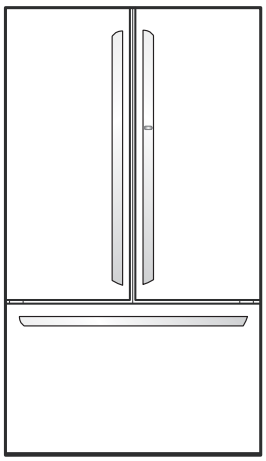
REFRIGERATOR
SERVICE MANUAL

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



MODELS :
LFCS25663*

CONTENTS

SAFETY PRECAUTIONS 2
1.SPECIFICATIONS 3
2.PARTS IDENTIFICATION 5
3.DISASSEMBLY 6
DOOR 6
DOOR ALIGNMENT 7
HOW TO REMOVE AND REINSTALL THE PULLOUT DRAWER 8
HOW TO REMOVE AND REINSTALL THE HOMEBAR 11
HOW TO REMOVE AND REINSTALL THE HOMEBAR DOOR 11
HOW TO REMOVE AND REINSTALL THE DOOR FOAM ASSEMBKY, REFRIGERATOR 11
HOW TO REMOVE FRAME DOOR SWITCH OF DOOR FOAM 12
HOW TO REMOVE THE HOME BAR DOOR 13
4.ADJUSTMENT 14
5.CIRCUIT DIAGRAM 15
6.TROUBLESHOOTING 16
7.PCB PICTURE 17
MAIN PCB 17
DISPLAY PCB & SUB PCB 17
8.TROUBLESHOOTING WITH ERROR DISPLAY 18
9.TROUBLESHOOTING WITHOUT ERROR DISPLAY 34
10.REFERENCE 47
11.COMPONENT TESTING INFORMATION 51
12.TROUBLESHOOTING 57
13.ICE MAKER AND DISPENSER WORKING PRINCIPLES AND REPAIR 68
14.EXPLODED VIEW & REPLACEMENT PARTS LIST 72

SAFETY PRECAUTIONS

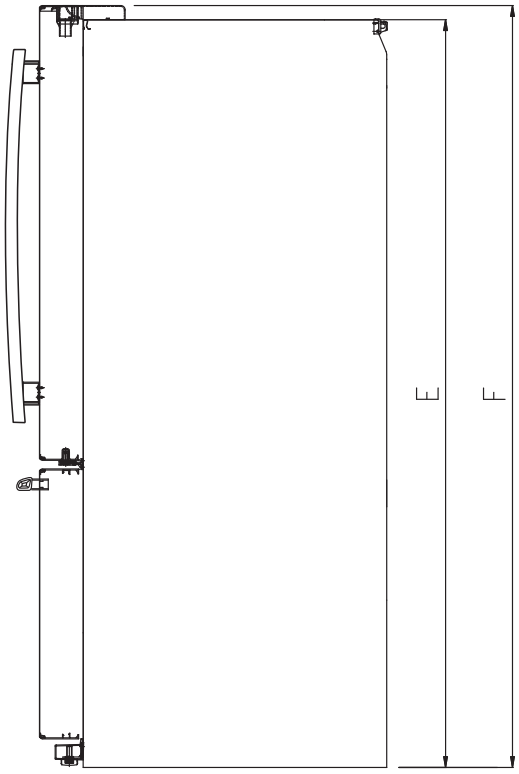
Please read the following instructions before servicing your refrigerator.

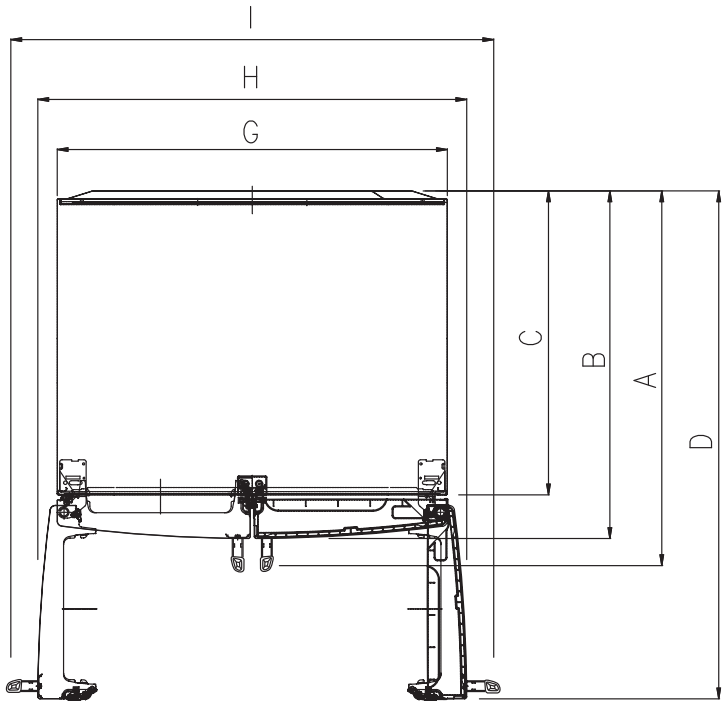
1. Unplug the power before handling any elctrical componets.
2. Check the rated current, voltage, and capacity.
3. Take caution not to get water near any electrical components.
4. Use exact replacement parts.
5. Remove any objects from the top prior to tilting the product.

1. SPECIFICATIONS

SPECIFICATIONS		MODELS
		LFCS25663S
GENERAL FEATURES	Color	Stainless Steel
	Dimensions (in)	32 3/4 X 35 3/8 X 69 3/4 (WXDXH)
	Net Weight (lb)	322
	Capacity	25cu.ft
	Refrigerant	R134A (125gr)
	Climate Class	Temperate (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
	Lubricating Oil	ISO8 (180ml)
	Drier	Molecular Sieve XH-7
	Capillary Tube	IDØ0.75
	First Defrost	4 hours
	Defrost Cycle	7-50 hours
	Defrosting Device	Sheath heater
	Anti-freezing Heater	Pipe heater
	Water Tank	No
	Auto Icemaker	Twisting
REFRIGERATOR	Case material	Embo
	Door material	Stainless Steel
	Handle type	Vista
	Display graphic	Raptor only
	F, Drawer upper	R-Vegetable (2 Crisper)
	Ice tray & bank	No
	Lamp	High Brightness LED
	Shelf	3FIX (S/PROOF)+ 1FOLD
	Egg Bank	No
	Pantry	Yes (No control)
FREEZER	F, Drawer lower	1EA PL + 1EA PL
	Lamp	Capsule LED
	Shelf	No

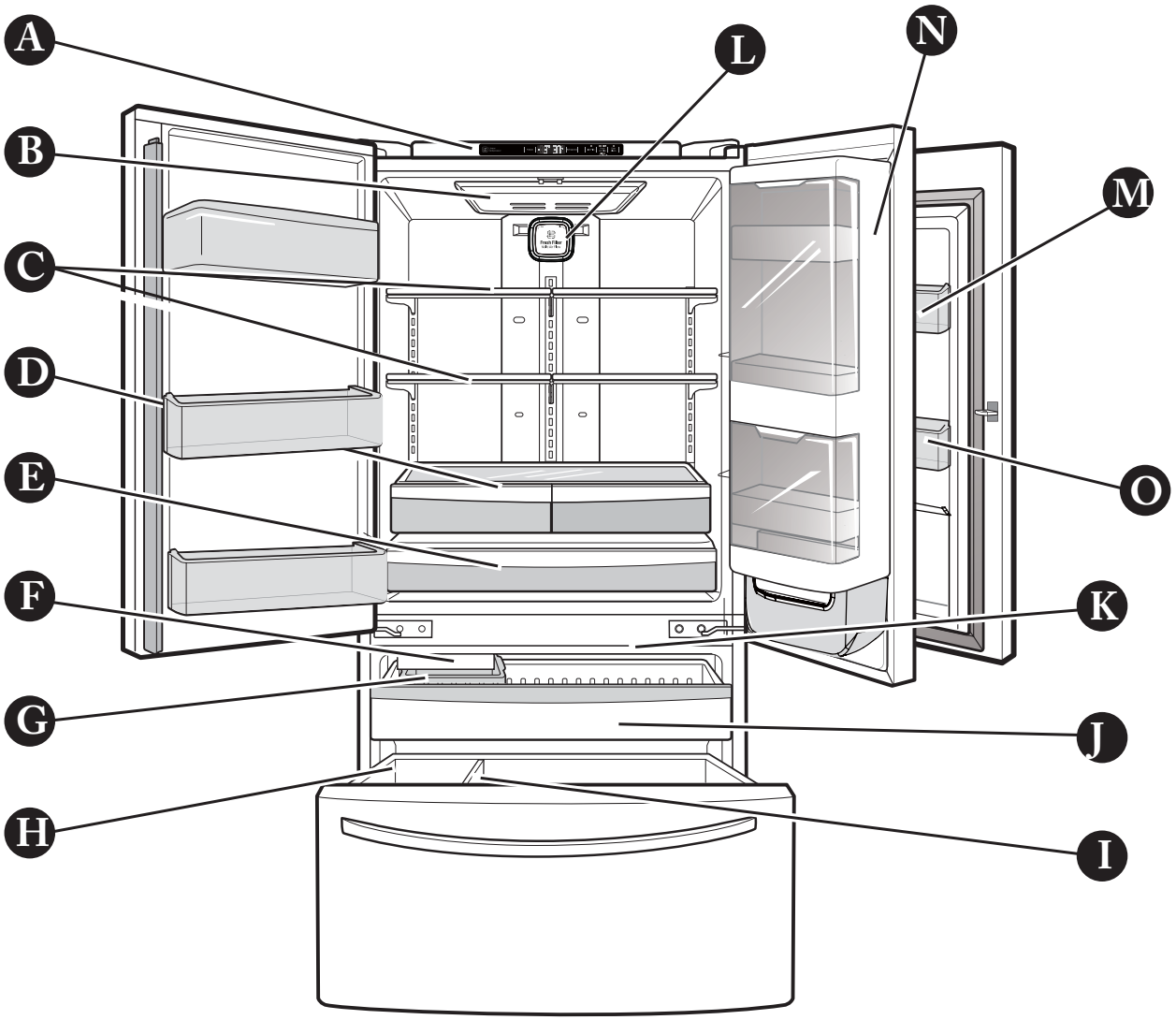
DIMENSIONS





Description		LFC25765**
Depth w/ Handles	A	35 3/8
Depth w/o Handles	B	32 7/8
Depth w/o Door	C	29
Depth (Total with Door Open)	D	46 1/4
Height to Top of Case	E	68 3/8
Height to Top of Door Hinge	F	69 3/4
Width	G	32 3/4
Width (door open 90 deg. w/o handle)	H	41 1/4
Width (door open 90 deg. w/ handle)	I	36 1/4

2. PARTS IDENTIFICATION



- **A** Refrigerator Temperature Control
- **B** Refrigerator Light
- **C** Shelves
- **D** Optibin Crisper
  Keeps fruits and vegetable fresh and crisp
- **E** Pantry *
- **F** Ice Maker *
- **G** Ice Bin*
- **H** Durabase
- **I** Durabase divider
- **J** Pull Out Drawer
- **K** Freezer Light
- **L** Air Filter
  The Air Filter helps remove odors from the refrigerator.
- **M** Cheese & Butter Bin
  It makes spreading butter and slicing cheese easier.
- **N** Door-In-Door Case
- **O** Condiment Bin

3. DISASSEMBLY

3-1 DOOR

Refrigerator door

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

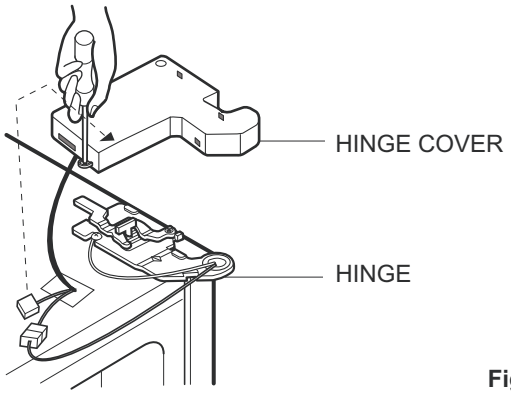


Figure 1

Door gasket removal

1. Remove door frame cover

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

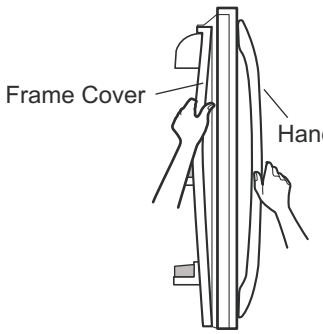


Figure 2

2. Remove gasket bracket clips

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

1)Pull gasket back to expose gasket bracket clip and door frame.

2)Insert a flat tip screwdriver into seam between gasket bracket and door frame and pry back until clips snaps out.

3)Continue prying back along seam until all clips snap out.

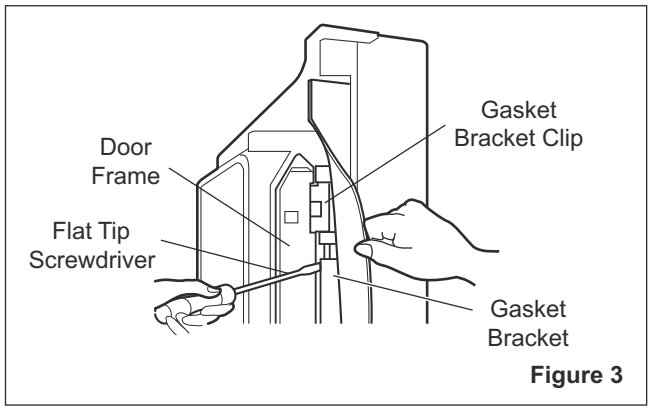


Figure 3

3. Remove gasket

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

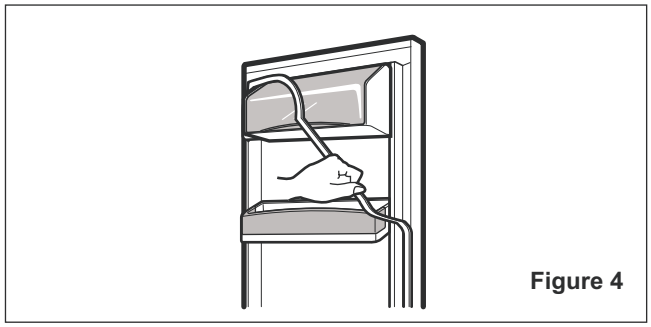


Figure 4

Door gasket replacement

1. Insert gasket bracket clips

1) Insert gasket bracket edge beneath door frame edge.

2) Turn upper gasket bracket spring so that both spring ends are in the door channel.

3) Push in clip until you hear it snap securely into place.

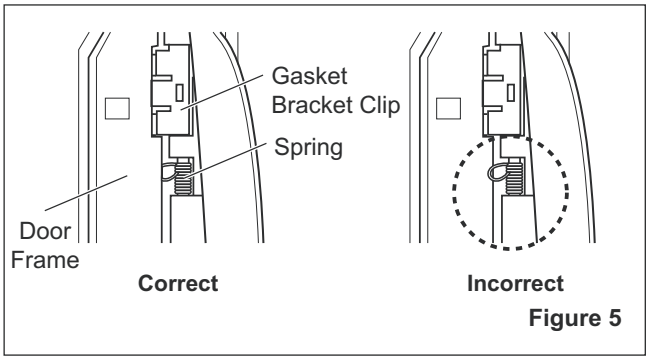


Figure 5

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

.

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

2. Insert gasket into channel

1) Snap gasket assembly into the door bracket.

Inserting the gasket assembly into the bracket door

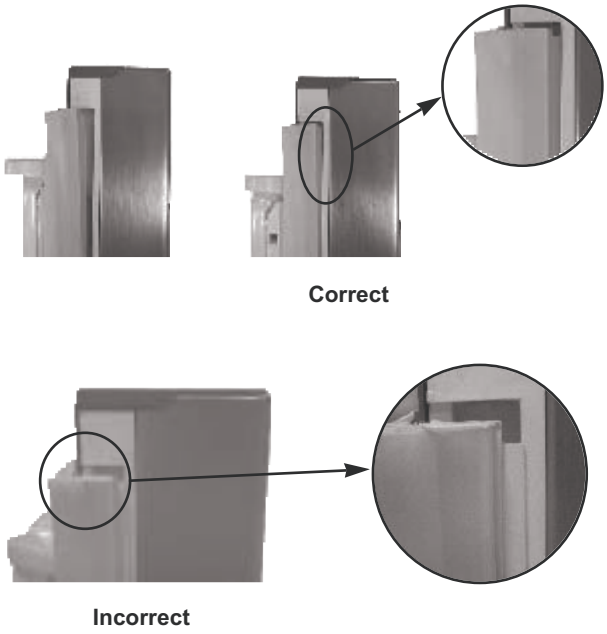


Figure 6

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

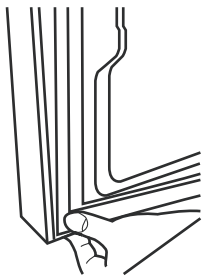


Figure 7

3. Replace door frame cover

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

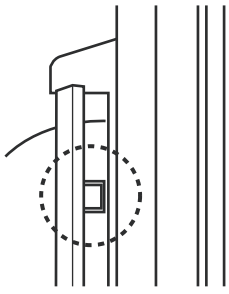


Figure 8

3-2 DOOR ALIGNMENT

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

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

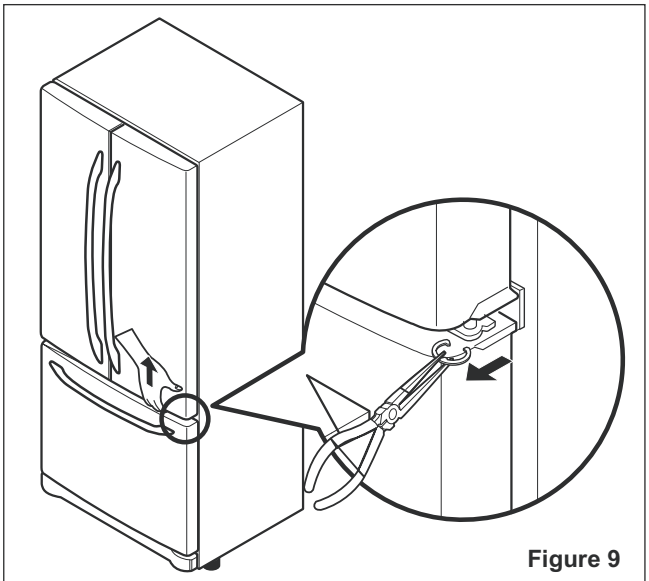


Figure 9

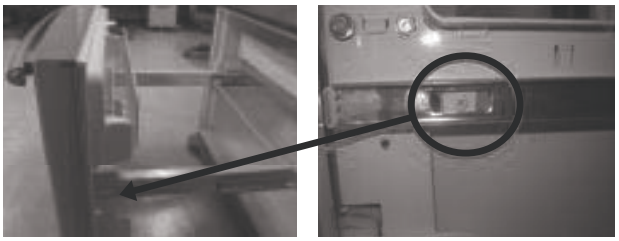
3-3 HOW TO REMOVE AND REINSTALL THE PULLOUT DRAWER

3-3-1 FOLLOW STEPS TO REMOVE

Step 1) Open the freezer door.

Step 2) Remove the lower basket.

