

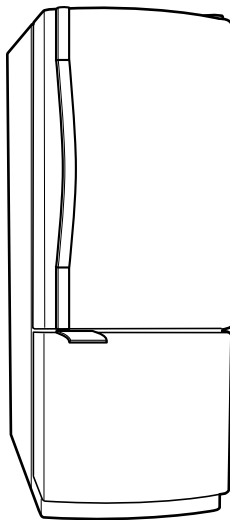


LG

REFRIGERATOR

SERVICE MANUAL

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



Models : LRBN2251***

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SAFETY PRECAUTIONS

Please read the following instructions before servicing your refrigerator.

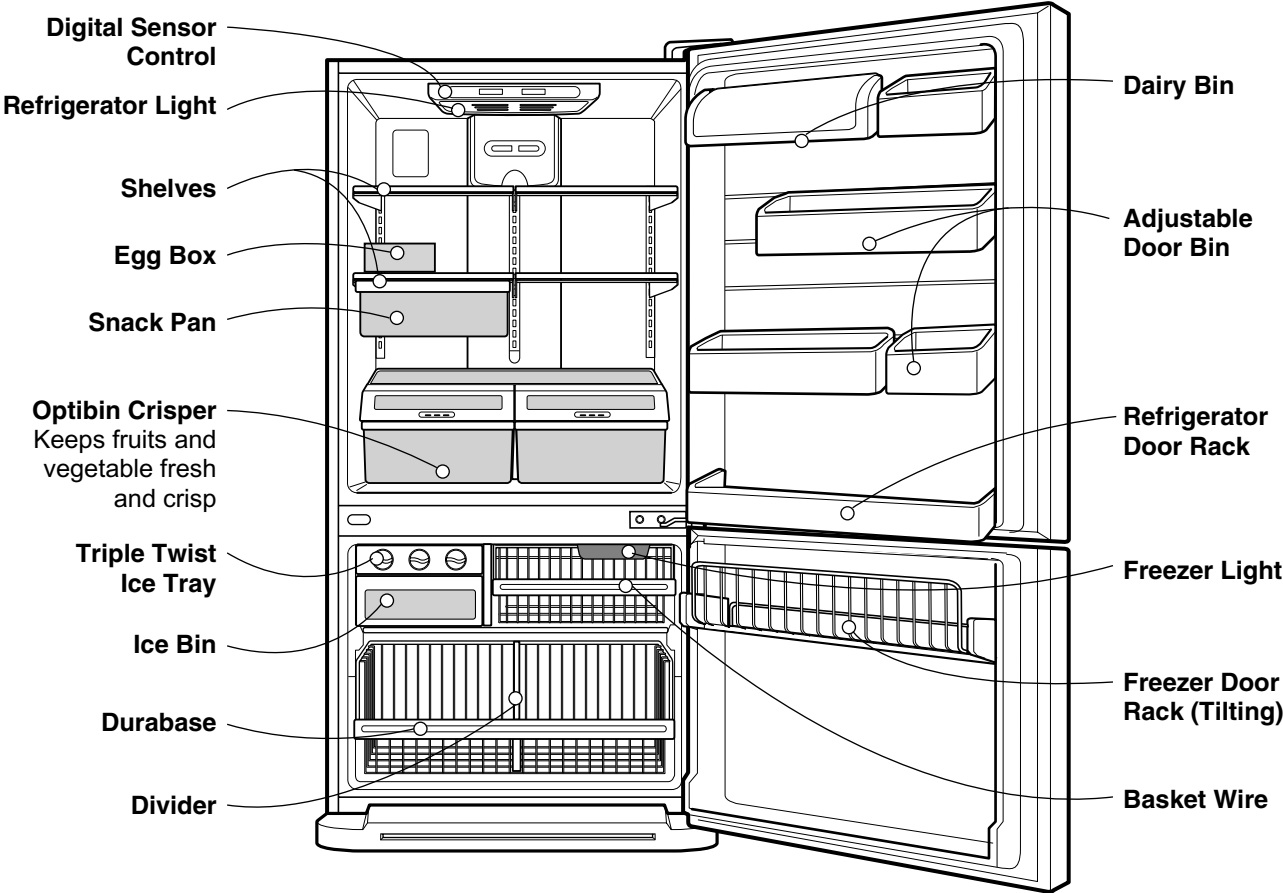
1. Check the refrigerator for electrical faults.
2. To prevent electric shock, unplug before servicing.
3. Always check line voltage and amperage.
4. Use standard electrical components.
5. Don't touch metal products in the freezer with wet hands. This may cause frostbite or cause your skin to freeze and stick to the surfaces inside the freezer.
6. Prevent water from flowing onto electric elements in the mechanical parts.
7. Close the top door before opening the bottom door. Otherwise, you might hit your head when you stand up.
8. When tilting the refrigerator, remove any materials on the refrigerator, especially the glass shelves and stored foods.
9. When servicing the evaporator, wear cotton gloves. This is to prevent injuries from the sharp evaporator fins.
10. Disassembly, repair, and servicing the sealed refrigeration system should be performed only by qualified and certified personnel. Refrigerant should not be vented into the atmosphere; proper recovery equipment should be used.

1. SPECIFICATIONS

19 cu. ft. / 22 cu. ft.

ITEMS	SPECIFICATIONS	ITEMS	SPECIFICATIONS	
DOOR DESIGN	Side Rounded	VEGETABLE TRAY	Opaque Drawer Type	
DIMENSIONS (inches)	29 7/8 x 31 3/4 x 67 7/8 (WxDxH) 20cu.ft	COMPRESSOR	PTC Starting Type	
	32 7/8 x 31 3/4 x 68 1/2 (WxDxH) 22cu.ft	EVAPORATOR	Fin Tube Type	
NET WEIGHT (pounds)	238.4 (20cu.ft)	CONDENSER	Wire Condenser	
	246.9 (22cu.ft)	REFRIGERANT	R-134a (115 g)	
COOLING SYSTEM	Fan Cooling	LUBRICATING OIL	Freol @ 10G (310 cc)	
TEMPERATURE CONTROL	Micom Control	DEFROSTING DEVICE	SHEATH HEATER	
DEFROSTING SYSTEM	Full Automatic	LAMP	REFRIGERATOR	60 W (2EA)
	Heater Defrost		FREEZER	40 W (1EA)
DOOR FINISH	Embossed Metal, VCM, Stainless			
HANDLE TYPE	Bar			
INNER CASE	ABS Resin			
INSULATION	Polyurethane Foam			

2. PARTS IDENTIFICATION

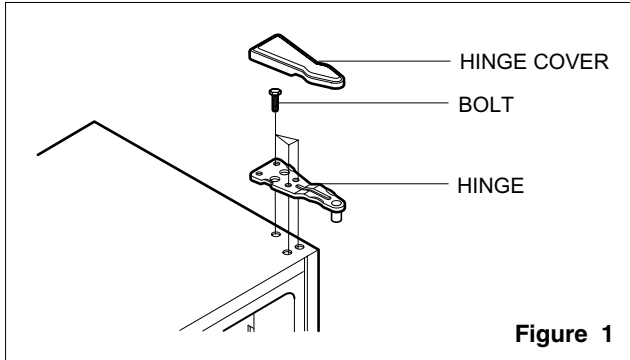


3. DISASSEMBLY

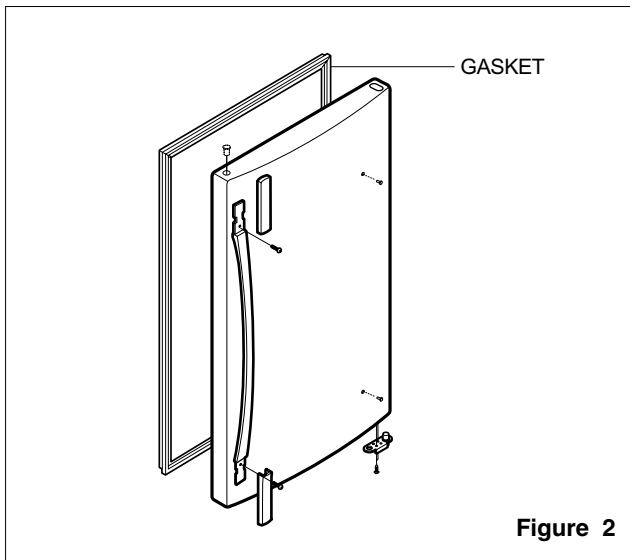
3-1 DOOR

● Refrigerator Door

1. Remove the hinge cover by pulling it upwards.
2. Loosen the hexagonal bolts attaching the upper hinge to the body and lift the freezer door.

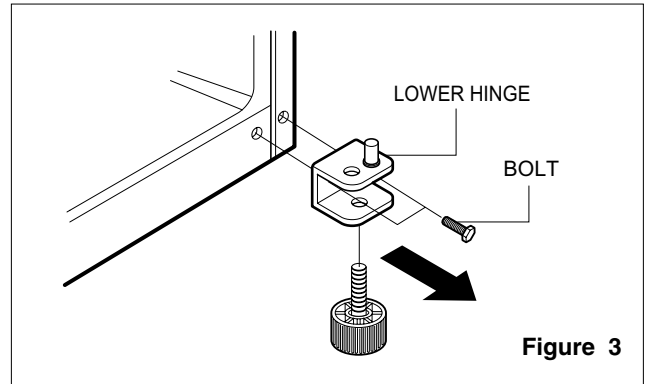


3. Pull out the door gasket to remove from the door foam assembly.



● Freezer Door

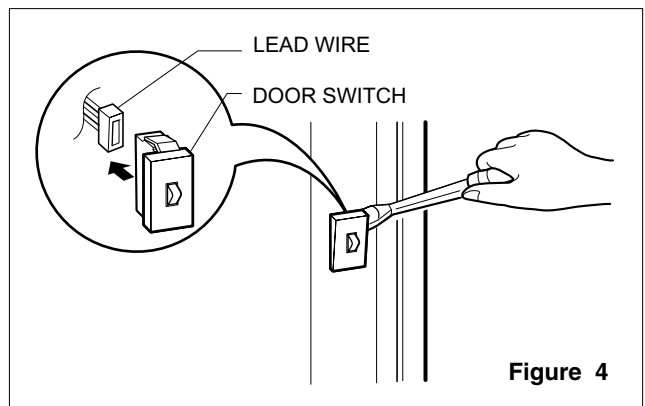
1. Loosen the hexagonal bolts attaching the lower hinge to the body to remove the refrigerator door only.



2. Pull out the door gasket to remove from the door foam assembly.

3-2 DOOR SWITCH

1. To remove the door switch, pry it out with a slotted-type driver, as shown in (Figure 4).
2. Disconnect the lead wire from the switch.



3-3 FAN AND FAN MOTOR

1. Remove the freezer shelf. (If your refrigerator has an icemaker, remove the icemaker first)
2. Remove the grille by pulling it out and by loosening a screw.
3. Remove the Fan Motor assembly by loosening 2 screws and disassemble the shroud.
4. Pull out the fan and separate the Fan Motor and Bracket.

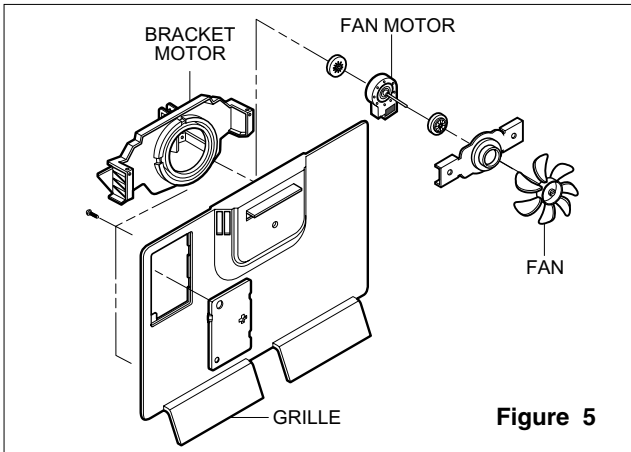


Figure 5

3-4 DEFROST CONTROL ASSEMBLY

Defrost Control assembly consists of Defrost Sensor and FUSE-M.

The Defrost Sensor works to defrost automatically. It is attached to the metal side of the Evaporator and senses its temperature. At 72°C, it turns the Defrost Heater off.

Fuse-M is a safety device for preventing over-heating of the Heater when defrosting.

1. Pull out the grille assembly. (Figure 6)
2. Separate the connector with the Defrost Control assembly and replace the Defrost Control assembly after cutting the Tie Wrap. (Figure 7)

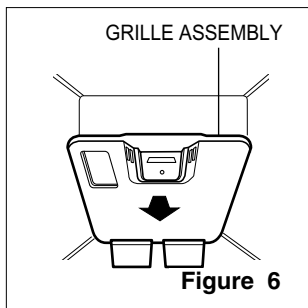


Figure 6

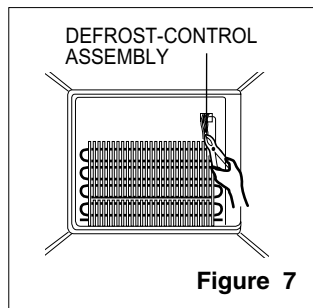


Figure 7

3-5 LAMP

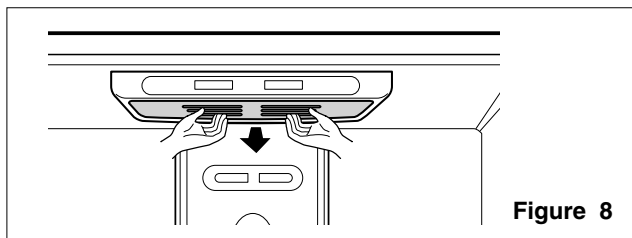


Figure 8

3-5-1 Refrigerator Compartment Lamp

1. Unplug the power cord from the outlet.
2. Remove refrigerator shelves.
3. Release the hooks on both ends of the lamp shield and pull the shield downward to remove it.
4. Turn the lamp counterclockwise.
5. Assemble in reverse order of disassembly. Replacement bulb must be the same specification as the original (Max. 60 W-2EA).

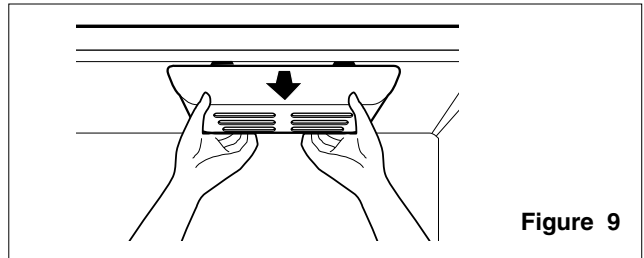


Figure 9

3-5-2 Freezer Compartment Lamp

1. Unplug refrigerator or disconnect power.
2. Reach behind light shield to remove bulb.
3. Replace bulb with a 40-watt appliance bulb.
4. Plug in refrigerator or reconnect power.

3-6 CONTROL BOX-REFRIGERATOR

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

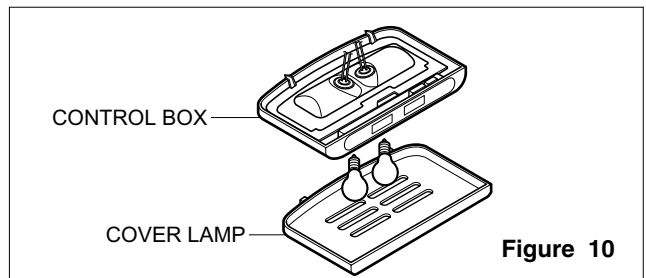


Figure 10

2. Remove the Refrigerator Control Box by pulling it downward.
3. Disconnect the lead wire on the right position and separate the lamp sockets.

3-7 MULTI DUCT

1. Remove an upper and lower Cap by using a flat screwdriver, and loosen 3 screws. (Figure 11)
2. Disconnect the lead wire on the bottom position.

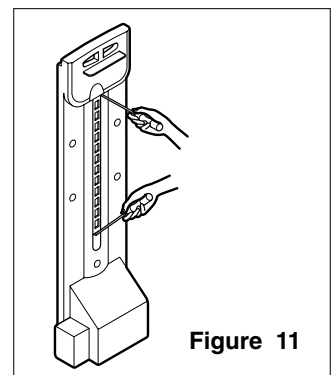


Figure 11

4. ADJUSTMENT

4-1 COMPRESSOR

4-1-1 Role

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

4-1-2 Composition

The compressor includes overload protection. The PTC starter and OLP (overload protector) are attached to the outside of the compressor. Since the compressor is manufactured to tolerances of 1 micron and is hermetically sealed in a dust and moisture-free environment, use extreme caution when repairing it.

