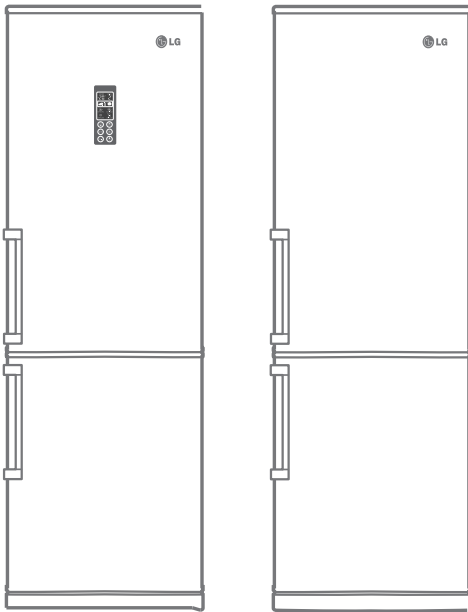




LG

Life's Good



SERVICE MANUAL REFRIGERATOR

Before servicing the unit, read the SAFETY PRECAUTIONS in this manual.

MODELS
GA-B499Y**Z

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SAFETY PRECAUTIONS

Please read the following instructions before servicing your refrigerator.

1. Check the set for electric losses.
2. Unplug prior to servicing to prevent electric shock.
3. Whenever testing with power on, wear rubber gloves to prevent electric shock.
4. If you use any kind of appliance, check regular current, voltage and capacity.
5. Don't touch metal products in the freezer with wet hands. This may cause frostbite.
6. Prevent water from following onto electric elements in the mechanical parts.
7. When standing up after having checked the lower section of the refrigerator with the upper door open, move with care to avoid hitting the upper door.
8. When tilting the set, remove any materials on the set, especially the thin plates (ex. Glass shelf or books).
9. When servicing the evaporator, wear cotton gloves. This is to prevent injuries from the sharp evaporator fins.
10. Leave the disassembly of the refrigerating cycle to a specialized service center. The gas inside the circuit may pollute the environment.
11. When you discharge the refrigerant, wear the protective safety glasses or goggle for eye safety.
12. When you repair the cycle system in refrigerator, the work area is well ventilated.
Especially if the refrigerant is R600a, there are no fire or heat sources. (No smoking)

Features of Refrigerant (R600a)

- Achromatic and odor less gas;
- Flammable gas and the ignition (explosion) at 494°C.
- Upper/lower explosion limit: 1.8%~8.4%/Vol. Features of the R600a refrigerator;
- Charging of 60% refrigerant compared with a R134a model;
- The suction pressure is below 1bar (abs) during the operation;
- Because of its low suction pressure, the external air may flow in the cycle system when the refrigerant leak, and it causes malfunction in the compressor;
- The displacement of compressor using R600a must be at least 1.7 times larger than that of R134a;
- Any type of dryer is applicable (XH-5, 7, 9);
- The EVAPORATOR or any other cycle part that has welding joint is hidden in the foam. (If not hidden inside, the whole electric parts must be tested with the LEAKAGE TEST according to the IEC Standard);
- The compressor has label of the refrigerant R600a;
- Only the SVC man must have an access to the system.

Installation Place

- Must be well ventilated.
- Must be 20 m3 or larger.
- Must be no-smoking area.
- No ignitable factors must be present.

Utility

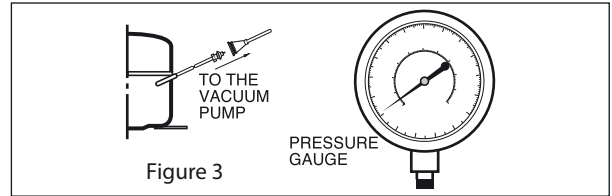
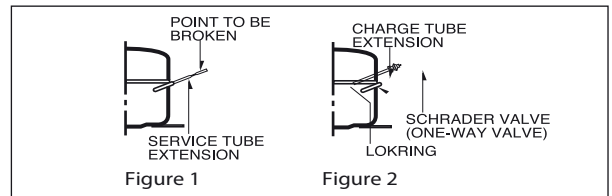
- Refrigerant cylinder (MAX NET 300g);
- Manometer;
- Vacuum pump (600[^]/min);
- Piercing Clamp;
- Quick coupler;
- Hoses (5m-1EA, 1m-3EA);
- LOKRING;
- Portable Leakage detector (3g/year!);
- Nitrogen cylinder (for leakage test);
- Concentration gauge.

Make Sure before Serving

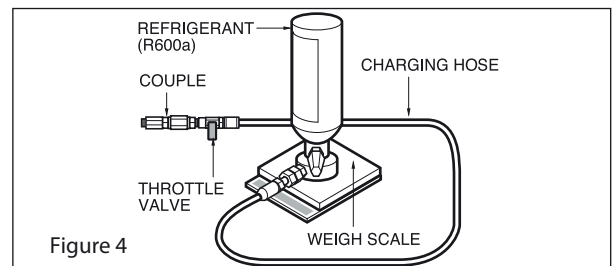
- Refrigerant Confirm the refrigerant by checking Name Plate and the label on the compressor, after opening the COVER ASSEMBLY, BACK-M/C.
- If the refrigerant is R600a, you must not weld or apply a heat source.

Air Recharging in Compressor

Before refilling the refrigerant, you must perform the test according to Chapter 5 (TROUBLESHOOTING CHART). When the defects are found, you must discharge the residual refrigerant (R600a) in the outdoor. For discharging the refrigerant R600a, break the narrow portion of tube extension by hand or with a pipe cutter as shown in Figure 1. Leave it for 30 min in outside to stabilize the pressure with ambient. Then, check the pressure by piercing the dryer part with piercing pliers. If the refrigerant is not completely discharged, let the refrigerator alone for more 30 min in outside.



After the refrigerant (R600a) is completely discharged, repair any defective parts and replace the dryer. At any case you must use the LOKRING for connecting or replacing any part in the cycle (No Fire, No Welding). Connect the Schrader valve to pump with the coupler. And then turn the pump on for vacuum state (Figure 3). Let the pump run until the low-pressure gauge indicates the vacuum (gauge pressure 0, absolute pressure -1atm or -760mmHg). Recommended vacuum time is 30 min. Charge the N2 gas in order to check for leakage from welding points and the LOKRING. If leakages are found, repair the defects and repeat the vacuum process.



After the system is completely vacuumed, fill it with the refrigerant R600a up to what has been specified at your refrigerator Name Plate. The amount of refrigerant (R600a) must be precisely measured within the error of $\pm 2g$ by an electron scale (Figure 4). REFRIGERANT (R600a) COUPLE CHARGING HOSE If you use the manifold connected with both the refrigerant (R600a) cylinder and the vacuum pump simultaneously, make sure the pump valve is closed. Connect the charging hose (that is connected to the refrigerant (R600a) cylinder) to the Schrader valve installed on the service tube. Then, charge the refrigerant (R600a) by controlling the Throttle valve. When you do so, do not fully open the Throttle valve because it may make damage to the compressor. Gradually charge the refrigerant (R600a) by changing open and close the Throttle Valve (5g at each time). The charging hose must use a one-way valve to prevent the refrigerant reflux. Close the Schrader valve cap after the refrigerant (R600a) is completely recharged. After you completely recharge the refrigerant (R600a), perform the leakage test by using a portable leakage detector or soapy water. Test the low pressure (suction) parts in compressor off time and high pressure parts in compressor on time. If the leakages are found, restart from the refrigerant (R600a) discharging process and repairs defects of leaks. After the leakage test, check the temperature of each parts of the cycle. Check with hands if the CONDENSER and the case (HOT-LINE pipe) that is contacted to the door gasket are warm. Confirm that frost is uniform distributed on the surface of the EVAPORATOR.

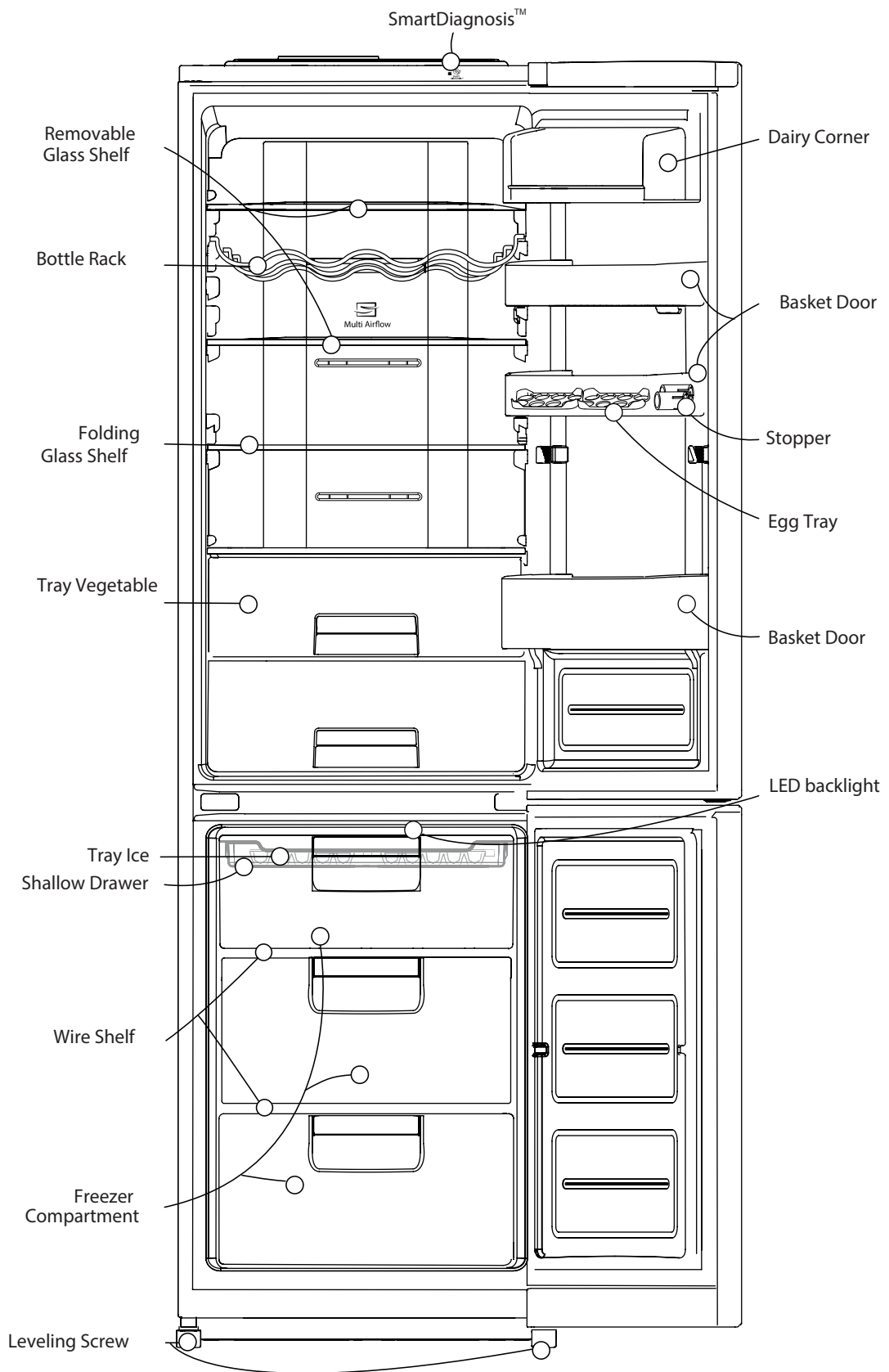
SPECIFICATIONS

1. Ref. No: GA-B499Y*QZ

ITEMS	SPECIFICATION
DIMENSIONS (mm)	595(W)X668(D)X2000(H)
NET WEIGHT (kg)	81/87
COOLING SYSTEM	Fan Cooling
TEMPERATURE CONTROL	Micom Control
DEFROSTING SYSTEM	Full Automatic
DOOR FINISH	Pre-Coated Metal or Vinyl Coated Metal
OUT CASE	Painted Steel Sheet
INNER CASE	ABS
INSULATION	Polyurethane Foam
DEFROSTING DEVICE	Heater, Sheath
REFRIGERANT	R600a (62g)
LUBRICATION OIL	Mineral S5HFP (120cm ³)
COMPRESSOR	Liner Type
EVAPORATOR	Fin Tube Type
CONDENSER	Wire Condenser
REFRIGERATOR COMPARTMENT	Transparent Shelf (3EA) Folding Shelf (1EA) Fresh Balanser(1EA) Vegetable Container (1EA) Fresh Converter (1EA)
DOOR BASKET	Dairy Corner (1EA) Basket (2EA) Egg Tray (2EA) 2 l Bottle Basket (1EA) Bottle Guide (1EA)
FREEZER COMPARTMENT	Tray Drawer (3EA) Shallow Drawer (1EA) Shelf Net (2EA) Tray Ice (1EA)

PARTS IDENTIFICATION

2. Ref. No: GA-B499Y*QZ



NOTE

This is a basic model. The shape of refrigerator is subject to change.

INSTRUCTIONS FOR REVERSING DOOR SWING

This refrigerator allows the owner to change the door swing if desired. The hinging of the doors can be changed to the opposite side anytime you wish. A Warning Electric Shock Hazard Disconnect electrical supply to refrigerator before in stalling. Failure to do so could result in death or serious injury.

When reversing the door swing :

- Read the in structions all the way through be fore starting.
- Handle parts carefully to avoid scratching paint.
- Set screws/bol ts d own by their related pa rts to avoid using them in the wrong places.
- Provide a non - scratching work surface for the doors.

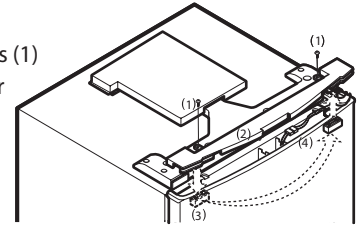
IMPORTANT

Once you begin, do not move the cabinet until door-swing reversal is completed. These in structions are for changing the hinges from the right side to the left side, if you ever want to change the hinges back to the right side, follow these same in structions and reverse all references to left and right. Before Removing the Doors, empty and Remove all the Door Baskets of both Refrigerator/ Freezer Doors, including the Bank Dairy. Close both doors before removing hinge pins.

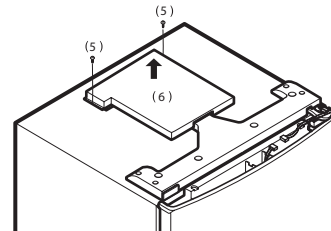
CAUTION!

1. Prior to hanging the door to the opposite side, first of all remove all food products and loose accessories – shelves and trays –from the refrigerator.
2. Make use of a torque wrench or box wrench 10 mm to tigh ten and remove the bolts.
3. Do not place the refrigerator on the Door.
4. Be careful not to drop the door while assembling and disassembling.

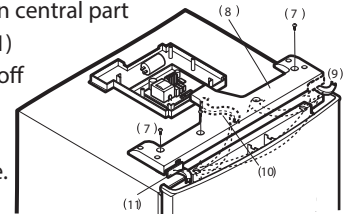
- After unscrewing the screws (1) take off top (2) of refrigerator door. Move the cap (3) to the opposite side the top cover (2). Disconnect the cabel (4).



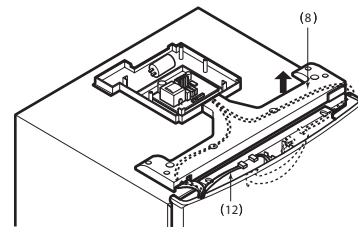
- Unscrew the screws (5) and take off the cover (6).



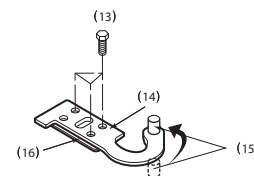
- Unscrew the screws (7) and take off the cover (8). Remove the cabel holder (9) and fix it (9) in central part of the cover (8). Install the cap (11) opposite side the cover (8). Take off the cabel holder (10) from central part of the cover (8) and install it (10) in reversing side.



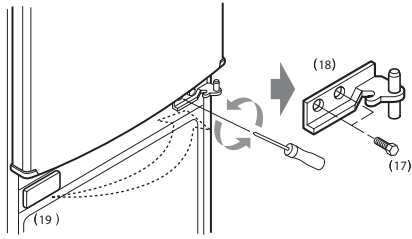
- Move the rope of cabel (12) to opposite side the cover (8).



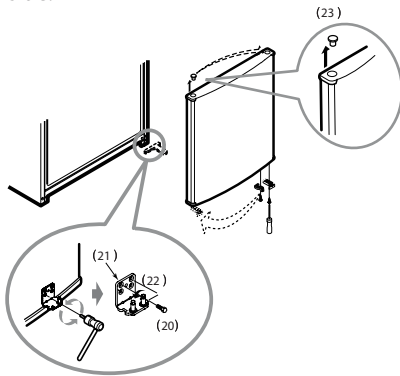
- Remove the upper hinge (14) by unscrew the bolts (13). Remove the door of refrigerating compartment. Unscrew the rod (15) and screw it on opposite side of the hinge (14). Fix the gasket (16) on opposite side of the hinge (14).



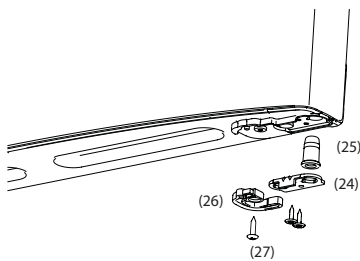
- Remove the central hinge (18) by unscrew the bolts (17) with hexahedron of 5 mm. Remove the door of freezing compartment. Move the cap (19) to opposite side the refrigerator.



• Take off the lower hinge (21) by unscrew the screws (20). After unscrew the rod (22) install it (22) to opposite side of the lower hinge (21) using key of 6 mm. Remove the cap (23) from upper part the door of freezing compartment and install it (23) to opposite side.



• Remove the limiter (24), the sleeve (25) and the closer (26) from lower part of the door of refrigerating compartment by unscrew the screws (27). After install and screw it (24,25,26) to opposite side. Repeat this doing with the door of freezing compartment.



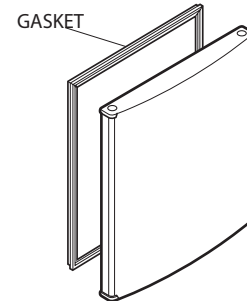
• Install the lower hinge (21) of freezing compartment, then install the door of freezing compartment, then install the central hinge (18) and the door of refrigerating compartment, then install the upper hinge (14), connect the cable (4) and install the covers (8,6) and the top cover (2).

DISASSEMBLY

1. DOOR

• Freezer Door

1. Refer to previous chapter "Instruction for Reversing Door Swing".
2. Pull out the Door Gasket to remove from the Door Foam Assembly, Freezer.

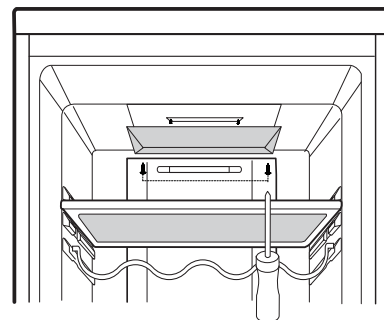


• Refrigerator Door

1. Refer to previous chapter "Instruction for Reversing Door Swing".
2. Pull out the Door Gasket to remove from the Door Foam Assembly, Refrigerator.

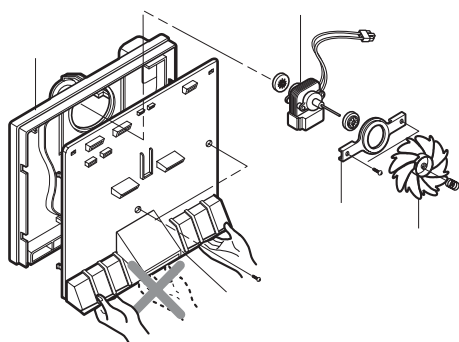
2. REFRIGERATOR ROOM LAMP

1. Unplug the power cord from the outlet.
 2. Turn out 2 screw and remove cover lamp assembly.
 3. Turn out 2 screw to remove LED PCB assembly if needed.
 4. Assemble in reverse order of disassembly.
- Replacement must be the same specification as original.



3. FAN AND FAN MOTOR

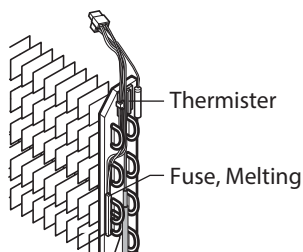
1. Remove freezer drawers.
2. Remove two cap screws and loosen two screws in Grille Fan.
3. Pull out the Grille Fan and Shroud, F.
4. Disconnect the housing of lead wire.
5. Separate the Fan Assembly.
6. Lose 2 screw fixed to the Bracket.
7. Pull out Shroud, F remove the Fan Motor Assembly.
8. Separate the Motor Bracket and Rubber.



4. DEFROST CONTROL ASSEMBLY

Defrost Control Assembly consists of Thermistor and Fuse, Melting. Thermistor functions to defrost automatically and it is attached to metal side of the Evaporator and senses temperature. Fuse, Melting is a kind of safety device for preventing overheating of the Heater when defrosting. At the temperature of 77°C, it stops the emission of heat from the Heater.

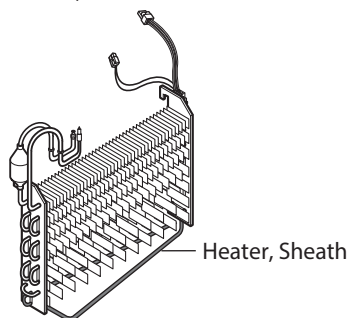
1. Pull out the Shroud, F after removing the Grille.
2. Separate the connector connected with the Defrost Control Assembly and replace new one.



