FOR SERVICE TECHNICIAN'S USE ONLY

Tech Sheet **Do not discard**

⚠ DANGER

Electrical Shock Hazard

Only authorized technicians should perform diagnostic voltage measurements.

After performing voltage measurements, disconnect power before servicing.

Failure to follow these instructions can result in death or electrical shock.

⚠ 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.

Voltage Measurement Safety Information

When performing live voltage measurements, you must do the following:

- **Verify the controls are in the off position so that the appliance does not start when energized.**
- **Allow enough space to perform the voltage measurements without obstructions.**
- **Keep other people a safe distance away from the appliance to prevent potential injury.**
- **Always use the proper testing equipment.**
- **After voltage measurements, always disconnect power before servicing.**

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, wave guide 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 this 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.

FOR SERVICE TECHNICIAN'S USE ONLY

FAILURE CODE INDICATIONS

NOTE: Many of the problems listed in the chart below may be solved by power cycling: Unplug microwave oven or disconnect power. After 1 minute, plug in microwave oven or reconnect power.

Display	Likely Failure Condition	Recommended Repair Procedure
Enter the Diagnostics mode (press CANCEL - CANCEL - START) and press COOK TIME/POWER to verify the failure code. If the failure code displayed matches complaint, see chart below for details.		
F1E4	Microwave ACU PCBA failure	1. Unplug microwave oven or disconnect power. 2. Replace ACU PCBA. 3. Replace all parts and panels before operating. 4. Plug in microwave oven or reconnect power.
F2E1	Stuck key failure	1. Unplug microwave oven or disconnect power. 2. Replace touch panel. 3. Replace all parts and panels before operating. 4. Plug in microwave oven or reconnect power.
F4E4	Humidity sensor error	1. Enter the Diagnostics mode (press CANCEL -CANCEL - START), and then press COOK to display the humidity sensor reading. If display does not show "8891," continue to Step 2. 2. Unplug microwave oven or disconnect power. 3. Connect a new humidity sensor to the ACU PCBA P6 connector. 4. Replace all parts and panels before operating. 5. Plug in microwave oven or reconnect power. 6. Enter the Diagnostics mode (press CANCEL - CANCEL - START), and then press COOK to see if failure code reappears. NOTE: There may be a delay (approximately 1 minute, 20 seconds) before the failure code is displayed. 7. If the failure code reappears, unplug microwave oven or disconnect power. 8. Replace ACU PCBA. 9. Replace all parts and panels before operating. 10. Plug in microwave oven or reconnect power.
F4E9	ACCUPOP error	1. Enter the Diagnostics mode (press CANCEL - CANCEL - START), and then press ACCUPOP. 2. Knock on the microwave oven door no fewer than 12 times within 5 seconds to check if the counter display operates properly. 3. If the counter does not operate properly, unplug microwave oven or disconnect power. 4. Check to see if the sound channel is blocked or the tube is loosened. 5. If the sound channel and tube are not blocked, connect a new ACCUPOP cable to the ACU PCBA. 6. Replace all parts and panels before operating. 7. Plug in microwave oven or reconnect power. 8. If failure code reappears, unplug microwave oven or disconnect power. 9. Replace ACCUPOP PCBA. 10. Replace all parts and panels before operating. 11. Plug in microwave oven or reconnect power. 12. If failure code reappears, unplug microwave oven or disconnect power. 13. Replace ACU PCBA. 14. Replace all parts and panels before operating. 15. Plug in microwave oven or reconnect power.
F8E5	Exhaust air template detection failure	1. Enter the Diagnostics mode (press CANCEL - CANCEL - START), and then press WARM HOLD to display the exhaust air temperature sensor reading. Verify the sensor temperature reading is at room temperature (typically 50°F to 90°F [10°C to 32°C]) and verify failure code. If failure code matches complaint, continue to Step 2. 2. Unplug microwave oven or disconnect power. 3. Disconnect sensor from ACU PCBA. 4. Measure sensor resistance between connector pins and confirm reading is between 9.5 kΩ and 10.5 kΩ at room temperature. If measurement is not correct, or if a short or open circuit is found, replace sensor. 5. Replace all parts and panels before operating. 6. Plug in microwave oven or reconnect power. 7. Enter the Diagnostics mode (press CANCEL - CANCEL - START), and then press WARM HOLD to display the cavity temperature sensor reading. Verify the sensor temperature reading. If it is still not correct, replace ACU PCBA. 8. If failure does not reappear, stop.

