⚠WARNING

Electric Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

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

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 failed 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.

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

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.
- Resistance checks must be made with power cord unplugged from outlet, and with wiring harness or connectors disconnected.

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.

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 TEMP pad "up" arrow (⏶) to increase the temperature in 10° F or 5° C increments.

   Press the TEMP pad "down" arrow (⏷) to decrease the temperature in 10° F or 5° C increments.

   Maximum offset temperature adjustment is ±30° F or ±15° C.

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

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.

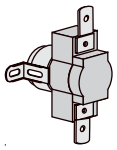
Programming the Cavity Size

When replacing the electronic control, be sure to program the cavity size:

1. Within 60 seconds of power up, press the following touchpads:
   OVEN CANCEL, WARM HOLD, BAKE, TEMP DOWN, TIMER OFF, MINUTE DOWN, MICRO CANCEL, 5, OVEN START/ENTER, OVEN LIGHT.
2. Size is shown in display - "id 30".
3. Press CLOCK pad until correct size is displayed.
4. Press CANCEL.
5. Press and hold OVEN CANCEL pad for 5 seconds to verify programming.

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

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.

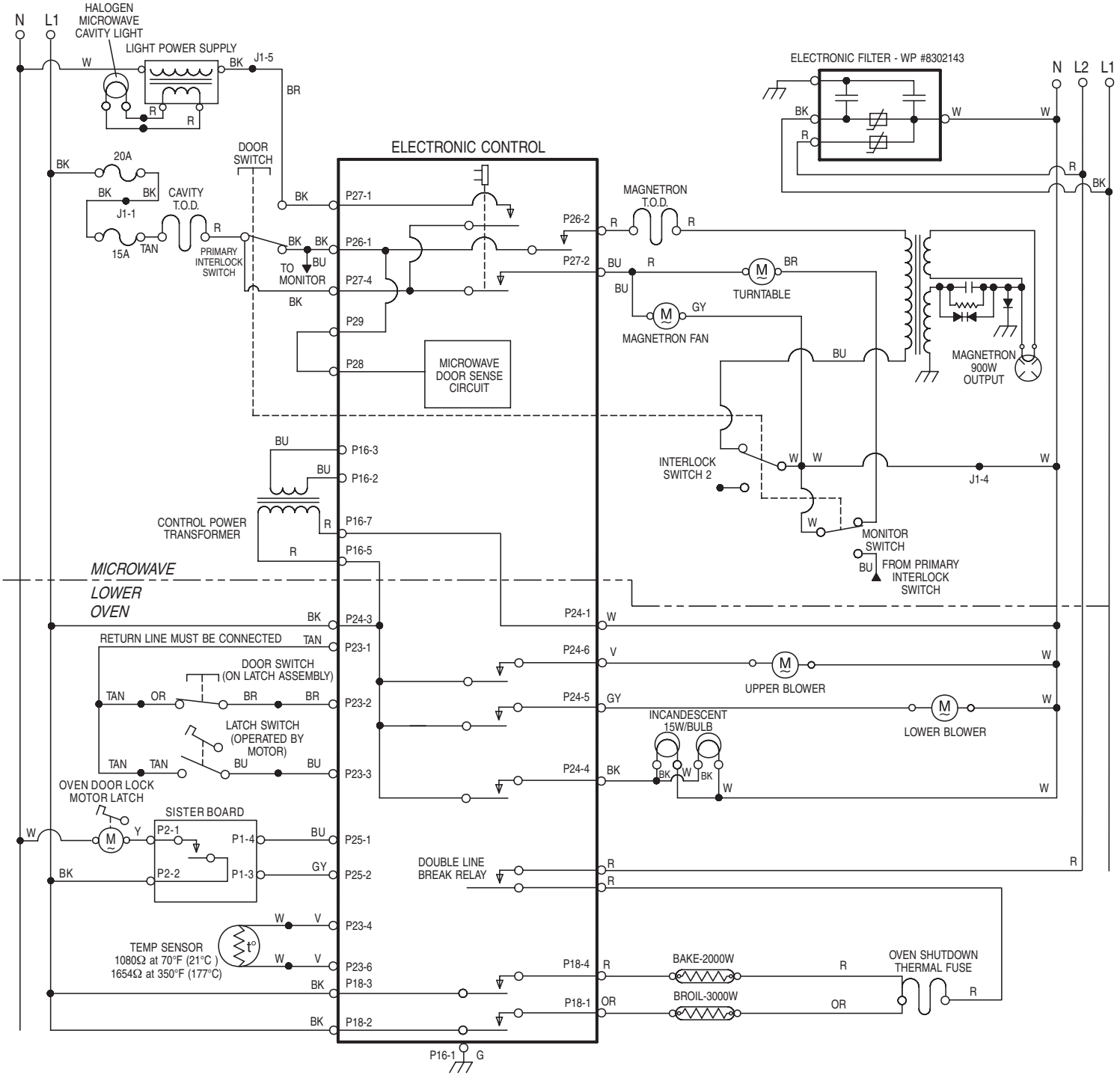
FAULT CODE	ERROR CODE	MEANING OF FAILURE CODE	RECOMMENDED REPAIR PROCEDURE
F0		Default F code - no failure	Will only be displayed if user presses and holds CANCEL key for 5 seconds and there is no pre-existing fault. Press CANCEL to clear display.
F1	**All E Codes**	Electronic control malfunction	1. Disconnect power or unplug oven. 2. Replace control.
F2	**E0**	Key held down too long or key is shorted	1. Disconnect power or unplug oven. 2. Check keypad connector for firm connection. 3. Press CANCEL. If error code returns after 60 sec., replace keypad. 4. Replace control.
	E1	Keypad keytail not connected	
	E5, E6	CANCEL key drive line open	
F3	**E0**	Temperature sensor opened R=2875 ohm (by spec)	1. Disconnect power or unplug oven. 2. Check sensor connection. 3. Measure sensor resistance (1080 Ω at 70° F [21° C]. Add 2 Ω per degree F.) 4. If resistance is not valid replace sensor. 5. If sensor resistance and connections are good, then check for welded-closed relays on the control.
	E1	Temperature sensor shorted R=825 ohm (by spec)	
	E2	Oven temp too high - over 575° F (302° C) in COOK mode	
	E3	Oven temp too high - over 950° F (510° C) in CLEAN mode	
F5	**E0**	Door is open, but latch is locked (condition exists when door switch is open indicating an open door, and latch switch is closed indicating a locked door)	1. Disconnect power or unplug oven. 2. Check the latch assembly: latch arm pivot joint, arm/motor connection, plunger and hook springs. 3. Check the Latch Motor: - Check for firm electrical connections. - Disconnect the two wires from the motor and measure the resistance of the motor. If the motor is open (∞Ω) or shorted (0Ω), it should be replaced. 4. 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. 5. Check Door Open/Closed Switch. Disconnect it and use a continuity tester: Door open = switch open, continuity should read ∞Ω. Door closed = switch closed, continuity should read 0Ω. 6. Check Sister Board: - Check connections latch motor – sister board. - Replace sister board. 7. Check power and element connections. 8. Replace control.
	E1	Self-clean latch will not lock/unlock	

