⚠WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all 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 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.
- Voltage checks **must** be made with all connectors **attached** to the boards.
- 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 & Other Damage)
4. Damage to or Loosening of Hinges & 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 temp. 0° or a previously entered offset temp. will show in the Temp. Display.

- Press the BAKE pad to increase the temperature in 10° F or 5° C increments.
- Press the BROIL pad to decrease the temperature in 10° F or 5° C increments.

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

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

FAILURE/ERROR DISPLAY CODES

NOTES:

- Always 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.
- The Failure code shows up in the 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 "0" key for 5 seconds and there is no pre-existing fault. Press CANCEL to clear display.
F1	**E0, E1, E2**	Door switch malfunction	Check Oven Door Switch. If okay, replace control.
	E3 or E4	Electronic control malfunction	Replace control.
F2	**E0 or E1**	Keypad 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	1. Check sensor connection. 2. Measure sensor resistance (1080 Ω at 70° F. Add 2 Ω per degree.) 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.
	E1	Temperature sensor shorted	
F4	**E0**	Meat probe shorted	1. Disconnect meat probe and measure probe resistance (78k Ω at 60° F, 37k Ω at 90°). 2. If resistance is not valid replace probe. 3. Insert probe and check for a firm connection between probe and jack (in oven cavity). 4. Check connection between jack and harness (in rear of oven).
F8	**E0**	Self-clean latch will not lock	1. Check the latch assembly: Check latch arm pivot joint, arm/solenoid connection, solenoid spring & and spring washer. 2. Check the Latch Solenoid: - Check for firm electrical connections. - Disconnect the two wires from the solenoid and measure the resistance of the solenoid. A small resistance (approx. 300 Ω) is normal. If the solenoid is open (∞ Ω) or shorted (0 Ω), it should be replaced. 3. Check the Latch Switch: Disconnect it and use a continuity tester: - Door latched = switch closed, continuity should read 0 Ω. - Door unlatched = switch open, continuity should read ∞ Ω. 4. Check Door Open/Closed Switch: Disconnect it and use a continuity tester: - Door open = switch closed, continuity should read 0 Ω. - Door closed = switch open, continuity should read ∞ Ω. 5. Finally, replace control.
	E1	Self-clean latch will not unlock	
All Other Codes		Electronic control malfunction	Replace control.

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. 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.

