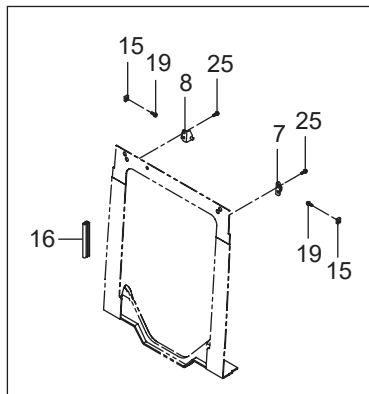
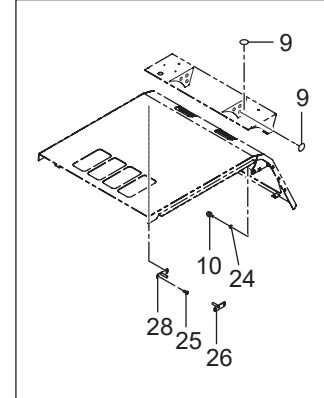
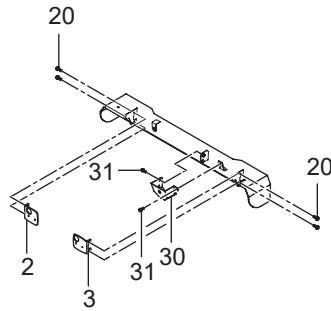
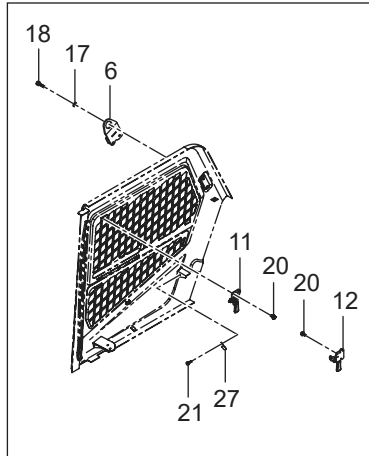
CABIN

INDEX

6.7 LF1-G491001 CABIN FRAME GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W6A88A

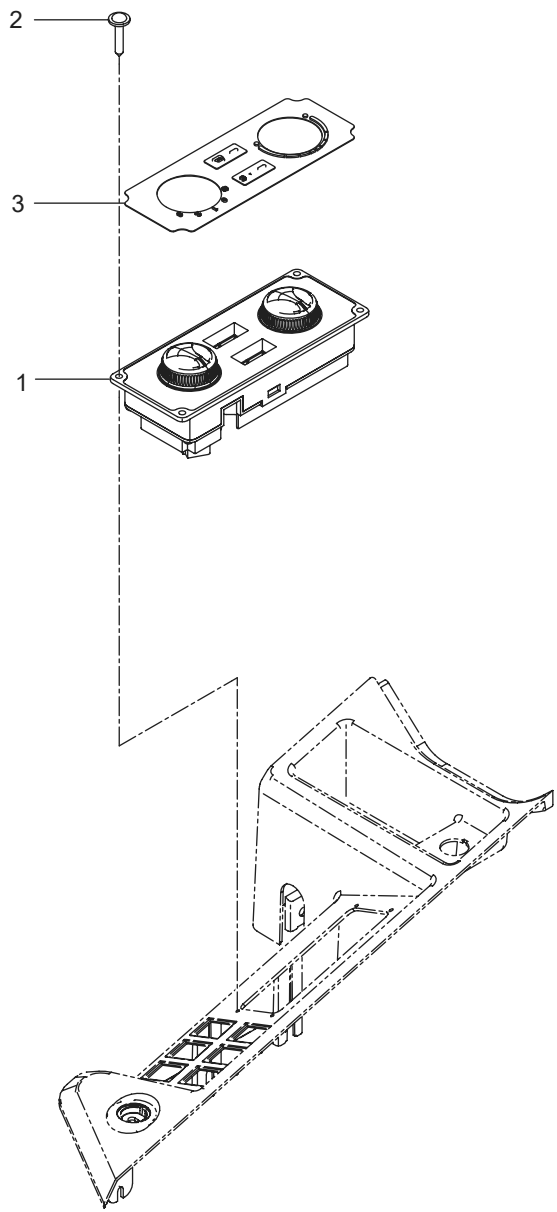
COMPONENTS

- | | | |
|-----------------------------------|-------------------------|---------------------------|
| (1) Assy Frame, Cabin | (12) Stopper, Open-LH | (23) Connector, Plate |
| (2) Bracket, Direction Lamp-FR | (13) Weatherstrip 1 | (24) Nut, M8 |
| (3) Bracket, Direction Lamp-FR RH | (14) Support, Cabin-LH | (25) Bolt, With Washer |
| (4) Cover, Fuse Box | (15) Cushion, Rubber 1 | (26) Striker, Latch-RR |
| (5) Guide, Harness | (16) Weatherstrip-FR | (27) Plate, Buzzer |
| (6) Support, Cabin-RH | (17) Plain Washer | (28) Striker, Latch-RR RH |
| (7) Striker, Latch | (18) With Washer Bolt | (29) Sponge-Isolation |
| (8) Striker, Latch-RH | (19) With Washer Bolt | (30) Cover-Horn |
| (9) Label, Cover | (20) Bolt, Washer | (31) With Washer Bolt |
| (10) Rubber, Damper | (21) With Washer Bolt | |
| (11) Stopper, Open | (22) Hex Head Cap Screw | |

6.8 LF1-G4B1001 AIR CONDITIONER GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W6A89A

COMPONENTS

(1) HVAC Cont

(2) Tapping Screw

(3) Cont Label

SAFETY FIRST

ENGINE

DRIVING & CHASSIS

HYDRAULIC SYSTEM

ELECTRIC SYSTEM

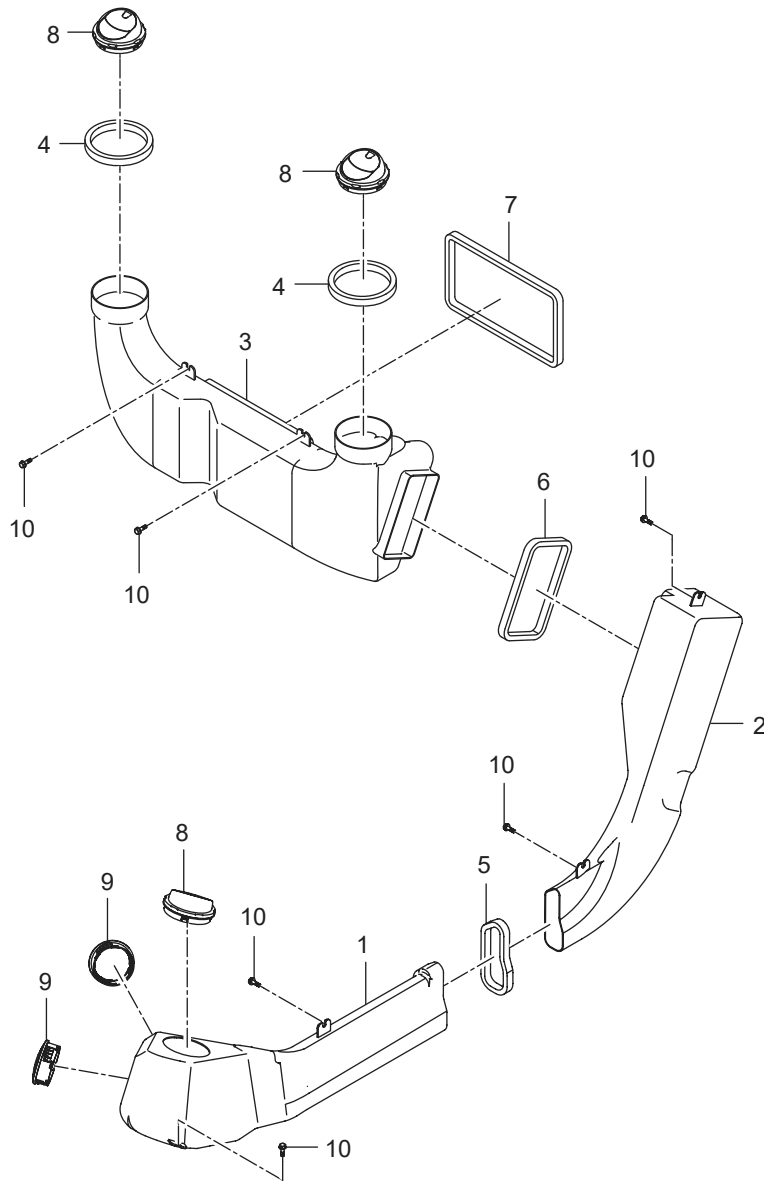
CABIN

INDEX

6.9 LF1-G4B2001 AIR CONDITIONER DUCT GROUP

* HS80V : Refer to parts manual.

HS120V



LF1W6A90A

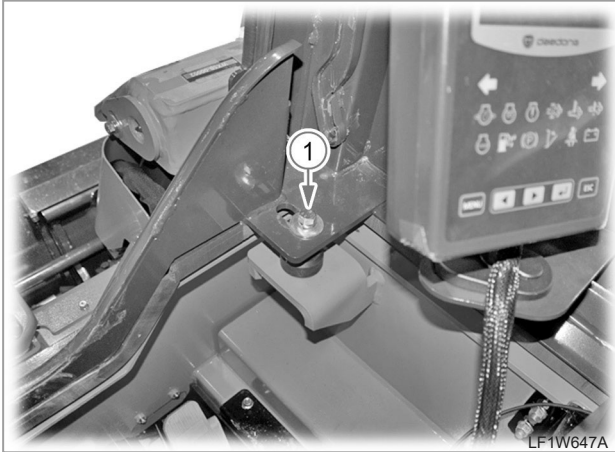
COMPONENTS

- | | | |
|--------------------|--------------------|-------------------------|
| (1) Duct-LWR FR | (5) Pad, Sealing 1 | (9) Grille, A/C(Circle) |
| (2) Duct-RH UPR | (6) Pad, Sealing 2 | (10) Bolt Flange |
| (3) Duct-RR | (7) Pad, Sealing 4 | |
| (4) Pad, Sealing 3 | (8) Grille, A/C 1 | |

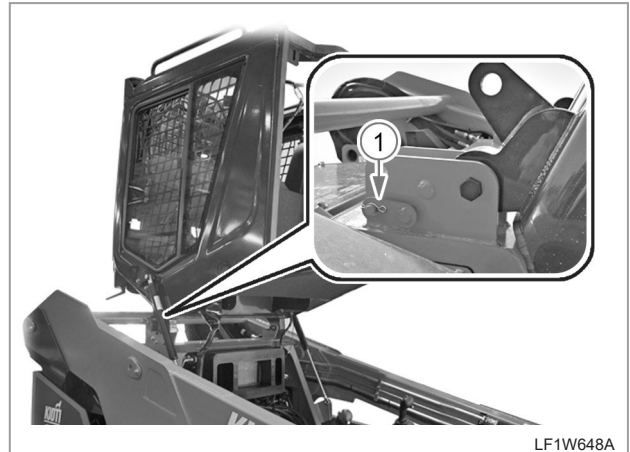
7. MAINTENANCE

7.1 OPENING THE CABIN (LIFTING UP)

1. Park the equipment on a flat surface, lower the boom lift, then turn off the engine and apply the parking brake.



2. Unscrew mounting bolts (1) on the left and right sides of the front of the cabin.



3. Grab the frame of the cabin from the front of the cabin and slowly lift it all the way up. Then, remove the mounting snap pin (a lock) (1) to disconnect the lock (mounting pin), screw it into the cabin mounting hole, secure the cabin, and assemble the snap pin.

CAUTION

- If a jack stand is not installed under the rear frame of the equipment, the equipment may tip over. Therefore, when raising the cabin or boom lift, install a jack stand on the back of the frame to prevent the equipment from tipping backwards.

7.2 CABIN REMOVAL

SAFETY FIRST

ENGINE

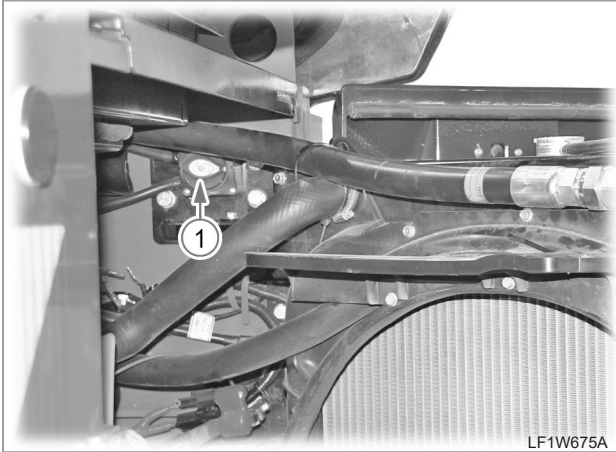
DRIVING & CHASSIS

HYDRAULIC SYSTEM

ELECTRIC SYSTEM

CABIN

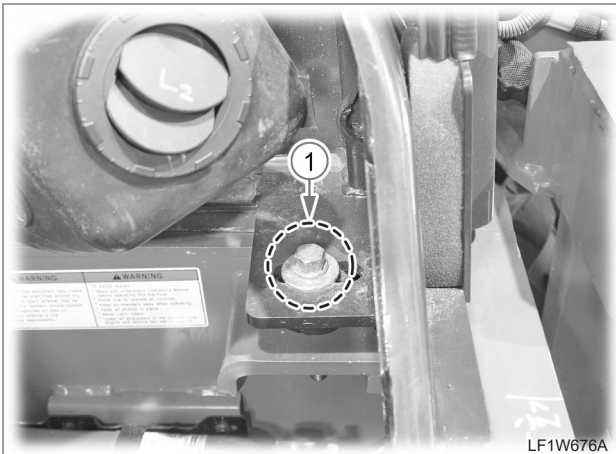
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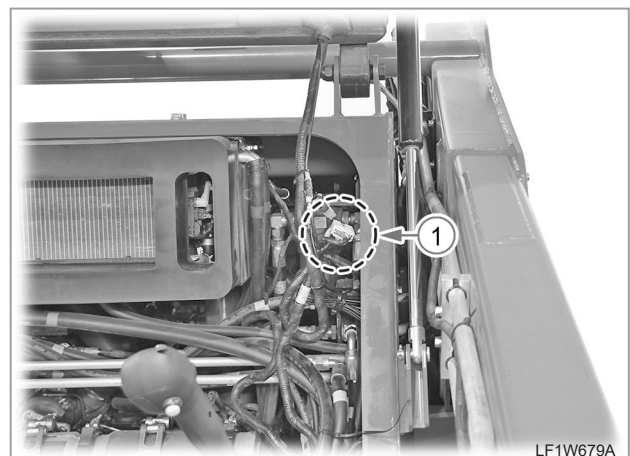
1. Turn off the battery power cut-off switch (1).



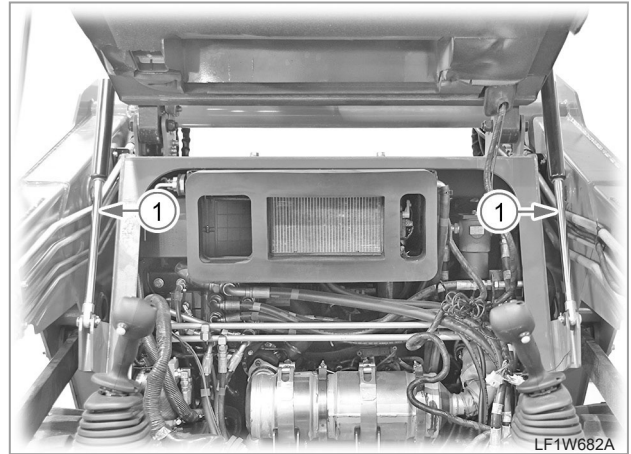
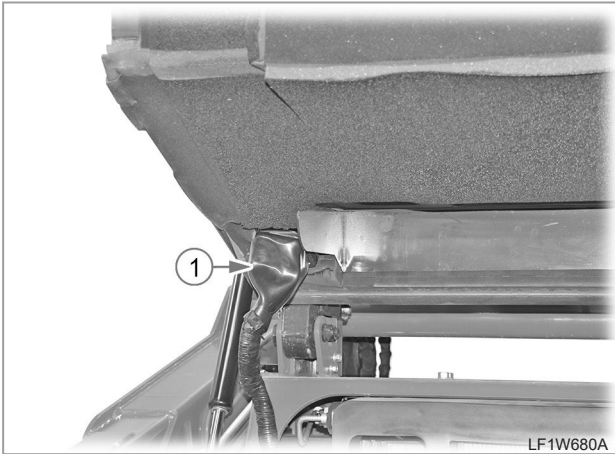
2. After unscrewing cabin mounting bolts (1)(2EA) and opening the cabin upwards, firmly fix the cabin with a mounting pin (2).



