

Disassembly of the parts (Indoor unit)

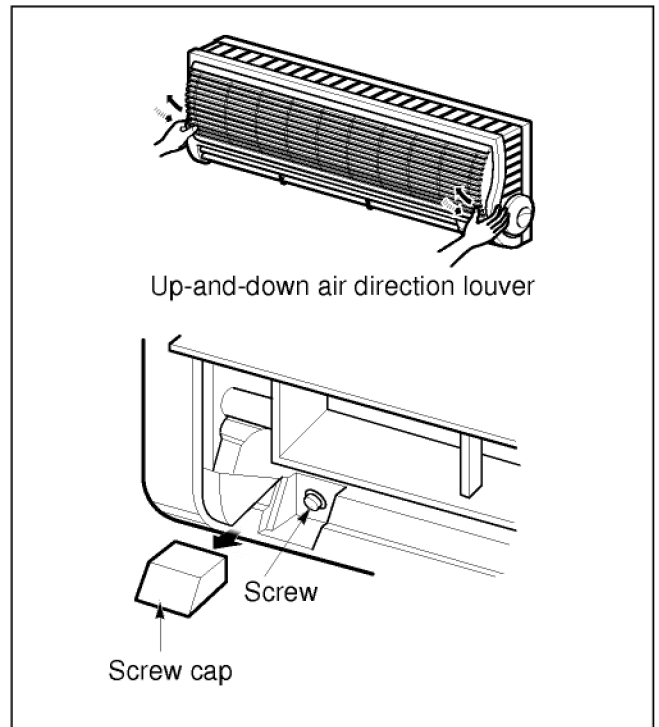
Warning :

Disconnect the unit from power supply before making any checks.

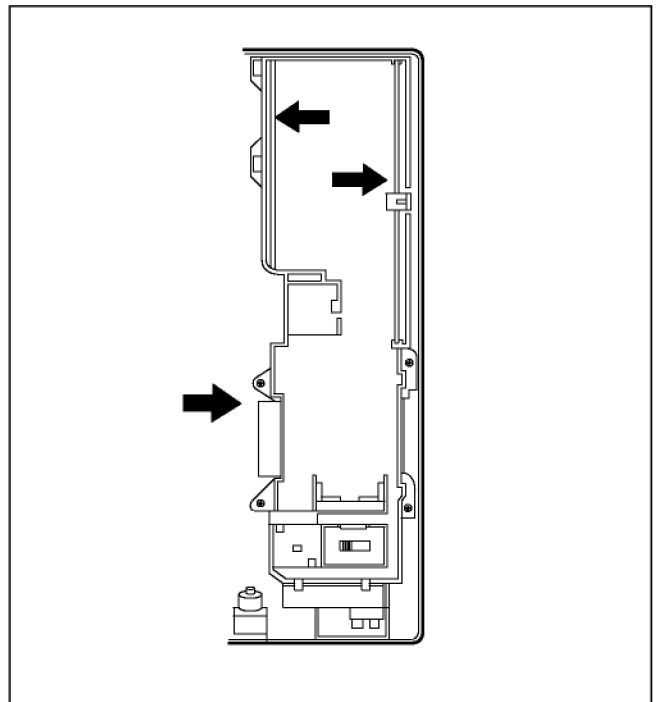
Be sure the power switch is set to "OFF".

To remove the Grille from the Chassis.

- Set the up-and-down air discharge louver to open position(horizontally) by finger pressure.
- Open the screw caps upward and remove the securing screws.
- To remove the Grille, pull the lower left and right side of the grille toward you (slightly tilted) and lift it straight upward.

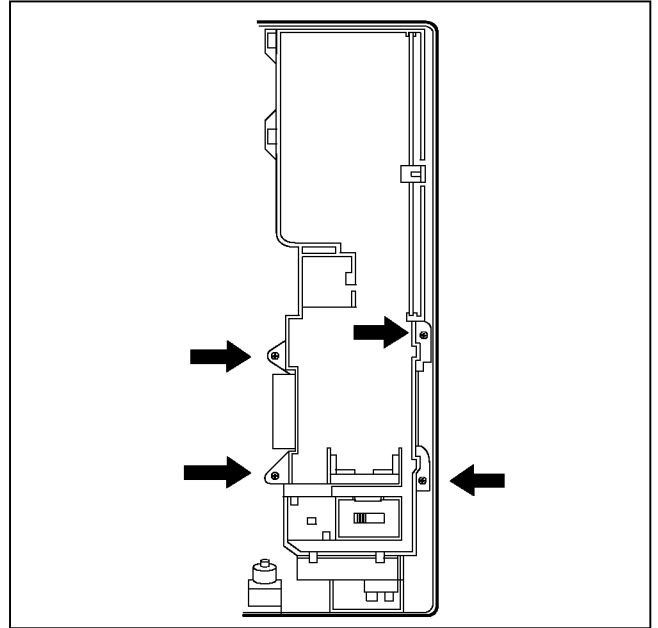


1. To remove the sensor, housing connect, earth conductor & step motor conductor with sensor holder, Motor, Evaporator & P.C.B.



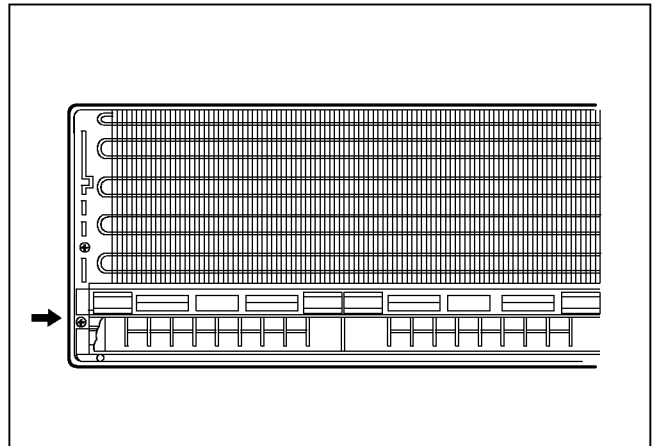
2. To remove the Control Box.

- Remove 2 or 4 securing screws.
- Pull the control box out from the chassis carefully.

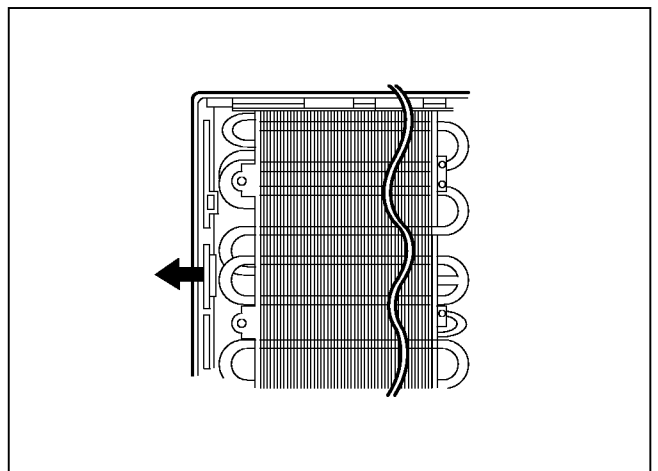


3. To remove the Discharge Grille.

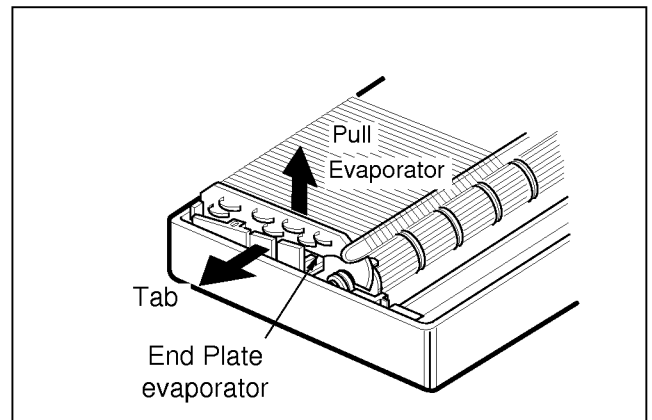
- Remove the securing screw.
- Pull the discharge grille out from the chassis carefully.



