⚠WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

Electrostatic Discharge (ESD) Sensitive Electronics

ESD problems are present everywhere. ESD may damage or weaken the electronic control assembly. The new control assembly may appear to work well after repair is finished, but failure may occur at a later date due to ESD stress.

- Use an anti-static wrist strap. Connect wrist strap to green ground connection point or unpainted metal in the appliance - ***OR*** - touch your finger repeatedly to a green ground connection point or unpainted metal in the appliance.
- Before removing the part from its package, touch the anti-static bag to a green ground connection point or unpainted metal in the appliance.
- Avoid touching electronic parts or terminal contacts; handle electronic control assembly by edges only.
- When repackaging failed electronic control assembly in anti-static bag, observe above instructions.

DIAGNOSTICS

Is oven in “Sabbath Mode”? If so, “SAB” will appear in digital display. Press and hold “6” key for 5 seconds to end Sabbath Mode.

Disconnect power and perform the following checks:

- The most common cause for control failure is corrosion on connectors. Therefore, disconnecting and reconnecting wires will be necessary throughout the test procedures.
- Check all connections before replacing components, looking for broken or loose wires, failed terminals, or wires not pressed into connectors far enough.
- All tests/checks should be made with a VOM or DVM having a sensitivity of 20,000 ohms per volt DC or greater.
- Resistance checks **must** be made with power cord unplugged from outlet, and with wiring harness or connectors **disconnected**.

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

a. Do not operate or allow the oven to be operated with the door open.

b. Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:

1. Interlock Operation
2. Proper Door Closing
3. Seal and Sealing Surfaces (Arcing, Wear and Other Damage)
4. Damage to or Loosening of Hinges and Latches
5. Evidence of Dropping or Abuse

c. Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, waveguide or transmission line and cavity for proper alignment, integrity and connections.

d. Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation, and transmission systems shall be repaired, replaced, or adjusted by procedures described in service manual before the oven is released to the owner.

e. A microwave leakage check to verify compliance with the Federal performance standard should be performed on each oven prior to release to the owner.

f. Do not attempt to operate the oven if the door glass is broken.

PROBLEM: Bake Temperature Needs Adjustment

1. Press BAKE pad for 5 seconds. The default temperature 0° or a previously entered offset temperature will show in the Temperature Display.

- Press the BAKE pad **to increase** the temperature in 5° F or 3° C increments.
- Press the BROIL pad **to decrease** the temperature in 5° F or 3° C increments.

Maximum offset temperature adjustment is ±35° F or ±21° C.

2. Press the START pad to save the temperature adjustment.

FAILURE/ERROR DISPLAY CODES

NOTES:

- Always unplug microwave oven or disconnect power before touching internal parts of the oven!
- Upon replacement, immediately return old electronic oven control using the mailing label supplied with each new control.
- For combo ovens, the failure code is displayed on the side of the display that corresponds to the oven with faulty part (upper oven = left side of display).

