SEARS

DIVISION 20

SUPPLEMENTARY BASIC FIELD MANUAL FOR MICROWAVE OVEN

MODEL 565.60586000

MARCH 2000

CAUTION

WARNING - TO SERVICE TECHNICIANS

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 sensing, (3) seal and sealing surfaces (arcing, 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 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.

- ***Never operate the magnetron unless it is properly installed. Proper operation of the microwave ovens requires that the magnetron should be assembled properly to the wave guide and cavity.***

- ***Be sure that the magnetron gasket is properly installed around the dome of the tube whenever installing the Magnetron.***

- ***Routine service safety procedures should be exercised at all times.***

- ***Untrained personnel should not attempt service without a thorough review of the test procedures and safety information contained in this manual.***

CAUTION For microwave energy emission

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On every service call, checks for microwave energy emission must be made according to the following manner.

Measurement of energy emission

Measurement must be made with the microwave oven operating at its maximum output and containing a load of 275 ± 15 milliliters of tap water initially at 20°C ± 5°C celsius (68°F ± 9°F) placed within the cavity at the center.

NOTE : The water container must be a 600 milliliter beaker and made of an electrically nonconductive material such as glass or plastic.
The cook tray must be in place when measuring emission.

A properly operating door and seal assembly will normally resister small emissions but they must be no greater than 4mw/cm² to allow for measurement uncertainty.

All repairs must be performed in such a manner that microwave energy emission is minimal.

Follow the instructions supplied with the survey meter being used and perform an R.F. emission test around the door front and edges and all edges and vents of the outer case. The cabinet (wrapper) must be in place and the oven fully assembled.

When performing an emission survey, the meter should be set on FAST RESPONSE and the movement of the Survey Meter probe shall not exceed one (1) inch per second.

In the area emitting the highest reading, switch the meter to SLOW RESPONSE and take a reading for minimum of three (3) seconds.

We recommend the pattern outline shown in below when the door surface is surveyed.

NOTE : Periodically check to be sure that the probe tip is not worn or dirty.

The following U.S. standard applies to microwave ovens : 21 CFR 1030. 10, Performance Standard for Microwave Ovens.

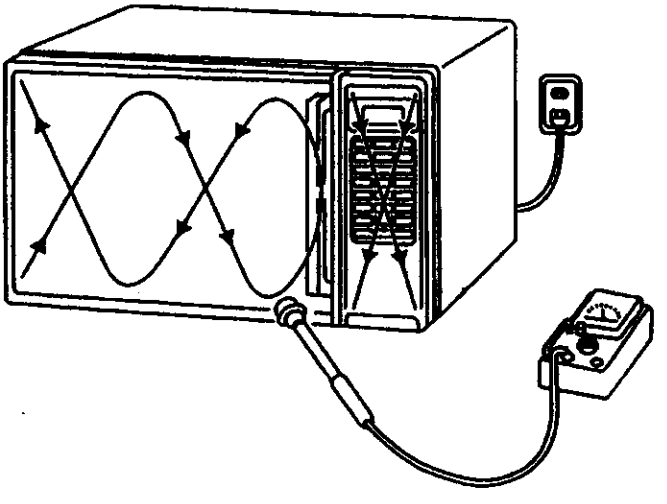
It requires that the power density of the microwave radiation emitted by a microwave ovens shall not exceed five (5) milliwatts per square centimeter at any point 5 centimeter (about 2 inches) or more from the external surface of the oven.

All microwave ovens exceeding the emission level of 4mw/cm² must be reported to Dept. of Service for microwave ovens and the manufacture immediately and the owner should be told not to use the microwave oven untill it has been repaired completely.

If a microwave oven is found to operate with the door open, report to Dept. of Service, the manufacture and CDRH* immediately. Also tell the owner not to use the oven.

* CDRH : Center for Device and Radiological Health.

The interlock monitor switch acts as the final safety switch protecting the customer from microwave radiation. If the interlock monitor switch operates to blow the fuse with interlocks failed, you must replace all interlock switches - primary and secondary interlock switches and the monitor switch with new ones because the contacts of those interlock switches may be melted and welded together.