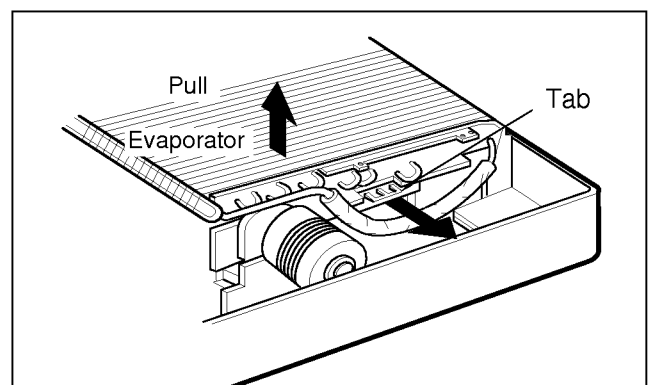
4. To remove the Evaporator.



- Unhook the tab on the left inside edge of the chassis by pressing it outwards and at the same time, slightly pull the evaporator until the tab is clear of the end-plate.
- Remove the evaporator from the chassis carefully.

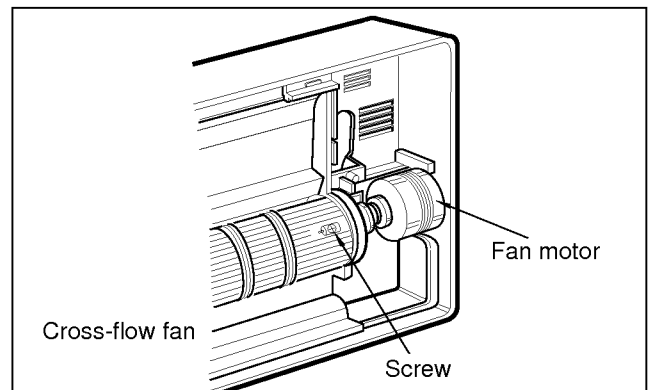


- Unhook the tab on the right inside of the chassis at the same time, slightly pull the evaporator toward you until the tab is clear of the slot.



5. To remove the Cross-Flow Fan

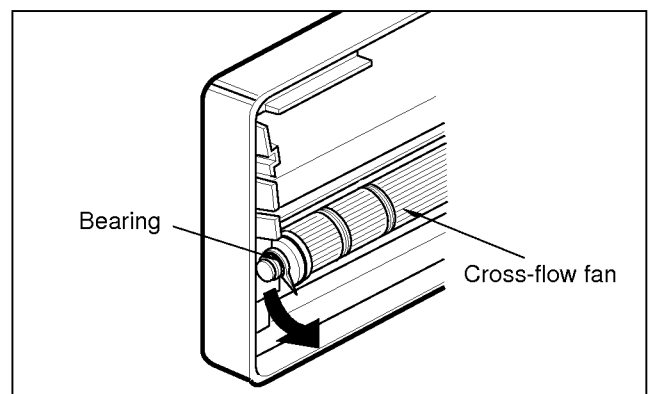
- Loosen the screw securing the cross-flow fan to the fan motor (do not remove).



- Pull the left end of the cross-flow fan with the self-aligning bearing out the groove.
- Remove the cross-flow fan by sliding it out from the shaft of fan motor.

6. To remove the Fan Motor

- Pick it up from the groove. (Do not remove a black rubber as a spacer.)



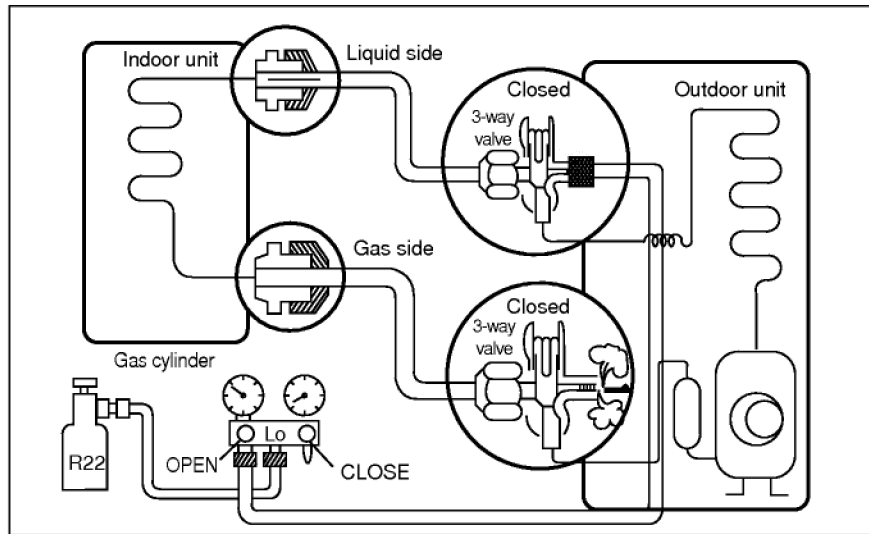
3-way Valve

Service Valve		3-way Valve (Liquid Side)		3-way Valve (Gas Side)	
Structure					
Works		Shaft position	Service port	Shaft position	Service port
Shipping		Closed (with valve cap)	Closed (with cap)	Closed (with valve cap)	Closed (with cap)
1.	Air purging (Installation)	Closed (clockwise)	Open (with charging cylinder)	Closed	Open (push-pin)
Operation		Open (with valve cap)	Closed (with cap)	Open (with valve cap)	Closed (with cap)
2.	Pumping down (Transferring)	Closed (clockwise)	Closed (with cap)	Open (counter-clockwise)	Open (connected manifold gauge)
3.	Evacuation (Servicing)	Open	Closed (with cap)	Open	Open (with charging cylinder)
4.	Gas charging (Servicing)	Open	Closed (with cap)	Open	Open (with charging cylinder)
5.	Pressure check (Servicing)	Open	Open (with cap)	Open	Open (with charging cylinder)
6.	Gas releasing (Servicing)	Open	Closed (with cap)	Open	Open (with charging cylinder)

1. Air purging

Required tools: Hexagonal wrench, adjustable wrench, torque wrenches, wrench to hold the joints, and gas leak detector.

The air in the indoor unit and in the piping must be purged. If air remains in the refrigeration pipes, it will affect the compressor, reduce to cooling capacity, and could lead to a malfunction.



Service port nut

Be sure, using a torque wrench to tighten the service port nut (after using the service port), so that it prevents the gas leakage from the refrigeration cycle.