FAULT CODE	ERROR CODE	MEANING OF FAILURE CODE	RECOMMENDED REPAIR PROCEDURE
F0	**E0**	Default F code – no failure	Will only be displayed if user presses and holds the UPPER OFF key for 5 seconds and there is no pre-existing fault. Press CANCEL to clear display.
F1	**E0, E1, & E2**	Electronic control malfunction	Check oven door switch. If OK replace control.
	E3, E4, & E5	Electronic control malfunction	Replace control.
F2	**E0 or E1**	Keypad keytail not connected	1. Check keypad connector for firm connection. 2. Press CANCEL. If error code returns after 60 sec., replace keypad.
	E3	Key held down too long, or key is shorted	
F3	**E0**	Temperature sensor opened (lower cavity)	1. Check lower cavity sensor connection. 2. Measure sensor resistance (1080Ω at 70° F [21° C]. Add 2Ω per degree F). 3. If resistance is not valid replace sensor. 4. If sensor resistance and connections are good, then check for welded-closed relays on the control. If relay is shorted, replace control.
	E1	Temperature sensor shorted (lower cavity)	
	E2	Temperature sensor opened (microwave)	1. Check microwave sensor connection. 2. Measure sensor resistance (280kΩ at 70° F [21° C]; 1kΩ at 392° F [200° C]). 3. If resistance is not valid replace sensor. 4. If sensor resistance and connections are good, then check for welded-closed relays on the control. If relay is shorted, replace control.
	E3	Temperature sensor shorted (microwave)	
F5	**E0**	Lower cavity over temperature while cleaning	See F3, Error Code E0, above.
F6	**E0**	Lower cavity over temperature during cooking	See F3, Error Code E0, above.
	E1	Microwave cavity over temperature during cooking	See F3, Error Code E2, above.
F8	**E0**	Self-clean latch will not lock	1. Check the latch assembly: Check latch arm pivot joint, arm/motor connection, plunger and hook springs. 2. Check the Latch Motor: - Check for firm electrical connections. - Disconnect the two wires from the motor and measure the resistance of the motor. The resistance should be approximately 2450Ω. If the motor is open (∞Ω) or shorted (0Ω), it should be replaced. 3. Check the Latch Switch: Disconnect it and use a continuity tester: - Door latched = switch closed, continuity should read 0Ω. - Door unlatched = switch open, continuity should read ∞Ω. 4. Check Door Open/Closed Switch: Disconnect it and use a continuity tester: - Door closed = switch closed, continuity should read 0Ω. - Door open = switch open, continuity should read ∞Ω. 5. Check power and element connections.
	E1	Self-clean latch will not unlock	
	E2	Oven over temperature while door open and latch lock	
	E3	Oven over temperature while door open and latch unlock	
	E4	Oven over temperature while door close and latch unlock	

Fahrenheit (° F) to Celsius (° C) Conversion

The default is Fahrenheit (° F).

1. Press the BROIL pad for 5 seconds. The temperature will be displayed in degrees Celsius indicated by the “C” in the temperature display.
2. To return the display to degrees Fahrenheit press the BROIL pad again for 5 seconds. “F” will show in the temperature display.

Microwave Oven Power Output Test

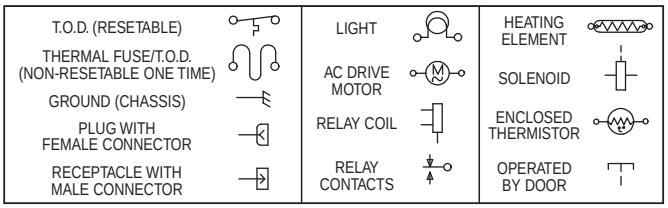
The power output of the magnetron can be measured by the following test: (for accurate results, the line voltage must be 120 VAC and the oven cavity must be clean).