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



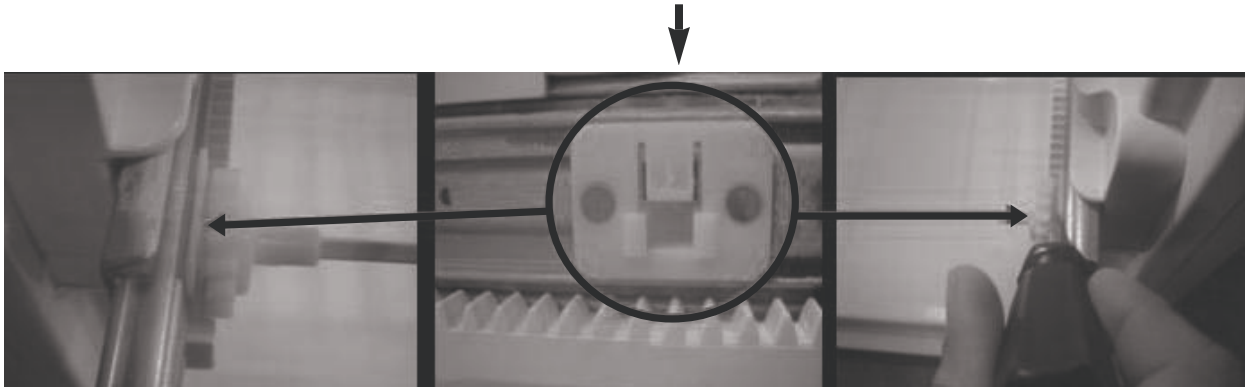
Step 4) Lift the freezer door up to unhook it from the rail support and remove.
Pull both rails to full extension.

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

Second : Remove the center rail.

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

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



3-3-2 FOLLOW STEPS TO REINSTALL

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



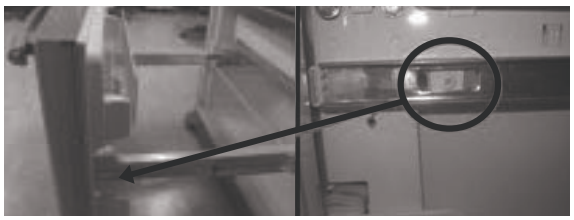
Step 2) Insert the rail into the right side gear. Gears do **not** need to be perpendicular to each other.

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

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


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

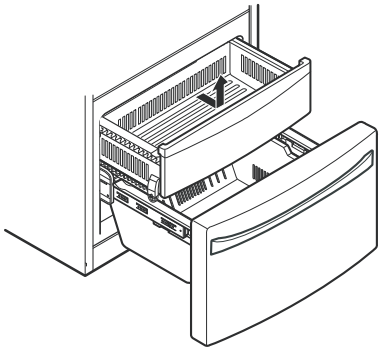
Step 6) Reinstall the two screws into the guide rails (one from each side).



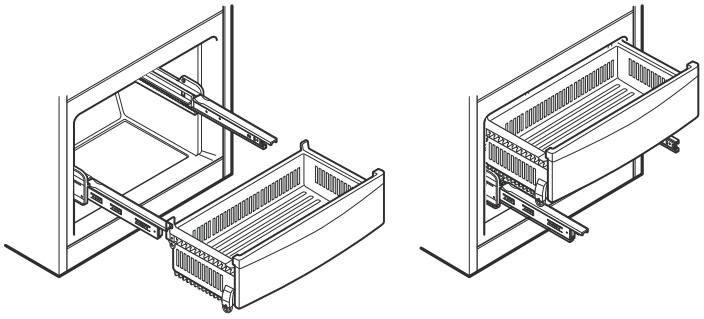
Step 7) Reinstall the lower basket, and close the freezer door.

3-3-3 PULL OUT DRAWER

To remove, pull the drawer out to full extension. Lift the font of the drawer up, then pull it straight out.



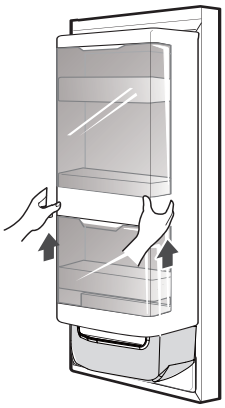
To replace, slightly tilt up the drawer front, insert the drawer into the frame, and push the drawer back into place.



3-4 HOW TO REMOVE AND REINSTALL THE HOMEBAR

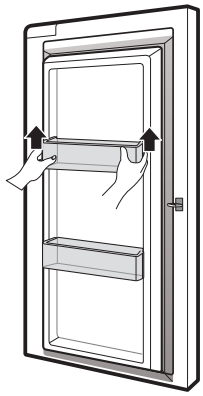
3-4-1 CASE ASSEMBLY, HOME BAR

The Home Bar is removable for easy cleaning and adjustment.
1.To open the Home Bar Door, push the Handle Button.
2.To remove the Case Home Bar, lift up and pull out.
3.To replace the Home Bar, slopingly slides it in above the desired support and push down until it snaps into place.



3-4-2 DOOR BASKET OF HOME BAR DOOR

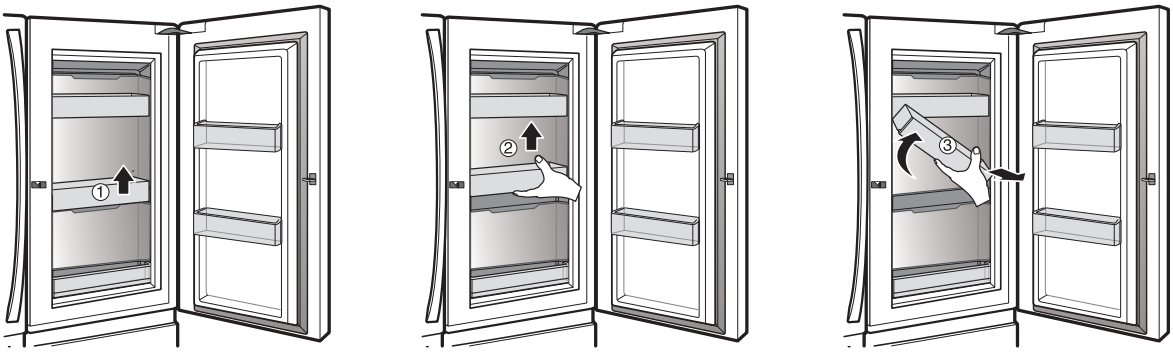
The Door Baskets are removable for easy cleaning and adjustment.
1. To remove the Door Baskets, simply lifts the Door Baskets up and pulls straight out.
2. To replace the Door Baskets, slides it in above the desired support and push down until it snaps into place.
NOTE : Some Door Baskets may vary in appearance and will only fit in one location.



3-4-3 DOOR BASKET OF HOME BAR

The Door Baskets of Homebar are removable for easy cleaning and adjustment.
1. To remove the Door Baskets of Homebar, simply lifts the Door Baskets of Homebar up and pulls straight out.
2. To replace the Door Baskets of Homebar, slides it in above the desired support and push down until it snaps into place.

NOTE: Some Door Baskets of Homebar may vary in appearance and will only fit in one location.

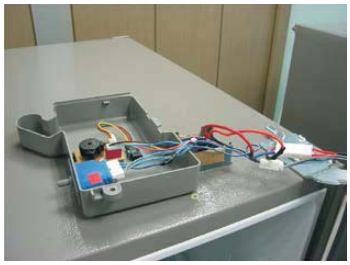


3-5 HOW TO REMOVE AND REINSTALL THE HOMEBAR DOOR

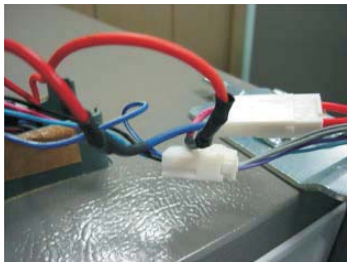
1. Remove three Screws on the Top of Frame Door.
2. Pull Frame Door. up and out.

3-6 HOW TO REMOVE AND REINSTALL THE DOOR FOAM ASSEMBLY, REFRIGERATOR

1. Remove the Screw of Right Hinge Cover.



2. Remove two Wire connectors.



3. Rotate the hinge lever clockwise.

4. Separate the Home Bar.

5. Pull THE DOOR FOAM ASSEMBLY, REFRIGERATOR up and out.

3-7 HOW TO REMOVE FRAME DOOR SWITCH OF DOOR FOAM

1.

2. Remove cap cover using a thin rod (or a flat-head screwdriver)

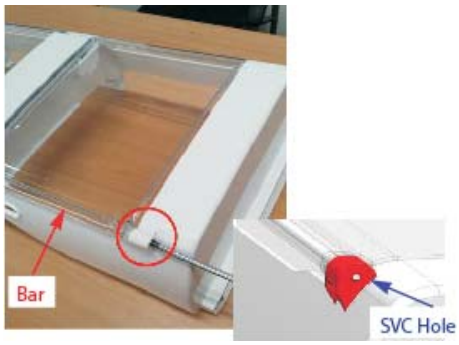
3. Change R-Switch after separating the connector

3-8 HOW TO REMOVE THE HOME BAR DOOR.

1. Remove the screw located on the top of hinge.

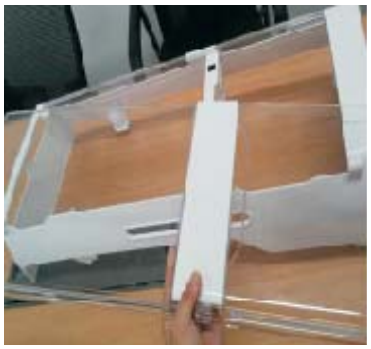
2. Remove the cap hinge(upper)

3. Remove the bar by pushing it up from the bottom through the SVC hole (bottom hinge).



4. Pull out the bar thought the top hinge.

5. Separate the Cover.



4. ADJUSTMENT

4-1 COMPRESSOR

4-1-1 Role

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

4-1-2 Note for Usage

(1) Be careful not to allow over-voltage and over-current.
(2) Do not drop or handle carelessly.
(3) Keep away from any liquid.
If liquid such as oil or water enters the Cover PTC Compressor may fail due to breakdown of their insulating capabilities.
(4) Always use the Parts designed for the compressor and make sure it is properly attached to the compressor. Parts may appear physically identical but could have different electrical ratings. Replace parts by part number and model number. Use only approved substitute parts.

4-1-3 Remove the cover PTC

(1) Remove the Cover Back M/C

(2) Loosen two screws on comp base

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

4-2-3 Compressor protection logic

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

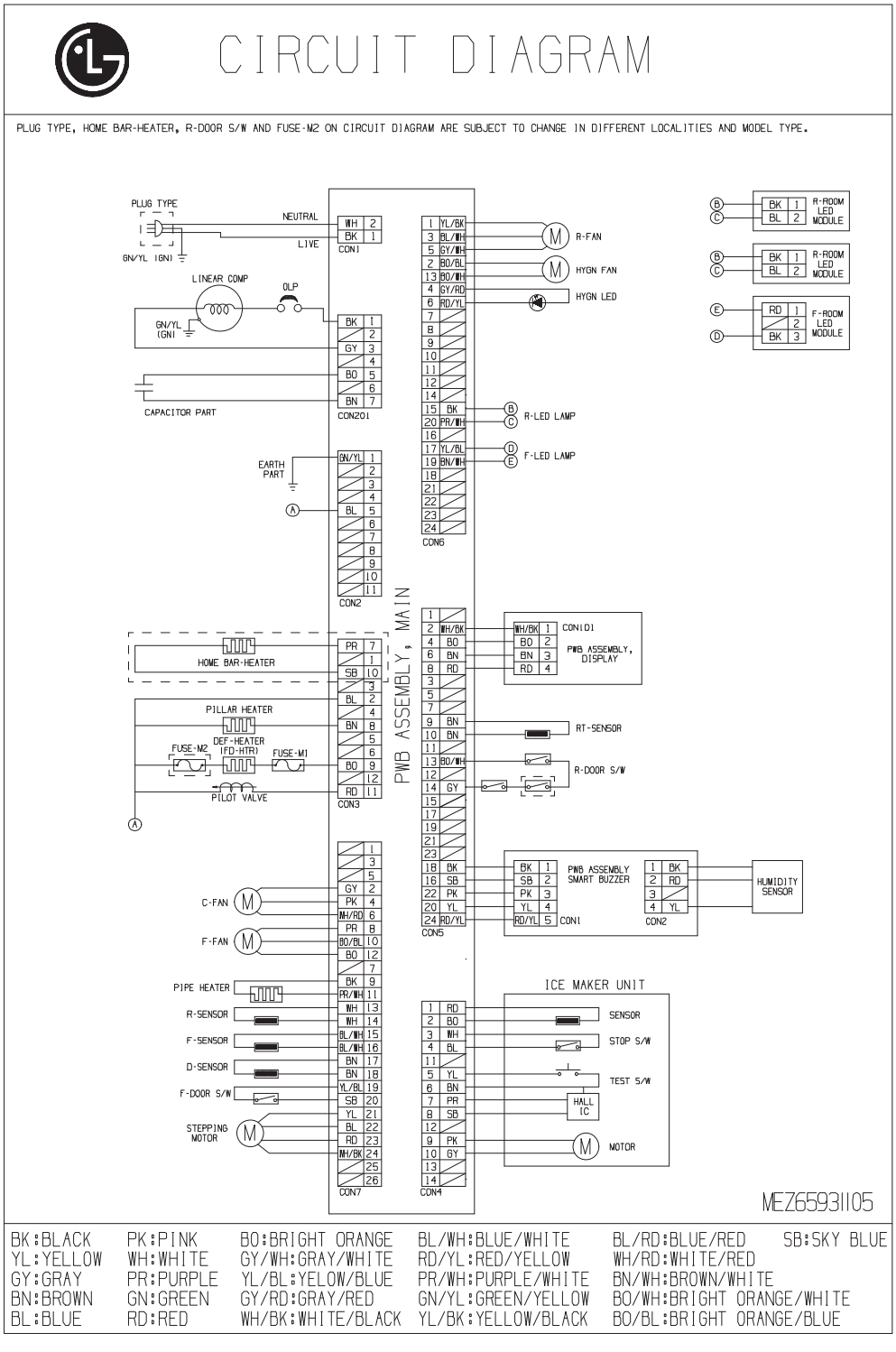
- Stroke Trip
  During the operation, if stroke is above the target value, decrease the target volt by 3V.

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

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

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

5. CIRCUIT DIAGRAM



6. TROUBLESHOOTING

6-1 Error Code Summary

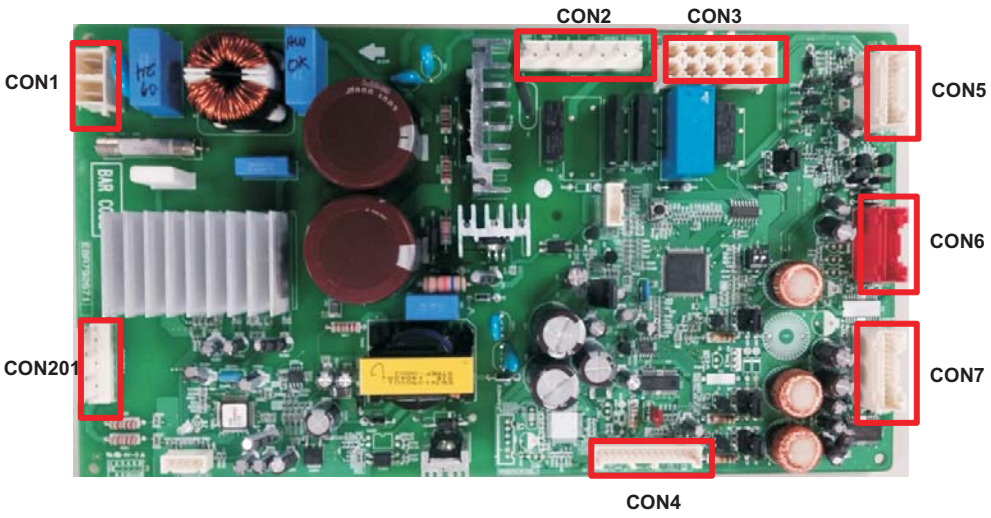
WARNING: When you check the resistance values, be sure to turn off the power. And wait for the voltage-discharge sufficiently.

NOTE) - When 3 hours passed after error happened, all main errors are displayed on display panel except sub error.
- Sub error not displayed before press the Ultra Ice button and Freezer button simultaneously.
- Sub errors as follow: “Er rt”, “Er IS”, “Er It”, “Er HS”.

NO	Error Detection Category	Error Display		Error Generation Factors	Remark
		Freezer Temperature	Ref. Temperature		
1	Normality			None	Normal operation of Display
2	Freezer Sensor Error	Er	FS	Short or Disconnection of Freezer Sensor	Check each sensor and its connector.
3	Refrigerator Sensor Error	Er	rS	Short or Disconnection of Refrigerator Sensor	
4	Defrosting Sensor Error	Er	dS	Short or Disconnection of Defrosting Sensor	
5	Icing Sensor Error	Er	IS	Short or Disconnection of Icing Sensor	
6	Poor Defrosting	Er	dH	Even though it is passed 1 hour since then Defrosting, if Defrosting sensor is not over 8°C, it is caused	Temperature Fuse Disconnection, Heater disconnection, DRAIN Jam, Poor Relay for Heater
7	Abnormality of BLDC FAN Motor for Freezer	Er	FF	It is caused when feedback signal isn’t over 65 seconds during BLDC FAN motor operating	Poor BLDC Motor connection, DRIVE IC, and TR
8	Abnormality of BLDC FAN Motor for Mechanic Room	Er	CF	It is caused when feedback signal isn’t over 65 seconds during BLDC FAN motor operating	Poor BLDC Motor connection, DRIVE IC, and TR
9	Communication Error	Er	CO	Communication Error between Micom of Main PWB and Display Micom	Poor Communication connection,Poor TR of Transmitter and Receiver
10	Humidity Sensor	Er	HS	Short or Disconnection of Humidity Sensor	Poor connection of housing, missing humidity sensor, sensor defect itself, short or disconnection of harnesses.
11	Room Temp Sensor Error	Er	rt	Short or Disconnection of Room temp.senspr	Check each sensor and its connector.
12	Icemaker kit defect	Er	It	Other electric system error such as motor, 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 (same as model applied Twisting Icemaker before).
13	Abonrmality of BLDC Fan Motor for refrigerator	Er	rF	It’s caused when feedback signal isn’t over 65 seconds during BLDC Fan motor operating.	Poor BLDC, Motor connection, DRIVE IC, and TR.

