

# Technical Service Manual

## Microwave Oven



Models  
EW27M055HSA  
EW30M055HSA

 **Electrolux**



## Safe Servicing Practices

**Avoid personal injury and/or property damage by observing important Safe Servicing Practices.**

**Following are some limited examples of safe practices:**

1. DO NOT attempt a product repair if you have any doubts as to your ability to complete the repair in a safe and satisfactory manner.
2. Always Use The Correct Replacement Parts as indicated in the parts documentation. Substitutions may defeat compliance with Safety Standards Set For Home Appliances. Do not exceed maximum recommended wattage on light bulb replacements. Doing so could blow fuses and/or damage transformers.
3. Before servicing or moving an appliance:
  - Remove power cord from the electrical outlet, trip circuit breaker to the OFF position, or remove fuse.
4. Never interfere with the proper operation of any safety device.
5. Use ONLY REPLACEMENT PARTS CATALOGED FOR THIS APPLIANCE. Substitutions may defeat compliance with Safety Standards Set For Home Appliances.
6. GROUNDING: The standard color coding for safety ground wires is GREEN, or GREEN with YELLOW STRIPES. Ground leads are not to be used as current carrying conductors. It is EXTREMELY important that the service technician reestablish all safety grounds prior to completion of service. Failure to do so will create a hazard.
7. Prior to returning the product to service, ensure that:
  - All electrical connections are correct and secure.
  - All electrical leads are properly dressed and secured away from sharp edges, high-temperature components, and moving parts.
  - All non-insulated electrical terminals, connectors, heaters, etc. are adequately spaced away from all metal parts and panels.
  - All safety grounds (both internal and external) are correctly and securely connected.
  - All panels are properly and securely reassembled.

© 2008 Electrolux Home Products, Inc.

# Basic Information

---

This Manual has been prepared to provide Electrolux Service Personnel with Operation and Service Information for Electrolux Microwave Ovens EW27MO55HSA and EW30MO55HSA.

## Table of Contents

### **Section 1 Basic Information**

Safe Servicing Practices.....	1-1
Table of Contents .....	1-2
Warnings and Safety Information .....	1-3
Precautions To Be Observed Before And During Servicing To Avoid Possible Exposure To Excessive Microwave Energy.....	1-4
Before Servicing .....	1-4
Danger High Voltage .....	1-4
Before Servicing .....	1-5
Microwave Measurement Procedure USA .....	1-6
Microwave Measurement Procedure Canada .....	1-7
Product Specification.....	1-8
Grounding Instructions .....	1-9
Oven Diagram .....	1-10

### **Section 2 Operation**

Operating Sequence Description.....	2-1
Oven Schematic-Off Condition .....	2-2
Oven Schematic-Cooking Condition.....	2-2
Variable Cooking .....	2-3
Sensor Cooking Condition.....	2-3
Cooking Sequence .....	2-3
Auto Defrost Cooking .....	2-4
Component Descriptions .....	2-4
Door Sensing and Primary Interlock Switch .....	2-4
Monitor Switch.....	2-4
Third Door Switch.....	2-4
Magnetron Thermal Switch Cut-Out.....	2-5
Oven Thermal Cut-Out.....	2-5
Humidity Sensor Circuit.....	2-5

### **Section 3 Troubleshooting and Testing**

Warnings and Cautions .....	3-1
Troubleshooting Guide Chart .....	3-2
Test Procedures .....	3-3

### **Section 4 Component Teardown**

Warnings and Cautions .....	4-1
Outer Case Removal.....	4-2
Magnetron Removal .....	4-2
Power Transformer Removal.....	4-2
High Voltage Rectifier Removal.....	4-3
High Voltage Capacitor Removal .....	4-3
Turntable Motor/Coupling Removal.....	4-3
Oven Lamp and Lamp Socket Removal.....	4-3
Fan Motor Removal .....	4-4
Power Supply Cord Replacement .....	4-5
Door Sensing Switch, Primary/Third Interlock Switch and Monitor Switch Replacement .....	4-5
Door Replacement.....	4-7
Door Adjustment.....	4-8
Door Disassembly .....	4-8
Control Assembly And CPU Unit Removal.....	4-9

### **Section 5 Wire Diagrams**

Wiring Schematic Oven Off Condition .....	5-1
Pictorial Diagram .....	5-2

### **Section 6 Parts List**

Parts Listing.....	6-1
Oven And Cabinet Parts Exploded View .....	6-3
Cabinet And Frame Parts Exploded View .....	6-4
Control And Door Parts Exploded View.....	6-5
Packing and Accessories Exploded View.....	6-6

### WARNING

CERTAIN INITIAL PARTS ARE INTENTIONALLY NOT GROUNDED AND PRESENT A RISK OF ELECTRICAL SHOCK ONLY DURING SERVICING. SERVICE PERSONNEL - DO NOT CONTACT THE FOLLOWING PARTS WHILE THE APPLIANCE IS ENERGIZED:

INVERTER UNIT, THAT INCLUDES HIGH VOLTAGE CAPACITOR, HIGH VOLTAGE POWER TRANSFORMER, HIGH VOLTAGE RECTIFIER, HEAT SINK, ETC., AND MAGNETRON, HIGH VOLTAGE HARNESS ETC.; IF PROVIDED, FAN ASSEMBLY, COOLING FAN MOTOR.

ALL THE PARTS MARKED “\*” ON PARTS LIST ARE USED AT VOLTAGES MORE THAN 250V.

REMOVAL OF THE OUTER WRAPPER GIVES ACCESS TO VOLTAGE ABOVE 250V.

ALL THE PARTS MARKED “Δ” ON PARTS LIST MAY CAUSE UNDUE MICROWAVE EXPOSURE, BY THEMSELVES, OR WHEN THEY ARE DAMAGED, LOOSENED OR REMOVED.

### WARNING

THIS SERVICE MANUAL IS INTENDED FOR USE BY PERSONS HAVING ELECTRICAL AND MECHANICAL TRAINING AND A LEVEL OF KNOWLEDGE OF THESE SUBJECTS GENERALLY CONSIDERED ACCEPTABLE IN THE APPLIANCE REPAIR TRADE. ELECTROLUX HOME PRODUCTS CANNOT BE RESPONSIBLE, NOR ASSUME ANY LIABILITY, FOR INJURY OR DAMAGE OF ANY KIND ARISING FROM THE USE OF THIS MANUAL.

### 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 NO OTHER VISIBLE DAMAGE WITH THE OVEN.

SERVICING AND REPAIR WORK MUST BE CARRIED OUT ONLY BY TRAINED SERVICE PERSONNEL.

## Basic Information

---

### 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 power 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.

### Before Servicing

Before servicing an operative unit, perform a microwave emission check as per the Microwave Measurement Procedure outlined in this service manual.

If microwave emissions level is in excess of the specified limit, contact ELECTROLUX HOME PRODUCTS, INC. immediately.

If the unit operates with the door open, service person should:

- 1) Tell the user not to operate the oven.
- 2) Contact Electrolux HOME PRODUCTS, INC. and Food and Drug Administration's Center for Devices and Radiological Health immediately.

Service personnel should inform ELECTROLUX HOME PRODUCTS, INC. of any certified unit found with emissions in excess of 4mW/cm<sup>2</sup>. The owner of the unit should be instructed not to use the unit until the oven has been brought into compliance.

### DANGER HIGH VOLTAGE

Do not energize a microwave oven with the outer case cabinet removed, because a microwave oven generates high voltage in the circuit.

If you intend to operate the oven employing the high frequency switching power converter circuit, you should take special precautions to avoid an electrical shock hazard.

The high voltage transformer, high voltage capacitor and high voltage diode have energized high voltage potential of approximately 8KV.

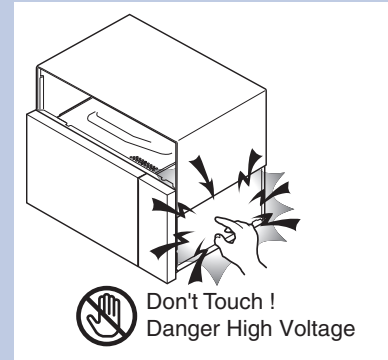
The aluminium heat sink is connected to the switching power transistor collector pole, and has an energized high voltage potential of approximately 650V peak.

**DO NOT ACCESS THE HIGH VOLTAGE TRANSFORMER, HIGH VOLTAGE CAPACITOR, HIGH VOLTAGE DIODE AND HEAT SINK WHEN THE POWER SUPPLY IS CONNECTED TO AN ELECTRICAL OUTLET.**

## **⚠ WARNING**

**MICROWAVE OVENS CONTAIN CIRCUITRY CAPABLE OF PRODUCING VERY HIGH VOLTAGE AND CURRENT. CONTACT WITH THE FOLLOWING PARTS MAY RESULT IN A SEVERE, POSSIBLY FATAL, ELECTRICAL SHOCK.**

**INVERTER UNIT, THAT INCLUDES HIGH VOLTAGE CAPACITOR, HIGH VOLTAGE POWER TRANSFORMER, HIGH VOLTAGE RECTIFIER, HEAT SINK ETC., AND MAGNETRON, HIGH VOLTAGE HARNESS ETC.. READ THE SERVICE MANUAL CAREFULLY AND FOLLOW ALL INSTRUCTIONS.**



## Before Servicing

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

## **⚠ CAUTION**

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

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

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

## When Testing Is Completed

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

## **⚠ CAUTION**

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Reconnect leads to the primary of the inverter unit.
5. Reinstall the outer case (cabinet).
6. Reconnect the power supply cord after the outer case is installed.
7. Run the oven and check all functions.

### After repairing

1. Reconnect all leads removed from components during testing.
2. Reinstall the outer case (cabinet).
3. Reconnect the power supply cord after the outer case is installed.
4. Run the oven and 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 to HIGH and then set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out Before Servicing procedure and re-examine the connections to the component being tested.

# Basic Information

---

## Microwave Measurement Procedure (USA)

### A. Requirements:

- 1) Microwave leakage limit (Power density limit): The power density of microwave radiation emitted by a microwave oven should not exceed  $1 \text{ mW/cm}^2$  at any point 5 cm or more from the external surface of the oven, measured prior to acquisition by a purchaser, and thereafter (through the useful life of the oven),  $5 \text{ mW/cm}^2$  at any point 5 cm or more from the external surface of the oven.
- 2) Safety interlock switches: Primary interlock switch shall prevent microwave radiation emission in excess of the requirement as above mentioned, secondary interlock switch shall prevent microwave radiation emission in excess of  $5 \text{ mW/cm}^2$  at any point 5 cm or more from the external surface of the oven.

### B. Preparation for testing:

Before beginning the actual measurement of leakage, proceed as follows:

- 1) Make sure that the actual instrument is operating normally as specified in its instruction booklet.  
Important:  
Survey instruments that comply with the requirement for instrumentation as prescribed by the performance standard for microwave ovens, 21 CFR 1030.10(c)(3)(i), must be used for testing.
- 2) Place the oven tray in the oven cavity.
- 3) Place the load of  $275 \pm 15 \text{ ml}$  (9.8 oz) of tap water initially at  $20 \pm 5 \text{C}$  ( $68 \text{F}$ ) in the center of the oven cavity. The water container shall be a low form of 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically nonconductive 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) Set the cooking control on Full Power Cooking Mode.
- 5) Close the door and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

### C. Leakage test:

Closed-door leakage test (microwave measurement)

- 1) Grasp the probe of the survey instrument and hold it perpendicular to the gap between the door and the body of the oven.
- 2) Move the probe slowly, not faster than 1 in./sec. (2.5 cm/sec.) along the gap, watching for the maximum indication on the meter.
- 3) Check for leakage at the door screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents). While testing for leakage around the door pull the door away from the front of the oven as far as is permitted by the closed latch assembly.
- 4) Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than  $4 \text{ mW/cm}^2$ , and that the primary interlock switch and secondary interlock switch do turn the oven OFF before any door movement.

**NOTE:** After servicing, record data on service invoice and microwave leakage report.



## Microwave Measurement Procedure (Canada)

After adjustment of the door switches are completed individually or collectively, switch test and microwave leakage test must be performed with survey instrument and test result must be confirmed to meet the requirement of the performance standard for microwave ovens as under mentioned.

### A. Requirements:

Every microwave oven shall function in such a manner that when the oven is fully assembled and operating with its service controls and user controls adjusted to yield the maximum output, the leakage radiation, at all points at least 5 cm. from the external surface of the oven, does not exceed:

- 1) 1.0 mW/cm<sup>2</sup> with the test load of 275 ± 15 ml of water at an initial temperature 20 ± 5°C.
- 2) 5.0 mW/cm<sup>2</sup> when the outer enclosure is removed with a test load of 275 ± 15 ml of water at an initial temperature 20 ± 5°C.
- 3) 5.0 mW/cm<sup>2</sup> without a test load.

### B. Preparation for testing:

Before beginning the actual measurement of leakage, proceed as follows:

- 1) Make sure that the actual instrument is operating normally as specified in its instruction booklet. Survey instruments that comply with the requirement for instrumentation as prescribed by CSA and NHW performance standard for microwave ovens must be used for testing recommended instruments are, NARDA 8100 and NARDA 8200.
- 2) Place the oven tray in the oven cavity.
- 3) Place the load of 275 ± 15 ml (9.8 oz) of tap water initially at 20 ± 5°C (68°F) in the center of oven cavity. The water container shall be a low form of a 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically nonconductive 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) Set the cooking control on Full Power Cooking Mode
- 5) Close the door and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

### C. Leakage test with enclosure installed:

- 1) Grasp probe of survey instrument and hold it perpendicular to gap between door and the body of the oven.
- 2) Move the probe slowly, not faster than 2.5 cm/sec. along the gap, watching for maximum indication on meter.
- 3) Check for leakage at the door screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents). While testing for leakage around door, pull door away from the front of the oven as far as is permitted by the closed latch assembly.
- 4) Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4 mW/cm<sup>2</sup>, and that the primary interlock switch and secondary interlock switch do turn the oven OFF before any door movement.

### D. Leakage test without enclosure:

- 1) Remove the enclosure (cabinet).
- 2) Grasp the probe of the survey instrument and hold it perpendicular to all mechanical and electric parts of the oven that is accessible to the user of the oven including, but not limited to, the waveguide, cavity seams, magnetron gap between the door and the body of the oven.
- 3) Move probe slowly, not faster than 2.5 cm/sec. along the gap, watching for the maximum indication on meter.
- 4) Measure carefully at the point of highest leakage and make sure that the highest leakage is under 5 mW/cm<sup>2</sup>.

**CAUTION: Special attention should be given to avoid electrical shock because HIGH VOLTAGE is generated during this test**

### E. No Load test

- 1) Operate the oven without a load and measure the leakage by the same method as the above test procedure "Leakage test with enclosure installed"
- 2) Make sure that the highest leakage should not exceed 5 mW/cm<sup>2</sup>.

