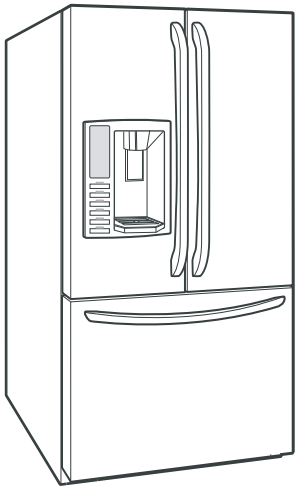
LG
Life's Good

REFRIGERATOR
SERVICE MANUAL

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



MODELS:

LFXS24623S
LFXS24623W
LFXS24623B

CONTENTS

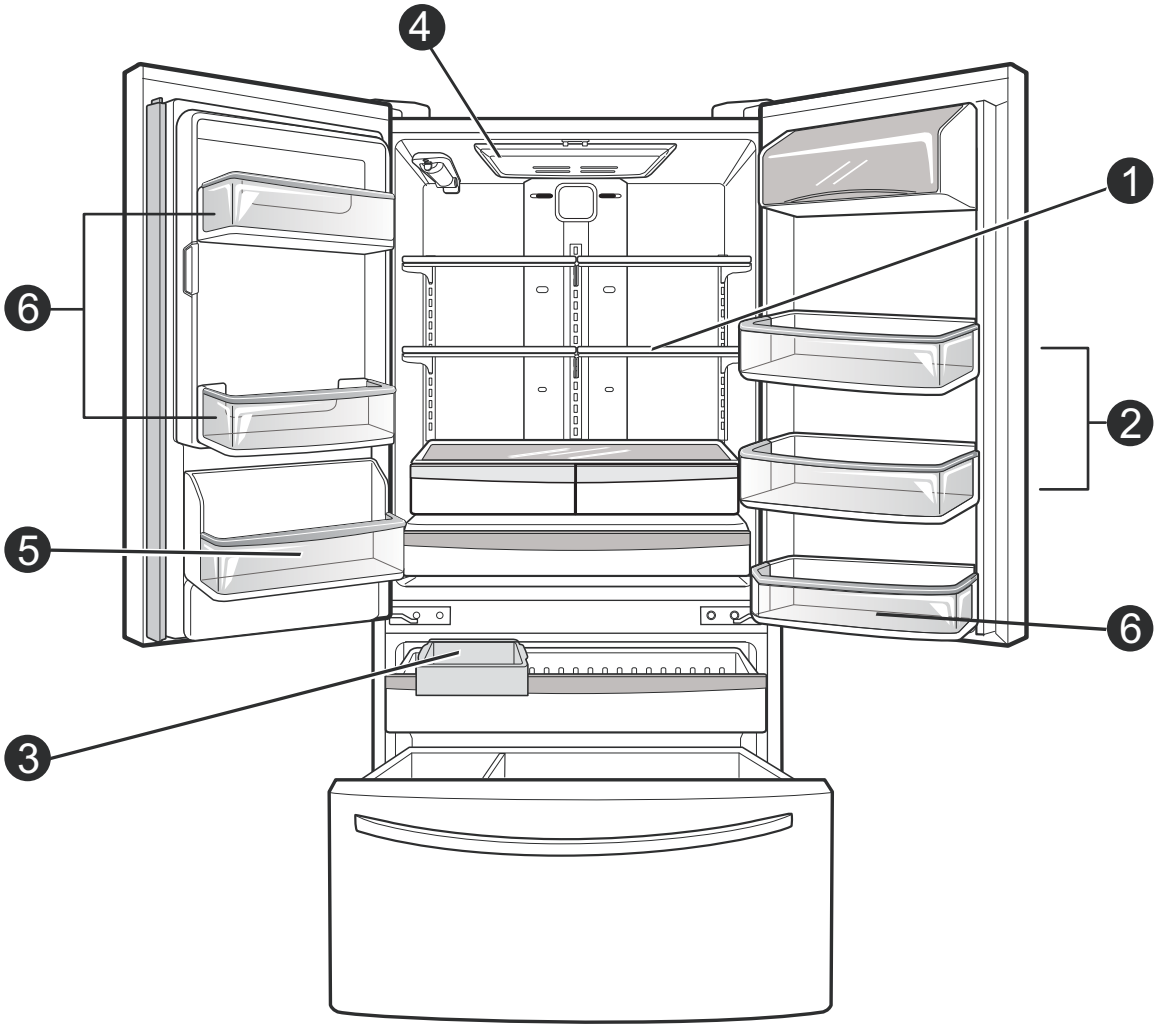
SAFETY PRECAUTIONS

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

	SPECIFICATIONS	MODELS		
		LFXS24623S	LFXS24623W	LFXS24623B
GENERAL FEATURES	Color	STAINLESS	WHITE	BLACK
	Dimensions (in)	32 3/4 X 35 3/8 X 69 3/4 (WXDXH)		
	Net Weight (lb)	321lb		
	Capacity	24.2cu.ft.		
	Refrigerant	R134A		
	Climate Class	TEMPERATURE (N)		
	Rated Rating	115/60		
	Cooling System	FAN COOLING		
	Temperature Control	MICOM CONTROL		
	Defrosting System	FULL AUTOMATIC		
		HEATER DEFROST		
	Insulation	CYCLO PENTANANE		
	Compressor	LINEAR		
	Evaporator	FIN TUBE TYPE		
	Condenser	AL SPIRAL CONDENSER		
	Lubricanting Oil	ISO8 (180 ml)		
	Drier	MOLECULAR SIEVE XH-7		
	Capillary Tube	ID Ø 0.75		
	First Defrost	4 HOURS		
	Defrost Cycle	7-50 HOURS		
	Defrosting Device	SHEATH HEATER		
	Anti-freezing Heater	WATER TUBE HEATER		
	Water Tank	DOOR		
	Auto ice maker	TWISTING		
REFRIGERATOR	Case Material	EMBO		
	Door material	STAINLESS	PCM	PCM
	Handle Type	B-VISTA		
	Display Graphic	10-Majesty-Brand-Best		
	R-VEGETABLE	2 CRISPER		
	Ice Tray & Bank	SLIM IN DOOR AUTO ICE MAKER		
	Lamp	HIGH BRIGHTNESS LED		
	Shelf	3FIX(S/PROOF)+1FOLD		
	Egg Bank	NO		
	Pantry	YES(Digital)		
FREEZER	F, Drawer lower	1EA PL+1EA PL		
	Lamp	CAPSULE LED		
	Shelf	NO		

2. PARTS IDENTIFICATION



1 ADJUSTABLE REFRIGERATOR SHELVING

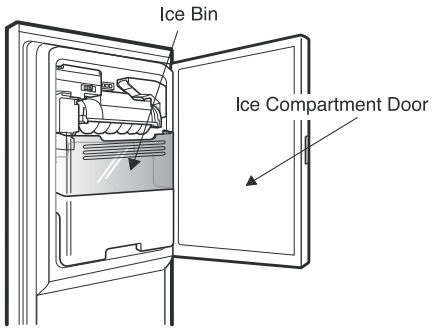
The refrigerator compartment shelves are adjustable to allow flexibility for storage needs.

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

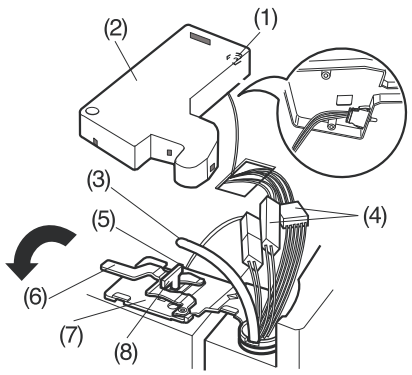
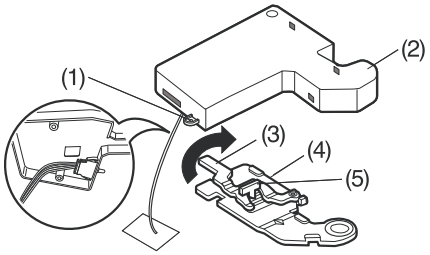


Figure 3



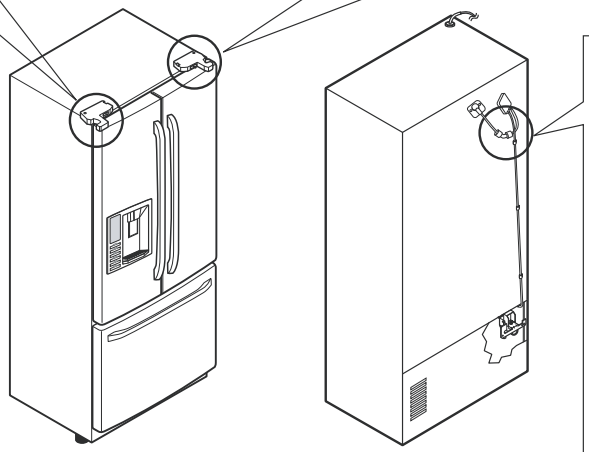
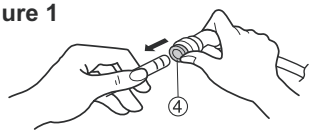
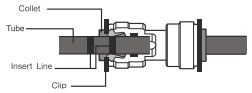


Figure 1





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.

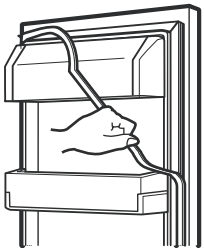


Figure 4

Door Gasket Replacement

1. **Insert gasket into channel**
   Press gasket into channels on the four remaining sides of door.

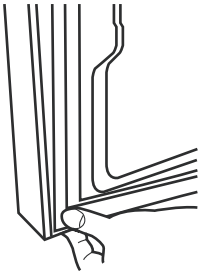


Figure 5

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.)

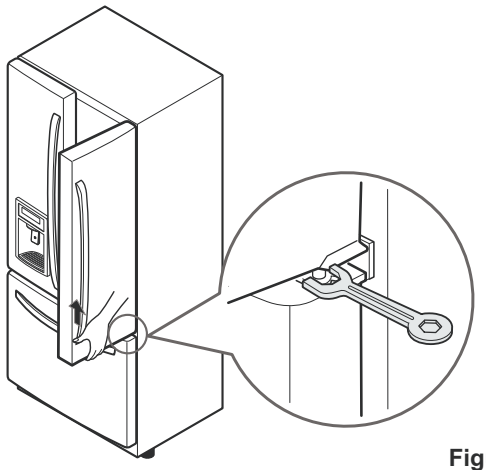


Figure 9

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.

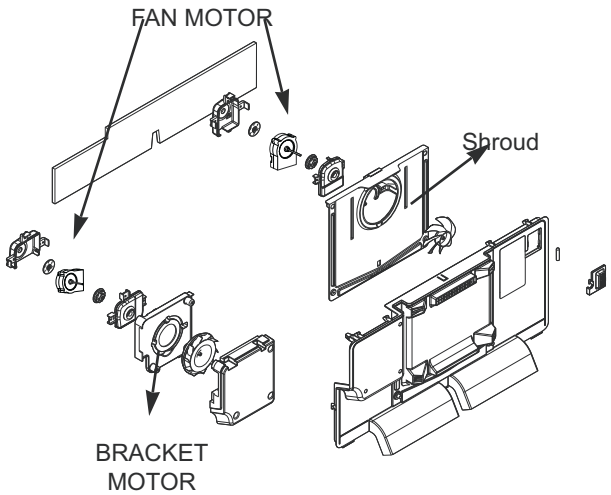


Figure 10

* 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.

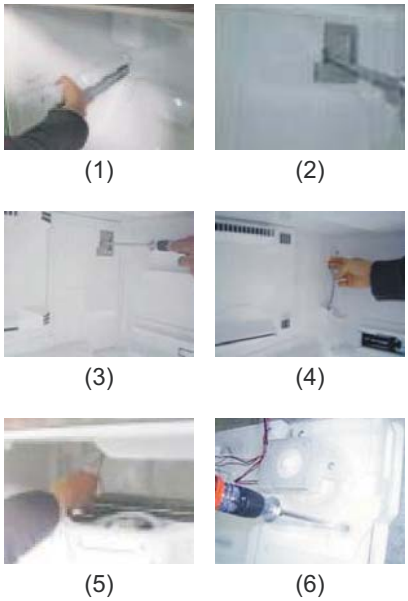


Figure 11

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)

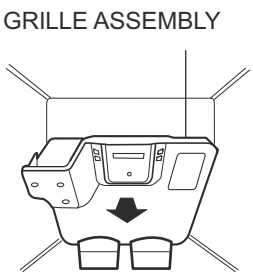


Figure 12

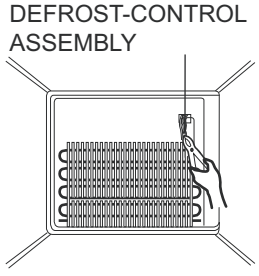


Figure 13

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.

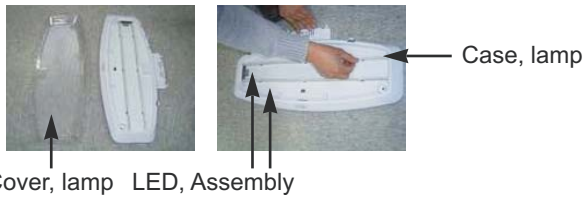


Figure 17

3-6-2 Freezer Compartment Lamp

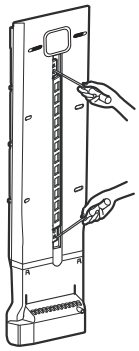
1. Unplug refrigerator power cord form outlet.
2. Remove screw with driver.
3. Grasp the cover Lamp, pull the cover downward.

4. Separate connector.

5. Remove screw with driver.

3-7 MULTI DUCT

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



3-8 AIR FILTER

1. Remove filter cover to turn counterclockwise about 30 degree.

2. Remove old air filter from filter cover. Install new air filter in filter cover to see “FRONT”.

3. Filter cover put on multi duct in position, and turn air filter clockwise about 30 degree.

3-9 MAIN PCB

1) Loosen 3 screws on the PWB cover.

Figure 20

2) Remove the PCB cover

Figure 21

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

Figure 22

3-10 DISPENSER

Figure 23

1) Pull out the drain

Figure 24

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

3-11 DISPLAY PCB

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

Figure 29

3-12 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.

Figure 30

3-13 WATER BUTTON ASSMEBLY

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

Figure 31

3-14 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.

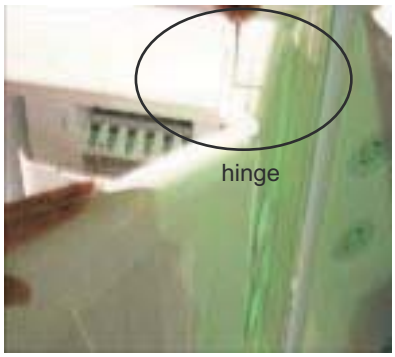


Figure 32

3-15 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.

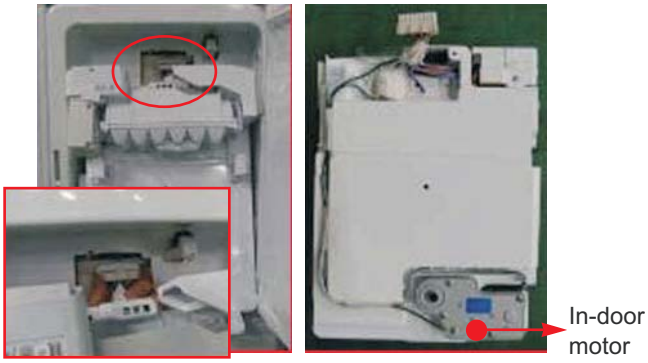


Figure 35

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

Figure 36

3-16 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

3-17 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.

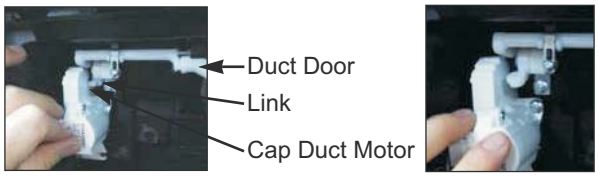


Figure 41

4) Insert 2 screws.

Figure 42

5) Push housing aside.

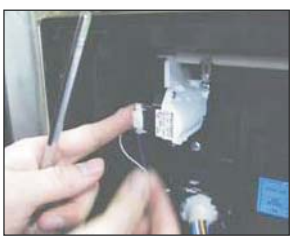


Figure 43

3-18 HOW TO REMOVE A ICE BIN

1) Grip the handles, as shown.

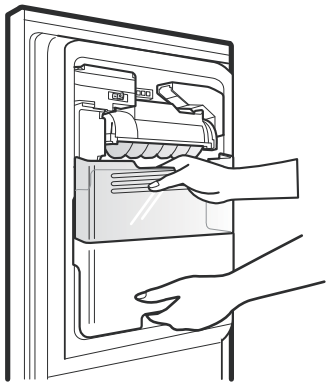


Figure 44

2) Tilt and lift slightly as shown.

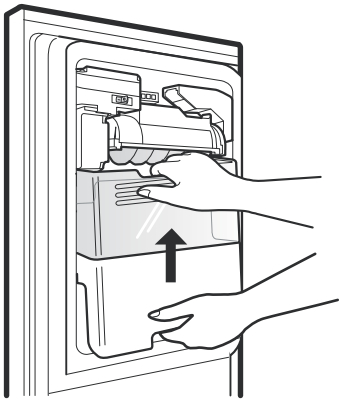


Figure 45

3) Remove ice bin slowly.

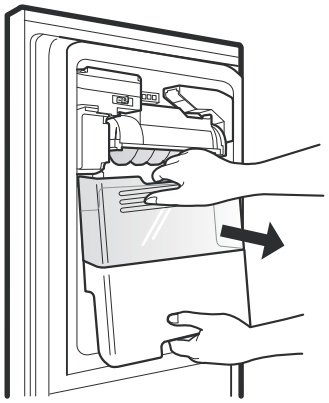


Figure 46

3-19 HOW TO INSERT A ICE BIN

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

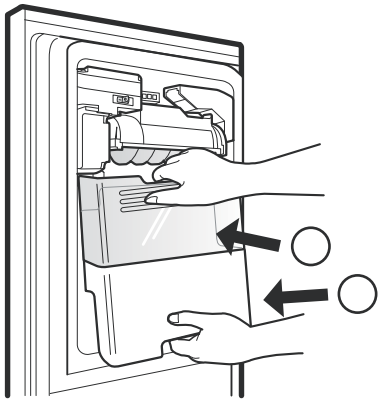


Figure 47

3-20 HOW TO REMOVE AND REINSTALL THE PULLOUT DRAWER

3-20-1 Follow Steps to Remove

Step 1) Open the freezer door.

Figure 48

Step 2) Remove the lower basket.

Figure 49

Step 3) Remove 2 screws one on each side of the guide rails.

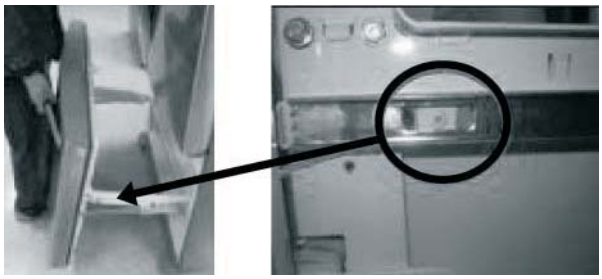


Figure 50

Step 4) Removal of the freezer door is done by lifting clear of the rail support. Fully extend both rails.

Figure 51

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

Second: Remove the center rail.

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

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

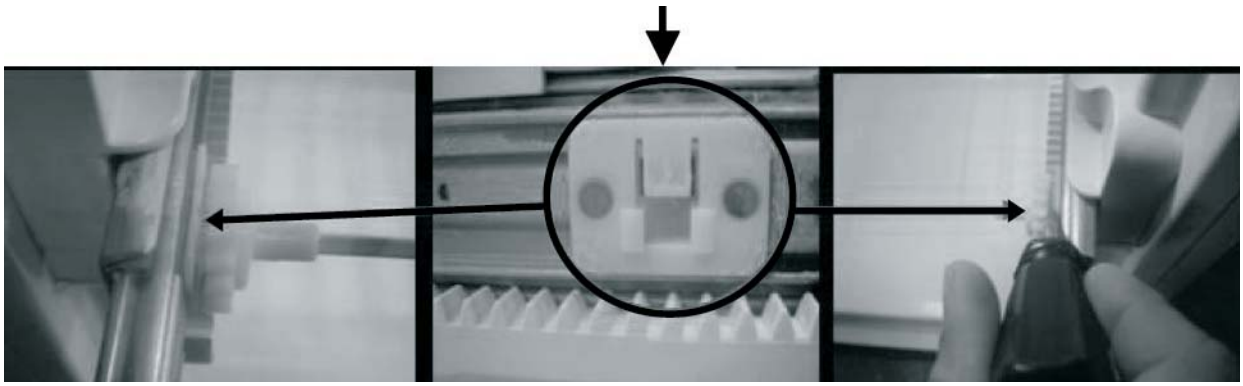


Figure 52

3-20-2 Follow Steps to Reinstall

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

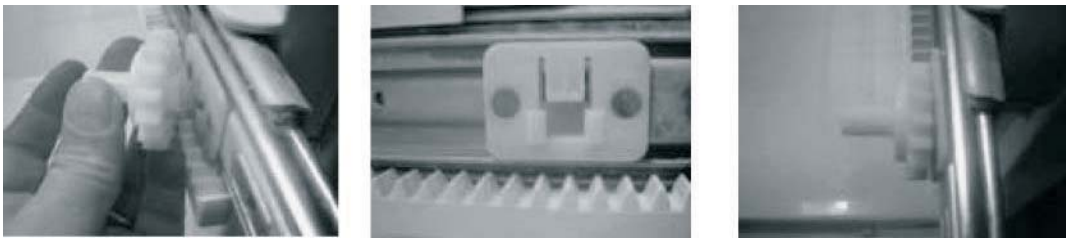


Figure 53

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

Figure 54

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

Figure 55

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

Figure 56

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

Figure 57

Step 6) Reinstall 2 screws into the guide rail one on each side.

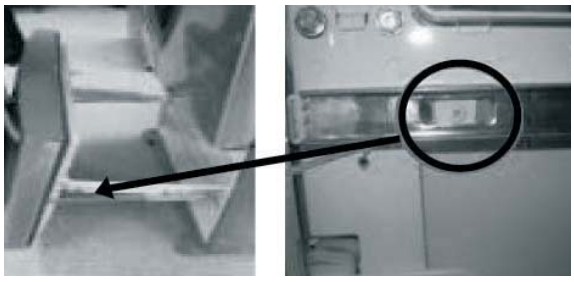


Figure 58

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

Figure 59

3-21 WATER VALVE DISASSEMBLY METHOD

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

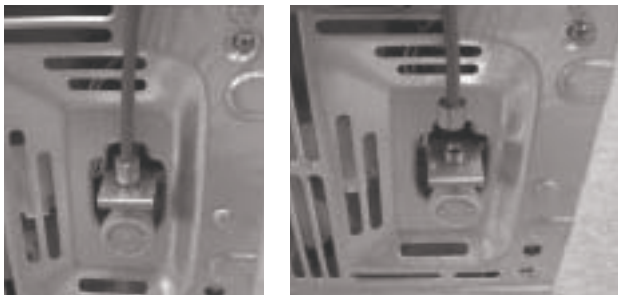


Figure 60

2) Remove cover and 1 screw from the valve.

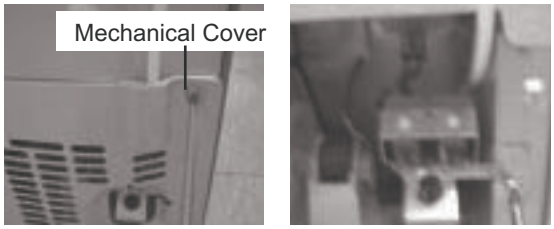


Figure 61

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.

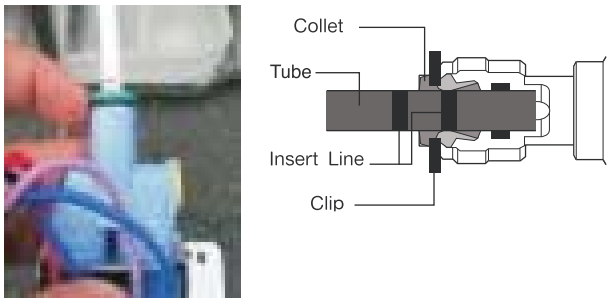


Figure 63

3-22 FAN AND FAN MOTOR DISASSEMBLY METHOD

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

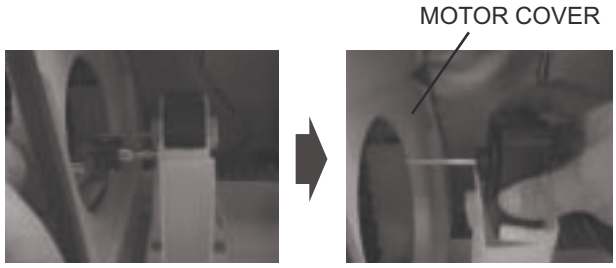


Figure 64

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

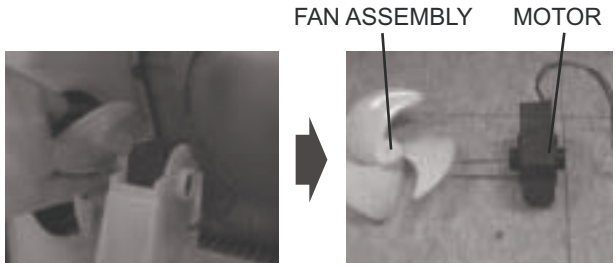


Figure 65

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.).

3-23 Drawer Removal

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

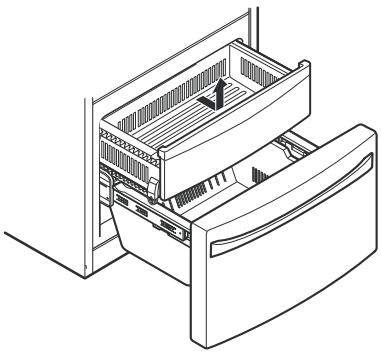


Figure 66

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

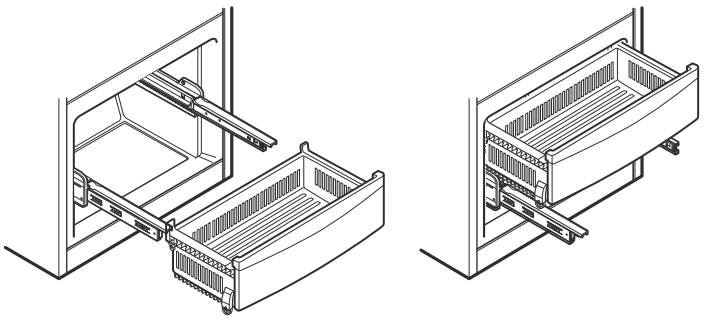


Figure 67

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

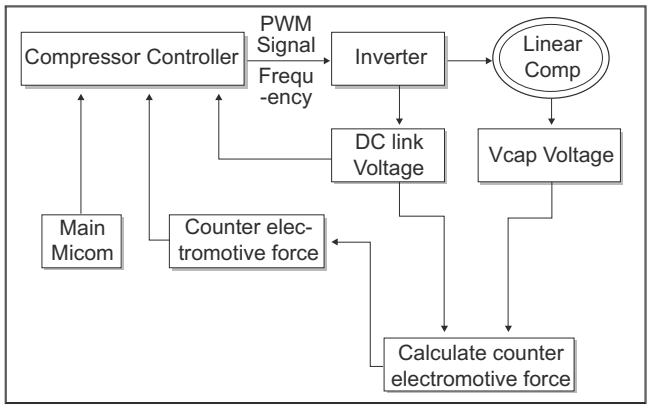
(2) Loosen two screws on comp base

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

4-2 INTRODUCTION OF E-LINEAR COMRESSOR

- E-Linear compressor is run by mechanical part design through automatically varying the cooling power. The main parts consist of compressor and Sub PCB which controls the compressor. PCB authorizes constant voltage and constant frequency to the compressor and protects it.

