

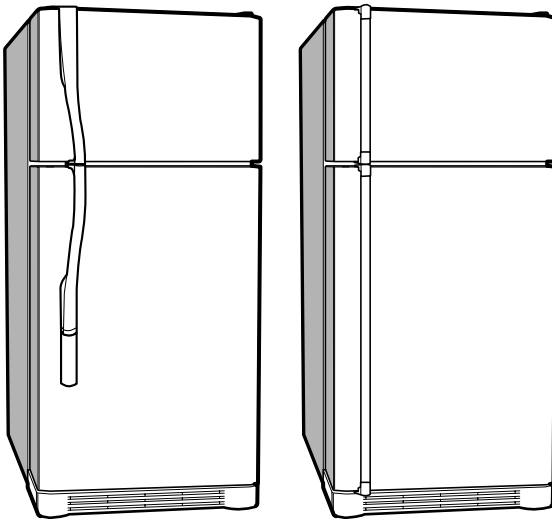


LG

REFRIGERATOR

SERVICE MANUAL

CAUTION
BEFORE SERVICING THE UNIT,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



models

LRTN19310**

LRTN22310**

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SAFETY PRECAUTIONS

Please read the following instructions before servicing your refrigerator.

1. Check the refrigerator for electrical faults.
2. To prevent electric shock, unplug before servicing.
3. Always check line voltage and amperage.
4. Use standard electrical components or cause your skin to freeze and stick to the surfaces inside the freezer.
5. Don't touch metal products in the freezer with wet hands. This may cause frostbite.
6. Prevent water from spilling onto electric elements or the machine parts.
7. Close the top door before opening the bottom door. Otherwise, you might hit your head when you stand up.
8. When tilting the refrigerator, remove any materials on the refrigerator, especially the glass shelves and stored food.
9. When servicing the evaporator, wear cotton gloves. This is to prevent injuries from the sharp evaporator fins.
10. Service on the refrigerator should be performed by a qualified technician. Sealed system repair must be performed by a CFC certified technician.

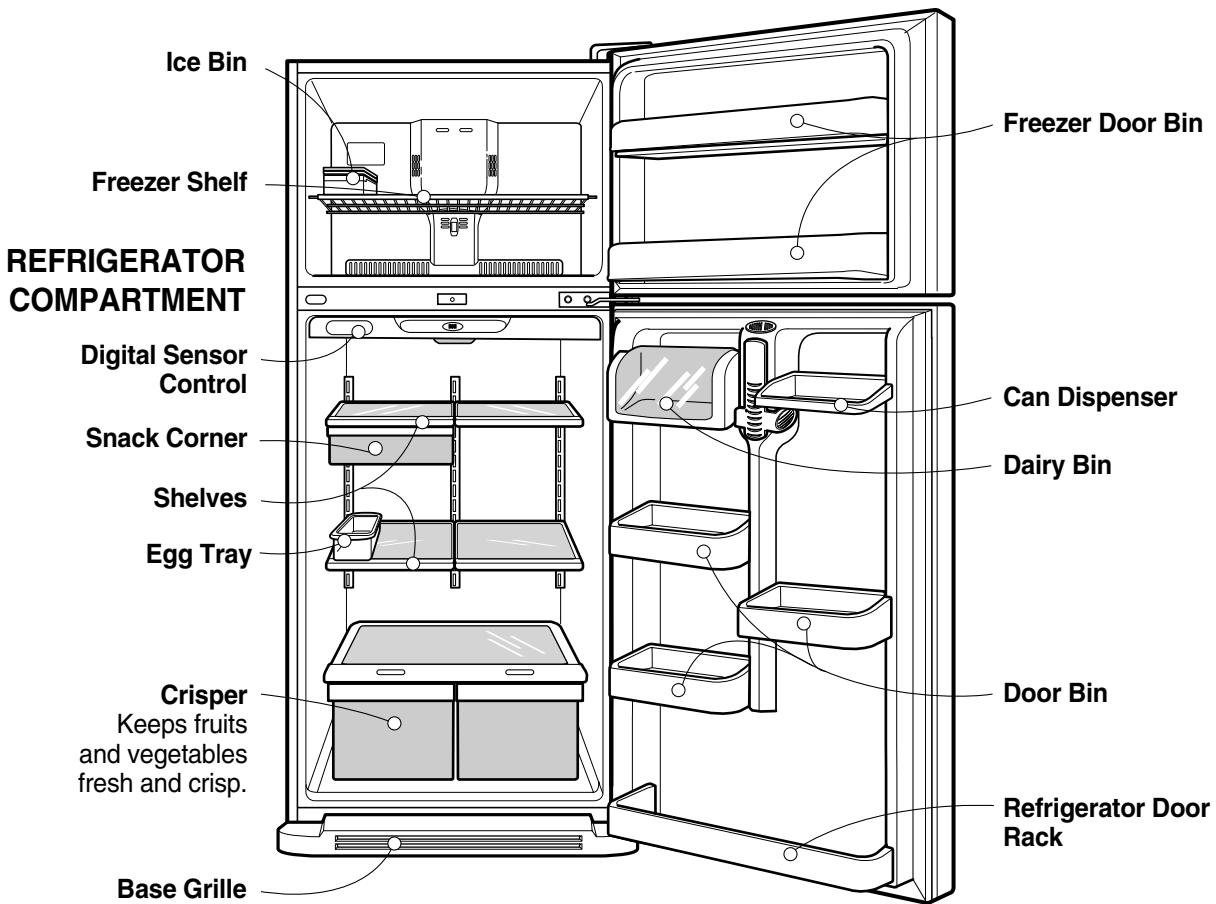
1. SPECIFICATIONS

Ref. No.: 19Cuft / 22Cuft

ITEMS	SPECIFICATIONS	ITEMS	SPECIFICATIONS
DOOR DESIGN	Slide Rounded	VEGETABLE TRAY	Opaque Drawer Type
DIMENSIONS (mm)	755 x 806 x 1664 (W x D x H) - 19 Cu.ft	COMPRESSOR	PTC Starting Type
	831 x 806 x 1715 (W x D x H) - 22 Cu.ft	EVAPORATOR	Fin Tube Type
NET WEIGHT (kg)	91 (19 cu.ft)	CONDENSER	Wire Condenser
	101 (22 cu.ft)	REFRIGERANT	R-134a (155 g)
COOLING SYSTEM	Fan Cooling	LUBRICATING OIL	Freol@10G (310 cc)
TEMPERATURE CONTROL	Micom Control	DEFROSTING DEVICE	SHEATH HEATER
DEFROSTING SYSTEM	Full Automatic Heater Defrost	LAMP	REFRIGERATOR
DOOR FINISH	VCM		60 W (1EA)
HANDLE TYPE	Bar		
INNER CASE	ABS Resin		
INSULATION	Polyurethane Foam		

2. PARTS IDENTIFICATION

FREEZER COMPARTMENT

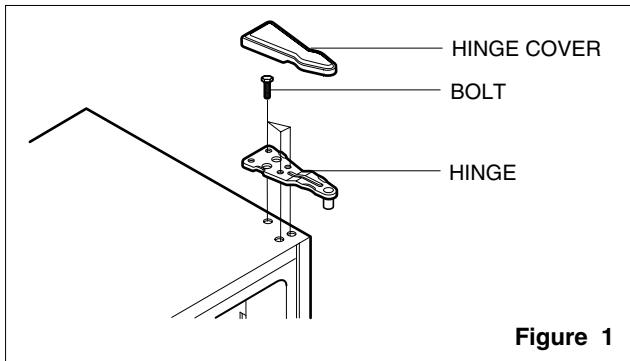


3. DISASSEMBLY

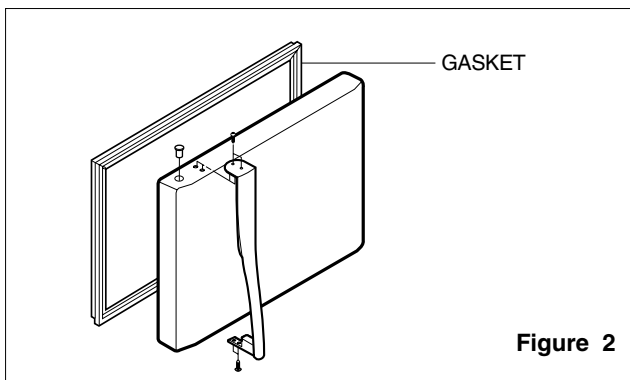
3-1 DOOR

● Freezer Door

1. Remove the hinge cover by pulling it upwards.
2. Loosen hexagonal bolts attaching the upper hinge to the body and lift the freezer door.

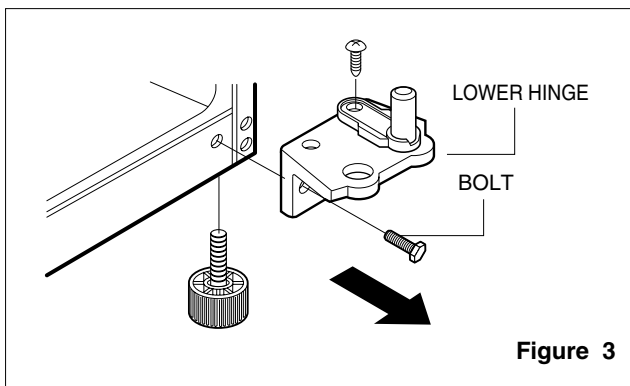


3. Pull out the door gasket to remove from the door foam assembly.



● Refrigerator Door

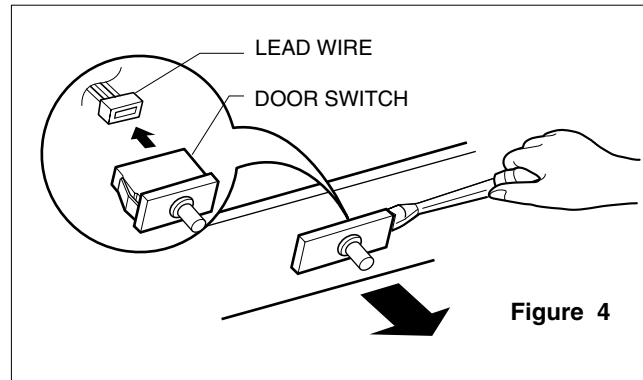
1. Loosen hexagonal bolts attaching the lower hinge to the body to remove the refrigerator door only.



2. Pull out the door gasket to remove from the door foam assembly.

3-2 DOOR SWITCH

1. To remove the door switch, pry it out with a slotted-type driver, as shown in (Figure 4).
2. Disconnect the lead wire from the switch.