WIRE HARNESS SCHEMATIC

NOTES:

- When replacing the electronic control, be sure to program the cavity size. See “Programming the Cavity Size” on page 2.
- Dots indicate connections or splices.
- Circuit shown in standby/off mode with microwave oven door and lower oven door closed.

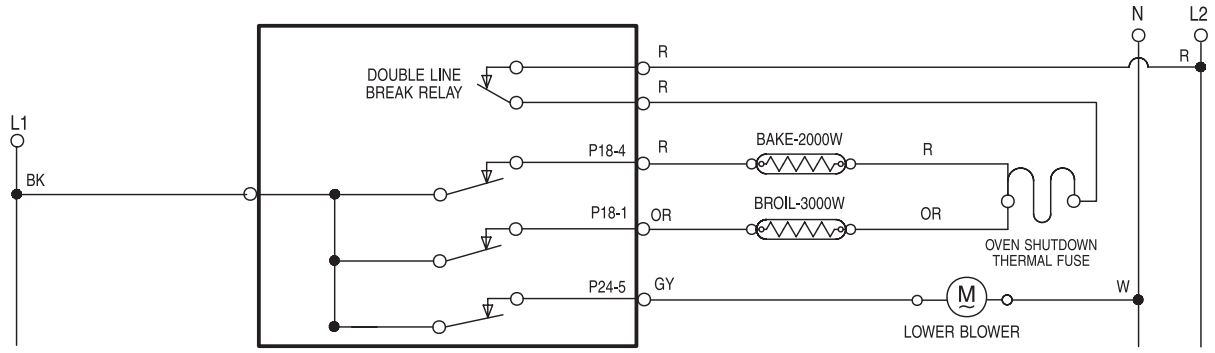
GROUND (CHASSIS)	AC DRIVE MOTOR	ENCLOSED THERMISTOR
PLUG WITH FEMALE CONNECTOR	RELAY COIL	OPERATED BY DOOR
RECEPTACLE WITH MALE CONNECTOR	RELAY CONTACTS	THERMAL FUSE
LIGHT	HEATING ELEMENT	



