

# SHARP SERVICE MANUAL

S0119R350YPJS

## MICROWAVE OVEN

MODELS **R-350Y(S)**  
**R-350Y(W)**



In the interest of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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Parts Guide

Parts marked with "⚠" are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP CORPORATION

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The contents are subject to change without notice.

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## Parts Guide

## CHAPTER 1. BEFORE SERVICING

### [1] GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

**WARNING: THIS APPLIANCE MUST BE EARTHED**

**IMPORTANT**

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW -----EARTH  
 BLUE -----NEUTRAL  
 BROWN -----LIVE

### [2] CAUTION MICROWAVE RADIATION

**DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.**

Service engineers should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

### [3] WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door brackets and hinges are not defective.
- (C) The door packing is not damaged.
- (D) The door is not deformed or warped.
- (E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked " △ " on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked "\*\*\*" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

## CHAPTER 2. WARNING TO SERVICE PERSONNEL

The ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in a severe, possibly fatal, electrical shock.

(Example)

Inverter unit, Magnetron, High Voltage Harness etc..

Read the Service Manual carefully and follow all instructions.



### [1] Before Servicing

#### CARRY OUT 3D CHECKS.

NOTE: Step 1, 2 and 3 form the basis of the 3D checks.

1. Disconnect the power supply cord, and then remove the outer case.
2. Door opened, and wedged open.
3. Discharge the high voltage capacitors of the inverter unit, by following the procedures below.
  - 3-1. Wait for 60 seconds to discharge the high voltage capacitors of the inverter unit.
  - 3-2. Disconnect the high voltage wire from the magnetron terminal with insulated pliers.
  - 3-3. Make the terminal (metal part) of the high voltage wire contact to the magnetron body with insulated pliers.
  - 3-4. Now, the capacitors of the inverter unit are discharged.
  - 3-5. Reconnect the high voltage wire to the magnetron terminal after discharging.

**WARNING: Use the pliers that the portions of their handles are insulated completely to avoid an electric shock.**

**WARNING: RISK OF ELECTRIC SHOCK. DISCHARGE THE HIGH-VOLTAGE CAPACITOR BEFORE SERVICING.**

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds.

Whenever troubleshooting is performed the power supply must be disconnected. It may, in some cases, be necessary to connect the power supply after the outer case has been removed, in this event,

1. Disconnect the power supply cord, and then remove the outer case.
2. Open the door and block it open.
3. Wait for 60 seconds to discharge the high voltage capacitors of the inverter unit.
4. Disconnect the high voltage wire from the magnetron terminal with insulated pliers.
5. Make the terminal (metal part) of the high voltage wire contact to the magnetron body with insulated pliers.
6. Now, the capacitors of the inverter unit are discharged.
7. Reconnect the high voltage wire to the magnetron terminal after discharging.

**WARNING: Use the pliers that the portions of their handles are insulated completely to avoid an electric shock.**

8. Disconnect the leads to the primary of the inverter unit.
9. Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.
10. After that procedure, reconnect the power supply cord.

**[2] When the testing is completed,**

1. CARRY OUT **3D** CHECKS.
2. CARRY OUT **4R** CHECKS.
  - 2-1.Reconnect all leads removed from components during testing.
  - 2-2.Reinstall the outer case.
  - 2-3.Reconnect the power supply cord after the outer case is installed.
  - 2-4.Run the oven and check all function.

**[3] After repairing**

1. CARRY OUT **4R** CHECKS.

Ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the turntable tray, close the door and set the power to 100% and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out Before Servicing procedure and re-examine the connections to the component being tested.

When all service work is completed and the oven is fully assembled, the microwave power output should be checked and microwave leakage test should be carried out.

**[4] Before replacing the Printed Wiring Board**

Some normal boards are found in board units that have been returned due to oven failure. So, most of board replacements may arise from poor harness connection. Accordingly, before replacing any board that was judged to require its replacement, use the following procedure to re-check that the connection terminal of a connector has been properly inserted:

**1. When the connectors have been incorrectly inserted to the control unit.**

PWB	CONNECTOR	Symptom
CONTROL UNIT	RY-2	No heating can be done.
	CN-B	No heating can be done (even if the door has not been opened).
	CN-C	No heating can be done.(Control signals can not be sent to inverter unit.)
	CN-A	The oven cannot be powered on, no fan motor runs and no oven lamp illuminate.
	CN-F	No heating can be done. (Humidity sensor error)

**2. When latch switch adjustment is incorrect**

When latch switch adjustment is incorrect, symptoms such as no heating, no heating start, no activation even with start button pressed, etc. will occur.

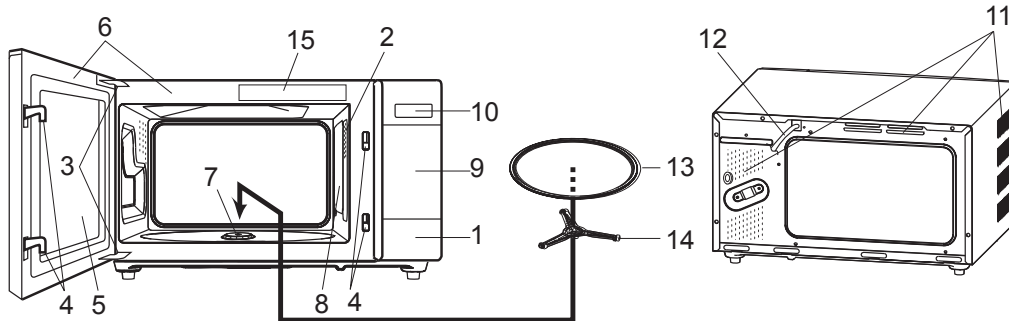
## CHAPTER 3. PRODUCT SPECIFICATIONS

ITEM	DESCRIPTION																																				
Power Requirements	230 - 240 Volts 50 Hertz Single phase, 3 wire earthed																																				
Power Consumption	Initial : 1.90kW 8.0A      Steady : 1.15kW 5.0A																																				
Power Output	1200 watts nominal of RF microwave energy (IEC Test Procedure) Operating frequency 2450 MHz																																				
Case Dimensions	Width 520 mm Height 310 mm including foot Depth 442 mm																																				
Turntable Diameter	320 mm																																				
Control Complement	<p>Touch Control System Clock (1:00 - 12:59) Timer (0 - 99 minutes 99 seconds) Microwave Power for Variable Cooking</p> <table border="1"> <thead> <tr> <th>Display</th> <th colspan="2">Power level</th> </tr> </thead> <tbody> <tr> <td>100P</td> <td>100%</td> <td>High</td> </tr> <tr> <td>90P</td> <td>90%</td> <td></td> </tr> <tr> <td>80P</td> <td>80%</td> <td></td> </tr> <tr> <td>70P</td> <td>70%</td> <td>Medium High</td> </tr> <tr> <td>60P</td> <td>60%</td> <td></td> </tr> <tr> <td>50P</td> <td>50%</td> <td>Medium</td> </tr> <tr> <td>40P</td> <td>40%</td> <td></td> </tr> <tr> <td>30P</td> <td>30%</td> <td>Medium Low</td> </tr> <tr> <td>20P</td> <td>20%</td> <td></td> </tr> <tr> <td>10P</td> <td>10%</td> <td>Low</td> </tr> <tr> <td>0P</td> <td>0%</td> <td></td> </tr> </tbody> </table> <p>POWER LEVEL pad NUMBER pads STOP/CLEAR pad INSTANT COOK/START pad SENSOR INSTANT ACTION pads SENSOR COOK pads EXPRESS DEFROST pad EASY DEFROST pad QUICK AND EASY MEALS pad MELT SOFTEN pad INFO/TIMER pad</p>	Display	Power level		100P	100%	High	90P	90%		80P	80%		70P	70%	Medium High	60P	60%		50P	50%	Medium	40P	40%		30P	30%	Medium Low	20P	20%		10P	10%	Low	0P	0%	
Display	Power level																																				
100P	100%	High																																			
90P	90%																																				
80P	80%																																				
70P	70%	Medium High																																			
60P	60%																																				
50P	50%	Medium																																			
40P	40%																																				
30P	30%	Medium Low																																			
20P	20%																																				
10P	10%	Low																																			
0P	0%																																				
Set Weight (Approx.)	17kg																																				

## CHAPTER 4. APPEARANCE VIEW

### [1] OVEN

1. Door open button
2. Oven lamp
3. Door hinges
4. Door safety latches
5. See through door
6. Door seal and sealing surfaces
7. Coupling
8. Wave guide cover
9. Touch control panel
10. Liquid crystal display
11. Ventilation openings
12. Power supply cord
13. Turntable
14. Roller stay
15. Menu label

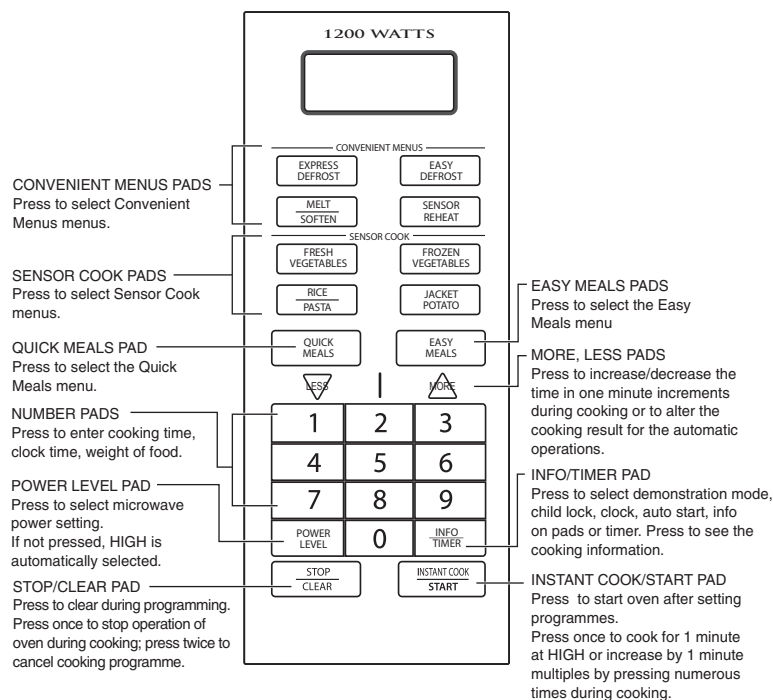


### [2] TOUCH CONTROL PANEL

#### Control Panel Display



#### Touch Control Panel Layout



NOTE: Some one-touch cooking features such as "INSTANT COOK" are disabled after three minutes when the oven is not in use.

These features are automatically enabled when the door is opened and closed or the STOP/CLEAR pad is pressed.

## CHAPTER 5. OPERATION SEQUENCE

### [1] OFF CONDITION

Closing the door activates all door interlock switches (1st. latch switch and 2nd. interlock relay control switch).

#### IMPORTANT

When the oven door is closed, the monitor switch contacts (COM-NC) must be open. When the microwave oven is plugged in a wall outlet, rated voltage is supplied to the noise filter and the control unit.

**Figure O-1 on page 14-1**

1. The display shows "MICRO-", "WAVE" and "OVEN".
2. To set any programmes or set the clock, you must first touch the STOP/CLEAR pad.
3. " . 0" appears in the display.

NOTE: When the oven door is opened, the oven lamp comes on at this time.

### [2] MICROWAVE COOKING CONDITION

#### 1. HIGH COOKING

Enter a desired cooking time with the touching NUMBER pad and start the oven with touching START pad.

#### Function sequence

**Figure O-2 on page 14-1**

CONNECTED COMPONENTS	RELAY
Oven lamp, Turntable motor	RY1
Inverter unit	RY2
Fan motor	RY3

1. The rated voltage is supplied to the inverter unit.
2. The inverter unit converts the rated voltage into high-voltage and high frequency current. And the inverter unit drives the magnetron.
3. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays (RY1+RY2) go back to their home position. The circuits to the oven lamp, inverter unit and turntable motor are cut off. The fan motor will operate for one minute after cooking.
5. When the door is opened during a cook cycle, the switches come to the following condition

SWITCH	CONTACT	CONDITION	
		DURING COOKING	DOOR OPEN (NO COOKING)
1st. latch switch	COM-NO	Closed	Open
2nd. interlock relay control switch	COM-NO	Closed	Open
Monitor switch	COM-NC	Open	Closed

The circuits to the inverter unit and turntable motor are cut off when the 1st. latch switch and 2nd. interlock relay control switch are made open. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stays closed. Shown in the display is the remaining time. The fan motor will operate for one minute after cooking.

#### 6. MONITOR SWITCH CIRCUIT

The monitor switch is mechanically controlled by oven door, and monitors the operation of the 1st. latch switch and 2nd. interlock relay.

