

GE Appliances

Technical Service Guide

DECEMBER 2011

GE Spacemaker® Over-the-Range Microwave Oven

DVM1950

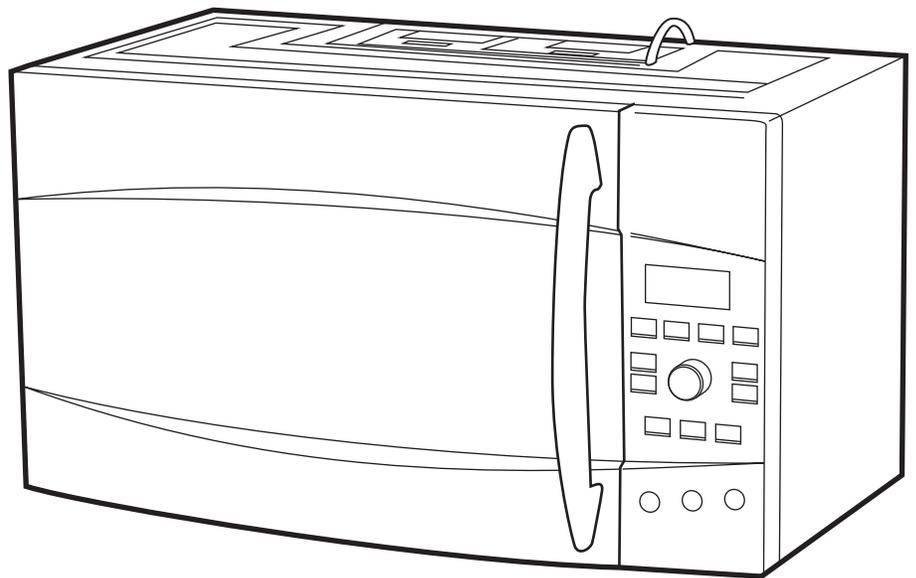
JNM1951

JVM1950

PNM1971

PVM1970

PVM2170



31-9222



GE Appliances
General Electric Company
Louisville, Kentucky 40225



IMPORTANT SAFETY NOTICE

The information in this service guide is intended for use by individuals possessing adequate backgrounds of electrical, electronic, and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

WARNING

To avoid personal injury, disconnect power before servicing this product. If electrical power is required for diagnosis or test purposes, disconnect the power immediately after performing the necessary checks.

RECONNECT ALL GROUNDING DEVICES

If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

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

- A. DO NOT OPERATE OR ALLOW THE OVEN TO BE OPERATED WITH THE DOOR OPEN.
- B. IF THE OVEN OPERATES WITH THE DOOR OPEN, INSTRUCT THE USER NOT TO OPERATE THE OVEN AND CONTACT THE MANUFACTURER IMMEDIATELY.
- C. MAKE THE FOLLOWING SAFETY CHECKS ON ALL OVENS TO BE SERVICED BEFORE ACTIVATING THE MAGNETRON OR OTHER MICROWAVE SOURCE, AND MAKE REPAIRS AS NECESSARY:
 - 1. INTERLOCK OPERATION.
 - 2. PROPER DOOR CLOSING.
 - 3. SEAL AND SEALING SURFACES (ARCING, WEAR AND OTHER DAMAGE).
 - 4. DAMAGE TO OR LOOSENING OF HINGES AND LATCHES.
 - 5. EVIDENCE OF DROPPING OR ABUSE.
- D. BEFORE TURNING ON MICROWAVE POWER FOR ANY TEST OR INSPECTION WITHIN THE MICROWAVE GENERATING COMPARTMENTS, CHECK THE MAGNETRON, WAVE GUIDE OR TRANSMISSION LINE AND CAVITY FOR PROPER ALIGNMENT, INTEGRITY AND CONNECTIONS.
- E. ANY DEFECTIVE OR MISADJUSTED COMPONENTS IN THE INTERLOCK MONITOR, DOOR SEAL AND MICROWAVE GENERATION AND TRANSMISSION SYSTEMS SHALL BE REPAIRED, REPLACED OR ADJUSTED BY PROCEDURE DESCRIBED IN THIS MANUAL BEFORE THE OVEN IS RELEASED TO THE OWNER.
- F. A MICROWAVE LEAKAGE CHECK TO VERIFY COMPLIANCE WITH THE FEDERAL PERFORMANCE STANDARD SHOULD BE PERFORMED ON EACH OVEN PRIOR TO RELEASE TO THE OWNER.

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IMPORTANT SAFETY INSTRUCTIONS.

READ ALL INSTRUCTIONS BEFORE USING.

When using electrical appliances basic safety precautions should be followed, including the following:

WARNING!

To reduce the risk of burns, electric shock, fire, injury to persons or exposure to excessive microwave energy:

PRECAUTIONS TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

- | | |
|---|--|
| <p>(a) Do Not Attempt to operate this oven with the door open since open-door operation can result in harmful exposure to microwave energy. It is important not to defeat or tamper with the safety interlocks.</p> <p>(b) Do Not Place any object between the oven front face and the door or allow soil or cleaner residue to accumulate on sealing surfaces.</p> | <p>(c) Do Not Operate the oven if it is damaged. It is particularly important that the oven door close properly and that there is no damage to the:</p> <ul style="list-style-type: none">(1) door (bent)(2) hinges and latches (broken or loosened)(3) door seals and sealing surfaces. <p>(d) The Oven Should Not be adjusted or repaired by anyone except properly qualified service personnel.</p> |
|---|--|

- **Read all instructions before using this appliance. When using electrical appliances, basic safety precautions should be followed, including the following:**
- Read and follow the specific precautions in the Precautions to Avoid Possible Exposure to Excessive Microwave Energy section above.
- This appliance must be grounded. Connect only to a properly grounded outlet.
- This microwave oven is UL listed for installation over both gas (less than 60,000BTU) and electric ranges.
- This over-the-range oven is designed for use over ranges no wider than 36." It may be installed over both gas and electric cooking equipment.
- Do not operate this appliance if it has a damaged power cord or plug, if it is not working properly, or if it has been damaged or dropped. If the power cord is damaged, it must be replaced by General Electric Service or an authorized service agent using a power cord available from General Electric..
- Install or locate this appliance only in accordance with the provided installation instructions.
- Do not clean with metal scouring pads. Pieces can burn off the pad and touch electrical parts involving risk of electric shock.

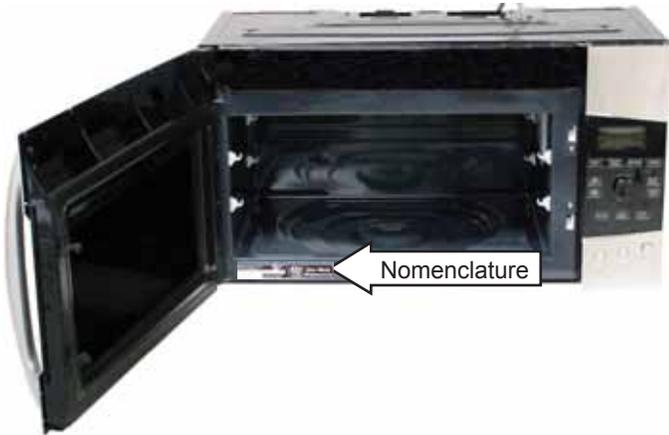
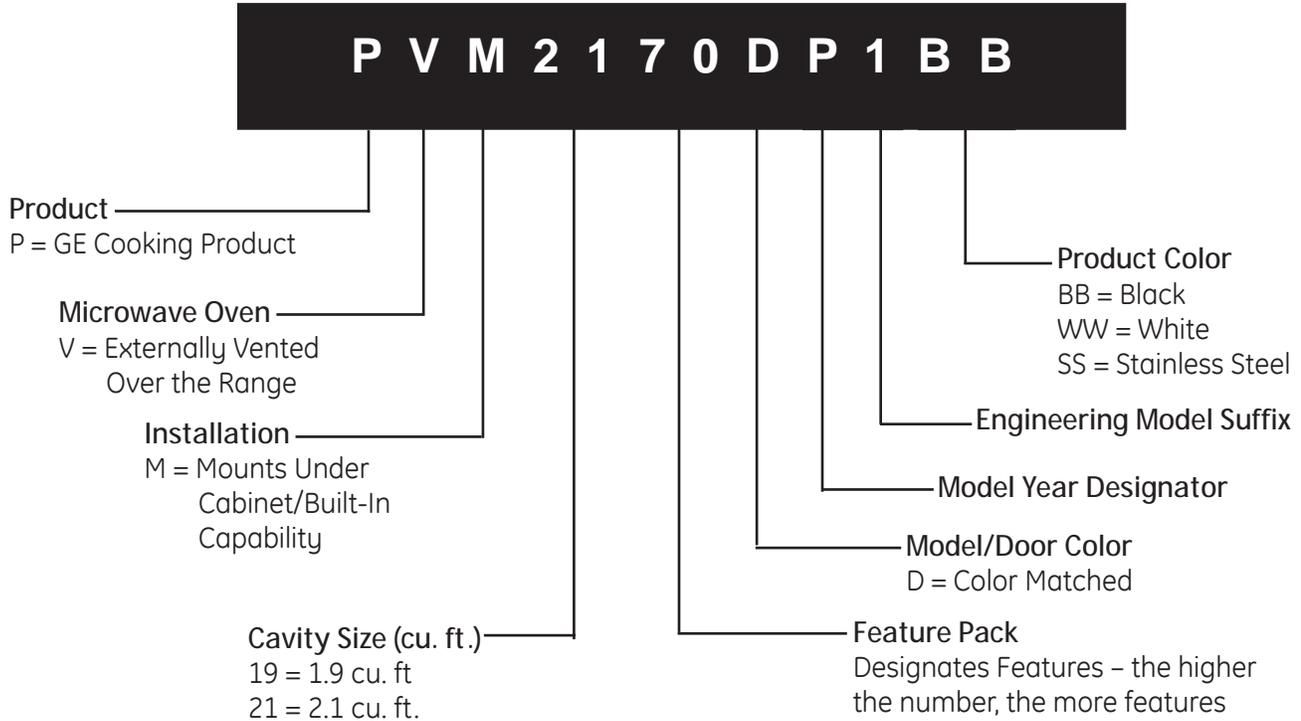
Table of Contents

Bottom Thermal Cut Out (TCO)	29
Capacitor and Diode	34
Cavity Thermal Cut Out (TCO).....	32
Circuit Board Connectors View.....	18
Component Locator Views.....	16
Components.....	19
Control Features.....	8
Control Panel Assembly.....	26
Control Performance Test (JVM1950, DVM1950, JNM1951, PVM1970, PNM1971).....	39
Cooling Fan Motor	33
Demo Mode	36
Display Board	29
Door Assembly.....	21
Door Interlocks (Door Latch Switches).....	40
Door Interlock Switches.....	27
Error Messages	38
Grille Assembly	19
High Voltage Fuse.....	25
High Voltage Half-Wave Doubler	47
High Voltage Transformer	35
Interior Light.....	22
Introduction.....	7
Key Panel Test (JVM1950, DVM1950, PVM1970).....	42
Line Fuse.....	25
Magnetron.....	31
Magnetron Thermal Cut Out (TCO).....	31
Microwave Leakage Test.....	38
Microwave Oven Removal.....	19

Noise Filter	25
Nomenclature	6
Outer Cover	20
Oven Performance Test.....	38
Power Saver (Energy Saver).....	23
Schematics and Wiring Diagrams	43
Sensor	41
Smart Board	28
Stirrer Assembly	24
Surface Lamps	30
Technical Data Sheet (JVM1950, DVM1950, JNM1951, PVM1970, PNM1971).....	39
Troubleshooting	37
Turntable Coupling.....	30
Turntable Motor.....	30
Vent Blower	25
Vent Fan Motor Capacitor.....	31
Vent Thermal Cut Out (TCO).....	32
Warranty	48

Nomenclature

Model Number



The nomenclature plate is located inside the microwave on the left side.

The mini-manual is located on the backside of the control panel assembly. It is secured by 2 metal tabs, just above the smart board.

Serial Number

The first two characters of the serial number identify the month and year of manufacture.

Example: ZV123456S = December 2011

Z - DEC	2011 - V
A - JAN	2009 - S
D - FEB	2008 - R
F - MAR	2007 - M
G - APR	2006 - L
H - MAY	2005 - H
L - JUN	2004 - G
M - JUL	2003 - F
R - AUG	2002 - D
S - SEP	2001 - A
T - OCT	2000 - Z
V - NOV	2010 - T

The letter designating the year repeats every 12 years.

Example:

V - 2011
V - 1999
V - 1987

Introduction

Features and Benefits

Circuwave™ 1000 cooking system – Provides more power for fast and more even cooking results.

Sensor cooking controls – Automatically adjusts time and power for delicious cooking results.

Easy-clean interior – Makes it easy to wipe up spills, splatters, and dried-on foods.

Power saver – Reduces standby power while the unit is not in use.

USDA MyPlate.gov menu – Preprogrammed foods and recipes assist in preparation of healthy meal choices.

Steam cook button – Perfectly prepares your steamed favorites for maximum nutrition retention.

Two-piece design with hidden vent – Creates a streamlined look for a smooth finish.

Four-speed, 400-CFM venting system – Quickly removes smoke, steam, and odors from the cooktop for fresher, cleaner kitchen air.

Recessed turntable with on/off button – Offers the flexibility to use different sizes of dishes.

PVM2170 (2.1 cu. ft. capacity)



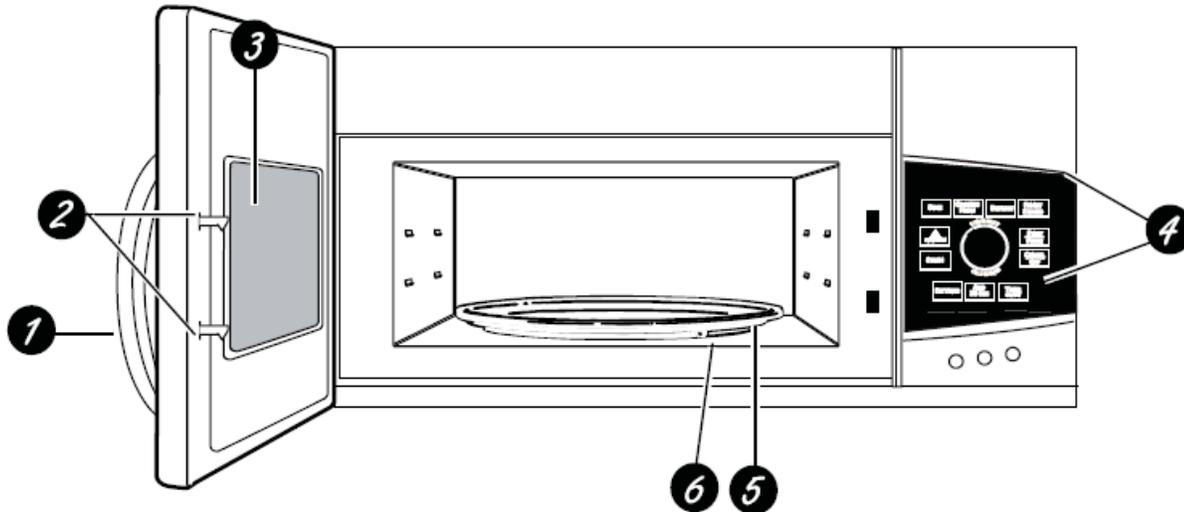
JVM1950, JNM1951, DVM1950, PVM1970, PNM1971 (1.9 cu. ft. capacity)



Control Features

PVM2170 Features

Throughout this manual, features and appearance may vary from your model.



Features of the Oven

- 1 Door Handle.**
- 2 Door Latches.**
- 3 Window with Metal Shield.** Screen allows cooking to be viewed while keeping microwaves confined in the oven.
- 4 Control Panel and Dial.**
- 5 Removable Turntable.** Do not operate the oven in the microwave mode without the turntable and turntable support seated and in place.
- 6 Removable Turntable Support.** Do not operate the oven in the microwave mode without the turntable and turntable support seated and in place.

Power Saver Feature (on some models)

Your GE microwave has an Power Saver feature. Many electronic appliances, including Microwaves, consume electric power while they are switched off or in a standby mode. Eliminating standby power can reduce your operating costs.

To **ACTIVATE** the Power Saver Feature—

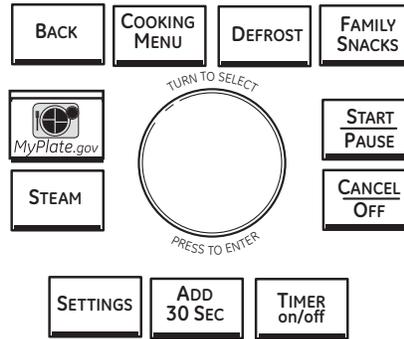
- 1** Press the **Power Saver** button on the unit, and the unit will turn off. (Note: If utilizing this feature, the clock will not be displayed on the unit.)

To **DEACTIVATE** the Power Saver Feature —

- 1** Press the **Power Saver** button on the unit, and the unit will turn on. The display will read "On" If the unit has had power applied recently (within the last few days), the time will be remembered.

- 2** If prompted, enter the time of day.

NOTE: The time keeping device that keeps your clock running will need to be recharged every few days. It is recommended that once a week you should leave the unit powered on (do not use the Power Saver feature) for at least 24 hours. If you are prompted to enter a time when turning on from the Power Saver mode, you should have the unit powered on for at least 48 hours. When you first install your unit, you should leave it powered on for at least 48 hours.