• Procedure

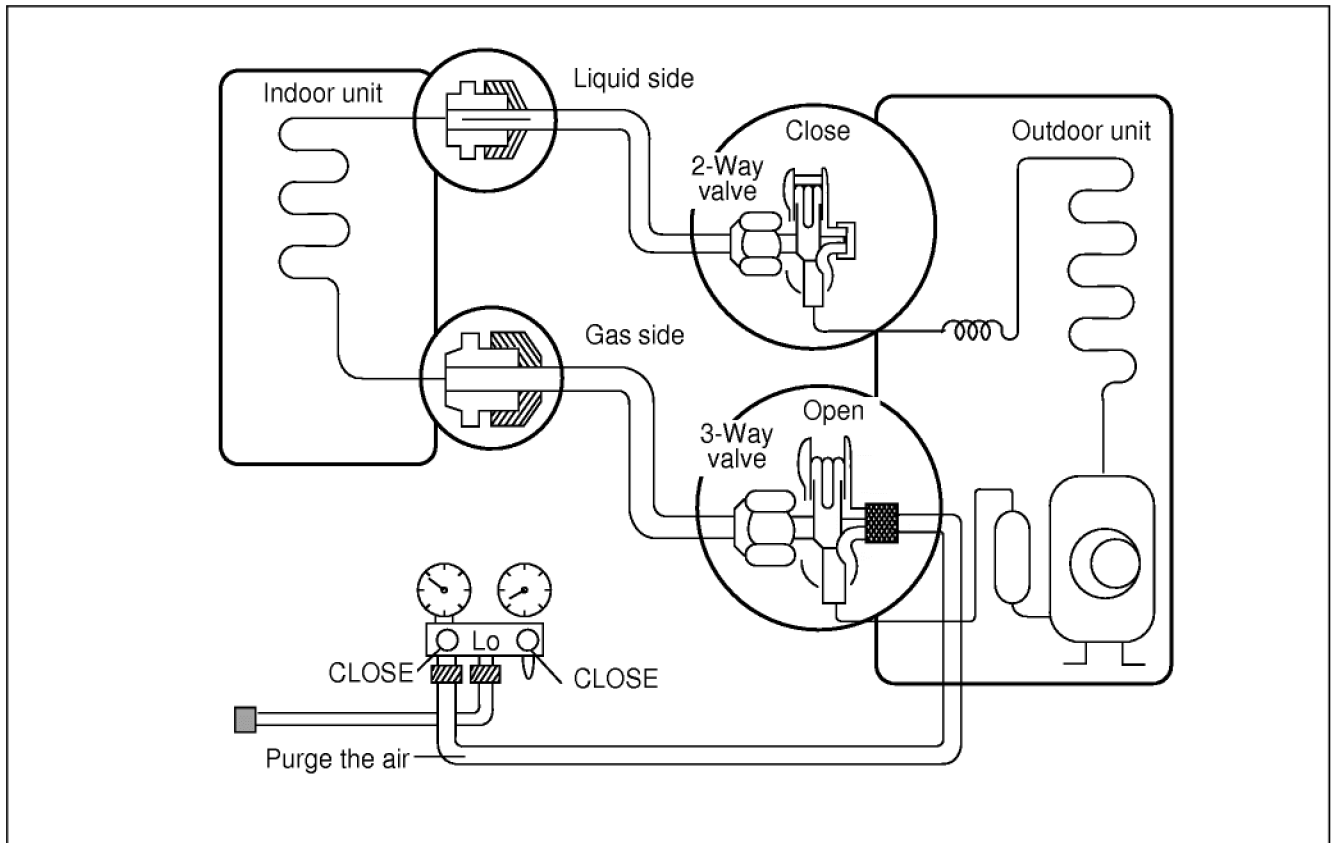
- (1) **Confirm that both the liquid side valve and the gas side valve are set to the closed position.**
- (2) **Connect the charge set and a gas cylinder to the service port of the liquid side valve.**
 - Leave the valve on the gas cylinder closed.
- (3) **Check for gas leakage.**
 - Open the valves on the gas cylinder and the charge set, wait 10 seconds, and then set it to closed position.
 - Check the flare connections for gas leakage.
- (4) **Air purging**
 - Open the valves on the gas cylinder and the charge set.
 - Using the Hexagonal wrench to press the gas side valve's core pin, discharge for three seconds and then wait for one minute. Repeat this three times.
- (5) **Discharge the refrigerant.**
 - Close the valve on the gas cylinder and discharge the refrigerant until the gauge indicates 0.5 to 1 kg/cm².G.
- (6) **Disconnect the charge set and the gas cylinder, and set the liquid side and gas side valves to the open position.**
 - Be sure to use a hexagonal wrench to operate the valve stems.
- (7) **Set the both liquid and gas side valves to open position with the Hexagonal wrench for the unit operation.**
- (8) **Apply steps from 1 to 7 to each (A-unit, B-unit) by the same method.**

Caution

Remember that outdoor unit does not contain the refrigerant for air purge when you purge the air, you should charge your refrigerant (or purchased) by use of the gas cylinder and charge set. If gas leakage are discovered in step 3 above, take the following measures:

If the gas leaks top when the piping connections are tightened further, continue working from step 4. If the gas leak do not stop when the connections are retightened, repair the location of the leak, discharge all of the gas through the service port, and then recharge with the specified amount of gas from a gas cylinder.

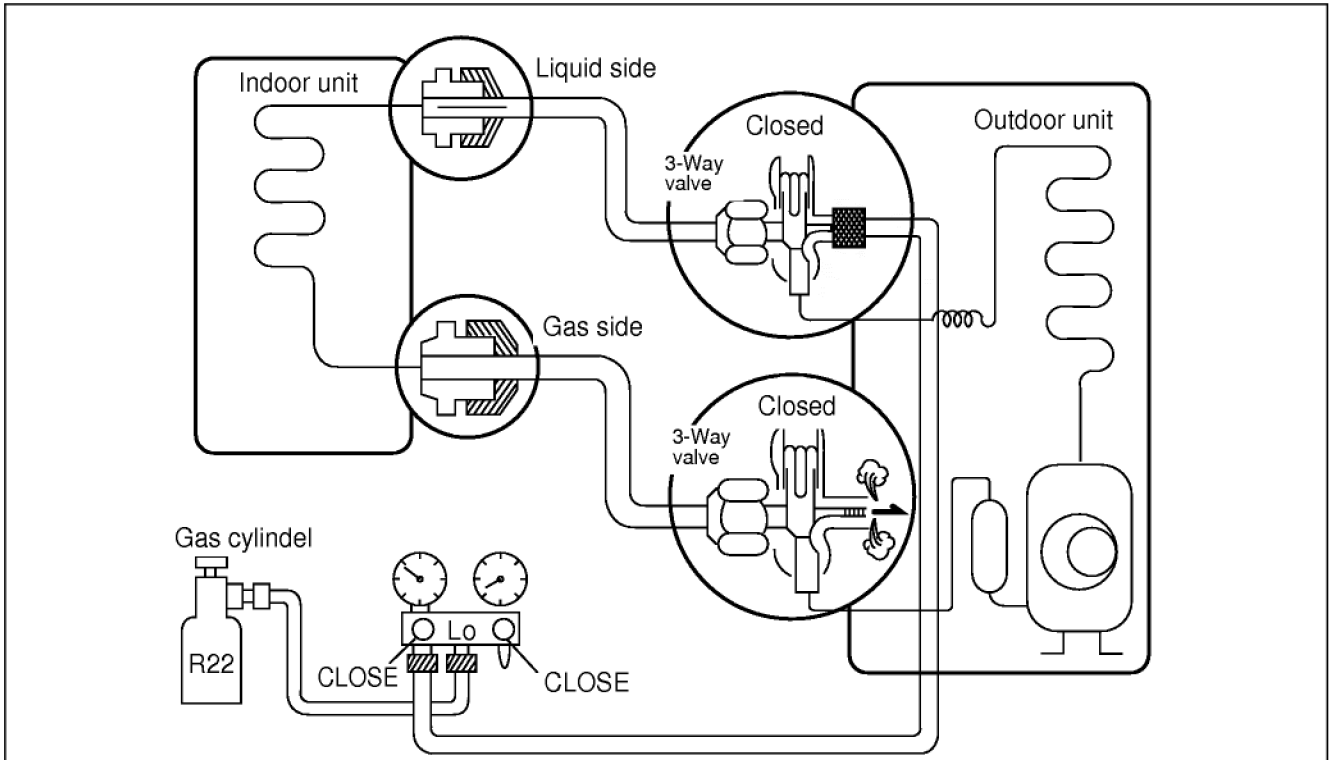
2. Pumping down



• Procedure

- (1) Confirm that both the gas side and liquid side valves are set to the open position.**
 - Remove the valve stem caps and confirm that the valve stems are in the raised position.
 - Be sure to use a hexagonal wrench to operate the valve stems.
- (2) Operate the unit for 10 to 15 minutes.**
- (3) Stop operation and wait for 3 minutes, then connect the charge set to the service port of the gas side valve.**
 - Connect the charge hose with the push pin to the service port.
- (4) Air purging of the charge hose.**
 - Open the low-pressure valve on the charge set slightly to air purge from the hose.
- (5) Set the liquid side valve to the closed position.**
- (6) Operate the air conditioner at the cooling cycle and stop it when the gauge indicates $1\text{kg}/\text{cm}^2\text{g}$.**
- (7) Immediately set the gas side valve to the closed position.**
 - Do this quickly so that the gauge ends up indicating 3 to $5\text{kg}/\text{cm}^2\text{g}$.
- (8) Disconnect the charge set, and mount the liquid side and gas side valve's stem nuts and the service port nut.**
 - Use torque wrench to tighten the service port nut to a torque of $1.8\text{kg}\cdot\text{m}$.
 - Be sure to check for gas leakage.
- (9) Apply steps from (1) to (8) to each unit (A-unit, B-unit) by the same method.**