- 1) When the oven door is opened during or after the cycle of a cooking program, the 1st. latch switch and 2nd. interlock relay control switch must open their contacts first. After that the contacts (COM-NC) of the monitor switch can be closed.
- 2) When the oven door is closed, the contacts (COM-NC) of the monitor switch must be opened. After that the contacts of the 1st. latch switch and 2nd. interlock relay control switch are closed.
- 3) When the oven door is opened and the contacts of the 1st. latch switch and 2nd. interlock relay remain closed. The fuse F10A will blow, because the monitor switch is closed and a short circuit is caused.

### 2. VARIABLE OUTPUT POWER COOKING

There are present eleven (11) microwave power levels. When the microwave oven is preset for variable cooking power, the output power of the magnetron is varied according to variable frequency which is generated from the inverter unit.

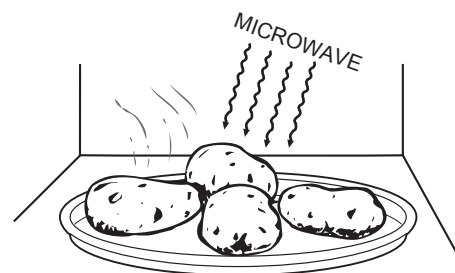
### [3] SENSOR COOKING CONDITION

Using the SENSOR function, the food is cooked without figuring time, power level or quantity. When the oven senses enough steam from the food, it relays the information to its microprocessor which will calculate the remaining cooking time and power level needed for best results. When the food is cooked, water vapor is developed. The sensor "senses" the vapor and its resistance increases gradually. When the resistance reaches the value set according to the menu, supplementary cooking is started. The time of supplementary cooking is determined by experiment with each food category and inputted into the LSI.

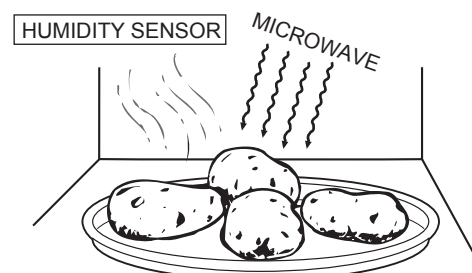
An example of how sensor works: (JACKET POTATOES)



1. Potatoes at room temperature. Vapor is emitted very slowly.



2. Heat potatoes. Moisture and humidity is emitted rapidly. You can smell the aroma as it cooks.;



3. Sensor detects moisture and humidity and calculates cooking time and variable power.



## 1. Cooking Sequence.

1. Operate the oven in sensor cooking mode by referring to the operation manual.

NOTE: The oven should not be operated on SENSOR immediately after plugging in the unit. Wait two minutes before cooking on SENSOR.

2. The coil of shut-off relay (RY-1) is energized, the turntable motor, oven lamp and cooling fan motor are turned on, but the inverter unit is not turned on.
3. After about 16 seconds, the cook relay (RY-2) is energized. The inverter unit is turned on, microwave energy is produced and first stage is started. The 16 seconds is the cooling time required to remove any vapor from the oven cavity and sensor.

NOTE: During this first stage, do not open the door or touch STOP/CLEAR pad.

4. When the sensor detects the vapor emitted from the food, the display switches over to the remaining cooking time and the timer counts down to zero. At this time, the door may be opened to stir, turn, or season food.
5. When the timer reaches zero, an audible signal sounds. The shut-off relay and cook relay are de-energized and the inverter unit, oven lamp, etc. are turned off.
6. Opening the door or touching the STOP/CLEAR pad, the time of day will reappear on the display and the oven will revert to an OFF condition. The fan motor will operate for one minute after cooking.

## [4] POWER OUTPUT REDUCTION

1. In 100%, 90%, 80% and 70% power levels, output power will gradually be reduced to avoid overheating.
  - 1-1. For an example of 100% power
 

After 3 minutes, the output power will be reduced to 70% gradually.
  - 1-2. For an example of 70% power
 

After 15 minutes, the output power will be reduced to 60%.
2. In 60% power level, after 30 minutes, the inverter unit will operate intermittently.

## CHAPTER 6. FUNCTION OF IMPORTANT COMPONENTS

### [1] DOOR OPEN MECHANISM

The door is opened by pushing the open button on the control panel, refer to the Figure D-1.

When the open button is pushed, the open button pushes up the switch lever, and then the switch lever pushes up the latch head. The latch heads are moved upward and released from latch hook. Now the door will open.

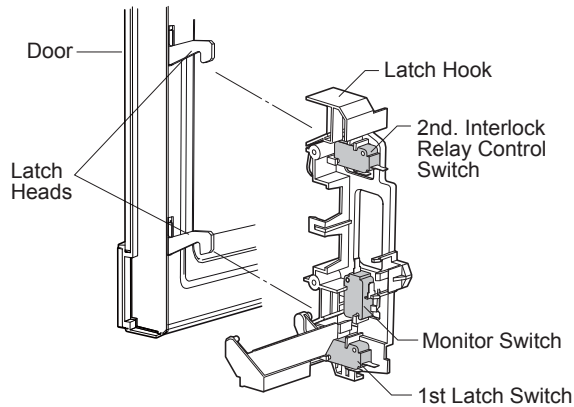


Figure D-1. Door Open Mechanism

### [2] 1ST. LATCH SWITCH AND 2ND. INTERLOCK RELAY CONTROL SWITCH

1. When the oven door is closed, the contacts (COM-NO) must be closed.
2. When the oven door is opened, the contacts (COM-NO) must be opened.

### [3] MONITOR SWITCH

1. When the oven door is closed, the contacts (COM-NC) must be opened.
2. When the oven door is opened, the contacts (COM-NC) must be closed.
3. If the oven door is opened and the contacts (COM-NO) of the 1st. latch switch and 2nd. interlock relay fail to open, the fuse F10A blows simultaneously with closing the contacts (COM-NC) of the monitor switch.

CAUTION: BEFORE REPLACING A BLOWN FUSE F10A TEST THE 1ST. LATCH SWITCH, 2ND.INTERLOCK RELAY, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION.

### [4] FUSE F10A

1. The fuse F10A blows when the contacts (COM-NO) of the 1st. latch switch and 2nd. interlock relay remain closed with the oven door open and when the monitor switch closes.
2. If the wire harness or electrical components are short-circuited, this fuse F10A blows to prevent an electric shock or fire hazard.

### [5] INVERTER UNIT

The inverter unit converts the rated voltage into high-voltage and high-frequency current and drives the magnetron.

### [6] OVEN TEMPERATURE FUSE

The temperature fuse, located on the top of the oven cavity, is designed to prevent damage to the oven by fire. If the food load is overcooked, by either error in cook time or defect in the control unit, the temperature fuse will open. Under normal operation, the temperature fuse remains closed. However, when abnormally high temperatures are reached within the oven cavity, the temperature fuse will open at 150°C, causing the oven to shut down.

### [7] TURNTABLE MOTOR

The turntable motor drives the turntable roller assembly to rotate the turntable.

### [8] FAN MOTOR

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vents surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapours given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

### [9] NOISE FILTER

The noise filter prevents the radio frequency interference that might flow back in the power circuit.

### [10] HUMIDITY SENSOR

This sensor detects the humidity from the food which is being cooked, to control its automatic cooking.

# CHAPTER 7. TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

**IMPORTANT:**

If the oven becomes inoperative because of a blown fuse F10A in the 1st. latch switch - 2nd. interlock relay - monitor switch circuit, check the 1st. latch switch, 2nd.interlock relay and monitor switch before replacing the fuse F10A.

CK = Check / RE = Replace

TEST PROCEDURE		A	Page 9-1	B	B	B	C	D	D	E	F	G	H	I	RE	CK	CK	RE	CK	CK	CK	CK	CK	CK	J
CONDITION	POSSIBLE CAUSE AND DEFECTIVE PARTS  PROBLEM	MAGNETRON	INVERTER UNIT	1ST. LATCH SWITCH	2ND. INTERLOCK RELAY CONTROL SWITCH	MONITOR SWITCH	TEMPERATURE FUSE (OVEN)	FAN MOTOR	TURNABLE MOTOR	FUSE F10A	NOISE FILTER	TOUCH CONTROL PANEL	KEY UNIT	FUSE F1 ON P.W.B.	POWER SUPPLY CORD	SHORTED WIRE HARNESS	OPENED WIRE HARNESS	OVEN LAMP	WALL OUTLET	MISADJUSTMENT SWITCH	HOME FUSE OR BREAKER	BLOCKED COOLING FAN	BLOCKED VENTILATION	HUMIDITY SENSOR	
OFF CONDITION	Home fuse blows when power supply cord is plugged into wall outlet.														○	○									
	FUSE F10A blows when power supply cord is plugged into wall outlet.									○	○					○									
	Display does not show anything when power supply cord is plugged into wall outlet.						○			○	○	○	○	○	○	○		○			○				
	Display does not operate properly when STOP/CLEAR pad is touched.				○							○	○				○			○					
	Oven lamp does not light at door opened. (Display appears.)				○							○				○	○	○							
ON CONDITION	Oven does not start when the START pad is touched. (Display appears)			○								○	○				○		○						
	Oven lamp does not light (Display appears.)											○					○	○							
	Fan motor does not operate. (Display appears.)							○				○					○					○			
	Turntable motor does not operate. (Display appears.)			○					○			○					○			○					
	Oven or any electrical parts does not stop when cooking time is 0 or STOP/CLEAR pad is touched.											○													
	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power level is set at 100%)	○	○														○								
	Oven does not seem to be operating properly when 90%~10% is set. (Oven operates properly at 100% and then the STOP/CLEAR pad is touched the oven stops.)												○												
	Oven goes into cook cycle but shuts down before end of cooking cycle.							○					○										○	○	
SENSOR COOKING CONDITION	Humidity sensor does not end during Sensor cooking condition. (Oven does not shut off after a cup of water is boiling by sensor cooking.)											○			○	○								○	
	Oven stops at 16 sec. after starting.											○			○	○								○	

## CHAPTER 8. TEST PROCEDURES

### [1] A: MAGNETRON (MG) TEST

**NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.**

CARRY OUT 3D CHECKS.

Isolate the magnetron from the high voltage circuit by removing all leads connected to the filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for a short circuit filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

#### MICROWAVE OUTPUT POWER (1 litre water load)

The following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted). Microwave output power from the magnetron can be measured by IEC test procedure, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used. When P(W) heating works for t (second), approximately  $P \times t / 4.187$  calorie is generated. On the other hand, if the temperature of the water with V(ml) rises  $\Delta T$  (°C) during this microwave heating period, the calorie of the water is  $v \times \Delta T$ .

The formula is as follows;

$$P \times t / 4.187 = V \times \Delta T + 0.55 \times mc (T2-T0)/4.187$$

$$P (W) = 4.187 \times V \times \Delta T / t + 0.55 \times mc (T2-T0)/t$$

Our condition for water load is as follows:

Room temperature (T0) ..... around 20°C

Power supply Voltage ..... Rated voltage

Water load ..... 1000 g

Initial temperature (T1) ..... 10±1°C

Heating time ..... 35 sec.

Mass of container (mc) ..... 330 g

T2 ..... Final Temperature

$\Delta T = T2 - T1$

$P = 120 \times \Delta T + 0.55 \times mc (T2-T0)/35$

Measuring condition:

1) Container

The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm.

2) Temperature of the oven and vessel

The oven and the empty vessel are at ambient temperature prior to the start of the test.

3) Temperature of the water

The initial temperature of the water is (10±1)°C

4) Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5°C.

5) Select stirring devices and measuring instruments in order to minimize addition or removal of heat.

6) The graduation of the thermometer must be scaled by 0.1°C at minimum and an accurate thermometer.

7) The water load must be (1000±5) g.

8) "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 3" sec. 3 sec. is magnetron filament heat-up time.

Measuring method:

1) 1.Measure the initial temperature of the water before the water is added to the vessel.

(Example: The initial temperature T1 = 11°C)

2) Add the 1 litre water to the vessel.

3) Place the load on the centre of the shelf.

4) Operate the microwave oven at 100% for the temperature of the water rises by a value  $\Delta T$  of 10°C.

5) Stir the water to equalize temperature throughout the vessel.

6) Measure the final water temperature. (Example: The final temperature T2 = 21°C)

7) Calculate the microwave power output P in watts from above formula.