Cooking Controls

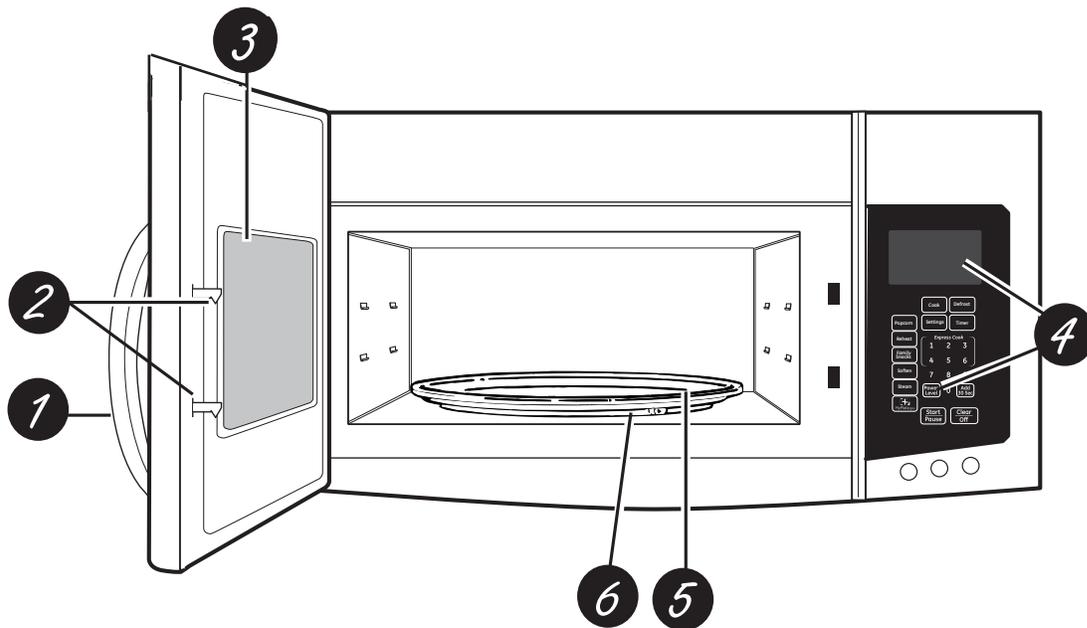
Check the Convenience Guide before you begin.

1 Time Features

Press	Enter
COOKING MENU	Food Type, Cook Type, etc.
DEFROST	Time, Weight, Food Type or 1 lb Quick Defrost
SETTINGS	Help, Clock Settings, Turntable On/Off, Auto Night Light, Beeper Volume, Reminder
TIMER	Kitchen Timer Settings
ADD 30 Sec	Starts Immediately!

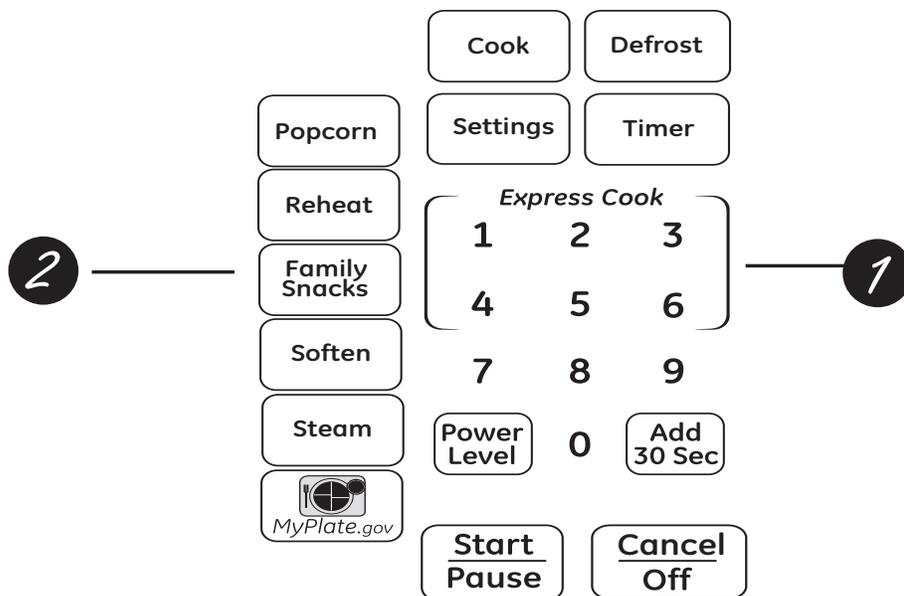
2 Convenience Features

Press	Enter
STEAM	Enter pad to select Food
MyPlate.gov	Enter pad to select Food
FAMILY SNACKS	Enter pad to select Food



Features of the Oven

- 1 Door Handle.**
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- 6 Removable Turntable Support.** Do not operate the oven in the microwave mode without the turntable and turntable support seated and in place.



Cooking Controls

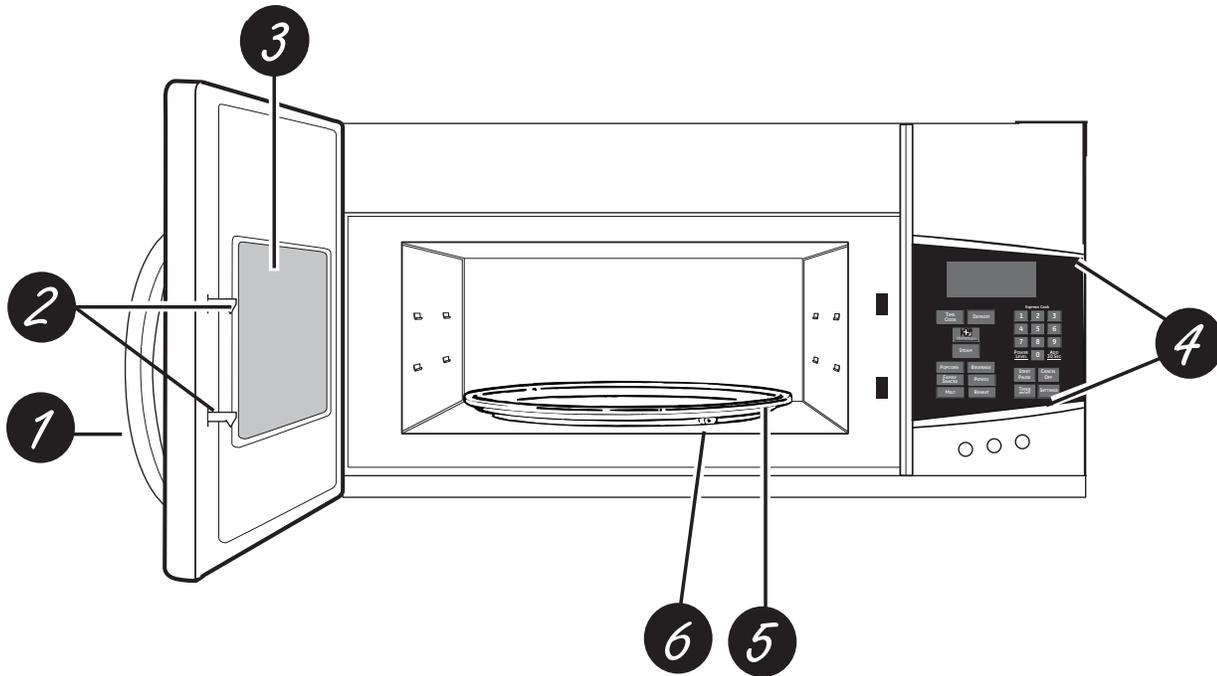
Check the Convenience Guide before you begin.

1 Time Features

Press	Enter
COOK	Amount of cooking time
DEFROST	Time, Weight or 1 lb Quick Defrost
SETTINGS	Help, Clock Settings, Turntable On/Off, Auto Night Light, Beeper Volume, Display Speed, Display Language
Timer	Kitchen Timer Settings
POWER LEVEL	Power level 1 to 10
ADD 30 SEC	Starts immediately!
EXPRESS COOK	Starts immediately! Press number pads (1-6)

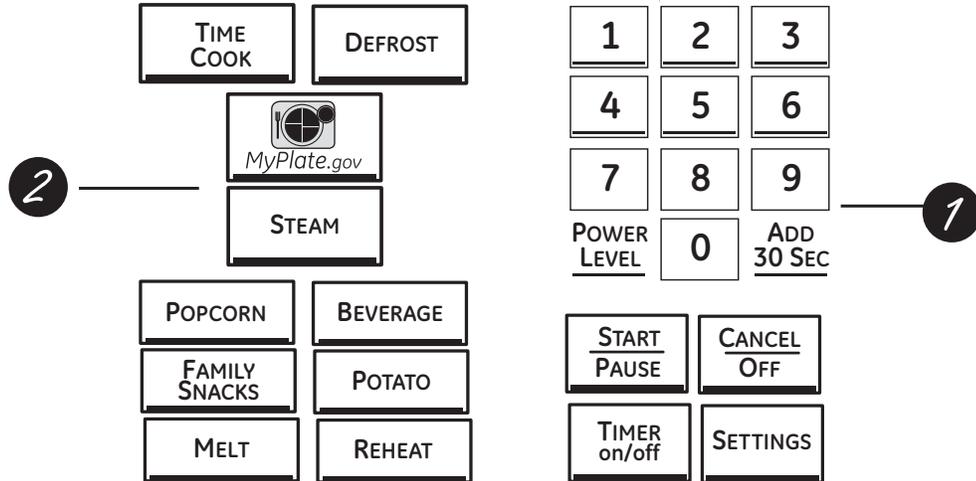
2 Convenience Features

Press	Enter
POPCORN	Starts immediately!
REHEAT	Starts immediately!
FAMILY SNACKS	Enter pad to select Food
SOFTEN	Enter pad to select Food
MELT	Enter pad to select Food
MyPlate.gov	Enter pad to select Food



Features of the Oven

- 1 Door Handle.**
- 2 Door Latches.**
- 3 Window with Metal Shield.** Screen allows cooking to be viewed while keeping microwaves confined in the oven.
- 4 Control Panel.**
- 5 Removable Turntable.** Do not operate the oven in the microwave mode without the turntable and turntable support seated and in place.
- 6 Removable Turntable Support.** Do not operate the oven in the microwave mode without the turntable and turntable support seated and in place.



Cooking Controls

Check the Convenience Guide before you begin.

1 Time Features

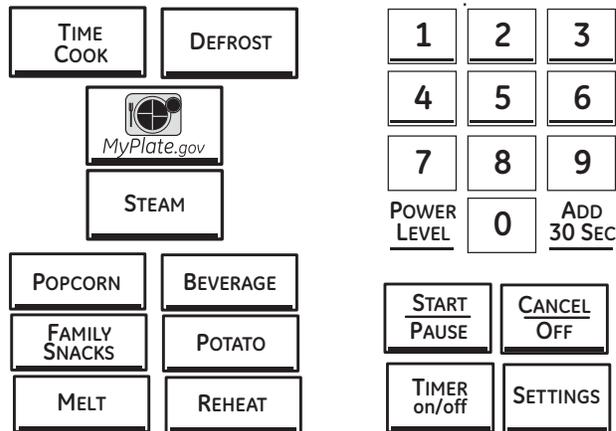
Press	Enter
COOK	Amount of cooking time
DEFROST	Time, Weight or 1 lb Quick Defrost
SETTINGS	Help, Clock Settings, Turntable On/Off, Auto Night Light, Beeper Volume, Display Speed, Display Language
Timer	Kitchen Timer Settings
POWER LEVEL	Power level 1 to 10
ADD 30 SEC	Starts immediately!
EXPRESS COOK	Starts immediately! Press number pads (1-6)

2 Convenience Features

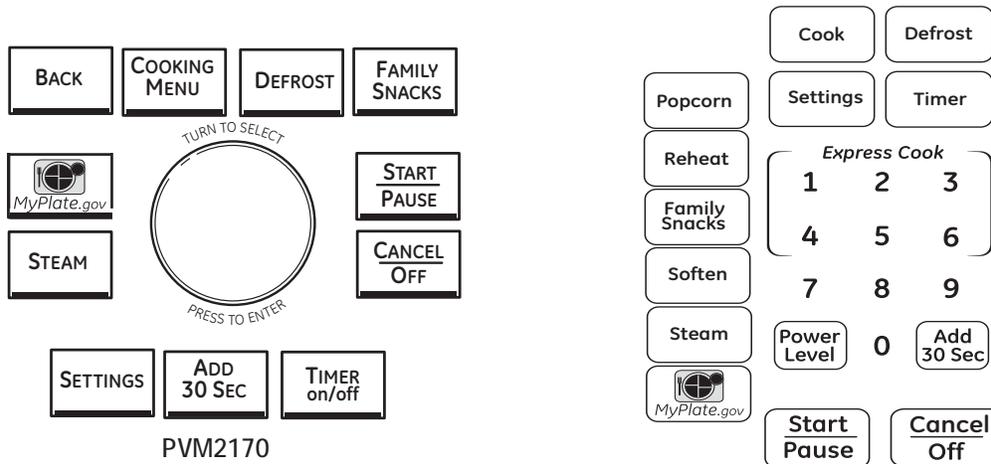
Press	Enter
POPCORN	Starts immediately!
BEVERAGE	Starts immediately! Starts immediately!
POTATO	Starts immediately!
REHEAT	Starts immediately!
FAMILY SNACKS	Enter pad to select Food
MELT	Enter pad to select Food
STEAM	Enter pad to select Food
MyPlate.gov	Enter pad to select Food Enter pad to select Food

MyPlate.gov Feature

The *Myplate.gov* feature allows you to microwave healthy food choices by servings with Sensor Cooking.



PVM1970, PNM1971



PVM2170

DVM1950, JNM1951,
JVM1950

DVM1950, JNM1951, JVM1950, PVM1970, PNM1971

1. Press *MyPlate.gov* pad.
2. Enter the food group (See *Cooking Guide for MyPlate.gov.*) code or check the display for the food group.
3. Enter the type (See *Cooking Guide for MyPlate.gov.*) code or check the display for food types.
4. Enter the amount as prompted for food type selection.
5. Press *Start*.

PVM2170

1. Press *MyPlate.gov* pad.
2. Turn the dial to display the food group you want (See *Cooking Guide for MyPlate.gov.*) press the dial to select.
3. Turn the dial again to display the specific food you want, then enter the amount, if prompted.
4. Press dial to select.
5. Press the dial or the *Start/Pause* button to begin cooking.

(Continued next page)

Cooking Guide for MyPlate.gov

Note: Bold code numbers do not apply to Model PVM2170. The **Turn To Select** dial is used to select appropriate food group.

Food Group	Food Type	Servings/Details
1 – Grain	1 – Rice	1 – 1/2 cup, 2 – 1 cup, 3 – 1½ cups
	2 – Oatmeal	1 to 4 packets
	3 – Popcorn	1 – 1 oz, 2 – 3.0 ozs, 3 – 3.5 ozs
	4 – Macaroni	1 – 1/2 cup, 2 – 1 cup, 3 – 1½ cups
	5 – Quinoa	1 – 1/2 cup, 2 – 1 cup, 3 – 1½ cups
2 – Vegetables	1 – Asparagus	1 – Fresh, 2 – Frozen, 3 – Canned
	2 – Broccoli	1 – Fresh, 2 – Frozen
	3 – Green Beans	1 – Fresh, 2 – Frozen, 3 – Canned
	4 – Carrots	1 – Fresh, 2 – Frozen, 3 – Canned
	5 – Corn	1 – Fresh Cobs (1 to 4), 2 – Frozen Kernels
	6 – Peas	1 – Frozen, 2 – Canned
	7 – Potatoes	1 – Baking, 2 – Sweet
	8 – Spinach	1 – Fresh, 2 – Frozen, 3 – Canned
3 – Ground Meat		
4 – Poultry	1 – Bone-In Chicken	
	2 – Boneless Chicken	
5 – Seafood	1 – Whitefish	
	2 – Tilapia	
	3 – Salmon	

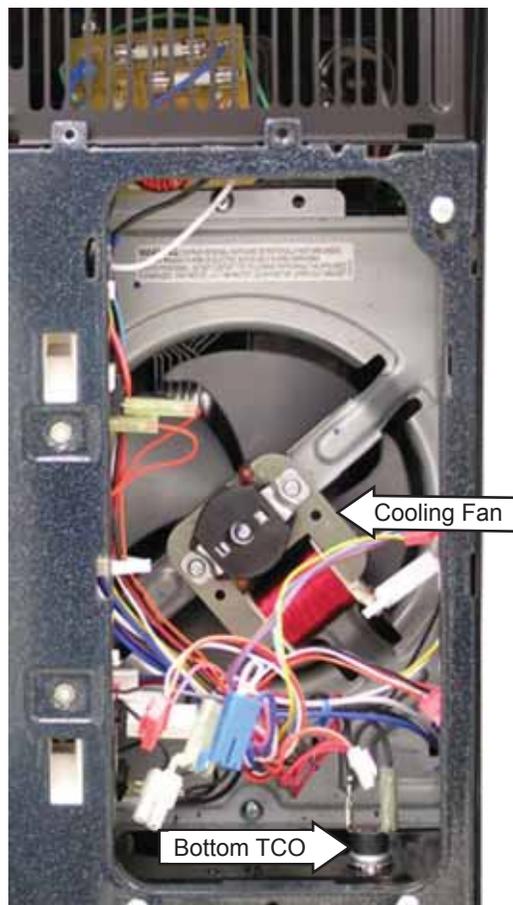
Note for Sensor Cooking: For best results, do not open the door while cooking. Do not use the sensor feature twice in succession on the same food portion. If food is undercooked after the first countdown, use *Time Cook* for additional time. Use *Power Level 10*, unless otherwise noted.