3-3 FAN AND FAN MOTOR

1. Remove the freezer shelf. (If your refrigerator has an icemaker, remove the icemaker **first**)
2. Remove the grille by pulling it out and loosening a screw.
3. Remove the Fan Motor assembly by loosening 4 screws and disassemble the shroud.
4. Pull out the fan and separate the Fan Motor and Bracket.

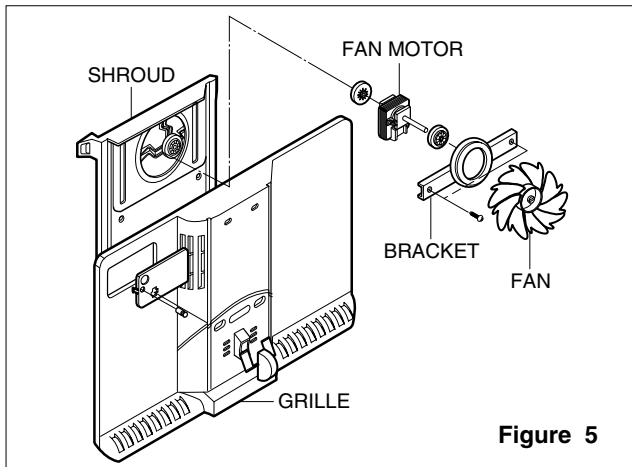


Figure 5

3-4 DEFROST CONTROL ASSEMBLY

Defrost Control assembly consists of Defrost Sensor and FUSE-M.

Defrost sensor functions to defrost automatically. It is attached to metal side of the Evaporator and senses Temperature. At the temperature of 162°F(72°C), it stops the emission of heat from the Heater.

Fuse-M is a safety device for preventing over-heating of the Heater when defrosting.

1. Pull out the grille assembly. (Figure 6)
2. Separate the connector with Defrost Control assembly and replace the Defrost Control assembly after cutting the Tie Wrap. (Figure 7)

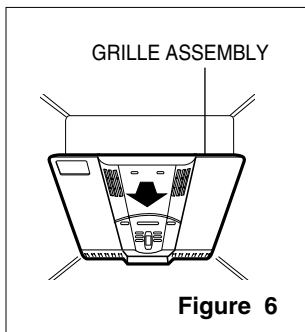


Figure 6

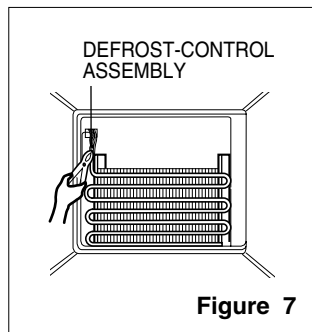


Figure 7

3-5 LAMP

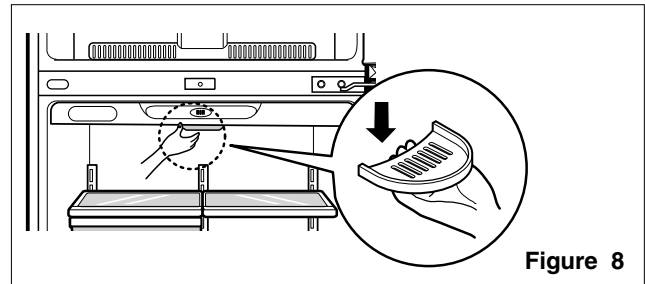


Figure 8

3-5-1 Refrigerator Compartment Lamp

1. Unplug the power cord from the outlet.
2. Remove refrigerator shelves.
3. Release the hooks on both ends of the lamp shield and pull the shield downward to remove it.
4. Turn the lamp counterclockwise.
5. Assemble in reverse order of disassembly. Replacement bulb must be the same specification as the original (Max. 60 W-1EA).

3-6 CONTROL BOX-REFRIGERATOR

1. First, remove all shelves in the refrigerator. Then remove the Refrigerator Control Box by loosening 2 screws.

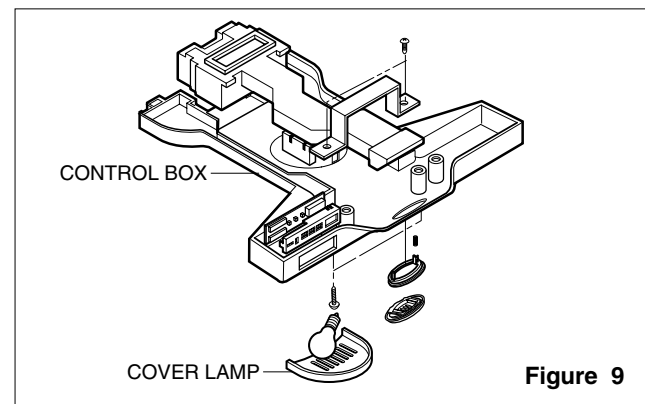


Figure 9

2. Remove the Refrigerator Control Box by pulling it downward.
3. Disconnect the lead wire on the right position and separate the lamp sockets.

4. ADJUSTMENT

4-1 COMPRESSOR

4-1-1 Role

The compressor intakes low temperature and low pressure gas from the evaporator of the refrigerator and compresses this gas to high-temperature and high-pressure gas. It then delivers the gas to the condenser.

4-1-2 Composition

The compressor includes overload protection. The PTC starter and OLP (overload protector) are attached to the outside of the compressor. Since the compressor is manufactured to tolerances of 1 micron and is hermetically sealed in a dust and moisture-free environment, use extreme caution when repairing it.

4-1-3 Note for Usage

- (1) Be careful not to allow over-voltage and over-current.
- (2) If compressor is dropped or handled carelessly, poor operation and noise may result.
- (3) Use proper electric components appropriate to the Particular Compressor in your product.
- (4) Keep Compressor dry.
If Compressor gets wet (in the rain or a damp environment) and rust forms in the pin of the Hermetic Terminal, poor operation and contact may result.
- (5) When replacing the Compressor, be careful that dust, humidity, and soldering flux don't contaminate the inside of the compressor. Dust, humidity, and solder flux contaminate the cylinder and may cause noise or improper operation even cause it to lock up.



4-2 PTC-STARTER

4-2-1 Composition of PTC-Starter

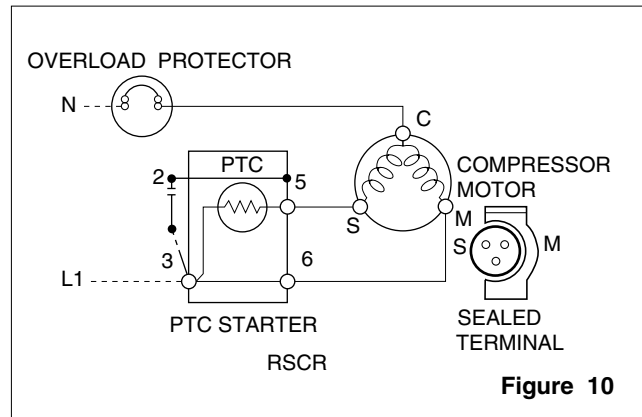
- (1) PTC (Positive Temperature Coefficient) is a no-contact semiconductor starting device which uses ceramic material consisting of BaTiO₃.
- (2) The higher the temperature is, the higher the resistance value. These features are used as a starting device for the Motor.

4-2-2 Role of PTC-Starter

- (1) The PTC is attached to the Sealed Compressor and is used for starting the Motor.
- (2) The compressor is a single-phase induction motor. During the starting operation, the PTC allows current flow to both the start winding and main winding.

4-2-3 PTC-Applied Circuit Diagram

● Starting Method for the Motor



4-2-4 Motor Restarting and PTC Cooling

- (1) It requires approximately 5 minutes for the pressure to equalize before the compressor can start.
- (2) The PTC device generates heat during operation. Therefore, it must be allowed to cool before the compressor can restart.

4-2-5 Relation of PTC-Starter and OLP

- (1) If the compressor attempts to restart before the PTC device is cooled, the PTC device will allow current to flow only to the main winding.
- (2) The OLP will open because of the over current condition. This same process will continue (3 to 5 times) when the compressor attempts to restart until the PTC device has cooled. The correct OLP must be properly attached to prevent damage to the compressor.

4-2-6 Note for Using the PTC-Starter

- (1) Be careful not to allow over-voltage and over-current.
- (2) Do not drop or handle carelessly.
- (3) Keep away from any liquid.
If liquid such as oil or water enters the PTC, PTC materials may fail due to breakdown of their insulating capabilities.
- (4) If the exterior of the PTC is damaged, the resistance value may be altered. This can cause damage to the compressor and result in a no-start or hard-to-start condition.
- (5) Always use the PTC designed for the compressor and make sure it is properly attached to the compressor.

4-3 OLP (OVERLOAD PROTECTOR)

4-3-1 Definition of OLP

- (1) OLP (OVERLOAD PROTECTOR) is attached to the Compressor and protects the Motor by opening the circuit to the Motor if the temperature rises and activating the bimetal spring in the OLP.
- (2) When high current flows to the Compressor motor, the Bimetal works by heating the heater inside the OLP, and the OLP protects the Motor by cutting off the current flowing to the Compressor Motor.

4-3-2 Role of the OLP

- (1) The OLP is attached to the Sealed Compressor used for the Refrigerator. It prevents the Motor Coil from being started in the Compressor.
- (2) For normal operation of the OLP, do not turn the Adjust Screw of the OLP in any way.

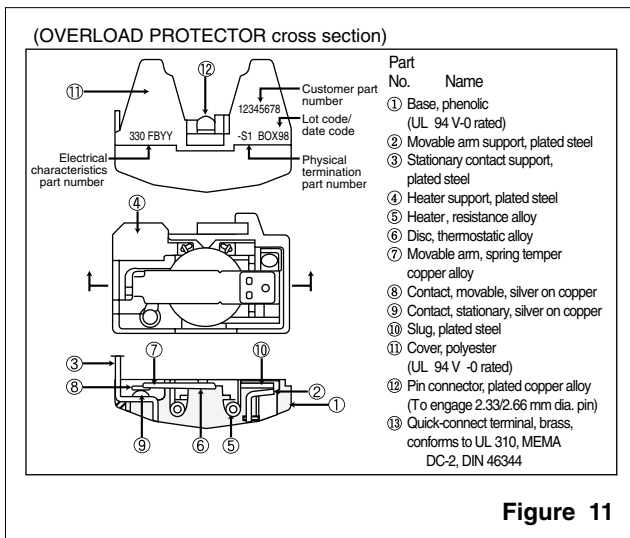
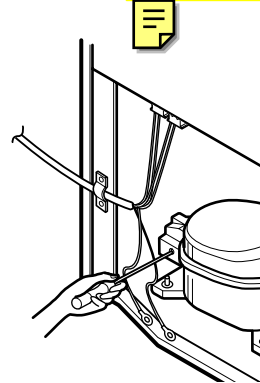


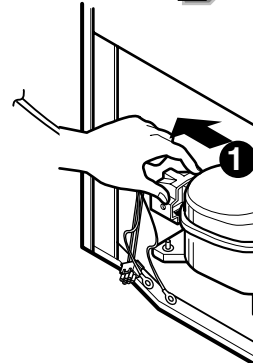
Figure 11

4-4 TO REMOVE THE COVER PTC



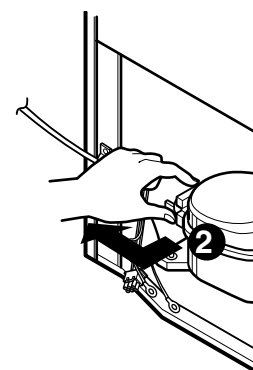
1) Remove the Cover Back M/C.