**NOTE:** After servicing, record data on service invoice and microwave leakage report.

# Basic Information

## Product Specification

Item	Description						
Power Requirements	(USA)120 Volts / 13.7 Amperes (Canada) 117 Volts / 13.0 Amperes 60 Hertz Single phase, 3 wire grounded						
Power Output	900 watts (IEC 705 Test Procedure) Operating frequency of 2450MHz						
Case Dimensions 27" Unit Dimensions (including handle) 30" Unit Dimensions (including handle)	<table border="0"> <tr> <td>Width 27"</td> <td>Height 20-7/8"</td> <td>Depth 24-7/32"</td> </tr> <tr> <td>Width 30"</td> <td>Height 20-7/8"</td> <td>Depth 24-7/32"</td> </tr> </table>	Width 27"	Height 20-7/8"	Depth 24-7/32"	Width 30"	Height 20-7/8"	Depth 24-7/32"
Width 27"	Height 20-7/8"	Depth 24-7/32"					
Width 30"	Height 20-7/8"	Depth 24-7/32"					
Cooking Cavity Dimensions (1.5 Cubic Feet )	Width 16-5/32" Height 9-21/32" Depth 16-5/32"						
Oven Cavity Light	Yes						
Hood fan	Approx. High - 300 C.F.M. / Low - 270 C.F.M.						
Control Complement	Touch Control System Clock ( 1:00 - 12:59 ) Timer (0 - 99 min. 99 seconds) Microwave Power for Variable Cooking Repetition Rate; P-HI Full power throughout the cooking time P-90 approx. 90% of Full Power P-80 approx. 80% of Full Power P-70 approx. 70% of Full Power P-60 approx. 60% of Full Power P-50 approx. 50% of Full Power P-40 approx. 40% of Full Power P-30 approx. 30% of Full Power P-20 approx. 20% of Full Power P-10 approx. 10% of Full Power P-0 No power throughout the cooking time Auto Reheat pad, Add 30 sec pad, Popcorn pad Auto Defrost pad, Sensor Cook pad, Fresh veggies pad, Frozen veggies pad, Baked potato pad, Sensor reheat pad, User pref pad, Pizza slice pad, Beverage pad, Melt/Softens pad, Snacks pad, Number selection pads, Timer pad, Clock pad, Stop/Clear pad, Power Level pad, Start / On-Off pad						
Safety Standard	UL Listed FCC Authorized DHHS Rules, CFR, Title 21, Chapter 1, Subchapter J Canadian Standards Association Health CANADA, Industry Canada						

## Grounding Instructions

This oven is equipped with a three prong grounding plug. It must be plugged into a wall receptacle that is properly installed and grounded in accordance with the National Electrical Code, local codes and ordinances. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current.

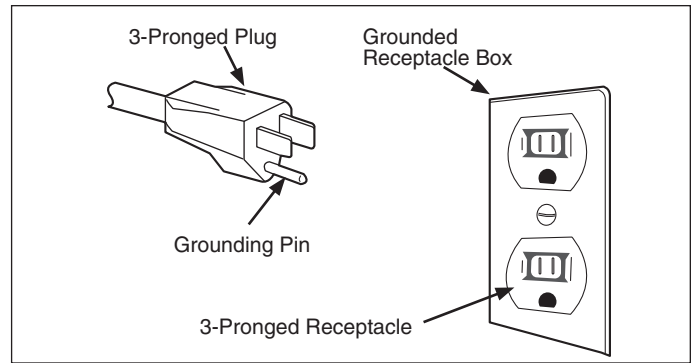
### **WARNING**

**IMPROPER USE OF THE GROUNDING PLUG CAN RESULT IN A RISK OF ELECTRIC SHOCK.**

### Electrical Requirements

The oven is equipped with a 3-prong grounding plug. **DO NOT UNDER ANY CIRCUMSTANCES CUT OR REMOVE THE GROUNDING PIN FROM THE PLUG.** The power supply cord and plug must be connected to a separate 120 Volt AC, 60 Hz, 15 Amp. or more dedicated line, using a grounded receptacle. When installing this appliance, observe all applicable codes and ordinances. A short power-supply cord is provided to reduce risks of becoming entangled in or tripping over a longer cord. Where a two-pronged wall-receptacle is encountered, it is the personal responsibility and obligation of the customer to contact a qualified electrician and have it replaced with a properly grounded three-pronged wall receptacle or have a grounding adapter properly grounded and polarized.

If an extension cord must be used, it should be a 3-wire, 15 amp. or more cord. Do not drape over a countertop or table where it can be pulled on by children or tripped over accidentally.

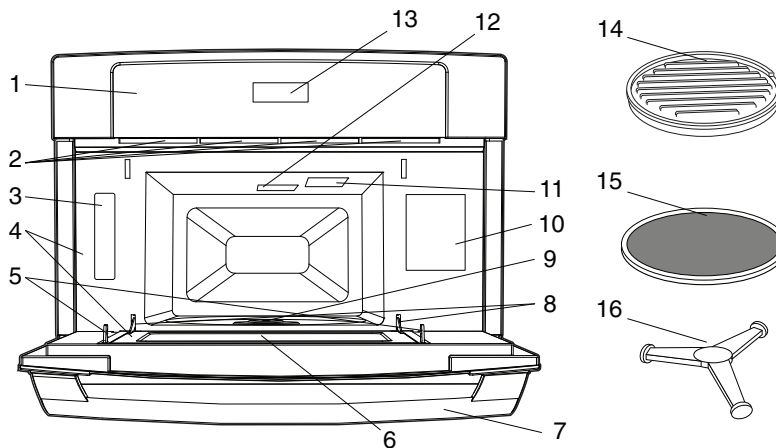


# Basic Information

## Oven Diagram

1. Control panel
2. Ventilation openings
3. Model / Serial label
4. Door seals and sealing surfaces
5. Safety door latches - The oven will not operate unless the door is securely closed.
6. Oven door with see-through window
7. Door handle
8. Door hinges
9. Turntable motor shaft
10. Menu label
11. Oven light - It will light when oven is operating or door is open.
12. Waveguide cover: DO NOT REMOVE.
13. Time display: 99 minutes, 99 seconds
14. Popcorn/Bacon Tray
15. Removable turntable - Place the turntable on the turntable support securely. The turntable will rotate clockwise or counterclockwise. Only remove for cleaning.
16. Removable turntable support - Carefully place the turntable support in the center of the oven floor.

OVEN DIAGRAM



TOUCH CONTROL PANEL



## Operating Sequence Description

The following is a description of component functions during oven operation.

### OFF CONDITION

Closing the door activates the stop switch, primary interlock switch and secondary interlock switch. (In this condition, the monitor switch contacts are opened.) When oven is plugged in, 117 volts AC is supplied to the control unit. (Figure 2-1).

1. The display will show "Enjoy your oven, press clear and press clock". To set any program or set the clock, you must first touch the STOP/CLEAR button. The display will clear, and " : " appears.

**NOTE:** When door is opened, the oven lamp comes on.

### COOKING CONDITION

Program desired cooking time touching the NUMBER pads. When the START button is touched, the following operations occur:

1. The contacts of relays are closed and components connected to the relays are turned on as follows. (For details, refer to Figure 2-2)

#### RELAY CONNECTED COMPONENTS

<u>RY1</u>	<u>Oven lamp / Turntable motor</u>
<u>RY2</u>	<u>Power Transformer</u>
<u>RY3</u>	<u>Fan motor</u>

2. 117 volts AC is supplied to the primary winding of the power transformer and is converted to about 3.0 volts AC output on the filament winding, and approximately 2360 volts AC on the high voltage winding.
3. The filament winding voltage heats the magnetron filament and the H.V. winding voltage is sent to a voltage doubler circuit.
4. The microwave energy produced by the magnetron is channeled through the waveguide into the cavity feedbox, and then into the cavity where the food is placed to be cooked.
5. Upon completion of the cooking time, the power transformer, oven lamp, etc. are turned off, and the generation of microwave energy is stopped. The oven will revert to the OFF condition.

6. When the door is opened during a cook cycle, third door switch, monitor switch, door sensing switch, the secondary interlock relay and the primary interlock switch are activated with the following results. The circuits to the turntable motor, the cooling fan motor, and the high voltage components are de-energized, the oven lamp remains on, and the digital read-out displays the time still remaining in the cook cycle when the door was opened.

7. The monitor switch is electrically monitoring the operation of the secondary interlock switch and primary interlock switch and is mechanically associated with the door so that it will function in the following sequence.

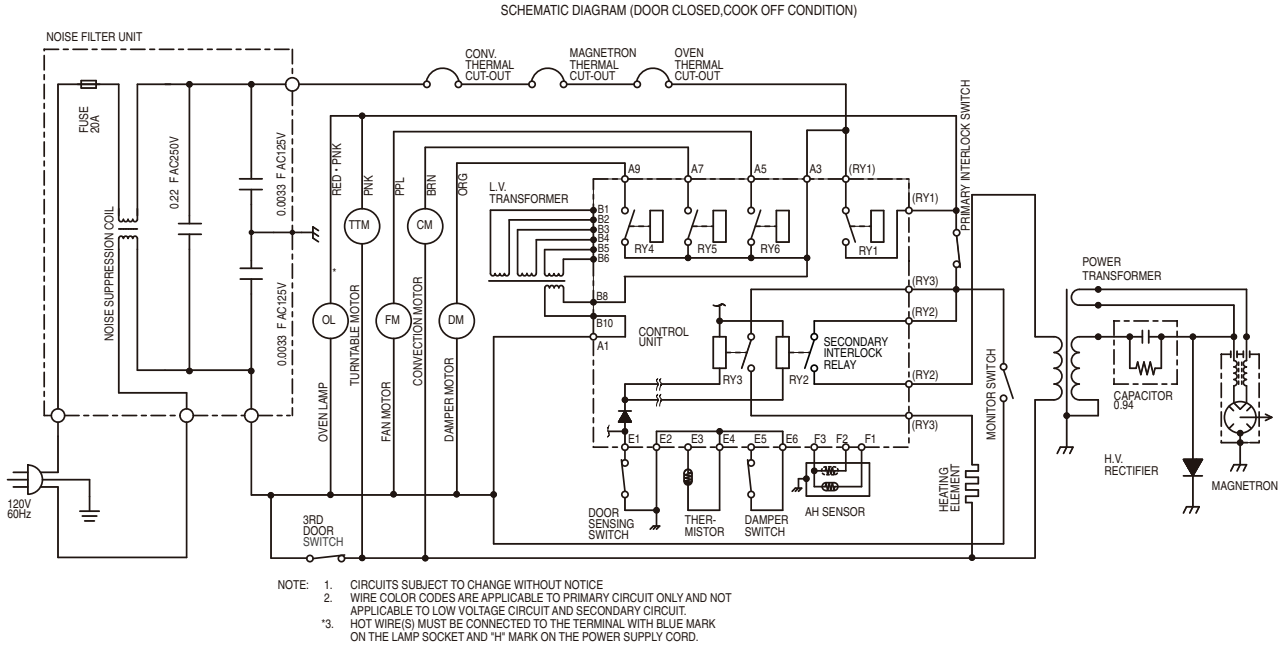
(1) When the door opens from a closed position, the primary interlock switch and secondary interlock switch open their contacts, and then the monitor switch contacts close.

(2) When the door is closed from the open position, the monitor switch contacts open first. Then the contacts of the secondary interlock switch and door sensing switch close.

If relay (RY1) and the primary interlock switch fail with their contacts closed when the door is opened, the closing of the monitor switch contacts will form a short circuit through the monitor fuse, the relay (RY1) and the primary interlock switch, causing the monitor fuse to blow.

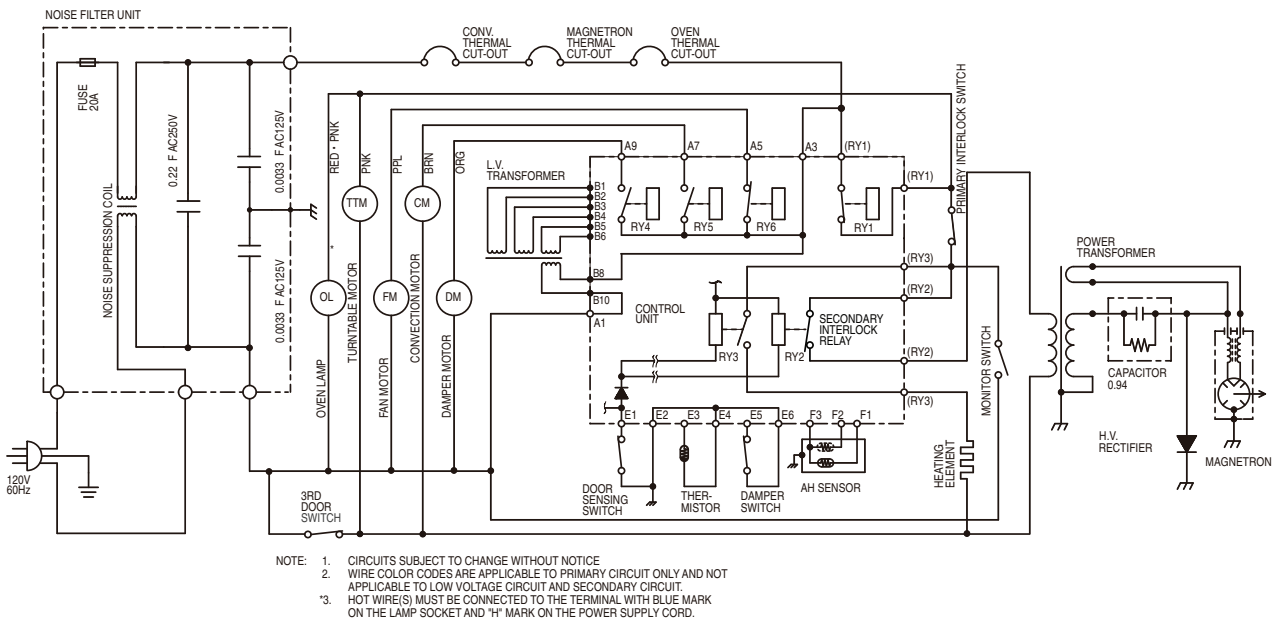
## SCHEMATIC DIAGRAM

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



**Figure 2-1. Oven Off Condition**

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



**Figure 2-2. Oven ON (Cooking) Condition**

## Variable Cooking

When Variable Cooking Power is programmed, the 120 volts AC is supplied to the power transformer intermittently through the contacts of relay (RY2) which is operated by the control unit within an interval second time base. Microwave power operation is as follows:

Vari-Mode	ON TIME	OFF TIME
Power 10 (High) (100% Power)	32 sec.	0 sec.
Power9(P-90) (Approx. 90%)	30 sec.	2 sec.
Power8(P-80) (Approx. 80%)	26 sec.	6 sec.
Power7(P-70) (Approx. 70%)	24 sec.	8 sec.
Power6(P-60) (Approx. 60%)	22 sec.	10 sec.
Power5(P-50) (Approx. 50%)	18 sec.	14 sec.
Power4(P-40) (Approx. 40%)	16 sec.	16 sec.
Power3(P-30) (Approx. 30%)	12 sec.	20 sec.
Power2(P-20) (Approx. 20%)	8 sec.	24 sec.
Power1(P-10) (Approx. 10%)	6 sec.	26 sec.
Power0(P-0) (0% power)	0 sec.	32 sec.