Component Locator Views

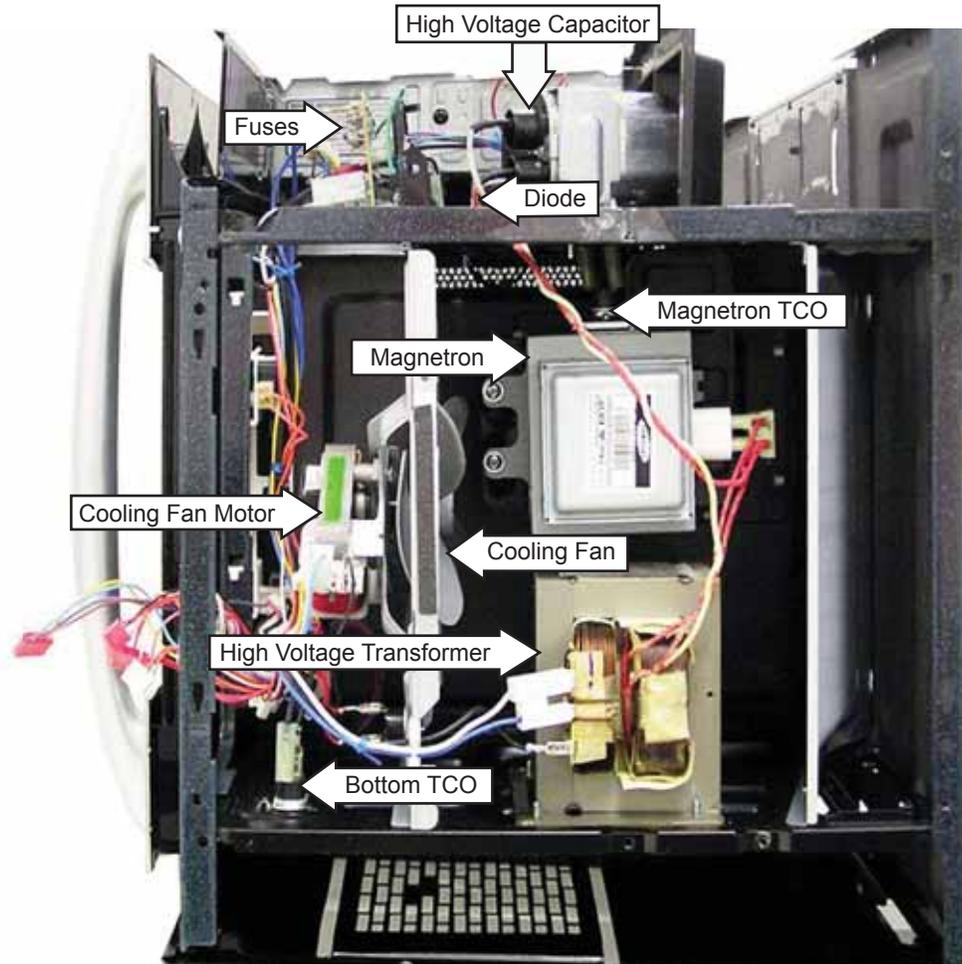
Front View



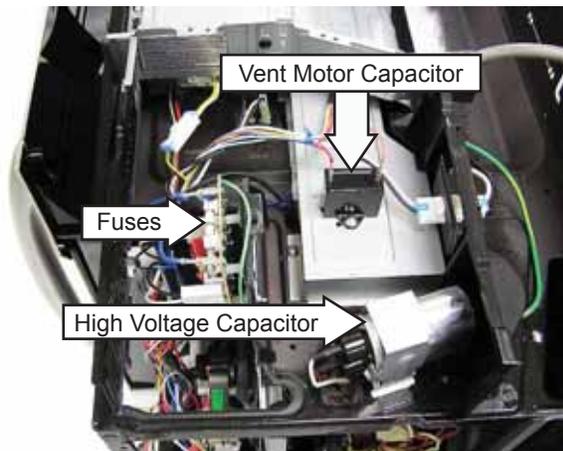
Front View – Control Panel Assembly Removed



Right Side View



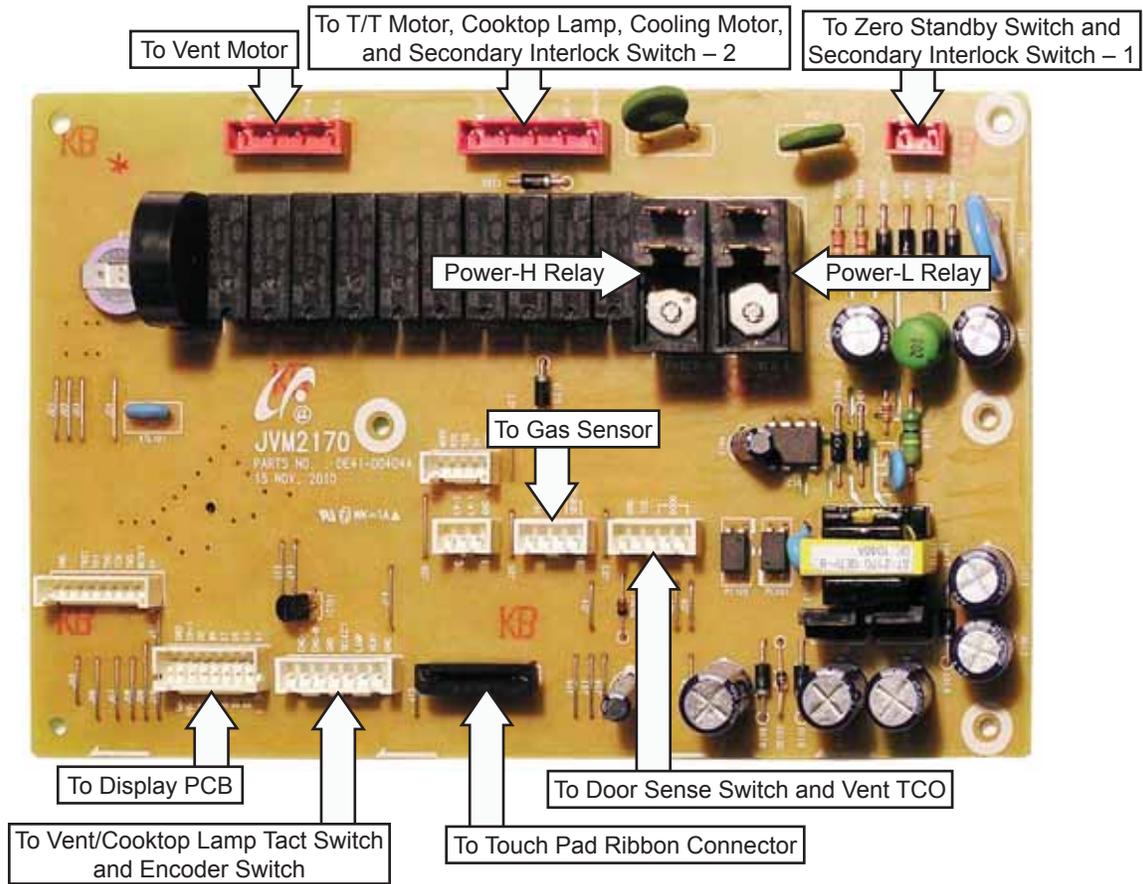
View From Right Side



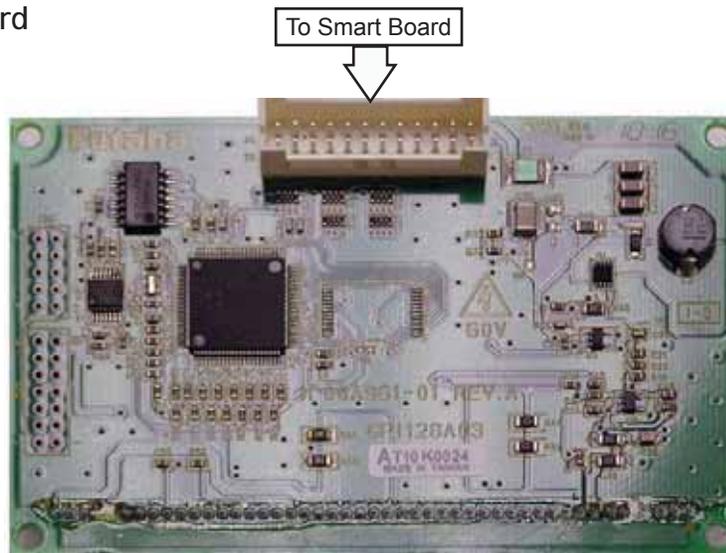
View From Top Right Side

Circuit Board Connectors View

PVM2170 Smart Board



PVM2170 Display Board



Components

Note: In the following section, certain electrical terminals that attach to the microwave oven components utilize a locking tab. Some tabs cannot be seen because they are encased in plastic. When removing these terminals, grasp the top and bottom of the terminal with needle-nose pliers. Gently squeeze the jaws of the pliers together while pulling the electrical terminal from the element.

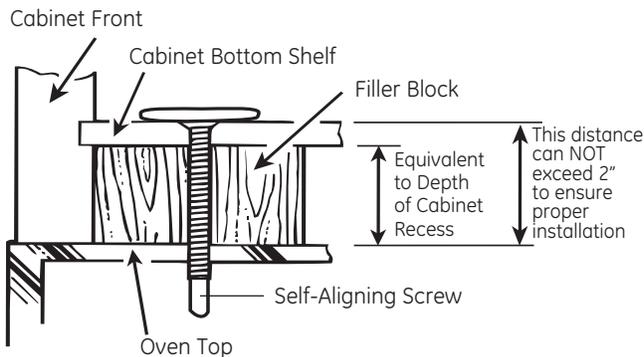
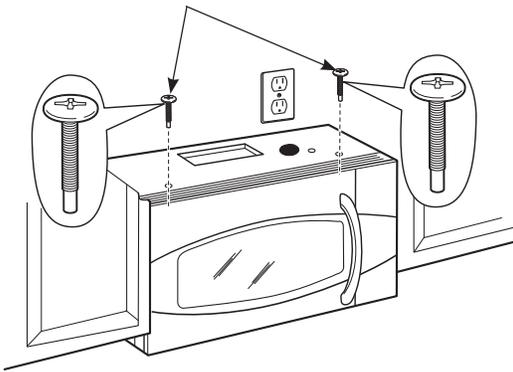


Electrical terminal release/locking tab
(shown with plastic covering removed)

Microwave Oven Removal

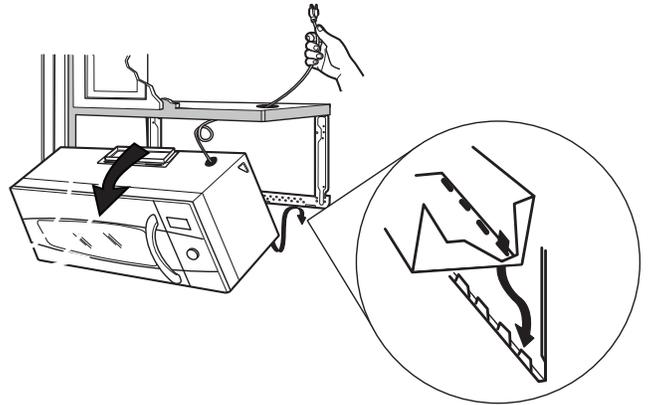
Caution: Two people are recommended for safe removal of the microwave oven.

1. While supporting the microwave oven, remove the 2 screws that attach the microwave oven to the cabinet.



2. Tilt microwave oven forward, then unhook the slots at the back, bottom edge from the lower tabs of the mounting plate.
3. Lift and remove the microwave oven.

WARNING: When removing the microwave oven, be sure to provide adequate support to prevent dropping the unit.

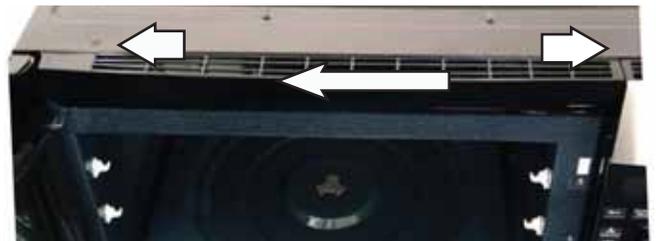


Grille Assembly

To remove the grille assembly:

1. Open the microwave oven door.
2. Remove the 2 Phillips-head screws from the top front of the oven cabinet.
3. Slide grille assembly to the left and pull out. The bottom of grille is held in place with 2 tabs.

Note: The tabs must be inserted when replacing the grille.



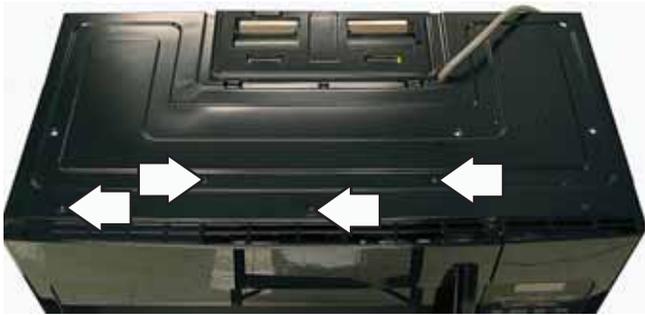
Outer Cover

To gain access to many of the microwave oven components, it is necessary to remove the outer cover.

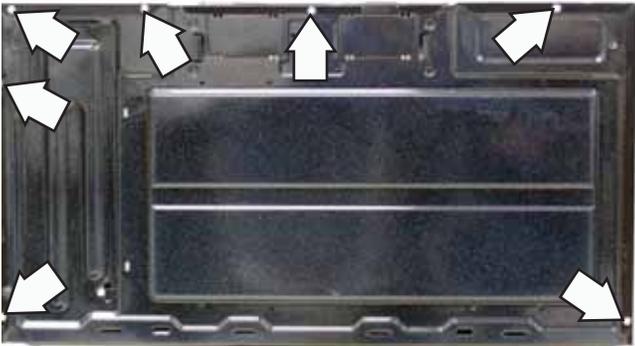
WARNING: To prevent electrical shock, use extreme caution when diagnosing oven with outer cover removed and power ON. The high voltage section of the power supply, including filament leads, has the potential with respect to ground to reach **4000 Volts!**

To remove the outer cover:

1. Remove the oven. (See *Microwave Oven Removal*.)
2. Remove 4 Phillips-head screws from the top of the oven.



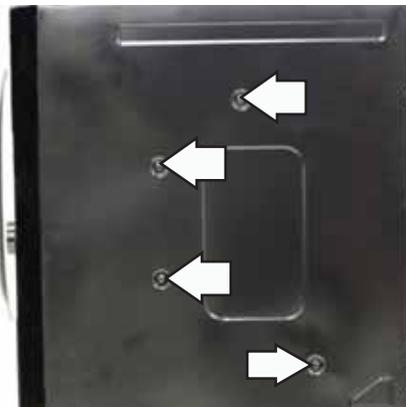
3. Remove 7 Phillips-head screws from the back of the oven.



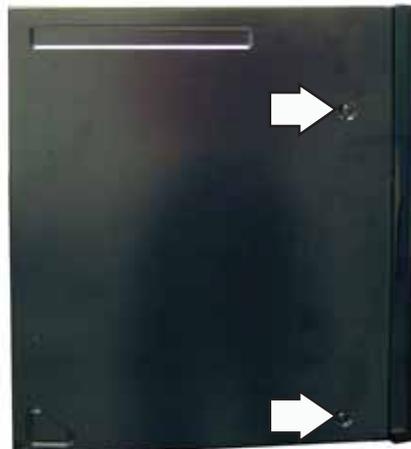
4. Remove 6 Phillips-head screws from the bottom cover of the oven.



5. Remove 4 Phillips-head screws from the right side of the oven.



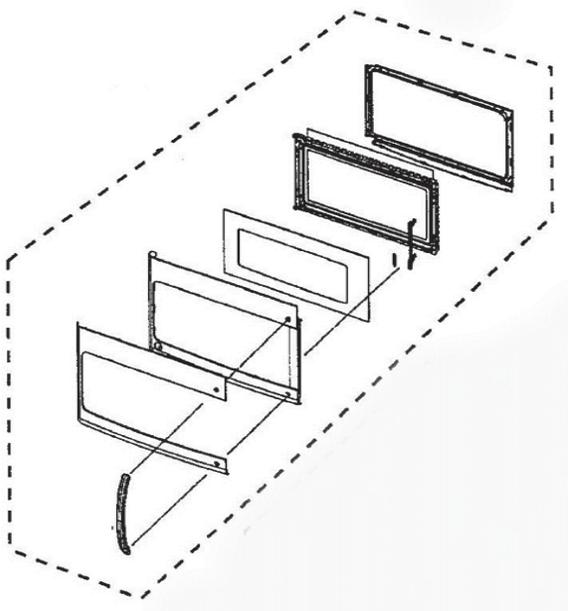
6. Remove 2 Phillips-head screws from the left side of the oven.



7. Slide the outer cover back about 1 inch toward the rear of the oven. Lift the cover from the oven.

Door Assembly

The door comes as an entire assembly, although, the door handle can be obtained separately.



Note: A microwave leakage test must be performed any time a door is removed, replaced, disassembled, or adjusted for any reason. The maximum allowable leakage is 4 MW/CM².

Door Assembly Removal

To remove the door assembly, remove the hinge clip by gently prying it straight out with a small, flat blade screwdriver.



Lift door to disengage upper and lower door hinge the pins from the hinge arms.