(2) Remove the screw on Cover PTC.



(3) Remove two Housings on upper part of Cover PTC.

(4) Take out the cover PTC from upper to lower position like ①.



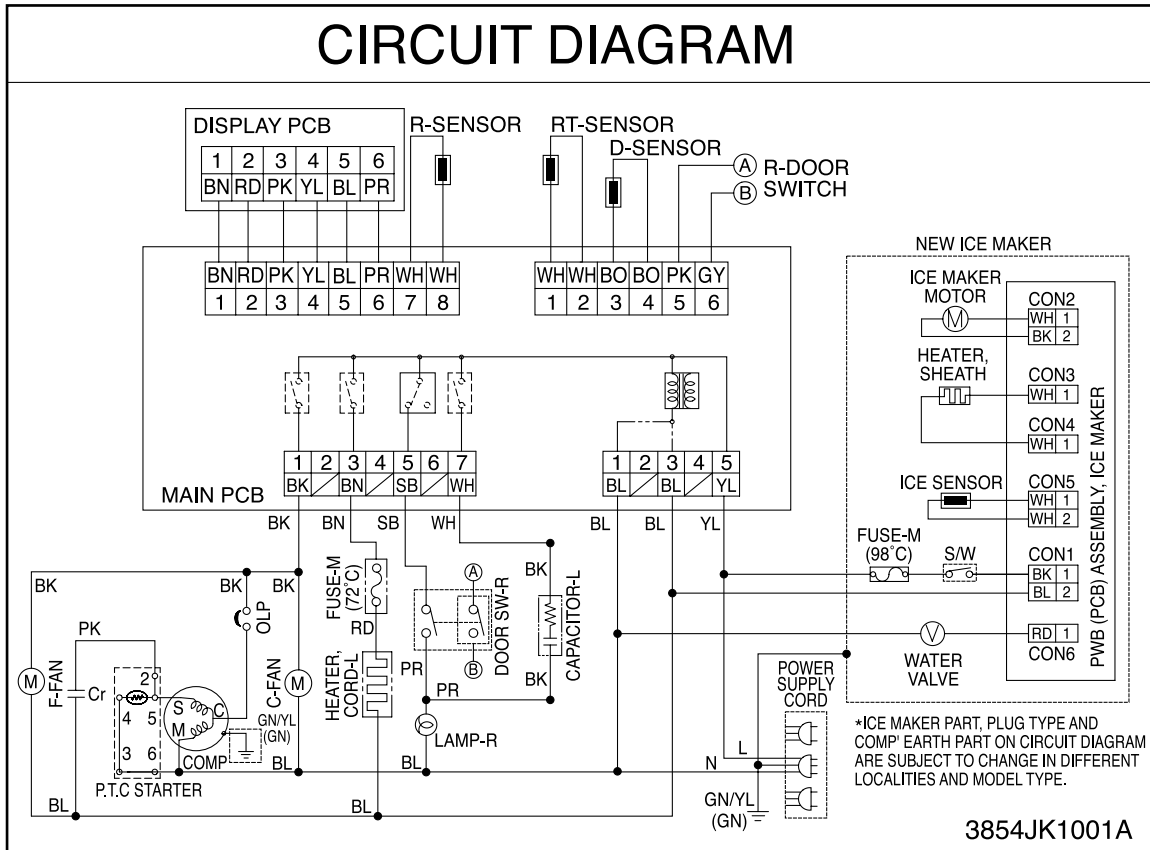
(5) Turn 45° in the direction of ② and take it out.

(6) Assembly in reverse order of disassembly.



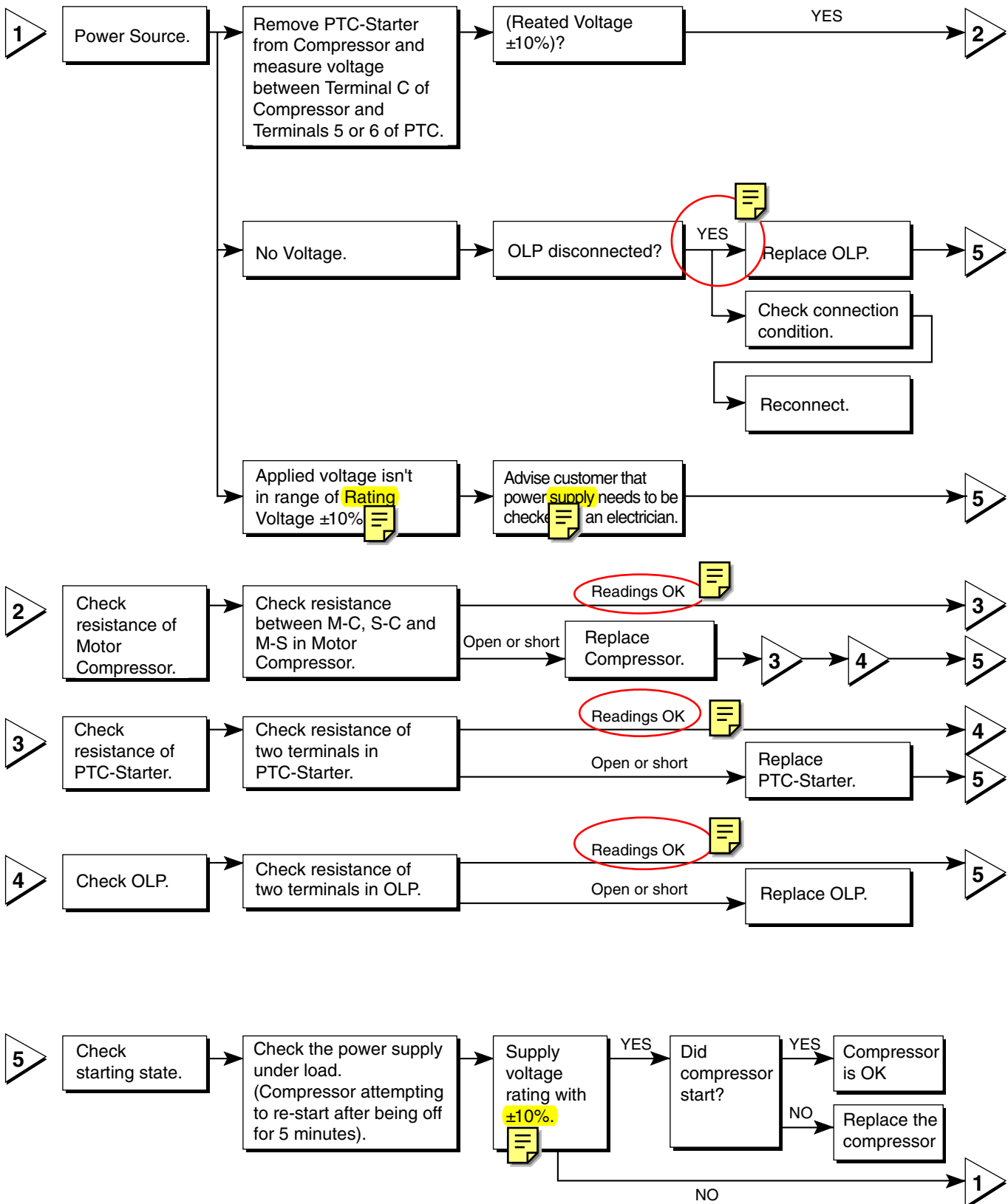
5. CIRCUIT DIAGRAM

GOOD MODEL



6. TROUBLESHOOTING

6-1 COMPRESSOR AND ELECTRIC COMPONENTS



6-2 PTC AND OLP

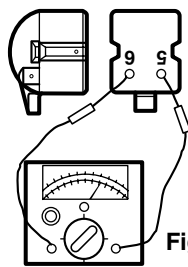
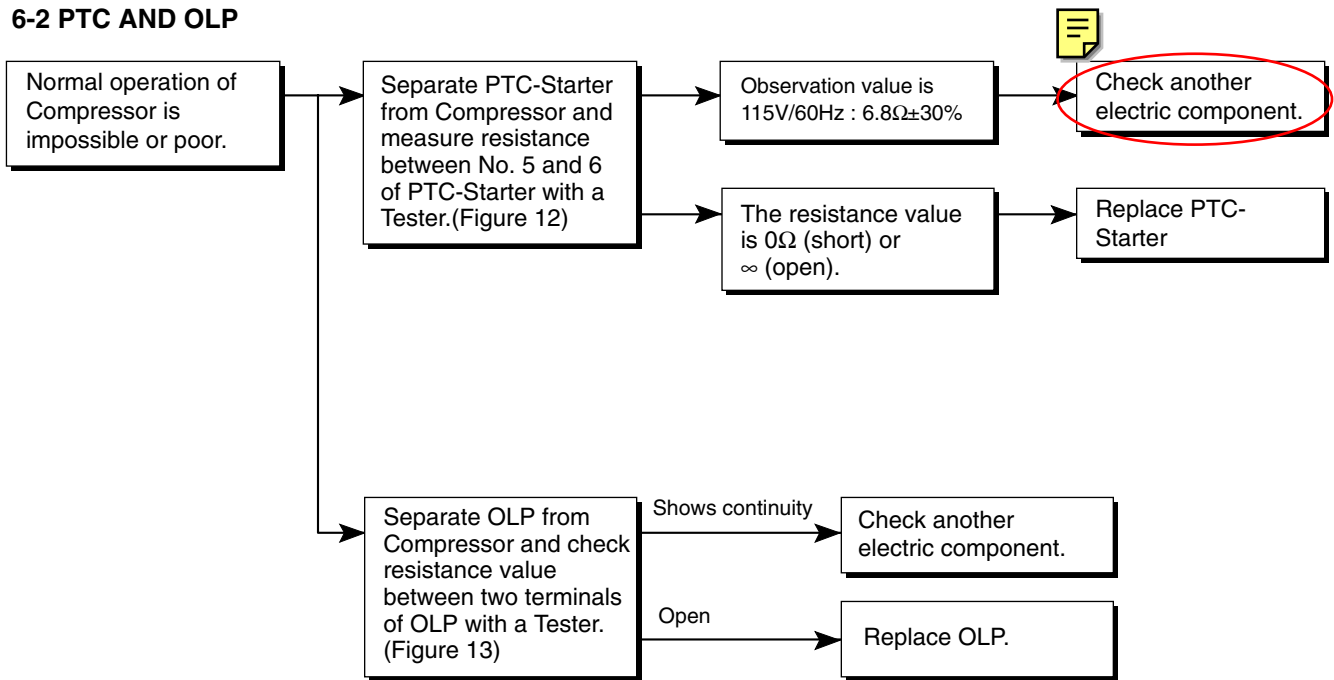


