

# SHARP SERVICE MANUAL

S8313R20APVNS

## MICROWAVE OVEN



## MODELS R-20A1(S)VN R-21A1(S)VN

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 List

# 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 wave guide 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

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with any part of the high voltage circuit will result in electrocution. High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage fuse, High voltage harness.

### REMEMBER TO CHECK 3D

- 1) Disconnect the supply.
- 2) Door opened, and wedged open.
- 3) Discharge the high voltage capacitor.

#### WARNING: AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may, in some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the power transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed, carry out 3D checks and reconnect the leads to the primary of the power transformer.

### REMEMBER TO CHECK 4R

- 1) Reconnect all leads removed from components during testing.
- 2) Replace the outer case (cabinet).
- 3) Reconnect the supply.
- 4) Run the oven. Check all functions.

Microwave 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 oven turntable, close the door and set the power level to HIGH (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 3D checks 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.

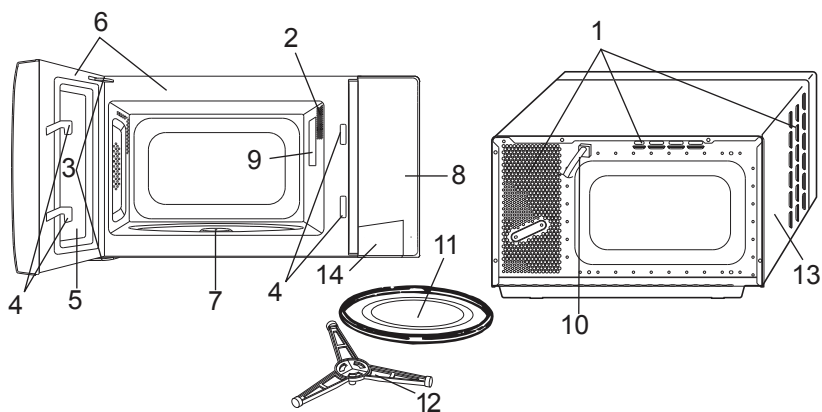
## CHAPTER 3. PRODUCT SPECIFICATIONS

TEM	DESCRIPTION
Power Requirements	220 Volts 50 Hertz Single phase, 3 wire earthed
Power Consumption	1.25 kW
Power Output	800 watts nominal of RF microwave energy (measured by method of IEC 60705) Operating frequency 2450 MHz
Outside Dimensions	Width 460 mm Height 275 mm including foot Depth 380 mm
Cooking Cavity Dimensions	Width 319 mm <b>NOTE: Internal capacity is calculated by measuring maximum width, depth and height.</b> Height 211 mm <b>Actual capacity for holding food is less.</b> Depth 336 mm
Turntable diameter	272 mm
Control Complement	Timer (0 - 30 minutes) Microwave Power for Variable Cooking Repetition Rate; HIGH ..... Full power throughout the cooking time MEDIUM HIGH ..... approx. 70% of FULL Power MEDIUM ..... approx. 50% of FULL Power MEDIUM LOW ..... approx. 30% of FULL Power LOW ..... approx. 10% of FULL Power
Set Weight (Approx.)	12 kg

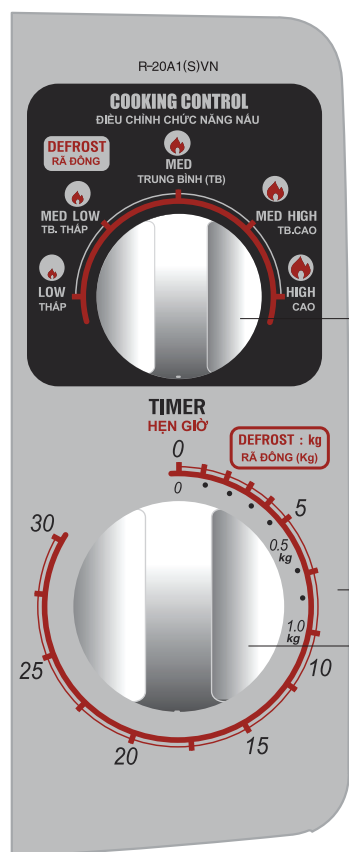
## CHAPTER 4. APPEARANCE VIEW

### [1] OVEN

1. Ventilation openings
2. Oven lamp
3. Door hinges
4. Door safety latches
5. See through door
6. Door seals sealing surfaces
7. Coupling
8. Control panel
9. Waveguide cover
10. Power supply cord
11. Turntable
12. Roller stay
13. Outer case cabinet
14. Door open button



### [2] TOUCH CONTROL PANEL



#### VARIABLE COOKING CONTROL

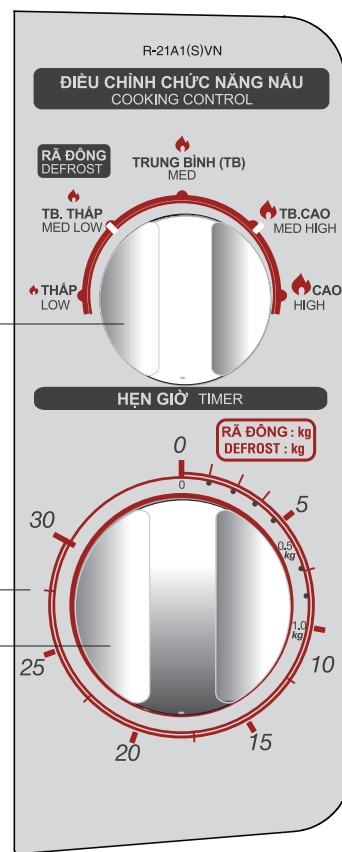
There are five power levels. The approximate percentage of microwave power for each setting is:

HIGH	100%
MED HIGH	70%
MED	50%
MED LOW (DEFROST)	30%
LOW	10%

#### MEAT DEFROST

#### TIMER (0-30minutes)

Turn to set cooking time or weight of defrost food.



## CHAPTER 5. OPERATION SEQUENCE

### [1] OFF CONDITION

1. When the timer knob is at "0", the oven is OFF condition.
2. Closing the oven door activates the monitored latch switch and the latch switch.

#### IMPORTANT

When the oven door is closed, the contacts (COM-NC) of the monitor switch must be open.

When the microwave oven is plugged in a wall outlet, rated voltage is supplied to the fuse holder assembly.

Figure O-1 on page 12-1

### [2] MICROWAVE COOKING CONDITION

#### 1. HIGH COOKING

Set the cooking control to HIGH and then set the timer.

##### Function sequence

Figure O-2 on page 12-1

1. Following components are energized.  
 High voltage rectifier    High voltage transformer  
 High voltage capacitor    High voltage fuse  
 Turntable motor    Timer motor    Fan motor
2. Rated voltage is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
3. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
4. 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.
5. When the cooking time is up, the timer returns to "0", the bell rings and the contacts of the timer switch are opened. The following components are turned off.  
 High voltage rectifier    High voltage transformer  
 High voltage capacitor    High voltage fuse  
 Turntable motor    Timer motor    Fan motor  
 Magnetron    Oven lamp
6. When the oven door is opened during a cook cycle, the switches come to the following position and they are common to the other cooking conditions too.

SWITCH	CONTACT	CONDITION	
		DURING COOKING	DOOR OPEN (NO COOKING)
Monitored latch switch	COM-NO	Closed	Open
Latch switch	COM-NO	Closed	Open
Monitor switch	COM-NC	Open	Closed

The circuits to the high voltage transformer, turntable motor, timer motor, fan motor, oven lamp are cut off when the contacts (COM-NO) of the monitored latch switch and latch switch are made open.

The timer stops to indicate how much cooking time remains.

#### 7. MONITOR SWITCH CIRCUIT

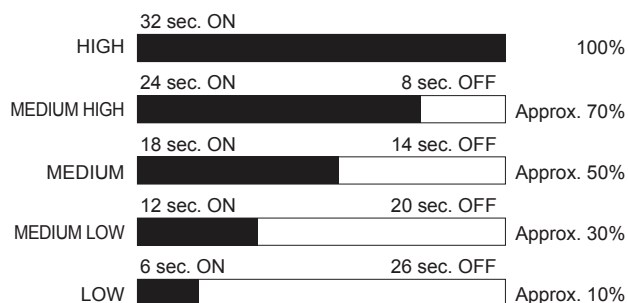
The monitor switch is mechanically controlled by oven door, and monitors the operation of the monitored latch switch and the relay RY1.