PRIMARY, MONITOR, SECONDARY, AND DOOR INTERLOCK SWITCH CHECKOUT PROCEDURES

IMPORTANT: Before checking the interlock switches, unplug microwave oven or disconnect power. Be sure to disconnect all of the wires at the switch being tested before taking any ohm readings.

NOTE: The Primary Interlock switch, Monitor Interlock switch, Secondary, and Door Interlock Switch are mounted in the door lock switch cradle. All the Interlock Switches can be identified by the wire colors that are connected to the terminals of the switches. See the chart below for wire color designation.

Switch	Check By	Door Open	Door Closed
Primary Interlock	1. Unplug microwave oven or disconnect power. 2. Disconnect the wires at the Primary Interlock Switch. 3. Check from the common terminal (black/brown wires) to the normally open terminal (black/white wires). 4. Reconnect wires to switch.	-	+

FOR SERVICE TECHNICIAN'S USE ONLY

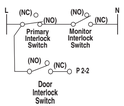
Switch	Check By	Door Open	Door Closed
Monitor Interlock	1. Unplug microwave oven or disconnect power. 2. Disconnect the wires at the Monitor Interlock Switch. 3. Check from the common terminal (white wire) to the normally closed terminal (blue/white wires). 4. Reconnect wires to switch.	+	-
Secondary Interlock	1. Unplug microwave oven or disconnect power. 2. Disconnect the wires at the Secondary Interlock Switch. 3. Check from the common terminal (white/blue wires) to the normally open terminal (blue/blue wires). 4. Reconnect wires to switch	-	+
Door Interlock	1. Unplug microwave oven or disconnect power. 2. Disconnect the wires at the Door Interlock Switch. 3. Check from the common terminal (blue wire) to the normally closed terminal (orange wire). 4. Reconnect wires to switch.	+	-

(+) Continuity (-) No Continuity

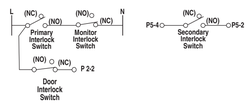
NOTE: Interlock, Monitor switches and Door interlock switch cannot be adjusted and all these switches should be replaced if any one of them is found to be defective. After replacing interlock/monitor switches, reconnect wires to switch and check for continuity. Safety interlocks and monitor switches will actuate within 2 mm.

NOTE: These diagrams are not intended to show a complete circuit; they represent the position of switches during "DOOR OPEN" or "DOOR CLOSED" (continuity checks only).

Door Closed



Door Open



NOT HEATING TROUBLESHOOTING INSTRUCTION

IMPORTANT: High-voltage is present at the magnetron and high-voltage capacitor terminals. Avoid direct contact when power is connected to these components to avoid serious injury or possible death. Always be sure that the high-voltage capacitor is discharged before accessing any of these components.

For a no-heat condition, refer to the following step-by-step instructions:

1. Unplug microwave oven or disconnect power.
2. Discharge the high-voltage capacitor.
3. Disconnect the high-voltage transformer primary windings.
4. Attach the voltmeter leads to the high-voltage transformer primary input wires.
5. Plug in microwave oven or reconnect power.
6. Close door and program the microwave oven to operate for 30 seconds.
7. Press START.
8. Check the input voltage at the high-voltage transformer primary input wires. If the voltage is not close to the rating voltage 120 +/-15 VAC, unplug microwave oven or disconnect power. Check the circuitry as follows:
   - Measure resistance of the fuse, microswitches and thermostats. Replace any failed components. (Refer to the wiring diagram.)
   - Check for loose terminals. (Refer to the wiring diagram.) Check all of the terminals on the main route from the power supply to the high-voltage transformer.
   - Check for loose or failed connectors on the ACU PCBA (P1, P2, P4). If these check out OK, plug in microwave oven or reconnect power.
   - Check for ACU PCBA failure. Refer to the "ACU PCBA Pin Voltage Matrix" section.
9. If the input voltage at the high-voltage transformer primary input wires is close to the rating voltage 120 +/-15 VAC, unplug microwave oven or disconnect power.
10. Check the power supply components. Refer to the "Component Tests" section.
    - High-voltage transformer
    - High-voltage capacitor
    - High-voltage diode
11. If the power supply components check out OK, check the connection between the magnetron and the high-voltage transformer.
12. If all of the components check out OK, replace the magnetron.
13. Reconnect the high-voltage transformer primary windings.

FOR SERVICE TECHNICIAN'S USE ONLY

ACU PIN VOLTAGE MATRIX

Check for proper voltage by completing the following steps:

1. Unplug microwave oven or disconnect power.
2. Connect voltage measurement equipment to the terminals listed below. (P1-3 and P2-3 are neutral.)
3. Plug in microwave oven or reconnect power, and confirm voltage reading.
4. Unplug microwave oven or disconnect power.