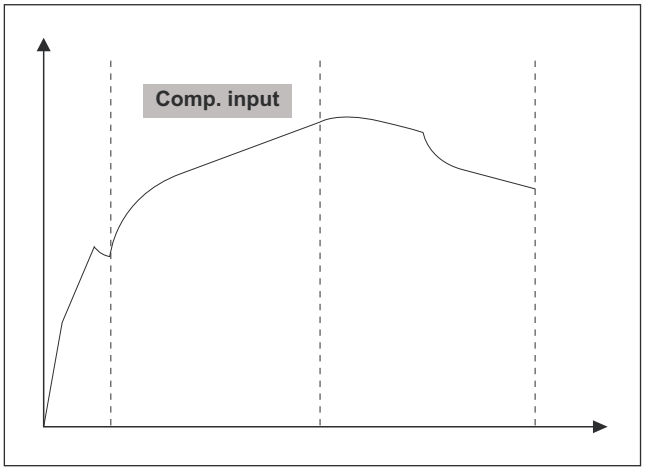
4-2-1 Control of Compressor Block Diagram



Control Block Diagram of Compressor

4-2-2 Compressor operating pattern

- Drive half stroke after turning on initial power for 30 seconds. Then, slowly increase stroke and reach target input. Once reaching the target input, input naturally changes according to refrigerator load without any special control.



Interval 1) Half stroke interval - after initial running, stay at the initial value for 30 seconds
Interval 2) Running interval - Increase at every 0.8 till it reaches the target input; it takes about 3' 45"
Interval 3) CVCF interval - Run by target voltage and main operating frequency and the input naturally changes according to refrigerator load

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.

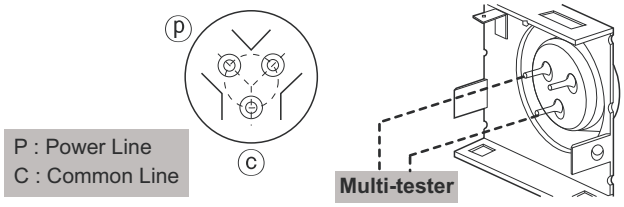
- IPM fault Trip
  It occurs if FO signal received from IPM is LOW. For every 416.7us, check whether FO signal is LOW. The trip occurs if it is found three times during the five periods(83ms).

4-2-4 Compressor problems diagnosis

- When there is a problem or failure with the `operation, you are kindly recommended to check it as follows ;

1) Check to normality by measurement of resistance

Measure the resistance between poles of the hermetic terminal (as shown picture) with a multi-tester.
(measurement several minutes after power off)



Case 1-1
If the measured values lie in the normal resistance range as in the table below,
➔ Compressor is normal.

Case 1-2
If the measured values are above several M or a infinity,
➔ Wire is disconnected in the shell.

Case 1-3
If the measured values are excessively of small number,
➔ There is short somewhere in the shell.

■ Normal resistance range (measured at ambient temperature 23)

	Resistance
FLB075L*NA	**7.2~9.2 Ω**

※ According to ambient temperature or operation situation, the values could show a little deviation.

2) Check to normality by measurement of Voltage

Measure the resistance between pin of the connector (as shown picture) with a multi-tester.

<Fig. 2>

<Fig. 2>

Standard for normality

- In order to decide whether compressor operating is normal or not, check the output transfer during the refrigerator operation.
- After input the initial power and compressor operates, wait for 10 minutes to estimate.
- Compressor operation may be diagnosed as normal if the voltage falls between 145V and 180V.

Warning

1. Please be cautious of electric shock and short (it is estimated after turning on initial power).
2. If the voltage is estimated less than 80V, it is diagnosed as bad.

3) Check problems by LED On & Off Count _ (Sub PCB)

If compressor protection logic is running, LED Lamp's blinking frequency of sub PCB, which takes in charge of control, can help estimate the protection logic's symptoms and the cause of its problems.

Trip name	Led Times	Comp Off Time
Stroke Trip	2	1min
Current Trip	6	6min
Lock Piston Trip	5	2min 30sec
IPM fault trip	7	20sec

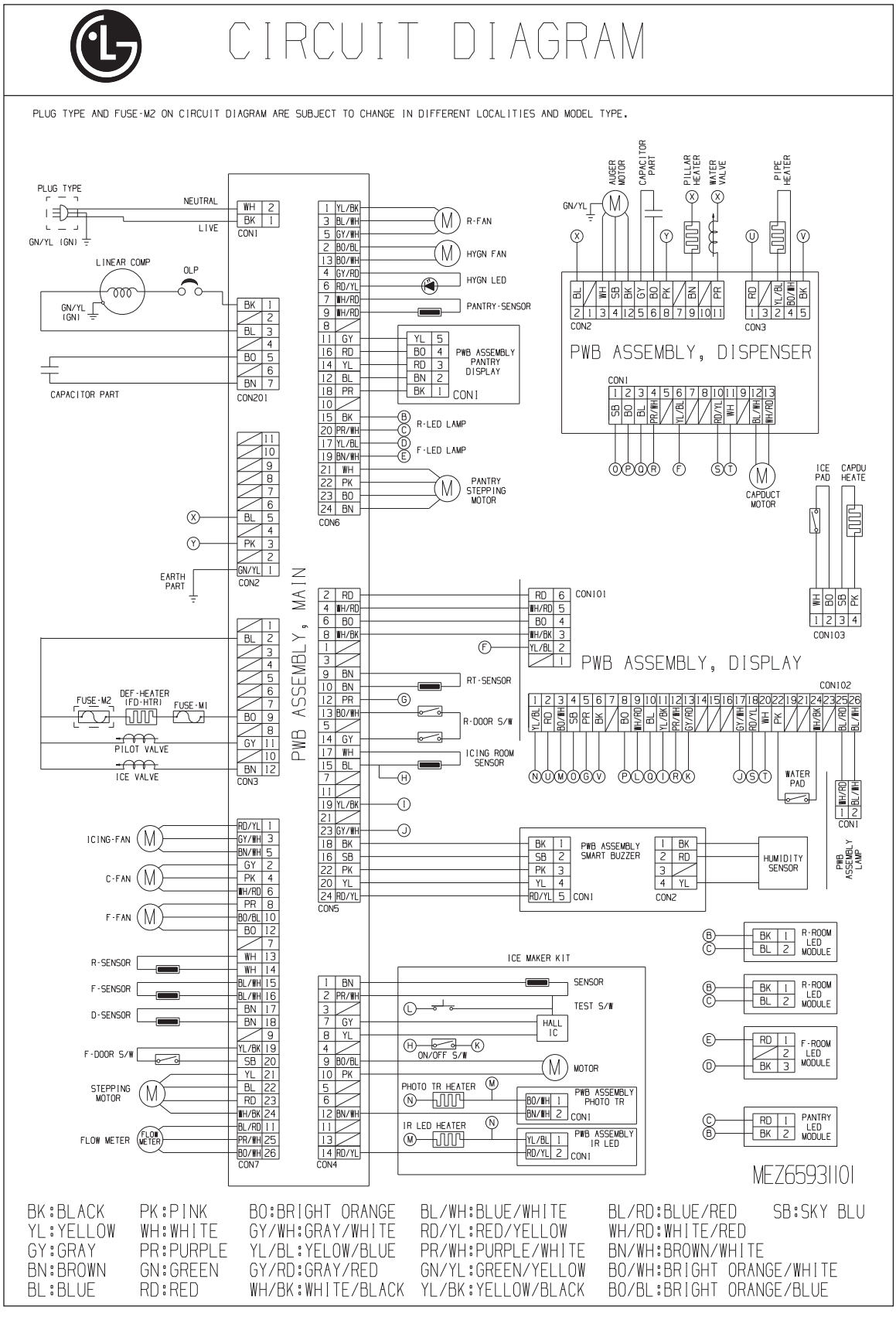
- Current Trip → PCB defects or Cycle clogging maybe the causes. After estimating winding resistance, estimate compressor operation voltage to check if there is any problem and take actions to repair cycle at replacement of compressor.

- Stroke Trip → can occur when the surrounding temperature is high, C-Fan, F-Fan and so on are constrained, or when cycle problems, such as moisture blocking or compressor defect, are related.

- Lock Piston Trip → Since compressor itself can be a potential cause of a defect, estimate the compressor resistance value according to #1's compressor winding value estimation method and estimate the #2's compressor operation voltage to decide whether it is defective or not
  (Before replacement of compressor, replace PCB and conduct the replacement of compressor during compressor replacement)

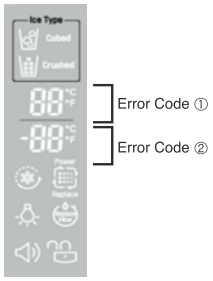
- IPM fault Trip → Replace sub PCB since there is high chance that it is caused by sub PCB's part defect.

5. CIRCUIT DIAGRAM



6. TROUBLESHOOTING

6-1 Error Code Summary



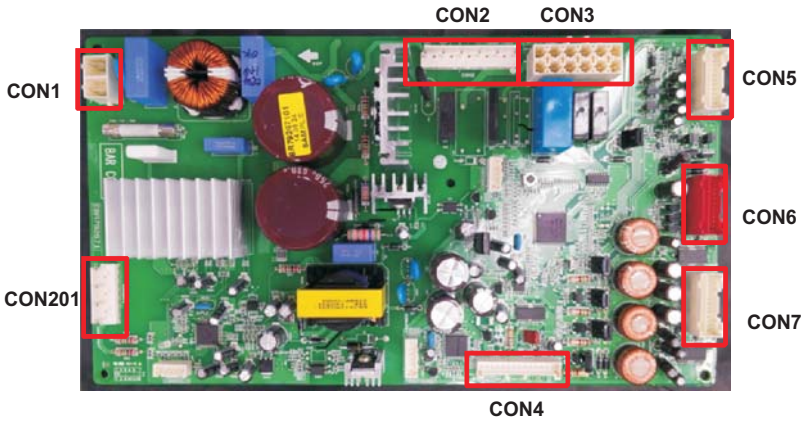
⚠ **WARNING:** When checking Resistance values, make sure to turn off the power, and wait for the voltage to discharge.

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 "E rt", "E SS",
"E IS(except for Icing sensor)", "E gF", "E It" error, are displayed.
"E IS" which is displayed without input of user is the error of Icing Sensor.

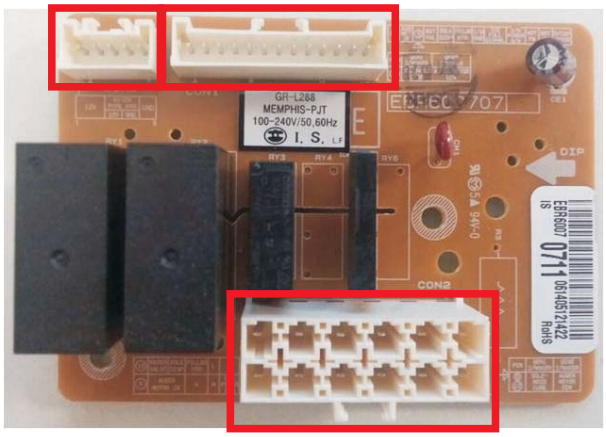
NO	Error Detection Category	Error Display		Error Generation Factors	Remark
		Freezer Temperature (Error code ①)	Refrigerator Temperature (Error code ②)		
1	Normal			None	Normal operation of Display
2	Freezer Sensor Error	E	FS	Short or Disconnection of Freezer Sensor	Check each sensor at it's connector.
3	Refrigerator Sensor Error	E	rS	Short or Disconnection of Refrigerator Sensor	
4	Defrosting Sensor Error	F	dS	Short or Disconnection of Defrosting Sensor	
5	Icing Sensor Error	E	IS	Short or disconnection of the sensor about Ice maker (Icing sensor, Ice maker sensor)	
6	Pantry sensor error	E	SS	Short or Disconnection of Pantry Sensor	
7	Room Temp Sensor Error	E	rt	Short or Disconnectoin of Room temp.sensor	
8	Ice maker kit defect	E	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	E	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	F	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	E	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	E	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	E	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	E	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	E	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.
16	Humidity Sensor Error	E	HS	Short or Disconnection of Humidity Sensor	Poor connection of housing, missing Humidity sensor, sensor defect itself, short or disconnection of harness

7. PCB PICTURE

7-1 Main PCB

P/ No & MFG	Picture
EBR792671** **(2014.06~)**	

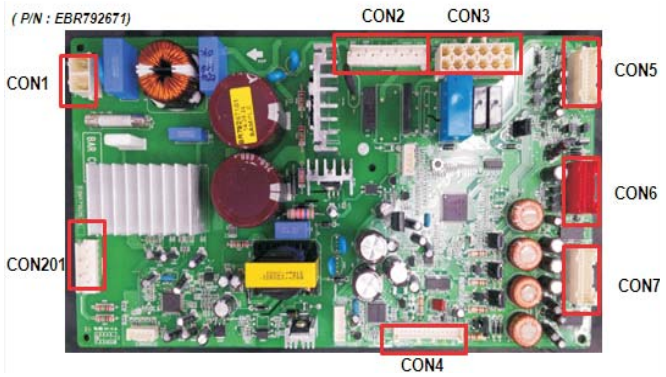
7-2 Display PCB & Sub PCB

P/No	Picture
Display PCB **EBR786626xx** **(2014.06~)**	
	 **CON104** **CON102** **CON101**
Sub PCB **EBR60070711** **(2014.06~)**	**CON3** **CON1**  **CON2**

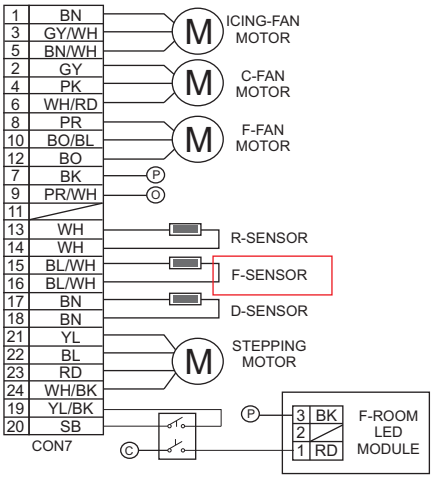
8. Troubleshooting With Error Display

8-1 Freezer Sensor Error (E FS)

Symptom	Check Point
1. E FS	1. Check for a loose connection 2. Check Sensor Resistance



CON7



	Resistance [Ω]	
CON7 15th pin ~ 16th pin	**Short**	**0**
	Open	**OFF**
	Other	**Normal**

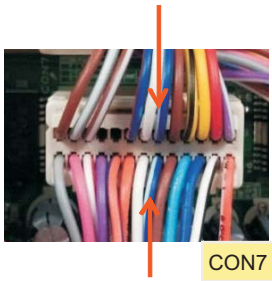
CON7 15th pin ~ 16th pin	Resistance [Ω]
-22°F /-30°C	**40k**
-13°F /-25°C	**30k**
-4°F /-20°C	**23k**
5°F /-15°C	**17k**
14°F /-10°C	**13k**
23°F /-5°C	**10k**
32°F / 0°C	**8k**

Freezer Sensor Error (E FS)

1

Is the Connector disconnected or loose between Main PCB and sensor?

Yes → Reconnect or repair the connector



No

2

Check the Sensor resistance.
Is resistance 0? (Sensor short)?

Yes → Change the Sensor

No

3

Check the Sensor resistance.
Is resistance OFF (Sensor open)?

Yes → Replace the refrigerator

No

4

Check the Sensor resistance.
Is resistance normal?

Yes

5

Check the Temperature and resistance refer to the table.
No problem?

CON7 15th pin ~ 16th pin	**Resistance [Ω]**
-22ºF / -30ºC	**40k**
-13ºF / -25ºC	**30k**
-4ºF / -20ºC	**23k**
5ºF / -15ºC	**17k**
14ºF / -10ºC	**13k**
23ºF / -5ºC	**10k**
32ºF / 0ºC	**8k**

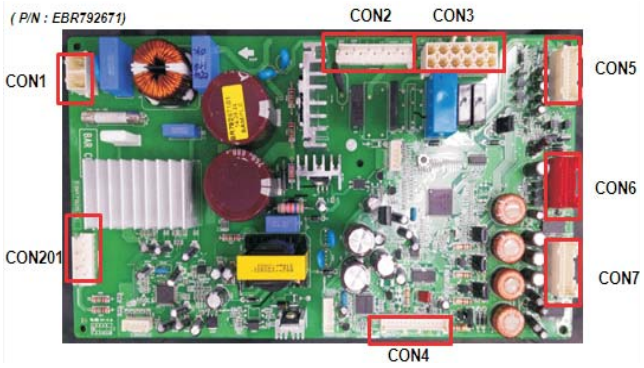
Yes

6

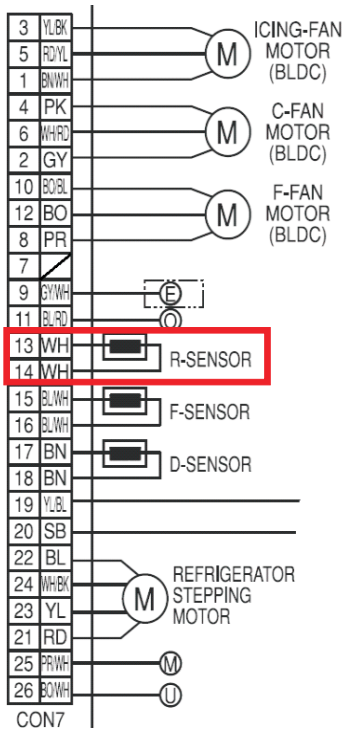
Explain to customer

8-2 Refrigerator Sensor Error (E rS)

Symptom	Check Point
1. E rS	1. Check for a loose connection 2. Check Sensor Resistance



CON7



	Resistance [Ω]	
CON7 13th pin ~ 14th pin	**Short**	**0**
	Open	**OFF**
	Other	**Normal**

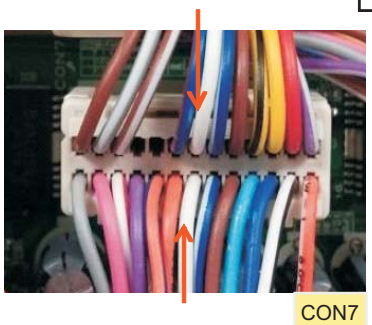
CON7 13th pin ~ 14th pin	Resistance [Ω]
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

Refrigerator Sensor Error (E rS)

1

Is the Connector disconnected or loose between Main PCB and sensor?

Yes → Reconnect or repair the connector



CON7

No

2

Check the Sensor resistance.
Is resistance 0? (Sensor short)?

Yes → Change the Sensor

No

3

Check the Sensor resistance.
Is resistance OFF (Sensor open)?

Yes → Replace the refrigerator

No

4

Check the Sensor resistance.
Is resistance normal?

Yes

5

Check the Temperature and resistance refer to the table.
No problem?

CON7 13th pin ~ 14th pin	**Resistance [Ω]**
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

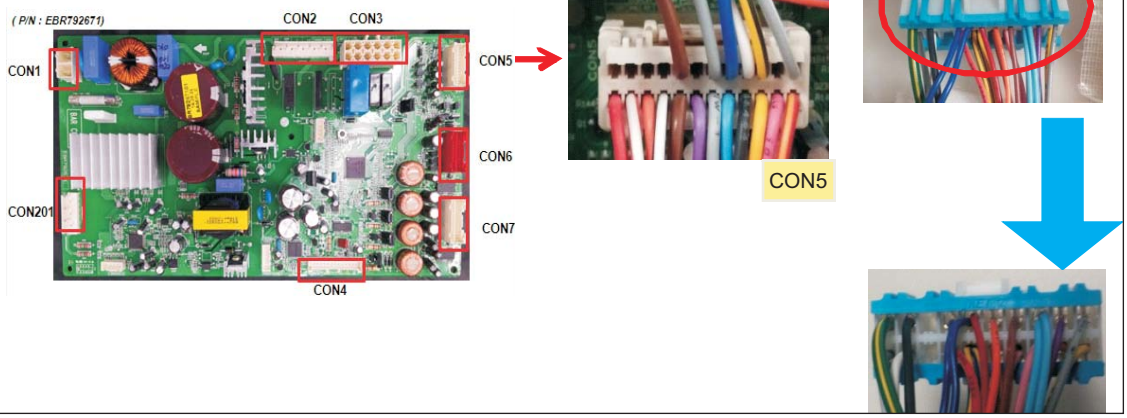
Yes

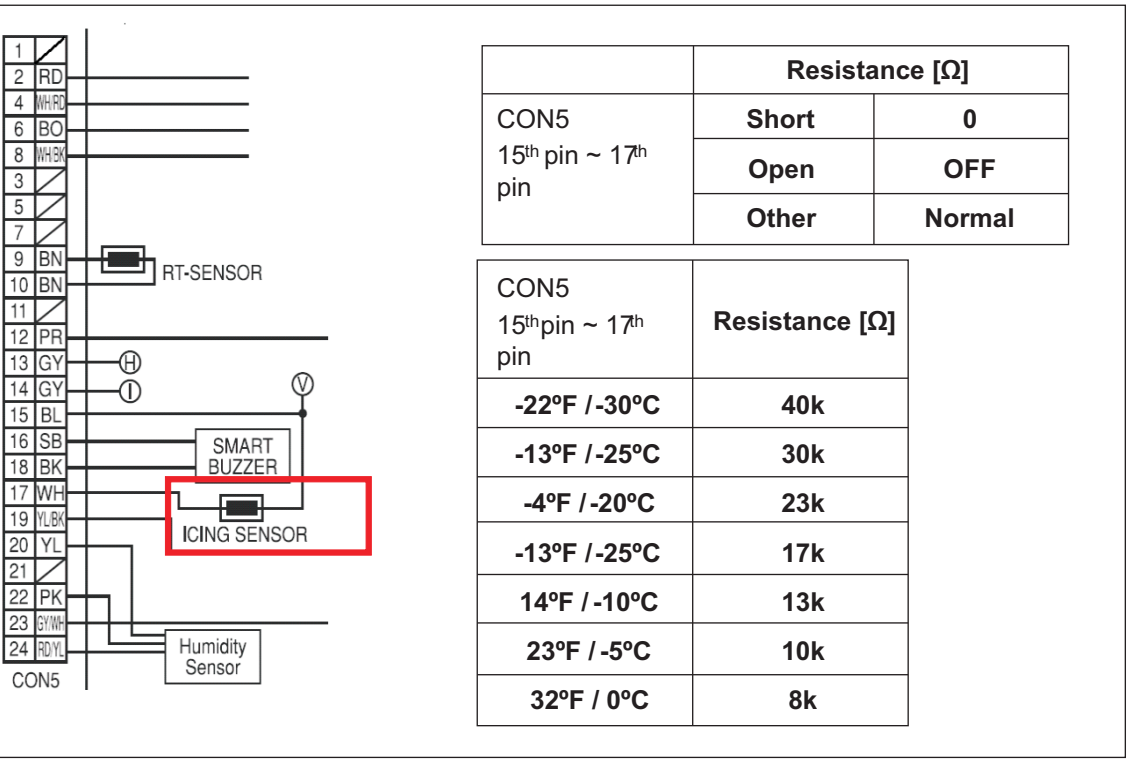
6

Explain to customer

8-3 Icing Sensor Error (E IS)

Symptom	Check Point
1. E IS	1. Check for a loose connection 2. Check Sensor Resistance





	Resistance [Ω]	
CON5 15th pin ~ 17th pin	**Short**	**0**
	Open	**OFF**
	Other	**Normal**

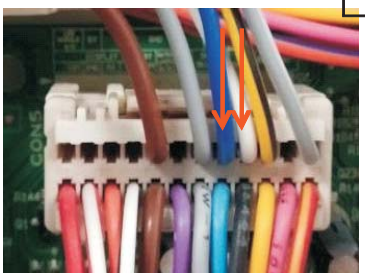
CON5 15th pin ~ 17th pin	Resistance [Ω]
-22°F / -30°C	**40k**
-13°F / -25°C	**30k**
-4°F / -20°C	**23k**
-13°F / -25°C	**17k**
14°F / -10°C	**13k**
23°F / -5°C	**10k**
32°F / 0°C	**8k**

Icing Sensor Error (E IS)

1

Is the Connector disconnected or loose between Main PCB and sensor?

Yes → Reconnect or repair the connector



CON5

No

2

Check the Sensor resistance.
Is resistance 0? (Sensor short)?

Yes → Change the Sensor

No

3

Check the Sensor resistance.
Is resistance OFF (Sensor open)?

Yes → Replace the refrigerator

No

4

Check the Sensor resistance.
Is resistance normal?

Yes

5

Check the Temperature and resistance refer to the table.
No problem?