Figure 12

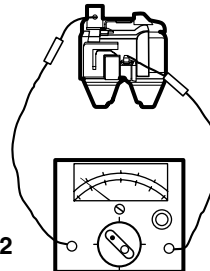
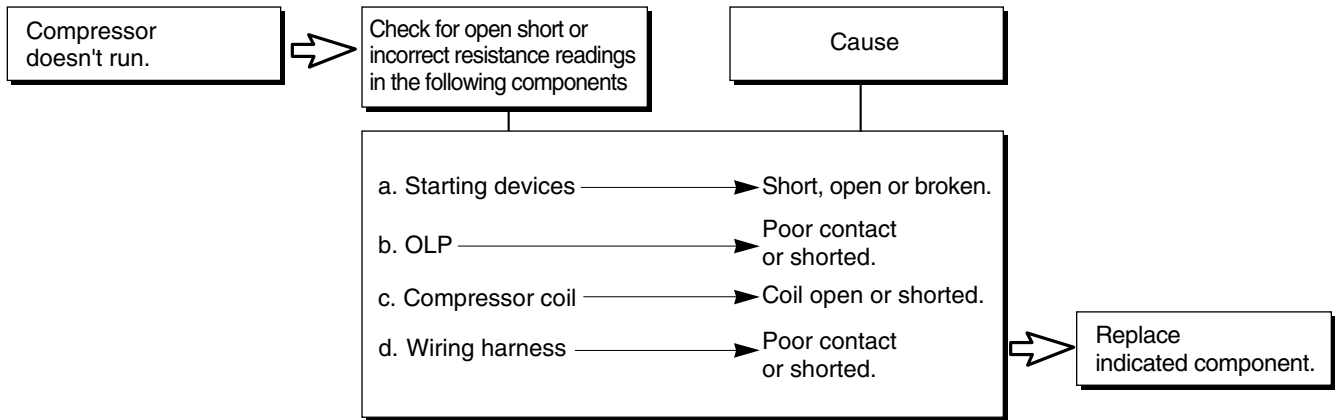


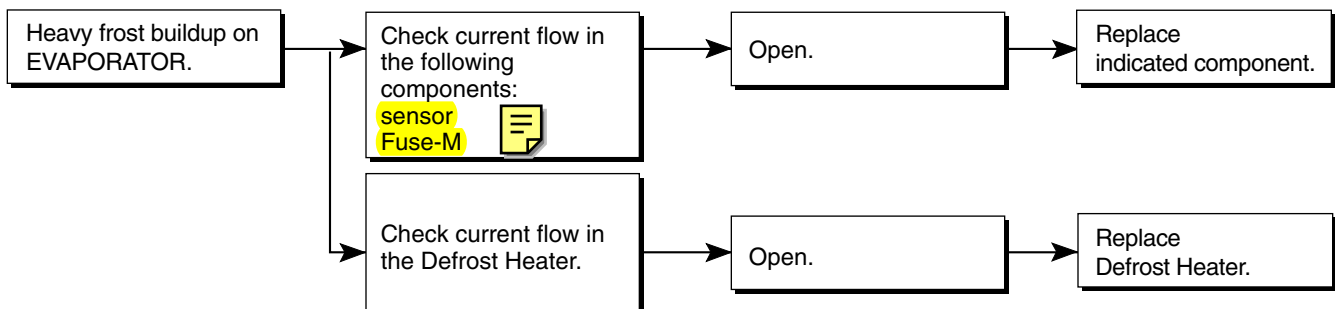
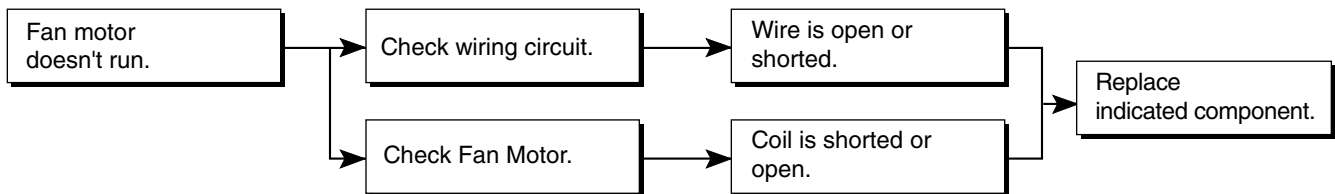
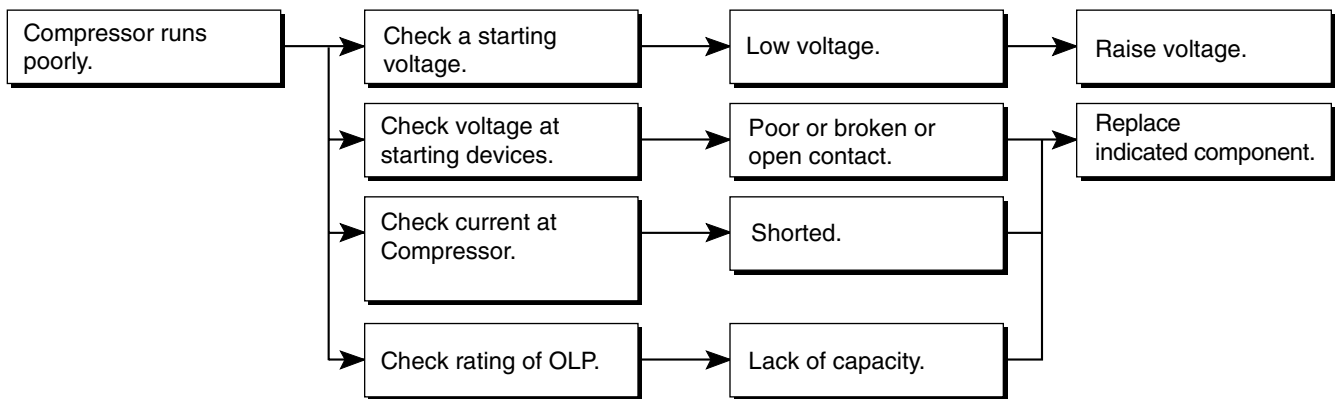
Figure 13

6-3 OTHER ELECTRIC COMPONENTS

▼ Not cooling at all



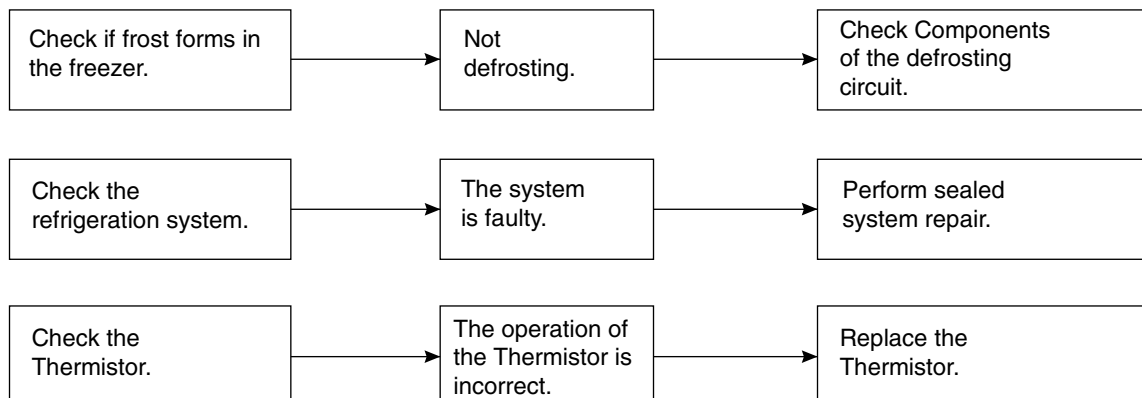
▼ Poor cooling performance



6-4 SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	REMEDY
No Cooling.	<ul style="list-style-type: none"> • Is the power cord unplugged from the outlet? • Check if the power Switch is set to OFF. • Check if the fuse of the power Switch is shorted. • Measure the voltage of the power outlet. 	<ul style="list-style-type: none"> • Plug into the outlet. • Set the switch to ON. • Replace the fuse. • If the voltage is low, correct the wiring.
Cools poorly.	<ul style="list-style-type: none"> • Check if the unit is placed too close to the wall. • Check if the unit is placed too close to the stove, gas cooker, or in direct sunlight. • Is the ambient temperature too high or the room door closed? • Check if food put in the refrigerator is hot. • Did you open the door of the unit too often or check if the door is sealed properly? • Check if the Control is set to Warm position. 	<ul style="list-style-type: none"> • Place the unit about 10 cm from the wall. • Place the unit away from these heat sources. • Lower the ambient temperature. • Put in foods after they have cooled down. • Don't open the door too often and close it firmly. • Set the control to Recommended-position.
Foods in the Refrigerator are frozen.	<ul style="list-style-type: none"> • Is food placed in the cooling air outlet? • Check if the control is set to colder-position. • Is the ambient temperature below 41°F(5°C)? 	<ul style="list-style-type: none"> • Place foods in the high-temperature section. (front part) • Set the control to Recommended-position. • Set the control to Warm-position.
Condensation or ice forms inside the unit.	<ul style="list-style-type: none"> • Is liquid food sealed? • Check if food put in the refrigerator is hot. • Did you open the door of the unit too often or check if the door is sealed properly? 	<ul style="list-style-type: none"> • Seal liquid foods with wrap. • Put in foods after they have cooled down. • Don't open the door too often and close it firmly.
Condensation forms in the Exterior Case.	<ul style="list-style-type: none"> • Check if the ambient temperature and humidity of the surrounding air are high. • Is there a gap in the door gasket? 	<ul style="list-style-type: none"> • Wipe moisture with a dry cloth. It will disappear in low temperature and humidity. • Fill up the gap.
There is abnormal noise.	<ul style="list-style-type: none"> • Is the unit positioned in a firm and even place? • Are any unnecessary objects placed in the back side of the unit? • Check if the Drip Tray is not firmly fixed. • Check if the cover of the compressor enclosure in the lower front side is taken out. 	<ul style="list-style-type: none"> • Adjust the Leveling Screw, and position in a firm place. • Remove the objects. • Fix the Drip Tray firmly in the original position. • Place the cover in its original position.
Door does not close well.	<ul style="list-style-type: none"> • Check if the door gasket is dirty with an item like juice. • Is the refrigerator level? • Is there too much food in the refrigerator? 	<ul style="list-style-type: none"> • Clean the door gasket. • Position in the firm place and level the Leveling Screw. • Make sure food stored in shelves does not prevent the door from closing.
Ice and foods smell unpleasant	<ul style="list-style-type: none"> • Check if the inside of the unit is dirty. • Are foods with a strong odor unwrapped? • The unit smells of plastic. 	<ul style="list-style-type: none"> • Clean the inside of the unit. • Wrap foods that have a strong odor. • New products smell of plastic, but this will go away after 1-2 weeks.