NOTE: For 50 V and over, the tolerance is +/-15 V. For 0 V, the tolerance is +/-3 V.

Abbreviations

CL – Cavity Light

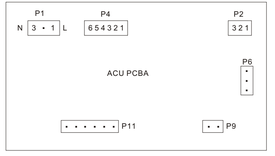
HL – Hood Light | N – Neutral | CF – Cooling Motor | HF – Hood Fan | L – Line Voltage | TT – Turntable Motor | NFS – Neutral for Switch

NOTE: When checking voltage readings on ACU PCBA, connect the grounding test lead of voltmeter to ACU PCBA neutral wire. Use the positive test lead to probe connectors designated below.

MW Oven Plugged In—Sitting Idle—ACV Readings

Pin Name	Wire Color	Power On, Door Closed	Power On, Door Open	Hood Fan Motor—High	Hood Fan Motor—High, Door Open	Hood Fan Motor—Med-High	Hood Fan Motor—Med-High, Door Open	Hood Fan Motor—Medium	Hood Fan Motor—Medium, Door Open	Hood Fan Motor—Low	Hood Fan Motor—Low, Door Open	Hood Light—High	Hood Light—High, Door Open	Hood Light—Low	Hood Light—Low, Door Open	MW Oven Running ACV Readings: MW Oven Start
P1-1 (L)	Brown	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120
P1-3 (N)	White	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
P2-1 (NFS)	White	0	120	0	120	0	120	0	120	0	120	0	120	0	120	6.3
P2-2 (Door)	Orange	0	120	0	120	0	120	0	120	0	120	0	120	0	120	50
P2-3 (N)	Green/Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
P4-2 (TT)	Red	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
P4-3 (CL)	Green	0	120	0	120	0	120	0	120	0	120	0	120	0	120	120
P4-4 (HL)	Yellow	0	0	0	0	0	0	0	0	0	0	120	120	68	68	0
P4-5 (HF)	Black	0	0	120	120	88	88	78	78	64	64	0	0	0	0	0
P4-6 (HF-R)	Gray	0	0	120	120	89	89	78	78	83	83	0	0	0	0	0

CONNECTORS ON ACU PCBA



NOTE: There are purposely empty terminals between each of the numbered terminals on P1 connector.

FOR SERVICE TECHNICIAN'S USE ONLY

TOUCH PANEL

Touch Panel and ACU PCBA Test

The microwave hood combination is provided with a self-diagnostic routine that can be accessed through the touch keypad.

To initiate this routine:

1. Plug in microwave oven or reconnect power and press CANCEL keypad to Standby mode (":").
2. Close door, then press CANCEL - CANCEL - START within 3 seconds.

   All display segments will be lit to indicate the Test mode has been entered. In the upper left corner of the display, the condition of the ACU PCBA will be displayed ("GOOD") or the most recent error code.
3. Open door. The model number will be displayed.
4. Close door. All display segments will be lit.

NOTE: If the Cancel keypad is pressed during this diagnostic routine, you will exit the Test mode.

Key Tables for Test Mode

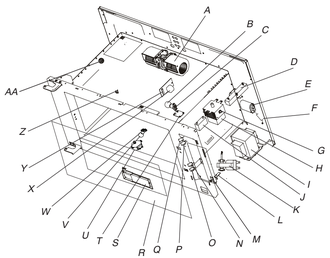
Key Name	Function	Display	Buzzer
+30 Sec	Display UISW and ACU PCBA SW Version and Gee Version	UI:xx.xx.xx and ACU:xx.xx.xx Gee:xx.xx.xx (alternating)	Yes
	-	key 30	1 beep
	-	key 28	1 beep
Reheat	-	key 08	1 beep
AccuPop	-	ACCUPOP Testing, ACCUPOP Pass or ACCUPOP Fail*	1 beep
Defrost	-	key 05	1 beep
Potato	-	key 14	1 beep
Soften/Melt	-	key 09	1 beep
Vegetable	-	key 06	1 beep
Steam/Simmer	-	key 12	1 beep
Warm Hold	NTC Ambient Temperature Check	0000-0120	1 beep
Cook Time/Power	Humidity Sensor Check	7000-9999	1 beep
	Failure History Check	If no error history: GOOD If error history: FxEx YY FxEx YY...	1 beep
Kids Menu	-	key 10	1 beep
	-	key 45	1 beep
Turntable	-	key 29	1 beep
	-	key 46	1 beep

