

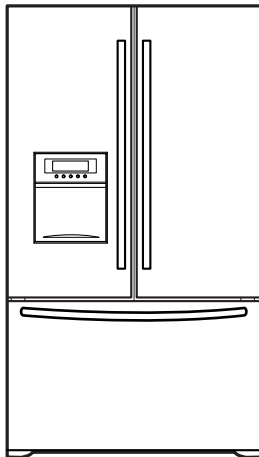


**LG**

# REFRIGERATOR

# SERVICE MANUAL

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



**MODELS: GR-F218**  
**GR-F258**

**COLORS: WESTERN BLACK(SB)**  
**TITANIUM(TT)**  
**SUPER WHITE(SW)**  
**STAINLESS(ST)**

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## SAFETY PRECAUTIONS

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Please read the following instructions before servicing your refrigerator.

1. Unplug the power before handling any electrical components.
2. Check the rated current, voltage, and capacity.
3. Take caution not to get water near any electrical components.
4. Use exact replacement parts.
5. Remove any objects from the top prior to tilting the product.

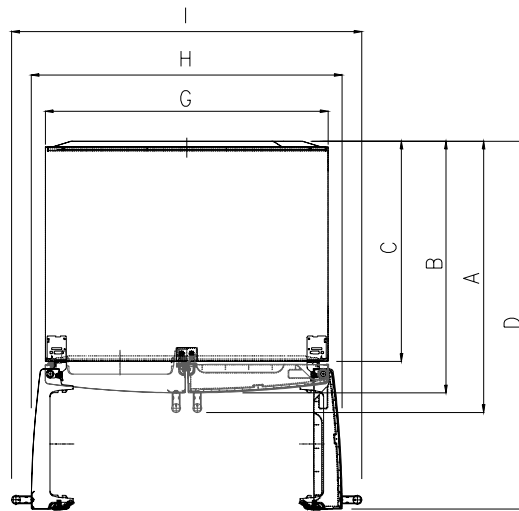
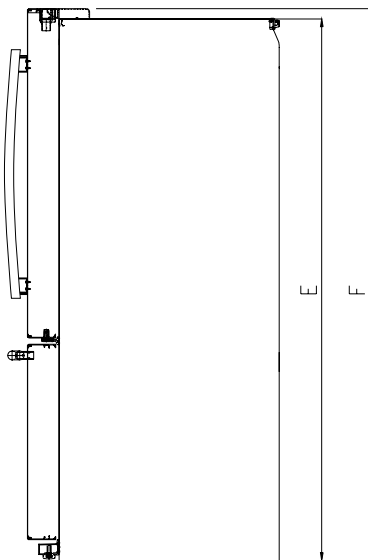
# 1. SPECIFICATIONS

## GR-F218/GR-F258

ITEMS	SPECIFICATIONS
DOOR DESIGN	Side Rounded
NET WEIGHT (pounds)	298 (21 cu. ft.)
	320 (25 cu. ft.)
COOLING SYSTEM	Fan Cooling
TEMPERATURE CONTROL	Micom Control
DEFROSTING SYSTEM	Full Automatic
	Heater Defrost
DOOR FINISH	PCM, VCM, Stainless
HANDLE TYPE	Bar
INNER CASE	ABS Resin
INSULATION	Polyurethane Foam

ITEMS	SPECIFICATIONS	
VEGETABLE TRAY	Opaque Drawer Type	
COMPRESSOR	PTC Starting Type	
EVAPORATOR	Fin Tube Type	
CONDENSER	Wire Condenser	
REFRIGERANT	R-134a (115 g)	
LUBRICATING OIL	ISO10 (280 ml)	
DEFROSTING DEVICE	SHEATH HEATER	
LAMP	REFRIGERATOR	60 W (2 EA)
	FREEZER	60 W (1 EA)

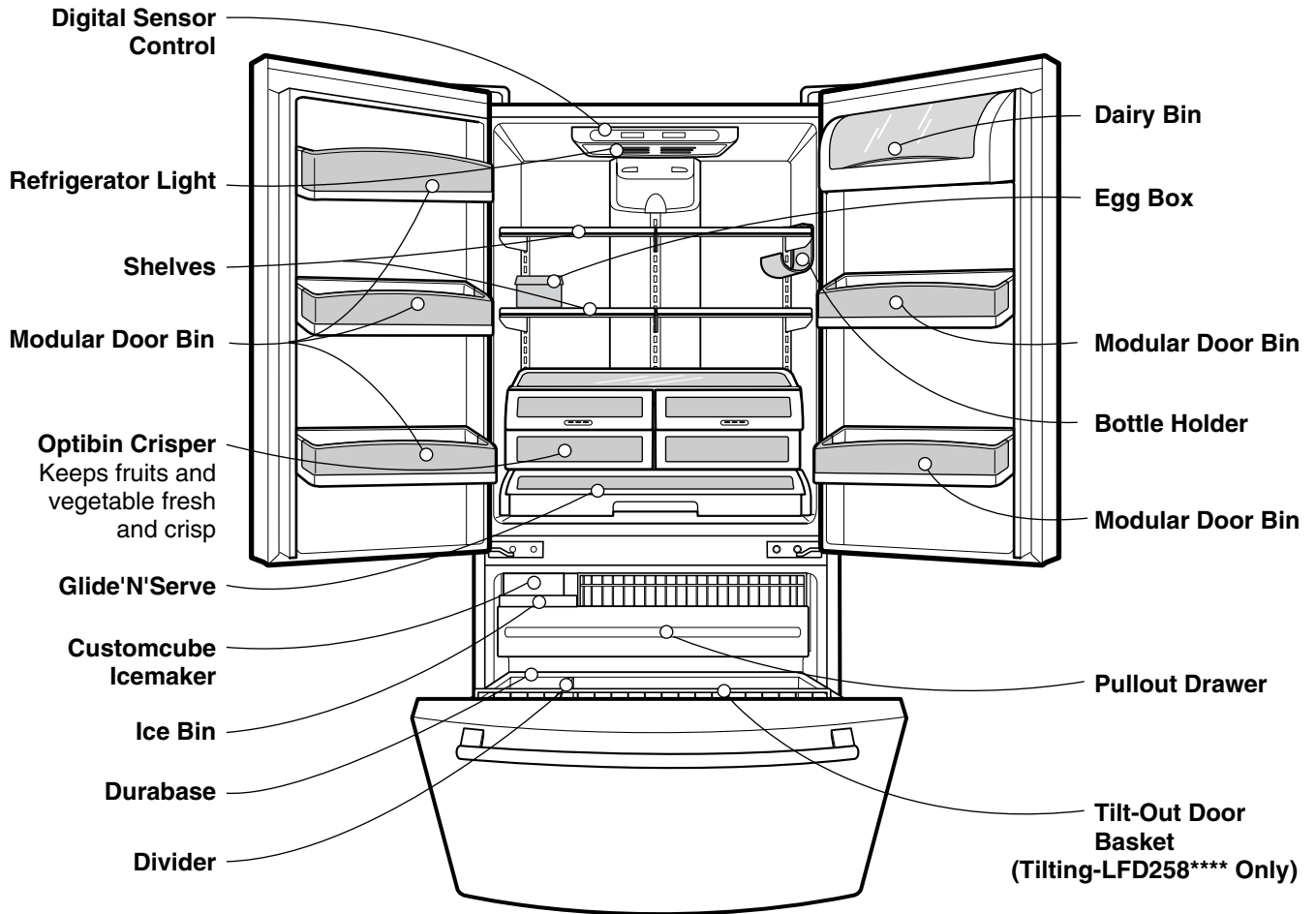
## DIMENSIONS



Description		GR-F218	GR-F258
Depth w/ Handles	A	30 in.	34 1/4 in.
Depth w/o Handles	B	27 1/2 in.	31 3/4 in.
Depth w/o Door	C	23 5/8 in.	27 7/8 in.
Depth (Total with Door Open)	D	42 1/4 in.	46 1/2 in.
Height to Top of Case	E	68 3/8 in.	68 3/8 in.
Height to Top of Door Hinge	F	69 3/4 in.	69 3/4 in.
Width	G	35 3/4 in.	35 3/4 in.
Width (door open 90 deg. w/o handle)	H	39 1/4 in.	39 1/4 in.
Width (door open 90 deg. w/ handle)	I	44 1/4 in.	44 1/4 in.

# 2. PARTS IDENTIFICATION

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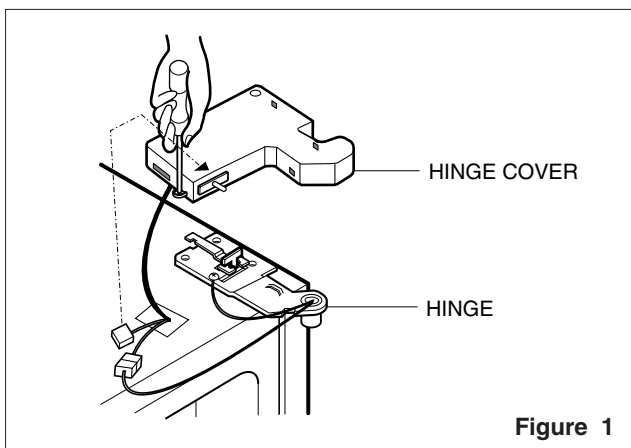


# 3. DISASSEMBLY

## 3-1 DOOR

### ● Refrigerator door

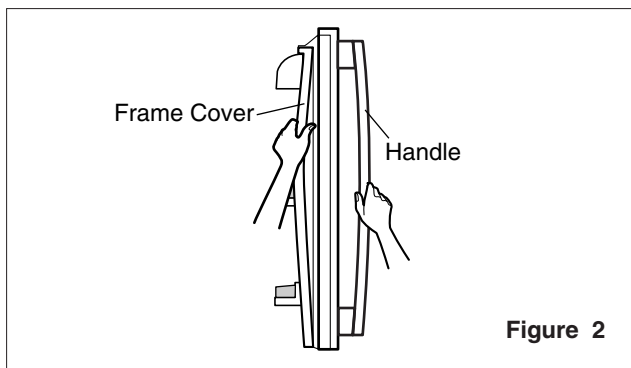
1. Remove the top hinge cover and disconnect the wire harness.
2. Remove the ground screw.
3. Rotate the lever hinge and lift off hinge.
4. Lift off the refrigerator door.
5. Replace in the reverse order.



### ● Door gasket removal

#### 1. Remove door frame cover

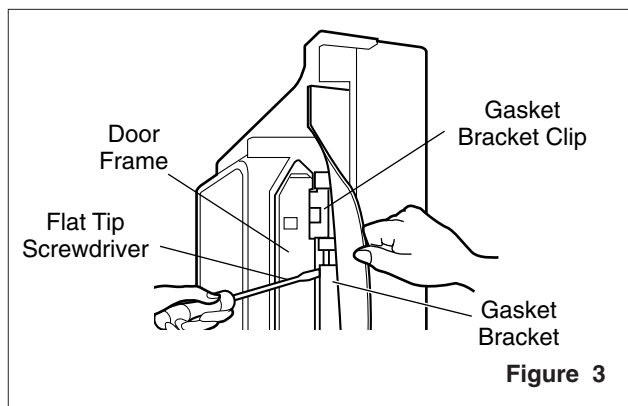
Starting at top of cover and working down, snap cover out and away from door.



#### 2. Remove gasket bracket clips

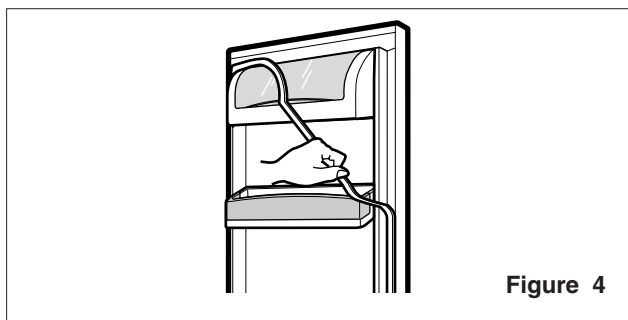
There are two clips on each door. Start bracket removal near one of the middle clips.

- 1) Pull gasket back to expose gasket bracket clip and door frame.
- 2) Insert a flat tip screwdriver into seam between gasket bracket and door frame and pry back until clips snap out.
- 3) Continue prying back along seam until all clips snap out.



#### 3. Remove gasket

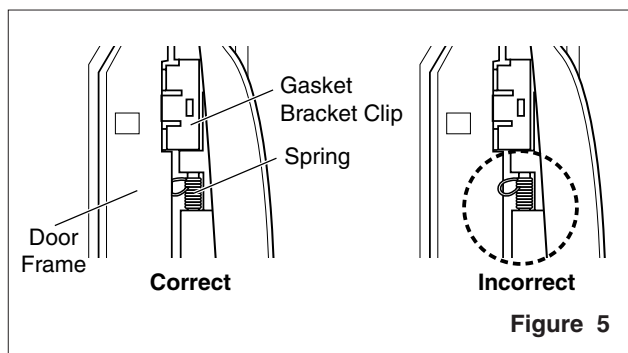
Pull gasket free from gasket channel on the three remaining sides of door.



### ● Door gasket replacement

#### 1. Insert gasket bracket clips

- 1) Insert gasket bracket edge beneath door frame edge.
- 2) Turn upper gasket bracket spring so that both spring ends are in the door channel.
- 3) Push in clip until you hear it snap securely into place.



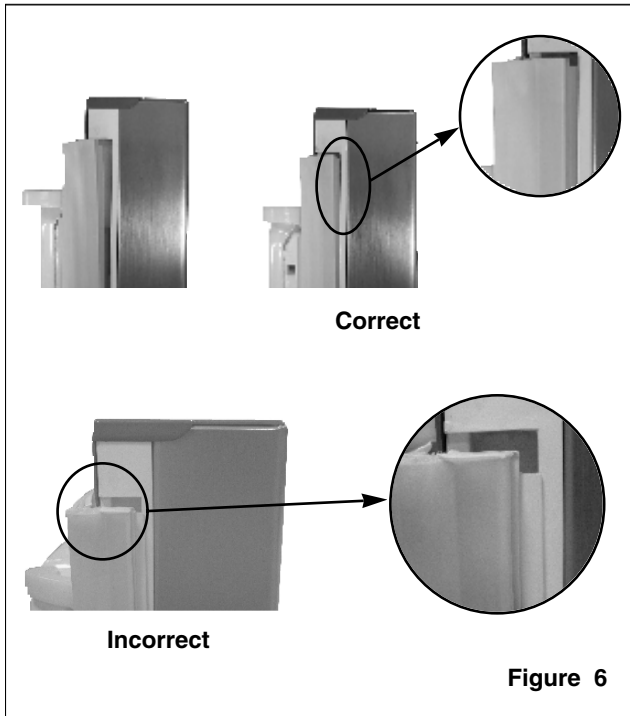
- 4) Push in remaining two clips until you hear each snap securely into place.

**Note:** Make sure that no part of gasket bracket edge protrudes from beneath door frame edge.

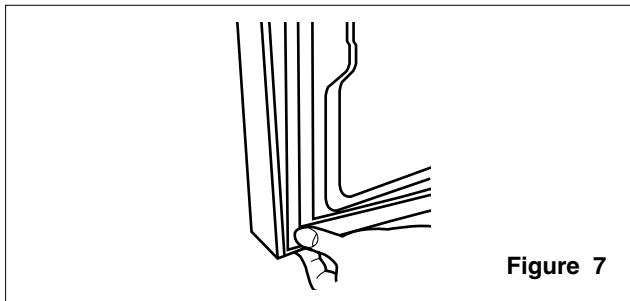
## 2. Insert gasket into channel

1) Snap gasket assembly into the door bracket.