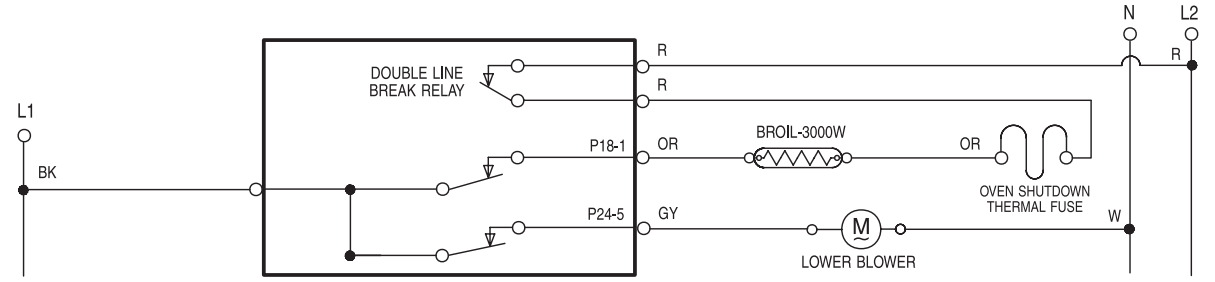
OVEN STRIP CIRCUITS

The following individual circuits are for use in diagnosis.
Do not continue with the diagnosis of the appliance if a fuse is blown, a circuit breaker is tripped, or if there is less than a 240 volt power supply at the wall outlet.