CON5 1st pin ~ 2nd pin	Resistance [Ω]
-22°F / -30°C	40k
-13°F / -25°C	30k
-4°F / -20°C	23k
-13°F / -25°C	17k
14°F / -10°C	13k
23°F / -5°C	10k
32°F / 0°C	8k

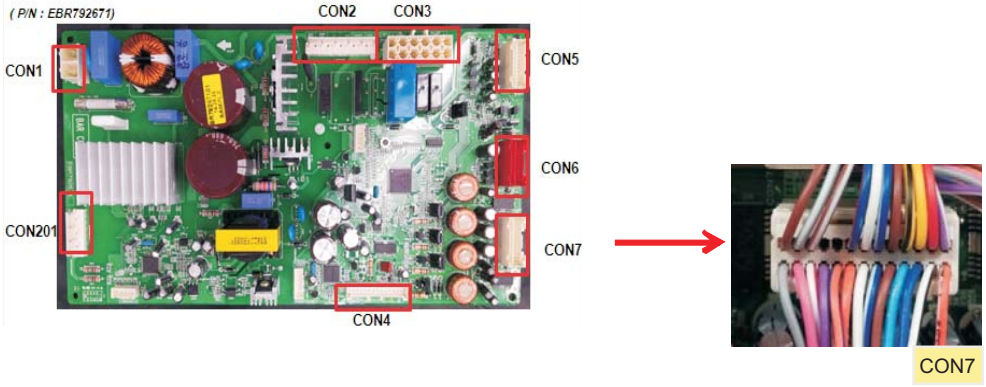
Yes

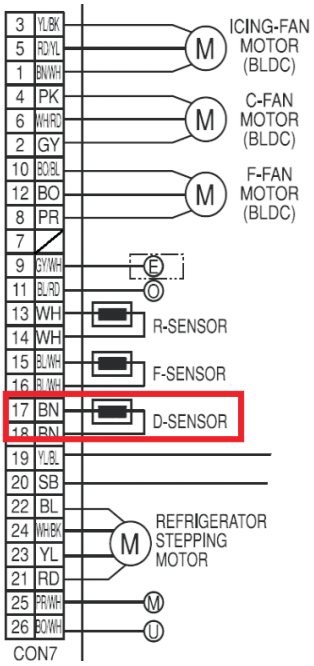
6

Explain to customer

8-4 Defrost Sensor Error (F dS)

Symptom	Check Point
1. F dS	1. Check for a loose connection 2. Check Sensor Resistance





	Resistance [Ω]	
CON7 17th pin ~ 18th pin	**Short**	**0**
	Open	**OFF**
	Other	**Normal**

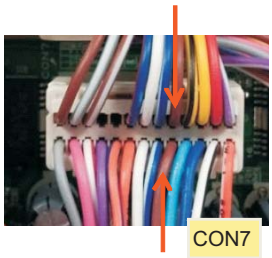
CON7 17th pin ~ 18th pin	Resistance [Ω]
23°F / -5°C	**38k**
32°F / 0°C	**30k**
41°F / 5°C	**24k**
50°F / 10°C	**19.5k**
59°F / 15°C	**16k**

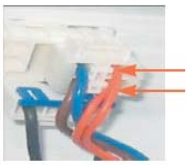
Defrost Sensor Error (F dS)

1

Is the Connector disconnected or loose between Main PCB, Defrost controller and Sensor?

Yes → Reconnect or repair the connector





No

2

Check the Sensor resistance.
Is resistance 0? (Sensor short)?

Yes → Change the Sensor

No

3

Check the Sensor resistance.
Is resistance OFF (Sensor open)?

Yes → Replace the refrigerator

No

4

Check the Sensor resistance.
Is resistance normal?

Yes

5

Check the Temperature and resistance refer to the table.
No problem?

CON7 17th pin ~ 18th pin	**Resistance [Ω]**
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

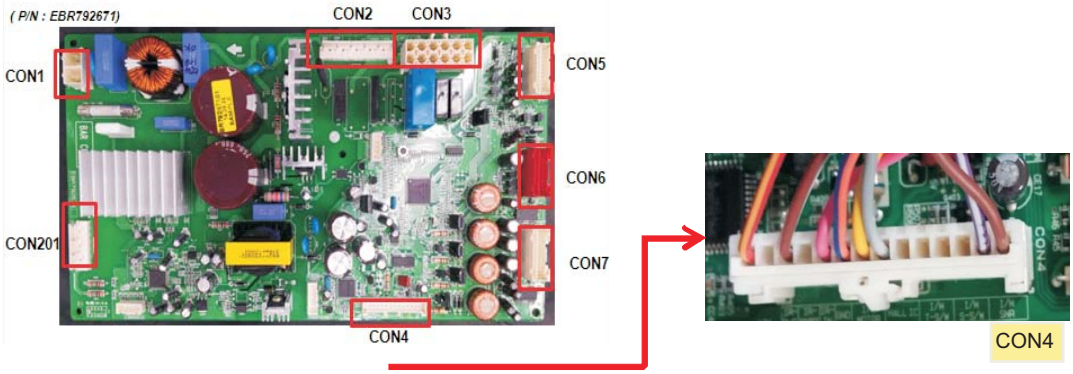
Yes

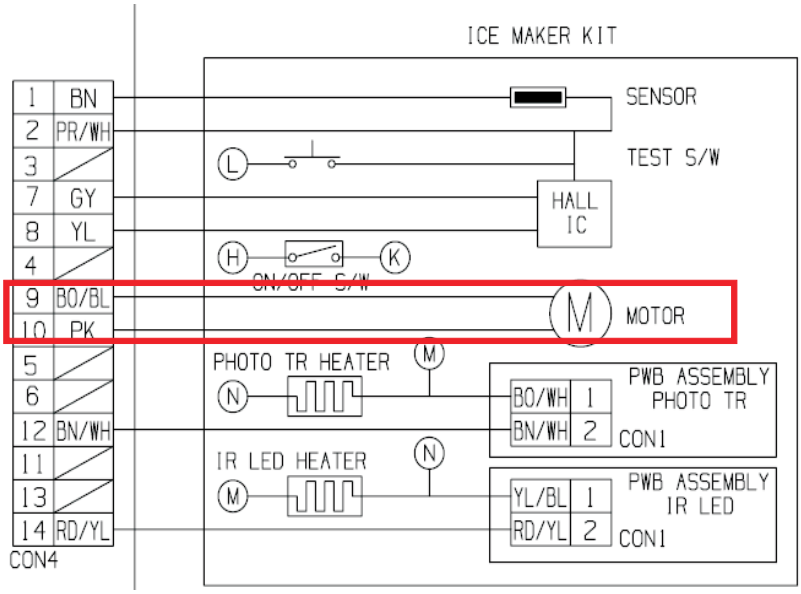
6

Explain to customer

8-5. Ice Maker Motor Error (E It)

Symptom	Check Point
1. E It	1. Check for a loose connection 2. Check Sensor Resistance

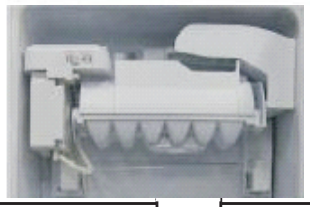




Ice Maker Motor Error (E It)

1

Input Ice Maker test mode(Push The ice maker test button),check The Ice Tray,Ice maker motor Rotate?

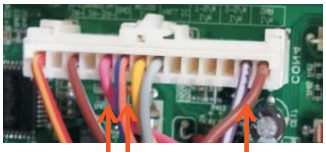


Yes → Explain to customer

No

2

Check the ice maker forward status The voltage (1)~(2) point 11~12V?

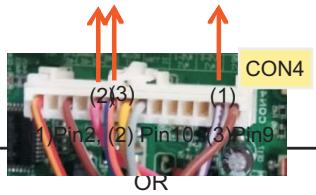


(1)Pin2, (2) Pin10, (3)Pin9

Yes → Change the Ice maker kit

OR

3 Check the ice maker reverse status The voltage (1)~(3) point 11~12V?

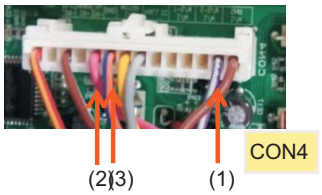


Yes → Change the Ice maker kit

OR

4

Check the ice maker forward status The voltage (1)~(2) point 0V?



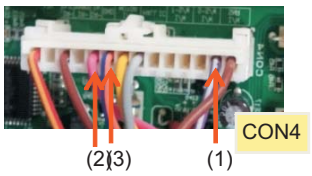
(1)Pin2, (2) Pin10, (3)Pin9

Yes → Change the Main PCB

OR

5

Check the ice maker reverse status The voltage (1)~(3) point 0V?



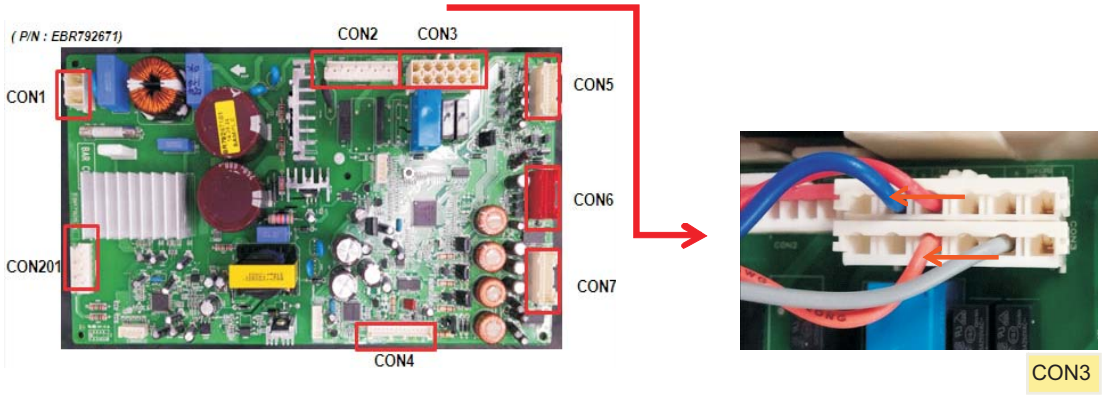
(1)Pin2, (2) Pin10, (3)Pin9

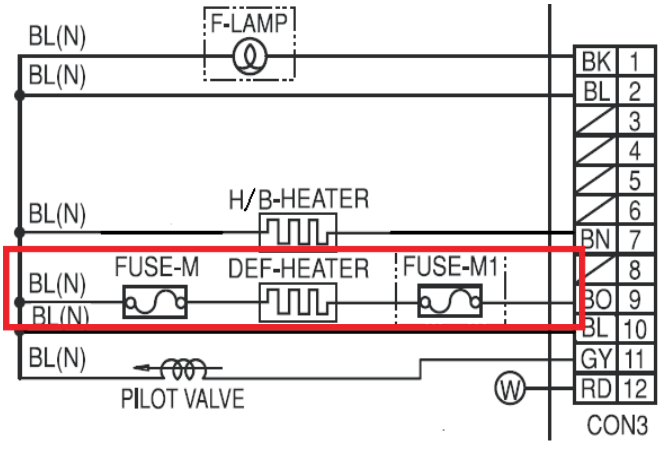
Yes → Change the Main PCB

No

8-5 Defrost Heater Error (F dH)

Symptom	Check Point
1. F dH	1. Check the door gasket 2. Check the Defrost control part 3. Check the PCB output voltage





Part	Resistance [Ω]
FUSE-M	**0**
Defrost Heater	**34~42**
Defrost Sensor	**22k ↑**

TEST MODE 3	Voltage [V]
CON3 2nd pin ~ 9th pin	**112V ~ 116V**

TEST MODE 1	Voltage [V]
CON3 2nd pin ~ 9th pin	**0V**

Defrost Heater Error (F dH)

1

Check the Door gasket .
Is door gasket damaged?

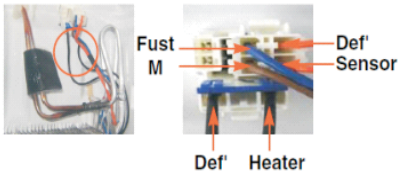
Yes → Replace the Door gasket

No ↓

2

Check the Defrost control part.
(1) Is Fuse-M resistance 0 Ω?
(2) Is Fuse-M resistance 34~42 Ω?

No → Change Fuse-M

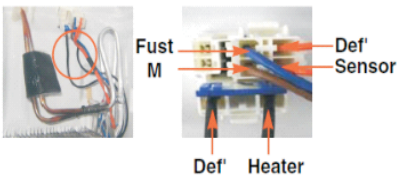


Yes ↓

3

Check the Defrost control part.
Is Defrost Sensor resistance
22k? ? or OFF?

OFF → Replace product

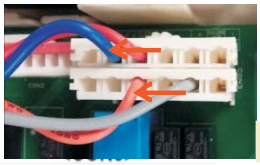


22kΩ ↑

4 **Input Test 3 Mode**
(Push the button 3 times)

Check the Heater Voltage.
Is voltage 220~240V?

NO → Replace Main PCB



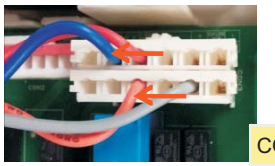
TEST MODE 3	**Voltage [V]**
CON3 2nd pin ~ 9thpin	**112V ~ 116V**

Yes ↓

5 **Input Test 1 Mode**
(Push the button 1 times)

Check the Heater Voltage.
Is voltage 0V?

No → Replace Main PCB



TEST MODE 1	**Voltage [V]**
CON3 2nd pin ~ 9thpin	**0V**

Yes ↓

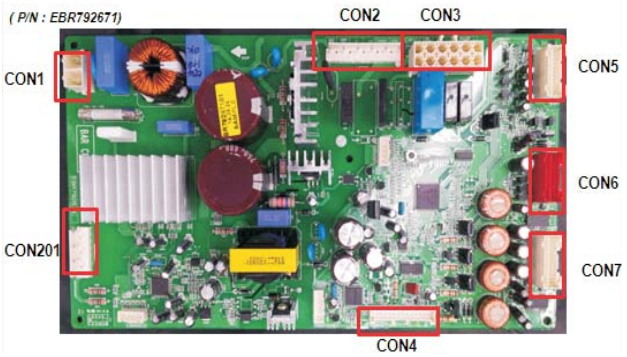
6

Explain to customer

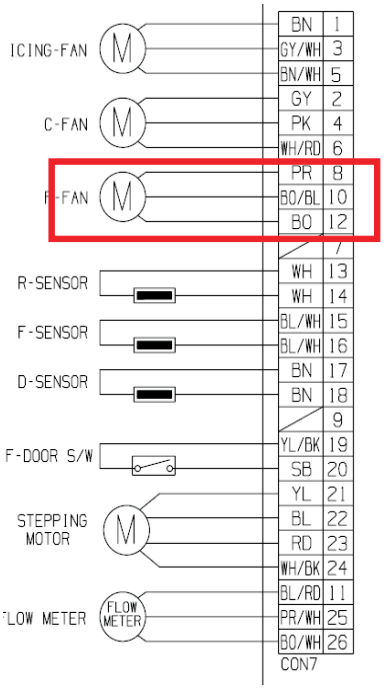
8-6 Freezer Fan Error (E FF)

Symptom	Check Point
1. E FF	1. Check the air flow 2. Check the Fan Motor 2. Check the PCB Fan motor voltage

Fan Motor



CON7



TEST MODE 1	Voltage [V]
CON7 10th pin ~ 12th pin	**8~12V**
CON7 8th pin ~ 12th pin	**Not 0V, 5V**

Freezer Fan Error (E FF)

1 **Reset the unit and Input Test1 Mode. (Push the button 1 time)**

2

Open the freezer door and Check the air flow. Windy?

No → Go to 3

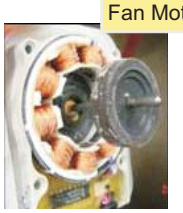
Yes → Go to 4

3

Check the Fan motor. Rotate fan using hand. It feel sticky?

Yes → Change the Fan motor

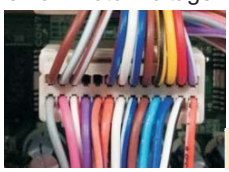
Fan Motor



4

Check the Fan Motor voltage Is Fan Motor voltage 8~12V?

No → Replace Main PCB



CON7

TEST MODE 1	**Voltage [V]**
CON7 10^{th}pin ~ 12^{h} pin	**8~12V**

Yes

5

Check the Fan Motor voltage Is Fan Feed Back voltage 0V, 5V?

Yes → Change the motor

CON7

TEST MODE 1	**Voltage [V]**
CON7 8^{th} pin ~ 12^{h} pin	**Not 0V, 5V**

No

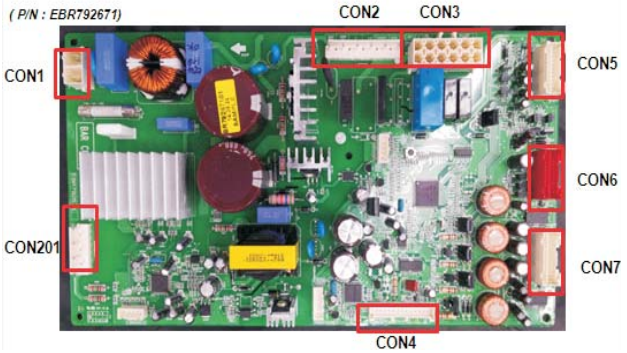
6

Explain to customer

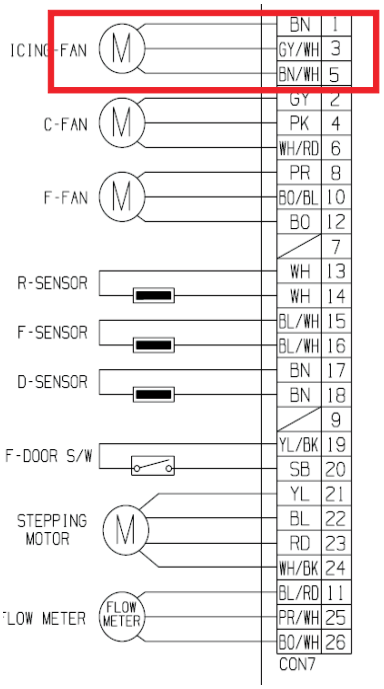
8-7 Icing Fan Error (E IF)

Symptom	Check Point
1. E IF	1. Check the air flow 2. Check the Connector 2. Check the PCB Fan motor voltage

Fan Motor



CON7



TEST MODE 1	Voltage [V]
CON7 3rd pin ~ 5th pin	**8~12V**
CON7 1st pin ~ 5th pin	**Not 0V, 5V**

Icing Fan Error(E IF)

1 **Reset the unit and Input Test1 Mode. (Push the button 1 time)**

2 Open the freezer door and Check the air flow. Windy?

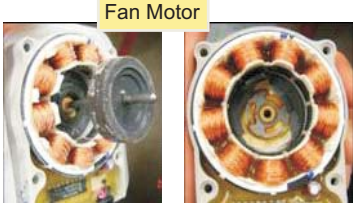
No → Go to 3

Yes → Go to 4

3 Check the Fan motor. Rotate fan using hand. It feel sticky?

Yes → Change the Fan motor

Fan Motor



4 Check the Fan Motor voltage Is Fan Motor voltage 8~12V?

No → Replace Main PCB

CON7

TEST MODE 1	**Voltage [V]**
CON7 3rd pin ~ 5th pin	**8~12V**

Yes

5 Check the Fan Motor voltage Is Fan Feed Back voltage 0V, 5V?

Yes → Change the motor

CON7

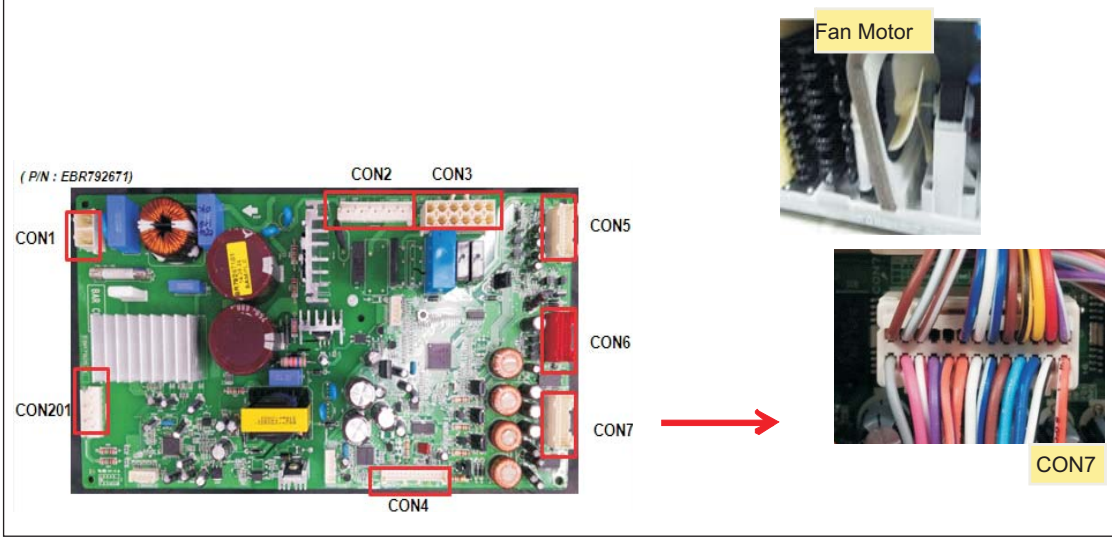
TEST MODE 1	**Voltage [V]**
CON7 1st pin ~ 5th pin	**Not 0V, 5V**

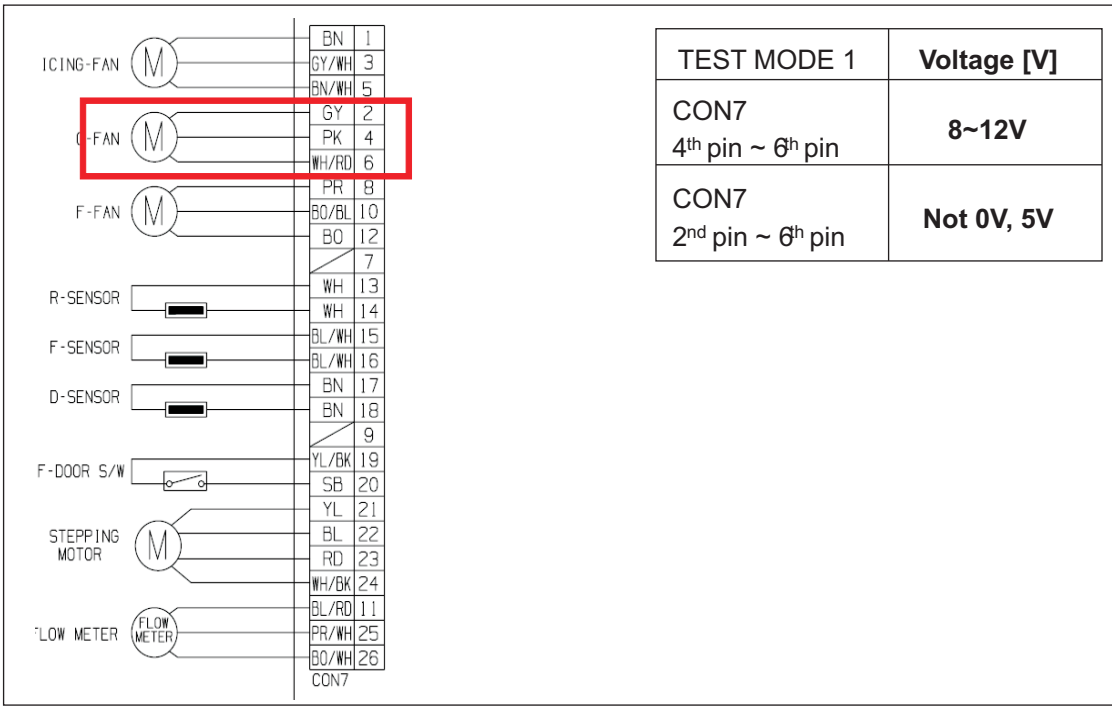
No

6 Explain to customer

8-8 Condenser Fan Error (E CF)

Symptom	Check Point
1. E CF	1. Check the air flow 2. Check the Connector 2. Check the PCB Fan motor voltage





TEST MODE 1	**Voltage [V]**
CON7 4th pin ~ 6th pin	**8~12V**
CON7 2nd pin ~ 6th pin	**Not 0V, 5V**

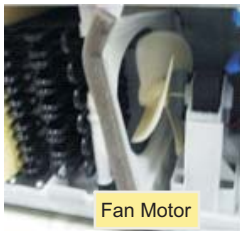
Condenser Fan Error (E CF)

1 **Reset the unit and Input Test1 Mode. (Push the button 1 time)**

2

Check the fan rotating.
Does fan rotate?

No → Go to 3

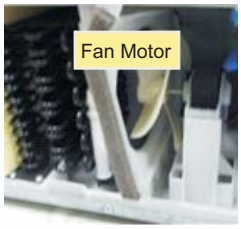


Yes → Go to 4

3

Check the Fan motor.
Rotate fan using hand.
It feel sticky?

Yes → Change the Fan motor



4

Check the Fan Motor voltage
Is Fan Motor voltage 8~12V?

No → Replace Main PCB

CON7

TEST MODE 1	**Voltage [V]**
CON7 4th pin ~ 6th pin	**8~12V**

Yes

5

Check the Fan Motor voltage
Is Fan Feed Back voltage 0V, 5V?