5. HEATER, SHEATH

In this refrigerator, Heater, Sheath is used for defrosting heater. During heating, the temperature of heater rises about 300 ~ 350. Therefore, be careful not to burn while servicing.

1. After removing the Grille and Shroud, separate the Heater, Sheath by disconnecting the connectors.
2. Exchanged Heater, Sheath and connected the housing.



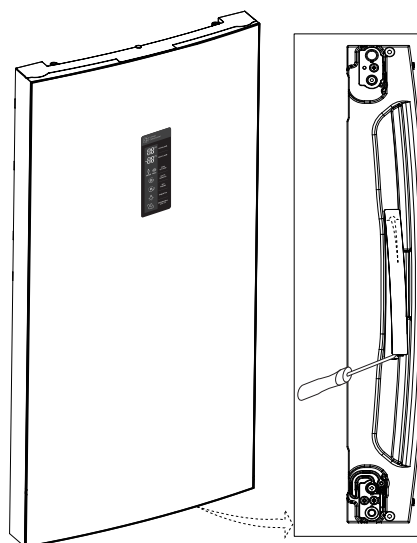
6. DISPLAY REMOVE

1. Insert the blade of a knife in the middle bottom of the screen carefully.
2. Tilt the knife down until the display while latches do not come out of the grooves.
3. Remove the display.



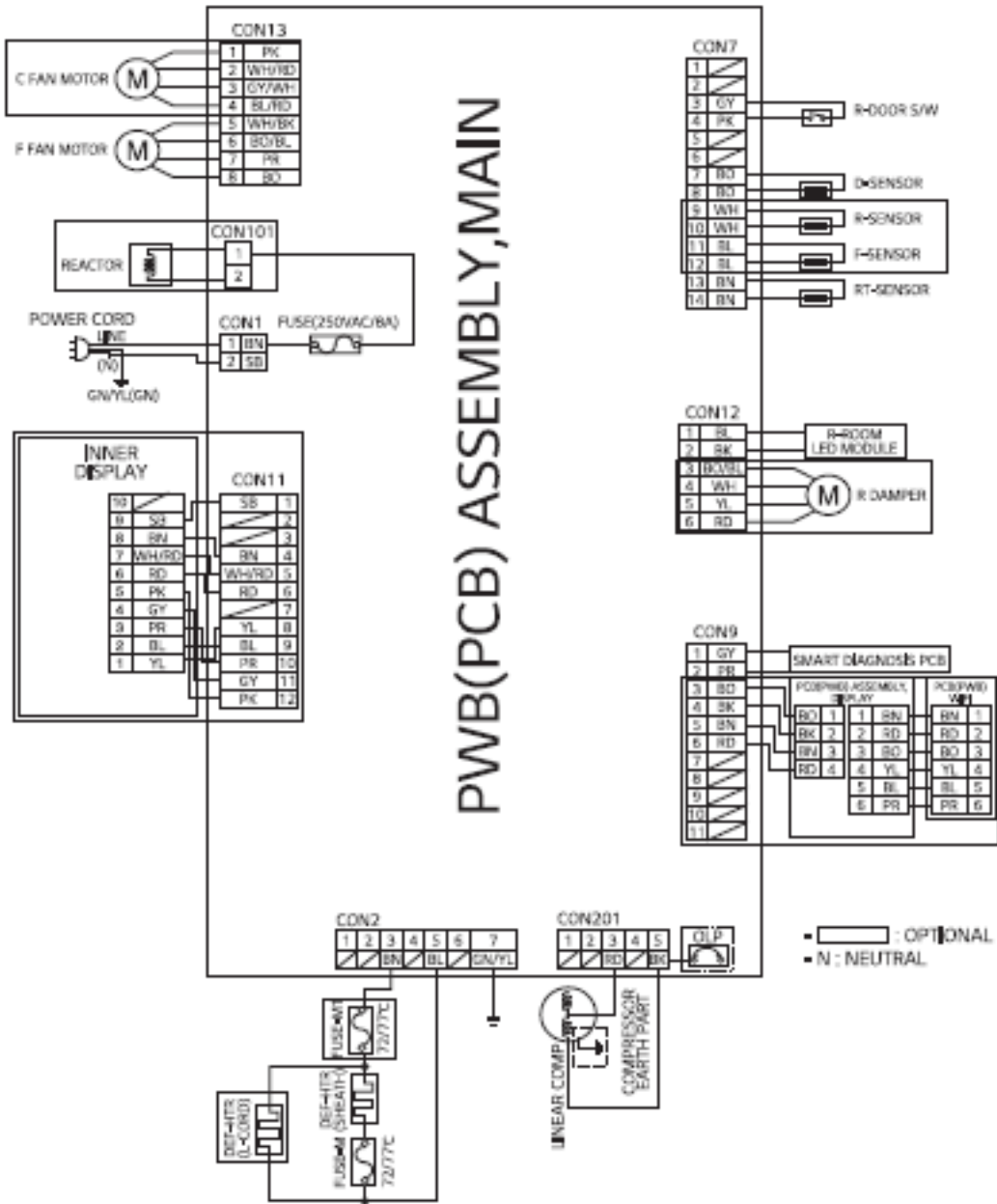
7. BACKLIGHT LED IN THE DOOR

1. To remove LED move cover LED to the left side for 2 mm in the lower part of the door. Then insert flat screwdriver in the gap and extract LED cover.
2. Disconnect the connector and remove LED.



GA-B499Y**Z

CIRCUIT DIAGRAM



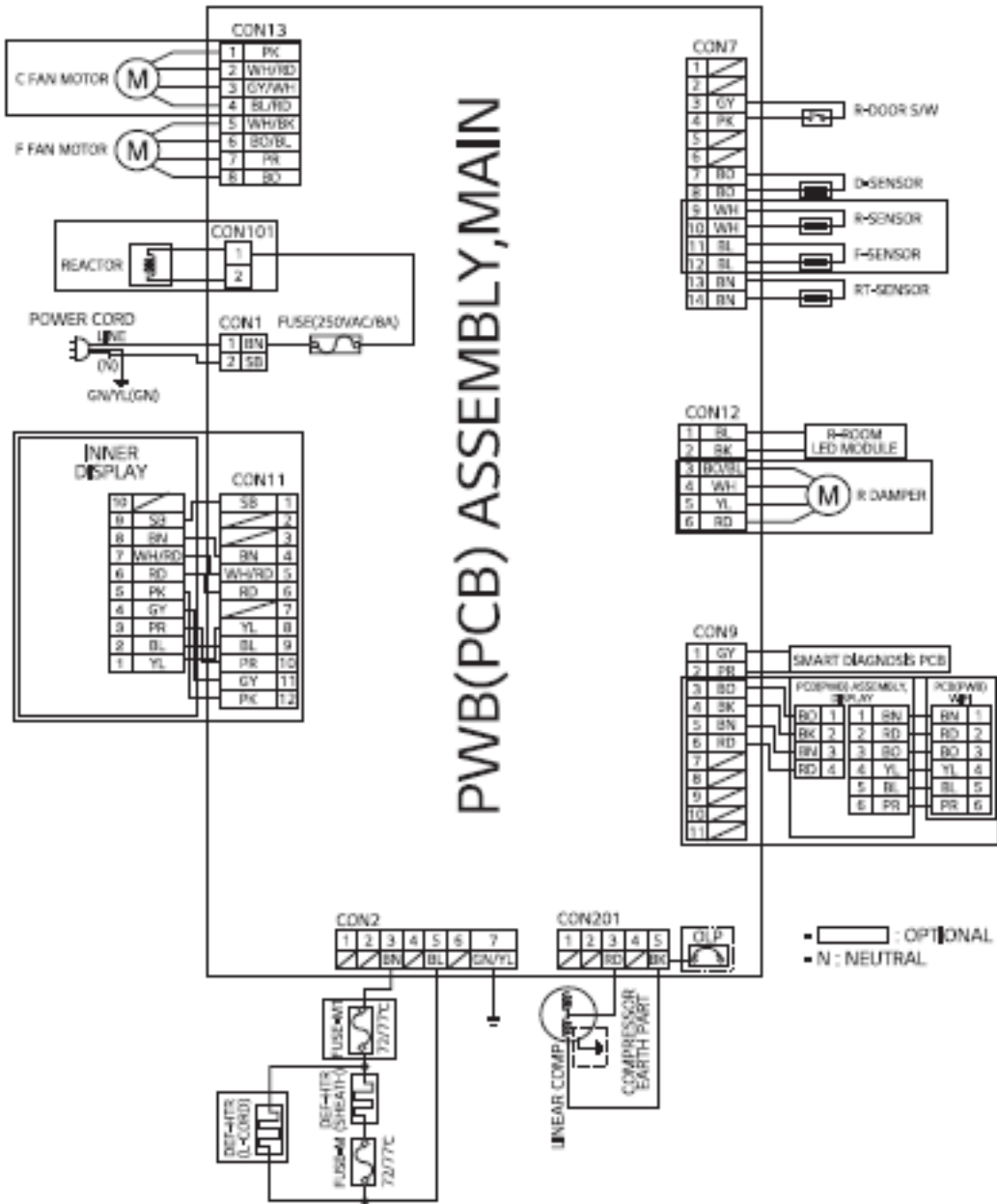
MEZ65081112

• THIS REFRIGERATOR IS ELECTRONIC ACTIVATION TYPE, SO WHEN POWER PLUG IS UNPLUGGED FROM THE SOCKET, PLUG IT IN AGAIN AFTER AT LEAST 5 MINUTES. IF IT IS PLUGGED IN RIGHT AWAY, THE COMPRESSOR OPERATION MAY BE STRESSED AND CAUSE DISORDER.

BK:BLACK	RD:RED	BO:BRIGHT ORANGE	GN:GREEN	WHRD : WHITE/RED	BLWH : BLUE/WHITE
BL:BLUE	GY:GRAY	SB:SKY BLUE	PK:PINK	BK/YL : BLACK/YELLOW	YL/BK : YELLOW/BLACK
BN:BROWN	PR:PURPLE	YL:YELLOW	WH:WHITE	BK/WH : BLACK/WHITE	PR/WH : PURPLE/WHITE
BO/BL : BRIGHT ORANGE/BLUE	GY/WH: GRAY/WHITE	WH/BL : WHITE/BLUE	WH/GN : WHITE/GREEN	RD/YL : RED/YELLOW	WH/GN:WHITE/GREEN
	WH/BK:WHITE/BLACK				

GA-B499Z**Z

CIRCUIT DIAGRAM



MEZ65081112

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BO/BL : BRIGHT ORANGE/BLUE	GY/WH: GRAY/WHITE	WH/BL : WHITE/BLUE	WH/BN : WHITE/BROWN	WH/GR : WHITE/GREEN	RD/YL : RED/YELLOW
	WH/BK:WHITE/BLACK			WH/GR : WHITE/GREEN	WH/GR : WHITE/GREEN

1. Inverter Linear Compressor

Check for defect of the inverter linear compressor in following orders:

1) Method to Measure Compressor Winding Resistance

Normal Determination Criteria.

The compressor winding resistance can be determined as normal if resistance values show the values as described in below figure when measuring resistance values of the harness (connected with compressor) to connect. Connect201(CON201) of the main PWB as shown in below figure.

Defect Determination Criteria

- Check connection status of the Compressor Connection Harness-P(Lead Wire) which is located at the M/C room where resistance values measured at the CON201 Housing are shown as infinite or several hundred MΩ . Separate connecting wires of the M/C room (A-point in Figure) and then measure resistance values at the connecting wires again. The compressor can be determined as normal if resistance values are shown as standard resistance value. Check connection status of a harness.

Defect at M/C room connection contact or CON201 Housing contact, short-circuit of harness)

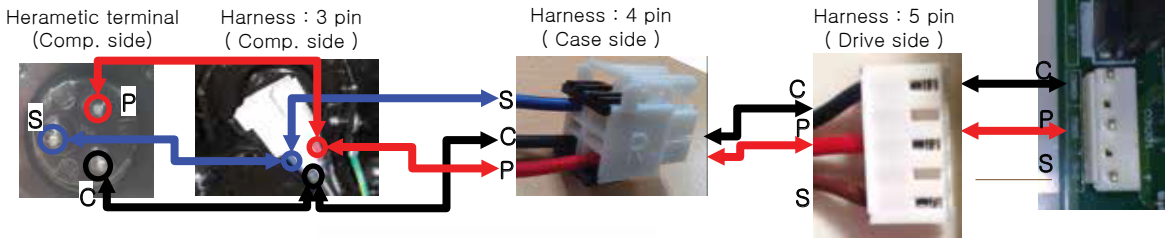
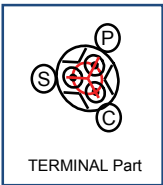
- Where resistance values measured at A-point are also shown as infinite or several hundred MΩ , disassemble a cover PTC of the compressor terminal and check the terminal connecting status at the B-point in Figure.
- Where there is no failure in the wiring status and resistance values are shown as infinite or several hundred MΩ , it may be determined as defect of compressor.
- Since if there is no failure in resistance values of the compressor, it may be defective Main PWB, replace the Main PCB and check for normal operation of the compressor.
- When determining any defect through resistance measuring, it can be determined as normal if resistance values show as described in the below figure by measuring ① power and ③ common terminal or ② full power and ③ common terminal. However, resistance values are measured when measuring ① power and ② full but measuring is meaningless since they cannot become criteria for determining defect (measuring not required).

Caution

1. Be sure to powering off the refrigerator and measure after several minutes has passed.
2. If not accurately measuring resistance, wrong determination may be guided. (Difference of resistance value of several W or so may occur.)

Connect harness to linear compressor FMC088NAMA

P : Power Line
S : Save Line
C : Common Line



Ex) S - C : 803 turn (17.4Ω 23°C)
S - P : 192 turn (5.3Ω 23°C)
P - C : 611 turn (12.1Ω 23°C)

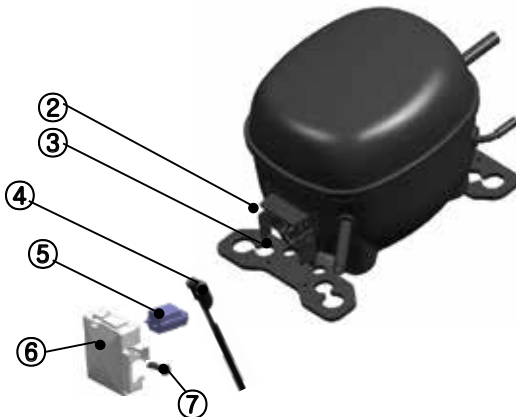


Fig. 1 Linear Controller exploded view

The correct position connect Harness to compressor



Parts List

Ref.	Description	Ref.	Description
1	Compressor	7	Cover Screw
2	Bracket Terminal		
3	Hermetic Terminal		
4	Harness (Compressor Cable)		
5	OLP (Overload protector)		
6	Cover PTC		

2) Method to Determine Defect of Inverter Linear Drive

Determination of Comp Operation

Separate the back cover at the rear of refrigerator and determine for possible operation while touching the compressor with the hands with insulation gloves worn.

Comp Operation

- Determine possible trip by checking operation status if cold air comes out after opening the doors of the R-Room.

Protective Logic (Trip)

- To protect the compressor from abnormal operation, this logic is used to temporally stop the refrigerator when abnormal operation occurs and to re-operate it after abnormal signal disappears.

Compressor protection Logic Table

	App.	Requirement	Waiting Time	The number of LED blinking
FCT0 Trip	A-Inv.	Initial, Motor sensing Voltage > 2.5V+20%	30"	1
Stroke Trip	A-Inv.	Piston overruns the designed range.	1'00"	2
Locked Piston Trip	A-Inv.	Piston is locked.	2'30"	5
Current Trip	A-Inv.	Current overruns the designed range	6'00"	6
IPM Fault	A-Inv.	IPM pin 14 output voltage = low (IPM Short, High current input, or low voltage input)	20"	7
Communication Error	A-Inv.	Checksum error	-	8

* If LED of PCB is blinking, Refer to next page.

3) LED blinks one time, then repeats (FCT0 Trip)



- FCT0 : When same trip occurs after power reset, change PCB.
- Because it is occurred by overvoltage (more than 2.5V) at voltage and current sensing parts, PCB has to be changed.

4) LED blinks two times, then repeats (Stroke Trip)



— Purpose: Prevent abnormally long piston strokes.

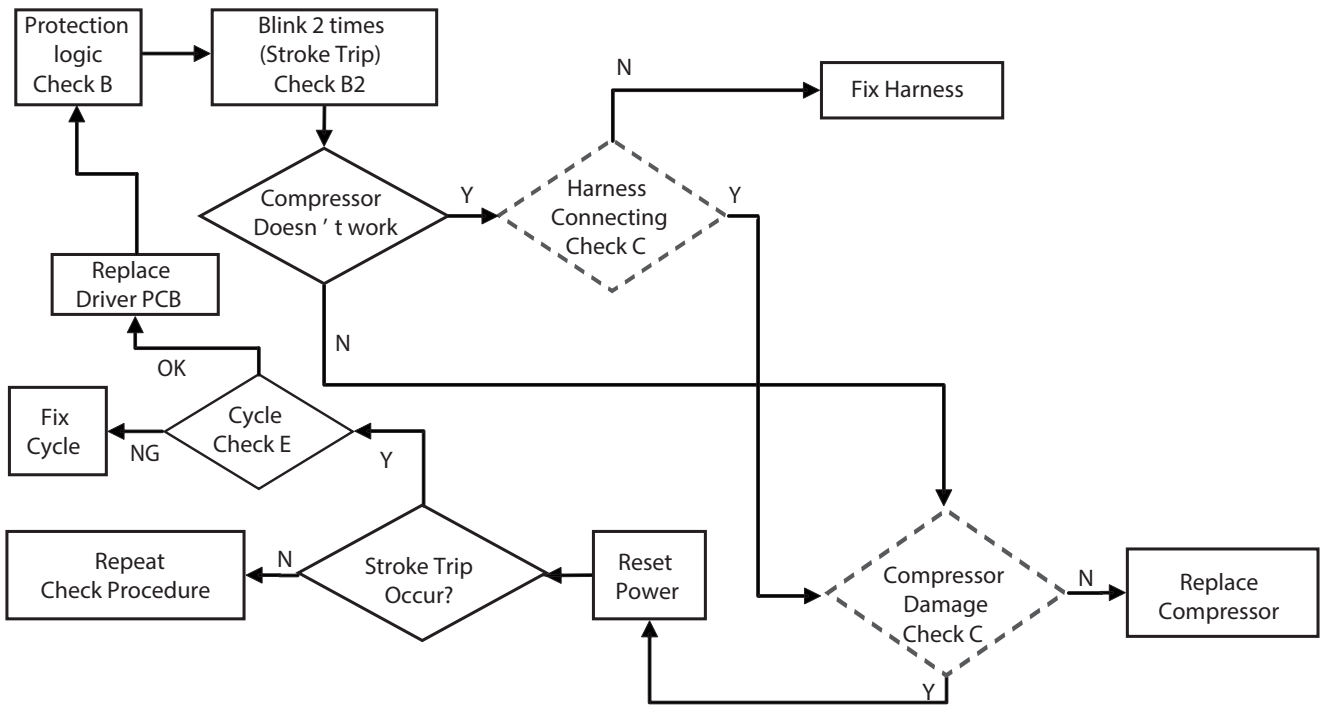
Case 1. If compressor doesn't work and LED blinks

- 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.

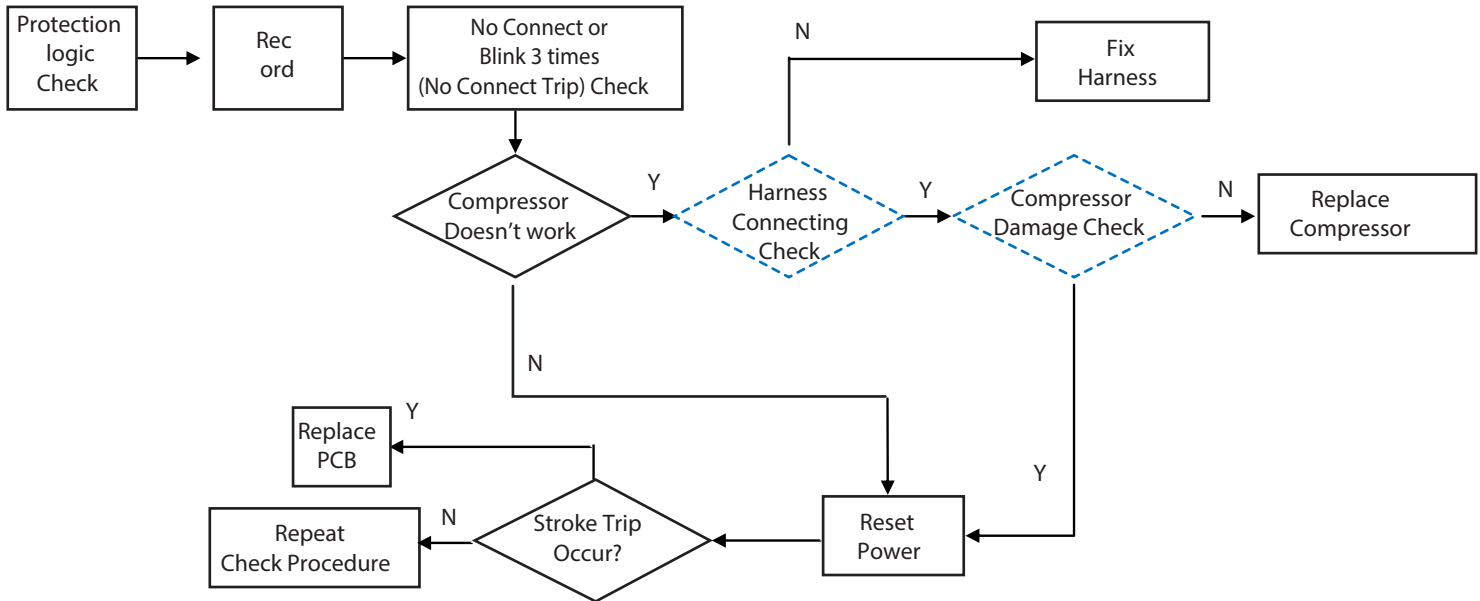
Logic: Compressor is forced to stop and then tries to restart after 1 minute.