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FORWARD

This supplement covers the information about model 565.60586000 by adding the following information to Basic Field Manual for Model 565.60509990.

Model 565.60586000

DIFFERENCES

Model 565.60586000 is the same as Model 565.60509990 in the mechanical construction except the following specifications.

A. The difference in features from Model 565.60509990.

Feature	Model 565.60586000	Model 565.60509990
Humidity Sensor	Yes	None

B. The difference in the main parts from Model 565.60509990.

Description	Model 565.60586000	Model 565.60509990
Cabinet	16707	16019
Bottom Plate	16702	16576
Detector Assy	16310	None
Duct, Detector Assy	16309	None
Circuit Diagram	16608	16548
Use & Care Manual	16579	16522
Fuse, 125V 20A	15628	16131
Fuse Holder	16703	16132
Space Partition (Blower)	16704	15905
Door Cover	16650	16519
Control Sheet, Display / Touch Key Board	16645	16518
Model No. & FCC Label	16709	16564
Control Frame	16708	16566
Control Base	16612	16568
Power & Control Circuit Board	16577	16516
Knob	16710	16570
Power & Control Circuit Board	16580	None
Part Base	16642	None

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1. Feature and Specification

Features

(A) The safety devices incorporated in this unit : -
  (1) Fuse (Cartridge Type 20A).
  (2) Primary interlock switch.
  (3) Interlock monitor switch.
  (4) Door sensing switch and relay 2.
  (5) Choke system.
  (6) Magnetron thermal protector opens at 122°C / closes at 105°C.

(B) Any one of 10 power levels ranging from minimum "P 0" up to maximum "P 100" can be selected by turning "DIAL" clockwise.

(C) Cooking time and power output level can be displayed on window by digital readout.

(D) Three different cooking stages can be set. The oven remembers three cooking stages from 1st stage to 3rd. This is made possible with the memory function of microprocessor.

SPECIFICATIONS

Rated Power Consumption	1580W (measured after 15 mins. operation).
Rated Microwave Output	Maximum 960W (with 2 liters of water). 1100W (IEC - 705 Method).
Magnetron / Oscillating Frequency	2M-247H(B) / 2450 ± 50MHz.
Power Supply, Input Current	120V ± 10% AC 60Hz only. 13.6A (measured after 15 mins. operation).
Tray	Special heat-resistant Glass Turntable.
Door Sealing	Choke System.
Rectifier / Rectification	500mA, 9.5KV / Half-Wave Voltage Doubler.
High Voltage Capacitor	1.03mfd, 2.1KV AC.
(including Resistor)	10 Meg. ohms, 1.5W.
Cavity Lamp	120V, 20W.
Timer	Digital, up to 99 minutes 99 seconds.
Outer Dimensions	$23\text{-}^{7}/_{16}$" (W) X $18\text{-}^{1}/_{8}$" (D) X $14\text{-}^{1}/_{4}$" (H).
Oven Cavity Dimensions	$16\text{-}^{5}/_{8}$" (W) X 16" (D) X $11\text{-}^{3}/_{8}$" (H).
Cavity Volume	2.0 Cubic Feet.
Accessories	Use and Care Manual and Cook Book, Glass Turntable and Turn-table Roller Rest.

