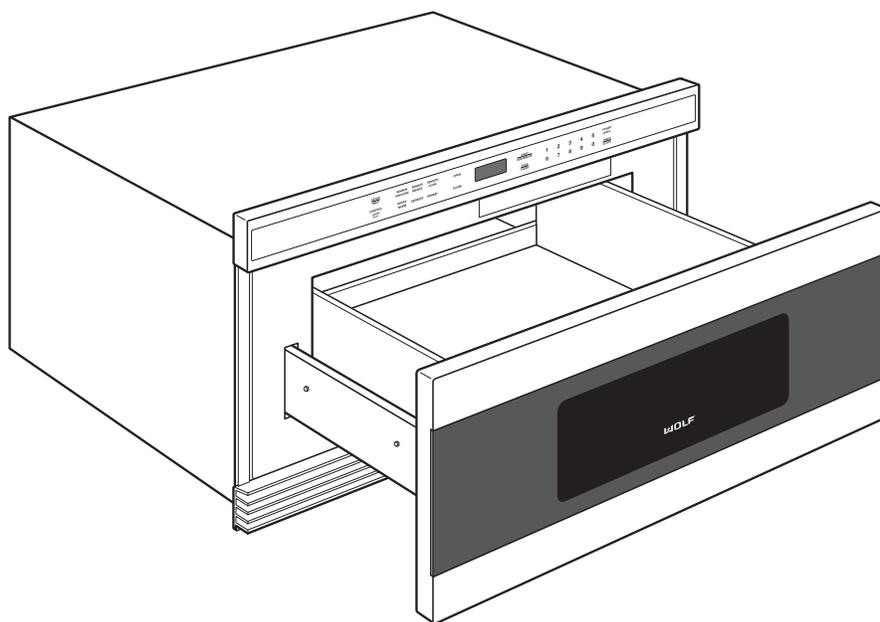




Technical Service Manual



Drawer Microwave Models: MWD24-2 & MWD30-2



SECTION 1

GENERAL INFORMATION



INTRODUCTION

This Wolf Drawer Microwave Technical Service Manual, Part #813632, has been compiled with information provided by the Sharp Electronics Corporation. This manual provides the most recent technical service information that will enable the service technician to troubleshoot and diagnose malfunctions, perform necessary repairs and return a Wolf Drawer Microwave to proper operational condition.

The Service Technician should read the complete instructions contained in this manual before initiating any repairs on a Wolf Appliance.

IMPORTANT SAFETY INFORMATION

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

When reviewing this manual, please note these different Product Safety Labels placed at the beginning of certain sections of this manual. You must follow the instructions given in the boxes of the Product Safety Labels in order to avoid personal injury and/or product damage.

The sample Product Safety Labels below illustrate the precautions that should 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, and/or product damage, and/or property damage!

In addition, please pay attention to the signal word "**NOTE**", which highlights information that is especially important for the topic being covered.

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

TECHNICAL ASSISTANCE

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

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

*Customer Assistance
Phone #: (800) 332 - 9513
Facsimile #: (608) 441 - 5887*

*Technical Assistance
(For Technicians in Customer's Homes Only)
Phone #: (800) 919 - 8324*

*Warranty Claims
Phone #: (800) 332 - 9513
Facsimile #: (608) 441 - 5886*

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

*Office Hours:
7:00 AM to 6:00 PM Central Time
Monday through Friday*

The information and images contained in this manual are the copyright property of Wolf appliance, Inc. Neither this manual nor any information or images contained herein may be copied or used in whole or in part without the express written consent of Wolf Appliance, Inc.©, all rights reserved.



TABLE OF CONTENTS

	<i>Page #</i>		<i>Page #</i>
<u>Section 1 - General Information</u>		<u>Section 4 - Component Access and Removal</u>	
Introduction	1-2	Warnings and Cautions	4-2
Important Safety Information	1-2	Precautions For Using Lead-Free Solder	4-3
Technical Assistance	1-2	Microwave Measurement Procedure	4-4
Table of Contents	1-3	Touch Control Panel Servicing	4-5
Warranty Information	1-4	Drawer Microwave Disassembly	4-6
Model Number Key	1-5	Upper Cabinet Component Replacement	4-7
Model Configurations	1-6	Cavity Light Replacement	4-7
<u>Section 2 - Installation Information</u>		Power Cord Replacement	4-7
Electrical Requirements	2-2	Switch (Stop, Monitor, Secondary Interlock) Removal	4-8
Clearances and Dimensions	2-3	Switch (Stop, Monitor, Secondary Interlock) Adjustment.....	4-9
Installation Procedures	2-4	Drawer Assembly and Choke Cover Removal	4-10
<u>Section 3 -Theory and Operation</u>		Drawer Support Angle Removal	4-10
User Operation	3-2	Actuator Removal	4-11
Set Clock	3-2	Actuator Adjustment.....	4-11
Timer	3-2	Auto Drawer Removal / Installation	4-12
Stop/Clear Feature	3-3	Rack Gear Removal	4-13
Open/Close Drawer Microwave	3-3	Major Control Components	4-13
Time Cooking	3-3	<u>Section 5 - Troubleshooting Guide</u>	
Setting Power Level	3-4	Warnings and Cautions	5-2
Sensor Cooking	3-4	Microwave Measurement Procedure	5-3
Sensor Popcorn and Sensor Reheat Feature	3-5	Touch Control Panel Test	5-4
To Sensor Cook	3-5	Key Unit Test	5-5
Defrost Feature	3-6	Relay Test	5-6
Manual Defrost	3-6	Defrost Test	5-7
Reheat Feature	3-6	Open Fuse On PWB	5-8
Micro Warm Feature	3-6	AH Sensor Test	5-9
Manual Cooking / Multiple Sequence Cooking	3-7	Magnetron Assembly Test	5-11
SetUp/Help Feature	3-7	Microwave Output Power	5-12
Start/Add Minute	3-8	Thermal Cut-Out Test	5-13
More or Less Time Adjustment	3-8	Secondary Interlock Switch Test	5-13
Control Lock ON/OFF Feature	3-8	Stop Switch Test	5-13
Audible Signal Elimination	3-9	Monitor Switch Test	5-14
Auto Start	3-9	Blown Monitor Fuse Test	5-15
Demonstration Mode	3-10	Power Transformer Test	5-15
Technical Operation	3-10	<u>Section 6 - Wiring Diagrams</u>	
Cooking Condition	3-11	Harness Pinout Wiring	6-2
Schematic (Off Condition)	3-12	Power Unit Circuit	6-3
Sensor Cooking Condition	3-13	Control Unit Circuit	6-4
Cooking Sequence	3-13	Printed Wiring Board of Power Unit	6-5
Humidity Sensor Circuit	3-14	Printed Wiring Board of Control Unit	6-6
Touch Panel Function	3-15		
Description of LSI	3-16		



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 & 1-2 for Rating Plate layout and location.

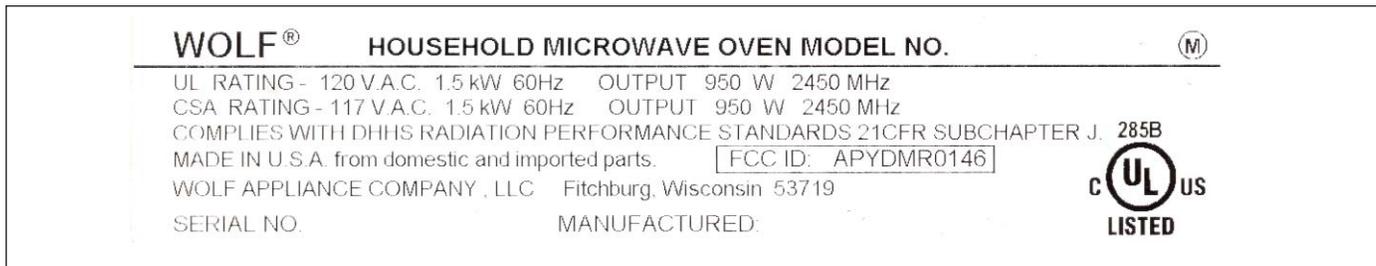


Figure 1-1. Rating Plate Label

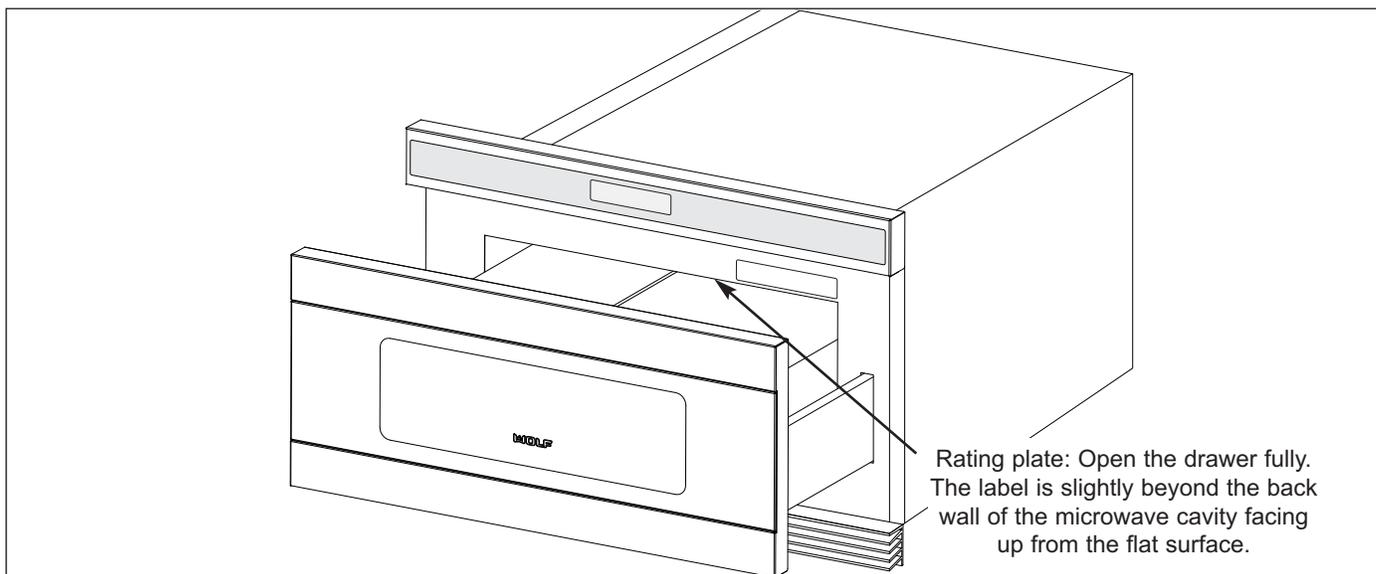


Figure 1-2. Rating Plate Label

DRAWER MICROWAVE FEATURES

- Built-in microwave oven with 950 watts of power
- 30" (762mm) model allows microwave to be built in to fit below a Wolf built-in E-Series oven
- Classic stainless steel finish
- Sensor cooking
- Micro warm allows you to keep food warm up to 30 minutes
- Easy-to-operate control panel and 11 programmable power levels (See Figure 1-4)
- Interactive display—99 minutes, 99 seconds
- Oven drawer with window
- Control lock
- Oven light comes on when oven is operating or drawer is open
- Tight drawer seals with automatic drawer open/close

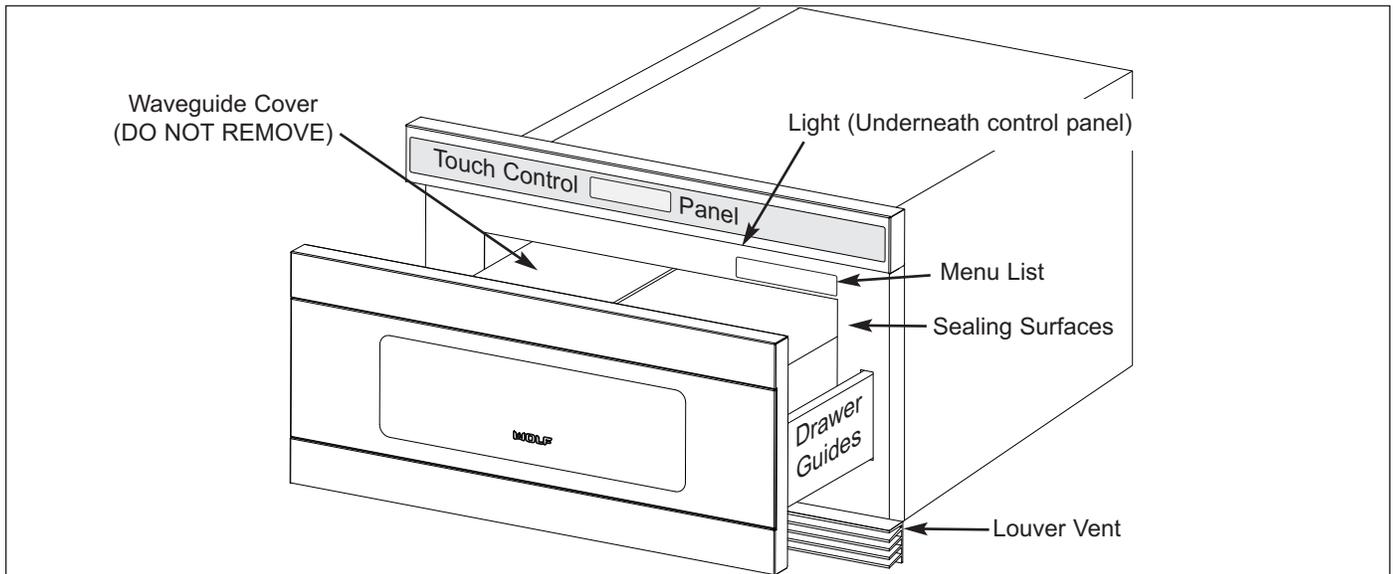


Figure 1-3. Drawer Microwave Features

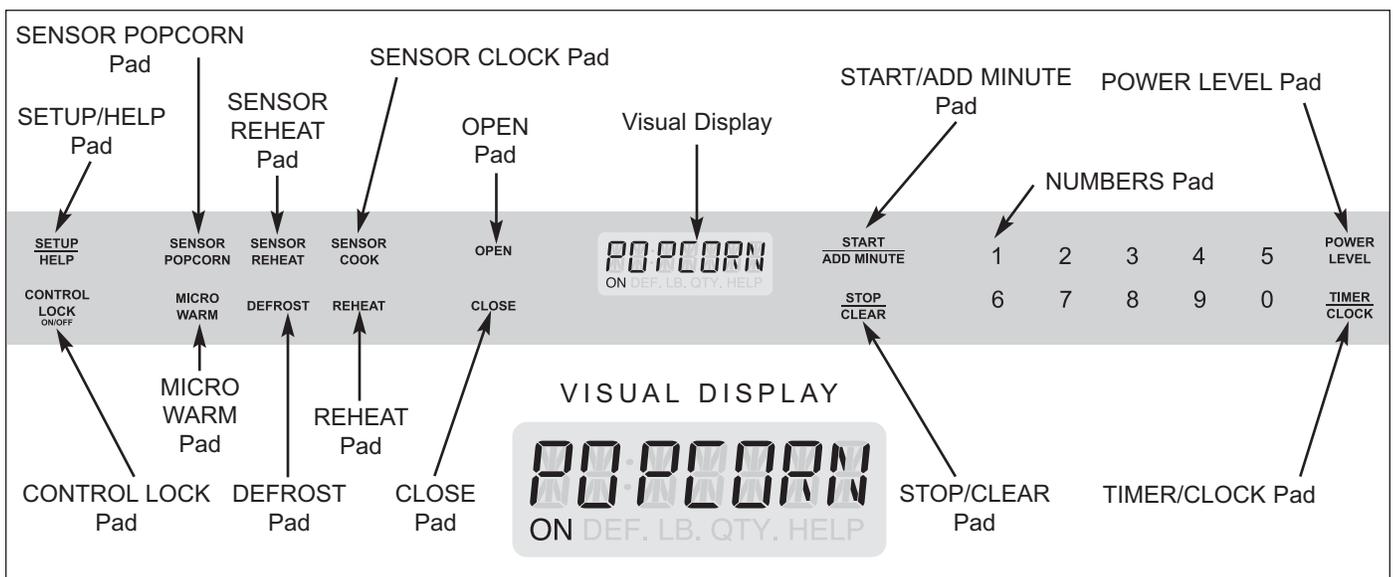


Figure 1-4. Touch Control Panel Layout



COOKWARE SUGGESTIONS

NOTE: Make sure the utensil does not touch the interior walls during cooking.

Use these utensils for safe microwave cooking and reheating:

- Glass ceramic
- Heat-resistant glass
- Microwave-safe plastics
- Microwave-safe paper plates
- Microwave-safe pottery, stoneware and porcelain
- Browning dish (Do not exceed recommended preheating time. Follow manufacturer's directions.)

These items can be used for short time reheating of foods that have little fat or sugar in them:

- Wood, straw, wicker

DO NOT USE:

- Metal pans and bake-ware
- Dishes with metallic trim
- Non-heat-resistant glass
- Non-microwave-safe plastics (margarine tubs)
- Recycled paper products
- Brown paper bags
- Food storage bags
- Metal twist-ties

NOTE: To check if a dish is safe for microwaving, place the empty dish in the oven and microwave on HIGH for 30 seconds. If the dish becomes very hot, DO NOT use it for microwaving.

RADIO OR TV INTERFERENCE

Should there be any interference caused by the drawer microwave to your radio or TV, check that the drawer microwave is on a different electrical circuit, relocate the radio or TV as faraway from the drawer as feasible or check position and signal of receiving antenna.

CLEANING AND CARE

Stainless Steel Surface: The exterior should be wiped often with a soft damp cloth and polished with a soft dry cloth to maintain its beauty. There are also a variety of products designed especially for cleaning and shining the stainless exterior of the oven. We recommend that the cleaner be applied to a soft cloth and then carefully used on the stainless exterior rather than sprayed directly on to it. Follow package directions carefully.

Front Side of Drawer: Wipe the window on both sides with a soft damp cloth to remove any spills or spatters. Metal parts will be easier to maintain if wiped frequently with a soft damp cloth. Avoid the use of spray and other harsh cleaners as they may stain, streak or dull the door surface.

Touch Control Panel: If desired, the touch pads may be deactivated before cleaning. See the CONTROL LOCK information on page 3-8 of section 3, Theory of Operation, of this manual. Wipe the panel with a cloth dampened slightly with water only. Dry with a soft cloth. Do not scrub or use any sort of chemical cleaners. Close door and follow directions on page 3-8 for turning CONTROL LOCK off. Touch STOP/CLEAR.

Interior: Cleaning is easy because no heat is generated to the interior surfaces; therefore, there is no baking and setting of spills or spattering. To clean the interior surfaces, including drawer sealing surfaces, wipe with a soft damp cloth. Do not use abrasive or harsh cleaners or scouring pads. For heavier soil, use mild soap; wipe clean with a soft damp cloth. Do not use any chemical oven cleaners.

Drawer Guides: Remove the food crumbs from the drawer guides. Wipe with a soft dry cloth in order to keep the drawer Microwave opening and closing smoothly.

Odor Removal: Occasionally, a cooking odor may remain in the drawer microwave. To remove, combine 1 cup (250 ml) water, grated peel and juice of one lemon and several whole cloves in a 2-cup(500 ml) glass measuring cup. Boil for several minutes using 100% power. Allow to sit in the drawer microwave until cool. Wipe interior with a soft cloth.



SECTION 2

INSTALLATION INFORMATION

INSTALLATION INFORMATION

Below are the Product Safety Labels used in this manual. This section of the manual covers some of the installation issues that a service technician may need to know when servicing a Wolf Drawer Microwave. 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.

⚠ WARNING

- **TO REDUCE RISK OF TIPPING, DRAWER MICROWAVE MUST BE SECURED BY A PROPERLY INSTALLED ANTI-TIP BLOCK.**
- **STEPPING, LEANING OR SITTING ON DRAWER MAY RESULT IN SERIOUS INJURIES AND CAN ALSO CAUSE DAMAGE TO DRAWER MICROWAVE.**
- **FOR SAFETY CONSIDERATIONS DO NOT INSTALL DRAWER IN ANY COMBUSTIBLE CABINETRY, WHICH IS NOT IN ACCORD WITH THE STATED CLEARANCES AND DIMENSIONS PROVIDED IN PRODUCT INSTALLATION INSTRUCTIONS.**
- **NEVER LEAVE CHILDREN ALONE OR UNATTENDED IN THE AREA WHERE A DRAWER MICROWAVE IS IN USE. NEVER LEAVE DRAWER OPEN WHEN MICROWAVE IS UNATTENDED.**
- **DO NOT USE DRAWER MICROWAVE AS A STORAGE SPACE. THIS CREATES A POTENTIALLY HAZARDOUS SITUATION. CHECK THAT THE TIME-OF-DAY IS IN THE DISPLAY. IF NOT, TOUCH STOP/CLEAR TO PREVENT UNINTENDED USE.**
- **THIS DRAWER MICROWAVE MUST BE ELECTRICALLY GROUNDED IN ACCORDANCE WITH LOCAL CODES.**
- **DO NOT USE AN EXTENSION CORD. IF POWER SUPPLY CORD IS TOO SHORT, HAVE A QUALIFIED ELECTRICIAN OR SERVICEMAN INSTALL AN OUTLET NEAR THE APPLIANCE.**

Electrical Requirements

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

- 120 volt 60Hz, AC only, 15 amp protected electrical supply.
- Separate the electrical circuit serving only this appliance.
- A properly grounded 3-prong receptacle (See Figure 2-1).