4-1-3 Note for Usage

- (1) Be careful not to allow over-voltage and over-current.
- (2) If compressor is dropped or handled carelessly, poor operation and noise may result.
- (3) Use proper electric components appropriate to the Particular Compressor in your product.
- (4) Keep Compressor dry.
If the Compressor gets wet (in the rain or a damp environment) and rust forms in the pin of the Hermetic Terminal, poor operation and contact may result.
- (5) When replacing the Compressor, be careful that dust, humidity, and soldering flux don't contaminate the inside of the compressor. Dust, humidity, and solder flux contaminate the cylinder and may cause noise, improper operation or even cause it to lock up.

4-2 PTC-STARTER

4-2-1 Composition of PTC-Starter

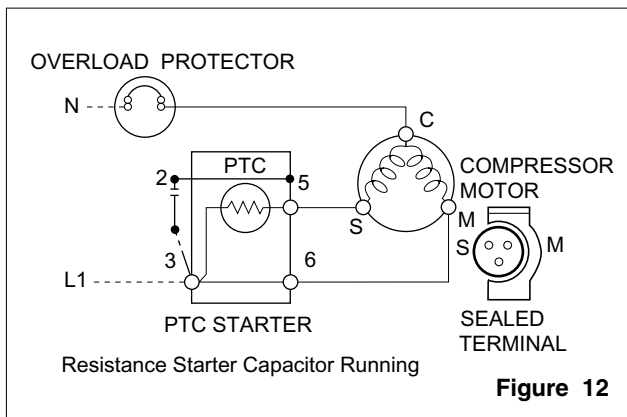
- (1) PTC (Positive Temperature Coefficient) is a no-contact semiconductor starting device which uses ceramic material consisting of BaTiO₃.
- (2) The higher the temperature is, the higher the resistance value. These features are used as a starting device for the Motor.

4-2-2 Role of PTC-Starter

- (1) The PTC is attached to the Sealed Compressor and is used for starting the Motor.
- (2) The compressor is a single-phase induction motor. During the starting operation, the PTC allows current flow to both the start winding and main winding.

4-2-3 PTC-Applied Circuit Diagram

● Starting Method for the Motor



4-2-4 Motor Restarting and PTC Cooling

- (1) It requires approximately 5 minutes for the pressure to equalize before the compressor can restart.
- (2) The PTC device generates heat during operation. Therefore, it must be allowed to cool before the compressor can restart.

4-2-5 Relation of PTC-Starter and OLP

- (1) If the compressor attempts to restart before the PTC device is cooled, the PTC device will allow current to flow only to the main winding.
- (2) The OLP will open because of the over current condition. This same process will continue (3 to 5 times) when the compressor attempts to restart until the PTC device has cooled. The correct OLP must be properly attached to prevent damage to the compressor.

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

4-2-6 Note for Using the PTC-Starter

- (1) Be careful not to allow over-voltage and over-current.
- (2) Do not drop or handle carelessly.
- (3) Keep away from any liquid.
If liquid such as oil or water enters the PTC, PTC materials may fail due to breakdown of their insulating capabilities.
- (4) If the exterior of the PTC is damaged, the resistance value may be altered. This can cause damage to the compressor and result in a no-start or hard-to-start condition.
- (5) Always use the PTC designed for the compressor and make sure it is properly attached to the compressor. Parts may appear physically identical but could have different electrical ratings. Replace parts by part number and model number. Using an incorrect part could result in damage to the product, fire, injury, or possibly death.

4-3 OLP (OVERLOAD PROTECTOR)

4-3-1 Definition of OLP

- (1) OLP (OVERLOAD PROTECTOR) is attached to the Compressor and protects the Motor by opening the circuit to the Motor if the temperature rises and activating the bimetal spring in the OLP.
- (2) When high current flows to the Compressor motor, the Bimetal works by heating the heater inside the OLP, and the OLP protects the Motor by cutting off the current flowing to the Compressor Motor.

4-3-2 Role of the OLP

- (1) The OLP is attached to the Sealed Compressor used for the Refrigerator. It prevents the Motor Coil from being started in the Compressor.
- (2) For normal operation of the OLP, do not turn the Adjust Screw of the OLP in any way.

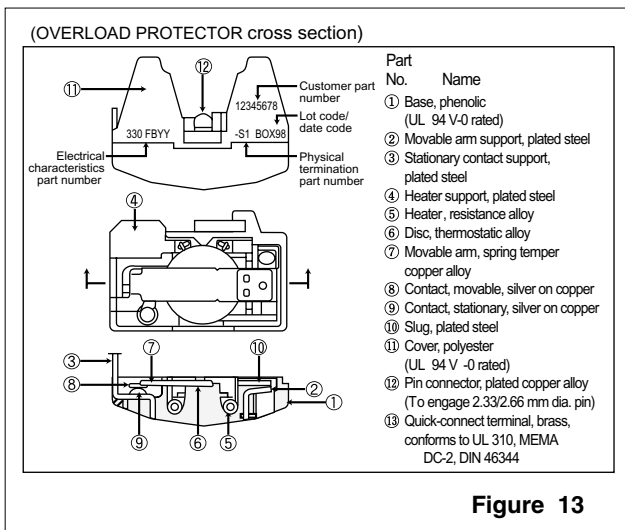
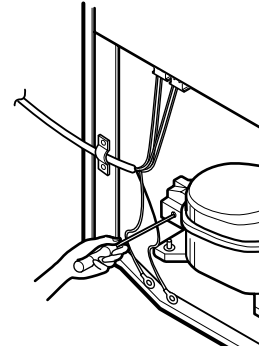
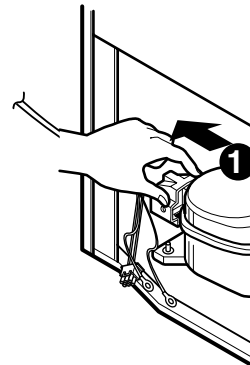


Figure 13

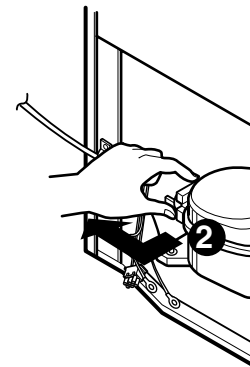
4-4 TO REMOVE THE COVER PTC



- 1) Remove the Cover Back M/C.
- (2) Remove the screw on Cover PTC.



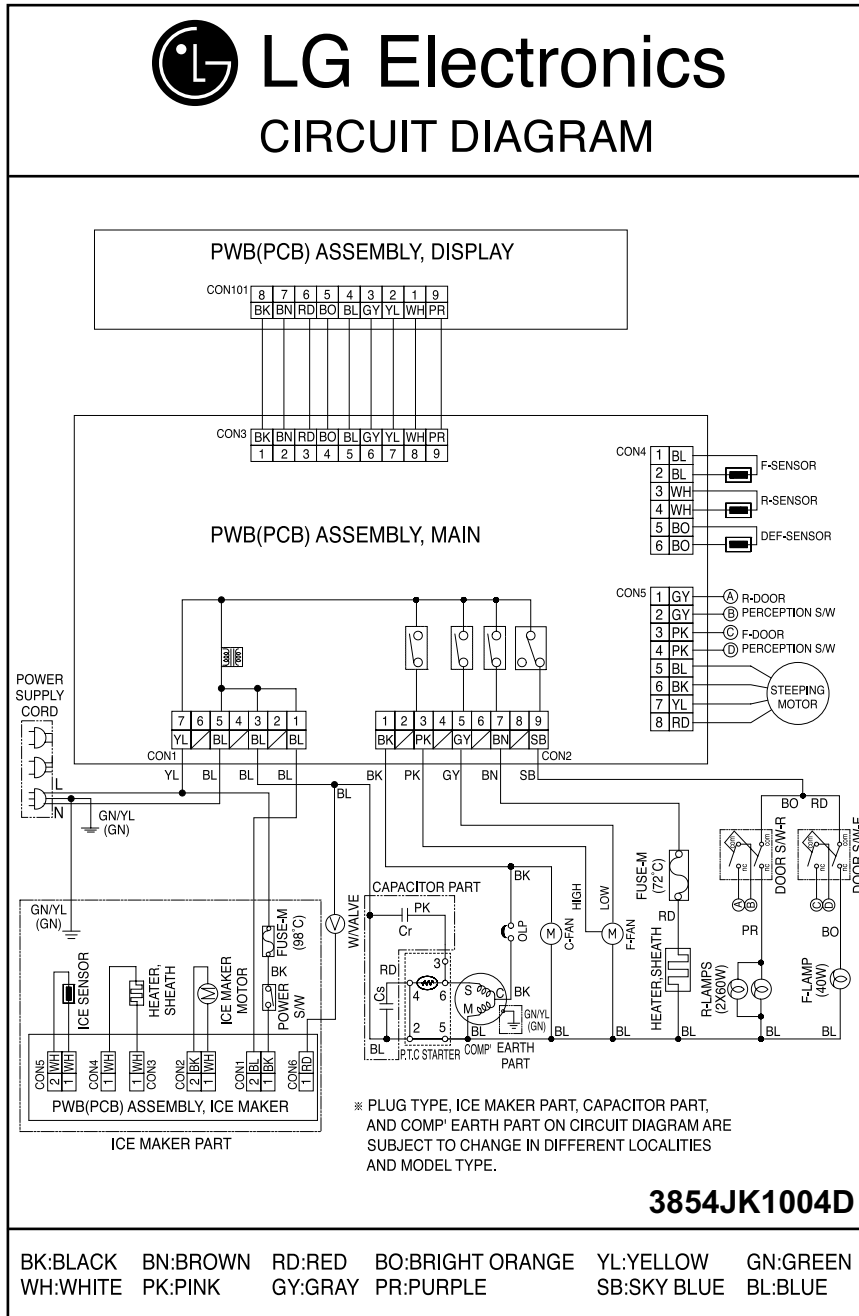
- (3) Remove two Housings on upper part of Cover PTC.
- (4) Take out the cover PTC from upper to lower position like ①.



- (5) Turn 45° in the direction of ② and take it out.
- (6) Assembly in reverse order of disassembly.

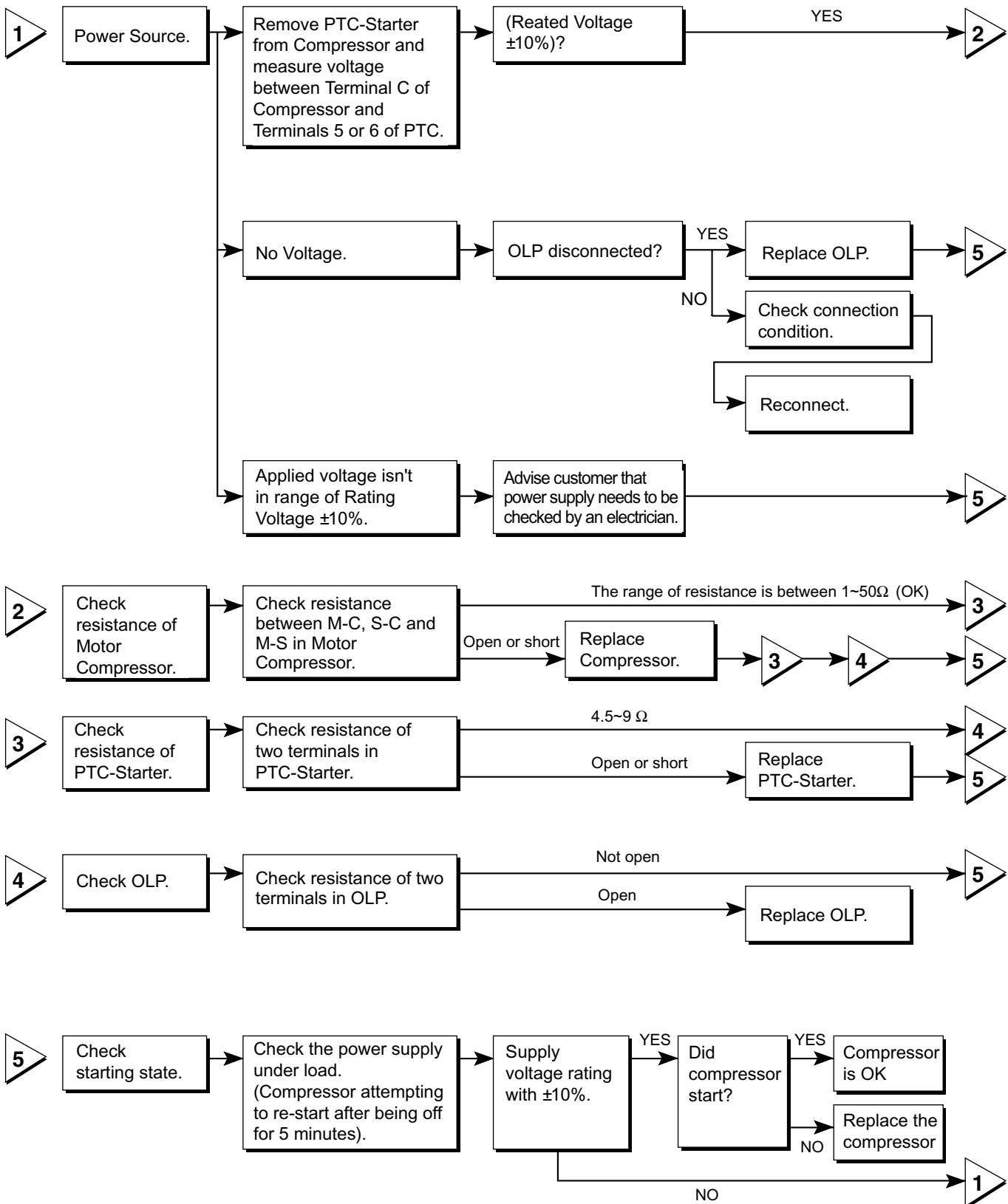
5. CIRCUIT DIAGRAM

BETTER / GOOD



6. TROUBLESHOOTING

6-1 COMPRESSOR AND ELECTRIC COMPONENTS



6-2 PTC AND OLP

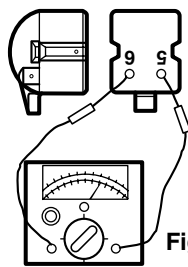
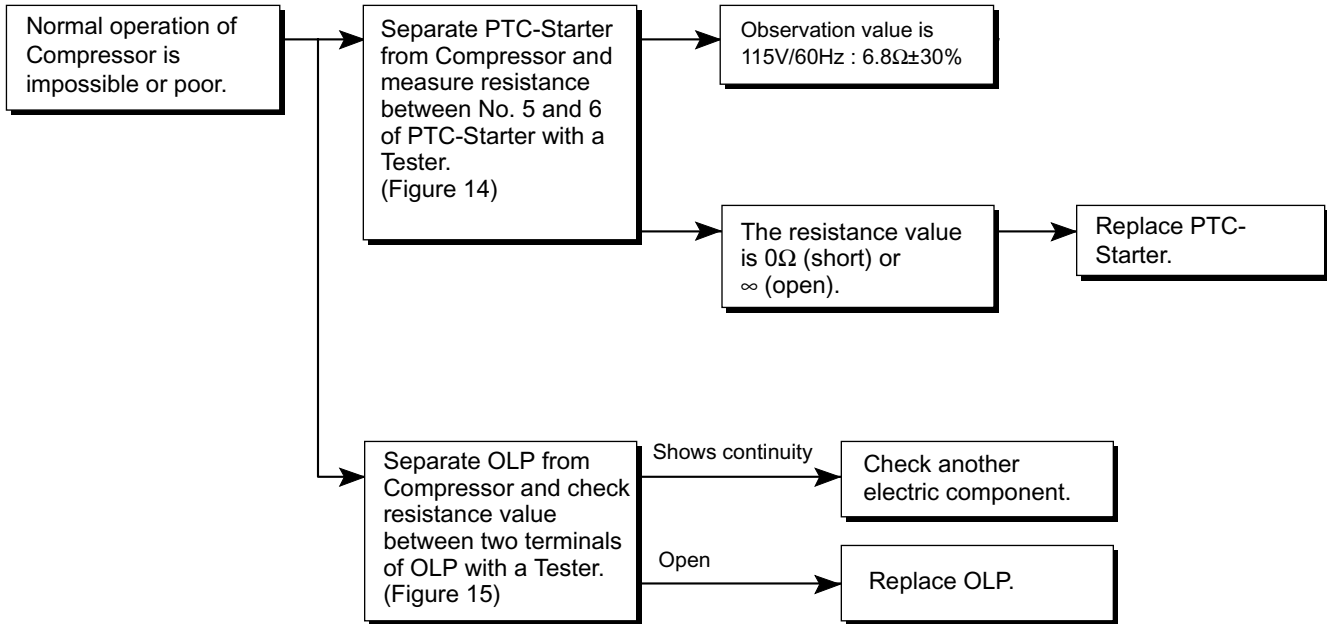