- 1) When the oven door is opened during or after the cycle of a cooking program, the monitored latch switch and latch switch must open their contacts (COM-NO) 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 first. And then the contacts (COM-NO) of the monitored latch switch and the latch switch are closed.
- 3) When the oven door is opened and the contacts (COM-NO) of the monitored latch switch and contacts of the timer switch and the contact of the relay RY1 remain closed, the fuse T6.3A will blow, because the monitor switch is closed and a short circuit is caused.

#### 2. MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, rated voltage is supplied to the high voltage transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay. The following levels of microwave power are given.

SETTING;



NOTE: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 3 seconds are needed for heating up the magnetron filament.

### [3] POWER OUTPUT REDUCTION

1. If the oven is set for more than 20 minutes at HIGH, after the first 20 minutes the power level will automatically adjust itself to 70% power to avoid overcooking.
2. If the oven is operated for more than 90 minutes continuously (at any power levels), the relay RY1 opens. And the circuit to the high voltage transformer will be cut off.

## 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.

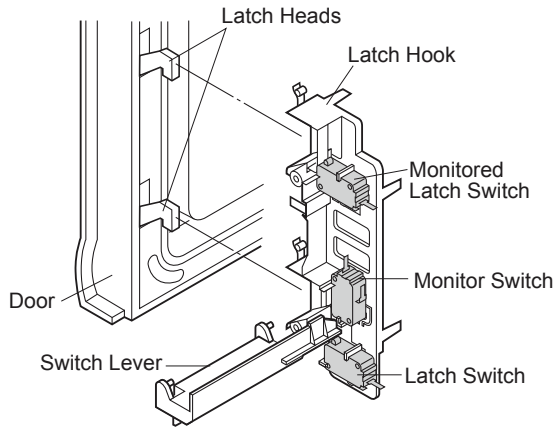


Figure D-1. Door Open Mechanism

### [2] MONITORED LATCH SWITCH AND LATCH SWITCH

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

### [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 monitored latch switch, the contacts of the relay RY1 and the timer switch fail to open, the fuse T6.3A blows immediately after closing the contacts (COM-NC) of the monitor switch.

CAUTION: BEFORE REPLACING A BLOWN FUSE TEST THE MONITORED LATCH SWITCH, RELAY RY1, TIMER SWITCH AND MONITOR SWITCH FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE".)

### [4] FUSE T6.3A

1. The fuse T6.3A blows when the contacts (COM-NO) of the monitored latch switch, the contacts of the relay RY1 and the timer switch remain closed with the oven door open and when the contacts (COM-NC) of the monitor switch are close.
2. If the wire harness or electrical components are short-circuited, the fuse T6.3A blows to prevent an electric shock or fire hazard.

### [5] HIGH VOLTAGE FUSE

The high voltage fuse blows when the high voltage rectifier or the magnetron is shorted.

### [6] TEMPERATURE FUSE 150C (OVEN)

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. The defective temperature fuse must be replaced with a new one.

### [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 vanes 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] TIMER MOTOR

#### Timer switch

1. When the timer switch is at "0" position, the switch of the timer is opened.
2. When the timer is turned clockwise from "0" position, the switch of the timer is closed.



# CHAPTER 7. TROUBLESHOOTING GUIDE

## [1] FOREWORD

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 T6.3A in the monitored latch switch - relay RY1 - timer switch - monitor switch circuit, check the monitored latch switch, relay RY1, timer switch and monitor switch before replacing the fuse T6.3A.

## [2] CHART

TEST PROCEDURE		A	B	C	CK	D	E	E	F	J	J	G	G	H	L	M	RE	CK	CK	RE	CK	CK	CK	CK	CK	I	
CONDITION	POSSIBLE CAUSE AND DEFECTIVE PARTS PROBLEM	MAGNETRON	HIGH VOLTAGE TRANSFORMER	H.V. RECTIFIER ASSEMBLY	HIGH VOLTAGE WIRE	HIGH VOLTAGE CAPACITOR	MONITORED. LATCH SWITCH	LATCH SWITCH	MONITOR SWITCH	TEMPERATURE FUSE	TIMER MOTOR	TIMER SWITCH	FAN MOTOR	TURNTABLE MOTOR	FUSE T6.3A	RELAY (RY-1)	FOIL PATTERN 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	H.V. FUSE
OFF CONDITION	Home fuse blows when powersupply cord is plugged into wall outlet.																	○	○					○			
	FUSE T6.3A blows when power supply cord is plugged into wall outlet.							○		○		○			○				○				○				
ON CONDITION	Oven does not start when the timer is set						○	○		○		○			○	○				○			○				
	Oven lamp does not light (Other function is normal.)																		○	○							
	Fan motor does not operate. (Other function is normal.)							○					○						○				○		○		
	Turntable motor does not operate. (Other function is normal.)													○						○							
	Oven or any electrical parts does not stop.										○	○				○											
	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power level is set at HIGH)	○	○	○	○	○										○				○						○	
	Oven does not seems to be operating properly when MED HIGH, MED, MED LOW or LOW is set. (Oven operates properly at HIGH.)															○											
	Oven goes into cook cycle but shuts down before end of cooking cycle.									○															○	○	

## CHAPTER 8. TEST PROCEDURES

### [1] Procedure 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(sec-ond), 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;

$$P \times t / 4.187 = V \times \Delta T / 0.55 \times mc (T_2 - T_0) / 4.187$$

$$P (W) = 4.187 \times V \times \Delta T / t + 0.55 \times mc (T_2 - T_0) / t$$

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 ..... 52 sec.

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

T2 ..... Final Temperature

$$\Delta T = T_2 - T_1$$

$$P = 80 \times \Delta T + 0.55 \times mc (T_2 - T_0) / 52$$

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) 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 (52 + 3) = 55 sec ..... T2 = 21°C

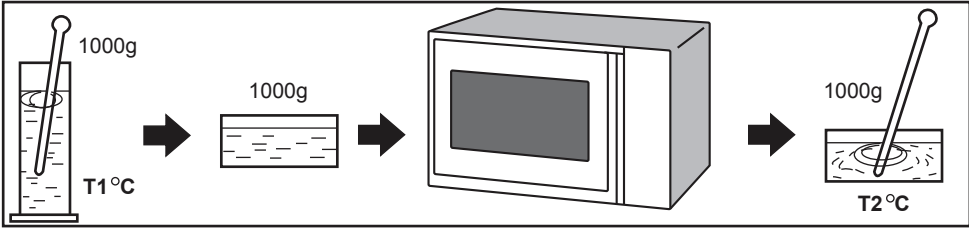
Temperature difference Cold-Warm ( $\Delta T = T_2 - T_1$ ) .....  $\Delta T = 10$  °C

Measured output power

The equation is " $P = 80 \times \Delta T$ " .....  $P = 80 \times 10$  °C = 800 Watts

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

CAUTION: 1°C CORRESPONDS TO 80 WATTS. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



[2] Procedure B: HIGH VOLTAGE TRANSFORMER TEST

**WARNING:** High voltages and large currents are present at the secondary winding and filament winding of the power transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.

- 1. CARRY OUT 3D CHECKS.
- 2. Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three winding. The following readings should be obtained:
  - a.Primary winding ----- 2.8 ohms approximately
  - b.Secondary winding ----- 204 ohms approximately
  - c.Filament winding ----- less than 1 ohm

If the readings obtained are not stated as above, then the high voltage transformer is probably faulty and should be replaced.

- 3. Also, the high voltage transformer has the thermal cut-out in the primary coil. The thermal cut-out will open when the temperature of the thermal cut-out in the primary coil reaches approximately 150 °C. The thermal cut-out resets automatically at 130 °C. If an ohmmeter indicates an open circuit under normal condition, replace the high voltage transformer because the primary coil (thermal cut-out) has opened. An open primary coil (thermal cut-out) indicates overheating of the high voltage transformer. Check for restricted air flow to the high voltage transformer, especially the ventilation opening.
- 4. CARRY OUT 4R CHECKS.