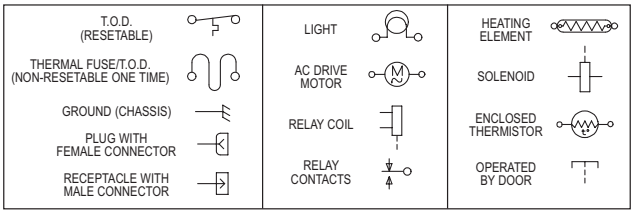
WIRE HARNESS SCHEMATIC

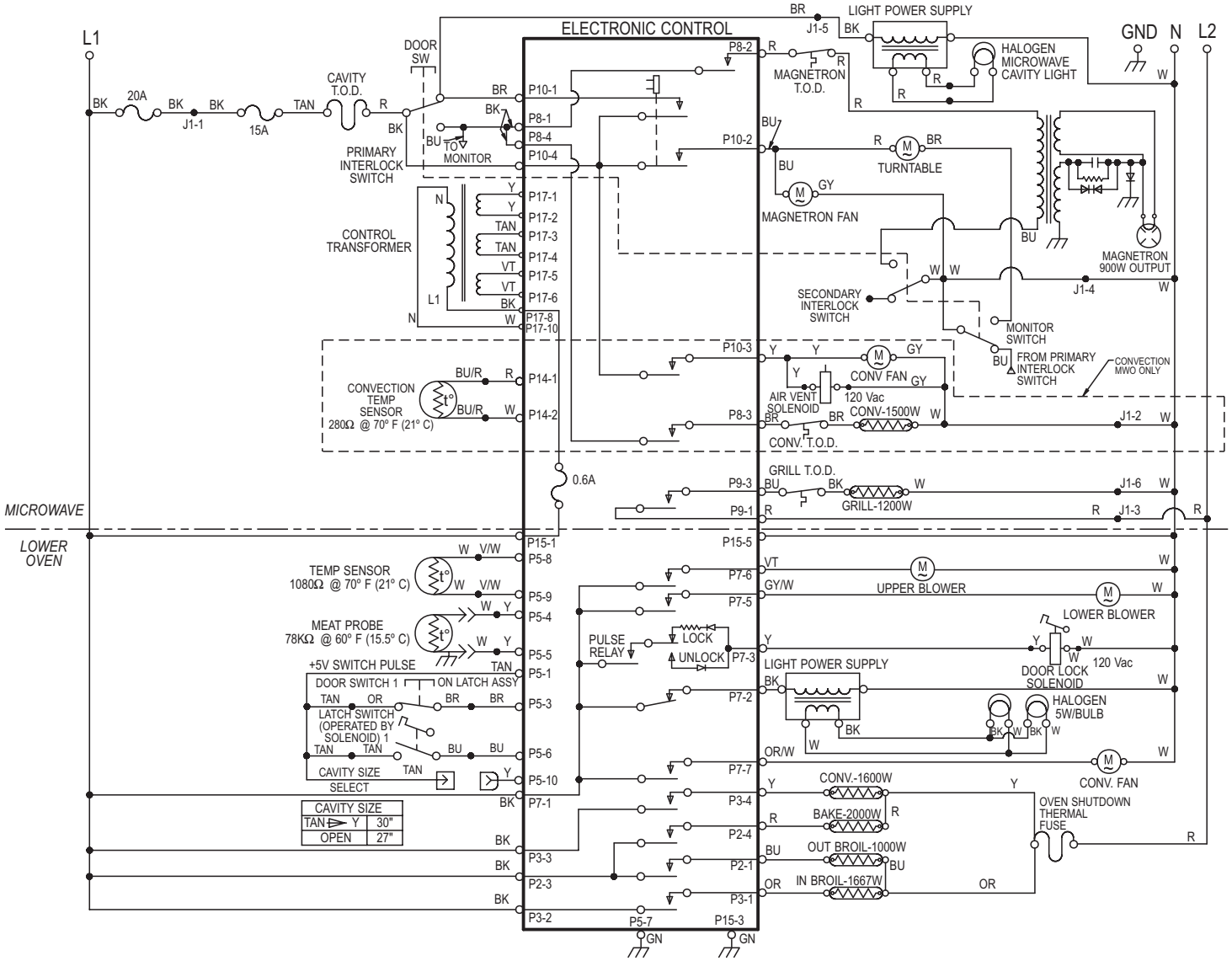
NOTES:

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 OPEN.

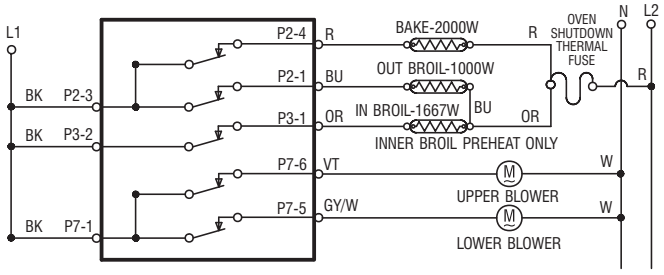




OVEN STRIP CIRCUITS

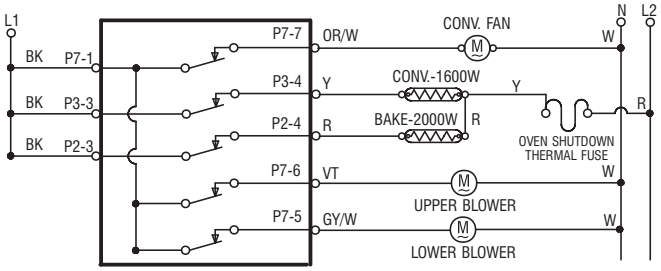
The following individual circuits are for use in diagnosis.
Before starting diagnosis, check the line voltage and for blown fuses.