5) No Connect Trip, LED blinks 3 times



- Purpose: Check for Connecting error. Prevent Over Current, Over Voltage.
- Cause: Harness Error between PCB and Compressor, Insulation Defect.
- Logic: Compressor is forced off and tries to restart within 40 seconds.

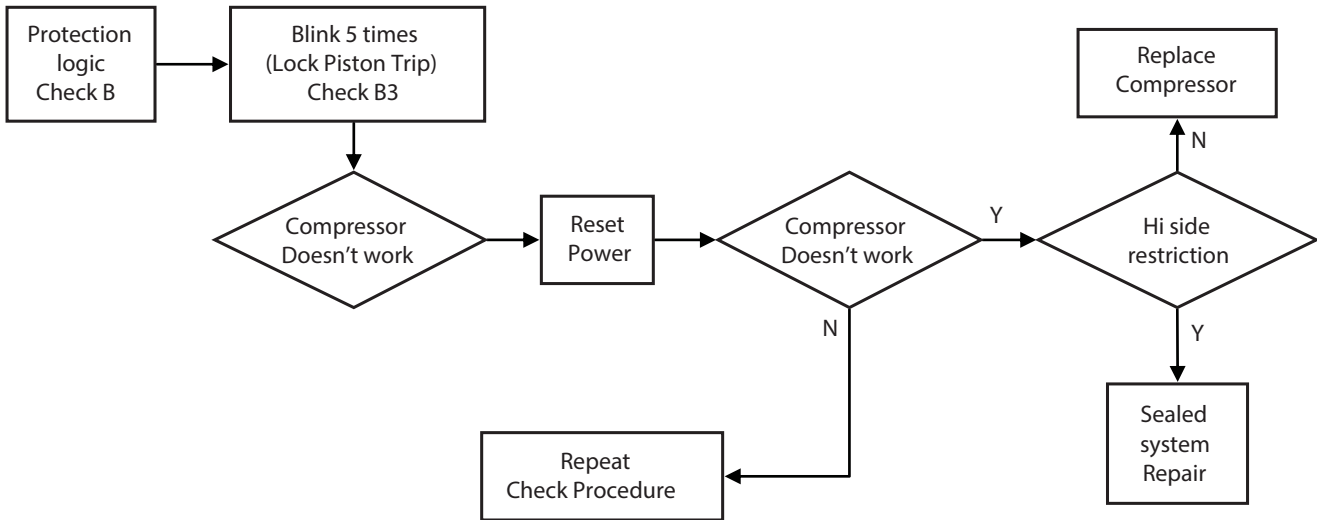


6) LED blinks five times, then repeats (Locked Piston)



Blink Blink Blink Blink Blink OFF

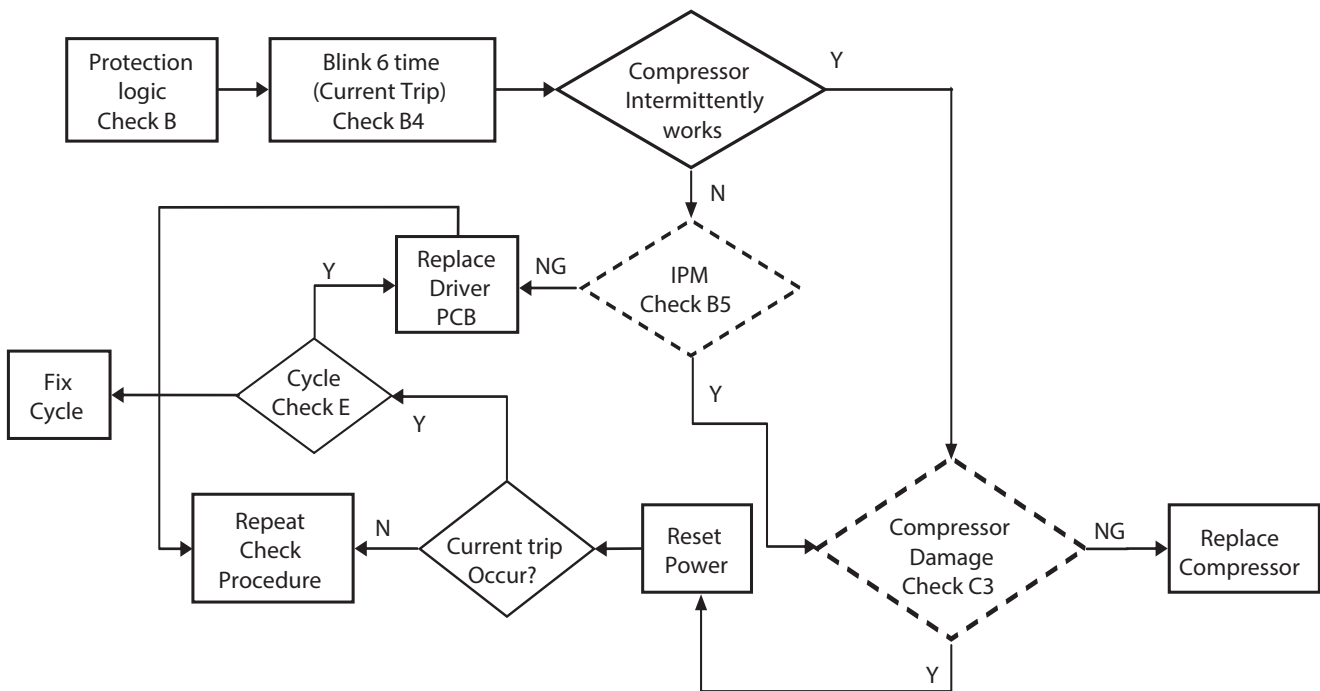
- Purpose: To detect locked piston
- Cause: Lack of oil to the cylinder, cylinder or piston damaged and or restricted discharge.
A Locked Piston can also be caused by foreign materials inside the compressor.
- Logic: Compressor is forced off and tries to restart within 2.5 minutes.



7) LED blinks six times, then repeats (Current Trip)



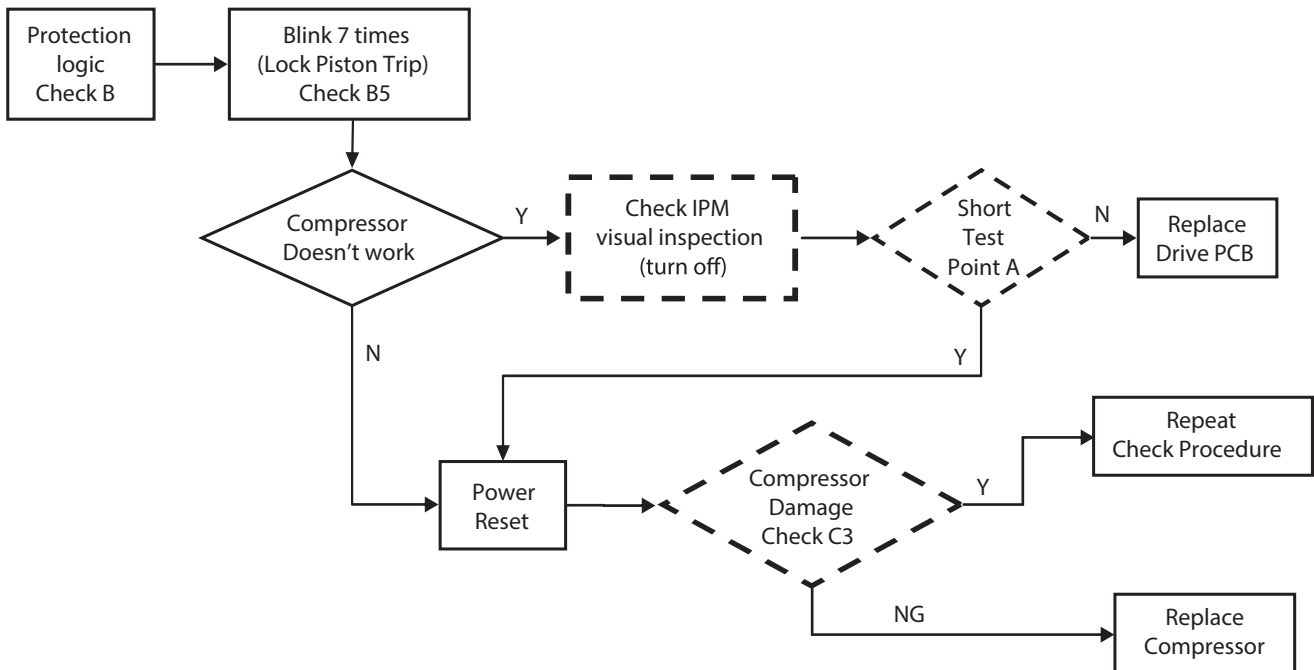
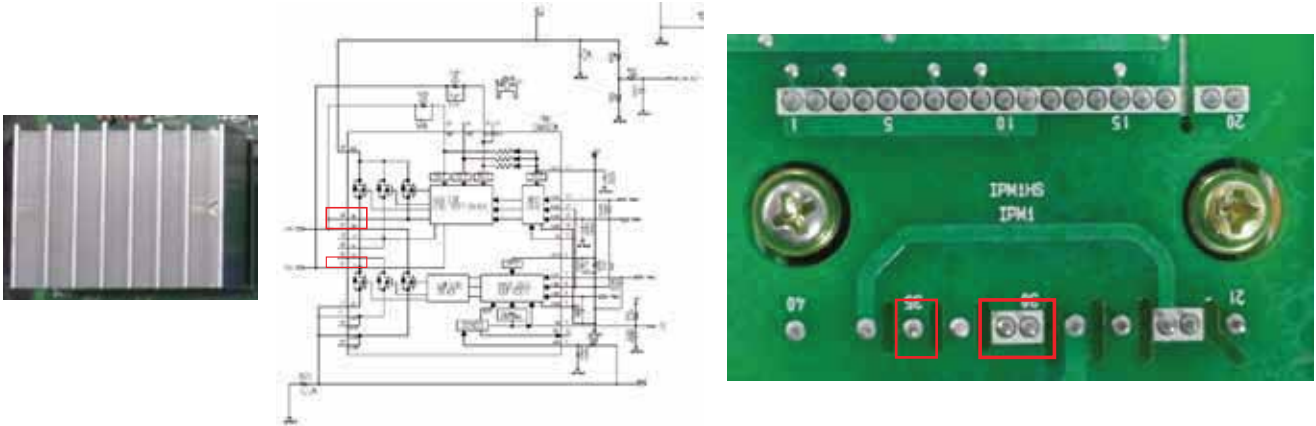
- Purpose: Prevent over-current (overload protect)
- Cause: Ambient temperature is high (over 43°C) and/or refrigerator's condenser air movement is restricted.
- Condenser Fan is stopped, restricted discharge line, compressor is damaged, or IPM device is defective.
- Logic: Compressor is forced off and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



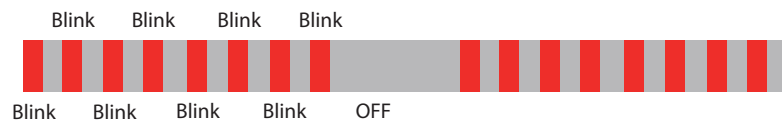
8) LED blinks seven times, then repeats (IPM Fault)



- 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 after 20 sec.



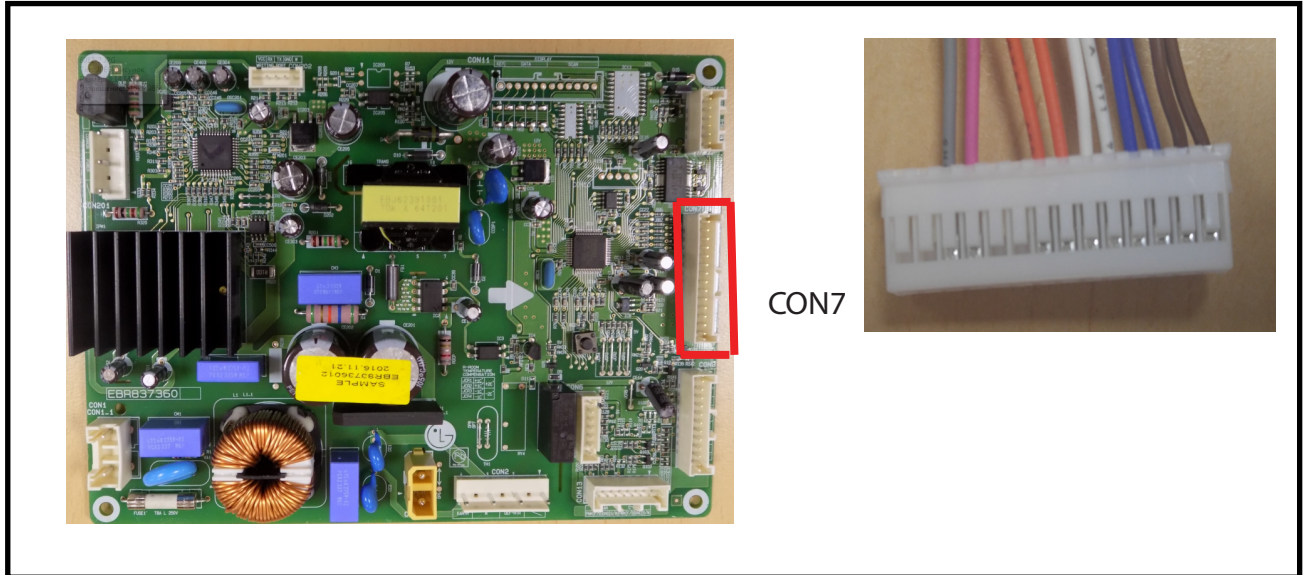
9) LED blinks eight times, then repeats (Communication Error)



- Communication Error : When same trip occurs after power reset, change PCB.
- Because Program is not matching in MICOM, program has to be rewritten or PCB has to be changed.

1. Freezer Sensor Error (FS E)

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




		Resistance [Ω]	
CON7 11 th pin ~ 12 th pin		Short	0
		Open	OFF
		Other	Normal

CON7		Resistance [Ω]		
1	/	CON7 11 th pin ~ 12 th pin		
2	/			
3	GY			
4	PK			R-DOOR S/W
5	/			
6	/			
7	BO			D-SENSOR
8	BO			
9	WH			R-SENSOR
10	WH			
11	BL			F-SENSOR
12	BL			
13	BN			RT-SENSOR
14	BN			

Freezer Sensor Error (FS E)

1
Is the Connector disconnected or loose between Main PCB and sensor?

Yes → Reconnect or repair the connector



CON7

No → [Next Step]

2
Check the Sensor resistance. Is resistance 0Ω (Sensor short)?

Yes → Change the Sensor

No → [Next Step]

3
Check the Sensor resistance. Is resistance ∞ (Sensor open)?

Yes → Replace the refrigerator

No → [Next Step]

4
Check the Temperature and resistance refer to the table. No problem?

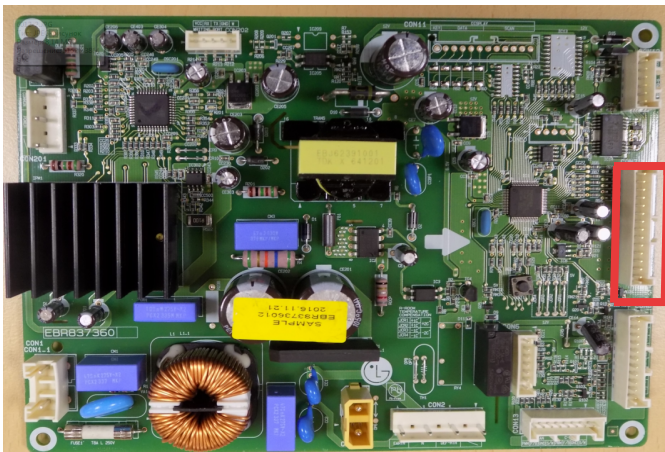
CON7 11 th pin ~ 12 th pin	Resistance [Ω]
-22° F / -30° C	40k
-13° F / -25° C	30k
-4° F / -20° C	23k
5° F / -15° C	17k
14° F / -10° C	13k
23° F / -5° C	10k
32° F / 0° C	8k

Yes → [Next Step]

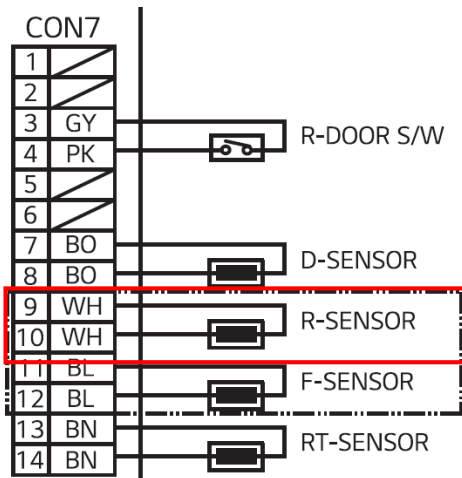
5
Explain to customer

3. Refrigerator Sensor Error (rSE)

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

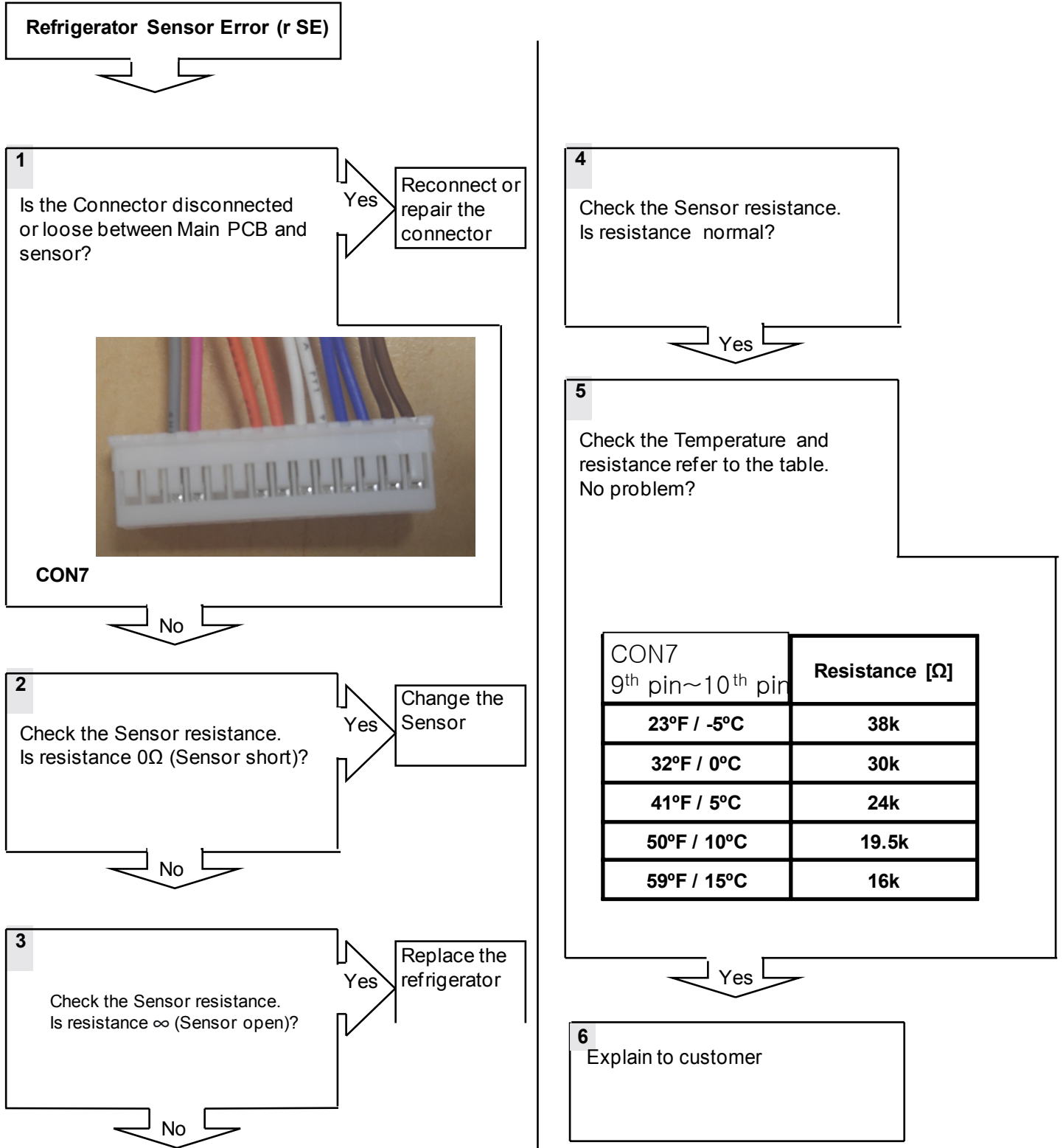


CON7



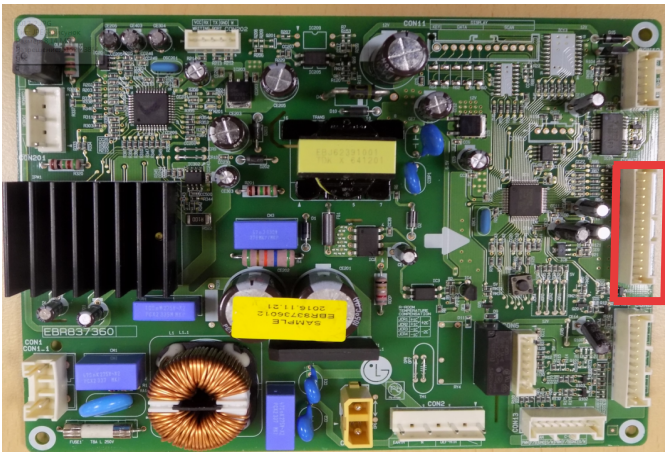
	Resistance [Ω]	
	CON7	Short
9 th pin~10 th pin	Open	OFF
	Other	Normal