[3] Procedure C: HIGH VOLTAGE RECTIFIER TEST

CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 kΩ in the other direction.

CARRY OUT 4R CHECKS.

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTION.

[4] Procedure D: HIGH VOLTAGE CAPACITOR TEST

CARRY OUT 3D CHECKS.

- 1. Isolate the high voltage capacitor from the circuit.
- 2. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
- 3. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
- 4. A short-circuited capacitor shows continuity all the time.
- 5. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
- 6. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
- 7. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS.

[5] Procedure E: 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	
Released	Open circuit	Short circuit	COM; Common terminal
Depressed	Short circuit	Open circuit.	NO; Normally open terminal
			NC; Normally close terminal

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

CARRY OUT 4R CHECKS.

### [6] Procedure F: 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 resetable type.	Above 150 °C	Closed circuit

If incorrect readings are obtained, replace the temperature fuse.

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

CARRY OUT 4R CHECKS.

### [7] Procedure G: 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	Resistance
Fan motor	Approximately 250 $\Omega$
Turntable motor	Approximately 14.7 k $\Omega$

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

### [8] Procedure H: FUSE T6.3A

CARRY OUT 3D CHECKS.

If the fuse T6.3A is blown when the door is opened, check the monitored latch switch, relay (RY1), timer switch and monitor switch.

If the fuse T6.3A is blown by incorrect door switching replace the defective switch(es) and the fuse T6.3A.

If the fuse T6.3A is blown, there is a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS.

CAUTION: ONLY REPLACE FUSE T6.3A WITH THE CORRECT VALUE REPLACEMENT.

### [9] Procedure I: HIGH VOLTAGE FUSE TEST

CARRY OUT 3D CHECKS.

If the high voltage fuse is blown, there could be a short in the high voltage rectifier or the magnetron.

Check them and replace the defective parts and the high voltage fuse.

CARRY OUT 4R CHECKS.

CAUTION: ONLY REPLACE HIGH VOLTAGE FUSE WITH THE CORRECT VALUE REPLACEMENT.

### [10] Procedure J: TIMER MOTOR TEST

CARRY OUT 3D CHECKS before any of the following timer tests.

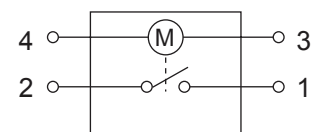
#### 1. TIMER SWITCH- CONTACTS

Disconnect the leads from terminals described at following table. Connect an ohmmeter across terminals described at following table.

Advance the timer and check that a short circuit reading is obtained on the meter.

Turn the timer back to the zero (0) position and check that an open circuit reading is obtained on the meter. If these readings

are not obtained then



Disconnecting and checking terminals	1 and 2
--------------------------------------	---------

## 2. TIMER - MOTOR

Disconnect the leads from terminals described at following table. Connect an ohmmeter across the timer motor winding, terminals are described at following table, and check that a reading of resistance described at following table is indicated.

If this reading is not obtained then the timer is probably defective and should be replaced.

Disconnecting and checking terminals	1 and 2
Resistance of motor winding	approximately 22.2 k ohms

CARRY OUT 4R CHECKS.

# CHAPTER 10. 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, High Voltage Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness etc..

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

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1) Disconnect the power supply cord.</li> <li>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.)</li> <li>3) Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).</li> </ol> | <ol style="list-style-type: none"> <li>3) The door gasket or seal is damaged.</li> <li>4) The door is bent or warped.</li> <li>5) There are defective parts in the door interlock system.</li> <li>6) There are defective parts in the microwave generating and transmission assembly.</li> <li>7) There is visible damage to the oven.</li> </ol> |
|--|--|

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

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

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1) Door does not close firmly.</li> <li>2) Door hinge, support or latch hook is damaged.</li> </ol> | <p>Do not operate the oven:</p> <ol style="list-style-type: none"> <li>1) Without the RF gasket (Magnetron).</li> <li>2) If the wave guide or oven cavity are not intact.</li> <li>3) If the door is not closed.</li> <li>4) If the outer case (cabinet) is not fitted.</li> </ol> |
|--|--|

### WARNING FOR WIRING

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

- |  |  |
|--|--|
| <ol style="list-style-type: none"> <li>1. Before wiring,             <ol style="list-style-type: none"> <li>1) Disconnect the power supply cord.</li> <li>2) Open the door and block it open.</li> <li>3) Discharge the high voltage capacitor and wait for 60 seconds.</li> </ol> </li> <li>2. Don't let the wire leads touch to the following parts;             <ol style="list-style-type: none"> <li>1) High voltage parts:<br/>Magnetron, High voltage transformer, High voltage capacitor, High voltage rectifier assembly.</li> <li>2) Hot parts:<br/>Oven lamp, Magnetron, High voltage transformer and Oven cavity.</li> </ol> </li> </ol> | <ol style="list-style-type: none"> <li>3) Sharp edge:<br/>Bottom plate, Oven cavity, Waveguide flange and other metallic plate.</li> <li>4) Movable parts (to prevent a fault)<br/>Fan blade, Fan motor, Turntable motor and Switch.</li> <li>3. Do not catch the wire leads in the outer case cabinet.</li> <li>4. Insert the positive lock connector certainly until its pin is locked and make sure that the wire leads do not come off even if the wire leads are pulled.</li> <li>5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.</li> </ol> |
|--|--|

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

### 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 REMOVAL

To remove the outer case, procedure as follows.

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Disconnect the oven from power supply.</li> <li>2. Open the oven door and wedge it open.</li> <li>3. Remove the two (2) screws from right side of the outer case cabinet.</li> <li>4. Remove the five (5) screws from rear and along the side edge of case.</li> <li>5. Slide the entire case back about 3cm to free it from retaining clips on the cavity face plate.</li> </ol> | <ol style="list-style-type: none"> <li>6. Lift the entire case from the oven.</li> <li>7. Discharge the H.V. capacitor before carrying out any further work.</li> <li>8. Do not operate the oven with the outer case removed.</li> </ol> <p>NOTE: Step 1, 2 and 7 form the basis of the <u>3D</u> checks.</p> <p>CAUTION: DISCONNECT OVEN FROM POWER SUPPLY BEFORE REMOVING OUTER CASE.</p> |
|---|---|

### [3] HIGH VOLTAGE TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads (main wire harness and H.V. fuse) from high voltage transformer.
3. Disconnect the filament lead of high voltage transformer from the magnetron.
4. Disconnect the filament lead of the high voltage transformer from high voltage capacitor.
5. Remove the two (2) screws holding the transformer to bottom plate from below.
6. Remove the two (2) screws holding the transformer to bottom plate from above.
7. Remove the transformer.

### [4] HIGH VOLTAGE RECTIFIER ASSEMBLY, HIGH VOLTAGE FUSE AND HIGH VOLTAGE CAPACITOR REMOVAL

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS.
2. Disconnect the H.V. fuse from the high voltage transformer.
3. Disconnect the H.V. wire of the H.V. rectifier assembly from the magnetron.
4. Disconnect the filament lead of the high voltage transformer from the H.V. capacitor.
5. Remove one (1) screw holding capacitor holder to the oven cavity back plate.
6. Remove one (1) screw holding earth side terminal of high voltage rectifier assembly, and remove capacitor holder.
7. Disconnect all the leads and terminals of high voltage rectifier assembly from high voltage capacitor.
8. Disconnect the H.V. fuse from the high voltage capacitor.
9. Now H.V. rectifier assembly, H.V. fuse and H.V. capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER WITH AN EARTHING SCREW.

CAUTION: DO NOT REPLACE ONLY HIGH VOLTAGE RECTIFIER. WHEN REPLACING IT, REPLACE HIGH VOLTAGE RECTIFIER ASSEMBLY.

### [5] MAGNETRON REMOVAL

#### 1. REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from the magnetron.
3. Remove the two (2) screws holding the air duct to the oven cavity.
4. Release the air duct from the oven cavity.
5. Carefully remove the four (4) screws holding the magnetron to the waveguide flange.
6. Lift up magnetron with care so that the magnetron antenna is not hit by any metal object around antenna.
7. Now, the magnetron is free.