7. PCB Picture

7-1 Main PCB

P/No & MFG	Picture
EBR792617 (2011.07~)	

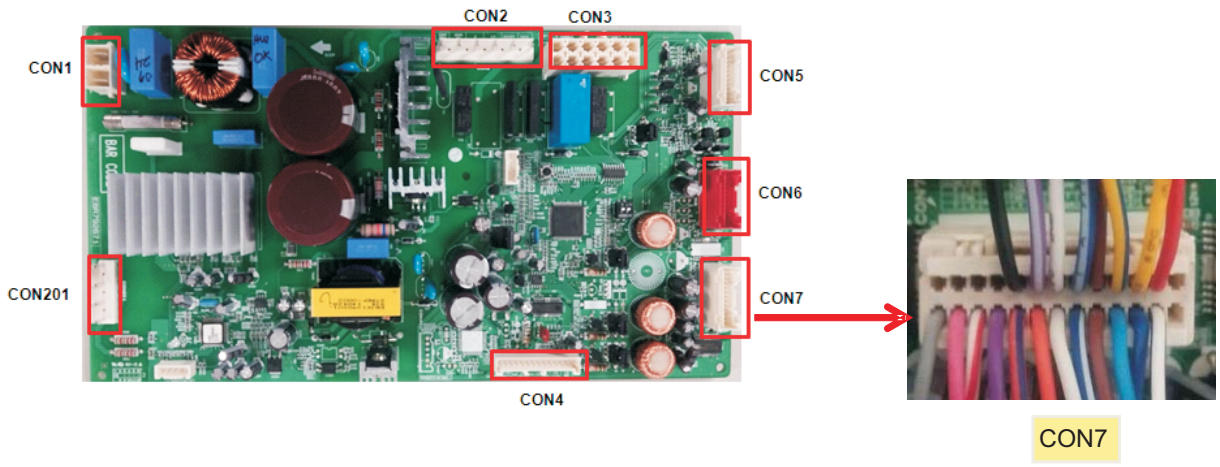
7-2 Display PCB

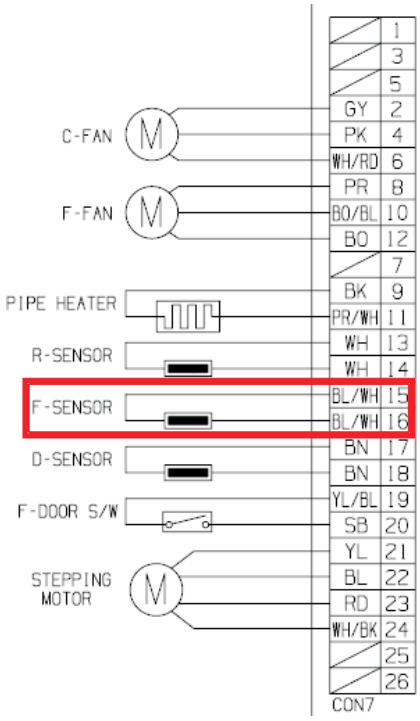
P/No & MFG	Picture
EBR766839 (2011.07~)	

8. Troubleshooting With Error Display

8-1. Freezer Sensor Error (Er FS)

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





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

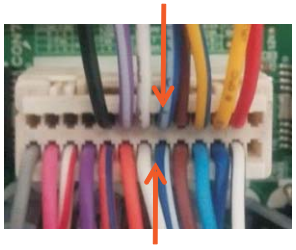
CON7 15th pin ~ 16th pin	Resistance [Ω]
-22°F / -30°C	40k
-13°F / -25°C	30k
-4°F / -20°C	23k
5°F / -15°C	17k
14°F / -10°C	13k
23°F / -5°C	10k
32°F / 0°C	8k

Freezer Sensor Error (Er FS)

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 0Ω (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**

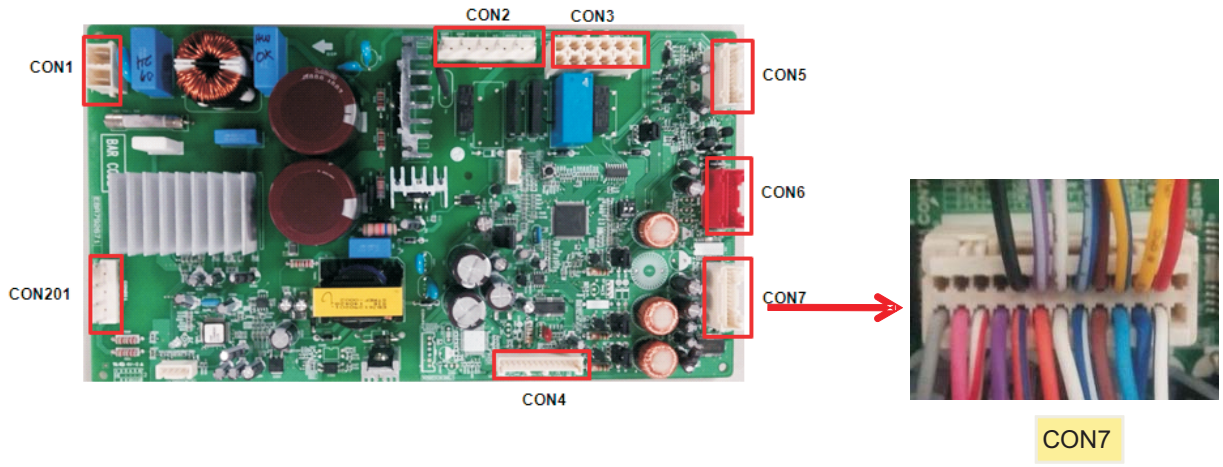
Yes

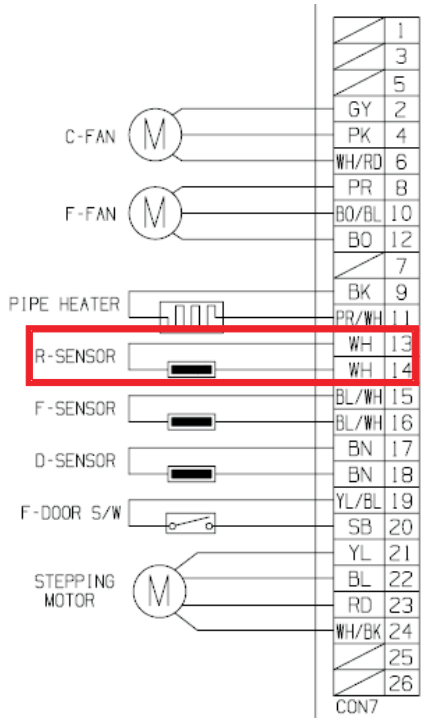
6

Explain to customer

8-2. Refrigerator Sensor Error (Er rS)

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





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

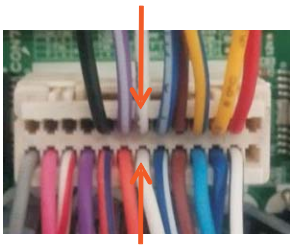
CON7 13rd pin ~ 14th pin	Resistance [Ω]
23°F / -5°C	38k
32°F / 0°C	30k
41°F / 5°C	24k
50°F / 10°C	19.5k
59°F / 15°C	16k

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

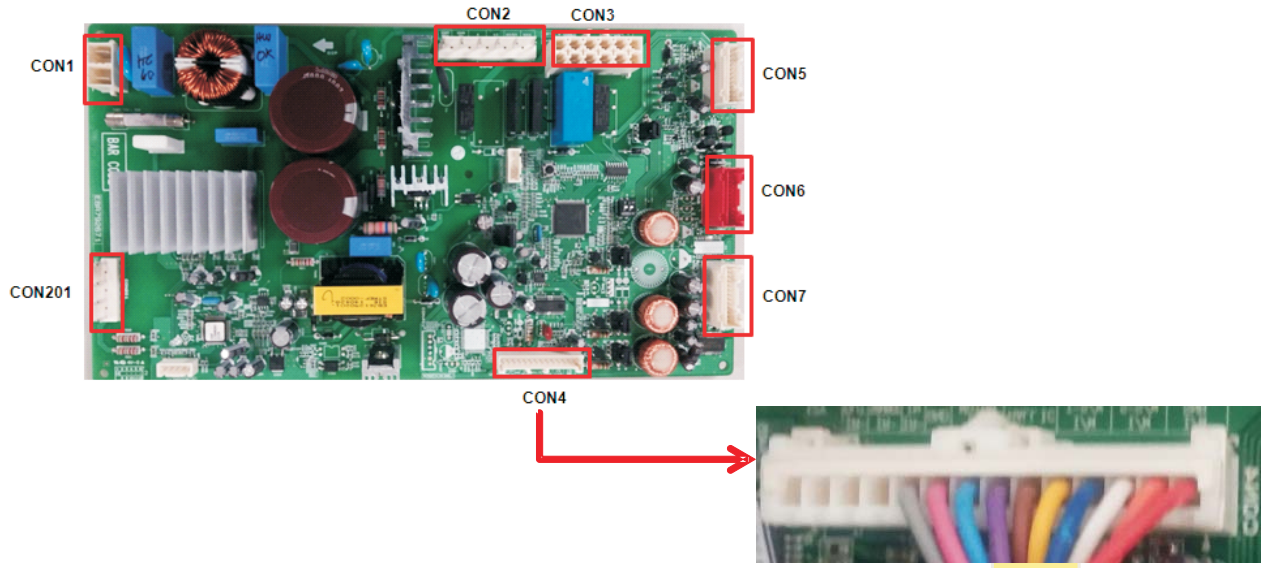
Yes

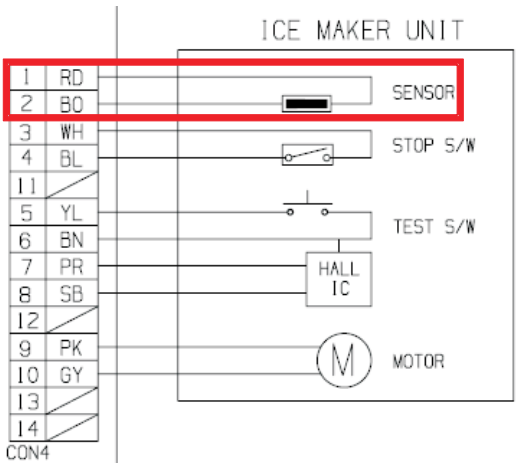
6

Explain to customer

8-3. Icing Sensor Error (Er IS)

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





	Resistance [Ω]	
CON4 1st pin ~ 2nd pin	**Short**	**0**
	Open	**OFF**
	Other	**Normal**

CON4 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**

Icing Sensor Error (Er IS)

1

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

Yes → Reconnect or repair the connector

CON4

No

2

Check the Sensor resistance.
Is resistance 0Ω (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?

CON4 1st pin ~ 2nd pin	**Resistance [Ω]**
-22ºF / -30ºC	**40k**
-13ºF / -25ºC	**30k**
-4ºF / -20ºC	**23k**
-13ºF / -25ºC	**17k**
14ºF / -10ºC	**13k**
23ºF / -5ºC	**10k**
32ºF / 0ºC	**8k**

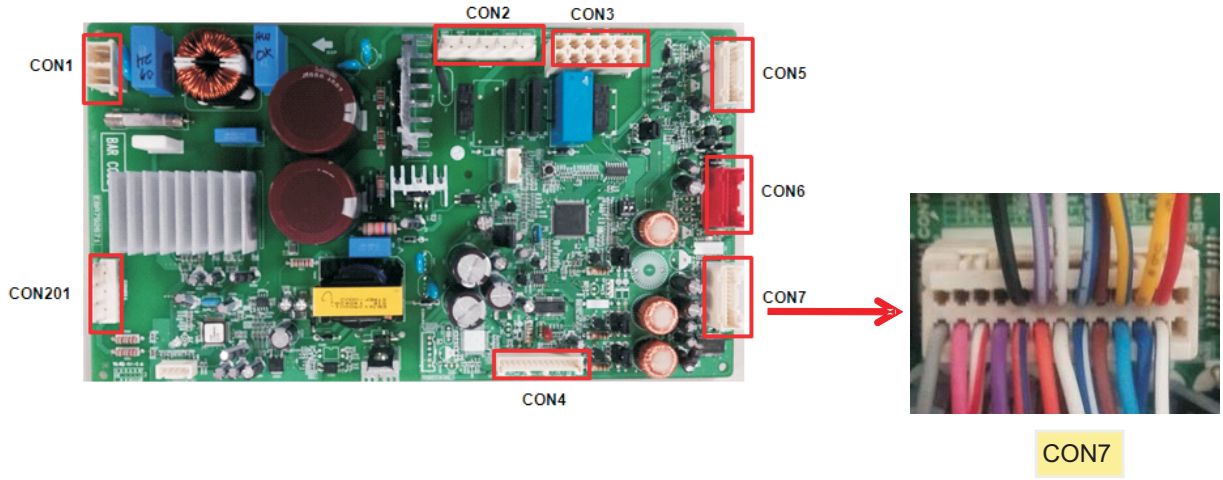
Yes

6

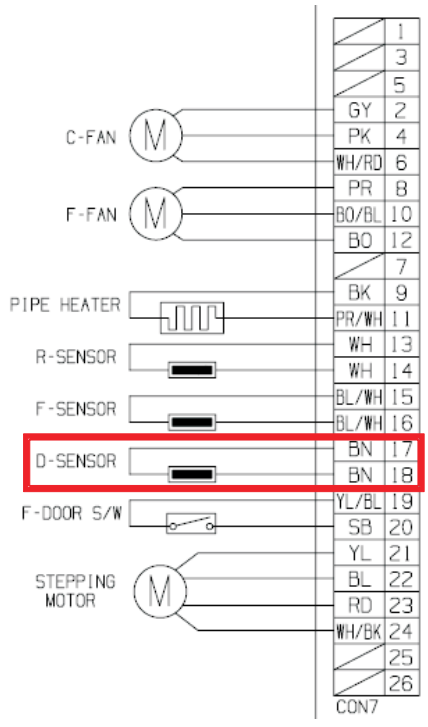
Explain to customer

8-4. Defrost Sensor Error (Er dS)

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



CON7



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

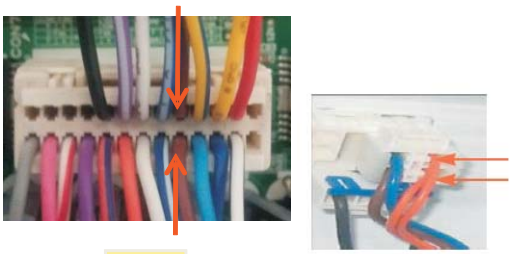
CON7 17th pin ~ 18th pin	Resistance [Ω]
23°F / -5°C	**38k**
32°F / 0°C	**30k**
41°F / 5°C	**24k**
50°F / 10°C	**19.5k**
59°F / 15°C	**16k**

Defrost Sensor Error (Er dS)

1

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

Yes → Reconnect or repair the connector



CON7

No

2

Check the Sensor resistance.
Is resistance 0Ω (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**

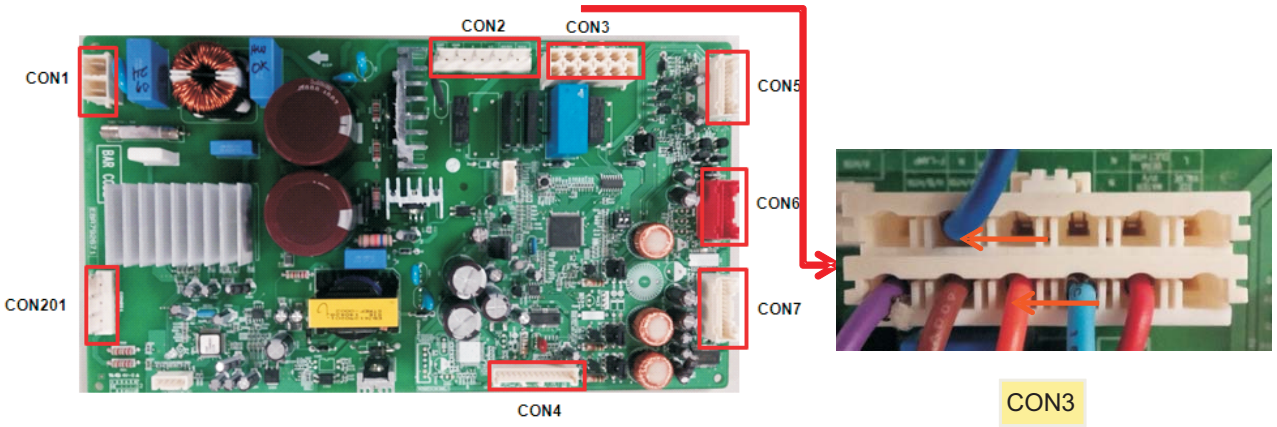
Yes

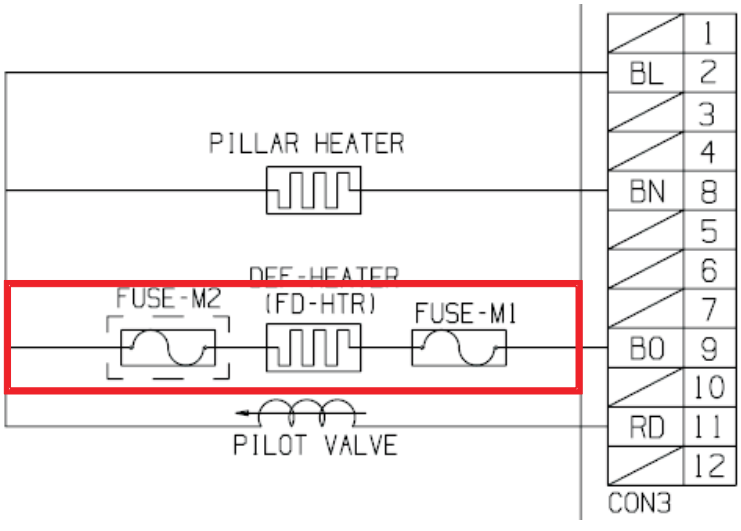
6

Explain to customer

8-5. Defrost Heater Error (Er dH)

Symptom	Check Point
1. Er 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 (Er dH)

1

Check the Door gasket .
Is door gasket damaged?

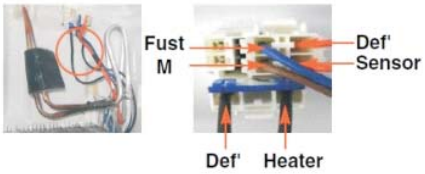
Yes → Replace the Door gasket

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

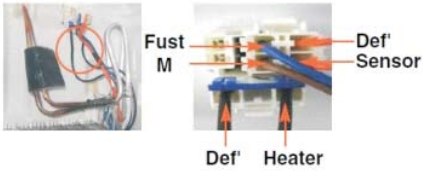


Yes

3

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

OFF → Replace product

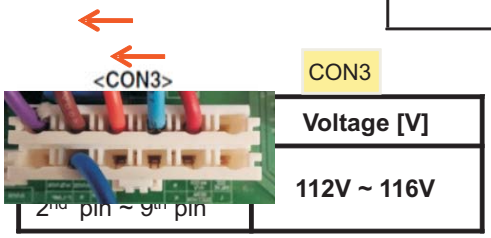


22kΩ ↑

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

Check the Heater Voltage.
Is voltage 112~116V?

NO → Replace Main PCB

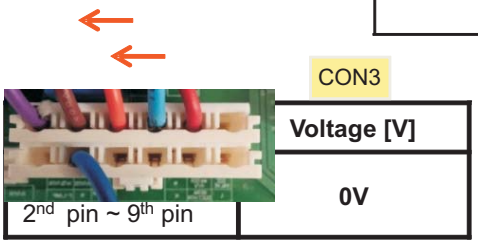


Yes

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

Check the Heater Voltage.
Is voltage 0V?

No → Replace Main PCB



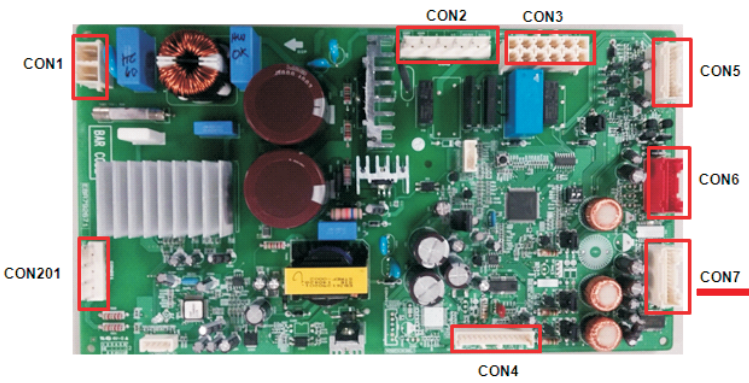
Yes

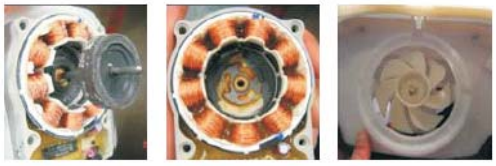
6

Explain to customer

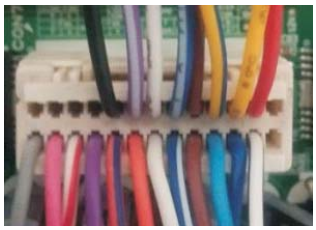
8-6. Freezer Fan Error (Er FF)

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

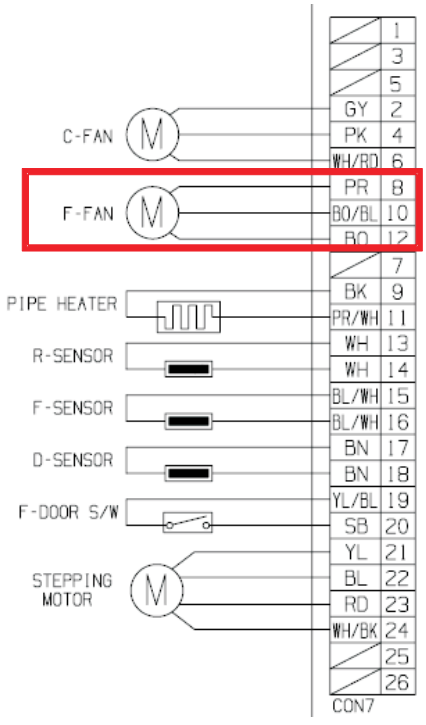




Fan Motor



CON7



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

Freezer Fan Error (Er 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?