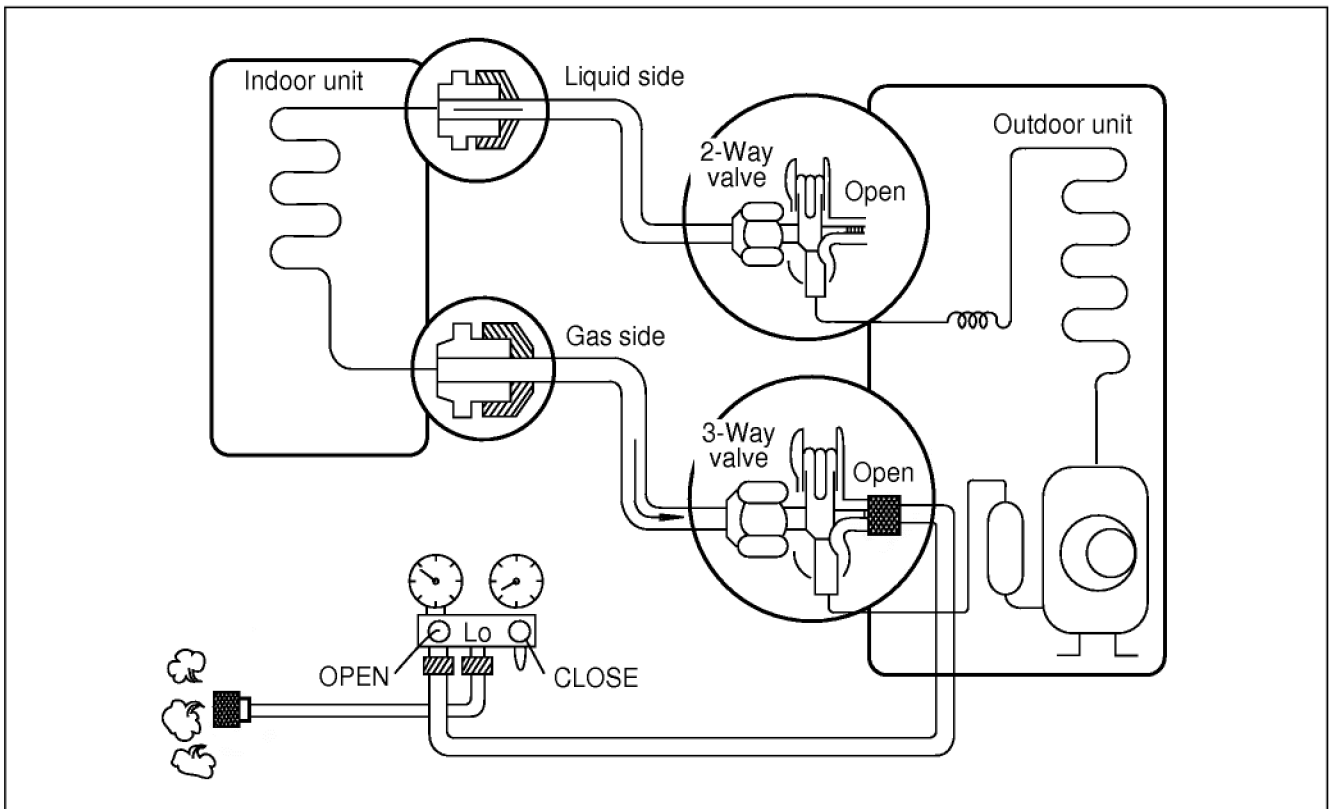
3. Re-air purging (Re-installation)



• Procedure

- (1) **Confirm that both the liquid side valve and the gas side valve are set to the closed position.**
- (2) **Connect the charge set and a gas cylinder to the service port of the liquid side valve.**
 - Leave the valve on the gas cylinder closed.
- (3) **Air purging.**
 - Open the valves on the gas cylinder and the charge set.
 - Using the Hexagonal wrench to press the gas side valve's core pin, discharge for three seconds and then wait for one minute. Repeat this three Times.
- (4) **Check for gas leakage.**
 - Check the flare connections for gas leakage.
- (5) **Discharge the refrigerant.**
 - Close the valve on the gas cylinder and discharge the refrigerant until the gauge indicates 3 to 5kg/c m²G.
- (6) **Disconnect the charge set and the gas cylinder, and set the liquid side and gas side valves to the open position.**
 - Be sure to use a hexagonal wrench to operate the valve stems.
- (7) **Mount the valve stem nuts and the service port nut.**
 - Use torque wrench to tighten the service port nut to a torque of 1.8kg.m.
 - Be sure to check for gas leakage.
- (8) **Apply steps from (1) to (8) to each (A-unit, B-unit) by the same method.**

4. Balance refrigerant of the liquid side, gas side valves (Gas leakage)



• Procedure

(1) Confirm that both the liquid side and gas side valves are set to the back seat.

(2) Connect the charge set to the gas side valve's port.

- Leave the valve on the charge set closed.
- Connect the charge hose with the push pin to the service port.

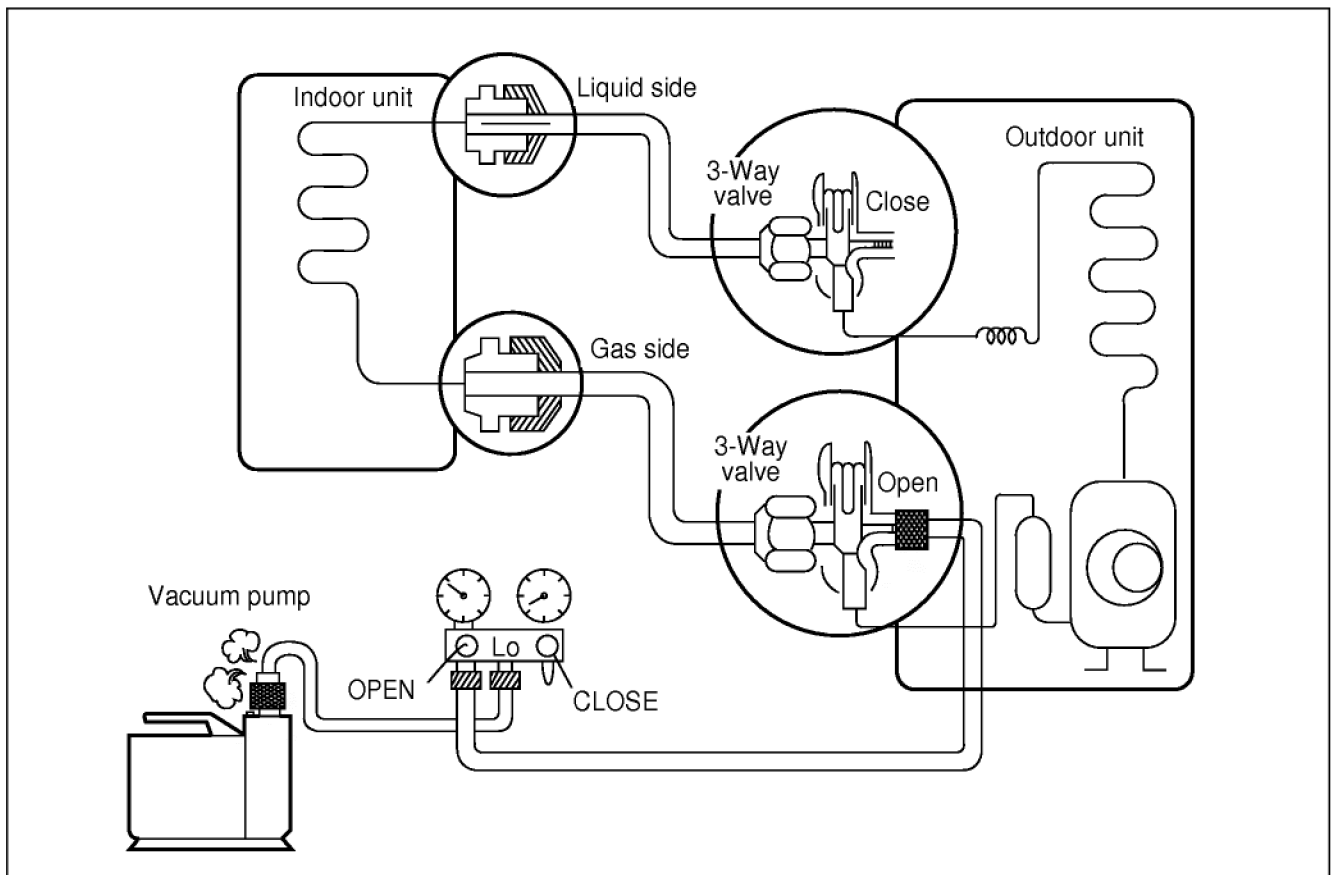
(3) Open the valve (Lo side) on the charge set and discharge the refrigerant until the gauge indicates 0 kg/cm²G.

