

# MICROWAVE OVEN **SERVICE MANUAL**

**MODEL : MV-1155W**

## **CAUTION**

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

# **CAUTION**

## **WARNING TO SERVICE TECHNICIANS**

### **PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY**

- a. Do not operate or allow the oven to be operated with the door open.**
- b. Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary; (1) Interlock operation, (2) proper door closing, (3) seal and sealing surfaces (arcing, wear, and other damage), (4) damage to or loosening of hinges and latches, (5) evidence of dropping or abuse.**
- c. Before turning on microwave for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.**
- d. Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.**
- e. A Microwave leakage check to verify compliance with the Federal performance Standard should be performed on each oven prior to release to the owner.**
- Proper operation of the microwave ovens requires that the magnetron be assembled to the wave guide and cavity. Never operate the magnetron unless it is properly installed.
- Be sure that the magnetron gasket is properly installed around the dome of the tube whenever installing the magnetron.
- Routine service safety procedures should be exercised at all times.
- Untrained personnel should not attempt service without a thorough review of the test procedures and safety information contained in this manual.

# FOREWORD

Read this Manual carefully. Failure to adhere to or observe the information in this Manual may result in exposing yourself to the Microwave Energy normally contained within the oven cavity.

## MECHANICAL SERVICE INFORMATION

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## 1. ADJUSTMENT PROCEDURES

To avoid possible exposure to microwave energy leakage, adjust the door latches and interlock switches, using the following procedure.

### ONLY AUTHORIZED SERVICE PERSONNEL SHOULD MAKE THIS ADJUSTMENT.

The Interlock Monitor and Secondary Interlock Switch act as the final safety switch protecting the user from microwave energy. The terminals between "COM" and "NC" of the Interlock Monitor switch must close when the door is opened. After adjusting the Interlock Monitor Switch make sure that it is correctly connected. See Figures 1-a and 1-b throughout this procedure.

### CHECK THE DOOR LATCH AND SWITCH CLOSINGS.

**NOTE:** The outer cover of the microwave oven is removed.

- (1) Set the microwave oven on its side so that you can see the latch board and the switches, as shown in Figure 1-a.
- (2) Close the door tightly and check gaps A and B to be sure they are no more than 1/64" (5 mm). See Figure 1-b for close-up view of gaps A and B (door latches).

If all gaps are less than 1/64" (5 mm), adjustment of the latch board may not be necessary. Go to Steps 5 and 6 to check the sequence of the switches.

**NOTE:** To correct sequence of the Primary Interlock Switch, Secondary Interlock Switch and the Interlock Monitor Switch is very important.

If any gap is larger than 1/64" (5 mm), you will need to adjust the latch board-U, L. Go to step 3 and follow all steps in order.

### ADJUST THE LATCH AND SWITCH CLOSING

- (3) Loosen the two screws holding the plastic latch board as shown.
- (4) With the oven door closed tightly, move the latch board upward toward the top of the oven and/or away from the door latch until the gaps are less than 1/64" (5 mm).  
Hold the latch board tightly in this position until you check the sequence of the switches in steps 5 and 6.

### TEST THE LATCH AND SWITCH SEQUENCE

- (5) Open the oven door slowly. Watch the door latch, the Secondary Switch. Release Rod and Lever on the switches to make sure they are zero to the body of the switches in the following sequence:

- Primary Interlock Switch
- Secondary Interlock Switch
- Interlock Monitor Switch

Adjust the latch board until the switches operate in this sequence. See Steps 3 and 4.

- (6) Close the oven door slowly and be sure it is tightly closed. Watch the three switches to make sure they are zero to the body of the switches in the following sequence:

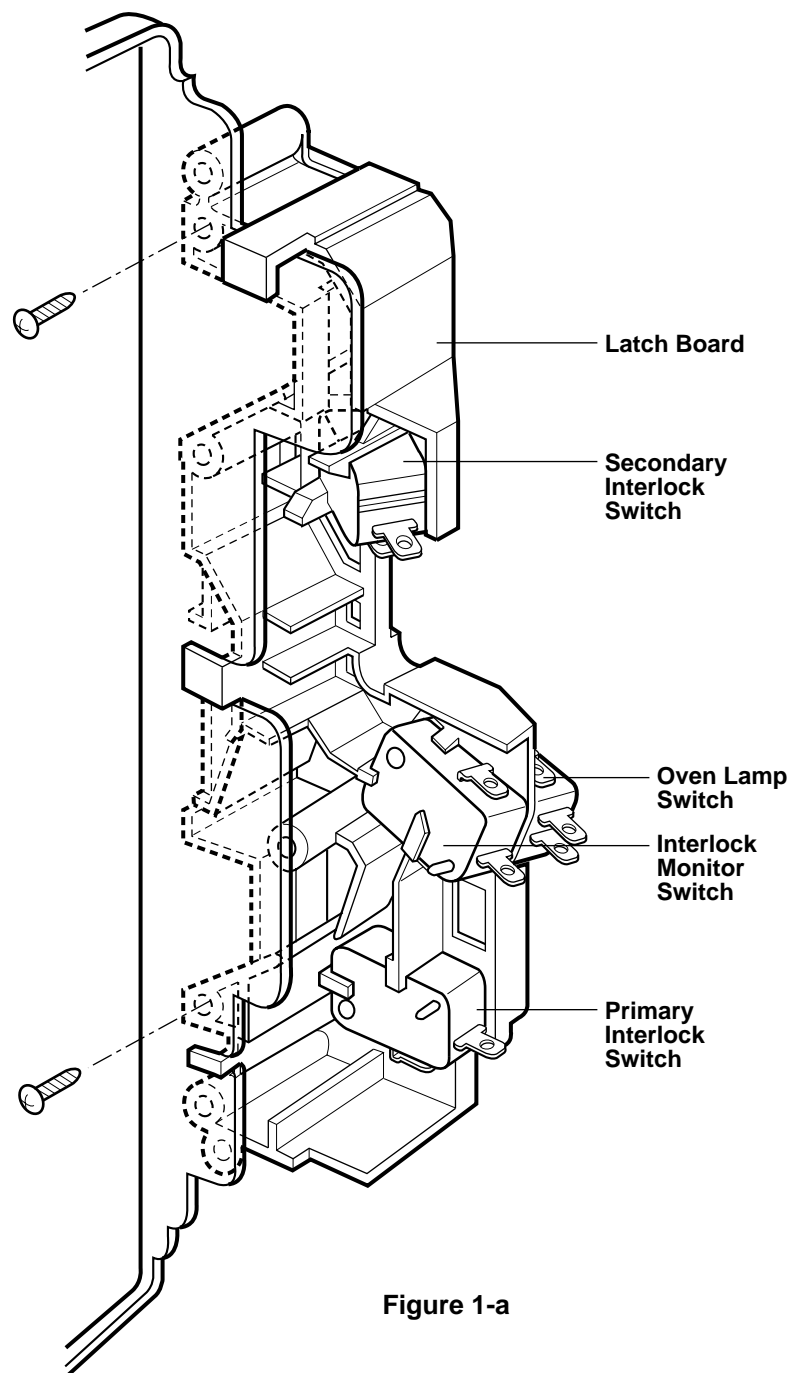
- Interlock Monitor Switch
- Primary Interlock Switch
- Secondary Interlock Switch

**NOTE:** The Interlock Monitor Switch is an added safety check on the Primary and Secondary Interlock Switches. If the Primary and Secondary Interlock Switches allow the oven to operate with the door open, the Monitor Switch will blow the fuse.

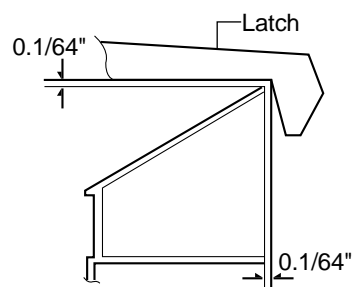
- (7) When you achieve the proper sequence of switches in Steps 5 and 6, tighten the latch board screws at that point.

### TEST THE MICROWAVE ENERGY LEAKAGE

- (8) Using a survey meter, make sure the microwave energy is below 4 mW/cm<sup>2</sup>.



**Figure 1-a**



## 2. PRECAUTIONS ON INSTALLATION (Figure 2)

- A. Plug the power supply cord into a 120V AC, 60Hz, single-phase power source with a capacity of at least 15 amperes.
- B. Avoid placing the unit in a location where there is direct heat or splashing water.
- C. Install the unit on the mounting plate firmly.
- D. Place the unit as far away as possible from TV, radio, etc. to prevent interference.

### CAUTION

This unit is equipped with a 3-prong plug for your safety. If the wall outlet is a grounded 3-hole type, the unit will be grounded automatically

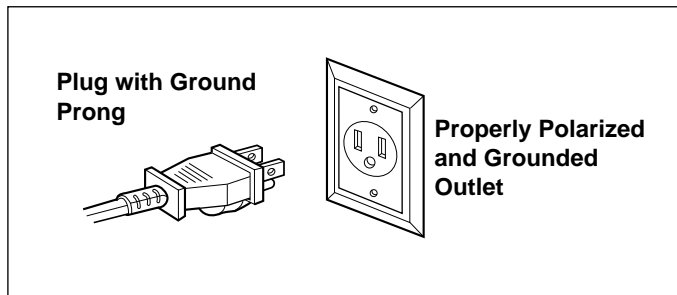


Figure 2

## 3. GENERAL PRECAUTIONS IN USE

- A. Never operate the unit when it is empty. Operating the oven with no load may shorten the life of the magnetron. Whenever cooking dry foods (dried fish, bread, etc.) or a small amount of food, be sure to put a glass of water into the cooking compartment. The ceramic plate may become hot after operating, be careful when touching it.
- B. Aluminum foil should be avoided because it will disrupt cooking and may cause arcing. However, small pieces may be used to cover some part of food to slow the cooking. Any aluminum foil used should never be closer than 2.5cm to any side wall of the oven.
- C. Be sure to insert the temperature probe into the food and the other end into the socket in the cooking cavity for the temperature controlled cooking.

## 4. TRIAL OPERATION

After installation, the following sequences and results should be checked carefully.

- A. Put a container filled with water (about 1 liter) into the oven, and close the door tightly.
- B. Touch the STOP/CLEAR and the TIME keys.
- C. Set cooking time for 10 minutes by touching "1" and then "0" three times. "1, 0, 0, 0" appears in the display window.
- D. Touch the START key.  
Make sure the cavity light comes on. The unit will begin cooking and the display window will show the time counting down by seconds.
- E. After about 5 minutes, make sure the primary interlock switch, the secondary interlock switch and the interlock monitor and oven lamp switch operate properly by opening and closing the door several times.  
Touch the START key each time the door is closed.
- F. Continue operating the unit. Two short and a long beep sound signal is heard when the time is up.  
The unit will shut off automatically.
- G. Confirm the water is hot.
- H. Finally, measure the output power according to "POWER OUTPUT MEASUREMENT" on page 12.

## 5. FEATURES AND SPECIFICATIONS

### FEATURES

- A. The safety systems incorporated in this model are:
  - (1) Primary interlock switch
  - (2) Secondary interlock switch
  - (3) Interlock monitor switch
  - (4) Choke system
  - (5) Magnetron thermostat
  - (6) Oven cavity thermostat

(Note: This thermostat located on the oven cavity will open and stop the unit from operation only if a high temperature is reached, such as, a fire created by overcooking food.)
- B. Any one of 10 power output levels ranging 85W to 850W can be selected by the touch control and electronic computer system.
- C. The temperature probe enables accurate control of cooking temperature and results.
- D. Cooking time, power output level and operating temperature can be displayed on the digital readout.
- E. Three different cooking stages can be set. The oven remembers three cooking stages and changes from one cooking stage to another. This is made possible with the memory function of the microprocessor. This cooking process can be set after Auto Defrost is set.

## SPECIFICATIONS

Rated Power Consumption .....	1300W maximum (Microwave oven only) 1500W maximum (Microwave oven+Cook top lamps+Ventilation fan) 1500W (Convection)
Microwave Output .....	850W (IEC 705 TEST PROCEDURE) Adjustable 85W through 850W, 10 steps 1350W (Convection)
Frequency .....	2,450 MHz $\pm$ 50 MHz
Power supply .....	120V $\pm$ 12V AC, 60Hz
Rated Current .....	12 Amp. (Microwave oven only) 13 Amp. (Microwave oven+Cook top lamps+Ventilation fan)
Magnetron Cooling .....	Forced Air Cooling
Microwave Stirring .....	Stirrer Fan Disk
Rectification .....	Rectification Voltage Doubler Half-Wave
Door Sealing .....	Choke System
Safety Devices .....	Magnetron Thermostat: Open at 150°C $\pm$ 6°C Close at 60°C $\pm$ 15°C Oven Thermostat: Open at 150°C $\pm$ 6°C Close at below 0°C Fuse(15A) Primary Interlock Switch Secondary Interlock Switch Interlock Monitor
Magnetron .....	2M214-19F
High Voltage Capacitor .....	Capacitor: 0.91 $\mu$ Fd, 2.1KV Ac
High Voltage Diode .....	Diode; 350mA, 9.0KV
Cook top Lamp .....	125V, 30W
Cavity Lamp .....	125V, 30W
Timer .....	Digital, up to 99 min. 99 sec. (in each cooking stage)
Tray .....	Ceramic Plate
Overall Dimensions .....	29 <sup>7</sup> / <sub>8</sub> "(W)x14"(D)x16 <sup>3</sup> / <sub>16</sub> "(H)
Oven Cavity Size .....	18 <sup>3</sup> / <sub>16</sub> "(W)x12 <sup>5</sup> / <sub>8</sub> "(D)x8 <sup>5</sup> / <sub>32</sub> "(H)
Effective Capacity of Oven Cavity .....	1.1 Cu.ft.
Accessories .....	Use and Care Manual, Installation Manual, Metal Rack, Exhaust Adapter, Exhaust Damper, Mounting Kit and Two filters.

## SWITCH CHART

SWITCH MODE	PRIMARY INTERLOCK SWITCH	SECONDARY INTERLOCK SWITCH	INTERLOCK MONITOR SWITCH
CONDITIONS	COM	COM	COM
	NO	NO	NC
DOOR OPEN			.
DOOR CLOSED	.	.	