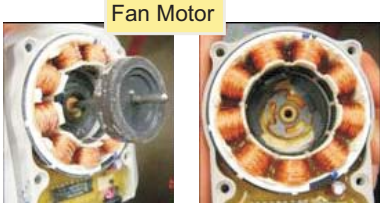
No → Go to 3

Yes → Go to 4

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

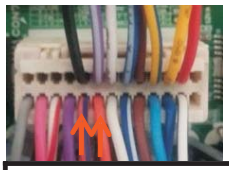
Yes → Change the Fan motor

Fan Motor



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

No → Replace Main PCB



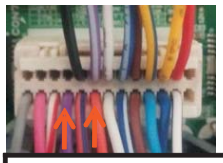
CON7

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

Yes

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

Yes → Change the motor



CON7

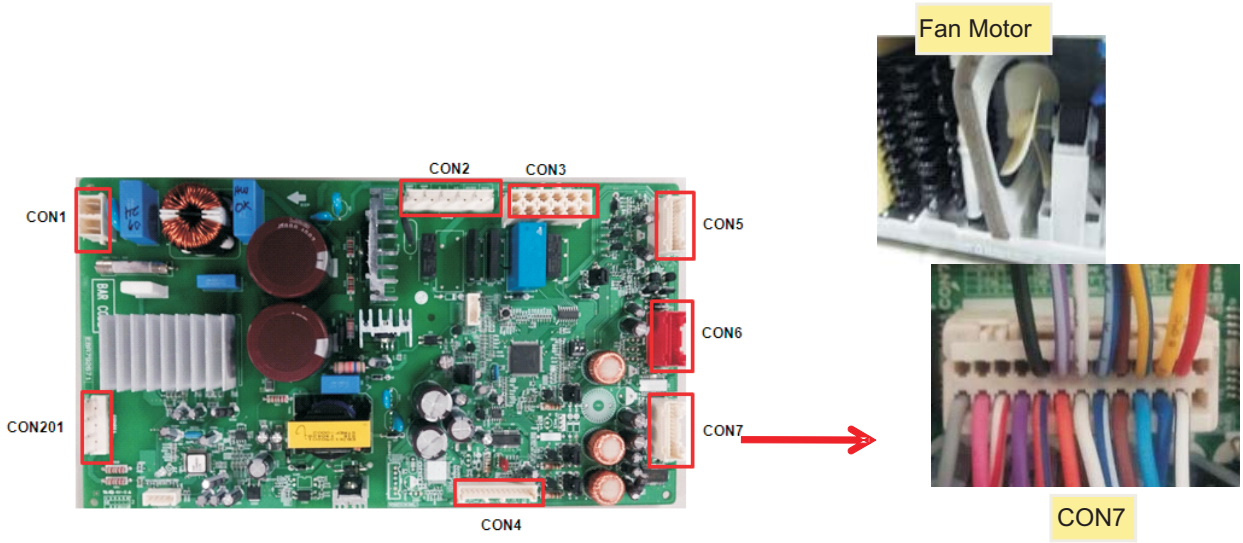
TEST MODE 1	**Voltage [V]**
CON7 8th pin ~ 12nd pin	**Not 0V, 5V**

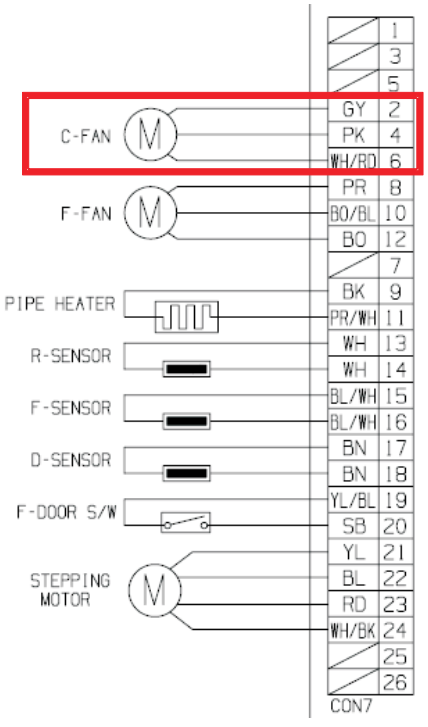
No

6 Explain to customer

8-7. Condenser Fan Error (Er CF)

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





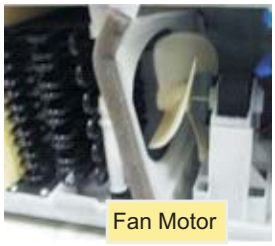
TEST MODE 1	**Voltage [V]**
CON7 4th pin ~ 6th pin	**8~12V**
CON7 2nd pin ~ 6th pin	**Not 0V, 5V**

Condenser Fan Error (Er CF)

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

2 Check the fan rotating. Does fan rotate?

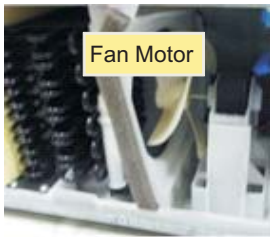
No → Go to 3



Yes → Go to 4

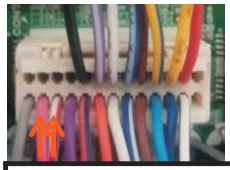
3 Check the Fan motor. Rotate fan using hand. It feel sticky?

Yes → Change the Fan motor



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

No → Replace Main PCB

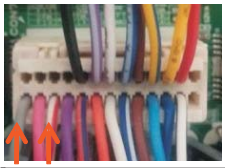


TEST MODE 1	**Voltage [V]**
CON7 4th pin ~ 6th pin	**8~12V**

Yes →

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

Yes → Change the motor



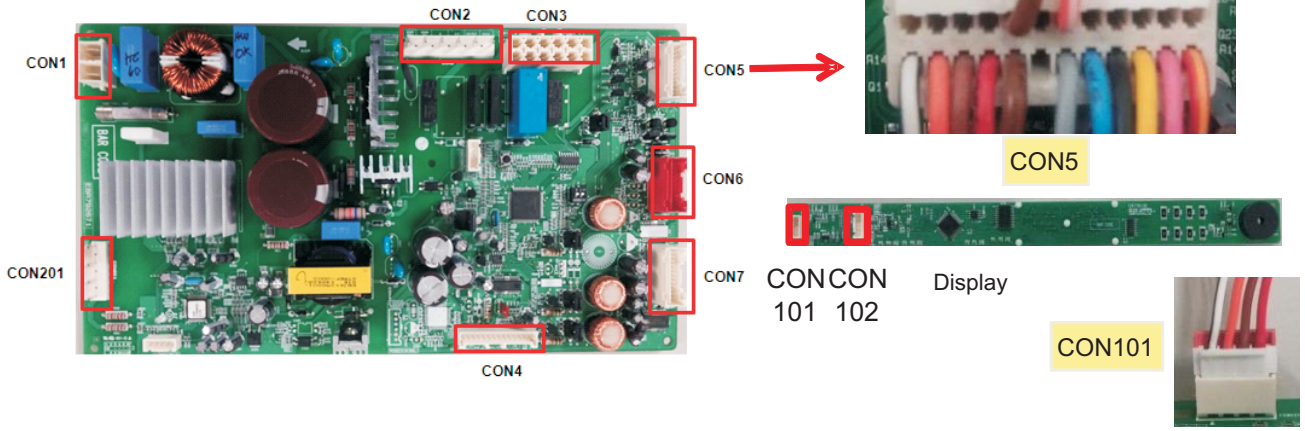
TEST MODE 1	**Voltage [V]**
CON7 2nd pin ~ 6th pin	**Not 0V, 5V**

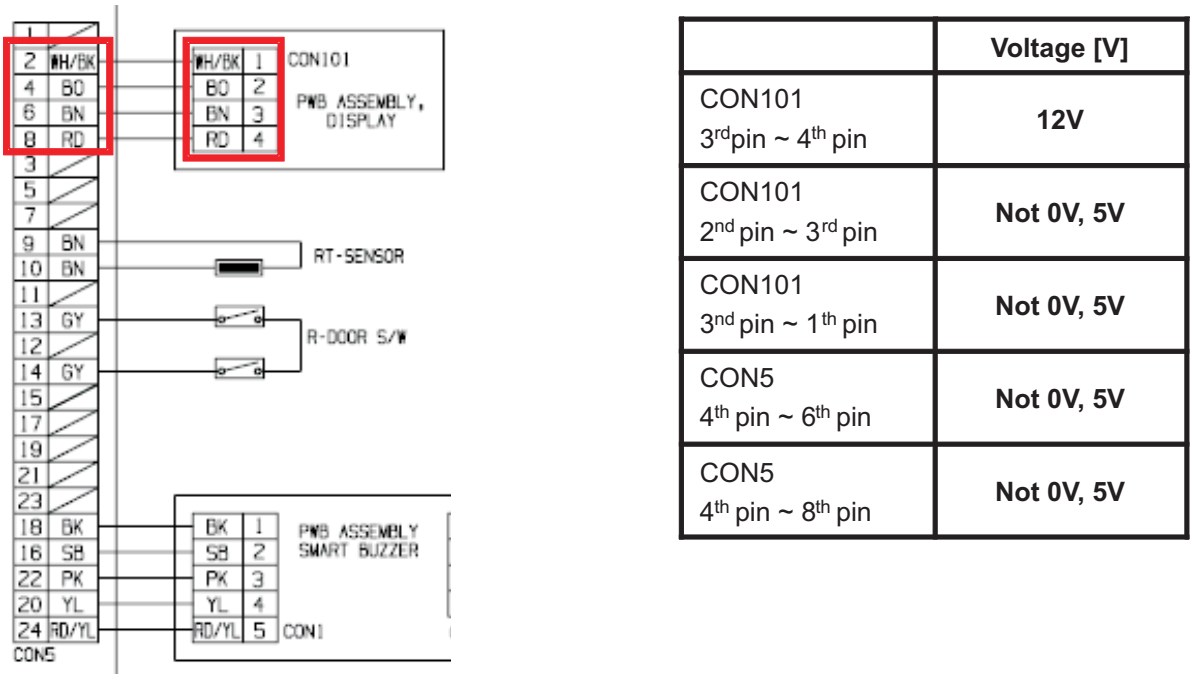
No →

6 Explain to customer

8-8. Communication Error (Er CO)

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





	Voltage [V]
CON101 3rd pin ~ 4th pin	**12V**
CON101 2nd pin ~ 3rd pin	**Not 0V, 5V**
CON101 3nd pin ~ 1th 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 3rd pin ~ 4th pin voltage 12V?

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

Housing	**Voltage [V]**
CON101 3rd pin ~ 4th pin	**12V**

CON101

Yes

3

Check the voltage.
Is CON101 2nd pin ~ 3rd pin voltage 0V or 5V?

Yes → Change the Display PCB

Housing	**Voltage [V]**
CON101 2nd pin ~ 3rd pin	**Not 0V, 5V**

CON101

No

4

Check the voltage.
Is CON101 3rd pin ~ 1st pin voltage 0V or 5V?

Yes → Change the Main PCB

Housing	**Voltage [V]**
CON101 3rd pin ~ 1st 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

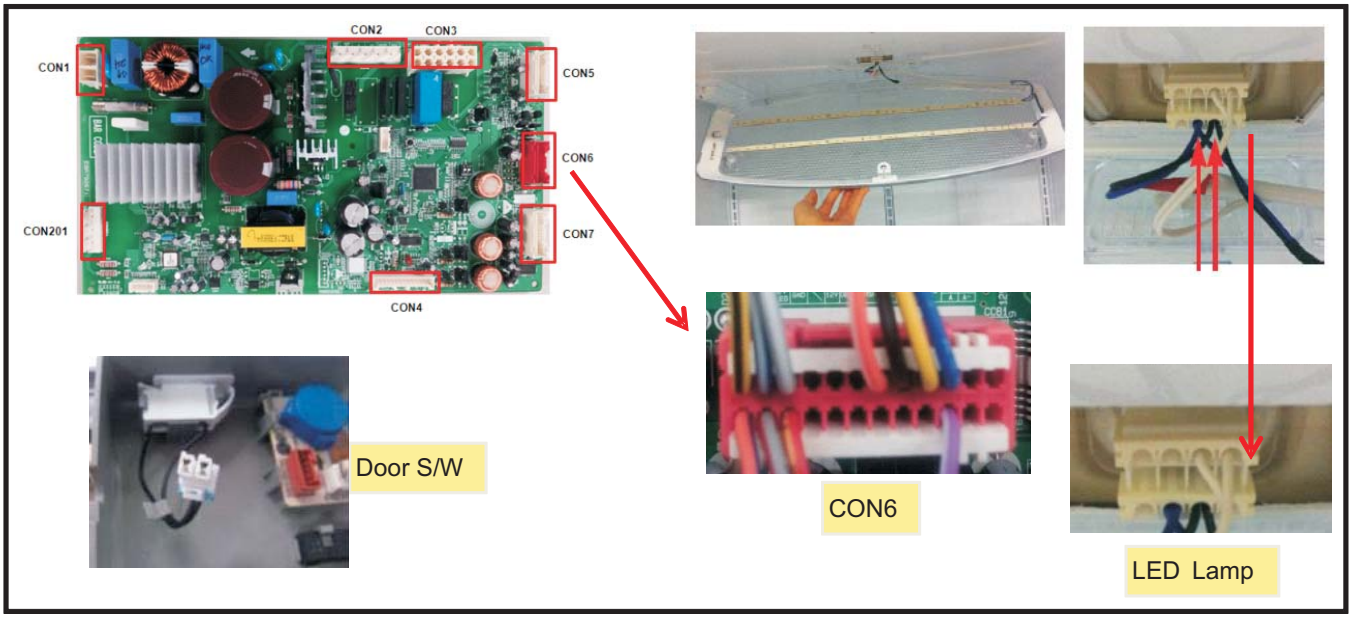
7

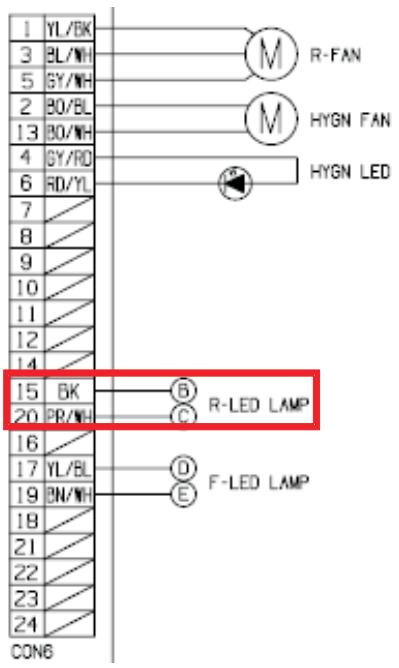
Explain to customer

9. Troubleshooting Without Error Display

9-1. 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

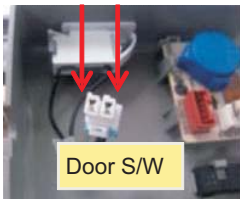
Check the Freezer door switch.
Does it feel sticky?

Yes → Change the Door S/W

No

2

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



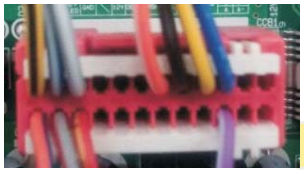
No → Change the Door S/W

	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?



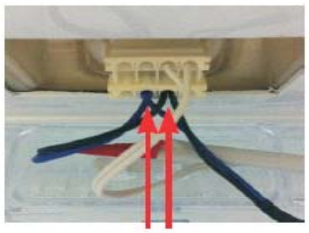
No → Change the PCB

	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

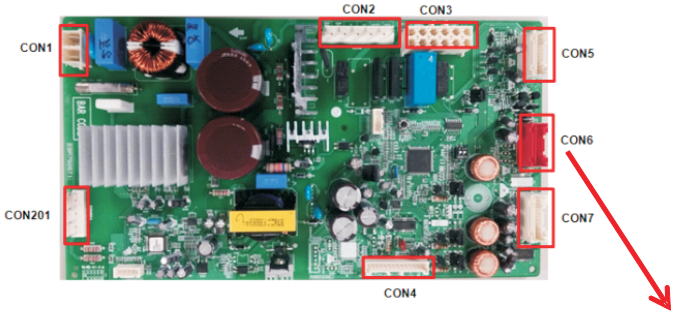
Yes

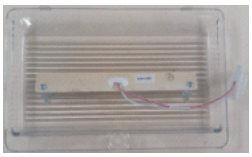
6

Explain to customer

9-2. Freezer room lamp doesn't work

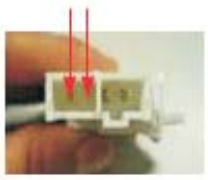
Symptom	Check Point
1. Freezer room lamp doesn't work	1. Check the Refrigerator door switch sticky 2. Check the door S/W resistance 3. Check the LED Lamp



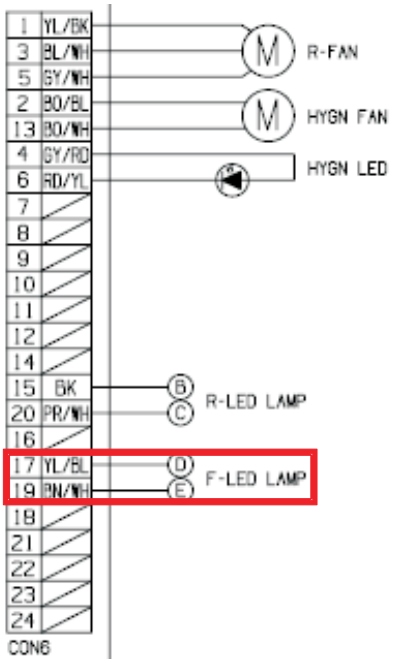


F room LED PCB

CON6



Door S/W



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

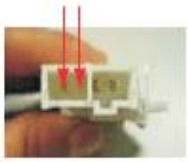
	Voltage [V]
CON6 19th pin ~ 17th pin	**12V**

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?

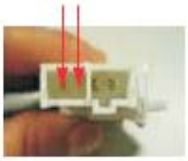


Yes → Change the Door S/W

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

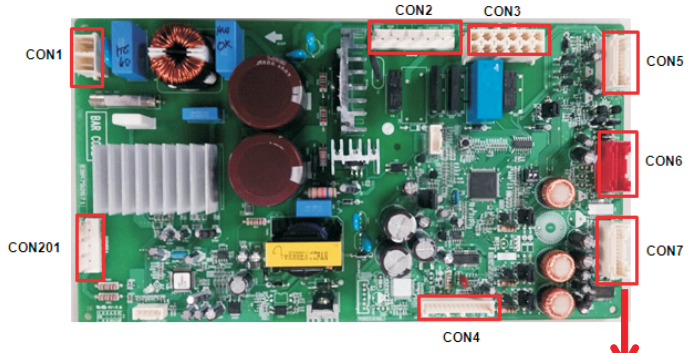
Yes

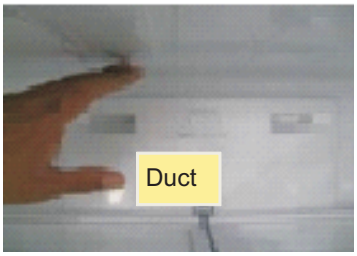
7

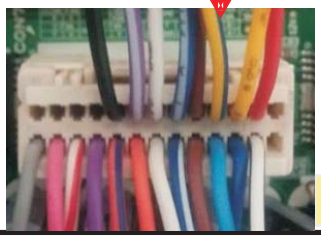
Explain to customer

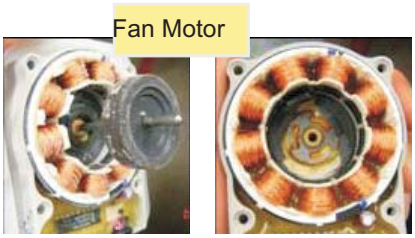
9-3. Poor cooling in Fresh food section

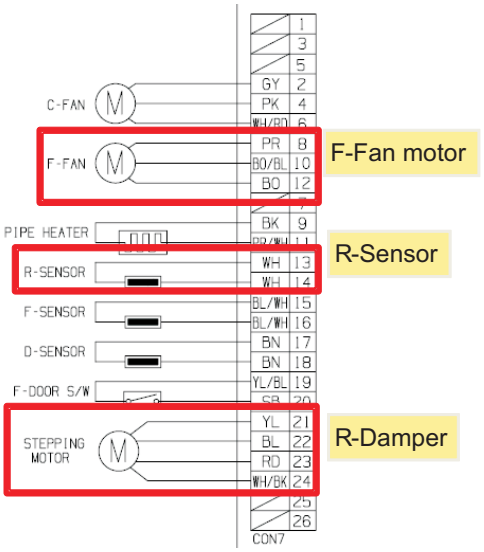
Symptom	Check Point
1. Poor cooling in Fresh food section	1. Check the sensor resistance 2. Check the air flow 3. Check the air Temperature 4. Check the R-Damper motor voltage











Duct	Status
Air Flow	**Windy**
Air Temperature	**Cold**

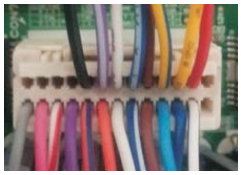
CON7 13rd pin ~ 14th pin	Resistance [Ω]
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

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

Poor cooling in Fresh food section

1

Check the sensor resistance.