Figure 14

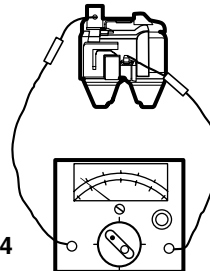
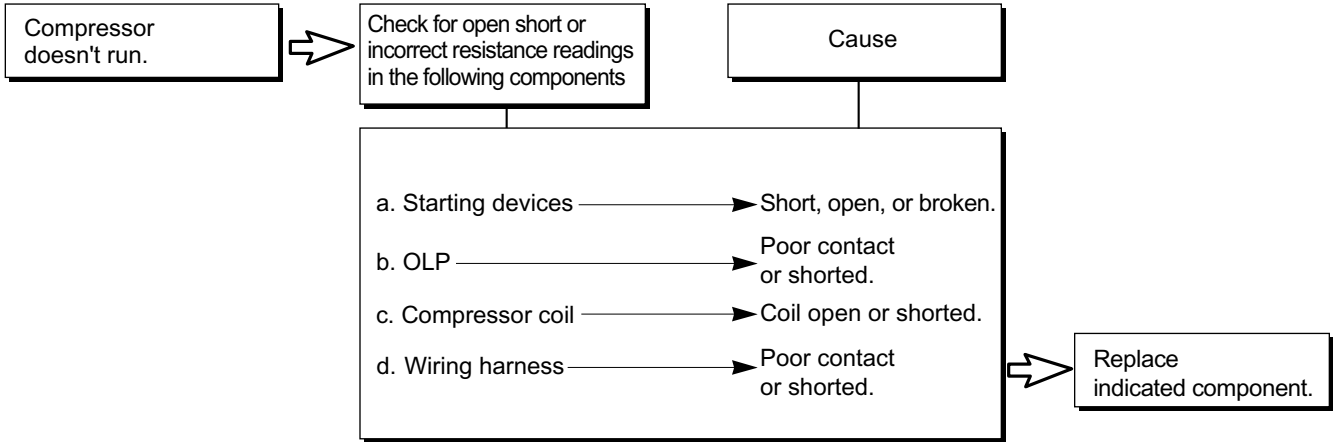


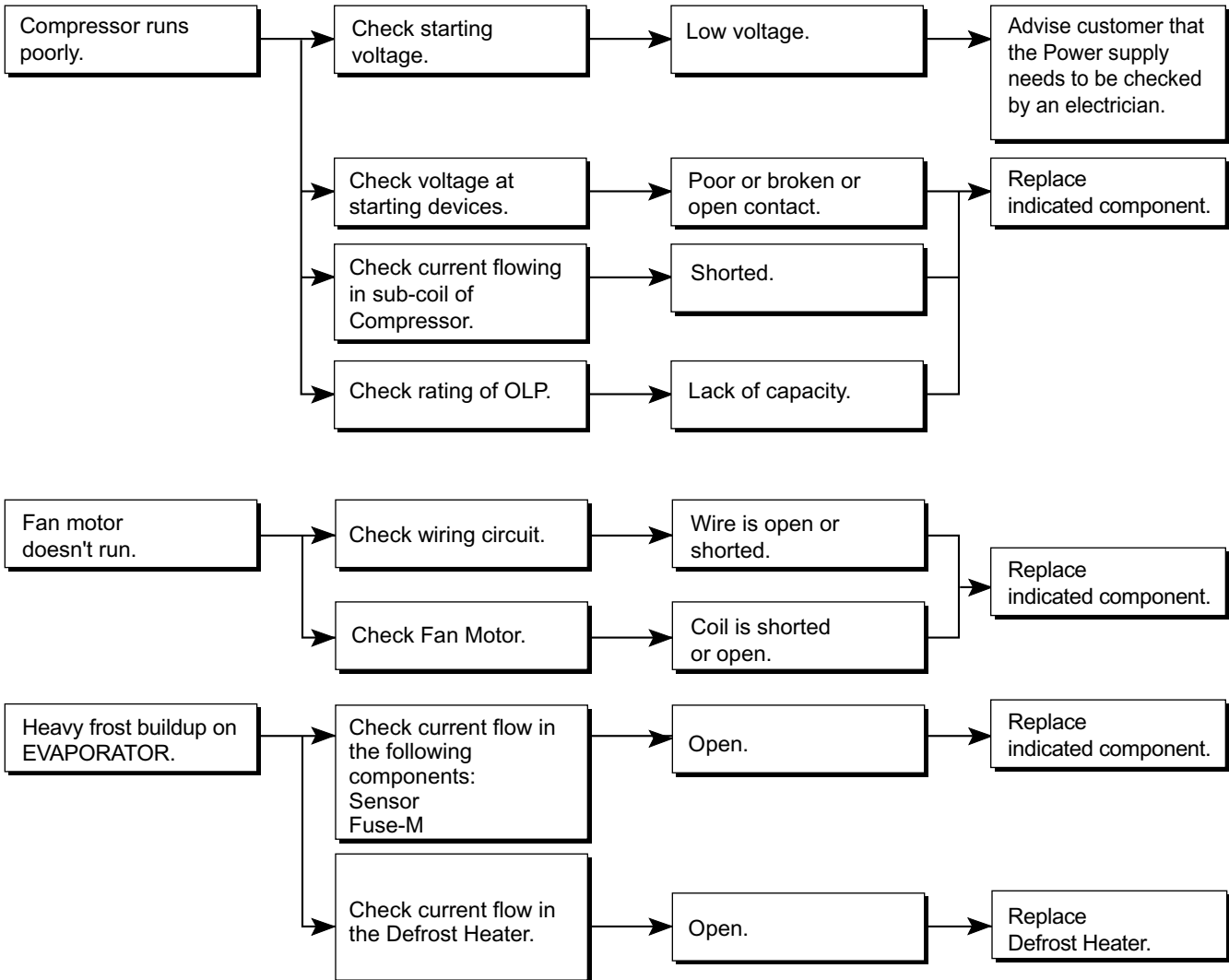
Figure 15

6-3 OTHER ELECTRICAL COMPONENTS

▼ Not cooling at all



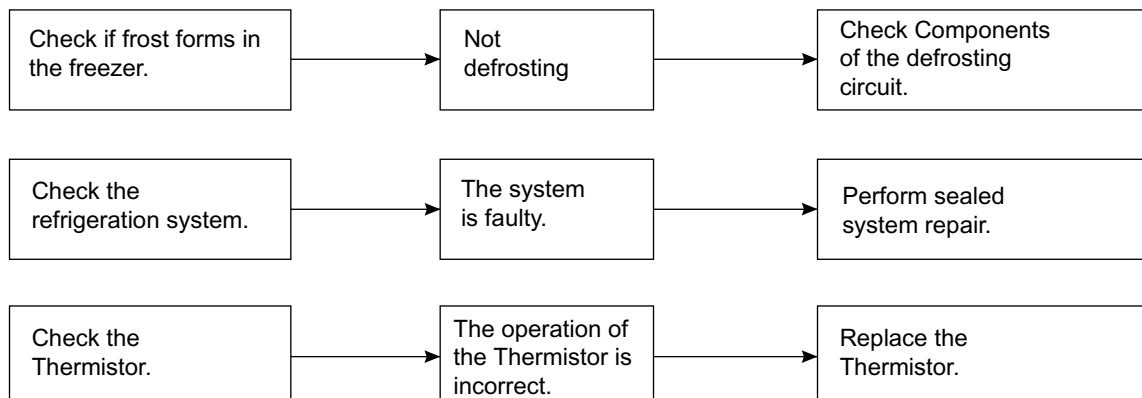
▼ Poor cooling performance



6-4 SERVICE DIAGNOSIS CHART

COMPLAINT	POINTS TO BE CHECKED	REMEDY
No Cooling.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Plug into the outlet. Set the switch to ON. Replace the fuse. If the voltage is low, correct the wiring.
Cools poorly.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.
Foods in the Refrigerator are frozen.	<ul style="list-style-type: none"> 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)? 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> 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? 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Check if the ambient temperature and humidity of the surrounding air are high. Is there a gap in the door gasket? 	<ul style="list-style-type: none"> Wipe moisture with a dry cloth. It will disappear in low temperature and humidity. Fill up the gap.
There is abnormal noise.	<ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> Check if the door gasket is dirty with an item like juice. Is the refrigerator level? Is there too much food in the refrigerator? 	<ul style="list-style-type: none"> Clean the door gasket. Position in the 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.	<ul style="list-style-type: none"> Check if the inside of the unit is dirty. Are foods with a strong odor unwrapped? The unit smells of plastic. 	<ul style="list-style-type: none"> 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:



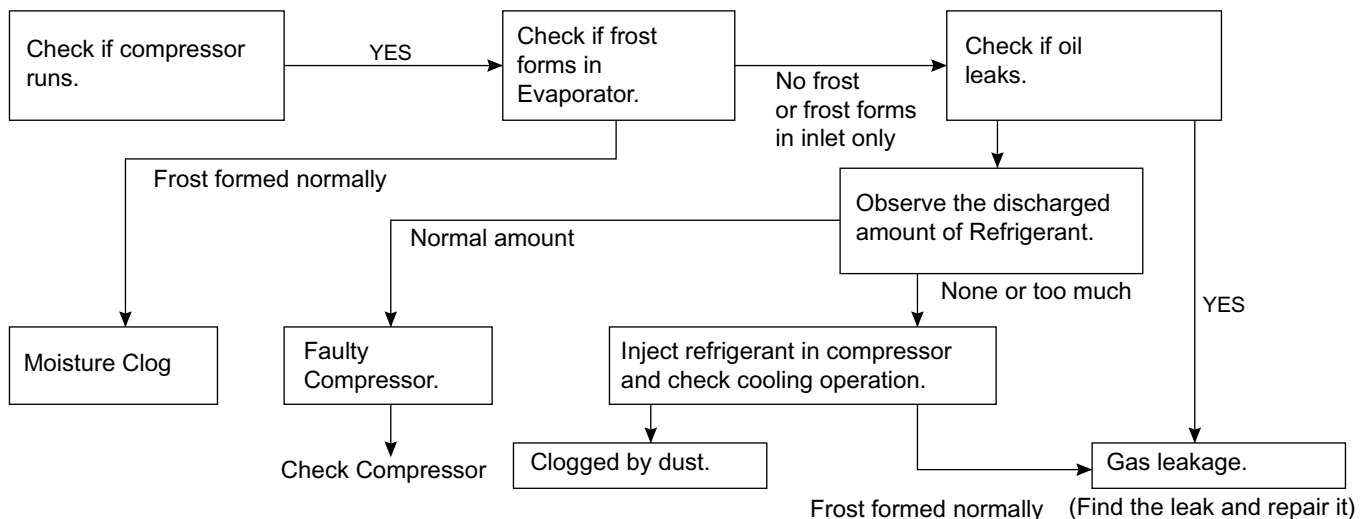
6-5 REFRIGERATION CYCLE

▼ Troubleshooting Chart

CAUSE		STATE OF THE UNIT	STATE OF THE EVAPORATOR	TEMPERATURE OF THE COMPRESSOR	REMARKS
LEAKAGE	PARTIAL LEAKAGE	Freezer compartment and Refrigerator don't cool normally.	Low flowing sound of Refrigerant is heard and frost forms in inlet only.	A little higher than ambient temperature.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> 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 ambient temperature.	<ul style="list-style-type: none"> 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.	<ul style="list-style-type: none"> No pressure in the high pressure part of the compressor.

▼ Leakage Detection

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



▼ General Control of Refrigerating Cycle

NO.	ITEMS	UNIT	STANDARDS	PURPOSES	REMARKS	
1	Pipe and piping system opening time	Min.	Pipe: within 1 hour. Comp: within 10 minutes. Drier: within 20 minutes.	To protect moisture penetration.	The opening time should be reduced to a half of the standards during rain and rainy seasons (the penetration of water into the pipe is dangerous).	
2	Welding	Nitrogen pressure	Weld under Nitrogen atmosphere. (N ₂ pressure: 0.1~0.2 kg/cm ²)	To protect oxide scale formation.	- Refer to repair note in each part. - R-134a refrigerant is more susceptible to leaks than R-12 and requires more care during welding. - Do not apply force to pipes before and after welding to protect pipe from cracking.	
3	N ₂ sealed parts	Confirm N ₂ leak	Confirm the sound of pressure relief when removing the rubber cap. Sound: usable No sound: not usable	To protect moisture penetration.	- In case of evaporator parts, if it doesn't make sound when removing rubber cap, blow dry air or N ₂ gas for more than 1 min. and then use the parts.	
4	Refrigeration Cycle	Evacuation time	Min.	More than 40 minutes	To remove moisture.	Note: Only applicable to the model equipped with reverse flow protect plate. Vacuum efficiency can be improved by operating compressor during evacuation. The rubber pipes for R-12 refrigerant will be melted when they are used for R-134a refrigerant (causes of leak.)
		Vacuum degree	Torr	Below 0.03 (ref)		
		Vacuum	EA	High and low pressure sides are evacuated at the same time for models above 200 l.		
		Vacuum piping	EA	Use R-134a manifold exclusively.	To protect mixing of mineral and ester oils.	
		Pipe coupler	EA	Use R-134a manifold exclusively.	To protect R-12 refrigerant mixing.	
		Outlet (Socket)		R-134a manifold exclusively.	To protect R-12 refrigerant mixing.	
		Plug		R-134a manifold exclusively.	To protect R-12 refrigerant mixing.	
5	Refrigerant weighing	EA	Use R-134a exclusively. Weighing allowance: ±5g Note: Winter: -5g Summer: +5g	Do not mix with R-12 refrigerant.	- Do not weigh the refrigerant at too hot or too cold an area. (77°F [25°C] is adequate.) - Make Copper charging canister (Device filling refrigerant) Socket: 2SV Plug: 2PV R-134a Note: Do not burn O-ring (bushing) during welding.	
6	Drier replacement		- Use R-134a exclusively for R-134a refrigerator. - Replace drier whenever repairing refrigerator cycle piping.	To remove the moisture from pipe inside.		
7	Leak check		- Do not use soapy water for check. It may be sucked into the pipe by a vacuum.	Defect in refrigerant leak area.	- Check for an oil leak at the refrigerant leak area. Use an electronic leak detector if an oil leak is not found. - The electronic leak detector is very sensitive to halogen gas in the air. It also can detect R-141b in urethane. Practice many times before using this type of detector to avoid false readings.	

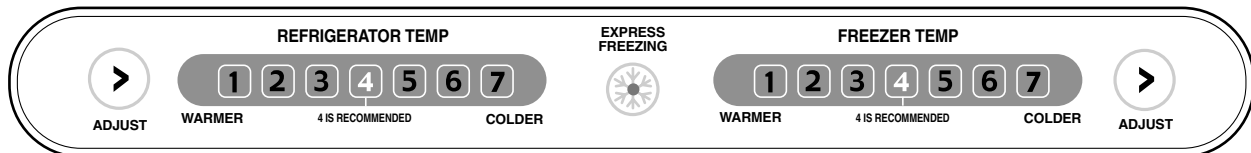
7. DESCRIPTION OF FUNCTION & CIRCUIT OF MICOM

7-1 FUNCTION

7-1-1 Function

1. When the appliance is plugged in, it is set to "4" for Refrigerator and "4" for freezer.
You can adjust the Refrigerator and the Freezer control temperature by pressing the ADJUST button.
2. When the power is initially applied or restored after a power failure, it is automatically set to "4" & "4".

BETTER / GOOD MODEL



7-1-2 Control of freezer fan motor

1. Freezer fan motor has high and standard RPMs.
2. High RPM is used when electricity is first on, for express freezing, and when refrigerator is overloaded.
But standard RPM is used for general purposes.
3. To improve cooling speed and load corresponding speed, the RPM of freezer fan motor shall change from normal speed to high speed.
4. High speed (2500RPM) : Initial power on or load corresponding operation, express freezing Normal speed (2200RPM) : General working conditions.
5. Fan motor stops when refrigerator or freezer door opens.