Room temperature ..... To = 21°C

Initial temperature ..... T1 = 11°C

Temperature after (35+ 3) = 38 sec. .... T2 = 21°C

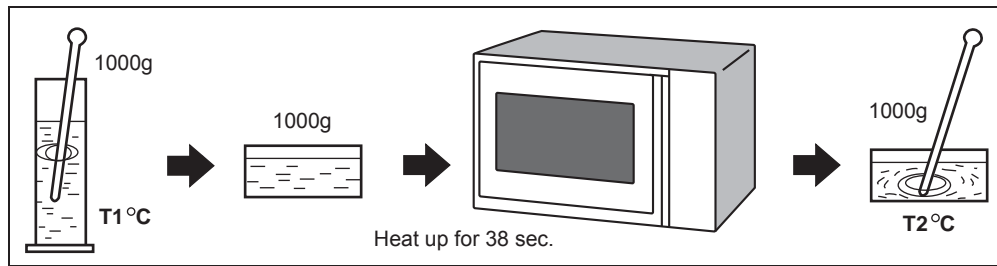
Temperature difference Cold-Warm ( $\Delta T = T2 - T1$ ) .....  $\Delta T = 10$ °C

Measured output power

The equation is "P = 120 x  $\Delta T$ " ..... P = 120 x 10°C = 1200 Watts

**JUDGEMENT: The measured output power should be at least ± 15% of the rated output power.**

CAUTION: 1°C CORRESPONDS TO 120 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



## [2] B: SWITCH TEST

CARRY OUT 3D CHECKS.

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC	COM; Common terminal
Released	Open circuit	Short circuit	NO; Normally open terminal
Depressed	Short circuit	Open circuit	NC; Normally close terminal

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

## [3] C: TEMPERATURE FUSE TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of the temperature fuse. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.

Table: Temperature Fuse Test

Parts Name	Temperature of "ON" condition (closed circuit).	Temperature of "OFF" condition (open circuit).	Indication of ohmmeter (When room temperature is approx. 20°C.)
Temperature fuse 150°C	This is not resettable type.	Above 150°C	Closed circuit

If incorrect readings are obtained, replace the temperature fuse.

An open circuit temperature fuse (OVEN) indicates that the foods in the oven may catch fire, this may be due to over heating produced by improper setting of the cooking time or failure of the control panel.

CARRY OUT 4R CHECKS.

## [4] D: MOTOR WINDING TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Fan motor		Turntable motor		
	RMOTEA450WRZZ	RMOTEA475WRZZ	RMOTDA253WRZZ	RMOTDA289WRZZ	RMOTDA302WRE0
Resistance	Approximately 384Ω	Approximately 333Ω	Approximately 14.5kΩ	Approximately 13.5kΩ	Approximately 14.7kΩ

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

## [5] E: FUSE F10A

CARRY OUT 3D CHECKS.

- If the fuse F10A is blown, there could be shorts or ground in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.
- If the fuse F10A is blown when the door is opened, check the 1st. latch switch, 2nd. interlock relay and monitor switch.

If the fuse F10A is blown by incorrect door switching replace the defective switch(s) and the fuse F10A.

CARRY OUT 4R CHECKS.

CAUTION: ONLY REPLACE FUSE F10A WITH THE CORRECT VALUE REPLACEMENT.

## [6] F: NOISE FILTER TEST

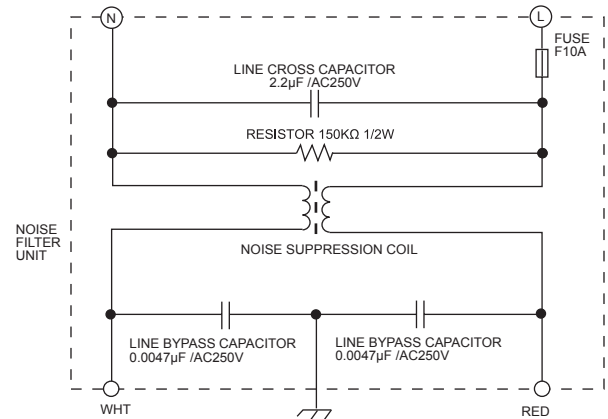
CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of the noise filter. Using an ohmmeter, check between the terminals as described in the following table.

MEASURING POINT	INDICATION OF OHMMETER
Between N and L	Approximately 150 k $\Omega$
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

If incorrect readings are obtained, replace the noise filter unit.

CARRY OUT 4R CHECKS.



## [7] G: TOUCH CONTROL PANEL ASSEMBLY TEST

The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter. In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and also the Control Unit is divided into two units, CPU Unit and Power Unit, and troubleshooting by unit replacement is described according to the symptoms indicated.

1. Key Unit. Note: Check key unit ribbon connection before replacement.

The following symptoms indicate a defective key unit. Replace the control unit assembly.

- 1) When touching the pads, a certain pad produces no signal at all.
- 2) When touching a number pad, two figures or more are displayed.
- 3) When touching the pads, sometimes a pad produces no signal.

2. Control Unit.

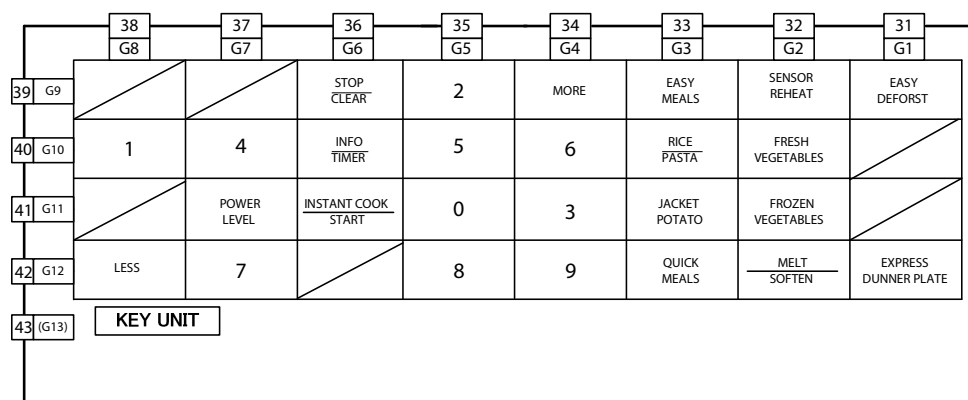
The following symptoms indicate a defective control unit. Before replacing the control unit, perform the Key unit test ([8] H) to determine if control unit is faulty.

- 1) In connection with pads.
  - a) When touching the pads, a certain group of pads do not produce a signal.
  - b) When touching the pads, no pads produce a signal.
- 2) In connection with indicators.
  - a) At a certain digit, all or some segments do not light up.
  - b) At a certain digit, brightness is low.
  - c) Only one indicator does not light up.
  - d) The corresponding segments of all digits do not light up; or they continue to light up.
  - e) Wrong figure appears.
  - f) A certain group of indicators do not light up.
  - g) The figure of all digits flicker.
- 3) Other possible troubles caused by defective control unit.
  - a) Buzzer does not sound or continues to sound.
  - b) Clock does not operate properly.
  - c) Cooking is not possible.

## [8] H: KEY UNIT (MEMBRANE SWITCH) TEST

1. CARRY OUT 3D CHECKS.
2. If the display fails to clear when the STOP/CLEAR pad is depressed, first verify the flat ribbon cable is making good contact, verify that the 2nd. Interlock relay control switch operates properly; that is the contacts are closed when the door is closed and open when the door is open.
3. If the 2nd. Interlock relay control switch is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the 2nd. interlock relay control switch is closed (either close the door or short the 2nd. interlock relay control switch connector).
4. Disconnect the leads to the primary of the inverter unit.
5. Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, reconnect the power supply cord.
7. Use the key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP/CLEAR pad making momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or keypad is at fault.
8. CARRY OUT 4R CHECKS.

### < KEY UNIT >



## [9] I: PROCEDURES TO BE TAKEN WHEN THE FUSE F1 ON THE PRINTED WIRING BOARD (PWB) IS OPEN

To protect the electronic circuits, this model is provided with the FUSE F1 added to the primary on the PWB. If the FUSE F1 is open, follow the troubleshooting guide given below for repair.

CARRY OUT 3D CHECKS.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present primary side of low voltage transformer.	Check supply voltage and oven power cord.
2	The rated AC voltage is present to primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Replace the control unit.
3	The fuse F1 is blown.	*Replace the control unit.

NOTE: \*At the time of making these repairs, make a visual inspection of the varistor. Check for burned damage and examine the transformer with a tester for the presence of layer short-circuit (check the primary coil resistance). If any abnormal condition is detected, replace the control unit.

CARRY OUT 4R CHECKS.

## [10] J: HUMIDITY SENSOR TEST

### Checking the initial sensor cooking condition

WARNING: The oven should be fully assembled before following procedure.

- 1) The oven should be plugged in at least two minutes before sensor cooking.
- 2) Room temperature should not exceed 95°F (35°C).
- 3) The unit should not be installed in any area where heat and steam are generated. The unit should not be installed, for example, next to a conventional surface unit. Refer to the "INSTALLATION INSTRUCTIONS" of the operation manual.
- 4) Exhaust vents are provided on the back of the unit for proper cooling and air flow in the cavity. To permit adequate ventilation, be sure to install so as not to block these vents. There should be some space for air circulation.
- 5) Be sure the exterior of the cooking container and the interior of the oven are dry. Wipe off any moisture with a dry cloth or paper towel.

- 6) The Sensor works with food at normal storage temperature. For example, chicken pieces would be at refrigerator temperature and canned soup at room temperature.
- 7) Avoid using aerosol sprays or cleaning solvents near the oven while using Sensor settings. The sensor will detect the vapor given off by the spray and turn off before food is properly cooked.
- 8) If the sensor has not detected the vapor of the food, ERROR will appear and the oven will shut off.

### **Water load cooking test**

WARNING: The oven should be fully assembled before following procedure.

Make sure the oven has been plugged in at least two minutes before checking sensor cook operation. The cabinet should be installed and screws tightened.

- 1) Fill approximately 200 milliliters (7.2 oz) of tap water in a 1000 milliliter measuring cup.
- 2) Place the container on the center of tray in the oven cavity.
- 3) Close the door.
- 4) Touch the POWER LEVEL pad, the number pad 1, the POWER LEVEL pad, the number pad 2 and the POWER LEVEL pad, then open the door and touch the START pad within 10 seconds. Then, close the door. And touch the number pads 1 once and the number pad 4 once. Now, the oven is in the sensor cooking condition, and "AH20", "SENSOR" and "COOK" will appear in the display.
- 5) The oven turns off automatically, and the time for detecting moisture will be displayed.  
If ERROR is displayed or the oven does not turn off, replace the humidity sensor or check the control unit, refer to explanation below.

## **1. TESTING METHOD FOR HUMIDITY SENSOR AND/OR CONTROL UNIT**

To determine if the sensor is defective, the simplest method is to replace it with a new replacement sensor.

- 1) Disconnect the power supply cord, and then remove outer case.
- 2) Open the door and block it open.
- 3) Discharge high voltage capacitor.
- 4) Remove the humidity sensor.
- 5) Install the new humidity sensor.
- 6) Reconnect all leads removed from components during testing.
- 7) Re-install the outer case (cabinet).
- 8) Reconnect the power supply cord after the outer case is installed.
- 9) Reconnect the oven to the power supply and check the sensor cook operation as follows:
  - a) Fill approximately 200 milliliters (7.2 oz) of tap water in a 1000 milliliter measuring cup.
  - b) Place the container on the center of tray in the oven cavity.
  - c) Close the door.
  - d) Touch the POWER LEVEL pad, the number pad 1, the POWER LEVEL pad, the number pad 2 and the POWER LEVEL pad, then open the door and touch the START pad within 10 seconds. Then, close the door. And touch the number pads 1 once and the number pad 4 once.
  - e) The control panel is in automatic Sensor operation.
  - f) The oven turns off automatically, and the time for detecting moisture will be displayed.

If new sensor does not operate properly, the problem is with the control unit, and refer to explanation below.

