



SEARS

MODEL 721.67902
721.67903
721.67909

DIVISION 20

BASIC FIELD MANUAL

FOR

MICROWAVE OVEN

MODEL 721.67902600
721.67903600
721.67909600

JUNE, 2006

CAUTION

WARNING TO SERVICE TECHNICIANS

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

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

CONTENTS

**MODEL 721.67902
721.67903
721.67909**

(Page)

SAFETY PRECAUTIONS	Inside front cover
SPECIFICATIONS	1-1
CAUTIONS	2-1
INSTALLATIONS	3-1
OPERATING INSTRUCTIONS	4-1
FEATURES	4-1
CONTROL PANEL	4-1
OPERATING SEQUENCE	4-2
SCHEMATIC DIAGRAM	4-3
CIRCUIT DESCRIPTION	4-4
SERVICE INFORMATION	5-1
TOOLS AND MEASURING INSTRUMENTS	5-1
MICROWAVE LEAKAGE TEST	5-1
MEASUREMENT OF MICROWAVE POWER OUTPUT	5-3
DISASSEMBLY AND ADJUSTMENT	5-3
INTERLOCK CONTINUITY TEST	5-8
COMPONENT TEST PROCEDURE	5-9
TROUBLE SHOOTING	5-14
EXPLODED VIEW	6-1
REPLACEMENT PARTS LIST	7-1

SPECIFICATIONS

Rated Power Consumption	1500W
Output	
Microwave	1000W (*IEC60705 Rating standard) Adjustable 100W through 1000W, 10 steps
Convection	1500W
Combination	1500W
Frequency	2450 MHz
Power Supply	120 V AC, 60 Hz
Rated Current	13 Amp.
Magnetron Cooling	Forced Air Cooling
Microwave Stirring	Turntable
Rectification	Rectification Voltage Doubler Half-Wave
Door Sealing	Choke Cover and Choke System
Safety Devices	Thermostat: Open at 90°C ± 5°C Close at 75°C ± 5°C Fuse(20A) Primary Interlock Switch Secondary Interlock Switch Interlock Monitor Switch
Magnetron	2M246
High Voltage Capacitor	Capacitor: 1.0 μF, 2.1 KV AC
High Voltage Diode	350 mA, 9.0 KV
Cavity Lamp	125 V, 20 W
Tray	Tempered Safety Glass
Overall Dimensions	22 ⁵ / ₈ "(W)x20"(H)x14 ⁷ / ₈ "(D)
Oven Cavity Size	15 ¹ / ₄ "(W)x15 ¹ / ₄ "(H)x10 ⁷ / ₈ "(D)
Effective Capacity of Oven Cavity	1.5 Cu.ft.
Accessories	Use and Care Manual, Glass Turntable, Rotating Ring, Metal Rack

SWITCH CHART

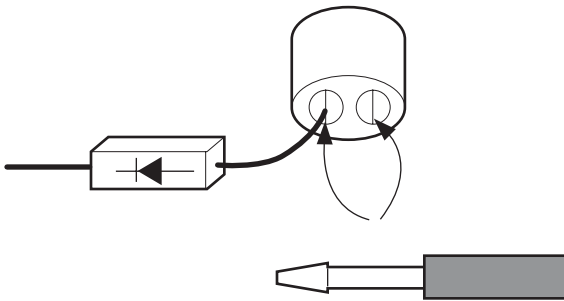
SWITCH MODE	PRIMARY INTERLOCK SWITCH	SECONDARY INTERLOCK SWITCH	INTERLOCK MONITOR SWITCH
CONDITIONS	COM	COM	COM
	NO	NO	NC
DOOR OPEN			•
DOOR CLOSED	•	•	

NOTE: Use the above switch chart with circuit diagram on page 4-4.
 “•” represents the connection of the terminal of each switch.

CAUTIONS

Unlike other appliances, the microwave oven is high-voltage and high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

- DO NOT operate on a 2-wire extension cord during repair and use.
- NEVER TOUCH any oven components or wiring during operation.
- BEFORE TOUCHING any parts of the oven, always remove the power plug from the outlet.
- For about 30 seconds after the oven stops, an electric charge remains in the high voltage capacitor. When replacing or checking, you must discharge the high voltage capacitor by shorting across the two terminals with an insulated screwdriver.

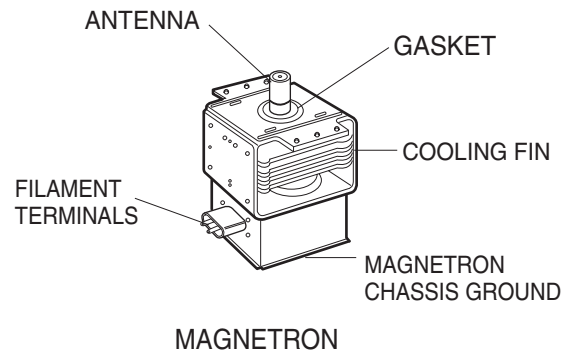


- Remove your watches whenever working close to or replacing the Magnetron.
- DO NOT touch any parts of the control panel circuit. A resulting static electric discharge may damage this P.C.B.
- NEVER operate the oven with no load.
- NEVER injure the door seal and front plate of the oven cavity.
- NEVER put iron tools on the magnetron.
- NEVER put anything into the latch hole and the interlock switches area.

MICROWAVE RADIATION

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

- Proper operation of the microwave oven requires that the magnetron be assembled to the waveguide and cavity. Never operate the magnetron unless it is properly installed.
- **Be sure that the magnetron gasket is properly installed around the dome of the tube whenever installing the magnetron.**



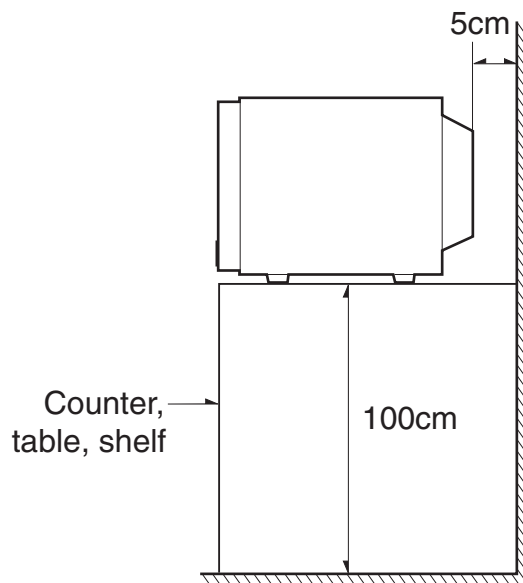
THE OVEN IS TO BE SERVICED ONLY BY PROPERLY QUALIFIED SERVICE TECHNICIANS.

INSTALLATIONS

BEFORE YOU BEGIN, READ THE FOLLOWING INSTRUCTIONS COMPLETELY AND CAREFULLY.

INSTALLING

1. Empty the microwave oven and clean inside it with a soft, damp cloth. Check for damage such as misaligned door, damage around the door, dents inside the cavity, or on the exterior.
2. Put the oven on a counter, table, or shelf at least 39.4 inches(100cm) from floor that is strong enough to hold the oven and the food and utensils you put in it. (The control panel side of the oven is the heavy side. Use care when handling.)
3. Do not block the vent and the air intake openings. Blocking vent or air intake openings can cause damage to the oven and poor cooking results. Make sure the microwave oven legs are in place to ensure proper air flow.
4. The oven should not be installed in any area where heat and steam are generated, because they may damage the electronic or mechanical parts of the unit. Do not install the oven next to a conventional surface unit or above a conventional wall oven.
5. Use microwave oven in an ambient temperature less than 104°F(40°C).
6. Place the microwave oven on a sturdy and flat surface at least 2 inches(5 cm) from the wall.
7. Place the microwave oven as far away as possible from TV, RADIO, COMPUTER, TELEPHONE, etc., to prevent interference.



GROUNDING INSTRUCTIONS

For personal safety, this appliance must be fully grounded at all times.

In the event of an electrical short circuit, grounding reduces the risk of electrical shock.

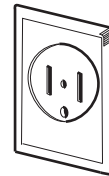
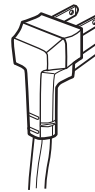
The plug must be plugged into an outlet that is properly installed and grounded.

WARNING

Improper use of the grounding plug can result in a risk of electric shock.

Do not, under any circumstances, cut or remove the third ground prong from the power cord plug.

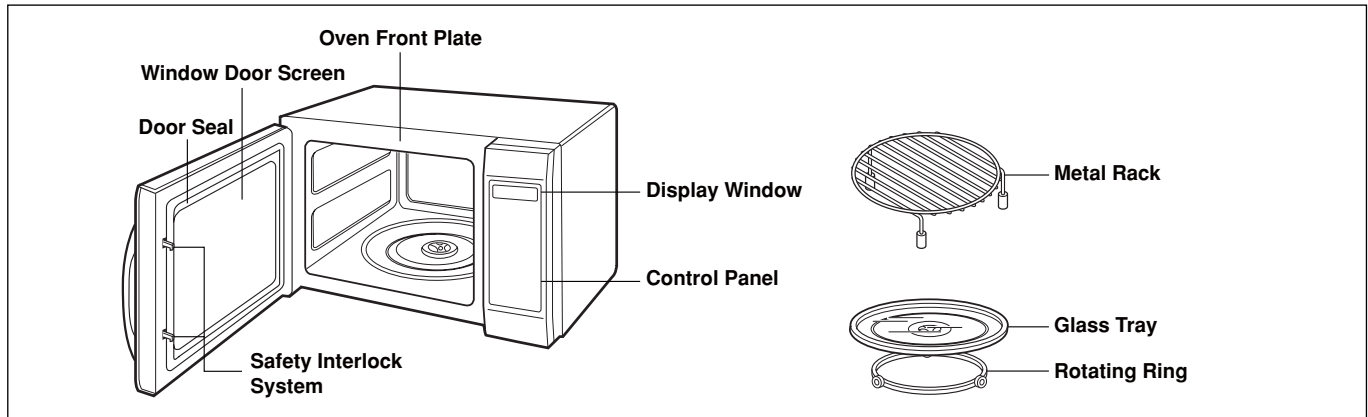
PREFERRED METHOD



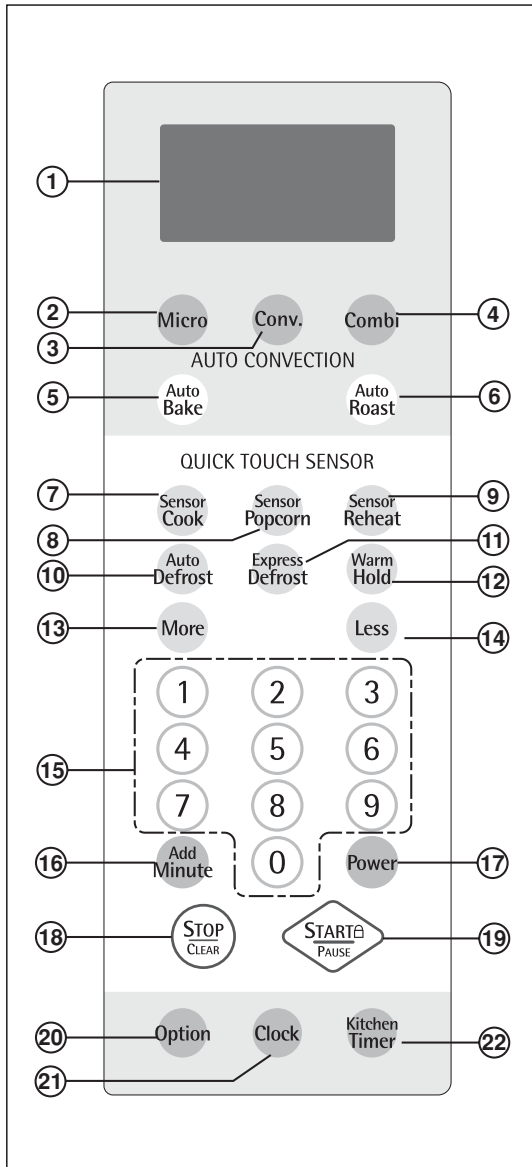
ENSURE PROPER GROUND EXISTS BEFORE USE

OPERATING INSTRUCTIONS

FEATURES



CONTROL PANEL



1. **DISPLAY.** The Display includes a clock and indicators to tell you time of day, cooking time settings and cooking functions selected.
2. **MICRO.** Touch this pad when setting microwave cooking.
3. **CONV.** Touch this pad to operate the oven for convection cooking only.
4. **COMBI.** Touch this pad to program the amount roasting time and heat for a cooking cycle using both microwave energy and convection energy.
5. **CONVECTION AUTO BAKE.** Touch this pad to automatically bake frozen pizza, muffins, biscuits and frozen French fries using both microwave and convection energy alternately.
6. **CONVECTION AUTO ROAST.** Touch this pad to automatically roast beef, chicken, turkey breasts and pork using both microwave and convection energy alternately.
7. **SENSOR COOK.** Touch this pad to cook 10 types of foods. The oven's sensor will tell the oven how long to cook depending on the amount of humidity coming from the food.
8. **SENSOR POPCORN.** Touch this pad when popping commercially packaged popcorn in your microwave oven. The oven's sensor will tell the oven how long to cook depending on the amount of humidity it detects from the popcorn.
9. **SENSOR REHEAT.** Touch this pad to reheat precooked, room-temperature or refrigerated foods. The oven's sensor will tell the oven how long to cook depending on the amount of humidity coming from the food.
10. **AUTO DEFROST.** Touch this pad once to automatically defrost Meat, Poultry, Fish or Bread according to weight. Touch this pad twice to defrost most other frozen foods by time.
11. **EXPRESS DEFROST.** Touch this pad for rapid defrosting of one pound of frozen food.
12. **WARM HOLD.** Touch this pad to keep hot, cooked foods warm in your microwave oven.
13. **MORE.** Touch this pad to add 10 seconds of cooking time each time it is pressed.
14. **LESS.** Touch this pad to subtract ten seconds of cooking time each time it is pressed.
15. **NUMBER.** Touch number pads to enter cooking times, cook powers, quantities, weights, or food categories.
16. **ADD MINUTE.** Touch this pad to set and start cooking at 100% power.
17. **POWER.** Touch this pad to select a cooking power level.
18. **STOP/CLEAR.** Touch this pad to cancel a currently running program or erase a cooking cycle being programmed.
19. **START/PAUSE.** Touch this pad to start a program or to pause the oven during cooking or defrosting.
20. **OPTION.** Touch this pad to change the oven's default settings for volume, clock, scroll speed, units of weight and language.
21. **CLOCK.** Touch this pad to enter the time of day.
22. **KITCHEN TIMER.** Touch this pad to set the kitchen timer.

OPERATING SEQUENCE

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

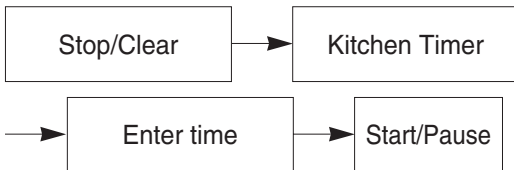
1. SETTING THE CLOCK



2. START/PAUSE and CANCEL FUNCTION

- 1) Touch **Start/Pause** pad to start oven or pause the oven temporarily during cooking.
- 2) Touch **Clear** pad to cancel a program during cooking or Erase during programming.