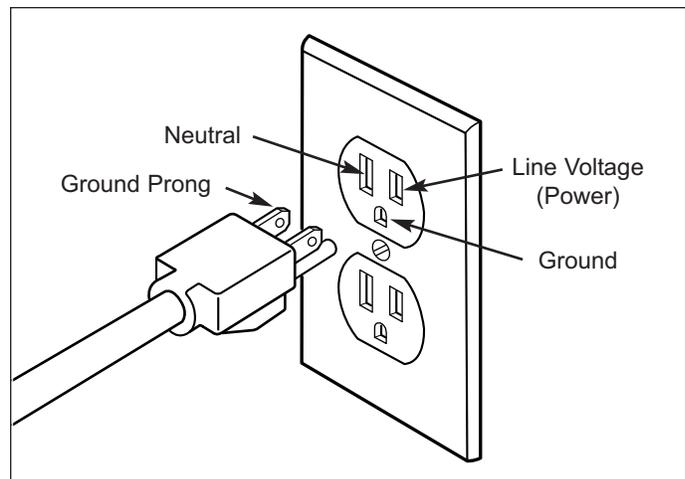


Figure 2-1. Grounded Receptacle

Clearances and Dimensions

Dimensions shown on this page must be used. Given dimensions provide minimum clearance. Locate electrical outlet in the shaded area in the upper left hand corner of the cutout (See Figures 2-2, 2-3, 2-4 & 2-5).

NOTES:

- The drawer microwave can also be installed using an electrical outlet in an adjacent cabinet within the area where the provided electrical cord can reach. Power cord access hole in cabinet should be a minimum of 1 1/2" (38mm) diameter hole and de-burred of all sharp edges.
- Always allow sufficient power cord length to the electrical outlet to prevent tension.

Contact surface must be solid and level. Pay special attention to the floor on which the drawer microwave will sit. The floor of the opening should be constructed of plywood strong enough to support the weight of the oven, about 100 pounds (45 kg).

Check location where the drawer microwave will be installed for proper electrical supply.

Your oven can be built into a cabinet or wall by itself or under a gas or electric wall oven.

Be sure that the clearance of the floor between the wall oven and the drawer microwave is a minimum of 2" (51mm).

The microwave interior will easily accommodate a 9" (229mm) x 13" (330mm) oblong dish or a bag of microwave popcorn.

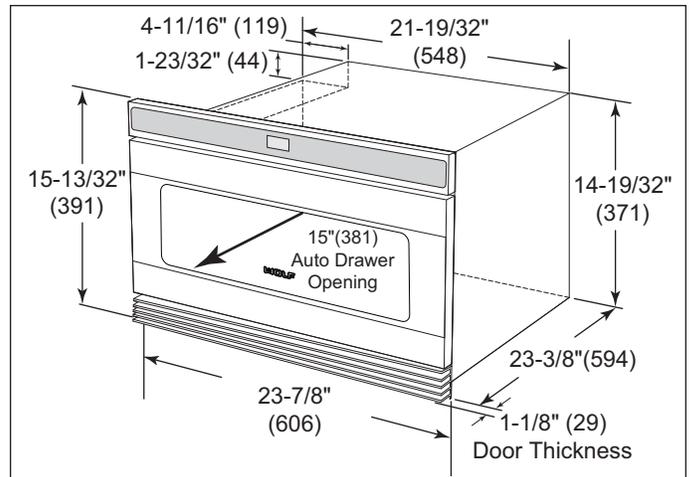


Figure 2-2. 24" Drawer Microwave Dimensions

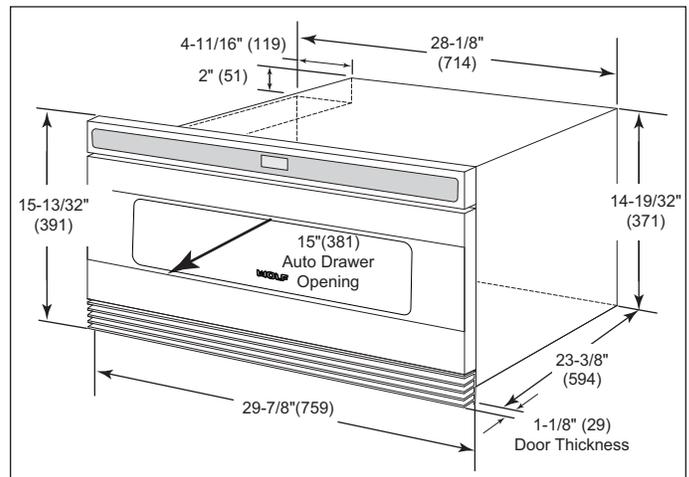


Figure 2-3. 30" Drawer Microwave Dimensions

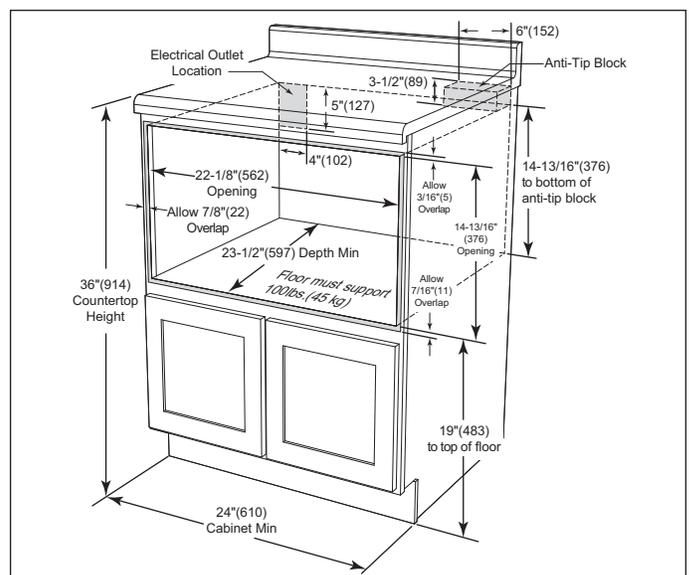


Figure 2-4. 24" Drawer Microwave Install Specifications

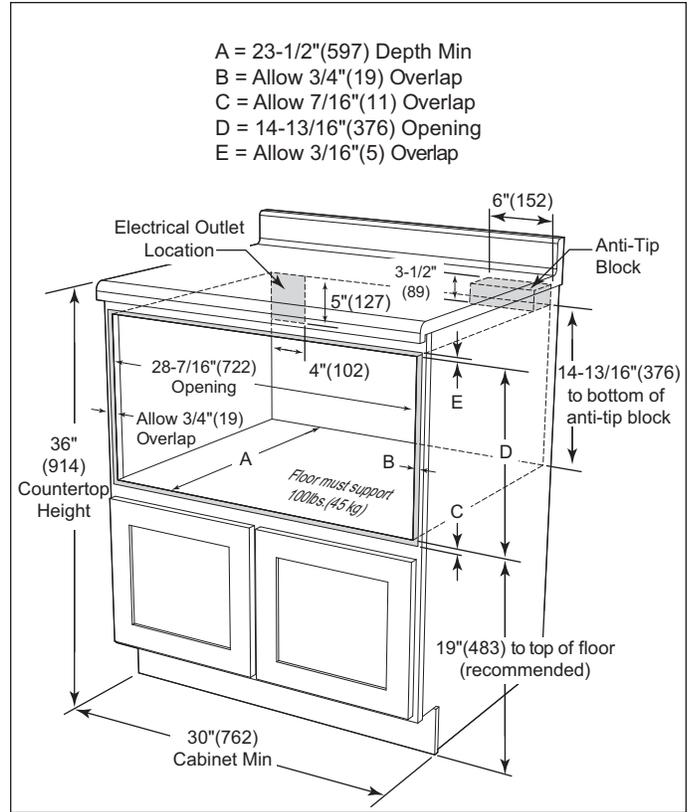
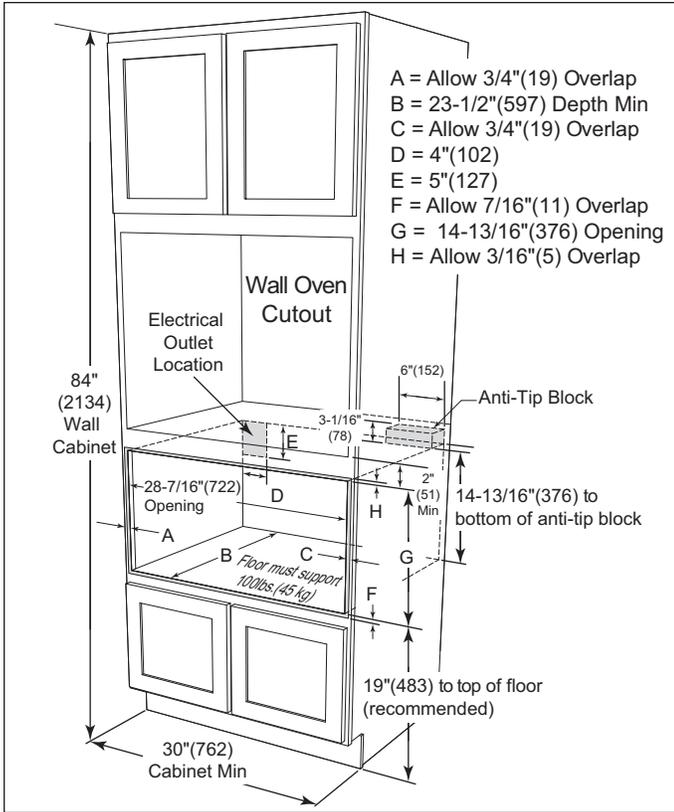


Figure 2-5. 30" Drawer Microwave Install Specifications

Drawer Installation

Place the drawer adjacent to the wall or cabinet opening. Plug the power supply cord into the electrical outlet. Carefully guide the drawer into the prepared opening. **NOTE:** Avoid pinching the cord between the oven and the wall. Slide the drawer all the way until the mounting flange is flush with the face of the cabinet. With the drawer open, use the four mounting holes on the drawer as a template. Pre drill the cabinet using a 1/16" (1.6mm) drill bit. Then, secure the drawer with the four mounting screws supplied (See Figure 2-6).

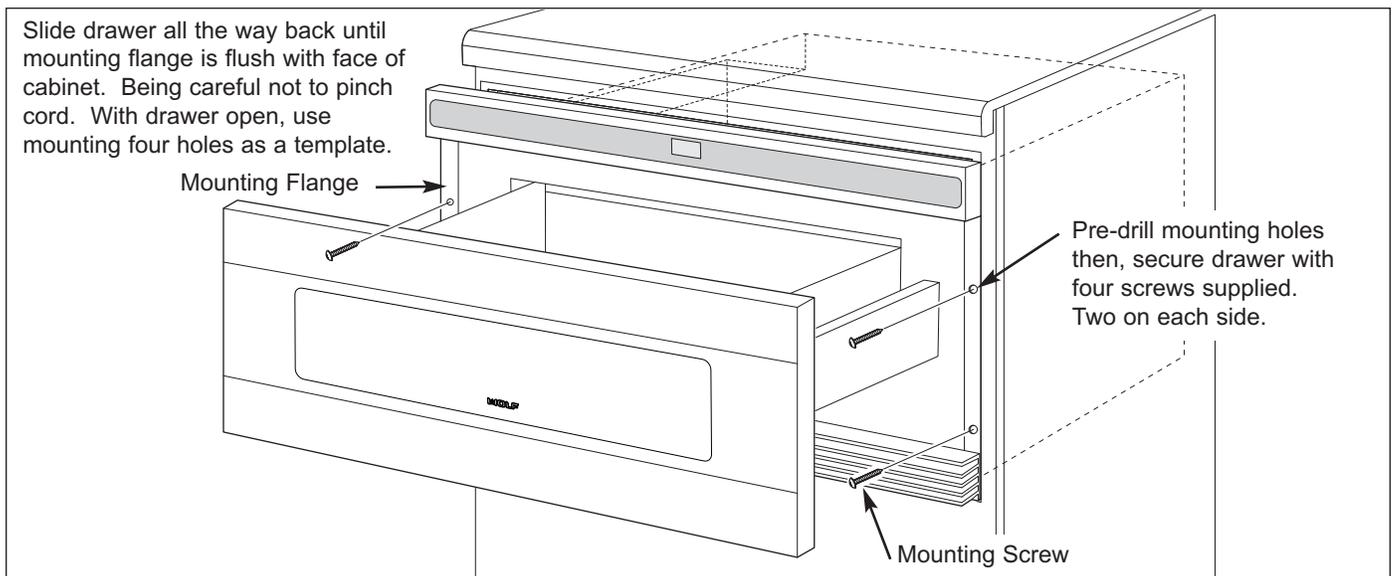


Figure 2-6. Drawer Microwave Installation (MWD24 shown)

SECTION 3

THEORY OF OPERATION



USER OPERATION

Before operating drawer microwave, make certain you read and understand the operation instructions completely. Before the drawer microwave can be used, follow these steps:

1. Plug in drawer microwave. **ENJOY YOUR MICRO-WAVE TOUCH CLEAR AND TOUCH CLOCK** will appear in the display (See Figure 3-1).
2. Touch the STOP/CLEAR pad (See Figure 3-1). **:** will appear in the display.
3. Set clock (proceed to steps below).



Figure 3-1. Getting Started

TO SET THE CLOCK (See Figure 3-2):

1. Touch TIMER/CLOCK pad. **TO SET TIMER PRESS 1 TO SET CLOCK PRESS 2** will appear in the display. Press the number two (2).
2. Touch number pads for correct time of day then, touch TIMER/CLOCK pad again.

This is a 12 hour clock. If you attempt to enter an incorrect clock time, **ERROR** will appear in the display. Touch the STOP/CLEAR pad and re-enter the time.

If the electrical power supply to your drawer microwave should be interrupted, the display will intermittently show **ENJOY YOUR MICRO-WAVE TOUCH CLEAR AND TOUCH CLOCK** after the power is reinstated. If this occurs during cooking, the program will be erased. The time of day will also be erased. Simply touch the STOP/CLEAR pad and reset the clock for the correct time of day.

NOTE: The drawer microwave can be programmed with the drawer open except for START/ADD MINUTE.



Figure 3-2. Setting the Clock

TIMER (See Figure 3-3):

1. Touch TIMER/CLOCK pad. **TO SET TIMER PRESS 1 TO SET CLOCK PRESS 2** will appear in the display. Press the number one (1).
2. Enter time.
3. Touch TIMER/CLOCK pad again. To cancel timer, touch STOP/CLEAR pad.



Figure 3-3. Setting the Timer

STOP/CLEAR FEATURE (See Figure 3-4):

Touch the STOP/CLEAR pad to:

- Erase if you make a mistake during programming.
- Cancel timer.
- Stop the drawer microwave temporarily during timed cooking.
- Return the time of day to the display.
- Cancel a program during cooking, touch twice for timed cooking.



Figure 3-4. STOP/CLEAR Pad Feature

OPEN/CLOSE DRAWER MICROWAVE (See Figure 3-5):

Always press the OPEN or CLOSE pad on the control panel to open or close the drawer microwave. Do not push or pull the drawer microwave by hand, except in case of emergency, such as a power failure. If necessary, push or pull slowly.

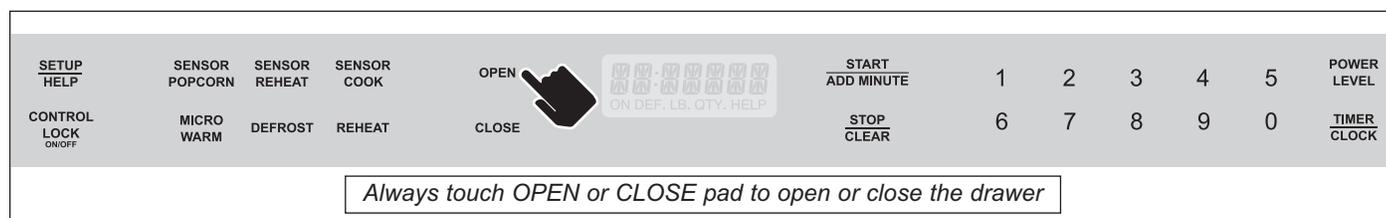


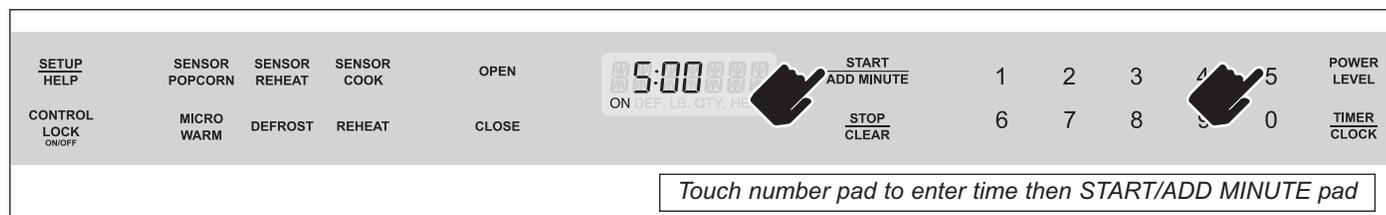
Figure 3-5. Opening and Closing The Drawer Microwave

TIME COOKING (See Figure 3-6):

Your drawer microwave can be programmed for 99 minutes and 99 seconds (99.99). Always enter the seconds after the minutes, even if they are both zeros.

Suppose you want to cook for 5 minutes at 100%:

1. Enter cooking time. Touch number pad 5 0 0. **5:00 TOUCH START OR TOUCH POWER LEVEL** will appear in the display.
2. To cook at 100% power (High), touch START/ADD MINUTE pad.



Touch number pad to enter time then START/ADD MINUTE pad

Figure 3-6. Time Cooking



TO SET POWER LEVEL

There are eleven preset power levels (See Figure 3-7). Using lower power levels increases cooking time which is recommended for foods such as cheese, milk and long slow cooking of meats. Consult a microwave cookbook or recipes for specific recommendations.

Suppose you want to defrost for 5 minutes at 30% (See Figure 3-8):

1. Enter defrost time. Touch number pad 5 0 0. **5:00** will appear in the display.
2. Touch POWER LEVEL pad eight (8) times.
3. Touch START/ADD MINUTE pad.

Touch POWER LEVEL Pad	% Power Level	Touch POWER LEVEL Pad	% Power Level
1 time	100% High	7 times	40%
2 times	90%	8 times	30% Med. Low/Defrost
3 times	80%	9 times	20%
4 times	70% Medium High	10 times	10% Low
5 times	60%	11 times	0%
6 times	50% Medium		

Figure 3-7. POWER LEVEL Chart



Figure 3-8. Setting the POWER LEVEL

SENSOR COOKING

Wolf’s sensor is a semi-conductor device that detects the vapor (moisture and humidity) emitted from the food as it heats. The sensor adjusts the cooking times and power levels for various foods and quantities.

USING SENSOR SETTINGS:

- After the drawer microwave is plugged in, wait two (2) minutes before using any SENSOR setting.
- Be sure the exterior of the cooking container and the interior of the drawer microwave are dry. Wipe off any moisture with a dry cloth or paper towel.
- The sensor works with foods at normal storage temperature. For example, popcorn would be at room temp.
- Any SENSOR selection can be programmed with More or Less Time Adjustment (See page 3-8).
- More or less food than the quantity listed in the Sensor Cooking Guide should be cooked following the guidelines in any microwave cookbook.
- During the first part of sensor use, the food name will appear on the display. Do not open the drawer microwave or touch STOP/CLEAR during this part of the cycle. The measurement of vapor will be interrupted. If this occurs, an error message will appear. To continue cooking, touch the STOP/CLEAR pad and cook manually.
- When the sensor detects the vapor emitted from the food, the remainder of cooking/reheating time will appear. The drawer microwave may be opened when the remaining time appears on the display. At this time, you may stir or season food, as desired.
- If the sensor does not detect vapor properly, for example when popping popcorn, the oven will turnoff, and the time of day will be displayed. If the sensor does not detect vapor properly when cooking other foods, **ERROR** will be displayed, and the microwave will turn off.
- Check food temperature after cooking. If additional time is needed, continue to cook manually.
- Each food has a cooking hint. Touch SETUP/HELP pad when the HELP indicator is illuminated in the display.

Covering Foods: Some foods work best when covered. Use the cover recommended in the Sensor Cooking Guide for these foods. Be careful when removing any covering to allow steam to escape away from you. You may refer to the hints by touching the SETUP/HELP pad (See Use and Care Manual page 24).

SENSOR POPCORN AND SENSOR REHEAT FEATURE (See Figure 3-10):

You can pop popcorn and reheat many foods and don't need to calculate cooking time or power level.

NOTE: The *SENSOR POPCORN* setting has two choices. Follow directions in the display to choose desired option.

1. Touch the *SENSOR POPCORN* pad. **REGULAR TOUCH START TOUCH AGAIN FOR MINI** will appear in display.
2. Then touch the *START/ADD MINUTE* pad. **POPCORN REGULAR SENSOR COOK** will appear in the display.
3. If you touch the *SENSOR REHEAT* pad, **SENSOR REHEAT TOUCH START** will appear in the display.
4. Then, touch the *START/ADD MINUTE* pad. **SENSOR REHEAT** will appear in the display.

When the sensor detects the vapor emitted from the food, the remainder of cooking/reheating time will appear.