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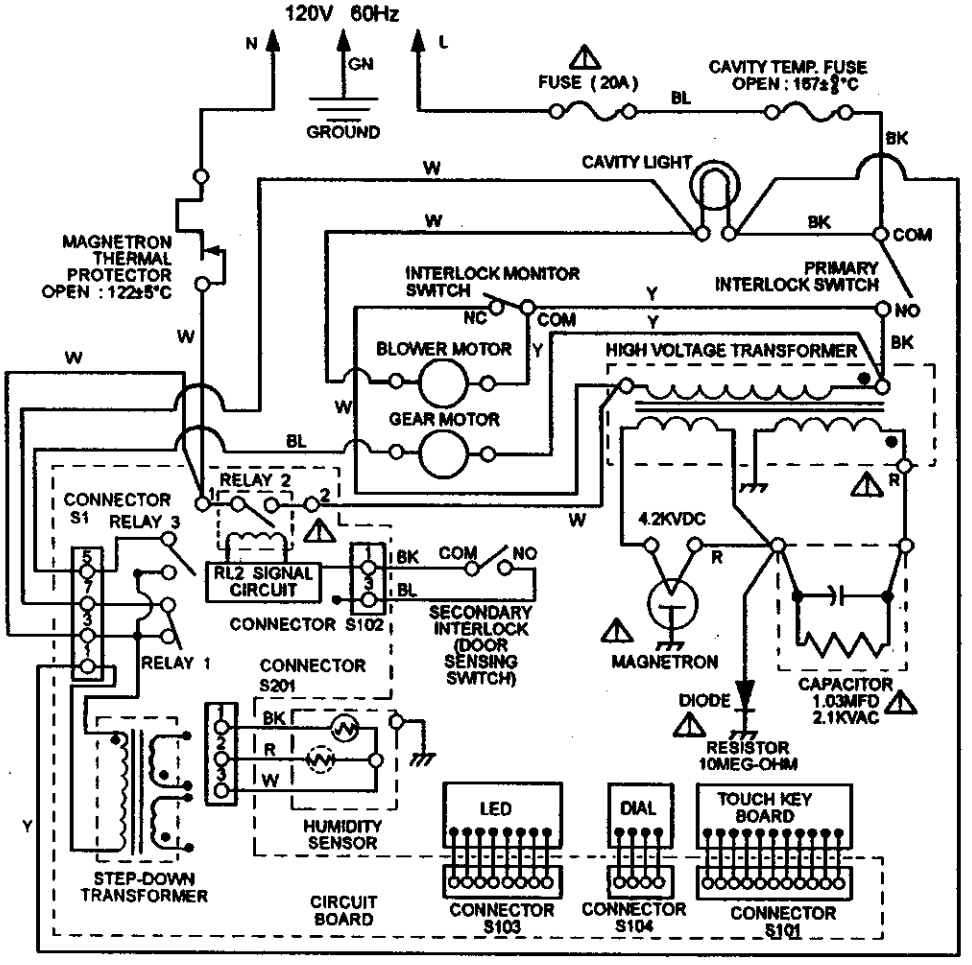
2. Overall Circuit Diagram



SWITCH MADE •	PRIMARY INTERLOCK SWITCH	INTERLOCK MONITOR SWITCH	SECONDARY INTERLOCK: DOOR SENSING SWITCH	SECONDARY INTERLOCK: RELAY 2
CONDITION	COM	COM	COM	COM
	NO	NC	NO	NO
DOOR OPEN		•		
DOOR CLOSE	•		•	•

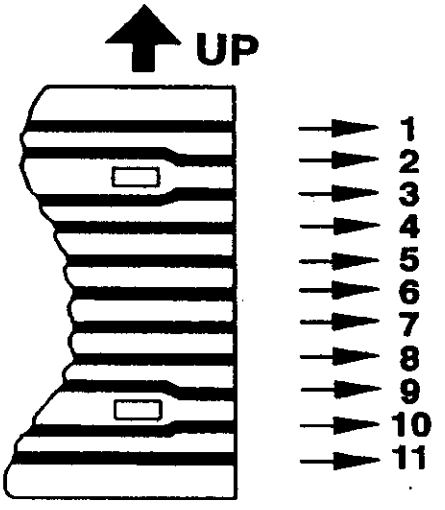
Caution :

*** : The parts marked with ⚠ carry more than 4KVDC high voltage with respective to ground.**

3. Matrix Circuit for Touch Key Board

FPC Connector (S101) & Matrix Circuit for Touch Key Board

FPC Connector - S101



Matrix Circuit for Touch Key Board

FPC CONNECTOR S101	6	7	8	9	10	11
1				POWER		
2			TOTAL DEFROST	TURNTABLE ON / OFF		
3				QUICK DEFROST		KITCHEN TIMER
4				TIME		ADD MINUTE
5		STOP / CLEAR	OPTION	CLOCK		