### NOTE

The ON/OFF time ratio does not correspond with the percentage of microwave power, because approx. 2 seconds are needed for heating of the magnetron filament.

### SENSOR COOKING CONDITION

Using the SENSOR COOK function, the foods are cooked without figuring time, power level or quantity. When the oven senses enough steam from the food, it relays the information to its microprocessor which will calculate the remaining cooking time and power level needed for best results.

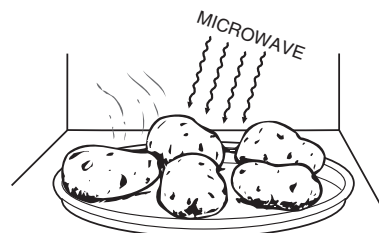
When food is cooked, water vapor is developed. The sensor "senses" the vapor and its resistance increases gradually. When the resistance reaches the value set according to the menu, supplementary cooking is started. The time of supplementary cooking is determined by experiment with each food category and inputted into the LSI.

An example of how the sensor works:  
(BAKED POTATOES)

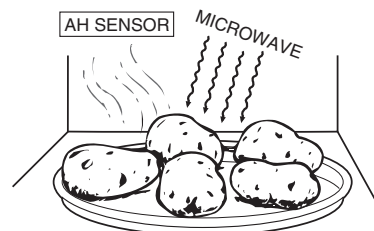
1. Potatoes at room temperature. Vapor is emitted very slowly.



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



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



### COOKING SEQUENCE

1. Touch SENSOR COOK pad.

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

2. Select desired Sensor setting. Touch START pad. The coil of shut-off relay (RY1, RY6) is energized, the oven lamp and cooling fan motor are turned on, but the power transformer is not turned on.
3. After about 16 seconds, the cook relay (RY2) is energized. The power transformer is turned on, microwave energy is produced and first stage is started. The 16 seconds is the cooling time required to remove any vapor from the oven cavity and sensor.

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

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

# Operation

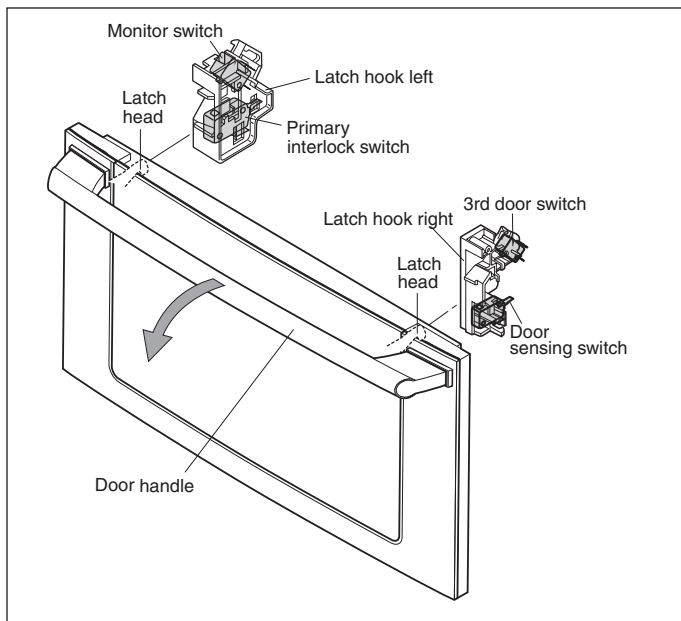
## AUTO DEFROST COOKING

The AUTO DEFROST key is a special function key to defrost meats and poultry faster and better. AUTO DEFROST automatically defrosts roast beef, chicken etc.. When the AUTO DEFROST is selected and the food weight is entered by using the AUTO DEFROST pad, the oven will cook according to the special cooking sequence.

## Component Descriptions

### DOOR SENSING AND PRIMARY INTERLOCK SWITCH

The door sensing switch, in the third door switch system is mounted on the right latch hook. The primary and monitor interlock switch is mounted on the left latch hook. They are activated by the latch heads on the door. When the door is opened, the switches interrupt the circuit to all components. A cook cycle cannot take place until the door is firmly closed, thereby activating both interlock switches. The third door switch system consists of the door sensing switch and secondary interlock relay located on the control circuit board.



**Figure 2-3. Door Sensing Switch, Monitor Switch, Third Door Switch And Primary Interlock Switch**

## MONITOR SWITCH

The monitor switch is mounted on the middle position of latch hook. It is activated (the contacts opened) by the lower latch head while the door is closed. The switch is intended to render the oven inoperative by means of blowing the monitor fuse when the contacts of the relay RY1 and primary interlock switch fail to open when the door is opened.

Functions:

1. When the door is opened, the monitor switch contacts close (to the ON condition) due to their being normally closed. At this time, the door sensing and primary interlock and third door switches are in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch contacts are first opened and then the door sensing switch, third door switch and the primary interlock switch contacts close. (On opening the door, each of these switches operate inversely.)
3. If the door is opened, and the relay RY1 and the primary interlock switch contacts fail to open, the monitor fuse blows simultaneously with closing of the monitor switch contacts.

### ⚠ CAUTION

Before replacing a blown monitor fuse, test the door sensing switch, primary interlock switch, Relay (RY1) and monitor switch for proper operation.

### 📄 NOTE

Monitor fuse and switch are replaced as an assembly.

## THIRD DOOR SWITCH

The switch is activated by the latch heads, while the door is closed. When the door is opened, the switch interrupts the circuit to the power transformer. This switch prevents power transformer engaging and microwave when the door opened.



## MAGNETRON THERMAL CUT-OUT

The thermal cut-out, located on the waveguide, is designed to prevent damage to the magnetron if an over heated condition develops in the magnetron due to cooling fan failure, obstructed air guide, dirty or blocked air intake, etc.

Under normal operation, the thermal cut-out remains closed. However, when abnormally high temperatures are reached within the magnetron, the thermal cut-out will open at 257°F (125°C) causing the oven to shut down. The magnetron thermal cut-out is not reset at room temperature.

## OVEN THERMAL CUT-OUT

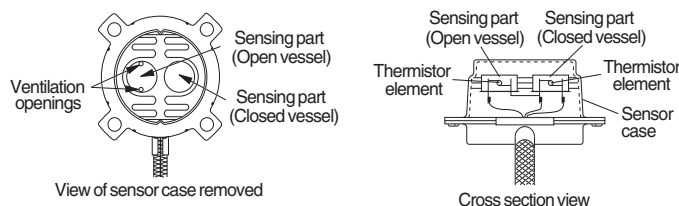
The thermal cut-out, located on the side of the steam duct, is designed to prevent damage to the unit if foods in the oven catch fire due to over heating produced by improper setting of cooking time or failure of control unit.

Under normal operation, the thermal cut-out remains closed. However, when abnormally high temperatures are reached within the oven cavity, the thermal cut-out will open at 302°F (150°C) causing the oven to shut down. When the thermal cut-out has cooled, the thermal cut-out closes at 266°F (130°C)

## Humidity Sensor Circuit

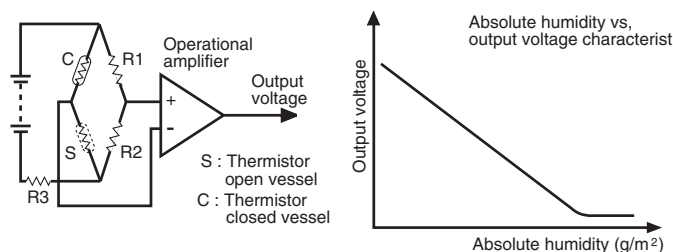
### (1) Structure of Absolute Humidity Sensor:

The absolute humidity sensor includes two thermistors as shown in the illustration. One thermistor is housed in the closed vessel filled with dry air while another in the open vessel. Each sensor is provided with the protective cover made of metal mesh to be protected from the external airflow.



### (2) Operational Principle of Absolute Humidity Sensor:

The figure below shows the basic structure of an absolute humidity sensor. A bridge circuit is formed by two thermistors and two resistors (R1 and R2). The output of the bridge circuit is to be amplified by the operational amplifier. Each thermistor is supplied with a current to keep it heated at about 150°C (302°F), the resultant heat is dissipated in the air and if the two thermistors are placed in different humidity conditions they show different degrees of heat conductivity leading to a potential difference between them, causing an output voltage from the bridge circuit, the intensity of which is increased as the absolute humidity of the air increases. Since the output is very minute, it is amplified by the operational amplifier.



# Operation

## (3) Detector Circuit of Absolute Humidity Sensor Circuit:

This detector circuit is used to detect the output voltage of the absolute humidity circuit to allow the LSI to control sensor cooking of the unit. When the unit is set in the sensor cooking mode, 16 seconds clearing cycle occurs then the detector circuit starts to function and the LSI observes the initial voltage available at its AN6 terminal.

With this voltage given, the switches SW1 to SW5 in the LSI are turned on in such a way as to change the resistance values in parallel with R50-1. Changing the resistance values results in that there is the same potential at both F-3 terminal of the absolute humidity sensor and AN7 terminal of the LSI. The voltage of AN6 terminal will indicate about -2.5V.

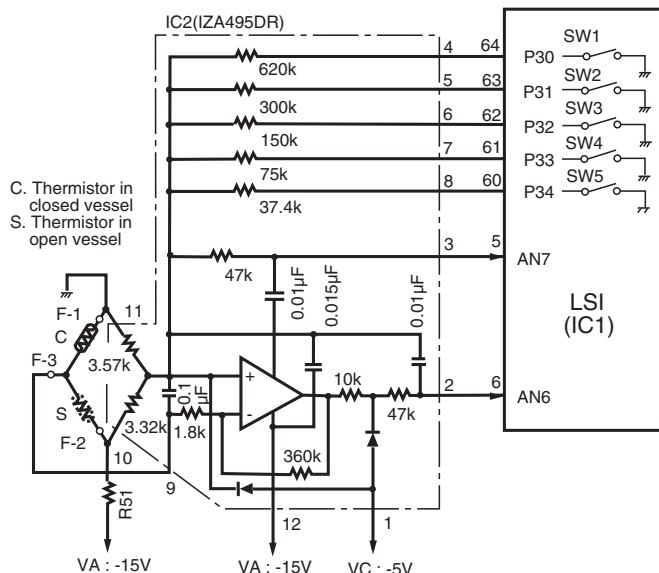
This initial balancing is set up about 16 seconds after the unit is put in the Sensor Cooking mode.

As the sensor cooking proceeds, the food is heated to generate moisture by which the resistance balance of the bridge circuit is deviated to increase the voltage available at AN6 terminal of the LSI.

Then the LSI observes that voltage at AN6 terminal and compares it with its initial value, and when the comparison rate reaches the preset value (fixed for each menu to be cooked), the LSI causes the unit to stop sensor cooking; thereafter, the unit goes in the next operation automatically.

When the LSI starts to detect the initial voltage at AN6 terminal 16 seconds after the unit has been put in the Sensor Cooking mode, if it is not possible to balance, of the bridge circuit due to disconnection of the absolute humidity sensor, ERROR will appear on the display and the cooking is stopped.

## 1) Humidity sensor circuit:



## Troubleshooting Guide

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

### CAUTION

If the oven becomes inoperative because of a blown monitor fuse, check the monitor switch, relay (RY1) primary interlock relay (RY2), door sensing switch and secondary interlock switch before replacing the monitor fuse. If the monitor fuse is replaced, the monitor switch must also be replaced. Use part FFS-BA037WRKZ as an assembly.

### WARNING

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

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. To discharge high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.
4. Disconnect the leads to the primary of the power transformer.
5. Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, reconnect the power supply cord.

### WARNING

When the testing is completed:

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. To discharge high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.
4. Reconnect the leads to the primary of the power transformer.
5. Reinstall the outer case (cabinet).
6. Reconnect the power supply cord after the outer case is installed.
7. Run the oven and 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 to HIGH and then set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out Before Servicing procedure and re-examine the connections to the component being tested.

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


# Troubleshooting and Testing

TEST PROCEDURE	CONDITION	OFF CONDITION				COOKING CONDITION				(MICROWAVE)				
	PROBLEM	Home fuse blows when power cord is plugged into wall receptacle.	Monitor fuse blows when power cord is plugged into wall receptacle	"ENJOY" does not appear in display when power cord is first plugged into wall receptacle.	Display does not operate properly when STOP/CLEAR pad is touched. (The time of day should appear on the display with beep sound.)	Oven lamp does not light with door opened.	Oven lamp does not light in cook cycle. (It lights when door is opened).	Cooking cycle runs 1 minute then shuts down.	Oven lamp lights, but turntable motor does not operate.	Turntable motor operates normally but cooling fan motor does not operate.	Oven does not go into a cook cycle, when START pad is touched.	Low or no power is produced during microwave cooking (The food is heated incompletely or not heated at all)	Extremely uneven heating is produced in oven load (food).	Function of sensor cooking does not operate properly except HIGH power.
POSSIBLE CAUSE AND DEFECTIVE PARTS														
A	MAGNETRON													
B	POWER TRANSFORMER													
C	H.V. RECTIFIER ASSEMBLY													
D	HIGH VOLTAGE CAPACITOR													
E	PRIMARY INTERLOCK SWITCH													
F	SECONDARY INTERLOCK SYSTEM													
G	MONITOR SWITCH													
H	MONITOR FUSE													
E	THIRD DOOR SWITCH													
I	THERMAL CUT-OUT													
K	TOUCH CONTROL PANEL													
K	KEY UNIT													
L	RELAY RY-1													
L	RELAY RY-2													
	RELAY RY-3 (not used)													
	RELAY RY-5 (not used)													
L	RELAY RY-6													
N	FOIL PATTERN ON PWB.													
O	AH SENSOR													
Replace	OVEN LAMP OR SOCKET													
Replace	FAN MOTOR													
Replace	TURNTABLE MOTOR													
Check	LOOSE WIRING													
Check	SHORTED IN POWER CORD													
Check	NO POWER AT OUTLET													
Check	LOW VOLTAGE													
O	NOISE FILTER													

