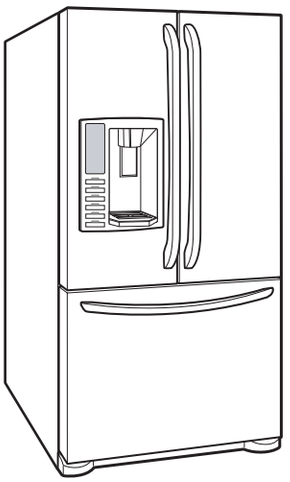
LG

REFRIGERATOR

SERVICE MANUAL

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



MODEL : LFX28978**

COLOR : STAINLESS(ST)
WESTERN BLACK(SB)
SUPER WHITE(SW)

CONTENTS

SAFETY PRECAUTIONS

Please read the following instructions before servicing your refrigerator.

1. Unplug the power before handling any elctrical componets.
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

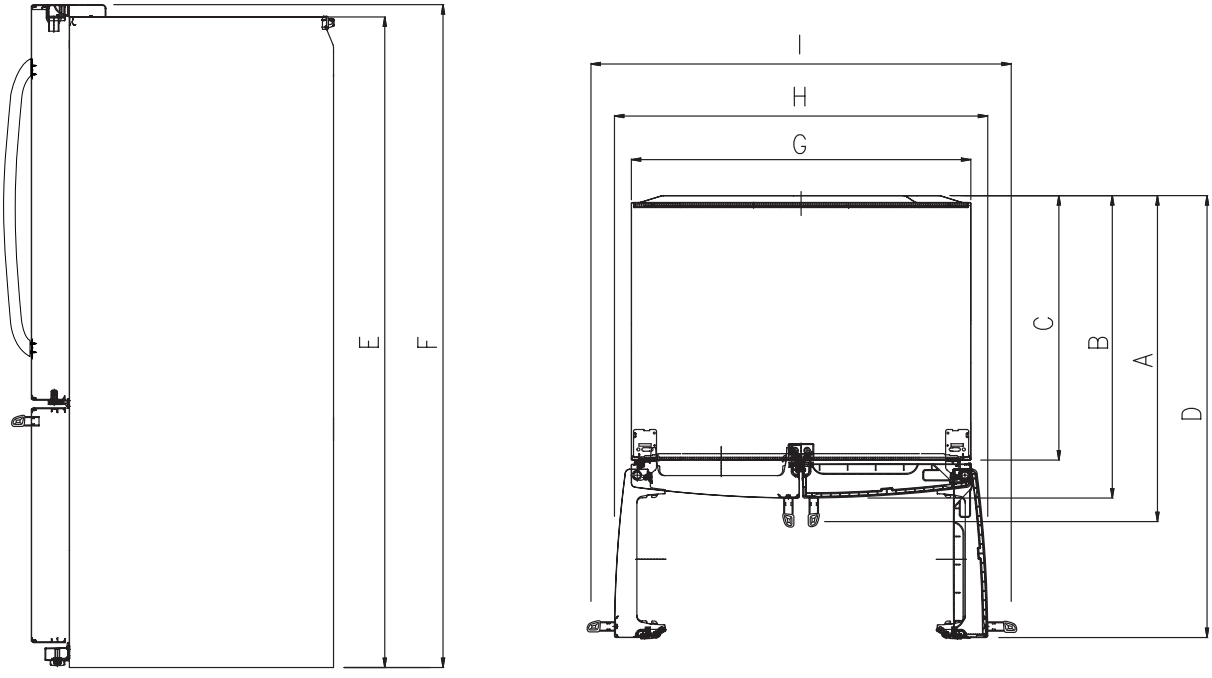
1-1 LFX28978**

● **28 cu.ft.**

ITEMS	SPECIFICATIONS
DOOR DESIGN	Side Rounded
DIMENSIONS (inches)	35 3/4 X 35 3/8 X 69 3/4 (WXDXH) 28cu.ft.
NET WEIGHT (pounds)	155kg (342lb)
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

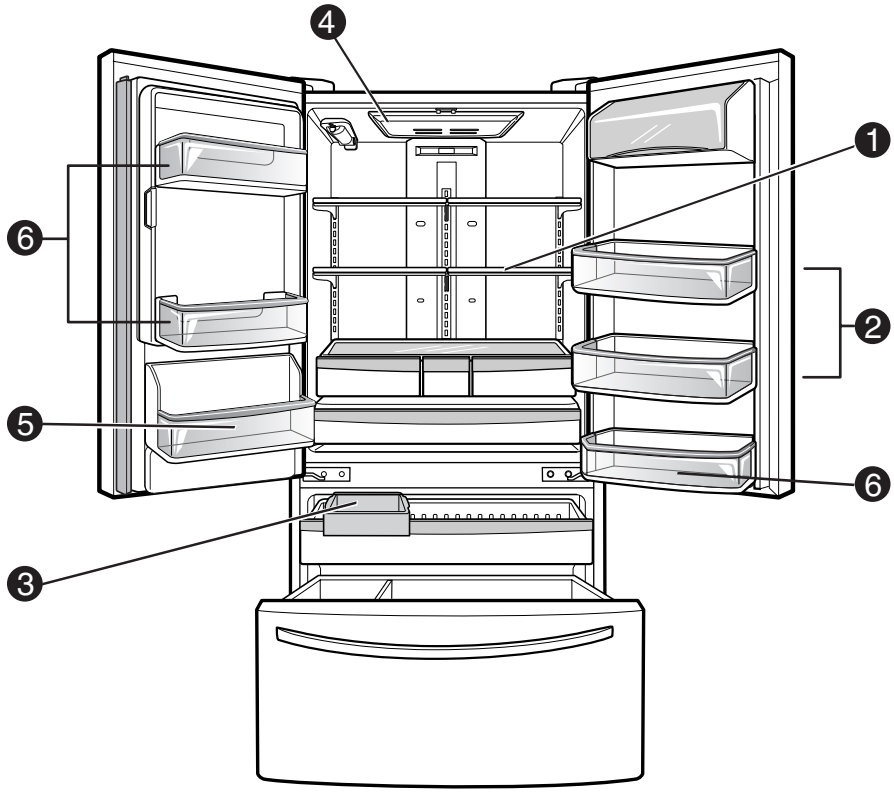
ITEMS		SPECIFICATIONS
VEGETABLE TRAY		Clear Drawer Type
COMPRESSOR		Linear
EVAPORATOR		Fin Tube Type
CONDENSER		Spiral Condenser
REFRIGERANT		R-134a (140 g)
LUBRICATING OIL		ISO10 (280 ml)
DEFROSTING DEVICE		SHEATH HEATER
LAMP	REFRIGERATOR	LED Module(24)
	FREEZER	Bulb Lamp

● **DIMENSIONS**



Description		LFX28978**
Depth w/ Handles	A	35 3/8 in
Depth w/o Handles	B	32 7/8 in
Depth w/o Door	C	29 in
Depth (Total with Door Open)	D	47 5/8 in
Height to Top of Case	E	68 3/8 in
Height to Top of Door Hinge	F	69 3/4 in
Width	G	35 3/4 in
Width (door open 90 deg. w/o handle)	H	39 1/4 in
Width (door open 90 deg. w/ handle)	I	44 1/4 in

2. PARTS IDENTIFICATION



1 ADJUSTABLE REFRIGERATOR SHELVING

The refrigerator compartment shelves are adjustable to allow flexibility for storage needs.

2 GALLON STORAGE BINS

Three interchangeable bins can be arranged to suit your storage needs.

3 REMOVABLE ICE STORAGE BIN

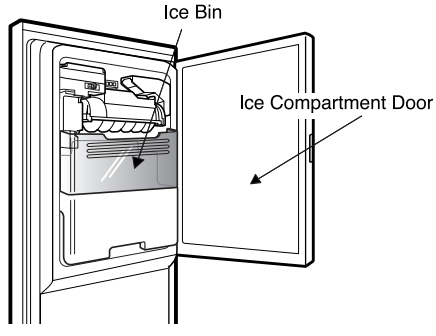
The ice storage bin can be removed to fill ice buckets, coolers, or pitchers.

4 LED INTERIOR LAMPS

Refrigerator interior is lit by the LED array.

5 CAN STORAGE BIN

6 FIXED DOOR BIN



3. DISASSEMBLY

3-1 REMOVING AND REPLACING REFRIGERATOR DOORS

● **Removing Refrigerator Door**

⚠ **CAUTION:** Before you begin, unplug the refrigerator. Remove food and bins from doors.

▶ **Left Door -FIG. 2**

1. Disconnect water supply tube by pushing back on the disconnect ring (3).-FIG. 1
2. Open door. Loosen top hinge cover screw (1).
   Use flat tip screwdriver to pry back hooks on front underside of cover (2). Lift up cover.
3. Disconnect door switch wire harness and remove the cover.
4. Pull out the tube.
5. Disconnect all 3 wiring harnesses (4). Remove the grounding screw (5).
6. Rotate hinge lever (6) counterclockwise. Lift top hinge (7) free of hinge lever latch (8).

⚠ **CAUTION:** When lifting hinge free from the latch, be careful that door does not fall forward.

7. Lift door from middle hinge pin and remove door.
8. Place the door with the insides facing up, on a not scratch surface.

▶ **Right Door -FIG. 3**

1. Open the door, remove 1 screw on the top of the hinge cover. Loosen top hinge cover screw (1). Lift up cover (2).
2. Disconnect door switch wire harness and remove the cover.
3. Rotate hinge lever (3) clockwise. Lift top hinge (4) free of hinge lever latch (5).
4. Lift door from middle hinge pin and remove door.

⚠ **CAUTION:** When lifting hinge free from the latch, be careful that the door does not fall forward.

5. Place the door with the insides facing up, on a not scratch surface.

Figure 2

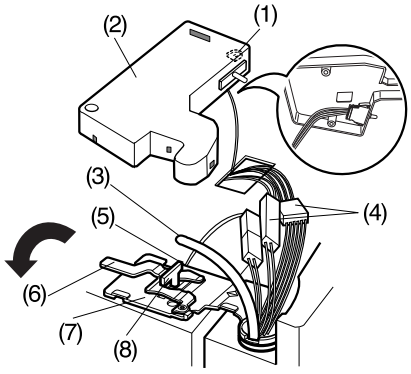
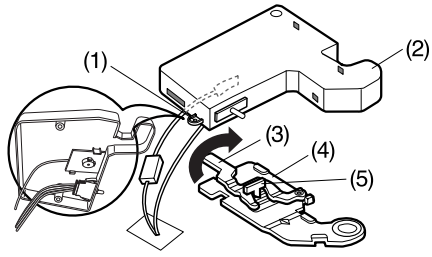


Figure 3



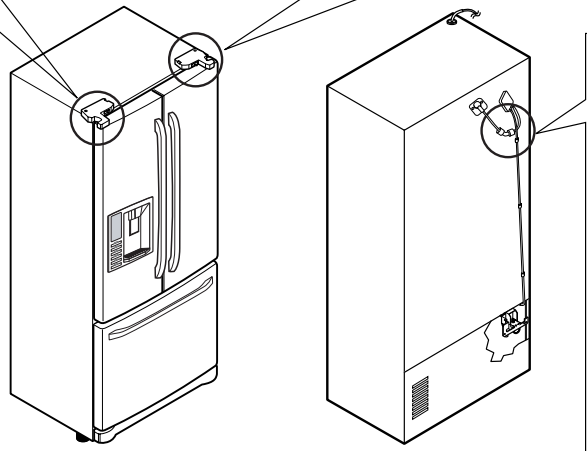
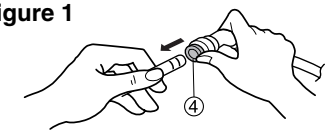
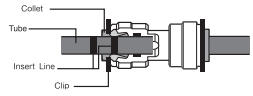


Figure 1





1) Insert the tube until you can see only one of the lines printed on the tube.
2) After inserting, pull the tube to ascertain that it is secure.
3) Assemble clip.

3-2 DOOR

● **Mullion Removal**

1. Remove 2 screws.

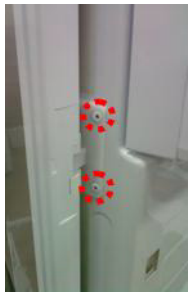


Figure 1

2. Lift Mullion up carefully.

Figure 2

3. Disconnect wire harness.

Figure 3

● **Door Gasket Removal**

1. Remove gasket

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

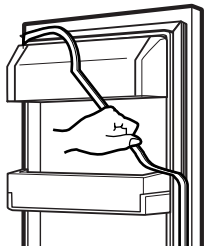


Figure 4

● **Door Gasket Replacement**

1. Insert gasket into channel

Press gasket into channels on the four remaining sides of door.

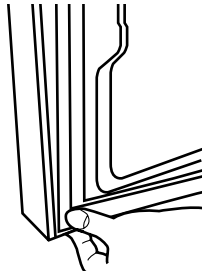


Figure 5

● **Mullion Replacement**

1. Connect wire harness.

Figure 6

2. Insert mullion into the channel.

Insert the cover assembly into bracket, door.

Figure 7

3. Assemble 2 screws.

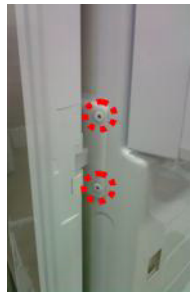


Figure 8

3-3 Door Alignment

If the space between the door are uneven,
follow the instructions to align them.
Remove the Base Grillie. Turn the leveling legs counter clock wise to raise or clock wise to lower the height of the front of the refrigerator by using flat blade screw driver or 11/32" wrench. Use the wrench (Included with the User Manual) to adjust the bolt in the door hinge to adjust the height. (CCW to raise or CW to lower the height.)

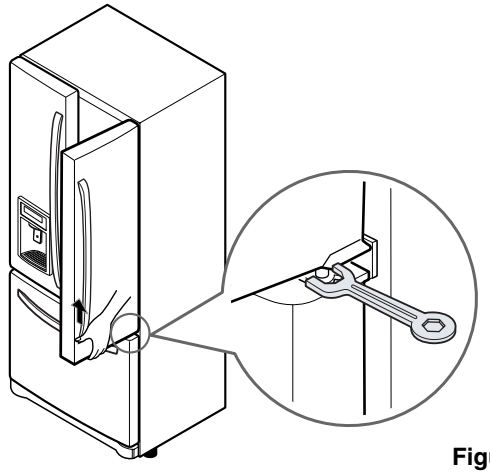


Figure 9

3-4 FAN AND FAN MOTOR(EVAPORATOR)

1. Remove the freezer drawer. (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 4 screws and pulling the grille forward.
4. Remove the Fan Motor assembly by loosening 3 screws and disassembling the shroud.
5. Pull out the fan and separate the Fan Motor and Bracket.

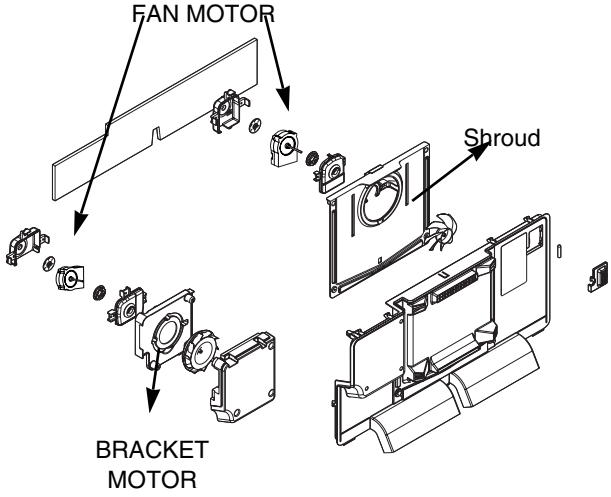


Figure 10

* Ice Fan Scroll Assembly Replacement

1) Remove the plastic guide on the left side, using a phillips screwdriver to remove the screws.
2) Pull off the sensor cover.
3) Remove the grill cover.
4) Gently pull on the grill assembly to remove.
5) Disconnect the wiring harness.
6) Remove all screws on the scroll assembly.

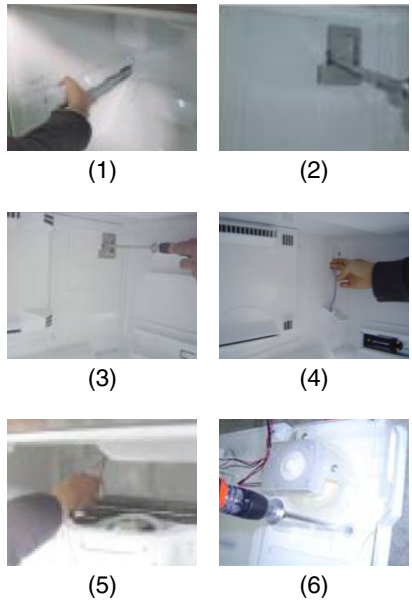


Figure 11

3-5 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 46F(8°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 12)
2. Separate the connector with the Defrost Control assembly and replace the Defrost Control assembly after cutting the Tie Wrap. (Figure 13)

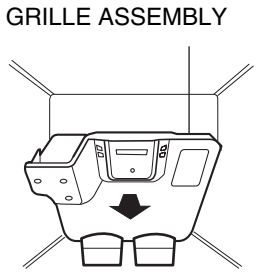


Figure 12

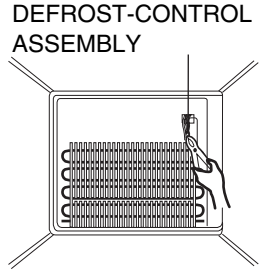


Figure 13

3-6 LAMP

Unplug, or disconnect power at the circuit breaker.
If necessary, remove top shelf or shelves.

3-6-1 Refrigerator Compartment Lamp

1) Release 2 screws.
2) Hold both ends and pull down to remove.

Figure 14

3) To remove the lamp case and cover, release 2 screws as shown.

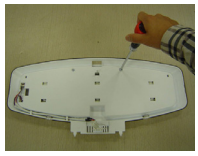


Figure 15

4) Use a flat tool as shown below to remove the lamp cover.

Figure 16

5) To remove the LED assembly, pull apart the cover.

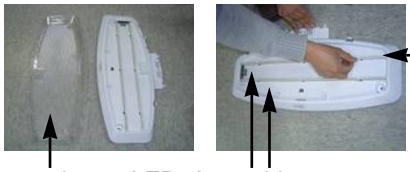


Figure 17

3-6-2 Freezer Compartment Lamp

1. Unplug refrigerator power cord form outlet.
2. Remove screw with driver.
3. Grasp the cover Lamp, pull the cover downward.

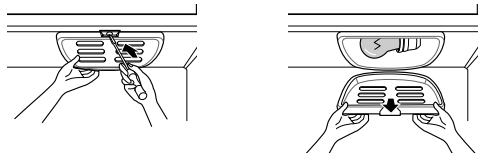


Figure 18

3-7 MULTI DUCT

1. Romove the upper and lower caps with a flat screwdriver and remove 2 screws. (Figure 19)
2. Disconnect the lead wire on the bottom position.

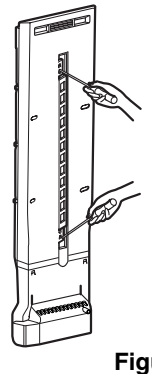


Figure 19

3-8 MAIN PWB

1) Loosen 3 screws on the PWB cover.

Figure 20

2) Remove the PWB cover

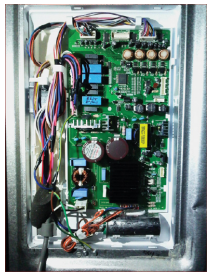


Figure 21

3) Disconnect wire harness and replace the main PWB in the reverse order of removal.

Figure 22

3-9 DISPENSER

Figure 23

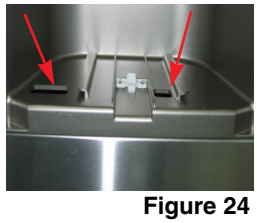


Figure 24

1) Pull out the drain

2) Use these 2 holes to pull out the bottom

Figure 25

3) If nozzle is interfered with button, push and pull out the bottom of button and then pull out the right side.

Figure 26

4) Holding the inner side of the dispenser pull forward to remove.

Figure 27

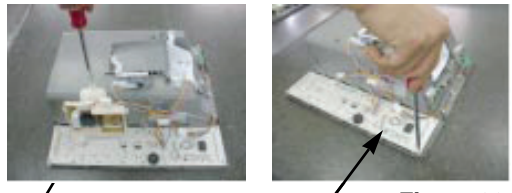
5) Remove the lead wire.

⚠ **CAUTION:** When replacing the dispenser cover make sure the lead wire does NOT come off and the water line is not pinched by the dispenser.

Figure 28

3-10 DISPLAY PCB

As shown below, remove 1 screw on the PCB fixing screw. Remove the display PCB fixing screw.



Case, PCB

Display PCB

Figure 29

3-11 ICE BUTTON ASSEMBLY

1) Remove the 1 screw holding the lever.
2) Remove the spring from the hook.
3) Push and pull on the tab to remove.

Button Lever

Figure 30

3-12 WATER BUTTON ASSMEBLY

1) Remove screws.
2) Grasp the Button assembly and lift.

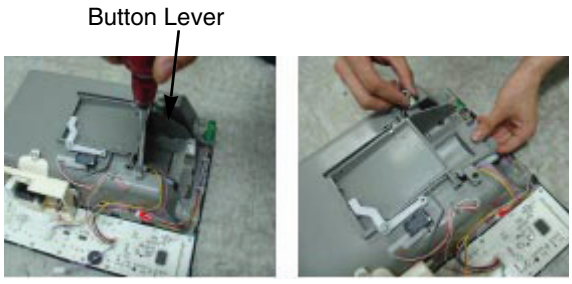


Figure 31

3-13 ICE CORNER DOOR REPLACEMENT

1) Loosen the front screw as shown in the picture.
2) Lift up the hinge with one hand.
3) Pull out the Ice Corner Door with the other hand.

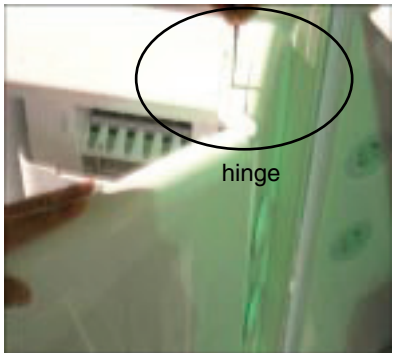


Figure 32

3-14 ICEMAKER REPLACEMENT

1) Remove 4 screws as shown.

Figure 33

2) Grasp the bottom of motor cover assembly and pull slowly.

Figure 34

3) Disconnect wire harness from wall of compartment.

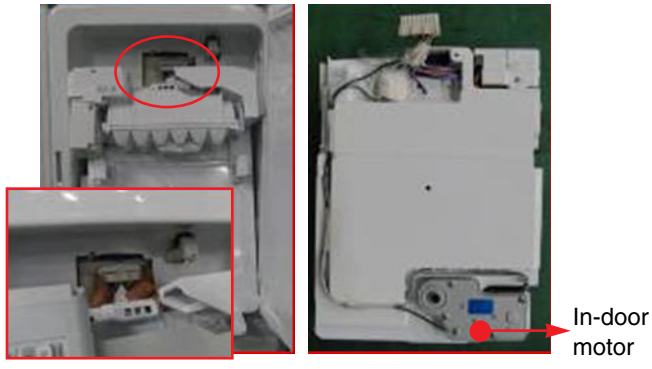


Figure 35

⚠ **CAUTION:** Make sure that the motor housing is taped to the mold, if not positioned correctly the cover will not fit properly.

Figure 36

3-15 SUB PWB FOR WORKING DISPENSER

1) Disconnect the wire harness.

Figure 37

2) Remove 1 screw from PWB and replace with new PWB.

Figure 38

3-16 CAP DUCT MOTOR REPLACEMENT

1) Separate the Housing of the Cap Duct Motor.

Figure 39

2) Unscrew 3 screws to disassemble the motor.

Figure 40

3) When replacing the motor, check the position of the door duct and the link for proper fit.