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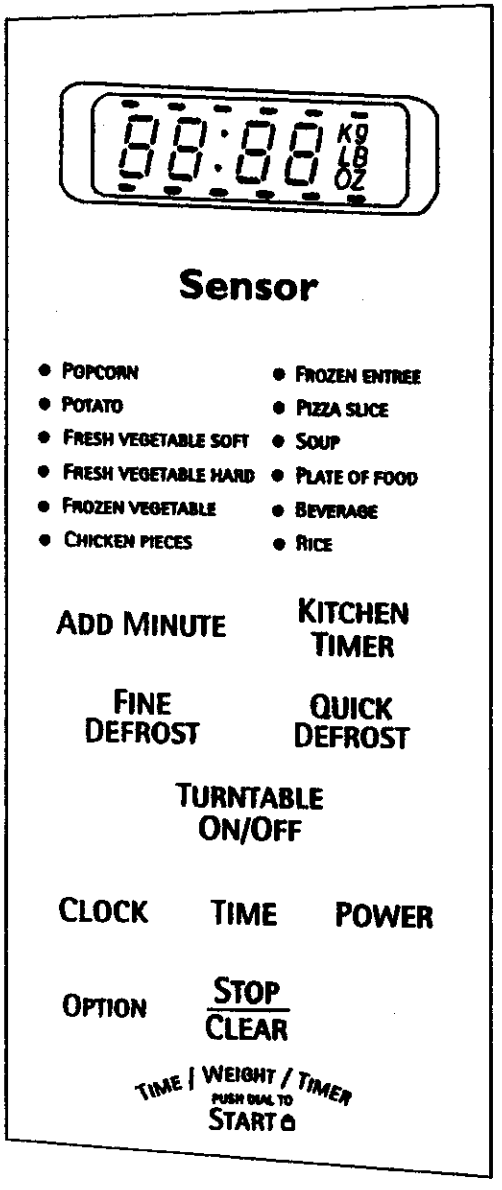
4. Control Sheet, Display / Touch Key Board

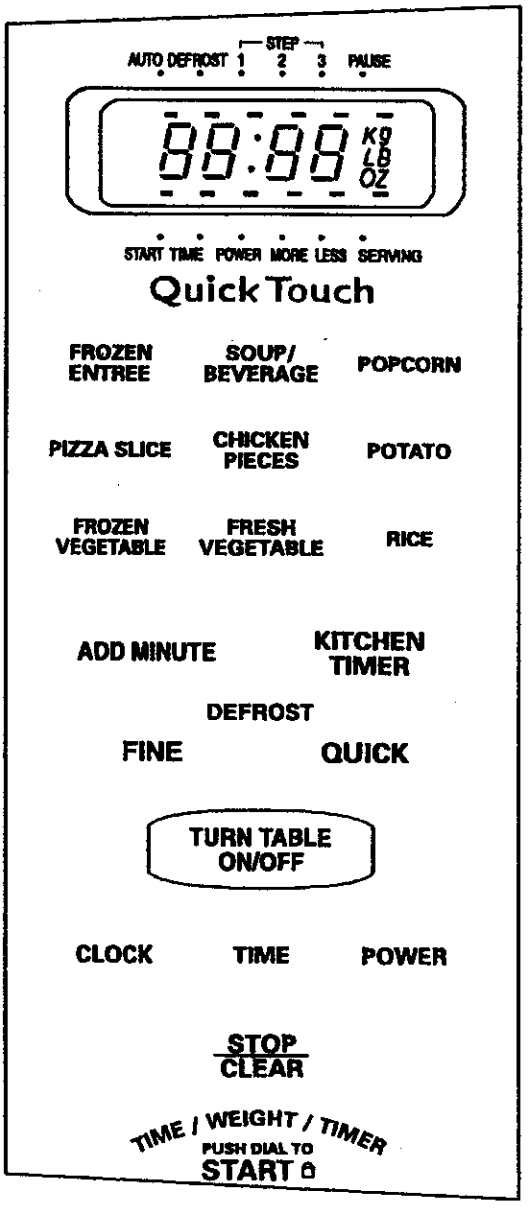
Model : 565.60586000

Part No : 16645



Model : 565.60509990

Part No : 16518



5. Power Output Measurement (1 Liter Method)

The power output of the magnetron can be measured by performing a tap water temperature rise test.
Equipment needed for test ;
One liter beaker.
One thermometer (digital recommended).