CON7	Resistance [Ω]
9 th pin~10 th pin	
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

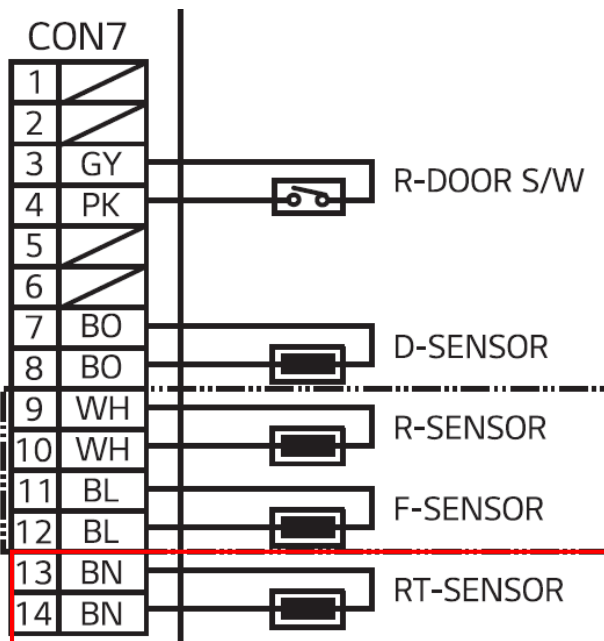


4. RT Sensor Error (rt E)

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

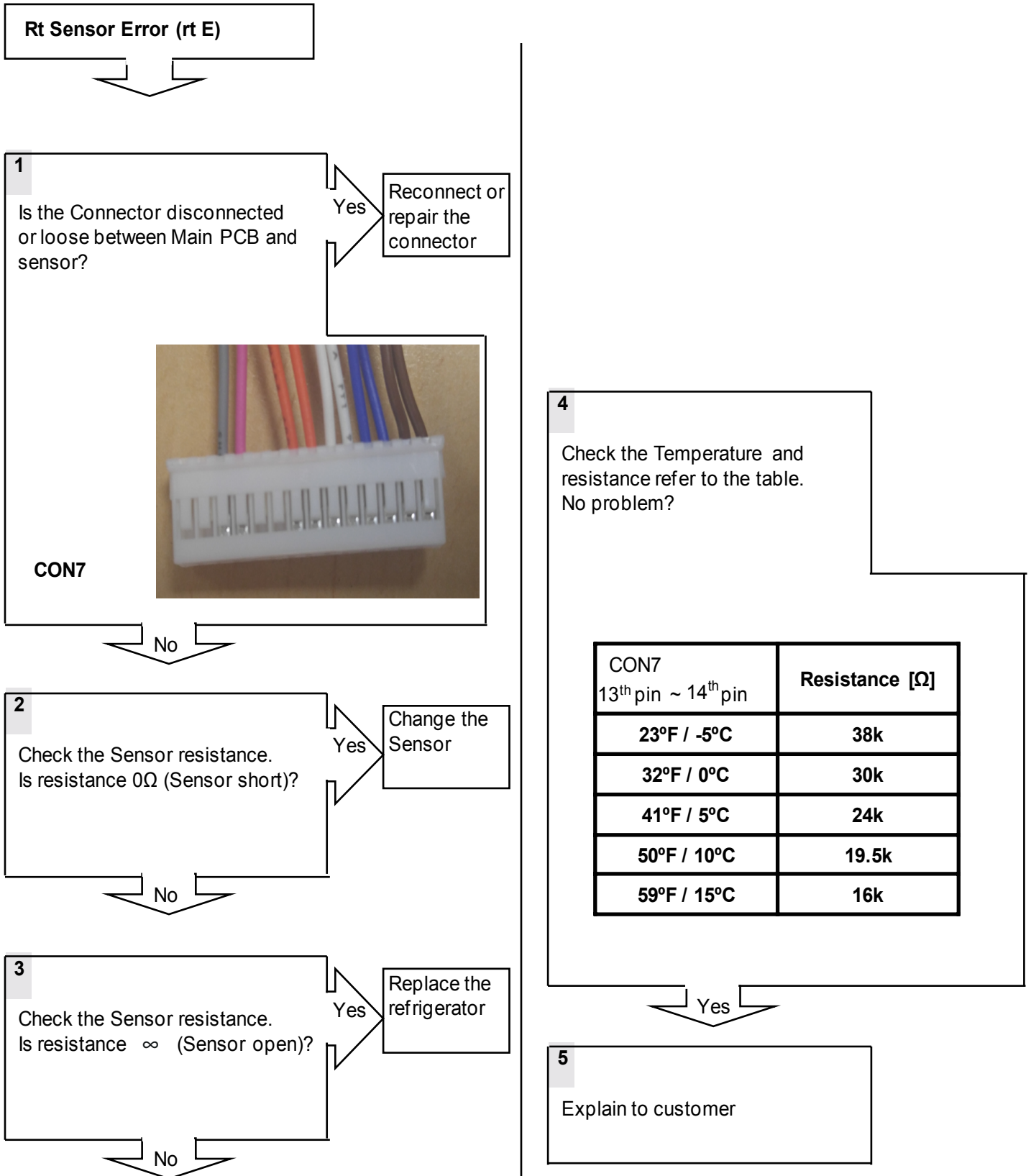


CON7



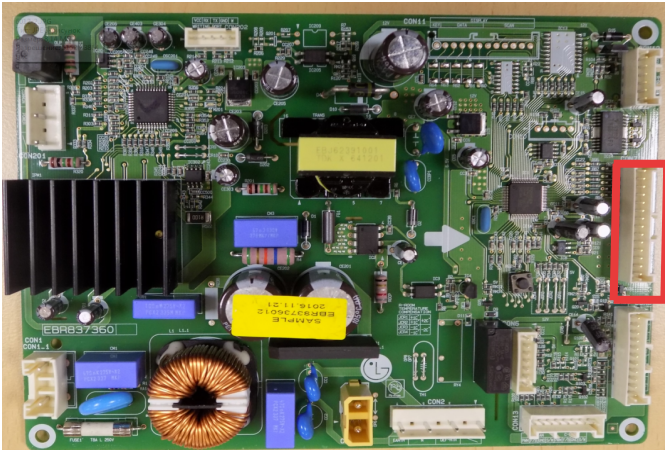
		Resistance [Ω]	
CON7 13 th pin ~ 14 ^h pin		Short	0
		Open	OFF
		Other	Normal

CON7 13 th pin ~ 14 th 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

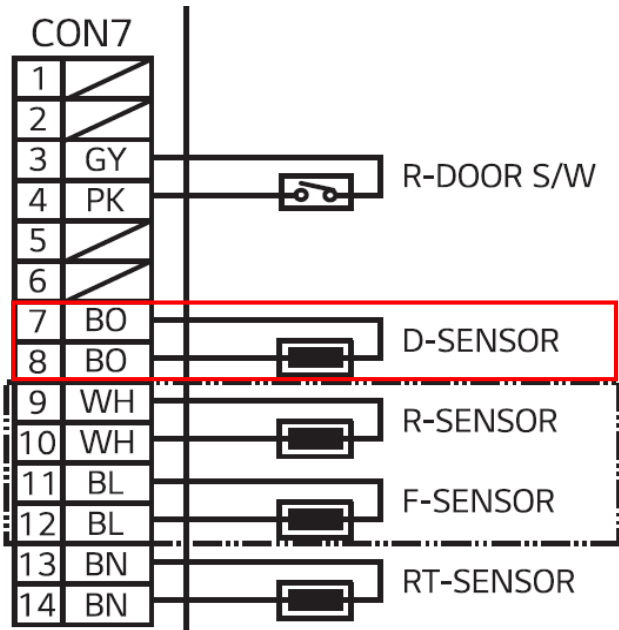
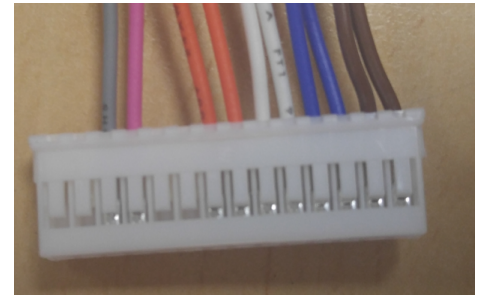
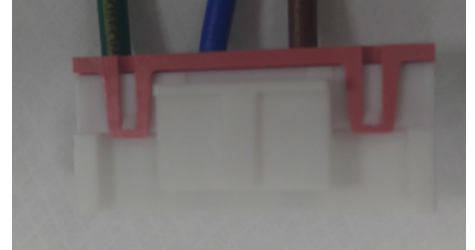


5. Defrost Sensor Error (dS F)

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



CON7



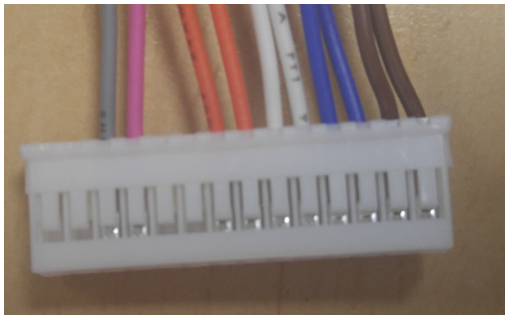
CON7 7 th pin ~ 8 th pin	Resistance [Ω]	
	Short	0
	Open	OFF
	Other	Normal

CON7 7 th pin ~ 8 th pin	Resistance [Ω]
-22° F / -30° C	130k
-13° F / -25° C	100k
-4° F / -20° C	77k
5° F / -15° C	60k
14° F / -10° C	47k
23° F / -5° C	38k
32° F / 0° C	30k

Defrost Sensor Error (dS F)

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 0Ω (Sensor short)?

Yes → Change the Sensor

No

3
Check the Sensor resistance. Is resistance ∞ (Sensor open)?

Yes → Replace the refrigerator

No

4
Check the Temperature and resistance refer to the table. No problem?

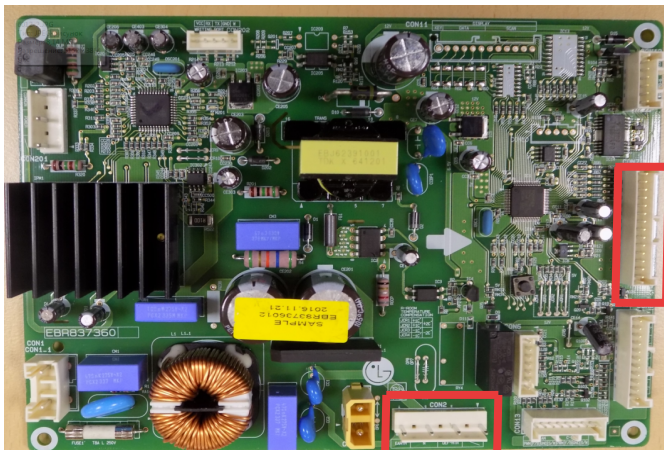
CON7 7 th pin ~ 8 th pin	Resistance [Ω]
-22° F / -30° C	130k
-13° F / -25° C	100k
-4° F / -20° C	77k
5° F / -15° C	60k
14° F / -10° C	47k
23° F / -5° C	38k
32° F / 0° C	30k

Yes

5
Explain to customer

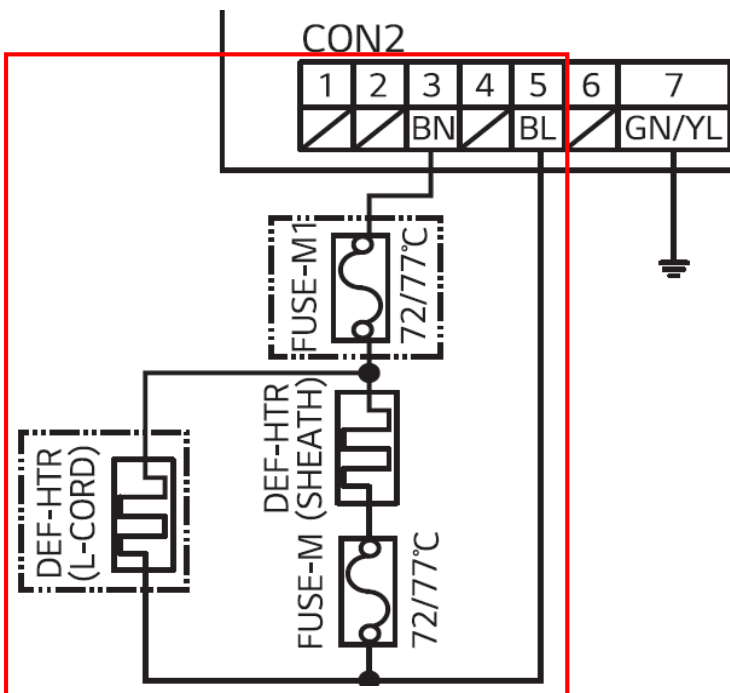
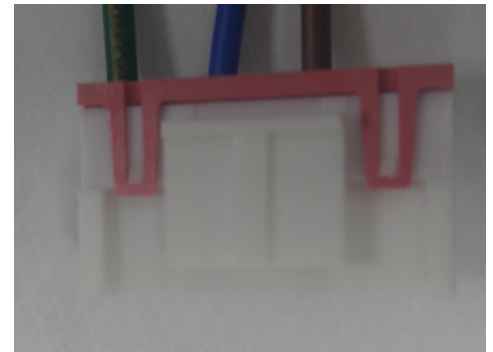
6. Defrost Heater Error (dH F)

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



CON7

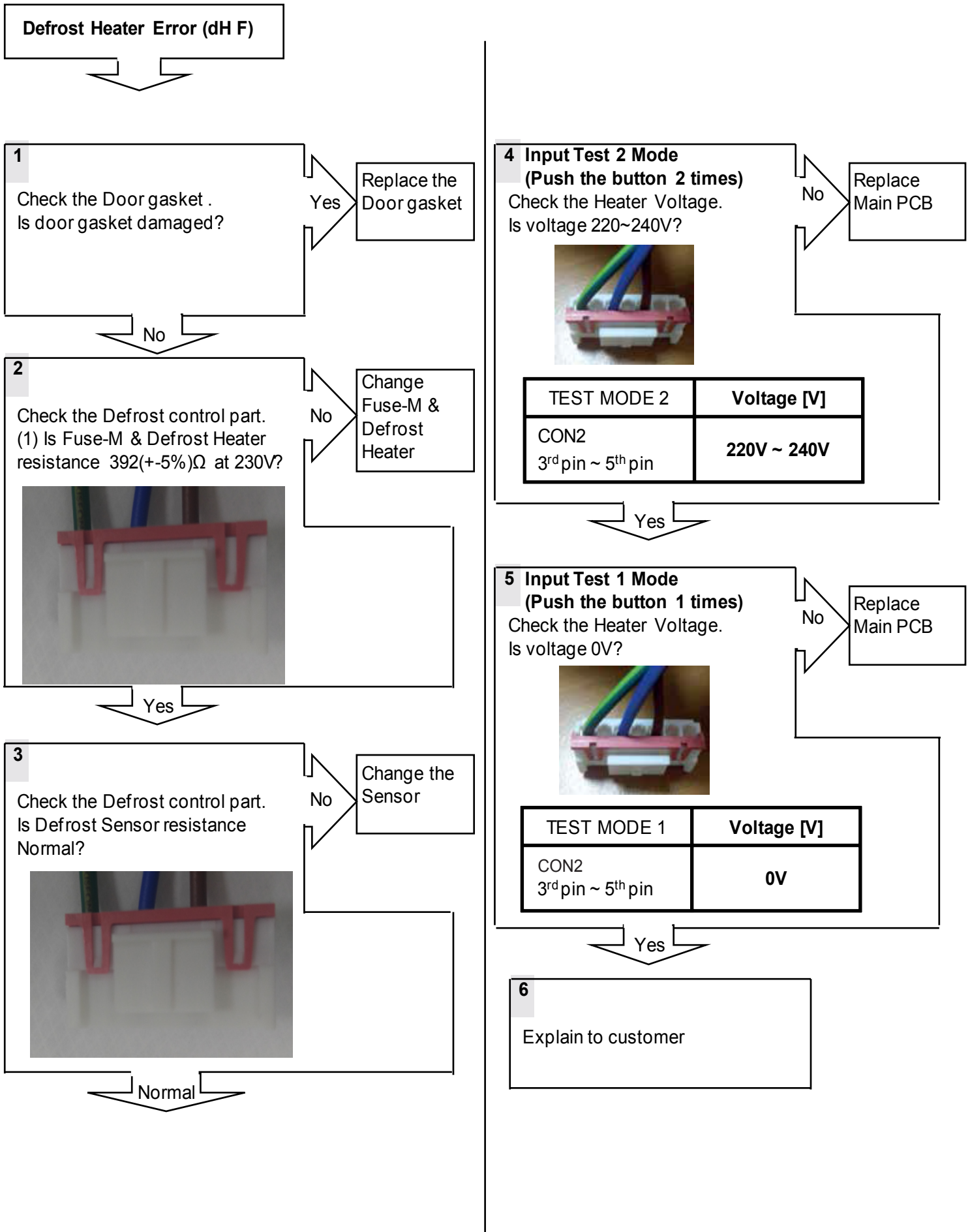
CON2



Part	Resistance [Ω]
FUSE-M & Defrost Heater	230V : 392(+/-5%) Ω
Defrost Sensor	Normal

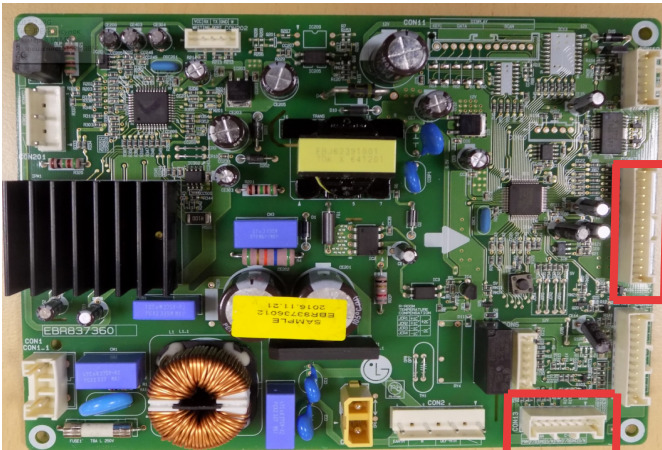
TEST MODE 1	Voltage [V]
CON2 3 rd pin ~ 5 th pin	0V

TEST MODE 2	Voltage [V]
CON2 3 rd pin ~ 5 th pin	220V ~ 240V



7. Freezer Fan Error (FF E)

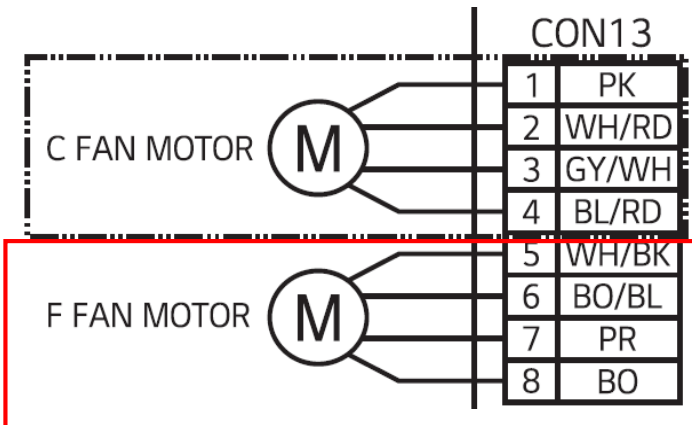
Symptom	Check Point
1. FF E	1. Check the air flow 2. Check the PCB Fan motor voltage