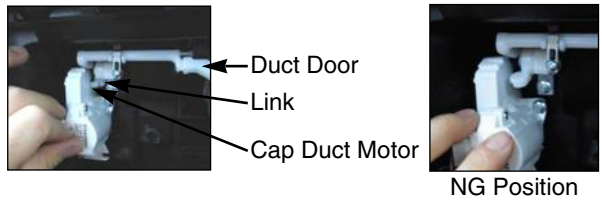


Figure 41

4) Insert 2 screws.

Figure 42

5) Push housing aside.

Figure 43

3-17 HOW TO REMOVE A ICE BIN

1) Grip the handles, as shown.

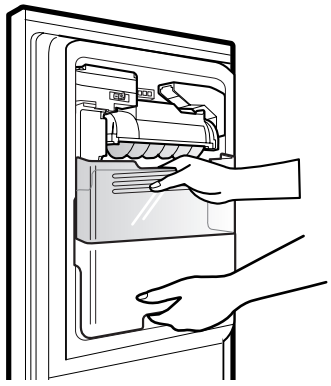


Figure 44

2) Tilt and lift slightly as shown.

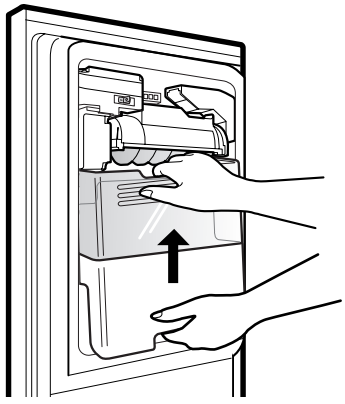


Figure 45

3) Remove ice bin slowly.

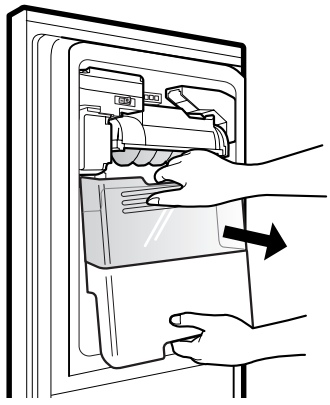


Figure 46

3-18 HOW TO INSERT A ICE BIN

1) Insert the Ice Bin, slightly tilting to avoid touching the Icemaker. (Especially, Ice-Detecting Sensor)

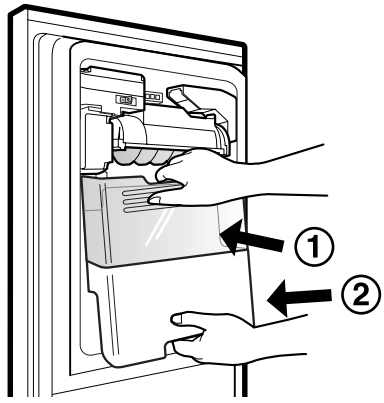


Figure 47

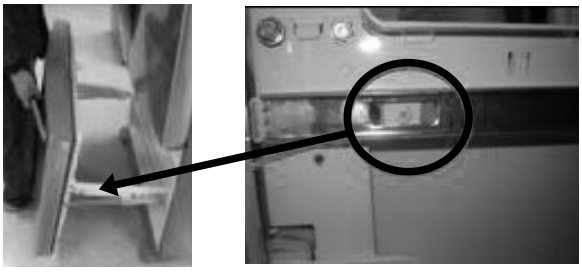
3-19 HOW TO REMOVE AND REINSTALL THE PULLOUT DRAWER

3-19-1 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) Removal of the freezer door is done by lifting clear of the rail support.
Fully extend both rails.

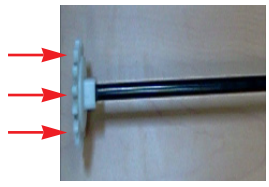
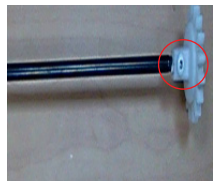
Step 5) Remove only 1 screw of gearice, and disassemble the bar and gearice

Step 6) Remove 2 screws of both side of supporter covers tv and disassemble the supporter cover tv.

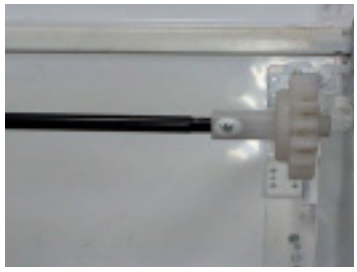
3-19-2 Follow Steps to Reinstall

Step 1) Insert both side of supporter cover tv into connector rails, and then screw them.

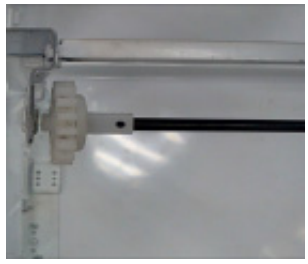

Step 2) ① Assemble a bar and gear ice with screw.
② Push the otherside of the gear to inside of the bar.

Step 3) Put gear ice assembled with the bar by screw into connector rail's hole.



Step 4) Insert opposite gear ice into connector rail and screw them

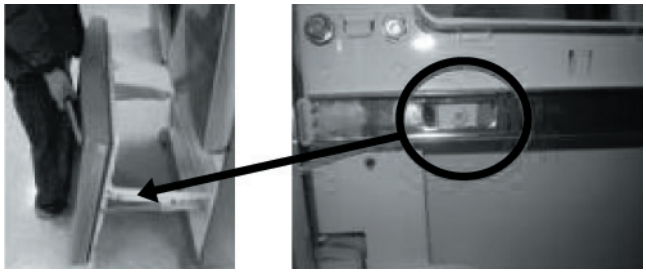



Step 5) The rail system will align itself by pushing the rails all the way into the freezer section.
Pull the rails back out to full extension.


Step 6) Reinstall the freezer door by inserting the rail tabs into the guide rail.

* Assemble them like as pictures


Step 7) Reinstall the two screws into the guide rails (one from each side).



Step 8) Reinstall the lower basket, and close the freezer door.

3-20 WATER VALVE DISASSEMBLY METHOD

1) Turn off the water to unit. Remove the waterline from the valve.

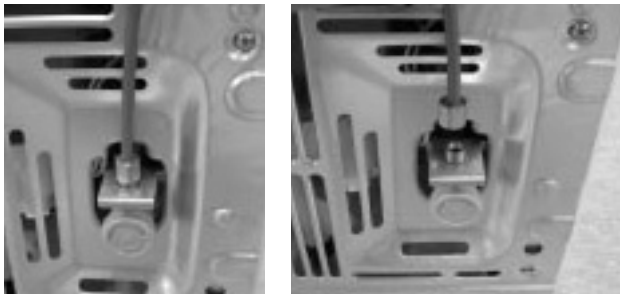


Figure 60

2) Remove cover and 1 screw from the valve.

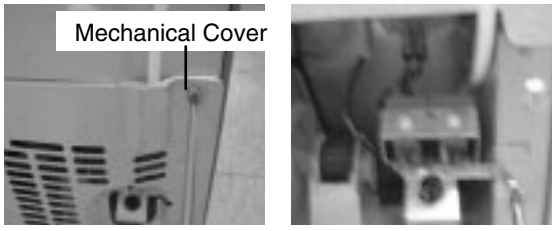


Figure 61

3) Separate the housing and remove the valve.

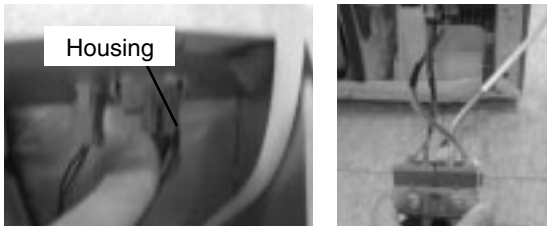


Figure 62

4) Remove the clip, and press the collet to separate the tube from the connector. Note: there maybe some water in the line.

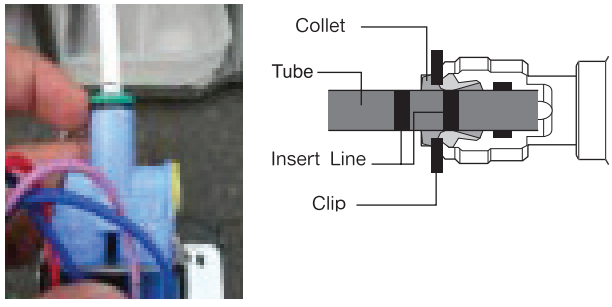


Figure 63

3-21 FAN AND FAN MOTOR DISASSEMBLY METHOD

1) Remove screws for the Drain Pipe Assembly and the 1 connected to the Motor Cover.

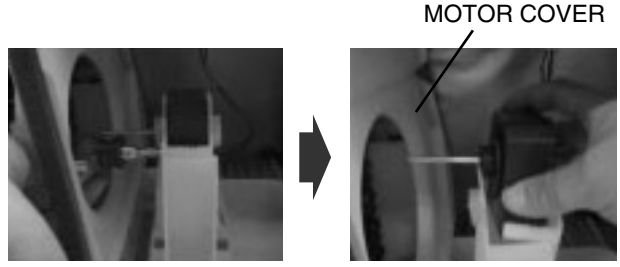


Figure 64

2) Separate the Fan Assembly and Motor, turn counter clockwise to remove from the motor shaft.

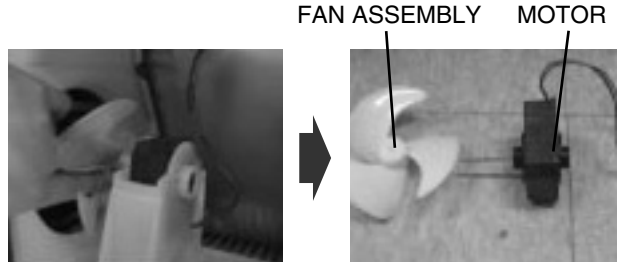


Figure 65

Assemble in reverse order. Taking care to avoid.

1. Do not to bend the tube during assembly.
2. Press the Water Dispenser button letting water pour out, this checks for any leaks in the tube connection, this may vary depending on the water pressure (about 2 minutes.).

3-22 Drawer Removal

Fully extend the drawer and lift from the front pulling straight out.

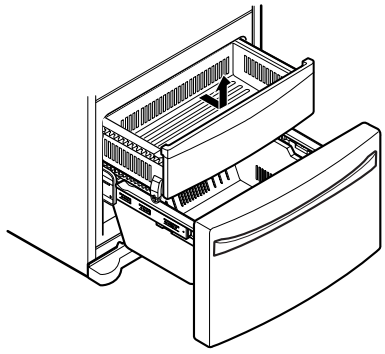


Figure 66

To install the drawer back into the frame, tilt the front sightly and pushingt back into place.

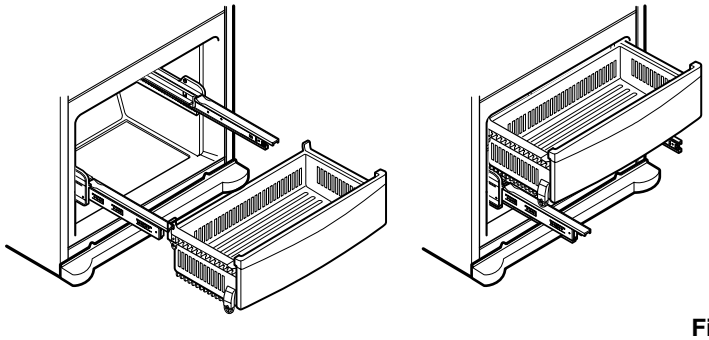


Figure 67

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 Note for Usage

(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 Cover PTC Compressor may fail due to breakdown of their insulating capabilities.
(4) Always use the Parts 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. Use only approved substitute parts.

4-1-3 Remove the cover PTC


(1) Remove the Cover Back M/C


(2) Loosen two screws on comp base

(3) Use a L-shaped flap tooll to pry off the cover
(4) Assembly in reverse order of disassembly

4-2-3 Compressor protection logic

- Since linear Comp conducts linear reciprocating motion, we have protection logic for compressor, motor and PCB as the below.

- Stroke Trip
  During the operation, if stroke is above the target value, decrease the target volt by 3V.

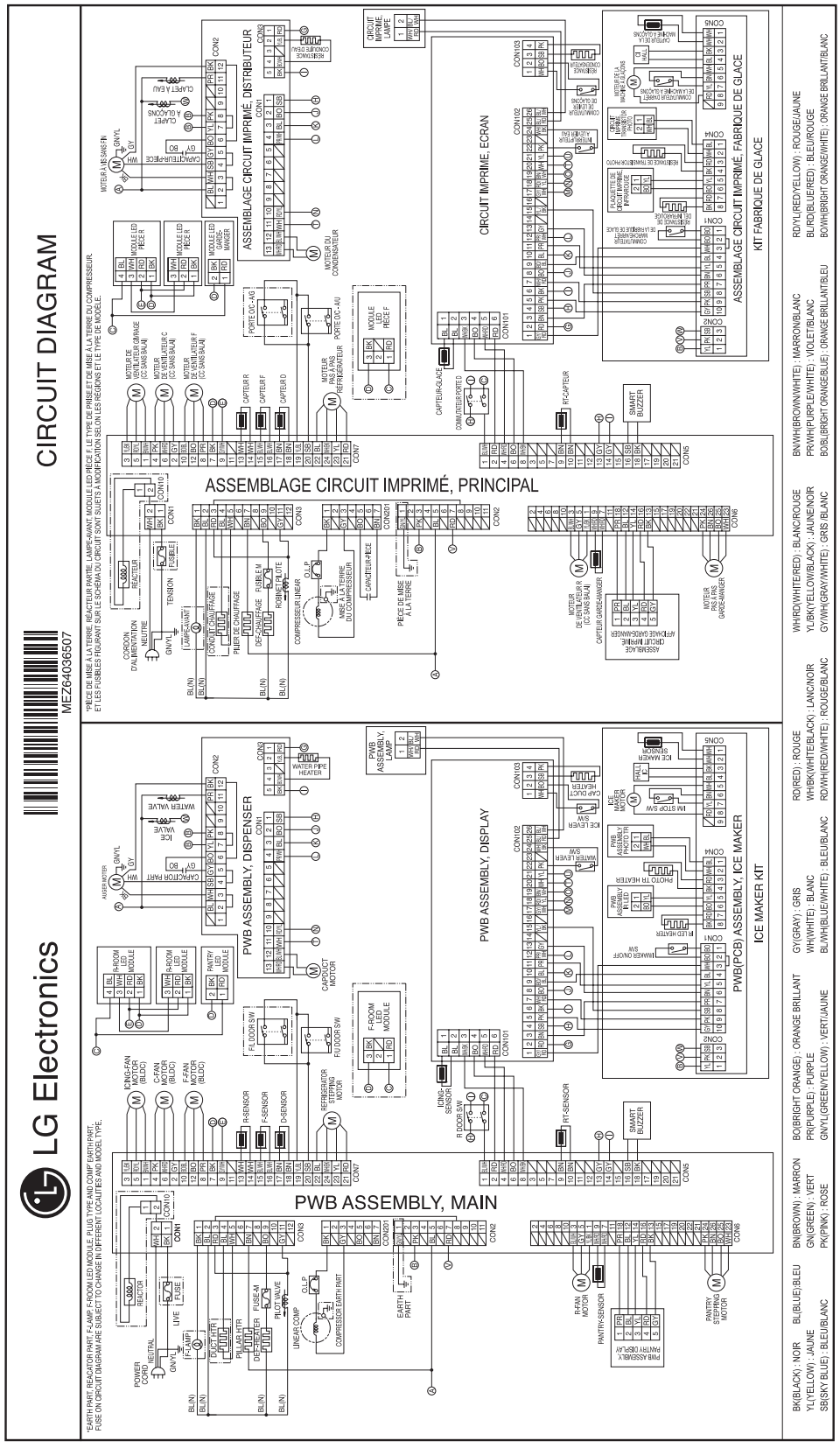
- Current Trip
  Current trip is set in order to protect compressor mechanical part and drive from the overcurrent that might arise during the operation.
  Check the current for every 416.7us and if the Trip exceeds 1.86Arms more than three times at Comp ON, forcibly stop and restart six minutes later.

- Lock Piston Trip
  If stroke is under 5mm even if the current is more than 14Arms, Take it as 'piston lock' and restart after 2'30" of Comp OFF. Check the current and stroke for every 416.7us and if the condition fits more than three times at Comp ON, the Trip occurs.

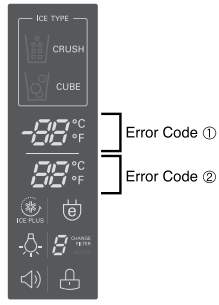
- IPM fault Trip
  It occurs if FO signal received from IPM is LOW. For every 416.7us, check whether FO signal is LOW. The trip occurs if it is found three times during the five periods(83ms).

5. CIRCUIT DIAGRAM

LFX28978**



6. TROUBLESHOOTING



6-1 Error Code Summary

⚠ **WARNING:** When checking Resistance values, make sure to turn off the power, and wait for the voltage to discharge.

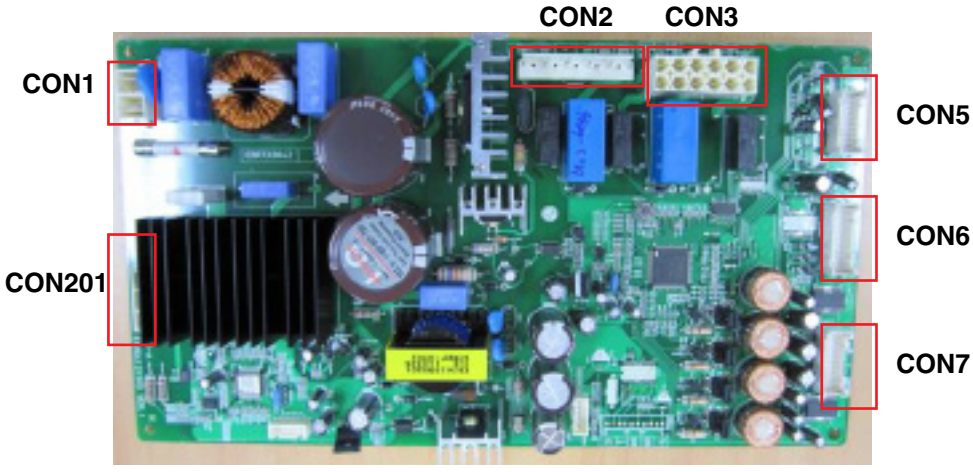
NOTE) Within 3 hours after the error : Press the Ice Plus button and Freezer button simultaneously
3 hours after the error : All errors, except for "Er rt", "Er SS",
"Er IS(except for Icing sensor)", "Er gF", "Er It" error, are displayed.
"Er IS" which is displayed without input of user is the error of Icing Sensor.

NO	Error Detection Category	Error Display		Error Generation Factors	Remark
		Freezer Temperature (Error code ①)	Refrigerator Temperature (Error code ②)		
1	Normal			None	Normal operation of Display
2	Freezer Sensor Error	Er	FS	Short or Disconnection of Freezer Sensor	Check each sensor at it's connector.
3	Refrigerator Sensor Error	Er	rS	Short or Disconnection of Refrigerator Sensor	
4	Defrosting Sensor Error	Er	dS	Short or Disconnection of Defrosting Sensor	
5	Icing Sensor Error	Er	IS	Short or disconnection of the sensor about Ice maker (Icing sensor, Ice maker sensor)	
6	Pantry sensor error	Er	SS	Short or Disconnection of Pantry Sensor	
7	Room Temp Sensor Error	Er	rt	Short or Disconnectoin of Room temp.sensor	
8	Ice maker kit defect	Er	It	Other Electric system error such as moter, gear, Hall IC, operation circuit within I/M kit	When the ice does not drop even when the I/M Test S/W is pressed
9	Flow Meter(Sensor) Defect	Er	gF	Error of flow meter or water input or low water pressure	Error of flow meter or water input or low water pressure or flow meter connection
10	Poor Defrosting	Er	dH	Even though it is passed 1 hour since then Defrosting, if Defrosting sensor is not over 46°F(8°C), it is caused	Temperature Fuse Disconnection, Heater disconnection, DRAIN Jam, Poor Relay for Heater
11	Abnormality of BLDC FAN Motor for Ice Making	Er	IF	It is caused when feedback signal isn't over 65 seconds during BLDC FAN motor operating	Poor BLDC Motor connection, DRIVE IC, and TR
12	Abnormality of BLDC FAN Motor for Freezer	Er	FF	It is caused when feedback signal isn't over 65 seconds during BLDC FAN motor operating	Poor BLDC Motor connection, DRIVE IC, and TR
13	Abnormality of BLDC FAN MOTOR For Refrigerator	Er	rF	It is caused when feedback signal isn't over 65 seconds during BLDC FAN motor operating	Poor BLDC Motor connection, DRIVE IC, and TR
14	Abnormality of BLDC FAN Motor for Mechanic Room	Er	CF	It is caused when feedback signal isn't over 65 seconds during BLDC FAN motor operating	Poor BLDC Motor connection, DRIVE IC, and TR
15	Communication Error	Er	CO	Communication Error between Micom of Main PCB and Display Micom	Poor Communication connection,Poor TR of Transmitter and Receiver Tx/Rx between display and main board.