● Other possible problems:



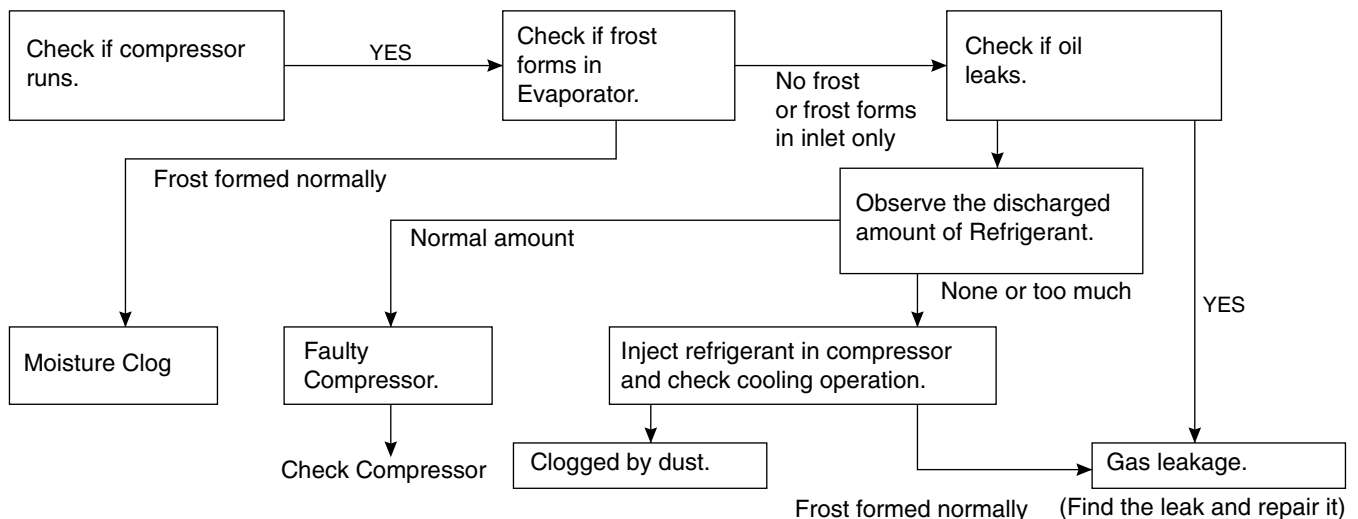
6-5 REFRIGERATING CYCLE

▼ Troubleshooting Chart





CAUSE		STATE OF THE UNIT	STATE OF THE EVAPORATOR	TEMPERATURE OF THE COMPRESSOR	REMARKS
LEAKAGE	PARTIAL LEAKAGE	Freezer compartment and Refrigerator don't cool normally.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little higher than ambient temperature.	<ul style="list-style-type: none"> Refrigerant level is low due to a leak. Normal cooling is possible by restoring the normal amount of refrigerant and repairing the leak.
	COMPLETE LEAKAGE	Freezer compartment and Refrigerator don't cool normally.	Flowing sound of refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	<ul style="list-style-type: none"> No discharging of Refrigerant. Normal cooling is possible by restoring the normal amount of refrigerant and repairing the leak.
RESTRICTED BY DUST	PARTIAL RESTRICTION	Freezer compartment and Refrigerator don't cool normally.	Flowing sound of refrigerant is heard and frost forms in inlet only.	A little higher than ambient temperature.	<ul style="list-style-type: none"> Normal discharging of the refrigerant. The capillary tube is faulty.
	WHOLE RESTRICTION	Freezer compartment and Refrigerator don't cool.	Flowing sound of refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	<ul style="list-style-type: none"> Normal discharging of the Refrigerant.
MOISTURE RESTRICTION		Cooling operation stops periodically.	Flowing sound of refrigerant is not heard and frost melts.	Lower than ambient temperature.	<ul style="list-style-type: none"> Cooling operation restarts when heating the inlet of the capillary tube.
DEFECTIVE COMPRESSION	COMP-RESSION	Freezer and Refrigerator don't cool.	Low flowing sound of refrigerant is heard and frost forms in inlet only.	A little higher ambient temperature.	<ul style="list-style-type: none"> Low pressure at high side of compressor due to low refrigerant level.
	NO COMP-RESSION	No compressing operation.	Flowing sound of refrigerant is not heard and there is no frost.	Equal to ambient temperature.	<ul style="list-style-type: none"> No pressure in the high pressure part of the compressor.

▼ Leakage Detection

- Observe the discharging point of the refrigerant, which may be in the oil discharging part of the compressor and in a hole in the evaporator.



▼ General Control of Refrigerating Cycle

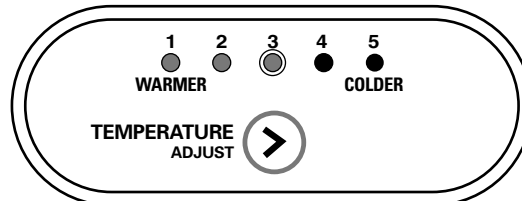
NO.	ITEMS	UNIT	STANDARDS	PURPOSES	REMARKS	
1	Pipe and piping system opening time	Min.	Pipe: within 1 hour. Comp: within 10 minutes. Drier: within 20 minutes.	To protect moisture penetration. 	The opening time should be reduced to a half of the standards during rain and rainy seasons (the penetration of water into the pipe is dangerous).	
2	Welding	Nitrogen pressure	Weld under Nitrogen atmosphere. (N ₂ pressure: 0.1~0.2 kg/cm ²)	To protect oxide scale formation.	<ul style="list-style-type: none"> - Refer to repair note in each part. - R-134a refrigerant is more susceptible to leaks than R-12 and requires more care during welding. - Do not apply force to pipes before and after welding to protect pipe from cracking. 	
3	N ₂ sealed parts	Confirm N ₂ leak	Confirm the sound of pressure relief when removing the rubber cap. Sound: usable No sound: not usable	To protect moisture penetration. 	<ul style="list-style-type: none"> - In case of evaporator parts, if it doesn't make sound when removing rubber cap, blow dry air or N₂ gas for more than 1 min. and than use the parts.  	
4	Refrigeration Cycle	Evacuation time	Min.	More than 40 minutes	To remove moisture.	Note: Only applicable to the model equipped with reverse flow protect plate.
		Vacuum degree	Torr	Below 0.03 (ref)		
		Vacuum	EA	High and low pressure sides are evacuated at the same time for models above 200 l.		Vacuum efficiency can be improved by operating compressor during evacuation.
		Vacuum piping	EA	Use R-134a manifold exclusively.	To protect mixing of mineral and ester oils.	The rubber pipes for R-12 refrigerant will be melted when they are used for R-134a refrigerant (causes of leak.)
		Pipe coupler	EA	Use R-134a manifold exclusively.	To protect R-12 refrigerant mixing.	
		Outlet (Socket)		R-134a manifold exclusively.	To protect R-12 refrigerant mixing.	
		Plug		R-134a manifold exclusively.	To protect R-12 refrigerant mixing.	
5	Refrigerant weighing	EA	Use R-134a exclusively. Weighing allowance: ±5g Note: Winter: -5g Summer: +5g	Do not mix with R-12 refrigerant.	<ul style="list-style-type: none"> - Do not weigh the refrigerant at too hot or too cold an area. (77°F [25°C] is adequate.) - Make Copper charging canister (Device filling refrigerant) Socket: 2SV Plug: 2PV R-134a Note: Do not burn O-ring (bushing) during welding. 	
6	Drier replacement		<ul style="list-style-type: none"> - Use R-134a exclusively for R-134a refrigerator. - Replace drier whenever repairing refrigerator cycle piping. 	To remove the moisture from pipe inside.		
7	Leak check		<ul style="list-style-type: none"> - Do not use soapy water for check. It may be sucked into the pipe by a vacuum. 	Defect in refrigerant leak area.	<ul style="list-style-type: none"> - Check for an oil leak at the refrigerant leak area. Use an electronic leak detector if an oil leak is not found. - The electronic leak detector is very sensitive to halogen gas in the air. It also can detect R-141b in urethane. Practice many times before using this type of detector to avoid false readings. 	

7. DESCRIPTION OF FUNCTION & CIRCUIT OF MICOM

7-1 FUNCTION

7-1-1 Function

- When the appliance is plugged in, it is set to "3" for the Refrigerator.
You can adjust the Refrigerator control temperature by pressing the ADJUST button.
- When the power is initially applied or restored after a power failure, it is automatically reset to "3".



7-1-2 Defrost Cycle

- A defrost cycle will be initiated after 4 hours of accumulated compressor run time after the initial power up or a power failure.
- After the initial defrost, the defrost cycle is initiated after 7 hour of accumulated compressor run time.
- The defrost cycle will be terminated once the defrost sensor reaches 50°F(10°C).

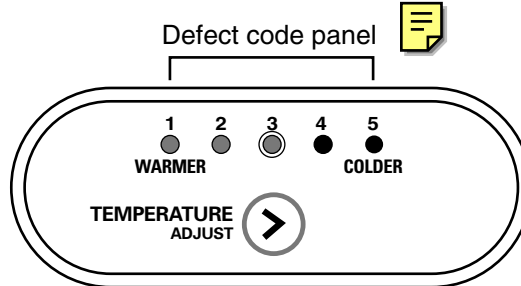
7-1-3 Electrical Parts Operates in Orders

Electrical parts such as COMP, defrost heater, freezer FAN, etc. operate in the following order to prevent noise and parts damage. Several parts are started at the same time at initial power on and are turned off together when TEST is completed.