BAKE AND PREHEAT-BAKE

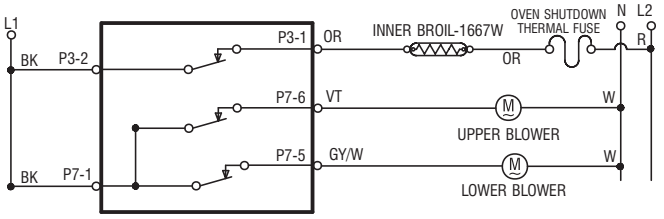


CONVECTION BAKE

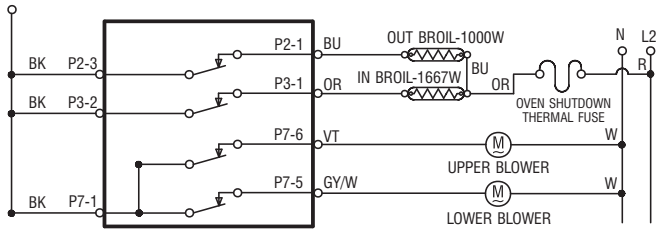
(BAKE ELEMENT USED ON 30" MODELS ONLY)



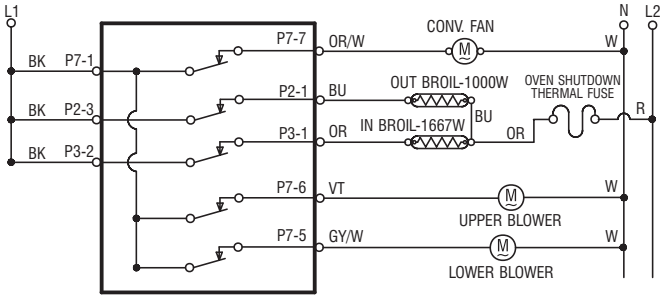
ECONO BROIL



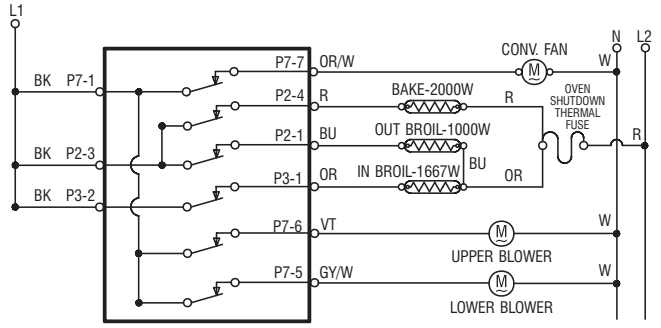
MAXI BROIL



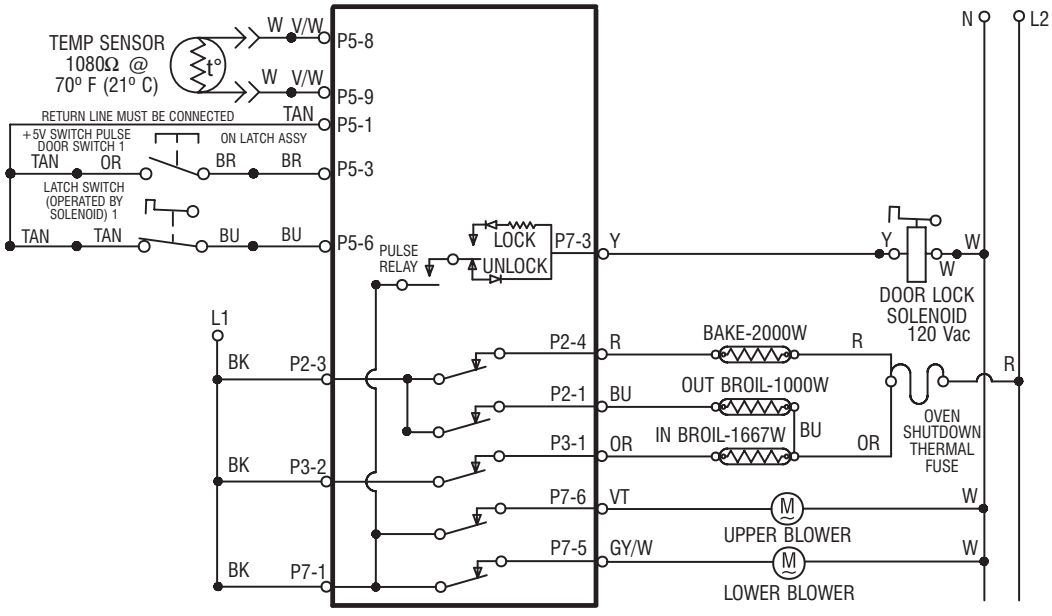
CONVECTION BROIL



CONVECTION ROAST AND PREHEAT-CONVECTION



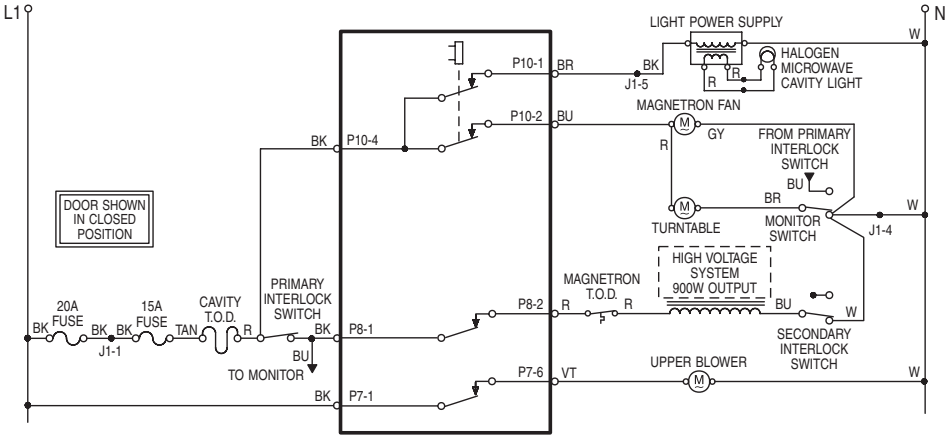
CLEAN



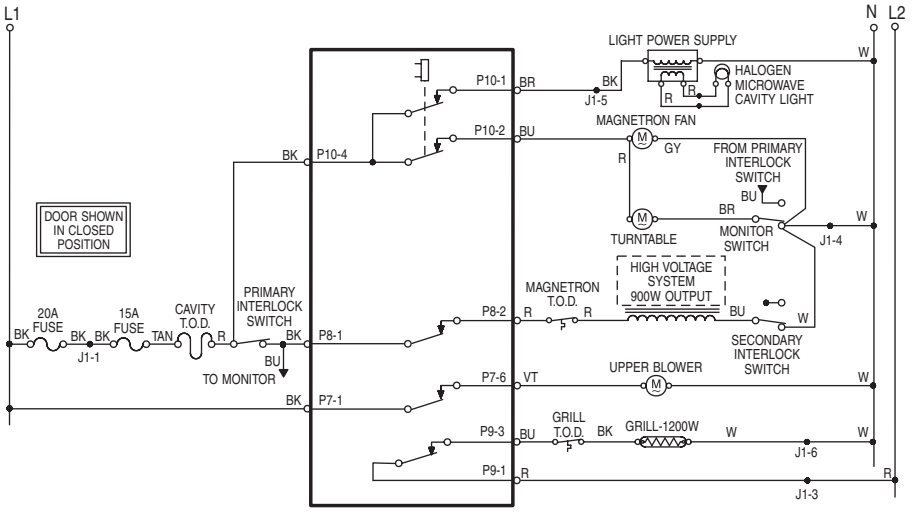
MICROWAVE STRIP CIRCUITS

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

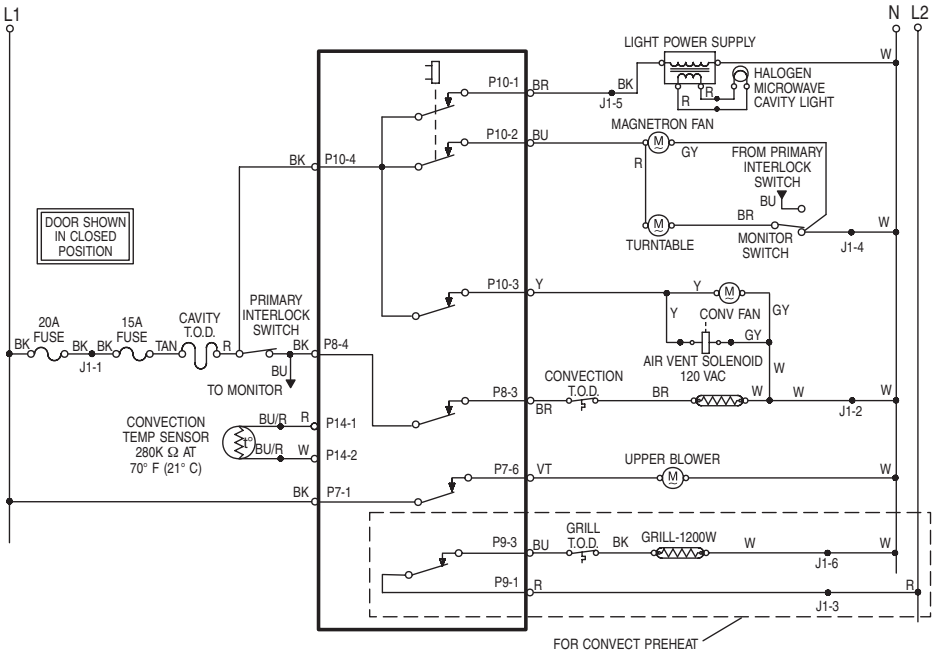
MICROWAVE FULL POWER / VARIABLE POWER



MANUAL CRISP - MICROWAVE



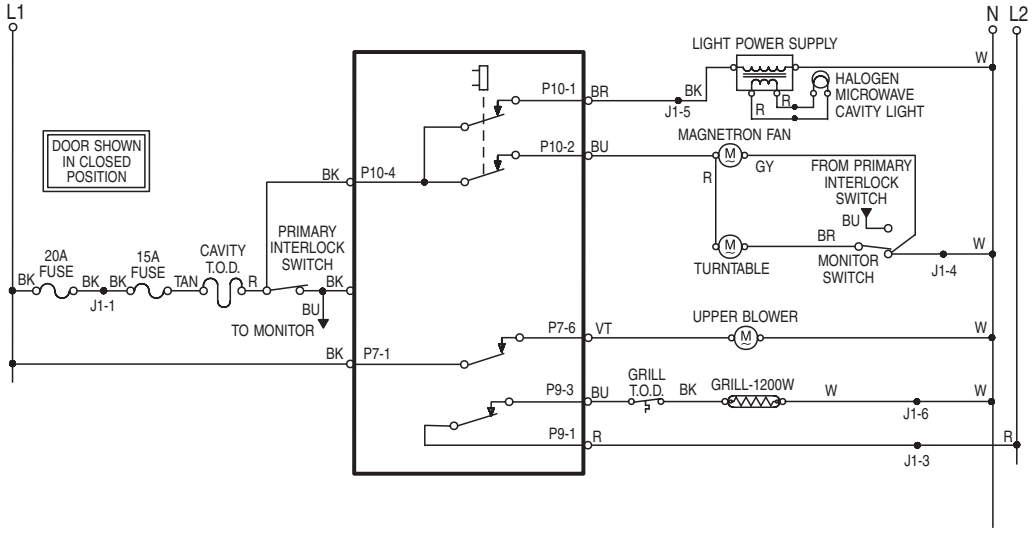
CONVECT *(FOR MICROWAVE)*



MICROWAVE STRIP CIRCUITS

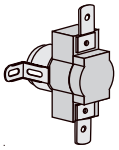
The following individual circuits are for use in diagnosis.