**NOTE:** Use the above switch chart with circuit diagram on page 7.

## **6. OVERALL CIRCUIT DIAGRAM**

### **A. SCHEMATIC DIAGRAM**



B. MATRIX CIRCUIT FOR TOUCH KEY BOARD

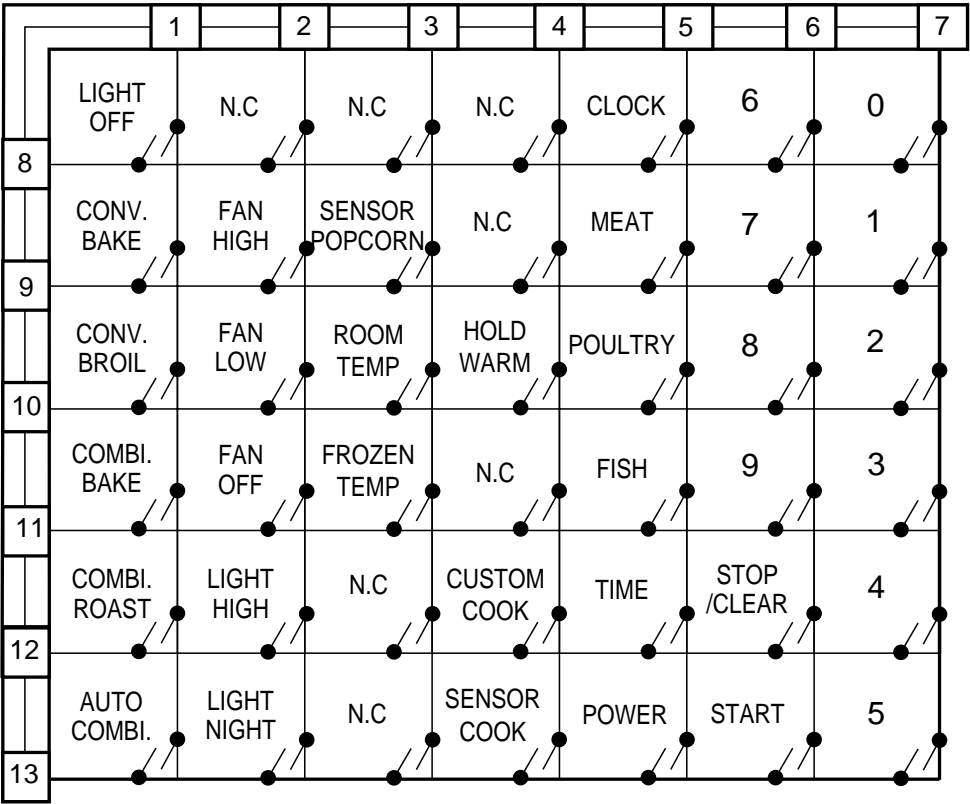


Figure 3

B. MATRIX CIRCUIT FOR TOUCH KEY BOARD

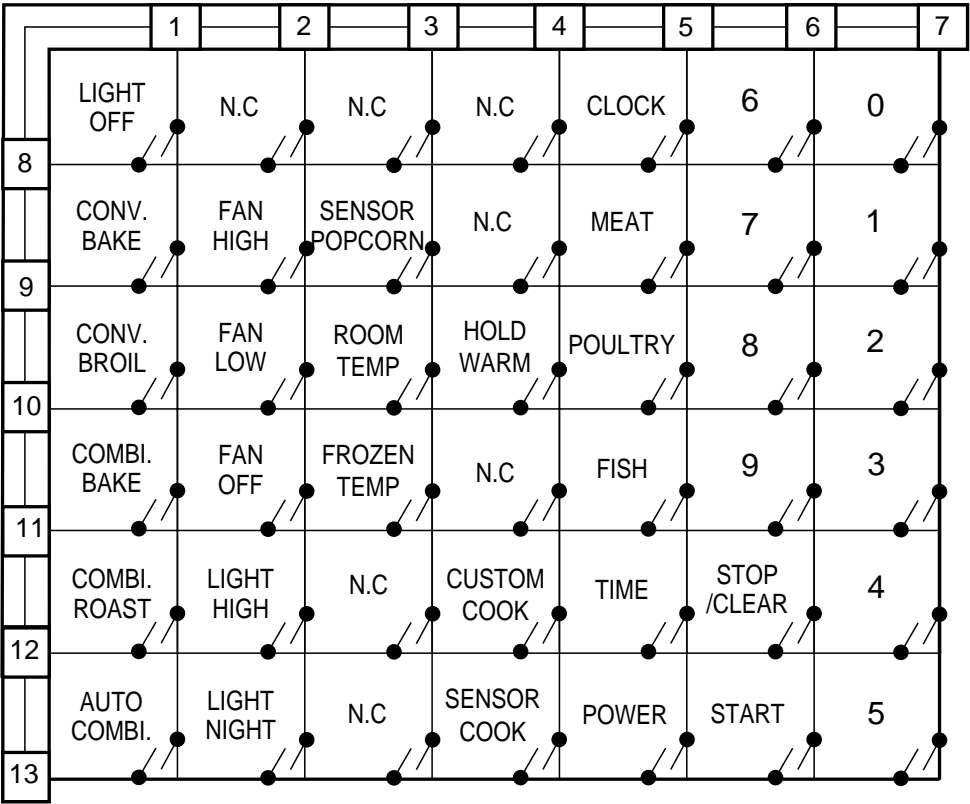


Figure 3

7. OPERATING PROCEDURES

A. OVEN CONTROL PANEL

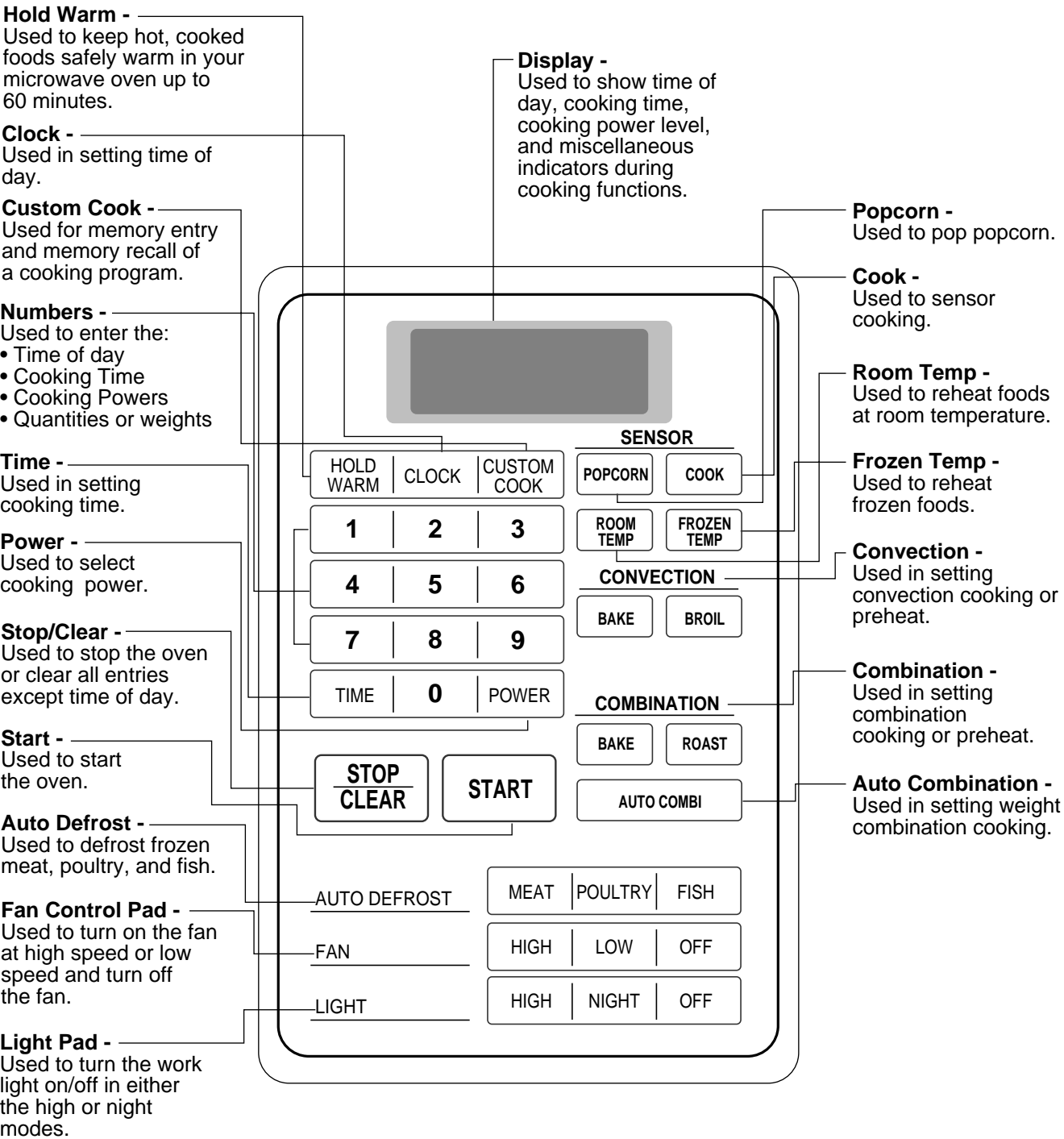


Figure 4

## B. PANEL INSTRUCTIONS (Figure 4)

The entire operation is done by simple touch control pads.

### (1) Display Window

Numbers and letters explained in Figure 4 are shown in the display window (Vacuum Fluorescent Tube).

(a) The Time of Day in five-digits (12-hour indication):

(b) Cooking Time in five digits.

(c) Power Control Level in two digits.

(d) Food Temperature (Doneness Temperature) in five digits.

(e) Each Indicator Light shows which function is set and involved in the course of cooking by turning itself on. Indicator Lights automatically go out upon completion of cooking.

### (2) TIME Key

The TIME key is used to set the microwave cooking time. Touch the TIME key and then number keys that correspond to the desired cooking time. The remaining time is continuously displayed during cooking.

### (3) POWER Key

Used to select cooking power level.

### (4) CLOCK Key

Used in setting Time of Day.

### (5) STOP/CLEAR Key

Used to stop the oven or clear all entries except Time of Day.

### (6) START Key

Touch the START key after setting the desired cooking time etc. Also touch the START key to resume cooking after the cooking is temporarily stopped by opening the door. The key will not function unless the door is closed.

### (7) SENSOR Key

Used to sensor cooking.

### (8) CONVECTION Key

Used in setting convection cooking or preheat.

### (9) COMBINATION Key

Used in setting combination cooking or preheat.

### (10) AUTO COMBINATION Key

Used in setting weight combination cooking.

### (11) AUTO DEFROST Key

Used to defrost for frozen foods by weight.

## 8. PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE

### A. CAUTIONS

- (1) Be sure to check a microwave emission prior to servicing the oven if the oven is operative prior to servicing.
- (2) The service personnel should inform the manufacturer, importer or assembler of any certified oven unit found to have a microwave emission level in excess of  $4 \text{ mW/cm}^2$  and should repair any unit found to have excessive emission levels at no cost to the owner and should ascertain the cause of the excessive leakage. The service personnel should instruct the owner not to use the unit until the oven has been brought into compliance.
- (3) If the oven operates with the door open, the service personnel should;
  - Tell the user not to operate the oven.
  - Contact the manufacturer and CDRH (Center for Devices and Radiological Health) immediately.**NOTE:** Address on CDRH  
Office of Compliance (HFZ-312)  
Center for Devices and Radiological Health  
1390 Piccard Drive  
Rockville, Maryland 20850
- (4) The service personnel should check all surface and vent openings for microwave emission testing.
- (5) Check for microwave energy leakage after every servicing. The power density of the microwave radiation leakage emitted by the microwave oven should not exceed  $4 \text{ mW/cm}^2$ . And always start measuring of an unknown field to assure safety for operating personnel from radiation leakage.  
**NOTE:** The standard is  $5 \text{ mW/cm}^2$ . while in the customer's home.  $4 \text{ mW/cm}^2$ . stated here is manufactruer's own voluntary standard for units in customer's home.

### EQUIPMENT

- Electromagnetic energy leakage monitor (NARDA 8100B, HOLADAY HI-1501).
- 600cc glass beaker.
- Glass thermometer  $100^\circ\text{C}$ .

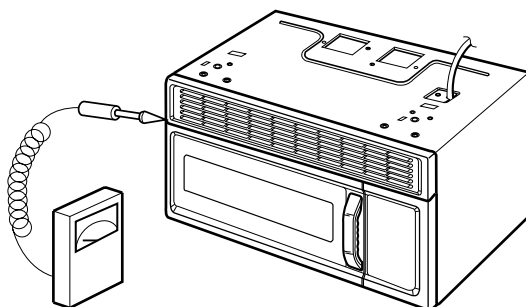


Figure 5

### B. MEASURING MICROWAVE ENERGY LEAKAGE

- (1) Pour  $275 \pm 15\text{cc}$  of  $20 \pm 5^\circ\text{C}$  water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
- (2) Set the energy leakage monitor to 2,450MHz and use it following the manufacturer's recommended test procedure to assure correct result.
- (3) When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.
- (4) Operate the oven at its maximum output.
- (5) Measure the microwave radiation using and electromagnetic radiation monitor by holding the probe perpendicular to the surface being measured.

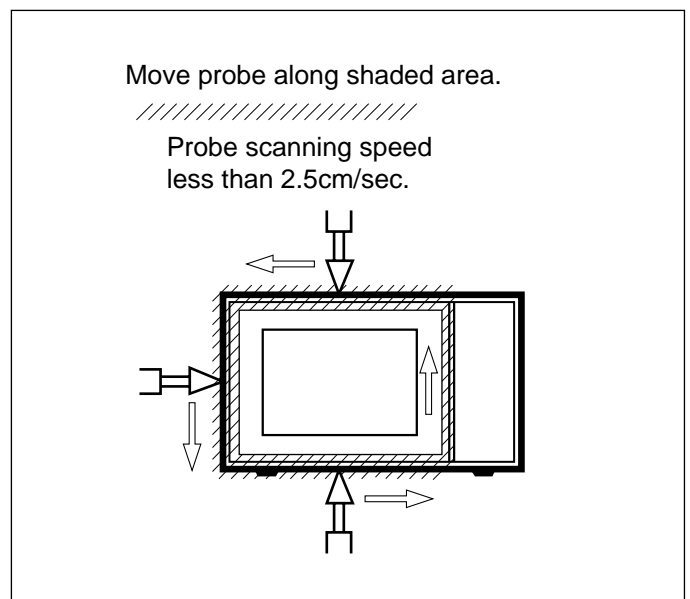


Figure 6

### C. MEASUREMENT WITH THE OUTER CASE REMOVED

- (1) When you replace the magnetron, measure for microwave energy leakage before the outer case is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring the following parts.
  - Around the magnetron
  - The waveguide

**WARNING:** AVOID CONTACTING ANY HIGH VOLTAGE PARTS.

#### D. MEASUREMENT WITH A FULLY ASSEMBLED OVEN

- (1) After all components, including the outer panels, are fully assembled, measure for microwave energy leakage around the door viewing window, the exhaust opening and air inlet openings.
- (2) Microwave energy leakage must not exceed the values prescribed below.

##### NOTES:

Leakage with the outer panels removed-less than 5mW/cm<sup>2</sup>.

Leakage for a fully assembled oven ("Before the latch switch (primary) is interrupted") with the door in a slightly opened position-less than 2mW/cm<sup>2</sup>.

#### E. NOTE WHEN MEASURING

- (1) Do not exceed meter full scale deflection.
- (2) The test probe must be removed no faster than 1 inch/sec (2.5 cm/sec) along the shaded area, otherwise a false reading may result.
- (3) The test probe must be held with the grip portion of the handle. A false reading may result if the operator's hand is between the handle and the probe.
- (4) When testing near a corner of the door, keep the probe perpendicular to the surface making sure the probe horizontally along the oven surface, this may possibly cause probe damage.

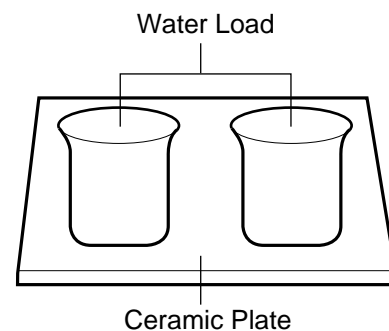
#### F. RECORD KEEPING AND NOTIFICATION AFTER MEASUREMENT

- (1) After adjustment and repair of any microwave energy interruption or microwave energy blocking device, record the measured values for future reference. Also enter the information on the service invoice.
- (2) Should the microwave energy leakage not be more than 2 mW/cm<sup>2</sup> after determining that all parts are in good condition, functioning properly and genuine replacement parts which are listed in this manual have been used.
- (3) At least once a year, have the electromagnetic energy leakage monitor checked for calibration by its manufacturer.