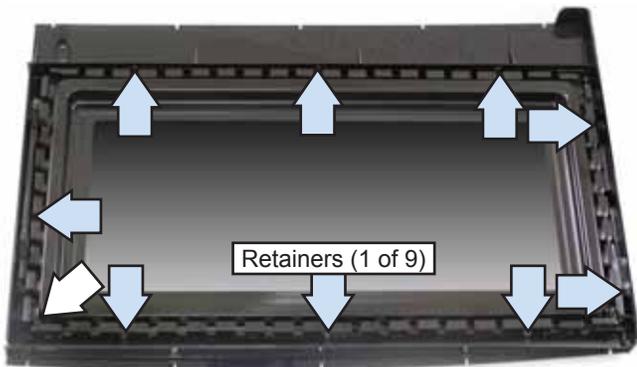


To disassemble the door:

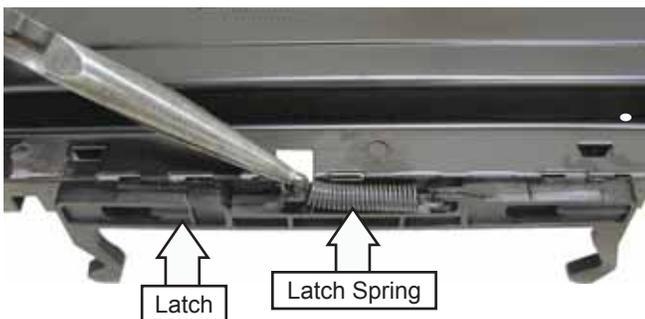
1. Place the door, face down, on a protective surface.
2. Using a putty knife, carefully pry the choke cover away from the door frame.



3. Remove the Phillips-head screw from the bottom left corner that fastens the bottom of the oven door handle.
4. Using a flat blade screwdriver, disengage the 9 door frame retainers (3 each on top and bottom, 2 on hinge pin side, and 1 on latch side), then separate the door frame from the door panel.



5. Using long nose pliers, remove the latch spring, then slide and remove the latch from the choke.

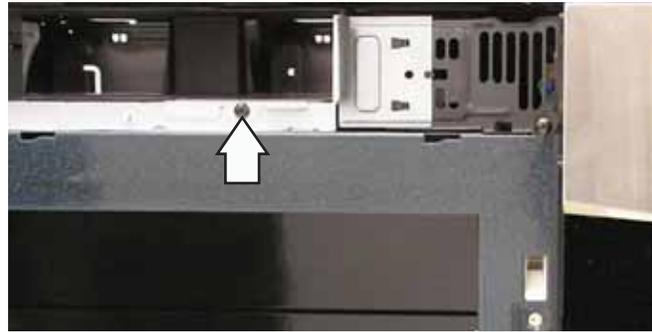


Interior Light

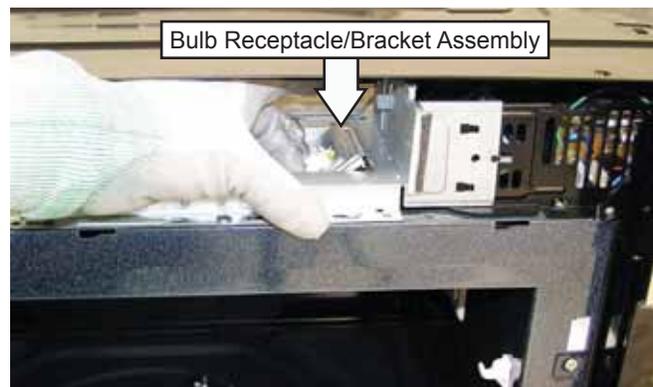
The interior light is 120 VAC, 50 watt halogen bulb (Part # WB25X10026.)

To remove the interior light:

1. Remove the grille assembly. (See *Grille Assembly*.)
2. Using a Phillips-head screwdriver, remove the screw securing the interior light cover.

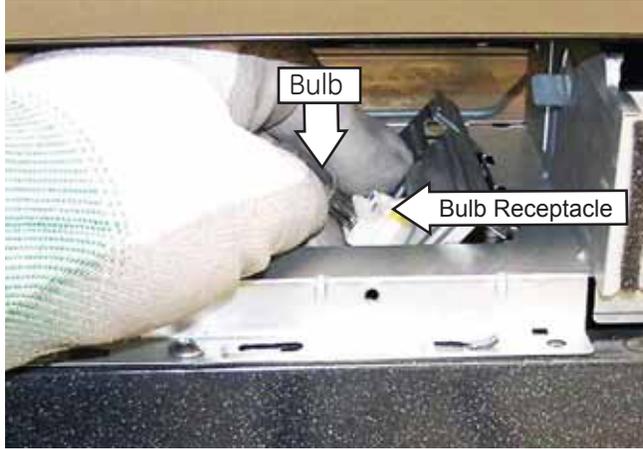


3. Raise the bulb receptacle/bracket assembly.



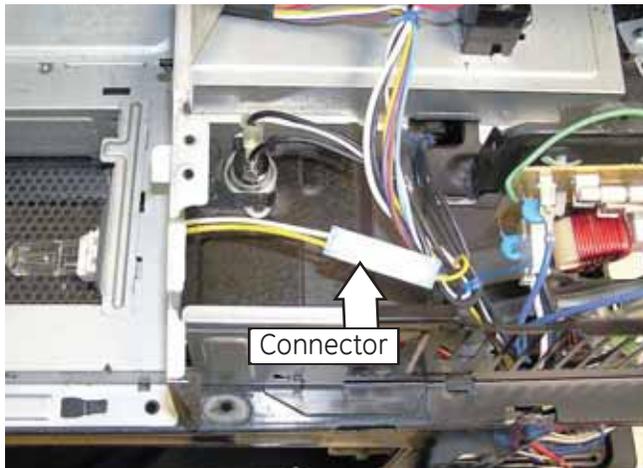
Note: Do not touch the surface of a quartz halogen bulb with bare fingers because the quartz surface will be exposed to the salts and oils on the skin. This will cause heat to concentrate in this area and lead to premature lamp failure. If you happen to contact the bulb with your fingers, carefully clean the quartz surface with a gentle solvent, such as alcohol.

- Using gloves or a cloth, pull the bulb straight out of its receptacle.



To remove the bulb receptacle/bracket assembly:

- Disconnect the bulb receptacle connector.



- Lift and remove the bulb receptacle/bracket assembly.
- Remove the Phillips-head screw securing the bulb receptacle to bracket.



Power Saver (Energy Saver)

The timekeeping device that keeps the clock running needs to be recharged every few days.

It is recommended that once a week the microwave oven be left powered on by not using the *Power Saver* (Energy Saver) feature for at least 24 hours.

If prompted to enter the time of day when powering the microwave oven on from the *Power Saver* (Energy Saver) mode, the microwave oven should have been powered on for at least 48 hours.

When the microwave oven is first installed, it should be powered on for at least 48 hours.

Some features, such as the auto night-light, will not function when the microwave oven is in *Power Saver* mode.



Power Saver Battery

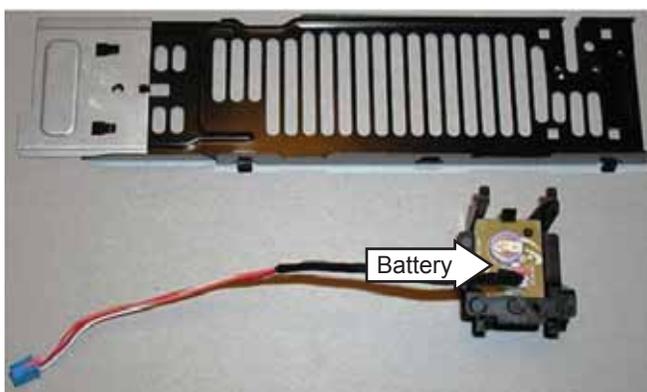
The rechargeable power saver battery is mounted in a plastic holder that is mounted to the grille, just above the control panel assembly. (See *Control Panel Assembly*.)

The power saver battery is connected to the smart board at CN901.



The power saver battery snaps into the plastic holder, which, in turn, snaps onto the grille.

The power saver battery output is approximately 2.5 VDC.

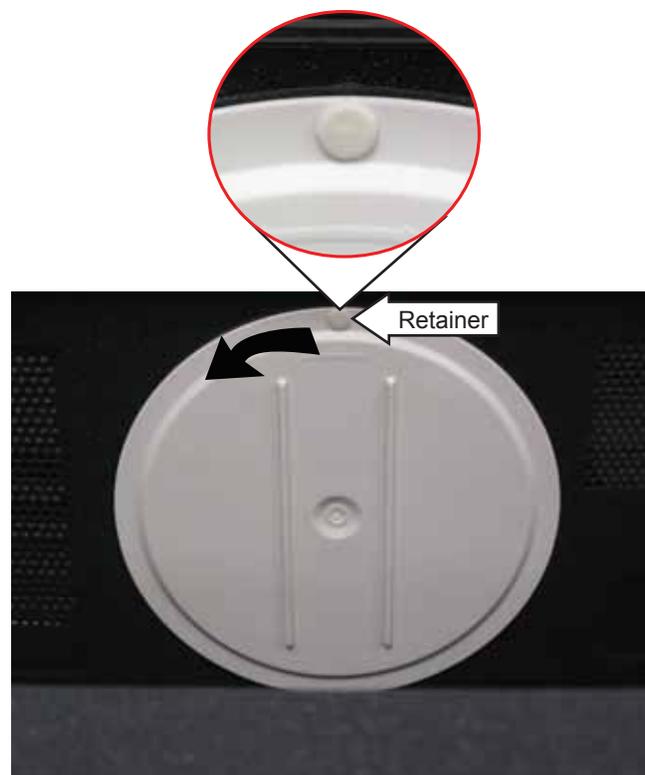


Stirrer Assembly

The stirrer assembly consists of a blade, pin, and cover. The blade is air driven and rotates on a shaft embedded in the stirrer cover. The stirrer assembly is located at the top of the oven cavity.

To remove the stirrer assembly:

1. Disconnect power from the microwave oven and open the door.
2. Gently pry up on the plastic retainer using a small, flat blade screwdriver and remove. Turn the stirrer cover counterclockwise to open. The stirrer assembly will then drop down. To reinstall, place in position and turn clockwise to lock in place.



Stirrer Assembly

Line Fuse

Note: When the line fuse is blown due to operation of the monitor switch, the monitor switch must be replaced. Also, the relays and/or the interlock switches must be replaced when the continuity check shows the contacts are shorted.

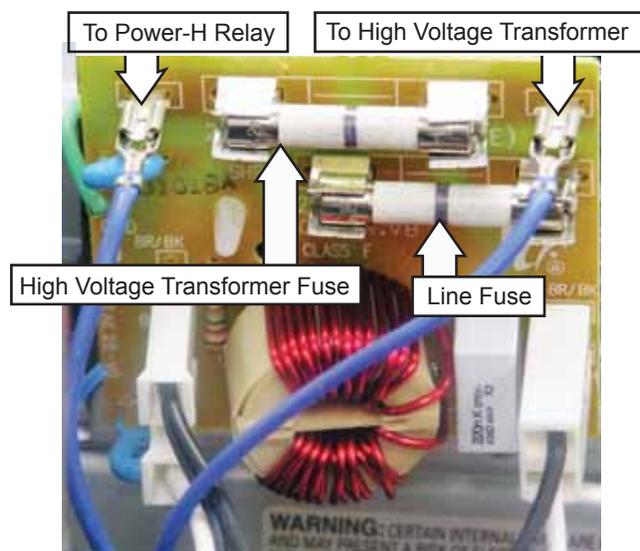
The unit is equipped with a 20-amp line fuse (Part # WB27X10928). The fuse is located on a receptacle near the top of the noise filter board and is common to all functions and door switches.

To remove the fuse:

1. Disconnect power to the microwave oven.
2. Remove grille assembly. (See *Grille Assembly*.)
3. Remove control panel vent plate.
4. Remove the control panel assembly. (See *Control Panel Assembly*.)
5. Remove the fuse. (See photo below.)

High Voltage Fuse

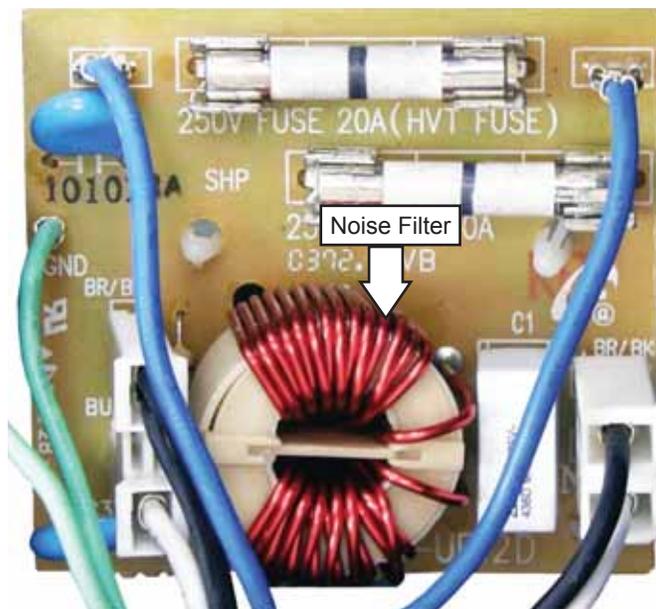
The unit is equipped with a 20-amp high-voltage transformer fuse (Part # WB27X10928). The fuse is located on a receptacle near the top of the noise filter board and is common to all high voltage functions. (See *Line Fuse* for removal procedure.)



Noise Filter

The noise filter helps to suppress electromagnetic interference (EMI) radiating from the operation of the microwave oven, and it also protects the oven from any line noise. The noise filter is located on the right side of the oven, behind the control panel. The noise filter is held in place by 3 compression pins.

Note: When installing the noise filter, ensure all filter wiring is connected to the correct terminals.



Check to make sure the fuse is not open. Check the noise filter for approximate resistance value at the following locations:

- White (neutral input) to white (neutral output) – 0 Ω .
- Black (line input) to black (line output) – 0 Ω .
- White (neutral input) to black (line input) – 23 Ω .

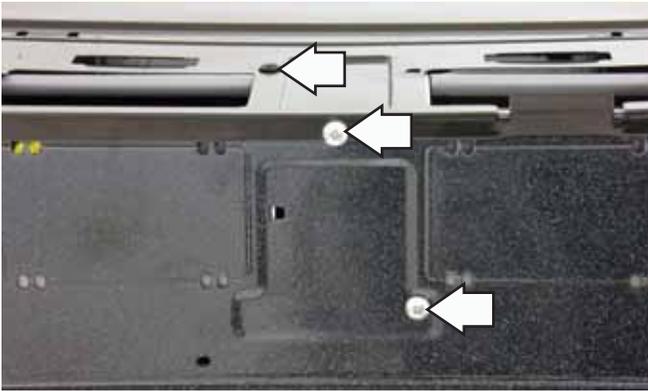
Vent Blower

The vent blower is located at the top rear of the microwave oven. See installation instructions for the proper method of directing the vent fan prior to installing the unit.

To remove the vent blower:

1. Remove the oven. (See *Microwave Oven Removal*.)

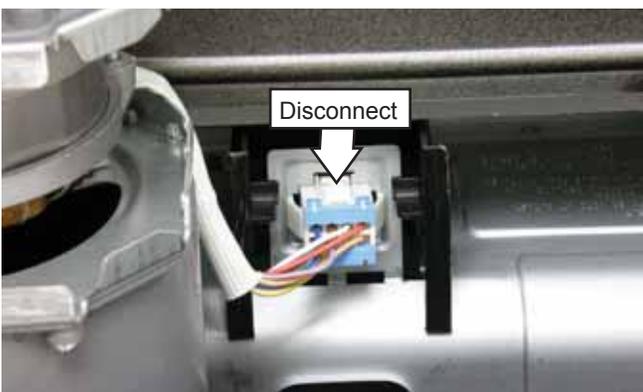
- Remove the Phillips-head screw from the top of the oven and the 2 Phillips-head screws from the rear of the oven.



- Lift the vent blower cover to expose the vent blower assembly.



- Lift the vent blower assembly straight up, rotate it left, and set it on its end inside the cavity.
- Disconnect the vent blower assembly wire harness.



- Remove the vent blower assembly.

Control Panel Assembly

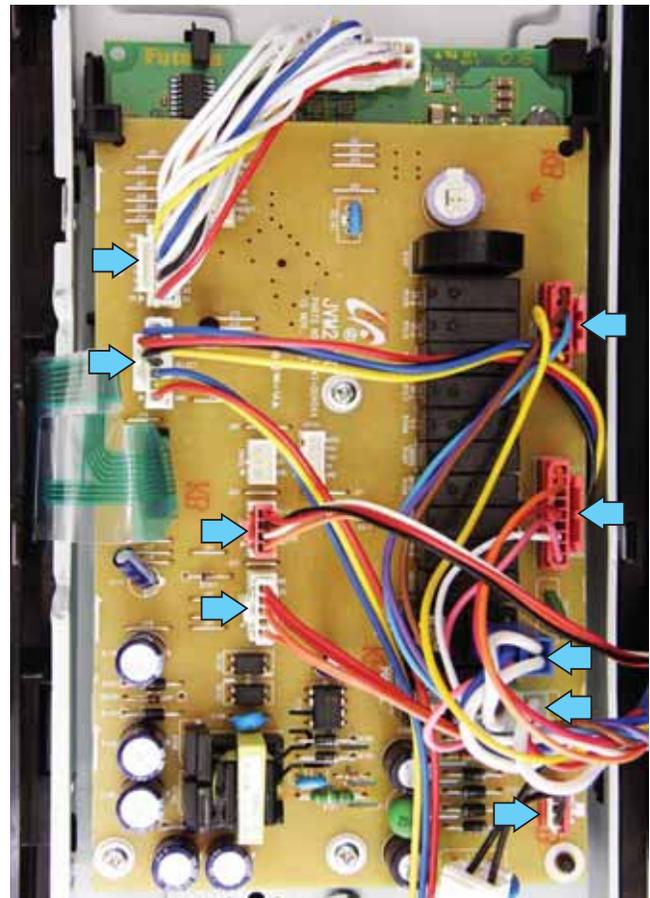
The control panel assembly consists of a smart board, frame, and touch pad assembly.

