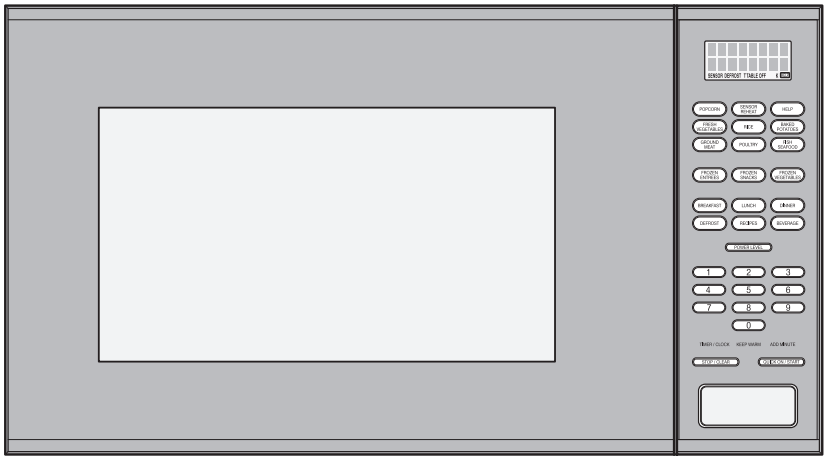
# Technical Service And Parts Manual

# Model MW24 Microwave Oven

## Starting with Serial #12001543



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JOB AID #807814 Revision D - Dec 2008

# SECTION 1

# GENERAL INFORMATION

## INTRODUCTION

This Technical Service and Parts Manual, Part #807814, has been compiled with information provided by the Sharp Electronics Corporation. This manual provides the most recent technical service information for the model MW24, starting with serial #12001542, which will enable the service technician to troubleshoot and diagnose malfunctions, perform necessary repairs and return a Wolf MW24 Microwave Oven to proper operational condition.

The Service Technician should read the complete instructions contained in this Technical Service and Parts Manual before initiating any repairs on a Wolf MW24 Appliance.

***NOTE:*** *This manual is to be used for model MW24 units starting with serial #12001542, which employ a C/T fuse instead of a separate magnetron temperature fuse and monitor fuse assembly.*

## IMPORTANT SAFETY INFORMATION

Below are the Product Safety Labels used in this manual. The "Signal Words" used are **WARNING** and **CAUTION**.

Please note that these safety labels are placed in areas where awareness of personal safety and product safety should be taken and lists the precautions to be taken when the signal word is observed.

**⚠ WARNING**

**INDICATES THAT HAZARDOUS OR UNSAFE PRACTICES COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH**

**⚠ CAUTION**

**Indicates that hazardous or unsafe practices could result in minor personal injury or product and/or property damage**

In addition, please pay attention to the signal word ***"NOTE"***, which highlights especially important information within each section.

## TECHNICAL ASSISTANCE

If you should have any questions regarding a Wolf appliance and/or this manual, please contact:

*Wolf Appliance, Inc*
*ATTN: Service Department*
*P.O. Box 44988*
*Madison, WI 53744-4988*

*Customer Service & Parts / Warranty Claims*
*Phone #: (800) 332 - 9513*

*Technical Assistance*
*Phone #: (800) 919 - 8324*

*Customer Service & Technical Assistance*
*Facsimile #: (608) 441 - 5887*

*Parts / Warranty Claims*
*Facsimile #: (608) 441 - 5886*

*Service Department e-mail Address*
*customerservice@wolfappliance.com*

*Office Hours:*
*7:00 AM to 7:00 PM Central Time*
*Monday through Friday*

**This manual is designed to be used by Authorized Service Personnel only. Wolf Appliance, Inc.assumes no responsibility for any repairs made to Wolf appliances by anyone other than Authorized Service Technicians.**

## TABLE OF CONTENTS

## WARRANTY INFORMATION

This page contains a summary of the 2 *& 5 Year Warranty* that is supplied with every Wolf product, followed by a *Non Residential Warranty summary* and then notes about the warranties.

### TWO & FIVE YEAR Warranty Summary

- Two year TOTAL PRODUCT warranty, parts and labor.
- Limited Parts Only Warranty for the 3rd through 5th year on the following parts: Transformer, Magnetron, Capacitor, Rectifier, Electronic Control System, etc.

  ***NOTE:*** *This warranty only applies to products installed for normal residential use in the United States or Canada.*

### NON RESIDENTIAL Warranty Summary

- Two year TOTAL PRODUCT warranty, parts and labor.

  ***NOTE:*** *This warranty only applies to products installed in test kitchens, culinary and school kitchens, and other installations which help promote Wolf Appliance products. Restaurant installations and other similar commercial applications carry no warranty.*

**Warranty Notes:**

- *All warranties begin at the time of the unit's initial installation.*
- *All Warranty and Service information collected by Wolf Appliance, Inc.is arranged and stored under the unit serial number and/or the customer's name. It is requested that you have the model and serial number available whenever contacting the factory or parts distributor.*
- See Figures 1-1 for serial tag layout and location.

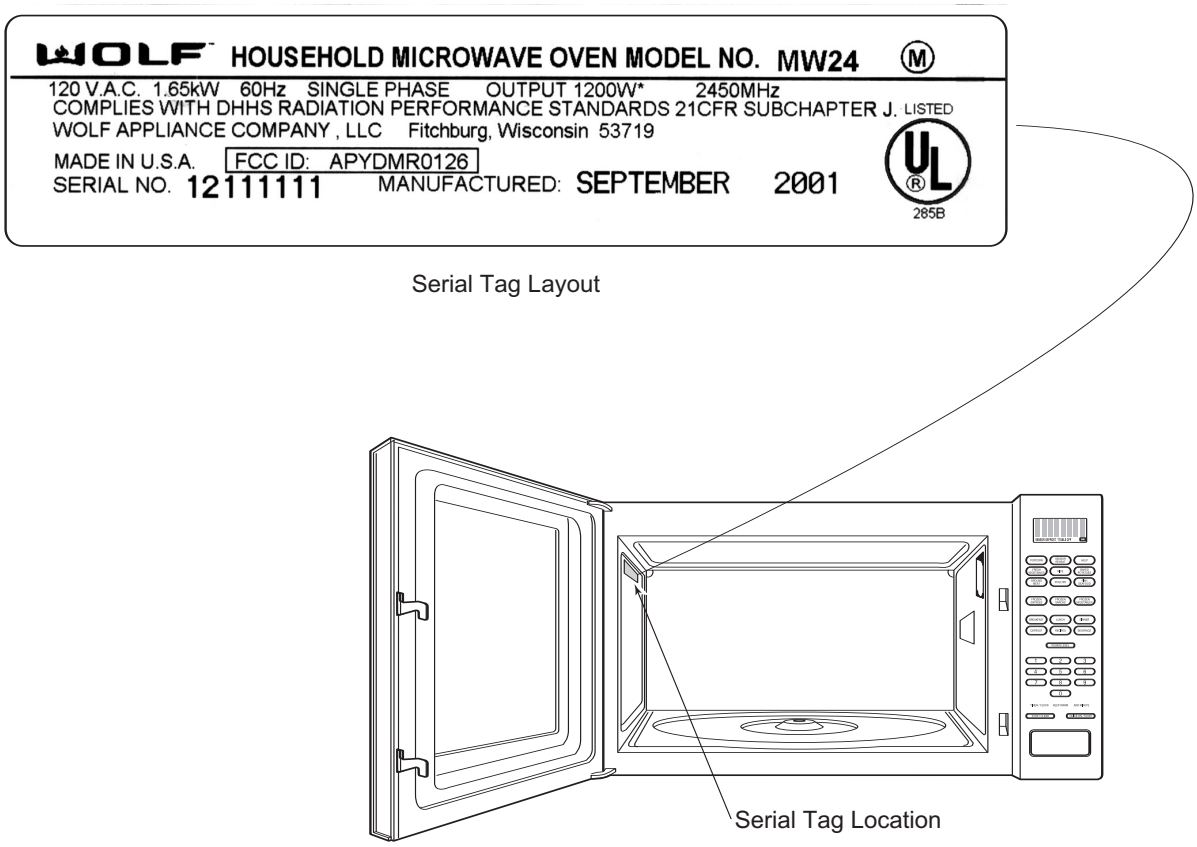



**Figure 1-1. Serial Number Tag Layout and Location**

## MODEL FEATURES

Listed below are some features of the Wolf microwave. (See Figure 1-3)

1. One Touch Door Open Button
2. Safety Door Latches (Two)
   ***NOTE:*** *The oven will not operate unless the door is securely closed.*
3. Removable Turntable Support
   ***NOTE:*** *Must be placed in center of oven floor.*
4. Removable Turntable
   ***NOTE:*** *Turntable will rotate clockwise or counterclockwise. Turntable should only be removed for cleaning.*

***NOTE:*** *6kg (13 1/4lbs) Maximum weight limit for turntable motor.*

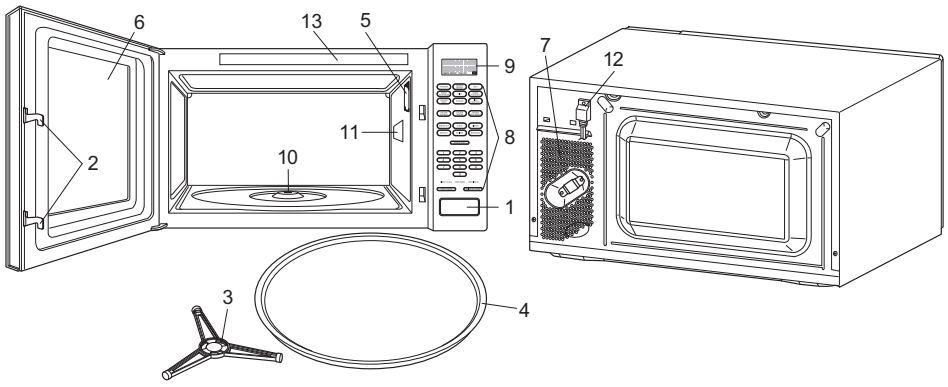



**Figure 1-3. Oven Front and Rear View**

5. Oven Lamp
   ***NOTE:*** *Lamp operates when oven is operating or door is open.*
6. Oven Door with See-through Window
7. Ventilation Openings (Rear of unit)
8. Touch Control Panel
   ***NOTE:*** *Also see Control Panel Layout on this page.*
9. Interactive Digital Display
   ***NOTE:*** *Maximum time display is 99 minutes, 99 seconds.*
10. Coupling (a.k.a. Turntable Motor Shaft)
11. Waveguide Cover
    ***NOTE:*** *Do NOT remove.*
12. Power Supply Cord (partial shown)
13. Menu Label

### Control Panel Layout

The diagram at right (See Figure 1-4) illustrates the layout of the microwave Touch Control Panel.

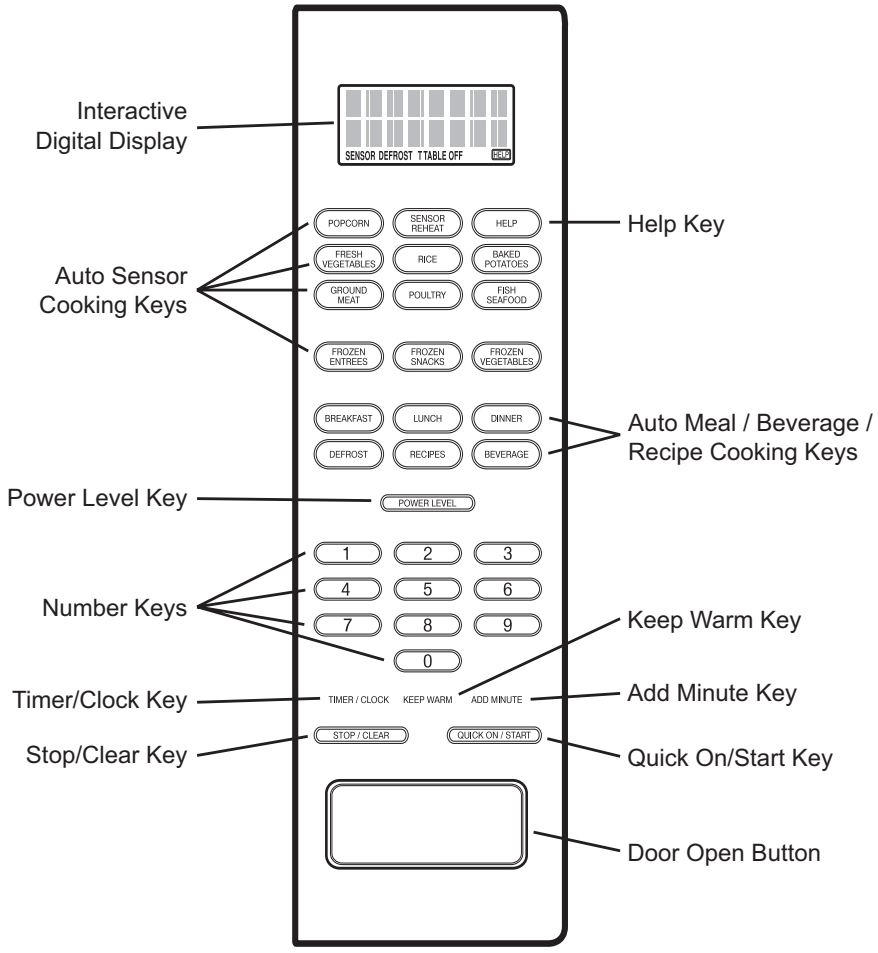



**Figure 1-4. Auto-Touch Control Panel**

# SECTION 2

# INSTALLATION INFORMATION

## INSTALLATION INFORMATION

The Wolf microwave oven can be set up as a free-standing unit or set into a built-in wall installation.

This section of the manual covers some of the installation issues that a service technician may need to know when servicing a Wolf microwave oven. If additional installation information is needed, after reviewing this section of the manual, please refer to the installation guide or contact the Wolf Appliance Customer Service Department.

### Electrical Requirements

- 110 to 120 Volts AC, 60Hz, 15 ampere fused electrical supply
- Separate electrical circuit serving only this appliance
- A properly grounded 3-prong receptacle

**⚠ WARNING**

**THE INSTALLATION SITE MUST BE EQUIPPED WITH A PROPERLY GROUNDED 3-SLOT RECEPTACLE TO MATCH THE 3-PRONG (GROUNDED) POWER SUPPLY CORD PROVIDED ON THE APPLIANCE. IF THE ELECTRIC RECEPTACLE OR POWER CORD ARE NOT PROPERLY GROUNDED, THIS COULD CAUSE A SHOCK HAZARD AND THE APPLIANCE MAY NOT FUNCTION.**

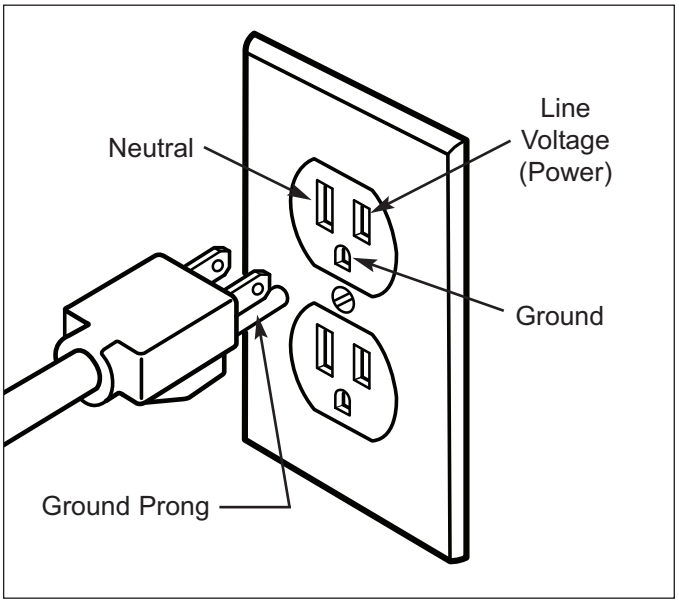



**Figure 2-1. Electrical Receptacle & Power Cord**

**⚠ WARNING**

**TO AVOID SHOCK HAZARD, NEVER REMOVE THE GROUND PRONG FROM THE PLUG OF THE POWER SUPPLY CORD.**

**⚠ WARNING**

- **EXTENSION CORDS ARE NOT RECOMMENDED.**
- **IF AN EXTENSION CORD IS NECESSARY, USE ONLY A 3-WIRE CORD WITH A 3-PRONG PLUG AND A 3-SLOT RECEPTACLE, RATED FOR 110 - 120VOLTS, 15 AMP OR HIGHER.**
- **DO NOT DRAPE EXTENSION CORD OVER COUNTERTOP OR TABLE WHERE IT CAN BE PULLED ON OR TRIPPED OVER ACCIDENTALLY.**

### Free-Standing Installation

With the microwave free-standing on the countertop, it is recommended to have counter space on at least one side of the appliance. At least 2 inches of clearance must be allowed on the sides, top and at the rear of the appliance for air circulation. (See Figure 2-2)

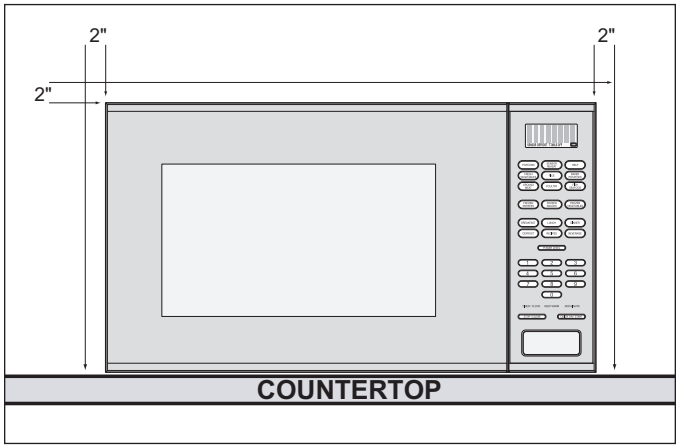



**Figure 2-2. 2” Clearance on Sides, Top & at Rear**

**Built-In Wall Installation**

The Wolf 24” microwave can be set into a built-in wall installation with the use of a 30” trim kit, available from a Wolf dealer or distributor.

The trim kit consists of a ductwork assembly, duct mounting screws, a decorative trim assembly and trim mounting screws. (See Figure 2-3)

The ductwork assembly is placed on the platform of the rough-in opening and secured with screws. The microwave oven is first plugged into the electrical receptacle, then set on top of the ductwork assembly with the feet of the oven sitting in detents on the rails. The decorative trim is then attached to the wall around the front of the microwave oven. (See Figure 2-4)

***NOTE:*** *Because of the decorative trim design, the ductwork assembly and microwave oven need to be positioned toward the right side of the rough-in opening. For complete built-in installation instructions, refer to the installation guide and the instructions that accompany the trim kit.*

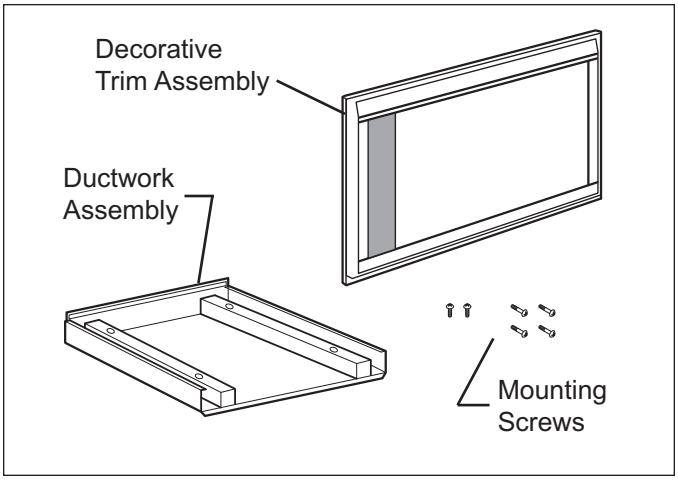



**Figure 2-3. Trim Kit Components**

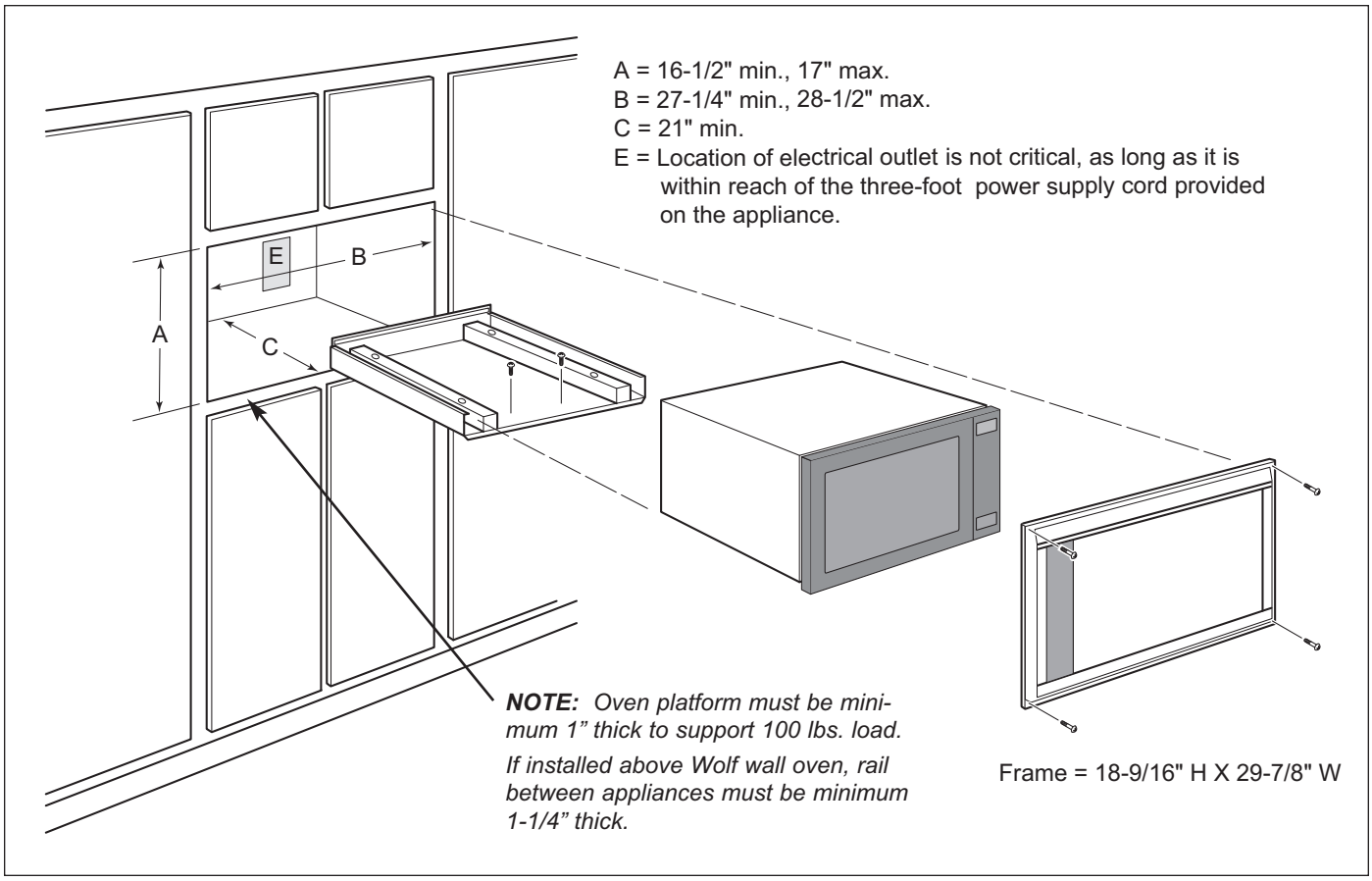



**Figure 2-4. Rough-in Opening Dimensions and Trim Kit Installation**

# SECTION 3

# THEORY OF OPERATION

## DESCRIPTION AND FUNCTION OF COMPONENTS

### Door Open Mechanism

The door is opened by pushing the open button on the control panel. When the open button is pushed, it causes the switch lever to lift up the latch heads. When the latch heads are moved upward they release from latch hook and the door opens. (See Figure 3-1)

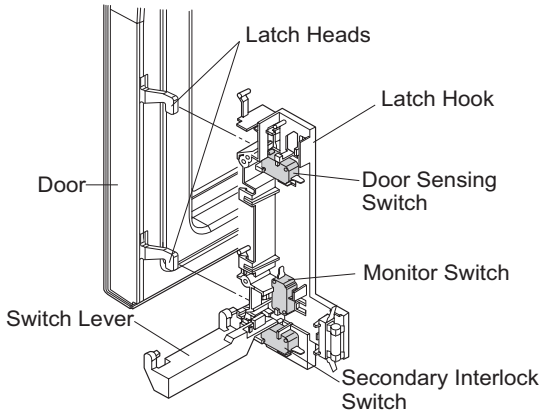



**Figure 3-1. Door Open Mechanism**

### Door Sensing and Secondary Interlock Switches

The secondary interlock switch is mounted in the lower position of the latch hook and the door sensing switch in the secondary interlock system is mounted in the upper position of the latch hook (See Figure 3-1). They are activated by the latch heads on the door. When the door is opened, the switches interrupt the power to all high voltage components. A cook cycle cannot take place until the door is firmly closed thereby activating both interlock switches. The secondary interlock system consists of the door sensing switch and secondary interlock relay located on the control circuit board.

### Monitor Switch

The monitor switch is mounted just above the secondary interlock switch on the latch hook (See Figure 3-1). 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, if the contacts of the primary interlock relay (RY-2) and secondary interlock switch fail to open when the door opens.

***Switches and Relays Interaction:***

1. When the door is opened, the monitor switch contacts close (to the ON condition) due to their being normally closed. At this time the primary interlock relay (RY-2) and secondary interlock 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 and the secondary interlock switch contacts close. (On opening the door, each of these switches operate inversely.)
3. If the door is opened, and the primary interlock relay (RY-2) and secondary interlock switch contacts fail to open, the C/T fuse blows simultaneously with closing of the monitor switch contacts.

### Cavity Temperature Fuse

The cavity temperature fuse, located on the top of the oven cavity, is designed to prevent possible fire damage to the oven. If the food load is overcooked, by either error in cook time or defect in the control unit, the 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 fuse does not reset.*

### C/T Temperature Fuse

The C/T temperature 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 temperature fuse remains closed. However, when abnormally high temperatures are reached within the magnetron, the C/T temperature 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 primary interlock relay (RY-2) and secondary interlock switch remain closed with the oven door open and when the monitor switch closes.
2. If the wire harness or electrical components are short-circuited, the C/T fuse blows to prevent an electric shock or fire hazard.

***NOTE:*** *This fuse does not reset.*

**Power Transformer**

The power transformer converts 115 volts AC to approximately 3.3 volts AC on the filament winding which heats the magnetron filament. The transformer also converts the 115 volts AC input to approximately 2300 volts AC on the high voltage winding, which is sent to the voltage doubler circuit. (See Figure 3-2)

**Voltage Doubler Circuit (Capacitor and Rectifier)**

***Capacitor*** **-** The capacitor receives approximately 2300 volts AC from the transformer, accumulates the voltage and stores it until approximately 4600 volts (two 2300 volt sine waves) are stored. The capacitor then discharges the 4600 volts in bursts to the magnetron. (See Figure 3-3)

***Rectifier*** **-** Before the capacitor receives the 4600 volts AC, the rectifier shunts the negative side of the two 2300 volt AC sine waves to ground, so the capacitor only receives the positive side of the sine waves. (See Figure 3-3)

**Magnetron**

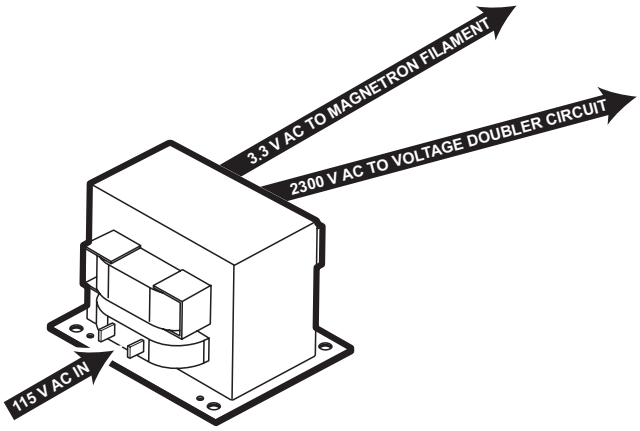



**Figure 3-2. Power Transformer**

The magnetron converts the high voltage from the voltage doubler circuit to microwave energy, then feeds the microwave energy through the waveguide, into the cavity feedbox and into the oven cavity where the food is cooked. (See Figure 3-4)

**Turntable Motor**

The turntable motor, located on the bottom of the oven cavity, rotates the turntable support and tray so that food on the tray cooks evenly. The turntable motor will turn in either direction.