## **2. CHECKING CONTROL UNIT**

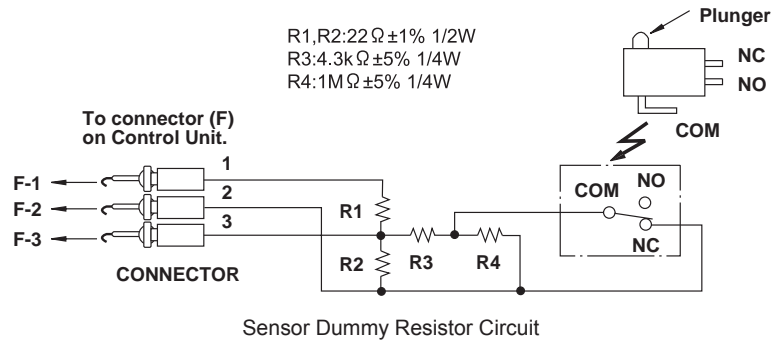
- 1) Disconnect the power supply cord, and then remove outer case.
- 2) Open the door and block it open.
- 3) Discharge high voltage capacitor.
- 4) Disconnect the sensor connector that is mounted to control panel.
- 5) Then connect the dummy resistor circuit (see fig.) to the sensor connector of control panel.
- 6) Disconnect the leads to the primary of the inverter unit.
- 7) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
- 8) After that procedure, re-connect the power supply cord.
- 9) Check the sensor cook operation proceed as follows:
  - a) Close the door. Touch the POWER LEVEL pad, the number pad 1, the POWER LEVEL pad, the number pad 2 and the POWER LEVEL pad, then open the door and touch the START pad within 10 seconds. Then, close the door. And touch the number pads 1 once and the number pad 4 once.
  - b) The control panel is in the sensor cooking operation.
  - c) After approximately 25 seconds, push plunger of select switch for more than 3 seconds. This condition is same as judgement by humidity sensor.
  - d) After approximately 3 seconds, the display shows "X X. X X " which is the time for detecting moisture.



If the above is not the case, the control unit is probably defective.

If the above is proper, the humidity sensor is probably defective.

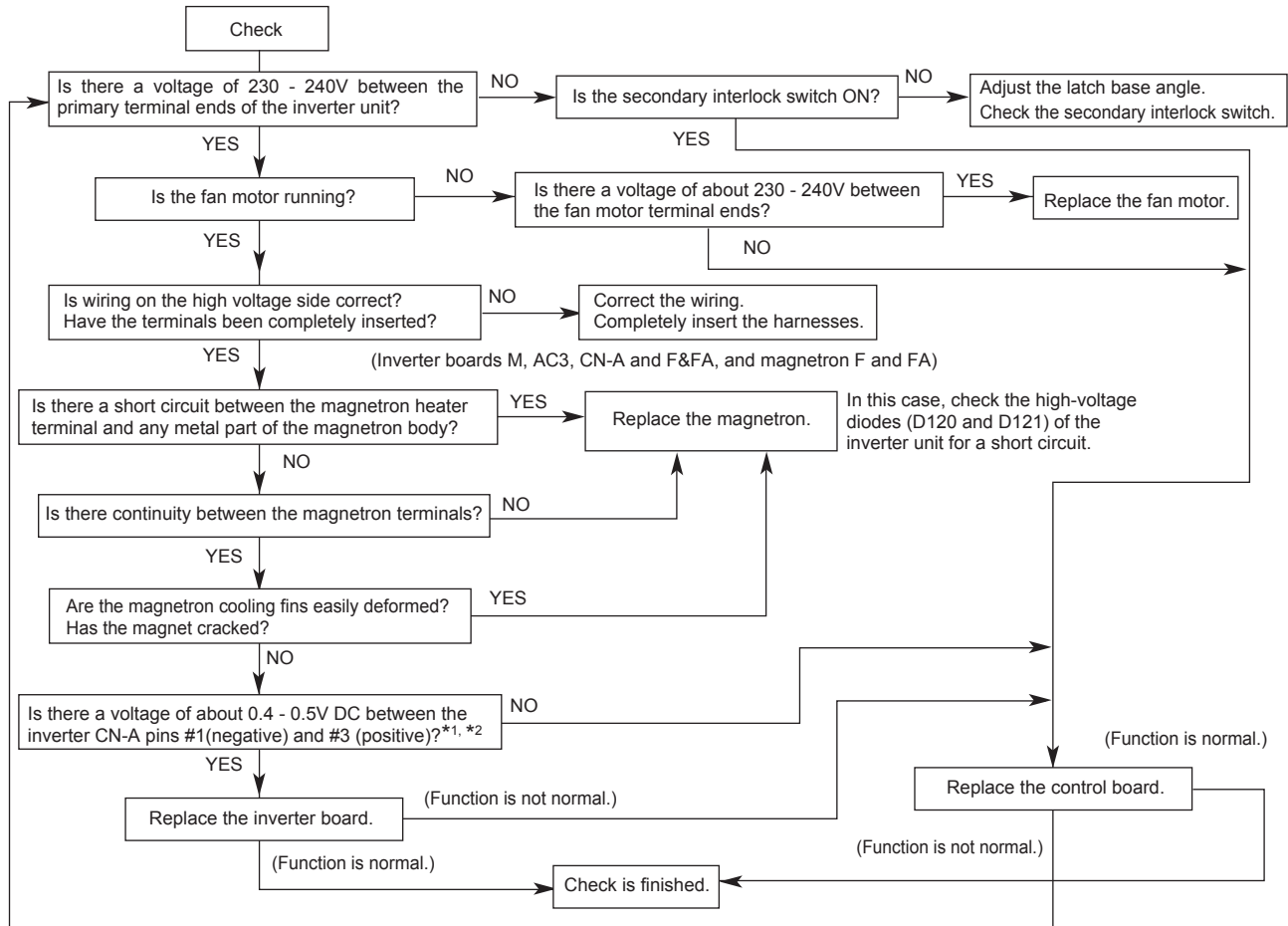
- 10) Disconnect the power supply cord, and then remove outer case.
- 11) Open the door and block it open.
- 12) Discharge high voltage capacitor.
- 13) Disconnect the dummy resistor circuit from the sensor connector of control panel.
- 14) Carry out necessary repair.
- 15) Reconnect all leads removed from components during testing and repairing.
- 16) Re-install the outer case (cabinet).
- 17) Reconnect the power supply cord after the outer case is installed. Run the oven and check all functions.
- 18) Carry out "Water load cooking test" again and ensure that the oven works properly.



## CHAPTER 9. CHECK IN THE EVENT OF NO MICROWAVE COOKING

Check of high voltage sections is very dangerous. Therefore, after the inverter boards (M and AC3) and 230 - 240V at the primary terminal are confirmed to be satisfactory, disconnect the main power and wait for at least one (1) minute before starting the check.

Check of individual components is done with the high voltage circuit wiring disconnected.



\*1 Disconnect only the inverter unit terminals M and AC3. Then measure voltage between CN-A pins #1 and #3 (between PD 100 2P and 1P) with an analog tester while performing heating operation.

\*2 If a value measured by a digital tester is unstable, connect a resistor of 10 k $\Omega$  to 100 k $\Omega$  between the pins #1 and #3 to measure the value.

### Adjustment of microwave power

The microwave power (100% power level) can be adjusted as follows.

At step 10, adjust the power so that the "3A" should be indicated at "YY" in the display for this model.

Step	Operation	Display	Indicator	Sound	Note
		. 0			
1	POWER LEVEL	↓			
2	1	(manual setting)		○	
3	POWER LEVEL	↓		○	
4	2	↓		○	
5	POWER LEVEL	↓		○	
6	(door open)	↓			
7	START	(set aging mode)		○	Set aging mode.
8	(door close)	↓			
9	8	0 XX (power)	COOK	○	Start power adjust
10	1 or 0	↓ 0 YY	↓	○	1 : power up 0 : power down
11	START	↓ 1 YY	↓	○	Fix power

## CHAPTER 10. SERVICING FOR TOUCH CONTROL PANEL

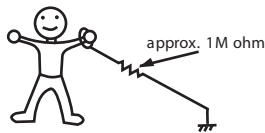
### [1] SERVICING FOR TOUCH CONTROL PANEL

#### 1. Precautions for Handling Electronic Components

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc. and sometimes it is not fully protected by the built-in protection circuit.

In order to protect CMOS LSI.

- 1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap all PW boards containing them in aluminium foil.
- 2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



#### 2. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

1. Servicing the touch control panel with power supply of the oven:

**CAUTION: THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD.**

Therefore, before checking the performance of the touch control panel,

- 1) Disconnect the power supply cord, and then remove outer case.
- 2) Open the door and block it open.
- 3) Discharge high voltage capacitor.
- 4) Disconnect the leads to the primary of the inverter unit.
- 5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
- 6) After that procedure, re-connect the power supply cord.

After checking the performance of the touch control panel,

- 1) Disconnect the power supply cord.
- 2) Open the door and block it open.
- 3) Re-connect the leads to the primary of the inverter unit.
- 4) Re-install the outer case (cabinet).
- 5) Re-connect the power supply cord after the outer case is installed.
- 6) Run the oven and check all functions.

- a) On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

- b) On some models, the power supply cord between the touch control panel and the oven proper is long enough that they may be separated from each other. For those models, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which activates an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.

2. Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which activates an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

#### 3. Servicing Tools

Tools required to service the touch control panel assembly.

- 1) Soldering iron: 60W  
(It is recommended to use a soldering iron with a grounding terminal.)
- 2) Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
- 3) Others: Hand tools

#### 4. Other Precautions

- 1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
- 2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
- 3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

## CHAPTER 11. PRECAUTIONS FOR USING LEAD-FREE SOLDER

### 1. Employing lead-free solder

The "Main PWB" of this model employs lead-free solder. This is indicated by the "LF" symbol printed on the PWB and in the service manual. The suffix letter indicates the alloy type of the solder.

**Example:**

**LF**a  
Sn-Ag-Cu

Indicates lead-free solder of tin, silver and copper

**LF**n  
Sn-Cu-Ni

Indicates lead-free solder of tin, copper and nickel

### 2. Using lead-free wire solder

When repairing a PWB with the "LF" symbol, only lead-free solder should be used. (Using normal tin/lead alloy solder may result in cold soldered joints and damage to printed patterns.)

As the melting point of lead-free solder is approximately 40°C higher than tin/lead alloy solder, it is recommend that a dedicated bit is used, and that the iron temperature is adjusted accordingly.

### 3. Soldering

As the melting point of lead-free solder (Sn-Ag-Cu, Sn-Cu-Ni) is higher and has poorer wettability, (flow), to prevent damage to the land of the PWB, extreme care should be taken not to leave the bit in contact with the PWB for an extended period of time. Remove the bit as soon as a good flow is achieved. The high content of tin in lead free solder will cause premature corrosion of the bit. To reduce wear on the bit, reduce the temperature or turn off the iron when it is not required.

Leaving different types of solder on the bit will cause contamination of the different alloys, which will alter their characteristics, making good soldering more difficult. It will be necessary to clean and replace bits more often when using lead-free solder. To reduce bit wear, care should be taken to clean the bit thoroughly after each use.

# CHAPTER 12. COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

## [1] BEFORE OPERATING

### WARNING AGAINST HIGH VOLTAGE:

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in severe, possibly fatal, electric shock.

(Example)

High Voltage Capacitor, Inverter Unit, Magnetron, High Voltage Rectifier Assembly, High Voltage Fuse, High Voltage Harness etc.

**WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.**

- 1) Disconnect the power supply cord.
- 2) Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.)
- 3) Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).
- 3) The door gasket or seal is damaged.
- 4) The door is bent or warped.
- 5) There are defective parts in the door interlock system.
- 6) There are defective parts in the microwave generating and transmission assembly.
- 7) There is visible damage to the oven.

Carry out any remedial work that is necessary before operating the oven.

Do not operate the oven if any of the following conditions exist;

- 1) Door does not close firmly.
- 2) Door hinge, support or latch hook is damaged.

Do not operate the oven:

- 1) Without the RF gasket (Magnetron).
- 2) If the wave guide or oven cavity are not intact.
- 3) If the door is not closed.
- 4) If the outer case (cabinet) is not fitted.

Please refer to "OVEN PARTS, CABINET PARTS, DOOR PARTS", when carrying out any of the following removal procedures:

### WARNING FOR WIRING

**To prevent an electric shock, take the following precautions.**

1. Before wiring,
  - 1) Disconnect the power supply cord.
  - 2) Open the door and block it open.
  - 3) Discharge the high voltage capacitor and wait for 60 seconds.
2. Don't let the wire leads touch to the following parts;
  - 1) High voltage parts:  
Magnetron, Inverter unit, High voltage capacitor, High voltage rectifier assembly and High voltage fuse.
  - 2) Hot parts:  
Convection heater, Oven lamp, Magnetron, High voltage transformer and Oven cavity.
  - 3) Sharp edge:  
Bottom plate, Oven cavity, Weveguide flange, Chassis support and other metallic plate.
  - 4) Movable parts (to prevent a fault)  
Fan blade, Fan motor, Switch, Switch lever, Open button.
3. Do not catch the wire leads in the outer case cabinet.
4. Insert the positive lock connector certainly until its pin is locked. And make sure that the wire leads should not come off even if the wire leads is pulled.
5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.

### REMEMBER TO CHECK 3D

- |                                                                                                                       |                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1) Disconnect the supply.</li> <li>2) Door opened, and wedged open.</li> </ol> | <ol style="list-style-type: none"> <li>3) Discharge high voltage capacitor.</li> </ol> |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|

## [2] OUTER CASE CABINET REMOVAL

To remove the outer case cabinet, procedure as follows.