To remove the control panel assembly:

- Disconnect power to the microwave oven.
- Open the oven door.
- Remove the grille assembly. (See *Grille Assembly*.)
- Remove the Phillips-head screw that attaches the control panel assembly to the oven.

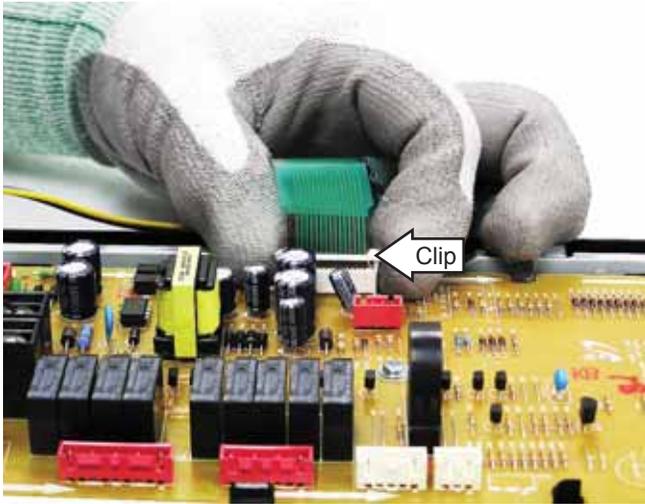


- Slide the control panel assembly up and out. Make note of the locations of the 7 wire connectors, 2 relay connectors, and then disconnect them.



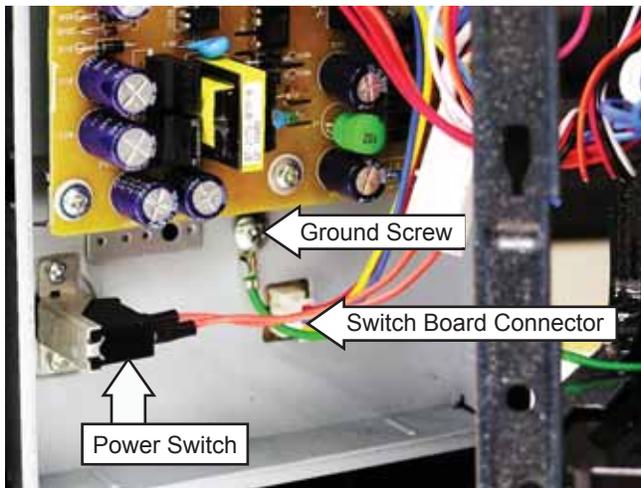
(Continued next page)

- Remove the ribbon cable by gently raising the connector clip that secures the ribbon cable, then pull the ribbon cable from connector.



(Models PVM1970, PNM1971)

- Remove the Phillips-head screw that attaches the ground wire to the control panel assembly.



Door Interlock Switches

The door has 3 interlock switches: the door sensing, primary interlock, and monitor switches. All switches are removed in the same manner.

Door Sensing and Primary Interlock Switches

The primary interlock and door sensing switches are activated by the latch heads on the door. When the door is opened, the switches interrupt the circuit to all components, except the oven lamp and the control panel display. A cook cycle cannot take place until the door is firmly closed, thereby activating both interlock switches. The primary interlock system consists of the door sensing switch, the primary interlock switch, and the power relay, which is mounted on the smart board.

Monitor Switch

The monitor switch is operated indirectly by the bottom latch pawl. The pawl operates a cam switch, which, in turn, activates the monitor switch. The monitor switch is intended to render the oven inoperative by blowing the monitor fuse when the contacts of the primary interlock switch and power relay fail to open when the door is opened.

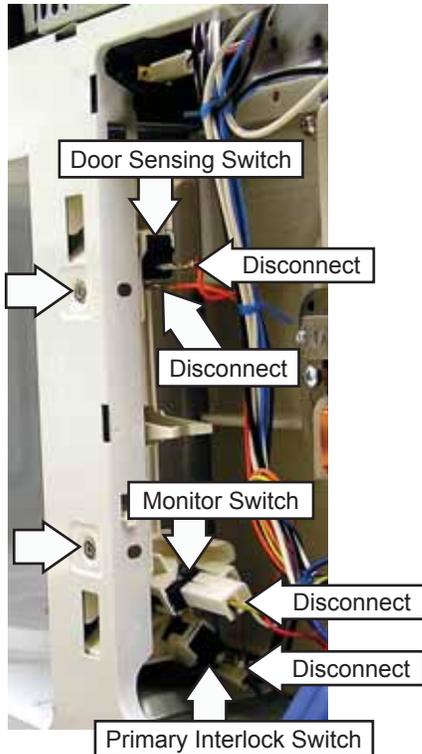
Functions

When the door is opened, the monitor switch is closed. At this time, the primary interlock switch and the power relay are open.

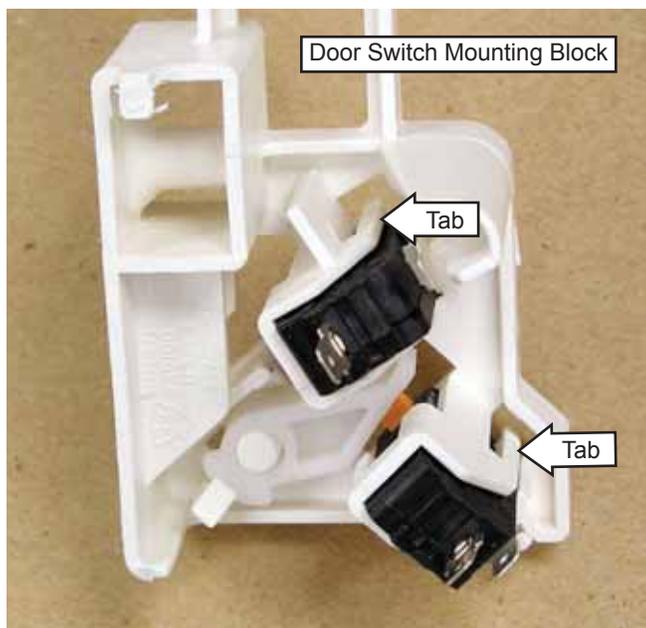
As the door closes, the monitor switch opens, then the door sensing switch and the primary interlock switch contacts close.

To remove the door interlock switches:

1. Disconnect wiring to the door switches.



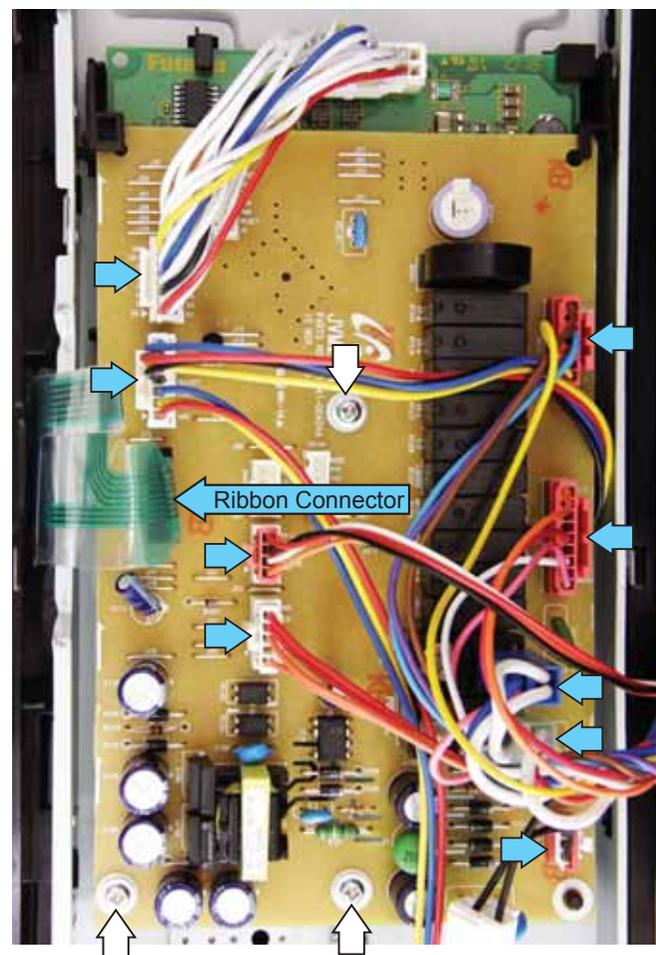
2. Remove the two T-20 Torx screws that attach the door switch bracket to the microwave oven frame and remove the door switch mounting block.
3. Using a small, flat blade screwdriver, gently lift the tab enough to remove the door interlock switches from the door switch mounting block.



Smart Board

To remove the smart board:

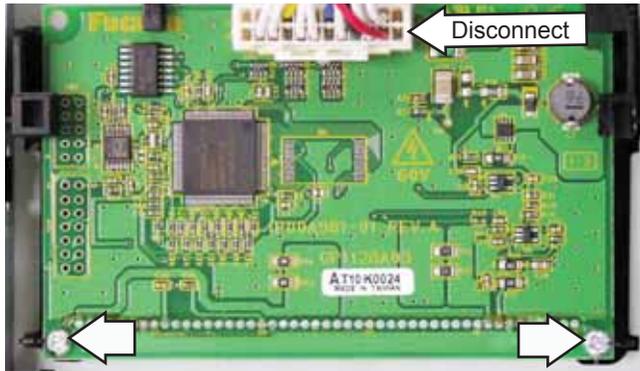
1. Remove the control panel assembly. (See *Control Panel Assembly*.)
2. Remove the 7 connectors from the smart board
3. Remove the 2 relay connectors.
4. Disconnect the touch panel ribbon by pulling up on the connector locking clip and removing the ribbon from the connector.
5. Remove the 3 Phillips-head screws that attach the smart board to the control board frame, then lift the smart board off the frame.



Display Board

To remove the display board:

1. Remove the control panel assembly. (See *Control Panel Assembly*.)
2. Remove the smart board. (See *Smart Board*.)
3. Disconnect the touch panel ribbon and 3 connectors from the smart board.
4. Remove the 2 Phillips-head screws that attach the display board to the control board frame, then lift the display board off the frame.



Back Side



Front Side

Bottom Thermal Cut Out (TCO)

The bottom TCO is located on the bottom-right side of the oven behind the control panel. The bottom TCO is not resettable.

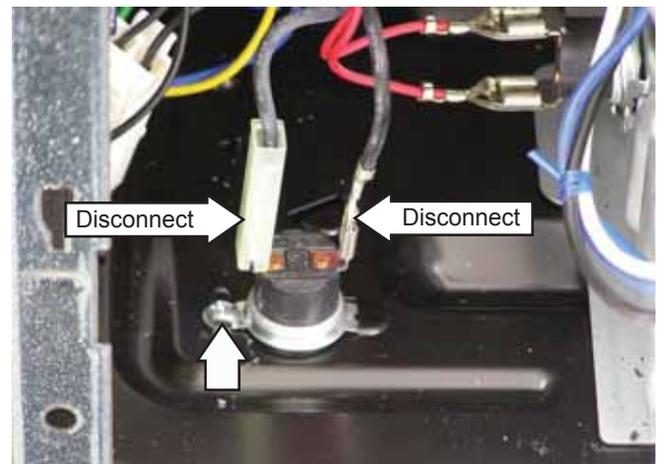
The bottom TCO's contacts open at approximately 284°F. An open bottom TCO may indicate that a thermal event had taken place on the cooktop below.

To remove the bottom TCO:

1. Remove the control panel assembly. (See *Control Panel Assembly*.)

Note: Both the insulated and non-insulated wire terminal ends have locking tabs. The insulated wire terminal end can be removed by inserting a small, flat screwdriver between the insulator and the terminal end on the locking tab side. Depress the locking tab with the tip of the screwdriver to unlock from the terminal while pulling electrical wire end off the terminal.

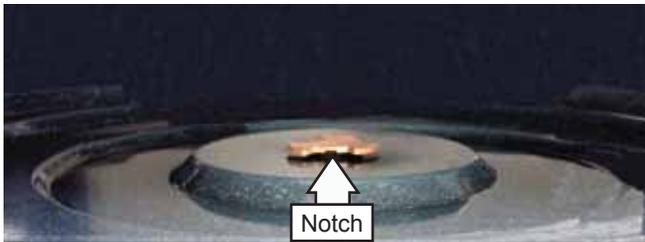
2. Disconnect wiring from the bottom TCO.
3. Remove the Phillips-head screw attaching the bottom TCO to the oven, then pull the TCO forward.



Turntable Coupling

To remove the turntable coupling:

Turn the turntable coupling, so the notch in the coupling is facing the front of the microwave oven, and lift coupling off motor shaft.



Turntable Motor

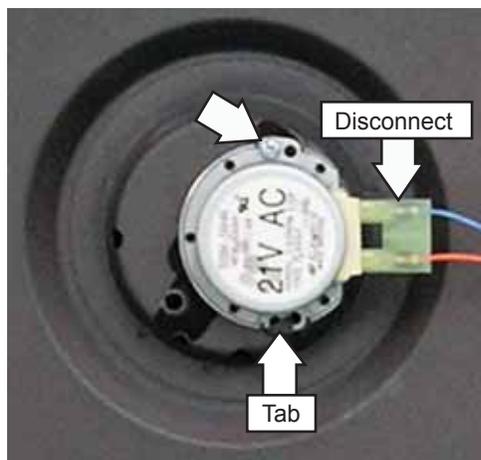
The turntable motor is located on the bottom of the microwave oven. The motor operates on 21 VAC.

To remove the turntable motor:

1. Remove 6 Phillips-head screws from the bottom of the microwave oven cabinet.



2. Disconnect the turntable motor wiring harness.
3. Remove the single Phillips-head screw and twist the motor slightly clockwise to release it from the tab on the frame.



Surface Lamps

The surface lamps are 120 VAC, 20 or 50 watt (maximum) halogen bulbs (Part # WB08X10051).

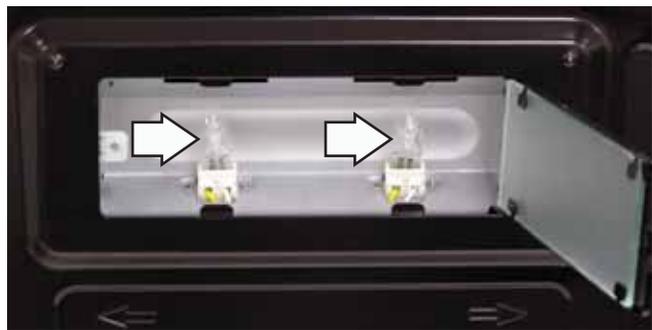
To remove surface lamp assemblies:

1. Remove the Phillips-head screw from the surface lens panel, then open the panel.



Note: Do not touch the surface of a quartz halogen bulb with bare fingers. The quartz surface will be exposed to the salts and oils on the skin. This will cause heat to concentrate in this area and lead to premature lamp failure. If you happen to contact the bulb with your fingers, carefully clean the quartz surface with a gentle solvent, such as alcohol.

2. Carefully remove the defective halogen bulb(s), then, using gloves or a cloth to hold it, carefully replace the defective bulb(s).



Magnetron Thermal Cut Out (TCO)

The magnetron TCO is located on the magnetron and opens when the magnetron temperature reaches 302°F.

The magnetron TCO is a normally closed switch. An open magnetron TCO may indicate an overheated magnetron.

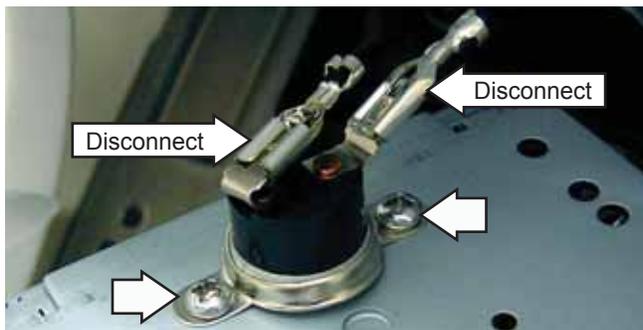
The magnetron TCO resets at 140°F.

To remove the magnetron TCO:

1. Remove the outer cover. (See *Outer Cover*.)
2. Disconnect the wiring to the magnetron.
3. Remove the 2 Phillips-head screws that attach the magnetron to the microwave oven.



4. Disconnect wiring to the magnetron TCO.
5. Disconnect wiring to the cavity TCO. (See *Cavity Thermal Cut Out (TCO)*.)
6. Remove 2 Phillips-head screws that attach the magnetron TCO to the magnetron and remove the TCO.

