

Technical Service Manual

Microwave Oven



Model
E124MO451BA



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.

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Basic Information

This Manual has been prepared to provide Electrolux Service Personnel with Operation and Service Information for Electrolux Microwave Oven EI24MO45IBA.

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 |
| When Testing Is Completed | 1-5 |
| Microwave Measurement Procedure USA | 1-6 |
| Microwave Measurement Procedure Canada | 1-7 |
| Product Specification..... | 1-8 |
| Grounding Instructions | 1-9 |
| Discharging Capacitor | 1-9 |
| Oven Diagram | 1-10 |
| Components | 1-10 |

Section 2 Operation

| | |
|--|-----|
| Operating Sequence Description..... | 2-1 |
| Off Condition..... | 2-1 |
| Cooking Condition | 2-1 |
| Variable Cooking | 2-3 |
| Component Descriptions | 2-3 |
| Door Open Mechanism | 2-3 |
| Primary Switch, Third Door Switch & Door Monitor Switch..... | 2-3 |
| Turntable Motor..... | 2-4 |
| Cooling Fan Motor..... | 2-4 |
| Monitor Fuse | 2-4 |
| Cavity Temperature Fuse..... | 2-4 |
| C/T Temperature Fuse..... | 2-4 |
| Sensor Cooking Condition..... | 2-4 |
| Humidity Sensor Circuit..... | 2-5 |

Section 3 Troubleshooting and Error Codes

| | |
|-----------------------------------|-----|
| Warnings and Cautions | 3-1 |
| Troubleshooting Guide Chart | 3-2 |

Section 4 Component Teardown and Testing

| | |
|---|-----|
| Warnings and Cautions | 4-1 |
| Outer Case Removal..... | 4-2 |
| Power Transformer Removal..... | 4-2 |
| Positive Lock® Connector (No-Case Type) Removal | 4-2 |
| High Voltage Rectifier And High Voltage Capacitor Removal..... | 4-3 |
| Magnetron Removal | 4-3 |
| Oven Lamp And Lamp Socket Removal | 4-4 |
| Control Panel Assembly Removal..... | 4-4 |
| Key Sheet Replacement..... | 4-4 |
| Turntable Motor Removal..... | 4-5 |
| Cooling Fan Motor Removal..... | 4-6 |
| Door Sensing Switch/Primary Switch/ Third Door Switch And Monitor Switch Removal..... | 4-7 |
| Door Sensing Switch/Primary Switch/ Third Door Switch And Monitor Switch Adjustment. | 4-7 |
| Door Replacement..... | 4-8 |
| Sealer Film | 4-9 |

Section 5 Wire Diagrams

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

Section 6 Parts List

| | |
|--|-----|
| Key Unit And Door Assembly | 6-1 |
| Parts List..... | 6-2 |
| Oven And Cabinet Parts Exploded View | 6-3 |
| Packing And Accessories | 6-4 |

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. SERVICEMEN SHOULD REMOVE THEIR WATCHES WHENEVER WORKING CLOSE TO OR REPLACING THE MAGNETRON.

CAUTION

All repairs should be done in accordance with the procedures described in this manual. This product complies with Federal Performance Standard 21 CFR Subchapter J(DHHS).

Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

Some semiconductor (“solid state”) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs). Examples include integrated circuits and field-effect transistors.

Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground.

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 $4\text{mW}/\text{cm}^2$. 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 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 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 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 $20 \pm 5 \text{C}$ ($68 \pm 9 \text{F}$) 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 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/cm² with the test load of 275 ± 15 ml of water at an initial temperature 20 ± 5°C.
- 2) 5.0 mW/cm² 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/cm² 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 ± 9°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/cm², 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/cm².

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/cm².

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

Basic Information

Product Specification

| Item | Description |
|---|--|
| Power Requirements | (USA)120 Volts / 13.0 Amperes / 1500 Watt 60 Hertz Single phase, 3 wire grounded |
| Power Output | 1100 watts (IEC 705 Test Procedure) Operating frequency of 2450MHz |
| Outside Case Dimensions | Width 24-5/8" Height 14" Depth 19-5/16" |
| Cooking Cavity Dimensions 2.0 Cubic Feet | Width 17-3/8" Height 10-1/2" Depth 18-5/8" Tray Size 15-7/8 |
| Lighting | 40 Watt bulb |
| Weight | Approximately 55 lbs. |
| 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 Sensor modes pads, Auto cook pads, Timer on-off pad, Set clock pad, User Pref pad, Quick start pad, Number selection pads, Power Level pad, Add 30 sec pad, Stop/Clear pad, Keep warm pad, and Start 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 rated cord. Do not drape over a countertop or table where it can be pulled on by children or tripped over accidentally.

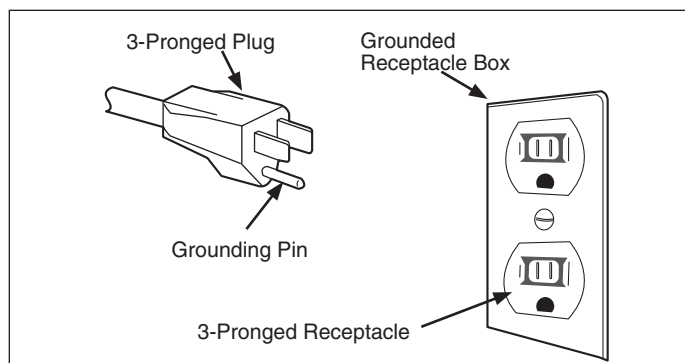


Figure 1-1. Electrical Connection

Discharging Capacitor

1. High Voltage Warning!

Do not attempt to measure any of the high voltages, this includes the filament voltage of the magnetron. High voltage is present during any cook cycle. Before touching any components or wiring, always unplug the oven and discharge the high voltage capacitor (See Figure 1-2).

2. The high-voltage capacitor remains charged about 60 seconds after disconnection. Short the negative terminal of the high-voltage capacitor to the oven chassis. (Use an insulated screwdriver.)
3. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.

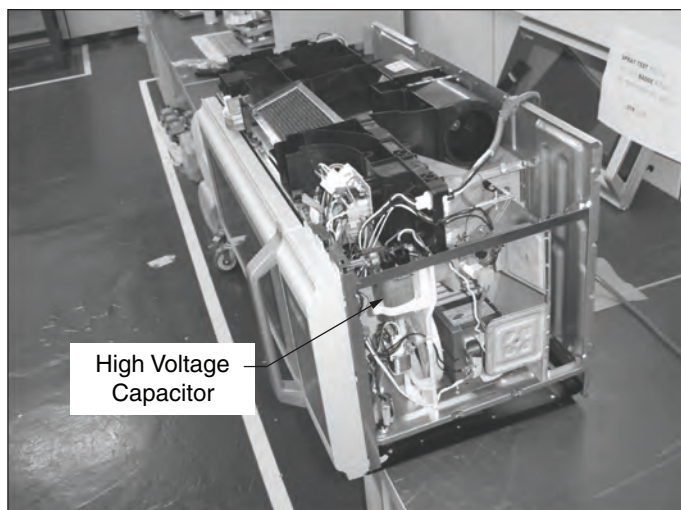
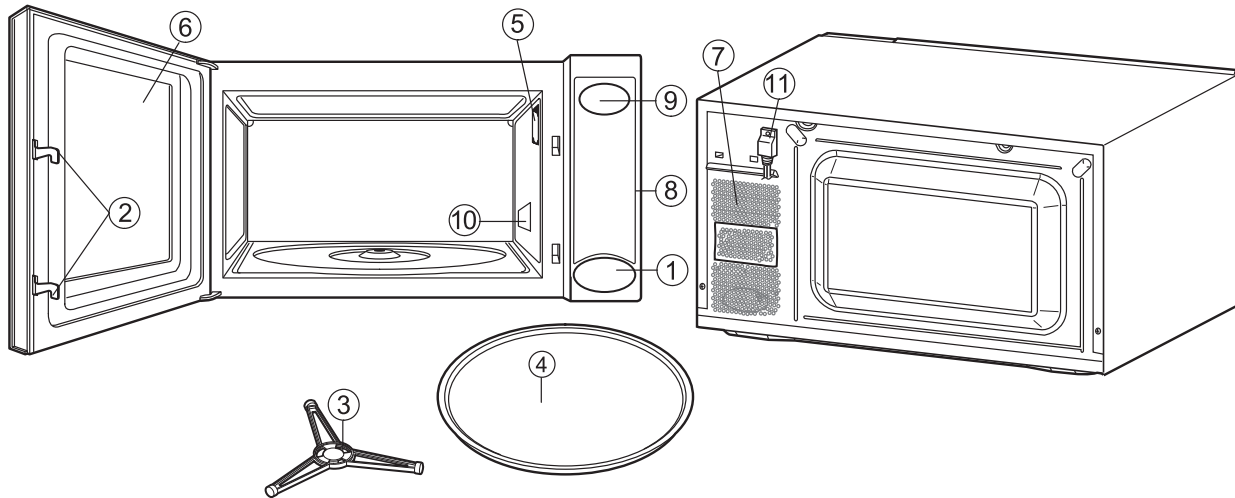


Figure 1-2. Capacitor Discharging

NOTE: The illustration above gives a generalized location of the high voltage capacitor. Refer to the exploded view of the oven and cabinet for exact location.

Basic Information

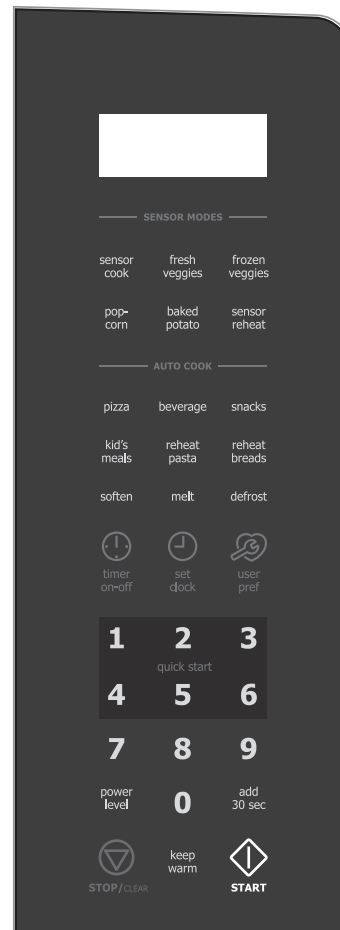
Oven Diagram



Components

1. One touch door open button. Push to open door.
2. Door latches. The oven will not operate unless the door is securely closed.
3. Removable turntable support.
4. Removable turntable. The turntable will rotate clockwise or counterclockwise.
5. Oven lamp. It will light when oven is operating or door is opened.
6. Oven door with see-through window.
7. Ventilation openings. (Rear)
8. Auto-Touch control panel.
9. Time display: Digital display, 99 minutes 99 seconds.
10. Wave guide cover.
11. Power supply cord.

Touch Control Panel



NOTE:

Some one-touch cooking features as “add 30 sec” are disabled after three minutes when the oven is not in use. These features are automatically enabled when the door is opened and closed or the STOP/ CLEAR pad is pressed.

Operating Sequence Description

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

OFF CONDITION

Closing the door activates the door sensing switch and secondary interlock switch. (In this condition, the monitor switch contacts are opened.)