OPERATING		ORDERS
Initial power on	Temperature of Defrost Sensor is 113°F(45°C) or more (when unit is newly purchased or when moved)	POWER ON → in 1/2 second → COMP & Freezer FAN ON
	Temperature of defrost sensor is lower than 113°F(45°C) (when power cuts, SERVICE)	POWER ON → in 1/2 second → Defrost heater ON → in 10 second → Defrost heater OFF in 1/2 second → COMP & Freezer FAN ON
Reset to normal operation from TEST MODE		Total load OFF → in 7 minute → COMP & Freezer FAN ON

7-1-4 Defect Diagnosis Function

1. Defect diagnosis functions are easy SVC when defects occur which can affect product performance.
2. When a defect occurs, the buttons will not operate, but the tones, such as "ding", will sound.
3. When the defect CODE removes the sign, it returns to normal operation (RESET).
4. The defect CODE shows on the refrigerator DISPLAY as temperature LED, and the other LED turns off.



- ERROR CODE on Refrigerator Temperature panel

☉:ON ●:OFF

NO	ITEM	DEFECT SIGNS					CONTENTS	REMARKS
		R1	R2	R3	R4	R5		
1	Refrigerator sensor malfunctions	●	●	☉	●	●	Open or short-circuited wire	*Inspect connecting wires on each sensor
2	Defrost sensor malfunctions	●	●	●	☉	●	Open or short-circuited wire	
3	Room Temperature sensor malfunctions	●	●	●	●	☉	Open or short-circuited wire	
4	Defrosting malfunctions	●	☉	☉	☉	☉	2 hours after defrosting starts, the sensor is not above 50°F(10°C)	Temperature FUSE cuts off, HEATER cuts off, DRAIN is clogged, HEATER starts, RELAY malfunctions

7-1-5 TEST Mode

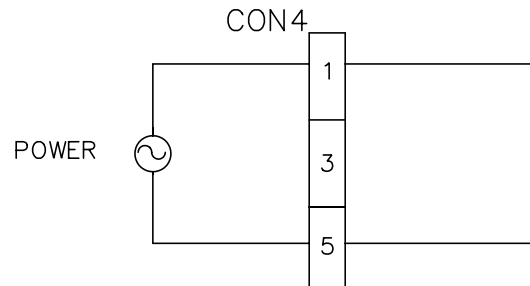
1. The Test mode allows checking the PCB and the function of the product as well as finding out the Defective part in case of an error.
2. The test button is on the main PCB of the refrigerator (Test S/W). The test mode will be cleared in 2 hours regardless of the type of test mode.
3. While in the test mode, the ADJUST button will not operate.
4. After exiting the test mode, be sure to reset by unplugging and then plugging in the appliance.
5. If an error (such as a sensor failure) is detected while in the test mode, the test mode is cleared and the error code is displayed.
6. While an error code is displayed, the test mode will not be activated even if the test button is pushed.

MODE	MANIPULATION	CONTENTS	REMARKS
TEST1	Push the test button once.	1. Continuous operation of the COMP 2. Continuous operation of the freezer fan 3. Defrosting Heater OFF 4. Every DISPLAY LED ON	
TEST2	Push the test button once while in TEST MODE 1.	1. COMP OFF 2. Freezer FAN OFF 3. Defrosting heater ON 4. 1, 3, 5 LED ON	Reset if the temperature of the Defrosting sensor is 50°F(10°C) or more.
Reset	Push the test button once while in TEST MODE 2.	Reset to the default setting	The compressor will Start after a 7-minute delay.

7-2 PCB FUNCTION

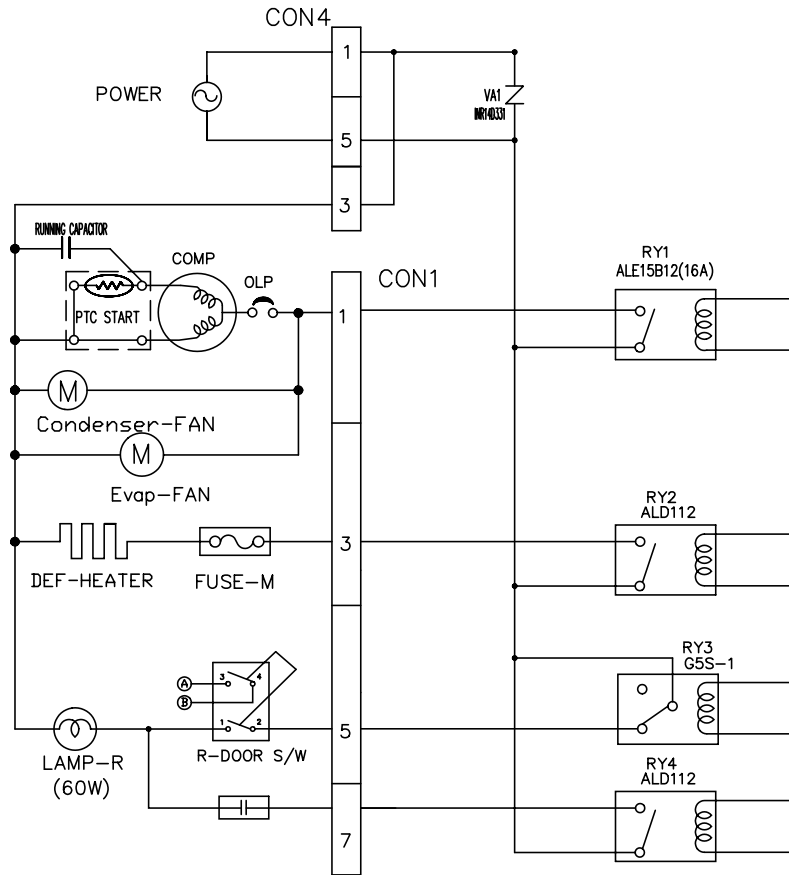
7-2-1 Power Circuit

1. Power is supplied to the control board at pins 1 and 5 of connector #4.



7-2-2 Load / Buzzer Drive & Open Door Detection Circuit

1. Load Drive Condition Check

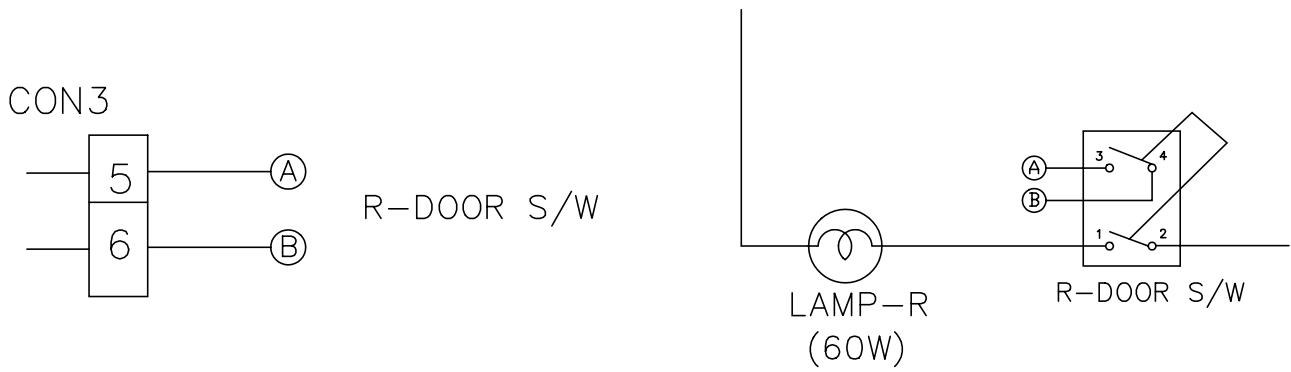


To measure outputs of the control board, check voltages between the pins for the following components:

Circuit	Pin Number	Pin Number	Output Voltage
Compressor	Con1 pin1	Con4 pin1	115 VAC
Condenser fan	Con1 pin1	Con4 pin1	115 VAC
Evaporator fan	Con1 pin1	Con4 pin1	115 VAC
Defrost heater	Con1 pin3	Con4 pin1	115 VAC
F,R-lamp	Con1 pin5	Con4 pin1	115 VAC

NOTE: When the door of the freezer/refrigerator is left open for 7 minutes or longer, the lamp of the freezer/refrigerator turns off automatically.

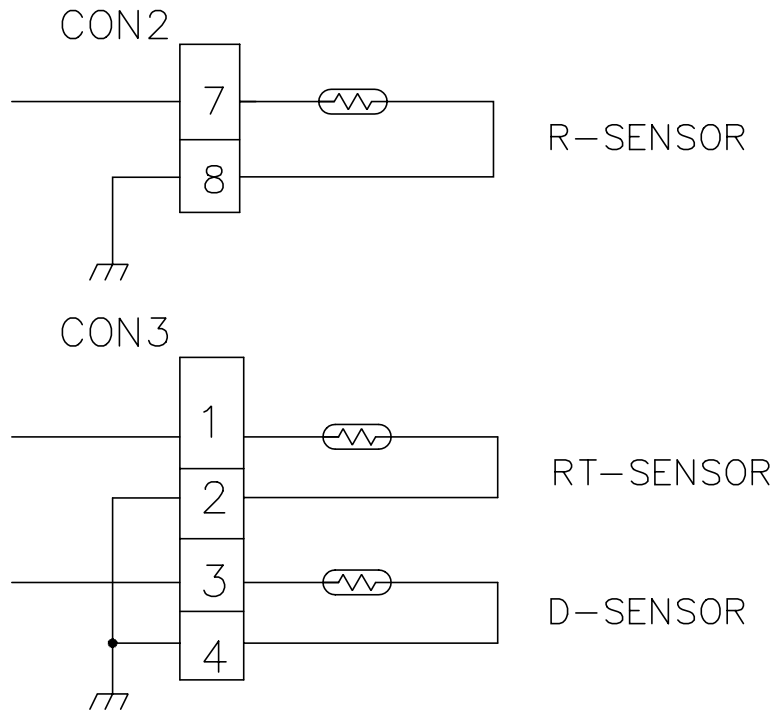
2. Open Door Circuit (Door Monitor Circuit)



Freezer or Refrigerator	Measurement between pins 5 and 6 at Con 3
Both Closed	0 volts
One door open	5 volts

7-2-3 Temperature Sensor Circuit

Voltage supplied to each sensor will range between 0.5 volts $-22^{\circ}\text{F}(-30^{\circ}\text{C})$ and 4.5 volts $122^{\circ}\text{F}(50^{\circ}\text{C})$ depending upon the temperature in the compartments. A measurement of 0 volts indicates a short in the sensor circuit. A measurement of 5 volts indicates an open in the sensor circuit.