**Inserting the gasket assembly into the bracket door**

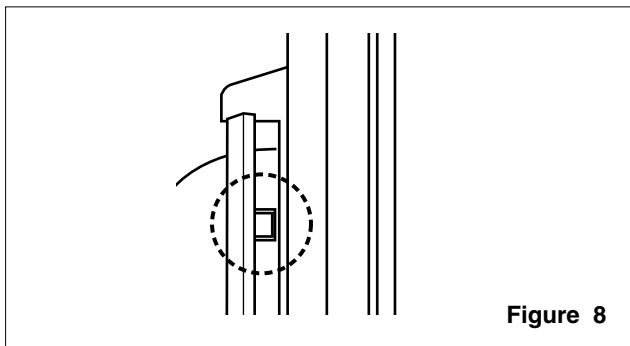


2) Press gasket into channels on the three remaining sides of door.



## 3. Replace door frame cover

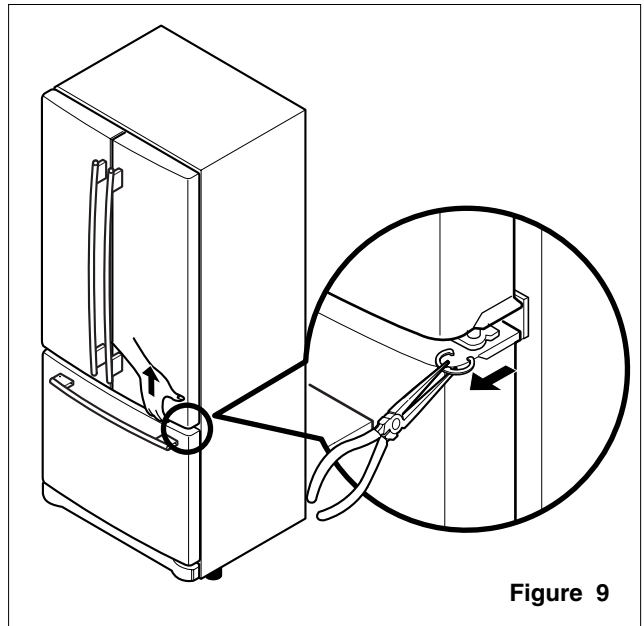
Starting at top of cover and working down, snap the cover back into door.



## 3-2 DOOR ALIGNMENT

If the space between your doors is uneven, follow the instructions below to align the doors:

1. With one hand, lift the door you want to raise at middle hinge.
2. With other hand, use pliers to insert snap ring as shown.
3. Insert additional snap rings until the doors are aligned. (Three snap rings are provided with the product.)



### 3-3 FAN AND FAN MOTOR

1. Remove the freezer shelf. (If your refrigerator has an icemaker, remove the icemaker first)
2. Remove the plastic guide for slides on left side by unscrewing phillips head screws.
3. Remove the grille by removing one screw and pulling the grille forward.
4. Remove the fan motor assembly by loosening 2 screws and disassembling the shroud.
5. Pull out the fan and separate the fan motor and bracket.

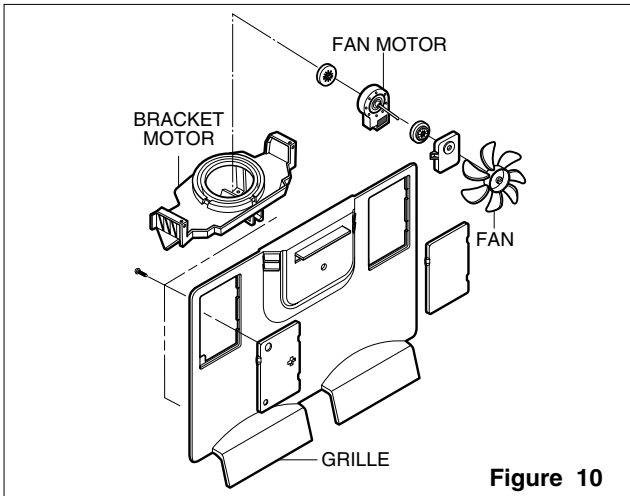


Figure 10

### 3-4 DEFROST CONTROL ASSEMBLY

Defrost control assembly consists of defrost sensor and FUSE-M.

The defrost sensor works to defrost automatically. It is attached to the metal side of the evaporator and senses its temperature. At 72°C, it turns the defrost heater off. FUSE-M is a safety device for preventing over-heating of the heater when defrosting.

1. Pull out the grille assembly. (Figure 11)
2. Separate the connector with the defrost control assembly and replace the defrost control assembly after cutting the tie wrap. (Figure 12)

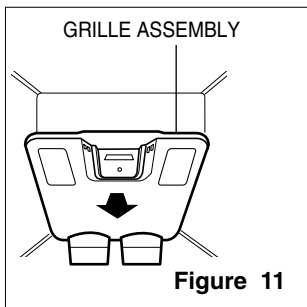


Figure 11

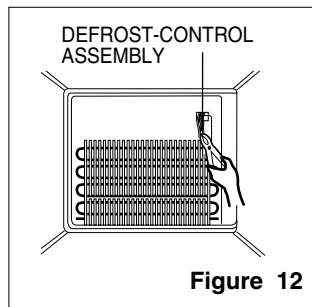


Figure 12

### 3-5 LAMP

#### 3-5-1 Refrigerator Compartment Lamp

1. Unplug Refrigerator, or disconnect power at the circuit breaker.
2. If necessary, remove top shelf or shelves.
3. Using a flat instrument, gently pry the cover loose in the front as shown. Rotate downward to remove rear tabs.

4. Make sure the bulbs are cool to the touch. Turn bulbs counterclockwise to remove.
5. Assemble in reverse order by snapping the Lamp Cover in, engaging the rear tabs followed by the front tabs. (Max. 60 W-2EA)

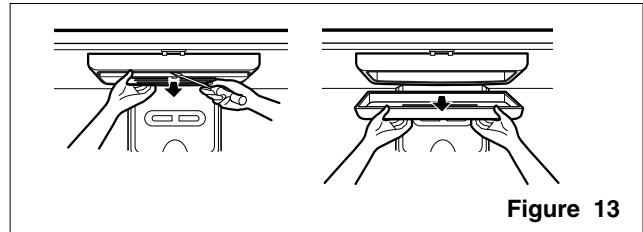


Figure 13

#### 3-5-2 Freezer Compartment Lamp

1. Unplug refrigerator power cord from outlet.
2. Using a flat instrument, gently pry the lamp cover loose in the front as shown. Rotate downward to remove the rear tabs.
3. Make sure the bulb is cool to the touch. Turn the bulb counterclockwise to remove.
4. Replace with a new 60-watt appliance bulb.
5. Insert tabs on back of cover into slots in freezer ceiling. Push cover up to snap front into place.

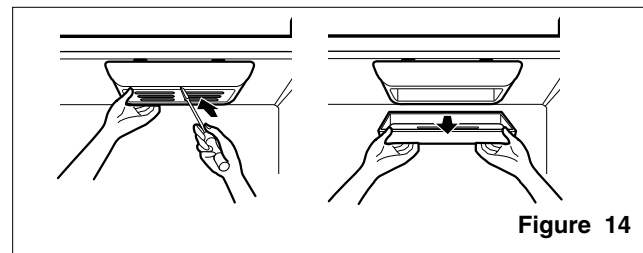


Figure 14

### 3-6 REFRIGERATOR CONTROL BOX

1. First, remove all shelves in the refrigerator, then remove the refrigerator control box by loosening 2 screws.

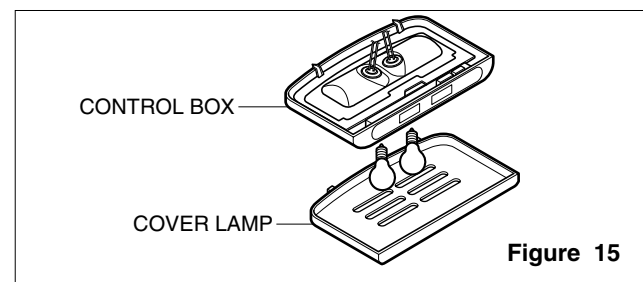


Figure 15

2. Remove the refrigerator control box by pulling it downward.
3. Disconnect the lead wire on the right position and separate the lamp sockets.

### 3-7 MULTI DUCT

1. Remove the upper and lower caps by using a flat screwdriver, and remove 2 screws. (Figure 16)
2. Disconnect the lead wire on the bottom position.

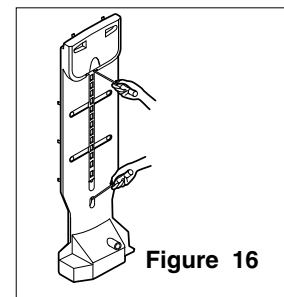


Figure 16

# 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 the 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.  
If the hermetic connector rusts out or fails, refrigerant and oil will be expelled into the contact area, probably resulting in smoke and fire.
- (5) When replacing the compressor, be careful that dust, humidity, and soldering flux don't contaminate the inside of the compressor. Contamination in the cylinder may cause noise, improper operation or even cause it to lock up.

## 4-2 PTC-STARTER

### 4-2-1 Composition of PTC-Starter

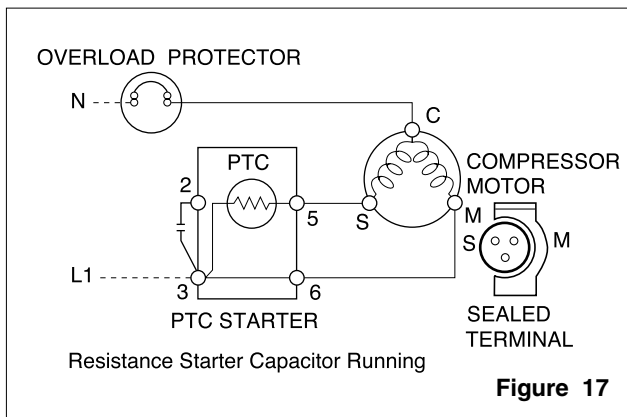
- (1) PTC (Positive Temperature Coefficient) is a no-contact semiconductor starting device which uses ceramic material consisting of BaTiO<sub>3</sub>.
- (2) The higher the temperature is, the higher the resistance value. These features are used as a starting device for the motor.

### 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 restart.
- (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 overcurrent 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.

**Parts may appear physically identical but could have different electrical ratings. Replace parts by part number and model number. Using an incorrect part could result in damage to the product, fire, injury, or possibly death.**

### 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. Parts may appear physically identical but could have different electrical ratings. Replace parts by part number and model number. Using an incorrect part could result in damage to the product, fire, injury, or possibly death.



### 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 adjustment screw of the OLP in any way.

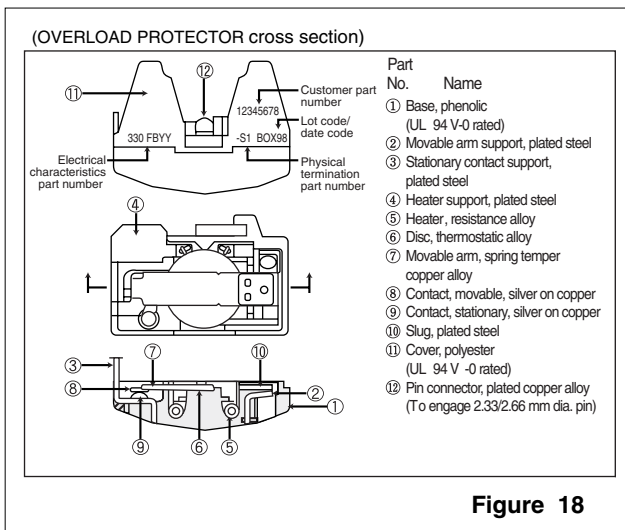
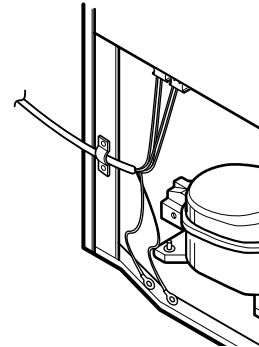
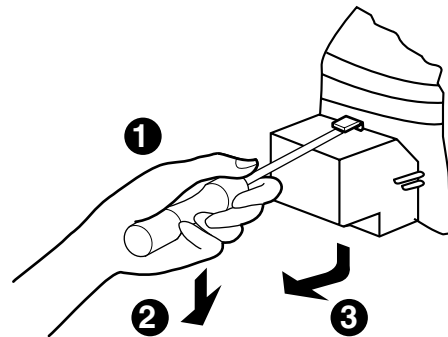


Figure 18

### 4-4 TO REMOVE THE COVER PTC



- (1) Remove the back cover of the mechanical area..
- (2) Disconnect the two connectors on the top of the compressor..
- (3) Loosen two screws on compressor base.



- (4) Use a flat screwdriver to pry off the cover.
- (5) Assembly is the reverse order of disassembly.

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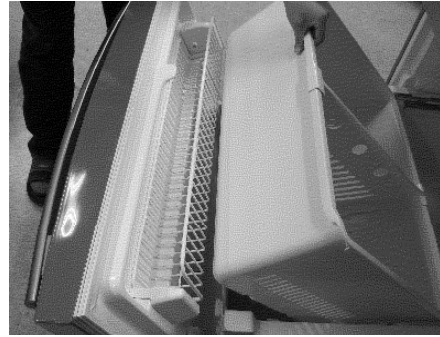
## 4-5 HOW TO REMOVE AND REINSTALL THE PULLOUT DRAWER

### 4-5-1 FOLLOW STEPS TO REMOVE

Step 1) Open the freezer door.



Step 2) Remove the lower basket.



Step 3) Remove the two screws from the guide rails (one from each side).



Step 4) Lift the freezer door up to unhook it from the rail support and remove. Pull both rails to full extension.

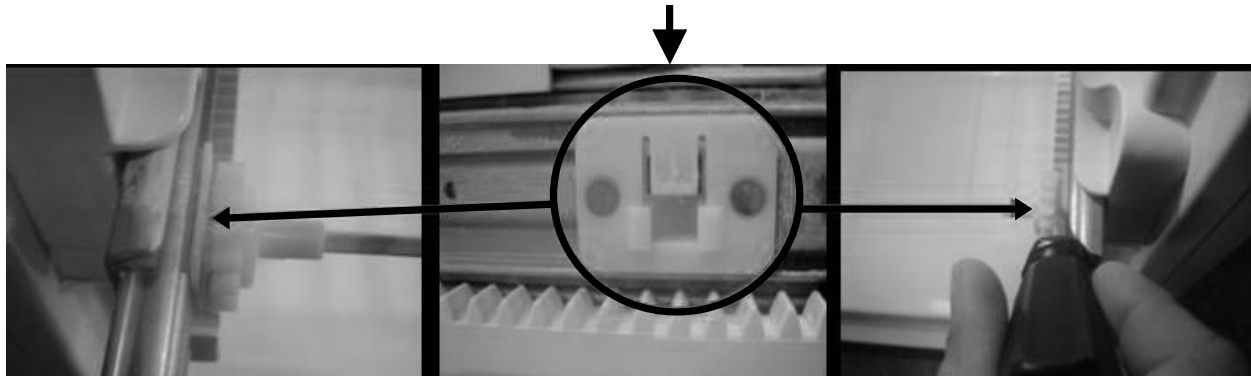


Step 5) First: Remove the gear from the left side first by releasing the tab behind the gear, place a screwdriver between the gear and the tab and pull up on the gear.