Key Name	Function	Display	Buzzer
Select	-	key 27	1 beep
Frozen Entree	-	key 01	1 beep
Timer Set/Off	Erase Service Error Records	GOOD	1 beep
Options/Clock	Error History Check	If no error history: GOOD If error history: FxEx FxEx...	1 beep
1	Cavity Light On	Cavity Lamp	1 beep
2	Cavity Light and Turntable On	Light and Turntable	1 beep
3	TT, CL, MW Relays 4913 & 4903 (1100W) On for 10 Seconds	MW Turbo On	1 beep
4	-	key 37	1 beep
5	-	key 38	1 beep
6	Hood Light Relay 4910 On	Hood Light High	1 beep
7	Hood Light Relay 4909 On	Hood Light Low	1 beep
8	Vent Fan Relay 4911 On (High Speed)	Hood Fan HIGH	1 beep
9	Vent Fan On Relay 4911 Off (Low Speed)	Hood Fan LOW	1 beep
0	TT, CL, MW Relay 4903 (1,000 W) On for 10 Seconds	MW TB	1 beep
Control Lock	Exit Test Mode	Timer	1 beep

* Knock on microwave oven door 12-24 times, then the result (Pass or Fail) will be displayed.

FOR SERVICE TECHNICIAN'S USE ONLY

PARTS LAYOUT (NOT TO SCALE)



A. Hood fan motor assembly
B. Cavity light
C. Cavity light holder
D. Power resistor
E. H.V. capacitor
F. H.V. diode
G. Magnetron thermostat—opens at 257°F (125°C), closes at 185°F (85°C)
H. Magnetron
I. H.V. transformer
J. Motor capacitor
K. Cooling fan motor
L. HF NTC thermistor
M. ACU and UIPCBA
N. Secondary interlock switch
O. Door Interlock switch
P. Monitor interlock switch
Q. Primary interlock switch
R. Door glass and touch PCBA assembly
S. Display board
T. ACCUPOP PCBA
U. Turntable motor
V. Hood (cooktop) light
W. Hood (cooktop) light holder
X. Filterboard
Y. Line fuse (20 A)
Z. Cavity thermostat— opens at 257°F (125°C), non-resettable
AA. Humidity sensor

POWER OUTPUT MEASUREMENT

The power output of the magnetron can be measured using the following "Voltage Measurement at Power Source" and "Output Test" sections. Before you perform the test:

- Make sure that the oven cavity is cool and clean.
- Check the line voltage at the wall outlet while microwave oven is operating. See the "Voltage Measurement at Power Source" section.

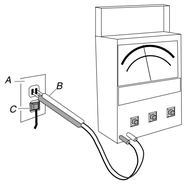
Tools Needed

- 2-cup measuring cup
- Thermometer
- Voltmeter/ohmmeter

Voltage Measurement at Power Source

1. Fill the measuring cup with 2 cups (500 mL) of tap water.
2. Place in the center of the microwave oven cavity.
3. Operate the microwave oven on high power for 1 minute.
4. While the microwave oven is operating, measure the line voltage at the power source. See the "Measure Voltage" illustration.
5. Verify the voltage is constant during microwave oven operation. If voltage drops below 108 V, contact a qualified electrician to check your electrical supply.
6. Make note of the voltage while the microwave oven is running and proceed to the output test.

Measure Voltage



A. House power supply wall outlet
B. Voltmeter/Ohmmeter test leads
C. Microwave oven plug

FOR SERVICE TECHNICIAN'S USE ONLY

POWER OUTPUT MEASUREMENT

Output Test

1. Fill the measuring cup with 2 cups (500 mL) of 70°F (21°C) tap water.
2. Stir the water with the thermometer to ensure uniform temperature. Add warm or cool water to bring the water to the correct temperature.
3. Place the measuring cup in the center of the microwave oven cavity.
4. Operate the microwave oven on high power for 1 minute.
5. Remove the measuring cup and stir the water with the thermometer for about 20 seconds.
6. Record the temperature of the water.
7. Refer to the model serial tag on the microwave oven to acquire wattage output rating of the microwave oven.
8. Using the following chart, determine if the output of the microwave oven is within the range listed based on the line voltage and wattage rating of the microwave oven.

Water Temperature for Line Voltage and Wattage Rating

Voltage	700 W	1000 W	1200 W
120 V	96°F to 102°F (36°C to 39°C)	110°F to 116°F (43°C to 47°C)	124°F to 130°F (51°C to 54°C)
108 V	91°F to 97°F (33°C to 36°C)	101°F to 107°F (38°C to 42°C)	111°F to 117°F (44°C to 47°C)

COMPONENT TESTS

- Unplug microwave oven or disconnect power.
- Discharge the high-voltage capacitor and remove the lead wires from the primary winding of the high-voltage transformer before conducting any of the following tests.
- Remove the lead wires from the related component before conducting any of the following tests.
- All operational checks using microwave energy must be done with the microwave oven loaded with a minimum of 8 oz (250 mL) of water in a microwave-safe container.