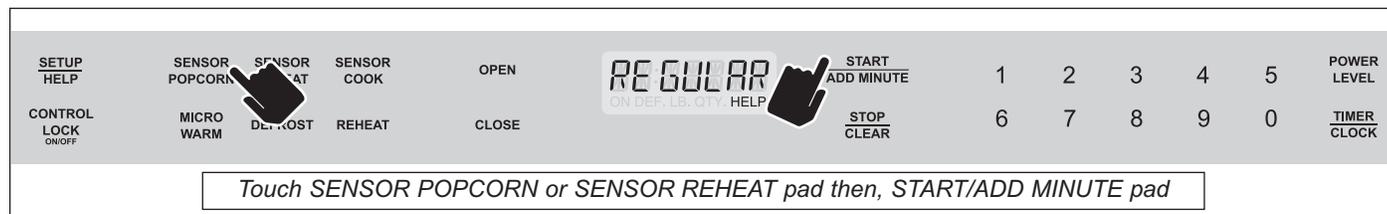


Figure 3-10. SENSOR POPCORN and SENSOR REHEAT Feature

TO SENSOR COOK (See Figure 3-11):

1. Touch *SENSOR COOK* pad once. **SEE LABEL SELECT FOOD NUMBER** will appear in display (See Menu Label located on the inside upper right-hand corner of the drawer microwave).
2. Select desired food by touching number pad. For example: Touch 5 for baked potatoes. **BAKED POTATOES** will appear in the display.
3. Touch *START/ADD MINUTE* pad.

NOTES:

- To heat or cook other foods or foods above or below the quantity allowed on the Sensor Cooking Guide (See Use and Care Manual), cook manually.
- *SENSOR COOK* can be programmed with More or Less Time Adjustment (See page 3-8 of this section).

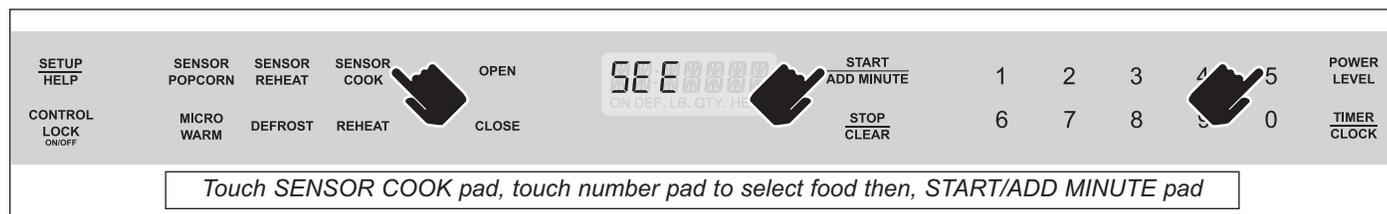


Figure 3-11. SENSOR COOK Feature



DEFROST FEATURE (See Figure 3-12):

Use this feature to defrost the foods shown in the Defrost Guide (See Use and Care Manual page 21).

1. Touch DEFROST pad. **SEE LABEL SELECT FOOD NUMBER** will appear. Select desired food by touching number pad (See Menu Label). Example: Touch 2 for steaks/chops. **STEAKS CHOPS ENTER WEIGHT** will appear.
2. Enter weight by touching number pads. For example: 1.0 lb. **1.0 LB TOUCH START** will appear in the display.
3. Touch START/ADD MINUTE pad. The oven will stop so that the food can be checked.
4. After the first stage, open drawer and turn steak over, shield any warm portions. **TURN FOOD OVER** will appear in the display. Close drawer and touch START/ADD MINUTE pad to continue.
5. After the second stage, open drawer and shield any warm portions. **CHECK FOOD COVER EDGE** will appear in the display. Close the drawer and touch START/ADD MINUTE pad to continue.
6. After defrost cycle ends, **LET STAND COVERED** will appear in the display. Several short beeps will sound until drawer is opened.

NOTES:

- DEFROST can be programmed with More or Less Time Adjustment (See page 3-8 of this section).
- To defrost other foods or foods above or below the weights allowed on the Defrost Guide, see “Manual Defrost”.

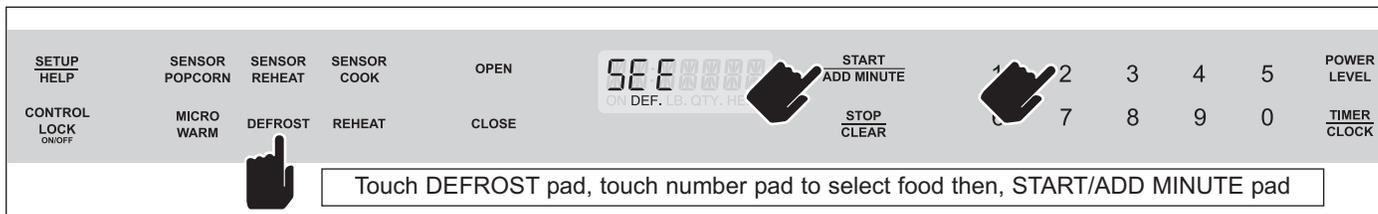


Figure 3-12. DEFROST Feature

MANUAL DEFROST

If the food that you wish to defrost is not listed on the Defrost Guide (See Use and Care Manual page 21) or is above or below the limits in the “Amount” column on the Defrost Guide, you need to defrost manually. You can defrost any frozen food, either raw or previously cooked, by using POWER LEVEL at 30%. Follow the 3-step procedure for the “To Set Power Level,” on page 3-4. Estimate defrosting time and press POWER LEVEL pad eight times for 30% power. For either raw or previously cooked then frozen food, the rule of thumb is approximately 4 minutes per pound (.45kg). For example, defrost 4 minutes for 1 pound (.45kg) of frozen spaghetti sauce. Always stop the oven periodically to remove or separate portions that are defrosted. If food is not defrosted at the end of estimated defrosting time, program the oven in 1 minute increments on POWER LEVEL 30% until totally defrosted.

When using plastic containers from freezer, defrost only long enough to remove from the plastic in order to place in a microwave safe dish.

REHEAT FEATURE (See Figure 3-13):

Reheat automatically computes the correct warming time and microwave power level for foods shown in the Reheat Guide. (See Use and Care Manual page 22)

1. Touch REHEAT pad once. **SEE LABEL SELECT FOOD NUMBER** will appear in the display. Select desired food by touching number pad (See Menu Label). Example: Touch 2 for frozen rolls or muffins.
2. Touch the number pad again to select the quantity. For example: Touch 2 for 2 rolls or muffins.
3. Touch START/ADD MINUTE pad.

NOTES: Reheat can be programmed with More or Less Time Adjustment (See page 3-8 of this section).

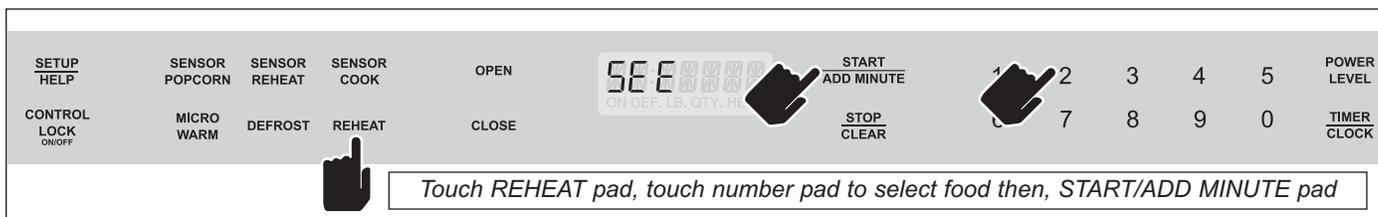


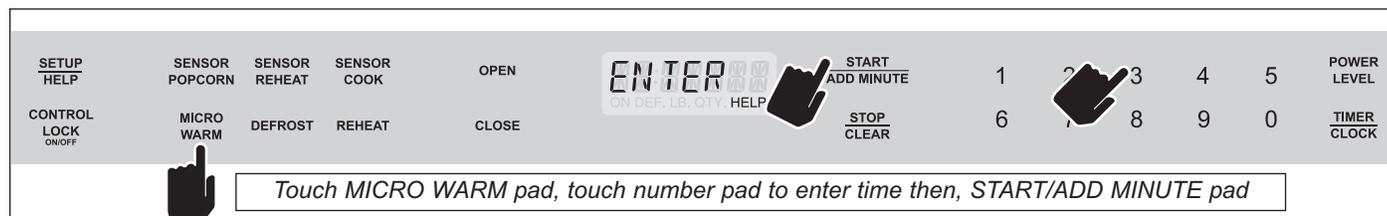
Figure 3-13. REHEAT Feature

MICRO WARM FEATURE (See Figure 3-14):

MICRO WARM allows you to keep food warm for up to 30 minutes.

DIRECT USE:

1. Touch MICRO WARM pad. **ENTER TIME UP TO 30 MINUTES** will appear in the display.
2. Enter desired time by touching the number pads. To enter 30 minutes, touch 3 0 0 0. **30:00 TOUCH START** will appear in the display.
3. Touch START/ADD MINUTE pad. The oven will start. The display will show **30:00** and count down. **KEEP WARM** will be displayed intermittently during the countdown.


Figure 3-14. MICRO WARM Feature
MANUAL COOKING (See Figure 3-15):

1. Enter desired cooking time and power level.
2. Touch MICRO WARM pad. Enter desired warming time up to 30 minutes.
4. Touch START/ADD MINUTE pad. The operation will start. When the cooking time is complete, a long tone will sound and MICRO WARM will start. The display will count down. **KEEP WARM** will be displayed intermittently during the countdown.

NOTES:

- If you attempt to enter more than 30 minutes for MICRO WARM, an error message will appear in the display.
- MICRO WARM cannot be programmed with SENSOR POPCORN, SENSOR REHEAT, SENSOR COOK, DEFROST or REHEAT.


Figure 3-15. Manual Cooking



MULTIPLE SEQUENCE COOKING (See Figure 3-16):

Your drawer microwave can be programmed for up to 4 automatic cooking sequences, switching from one power level setting to another automatically. Sometimes cooking directions tell you to start on one power level and then change to a different power level. Your drawer microwave can do this automatically.

1. First enter cooking time. Then touch POWER LEVEL pad once for 100% cooking or repeat touching POWER LEVEL pad for a lower power level.
2. Enter second cooking time. Repeat touching POWER LEVEL pad for desired level. You can follow this procedure up to 4 times. **TOUCH START** will appear in visual display.
3. Touch START/ADD MINUTE pad.

NOTES:

- If POWER LEVEL pad is touched once, **HIGH** will be appear in the display.
- If 100% is selected as the final sequence, it is not necessary to touch the POWER LEVEL pad.
- If you wish to know the power level during cooking, simply touch the POWER LEVEL pad. As long as your finger is touching the POWER LEVEL pad, the power level will be displayed.
- MICRO WARM can be programmed even if 4 cooking sequences have been set.

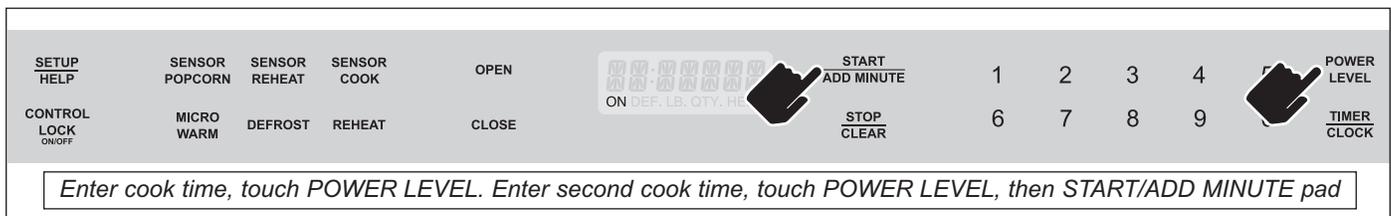


Figure 3-16. Multiple Sequence Cooking

SETUP/HELP FEATURE (See Figure 3-17):

Each setting of SENSOR REHEAT, SENSOR COOK, SENSOR POPCORN, MICRO WARM, REHEAT and DEFROST has a cooking hint. If you wish to check, touch SETUP/HELP pad whenever HELP is illuminated in the Interactive Display for these and other manual operation hints.

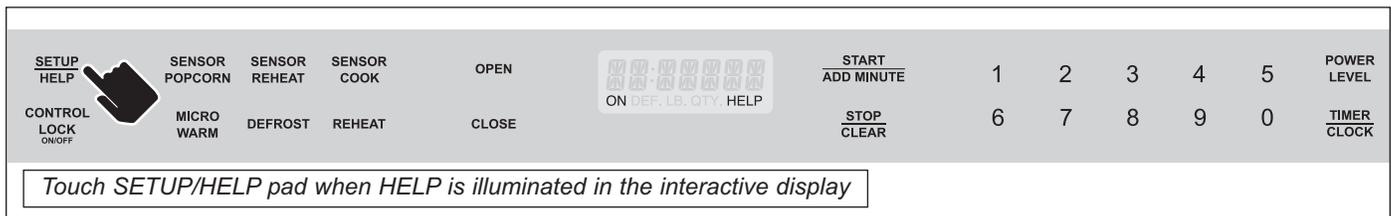


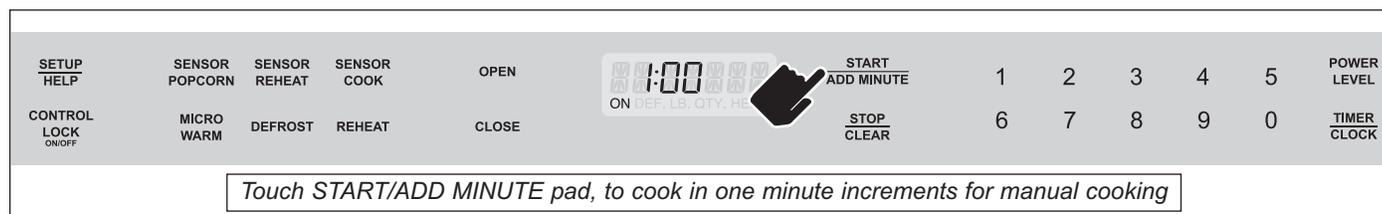
Figure 3-17. SETUP/HELP Feature

START/ADD MINUTE FEATURE (See Figure 3-18):

The START/ADD MINUTE feature allows you to cook for a minute at 100% (HIGH) power level. By simply touching the START/ADD MINUTE pad, **1:00** will appear in the display and start cooking automatically. You can also extend the cooking time in multiples of one (1) minute by repeatedly touching the START/ADD MINUTE pad during manual cooking.

NOTES:

- To use the START/ADD MINUTE feature again, touch START/ADD MINUTE pad within 3 minutes after cooking, after closing the drawer or after touching the STOP/CLEAR pad.
- The START/ADD MINUTE feature cannot be used with SENSOR settings, REHEAT or DEFROST features.


Figure 3-18. START/ADD MINUTE Feature
MORE OR LESS TIME ADJUSTMENT (See Figure 3-19):

Should you discover that you like any of the SENSOR, REHEAT or DEFROST settings slightly more done:

1. Touch the POWER LEVEL pad once, after touching your selection. **MORE TOUCH START** will appear in the display.

For slightly less done, touch the POWER LEVEL pad twice, after touching your selection. **LESS TOUCH START** will appear in the display.

3. Touch START/ADD MINUTE pad.


Figure 3-19. Adjusting "More" or "Less" Cooking Time
CONTROL LOCK ON/OFF FEATURE (See Figure 3-20):

The CONTROL LOCK ON/OFF feature prevents unwanted drawer operation such as by small children. The drawer microwave can be set so that the control panel is deactivated or locked.

To Lock: Touch CONTROL LOCK ON/OFF pad and hold for three (3) seconds.

The display will show **LOCK ON ?**.

To Unlock: Touch CONTROL LOCK ON/OFF pad and hold for three (3) seconds.

The display will show **LOCK OFF ?**.


Figure 3-20. CONTROL LOCK Feature

AUDIBLE SIGNAL ELIMINATION (See Figure 3-21):

At the end of timed cook, a series of beeps will sound. If you wish to have the appliance with no audible signals, you can turn the audible signals off.

To turn sound off:

1. Touch SETUP/HELP pad. The display shows - TOUCH AGAIN .
2. Touch SETUP/HELP pad again. The display shows - SOUND OFF ? TOUCH START .
3. Touch START/ADD MINUTE pad. The display shows - SOUND OFF .

To restore sound:

1. Touch SETUP/HELP pad. The display shows - TOUCH AGAIN .
2. Touch SETUP/HELP pad again. The display shows - SOUND ON ? TOUCH START .
3. Touch START/ADD MINUTE pad. The display shows - SOUND ON .

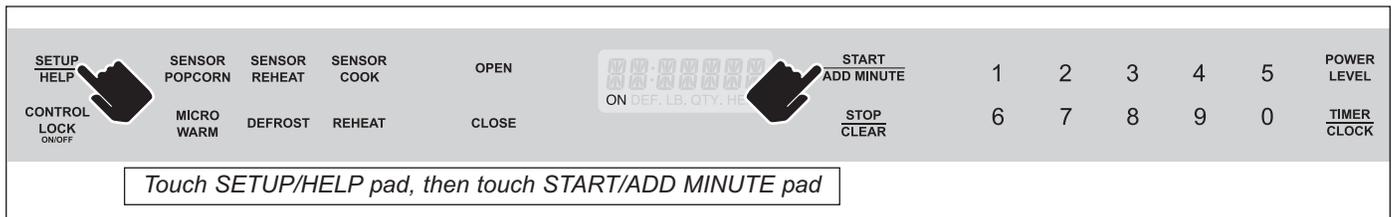


Figure 3-21. Audible Signal On or Off

END OF COOKING REMINDER (See Figure 3-22):

At the end of timed cook, the microwave will signal every ten seconds for the first minute; then every three seconds until the STOP/CLEAR pad is touched, up to one hour.

To turn sound off:

1. Touch SETUP/HELP pad three times. The display shows - REMIND SIGNAL OFF ? TOUCH START .
2. Touch START/ADD MINUTE pad. The display shows - REMIND SIGNAL OFF .

To restore sound:

1. Touch SETUP/HELP pad three times. The display shows - REMIND SIGNAL ON ? TOUCH START .
2. Touch START/ADD MINUTE pad. The display shows - REMIND SIGNAL ON .



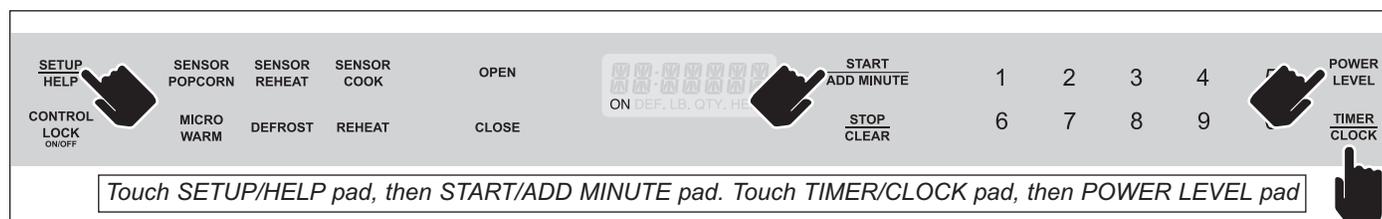
Figure 3-22. End of Cooking Reminder On or Off

AUTO START (See Figure 3-23):

If you wish to program the drawer microwave to begin cooking automatically at a designated time of day:

1. Touch SETUP/HELP pad 4 times. The display shows **AUTO START TOUCH START** .
2. Touch START/ADD MINUTE pad. The display shows **ENTER START TIME** .
3. Enter start time. Example "4:30" The display will show **TOUCH CLOCK** .
4. Touch TIMER/CLOCK pad. The display will show **ENTER COOKING TIME** .
5. Touch the number pads to enter cooking time. For example 20:00 minutes. The display will show **20:00 TOUCH START OR TOUCH POWER LEVEL** .
6. Touch POWER LEVEL pad repeatedly until the desired power level is reached. The display will show **TOUCH START** .
7. Touch START/ADD MINUTE pad **AUTO START 4:30 ON** will appear in the display.

Once the set time is reached, the oven will start automatically. A long beep will sound when cooking is finished. Several short beeps will sound until drawer is opened.


Figure 3-23. Auto Start Setting
DEMONSTRATION MODE (See Figure 3-24):
To select Demo Mode:

1. Touch SETUP/HELP pad five (5) times. The display shows **DEMO ON ? HOLD START 3 SEC** .
2. Hold START/ADD MINUTE pad for three (3) seconds. The display shows **DEMO ON** .

To cancel Demo Mode:

1. Touch SETUP/HELP pad five (5) times. The display shows **DEMO OFF ? HOLD START 3 SEC** .
2. Hold START/ADD MINUTE pad for three (3) seconds. The display shows **DEMO OFF** .

NOTES:

- The drawer microwave doesn't heat in Demo Mode.
- The Display counts down quickly.


Figure 3-24. Demonstration Mode



TECHNICAL OPERATION (See Figure 3-25):

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

Off Condition: Closing the drawer activates the door sensing switch and secondary interlock switch. (In this condition, the monitor switch contacts are opened.) When the oven is plugged in, 20 vac is supplied to the control unit (See Figure 3-26 Off Schematic Condition diagram).

The display will show flashing **ENJOY YOUR MICRO-WAVE TOUCH CLEAR AND TOUCH CLOCK**. To set any program or set the clock, you must first touch the STOP/CLEAR pad.

The display will clear, and **.** will appear.