7-1-3 EXPRESS FREEZING

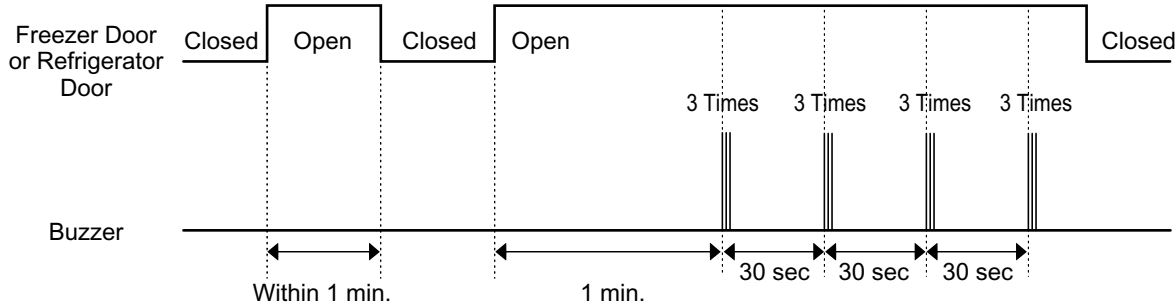
1. The purpose of this function is to intensify the cooling speed of freezer and to increase the amount of ice.
2. Whenever selection switch is pressed, selection/release, the LED will turn ON or OFF.
3. If there is a power cut and the refrigerator is power on again, EXPRESS FREEZING function will be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

7-1-4. REFRIGERATOR LAMP AUTO OFF

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

7-1-5 Alarm for Open Door

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



7-1-6 Buzzer Sound

When the button on the front Display is pushed, a Ding~ Dong~ sound is produced.
 (Refer to the Buzzer Circuit 7-2-4 No. 2)

7-1-7 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 4 hours.
3. Defrosting stops if the sensor temperature reaches 46.4°F(8°C) or more. If the sensor doesn't reach 46.4°F(8°C) in 2 hours, the defrost mode is malfunctioning. (Refer to the defect diagnosis function, 7-1-9.)
4. Defrosting won't function if its sensor is defective (wires are cut or short circuited)

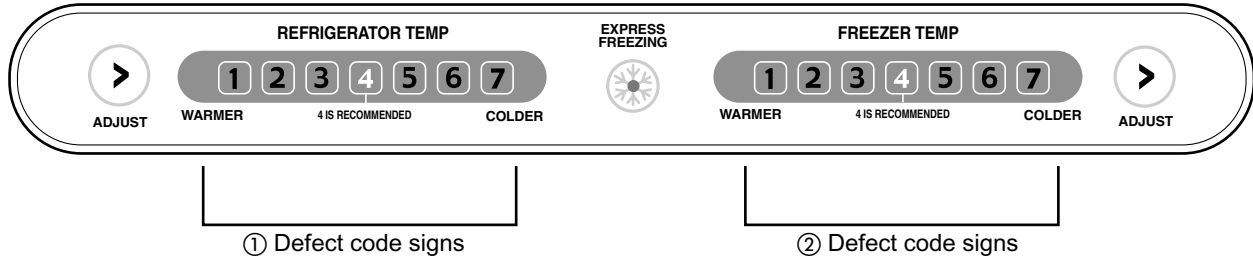
7-1-8 Electrical Parts Are Turned On Sequentially

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.

OPERATING		ORDERS				
Initial power on	Temperature of Defrosting Sensor is 45°C or more (when unit is newly purchased or when moved)	POWER ON	in 1/2 second →	COMP ON	in 1/2 second →	Freezer FAN ON
	Temperature of defrosting sensor is lower than 45°C (when power cuts, SERVICE)	POWER ON	in 1/2 second →	Defrosting heater ON	in 10 second →	Defrosting heater OFF
		in 1/2 second →	COMP ON	in 1/2 second →	Freezer FAN ON	
	Reset to normal operation from TEST MODE	Total load OFF	in 7 minute →	COMP ON	in 1/2 second →	Freezer FAN ON

7-1-9 Defect Diagnosis Function

1. Automatic diagnosis makes servicing the refrigerator easy.
2. When a defect occurs, the buttons will not operate; but the tones, such as ding, will sound.
3. When the defect CODE removes the sign, it returns to normal operation (RESET).
4. The defect CODE shows on the Refrigerator and Freezer Display.



ERROR CODE on display panel

NO	ITEM	ERROR CODE		CONTENTS	REMARKS
		①	②		
1	Failure of freezer sensor	All off	● ○ ○ ○ ○ ○ ○ ○	Cut or short circuit wire	Inspect Connecting wires on each sensor
2	Failure of Refrigerator sensor	All off	○ ● ○ ○ ○ ○ ○ ○	Cut or short circuit wire	
3	Failure of defrost sensor	All off	○ ○ ● ○ ○ ○ ○ ○	Cut or short circuit wire	
4	Poor of defrost	All off	● ● ● ● ○ ○ ○	2hours later After starting defrost, If sensor doesn't be over 46°F (8°C)	Snapping of defrost heater or Temperature fuse, pull-out of Connector (indicated minimum 2 Hours after failure occurs)

7-1-10 TEST Mode

1. The Test mode allows checking the PCB and the function of the product as well as finding out the defective part in case of an error.
2. The test mode is operated by pressing two buttons at Display panel.
3. While in the test mode, the function control button is not recognized, but the recognition tone (beep~) sounds.
4. After exiting the test mode, be sure to reset by unplugging and then plugging in the appliance.
5. If an error, such as a sensor failure, is detected while in the test mode, the test mode is cleared and the error code is displayed.
6. While an error code is displayed, the test mode will not be activated.

MODE	MANIPULATION	CONTENTS	REMARKS
TEST1	Push Express Freezing key and COLDER KEY of Freezer Temp. at the same time over 3 seconds.	<ol style="list-style-type: none"> 1. Continuous operation of the COMPRESSOR 2. Continuous operation of the freezer fan 3. STEPPING DAMPER OPEN 4. Defrosting Heater OFF 5. Every DISPLAY LED ON 	
TEST2	Push Express Freezing key and COLDER KEY of Freezer Temp. at the same time over 3 seconds in TEST MODE 1	<ol style="list-style-type: none"> 1. COMP OFF 2. Freezer FAN OFF 3. STEPPING DAMPER CLOSE 4. Defrosting heater ON 5. DISPLAY LED 1, 3, 5, 7 ON 	Reset if the temperature of the Defrosting sensor is 46°F (8°C) or more.
Reset	Push Express Freezing key and COLDER KEY of Freezer Temp. at the same time over 3 seconds. in TEST MODE 2	Reset to the previously setting before TEST MODE	The compressor will Start after a 7-minute delay.

NOTE : LED CHECK MODE: When the refrigerator temperature control and the freezer temperature control button at the same time are hold for 1 second or longer, every LED on the display turns on at the same time. when the button are released, the previous mode is restored.

* Freezer Fan RPM Variable Check:

In case the freezer fan is in operation when the WARMER KEY in Refrigerator and Freezer Temp. Control are pressed for more than one second at the same time freezer fan RPM changes. (for example if high speed, to normal speed or if normal speed, to high speed for 30 seconds)

After 30 seconds, it turns to its original RPM.

* Demonstration MODE:

1. When the KEY of refrigerator Temp. control or of freezer Temp. control is pushed and held over 5 seconds, warmest temperature's It converts to Demonstration Mode.

2. In this status, each LED is rotated with 1 second interval.

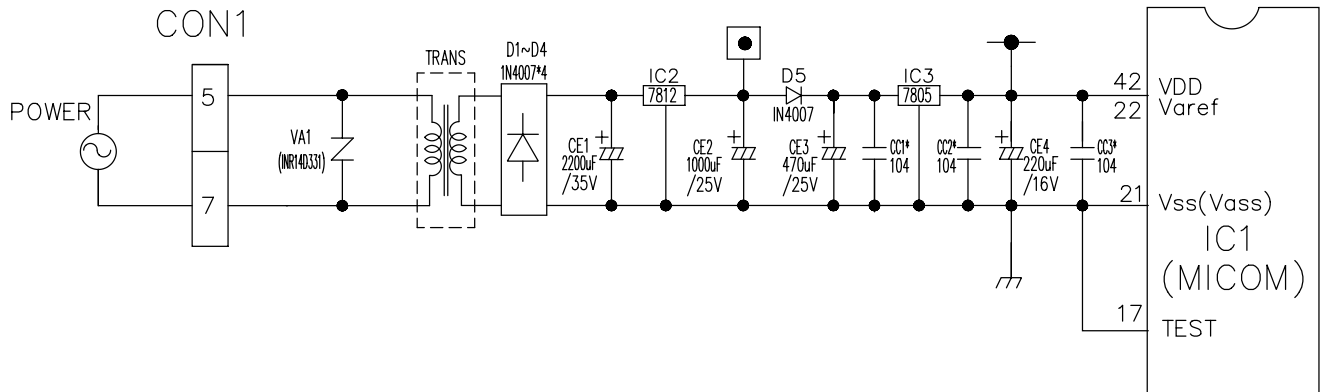
3. In this status, all Loads are off (Compressor / Fan / Damper / Heater)

(Even is Demonstration Mode, the refrigerator Lamp automatic off function works normally and can be demonstrated)

4. It reset if you do again as clause.

7-2 PCB FUNCTION

7-2-1 Power Circuit



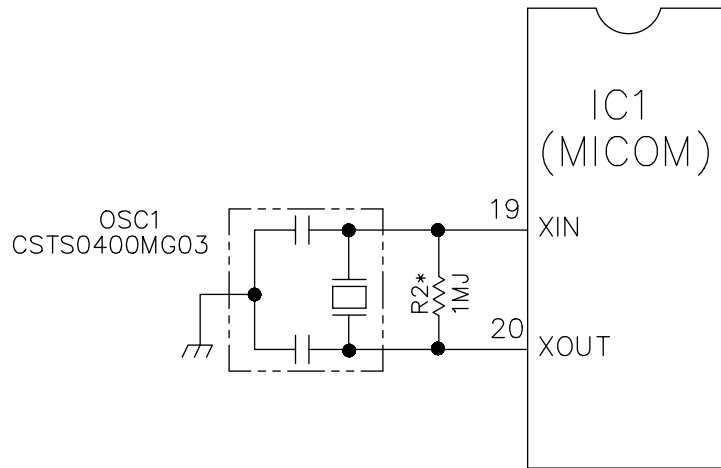
The secondary part of the TRANSFORMER is composed of the power supply for the display, the BLDC FAN Motor drive (15.5 V), the relay drive (12 Vdc) and the MICOM and IC (5 Vdc).

The voltage for each part is as follows:

PART	VA 1	CE 3	CE 4	CE 5
VOLTAGE	115 Vac	12 Vdc	15.5 Vdc	5 V

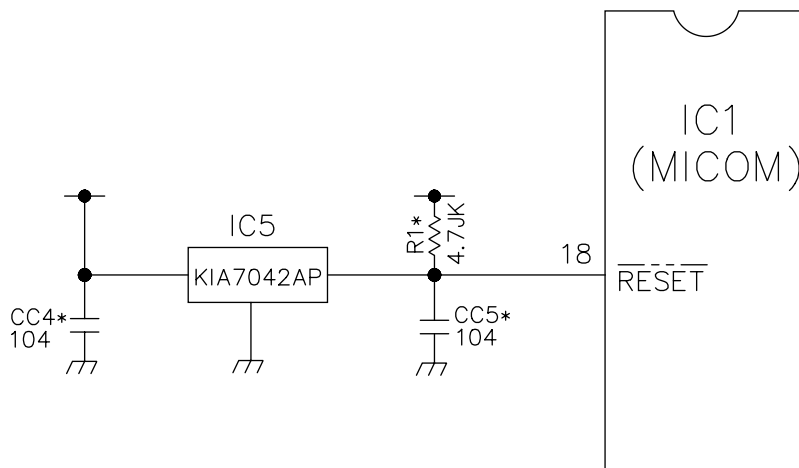
VA1 is a part for preventing over voltage and noise. When 385V or higher power is applied, the inside elements are short-circuited and broken, resulting in blowout of the fuse in order to protect the elements of the secondary part of the TRANSFORMER.

7-2-2 Oscillation Circuit



This circuit generates the base clock for calculating time and the synchro clock for transmitting data from and to the inside logic elements of the IC1 (MICOM). Be sure to use specific replacement parts, since calculating time by the IC1 may be changed. If changed, the OSC1 SPEC will not work.

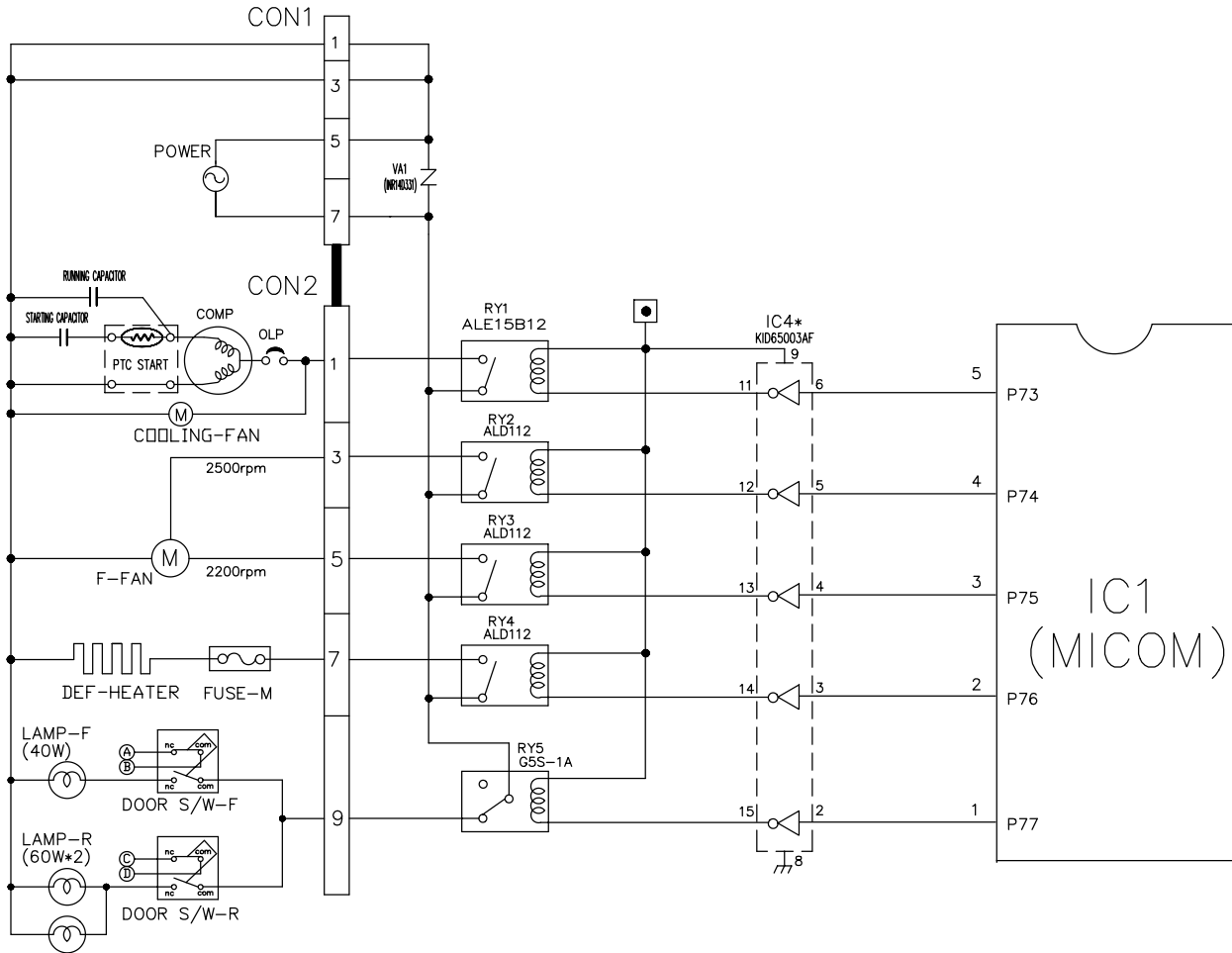
7-2-3 Reset Circuit



The RESET circuit allows all the functions to start at the initial conditions by initializing various parts, including the RAM inside the MICOM (IC1) when the power is initially supplied or the power supply to the MICOM is restored after a momentary power failure. For the initial 10ms of power supply, LOW voltage is applied to the MICOM RESET terminal. During a normal operation, 5V is applied to the RESET terminal. (If a malfunction occurs in the RESET IC, the MICOM will not operate.)