IMPORTANT:

- Conduct a microwave energy test after performing any tests or repairs to the microwave oven.
- Check that all wire leads are in the correct positions before operating the microwave oven.
- Grasp wire connectors when removing the wire leads from microwave oven parts.
- All testing must be done with an ohmmeter having a sensitivity of 20,000 ohms per volt DC or greater and powered by at least a 9 V battery.

Components	Test/Results
H.V. Transformer Filament (orange/red wires) Primary Secondary (white wire - ground to transformer case)	1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure resistance: ■ Primary winding: Less than 0.5 ohm (approximate) ■ Secondary winding: 120 ohms (approximate) ■ Filament winding: 0 ohms ■ Primary winding to grounding: Normal: Infinite ■ Filament winding to grounding: Normal: Infinite
Magnetron	1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure resistance: ■ Filament terminal: Normal: Less than 1 ohm ■ Filament to chassis: Normal: Infinite
AC Line Filter Board	1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure resistance: ■ Normal: L-IN to L-OUT (coil): Less than 1 ohm; N-IN to N-OUT (coil): Less than 1 ohm

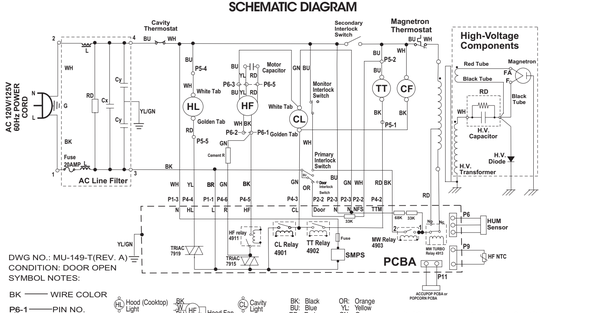
Components	Test/Results
Turntable Motor	1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure resistance: ■ Normal: 2.4k to 3.2k ohms (approximate)
Motor Capacitor	1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure motor capacitor: ■ Normal: Momentarily 0 ohms, then goes to infinite
Humidity Sensor WH RD BK Resistor	1. Unplug microwave oven or disconnect power. 2. Remove the 3-pin connector from the electronic control (P6). **NOTE:** Do not remove the attached resistor which is used for internal resistance calibration. 3. Measure resistance across pins 1 and 3 and across pins 2 and 3: ■ Normal: 2.8k ohms (approximate) at 77°F (28°C) +/-18°F (-10°C)
H.V. Diode	**NOTE:** Some inexpensive meters may indicate infinite resistance in both directions. 1. Unplug microwave oven or disconnect power. 2. Measure resistance: ■ Forward: Normal: Continuity ■ Reverse: Normal: Infinite

FOR SERVICE TECHNICIAN'S USE ONLY

Components	Test/Results
H.V. Capacitor	1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure resistance: ■ Terminal to terminal: Normal: Momentarily indicates several ohms and then gradually returns to infinite. ■ Terminal to case: Normal: Infinite
Cooling Fan Motor	1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure resistance: ■ Normal: 40 to 60 ohms (approximate)
Power Resistor	1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure resistance: ■ Normal: 20 ohms / 25 W
Thermostats Magnetron/Grill/FC/ Cavity Thermostat	**NOTE:** Refer to "Parts Layout" for opening and closing temperatures. 1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure continuity: ■ Normal: Continuity

Components	Test/Results
Hood Exhaust Fan Motor	1. Unplug microwave oven or disconnect power. 2. Remove wire leads. 3. Measure resistance: ■ High Speed—Normal: Red (RD) and Blue (BU) wires: 70 to 100 ohms (approximate); Blue (BU) and Black (BK) wires: 30 to 60 ohms (approximate) ■ Low Speed—Normal: Red (RD) and Blue (BU) wires: 70 to 100 ohms (approximate); Blue (BU) and White (WH) wires: 50 to 80 ohms (approximate)
HF NTC Thermistor	1. If "NTC SHORT, CALL FOR SERVICE" or "NTC OPEN, CALL FOR SERVICE" scrolls on display, unplug microwave oven or disconnect power. 2. Remove wire leads. ■ Normal: 10k ohms +/-5% at 77°F (25°C)

SCHEMATIC DIAGRAM



W11268412A

08/18

FOR SERVICE TECHNICIAN'S USE ONLY