#### 2. REINSTALLATION

1. Reinstall the magnetron to the waveguide flange with the four (4) screws.
2. Reinstall the air duct to the oven cavity with the two (2) screws.
3. Reconnect the wire leads to the magnetron. Refer to "PICTORIAL DIAGRAM".
4. Reinstall the outer case and check that the oven is operating properly.

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

### [6] 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.

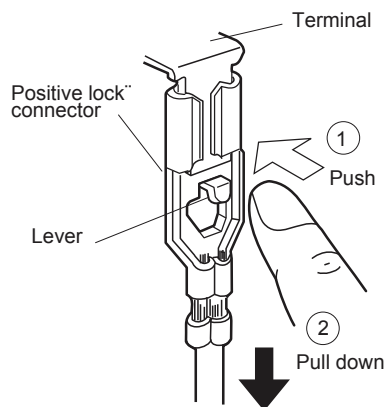


Figure C-1. Positive lock ® connector

## [7] TURNTABLE MOTOR REMOVAL

### 1. REMOVAL

1. Disconnect the power supply cord.
2. Remove turntable and turntable support from oven cavity.
3. Lay the oven on it's 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. Remove the TTM packing from the turntable motor.
8. Now, the turntable motor is free.

### 2. REINSTALL

1. Re-install the TTM packing to the turntable motor.

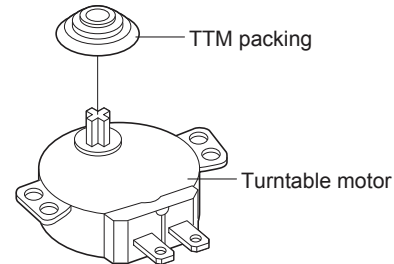


Figure C-2. TTM packing Installation

## [8] COOLING FAN MOTOR REMOVAL

### 1. REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from the fan motor.
3. Remove the two (2) screws holding the fan motor to the oven cavity back plate.
4. Remove the fan blade from the fan motor shaft according to the following procedure.
5. Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION: MAKE SURE THAT ANY PIECES DO NOT ENTER THE GAP BETWEEN THE ROTOR AND THE STATOR OF THE FAN MOTOR. BECAUSE THE ROTOR IS EASY TO BE 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.

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

CAUTION: DO NOT RE-USE THE REMOVED FAN BLADE BECAUSE THE HOLE (FOR SHAFT) MAY BE LARGER THAN NORMAL.

8. Now, the fan motor is free.

### 2. INSTALLATION

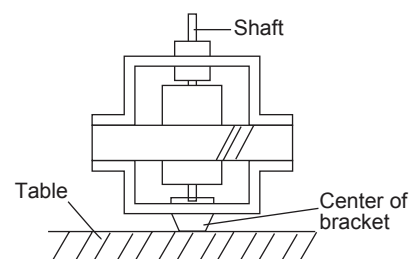
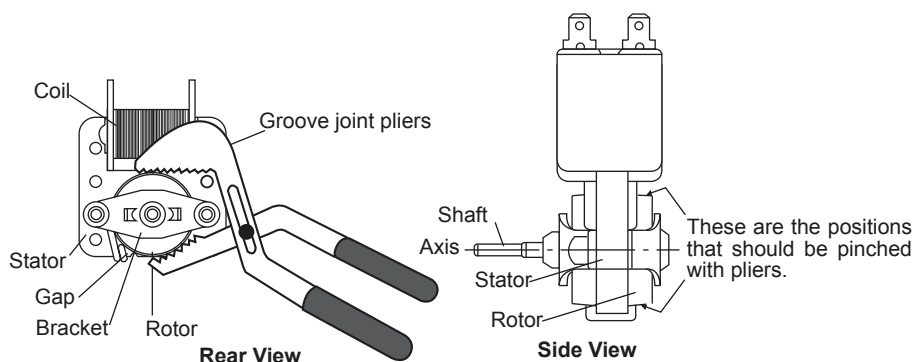
1. Install the fan blade to the fan motor shaft according to the following procedure.
2. Hold the center of the bracket which supports the shaft of the fan motor on the flat table.
3. Apply the screw lock tight into the hole (for shaft) of the fan blade.
4. Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

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 INSTALLED.

MAKE SURE THAT THE AXIS OF THE SHAFT IS NOT SLANTED.

5. Install the fan motor assembly to the oven cavity back plate with two (2) screws.
6. Connect the wire leads to the magnetron and fan motor, referring to the pictorial diagram.





## [9] 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 fuse holder assembly, 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.

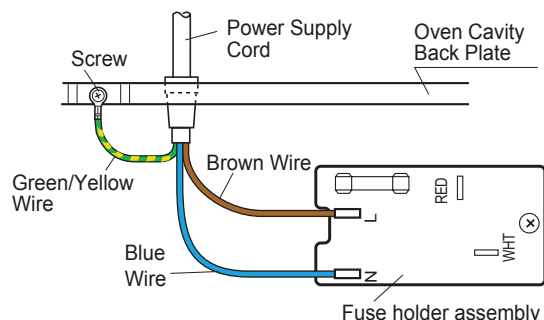


Figure C-3(a) Power Supply Cord Replacement

### 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 fuse holder assembly correctly, referring to the Pictorial Diagram.

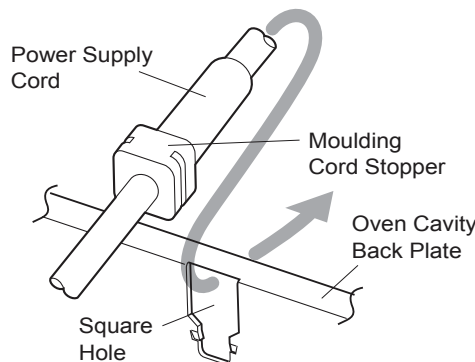


Figure C-3(b) Power Supply Cord Replacement

## [10] CONTROL PANEL ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the control panel to the front panel of the oven cavity.

3. Lift up the control panel assembly and release it from the oven cavity.
4. Now, the control panel assembly is free.

## [11] MONITORED LATCH SWITCH, LATCH 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 the switch lever from the oven cavity.
5. Remove latch hook assembly from oven flange.
6. Push outward on the two (2) retaining tabs holding switch in place.
7. Switch is now free.

### 2. REINSTALL

1. Re-install each switch in its place. The latch/monitor switches are in the lower position and the monitored latch switch is in the upper position.
2. Re-connect wire leads to each switch. Refer to pictorial diagram.
3. Secure latch hook (with two (2) mounting screws) to oven flange.
4. Install the switch lever to the oven cavity.
5. 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] MONITORED LATCH SWITCH, LATCH SWITCH AND MONITOR SWITCH ADJUSTMENT

### 1. Adjustment

1. CARRY OUT 3D CHECKS.

If the monitored latch switch, latch switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.

2. Loosen the two (2) screws holding latch hook to the oven cavity front flange.

3. 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 monitored latch switch and latch 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.
4. Secure the screws with washers firmly.
5. Check the operation of all switches. If each switch has not activated with the door closed, loosen screw and adjust the latch hook position.

## 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 monitored latch switch, latch switch interrupt the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

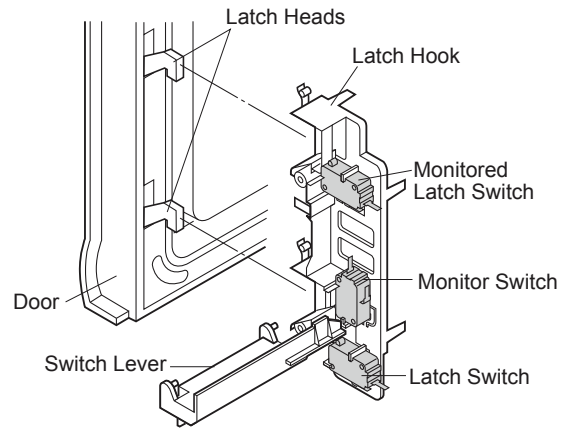


Figure C-5. Latch Switch Adjustments

## [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 corner portion of door panel as shown in Figure C-5 to free engaging parts.
4. Pry the choke cover by inserting a putty knife in order shown in 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.