3. KITCHEN TIMER.



4. CHILD LOCK

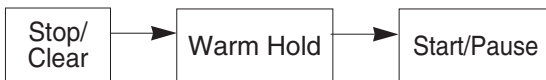
TO SET CHILD LOCK

- Touch and hold **START/PAUSE** pad
- Touch and hold **START/PAUSE** pad → **LOCKED** appear on the display.

TO CANCEL CHILD LOCK

- Touch and hold **START/PAUSE** pad → **LOCKED** disappear in the display.

5. WARM HOLD



To keep hot, cooked food warm.

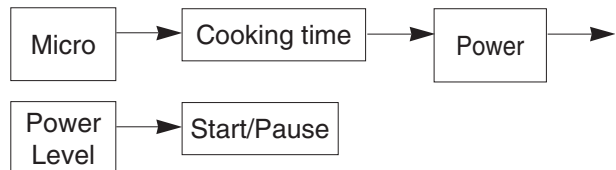
6. MORE / LESS

- The More and Less functions will adjust the cook time of many oven functions.
- More/Less will add/subtract 10 seconds to the cook time each time you press it.

NOTE:

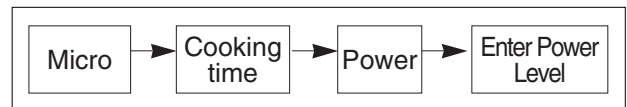
- For convection cooking, More and Less are used as temperature selection pads.

7. MICRO COOKING

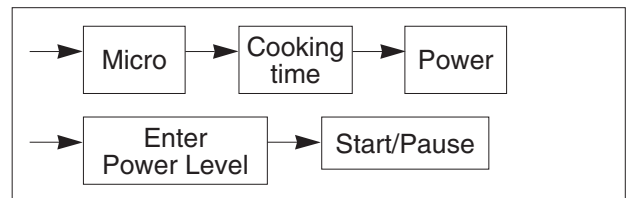


8. MULTI-STAGE COOKING

1ST STAGE



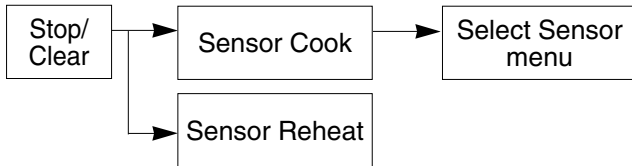
2ND STAGE



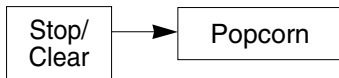
OPERATING SEQUENCE

9. SENSOR TOUCH COOKING

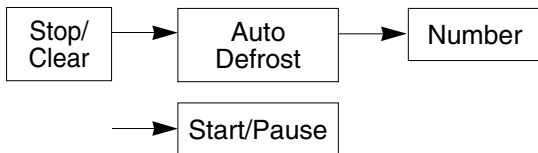
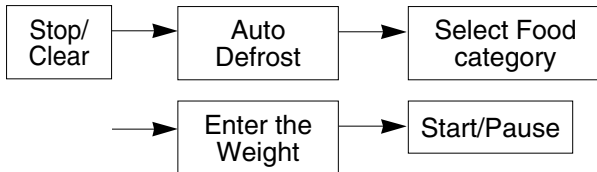
- Sensor cook and reheat



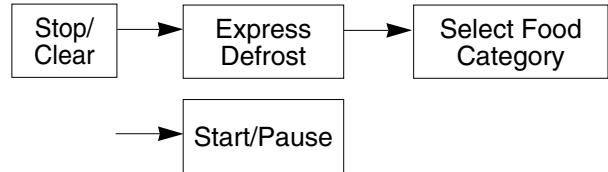
- Sensor Popcorn



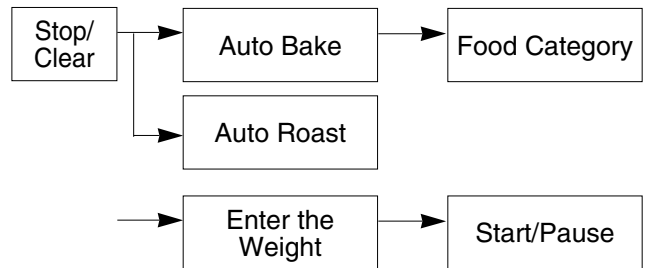
10. AUTO DEFROST



11. EXPRESS DEFROST

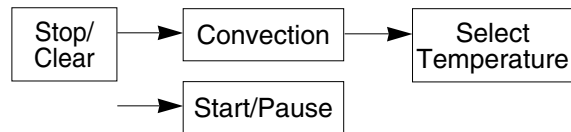


12. AUTO BAKE/ROAST



13. CONVECTION

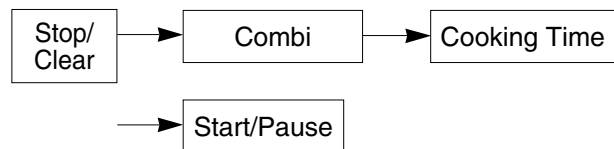
TO PREHEAT



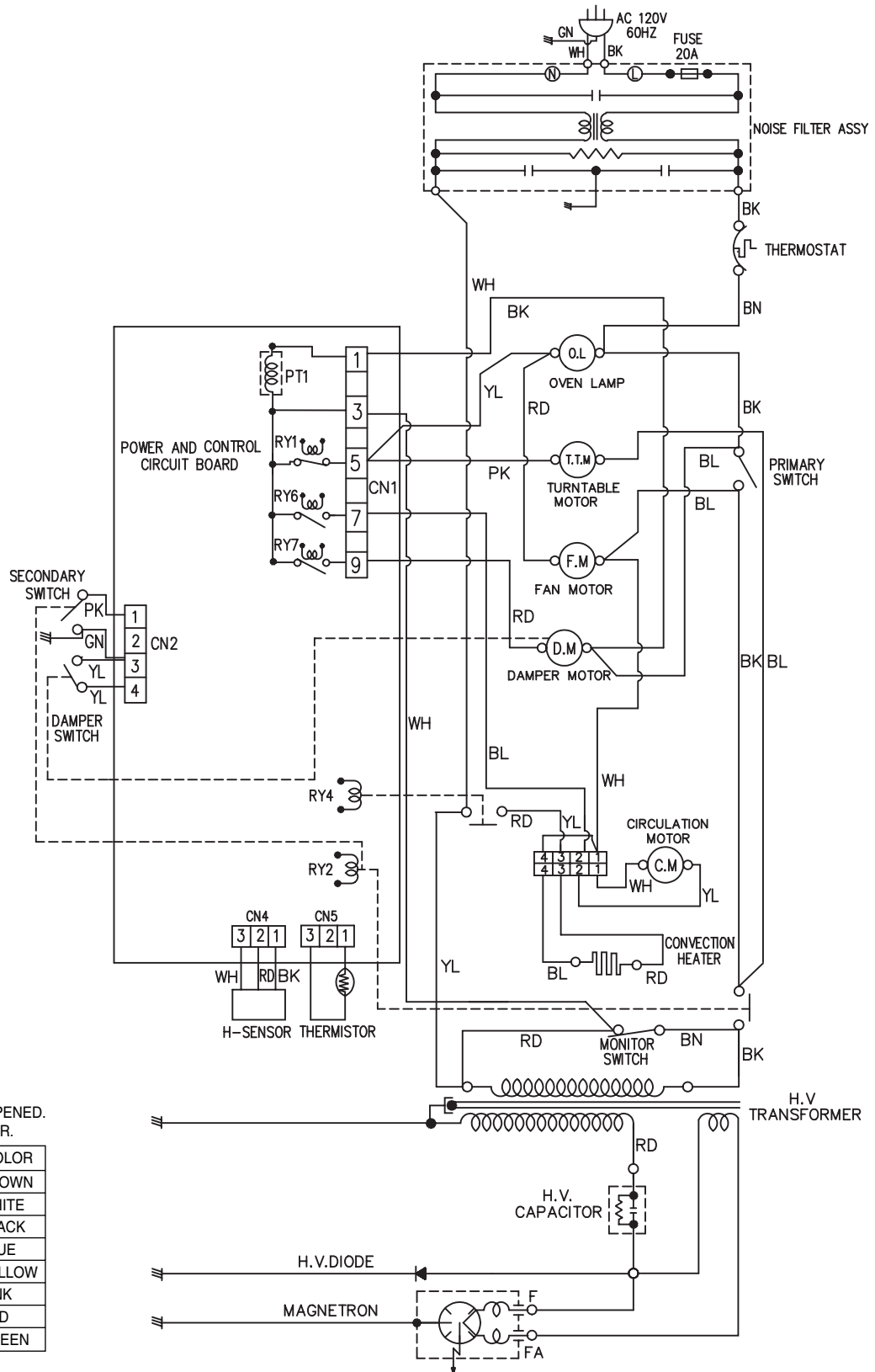
TO COOK(After preheating)



14. COMBINATION



SCHEMATIC DIAGRAM



CIRCUIT DESCRIPTION

GENERAL DETAILS

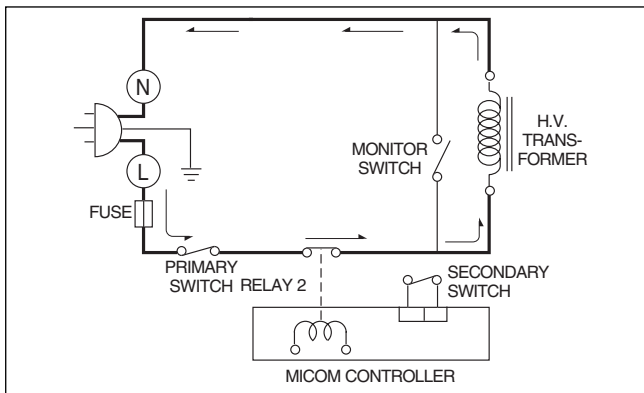
- The low voltage transformer supplies the necessary voltage to the micom controller when power cord is plugged in.
- When the door is closed, the primary switch is ON, the secondary switch is ON, and the monitor switch opens (contact COM and NO).

WHEN SELECTING COOKING POWER LEVEL AND TIME

- The micom controller memorizes the function you set.
- The time you set appears in the display window.
- Each indicator light turns on to indicate that the stage has been set.

WHEN TOUCHING THE START PAD

- The coil of the relay is energized by the micom controller.
- Power input is supplied to the high voltage transformer through the fuse to the primary switch and relay 2.
- Turntable rotates.



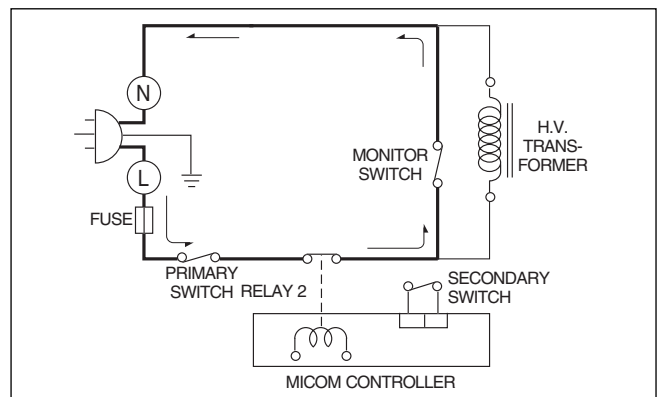
- The fan motor rotates and cools the magnetron by blowing the air.
- The air is also directed into the oven to exhaust the vapor in the oven through the upper plate.
- Cooking time starts counting down.
- 3.15 volts AC is generated from the filament winding of the high voltage transformer. This 3.15 volts is applied to the magnetron to heat the magnetron filament through two noise-preventing choke coils.
- A high voltage of approximately 2,210 volts AC is generated in the secondary of the high voltage transformer which is increased by the action of the high voltage diode and charging of the high voltage capacitor.
- The negative 4,000 Volts DC is applied to the filament of the magnetron.

WHEN THE OVEN IS SET AT ANY LEVEL EXCEPT MAXIMUM.

- The micom controller controls the ON-OFF time of relay 2 by the applied signal to vary the average output power of microwave oven as POWER LEVEL. (refer to page 1-1)
- One complete cycle of relay 2 is 22 seconds.

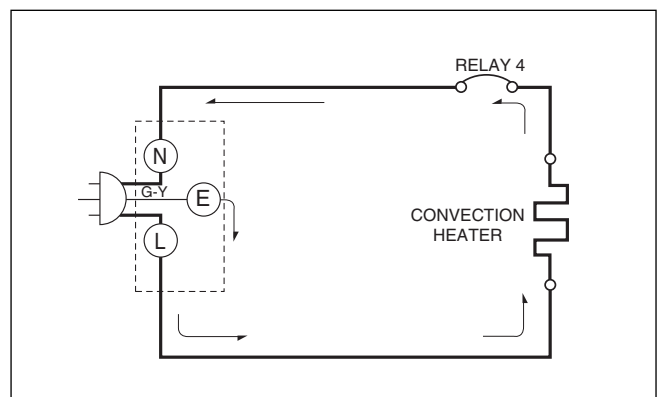
WHEN THE DOOR IS OPENED DURING COOKING

- Both the primary switch and relay 2 cut off the primary winding voltage of the high voltage transformer.
- ON-OFF of relay 2 is coupled electrically with opening and closing of the secondary switch.
- When the door is opened, the secondary switch is opened and when the door is closed, the secondary switch is closed.
- The cooking time stops counting down.
- Relay stops functioning.
- As the door is opened, if the contact of primary switch and relay 2 and/or secondary switch fail to open, the fuse opens due to the large current surge caused by the monitor switch activation, which in turn stops magnetron oscillation.



WHEN TOUCHING THE START KEY WITH THE CONVECTION COOKING.

- The contacts of the primary switch and the secondary switch close the circuit.
- Damper close.
- Turntable rotates.
- Fan Motor, Circulation Motor rotate.



SERVICE INFORMATION

TOOLS AND MEASURING INSTRUMENTS

NECESSARY TOOLS

Tools normally used for TV servicing are sufficient.
Tools needed for service are listed below.