#### G. POWER OUTPUT MEASUREMENT

- (1) 1. Fill two test bowls with each 59°F (15°C)-75°F(24°C) 1 liter water respectively.  
2. Use accurate thermometer (°F or °C) and measure each water temperature respectively.
- (2) Place the two bowls on ceramic plate.
- (3) 1. Set cooking time to 2 minutes. ("2 00" appears in display)  
2. Touch START key and operate oven for exactly 2 minutes.
- (4) 1. Take out the two bowls at once.  
2. Stir both water with thermometer and measure the water temperature rise respectively.
- (5) 1. Get temperature rise by calculating the difference (water temperature after cooking minus initial temperature) in each test bowls.  
2. Then calculate average value of both temperature rises in degrees Fahrenheit (°F) or Centigrade (°C).
- (6) Power output shall be indicated by the following ranges of water temperature rise as shown in the chart below.
- (7) Power Output will be influenced by line voltage of power supply. Consequently, correct power output must be measured within 120V AC ± 1 volt while unit is operating.

Average Temp. Rise		108V (Low Voltage) Temp. Rise
Min.	Max.	Min.
16.2°F (9.0°C)	22.1°F (12.3°C)	16.2°F (9.0°C)



**Figure 7**

## 9. DISASSEMBLY INSTRUCTIONS

### IMPORTANT NOTES:

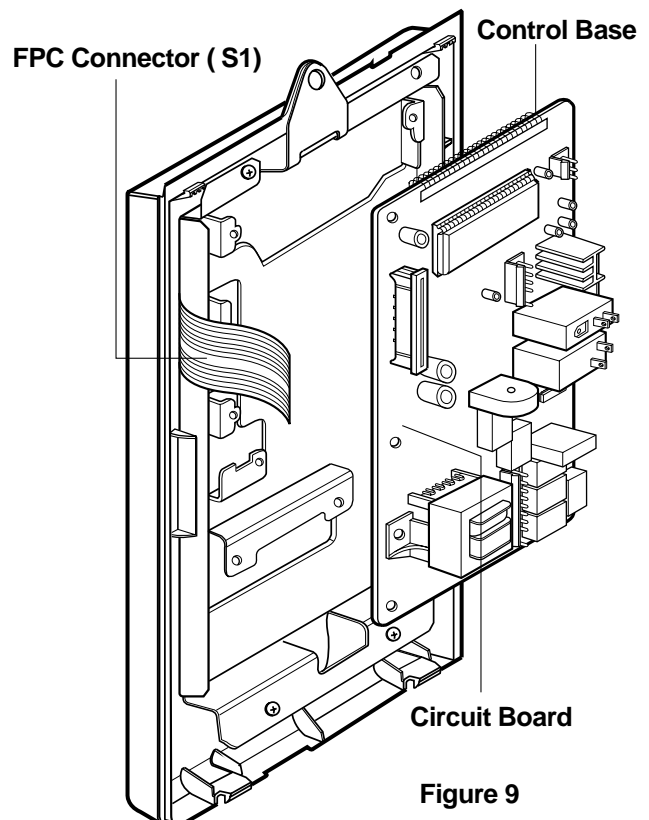
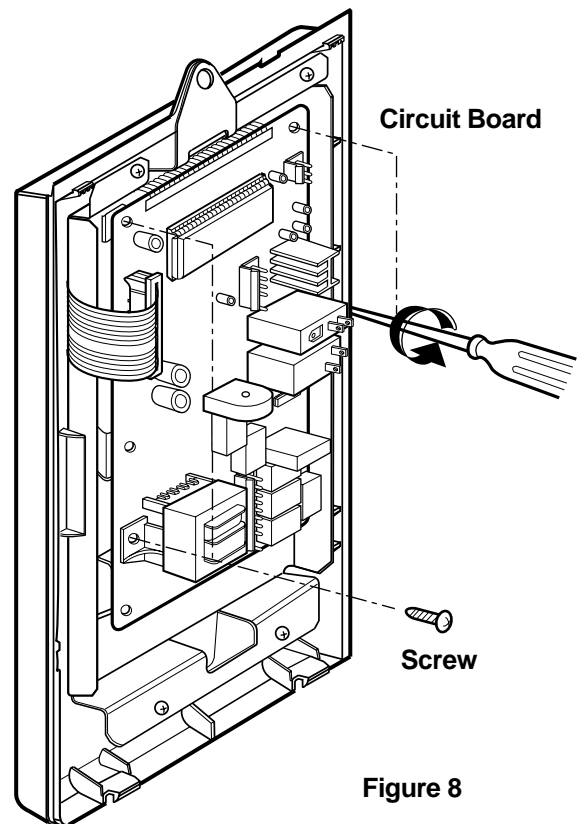
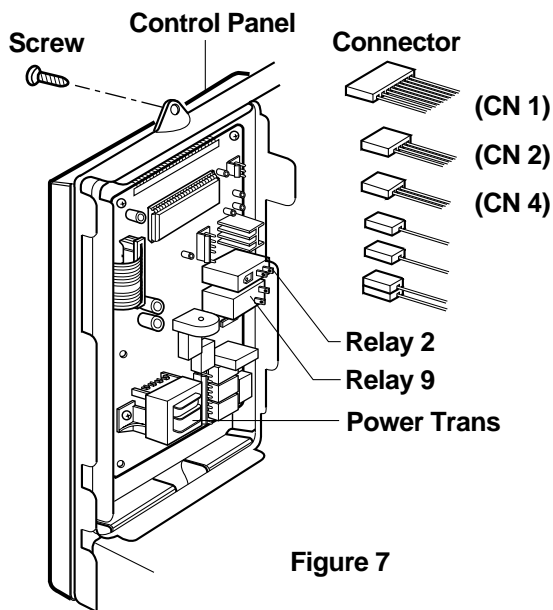
UNIT MUST BE DISCONNECTED FROM ELECTRICAL OUTLET WHEN MAKING REPAIRS, REPLACEMENTS, ADJUSTMENTS AND CONTINUITY CHECKS. WAIT AT LEAST ONE MINUTE, UNTIL THE HIGH VOLTAGE CAPACITOR IN THE HIGH VOLTAGE POWER SUPPLY HAS FULLY DISCHARGED. THE CAPACITOR SHOULD BE DISCHARGED BY USING INSULATED WIRE-I.E. TEST PROBE CONNECTED TO 10K-OHM RESISTOR IN SERIES TO GROUND.

WHEN RECONNECTING THE WIRE LEADS TO ANY PART, MAKE SURE THE WIRING CONNECTIONS AND LEAD COLORS ARE CORRECTLY MATCHED ACCORDING TO THE OVERALL CIRCUIT DIAGRAM. (ESPECIALLY SWITCHES AND HIGH VOLTAGE CIRCUIT.)

### A. REMOVING POWER AND CONTROL CIRCUIT

#### BOARD (Figure 7, 8 and 9)

- (1) Remove 1 screw securing the control panel assembly to the oven cavity. (Figure 7)
- (2) Remove the control panel with pushing it upward.
- (3) Remove the three connectors (CN1, CN2, CN4) and wire leads (Relay) from the circuit board.
- (4) Remove 5 screws securing the circuit board. (Figure 8)
- (5) Remove the FPC connector from the terminal socket following "HOW TO REMOVE THE FPC CONNECTOR" on the next page.
- (6) Remove the circuit board from the control bracket carefully.



## HOW TO REMOVE THE F.P.C. CONNECTOR

Follow the steps below as illustrated Figures 10 and 11 to remove the F.P.C. connector.

- (1) Hold the edges of the plastic fastener with thumb and forefinger. (Figure 10)
- (2) Lift up the lever and of the plastic fastener from the terminal socket by lightly pressing the lever end with thumb and forefinger. (Figure 11)
- (3) Remove the F.P.C. connector from the terminal socket.

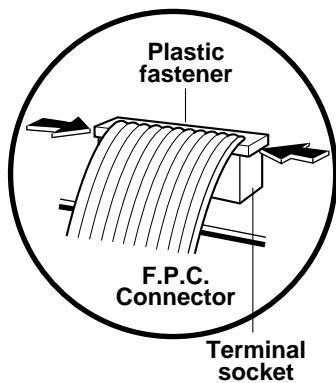


Figure 10

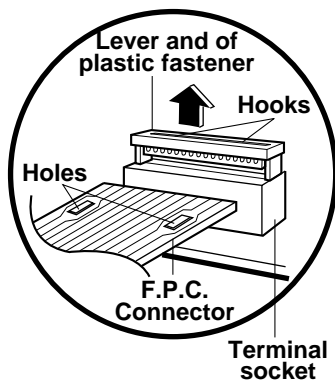


Figure 11

## HOW TO INSERT THE F.P.C. CONNECTOR

Follow the steps below as illustrated in Figures 12 and 13 to insert the F.P.C. connector.

- (1) Insert the F.P.C. connector into the terminal socket securely with the fingers.
- (2) Hold the plastic fastener with thumb and forefinger of the other hand, and push it slowly into the terminal socket. (Figure 12)

**NOTE:** When reconnecting the F.P.C. connector, make sure that the holes on the F.P.C. connector are properly engaged with the hooks on the plastic fastener.

- (3) Lock the level end of the plastic fastener into the hook of the terminal socket securely by releasing the fingers. (Figure 13)

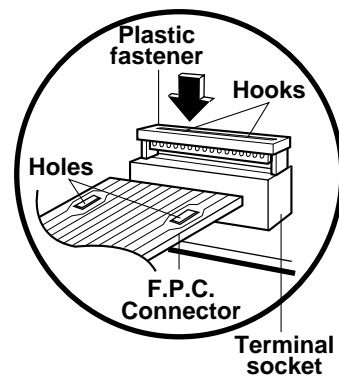


Figure 12

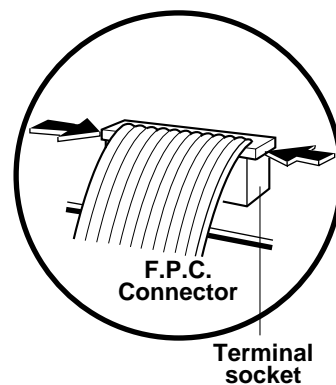


Figure 13



## B. REMOVING THE OUT CASE

- (1) Remove the vent grille by removing two screws securing it to the outcase.
- (2) Remove two screws securing it to the front bracket.
- (3) Remove the mounting plate by turning the three screws securing it to the outcase.
- (4) Remove the base plate by removing six screws securing it to the out case. Remove two screws securing it to the ventilation motor Asm.
- (5) Remove the power cord cover from outcase by removing a screw.
- (6) Push the power cord to the inner of the outcase and remove the outcase.

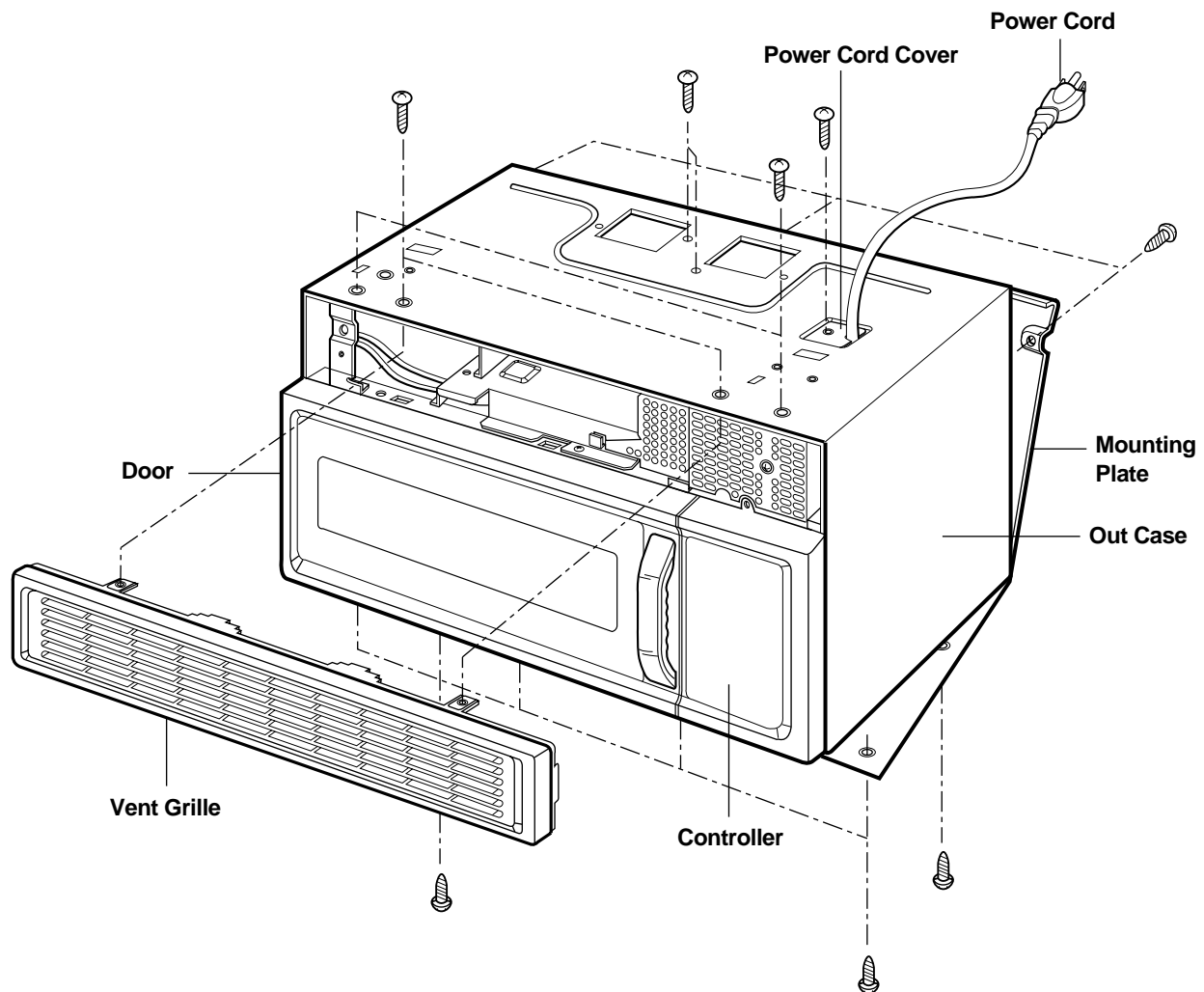
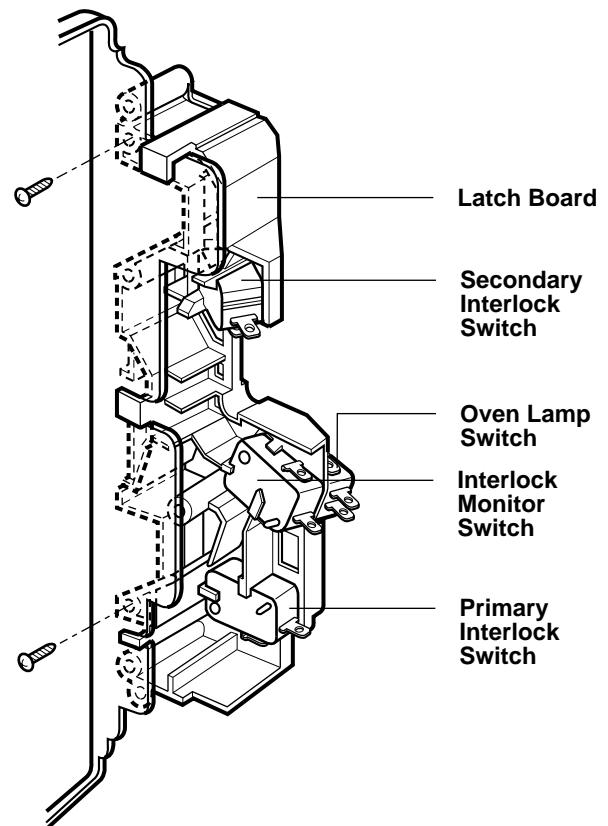