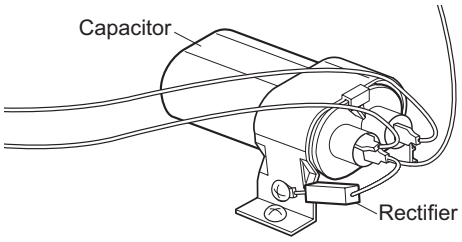



**Figure 3-3. Voltage Doubler Circuit**

**AH (Absolute Humidity) Sensor**

The AH sensor "senses" the vapor from foods cooking in the cavity. When enough steam from the food is sensed, the sensor relays the information to the microprocessor which then calculates the remaining cooking time and power level needed for best results. In this mode, food is cooked without figuring time, power level or quantity.

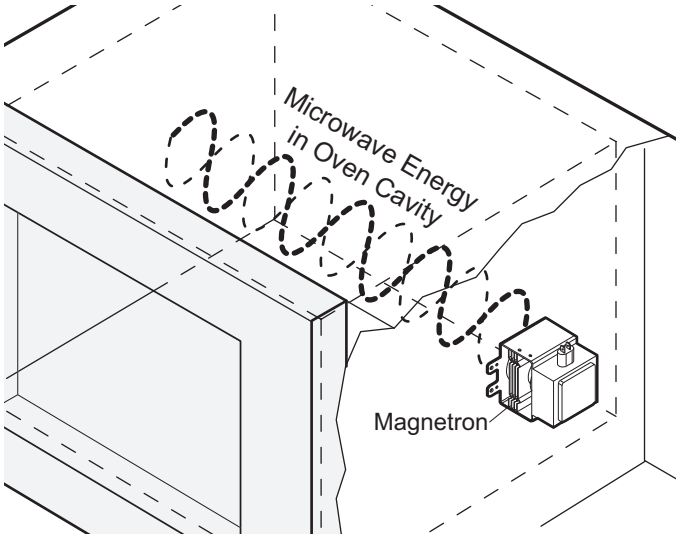



**Figure 3-4. Magnetron**

**Touch Control Panel Assembly**

The touch control section consists of the following units:

1. *Key Unit*
2. *Control Unit (Control Unit consists of:)*
   a. *Power Unit*
   b. *LSI (Large Scale Integration circuit) Unit.*

The principal functions of these units and the signals communicated among them are explained below.

*Key Unit*

The key unit is composed of a matrix. Signals generated in the LSI are sent to the key unit through P00-P07.

When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through P14, P15, P16, P17, AIN6 and AIN7 to perform the function that was requested.

*Control Unit*

Control unit consists of LSI, ACL circuit, indicator circuit, power source circuit, relay circuit, buzzer circuit, synchronizing signal circuit, absolute humidity sensor circuit and back light circuit.

1. *ACL*

   This circuit generates a signal which resets the LSI to the initial state when power is supplied.

2. *Indicator Circuit*

   This circuit consists of 40 segments and 16 common electrodes using a Liquid Crystal Display.

3. *Power Source Circuit*

   This circuit generates voltages necessary in the control unit from the AC line voltage.

   In addition, the synchronizing signal is available in order to compose a basic standard time in the clock circuit.

| Symbol | Voltage | Application |
|---|---|---|
| VC | -5V | LSI(IC1) |

4. *Relay Circuit*

   A circuit to drive the magnetron, fan motor, turntable motor and light the oven lamp.

5. *Buzzer Circuit*

   The buzzer is responsive to signals from the LSI to emit audible sounds (key touch sound and completion sound).

6. *Synchronizing Signal Circuit*

   The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit.

   It accompanies a very small error because it works on commercial frequency.

7. *Door Sensing Switch*

   A switch to “tell” the LSI if the door is open or closed.

8. *Back Light Circuit*

   A circuit to drive the back light (Light Emitting Diodes LD10- LD15).

9. *Absolute Humidity Sensor Circuit*

   This circuit detects moisture of the cooking food to allow its automatic cooking.

## SIMPLE THEORY OF OPERATION

The simple definition of microwave energy in a microwave oven is: A high-frequency electromagnetic wave that penetrates food (approximately 1”), causing the food’s water and fat molecules to vibrate very rapidly which generates heat within the food to cook it in a very short time. A Wolf microwave oven uses mechanical components and electrical circuits in various combinations to produce and control the output of microwave energy. The electromechanical system of the microwave oven consists of two fundamental sections, the Control Section and the High-Voltage Section.

### The Control Section

The control section consists of electrical fuses, interlock switches, an electronic control board, an electronic control panel and a power output control system.

With the microwave oven plugged in and switched on, 115V AC from the house electrical supply travels through the power cord, a series of fuses, the electronic control board circuitry and the interlock switches (if the door is closed). (See Figure 3-5)

If the door is open, power will not flow through the interlock switches, preventing the units operation. If the interlock relay on the control board or one of the interlock switches is bad, the oven will be deactivated. In the event of an electrical short or overheating condition, one or more of the fuses will open and deactivate the oven.

If the door is closed and all components in the control section are operating correctly, the cooling fan will function, the turntable motor will spin the tray *(not shown)* and 115V AC from the control board will be supplied to the primary winding of the power transformer (See Figure 3-6). The voltage to the transformer is applied at an adjustable on/off time ratio (X time on / X time off), governed by the power level input setting at the control panel. *(This means higher power level settings = longer time on / shorter time off, conversely lower power level settings = shorter time on / longer time off.)*

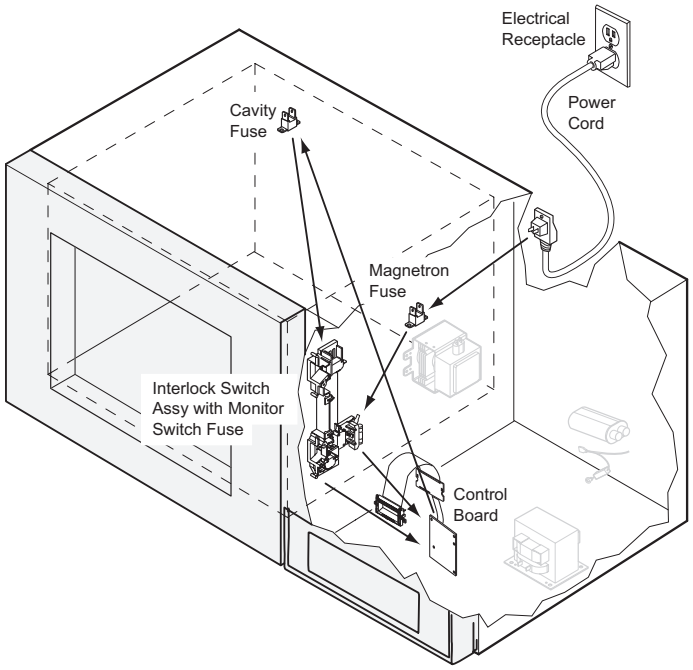



**Figure 3-5. Control Section**

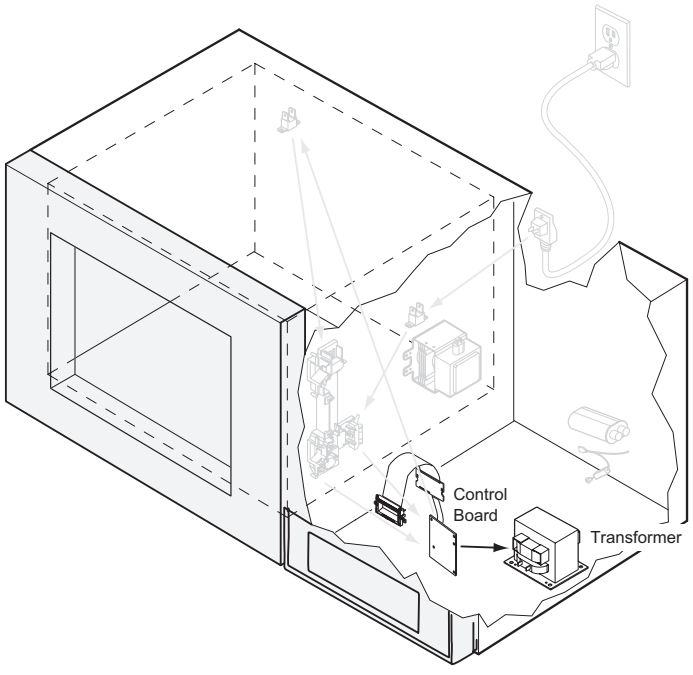



**Figure 3-6. Control Section**

**The High Voltage Section**

The high voltage section consists of the power transformer, doubler circuit and the magnetron.

If the control section is operating properly and supplying 115V AC to the power transformer, the transformer will convert the 115V AC to approximately 2300V AC. The 2300V AC is then supplied to the doubler circuit (high voltage capacitor and rectifier) (See Figure 3-7), where the the capacitor effectively doubles the voltage and the rectifier shunts the negative side of the AC voltage to ground. The 4600 Volts are then supplied by the capacitor to the magnetron in bursts (See Figure 3-8). The magnetron converts the high voltage to microwave energy. These microwaves are channeled through the waveguide on the magnetron into the oven cavity where they bounce off of the walls (See Figure 3-9). As stated before, the microwaves travel through the food in the oven causing the food's water and fat molecules to vibrate very rapidly which generates heat within the food to cook it in a very short time.

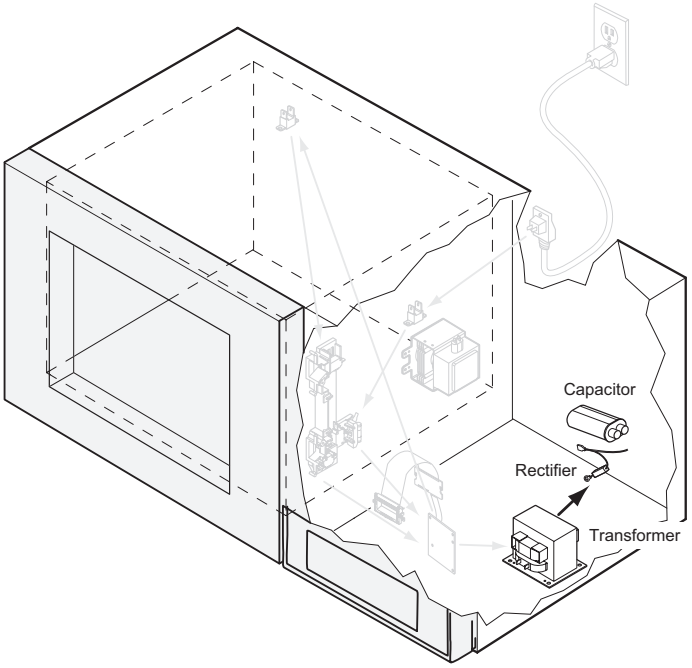



**Figure 3-7. High Voltage Section**

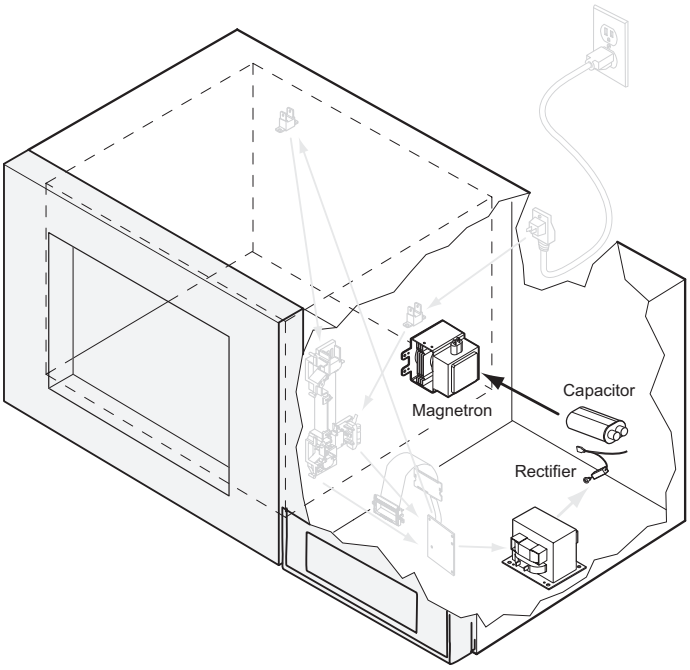



**Figure 3-8. High Voltage Section**

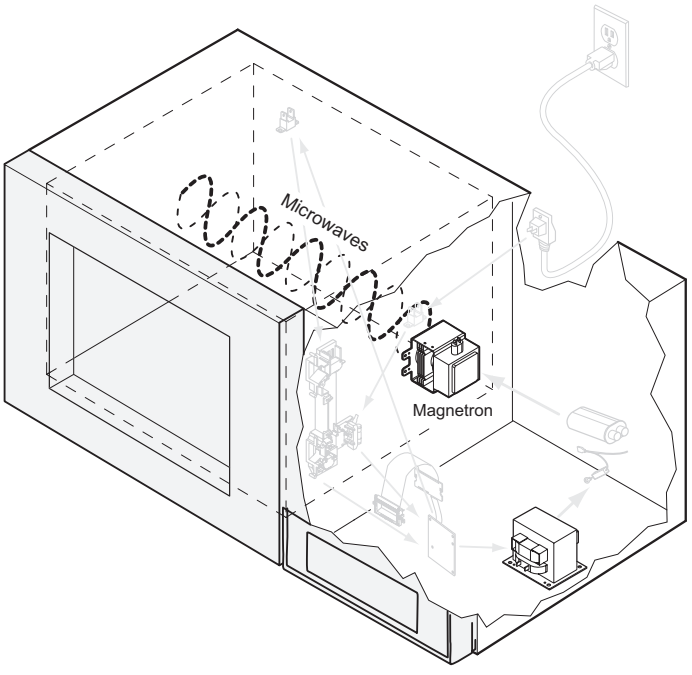



**Figure 3-9. Microwaves Enter Cavity**

## DETAILED OPERATING SEQUENCE

The Simple Theory of Operation on the previous pages explains the basics of how a Wolf microwave oven works. This Detailed Operating Sequence explains the component functions in greater detail 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 the oven is plugged in, 115 volts AC are supplied to the control unit (See Figure 3-10) and the following occurs:

1. The display will show flashing"WELCOME, PRESS CLEAR"

   ***NOTE:*** *To set any program or set the clock, the STOP/CLEAR pad must be touched first. The display will clear, and " : " will appear.*

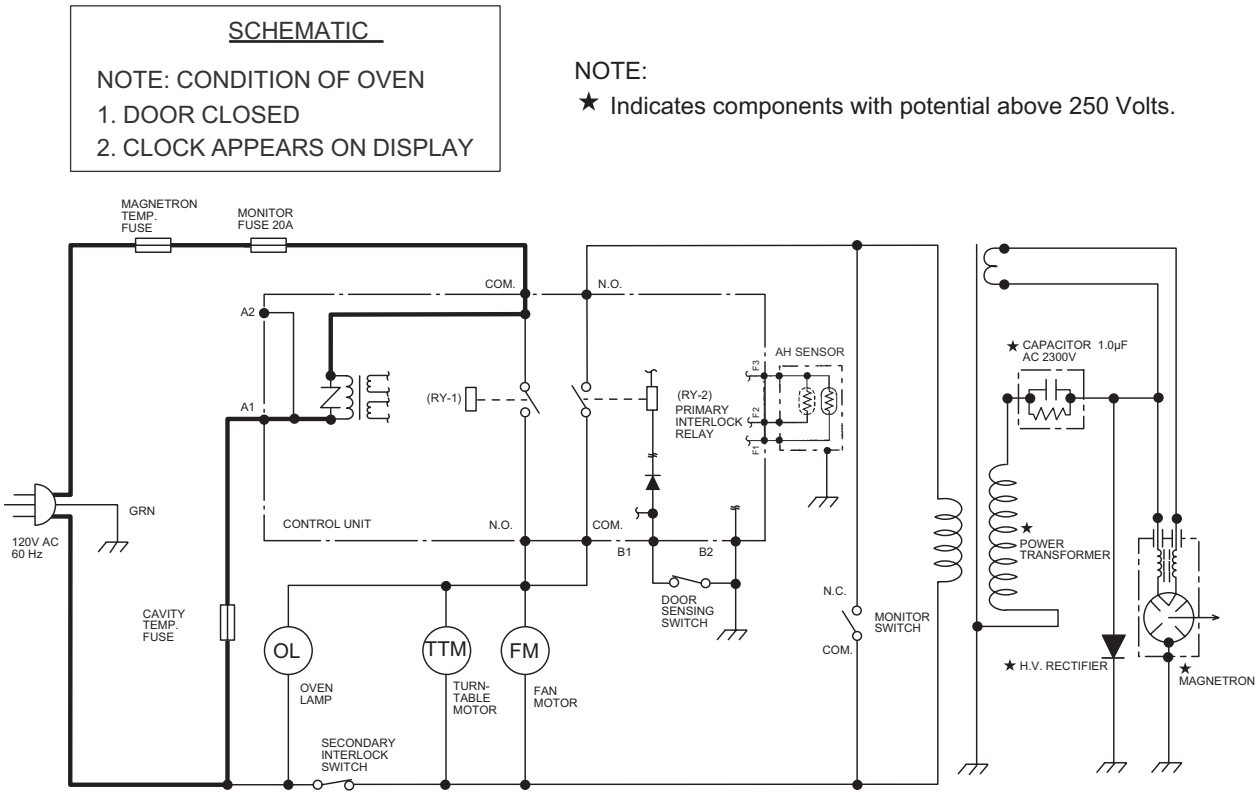



**Figure 3-10. Oven Schematic, Off Condition**

### 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 are turned on as follows (For details, see Figure 3-11):

| RELAY | CONNECTED COMPONENTS |
|---|---|
| RY-1 | Oven Lamp / Turntable Motor / Fan Motor |
| RY-2 | Power Transformer |

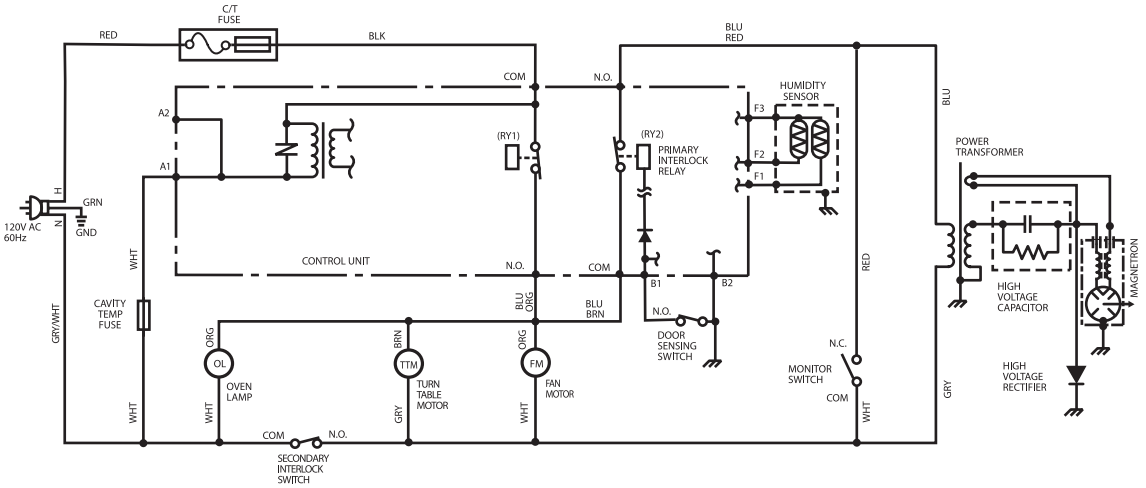
2. 115 volts AC is supplied to the primary winding of the power transformer and is converted to approximately 3.3 volts AC output on the filament winding, and approximately 2300 volts AC on the high voltage winding.

3. The filament winding voltage heats the magnetron filament and the voltage from the high voltage winding is sent to a voltage doubler circuit.
4. The microwave energy produced by the magnetron is channeled through the waveguide into the cavity feed-box, 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 switched off, and the generation of microwave energy is stopped. The oven then reverts to the OFF condition.
6. When the door is opened during a cook cycle, the monitor switch, door sensing switch, secondary interlock switch, relay (RY-1) and primary 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 interlock switch and secondary interlock relay and is mechanically associated with the door so that it will function in the following sequence.
   a. When the door opens from the closed position, the secondary interlock relay (RY-2) and primary interlock switch open their contacts. Contacts of the relay (RY-1) remains closed. Then, the monitor switch contacts close.
   b. When the door is closed from the open position, the monitor switch contacts open first. Then the contacts of the primary interlock switch and door sensing switch close. And contacts of the relay (RY-1) open.

   If the primary interlock switch and secondary interlock relay (RY-2) 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 (RY-2), causing the C/T fuse to blow.

SCHEMATIC

NOTE: CONDITION OF OVEN
1. DOOR CLOSED
2. COOKING TIME PROGRAMMED
3. VARIABLE COOKING CONTROL "HIGH"
4. "START" PAD TOUCHED




Notes
1. Circuits subject to change without notice.
2. Terminal with projection or opposite blue mark on lamp socket must be connected to neutral wire.
3. Only certain models use the absolute humidity sensor.
4. Power transformer top (finish lead) terminal must be connected to the hot (BLU) wire.

**Figure 3-11. Oven Schematic, Cooking Condition**

**Power Level Cooking, P-0 (0%) to P-HI (100%)**

When Variable Cooking Power is programmed, the 115 volts AC 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 (P-HI) - 100% Power | 32 sec. | 0 sec. |
| Power 9 (P-9) - 90% Power | 30 sec. | 2 sec. |
| Power 8 (P-8) - 80% Power | 26 sec. | 6 sec. |
| Power 7 (P-7) - 70% Power | 24 sec. | 8 sec. |
| Power 6 (P-6) - 60% Power | 22 sec. | 10 sec. |
| Power 5 (P-5) - 50% Power | 18 sec. | 14 sec. |
| Power 4 (P-4) - 40% Power | 16 sec. | 16 sec. |
| Power 3 (P-3) - 30% Power | 12 sec. | 20 sec. |
| Power 2 (P-2) - 20% Power | 8 sec. | 24 sec. |
| Power 1 (P-1) - 10% Power | 6 sec. | 26 sec. |
| Power 0 (P-0) - 0% Power | 0 sec. | 32 sec. |

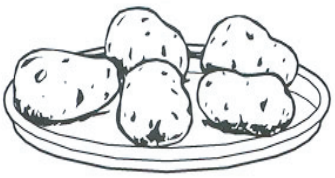
***NOTE:*** *The ON/OFF time ratio does not correspond with the percentage of microwave power, because approximately 2 seconds are needed for heating of the magnetron filament.*

**Sensor Cooking Condition**

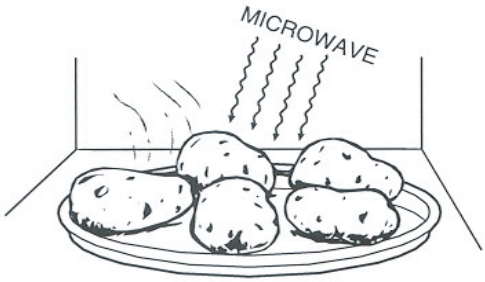
When using the SENSOR function, food is cooked without figuring time, power level or quantity. When the oven senses enough steam from the food, it relays the information to its microprocessor which will calculate the remaining cooking time and power level needed for best results. When the food is cooked, water vapor is developed, the sensor "senses" the vapor and its resistance increase gradually. When the resistance reaches the value set according to the menu, supplementary cooking is started.

The time of supplementary cooking was determined by experiment with each food category and inputted into the LSI (Large Scale Integration circuit).

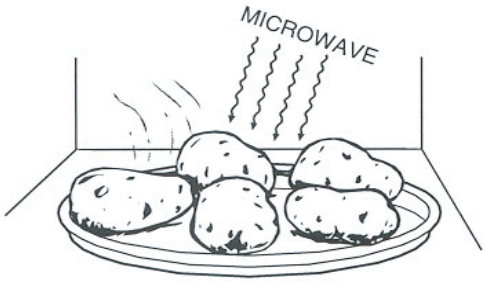
***Example of how sensor cooking works (Potatoes):***



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




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




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

***Sensor cooking sequence***

1. Touch one of the SENSOR pads.

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

2. The coil of shut-off relay (RY-1) is energized and the turntable motor oven lamp and cooling fan are turned on, but power transformer is not turned on.
3. After about 16 seconds, the cook relay (RY-2) is energized. The power transformer is turned on, microwave energy is produced and first stage is started. The initial 16 seconds is the cooling time required to remove any vapor from the oven cavity and sensor.

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

4. When the sensor detects vapor being emitted from the food, the display switches over to the remaining cooking time and the timer counts down to zero.

   ***NOTE:*** *At this time, the door may be opened to stir, turn or season food.*

5. When the timer reaches zero, an audible signal sounds. The shut-off relay and cook relay are de-energized and the power transformer, oven lamp, etc. are turned off.

## ABSOLUTE HUMIDITY SENSOR CIRCUIT

### Structure of AH Sensor

The absolute humidity sensor includes two thermistors (See Figure 3-12). One thermistor is housed in the closed vessel filled with dry air, while the other in the open vessel. Each sensor is provided with a protective metal mesh cover to protect it from external airflow.

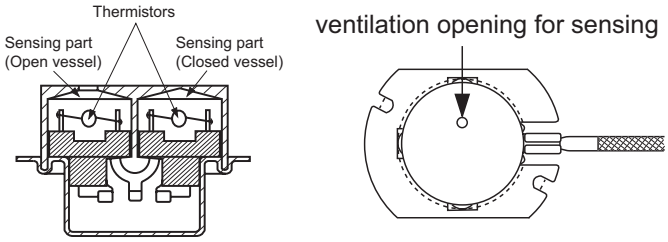



**Figure 3-12. AH (Absolute Humidity) Sensor**

### AH Sensor Operational Principle

Figure 3-13 below shows the basic structure of an absolute humidity sensor. A bridge circuit is formed by two thermistors and two resistors (R1 and R2). The output of the bridge circuit is amplified by the operational amplifier.

Each thermistor is supplied with a current to keep it heated at about 302°F (150°C). The resulting heat is dissipated in the air. If the two thermistors are placed in differing degrees of heat conductivity, leading to a potential difference between them, an output voltage from the bridge rectifier is caused, the intensity of which will increase as the absolute humidity of the air increases. Since the output is very minute, it is amplified by the operational amplifier.

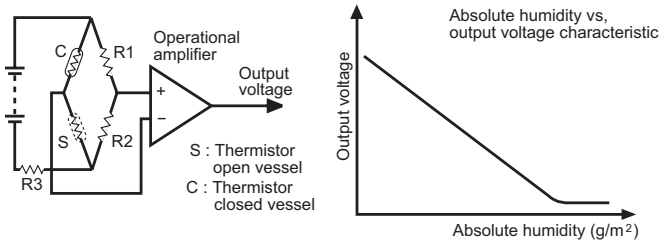



**Figure 3-13. AH Sensor Basic Structure**

### Detector Circuit of AH Sensor Circuit

The detector circuit detects the output voltage of the absolute humidity circuit, which allows the LSI to control sensor cooking. When the unit is set to sensor cooking mode, a 16 second clearing cycle occurs, then the detector circuit begins to function and the LSI observes the initial voltage available at its AN1 terminal.