Before starting diagnosis, check the line voltage and for blown fuses.

BROIL *(NO MICROWAVE ENERGY)*



COMPONENT	FRONT/TOP/REAR SERVICEABLE	CAN BE TESTED AT CONTROL PANEL	
		CHECK POINTS	RESULTS
Electronic Control	Front	—	—
Control Transformer	Top	—	—
Membrane Switch	Front	—	—
Halogen Lights	Light Bulb - Front Light Assy. - Rear	—	—
Latch Solenoid	Front	—	—
Latch Switch	Front	P5-6 (BU) to P5-1 (TAN)	Door Unlocked = Open Circuit Door Locked = Closed Circuit
Door Switch	Front	P5-3 (BR) to P5-1 (TAN)	Door Open = Closed Circuit Door Closed = Open Circuit
Door Lock Solenoid (with Door Closed)	Front	P7-3 (Y) to Neutral (W)	50 Ω
Oven Temperature Sensor	Front	P5-9 (V/W) to P5-8 (V/W)	1080 Ω @ 70° F
Bake Element	Front	P2-4 (R) to Red Wire at Terminal Block	25 Ω to 30 Ω
Grill Element	Front	P9-3 (BU) to Neutral (W)	14 Ω
In Broil Element	Front	P3-1 (OR) to Red Wire at Terminal Block	32 Ω to 35 Ω
Out Broil Element	Front	P2-1 (BU) to Red Wire at Terminal Block	53 Ω to 59 Ω
Lower Blower Motor	Rear	P7-5 (GY/W) to Neutral (W)	14 Ω to 18 Ω
Meat Probe	Rear	P5-4 (Y) to P5-5 (Y)	78k Ω @ 60° F
Oven Shutdown Thermal Fuse	Rear	P2-4 (R) or P3-1 (OR) to Red Wire at Terminal Block	Closed Circuit
Convection Fan (Lower Oven)	Rear	P7-7 (OR/W) to Neutral (W)	18 Ω
Convection Element (Lower Oven)	Front	P3-4 (Y) to Red Wire at Terminal Block	33 Ω to 37 Ω
Oven Light Transformer	Front	Primary Winding	40 Ω to 45 Ω
		Secondary Winding	Less than 1 Ω
Microwave Light Transformer (M/W)	Top	Primary Winding	40 Ω to 45 Ω
		Secondary Winding	Less than 1 Ω
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
Convection Element (M/W)	Rear	P8-3 (BR) to Neutral (W)	10 Ω to 20 Ω