When oven is plugged in, 120 volts A.C. is supplied to the control unit. (See 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 pad. The display will clear, and " : " appears.

COOKING CONDITION

Program desired cooking time by touching the NUMBER pads. Program the power level by touching the POWER LEVEL pad and then a Number pad.

When the START pad 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

RY-1 Oven Lamp / Turntable Motor / Fan Motor

RY-2 Power Transformer

2. 120 volts AC is supplied to the primary winding of the power transformer and is converted to about 3.3 volts AC output on the filament winding, and approximately 2370 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, the monitor switch, door sensing switch, third door switch, primary switch relay (RY1) and secondary interlock relay 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 electrically monitors the operation of the primary and third door switch and is mechanically associated with the door so that it will function in the following sequence.

- (1) When the door opens from the closed position, the secondary interlock relay (RY2) secondary switch open their contacts. And contacts of the relay (RY1) remains closed. 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 primary switch, third door switch and door sensing switch close. and the contacts of the relay (RY1) open.

If the primary interlock switch and secondary interlock relay (RY2) fail with the contacts closed when the door is opened, the closing of the monitor switch contacts will form a short circuit through the C/T fuse, primary interlock switch, relay (RY1) and secondary interlock relay (RY2), causing the C/T fuse to blow.

Operation

SCHEMATIC
 NOTE: Condition Of Oven
 1. Door Closed
 2. Clock Appears On Display

NOTE: "*" indicates components with potential above 250V.

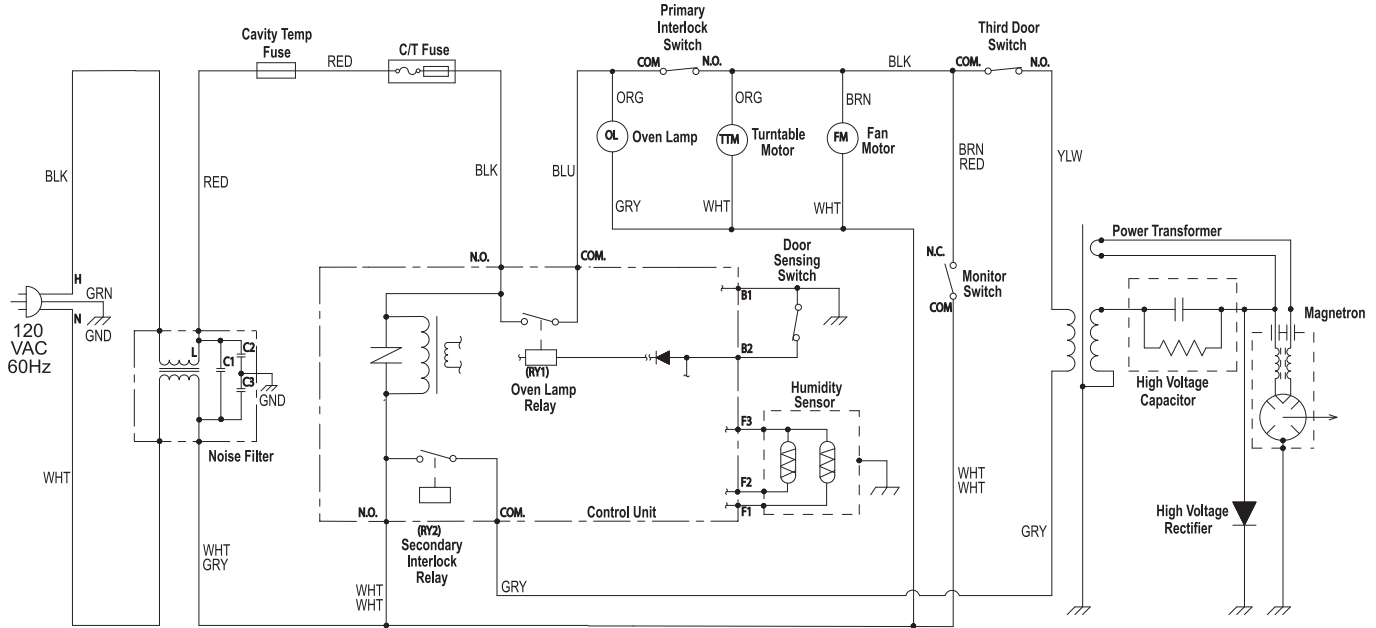


Figure 2-1. Oven Off Condition

SCHEMATIC
 NOTE: Condition Of Oven
 1. Door Closed
 2. Cooking Time Programmed
 3. Variable Cooking Control "High"
 4. "Start" Pad Touched

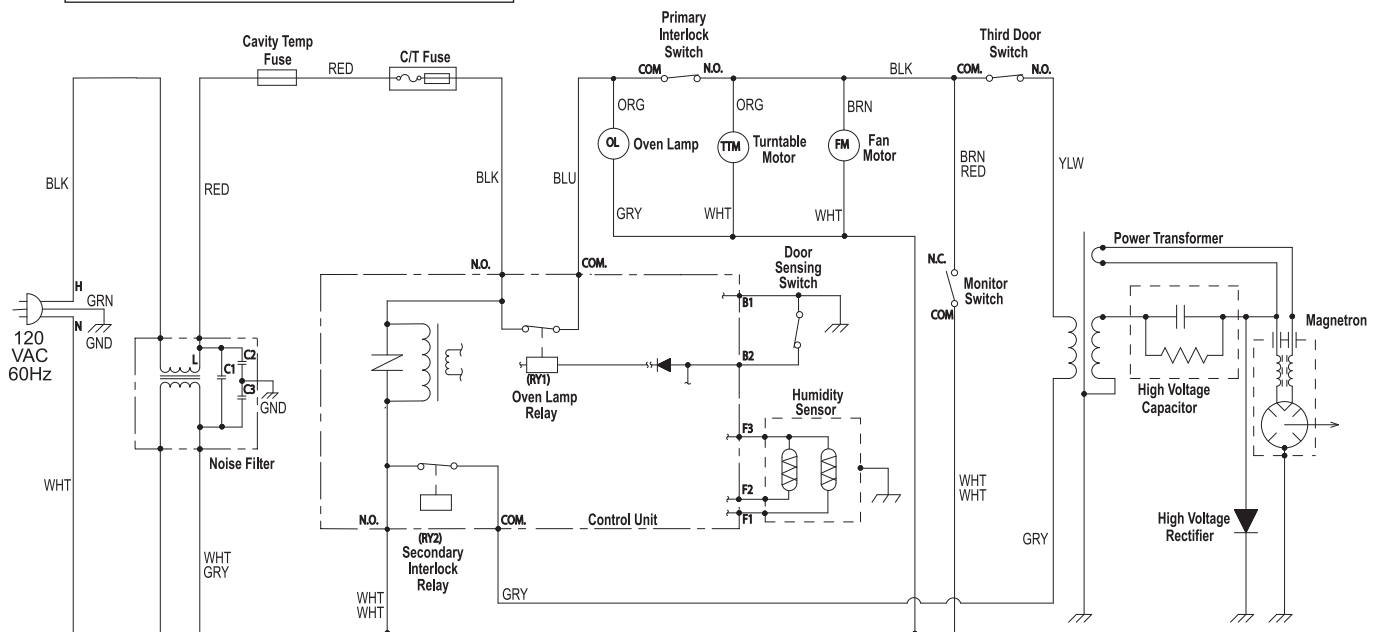


Figure 2-2. Oven Schematic-Microwave Cooking Condition

Variable Cooking

When Variable Cooking Power is programmed, the 120 volts A.C. is supplied to the power transformer intermittently through the contacts of relay (RY-2) which is operated by the control unit within a 32 second time base. Microwave power operation is as follows:

| Vari-Mode | ON TIME | OFF TIME |
|------------------------------|---------|----------|
| Power 10 (High) (100% Power) | 32 sec. | 0 sec. |
| Power 9 (P-90) (Approx. 90%) | 30 sec. | 2 sec. |
| Power 8 (P-80) (Approx. 80%) | 26 sec. | 6 sec. |
| Power 7 (P-70) (Approx. 70%) | 24 sec. | 8 sec. |
| Power 6 (P-60) (Approx. 60%) | 22 sec. | 10 sec. |
| Power 5 (P-50) (Approx. 50%) | 18 sec. | 14 sec. |
| Power 4 (P-40) (Approx. 40%) | 16 sec. | 16 sec. |
| Power 3 (P-30) (Approx. 30%) | 12 sec. | 20 sec. |
| Power 2 (P-20) (Approx. 20%) | 8 sec. | 24 sec. |
| Power 1 (P-10) (Approx. 10%) | 6 sec. | 26 sec. |
| Power 0 (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.

Component Descriptions

DOOR OPEN MECHANISM

The door is opened by pulling the door handle down and forward, referring to Figure 2-6. When the door handle is pulled down, the latch heads are moved upward. When the door handle is pulled forward, the latch heads are released from the latch hooks right and left. Now, the door will open.

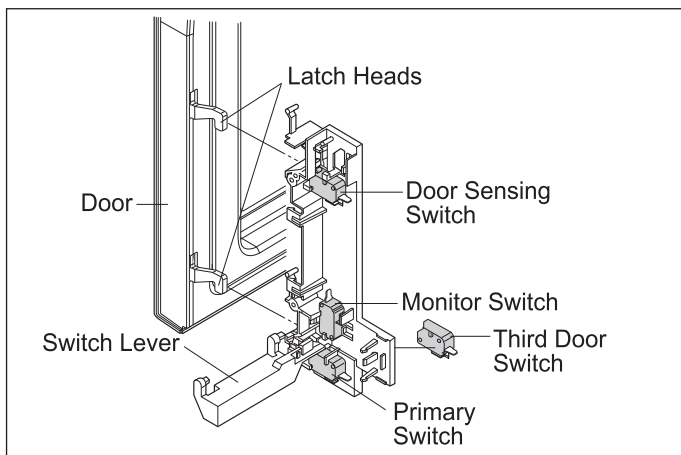


Figure 2-6.

PRIMARY SWITCH, THIRD DOOR SWITCH & DOOR SENSING SWITCH

The primary switch and third door switch mounted parallel to each other horizontally in the lower positions of the latch hook, and the door sensing switch is mounted horizontally in the upper position of the latch hook. They are activated by the latch head on the door. When the door is opened, the switches interrupt the power to all high voltage components, except the oven lamp. A cook cycle cannot take place until the door is firmly closed, thereby activating all interlock switches. The secondary interlock system consists of the door sensing switch and the secondary interlock relay, located on the control circuit board.

MONITOR SWITCH

The monitor switch is activated (the contacts opened) by the latch head on the door while the door is closed. The switch is intended to render the oven inoperative, by means of blowing the C/T fuse, when the contacts of the secondary interlock relay (RY2) and primary interlock switch fail to open when the door is opened.

Functions:

1. When the door is opened, the monitor switch contact closes (to the ON condition) due to their being normally closed. At this time the secondary interlock relay, primary switch and third door switch 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, primary switch and third door switch contacts close. (On opening the door, each of these switches operate inversely.)
3. If the door is opened, and the secondary interlock relay (RY2) and primary interlock switch contacts fail to open, the C/T fuse blows simultaneously with closing of the monitor switch contacts.

CAUTION

Before replacing a blown C/T fuse, test the door sensing switch, secondary interlock relay (RY2), relay (RY1), primary/third door interlock switch and monitor switch for proper operation.