With this voltage given, switches SW1 to SW5 in the LSI are turned on in such a way that it changes the resistance values in parallel with R107 ~ R111 of IC2. Changing the resistance value creates the same potential at both the F-3 terminal of the absolute humidity sensor and the AN0 terminal of the LSI. The voltage of the AN1 terminal will indicate about -2.50 V for about 16 seconds. This initial balancing is set up about 16 seconds after the unit is put into sensor cooking mode. As the sensor cooking proceeds, the food is heated, generating moisture causing the resistance balance of the bridge circuit to deviate and increase the voltage available at the AN1 terminal of the LSI.

The LSI then observes the voltage at the AN1 terminal and compares it with its initial value. 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 into the next operation automatically. If the LSI begins detecting the initial voltage at the AN1 terminal, 16 seconds after sensor cooking mode is initiated, but 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.

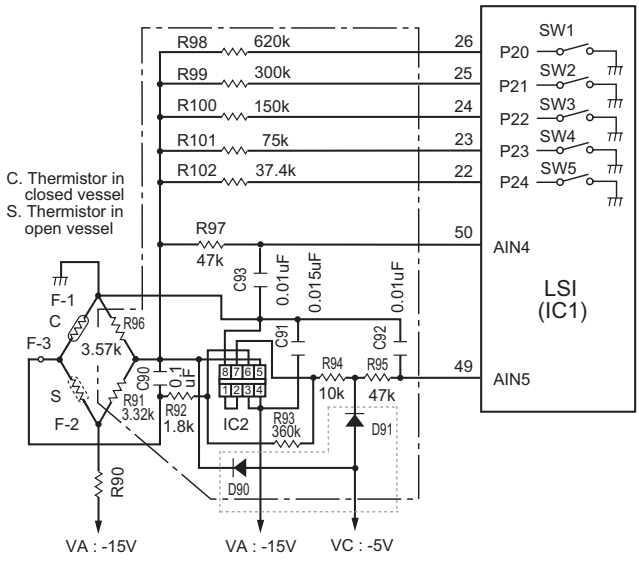



**Figure 3-14. AH Sensor Circuit**

## MODES OF OPERATION AND FEATURES

This portion of the manual explains the input key strokes performed at the touch control panel in order to begin, use and end different modes of operation and to enable specific features of the Wolf MW24 microwave oven. For more detailed information on any of the following articles, refer to the complete Microwave Oven Use and Care Guide, supplied with the unit.

### Start-up Mode

When power is initially supplied to the unit, "*WELCOME - PRESS CLEAR - AND - PRESS CLOCK*" will flash on the digital display (See Figure 3-15). At this time, press the STOP/CLEAR key and " **:** " will appear on the display (See Figure 3-16). The unit is now ready for use and the first input operation suggested is setting the clock.

***NOTE:*** *If power to the microwave oven is interrupted, the unit will automatically enter Start-up Mode.*

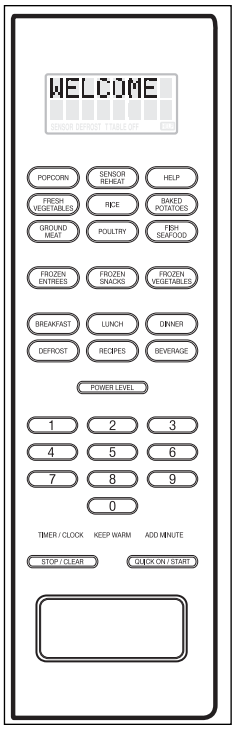



**Figure 3-15. Start-up Mode Initiated When Unit Plugged In**

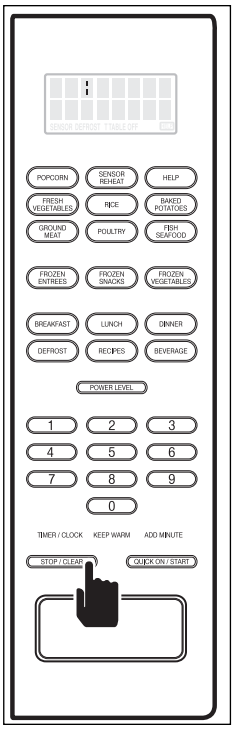


**Figure 3-16. Press STOP/CLEAR key to end Start-up Mode**

### Clock Set Mode

To set the correct time on the clock, follow the steps below:

1. Press the TIMER/CLOCK key and "*TO SET - KITCHEN TIMER - PRESS 1 - TO SET CLOCK - PRESS 2*" will flash on the digital display (See Figure 3-17).
2. Press the number 2 key and "*ENTER - TIME OF DAY*" will flash on the digital display (See Figure 3-18).
3. Enter the time of day by pressing the numbers in sequence. For example: If setting the time of 1:30, press the number 1 key, then the number 3 key, then the number 0 key and the display will flash "*1:30 - PRESS CLOCK*" (See Figure 3-19).

   ***NOTE:*** *It is not possible to designate AM or PM.*
4. After the correct time of day is entered, press the TIMER/CLOCK key again to exit Clock Set Mode (See Figure 3-20).

***NOTE:*** *If a mistake is made while setting the correct time, press the STOP/CLEAR key to start over.*

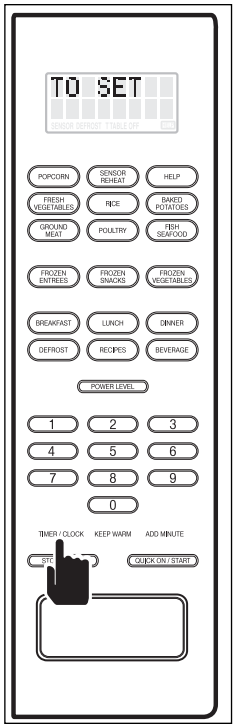



**Figure 3-17. Press Time/Clock Key**

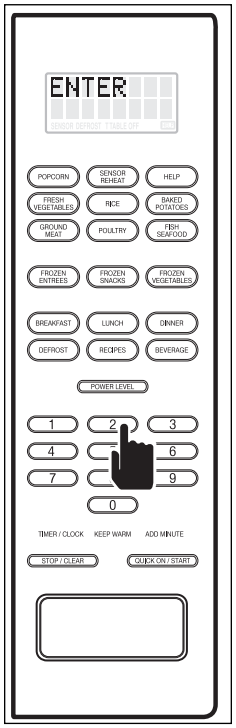



**Figure 3-18. Press Number 2 Key**

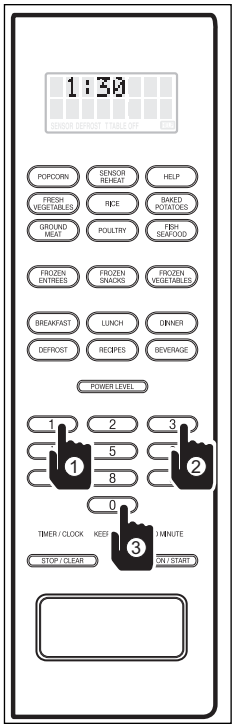



**Figure 3-19. Enter Time of Day**

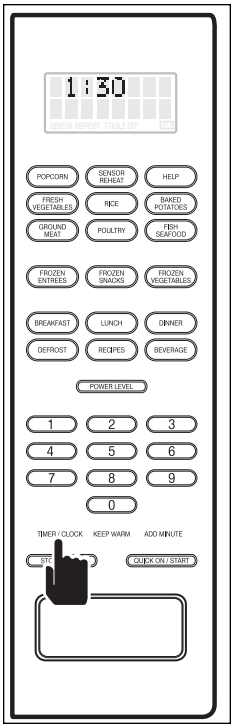



**Figure 3-20. Press Time/Clock Key**

**Clock ON/OFF Feature**

After the time of day is set, it may be desired to switch the clock display off. To do this, follow the steps below:

1. Press the HELP key and five help features will flash on the display, the fifth one will read "*CLOCK DISPLAY - ON OR OFF - PRESS 5*" (See Figure 3-21).
2 Press the number 5 key and "*TO TURN OFF - CLOCK DISPLAY - PRESS CLEAR*" will flash on the digital display (See Figure 3-22).
3. Press the STOP/CLEAR key and the display will go blank. (See Figure 3-23).

***NOTE:*** *If it is desired to redisplay the time of day, repeat steps 1 and 2 above, but for step 3, press the QUICK ON/START key.*

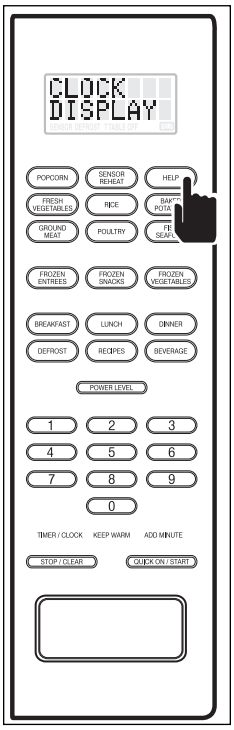



**Figure 3-21. Press HELP Key**

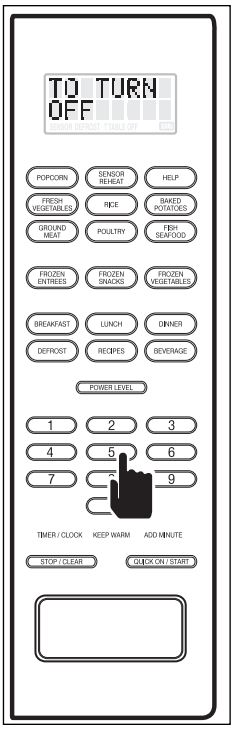



**Figure 3-22. Press Number 5 Key**

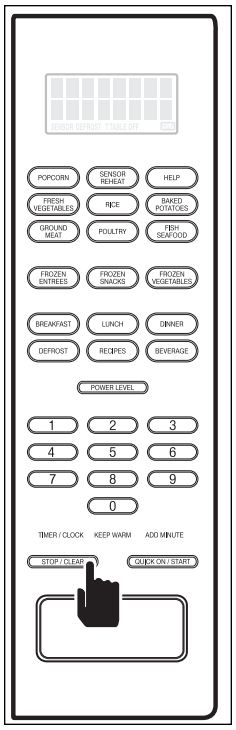


**Figure 3-23. Press STOP/CLEAR Key**

**Timer/Clock Mode**

If it is desired to time some event, it can be done with the clock on the microwave oven, without energizing the oven. One example would be: timing the boil of an egg on the stove. To start the Timer/Clock Mode, follow the steps below:

1. Press the TIMER/CLOCK key and "*TO SET - KITCHEN TIMER - PRESS 1 - TO SET CLOCK - PRESS 2*" will flash on the digital display (See Figure 3-24).
2 Press the number 1 key and "*ENTER TIME*" will appear on the digital display (See Figure 3-25).
3. Enter amount of time for the timer to countdown. For example: 3 minutes; press the number 3 key, then the number 0 key twice and the display will flash *"3.00 TIMER - PRESS TIMER"* (See Figure 3-26).
4. After the amount of time is entered, press the TIMER/CLOCK key to begin the timer countdown (See Figure 3-27). At the end of the countdown, the display will show "*TIMER IS FINISHED*" and the alarm will beep. Push the STOP/CLEAR key to return to normal operation.

***NOTE:*** *To end the timer before the countdown time has elapsed, press the STOP/CLEAR key.*

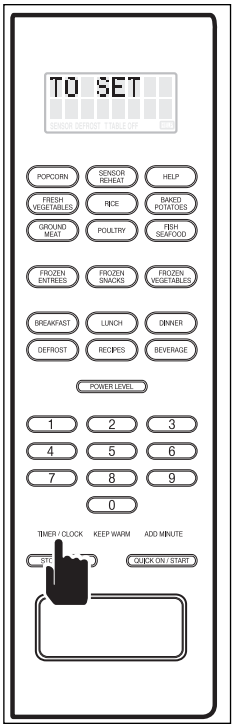



**Figure 3-24. Press Time/Clock Key**

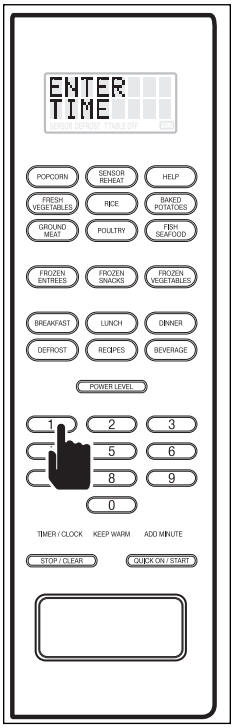



**Figure 3-25. Press Number 1 Key**

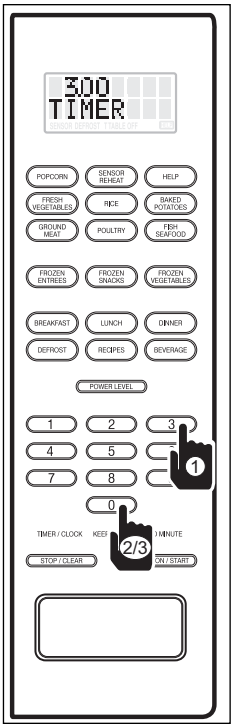



**Figure 3-26. Enter Time Amount**

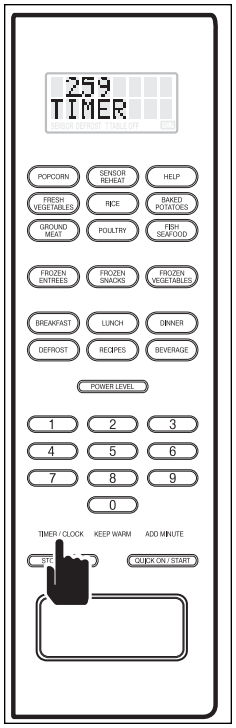



**Figure 3-27. To Start, Press Time/Clock Key**

**Manual Time Cook Mode**

The microwave oven can be programmed for up to 99 minutes and 99 seconds of cooking time, at various power levels. *(To explain basic Manual Time Cook Mode, the power level will not be adjusted in this example.)* To initiate Time Cook Mode, follow the steps below:

1. Enter desired cooking time duration. For example: 4 minutes; press the number 4 key, then the number 0 key twice (See Figure 3-28), and the display will flash "4.00 - PRESS START - OR PRESS - POWER LEVEL".
2. Press the QUICK ON/START key to begin cooking for the time amount entered. The oven will energize and the display will show the time as it counts down. (See Figure 3-29) At the end of the cooking time, "END" will flash on the display and the alarm will beep.

***NOTE:*** *To stop the cooking process before the countdown time has elapsed, press the STOP/CLEAR key, or open the door. If the cooking process is interrupted, the countdown will remain on the display until cooking is resumed or the STOP/CLEAR key is pressed.*

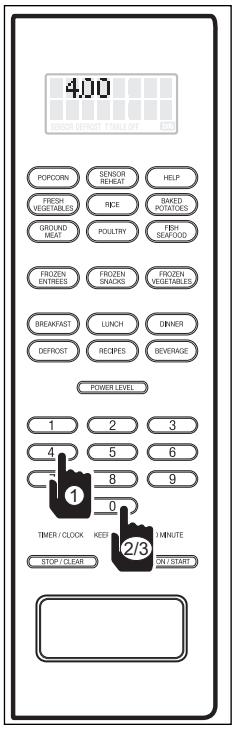



**Figure 3-28. Enter Amount of Cooking Time**

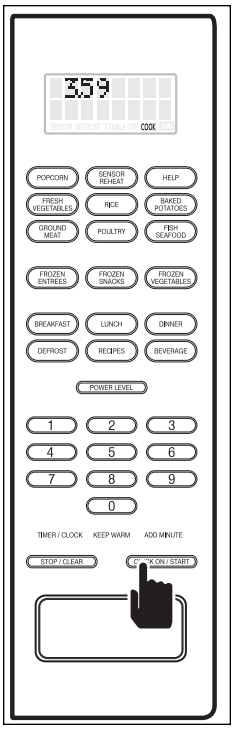



**Figure 3-29. Press QUICK ON/START Key**

**Power Level Setting Feature**

Without making any power level adjustments, the microwave oven will operate at 100% power. Power level adjustments would be performed if a recipe calls for a lower power level or if manually defrosting foods.

To cook at a lower power level, follow the steps below:

1. Enter desired cooking or defrost time duration. For example: 4 minutes; press the number 4 key, then the number 0 key twice (See Figure 3-30), and the display will flash "4.00 - PRESS START - OR PRESS - POWER LEVEL".
2. Press the POWER LEVEL key in multiple key strokes until the desired power level is shown on the display *(in this example, four key strokes for 70% power)* (See Figure 3-31). After the last POWER LEVEL key stroke, the display will flash "70 PERCENT - PRESS START".
   ***NOTE:*** *Also see Power Level Table on following page.*
3. Press the QUICK ON/START key to begin cooking at the power level chosen. The oven will energize and the display will show the time as it counts down. (See Figure 3-32) At the end of the cooking time, "END" will flash on the display and the alarm will beep.

***NOTE:*** *To stop the cooking process before the countdown time has elapsed, press the STOP/CLEAR key, or open the door. If the cooking process is interrupted, the countdown will remain on the display until cooking is resumed or the STOP/CLEAR key is pressed.*

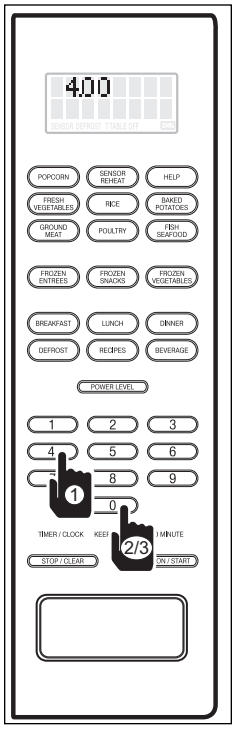



**Figure 3-30. Enter Amount of Cooking Time**

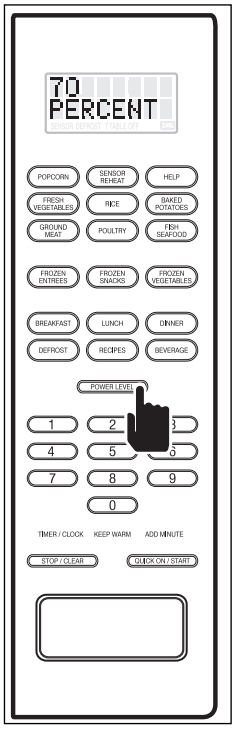



**Figure 3-31. Press POWER LEVEL Key in Multiple Strokes**

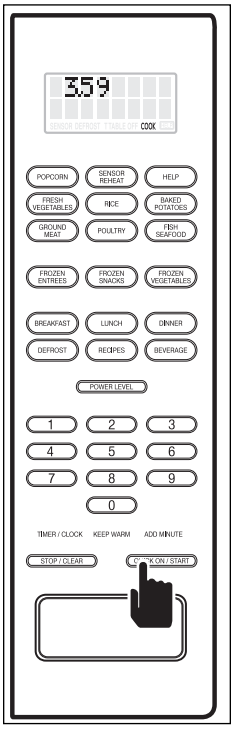



**Figure 3-32. Press QUICK ON/START Key**

| Power Level Table | | |
|---|---|---|
| **Touch POWER LEVEL Key Number of Times Indicated for Desired Power Level** | **Percent of Microwave Power** | **Common Term for Power Levels** |
| POWER LEVEL Key X 1 | 100% | High |
| POWER LEVEL Key X 2 | 90% | |
| POWER LEVEL Key X 3 | 80% | |
| POWER LEVEL Key X 4 | 70% | Medium High |
| POWER LEVEL Key X 5 | 60% | |
| POWER LEVEL Key X 6 | 50% | Medium |
| POWER LEVEL Key X 7 | 40% | |
| POWER LEVEL Key X 8 | 30% | Medium Low / Defrost |
| POWER LEVEL Key X 9 | 20% | |
| POWER LEVEL Key X 10 | 10% | Low |
| POWER LEVEL Key X 11 | 0% | |

**Add Minute Feature**

The Add Minute Feature works two ways.

- If the microwave oven is off and the ADD MINUTE key is pressed, the microwave oven will automatically switch to Time Cook Mode at 100% power for one minute (See Figure 3-33). At the end of the cooking time, "*END*" will flash on the display and the alarm will beep.
- If the microwave is already running in Time Cook Mode or Defrost Mode and the ADD MINUTE key is pressed, one minute will be added to the cooking time for every key stroke of the ADD MINUTE key (See Figure 3-34). At the end of the cooking time, "*END*" will flash on the display and the alarm will beep.

***NOTE:*** *To stop the cooking process before the countdown time has elapsed, press the STOP/CLEAR key, or open the door. If the cooking process is interrupted, the countdown will remain on the display until cooking is resumed or the STOP/CLEAR key is pressed.*

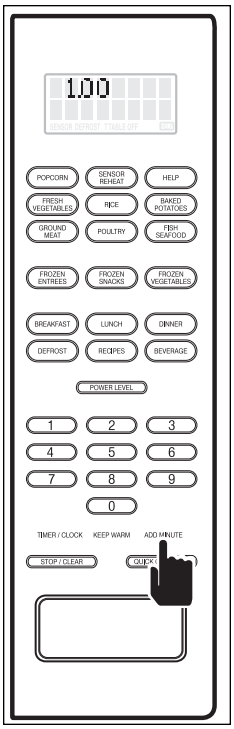



**Figure 3-33. Press ADD MINUTE Key to Start Cooking**

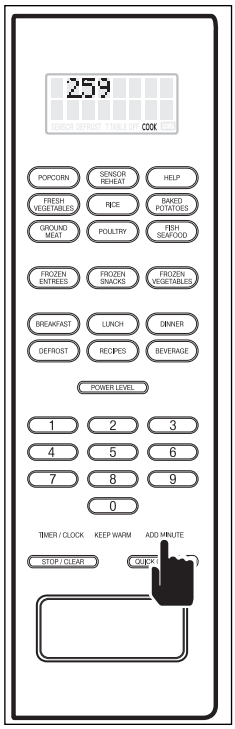



**Figure 3-34. Press ADD MINUTE Key to Extend Cooking Time**

**Quick ON Mode**

If the microwave oven is off and the QUICK ON/START key is pushed and held, the microwave oven will automatically switch on at 100% power and the display will flash a one-second count, starting with "*1*" (See Figure 3-35). Cooking will stop and the word "*END*" will flash on the display as soon as the QUICK ON/START key is released. This can be done for a maximum of three minutes.

**Manual Defrost Mode**

Manual Defrost Mode uses the same key strokes as the power level setting feature, except that 30% power is suggested for defrosting most foods. To initiate Manual Defrost Mode, follow the steps below:

1. Enter desired defrost time duration. For example: 4 minutes; press the number 4 key, then the number 0 key twice (See Figure 3-36), and the display will flash "*4.00 - PRESS START - OR PRESS - POWER LEVEL*".
2. Press the POWER LEVEL key eight times, until the display shows *"30 PERCENT"* (See Figure 3-37).
3. Press the QUICK ON/START key to begin defrosting. The oven will energize at 30% and the display will show the time as it counts down (See Figure 3-38). At the end of the defrost time, "*END*" will flash on the display and the alarm will beep.

***NOTE:*** *To stop the defrosting process before the countdown time has elapsed, press the STOP/CLEAR key, or open the door. If the defrosting process is interrupted, the countdown will remain on the display until defrosting is resumed or the STOP/CLEAR key is pressed.*

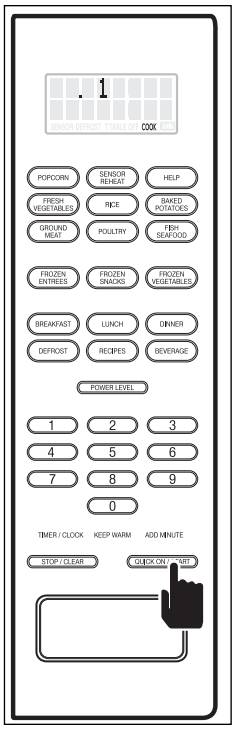



**Figure 3-35. Press and Hold QUICK ON/START Key**

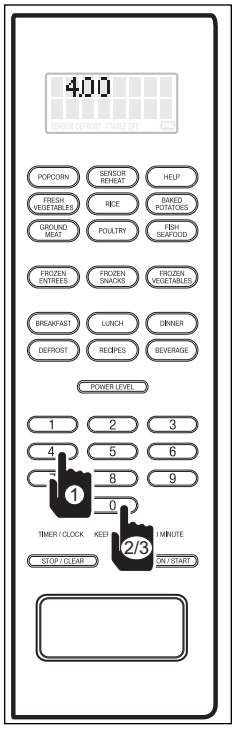



**Figure 3-36. Enter Amount of Defrost Time**

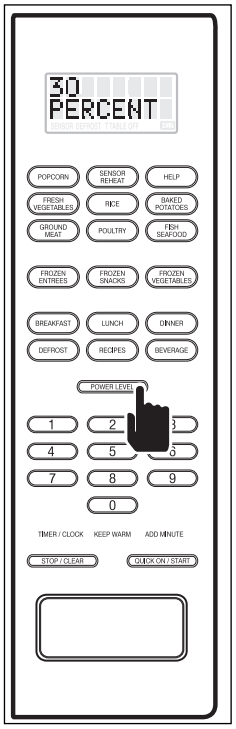



**Figure 3-37. Press POWER LEVEL Key Eight Times**

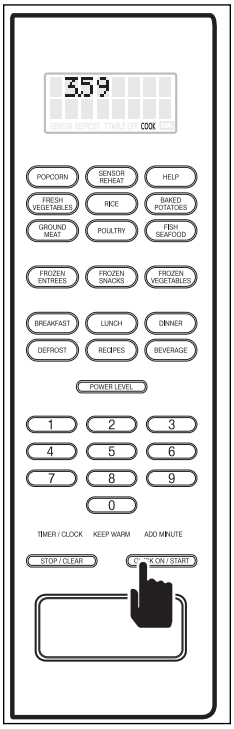



**Figure 3-38. Press QUICK ON/START Key**

**Keep Warm Mode**

Keep Warm Mode allows food to be kept warm up to 30 minutes. To initiate Keep Warm Mode, follow the steps below:

1. Press the KEEP WARM key and "ENTER TIME" will appear on the display (See Figure 3-39).
2. Enter desired keep warm time duration. For example: 13 minutes; press the number 1 key, then the number 3 key, then the number 0 key twice (See Figure 3-40), and the display will flash "PRESS START - 13.00".
3. Press the QUICK ON/START key to begin the Keep Warm Mode. The oven will energize and the display will flash the time as it counts down along with "KEEP WARM" (See Figure 3-41). At the end of Keep Warm Mode, "END" will flash on the display and the alarm will beep.

***NOTE:*** *To interrupt Keep Warm Mode before the countdown time has elapsed, press the STOP/CLEAR key, or open the door. If the keep warm process is interrupted, the countdown will remain on the display until Keep Warm Mode is resumed or the STOP/CLEAR key is pressed.*

***NOTE:*** *If more then 30 minutes are entered in Keep Warm Mode, the display will flash "TOO MANY MINUTES - ENTER TIME - UP TO - 30 MINUTES" until fewer minutes are entered or the STOP/CLEAR key is pressed.*

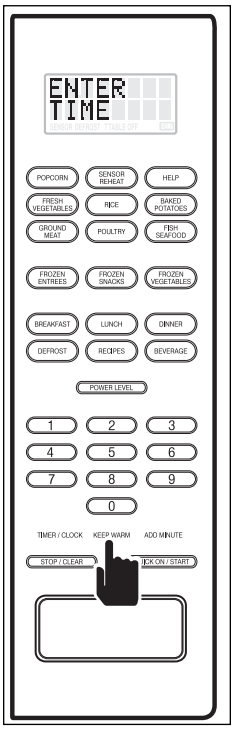



**Figure 3-39. Press KEEP WARM Key**

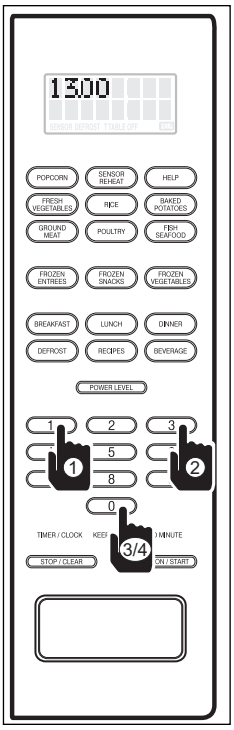



**Figure 3-40. Enter Amount of Keep Warm Time**

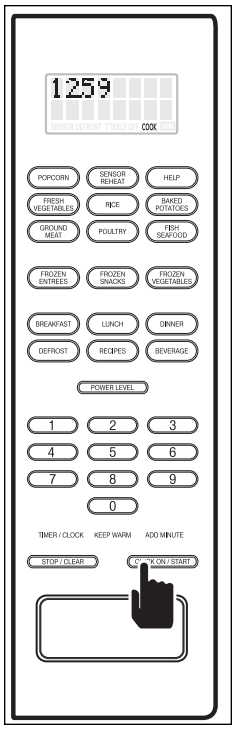



**Figure 3-41. Press QUICK ON/START Key**

**Multiple Sequence Feature**

The Multiple Sequence Feature allows up to four different time and power level adjustments to occur in a programmed sequence. For example, it's possible to defrost, cook and keep food warm without having to reprogram the microwave for each feature.