1. Disconnect the oven from power supply.
2. Door opened, and wedged open.
3. Remove five (5) screws from rear and one (1) screw along the right side edge of case.
4. Slide the entire case back out about 1 inch (3 cm) to free it from retaining clips on the cavity face plate.
5. Lift entire case from the unit.
6. Discharge the high voltage capacitors of the inverter unit, by following the procedures below.
  - i) Wait for 60 seconds to discharge the high voltage capacitors of the inverter unit.
  - ii) Disconnect the high voltage wire from the magnetron terminal with insulated pliers.
  - iii) Make the terminal (metal part) of the high voltage wire contact to the magnetron body with insulated pliers.
  - iv) Now, the capacitors of the inverter unit are discharged.
7. Reconnect the high voltage wire to the magnetron terminal after discharging.

**WARNING:** Use the pliers that the portions of their handles are insulated completely to avoid an electric shock.

WARNING: RISK OF ELECTRIC SHOCK. DISCHARGE THE HIGH-VOLTAGE CAPACITORS BEFORE SERVICING.

- Do not operate the oven with the outer case removed.

### [3] INVERTER UNIT REPLACEMENT

#### 1. REMOVAL

- CARRY OUT 3D CHECKS.
- Disconnect the main wire harness from the inverter harness.
- Disconnect the main wire harness from the connector CN-A in the inverter unit.
- Disconnect the high voltage wires from the magnetron.
- Remove the four (4) screws holding the inverter angle to the bottom plate.
- Remove the inverter angle with the inverter unit from the bottom plate.
- Disconnect the inverter harness from the inverter unit.
- Disconnect the high voltage wires from the inverter unit.
- Remove the one (1) screw which earths the inverter unit to the inverter angle.
- Remove the two (2) screws holding the inverter unit to the inverter angle.
- Remove the inverter unit from the inverter angle.
- Now, the inverter unit is free.

#### 2. RE-INSTALL

- Insert the tab of the inverter unit to the slit of the inverter angle, as shown in the picture "Tab of inverter unit".
- Hold the inverter unit to the inverter angle with the two (2) screws, as shown in the picture "Screws for inverter unit".
- Earth the inverter unit to the inverter angle with one (1) screw, as shown in the picture "Tab of inverter unit".
- Connect the inverter harness to the inverter unit, referring to the pictorial diagram.
- Connect the high voltage wires to the inverter unit, referring to the pictorial diagram.
- Rest the inverter angle with the inverter unit on the bottom plate with the inverter harness terminal side toward the oven face plate.
- Secure the inverter angle with four (4) screws to the bottom plate.

### [4] MAGNETRON REMOVAL

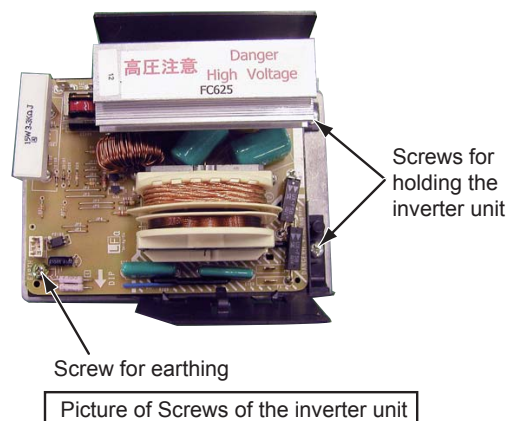
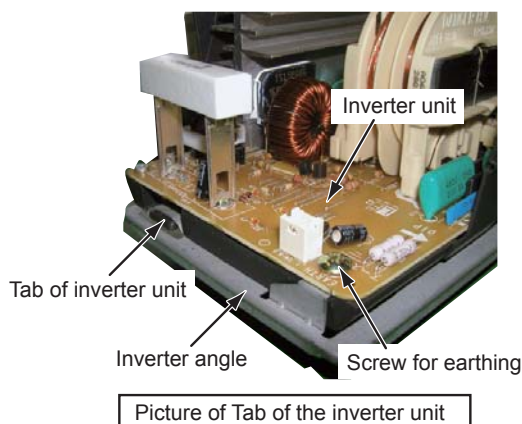
#### 1. REMOVAL

- CARRY OUT 3D CHECKS.
- Disconnect all wire leads from magnetron.
- Remove the one (1) screw holding the chassis support to the magnetron.
- Release the chassis support from the hole of the oven cavity front flange.
- Remove the two (2) screws holding air duct to magnetron and oven cavity top plate.
- Remove the air duct from oven.
- Carefully remove the four (4) screws holding magnetron to waveguide flange.
- Remove magnetron with care so that magnetron antenna is not hit by any metal object around antenna.
- Now, the magnetron is free.

NOTE: Step 1, 2 and 6 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.

- Connect the high voltage wires to the magnetron, referring to the pictorial diagram.
- Connect the connector of the main wire harness to the connector CN-A on the inverter unit.
- Connect the inverter harness to the main wire harness.
- CARRY OUR 4R CHECKS.



#### 2. REINSTALLATION

- Reinstall the magnetron to waveguide flange with the four (4) screws.
- Reinstall the air duct to the oven cavity top plate and the magnetron with two (2) screws.
- Insert the end of the chassis support into the hole of the oven cavity front flange.
- Hold the other end of the chassis support to the magnetron with the one (1) screw.
- Reconnect the wire leads to the magnetron. Refer to "PICTORIAL DIAGRAM".
- Reinstall outer case and check that the oven is operating properly.

CAUTION: WHEN REPLACING MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND MOUNTING SCREWS ARE TIGHTENED SECURELY.

## [5] POSITIVE LOCK CONNECTOR (NO-CASE TYPE) REMOVAL

1. CARRY OUT 3D CHECKS.
2. Push the lever of positive lock connector.
3. Pull down on the positive lock connector.

CAUTION: WHEN CONNECTING THE POSITIVE LOCK CONNECTORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK SO THAT THE LEVER FACES YOU.

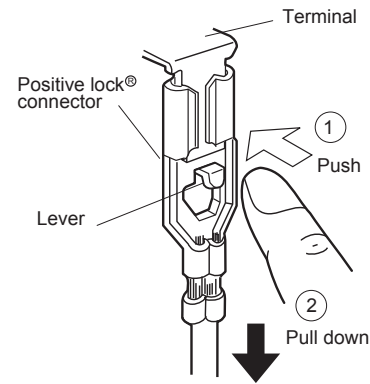


Figure C-1. Positive lock connector

## [6] CONTROL PANEL ASSEMBLY REMOVAL

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the wire leads from control unit.
5. Remove the one (1) screw holding the control panel assembly to the oven flange.
6. Slide the control panel assembly upward and remove it.
7. Now, individual components can be removed.

## [7] GRAPHIC SHEET AND MEMBRANE SWITCH REPLACEMENT

### 1. REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly, referring to chapter of CONTROL PANEL ASSEMBLY REMOVAL.
3. Remove the four (4) screws holding the control unit to the control panel frame. And remove the control unit.
4. Tear away the graphic sheet from the control panel frame.
5. Tear away the membrane switch from the control panel frame.

### 2. REINSTALL

1. Remove remaining adhesive on the control panel frame surfaces with a soft cloth soaked in alcohol.
2. Tear the backing paper from the new membrane switch.
3. Insert the ribbon cable of the membrane switch into the slit of the control panel frame.
4. Adjust the upper edge and right edge of the membrane switch to the small depression on the surface of the control panel frame.
5. Attach the membrane switch to the control panel frame by rubbing with a soft cloth not to scratch.
6. Tear the backing paper from the new graphic sheet.
7. Adjust the upper edge and left edge of the graphic sheet to the large depression on the surface of the control panel frame.
8. Attach the graphic sheet to the control panel frame by rubbing with a soft cloth not to scratch.

9. Insert the ribbon cable into the slit of the control unit.
10. Reinstall the control unit to the control panel frame with four (4) screws.
11. Connect membrane switch's ribbon cable to the connector CN-G of the control unit.

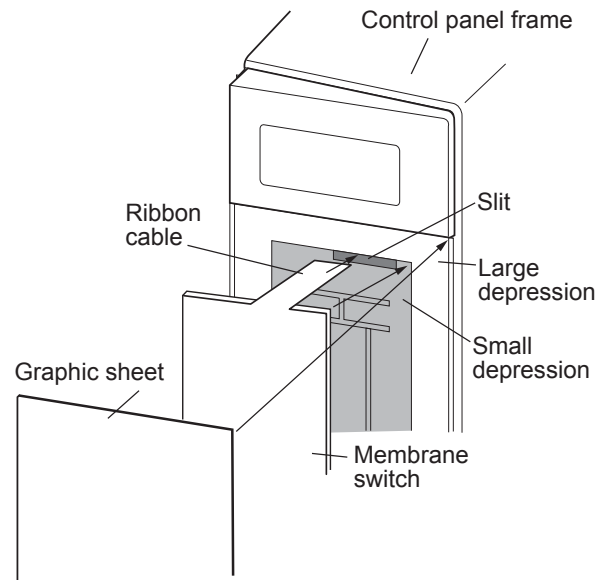


Figure C-2. Graphic Sheet and Membrane Switch Replacement

## [8] TURNTABLE MOTOR REMOVAL

1. Disconnect the power supply cord.
2. Remove turntable and turntable support from oven cavity.
3. Lay the oven on its backside. Remove the turntable motor cover by snipping off the material in four corners.
4. Where the corners have been snipped off bend corner areas flat. No sharp edges must be evident after removal of the turntable motor cover.
5. Disconnect wire leads from turntable motor.  
(See "Positive lock connector removal")
6. Remove one (1) screw holding turntable motor to oven cavity.
7. Now the turntable motor is free.
8. After replacement use the one (1) screw (XHPS740P08K00) to fit the turntable motor cover.



## [9] COOLING FAN MOTOR REMOVAL

### 1. REMOVAL

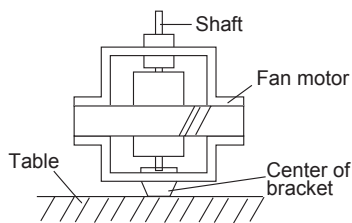
1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from the fan motor.
3. Remove the three (3) screws holding the fan duct (upper one) to the oven cavity back plate and the oven cavity top plate.
4. Lift up the fan duct (with the noise filter) and place it on the oven cavity top plate. This is to avoid that the coil of the fan motor is injured when the fan motor is removed.
5. Remove the two (2) screws holding the fan motor to the oven cavity back plate.
6. Now, the fan motor with the fan blade is free.

### 2. REINSTALL

1. Install the new fan blade to the fan motor shaft according to the following procedure.

CAUTION: Do not reuse the removed fan blade because the hole (for shaft) may be larger than normal.

2. Hold the center of the bracket which supports the shaft of the fan motor on the flat table.



3. Apply the screw lock tight into the hole (for shaft) of the fan blade.
4. Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.
5. Install the fan motor to the oven cavity back plate with two (2) screws.
6. Install the fan duct (with the noise filter) to the oven cavity back plate and the oven cavity top plate with the three (3) screws.

CAUTION: • Do not hit the fan blade strongly when installed because the bracket may be transformed.

- Make sure that the fan blade rotates smooth after installation.
- Make sure that the axis of the shaft is not slanted.

7. Connect the wire leads to the fan motor, referring to the pictorial diagram.

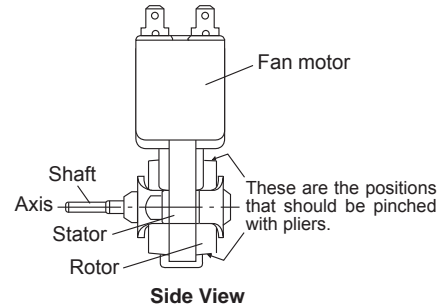
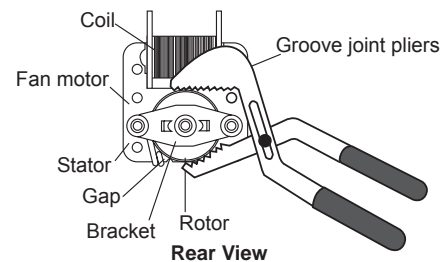
### 3. INFORMATION (How to remove the fan blade)

1. Remove the fan motor with the fan blade, referring to "REMOVAL".
2. Remove the fan blade from the fan motor shaft according to the following procedure.
3. Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION: • Make sure that no metal pieces enter the gap between the rotor and the stator of the fan motor because the rotor is easily shaven by pliers and metal pieces may be produced.

- Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.
- Do not disfigure the bracket by touching with the pliers.