7-3 RESISTANCE SPECIFICATION OF SENSOR

TEMPERATURE	RESISTANCE OF FREEZER SENSOR	RESISTANCE OF REFRIGERATOR & DEFROST SENSOR
- 20 °C (-4 °F)	22.3 KΩ	77 KΩ
- 15 °C (5 °F)	16.9 KΩ	60 KΩ
- 10 °C (14 °F)	13.0 KΩ	47.3 KΩ
- 5 °C (23 °F)	10.1 KΩ	38.4 KΩ
0 °C (32 °F)	7.8 KΩ	30 KΩ
+ 5 °C (41 °F)	6.2 KΩ	24.1 KΩ
+ 10 °C (50 °F)	4.9 KΩ	19.5 KΩ
+ 15 °C (59 °F)	3.9 KΩ	15.9 KΩ
+ 20 °C (68 °F)	3.1 KΩ	13 KΩ
+ 25 °C (77 °F)	2.5 KΩ	11 KΩ
+ 30 °C (86 °F)	2.0 KΩ	8.9 KΩ
+ 40 °C (104 °F)	1.4 KΩ	6.2 KΩ
+ 50 °C (122 °F)	0.8 KΩ	4.3 KΩ

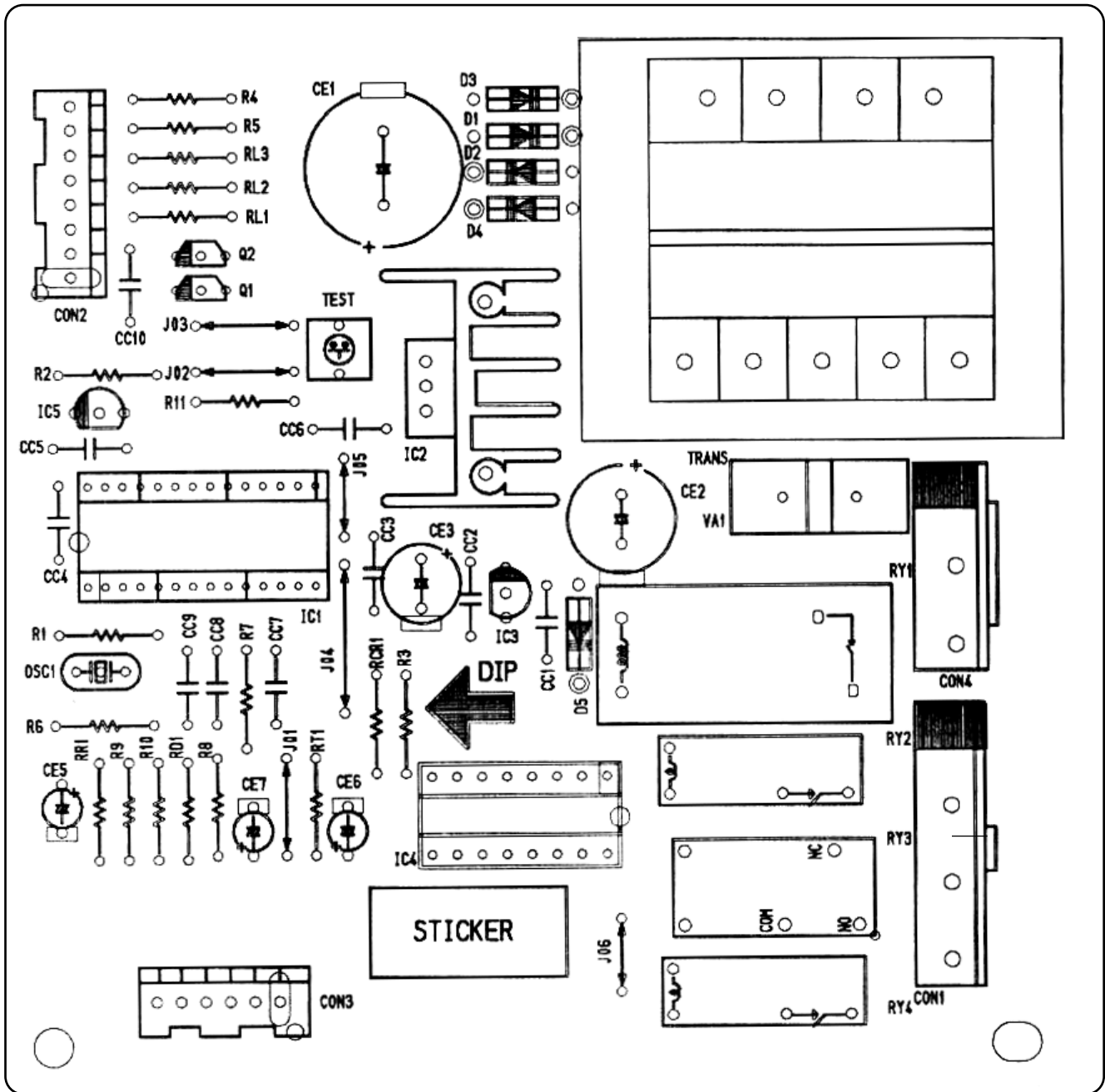
- The resistance of the SENSOR has a $\pm 5\%$ common difference.
- Measure the resistance of the SENSOR after leaving it for over 3 minutes in the measuring temperature. This delay is necessary due to sensor response speed.

7-4 TROUBLESHOOTING

COMPLAINT	SYMPTOM	POSSIBLE CAUSES	SOLUTION
Electronic Display not operating correctly	1. No Display at all	<ol style="list-style-type: none"> 1. Supply voltage not within specifications 2. Open in wiring harness from PWB board 3. Open in door monitor switch circuit 	<ol style="list-style-type: none"> 1. Check supply voltage to refrigerator 2. Check wiring and connectors to PWB board 3. Check door monitor circuit
	2. Partial or abnormal display	<ol style="list-style-type: none"> 1. Supply voltage not within specifications 2. Open in wiring harness from PWB board 	<ol style="list-style-type: none"> 1. Check supply voltage to refrigerator 2. Check wiring and connectors to and from PWB board
Not Cooling	1. Display on but compressor not operating	<ol style="list-style-type: none"> 1. Compressor not operating 2. Open in compressor circuit 	<ol style="list-style-type: none"> 1. Check for compressor operation by using the test key on main circuit board 2. Check for open on OLP, PTC, compressor, wiring, etc.
Not cold enough	2. Display on compressor is operating	<ol style="list-style-type: none"> 1. Condenser fan motor not operating 2. Condenser coils blocked 3. Evaporator fan motor not operating 4. Damper not opening or internal air flow blocked 5. Sensor not operating properly 6. Door not sealing 7. Evaporator Frosted up 8. Sealed System related problem 	<ol style="list-style-type: none"> 1. Check condenser fan motor and wiring circuit 2. Check air flow across condenser 3. Check evaporator fan motor and wiring circuit 4. Check damper motor circuit 5. Check refrigerator and freezer sensors 6. Check for proper door esal  7. Check defrost circuit components
		<ol style="list-style-type: none"> 1. Frosted up in Freezer  	<ol style="list-style-type: none"> 1. Open in defrost circuit 2. Defrost sensor not operating correctly 3. Defrost drain clogged
Not defrosting	1. Frosted up in Freezer 	<ol style="list-style-type: none"> 1. Open in defrost circuit 2. Defrost sensor not operating correctly 3. Defrost drain clogged 	<ol style="list-style-type: none"> 1. Check defrost heater and circuit using Test Key 2. Check sensor 3. Check drain