Note : Check the line voltage during the test.
Low voltage will lower the magnetron output.

Make all temperature test with accurate equipment.

(A) Fill the 1 liter beaker with water (1000cc).

(B) Stir the water in the beaker with the thermometer and record the temperature.
Initial water temperature = **T1**.
The initial water temperature should be within 59°F(15°C) - 75°F(24°C).

(C) Place the beaker on the center of the turntable.

(D) Set for one minute and three seconds and operate the oven at high power.
Note : The additional three (3) seconds is to allow the magnetron to begin generating power.

(E) When the heating is finished, again stir the water with the thermometer and measure the temperature as **T2**.

(F) Subtract **T1** from **T2**, this will give you the Temperature Rise.

(G) The Microwave Power Output is within specifications if the Temperature Rise is as shown below :

	Temperature Rise	
Line Voltage	Degrees F	Degrees C
120V	18.5 ~ 25.5	10.3 ~ 14.2
108V	Min 17.5	Min. 9.5

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6. Disassembly Instructions

A. Removing the Cabinet
(Figure 1)

1. The new UL Standard for Microwave Ovens requires that access to the potentiall hazardous electrical voltages be restricted by some means. Kenmore, Source 565, use a new type of screw that cannot be removed by a regular screwdriver.

2. A special screw will prevent customer from removing the cabinet when they attempt to repair or service the unit. This should reduce the number of injuries reported.

3. Sears Service technicians can remove the screws with the following required screwdriver, part number 22-16346 or bit, part number 22-16347.