NOTE

Monitor fuse and switch are replaced as an assembly.

Operation

TURNTABLE MOTOR

The turntable motor rotates the turntable located in the bottom of the oven cavity, so that the food on the turntable is cooked evenly during cooking. The turntable may turn in either direction.

COOLING FAN MOTOR

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

MONITOR FUSE

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

CAVITY TEMPERATURE FUSE

The cavity temperature fuse, located on the top of the oven cavity, is designed to prevent damage to the oven by fire. If the food load is overcooked, by either error in cook time or defect in the control unit, the oven cavity temperature fuse will open.

Under normal operation, the cavity temperature fuse remains closed. However, when abnormally high temperatures are reached within the oven cavity, the cavity temperature fuse will open at 302°F (150°C) causing the oven to shut down.

NOTE: This is fuse. It does not reset.

C/T TEMPERATURE FUSE

The C/T fuse located near the magnetron is designed to prevent damage to the magnetron if an over heated condition develops in the tube due to cooling fan failure, obstructed air guide, dirty or blocked air intake, etc.

Under normal operation, the C/T fuse remains closed. However, when abnormally high temperatures are reached within the magnetron, the C/T fuse will open at 302°F(150°C) causing the oven to shut down.

1. The C/T fuse blows when the contacts (COM-NO) of the secondary interlock relay (RY2) and primary interlock switch remain closed with the oven door open and when the monitor switch closes.
2. If the wire harness or electrical components are shortcircuited, this monitor fuse blows to prevent an electric shock or fire hazard.

NOTE: This is fuse. It does not reset

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.

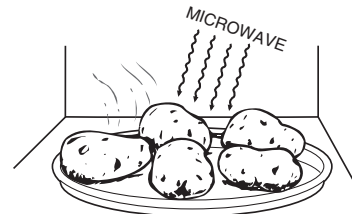
When food is cooked, water vapor is developed. The sensor “senses” the vapor and its resistance increases gradually. When resistance reaches the value set according to the menu, supplementary cooking is started. The time of supplementary cooking is determined by experiment with each food category and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

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

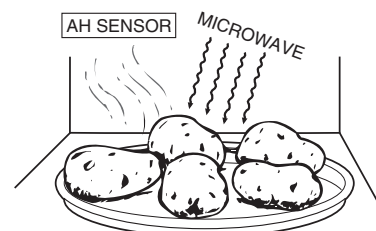
1. Potatoes at room temperature. Vapor is emitted very slowly.



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



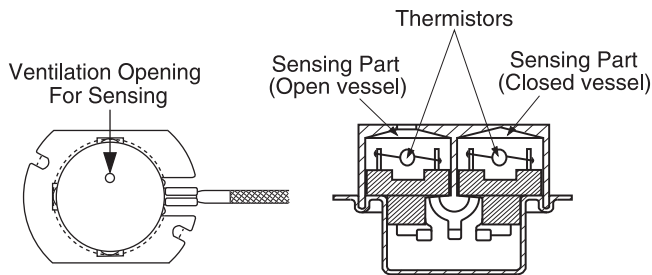
3. Sensor detects moisture and humidity and calculates cooking time and variable power.



Humidity Sensor Circuit

(1) Structure of Absolute Humidity Sensor:

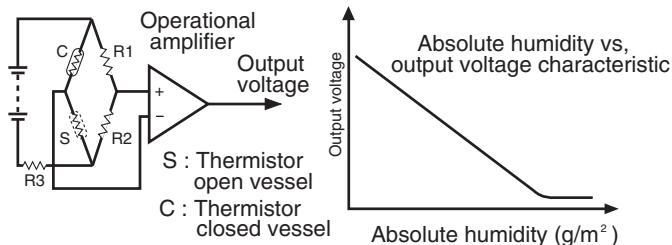
The absolute humidity sensor includes two thermistors as shown in the illustration. One thermistor is housed in the closed vessel filled with dry air while another in the open vessel. Each sensor is provided with the protective cover made of metal mesh to be protected from the external airflow.



(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 (R91 and R96). 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.



(3) Detector Circuit of Absolute Humidity Sensor Circuit:

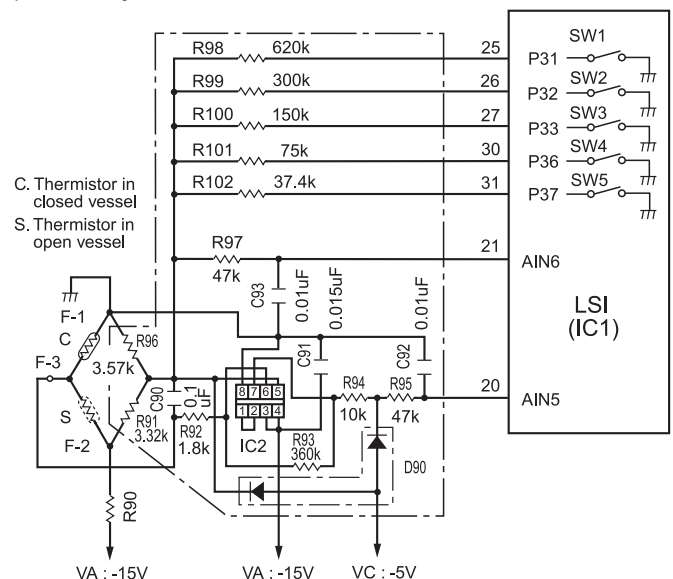
This detector circuit is used to detect the output voltage of the absolute humidity circuit to allow the LSI to control sensor cooking of the unit. When the unit is set in the sensor cooking mode, 16 seconds clearing cycle occurs then the detector circuit starts to function and the LSI observes the initial voltage available at its AN1 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 R98 ~ R102. Changing the resistance values results in that there is the same potential at both F-3 terminal of the absolute humidity sensor and AIN6 terminal of the LSI. The voltage of AIN6 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 AIN5 terminal of the LSI.

Then the LSI observes that voltage at AIN5 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 AIN5 terminal 16 seconds after the unit has been put in the Sensor Cooking mode, if it is not possible to balance 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 C/T fuse, check the monitor switch, relay (RY3-1) secondary interlock relay (RY2), door sensing switch and primary interlock switch before replacing the C/T fuse. If the C/T fuse is replaced, the monitor switch must also be replaced. Use part FFS-BA03-19/KIT 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. Remove the back plate from the oven
5. Disconnect the leads to the primary of the power transformer.
6. Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.
7. 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


CK = Check / RE = Replace

| Condition | TEST PROCEDURE PROBLEM | RE | RE | A | B | C | D | E | E | F | F | G | H | RE | RE | CK | I | CK | CK | CK | J | K | L | M |
|--------------------------|--|----|----|---|---|---|---|---|---|---|---|---|---|----|----|----|---|----|----|----|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Off Condition | Home fuse or circuit breaker blows when power cord is plugged into wall receptacle | ○ | ○ | | | | | | | | | | | | | | | | | | | | | |
| | C/T fuse blows when power cord is plugged into wall receptacle. | | ○ | | | | | | | ○ | ○ | | | | | | ○ | | | | | | ○ | |
| | All letters and indicators do not appear in display when power cord is first plugged into wall outlet. | | ○ | | | | | ○ | | | | | ○ | | | | | ○ | ○ | | | | | ○ |
| | Display does not operate properly when STOP/CLEAR key is touched. (Buzzer should sound and ":" or time of day should appear in display.) | | ○ | | | | | | | | ○ | | | | | | | ○ | ○ | | | ○ | | |
| | Oven lamp does not light when door is opened. | | ○ | | | | | ○ | | ○ | ○ | | | ○ | ○ | | | ○ | | | | | ○ | ○ |
| Cooking Condition | Oven lamp does not go out when door is closed. | | | | | | | | | ○ | | | | | | | | | | | | ○ | | |
| | Oven lamp lights but fan motor and turntable motor do not operate. | | ○ | | | | | | | | ○ | | | | | ○ | ○ | | | | | | | |
| | Oven does not go into cook cycle when START pad is touched | | ○ | | | | | | | ○ | ○ | | | | | | | ○ | ○ | | | ○ | ○ | |
| | Oven seems to be operating but little or no heat is produced in oven load. (Food incompletely cooked or not cooked at all at end of cook cycle.) | | ○ | ○ | ○ | ○ | ○ | | ○ | ○ | | | | | | | | ○ | ○ | | | | | |
| | Oven goes into a cook cycle but extremely uneven heating is produced in oven load (food). | | ○ | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | | | | |
| | Oven does not cook properly when programmed for Cooking Power P-50 mode. (Operates properly on Cooking P-HI (HIGH) mode.) | | | | | | | | | | ○ | | | | | | | | ○ | | | | | |
| | Oven goes into COMPU DEFROST but food is not defrosted well. | | | | | | | | | | | | | | | | | ○ | ○ | | | | | ○ |
| Sensor Cooking Condition | AH sensor does not end during sensor cooking condition. (Oven does not shut off after a cup of water is boiling by sensor cooking) | | | | | | | | | | | | | | | | | | | | | | | |
| | Oven stops at 16 sec. after starting. | | | | | | | | | | | | | | | | | | | | | | | |

Test Procedures

| Procedure Letter | Component Test |
|------------------|---|
| A | <p>MAGNETRON ASSEMBLY TEST</p> <p> WARNING</p> <p>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.</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Remove the outer case cabinet, referring to “OUTER CASE CABINET REMOVAL”. 3. Open the oven door and block it open. 4. Discharge the high voltage capacitor. (See Warnings and Instructions on page 3-1) 5. 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. 6. 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. 7. Reconnect all leads removed from components during testing. 8. Reinstall the outer case (cabinet) and back plate. 9. Reconnect the power supply cord after the outer case is installed. 10. Run the oven and check all functions. <p>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 (453 cc.) measuring cup and an accurate mercury thermometer or thermocouple type temperature tester. For accurate results, the following procedure must be followed carefully:</p> <ol style="list-style-type: none"> 1. Fill the measuring cup with 16 oz. (453 cc.) 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. 2. Place the cup of water in the oven. Operate oven at POWER 10(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. 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. 4. Subtract the cold water temperature from the hot water temperature. The normal result should be 38 to 78°F (23-3 to 42.6°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 240 volts and the oven cavity is clean. |