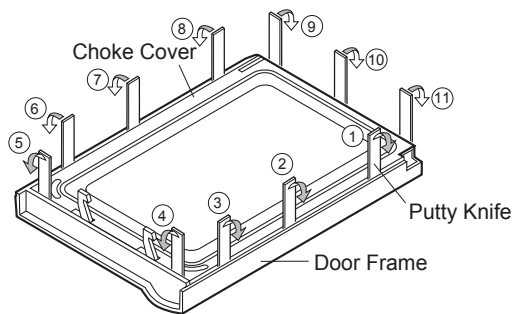


Figure C-5. Door Disassembly

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 is free from oven cavity.
9. Release door panel from ten (10) tabs of door frame and remove door frame by sliding the door panel downward.
10. Now, door panel with sealer film is free.
11. Tear sealer film from door panel.
12. Now, door panel is free.
13. Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head.
14. Now, latch head and latch spring are free.
15. Remove door screen from door frame.
16. Now, door screen is free.

### 2. REINSTALLATION

1. Re-install door screen to door frame.
2. Re-install latch spring to the head. Re-install latch spring to the door frame. Re-install latch head to the door frame.
3. Put sealer film on door panel. Refer to "Sealer Film" and figure C-7, on how to handle the new film.
4. Put sealer film on door panel. Refer to "Sealer Film" and figure C-7, on how to handle the new film.
5. Catch two (2) pins of door panel on two (2) hole of upper and lower oven hinges.
6. Re-install choke cover to door panel by pushing.

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

- 1) Make sure that monitored latch switch, latch 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 micro-wave 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.

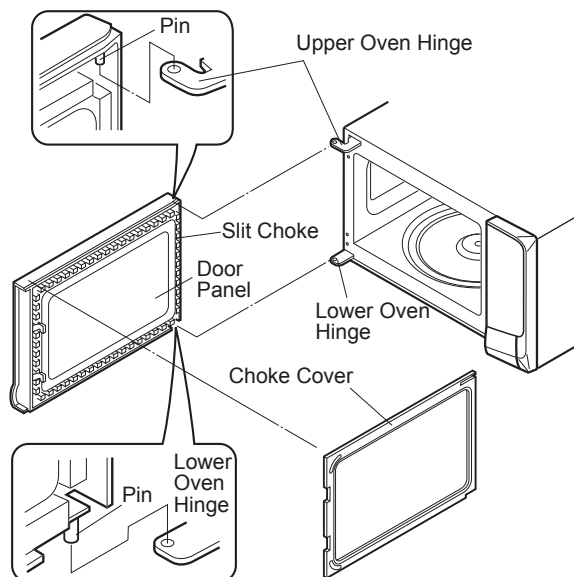


Figure C-6. Door Replacement

#### 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

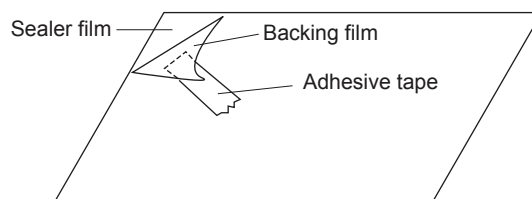


Figure C-7. Sealer film

## CHAPTER 11. 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:

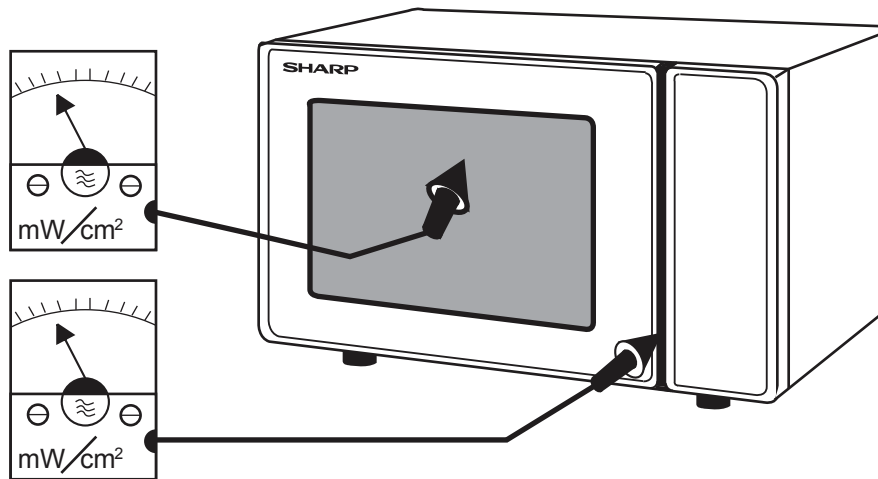
NARDA 8100

NARDA 8200

HOLADAY HI 1500

SIMPSON 380M

2. Place the oven tray into the oven cavity.
3. Place the load of  $275 \pm 15\text{ml}$  of water initially at  $20 \pm 5^\circ\text{C}$  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  $2.5\text{cm}/\text{sec.}$ ) 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

Microwave leakage measurement at 5 cm distance

# CHAPTER 12. CIRCUIT DIAGRAMS

## [1] Oven Schematic

### SCHEMATIC

NOTE: CONDITION OF OVEN  
1. DOOR CLOSED.

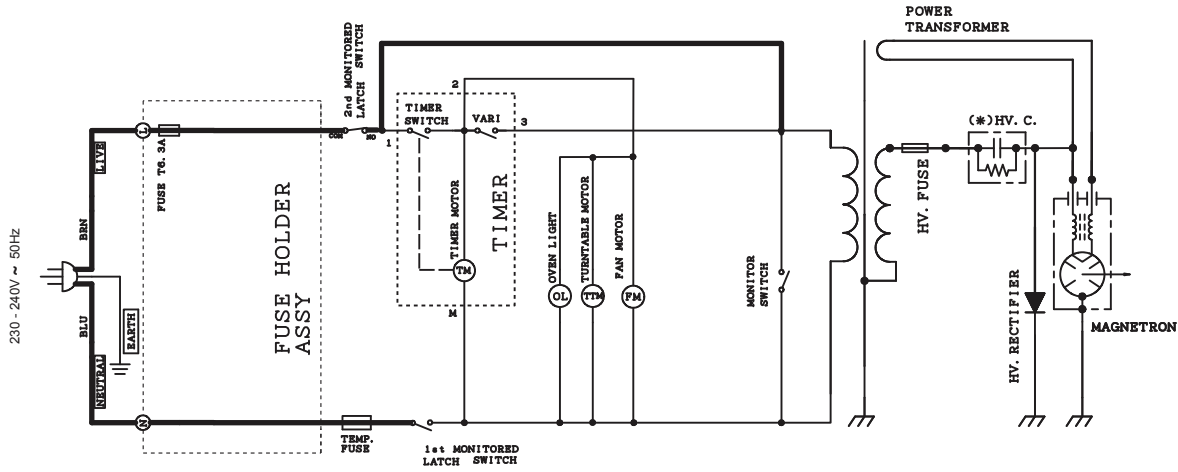


Figure O-1 Oven Schematic-OFF Condition

### SCHEMATIC

NOTE: CONDITION OF OVEN  
1. DOOR CLOSED.  
2. COOKING TIME PROGRAMMED.