## Test Procedures

Procedure Letter	Component Test
A	<p data-bbox="337 352 740 384">MAGNETRON ASSEMBLY TEST</p> <div data-bbox="342 407 1507 621" style="background-color: #e6f2ff; padding: 5px;"> <p data-bbox="354 415 561 449"> <b>WARNING</b></p> <p data-bbox="354 478 1450 609"><b>HIGH VOLTAGES ARE PRESENT DURING THE COOK CYCLE, SO EXTREME CAUTION SHOULD BE OBSERVED. DISCHARGE THE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENTS OR WIRING.</b></p> </div> <p data-bbox="337 659 1507 722">To test for an open filament, isolate the magnetron from the high voltage circuit. A continuity check across the magnetron filament leads should indicate less than 1 ohm.</p> <p data-bbox="337 743 1523 840">To test for a shorted magnetron, connect the ohmmeter leads between the magnetron filament leads and chassis ground. This test should indicate an infinite resistance. If there is little or no resistance the magnetron is grounded and must be replaced.</p> <p data-bbox="337 861 1507 1058">Power output of the magnetron can be measured by performing a water temperature rise test. This test should only be used if above tests do not indicate a faulty magnetron and there is no defect in the following components or wiring: silicon rectifier, high voltage capacitor and power transformer. This test will require a 16 ounce (453cc) measuring cup and an accurate mercury thermometer or thermocouple type temperature tester. For accurate results, the following procedure must be followed carefully:</p> <ol data-bbox="337 1079 1528 1671" style="list-style-type: none"> <li data-bbox="337 1079 1528 1176">1. Fill the measuring cup with 16 oz. (453cc) of tap water and measure the temperature of the water with a thermometer or thermocouple temperature tester. Stir the thermometer or thermocouple through the water until the temperature stabilizes. Record the temperature of the water.</li> <li data-bbox="337 1184 1528 1281">2. Place the cup of water in the oven. Operate oven at POWER HI(HIGH) selecting more than 60 seconds cook time. Allow the water to heat for 60 seconds, measuring with a stop watch, second hand of a watch or the digital read-out countdown.</li> <li data-bbox="337 1289 1528 1352">3. Remove the cup from the oven and again measure the temperature, making sure to stir the thermometer or thermocouple through the water until the maximum temperature is recorded.</li> <li data-bbox="337 1360 1528 1671">4. Subtract the cold water temperature from the hot water temperature. The normal result should be 22 to 43°F (12.2 to 23.8°C) rise in temperature. If the water temperatures are accurately measured and tested for the required time period the test results will indicate if the magnetron tube has low power output (low rise in water temperature) which would extend cooking time or high power output (high rise in water temperature) which would reduce cooking time. Because cooking time can be adjusted to compensate for power output, the magnetron tube assembly should be replaced only if the water temperature rise test indicates a power output well beyond the normal limits. The test is only accurate if the power supply line voltage is 117 volts and the oven cavity is clean.</li> </ol>

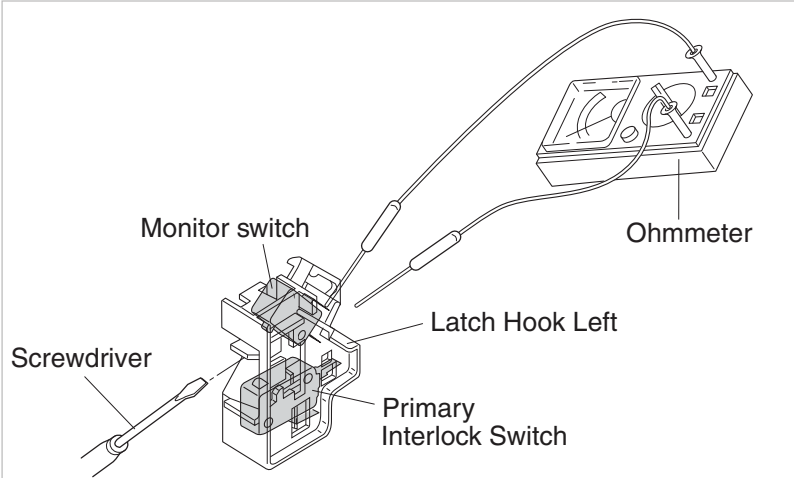
# Troubleshooting and Testing

Procedure Letter	Component Test
<b>B</b>	<p><b>POWER TRANSFORMER TEST</b></p> <p> <b>WARNING</b></p> <p><b>DO NOT TOUCH THE COMPONENTS OF THE POWER TRANSFORMER WHILE POWER TRANSFORMER IS ENERGIZED. IT IS DANGEROUS BECAUSE THIS HAS HIGH VOLTAGE COMPONENTS. (HIGH VOLTAGES ARE PRESENT AT THE HIGH VOLTAGE TERMINAL, SO DO NOT ATTEMPT TO MEASURE THE FILAMENT AND HIGH VOLTAGE.)</b></p> <ol style="list-style-type: none"><li>1. Disconnect the power supply cord, and then remove outer case.</li><li>2. Open the door and block it open.</li><li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li><li>4. Disconnect the primary input terminals and measure the resistance of the transformer with an ohmmeter. Check for continuity of the coils with an ohmmeter. On R x 1 scale, the resistance of the primary coil should be less than 1 ohm and the resistance of the high voltage coil should be approximately 84.4 ohms; the resistance of filament coil should be less than 1 ohm.</li><li>5. Reconnect all leads removed from components during testing.</li><li>6. Reinstall the outer case (cabinet).</li><li>7. Reconnect the power supply cord after the outer case is installed.</li><li>8. Run the oven and check all functions.</li></ol>
<b>C</b>	<p><b>HIGH VOLTAGE RECTIFIER TEST</b></p> <ol style="list-style-type: none"><li>1. Disconnect the power supply cord, and then remove outer case.</li><li>2. Open the door and block it open.</li><li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li><li>4. Isolate the rectifier from the circuit. Using the highest ohm scale of the meter, read the resistance across the terminals and observe, reverse the leads to the rectifier terminals and observe meter reading. If a short is indicated in both directions, or if an infinite resistance is read in both directions, the rectifier is probably defective and should be replaced.</li><li>5. Reconnect all leads removed from components during testing.</li><li>6. Reinstall the outer case (cabinet).</li><li>7. Reconnect the power supply cord after the outer case is installed.</li><li>8. Run the oven and check all functions.</li></ol> <p><b>NOTE:</b> Be sure to use an ohmmeter that will supply a forward bias voltage of more than 6.3 volts.</p>

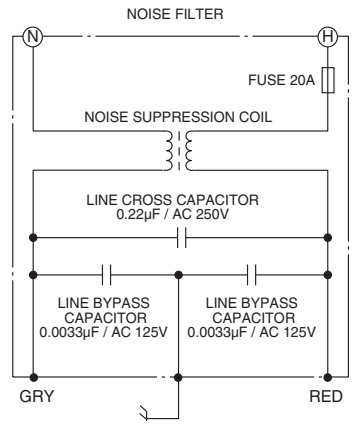
# Troubleshooting and Testing

Procedure Letter	Component Test
<p style="text-align: center;"><b>D</b></p>	<p><b>HIGH VOLTAGE CAPACITOR TEST</b></p> <ol style="list-style-type: none"> <li>1. Disconnect the power supply cord, and then remove outer case.</li> <li>2. Open the door and block it open.</li> <li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li> <li>4. If the capacitor is open, no high voltage will be available to the magnetron. Disconnect input leads and check for short or open between the terminals using an ohmmeter. Checking with a high ohm scale, if the high voltage capacitor is normal, the meter will indicate continuity for a short time and should indicate approximately 10 MΩ once the capacitor is charged. If the above is not the case, check the capacitor with an ohmmeter to see if it is shorted between either of the terminals and case. If it is shorted, replace the capacitor.</li> <li>5. Reconnect all leads removed from components during testing.</li> <li>6. Reinstall the outer case (cabinet).</li> <li>7. Reconnect the power supply cord after the outer case is installed.</li> <li>8. Run the oven and check all functions.</li> </ol>
<p style="text-align: center;"><b>E</b></p>	<p><b>PRIMARY INTERLOCK SWITCH AND THIRD DOOR SWITCH TEST</b></p> <ol style="list-style-type: none"> <li>1. Disconnect the power supply cord, and then remove outer case.</li> <li>2. Open the door and block it open.</li> <li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li> <li>4. Isolate the switch and connect the ohmmeter to the common (COM.) and normally open (NO) terminal of the switch. The meter should indicated an open circuit with the door open and a closed circuit with the door closed. If improper operation is indicated, replace the switch.</li> <li>5. Reconnect all leads removed from components during testing.</li> <li>6. Reinstall the outer case (cabinet).</li> <li>7. Reconnect the power supply cord after the outer case is installed.</li> <li>8. Run the oven and check all functions.</li> </ol>
<p style="text-align: center;"><b>F</b></p>	<p><b>SECONDARY INTERLOCK SYSTEM TEST</b></p> <p><b>DOOR SENSING SWITCH</b></p> <ol style="list-style-type: none"> <li>1. Disconnect the power supply cord, and then remove outer case.</li> <li>2. Open the door and block it open.</li> <li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li> <li>4. Isolate the switch and connect the ohmmeter to the common (COM.) and normally open (NO) terminal of the switch. The meter should indicate an open circuit with the door open and a closed circuit with the door closed. If improper operation is indicated, replace the door sensing switch.</li> <li>5. Reconnect all leads removed from components during testing.</li> <li>6. Reinstall the outer case (cabinet).</li> <li>7. Reconnect the power supply cord after the outer case is installed.</li> <li>8. Run the oven and check all functions.</li> </ol>


# Troubleshooting and Testing

Procedure Letter	Component Test
F	<p><b>SECONDARY INTERLOCK RELAY</b></p> <ol style="list-style-type: none"><li>1. Disconnect the power supply cord, and then remove outer case.</li><li>2. Open the door and block it open.</li><li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li><li>4. Disconnect two (2) wire leads from the tab terminal of the secondary interlock relay (RY2). Check the state of the relay contacts using a ohmmeter. The relay contacts should be open. If the relay contacts are closed, replace the circuit board entirely or the relay itself.</li><li>5. Reconnect all leads removed from components during testing.</li><li>6. Reinstall the outer case (cabinet).</li><li>7. Reconnect the power supply cord after the outer case is installed.</li><li>8. Run the oven and check all functions.</li></ol>
G	<p><b>MONITOR SWITCH TEST</b></p> <ol style="list-style-type: none"><li>1. Disconnect the power supply cord, and then remove outer case.</li><li>2. Open the door and block it open.</li><li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li><li>4. Before performing this test, make sure that the secondary interlock relay and the primary interlock switch are operating properly, according to the above Test Procedure. Disconnect the wire lead from the monitor switch (NC) terminal. Check the monitor switch operation by using the ohmmeter as follows. When the door is open, the meter should indicate a closed circuit. When the monitor switch actuator is pushed by a screwdriver through the lower latch hole on the front plate of the oven cavity with the door opened (in this condition the plunger of the monitor switch is pushed in), the meter should indicate an open circuit. If improper operation is indicated, the switch may be defective. After testing the monitor switch, reconnect the wire lead to the monitor switch (NC) terminal and check the continuity of the monitor circuit.</li><li>5. Reconnect all leads removed from components during testing.</li><li>6. Reinstall the outer case (cabinet).</li><li>7. Reconnect the power supply cord after the outer case is installed.</li><li>8. Run the oven and check all functions.</li></ol> 



Procedure Letter	Component Test								
<b>H</b>	<p><b>BLOWN MONITOR FUSE TEST</b></p> <ol style="list-style-type: none"> <li>1. Disconnect the power supply cord, and then remove outer case.</li> <li>2. Open the door and block it open.</li> <li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li> <li>4. If the monitor fuse is blown when the door is opened, check the primary interlock switch, door sensing relay (RY1), and monitor switch according to the “TEST PROCEDURE” for those switches before replacing the blown monitor fuse.</li> </ol> <div style="background-color: #e0e0e0; padding: 5px; margin: 10px 0;"> <p><b>⚠ CAUTION</b></p> <p><b>If the monitor fuse is blown by improper switch operation, the monitor fuse and switch must be replaced with “monitor fuse and switch assembly” part number FFS-BA012WRK0, even if the monitor switch operates normally. The monitor fuse and switch assembly is packed with 20 ampere fuse and switch.</b></p> </div> <ol style="list-style-type: none"> <li>5. Reconnect all leads removed from components during testing.</li> <li>6. Reinstall the outer case (cabinet).</li> <li>7. Reconnect the power supply cord after the outer case is installed.</li> <li>8. Run the oven and check all functions.</li> </ol>								
<b>I</b>	<p><b>OVEN THERMAL CUT-OUT (on the side of steam duct)</b></p> <ol style="list-style-type: none"> <li>1. Disconnect the power supply cord, and then remove outer case.</li> <li>2. Open the door and block it open.</li> <li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li> <li>4. A continuity check across the thermal cut-out terminals should indicate a closed circuit unless the temperature of the thermal cut-out reaches approximately 302°F (150°C). The thermal cut-out reset automatically at approximately 266°F (130°C). If the thermal cut-out has operated under the normal condition, replace the thermal cut-out. An open thermal cut-out indicates overheating of the oven cavity.</li> <li>5. Reconnect all leads removed from components during testing.</li> <li>6. Reinstall the outer case (cabinet).</li> <li>7. Reconnect the power supply cord after the outer case is installed.</li> <li>8. Run the oven and check all functions.</li> </ol>								
<b>J</b>	<p><b>NOISE FILTER TEST</b></p> <ol style="list-style-type: none"> <li>1. Disconnect power supply cord, and remove outer case.</li> <li>2. Open the door and block it open.</li> <li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li> <li>4. Disconnect the leads to the primary of the power transformer.</li> <li>5. Using an ohmmeter, check between the terminals as described in the table below. If incorrect readings are obtained, replace the noise filter.</li> <li>6. Reconnect all leads removed from components during testing.</li> <li>7. Reinstall the outer case (cabinet).</li> <li>8. Reconnect power supply cord after the outer case is installed.</li> <li>9. Run oven and check all functions.</li> </ol> <div style="text-align: right; margin-top: 20px;">  </div> <table border="1" style="width: 100%; margin-top: 10px; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">MEASURING POINT</th> <th style="text-align: center;">INDICATION OF OHMMETER</th> </tr> </thead> <tbody> <tr> <td>Between N and H</td> <td>Open circuit.</td> </tr> <tr> <td>Between terminal N and GRAY</td> <td>Short circuit.</td> </tr> <tr> <td>Between terminal H and RED</td> <td>Short circuit.</td> </tr> </tbody> </table>	MEASURING POINT	INDICATION OF OHMMETER	Between N and H	Open circuit.	Between terminal N and GRAY	Short circuit.	Between terminal H and RED	Short circuit.
MEASURING POINT	INDICATION OF OHMMETER								
Between N and H	Open circuit.								
Between terminal N and GRAY	Short circuit.								
Between terminal H and RED	Short circuit.								