3. Install a disassembly jig at the top of the cabin and place it on the hoist.

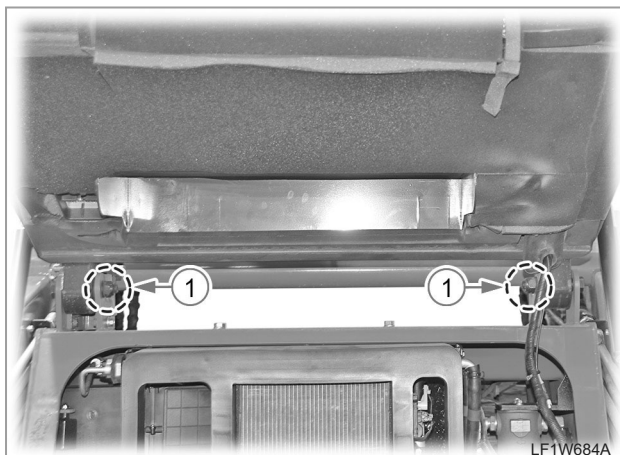


4. Disconnect the wiring connector (1) from the left side of the cabin.



5. After disconnecting the wire boots (1) at the bottom right of the cabin, unscrew the connector mounting bolt (2) to disconnect the entire main wiring connector assembly.

6. Remove the gas springs (1).



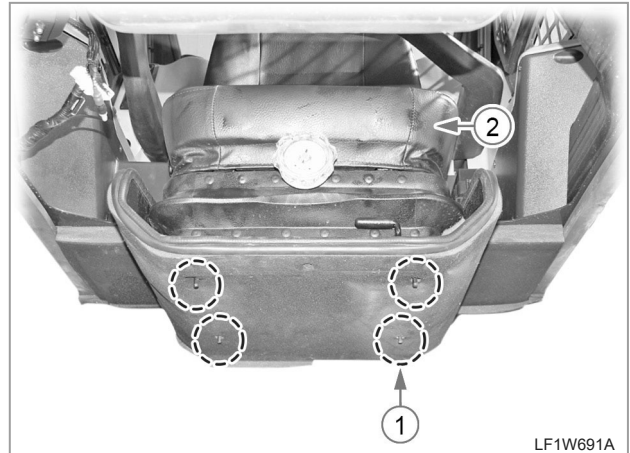
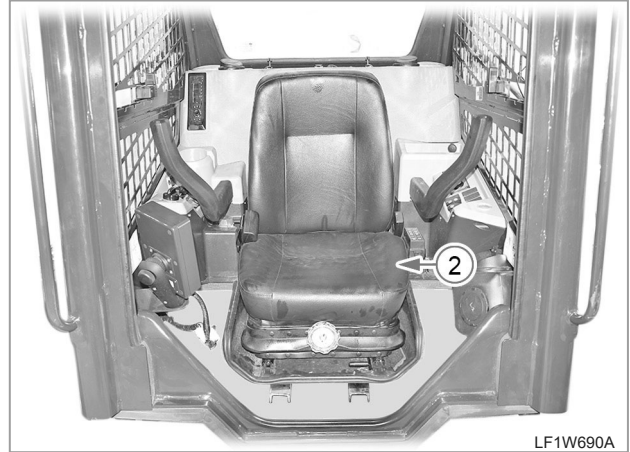
7. Unscrew mounting nuts (1) on the cabin hinges and lower the cabin.

8. Reinstall the disassembly jig on the top of the cabin to remove the mounting bolts (1) from the hinges, then separate the cabin.

7.3 CABIN COMPONENTS DISASSEMBLY & ASSEMBLY

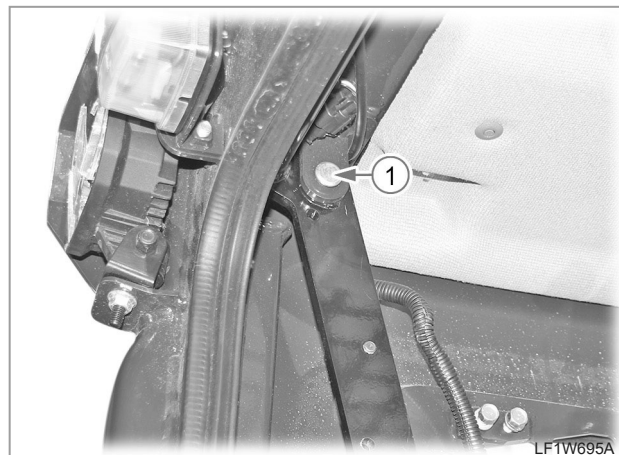


1. Remove the cabin assembly.

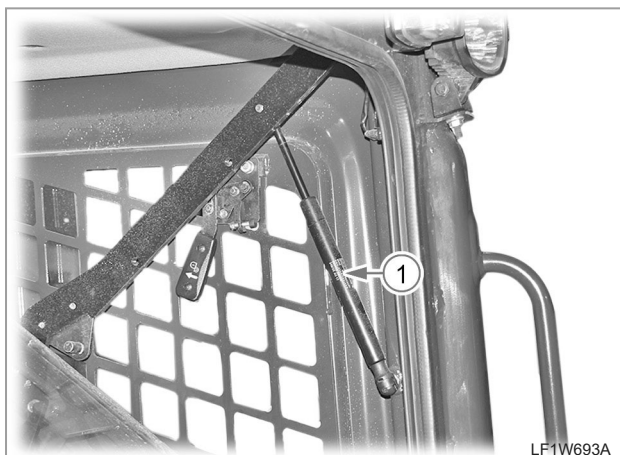


2. After opening the door, unscrew seat mounting nuts (1)(4EA) at the bottom of the cabin to remove the seat assembly (2).

► DOOR REMOVAL



3. Disconnect the door wiring (1).



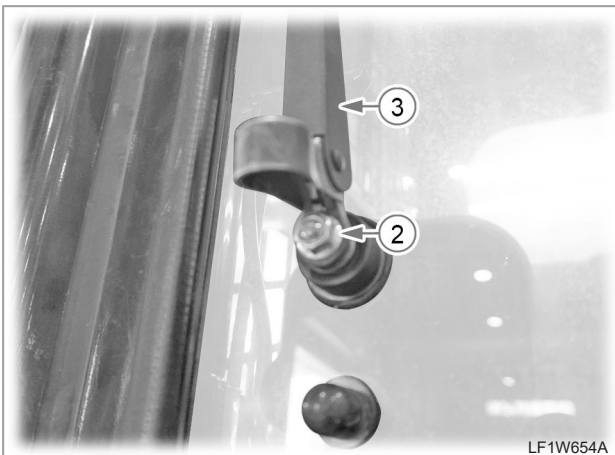
4. Disconnect left (1) and right (2) air cylinders.

5. Remove the door hinge pins (1) (one each on the left and right sides), then remove the door (2).

► WIPER DISASSEMBLY



6. Open the cover (1) on the bottom of the wiper assembly.



7. Unscrew the wiper assembly mounting nut (2) to remove the wiper assembly (3).

► WIPER MOTOR DISASSEMBLY



8. Unscrew the wiper motor mounting nut (1).



9. Remove the wiper motor assembly cover (2).

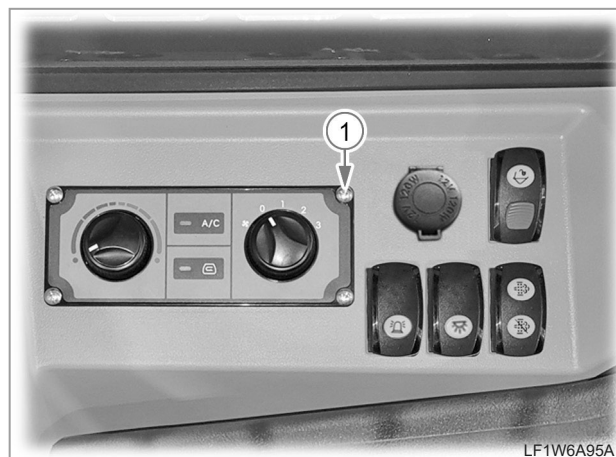


10. Disconnect the wiper motor connector (3).



11. Remove the wiper motor (4).

► AIR CONTROLLER DISASSEMBLY



12. Unscrew A/C controller mounting screws (1).

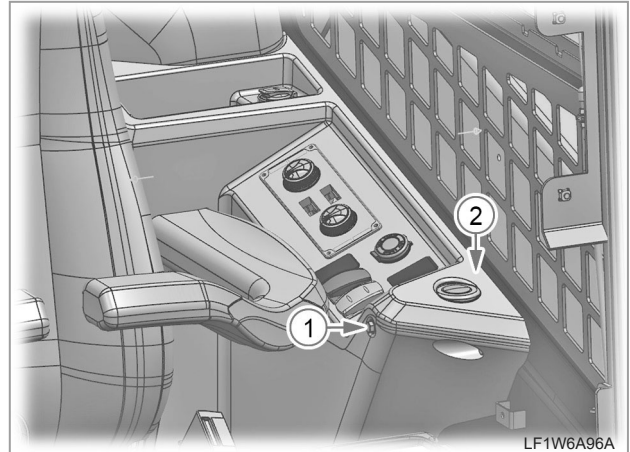


13. Disconnect the A/C controller wiring connector (2).

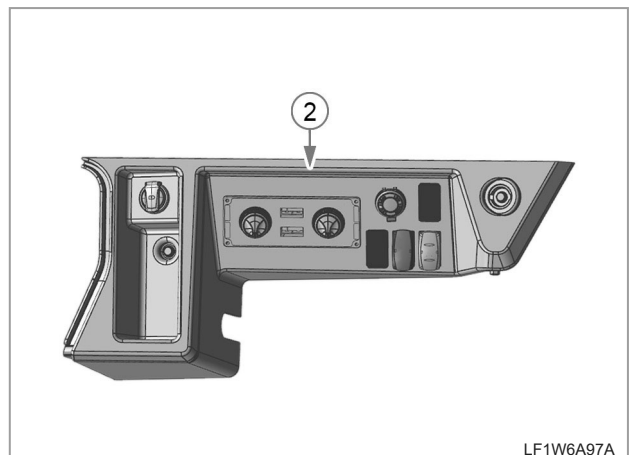
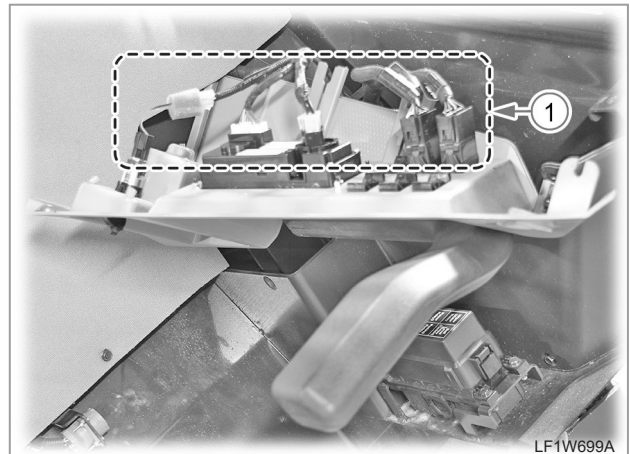
► LEFT TRIM REMOVAL



14. Remove the A/C controller assembly.

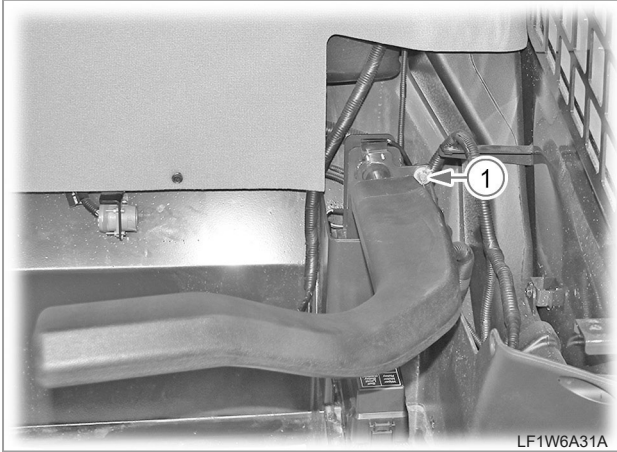


15. Unscrew control panel mounting bolts (1)(7EA) on the left side of the cabin to remove the control panel assembly (2).

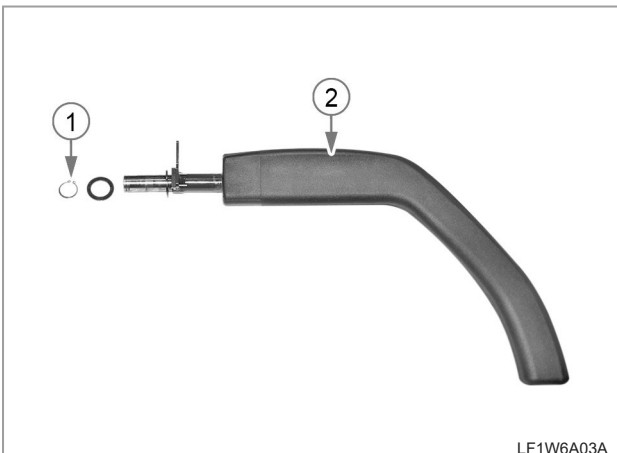
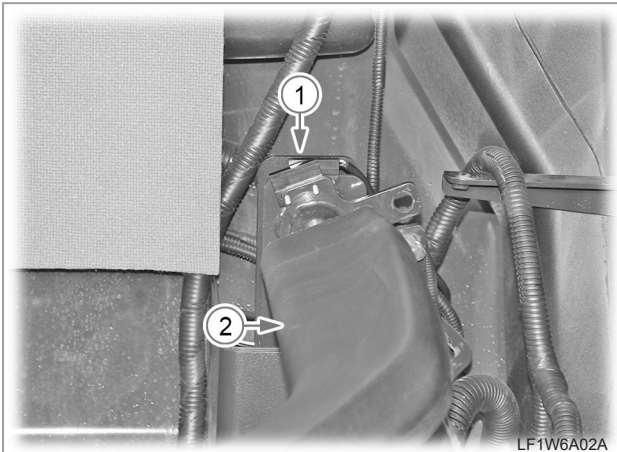


16. Disconnect 5 wiring connectors (1) and remove the control panel (2).

► SEAT BAR DISASSEMBLY

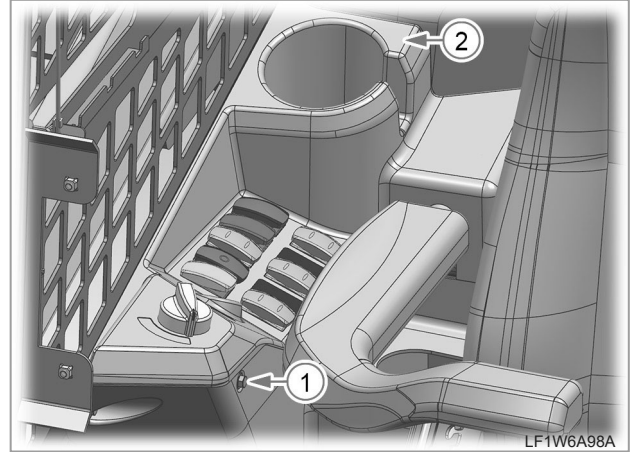


17. Pull out the seat bar operating lever clip pin (1) to disconnect it.

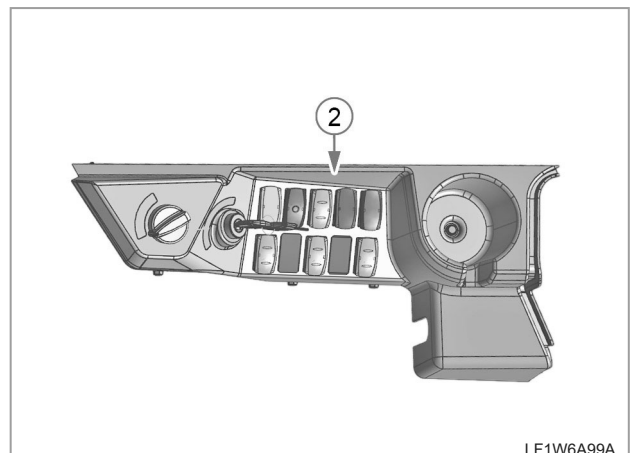
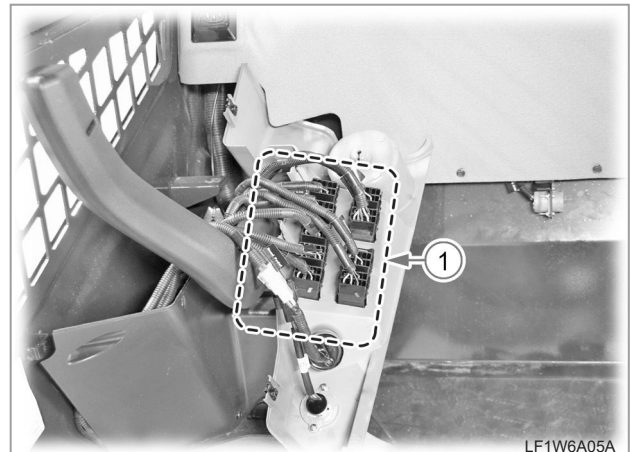