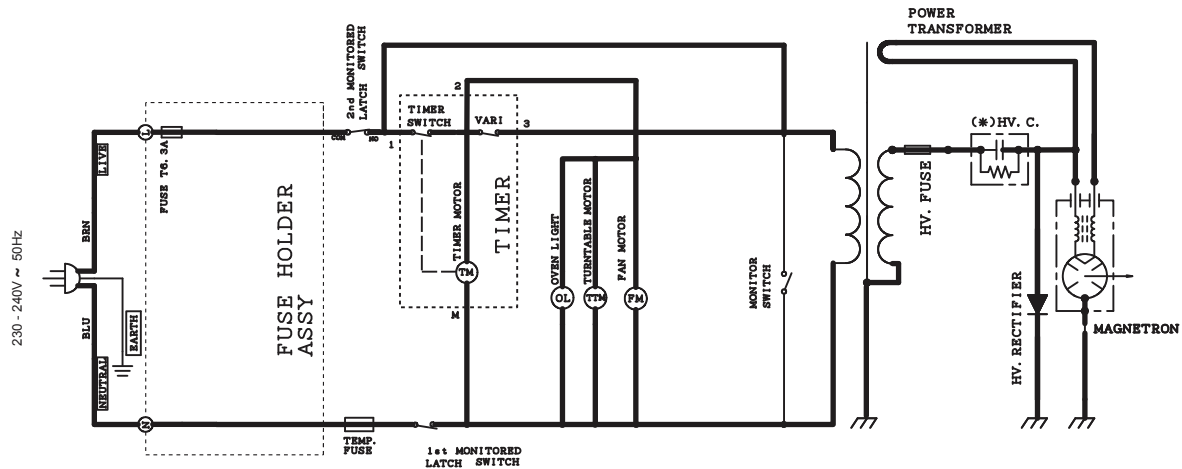


Figure O-2 Oven Schematic-ON Condition

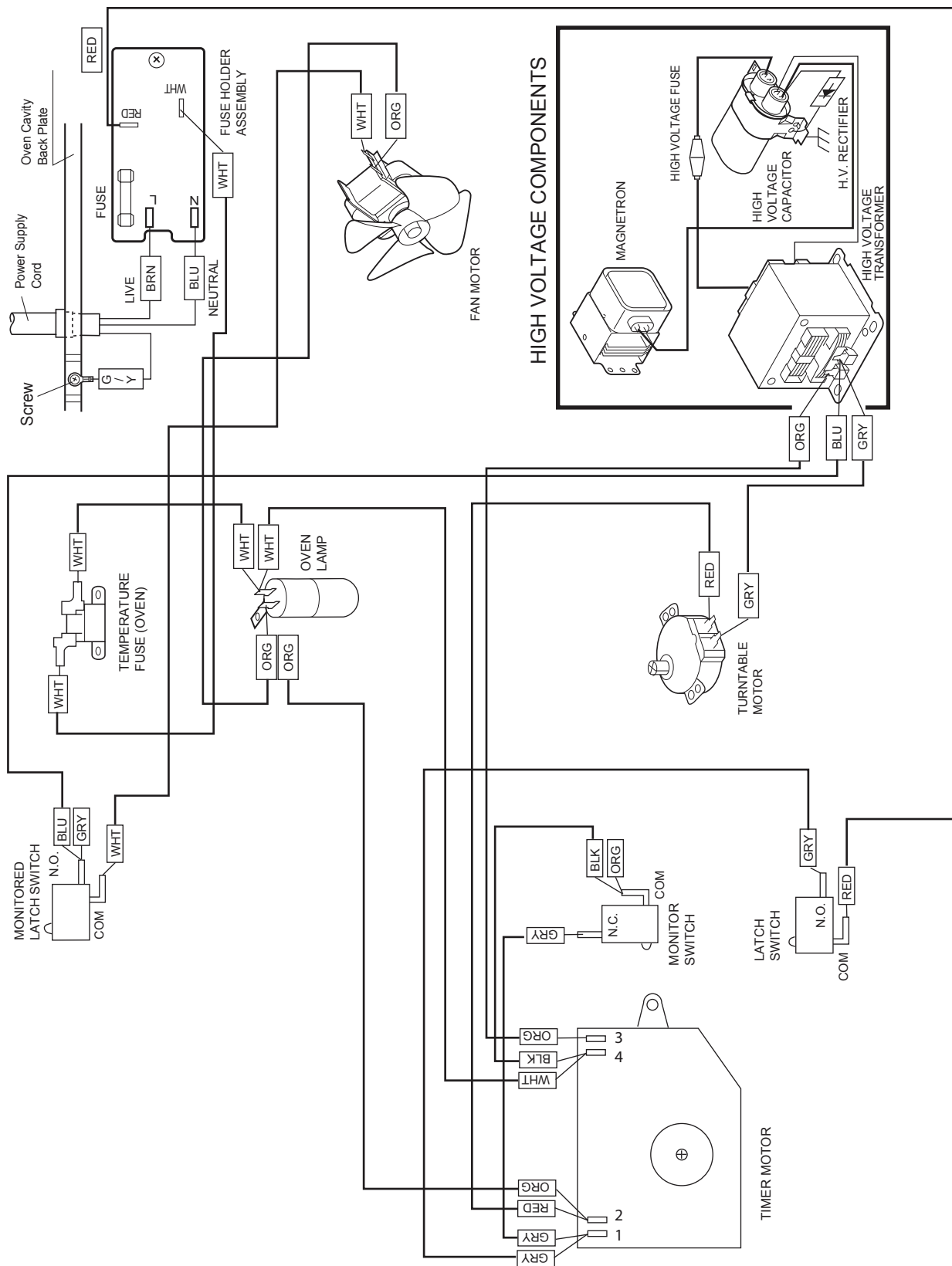
**[2] Pictorial Diagram (Figure S-1)**

Figure S-1. Pictorial Diagram

# 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-20A1(S)VN R-21A1(S)VN

Parts marked "\*" may cause undue microwave exposure.

Parts marked "⚠" are used in voltage more than 250V.