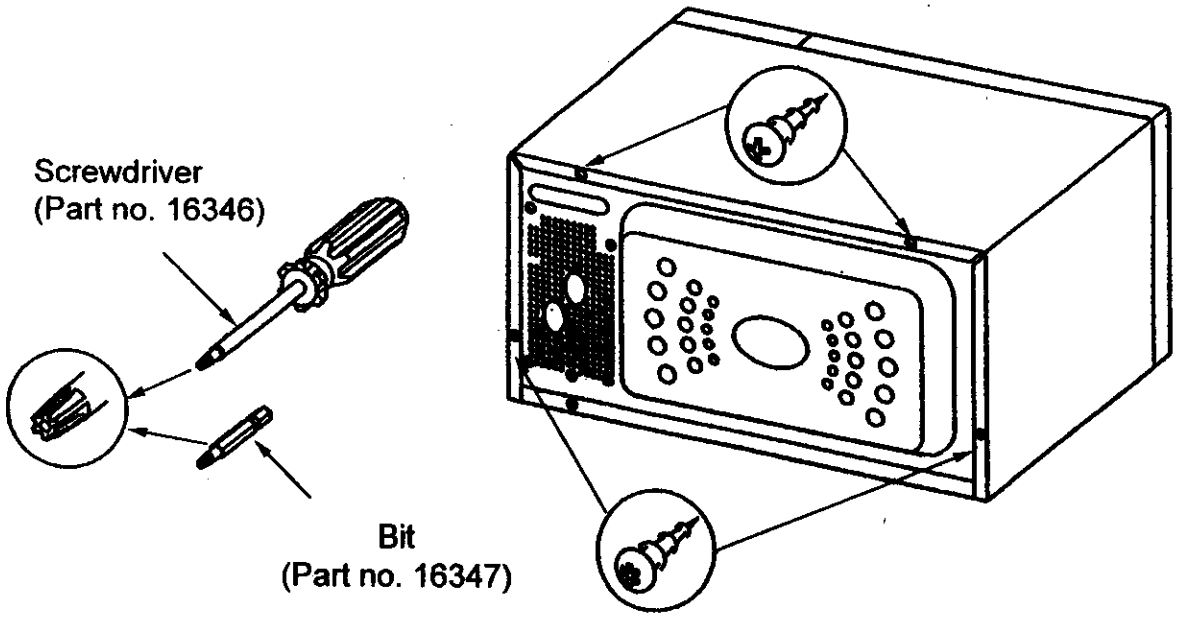

Figure 1

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6. Disassembly Instructions

B. Removing & Installation of Antenna (Figure 2 & 3)

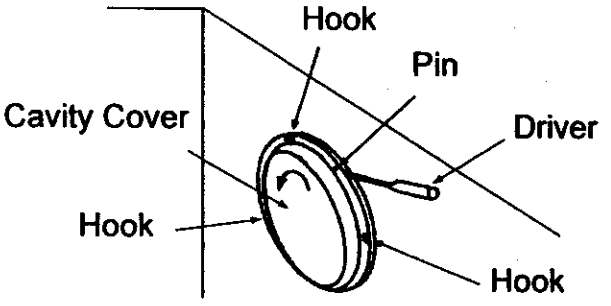

Figure 2

Removing of Antenna
Figure 2.

1. To detach the cavity cover from right side of the oven cavity :
   To detach the 3 hooks of cavity cover, insert a thin flat-screw driver lower than pin area as shown below and pushing it forward between cavity cover and cavity wall and turn the cavity cover slightly to left side.
2. Take cavity cover off VERY CAREFULLY.

Installation Antenna
Figure 3.

1. Place the each parts as shown in figure 3 when installing new antenna.
2. Make sure that insert the pin of cavity cover to the hole of the cavity wall.

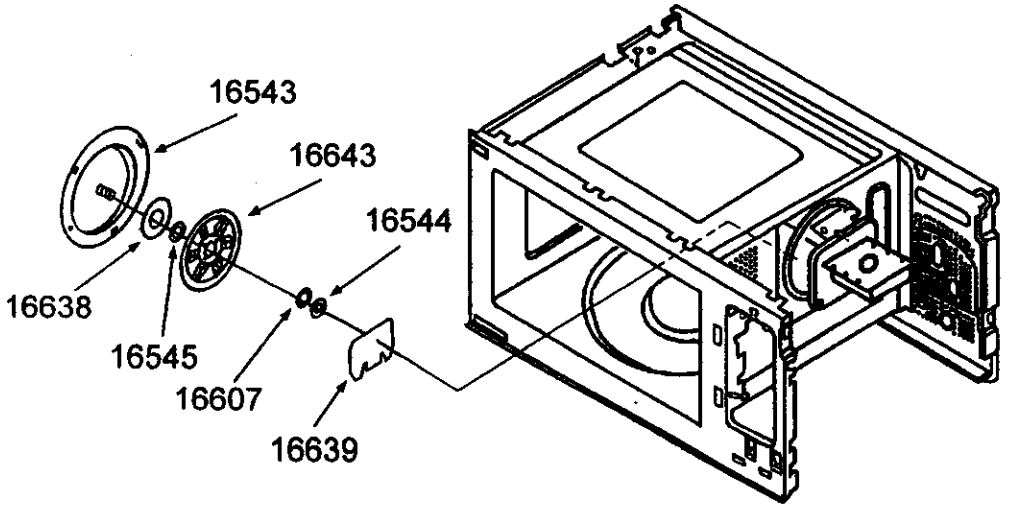

Figure 3

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7. Test and Checkout Procedure and Troubleshooting

- Caution - DISCONNECT THE POWER SUPPLY CORD FROM WALL OUTLET, WHENEVER REMOVING THE CABINET FROM UNIT, PROCEED WITH THE TESTS AFTER THE HIGH VOLTAGE CAPACITOR DISCHARGED AND PRIMARY WINDING OF HIGH VOLTAGE TRANSFORMER DISCONNECTED FROM POWER SUPPLY. ALL OPERATION CHECKS WITH MICROWAVE LEAKAGE MUST BE DONE WITH A WATER LOAD (1 CUP OF GLASS CONTAINER) IN THE OVEN.