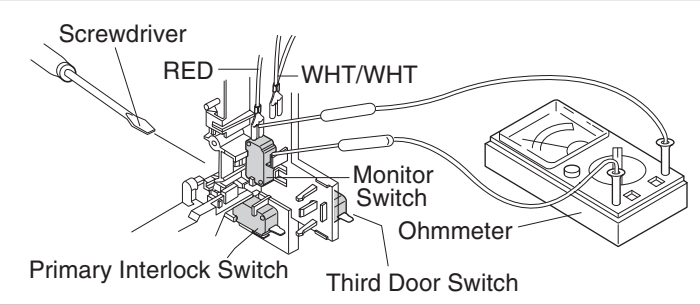
Troubleshooting and Testing

| Procedure Letter | Component Test |
|------------------|--|
| <p>B</p> | <p>POWER TRANSFORMER TEST</p> <p> WARNING</p> <p>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.)</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 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 the R x 3-4 scale, the resistance of the primary coil should be less than 1 ohm and the resistance of the high voltage coil should be approximately 90 ohms; the resistance of the filament coil should be less than 1 ohm. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. |
| <p>C</p> | <p>HIGH VOLTAGE RECTIFIER TEST</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 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. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet) . 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p>NOTE: Be sure to use an ohmmeter that will supply a forward bias voltage of more than 6.3 volts.</p> |
| <p>D</p> | <p>HIGH VOLTAGE CAPACITOR TEST</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 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 an open circuit 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. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. |

| Procedure Letter | Component Test |
|------------------|---|
| E | <p>CAVITY TEMPERATURE FUSE TEST</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. A continuity check across the cavity temperature fuse terminals should indicate a closed circuit unless the temperature of the cavity temperature fuse reaches approximately 302°F(150°C). An open cavity temperature fuse indicates overheating of the oven, exchange the cavity temperature fuse and check inside of oven cavity and for improper setting of cooking time or operation of control unit. Check for restricted air flow through the vent holes of the oven cavity, especially the cooling fan and air guide. 5. Reconnect all leads removed from components during testing. 6. Reinstall the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p>C/T FUSE TEST</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. (See Warnings and Instructions on page 3-1) 4. A continuity check across the C/T fuse terminals should indicate a closed circuit unless the temperature of the cavity temperature fuse reaches approximately 302°F(150°C). An open cavity temperature fuse indicates overheating of the oven, exchange the cavity temperature fuse and check inside of oven cavity and for improper setting of cooking time or operation of control unit. Check for restricted air flow through the vent holes of the oven cavity, especially the cooling fan and air guide. <div style="background-color: #e6f2ff; padding: 5px;">⚠ CAUTION</div> <div style="background-color: #e6f2ff; padding: 5px;">If the temperature fuse indicates an open circuit at room temperature, replace temperature fuse.</div> <ol style="list-style-type: none"> 5. If the C/T fuse is blown when the door is opened, check the secondary interlock relay, primary interlock switch and monitor switch according to the “TEST PROCEDURE” for those switches before replacing the blown monitor fuse. <div style="background-color: #e6f2ff; padding: 5px;">⚠ CAUTION</div> <div style="background-color: #e6f2ff; padding: 5px;">Before replacing a blown C/T fuse, test the secondary interlock relay, primary interlock switch, door sensing switch and monitor switch for proper operation.</div> <p>If the C/T fuse is blown by improper switch operation, the C/T fuse and monitor switch must be replaced with “C/T fuse and monitor switch assembly” part number FFS-BA03-59/KIT, even if the monitor switch operates normally. The C/T fuse and monitor switch assembly is comprised of a 20 ampere fuse and switch.</p> <ol style="list-style-type: none"> 6. Reconnect all leads removed from components during testing. 7. Reinstall the outer case (cabinet). 8. Reconnect the power supply cord after the outer case is installed. 9. Run the oven and check all functions. |

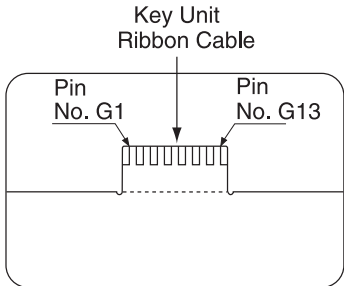
Troubleshooting and Testing

| Procedure Letter | Component Test |
|---------------------|---|
| F | <p data-bbox="310 275 886 302">PRIMARY AND THIRD DOOR SWITCH TEST</p> <ol data-bbox="310 323 1430 695" style="list-style-type: none">1. Disconnect the power supply cord, and then remove outer case.2. Open the door and block it open.3. Discharge high voltage capacitor.4. 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 third door interlock switch.5. Reconnect all leads removed from components during testing.6. Reinstall the outer case (cabinet).7. Reconnect the power supply cord after the outer case is installed.8. Run the oven and check all functions. <p data-bbox="310 716 850 743">SECONDARY INTERLOCK SYSTEM TEST</p> <p data-bbox="310 768 639 795">DOOR SENSING SWITCH</p> <ol data-bbox="310 816 1442 1188" style="list-style-type: none">1. Disconnect the power supply cord, and then remove outer case.2. Open the door and block it open.3. Discharge high voltage capacitor.4. 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.5. Reconnect all leads removed from components during testing.6. Reinstall the outer case (cabinet).7. Reconnect the power supply cord after the outer case is installed.8. Run the oven and check all functions. <p data-bbox="310 1209 1393 1268">NOTE: If the door sensing switch contacts fail in the open position and the door is closed, the cooling fan, turntable and oven light will be activated by RY1.</p> <p data-bbox="310 1310 818 1337">SECONDARY INTERLOCK RELAY (RY2)</p> <ol data-bbox="310 1358 1463 1688" style="list-style-type: none">1. Disconnect the power supply cord, and then remove outer case.2. Open the door and block it open.3. Discharge high voltage capacitor.4. Disconnect two (2) wire leads from the male tab terminals of the Secondary Interlock Relay. Check the state of the relay contacts using an ohmmeter. The relay contacts should be open. If the relay contacts are closed, replace the circuit board entirely or the relay itself.5. Reconnect all leads removed from components during testing.6. Reinstall the outer case (cabinet).7. Reconnect the power supply cord after the outer case is installed.8. Run the oven and check all functions. |

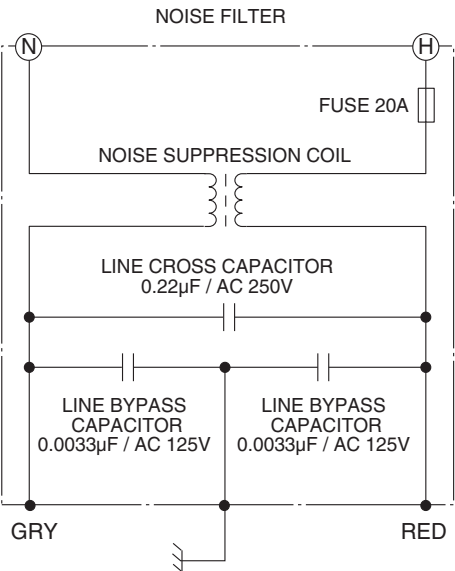
| Procedure Letter | Component Test |
|------------------|---|
| H | <p>MONITOR SWITCH TEST</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Before performing this test, make sure that the primary switch is operating properly, according to the above Switch Test Procedure. Disconnect the wire lead from the monitor switch (COM) 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 (COM) terminal and check the continuity of the monitor circuit. <div style="text-align: right;">  </div> <ol style="list-style-type: none"> 5. Reconnect all leads removed from components during testing. |
| I | <p>TOUCH CONTROL PANEL ASSEMBLY TEST</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. In this service manual, the touch control panel assembly is divided into two units, Control Unit and Key Unit, and also the Control Unit is divided into two units, LSI Unit and Power Unit, and troubleshooting by unit replacement is described according to the symptoms indicated.</p> <p>Before testing:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Disconnect the leads to the primary of the power transformer. 5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape. 6. After that procedure, re-connect the power supply cord. <p>1. Key Unit.</p> <p>NOTE:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Check Key unit ribbon connection before replacement. 5. Reconnect all leads removed from components during testing. 6. Re-install the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions. <p>continued</p> |

Troubleshooting and Testing

| Procedure Letter | Component Test |
|------------------|---|
| I | <p>The following symptoms indicate a defective key unit.</p> <ol style="list-style-type: none"> When touching the pads, a certain pad produces no signal at all. When touching a number pad, two figures or more are displayed. When touching the pads, sometimes a pad produces no signal. <p>If the Key unit is defective.</p> <ol style="list-style-type: none"> Disconnect the power supply cord, and then remove outer case. Open the door and block it open. Discharge high voltage capacitor. Replace the Key unit. Reconnect all leads removed from components during testing. Re-install the outer case (cabinet). Reconnect the power supply cord after the outer case is installed. Run the oven and check all functions. <p>2. Control Unit</p> <p>The following symptoms indicate a defective control unit. Before replacing the control unit, perform the Key unit test (Procedure J) to determine if control unit is faulty.</p> <p>2-1 In connection with pads.</p> <ol style="list-style-type: none"> When touching the pads, a certain group of pads do not produce a signal. When touching the pads, no pads produce a signal. <p>2-2 In connection with indicators</p> <ol style="list-style-type: none"> At a certain digit, all or some segments do not light up. At a certain digit, brightness is low. Only one indicator does not light. The corresponding segments of all digits do not light up; or they continue to light up. Wrong figure appears. A certain group of indicators do not light up. The figure of all digits flicker. The following symptoms indicate a defective LSI unit. <ul style="list-style-type: none"> When touching the keys on the touch screen, a certain key produces no signal at all. When touching a number key on the touch screen, two figures or more are displayed. When touching the keys on the touch screen, sometimes a key produces no signal. <p>2-3 Other possible problems caused by defective control unit.</p> <ol style="list-style-type: none"> Buzzer does not sound or continues to sound. Clock does not operate properly. Cooking is not possible. <p>When testing is completed,</p> <ol style="list-style-type: none"> Disconnect the power supply cord, and then remove outer case. Open the door and block it open. Discharge high voltage capacitor. Reconnect all leads removed from components during testing. Re-install the outer case (cabinet). Reconnect the power supply cord after the outer case is installed. Run the oven and check all functions. |