Figure 3-25. 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 connected to the relays are turned on as follows
(See the Schematic (Off Condition) diagram on page 3-15):

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

2. 20 vac is supplied to the primary winding of the power transformer and is converted to about 3.3 vac output on the filament winding, and approximately 2370 vac on the high voltage winding.
3. The filament winding voltage heats the magnetron filament and the H.V. winding voltage is sent to a voltage doubler circuit.
4. The microwave energy produced by the magnetron is channeled through the waveguide into the cavity 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 turned off, and the generation of microwave energy is stopped. The oven will revert to the OFF condition.
6. When the drawer is opened during a cook cycle, the monitor switch, door sensing switch, secondary interlock switch, relay (RY) and primary interlock relay are activated with the following results. The circuits to the stir fan 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 secondary interlock switch and secondary interlock relay and is mechanically associated with the drawer so that it will function in the following sequence.
8. When the drawer opens from the closed position, the primary interlock relay (RY2) and secondary interlock switch open their contacts. And contacts of the relay (RY) remains closed. Then the monitor switch contacts close.
9. When the drawer is closed from the open position, the monitor switch contacts open first. Then the contacts of the secondary interlock switch and door sensing switch close. And contacts of the relay (RY) open.

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

POWER LEVEL P-0 TO P-90 COOKING:

When Variable Cooking Power is programmed, the 120 volts A.C. is supplied to the power transformer intermittently through the contacts of relay (RY-2) which is operated by the control unit within 32 seconds 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 10 (P-90) (approx 90% power)	30 sec.	2 sec.
Power 10 (P-80) (approx 80% power)	26 sec.	6 sec.
Power 10 (P-70) (approx 70% power)	24 sec.	8 sec.
Power 10 (P-60) (approx 60% power)	22 sec.	10 sec.
Power 10 (P-50) (approx 50% power)	18 sec.	14 sec.
Power 10 (P-40) (approx 40% power)	16 sec.	16 sec.
Power 10 (P-30) (approx 30% power)	12 sec.	20 sec.
Power 10 (P-20) (approx 20% power)	8 sec.	24 sec.
Power 10 (P-10) (approx 10% power)	6 sec.	26 sec.
Power 10 (P-0) (0% power)	0 sec.	32 sec.

POWER LEVEL Cooking Conditions

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

SENSOR COOKING CONDITION

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 is determined by experiment with each food category and inputted into the LSI. An example of how sensor works (See Figures 3-26, 3-27 and 3-28 below):

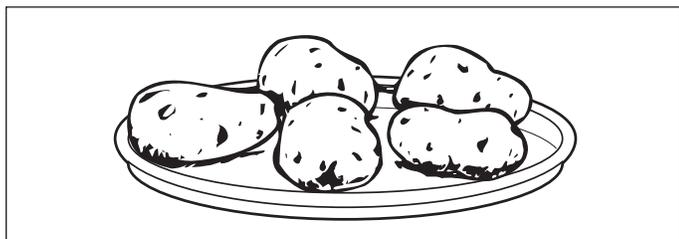


Figure 3-26. Potatoes at room temperature. Vapor is emitted very slowly.

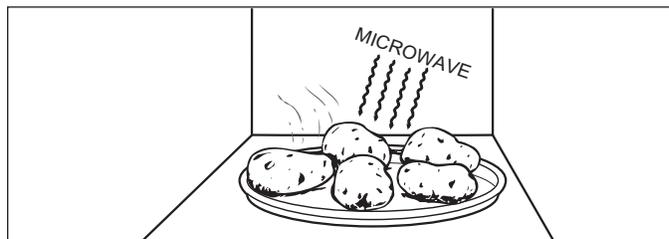


Figure 3-27. Heat Potatoes. Moisture and humidity is emitted very rapidly. You can smell the aroma as it cooks.

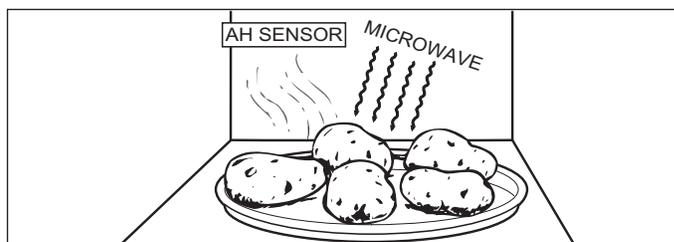


Figure 3-28. Sensor detects moisture and humidity and calculates cooking time and variable power.

COOKING SEQUENCE (See Figure 3-29):

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-) is energized, but the power transformer is not turned on.
3. After about 3-86 seconds, the cook relay (RY-2) is energized. The power transformer is turned on, microwave energy is produced and first stage is started. The 3-86 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 drawer or touch the STOP/CLEAR pad.
4. When the sensor detects the vapor emitted from the food, the display switches over to the remaining cooking time and the timer counts down to zero. At this time, the drawer may be opened to stir, turn or season food.
5. When the timer reaches zero, an audible signal sounds. The shut-off relay and cook relay are de-energized and the power transformer, oven lamp, etc. are turned off.
6. Opening the drawer or touching the STOP/CLEAR pad, the time of the day will reappear on the display and the oven will revert to an OFF condition. When the timer reaches zero, an audible signal sounds.

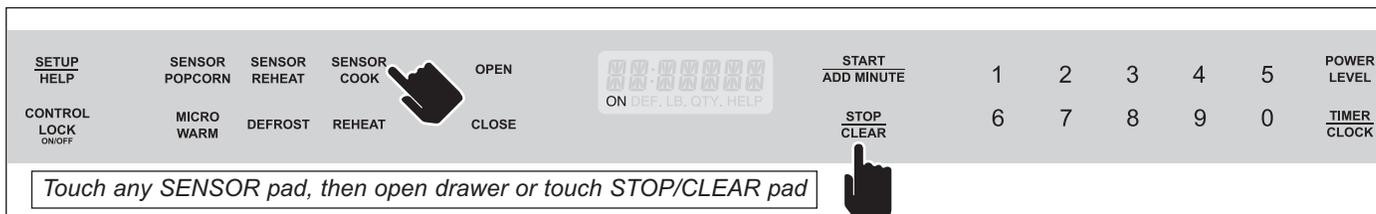


Figure 3-29. Cooking Sequence

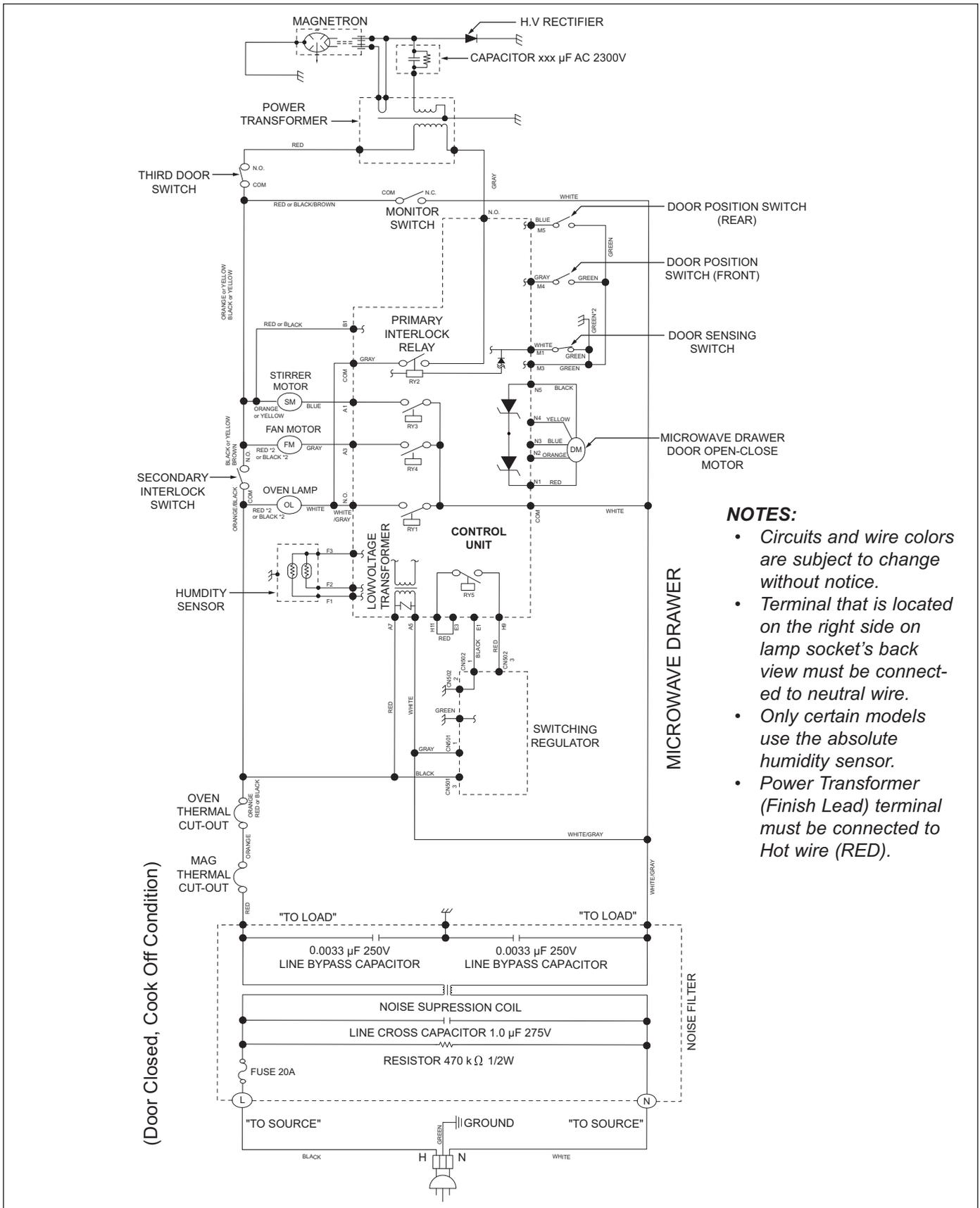


Figure 3-30. Schematic (Off Condition)

HUMIDITY SENSOR CIRCUIT

A. Structure of Humidity Sensor (See Figure 3-31): The humidity sensor includes two thermistors. One thermistor is housed in the closed vessel filled with dry air while another in the open vessel. Each sensor is provided with the protective cover made of metal mesh to be protected from the external airflow.

B. Operational Principle of Humidity Sensor (See Figure 3-32): This illustration shows the basic structure of an absolute humidity sensor. A bridge circuit is formed by two thermistors and two resistors (R and R2). The output of the bridge circuit is to be amplified by the operational amplifier. Each thermistor is supplied with a current to keep it heated at about 150°C (302°F), the resultant heat is dissipated in the air and if the two thermistors are placed in different humidity conditions they show different degrees of heat conductivity leading to a potential difference between them causing an output voltage from the bridge circuit, the intensity of which is increased as the absolute humidity of the air increases. Since the output is varied every minute, it is amplified by the operational amplifier.

C. Detector Circuit of Humidity Sensor Circuit (See Figure 3-33): This detector circuit is used to detect the output voltage of the absolute humidity circuit to allow the LSI to control sensor cooking of the unit. When the unit is set in the sensor cooking mode, 6 seconds clearing cycle occurs than the detector circuit starts to function and the LSI observes the initial voltage available at its AN6 terminal.

With this voltage given, the switches SW to SW5 in the LSI are turned on in such a way as to change the resistance values in parallel with R45 ~ R49. Changing the resistance values results in that there is the same potential at both F-3 terminal of the absolute humidity sensor and AN6 terminal of the LSI. The voltage of AN7 terminal will indicate about +2.5V. This initial balancing is set up about 6 seconds after the unit is put in the Sensor Cooking mode. As the sensor cooking proceeds, the food is heated to generate moisture by which the resistance balance of the bridge circuit is deviated to increase the voltage available at AN6 terminal of the LSI.

Then the LSI observes that voltage at AN7 terminal and compares it with its initial value, and when the comparison rate reaches the preset value (fixed for each menu to be cooked), the LSI causes the unit to stop sensor cooking; thereafter, the unit goes in the next operation automatically.

When the LSI starts to detect the initial voltage at AN7 terminal 6 seconds after the unit has been put in the Sensor Cooking mode, if it is not possible to balance the bridge circuit due to disconnection of the absolute humidity sensor, ERROR will appear on the display and the cooking is stopped.

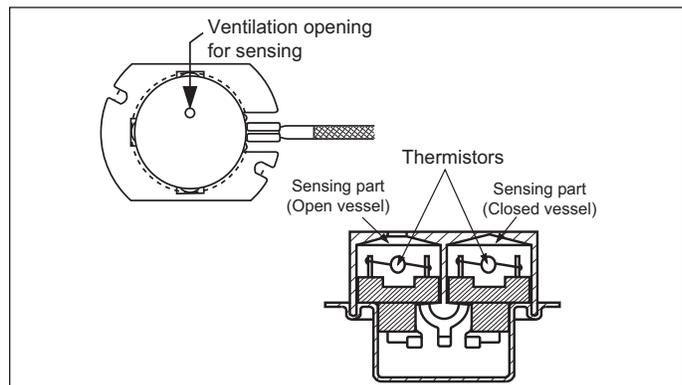


Figure 3-31. Humidity Sensor

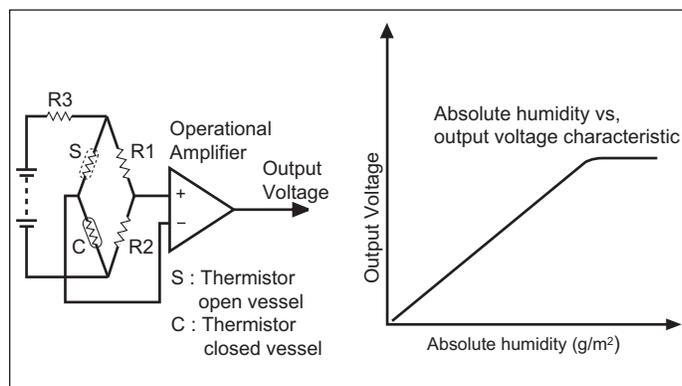


Figure 3-32. Bridge Circuit

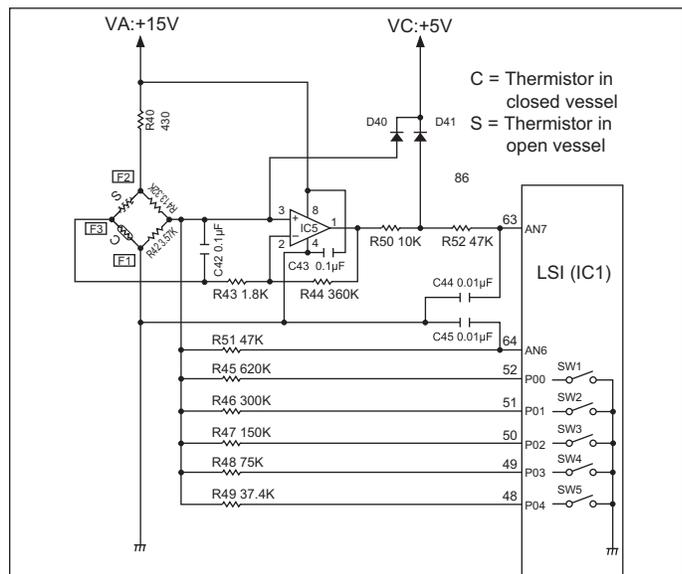


Figure 3-33. Detector Circuit

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL:

The touch control section consists of the following units.

- Key Unit
- Control Unit
- Power 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 from P0 - P7. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through P20 - P23 to perform the function that was requested.

CONTROL UNIT AND POWER UNIT:

Control Unit: Consists of LSI, IC, reset circuit, indicator circuit, power source circuit, relay circuit, buzzer circuit, synchro-nizing signal circuit, keyboard unit circuit, humidity sensor circuit and back light circuit.

1. IC1 (LSI): This is a microcomputer, responsible for controlling the entire control unit.
2. IC2: This is the IC to drive the Liquid Crystal Display.
3. IC5: This is the IC to amplify the signal from the humidity sensor.
4. Reset Circuit: This circuit generates a signal which resets the LSI (IC) to the initial state when power is supplied.
5. Indicator Circuit: A circuit to drive the Liquid Crystal Displays (LCD).

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.

<u>Symbol</u>	<u>Voltage</u>	<u>Application</u>
VC	+5V	LSI(IC)

Relay Circuit : A circuit to drive the magnetron, fan motor, stirrer motor and light the oven lamp.

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

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.

Door Sensing Switch (Microwave Drawer): A switch to "tell" the LSI if the drawer is open or closed.

Door Position Switch Front / Rear: The switch to "tell" the position of the Microwave drawer door.

Back Light Circuit: A circuit to drive the back light (Light emitting diodes LD- LD3).

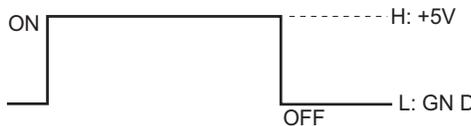
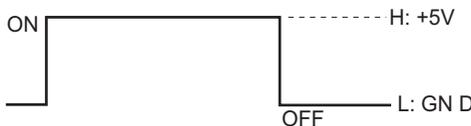
Humidity Sensor Circuit: This circuit detects moisture of the cooking food to allow its automatic cooking.

Microwave Drawer Door Open-Close Circuit: A circuit to drive the microwave drawer door open-close motor.

DESCRIPTION OF LSI (IC-1)

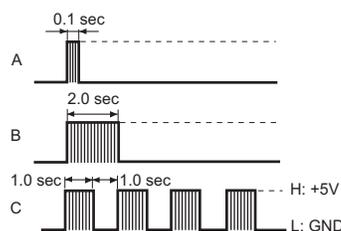
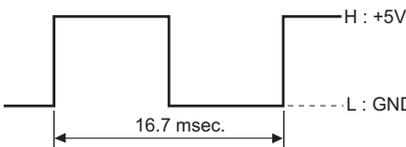
The I/O signal of the LSI is detailed in the following table:

Pin No.	Signal	I/O	Description
1- 3	AN5 AN3	IN	Terminal to Change Cooking Input According to the Model: By using A/D converter contained in the LSI, DC voltage in accordance with the Model in operation is applied to set up its cooking constant.
4	AN2	IN	Input signal which inform the drawer door is in the middle position between the opened position and the closed position, to LSI from the door position switch rear.
5	AN1	IN	Terminal not used.
6	AN0	IN	Terminal not used.
7	CNVSS	IN	Power Source Voltage: 0V (GND): VC voltage of power source circuit input. Connected GND.
8	RESET	IN	Auto Clear Terminal: Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.
9	P62	OUT	Terminal not used.
10	P61	IN/OUT	Terminal not used.
11	VSS	IN	Power Source Voltage: 0V (GND): VS voltage of power source circuit input. Connected GND.
12	XIN	IN	Internal Clock Oscillation Frequency Setting Input: The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to Xout terminal.
13	XOUT	OUT	Internal Clock Oscillation Frequency Control Output: Output to control oscillation input of Xin.
14	VCC	IN	Power Source Voltage: +5V: VC voltage of power source circuit input.
15	P60	IN	Plus signal coming from the Microwave drawer door open-close motor is input into P60 as revolution number.
16	P37	IN	Input Signal Which Communicates the Drawer Door Open Information to LSI from the Door Position Switch Front: Door opened; "L" level signal(0V). Door closed; "H" level signal(+5V).
17	P36	OUT	Signal to change the rotational direction is output to the Microwave drawer door open-close motor.
18	TXOUT	OUT	Signal to change the rotational speed is output to the Microwave drawer door open-close motor.
19	P34	OUT	Power source to drive the Microwave drawer door open-close motor is output.
20	RXD2	IN	Input Terminal to Check the Data of Display: Data signal from IC-2 is input to RXD2 to check the flow of the data.
21	TXD2	IN	Output Terminal to Send IC-2 the Data: The data of display is output to IC-2.
22	SCLK2	OUT	Clock Timing Signal Output Terminal: Clock timing signal is sent to IC-2.
23	P30	OUT	Signal to Reset LSI: Signal is output to reset IC-2.
24 - 25	COM3 COM2	OUT	Terminal not used.
26	COM1	OUT	Common Data Signal: Connected to LCD signal C5.