# Troubleshooting and Testing

Procedure Letter	Component Test
K	<p><b>TOUCH CONTROL PANEL ASSEMBLY TEST</b></p> <p>The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter.</p> <p>In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit and troubleshooting by unit replacement is described according to the symptoms indicated.</p> <p><b>1. Key Unit</b></p> <p><b>Note : Check key unit ribbon connection before replacement.</b></p> <p>The following symptoms indicate a defective key unit. Replace the key unit.</p> <ul style="list-style-type: none"><li>a) When touching the pads, a certain pad produces no signal at all.</li><li>b) When touching a number pad, two figures or more are displayed.</li><li>c) When touching the pads, sometimes a pad produces no signal.</li></ul> <p><b>2. Control Unit.</b></p> <p>The following symptoms indicate a defective control unit. Replace the control unit.</p> <p>2-1 In connection with pads.</p> <ul style="list-style-type: none"><li>a) When touching the pads, a certain group of pads do not produce a signal.</li><li>b) When touching the pads, no pads produce a signal.</li></ul> <p>2-2 In connection with indicators</p> <ul style="list-style-type: none"><li>a) At a certain digit, all or some segments do not light up.</li><li>b) At a certain digit, brightness is low.</li><li>c) Only one indicator does not light.</li><li>d) The corresponding segments of all digits do not light up; or they continue to light up.</li><li>e) Wrong figure appears.</li><li>f) A certain group of indicators do not light up.</li><li>g) All digits in the figure flicker.</li></ul> <p>2-3 Other possible troubles caused by defective control unit.</p> <ul style="list-style-type: none"><li>a) Buzzer does not sound or continues to sound.</li><li>b) Clock does not operate properly.</li><li>c) Cooking is not possible.</li><li>d) Proper temperature measurement is not obtained.</li></ul> <p> <b>NOTE</b></p> <p><b>When defective components, the Control Unit or Key Unit are replaced, the defective part or parts must be properly packed for return in the shipping carton, with its cushion material in which the new replacement part was shipped to you.</b></p>

Procedure Letter	Component Test																				
<b>L</b>	<p><b>RELAY TEST</b></p> <ol style="list-style-type: none"> <li>1. Disconnect the power supply cord, and then remove outer case.</li> <li>2. Open the door and block it open.</li> <li>3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li> <li>4. Disconnect the leads to the primary of the power transformer.</li> <li>5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.</li> <li>6. After that procedure, re-connect the power supply cord.</li> <li>7. Remove the outer case and check voltage between Pin #7 and 9 of the 9- pin connector (A) on the control unit with an A.C. voltmeter. The meter should indicate 120 volts, if not, check the oven circuitry.</li> </ol> <p><b>Shut-off, Cook and Heater Relay Test</b>                      These relays are operated by DC voltage.                      Check voltage at the relay coil with a DC voltmeter during the microwave cooking operation or convection cooking operation.                      DC voltage indicated ----- Defective relay.                      DC voltage not indicated ----- Check diode which is connected to the relay coil. If diode is good, control unit is defective.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="width: 25%;">RELAY SYMBOL</th> <th style="width: 35%;">OPERATIONAL VOLTAGE</th> <th style="width: 40%;">CONNECTED COMPONENTS</th> </tr> </thead> <tbody> <tr> <td>RY1</td> <td>Approx. 2.5V D.C.</td> <td>Oven lamp / Turntable motor</td> </tr> <tr> <td>RY2(COOK)</td> <td>Approx. 2.4V D.C.</td> <td>Power transformer</td> </tr> <tr> <td>RY6</td> <td>Approx. 2.5V D.C.</td> <td>Cooling fan motor</td> </tr> </tbody> </table> <ol style="list-style-type: none"> <li>8. If any abnormal condition is detected, replace the control unit.</li> <li>9. Disconnect the power supply cord and then remove outer case.</li> <li>10. Open the door and block it open.</li> <li>11. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li> <li>12. Reconnect all leads removed from components during testing.</li> <li>13. Re-install the outer case (cabinet).</li> <li>14. Reconnect the power supply cord after the outer case is installed.</li> <li>15. Run the oven and check all functions.</li> </ol>	RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS	RY1	Approx. 2.5V D.C.	Oven lamp / Turntable motor	RY2(COOK)	Approx. 2.4V D.C.	Power transformer	RY6	Approx. 2.5V D.C.	Cooling fan motor								
RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS																			
RY1	Approx. 2.5V D.C.	Oven lamp / Turntable motor																			
RY2(COOK)	Approx. 2.4V D.C.	Power transformer																			
RY6	Approx. 2.5V D.C.	Cooling fan motor																			
<b>M</b>	<p><b>AUTO DEFROST TEST</b></p> <ol style="list-style-type: none"> <li>1. Place one cup of water in the center of the turntable tray in the oven cavity.</li> <li>2. Close the door, touch the "AUTO DEFROST" pad and touch the Number pad "2", then "2" again, then "0" (2 = Steaks &amp; Chops, 2,0 = 2.0lbs). Touch the "START" pad.</li> <li>3. After 2 seconds, the oven is in AUTO DEFROST cooking condition.</li> <li>4. The oven will operate as follows.</li> </ol> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th rowspan="2" style="width: 15%;">WEIGHT</th> <th colspan="2" style="width: 20%;">1ST STAGE</th> <th colspan="2" style="width: 20%;">2ND STAGE</th> <th colspan="2" style="width: 23%;">3RD STAGE</th> </tr> <tr> <th style="width: 10%;">LEVEL</th> <th style="width: 10%;">TIME</th> <th style="width: 10%;">LEVEL</th> <th style="width: 10%;">TIME</th> <th style="width: 11.5%;">LEVEL</th> <th style="width: 11.5%;">TIME</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2.0lbs</td> <td style="text-align: center;">70%</td> <td style="text-align: center;">47sec.</td> <td style="text-align: center;">50%</td> <td style="text-align: center;">32sec.</td> <td style="text-align: center;">30%</td> <td style="text-align: center;">40sec.</td> </tr> </tbody> </table> <ol style="list-style-type: none"> <li>5. If improper operation is indicated, the control unit is probably defective and should be checked.</li> </ol>	WEIGHT	1ST STAGE		2ND STAGE		3RD STAGE		LEVEL	TIME	LEVEL	TIME	LEVEL	TIME	2.0lbs	70%	47sec.	50%	32sec.	30%	40sec.
WEIGHT	1ST STAGE		2ND STAGE		3RD STAGE																
	LEVEL	TIME	LEVEL	TIME	LEVEL	TIME															
2.0lbs	70%	47sec.	50%	32sec.	30%	40sec.															

# Troubleshooting and Testing

Procedure Letter	Component Test
N	<p><b>AH SENSOR TEST</b></p> <p>Checking the initial sensor cooking condition:</p> <p><b>WARNING: The oven should be fully assembled before following procedure.</b></p> <ol style="list-style-type: none"> <li>1. The oven should be plugged in at least two minutes before sensor cooking.</li> <li>2. Room temperature should not exceed 95°F (35°C).</li> <li>3. The unit should not be installed in any area where heat and steam are generated. The unit should not be installed, for example, next to a conventional surface unit. Refer to the “Installation Section”.</li> <li>4. Exhaust vents are provided on the back of the unit for proper cooling and air flow in the cavity. To permit adequate ventilation, be sure to install so as not to block these vents. There should be some space for air circulation.</li> <li>5. Be sure the exterior of the cooking container and the interior of the oven are dry. Wipe off any moisture with a dry cloth or paper towel.</li> <li>6. The Sensor works with food at normal storage temperature. For example, chicken pieces would be at refrigerator temperature and canned soup at room temperature.</li> <li>7. Avoid using aerosol sprays or cleaning solvents near the oven while using Sensor settings. The sensor will detect vapor given off by the spray and turn off before food is properly cooked.</li> <li>8. After the oven is started on sensor cooking condition, if the sensor has not detected the vapor of the food within 30 minutes, ERROR will appear and the oven will shut off.</li> </ol> <p><b>WATER LOAD COOKING TEST</b></p> <p><b>WARNING: The oven should be fully assembled before following procedure.</b></p> <p>Make sure the oven has been plugged in at least two minutes before checking sensor cook operation. The cabinet should be installed and screws tightened.</p> <ol style="list-style-type: none"> <li>1. Fill approximately 200 milliliters (7.2 oz) of tap water in a 1000 milliliter measuring cup.</li> <li>2) Place the container on the center of tray in the oven cavity.</li> <li>3) Close the door.</li> <li>4) Touch BAKED POTATO pad and number pad 1. Now, the oven is in the sensor cooking condition and “BAKED POTATO” will appear in the display.</li> <li>5) The oven will operate for the first 16 seconds, without generating microwave energy. When the AH sensor is defective (open or short), Error will appear in the display after 16 seconds cleaning time. If ERROR appears check sensor wire connections and/or AH sensor.</li> </ol> <p><b>NOTE:</b> ERROR will appear if the door is opened or STOP/CLEAR pad is touched during first stage of sensor cooking.</p> <ol style="list-style-type: none"> <li>6) After approximately 16 seconds, microwave energy is produced. If ERROR is displayed or the oven does not turn off, replace the humidity sensor or check the control unit, refer to explanation on next page.</li> </ol>

Procedure Letter	Component Test
	<p><b>1. TESTING METHOD FOR AH SENSOR AND/OR CONTROL UNIT</b></p> <p>To determine if the sensor is defective, the simplest method is to replace it with a new replacement sensor.</p> <ol style="list-style-type: none"> <li>1. Disconnect the power supply cord, and then remove outer case.</li> <li>2. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1)</li> <li>3. Remove the AH sensor.</li> <li>4. Install the new AH sensor.</li> <li>5. Re-install the outer case (cabinet).</li> <li>6. Reconnect the power supply cord after the outer case is installed.</li> <li>7. Reconnect the oven to the power supply and check the sensor cook operation as follows:               <ol style="list-style-type: none"> <li>a) Fill approximately 200 milliliters (7.2 oz) of tap water in a 1000 milliliter measuring cup.</li> <li>b) Place the container on the center of tray in the oven cavity.</li> <li>c) Close the door.</li> <li>d) Touch SENSOR COOK pad and number 1 pad.</li> <li>e) Touch Start pad. The control panel is in automatic Sensor operation.</li> <li>f) The display will start to count down the remaining cooking time, and the oven will turn off automatically after the water is boiling (bubbling).</li> </ol> </li> </ol> <p>If new sensor dose not operate properly, the problem is with the control unit.</p> <p><b>2. CHECKING CONTROL UNIT</b></p> <ol style="list-style-type: none"> <li>1. Disconnect the power supply cord, and then remove outer case.</li> <li>2. Discharge high voltage capacitor.</li> <li>3. Disconnect the wire leads from the cook relay.</li> <li>4. Disconnect the sensor connector that is mounted to lower portion of control panel.</li> <li>5. Then connect the dummy resistor circuit (see fig.) to the sensor connector of control panel.</li> <li>6. Reconnect oven to the power supply and check the sensor cook operation proceed as follows:               <ol style="list-style-type: none"> <li>6-1. Touch BAKED POTATO pad and number 1 pad.</li> <li>6-2. Touch Start pad. The control panel is in the sensor cooking operation.</li> <li>6-3. After approximately 20 seconds, push plunger of select switch for more than 3 seconds. This condition is same as judgement by AH sensor.</li> <li>6-4. After approximately 3 seconds, the display shows " X X . X X " which is the remaining cooking time, and the display count down.</li> </ol> </li> </ol> <p>If the above is not the case, the control unit is probably defective. If the above is proper, the AH sensor is probably defective.</p> <p>R1,R2 : 22Ω ± 1% 1/2W            R3 ..... : 4.3kΩ ± 5% 1/4W            R4 ..... : 1MΩ ± 5% 1/4W</p>

# Troubleshooting and Testing

---

## Notes

## WARNING

**TO PREVENT AN ELECTRIC SHOCK, TAKE THE FOLLOWING PRECAUTIONS:**

**1. BEFORE WIRING:**

- 1) Disconnect the power supply.
- 2) Open the door and wedge the door open.
- 3) Discharge the high voltage capacitor and wait for 60 seconds.

**2. DO NOT LET WIRE LEADS TOUCH TO THE FOLLOWING PARTS:**

- 1) High voltage parts:  
Magnetron, High voltage transformer, High voltage capacitor and High voltage rectifier assembly.
- 2) Hot parts:  
Oven lamp, Magnetron, High voltage transformer and Oven cavity.
- 3) Sharp edge:  
Bottom plate, Oven cavity, Waveguide flange, Chassis support and other metallic plates.
- 4) Movable parts (to prevent a fault)  
Fan blade, Fan motor, Switch, Switch lever, Open button.

**3. Do not catch the wire leads in the outer case cabinet.**

**4. Insert the positive lock connector completely until its pin is locked. Make sure that the wire leads should not come off even if the wire leads are pulled.**

**5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.**

## WARNING

**AVOID POSSIBLE EXPOSURE TO MICROWAVE ENERGY. PLEASE FOLLOW INSTRUCTIONS BELOW BEFORE OPERATING THE OVEN.**

1. Disconnect the power supply cord.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch leads to rise, it is then possible to hear a "click" as the door switches operate.)
3. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.). Carry out any remedial work that is necessary before operating the oven.

**DO NOT OPERATE THE OVEN IF ANY OF THE FOLLOWING CONDITIONS EXIST;**

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal is damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

**DO NOT OPERATE THE OVEN:**

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

## CAUTION

**Disconnect oven from power supply before removing outer case.**

**Discharge high voltage capacitor before touching any oven components or wiring after removing outer case.**

# Component Teardown

## Outer Case Removal

### CAUTION

1. **Disconnect oven from power supply before removing outer case.**
2. **Discharge the high voltage capacitor before touching any oven components or wiring.**

1. Disconnect the power supply cord.
2. Remove six (6) screws holding top duct and remove.
3. Remove the eight (8) screws on the back side of the outer case and two ducts to the back plate.
4. Remove the four (4) screws holding the right and left sides of the outer case cabinet to the bottom plate.
5. Remove three (3) screws on top of the cabinet directly behind the control panel.
6. Slide the entire outer case cabinet back out about 1 inch to free it from the retaining clips on the oven cavity front plate.
7. Lift the entire outer case cabinet from the unit.

## Magnetron Removal

1. Disconnect the oven power supply cord and remove outer case.
2. Discharge high voltage capacitor.

### CAUTION

**To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.**

3. Disconnect filament lead of transformer from magnetron.
4. Disconnect high voltage wire lead from magnetron.
5. Carefully remove four (4) mounting screws hold the magnetron to waveguide, when removing the screws hold the magnetron to prevent it from falling.
6. Remove the magnetron from the unit with care so the magnetron tube does not hit by any metal objects around the tube.

### CAUTION

**When replacing the magnetron, be sure the R.F. Gasket is in place and mounting screws are tightened securely.**

## Power Transformer Removal

### REMOVAL

1. Disconnect the oven power supply cord and remove outer case.
2. Discharge high voltage capacitor.

### CAUTION

**To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.**

3. Disconnect filament leads of transformer from the magnetron and capacitor.
4. Disconnect high voltage lead of capacitor from the transformer.
5. Disconnect wire leads from transformer.
6. Remove two (2) screws holding the transformer to the base cabinet.

### RE-INSTALL

1. Rest the transformer on the base cabinet with its primary terminals toward rear cabinet.
2. Insert the two edges of the transformer into two metal tabs of the base cabinet.
3. Make sure the transformer is mounted correctly to the corners underneath those tabs.
4. After re-installing the transformer, secure transformer with two screws to the base cabinet, one is with an outer tooth washer and the other is without outer tooth washer.
5. Re-connect the wire leads (primary and high voltage) and high voltage lead to the transformer and filament leads of transformer to the magnetron and capacitor, referring to the Wiring Diagram.