4. Remove the fan blade from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
5. Now, the fan blade will be free.



## [10] POWER SUPPLY CORD REPLACEMENT

### 1. REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the single (1) screw holding the green/yellow wire to the oven cavity back plate.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-3(a).
4. Release the moulding cord stopper of the power supply cord from the square hole of the oven cavity back plate, referring to the Figure C-3(b).
5. Now, the power supply cord is free.

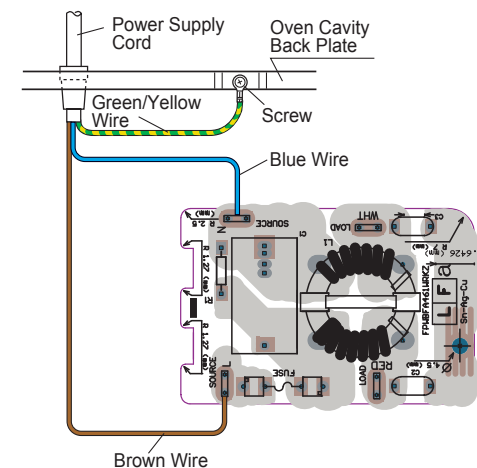


Figure C-3(a) Power Supply Cord Replacement

## 2. REINSTALL

1. Insert the moulding cord stopper of power supply cord into the square hole of the rear cabinet, referring to the Figure C-3 (b).
2. Install the earth wire lead of power supply cord to the oven cavity back plate with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.
4. Re-install outer case and check that the oven is operating properly.

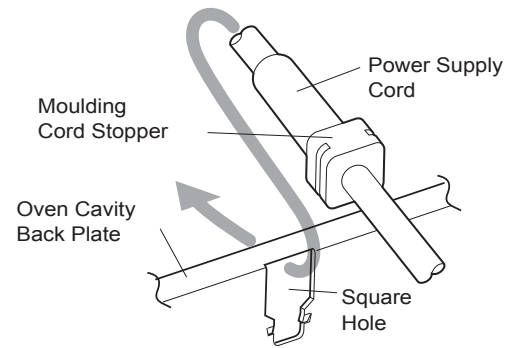


Figure C-3(b) Power Supply Cord Replacement

## [11] 1ST. LATCH SWITCH, 2ND. INTERLOCK RELAY CONTROL SWITCH AND MONITOR SWITCH REMOVAL

### 1. REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from the switches.
3. Remove two (2) screws holding latch hook to oven flange.
4. Remove latch hook assembly from oven flange.
5. Push outward on the two (2) retaining tabs holding switch in place.
6. Switch is now free. At this time switch lever will be free, do not lose it.

### 2. REINSTALL

1. Reinstall each switch in its place. The 1st. latch and monitor switches are in the lower position and the 2nd. interlock relay control switch is in the upper position.
2. Reconnect wire leads to each switch. Refer to pictorial diagram.
3. Secure latch hook (with two (2) mounting screws) to oven flange.
4. Make sure that the monitor switch is operating properly and check continuity of the monitor circuit. Refer to chapter "Test Procedure" and Adjustment procedure.

## [12] 1ST. LATCH SWITCH, 2ND. INTERLOCK RELAY CONTROL SWITCH AND MONITOR SWITCH ADJUSTMENT

### 1. Adjustment

If the 1st. latch switch, 2nd. interlock relay control switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.

1. Loosen the two (2) screws holding latch hook to the oven cavity front flange.
2. With door closed, adjust latch hook by moving it back and forth, and up and down. In and out play of the door allowed by the upper and lower position of the latch hook should be less than 0.5mm. The vertical position of the latch hook should be adjusted so that the 1st. latch switch and 2nd. interlock relay control switch are activated with the door closed. The horizontal position of the latch hook should be adjusted so that the plunger of the monitor switch is pressed with the door closed.
3. Secure the screws with washers firmly.
4. Check all switches operation. If each switch has not activated with the door closed, loosen screw and adjust the latch hook position.

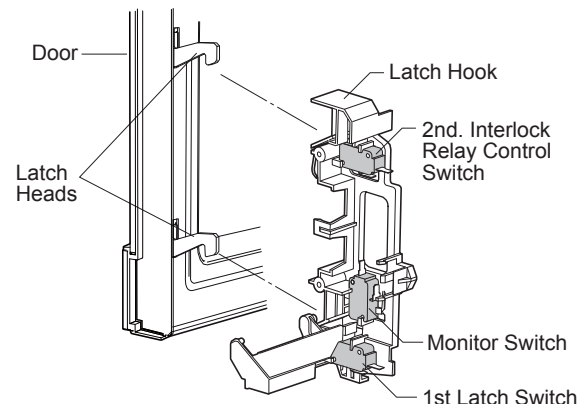


Figure C-4. Latch Switch Adjustments

### 2. After adjustment, check the following.

1. In and out play of door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of door toward the oven face. Then check lower portion of the latch hook, pushing and pulling lower portion of the door toward the oven face. Both results (play in the door) should be less than 0.5mm.
2. The 1st. latch switch and 2nd. interlock relay controls witch interrupt the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. Reinstall outer case and check for microwave leakage around door with an approved microwave survey meter.(Refer to Microwave Measurement Procedure.)

## [13] DOOR REPLACEMENT

### 1. REMOVAL

1. Disconnect the power supply cord.
2. Open the door slightly.
3. Insert a putty knife (thickness of about 0.5mm) into the gap between the choke cover and door frame as shown in Figure C-5 to free engaging parts.
4. Pry the choke cover by inserting a putty knife as shown Figure C-5.
5. Release choke cover from door panel.
6. Now choke cover is free.

**NOTE: When carrying out any repair to the door, do not bend or warp the slit choke (tabs on the door panel assembly) to prevent microwave leakage.**

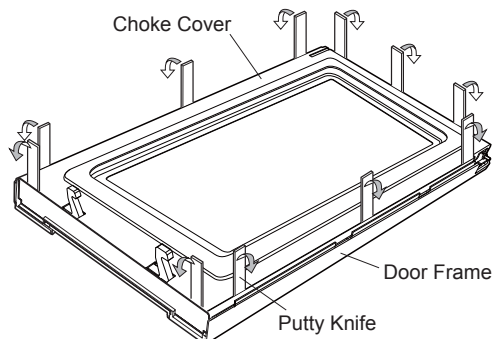


Figure C-5. Door Disassembly

7. Release two (2) pins of door panel from two (2) holes of upper and lower oven hinges by lifting up.
8. Now, door panel with door frame is free from oven cavity.
9. Remove the two (2) screws holding the door panel to door frame.
10. Release door panel from ten (10) tabs of door frame.
11. Now, door panel with sealer film is free.
12. Tear sealer film from door panel.
13. Now, door panel is free.
14. Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head.
15. Now, latch head and latch spring are free.
16. Remove the two (2) door stoppers.
17. Remove door glass from door frame by sliding.
18. Now, door glass is free.
19. Remove the door decorations from the door frame by straightening all tabs of the door decorations.
20. Now, the door frame is free.

### 2. REINSTALL

1. Re-install door screen and door decoration to door frame.
2. Reinstall the latch spring to the latch head. Reinstall the latch spring to the door frame. Reinstall latch head to door frame.
3. Reinstall door panel to door frame by fitting ten (10) tabs of door frame to ten (10) holes of door panel.
4. Hold the door panel to the door frame with the two (2) screws.
5. Put sealer film on door panel. Refer to "Sealer Film" about how to handle new one.
6. Catch two (2) pins of door panel on two (2) hole of upper and lower oven hinges.
7. Re-install choke cover to door panel by pushing.

**NOTE: After any service to the door;**

- 1) Make sure that 1st. latch switch, 2nd. interlock relay control switch and monitor switch are operating properly. (Refer to chapter "Test Procedures".)
- 2) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

### 3. After any service, make sure of the following:

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through center of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

**NOTE: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves, indicate a leakage of microwave energy from oven cavity.**

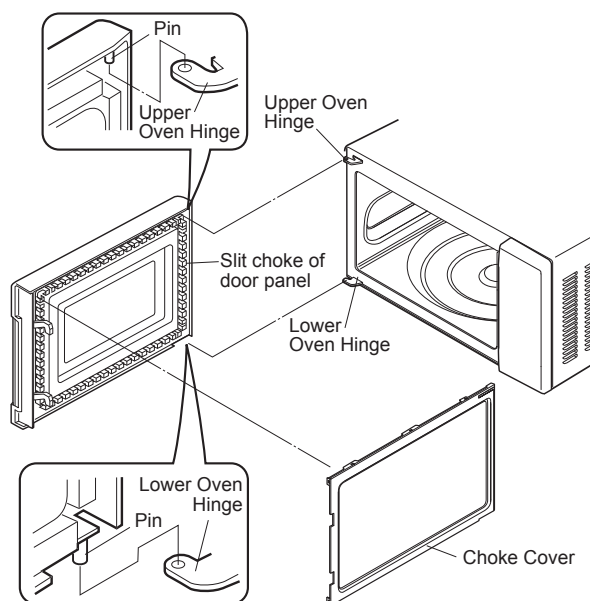


Figure C-6. Door Replacement

### 4. SEALER FILM

1. Put the adhesive tape on the backing film of the sealer film as shown in Fig. C-7
2. Tear the backing film by pulling the adhesive tape.
3. Put the pasted side of the sealer film on the door panel

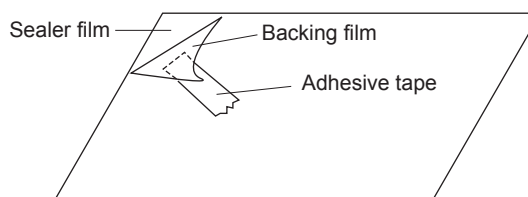


Figure C-7. Sealer film

## CHAPTER 13. MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

### REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of  $5\text{mW}/\text{cm}^2$  at any point 5cm or more from external surface of the oven.

### PREPARATION FOR TESTING

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.

Important:

Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.

Recommended instruments are:

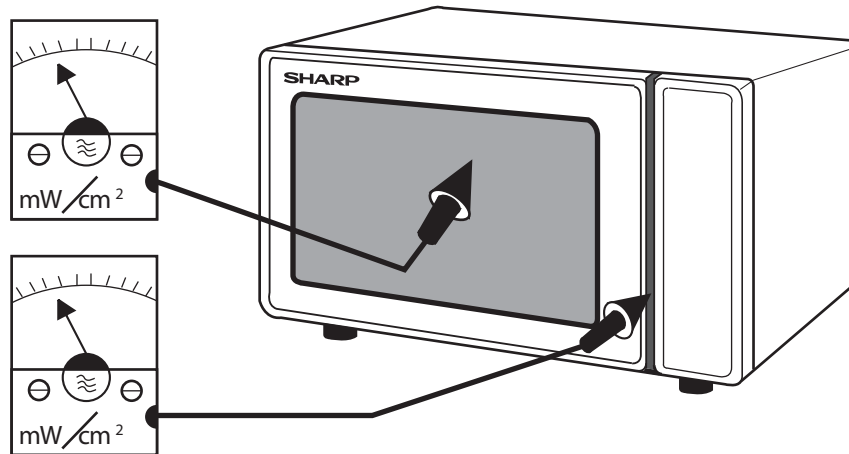
NARDA 8100

NARDA 8200

HOLADAY HI 1500

SIMPSON 380M

2. Place the oven tray into the oven cavity.
3. Place the load of 275  $\pm$  15ml of water initially at 20  $\pm$  5°C in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.  
The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster than 2.5cm/sec.) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