Pin No.	Signal	I/O	Description
27	COM0	OUT	Common Data Signal: Connected to LCD signal C4.
28	VL3	IN	Connected VC (+5V).
29 - 31	P27- P25	OUT	Terminal not used.
32	SEG20	OUT	Segment Data Signal: Connected to LCD segment S24.
33	P23	IN	Signal Coming from Touch Key: When any one of J-4 line keys on key matrix is touched, a corresponding signal from P10 - P17 will be input into P23. When no key is touched, the signal is held at "L" level.
34	P22	IN	Signal Similar to P23: When any one of J-3 line keys on key matrix is touched, a corresponding signal will be input into P22.
35	P21	IN	Signal Similar to P23: When any one of J-2 line keys on key matrix is touched, a corresponding signal will be input into P21.
36	P20	IN	Signal Similar to P23: When any one of J-1 line keys on key matrix is touched, a corresponding signal will be input into P20.
37	P17	OUT	Key Strobe Signal: Signal applied to touch-key section. A pulse signal is input to P20 - P23 terminal while one of J-12 line key on matrix is touched.
38	P16	OUT	Key Strobe Signal: Signal applied to touch-key section. A pulse signal is input to P20 - P23 terminal while one of J-11 line key on matrix is touched.
39	P15	OUT	Key Strobe Signal: Signal applied to touch-key section. A pulse signal is input to P20 - P23 terminal while one of J-10 line key on matrix is touched.
40	P14	OUT	Key Strobe Signal: Signal applied to touch-key section. A pulse signal is input to P20 - P23 terminal while one of J-9 line key on matrix is touched.
41	P13	OUT	Key Strobe Signal: Signal applied to touch-key section. A pulse signal is input to P20 - P23 terminal while one of J-8 line key on matrix is touched.
42	P12	OUT	Key Strobe Signal: Signal applied to touch-key section. A pulse signal is input to P20 - P23 terminal while one of J-7 line key on matrix is touched.
43	P11	OUT	Key Strobe Signal: Signal applied to touch-key section. A pulse signal is input to P20 - P23 terminal while one of J-6 line key on matrix is touched.
44	P10	OUT	Key Strobe Signal: Signal applied to touch-key section. A pulse signal is input to P20 - P23 terminal while one of J-5 line key on matrix is touched.
45	P07	OUT	<p>Fan Motor (Drawer) Driving Signal: To turn on and off relay(RY4):</p> <p>"H" level: During fan motor ON. "L" level: During fan motor OFF.</p> 
46	P06	OUT	<p>Stirrer Motor Driving Signal: To turn on and off relay(RY3):</p> <p>"H" level: During fan motor ON. "L" level: During fan motor OFF.</p> 



Pin No.	Signal	I/O	Description																																																																
47	P05	OUT	<p>Magnetron High-Voltage Circuit Driving Signal: To turn on and off cook relay (RY2), in 100% power operation, the signals holds "H" level during microwave cooking and "L" level while not cooking. In other cooking modes (90%, 80%, 70%, 60%, 50%, 40%, 30%, 20%, 10%, 0%) the signal turns to "H" level and "L" level in repetition according to power level.</p> <table border="1"> <thead> <tr> <th rowspan="2">Vari Mode</th> <th colspan="2">Microwave Cooking Mode</th> <th colspan="2">Other Cooking Mode</th> </tr> <tr> <th>On Time</th> <th>Off Time</th> <th>On Time</th> <th>Off Time</th> </tr> </thead> <tbody> <tr> <td>100% power</td> <td>32 sec.</td> <td>0 sec.</td> <td>60 sec.</td> <td>0 sec.</td> </tr> <tr> <td>90% power</td> <td>30 sec.</td> <td>2 sec.</td> <td>54 sec.</td> <td>6 sec.</td> </tr> <tr> <td>80% power</td> <td>26 sec.</td> <td>6 sec.</td> <td>48 sec.</td> <td>12 sec.</td> </tr> <tr> <td>70% power</td> <td>24 sec.</td> <td>8 sec.</td> <td>42 sec.</td> <td>18 sec.</td> </tr> <tr> <td>60% power</td> <td>22 sec.</td> <td>10 sec.</td> <td>36 sec.</td> <td>24 sec.</td> </tr> <tr> <td>50% power</td> <td>18 sec.</td> <td>14 sec.</td> <td>30 sec.</td> <td>30 sec.</td> </tr> <tr> <td>40% power</td> <td>16 sec.</td> <td>16 sec.</td> <td>24 sec.</td> <td>36 sec.</td> </tr> <tr> <td>30% power</td> <td>12 sec.</td> <td>20 sec.</td> <td>18 sec.</td> <td>42 sec.</td> </tr> <tr> <td>20% power</td> <td>8 sec.</td> <td>24 sec.</td> <td>12 sec.</td> <td>48 sec.</td> </tr> <tr> <td>10% power</td> <td>6 sec.</td> <td>26 sec.</td> <td>4 sec.</td> <td>56 sec.</td> </tr> <tr> <td>0% power</td> <td>0 sec.</td> <td>32 sec.</td> <td>0 sec.</td> <td>60 sec.</td> </tr> </tbody> </table>	Vari Mode	Microwave Cooking Mode		Other Cooking Mode		On Time	Off Time	On Time	Off Time	100% power	32 sec.	0 sec.	60 sec.	0 sec.	90% power	30 sec.	2 sec.	54 sec.	6 sec.	80% power	26 sec.	6 sec.	48 sec.	12 sec.	70% power	24 sec.	8 sec.	42 sec.	18 sec.	60% power	22 sec.	10 sec.	36 sec.	24 sec.	50% power	18 sec.	14 sec.	30 sec.	30 sec.	40% power	16 sec.	16 sec.	24 sec.	36 sec.	30% power	12 sec.	20 sec.	18 sec.	42 sec.	20% power	8 sec.	24 sec.	12 sec.	48 sec.	10% power	6 sec.	26 sec.	4 sec.	56 sec.	0% power	0 sec.	32 sec.	0 sec.	60 sec.
Vari Mode	Microwave Cooking Mode		Other Cooking Mode																																																																
	On Time	Off Time	On Time	Off Time																																																															
100% power	32 sec.	0 sec.	60 sec.	0 sec.																																																															
90% power	30 sec.	2 sec.	54 sec.	6 sec.																																																															
80% power	26 sec.	6 sec.	48 sec.	12 sec.																																																															
70% power	24 sec.	8 sec.	42 sec.	18 sec.																																																															
60% power	22 sec.	10 sec.	36 sec.	24 sec.																																																															
50% power	18 sec.	14 sec.	30 sec.	30 sec.																																																															
40% power	16 sec.	16 sec.	24 sec.	36 sec.																																																															
30% power	12 sec.	20 sec.	18 sec.	42 sec.																																																															
20% power	8 sec.	24 sec.	12 sec.	48 sec.																																																															
10% power	6 sec.	26 sec.	4 sec.	56 sec.																																																															
0% power	0 sec.	32 sec.	0 sec.	60 sec.																																																															
48-52	P04-P00	OUT	Used for initial balancing of the bridge circuit (absolute humidity sensor).																																																																
53	P57	OUT	<p>Common Relay Driving Signal (Square Waveform : 60Hz): To turn on and off the shut-off relays (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit.</p>																																																																
54	P56	IN	Terminal not used.																																																																
55	TXD1	IN	Terminal not used.																																																																
56	RXD1	IN	Terminal not used.																																																																
57	P53	IN	Terminal not used.																																																																

Pin No.	Signal	I/O	Description
58	P52	OUT	<p>Signal to Sound Buzzer: A: Key touch sound. B: Completion sound. C: When the oven stops so that the food can be checked in Automatic cooking mode.</p> 
59	P51	IN	<p>Input Signal Which Communicates the Drawer Door Close Information to LSI: Door opened; "H" level signal(+5V). Door closed; "L" level signal(0V).</p>
60	INT0	IN	<p>Signal to Synchronize LSI With Commercial Power Source Frequency: This is the basic timing for all real time processing of LSI.</p> 
61	AVSS	IN	<p>A/D Converter Power Source Voltage: The power source voltage to drive the A/D converter in the LSI.</p>
62	VREF	IN	<p>Reference Voltage Input Terminal: A reference voltage applied to the A/D converter in the LSI. Connected to +5V.</p>
63	AN7	IN	<p>AH Sensor Input: This input is an analog input terminal from the AH sensor circuit, and connected to the A/D converter built into the LSI.</p>
64	AN6	IN	<p>Used for initial balancing of the bridge circuit (absolute humidity sensor). This input is an analog input terminal from the AH sensor circuit, and connected to the A/D converter built into the LSI.</p>

SECTION 4

COMPONENT ACCESS AND REMOVAL

COMPONENT ACCESS AND REMOVAL

This section explains how to adjust, access and remove components in a Drawer 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 procedures listed earlier in this section.

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

⚠ WARNING

HIGH VOLTAGE: 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
- BEFORE SERVICING 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 (SEE FIGURE 4-1 ON PAGE 4-3).
 - TO AVOID ELECTRIC SHOCK, POWER TO UNIT MUST BE DISCONNECTED WHENEVER ACCESSING AND/OR REMOVING COMPONENTS POWERED BY ELECTRICITY OR COMPONENTS NEAR OTHER ELECTRICAL COMPONENTS.
 - BEFORE WIRING:
 1. DISCONNECT POWER SUPPLY CORD, OPEN DRAWER, WAIT 60 SECONDS, THEN DISCHARGE THE HIGH VOLTAGE CAPACITOR.
 2. DON'T LET THE WIRE LEADS TOUCH TO THE FOLLOWING PARTS:
 - HIGH VOLTAGE PARTS: MAGNETRON, HIGH VOLTAGE TRANSFORMER, HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY.
 - HOT PARTS: OVEN LAMP, MAGNETRON, HIGH VOLTAGE TRANSFORMER AND OVEN CAVITY.
 - TO AVOID EXPOSURE TO MICROWAVES, NEVER OPERATE OR ALLOW DRAWER MICROWAVE TO BE OPERATED WITH THE DRAWER OPEN.
 - AFTER PERFORMING ANY REPAIR TO THE DOOR, DRAWER LATCH MECHANISM, OR DRAWER CLOSING FACE, YOU MUST TEST THE INTEGRITY OF THE DRAWER SEAL WITH A MICROWAVE LEAK DETECTOR TO VERIFY THERE ARE NO MICROWAVE LEAKS. (SEE PROCEDURES ON PAGE 4-4)
 - IF NECESSARY TO REMOVE MICROWAVE OVEN FROM ITS INSTALLATION, REMEMBER THAT THE UNIT IS HEAVY AND COULD TIP AND/OR FALL, RESULTING IN SERIOUS INJURY.

⚠ CAUTION

Be careful when handling sheet metal parts - Edges may be sharp.

NOTE: When all service work is completed and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test should be performed and drawer interlock operation checked (See Following Page).

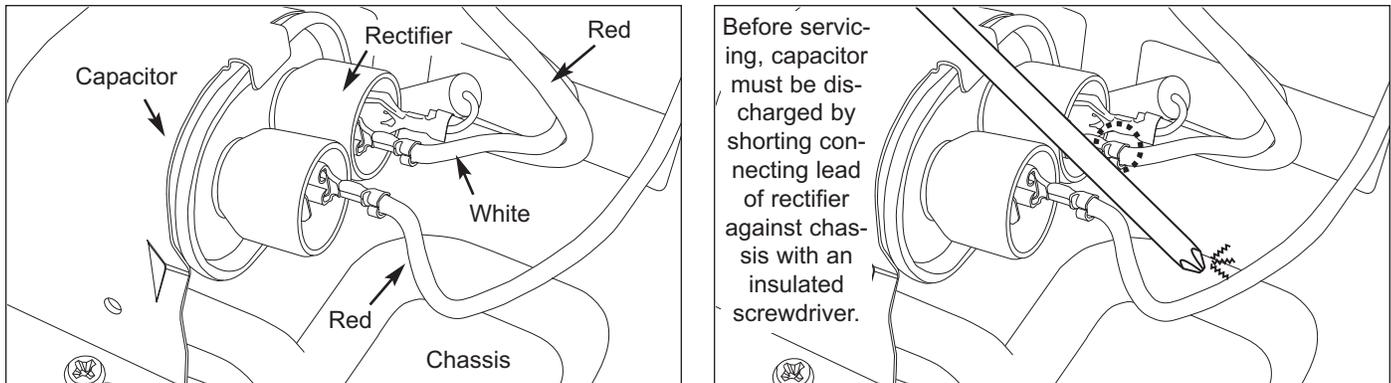


Figure 4-1. Discharge Capacitor

PRECAUTIONS FOR USING LEAD-FREE SOLDER

1. **Employing Lead-Free Solder:** The “Main PWB” of this model employs lead-free solder. This is indicated by the “LF” symbol printed on the PWB and in the service manual. The suffix letter indicates the alloy type of the solder. Example:

LFa

Sn-Ag-Cu

Indicates lead-free solder of tin, silver and copper.

2. **Using Lead-Free Wire Solder:** When repairing a PWB with the “LF” symbol, only lead-free solder should be used. (Using normal tin/lead alloy solder may result in cold soldered joints and damage to printed patterns.) As the melting point of lead-free solder is approximately 40°C higher than tin/lead alloy solder, it is recommend that a dedicated bit is used, and that the iron temperature is adjusted accordingly.
3. **Soldering:** As the melting point of lead-free solder (Sn-Ag-Cu) is higher and has poorer wettability, (flow), to prevent damage to the land of the PWB, extreme care should be taken not to leave the bit in contact with the PWB for an extended period of time. Remove the bit as soon as a good flow is achieved. The high content of tin in lead free solder will cause premature corrosion of the bit. To reduce wear on the bit, reduce the temperature or turn off the iron when it is not required. Leaving different types of solder on the bit will cause contamination of the different alloys, which will alter their characteristics, making good soldering more difficult. It will be necessary to clean and replace bits more often when using lead-free solder. To reduce bit wear, care should be taken to clean the bit thoroughly after each use.



MICROWAVE MEASUREMENT PROCEDURE

1. Requirements:

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

2. Preparation for testing: Before beginning the actual measurement of leakage, proceed as follows:

- A. Make sure that the actual instrument is operating normally as specified in its instruction booklet.

NOTES:

- Survey instruments that comply with the requirement for instrumentation as prescribed by the performance standard for microwave ovens, 2 CFR 030.0(c)(3)(i), must be used for testing.
- Survey instruments that comply with the requirement for instrumentation as prescribed by CSA and NHW performance standard for microwave ovens must be used for testing recommended instruments are, NARDA 800 and NARDA 8200.

- B. Place the load of 275 ± 5 ml (9.8 oz) of tap water initially at 20 ± 5 OC (68OF) in the center of the oven cavity. The water container shall be a low form of 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically non conductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
- C. Set the cooking control on Full Power Cooking Mode.
- D. Close the drawer and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

3. Leakage test: Closed-drawer leakage test (microwave measurement):

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

BEFORE OPERATING OVEN AFTER SERVICE

1. Disconnect the power supply cord.
2. Make sure that a definite "click" can be heard when the microwave oven drawer is unlatched. (Hold the drawer in a closed position with one hand, then pull the drawer open, this causes the latch leads to rise, it is then possible to hear a "click" as the drawer switches operate.)
3. Visually check the drawer and cavity face plate for damage (dents, cracks, signs of arcing etc.). Do not operate the oven if any of the following conditions exist:
 - Drawer does not close firmly.
 - Drawer latch hook is damaged.
 - The drawer gasket or seal is damaged.
 - The drawer is bent or warped.
 - There are defective parts in the drawer interlock system.
 - There are defective parts in the microwave generating and transmission assembly.
 - There is visible damage to the oven.

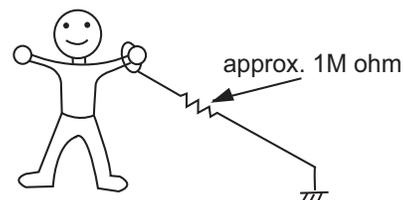
Do not operate the oven: Without the RF gasket (Magnetron); if the wave guide or oven cavity are not intact; if the drawer is not closed.

TOUCH CONTROL PANEL SERVICING

1. **Precautions for Handling Electronic Components:** This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc. and sometimes it is not fully protected by the built-in protection circuit.

In Order to Protect The CMOS LSI: When storing and transporting, thoroughly wrap them in aluminum foil. Also wrap all PW boards containing them in aluminum foil. When soldering, ground the technician as shown in the illustration to the right and use grounded soldering iron and work table.

2. **Servicing of Touch Control Panel:** We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.



- A. *Servicing the touch control panel with power supply of the oven, therefore, before checking the performance of the touch control panel you must:*

⚠ WARNING

THE HIGH VOLTAGE TRANSFORMER OF MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD.

- Disconnect the power supply cord, and then remove the outer case.
 - Open the door and block it open.
 - Discharge high voltage capacitor. (See Figure 4-1 on page 4-3 of this section)
 - Disconnect the leads to the primary of the power transformer.
 - Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
 - Re-connect the power supply cord.
- B. *After checking the performance of the touch control panel:*
 - Disconnect the power supply cord.
 - Open the door and block it open.
 - Re-connect the leads to the primary of the power transformer.
 - Re-install the outer case (cabinet).
 - Re-connect the power supply cord after the outer case is installed.
 - Run the oven and check all functions.
 - C. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all controls (sensor-related ones included) of touch control panel while keeping it connected to the oven.
 - D. On some models, the power supply cord between touch control panel and oven proper is long enough that they may be separated from each other. For those models, it is possible to check and repair the controls of touch control panel while keeping it apart from oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which activates an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if dummy resistor(s) with resistance equal to that of the controls are used.
2. **Servicing Touch Control Panel with Power Supply from an External Power Source:** Disconnect touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which activates an operational state that is equivalent to the oven door being closed. Connect an external power source to power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel. It is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).
 3. **Servicing Tools:** Tools required to service the touch control panel assembly.
 - Soldering iron: 30W (It is recommended to use a soldering iron with a grounding terminal.)
 - Oscilloscope: Single beam, frequency range: DC-0MHz type or more advanced model.
 - Others: Hand tools

4. Other Precautions:

- Before turning on the power source of the control unit, remove the aluminum foil applied for preventing static electricity.
- Connect the connectors of the key unit to the control unit being sure that the lead wires are not twisted.
- After aluminum foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
- Be sure to use specified components where high precision is required.

⚠ WARNING

FOLLOW ALL SAFETY PRECAUTIONS AS STATED AT THE BEGINNING OF THIS SECTION BEFORE PROCEEDING!

DRAWER MICROWAVE DISASSEMBLY

1. Open the drawer and extract the four mounting screws holding the unit on to the wall or cabinet opening. (See Figure 4-2).
2. Close the drawer, then carefully pull the unit out from the opening and unplug the power supply cord. Place the unit on a sturdy work surface.
3. Extract four mounting screws (two on each side) from the left and right side angles to remove the louver vent from the unit (See Figure 4-3). Place vent off to the side, on a flat protected surface.
4. Remove the top cover. (See Figure 4-3).
5. Remove the air cover from the back of the unit, both right and left side angles, then both side cabinet panels (See Figure 4-3).
6. Remove the exhaust duct. Disconnect the ground wire terminal from the grounding peg on the back plate. Then, remove back plate (See Figure 4-3).

NOTE: You now have access to various components for the drawer.

7. To remove the control panel frame assembly from the top of the drawer, extract five mounting screws holding the control panel frame to the control panel angle in the back of the drawer (See Figure 4-4).
8. Unsnap the top control board assembly away from the control panel frame and unplug all wires. The control board assembly is now free.
9. If the control board is being replaced, transfer connectors one at a time to the new control board, to ensure proper connection .

NOTE: At this point, you will have access to all parts of the drawer microwave.

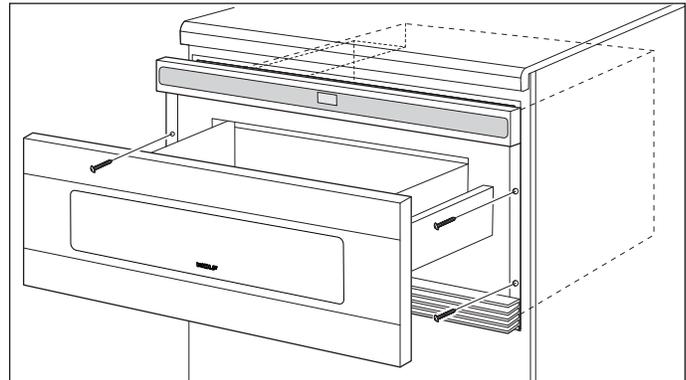


Figure 4-2. Installation Mounting Screw Removal

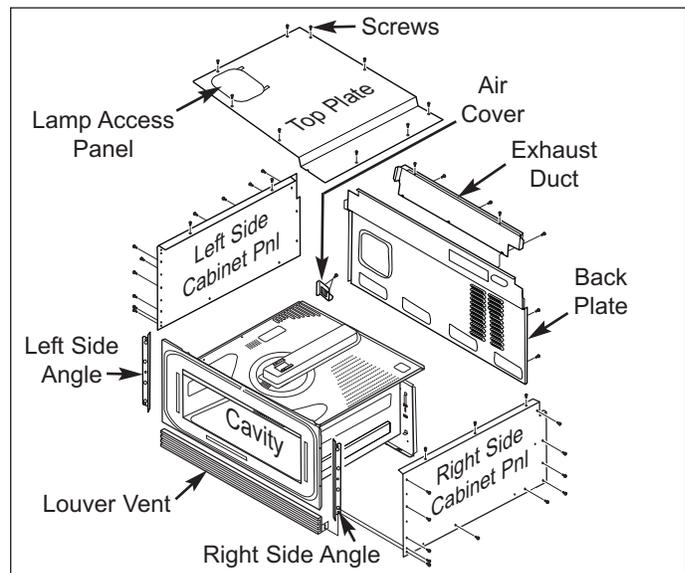


Figure 4-3. Drawer Microwave Exploded View

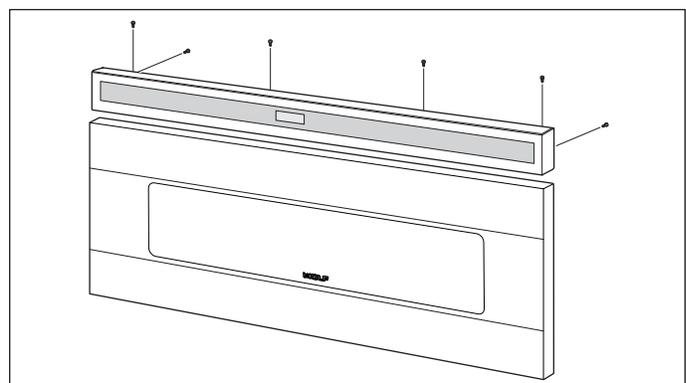


Figure 4-4. Touch Control Panel Removal

Upper Cabinet Component Replacement: (Sensor, Stirrer Motor, Upper Thermal Limiter)

1. Drawer Microwave must be removed from its installation. See Drawer Microwave Disassembly (page 4-6) steps 1-3.
2. Wait 60 Sec. to discharge High Voltage Capacitor.
3. Using a phillips screwdriver, remove the two mounting screws (one on each side of the stirrer motor) that fasten the stirrer motor assembly to the top of the unit (See Figure 4-5).