- If there is no air in the refrigerant cycle (the pressure when the air conditioner is not running is higher than 1 kg/cm².G), discharge the refrigerant until the gauge indicates 0.5 to 1kg/cm².G. if this is the case, it will not be necessary to apply a evacuation.
- Discharge the refrigerant gradually; if it is discharged too suddenly, the refrigeration oil will also be discharged.

(4) Apply steps from (1) to (3) to each unit (A-unit, B-unit) by the same method.

5. Evacuation

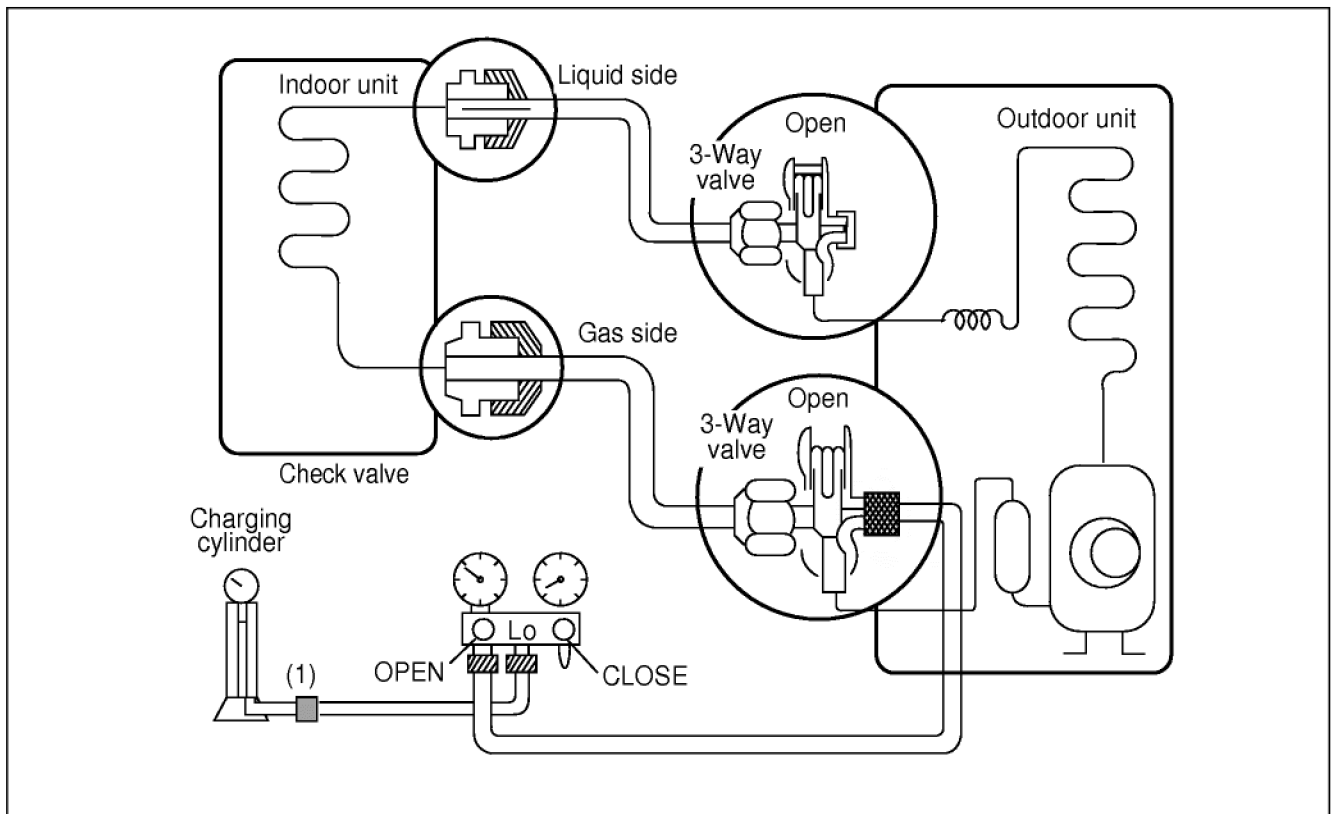
(All amount of refrigerant leaked)



• Procedure

- (1) Connect the vacuum pump to the charge set's center hose.
- (2) Evacuation for approximately one hour.
 - Confirm that the gauge needle has moved toward -76 cmHg (vacuum of 4 mmHg or less).
- (3) Close the valve (Lo side) on the charge set turn off the vacuum pump, and confirm that the gauge needle does not move (approximately 5 minutes after turning off the vacuum pump).
- (4) Disconnect the vacuum pump from the vacuum pump.
 - Vacuum pump oil.
 - If the vacuum pump oil becomes dirty or depleted, replenish as needed.
- (5) Apply steps from (1) to (4) to each (A-unit, B-unit) by the same method.

6. Gas Charging (After Evacuation)



• Procedure

(1) Connect the charge hose the charging cylinder.

- Connect the charge hose which you disconnected from the vacuum pump to the valve at the bottom of the cylinder.
- If you are using a gas cylinder, also use a scale and reverse the cylinder so that the system can be charged with liquid.

(2) Purge the air from the charge hose.

- Open the valve at the bottom of the cylinder and press the check valve on the charge set to purge the air. (Be careful of the liquid refrigerant). The procedure is the same if using a gas cylinder.

(3) Open the valve (Lo side) on the charge set and charge the system with liquid refrigerant.

- If the system can not be charged with the specified amount of refrigerant, it can be charged with a little at a time (approximately 150g each time) while operating the air conditioner in the cooling cycle; however, one time is not sufficient, wait approximately 1 minute and then repeat the procedure (pumping down-pin).

This is different from previous procedures. Because you are charging with liquid refrigerant from the gas side, absolutely do not attempt to charge with larger amounts of liquid refrigerant while operating the air conditioner.

(4) Immediately disconnect the charge hose from the gas side valve's service port.

- Stopping partway will allow the gas to be discharged.
- If the system has been charged with liquid refrigerant while operating the air conditioner turn off the air conditioner before disconnecting the hose.

(5) Mount the valve stem nuts and the service port nut.

- Use torque wrench to tighten the service port nut to a torque of 1.8 kg.m.
- Be sure to check for gas leakage.

(6) Apply steps from (1) to (5) to each unit (A-unit, B-unit) by the same method.

Cycle Trouble Shooting Guide

Trouble analysis

1. Check temperature difference between intake and discharge air and operating current.

Temp. Difference	Temp. difference : approx. 0°C Current : less than 80% of rated current	All amount of refrigerant leaked out. Check refrigeration cycle.
	Temp. difference : approx. 8°C Current : less than 80% of rated current	Refrigerant leakage Clog of refrigeration cycle Defective compressor
Operating Current	Temp. difference : less than 8°C Current : over the rated current	Excessive amount of refrigerant
	Temp. difference : over 8°C	Normal

Notice:

Temperature difference between intake and discharge air depends on room air humidity. When the room air humidity is relatively higher, temperature difference is smaller. When the room air humidity is relatively lower temperature difference is larger.