| Procedure Letter | Component Test | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|---|---|---------------------|----------------------|--------|--------------------|---|---------------|--------------------|-------------------|----|--|--------------|----------|--------------|------|---------|---------------|--------|----|---|-----------|---|---|---|-----------|------------|---|----|--|-------------|------------|-----------|---|---|-------|---------------|----|--|----------|-------|-------------|--------|--------------|---|---|----|--|----------------|---------------|-------------|--|--|--|--|
| J | <p>KEY UNIT TEST</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Isolate the key unit with the control panel frame to be tested. 5. Using an ohmmeter and referring to the key unit matrix indicated on the control unit circuit, check the circuit between the pins of the key unit that correspond to the STOP/CLEAR pad. When the pad is pressed, the ohmmeter should indicate short circuit. When the pad is released, the ohmmeter should indicate open circuit. If incorrect readings are obtained, the key unit is faulty and must be replaced. About the other pads, the above method may be used 6. Reconnect all leads removed from components during testing. 7. Re-install the outer case (cabinet). 8. Reconnect the power supply cord after the outer case is installed. 9. Run the oven and check all functions. <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;">  <p>Key unit (Membrane Switch)</p> </div> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>G6</td> <td>G7</td> <td>G8</td> <td>G9</td> <td>G10</td> <td>G11</td> <td>G12</td> <td>G13</td> </tr> <tr> <td>G5</td> <td></td> <td>baked potato</td> <td>beverage</td> <td>reheat pasta</td> <td>melt</td> <td>defrost</td> <td>reheat breads</td> <td>snacks</td> </tr> <tr> <td>G4</td> <td>6</td> <td>set clock</td> <td>5</td> <td>2</td> <td>3</td> <td>user pref</td> <td>add 30 sec</td> <td>9</td> </tr> <tr> <td>G3</td> <td></td> <td>power level</td> <td>STOP/CLEAR</td> <td>keep warm</td> <td>8</td> <td>0</td> <td>START</td> <td>sensor reheat</td> </tr> <tr> <td>G2</td> <td></td> <td>pop-corn</td> <td>pizza</td> <td>kid's meals</td> <td>soften</td> <td>timer on-off</td> <td>7</td> <td>1</td> </tr> <tr> <td>G1</td> <td></td> <td>frozen veggies</td> <td>fresh veggies</td> <td>sensor cook</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p style="text-align: right; margin-right: 20px;">KEY UNIT</p> </div> </div> | | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G5 | | baked potato | beverage | reheat pasta | melt | defrost | reheat breads | snacks | G4 | 6 | set clock | 5 | 2 | 3 | user pref | add 30 sec | 9 | G3 | | power level | STOP/CLEAR | keep warm | 8 | 0 | START | sensor reheat | G2 | | pop-corn | pizza | kid's meals | soften | timer on-off | 7 | 1 | G1 | | frozen veggies | fresh veggies | sensor cook | | | | |
| | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G5 | | baked potato | beverage | reheat pasta | melt | defrost | reheat breads | snacks | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G4 | 6 | set clock | 5 | 2 | 3 | user pref | add 30 sec | 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G3 | | power level | STOP/CLEAR | keep warm | 8 | 0 | START | sensor reheat | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G2 | | pop-corn | pizza | kid's meals | soften | timer on-off | 7 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G1 | | frozen veggies | fresh veggies | sensor cook | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| K | <p>RELAY TEST</p> <ol style="list-style-type: none"> 1. Disconnect power supply cord, and remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Disconnect the leads to the primary of the power transformer. 5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape. 6. After that procedure, re-connect the power supply cord. 7. Remove the outer case and check voltage between Pin No. 1 of the 2 pin connector (A) and the common terminal of the relay RY1 on the control unit with an A.C. voltmeter. The meter should indicate 240 volts, if not check oven circuit. <p style="margin-top: 20px;">Shut-off, Cook and Heater Relays Test</p> <p>These relays are operated by D.C. voltage</p> <p>Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.</p> <p>DC. voltage indicated Defective relay.</p> <p>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-top: 10px;"> <thead> <tr> <th>RELAY SYMBOL</th> <th>OPERATIONAL VOLTAGE</th> <th>CONNECTED COMPONENTS</th> </tr> </thead> <tbody> <tr> <td>RY1</td> <td>Approx. 24.0V D.C.</td> <td>Oven lamp / Turntable motor / Cooling fan motor</td> </tr> <tr> <td>RY2</td> <td>Approx. 24.0V D.C.</td> <td>Power transformer</td> </tr> </tbody> </table> | RELAY SYMBOL | OPERATIONAL VOLTAGE | CONNECTED COMPONENTS | RY1 | Approx. 24.0V D.C. | Oven lamp / Turntable motor / Cooling fan motor | RY2 | Approx. 24.0V D.C. | Power transformer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RELAY SYMBOL | OPERATIONAL VOLTAGE | CONNECTED COMPONENTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RY1 | Approx. 24.0V D.C. | Oven lamp / Turntable motor / Cooling fan motor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RY2 | Approx. 24.0V D.C. | Power transformer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Troubleshooting and Testing

| Procedure Letter | Component Test | | | | | | | | | | | | | | | |
|-----------------------------|--|-----------------|------------------------|-----------------|---------------|-----------------------------|----------------------------|----------------------------|----------------|-------|------|--|-----|--------|-----|--------|
| K | 8. Disconnect the power supply cord, and then remove outer case. 9. Open the door and block it open. 10. Discharge high voltage capacitor. 11. Reconnect all leads removed from components during testing. 12. Re-install the outer case (cabinet). 13. Reconnect the power supply cord after the outer case is installed. 14. Run the oven and check all functions. | | | | | | | | | | | | | | | |
| L | <p>SOLID-STATE RELAY TEST</p> <p>⚠ WARNING</p> <p>The oven should be fully assembled before following procedure.</p> <ol style="list-style-type: none"> Place one cup of water in the center of the turntable tray in the oven cavity. Close the door. Touch the “ DEFROST “ pad, then number 2. The oven is in Defrost Center cooking condition. The oven will operate as follows <table border="1" data-bbox="297 905 1078 1014"> <thead> <tr> <th>MENU</th> <th colspan="2">1ST STAGE</th> <th colspan="2">2ND STAGE</th> </tr> <tr> <th>STEAKS/CHOPS/FISH 0.5lb</th> <th>LEVEL</th> <th>TIME</th> <th>LEVEL</th> <th>TIME</th> </tr> </thead> <tbody> <tr> <td></td> <td>60%</td> <td>57sec.</td> <td>40%</td> <td>22sec.</td> </tr> </tbody> </table> | MENU | 1ST STAGE | | 2ND STAGE | | STEAKS/CHOPS/FISH 0.5lb | LEVEL | TIME | LEVEL | TIME | | 60% | 57sec. | 40% | 22sec. |
| MENU | 1ST STAGE | | 2ND STAGE | | | | | | | | | | | | | |
| STEAKS/CHOPS/FISH 0.5lb | LEVEL | TIME | LEVEL | TIME | | | | | | | | | | | | |
| | 60% | 57sec. | 40% | 22sec. | | | | | | | | | | | | |
| M | <p>NOISE FILTER TEST</p> <ol style="list-style-type: none"> Disconnect the power supply cord, and then remove outer case. Open the door and block it open. Discharge high voltage capacitor. Disconnect the leads to the primary of the power transformer. Using an ohm-meter, check between the terminals as described in the following table: <table border="1" data-bbox="318 1289 959 1438"> <thead> <tr> <th>Measuring Point</th> <th>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> <p>If incorrect readings are obtained, replace the noise filter.</p> <ol style="list-style-type: none"> Reconnect all leads removed from components during testing. Re-install the outer case (cabinet). Reconnect the power supply cord after the outer case is installed. Run the oven and check all functions.  | 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. | | | | | | | | | | | | | | | |

Component Teardown and Testing

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 and Testing

Outer Case Removal

To remove the outer case, proceed as follows;

1. Disconnect the power supply cord.
2. Open the oven door and block it open.
3. Remove the two (2) screws from the lower portion of the rear cabinet using a T20H Torx type or GTXH20-100 screwdriver.
4. Remove the remaining two (2) screws from rear and four (4) screws along the right side of outer case.
5. Slide the entire outer case back out about 1 inch (3 cm) to free it from retaining clips on the cavity face plate.
6. Lift entire outer case from the unit.

⚠ CAUTION

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

☰ NOTE

When replacing the outer case, the 2 special Torx screws must be reinstalled in the same locations.

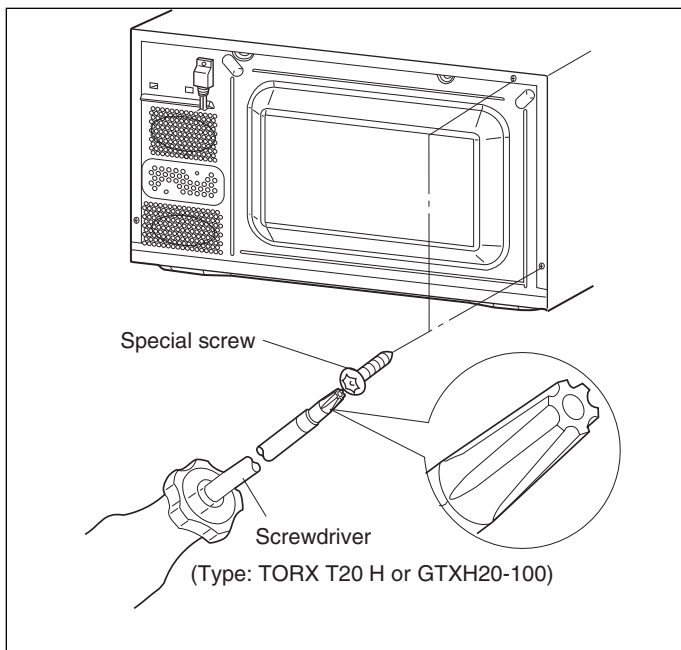


Figure 4-1. Outer Case Removal

Power Transformer Removal

1. Disconnect the power supply cord and then remove outer case.
2. Open the oven 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 wire leads (primary and high voltage) from power transformer and the filament leads from the magnetron and capacitor terminals.
5. Remove four (4) screws holding transformer to bottom plate.
6. Remove transformer from bottom plate.

Re-install

1. Rest transformer on the bottom plate with its primary terminals toward the oven face plate.
2. Secure transformer with four screws to bottom plate.
3. Re-connect wire leads (primary and high voltage) to power transformer and filament leads of transformer to magnetron and high voltage capacitor. Refer to "Pictorial diagram" on page 5-1.
4. Re-install outer case and check that oven is operating Properly.

Positive Lock® Connector (No-Case Type) Removal

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

⚠ 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. Push the lever of positive lock® connector.
5. Pull down on the positive lock® connector.

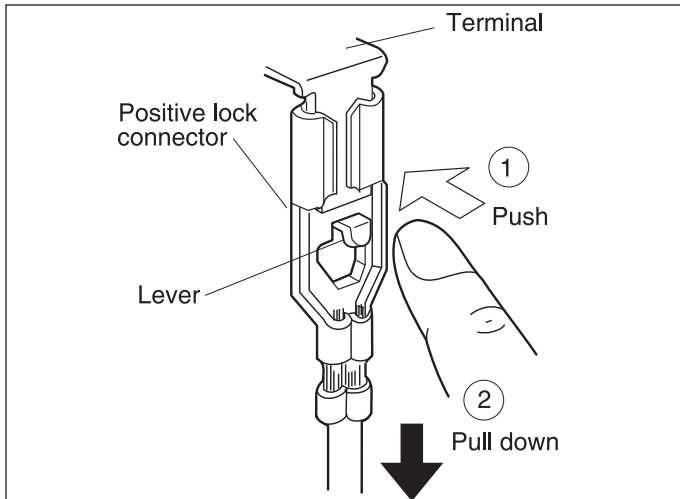


Figure 4-2. Positive Lock® Connector

High Voltage Rectifier And High Voltage Capacitor Removal

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

⚠ 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 high voltage wire A from the high voltage capacitor.
5. Disconnect the high voltage wire of high voltage rectifier assembly from the magnetron.
6. Disconnect the filament lead (short one) of the power transformer from the high voltage capacitor.
7. Remove one (1) screw holding capacitor holder with the high voltage rectifier to the base plate.
8. Disconnect rectifier terminal from capacitor. High voltage rectifier assembly is now free.
9. Remove capacitor holder. Capacitor is now free.

⚠ CAUTION

When replacing high voltage rectifier and high voltage capacitor, ground side terminal of the high voltage rectifier must be secured firmly with a grounding screw.

Magnetron Removal

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

⚠ 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 wire leads from magnetron.
5. Remove the two (2) screws holding the chassis support to the magnetron and the oven cavity front flange.
6. Slide the magnetron duct slightly so that the two (2) screws at left hand side of the magnetron appear.
7. Carefully remove the four (4) screws holding magnetron to waveguide flange.
8. Remove the magnetron with care so that the magnetron antenna is not hit by any metal object around the antenna.
9. Now, the magnetron is free.

Re-install

1. Re-install the magnetron to waveguide flange with care to prevent damage to the magnetron antenna.
2. Secure the magnetron with the four (4) screws.
3. Hold the chassis support to the oven cavity front plate and the magnetron with the two (2) screws.
4. Reconnect the wire leads to the magnetron. Refer to "Pictorial diagram" on page 5-1.
5. Re-install outer case and check that the oven is operating properly.