OVEN SHUTDOWN THERMAL FUSE



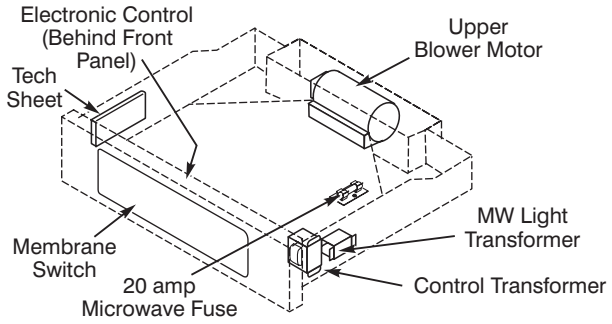
The oven shutdown thermal fuse is located at the back of the oven. It will shut down the elements if the temperature at the back of the oven exceeds component limits.

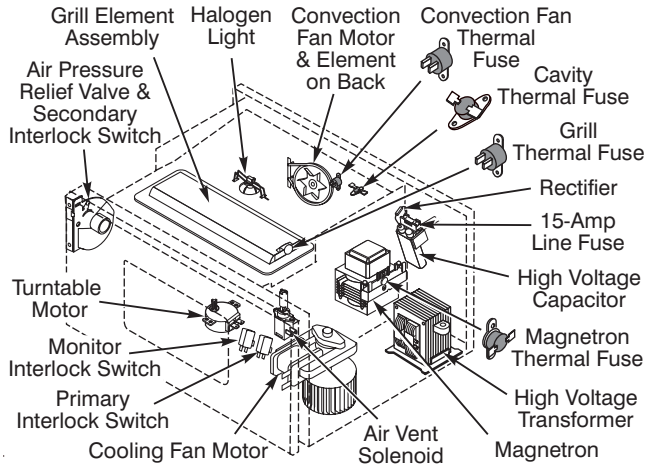
Verify that the oven shutdown thermal fuse is okay.

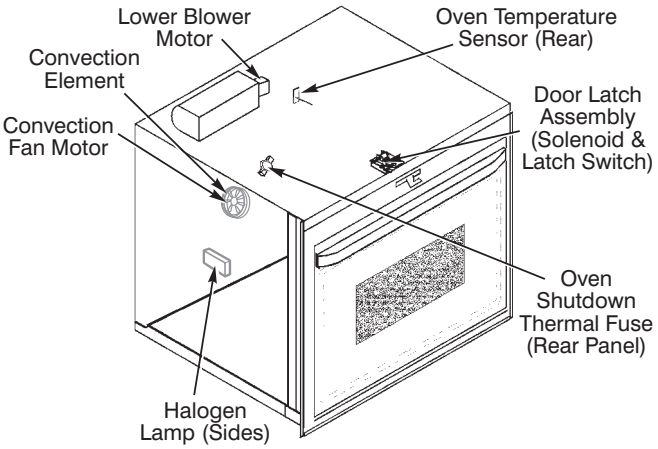
To replace this thermal fuse, refer to chart at right for correct part number.