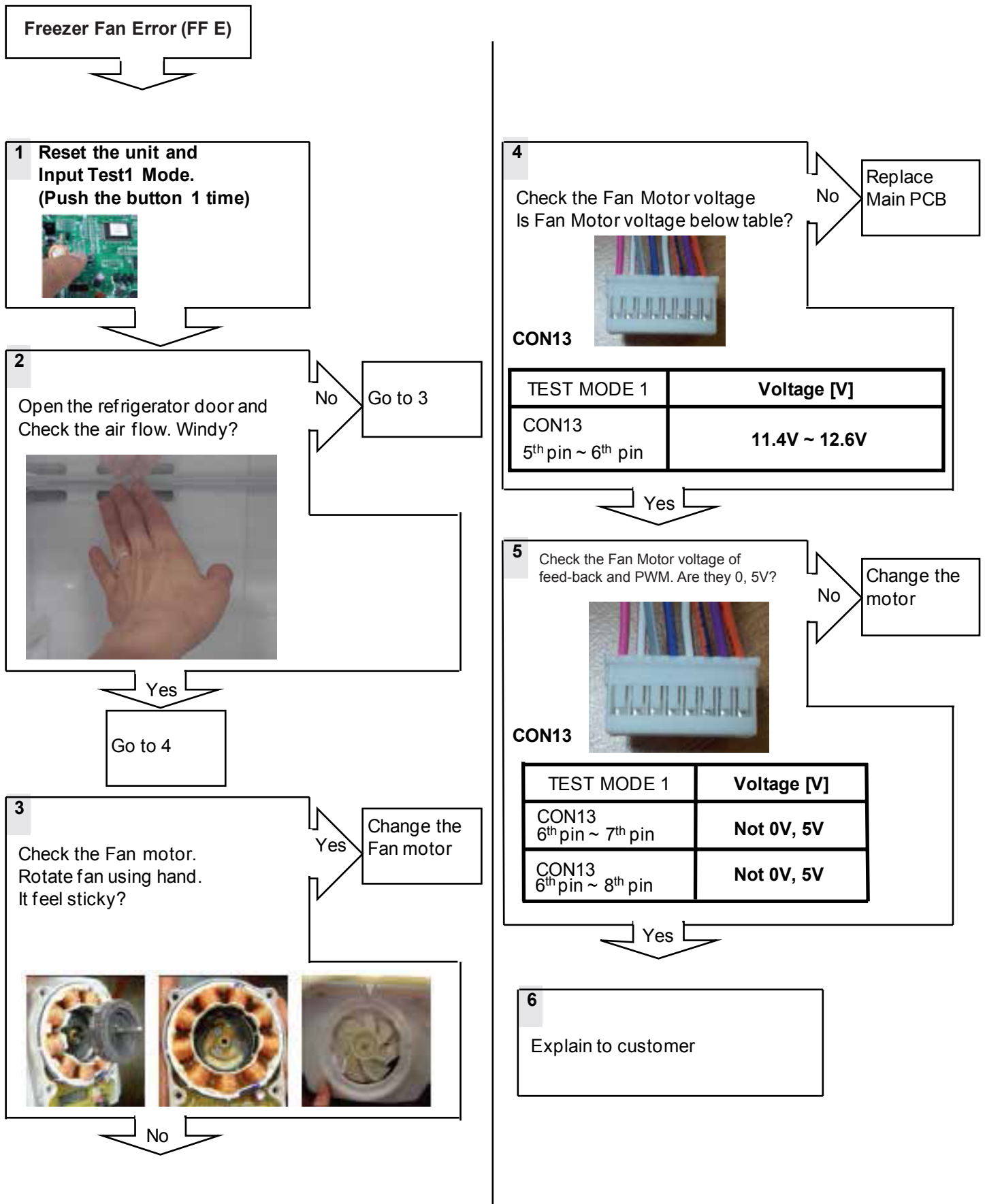
CON7



CON13

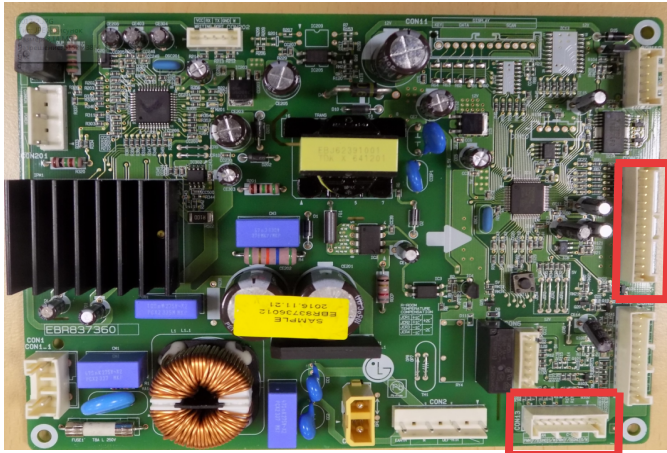


TEST MODE 1	Voltage [V]
CON13 5 th pin ~ 6 th pin	11.4V ~ 12.6V
CON13 6 th pin ~ 7 th pin	Not 0V, 5V
CON13 6 th pin ~ 8 th pin	Not 0V, 5V



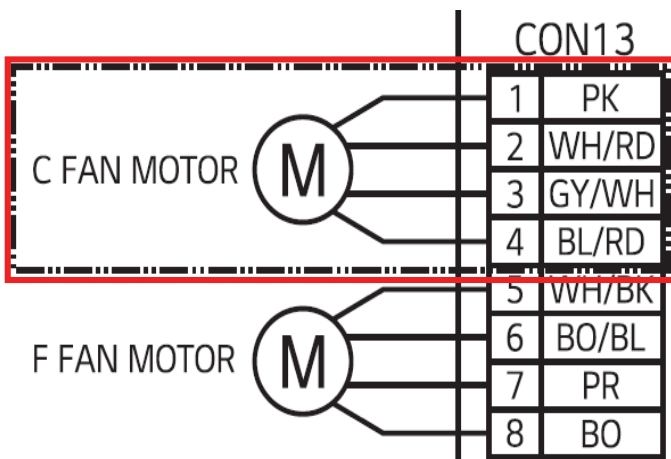
8. Condenser Fan Error (CF E)

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

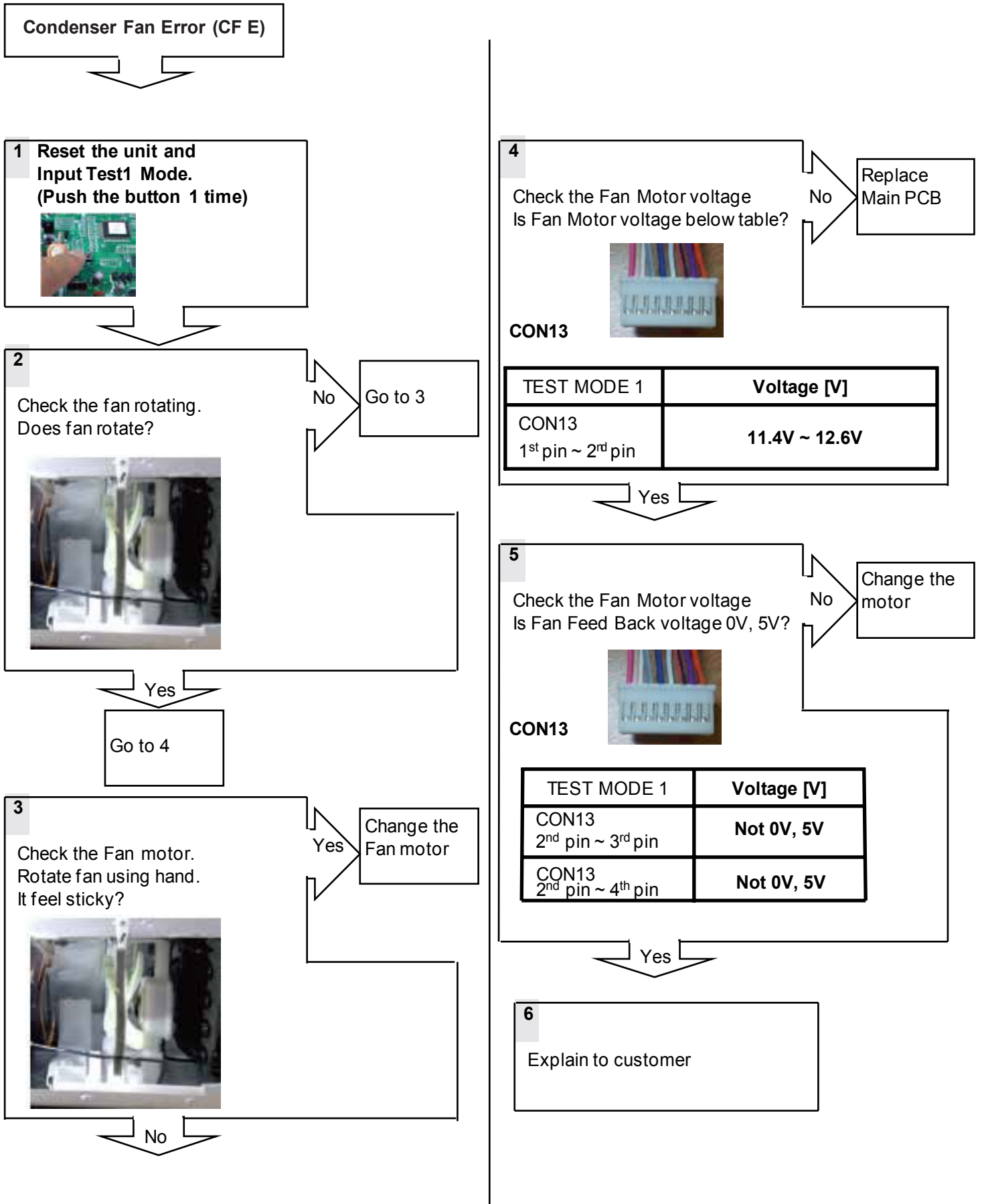


CON7

CON13

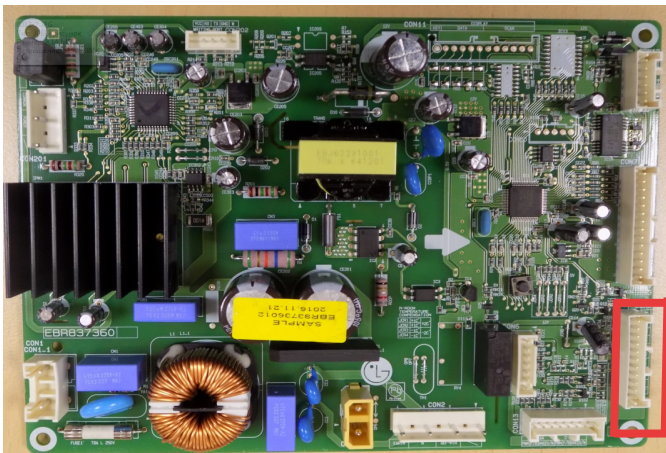


TEST MODE 1	Voltage [V]
CON13 1 th pin ~ 2 nd pin	11.4V ~ 12.6V
CON13 2 nd pin ~ 3 rd pin	Not 0V, 5V
CON13 2 nd pin ~ 4 th pin	Not 0V, 5V

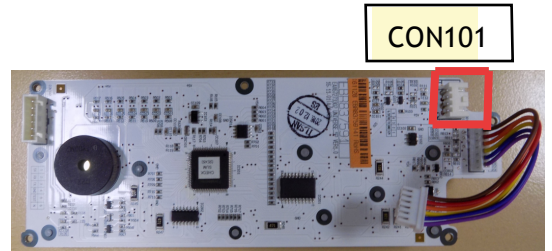


9. Communication Error (CO E)

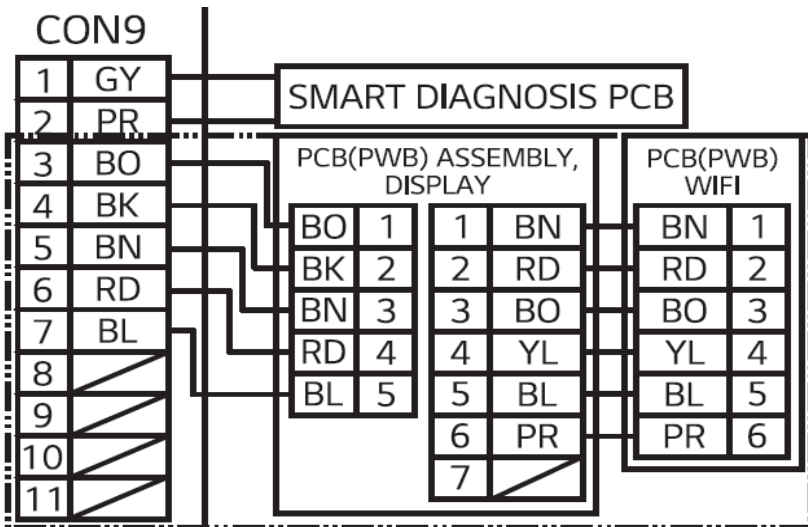
Symptom	Check Point
1. CO E	1. Check for a loose connection 2. Check Voltage output.



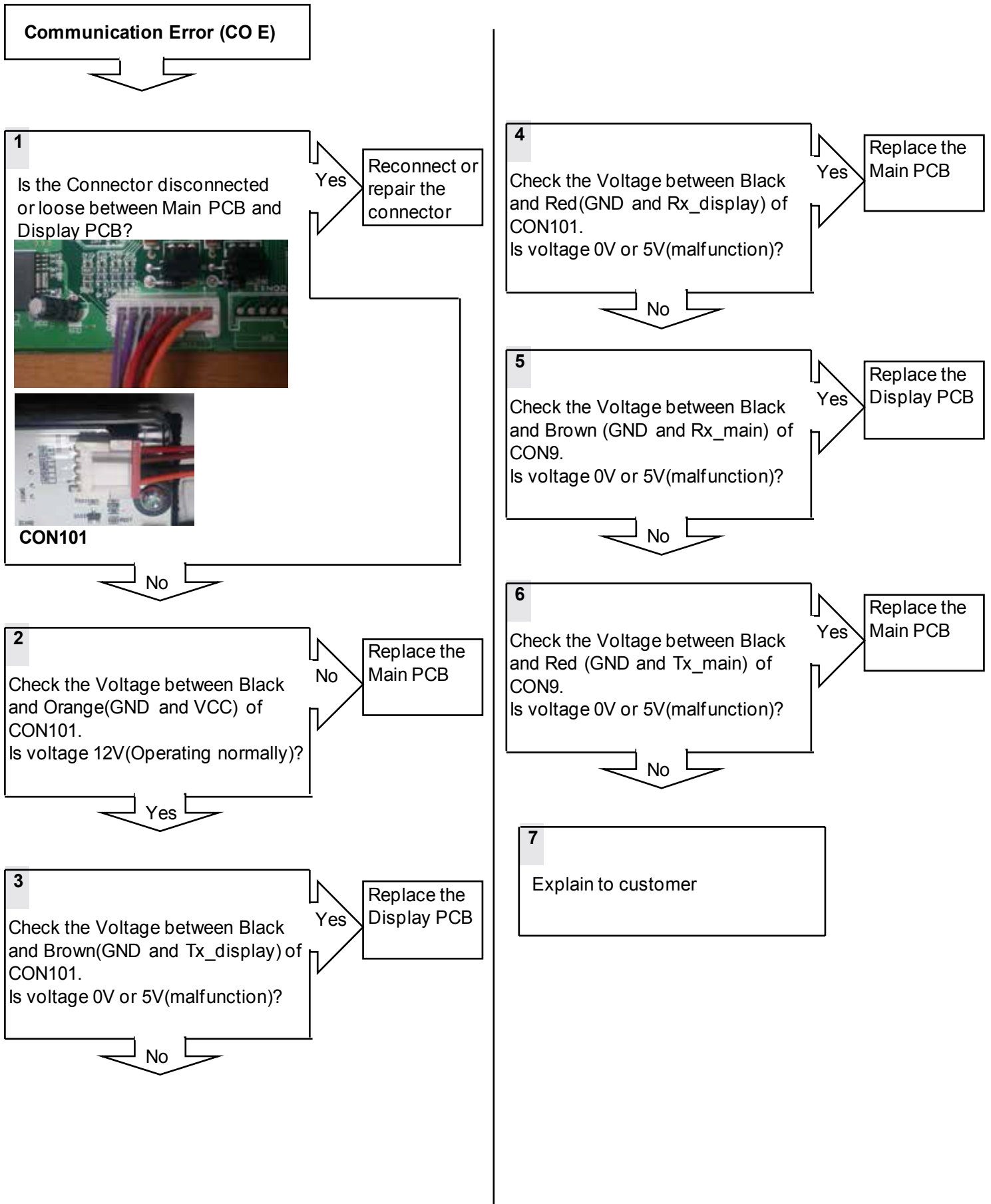
CON9



CON101

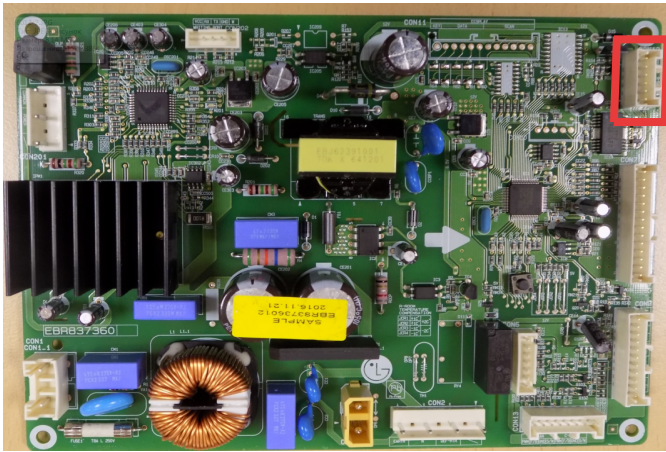


	TEST MODE 1	VOLTAGE [V]
PCB	CON101 1st pin ~ 2nd pin	12V
	CON101 2nd pin ~ 3rd pin	Not 0V, 5V
	CON101 2nd pin ~ 4th pin	Not 0V, 5V
PCB	CON9 2nd pin ~ 3rd pin	Not 0V, 5V
	CON9 2nd pin ~ 4th pin	Not 0V, 5V

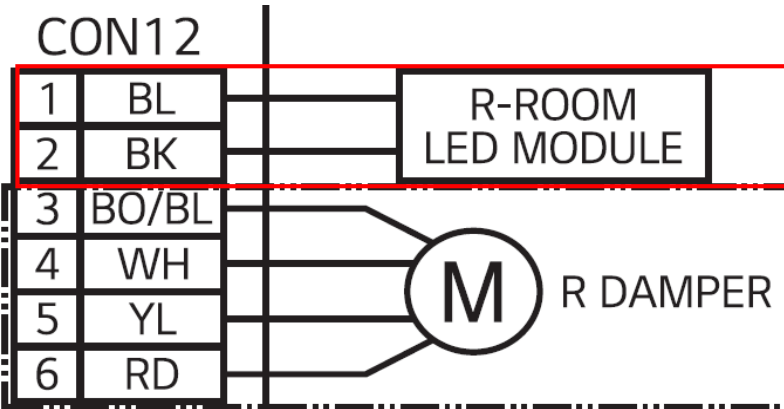


10. Refrigerator room lamp doesn't work

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



CON12




	Resistance(Ω)	
Door S/W Resistance	Door close	Door open
	0 Ω	Infinity

	Voltage(V)	
CON12 1st pin ~ 62d pin	Door Open	Door Closed
	12V	0V

Refrigerator room lamp doesn't work


1
Check the Refrigerator door switch.

Yes → Change the Door S/W



No → [Next Step]

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




Resistance [Ω]		
Door S/W	Magnet near SW	0
	Without magnet	Infinity

No → Change the Door S/W

Yes → [Next Step]

3
Check the PCB Voltage. Is CON12 1st pin ~ 2nd pin voltage below voltage status?




Door Status	Voltage [V]
Closed	0V
Open	12V

No → Change the PCB

Yes → [Next Step]


4
Check the LED Lamp voltage. Is voltage 12V? (While door open)



No → Change the LED Lamp

Yes → [Next Step]

5
Check the LED Lamp voltage. Is it 0~2V? (While door closed)



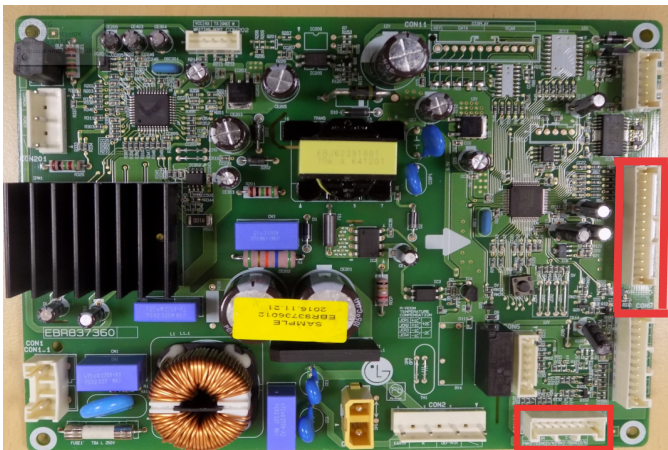
No → Change the Door S/W

Yes → [Next Step]

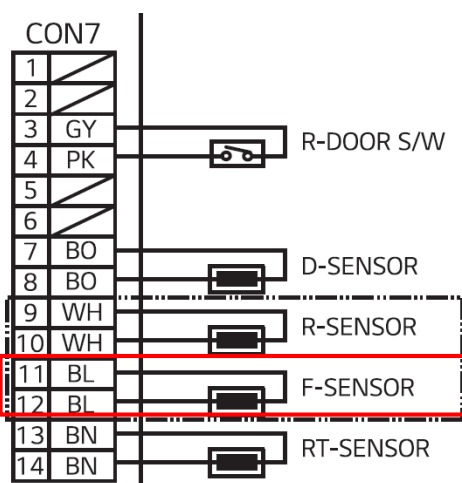
6
Explain to customer

11. Poor cooling in Freezer Compartment

Symptom	Check Point
1. Poor cooling in freezer room	1. Check the F- sensor resistance 2. Check the air flow 3. Check the air Temperature 4. Check the F-Fan motor voltage

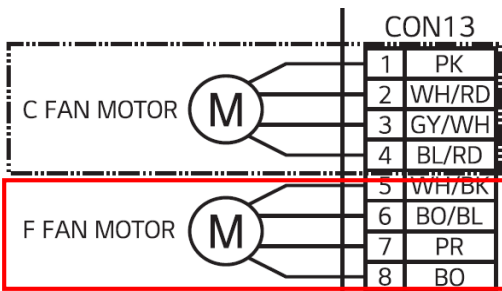


CON7



CON13


CON7 11 th pin ~ 12 th 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



TEST MODE 1	Voltage [V]
CON13 5 th pin ~ 6 th pin	11.4V ~ 12.6V
CON13 6 th pin ~ 7 th pin	Not 0V or 5V
CON13 6 th pin ~ 8 th pin	Not 0V or 5V