Yes → Change the motor

CON7

TEST MODE 1	**Voltage [V]**
CON7 2nd pin ~ 6th pin	**Not 0V, 5V**

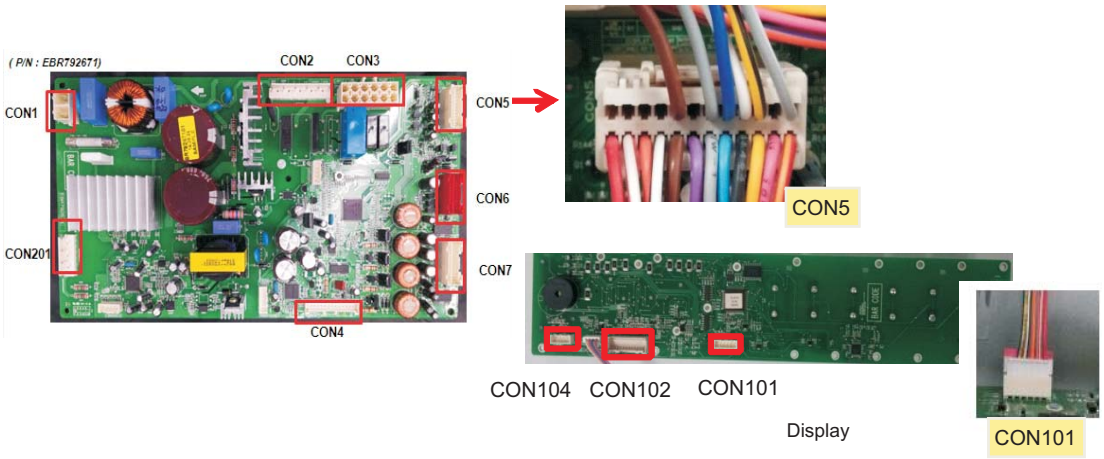
No

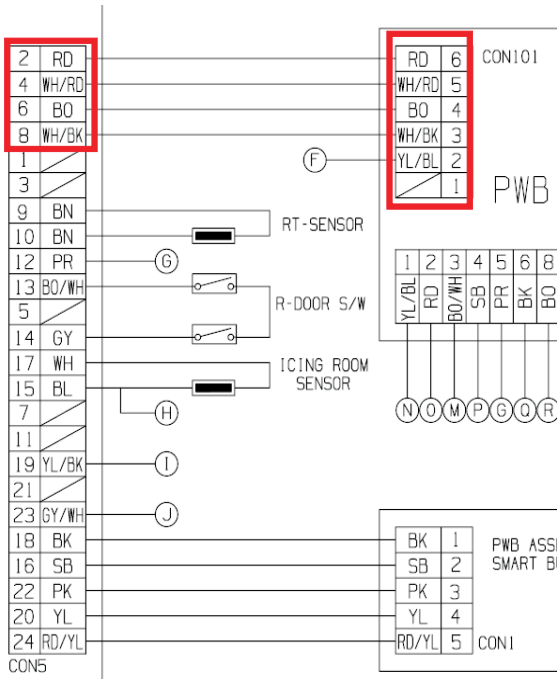
6

Explain to customer

8-9 Communication Error (E CO)

Symptom	Check Point
1. E CO	1. Check the loose connection 2. Check the Hinge connection





	Voltage [V]
CON101 5th pin ~ 6th pin	12V
CON101 4th pin ~ 5th pin	Not 0V, 5V
CON101 5th pin ~ 3th pin	Not 0V, 5V
CON5 4th pin ~ 6th pin	Not 0V, 5V
CON5 4th pin ~ 8th pin	Not 0V, 5V

Communication Error (Er CO)

1
Check the loose connection

2
Check the voltage.
Is CON101 5th pin ~ 6th pin voltage 12V?

No → Check the Hinge (loose connection) Change the Main PCB

Housing	Voltage [V]
CON101 5th pin ~ 6th pin	12V


CON101

Yes

3
Check the voltage.
Is CON101 4th pin ~ 5th pin voltage 0V or 5V?

Yes → Change the Display PCB

Housing	Voltage [V]
CON101 4th pin ~ 5th pin	Not 0V, 5V


CON101

No

4
Check the voltage.
Is CON101 5th pin ~ 3rd pin voltage 0V or 5V?

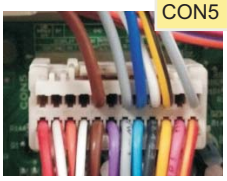
Yes → Change the Main PCB

Housing	Voltage [V]
CON101 5th pin ~ 3rd pin	Not 0V, 5V

No

5
Check the voltage.
Is CON5 4th pin ~ 6th pin voltage 0V or 5V?

Yes → Change the Display PCB

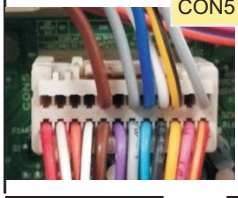

CON5

Housing	Voltage [V]
CON5 4th pin ~ 6th pin	Not 0V, 5V

No

6
Check the voltage.
Is CON5 4th pin ~ 8th pin voltage 0V or 5V?

Yes → Change the Main PCB


CON5

Housing	Voltage [V]
CON5 4th pin ~ 8th pin	Not 0V, 5V

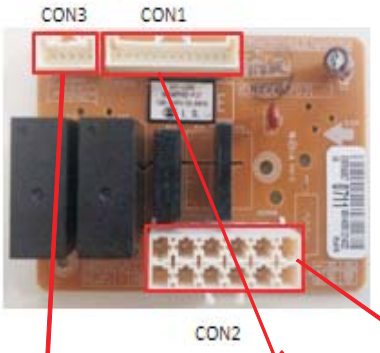
No

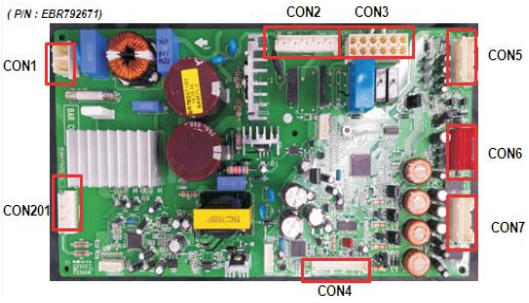
7
Explain to customer

9. Troubleshooting Without Error Display

9-1 Cube mode doesn't work

Symptom	Check Point
1. Cube mode doesn't work	1. Check the loose connection 2. Check the resistance





CON3

CON1

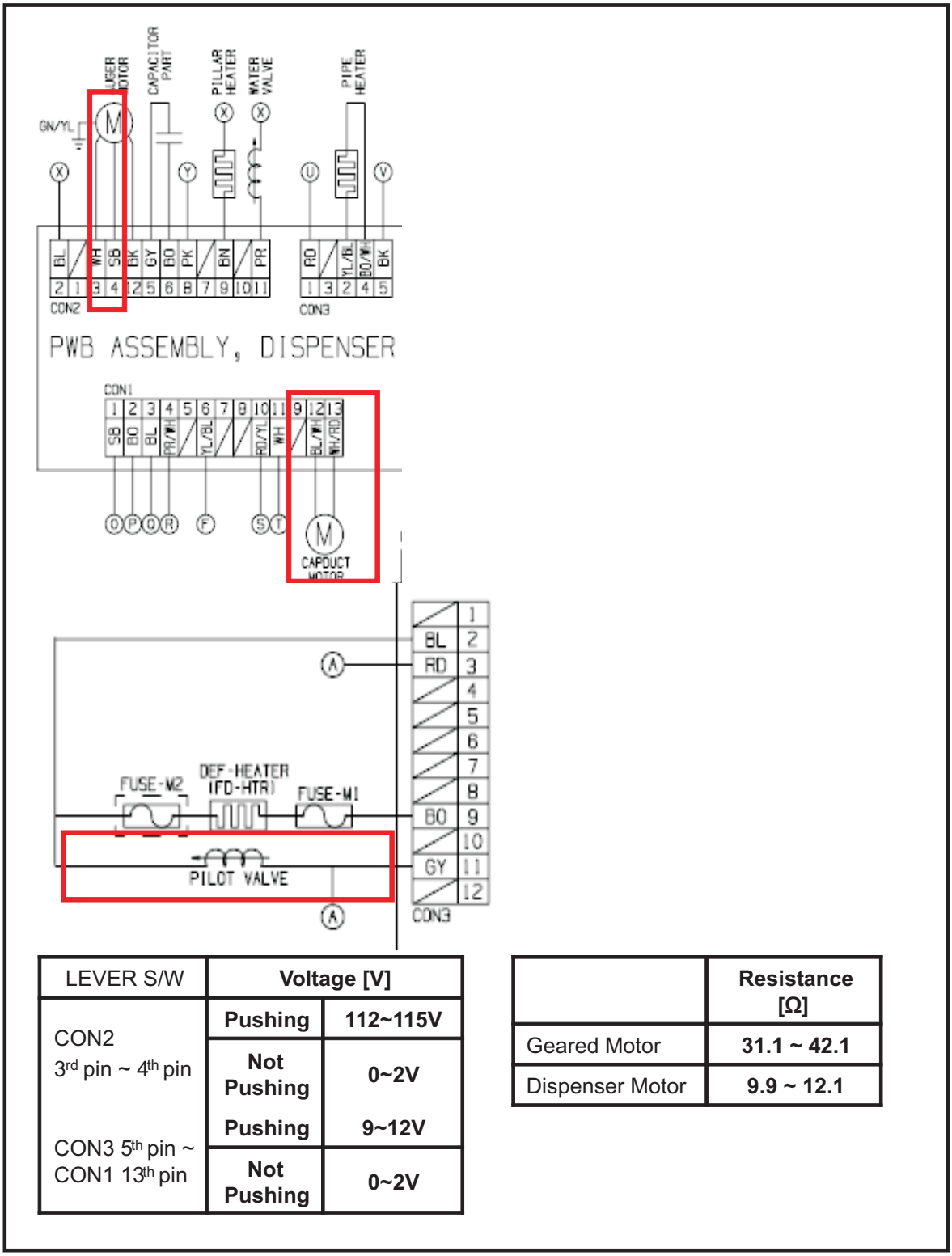
CON2

Ice Maker

Geared Motor

Dispenser Motor

9-1. Cube mode doesn't work



LEVER S/W	Voltage [V]	
CON2 3rd pin ~ 4th pin	**Pushing**	**112~115V**
	Not Pushing	**0~2V**
CON3 5th pin ~ CON1 13th pin	**Pushing**	**9~12V**
	Not Pushing	**0~2V**

	Resistance [Ω]
Geared Motor	**31.1 ~ 42.1**
Dispenser Motor	**9.9 ~ 12.1**

Cube mode doesn't work

1

Check the loose connection

2

Check the voltage.
(while pushing the lever S/W)
Is voltage correct?

No → Change the PCB

CON2

LEVER S/W	Voltage [V]	
CON2 3rd pin ~ 4th pin	Pushing	112~115V
	Not Pushing	0~2V

Yes

3

Check the voltage.
(while pushing the lever S/W)
Is voltage correct compared with table?

No → Change the PCB

CON3

CON1

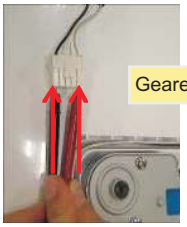
LEVER S/W	Voltage [V]	
CON3 5th pin ~ CON1 13th pin	Pushing	9~12V
	Not Pushing	0~2V

Yes

4

Check the resistance value.
Is Geared Motor resistance 144~ 176? ?

No → Replace Geared Motor



Geared Motor

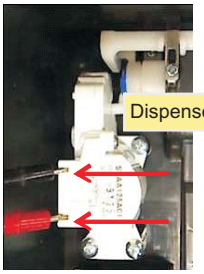
	Resistance [Ω]
Geared Motor	31.1 ~ 42.1

Yes

5

Check the resistance value.
Is Dispenser Motor resistance 9.9 ~ 12.1? ?

No → Replace Geared Motor



Dispenser Motor

	Resistance [Ω]
Dispenser Motor	9.9 ~ 12.1

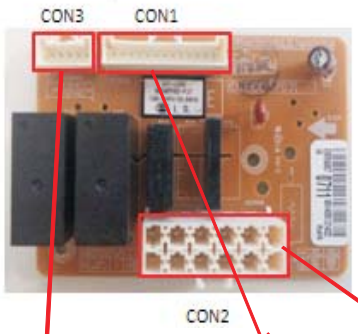
Yes

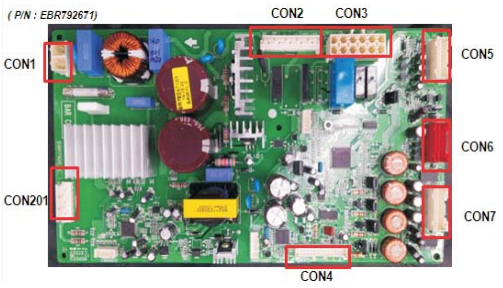
6

Explain to customer

9-2 Crush mode doesn’t work

Symptom	Check Point
1. Crush mode doesn’t work	1. Check the loose connection 2. Check the resistance





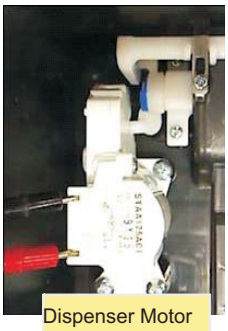
CON3

CON1

CON2

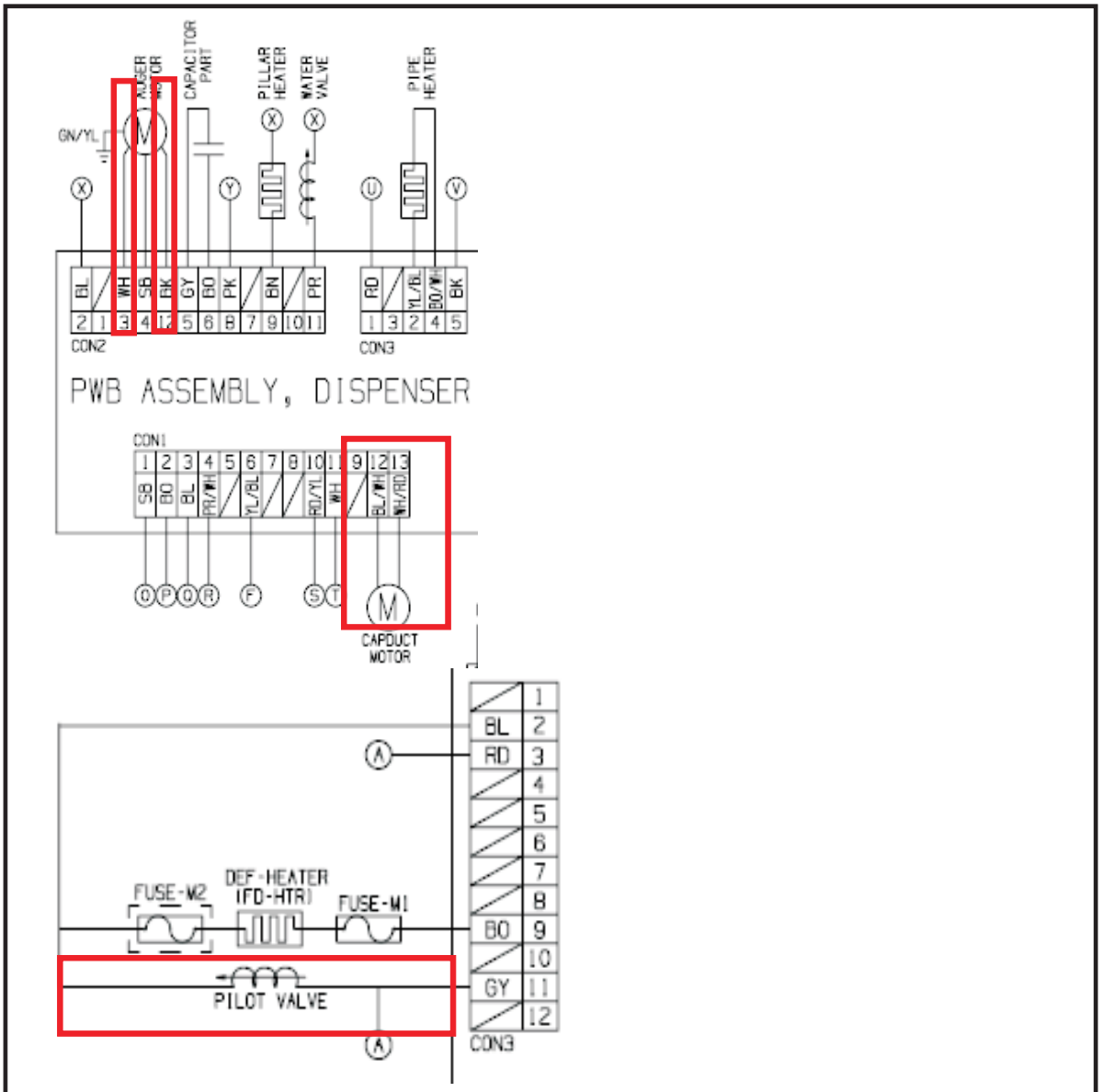
Ice Maker

Geared Motor



Dispenser Motor

9-2. Crush mode doesn't work



LEVER S/W	Voltage [V]	
CON2 3rd pin ~ 12th pin	**Pushing**	**112~115V**
	Not Pushing	**0~2V**
CON3 5th pin ~ CON1 13th pin	**Pushing**	**9~12V**
	Not Pushing	**0~2V**

	Resistance [Ω]
Geared Motor	**31.1 ~ 42.1**
Dispenser Motor	**9.9 ~ 12.1**

Crush mode doesn't work

1

Check the loose connection

2

Check the voltage.
(while pushing the lever S/W)
Is voltage correct?

No → Change the PCB

CON2

LEVER S/W	Voltage [V]	
CON2 3rd pin ~ 12th pin	**Pushing**	**112~115V**
	Not Pushing	**0~2V**

Yes

3

Check the voltage.
(while pushing the lever S/W)
Is voltage correct compared with table?

No → Change the PCB

CON3

CON1

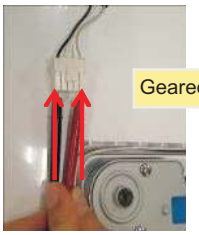
LEVER S/W	Voltage [V]	
CON3 5th pin ~ CON1 13th pin	**Pushing**	**9~12V**
	Not Pushing	**0~2V**

Yes

4

Check the resistance value.
Is Geared Motor resistance
87 ~ 107? ?

No → Replace Geared Motor



Geared Motor

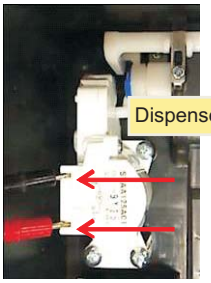
	Resistance [Ω]
Geared Motor	**31.1 ~ 42.1**

Yes

5

Check the resistance value.
Is Dispenser Motor resistance
9.9 ~ 12.1? ?

No → Replace Geared Motor



Dispenser Motor

	Resistance [Ω]
Dispenser Motor	**9.9 ~ 12.1**

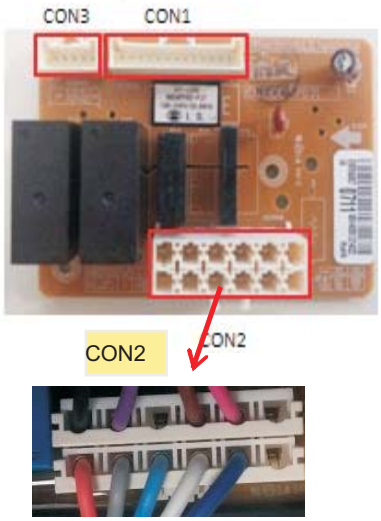
Yes

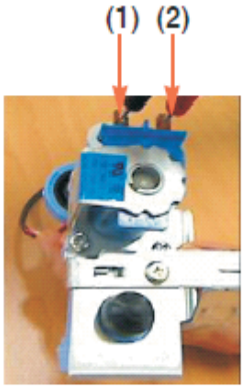
6

Explain to customer

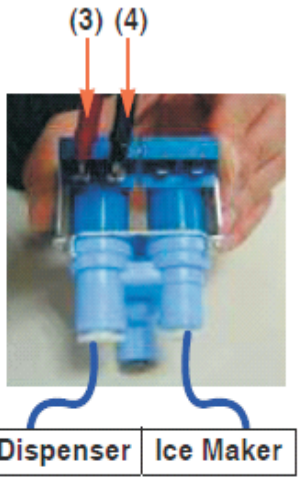
9-3 Water mode doesn't work

Symptom	Check Point
1. Water mode doesn't work	1. Check the loose connection 2. Check the resistance valve

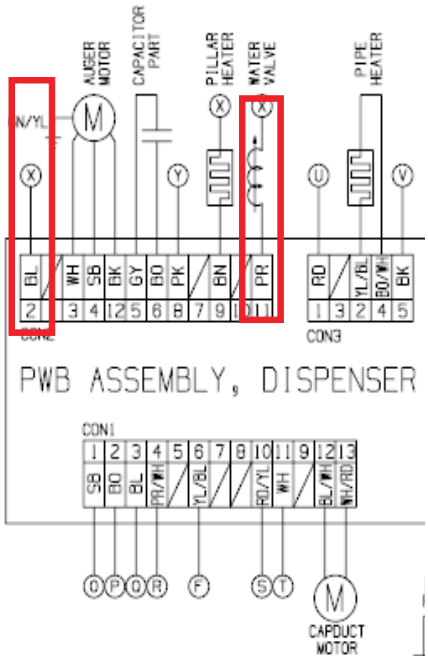




<Pilot Valve>
Machine Room



<Water Valve>
In door



LEVER S/W	Voltage [V]	
CON2 2nd pin ~11th pin	Pushing	112~115V
	Not Pushing	0~2V

	Resistance [Ω]
Pilot Valve	360~420
Water valve	360~420

Water mode doesn't work

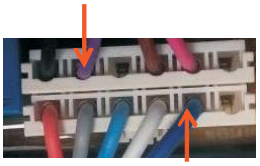
1

Check the loose connection

2

Check the voltage.
(while pushing the lever S/W)
Is voltage correct?

No → Change the PCB



CON2

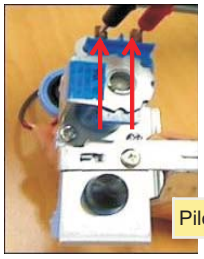
LEVER S/W	Voltage [V]	
CON2 2nd pin ~11th pin	**Pushing**	**112~115V**
	Not Pushing	**0~2V**

Yes

3

Check the resistance value.
Is Pilot Valve resistance
360~420 ? ?

No → Replace Water Valve



Pilot Valve

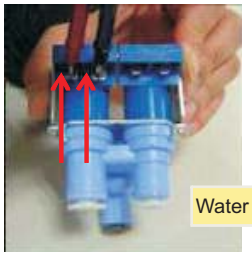
	Resistance [Ω]
Pilot Valve	**360~420**

Yes

4

Check the resistance value.
Is Water Valve resistance
360~420 ? ?

No → Replace Water Valve



Water Valve

	Resistance [Ω]
Water valve	**360~420**

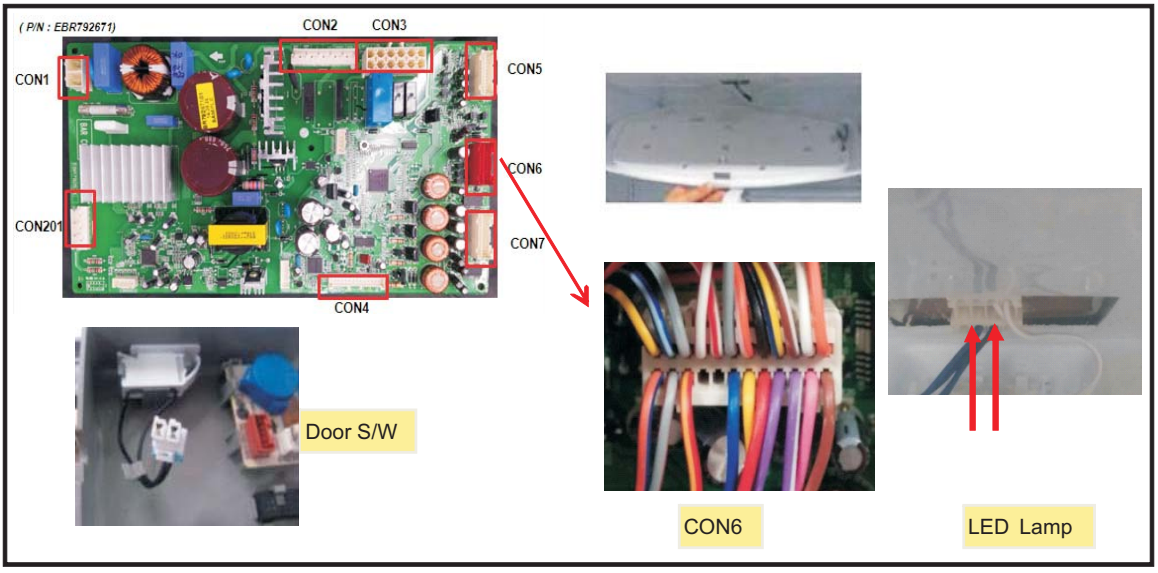
Yes

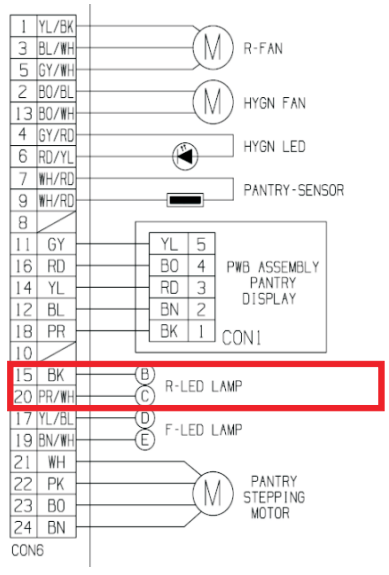
5

Explain to customer

9-5 Refrigerator room lamp doesn't work

Symptom	Check Point
1. Refrigerator room lamp doesn't work	1. Check the freezer door switch sticky 2. Check the door S/W resistance 3. Check the LED Lamp





	Resistance [Ω]	
Door S/W	Normal	Infinity
	Push S/W	0

	Voltage [V]
CON6 20th pin ~ 15th pin	12V

LED Lamp	Voltage [V]	
Blue~ Black	Closed	0~2V
	Open	12V

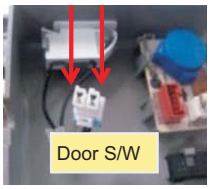
Refrigerator room lamp doesn't work

1 Check the Freezer door switch. Does it feel sticky?

Yes → Change the Door S/W

No

2 Check the door S/W resistance. Is it correct compared with table?



No → Change the Door S/W

	Resistance [Ω]	
Door S/W	**Normal**	**Infinity**
	Push S/W	**0**

Yes

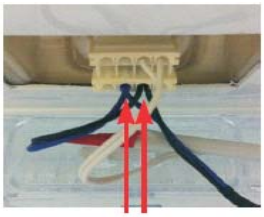
3 Check the PCB Voltage. Is CON6 20th pin ~ 15th pin voltage 12V?

No → Change the PCB

	Voltage [V]
CON6 20th pin ~15th pin	**12V**

Yes

4 Check the LED Lamp voltage. Is it 0~2V? (While door closed)



No → Change the Door S/W

Yes

5 Check the LED Lamp voltage. Is it 12V? (While door open)

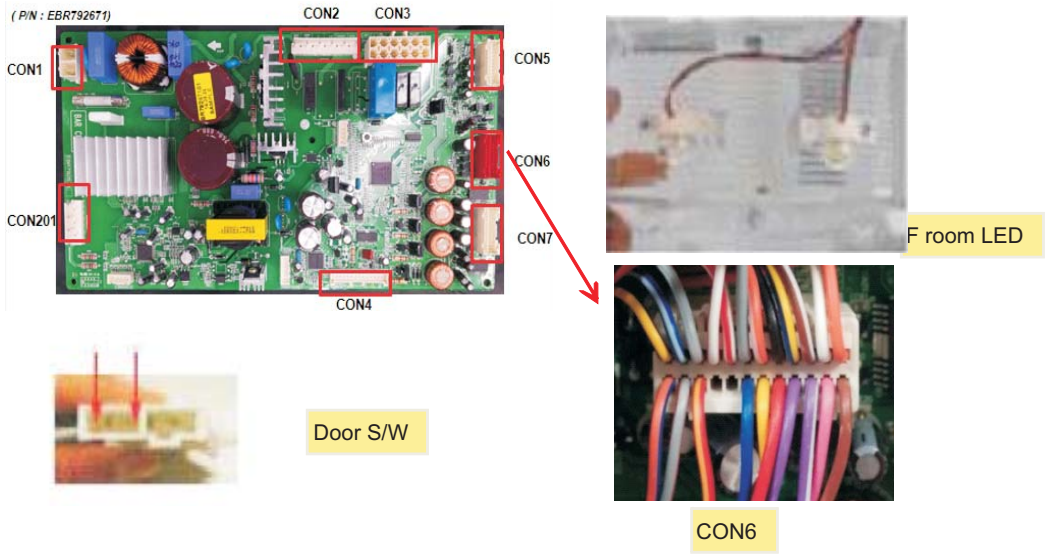
No → Change the LED Lamp

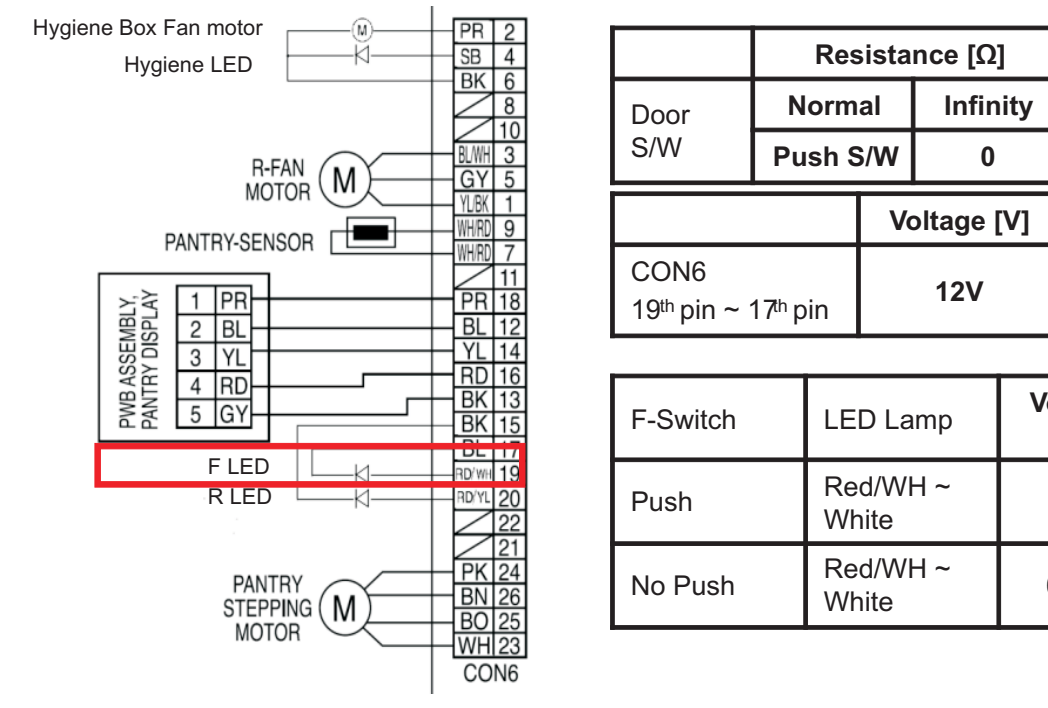
Yes

6 Explain to customer

9-5. Freezer room lamp doesn't work

Symptom	Check Point
1. Freezer room lamp doesn't work	1. Check the Refrigerator door switch sticky 2. Check the door S/W resistance 3. Check the LED Lamp





	Resistance [Ω]	
Door S/W	**Normal**	**Infinity**
	Push S/W	**0**

	Voltage [V]
CON6 19th pin ~ 17th pin	**12V**

F-Switch	LED Lamp	Voltage [V]
Push	Red/WH ~ White	**12V**
No Push	Red/WH ~ White	**0~2V**

Freezer room lamp doesn't work

1

Check the Refrigerator door switch.
Does it feel sticky?