Second: Remove the center rail.

Third: Remove the gear from the right side by following the same steps for the left side.

**NOTE: THIS TAB MUST BE PUSHED IN TO RELEASE THE GEAR.**



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#### 4-5-2 FOLLOW STEPS TO REINSTALL

Step 1) Reinstall the right side gear into the clip.



Step 2) Insert the rail into the right side gear. Gears do **not** need to be perpendicular to each other.



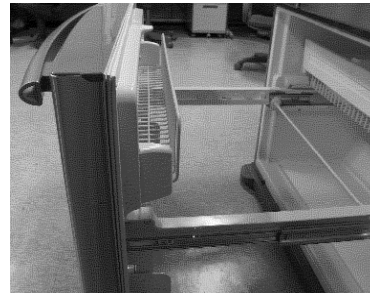
Step 3) Insert the rail into the left side gear, and insert the gear into the clip.



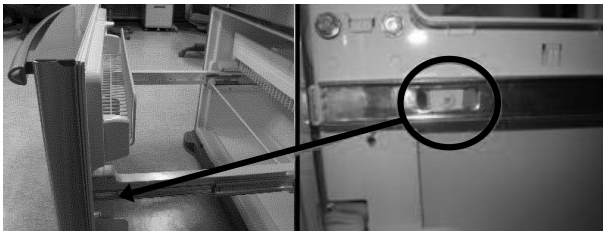
Step 4) The rail system will align itself by pushing the rails all the way into the freezer section. Pull the rails back out to full extension.



Step 5) Reinstall the freezer door by inserting the rail tabs into the guide rail.



Step 6) Reinstall the two screws into the guide rails (one from each side).



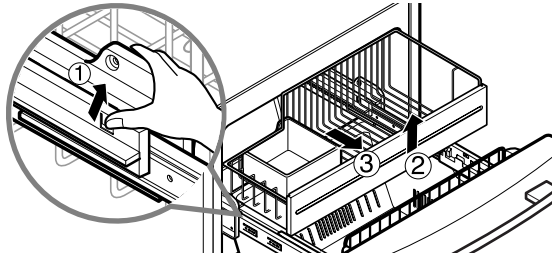
Step 7) Reinstall the lower basket, and close the freezer door.



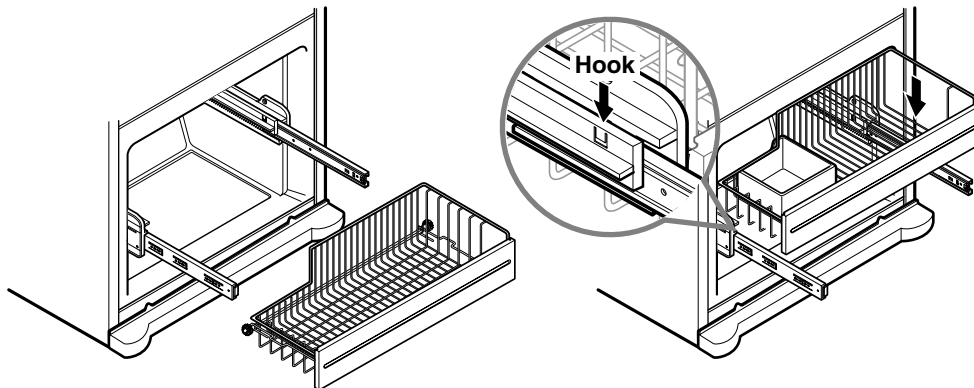
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### 4-5-3 PULL OUT DRAWER

To separate the drawer, push the front left and right hooks in ① direction to pull up and remove.  
Then gently lift the gear part of rear left and right side of the drawer and pull it out in ③ direction.

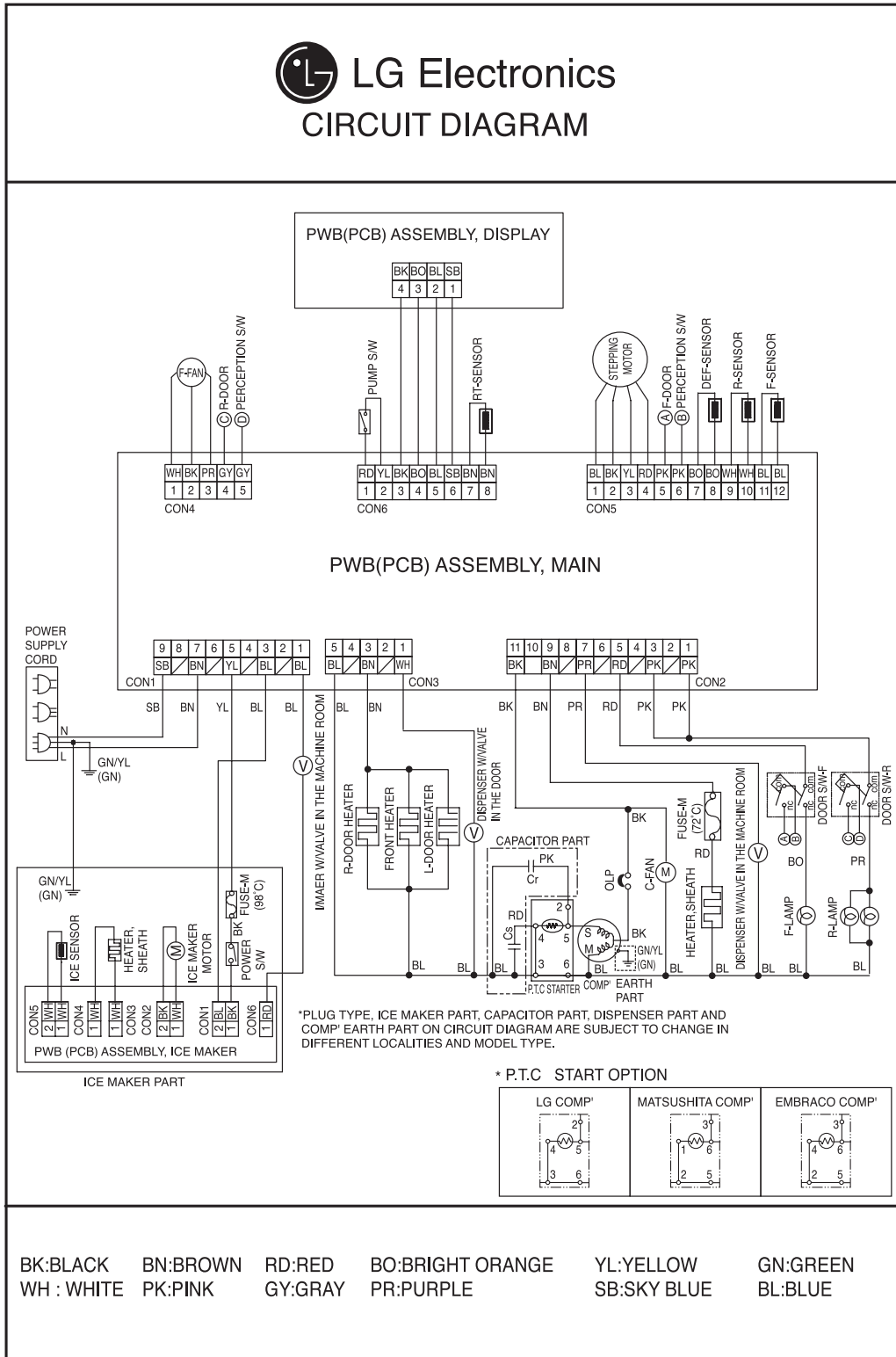


To install, reposition the gear part of rear left and right side of the drawer after pulling out both rails as much as possible, and gently push down both left and right side while checking the hook on the front part.



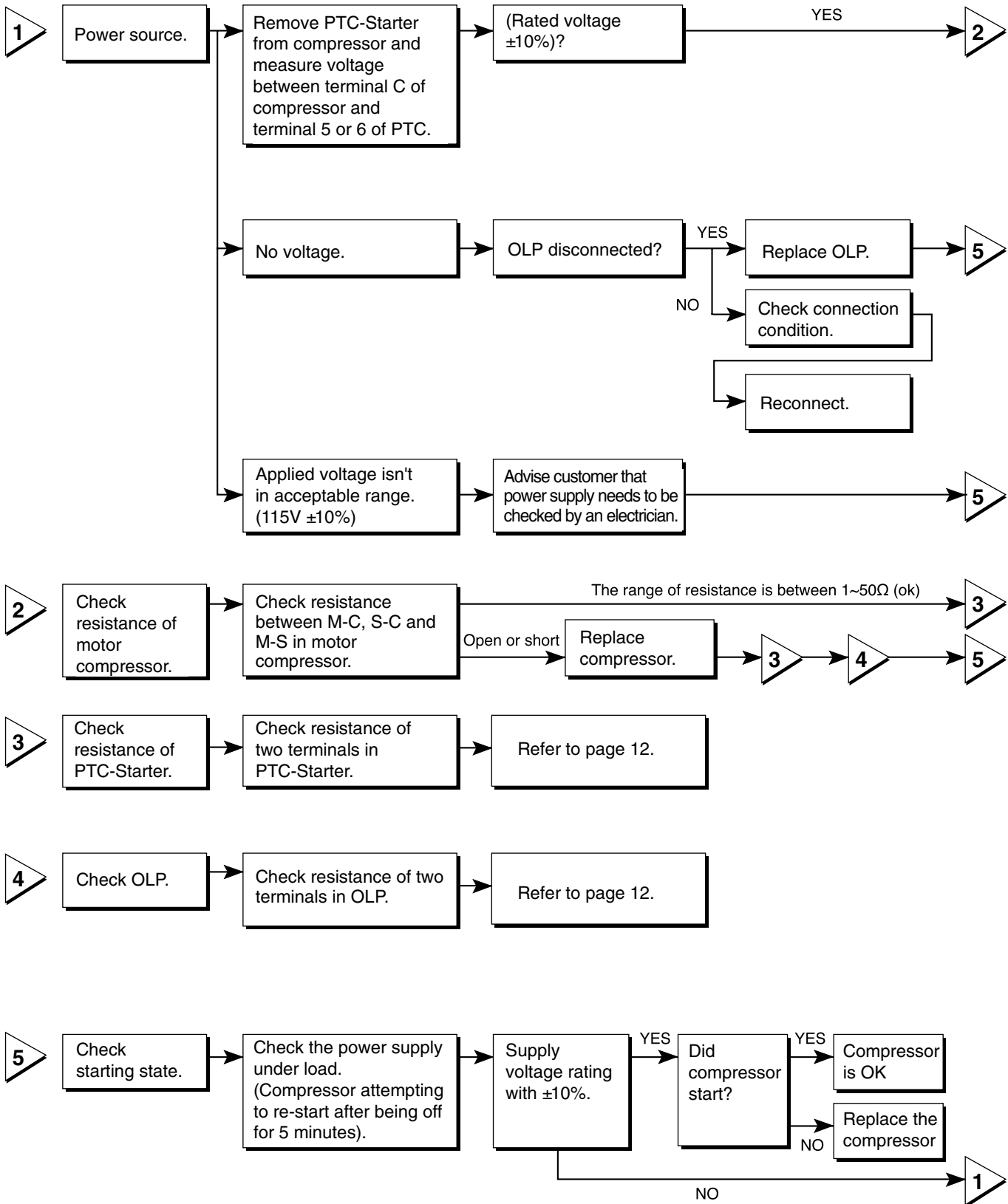
# 5. CIRCUIT DIAGRAM

## LG Electronics CIRCUIT DIAGRAM



# 6. TROUBLESHOOTING

## 6-1 COMPRESSOR AND ELECTRIC COMPONENTS



## 6-2 PTC AND OLP

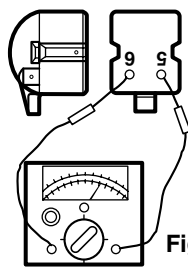
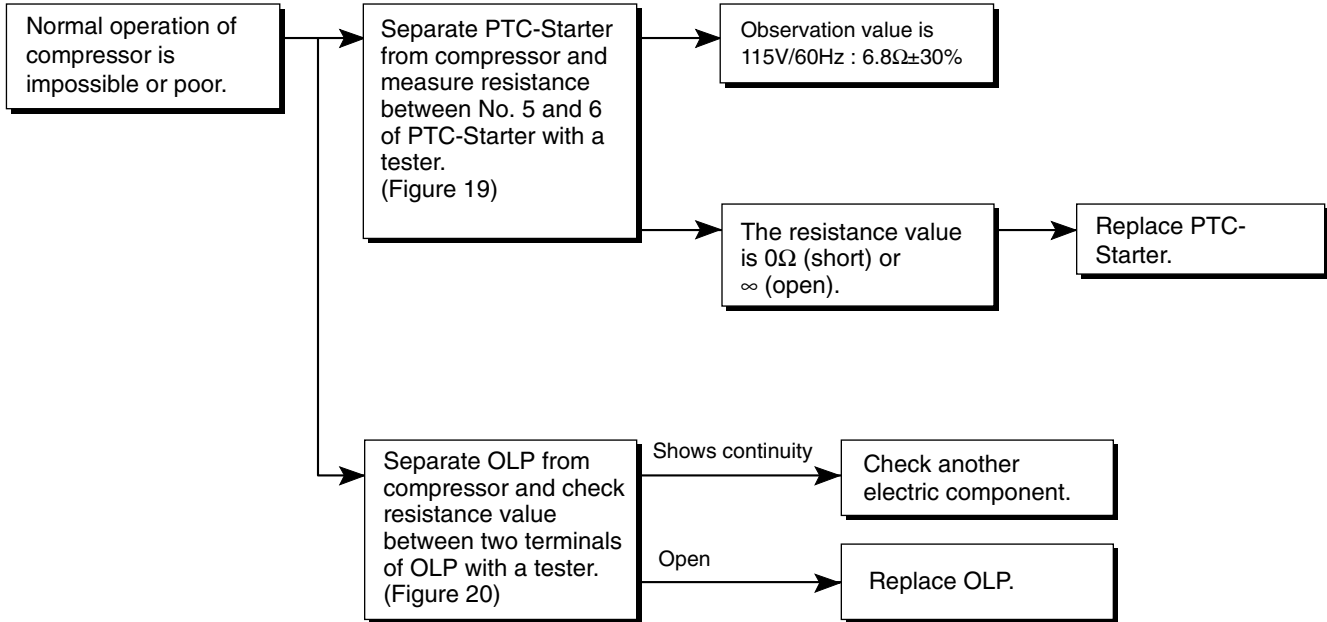