Poor cooling in Freezer Compartment

1 Check the sensor resistance.




CON7 11 th pin ~ 12 th 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

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

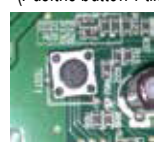


3 Open the refrigerator door and Check the air flow. Windy?



No
Check the F Fan Motor. Check the Freezer Control. Go to 5

4 Input test 2 Mode and Check the airflow. Windy? (Push the button 1 time)




5 Damper Checking method
Inputting Test Mode
Is damper normal

Point	Result
Test 1 Mode	Open
Test 2 Mode	Closed

No → Change the damper
Yes →


6 Check the Fan Motor voltage
Is Fan Motor voltage below table?



TEST MODE 1	Voltage [V]
CON13 5 th pin ~ 6 th pin	11.4V ~ 12.6V

No → Replace Main PCB
Yes →

6 Check the Fan Motor voltage of feed-back and PWM. Are they 0, 5V?



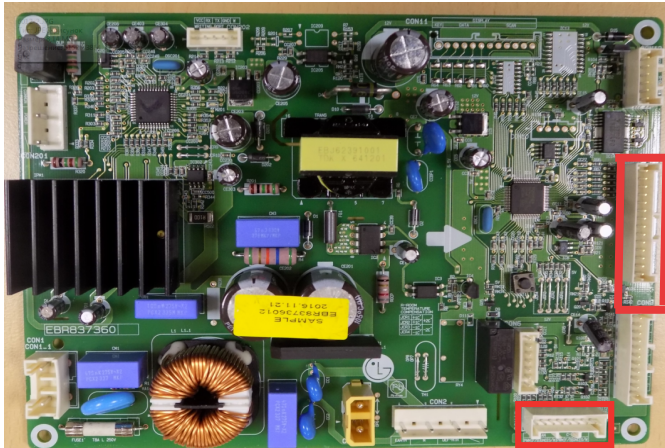
TEST MODE 1	Voltage [V]
CON13 6 th pin ~ 7 th pin	Not 0V or 5V
CON13 6 th pin ~ 8 th pin	Not 0V or 5V

Yes → Change the motor
No →

7 Explain to customer

12. Poor cooling in Refrigerator Compartment

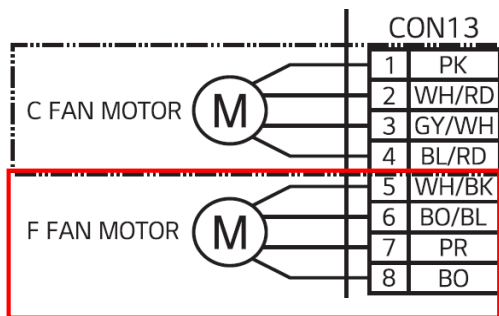
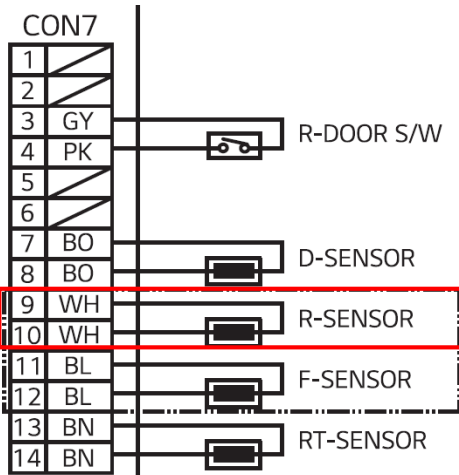
Symptom	Check Point
1. Poor cooling in refrigerator room	1. Check the R- sensor resistance 2. Check the air flow 3. Check the air Temperature 4. Check the F-Fan motor voltage



CON7




CON13



TEST MODE 1	Voltage [V]
CON13 5 th pin ~ 6 th pin	11.4V ~ 12.6V
CON13 6 th pin ~ 7 th pin	Not 0V or 5V
CON13 6 th pin ~ 4 th pin	Not 0V or 5V


Over cooling in Refrigerator Compartment

1 Check the sensor resistance.




CON7 9 th pin ~ 10 th 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

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




3 Open the refrigerator door and Check the air flow. Windy?



No → Check the F Fan Motor. Check the Freezer Control. Go to 6

Yes →

4 Input Test 2 Mode and Check the air flow. Windy? (Push the button 1 time)



No → Go to 8

Yes →


5 Damper Checking method Inputting Test Mode Is damper normal

Point	Result
Test 1 Mode	Open
Test 2 Mode	Closed

No → Change the damper

Yes →

6 Check the Fan Motor voltage Is Fan Motor voltage below table?




TEST MODE 1	Voltage [V]
CON13 5 th pin ~ 6 th pin	11.4V ~ 12.6V

No → Replace Main PCB

Yes →

7 Check the Fan Motor voltage of feed-back and PWM. Are they 0, 5V?



Test Mode 1	Voltage (V)
CON13 6 nd pin~7 nd pin	Not 0V or 5V
CON13 6 nd pin~8 nd pin	Not 0V or 5V

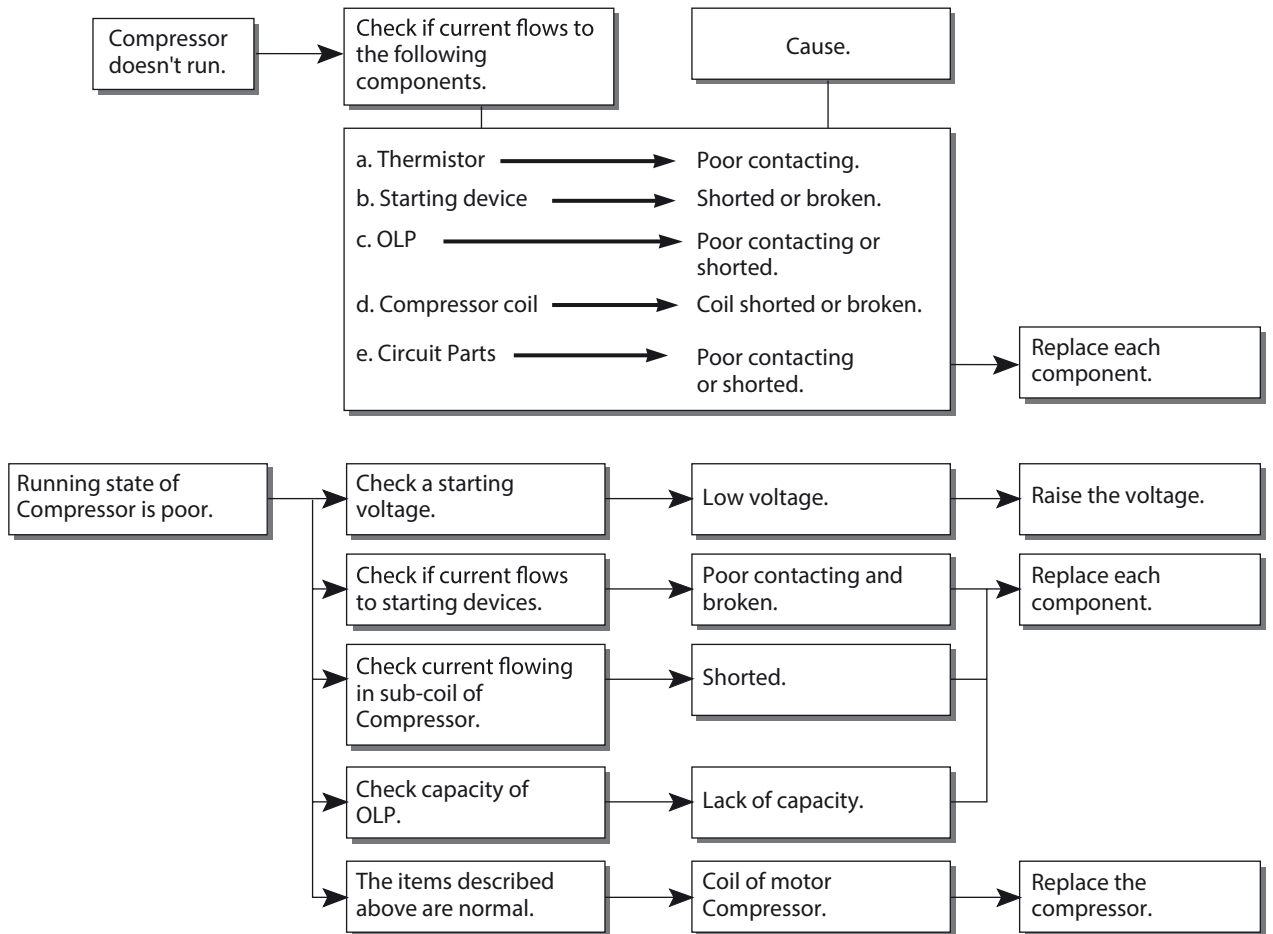
Yes → Change the motor

No →

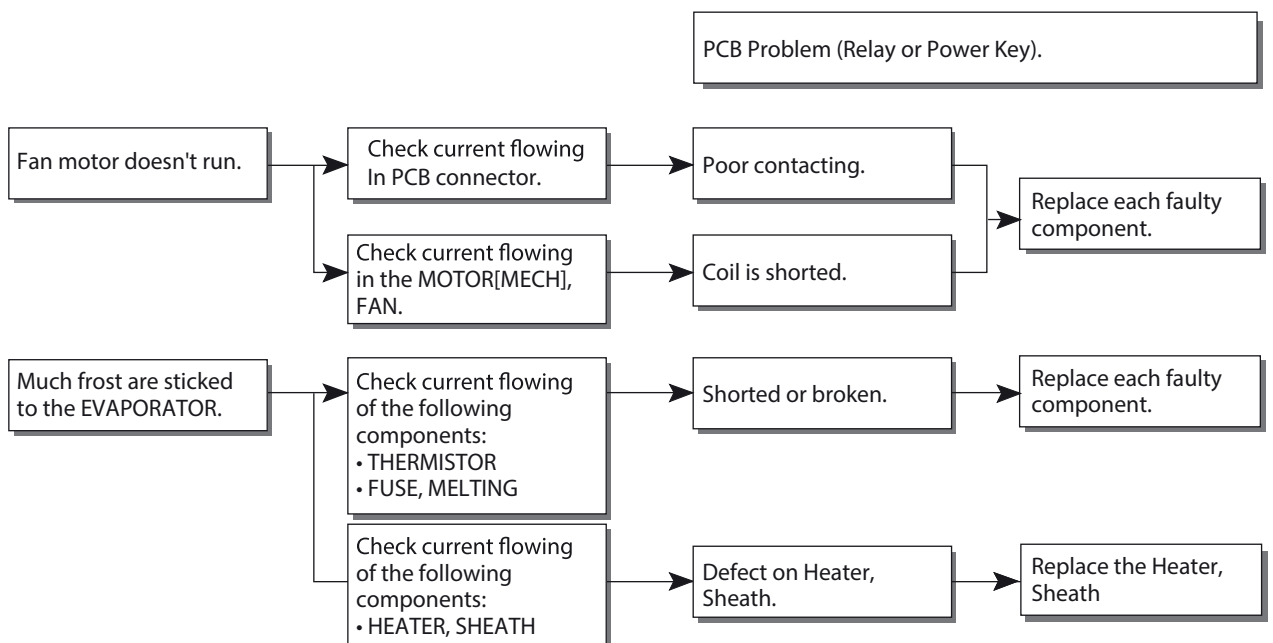
8 Explain to customer

1. ANOTHER ELECTRIC COMPONENTS

▼ Cooling is impossible



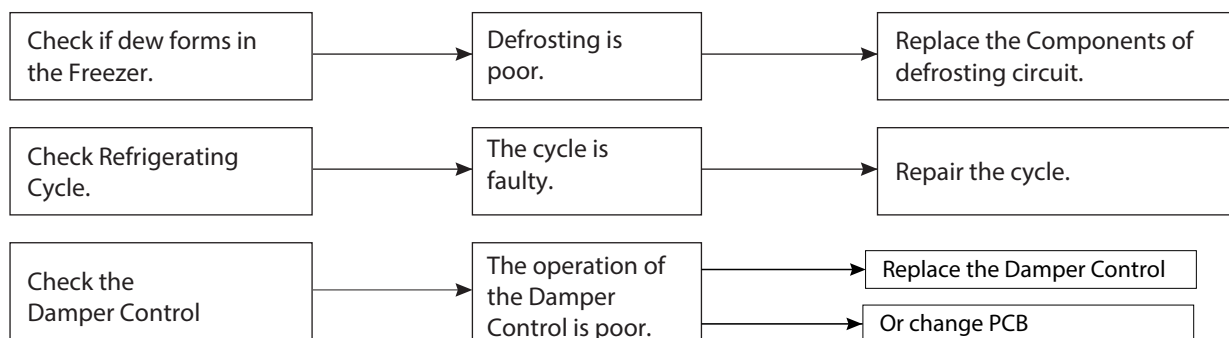
▼ Cooling ability is poor



2. SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	REMEDY
Cooling is impossible.	<ul style="list-style-type: none"> ● Is the power cord unplugged from the outlet? ● Check if the power switch is set to OFF. ● Check if the fuse of power switch is shorted. ● Measure the voltage of power outlet. 	<ul style="list-style-type: none"> ● Plug to the outlet. ● Set the switch to ON. ● Replace a regular fuse. ● If voltage is low, wire newly.
Cooling ability is poor.	<ul style="list-style-type: none"> ● Check if the set is placed close to wall. ● Check if the set is placed close to stove, gas cooker and direct rays. ● Is the ambient temperature high or the room door closed? ● Check if put in is hot. ● Did you open the door of the set too often or check if the door is closed up? ● Check if the Damper Control is set to "cold-position". 	<ul style="list-style-type: none"> ● Place the set with the space of about 10cm. ● Place the set apart from these heat appliances. ● Make the ambient temperature below. ● Put in foods after cooled down. ● Don't open the door too often and close it firmly. ● Set the control to mid-position.
Foods in the Refrigerator are frozen.	<ul style="list-style-type: none"> ● Is foods placed in cooling air outlet? ● Check if the control is set to "cold-position". ● Is the ambient temperature below 5°C? 	<ul style="list-style-type: none"> ● Place foods in high temperature section. (Front Part) ● Set the control to "mid-position". ● Set the control to "warm-position".
Dew or ice forms in the chamber of the set.	<ul style="list-style-type: none"> ● Is liquid food stored? ● Check if put in is hot. ● Did you open the door of the set too often or check if the door is closed up. 	<ul style="list-style-type: none"> ● Seal up liquid foods with wrap. ● Put in foods after cooled down. ● Don't open the door too often and close it firmly.
Dew forms in the Exterior Case.	<ul style="list-style-type: none"> ● Check if ambient temperature and humidity of surrounding air are high. ● Is there gap in the door packed? 	<ul style="list-style-type: none"> ● Wipe dew with a dry cloth. This occurrence is solved naturally in low temperature and humidity. ● Fill up the gap.
Abnormal noise generates.	<ul style="list-style-type: none"> ● Are the set positioned in a firm and even place? ● Are any unnecessary objects set in the back side of the set? ● Check if the Tray Drip is not firmly fixed. ● Check if the cover of mechanical room in below and front side is taken out. 	<ul style="list-style-type: none"> ● Adjust the Adjust Screw, and position in the firm place. ● Remove the objects. ● Fix it firmly on the original position. ● Place the cover at the original position.
To close the door is not handy.	<ul style="list-style-type: none"> ● Check if the door packing is dirty with filth such as juice. ● Is the set positioned in a firm and even place? ● Is too much food putted in the set? 	<ul style="list-style-type: none"> ● Clean the door packing. ● Position in the firm place and adjust the Adjust Screw. ● Keep foods not to reach the door.
Ice and foods smell unpleasant.	<ul style="list-style-type: none"> ● Check if the inside of the set is dirty. ● Did you keep smelly foods without wrapping? ● It smells of plastic. 	<ul style="list-style-type: none"> ● Clean the inside of the set. ● Wrap smelly foods. ● The new products smells of plastic, but it is eliminated after 1-2 weeks.

● In addition to the items described left, refer to the followings to solve the complaint.



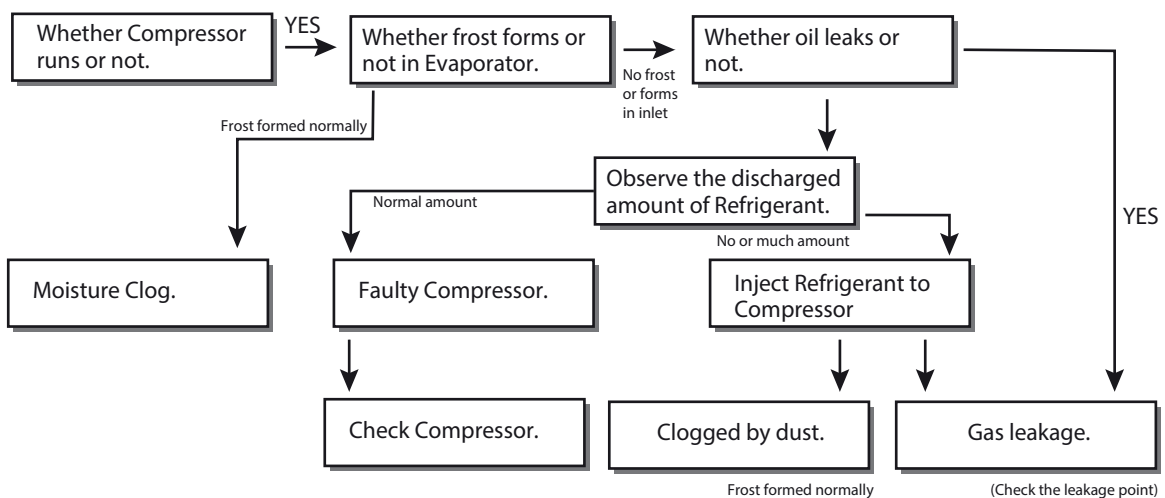
3. REFRIGERATING CYCLE

▼ Troubleshooting Chart

CAUSE		STATE OF THE SET	STATE OF THE EVAPORATOR	TEMPERATURE OF THE COMPRESSOR	REMARKS
LEAKAGE	PARTIAL LEAKAGE	Freezer room and Refrigerator don't cool normally.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high more than ambient temperature.	• A little Refrigerant discharges. • Normal cooling is possible when injecting of Refrigerant the regular amount.
	WHOLE LEAKAGE	Freezer room 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 when injecting of Refrigerant the regular amount.
CLOGGED BY DUST	PARTIAL CLOG	Freeze room and Refrigerator don't cool normally.	Flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high more than ambient temperature.	• Normal discharging of refrigerant. • The capillary tube is faulty.
	WHOLE CLOG	Freezer room and Refrigerator don't cool.	Flowing sound of Refrigerant is not heard and frost isn't formed.	Equal to ambient temperature.	• Normal discharging of Refrigerant.
MOISTURE CLOG		Cooling operation stops periodically.	Flowing sound of Refrigerant is not heard and frost melts.	Low than ambient temperature.	• Cooling operation restarts when heating the inlet of capillary tube.
DEFECTIVE COMPRESSION	COMPRESSION	Freezer and Refrigerator don't cool.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little high than ambient temperature.	• The pressure of high pressure part in compressor is low.
	NO COMPRESSION	No compressing operation.	Flowing sound of Refrigerant is not heard and no frost.	Equal to ambient temperature.	• No pressure of high pressure part in the compressor.

▼ Leakage Detection

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



▼ General Control of Refrigerating Cycle

NO.	ITEMS	CONTENTS AND SPECIFICATIONS	REMARKS
1.	WELDING ROD	(1)H30 • Chemical Ingredients Ag: 30%, Cu: 27%, Zn: 23%, Cd: 20% • Brazing Temperature: 710~840°C (2) Bcup-2 • Chemical Ingredients Cu: About 93% P: 6.8-7.5% The rest: within 0.2% • Brazing Temperature: 735~840°C	• Recommend H34 containing 34% Ag in the Service Center.
2.	FLUX	• Ingredients and how to make Borax 30% Borax 35% Fluoridation kalium: 35% Water: 4% Mix the above ingredients and boil until they are transformed into liquid.	• Make amount for only day. Holding period: 1 day • Close the cover of container to prevent dust putting in the FLUX. • Keep it in a stainless steel container.
3.	LOKRING (21 page figure 1,2)	(1) Both of the tube is inserted up to the stop. (2) Both of the LOKRING is pushed up to the stop (3) The bending point is not too close to the joint ending. (4) During the assembly it is important that both ends remain completely within the joint.	• For a hermetically sealed metal/metal connection, the tube ends have to be clean. • LOKPREP is distributed all of out-surface of the tube ends.
4.	DRIER ASM	(1) Assemble the drier within 30min. after unpacking. (2) Keep the unpacked drier at the temperature of 80~100°C.	• Don't keep the drier in a outdoors because humidity damages to it.
5.	VACUUM	(1) When measuring with pirant Vacuum gauge the charging M/C, vacuum degree is within 1 Torr. (2) If the vacuum degree of the cycle inside is 10 Torr. below for low pressure and 20 Torr. for high pressure, it says no vacuum leakage state. (3) Vacuum degree of vacuum pump must be 0.05 Torr. below after 5 min. (4) Vacuum degree must be same to the value described item (2) above for more than 20 min.	• Apply M/C Vacuum Gauge without fail. • Perform vacuum operation until a proper vacuum degree is built up. • If a proper vacuum degree isn't built up, check the leakage from the Cycle Pipe line part and Quick Coupler Connecting part.
6.	DRY AND AIR NITROGEN GAS	(1) The pressure of dry air must be more than 12~16kg/cm ² (2) Temperature must be more than -20~-70°C. (3) Keep the pressure at 12~6kg/cm ² also when substituting dry air for Nitrogen Gas.	
7.	NIPPLE AND COUPLER	(1) Check if gas leaks with soapy water. (2) Replace Quick Coupler in case of leakage.	• Check if gas leaks from joint of the Coupler
8.	PIPE	(1) Put all Joint Pipes in a clean box and cover tightly with the lid so that dust or humidity is not inserted.	