18. Pull out the snap ring (1) from the inside of the seat bar to remove the seat bar (2).

► RIGHT TRIM REMOVAL

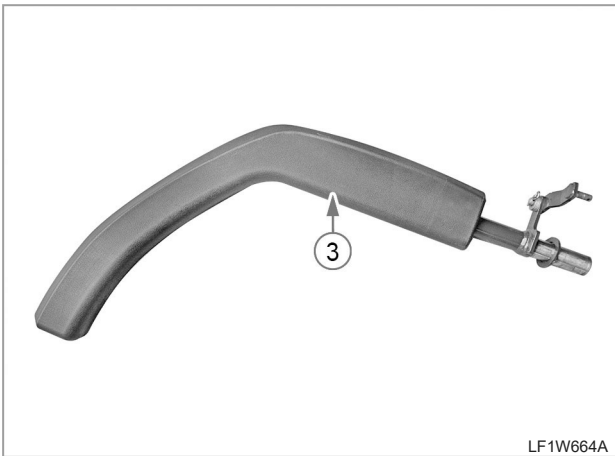
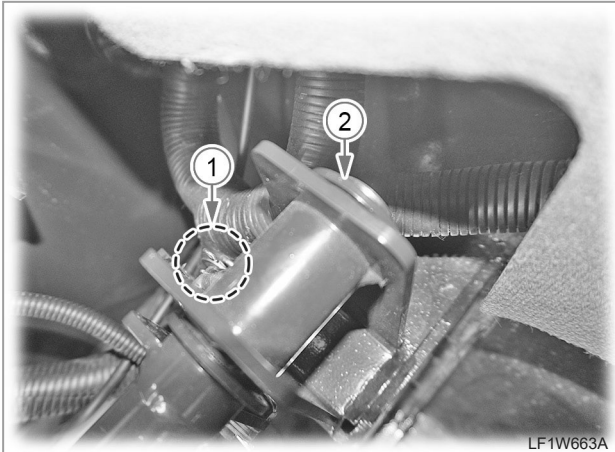


19. Unscrew right control panel mounting bolts (1)(6EA) to disconnect the right control panel assembly (2).

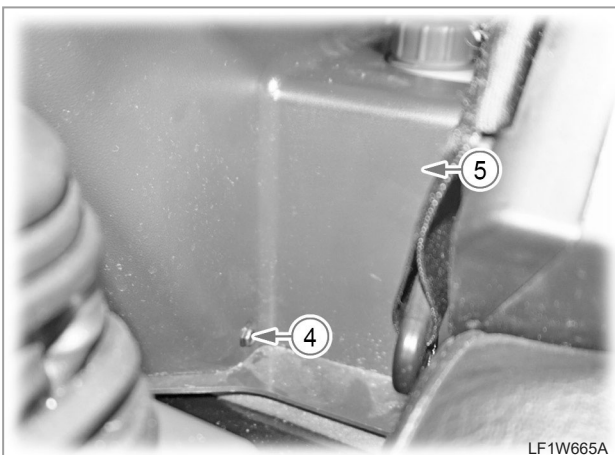


20. Disconnect switch connectors (1)(11EA) from the right control panel assembly to remove the right control panel (2).

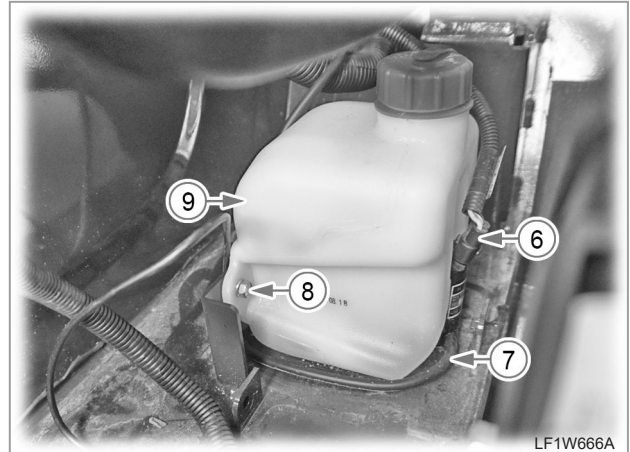
► WASHER LIQUID TANK DISASSEMBLY



21. Pull out the right seat bar clip pin (1) and snap ring (2) to remove the right seat bar (3).

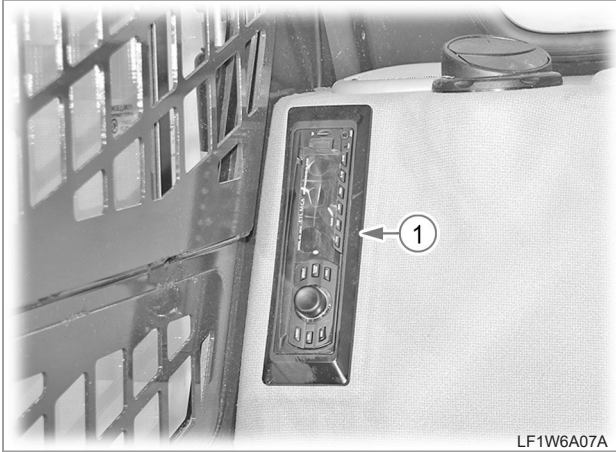


22. Unscrew the lower cover mounting bolt (4) of the right control panel to remove the lower cover (5).

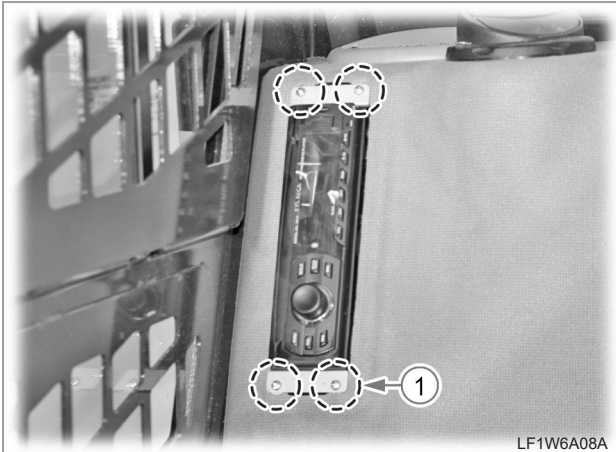


23. Disconnect the washer fluid tank pump connection wiring connector (6) and hose (7), and unscrew the washer fluid tank mounting bolt (8) to remove the washer fluid tank.

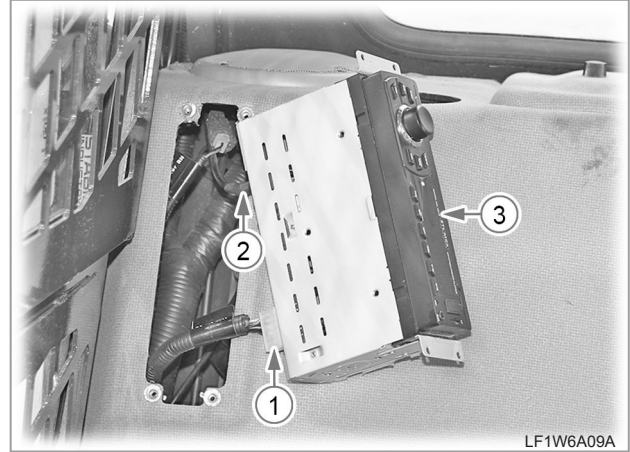
► STEREO REMOVAL



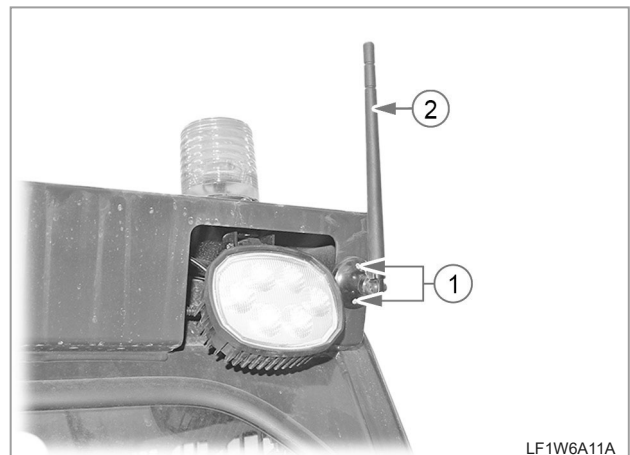
24. Remove the face frame (1) on the edge of the stereo.



25. Unscrew 4 stereo mounting screws (1) and pull out the stereo assembly.

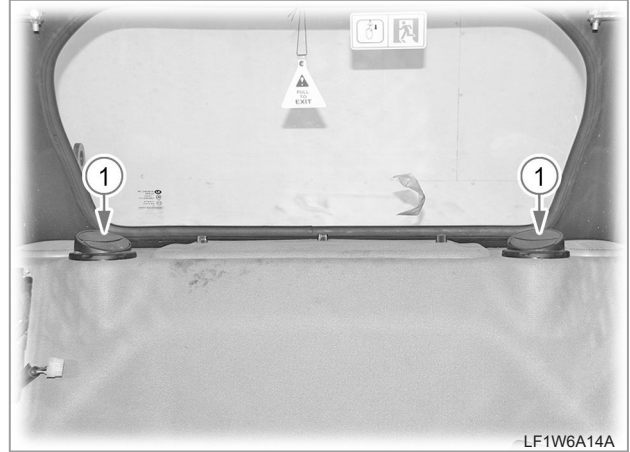
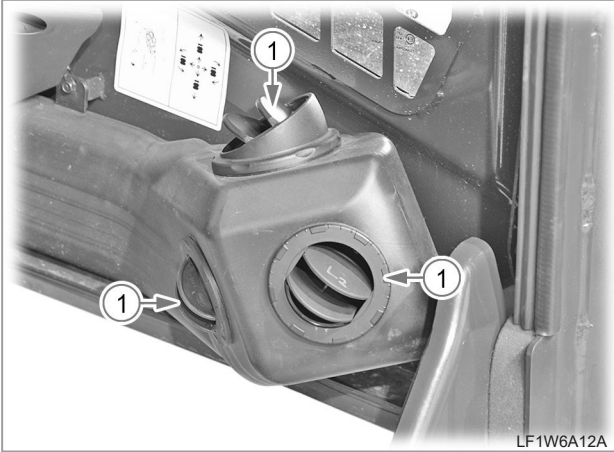


26. Disconnect the stereo wiring connector (1) and antenna cable (2) to remove the stereo (3).



27. Unscrew antenna mounting screws (1) and pull out the antenna (2).

► AIR VENT REMOVAL

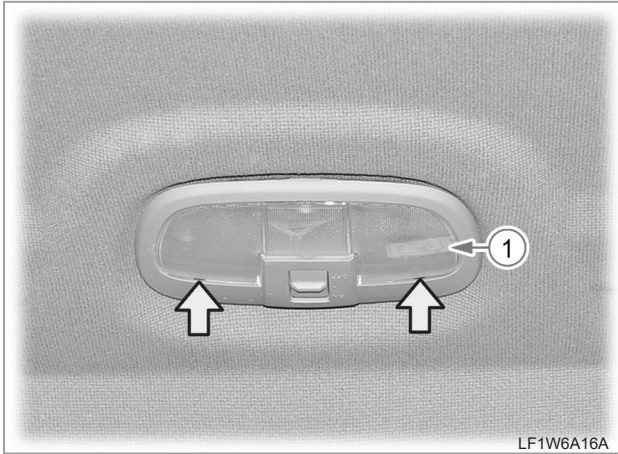


28. Pull out vents (1)(3EA) from the front duct.

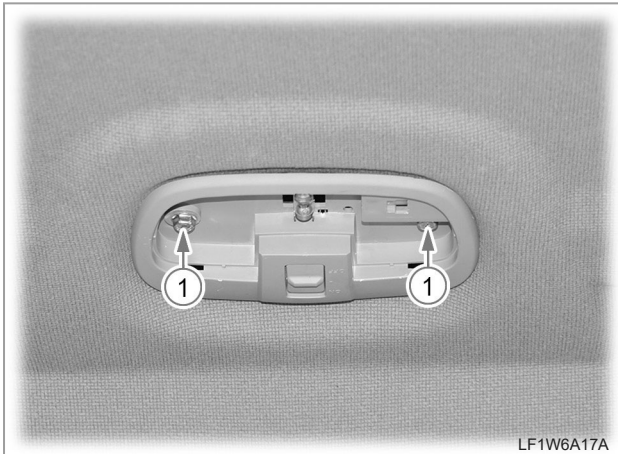


29. Pull out vents (1)(2EA) from the rear of the cabin seat.

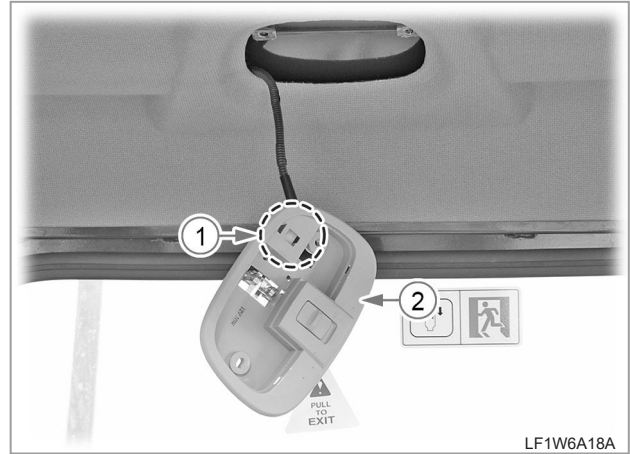
► ROOM LAMP REMOVAL



30. Remove the room lamp lens (1).

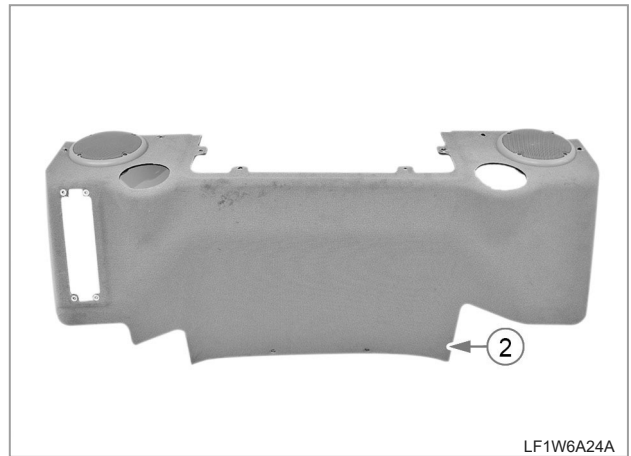
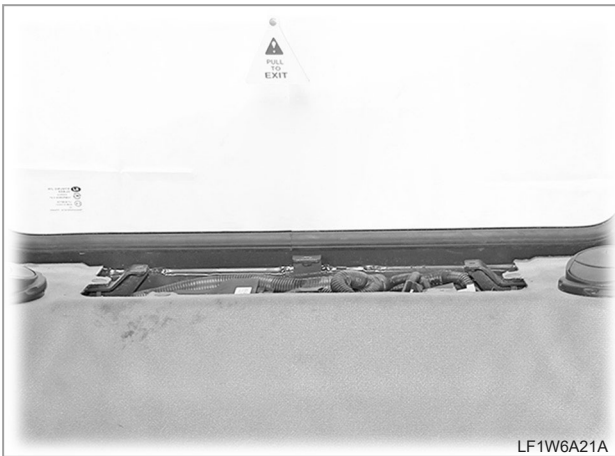
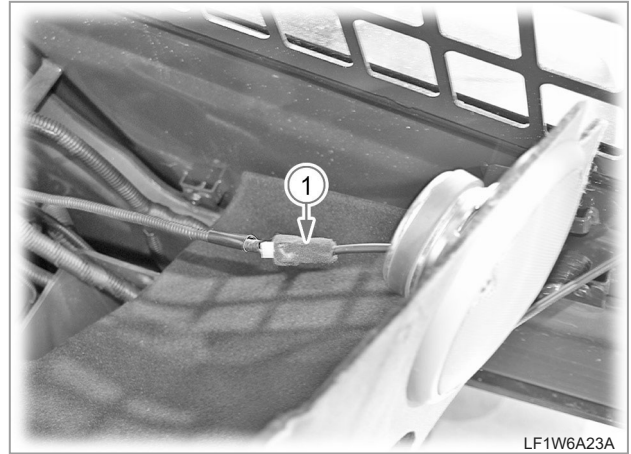
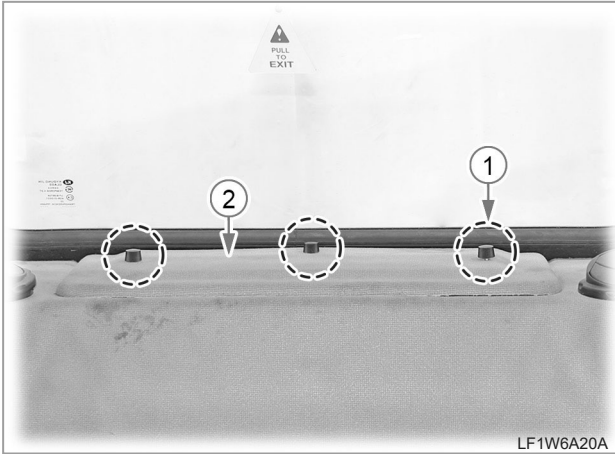


31. Unscrew room lamp mounting bolts (1)(2EA) to disconnect the room lamp from the ceiling.



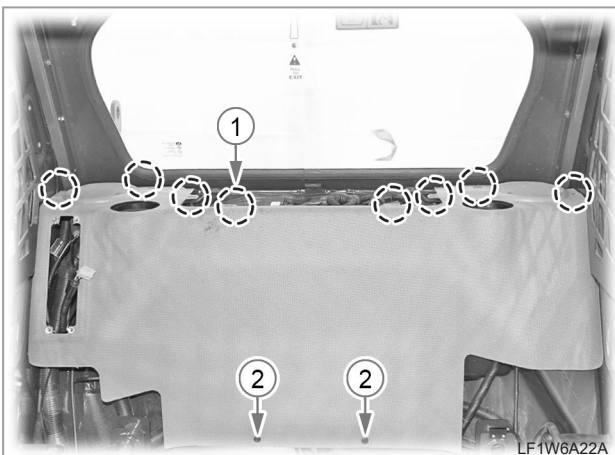
32. Disconnect the connector (1) from the room lamp wiring to remove the room lamp (2).