- Diagonal pliers
- Long nose pliers
- Phillips screwdriver
- Flat blade screwdriver
- Wrench (size 2 inches(5mm))
- Nutdriver (size 2 inches(5mm))
- Adjustable wrench
- Soldering iron
- Solder
- Vinyl insulation tape
- Polishing cloth

NECESSARY MEASURING INSTRUMENTS

- TESTER (VOLTS-DC, AC, Ohm meter)
- Microwave survey meter
 - Holaday HI-1500
 - HI-1501
 - Narda 8100
 - 8200
- Inch scale
- 600 cups (cc) non conductive material beaker (glass or plastic), inside diameter: approx. 3½ inches (8.5 cm)
- Cylindrical and made of borosilicate glass vessel.
 - max. thickness: 0.12 inches (3mm)
 - outside diameter: approx. 7.5 inches (190mm)
 - height: approx. 3.5 inches (90mm)
- Glass thermometer: 212°F (100°C) (1 deg scale)

MICROWAVE LEAKAGE TEST

CAUTIONS

- Be sure to check microwave leakage prior to servicing the oven if the oven is operative prior to servicing.
- The service personnel should inform the manufacture importer, or assembler of any certified oven unit found to have a microwave emission level in excess of 5 mW/cm² and should repair any unit found to have excessive emission levels at no cost to the owner and should ascertain the cause of the excessive leakage. The service personnel should instruct the owner not to use the unit until the oven has been brought into compliance.
- If the oven operates with the door open, the service personnel should:
 - Tell the user not to operate the oven.
 - Contact the manufacturer.
- The service personnel should check all surface and vent openings for microwave leakage.
- Check for microwave leakage after every servicing. The power density of the microwave radiation leakage emitted by the microwave oven should not exceed 5 mW/cm². Always start measuring of an unknown field to assure safety for operating personnel from radiation leakage.

MEASURING MICROWAVE ENERGY LEAKAGE

- Pour 275±15cc of 20±5°C(68±9°F) water in a beaker which is graduated to 600 cc, and place the beaker on the center of the turntable.
- Set the energy leakage monitor to 2,450 MHz and use it following the manufacturer's recommended test procedure to assure correct result.
- When measuring the leakage, always use the 2 inches (5cm) spacer supplied with the probe.
- Operate the oven at its maximum output.
- Measure the microwave radiation using and electromagnetic radiation monitor by holding the probe perpendicular to the surface being measured

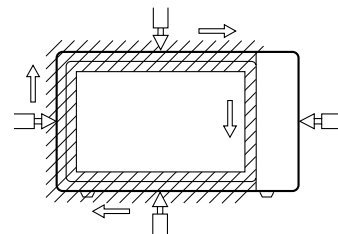
Move probe along shaded area

////////////////////

Probe scanning speed

Less than 2.5 cm/sec

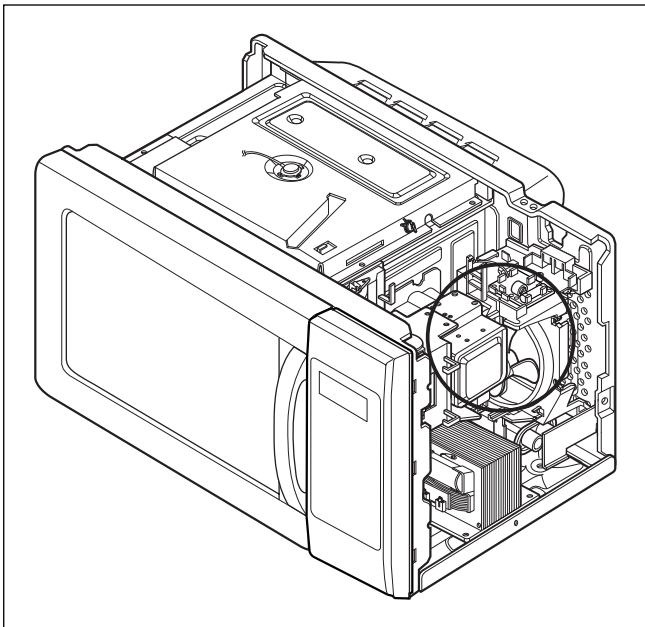
(1 in/sec)



MEASUREMENT WITH OUTER CASE REMOVED

- When you replace the magnetron, measure for microwave energy leakage around the door view window, the exhaust opening, and air inlet opening before the outer case is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring the following parts. (Circled area of Fig. below)
 - Around the magnetron
 - The waveguide

WARNING : AVOID CONTACTING ANY HIGH VOLTAGE PARTS



MEASUREMENT WITH A FULLY ASSEMBLED OVEN

- After all components, including the outer case, are fully assembled, measure for microwave energy leakage around the door viewing window.

NOTES WHEN MEASURING

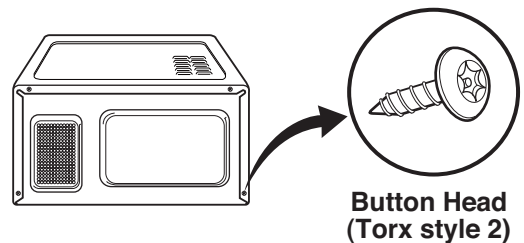
- Do not exceed meter full scale deflection.
- The test probe must be removed no faster than 1 inches/sec (2.5 cm/sec) along the shaded area, otherwise a false reading may result.
- The test probe must be held with the grip portion of the handle. A false reading may result if the operator's hand is between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

RECORD KEEPING AND NOTIFICATION AFTER MEASUREMENT

- After adjustment and repair of any microwave energy interruption or microwave energy blocking device, record the measured values for future reference. Also enter the information on the service invoice.
- The microwave energy leakage should not be more than 5 mW/cm². after determining that all parts are in good condition, functioning properly and genuine replacement parts which are listed in this manual have been used.
- At least once a year, have the electromagnetic energy leakage monitor checked for calibration by its manufacturer.

SPECIAL TIP

- This oven used the button head screws.



- When you remove the screws, using the tamper-resistant Torx driver have a pin-in-head.

MEASUREMENT OF MICROWAVE POWER OUTPUT

- Microwave power output measurement is made with the microwave oven supplied at its rated voltage and operated at its maximum microwave power setting with a load of (1000 ± 5)g of potable water.
- The water is contained in a cylindrical borosilicate glass vessel having a maximum material thickness of 0.12 inches (3mm) and an outside diameter of approximately 7.5 inches (190mm).
- The oven and the empty vessel are at ambient temperature prior to the start of the test.
- The initial temperature (T₁) of the water is (10±2)°C. It is measured immediately before the water is added to the vessel. After addition of the water to the vessel, the load is immediately placed on the center of the turntable which is in the lowest position and the microwave power switched on.
- The time T for the temperature of the water to rise by a value ΔT of (10±2)°K is measured, where T is the time in seconds and ΔT is the temperature rise. The initial and final water temperatures are selected so that the maximum difference between the final water temperature and the ambient temperature is 5°K.

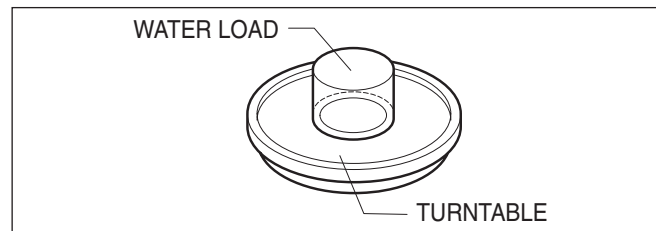
- The microwave power output P in watts is calculated from the following formula:

$$P = \frac{4187 \times (\Delta T) + 0.55 \times (T_2 - T_0) \times M}{T}$$

- T₂ : Temperature after heating
- T₀ : Temperature of bowl
- M : Weight of bowl

is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included. (about 3 sec)

- The water is stirred to equalize temperature throughout the vessel, prior to measuring the final water temperature.
- Stirring devices and measuring instruments are selected in order to minimize addition or removal of heat.



DISASSEMBLY AND ADJUSTMENT

A. OUTER CASE REMOVAL

- 1) Disconnect the power supply cord from the outlet.
- 2) Remove the screws from the rear of the case.
The outer case must be moved backward to be lifted off.

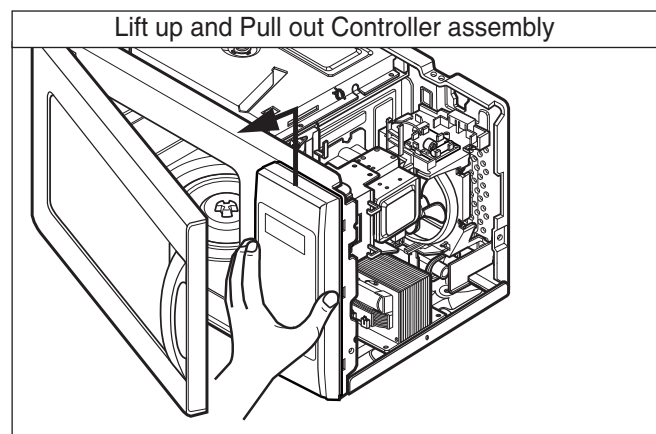
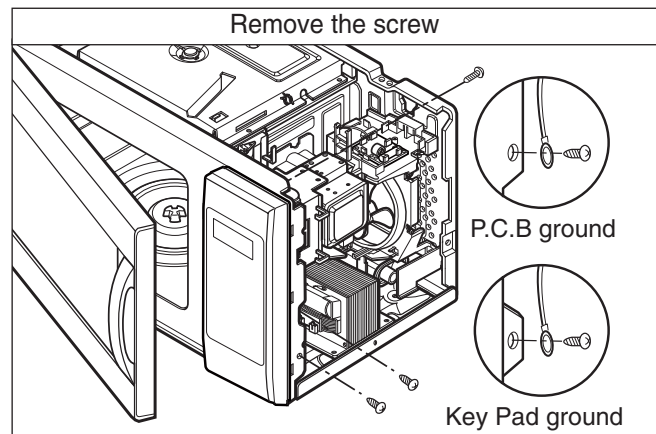
B. POWER SUPPLY CORD REMOVAL

- 1) Remove the outer case.
- 2) Disconnect two terminals, and remove one screw of the ground terminal.

C. CONTROLLER ASSEMBLY REMOVAL

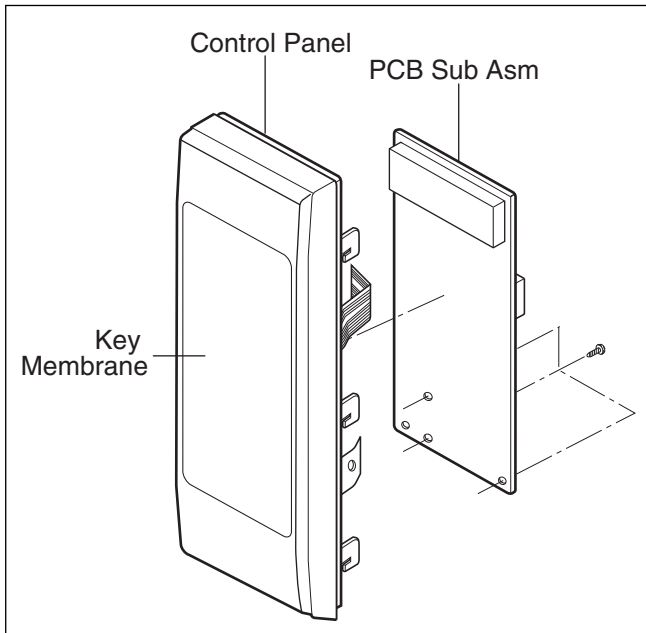
- 1) Open the door.
- 2) Remove the screws which hold the CONTROLLER assembly to the cavity and of the ground terminal.
- 3) Disconnect the leadwires from RELAY and connector of the P.C.B. SUB assembly.
- 4) Lift up and pull out CONTROLLER assembly carefully from the cavity.

CAUTION: DISCHARGE THE HIGH VOLTAGE CAPACITOR BEFORE SERVICING
(refer to page 2-1)



D. P.C.B ASSEMBLY REMOVAL

- 1) Remove the control panel assembly from the cavity.
(Refer to control panel assembly removal on previous page.)
- 2) Remove screws which hold the P.C.B. SUB Assembly to the control panel.
- 3) Pull P.C.B. SUB Assembly carefully from the control panel.



E. DOOR ASSEMBLY / REMOVAL

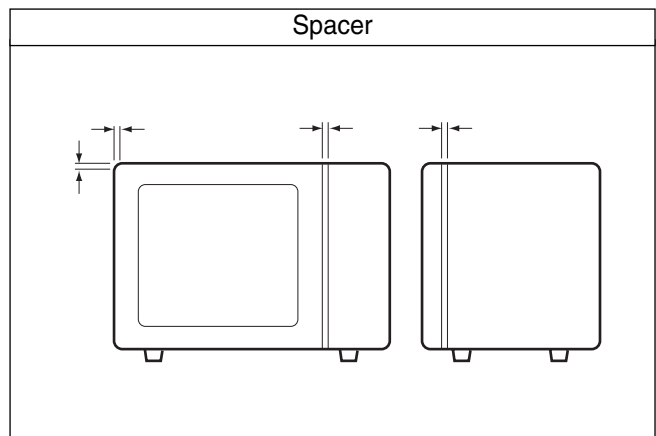
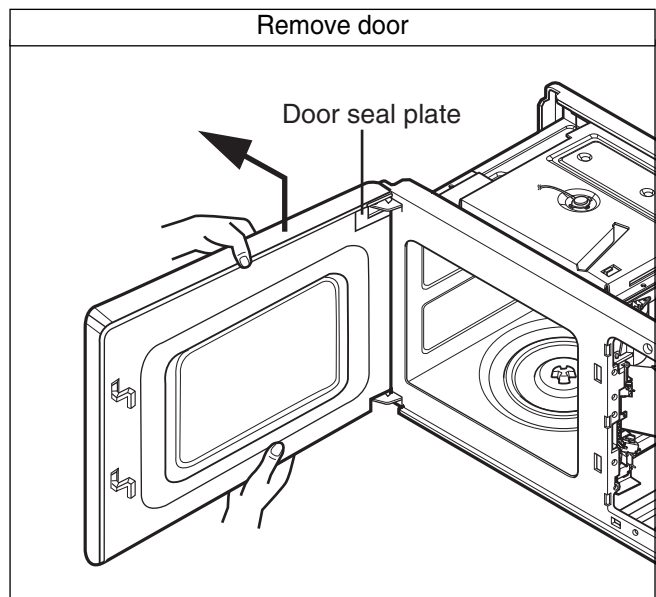
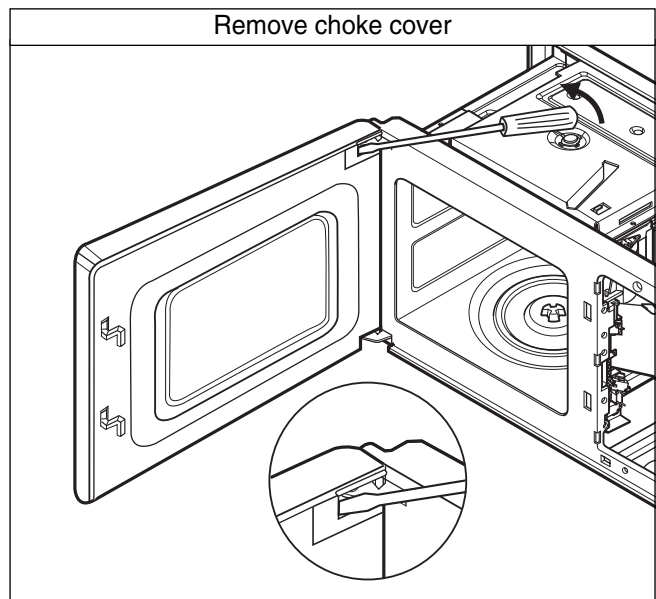
- 1) Open the door.
- 2) Remove the choke cover very carefully with a flat-blade screwdriver.