A. Test Procedures

* P = Using Simpson #260 meter which is provided with 9-volt battery.

* WIRE LEADS REMOVED
* a = NORMAL READING
* b = ABNORMAL READING

COMPONENTS	TEST PROCEDURES	RESULTS
MAGNETRON *	1) Measure resistance across the filament terminals of the Magnetron with Rx1 ohm range.	* a = Less than 1 ohm
	2) Measure resistance between each filament terminal and earth terminal (Chassis) with the highest ohm range.	* a = Infinite ohms
HIGH-VOLTAGE TRANSFORMER *	1) Measure resistance (marked •) with Rx1 ohm range. • Primary winding • Filament winding • Secondary winding	 * a = 0.322 ohms * a = Less than 1 ohms * a = 64.8 ohms
	2) Measure resistance (marked •) with the highest ohm range. • Primary winding to ground • Filament winding to ground	 * a = Infinite ohms * a = Infinite ohms
HIGH-VOLTAGE CAPACITOR * (INCLUDING RESISTOR)	1) Measure resistance with the highest ohm range.	* a = momentarily middle position and then soon reach 10 Meg. ohms ---- * P * b = continuity or infinite ohms from beginning.

NOTE : A MICROWAVE ENERGY LEAKAGE TEST IN ACCORDANCE WITH BULLETIN S - 375 MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED FOR ANY REASON.

7. Test and Checkout Procedure and Troubleshooting

A. Test Procedures

Humidity Sensor
The following test procedures indicate a check method as to whether the thermistors in the sensor are open or short-circuited. Any characteristic relation between moisture resistance value of the thermistors can not be checked because the amount of the moisture can not be created as you need.

COMPONENTS	TEST PROCEDURES	RESULTS
HUMIDITY SENSOR	Measure the resistance between pins of connector S201 after removing connector S201 : Between Pins #1 and #3 of connector S201 : Between Pins #2 and #3 of connector S201 :	Normal reading : * About 2.5K ohms * About 2.5K ohms
	Note : * The resistance value is measured by Simpson #260 meter at 20°C room temperature. But a different meter will indicate different readings because the value of resistance varies depending on the temperature of the thermistors in the sensor and these thermistors are heated by themselves when the meter current passes through them. Note : If the thermistors in the sensor are open or short-circuited, the symptoms will be as explained under TROUBLESHOOTING on page 11.	

NOTE : A MICROWAVE ENERGY LEAKAGE TEST IN ACCORDANCE WITH BULLETIN S - 375 MUST ALWAYS BE PERFORMED WHEN THE UNIT IS SERVICED FOR ANY REASON.

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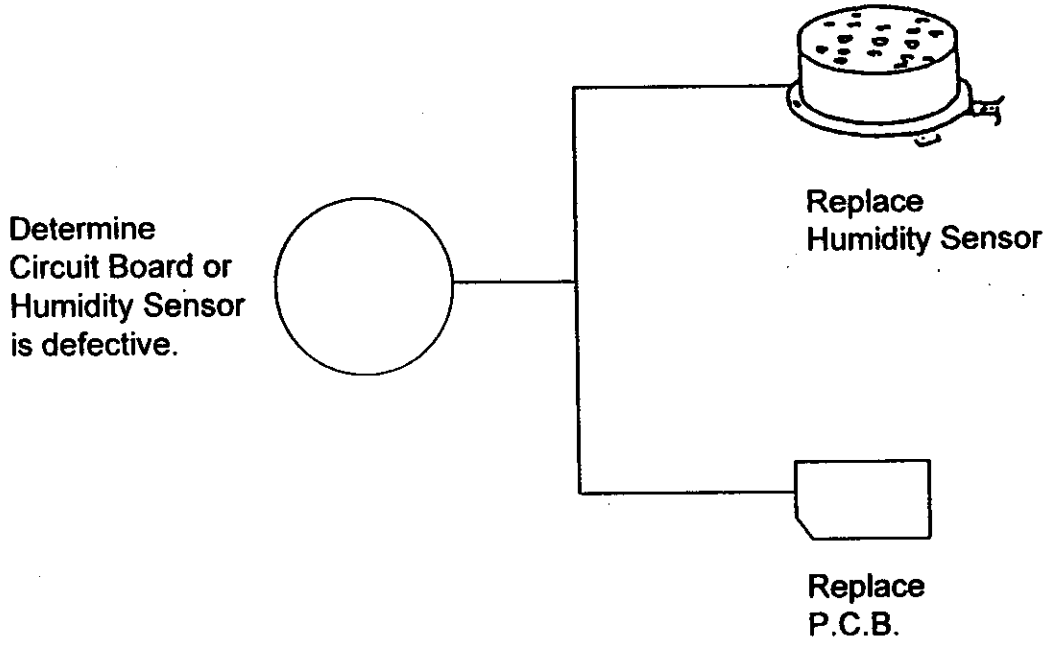
7. Test and Checkout Procedure and Troubleshooting