NOTES:

- The stirrer motor shaft has flat spots that must be aligned with the stirrer fan assembly for reinstallation.
- Please see "After Servicing" (Page 4-11) when repair is complete.

Cavity Light Replacement:

1. Drawer Microwave must be removed from its installation. See Drawer Microwave Disassembly (page 4-6) steps 1-3.
2. Locate and remove lamp access panel in top plate (See Figure 4-3 on page 4-6).

NOTE: Lamp and socket are an assembly. You must change socket along with the lamp.

3. Remove lamp socket screw to remove the lamp assembly and replace with new (See Figure 4-6).

Power Cord Replacement:

1. Un-hook the black and white AC terminals from the noise filter PWB and green ground wire from the back plate (See Figure 4-7).
2. Attach the black and white AC terminals from the new power cord to the noise filter as shown in figure 4-7.

NOTE: The green ground wire terminal can be attached when reassembling the back plate to the drawer cavity.

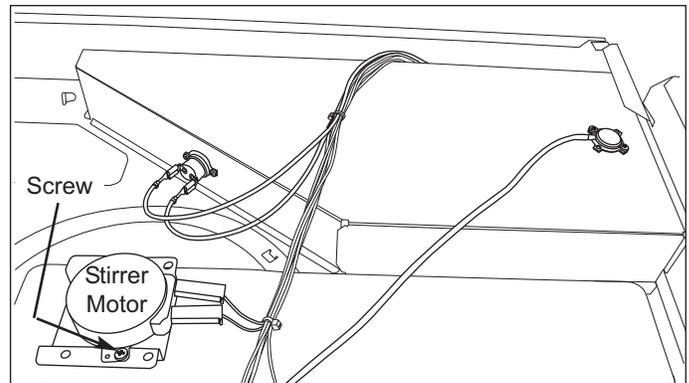


Figure 4-5. Upper Components

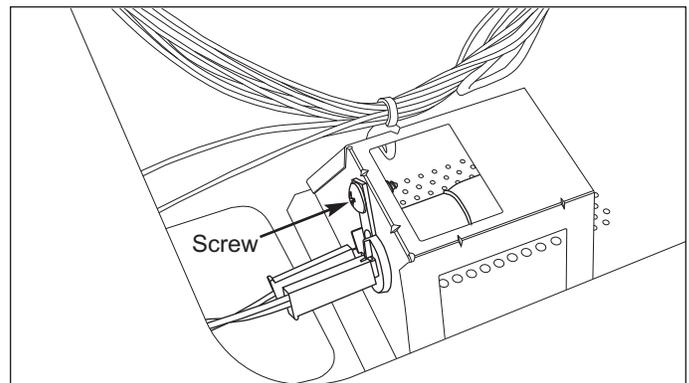


Figure 4-6. Lamp & Socket Removal

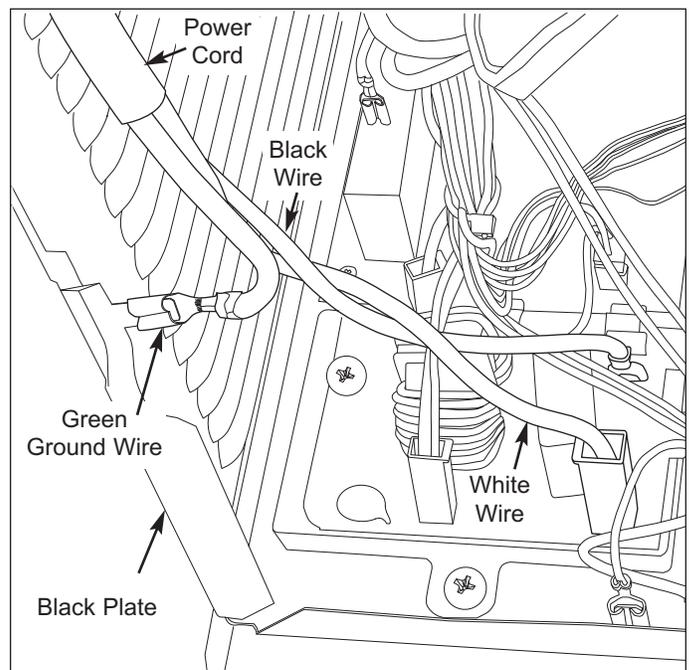


Figure 4-7. Power Cord Replacement

Stop Switch, Secondary Interlock Switch and Monitor Switch Removal:

1. Follow the Drawer Microwave disassembly as previously stated on page 4-6, steps 1-3.
2. Open the drawer and keep it open.
3. To discharge the high voltage capacitor, wait for 60 seconds.
4. Extract the mounting screw/washer holding the latch hook to the latch angle assembly (See Figure 4-8).
5. Remove the latch hook from the latch angle assembly.
6. Disconnect the wire leads of each switch.
7. Remove each switch from the latch hook by pushing the one stopper tab (located at the bottom) holding each switch (See Figure 4-8).

NOTE: Care must be taken not to break the plastic stopper tab or the holding clips.

8. Now, each switch is free.

Re-install:

1. Re-install each switch in its place. The secondary interlock switch is in the lower position and the monitor switch is in the top position, located on the left side of the unit. The door sensing switch is by itself on the right side of the unit.
2. Re-connect wire leads to each switch (See Figure 4-6).
3. Secure the latch hooks with mounting screws to oven flange.
4. Make sure that the monitor switch is operating properly and check continuity of the monitor circuit. Refer to section 5, Troubleshooting Guide "Test Procedure" pages 5-13 and 5-14 and "Adjustment procedure" on page 4-9.

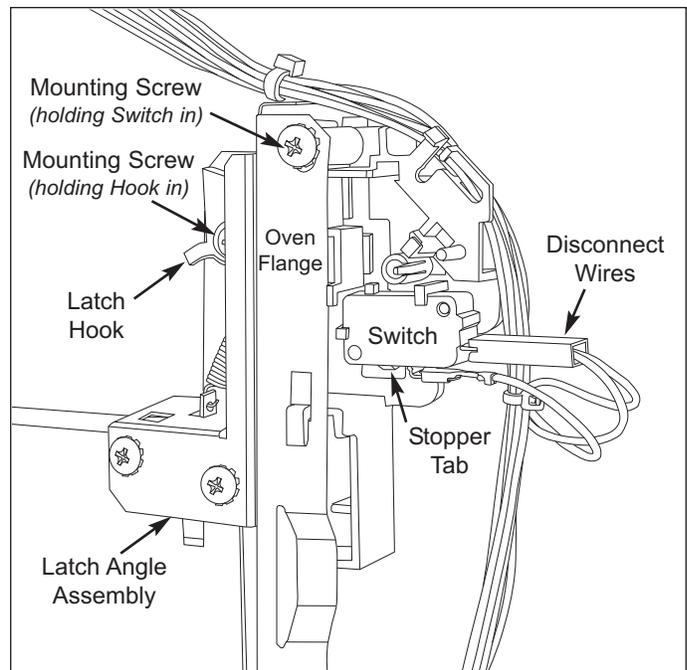
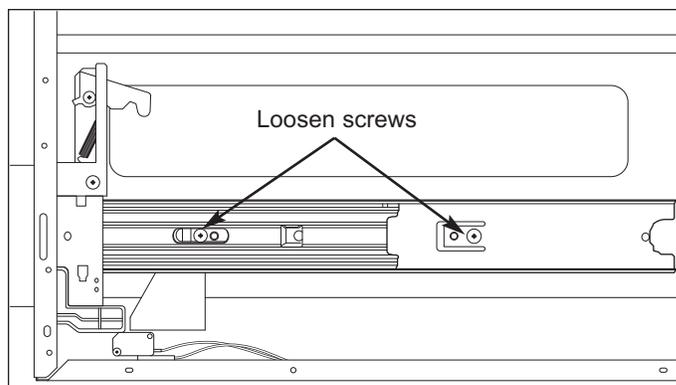


Figure 4-8. Switch Assembly Removal (Door Sensing Switch Shown)

Stop Switch, Secondary Interlock Switch and Monitor Switch Adjustment:

1. Follow the Drawer Microwave disassembly as previously stated on page 4-6.
2. Open the drawer and keep it open.
3. To discharge the high voltage capacitor, wait for 60 seconds.
4. If the door sensing switch, secondary interlock switch and monitor switch do not operate properly due to a misadjustment, the following adjustment should be made.
6. Loosen the screw holding latch hook to the oven cavity flange.
7. With drawer closed, adjust latch hook by moving it back and forth, and up and down. In and out play of the door allowed by the upper and lower position of the latch hook should be less than 0.5mm. The vertical position of the latch hook should be adjusted so that the secondary interlock switch is activated with the drawer closed. The horizontal position of the latch hook should be adjusted so that the monitor switch and drawer sensing switch are activated with the drawer closed.
8. Secure the screws with washers firmly.
9. Check all of the switches operation. If any switch has not activated fully, you will need to adjust the slide rail attached to the microwave cavity.
10. This is done by following the steps to remove the "Drawer Assembly and Drawer Support Angle Removal" on page 4-10. After you have removed the drawer support covers, loosen the two screws holding the slide rail to the microwave cavity and tilt the front end up and the rear end down, then tighten the screws (See Figure 4-9).
11. Check and assure that the cap nuts on the drawer support angles are centered when passing through the cavity face plate.


Figure 4-9. Slide Rail Adjustment
After Adjustment, Check The Following:

1. In and out play of door remains less than 0.5mm when in the latched position. First check upper position of latch hook, pushing and pulling upper portion of drawer toward the oven face. Then check lower portion of the latch hook, pushing and pulling lower portion of the door toward the oven face. Both results (play in the door) should be less than 0.5mm.
2. The secondary interlock switch interrupts the circuit before the door can be opened.
3. Monitor switch contacts close when door is opened.
4. Door sensing switch contacts open when door is opened.
5. Reassemble the unit and check for microwave leakage around door with an approved microwave survey meter (Refer to Microwave Measurement Procedure on page 4-4).

Drawer Assembly and Choke Cover Removal:

1. Follow the Drawer Microwave disassembly as previously stated on page 4-6.
2. Open the drawer and keep it open.
3. To discharge the high voltage capacitor, wait for 60 seconds.
4. Remove the both right and left side cabinet panels.
5. Remove the two drawer support covers from the choke cover as shown in Figure 4-10.
6. Insert a putty knife or flat thin blade screwdriver (thickness of about 0.5mm) into the gap between the choke cover and the door frame (See Figure 4-10).
7. Carefully slide choke cover away from drawer as far as possible.
8. Extract six mounting screws from all three drawer support angles as shown in Figure 4-11.
9. Unhook the drawer support angles from the drawer, then remove.
10. Now, the door assembly is free and the choke cover can now be removed.

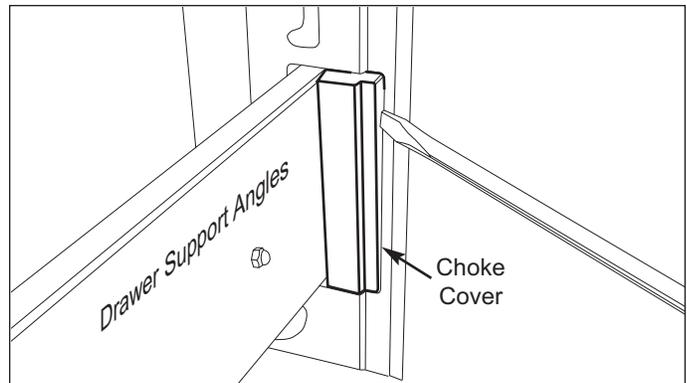


Figure 4-10. Choke Cover Removal

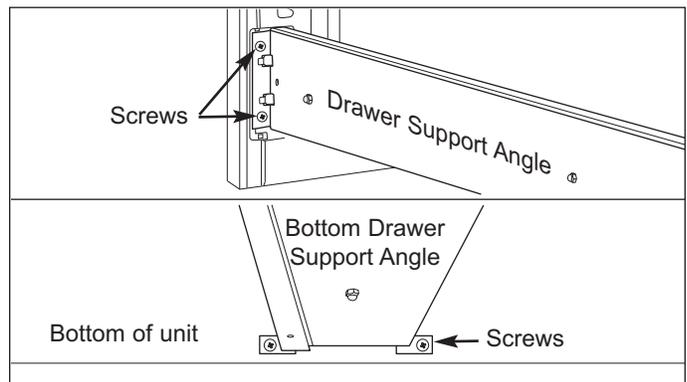


Figure 4-11. Drawer Support Screw Removal

Drawer Support Angle Removal:

1. Remove the drawer assembly and choke cover first.
2. Remove two mounting screws from the right or left latch angle assembly, then remove angle assembly (See Figure 4-12).
3. Separate slide rails by moving inside lever of slide rail. The slide rail will now separate by pulling straight forward and out (See Figure 4-13).
4. At this point, you can replace either latch angle assy or latch angles.

To reassemble, just reverse the above order.

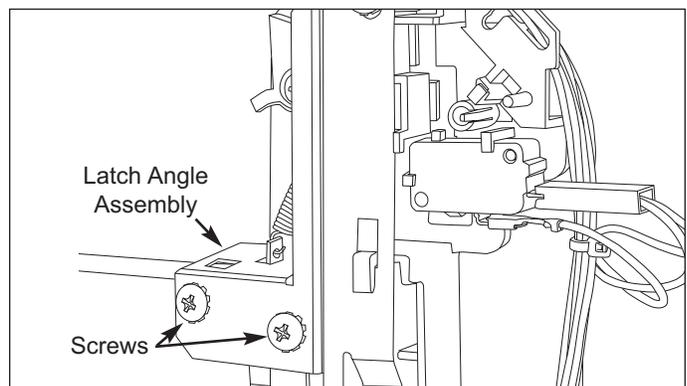


Figure 4-12. Latch Angle Assembly Removal

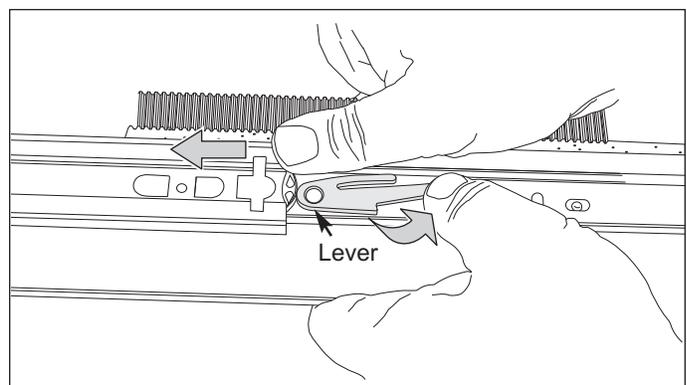


Figure 4-13. Disconnect Center Slides

After Reassembly, Do The Following:

- A. Make sure that drawer sensing switch, secondary interlock switch and monitor switch are operating properly. (Refer to section 5, Troubleshooting Guide "Test Procedures".)
- B. An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

After Any Servicing, Make Sure Of The Following:

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

NOTE: The drawer on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven drawer is not abnormal and do not of themselves.

Actuator Removal:

1. Follow the Drawer Microwave disassembly as previously stated on page 4-6.
2. Open the drawer and keep it open.
3. To discharge the high voltage capacitor, wait for 60 seconds.
4. Locate either the right or left actuator and remove the two mounting screws holding the actuator to the door support angles (See Figure 4-14).
5. Replace with the new actuator.

Actuator Adjustment:

6. It is very critical that proper adjustment is made to actuator.
7. Adjust each actuator to fully depress ("0" gap) switch lever switches on left and right side (See Figure 4-14).

NOTE: If this adjustment is not adjusted correctly, it will effect the performance of the Auto Drawer.

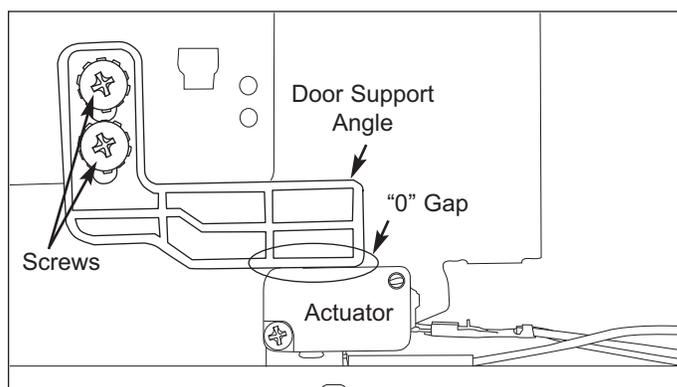


Figure 4-14. Actuator Removal/ Adjustment

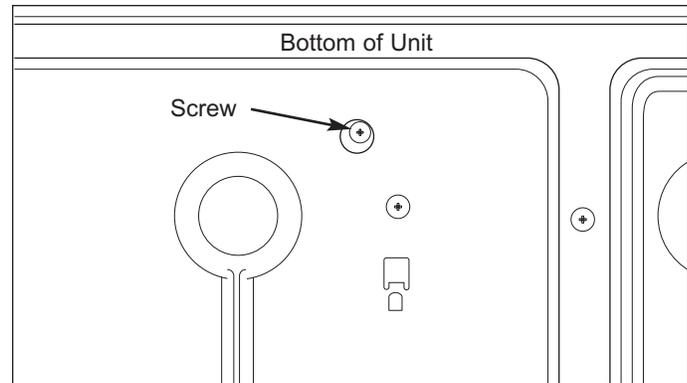
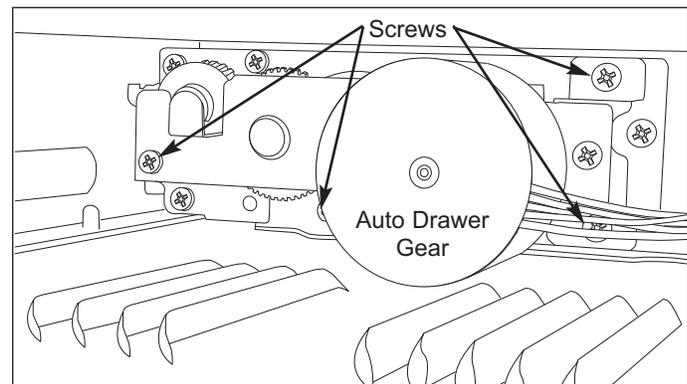
Auto Drawer Gear Removal/Installation:**NOTES:**

- This procedure requires a 1/4" or greater phillips screwdriver.
- The MWD30-2 auto drawer gear can be pulled straight out, after removing screws holding gear to cavity.

1. Disengage any power going to the unit.
2. Open the drawer and keep it open.
3. Remove the top cover and right side cabinet.
4. Unhook wiring to auto drawer gear.
5. Remove the bottom screw from below the auto drawer gear (See Figure 4-15).
6. Extract four (4) mounting screws holding the auto drawer gear to the bottom cavity angle (See Figure 4-16).
7. Disengage (pull) the auto drawer gear from rack gear and slide to the right (toward the rear), then turn motor 90° and slip out along the rear of the drawer.
8. Then tilt auto gear motor 20° to remove the assembly. The auto drawer gear is now free.

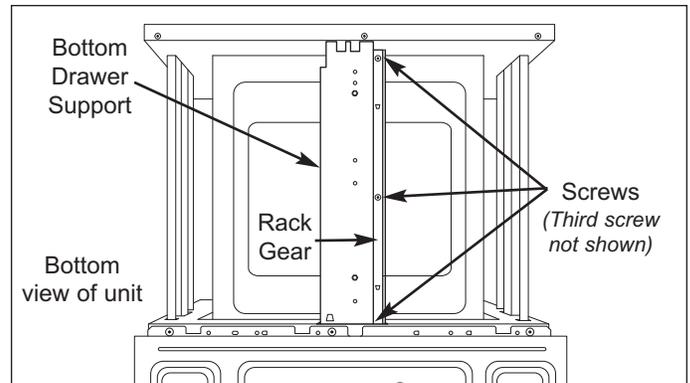
Installation:

1. Proceed in reverse to reinstall the auto drawer gear taking care that the gear teeth are set into the cavity angle correctly.