CAUTION: Be careful not to damage door seal plate by screwdriver.

- 3) Lift up and pull the door.

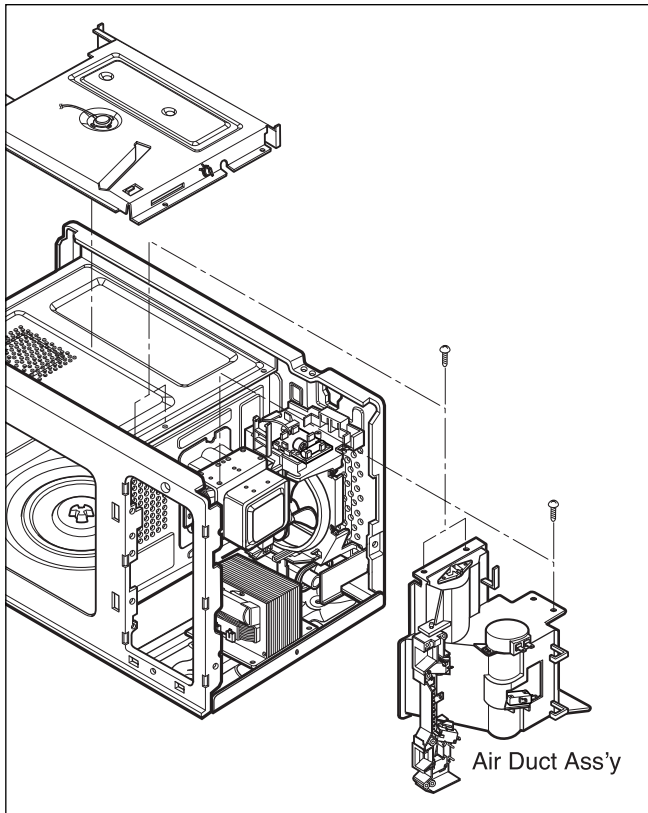
NOTE:

1. After replacing the door, be sure to check that the primary switch, monitor switch, and secondary switch operate normally.
2. After replacing the door, check for microwave energy leakage with a survey meter. Microwave energy must be below the limit of 5 mW/cm^2 . (with a 275 ml water load)
3. When mounting the door assembly to the oven assembly, be sure to adjust the door assembly parallel to the chassis, and adjust so the door has no play between the inner door surface and oven frame assembly. If the door assembly is not mounted properly, microwaves may leak from the clearance between the door and the oven.



F. AIR DUCT ASSEMBLY / REMOVAL

- 1) Disconnect the leadwires from the lamp, micro switch, damper motor, and damper switch.
- 2) Remove the screws holding the oven cavity and latch board, air duct, and air tunnel assembly.
- 3) Remove the mounting screws holding the magnetron and air duct assembly.
- 4) Remove air tunnel.
- 5) Pull latch board assembly and air duct assembly.



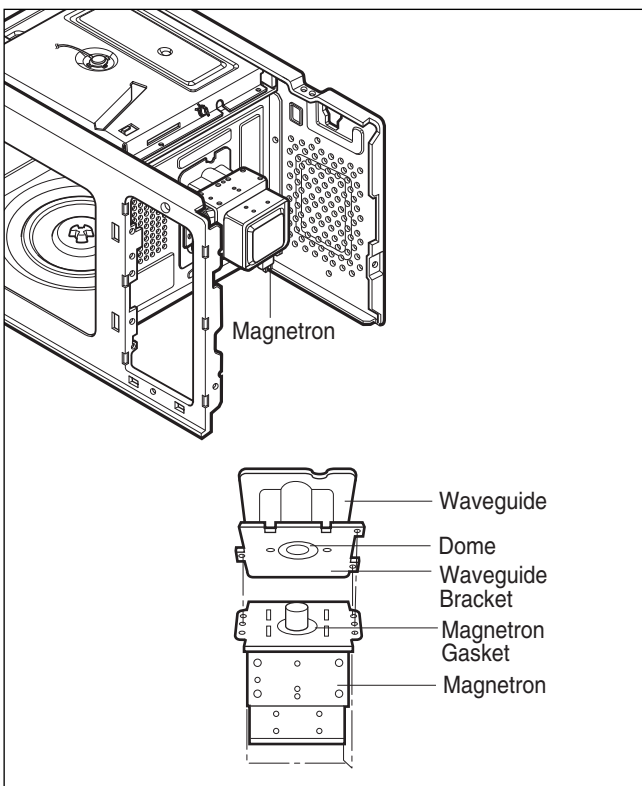
G. MAGNETRON REMOVAL

- 1) Remove the mounting screw holding the magnetron and air duct assembly.
- 2) Disconnect the leadwire from the magnetron.
- 3) Carefully remove the mounting screws holding the magnetron and the waveguide.
- 4) Remove the magnetron from the waveguide.

NOTE:

1. When removing the magnetron, make it sure dome does not hit any adjacent parts, or it may be damaged.
2. When replacing the magnetron, be sure to install the magnetron gasket in the correct position and be sure that the gasket is in good condition.
3. After replacing the magnetron, check for microwave leakage with a survey meter around the magnetron. Microwave energy must be below the limit of 5 mW/cm^2 . (With a 275 ml. water load).

Make sure that gasket is rigidly attached to the magnetron. To prevent microwave leakage, tighten the mounting screws properly, making sure there is no gap between the waveguide and the magnetron.

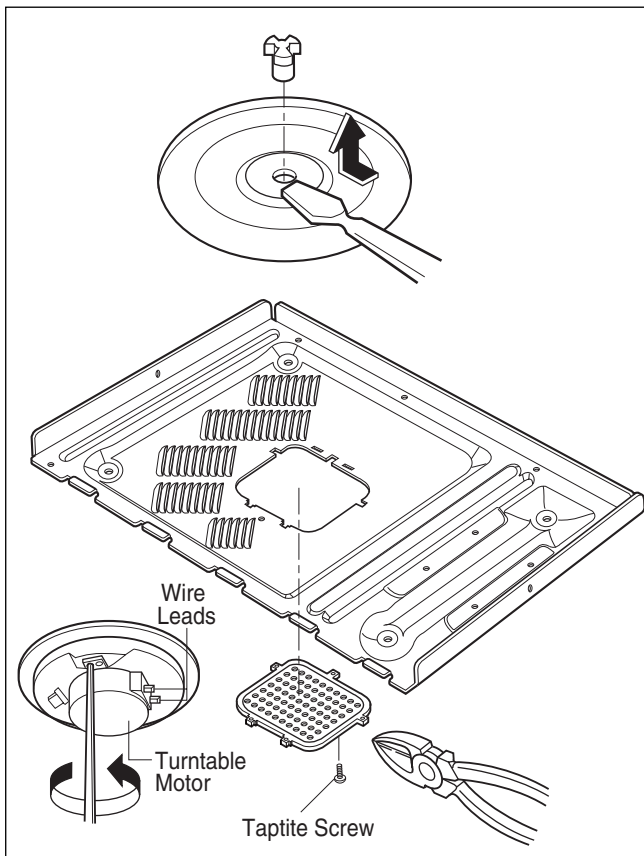


H. THE TURNTABLE MOTOR REMOVAL

- 1) Remove the turntable and rotating ring.
- 2) Lay the unit on its back.
- 3) Remove the turntable motor cover.
The turntable base cover can be easily removed by pinching the six tabs with wire cutters.
- 4) Disconnect the lead wire from the turntable motor terminals.
- 5) Remove the screws securing the turntable motor to the oven cavity assembly.
- 6) After repairing the motor, rotate the removed turntable motor cover 180° and place the tabs in the lower slots. Secure the cover with the screws provided.
- 7) Fit the turntable motor cover's projecting part to the base plate slit.
- 8) The taptite screw shall be used when a turntable motor cover is secured with a screw.

NOTE:

1. Remove the lead from the turntable motor VERY CAREFULLY.
2. Be sure to grasp the connector, not the wires, when removing.



I. HIGH VOLTAGE TRANSFORMER REMOVAL

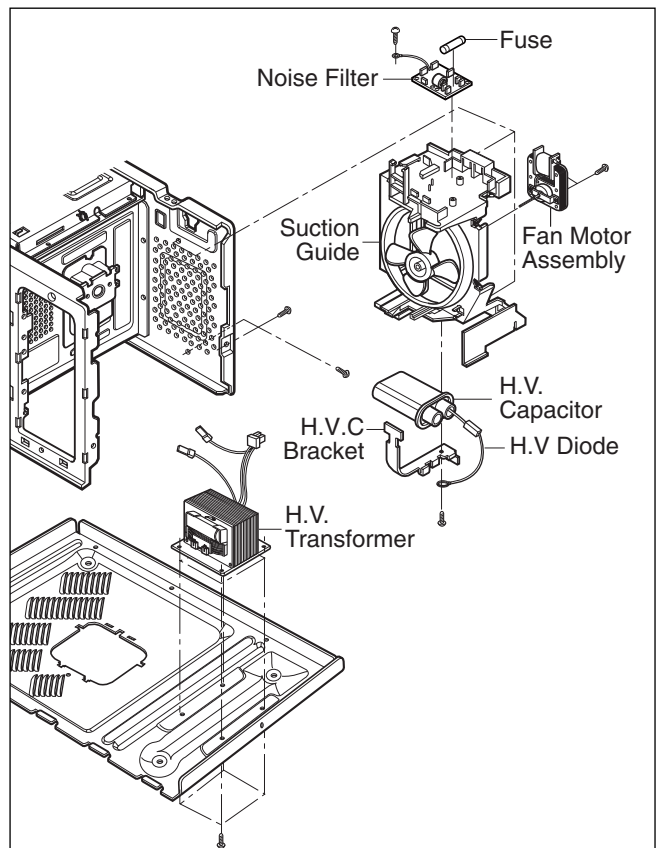
- 1) Discharge the high voltage capacitor.
- 2) Disconnect the leadwire from magnetron, and high voltage capacitor.
- 3) Remove the screws holding the high voltage transformer to the baseplate.

J. FAN MOTOR ASSEMBLY / REMOVAL

- 1) Discharge the high voltage capacitor.
- 2) Disconnect the leadwires from fan motor, fuse holder, and high voltage capacitor.
- 3) Remove the two screws holding the suction guide assembly to the oven cavity and remove the high voltage diode ground screw.
- 4) Remove the two screws holding the fan motor assembly to the suction guide assembly.

K. HIGH VOLTAGE CAPACITOR AND DIODE REMOVAL

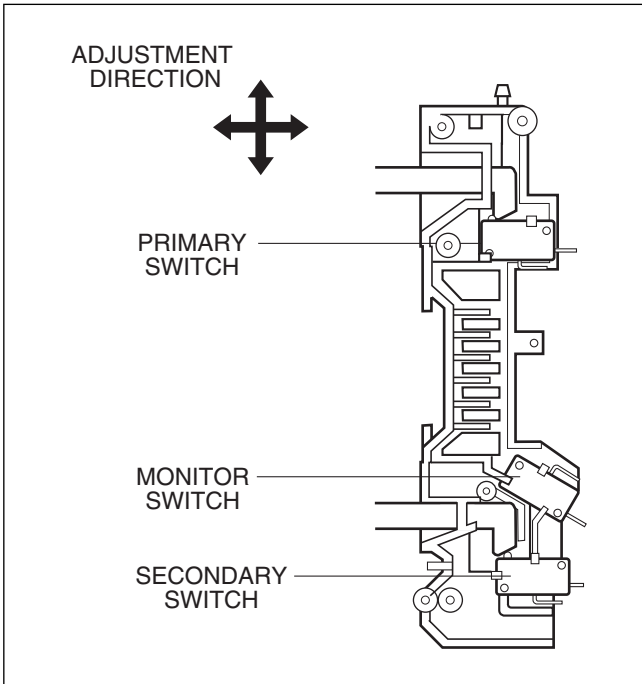
- 1) Discharge the high voltage capacitor.
- 2) Disconnect the leadwires from fan motor, fuse holder, and high voltage capacitor.
- 3) Remove the screw holding the suction guide assembly to the oven cavity and remove the high voltage diode ground screw.
- 4) Remove the screw holding the high voltage capacitor bracket.



L. INTERLOCK SYSTEM

1) INTERLOCK MECHANISM

The door lock mechanism is a device which has been specially designed to stop microwave activity when the door is opened during cooking and thus to prevent the danger resulting from the microwave leakage.



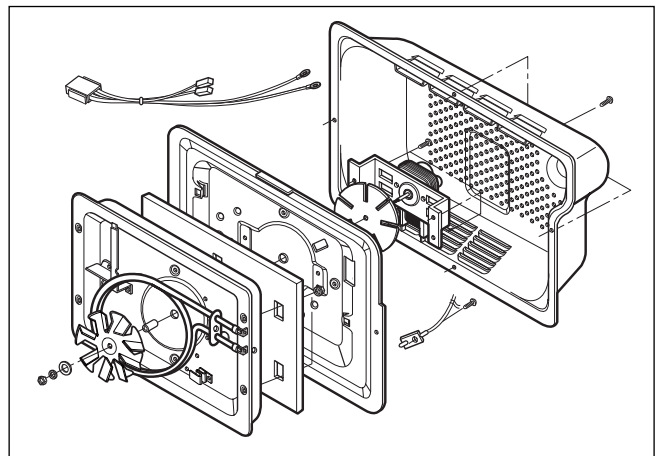
2) MOUNTING OF THE PRIMARY/MONITOR/SECONDARY SWITCHES TO THE LATCH BOARD

3) INSTALLATION AND ADJUSTMENT OF THE LATCH BOARD TO THE OVEN ASSEMBLY

- Mount the latch board to the oven assembly.
- Adjust the latch board in the arrow direction so that oven door will not have any play in it when the door is closed.
- Tighten the mounting screw.
- **Check for play in the door by pulling and pushing the door handle. Door movement should be less than 1/64 inches. (0.5 mm)** Don't pull the door handle while making this adjustment. Make sure that the latch moves smoothly after adjustment is completed and that the screws are tight. Make sure the primary, monitor, and secondary switches operate properly by following the continuity test procedure.

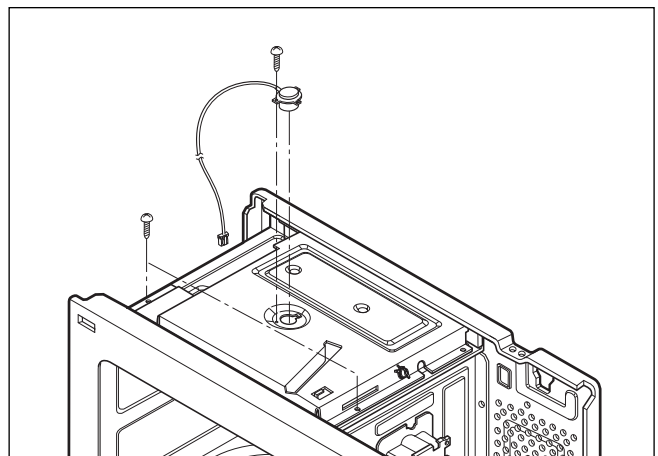
M. C-MOTOR, THERMISTOR AND SHEATH HEATER REMOVAL

- 1) Remove the back cover by removing the four screws securing the cover assembly to the oven cavity.
- 2) Disconnect the leadwire from the circulation motor and the sheath heater terminal.
- 3) Remove four hex nuts holding chamber assembly to the oven cavity.
- 4) Remove the screws of the thermistor, and lift up chamber assembly.
- 5) Remove a hex nut securing the circulation fan to shaft of the C-motor.
- 6) Remove screws securing sheath heater to chamber wall.
- 7) Remove sheath heater from chamber assembly.