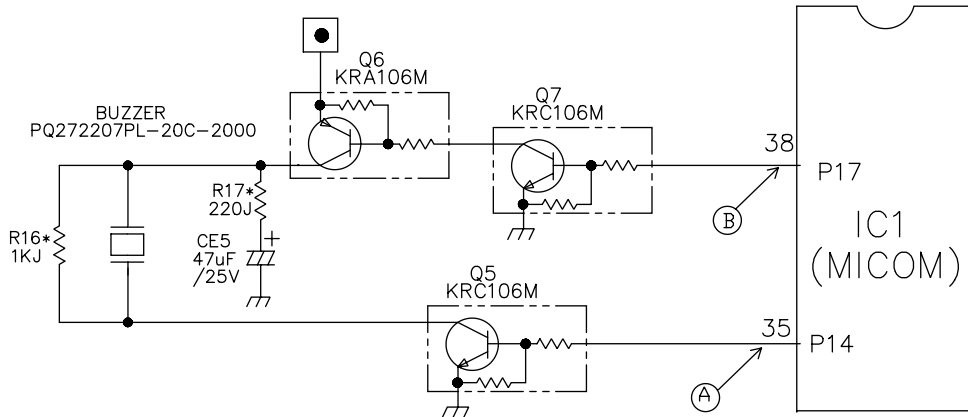
7-2-4 Load / Buzzer Drive & Open Door Detection Circuit

1. Load Drive Condition Check



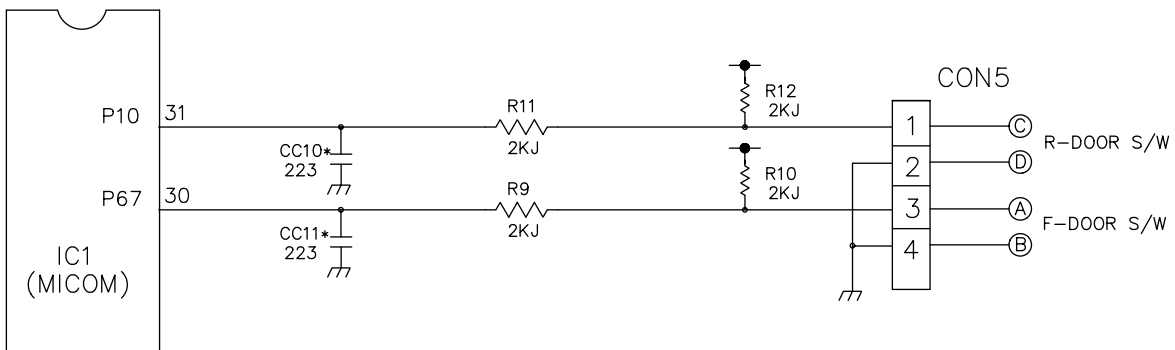
LOAD TYPE	COMP	DEFROSTING HEATER	LAMP	FREEZER FAN MOTOR (HIG RPM)	FREEZER FAN MOTOR (LOW RPM)
Measurement Location (IC4)	NO.11	NO.14	NO.15	NO.12	NO.13
Condition	ON	1V or below			
	OFF	12V			

2. Buzzer Drive Condition Check



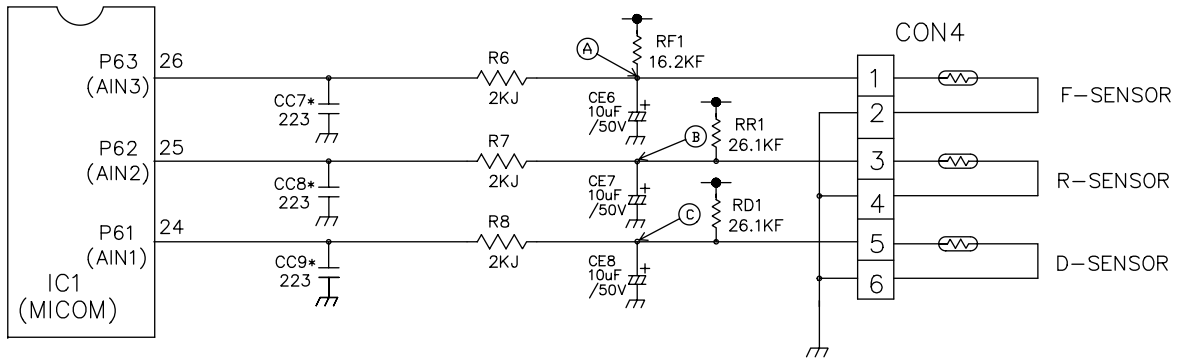
Condition Measurement Location	Tone (Ding~Dong~) when the button on the display is pushed.	Alarm for open door (beep-beep-beep)	OFF
IC1 (A)			0 V
IC1 (B)			0 V

3. Open Door Detection Circuit Check



Measurement Location Freezer/ Refrigerator Door	(PIN NO.31 & PIN NO.30)
Closed	5 V
Open	0 V

7-2-5 Temperature Sensor Circuit

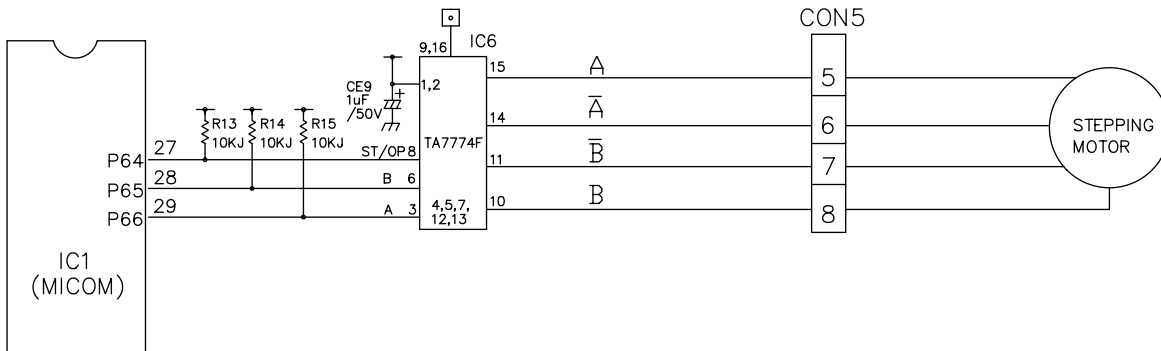


The upper CIRCUIT reads REFRIGERATOR temperature, FREEZER Temperature, and DEFROST-SENSOR temperature for defrosting and the indoor temperature for compensating for the surrounding temperature into MICOM. OPENING or SHORT state of each TEMPERATURE SENSOR are as follows:

SENSOR	CHECK POINT	NORMAL (-30°C ~ 50°C)	SHORT-CIRCUITED	OPEN
Freezer Sensor	POINT (A) Voltage	0.5 V ~ 4.5 V	0 V	5 V
Refrigerator Sensor	POINT (B) Voltage			
Defrosting Sensor	POINT (C) Voltage			

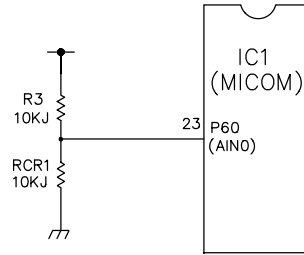
7-2-6 Refrigeration Compartment Stepping Motor Damper Circuit

* The circuit shown below is the damper circuit to regulate the refrigerator temperature.



7-2-7 Temperature Compensation & Overcooling/Undercooling Compensation Circuit

1. Refrigerator Temperature Compensation



Refrigerator		Remark
Resistance (RCR)	Temperature Compensation	
180 KΩ	+2.5°C	Compensation by raising the temperature ↑
56 KΩ	+2.0°C	
33 KΩ	+1.5°C	
18 KΩ	+1.0°C	
12 KΩ	+0.5°C	
10 KΩ	0 °C	Standard Temperature
8.2 KΩ	-0.5°C	Compensation by lowering the temperature ↓
5.6 KΩ	-1.0°C	
3.3 KΩ	-1.5°C	
2 KΩ	-2.0°C	
470 Ω	-2.5°C	

◆ Table of Temperature Compensation by adjusting the resistance (difference from the current temperature) e.g., If the refrigerator compensation resistance (RCR) is changed from 10K (the current resistance) to 18K (the adjustment resistance), the temperature of the refrigerator rises 33.8°F(+1°C).

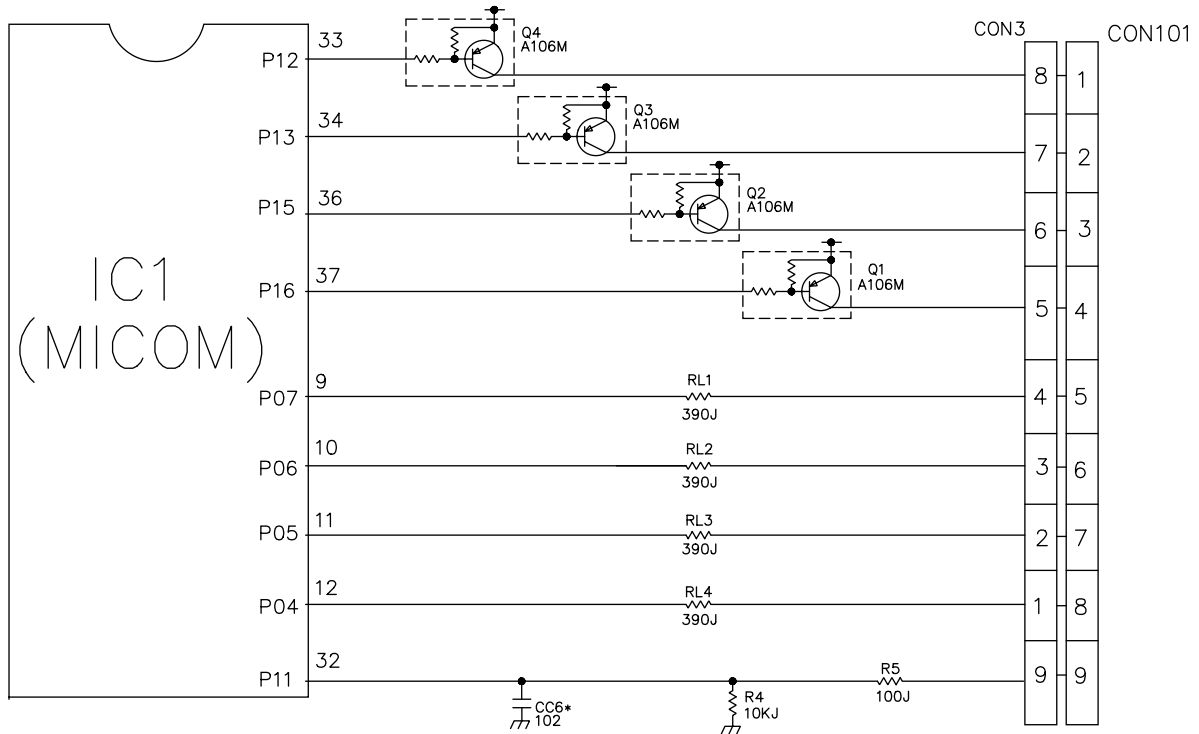
2. The temperature compensation for refrigerator compartment is in the following table:

	Revised resistance	470Ω	2kΩ	3.3kΩ	5.6kΩ	8.2kΩ	10kΩ	12kΩ	18kΩ	33kΩ	56kΩ	180kΩ
	Present resistance											
Refrigerator (RCR)	470Ω	No change	0.5°C Up	1°C Up	1.5°C Up	2°C Up	2.5°C Up	3°C Up	3.5°C Up	4°C Up	4.5°C Up	5°C Up
	2kΩ	0.5°C Down	No Change	0.5°C Up	1°C Up	1.5°C Up	2°C Up	2.5°C Up	3°C Up	3.5°C Up	4°C Up	4.5°C Up
	3.3kΩ	1°C Down	0.5°C Down	No Change	0.5°C Up	1°C Up	1.5°C Up	2°C Up	2.5°C Up	3°C Up	3.5°C Up	4°C Up
	5.6kΩ	1.5°C Down	1°C Down	0.5°C Down	No Change	0.5°C Up	1°C Up	1.5°C Up	2°C Up	2.5°C Up	3°C Up	3.5°C Up
	8.2kΩ	2°C Down	1.5°C Down	1°C Down	0.5°C Down	No Change	0.5°C Up	1°C Up	1.5°C Up	2°C Up	2.5°C Up	3°C Up
	10kΩ	2.5°C Down	2°C Down	1.5°C Down	1°C Down	0.5°C Down	No Change	0.5°C Up	1°C Up	1.5°C Up	2°C Up	2.5°C Up
	12kΩ	3°C Down	2.5°C Down	2°C Down	1.5°C Down	1°C Down	0.5°C Down	No Change	0.5°C Up	1°C Up	1.5°C Up	2°C Up
	18kΩ	3.5°C Down	3°C Down	2.5°C Down	2°C Down	1.5°C Down	1°C Down	0.5°C Down	No Change	0.5°C Up	1°C Up	1.5°C Up
	33kΩ	4°C Down	3.5°C Down	3°C Down	2.5°C Down	2°C Down	1.5°C Down	1°C Down	0.5°C Down	No Change	0.5°C Up	1°C Up
	56kΩ	4.5°C Down	4°C Down	3.5°C Down	3°C Down	2.5°C Down	2°C Down	1.5°C Down	1°C Down	0.5°C Down	No Change	0.5°C Up
180kΩ	5°C Down	4.5°C Down	4°C Down	3.5°C Down	3°C Down	2.5°C Down	2°C Down	1.5°C Down	1°C Down	0.5°C Down	No Change	

NOTE: This circuit is designed to input the necessary temperature compensation values into the MICOM. This adjusts the refrigerator temperature, which is different in each model.

7-2-8 Key Button Input & Display Light-On Circuit

◆ The circuit shown above determines whether a function control key on the operation display is pushed. It also turns on the corresponding function indication LED DISPLAY. The drive type is the scan type.



7-3 RESISTANCE SPECIFICATION OF SENSOR

TEMPERATURE DETECTED BY SENSOR	RESISTANCE OF FREEZER SENSOR	RESISTANCE OF REFRIGERATOR & DEFROST SENSOR & ROOM SENSOR
- 20 °C	22.3 KΩ	77 KΩ
- 15 °C	16.9 KΩ	60 KΩ
- 10 °C	13.0 KΩ	47.3 KΩ
- 5 °C	10.1 KΩ	38.4 KΩ
0 °C	7.8 KΩ	30 KΩ
+ 5 °C	6.2 KΩ	24.1 KΩ
+ 10 °C	4.9 KΩ	19.5 KΩ
+ 15 °C	3.9 KΩ	15.9 KΩ
+ 20 °C	3.1 KΩ	13 KΩ
+ 25 °C	2.5 KΩ	11 KΩ
+ 30 °C	2.0 KΩ	8.9 KΩ
+ 40 °C	1.4 KΩ	6.2 KΩ
+ 50 °C	0.8 KΩ	4.3 KΩ

- The resistance of the SENSOR has a $\pm 5\%$ common difference.
- Measure the resistance of the SENSOR after leaving it for over 3 minutes in the measuring temperature. This delay is necessary due to sensor response speed.