To program the Multiple Sequence Feature, follow the steps below *(For this example, the sequence of defrost, cook and keep food warm is used)*:

1. Enter desired defrost time duration. For example: 4 minutes; press the number 4 key, then the number 0 key twice (See Figure 3-42), and the display will flash "4.00 - PRESS START - OR PRESS - POWER LEVEL".
2. Press the POWER LEVEL key eight times, until the display shows "30 PERCENT " (See Figure 3-43).
3. Enter desired cooking time duration. For example: 6 minutes; press the number 6 key, then the number 0 key twice (See Figure 3-44), and the display will flash "6.00 - PRESS START - OR PRESS - POWER LEVEL".
4. Press the POWER LEVEL key once, until the display shows "1HIGH POWER" (See Figure 3-45).
5. Press the KEEP WARM key and "ENTER TIME" will appear on the display (See Figure 3-46).
6. Enter desired keep warm time duration. For example: 30 minutes; press the number 3 key, then the number 0 key three times (See Figure 3-47), and the display will flash "PRESS START - .30.00".
7. Press the QUICK ON/START key to begin. The oven will energize, the display will show the countdown, starting with first input (See Figure 3-48), and the control will automatically switch from one time and power level to the next. At the end of Multiple Sequence Feature, "END " will flash on the display and the alarm will beep.

***NOTE:*** *To stop the cooking process before countdown time has elapsed, press STOP/CLEAR key, or open door. If the cooking process is interrupted, the countdown will remain on the display until cooking is resumed or the STOP/CLEAR key is pressed.*

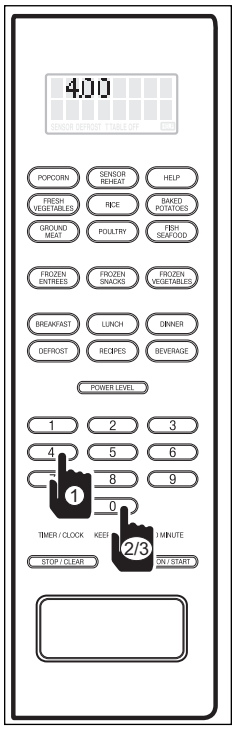



**Figure 3-42. Enter Amount of Defrost Time**

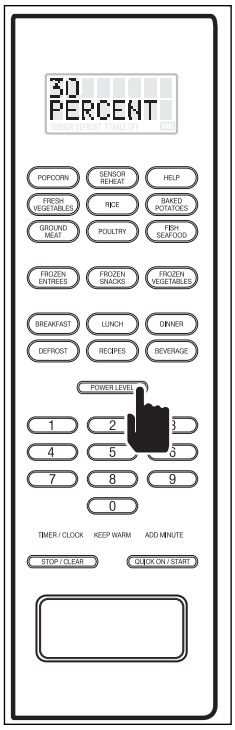



**Figure 3-43. Press POWER LEVEL Key Eight Times**

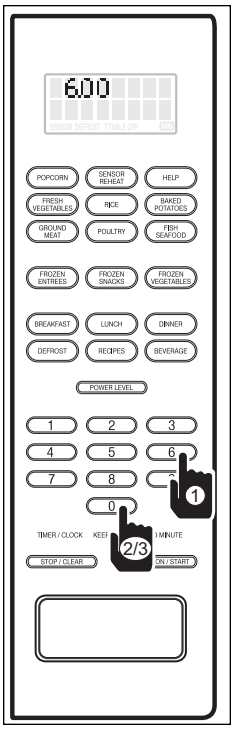



**Figure 3-44. Enter Amount of Cooking Time**

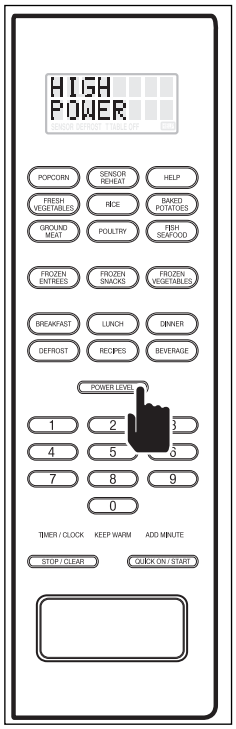



**Figure 3-45. Press POWER LEVEL Key One Time**

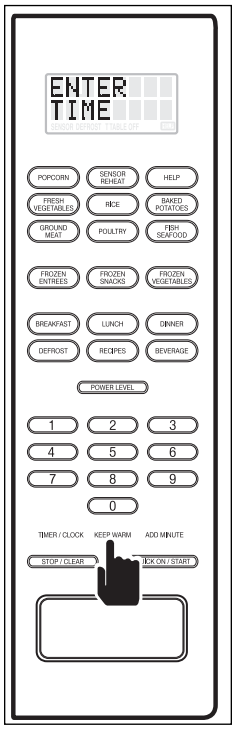



**Figure 3-46. Press KEEP WARM Key**

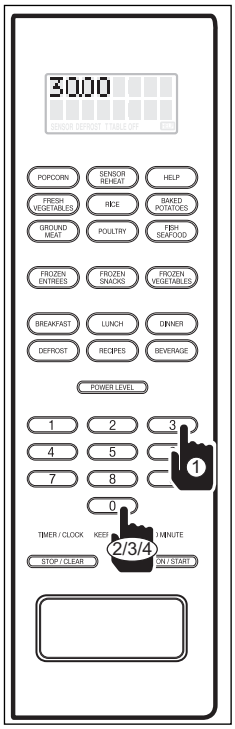



**Figure 3-47. Enter Amount of Keep Warm Time**

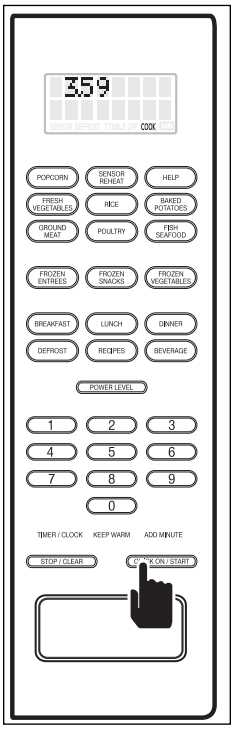



**Figure 3-48. Press QUICK ON/START Key**

***NOTE:*** *The Multiple Sequence Feature will not work in conjunction with Sensor Cook Mode or Auto Cook Modes..*

**Auto Start Feature**

The Auto Start Feature allows the microwave oven to begin cooking automatically at a designated time of day (within 12 hours from program input). To program the Auto Start Feature, follow the steps below:

1. Press the HELP key and five help features will flash on the display, the third one will read "*AUTO START - PRESS 3*" (See Figure 3-49).
2. Press the number 3 key and "*ENTER - START TIME*" will flash on the digital display (See Figure 3-50).
3. Enter desired start time. For example: 6:00; press the number 6 key and the number 0 key twice (See Figure 3-51). The display will flash "*PRESS CLOCK*".
4. Press the TIMER/CLOCK key and "*ENTER - COOKING TIME*" will flash on the display (See Figure 3-52).
5. Enter desired cooking (or defrost, or keep warm) time duration. For example: 4 minutes; press the number 4 key, then the number 0 key twice (See Figure 3-53), and the display will flash "*4.00 - PRESS START - OR PRESS - POWER LEVEL*".
6. Press the QUICK ON/START key and the start time will be appear on the display along with the word "*START*" (See Figure 3-54). The microwave will now be energized at the time of day specified, for the amount of time specified and at the power level specified. At the end of the cooking time, "*END*" will flash on the display and the alarm will beep.

***NOTE:*** *If the STOP/CLEAR key is pressed before Auto Start is initiated, "AUTO START - OFF" will flash on the display, then the correct time of day will be displayed.*

***NOTE:*** *It is also possible to use the Auto Start Feature in conjunction with the Multiple Sequence Mode. The Auto Start Feature will not work in conjunction with Sensor Cook Mode or any of the Auto Modes.*

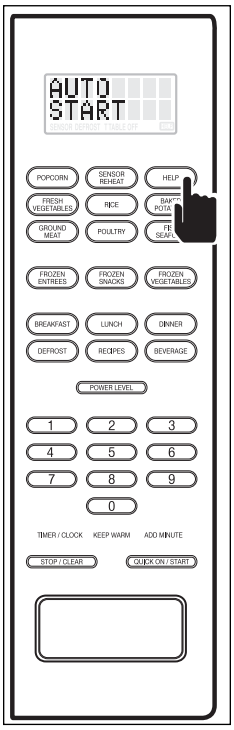



**Figure 3-49. Press HELP Key**

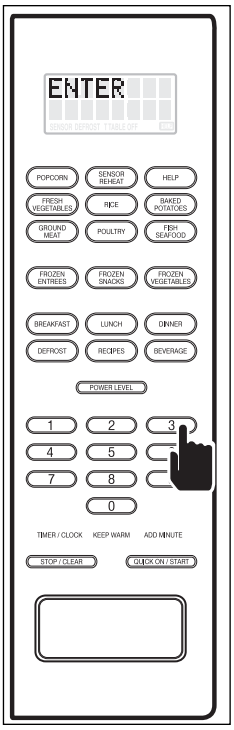



**Figure 3-50. Press Number 3 Key**

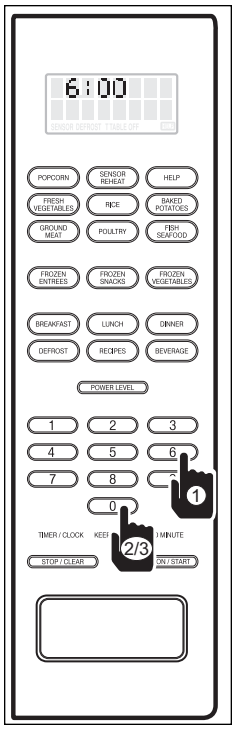



**Figure 3-51. Enter Start Time**

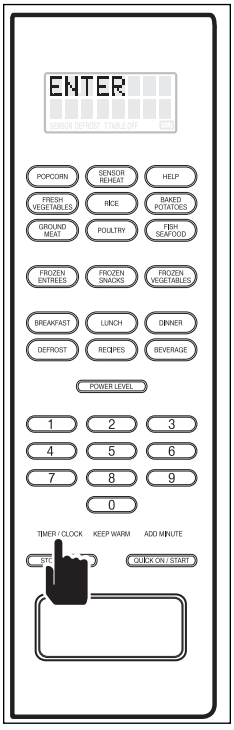



**Figure 3-52. Press TIMER/CLOCK Key**

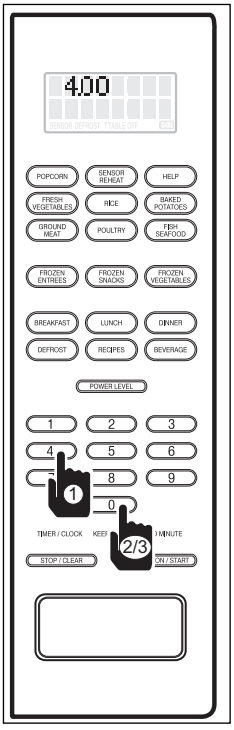



**Figure 3-53. Enter Amount of Cooking Time**

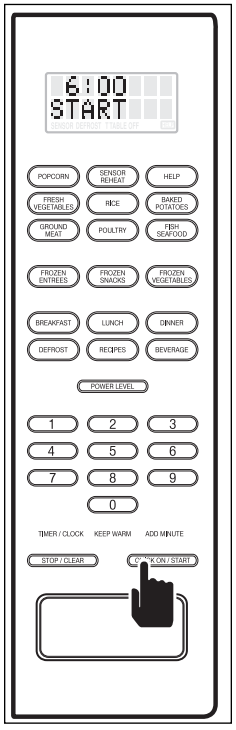



**Figure 3-54. Press QUICK ON/START Key**

**Auto Defrost Mode**

Auto Defrost Mode is to be used while referencing the Super Defrost and Auto Defrost charts in the Use and Care Guide, supplied with the microwave oven.

***NOTE:*** *If defrosting foods not found on the Super Defrost or Auto Defrost charts, or if the food being defrosted is above or below the weights listed on the charts, it is recommended that the Manual Defrost Mode be used.*

To initiate Auto Defrost mode, follow the steps below:

1. Press the DEFROST key and "*SEE LABEL - SELECT FOOD - NUMBER*" will flash on the display (See Figure 3-55).
2. Press the desired number key, based on the information found on the label affixed to the door sealing surface, just above the oven cavity, or in the Super Defrost and Auto Defrost charts in the Use and Care Guide.. For example, the number 4 key is used for "Ground Meat, .5 to 3.0 pounds". Press the number 4 key and "*GROUND MEAT - ENTER WEIGHT - IN POUNDS*" will flash on the display (See Figure 3-56).
3. Enter the weight of the of the food being defrosted. For example, press the number 3 key, then the number 0 key for 3.0 pounds (See Figure 3-57). After the weight is entered, the display will flash the weight entered along with the words "*PRESS START*".
4. Press the QUICK ON/START key to start the auto defrost process and the display will show the time as it counts down along with the word "*DEFROST*" (See Figure 3-58).

   The microwave oven will stop/pause during the auto defrost process, the alarm will beep and the display will flash instructions. For example, "*PULL APART - AND REMOVE - THAWED AREAS*".

   After the the door is opened, the instructions are followed and the door is closed, the display will show "*PRESS START*".
5. Press the QUICK ON/START key to resume the auto defrost process and the display will show the remaining time as it counts down along with the word "*DEFROST*" (See Figure 3-59). At the end of the defrost time, "*END*" will flash on the display and the alarm will beep.

***NOTE:*** *To stop the auto defrost process before the countdown time has elapsed, press the STOP/CLEAR key, or open the door. If the defrosting process is interrupted, the countdown will remain on the display until defrosting is resumed or the STOP/CLEAR key is pressed.*

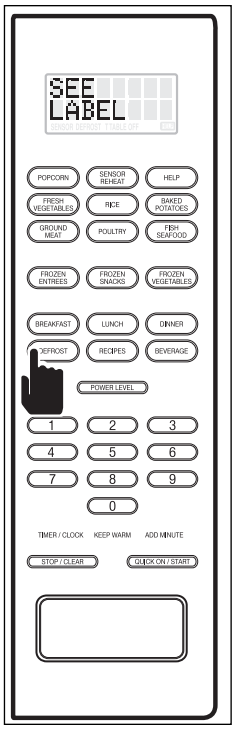



**Figure 3-55. Press DEFROST Key**

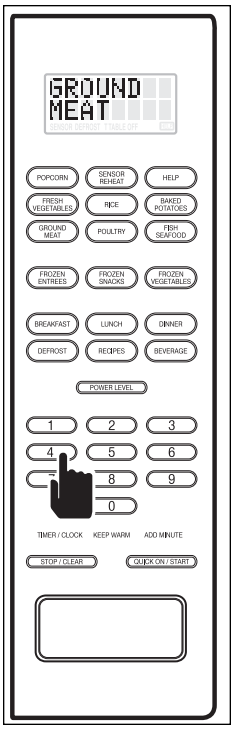



**Figure 3-56. Press Desired Number From Charts**

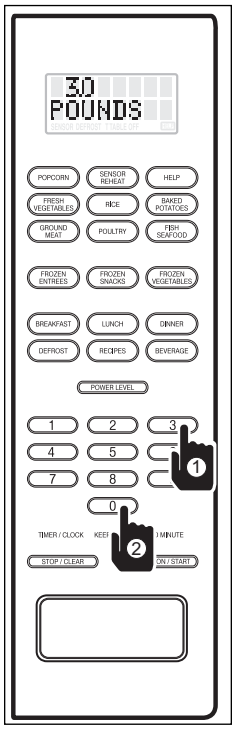



**Figure 3-57. Enter Weight of Food**

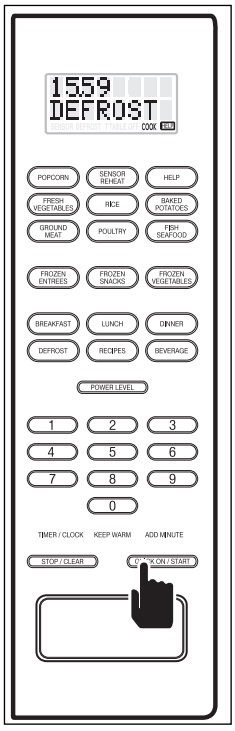



**Figure 3-58. Press QUICK ON/START Key to Begin Cooking**

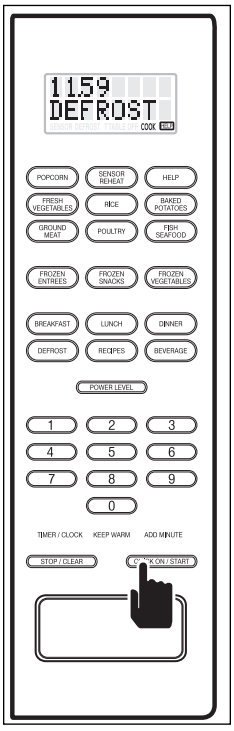



**Figure 3-59. Press QUICK ON/START Key to Resume Cooking**

**Auto Sensor Cooking Modes**

Auto Sensor Cooking Modes are to be used while referencing the recipes and related charts in the Use and Care Guide, supplied with the microwave oven.

When the microwave is in a Sensor Cooking Mode, food is cooked without figuring time, power level or quantity. When the sensor in the oven senses steam from the food, it relays the information to the microprocessor which calculates the cooking time and power level needed for best results.

There are eleven preprogrammed Auto Sensor Cooking Modes. Each of the preprogrammed Auto Sensor Cooking Modes have a designated key on the control panel labeled as follows: POPCORN, SENSOR REHEAT, FRESH VEGETABLES, RICE, BAKED POTATOES, GROUND MEAT, POULTRY, FISH SEAFOOD, FROZEN ENTRÉES, FROZEN SNACKS, and FROZEN VEGETABLES.

***NOTE:*** *There are also several programmable Auto Sensor Cooking Modes which will be covered in the following Meal/Beverage/Recipe Modes article.*

To initiate one of the eleven Preprogrammed Auto Sensor Cooking Modes, follow the steps below:

1. Press the desired Sensor Cooking Mode key. For example, press the RICE key and "*RICE - PRESS START*" flashes on the display (See Figure 3-60).

   ***NOTE:*** *If the FRESH VEGETABLES key is pressed, an additional key stroke to select "fresh soft vegetables" or "fresh hard vegetables" is required before proceeding to step 2 below.*

   ***NOTE:*** *If the POULTRY key is pressed, an additional key stroke to select "boneless " or "bone-in" is required before proceeding to step 2 below.*

2. Press the QUICK ON/START key. In this example, "*RICE - SENSOR COOK* " flashes on the display and the microwave is energized. (See Figure 3-61) When the sensor in the oven senses enough steam from the food, it will switch the microwave oven off, "*END* " will flash on the display and the alarm will beep.

***NOTE:*** *If the STOP/CLEAR key is pressed before a Sensor Cooking Mode has finished, the display will flash "ERROR - PRESS CLEAR", requiring the STOP/CLEAR key to be pressed again.*

***NOTE:*** *By pressing the HELP key before step 2, above, helpful hints will flash on the display.*

***NOTE:*** *By pressing the HELP key after step 2, above, the approximate cooking time per measure/weight will flash on the display.*

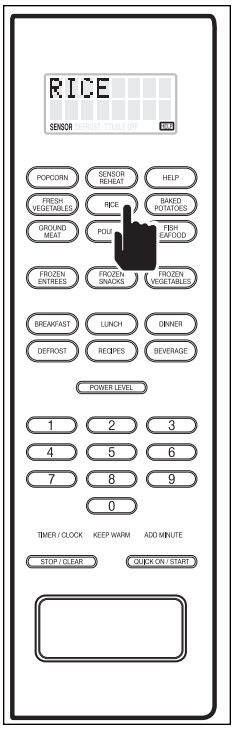



**Figure 3-60. Press Desired Sensor Cook Key**

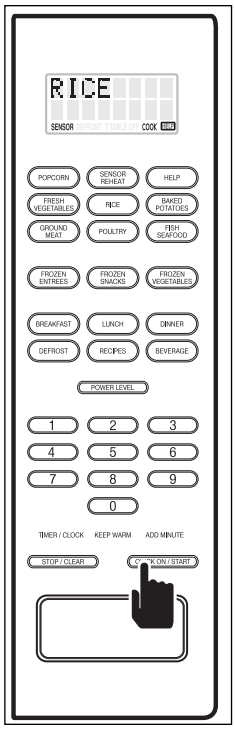



**Figure 3-61. Press QUICK ON/START Key**

**More or Less Time Adjustment Feature**

If it is discovered that it is desirable to have the food more or less done in the future, press the POWER LEVEL key once for "more" or twice for "less", before performing step number 2, as described in the Auto Sensor Cooking Modes article. The words "*MORE - PRESS START* " or the words "*LESS - PRESS START*" will flash on the display, depending on the number of times the POWER LEVEL key is pressed. In this example, the POWER LEVEL key was pushed once (See Figure 3-62).

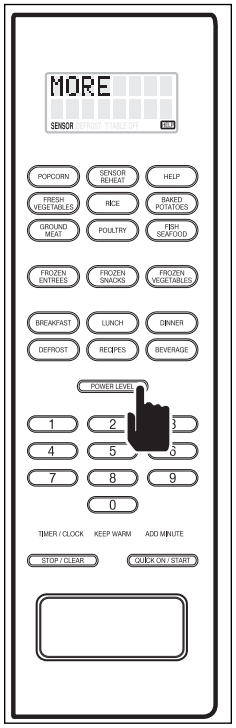



**Figure 3-62. Press POWER LEVEL Key**

**Auto Meal /Beverage / Recipe Cook Modes**

The key strokes described here cover the following keys on the control panel: BREAKFAST, LUNCH, DINNER, BEVERAGE and RECIPE. The Auto Meal / Beverage / Recipe Cook Modes are to be used while referencing the recipes and related charts in the Use and Care Guide, supplied with the microwave oven.

***NOTE:*** *Some of the Auto Meal /Beverage / Recipe Cook Modes use sensor cooking technology as described in the Auto Sensor Cooking Modes article on the previous page. If sensor cooking technology utilized during the mode chosen, the word "SENSOR" will appear in the bottom left corner of the display.*

To initiate an Auto Meal /Beverage / Recipe Cook Mode, follow the steps below:

1. Press the desired Auto Meal /Beverage / Recipe Cook Mode key. For example, by pressing the LUNCH key, "*SEE LABEL - SELECT FOOD - NUMBER* " flashes on the display (See Figure 3-63).

   ***NOTE:*** *If the DINNER or RECIPE keys are pressed, the display will flash "SEE LABEL - SELECT RECIPE - NUMBER ".*

2. Press the desired number for the food or recipe, based on the information found on the label affixed to the door sealing surface, just above the oven cavity, or in the Use and Care Guide. For this example, the number 2 key is pressed and "*HOT DOGS IN BUNS - PRESS START* " flashes on the display (See Figure 3-64).

3. Press the QUICK ON/START key. In this example, "*HOT DOGS IN BUNS - SENSOR COOK* " flashes on the display and the microwave is energized (See Figure 3-65).

***NOTE:*** *If the STOP/CLEAR key is pressed before an Auto Meal /Beverage / Recipe Cook Mode has finished, the display will flash "ERROR - PRESS CLEAR", requiring the STOP/CLEAR key to be pressed again.*

***NOTE:*** *For some Auto Meal /Beverage / Recipe Cook Modes, it is possible to press the HELP key before step 3, above, to have helpful hints flash on the display.*

***NOTE:*** *For some Auto Meal /Beverage / Recipe Cook Modes, it is possible to press the HELP key after step 3, above, to have helpful hints and/or approximate cooking time per measure/weight flash on the display.*

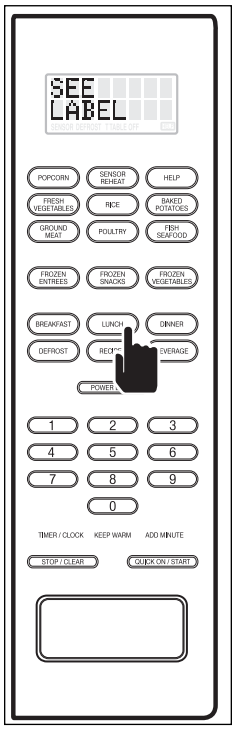



**Figure 3-63. Press Desired M/B/R Mode Key**

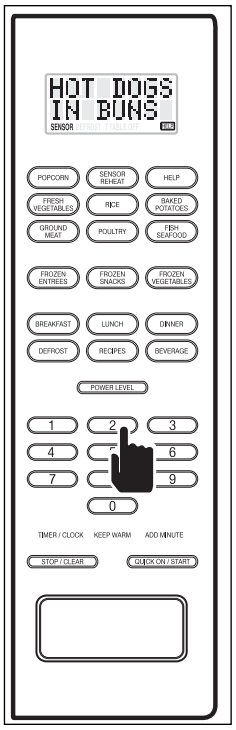



**Figure 3-64. Tress the Appropriate Number Key**

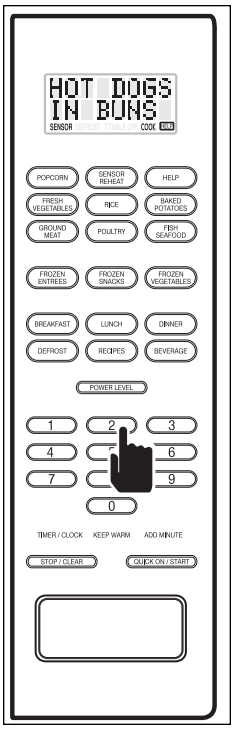



**Figure 3-65. Press QUICK ON/START Key to Begin Cooking**

**More or Less Time Adjustment Feature**

If it is discovered that it is desirable to have the food more or less done in the future, press the POWER LEVEL key once for "more" or twice for "less", before performing step number 3, as described in the Auto Meal /Beverage / Recipe Cook Modes article. The words "*MORE - PRESS START* " or the words "*LESS - PRESS START* " will flash on the display, depending on the number of times the POWER LEVEL key is pressed. In this example, the POWER LEVEL key was pushed twice (See Figure 3-66).

***NOTE:*** *This feature does not work if the DINNER or RECIPE keys were pressed in step 1, as described in the the Auto Meal /Beverage / Recipe Cook Modes article.*

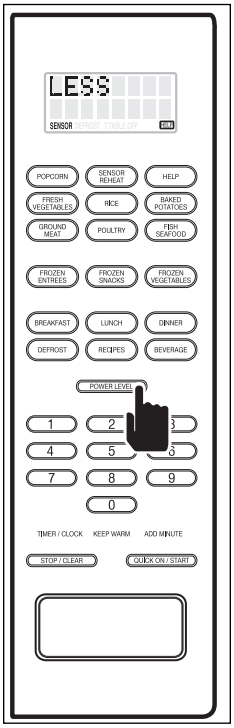



**Figure 3-66. Press POWER LEVEL Key**

**Help Features**

There are five help features accessible by pressing the HELP key. When the HELP key is pressed they will flash on the digital display in this order:

- CHILD LOCK - PRESS ONE
- TURN SOUND - ON OR OFF - PRESS 2
- AUTO START - PRESS 3
- CHOOSE ENGLISH - OR SPANISH - OR FRENCH - PRESS 4
- CLOCK DISPLAY - ON OR OFF - PRESS 5

To utilize one of the Help Features, follow the steps below:

1. Press the HELP key (See Figure 3-67), and the display will flash the Help Features as listed above.
2. Press the number key that correlates with the help feature desired and follow the instructions shown on the display. For this example, "child lock" was chosen by pressing the number 1 key and "TO SET - CHILD LOCK - PRESS START" flashes on the display (See Figure 3-68).
3. For this example, the QUICK ON/START key is pressed, initiating the Child Lock Feature. The display will then show the time of day. (See Figure 3-69) With the Child Lock Feature on, all keys on the control panel, except the HELP key, will be disabled. If any of the keys are pressed, except the HELP key, "CHILD LOCK " will flash on the display.
4. For this example, to switch the Child Lock Feature off, press the HELP key again and "TO UNDO - CHILD LOCK - PRESS CLEAR" will flash on the display (See Figure 3-70).
5. When the STOP/CLEAR key is pressed at this time, the display will flash "CHILD LOCK OFF" (See Figure 3-71) and then show the time of day.