N. SENSOR REMOVAL

- 1) Disconnect the sensor connector from P.C.B. Sub assembly.
- 2) Remove the screw securing sensor to Air tunnel.



INTERLOCK CONTINUITY TEST

WARNING : FOR CONTINUED PROTECTION AGAINST EXCESSIVE RADIATION EMISSION, REPLACE ONLY WITH IDENTICAL REPLACEMENT PARTS.

TYPE NO. SZM-V 16-FA-63 OR VP-533A-OF FOR PRIMARY SWITCH
 TYPE NO. SZM-V 16-FA-62 OR VP-532A-OF FOR MONITOR SWITCH
 TYPE NO. SZM-V 16-FA-63 OR VP-533A-OF FOR SECONDARY SWITCH

A. PRIMARY INTERLOCK SWITCH TEST

When the door handle is depressed slowly with the door closed, an audible **click** should be heard at the same time or successively at intervals. When the door handle is released slowly, the latches should activate the switches with an audible **click**.
 If the latches do not activate the switches when the door is closed, the switches should be adjusted in accordance with the adjustment procedure. Disconnect the wire lead from the primary switch. Connect the ohm meter leads to the common (COM) and normally open (NO) terminal of the switch. The meter should indicate an open circuit in the door open condition. When the door is closed, the meter should indicate a closed circuit.
 When the primary switch operation is abnormal, make the necessary adjustment or replace the switch only with the same type of switch.

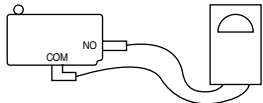


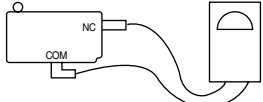


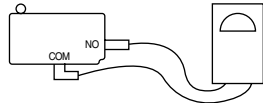


B. SECONDARY INTERLOCK SWITCH TEST

Disconnect the wire lead from the secondary switch.
 Connect the ohm meter leads to the common (COM) and normally open (NO) terminals of the switch. The meter should indicate a open circuit in the door open condition. When the door is closed, meter should indicate an closed circuit. When the secondary switch operation is abnormal, make the necessary adjustment or replace the switch only with the same type of switch.

C. MONITOR SWITCH TEST

Disconnect the wire lead from the monitor switch. Connect the ohm meter leads to the common (COM) and normally closed (NC) terminals of the switch. The meter should indicate a closed circuit in the door open position. When the door is closed, meter should indicate an open circuit. When the monitor switch operation is abnormal, replace with the same type of switch.

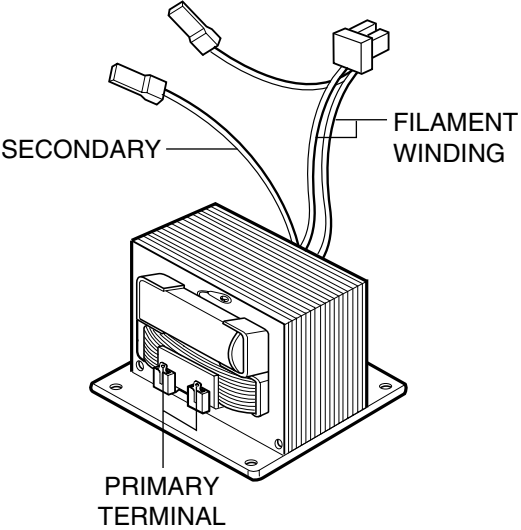
NOTE: After repairing the door or the interlock system, it is necessary to do this continuity test before operating the oven.

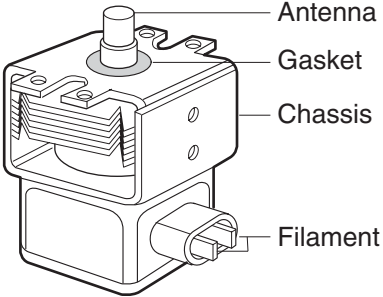
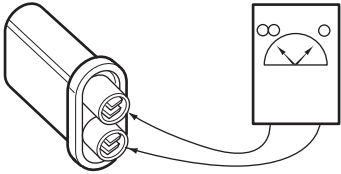
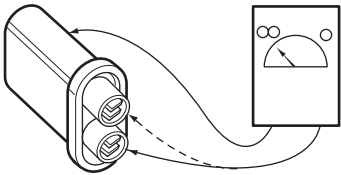
COMPONENTS	TEST PROCEDURE		RESULTS	
SWITCHES (Wire leads removed)	Check for continuity of the switch with an Ohm-meter		Door open	Door closed
	Primary Switch			
	Monitor Switch			
	Secondary Switch			
NOTE : After checking for the continuity of switches, make sure that they are connected correctly.				

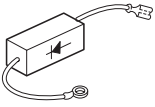
COMPONENT TEST PROCEDURE

CAUTIONS

1. DISCONNECT THE POWER SUPPLY CORD FROM THE OUTLET WHENEVER REMOVING THE OUTER CASE FROM THE UNIT. PROCEED WITH THE TEST ONLY AFTER DISCHARGING THE HIGH VOLTAGE CAPACITOR AND REMOVING THE WIRE LEADS FROM THE PRIMARY WINDING OF THE HIGH VOLTAGE TRANSFORMER. (SEE PAGE 2-1)
2. ALL OPERATIONAL CHECKS WITH MICROWAVE ENERGY MUST BE DONE WITH A LOAD (1 LITER OF WATER IN CONTAINER) IN THE OVEN.

COMPONENTS	TEST PROCEDURE	RESULTS
<p>HIGH VOLTAGE TRANSFORMER (Wire leads removed)</p>	 <p>The diagram shows a high voltage transformer with three sets of wire leads. One lead is labeled 'SECONDARY', another 'FILAMENT WINDING', and the third 'PRIMARY TERMINAL'. The transformer is mounted on a metal base with a terminal block.</p> <ol style="list-style-type: none"> 1. Measure the resistance. (Ohm-meter scale: Rx1 and Rx100) <ul style="list-style-type: none"> • Primary winding • Secondary winding • Filament winding 2. Measure the resistance. (Ohm-meter scale: Rx1 and Rx100) <ul style="list-style-type: none"> • Primary winding to ground • Filament winding to ground 	<p>Approx.: 0.3 ~ 0.6 ohm Approx.: 70 ~ 100 ohm Less than: 1 ohm</p> <p>Normal: Infinite Normal: Infinite</p>
<p>MAGNETRON (Wire leads removed)</p>	<ol style="list-style-type: none"> 1. Measure the resistance. (Ohm-meter scale: Rx1) <ul style="list-style-type: none"> • Filament terminal 2. Measure the resistance. (Ohm-meter scale: Rx1) <ul style="list-style-type: none"> • Filament to chassis 	<p>Normal: Less than 1 ohm</p> <p>Normal: Infinite</p>

COMPONENTS	TEST PROCEDURE	RESULTS
	 <p>NOTE: When testing the magnetron, be sure to install the magnetron gasket in the correct position and be sure that the gasket is in good condition.</p>	
HIGH VOLTAGE CAPACITOR	<p>Measure the resistance. (Ohm-meter scale: Rx10,000)</p> <ul style="list-style-type: none"> • Terminal to terminal. 	Normal: Momentarily indicates several ohms, and then gradually returns to infinite.
	<p>Measure the resistance. (Ohm-meter scale: Rx10,000)</p> <ul style="list-style-type: none"> • Terminal to case. 	Normal: Infinite.

COMPONENTS	TEST PROCEDURE	RESULTS
<p>H.V.Diode (RECTIFIER)</p> 	<p>STEP 1. Test the diode to see if it is shorted. Procedure: 1. Select the ohm scale on the meter. 2. Place the meter leads across the diode as pictured in Figure 1. The reading should be “40MΩ,” “OL,” or a reading of infinity. 3. Reverse the meter leads. The reading should again indicate a reading of infinity. If the diode shows “infinity” in BOTH directions, it is NOT shorted. 4. If the diode is not shorted, proceed to step 2.</p> <p>STEP 2. Test the diode for forward biasing. Procedure: 1. Select the DCV scale on the meter. 2. Using the meter, battery, and jumper wire, connect the items as illustrated in Figure 2. This has the positive side of the battery connected to the cathode of the diode. 3. The diode should be forward biased therefore a voltage reading of approximately 4.7 VDC to 6.4 VDC will be read depending on meter, battery strength, etc. (Note: If the meter leads were reversed, a negative voltage of the same amount would be seen.)</p> <p>STEP 3. Test the diode for reverse biasing. Procedure: 1. Using the same scale on the meter, connect the positive side of the battery to the anode of the diode as illustrated in Figure 3. 2. The diode should be reverse biased therefore a reading of 0 volt or a value displayed in mV will be seen. (The display will be erratic changing values rapidly in the mV scale.)</p>	<p>Normal: Approximately 4.7-6.4V</p> <p>Normal: Approximately 0V</p>

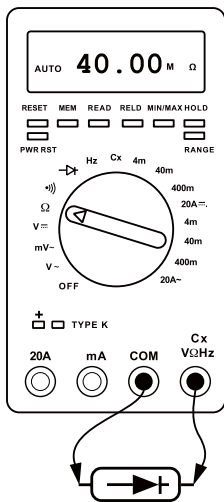


Figure 1

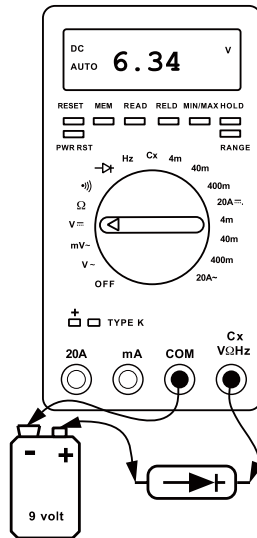


Figure 2

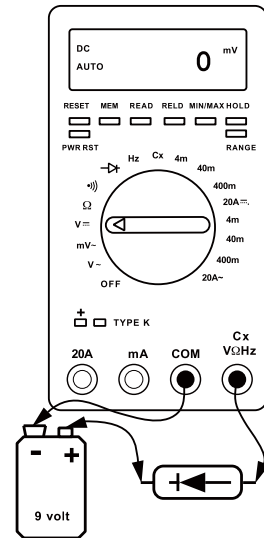
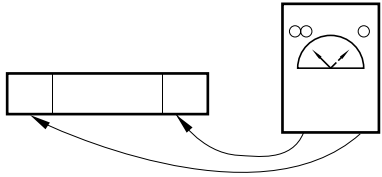
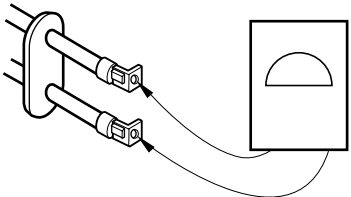
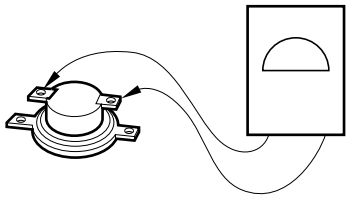
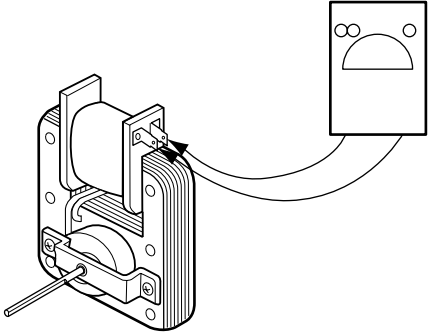
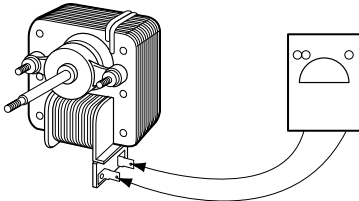
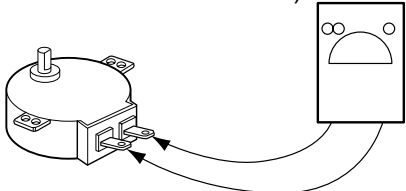
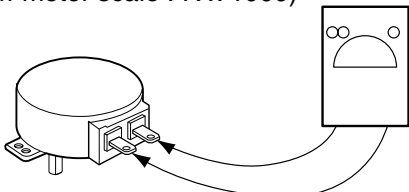
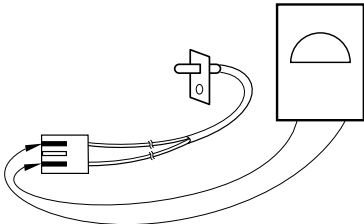
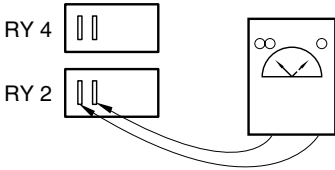




Figure 3

COMPONENTS	TEST PROCEDURE	RESULTS	
<p>FUSE (Wire leads removed.)</p>	<p>Check for continuity of the switch with a Multi-meter.</p>  <p>NOTE: If the fuse is blown, check the primary, the secondary, and the monitor switches, H.V.D. and H.V.C. before replacing the fuse. If the fuse is blown by improper switch operation replace the defective switch and the fuse at the same time. Replace just the fuse if the switches operate normally.</p>	Normal	Abnormal
<p>CONVECTION HEATER (Wire leads removed)</p>	<p>Measure the resistance. (Multi-meter scale : R x 1)</p>  <p>NOTE: Make sure heater is fully cooled when tested.</p>	<p>Normal: Approx. 9.5 ohm (at 20~30°C)</p>	
<p>MAGNETRON THERMOSTAT</p>		Normal	Abnormal
<p>FAN MOTOR (Wire leads removed)</p>	<p>Measure the resistance. (Ohm-meter scale : R x 1)</p> 	<p>Normal: Approx. 49 ohm.</p> <p>Abnormal: Infinite or several ohm.</p>	

COMPONENTS	TEST PROCEDURE	RESULTS	
CIRCULATION MOTOR (Wire leads removed)	Measure the resistance. (Multi-meter scale : R x 1) 	Normal : Approx. 29.5 ohm Abnormal : Infinite or several ohm.	
TURNTABLE MOTOR (Wire leads removed)	Measure the resistance. (Ohm-meter scale : R x 1000) 	Normal : Approx. 3.48 Kohm Abnormal : Infinite or several ohm.	
DAMPER MOTOR (Wire leads removed)	Measure the resistance. (Ohm-meter scale : R x 1000) 	Normal : Approx. 2.93 Kohm Abnormal : Infinite or several ohm.	
THERMISTOR (Disconnect the 2 pin connector from P.C.B.)		Normal at room temperature (20°C~30°C) Approx. 255 Kohm	
RELAY 2, 3, 4 OF P.C.B. (leadwires removed.) RY2 : Microwave RY4 : Convection		Cooking Start	OFF
			
NOTE : A MICROWAVE ENERGY LEAKAGE TEST MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED FOR ANY REASON. MAKE SURE THE WIRE LEADS ARE CORRECT POSITION. WHEN REMOVING THE WIRE LEAD FROM THE PARTS, BE SURE TO GRASP THE CONNECTOR, NOT THE WIRES.			