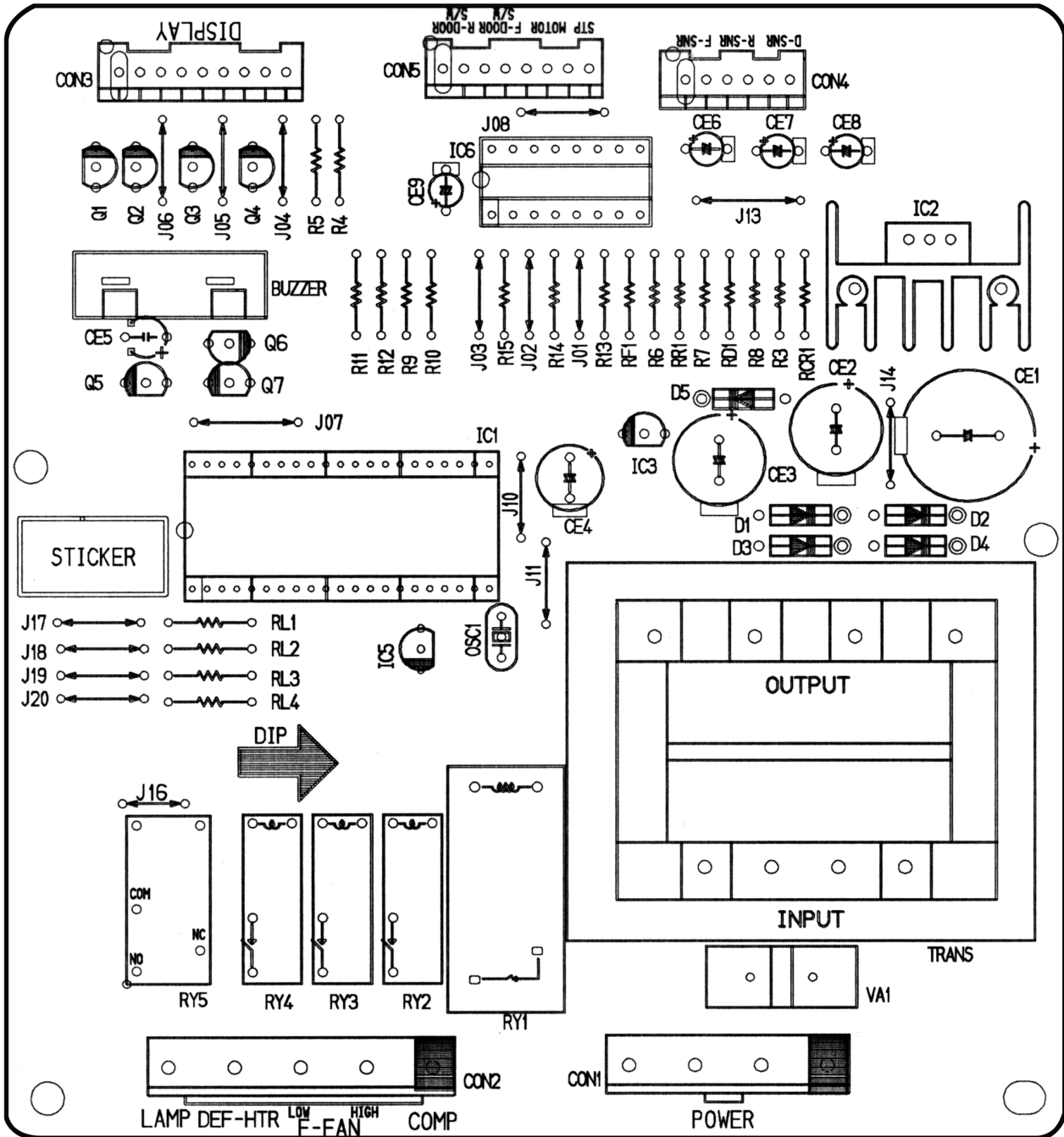
7-4 TROUBLESHOOTING

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

PROBLEM	INDICATED BY	CHECK	CHECKING METHOD	CAUSE	SOLUTION
COOLING is poor.	If REFRIGERATOR TEMPERATURE is too low.	1. If FREEZER TEMPERATURE is normal.	Check is FREEZER TEMPERATURE is too low.		Make sure the DOOR is attached. Replace FAN MOTOR.
		2. If amount of cool air from FAN MOTOR is sufficient.	Make sure that the amount and speed of cool air are sufficient by touching the check supplied on the REFRIGERATOR.	FAN MOTOR is poor. Passage of cool air is blocked. EVA frozen.	Remove impurities. See DEFROSTING is poor.
		3. Door Line contact.	Check door seal when door is closed.	Door liner damaged.	Replace Door liner.
DEFROSTING is poor.	NO DEFROSTING.	1. If HEATER emits heat.	USE TEST MODE2 (forced DEFROSTING).	HEATER disconnection.	Replace HEATER.
				TEMPERATURE FUSE disconnection.	Replace TEMPERATURE FUSE.
				Connection is poor.	Check EVAPORATOR connection and wire of MAIN PWB CONNECTOR.
		2. If DRAIN PIPE is blocked.	Check DRAIN PIPE.	DEFROST-SENSOR is poor.	Replace DEFROST-SENSOR.
				HEATER RELAY is poor.	Replace RY3 of MAIN PWB.
				DRAIN PIPE is blocked.	Remove ice and impurities. Check HEATER PLATE resistance.
3. If ice remains after DEFROSTING.	Make sure that DEFROST SENSOR is connected. Make sure that FREEZER/REFRIGERATOR DOOR is closed.	Connection is poor.	Reassemble the DEFROST-SENSOR.		
		DOOR does not close properly.	Reassemble DOOR. Replace GASKET.		

7-5 MAIN PWB ASSEMBLY AND PARTS LIST

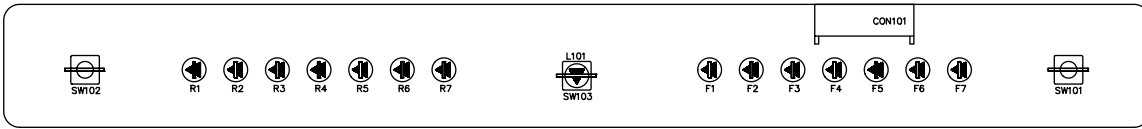
7-5-1 Main PWB Assembly



7-5-2 Replacement Parts List

No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1	6870JB8089B	PWB(PCB)	KS-PJT GOOD MDL	DDO SAN	T=1.6
2	6170JB2002H	TRANSFORMER,LOW VOLTAGE	240V 15V YES GR-MICOM ONE TAB	TAE SUNG	TRANS
3	6170JB2002M	TRANSFORMER,LOW VOLTAGE	260V 15V YES GR-MICOM ONE TAB	TAE SUNG	TRANS
4	6170JB2002R	TRANSFORMER,LOW VOLTAGE	140V 15V YES GR-MICOM ONE TAB	TAE SUNG	TRANS
5	6170JB2002W	TRANSFORMER,LOW VOLTAGE	115V 15V YES GR-MICOM ONE TAB	TAE SUNG	FRANS
6	6630AQ9106C	CONNECTOR (CIRC),WAFER	YW396-07AV YEONHO 7PIN 3.96MM STRAIGHT SN	YEON HO	CON1
7	6630AQ9106D	CONNECTOR (CIRC),WAFER	YW396-09AV	YEON HO	CON2
8	6630AQ9106B	CONNECTOR (CIRC),WAFER	YW396-05AV	YEON HO	-
9	6630JB8007G	CONNECTOR (CIRC),WAFER	917786-1 AMP 8PIN 2.5MM STRAIGHT SN	AMP	CON5
10	6630JB8007H	CONNECTOR (CIRC),WAFER	917787-1 AMP 9PIN 2.5MM STRAIGHT SN	AMP	CON3
11	6630JB8007E	CONNECTOR (CIRC),WAFER	917784-1 AMP 6PIN 2.5MM STRAIGHT SN	AMP	CON4
12	01ZZJB2023L	IC,DRAWING	TMP87C846N 42 SDIP BK KS-BETTER/GOOD(MASK)	TOSHIBA	IC1(01ZZJB2022M)
13	01ZZJB2022	IC,DRAWING	-	TOSHIBA	IC1(01ZZJB2022)
14	01ZZJB2022	IC,DRAWING	-	TOSHIBA	IC1(01ZZJB2022)
15	01KE781200B	IC,KEC	KIA7812PI 12V 1A,KEC - - - -	KEC	IC2
16	01KE781200M	IC,KEC	KIA7812PI 3DIP BK 12V 1A REFORM	KEC	-
17	01KE780500A	IC,KEC	KIA78S05P,3PIN,DIP. KEC	KEC	IC3
18	01STLM1001A	IC,STANDARD LOGIC	M54563FP MITSUBISHI 20 R/TP CONVERT	MITSUBISHI	-
19	01TD777400A	IC,TOSHIBA	TA7774AP 16 SDIP BK STEPPING MOTOR	TOSHIBA	IC6
20	01KE650030C	IC,KEC	K1D65003AF 16SDIP BK 7CH DRIVER	KEC	IC4
21	01KE704200A	IC,KEC	KIA7042P 3P BK RESET	KEC	IC5
22	01RH934600D	IC,RDHM	BR93LC46RF-W 8PIN SDP BK EEPROM -	RDHM	-
23	6920000001A	RELAY	AL15B12 MATSUSHITA 250VAC 16A 12VDC 1A NO VENTING	NAIS	RY1
24	6920WRD010A	RELAY	US11-12S YUYU 250VAC 3A 12VDC 1A	YUYU	-
25	6920JB2003B	RELAY	ALD112 MATSUSHITA 250VAC 3A 12VDC 1A	EMRON	RY2~RY4
26	6920JB2009A	RELAY	65S-1 DMRN 12V 3A 227V 1C	EMRON	RY5
27	6212JB8001B	RESNATOR,CERAMIC	CST50400 MURATA 4MHZ +/- 0.5% 15PF TP NONE	MURATA	OSC1(J570-00012B)
28	6102W5V006A	VARISTOR	INR14D331 ILJIN UL/CSA/VDE BK	ILJIN	VA1
29	6102JB8003A	VARISTOR	INR14D271 ILJIN UL/VDE TP 270V	ILJIN	VA1
30	6102JB8001B	VARISTOR	INR14D621 ILJIN UL/VDE BK 620V	ILJIN	VA1
31	8DD400709AA	DIODE,RECTIFIERS	IN4007 TP MOTOROLA - - 1A - - -	DELTA	DI~D5
32	0CE2286J610	CAPACITOR,AL.ELECTROLYTIC	2200 UF SMS,SG 35V M FL BULK	SAM HWA	CE1
33	0CE1086J610	CAPACITOR,FIXED ELECTROLYTIC	1000UF SMS,SG 35V 20% FL BULK	SAM HWA	-
34	0CE1086H618	CAPACITOR,AL.ELECTROLYTIC	1000 UF SMS,SG 25V M FL TP 5	SAM HWA	CE2
35	0CE4776H618	CAPACITOR,FIXED ELECTROLYTIC	470UF SMS,SG 25V 20% FL TP 5	SAM HWA	CE3
36	0CE2276F638	CAPACITOR,FIXED ELECTROLYTIC	220UF SMS,SG 16V 20% FMS TP 5	SAM HWA	CE4
37	0CE1076H638	CAPACITOR,FIXED ELECTROLYTIC	100UF SMS,SG 25V 20% FMS TP 5	SAM HWA	-
38	0CE1066K638	CAPACITOR,FIXED ELECTROLYTIC	10UF SMS,SG 50V 20% FMS TP 5	SAM HWA	CE6~CE8
39	0CE1056K638	CAPACITOR,FIXED ELECTROLYTIC	1UF SMS,SG 50V 20% FMS TP 5	SAM HWA	CE9
40	0CE4761H638	CAPACITOR,FIXED ELECTROLYTIC	47UF SMS,SG 25V 20% FMS TP 5	SAM HWA	CE5
41	0CQ2231N409	CAPACITOR,POLYESTER	0.022 UF D 100V J PE TP	SAM HWA	-
42	0CK102DK96A	CAPACITOR,FIXED CERAMIC(HIGH DIELECTRIC)	1NF 2012 50V 80%,-20% R/TP X7R	SAM HWA	CC6
43	0CK223DK96A	CAPACITOR,FIXED CERAMIC(HIGH DIELECTRIC)	22NF 2012 50V 80%,-20% R/TP X7R	SAM HWA	CC7~CC11
44	0CK104DK94A	CAPACITOR,FIXED CERAMIC(HIGH DIELECTRIC)	100NF 2012 50V R/TP (GRM40X7R104K50PE)	MURATA	CC1~CC5
45	0CK104K949	CAPACITOR,FIXED CERAMIC(HIGH DIELECTRIC)	0.1UF D 50V 80%,-20% F(Y5V) TA52	SAM HWA	-
46	0RD3900G609	RESISTOR,FIXED CARBON FILM	390 OHM 1/4 W 5.00% TA52	SMART	R1~RL4
47	0RD1000G609	RESISTOR,FIXED CARBON FILM	100 OHM 1/4 W 5.00% TA52	SMART	R5
48	0RJ1001E672	RESISTOR,METAL GLAZED(CHIP)	1K OHM 1/8 W 5% 2012 R/TP	RDHM	R16
49	0RJ2001E672	RESISTOR,METAL GLAZED(CHIP)	2K OHM 1/8 W 5% 2012 R/TP	RDHM	-
50	0RD2001G609	RESISTOR,FIXED CARBON FILM	2K OHM 1/4 W 5.00% TA52	SMART	R6~R12
51	0RH2200L622	RESISTOR,METAL GLAZED(CHIP)	220 OHM 1/8 W 2012 5.00% D	RDHM	R17
52	0RJ201E672	RESISTOR,METAL GLAZED(CHIP)	2.2K OHM 1/8 W 5% 2012 R/TP	RDHM	-
53	0RJ4701E672	RESISTOR,METAL GLAZED(CHIP)	4.7K OHM 1/8 W 5% 2012 R/TP	RDHM	R1
54	0RJ4701E672	RESISTOR,METAL GLAZED(CHIP)	4.7K OHM 1/8 W 5% 2012 R/TP	RDHM	-
55	0RD4701G609	RESISTOR,FIXED CARBON FILM	4.7K OHM 1/4 W 5.00% TA52	SMART	-
56	0RJ1002E672	RESISTOR,METAL GLAZED(CHIP)	10K OHM 1/8 W 5% 2012 R/TP	RDHM	-
57	0RJ1002E672	RESISTOR,METAL GLAZED(CHIP)	10K OHM 1/8 W 5% 2012 R/TP	RDHM	-
58	0RD1002G609	RESISTOR,FIXED CARBON FILM	10K OHM 1/4 W 5.00% TA52	SMART	R3,R4,RCR1,R13~R15
59	0RJ2702E672	RESISTOR,METAL GLAZED(CHIP)	27K OHM 1/8 W 5% 2012 R/TP	RDHM	-
60	0RJ1004E672	RESISTOR,METAL GLAZED(CHIP)	1M OHM 1/8 W 5% 2012 R/TP	RDHM	R2
61	0RJ2612E472	RESISTOR,FIXED METAL FILM	26.1K OHM 1/4 W 1.00% TA52	SMART	RR1,RD1
62	0RJ622E472	RESISTOR,FIXED METAL FILM	16.2K OHM 1/4 W 1.00% TA52	SMART	RF1
63	3J03565D	FUSE,DRAWING	9A 250V - -	SAM JU	-
64	0TR106009AC	TRANSISTOR	KRA106MKRA2206) TP KEC	KEC	Q1~Q4 Q6
65	0TR106009AF	TRANSISTOR	KRC 106M KEC	KEC	Q5,Q7
66	0TR319809AA	TRANSISTOR	KTC3198-TP-Y (KTC1815)KEC	KEC	-
67	6908JB3002D	BUZZER	PQ272207PL-20C-2000 SUNWAY PIEZO 2KHZ 80DB (CHINA)	SUNWAY	BUZZER
68	6600RR001Z	SWITCH,TACT	JTP1280A6 JEIL 12V DC 50MA	JEIL	-
69	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN(6MM)	-	J16
70	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN(10MM)	-	J1~J6,J8,J10,J14,J17~J20
71	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN(12.5MM)	-	J13
72	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN(12.5MM)	-	J07
73	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	-
74	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN	-	-
75	4920JB3003A	HEAT SINK	30*25*30 IC-12V R-B50,51,52,53,54,55,56 2PIN 1-SCREW 3	-	(IC2)
76	1SBF0302418	SCREW TAP TITE(S),BINDING HEAD	+ D3.0 L8.0 MSWR3/FZY	-	(IC2)
78	9VWF0120000	SOLDER(ROSN WIRE) RSO	DI.20	HEE SUNG	-
79	49111004	SOLDERING	H63A	-	-
80	59333105	FLUX	SGJ0.825-0.830 KOREA F.H-206	KOKI	-

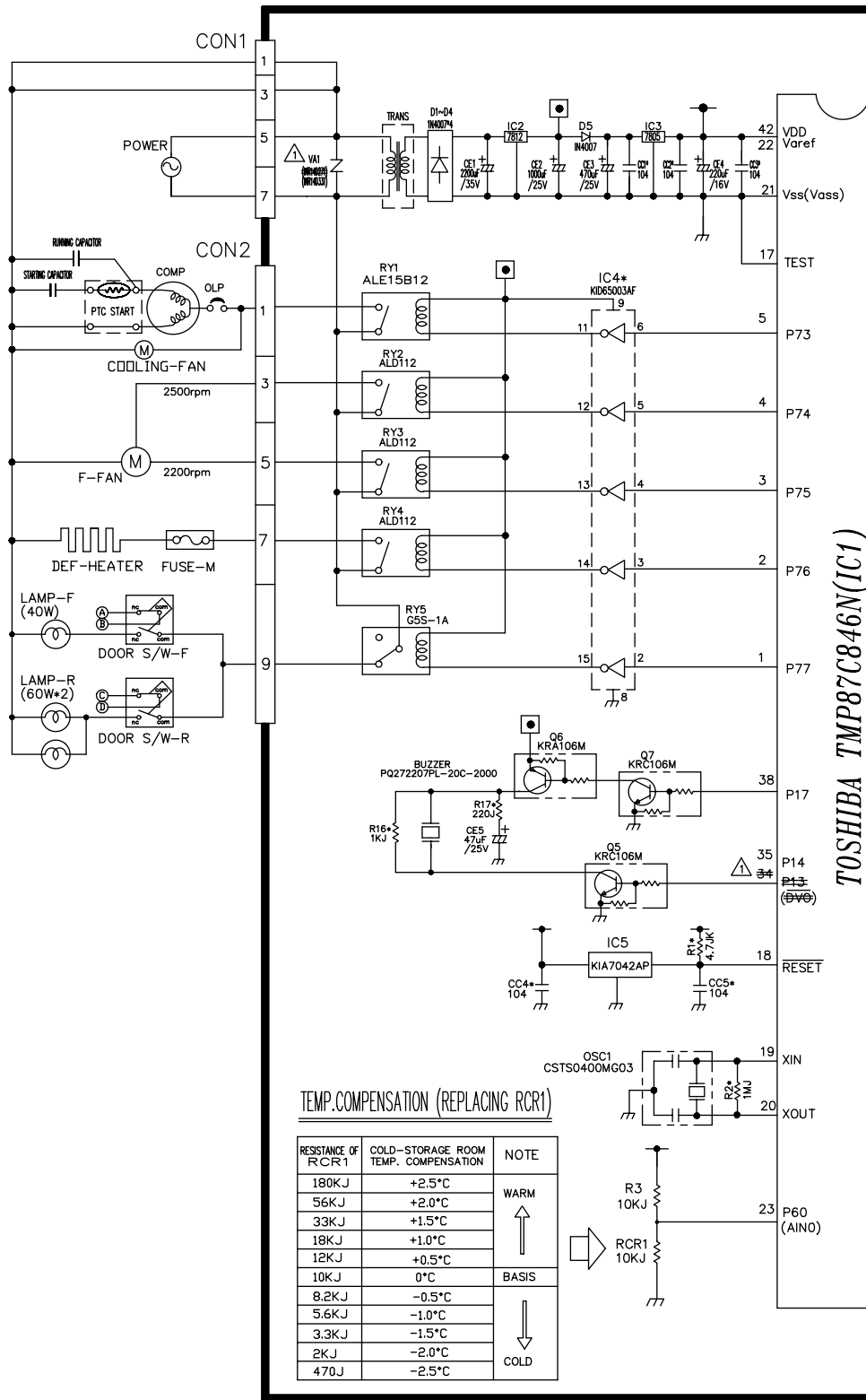
7-5-3 PWB Assembly, Display, And Parts List