CON7

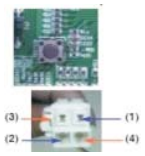
CON7 13rd pin ~ 14th pin	**Resistance [Ω]**
23ºF / -5ºC	**38k**
32ºF / 0ºC	**30k**
41ºF / 5ºC	**24k**
50ºF / 10ºC	**19.5k**
59ºF / 15ºC	**16k**

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?

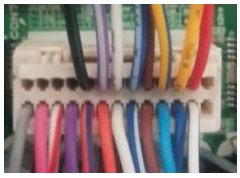
No → Check the Compressor and sealed system

Yes → Go to 7

5

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

No → Replace Main PCB



CON7

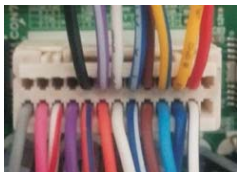
TEST MODE 1	**Voltage [V]**
CON7 10thpin ~ 12nd pin	**8~12V**

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 ~ 12nd pin	**Not 0V, 5V**

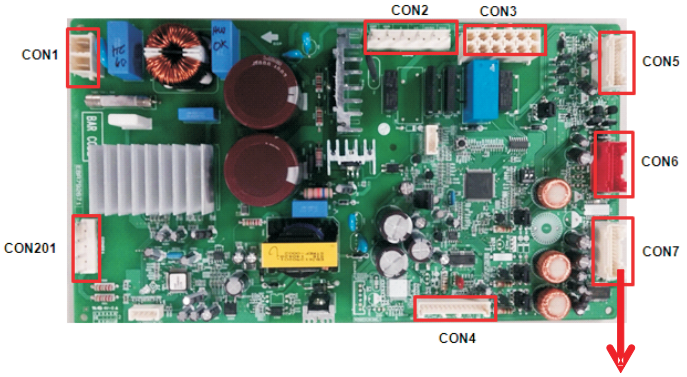
No

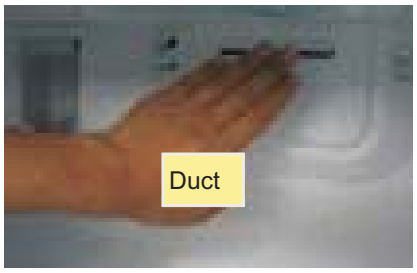
7

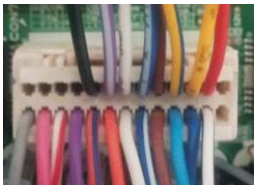
Explain to customer

9-4. Poor/Over cooling in Freezer compartment

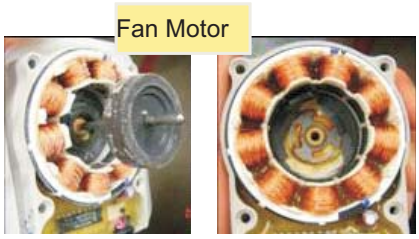
Symptom	Check Point
1. Poor/Over cooling in Freezer compartment	1. Check the sensor resistance 2. Check the air flow 3. Check the air Temperature 4.Check the Fan motor sticky 4. Check the Fan motor voltage

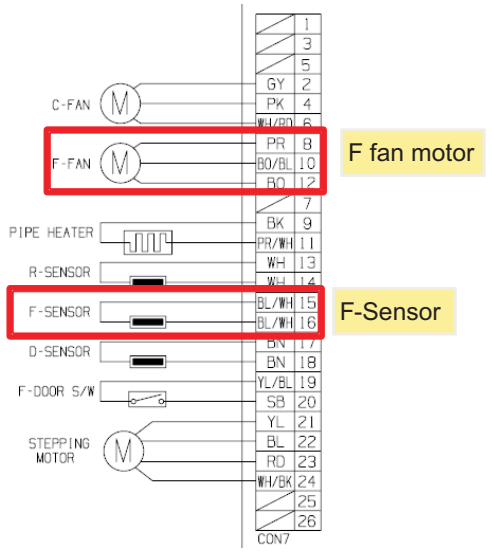






CON7





F fan motor

F-Sensor

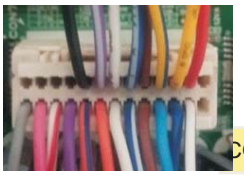
Duct	Status
Air Flow	**Windy**
Air Temperature	**Cold**

CON7 15th pin ~ 16th 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**

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

Poor/Over 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

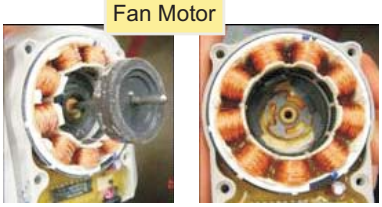
Yes

5

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

Yes → Change the Fan motor

Fan Motor

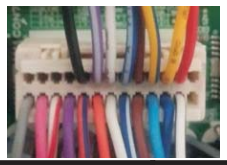


No

6

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

No → Replace Main PCB



CON7

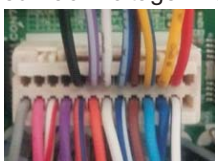
TEST MODE 1	**Voltage [V]**
CON7 10th pin ~ 12nd pin	**8~12V**

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 ~ 12nd pin	**Not 0V, 5V**

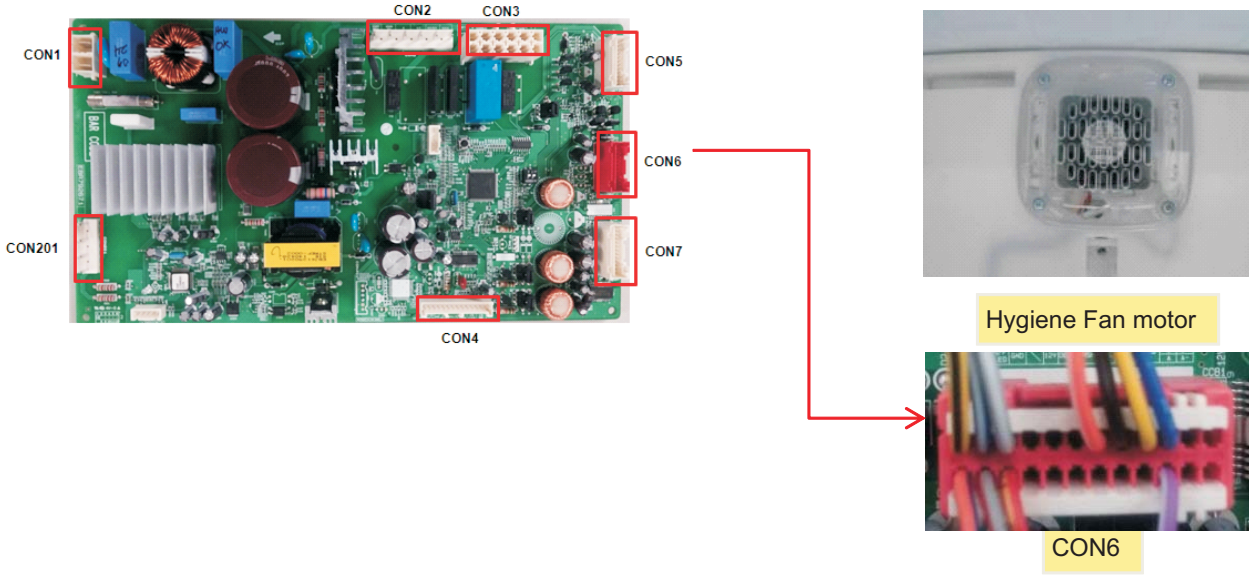
No

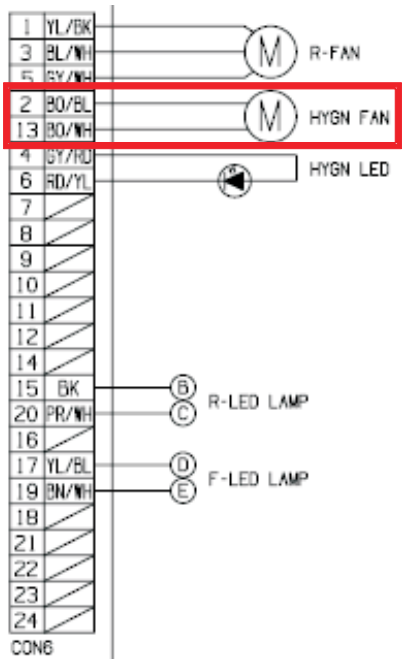
8

Explain to customer

9-5. Hygiene fan doesn't work

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





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

Hygiene fan doesn't work

1

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

No → Change the PCB

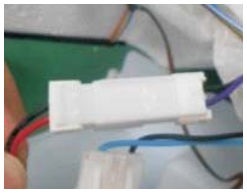
CON6

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

Yes

2

Is the connector loose?

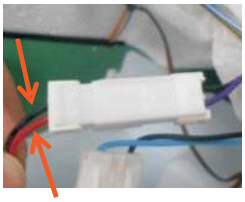


Yes → Connect the housing

No

3

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



No → Change the Fan motor

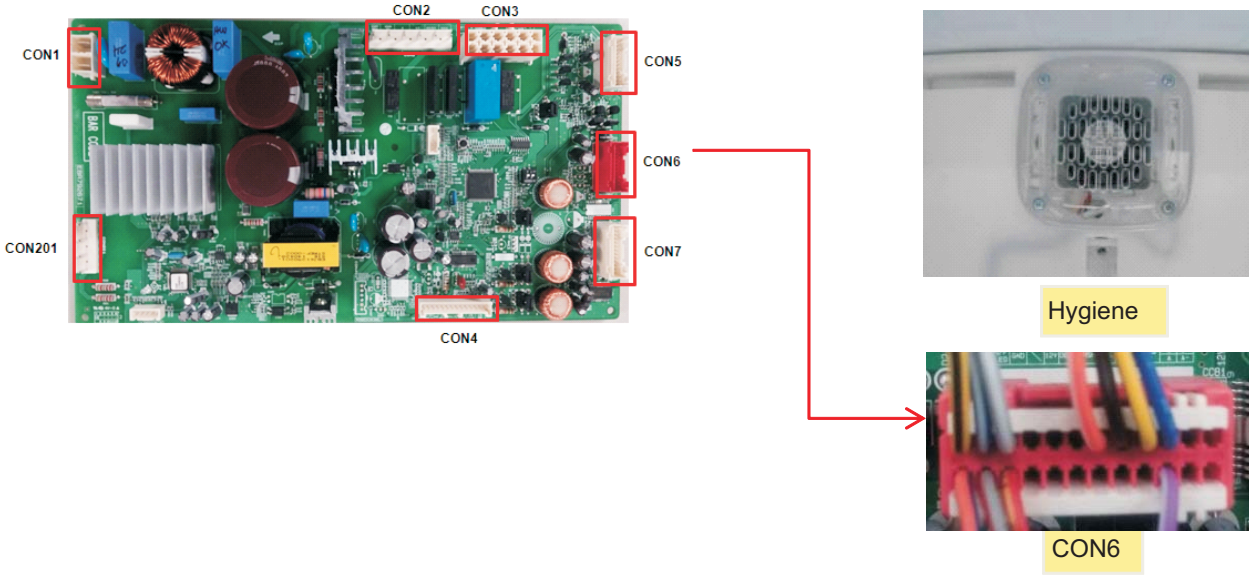
Yes

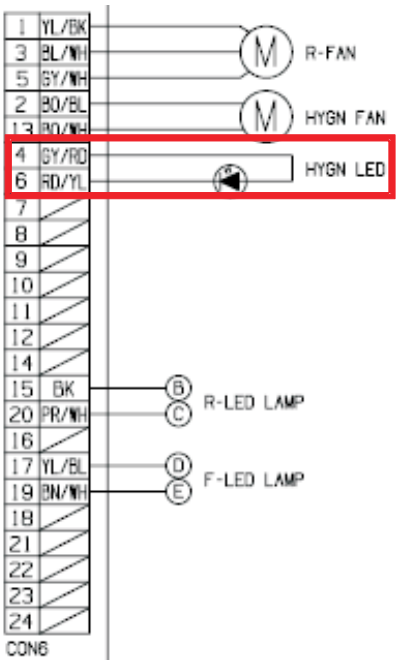
4

Explain to customer

9-6. Hygiene LED doesn't work

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





	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

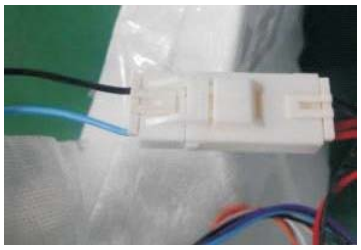
	Voltage [V]
CON6 4th pin ~ 6th pin	**12V**

Yes

2

Is the connector loose?

Yes → Connect the housing

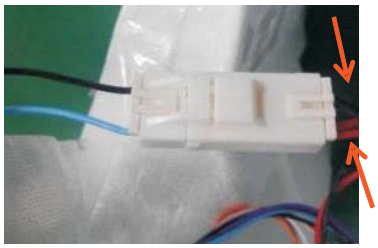


No

3

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

No → Change the Fan motor



Yes

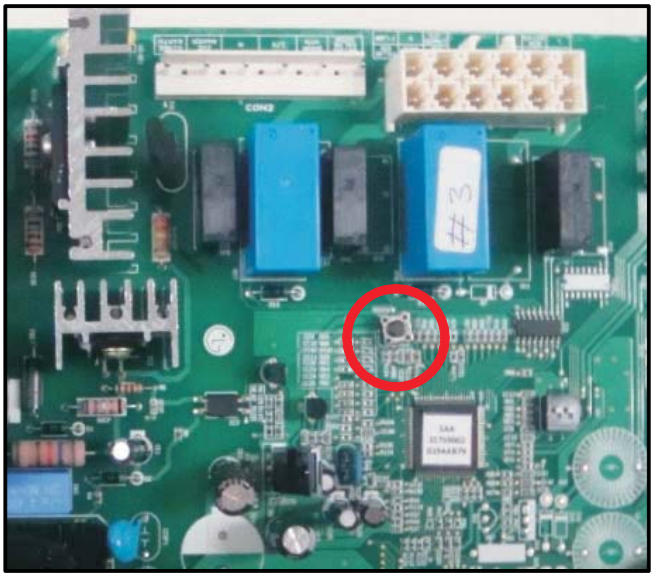
4

Explain to customer

10. Reference

10-1 TEST MODE and Removing TPA

1. How to make TEST MODE
   If you push the test button on the Main PCB, the refrigerator will be enter the TEST MODE.



Main PWB

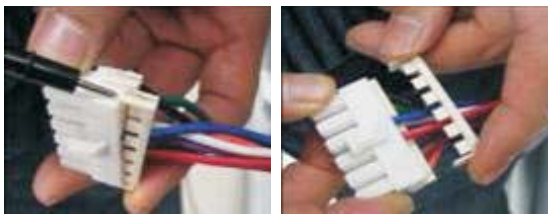
* 1 time : Comp / Damper / All FAN on
  (All things displayed)

* 2 times : Damper closed
  (22 22 displayed)

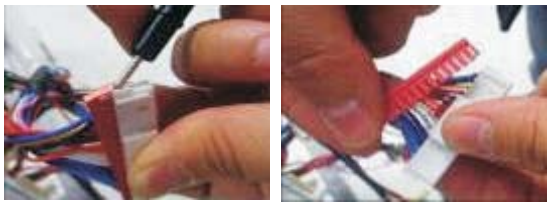
* 3 times : Forced defrost mode
  (33 33 displayed)

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

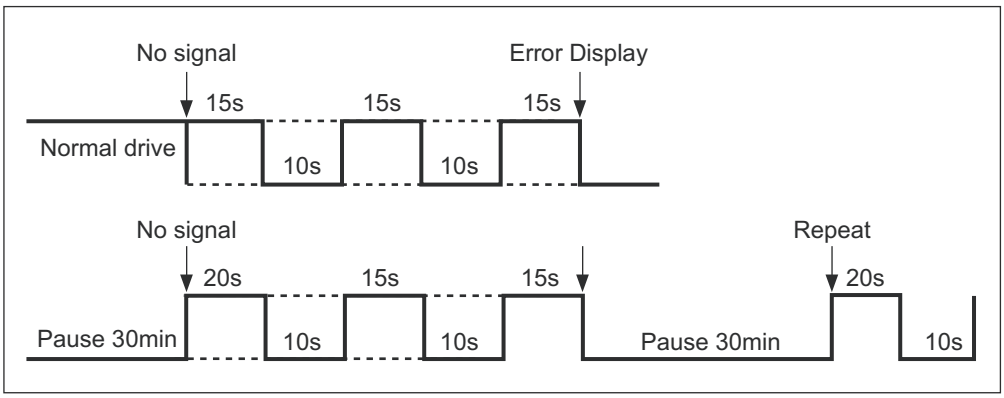
10-3 TEMPERATRUE CHART - REF AND DEF SENSOR

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

10-4 How to check the Fan-Error

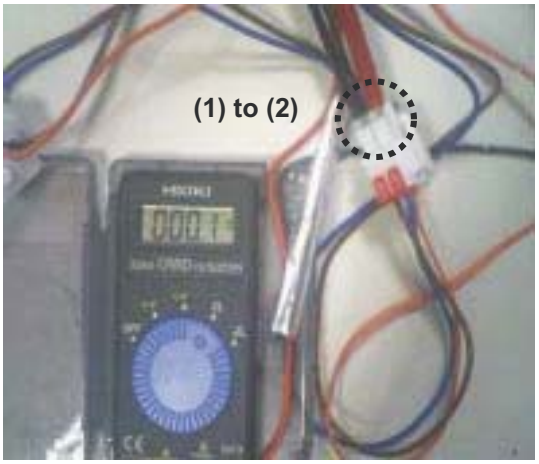
(1) EBR673480

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



11. COMPONENT TESTING INFORMATION

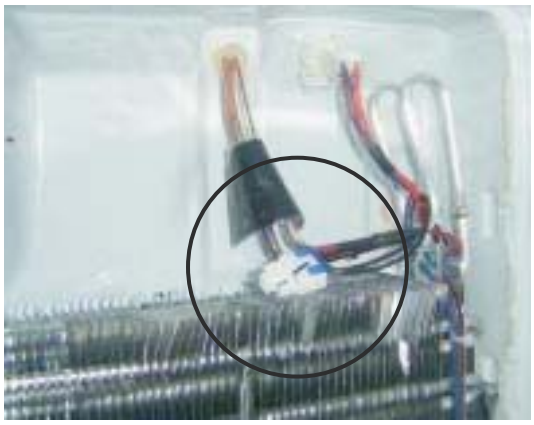
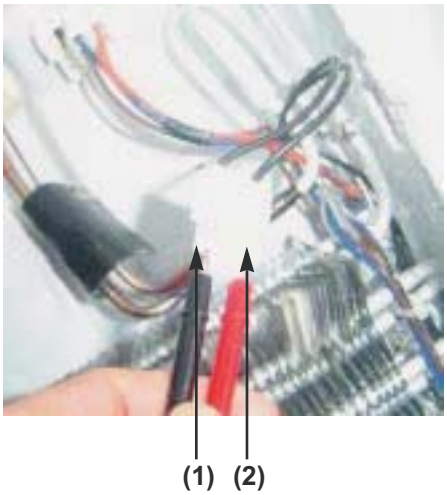
11-1 Defrost Controller Assembly