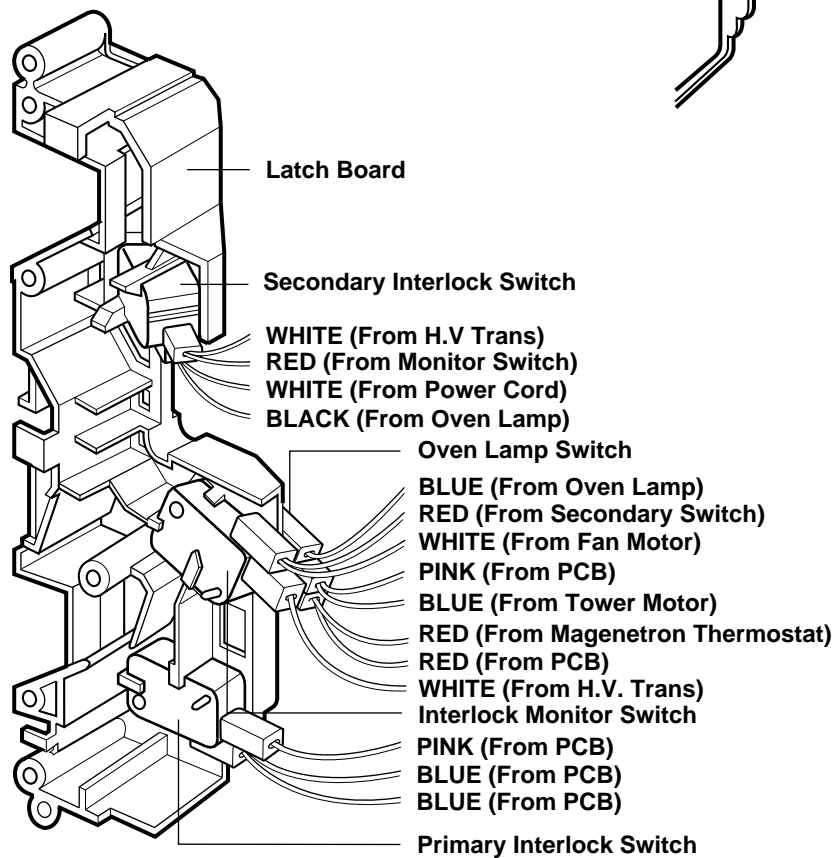
Figure 14

**C. REMOVING THE PRIMARY INTERLOCK SWITCH, INTERLOCK MONITOR SWITCH AND SECONDARY INTERLOCK SWITCH (Figures 15, 16)**

- (1) Disconnect the wire leads from the primary interlock switches.
- (2) Remove two screws securing the Latch Board.
- (3) Make necessary replacement and check microwave energy leakage according to "1. ADJUSTMENT PROCEDURE" on page 3.



**Figure 16**



**Figure 15**

#### **D. REMOVING MAGNETRON (Figures 17 through 21)**

- (1) Remove the vent grille by removing two screws.
- (2) Remove the controller by removing a screw and disconnect all wire leads.
- (3) Remove the base plate by removing six screws securing it to the oven front plate and outcase.
- (4) Remove the wire cover by removing a screw securing it to the oven lower plate. Disconnect the cook top leads connector from the bottom plate-R. (Figure 17)
- (5) Remove the outcase by removing eleven screws securing it to the front bracket, power cord cover, ventilation asm and outcase.
- (6) Remove the ventilation asm by disconnect the wire leads.
- (7) Remove the air duct by removing five screws securing it to the oven front plate, cover glasswool-R, and guide air. (Figure 18)
- (8) Remove the C-motor bracket assy by removing four screws securing it to the cover glasswool-R and guide air. (Figure 19)
- (9) Remove the guide air by removing three screws securing it to the bottom plate-R and guide air. (Figure 19)

- (10) Remove the guide suction by removing three screws securing it to the bottom plate-R, oven front plate and magnetron. (Figure 20)
- (11) Remove four tap tite screws securing the magnetron to the wave guide. (Figure 21)
- (12) Remove the magnetron VERY CAREFULLY.

#### **NOTES**

Remove the leads from the magnetron thermostat very carefully. Use long nose pliers.

#### **NOTES**

- When removing the magnetron, make sure that its dome does not hit any adjacent parts, or it may be damaged.
- When replacing the magnetron, be sure to install the magnetron gasket in the correct position and be sure that the gasket is in good condition.
- After replacing the magnetron, check for microwave energy leakage with a survey meter. Check microwave energy leakage must be below the limit of 4 mW/Cm<sup>2</sup>. (All service adjustments should be made minimum microwave energy leakage readings).

#### **E. REMOVING STIRRER FAN DISK (Figures 22, 23)**

- (1) Remove ceramic plate.
- (2) Remove the stirrer fan disk.

#### **NOTES**

- After replacing the door, be sure to check that the primary interlock switch the secondary interlock switch and the interlock monitor and the lamp switch operate normally.
- After replacing the door, check for microwave energy leakage with a survey meter. Microwave energy leakage must be below the limit of 5 mW/cm<sup>2</sup>. (All service adjustments should be made for minimum microwave energy leakages.)

**Figure 22**

**Figure 24**

#### **G. DISASSEMBLING DOOR (Figure 25)**

- (1) Remove the dielectric choke by using knife blade or small screw driver, etc.
- (2) Remove two screws securing it to the door handle.

**Figure 23**

#### **F. REMOVING DOOR (Figure 24)**

- (1) Remove 6 tap tite screws securing the upper and lower hinge.
- (2) To remove the door, tilt the top of the door toward you and lift the door up:

**Figure 25**

## H. REMOVING THE VENTILATION FAN ASM

- (1) Remove the mounting plate by removing three screws securing it to the back plate. (See Figure 26)
- (2) Remove the two screws securing the ventilation fan asm. (See Figure 27)
- (3) Carefully pull the ventilation motor asm out of the microwave oven. (See figure 28)
- (4) Disconnect the wire leads.

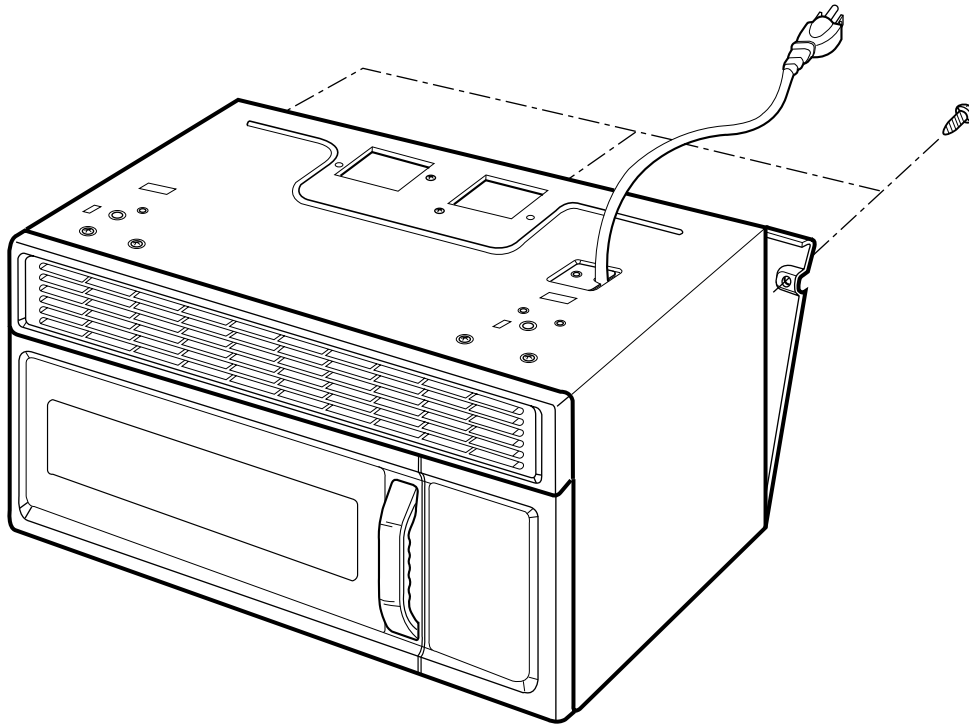


Figure 26

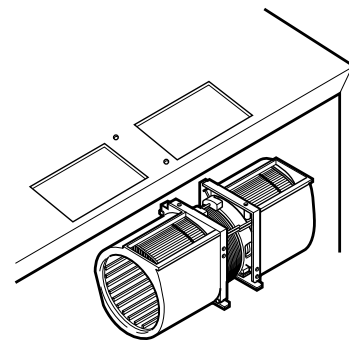


Figure 27

Figure 28

## **I. REMOVING CONVECTION HEATER AND THERMISTOR (Figure 29)**

- (1) Remove the out case.
- (2) Remove the air duct by removing five screws securing it to the oven front plate, guide air and glasswool-R cover.
- (3) Disconnect the wire leads of heater element terminal and the C-motor assy wire asm.
- (4) Remove the silicone belt.
- (5) Remove the C-motor assy by removing four screws securing it to the guide air and glasswool-R cover.
- (6) Remove the thermistor by removing one screw securing the chamber-out plater.
- (7) Remove the five screws securing the glasswool-L cover, chamber assy and glasswool-R cover.
- (8) Lift the chamber assy from the oven cavity.
- (9) Remove four screws securing the heater fo the chamber assy.
- (10) Lift the convection heater from the chamber assy.

**Figure 29**

## 10. PRECAUTIONS AND REPAIR SERVICE TIPS

### PRELIMINARY

#### A. SINCE NEARLY 2,100 VOLTS EXISTS IN SOME CIRCUITS OF THIS UNIT, REPAIRS SHOULD BE CARRIED OUT WITH GREAT CARE.

The filament leads of magnetron carry High Voltage with respect to ground. Extreme caution must be exercised. Never plug the unit into a power source to determine which component is defective in high voltage section.

#### B. TO AVOID POSSIBLE EXPOSURE TO MICROWAVE ENERGY LEAKAGE, THE FOLLOWING PRECAUTIONS MUST BE TAKEN BEFORE SERVICING.

- (1) Before the power is applied.
  - a. Make sure the primary interlock switch, the secondary interlock switch and the interlock monitor switch operate properly by opening and closing the door several times. (See page 24)
  - b. Make sure the perforated screen and the dielectric choke of the door are correctly and firmly mounted.
- (2) After power is applied:
  - a. Make sure the interlock switch mechanism is operating properly by opening and closing the door.
  - b. Check microwave energy leakage must be below the limit of 4 mW/cm<sup>2</sup>.  
(All service adjustment should be made for minimum microwave energy leakage readings).
- (3) Do not operate the unit until it is completely repaired, if any of the following conditions exist.  
The unit must not be operated.
  - a. The door does not close firmly.
  - b. The hinge is broken.
  - c. The dielectric choke of the door seal is damaged.
  - d. The door is bent or warped, or there is any other visible damage on the unit that may cause microwave energy leakage.

**NOTE:** Always keep the seal clean.

  - e. Make sure that there are no defective parts in the interlock mechanism.
  - f. Make sure that there are no defective parts in the microwave generating and transmission assembly (especially waveguide).
- (4) The following items should be checked after the unit is repaired:
  - a. The interlock monitor switch is connected correctly and firmly.
  - b. The magnetron gasket is properly positioned and mounted.
  - c. The waveguide and the oven cavity are intact. (no microwave energy leakage).
  - d. The door can be properly closed and the safety switches work properly.
  - e. The unit must stop when the door is opened or the time is up.  
The unit must not be operated with any of the above components removed or by-passed.

## 11. TEST AND CHECKOUT PROCEDURES, AND TROUBLESHOOTING

### CAUTIONS

DISCONNECT THE POWER SUPPLY CORD FROM THE WALL OUTLET WHENEVER REMOVING THE CABINET FROM THE UNIT. PROCEED WITH THE TESTS ONLY AFTER DISCHARGING THE HIGH VOLTAGE CAPACITOR AND REMOVING THE WIRE LEADS FROM THE PRIMARY WINDING OF THE HIGH VOLTAGE TRANSFORMER. (SEE FIGURE 30)

ALL OPERATIONAL CHECKS WITH MICROWAVE ENERGY MUST BE DONE WITH A LOAD (1 LITER OF WATER IN CONTAINER) IN THE OVEN.

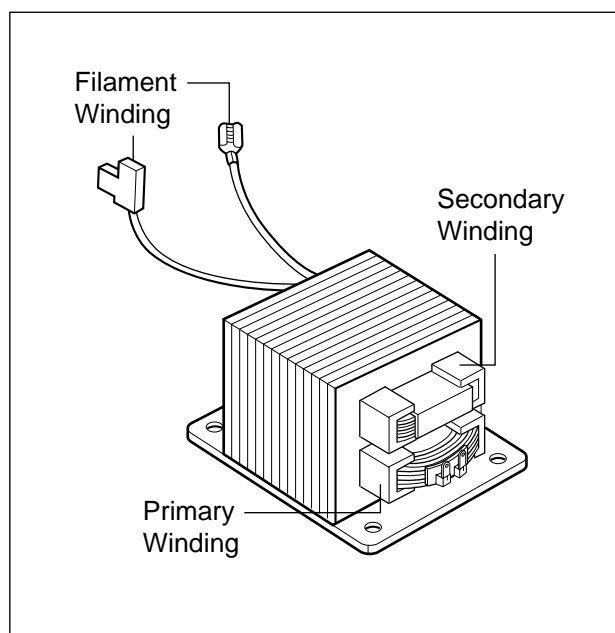


Figure 30

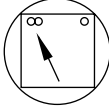
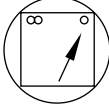
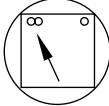
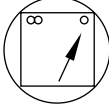
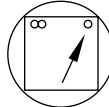
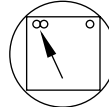
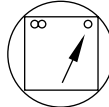
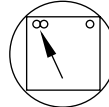
### A. TEST PROCEDURES

COMPONENTS	TEST PROCEDURE	RESULTS
MAGNETRON (Wire leads are removed)	<ol style="list-style-type: none"> <li>1) Measure the resistance: Across the filament terminals of the magnetron with an ohm-meter on Rx1 scale.</li> <li>2) Measure the resistance: Between each filament terminal of the magnetron and the chassis ground with an ohm-meter on highest scale.</li> </ol>	<p>Normal reading: Less than 1 ohm</p> <p>Normal reading: Infinite ohms</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>● Replace the magnetron, if the magnetron checks and all of the high voltage component tests are good, but the unit still does not heat a load.</li> </ul>
HIGH VOLTAGE TRANSFORMER (Wire leads are removed)	<ol style="list-style-type: none"> <li>1) Measure the resistance: With an ohm-meter on Rx1 scale. <ol style="list-style-type: none"> <li>a. Primary winding;</li> <li>b. Filament winding;</li> <li>c. Secondary winding;</li> </ol> </li> <li>2) Measure the resistance; With an ohm-meter on highest scale. <ol style="list-style-type: none"> <li>a. Primary winding to ground;</li> <li>b. Filament winding to ground;</li> </ol> </li> </ol>	<p>Normal readings:</p> <p>Approx. 0.44 ohms Less than 0.1 ohm Approx 105 ± 5 ohms</p> <p>Normal readings: Infinite ohms Infinite ohms</p>

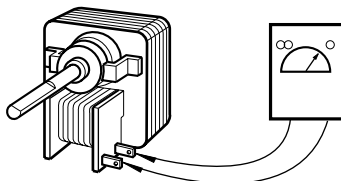
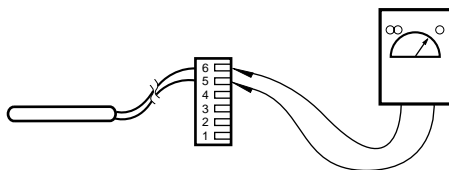
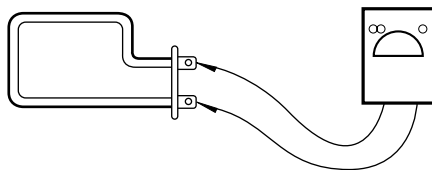
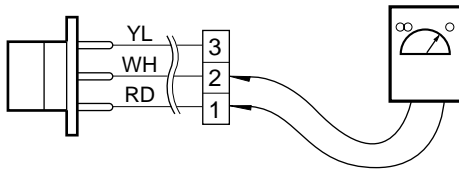
**NOTE:** A MICROWAVE ENERGY LEAKAGE TEST MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED FOR ANY REASON.