Yes → Change the Door S/W

No

2

Check the door S/W resistance.
Is it correct compared with table?

Door S/W

No → Change the Door S/W

	Resistance [Ω]	
Door S/W	**Normal**	**Infinity**
	Push S/W	**0**

Yes

3

Check the PCB Voltage.
Is CON6 19th pin ~ 17th pin voltage 12V?

CON6

No → Change the PCB

	Voltage [V]
CON6 19th pin ~ 17th pin	**12V**

Yes

4

Check the LED Lamp voltage
Is voltage 12V? (While door open)

No → Change the LED Lamp

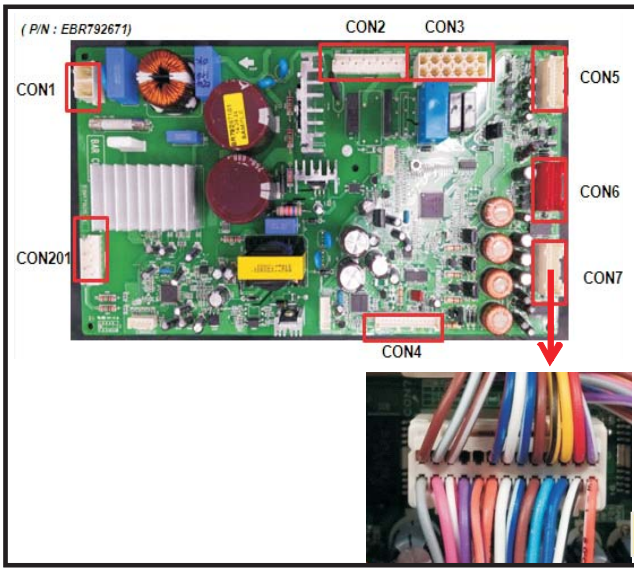
Yes

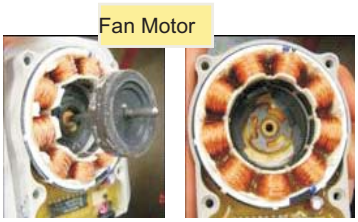
7

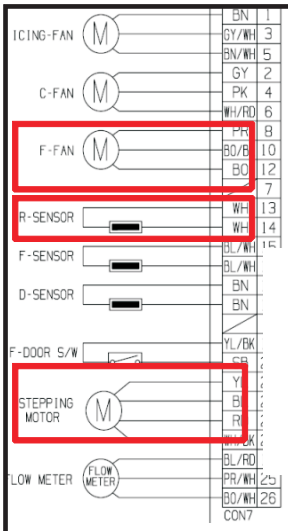
Explain to customer

9-6 Poor/over cooling in Fresh food section

Symptom	Check Point
1. Poor cooling in Fresh food section	1. Check the sensor resistance 2. Check the air flow 3. Check the air Temperature 4. Check the R-Damper motor voltage







F-Fan motor

R-Sensor

R-Damper

CON7 13th pin ~ 14th pin	Resistance [Ω]
23ºF / -5ºC	38k
32ºF / 0ºC	30k
41ºF / 5ºC	24k
50ºF / 10ºC	19.5k
59ºF / 15ºC	16k

Duct	Status
Air Flow	Windy
Air Temperature	Cold

TEST MODE 1	Voltage [V]
CON7 10thpin ~ 12th pin	8~12V
CON7 8th pin ~ 12th pin	Not 0V, 5V

Poor cooling in Fresh food section

1

Check the sensor resistance.

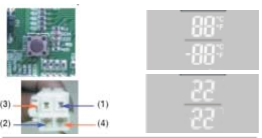
CON7

CON7 13th pin ~ 14th pin	**Resistance [Ω]**
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

2 **Reset the unit and Input Test1 Mode (Push the button 1 time)**

3 Open the fresh food door and Check the air flow D amper?

No → Check the damper Go to 5



Test Mode	Damper state	SVC Action
1 Mode	Closed	Damper is normal. (Go to the 7)
2 Mode	Open	
1, 2 mode	Not working	Change the damper

Test Point	Result	SVC Action
(1) To (2)	270 ~ 330Ω	It's normal
	Other	Change damper
(3) To (4)	270 ~ 330Ω	It's normal
	Other	Change damper

Yes

4 Check the air temperature. Is it cold?

No → Check the Compressor and sealed system

Yes → Go to 7

5 Check the Fan Motor voltage Is Fan Motor voltage 8~12V?

No → Replace Main PCB

CON7

TEST MODE 1	**Voltage [V]**
CON7 10th pin ~ 12th pin	**8~12V**

Yes

6 Check the Fan Motor voltage Is Fan Feed Back voltage 0V, 5V?

Yes → Change the motor

CON7

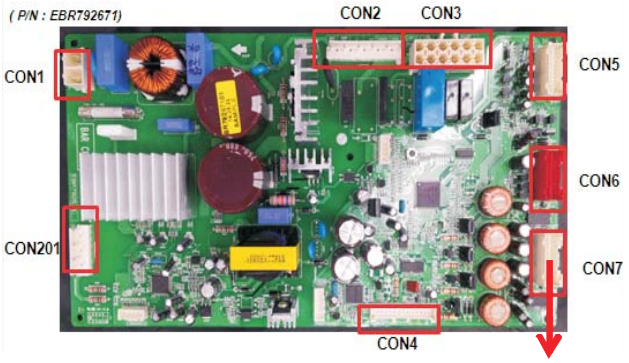
TEST MODE 1	**Voltage [V]**
CON7 8th pin ~ 12th pin	**Not 0V, 5V**

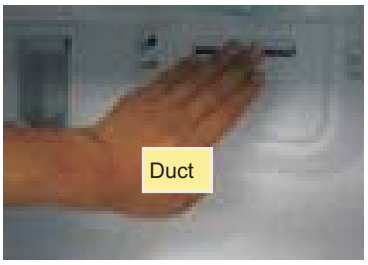
No

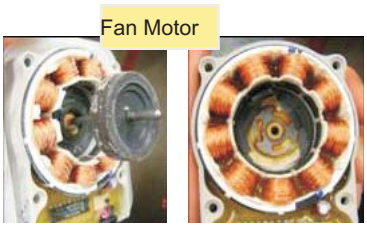
7 Explain to customer

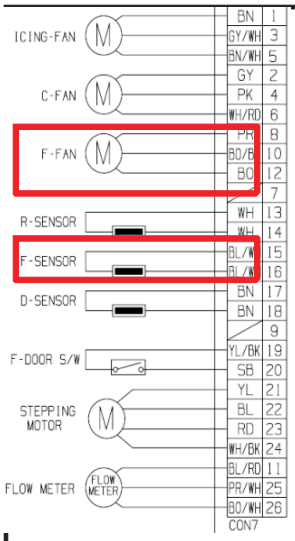
9-7. Poor cooling in Freezer compartment

Symptom	Check Point
1. Poor cooling in Freezer compartment	1. Check the sensor resistance 2. Check the air flow 3. Check the air Temperature 4.Check the Fan motor sticky 4. Check the Fan motor voltage









CON7 15th pin ~ 16th pin	Resistance [Ω]
-22ºF /-30ºC	40k
-13ºF /-25ºC	30k
-4ºF /-20ºC	23k
-13ºF /-25ºC	17k
14ºF /-10ºC	13k
23ºF /-5ºC	10k
32ºF / 0ºC	8k

Duct	Status
Air Flow	Windy
Air Temperature	Cold

TEST MODE 1	Voltage [V]
CON7 10thpin ~ 12thpin	8~12V
CON7 8th pin ~ 12th pin	Not 0V, 5V

Poor cooling in Freezer compartment

1 Check the sensor resistance.

CON7

CON7 15th pin ~ 16th pin	**Resistance [Ω]**
-22ºF /-30ºC	**40k**
-13ºF /-25ºC	**30k**
-4ºF /-20ºC	**23k**
-13ºF /-25ºC	**17k**
14ºF /-10ºC	**13k**
23ºF /-5ºC	**10k**
32ºF / 0ºC	**8k**

2 **Reset the unit and Input Test1 Mode. (Push the button 1 time)**

3 Open the fresh food door and Check the air flow. Windy?

No → Check the F Fan Motor Go to 5

Yes

4 Check the air temperature. Is it cold?

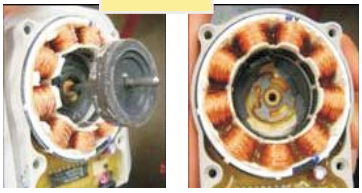
No → Check the Compressor and sealed system

Yes

5 Check the Fan motor. Rotate fan using hand. It feel sticky?

Yes → Change the Fan motor

Fan Motor



No

6

Check the Fan Motor voltage
Is Fan Motor voltage 8~12V?

No → Replace Main PCB

CON7

TEST MODE 1	**Voltage [V]**
CON7 10th pin ~ 12th pin	**8~12V**

Yes

7

Check the Fan Motor voltage
Is Fan Feed Back voltage 1~5V?

Yes → Change the motor

CON7

TEST MODE 1	**Voltage [V]**
CON7 8th pin ~ 12th pin	**Not 0V, 5V**

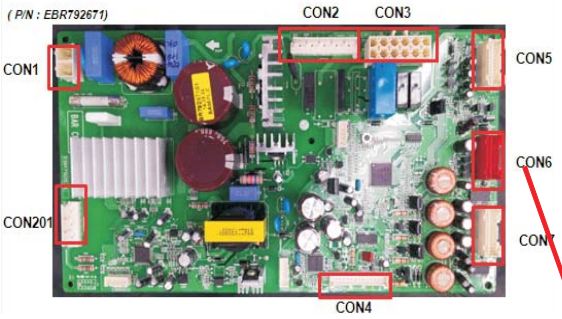
No

8

Explain to customer

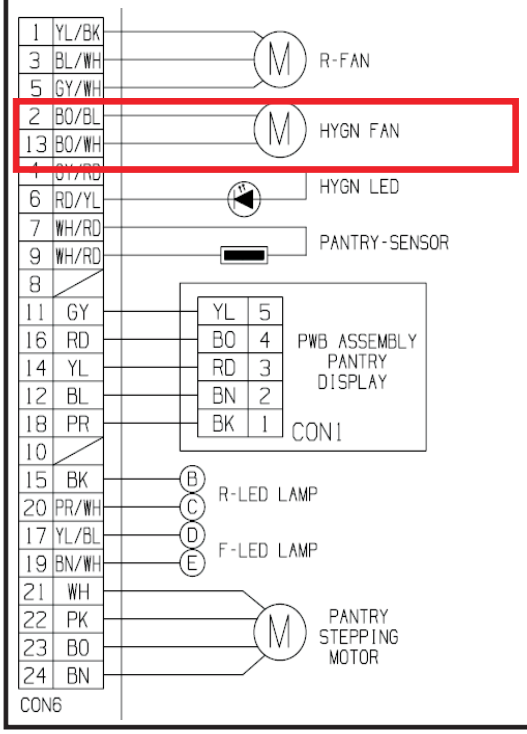
9-9. Hygiene fan doesn't work

Symptom	Check Point
1. **Hygiene fan doesn't work**	1. Check Hygiene Fan motor voltage 2. Main PCB



CON6

Hygiene Fan motor



	Voltage [V]
CON6 2nd pin ~ 13th pin	**12V**

Hygiene fan doesn't work

1

Choose the Hygiene Max in display
Check the PCB Voltage.
Is CON6 2nd pin ~ 13th pin voltage 12V?

CON6

	Voltage [V]
CON6 2nd pin ~13th pin	12V

No → Change the PCB

Yes

2

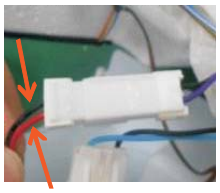
Is the connector loose?

Yes → Connect the housing

No

3

Check the Hygiene voltage
Is voltage 12V? (While door open)



No → Change the Fan motor

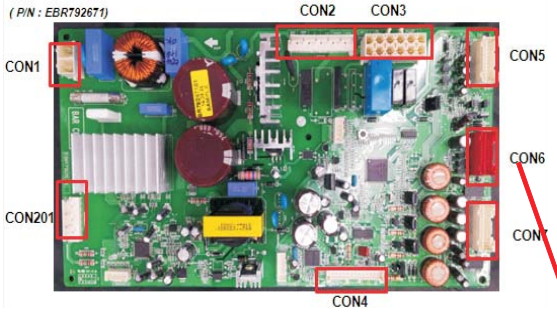
Yes

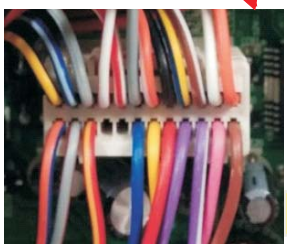
4

Explain to customer

9-10. Hygiene LED doesn't work

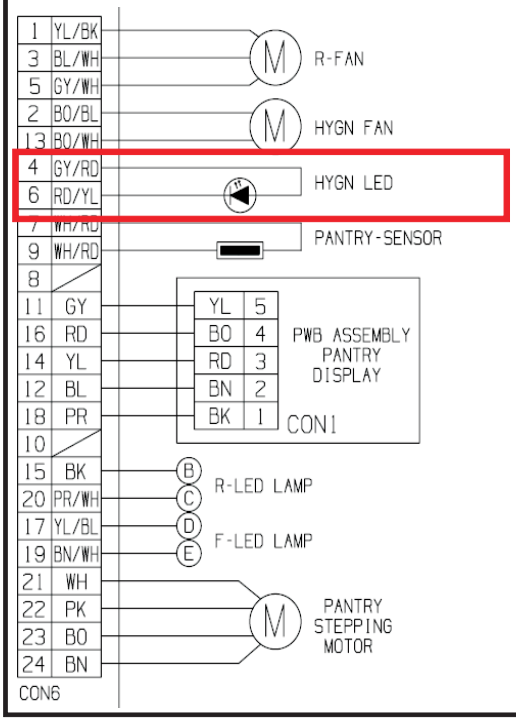
Symptom	Check Point
1. **Hygiene LED doesn't work**	1. Check Hygiene LED voltage 2. Main PCB





CON6

Hygiene Fan motor



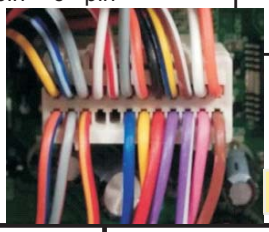
	Voltage [V]
CON6 4th pin ~ 6th pin	12V

Hygiene LED doesn't work

1

Choose the Hygiene Max in display
Check the PCB Voltage.
Is CON6 4th pin ~ 6th pin voltage 12V?

No → Change the PCB



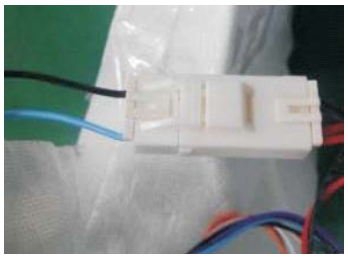
CON6

	Voltage [V]
CON6 4th pin ~ 6th pin	12V

Yes

2

Is the connector loose?

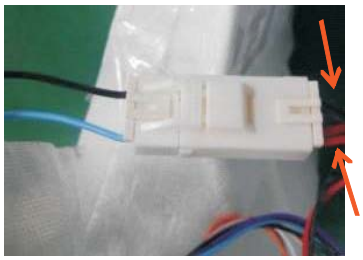


Yes → Connect the housing

No

3

Check the Hygiene LED voltage
Is voltage 12V? (While door open)



No → Change the Fan motor

Yes

4

Explain to customer

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

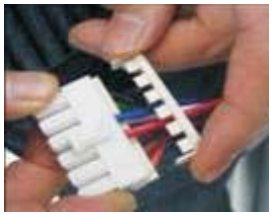
* 1 time : Comp / Damper / All FAN on
  (Everything is displayed)

* 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

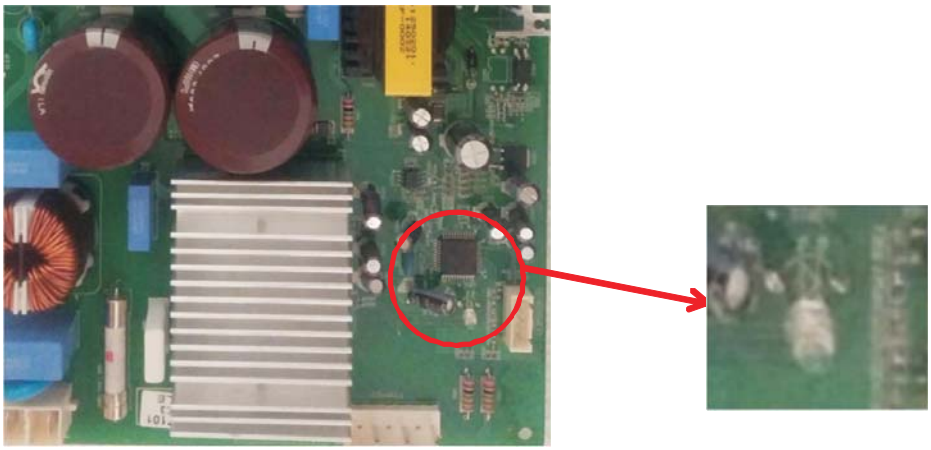
10-3 TEMPERATRUE CHART - REF AND DEF SENSOR

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

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

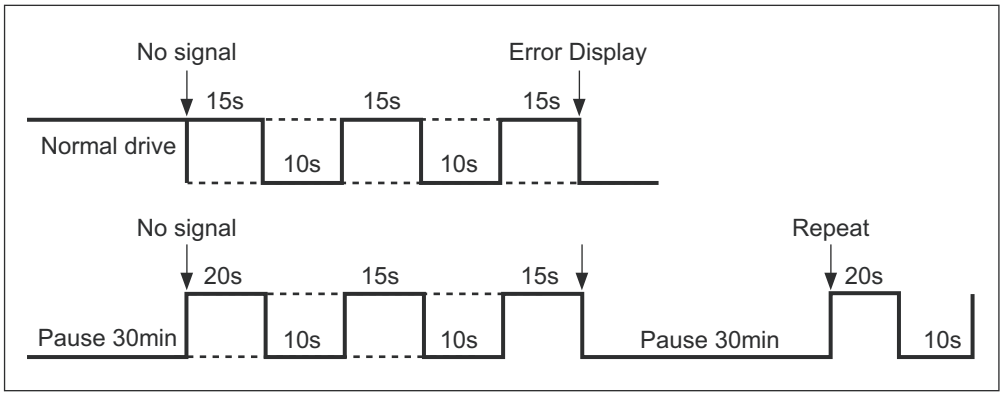
Actions to take according to Led blinking frequency

No	LED operating condition	Cause	Service guideline
1	**LED two - time repetiton**  ··on - on - off - on - on - off - on - on - off ··repeating	PCB part defect (piston overrun)	1.After resetting power, check if it is running normal 2.If the same symptom arises after the first action, replace PCB
2	**LED four - time repetiton**  ··on - on - on - on - off - on - on - on - on - off ··repeating	outlet clogging	1.After resetting power, check if it is running normal 2.If the same symptom arises after the first action, replace PCB 3.If the same symptom arises after the second action, replace compressor
3	**LED five - time repetiton**  ··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, replace PCB 3. If the same symptom arises after the second action, replace compressor
4	**LED six - time repetiton**  ··on - on - on - on - on - on - off - on - on - on - on - on - on - off ··repeating	circuit overcurrent error	1. After resetting power, check if it is running normal If the same symptom arises after the first action, replace PCB If the same symptom arises after the second action, replace compressor
5	**LED seven- time repetiton**  ··on - on - on - on - on - on - on - off - on - on -on - on - on - on- on - off ··repeating	PCB part defect (IPM)	1.After resetting power, check if it is running normal 2. If the same symptom arises after the first action, replace PCB

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.



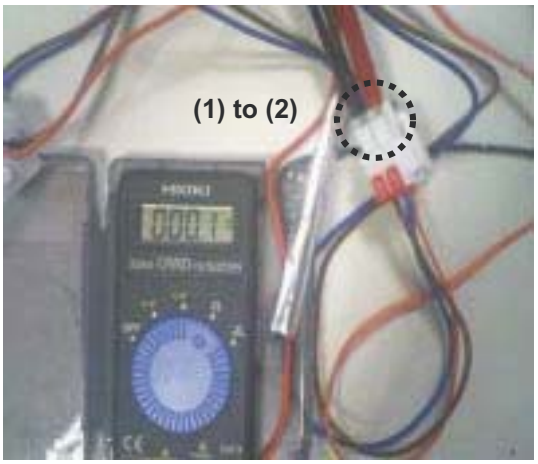
11. COMPONENT TESTING INFORMATION

11-1 Defrost Controller Assembly

Function

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.

How to Measure (Fuse-M)



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.

How to Measure (Sensor)

Set a ohmmeter to The 2housing pin.
Measure the 2 pin connected to Sensor.
If the ohmmeter indicate 11kΩ(at room temperature) Sensor is good.
When check the ohm at other temperatures Check the sensor manual.

Standard

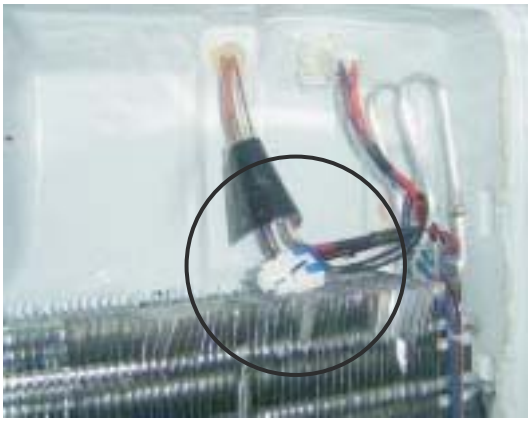
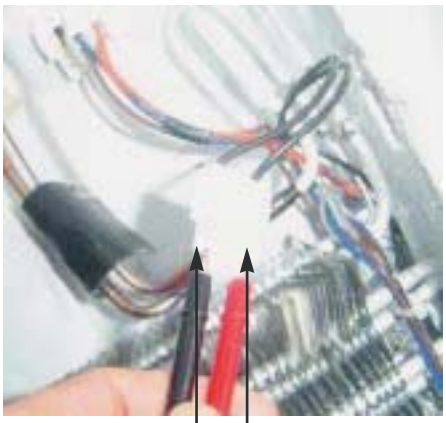
Fuse-M (at all temperature)

Test Point	Result
(1) to (2)	0 ~ 0.1

Sensor (at room temperature)

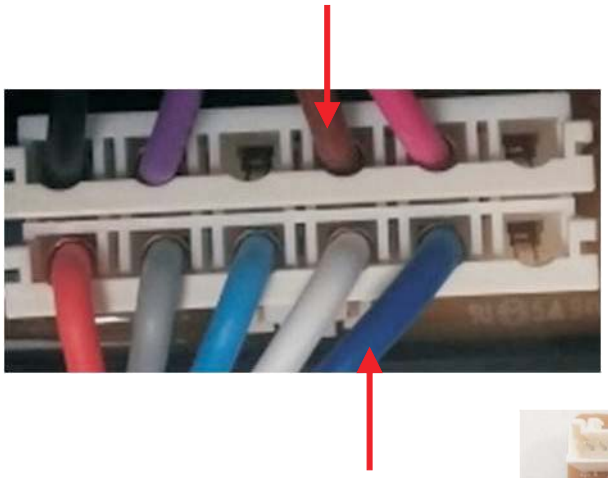
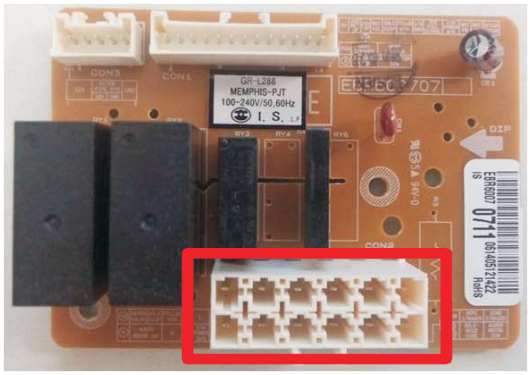
Test Point	Temperature	Resistance (kΩ)
(1) to (2)	-3.0 ºC / 26.6 ºF	34.30
	0.0 ºC / 32.2 ºF	30.00
	5.0 ºC / 41.0 ºF	24.13
	10.0 ºC / 50.0 ºF	19.53
	15.0 ºC / 59.0 ºF	15.91
	20.0 ºC / 68.0 ºF	12.78
	25.0 ºC / 77.0 ºF	10.74
	30.0 ºC / 86.0 ºF	8.90