Figure 19

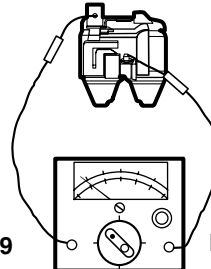
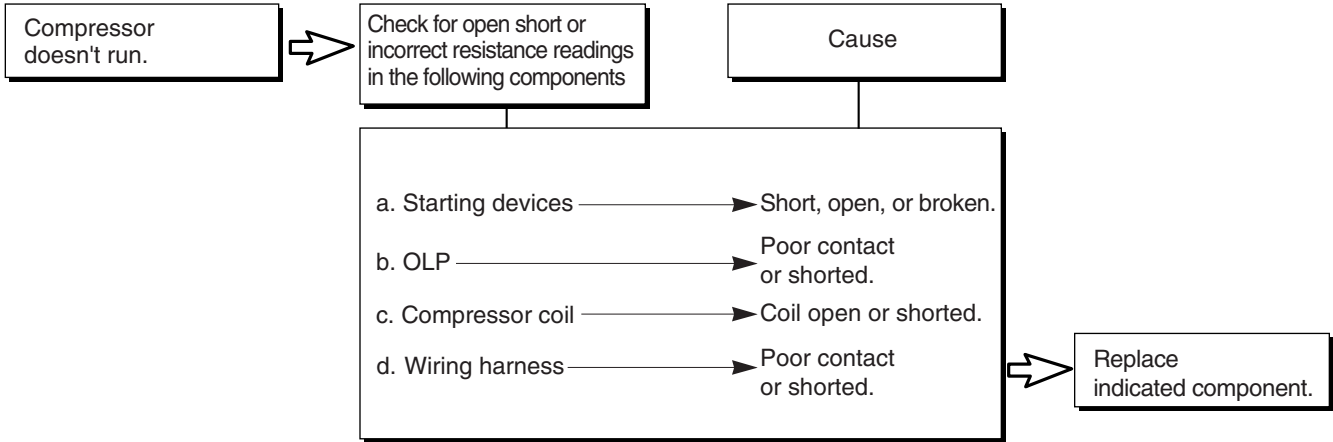


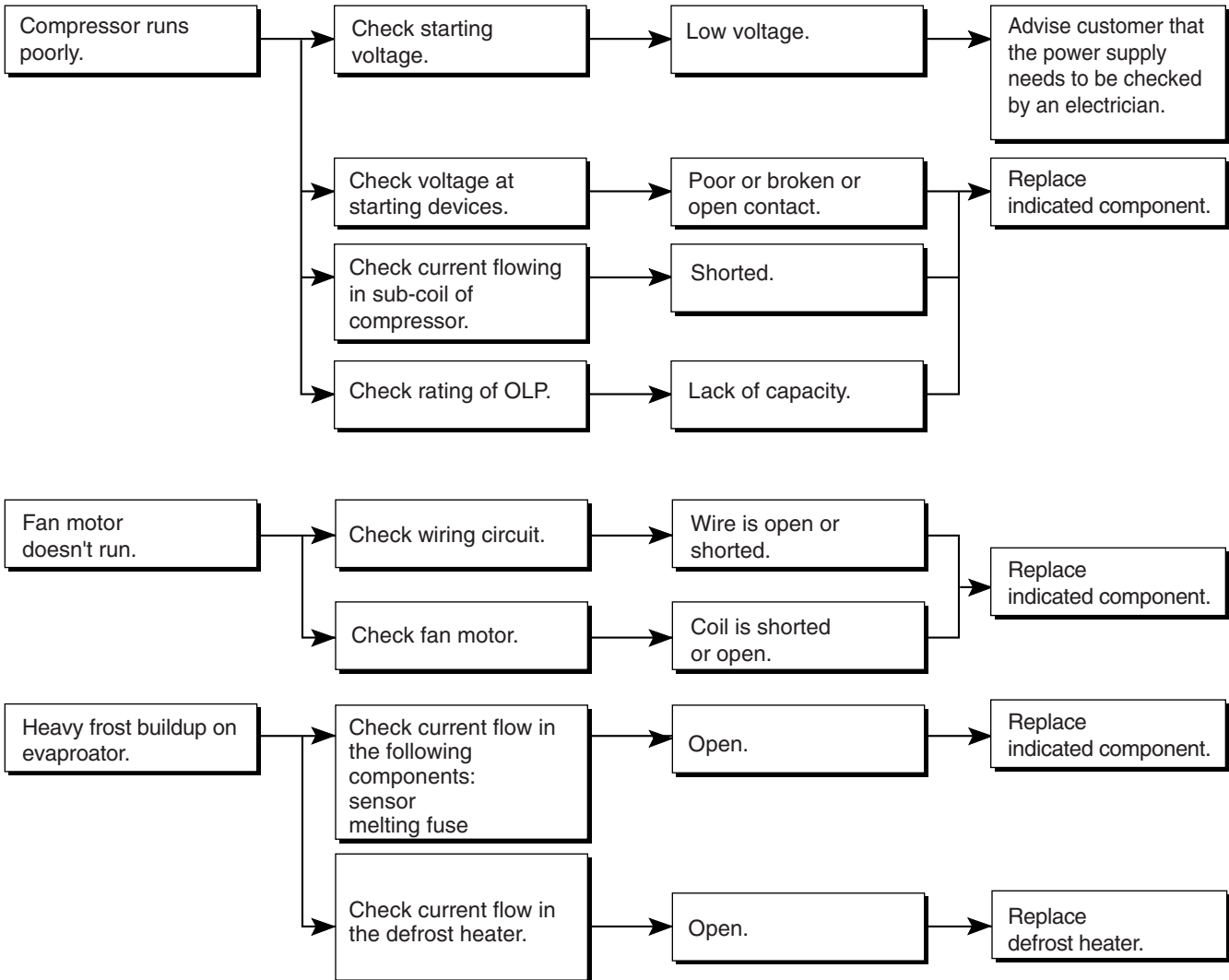
Figure 20

### 6-3 OTHER ELECTRICAL COMPONENTS

#### ▼ Not cooling at all



#### ▼ Poor cooling performance

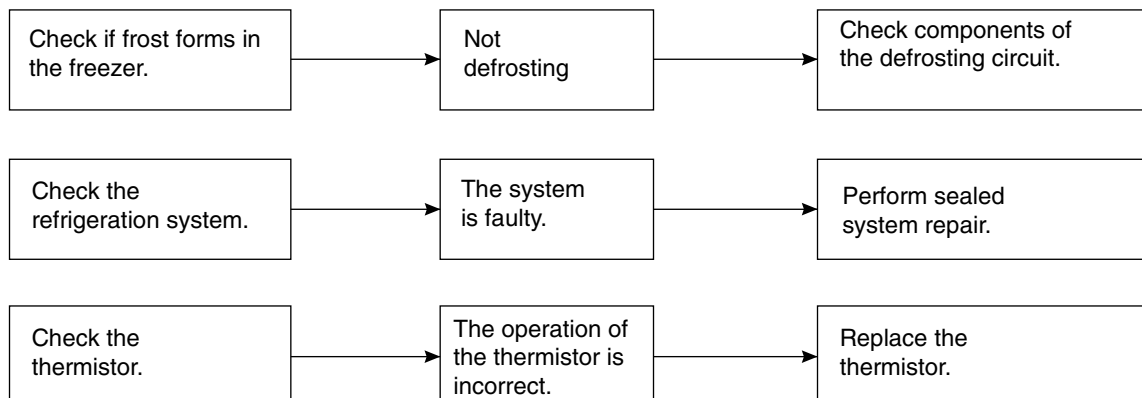




## 6-4 SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	REMEDY
No Cooling.	<ul style="list-style-type: none"> <li>• Is the power cord unplugged from the outlet?</li> <li>• Check if the power switch is set to OFF.</li> <li>• Check if the fuse of the power switch is shorted.</li> <li>• Measure the voltage of the power outlet.</li> </ul>	<ul style="list-style-type: none"> <li>• Plug into the outlet.</li> <li>• Set the switch to ON.</li> <li>• Replace the fuse.</li> <li>• If the voltage is low, correct the wiring.</li> </ul>
Cools poorly.	<ul style="list-style-type: none"> <li>• Check if the unit is placed too close to the wall.</li> <li>• Check if the unit is placed too close to the stove, gas cooker, or in direct sunlight.</li> <li>• Is the ambient temperature too high or the room door closed?</li> <li>• Check if food put in the refrigerator is hot.</li> <li>• Did you open the door of the unit too often or check if the door is sealed properly?</li> <li>• Check if the Control is set to <b>warm position</b>.</li> </ul>	<ul style="list-style-type: none"> <li>• Place the unit about 4 inches (10 cm) from the wall.</li> <li>• Place the unit away from these heat sources.</li> <li>• Lower the ambient temperature.</li> <li>• Put in foods after they have cooled down.</li> <li>• Don't open the door too often and close it firmly.</li> <li>• Set the control to <b>recommended position</b>.</li> </ul>
Food in the Refrigerator is frozen.	<ul style="list-style-type: none"> <li>• Is food placed in the cooling air outlet?</li> <li>• Check if the control is set to <b>colder position</b>.</li> <li>• Is the ambient temperature below 5°C?</li> </ul>	<ul style="list-style-type: none"> <li>• Place foods in the high-temperature section. (front part)</li> <li>• Set the control to <b>recommended position</b>.</li> <li>• Set the control to <b>warm position</b>.</li> </ul>
Condensation or ice forms inside the unit.	<ul style="list-style-type: none"> <li>• Is liquid food sealed?</li> <li>• Check if food put in the refrigerator is hot.</li> <li>• Did you open the door of the unit too often or check if the door is sealed properly?</li> </ul>	<ul style="list-style-type: none"> <li>• Seal liquid foods with wrap.</li> <li>• Put in foods after they have cooled down.</li> <li>• Don't open the door too often and close it firmly.</li> </ul>
Condensation forms in the Exterior Case.	<ul style="list-style-type: none"> <li>• Check if the ambient temperature and humidity of the surrounding air are high.</li> <li>• Is there a gap in the door gasket?</li> </ul>	<ul style="list-style-type: none"> <li>• Wipe moisture with a dry cloth. It will disappear in low temperature and humidity.</li> <li>• Fill up the gap.</li> </ul>
There is abnormal noise.	<ul style="list-style-type: none"> <li>• Is the unit positioned in a firm and even place?</li> <li>• Are any unnecessary objects placed behind of the unit?</li> <li>• Check if the drip tray is not firmly attached.</li> <li>• Check if the cover of the compressor enclosure in the lower front side is taken out.</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust the leveling screw, and position the refrigerator in a firm place.</li> <li>• Remove the objects.</li> <li>• Fix the drip tray firmly in the original position.</li> <li>• Place the cover in its original position.</li> </ul>
Door does not close well.	<ul style="list-style-type: none"> <li>• Check if the door gasket is dirty with an item like juice.</li> <li>• Is the refrigerator level?</li> <li>• Is there too much food in the refrigerator?</li> </ul>	<ul style="list-style-type: none"> <li>• Clean the door gasket.</li> <li>• Position in a firm place and level the leveling screw.</li> <li>• Make sure food stored in shelves does not prevent the door from closing.</li> </ul>
Ice and foods smell unpleasant.	<ul style="list-style-type: none"> <li>• Check if the inside of the unit is dirty.</li> <li>• Are foods with a strong odor unwrapped?</li> <li>• The unit smells of plastic.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean the inside of the unit.</li> <li>• Wrap foods that have a strong odor.</li> <li>• New products smell of plastic, but this will go away after 1-2 weeks.</li> </ul>

● Other possible problems:

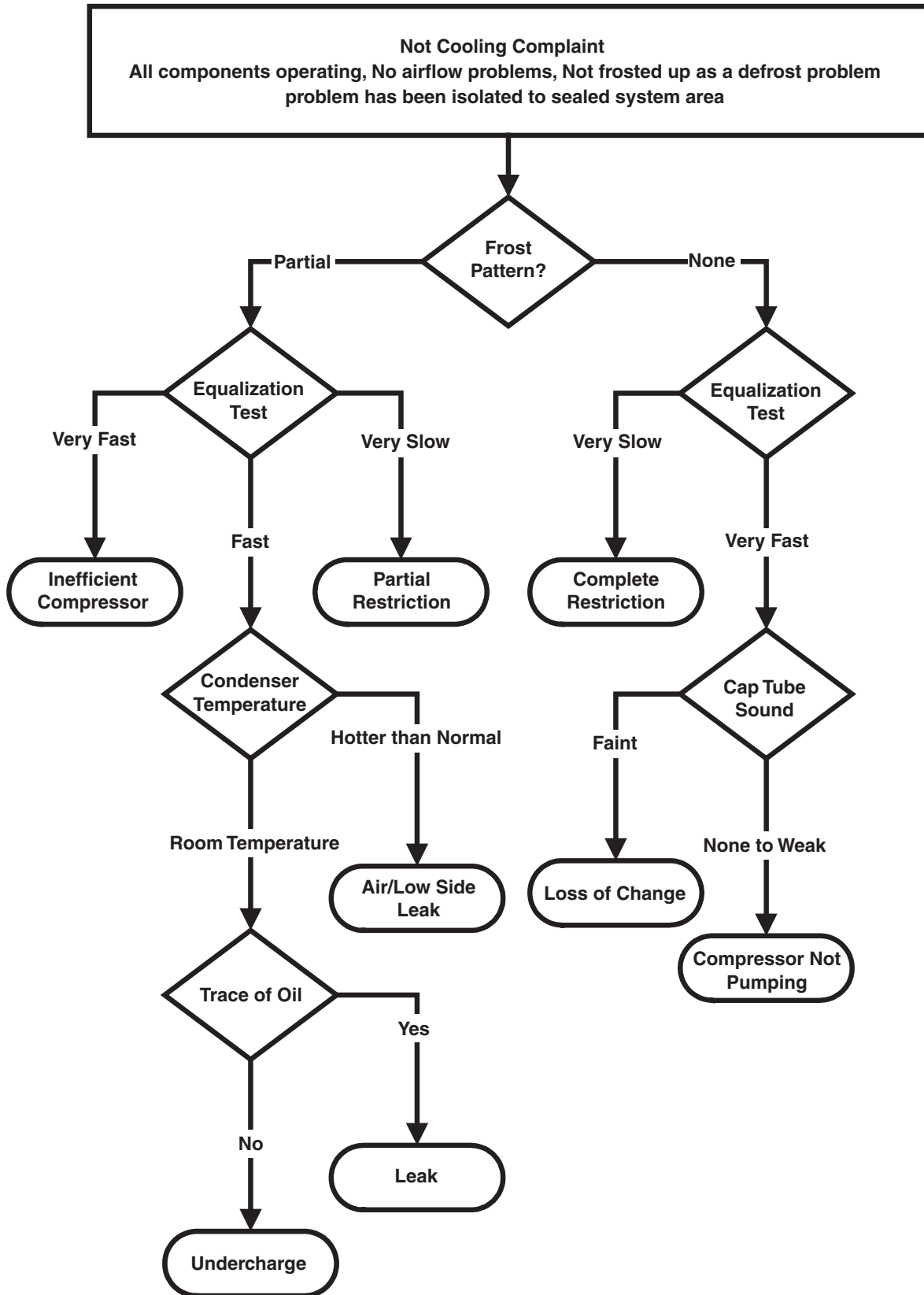


## 6-5 REFRIGERATION CYCLE

### ▼ 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"> <li>Refrigerant level is low due to a leak.</li> <li>Normal cooling is possible by restoring the normal amount of refrigerant and repairing the leak.</li> </ul>
	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"> <li>No discharging of refrigerant.</li> <li>Normal cooling is possible by restoring the normal amount of refrigerant and repairing the leak.</li> </ul>
CLOGGED BY DUST	PARTIAL CLOG	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"> <li>Normal discharging of the refrigerant.</li> <li>The capillary tube is faulty.</li> </ul>
	WHOLE CLOG	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"> <li>Normal discharging of the refrigerant.</li> </ul>
MOISTURE CLOG		Cooling operation stops periodically.	Flowing sound of refrigerant is not heard and frost melts.	Lower than ambient temperature.	<ul style="list-style-type: none"> <li>Cooling operation restarts when heating the inlet of the capillary tube.</li> </ul>
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 than ambient temperature.	<ul style="list-style-type: none"> <li>Low pressure at high side of compressor due to low refrigerant level.</li> </ul>
	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"> <li>No pressure in the high pressure part of the compressor.</li> </ul>