Qty	No	P/NO	DESCRIPTION	SPEC	MAKER	REMARK
1	1	6870JB8091A	PWB(PCB)	KS-PJT GOOD/BETTER DISPLAY	DOO SAN	t=1.6
	2					
1	3	6630AQ9159H	WAFER	SMAW250-09	YEON HO	CON101
	4					
2	5	6600RRT002K 6600JB8005A	SWITCH,TACT	JTP1230A JEIL 12V DC 50MA KPT-1105A	JEIL KYUNG IN	SW101,102
1	6	-	TACT S/W	KPT-1109G	KYUNG IN	SW103
14	7	0DLLE0019AA	LED	LT1824-81-BCM TP GREEN 2		R1~R7,F1~F7
3	8	0DD414809AA	DIODE,SWITCHING	1N4148 26MM	PYUNG CHANG DELTA	D101,102,103
12	10	6854B50001A	JUMP WIRE	0.6MM 52MM TP TAPING SN (10MM)	-	J101~J112
	11					
-	12	9VWF0120000	SOLDER(RDSIN WIRE) RSO	D1.20	HEE SUNG	-
0.001	13	49111004	SOLDER,SOLDERING	H63A	-	-
0.0005	14	59333105	FLUX	SG;0.825-0.830 KOREA F.H-206	KOKI	-

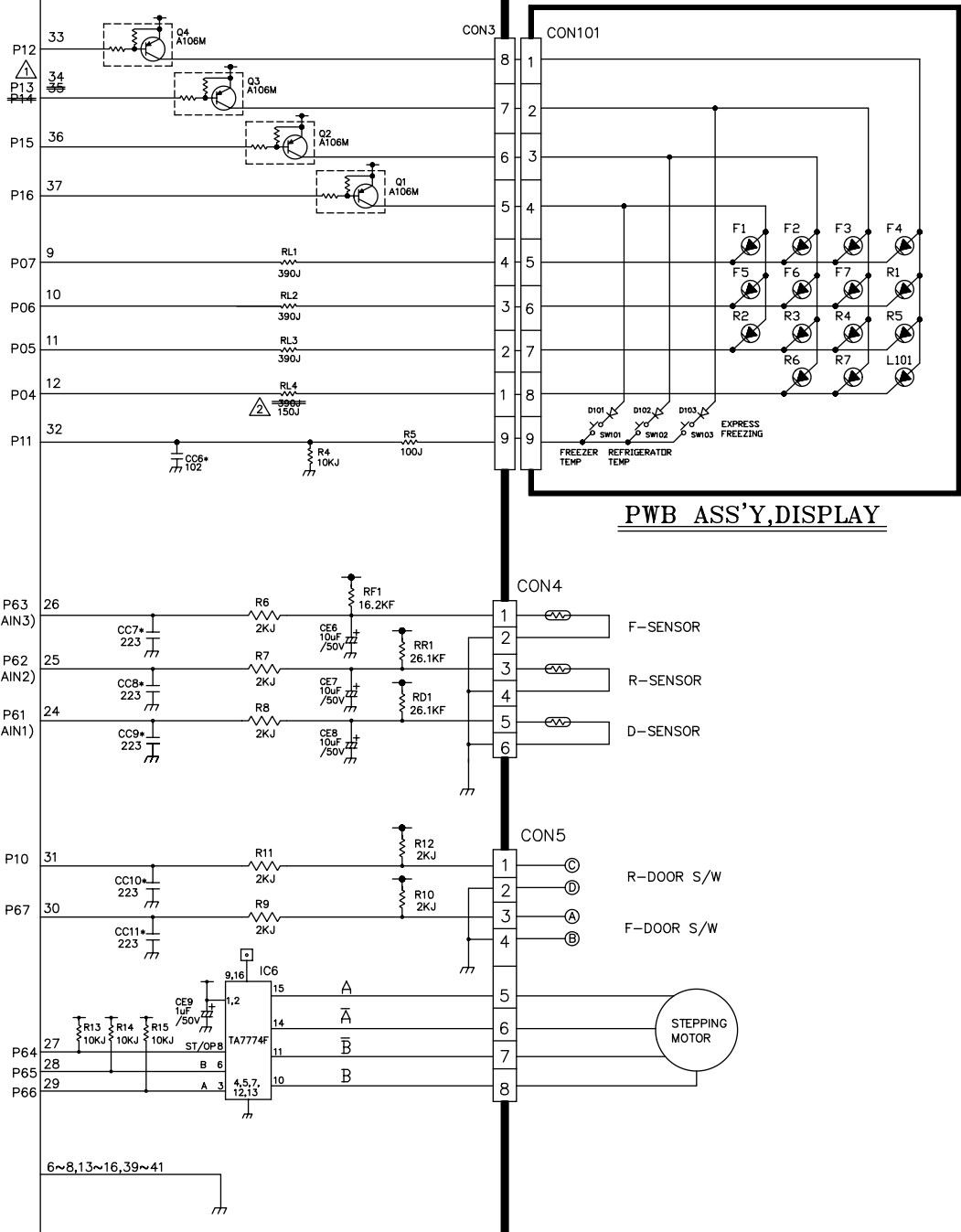
7-6 PWB DIAGRAM

7-6-1 PWB Main Assembly



TOSHIBA TMP87C846N(IC1)

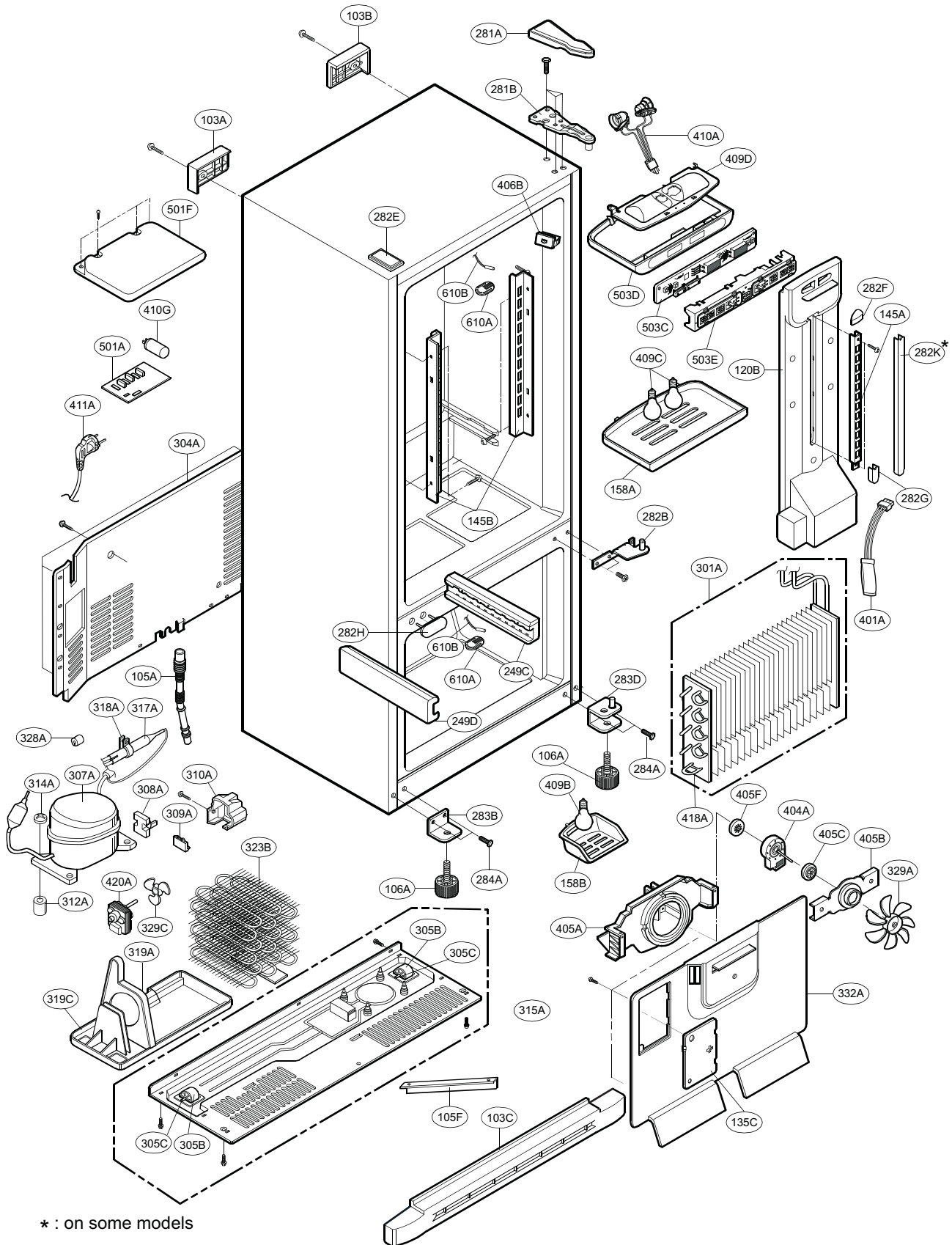
FIG.1 CIRCUIT DIAGRAM



8. EXPLODED VIEW & REPLACEMENT PARTS LIST

CASE PARTS

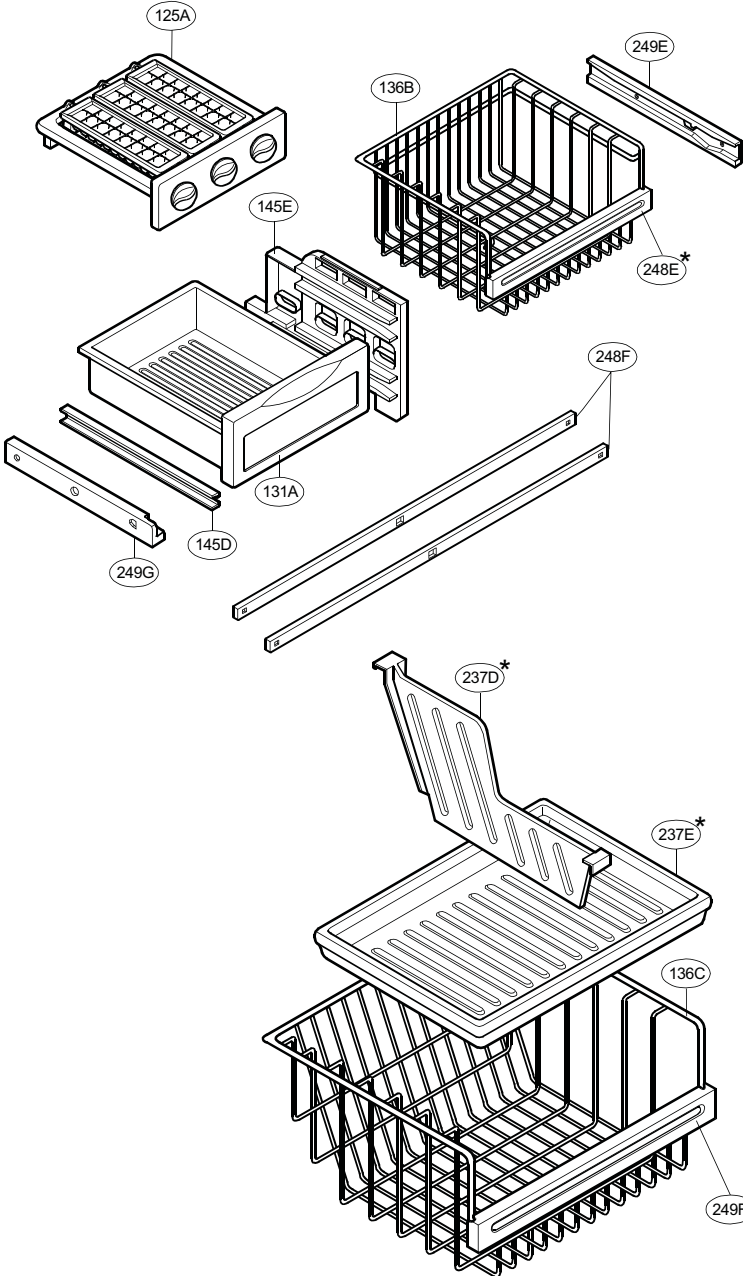
CAUTION: Use the part number to order part, not the position number.



* : on some models

FREEZER PARTS(Swing)

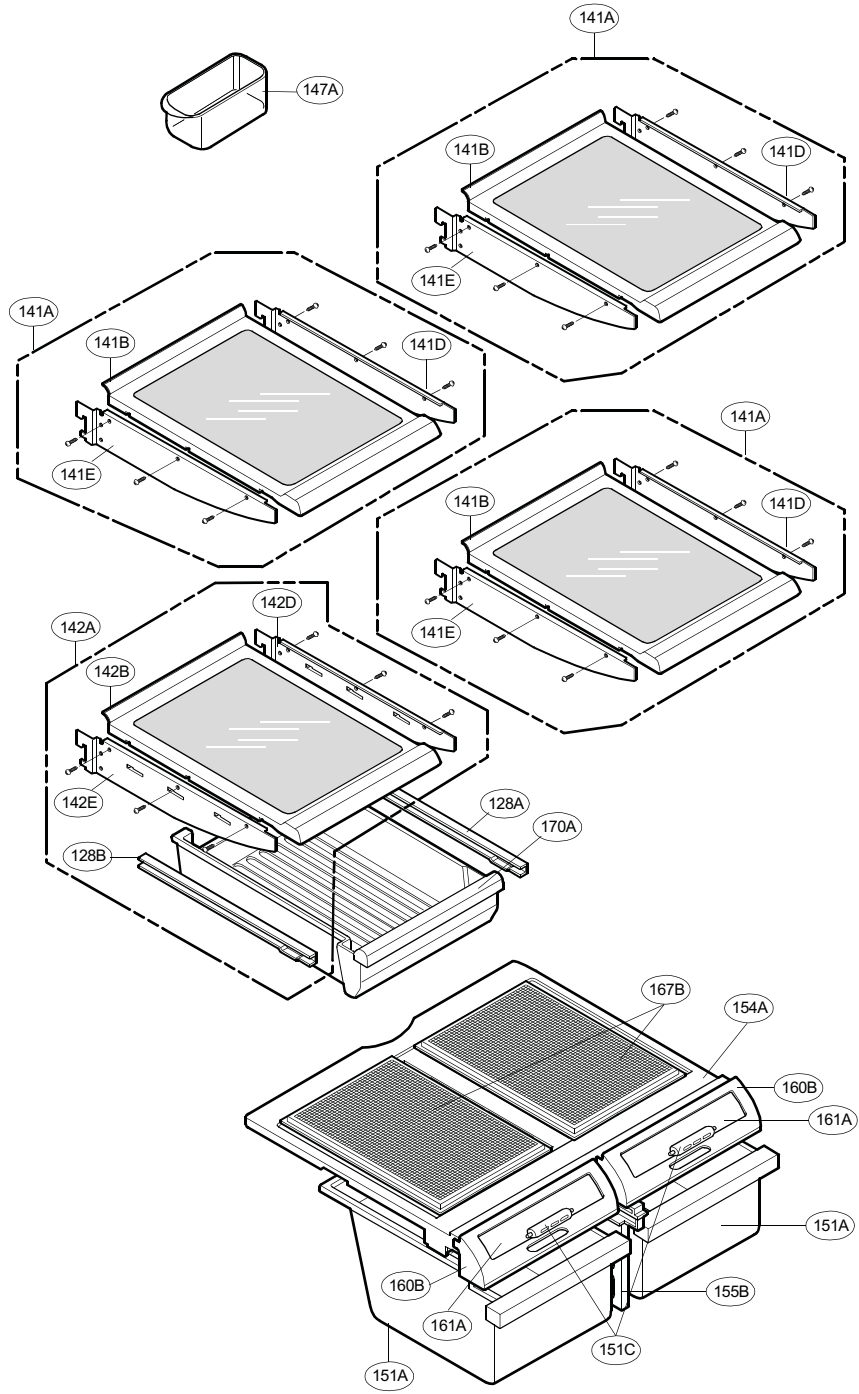
CAUTION: Use the part number to order part, not the position number.