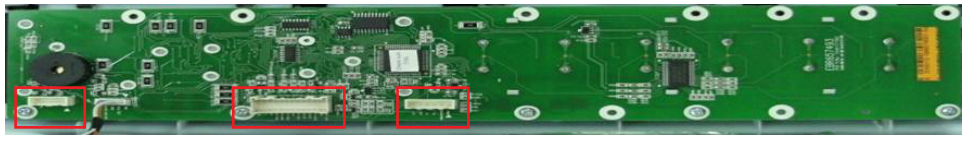
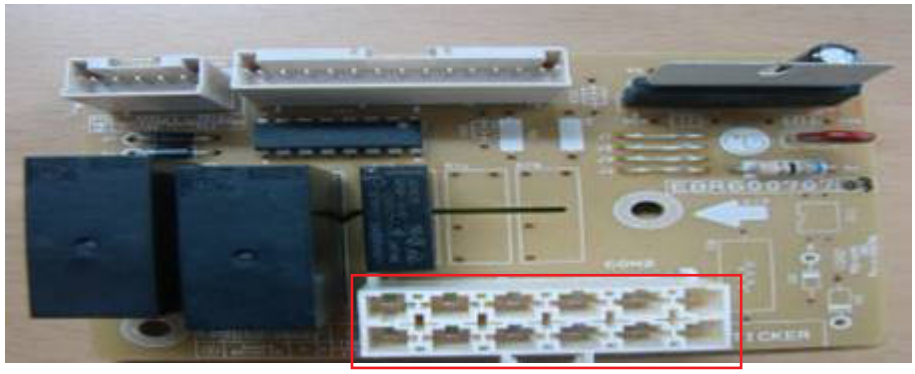
7. PCB PICTURE

7-1 Main PCB

● LFX28978**

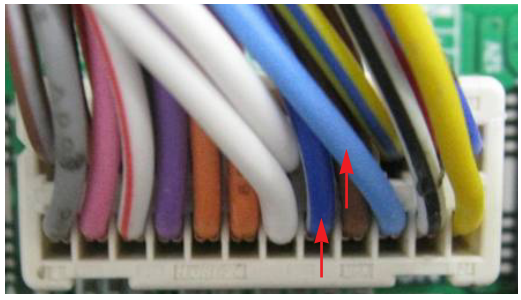
P/No & MFG	Picture
EBR73304210 (2011.05~)	

7-2 Display PCB & Sub PCB

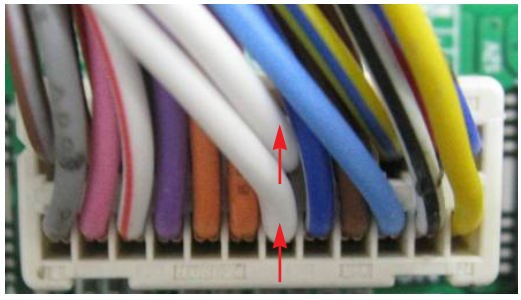
P/No	Picture
Display PCB **EBR65749303** **(2011.05~)**	
	 **CON103** **CON102** **CON101**
Sub PCB **EBR60070707** **(2010.02~)**	 **CON2**

8. Troubleshooting With Error Display

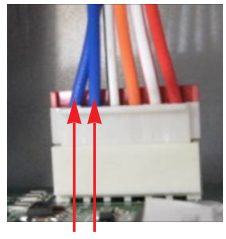
8-1 Freezer Sensor Error (Er FS)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check for a loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the Blue/White to Blue/White at CON7 on the main PCB
 
<CON7></td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr>
<tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance (Table-1)</td></tr>
</table>
<Temperature table-1>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>-22°F / −30°C</td><td>40 kΩ</td></tr>
<tr><td>-13°F / −25°C</td><td>30 kΩ</td></tr>
<tr><td>-4°F / −20°C</td><td>23 kΩ</td></tr>
<tr><td>5°F / −15°C</td><td>17 kΩ</td></tr>
<tr><td>14°F / −10°C</td><td>13 kΩ</td></tr>
<tr><td>23°F / −5°C</td><td>10 kΩ</td></tr>
<tr><td>32°F / 0°C</td><td>8 kΩ</td></tr>
</table>
※ The sensor is determined by the temperature.
For example, 23kΩ indicates -4°F.
</td></tr>
</table>

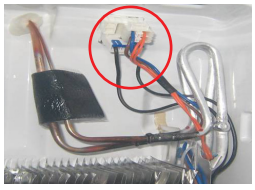
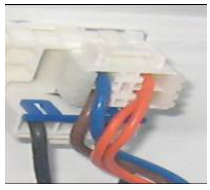
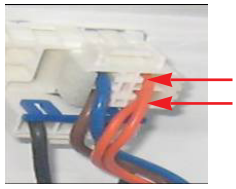
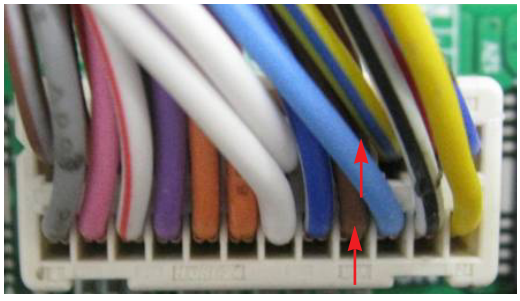
8-2 Refrigerator Sensor Error (Er rS)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check for a loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the White to White at CON7 on the main PCB
 
<CON7></td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr>
<tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance (Table-2)</td></tr>
</table>
<Temperature table-2>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>23°F / −5°C</td><td>38 kΩ</td></tr>
<tr><td>32°F / 0°C</td><td>30 kΩ</td></tr>
<tr><td>41°F / 5°C</td><td>24 kΩ</td></tr>
<tr><td>50°F / 10°C</td><td>19.5 kΩ</td></tr>
<tr><td>59°F / 15°C</td><td>16 kΩ</td></tr>
</table>
※ The sensor is determined by the temperature.
For example, 30kΩ indicates 32°F.
</td></tr>
</table>

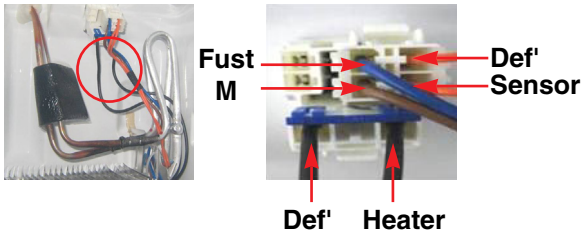
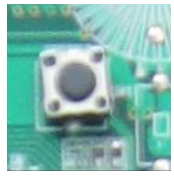
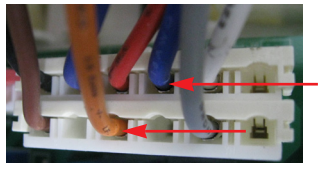
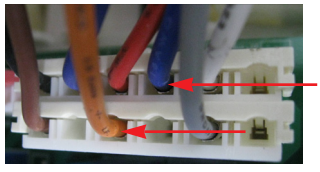
8-3 Icing Sensor Error (Er IS)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check for a loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the <u>Blue to Blue.</u>
  
 
CON101 
 
<Display> <CON101></td><td>
<table>
<tr><th colspan="2">Result</th><th>SVC Action</th></tr>
<tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr>
<tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr>
<tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance (Table-1)</td></tr>
</table>
<Temperature table-1>
<table>
<tr><th>(1) To (2)</th><th>Result</th></tr>
<tr><td>-22°F / −30°C</td><td>40 kΩ</td></tr>
<tr><td>-13°F / −25°C</td><td>30 kΩ</td></tr>
<tr><td>-4°F / −20°C</td><td>23 kΩ</td></tr>
<tr><td>5°F / −15°C</td><td>17 kΩ</td></tr>
<tr><td>14°F / −10°C</td><td>13 kΩ</td></tr>
<tr><td>23°F / −5°C</td><td>10 kΩ</td></tr>
<tr><td>32°F / 0°C</td><td>8 kΩ</td></tr>
</table>
※ The sensor is determined by the temperature.
For example, 23kΩ indicates -4°F.
</td></tr>
</table>

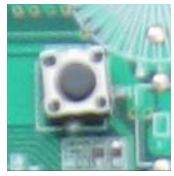
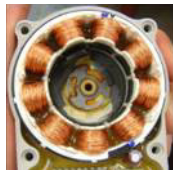
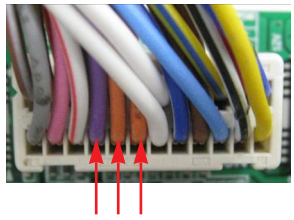
8-4 Defrost Sensor Error (F dS)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check for a loose connection.
   </td><td></td></tr>
<tr><td>2</td><td>Check the <u>Orange to Orange.</u>
 
Check the <u>Brown to Brown</u> at CON7 on the main PCB
 
<CON7>
<table><tr><th colspan="2">Result</th><th>SVC Action</th></tr><tr><td>0 Ω</td><td>Short</td><td>Change the sensor</td></tr><tr><td>OFF</td><td>Open</td><td>Replace the refrigerator</td></tr><tr><td>Other</td><td>Normal</td><td>Check the Temp and resistance (Table-3)</td></tr></table><Temperature table-3><table><tr><th>(1) To (2)</th><th>Result</th></tr><tr><td>23°F / −5°C</td><td>38 kΩ</td></tr><tr><td>32°F / 0°C</td><td>30 kΩ</td></tr><tr><td>41°F / 5°C</td><td>24 kΩ</td></tr><tr><td>50°F / 10°C</td><td>19.5 kΩ</td></tr><tr><td>59°F / 15°C</td><td>16 kΩ</td></tr></table>※ The sensor is determined by the temperature.
For example, 30kΩ indicates 32°F.</td></tr>
</table>

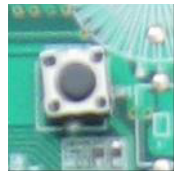
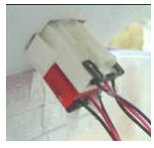
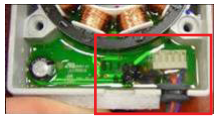
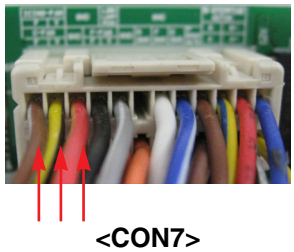
8-5 Defrost Heater Error (Er dH)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the <u>Door gasket.</u></td><td rowspan="2"><table>
<tr><th>Part</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Fuse-M</td><td>0 Ω</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change Controller Assembly (Position No.400A)</td></tr>
<tr><td rowspan="2">Defrost Heater</td><td>34~42 Ω</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change Controller Assembly (Position No.400A)</td></tr>
<tr><td rowspan="2">Defrost Sensor</td><td>0 Ω</td><td>Go to the 3</td></tr>
<tr><td>OFF</td><td>Replace product</td></tr>
</table></td></tr>
<tr><td>2</td><td>Check the <u>Defrost control part.</u>
 
</td></tr>
<tr><td>3</td><td>Input Test 3 Mode.
(Push the button 3 times)</td><td> 
 </td></tr>
<tr><td>4</td><td>Check the <u>Blue(Pin4) to Orange(Pin9)</u> at CON3 on the main PCB
 
<CON3></td><td><table>
<tr><th>Result</th><th>SVC Action</th></tr>
<tr><td>112 ~ 116 V</td><td>Go to the 5</td></tr>
<tr><td>0 V</td><td>Replace Main PCB</td></tr>
</table></td></tr>
<tr><td>5</td><td>Release the test mode.
push the button 1 times. (normal)</td><td>  </td></tr>
<tr><td>6</td><td>Check the <u>Blue(Pin4) to Orange(Pin9)</u> at CON3 on the main PCB
 
<CON3></td><td><table>
<tr><th>Result</th><th>SVC Action</th></tr>
<tr><td>0 V</td><td>Explain to customer</td></tr>
<tr><td>112 ~ 116 V</td><td>Replace Main PCB</td></tr>
</table></td></tr>
</table>

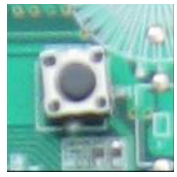
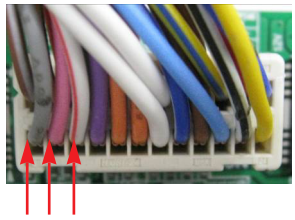
8-6 Freezer Fan Error (Er FF)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Reset the unit and
Input Test 1 Mode.
(Push the button 1 time)</td><td> 
 
</td></tr>
<tr><td>2</td><td>Open the freezer door and Check the air flow.
※ While an error code is displayed, the fan is not working.</td><td> 
<table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>No windy</td><td>Go to 3</td></tr><tr><td>Windy</td><td>Go to 4</td></tr></table></td></tr>
<tr><td>3</td><td>Check the <u>Fan motor.</u>
    </td><td>Rotate fan using your hand.
It feel sticky, change the motor.
(cause of ice or rust inside of motor)</td></tr>
<tr><td>4</td><td>Check the <u>Fan motor voltage.</u>
 
(1)Pin8, (2)Pin10, (3)Pin12
 
<CON7></td><td><table><tr><th>Point</th><th>Result</th><th>SVC Action</th></tr><tr><td>(2) ~ (3)</td><td>Below 7 V</td><td>Change the PCB</td></tr><tr><td>(1) ~ (3)</td><td>0 or 5 V</td><td>Change the motor</td></tr></table></td></tr>
</table>

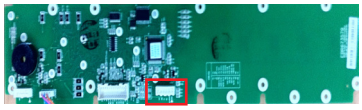
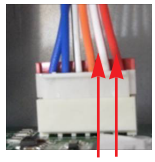
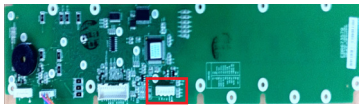
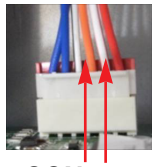
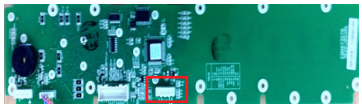
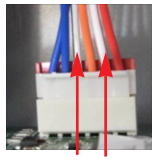
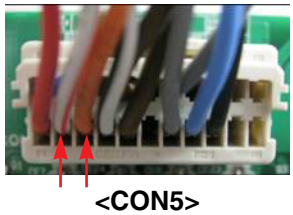
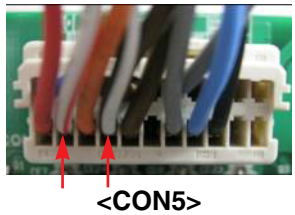
8-7 Icing Fan Error (Er IF)

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Reset the unit and
Input Test 1 Mode.
(Push the button 1 time)</td><td>   </td></tr>
<tr><td>2</td><td>Open the refrigerator door and Check the air flow.
※ While an error code is displayed, the fan is not working.</td><td> 
<table>
<tr><th>Status</th><th>SVC Action</th></tr>
<tr><td>No windy</td><td>Go to the 3,4</td></tr>
<tr><td>Windy</td><td>Go to the 5</td></tr>
</table></td></tr>
<tr><td>3</td><td>Check the <u>Connector.</u>
(Frozen caused the PCB short)
    </td><td rowspan="2"></td></tr>
<tr><td>4</td><td>Check the <u>Fan motor.</u>
(Frozen, Lock, ect.)
   
  </td></tr>
<tr><td>5</td><td>Check the <u>Fan motor voltage.</u>
 
(1)Pin1, (2)Pin3, (3)Pin5
 
<CON7></td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>(2) ~ (3)</td><td>Below 7 V</td><td>Change the PCB</td></tr>
<tr><td>(1) ~ (3)</td><td>0 or 5 V</td><td>Change the motor</td></tr>
</table></td></tr>
</table>

8-8 Condenser Fan Error (Er CF)

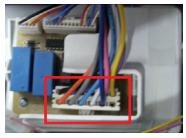
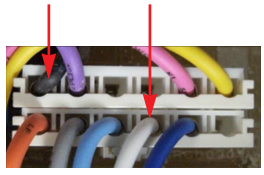
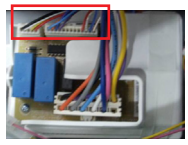
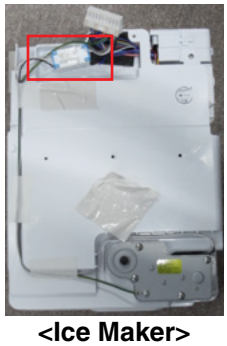
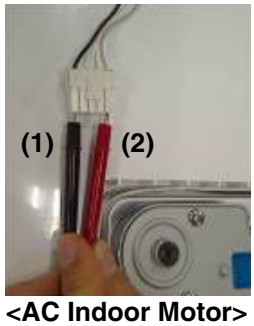
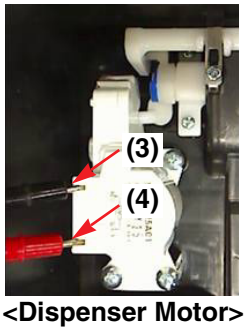
<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Reset the unit and
Input Test 1 Mode.
(Push the button 1 time)</td><td>   </td></tr>
<tr><td>2</td><td>Check the fan rotating.
※ While an error code is displayed,
the fan is not working.</td><td> 
<table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>No windy</td><td>Go to the 3</td></tr><tr><td>Windy</td><td>Go to the 4</td></tr></table></td></tr>
<tr><td>3</td><td>Check the <u>Fan motor</u> and <u>surrounding.</u>
  </td><td>Rotate fan using your hand.
It feel sticky, change the motor.</td></tr>
<tr><td>4</td><td>Check the <u>Fan motor voltage.</u>
 
(1)Pin2, (2)Pin4, (3)Pin6
 
<CON7></td><td><table><tr><th>Point</th><th>Result</th><th>SVC Action</th></tr><tr><td>(2) ~ (3)</td><td>Below 7 V</td><td>Change the PCB</td></tr><tr><td>(1) ~ (3)</td><td>0 or 5 V</td><td>Change the motor</td></tr></table></td></tr>
</table>

8-9 Communication Error (Er CO)

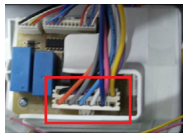
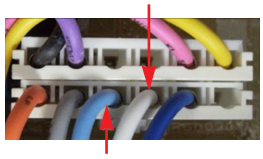
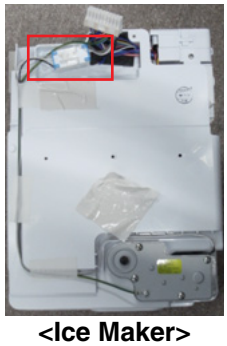
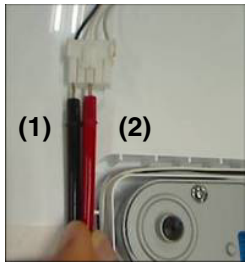
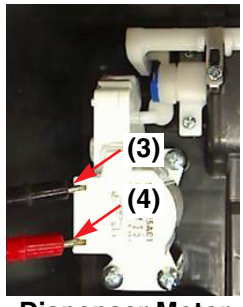
<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the loose connection.</td><td></td></tr>
<tr><td>2</td><td>Check the Red to White/Red.
 
CON101
<Display>
 
<CON101></td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>12 V</td><td>Go to the 3</td></tr><tr><td>Other</td><td>Check the Hinge
(loose connection)
Change the Main PCB</td></tr></table></td></tr>
<tr><td>3</td><td>Check the Orange to White/Red.
 
CON101
<Display>
 
<CON101></td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 or 5 V</td><td>Change the Display PCB</td></tr><tr><td>Other</td><td>Go to the 4</td></tr></table></td></tr>
<tr><td>4</td><td>Check the White/Black to White/Red.
 
CON101
<Display>
 
<CON101></td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 or 5 V</td><td>Change the Main PCB</td></tr><tr><td>Other</td><td>Go to the 5</td></tr></table></td></tr>
<tr><td>5</td><td>Check the White/Red to Orange.
 
 
<CON5></td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 or 5 V</td><td>Change the Display PCB</td></tr><tr><td>Other</td><td>Go to the 6</td></tr></table></td></tr>
<tr><td>6</td><td>Check the White/Red to White/Black.
 
 
<CON5></td><td><table><tr><th>Result</th><th>SVC Action</th></tr><tr><td>0 or 5 V</td><td>Change the Main PCB</td></tr><tr><td>Other</td><td>Explain to customer</td></tr></table></td></tr>
</table>

9. Troubleshooting Without Error Display

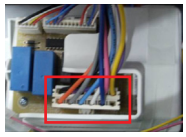
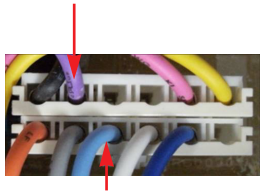
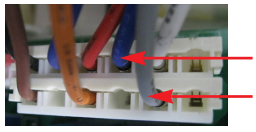
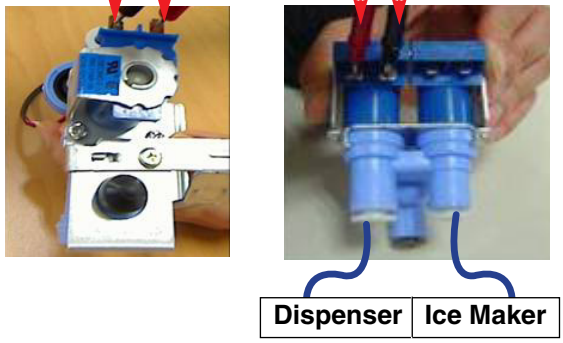
9-1 Cube mode doesn't work

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the loose connection on the Dispenser PCB</td><td></td></tr>
<tr><td>2</td><td>Check the Black to White on the Dispenser PCB (While pushing the Ice Button)
  
<CON2></td><td>
<table>
<tr><th>Ice Button</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Pushing</td><td>112 ~ 115 V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
<tr><td rowspan="2">Not pushing</td><td>0 ~2 V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check the RED to White Red.
(While pushing the lever S/W)
   
<CON3> <CON1></td><td>
<table>
<tr><th>Ice Button</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Pushing</td><td>9 ~ 12 V</td><td>Go to the 4</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
<tr><td rowspan="2">Not pushing</td><td>0 ~2 V</td><td>Go to the 4</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the resistance value.
 
<Ice Maker>
 
<AC Indoor Motor>
 
<Dispenser Motor></td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">(1) to (2)</td><td>31.1 ~ 42.1 Ω</td><td>Explain</td></tr>
<tr><td>Other</td><td>Replace
<AC Indoor Motor></td></tr>
<tr><td rowspan="2">(3) to (4)</td><td>9.9 ~ 12.1 Ω</td><td>Explain</td></tr>
<tr><td>Other</td><td>Replace
<AC Indoor Motor></td></tr>
</table>
</td></tr>
</table>

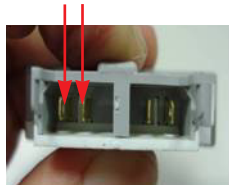
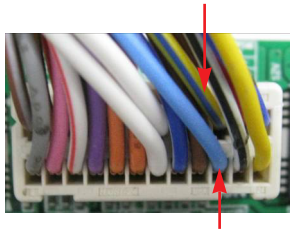
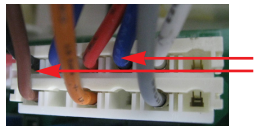
9-2 Cube mode doesn't work

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the loose connection on the Dispenser PCB</td><td></td></tr>
<tr><td>2</td><td>Check the Skyblue to White on the Dispenser PCB (While pushing the Ice Button)
  
<CON2></td><td>
<table>
<tr><th>Ice Button</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Pushing</td><td>112 ~ 115 V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
<tr><td rowspan="2">Not pushing</td><td>0 ~ 2 V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check the <u>RED to White Red.</u>
(While pushing the Ice Button)
   
<CON3> <CON1></td><td>
<table>
<tr><th>Ice Button</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Pushing</td><td>9 ~ 12 V</td><td>Go to the 4</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
<tr><td rowspan="2">Not pushing</td><td>0 ~ 2 V</td><td>Go to the 4</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the resistance value.
 
<Ice Maker>
 
<AC Indoor Motor>
 
<Dispenser Motor></td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">(1) to (2)</td><td>31.1 ~ 42.1 Ω</td><td>Explain</td></tr>
<tr><td>Other</td><td>Replace
<AC Indoor Motor></td></tr>
<tr><td rowspan="2">(3) to (4)</td><td>9.9 ~ 12.1 Ω</td><td>Explain</td></tr>
<tr><td>Other</td><td>Replace
<AC Indoor Motor></td></tr>
</table>
</td></tr>
</table>

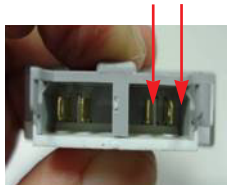
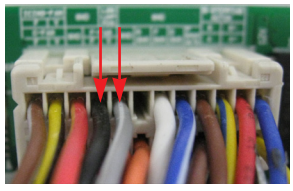
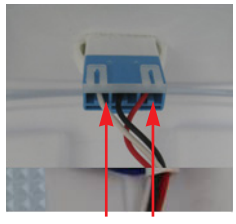
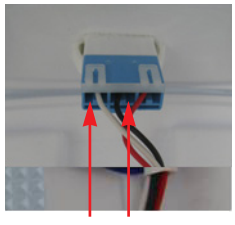
9-3 Water mode doesn't work

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the loose connection on the Dispenser PCB</td><td></td></tr>
<tr><td>2</td><td>Check the Purple to White on the Dispenser PCB (While pushing the Water Button)
  
<CON2></td><td>
<table>
<tr><th>Water Button</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Pushing</td><td>112 ~ 115 V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
<tr><td rowspan="2">Not pushing</td><td>0 ~2 V</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check the Blue to Gray on the Dispenser PCB (While pushing the Water Button)
  
<CON3></td><td>
<table>
<tr><th>Water Button</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Pushing</td><td>112 ~ 115 V</td><td>Go to the 4</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
<tr><td rowspan="2">Not pushing</td><td>0 ~2 V</td><td>Go to the 4</td></tr>
<tr><td>Other</td><td>Dispenser PCB</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the resistance value.
(1) (2) (3) (4)
 
Dispenser | Ice Maker
<Pilot Valve>
Machine Room
<Water Valve>
In door</td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">(1) to (2)</td><td>360 ~ 420Ω</td><td>Explain</td></tr>
<tr><td>Other</td><td>Replace Pilot Valve</td></tr>
<tr><td rowspan="2">(3) to (4)</td><td>360 ~ 420Ω</td><td>Explain</td></tr>
<tr><td>Other</td><td>Replace Water Valve</td></tr>
</table>
</td></tr>
</table>

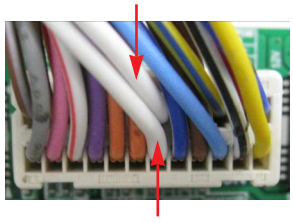
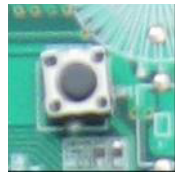
9-4 Freezer room AC Bulb Lamp doesn't work

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the Freezer door switch.
  </td><td>If feel sticky, Change the door s/w.</td></tr>
<tr><td>2</td><td>Check the <u>door S/W resistance.</u>
  </td><td>
<table>
<tr><th>Status</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Normal</td><td>0Ω</td><td>Go to the 3</td></tr>
<tr><td>not</td><td>Change door S/W</td></tr>
<tr><td rowspan="2">Push S/W</td><td>Infinity</td><td>Go to the 3</td></tr>
<tr><td></td><td>Change door S/W</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check the <u>Yellow/Blue to Sky blue.</u>
 
 
<CON7></td><td>
<table>
<tr><th>Status</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Closed</td><td>0V</td><td>Go to the 4</td></tr>
<tr><td>Other</td><td>Change the Door S/W</td></tr>
<tr><td rowspan="2">Open</td><td>5V</td><td>Go to the 4</td></tr>
<tr><td>Other</td><td>Change the Door S/W</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the <u>Blue to Black.</u>
 
 
<CON3></td><td>
<table>
<tr><th>Status</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Closed</td><td>0~2V</td><td>Explain to customer</td></tr>
<tr><td>Other</td><td>Change the Main PCB</td></tr>
<tr><td rowspan="2">Open</td><td>115V</td><td>Change the F Lamp</td></tr>
<tr><td>Other</td><td>Change the main PCB</td></tr>
</table>
</td></tr>
</table>

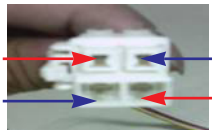
9-5 Refrigerator room lamp doesn't work

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the Refrigerator door switch.
  </td><td>If feel sticky, Change the door s/w.</td></tr>
<tr><td>2</td><td>Check the door S/W resistance.
  </td><td>
<table>
<tr><th>Status</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Normal</td><td>0Ω</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change door S/W</td></tr>
<tr><td rowspan="2">Push S/W</td><td>Infinity</td><td>Go to the 3</td></tr>
<tr><td>Other</td><td>Change door S/W</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>Check the Black to Gray White.
 