**Figure 4-15. Auto Drawer Gear Screw Removal****Figure 4-16. Auto Drawer Gear Mounting Screws**

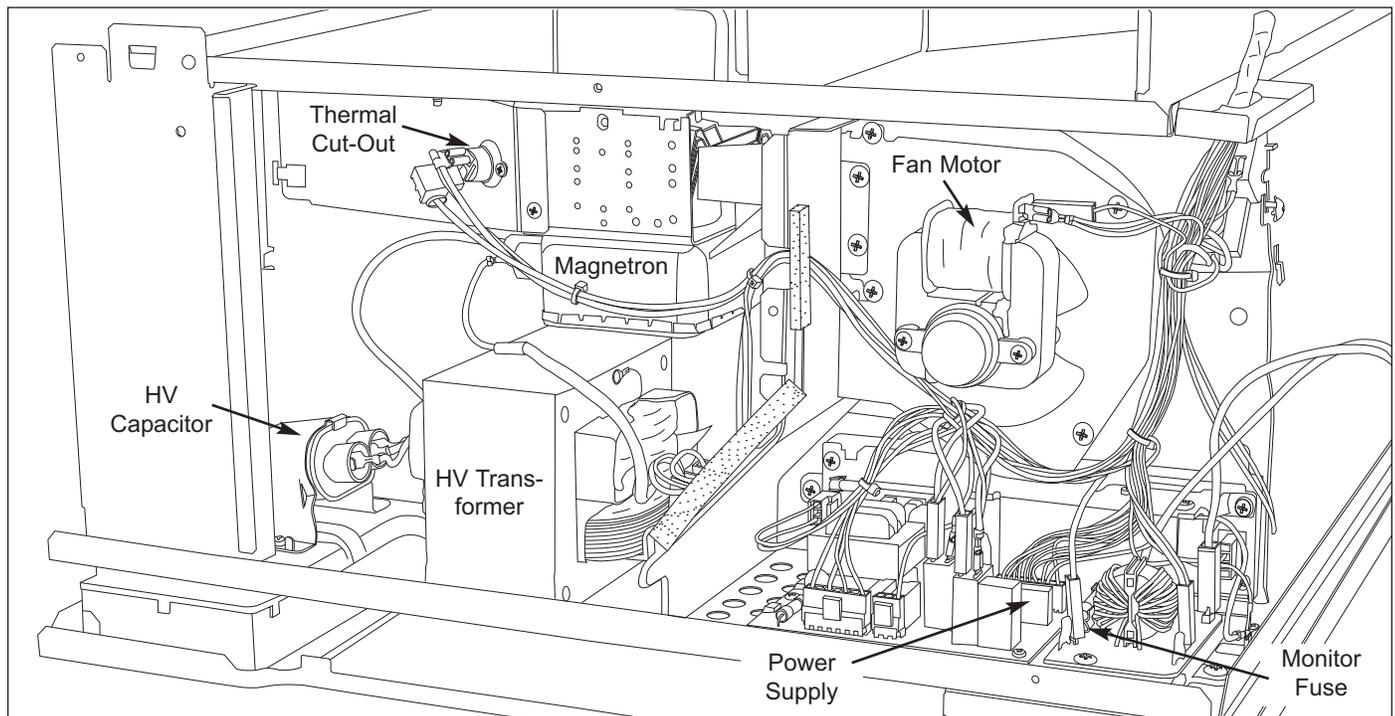
Rack Gear Removal:

1. Follow the Drawer Microwave disassembly as previously stated on page 4-6.
2. Open the drawer and keep it open.
3. To discharge the high voltage capacitor, wait for 60 seconds.
4. Remove the drawer microwave by following steps 1, 2, 5, 8, 9 & 10 as instructed under "Drawer Assembly and Choke Removal".
5. Remove the three (3) mounting screws holding the rack gear to the bottom slide rail (See Figure 4-17).
7. Proceed in reverse to reinstall the new rack gear.


Figure 4-17. Rack Gear Removal
Major Control Components:

1. Drawer Microwave must be removed from its installation. Remove the top plate, both side cabinet panels, the exhaust duct and the back plate.
2. Only attempt to remove a major control component after allowing the capacitor to self discharge which takes approximately 60 seconds, or discharge capacitor as instructed on page 4-3.
3. All major control components are attached with phillips head screws. To Remove a component, extract its mounting screws after detaching electrical wiring.

NOTE: Be careful to maintain proper wire location. Check for clear wire marking before removing any wires and label any wires that can not be easily identified.


Drawer Microwave Major Control Components

SECTION 5

TROUBLESHOOTING GUIDE



TROUBLESHOOTING AND TECHNICAL DATA

This section of the manual Component Test Procedures.

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

⚠ WARNING

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

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.

- **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.**
- **DO NOT OPERATE OR ALLOW THE OVEN TO BE OPERATED WITH THE DOOR OPEN.**

⚠ CAUTION

Be careful when handling sheet metal parts - Edges may be sharp.

NOTE: When troubleshooting, it may be necessary in some cases to supply power to the unit with the outer cabinet case removed (See **CAUTION** above).

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 (See **WARNING** above).
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.

NOTES:

- *After performing any service to the Drawer Microwave, test to verify that there is no leakage of microwave energy (See next page).*
- *Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:*
 - *Interlock operation*
 - *Proper drawer closing*
 - *Seal and sealing surfaces (arcing, wear, and other damage)*
 - *Evidence of dropping or abuse*
- *Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.*

MICROWAVE MEASUREMENT PROCEDURE

Requirements:

1. Microwave leakage limit (Power density limit): The power density of microwave radiation emitted by a microwave oven should not exceed 1mW/cm² at any point 5cm or more from the external surface of the oven, measured prior to acquisition by a purchaser, and thereafter (through the useful life of the oven), 5 mW/cm² at any point 5cm or more from the external surface of the oven.
2. Safety interlock switches: Primary interlock relay switch shall prevent microwave radiation emission in excess of the requirement as above mentioned. Secondary interlock relay and door sensing switch shall prevent microwave radiation emission in excess of 5 mW/cm² at any point 5cm or more from the external surface of the oven.

Preparation for testing:

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

1. Make sure that the actual instrument is operating normally as specified in its instruction booklet.

NOTES:

- Survey instruments that comply with the requirement for instrumentation as prescribed by the performance standard for microwave ovens, 21 CFR 1030.10(c)(3)(i), must be used for testing.
 - Survey instruments that comply with the requirement for instrumentation as prescribed by CSA and NHW performance standard for microwave ovens must be used for testing recommended instruments are, NARDA 8100 and NARDA 8200.
2. Place the load of 275±15 ml (9.8 oz) of tap water initially at 20±5° C (68°F) in the center of the oven cavity. The water container shall be a low form of 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically non conductive material such as glass or plastic. The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
 3. Set the cooking control on Full Power Cooking Mode.
 4. Close the drawer and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

Leakage test:

Closed-drawer leakage test (microwave measurement):

1. Grasp the probe of the survey instrument and hold it perpendicular to the gap between the drawer and the body of the oven.
2. Move the probe slowly, not faster than 1 in./sec. (2.5 cm/sec.) along the gap, watching for the maximum indication on the meter.
3. Check for leakage at the drawer screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents).
While testing for leakage around the drawer, pull the drawer away from the front of the oven as far as is permitted by the closed latch assembly.
4. Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4mW/cm², and that the primary interlock switch/secondary interlock relay does turn the oven OFF before any door movement.



TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
<p>A</p>	<p>TOUCH CONTROL PANEL ASSEMBLY TEST: The touch control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter. In this service manual, the touch control panel assembly is divided into three units, Control Unit, Keyboard Unit and Power Unit, and troubleshooting by unit replacement is described according to the symptoms indicated.</p> <p>Before Testing:</p> <ol style="list-style-type: none"> 1. Disconnect power supply cord, and then disassemble as per “Drawer Microwave Disassembly” Section 4 Component Access Removal, Page 4-6. 2. Open the drawer and block it open. 3. Discharge high voltage capacitor. 4. Disconnect the leads to the primary of the power transformer. 5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape. <p>Keyboard Unit:</p> <ol style="list-style-type: none"> 1. Check Keyboard unit connection before replacement. 2. Reconnect all leads removed from components during testing. 3. Re-install the covers. 4. Reconnect the power supply cord after the covers are installed. 5. Run the oven and check all functions. <p>The following symptoms indicate a defective keyboard unit:</p> <ul style="list-style-type: none"> • When touching the pads, a certain pad produces no signal at all. • When touching a number pad, two figures or more are displayed. • When touching the pads, sometimes a pad produces no signal. <p>If The Keyboard Unit is Defective:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove covers. 2. Open the drawer and block it open. 3. Discharge high voltage capacitor. 4. Replace the Keyboard unit. 5. Reconnect all leads removed from components during testing. 6. Re-install the covers. 7. Reconnect the power supply cord after the covers are installed. 8. Run the oven and check all functions. <p>Control Unit: The following symptoms indicate a defective control unit. Before replacing the control unit, perform the Keyboard unit test (Procedure B) to determine if control unit is faulty.</p> <ol style="list-style-type: none"> 1. In connection with indicators <ul style="list-style-type: none"> • At a certain digit, all or some segments do not light up. • At a certain digit, brightness is low. • Only one indicator does not light. • The corresponding segments of all digits do not light up; or they continue to light up. • Wrong figure appears. • A certain group of indicators do not light up. • The figure of all digits flicker. 2. Other possible problems caused by defective control unit. <ul style="list-style-type: none"> • Buzzer does not sound or continues to sound. • Clock does not operate properly. • Cooking is not possible. <p style="text-align: right;"><i>(This Section continues on the next page)</i></p>

PROCEDURE LETTER	COMPONENT TEST
<p style="text-align: center;">A (Cont.)</p>	<p>Power Unit or Touch Control Transformer:</p> <ol style="list-style-type: none"> 1. Fan motor, stirrer motor, oven lamp or electrical parts do not turn on or do not turn off. 2. Digital display on the control unit does not show anything. <p>When Testing is Completed:</p> <ol style="list-style-type: none"> 1. Disconnect power supply cord, and then disassemble as per “Drawer Microwave Disassembly” Section 4 Component Access Removal, Page 4-6. 2. Open the drawer and block it open. 3. Discharge high voltage capacitor. 4. Reconnect all leads removed from components during testing. 5. Re-install the covers. 6. Reconnect the power supply cord after the covers are installed. 7. Run the oven and check all functions.
<p style="text-align: center;">B</p>	<p>KEY UNIT TEST:</p> <ol style="list-style-type: none"> 1. Disconnect power supply cord, and then remove outer case. 2. Open the drawer and block it open. 3. Discharge high voltage capacitor. 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 drawer is closed and open when the drawer 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 drawer sensing switch is closed (either close the drawer or short the door sensing switch connector). 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. 5. Reconnect all leads removed from components during testing. 6. Re-install the outer case (cabinet). 7. Reconnect the power supply cord after the outer case is installed. 8. Run the oven and check all functions.

/	6	9	TIMER CLOCK
/	1	8	0
/	2	3	5
/	7	4	POWER LEVEL
/	SENSOR COOK	OPEN	/
/	SENSOR REHEAT	SENSOR POPCORN	SET UP CUSTOM HELP
REHEAT	DEFROST	KEEP WARM	CONTROL LOCK ON/OFF
STOP/ CLEAR	START/ MINUTE PLUS	/	CLOSE



PROCEDURE LETTER	COMPONENT TEST		
<p style="text-align: center;">C</p>	<p>RELAY TEST:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then remove outer case. 2. Open the door and block it open. 3. Discharge high voltage capacitor. 4. Disconnect the leads to the primary of the power transformer. 5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape. 6. After that procedure, re-connect the power supply cord. 7. Remove the outer case and check voltage between Pin Nos. 5 and 7 of the 4 pin connector (CN-A) on the power unit with an A.C. voltmeter. The meter should indicate 120 volts, if not check oven circuit. <p>RY, RY2, RY3 and RY4 Relay Test These relays are operated by D.C. voltage Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.</p> <ul style="list-style-type: none"> • DC. voltage indicated Defective relay. • DC. voltage not indicated Check diode which is connected to the relay coil. If diode is good, control unit is defective. 		
	RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
	RY1	Approx. 26 vdc	Oven lamp / Common
	RY2	Approx. 25 vdc	Power transformer
	RY3	Approx. 26 vdc	Stirred motor
	RY4	Approx. 26 vdc	Fan motor
	RY5	Approx. 26 vdc	Switching regulator or drawer motor
<ol style="list-style-type: none"> 8. Disconnect the power supply cord, and then remove outer case. 9. Open the door and block it open. 10. Discharge high voltage capacitor. 11. Reconnect all leads removed from components during testing. 12. Re-install the outer case (cabinet). 13. Reconnect the power supply cord after the outer case is installed. 14. Run the oven and check all function. 			

PROCEDURE LETTER	COMPONENT TEST							
D	DEFROST TEST:							
	⚠ WARNING							
	THE OVEN SHOULD BE FULLY ASSEMBLED BEFORE ATTEMPTING THE FOLLOWING PROCEDURE.							
	<ol style="list-style-type: none"> 1. Place one cup of water in the center of the tray in the oven cavity. 2. Close the drawer, touch the Defrost pad. Then select Steaks/Chops by touching the number pad 2. And touch the number pad 5. (Now, weight 0.5lb is set.) And then touch the start pad. 3. The oven is in Defrost cooking condition. 4. The oven will operate as follows: 							
	WEIGHT		1ST STAGE		2ND STAGE		3RD STAGE	
			LEVEL	TIME	LEVEL	TIME	LEVEL	TIME
0.5 lb		60%	20 sec.	40%	20 sec.	30%	45 sec.	
<ol style="list-style-type: none"> 5. If improper operation is indicated, the control unit is probably defective and should be checked. 								



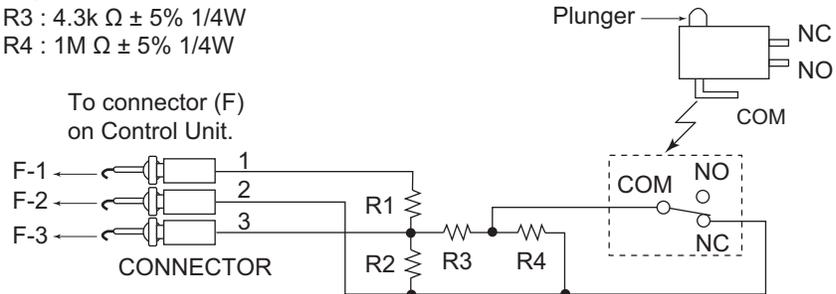
PROCEDURE LETTER	COMPONENT TEST		
<p>E</p>	<p>PROCEDURES TO BE TAKEN WHEN THE FUSE ON THE PRINTED WIRING BOARD (PWB) IS OPEN:</p> <p>To protect the electronic circuits, this model is provided with a fuse added to the primary on the PWB.</p> <ol style="list-style-type: none"> 1. Fuse check and repairs. <ul style="list-style-type: none"> • Disconnect the power supply cord. • Remove the outer case cabinet. • Open the door and block it open. • Discharge high voltage capacitor. • If the Fuse is blown, replace power unit. • Make a visual inspection of the varistor. Check for burned damage. If the varistor has been burned, replace the power unit. • Examine the touch control transformer with a tester for the presence of layer short-circuit (check the primary coil resistance which is approximately 151.6? ± 10%). If any abnormal condition is detected, replace the touch control transformer. • Reconnect all leads removed from components during testing. • Re-install the outer case (cabinet). • Reconnect the power supply cord after the outer case is installed. • Run the oven and check all functions. 2. Follow the troubleshooting guide given below, if indicator does not light up after above check and repairs are finished. <ul style="list-style-type: none"> • Disconnect the power supply cord. • Remove the outer case cabinet. • Open the door and block it open. • Discharge high voltage capacitor. • Disconnect the leads to the primary of the power transformer. • Ensure that these leads remain isolated from other components and oven chassis by using insulation tape. • After that procedure, re-connect the power supply cord. • Follow the troubleshooting guide given below for repair. 		
	STEPS	OCCURRENCE	CAUSE OR CORRECTION
	1	The rated AC voltage is not present between Pin Nos. 5 and 7 of the 4-pin connector (CN-A).	Check supply voltage and oven power cord.
	2	The rated AC voltage is present at primary side of touch control transformer.	Touch control transformer or secondary circuit defective. Check and replace touch control transformer or power unit.
	<ul style="list-style-type: none"> • Disconnect the power supply cord, and then remove outer case. • Open the door and block it open. • Discharge high voltage capacitor. • Reconnect all leads removed from components during testing. • Re-install the outer case (cabinet). • Reconnect the power supply cord after the outer case is installed. • Run the oven and check all functions. 		

PROCEDURE LETTER	COMPONENT TEST
<p>F</p>	<p>AH SENSOR TEST: Checking the initial sensor cooking condition</p> <p style="background-color: black; color: white; text-align: center;">⚠ WARNING</p> <p style="background-color: black; color: white; text-align: center;">THE OVEN SHOULD BE FULLY ASSEMBLED BEFORE ATTEMPTING THE FOLLOWING PROCEDURE.</p> <ol style="list-style-type: none"> 1. The oven should be plugged in at least two minutes before sensor cooking. 2. Room temperature should not exceed 95°F (35°C). 3. The unit should not be installed in any area where heat and steam are generated. The unit should not be installed, for example, next to a conventional surface unit. Refer to the "INSTALLATION INSTRUCTIONS" of the operation manual. 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. 5. Be sure the exterior of the cooking container and the interior of the oven are dry. Wipe off any moisture with a dry cloth or paper towel. 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. 7. Avoid using aerosol sprays or cleaning solvents near the oven while using Sensor settings. The sensor will detect the vapor given off by the spray and turn off before food is properly cooked. 8. If the sensor has not detected the vapor of the food, ERROR will appear and the oven will shut off. <p>Water Load Cooking Test: Make sure the oven has been plugged in at least two minutes before checking sensor cook operation. The cabinet should be installed and screws tightened.</p> <ol style="list-style-type: none"> 1. Fill approximately 200 milliliters (7.2 oz) of tap water in a 1000 milliliter measuring cup. 2. Place the container on the center of tray in the oven cavity. 3. Close the drawer. 4. Touch the TIMER/CLOCK pad once, the POWER LEVEL pad twice and the START pad once. And touch the number pads 1 once and the number pad 4 once. Now, the oven is in the sensor cooking condition, and "AH20" and "ON" will appear in the display. 5. The oven will operate for the first 16 seconds, without generating microwave energy. NOTE: ERROR will appear if the door is opened or STOP/CLEAR pad is touched during first stage of sensor cooking. 6. After approximately 16 seconds, microwave energy is produced. If ERROR is displayed or the oven does not turn off, replace the AH sensor or check the control unit, refer to explanation below. If the oven stops after 5 minutes and no ERROR code is displayed, then the AH sensor is normal. Check other parts except the AH sensor.

(This Section continues on the next page)



PROCEDURE LETTER	COMPONENT TEST
<p style="text-align: center;">F (Cont.)</p>	<p>TESTING METHOD FOR AH SENSOR AND/OR CONTROL UNIT: To determine if the sensor is defective, the simplest method is to replace it with a new replacement sensor.</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then disassemble as per “Drawer Microwave Disassembly” Section 4 Component Access Removal, Page 4-6. 2. Open the drawer and block it open. 3. Discharge high voltage capacitor. 4. Remove the AH sensor. 5. Install the new AH sensor. 6. Reconnect all leads removed from components during testing. 7. Re-install the covers. 8. Reconnect the power supply cord after the covers are installed. 9. Reconnect the oven to the power supply and check the sensor cook operation as follows: <ul style="list-style-type: none"> • Fill approximately 200 milliliters (7.2 oz) of tap water in a 1000 milliliter measuring cup. • Place the container on the center of tray in the oven cavity. • Close the drawer. • Touch the TIMER/CLOCK pad once, the POWER LEVEL pad twice and the START pad once. And touch the number pads 1 once and the number pad 4 once. • The control panel is in automatic Sensor operation. • The oven turns off automatically, and the time for detecting moisture will be displayed. <p>If new sensor does not operate properly, the problem is with the control unit, and refer to explanation be-low.</p> <p>CHECKING CONTROL UNIT:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord, and then disassemble as per “Drawer Microwave Disassembly” Section 4 Component Access Removal, Page 4-6. 2. Open the drawer 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 the power transformer. 7. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape. 8. After that procedure, re-connect the power supply cord. 9. Check the sensor cook operation proceed as follows: <ul style="list-style-type: none"> • Close the door. Touch the TIMER/CLOCK pad once, the POWER LEVEL pad twice and the START pad once. And touch the number pads 1 once and the number pad 4 once. • The control panel is in the sensor cooking operation. • After approximately 25 seconds, push plunger of select switch for more than 3 seconds. This condition is same as judgement by AH sensor. • After approximately 3 seconds, the display shows “ X X . X X “ which is the time for detecting moisture. If the above is not the case, the control unit is probably defective. If the above is proper, the AH sensor is probably defective. If the above is proper, the AH sensor is probably defective. <p style="text-align: right;"><i>(This Section continues on the next page)</i></p>

PROCEDURE LETTER	COMPONENT TEST
<p style="text-align: center;">F (Cont.)</p>	<p>10. Disconnect the power supply cord, and then remove covers. 11. Open the drawer and block it open. 12. Discharge high voltage capacitor. 13. Disconnect the dummy resistor circuit from the sensor connector of control panel. 14. Carry out necessary repair. 15. Reconnect all leads removed from components during testing and repairing. 16. Re-install the covers. 17. Reconnect the power supply cord after the outer case is installed. Run the oven and check all functions. 18. Carry out "Water load cooking test" again and ensure that the oven works properly.</p> <p>R1, R2 : 22 Ω ± 1% 1/2W R3 : 4.3k Ω ± 5% 1/4W R4 : 1M Ω ± 5% 1/4W</p>  <p>To connector (F) on Control Unit.</p> <p>Refer to the Disassembly instructions found on page 16.</p>
<p style="text-align: center;">G</p>	<p>MAGNETRON ASSEMBLY TEST:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Open the drawer and keep it open. 3. To discharge high voltage capacitor, wait for 60 seconds. 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. 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. 6. Reconnect all leads removed from components during testing. 7. Reassemble the unit. 8. Reconnect the power supply cord. 9. Run the oven and check all functions. <i>(This Section continues on the next page)</i>



PROCEDURE LETTER	COMPONENT TEST
<p>G (Cont.)</p>	<p>MICROWAVE OUTPUT POWER:</p> <p>⚠ WARNING</p> <ul style="list-style-type: none"> • THE OVEN SHOULD BE FULLY ASSEMBLED BEFORE ATTEMPTING THE FOLLOWING PROCEDURE. • HIGH VOLTAGES ARE PRESENT DURING COOK CYCLE, SO EXTREME CAUTION SHOULD BE OBSERVED. <p>Power output of the magnetron can be measured by performing a water temperature rise test. This test should only be used if above tests do not indicate a faulty magnetron and there is no defect in the following components or wiring: This test will require a 16 ounce (453cc) measuring cup and an accurate mercury thermometer or thermocouple type temperature tester. For accurate results, the following procedure must be followed carefully:</p> <ol style="list-style-type: none"> 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. 2. Place the cup of water in the oven. Operate oven at POWER 10(HIGH) selecting more than 60 seconds cook time. Allow the water to heat for 60 seconds, measuring with a stop watch, second hand of a watch or the digital read-out countdown. 3. Remove the cup from the oven and again measure the temperature, making sure to stir the thermometer or thermocouple through the water until the maximum temperature is recorded. 4. Subtract the cold water temperature from the hot water temperature. The normal result should be 28° to 54°F (16° to 30°C) rise in temperature. If the water temperatures are accurately measured and tested for the required time period the test results will indicate if the magnetron tube has low power output (low rise in water temperature) which would extend cooking time or high power output (high rise in water temperature) which would reduce cooking time. Because cooking time can be adjusted to compensate for power output, the magnetron tube assembly should be replaced only if the water temperature rise test indicates a power output well beyond the normal limits. The test is only accurate if the power supply line voltage is 120 volts and the oven cavity is clean.