Thermal Fuse Part No.	Opening Temp. °C	Reclose Temp. °C	Marking (with Black Letters)
4452223	130°C ± 5.5°C	–35°C MAX	Pink/Wht Stripe
4451442	120°C+10°C to 120°C – 0°C		Yellow/Wht Stripe
4450934	170°C ± 6.5°C		Red
4450334	135°C ± 6.5°C		Orange/Wht Stripe
4450250	160°C ± 6.5°C		Blue
4450249	150°C ± 6.5°C		Green/Wht Stripe
8300802	110°C+10°C to 110°C – 0°C		Blue/Wht Stripe

COMPONENT LOCATIONS







RELAY LOGIC MICROWAVE OVEN

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

RELAY LOGIC LOWER OVEN

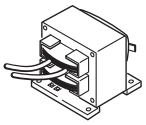
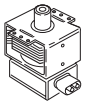
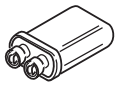
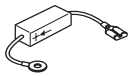
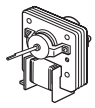
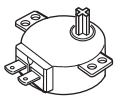
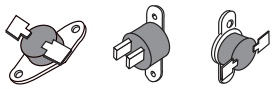
MODES	RELAYS	BAKE	IN BROIL	OUT BROIL	CONV ELEM	CONV FAN	OV. LT	LOWER BLOWER	PULSE RELAY	LOCK/UNLOCK	UPPER BLOWER
OFF	O	O	O	O	O	O	⊠	⊠	O	O	⊠
BAKE ■	⊕	O	X	O	O	⊠	X	O	O	X	
ECONO BROIL	O	X	O	O	O	⊠	X	O	O	X	
MAXI BROIL	O	X	X	O	O	⊠	X	O	O	X	
CONV BROIL	O	X	X	O	X	⊠	X	O	O	X	
CONV ROAST ●	X	⊕	X	O	X	⊠	X	O	O	X	
CONV BAKE ●	⊠	O	O	+	X	⊠	X	O	O	X	
CLEAN ▲	⊕	⊕	X	O	O	O	X	✳	✳	X	
■ PREHEAT-BAKE	X	+	X	O	O	⊠	X	O	O	X	
● PREHEAT-CONV	⊠	+	X	O	X	⊠	X	O	O	X	
▲ PREHEAT-CLEAN	⊕	⊕	X	O	O	O	X	✳	✳	X	
DEHYDRATE	O	O	O	+	X	⊠	X	O	O	X	
RAISING BREAD	O	O	O	+	X	⊠	X	O	O	X	

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

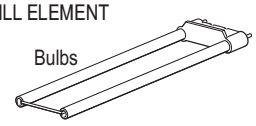
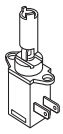
RELAY LOGIC KEY

O – OFF
X – ON
⌓ – CYCLING (MAX. PERIOD = 23 SEC.)
\+ – CYCLING (MAX. PERIOD = 90 SEC.)
⊕ – CYCLING (MAX. PERIOD = 60 SEC.)
⊠ – ON OR OFF
✳ – PULSED FOR 1/2 SECOND

TESTING THE MICROWAVE OVEN COMPONENTS

COMPONENT	TEST PROCEDURE	RESULTS
HIGH VOLTAGE TRANSFORMER 	1. Remove the leads from the terminals. 2. Set the ohmmeter to R x 1 and touch the leads to the terminals. Primary Secondary Filament to Ground 3. Measure resistance (R x 100) 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 R x 1 and touch the leads to the F and FA terminals. 3. Set the ohmmeter to R x 1000 and measure filament to chassis.	 Normal = approximately 0 Ω. Normal = Infinity.
CAPACITOR 	1. Remove the leads from the terminals. 2. Set the ohmmeter to R x 1000 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 R x 1000 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 R x 1 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 R x 1 and touch the leads to the terminals.	 Normal = approximately 25 Ω. Abnormal = Infinity.
THERMAL FUSES  Cavity Thermal Fuse, Grill Thermal Fuse, Magnetron Thermal Fuse	1. Remove the leads from the terminals. 2. Set the ohmmeter to R x 1 and touch the leads to the terminals.	 Normal = Continuity. Abnormal = Infinity.

	Open	Close
Cavity Thermal Fuse	165° F	
Grill Thermal Fuse	175° F	125° F
Mag Thermal Fuse	145° F	125° F

GRILL ELEMENT  Bulbs	1. Remove the leads from the terminals. 2. Set the ohmmeter to R x 1 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 the R x 1k and touch the leads to the terminals.	 Normal = approximately 1650 Ω. Abnormal = Infinity.

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

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

OTHER PATENTS PENDING

PART NO. 4452295 REV. D

NOTE: This sheet contains important Technical Service Data

FOR SERVICE TECHNICIAN ONLY
DO NOT REMOVE OR DESTROY