6-5-1 SEALED SYSTEM DIAGNOSIS

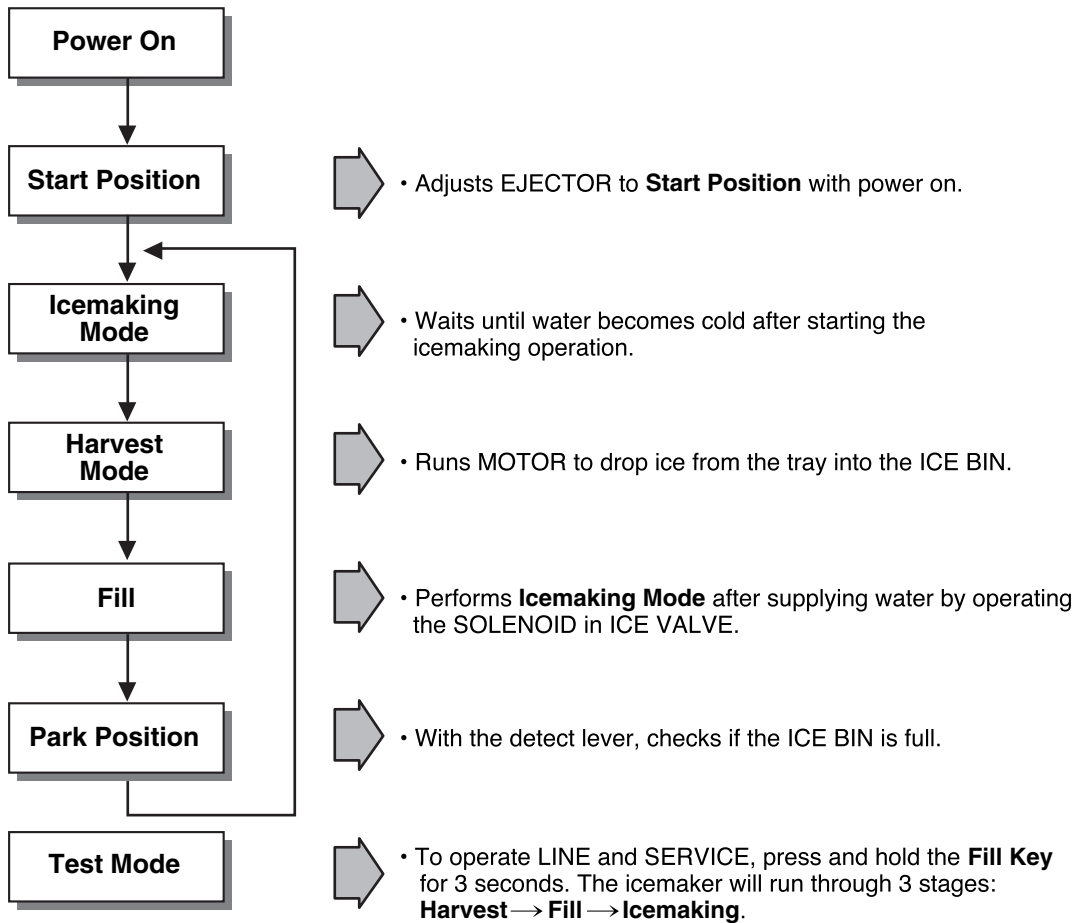


(The equalization test is trying to restart a compressor using a start kit after it has been operating.)

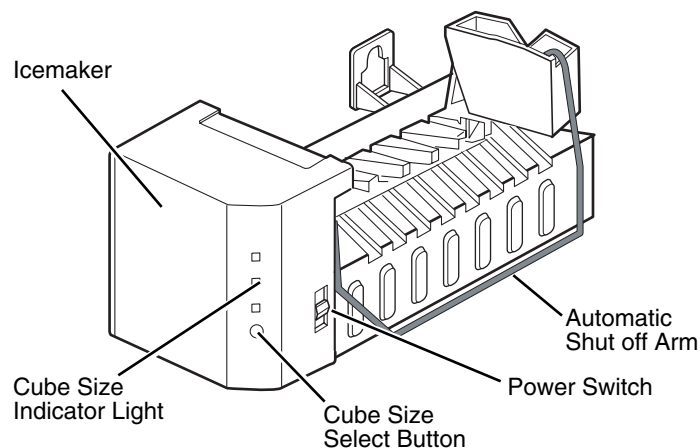
# 7. OPERATION PRINCIPLE AND REPAIR METHOD OF ICEMAKER

## 7-1 OPERATION PRINCIPLE

### 7-1-1 Operation Principle of Icemaker



1. Turning the Icemaker stop switch off (O) stops the icemaking function.
2. Setting the Icemaker switch to OFF and then turning it back on will reset the icemaker control.



---

## 7-2 ICE MAKER FUNCTIONS

### 7-2-1 Start Position

1. After POWER OFF or power outage, check the EJECTOR's position with MICOM initialization to restart.
2. How to check if it is in place:
  - Check **HIGH/LOW** signals from HALL SENSOR in MICOM PIN.
3. Control method to check if it is in place:
  - (1) EJECTOR is in place,
    - It is an initialized control, so the mode can be changed to ice making control.
  - (2) EJECTOR isn't in place:
    - A. If EJECTOR is back in place within 2 minutes with the motor on, it is being initialized. If not, go to step B.
    - B. If EJECTOR is back in place within 18 minutes after the heater turns from ON to OFF, it is being initialized. If not, it is not functioning. Repeat step B with heater and motor off.

### 7-2-2 Ice Making Mode

1. Icemaking refers to the freezing of supplied water in the ice trays. Complete freezing is assured by measuring the temperature of the Tray with icemaking SENSOR.
2. Icemaking starts after completion of the water fill operation.
3. The icemaking function is completed when the sensor reaches -7°C, 60 to 240 minutes after starting.
4. If the temperature sensor is defective, the icemaking function will be completed in 4 hours.

**NOTE :** After icemaker power is ON, the icemaker heater will be on for test for 9 sec.

### 7-2-3 Harvest Mode

1. Harvest (Ice removing) refers to the operation of dropping ices into the ice bin from the tray when icemaking has completed.
2. Harvest mode:
  - (1) The Heater is ON for 30 seconds, then the motor starts.
  - (2) Harvest mode is completed if it reaches start position again while Heater & Motor are on at the same time.
    - A. ice bin is full : The EJECTOR stops (heater off).
    - B. ice bin is not full : The EJECTOR rotates twice to open for ice.




**NOTE :** If the EJECTOR does not rotate once within 5 minutes in status (2), separate heater control mode starts operating to prevent the EJECTOR from being constrained. (It is recommended that the user open for ice to return to normal mode.)

---

### 7-2-4 Fill/Park Position

1. Once a normal harvest mode has been completed, the water solenoid will be activated.
2. The amount of water is adjusted by pressing the fill key repeatedly. This changes the time allowed for fill as illustrated in the table below.

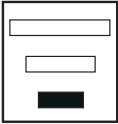

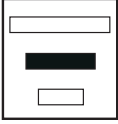


**Water supply amount table**

STAGE	TIME TO SUPPLY	INDICATIONS	REMARKS
1	6 sec.		The water amount will vary depending on the water control switch setting, as well as the water pressure of the connected water line.
2	7 sec.		
3	8 sec.		

### 7-2-5 Function TEST


1. This is a compulsory operation for test, service, cleaning, etc. It is operated by pressing and holding the fill key for 3 seconds.
2. The test works only in the icemaking mode. It cannot be entered from the harvest or fill mode. (If there is an ERROR, it can only be checked in the test mode.)
3. **Caution!** If the test is performed before water in the icemaker is frozen, the ejector will pass through the water. When the fill mode begins (stage 4), unless the water supply has been shut off, added water will overflow into the ice bin. If the control doesn't operate normally in the test mode, check and repair as needed.
4. After water is supplied, the normal cycle is followed: **icemaking** → **harvest** → **fill** → **park position**.
5. Five seconds after stage 5 is completed, the icemaker returns to MICOM control. The time needed to supply water resets to the pre-test setting.

#### < 5 stage of diagnosis >

STAGE	ITEMS	INDICATOR	REMARKS
1	HEATER		Five seconds after heater starts, heater will go off if temperature recorded by sensor is 50°F(10°C) or lever is in up position.
2	MOTOR		Five seconds after heater starts, you can confirm that motor is moving.
3	HALL IC I (detection of position)		You can confirm hall ic detection of position.
4	VALVE		Two seconds after detection of initial position, you can confirm that valve is on.
5	HALL IC II (detection of full-filled Ice)		You can check whether the Hall IC is sensing a full ice condition.(If there is a full-filled error, the fifth stage would not be progressed)
6	Reset	Mark previous status on TEST mode	Five seconds after fifth stage is completed, the icemaker resets to initial status.

### 7-3 DEFECT DIAGNOSIS FUNCTION

#### 7-3-1 ERROR CODE on water supply control panel at Ice Maker

No	ITEM	ERROR CODE	CONTENTS	REMARKS
1	Normal	Mark time to supply	None	Display switch operates properly
2	Ice-Making Sensor malfunction		Open or short-circuited wire	Make sure that the wire on each sensor is connected.

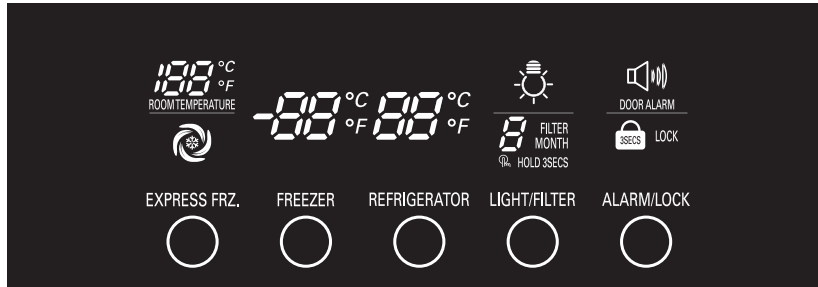
\* ERROR indicators in table can be checked only on TEST mode.

# 8. DESCRIPTION OF FUNCTION & CIRCUIT OF MICOM

## 8-1 FUNCTION

### 8-1-1 Function

1. When the appliance is plugged in, it is set to “37” for Refrigerator and “0” for freezer.  
You can adjust the Refrigerator and the Freezer control temperature by pressing the ADJUST button.
2. When the power is initially applied or restored after a power failure, it is automatically set to “37” & “0”.

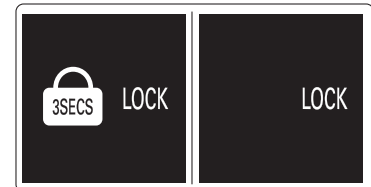


### 8-1-2 How to Change the Temperature Mode to °F / °C

1. The setting temperature mode can be changed to °F / °C by pressing and holding Freezer Temp. key of Freezer and Refrigerator Temp. key of Refrigerator over 5 seconds. at the same time.
2. The initial setting is °F. Whenever the mode is changed, the LED lights are changed.

### 8-1-3 Lock function (dispenser and display button lock)

1. In power application of refrigerator, the “LOCK” icon is turned off at the upper side of lock graphic of display with the lock release status.
2. If desiring to lock the display the dispenser and control panel push on the LOCK button more than 3 seconds. LOCK text is turned on at the upper side of lock graphic of display with lock status.
3. The buzzer sound and control panel and dispenser function is not performed even if pressing display button other than lock key in the lock status.
4. If desiring to release the lock status and pressing the lock button more than 3 seconds. “LOCK” icon is turned off at the upper side of lock graphic of display with the lock release status.



Ex) In selecting "LOCK"

Ex) In selecting "LOCK" again

### 8-1-4 Filter condition display function

1. There is a replacement indicator icon for the water filter cartridge on the dispenser.
2. Water filter needs replacement once six months or about 28,000 seconds of using water filter.
3. Water filter icon turns on to tell you need to replace the filter soon.
4. After replace the filter, press and hold the lock button more than 3 seconds.  
Then water filter light turns off with reset status.

Classification

In initial Power On / Filter RESET

Replace indicator light on

Filter Status Display

	In initial Power On / Filter RESET	Replace indicator light on
Filter Status Display		

### 8-1-5 Express Freezing selection

Please select this function for prompt freezer.

- Function is repeated following below whenever pressing Express Freezing button.
- Ultra Ice function automatically turns off if a fixed time passes.

EXPRESS FRZ.





### 8-1-6 CONTROL OF FREEZER FAN MOTOR

1. Freezer fan motor has high and standard speeds.
2. High speed is used at power-up, for Ultra Ice, and when refrigerator is overloaded.  
Standard speeds is used for general purposes.
3. To improve cooling speed, the RPM of the freezer fan motor change from normal speed to high.
4. High speed (2700RPM) : Initial power on or load corresponding operation, Ultra Ice.  
Normal speed (2400RPM) : General working conditions.
5. Fan motor stops when refrigerator or freezer door opens.

### 8-1-7 Ultra Ice

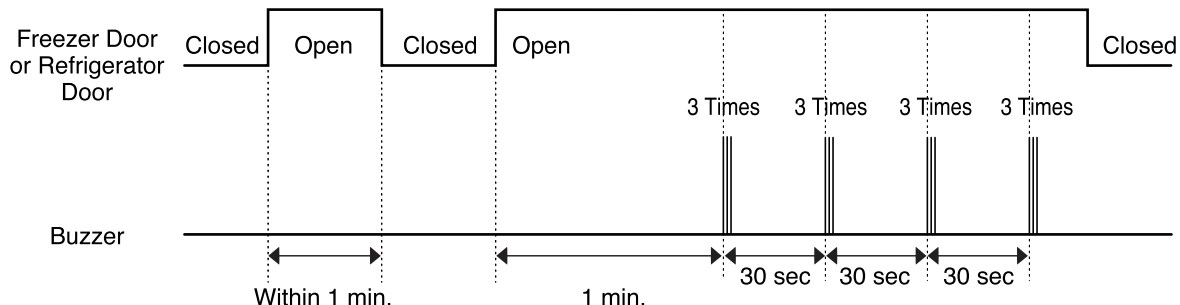
1. The purpose of this function is to intensify the cooling speed of freezer and to increase the amount of ice.
2. When Ultra Ice is selected, LED will remain ON for Ultra Ice Cycle.
3. If power is lost to the refrigerator, Ultra Ice function will be canceled.
4. To activate this function, to press the Ultra Ice key and the LED will turn ON. This function will remain activated for 24 hrs. The first three hours the compressor and Freezer Fan will be ON. The next 21 hours the freezer will be controlled at the lowest temperature. After 24 hours or if the Ultra Ice key is pressed again, the freezer will return to its previous temperature.
5. For the first three hours notice the following cases:
  - (1) Compressor and freezer fan (HIGH RPM) continuously operate for three hours.
  - (2) If defrost starts during Ultra Ice, Ultra Ice operates for the rest of time after defrost is completed, when Ultra Ice operation time is less than 90 minutes.  
If Ultra Ice operates for more than 90 minutes, the Ultra Ice will operate for two hours after defrost is completed.
  - (3) If Ultra Ice is pressed during defrost, Ultra Ice LED is on but this function will start seven minutes after defrost is completed and it shall operate for three hours.
  - (4) If Ultra Ice is selected within seven minutes after compressor has stopped, the compressor (compressor delays seven minutes) shall start after the balance of the delay time.
  - (5) The fan motor in the freezer compartment runs at high speed during Ultra Ice .
6. For the rest of the 21 hours, the freezer will be controlled at the lowest temperature.