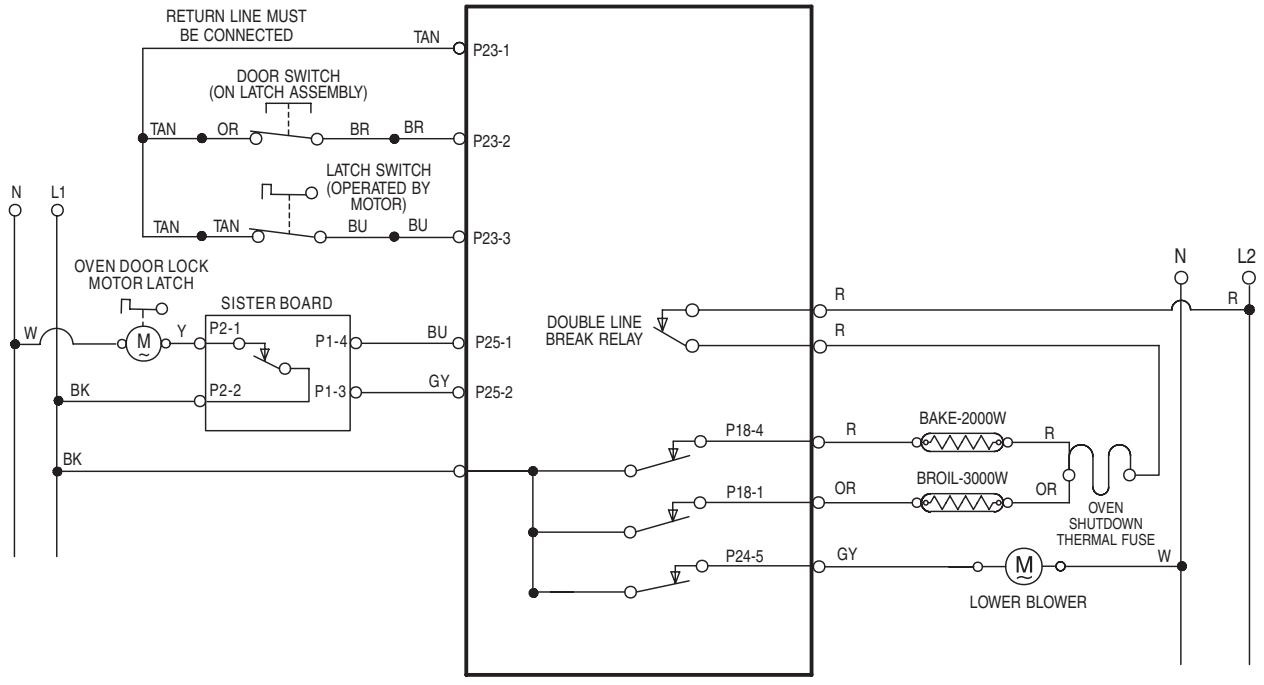
BAKE AND PREHEAT-BAKE



BROIL



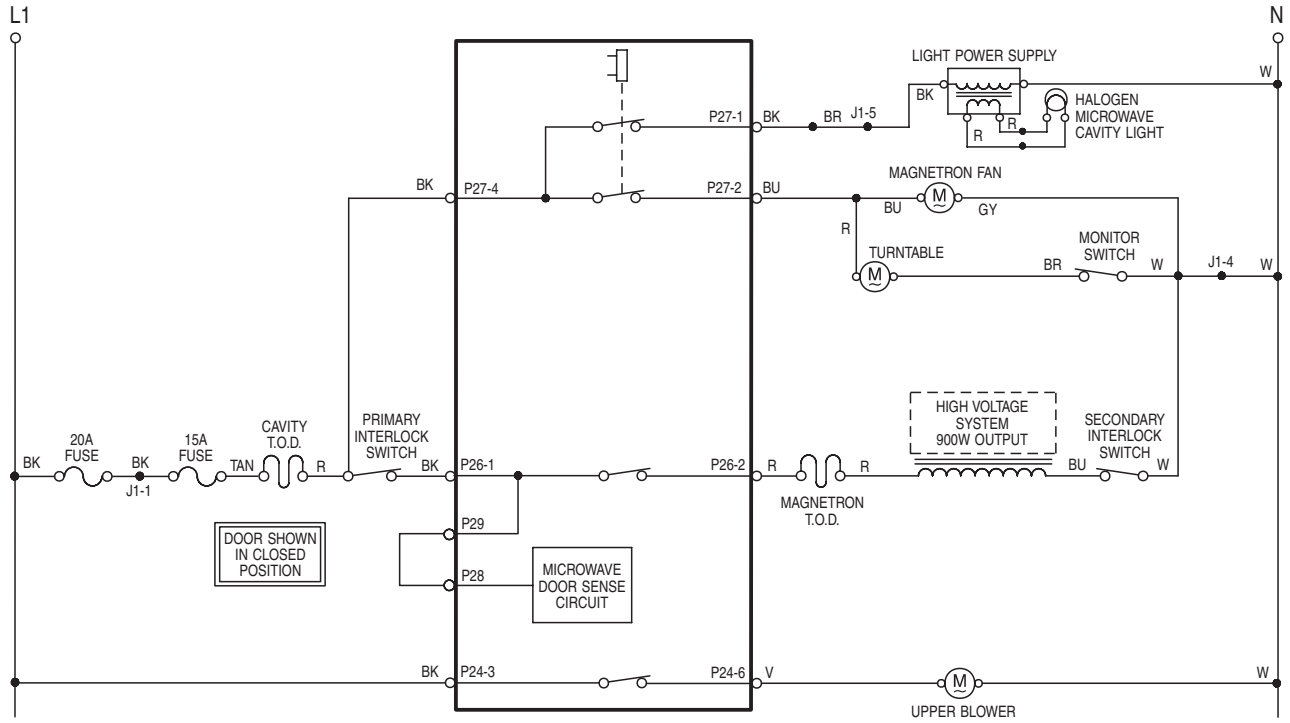
CLEAN AND PREHEAT-CLEAN



MICROWAVE STRIP CIRCUIT

The following individual circuits are for use in diagnosis.
Do not continue with the diagnosis of the appliance if a fuse is blown, a circuit breaker is tripped, or if there is less than a 240 volt power supply at the wall outlet.

MICROWAVE FULL POWER / VARIABLE POWER



RELAY LOGIC MICROWAVE OVEN

MODES / RELAYS	MAG.	MAG. FAN	LIGHT	UP BLOWER	LO BLOWER
MICRO FULL PWR	X	X	X	X	⊠
MICRO VAR. PWR	⌓	X	X	X	⊠
OFF	O	O	⊠	⊠	⊠

RELAY LOGIC KEY

O - OFF

X - ON

⌓ - CYCLING (Max. Period = 23 sec.)

+ - CYCLING (Max. Period = 60 sec.)