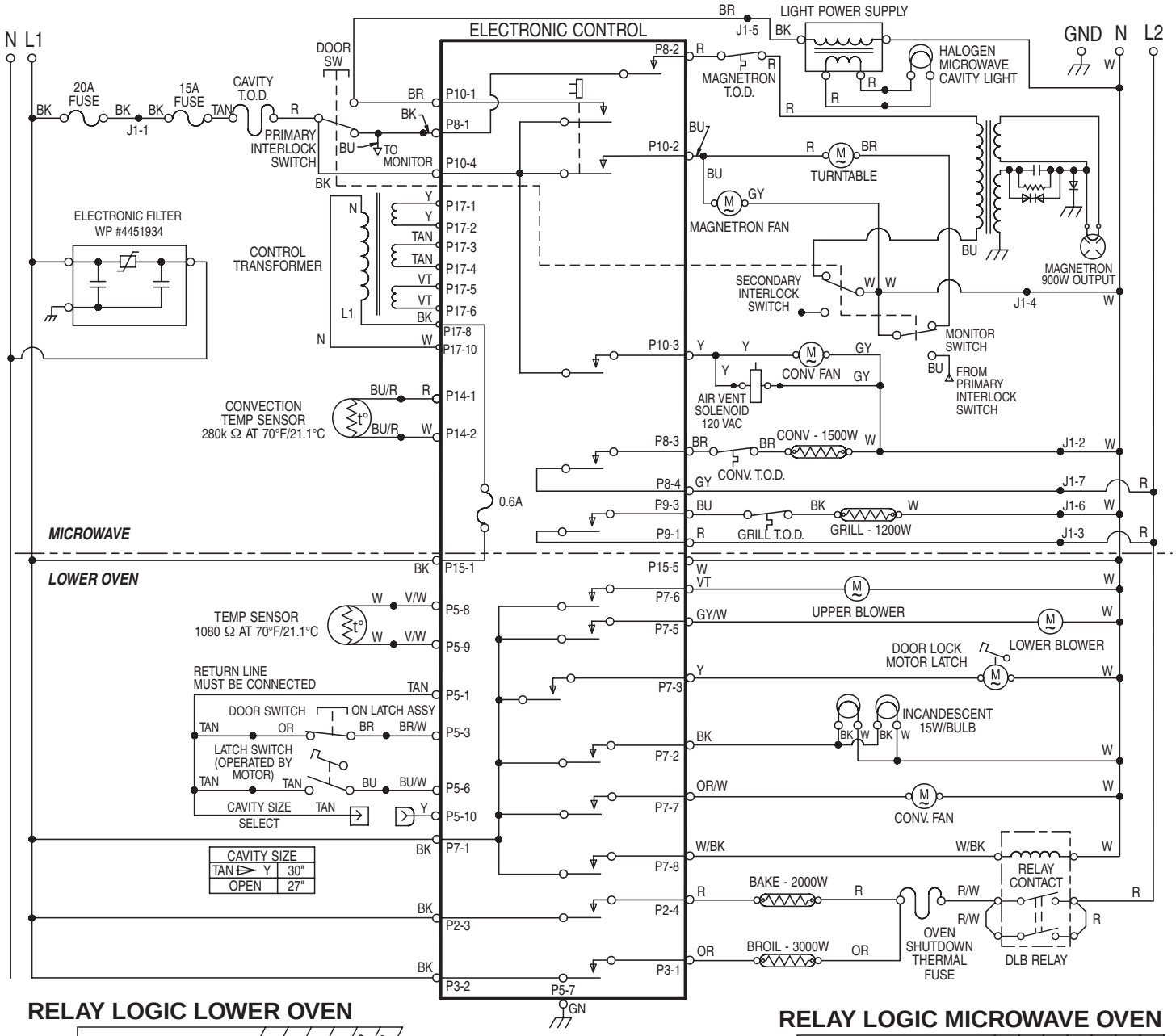
1. Fill a glass measuring cup with 16 oz. (453cc) of tap water. Stir the thermometer through the water until the temperature stabilizes.
2. Place the cup of water in the center of the oven. Operate on HIGH for 60 seconds.
3. Stir the thermometer through the water and record the maximum temperature.
4. Subtract the cold water temperature from the hot water temperature. The normal result should be a 20 - 38° F (11.1 - 21.1° C) rise in temperature.

NOTE: Less than a 20° F (11.1° C) temperature rise may indicate an operating voltage of less than 110 volts or a low power output from the magnetron. Cooking time can be adjusted to compensate for either circumstance. Replace the magnetron only if the water temperature rise indicates a power output well beyond the normal result.

WIRE HARNESS SCHEMATIC

NOTES: When replacing the electronic control, be sure to attach the cavity select line to the proper terminal (see "CAVITY SIZE" table below).
Dots indicate connections or splices.
Circuit shown in standby/off mode with microwave oven door and lower oven door closed.





RELAY LOGIC LOWER OVEN

MODES	RELAYS BAKE	BROIL	CONV FAN	OV LT	LOWER BLOWER	UPPER BLOWER
OFF	○	○	○	⊠	⊠	⊠
BAKE	⊕	⊕	○	⊠	X	X
CUSTOM BROIL	○	X	○	⊠	X	X
CONV BROIL	○	X	X	⊠	X	X
CONV BAKE	⊕	⊕	X	⊠	X	X
CLEAN	⊕	⊕	○	○	X	X
PREHEAT-BAKE	X	+	○	⊠	X	X
PREHEAT-CONV	⊠	+	X	⊠	X	X
PREHEAT-CLEAN	⊕	⊕	○	○	X	X

✳ IF LOWER OVEN IS IN CLEAN MODE, MICROWAVE WILL NOT FUNCTION

RELAY LOGIC KEY

○ – OFF
X – ON
⌓ – CYCLING (MAX. PERIOD = 23 SEC.)
\+ – CYCLING (MAX. PERIOD = 90 SEC.)
⊕ – CYCLING (MAX. PERIOD = 60 SEC.)
⊠ – ON OR OFF