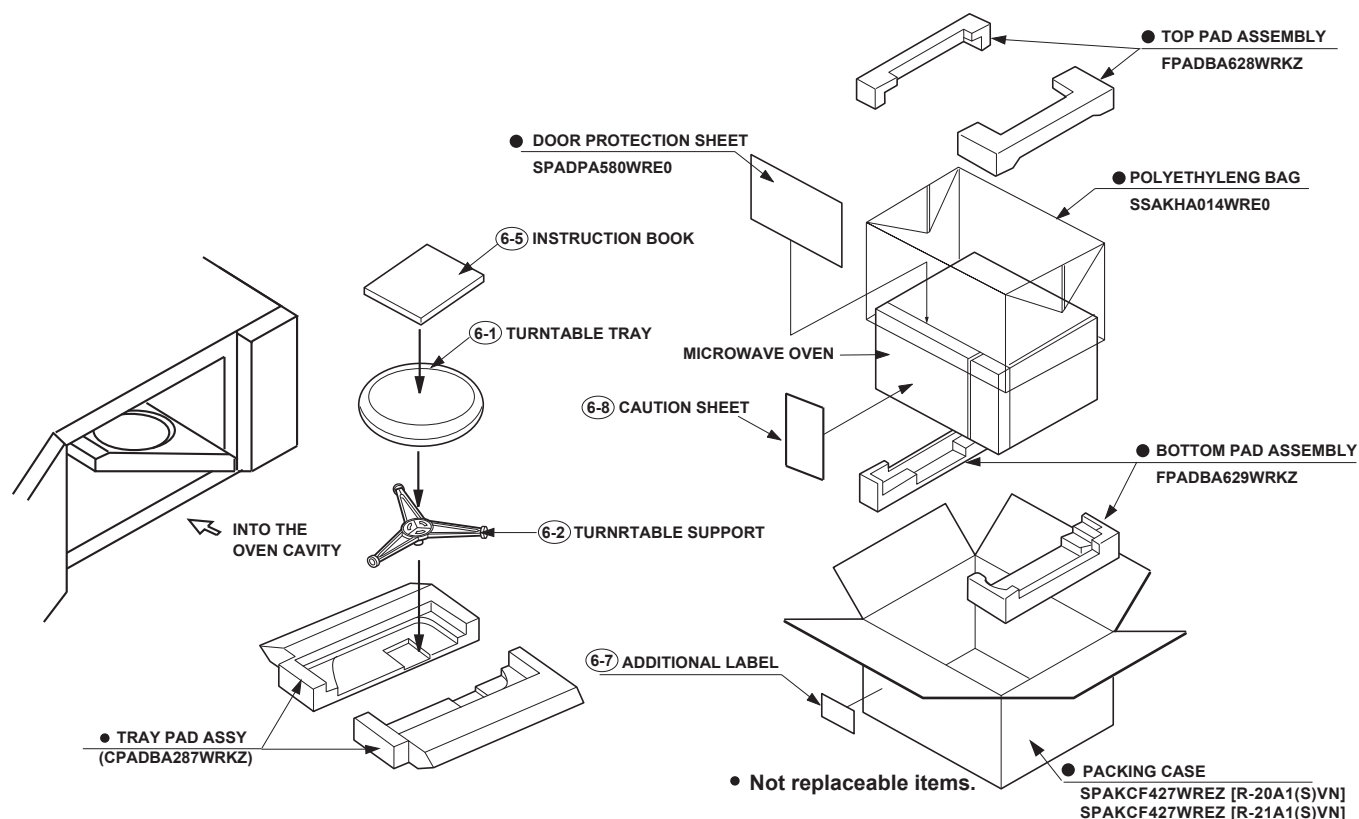
### CONTENTS

[1] OVEN PARTS

PANEL PARTS

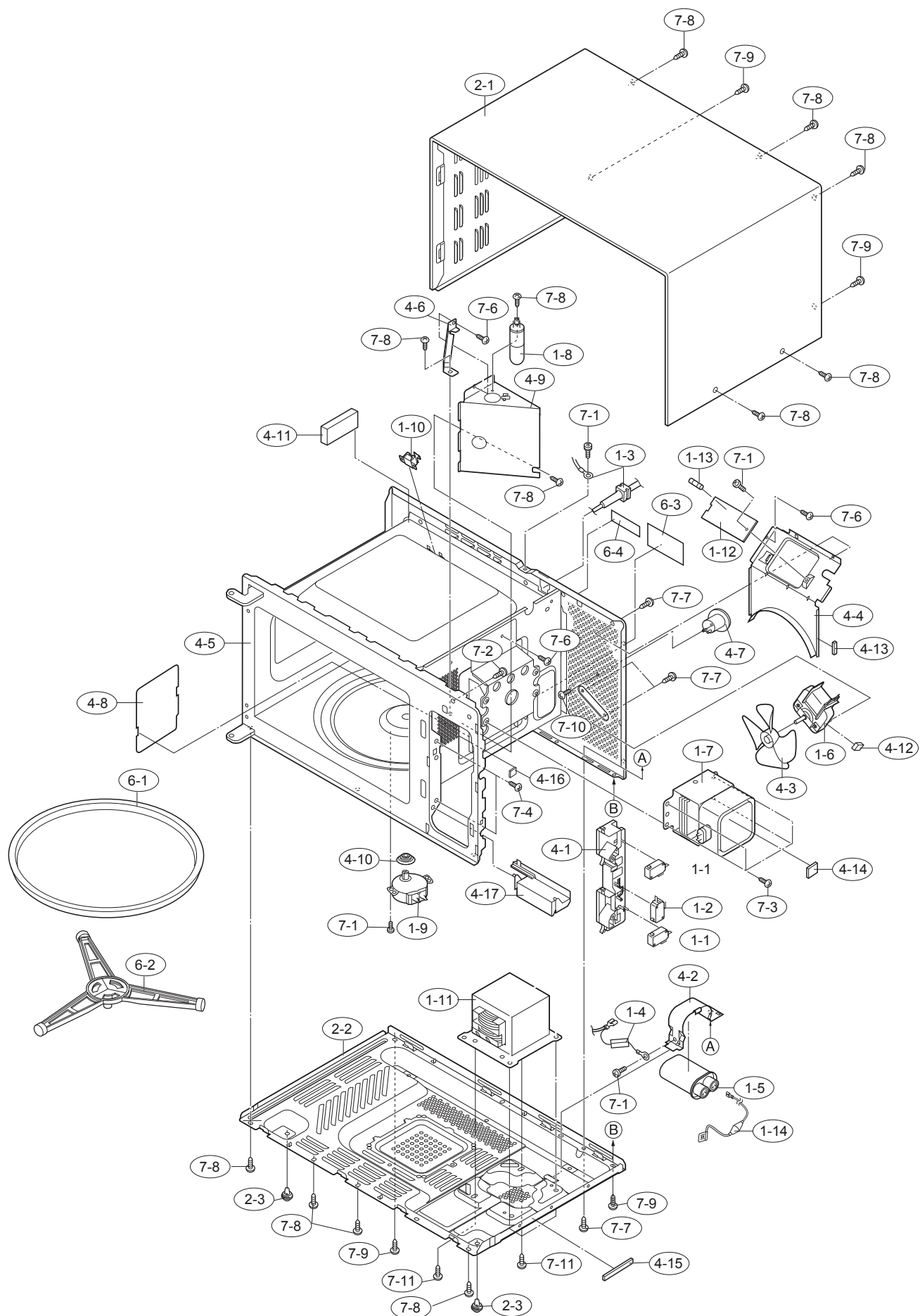
[2] DOOR AND CONTROL

■ INDEX



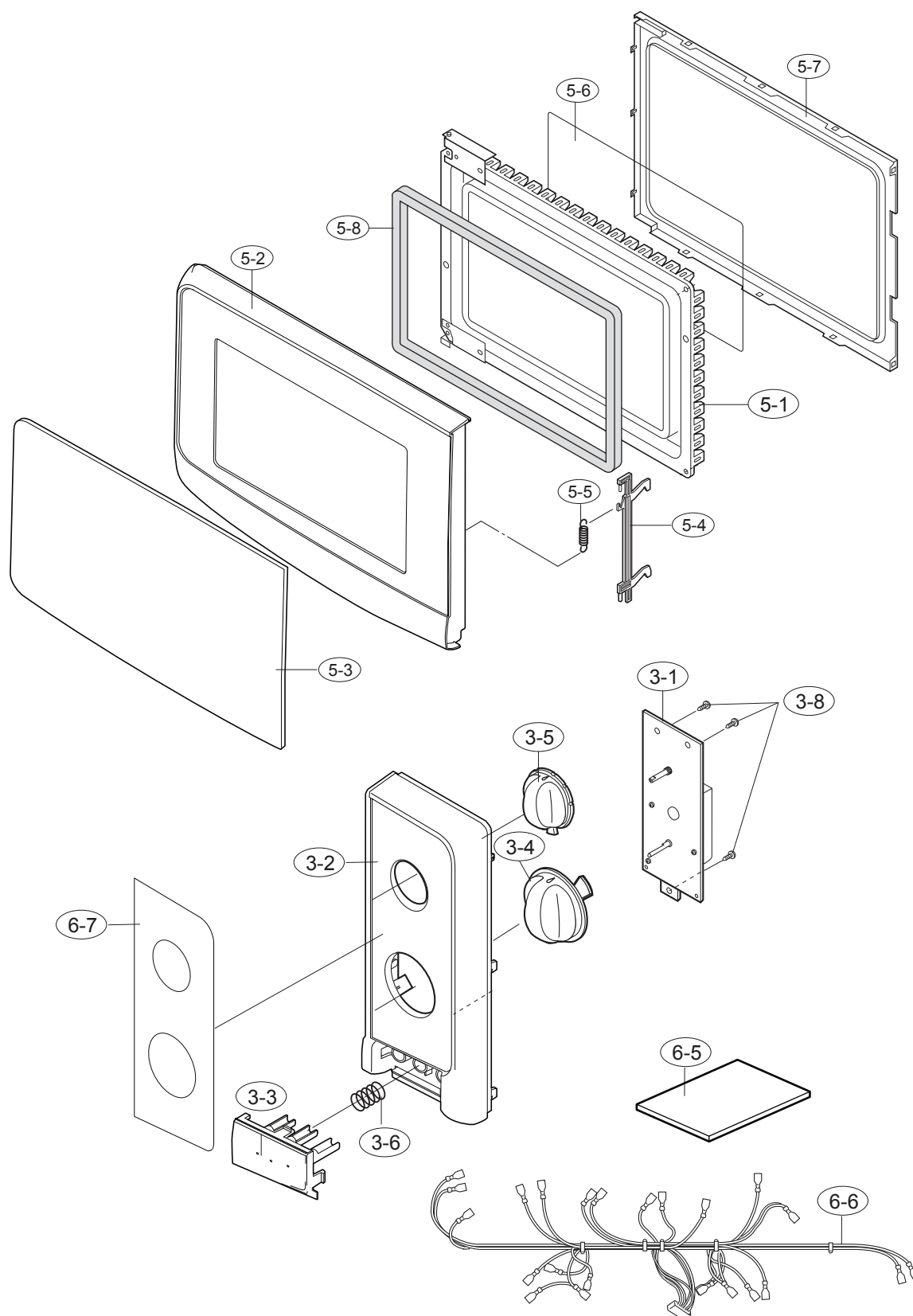
**SHARP CORPORATION**

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The contents are subject to change without notice.