 
<CON7></td><td>
<table>
<tr><th>Status</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Normal</td><td>12 V</td><td>Go to the 4</td></tr>
<tr><td>Other</td><td>Change the PCB</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>Check the Red to Black.
 
  </td><td>
<table>
<tr><th>Status</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Normal</td><td>12 V</td><td>Go to the 5</td></tr>
<tr><td>Other</td><td>Change the LED Lamp</td></tr>
</table>
</td></tr>
<tr><td>5</td><td>Check the Black to White.
 
  </td><td>
<table>
<tr><th>Status</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Closed</td><td>0~2V</td><td>Explain to customer</td></tr>
<tr><td>Other</td><td>Change the Door S/W</td></tr>
<tr><td rowspan="2">Open</td><td>12V</td><td>Explain to customer</td></tr>
<tr><td>Other</td><td>Change the LED Lamp</td></tr>
</table>
</td></tr>
</table>

9-6 Poor cooling in Refrigerator room

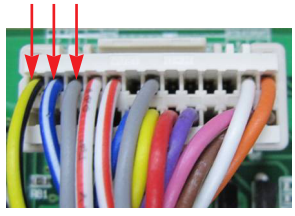
<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check R-Sensor resistance.
 
<CON7>
※ R-Sensor is determined by the temperature.
For example, 30kΩ indicates 32°F.</td><td><table><tr><th>Temperature</th><th>Result</th></tr><tr><td>23°F / −5°C</td><td>38 kΩ</td></tr><tr><td>32°F / 0°C</td><td>30 kΩ</td></tr><tr><td>41°F / 5°C</td><td>24 kΩ</td></tr><tr><td>50°F / 10°C</td><td>19.5 kΩ</td></tr><tr><td>59°F / 15°C</td><td>16 kΩ</td></tr></table></td></tr>
<tr><td>2</td><td>Reset the unit and
Input Test 1 Mode.
(Push the button 1 time)</td><td>   </td></tr>
<tr><td>3</td><td>Open the fresh food door and Check the air flow.
  </td><td><table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Windy</td><td>Go to the 4</td></tr><tr><td>No windy</td><td>Check the F Fan motor
Check the Damper
(Go to the 5)</td></tr></table></td></tr>
<tr><td>4</td><td>Check the air temperature.
Cold or not ?</td><td><table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Cold</td><td>Explain to customer</td></tr><tr><td>Not cold</td><td>Check the Compressor
And sealed system</td></tr></table></td></tr>
</table>

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>5</td><td>
Damper checking method.
Inputting TEST Mode,
Check the damper and PCB.

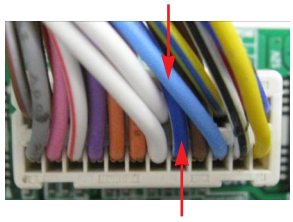
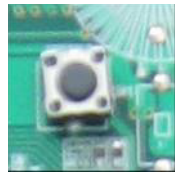


</td><td>
<table>
<tr><th>Test Mode</th><th>Damper State</th><th>SVC Action</th></tr>
<tr><td>1 Mode</td><td>Open</td><td rowspan="2">Damper is normal.
(Go to 6)</td></tr>
<tr><td>2 Mode</td><td>Closed</td></tr>
<tr><td>1,2 mode</td><td>Not working</td><td>Change the damper</td></tr>
</table>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">(1) to (2)</td><td>270 ~330Ω</td><td>It's normal</td></tr>
<tr><td>Other</td><td>Change damper</td></tr>
<tr><td rowspan="2">(3) to (4)</td><td>270 ~330Ω</td><td>It's normal</td></tr>
<tr><td>Other</td><td>Change damper</td></tr>
</table>
</td></tr>
<tr><td>6</td><td>
Check the <u>Fan motor.</u>
Rotate fan using your hand.
Stuck change the motor.
(Cause of ice or rust inside of motor)

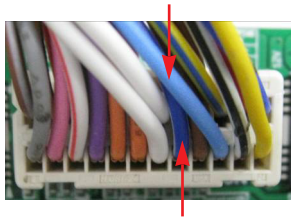
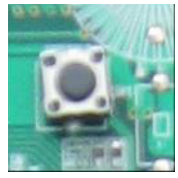
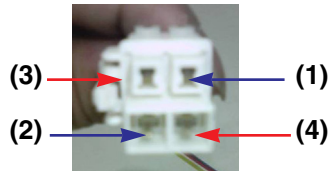
</td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td rowspan="2">Motor</td><td>Sticky</td><td>Change the motor</td></tr>
<tr><td>Not Sticky</td><td>Go to 7</td></tr>
</table>
</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>7</td><td>
Check the R <u>Fan motor voltage.</u>

(1)Pin1, (2)Pin3, (3)Pin5

<CON6>
</td><td>
<table>
<tr><th>Point</th><th>Result</th><th>SVC Action</th></tr>
<tr><td>(1) ~ (2)</td><td>Below 12 V</td><td>Change the PCB</td></tr>
<tr><td>(2) ~ (3)</td><td>0 or 5 V</td><td>Change the motor</td></tr>
</table>
</td></tr>
</table>

9-7 Poor cooling in Freezer compartment

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the F Sensor resistance
 
<CON7>
※ The F Sensor is determined by the temperature.
For example, 23kΩ indicate -4°F.</td><td><table><tr><th>Temperature</th><th>Result</th></tr><tr><td>-22°F / -30°C</td><td>40 kΩ</td></tr><tr><td>-13°F / -25°C</td><td>30 kΩ</td></tr><tr><td>-4°F / -20°C</td><td>23 kΩ</td></tr><tr><td>5°F / -15°C</td><td>17 kΩ</td></tr><tr><td>14°F / -10°C</td><td>13 kΩ</td></tr><tr><td>23°F / -5°C</td><td>10 kΩ</td></tr><tr><td>32°F / 0°C</td><td>8 kΩ</td></tr></table></td></tr>
<tr><td>2</td><td>Reset the unit and
Input Test 1 Mode.
(Push the button 1 time)</td><td>   </td></tr>
<tr><td>3</td><td>Open the freezer door and Check the air flow.
  </td><td><table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Windy</td><td>Go to the 4</td></tr><tr><td>No windy</td><td>Check the F Fan motor</td></tr></table></td></tr>
<tr><td>4</td><td>Check the air temperature.
Cold or not ?</td><td><table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Cold</td><td>Explain to customer</td></tr><tr><td>Not cold</td><td>Check the Compressor And sealed system</td></tr></table></td></tr>
</table>

9-8 Over cooling in Refrigerator room

<table>
<tr><th>No</th><th>Checking flow</th><th>Result & SVC Action</th></tr>
<tr><td>1</td><td>Check the R Sensor resistance.
 
<CON7>
※ The R Sensor is determined by the temperature.
For example, 30kΩ indicates 32°F.</td><td><table><tr><th>Temperature</th><th>Result</th></tr><tr><td>23°F / −5°C</td><td>38 kΩ</td></tr><tr><td>32°F / 0°C</td><td>30 kΩ</td></tr><tr><td>41°F / 5°C</td><td>24 kΩ</td></tr><tr><td>50°F / 10°C</td><td>19.5 kΩ</td></tr><tr><td>59°F / 15°C</td><td>16 kΩ</td></tr></table></td></tr>
<tr><td>2</td><td>Reset the unit and
Input Test 1 Mode.
(Push the button 1 time)</td><td>   </td></tr>
<tr><td>3</td><td>Open Refrigerator room door and Check the air flow.
  </td><td><table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Windy</td><td>Go to the 4</td></tr><tr><td>No windy</td><td>Check the R Fan Check the damper (Go to the 5)</td></tr></table></td></tr>
<tr><td>4</td><td>Input Test 2 Mode and
Check the air flow.
(push the button 1 more time)
   </td><td><table><tr><th>Status</th><th>SVC Action</th></tr><tr><td>Windy</td><td>Go to the 5</td></tr><tr><td>No windy</td><td>It’s normal</td></tr></table></td></tr>
<tr><td>5</td><td>Check the damper resistance.
  </td><td><table><tr><th>Test Point</th><th>Result</th><th>SVC Action</th></tr><tr><td rowspan="2">(1) To (2)</td><td>270 ~ 330 Ω</td><td>It’s normal</td></tr><tr><td>Other</td><td>Change damper</td></tr><tr><td rowspan="2">(3) To (4)</td><td>270 ~ 330 Ω</td><td>It’s normal</td></tr><tr><td>Other</td><td>Change damper</td></tr></table></td></tr>
</table>

10. Reference

10-1 TEST MODE and Removing TPA

1. How to enter the TEST MODE
Push the test button on the Main PCB to enter the TEST MODE.

Main PWB

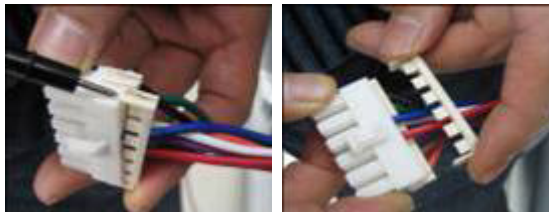
⋆ 1 time : Comp / Damper / All FAN on
(Everything is displayed)

⋆ 2 times : Damper closed
(22 22 displayed)

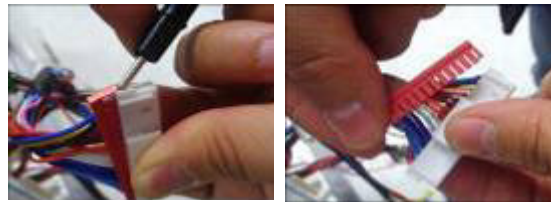
⋆ 3 times : Forced defrost mode
(33 33 displayed)

2. How to remove Terminal Position Assurance (TPA)

<AC TPA>



<DC TPA>



※ After measure the values, you should put in the TPA again.

10-2 TEMPERATRUE CHART - FRZ AND ICING SENSOR

TEMP	RESISTANCE	VOLTAGE
-39°F (-40°C)	73.29 kΩ	4.09 V
-30°F (-35°C)	53.63 kΩ	3.84 V
-21°F (-30°C)	39.66 kΩ	3.55 V
-13°F (-25°C)	29.62 kΩ	3.23 V
-4°F (-20°C)	22.33 kΩ	2.89 V
5°F (-15°C)	16.99 kΩ	2.56 V
14°F (-10°C)	13.05 kΩ	2.23 V
23°F (-5°C)	10.10 kΩ	1.92 V
32°F (0°C)	7.88 kΩ	1.63 V
41°F (5°C)	6.19 kΩ	1.38 V
50°F (10°C)	4.91 kΩ	1.16 V
59°F (15°C)	3.91 kΩ	0.97 V
68°F (20°C)	3.14 kΩ	0.81 V
77°F (25°C)	2.54 kΩ	0.67 V
86°F (30°C)	2.07 kΩ	0.56 V
95°F (35°C)	1.69 kΩ	0.47 V
104°F (40°C)	1.39 kΩ	0.39 V

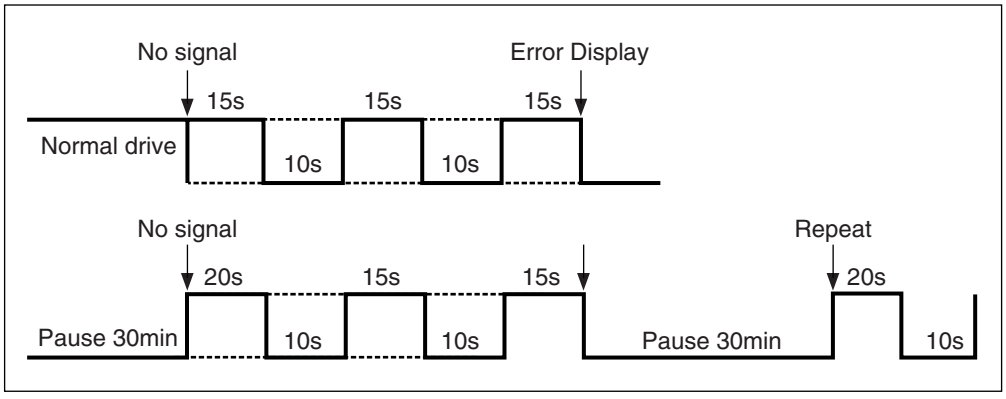
10-3 TEMPERATRUE CHART - REF AND DEF SENSOR

TEMP	RESISTANCE	VOLTAGE
-39°F (-40°C)	225.1 kΩ	4.48 V
-30°F (-35°C)	169.8 kΩ	4.33 V
-21°F (-30°C)	129.3 kΩ	4.16 V
-13°F (-25°C)	99.30 kΩ	3.95 V
-4°F (-20°C)	76.96 kΩ	3.734 V
5°F (-15°C)	60.13 kΩ	3.487 V
14°F (-10°C)	47.34 kΩ	3.22 V
23°F (-5°C)	37.55 kΩ	2.95 V
32°F (0°C)	30 kΩ	2.67 V
41°F (5°C)	24.13 kΩ	2.40 V
50°F (10°C)	19.53 kΩ	2.14 V
59°F (15°C)	15.91 kΩ	1.89 V
68°F (20°C)	13.03 kΩ	1.64 V
77°F (25°C)	10.74 kΩ	1.45 V
86°F (30°C)	8.89 kΩ	1.27 V
95°F (35°C)	7.40 kΩ	1.10 V
104°F (40°C)	6.20 kΩ	0.96 V

10-4 How to check the Fan-Error

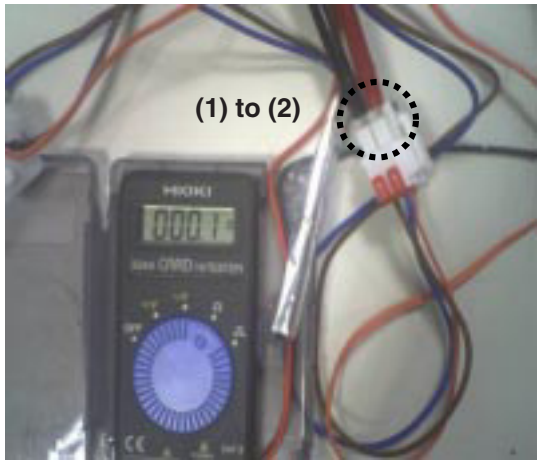
(1) EBR650027**

After sending a signal to the fan, the MICOM checks the BLDC fan motor s lock status. If there is no feedback signal from the BLDC fan, the fan motor stops for 10 seconds and then is powered again for 15 seconds. To determine that there is a fan motor malfunction, this process is repeated 3 times. If the fan motor is determined to be defective, the error code will be shown in the display for 30 minutes. At this point, the process will be repeated until the fan motor operates normally. If normal operation is achieved, the error display is erased and the MICOM is reset automatically.



11. COMPONENT TESTING INFORMATION

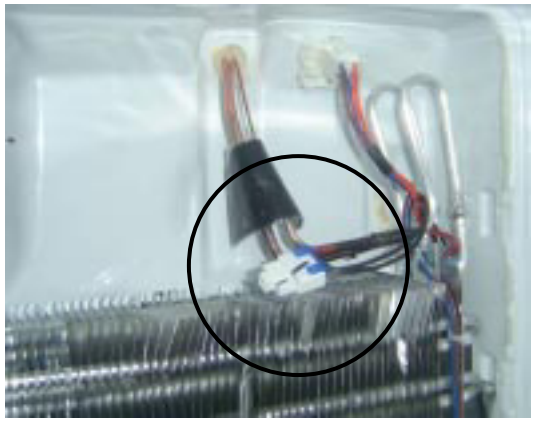
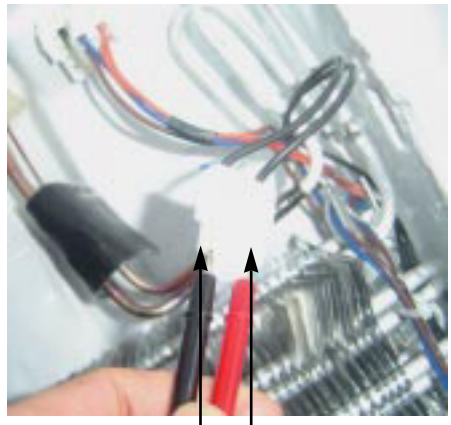
11-1 Defrost Controller Assembly

<table>
<tr><td>Function</td><td>The controller assembly is made up of two different kinds of parts. The fuse and the sensor. To determine if these parts are defective, check for resistance. The fuse will cut power to the defrost heater at very high temperatures.</td></tr>
<tr><td>How to Measure (Fuse-M)</td><td> 

Set a ohmmeter to the 2 housing pin.
Measure the 2 pin connected to Fuse-M.
If the ohmmeter indicate below 0.1ohm fuse-m is a good condition, But if infinite the part is bad.</td></tr>
<tr><td>How to Measure (Sensor)</td><td> 

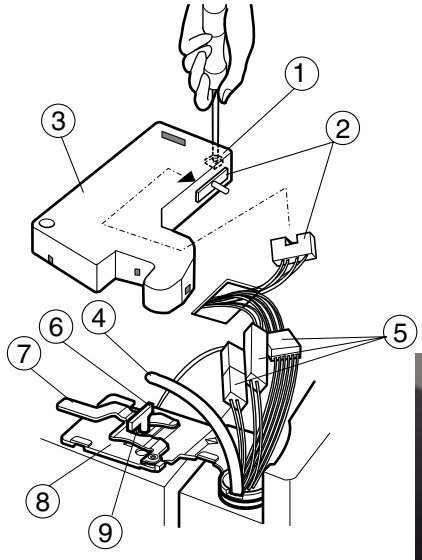
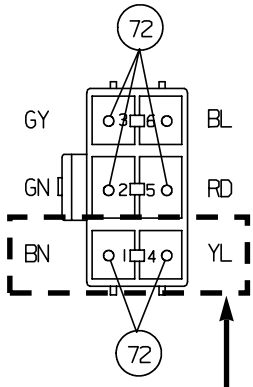
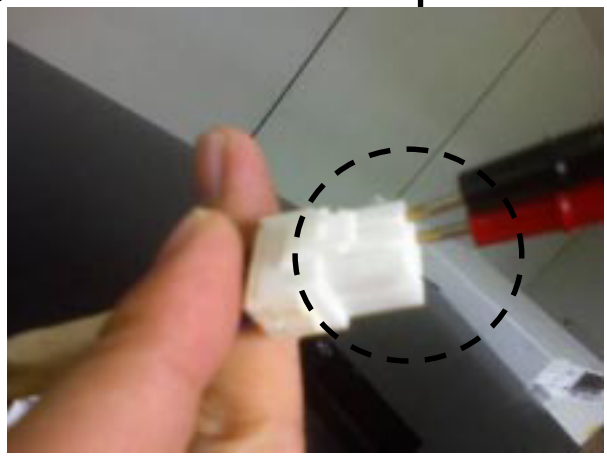
Set a ohmmeter to The 2housing pin.
Measure the 2 pin connected to Sensor.
If the ohmmeter indicate 11㏀ (at room temperature) Sensor is good.
When check the ohm at other temperatures Check the sensor manual.</td></tr>
<tr><td>Standard</td><td>Fuse-M (at all temperature)
<table><tr><td>Test Point</td><td>Ressult</td></tr><tr><td>(1) to (2)</td><td>0 ~ 0.1Ω</td></tr></table>
Sensor (at room temperature)
<table><tr><td>Test Point</td><td>Ressult</td></tr><tr><td>(1) to (2)</td><td>11Ω</td></tr></table></td></tr>
</table>

11-2 Sheath Heater

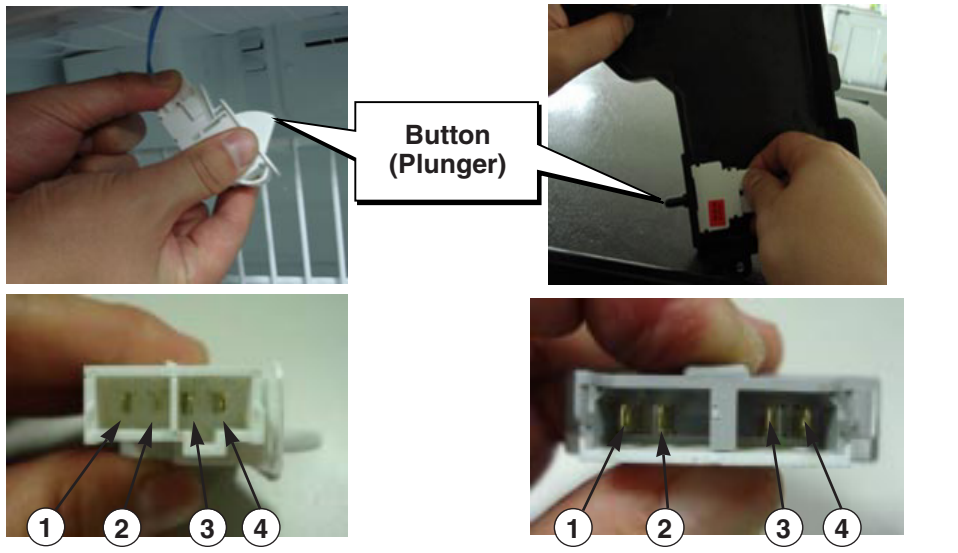
<table>
<tr><td>Function</td><td>Sheath heater is a part for defrost. All heating wire is connected to only one line. To check if the part is defective, check the resistance.</td></tr>
<tr><td>How to Measure</td><td>



Set a ohmmeter connect to The 2 housing pin.
Measure the 2 pin connected to Sheath Heater.
If the ohmmeter indicate (V°øV)/Watt=R is good condition,
ex) when watt=350w, voltage=115v R=(115°ø115)/350=38Ω
But if the ohm meter indicate infinity the Sheath heater is bad.
</td></tr>
<tr><td>Standard</td><td>
Sheath heater (at all temperature)
<table>
<tr><th>Test Point</th><th>Ressult</th></tr>
<tr><td>(1) to (2)</td><td>34 ~ 42Ω</td></tr>
</table>
</td></tr>
</table>