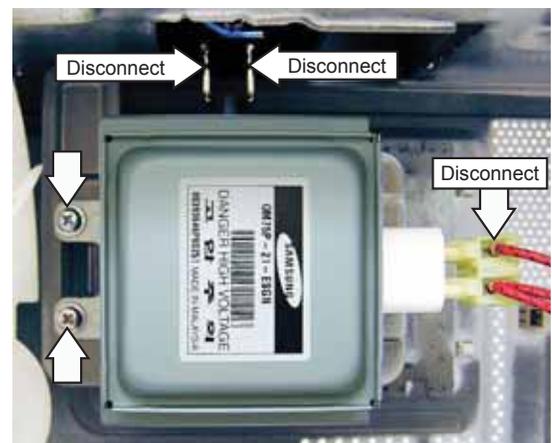


Magnetron

WARNING: Prior to servicing the magnetron, be certain the capacitor is discharged. Manually discharge it by placing an insulated-handle screwdriver between the diode connection on the capacitor and the oven chassis ground.

To remove the magnetron:

1. Remove the outer cover. (See *Outer Cover*.)
2. Disconnect wiring to the magnetron.
3. Remove the 2 Phillips-head screws that attach the magnetron, and then remove the magnetron.



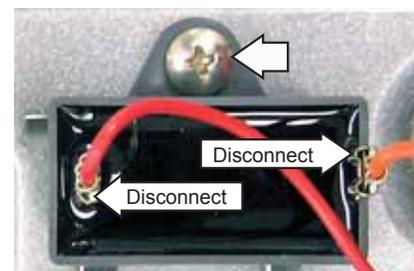
View From Right Side

Vent Fan Motor Capacitor

The vent fan motor capacitor is located on the top of the microwave oven above the cooling fan.

To remove the vent fan motor capacitor:

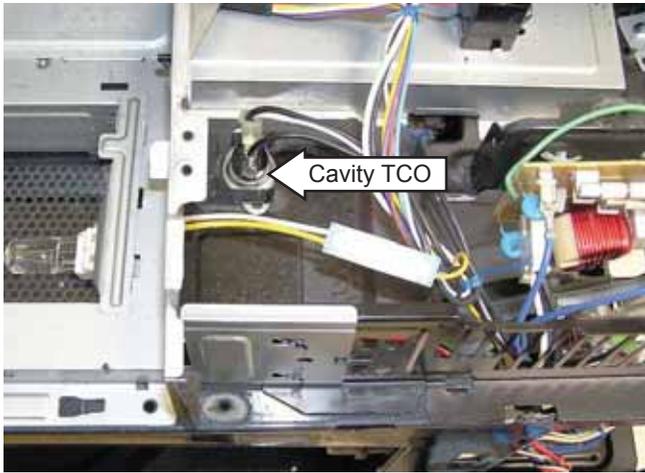
1. Remove the outer cover. (See *Outer Cover*.)
2. Disconnect wiring to the vent fan motor capacitor.
3. Remove the Phillips-head screw that attaches the motor capacitor to the oven, then remove the capacitor.



Cavity Thermal Cut Out (TCO)

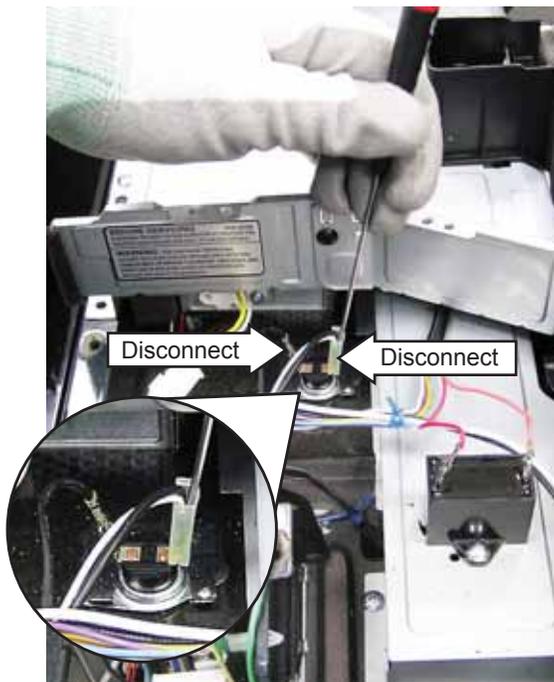
The cavity TCO is a one-shot device that will open at 230°F if a thermal event takes place within the oven cavity.

1. Remove the outer cover. (See *Outer Cover*.)

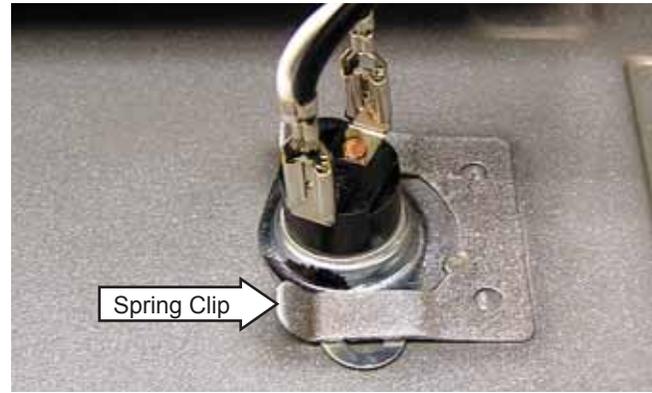


2. Disconnect leads from the cavity TCO using needle-nose pliers by gently pulling the terminals off the male cavity TCO terminals.

Note: Both the insulated and non-insulated wire terminal ends have locking tabs. The insulated wire terminal end can be removed by inserting a small, flat screwdriver between the insulator and the terminal end on the locking tab side. Depress the locking tab with the tip of the screwdriver to unlock from the terminal while pulling electrical wire end off the terminal.



Slide the cavity TCO from beneath the spring clips.

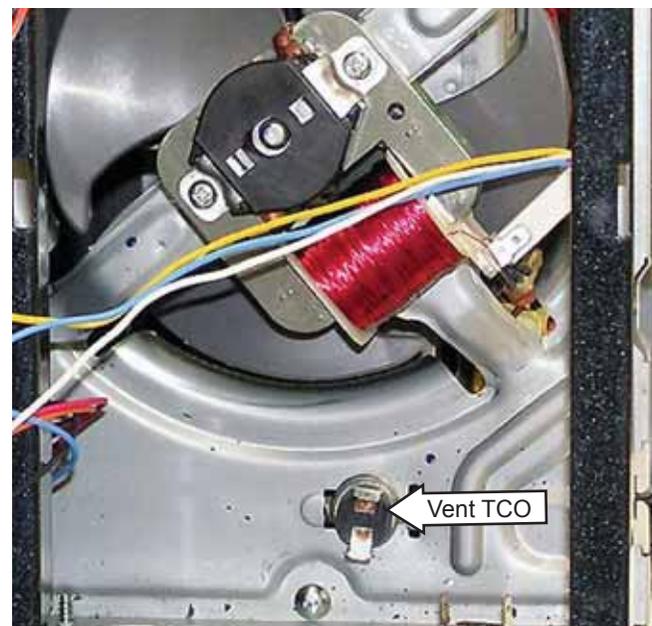


Vent Thermal Cut Out (TCO)

The vent TCO is attached to the magnetron cooling fan motor mounting bracket. The contacts close at approximately 158°F and open at approximately 104°F.

To remove the vent TCO:

1. Remove the control panel assembly. (See *Control Panel Assembly*.)
2. Disconnect wiring to the vent TCO.
3. Remove the Phillips-head screw attaching the vent TCO to the cooling fan motor mounting bracket and lift it out from the slot in the mounting bracket.

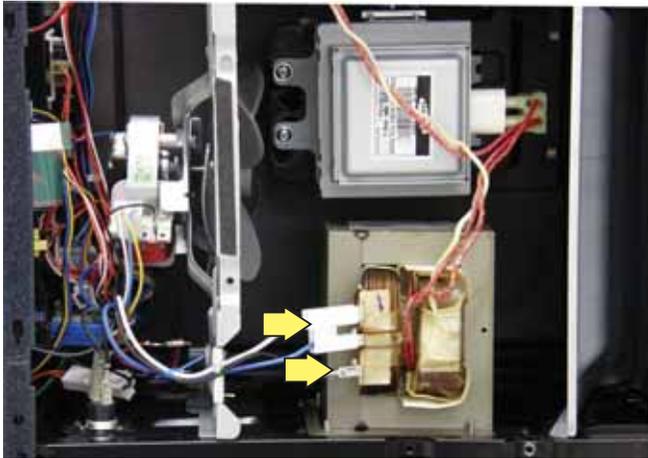


Cooling Fan Motor

The cooling fan motor is located on the right side of the microwave oven.

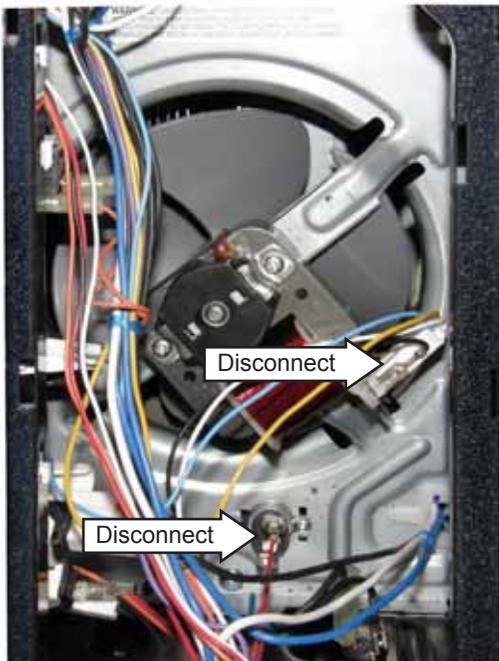
To remove the cooling fan motor:

1. Remove the control panel assembly. (See *Control Panel Assembly*.)
2. Remove the outer cover. (See *Outer Cover*.)
3. Disconnect wiring to the primary connection of the high voltage transformer.



View From Right Side

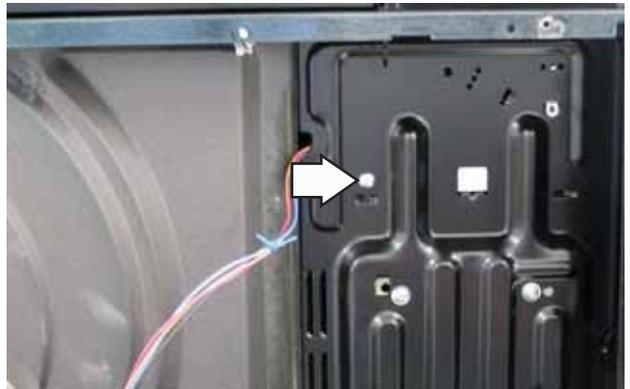
4. Disconnect the wiring to the cooling fan motor and the vent TCO.



5. Remove the 6 Phillips-head screws attaching the bottom cover of the microwave oven cabinet.



6. Remove the Phillips-head screw attaching the cooling fan bracket to the base.



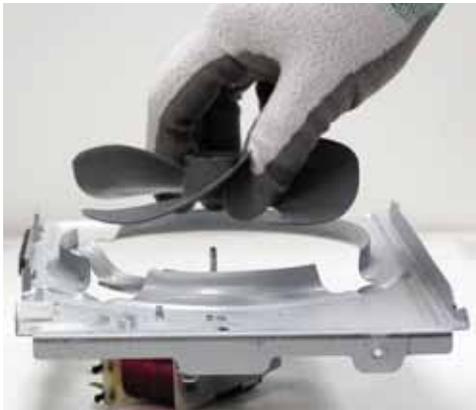
7. Remove the 2 Phillips-head screws attaching the cooling fan frame to the microwave oven.



8. Move the cooling fan frame out thru the right side of the microwave oven.



9. Grasp the hub of the cooling fan blade and pull the cooling fan blade off the motor shaft.



10. Remove 2 Phillips-head screws that attach the cooling fan motor to the cooling fan frame.



Capacitor and Diode

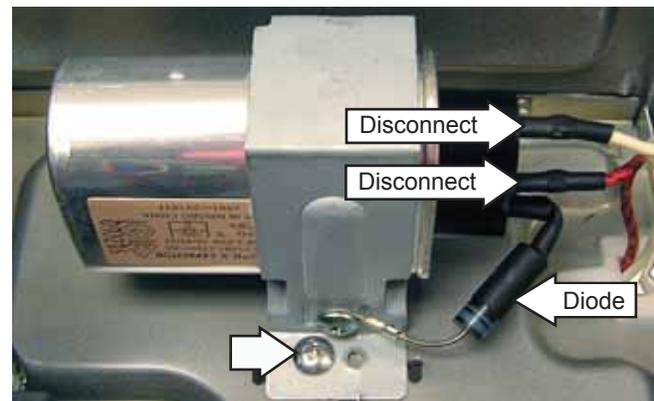
The capacitor has an internal shunt resistor to automatically discharge the capacitor when the microwave oven turns off. Under normal operation, the capacitor should fully discharge within 30 seconds.

WARNING: Always be certain the capacitor is discharged before servicing. Mechanically discharge the capacitor by placing an insulated-handle screwdriver between the diode connection on the capacitor and the oven chassis ground.

Note: Use the screw head closest to the capacitor to ensure ground metal contact.

To remove the capacitor and diode:

1. Remove the outer cover. (See *Outer Cover*.)
2. Disconnect the wiring to the high voltage capacitor.
3. Remove the Phillips-head screw that attaches the capacitor and diode to the oven and remove the high voltage capacitor.
4. Disconnect the diode from the high voltage capacitor.



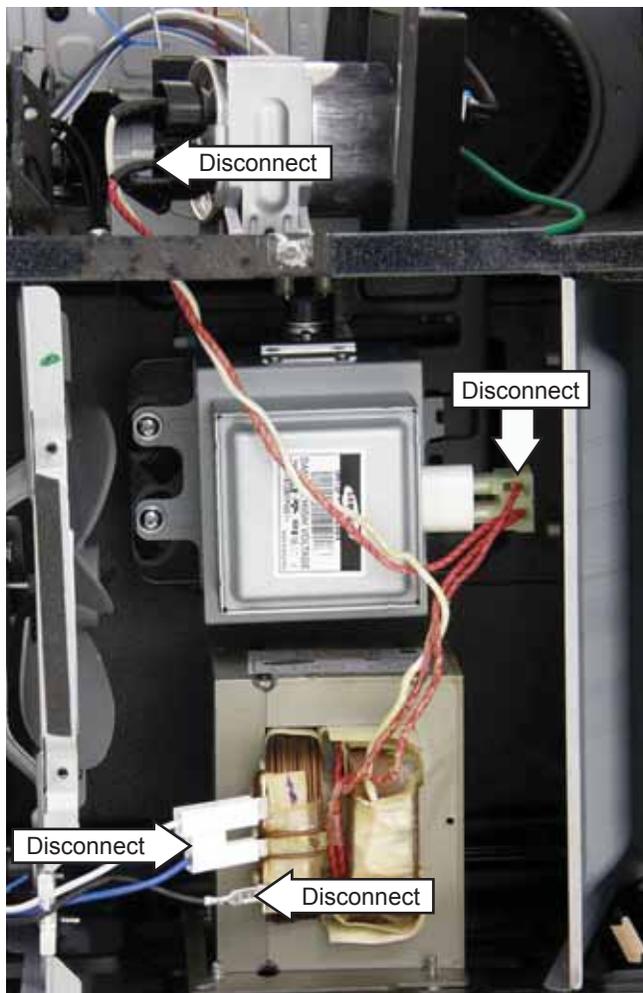
High Voltage Transformer

The high voltage transformer is located on the right side of the microwave oven, beneath the magnetron.

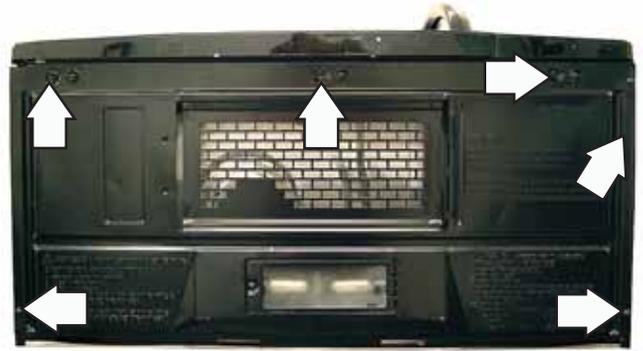
WARNING: Prior to servicing the transformer, be certain the capacitor is discharged. Manually discharge it by placing an insulated-handle screwdriver between the diode connection on the capacitor and the oven chassis ground.

To remove the high voltage transformer:

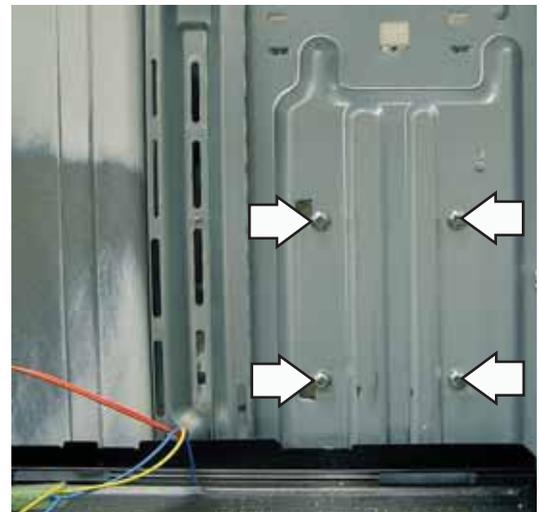
1. Remove the outer cover. (See *Outer Cover*.)
2. Disconnect wiring to the high voltage transformer.



3. Remove 6 Phillips-head screws from the bottom cover of the microwave oven cabinet.



4. Remove 4 Phillips-head screws that attach the high voltage transformer to the bottom plate, then remove the transformer.