11-2 Sheath Heater

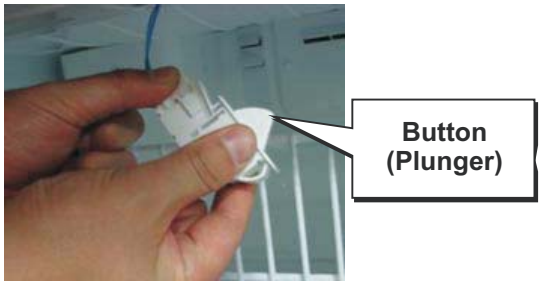
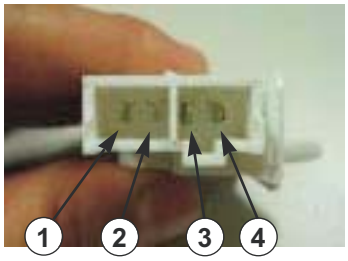
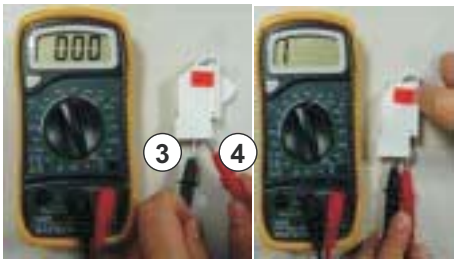
Function	Sheath heater is a part for defrost. All heating wire is connected to only one line. To check if the part is defective, check the resistance.
How to Measure	  Set a ohmmeter connect to The 2 housing pin. Measure the 2 pin connected to Sheath Heater. If the ohmmeter indicate (V°øV)/Watt=R is good condition, ex) when Watt=300W, Voltage=120V, R=(120x120)/300=48Ω But if the ohm meter indicate infinity the Sheath heater is bad.
Standard	**Sheath heater (at all temperature)**

Test Point	Result
(1) to (2)	45 ~ 51Ω

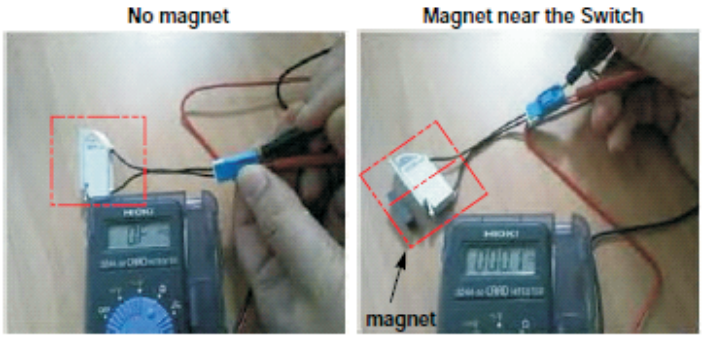
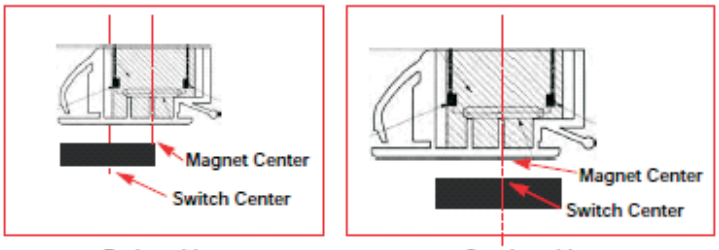
11-3 Door Heater Assembly

Function	The heater is designed to prevent the door from sweating.
How to Measure	Check the Brown to Blue at CON2 on the sub PCB  **Sub PCB** 
Standard	Test Point: (1) to (2) — Result: 2.3 ~ 2.9

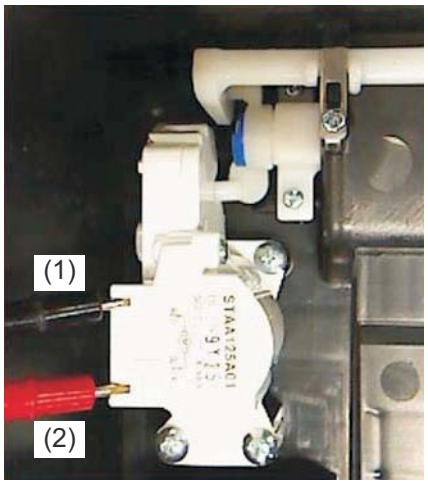
11-4 DOOR SWITCH, Freezer

Function	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.
How to Measure	**<Switch, Freezer>**    **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.
Standard	**Multimeter beep – Switch F** Nomal: Push the button(Plunger) Beep or 0: None (

11-5 DOOR SWITCH, Refrigerator

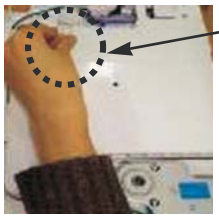
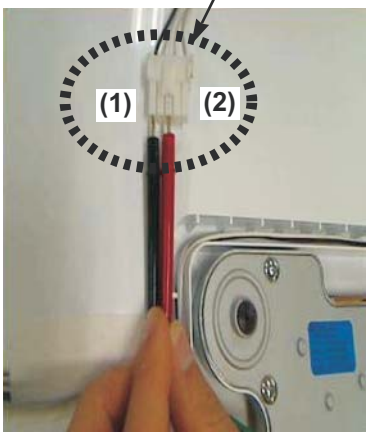
Function	The switch senses if the door is open or closed. - When the door open, lamp on. - When the door open, the switch give information to Micom. When the door open, internal contact operate on and off moving plunger of door switch up and down. -. Disassemble Housing  Push Hook Push Hook 
How to Measure	 ※ Magnet must be center of Switch  Bad position Good position
Standard	<table><tr><th>Status</th><th>Result</th></tr><tr><td>No magnet near the Switch</td><td>∞Ω</td></tr><tr><td>Magnet is near the Switch</td><td>1Ω ↑</td></tr></table>

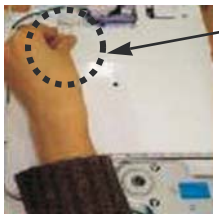
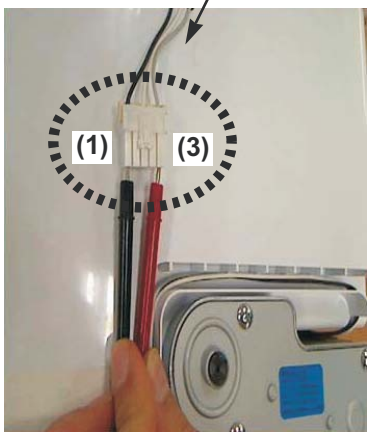
11-6 Dispenser DC Motor

<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 ~ 12.1</td></tr>
</table></td></tr>
</table>

11-7 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 ~ 42.09</td></tr>
</table>
Cube Solenoid
<table>
<tr><th>Test Points</th><th>Result</th></tr>
<tr><td>(1) to (3)</td><td>31.1 ~ 42.09</td></tr>
</table>
</td></tr>
</table>

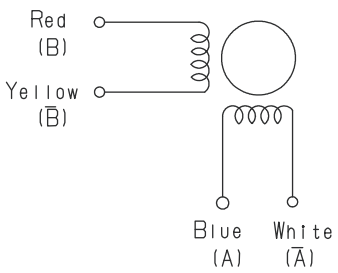
11-8 Damper

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

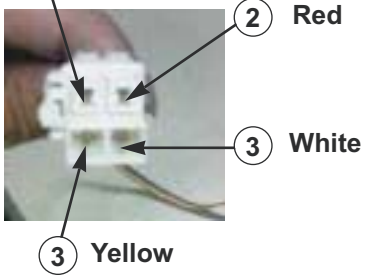
Table(1): 결선도(Wirering)

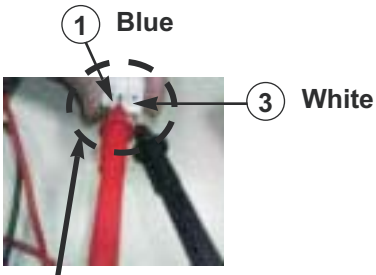


Table(2): 2-2상 여자순서(CW Rotation)

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

< Damper Circuit >

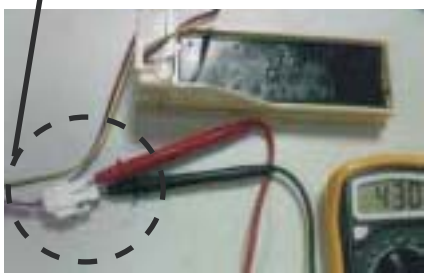




Check the (1), (3)

< 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.

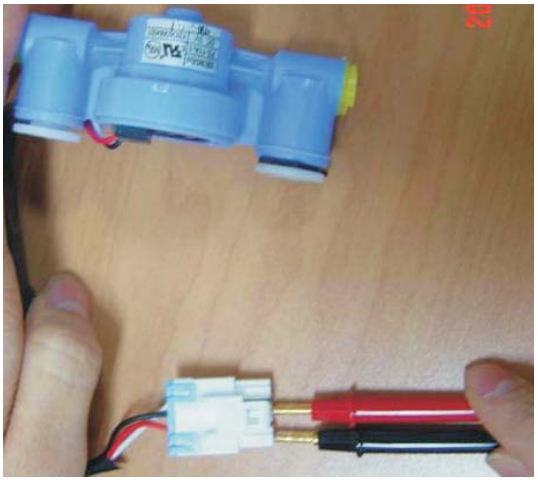
Standard

Damper

Test Points	Result
Red and Yellow	373 ~ 456

Test Points	Result
Blue and White	373 ~ 456

11-9 Flow Sensor

Function	Flow Sensor (in machine room) Count the water quantity from city water to water filter in refrigerator
How to Measure	 Flow Sensor (in machine room) 
Standard	

Test Points	Result
Red wire to Black wire	4 ~ 30

12. TROUBLESHOOTING

12-1 INFORMATION OF LINEAR COMPRESSOR

• The information tag provides compressor model, refrigerant, serial number and safety approval

Name Plate

Size : 90mm X 20mm

Compressor Label

1. Compressor Model

F L B 0 7 5 L * N A

- Series name: DLF/FA/FB/FLA/FLB
- Displacement: ex)90=9.0cm³/stroke
- Application Category
  - L : LBP with R134a
  - H : HBP with R134a
  - N : LBP with R600a
- Operating Type: A : A-Inverter, E : E-Inverter
- Rated Voltage & Frequency
  - M : 220V 50/60Hz
  - N : 115V 50/60Hz
- Efficiency version: A : 1st generation, B : 2nd generation

2. Refrigerant

3. Serial Number

00 00 9 2003 5 13 0012

Buyer Code / Model Code / Line / Year / Month / Date / Serial No.

Month		
1 : January	~	O : October
9 : September		N : November
		D : December

4. Safety Approval

Ex)

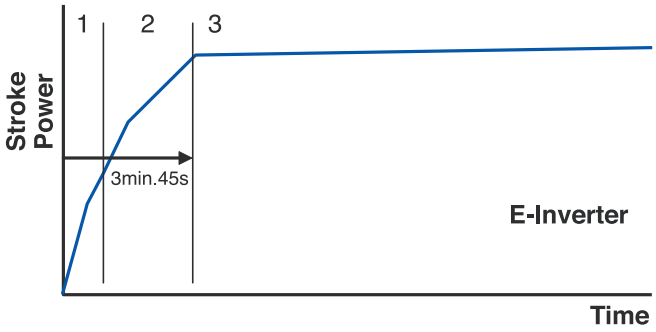
• There are two types of controllers used in the linear compressor system.
  - The “A”-inverter system is used with theFLB075L*NA compressor.

	Refrigerator	Comp Drive	Compressor
FLB075L*NA E-Inverter System	Controls the algorithm according to various conditions. →	**Inverter VVVF** →	**Stroke Modulation**

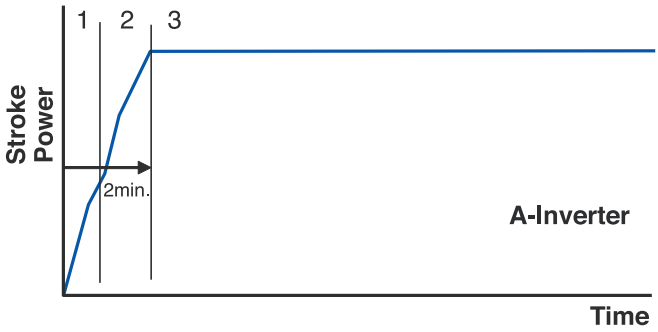
**CVCF : Variable Voltage Variable Frequency

**CVCF : Constant Voltage Constant Frequency

- To reduce noise level, the piston stroke is slowly increased to full power during start up.



Step 1) Start up - Half stroke interval for first 30 seconds.
Step 2) Ramp up - Stroke increases every 0.8sec until maximum stroke length is reached (about 3 min, 15 sec)
Step 3) CVCF interval - 180V / 60Hz

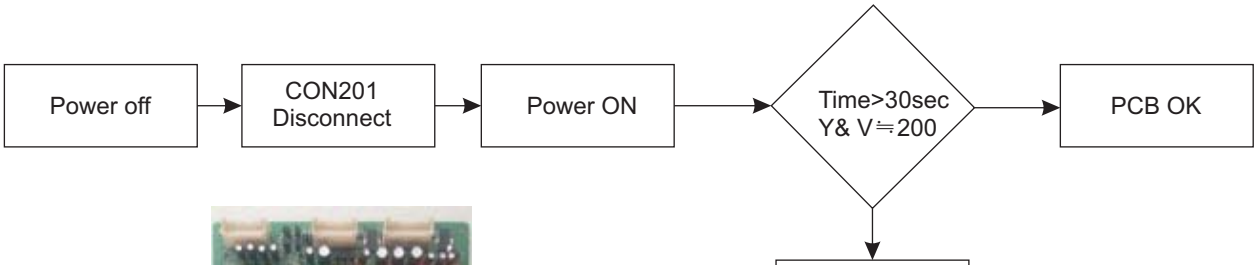


Step 1) Start up - Half stroke interval for first 20 seconds.
Step 2) Ramp up - Stroke increases until maximum stroke length is reached (about 1 min, 40 sec)
Step 3) VVCF interval - target voltage and frequency controlled by Control Board signals

- There are 6 protection logics designed to protect the linear compressor system. When a failure is detected, the compressor will shut and will try to restart after a set period of time for each type of failure. The LED located on the inverter drive PCB will flash the appropriate code to indicate the detected failure. This code will continue to flash until the unit is disconnected from the power source.

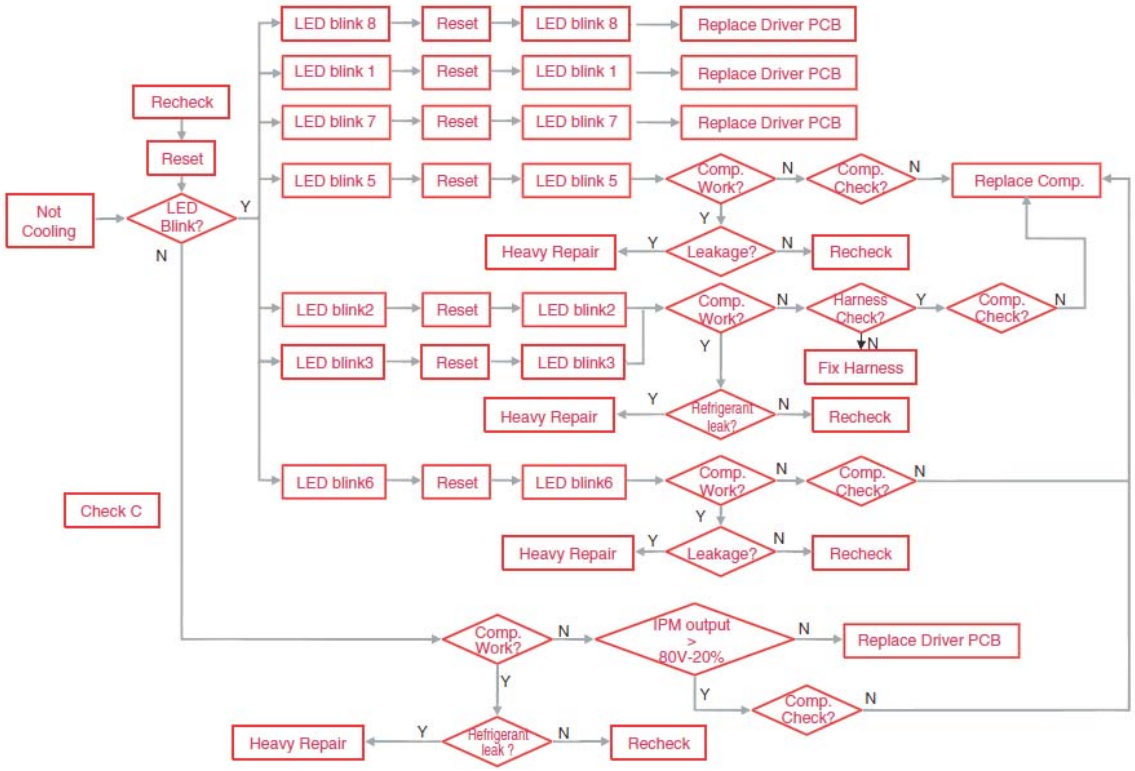
Inverter Error Codes

Inverter Error Codes	code	Requirement	Off Time	The number of LED flashes
FCT0	5	|Vm, Im|> 2.5V+20% @ COMP off	30s	1
Stroke	10	|Stroke|>17.5mm	60s	2
No Connect	15	|Stroke|<=9.4mm & While 4 seconds |AC Current|<0.05A	40s	3
Lock	25	|AC Current|>1.0A & |Stroke|<3.0mm	150s	5
Current	30	|Current|>3Ap	360s	6
IPM	35	uc_Fo_Trip!= 0	20S	7
Communication Error	-	Checksum error	0	8



	Ref.	Comp FLB075(A-Inverter)	Display & sound	Refer
TEST1	Forced Starting	TDC (Full Stroke)	Display ON, Buzz 1 time	

Troubleshooting



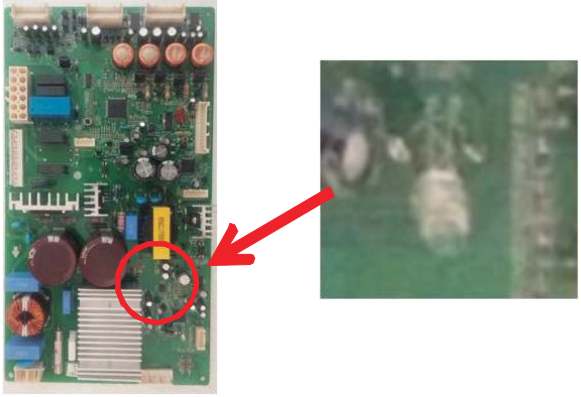
12-1 Check A

- Dear 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.

Step 1. Open PCB Cover

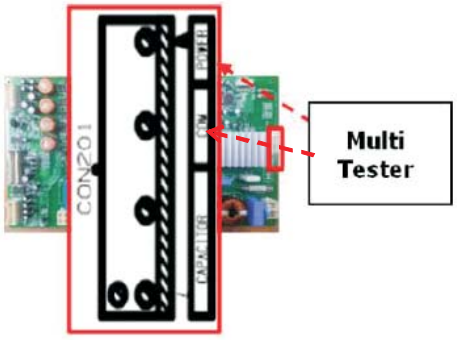
Step 2. Check Driver PCB



* Driver PCB located in machine room.

IPM Output check

- Measure the voltage between the POWER and COMM pins of the connector as shown below.



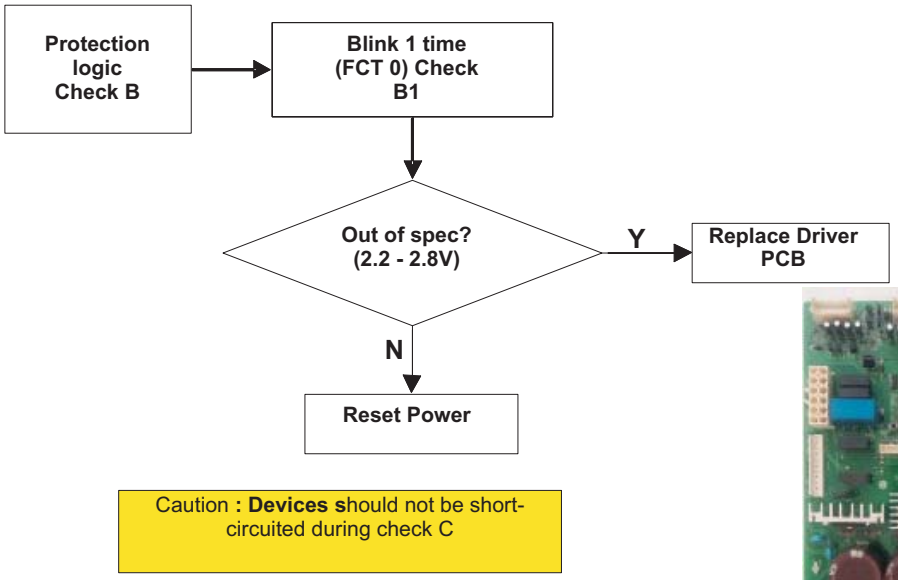
Check to make sure compressor is receiving voltage from IPM

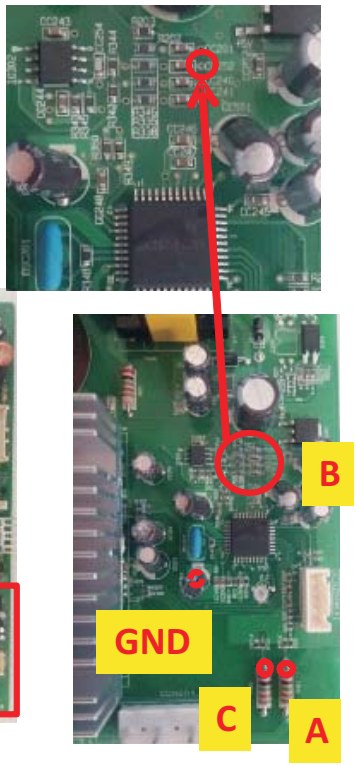
- In order to determine whether the compressor is operating normally, check the output voltage during the refrigeration cycle.
- After initial power-up, when the compressor begins to operate, wait 10 minutes before checking.
- The compressor is operating normally if the voltage is greater than 80V.

12-1 Check B

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

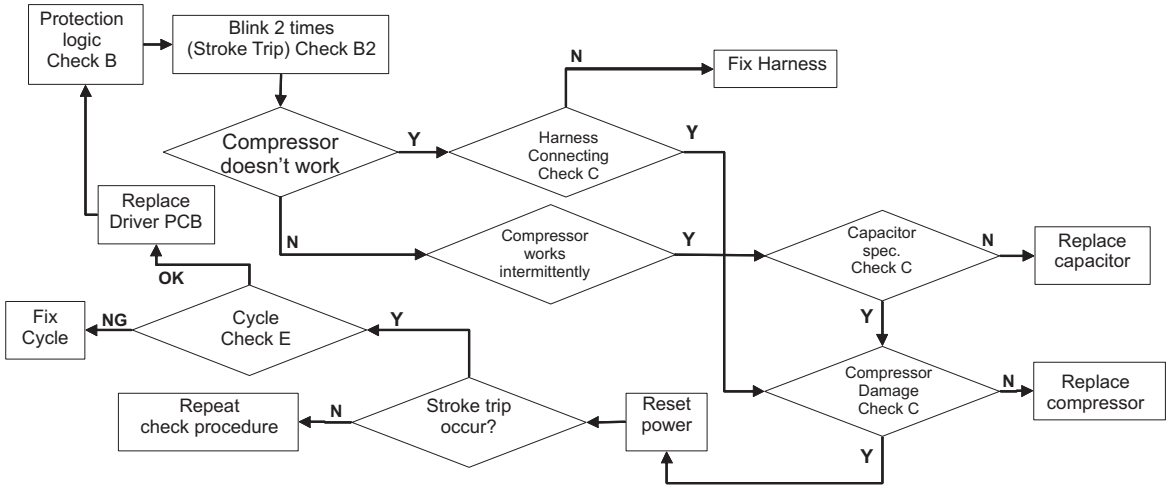
- Purpose: Detecting motor current and voltage error
- Check voltage at point A (Motor Voltage), point B (Motor Current) and Point C (Capacitor Voltage) when compressor is off.
- Spec: Points A, B, & C 2.5V 0.3V





B2. LED blinks two times, then repeats (Stroke Trip)

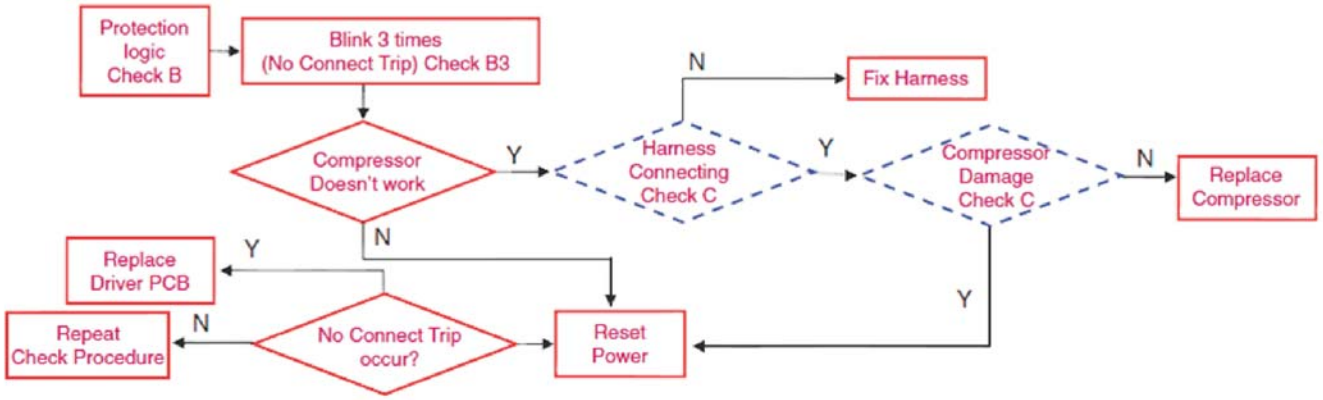
- Purpose: Prevent abnormally long piston strokes.
- Case 1. If compressor doesn't work and LED blinks - Cause: Possibly harness from compressor to PCB might be defective.
- Case 2. If compressor works intermittently and LED blinks - Cause: Condenser Fan or Freezer Fan is not running. Sealed system problem 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 three times, then repeats (Stroke Trip)

Protection Logic

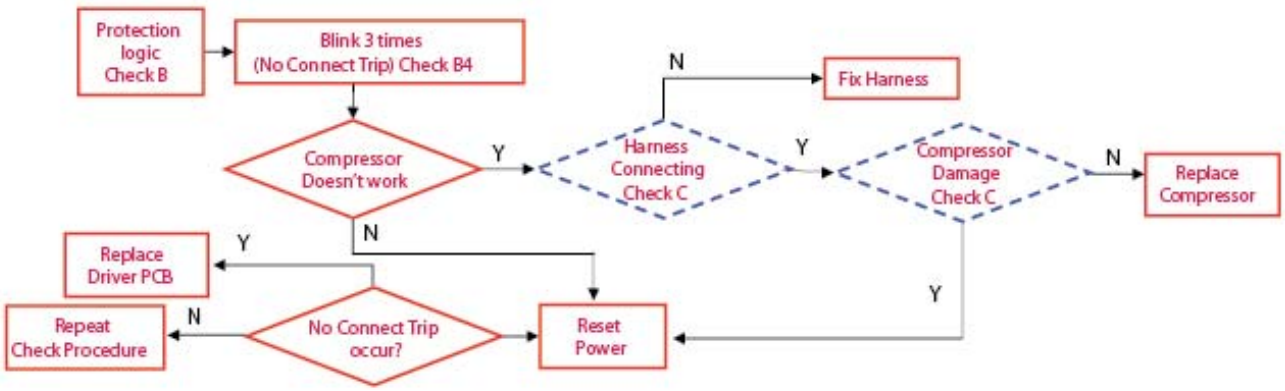
- Purpose : Prevent over voltage and current detecting connecting error.
- Cause : -.Connecting error of PCB and Comp, Capacitor harness -. Comp insulation damage.
- Logic : Compressor is forced off and tries to restart within 40 seconds.