Heavy Repair Method of Refrigerator by Application of Refrigerant

1. Outline

1) Checkpoints before Heavy Repair

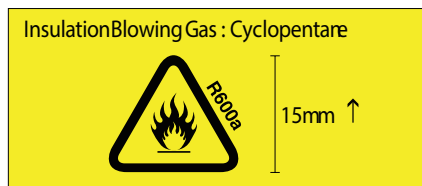
Open the Cover ASM, Back-M/C of refrigerator and check the type of refrigerant indicated on a compressor before starting work. A yellow label is adhered to the compressor for the refrigerator using R600a as refrigerant.

2) Features of R600a Refrigerant

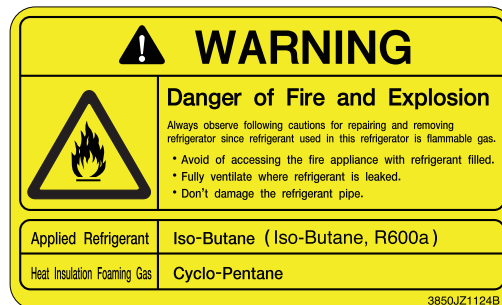
- Non-polar natural gas refrigerant (CH(CH₃)₃)
- Since R600a is same series as butane gas, there is danger of fire when discharged into air at appropriate concentration (extreme handling is required for heavy repair of cycle).
Explosion concentration: .8% ~ 8.4%/Vol.
Burning temperature: 494°C

3) Features of R600a Refrigerant

- With refrigerant quantity of 60% or so for the refrigerator using R134a as refrigerant
- Large vacuum level at suction pressure (at low pressure side)
- COMP capacity of the refrigerator using R609a as refrigerant is large by 1.7 times than that of the refrigerator using R134a.
- Labels as in Figure are displayed at the compressor of a refrigerator for R600a and the back plate of refrigerator.



[Warning sign according to ISO 3864]



4) Location and Environment for Heavy Repair

- Check that drafting and air ventilation are well done at a working area and perform work after making drafting and air ventilation smooth (use refrigerant return bag indoors).
- Check that there are fire appliances or heating source around the working area and then remove them before work.
- Since R600a refrigerant is very inflammable, they should not be discharged indoors.
- Be sure to follow heavy repair SVC procedures during work.

5) Heave Repair Work Tool

- R600a refrigerant
- Bombe
- Pinch Pliers
- Refrigerant Discharge Hose
- Refrigerant Return Bag
- Vacuum Pump
- Handy Welding Machine
- Charging Tube
- Leakage Tester
- Drier

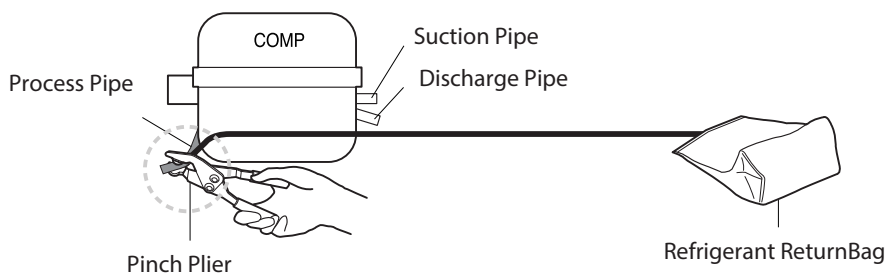
2. Heavy Repair SVC Method

For the heavier repair of R600a type of refrigerator, perform work according to following SVC method.

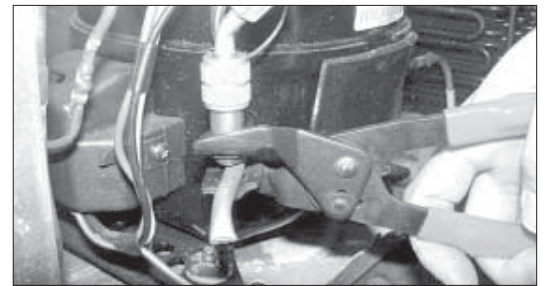
1) Return of Refrigerator Refrigerant

Required equipment: Pinch pliers, refrigerant discharging hose, refrigerant return bag

- Leave doors of a refrigerator so that they are not closed.
- Connect pinch pliers with a refrigerant discharging hose.
- Place the outlet of a refrigerant discharging hose outside.
(Remove fire appliances or heating sources near a refrigerant discharging hose.)
- Always use a refrigerant return bag for working at the contained space.
- Bore the charging pipe of a compressor with pinch pliers.
(Remove fire appliances or heating sources near a refrigerator.)
- Perform refrigerant discharge for more than 7 minutes.



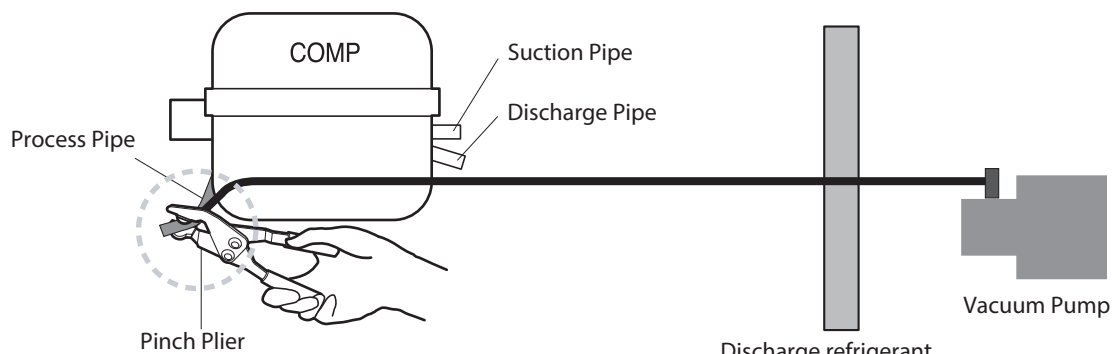
Linear compressor Type



2) Return of Remained Refrigerant

Required equipment: Pinch pliers, hose for refrigerant recovery, vacuum pump

- If refrigerant return time of 7 minutes has passed, connect a vacuum pump at the ends of a refrigerant return hose outdoor. (Vacuum pump must operate outdoor.)
- Operate a vacuum pump in order to return refrigerant remained in the pipe.
- Vacuum working time should be for more than 10 minutes.



Linear Compressor Type

3) Welding Repair Step

Required equipment: Simple welding machine

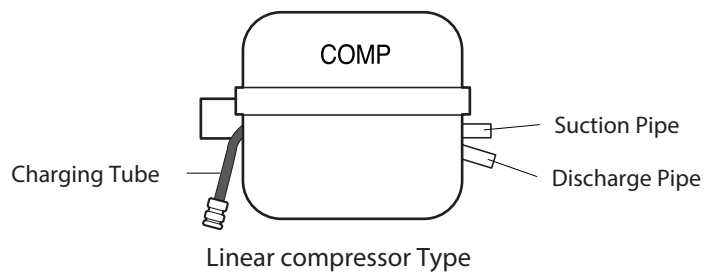
- Remove pinch pliers if remaining refrigerant returns completed.
- Cut the front part of a process pipe with a cutter. (Check that remaining refrigerant comes out.)
- Perform welding work such as replacement of compressor and dryer, or repair of leakage part. (Be cautious of fire during welding work.)



4) Charging Tube Connection Step

Required equipment: Charging tube, simple welding machine

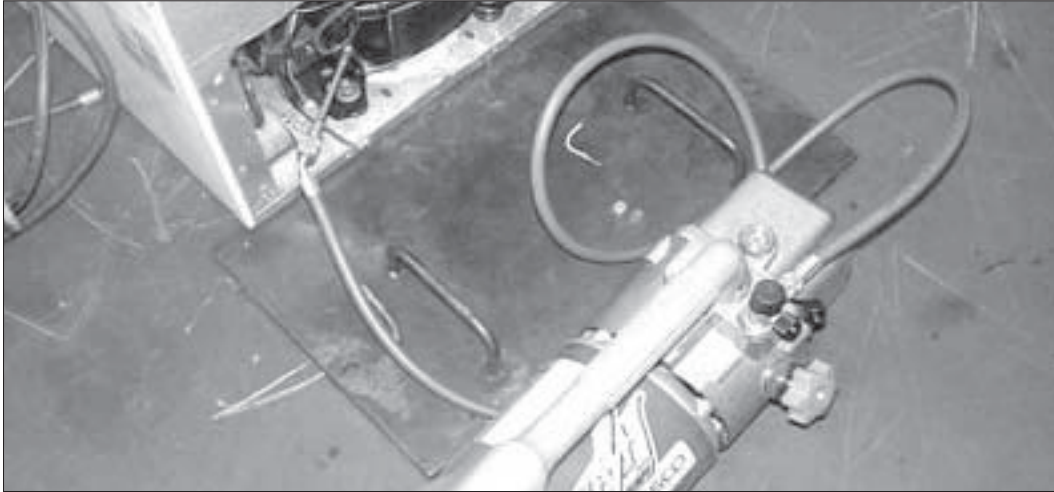
- Remove a charging pipe to recharge R600a refrigerant after completing work, and then connect a charging tube with welding



5) Vacuum Air Removal

Required equipment: Vacuum pump

- Connect a vacuum pump to a charging tube to perform vacuum cycle.
- Vacuum work should be performed for an hour. (If vacuum time is short, normal cooling performance may not be exerted due to failure of cooling cycle.)



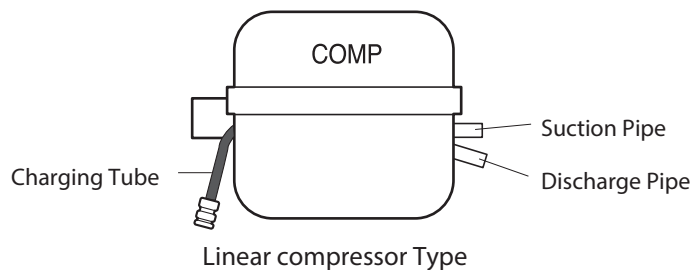
6) Refrigerant Charging

Required equipment: Bombe, R600a refrigerant (55g)

- Firstly remove fire appliances and heating source for performing work when charging scaled refrigerant. (Do not spray refrigerant indoor.)
- Measure the accurate quantity (55g) of refrigerant to charge it into a Bombe.
- Make the Bombe as vacuum status to charge refrigerant.
(If there is air or moisture in a Bombe, it may give effect on performance of a cooling cycle.)
- Please manage refrigerant quantity as 55g ± 1g. Differently from R134a, R600a gives much effect on cooling performance depending on change of refrigerant quantity.

Refrigerant quantity = Weight after charging - Weight before charging (weight of vacuumed Bombe)

- Connect Bombe with a charging tube to charge refrigerant.
- Turn on power of refrigerator to operate a compressor.
- Measure Bombe weight after 5 through 10 minutes to check remained refrigerant quantity to complete charging of refrigerant.
(After charging refrigerant, never perform welding work or work using fire appliances.)

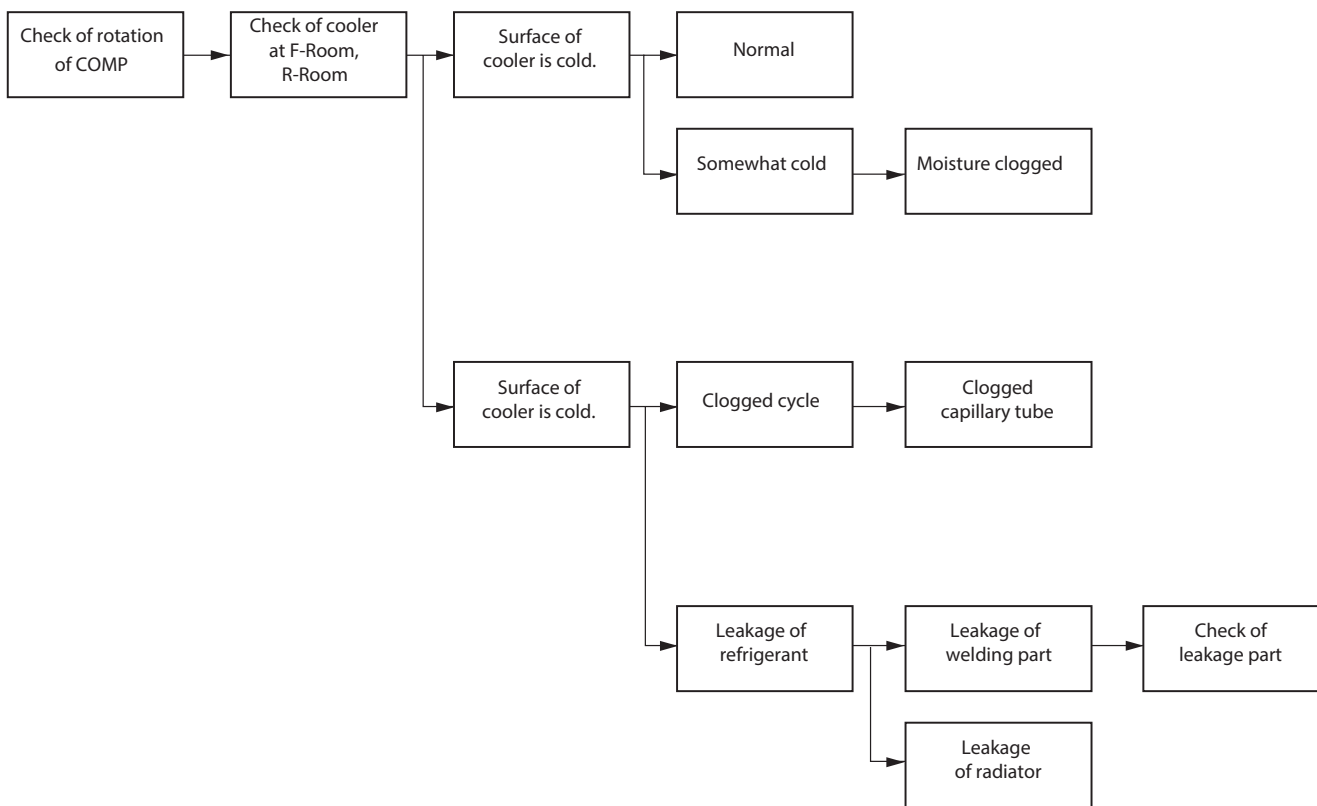


7) Leak Inspection and Cycle Check

Required equipment: Leakage checking machine (foam and leakage inspection machine)

- Check for leakage by using foam or a leakage inspection machine at the worked part if charging of refrigerant is completed.
- Check for leakage at the low pressure part with the compressor stopped, and check at the high pressure part with the compressor being operating.
- If leakage is detected, proceed to repair according to repair process again starting from "2-1. Return of Refrigerator Refrigerant".
(Never perform welding work or work using fire appliances.)
- Check that heat remains at a discharge pipe or condenser with the hands if leakage check is completed. If heat remains, the cooling cycle is normal.
(Take care since a discharge pipe may be hot.)

8) Failure Checking Procedures



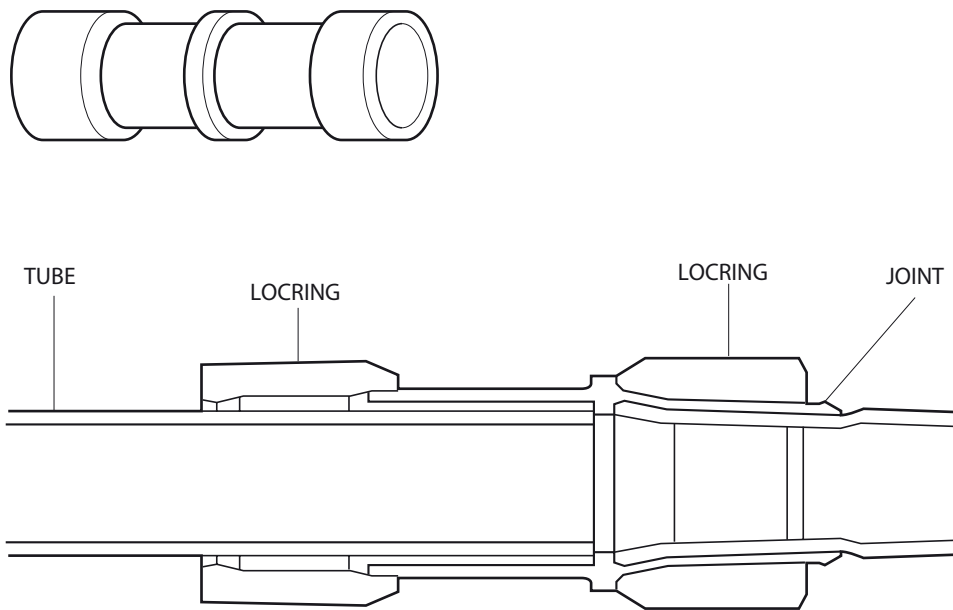


Figure 1. LOKRING

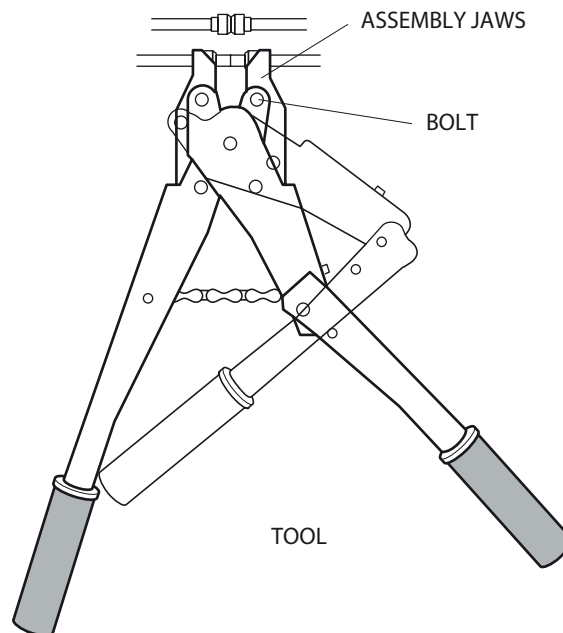


Figure 2. LOKRING TOOL

GA-B499S*KZ



Temperature Adjustment Button for Fridge Compartment

Temperature Adjustment Button for Freezer Compartment

Wi-Fi

Express Frz.

Eco Friendly

Freezer lightback

Child Lock

* УДЕРЖ. ЭСЕК.

*Extra Function : Hold 3 sec.

How to adjust the temperature in the fridge and freezer compartment

- The initial temperature of the fridge and freezer compartment

GA-B419S*QZ



Freezer, refrigerator NOTCH and temperature setup display part

- The initial temperature of the fridge and freezer compartments is -20°C and 3°C respectively. You can now adjust the temperature of the compartments as you want.

Freezer (standard)

		unit : temperature								
Classification	First Power On	1 time press	2 times press	3 times press	4 times press	5 times press	6 times press	7 times press	8 times press	9 times press
NOTCH	-20	-21	-22	-23	-15	-16	-17	-18	-19	-20
Temperature setup	-20	-21	-22	-23	-15	-16	-17	-18	-19	-20

Fridge temperature compensation

Jump Wire Cutting the SVC to facilitate a way to compensate +2 To -2 deg Cutting depending on temperature compensation is possible. Claim of overcooling and undercooling compensation is possible.

OPTION	CUTTING at compensation	Remark
 JCR1(+1,0)	Compensation +1,0 deg	Overcooling compensation
 JCR2(+1,0)	Compensation +1,0 deg	
 JCR3(-1,0)	Compensation -1,0 deg	Undercooling compensation
 JCR4(-1,0)	Compensation -1,0 deg	

CUTTING compensation combined fridge temperature compensation

NOTE

The actual inner temperature varies depending on the food status, as the indicated setting temperature is a target temperature, not actual temperature within refrigerator. Fridge-freezer function is weak in the initial time. Please adjust temperature as above after using refrigerator for minimum 2~3 day.

Express Freezing function

You can use this function for quick freezing. This function is used when you want to freeze the food quickly.

Express Freezing on/off method:

- Press the Express Frz. Button once. The Express Frz. Lamp turns on and the quick freezing starts;
- If you want to stop the quick freezing operation, press the Express Frz. Button once more, the lamp goes out, and the Express Frz. Operation stops and the refrigerator returns to the previous temperature setting.

DISPLAY operation of Express Freezing function:

- when pressing button for the first time Express Freezing has to be on;
- freezer/ fridge temperature is not change.
- when pressing button for the next time Express Freezing has to be off;
- changing setup of freezer/fridge temperature on display is possible during Express Freezing.

Load operation during the Express Freezing.

- Load operation during the start of Express Freezing and maintenance of express freezing function during 24 hours: for the first 7 hours compressor operates continually, last 17 hours temperature maintains on -27°C in a freezer only;
- in case when compressor stops in the process of express freezing time delays and terminates after continuous operation during 7 hrs. If you have signal of defrost during Express Freezing, defrost time is included.

GA-B419S*QZ



Eco Friendly function

This function tunes on the power saving mode which is useful when you are away for holiday. It helps to reduce energy consumption.

It helps to reduce energy consumption:

- Eco Friendly on/off method;
- To start the function press ECO FRIENDLY button, the lamp will turn on;
- To stop the function press the button again.

DISPLAY operating of Eco Friendly function:

- when pressing button for the first time Eco Friendly function has to be turned on;
- icons of freezer/fridge temperature after pressing Eco Friendly are shown in pic.1(c) and pic.2(c);
- state of freezer/fridge temperature after turning off Eco Friendly are shown in pic.1(d) and pic.2(d);
- other buttons don't function while Eco Friendly is turned on except Door Alarm, Lock and Power buttons.