11-3 Door Heater Assembly

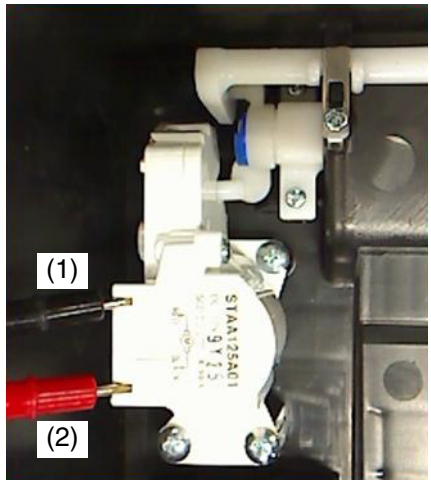
Function	The heater is designed to prevent the door from sweating.
How to Measure	  
Standard	Test Point: (1) to (2) — Ressult: 2.3 ~ 2.9Ω

11-4 Door Switch

<table>
<tr><td>Function</td><td>The switch senses if the door is open or closed.
- When the door open, lamp on.
- When the door open, the switch give information to Micom.
When the door open, internal contact operate on and off moving plunger of door switch up and down.</td></tr>
<tr><td>How to Measure</td><td><Switch, Freezer> <Switch, Refrigerator>
 

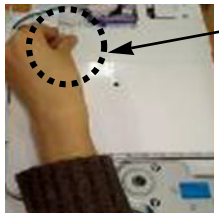
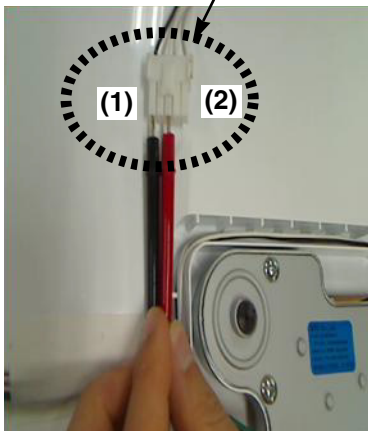
Beep Beep
Check the resistance between connectors 1, 2 and 3, 4 .It means check whether or not applying an electric current. If there is resistance, the switch is good.</td></tr>
<tr><td>Standard</td><td>Multimeter beep – Switch F,R
<table>
<tr><td>Nomal</td><td>Push the button(Plunger)</td></tr>
<tr><td>Beep or 0Ω</td><td>None (∞Ω)</td></tr>
</table></td></tr>
</table>

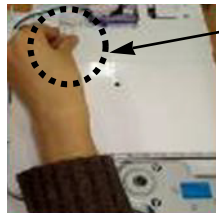
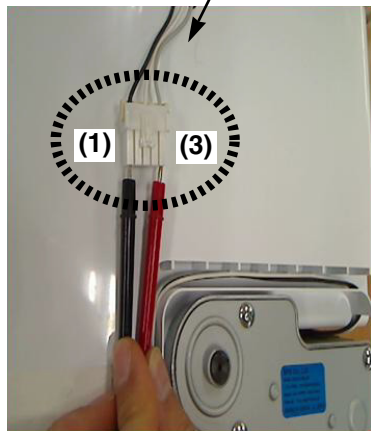
11-5 Dispenser DC Motor

<table>
<tr><td>Function</td><td>- Dispenser DC Motor : When customer push the dispenser button, Pull duct door and abstract from ice bank.</td></tr>
<tr><td>How to Measure</td><td> 

Dispensor DC Motor</td></tr>
<tr><td>Standard</td><td>Dispenser DC Motor
<table>
<tr><th>Test Points</th><th>Result</th></tr>
<tr><td>(1) to (2)</td><td>9.9 ~ 12.1Ω</td></tr>
</table></td></tr>
</table>

11-6 AC Motor ASSEMBLY

<table>
<tr><td>Function</td><td>The motor in the door pushed the ice into the dispenser.</td></tr>
<tr><td>How to Measure</td><td>
< In-door Motor >

① Separate the housing.
② Measure the resistance between (1) and (2)


< In-door Motor >

① Separate the housing.
② Measure the resistance between (1) and (3)


Check the resistance between connectors (In-door motor 1, 2) and (In-door motor 1, 3). It means check whether or not applying an Electric current. If there is resistance, it means the geared motor or solenoid is not inferiority
</td></tr>
<tr><td>Standard</td><td>
Geared Motor
<table>
<tr><th>Test Points</th><th>Result</th></tr>
<tr><td>(1) to (2)</td><td>31.1 ~ 42.09Ω</td></tr>
</table>
Cube Solenoid
<table>
<tr><th>Test Points</th><th>Result</th></tr>
<tr><td>(1) to (3)</td><td>31.1 ~ 42.09Ω</td></tr>
</table>
</td></tr>
</table>

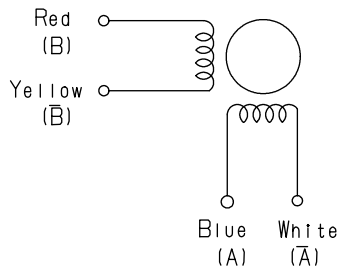
11-7 Damper

Function

The damper supplies cold air from the freezer to the chill room using the damper plate. The chill room is colder when the damper plate is open. When the damper is closed the chill rooms temperature will rise.

How to Measure

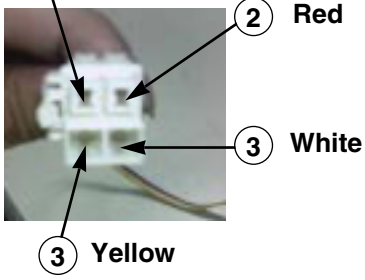
Table(1): 결선도(Wirering)



Table(2): 2-2상 여자순서(CW Rotation)

Housing No. & L/Wire Color	Step			
	1	2	3	4
1- Blue (A)	+	-	-	+
2- Red (B)	+	+	-	-
3- White(A)	-	+	+	-
4- Yellow(B)	-	-	+	+

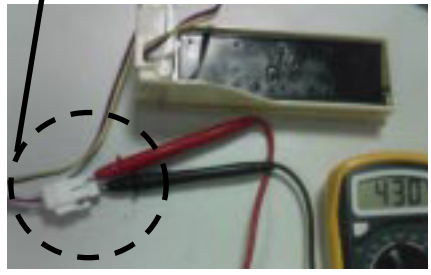
< Damper Circuit >



Check the (1), (3)

< extension >

Check the (2), (4)



Check the (1), (3)

Check to see if there is electrical current, if there is resistance the damper is good.

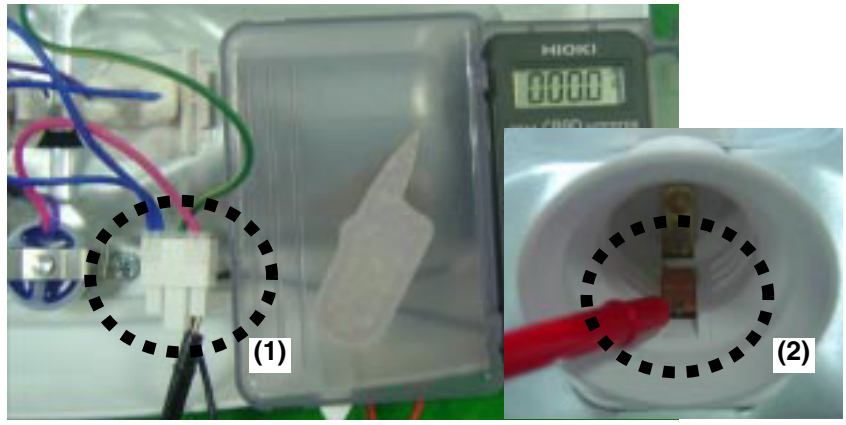
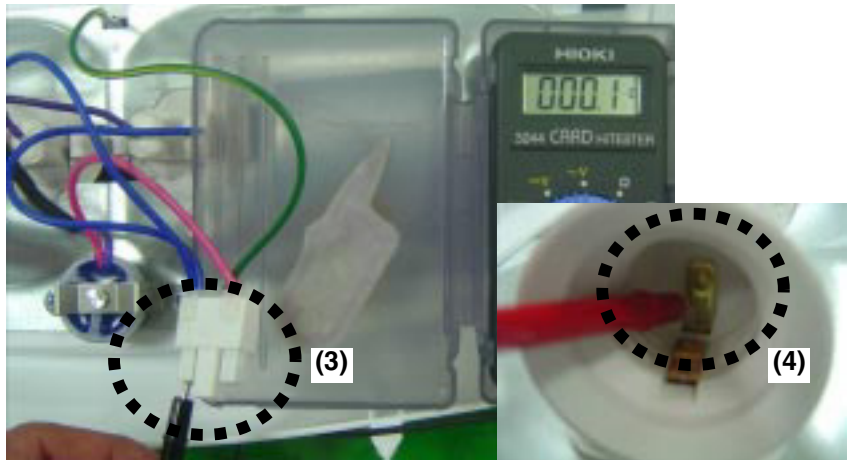
Standard

Damper

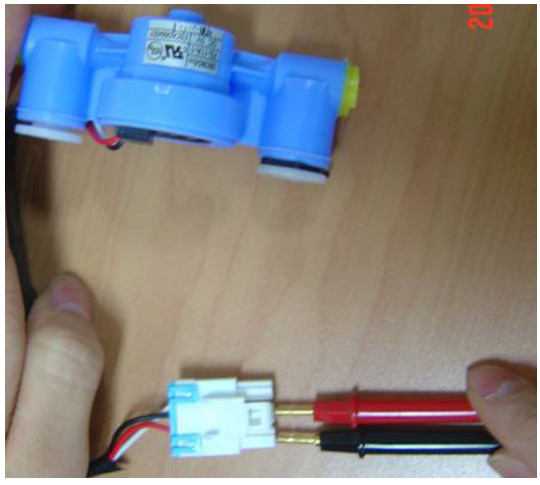
Test Points	Result
Red and Yellow	373 ~ 456Ω

Test Points	Result
Blue and White	373 ~ 456Ω

11-8 Lamp Socket

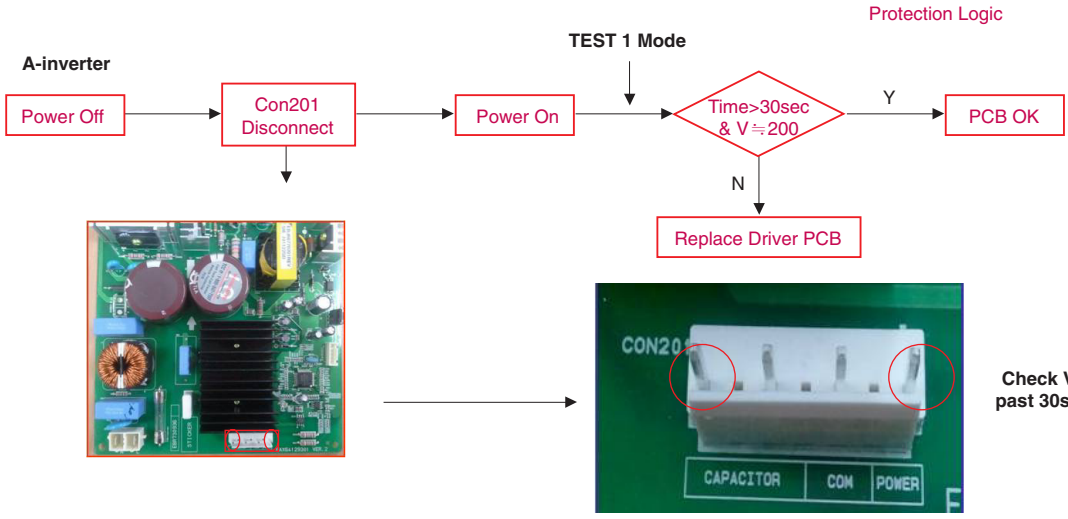
Function	The lamp socket connect cover lamp assembly to lamp. The lamp socket fix lamp and unite lamp and cover lamp assembly. The lamp socket supply electric source to lamp also.
How to Measure	  Check the resistance between connector of housing and connector of lamp socket. It means check whether or not applying an electric current. If there is resistance it means the lamp socket is good.
Standard	Test Points: (1) to (2) and (3) to (4) — Result: 0Ω

11-9 Flow Sensor

<table>
<tr><td>Function</td><td>Flow Sensor (in machine room)
Count the water quantity from city water to water filter in refrigerator</td></tr>
<tr><td>How to Measure</td><td> 
Flow Sensor
(in machine room)
  </td></tr>
<tr><td>Standard</td><td><table><tr><th>Test Points</th><th>Result</th></tr><tr><td>Red wire to Black wire</td><td>4 ~ 30 kΩ</td></tr></table></td></tr>
</table>

12. Compressor Troubleshooting

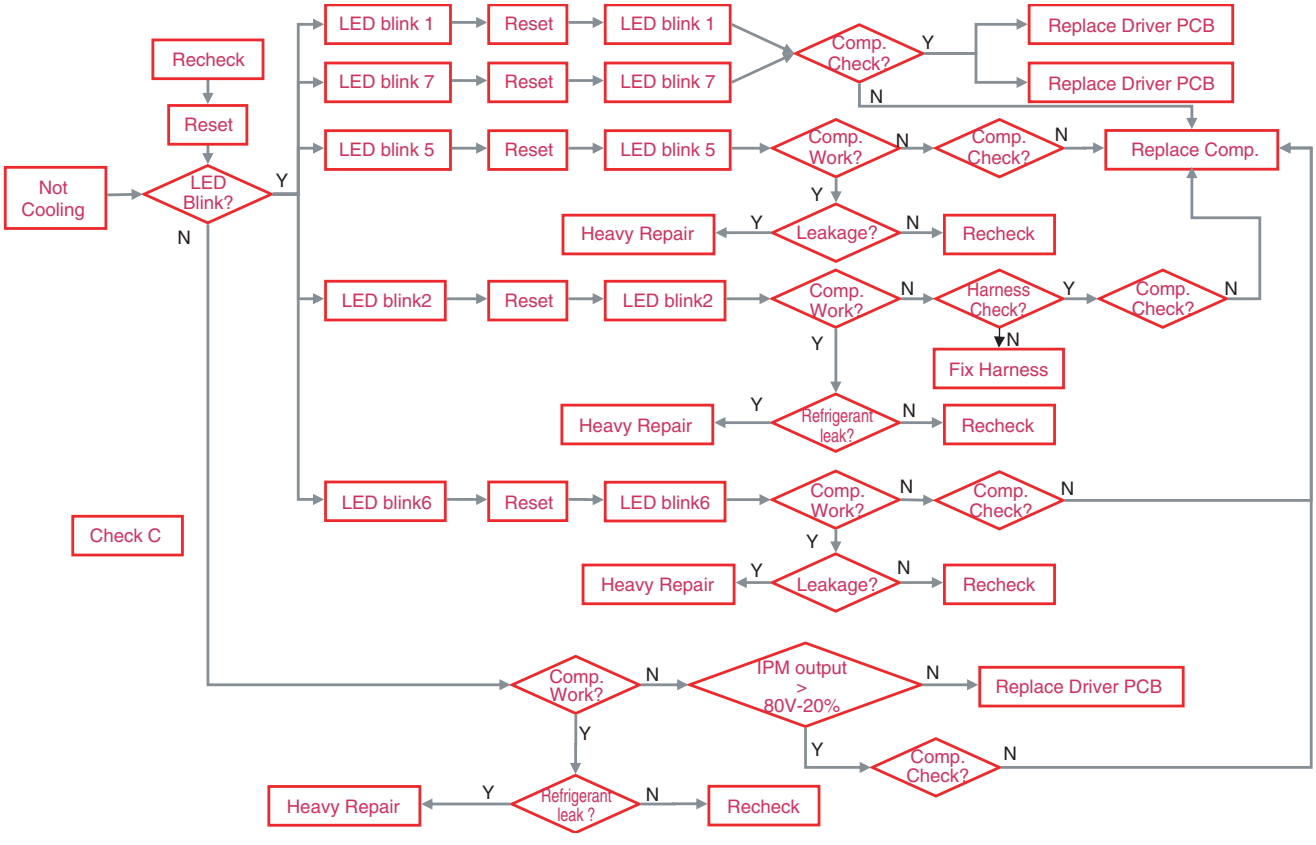
PCB Check (Simplify)



Test Mode

	Ref.	Comp	Display & sound	Refer
		FC75(A-Inverter)		
TEST1	Forced Starting	TDC (Full Stroke)	Display ON, Buzz 1 time	

Troubleshooting

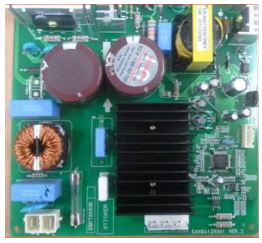


12-1 Check A

- There is PC Board located in the PCB case.
  The control driver is PC board for the compressor.
- This step shows the source voltage of the driver PC board.

Step1. Open PCB Cover

Step2. Check Driver PCB



* Driver PCB located in machine room.

12-2 Check B

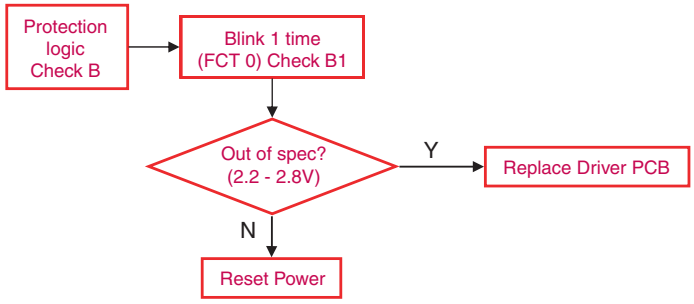
B1. LED blinks once, then repeats (FCT0 Fault: A-Inverter)

Protection Logic

Blink OFF Blink OFF

- Purpose: Detecting motor current and voltage error
- Check voltage at **point A** (Motor Voltage), **point B** (Motor Current) and **Point C** (Capacitor Voltage) when **compressor is off**.
- Spec: **Points A, B,** & **C 2.5V ± 0.3V**

GND
Voltage

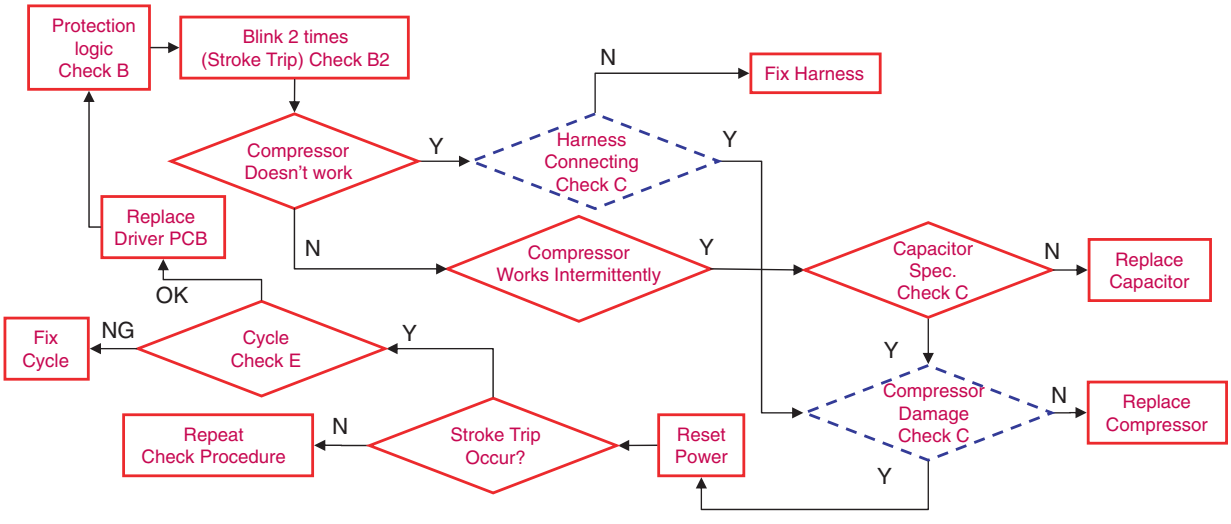


B2. LED blinks two times, then repeats (Stroke Trip: A & E Inverters)

Protection Logic

Blink Blink OFF Blink Blink OFF

- Purpose: Prevent abnormally long piston strokes.
- Case 1. If compressor doesn't work and LED blinks - Cause: Possibly harness from compressor to PCB might be defective.
- Case 2. If compressor works intermittently and LED blinks - Cause: Condenser Fan or Freezer Fan is not running. Sealed system problem such as moisture restriction, restriction at capillary tube or refrigerant leak.
- Logic: Compressor is forced to off and then tries to restart after 1 minute.

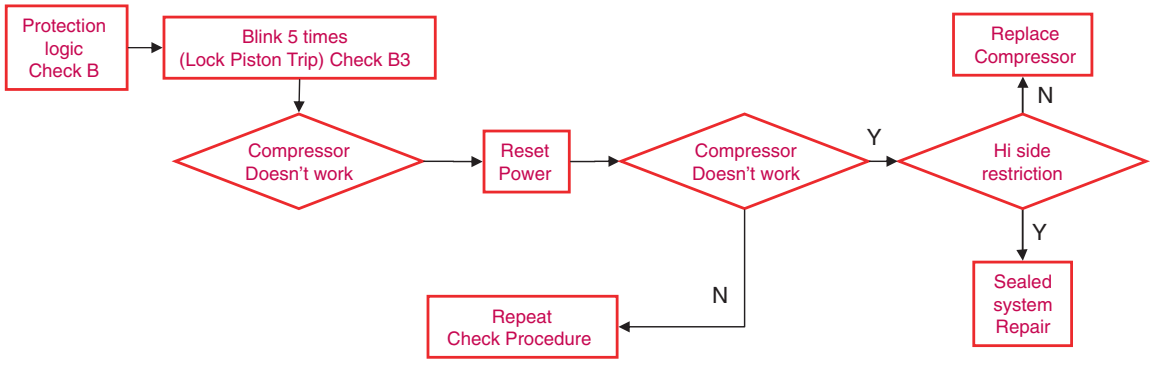


B3. LED blinks five times, then repeats (Locked Piston: A & E Inverters)

Protection Logic

Blink Blink Blink Blink Blink OFF

- Purpose: To detect locked piston
- Cause: Lack of oil to the cylinder, cylinder or piston damaged and or restricted discharge. A Locked Piston can also be caused by foreign materials inside the compressor.
- Logic: Compressor is forced off and tries to restart within 2.5 minutes.

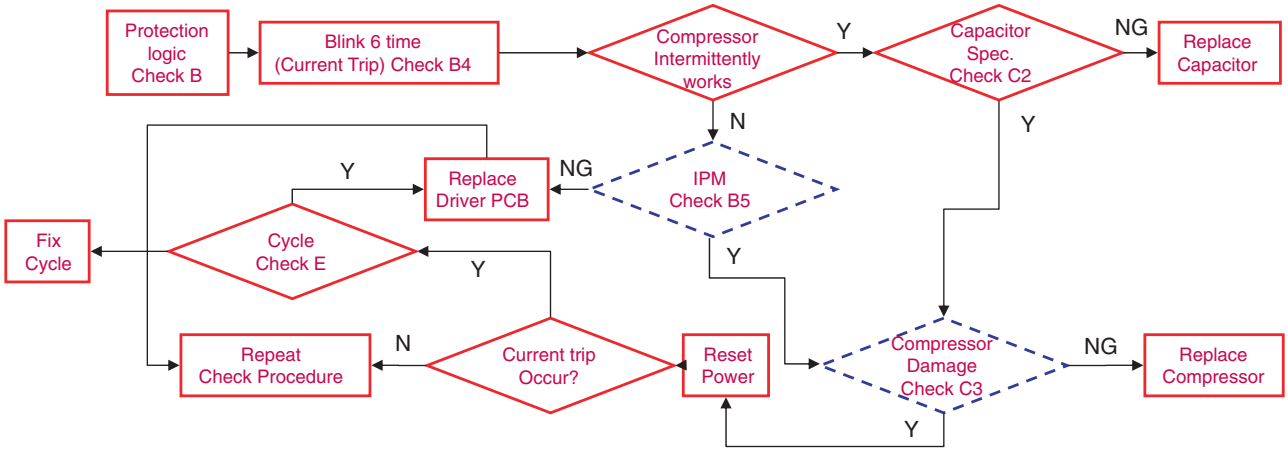


B4. LED blinks six times, then repeats (Current Trip: A & E-Inverters)

Protection Logic

Blink Blink Blink Blink Blink Blink OFF

- Purpose: Prevent over-current (overload protect)
- Cause: Ambient temperature is high (over 43°C) and/or refrigerator's condenser air movement is restricted.
- Condenser Fan is stopped, restricted discharge line, compressor is damaged, or IPM device is defective.
- Logic: Compressor is forced off and tries to restart after 6 minutes.