PROCEDURE LETTER	COMPONENT TEST
H	<p>THERMAL CUT-OUT TEST:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Open the drawer and keep it open. 3. To discharge high voltage capacitor, wait for 60 seconds. 4. A continuity check across the thermal cut-out terminals should indicate a closed circuit unless the temperature of the thermal cut-out reaches approximately 293°F(145°C). An open thermal cut-out indicates overheating of the oven, exchange the oven thermal cut-out and check inside of oven cavity and for improper setting of cooking time or operation of control unit. Check for restricted air flow through the vent holes of the oven cavity, especially the cooling fan and air guide. 5. Reconnect all leads removed from components during testing. 6. Reassemble the unit. 7. Reconnect the power supply cord. 8. Run the unit and check all functions. <p style="text-align: center;">⚠ CAUTION</p> <p>If the thermal cut-out indicates an open circuit at room temperature, replace thermal cut-out.</p>
I	<p>SECONDARY INTERLOCK SWITCH TEST:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Open the drawer and keep it open. 3. To discharge high voltage capacitor, wait for 60 seconds. 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 drawer open and a closed circuit with the drawer closed. If improper operation is indicated, replace the secondary interlock switch. 5. Reconnect all leads removed from components during testing. 6. Reassemble the unit. 7. Reconnect the power supply cord. 8. Run the oven and check all functions.
J	<p>STOP SWITCH TEST:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Open the drawer and keep it open. 3. To discharge high voltage capacitor, wait for 60 seconds. 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 drawer open and a closed circuit with the drawer closed. If improper operation is indicated, replace the stop switch. 5. Reconnect all leads removed from components during testing. 6. Reassemble the unit. 7. Reconnect the power supply cord. 8. Run the oven and check all functions. <p>NOTE: <i>If the stop switch contacts fail in the open position and the door is closed, the cooling fan motor, stirrer motor and oven light will be activated by RY1.</i></p>

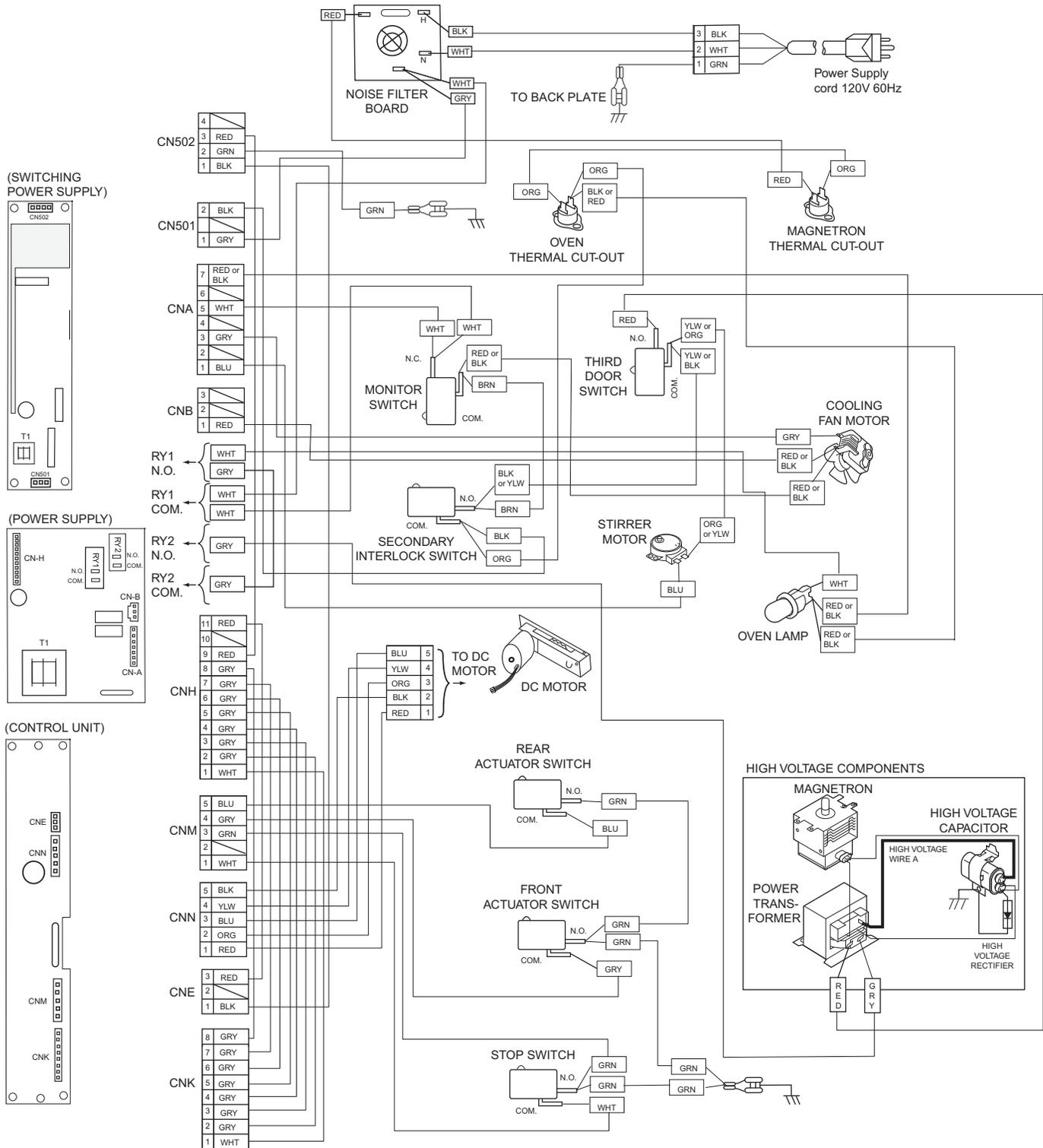
PROCEDURE LETTER	COMPONENT TEST
<p>K</p>	<p>MONITOR SWITCH TEST:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Open the drawer and keep it open. 3. To discharge high voltage capacitor, wait for 60 seconds. 4. Before performing this test, make sure that the secondary interlock switch, according to the above Switch Test Procedure. Disconnect the wire lead from the monitor switch (COM) terminal. Check the monitor switch operation by using the ohmmeter as follows. When the drawer is open, the meter should indicate a closed circuit. When the monitor switch actuator is pushed by a screw driver through the lower latch hole on the front plate of the oven cavity with the drawer opened (in this condition the plunger of the monitor switch is pushed in), the meter should indicate an open circuit. If improper operation is indicated, the switch may be defective and both the monitor switch, plus fuse will need to be replaced. After testing the monitor switch, reconnect the wire lead to the monitor switch (COM) terminal and check the continuity of the monitor circuit. 5. Reconnect all leads removed from components during testing. 6. Reassemble the unit. 7. Reconnect the power supply cord. 8. Run the oven and check all functions. <div style="text-align: center; margin-top: 20px;"> </div>

PROCEDURE LETTER	COMPONENT TEST
L	<p>BLOWN MONITOR FUSE TEST:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Open the drawer and block it open. 3. To discharge high voltage capacitor, wait for 60 seconds. 4. If the monitor fuse is blown when the drawer is opened, check the primary interlock switch, secondary interlock switch and monitor switch according to the "TEST PROCEDURE" for those switches before replacing the blown monitor fuse. <p style="text-align: center;">⚠ CAUTION</p> <p>Before replacing a blown monitor fuse, test the secondary interlock switch, stop switch and monitor switch for proper operation.</p> <p>If the monitor fuse is blown by improper switch operation, the monitor fuse and monitor switch must be replaced with "monitor fuse and monitor switch assembly" See Section 5, even if the monitor switch operates normally. The monitor fuse and monitor switch assembly is comprised of a 20 ampere fuse and switch.</p> <ol style="list-style-type: none"> 5. Reconnect all leads removed from components during testing. 6. Reassemble the unit. 7. Reconnect the power supply cord. 8. Run the oven and check all functions.
M	<p>POWER TRANSFORMER TEST:</p> <ol style="list-style-type: none"> 1. Disconnect the power supply cord. 2. Open the drawer and block it open. 3. Discharge high voltage capacitor. 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. 5. Reconnect all leads removed from components during testing. 6. Reassemble the unit. 7. Reconnect the power supply cord. 8. Run the oven and check all functions. <p style="text-align: center;">⚠ WARNING</p> <p>HIGH VOLTAGES ARE PRESENT AT THE HIGH VOLTAGE TERMINAL, SO DO NOT ATTEMPT TO MEASURE THE FILAMENT AND HIGH VOLTAGE.</p>

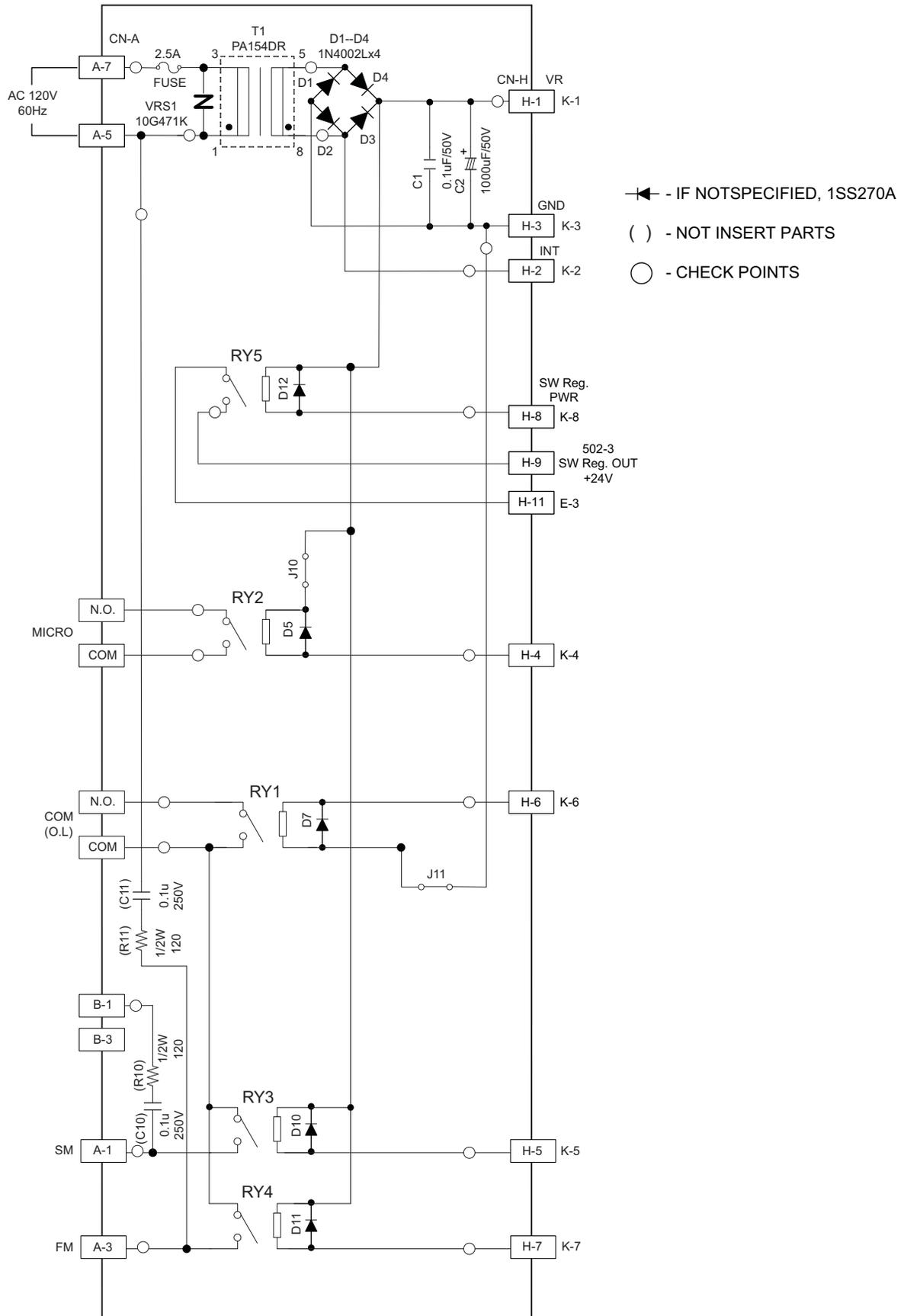
SECTION 6

WIRING DIAGRAMS

DRAWER MICROWAVE HARNESS PINOUT



DRAWER MICROWAVE POWER UNIT CIRCUIT

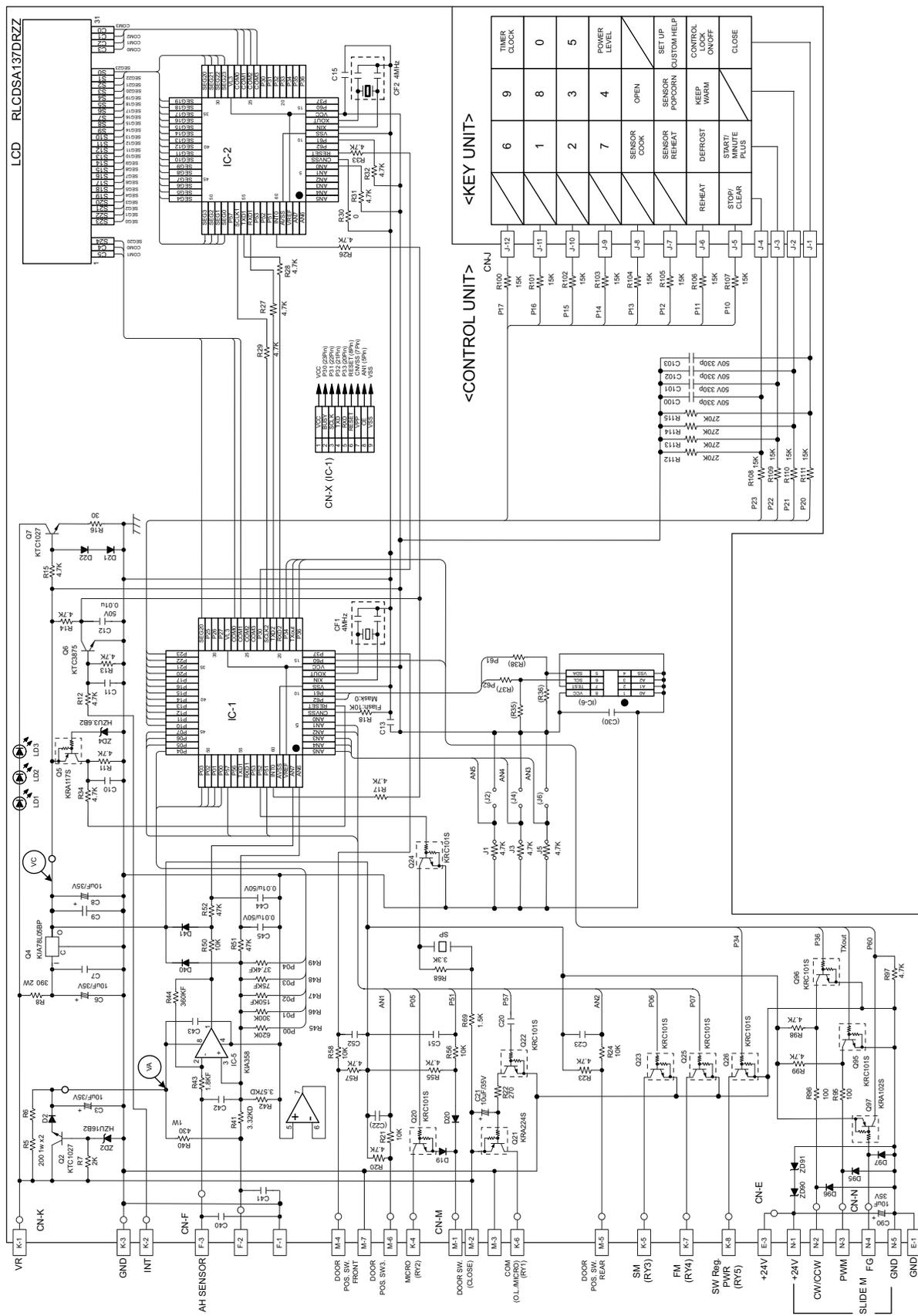


⚡ - IF NOT SPECIFIED, 1SS270A

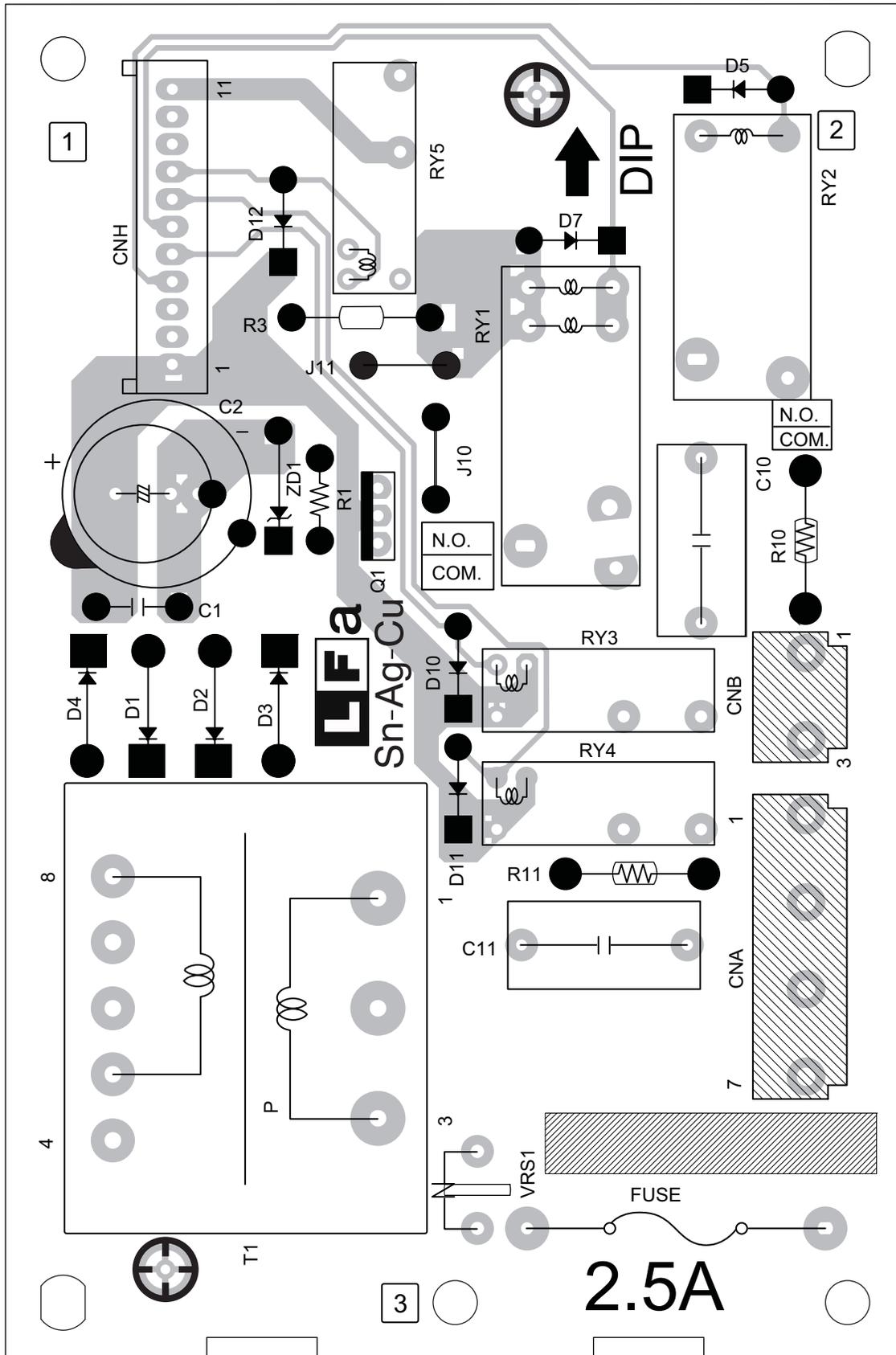
() - NOT INSERT PARTS

○ - CHECK POINTS

DRAWER MICROWAVE CONTROL UNIT CIRCUIT



PRINTED WIRING BOARD OF POWER UNIT



PRINTED WIRING BOARD OF CONTROL UNIT