### 8-1-8 REFRIGERATOR LAMP AUTO OFF

1. To avoid heat damage caused by the lamp, it is turned off automatically when the refrigerator door is open for more than 7 minutes.

### 8-1-9 Alarm for Open Door

1. This feature sounds a buzzer when the freezer or refrigerator door is not closed within 1 minute after it is opened.
2. One minute after the door is opened, the buzzer sounds three times each for 1/2 seconds. These tones repeat every 30 seconds.
3. The alarm is cancelled when the freezer or the refrigerator is closed while the buzzer sounds.



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### **8-1-10 Buzzer Sound**

When the button on the front Display is pushed, a Ding~ Dong~ sound is produced.

### **8-1-11 Defrost cycle**

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

### **8-1-12 Filter Replacement Indication**

1. In 6 months after the UNIT (refrigerator) is power on, or after 28,000 seconds of dispenser use, the water filter icon is ON.
2. When the water filter indicator LED is illuminated, you should change the water filter. After this, you must press the water filter button for three seconds and you will hear a ding-dong sound.  
The icon will be OFF. This operation will indicate that the UNIT is reset to its initial conditions, so this process is restarted.

### **8-1-13 DISPENSER LIGHT**

Please select this function for DISPENSER LIGHT MODE.

1. Normal status (LIGHT icon is OFF) : When dispenser is operated, DISPENSER LIGHT is ON.
2. ON status (LIGHT icon is ON) : DISPENSER LIGHT is on continuously.

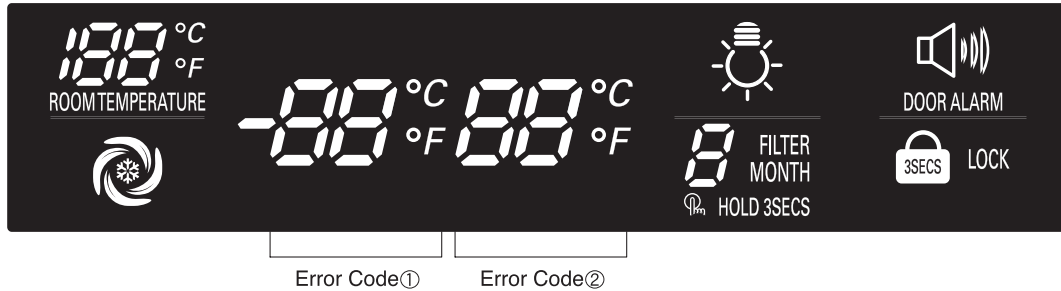
### 8-1-14 Electrical Parts Are Turned On Sequentially

Electrical parts such as compressor, defrosting heater, freezer fan, etc. are turned on 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 defrosting sensor is 45°C or more (when unit is newly purchased or when moved)	<b>Power ON</b>	in 0.5 sec. →	<b>Compressor ON</b>	in 0.5 sec. →	<b>Freezer fan ON</b>
	Temperature of defrosting sensor is lower than 45°C (during power outages or for service)	<b>Power ON</b>	in 0.5 sec. →	<b>Defrosting heater ON</b>	in 10 sec. →	<b>Defrost heater OFF</b>
		in 0.5 sec. →	<b>Compressor ON</b>	in 0.5 sec. →	<b>Freezer fan ON</b>	
	Reset to normal operation from test mode	<b>Total load OFF</b>	in 7 min. →	<b>Compressor ON</b>	in 0.5 sec. →	<b>Freezer fan ON</b>

## 8-1-15 Defect Diagnosis Function

1. Automatic diagnosis makes servicing the refrigerator easy.
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 and freezer display.



### FAILURE DETECTION FUNTION

NO	ITEM	ERROR CODE		CONTENTS	REMARKS
		①	②		
1	Failure of freezer sensor	Er	FS	Cut or short circuit wire	Inspect Connecting wires on each sensor
2	Failure of Refrigerator sensor	Er	rS	Cut or short circuit wire	
3	Failure of defrost sensor	Er	dS	Cut or short circuit wire	
4	Failure of Room Temperature sensor	* NOTE 1		Cut or short circuit wire	
5	Failure of defrost mode	Er	dH	When defrost sensor doesn't reach 46°F(8°C) within 1 hour after starting defrost	Snapping of defrost heater or Temperature fuse, pull-out of connector (indicated minimum 1 hour after failure occurs)
6	Failure of BLDC Fan Motor at Freezing Compartment	Er	FF	If there is no fan motor signal for more than 115sec in operation fan motor	Poor motor, hooking to wires of fan, contact of structures to fan, snapping or short circuit of Lead wires

\* NOTE1) "Er" INDICATED ON THE AMBIENT TEMPERATURE DISPLAY(EXCEPT FOR THE AMBIENT TEMPERATURE DISPLAY OTHER DISPLAY PARTS ARE INDICATED NORMALLY)

\* LED check function: If press and hold the warmer key of refrigerator temp and the warmer key of freezer temp for a second, all display LED graphics on. When you release the buttons, the LED graphics displays the previous status.

## 8-1-16 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 mode is operated by pressing two buttons on the display panel.
3. While in the test mode, the function control button is not recognized, but the recognition tone (beep~) sounds.
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.

### TEST FUNCTION

MODE	MANIPULATION	CONTENTS	REMARKS
TEST1	Push FREEZER KEY and LOCK KEY at the same time over 5 seconds OR Push TEST S/W(in the main Board) once.	1) Continuous operation of the COMPRESSOR and the Freezer fan 2) Stepping DAMPER OPEN 3) Defrosting HEATER OFF 4) DISPLAY LED all ON	
TEST2	Push FREEZER KEY and LOCK KEY at the same time over 5 seconds in TEST MODE 1 OR Push TEST S/W once in TEST MODE 1	1) Continuous operation of the COMPRESSOR and the Freezer fan 2) Stepping DAMPER CLOSE 3) Defrosting HEATER OFF 4) DISPLAY LED shows no. 2	
TEST3	Push FREEZER KEY and LOCK KEY at the same time over 5 seconds in TEST MODE 2 OR Push TEST S/W once in TEST MODE 2	1) COMPRESSOR and the Freezer fan OFF 2) Stepping DAMPER CLOSE 3) Defrosting HEATER ON 4) DISPLAY LED shows no. 3	Reset if the Temperature of the Defrosting Sensor is 46°F(8°C)or more.
RESET	Push FREEZER KEY and LOCK KEY at the same time over 5 seconds in TEST MODE 3 OR Push TEST S/W once in TEST MODE 3	Reset to the previously setting Before TEST MODE.	The compressor will Start after a 7-minute Delay.

#### \* Freezer Fan Variable RPM Check:

To check the variable rpm, press and hold the WARMER keys of both the REF TEMP and FRX TEMP. The fan speed will change (low to high or high to low) for 30 seconds before reverting to its original setting.

#### \* Demonstration (Display) MODE:

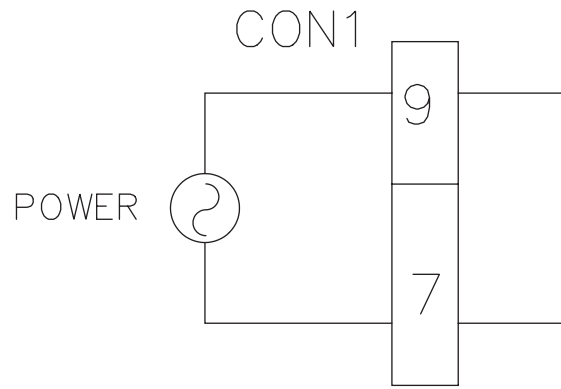
1. To enter this mode, raise either the Refrigerator or Freezer temperature to its highest setting. Then, press and hold WARMER Key for 5 seconds.
2. The LED panels will display OFF, to indicate that the compressor, circulating fan, damper, and defrost heater are not operating.
3. The open door alarm and the lamp auto-off feature will work normally and can be demonstrated.
4. To reset to normal operation, press and hold either WARMER key for about 5 seconds.

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## 8-2 PCB FUNCTION

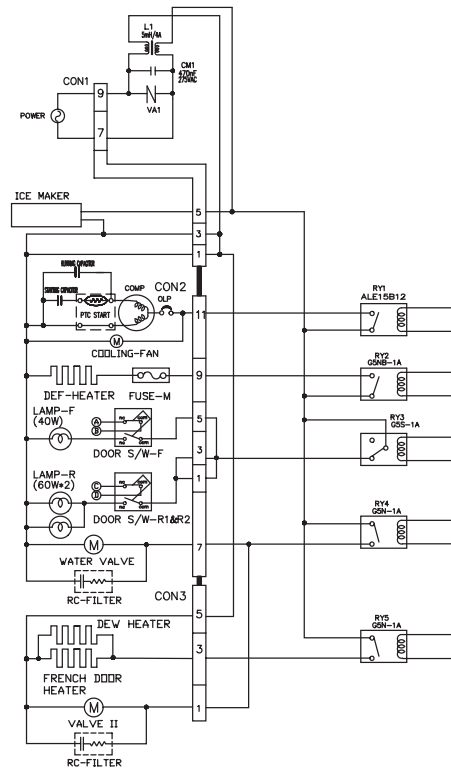
### 8-2-1 Power Circuit

1. Power is supplied to the control board at pin7 and 9 od connector #1.



## 8-2-2 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:

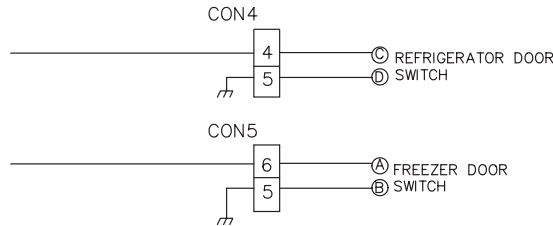
Circuit	Pin Number	Pin Number	Output Voltage
Compressor	Con2 pin11	Con1 pin1	115 VAC
Condenser fan	Con2 pin11	Con1 pin1	115 VAC
Defrost heater	Con2 pin9	Con1 pin1	115 VAC
F,R-lamp	Con2 pin,3,5	Con1 pin1	115 VAC
Water valve	Con2 pin7	Con1 pin1	115 VAC
Dew heater	Con2 pin3	Con1 pin1	115 VAC
Water valve	Con2 pin1	Con1 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.

### 2. Fan motor driving circuit (freezing compartment fan)

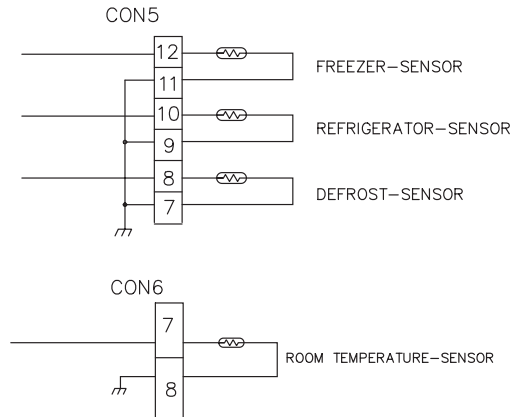
	Pin1 & 2 of con4
MOTOR OFF	2V or less
MOTOR ON	13V~15V

### 3. Open Door Detection Circuit Check



### 8-2-3 Temperature Sensor Circuit

Measurement Location Freezer/ Refrigerator Door	Pin 4 & 5 of con4 Ref.Door Pin 5 & 6 of con5 Fre.Door
Closed	0 V
Open	5 V



TEMPERATURE	RESISTANCE OF FREEZER SENSOR	RESISTANCE OF REFRIGERATOR & DEFROST SENSOR & ROOM 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 ±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.



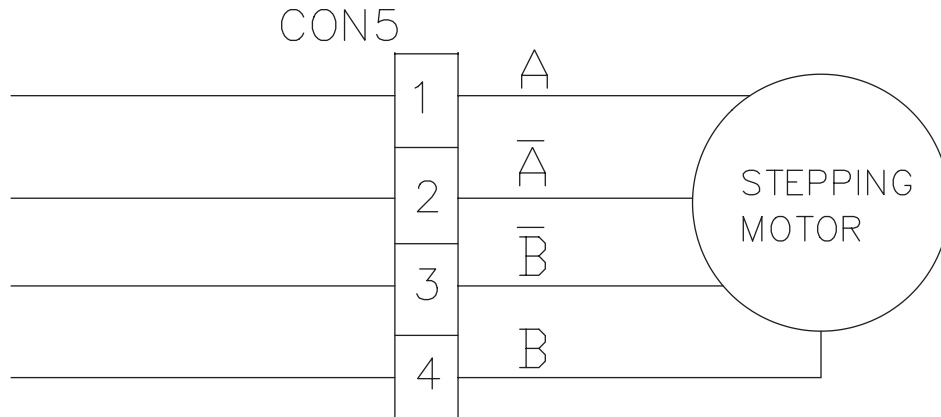
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### 8-2-4 Refrigeration Compartment Stepping Motor Damper Circuit

A reversible DC motor is used to open and close the damper.

To open the damper, push test button once.

To close the damper, push test button twice.