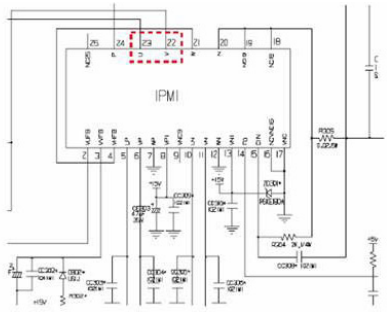


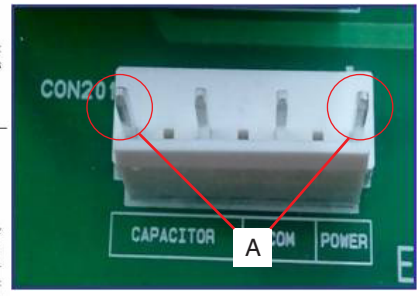
B5. LED blinks seven times, then repeats (IPM Fault: A & E Inverters)

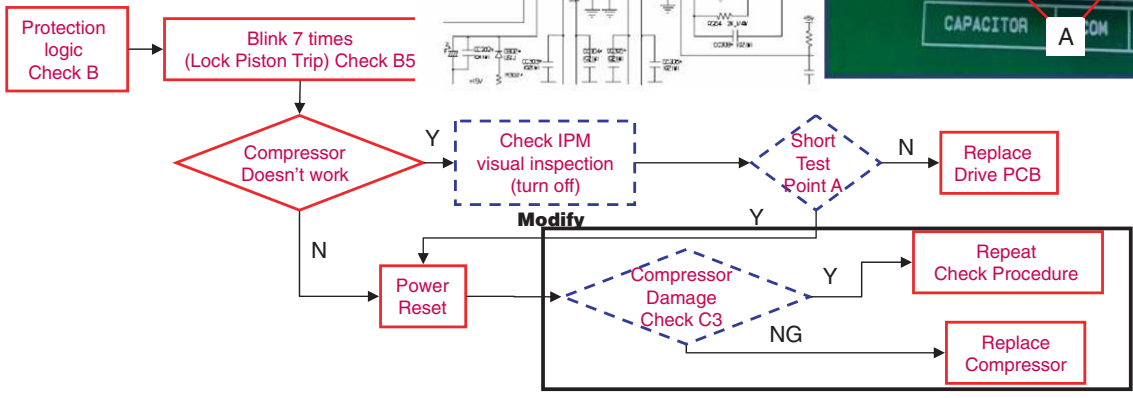
Blink Blink Blink Blink Blink Blink Blink OFF

- Purpose: Prevent high current due to IPM Short
- Cause: Damaged IPM (Dead Short)
- Test for a dead short at **Point A** with a VOM.
- Logic: Compressor is forced off and tries to restart in 20 minutes.

Protection Logic





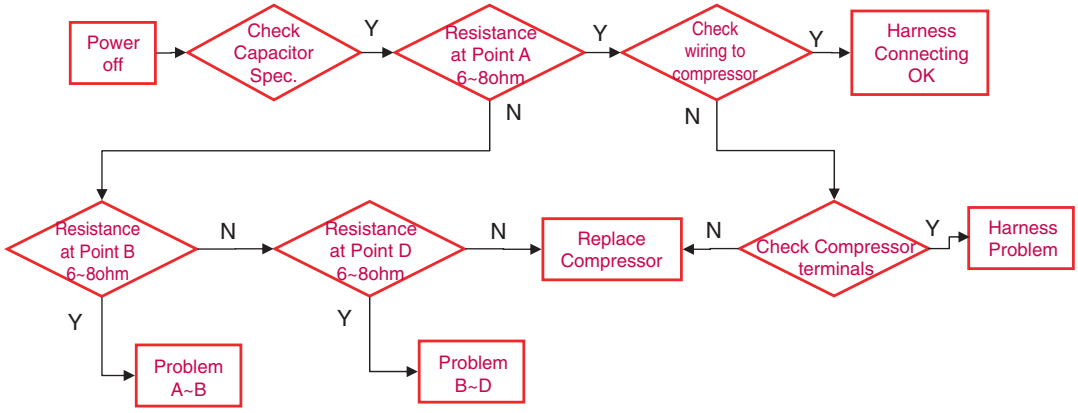


12-3 Check C

C1. Harness Connection Check
C2. Capacitor Specifications
C3. Compressor Check

Check Process

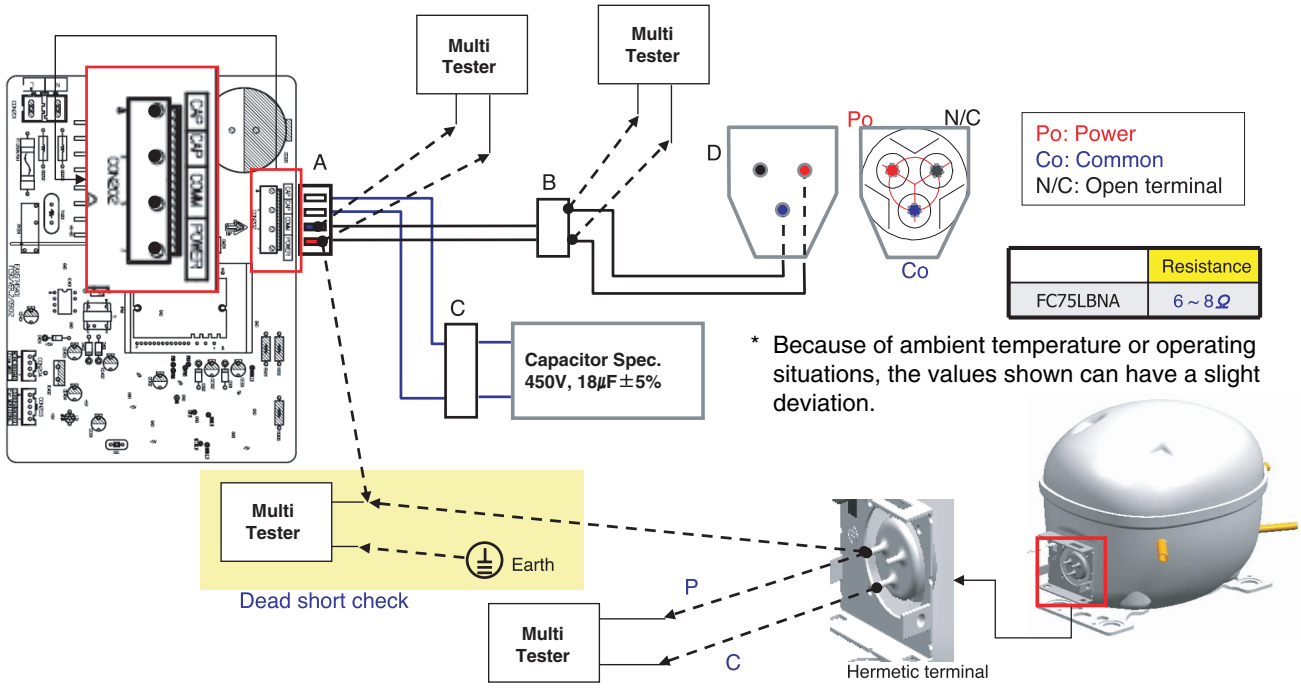
- Step 1. Power off. Step 2. Check capacitor spec. (table1). Step3. Check resistance of point A
  Step 4. Check wire harness (INF ohm). Step 5. Check resistance at point B. Step 6. Point D.



Caution : Turn off power during check C

- Measure the resistance at each point except point C
- Dead short check: measure the resistance between power line in compressor and earth ground in refrigerator (Inf. Ohm)

FC150NAMA



	Resistance
FC75LBNA	6 ~ 8Ω

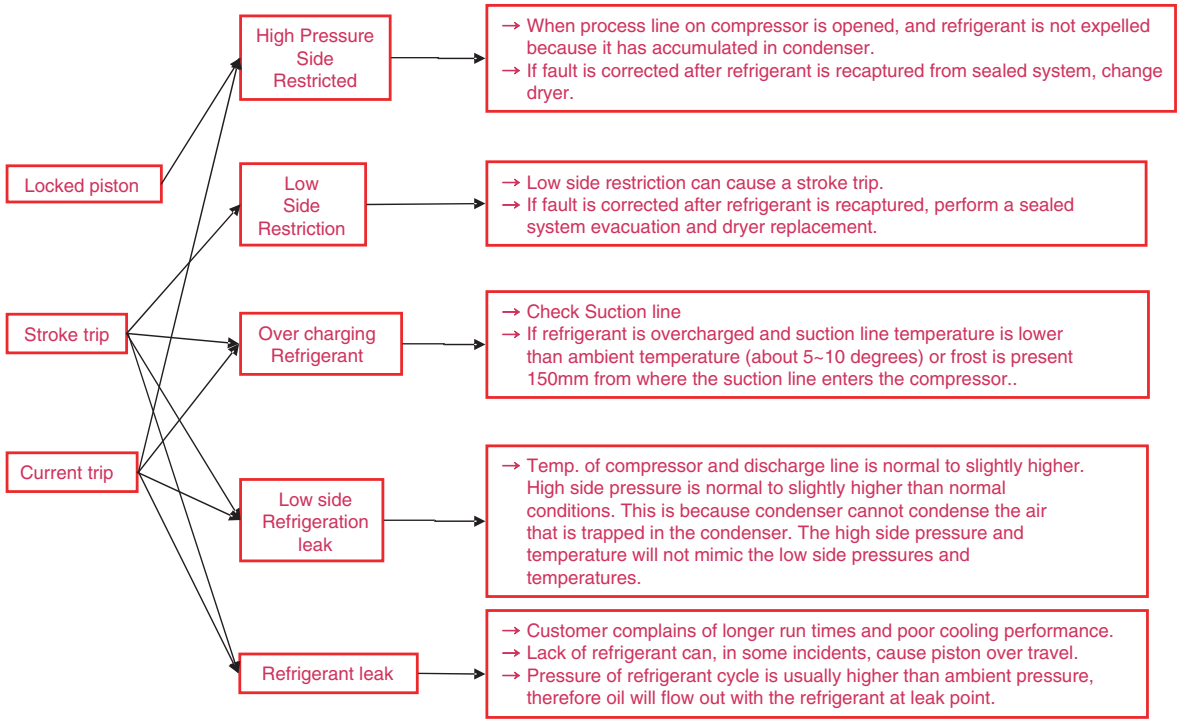
* Because of ambient temperature or operating situations, the values shown can have a slight deviation.

12-4 Check D

D1. Activate Protection logic

Cycle check with protection logic

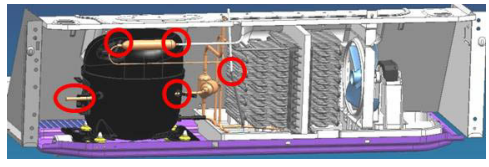
- We have to check Condenser fan and Freezer fan before performing Check D
- Locked Piston, Current trip and stroke trip can be activated by other problems then the driver or compressor.

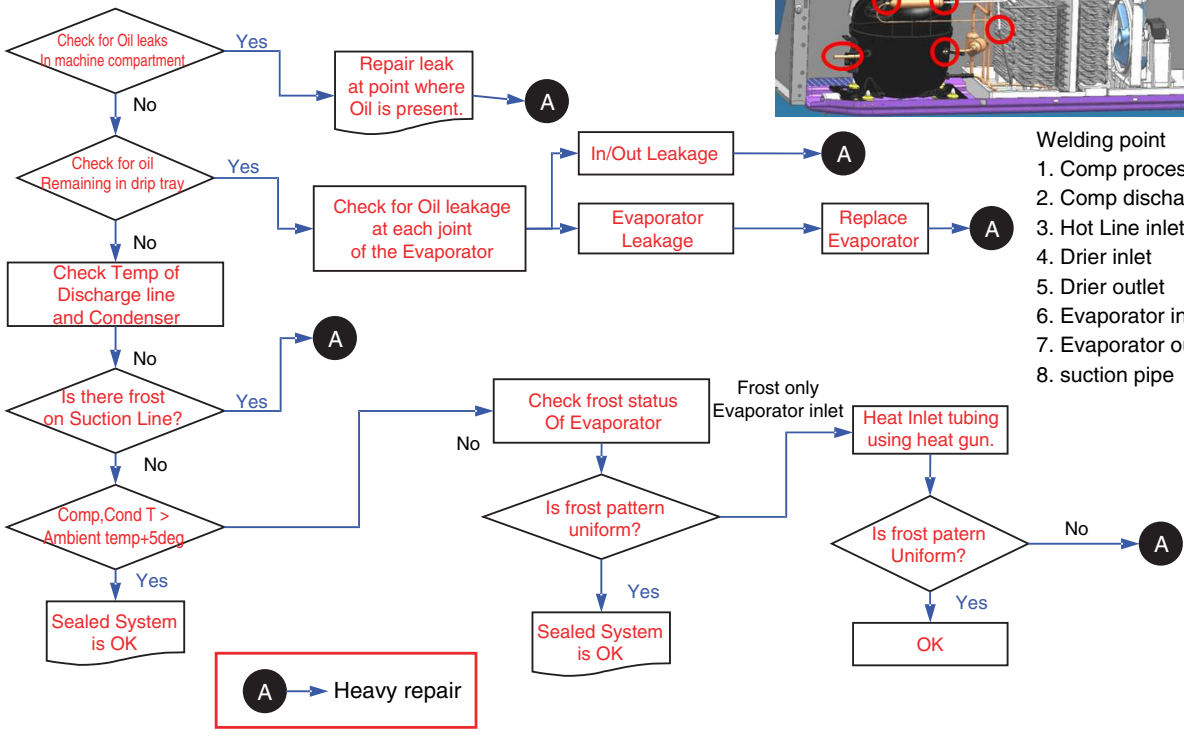


D2. sealed system diagnosis

Sealed system

- Check as follows;





Welding point
1. Comp process stub,
2. Comp discharge
3. Hot Line inlet
4. Drier inlet
5. Drier outlet
6. Evaporator inlet
7. Evaporator outlet
8. suction pipe

Compressor Troubleshooting

Step 1) Open PWB cover

Step 2) Check for blinking frequency of LED, PWB

If compressor is normal, it does not blink

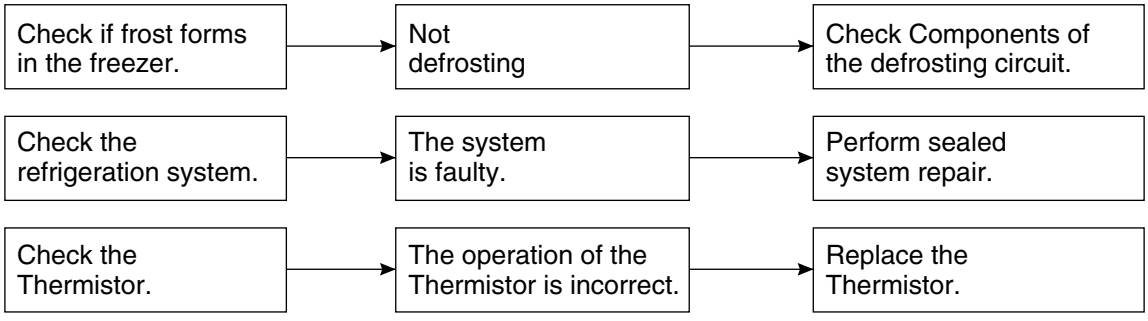
: Refer to the next page to find out what actions to take according to how many times LED blink

No	LED operating condition	Cause	Service guideline
1	**LED two - time repetiton (Stroke Trip)**  ‥on - on - off - on - on - off - on - on - off ‥repeating	PCB Parts defect or Compress or Connector miss connecting (Piston over run)	1. Please check, Whether connector of compressor is attached rightly or not. after power off 2. After the first action, You check on normal operation of compressor. 3. If the same symptom arises after the second action, replace PCB
2	**LED five - time repetiton (Piston Lock Trip)**  ‥on - on - on - on - on - off - on - on - on - on - on - off ‥repeating	Piston constraint	1. After resetting power, check if it is running normal 2. If the same symptom arises after the first action 3. If the same symptom arises after the second action, replace compressor
3	**LED six - time repetiton (Current Trip)**  ‥on - on - on - on - on - on - off - on - on - on - on - on - on - off ‥repeating	Circuit over current error Or cycle error	1. After resetting power, check if it is running normal 2. If the same symptom arises after the first action 3. If the same symptom arises after the second action, replace compressor
4	**LED seven- time repetiton (IPM Fault Trip)**  ‥on - on - on - on - on - on - on - off - on - on -on - on - on - on- on - off ‥repeating	PCB parts defect (IPM)	1. After resetting power, check if it is running normal 2. If the same symptom arises after the first action, replace PCB

12-5 SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	REMEDY
No Cooling.	• 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.	• Plug into the outlet. • Set the switch to ON. • Replace the fuse. • If the voltage is low, correct the wiring.
Cools poorly.	• 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**.	• Place the unit about 4 inches (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**.
Food in the Refrigerator is frozen.	• 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)?	• 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.	• 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?	• 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.	• Check if the ambient temperature and humidity of the surrounding air are high. • Is there a gap in the door gasket?	• Wipe moisture with a dry cloth. It will disappear in low temperature and humidity. • Fill up the gap.
There is abnormal noise.	• 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.	• Adjust the Leveling Screw, and position the refrigerator 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.	• Check if the door gasket is dirty with an item like juice. • Is the refrigerator level? • Is there too much food in the refrigerator?	• Clean the door gasket. • Position in a 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.	• Check if the inside of the unit is dirty. • Are foods with a strong odor unwrapped? • The unit smells of plastic.	• 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:



12-6 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.	• 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.	• No discharging of Refrigerant. • Normal cooling is possible by restoring the normal amount of refrigerant and repairing the leak.
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.	• Normal discharging of the refrigerant. • The capillary tube is faulty.
	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.	• Normal discharging of the Refrigerant.
MOISTURE CLOG		Cooling operation stops periodically.	Flowing sound of refrigerant is not heard and frost melts.	Lower than ambient temperature.	• 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 than ambient temperature.	• 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.	• No pressure in the high pressure part of the compressor.

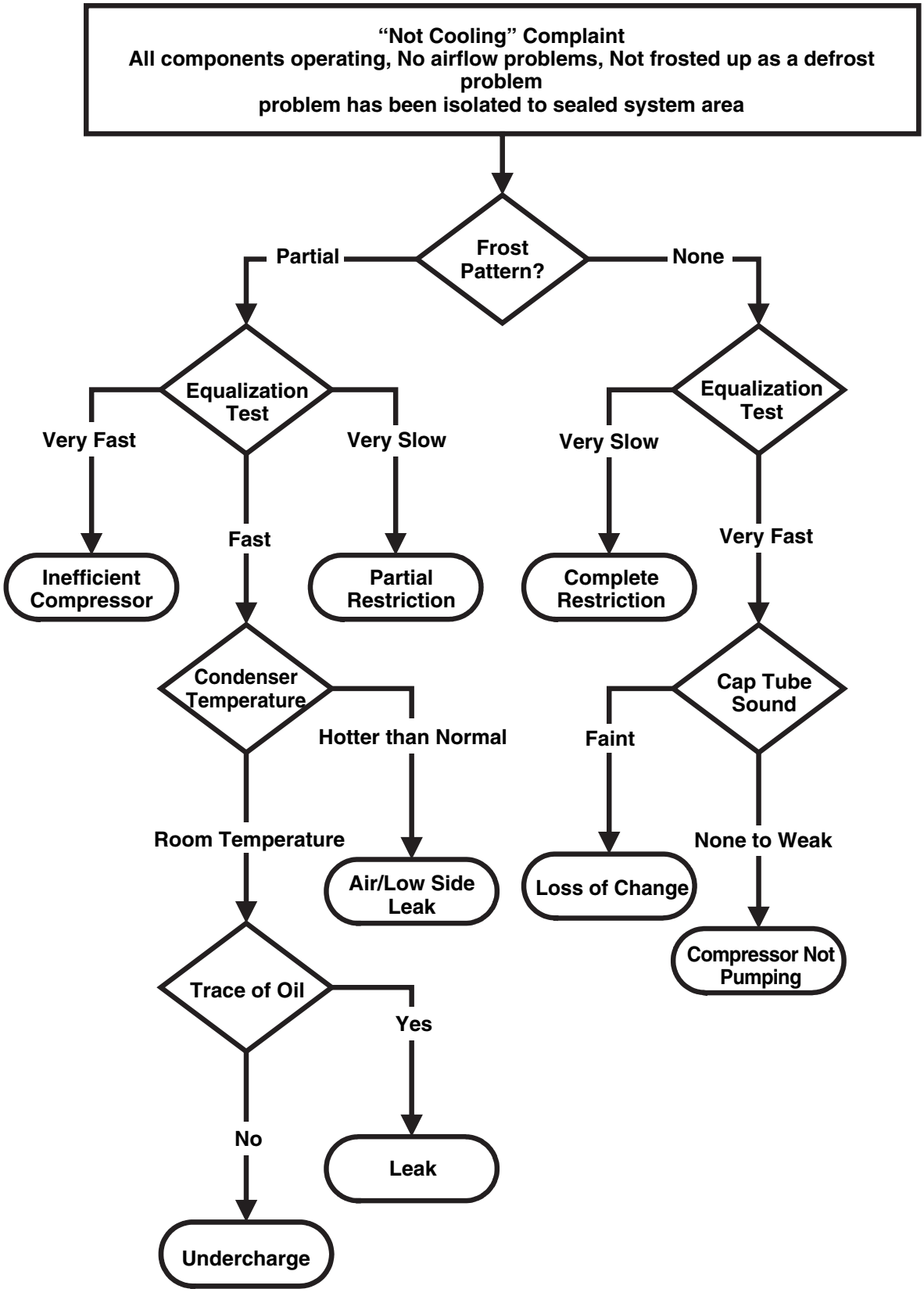
12-6-1 Cleaning

There is no need for routine condenser cleaning in normal Home operating environments. If the environment is particularly greasy or dusty, or there is significant pet traffic in the home, the condenser should be cleaned every 2 to 3 months to ensure maximum efficiency.

If you need to clean the condenser:

- Remove the mechanical cover.
- Use a vacuum cleaner with a soft brush to clean the grille, the open areas behind the grille and the front surface area of the condenser.
- Replace the mechanical cover.

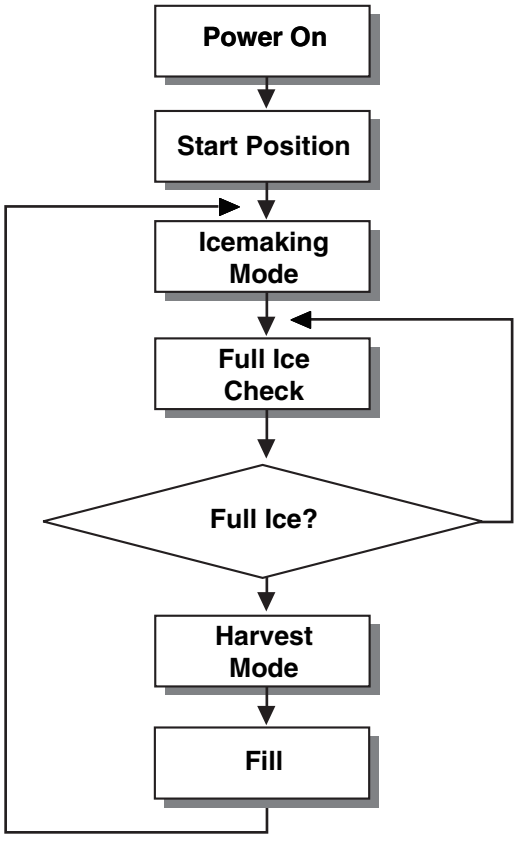
12-6-2 SEALED SYSTEM DIAGNOSIS



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

13. ICEMAKER OPERATING METHOD AND TROUBLE SHOOTING

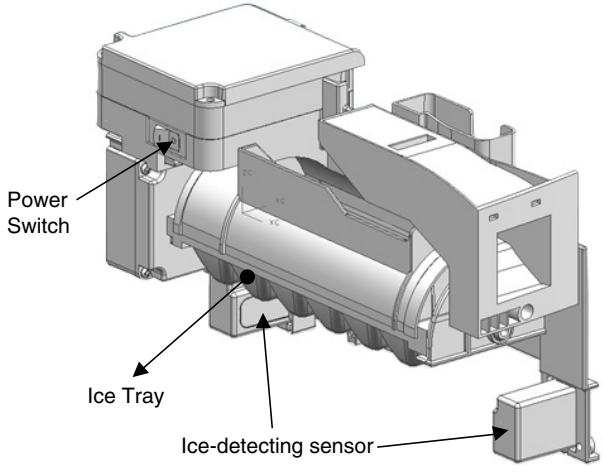
13-1 Icemaker's Basic Operating Method



- Adjusts Ice Tray to Start Position with power on.
- Waits until water becomes ice.
  ※ For cold air circulation, Ice tray will be on a slightly tilt one hour after ice-making mode begins. Atilt ice tray means icemaker's normal operation.