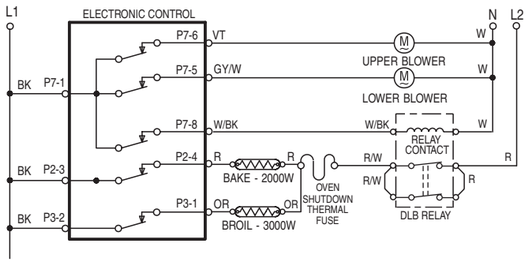
RELAY LOGIC MICROWAVE OVEN

MODES	RELAYS MAG.	GRILL	CONV	CONV FAN	MAG FAN	LIGHT	UPPER BLOWER
MICRO. FULL PWR	X	○	○	○	X	X	X
MICRO. VAR. PWR	⌓	○	○	○	X	X	X
BROIL	○	X	○	○	X	X	X
MANUAL CRISP	⌓	X	○	○	X	X	X
OFF	○	○	○	○	⊠	⊠	⊠
CONV. QUICK PREHEAT	○	X	X	X	○	X	X
CONV. COOK	○	⌓	⊠	X	○	X	X
SPEED COOK	⌓	⌓	⊠	X	X	X	X

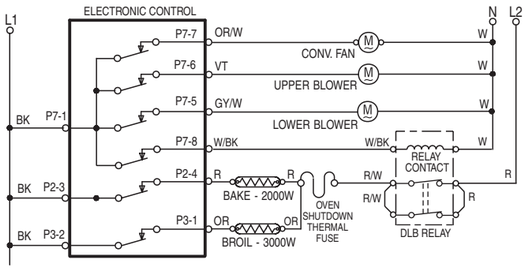
STRIP CIRCUITS

The following individual circuits are for use in diagnosis. **Before starting diagnosis, check the line voltage and for blown fuses.**

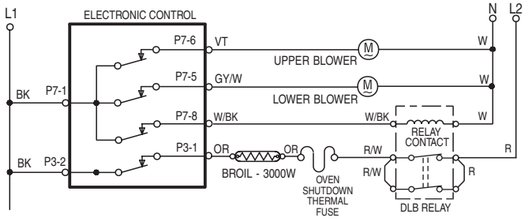
BAKE AND PREHEAT-BAKE (OVEN)



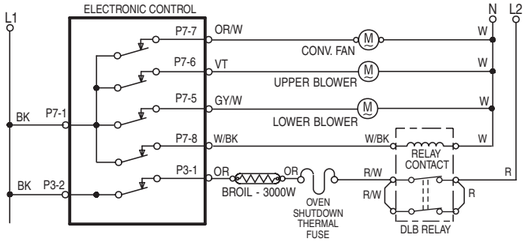
CONVECTION BAKE (OVEN)



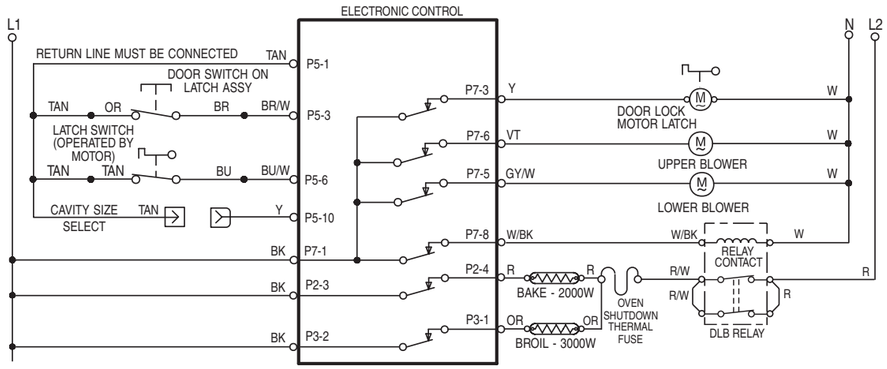
CUSTOM BROIL (OVEN)