COMPONENTS	TEST PROCEDURE	RESULTS
HIGH-VOLTAGE CAPACITOR	Measure the resistance: 1) Terminal to terminal. <div data-bbox="583 421 881 577" data-label="Image"> </div> <div data-bbox="828 660 979 694" data-label="Caption"> <p>Figure 31-a</p> </div>	Normal reading: Momentarily indicates several ohms, and then gradually returns to infinite ohms.  Abnormal reading: Indicates continuity or infinite ohm from the beginning.
	1) Terminal to case. <div data-bbox="583 851 881 1028" data-label="Image"> </div> <div data-bbox="828 1111 979 1144" data-label="Caption"> <p>Figure 31-b</p> </div>	Normal reading: Infinite.  Abnormal reading: Indicates continuity.
HIGH-VOLTAGE DIODE	Measure the continuity 1) Forward (Ohm-meter on Rx10000 scale.) <div data-bbox="583 1330 899 1482" data-label="Image"> </div> <div data-bbox="828 1565 979 1599" data-label="Caption"> <p>Figure 32-a</p> </div>	Normal reading: Continuity  Abnormal reading: Infinite.
	2) Reverse <div data-bbox="583 1780 899 1933" data-label="Image"> </div> <div data-bbox="828 2027 979 2060" data-label="Caption"> <p>Figure 32-b</p> </div>	Normal reading: Infinite.  Abnormal reading: continuity.

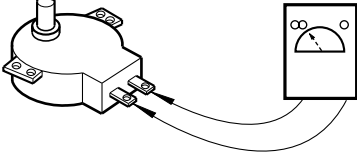
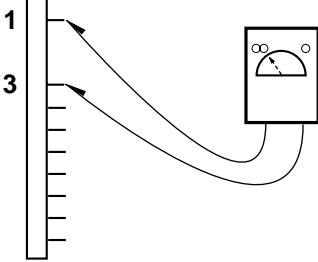
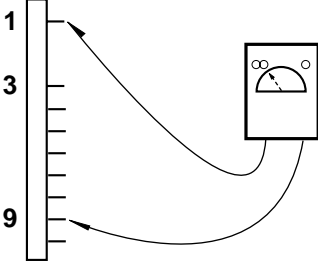
COMPONENTS	TEST PROCEDURE		RESULTS	
SWITCHES (Wire leads are removed)	Check for the continuity of the switch with an ohm-meter		DOOR OPEN	DOOR CLOSED
				
	Secondary Interlock	Terminals "COM" and "NO" of switch		
	Primary Interlock	Terminals "COM" and "NO" of switch		
	Lamp Switch	Terminals "COM" and "NO" of switch		
		Terminals "COM" and "NC" of switch		
	Interlock Monitor	Terminals "COM" and "NC" of switch		
<ul style="list-style-type: none"> <li>● The service personnel should replace all of the monitored safety interlock switches and monitor switch if the oven has been rendered inoperative due to the failure of the monitored safety interlock(s).</li> <li>● Be sure to connect the monitor switch after replacement and to check interlock monitor continuity.</li> </ul> <p><b>NOTE:</b> After checking for the continuity of switches, make sure that they are correctly connectly connected.</p>				
CIRCUIT BOARD	See page 30 for "CHECKOUT PROCEDURES FOR CIRCUIT BOARD".			

**NOTE:** A MICROWAVE ENERGY LEAKAGE TEST MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED FOR ANY REASON.

COMPONENTS	TEST PROCEDURE	RESULTS						
FAN MOTOR TOWER MOTOR CIRCULATIONS MOTOR (Wire leads are removed)	Measure the resistance with an ohm-meter on Rx1 scale.  <b>Figure 34</b>	Normal reading: <table border="1"><tr><td>Fan</td><td>Tower</td><td>Cir.</td></tr><tr><td>30-45</td><td>60-75</td><td>25-40</td></tr></table> ohms.	Fan	Tower	Cir.	30-45	60-75	25-40
Fan	Tower	Cir.						
30-45	60-75	25-40						
THERMISTOR (Disconnect the 6 pin conncektor CN2 from PCB)	Measure the resistance across pins 5 & 6 with an ohm-meter on Rx1 scale.  <b>Figure 35</b>	Normal reading: Approx. 250~350 K ohms at 20°C.						
HEATER ELEMENT (Wire leads are removed)	Measure the resistance with an ohm-meter on Rx1 scale.  <b>Figure 36</b>	Normal reading: Approx. 9~12 ohms at 20°C						
SENSOR (Disconnect the 3 pin connector CN4 from PCB)	Measure the resistance across pins 1 & 2 an ohm-meter on Rx1 scale.  <b>Figure 37</b>	Normal reading: <table border="1"><tr><td>1 &amp; 2</td><td>2 &amp; 3</td></tr><tr><td>20</td><td></td></tr></table> ohms at 20°C.	1 & 2	2 & 3	20			
1 & 2	2 & 3							
20								

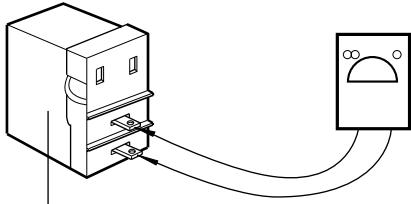


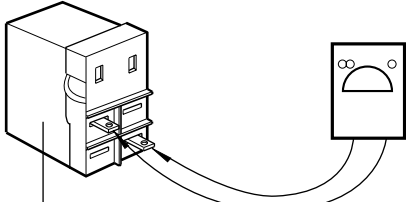


**NOTE:** ● A MICROWAVE ENERGY TEST MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED FOR ANY REASON.

- MAKE SURE THE WIRE LEADS ARE IN THE CORRECT POSITION.
- WHEN REMOVING THE WIRE LEADS FROM THE PARTS, BE SURE TO GRASP THE CONNECTOR, NOT THE WIRES.

COMPONENTS	TEST PROCEDURE	RESULTS	
SYNCHRONOUS MOTOR (Wire leads are removed)	<p>Measure the resistance with an ohm-meter on Rx10000 scale.</p>  <p><b>Figure 38</b></p>	Normal reading: Approx. 3~4 Kohms.	
RELAY 1 of P. C. B <Disconnect the 10 pin connector (CN 1) from P.C.B>	 <p><b>Figure 39</b></p>	Cooking Start	OFF
RELAY 7 of P.C.B <Disconnect the 10 pin connector (CN 1) from P.C.B>	 <p><b>Figure 40</b></p>	Convection Cooking Start	OFF

**NOTE:** ● A MICROWAVE ENERGY TEST MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED FOR ANY REASON.

- MAKE SURE THE WIRE LEADS ARE IN THE CORRECT POSITION.
- WHEN REMOVING THE WIRE LEADS FROM THE PARTS, BE SURE TO GRASP THE CONNECTOR, NOT THE WIRES.

COMPONENTS	TEST PROCEDURE	RESULTS		
RELAY 2	<p>Check for continuity of the relay 2 with an ohm-meter. (Remove wire leads from relay 2 and operate the unit on microwave cooking mode.)</p>  <p>RELAY 2</p> <p style="text-align: right;"><b>Figure. 41</b></p>	POWER LEVEL		
		1	4 sec	18 sec
		2	6 sec	16 sec
		3	8 sec	14 sec
		4	10 sec	12 sec
		5	12 sec	10 sec
		6	14 sec	8 sec
		7	16 sec	6 sec
		8	18 sec	4 sec
		9	20 sec	2 sec
		10	22 sec	0 sec
RELAY 9	<p>Check for continuity of relay 9 with an ohm-meter. (Remove wire leads from relay 9 and operate the unit on convection cooking mode.)</p>  <p>RELAY 9</p> <p style="text-align: right;"><b>Figure 42</b></p>	STAND-BY CONDITION		
				

**NOTE:** ● A MICROWAVE ENERGY TEST MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED FOR ANY REASON.

- MAKE SURE THE WIRE LEADS ARE IN THE CORRECT POSITION.
- WHEN REMOVING THE WIRE LEADS FROM THE PARTS, BE SURE TO GRASP THE CONNECTOR, NOT THE WIRES.

COMPONENTS	TEST PROCEDURE	RESULTS						
TOUCH KEY BOARD	<p>Measure the resistance between terminal pins of connector KEY CON.</p> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>When reconnecting the F.P.C connector, make sure that the holes on the F.P.C. connector are properly engaged with the hooks on the plastic fastener.</li> </ul> <p>MATRIX CIRCUIT FOR TOUCH KEY BOARD</p> <p>CONNECTOR (KEY CON)</p> <p><b>Figure 43</b></p>	<table> <tr> <th>Resistance value</th><th>When touched</th><th>When not touched</th></tr> <tr> <td></td><td>Less than 400 ohms</td><td>More than 1 M ohm</td></tr> </table> <p>FPC CONNECTOR Top</p> <p><b>Figure 44</b></p>	Resistance value	When touched	When not touched		Less than 400 ohms	More than 1 M ohm
Resistance value	When touched	When not touched						
	Less than 400 ohms	More than 1 M ohm						

## B. CHECKOUT PROCEDURES

### (1) CHECKOUT PROCEDURES FOR FUSE BLOWING.

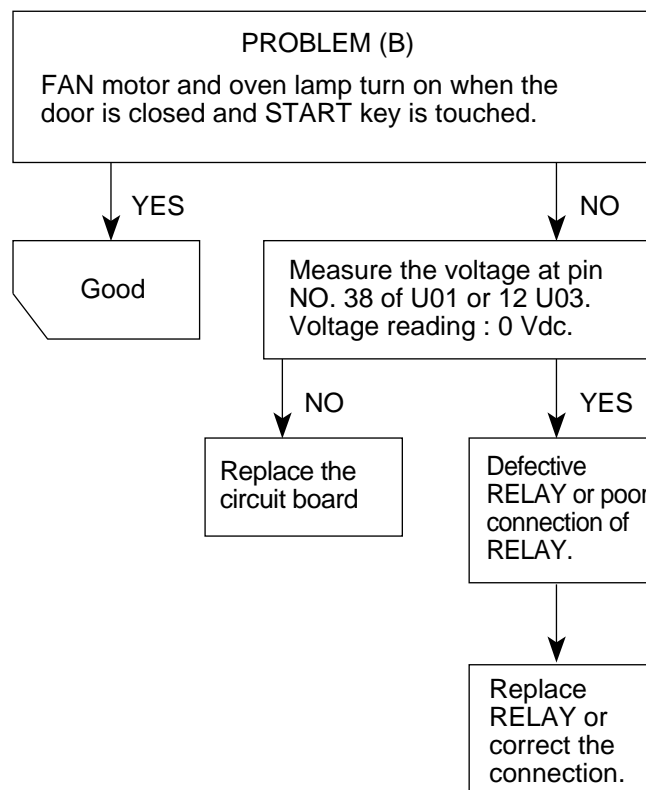
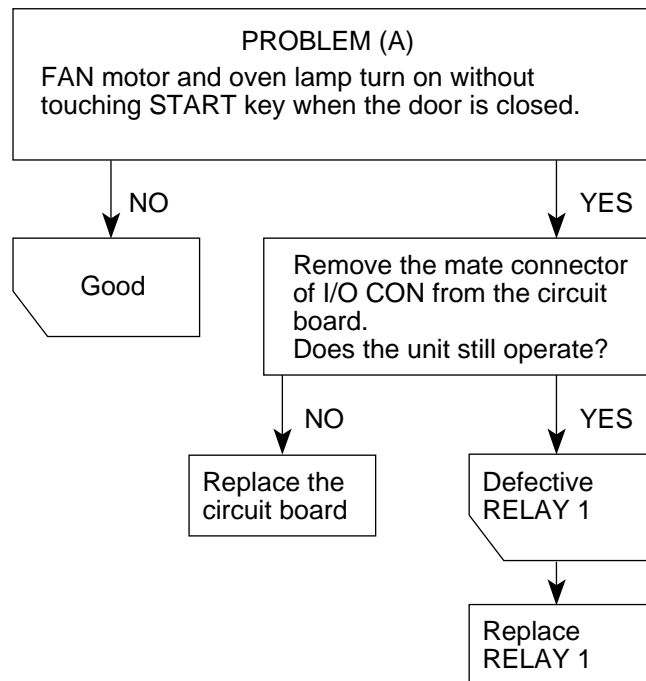
**CAUTION:** REPLACE BLOWN FUSE WITH 15 AMPERE FUSE.

PROBLEMS	CAUSES
Fuse blows immediately after the door is closed.	Improper operation of the primary inerlock, secondary inerlock switches and/or the interlock monitor switch.
Fuse blows immediately after the door is opened.	
Fuse blows when the door is closed and START key is touched.	Malfunction of the high voltage transformer, the high voltage capacitor including the diode, the magnetron, the blower motor, or the circuit board.

#### NOTES:

- If the fuse is blown by an improper switch operation, replace all switches in the interlock circuit and the fuse. After replacing the switches with new ones, make sure that they are correctly connected.
- Check for microwave energy leakage according to "ADJUSTMENT PROCEDURES" on page 3, when the primary interlock, secondary interlock switches and/or the interlock monitor switches are adjusted or replaced.

## (2) CHECKOUT PROCEDURES FOR RELAY



### (3) CHECKOUT PROCEDURES FOR CIRCUIT BOARD.

The following symptoms indicate a defective circuit board.

- 1) The start function fails to operate but the high voltage systems, the interlock switches, the door sensing and the relay check good.
- 2) The unit with a normal relay continuously operates.
- 3) Proper temperature measurement is not obtained.
- 4) The buzzer does not sound or continues to sound.
- 5) Some segments of one or more digits do not light up, or they continue to light up, or segments when they should not.
- 6) Wrong figures appear.
- 7) The figures of all digits flicker.
- 8) Some of the indicators do not light up.
- 9) The clock does not keep time properly.

**NOTE:** A MICROWAVE ENERGY LEAKAGE TEST MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED ANY REASON.



C. TROUBLESHOOTING

Before following this troubleshooting read "TRIAL OPERATION" on page 5.