- If water becomes ices in the ice tray, Ice-detecting sensor check if the ice bin is full.
- Twist the ice tray to drop ice into the ICE BIN.
- Supply water to the ice tray by operating the solenoid valve.
- To force water to supply to the ice tray, or check icemaker's condition press and hold the **FILL Key** for about 3seconds.
  In the test mode, The icemaker will run through 3 stages step by step
  : **Harvest → Fill water → Ice making**

To reset the icemaker's operation, set the power switch OFF position and back it to ON position.



Icemaker Unit

13-2 ICE MAKER FUNCTIONS

13-2-1 Icemaking Mode

1. Icemaking Mode begins right after the ice tray fills with water.
2. Icemaker waits until water becomes ice in the ice tray.

※ Ice-detecting sensor checks if the ice bin is full every 2min.

13-2-2 Harvest Mode

At least in 110min, since icemaker begun icemaking mode, Icemaker starts to twist the ice tray to drop ices into the Ice bin. (After installation, at least 1day is needed to make ices)

※ If the icemaker never drop ices to the ice bin though water becomes ices in the ice tray, check the real temperature of compartment. (not temperature on display)
Icemaker needs below 0°F to drop ices to ice bin.

13-2-3 Fill/Park Position

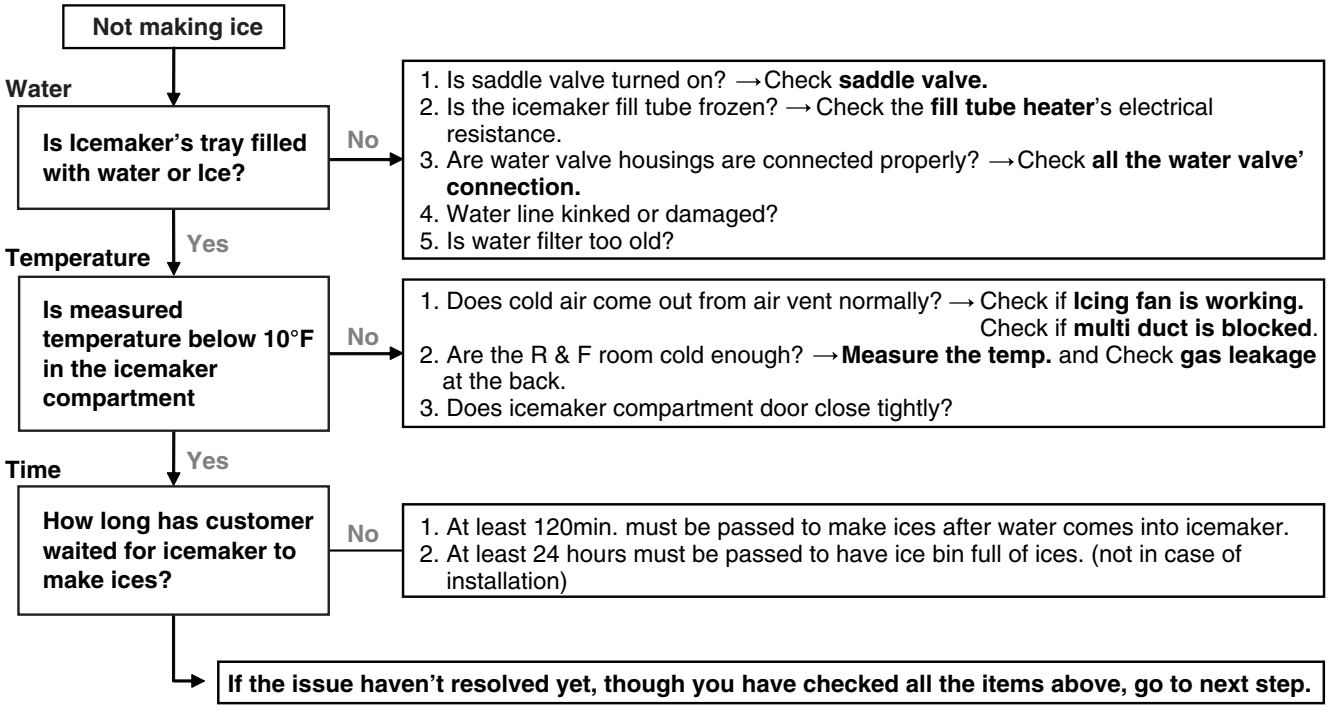
Once the normal harvest mode has been completed, the water solenoid will be activated.

13-3 Trouble Shooting Ice & Water system Issues

13-3-1 Icemaker not making ice or not making enough ice (Environmental Diagnosis)

▶ Icemaker can't make ices itself. Basically, water, temperature and time are needed.
- Water : If no Water, then no Ice.
- Temperature : The compartment, where the icemaker is located, has to be at least 1°F so that icemaker dumps ices to the bin.
- Time : At least 80 minutes must be passed to make one series of ices after water comes into icemaker.

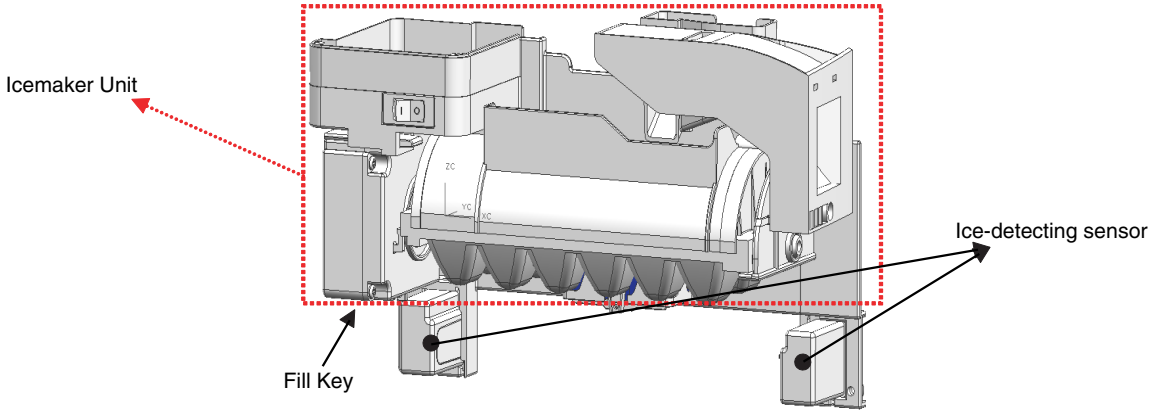
※ ***Test Mode should not be carried out before checking below.***



13-3-2 Icemaker not making ice or not making enough ice (Icemaker Unit & Ice-detecting sensor Diagnosis)

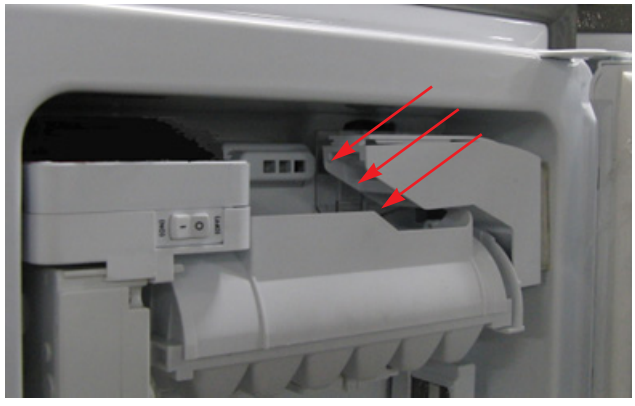
▶ **Icemaker Unit and Ice-detecting sensor Diagnosis**

The icemaker unit and Ice-detecting sensor is programmed to be diagnosed.
Follow the procedure step by step to check to see if icemaker and Ice-detecting sensor is working normally.



1st STEP (Icemaker Unit Diagnosis)

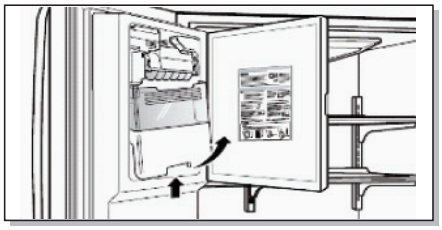
Press the fill key for about 3sec. If the icemaker runs 2 stages of harvest and filling water step by step, It means icemaker's mechanism is normal.



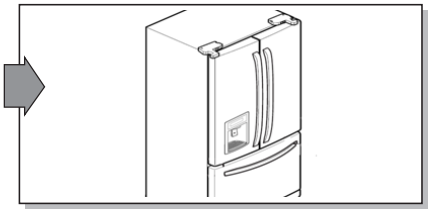
※ Caution : Be sure that the ice tray is not filled with water before pressing fill key.

2st STEP (Ice-detecting sensor Diagnosis)

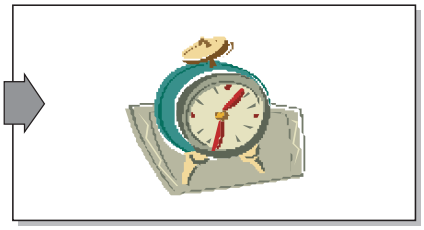
1. Remove Ice bin from compartment



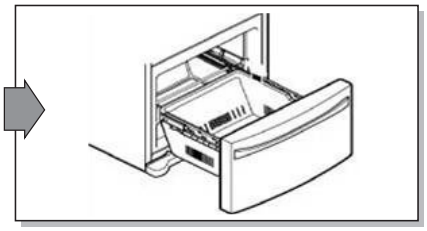
2. Close the left door (Door switch pushed)



3. Wait for 3min.



4. Freezer door stays open



5. Push the refrigerator button & lock button at the same time.

If "ETY" is shown on the display after the procedure above, Ice-detecting sensor is normal.
If "FULL" is shown on the display after the procedure above, Ice-detecting sensor is abnormal.
※ *ETY = empty*

13-3-3 Icemaker not making ice or not making enough ice (Other Suspected Items)

Strongly suspect items below If the issue remains yet, though all the diagnosis for icemaker has been carried out.

- Cap duct bad sealing
- Defective thermal sensor in the icemaker compartment
- Not cold icemaker compartment area (sealed system)

13-3-4 Not Dispensing Ice

▶ Clogged Ice In the Ice Bin (suspected items)

- Customer haven't used ice dispenser over a week.
  →**Resolution** : the ices gets stuck if customer doesn't use ice dispenser.
  In this case, empty the ice bin and wait until the new ices are stacked in the ice bin.
- Temperature of icemaker compartment is not cold enough.
  →**Resolution** : Check ice fan, sealed system, cap duct, vent and other items related to temperature.
- Cap duct doesn't seal the air properly.
  →**Resolution** : Possibly, warm air could get into the compartment and make ices get stuck. Replace the cap duct with new one.
- In-door geared motor doesn't work
  →**Resolution** : Change the in-door geared motor and test it.
- The water comes out of fill cup and the water get into the ice bin.
  →**Resolution** : The water pressure from shutoff valve is too high.
  Recommend to use regulator to the customer and close the shutoff valve slightly.

▶ Clogged Ices In the Chute (suspected items)

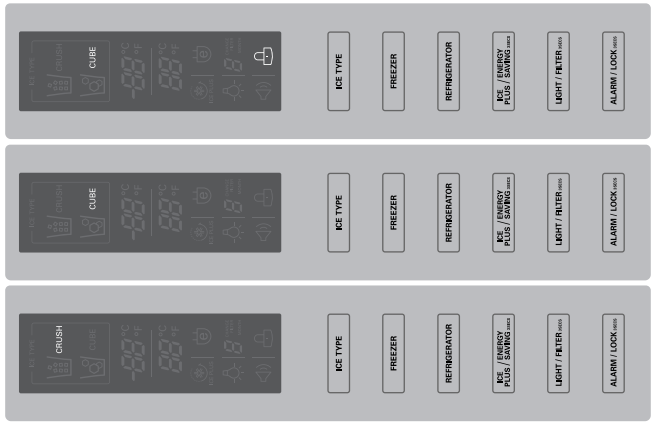
- Cap duct doesn't seal the air properly.
  →**Resolution :** Possibly, warm air could get into the compartment and make ices get stuck. Replace the cap duct with new one.

14. DESCRIPTION OF FUNCTION & CIRCUIT OF MICOM

14-1 FUNCTION

14-1-1 Function

1. When the appliance is plugged in, it is set to 37°F for Refrigerator and 0°F 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 set to Control temperature Previously.
3. If you do not press any button after turning on the power, only CRUSH or CUBE Label that has been selected will be turned on and all other LEDs on the display Panel will be turned off within 60 seconds. (Power Save Mode)
4. If you press a button, only CRUSH, CUBE label and Lock icon that has been selected will be turned on and all other LEDs on the display Panel will be turned off within 20 seconds. (Power Save Mode)



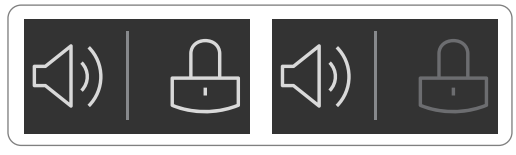
5. If you do not want to use the Power Save Mode, you can change the Mode by pressing the ICE PLUS Button and Freezer TEMP button simultaneously for more than 5 seconds.

14-1-2 How to Toggle the Display between °F & °C

1. The initial setting is °F and the display temperature mode can be changed from °F to °C or °C to °F by pressing and holding the FRZ TEMP and the REF TEMP keys at the same time for over 5 seconds.

14-1-3 Lock function (dispenser and display button lock)

1. When the refrigerator is first turned on, the buttons are not locked. “LOCK” is deactivated with no light on.
2. To lock the display, the dispenser, and the control panel, press and hold the LOCK button for 3 seconds. “LOCK” is activated with “Lock Icon” on.
3. The LOCK button is the only control feature that remains active in the locked state. The buzzer sound, other control buttons, and the dispenser are deactivated.
4. To release from the locked state, press and hold the LOCK button again for 3 seconds.
5. If you don’t hold the Alarm/Lock button more than 3 seconds, Alarm function will be changed and alarm for opened door will be on/off same as alarm icon indicating.

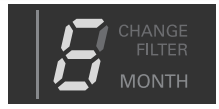
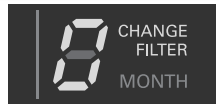


Ex) In selecting "LOCK"

Ex) In selecting "LOCK" again

14-1-4 Filter condition display function

1. There is a replacement indicator light for the filter cartridge on the dispenser.
2. Water filter needs replacement once six months or of using water filter.
3. When the Water Filter Icon blinks, you must exchange the filter.
4. After replacing the filter, press and hold the Light/Filter button for more than 3 seconds.
   After then water Filter icon turn off with reset status.

Classification	In initial Power On / Filter RESET	Blinking
Filter Status Display		

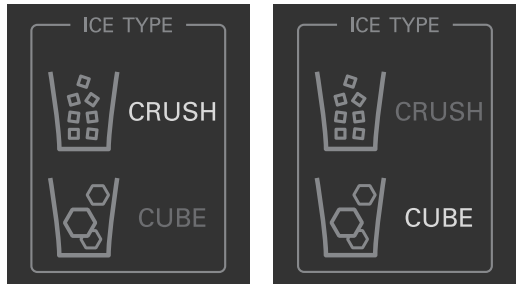
14-1-5 Ice Plus selection

1. Please select ice plus function for quick freezing.
2. When you press the ice plus button, the ice plus icon will be turned on again.
3. Ice plus function automatically turns off after a fixed time passes.
4. If you want additional power save, you can turn on energy saving (some heater off for anti-dew).
5. To turn on or off the energy saving function, press Ice plus/Energy saving Button for more than 3 seconds.
6. We recommend using energy saving function when you go out for quite a long time and are out of the rainy season.

14-1-6 Dispenser use selection

You can select water or ice by separated pad switch.

- When you press ice type button, ice type will be changed. (Crush or Cube)
- Hold your cup in the dispenser for a few seconds after dispensing ice or water to allow the last pieces of ice drops of water to fall into the cup.
- When after initially establ ishing the water comes out, the water tank inside fills and until at the time of quality the hour is caught.



14-1-7 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.

14-1-8 Cooling Fan Motor

1. The cooling fan is switched ON and OFF in conjunction with the compressor.
2. The cooling fan Motor has high and standard speeds. (When room temper rapture more high then 38°C speed is high)
3. The Failure sensing method is the same as in the fan motor of the freezing fan motor(refer to failure diagnosis function table for failure display).

14-1-9 Ice Compartment Fan

1. The Icing Fan is controlled by the the sensor on the top of the ice compartment.
2. The Failure sensing method is the same as in the fan motor of the freezer
   (refer to failure diagnosis function table for failure display)

14-1-10 Refrigeration room Fan Motor

1. The refrigeration room fan is switched ON and OFF in conjunction with the refrigeration room temperature.
2. The Failure sensing method is the same as in the fan motor of the freezing fan motor (refer to failure diagnosis function table for failure display).

14-1-11 Ice PLUS

1. The purpose of this function is to intensify the cooling speed of freezer and to increase the amount of ice.
2. Whenever selection switch is pressed, selection/release, the Icon will turn ON or OFF.
3. If there is a power outage and the refrigerator is powered on again, Ice PLUS will be canceled.
4. To activate this function, press the Ice PLUS key and the Icon will turn ON. This function will remain activated for 24 hrs. The first one hour the compressor, Freezer Fan and Icing Fan will be ON. The next 23 hours the Ice room will be controlled at the lowest temperature. After 24 hours or if the Ice PLUS key is pressed again, the Ice room will return to its previous temperature.
5. During the first hour :
   (1) Compressor, Freezer Fan and Icing Fan run continuously.
   (2) If a defrost cycle begins during the first 30 minutes of Ice Plus, the Ice PLUS cycle will complete its cycle after defrosting has ended.
   If the defrost cycle begins when Ice Plus has run for more than 30 minutes, Ice PLUS will run for 40 minutes after the defrost is completed.
   (3) If Ice PLUS is pressed during defrost, Ice Plus Icon is on but this function will start seven minutes after defrost is completed and it shall operate for three hours.
   (4) If Ice Plus is selected within seven minutes after compressor has stopped, the compressor (compressor delays seven minutes) shall start after the balance of the delay time.
6. For the rest of the 23 hours, the Ice room will be controlled at the lowest temperature.

14-1-12 How to set the display mode and cancel it

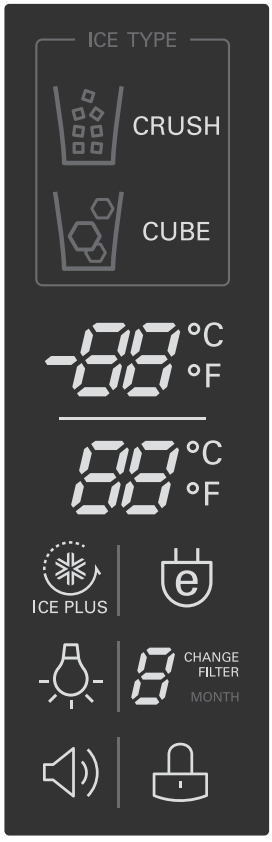
1. With the refrigerator door open, keep pressing the Refrigerator Temp Button and ICE PLUS Button more than 5 seconds, then it goes to the display mode with Special Beep Sound With Special Beep Sound.
2. Perform the same way again to cancel the display mode.
3. All Freezing unit will be turned off at display mode (Exceptions : Lamp, Display)

14-1-13 Defrosting (removing frost)

1. Defrosting starts each time the COMPRESSOR running time Betwee 7~50 hours.
2. For initial power on or for restoring power, defrosting starts when the compressor running time reaches 4 hours.
3. Defrosting stops if the sensor temperature reaches 46.4°F(8°C) or more. If the sensor doesn't reach 46.4°F(8°C) in 1 hours, the defrost mode is malfunctioning. (Refer to the defect diagnosis function, 8-1-15.)
4. Defrosting won't function if its sensor is defective (wires are cut or short circuited)

14-1-14 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.



* Display check function: If simultaneously pressing Ultra Ice button and freezing temperature adjustment button for a second, display LCD graphics on. If releasing the button, the LCD graphic displays the previous status.
You can check the error code Within 3-hour Period from initial error

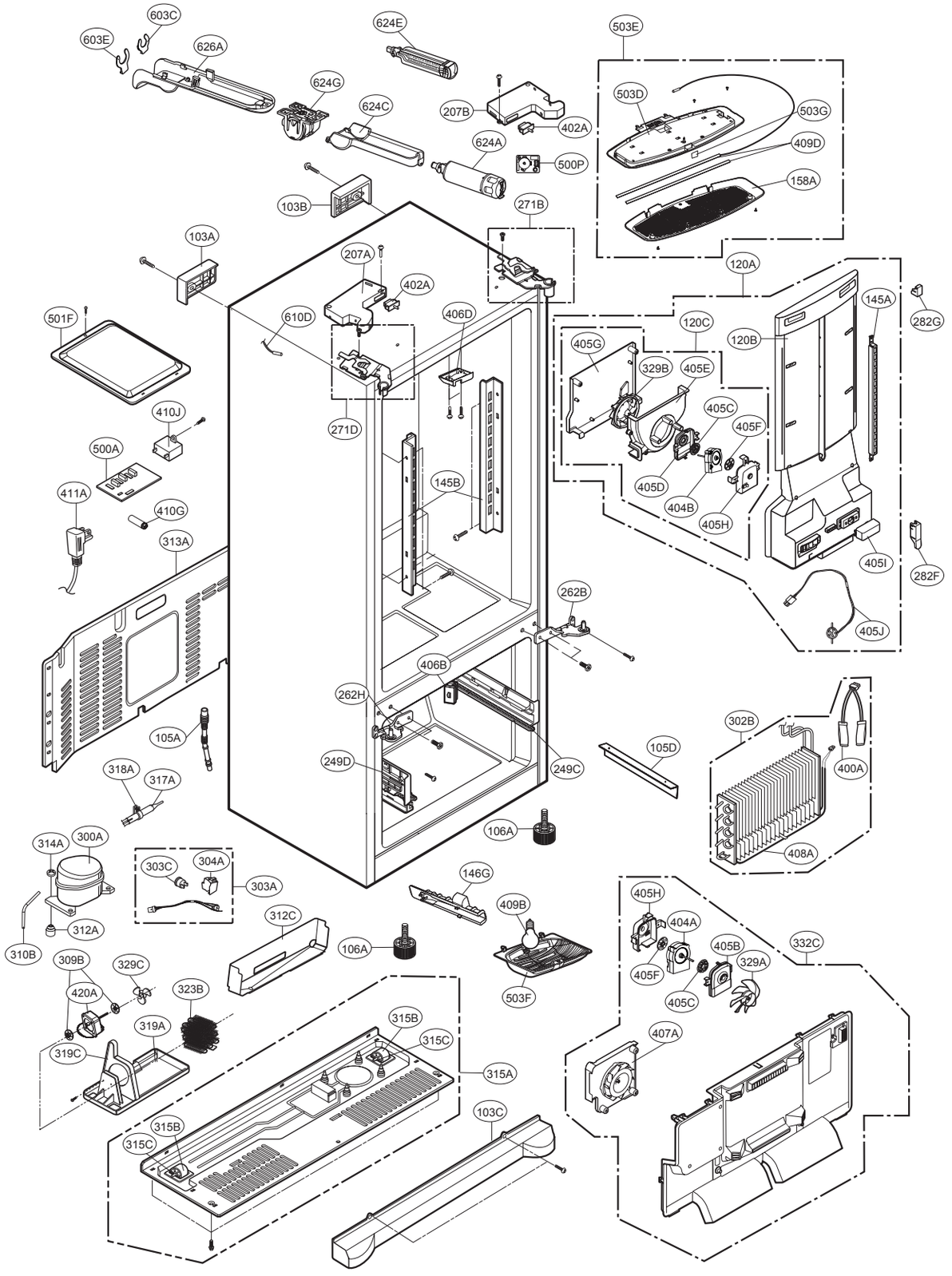
14-1-15 Auto pantry

1. The temperature control will automatically start upon the selected Auto Pantry temperature control.
2. You can adjust the Pantry control with three different temperature ranges by pressing the Temp.Selector button.