► SEAT REAR COVER REMOVAL

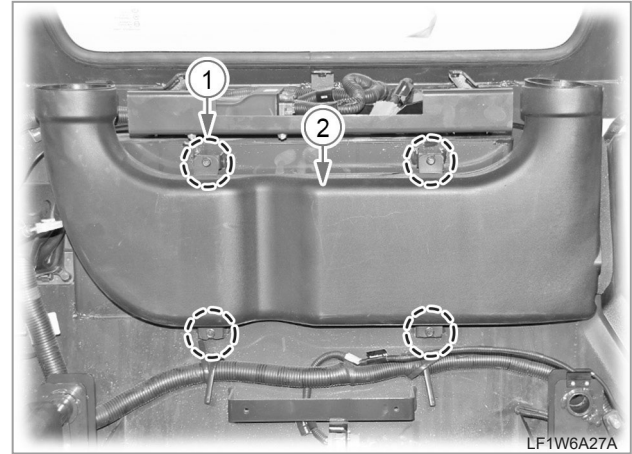
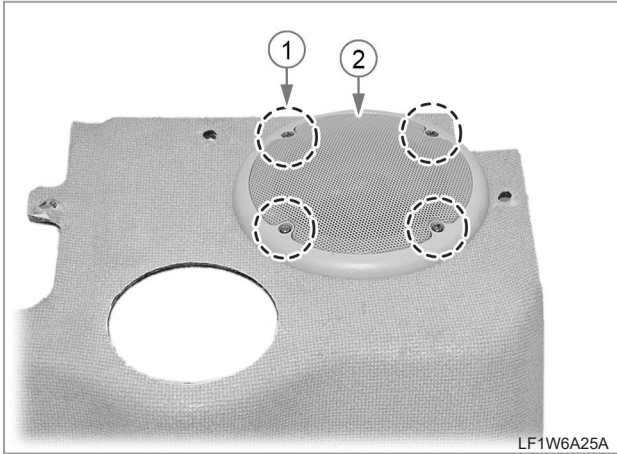


33. Unscrew knob bolts (1)(3EA) on the cover at the back of the seat to remove the upper cover (2).

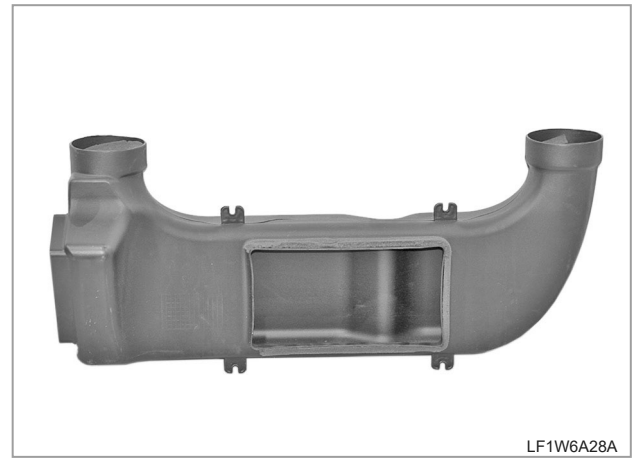
35. Disconnect connectors (1) from the left-hand and right-hand speakers and remove the cover (2) at the back of the seat.



34. Unscrew mounting rivets (1)(8EA) and bolts (2)(2EA) on the cover at the back of the seat.



36. Unscrew speaker mounting screws (1)(4EA) from the cover at the back of the seat to remove the speaker (2).



37. Unscrew duct no. 1 mounting bolts (1)(4EA) to remove the duct no. 1 (2).

7.4 AIR CONDITIONER & HEATER DISASSEMBLY

SAFETY FIRST

ENGINE

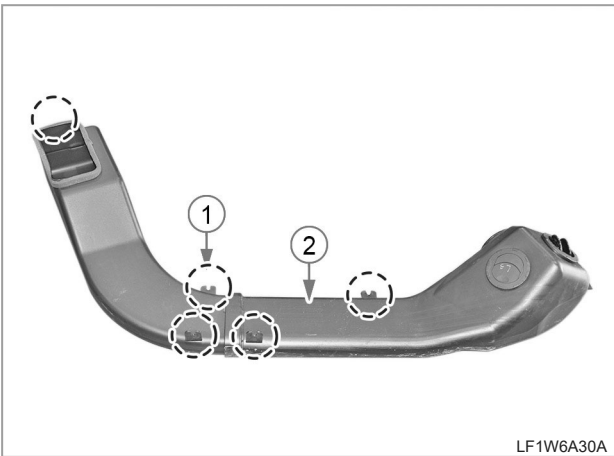
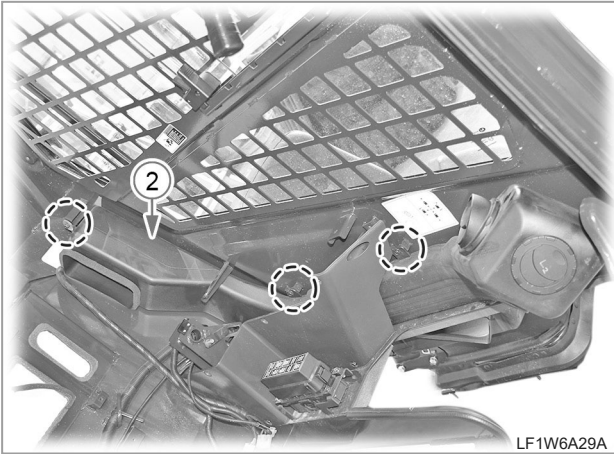
DRIVING & CHASSIS

HYDRAULIC SYSTEM

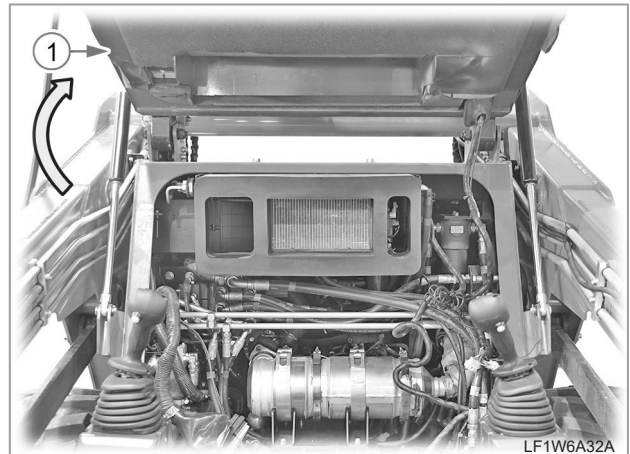
ELECTRIC SYSTEM

CABIN

INDEX



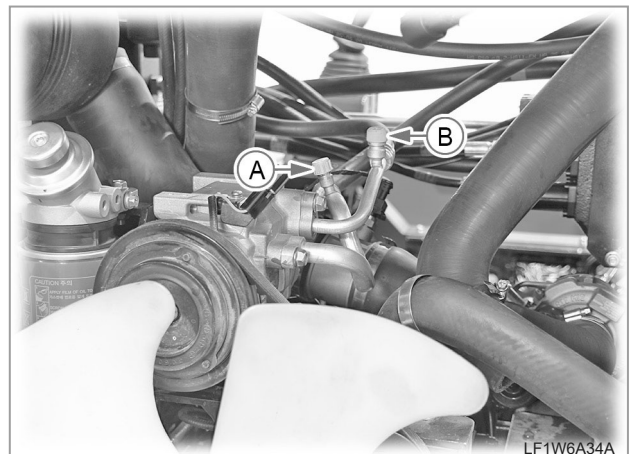
38. Unscrew duct no. 2 mounting bolts (1)(5EA) to remove the duct no. 2 (2).



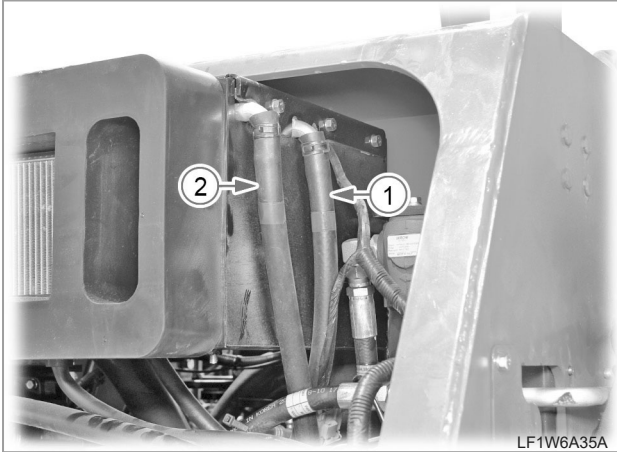
1. Open the cabin (1) and make sure it is firmly held.



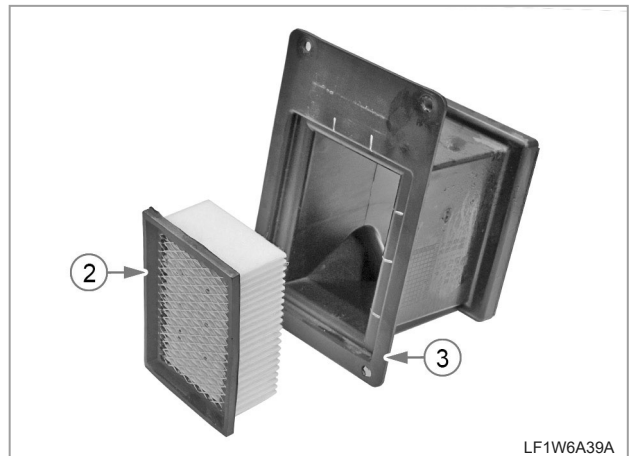
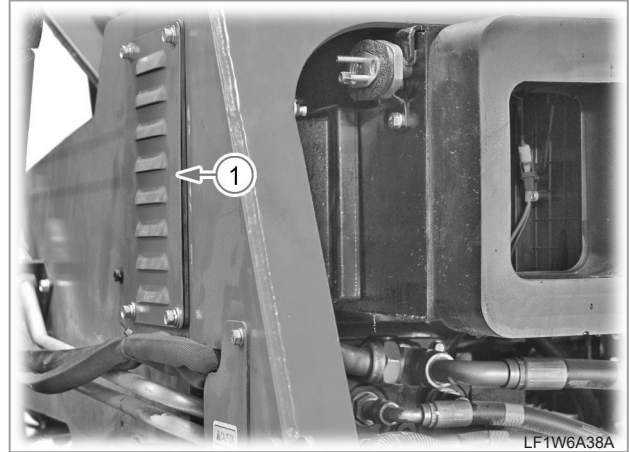
2. Turn off the battery power cut-off switch (1).



3. Install a refrigerant collector to be connected to the A/C hoses (A & B) to collect the refrigerant.



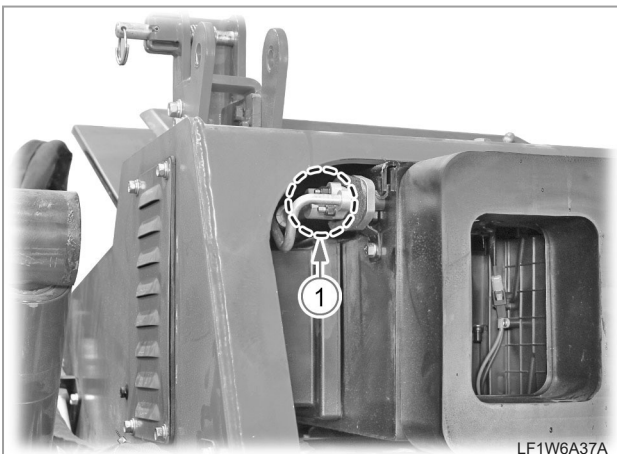
4. Disconnect the heater hoses (1 & 2).



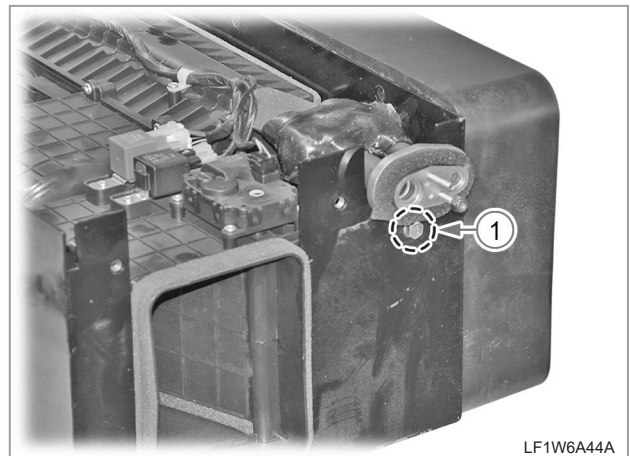
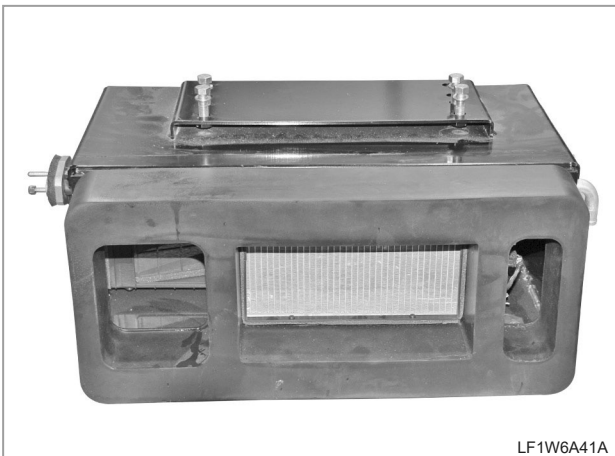
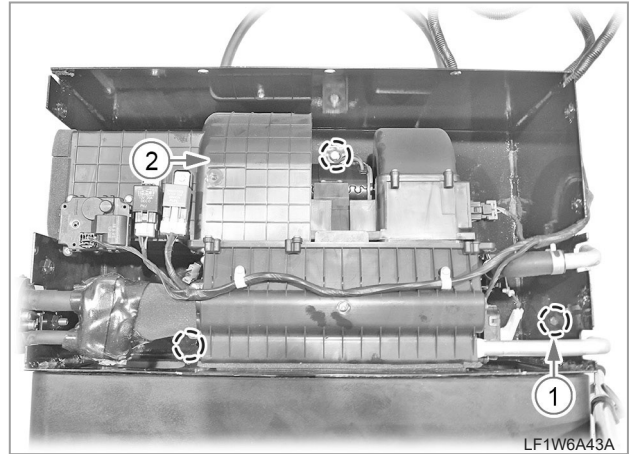
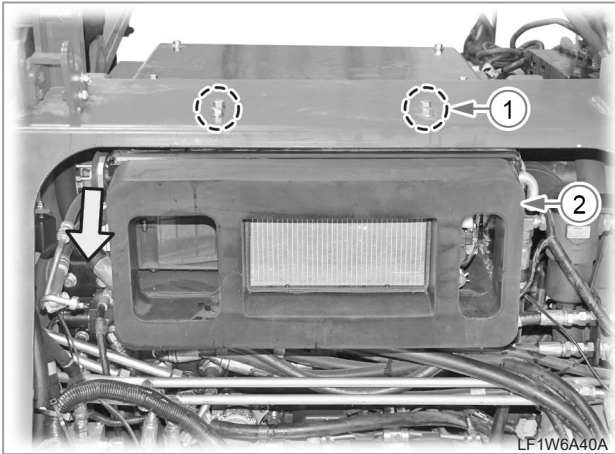
7. Release the fresh air intake cover (1) and remove the internal filter (2) and duct (3).