B4. LED blinks three times, then repeats (Stroke Trip)

Protection Logic

- Purpose : Prevent over voltage and current detecting connecting error.
- Cause : -.Connecting error of PCB and Comp, Capacitor harness -. Comp insulation damage.
- Logic : Compressor is forced off and tries to restart within 40 seconds.

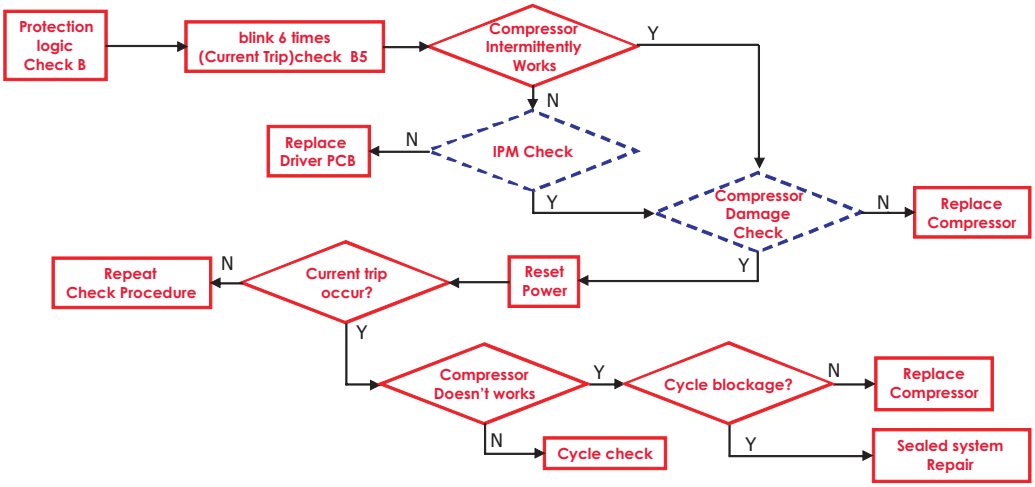


B5. LED blinks five times, then repeats (Locked Piston: A & E Inverters)

Protection Logic

Blink Blink Blink Blink Blink OFF

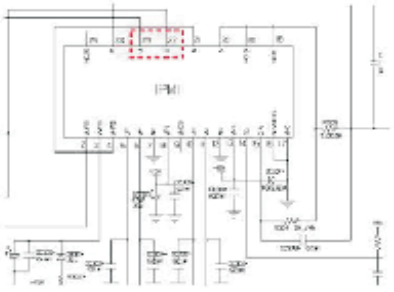
- Purpose: To detect locked piston
- Cause: Lack of oil to the cylinder, cylinder or piston damaged and or restricted discharge. A Locked Piston can also be caused by foreign materials inside the compressor.
- Logic: Compressor is forced off and tries to restart within 2.5 minutes.

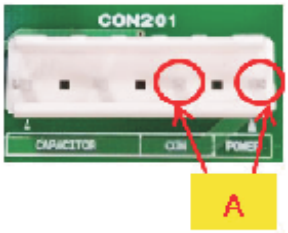


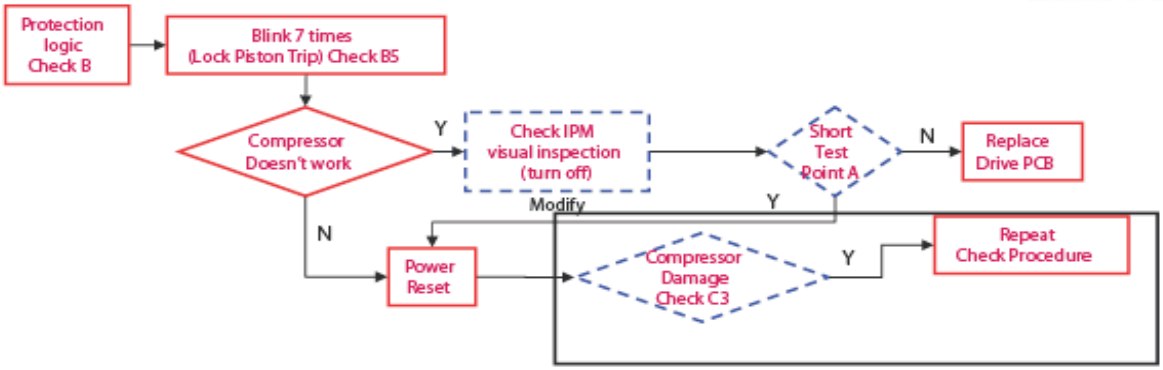
B6. LED blinks seven times, then repeats (IPM Fault: A & E Inverters)

Blink Blink Blink Blink Blink Blink Blink OFF

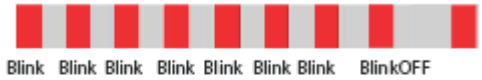
- Purpose: Prevent high current due to IPM Short
- Cause: Damaged IPM (Dead Short)
- Test for a dead short at Point A with a VOM.
- Logic: Compressor is forced off and tries to restart in 20 seconds.







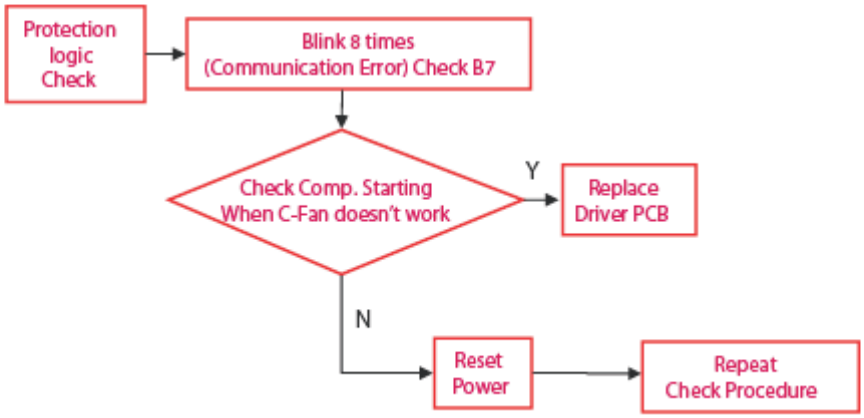
B7. LED Blinks eight times, then repeats (Communication Error)

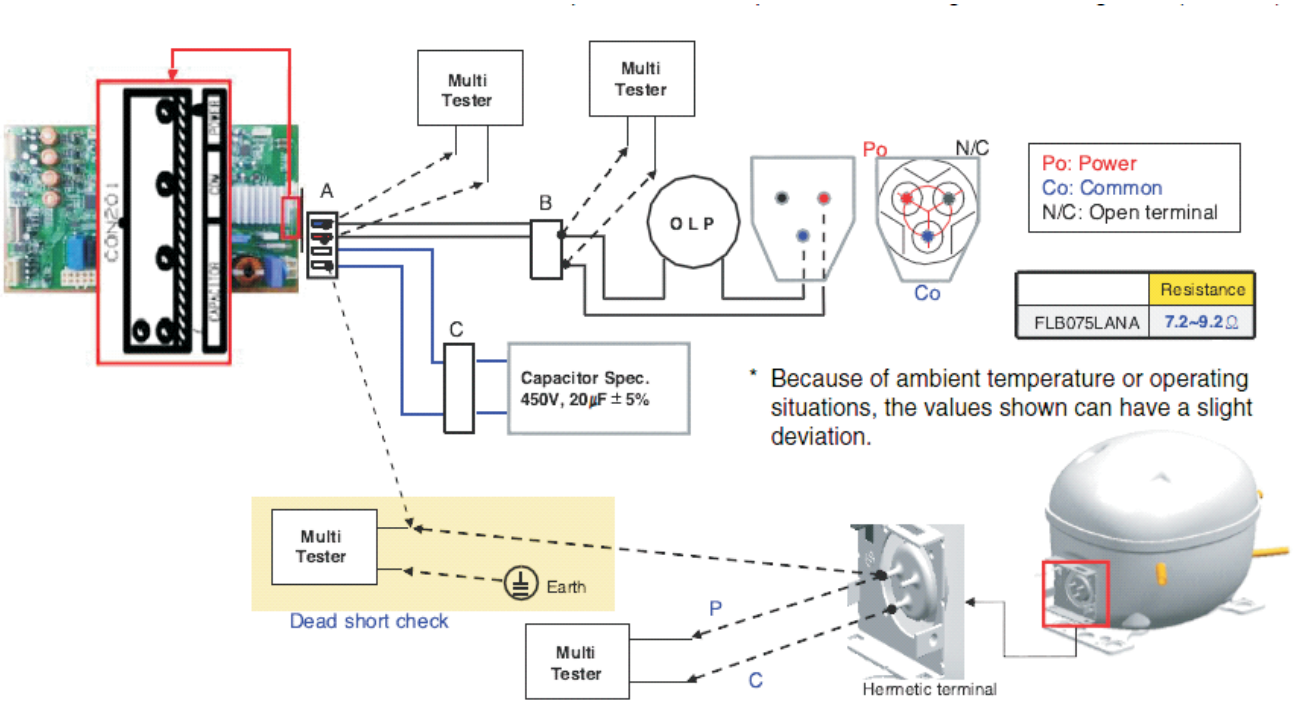


- Purpose: To detect Set control Micom and communication error
- Cause : Communication Error
- Logic : LED blink. (Compressor runs reference value before occuring communication Error)

1. Check Temp.&Sound Pressure of comp and D-pipe

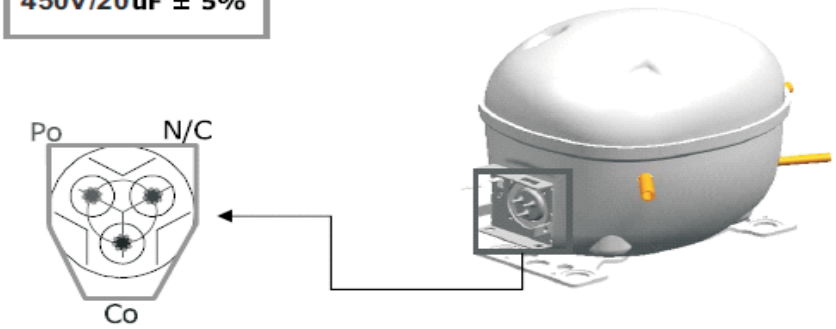
2. Check whether or not C-Fan Works





FLB075LANA

Capacitor Spec.
450V/20uF ± 5%



Po : Power
Co : Common
N/C : No Connecting

Specification

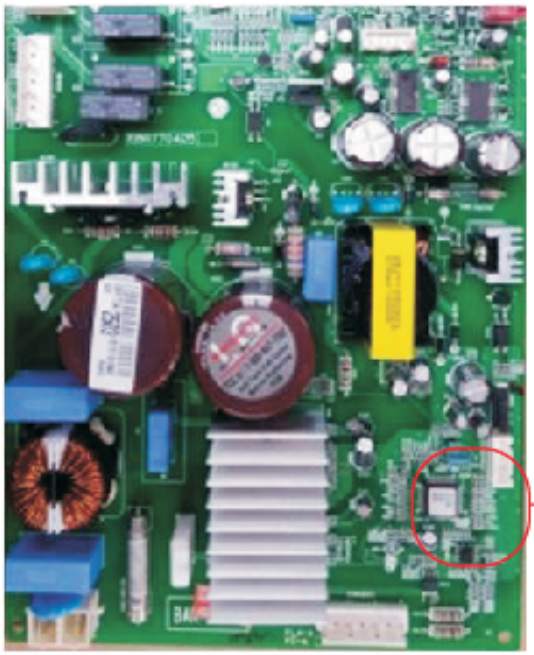
7.2 ~ 9.2 Ω Between Po and Co

Compressor Troubleshooting

⚠ WARNING HIGH VOLTAGE

Step 1) Open PCB cover

Step 2) Check for blinking frequency of LED and PCB



LED Lamp

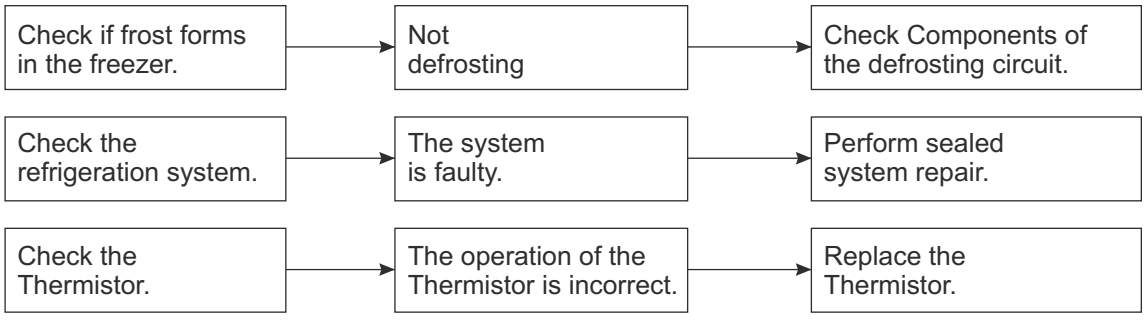
When compressor is normal, it does not blink

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

12-2 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:



12-3 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.

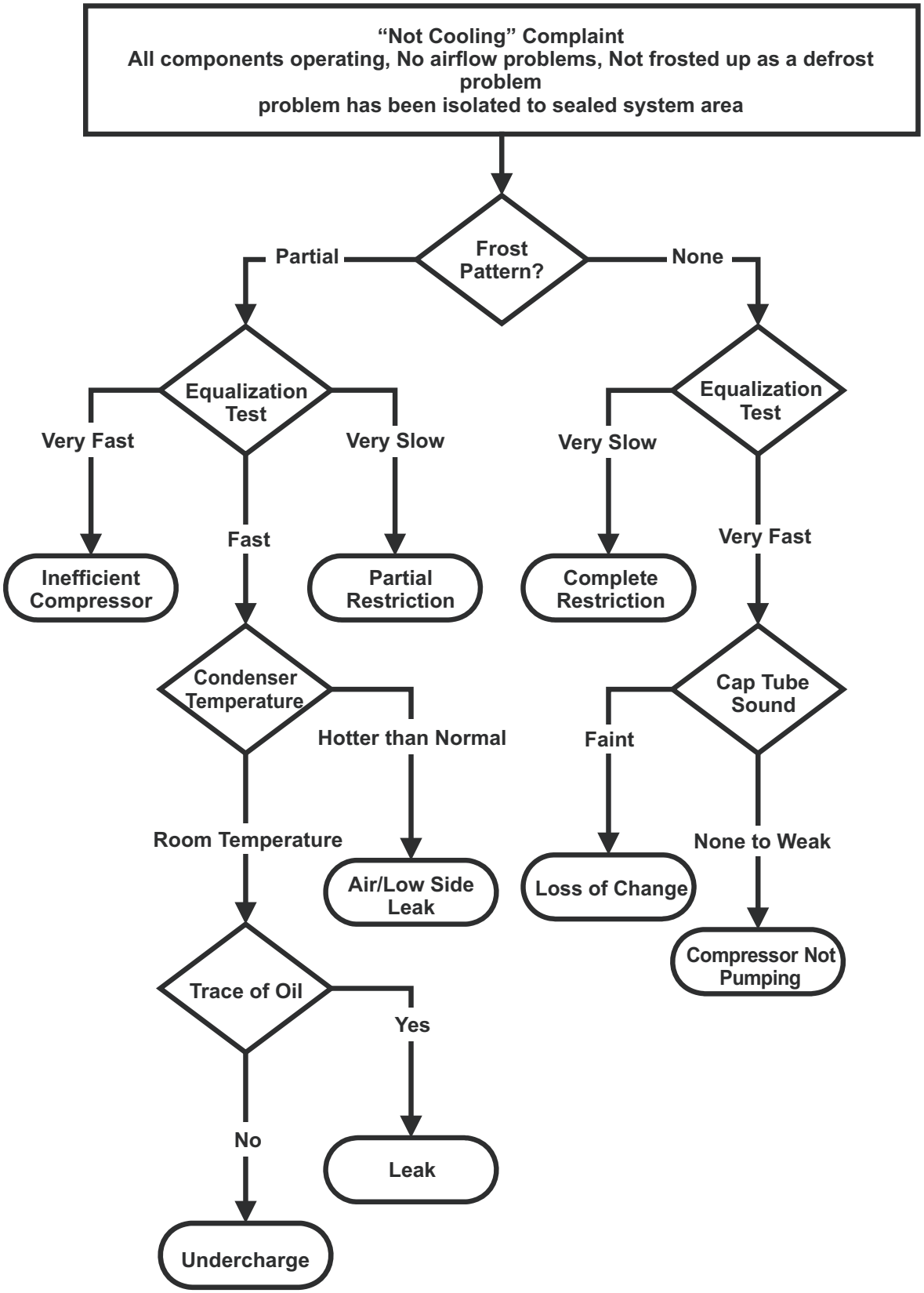
12-3-1 Cleaning

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.

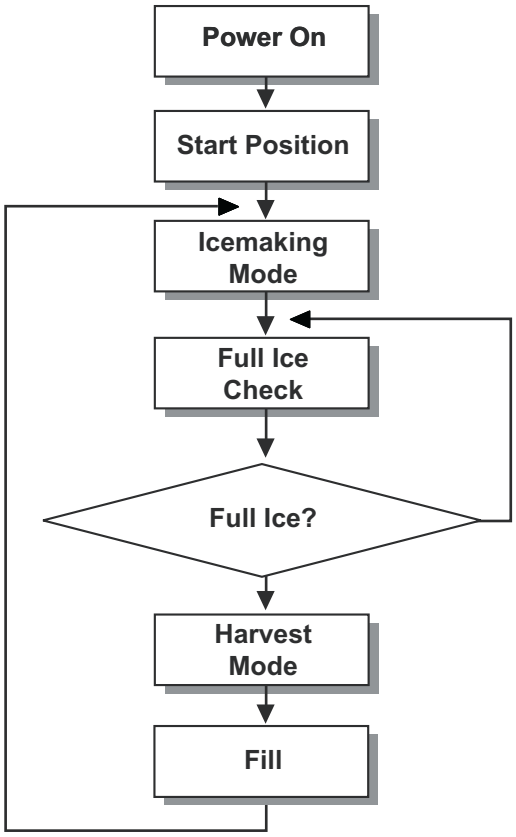
12-3-2 SEALED SYSTEM DIAGNOSIS



(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.

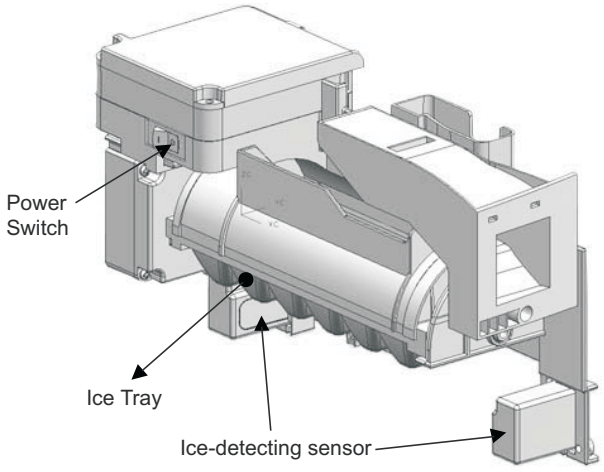
- If water becomes ices in the ice tray, Ice-detecting sensor check if the ice bin is full.

- 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

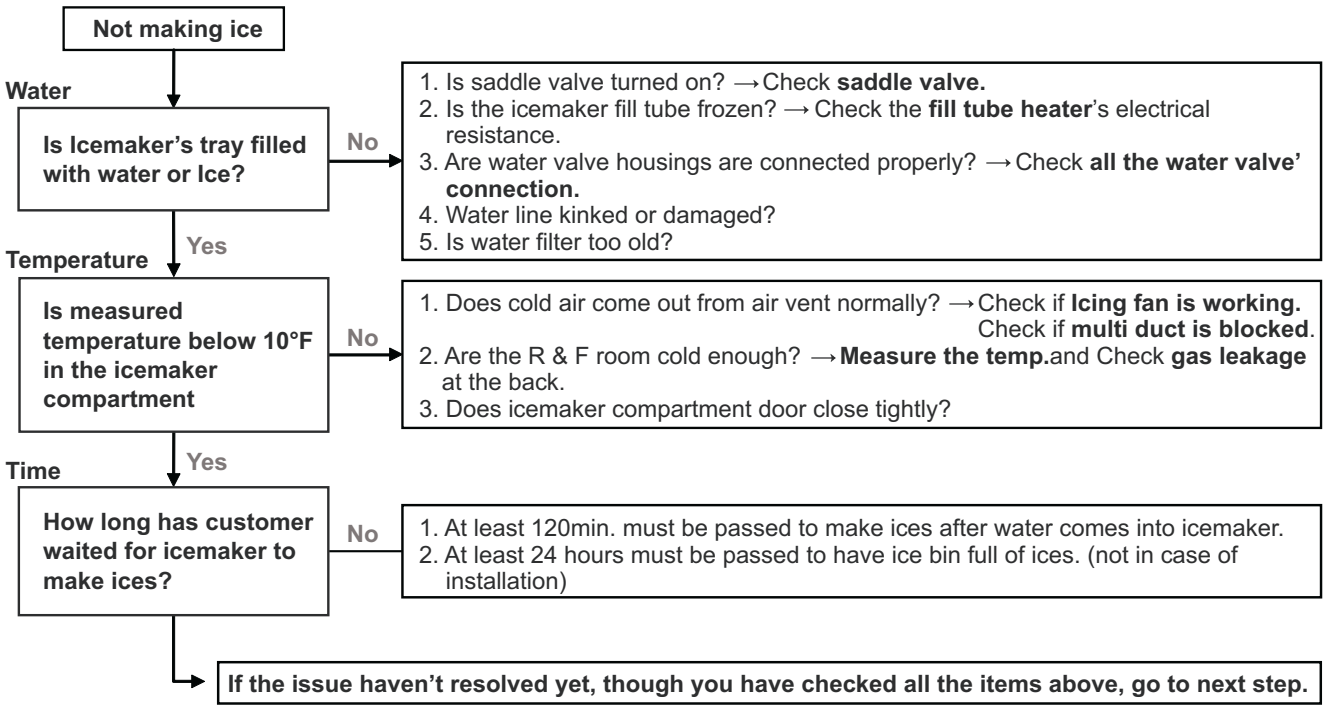
Once the normal harvest mode has been completed, the water solenoid will be activated.

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.

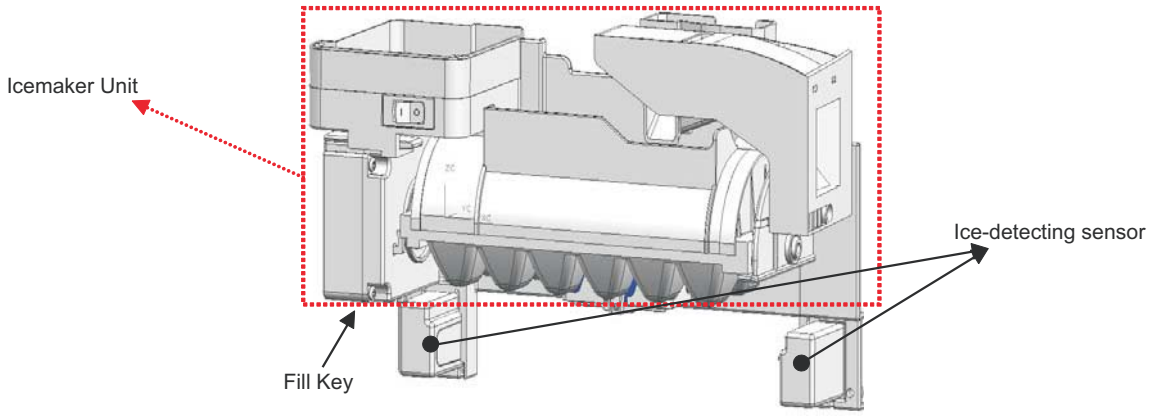
※ **Test Mode should not be carried out before checking below.**



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

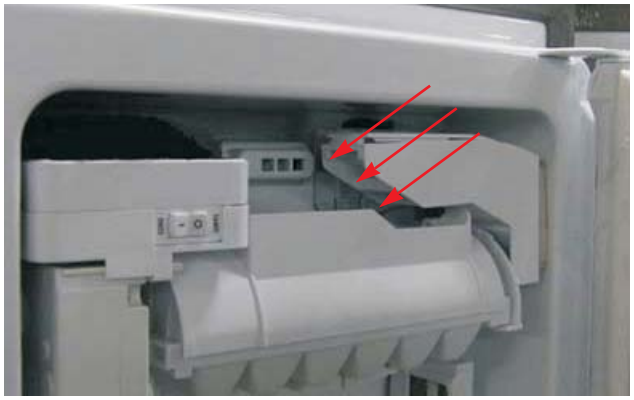
▶ **Icemaker Unit and Ice-detecting sensor Diagnosis**

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)

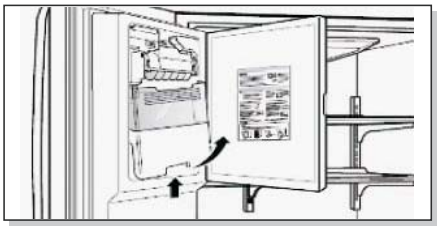
Press the fill key for about 3sec. If the icemaker runs 2 stages of harvest and filling water step by step, It means icemaker's mechanism is normal.



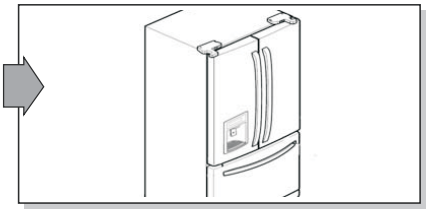
※ Caution : Be sure that the ice tray is not filled with water before pressing fill key.