***NOTE:*** *The Child Lock Feature was used as one example of the Help Features. All Help Features require different key press sequences. After pressing the HELP key, follow the instructions shown on the display.*

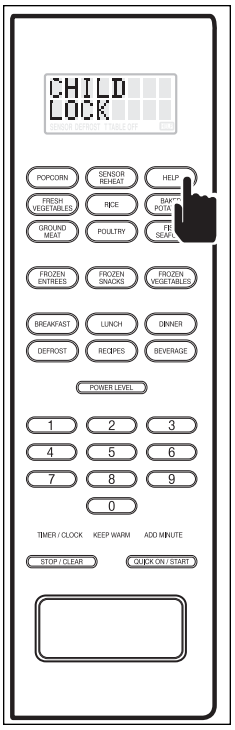



**Figure 3-67. Press HELP Key *(Follow Display Instructions)***

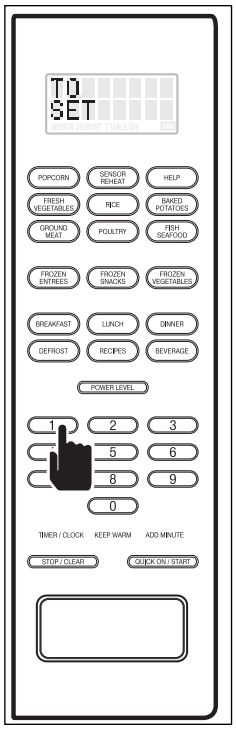



**Figure 3-68. Press Desired Feature Number Key**

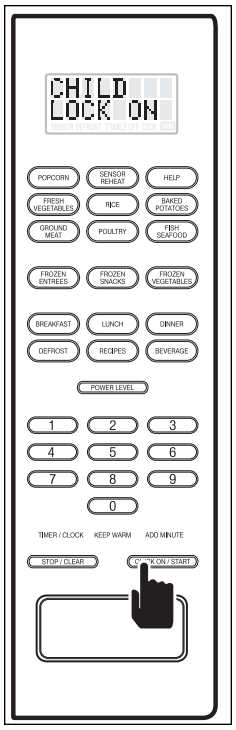



**Figure 3-69. Press QUICK ON/START Key to Initiate**

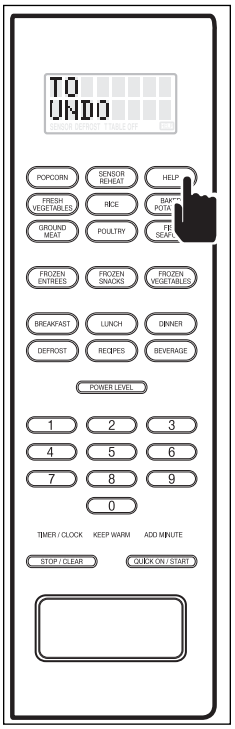



**Figure 3-70. To Disable, Press HELP Key *(Follow Display Instructions)***

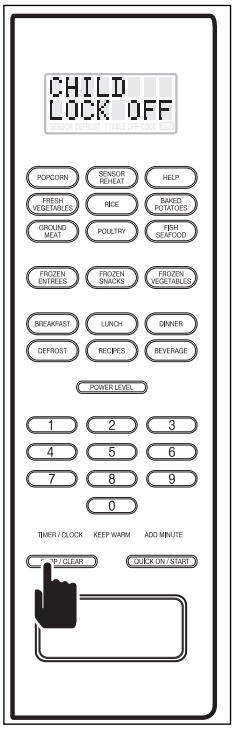



**Figure 3-70. Press STOP/CLEAR Key**

**Demonstration Mode**

Demo Mode was incorporated into the software of the microwave oven to so that the appliance could be used in a showroom setting, allowing the keys to be pressed and the display to function, without allowing power to the microwave cooking components.

To initiate Demo Mode, follow the steps below:

1. Press the TIMER/CLOCK key and "*TO SET - KITCHEN TIMER - PRESS 1 - TO SET CLOCK - PRESS 2*" will flash on the digital display (See Figure 3-71).
2. Though not one of the options given on the display, Press and release the number 0 key, then press and hold the QUICK ON/START for three seconds. The display will flash "*DEMO ON - DURING DEMO - NO OVEN POWER*" the show a steady "*DEMO*" (See Figure 3-72). While in Demo Mode, any of the keys can be pressed and the display will show or flash the appropriate message. If the QUICK ON/START key is pressed, the microwave oven will function in all respects except that microwave cooking components will not be energized and the timer on the display will abbreviate the count down from minutes to seconds.
3. To exit Demo Mode, press the TIMER/CLOCK again and "*TO SET - KITCHEN TIMER - PRESS 1 - TO SET CLOCK - PRESS 2*" will flash on the digital display (See Figure 3-73).
4. Again, though not one of the options given on the display, Press and release the number 0 key and the display will flash "*TO QUIT DEMO - PRESS CLEAR*". (See Figure 3-74)
5. When the STOP/CLEAR key is pressed at this time, the display will flash "*DEMO OFF*" (See Figure 3-75) and then show the time of day.

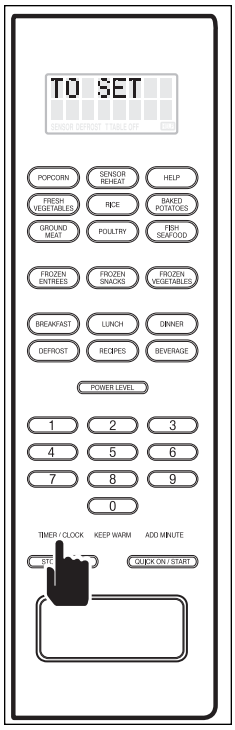



**Figure 3-71. Press TIMER/CLOCK Key**

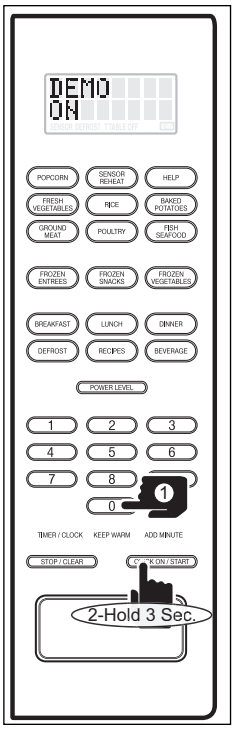



**Figure 3-72. Press Number 0 Key, Press/Hold QUICK ON/START Key**

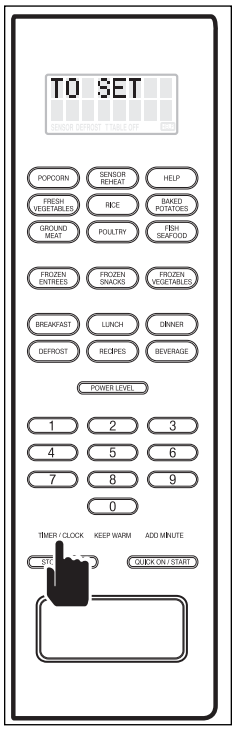



**Figure 3-73. Press TIMER/CLOCK Key**

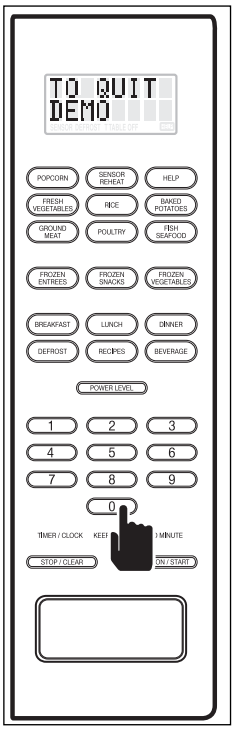



**Figure 3-74. Press Number 0 Key**

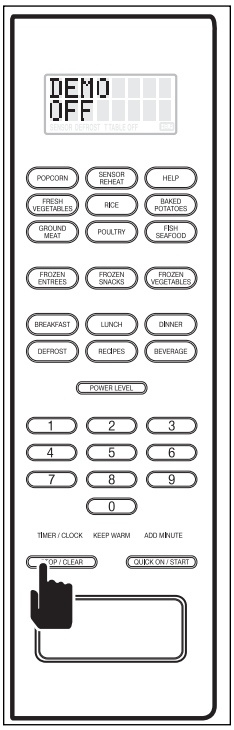



**Figure 3-75. Press STOP/CLEAR Key**

# SECTION 4

# COMPONENT REMOVAL

## COMPONENT ACCESS AND REMOVAL

This section explains how to adjust, access and remove components in a model MW24 Microwave Oven.

An attempt has been made to arrange these procedures in such a way as to simulate which components would need to be removed first in order to gain access to other components. When following a component removal procedure, it may be necessary to reference another component removal procedure listed earlier in this section.

***NOTE:*** *Before continuing, please take note of the WARNINGS and CAUTIONS below.*

### ⚠ WARNING

- **MICROWAVE OVENS CONTAIN CIRCUITRY CAPABLE OF PRODUCING VERY HIGH VOLTAGE AND CURRENT. CONTACT WITH THE FOLLOWING COMPONENTS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH:**
  - **TRANSFORMER**
  - **CAPACITOR**
  - **RECTIFIER**
  - **MAGNETRON**
  - **HIGH VOLTAGE HARNESS**

- **TO AVOID ELECTRIC SHOCK, POWER TO THE UNIT MUST BE DISCONNECTED WHENEVER ACCESSING AND/OR REMOVING COMPONENTS POWERED BY ELECTRICITY OR COMPONENTS NEAR OTHER ELECTRICAL COMPONENTS.**

- **BEFORE SERVICING THE MICROWAVE OVEN, THE CAPACITOR MUST BE DISCHARGED BY SHORTING THE CONNECTING LEAD OF THE RECTIFIER AGAINST THE CHASSIS WITH AN INSULATED SCREWDRIVER. FAILURE TO FOLLOW THIS STEP COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH.** ***NOTE: THE CAPACITOR REMAINS CHARGED APPROXIMATELY 60 SECONDS AFTER THE OVEN IS SWITCHED OFF. WAIT FOR 60 SECONDS, THEN SHORT THE CAPACITOR TO THE CHASSIS.***

- **TO AVOID EXPOSURE TO MICROWAVES, NEVER OPERATE OR ALLOW THE MICROWAVE OVEN TO BE OPERATED WITH THE DOOR OPEN.**

- **IF IT IS NECESSARY TO REMOVE THE MICROWAVE OVEN FROM ITS INSTALLATION, REMEMBER THAT THE UNIT IS HEAVY AND COULD TIP AND/OR FALL, RESULTING IN SERIOUS INJURY.**

- **AFTER PERFORMING ANY REPAIR TO THE DOOR, DOOR LATCH MECHANISM, OR DOOR CLOSING FACE, YOU MUST TEST THE INTEGRITY OF THE DOOR SEAL WITH A MICROWAVE LEAK DETECTOR TO VERIFY THERE ARE NO MICROWAVE LEAKS.**

### ⚠ CAUTION

- **Metal edges may be sharp. Use caution when servicing the unit to avoid personal injury.**

### Turntable Tray and Turntable Support

The collar at the bottom center of the turntable support is placed onto the shaft of the turntable motor. The turntable tray sits on top of the turntable support.

To remove the turntable tray, lift it off of the support and out of the oven cavity. (See Figure 4-1)

To remove the turntable support, lift it straight up off of the turntable motor shaft and out of the oven cavity. (See Figure 4-1)

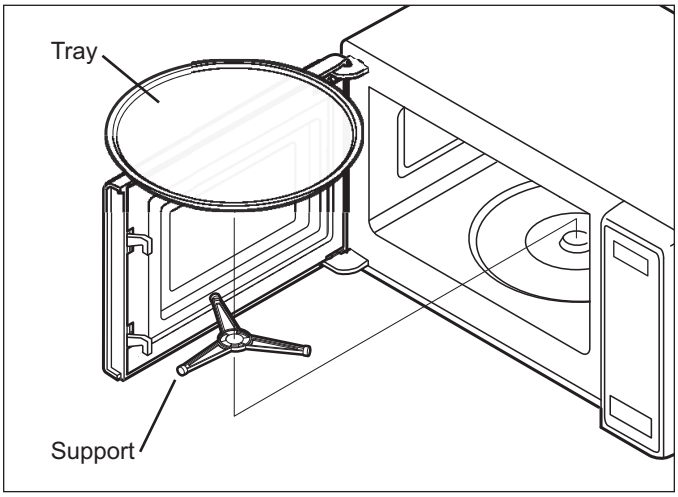



**Figure 4-1. Turntable Tray & Support Removal**

### Choke Cover

The choke cover has a series of plastic tabs around its backside that fit into slots in the outer edge of the door panel.

To remove the choke cover, open the door and insert a putty knife into the gap between the choke cover and the door frame. Then, work the putty knife around the entire choke cover while prying it off of the door panel. (See Figure 4-2)

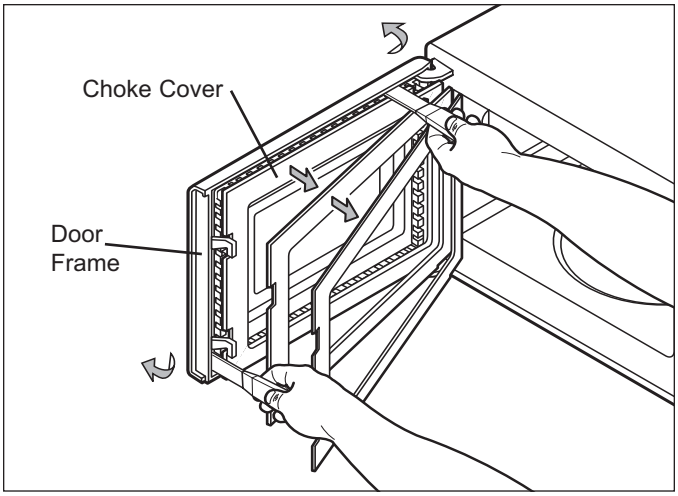



**Figure 4-2. Choke Cover Removal**

### Latch Head and Latch Spring

The latch head spring is attached between a hook on the latch head and a hook on the backside of the door frame. The pins on the latch head then fit down into tabs with holes on the backside of the door frame.

To remove the latch head and latch head spring, the choke cover will need to be removed first. Then, pull the latch head straight up until the pins disengage the holes in the tabs. Pull the latch head forward slightly, then down until the latch head spring disconnects from the hook on the backside of the door frame. (See Figure 4-3)

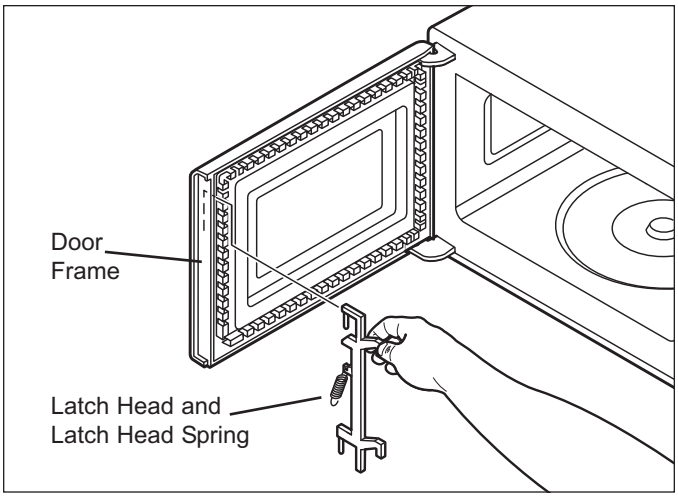



**Figure 4-3. Latch Head & Spring Removal**

**Door Assembly (with Door Panel and Latch Head)**

The door hinge pins, which are part of the door frame, fit down into holes in the oven hinges.

To remove the door assembly, the choke cover will first need to be removed. With the choke cover removed, lift the door assembly straight up until the hinge pins clear the holes in the oven hinges, then pull the door assembly away from the unit. (See Figure 4-4)

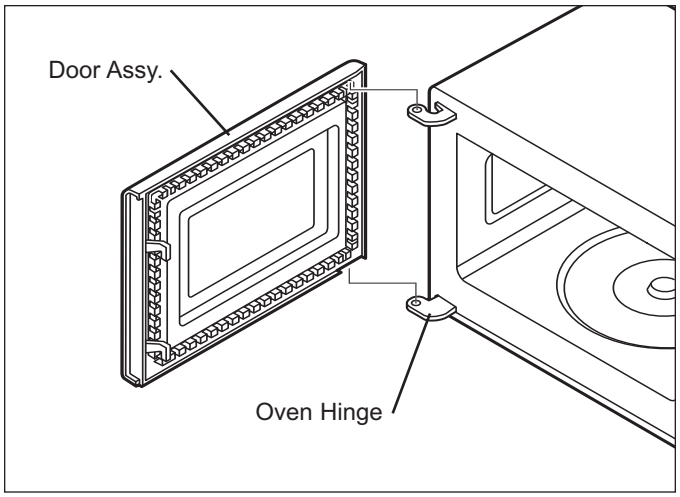



**Figure 4-4. Door Assembly Removal**

**Door Panel and Door Frame**

Part of the door panel is the slit choke. The slit choke is a series of J-shaped metal flanges around the perimeter of the door panel. Plastic tabs on the back-side of the door frame fit into spaces between the J-shaped metal flanges of the slit choke to secure the door panel to the door frame.

To separate the door panel from the door frame, the choke cover will first need to be removed. Then, remove the door assembly from the oven and place the door assembly face down on a solid surface. Now, insert a putty knife between the door panel and the tabs of the door frame while prying the door panel from the frame. (See Figure 4-5)

***NOTE:*** *It may be necessary to wedge several putty knives between the door panel and the tabs of the door frame in order to release the panel from the frame.*

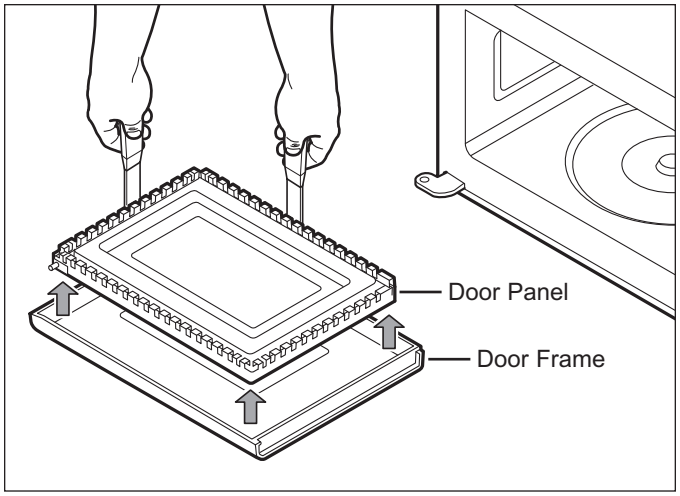



**Figure 4-5. Door Panel & Frame Removal**

**Cabinet Case**

A channel under the front top and front sides of the cabinet case fits over the front flange of the oven cavity frame. Tamperproof Torx-head screws and phillips-head screws secure the cabinet case to the base plate at the bottom of each side and to the oven cavity along the top and sides at the rear.

Begin removing the cabinet case be extracting the screws from the bottom of each side and along the top and sides at the rear. Then, lift the back of the cabinet case up slightly while sliding it toward the rear until the front flange of the oven cavity frame disengages from the channel in the cabinet case. Now, lift the cabinet case straight up. (See Figure 4-6)

***NOTE:*** *When replacing the cabinet case, the two Tamperproof Torx-head screws must be reinstalled in the same place they were extracted from.*

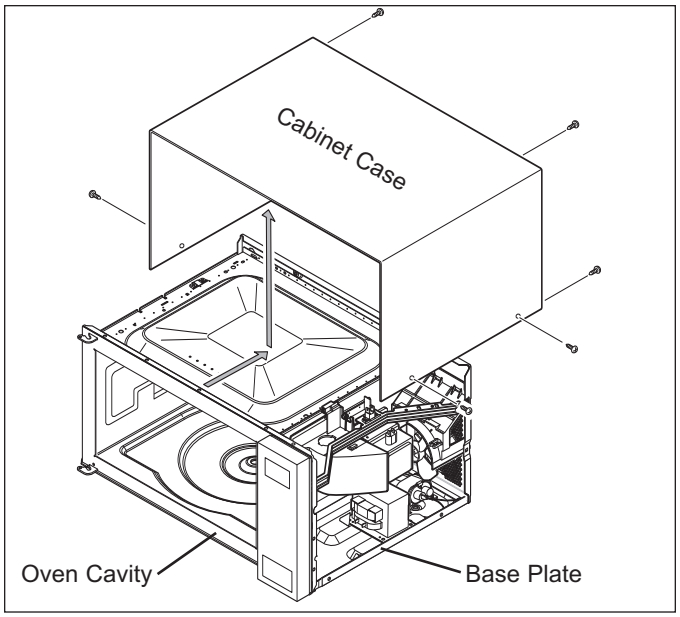



**Figure 4-6. Cabinet Case Removal**

**Power Supply Cord**

The power supply cord is attached to the back of the microwave oven with a screw.

To remove the power supply cord, the cabinet case must first be removed. Then, unplug the electrical leads from the terminals. Extract the mounting screw and pull the cord from the oven. (See Figure 4-7)

***NOTE:*** *The power cord mounting screw also grounds the power cord to the chassis of the microwave oven. This screw must be tightened fully when the power cord is reattached.*

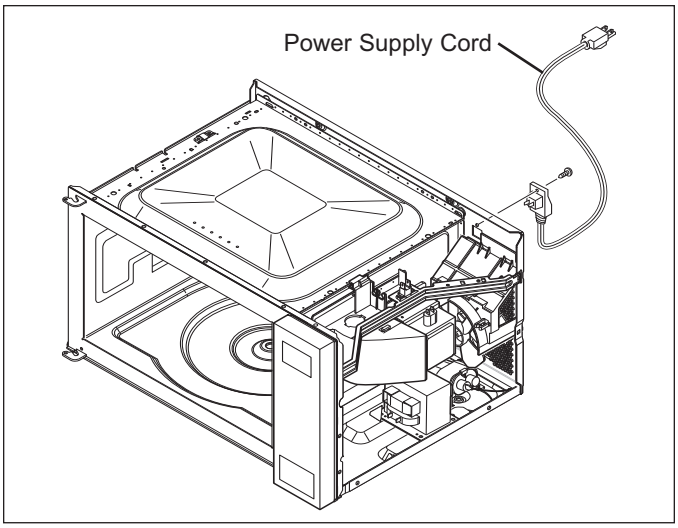



**Figure 4-7. Power Supply Cord Removal**

**Control Panel Assembly**

The control panel assembly has hooks at the rear that are inserted back into slots in the oven cavity frame, then the the control panel assembly is slid down so that the hooks engage the frame.

To remove the control panel assembly, the cabinet case must first be removed. Then, unplug all electrical leads from the back of the control panel assembly. Slide the control panel assembly up and pull it away from the frame of the oven cavity. (See Figure 4-8)

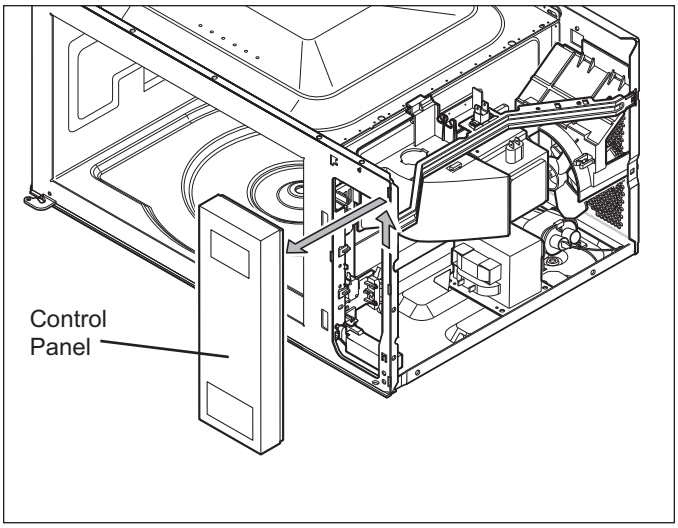



**Figure 4-8. Control Panel Removal**

**Switch Lever**

The switch lever is a molded plastic component with two pegs that fit into holes in the oven cavity frame.

To remove the switch lever, the cabinet case must first be removed. Then, pull the switch lever toward the right to flex the oven cavity frame and the switch lever. After the right peg clears the hole, continue pulling toward the right while rotating the lever toward the rear of the unit, until the left peg clears the hole. (See Figure 4-9)

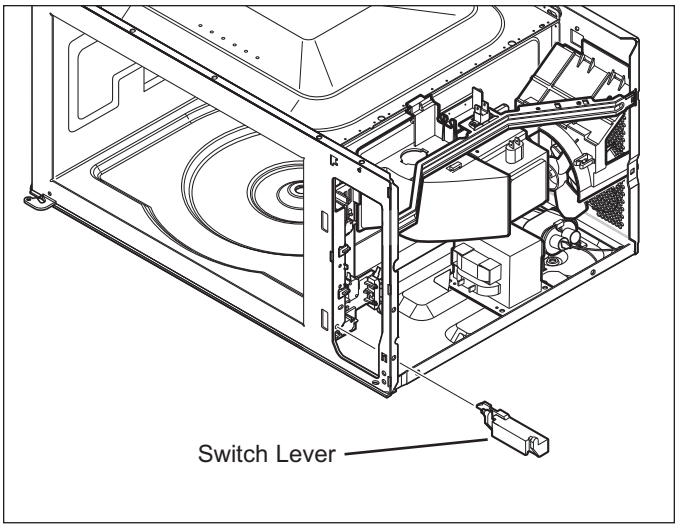



**Figure 4-9. Switch Lever Removal**

### Latch Hook/Switch Assembly

The latch hook/switch assembly consists of the latch hook, door sensing switch, secondary interlock switch, monitor switch, monitor switch fuse and fuse holder. Plastic tabs on the latch hook fit into slots in the oven cavity frame. Two screws pass through the latch hook into the oven cavity frame and are tightened down to hold the assembly securely in place.