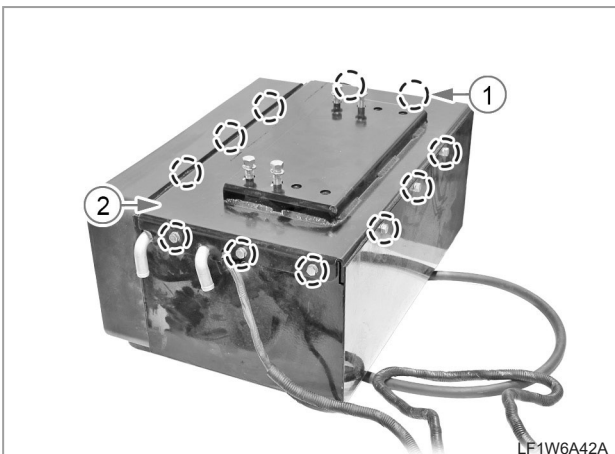
5. Disconnect the wiring connector (1).



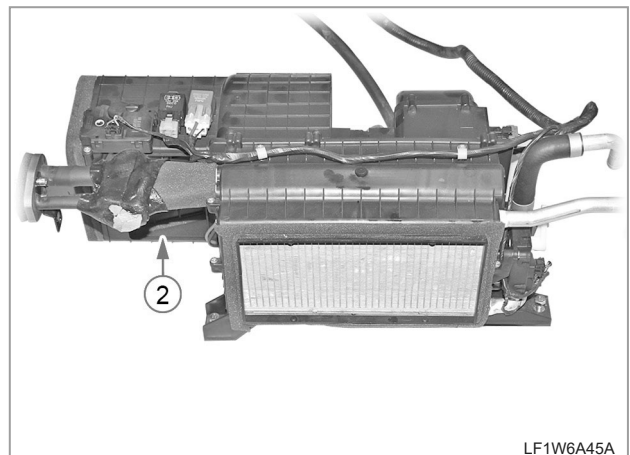
6. Disconnect the A/C refrigerant hose (1).



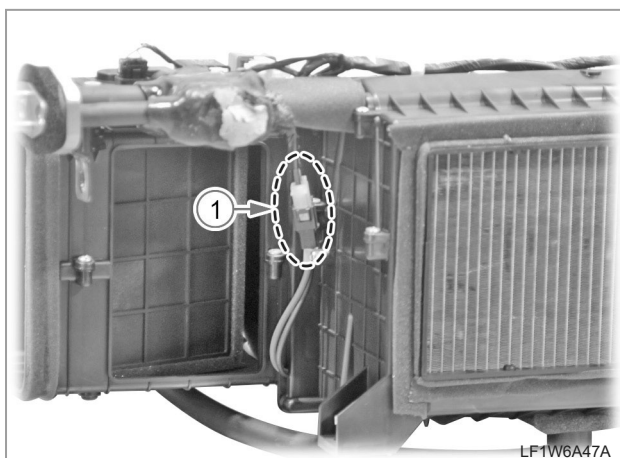
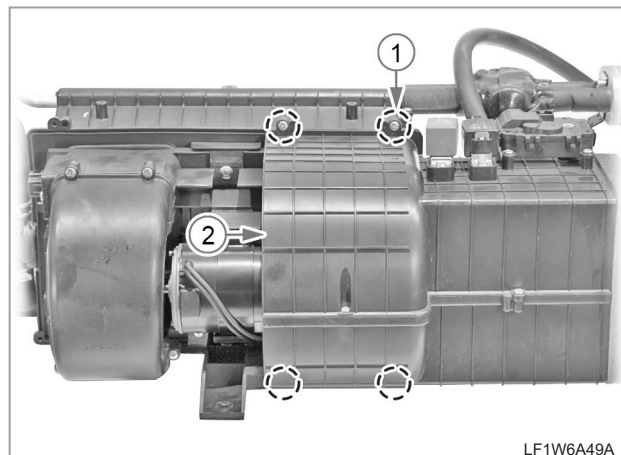
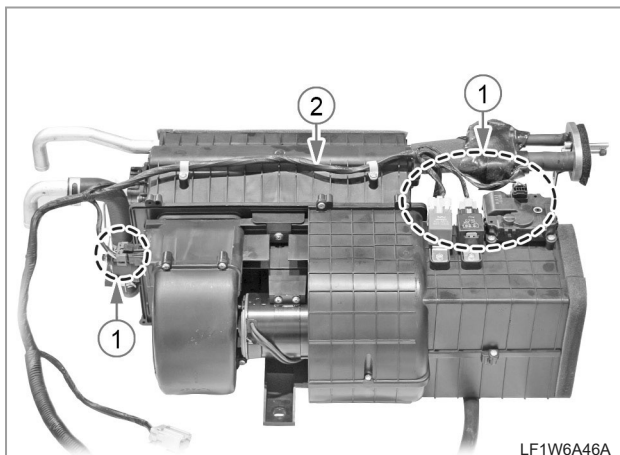
8. Unscrew A/C and heater case mounting bolts (1)(4EA) and remove the case assembly (2).



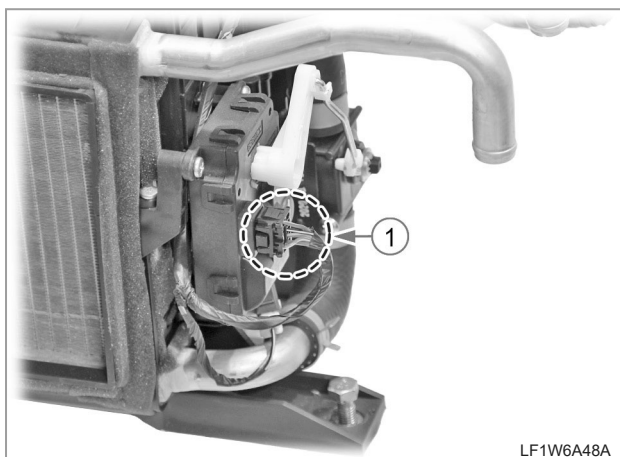
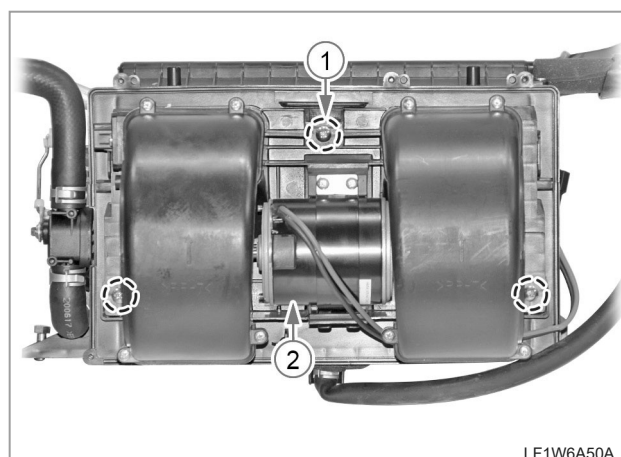
9. Unscrew A/C and heater case mounting bolts (1)(11EA) and remove the upper case (2).



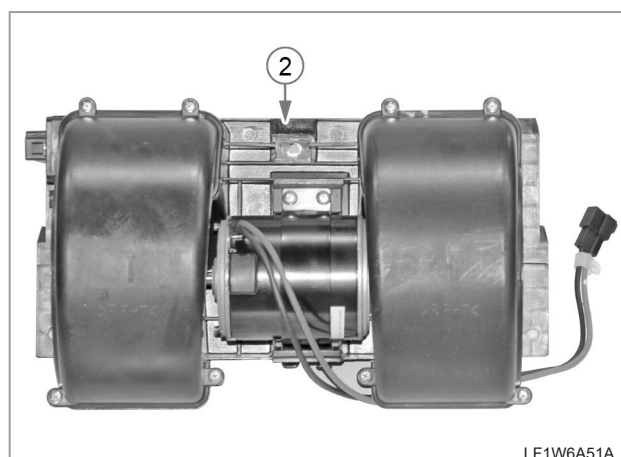
10. Unscrew A/C and heater assembly mounting bolts (1)(4EA) and pull out the A/C and heater assembly (2) from the inside of the case.



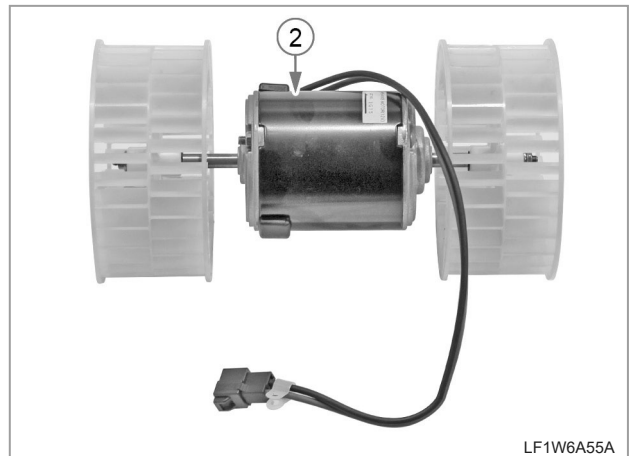
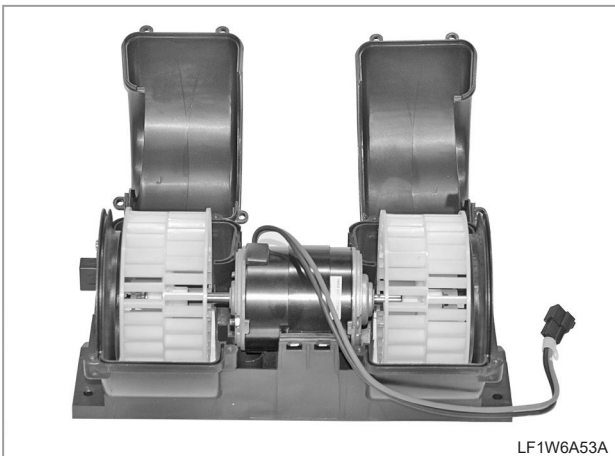
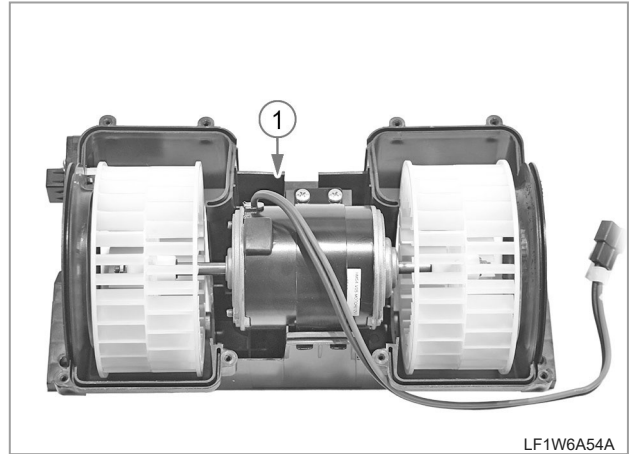
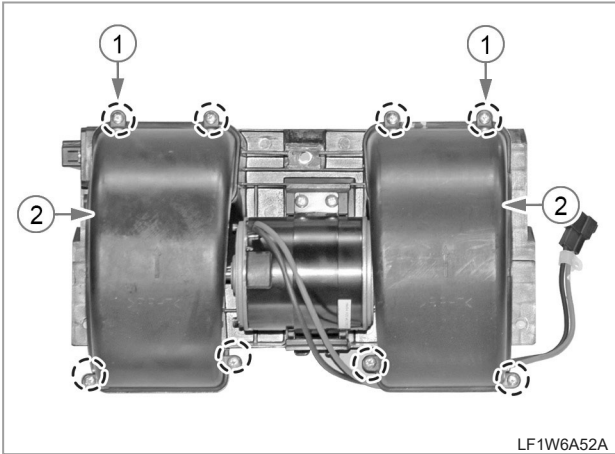
12. Unscrew A/C duct mounting screws (1)(4EA) to remove the duct assembly (2).



11. Disconnect the A/C wiring connectors (1) and remove the wirings (2).



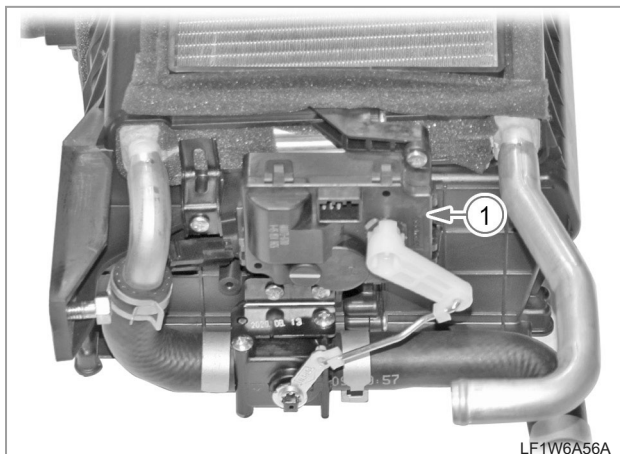
13. Unscrew blower motor assembly mounting screws (1)(3EA) to remove the blower motor assembly (2).



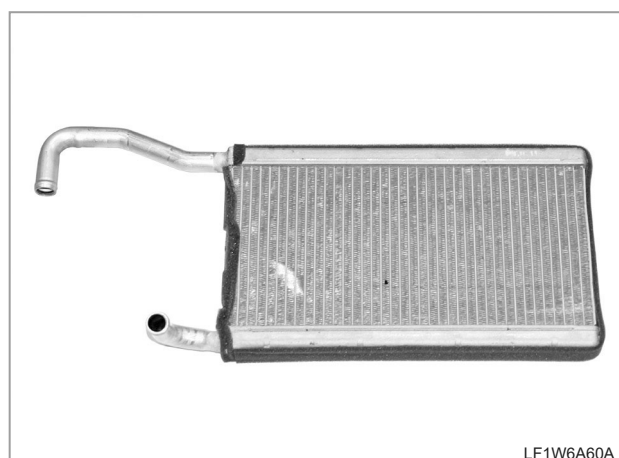
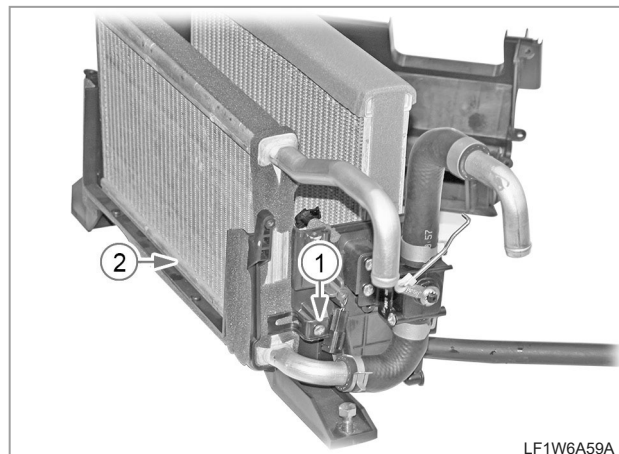
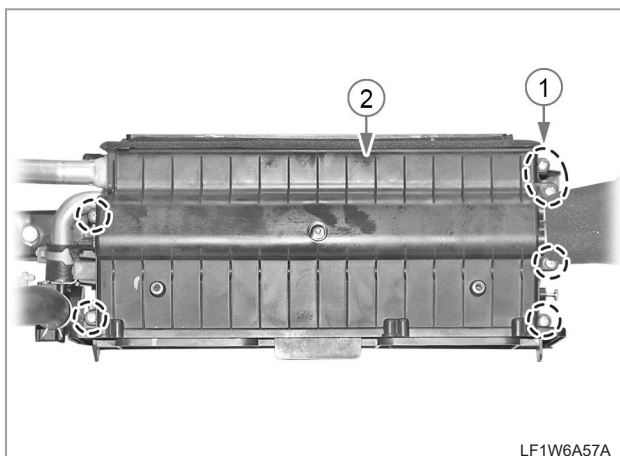
14. Unscrew motor cover screws (1)(8EA) to remove the blower motor cover (2).