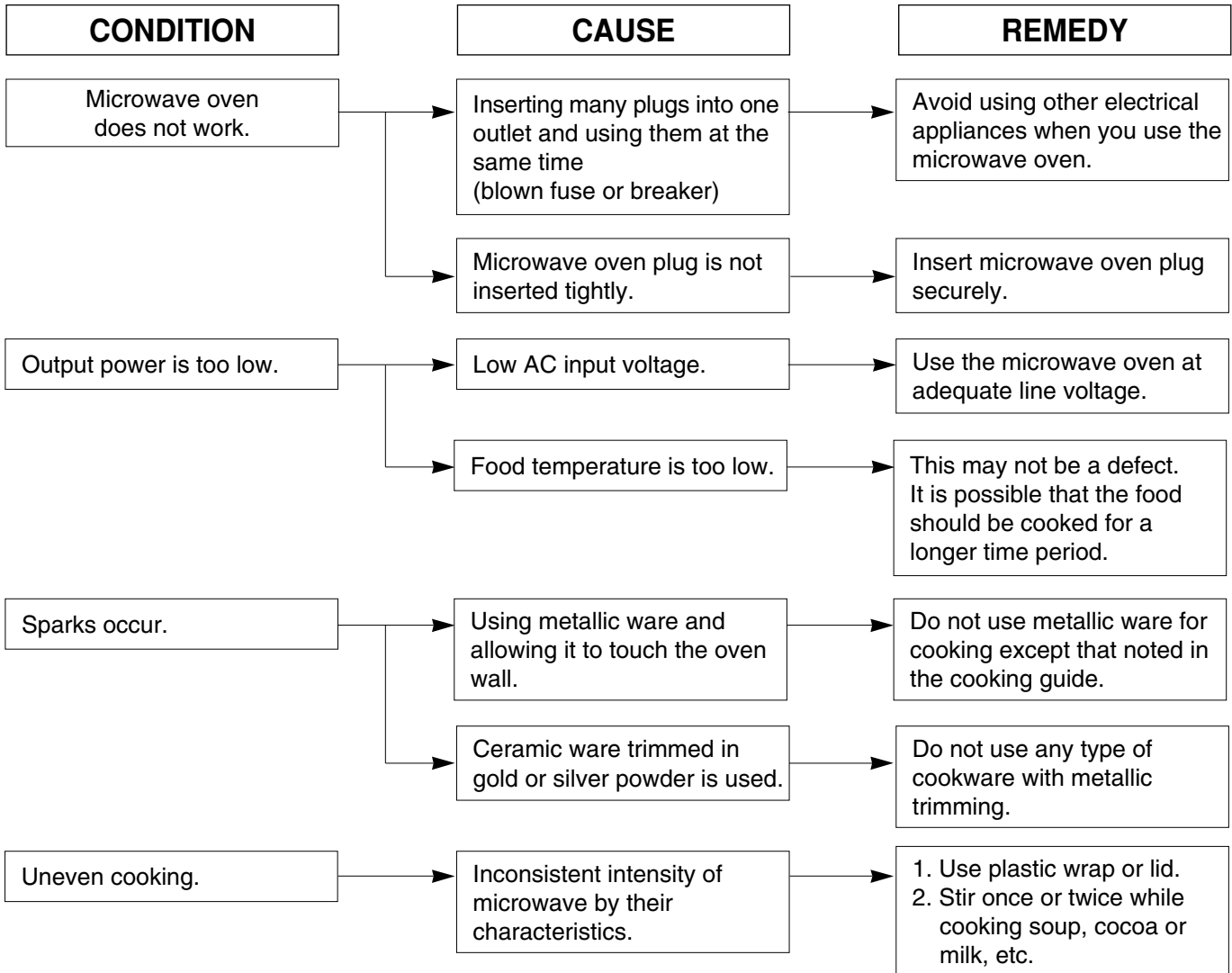
F-code	Cause	Corrective Action
F-1	Temperature probe open on cook.	Replace Temperature probe.
F-2	Temperature probe short on cook.	Replace Temperature probe.
F-4	Humidity sensor open.	Replace Humidity sensor.

TROUBLE SHOOTING

WHEN YOU GET A COMPLAINT FROM YOUR CUSTOMER, EVALUATE THE COMPLAINT CAREFULLY. IF THE FOLLOWING SYMPTOMS APPLY, PLEASE INSTRUCT THE CUSTOMER IN THE PROPER USE OF THE MICROWAVE OVEN. THIS CAN ELIMINATE AN UNNECESSARY SERVICE CALL.

CAUTIONS

1. Check grounding before checking for trouble.
 2. Be careful of the high voltage circuit.
 3. Discharge the high voltage capacitor. (See page 2-1)
 4. When checking the continuity of the switches or of the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
 5. Do not touch any part of the circuit on the P.C.B since static electric discharge may damage this control panel.
- Always ground yourself while working on this panel to discharge any static charge built up in your body.

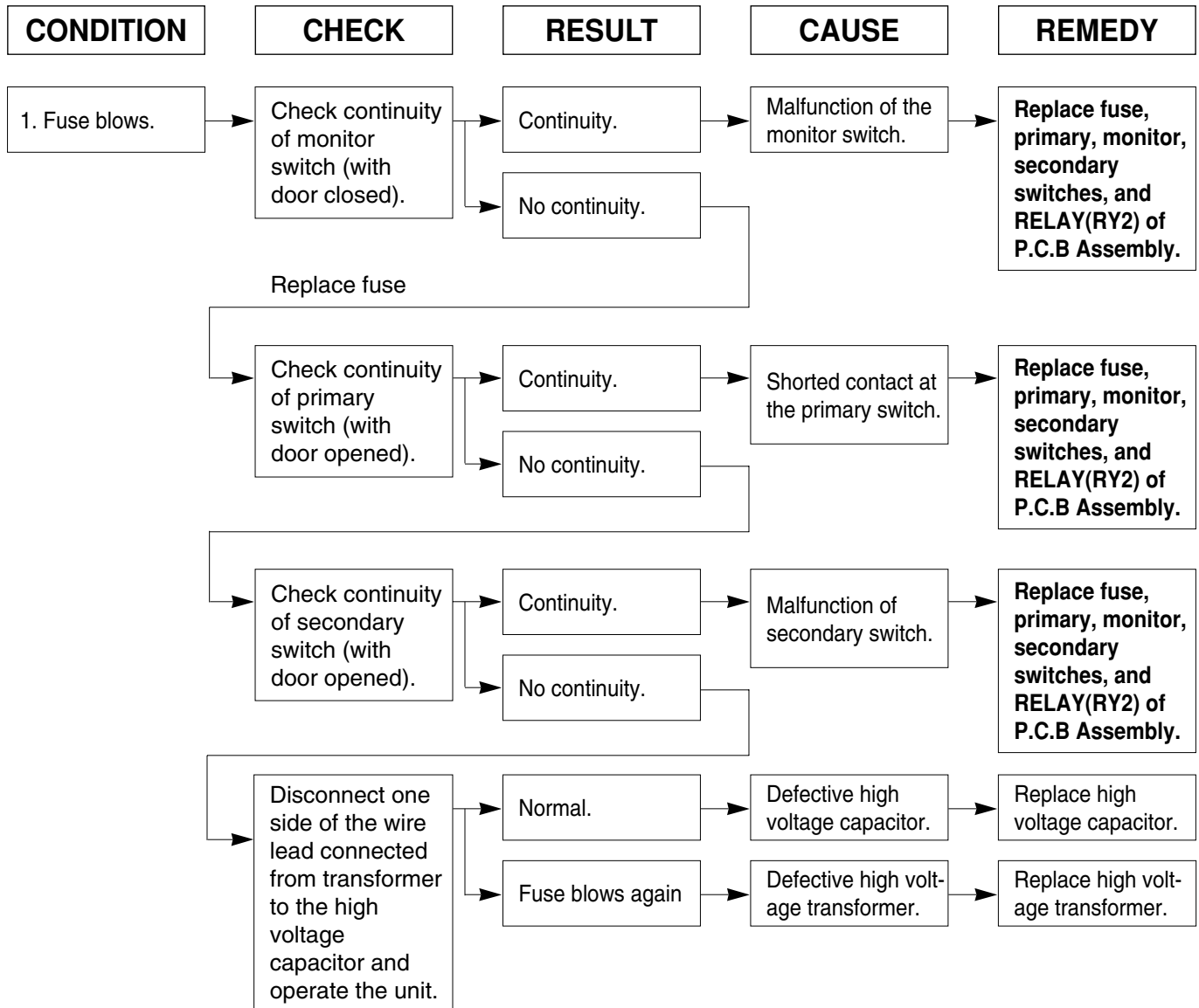


(TROUBLE 1) The following visual conditions indicate a probable defective control circuit.

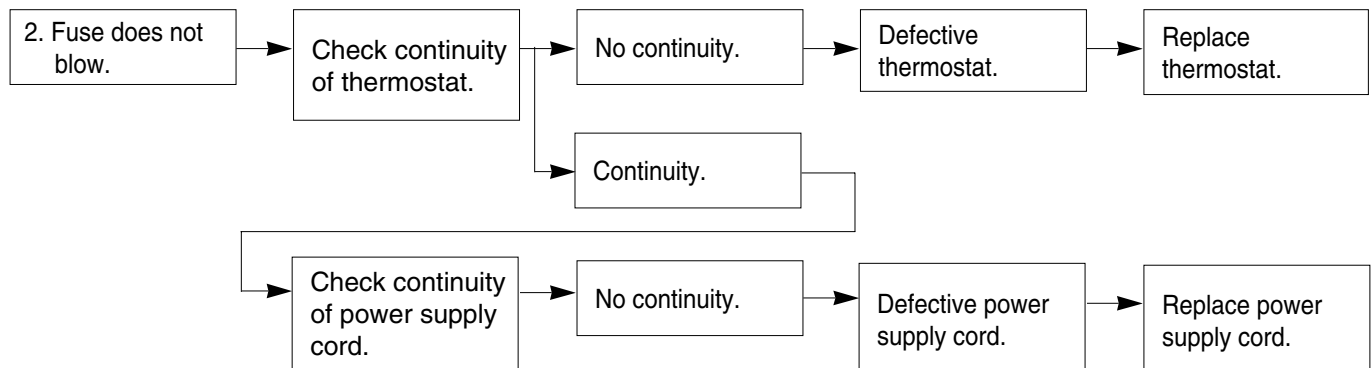
1. Incomplete segments.
 - Segment missing.
 - Partial segment missing.
 - Digit flickering (NOTE: Slight flickering is normal.)
2. Colon does not turn on or blink.
3. A distinct change in the brightness of one or more numbers in display.
4. One or more digits in the display are not lighting.
5. Display indicates a number different from one touched, for example, key in **5** and **3** appears in the display.
6. Specific numbers (for example 7 or 9) does not display when key pad is touched.
7. Display does not count down with time blinking or up with clock operation.
8. Display obviously jumps in time while counting down.
9. Display counts down too fast while cooking.
10. Each indicator light does not turn on after setting cooking cycle.
11. Display time of day does not reappear when cooking is finished.

CONDITION	CHECK	RESULT	CAUSE	REMEDY
1. No input can be programmed.	Check the connection between membrane key assembly and P.C.B assembly.	Continuity.	Defective P.C.B assembly.	Replace P.C.B assembly.
		No continuity.	Loose connection.	Connect them tightly.
2. Some inputs cannot be programmed.	Replace key membrane assembly and check operation.	Everything works as specified.	Defective key membrane assembly.	Replace key membrane assembly.
3. Display shows a number or figure different from one touched.		Still have trouble.	Defective P.C.B assembly.	Replace P.C.B assembly.
4. Random programming when touching other pads.				
5. Display is fixed at some figure and can not accept any input.				

(TROUBLE 2) Oven does not operate at all, display window does not display any figures, and no input is accepted.



NOTE : All these switches must be replaced at the same time. Refer to page 5-7, 5-8



(TROUBLE 3) Display shows all figures set, but oven does not start cooking while desired program times are set and START pad is touched.

CONDITION	CHECK	RESULT	CAUSE	REMEDY
1. Setting time does not count down when touching START pad.	Check continuity of secondary switch (with door closed).	No continuity.	Defective secondary switch.	Replace secondary switch.
		Continuity.		
	Check the connection between CN1 connector and P.C.B assembly.	Continuity	Defective P.C.B assembly.	Replace P.C.B assembly.
		No continuity	Loose connection.	Connect them tightly.
2. Fan motor or oven lamp do not turn on.	Check fan motor.	Abnormal.	Defective fan motor.	Replace fan motor.
	Check oven lamp.	Abnormal.	Defective oven lamp.	Replace oven lamp.
		Normal.		
	Check continuity of primary switch.	No continuity	Defective primary switch.	Replace primary switch.
		Continuity		

(TROUBLE 4) Oven seems to be operating but little heat is produced in oven load.

CONDITION	CHECK	RESULT	CAUSE	REMEDY
Output is low.	Check the power source voltage.	Lower than 90% of rating voltage.	Decrease in power source voltage with load.	Suggest customer contact local electric power utility co. or qualified electrician.
		Normal.		
	Disconnect the wire leads from relay 2 and check on and off time with multimeter.	Abnormal.	Defective P.C.B assembly.	Replace P.C.B assembly.
		Normal.		
	Measure the output power.	Abnormal.	Defective magnetron.	Replace magnetron.

NOTE: Simple test of power output-conducted by heating one liter water for one minute if available. Minimum 8.5°C temperature rise is normal condition.

**(TROUBLE 5) No microwave oven operation even though oven lamp and fan motor run
(Display operates properly)**

CONDITION	CHECK	RESULT	CAUSE	REMEDY
No microwave oscillation.	Disconnect the wire leads from relay 2 and check continuity of relay2. (Operate the unit)	No continuity.	Defective P.C.B assembly	Replace P.C.B assembly
		Continuity.		
	Check high voltage transformer	Abnormal	Defective high voltage transformer.	Replace high voltage transformer.
		Normal		
	Check high voltage capacitor	Abnormal	Defective high voltage capacitor.	Replace high voltage capacitor.
Normal				
Check high voltage diode	Abnormal	Defective high voltage diode.	Replace high voltage diode.	
	Normal			
Check magnetron.	Abnormal	Defective magnetron.	Replace magnetron.	

NOTE : • Make sure the wire leads are in the correct position.