# CHAPTER 14. CIRCUIT DIAGRAMS

## [1] Oven Schematic

**SCHEMATIC**  
 NOTE: CONDITION OF OVEN  
 1. DOOR CLOSED.  
 2. CLOCK APPEARS ON DISPLAY.

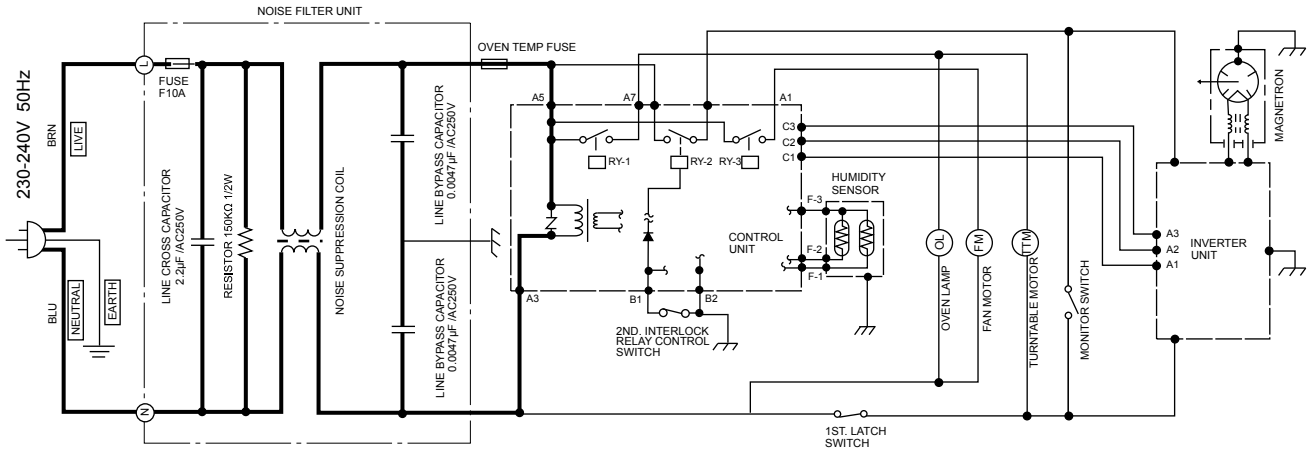


Figure O-1 Oven Schematic-OFF Condition

**SCHEMATIC**  
 NOTE: CONDITION OF OVEN  
 1. DOOR CLOSED.  
 2. COOKING TIME PROGRAMMED.  
 3. START KEY TOUCHED.

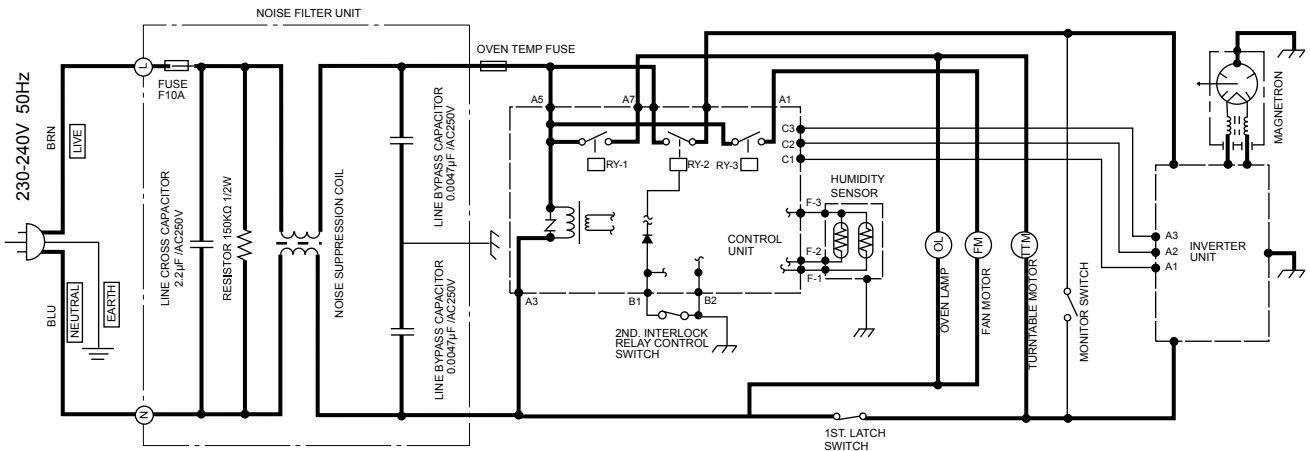


Figure O-2 Oven Schematic-ON Condition

[2] Pictorial Diagram (Figure S-1)

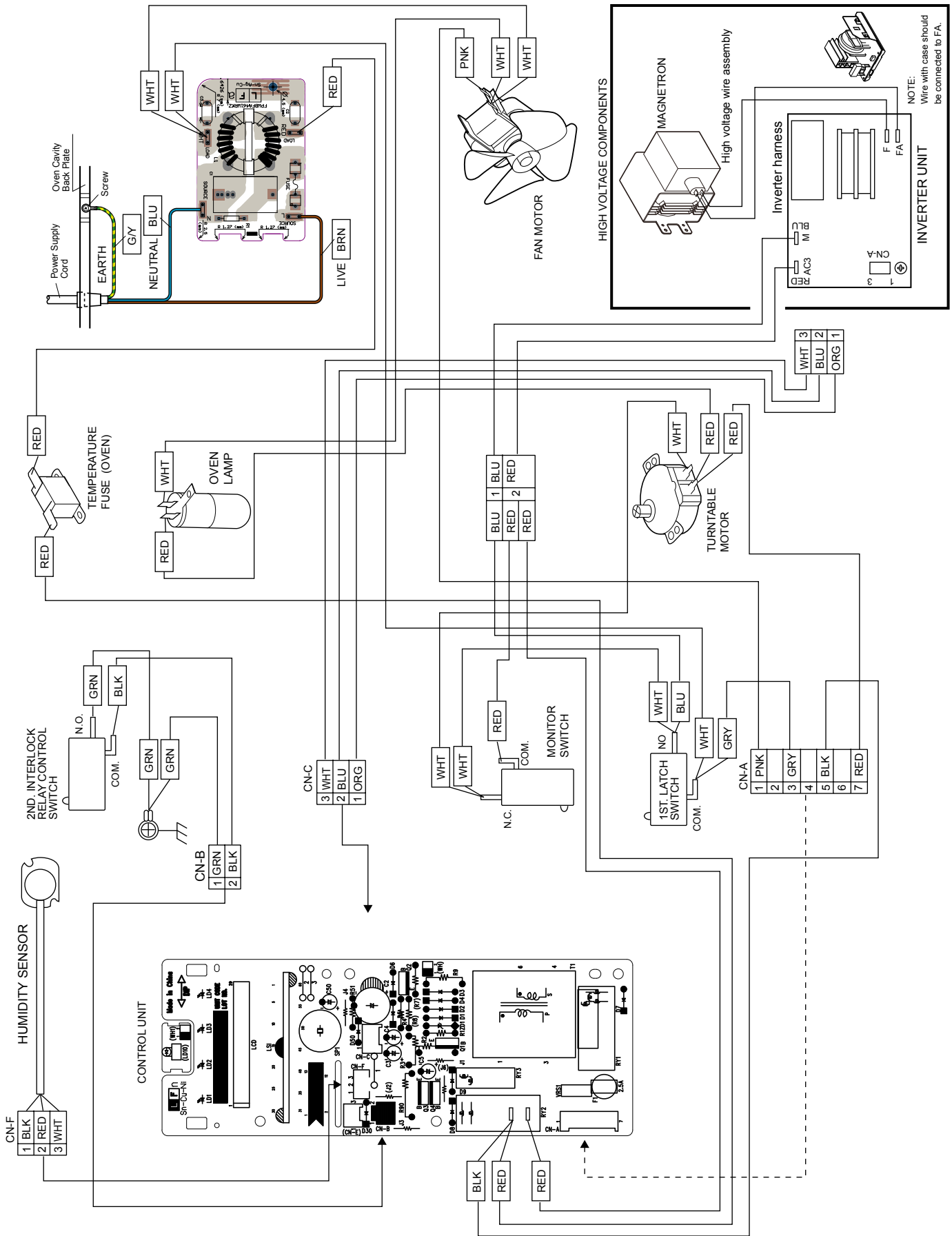


Figure S-1. Pictorial Diagram





[4] Printed Wiring Board (Figure S-3)

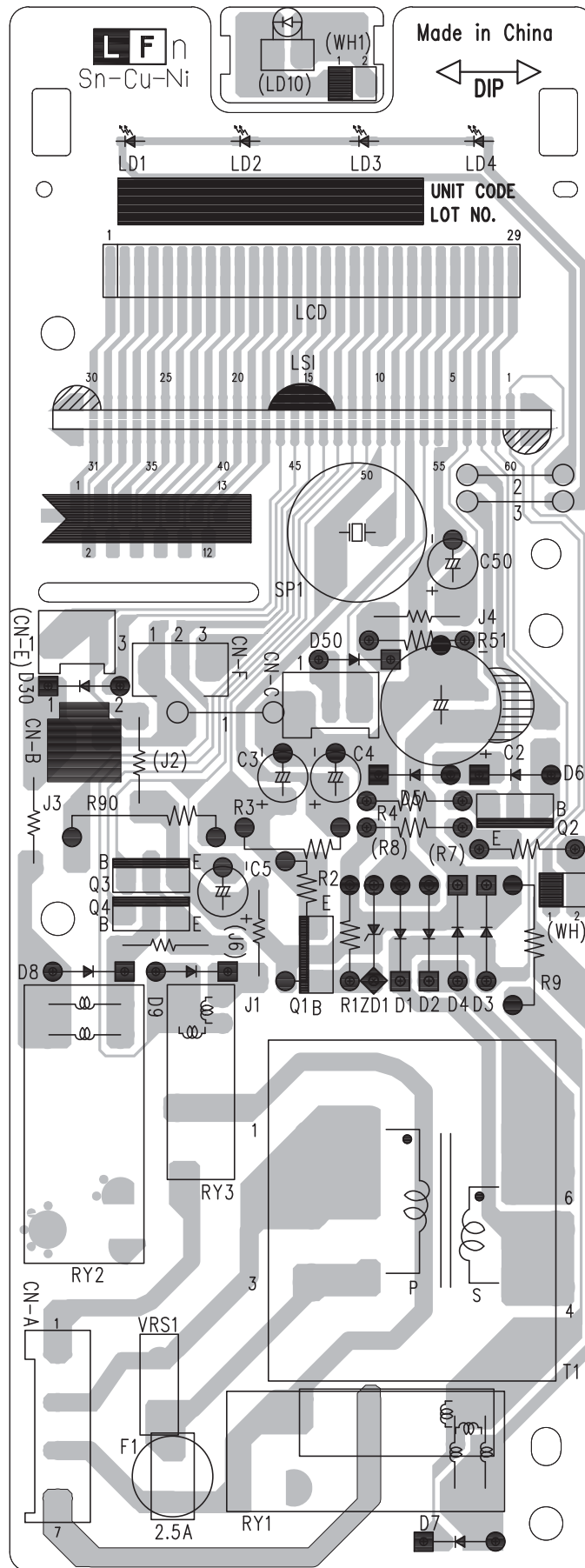


Figure S-3. Printed Wiring Board of Power Unit







# SHARP PARTS LIST

## MICROWAVE OVEN

**HOW TO ORDER REPLACEMENT PARTS**  
To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

## MODELS **R-350Y(S)** **R-350Y(W)**

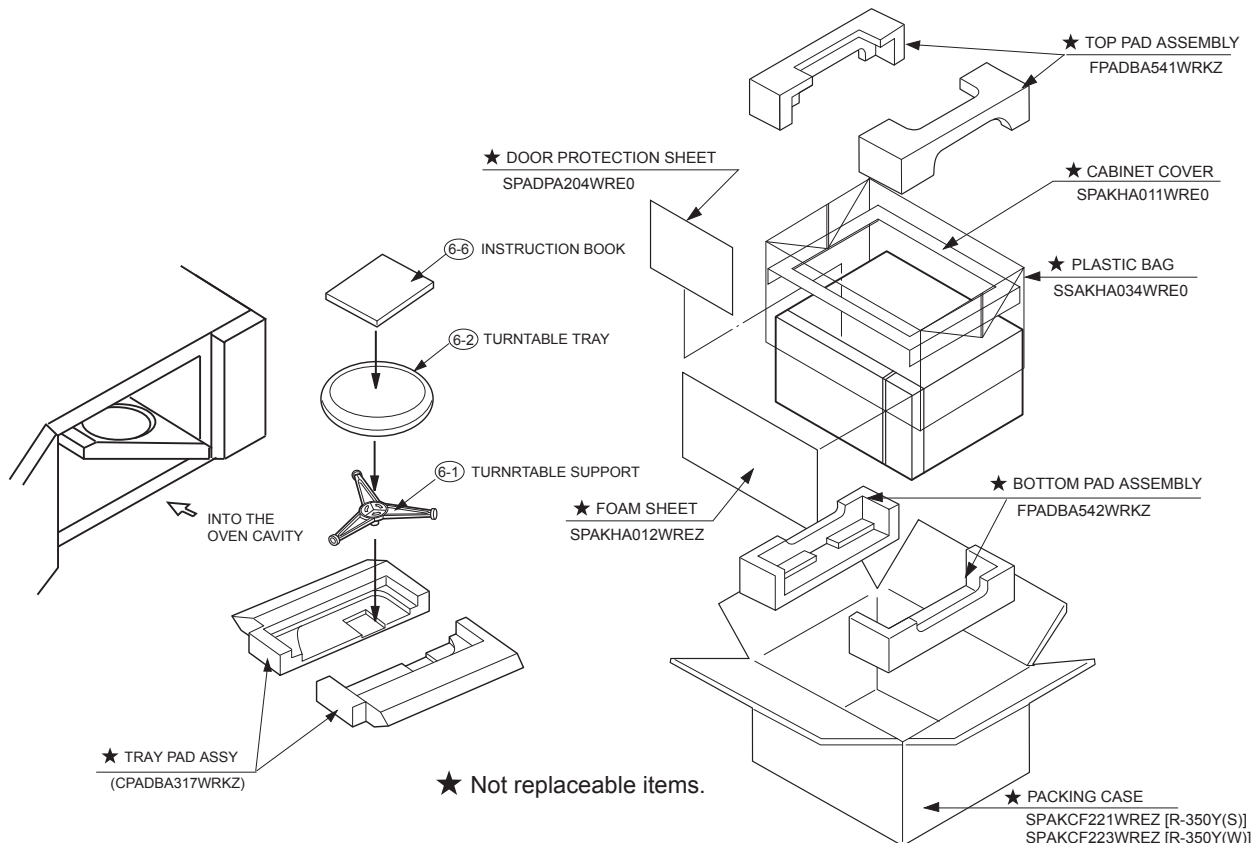
Parts marked "\*" may cause undue microwave exposure.  
Parts marked "▲" are used in voltage more than 250V.