2st STEP (Ice-detecting sensor Diagnosis)

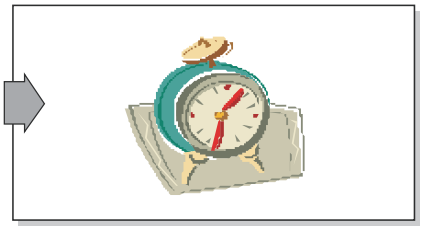
1. Remove Ice bin from compartment



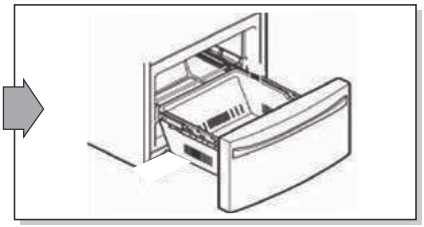
2. Close the left door



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)

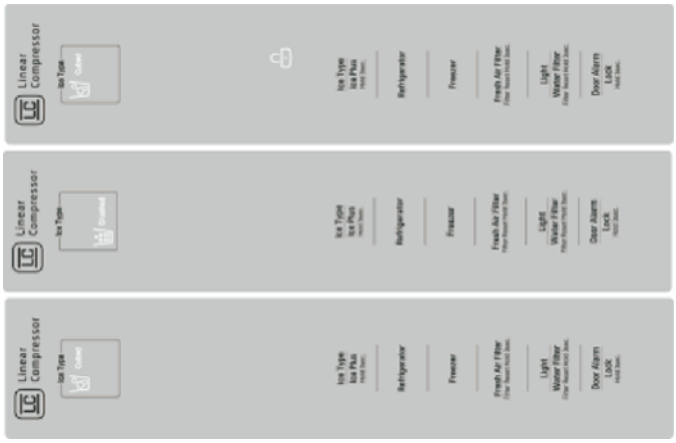
- Cap duct doesn't seal the air properly.
  → **Resolution :** Possibly, warm air could get into the compartment and make ices get stuck. Replace the cap duct with new one.

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)



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 .
2. To lock the display, the dispenser, and the control panel, press and hold the LOCK button for 3 seconds. “LOCK” is activated
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/ Water Filter button for more than 3 seconds.
   After then water Filter icon turn off with reset status.

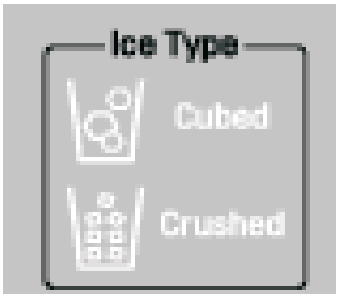
14-1-5 Ice Plus selection

1. Please select ice plus function for quick freezing.
2. When you press the Ice Type/Ice Plus Button for 3seconds the ice plus icon will be turned on again.
3. Ice plus function automatically turns off after a fixed time passes.

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

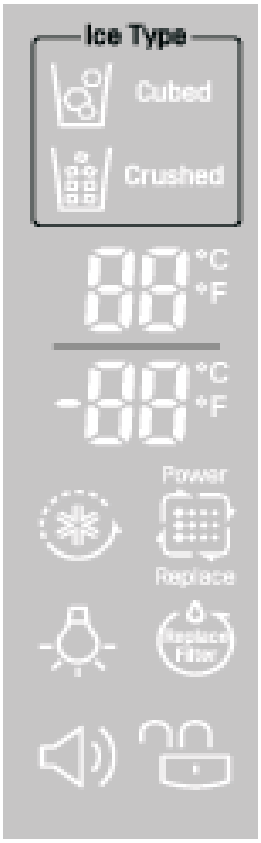
1. With the refrigerator door open, keep pressing the Refrigerator Temp Button and ICE PLUS Button more than 5 seconds, then it goes to the display mode with Special Beep Sound With Special Beep Sound.
2. Perform the same way again to cancel the display mode.
3. All Freezing unit will be turned off at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



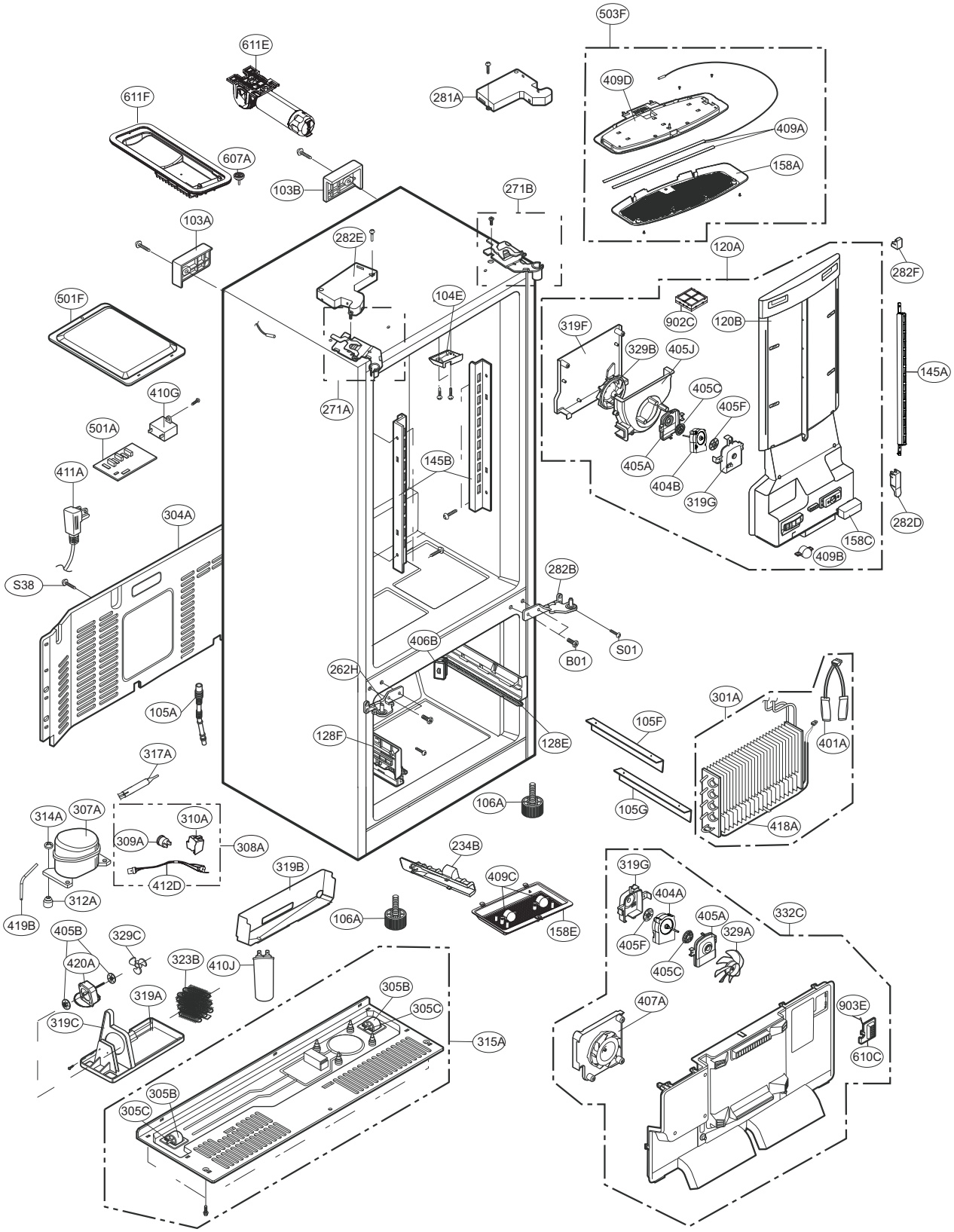
* Display check function: If simultaneously pressing Ultra Ice button and freezing temperature adjustment button for a second, display LCD graphics on. If releasing the button, the LCD graphic displays the previous status.
You can check the error code Within 3-hour Period from initial error

14-1-15 Auto pantry

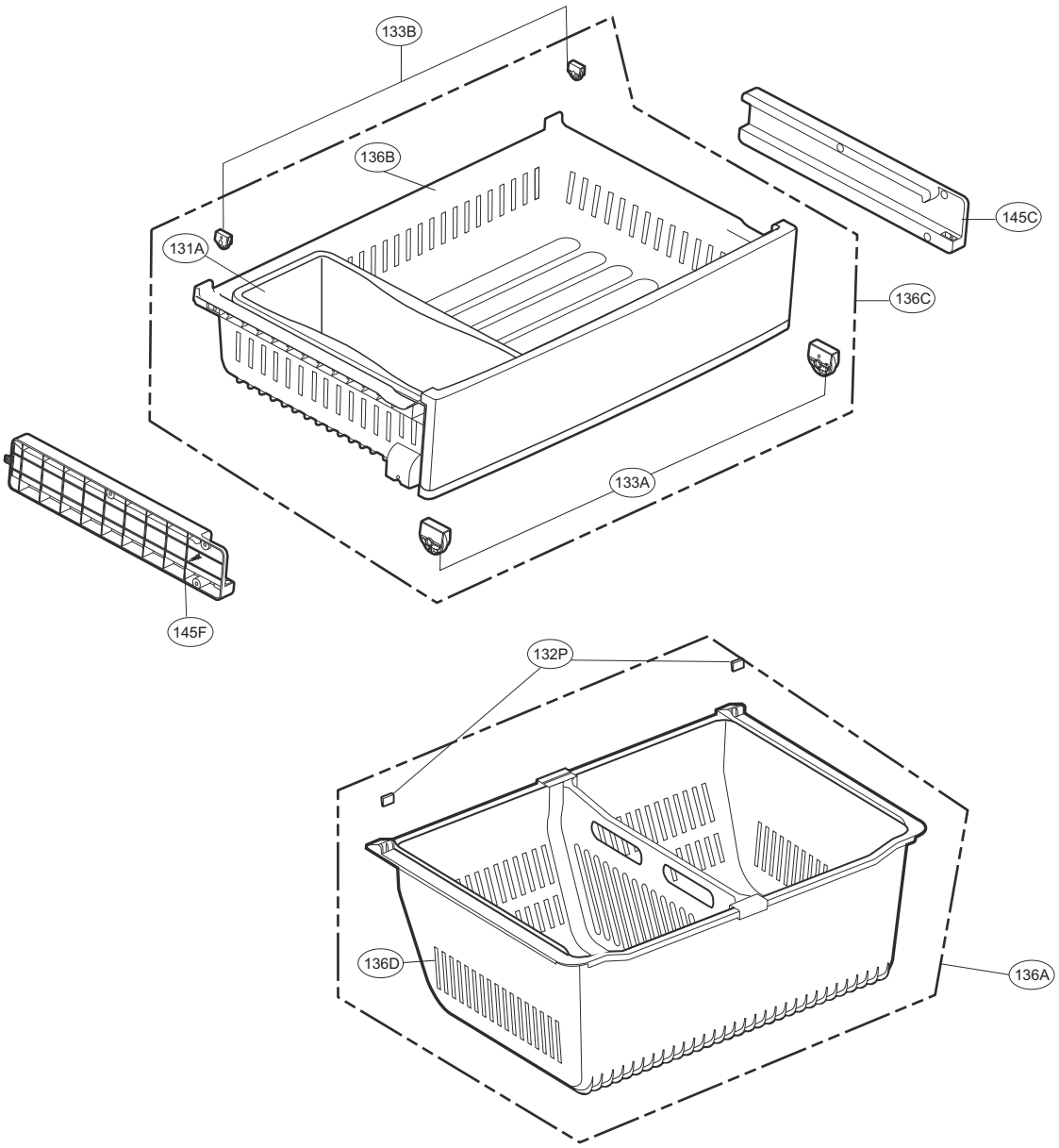
1. The temperature control will automatically start upon the selected Auto Pantry temperature control.
2. You can adjust the Pantry control with three different temperature ranges by pressing the Temp.Selector button.

15. EXPLODED VIEW

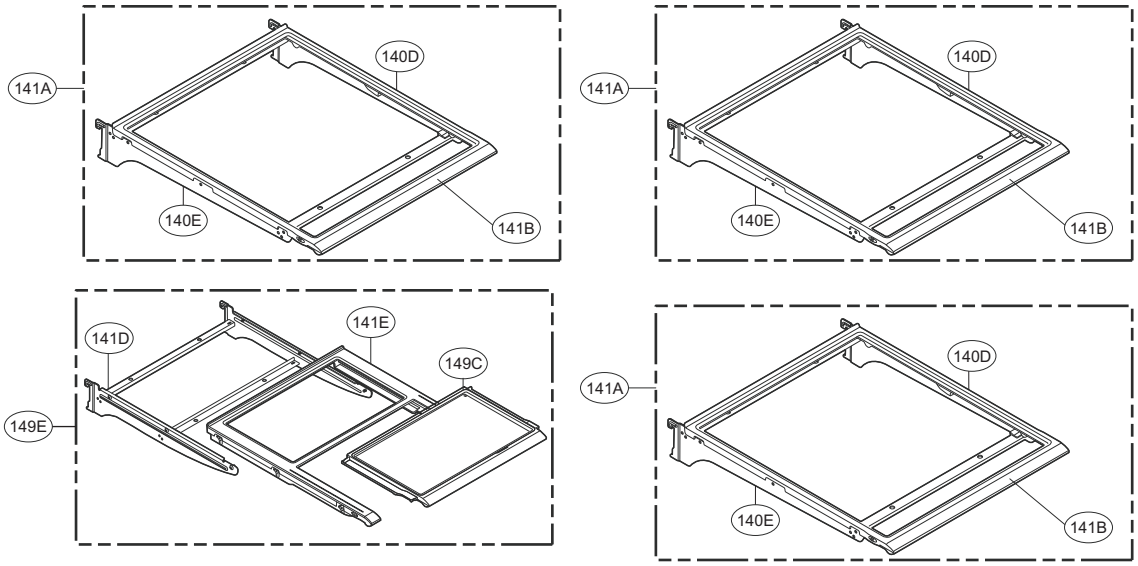
CASE PARTS

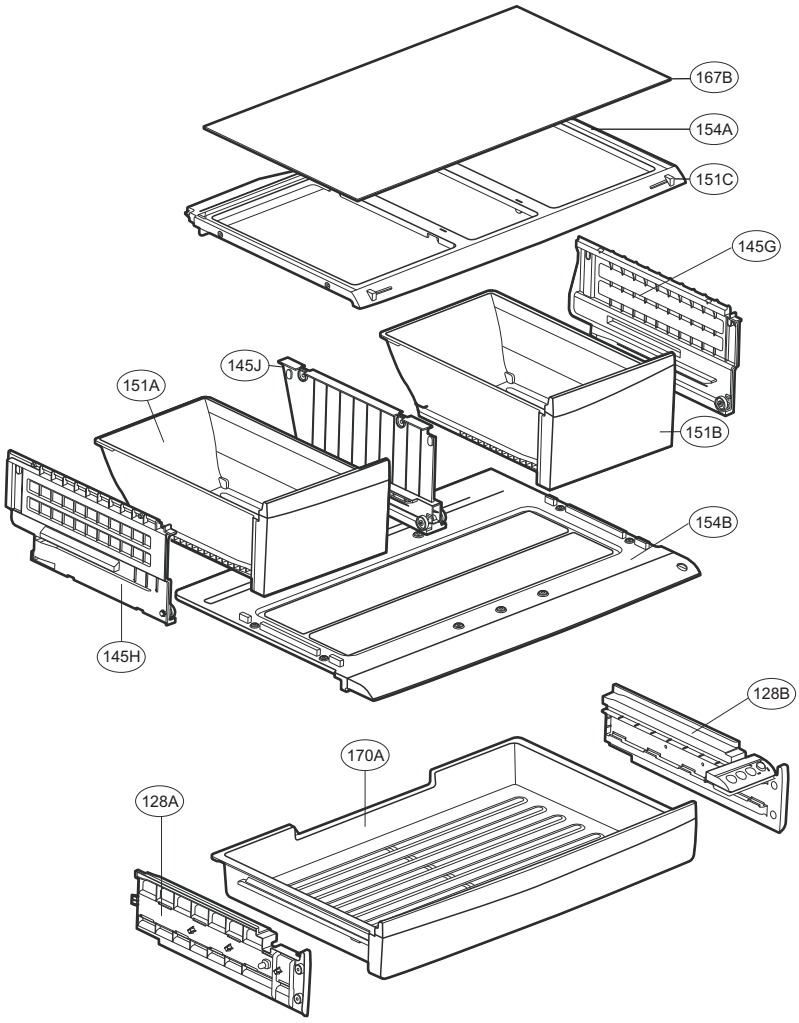


FREEZER PARTS

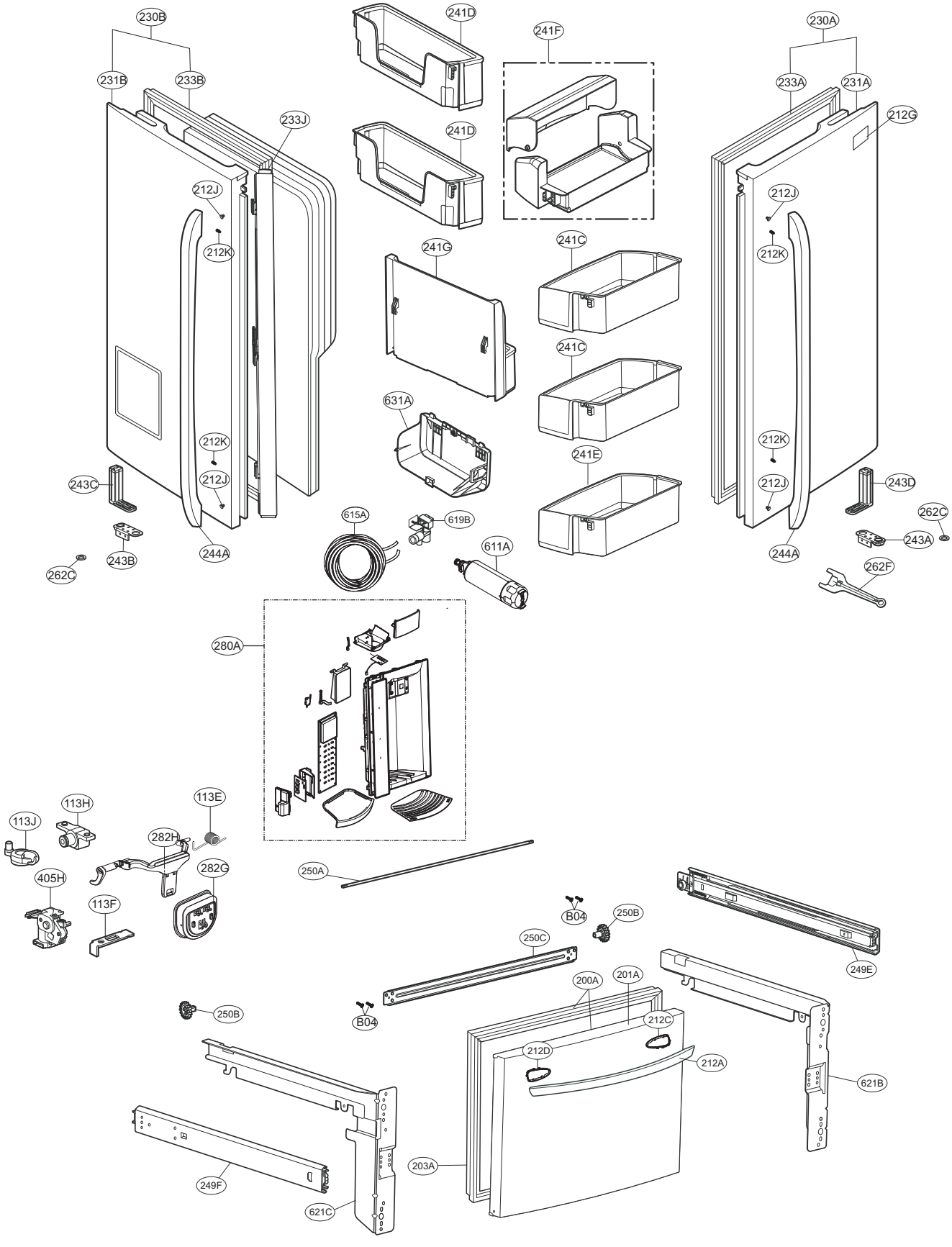


REFRIGERATOR PARTS

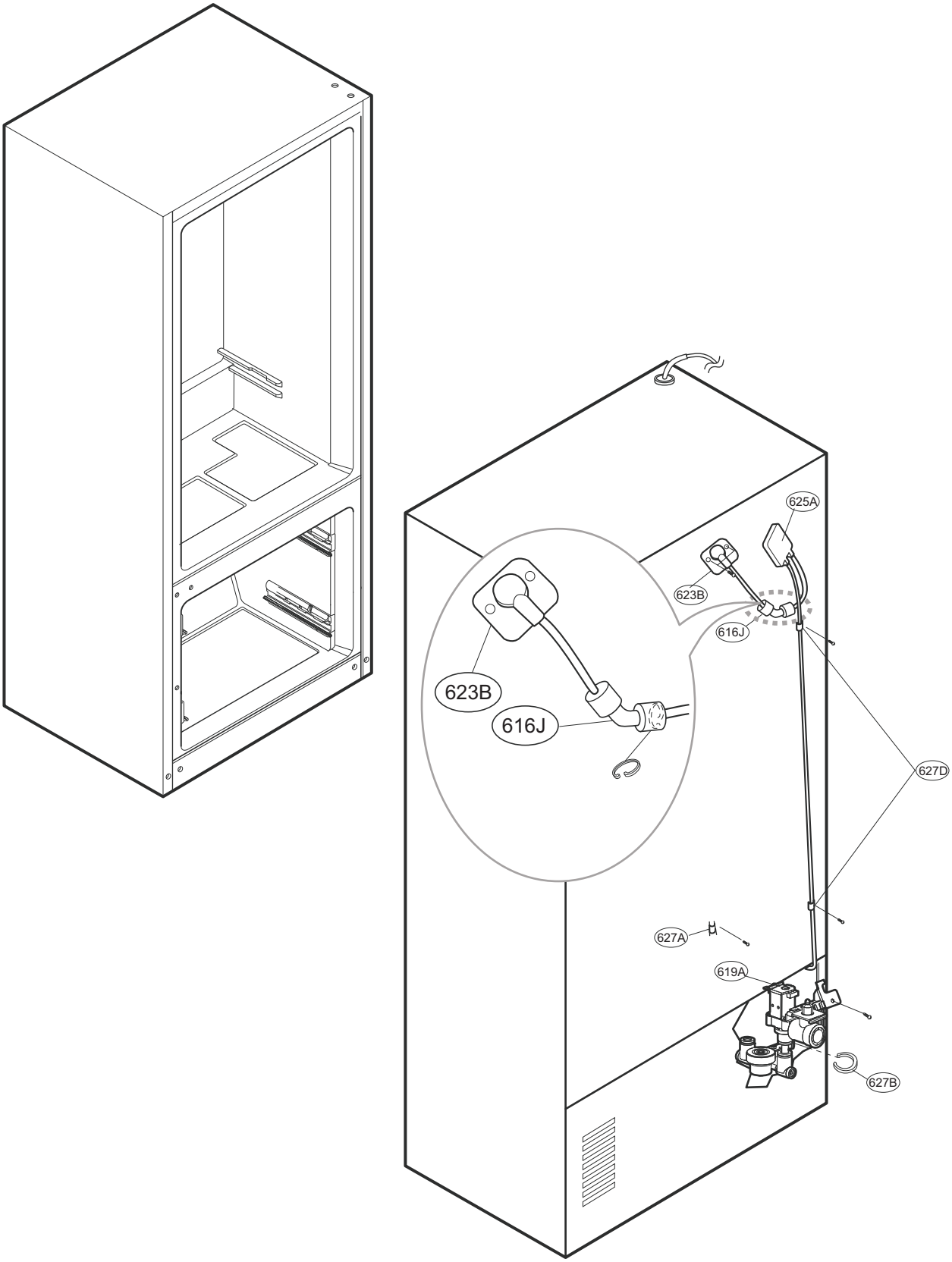




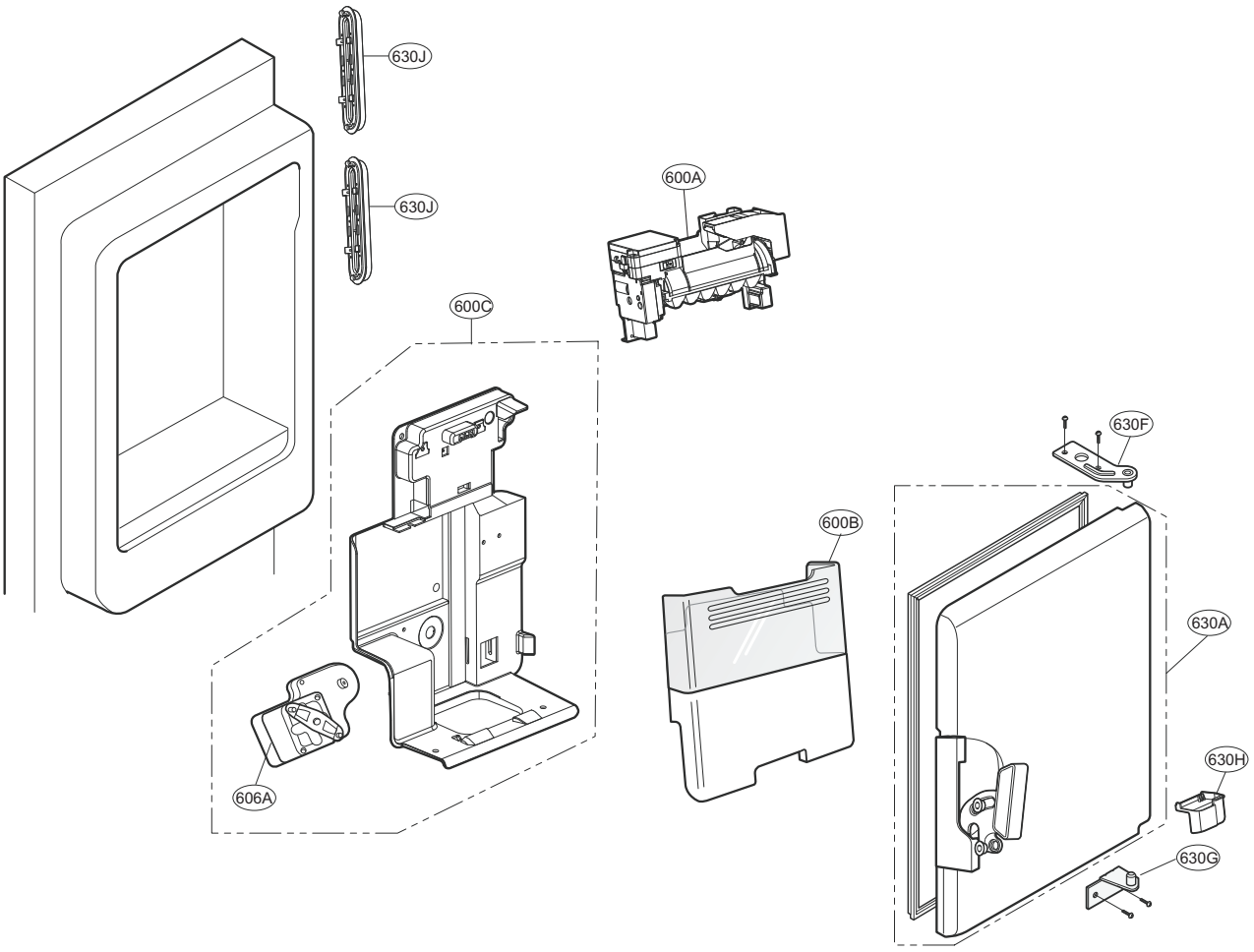
DOOR PARTS



VALVE & WATER TUBE PARTS



ICEMAKER & BIN PARTS



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