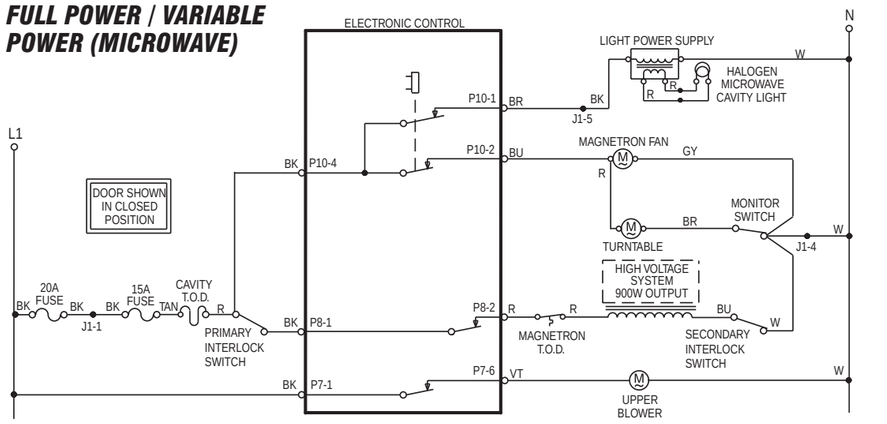
CONVECTION BROIL (OVEN)



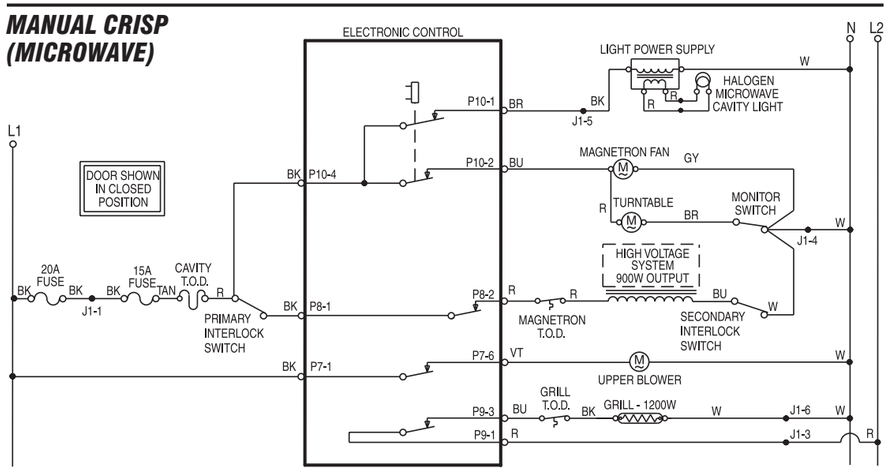
CLEAN (OVEN)



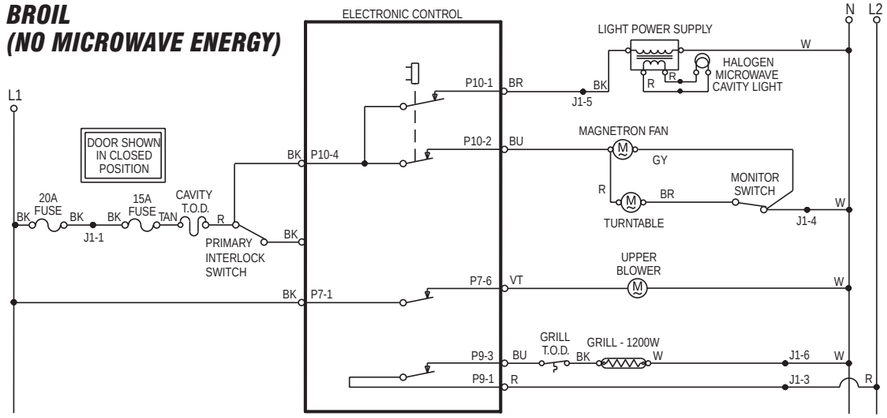
FULL POWER / VARIABLE POWER (MICROWAVE)