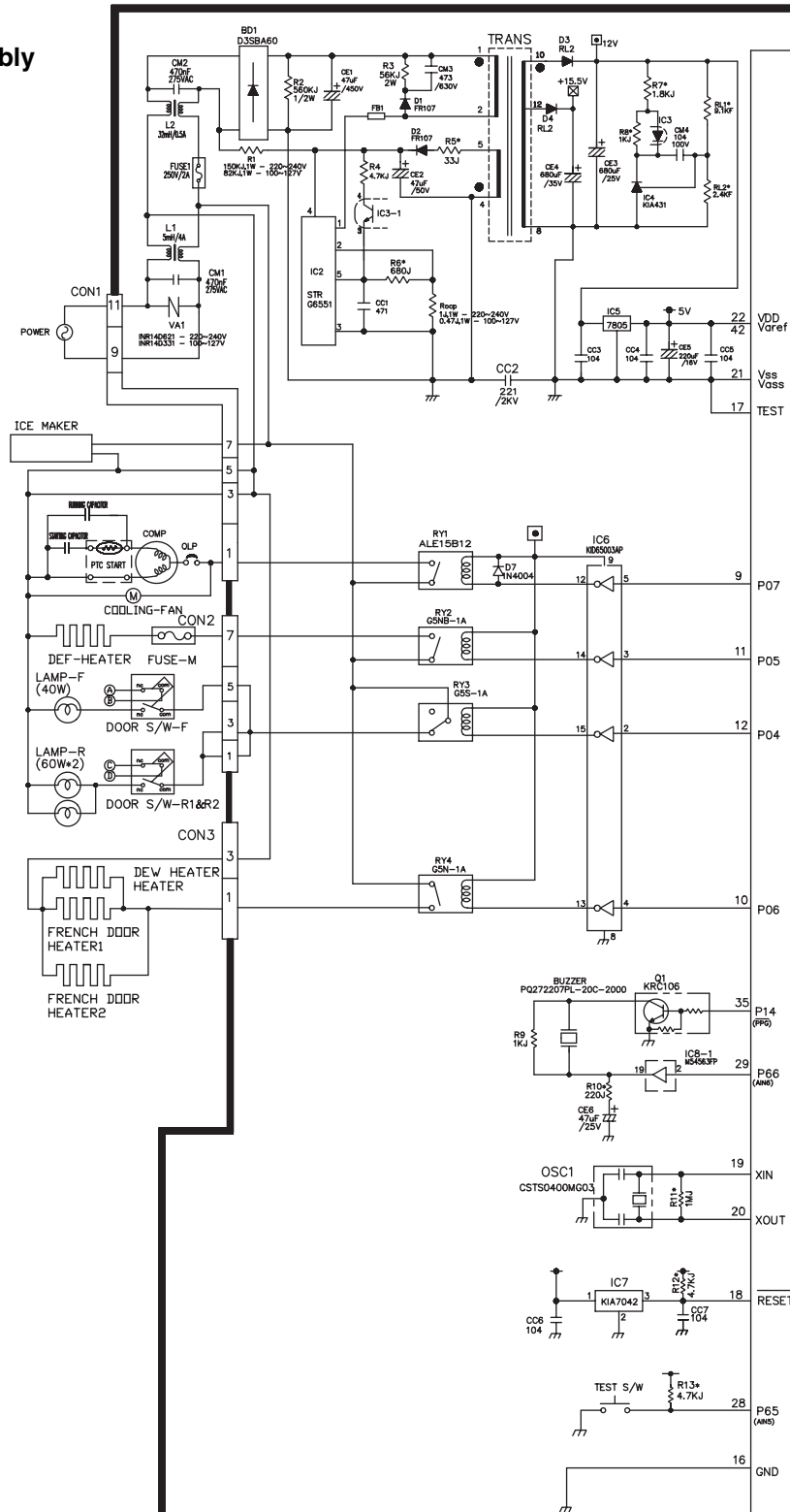
## 8-3 TROUBLESHOOTING

PROBLEM	INDICATED BY	CHECK	CHECKING METHOD	CAUSE	SOLUTION
POWER SOURCE is poor.	1. The whole DISPLAY LED/SEVEN SEGMENT DISPLAY is off.	1. FREEZER/ REFRIGERATOR.	Check if FREEZER/REFRIGERATOR DOOR IS OPEN and check display.	POWER SOURCE is poor.	Use boosting TRANS.
		2. If LAMP is dim.	Check visually.	Applied voltage error.	Reconnect CONNECTOR.
	2. DISPLAY LED/ SEVEN SEGMENT DISPLAY operates abnormally	3. The connection of the MAIN PWB CONNECTOR.	Check connection of CONNECTOR.	CONNECTOR connection is poor.	Replace TRANS.
				TRANS FUSE is open.	Replace COMPRESSOR.
COOLING is poor.	NO COOLING.	1. If the COMPRESSOR operate.	USE TEST MODE1 (forced COOLING). If less than 7 minutes pass after compressor shuts off, don't press the KEY and wait.	COMPRESSOR locked or blocked.	Replace OLP, PTC.
				OLP, PTC is poor. COMPRESSOR RELAY is poor.	Replace MAIN PWB.
				THE CONNECTING WIRE is poor.	Check the connection of the black wire of the MAIN PWB CONNECTOR (CON2).
		2. If refrigerant is leaking.	Measure the amount of frost sticking on EVAPORATOR and the surface temperature of the condenser pipe.	Refrigerant leakage.	Replace the leaking part and replace any lost refrigerant.
	FREEZER TEMPERATURE is incorrect	1. If FAN MOTOR operates.	USE TEST MODE1 (forced COOLING).	FAN MOTOR is poor.	Replace the FAN MOTOR.
				CONNECTING WIRE is poor.	Certify the MOTOR and the connection of the black wire of the MAIN PWB CONNECTOR (CON2).
		2. If DEFROSTING is normal.	Check the amount of frost sticking on the EVAPORATOR .	DEFROSTING is poor.	See DEFROSTING is poor.
		3. If SENSOR is normal.	of the Refrigerator SENSOR.	SENSOR RESISTANCE is poor.	Replace SENSOR.
		4. Door Line contact.	Check the seal when the door is closed.	Door liner damaged.	Replace door liner.

<b>PROBLEM</b>	<b>INDICATED BY</b>	<b>CHECK</b>	<b>CHECKING METHOD</b>	<b>CAUSE</b>	<b>SOLUTION</b>
COOLING is poor.	If REFRIGERATOR TEMPERATURE is too low.	1. If FREEZER TEMPERATURE is normal.	Check is FREEZER TEMPERATURE is too low.		Make sure the DOOR is attached.
		2. If amount of cool air from FAN MOTOR is sufficient.	Make sure that the amount and speed of cool air are sufficient by touching the check supplied on the REFRIGERATOR.	FAN MOTOR is poor.	Replace FAN MOTOR.
				Passage of cool air is blocked.	Remove impurities.
		3. Door Line contact.	Check door seal when door is closed.	EVA frozen.	See DEFROSTING is poor.
Door liner damaged.	Replace Door liner.				
DEFROSTING is poor.	NO DEFROSTING.	1. If HEATER emits heat.	USE TEST MODE3 (forced DEFROSTING).	HEATER disconnection.	Replace HEATER.
				TEMPERATURE FUSE disconnection.	Replace TEMPERATURE FUSE.
				Connection is poor.	Check EVAPORATOR connection and wire of MAIN PWB CONNECTOR.
				DEFROST-SENSOR is poor.	Replace DEFROST-SENSOR.
				HEATER RELAY is poor.	Replace RY3 of MAIN PWB.
		2. If DRAIN PIPE is blocked.	Check DRAIN PIPE.	DRAIN PIPE is blocked.	Remove ice and impurities.
					Check HEATER PLATE resistance.
		3. If ice remains after DEFROSTING.	Make sure that DEFROST SENSOR is connected.	Connection is poor.	Reassemble the DEFROST-SENSOR.
Make sure that FREEZER /REFRIGERATOR DOOR is closed.	DOOR does not close properly.				Reassemble DOOR. Replace GASKET.

# 8-4 PWB DIAGRAM

## 8-4-1 PWB Main Assembly



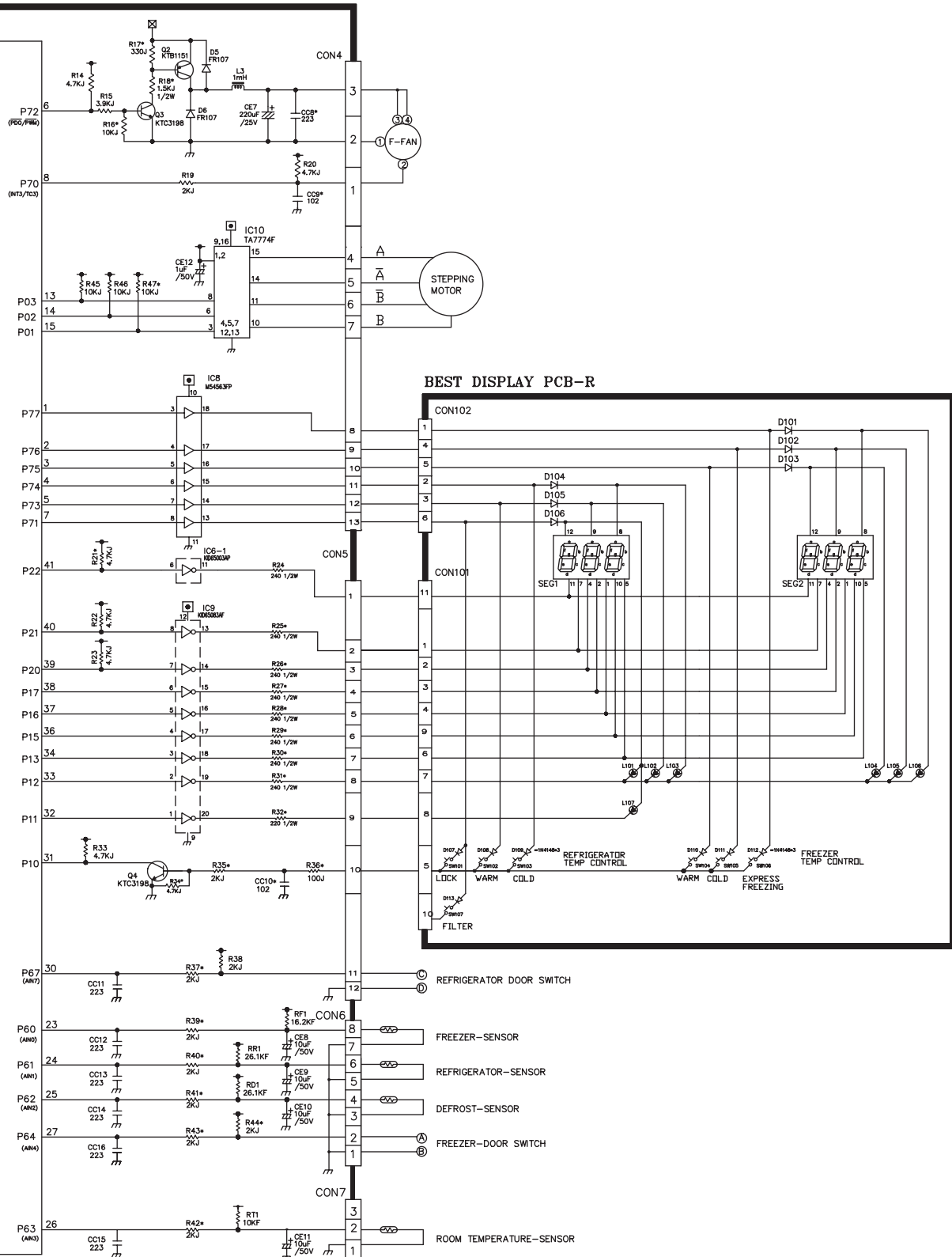
TOSHIBA TMP87C846N(IC1)

PWB ASSY,MAIN

\*:SMD부품임.

FIG.1

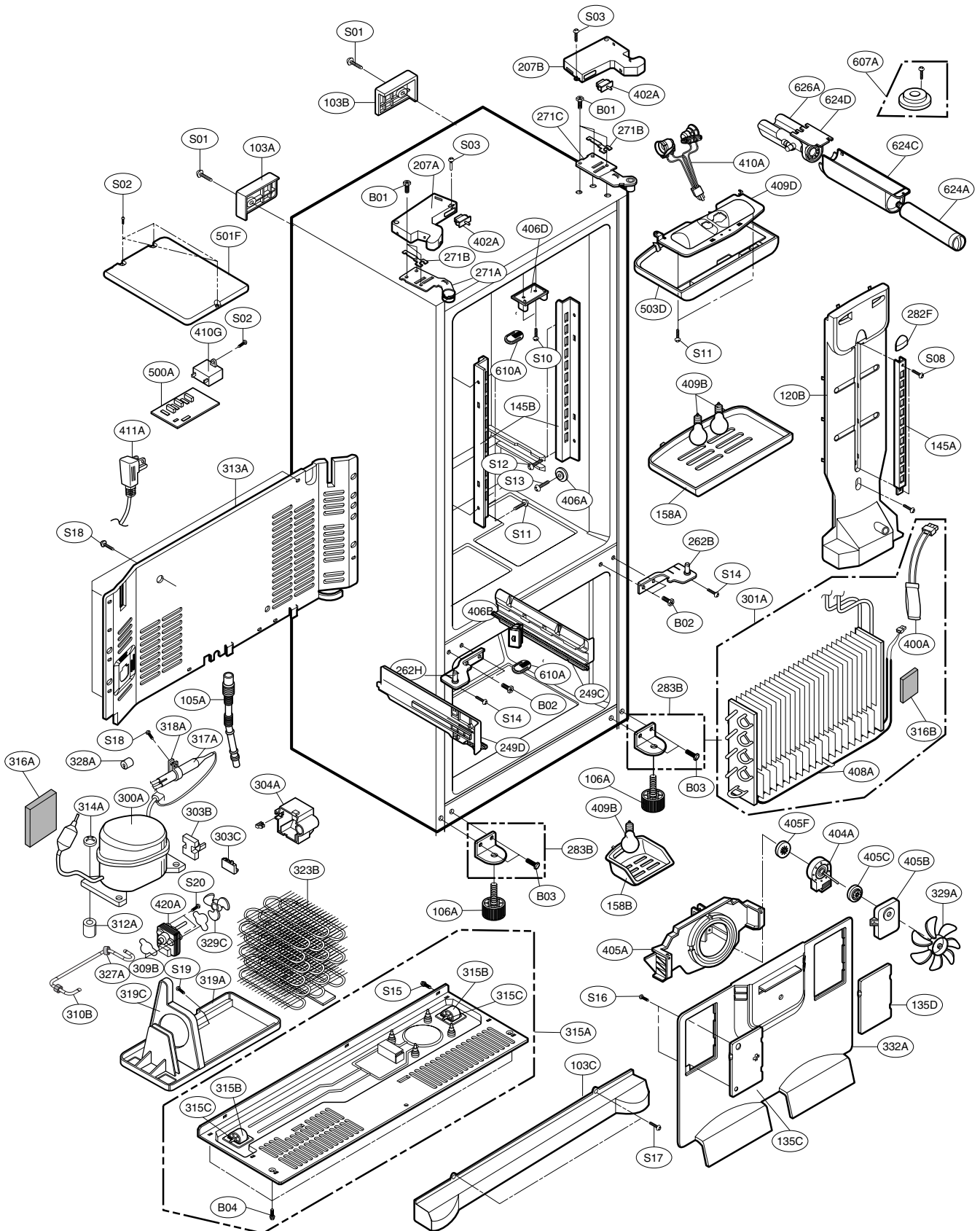
TOSHIBA TMP87C846N(IC1)



# 9. EXPLODED VIEW & REPLACEMENT PARTS LIST

## CASE PARTS

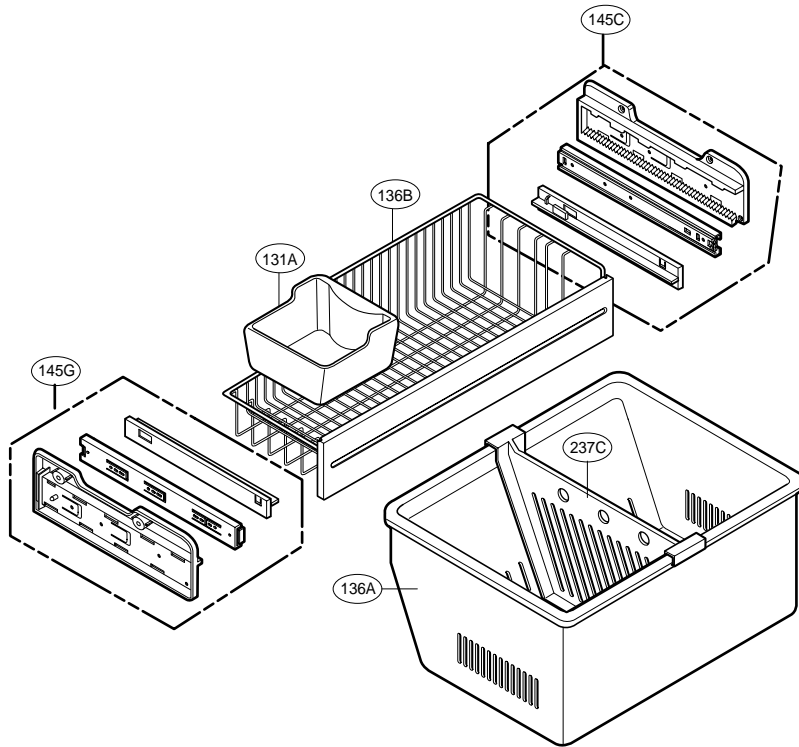
CAUTION: Use the part number to order part, not the position number.