<table>
<tr><td>Function</td><td>- Controller assembly is consist of 2 kinds of part those are fuse-m and sensor. we can decide part is defect or not when we check the resistance.
- Fuse-m can cut off the source when defrost heater operate the unusual high temperature.
- Sensor give temperature information to Micom</td></tr>
<tr><td>How to Measure (Fuse-M)</td><td> 

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

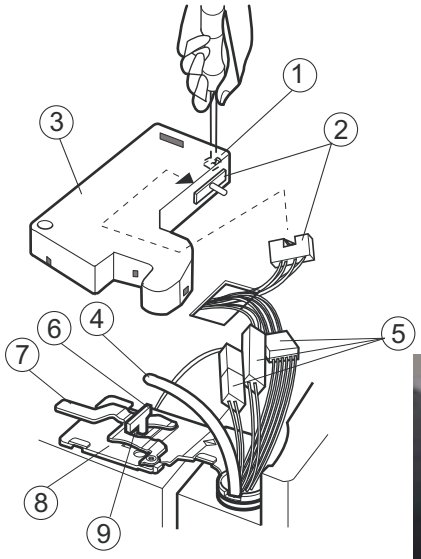
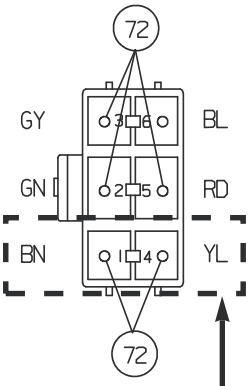
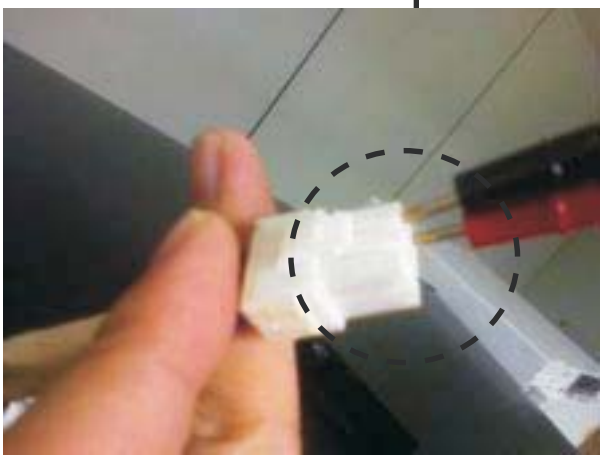
Set a ohmmeter to The 2housing pin.
Measure the 2 pin connected to Sensor.
If the ohmmeter indicate 11□ (at room temperature) Sensor is not a defect.
When check the ohm at other temperature Check the sensor manual.</td></tr>
<tr><td>Standard</td><td>Fuse-M (at all temperature)
<table><tr><td>Test Point</td><td>Ressult</td></tr><tr><td>(1) to (2)</td><td>0 ~ 0.1?</td></tr></table>
Sensor (at room temperature)
<table><tr><td>Test Point</td><td>Ressult</td></tr><tr><td>(1) to (2)</td><td>11 ?</td></tr></table></td></tr>
</table>

11-2 Sheath Heater

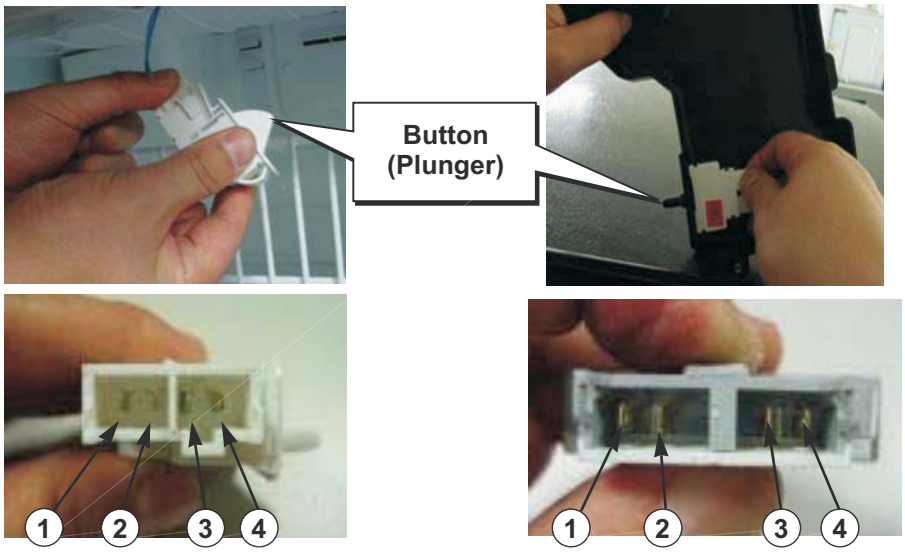
<table>
<tr><td>Function</td><td>Sheath heater is a part for defrost. All heating wire is connected to only one line. So we can decide part is defect or not when we check the resistance.</td></tr>
<tr><td>How to Measure</td><td>



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

11-3 Door Heater Assembly

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

11-4 Door Switch

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


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

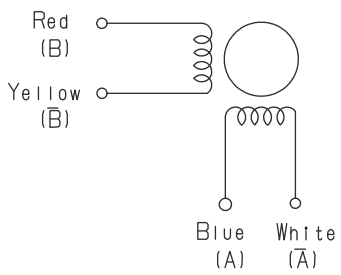
11-7 Damper

Function

The damper supplies the cold air at freezer room to chillroom by using the damper's plate. Chillroom is colder than before when damper's plate is open. When damper's plate is close, chillroom's temperature will rise.

How to Measure

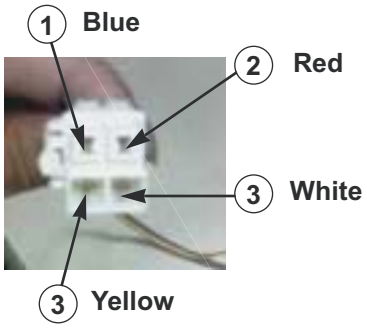
Table(1): 결선도(Wirering)

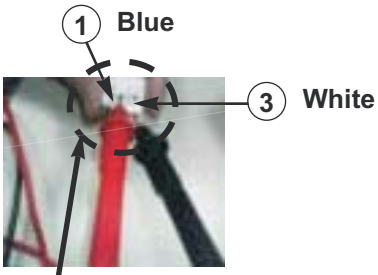


Table(2): 2-2상 여자순서(CW Rotation)

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

< Damper Circuit >

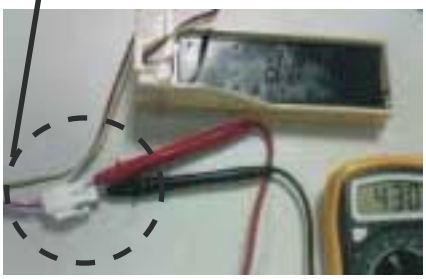




Check the (1), (3)

< extension >

Check the (2), (4)



Check the (1), (3)

Check the resistance between connectors 1,3 and 2,4 .It means check whether or not applying an electric current. If there is resistance, it means the damper not inferiority

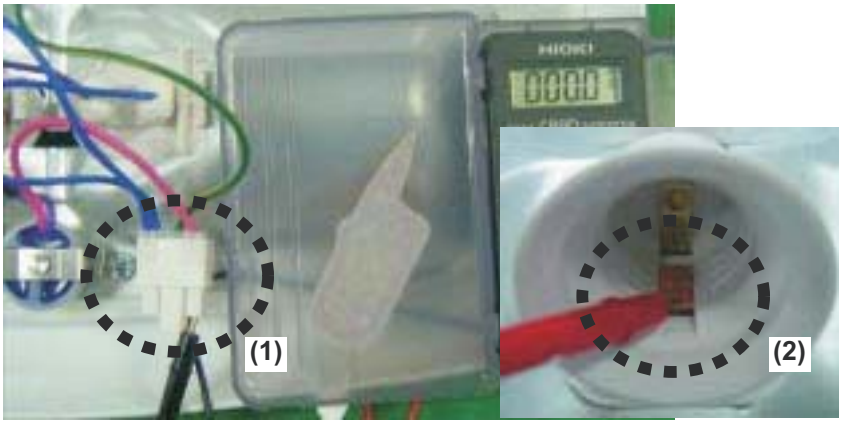
Standard

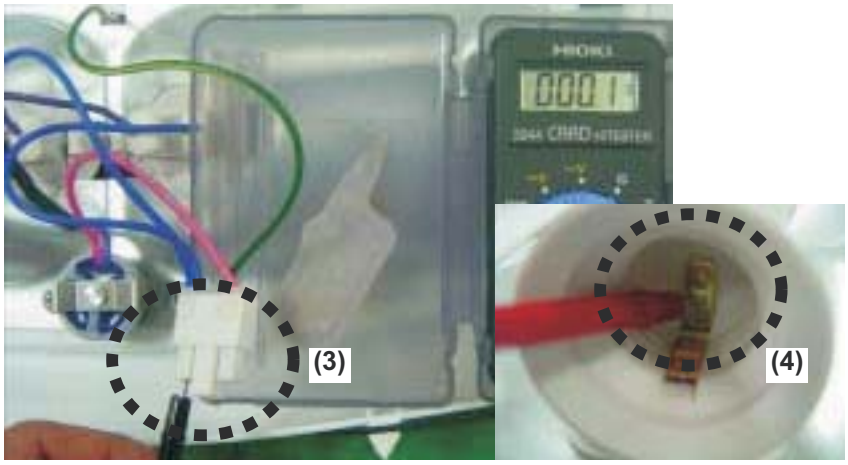
Damper

Test Points	Result
Red and Yellow	373 ~ 456**?**

Test Points	Result
Blue and White	373 ~ 456**?**

11-8 Lamp Socket

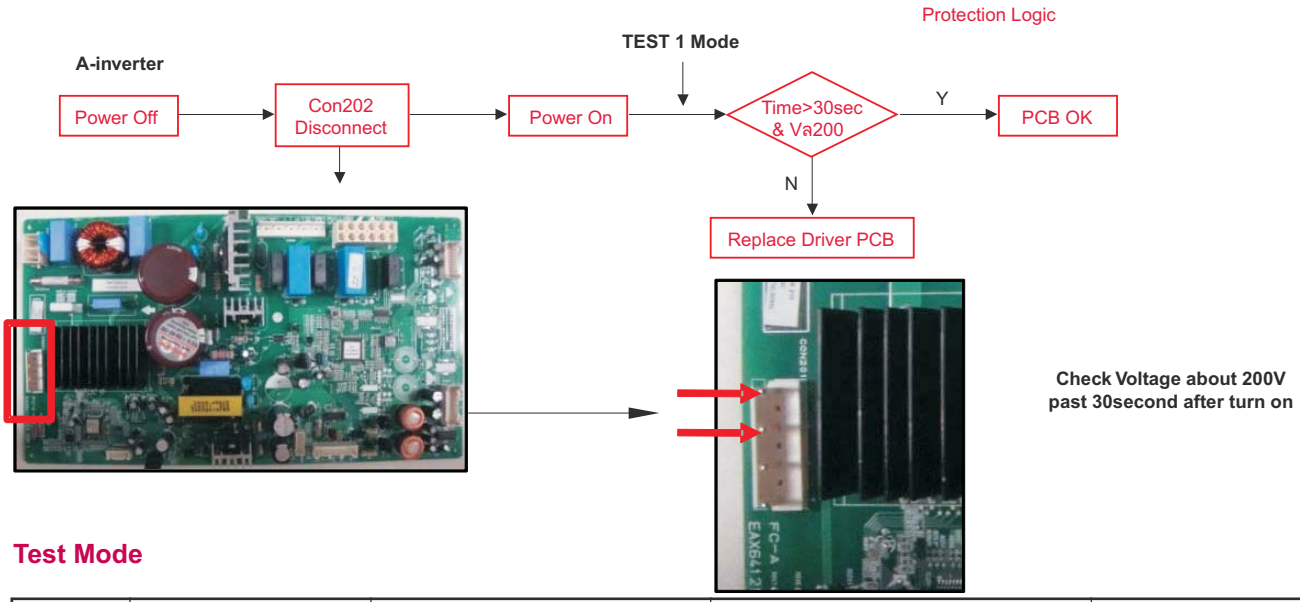
<table>
<tr><td>Function</td><td>The lamp socket connect cover lamp assembly to lamp.
The lamp socket fix lamp and unite lamp and cover lamp assembly.
The lamp socket supply electric source to lamp also.</td></tr>
<tr><td>How to Measure</td><td> 



Check the resistance between connector of housing and connector of lamp socket. It means check whether or not applying an electric current.
If there is resistance it means the lamp socket is not inferiority.</td></tr>
<tr><td>Standard</td><td><table>
<tr><th>Test Points</th><th>Result</th></tr>
<tr><td>(1) to (2) and (3) to (4)</td><td>0?</td></tr>
</table></td></tr>
</table>

12. TROUBLESHOOTING

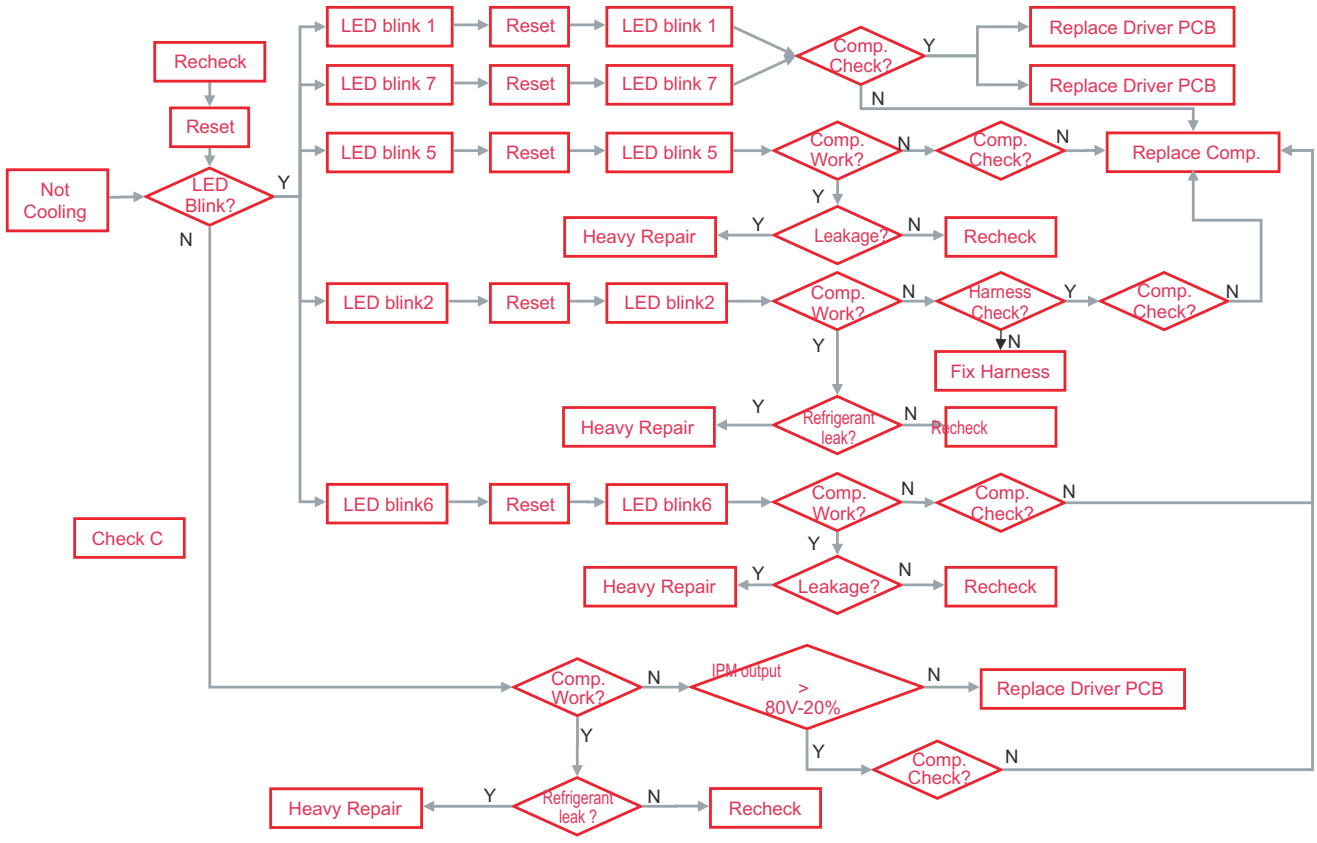
PCB Check (Simplify)



Test Mode

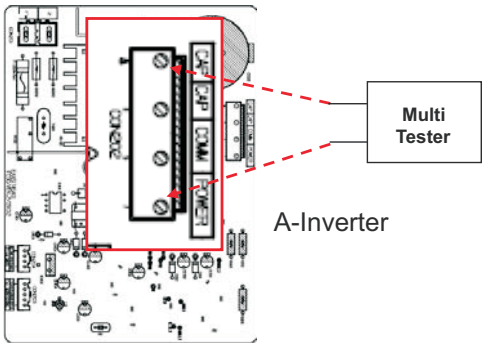
	Ref.	Comp	Display & sound	Refer
		FC75(A-Inverter)		
TEST1	Forced Starting	TDC (Full Stroke)	Display ON, Buzz 1 time	

Troubleshooting



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.