⚠ CAUTION

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

Component Teardown and Testing

Oven Lamp And Lamp Socket Removal

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

⚠ 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. Pull the wire leads from the oven lamp socket.
5. Remove support bracket and the magnetron duct.
6. Unscrew the oven lamp from the lamp socket.
7. Remove socket from magnetron duct.
8. Now, the oven lamp and socket are free.

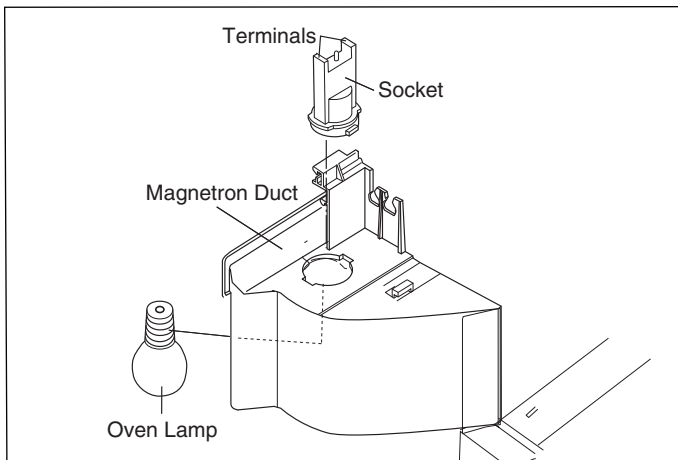


Figure 4-3. Oven Lamp Socket

Control Panel Assembly Removal

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

⚠ 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 panel components.
5. Remove the one (1) screw holding the control panel assembly to the oven cavity front plate.
6. Slide the control panel assembly upward and remove it.
7. Now, individual components can be removed.

NOTES:

1. Before attaching a new key unit, wipe off remaining adhesive on the control panel frame surfaces completely with a soft cloth soaked in alcohol.
2. When attaching the key unit to the control panel frame, adjust the upper edge and right edge of the key unit to the correct position of control panel frame.
3. Place the key unit firmly to the control panel frame by rubbing with soft cloth not to scratch.

Key Sheet Replacement

Removal

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Remove the control panel assembly.
5. Remove the five (5) screws holding the control unit to the control panel frame. And remove the control unit by releasing from tabs.
6. Remove the key sheet from the control panel frame.
NOTE: Heat gun will soften adhesive.

Installation

1. Remove remaining adhesive on the control panel frame surfaces with a soft cloth soaked in alcohol.
2. Make sure that the VFD (Vacuum Fluorescent Display) is in good condition.
3. Remove the backing paper from the new graphic sheet.
4. Adjust the upper edge and left edge of the graphic sheet to the large depression on the surface of the control panel frame.
5. Attach the graphic sheet to the control panel frame by rubbing with a soft cloth not to scratch.
6. Reinstall the control panel frame to the oven.

NOTE: Do not touch the contact surface of the ribbon cable (edge).

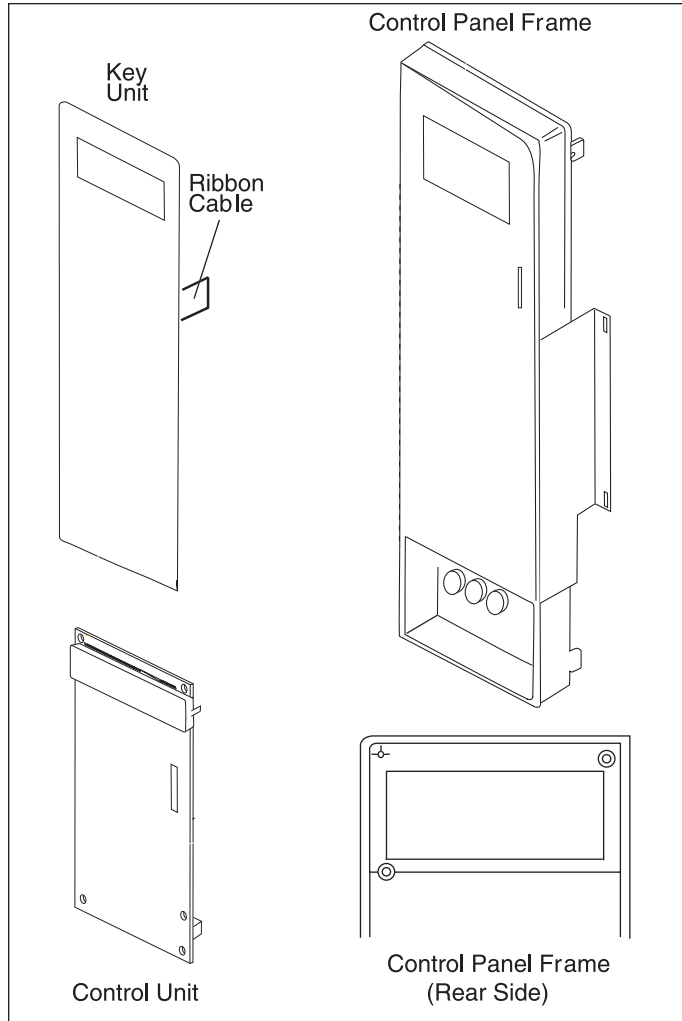


Figure 4-4. Key Unit Replacement

Turntable Motor Removal

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

Component Teardown and Testing

Cooling Fan Motor Removal

REMOVAL

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

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 fan motor.
5. Remove the two (2) screws holding the fan motor to the oven cavity back plate.
6. Remove the fan blade from the fan motor shaft according to the following procedure.
7. Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

CAUTION

- * Make sure that no metal pieces enter the gap between the rotor and the stator of the fan motor because the rotor is easily shaven by pliers and metal pieces may be produced.
- * Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.
- * Do not disfigure bracket by touching with pliers.

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

CAUTION

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

INSTALLATION

1. Install the fan blade to the fan motor shaft according to the following procedure.
2. Hold the center of the bracket which supports the shaft of the fan motor on the flat table.
3. Apply the screw lock tight into the hole (for shaft) of the fan blade.

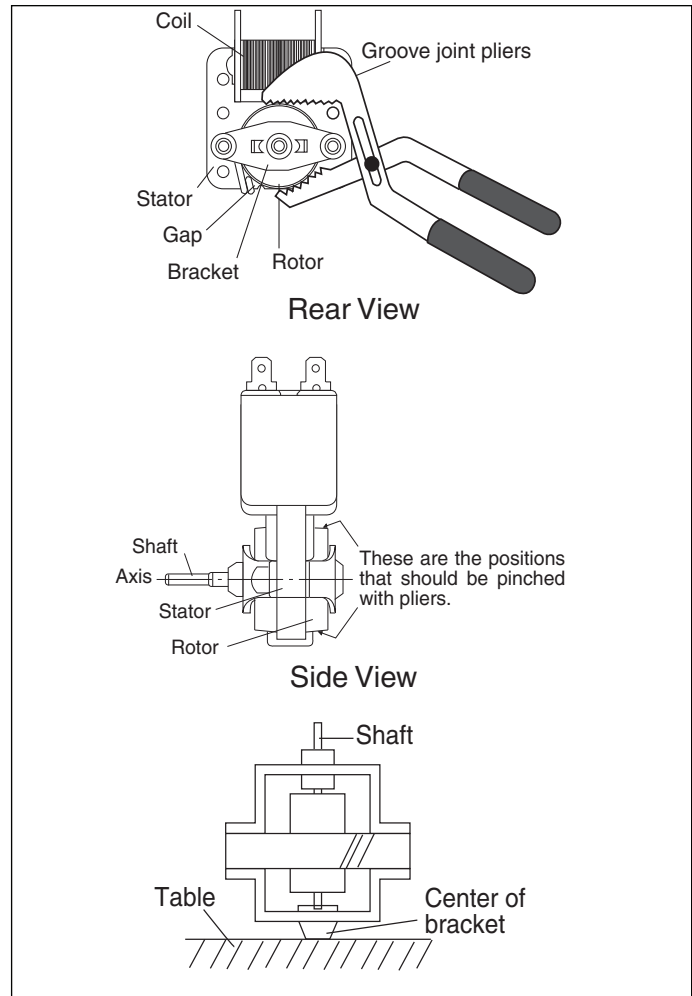


Figure 4-5. Cooling Fan Motor Removal

4. Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

CAUTION

- * Do not hit the fan blade strongly when installed because the bracket may be disfigured.
- * Make sure that the fan blade rotates smooth after installation.
- * Make sure that the axis of the shaft is not slanted.

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

Door Sensing Switch/Primary Switch/Third Door Switch And Monitor Switch Removal

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

Re-install

1. Re-install each switch in its place. The third door interlock/monitor switches are in the lower position and the door sensing switch is in the upper position.
2. Re-connect wire leads to each switch. Refer to pictorial diagram.
3. Secure latch hook (with two (2) mounting screws) to oven flange.
4. Make sure that the monitor switch is operating properly and check continuity of the monitor circuit.

Door Sensing Switch/Primary Switch/Third Door Switch And Monitor Switch Adjustment

1. Disconnect power 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.

If door sensing switch, primary switch, secondary switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

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

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 upper portion of door toward the oven face. Both results (play in the door) should be less than 0.5mm.
2. The door sensing switch, primary switch and third door switch interrupt the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. Re-install outer case and check for microwave leakage around door with an approved microwave survey meter.

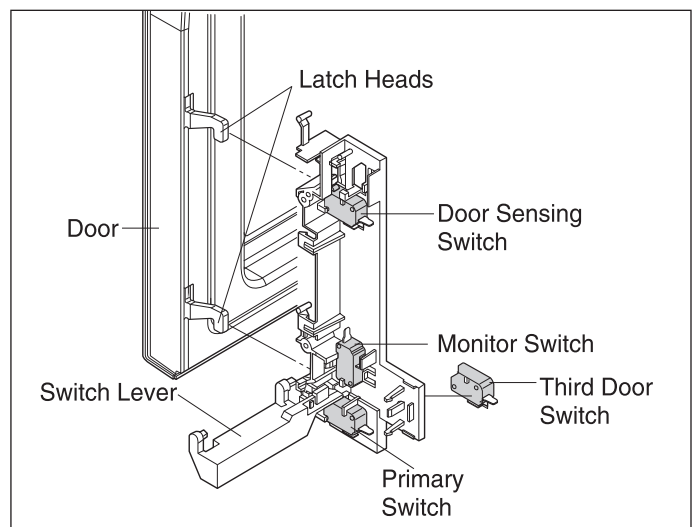


Figure 4-6. Latch Switch Adjustments

Component Teardown and Testing

Door Replacement

Removal

1. Disconnect the power supply cord.
2. Push the open button and open the door slightly.
3. Insert a putty knife (thickness of about 0.5mm) into the gap between the choke cover and door frame as shown in Figure 4-7 to free engaging parts.
4. Pry the choke cover by inserting a putty knife as shown Figure 4-7.
5. Release choke cover from door panel.
6. Now choke cover is free.
7. Release two (2) pins of door panel from two (2) holes of upper and lower oven hinges by lifting up.
8. Now, door panel with door frame is free from oven cavity.

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

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

Re-Install

1. Re-install door screen to door frame.
2. Re-install the latch spring to the latch head. Re-install the latch spring to the door frame. Re-install latch head to door frame.
3. Re-install door panel to door frame by fitting twelve (12) tabs of door frame to twelve (12) holes of door panel.
4. Put sealer film on door panel. Refer to “Sealer Film” about how to handle a new one.
5. Catch two (2) pins of door panel on two (2) hole of upper and lower oven hinges.
6. Re-install choke cover to door panel by pushing in.