To remove the latch hook/switch assembly, the cabinet case must first be removed as well as the switch lever. Then, use a needle-nose pliers to disconnect all "Positive-Lock" wire connectors from the components on the assembly (See Figure 4-10). Extract the two latch hook mounting screws. Flex the tabs on the latch hook outward to disengage them from the slots frame while pulling the assembly toward the rear of the unit. (See Figure 4-11)

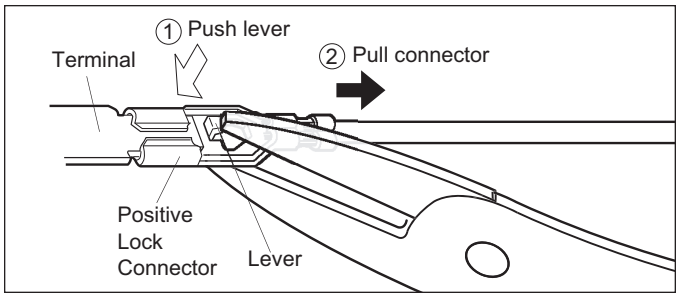



**Figure 4-10. Disconnect Positive Lock Connectors**

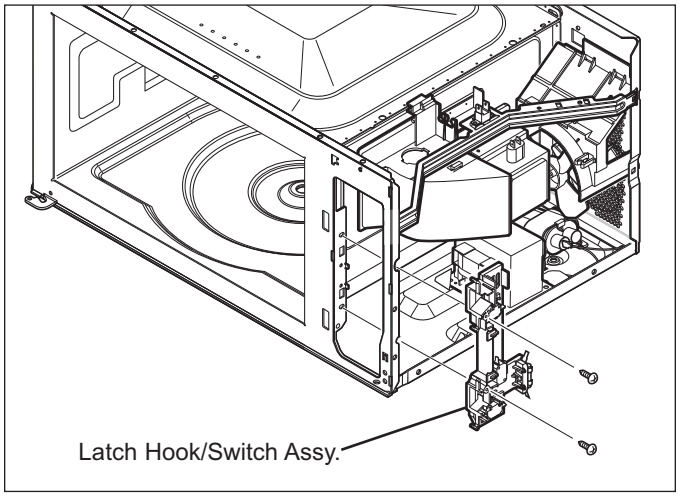



**Figure 4-11. Latch Hook/Switch Assy. Removal**

### Oven Lamp and Lamp Socket

The oven lamp is screwed into the lamp socket.

The lamp socket is inserted down into the light socket mounting hole in the top of the magnetron duct and secured using a screw.

***Oven Lamp*** **-** To remove the lamp, the cabinet case must first be removed. Then, remove the screw securing the lamp socket to the magnetron duct and pull straight up (See Figure 4-12). With the socket dismounted, turn the lamp counterclockwise to remove it from the socket.

***Lamp Socket*** **-** To fully remove the lamp socket, first follow the steps listed above to dismount the socket. After the socket is dismounted, the wire leads will need to be disconnected by unplugging them from the lamp socket terminals. (See Figure 4-13)

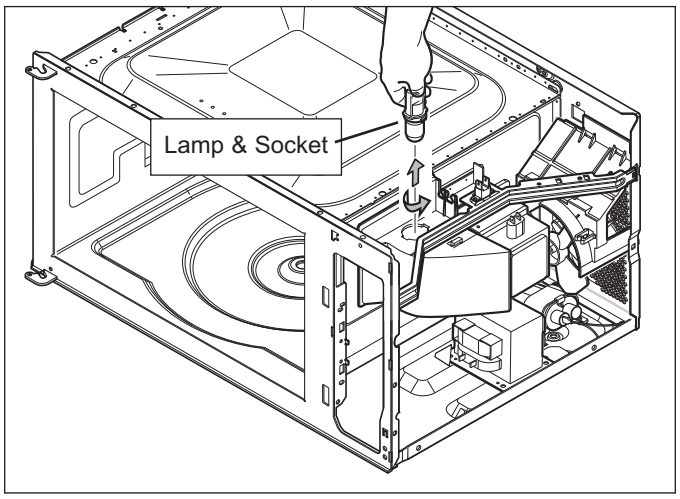



**Figure 4-12. Lamp and Socket Removal**

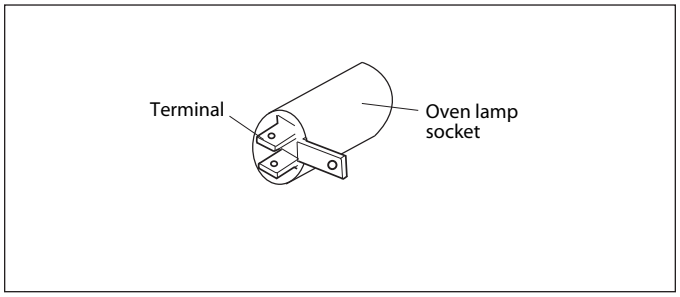



**Figure 4-13. Disconnecting Wire Leads from Socket**

### C/T Fuse

The C/T fuse is held to the chassis support with a screw.

To remove the C/T fuse, the cabinet case must first be removed. Then, use a needle-nose pliers to disconnect the "Positive-Lock" wire connectors from the fuse (See Figure 4-14). Extract the mounting screw and lift the fuse off of the chassis support. (See Figure 4-15)

***NOTE:*** *If the C/T fuse needs to be replaced, the Monitor switch must also be replaced, even if the monitor switch operates normally.*

### Chassis Support

The back end of the chassis support is inserted into a slot in the back cover of the oven cavity. A screw at the front of the support holds the support to a flange on the oven cavity frame. There is also a screw inserted through the bottom flange of the support, into the top of the magnetron. There is also a ground wire attached to the support toward the front.

To remove the chassis support, the cabinet case and magnetron fuse must first be removed. Then, disconnect the ground wire from the chassis support, just behind the control panel. Extract the screw from the top of the magnetron and the screw at the front end of the chassis support. Now, pull the support from the appliance. (See Figure 4-16)

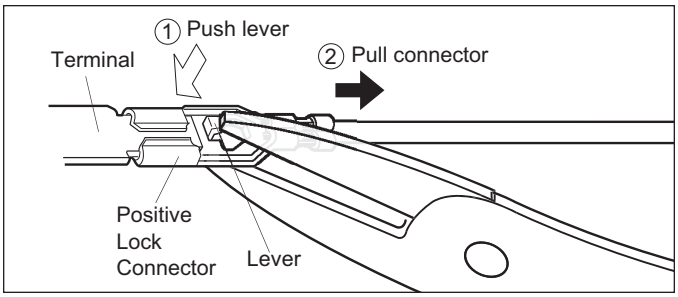



**Figure 4-14. Disconnect Positive Lock Connectors**

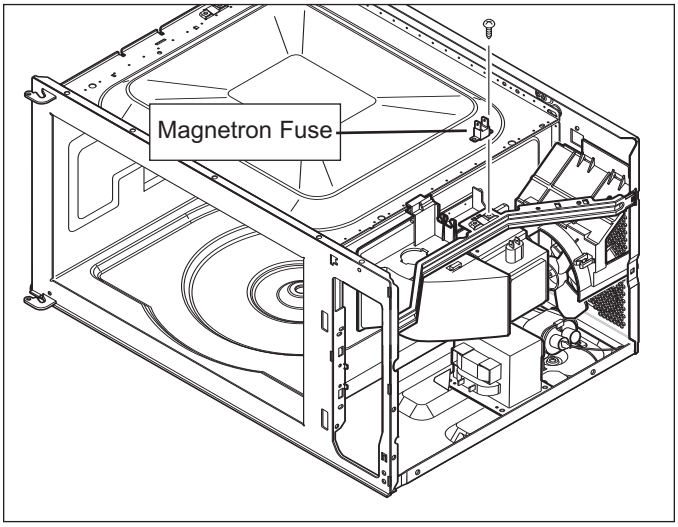



**Figure 4-15. Magnetron Fuse Removal**

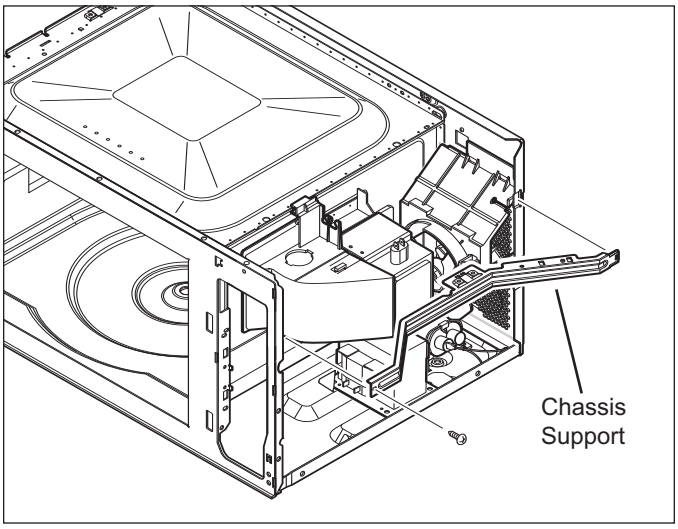



**Figure 4-16. Chassis Support Removal**

**Cooling Fan Duct, Fan Blade and Fan Motor**

Two screws mount the cooling fan to the back cover of the oven cavity. The fan blade is inserted onto the fan shaft and a small amount of Loc-tite is applied to help hold the blade on the shaft. The tabs at the top and right side of the fan duct fit into slots in the back cover of the oven cavity to hold the duct in place over the fan motor and fan blade.

***Fan Duct -*** To remove the fan duct, the cabinet case must first be removed. *(Though it is not necessary, it is recommended to also remove the chassis support.)* Then, push the fan wire leads from the slot in the fan duct. Pull the magnetron wire leads from the clip in the fan duct. Push the rear tabs of the fan duct out of the slots in the back cover, while pulling the fan duct up. (See Figure 4-17)

***Fan Blade -*** To remove the fan blade, first follow the steps listed above to remove the fan duct. After the duct is removed, pull the fan blade from the shaft of the fan motor. (See Figure 4-17)

***NOTE:*** *Because Loc-tite is used to help hold the blade to the motor shaft, it may be necessary to hold the edge of the fan motor rotor with pliers while pulling and rotating the fan blade.*

***Cooling Fan Motor -*** To remove the fan motor, first follow the steps listed above to remove the fan duct. After the duct is removed, disconnect the wire leads from the fan motor. Extract the motor mounting screws from the back of the unit and lift the motor out. (See Figure 4-17)

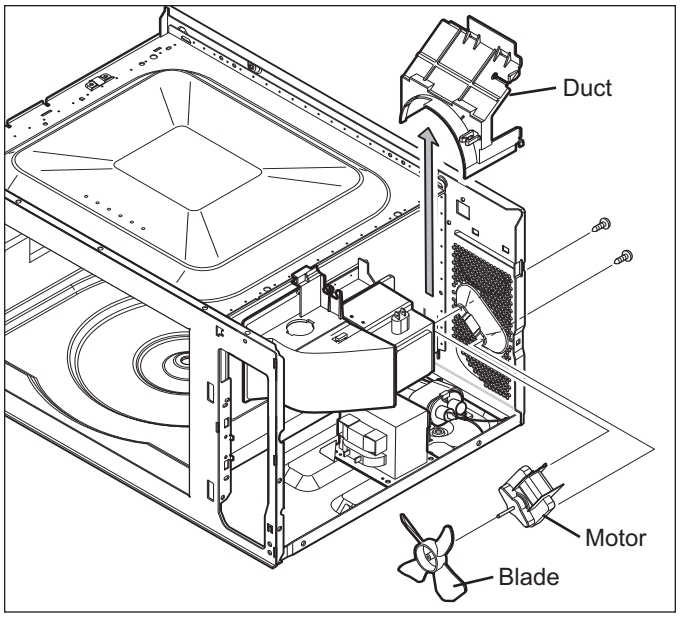



**Figure 4-17. Fan Motor, Blade & Duct Removal**

**Magnetron Duct**

At the top of the magnetron duct is a ridged channel that hooks around the top flange of the oven cavity. Another channel, to the right of the light socket mounting hole, fits over the lower flange of the chassis support.

To remove the magnetron duct, the cabinet case, chassis support and lamp socket must first be removed. Then, rotate the magnetron duct counterclockwise to unhook the top channel from the oven cavity. (See Figure 4-18)

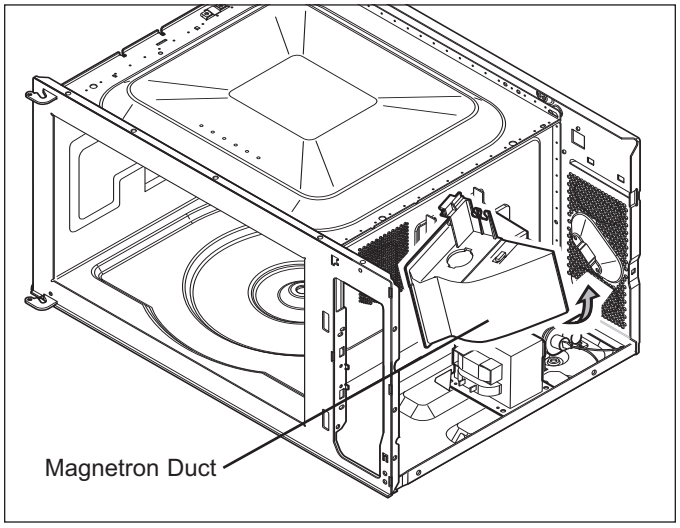



**Figure 4-18. Magnetron Duct Removal**

**Magnetron**

The magnetron is attached to the mounting plate on the right side of the oven cavity with four screws.

To remove the magnetron, the cabinet case, chassis support and magnetron duct must first be removed. Then, extract the four magnetron mounting screws and pull the magnetron from the mounting plate. (See Figure 4-19)

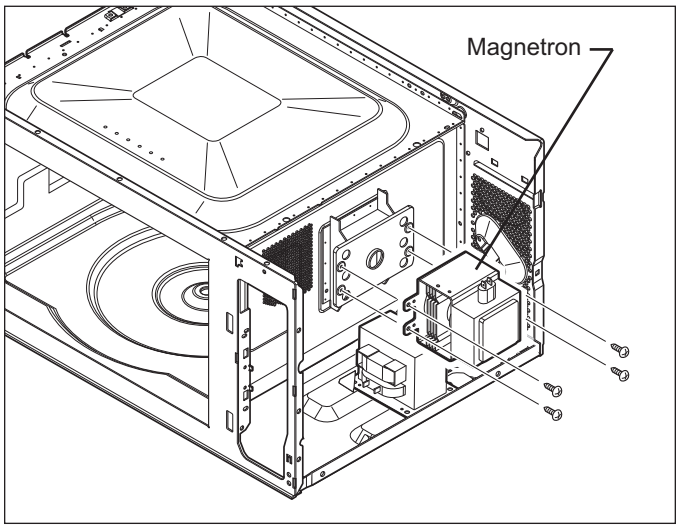



**Figure 4-19. Magnetron Removal**

### Capacitor, Capacitor Band and Rectifier

The capacitor is held in place by the capacitor band. The capacitor band is attached to the base plate with a screw on one side, while the other side fits into a channel in the base plate. One end of the rectifier is connected to the capacitor band with a screw, the other end is attached to the wire connector at the capacitor end of the wire between the capacitor and the magnetron.

***Capacitor and Capacitor Band -*** To remove the capacitor and capacitor band, the cabinet case must first be removed. Then, use a needle-nose pliers to disconnect the "Positive-Lock" wire connectors from the capacitor (See Figure 4-20). Extract the screw that holds the capacitor band to the base plate and pull the capacitor and capacitor band from the base plate (See Figure 4-21). Now, flex the legs of the capacitor band away from each other to release the capacitor from the band.

***Rectifier -*** To remove the rectifier, follow the steps listed above to dismount the capacitor band first. Then, extract the screw which holds the rectifier to the capacitor band and cut off the wire connector at the capacitor end of the wire between the capacitor and the magnetron. (See Figure 4-22)

### Transformer

Two corners of the transformer base fit into channels on the microwave oven base plate. Screws passing up through the base plate hold the other two corners of the transformer base to the base plate.

To remove the transformer, the cabinet case must first be removed. Then, use a needle-nose pliers to disconnect the "Positive-Lock" wire connectors from the transformer along with the "Positive-Lock" wire connector on the white wire at the capacitor (See Figure 4-20). Now, extract the transformer mounting screws from the bottom side of the base plate and lift the transformer off of the base plate. (See Figure 4-23)

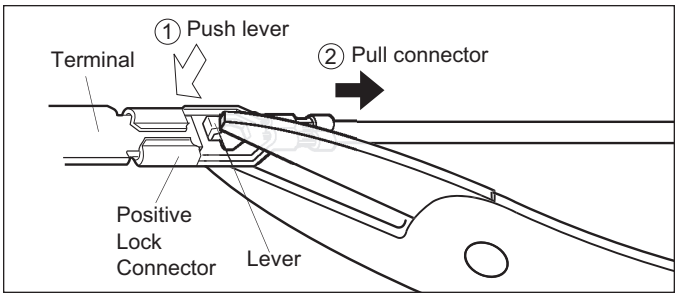



**Figure 4-20. Disconnect Positive Lock Connectors**

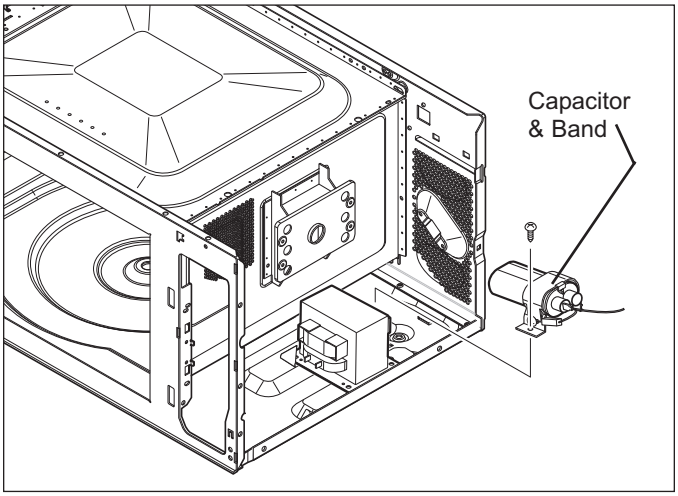



**Figure 4-21. Capacitor & Band Removal**

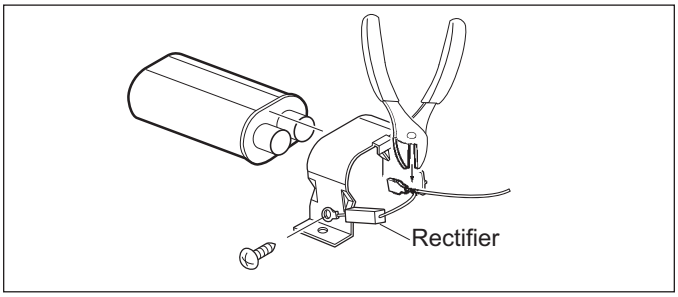



**Figure 4-22. Rectifier Removal**

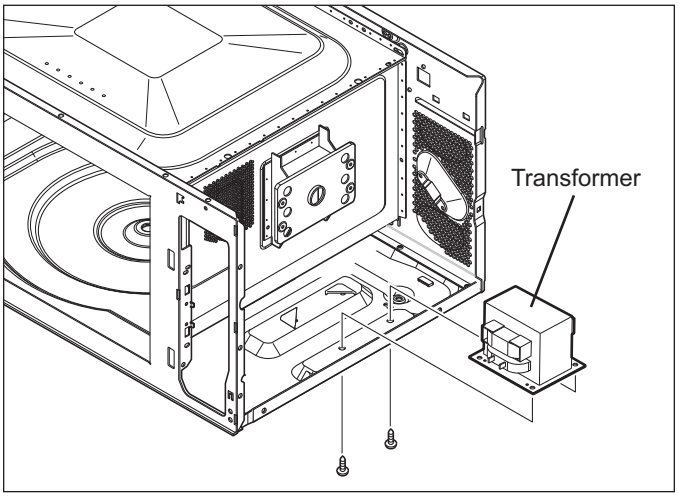



**Figure 4-23. Transformer Removal**

**Cavity Temperature Fuse**

The cavity temperature fuse is attached to the top left side of the oven cavity with a screw.

To remove the cavity temperature fuse, the cabinet case must first be removed. Then, use a needle-nose pliers to disconnect the “Positive-Lock” wire connectors from the fuse (See Figure 4-24). Extract the fuse mounting screw and lift the fuse off of the oven cavity (See Figure 4-25).

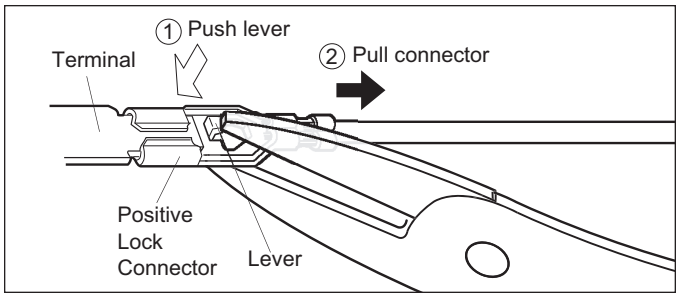



**Figure 4-24. Disconnect Positive Lock Connectors**

**AH (Absolute Humidity) Sensor and Sensor Duct**

The AH sensor duct is positioned on the outside left wall of the oven cavity and is held in place with a screw that passes down through the top left flange of the oven cavity, into the top of the duct. The AH sensor is attached to the AH sensor duct with a screw.

***AH Sensor -*** To remove the AH sensor, the cabinet case must first be removed. Then, disconnect the AH sensor wire lead from the back of the control panel assembly. Extract the sensor mounting screw and pull the sensor from the sensor duct. (See Figure 4-26)

***AH Sensor Duct -*** To remove the AH sensor duct, first follow the steps listed above to remove the AH sensor. After the sensor is removed, extract the duct mounting screw from the top left flange of the oven cavity, lower the duct slightly and then pull it from the left wall of the oven cavity. (See Figure 4-26)

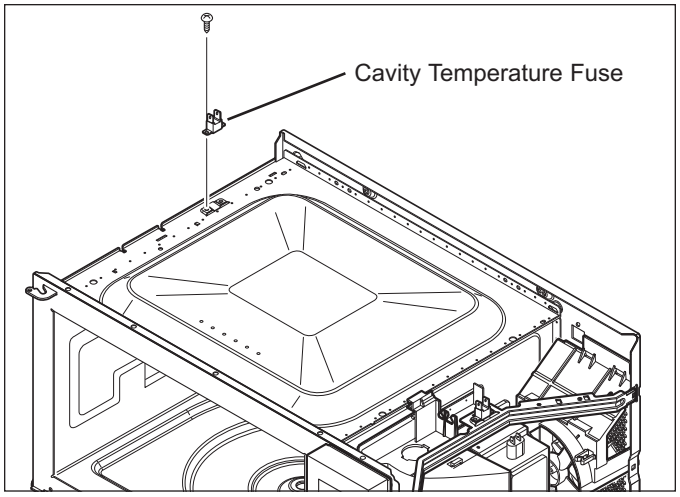



**Figure 4-25. Cavity Temperature Fuse Removal**

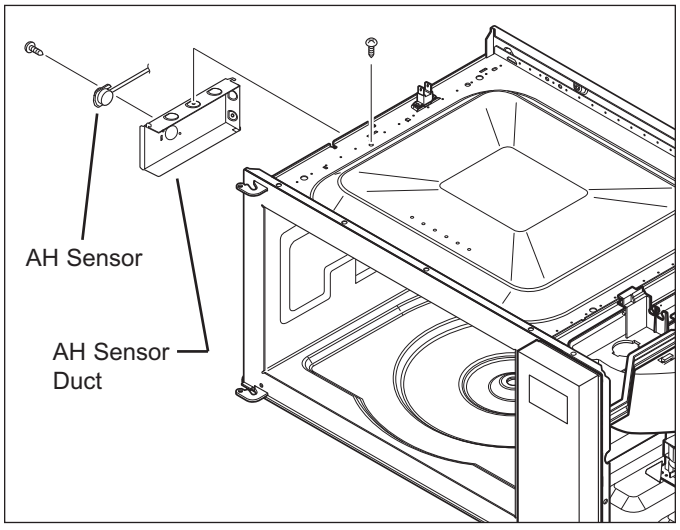



**Figure 4-26. AH Sensor & Duct Removal**

**Turntable Motor, Cushion, Motor Packing and Motor Cover**

***NOTE:*** *6kg (13 1/4lbs) Maximum weight limit for turntable motor.*

The turntable motor is attached to the bottom side of the oven cavity with a screw. The motor packing is attached around the collar at the base of the motor shaft. The cushion is adhered to the bottom of the motor case. The motor, cushion and packing are behind a knock-out cover that is punched into the base plate.

***Turntable Motor Cover -*** To remove the turntable motor and cover, the turn table tray and turntable support must first be removed. Then, lay the oven on its backside or upside down, being careful not to scratch the counter top or the cabinet case. Use a tin snips or similar tool to snip the material between the knock-out holes on each side of the turntable motor cover and lift the cover off of the base plate. (See Figure 4-27 and Figure 4-28)

***NOTE:*** *After removing the cover, make sure all edges of cover that have become bent at the snip points are flattened before reinstalling.*

***Turntable Motor, Cushion and Motor Packing -*** To remove the turntable motor, cushion and motor packing, first follow the steps listed above to remove the motor cover. After the cover is removed, disconnect the electrical leads from the motor. Extract the motor mounting screw from the bottom of the oven cavity and lift the motor, cushion and motor packing away from the oven cavity. (See Figure 4-28)

***NOTE:*** *When reinstalling the components, make sure motor packing and cushion are in place, but do NOT reinstall the motor mounting screw. Rotate the cover 180 degrees and flip it upside down. Place the tab of the cover into the channel in the base plate and use the motor mounting screw to secure the cover to the base plate. (See Figure 4-29)*