Operation status during Eco Friendly:

- freezer and fridge display is controlled by the minimal Notch;
- control temperature of freezer / refrigerator has to be at minimal Notch.

NOTE

When the Eco Friendly mode is "ON", the other buttons will not operate. When you don't need this function any more press the Eco Friendly button to return the appliance to its previous temperature setting and turn on other buttons.

The display indication of different Models

Express Freezing & Eco-Friendly on/off is shown below:

Fig.1 GA-B499Y**Z



(a) Normal mode

(b) Express Freezing start

(c) Eco Friendly start

(d) Wi-Fi

LOCK function (Display button lock)

Lock On/Off method:

- on:press continuously the Lock/Alarm button for more 3 sec.;
- off:press continuously the Lock/Alarm button for more 3 sec.

DISPLAY operation of LOCK function:

- before the first power on the lock has to be unfasten;
- at locking time the Lock button indication flashes 3 times (except Bar LED) after 3 seconds the lock icon (b) becomes faster;
- at unlocking time the Lock button indication flashes 3 times (except Bar LED) after 3 seconds the lock icon (a) becomes unfasten;
- There is no buzzer sounds when the button pressed in fasten situation other than Lock button switching function is also not available.

At this time, the indication of the Best 88 Display Lock button flashes 3 times.



Display power-saving mode

Power-saving mode on/off method:

- on: If the display buttons are not pressed during 20 seconds or more, the mode starts automatically;
- off: press 1 time any button during power- saving mode.

DISPLAY operation of power-saving mode:

- in the process of power- saving mode, all indications are turned off;
- when the mode turned off, display shows the previous state of the power-saving mode.

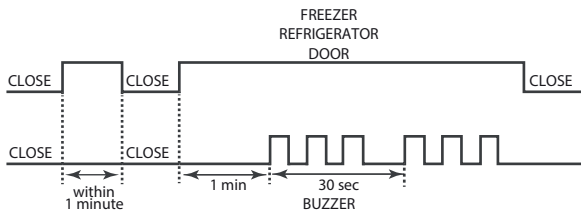
When the function of Express FRZ. or Eco Friendly is on, indication is turn on in the process of power saving mode

Fig.1 GA-B499Y**Z



DOOR OPEN ALARM

1. Buzzer shall give warnings if freezer, refrigerator, or home bar door is open for more than one minute.
2. Buzzer shall give warnings three times in 0.5 second interval, then three times on/off in 0.5 second interval in every thirty seconds.
3. Warnings are ceased when freezer, refrigerator and home bar doors are all closed.



BUZZER SOUND

When the button on the front Display is pushed, a Ding ~ sound is produced. (Refer to the BUZZER OPERATION CHECK)

REFRIGERATOR LAMP AUTO OFF

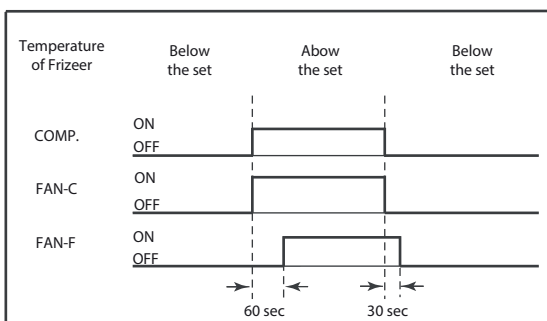
To protect the risk of lamp heat, when Refrigerator door opens for 7 min., refrigerator lamp is auto off.

DEFROSTING (REMOVING FROST)

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

ELECTRICAL PARTS ARE TURNED ON SEQUENTIALLY

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



NOTE

1. In the case of BEST/BETTER model, dispenser heater is optional.
2. Damper heater is only applied in the BEST model.

F-LIGHTING

This function control F-Room Light LED.

Setting

Whenever pressing the F-Light button,

F-Room Lighting LED will be:

OFF -> 3Step ON -> 1Step ON -> OFF.

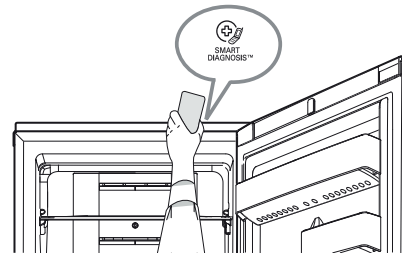
(0Step is OFF, 1Step is 'weak brightness', 2Step is 'medium brightness', 3Step is 'strong brightness'.)

SMART DIAGNOSIS

Function enable to remotely check the refrigerator for errors.

What would you use this function to do the following when the refrigerator work:

1. Unlock the display, if Locked;
2. Close the door of refrigerator compartment;
3. Hold down button Lock to lock the display;
4. Release button the Lock of the display;
5. Hold down button temperature adjustment for freezer comparme to the extinction of the display (about 3 seconds) and open the door.
6. When you bring the phone to the dynamics of the refrigerator starting playback of encrypted signals of error.



Exhibition(Demo) Mode

- Demo mode is available for displaying the refrigerator in a sales setting or similar condition.
- It allows the display, dispenser, and lights to operate without running the compressor and fan.
- To apply the DEMO mode, open the door and press and hold REFRIGERATOR button and then press EXPRESS FRZ button 3 times
- To exit the DEMO mode and return to normal operation, press and hold REFRIGERATOR button and then press EXPRESS FRZ button 3 times

► Larder

Show error mode when push 'Fridge temp' and 'express Freezing' button, simultaneously for 1 sec. (All on Mode)

No.	Category	Disorder CODE Display Part		Contents of Failure	Remarks
		Refrigeration Setting Temperature	Freezing Setting Temperature		
1	Freezing Sensor Problem	E	FS	Freezing Sensor Open or Short	Check each corresponding sensor connection
2	RT Sensor Problem	E	rt	RT Sensor Open or Short	
3	Refrigeration Sensor Problem	E	rS	Refrigeration Sensor1 Open or Short	
4	Freezing Defrost Sensor Problem	F	dS	Freezing Defrost Sensor1 or Sensor2 Open or Short	
5	WiFi Modem Problem	E	Od	Communication defect between Display and WiFi Modem	
6	Freezing Defrost Defect	F	dH	After starting the Defrost if Defrost Sensor dose not become 5(8)°C or more after 80 min.	Temperature FUSE open, Heater open, DRAIN clogged, Heater activation RELAY defect.
7	Freezer BLDC FAN Motor Problem	E	FF	When BLDC Fan Motor is activated, if there is no F/B signal for 65 Sec. or more	BLDC MOTOR connection and DRIVE IC, TR defect
8	Machine Room BLDC FAN Motor Problem	E	CF	When BLDC Fan Motor is activated, if there is no F/B signal for 65 Sec. or more	BLDC MOTOR connection and DRIVE IC, TR defect
9	Communication Problem	E	CO	Communication defect between SET MICOM and DISPLAY MICOM	Communication connection and transmission TR reception defect

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.

(1) FAILURE DIAGNOISS FUNCTION

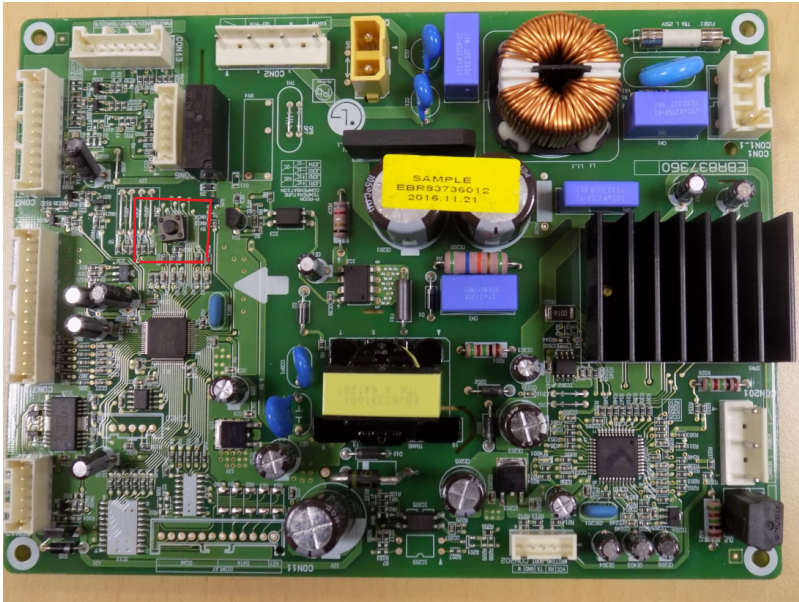
○: Normality

NO	Item	Load control				
		Comp	F-FAN	Damper	C-FAN	F-Defrost Heater
1	Normal	○	○	○	○	○
2	Failure of Freezer Sensor	15min ON / 15min OFF	○	○	15min ON / 15min OFF	○
3	Failure of Refrigerator Sensor	○	○	10 min,Open 15 min, Close	10min ON / 15min OFF	○
4	Failure of Freezer Defrost Sensor	○	○	○	○	No Defrosting
5	Poor of Freezer Defrost	○	○	○	○	○
6	Failure of Fan Motor at Freezing Compartment.	○	Every 30min On/Off	○	○	○
7	Failure of Fan Motor at Mechanical Room	○	○	○	Every 30min On/Off	○
8	Failure of Communication	○	○	○	○	○

1. TEST MODE and Removing TPA

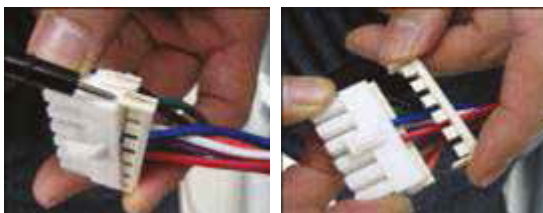
1. How to make TEST MODE

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

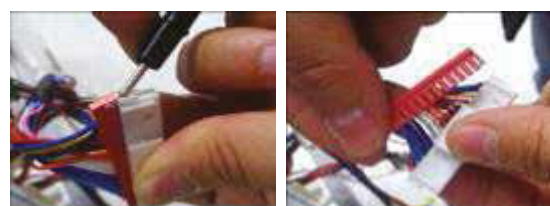


2. How to remove Terminal Position Assurance (TPA)

<AC TPA>



<DC TPA>



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

2. TEMPERATRUE CHART - FRZ AND 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

3. TEMPERATRUE CHART - REF AND DEF SENSOR

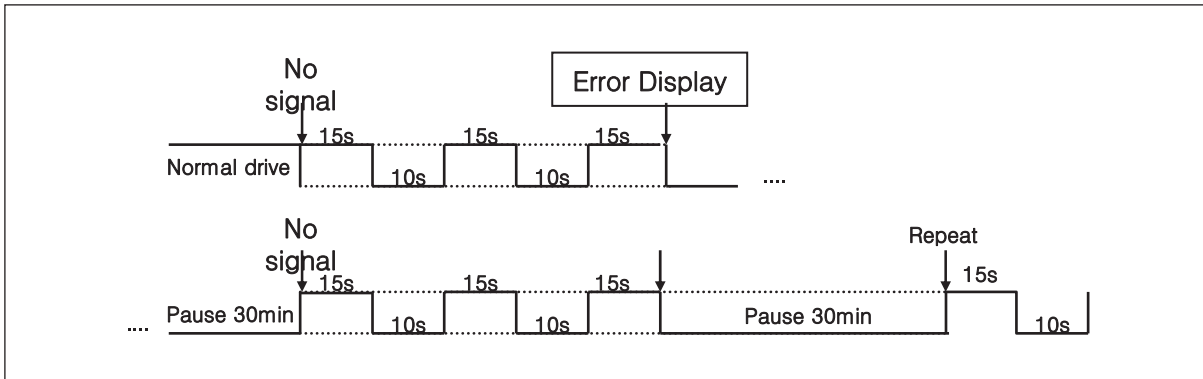
TEMP	RESISTANCE	VOLTAGE
-39°F (-40°C)	225.1 kΩ	4.48 V
-30°F (-35°C)	169.8 kΩ	4.33 V
-21°F (-30°C)	129.3 kΩ	4.16 V
-13°F (-25°C)	99.30 kΩ	3.95 V
-4°F (-20°C)	76.96 kΩ	3.734 V
5°F (-15°C)	60.13 kΩ	3.487 V
14°F (-10°C)	47.34 kΩ	3.22 V
23°F (-5°C)	37.55 kΩ	2.95 V
32°F (0°C)	30 kΩ	2.67 V
41°F (5°C)	24.13 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

4. TEMPERATRUE CHART - AMBIENT SENSOR

TEMP	RESISTANCE	VOLTAGE
-39°F (-40°C)	225.1 kΩ	4.79 V
-30°F (-35°C)	169.8 kΩ	4.72 V
-21°F (-30°C)	129.3 kΩ	4.64 V
-13°F (-25°C)	99.30 kΩ	4.54 V
-4°F (-20°C)	76.96 kΩ	4.43 V
5°F (-15°C)	60.13 kΩ	4.29 V
14°F (-10°C)	47.34 kΩ	4.13 V
23°F (-5°C)	37.55 kΩ	3.95 V
32°F (0°C)	30 kΩ	3.75 V
41°F (5°C)	24.13 kΩ	3.54 V
50°F (10°C)	19.53 kΩ	3.31 V
59°F (15°C)	15.91 kΩ	3.07 V
68°F (20°C)	13.03 kΩ	2.83 V
77°F (25°C)	10.74 kΩ	2.59 V
86°F (30°C)	8.89 kΩ	2.35 V
95°F (35°C)	7.40 kΩ	2.13 V
104°F (40°C)	6.20 kΩ	1.91 V
113°F (45°C)	5.19 kΩ	1.71 V

5. How to check the Fan-Error

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.



6. MAIN PCB

P/No & MFG	Picture
EBR837360**	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>CON201 CON202</p> <p>CON1 CON2 CON13</p> </div> <div style="text-align: right;"> <p>CON12</p> <p>CON7</p> <p>CON9</p> </div> </div>

7. PCB LED

P/NO. : EAV61272506



8. DISPLAY PCB

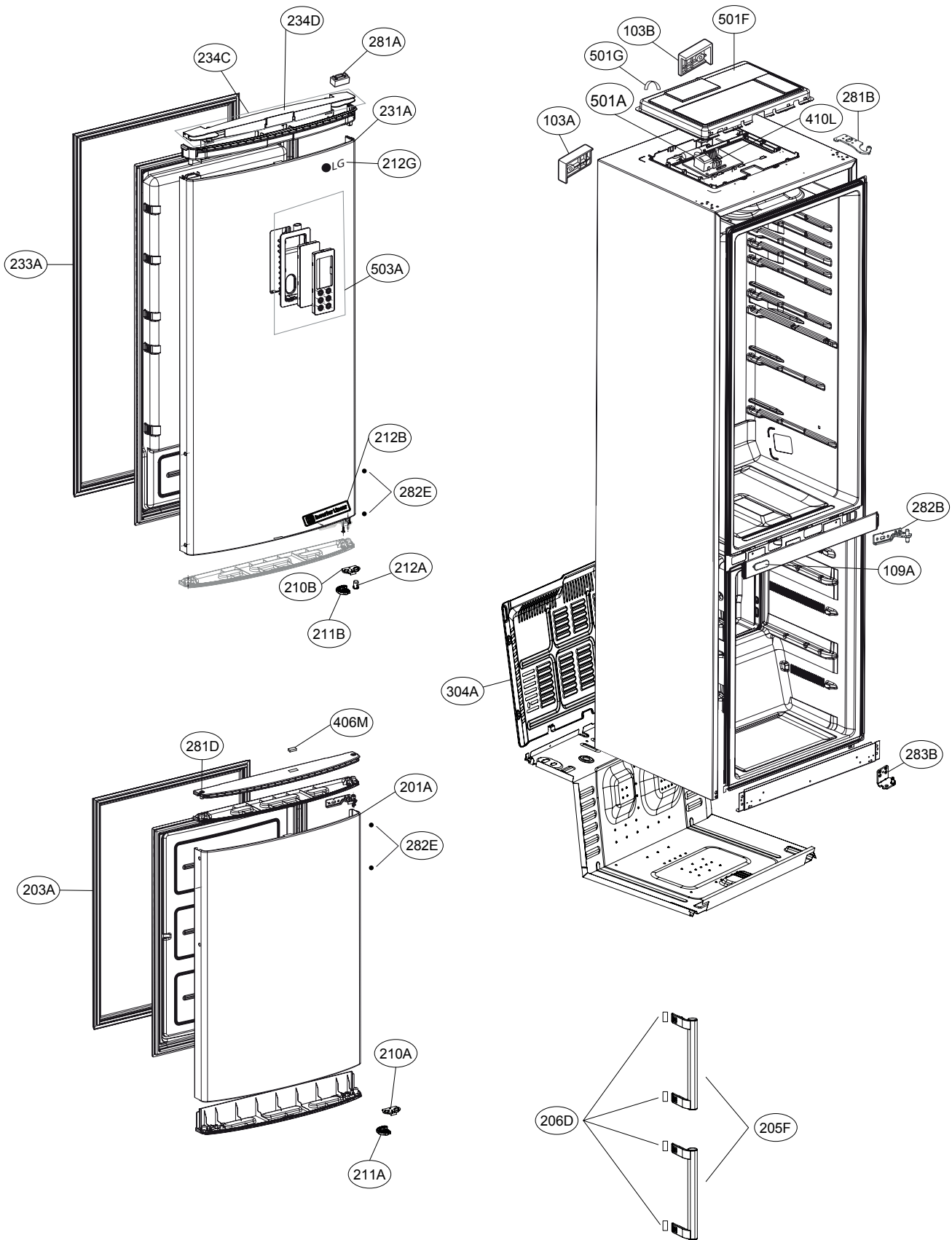
P/No & MFG

Picture

P/No & MFG	Picture
EBR80052801	

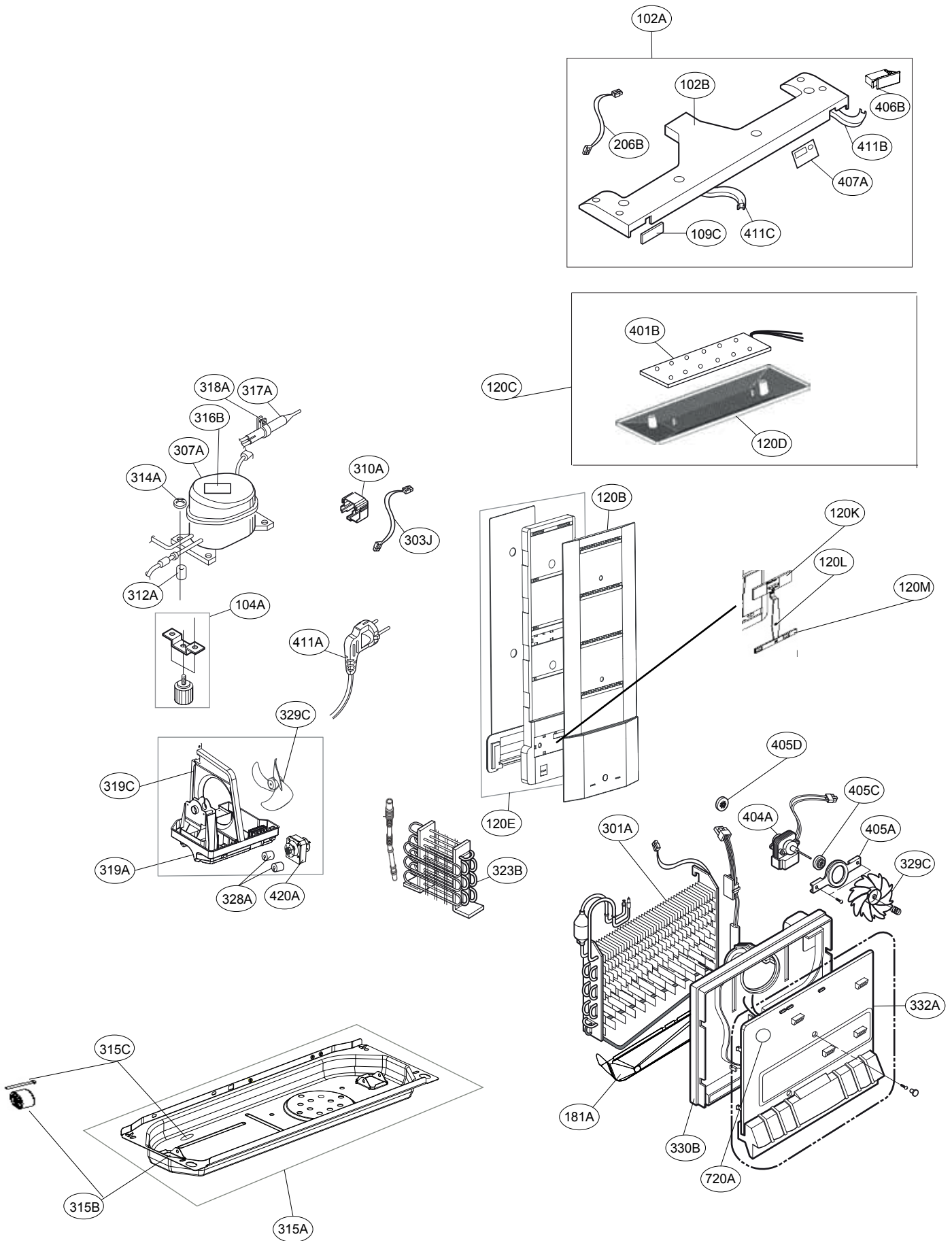
EXPLODED VIEW & REPLACEMENT PARTS LIST

GA-B499Y*QZ



EXPLODED VIEW & REPLACEMENT PARTS LIST

GA-B499Y*QZ



EXPLODED VIEW & REPLACEMENT PARTS LIST

GA-B499Y*QZ