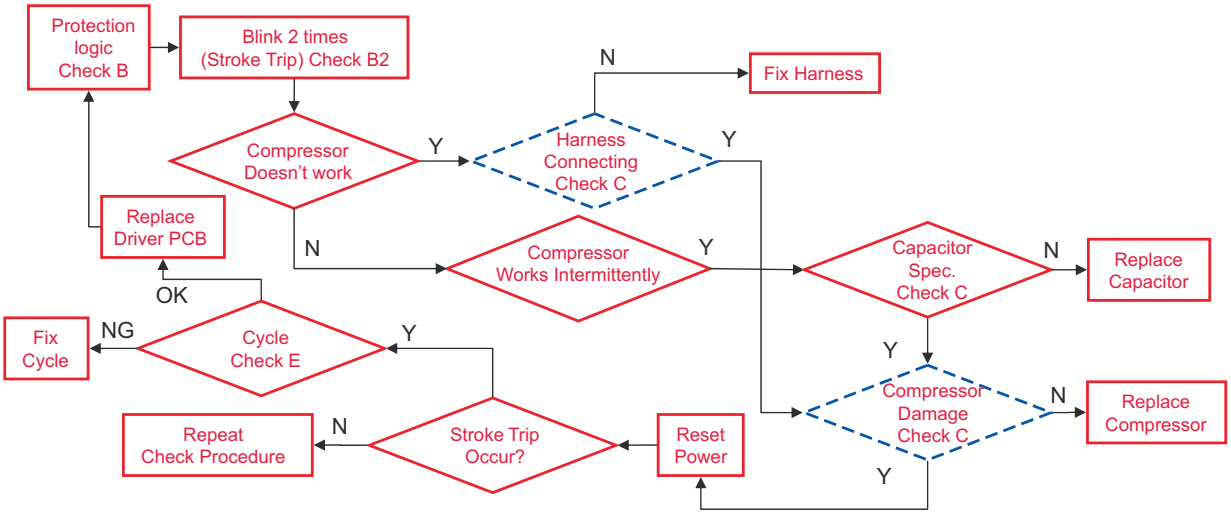
12-2 Check B

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

Protection Logic

Blink Blink OFF Blink Blink OFF

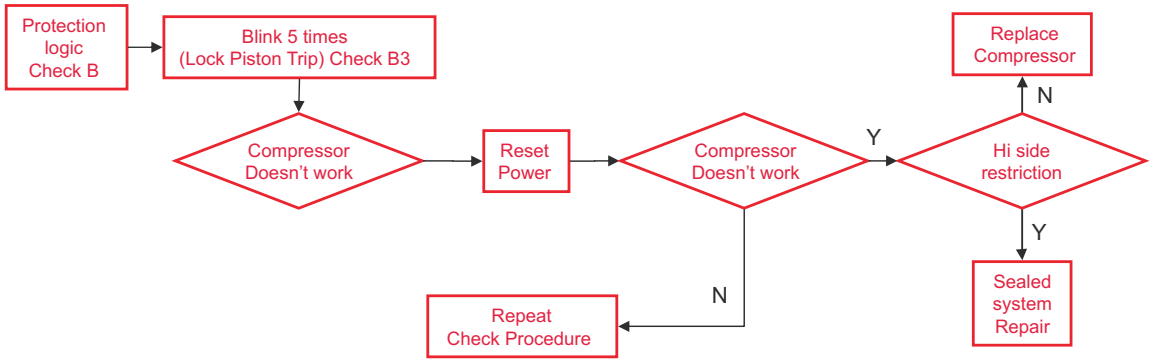
- Purpose: Prevent abnormally long piston strokes.
- Case 1. If compressor doesn't work and LED blinks - Cause: Possibly harness from compressor to PCB might be defective.
- Case 2. If compressor works intermittently and LED blinks - Cause: Condenser Fan or Freezer Fan is not running. Sealed system problem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



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

Blink Blink Blink Blink Blink OFF

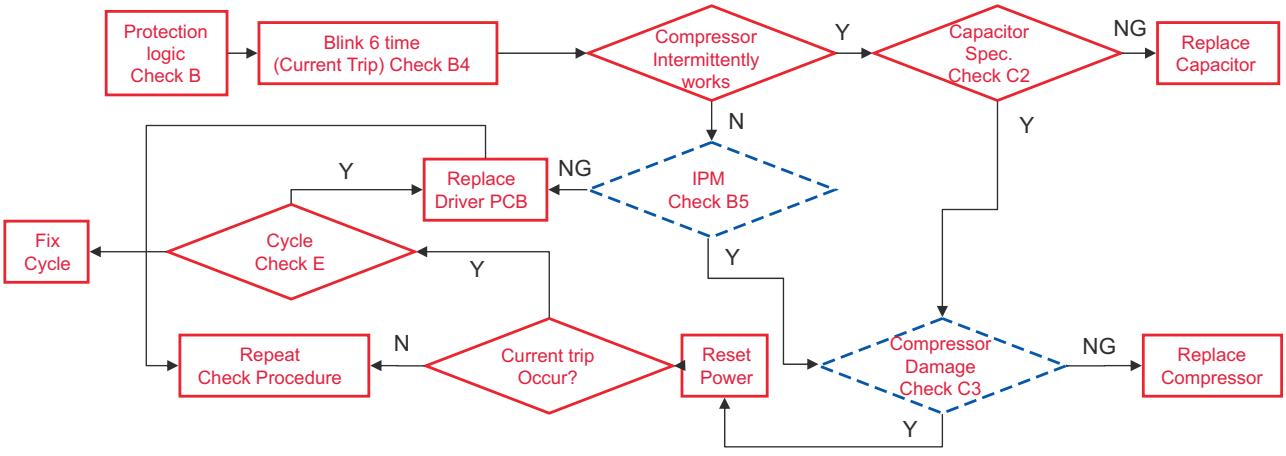
- Purpose: To detect locked piston
- Cause: Lack of oil to the cylinder, cylinder or piston damaged and or restricted discharge. A Locked Piston can also be caused by foreign materials inside the compressor.
- Logic: Compressor is forced off and tries to restart within 2.5 minutes.



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

Blink Blink Blink Blink Blink Blink OFF

- Purpose: Prevent over-current (overload protect)
- Cause: Ambient temperature is high (over 43°C) and/or refrigerator's condenser air movement is restricted.
- Condenser Fan is stopped, restricted discharge line, compressor is damaged, or IPM device is defective.
- Logic: Compressor is forced off and tries to restart after 2.5 minutes.

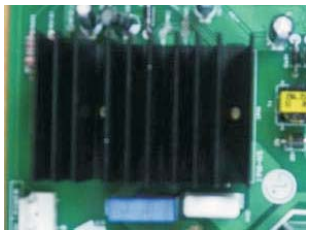


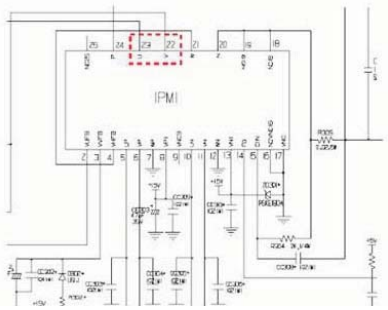
B5. LED blinks seven times, then repeats (IPM Fault: A & E Inverters)

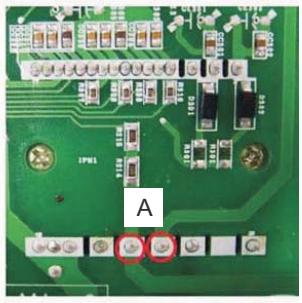
Blink Blink Blink Blink Blink Blink Blink OFF

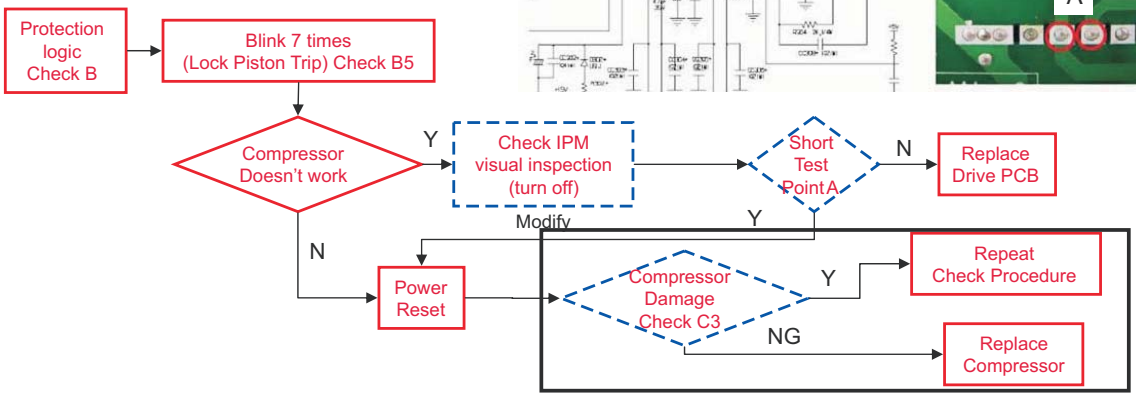
- Purpose: Prevent high current due to IPM Short
- Cause: Damaged IPM (Dead Short)
- Test for a dead short at **Point A** with a VOM.
- Logic: Compressor is forced off and tries to restart in 2.5 minutes.

Protection Logic







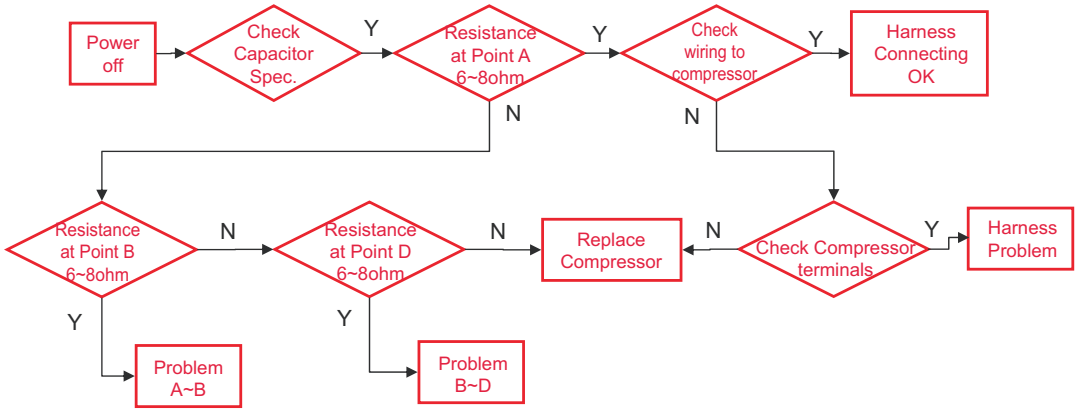


12-3 Check C

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

Check Process

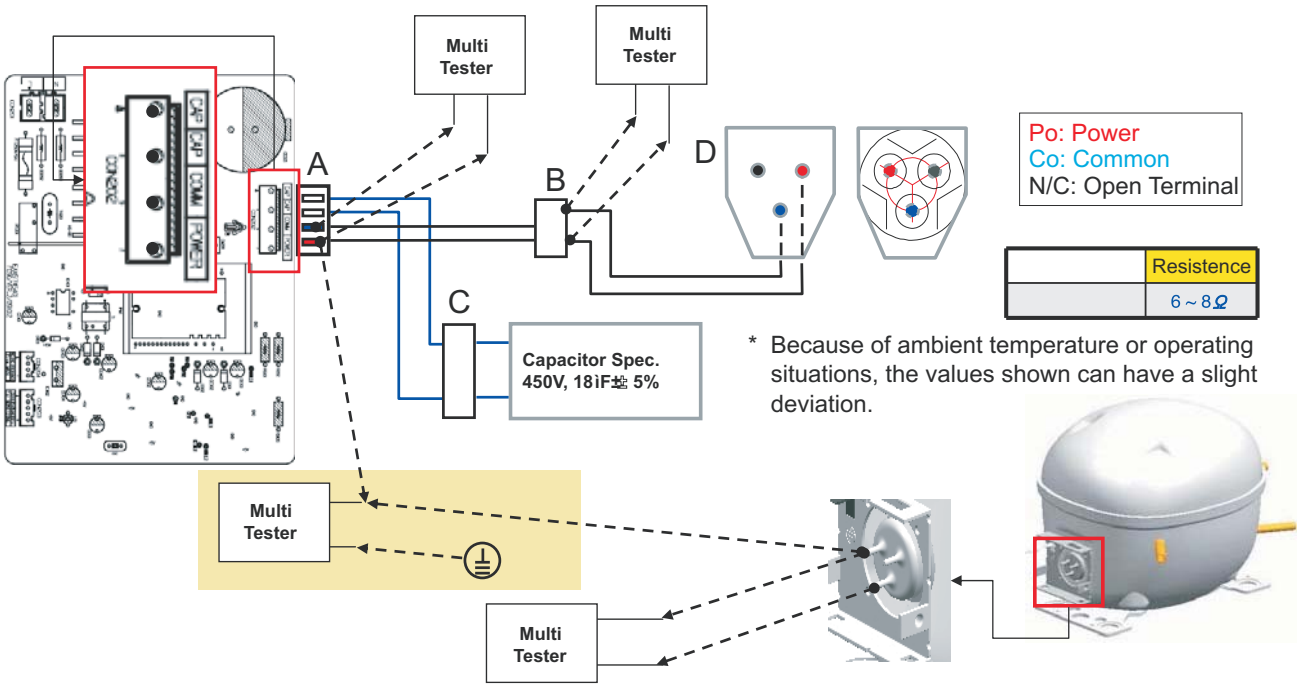
- Step 1. Power off. Step 2. Check capacitor spec. (table1). Step3. Check resistance of point A
  Step 4. Check wire harness (INF ohm). Step 5. Check resistance at point B. Step 6. Point D.



Caution : Turn off power during check C

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

FC150NAMA

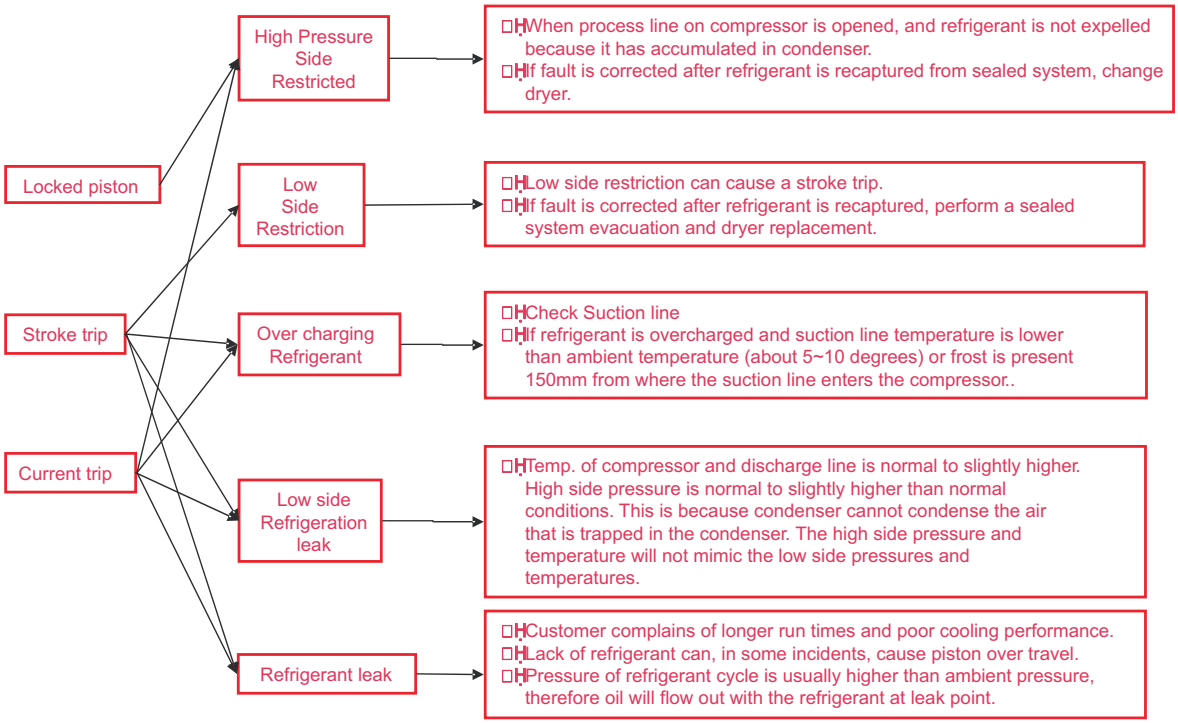


12-4 Check D

D1. Activate Protection logic

Cycle check with protection logic

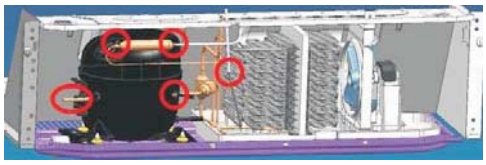
- We have to check Condenser fan and Freezer fan before performing Check D
- Locked Piston, Current trip and stroke trip can be activated by other problems then the driver or compressor.



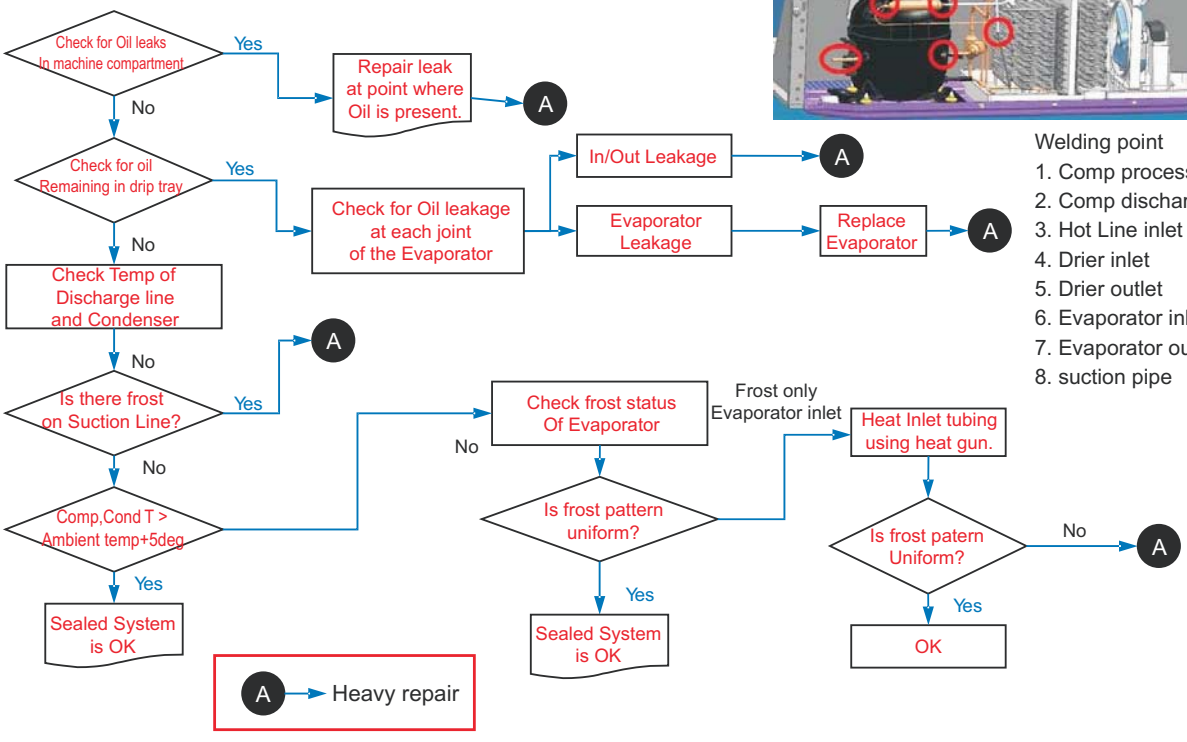
D2. sealed system diagnosis

Sealed system

- Check as follows;



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

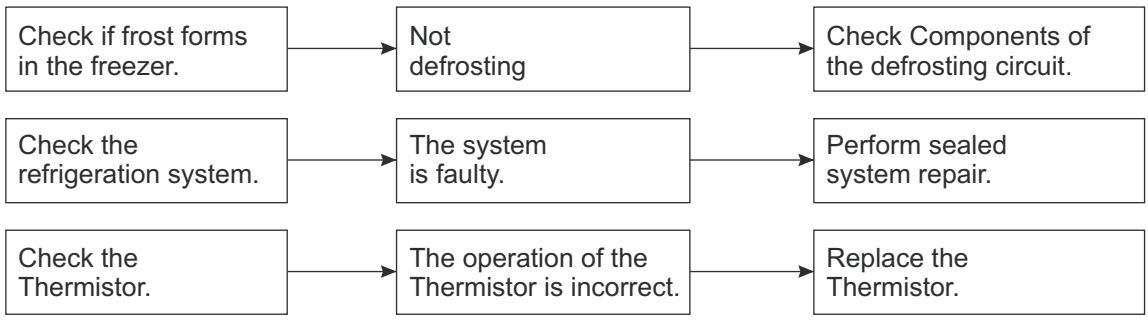


	No	LED operating condition	Cause	Service guideline
		LED two - time repetiton (Stroke Trip)  **··on- on- off - on- on - off - on - on - off ··repeating**	PCB Parts defect or Compressor or Connector miss connecting (Piston over run)	1. Please check, Whether connector of compressor is attached rightly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

12-5 SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	REMEDY
No Cooling.	• Is the power cord unplugged from the outlet? • Check if the power switch is set to OFF. • Check if the fuse of the power switch is shorted. • Measure the voltage of the power outlet.	• Plug into the outlet. • Set the switch to ON. • Replace the fuse. • If the voltage is low, correct the wiring.
Cools poorly.	• Check if the unit is placed too close to the wall. • Check if the unit is placed too close to the stove, gas cooker, or in direct sunlight. • Is the ambient temperature too high or the room door closed? • Check if food put in the refrigerator is hot. • Did you open the door of the unit too often or check if the door is sealed properly? • Check if the Control is set to **Warm position**.	• Place the unit about 4 inches (10 cm) from the wall. • Place the unit away from these heat sources. • Lower the ambient temperature. • Put in foods after they have cooled down. • Don't open the door too often and close it firmly. • Set the control to **Recommended position**.
Food in the Refrigerator is frozen.	• Is food placed in the cooling air outlet? • Check if the control is set to **colder position**. • Is the ambient temperature below 41°F(5°C)?	• Place foods in the high-temperature section. (front part) • Set the control to **Recommended position**. • Set the control to **Warm position**.
Condensation or ice forms inside the unit.	• Is liquid food sealed? • Check if food put in the refrigerator is hot. • Did you open the door of the unit too often or check if the door is sealed properly?	• Seal liquid foods with wrap. • Put in foods after they have cooled down. • Don't open the door too often and close it firmly.
Condensation forms in the Exterior Case.	• Check if the ambient temperature and humidity of the surrounding air are high. • Is there a gap in the door gasket?	• Wipe moisture with a dry cloth. It will disappear in low temperature and humidity. • Fill up the gap.
There is abnormal noise.	• Is the unit positioned in a firm and even place? • Are any unnecessary objects placed in the back side of the unit? • Check if the Drip Tray is not firmly fixed. • Check if the cover of the compressor enclosure in the lower front side is taken out.	• Adjust the Leveling Screw, and position the refrigerator in a firm place. • Remove the objects. • Fix the Drip Tray firmly in the original position. • Place the cover in its original position.
Door does not close well.	• Check if the door gasket is dirty with an item like juice. • Is the refrigerator level? • Is there too much food in the refrigerator?	• Clean the door gasket. • Position in a firm place and level the Leveling Screw. • Make sure food stored in shelves does not prevent the door from closing.
Ice and foods smell unpleasant.	• Check if the inside of the unit is dirty. • Are foods with a strong odor unwrapped? • The unit smells of plastic.	• Clean the inside of the unit. • Wrap foods that have a strong odor. • New products smell of plastic, but this will go away after 1-2 weeks.