### CONTENTS

[1] OVEN PARTS

[2] DOOR AND CONTROL PANEL PARTS

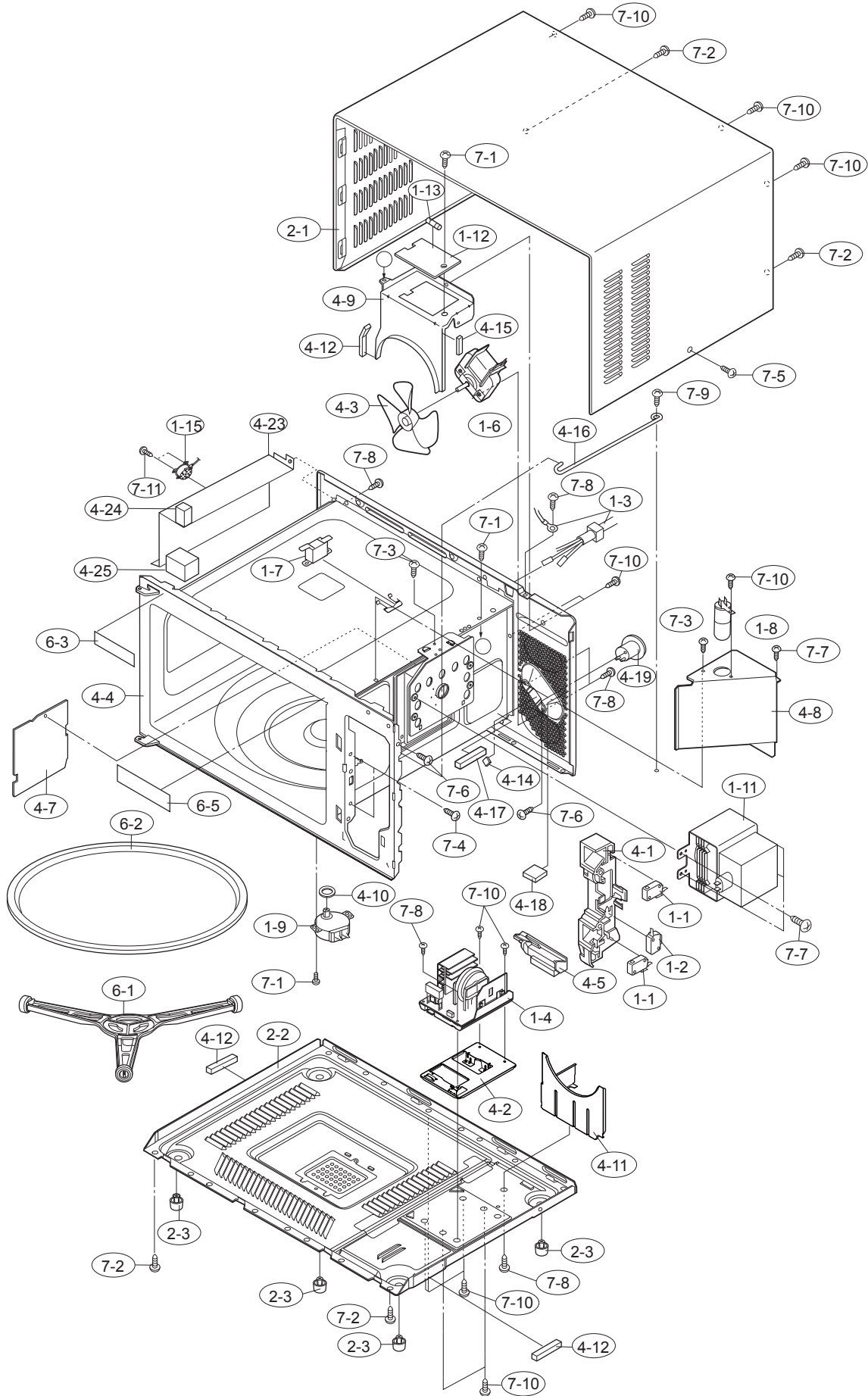
■ INDEX



SHARP CORPORATION

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The contents are subject to change without notice.

# [1] OVEN PARTS



NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
<b>[1] OVEN PART</b>					
<b>ELECTRIC PARTS</b>					
1-1	QSW-MA147WRZZ	AG			1st.latch/ 2nd.interlock relay control switch (Micro switch a)
1-1	QSW-MA085WRE0	AF			1st.latch/ 2nd.interlock relay control switch (Micro switch a Interchangeable)
1-1	QSW-MA137WRE0	AH			1st.latch/ 2nd.interlock relay control switch (Micro switch a Interchangeable)
1-2	QSW-MA148WRZZ	AF			Monitor switch (Micro switch b)
1-2	QSW-MA086WRE0	AF			Monitor switch (Micro switch b Interchangeable)
1-2	QSW-MA138WRE0	AH			Monitor switch (Micro switch b Interchangeable)
1-3	QACC-A178WRZZ	AQ			Power supply cord
1-3	QACC-A156WRZZ	AQ			Power supply cord (Interchangeable)
1-3	QACC-A139WRZZ	AQ			Power supply cord (Interchangeable)
1-3	QACC-A180WRZZ	AQ			Power supply cord (Interchangeable)
1-4	DPWBFC625WRKZ	BQ			Inverter unit
1-6	RMOTEA450WRZZ	AV			Fan motor
1-6	RMOTEA405WRZZ	AX			Fan motor (Interchangeable)
1-6	RMOTEA450WRZZ	AV			Fan motor (Interchangeable)
1-6	RMOTEA475WRZZ	AX			Fan motor (Interchangeable)
1-7	QFS-TA014WRE0	AG			Temperature fuse 150A(oven) (Temp. Fuse 150H)
1-8	RLMPTA088WRZZ	AN			Oven lamp
1-8	RLMPTA083WRZZ	AM			Oven lamp (Interchangeable)
1-8	RLMPTA101WRZZ	AM			Oven lamp (Interchangeable)
1-9	RMOTDA302WRZZ	AN			Turntable motor
1-9	RMOTDA253WRZZ	AV			Turntable motor (Interchangeable)
1-9	RMOTDA289WRZZ	AQ			Turntable motor (Interchangeable)
1-9	RMOTDA173WRE0	AX			Turntable motor (Interchangeable)
1-9	RMOTDA299WRZZ	BE			Turntable motor (Interchangeable)
1-11	RV-MZA381WRZZ	BG			Magnetron
1-12	FPWBFA461WRKZ	AT			Noise filter unit
1-13	QFS-CA026WRZZ	AH			Fuse f10a
1-15	FDTCTA230WRKZ	AX			Humidity sensor
<b>CABINET PARTS</b>					
2-1	GCABUA935WRPZ	BD			Outer case cabinet [R-350Y(S)]
2-1	GCABUA883WRPZ	BF			Outer case cabinet [R-350Y(W)]
2-2	GDAL-A489WRWZ	AS			Bottom plate
2-3	GLEGPA074WRE0	AC			Leg
<b>OVEN PARTS</b>					
4-1	PHOK-A131WRFZ	AL			Latch hook
4-2	LANGQA841WRPZ	AH			Inverter angle
4-3	NFANJA053WRFZ	AG			Fan blade
4-4	FOVN-A693WRTZ				Oven cavity assy
4-5	MLEVPA233WRF0	AG			Switch lever
4-7	FCOVPA083WRKZ	AF			Wg cover assy
4-8	PDUC-A833WRPZ	AM			Air duct
4-9	PDUC-A854WRPZ	AL			Fan duct
4-10	PPACGA176WREZ	AC			Ttm packing
4-11	PDUC-B224WRPZ	AG			Lower fan duct
4-12	PCUSUA278WRP0	AB			Mg cushion
4-14	PCUSGA614WRPZ	AE			Cushion
4-15	PCUSGA615WRPZ	AE			Cushion
4-16	MROD-A019WREZ	AN			Chassis support
4-17	PCUSUA313WRP0	AF			Cushion
4-18	PCUSGA620WRPZ	AF			Cushion
4-19	PSPAJA007WRFZ	AF			Spacer
4-23	PDUC-A842WRPZ	AP			Sensor duct
4-24	PCUSGA388WRP0	AK			Rubber cushion
4-25	PCUSUA212WRP0	AB			Cushion
<b>MISCELLANEOUS</b>					
6-1	FROLPA101WRKZ	AR			Roller assy
6-2	NTNT-A117WREZ	AS			Turntable
6-3	TCAUHA343WRRZ	AF			Micro caution
6-5	TLABMB405WRRZ	AF			Menu label
<b>SCREWS</b>					
7-1	XHPS740P08K00	AB			Screw : 4mm x 8mm
7-2	XOTS740P12RV0	AD			Screw : 4mm x 12mm
7-3	LX-CZA073WRE0	AC			Special screw
7-4	LX-CZ0052WRE0	AA			Special screw
7-5	XOTS740P08000	AA			Screw : 4mm x 8mm
7-6	XETS740P10000	AA			Screw : 4mm x 10mm
7-7	XHPS740P08000	AB			Screw : 4mm x 8mm
7-8	XHTS740P08RV0	AG			Screw : 4mm x 8mm
7-9	XHTS740P08000	AC			Screw : 4mm x 8mm
7-10	XOTS740P08000	AA			Screw : 4mm x 8mm
7-11	XHPS730P06000	AB			Screw : 3mm x 6mm



NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION
<b>[2] DOOR AND CONTROL PANEL PARTS</b>					
<b>ELECTRIC PARTS</b>					
1-5	FW-QZA130WRKZ	AH			High voltage wire assembly
1-10	FW-VZC337WREZ	AG			Inverter harness
1-14	FW-VZC336WREZ	AW			Main wire harness
<b>CONTROL PANEL PARTS</b>					
3-1	DPWB-B044DRKZ	BE			Control unit
3-2	PSHEPB587WREZ	AK			Graphic sheet
3-3	QSW-KA061DRZZ	AQ			Membrane switch
3-4	JBTN-B631WRTZ	AM			Open button R-350Y(S)
3-4	JBTN-B630WRFZ	AG			Open button R-350Y(W)
3-5	MSPRCA050WRE0	AB			Button spring
3-7	XEPS730P08XS0	AB			Screw : 3mm x 8mm
3-8	HPNLCC346WRTZ	AW			Control panel R-350Y(S)
3-8	HPNLCC345WRFZ	AT			Control panel R-350Y(W)
3-9	HDECQA465WRFZ	AG			Panel cap right
<b>DOOR PARTS</b>					
* 5-1	FDORFA403WRTZ	BF			Door panel
5-2	PSHEPA382WRE0	AH			Sealer film
* 5-3	GWAKPB432WRRZ	AT			Door frame R-350Y(S)
* 5-3	GWAKPB428WRRZ	AT			Door frame R-350Y(W)
5-4	HDECQA464WRFZ	AG			Door sash
* 5-5	LSTPPA188WRF0	AG			Latch head
5-6	MSPRTA187WRE0	AC			Spring
* 5-7	GCOVHA450WRFZ	AG			Choke cover
5-8	LSTPPA318WRFZ	AF			Glass stoper R
5-9	LSTPPA319WRFZ	AF			Glass stoper L
5-10	PGLSPA811WREZ	AX			Front door glass
5-11	XEPS740P08000	AB			Front door glass
<b>MISCELLANEOUS</b>					
6-6	TINSEB318WRRZ	AN			Instruction book

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