Demo Mode

To enter Demo Mode for the 2.1 Series microwave models:

1. Unplug unit or turn off power for at least 3 minutes.
2. Restore power.
3. Within 30 seconds, press and hold the **Start/Pause** and **Back** pads at the same time for at least 3 seconds.

To Exit Demo Mode, follow the same steps as above.



To enter Demo Mode for the 1.9 Series microwave models:

1. Unplug unit or turn off power for at least 3 minutes.
2. Restore Power.
3. Within 30 seconds, press and hold the **Power Level** and **0** pads at the same time for at least 3 seconds.

To Exit Demo Mode, follow the same steps as above.



Oven Performance Test

1. Measure line voltage (loaded). This is based on normal voltage variations of 108V to 132V. Low voltage will lower output power and temperature rise.
2. Place WB64X73 (do not use any other load or dish as results will vary from standard), beaker containing one liter of water (1000 ml, 59°F ~ 75°F) on turntable and record the starting temperature with an accurate thermometer.
3. Set at high power for 2 minutes and 3 seconds.
4. Turn on the oven.
5. Record end water temperature. The minimum difference between initial and ending temperature should be 40°F @ 120 VAC .

Microwave Leakage Test

1. Place 275 ml of water in 600 ml beaker (Part #WB64X5010).
2. Place beaker in center of oven shelf.
3. Set meter to 2450 MHz scale.
4. Turn ON for 5-minute test.
5. Hold probe perpendicular to surface being tested and scan surfaces at a rate of one inch/second.

Test the following areas:

- Entire perimeter of door and control panel
 - Viewing surface of door window
 - Exhaust vents
6. Maximum leakage 4 MW/CM²
 7. Record data on service invoice and microwave leakage report.

Note : Maximum allowable leakage is 5 MW/CM².

To allow for measurement and meter accuracy 4 MW/CM² is used.

Inform the manufacturer of any oven found to have emission in excess of 5 MW/CM². Make repairs to bring the unit into compliance at no cost to owner and try to determine cause. Instruct owner not to use oven if it has not been brought into compliance.

Error Messages

Displayed	Description
KEYPAD SHORTED	Keypad shorted continuously for 60 seconds
OPEN STEAM SENSOR	Open humidity sensor
SHORTED STEAM SENSOR	Shorted Humidity sensor

Note: Error beep will sound for 4 cycles (0.5 seconds on, 0.5 seconds off, at 2000 Hz) with loud beeper volume setting.

Control Performance Test (JVM1950, DVM1950, JNM1951, PVM1970, PNM1971)

1. Set Clock – Touch **Settings** pad 2 times, enter time of day, press **Settings** pad to select AM/PM, then touch **Settings** pad again to set.
2. Alternately, touch each function pad and enter time, power level, or selection for the selected function.
3. Touch **Cancel/Off** after each function test to clear that function.
4. Repeat procedure for each function to test each pad.
5. Control and display should respond to each entry.
6. Display should revert to **Time Of Day** after each **Cancel/Off**.
7. Refer results to troubleshooting flowchart.

Technical Data Sheet (JVM1950, DVM1950, JNM1951, PVM1970, PNM1971)

The Smart Board contains the power relay, vent blower triac, surface light relays, and other components to perform the proper switching circuits. Several disconnect plugs are also located on the Smart Board:

- CN101 – Ribbon Connector
- CN102 – Vent and Cooktop Lamp Tact Switch Connector
- CN201 – Primary SMPS and Zero Standby Switch Connector
- CN202 – Main Relay, Cooktop Light, Turntable Relay and Inrush Relay Connector
- CN203 – Vent Relay Connector
- CN301 – Gas Sensing Connector
- CN402 – Door and Hood Sensing Connector
- CN901 – Battery Connector

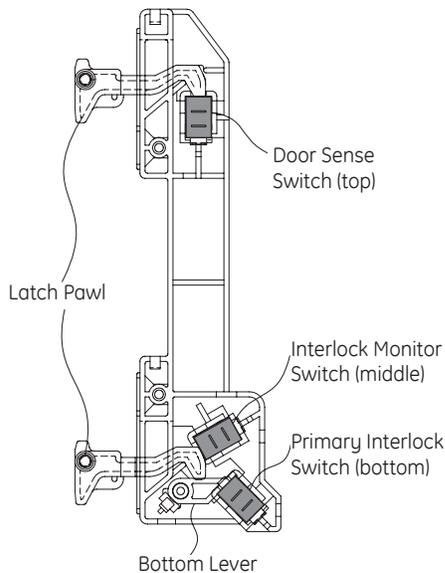
Many diagnostic circuit tests can be made at the disconnect plugs. (Refer to troubleshooting flowchart and simplified schematic in mini-manual.)

Connector	Pin	Voltage	Connector	Pin	Voltage
CN101	1	0 - 5.25 V	CN102	1	4.75 - 5.2 V
	2	0 - 5.25 V		2	4.75 - 5.25 V
	3	0 - 5.25 V		3	GND
	4	0 - 5.25 V	CN301	1	4.75 - 5.25 V
	5	0 - 5.25 V		2	0 - 5.25 V
	6	0 - 5.25 V		3	GND
	7	0 - 5.25 V		4	4.75 - 5.25 V
	8	0 - 5.25 V	CN402	1	9.6 - 14.4 V
	9	0 - 5.25 V		2	Not Connected
	10	0 - 5.25 V		3	0 - 14.4 V
	11	0 - 5.25 V		4	0 - 5.25 V
	12	0 - 5.25 V		5	GND
	13	0 - 5.25 V	CN901	1	0 - 3.1 V
	14	0 - 5.25 V		2	GND
	15	0 - 5.25 V		3	GND
	16	0 - 5.25 V			

Door Interlocks (Door Latch Switches)

The interlocks are designed as follows:

Primary interlock switch – Bottom switch operated by bottom latch pawl connected to line (L) leg.



To test the door interlocks:

1. Disconnect power to the oven.
2. Open the control panel.
3. Discharge the capacitor.
4. Check continuity of **Common and Normally Open**:
 - Door closed – 0Ω
 - Door open – $\infty \Omega$

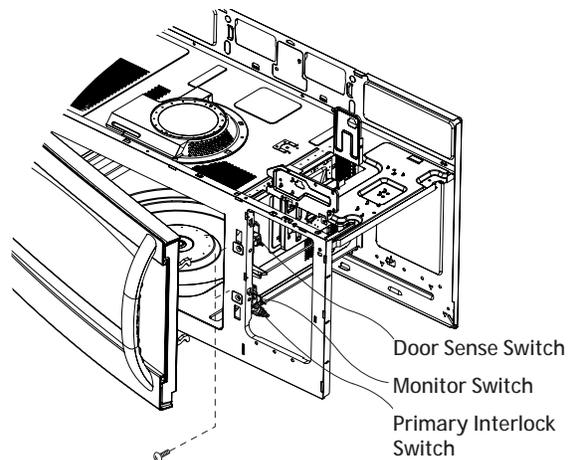
Monitor Switch

The monitor switch is located between the top and bottom interlocks. The monitor switch is operated indirectly by the bottom latch pawl.

To test the interlock system:

1. Disconnect power to the oven.
2. Open the control panel.
3. Discharge the capacitor.
4. Disconnect the monitor switch leads and test at the terminals:
 - Door closed – $\infty \Omega$
 - Door open – 0Ω
5. Reconnect the switch wiring.

6. Test the circuit operation:
 - a. Connect a temporary jumper across the relay contacts and primary switch to simulate shorted switch contacts. Locate convenient connections in the circuit to be certain Common and Normally Open terminals are used.
 - b. Connect an ohmmeter (low scale) across the two line terminals of the appliance power cord. Continuity must show:
 - Door closed Some Ω
 - Door open – 0Ω
 - c. Remove the 20-amp fuse – the circuit must open ($\infty \Omega$). If not, check the wiring of the monitor and interlock switch circuits.
7. After the test, remove the temporary jumper leads from the interlocks and relay. Reconnect the monitor switch leads and reinstall the fuse.
8. Replacement of any parts in monitor circuit requires repeating this entire test procedure.



The switch housing is not adjustable. It is fixed on the front cavity with two screws.

Caution: Check for microwave leakage after replacing or adjusting door, interlock switches, or switch mounting block.

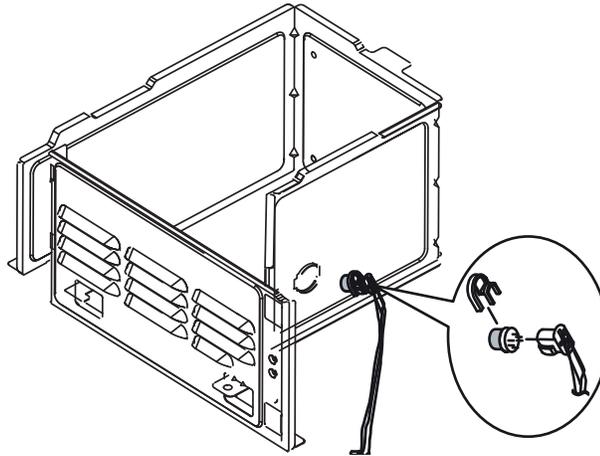
Main Fuse

WARNING: When the 20-amp fuse is blown due to operation of the monitor switch, the monitor switch must be replaced. Also replace relays and/or interlock switches when continuity check shows contacts are shorted.

Sensor

Sensor Cooking

The Sensor Cooking function uses a special gas sensor that detects both humidity (steam) and hydrocarbons (food odors) during the cooking process. Before conducting either of the sensor tests below, ensure the unit is plugged into a wall outlet for at least 5 minutes. Do not power the unit during the 5 minutes. If unit is already plugged in, proceed. The gas sensor is a plug-in device located in the vent area at the top, left-hand corner of the cavity behind the grille.



Sensor Cooking Test

1. Place ground meat in oven.
2. Touch **MyPlate.gov** and select **Ground Meat** by selecting number pad 3.
3. Press **Start**.
4. Control beeps and shuts off.
5. Touch **Cancel/Off**.
 - A) Test OK – Normal
 - B) Test Fails – Check Sensor (See **Sensor Test** below).

Sensor Test (Quick Test)

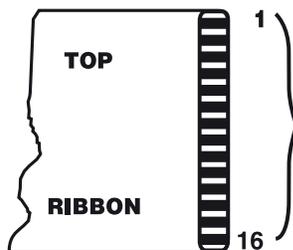
1. With two fingers, touch and hold the following pads simultaneously: 7 and 8.
2. Observe diagnostic number on the display (numbers approximate).
 - 15 - 185 (normal)
 - 213 or higher (sensor failed to open, sensor unplugged, wiring or smart board).
 - Less than 6 (shorted sensor or smart board).

Only heater terminals (H: black and red leads) can be checked with an ohmmeter (30 Ω).

Caution: Do not attempt to check sensor terminals (white and orange leads) as this could damage the sensor.

Key Panel Test (JVM1950, DVM1950, PVM1970)

If necessary, the key panel pads can be verified by a continuity test. For ease of handling, the key panel should be removed and placed on a flat surface. Check the continuity between the connections at the end of the ribbon. (Use high Ω scale.)



Ribbon Cable

Pad	Connection	Pad	Connection
DVM1950, JVM1950, PVM1970		DVM1950, JVM1950, PVM1970	
<i>Reheat</i>	7-10	<i>1</i>	6-12
<i>Popcorn</i>	9-11	<i>2</i>	5-12
<i>Family Snacks</i>	5-11	<i>3</i>	4-12
<i>Time Cook</i>	9-12	<i>4</i>	3-12
<i>Defrost</i>	8-12	<i>5</i>	2-12
<i>Power Level</i>	4-13	<i>6</i>	9-13
<i>Start/Pause</i>	3-13	<i>7</i>	8-13
<i>Cancel/Off</i>	2-13	<i>8</i>	7-13
<i>Settings</i>	6-14	<i>9</i>	6-13
<i>MyPlate.gov</i>	6-15	<i>0</i>	5-13
<i>Add 30 Sec</i>	2-14		
<i>Timer</i>	7-15		
<i>Steam</i>	2-15		

JVM1950	
<i>Soften</i>	3-14

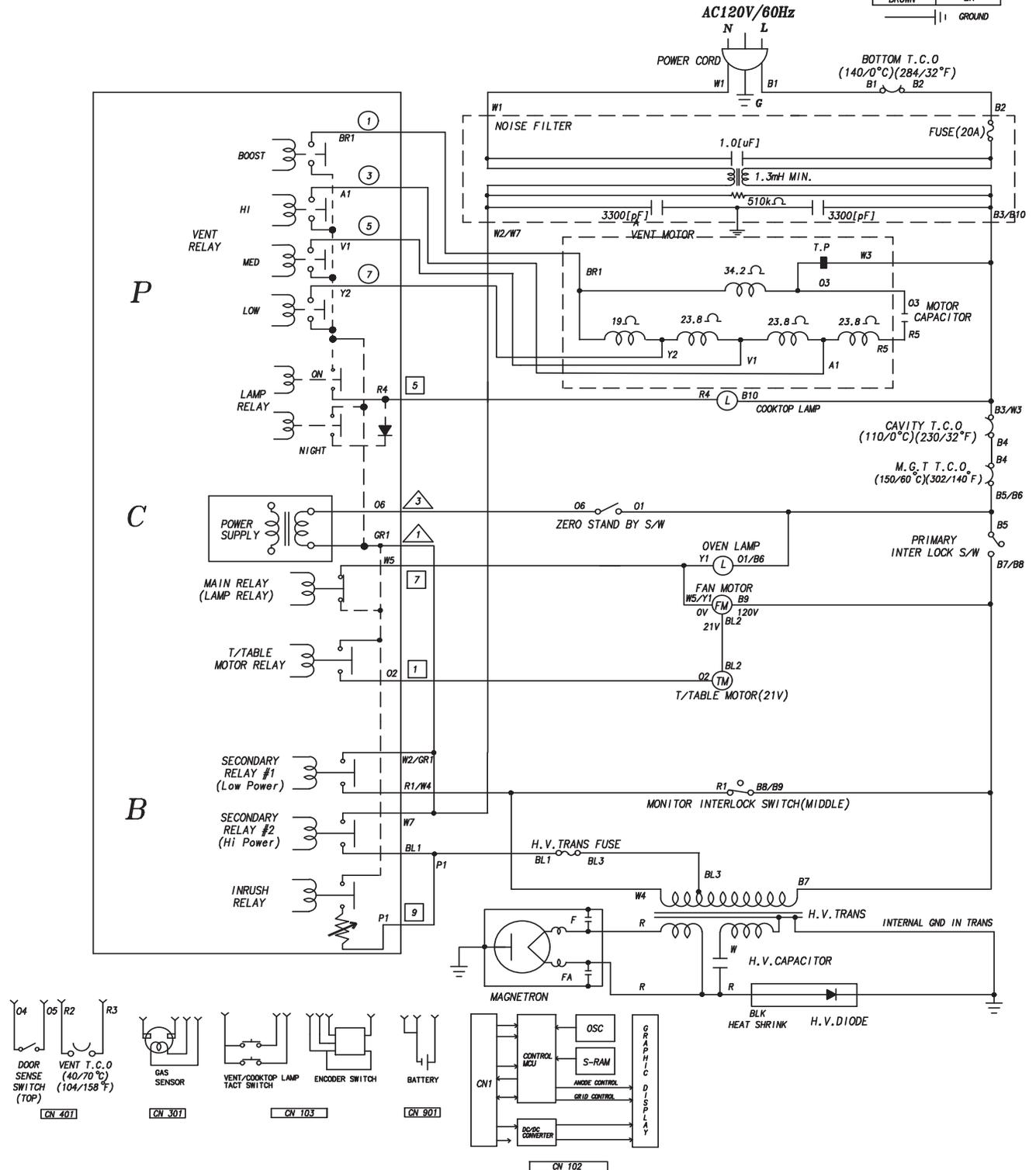
PVM1970	
<i>Beverage</i>	6-10
<i>Potato</i>	5-10
<i>Melt</i>	2-11