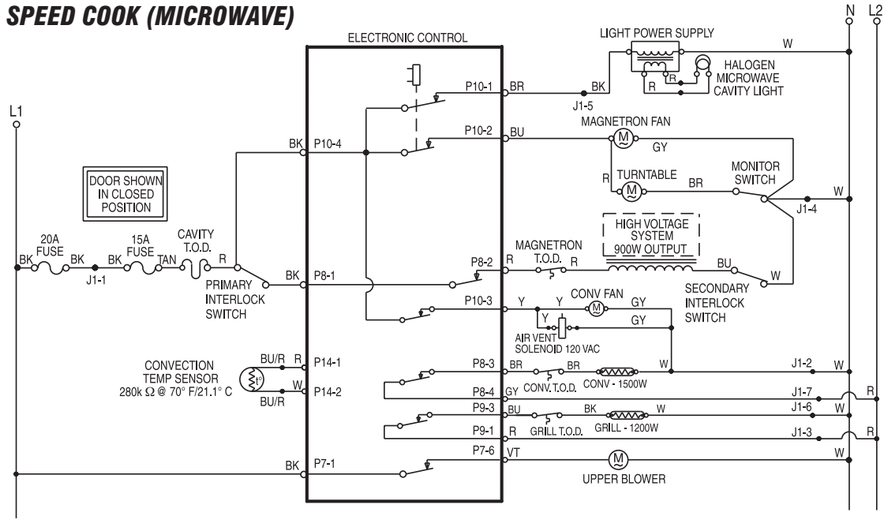
MANUAL CRISP (MICROWAVE)



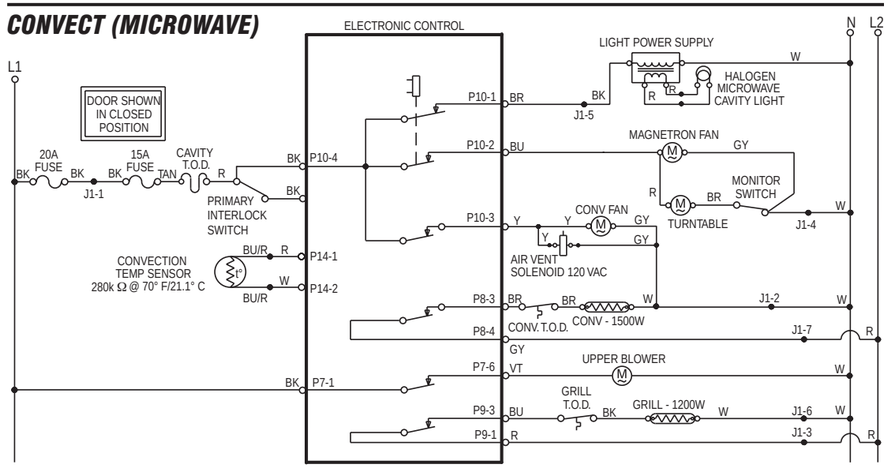
BROIL (NO MICROWAVE ENERGY)



SPEED COOK (MICROWAVE)

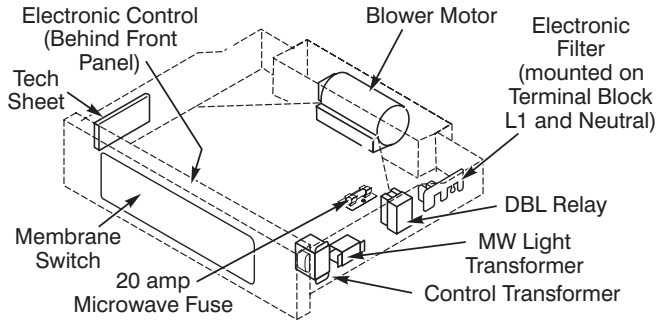


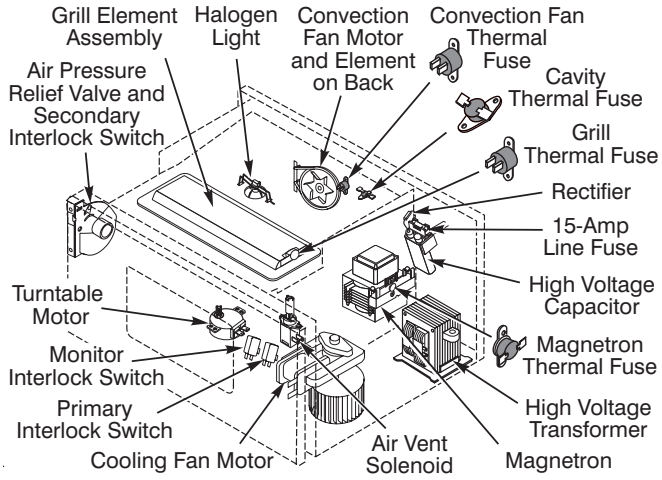
CONVECT (MICROWAVE)