- "DISPLAY" Problems, "A" thru "C"
- "HEAT UP" Problems, "D" thru "E"
- "TEMPERATURE CONTROLLED COOKING" Problems, "F"
- "BUZZER" Problems "G"

SEQUENCE

RESULT

PROBLEM A : "0" does not appear in display window when power supply cord is plugged into wall outlet.		
1	<div>CHECK : 1. POWER SUPPLY 2. FUSE (See "CHECKOUT PROCEDURE FOR FUSE BLOWING" on page 25.) 3. OVEN CAVITY THERMOSTAT</div> <div><p>Measure voltage between pin 1 and pin 4 of connector CN1.</p></div>	<div><p>120V</p></div> <div><p>Voltage incorrect.</p></div> <div><p>Replace circuit board</p></div> <div><p>Normal circuit board</p></div> <div><p>Correct connections</p></div> <div><p>Normal resistance</p></div> <div><p>Runs</p></div> <div><p>Runs</p></div>
PROBLEM B : Display does not show correct numbers and/or correct indications when programmed.		
1	<div><p>Measure resistance of touch key board after removing connector S1. (See page 14 and 28)</p></div> <div><p>Resistance incorrect</p></div> <div><p>Normal resistance</p></div> <div><p>Check contact of connector S1</p></div> <div><p>Poor contact</p></div> <div><p>Normal contact</p></div> <div><p>Replace circuit board</p></div> <div><p>Normal circuit board</p></div> <div><p>Correct seating</p></div> <div><p>Normal touch key board</p></div> <div><p>Runs</p></div> <div><p>Runs</p></div> <div><p>Runs</p></div>	

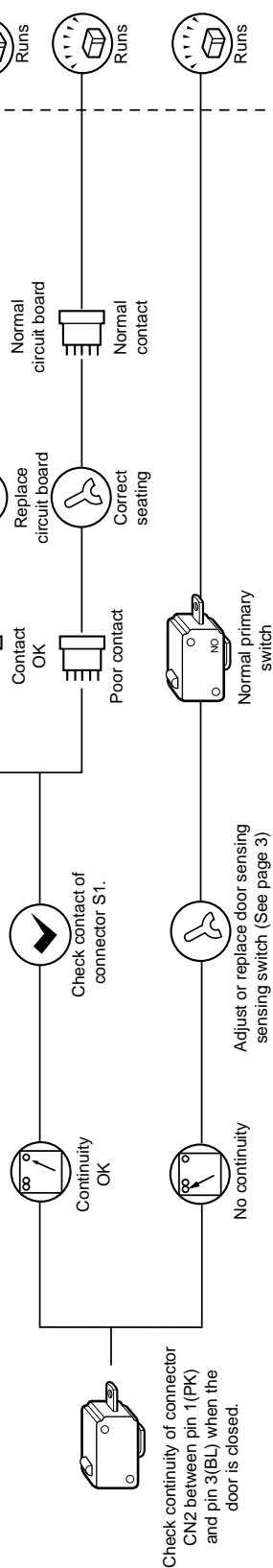
SEQUENCE

RESULT

**PROBLEM C** :Display does not start countdown when START key is touched.

1

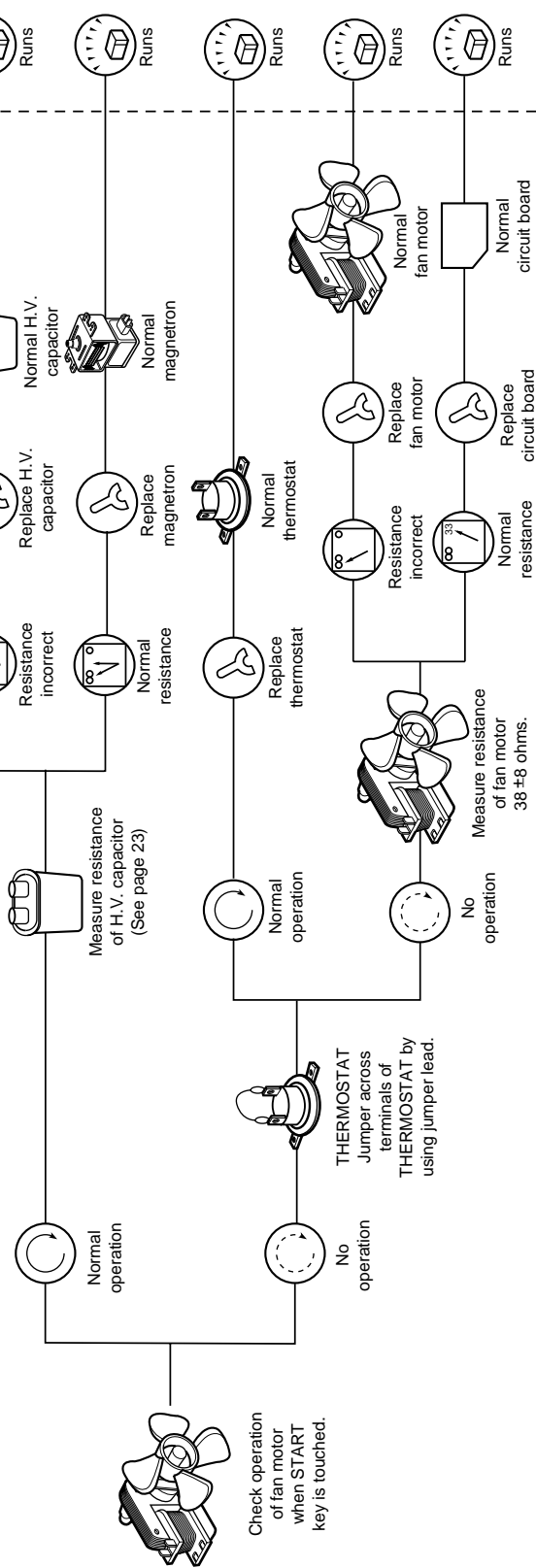
CHECK : 1. TOUCH KEY BOARD (START KEY FUNCTION)



**PROBLEM D** : Unit operation seems to be normal but little or no heating is produced in oven load.

1

CHECK: 1. AIR VENTS



SEQUENCE

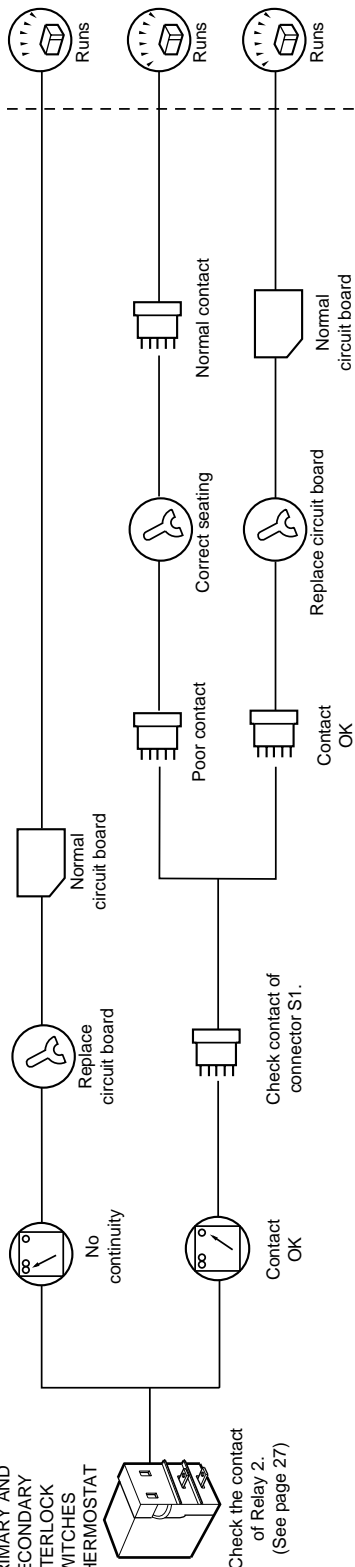
RESULT

**PROBLEM E :** Unit does not heat up even if display counts down when START key is touched for "NIGH POWER" cooking.

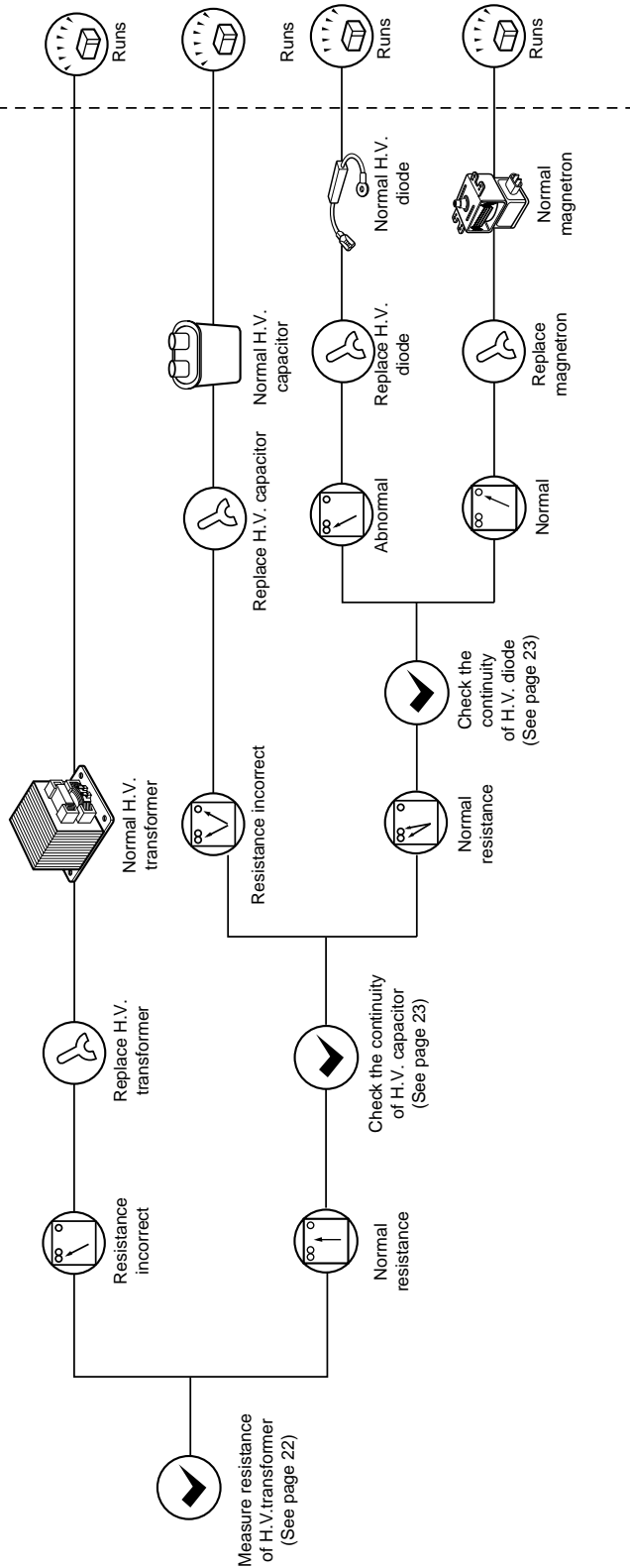
1

CHECK: 1. PRIMARY AND SECONDARY INTERLOCK SWITCHES

2. THERMOSTAT



2



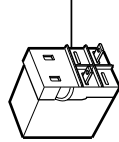
SEQUENCE

RESULT

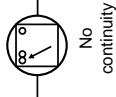
**PROBLEM F :** Unit does not heat up at all even if display counts down when START key is touched for convection cooking.

1

CHECK: 1. PRIMARY INTERLOCK SWITCH



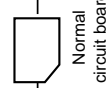
Check the contact of Relay 9 (See page 27)



No continuity



Replace circuit board



Normal circuit board



Contact OK



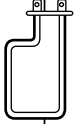
Measure resistance of heater. (See page 25)



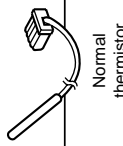
Resistance incorrect



Replace heater



Normal heater



Normal thermistor



Replace thermistor

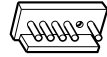


Normal resistance

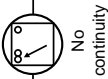
**PROBLEM G :** Oven temperature is very low even if display counts down when START key is touched for convection cooking.

1

CHECK: 1. PRIMARY INTERLOCK SWITCH  
2. THERMISTOR



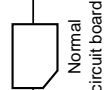
Check the contact of Relay 7. (See page 26)



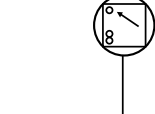
No continuity



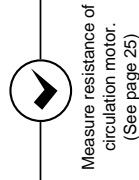
Replace circuit board



Normal circuit board



Contact OK



Measure resistance of circulation motor. (See page 25)



Resistance incorrect



Replace circulation motor



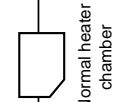
Normal circulation motor



Normal resistance

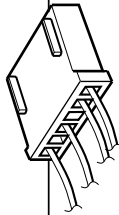


Replace heater chamber



Normal heater chamber



SEQUENCE	RESULT
<p><b>PROBLEM H :</b> When START key is touched for convection cooking, oven temperature is very high and then unit stops operating.</p> <p><b>1</b></p> <p>CHECK: 1. POWER SUPPLY 2. FUSE</p> <p>Please cool unit sufficiently</p>  <p>Check contact of 6 pin thermistor connector</p> <p>Poor contact</p> <p>Correct seating</p> <p>Normal contact</p> <p>Contact OK</p> <p>Replace thermistor</p> <p>Runs</p> <p>Runs</p>	
<p><b>PROBLEM I :</b> No buzzing when touching the key, between stages or at end of cooking.</p> <p><b>1</b></p> <p>Check normal operation circuit board</p> <p>Replace circuit board</p> <p>Normal circuit board</p> <p>Runs</p>	

RESULT

SEQUENCE

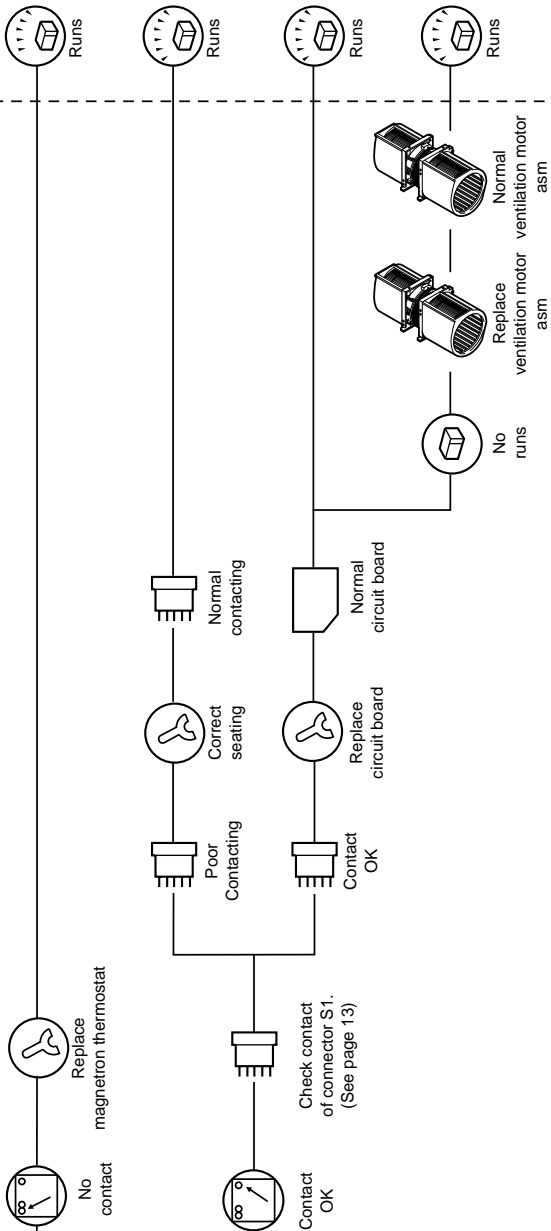
**PROBLEM J :** Ventilation fan does not operate  
when "FAN HIGH/LOW" key is touched.