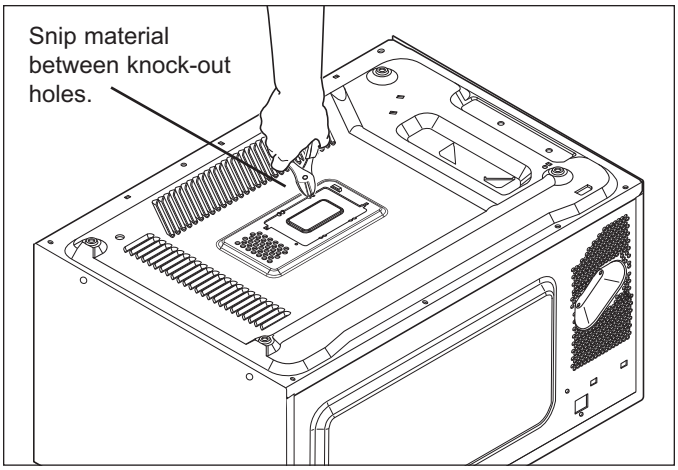



**Figure 4-27. Turntable Motor Cover Removal**

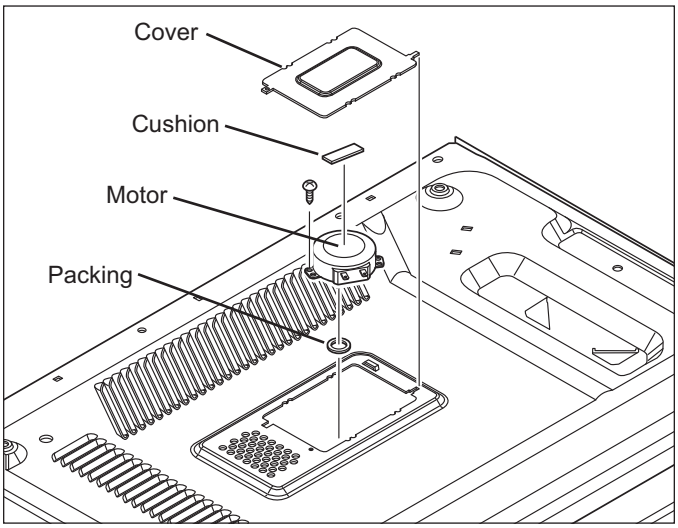



**Figure 4-28. Turntable Motor, Cushion, Motor Packing and Cover Removal**

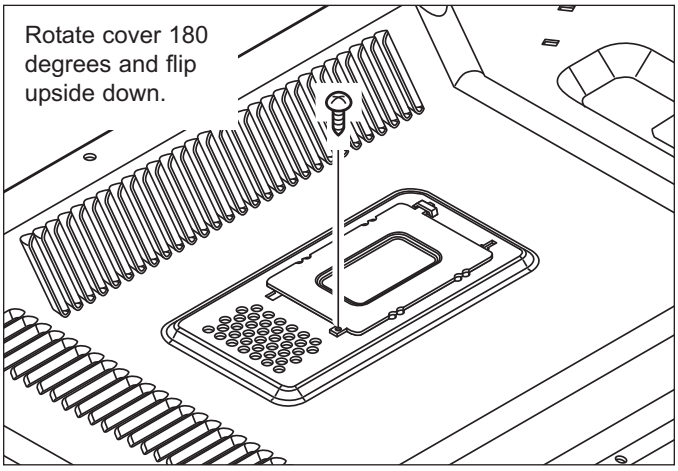



**Figure 4-29. Turntable Motor Cover Installation**

# SECTION 5

# PART LISTS WITH EXPLODED VIEWS

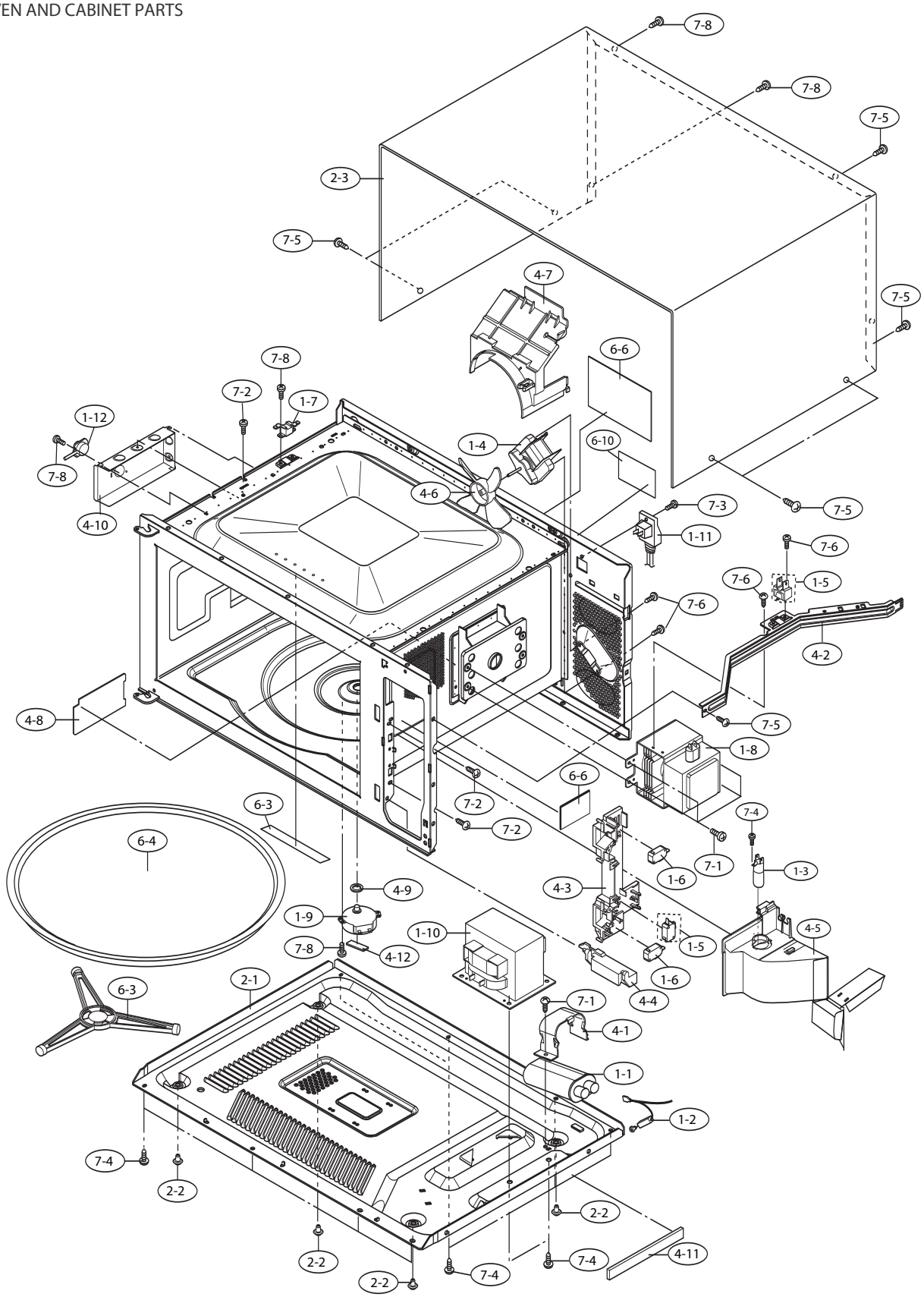
***NOTE:*** *The parts with " **!** " at left may cause undue microwave exposure if defective or installed improperly.*
*The parts with " **V** " at left are used in voltage above 250 Volts. Observe all warnings when servicing.*

| | Ref. # | Part # | Description | Qty. |
|---|---|---|---|---|
| | | | **ELECTRIC PARTS** | |
| ***V*** | 1-1 | 801829 | High Voltage Capacitor | 1 |
| ***V*** | 1-2 | 807815 | High Voltage Rectifier Assembly | 1 |
| | 1-3 | 807816 | Oven Lamp/Socket | 1 |
| | 1-4 | 801832 | Fan Motor | 1 |
| | 1-5 | 807817 | Monitor Switch (V 16G-2C25 and Fuse Assembly (20A 250V AC | 1 |
| | 1-6 | 801827 | Secondary Interlock Switch & Door Sensing Switch (V-5230Q) | 2 |
| | 1-7 | 801825 | Cavity Temperature Fuse 150°C | 1 |
| | 1-8 | 801834 | Magnetron | 1 |
| | 1-9 | 807818 | Turntable Motor | 1 |
| | 1-10 | 807819 | Power Transformer | 1 |
| ***! V*** | 1-11 | 801769 | Power Supply Cord | 1 |
| | 1-12 | 801772 | AH Sensor | 1 |
| ***V*** | 1-13 | 802955 | Latch Hook/Switch/Harness Assembly | 1 |
| | | | **CABINET PARTS** | |
| | 2-1 | 801782 | Base Plate | 1 |
| | 2-2 | 801783 | Foot | 4 |
| | 2-3 | 801780 | Outer Case Cabinet | 1 |
| | | | **CONTROL PANEL PARTS** | |
| | 3-1 | 801768 | Control Panel Assembly | 1 |
| | 3-2 | 809106 | Control Panel Frame Assembly | 1 |
| | 3-3 | 809105 | Key Unit | 1 |
| | 3-4 | 801784 | Open Button | 1 |
| | 3-5 | 801795 | Open Button Spring | 1 |
| | 3-6 | 801842 | Screw, 3mm X 10mm | 3 |
| | 3-7 | 801822 | LED Sheet | 1 |
| | 3-8 | 801787 | LCD Holder | 1 |
| | | | **OVEN PARTS** | |
| | 4-1 | 801786 | High Voltage Capacitor Band | 1 |
| | 4-2 | 807820 | Chassis Support | 1 |
| | 4-3 | NA | *(See Latch/Switch/Harness Assembly in Electric Parts List Above)* | ---- |
| | 4-4 | 801793 | Switch Lever | 1 |
| | 4-5 | 807821 | Magnetron Duct | 1 |
| | 4-6 | 801796 | Fan Blade | 1 |
| | 4-7 | 801801 | Fan Duct | 1 |
| | 4-8 | 801798 | Waveguide Cover | 1 |
| | 4-9 | 801820 | Turntable Motor Packing | 1 |
| | 4-10 | 801818 | Sensor Duct | 1 |
| | 4-11 | 801800 | Cushion | 1 |
| | 4-12 | 801799 | Turntable Motor Cushion | 1 |

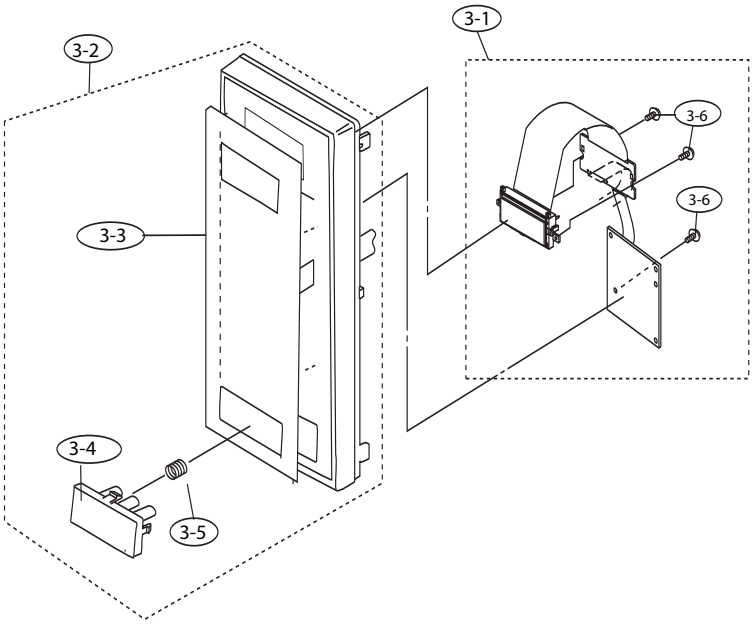
***NOTE:*** *The parts with " **!** " at left may cause undue microwave exposure if defective or installed improperly.*
*The parts with " **V** " at left are used in voltage above 250 Volts. Observe all warnings when servicing.*

| | Ref. # | Part # | Description | Qty. |
|---|---|---|---|---|
| | | | **DOOR PARTS** | |
| ! | 5-1 | 801770 | Door Frame Assembly | 1 |
| ! | 5-1-1 | 801788 | Latch Head | 1 |
| | 5-1-2 | 801794 | Latch Spring | 1 |
| ! | 5-2 | 807822 | Door Panel | 1 |
| | 5-3 | 801821 | Sealer Film | 1 |
| | 5-4 | 801781 | Choke Cover | 1 |
| | | | | 1 |
| | | | **MISCELLANEOUS** | |
| | 6-1 | 801778 | Stop Switch Harness | 1 |
| | 6-2 | 807823 | Main Wire Harness | 1 |
| | 6-3 | 801776 | Turntable Support | 1 |
| | 6-4 | 801797 | Turntable Tray | 1 |
| | 6-5 | 807824 | Monitor Caution Label | 1 |
| | 6-6 | 801837 | DHHS / Screw Caution Label | 1 |
| | 6-7 | XXXXX | Operation Manual | 1 |
| V | 6-8 | 801828 | High Voltage Wire A | 1 |
| | 6-9 | 801835 | Recipe Card | 1 |
| | 6-10 | 801838 | BIK Caution Label | 1 |
| | | | | 1 |
| | | | | 1 |
| | | | **SCREWS, NUTS & WASHERS** | |
| | 7-1 | 801789 | Special Screw | 5 |
| | 7-2 | 801790 | Special Screw | 3 |
| | 7-3 | 801844 | Screw | 1 |
| | 7-4 | 801846 | Screw | 12 |
| | 7-5 | 801791 | Screw | 6 |
| | 7-6 | 801843 | Screw | 3 |
| | 7-7 | 801792 | Special Screw (Torx Tamperproof) | 2 |
| | 7-8 | 801841 | Screw | 3 |

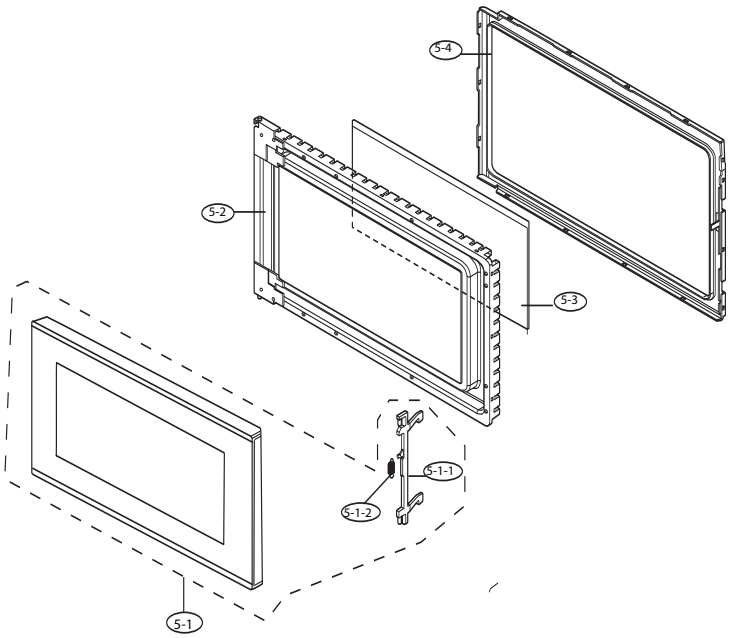
OVEN AND CABINET PARTS



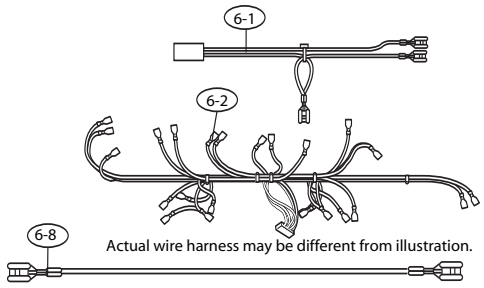
CONTROL PANEL PARTS



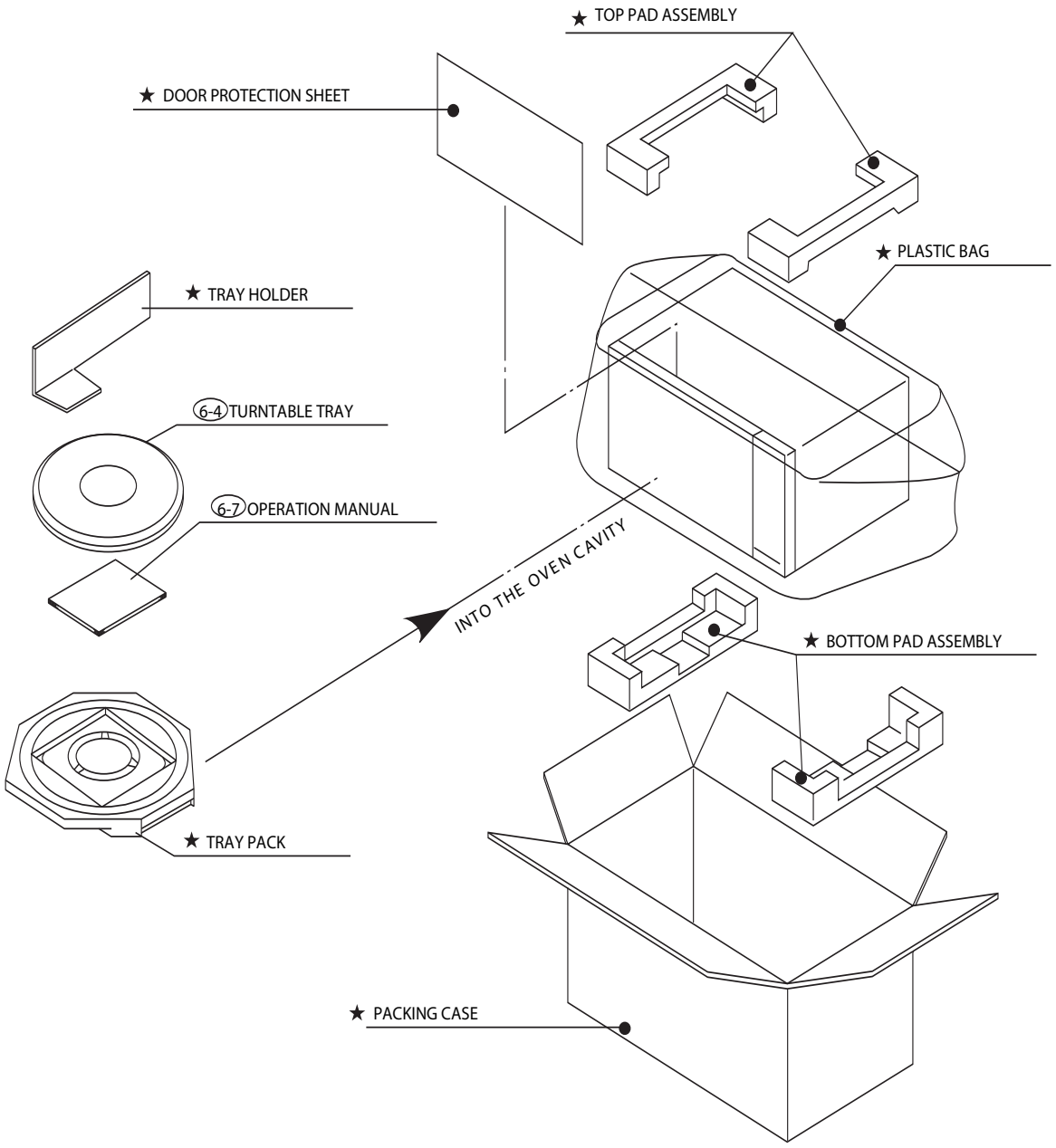

DOOR PARTS




MISCELLANEOUS



PACKING AND ACCESSORIES




★ Non-replaceable items.

# SECTION 6

# TROUBLESHOOTING AND TECHNICAL DATA

## TROUBLESHOOTING AND TECHNICAL DATA

This section of the manual combines the Troubleshooting Guide with Technical Data. The troubleshooting table on the following page lists the condition and problems, as well as which parts need to be replaced or checked and which test procedures to follow. The test procedures on the pages following the troubleshooting table contain the appropriate technical data needed for each test.

When troubleshooting the microwave oven, it will be helpful to follow the Detailed Operating Sequence when 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" portion of this troubleshooting guide. See “How to Use This Troubleshooting Table” on following page.

Before continuing, take note of the WARNING and Important Notes below.

**⚠ WARNING**

- **MICROWAVE OVENS CONTAIN CIRCUITRY CAPABLE OF PRODUCING VERY HIGH VOLTAGE AND CURRENT. CONTACT WITH THE FOLLOWING COMPONENTS MAY RESULT IN SERIOUS PERSONAL INJURY OR DEATH:**
  - **TRANSFORMER**
  - **RECTIFIER**
  - **HIGH VOLTAGE HARNESS**
  - **MAGNETRON**
  - **CAPACITOR**

- **TO AVOID ELECTRIC SHOCK DURING TROUBLESHOOTING, NEVER TOUCH ANY PART OF THE ELECTRICAL CIRCUIT WITH HANDS OR UNINSULATED TOOLS WHILE THE POWER IS CONNECTED.**

- **BEFORE SERVICING THE MICROWAVE OVEN, THE CAPACITOR MUST BE DISCHARGED BY SHORTING THE CONNECTING LEAD OF THE RECTIFIER AGAINST THE CHASSIS WITH AN INSULATED SCREWDRIVER. FAILURE TO FOLLOW THIS STEP COULD RESULT IN SERIOUS PERSONAL INJURY OR DEATH. *NOTE: THE CAPACITOR REMAINS CHARGED APPROXIMATELY 60 SECONDS AFTER THE OVEN IS SWITCHED OFF. WAIT FOR 60 SECONDS, THEN SHORT THE CAPACITOR TO THE CHASSIS.***

***IMPORTANT NOTE:*** *If the oven becomes inoperative because of a blown C/T fuse, defective monitor switch, interlock switch or door sensing switch, the complete Latch Hook/Switch Assembly must be replaced. See part #802955 in the Service Parts Price List.*

***IMPORTANT NOTE:*** *When troubleshooting, it may be necessary in some cases to supply power to the unit with the outer cabinet case removed. In this event:*

1. *Disconnect the power supply cord, and then remove outer cabinet 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 the leads remain isolated from other components and oven chassis by using insulation tape.*
6. *Only after performing the five steps listed above should the power supply cord be reconnected.*

*When the testing is completed:*

1. *Disconnect the power supply cord, then remove outer case.*
2. *Open the door and block it open.*
3. *Discharge high voltage capacitor.*
4. *Reconnect the leads to the primary of the power transformer.*
5. *Reinstall the outer cabinet.*
6. *Reconnect the power supply cord after the outer case is installed.*
7. *Run the oven and check all functions.*

**How to use this table:**

CK = Check Parts Listed

RE = Replace Parts Listed (after verifying defects)

All other letters indicate which test procedure to be performed. Test procedures can be found in alphabetical order on the following pages.

| TEST PROCEDURE | | RE | RE | A | B | C | D | E | E | F | F | G | H | RE | RE | CK | I | CK | CK | CK | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POSSIBLE CAUSE AND DEFECTIVE PARTS | | SHORT IN POWER CORD | SHORT OR OPENED WIRING | MAGNETRON | POWER TRANSFORMER | H.V. RECTIFIER ASSEMBLY | HIGH VOLTAGE CAPACITOR | CAVITY TEMPERATURE FUSE | C/T FUSE | SECONDARY INTERLOCK SYSTEM | PRIMARY INTERLOCK RELAY | MONITOR SWITCH | C/T FUSE | OVEN LAMP OR SOCKET | COOLING FAN MOTOR | TURNTABLE MOTOR | TOUCH CONTROL PANEL | WRONG OPERATION | LOW VOLTAGE | DIRTY OVEN CAVITY | KEY UNIT | RELAY (RY1) | DEFROST CENTER | FOIL PATTERN ON PWB. | AH SENSOR |
| CONDITION | PROBLEM | | | | | | | | | | | | | | | | | | | | | | | | |
| OFF CONDITION | Home fuse or circuit breaker blows when power cord is plugged into wall receptacle. | ● | ● | | | | | | | | | | | | | | | | | | | | | | |
| | Monitor fuse blows when power cord is plugged into wall receptacle. | | ● | | | | | | | ● | | ● | | | | | ● | | | | | | | | |
| | Any letters or 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 P-50/ 50 PERCENT mode. (Operates properly on P-HI/ 100 PERCENT mode.) | | | | | | | | | ● | | | | | | | ● | | | | | | | | |
| | Oven goes into Defrost Center 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. | | ● | | | | | | | | | | | | | | | | | | | | | | ● |

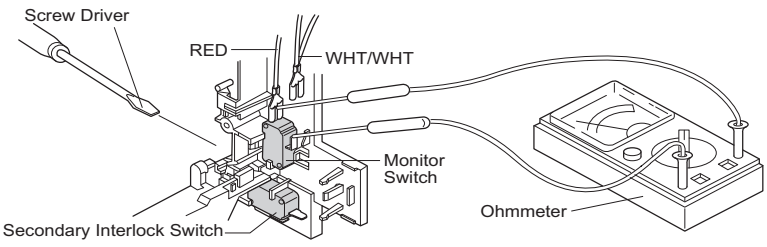
## TEST PROCEDURES

| PROCEDURE LETTER | COMPONENT TEST |
|---|---|
| A | **MAGNETRON ASSEMBLY TEST**<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. 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.<br>5. 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.<br>6. Reconnect all leads removed from components during testing.<br>7. Reinstall the outer cabinet case, then reconnect power supply cord.<br>8. Run the oven and check all functions.<br><br>***NOTE:*** *Power output of the magnetron (also referred to as Microwave output power) 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: power transformer, high voltage capacitor and silicon rectifier. This test will require a 16 ounce (453cc) measuring cup and an accurate mercury thermometer or thermocouple type temperature tester. For accurate results, the following procedure must be followed carefully:*<br>*The following test procedure should be performed with the microwave oven fully assembled.*<br><br>***WARNING:*** *HIGH VOLTAGE IS PRESENT DURING THE COOK CYCLE, SO EXTREME CAUTION SHOULD BE OBSERVED.*<br><br>*1. Fill the measuring cup with 16 oz. (453cc) of tap water and measure the temperature of the water with a thermometer or thermocouple temperature tester. Stir the thermometer or thermocouple through the water until the temperature stabilizes. Record the temperature of the water.*<br>*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.*<br>*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.*<br>*4. Subtract the cold water temperature from the hot water temperature. The normal result should be 38°F to 78°F (21°C 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 above or below the normal limits. The test is only accurate if the power supply line voltage is 120 volts and the oven cavity is clean.* |
| B | **POWER TRANSFORMER TEST**<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>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 1 scale, the resistance of the primary coil should be less than 1 ohm and the resistance of the high voltage coil should be approximately 90 ohms; the resistance of the filament coil should be less than 1 ohm.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions.<br><br>**WARNING:** HIGH VOLTAGE IS PRESENT AT THE HIGH VOLTAGE TERMINAL. DO NOT ATTEMPT TO MEASURE HIGH VOLTAGE AT THE FILAMENT. |

## TEST PROCEDURES

| PROCEDURE LETTER | COMPONENT TEST |
|---|---|
| C | **HIGH-VOLTAGE RECTIFIER TEST**<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. Isolate the rectifier from the circuit. Using the highest ohm scale of the meter, read the resistance across the terminals and observe meter reading, then 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.<br>***NOTE:*** *Be sure to use an ohmmeter that will supply a forward bias voltage of more than 6.3 volts.*<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions. |
| D | **HIGH VOLTAGE CAPACITOR TEST**<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>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.<br>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.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions. |
| E | **CAVITY TEMPERATURE FUSE TEST**<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>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, replace 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.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions. |
| ***(CONTINUED)*** | **C/T FUSE TEST**<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. A continuity check across the C/T fuse terminals should indicate a closed circuit unless the temperature of the C/T fuse reaches approximately 302°F (150°C). An open C/T fuse indicates overheating of the magnetron. Replace the temperature fuse and check for restricted air flow to the magnetron, especially the cooling fan air guide.<br>***NOTE:*** *If the temperature fuse indicates an open circuit at room temperature, replace the temperature fuse.*<br>5. If the C/T fuse is blown when the door is opened, check the primary interlock relay, secondary interlock switch and monitor switch according to the "TEST PROCEDURE" for those switches before replacing the blown monitor fuse.<br>***NOTE:*** *Before replacing a blown C/T fuse, test the primary interlock relay, secondary interlock switch and monitor switch according to the test procedure for those switches before replacing the blown C/T fuse.* |

## TEST PROCEDURES

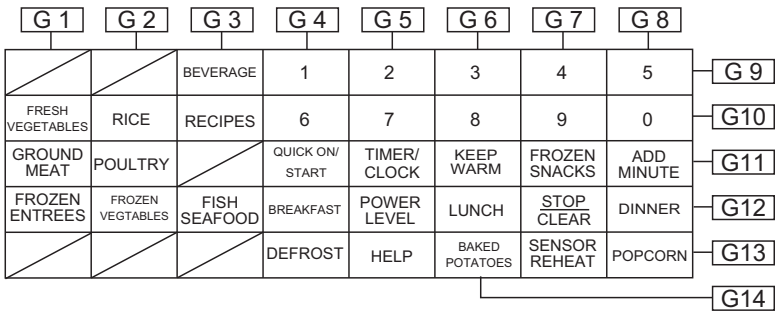
| PROCEDURE LETTER | COMPONENT TEST |
|---|---|
| *(CONTINUED)* E | *(CONTINUED)*<br>6. Reconnect all leads removed from components during testing.<br>7. Reinstall the outer cabinet case, then reconnect power supply cord.<br>8. Run the oven and check all functions. |
| F | **SECONDARY INTERLOCK SWITCH TEST**<br><br>*DOOR SENSING SWITCH*<br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>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 the complete Latch Hook/Switch Assembly.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions.<br><br>***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.* |
| | **PRIMARY INTERLOCK SYSTEM TEST**<br><br>*PRIMARY INTERLOCK RELAY (RY2)*<br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. Disconnect wire leads from the male tab terminals of Primary Interlock Relay. Check the state of the relay contacts with an ohmmeter, contacts should be open. If contacts are closed, replace entire circuit board.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions. |
| G | **MONITOR SWITCH TEST**<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. Before performing this test, make sure secondary interlock switch and primary interlock relay are operating properly. Then, disconnect wire lead from monitor switch (COM) terminal. Check monitor switch operation with ohmmeter as follows: With door open, meter should indicate a closed circuit. With monitor switch actuator pushed by a screw driver through the lower latch hole in oven cavity face plate and door opened (in this condition, monitor switch plunger is pushed in), meter should indicate an open circuit. If proper operation is indicated, reconnect wire lead to the monitor switch (COM) terminal and check continuity of monitor circuit. If monitor switch or monitor circuit indicates improper operation, replace Latch Hook/Switch Assembly.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions.<br><br>  <br> |

## TEST PROCEDURES

| PROCEDURE LETTER | COMPONENT TEST |
|---|---|
| H | **BLOWN C/T FUSE TEST**<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. If the monitor fuse is blown when the door is opened, check primary interlock relay as described earlier. If primary interlock relay indicates proper operation, replace the the complete Latch Hook/Switch Assembly.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions. |
| I | **TOUCH CONTROL PANEL ASSEMBLY TEST**<br><br>***NOTE:*** *The touch control panel consists of circuits including semiconductors such as LSI, ICS, etc. Therefore, unlike conventional microwave ovens, proper troubleshooting 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 the Control Unit is divided into two units, LSI Unit and Power Unit. Troubleshooting by unit replacement is described according to the symptoms indicated.*<br><br>*Before Testing:*<br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. Disconnect the leads to the primary of the power transformer and ensure that these leads remain isolated from other components and oven chassis by using insulation tape.<br>5. Re-connect the power supply cord.<br><br>*KEY UNIT*<br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. Check Key Unit ribbon connection before replacement.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions.<br>*The following symptoms indicate a defective Key Unit:*<br>*a. When touching the pads, a certain pad produces no signal at all.*<br>*b. When touching a number pad, two figures or more are displayed.*<br>*c. When touching the pads, sometimes a pad produces no signal.*<br>*If the Key unit is defective.*<br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. Replace the Key Unit.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions.<br><br>*CONTROL UNIT*<br>*The following symptoms may indicate a defective control unit. Before replacing the control unit, perform the Key Unit test (Procedure J) to determine if control unit is faulty.*<br>*a. In connection with pads.*<br>*1. When touching the pads, a certain group of pads do not produce a signal.*<br>*2. When touching the pads, no pads produce a signal.*<br>*b. In connection with indicators*<br>*1. At a certain digit, all or some segments do not light up.*<br>*2. At a certain digit, brightness is low.*<br>*3. Only one indicator does not light.* |

***(CONTINUED)*** ***(CONTINUED)***

## TEST PROCEDURES

| PROCEDURE LETTER | COMPONENT TEST |
|---|---|
| *(CONTINUED)* I | *(CONTINUED)*<br>*4. The corresponding segments of all digits do not light up; or they continue to light up.*<br>*5. Wrong figure appears.*<br>*6. A certain group of indicators do not light up.*<br>*7. The figure of all digits flicker.*<br>*8. The following symptoms indicate a defective LSI unit.*<br>*a. When touching the keys on the touch screen, a certain key produces no signal at all.*<br>*b. When touching a number key on the touch screen, two figures or more are displayed.*<br>*c. When touching the keys on the touch screen, sometimes a key produces no signal.*<br>*c. Other possible problems caused by defective control unit.*<br>*1. Buzzer does not sound or continues to sound.*<br>*2. Clock does not operate properly.*<br>*3. Cooking is not possible.*<br><br>*When testing is completed:*<br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. Reconnect all leads removed from components during testing.<br>5. Reinstall the outer cabinet case, then reconnect power supply cord.<br>6. Run the oven and check all functions. |
| J | **KEY UNIT TEST**<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. If the display fails to clear when the STOP/CLEAR pad is depressed, first verify the flat ribbon cable is making good contact, verify that the door sensing switch (stop switch) operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the door sensing switch (stop switch) is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the door sensing switch is closed (either close the door or short the door sensing switch connecter). Use the Key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP/CLEAR pad making momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.<br>5. Reconnect all leads removed from components during testing.<br>6. Reinstall the outer cabinet case, then reconnect power supply cord.<br>7. Run the oven and check all functions.<br><br>  <br> |

## TEST PROCEDURES

| PROCEDURE LETTER | COMPONENT TEST |
|---|---|
| K | **RELAY TEST** |

1. Disconnect power supply cord and remove outer cabinet case.
2. Open door and block it open.
3. Discharge high-voltage capacitor.
4. Disconnect the leads to the primary of the power transformer and ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
5. Re-connect the power supply cord.
6. 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 120 volts, if not, check oven circuit.