### CAUTION

**Hot (orange) wire must be connected to the power transformer terminal nearest to the transformer mounting screw.**

6. Re-install the outer case and check that the oven is operating properly.



## High Voltage Rectifier Removal

1. Disconnect the oven power supply cord and remove outer case.
2. Discharge high voltage capacitor.

### ⚠ CAUTION

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

3. Remove one (1) screw holding the rectifier assembly to the capacitor holder.
4. Disconnect the rectifier assembly from the capacitor and magnetron.

### ⚠ CAUTION

When replacing the silicon rectifier assembly, the ground side terminal must be secured firmly with a grounding screw.

## High Voltage Capacitor Removal

1. Disconnect the oven power supply cord and remove outer case.
2. Discharge high voltage capacitor.

### ⚠ CAUTION

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

3. Disconnect high voltage wire leads and rectifier assembly from high voltage capacitor and magnetron.
4. Disconnect filament lead of transformer from high voltage capacitor.
5. Disconnect high voltage wire lead of capacitor from transformer.
6. Remove one (1) screw and washer holding rectifier from the capacitor holder.
7. Remove one (1) screw holding the capacitor holder to the rear cabinet.
8. Remove the capacitor from the holder.

## Turntable Motor/Coupling Removal

1. Disconnect the power supply cord.
2. Remove the turntable tray, and the turntable support out of the oven cavity.
3. Turn the oven on its back and remove the screws holding the bottom duct to bottom of the oven.
4. Remove the one (1) screw holding the turntable motor cover to the base plate and take off the turntable motor cover.
5. Disconnect wire leads from the turntable motor.
6. Remove the two (2) screws holding the turntable motor.
7. Remove turn table motor, and if replacing coupling, push coupling through the hole into inside the cavity.

## Oven Lamp and Lamp Socket Removal

1. Disconnect oven from power supply and remove outer case.
2. Discharge high voltage capacitor.

### ⚠ CAUTION

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

3. Unplug wires from the lamp socket.
4. Remove lamp from socket.
5. Twist the lamp socket to free it from the holder.
6. Pull lamp socket through hole. The oven lamp socket is now free.

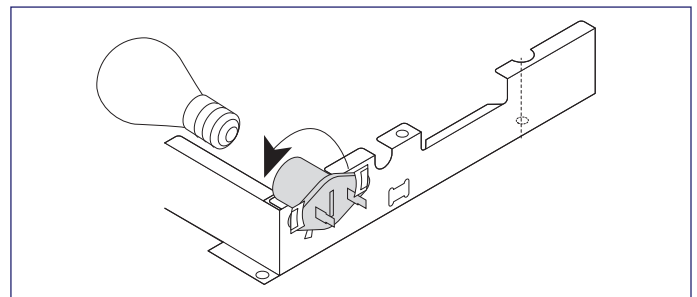


Figure 4-1. Oven Lamp Socket

# Component Teardown

## Fan Motor Removal

### REMOVAL

1. Disconnect the oven power supply cord and remove outer case.
2. Discharge high voltage capacitor.

### ⚠ CAUTION

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

3. Disconnect the wire leads from the fan motor.
4. Remove three (3) screws holding chassis support to rear cabinet, waveguide and control panel back plate.
5. Remove the chassis support from the oven.
6. Disconnect wire leads from the fan motor.
7. Release main harness from the hole of the fan duct.
8. Release one (1) tab holding the fan duct to the rear cabinet.
9. Release one (1) tab holding the fan duct to the air guide (Right).
10. Remove the fan duct assembly from the oven.
11. Remove the fan blade from the fan motor shaft according the following procedure:
  - 1) 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 easily shaven by pliers and metal pieces may be produced.

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

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

- 2) Remove the fan blade from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
12. Remove the two (2) screws and nuts holding the fan motor to the fan duct.
13. Now, the fan motor is free.

### INSTALLATION

1. Install fan motor to fan duct with the two (2) screws.
2. Install the fan blade to the fan motor shaft according to the following procedure:
  - 1) Hold the center of the bracket which supports the shaft of the fan motor on the flat table.
  - 2) Apply the screw lock tight into the hole (for shaft) of the fan blade.
  - 3) 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 fan blade with excessive force when installing because the bracket may be disfigured.
- \* Make sure that the fan blade rotates smooth after installation.
- \* Make sure the axis of the shaft is not slanted.

3. Reset the fan duct assembly to its install position.
4. Install tabs of fan duct to rear cabinet and air guide.
5. Install magnetron air guide with the one (1) screw.
6. Reinstall the main harness and thermistor harness to each hole of the fan duct.
7. Reinstall the chassis support to the control panel back plate, waveguide and rear cabinet with the three (3)screws.
8. Re-connect the wire leads to the fan motor, referring to the pictorial diagram.
9. Re-install the fan motor grounding wire to the air guide (Right) with one (1) screw.

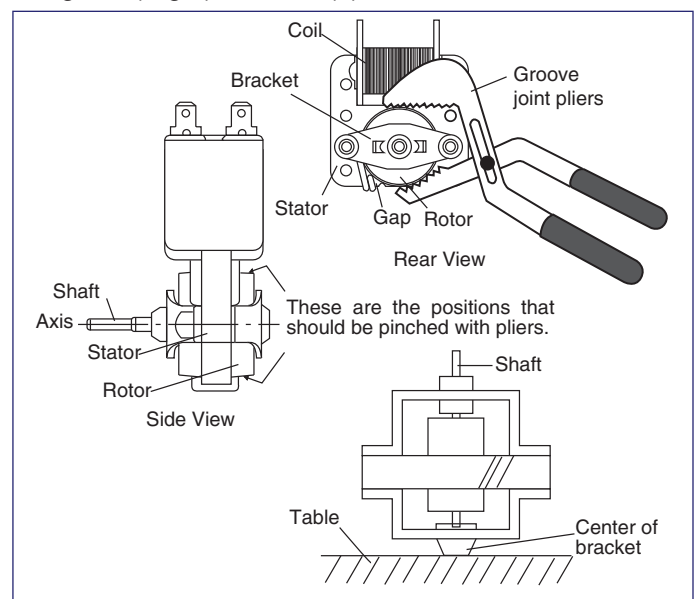


Figure 4-2. Fan Motor Components

## Power Supply Cord Replacement

### REMOVAL

1. Disconnect the power supply cord.
2. Discharge high voltage capacitor.

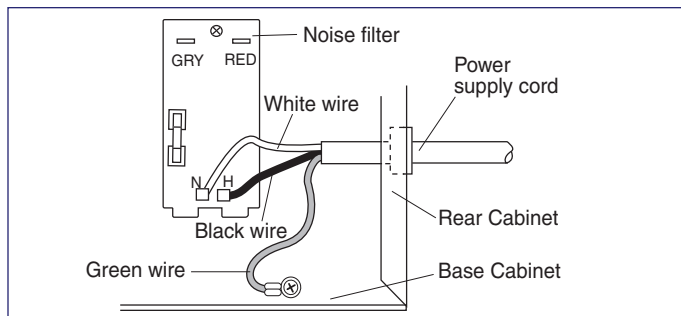
### ⚠ CAUTION

**To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.**

3. Disconnect the white and black wires of the power supply cord from the noise filter.
4. Remove the one (1) screw holding the ground wire of the power supply cord to the base cabinet.
5. Remove the power supply cord from the rear cabinet.

### Re-install

1. Insert the power supply cord into the rear cabinet.
2. Connect the white and black wires of the power supply cord into the terminal of noise filter, referring to the Wiring Diagram.
3. Re-install the ground wire of the power supply cord to the base cabinet with the one (1) screw.



**Figure 4-3. Power Cord Connections**

## Door Sensing Switch, Primary/Third Interlock Switch and Monitor Switch Replacement

### REMOVAL

1. Disconnect the oven power supply cord and remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

### ⚠ CAUTION

**To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.**

4. Disconnect the wire leads from the switch.
5. Remove the one (1) screw holding the latch hook (right or left) to the oven cavity front plate, and release the latch hook (right or left).
6. Keep pushing the stopper tub holding the switch to the latch hook (right or left) and revolve the switch on the pole.
7. Remove the switch from the latch hook (right or left).
8. Now, the switch is free.

### REINSTALL

1. Re-install each switch in its place. The door sensing switch is in the lower position of the latch hook right. The primary interlock switch is in the lower position of the latch hook left. The monitor switch is in the upper position of the latch hook left.
2. Hold the latch hook (right or left) to the oven cavity front plate and secure with the one (1) screw.
3. Reconnect the wire leads to the switch.
4. Make sure that monitor switch is operating properly and check continuity of the monitor circuit. Refer to "Test Procedure" and "Adjustment procedure."

# Component Teardown

## ADJUSTMENT

If the door sensing switch, primary interlock switch, third interlock switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.

1. Disconnect the oven power supply cord and remove outer case.
2. Open the oven door and block it open.
3. Discharge the high voltage capacitor.

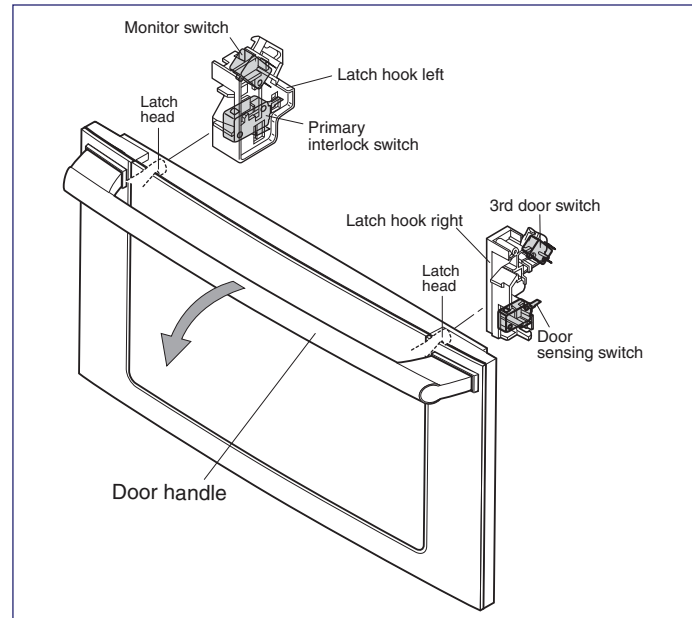
### CAUTION

**To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.**

4. Loosen each one (1) screw holding the latch hook right and the latch hook left to the oven cavity front plate.
5. With door closed, adjust the latch hook right and the latch hook left by moving them back and forth and up and down. In and out play of the door allowed by the latch hook right and the latch hook left should be less than 0.5 mm. The vertical position of the latch hook right and the latch hook left should be adjusted so that the door sensing switch and the primary interlock switch are activated with the door closed. The horizontal position of the latch hook right and the latch hook left should be adjusted so that the plunger of the monitor switch is pressed with the door closed.
6. Secure the screws firmly.
7. Check all of the switches operation. If any switch has not activated with the door closed, loosen the screws and adjust the position of the latch hook right and the latch hook left.

### 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 door sensing switch, and secondary interlock switch interrupt the circuit before the door can be opened.



**Figure 4-4. Door Switch Components**

3. Monitor switch contacts close when door is opened.
4. The contact of door sensing switch and secondary interlock switch open within 1.2mm gap between right side of cavity face plate and door when door is open.
5. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

## Door Replacement

1. Disconnect the oven power supply cord and remove outer case.
2. Open the door and block it open.
3. Discharge the high voltage capacitor.

### ⚠ CAUTION

To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

4. Close the door.
5. Remove two (2) door springs from door cam right, oven hinge right, door cam left and oven hinge left.
6. Release the door cams right and left from the right and left door cam pins of the door.
7. Remove the door cams right and left from the oven cavity front plate.
8. Open the door assembly at an angle of more than  $90\frac{1}{2}^\circ$  with the oven cavity front plate.
9. To release the right and left door hinge pins of the door assembly from the oven hinges right and left, slide the door assembly to the left. When removing the door assembly, hold the door assembly to prevent it from falling.
10. Now, the door assembly is free.

**NOTE:** When the individual parts are replaced, refer to “Door Disassembly”.

### Door Assembly Re-install

1. On reinstalling the door assembly, insert oven hinges right and left into the right and left door hinge pins.
2. Insert and hook the door cams right and left to the right and left door cam pins.
3. Reinstall the two (2) door springs between the door cams and the oven hinges right and left.

### ☰ NOTE

After any service to the door:

- (A) Make sure that the door sensing switch and the secondary interlock switch are operating properly. (Refer to chapter “Test Procedures”.)
- (B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

### ☰ NOTE

The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from the oven cavity during the cook cycle. This function does not require that the door be airtight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around the oven door is not abnormal and do not of themselves indicate a leakage of microwave energy from the oven cavity. If such were the case, the oven could not be equipped with a vent, the very purpose of which is to exhaust the vapor-laden air from the oven cavity.

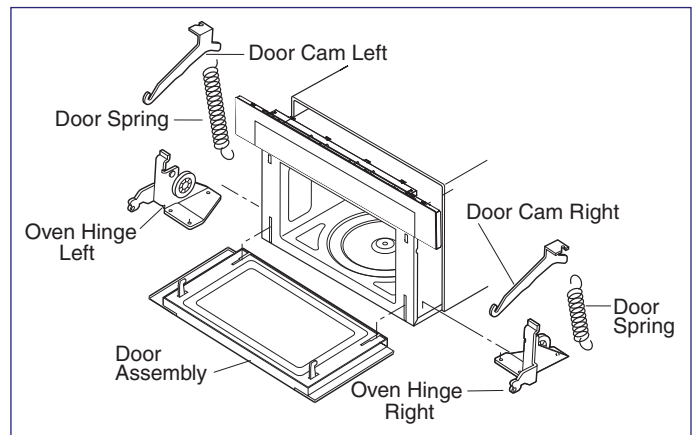


Figure 4-5. Door Replacement and Adjustment

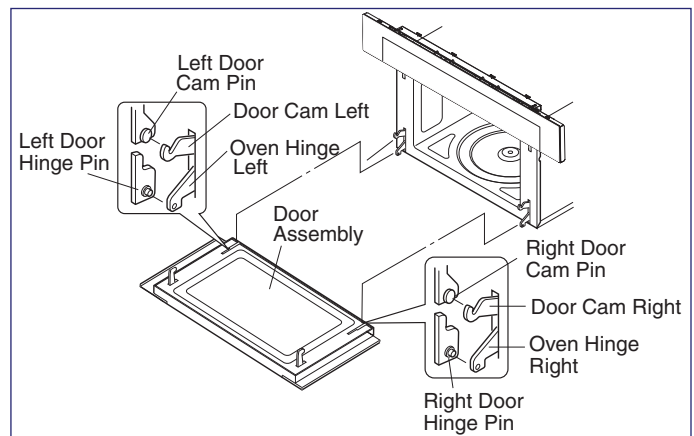


Figure 4-6. Door Assembly Components

# Component Teardown

## Door Adjustment

When removing and/or loosening the oven hinges such as in door replacement, the following adjustment criteria are taken.