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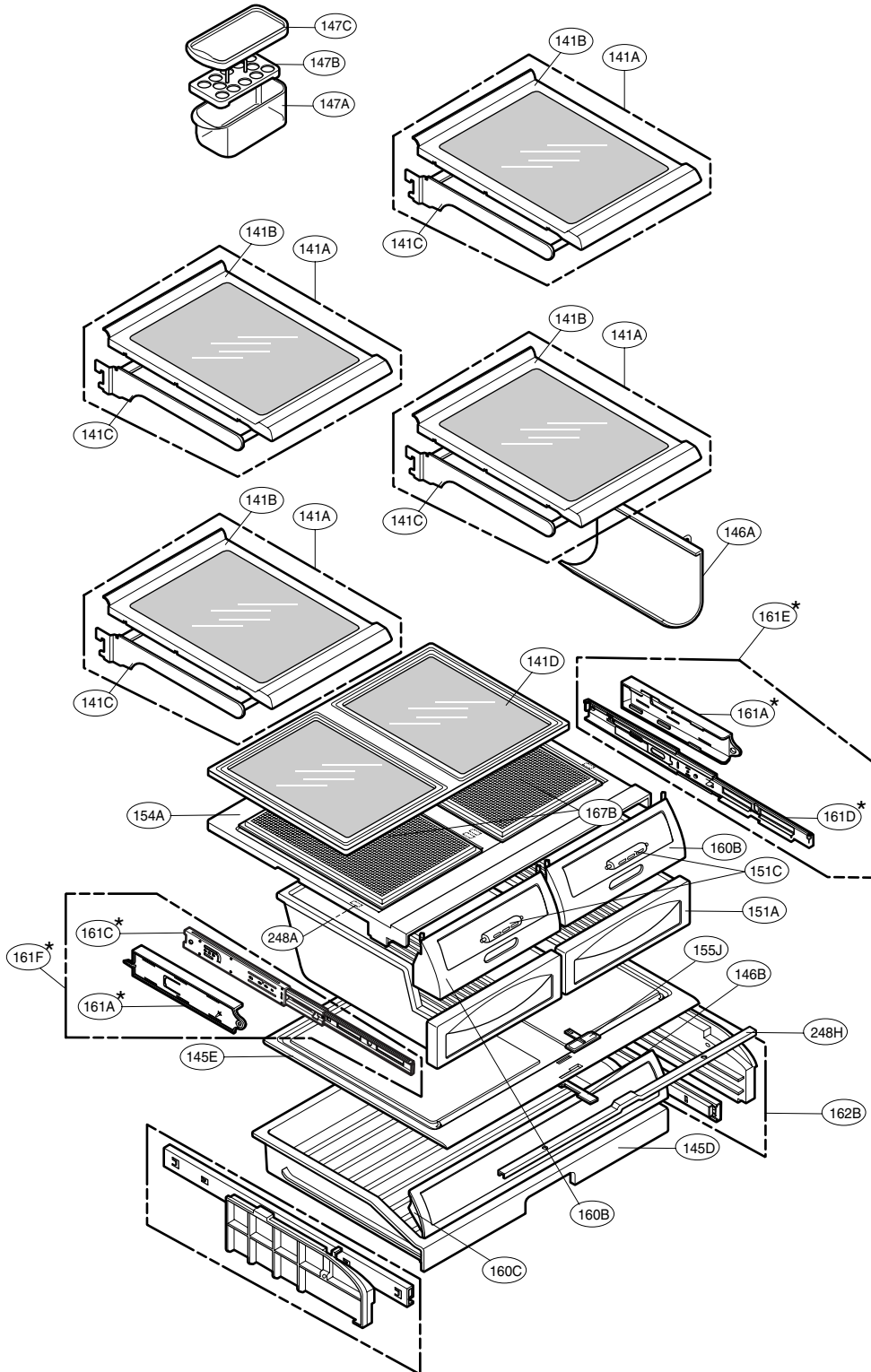
## **FREEZER PARTS**

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.

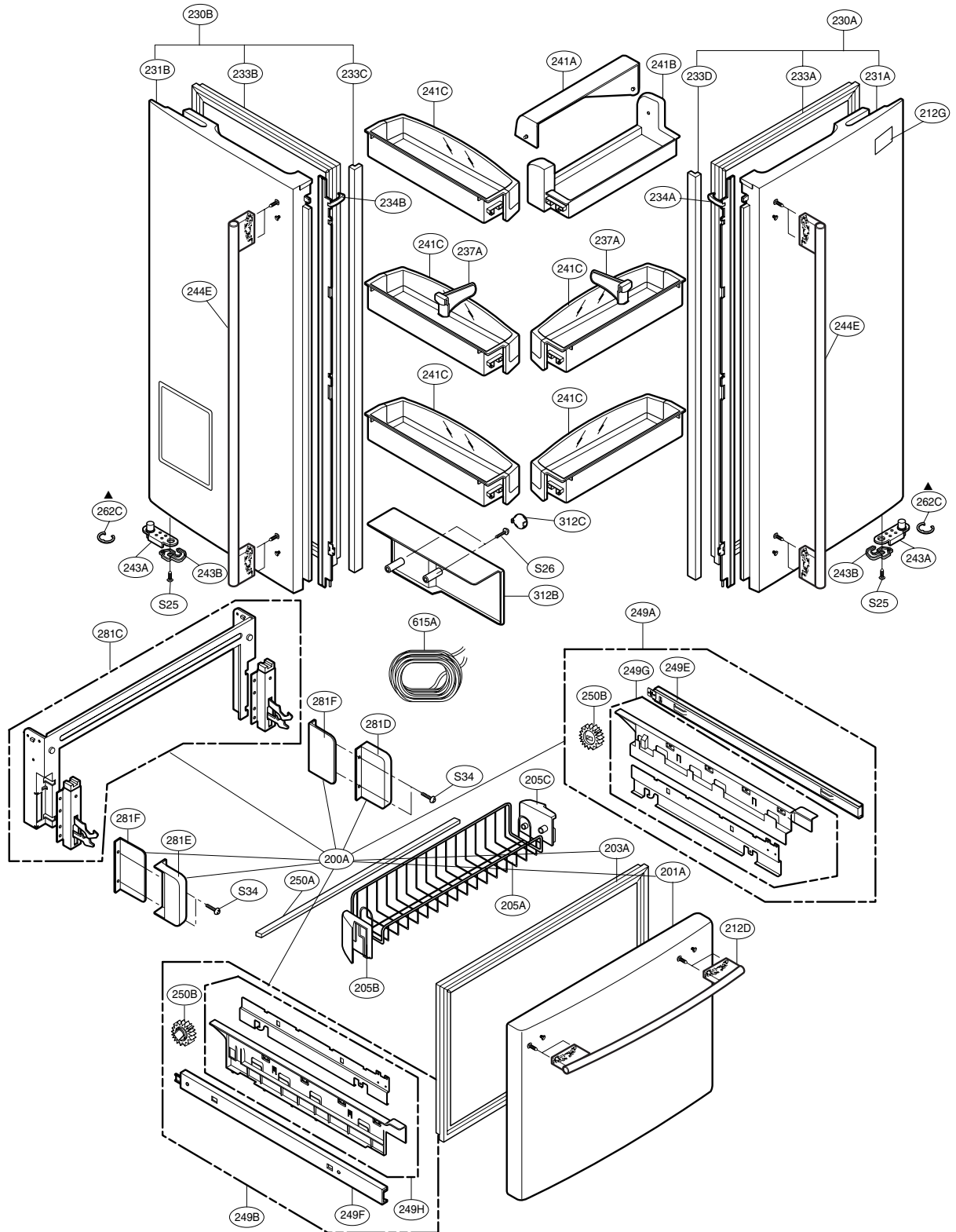


\* : on some models



# DOOR PARTS

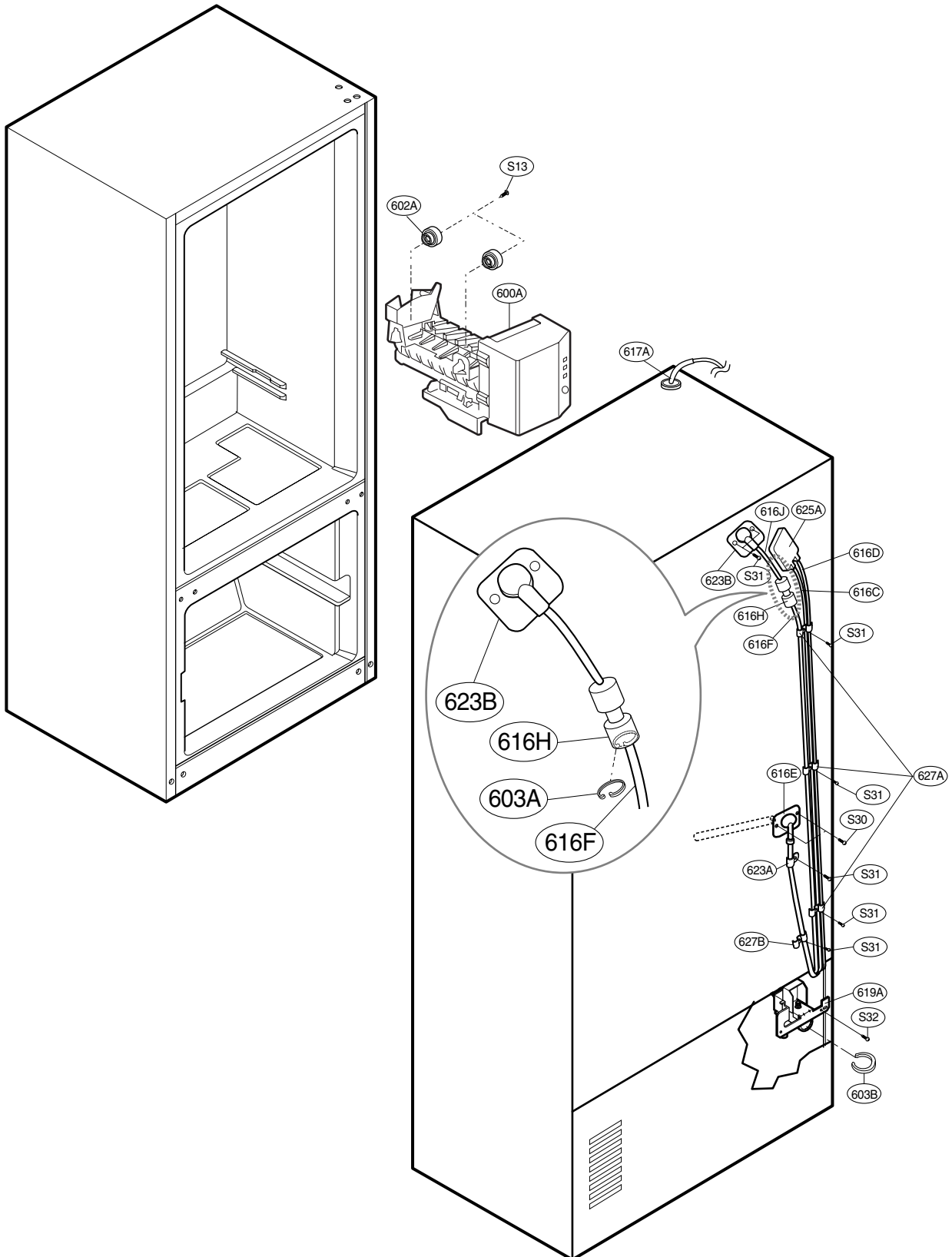
CAUTION: Use the part number to order part, not the position number.



\* : on some models  
 ▲ Only for the service

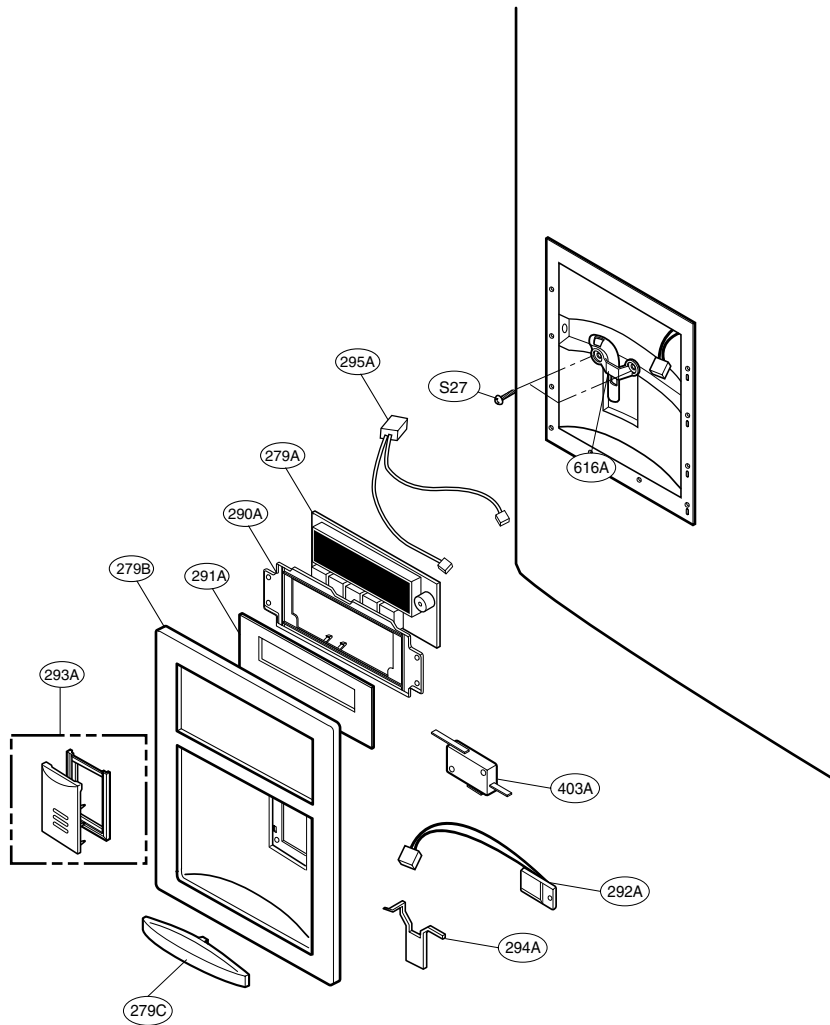
# WATER AND ICEMAKER PARTS

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



# DISPENSER PARTS

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





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