B. Troubleshooting

PROBLEM : Little, no heating or overheating in produced in Automatic Reheat.

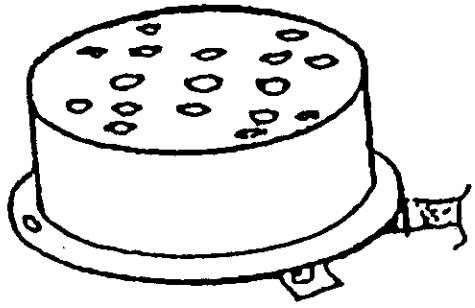
CHECK : 1. AIR FLOW.
2. CONNECTOR S201.



NOTE : When the thermistors in the sensor are open or short-circuited ; The unit operates normally about 17 seconds. Then it will stop operating and the display window will show "Error 2" and "Beep Tone" for a moment.

8. How the Humidity Sensor Works for "Sensor Reheat"

The humidity sensor is located on top of the oven cavity.
This sensor detects an amount of moisture as it escapes from the food and the amount of moisture is closely related to the doneness of the food being reheated.
The sensor is composed of two thermistors. One is sealed in a dry air compartment and the other is in an open compartment. (Figure 2).



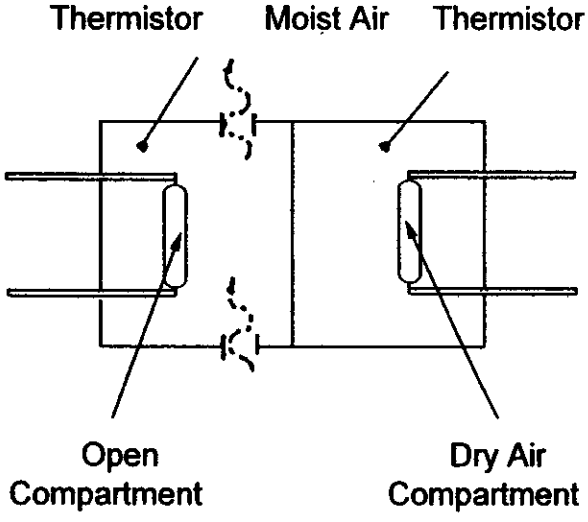
Outside of
Humidity Sensor

Figure 1

The both thermistors are heated by themselves at about 200°C when the oven is plugged in. The thermistor in the dry air compartment is cooled by the influence of air temperature and the thermistor in the open compartment is cooled by not only the air temperature but also evaporation of the moisture in the air around the sensor.
If the sensor is in dry air, the both thermistors in the sensor have the same resistance value, regardless of the air temperature.

But if it is in moist air, the thermistor in the open compartment will be cooled more by evaporation of the moisture and the resistance value will increase, compared with the thermistor in the dry air compartment.

This develops a difference between both thermistors in resistance value.
The sensor sends that information to the microcomputer, which calculates and automatically adjusts the power lever and remaining operating time.



Inside of Humidity Sensor

Figure 2