Door adjustment is performed with the door properly installed and closed and while the oven hinges are loose.

1. Loosen screws holding the oven hinge right and the oven hinge left to the bottom plate with screwdriver.
2. Adjust door by moving it so that the door is parallel with the oven cavity front plate lines (right and left side lines) and the door latch heads pass through the latch holes correctly.
3. Tighten the screws holding the oven hinge right and the oven hinge left to the bottom plate.

### After adjustment, make sure of the following:

1. The door latch heads smoothly catch the latch hooks through latch holes and the latch heads goes through center of latch holes.
2. The door is positioned with its face pressed toward oven cavity front plate.
3. Reinstall outer case cabinet and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

## Door Disassembly

1. Disconnect the power supply cord and remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

### ⚠ CAUTION

**To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.**

4. Remove the door assembly, referring to “Door Replacement”.
5. Place the door assembly on a soft cloth with latch heads facing up.

**NOTE:** As the engaging part of choke cover and door frame are provided at 16 places, do not force any particular part.

6. Replacement of the door components are as follows:

### CHOKE COVER

7. Insert a putty knife (thickness of about 0.5mm) into the gap A between the choke cover and door stopper and between the choke cover and the door frame as shown in Figure 4-7 to free engaging parts.
8. Pry the choke cover by inserting a putty knife in order shown in Figure 4-7.
9. Now choke cover is free from door panel and door frame.

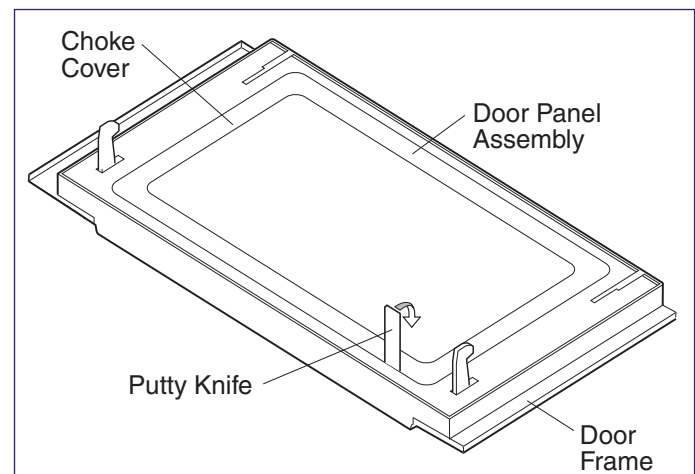


Figure 4-7. Door Disassembly

## Door Disassembly (Continued)

### DOOR PANEL ASSEMBLY AND LEFT AND RIGHT LATCH HEAD REMOVAL

10. Remove the fourteen (14) screws holding the door panel assembly to the door frame.
11. Remove the door panel assembly from door frame.
12. Remove the one (1) screw holding the latch head R to the door panel assembly.
13. Remove the latch spring R from the latch head R and the handle lever.
14. Now, the latch head R is free.
15. Remove the one (1) screw holding the latch head L to the door panel assembly.
16. Remove the latch spring L from the latch head L and the handle lever.
17. Now, the latch head L is free.
18. Release the two (2) handle springs from the two (2) handle levers.
19. Pull out the two (2) handle pins from the two (2) handle levers.
20. Remove the two (2) handle levers from the door panel.
21. Now, the door panel is free.

## Control Assembly And CPU Unit Removal

### CONTROL PANEL ASSEMBLY

1. Disconnect the oven power supply cord and remove outer case.
2. Open the oven door and block it open.
3. Discharge the high voltage capacitor.

#### CAUTION

**To discharge the high voltage capacitor, wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.**

4. Disconnect the 9-pin & 14-pin harness from the connectors CN-D and CN-N on the power unit.
5. Remove the four (4) screws holding the control panel assembly to the oven cavity front plate.
6. Now, the control panel assembly is free.

### CPU UNIT

7. Disconnect the 12-pin (CN-S), 6-pin (CN-M) & 10-pin (CN-L), 16-pin (CN-K) harness from the connectors on the power unit.
8. Remove the eight (8) screws holding the CPU unit to the panel sub assembly. See Figure 4-8.
9. Now, the CPU unit is free.

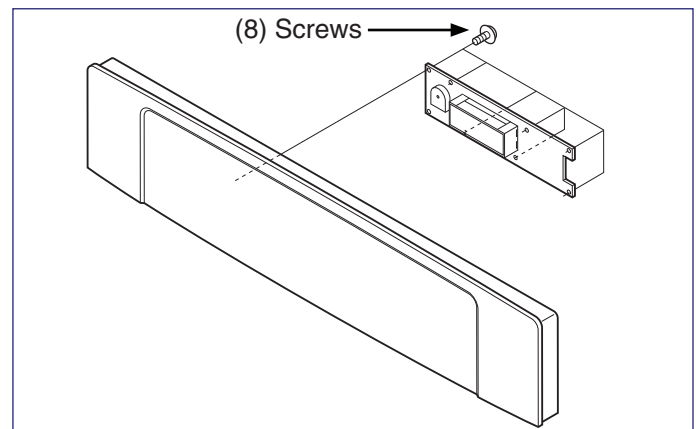


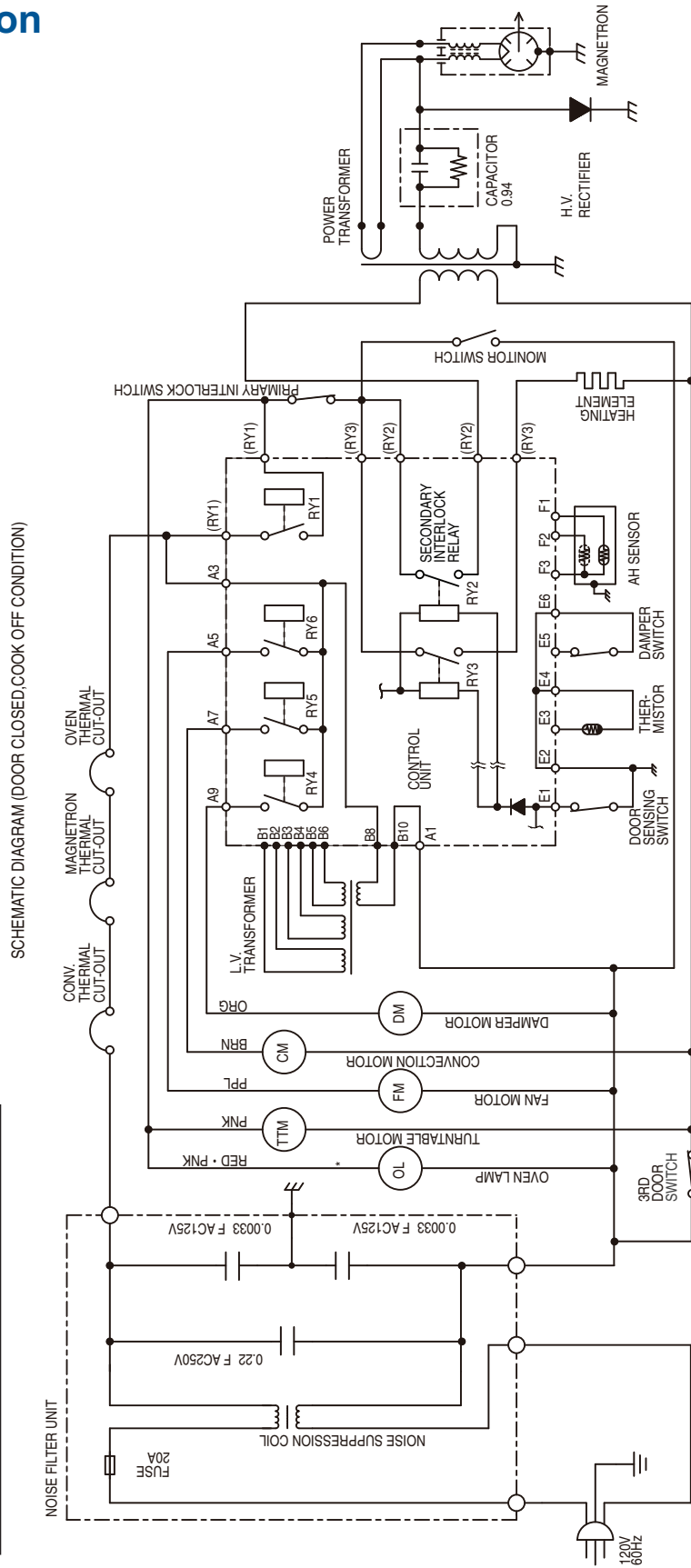
Figure 4-8. Control Panel and CPU





## Wiring Schematic Oven Off Condition

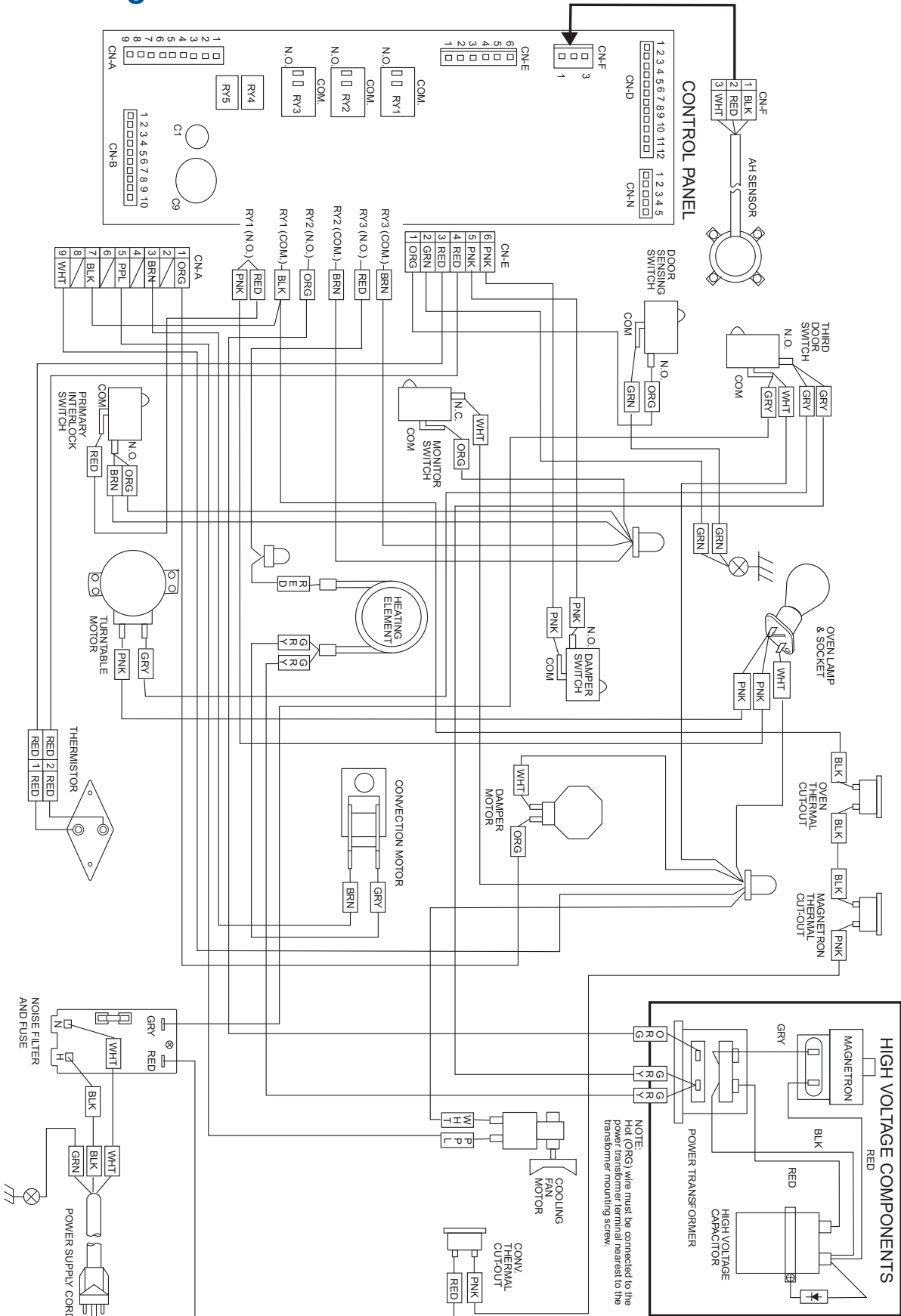
**SCHEMATIC**  
NOTE: CONDITION OF OVEN  
1. DOOR CLOSED.  
2. CLOCK APPEARS ON DISPLAY.



- NOTE:
1. CIRCUITS SUBJECT TO CHANGE WITHOUT NOTICE
  2. WIRE COLOR CODES ARE APPLICABLE TO PRIMARY CIRCUIT ONLY AND NOT APPLICABLE TO LOW VOLTAGE CIRCUIT AND SECONDARY CIRCUIT.
  - \*3. HOT WIRE(S) MUST BE CONNECTED TO THE TERMINAL WITH BLUE MARK ON THE LAMP SOCKET AND "H" MARK ON THE POWER SUPPLY CORD.