DVM1950	
<i>Soften & Melt</i>	3-11

Schematics and Wiring Diagrams

PVM2170 Schematic Diagram

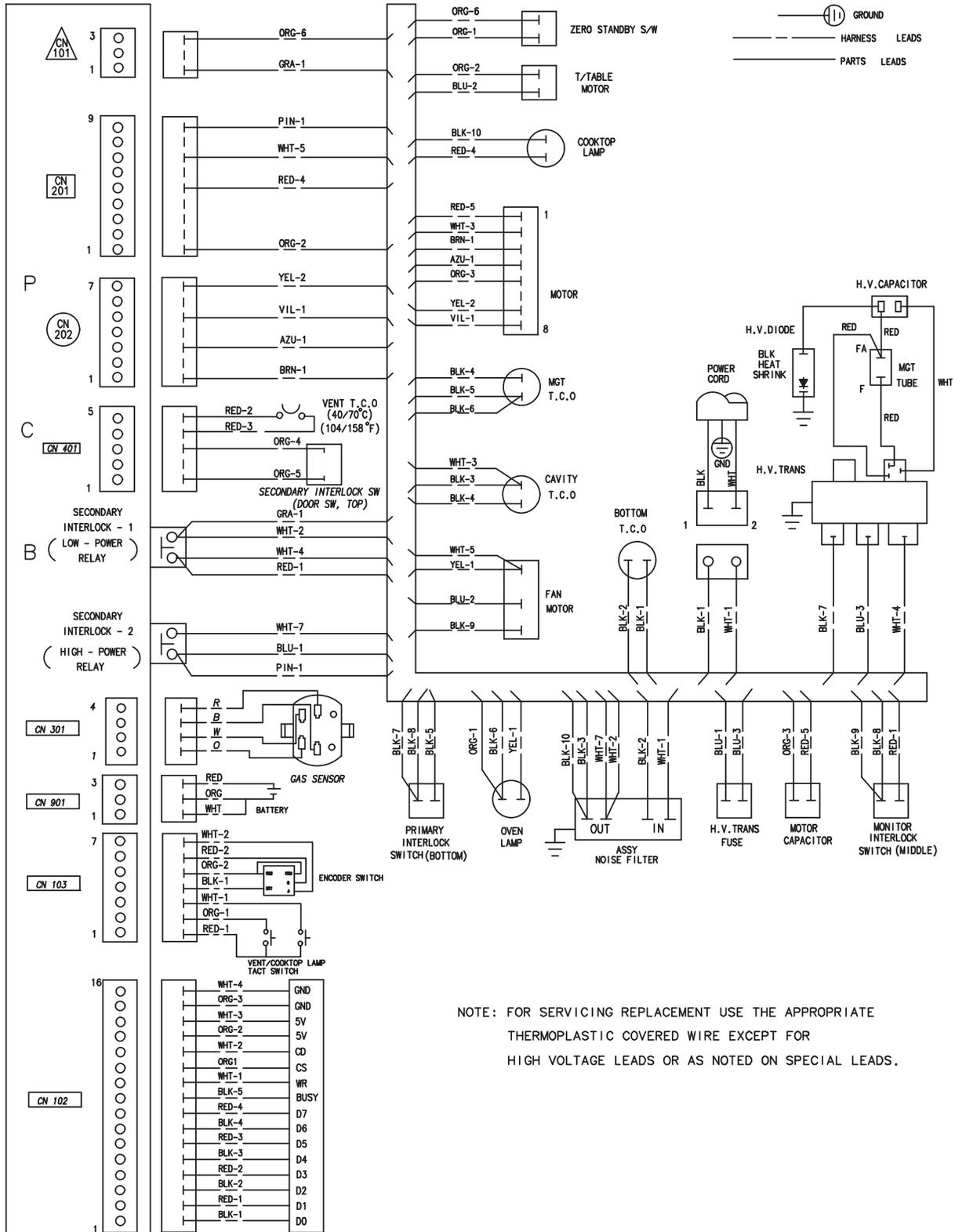
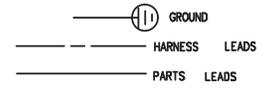
COLOR	SYMBOL
GRAY	GR
WHITE	W
BLACK	B
RED	R
BLUE	BL
ORANGE	O
YELLOW	Y
GREEN	G
PINK	P
AZURE	A
VIOLET	V
BROWN	BR



(Continued next page)

PVM2170 Wiring Diagram

COLOR	SYMBOL
GRAY	GRA
WHITE	WHT
BLACK	BLK
RED	RED
BLUE	BLU
ORANGE	ORG
YELLOW	YEL
GREEN	GRN
PINK	PIN
AZURE	AZU
VIOLET	VIL
BROWN	BRN

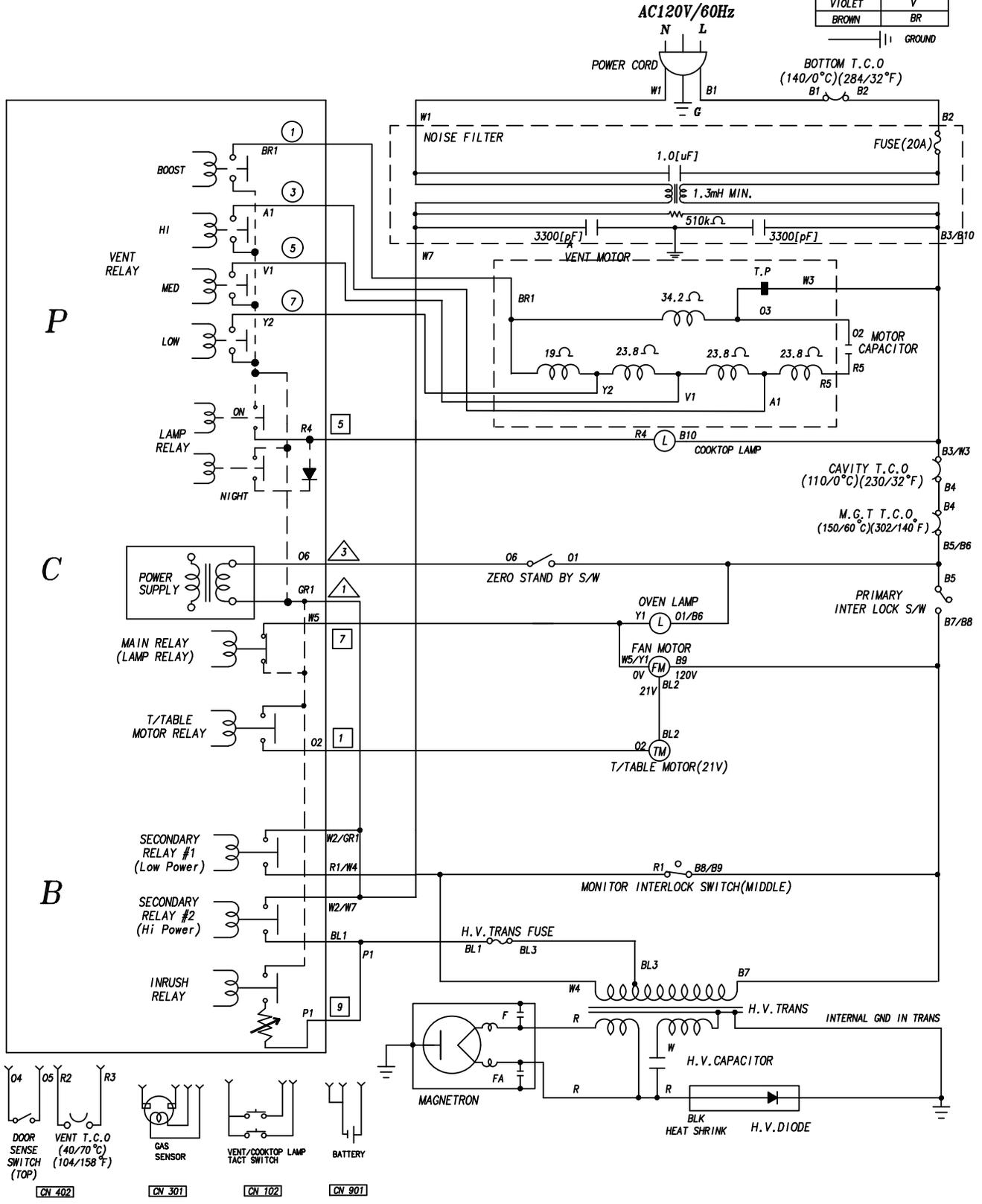


NOTE: FOR SERVICING REPLACEMENT USE THE APPROPRIATE THERMOPLASTIC COVERED WIRE EXCEPT FOR HIGH VOLTAGE LEADS OR AS NOTED ON SPECIAL LEADS.

(Continued next page)

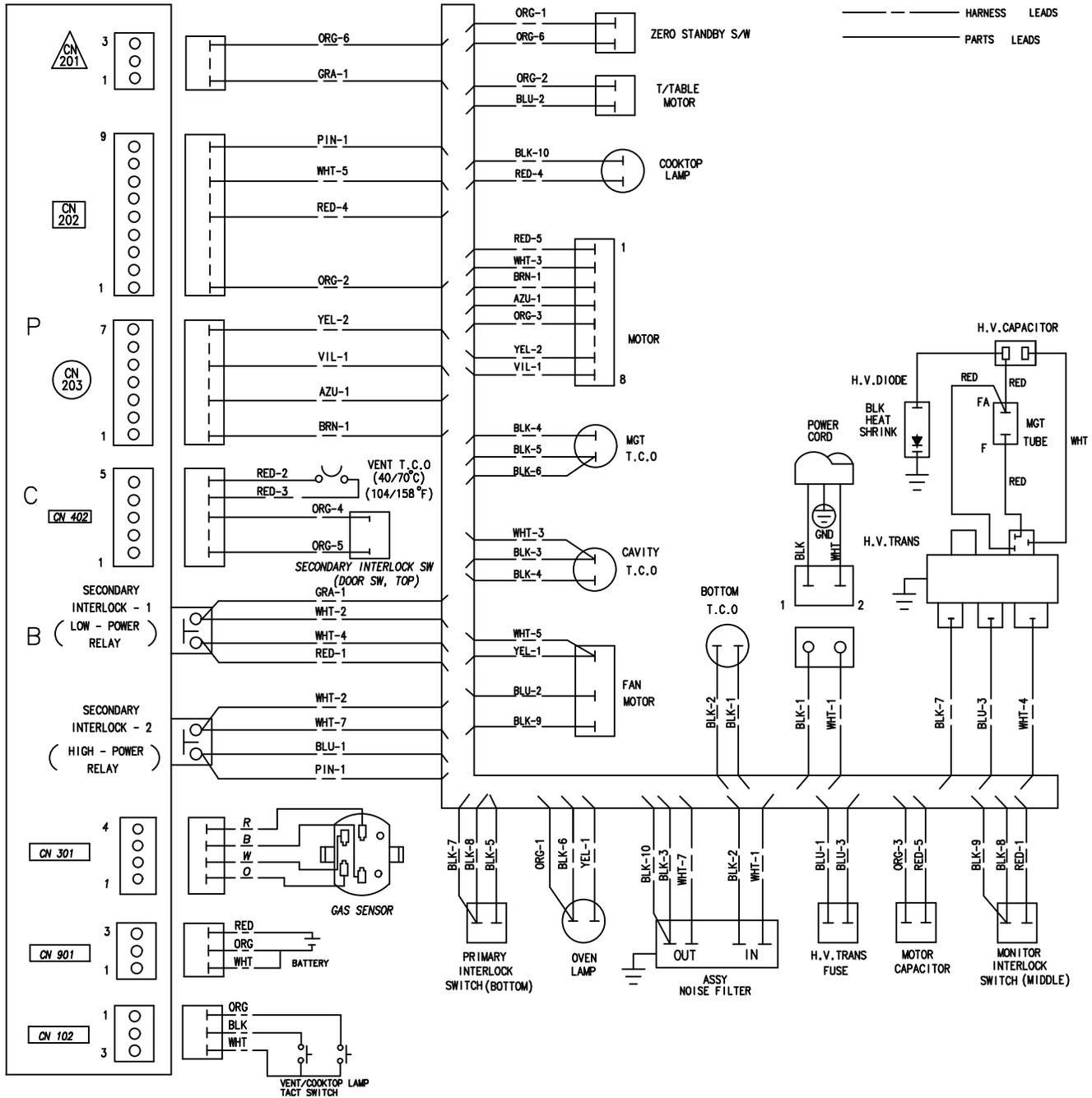
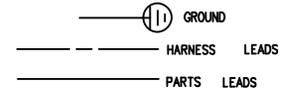
DVM1950, JNM1951, JVM1950, PVM1970, PNM1971 Schematic Diagram

COLOR	SYMBOL
GRAY	GR
WHITE	W
BLACK	B
RED	R
BLUE	BL
ORANGE	O
YELLOW	Y
GREEN	G
PINK	P
AZURE	A
VIOLET	V
BROWN	BR



DVM1950, JNM1951, JVM1950, PVM1970, PNM1971 Wiring Diagram

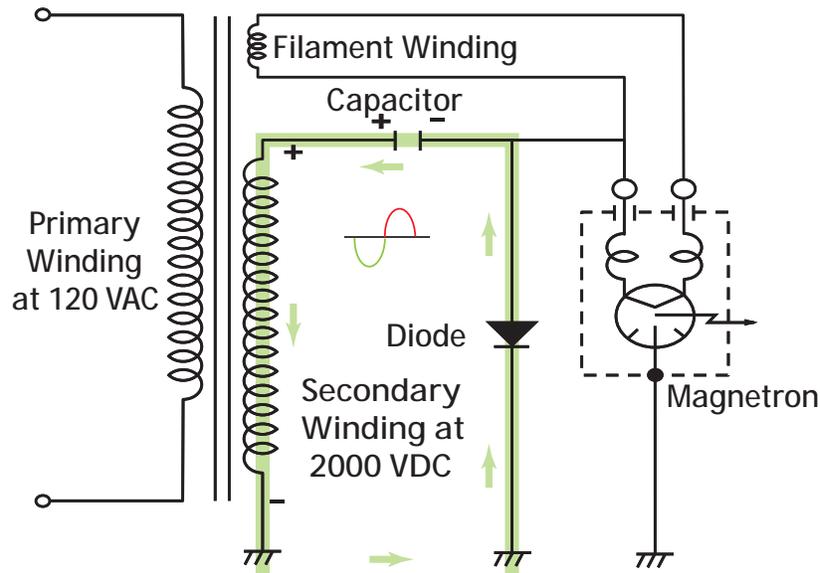
COLOR	SYMBOL
GRAY	GRA
WHITE	WHT
BLACK	BLK
RED	RED
BLUE	BLU
ORANGE	ORG
YELLOW	YEL
GREEN	GRN
PINK	PIN
AZURE	AZU
VIOLET	VIL
BROWN	BRN



High Voltage Half-Wave Doubler

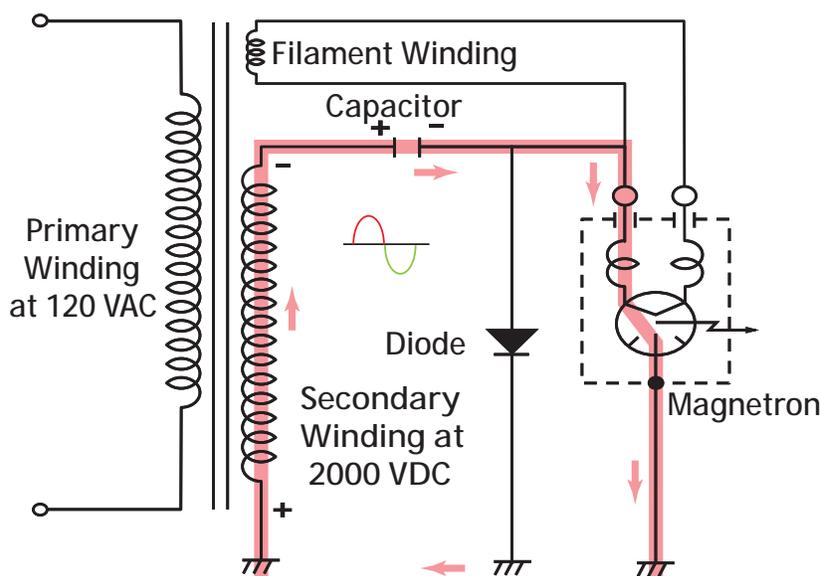
The half wave voltage doubler circuit consists of the secondary winding of the high voltage transformer, high voltage diode (rectifier), and the high voltage capacitor. The high voltage diode allows alternating current (AC) to flow in one direction only and rectifies it to pulsating direct current (DC).

The high voltage capacitor is able to store energy on one half of the AC cycle and release it on the other half cycle. During the first half cycle of operation, the secondary winding of the transformer supplies 2000 VAC to the capacitor. Current flows through the diode and returns to the transformer for a complete circuit. This half cycle of the AC charges the capacitor to approximately 2000 VDC.

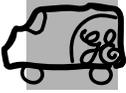


During the second half cycle of operation, the current flows in the opposite direction, and again supplies 2000 VDC to the circuit. This allows the capacitor to discharge its 2000 VDC on top of the 2000 VDC generated by the secondary winding, creating an approximate total voltage of negative 4000 VDC.

The negative 4000 VDC causes the magnetron to conduct current and oscillate at 2450 MHz. The first half cycle and the second half cycle become one complete cycle, repeating with input power frequency at 60 Hz.



Warranty



All warranty service provided by our Factory Service Centers, or an authorized Customer Care® technician. To schedule service, on-line, visit us at ge.com, or call 800.GE.CARES (800.432.2737). Please have serial and model numbers available when calling for service.

Staple your receipt here.
Proof of the original purchase date is needed to obtain service under the warranty.

For The Period Of: GE Will Replace:

One Year

From the date of the original purchase

Any part of the microwave oven which fails due to a defect in materials or workmanship. During this **limited one-year warranty**, GE will also provide, **free of charge**, all labor and related service to replace the defective part.

What GE Will Not Cover:

- Service trips to your home to teach you how to use the product.
- Improper installation, delivery or maintenance.
- Product not accessible to provide required service.
- Failure of the product or damage to the product if it is abused, misused (for example, cavity arcing from wire rack or metal/foil), or used for other than the intended purpose or used commercially.
- Replacement of the cooktop light bulbs.
- Replacement of house fuses or resetting of circuit breakers.
- Damage to the product caused by accident, fire, floods or acts of God.
- Incidental or consequential damage caused by possible defects with this appliance.
- Damage caused after delivery.

EXCLUSION OF IMPLIED WARRANTIES—Your sole and exclusive remedy is product repair as provided in this Limited Warranty. Any implied warranties, including the implied warranties of merchantability or fitness for a particular purpose, are limited to one year or the shortest period allowed by law.

This warranty is extended to the original purchaser and any succeeding owner for products purchased for home use within the USA. If the product is located in an area where service by a GE Authorized Servicer is not available, you may be responsible for a trip charge or you may be required to bring the product to an Authorized GE Service Location for service. In Alaska, the warranty excludes the service calls to your home. Some states do not allow the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. To know what your legal rights are, consult your local or state consumer affairs office or your state's Attorney General.

Warrantor: General Electric Company, Louisville, KY 40225