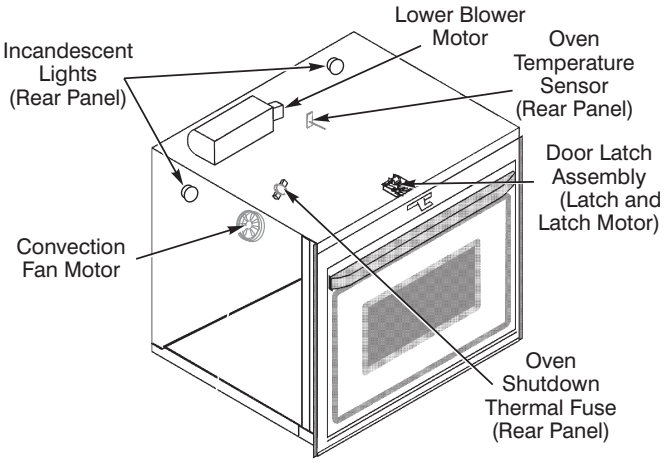


COMPONENTS	FRONT/TOP/REAR SERVICEABLE	CAN BE TESTED AT CONTROL PANEL	
		CHECK POINTS	RESULTS
Electronic Control	Front	—	—
Electronic Filter	Front	—	—
Control Transformer	Front	—	—
DBL Relay	Front	—	—
Membrane Switch	Front	—	—
Incandescent Light	Light Bulb - Front Light Assy. - Rear	—	—
Latch Switch	Front	P5-6 (BU/W) to P5-1 (TAN)	Door Unlocked = Open Circuit Door Locked = Closed Circuit
Latch Motor	Front	P7-3 (Y) to Neutral (W)	Approx. 2450 Ω
Door Switch	Front	P5-3 (BR/W) to P5-1 (TAN)	Door Closed = Closed Circuit Door Open = Open Circuit
Oven Temperature Sensor	Front	P5-8 (V/W) to P5-9 (V/W)	1080 Ω @ 70°F
Lower Console Blowers	Rear	P7-5 (GY/W) to Neutral (W)	14 Ω to 18 Ω
Oven Shutdown Thermal Fuse	Rear	P2-4 (R) or P3-1 (OR) to Red/White Wire at DLB Relay	Closed Circuit
Convection Fan Motor (Lower Oven)	Rear	P7-7 (OR/W) to Neutral (W)	18 Ω
Bake Element	Rear	P2-4 (R) to Red/White Wire at DLBRelay	25 Ω to 30 Ω
Broil Element	Front	P3-1 (OR) to Red/White Wire at DLBRelay	17 Ω to 20 Ω
Microwave Light Transformer (M/W)	Rear	Primary Winding	40 Ω to 45 Ω
		Secondary Winding	Less than 1 Ω
Halogen Light (M/W)	Light Bulb - Front Light Assy. - Rear	—	—
Upper Blower (M/W)	Rear	P7-6 (VT) to Neutral (W)	10 Ω to 15 Ω
Convection Motor/Fan (M/W)	Rear	P10-3 (Y) to Neutral (W)	44 Ω
All Other Microwave Components	Rear	—	—

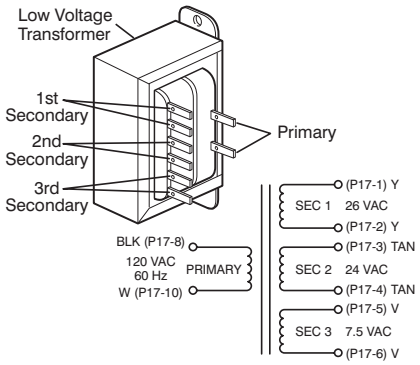
COMPONENTS LOCATIONS



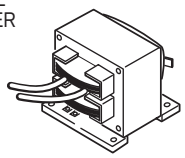
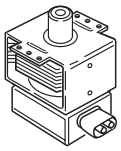
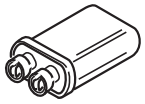
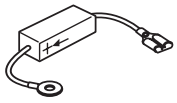
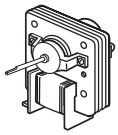
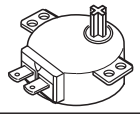
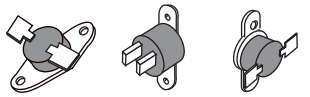
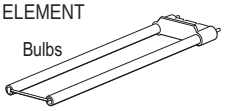
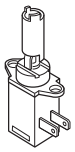