2. Check temperature and pressure of refrigeration cycle.

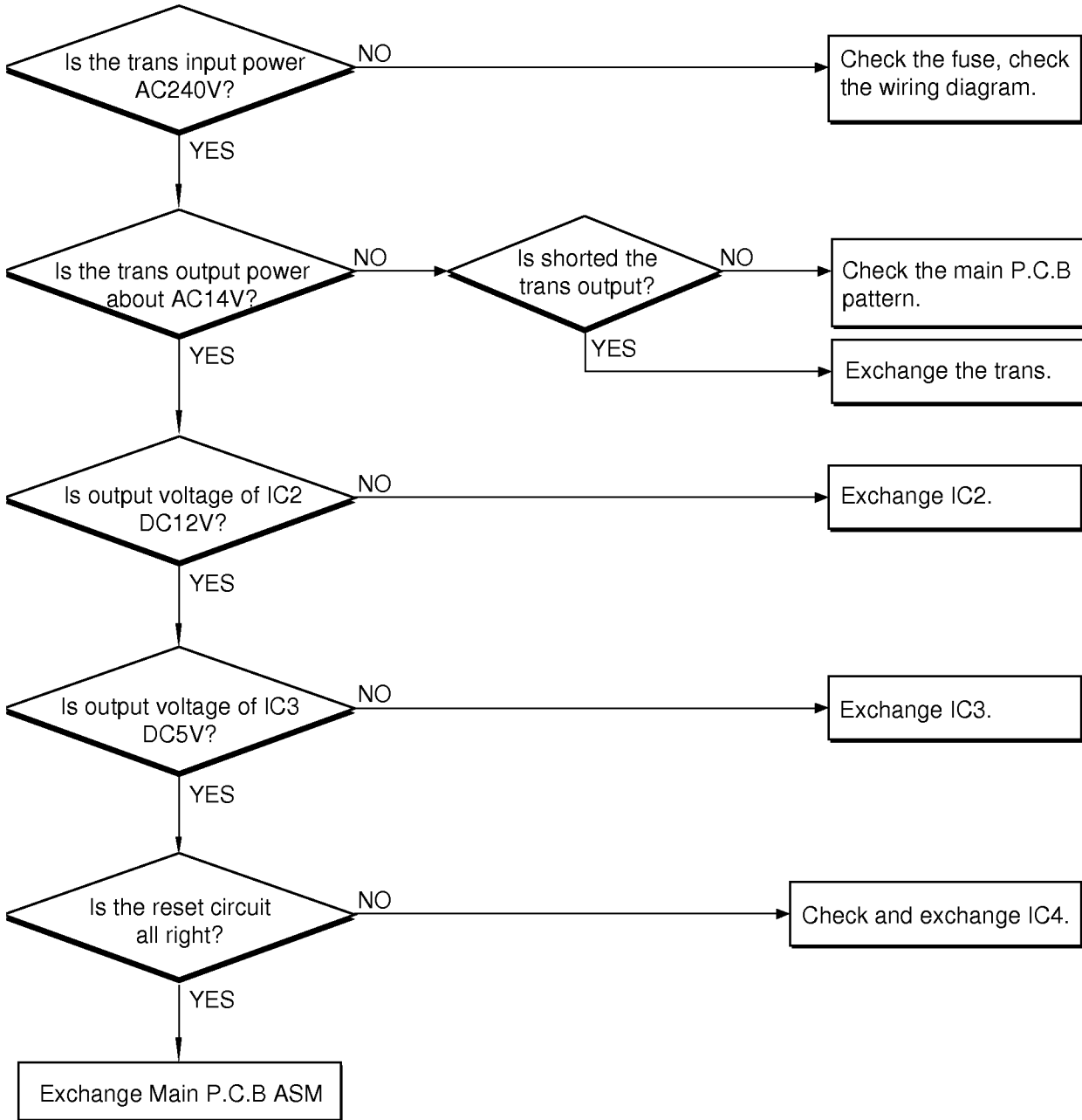
Suction pressure (Compared with the normal value)	Temperature (Compared with the normal value)	Cause of Trouble	Description
Higher	High	Defective compressor Defective 4-way reverse valve	Current is low.
	Normal	Excessive amount of refrigerant	High pressure does not quickly rise at the beginning of operation.
Lower	Higher	Insufficient amount of refrigerant (Leakage)	Current is low.
		Clogging	Current is low.

Notice:

1. The suction pressure is usually 4.5~6.0 kg/cm²G at normal condition.
2. The temperature can be measured by attaching the thermometer to the low pressure tubing and wrap it with putty.

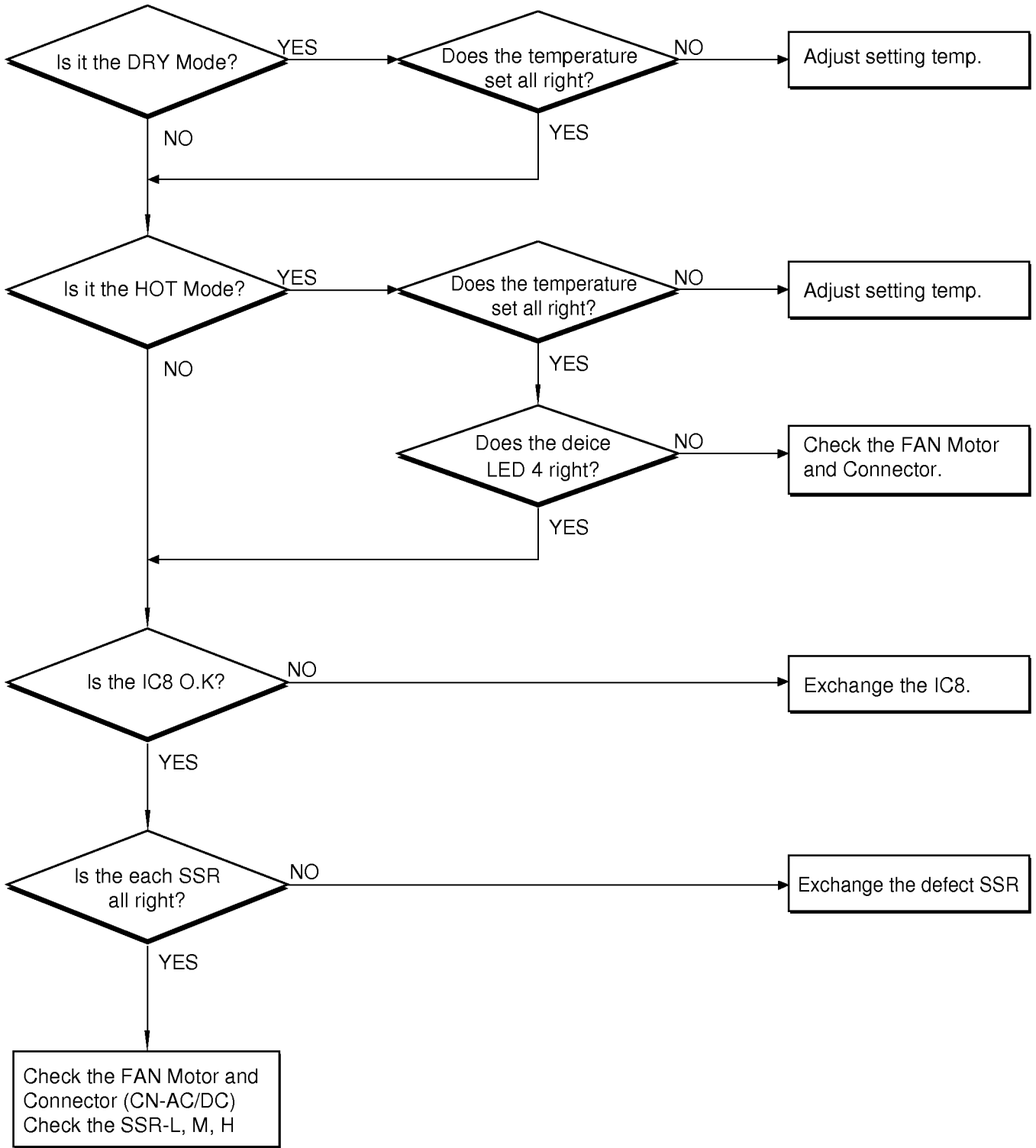
Electronic Parts Trouble shooting Guide

Possible Trouble 1 : The unit does not operate.