* : on some models

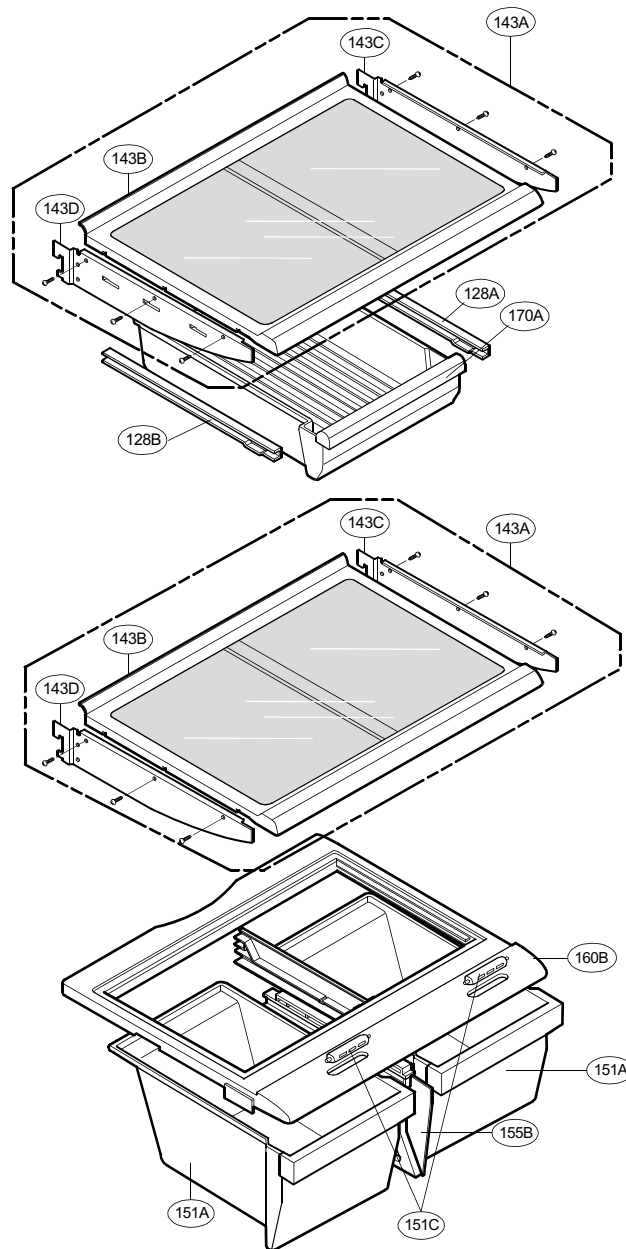
REFRIGERATOR PARTS(Better)

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



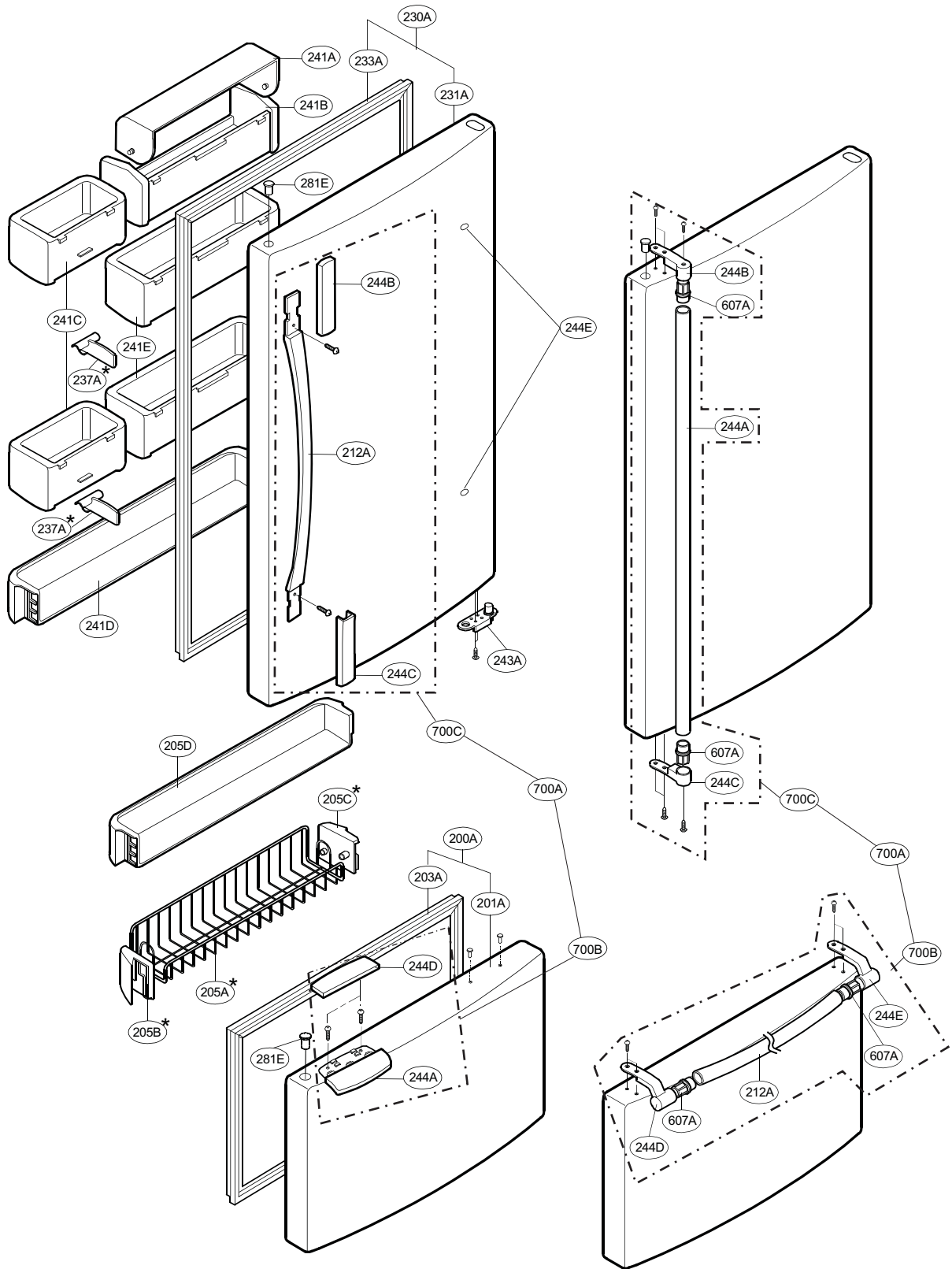
REFRIGERATOR PARTS(Good)

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



DOOR PARTS(Swing)

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



* : on some models

LOC	DESCRIPTION	LRBN22514SB	LRBN22514ST
103A	HANDLE,BACK	3650JJ2003L	3650JJ2003L
103B	HANDLE,BACK	3650JJ2003M	3650JJ2003M
103C	COVER,LOWER	3550JJ0006C	3550JJ0006C
105A	DRAIN ASSEMBLY,PIPE-Z	5251JJ2003A	5251JJ2003A
105F	SKIRT,LOWER	5070JJ3002A	5070JJ3002A
106A	LEG ASSEMBLY,ADJUST	4779JJ2001A	4779JJ2001A
106A	LEG ASSEMBLY,ADJUST	4779JJ2001A	4779JJ2001A
106B	WASHER,DRAWING	4J00382C	4J00382C
120B	DUCT ASSEMBLY,MULTI	5209JJ1002A	5209JJ1002A
125A	TRAY ASSEMBLY,ICE	3391JJ1009B	3391JJ1009B
128C	GUIDE,RAIL	4974JJ2003A	4974JJ2003A
131A	BANK ASSEMBLY,ICE	5075JJ1001B	5075JJ1001B
135C	COVER,GRILLE FAN	3550JJ2030A	3550JJ2030A
136B	TRAY,DRAWER	3390JJ1034A	3390JJ1034A
136C	TRAY,DRAWER	3390JJ1027A	3390JJ1027A
140B	SHELF ASSEMBLY,R	5027JJ2007B	5027JJ2007B
140D	SHELF,NET	5026JJ2001G	5026JJ2001G
140E	SHELF,NET	5026JJ2001H	5026JJ2001H
143A	SHELF ASSEMBLY,R	5027JJ1028D	5027JJ1028D
143B	SHELF ASSEMBLY,R	5027JJ1015B	5027JJ1015B
143C	SHELF,NET	5026JJ2001G	5026JJ2001G
143D	SHELF,NET	5026JJ2001H	5026JJ2001H
145A	HOLDER,SHELF	4930JJ2003A	4930JJ2003A
145B	HOLDER,SHELF	4930JJ2004A	4930JJ2004A
145D	GUIDE,RAIL	4974JJ1012A	4974JJ1012A
145E	GUIDE,RAIL	4974JJ1014A	4974JJ1014A
145F	GUIDE,RAIL	4974JJ1013A	4974JJ1013A
145G	GUIDE ASSEMBLY,RAIL	4975JJ2005B	4975JJ2005B
151A	TRAY,VEGETABLE	3390JJ1031A	3390JJ1031A
151C	KNOB,SHUTTER	4940JJ2003B	4940JJ2003B
154A	COVER,T/V	3550JL1006C	3550JL1006C
155B	SUPPORTER ASSEMBLY,COVER-T/V	4981JJ2001B	4981JJ2001B
155B	SUPPORTER,COVER-T/V	4980JJ3006B	4980JJ3006B
158A	COVER,LAMP	3550JJ1040A	3550JJ1040A
158E	COVER,LAMP	3550JJ1051A	3550JJ1051A
170A	TRAY ASSEMBLY,MEAT	3391JJ2004H	3391JJ2004H
200A	DOOR ASSEMBLY,F	3581JJ8020G	3581JJ8020H
201A	DOOR FOAM ASSEMBLY,F	5433JJ0058F	5433JJ0058G
203A	GASKET ASSEMBLY,DOOR	4987JJ1004E	4987JJ1004E
205D	BASKET,DOOR	5004JJ1040A	5004JJ1040A
212A	HANDLE,F	3650JJ1035C	3650JJ1035A
212G	MARK	3846JD1007B	3846JD1007B
230A	DOOR ASSEMBLY,R	3581JJ8024G	3581JJ8024H
231A	DOOR FOAM ASSEMBLY,R	5433JJ0019S	5433JJ0019T
233A	GASKET ASSEMBLY,DOOR	4987JJ1004F	4987JJ1004F
241A	COVER,TRAY	3550JL2003H	3550JL2003H
241B	BASKET,DOOR	5004JJ1021A	5004JJ1021A
241C	BASKET,DOOR	5004JJ1031A	5004JJ1031A
241D	BASKET,DOOR	5004JJ0001A	5004JJ0001A
241E	BASKET,DOOR	5004JJ1029A	5004JJ1029A
243A	STOPPER,DOOR	4620JJ3006C	4620JJ3006C
243A	STOPPER,DOOR	4620JJ3006C	4620JJ3006C
244A	HANDLE,R	3650JJ1034Q	3650JJ1034E
248F	SUPPORTER,HOLDER	4980JJ2005A	4980JJ2005A
249C	HOLDER,RAIL	4930JJ1006A	4930JJ1006A
249D	HOLDER,RAIL	4930JJ1006B	4930JJ1006B
249G	GUIDE,RAIL	4974JJ1010A	4974JJ1010A
281A	COVER,HINGE	3550JJ2013C	3550JJ2013C

LOC	DESCRIPTION	LRBN22514SB	LRBN22514ST
281B	HINGE ASSEMBLY,U	4775JJ2003B	4775JJ2003B
282B	PIN,DRAWING	1PZZJJ3002F	1PZZJJ3002F
282B	HINGE ASSEMBLY,C	4775JJ8002E	4775JJ8002E
282E	CAP,HINGE	5006JJ2001F	5006JJ2001F
282F	DECO,DUCT	3806JL2006E	3806JL2006E
282G	CAP,DUCT	5006JJ3011A	5006JJ3011A
282H	CAP,HINGE	5006JJ3004E	5006JJ3004E
282Z	CAP,HANDLE	5006JJ3010C	5006JJ3010C
283D	HINGE,L	4774JJ2002A	4774JJ2002A
283D	HINGE,L	4774JJ3001A	4774JJ3001A
284B	COVER,CONNECTOR	3550JA3120A	3550JA3120A
284D	SCREW,DRAWING	1STZJA3004K	1STZJA3004K
301A	EVAPORATOR ASSEMBLY	5421JJ1001B	5421JJ1001B
304A	COVER ASSEMBLY,BACK-M/C	3551JJ2008B	3551JJ2008B
305B	ROLLER	4580JJ3001A	4580JJ3001A
305B	ROLLER	4580JJ3001A	4580JJ3001A
305C	PIN,DRAWING	4J04238A	4J04238A
305C	PIN,DRAWING	4J04238A	4J04238A
307A	COMPRESSOR,SET ASSEMBLY	2521JJ8007A	2521JJ8007A
308A	P.T.C ASSEMBLY	6749C-0008D	6749C-0008D
309A	O.L.P	6750C-0004S	6750C-0004S
310A	COVER,P.T.C	3550JA2042A	3550JA2042A
312A	RUBBER,SEAT	5040JA3031A	5040JA3031A
314A	STOPPER,COMP	4620JA3009A	4620JA3009A
315A	COMP BASE ASSEMBLY,STD	3103JJ1001A	3103JJ1001A
317A	DRIER ASSEMBLY	5851JJ2002B	5851JJ2002B
318A	HOLDER,DRIER	4930JJ3002A	4930JJ3002A
319A	TRAY,DRIP	3390JJ0003A	3390JJ0003A
319C	GUIDE,FAN	4974JJ1009A	4974JJ1009A
323A	CONDENSER ASSEMBLY,WIRE	5403JJ1004A	5403JJ1004A
328A	RUBBER,DAMPING	5040JJ3002A	5040JJ3002A
329A	FAN ASSEMBLY	5901JJ1005A	5901JJ1005A
329C	FAN ASSEMBLY	5901JJ1004B	5901JJ1004B
332A	GRILLE ASSEMBLY,FAN	3531JJ1004A	3531JJ1004A
401A	CONTROLLER ASSEMBLY(CIRC)	6615JB2005C	6615JB2005C
404A	MOTOR(MECH),FAN	4680JK1002B	4680JK1002B
405A	BRACKET ASSEMBLY,MOTOR	4811JJ2002B	4811JJ2002B
405B	BRACKET,MOTOR	4810JJ3005A	4810JJ3005A
405C	RUBBER,MOTOR-N	J756-00008B	J756-00008B
406B	SWITCH,[PUSH]	6600JB1004A	6600JB1004A
409B	LAMP,[INCANDESCENT]	6912JK2002C	6912JK2002C
410A	SOCKET ASSEMBLY,LAMP	6621JK2002D	6621JK2002D
410G	CAPACITOR,DRAWING	0CZZJB2003H	0CZZJB2003H
411A	POWER CORD ASSEMBLY	6411JK1006A	6411JK1006A
418A	HEATER,SHEATH	5300JB1100J	5300JB1100J
501A	PWB(PCB) ASSEMBLY,MAIN	6871JB1215A	6871JB1215A
501F	COVER,PWB	3550JJ1042B	3550JJ1042B
503B	REFLECTOR,LAMP	3034JJ1002A	3034JJ1002A
503C	PWB(PCB) ASSEMBLY,DISPLAY	6871JB2047A	6871JB2047A
503D	CASE,DISPLAY	3110JJ1005A	3110JJ1005A
503E	COVER,DISPLAY	3550JJ2031A	3550JJ2031A
602A	HOLDER,BRACKET	4930JA3037A	4930JA3037A
610A	COVER,SENSOR	3550JL2004B	3550JL2004B
700B	HANDLE ASSEMBLY,F	3651JJ2010J	3651JJ2010G
700C	HANDLE ASSEMBLY,R	3651JJ2017C	3651JJ2017A
B01	SCREW,DRAWING	1STZJA3004F	1STZJA3004F
S01	SCREW,DRAWING	1SZZJJ3010D	1SZZJJ3010D
S22	SCREW,DRAWING	3J05696C	3J05696C
S24	SCREW,DRAWING	3J05696C	3J05696C
S28	SCREW,DRAWING	3J05696W	3J05696W
S38	SCREW,DRAWING	4000W4A003A	4000W4A003A



P/No. 3828JL8006B

MAY,04 Printed in Mexico