15. EXPLODED VIEW & REPLACEMENT PARTS LIST

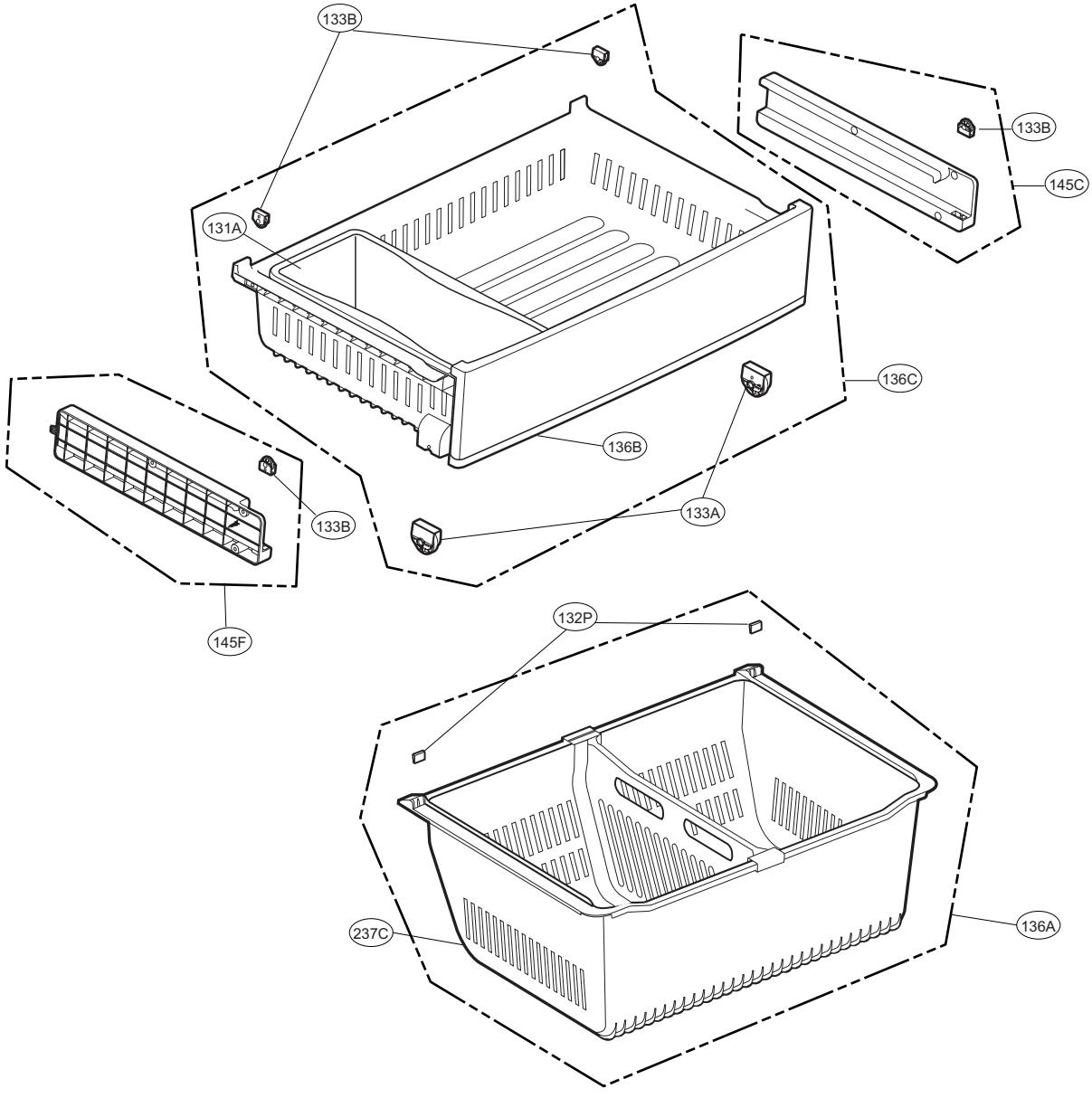
CASE PARTS

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



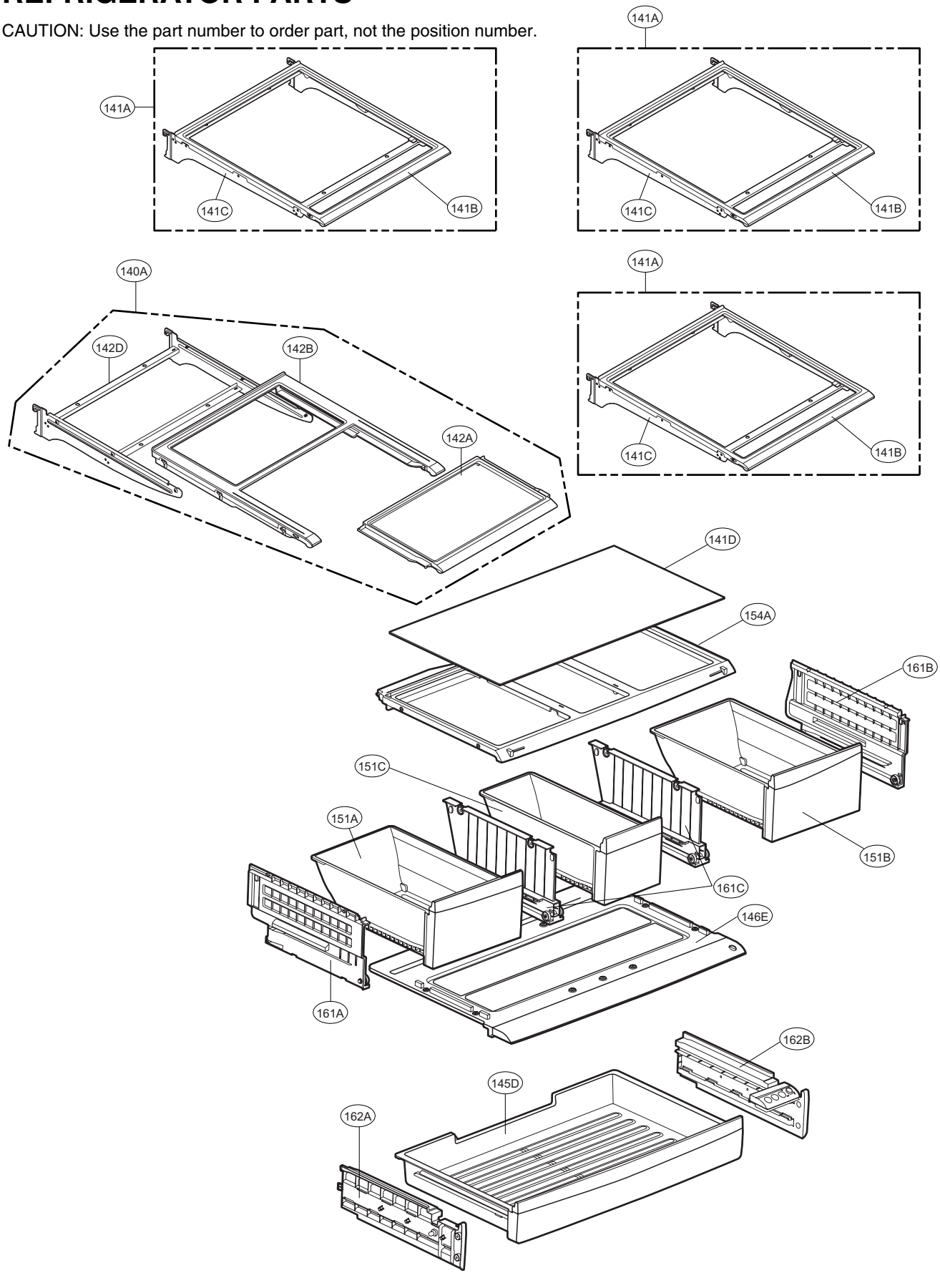
FREEZER PARTS

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



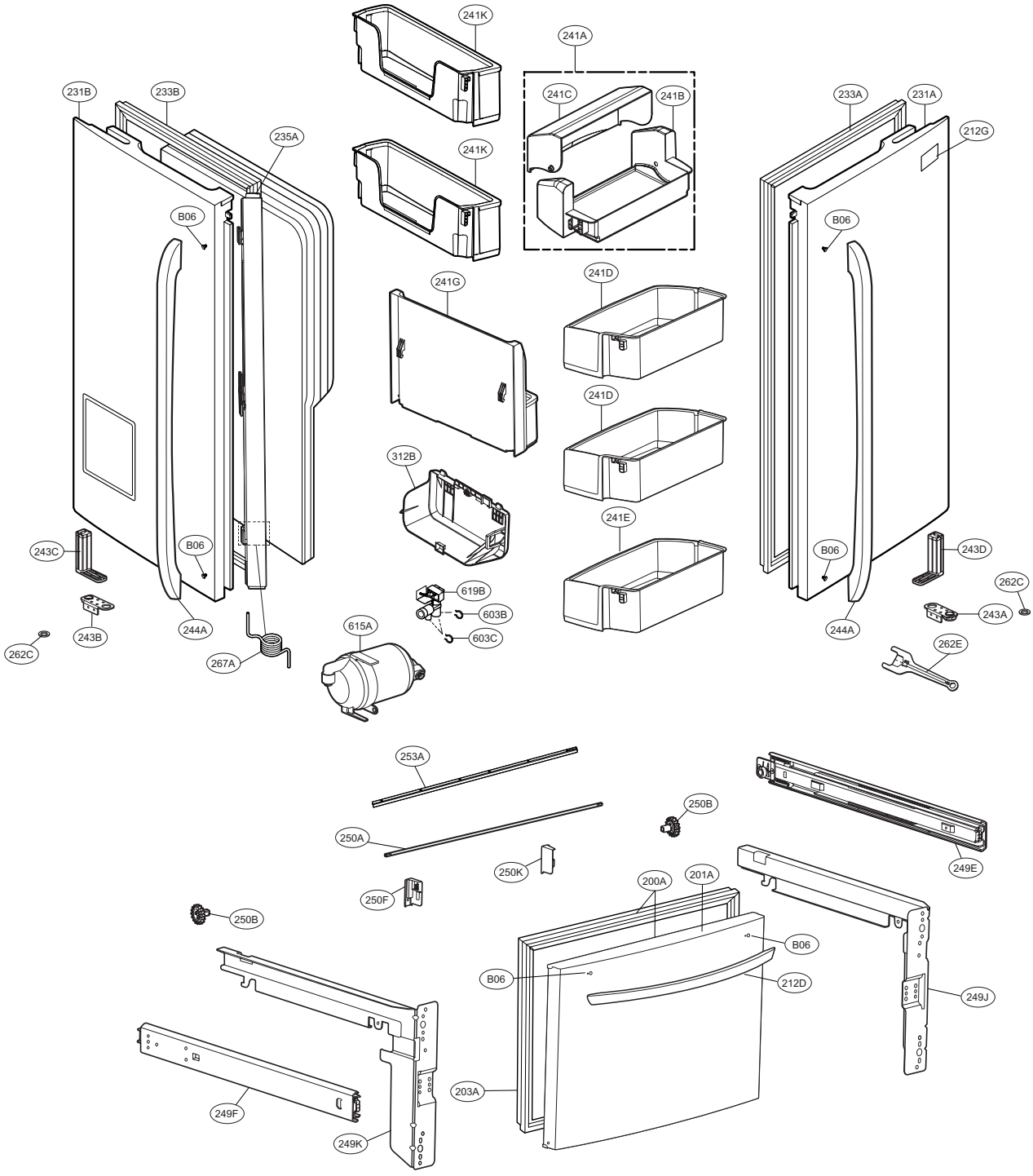
REFRIGERATOR PARTS

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



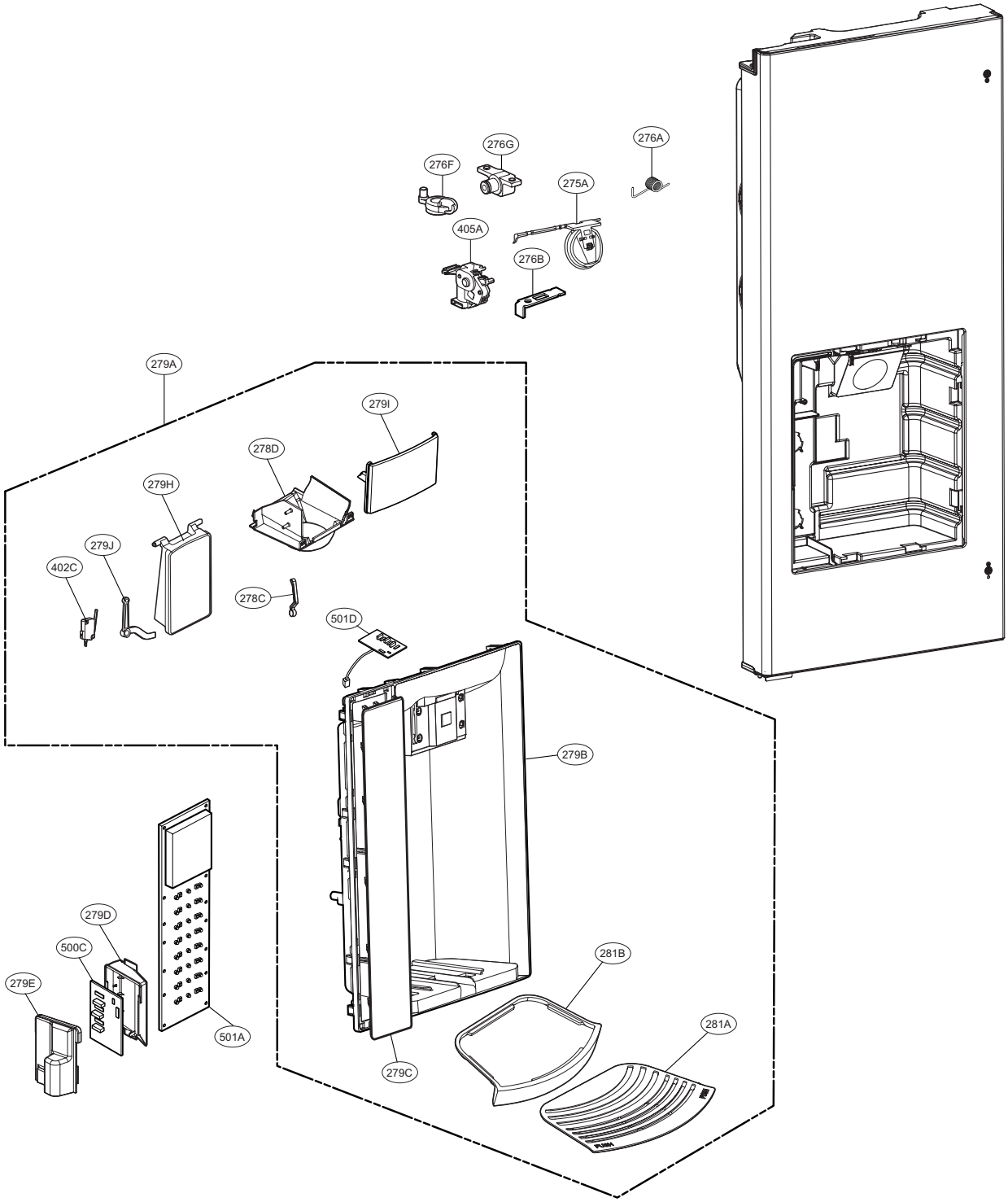
DOOR PARTS

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



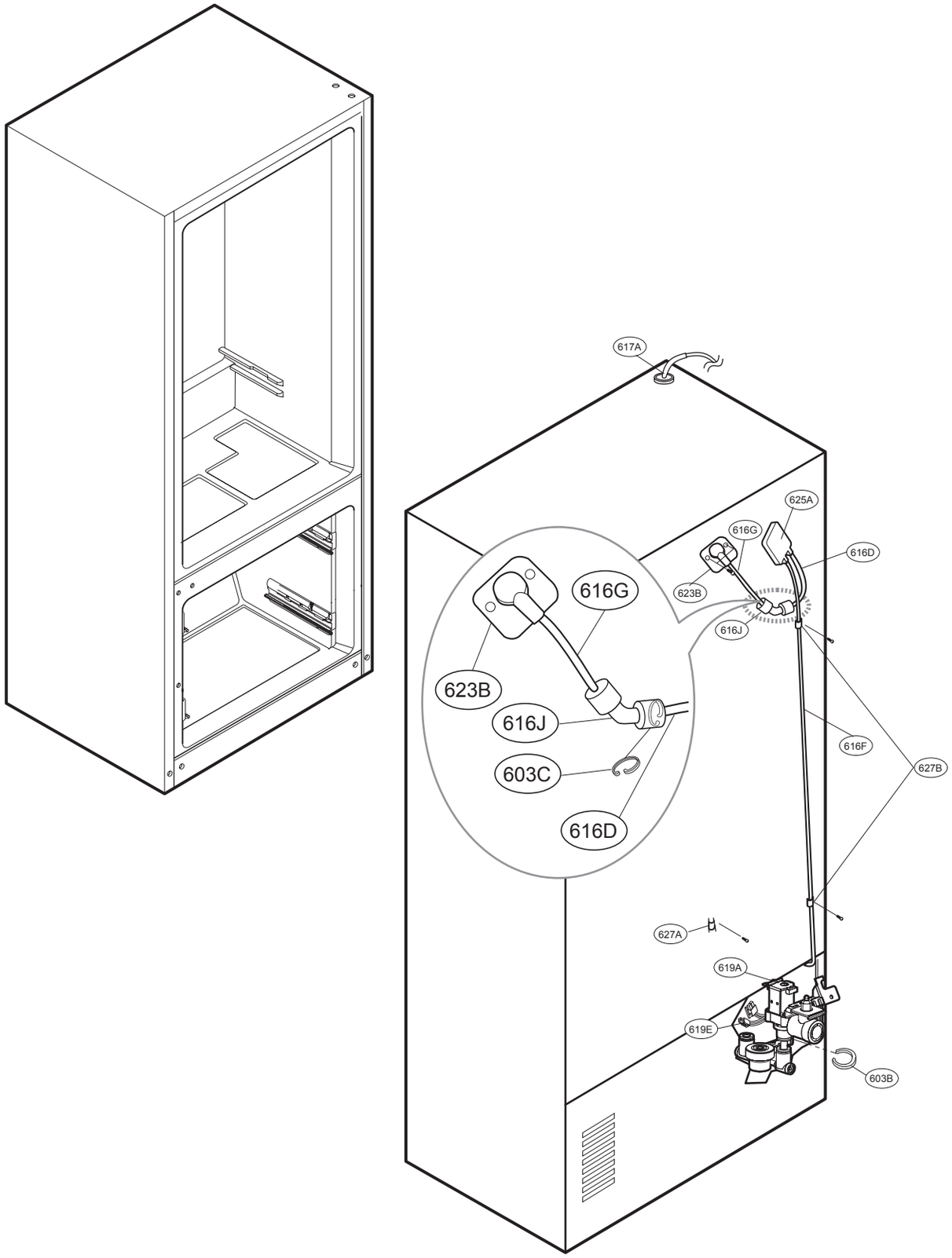
DISPENSER PARTS

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



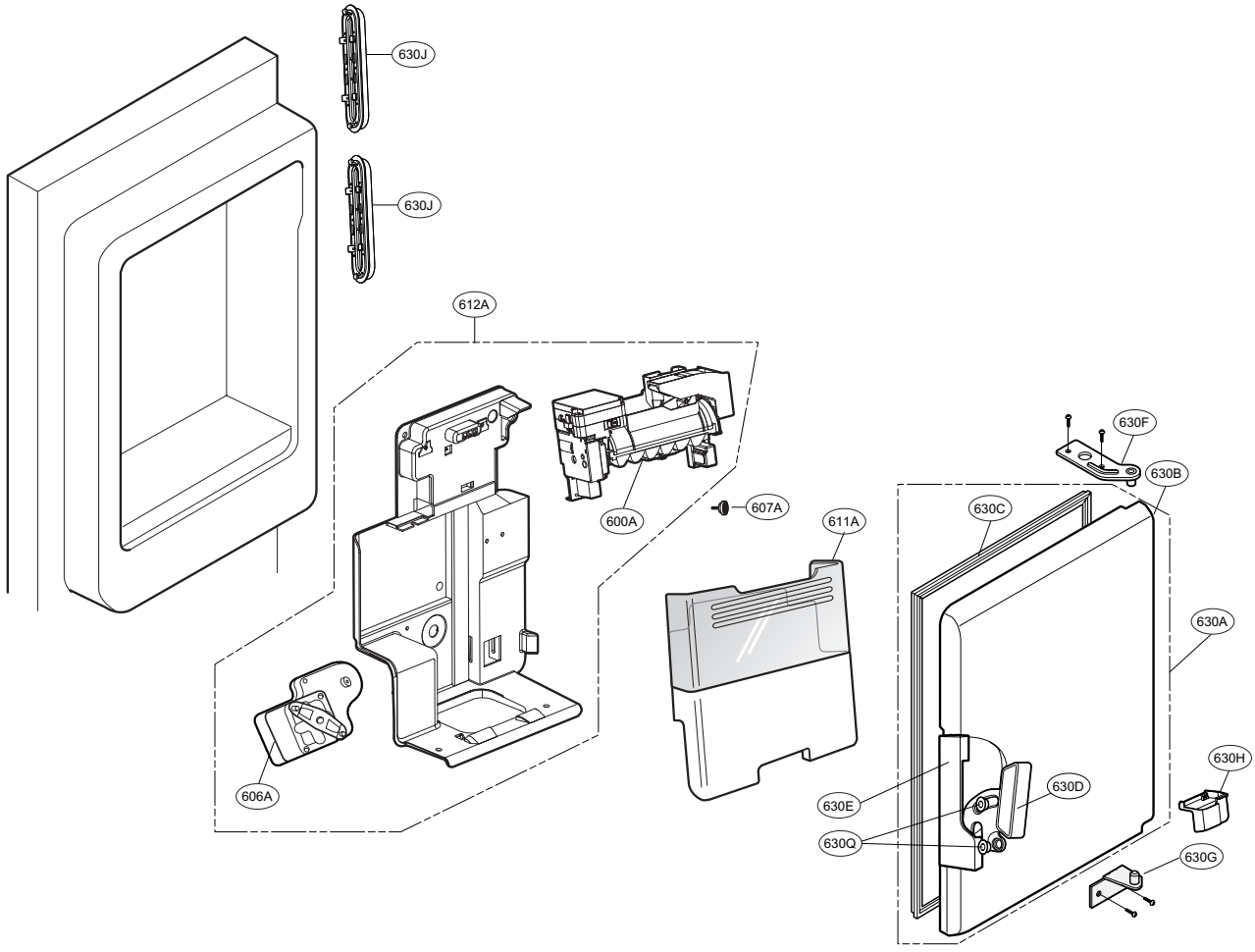
VALVE & WATER TUBE PARTS

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



ICE MAKER & ICE BIN PARTS LFX28978**

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



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