15. Release the blower motor support (1) to disconnect the blower motor assembly (2).

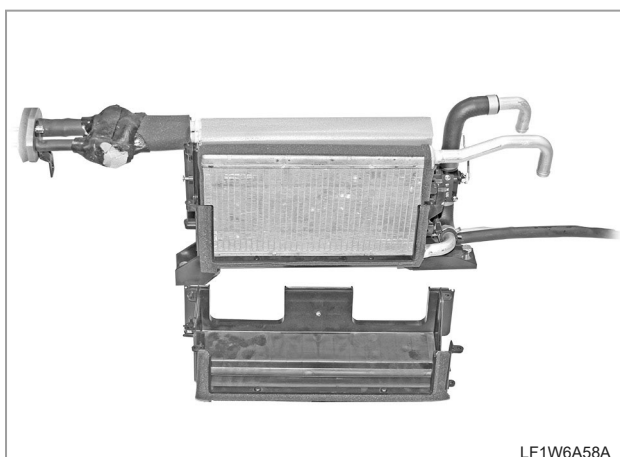
► HEATER CORE



16. Disconnect the temp motor actuator (1).

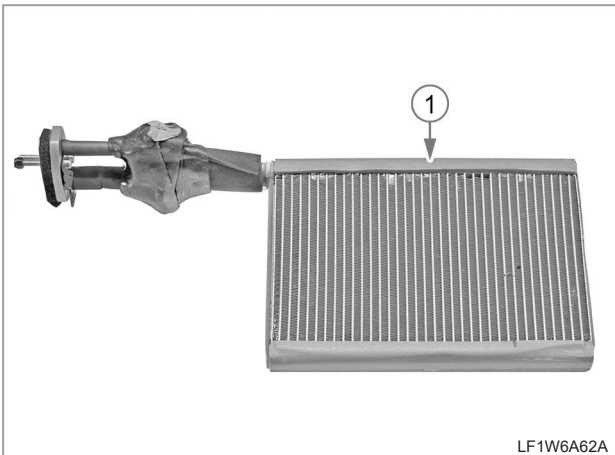
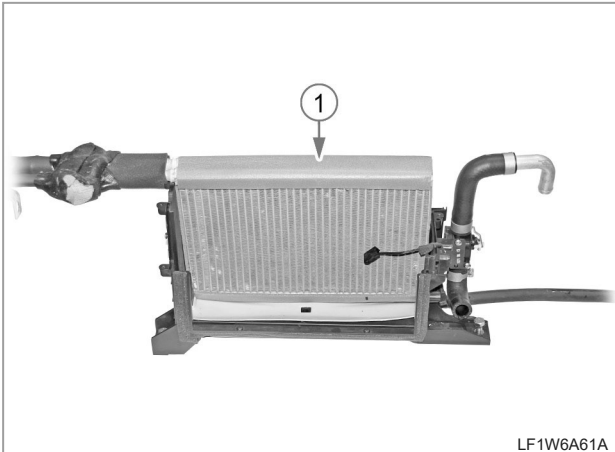


18. Unscrew the heater core fastener (1) to remove the heater core (2).



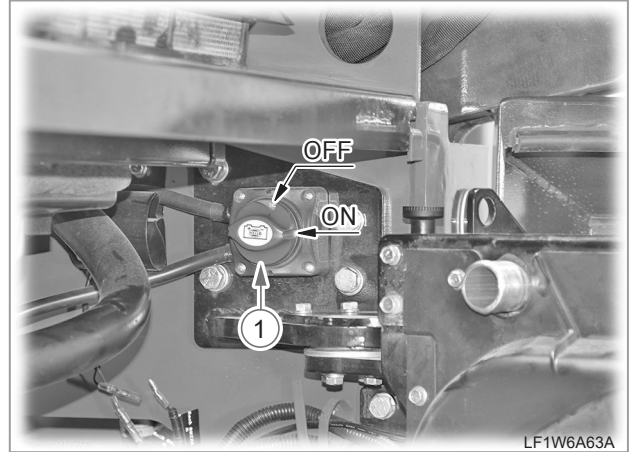
17. Unscrew A/C cover mounting screws (1)(6EA) to remove the cover (2).

► EVAPORATOR

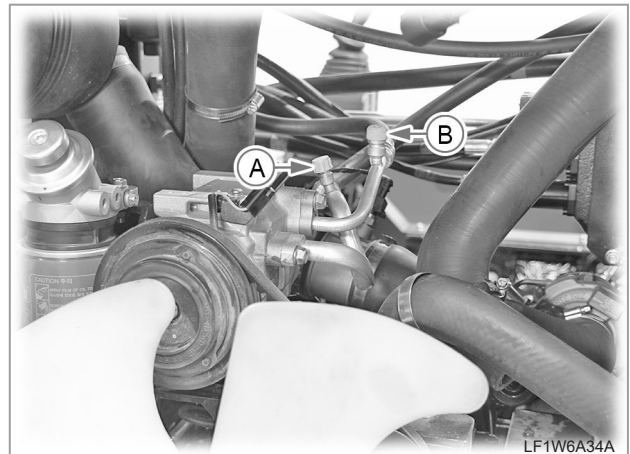


19. Pull up the evaporator (1) to be separated from the A/C assembly.

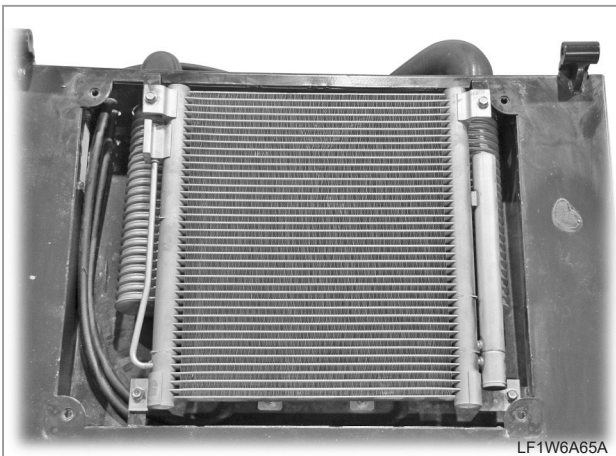
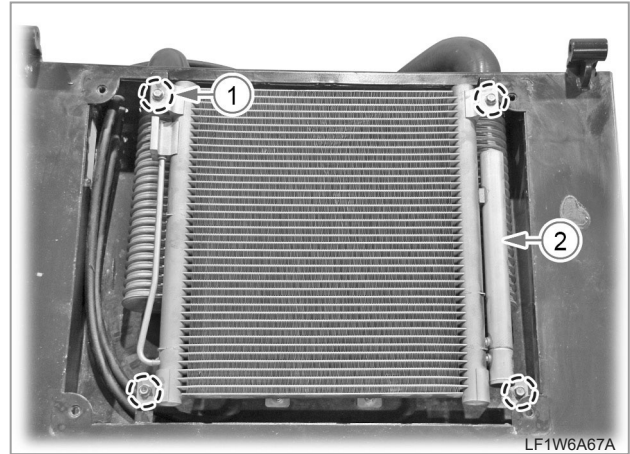
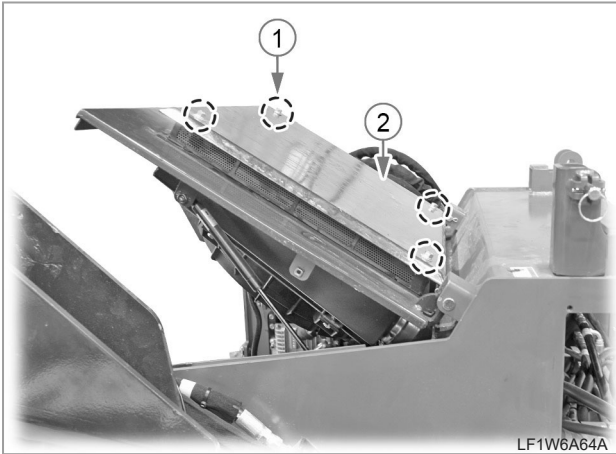
7.5 CONDENSER DISASSEMBLY



1. After opening the engine rear door, turn off the battery power cut-off switch (1).

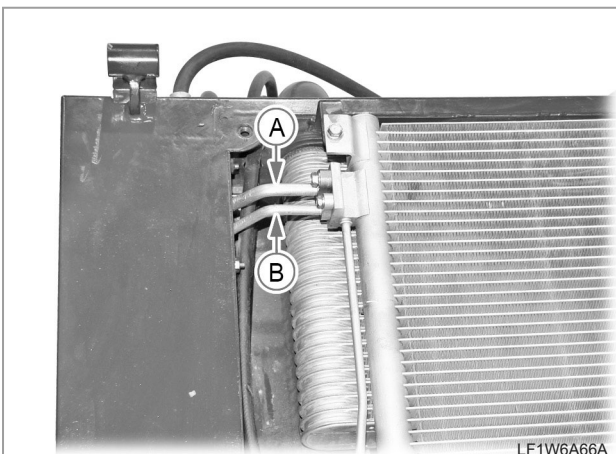


2. Install a refrigerant collector to be connected to the compressor A/C hose (A & B) to collect the refrigerant.



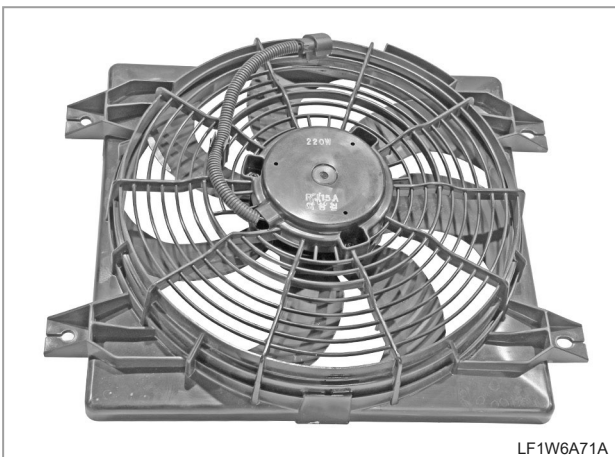
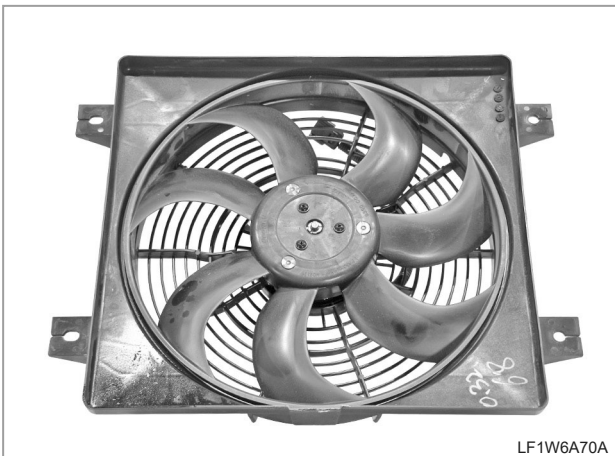
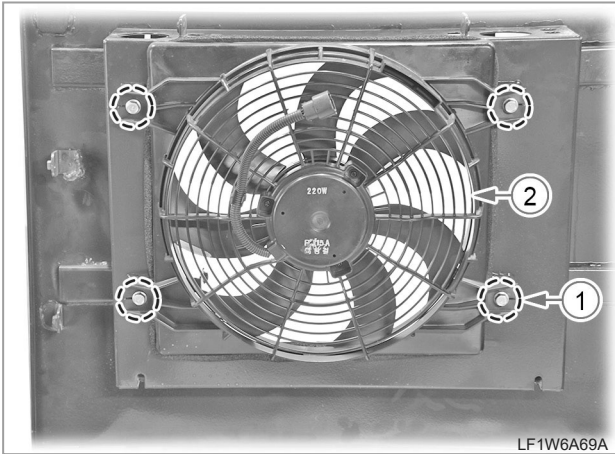
3. Unscrew mounting bolts (1)(4EA) of the upper cover of the engine compartment and remove the cover (2).

5. Unscrew condenser mounting bolts (1)(4EA) to remove the condenser (2).



4. Disconnect the A/C hoses (A: low-pressure, B: high-pressure) from the condenser.

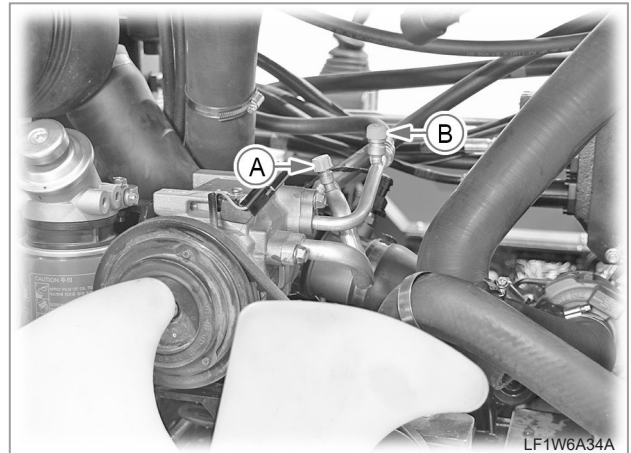
7.6 FAN MOTOR DISASSEMBLY



1. Unscrew fan motor mounting bolts (1)(4EA) to remove the fan motor (2).

7.7 COMPRESSOR DISASSEMBLY

1. Open the rear cover and radiator of the engine compartment.



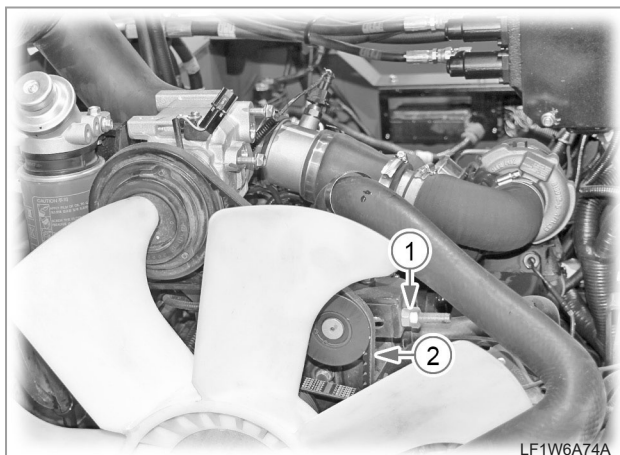
2. Install a collector to be connected to the compressor A/C hose (A & B) to collect the refrigerant.



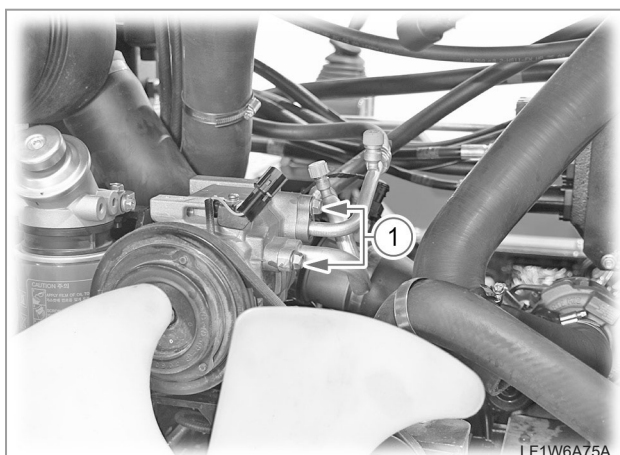
3. Turn off the battery power cut-off switch (1).



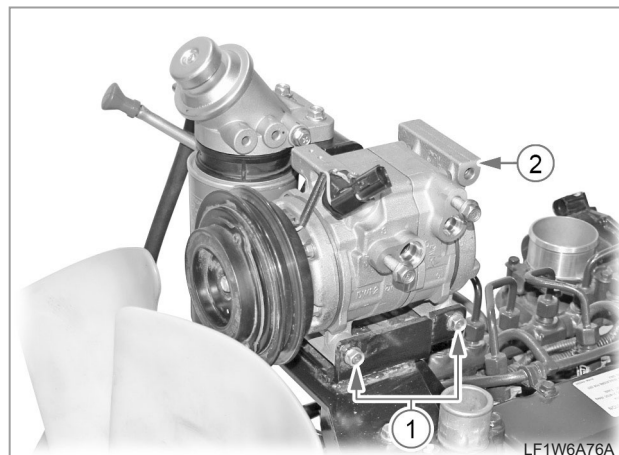
4. Remove the compressor connector (1).