↴ Other possible problems:



12-6 REFRIGERATION CYCLE

Troubleshooting Chart

CAUSE		STATE OF THE UNIT	STATE OF THE EVAPORATOR	TEMPERATURE OF THE COMPRESSOR	REMARKS
LEAKAGE	PARTIAL LEAKAGE	Freezer compartment and Refrigerator don't cool normally.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little higher than ambient temperature.	• Refrigerant level is low due to a leak. • Normal cooling is possible by restoring the normal amount of refrigerant and repairing the leak.
	COMPLETE LEAKAGE	Freezer compartment and Refrigerator don't cool normally.	Flowing sound of refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	• No discharging of Refrigerant. • Normal cooling is possible by restoring the normal amount of refrigerant and repairing the leak.
CLOGGED BY DUST	PARTIAL CLOG	Freezer compartment and Refrigerator don't cool normally.	Flowing sound of refrigerant is heard and frost forms in inlet only.	A little higher than ambient temperature.	• Normal discharging of the refrigerant. • The capillary tube is faulty.
	WHOLE CLOG	Freezer compartment and Refrigerator don't cool.	Flowing sound of refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	• Normal discharging of the Refrigerant.
MOISTURE CLOG		Cooling operation stops periodically.	Flowing sound of refrigerant is not heard and frost melts.	Lower than ambient temperature.	• Cooling operation restarts when heating the inlet of the capillary tube.
DEFECTIVE COMPRESSION	COMP-RESSION	Freezer and Refrigerator don't cool.	Low flowing sound of refrigerant is heard and frost forms in inlet only.	A little higher than ambient temperature.	• Low pressure at high side of compressor due to low refrigerant level.
	NO COMP-RESSION	No compressing operation.	Flowing sound of refrigerant is not heard and there is no frost.	Equal to ambient temperature.	• No pressure in the high pressure part of the compressor.

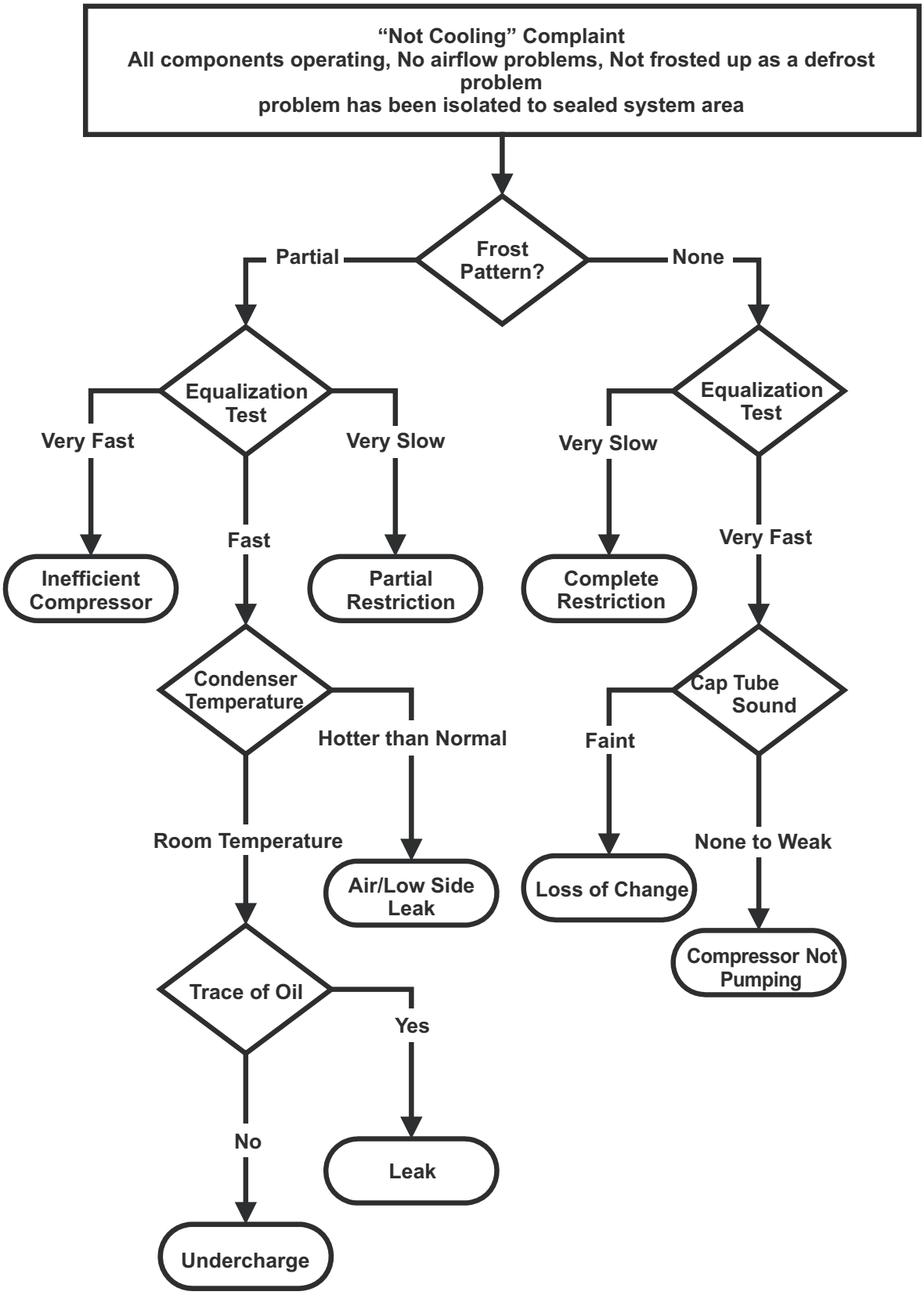
12-6-1 Cleaning

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

If you need to clean the condenser:

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

12-6-2 SEALED SYSTEM DIAGNOSIS

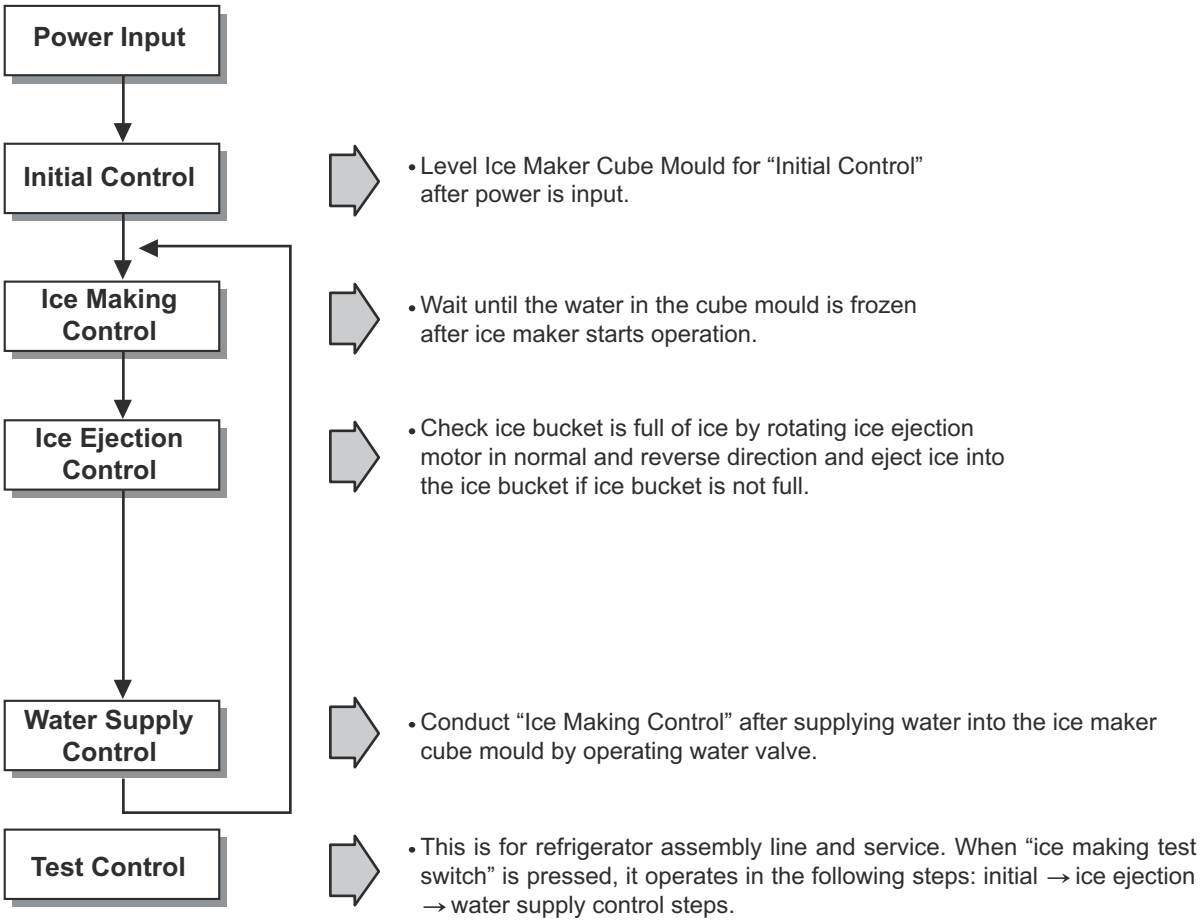


(The equalization test is trying to restart a compressor using a start kit after it has been operating.)

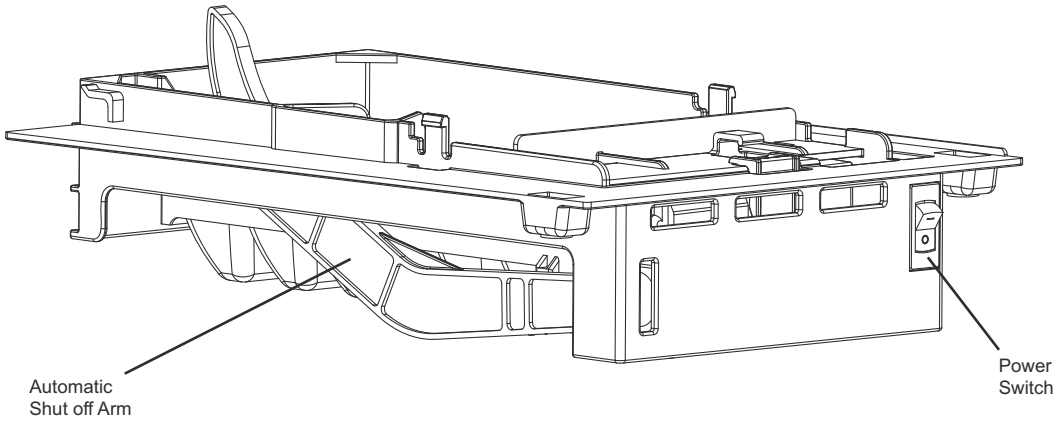
13. ICE MAKER AND DISPENSER WORKING PRINCIPLES AND REPAIR

13-1 Working Principles

13-1-1 Ice Maker Working Principles



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



13-2 Function of Ice Maker

13-2-1 Initial Control Function

1. When power is initially applied or reapplied after power cut, it detects level of ice maker cube mould after completion of MICOM initialization. The detecting lever moves up and down.
2. The level of ice maker cube mould is judged by output signal, high and low signal, of Hall IC. Make the cube mould to be horizontal by rotating ice ejection motor in normal or reverse direction.
3. If there is no change in signals one minute after the geared motor starts to operate, it stops icemaker operation and check the signal every hour. It resets initialization of icemaker when it becomes normal.
4. It judges that the initial control is completed when it judges the ice maker cube mould is horizontal.
5. Ice ejection conducts for 1 cycle irrespect of ice in the ice bucket when power is initially applied.

13-2-2 Water Supply Control Function

1. This is to supply water into the ice maker cube mould by operating water valve in the machine room when ice ejection control is completed and ice maker mould is even.
2. The quantity of water supplied is determined by DIP switch and time.

<Water Supply Quantity Table>

No	DIP SWITCH SETTING		WATER SUPPLY TIME	REMARKS
	S1	S2		
1	OFF	OFF	9 SEC	* The quantity of water supplied depends on DIP switch setting conditions and water pressure as it is a direct tap water connection type. (the water supplied is generally 60 cc to 100 cc)
2	ON	OFF	8 SEC	
3	OFF	ON	10 SEC	
4	ON	ON	11 SEC	* DIP switch is on the main PCB.

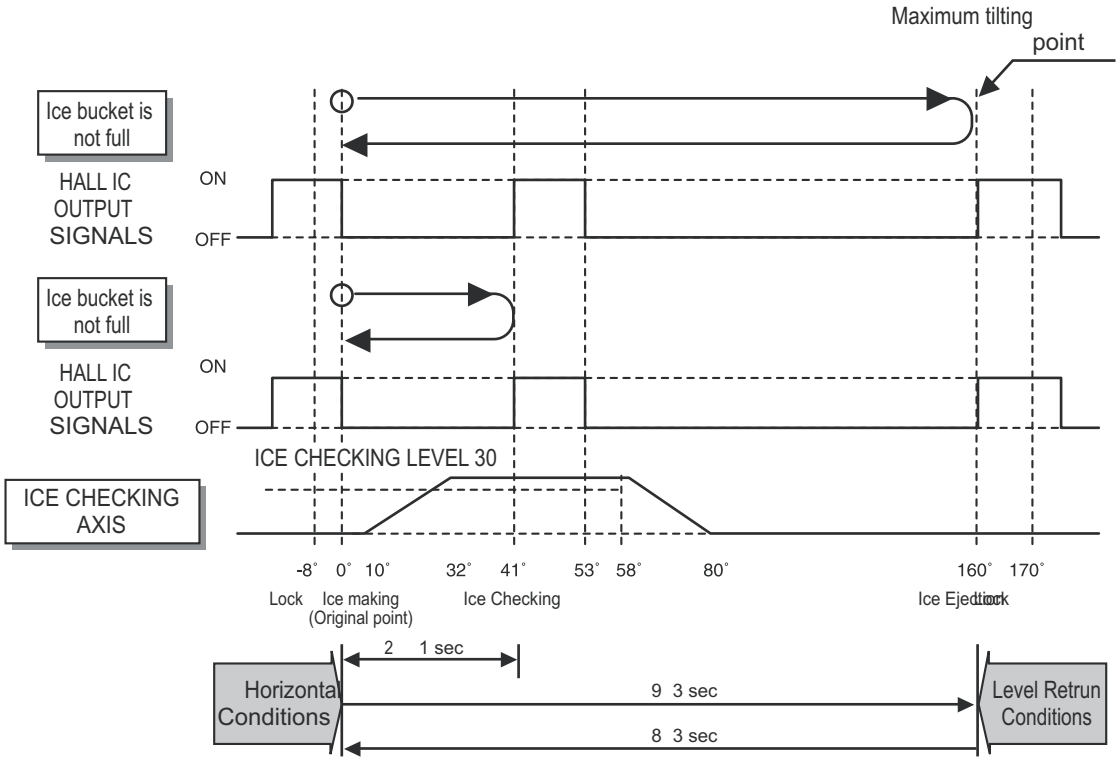
3. If water supply quantity setting is changed while power is on, water supplies for the amended time. If DIP switch is changed during water supply, water shall be supplied for the previous setting time. But it will supply for the amended time from the next supply.
4. When water supply signal is applied to water and ice valves at the same time during water supply, water shall be supplied to water valve. If water supply signal is applied to ice valve during water supply, water shall be supplied to both water and ice valves.

13-2-3 Ice Making Control Function

1. Ice making control is carried out from the completion of water supply to the completion of ice making in the cube mould. Ice making sensor detects the temperature of cube mould and completes ice making. (ice making sensor is fixed below ice maker cube mould)
2. Ice making control starts after completion of water supply control or initial control.
3. At first, It is judged that ice making is completed when ice making sensor temperature reaches at -8°C after 70 minutes when water is supplied to ice maker cube mould.
4. Finally, It is judged that ice making is completed when ice maker sensor temperature reaches below -8 °C after 10 minutes in condition 3.

13-2-4 Ice Ejection Control Function

1. This is to eject ice from ice maker cube mould after ice making is completed.
2. If Hall IC signal is on within 3.6 seconds after ice ejection motor rotates in normal direction, it does not proceed ice ejection but waits. If the ice bucket is full, ice ejection motor rotates in normal direction in every hour to check the condition of ice bucket. If the ice bucket is not full, the water supply control starts after completion of ice ejection control. If the ice bucket is full, ice ejection motor rotates in reverse direction and sops under ice making or waiting conditions.
3. If ice bucket is not full, ice ejection starts. The cube mould tilts to the maximum and ice is separated from the mould and ice checking lever raises.
4. Ice ejection motor stops for 1 second if Hall IC signal changes from OFF (low) to ON (high) after 3.6 seconds when ice ejection motor rotates in normal direction. If there is no change in Hall IC signals within 1 minute after ice ejection motor operates, ice ejection motor stops as ice ejection motor or hall IC is out of order.
5. If ice ejection motor or Hall IC is abnormal, ice ejection motor rotates in normal direction to exercise initial operation. It resets the ice maker if ice ejection motor or Hall IC is normal.
6. The mould stops for 1 second at maximum tilted conditions.
7. The mould returns to horizontal conditions as ice ejection motor rotates in reverse direction.
8. When the mould becomes horizontal, the cycle starts to repeat:
   Water Supply □ Ice Making □ Ice Ejection □ Mould Returns to Horizontal
9. When freezer door is open, ice ejection don't operating, and after 1minute of Freezer door closing, ejection control function is operated.



<Timing Chart During Ice Ejection>

13-2-5 Test Function

1. It is to force the operation during operation test, service, and cleaning. The test switch is mounted under the automatic ice maker. The test function starts when the test switch is pressed for more than 0.5 second.
2. Test button does not work during ice ejection and water supply. It works when it is in the horizontal conditions. If mould is full of ice during test function operation, ice ejection control and water supply control do not work.
3. When test switch is pressed for more than 0.5 second in the horizontal conditions, ice ejection starts irrespect of the mould conditions. Water shall be splashed if test switch is pressed before the water in the mould freezes. Water shall be supplied while the mould returns to the horizontal conditions after ice ejection. Therefore the problems of ice ejection, returning to the horizontal conditions, and water supply can be checked by test switch. When test function performs normally, buzzer sounds and water supply shall carry out. Check it for repair if buzzer does not sound.
4. When water supply is completed, the cycle operates normally as follows: Ice making Ice ejection Returning to horizontal conditions Water supply
5. Remove ice from the ice maker cube mould and press test switch when ice maker cube mould is full of ice as ice ejection and water supply control do not work when cube mould is full of ice.

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