⊠ - ON OR OFF

RELAY LOGIC LOWER OVEN

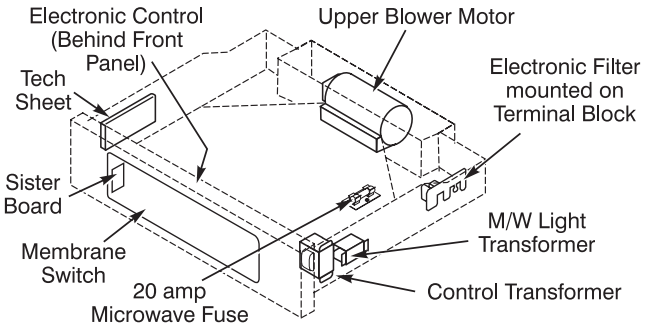
MODES / RELAYS	BAKE	BROIL	OVEN LT	UP BLOWER	LO BLOWER
OFF	O	O	⊠	⊠	⊠
BAKE 27"	+	+	⊠	X	X
BAKE 30"	X	+	⊠	X	X
BROIL	O	X	⊠	X	X
CLEAN	+	+	O	X	X
PREHEAT-BAKE	+	+	⊠	X	X
PREHEAT-CLEAN	O	+	O	X	X
PREHEAT-BROIL	O	X	⊠	X	X

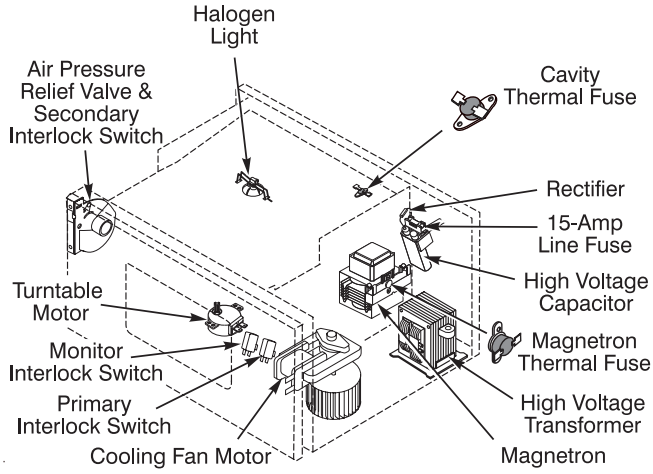
NOTE: IF LOWER OVEN IS IN CLEAN MODE, MICROWAVE WILL NOT FUNCTION.

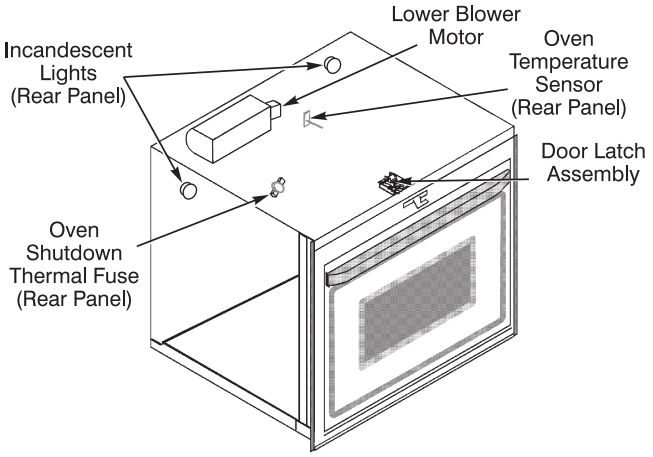
COMPONENT	FRONT/TOP /REAR SERVICEABLE	CAN BE TESTED AT CONTROL PANEL*	
		CHECK POINTS	RESULTS
Electronic Control	Front	—	—
Control Transformer	Front	—	—
Electronic Filter	Rear	—	—
Membrane Switch	Front	—	—
Incandescent Lights	Light Bulb - Front Light Assy. - Rear	—	—
Latch Motor	Front	—	—
Latch Switch	Front	P23-3 (BU) to P23-1 (TAN)	Door Unlocked = Open Circuit Door Locked = Closed Circuit
Door Switch	Front	P23-2 (BR) to P23-1 (TAN)	Door Open = Open Circuit Door Closed = Closed Circuit
Sister Board	Front	P25-1 (BU) to P1-4 (BU) and P25-2 (GY) to P1-3 (GY)	Closed Circuit
Control Power Transformer	Front	Primary Wiring: P16-5 (R) to P16-7 (R)	75 Ω to 95 Ω
		Secondary Wiring: P16-2 (BU) to P16-3 (BU)	Less than 1 Ω
Door Lock Motor (with Door Closed)	Front	On Sister Board P2-1 (Y) to Neutral (W)	2500 Ω
Oven Temperature Sensor	Front	P23-4 (VT) to P23-6 (VT)	1080 Ω @ 70° F
Lower Oven Blower	Rear	P24-5 (GY) to Neutral (W)	14 Ω to 18 Ω
Oven Shutdown Thermal Fuse	Rear	P18-1 (OR) to (R) Wire at Double Line Break Relay	Closed Circuit
Bake Element (2000 Watt)	Front	P18-4 (R) to (R) Wire at Double Line Break Relay	26 Ω to 30 Ω
Broil Element (3000 Watt)	Front	P18-1 (OR) to (R) Wire at Double Line Break Relay	17 Ω to 20 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	P24-6 (VT) to Neutral (W)	10 Ω to 15 Ω
All Other Microwave Components	Rear		