5. Loosen the tension nut (1) of the tension pulley to disconnect the A/C belt (2).



6. Unscrew A/C high-pressure and low-pressure mounting bolts (1) to disconnect the hose.



7. Unscrew compressor mounting bolts (1)(2EA) to remove the compressor (2).

7.8 COMPRESSOR ASSEMBLY

1. Install the compressor to its bracket and tighten its bolts.

Bolt

tightening torque..... 23.5 ~ 26.8 Nm
2.4 ~ 2.74 kgf-m
17.3 ~ 19.8 lb-ft

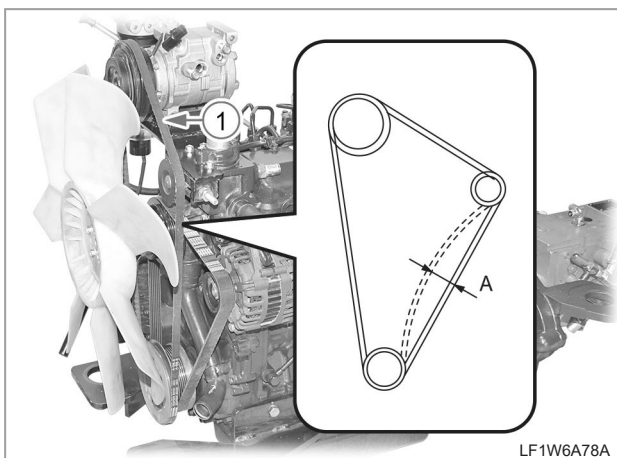
- When installing a new compressor, check that the required oil is included. Also, check the oil amount in the used compressor to add oil to a new compressor to the same amount.
- Oil type and capacity : PAG30 100⁺¹⁰₀ cc

4. Connect the wiring connector to the compressor.
5. Turn on the battery power cut-off switch.
6. After charging and inspecting refrigerant, perform a leak test.
(refer to "4.10.1 Leak Test" in this chapter)



CAUTION

- Various types of compressor oil with different chemical characteristics are used in different compressors. Therefore, use the same type of oil that were used in the used oil compressor when replacing.



2. Fit the A/C belt (1) and adjust the tension bolt to set the specified tension.

Proper tension (A)	When pressing the belt center with a 4.5 kgf of force, its deflection should be 10 ~ 12 mm (0.394 ~ 0.472 in.).
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3. Fit the high/low pressure pipes.
 - When assembling, apply compressor oil to the O-ring
 - Make sure that foreign material or water does not enter the system.

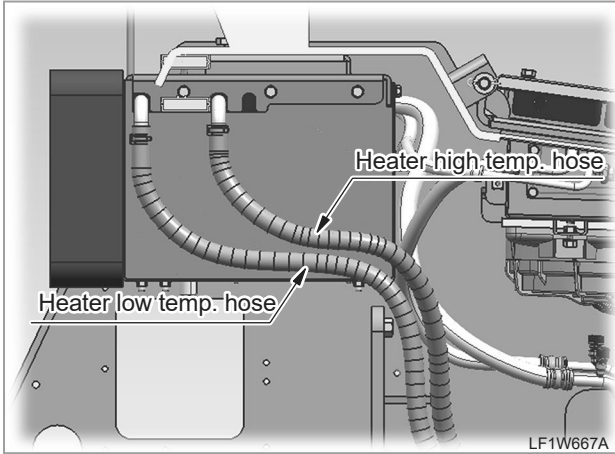
Bolt

tightening torque..... 7.8 ~ 11.7 Nm
0.8 ~ 1.2 kgf-m
5.7 ~ 8.6 lb-ft

7.9 HEAT HOSE/AIR CONDITIONER HOSE ASSEMBLY

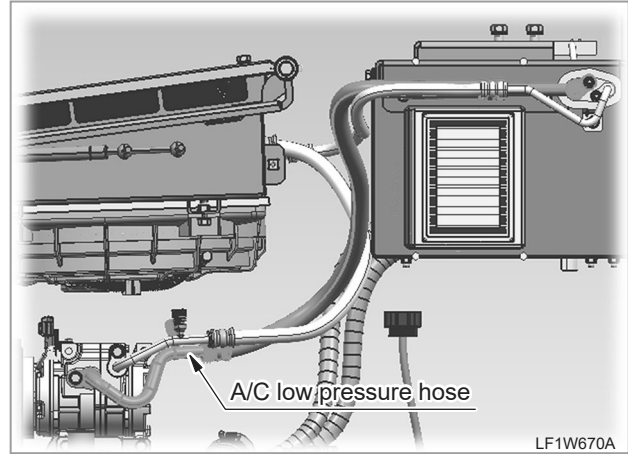
7.9.1 HEATER HOSE

Mounting section of heater high-pressure and low-pressure hoses on A/C

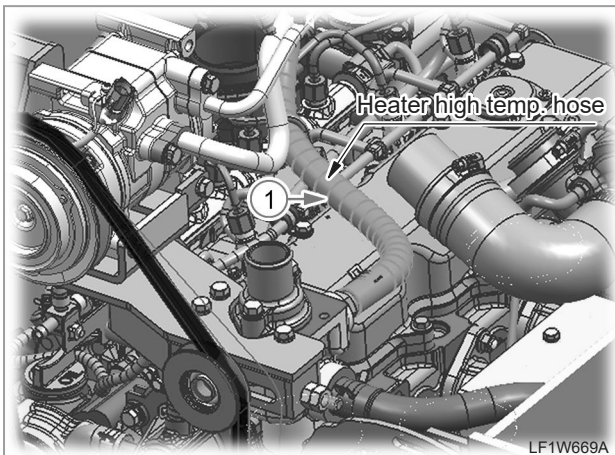


7.9.2 A/C HOSE (REFRIGERANT)

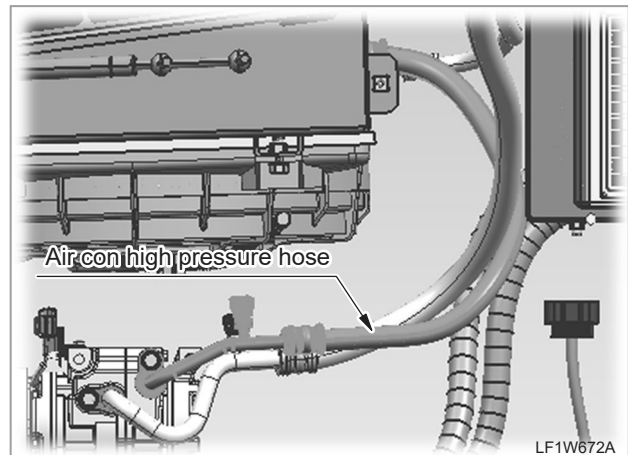
Mounting section of A/C low-pressure hose on A/C and compressor



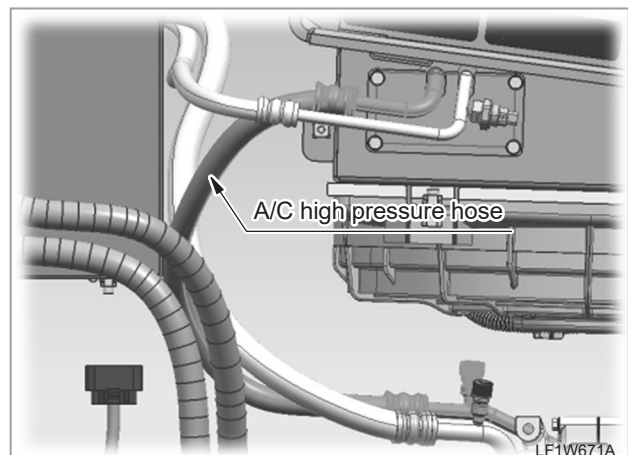
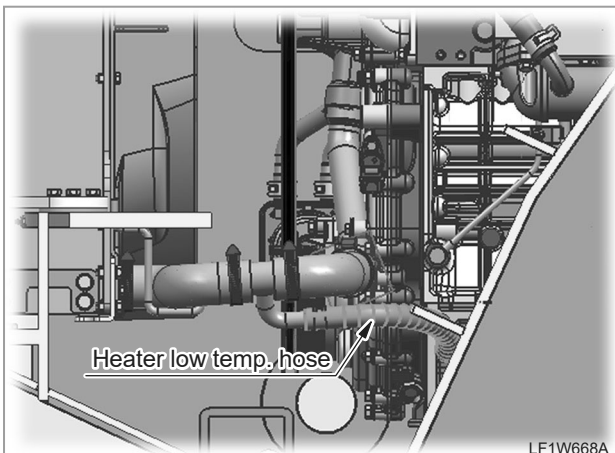
Mounting section of heater high-pressure hose on engine



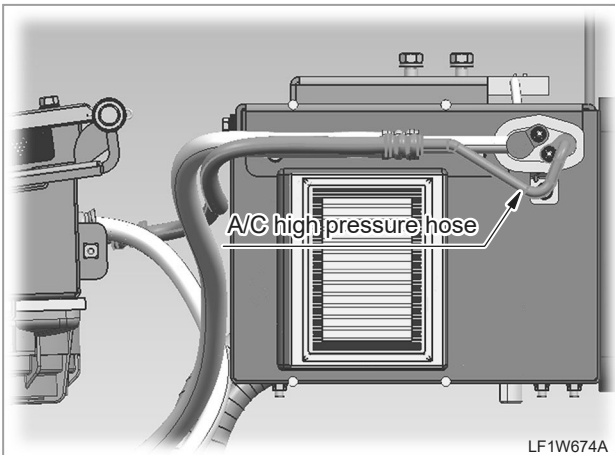
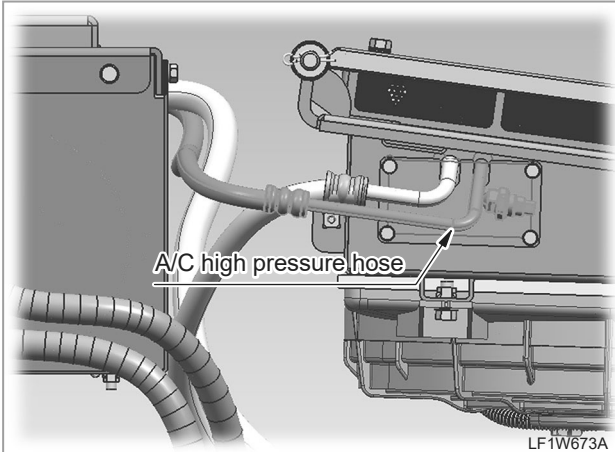
Mounting section of A/C high-pressure hose 2 on compressor and condenser



Mounting section of heater low-pressure hose on radiator



Mounting section of A/C high-pressure hose 1 on A/C and condenser



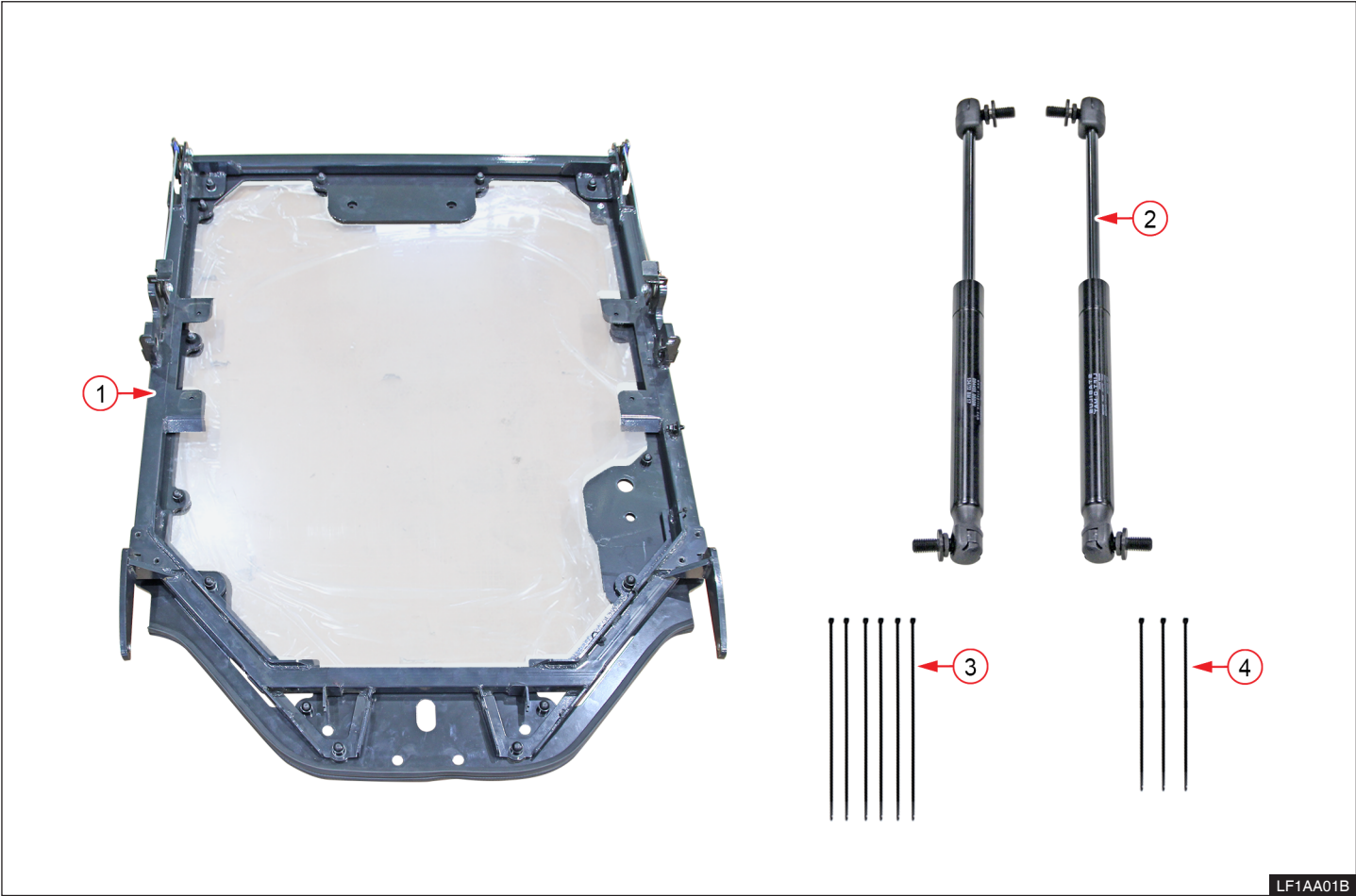
INSTALLATION INSTRUCTIONS

WIND SHIELD ASSY KIT

- 1. PACKING LIST & ACTUAL IMAGE**
- 2. GENERAL SAFETY INFORMATION**
- 3. INSTALLATION INSTRUCTION**

1. PACKING LIST & ACTUAL IMAGE

NO.	Part No.	Description	Q'TY	Remark
1	LF15-0207A	CABIN GATE DOOR ASSY-PC	1	
2	LF14-1351A	AIR CYL, GATE DOOR-800	2	
3	P6270-82552	BAND, CORD	6	
4	T2198-82571	BAND	3	



2. GENERAL SAFETY INFORMATION



This symbol means ATTENTION! YOUR SAFETY IS INVOLVED.

The message that follows the symbol contains important information about safety. Carefully read the message.

BEFORE SERVICING AND REPAIRING

1. Read all safety instruction in this manual and be aware of safety decal locations on your machine.
2. Thoroughly clean your work area and the machine.
3. Make sure the machine is on firm and level ground and that the parking brake is set.
4. Lower the implement to the ground.
5. Stop the engine and remove the key.
6. Disconnect the negative battery cable.
7. Place a "DO NOT OPERATE" tag in the operator station.

WORKING SAFETY

1. Do not operate or service the machine while under the influence of alcohol, medications, or other substances.
2. Never wear loose fitting clothing and always use safety equipment appropriate to the job.
3. Never use improvised tools, parts or procedures. Use only recommended tools appropriate to the work.
4. Extra care should be taken to work safely when servicing is done by two or more persons.
5. Always support the machine with safety stands rated for the weight of the machine. Never work under a machine that is supported solely with a jack.
6. Do not touch any rotating or hot parts while the engine is running.
7. Escaping fluid (hydraulic oil) under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or fuel lines. Tighten all connections before applying pressure.

DISPOSE OF FLUIDS PROPERLY

1. Observe relevant environmental protection regulations when disposing of oil. NEVER pour fluids onto the ground, down a drain, or into any body of water.