1

CHECK: 1. POWER SUPPLY  
2. FUSE



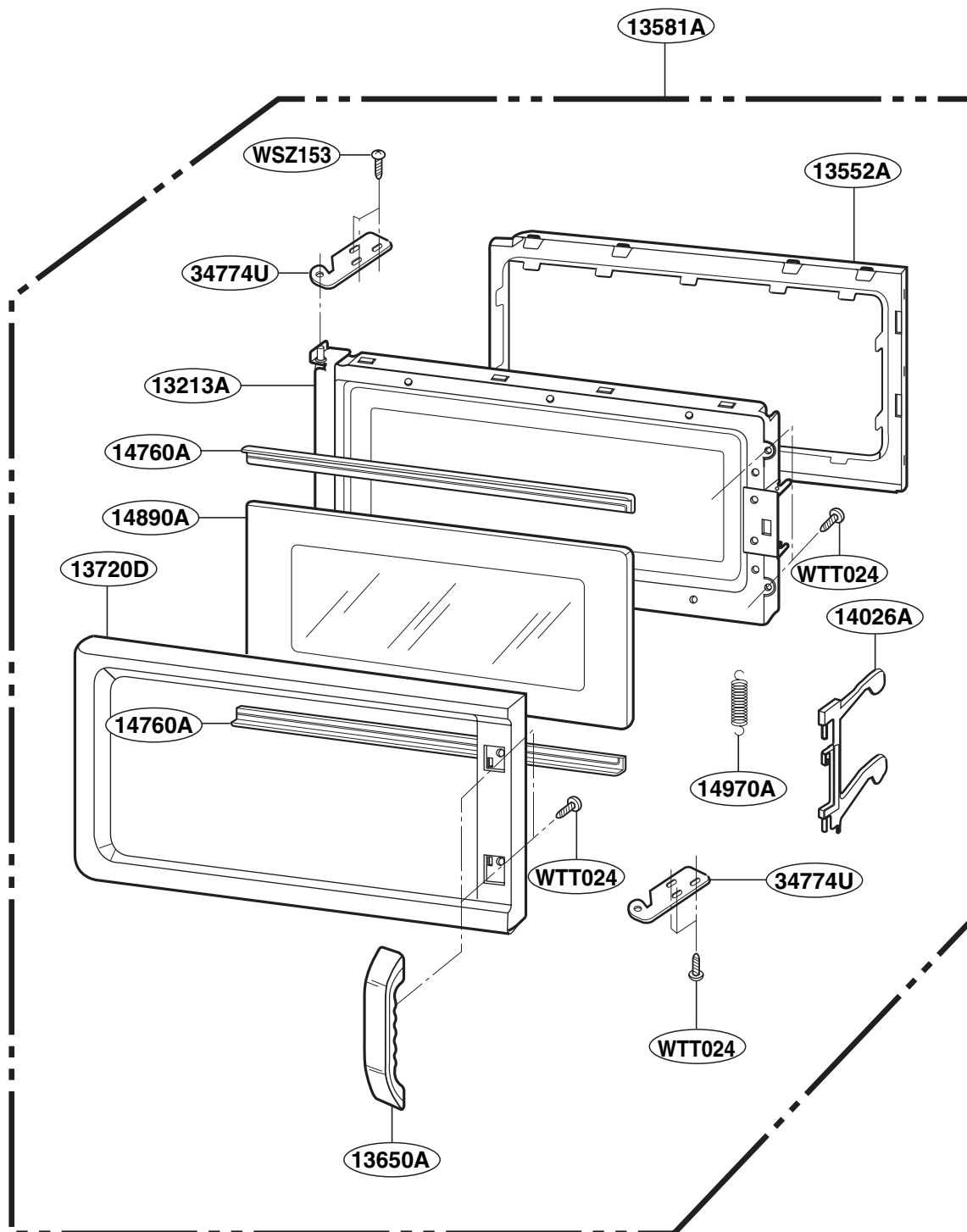
Check the contact of  
Magnetron thermostat.