- When Removing the wire leads from the parts, be sure to grasp the connector, not the wires.
- When removing the magnetron, be sure to install the magnetron gasket in the correct position and in good condition.

Output is full power when you set lower power level.	Disconnect the wire leads from relay 2 and check continuity relay 2. (Operate the unit)	Abnormal.	Defective P.C.B. assembly.	Replace P.C.B. assembly.
--	---	-----------	----------------------------	--------------------------

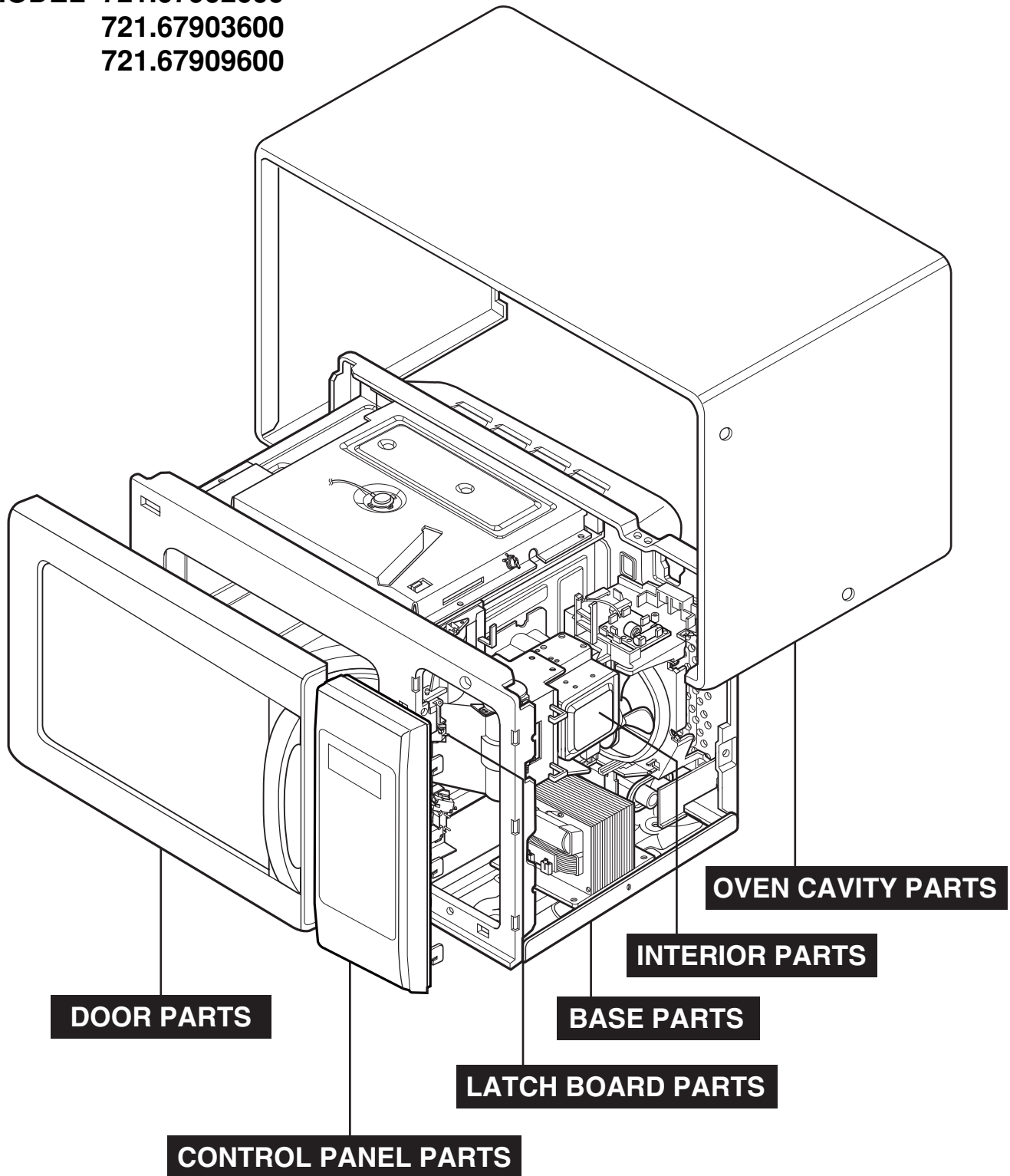
(TROUBLE 6) Convection oven does not operate at all or convection cook is bad.

CONDITION	CHECK	RESULT	CAUSE	REMEDY
Convection indicator light but oven does not go into cook cycle when START pad is touched.	Check the Relay 4 or 6 of P.C.B. assembly .	Abnormal	Defective Relay 4 or 6.	Replace Relay 4 or 6.
		Normal		
	Check the connection between P.C.B. assembly and headwire connector.	No continuity.	Loose connection.	Connect them tightly.
Temperature in the oven cavity is lower or higher than preset.	Check the Relay 4 or 6 of P.C.B. assembly .	Abnormal	Defective Relay 4 or 6.	Replace Relay 4 or 6.
		Normal		
	Check the convection heater element.	Abnormal	Defective convection heater.	Replace convection heater.
		Normal		
	Check the circulation motor.	Abnormal	Defective circulation motor.	Replace circulation motor.
		Normal		
	Check the damper motor.	Abnormal	Defective damper motor.	Replace damper motor.
		Normal		
	Check the air duct assembly.	Interference Damper open and close at air duct assembly.	Defective air duct assembly.	Replace air duct assembly.
		Normal		
	Check the thermistor.	Error message shows in the display.	Thermistor open or short.	Replay thermistor.
		Normal		
	Check the Rack.	Cook on the glass tray.	Without metal rack.	Cook with metal rack.