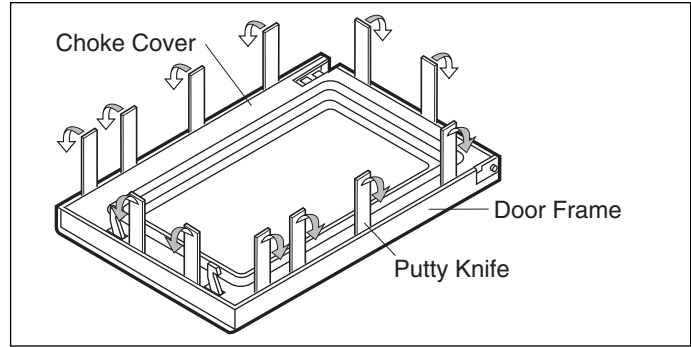


Figure 4-7. Choke Cover

NOTE

After any service to the door:

- (A) Make sure that door sensing switch, primary switch and secondary switch are operating properly.
- (B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

After any service, make sure of the following :

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

NOTE

The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight.

Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves indicate a leakage of microwave energy from oven cavity.

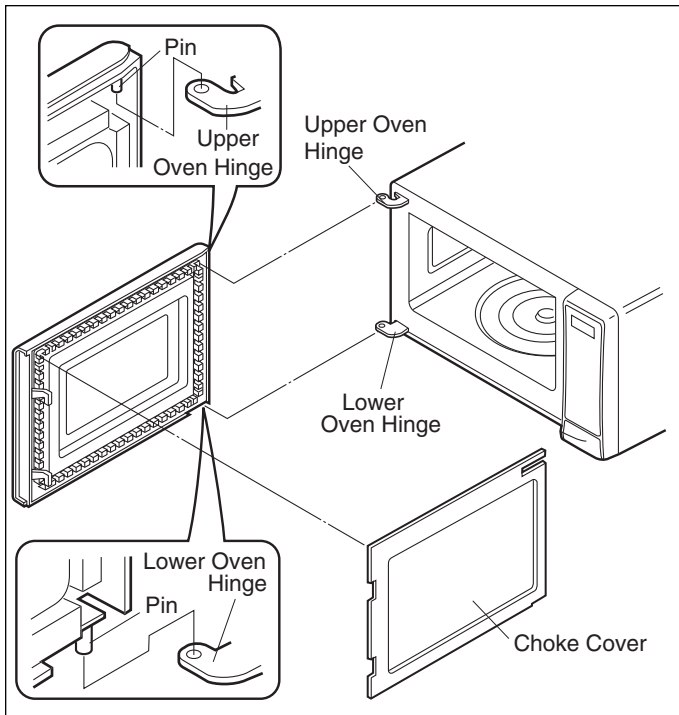


Figure 4-8. Door Removal

Sealer Film

Installation

1. Put the adhesive tape on the backing film of the sealer film as shown in Figure 4-9.
2. Tear the backing film by pulling the adhesive tape.
3. Put the pasted side of the sealer film on the door panel.

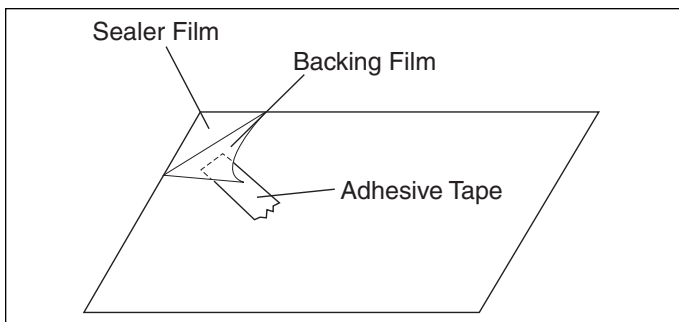
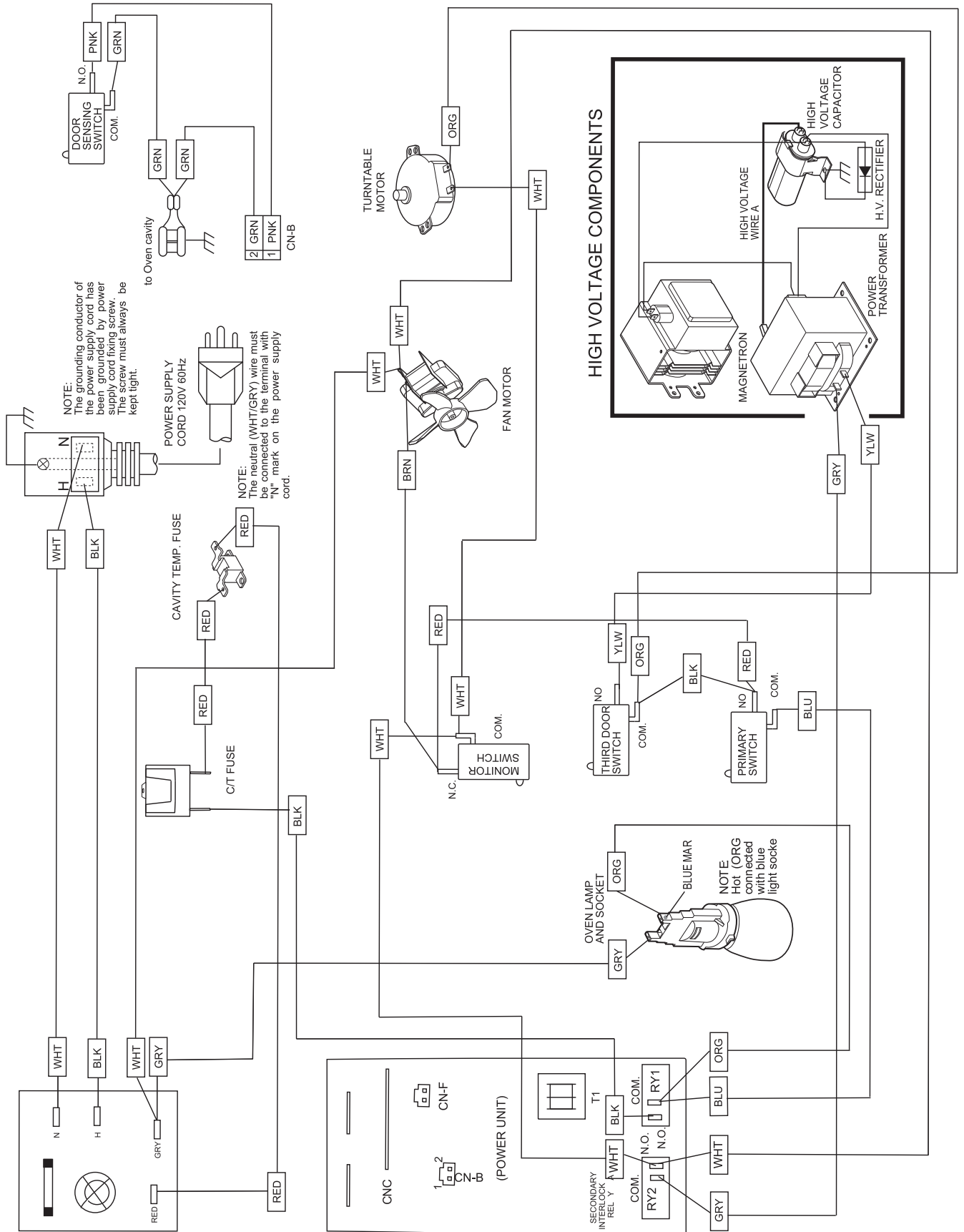