CONTROL TRANSFORMER

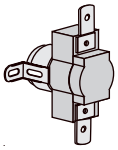


TESTING THE MICROWAVE OVEN COMPONENTS

COMPONENT	TEST PROCEDURE	RESULTS
HIGH VOLTAGE TRANSFORMER 	1. Remove the leads from the terminals. 2. Set the ohmmeter to Rx1 and touch the leads to the terminals. Primary Secondary Filament to Ground 3. Measure resistance (Rx100) Primary Filament	 Normal = Less than 1 Ω. Normal = Less than 1 Ω. Normal = 0 Ω. Normal = Infinity. Normal = Infinity.
MAGNETRON 	1. Remove the leads from the terminals. 2. Set the ohmmeter to Rx1 and touch the leads to the F and FA terminals. 3. Set the ohmmeter to Rx1k and measure filament to chassis.	 Normal = approximately 0 Ω. Normal = Infinity.
CAPACITOR 	1. Remove the leads from the terminals. 2. Set the ohmmeter to Rx1k and touch the leads to the terminals. 3. Terminal to chassis.	 Normal = Momentarily indicates several ohms, and gradually returns to infinity. Normal = Infinity.
RECTIFIER 	1. Remove the leads from the terminals. 2. Set the ohmmeter to Rx1k and measure forward resistance. 3. Measure the reverse resistance. NOTE: Some inexpensive meters may show infinity in both directions.	 Normal = Continuity. Abnormal = Infinity. Normal = Infinity. Abnormal = Continuity.
FAN MOTOR 	1. Remove the leads from the terminals. 2. Set the ohmmeter to Rx1 and touch the leads to the terminals.	 Normal = approximately 25 Ω. Abnormal = Infinity.
TURNTABLE MOTOR 	1. Remove the leads from the terminals. 2. Set the ohmmeter to Rx1 and touch the leads to the terminals.	 Normal = approximately 25 Ω. Abnormal = Infinity.
THERMAL FUSES  Cavity Thermal Fuse; Grill and Convection Fan Thermal Fuses; Magnetron Thermal Fuse	1. Remove the leads from the terminals. 2. Set the ohmmeter to Rx1 and touch the leads to the terminals.	Normal = Continuity. Abnormal = Infinity.
	Cavity Thermal Fuse: Open 329° F (165° C); Close —	
	Grill Thermal Fuse: Open 320° F (160° C); Close 284° F (140° C)	
	Magnetron Thermal Fuse: Open 293° F (145° C); Close 257° F (125° C)	
	Convection Fan Thermal Fuse: Open 293° F (145° C); Close 221° F (105° C)	
GRILL ELEMENT  Bulbs	1. Remove the leads from the terminals. 2. Set the ohmmeter to Rx1 and touch the leads to the terminals.	Normal = 14 Ω for both bulbs. Normal = 7 Ω for one bulb. Abnormal = Infinity.
AIR VENT SOLENOID 	1. Remove the lead from one terminal. 2. Set the ohmmeter to Rx1k and touch the leads to the terminals.	Normal = approximately 1650 Ω. Abnormal = Infinity.

OVEN SHUTDOWN THERMAL FUSE

The oven shutdown thermal fuse is located at the back of the oven. It will shut down the elements if the temperature at the back of the oven exceeds component limits.



Verify that the oven shutdown thermal fuse is OK.

To replace this thermal fuse, refer to chart at right for correct part number.

Thermal Fuse Part No.	Opening Temp. °F	Reclose Temp. °F	Marking (with Black Letters)
4452223	266°F ± 10°F	–31°F MAX	Pink/Wht Stripe
4451442	248°F+18°F to 248°F – 0°F		Yellow/Wht Stripe
4450934	338°F ± 11.7°F		Red
4450334	275°F ± 11.7°F		Orange/Wht Stripe
4450250	320°F ± 11.7°F		Blue
4450249	302°F ± 11.7°F		Green/Wht Stripe
8300802	230°F+18°F to 230°F – 0°F		Blue/Wht Stripe

MANUFACTURED UNDER ONE OR MORE OF
THE FOLLOWING UNITED STATES PATENTS:

4,102,322 4,364,589 4,467,184

OTHER PATENTS PENDING