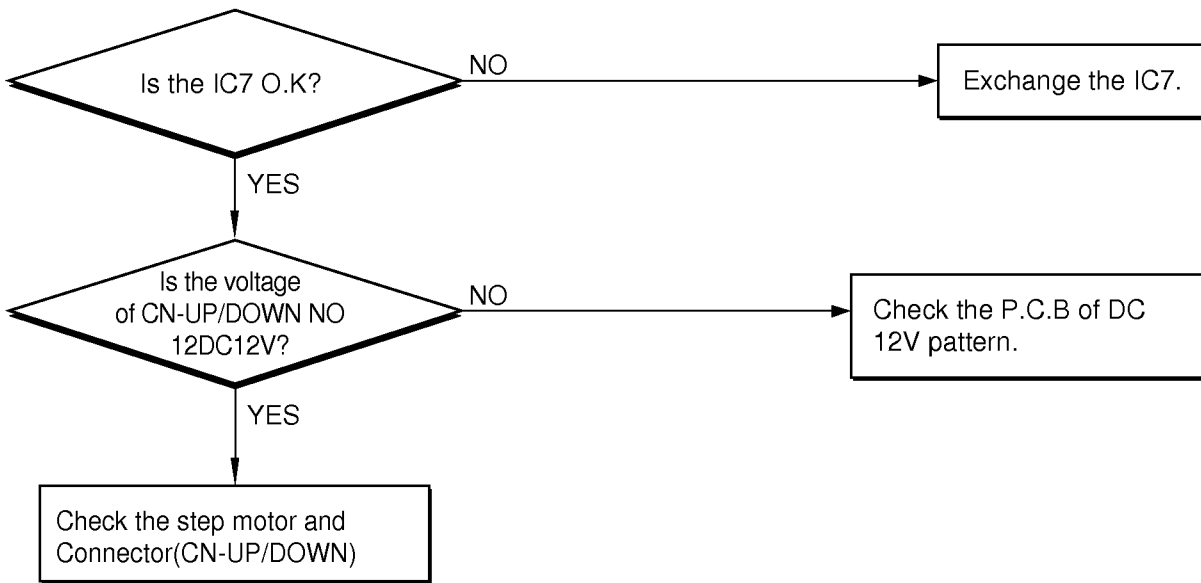
Possible Trouble 2

: Fan does not operate.



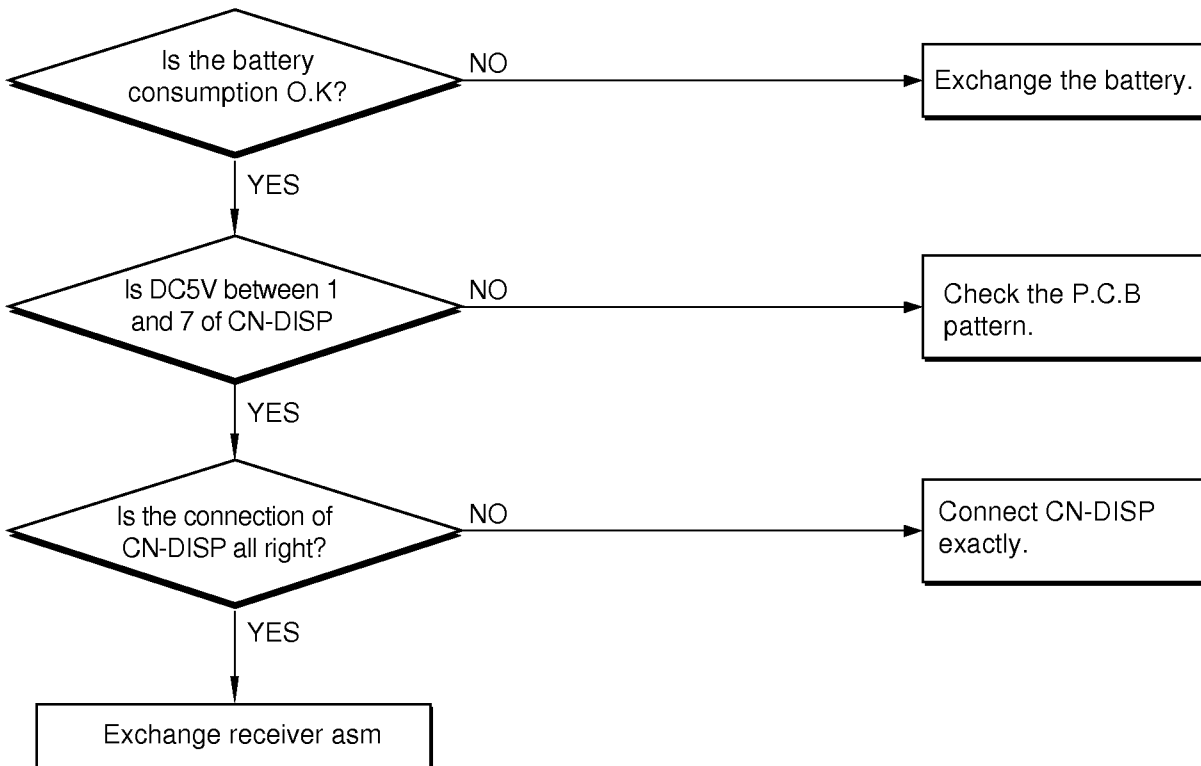
Possible Trouble 3

: Up/Down Air direction louver does not operate.



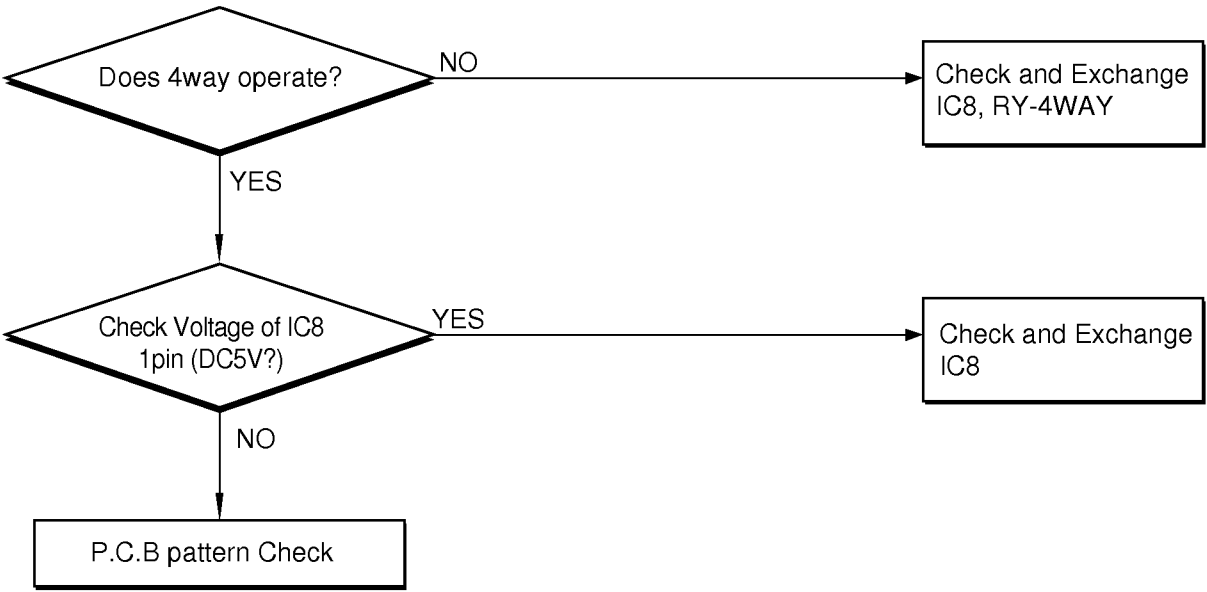
Possible Trouble 4

: Remote controller does not operate.