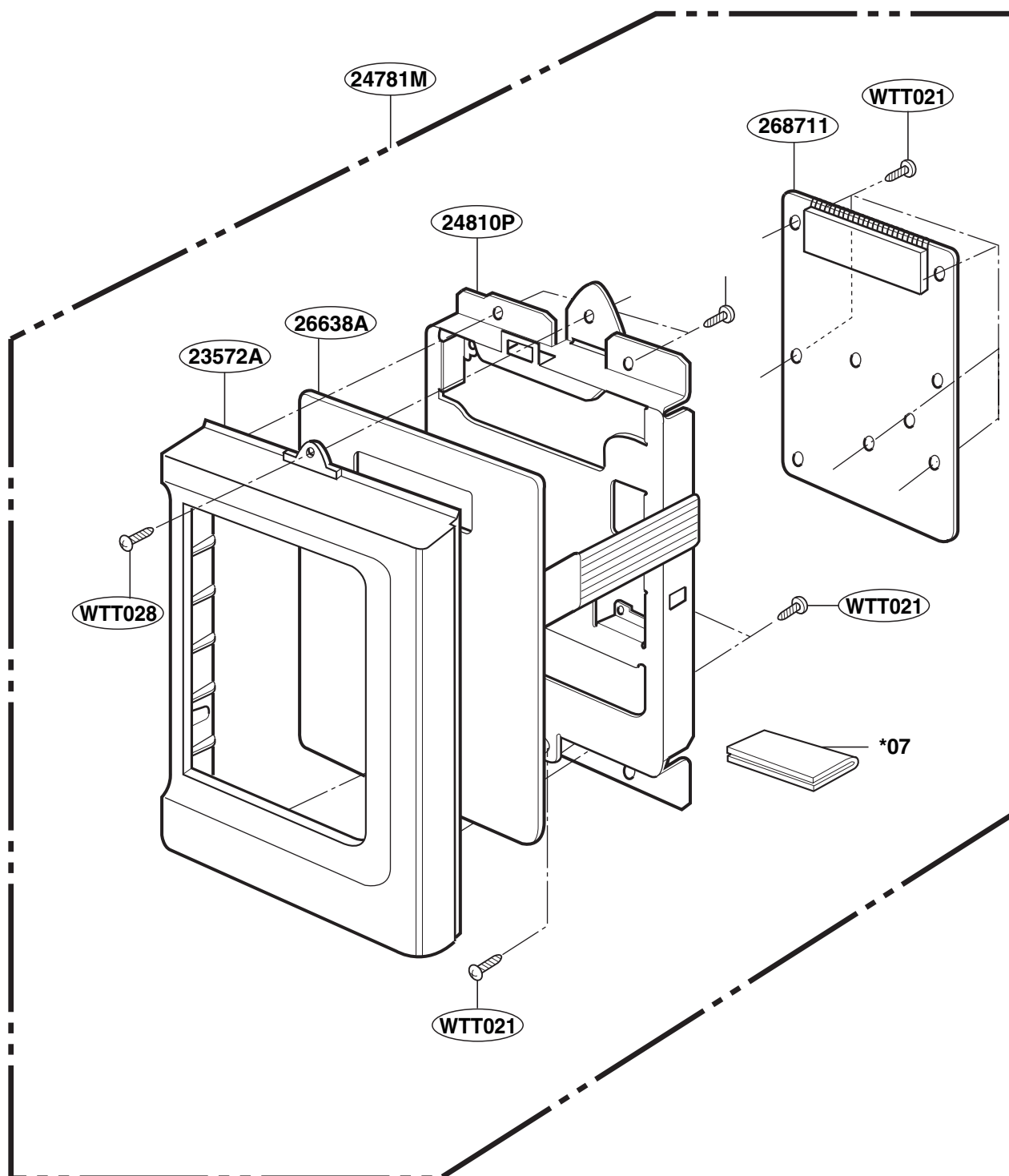
# EXPLODED VIEW

## DOOR PARTS

MODEL: MV-1155W

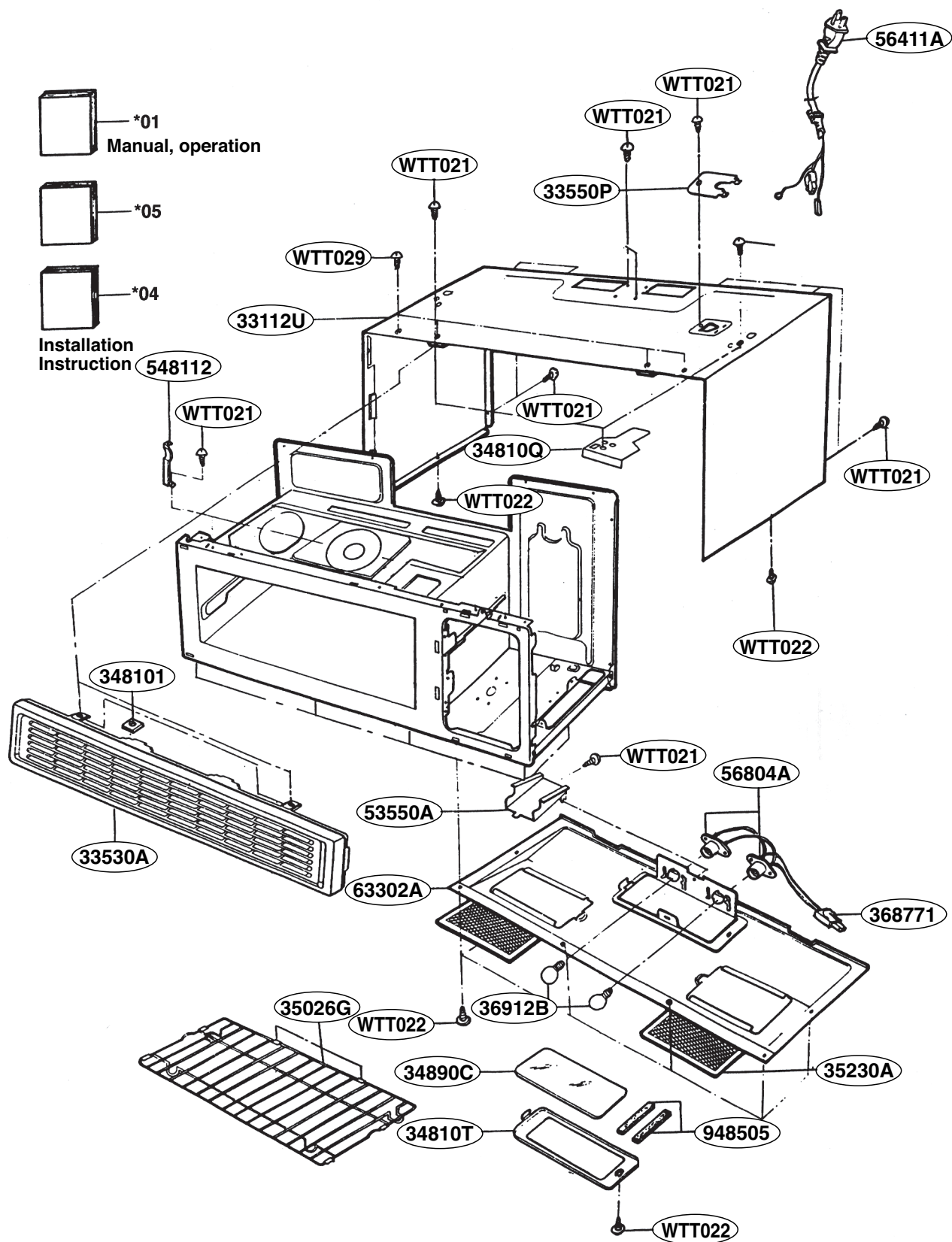


## CONTROLLER PARTS

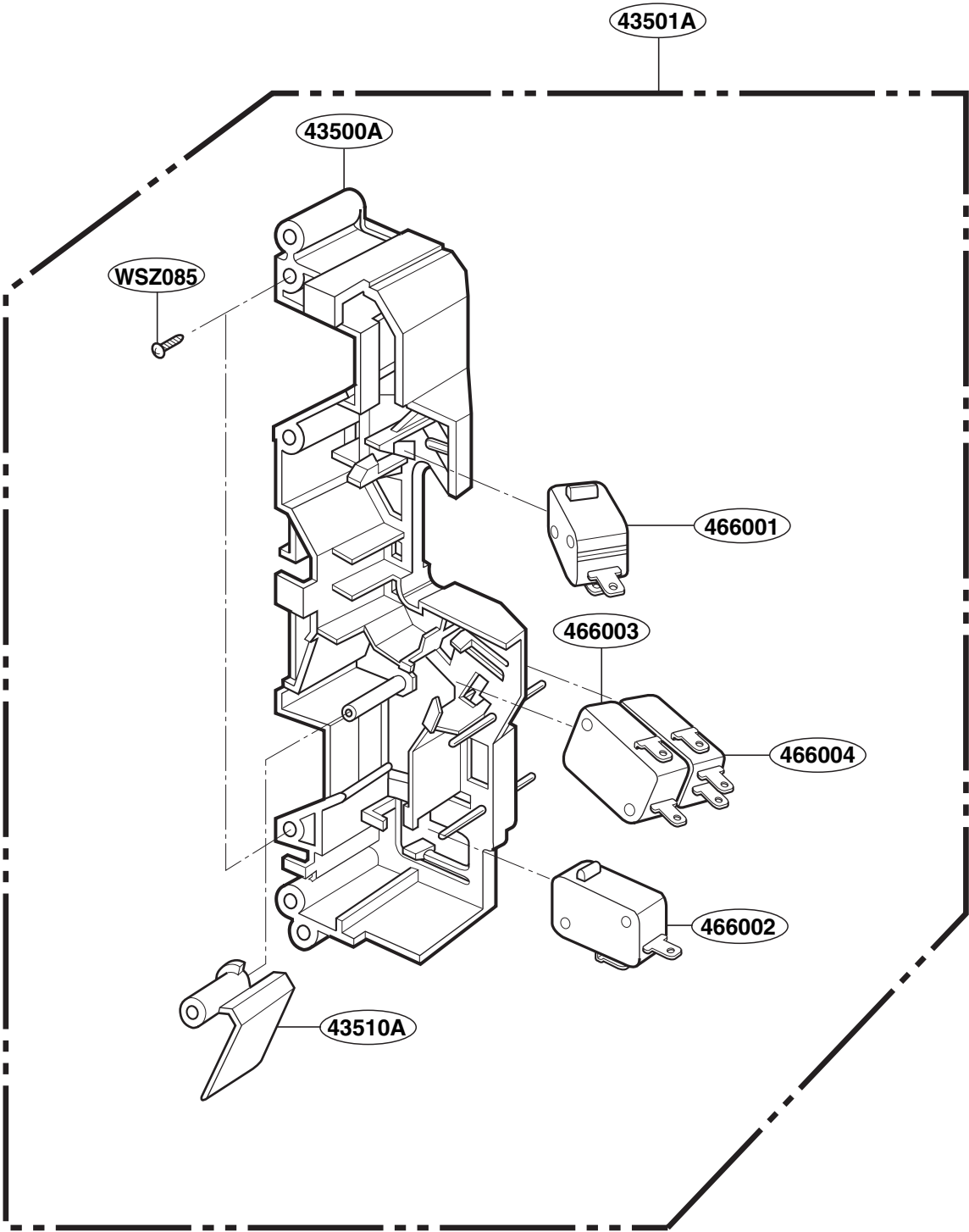




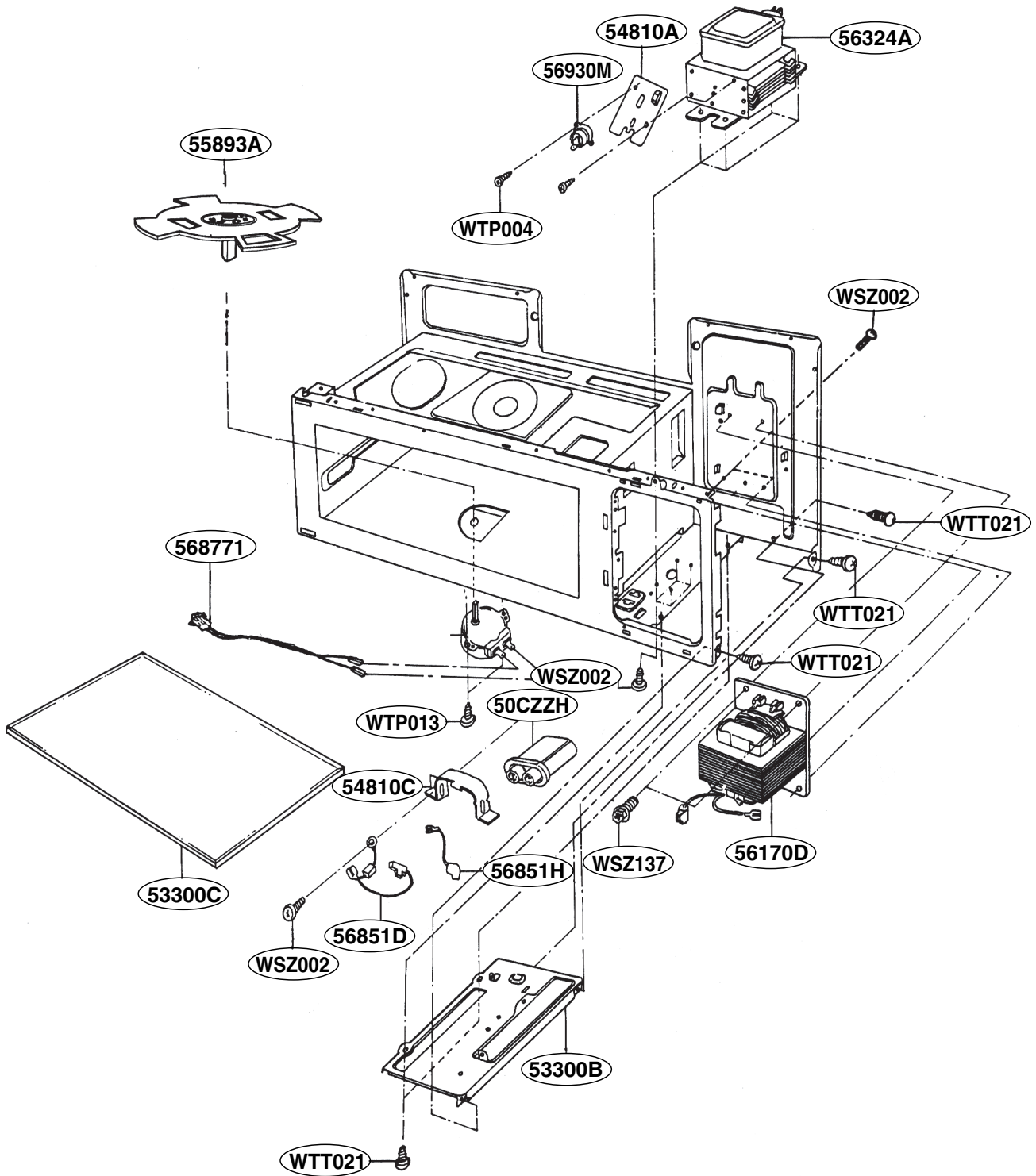
# OVEN CAVITY PARTS



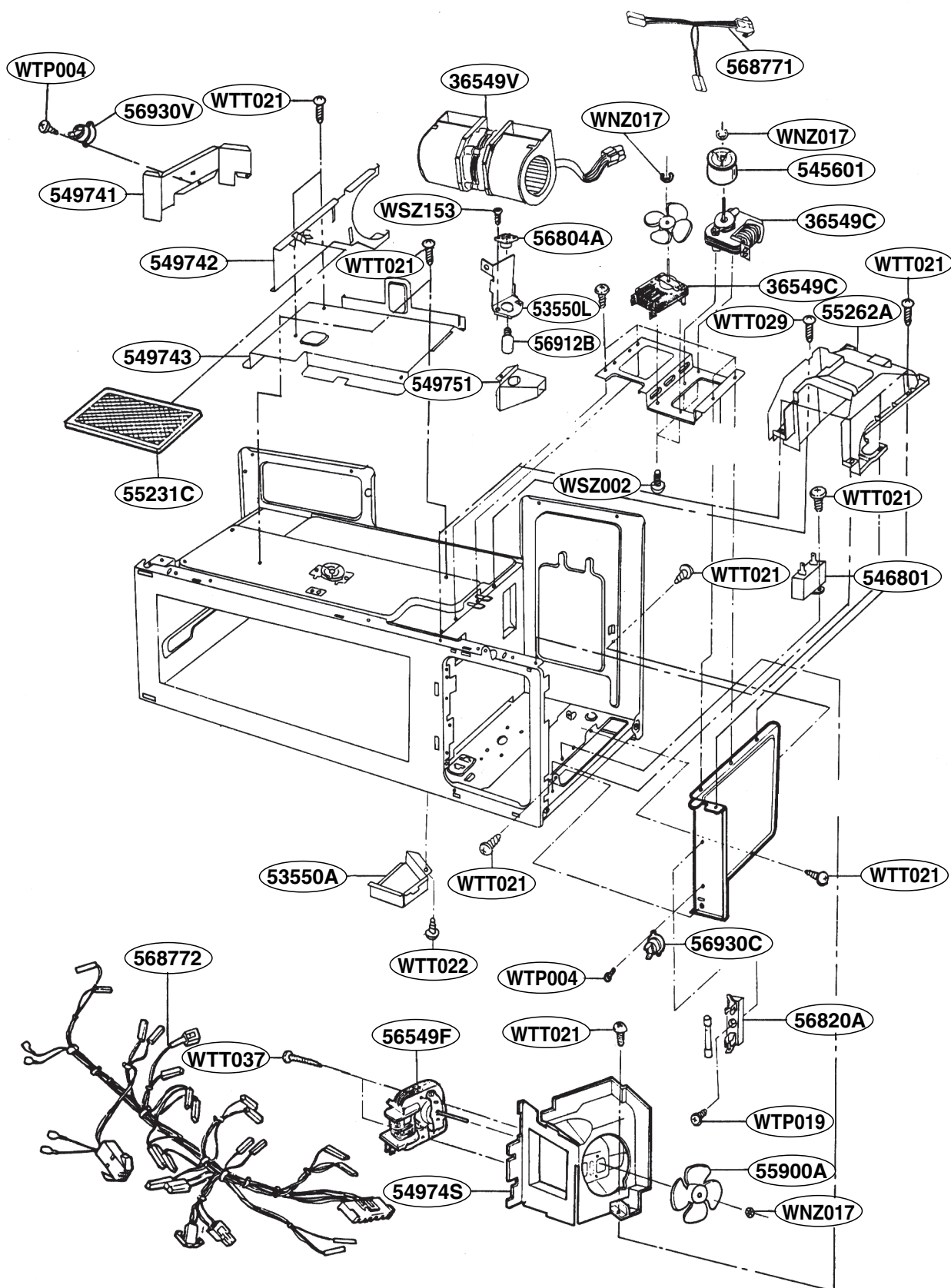
# LATCH BOARD PARTS



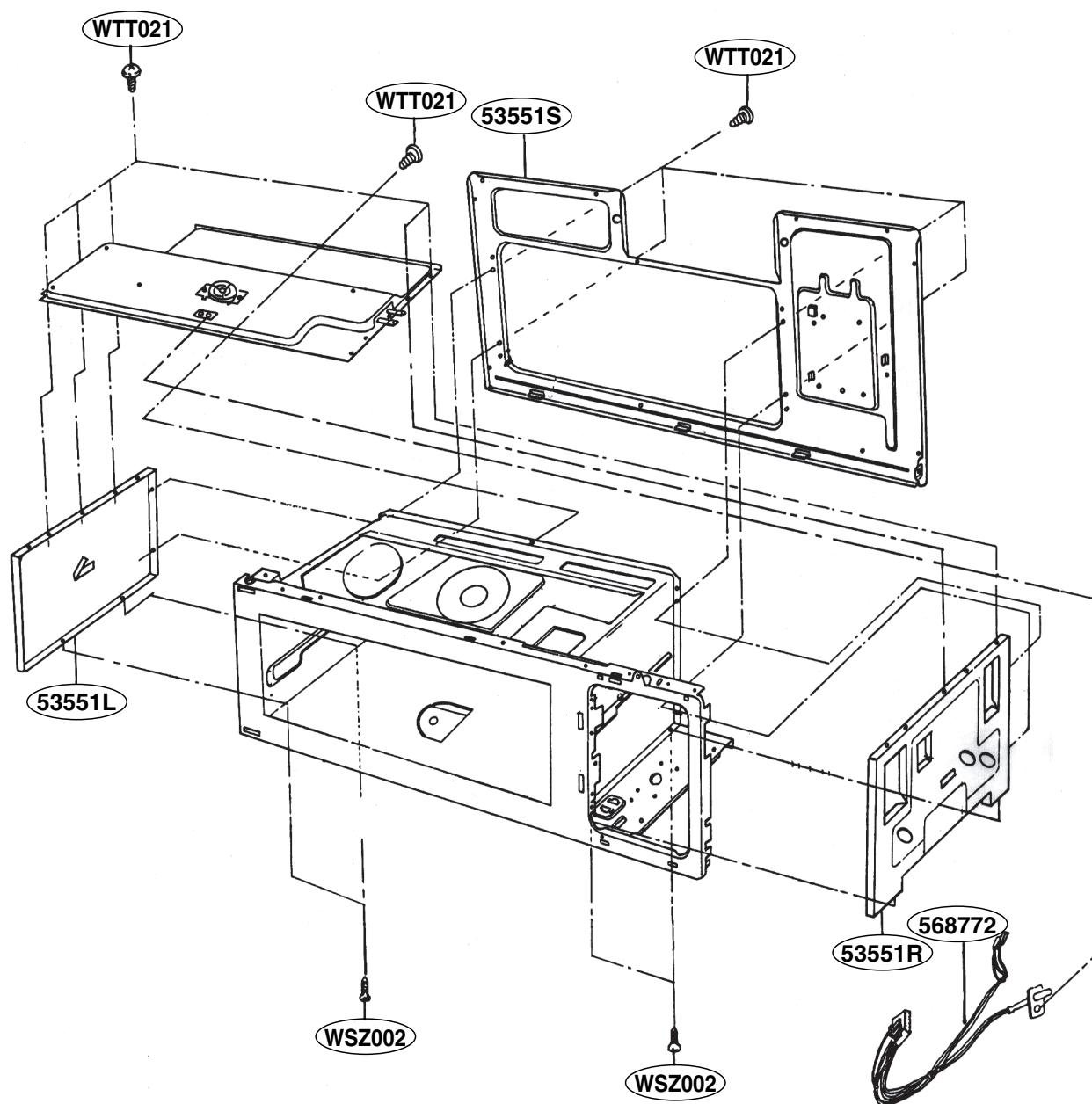
# INTERIOR PARTS( I )



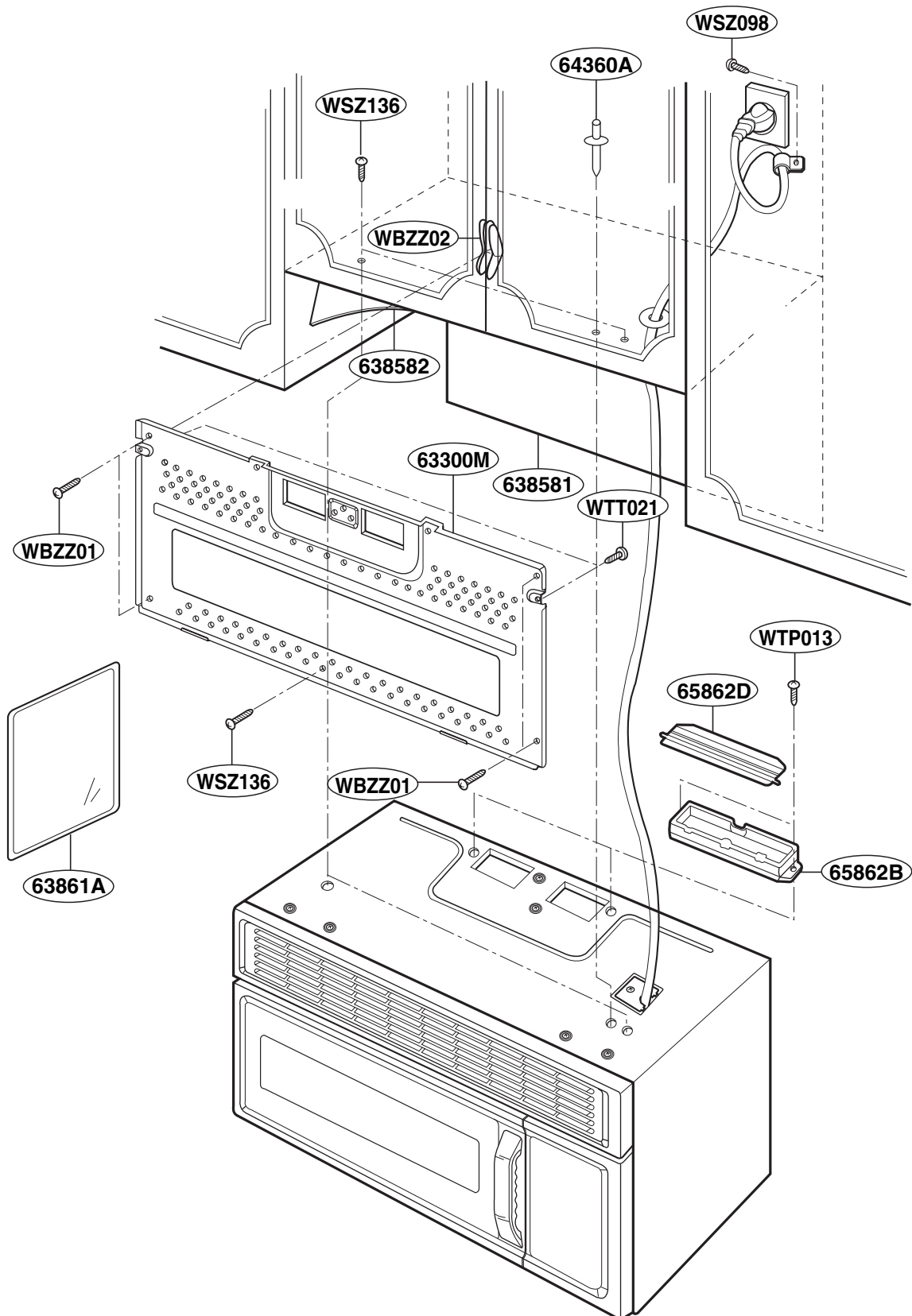
## INTERIOR PARTS( II )



## INTERIOR PARTS( III )



## INSTALLATION PARTS





# PLATE CHAMBER ASSY PARTS