EXPLODED VIEW

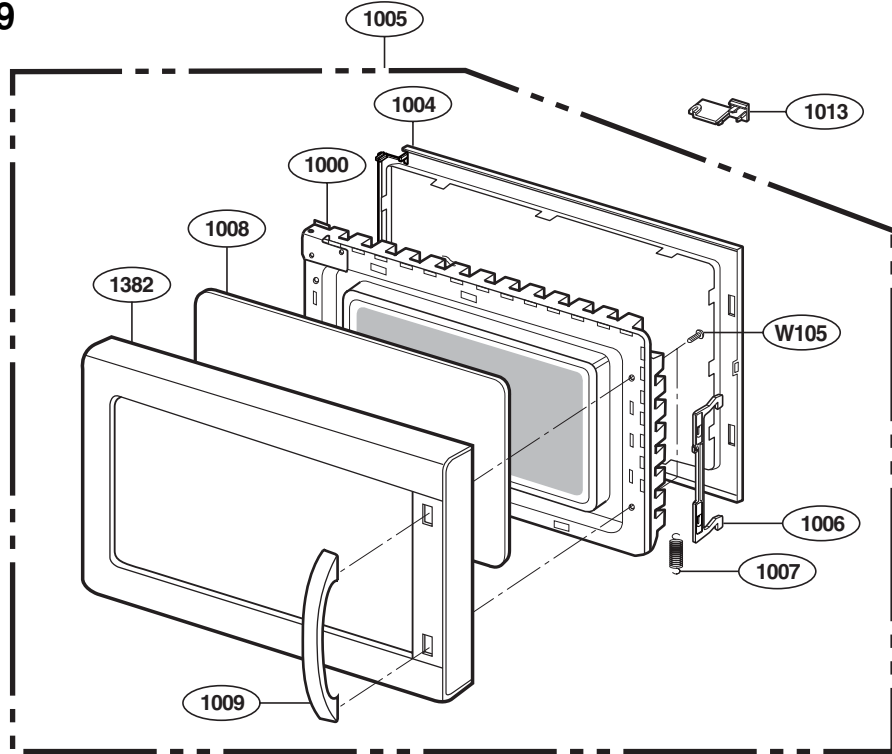
INTRODUCTION

MODEL 721.67902600
721.67903600
721.67909600

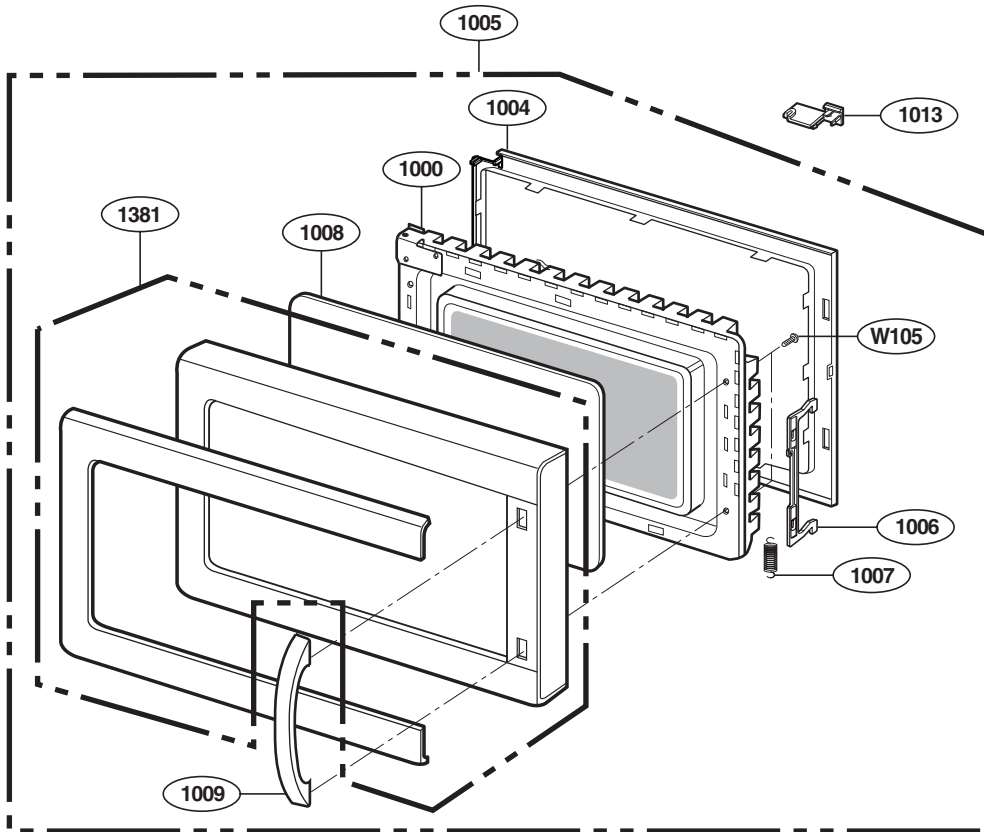


DOOR PARTS

For Model: 721.67902
721.67909

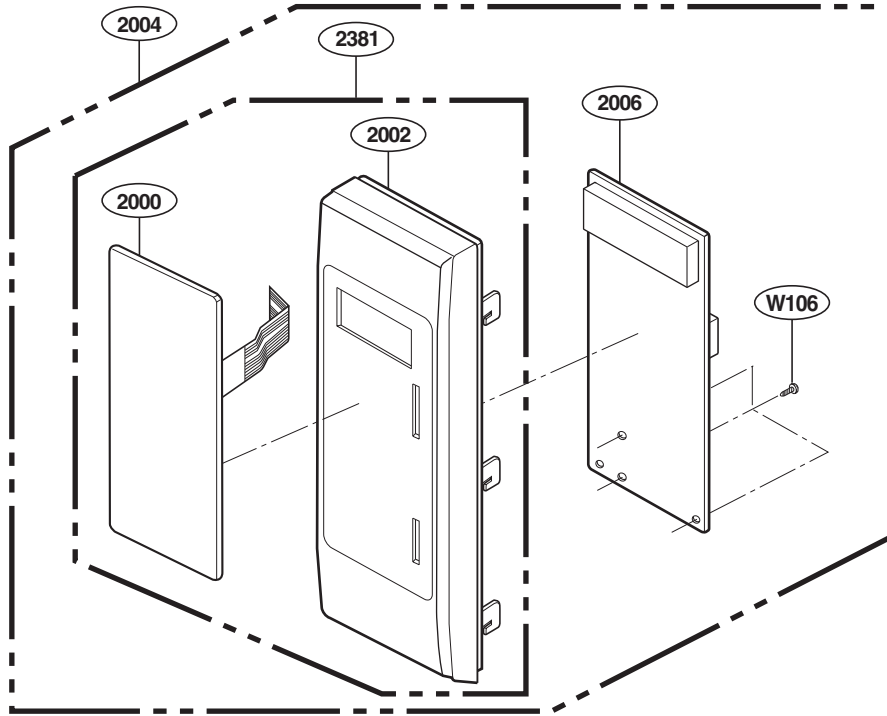


For Model: 721.67903

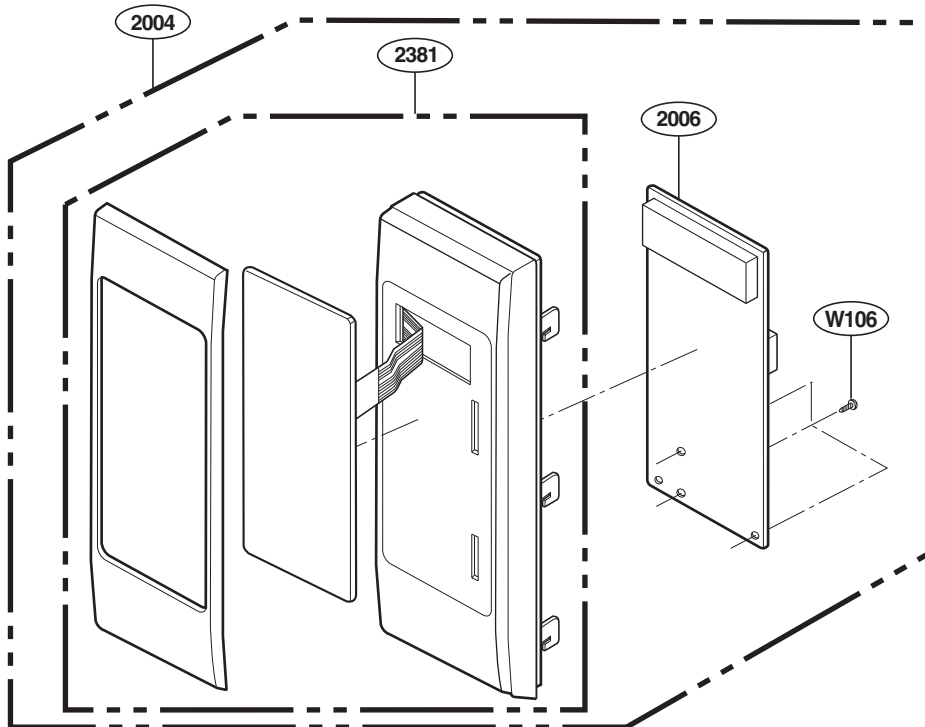


CONTROLLER PARTS

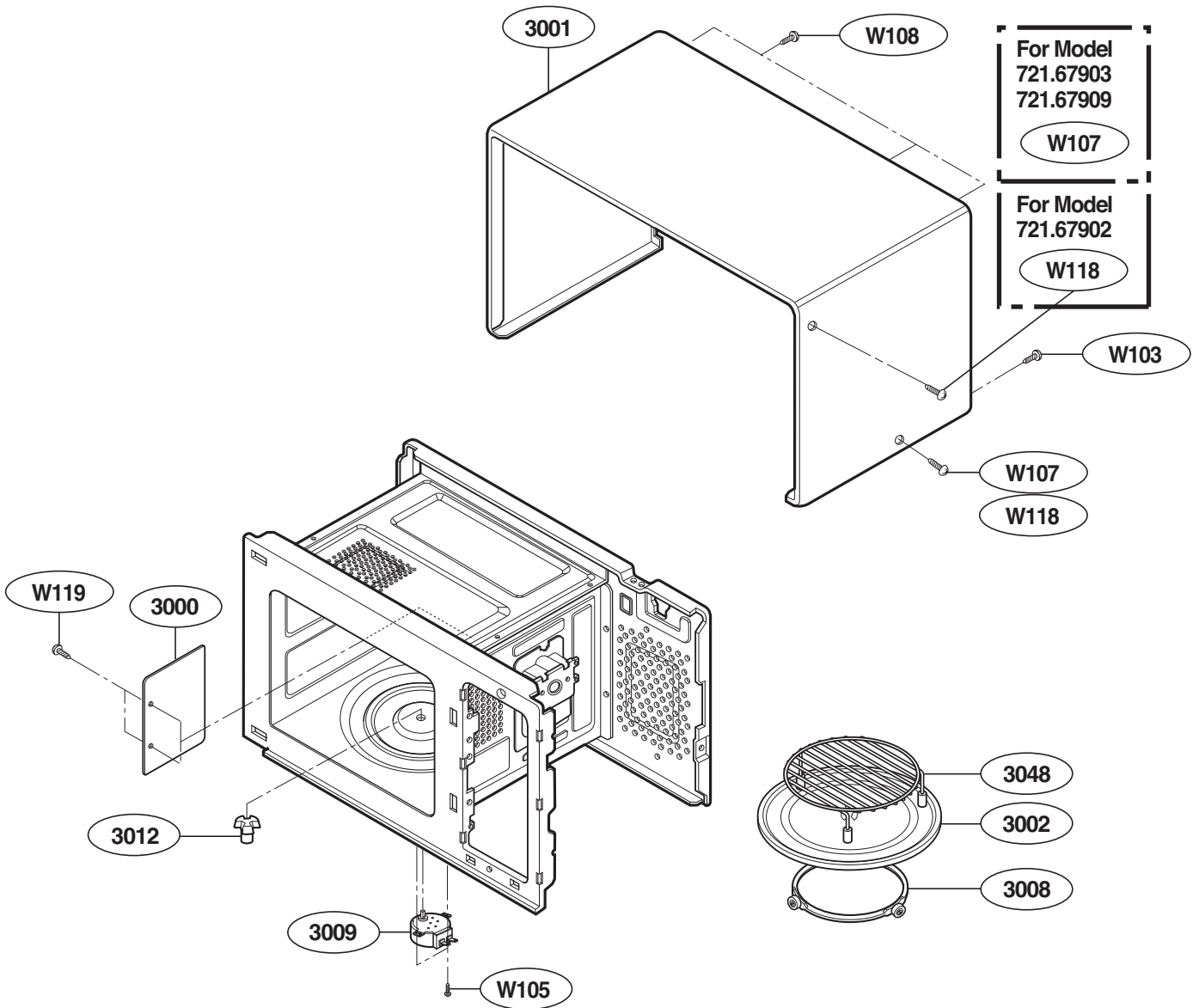
For Model: 721.67902
721.67909



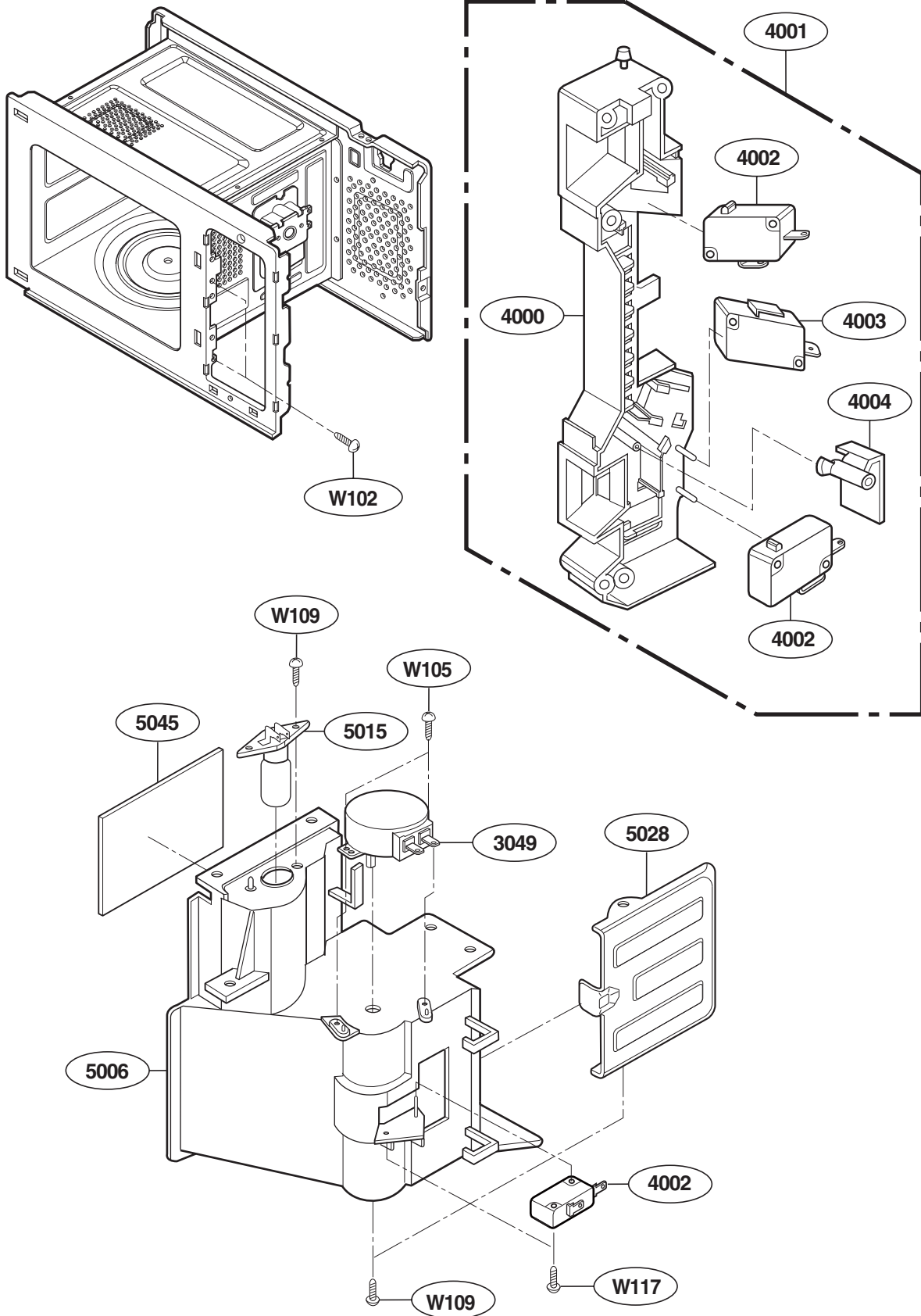
For Model: 721.67903



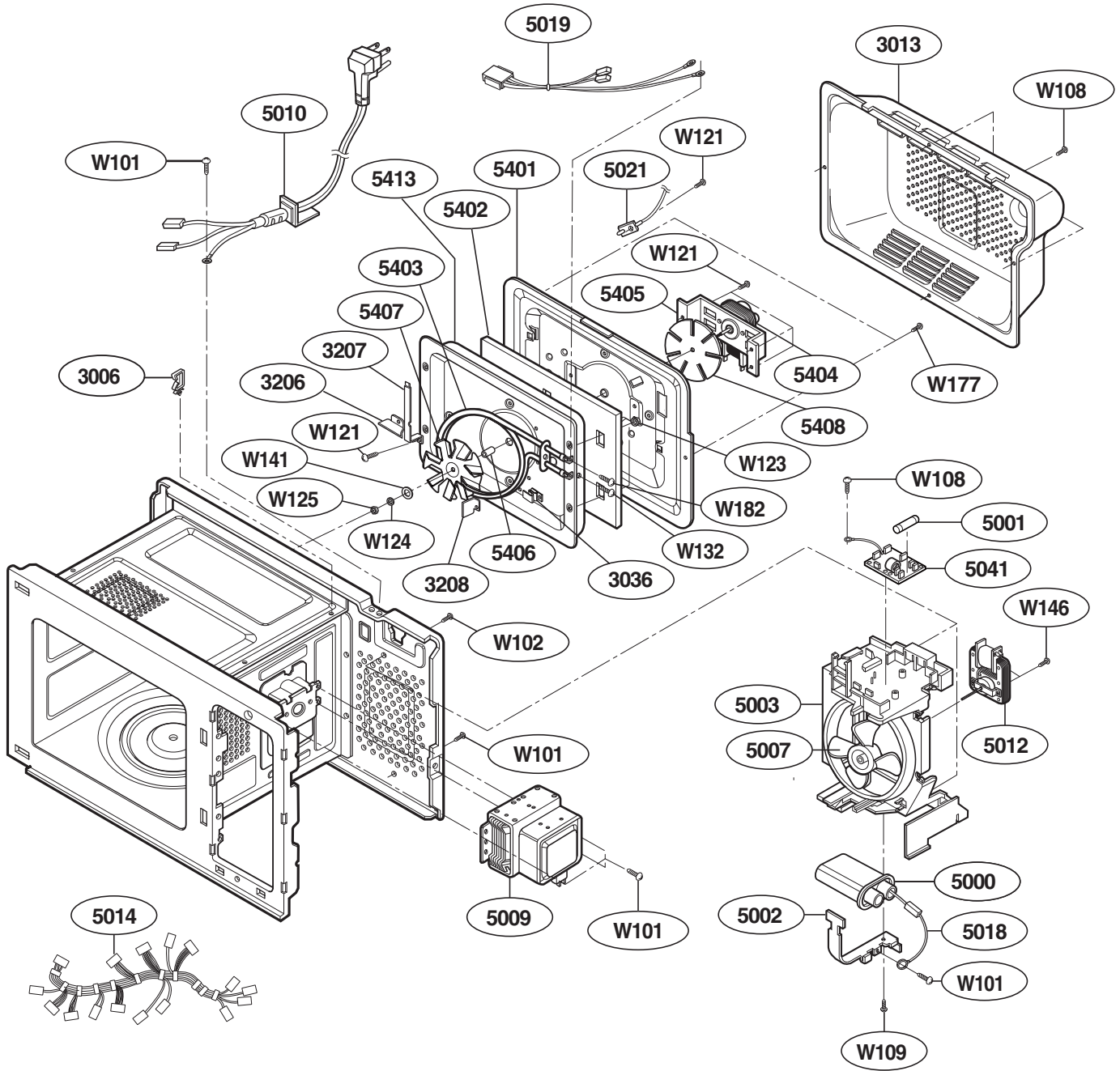
OVEN CAVITY PARTS



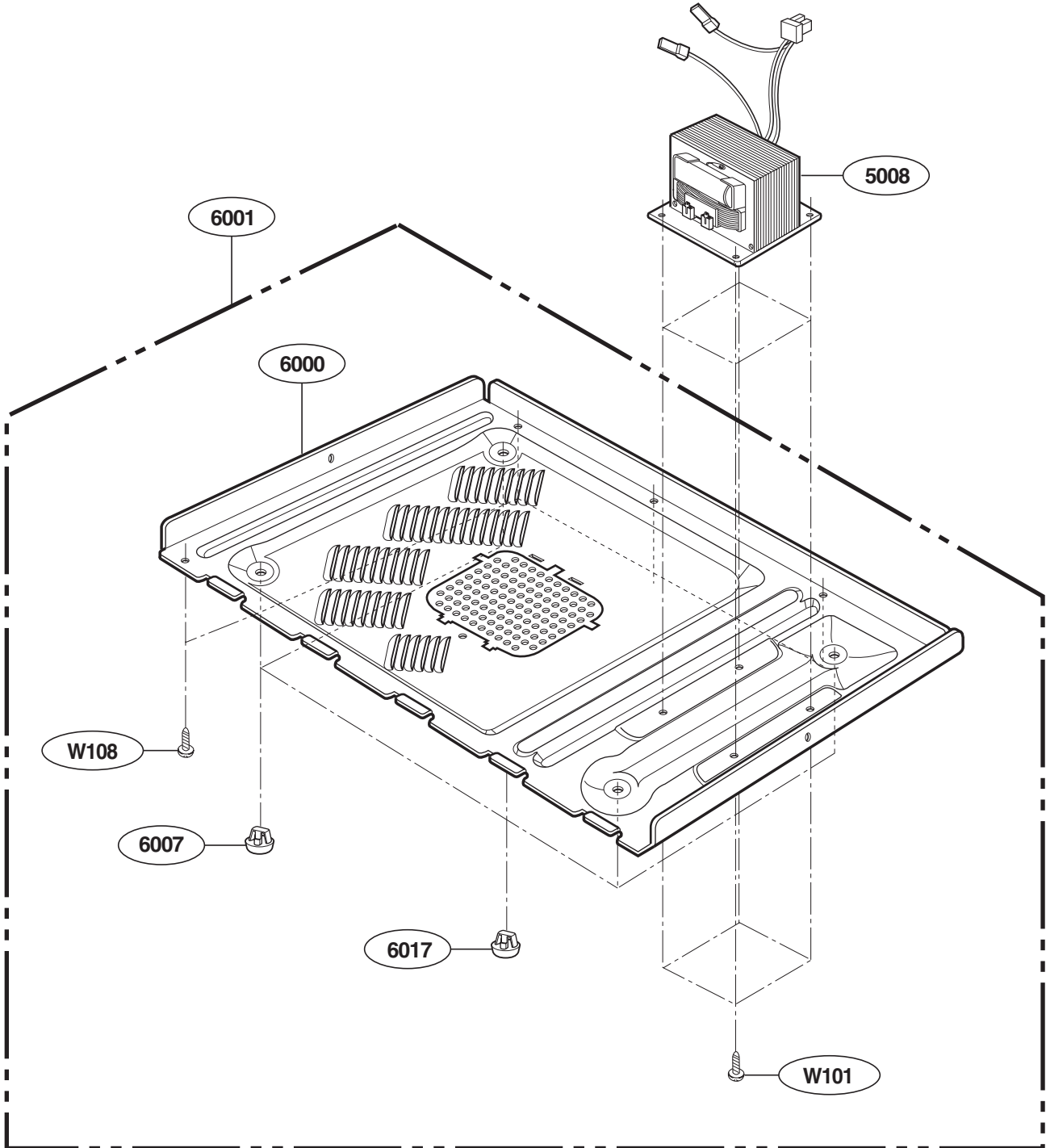
LATCH BOARD PARTS



INTERIOR PARTS



BASE PLATE PARTS



SENSOR PARTS