3. INSTALLATION INSTRUCTION

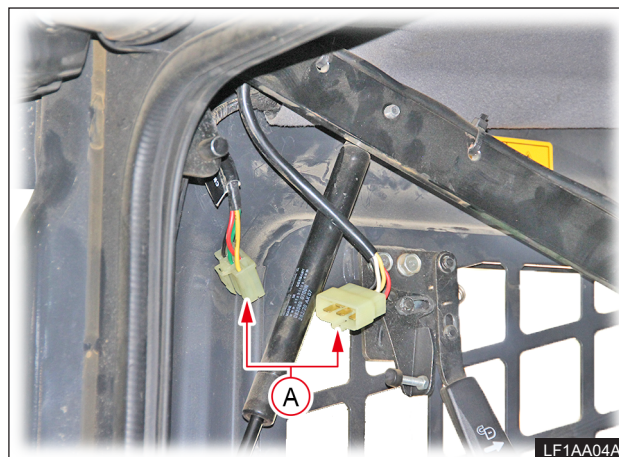
1. Park the vehicle on firm and level ground.
Then, engage the parking brake and stop the engine.

REMOVE THE ENTRANCE DOOR

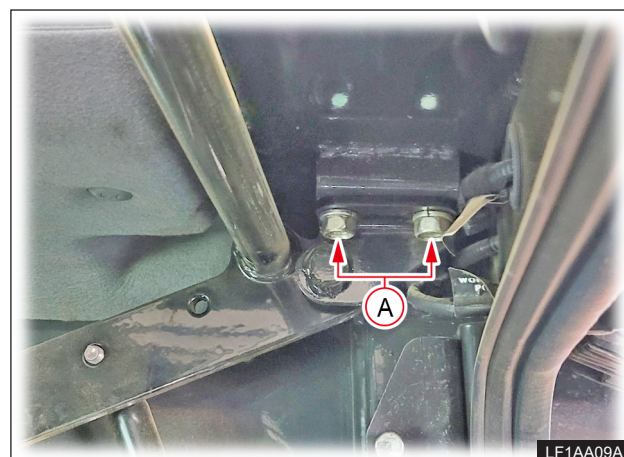
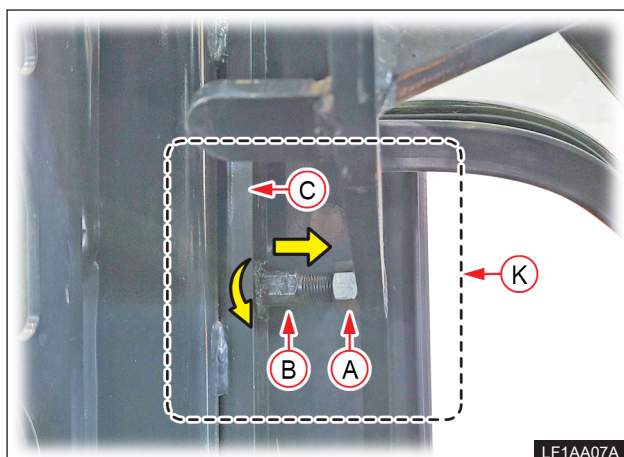
- 1) Work together in a group of 2 people. (Inside the cab: 1 person, outside the cab: 1 person)



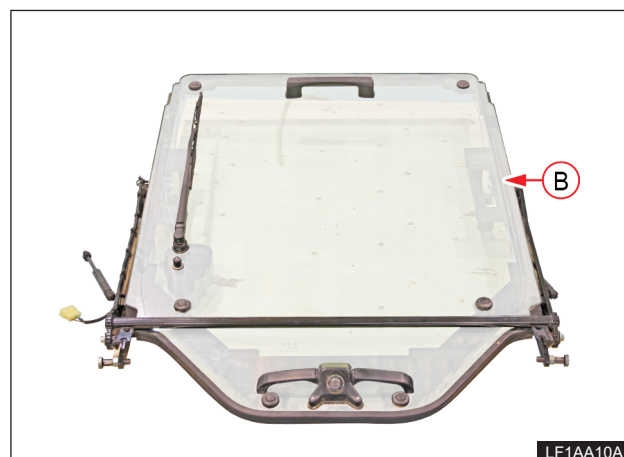
- 2) Open the entrance door.



- 3) Disconnect the wiper motor wiring connector(A) at the top of the door and separate the left and right air cylinders(B) of the door.



- 4) Unscrew the roller fixing nut(A) from the door bracket and turn the roller shaft(B) to release it from the rail(C).



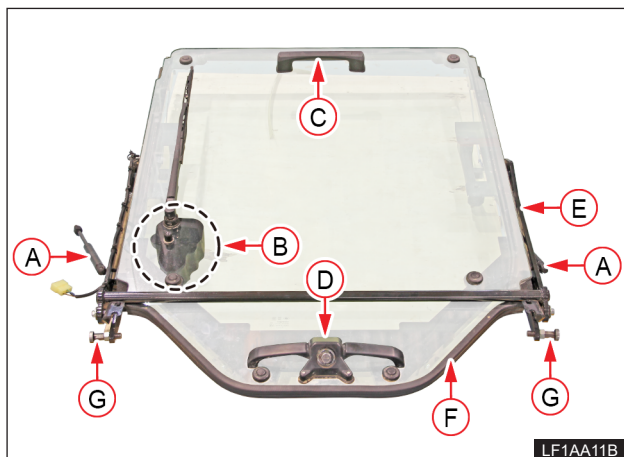
- 5) Unscrew the door bracket fixing bolts(A)(2 each on the left and right) from the ceiling of the cab, remove the door(B) and place it outside the cab.



REMARKS

- The door bracket fixing bolts will be reused, so be careful not to lose them.

REINSTALL THE ENTRANCE DOOR



1. Remove the air cylinder(A: 2), wiper motor(B), door handle(C), door handle bottom(D), door bracket(E), cable(F), and roller(G) from the door assembly.



REMARKS

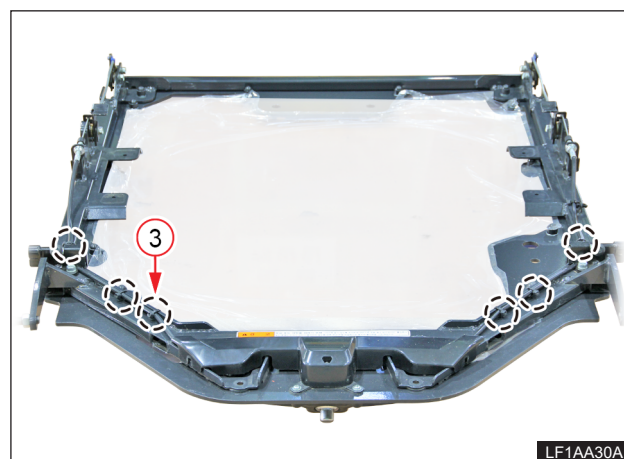
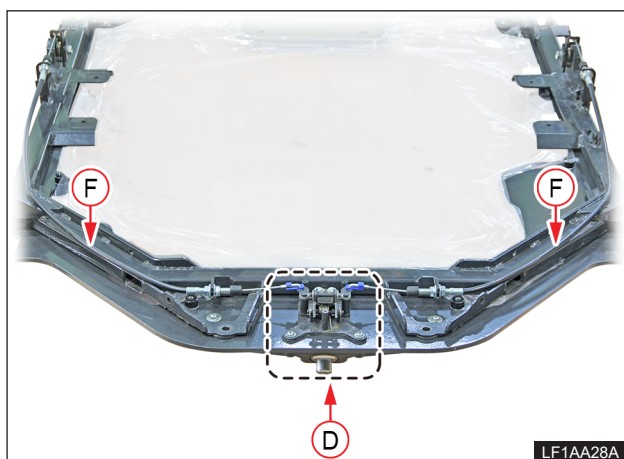
- Take care not to lose the disassembled parts, bolts and nuts as they will be used for the optional windshield (1).



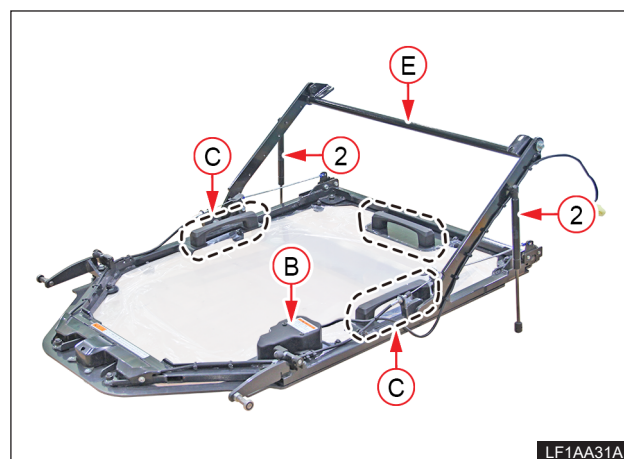
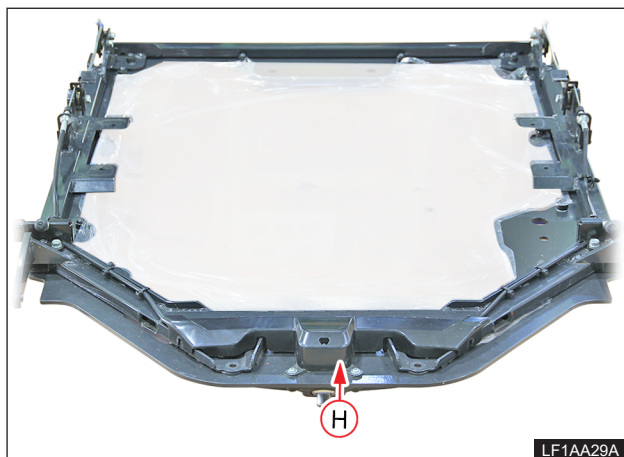
- ① Assemble the rollers(G) on the left and right sides of the door.



2. Assemble the parts disassembled in Step 1 above to the optional door(1).

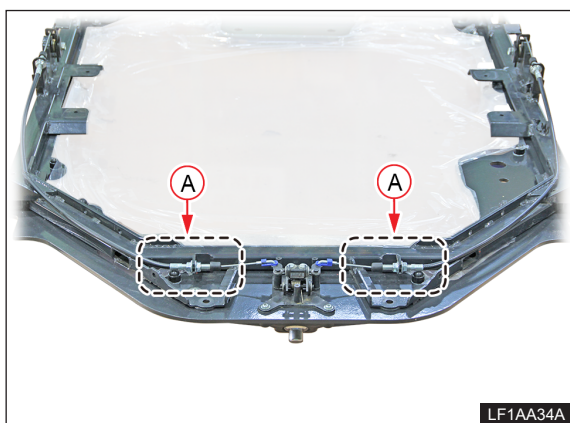


③ Fix the door cable to the door bracket with the cord band(3).

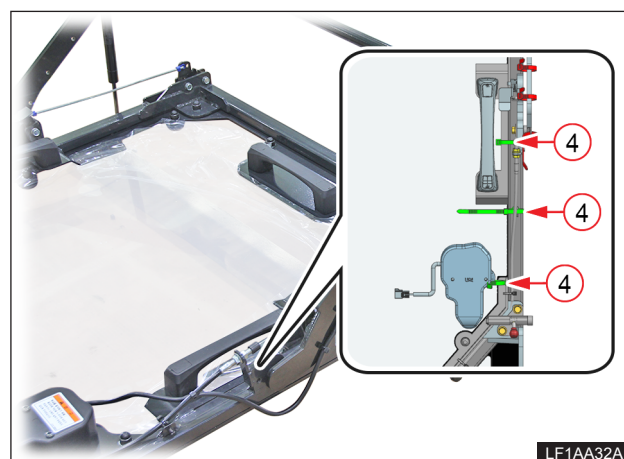


② Assemble the lower door handle(D), door cable(F), and cover(H).

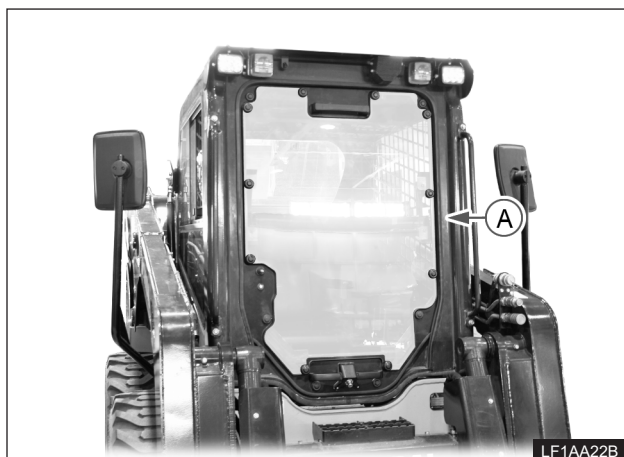
REMARKS



- Set the cable so that the door cable bolt(A) is located at the center of the bracket(Same for left and right).

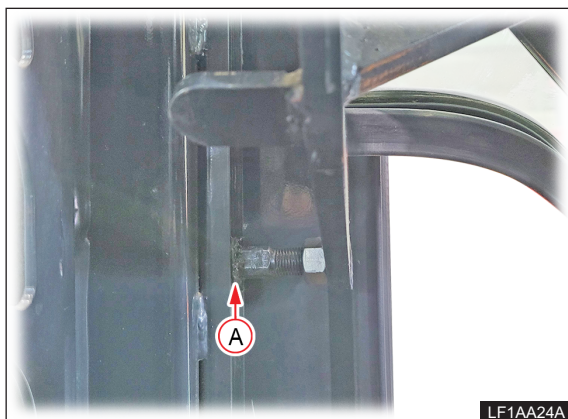


④ Assemble the wiper motor(B), door handle(C), and door bracket(E). Fix the wiring of the wiper motor to the door bracket with the cord band(4). Assemble the air cylinder(2) on the left and right side of the door bracket.



3. Assemble the door assembly (A) to the cabin(The assembly order is the reverse order of disassembly).

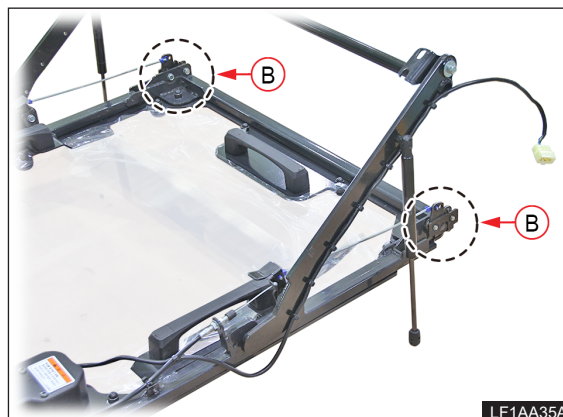
REMARKS



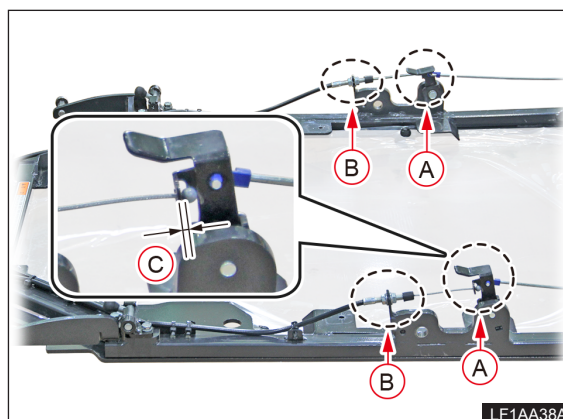
- When assembling the door, make sure that the roller part(A) of the roller shaft does not interfere with the inside and does not deviate outside the roller groove.

REMARKS

HOW TO ADJUST THE DOOR OPENING AND CLOSING CABLE



- Check if the latch "B" opens smoothly when the door handle button is pressed while the latch "B" is locked (If it doesn't work properly, reduce tolerance a little from the suggested 1mm as below).



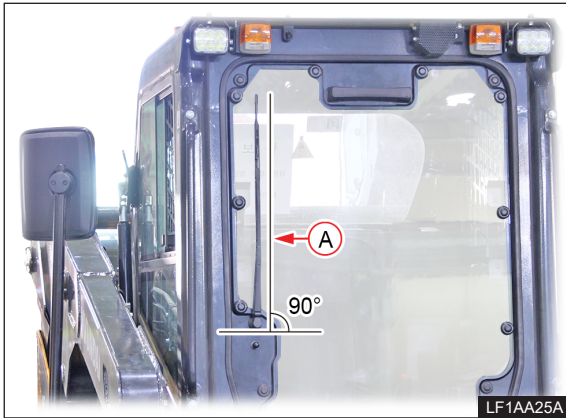
- Adjust and set the cable at the "B" so that the gap between the end of the cable "A" and the plate(C) is 1mm (same for left and right).



4. Attach the wiper arm(A) to the wiper motor.



REMARKS



- Assemble the wiper arm(A) vertically to the wiper motor.

[illegible]