* Short double line break relay red wire terminals fastons

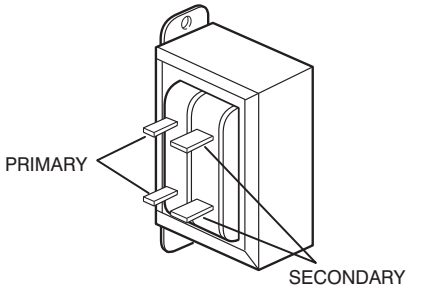
COMPONENT LOCATIONS

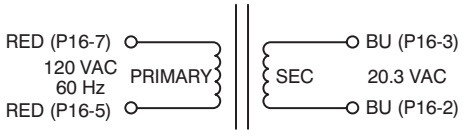




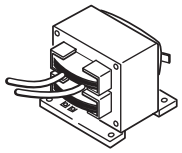
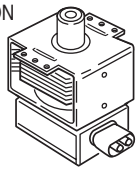
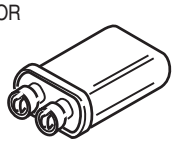
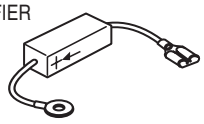
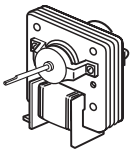
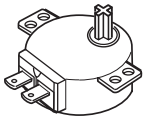
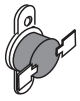


CONTROL TRANSFORMER





Testing the Microwave Oven Components

COMPONENT	TEST PROCEDURE	RESULTS
HIGH VOLTAGE TRANSFORMER 	1. Disconnect power or unplug oven. 2. Remove the leads from the terminals. 3. Set the ohmmeter to Rx1 and touch the leads to the terminals. Primary Secondary Filament to Ground 4. Measure resistance (Rx100) Primary Filament	 Normal = Less than 1 Ω. Normal = Less than 1 Ω. Normal = 0 Ω. Normal = Infinity. Normal = Infinity.
MAGNETRON 	1. Disconnect power or unplug oven. 2. Remove the leads from the terminals. 3. Set the ohmmeter to Rx1 and touch the leads to the F and FA terminals. 4. Set the ohmmeter to Rx1k and measure filament to chassis.	 Normal = approximately 0 Ω. Normal = Infinity.
CAPACITOR 	1. Disconnect power or unplug oven. 2. Remove the leads from the terminals. 3. Set the ohmmeter to Rx1k and touch the leads to the terminals. 4. Terminal to chassis.	 Normal = Momentarily indicates several ohms, and gradually returns to infinity. Normal = Infinity.
RECTIFIER 	1. Disconnect power or unplug oven. 2. Remove the leads from the terminals. 3. Set the ohmmeter to Rx1k and measure forward resistance. 4. 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. Disconnect power or unplug oven. 2. Remove the leads from the terminals. 3. Set the ohmmeter to Rx1 and touch the leads to the terminals.	 Normal = approximately 25 Ω. Abnormal = Infinity.
TURNTABLE MOTOR 	1. Disconnect power or unplug oven. 2. Remove the leads from the terminals. 3. Set the ohmmeter to Rx1 and touch the leads to the terminals.	 Normal = approximately 25 Ω. Abnormal = Infinity.
THERMAL FUSES  Cavity Thermal Fuse  Magnetron Thermal Fuse	1. Disconnect power or unplug oven. 2. Remove the leads from the terminals. 3. Set the ohmmeter to Rx1 and touch the leads to the terminals.	 Normal = Continuity. Abnormal = Infinity.

	Open	Close
Cavity Thermal Fuse	329°F (165°C)	
Mag Thermal Fuse	293°F (145°C)	257°F (125°C)

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

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

OTHER PATENTS PENDING