**[1] OVEN PARTS**



NO.	PARTS CODE	DESCRIPTION	PRICE RANK
<b>[1] OVEN PART</b>			
<b>ELECTRIC PARTS</b>			
1-1	QSW-MA085WRE0	Latch / Monitored latch switches	AF
1-1	QSW-MA137WRE0	Latch / Monitored latch switches (Interchangable)	AH
1-1	QSW-MA147WRZZ	Latch / Monitored latch switches (Interchangable)	AG
1-1	QSW-MA168WRZZ	Latch / Monitored latch switches (Interchangable)	AK
1-2	QSW-MA086WRE0	Monitor switch	AF
1-2	QSW-MA138WRE0	Monitor switch (Interchangable)	AH
1-2	QSW-MA148WRZZ	Monitor switch (Interchangable)	AF
1-2	QSW-MA169WRZZ	Monitor switch (Interchangable)	AF
1-3	QACC-A172WRZZ	Power supply cord	AS
1-4	FH-DZA163WRKZ	High voltage rectifier assy	AR
1-5	RC-QZA334WRZZ	High voltage capacitor	AS
1-5	RC-QZA210WRE0	High voltage capacitor (Interchangable)	AX
1-5	RC-QZA211WRE0	High voltage capacitor (Interchangable)	AV
1-5	RC-QZA251WRE1	High voltage capacitor (Interchangable)	AR
1-5	RC-QZA251WRE2	High voltage capacitor (Interchangable)	AR
1-5	RC-QZA331WRZZ	High voltage capacitor (Interchangable)	AS
1-5	RC-QZA342WRZZ	High voltage capacitor (Interchangable)	AS
1-6	RMOTEA405WRZZ	Fan motor	AX
1-6	RMOTEA450WRZZ	Fan motor (Interchangable)	AV
1-6	RMOTEA460WRZZ	Fan motor (Interchangable)	AX
1-6	RMOTEA463WRZZ	Fan motor (Interchangable)	AX
1-6	RMOTEA475WRZZ	Fan motor (Interchangable)	AX
1-7	RV-MZA351WRZZ	Magnetron	BM
1-7	RV-MZA341WRZZ	Magnetron (Interchangable)	BG
1-8	RLMPTA101WRZZ	Oven lamp	AM
1-8	RLMPTA083WRZZ	Oven lamp (Interchangable)	AM
1-8	RLMPTA088WRZZ	Oven lamp (Interchangable)	AN
1-9	RMOTDA253WRZZ	Turntable motor	AN
1-9	RMOTDA173WRE0	Turntable motor (Interchangable)	AR
1-9	RMOTDA289WRZZ	Turntable motor (Interchangable)	AN
1-9	RMOTDA299WRZZ	Turntable motor (Interchangable)	AN
1-10	QFS-TA014WRE0	Temperature fuse 150C (Oven)	AG
1-11	RTRN-A806WRZZ	High voltage transformer	BF
1-11	RTRN-A759WRZZ	High voltage transformer (Interchangable)	BH
1-11	RTRN-A817WRZZ	High voltage transformer (Interchangable)	BF
1-12	FPWBFA422WRKZ	Fuse holder assembly	AU
1-13	QFS-CA027WRZZ	Fuse T6.3A	AG
1-14	QFS-IA016WRZZ	High voltage fuse 0.6A	AN
1-14	QFS-IA004WRE0	High voltage fuse 0.6A (Interchangable)	AK
<b>CABINET PARTS</b>			
2-1	GCABUA966WRPZ	Outer case cabinet [R-20A1(S)VN]	BE
2-1	GCABUB220WRPZ	Outer case cabinet	BC
2-2	GDAI-A459WRWZ	Bottom plate	AF
2-3	GLEGPA104WREZ	Foot	AF
<b>OVENPARTS</b>			
4-1	PHOK-A176WRFZ	Latch hook	AF
4-2	LBNDKA168WRPZ2	Capacitor holder	AF
4-3	NFANJA053WRFZ	Fan blade	AG
4-4	PDUC-A908WRWZ2	Fan duct	AG
4-5	FOVN-A634WRTZ	Oven cavity	BC
4-6	LANGFA267WRPZ2	Chassis support	AF
4-7	PSPAJA007WRFZ	Spacer	AF
4-8	PCOVPA419WREZ	Waveguide cover	AG
4-9	PDUC-A909WRPZ	Air duct	AN
4-10	PPACGA084WRF0	TTM packing	AE
4-11	PCUSUA501WRP0	Cushion	AB
4-12	PPACGA276WREZ	Cushion C	AG
4-13	PCUSGA615WRPZ	Cushion	AE
4-14	PCUSGA661WREZ	Cushion	AD
4-15	PCUSUA278WRP0	Cushion	AB
4-16	PCUSUA647WRPZ	Cushion	AC
4-17	MLEVPA241WRFZ	Switch lever	AG
<b>MISCELLANEOUS</b>			
6-1	NTNT-A034WRF0	Turntable	AM
6-2	FROLPA113WRKZ	Turntable support	AS
6-3	TCAUAA406WRRZ	CR Mark	AD
6-4	TCAUAA419WRRZ	Caution label	AC
<b>SCREWS, NUTS AND WASHERS</b>			
7-1	XHPS740P08K00	Screw : 4mm x 8mm	AB
7-2	XETS740P10000	Screw : 4mm x 10mm	AA
7-3	XHPS740P08000	Screw : 4mm x 8mm	AB
7-4	LX-CZ0052WRE0	Special screw	AA
7-6	LX-CZA073WRE0	Special screw	AC
7-7	XHTS740P08RV0	Screw : 4mm x 8mm	AG
7-8	XOTS740P08000	Screw : 4mm x 8mm	AA
7-9	XOTS740P12RV0	Screw : 4mm x 12mm	AD
7-10	XOTS740P12000	Screw : 4mm x 12mm	AA
7-11	LX-BZA217WREZ	Screw : 4mm x 8mm	AD

**[2] DOOR AND CONTROL PANEL PARTS**

Actual wire harness may be different than illustration.

NO.	PARTS CODE	DESCRIPTION	PRICE RANK
<b>[2] DOOR AND CONTROL PANEL PARTS</b>			
<b>CONTROL PANEL PARTS</b>			
3-1	QSWTEA134WRZZ	Timer	AV
3-2	HPNLCC294WRTZ	Control panel	AR
3-3	JBTN-B256WRTZ	Open button	AH
3-4	JKNBKA859WRTZ	Timer knob	AK
3-5	JKNBKA861WRTZ	Vari knob	AK
3-6	MSPRCA050WRE0	Button spring	AB
3-7	TLABMB468WRRZ	Panel sheet [R-20A1(S)VN]	AF
3-7	TLABMB467WRRZ	Panel sheet [R-21A1(S)VN]	AF
3-8	XEPS730P08XS0	Screw; 3mm x 10mm	AB
<b>DOOR PARTS</b>			
* 5-1	FDORFA397WRTZ	Door panel assembly	BB
* 5-2	GWAKPB231WRTZ	Door frame	AX
5-3	HPNL-A821WRRZ	Door screen	AR
* 5-4	LSTPPA205WRFZ	Latch head	AF
5-5	MSPRTA187WRE0	Spring	AC
5-6	PSHEPA782WREZ	Sealer film	AG
* 5-7	GCOVHA424WRFZ	Choke cover	AK
5-8	PCUSUA622WRPZ	Cushion	AG
<b>MISCELLANEOUS</b>			
6-5	TINSZA285WRRZ	Instruction book	AE
6-6	FW-VZC307WREZ	Main wire harness	AR
6-7	TCAUAA425WRRZ	Additional label [R-20A1(S)VN]	AD
6-7	TCAUAA422WRRZ	Additional label [R-21A1(S)VN]	AD
6-8	TINSJA378WRRZ	Caution Sheet	AC

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