7-5 MAIN PWB ASSEMBLY AND PARTS LIST

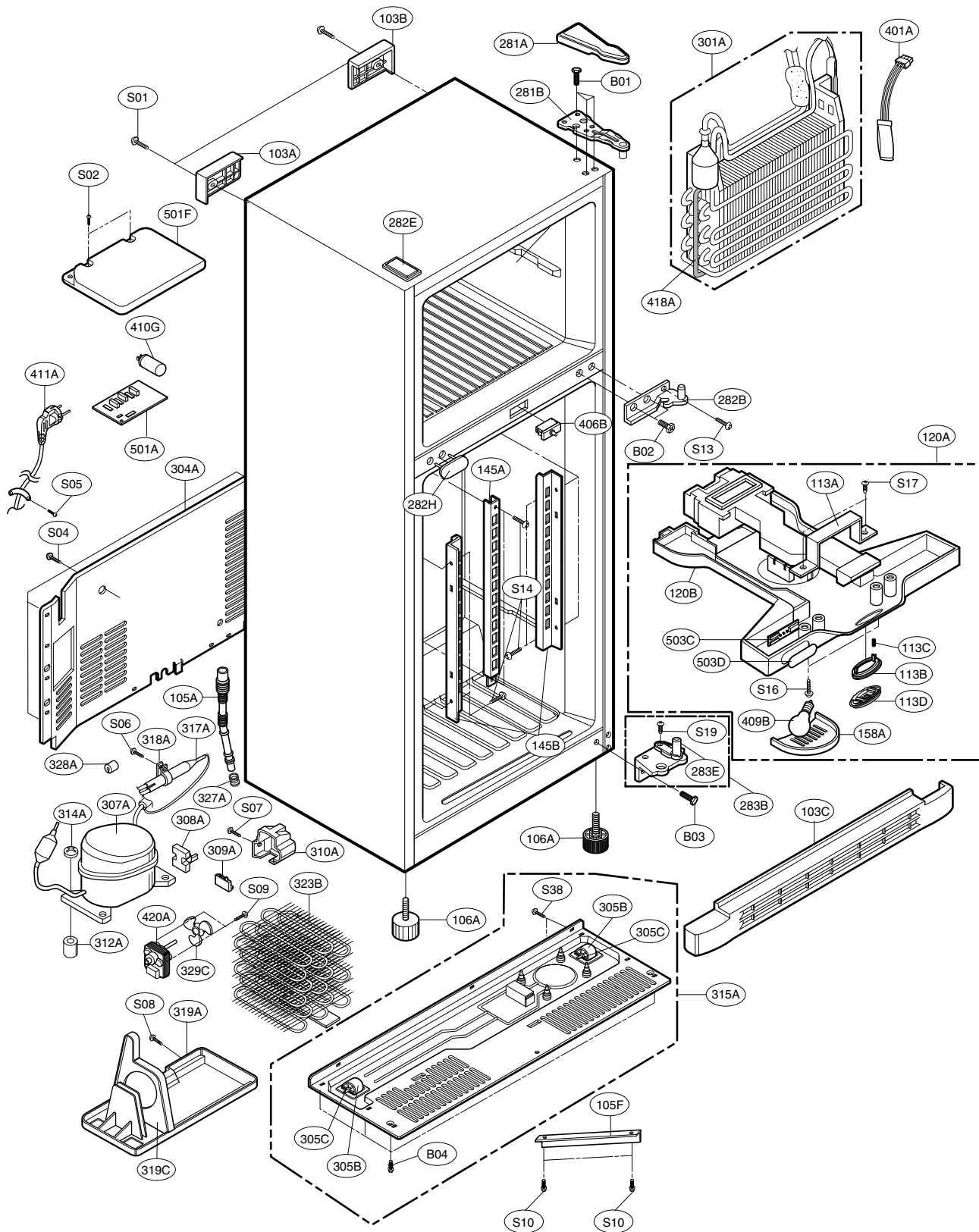
7-5-1 Main PWB Assembly



8. EXPLODED VIEW & REPLACEMENT PARTS LIST

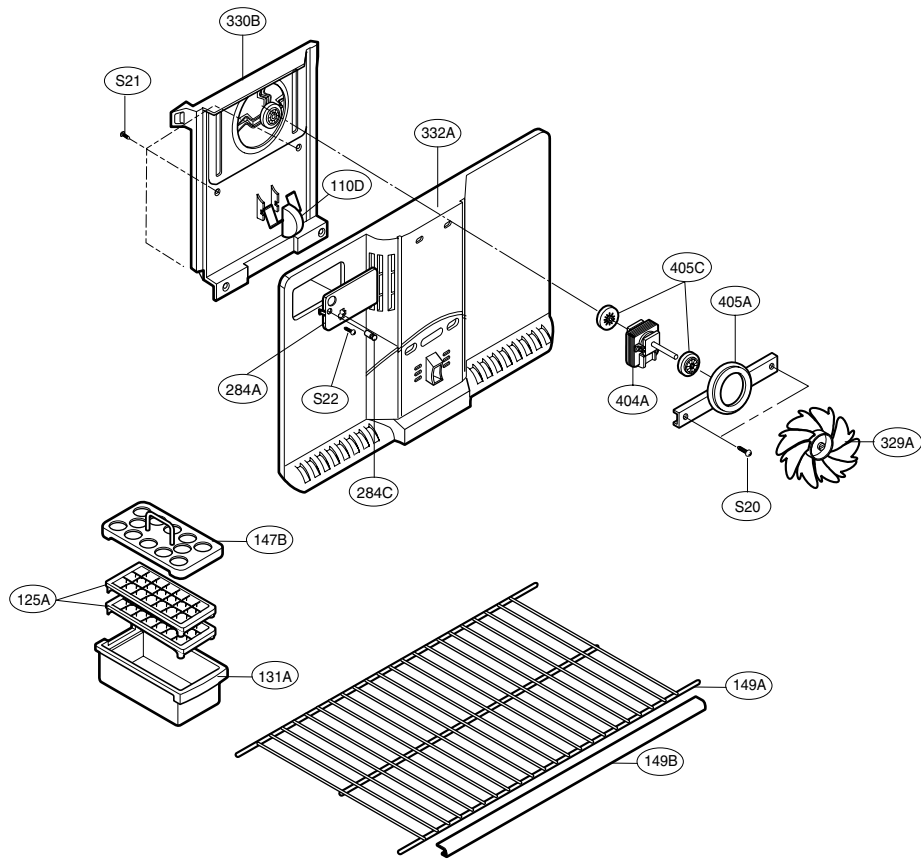
CASE PARTS

CAUTION: Use the part number to order part, not the position number.



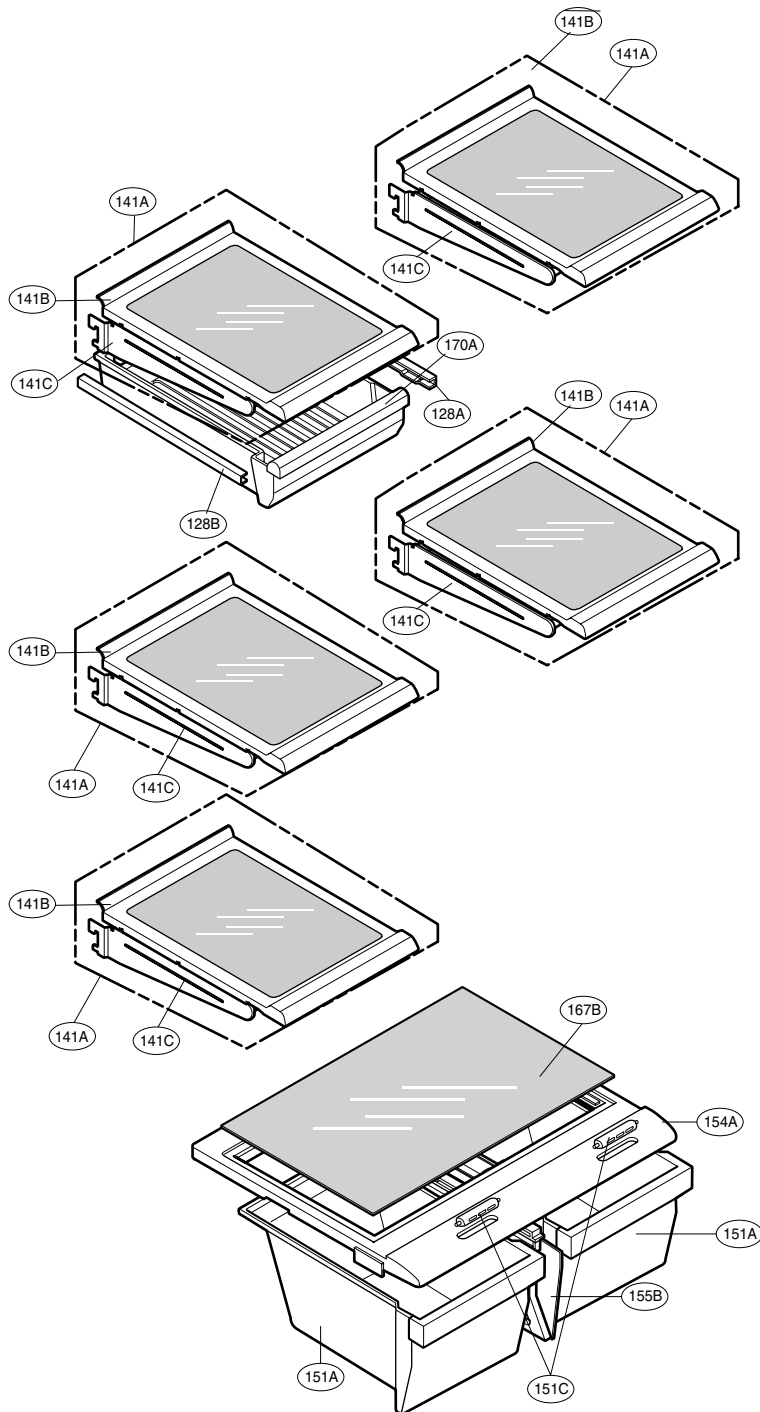
FREEZER PARTS

CAUTION: Use the part number to order part, not the position number.



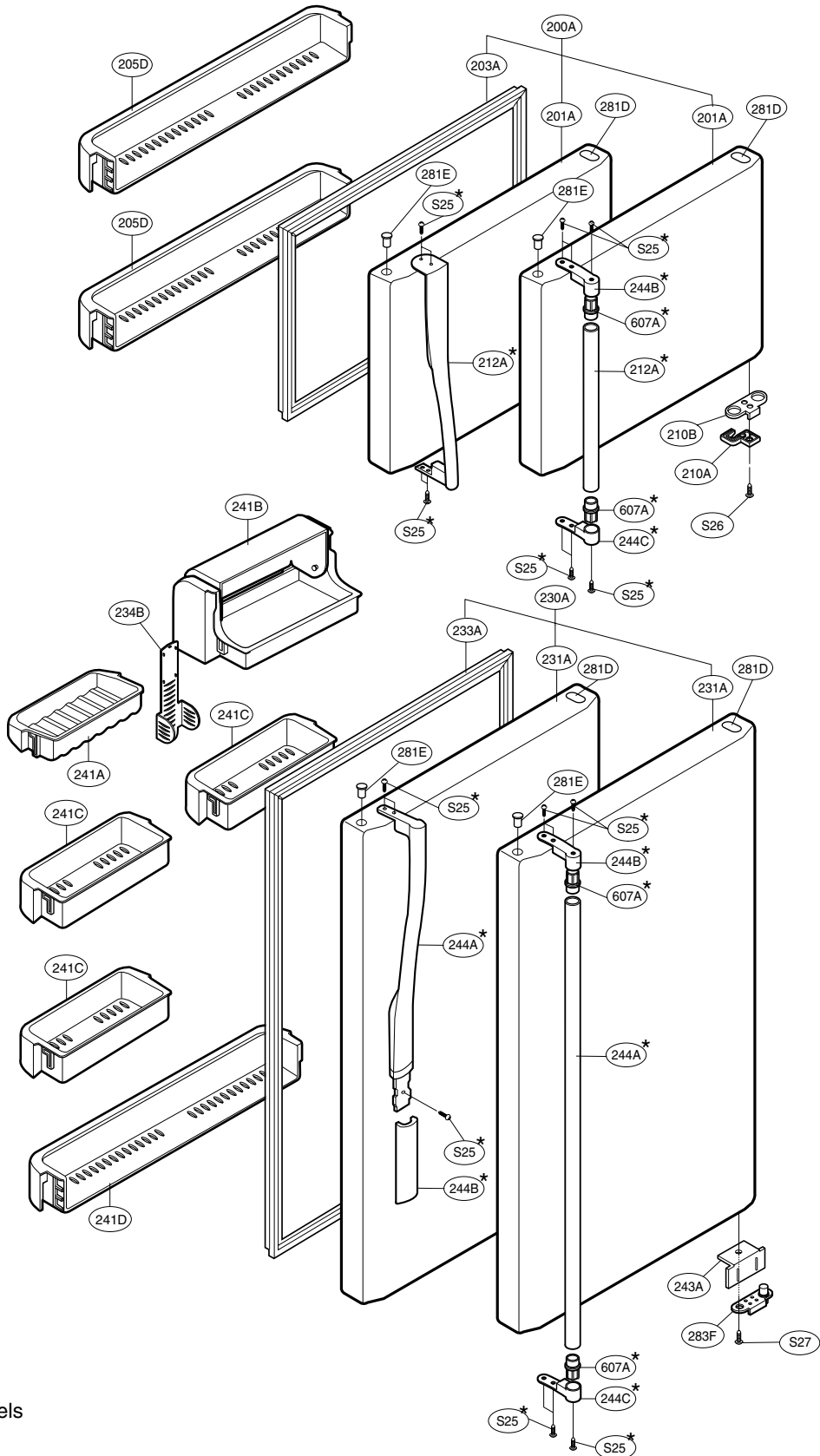
REFRIGERATOR PARTS

CAUTION: Use the part number to order part, not the position number.



DOOR PARTS

CAUTION: Use the part number to order part, not the position number.



* : on some models



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