Figure 4-9. Door Removal

Wiring Diagram

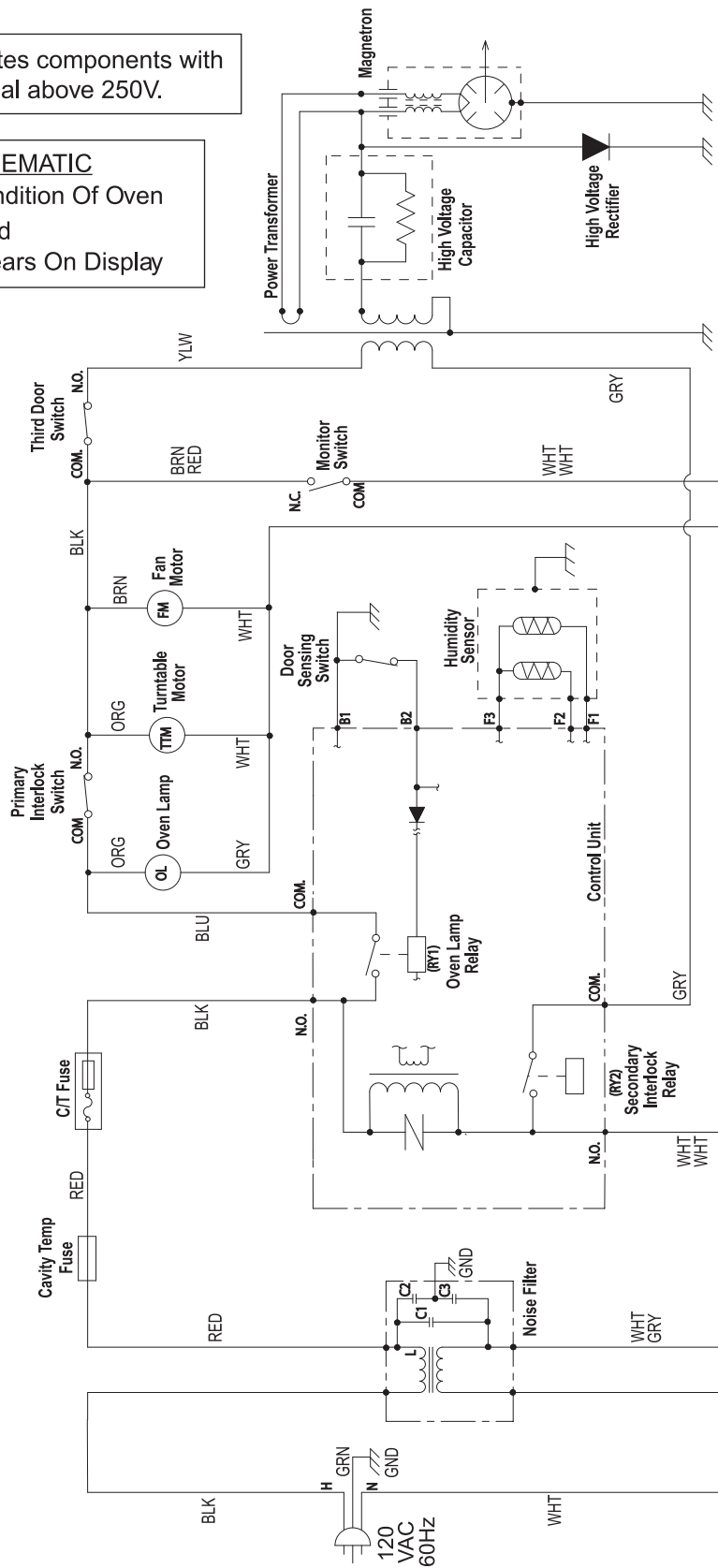


Wiring Diagrams

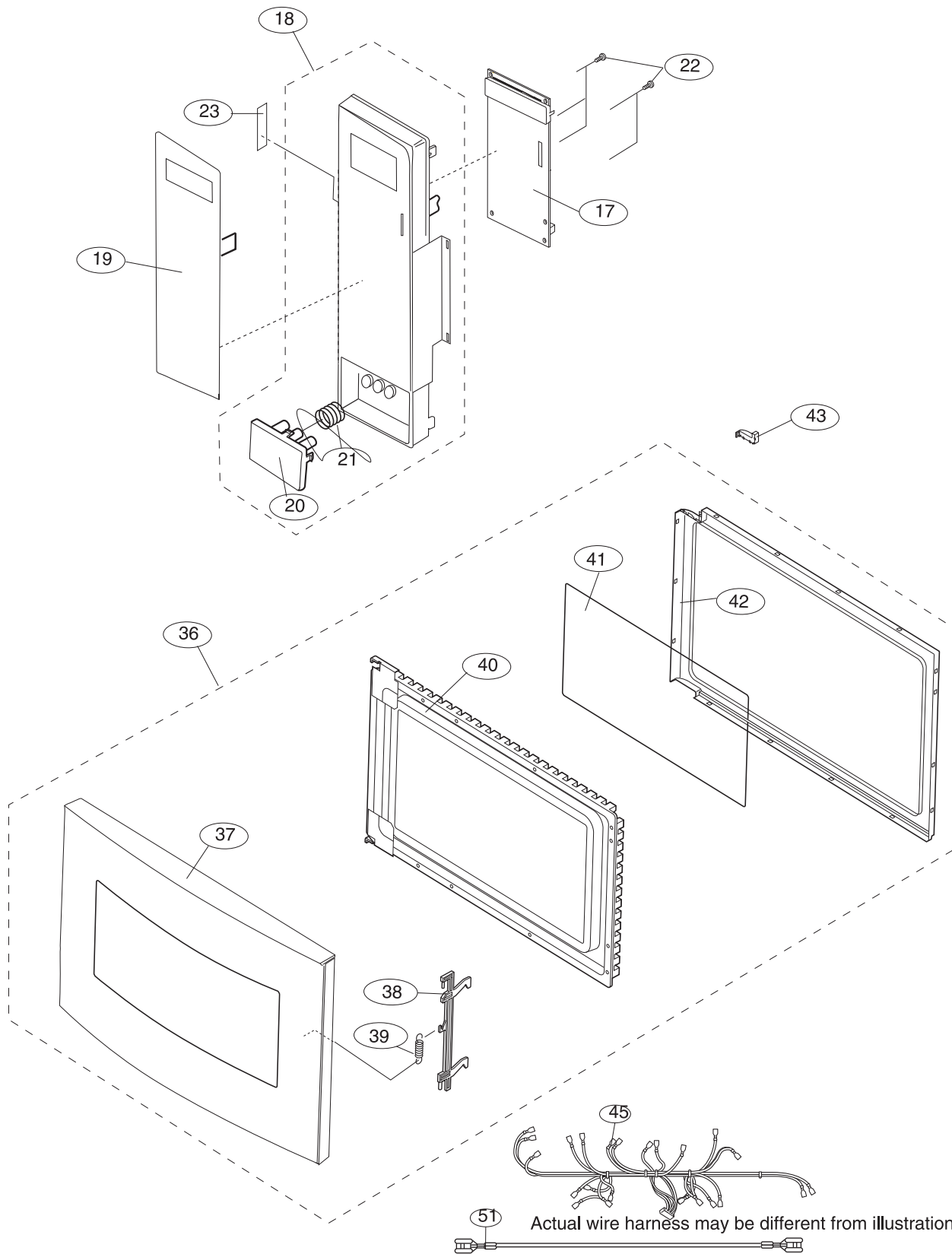
Oven Wiring Schematic Off Condition

NOTE: "*" indicates components with potential above 250V.

SCHMATIC
NOTE: Condition Of Oven
1. Door Closed
2. Clock Appears On Display



Key Unit And Door Assembly



Parts List

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

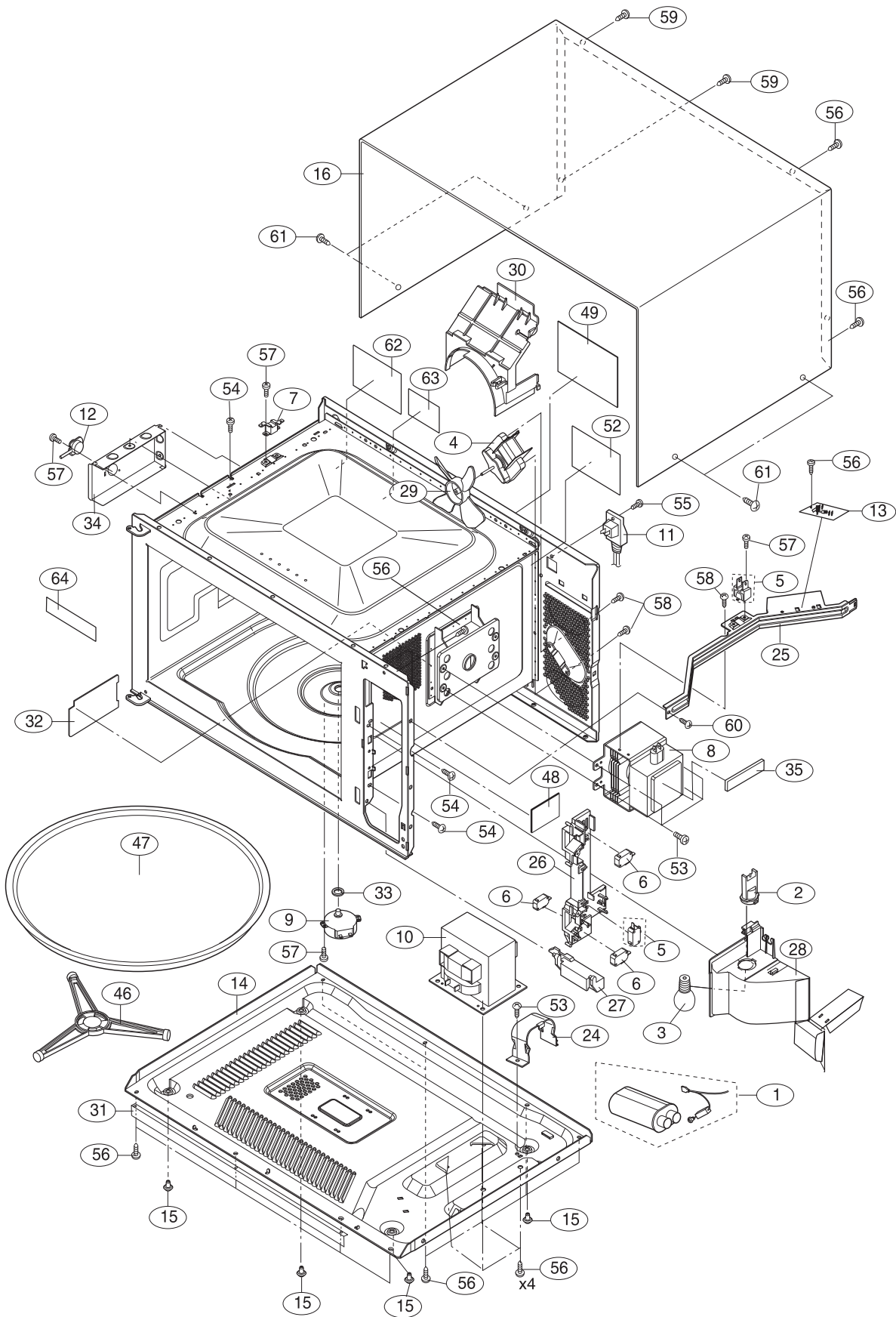
| REF. NO. | DESCRIPTION | Q'TY |
|----------------------------|--|------|
| ELECTRICAL PARTS | | |
| * 1 | High voltage assembly | 1 |
| 2 | Lamp socket | 1 |
| 3 | Oven lamp | 1 |
| 4 | Fan motor | 1 |
| 5 | Monitor switch (V-16G-2C25), C/T fuse (20A 250V AC) & Inst. | 1 |
| 6 | Primary interlock switch and door sensing switch (V-5230Q) | 3 |
| 7 | Cavity temperature fuse 150°C | 1 |
| Δ 8 | Magnetron | 1 |
| 9 | Turntable motor | 1 |
| 10 | Power transformer | 1 |
| 11 | Power supply cord | 1 |
| 12 | AH Sensor | 1 |
| 13 | Noise filter | 1 |
| CABINET PARTS | | |
| 14 | Base plate | 1 |
| 15 | Foot | 4 |
| 16 | Outer case cabinet | 1 |
| CONTROL PANEL PARTS | | |
| 17 | CPU assy | 1 |
| 18 | Control panel sub assembly | 1 |
| 19 | Key unit | 1 |
| 20 | Open button | 1 |
| 21 | Open button spring | 1 |
| 22 | Screw; 3mm x 6mm | 5 |
| 23 | User caution label | 1 |
| OVEN PARTS | | |
| 24 | H.V. Capacitor band | 1 |
| 25 | Chassis support | 1 |
| 26 | Latch hook | 1 |
| 27 | Switch lever | 1 |
| 28 | Magnetron duct | 1 |
| 29 | Fan blade | 1 |
| 30 | Fan duct | 1 |
| 31 | Bottom filler | 1 |
| 32 | Waveguide cover | 1 |
| 33 | Turntable motor packing | 1 |
| 34 | Sensor duct | 1 |
| 35 | Mag cushion | 1 |
| DOOR PARTS | | |
| 36 | Door assembly | 1 |
| * 37 | Door frame assembly | 1 |
| 38 | Latch head | 1 |
| 39 | Latch spring | 1 |
| 40 | Door panel | 1 |
| 41 | Sealer film | 1 |
| 42 | Choke cover | 1 |
| 43 | Door stopper | 1 |
| * 44 | Screw | 1 |

* NOTE : Supplied on higher level assembly

MISCELLANEOUS

| REF. NO. | DESCRIPTION | Q'TY |
|--------------------------------|---|------|
| 45 | Main wire harness | 1 |
| 46 | Turntable support | 1 |
| 47 | Turntable tray | 1 |
| 48 | Monitor caution label | 1 |
| 49 | DHHS/Screw caution label | 1 |
| 50 | Operation manual | 1 |
| 51 | High voltage wire A | 1 |
| 52 | NHW caution label | 1 |
| SCREWS NUTS AND WASHERS | | |
| 53 | Special screw | 5 |
| 54 | Special screw | 3 |
| 55 | Screw : 4mm x 12mm | 1 |
| 56 | Screw : 4mm x 12mm | 17 |
| 57 | Screw : 3mm x 8mm | 5 |
| 58 | Screw : 4mm x 8mm | 4 |
| 59 | Special screw (Torx tamper proof screw) | 2 |
| 60 | Screw | 1 |
| 61 | Screw : Outercase screws | 4 |
| 62 | UL screw label | 1 |
| 63 | Built-in height label | 1 |
| 64 | Menu label | 1 |

Oven And Cabinet Parts



Parts List

Packing And Accessories