# Wiring Diagrams

## Pictorial Diagram

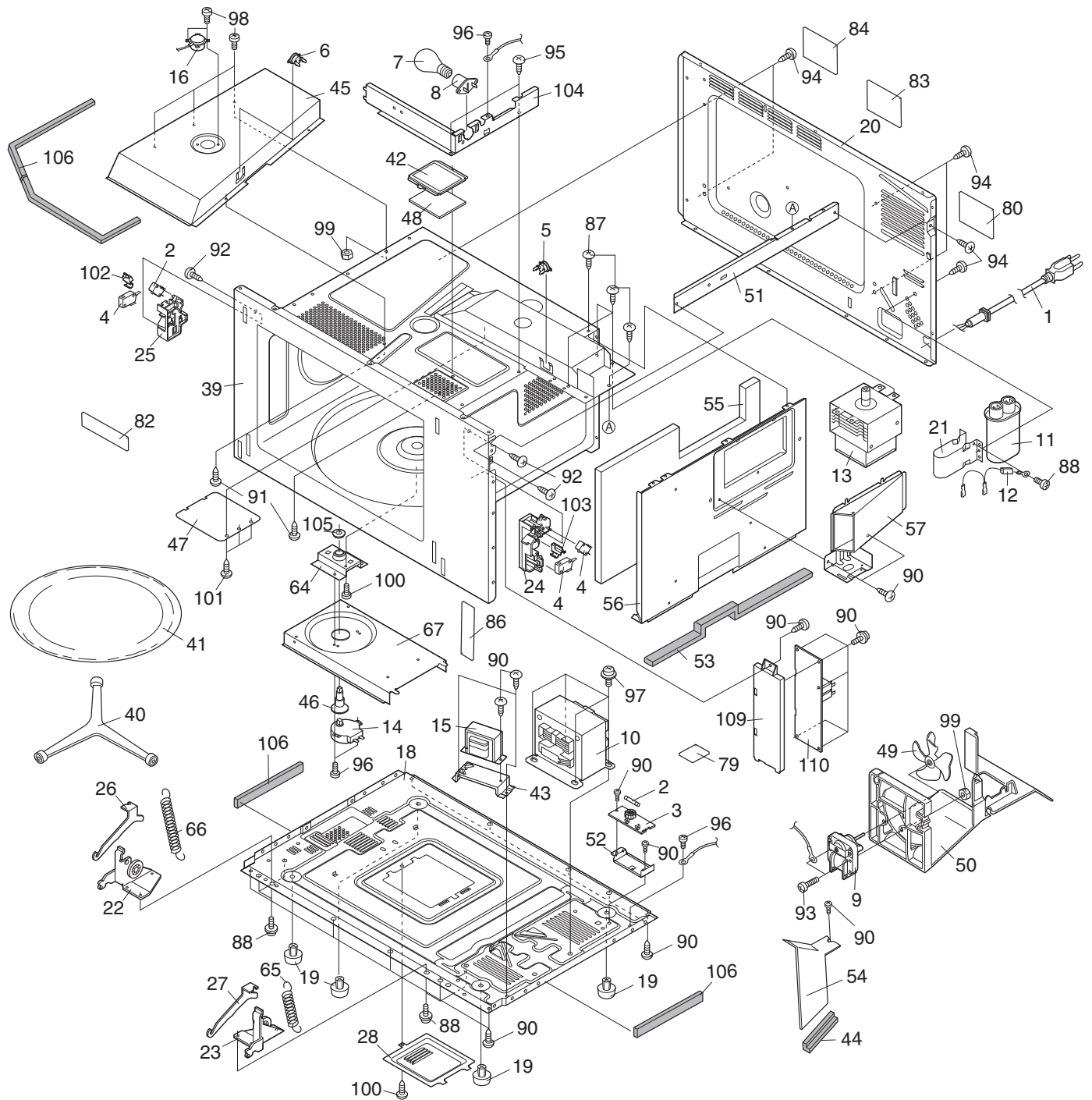


REF. NO.	DESCRIPTION	Q'TY
<b>ELECTRICAL PARTS</b>		
1	Power supply cord	1
2	Monitor fuse 20A and monitor switch (V-5220D-070) assembly	1
3	Noise filter	1
4	Primary interlock switch/Third door switch/Door sensing switch	3
5	Magnetron thermal cut-out 125°C	1
6	Oven thermal cut-out 150°C	2
7	Oven lamp	1
8	Oven lamp socket	1
9	Fan motor	1
10	Power transformer	1
11	H.V. Capacitor	1
12	H.V. Rectifier assembly	1
13	Magnetron	1
14	Turntable motor	1
15	Low voltage transformer	1
16	AH sensor assembly	1
<b>CABINET PARTS</b>		
17	Outer case cabinet	1
18	Base plate	1
19	Foot	4
20	Rear plate	1
21	Capacitor holder	1
22	Oven hinge (L)	1
23	Oven hinge (R)	1
24	Latch hook (R)	1
25	Latch hook (L)	1
26	Door cam (L)	1
27	Door cam (R)	1
28	Turntable motor cover	1
29	Front cover	1
30	Duct B	1
31	Duct C	1
<b>CONTROL PANEL PARTS</b>		
32	Touch control assy	1
33	Display unit	1
34	Control panel angle	1
35	Grounding spring	1
36	PSU harness	1
37	Screw	8
38	Screw	4
<b>OVEN PARTS</b>		
39	Oven cavity assembly (Not Replaceable)	1
40	Turntable support	1
41	Turntable tray	1
42	Glass mounting plate	1
43	Transformer mount angle	1
44	Cushion	1
45	Steam duct assembly	1
46	Turntable coupling	1
47	Waveguide cover	1
48	Light glass	1
49	Fan blade	1
50	Cooling fan duct	1
51	Chassis support	1
52	Noise unit angle	1
53	Cushion	1
54	Magnetron air guide	1

# Parts List

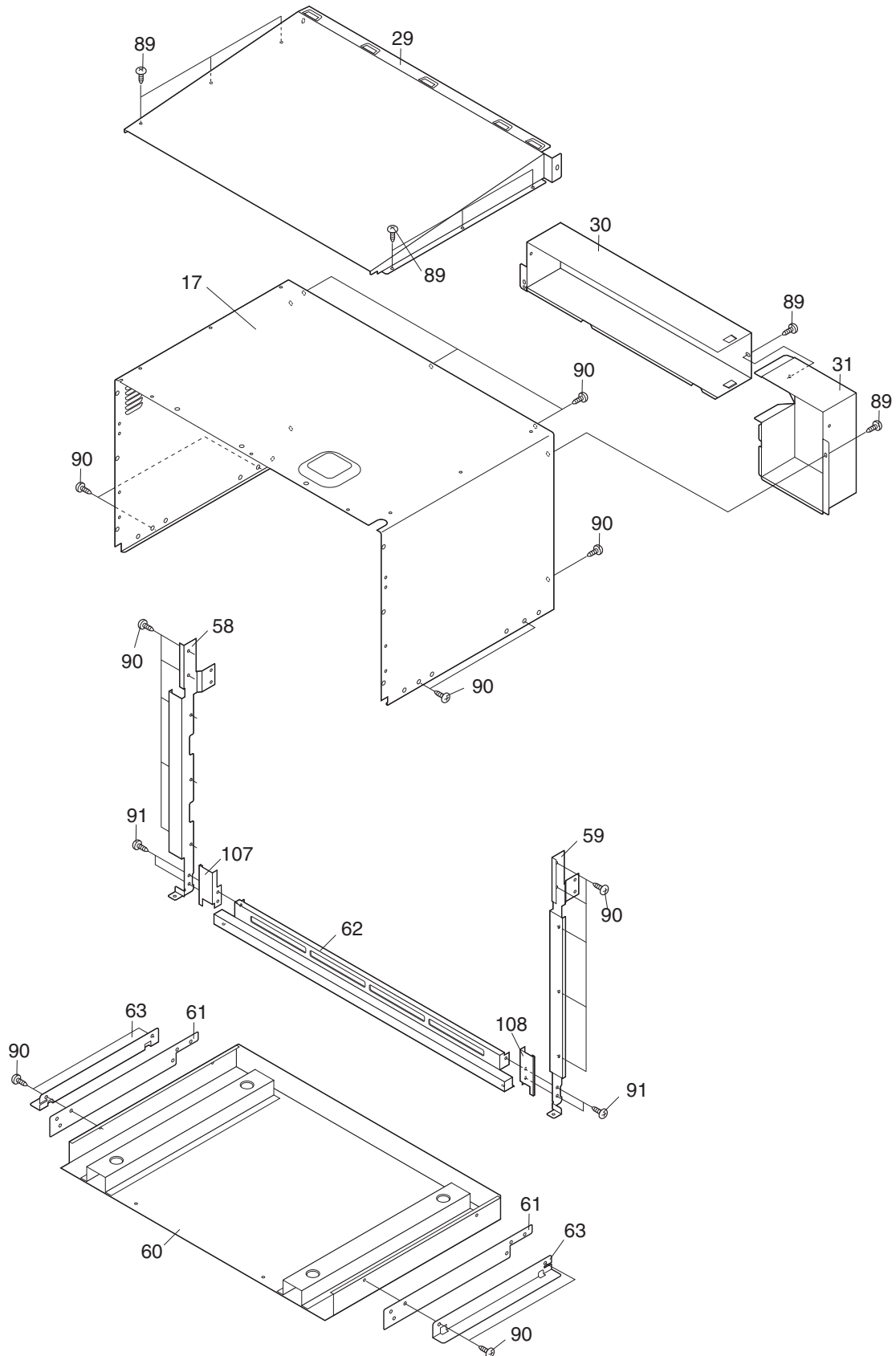
REF. NO.	DESCRIPTION	Q'TY
55	Thermal protection sheet	1
56	Thermo cover	1
57	Duct	1
58	Side trim L	1
59	Side trim R	1
60	Exhaust duct	1
61	Bottom angle	1
62	Inlet louver	1
63	Shipping angle	1
64	TT mounting angle	1
65	Door spring R (EW30MO55HS)	1
65	Door spring R (EW27MO55HS)	1
66	Door spring L (EW30MO55HS)/(EW27MO55HS)	1
67	Barrier	1
<b>DOOR PARTS</b>		
68	Door frame assembly	1
69	Door panel	1
70	Choke cover	1
71	Latch head R	1
72	Latch head L	1
73	Latch head spring	1
74	Screw	10
75	Screw	2
<b>WIRING/LABELS</b>		
76	Main wire harness	1
77	High voltage wire B	1
78	Grounding wire (Cooling fan motor)	1
79	Monitor caution label	1
80	NHW caution label	1
81	Operation manual	1
82	User caution	1
83	BIK label	1
84	GND caution label	1
85	Installation instructions	1
86	Menu label	1
<b>SCREWS NUTS AND WASHERS</b>		
87	Screw	4
88	Screw	2
89	Screw	14
90	Screw	41
91	Screw	6
92	Special screw	3
93	Screw	2
94	Screw	6
95	Screw	2
96	Screw	2
97	Screw	4
98	Screw	2
99	Special nut	3
100	Screw	2
101	Screw	3
<b>MISCELLANEOUS</b>		
102	Switch lever	1
103	Switch lever	1
104	Air guide R	1
105	TT motor packing	1
106	Cushion	2
107	Trim dec L	1
108	Trim dec R	1
109	Power board holder	1
110	Power board	1

Oven And Cabinet Parts

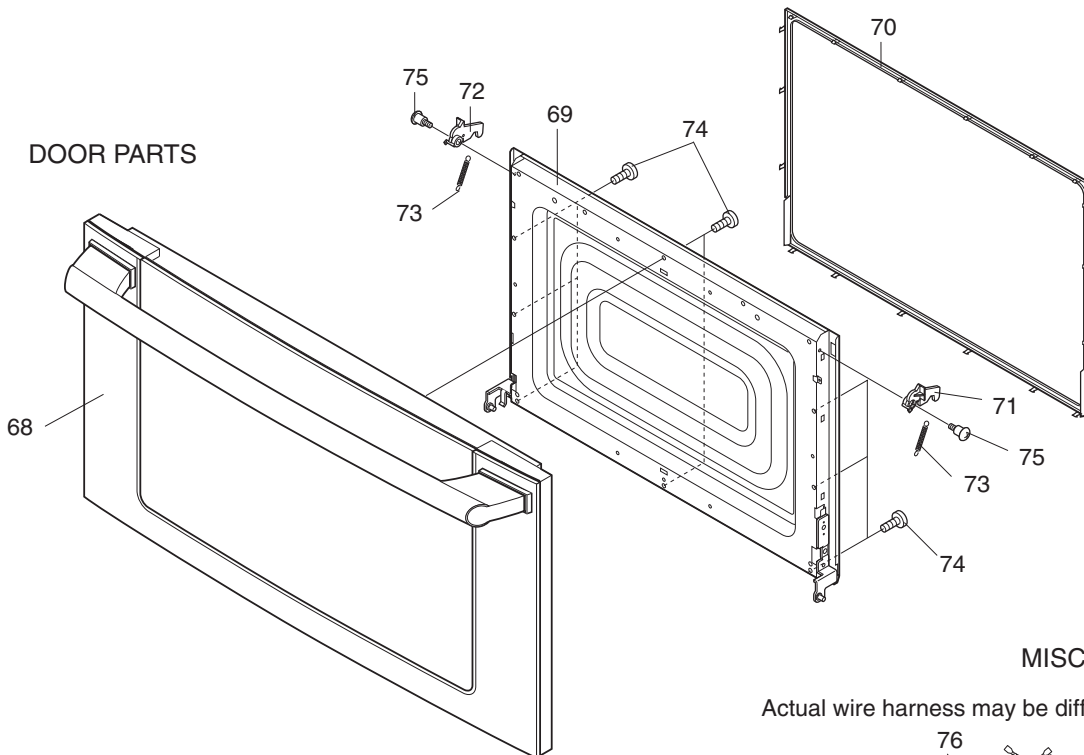
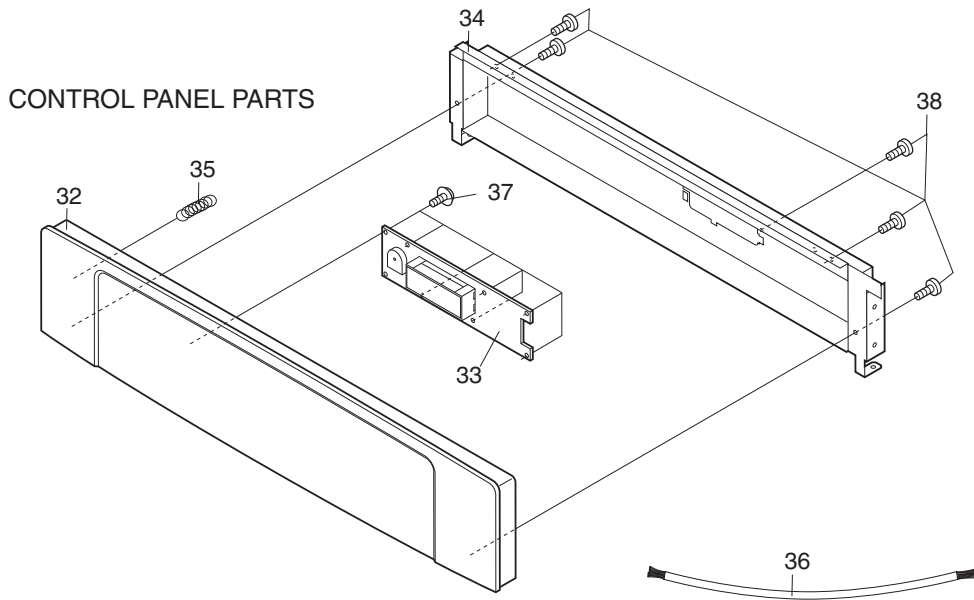


# Parts List

## Cabinet And Frame Parts

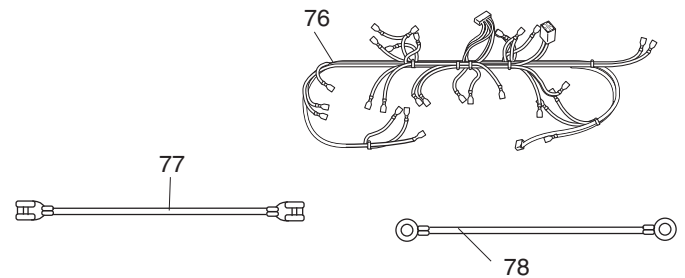


Control And Door Parts



MISCELLANEOUS

Actual wire harness may be different than illustration.



# Parts List

## Packing and Accessories