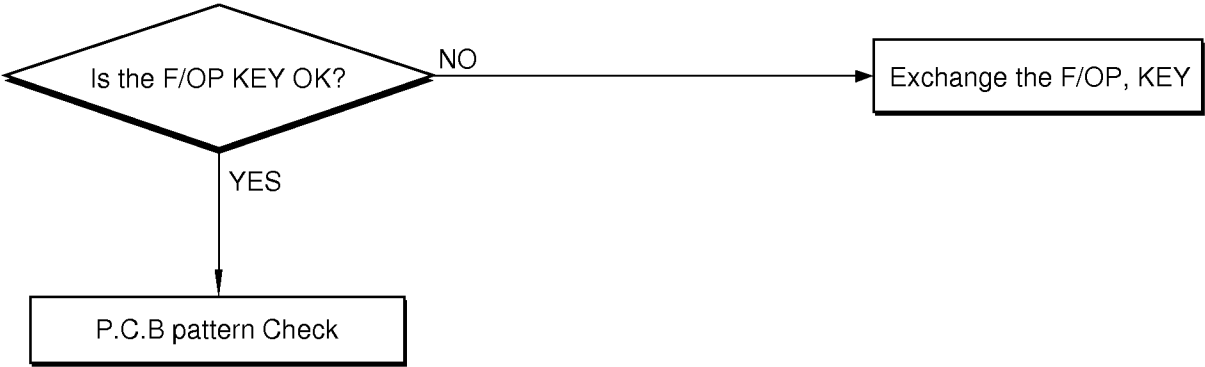
Possible Trouble 5

: Ineffective Heating



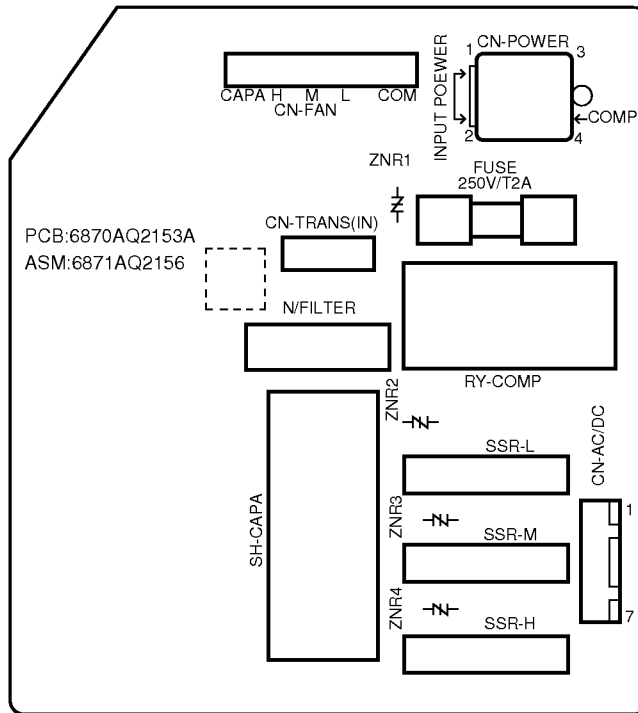
Possible Trouble 6

: It does not operate forced operation.

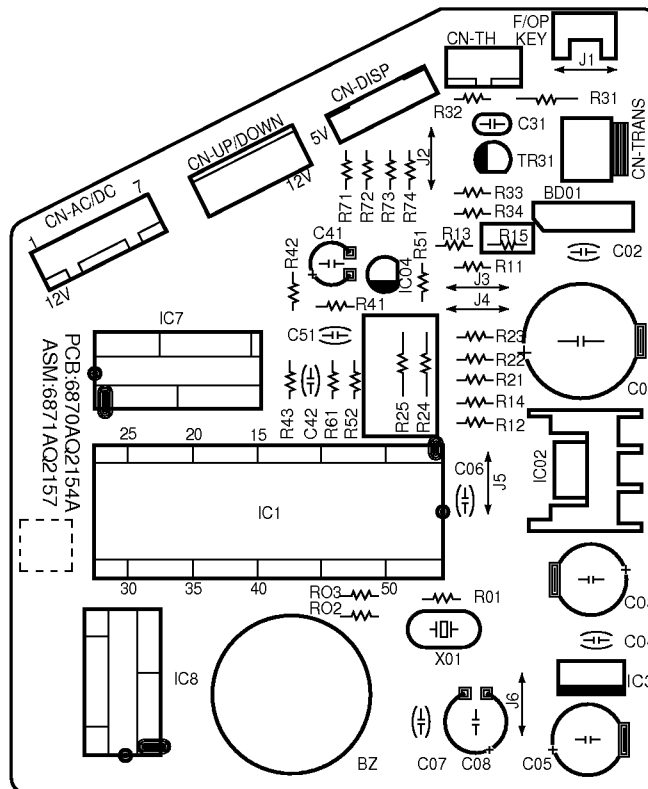


Electronic Control Device

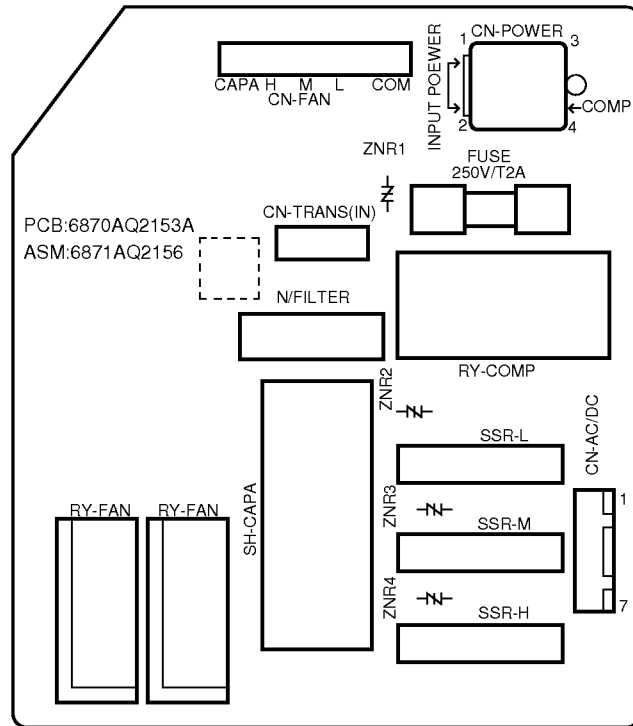
(1) MAIN P.C.B ASM: LM-1860CL(A.C.CIRCUIT)



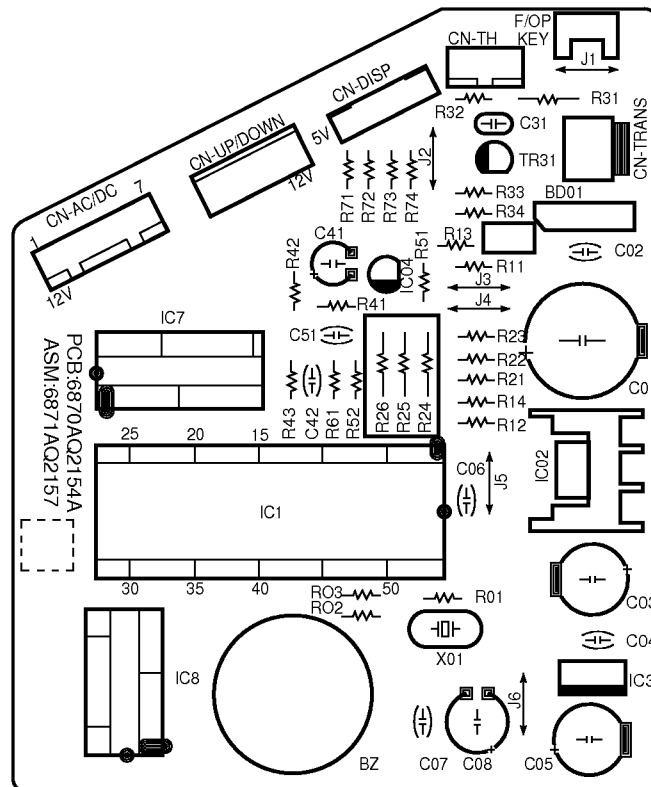
(2) MAIN P.C.B ASM: LM-1860CL(D.C.CIRCUIT)



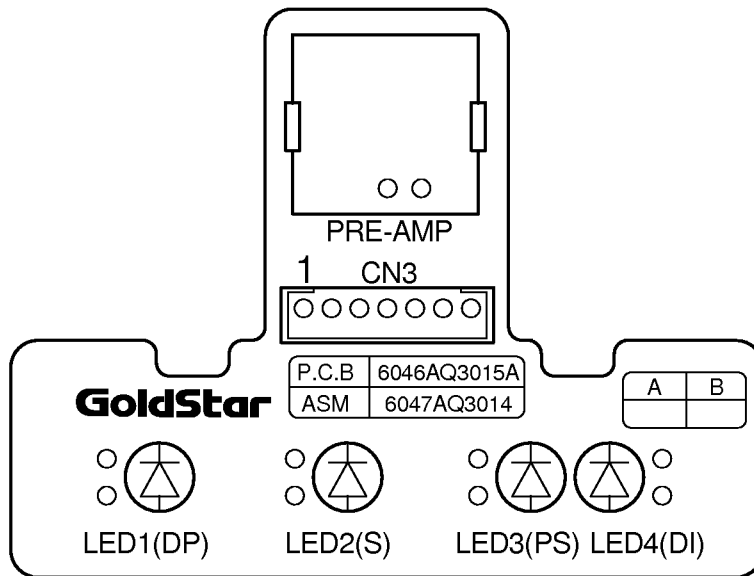
(3) MAIN P.C.B ASM: LM-1860HL(A.C. CIRCUIT)



(4) MAIN P.C.B ASM: LM-1860HL(D.C. CIRCUIT)



(5) DISPLAY P.C.B ASM



Schematic Diagram

LM-1860CL