*RY1 and RY2 RELAY TEST*

***NOTE:*** *These relays are operated by D.C. voltage. Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.*

a. DC. voltage indicated ..... Defective relay.
b. DC. voltage not indicated ..... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

| RELAY SYMBOL | OPERATIONAL VOLTAGE | CONNECTED COMPONENTS |
|---|---|---|
| RY1 | Approx. 24.0V D.C. | Oven lamp / Turntable motor / Cooling fan motor |
| RY2 | Approx. 23.0V D.C. | Power transformer |

7. Disconnect power supply cord and remove outer cabinet case.
8. Open door and block it open.
9. Discharge high-voltage capacitor.
10. Reconnect all leads removed from components during testing.
11. Reinstall the outer cabinet case, then reconnect power supply cord.
12. Run the oven and check all functions.

| | |
|---|---|
| L | **COMPU DEFROST TEST** |

**WARNING:** THE OVEN SHOULD BE FULLY ASSEMBLED BEFORE PERFORMING THE FOLLOWING PROCEDURE.

1. Place one cup of water in the center of the turntable tray in the oven cavity.
2. Close the door; touch the Defrost pad and touch the number pad 5 twice; touch the start pad.
3. The oven is in Compu Defrost cooking condition.
4. The oven will operate as follows:

| WEIGHT | 1ST STAGE | | 2ND STAGE | |
|---|---|---|---|---|
| | LEVEL | TIME | LEVEL | TIME |
| 0.5lb | 70% | 30sec. | 40% | 15sec. |

5. If improper operation is indicated, the control unit is probably defective and should be checked.

## TEST PROCEDURES

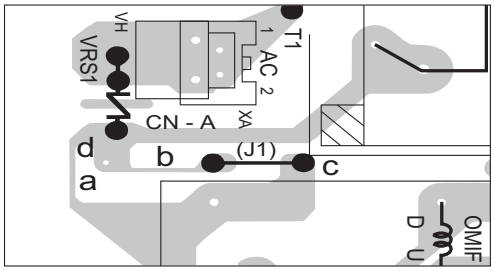
| PROCEDURE LETTER | COMPONENT TEST |
|---|---|
| M | **FOIL PATTERN ON THE PRINTED WIRING BOARD TEST** |

***NOTE:*** *To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse.*

1. Foil pattern check and repairs.
   a. Disconnect power supply cord and remove outer cabinet case.
   b. Open door and block it open.
   c. Discharge high-voltage capacitor.
   d. Follow steps on troubleshooting table below for repair.

| STEPS | OCCURRENCE | CAUSE OR CORRECTION |
|---|---|---|
| 1 | Only pattern at "a" is broken. | Replace PWB |
| 2 | Pattern at "a" and "b" are broken. | Replace PWB |

   e. Make a visual inspection of the varistor. Check for burned damage and examine the transformer with a tester for the presence of layer short-circuit (check the primary coil resistance which is approximately 210 ohm ± 15%). If any abnormal condition is detected, replace the PWB.
   f. Reconnect all leads removed from components during testing.
   g. Reinstall the outer cabinet case, then reconnect power supply cord.
   h. Run the oven and check all functions.




2. Follow the troubleshooting guide given below, if indicator does not light up after above check and repairs are finished.
   a. Disconnect power supply cord and remove outer cabinet case.
   b. Open door and block it open.
   c. Discharge high-voltage capacitor.
   d. Disconnect the leads to the primary of the power transformer and ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
   e. After that procedure, re-connect the power supply cord.
   f. Follow steps on troubleshooting table below for repair.

| STEPS | OCCURRENCE | CAUSE OR CORRECTION |
|---|---|---|
| 1 | The rated AC voltage is not present between Pin No. 1 of the 2-pin connector (A) and the common terminal of the relay RY1. | Check supply voltage and oven power cord. |
| 2 | The rated AC voltage is present at primary side of low voltage transformer. | Low voltage transformer or secondary circuit defective. Check and repair. |

   g. Disconnect power supply cord and remove outer cabinet case.
   h. Open door and block it open.
   i. Discharge high-voltage capacitor.
   j. Reconnect all leads removed from components during testing.
   k. Reinstall the outer cabinet case, then reconnect power supply cord.
   l. Run the oven and check all functions.

## TEST PROCEDURES

| PROCEDURE LETTER | COMPONENT TEST |
|---|---|
| N | **AH SENSOR TEST (Checking the initial sensor cooking condition)**<br><br>**WARNING:** THE OVEN SHOULD BE FULLY ASSEMBLED BEFORE PERFORMING THE FOLLOWING PROCEDURE.<br><br>1. The oven should be plugged in at least two minutes before sensor cooking.<br>2. Room temperature should not exceed 95°F (35°C)<br>3. The unit should not be installed in any area where heat and steam are generated. The unit should not be installed for example, next to conventional surface unit. Refer to the "INSTALLATION GUIDE".<br>4. Exhaust vents are provided on the back of the unit for proper cooling and air flow in the cavity. To permit adequate ventilation, be sure to install so as not to block these vents. There should be some space for air circulation.<br>5. Be sure the exterior of the cooking container and the interior of the oven are dry. Wipe off any moisture with dry cloth or paper towel.<br>6. The Sensor works with food at normal storage temperature. For example, chicken pieces would be at refrigerator temperature and canned soup at room temperature.<br>7. Avoid using aerosol sprays or cleaning solvents near the oven while using Sensor settings. The sensor will detect the vapor given of by the spray and turn off before food is properly cooked.<br>8. If the sensor has not detected the vapor of the food, ERROR will appear and the oven will shut off.<br><br>*WATER LOAD COOKING TEST*<br><br>***NOTE:*** *Make sure the oven has been plugged in at least two minutes before checking sensor cook operation. The cabinet should be installed and screws tightened.*<br><br>1. The oven should be plugged in at least two minutes before sensor cooking.<br>2. Fill approximately 200 milliliters (7.2 oz) of tap water in 1000 milliliters measuring cup.<br>3. Place the container on center of tray in the oven cavity.<br>4. Close the door.<br>5. Touch the Timer/Clock pad once, the Power Level pad twice, the Start pad once and the Number pad once. The oven is now in sensor cooking condition and "TEST", "SENSOR" and "COOK" will appear in the display.<br>6. The oven will operate for the first 16 seconds, without generating microwave energy.<br>***NOTE:*** *ERROR will appear if the door is opened or STOP/CLEAR pad is touched during the first stage of sensor cooking.*<br>7. After approximately 16 seconds, microwave energy is produced.<br>8. If ERROR is displayed, replace the AH sensor or check the control unit, refer to explanation below. If the oven stops after 5 minutes and ERROR is displayed, check the parts except for the AH sensor.<br><br>*TESTING METHOD FOR AH SENSOR AND /OR CONTROL UNIT*<br><br>***NOTE:*** *To determine if sensor is defective, the simplest method is to replace it with a new replacement sensor.*<br><br>1. Disconnect power supply cord and remove outer cabinet case.<br>2. Open door and block it open.<br>3. Discharge high-voltage capacitor.<br>4. Remove the AH sensor.<br>5. Install the new AH sensor.<br>6. Reconnect all leads removed from components during testing.<br>7. Reinstall the outer cabinet case, then reconnect power supply cord.<br>8. Perform the Water Load Cooking Test described above.<br>9. If new sensor does not operate properly, the problem is with the control unit, see Checking Control Unit on next page. |

*(CONTINUED)*

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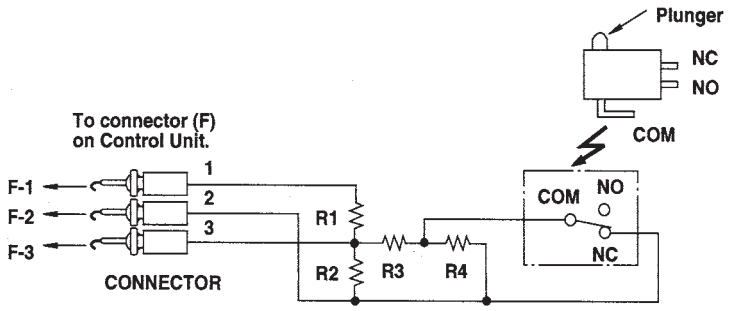
## TEST PROCEDURES

| PROCEDURE LETTER | COMPONENT TEST |
|---|---|
| *(CONTINUED)* **N** | *(CONTINUED)* |

*CHECKING CONTROL UNIT*

1. Disconnect power supply cord and remove outer cabinet case.
2. Open door and block it open.
3. Discharge high-voltage capacitor.
4. Disconnect the sensor connector that is mounted to control panel.
5. Then connect the dummy resistor circuit (see fig.) to the sensor connector of control panel.
6. Disconnect the leads to the primary of power transformer.
7. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
8. Re-connect the power supply cord.
9. Check the sensor cook operation proceed as follows:
   a. Touch Timer/Clock pad once, the Power Level pad twice, the Start pad once and the Number pad once.
   b. The control panel is in the sensor cooking operation.
   c. After approximately 25 seconds, push plunger of select switch for more than 3 seconds. This condition is same as judgement by AH sensor.
   d. After approximately 3 seconds, the display shows "xx.xx" which is remaining cooking time, and the display count down.
      1. If the above is not the case, the control unit is probably defective.
      2. If the above is proper, the AH sensor is probably defective.
10. Disconnect power supply cord and remove outer cabinet case.
11. Open door and block it open.
12. Discharge high-voltage capacitor.
13. Reconnect the sensor connector that is mounted to control panel.
14. Carry out the necessary repair.
15. Reconnect all leads removed from components during testing.
16. Reinstall the outer cabinet case, then reconnect power supply cord.
17. Run the oven and check all functions.
18. Perform the Water Load Cooking Test described on previous page to ensure proper operation.



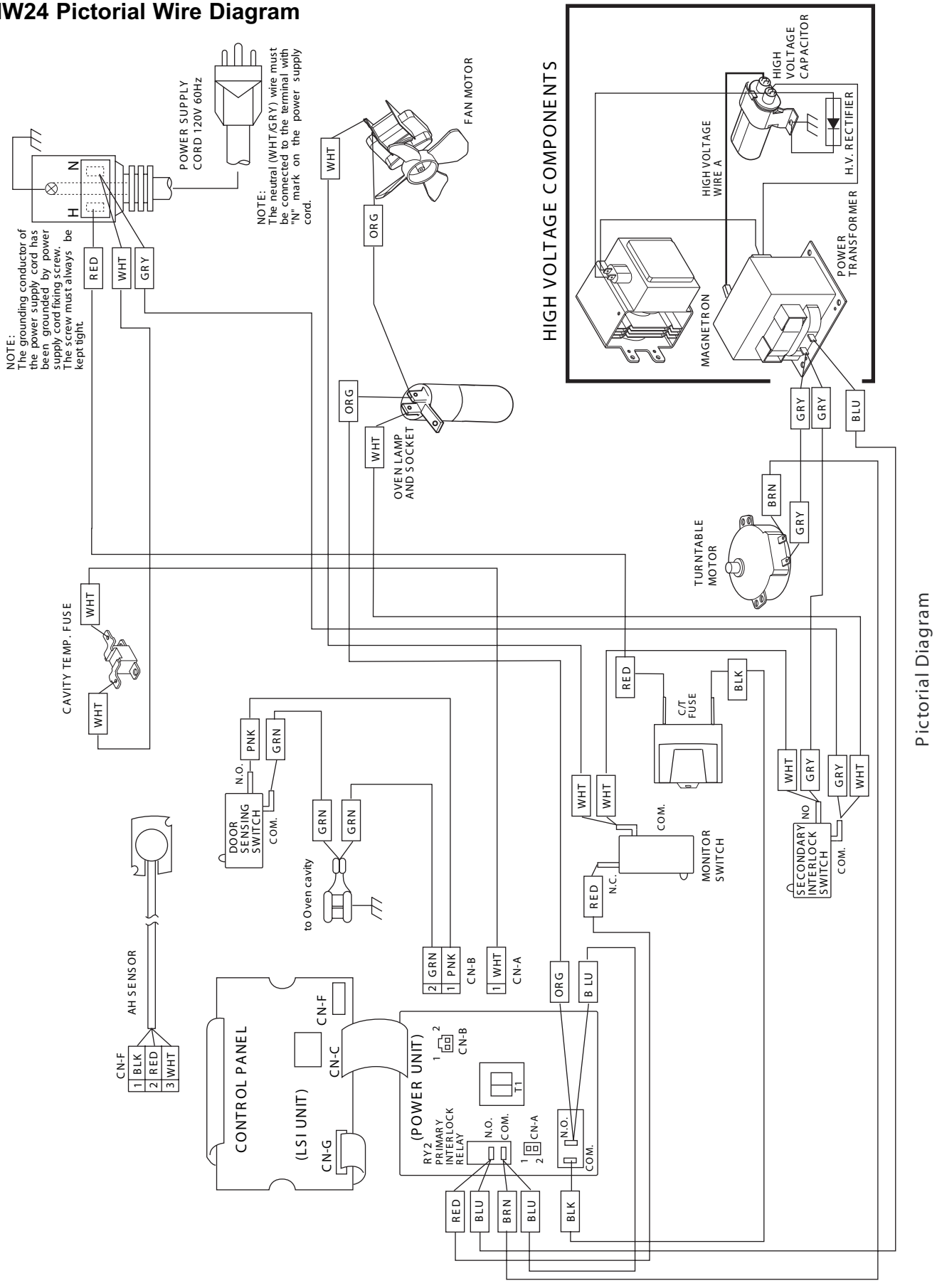

R1,R2 : 22Ω ± 1% 1/2W
R3 : 4.3kΩ ± 5% 1/4W
R4 : 1MΩ ± 5% 1/4W

**Sensor Dummy Resistor Circuit**

# SECTION 7

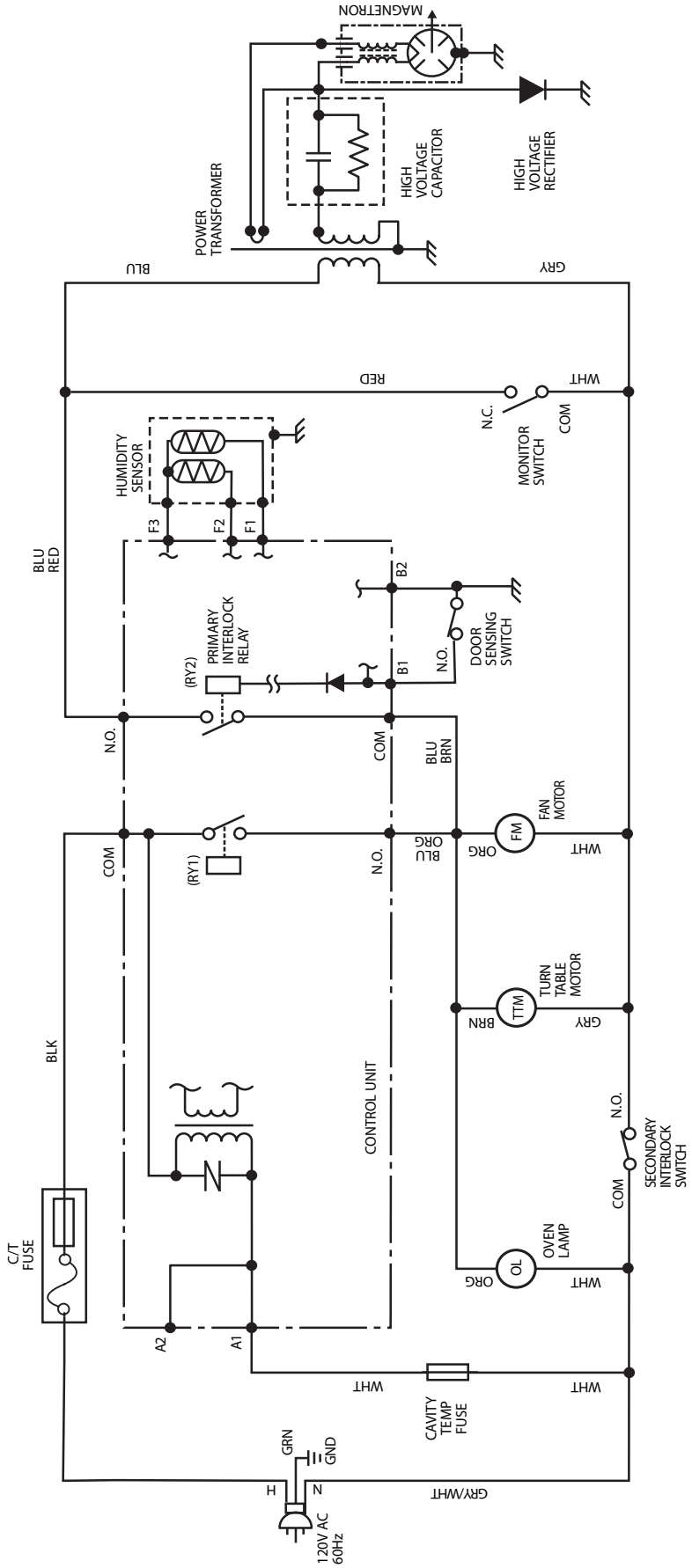
# WIRING DIAGRAMS & SCHEMATICS

## MW24 Pictorial Wire Diagram

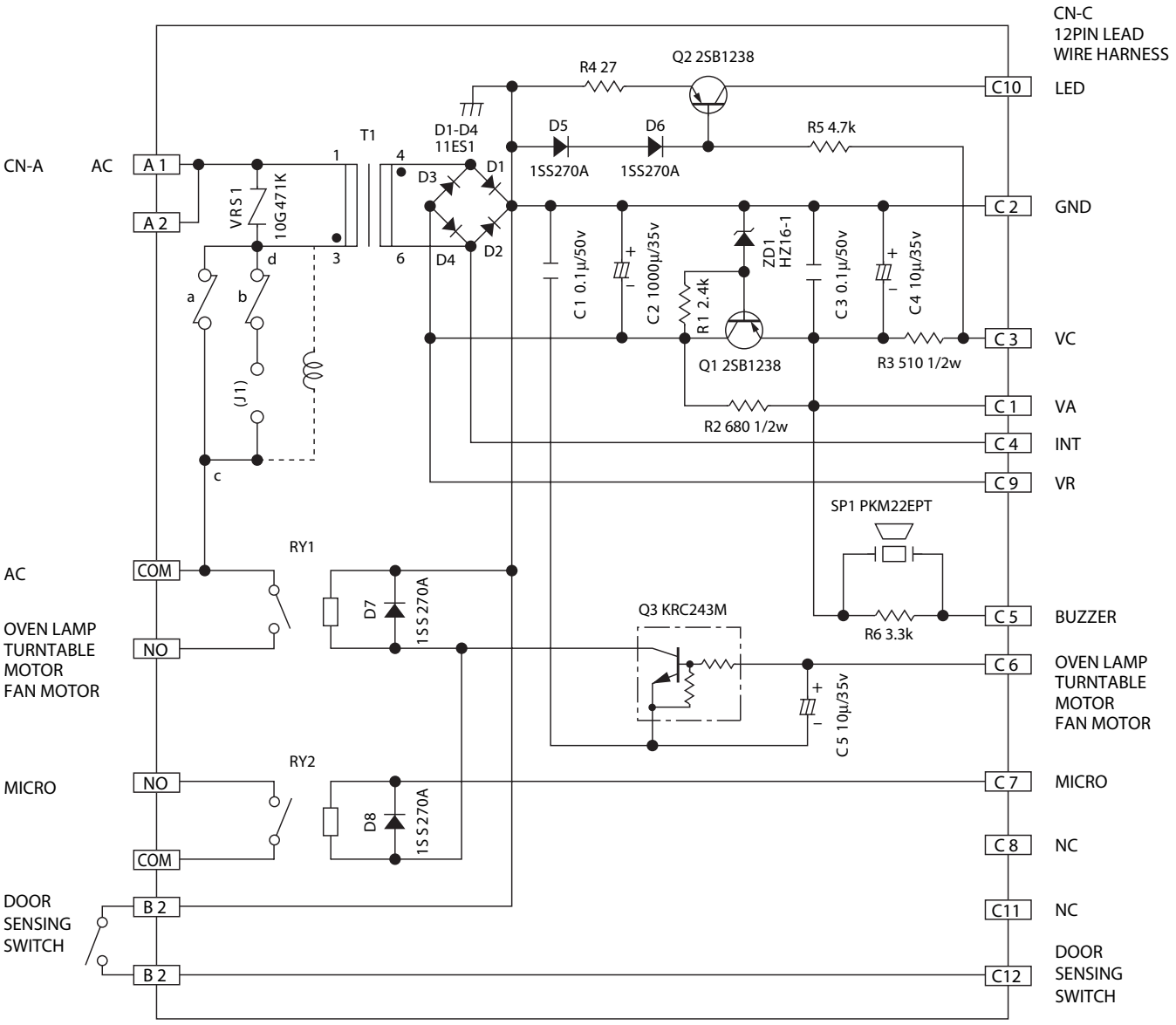



Pictorial Diagram

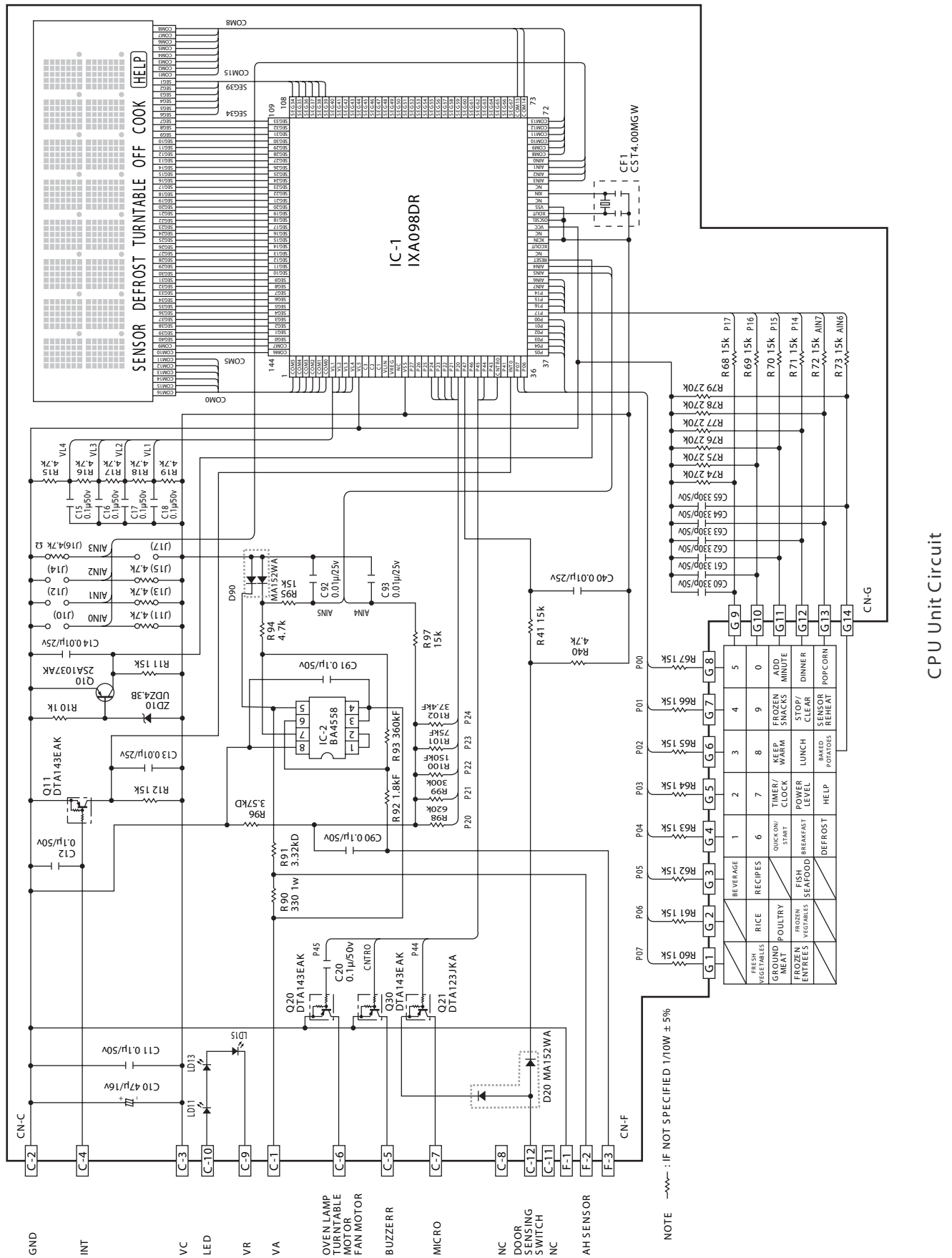
## MW24 Wire Schematic



## MW24 Power Unit Circuit



## MW24 LSI (Large Scale Integration) Unit Circuit



**MW24 PC Board of Power Unit**