



# MICROWAVE OVEN

BASIC : CM1069  
MODEL : CM1089  
MODEL CODE : CM1089/XEU

# **SERVICE** *Manual*

## MICROWAVE OVEN



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Refer to the service manual in the GSPN(see rear cover) for the more information.

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## 1. Precaution

### **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.

# 1. Precaution

Follow these special safety precautions. Although the microwave oven is completely safe during ordinary use, repair work can be extremely hazardous due to possible exposure to microwave radiation, as well as potentially lethal high voltages and currents.

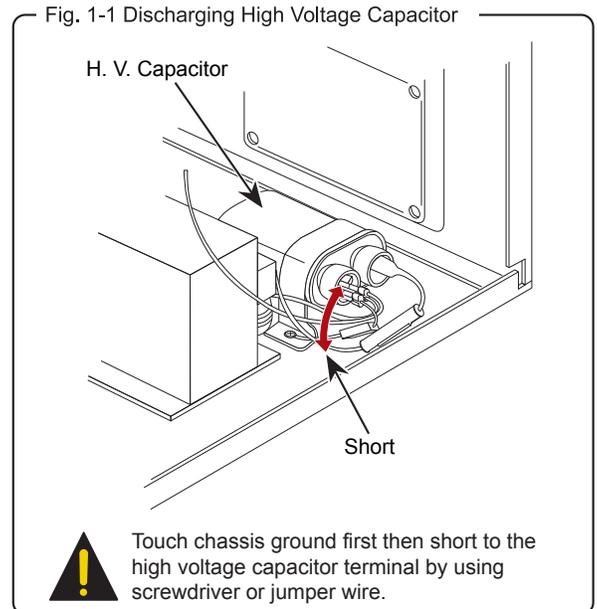
## 1-1 Safety precautions ( )

1. All repairs should be done in accordance with the procedures described in this manual. This product complies with Federal Performance Standard 21 CFR
2. Microwave emission check should be performed prior to servicing if the oven is operative.
3. If the oven operates with the door open :Instruct the user not to operate the oven and contact the manufacturer and the center for devices and radiological health immediately.
4. Notify the Central Service Center if the microwave leakage exceeds 5 mW/cm<sup>2</sup>.
5. Check all grounds.
6. Do not power the MWO from a “2-prong” AC cord. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.
7. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including: nonmetallic control knobs and compartment covers.
8. Make sure that there are no cabinet openings through which people --particularly children--might insert objects and contact dangerous voltages. Examples: Lamp hole, ventilation slots.
9. Inform the manufacturer of any oven found to have emission in excess of 5 mW/cm<sup>2</sup> ,Make repairs to bring the unit into compliance at no cost to owner and try to determine cause. Instruct owner not to use oven until it has been brought into compliance.  
**CENTRAL SERVICE CENTER**
10. Service technicians should remove their watches while repairing an MWO.
11. To avoid any possible radiation hazard,replace parts in accordance with the wiring diagram. Also, use only the exact replacements for the following parts: Primary and secondary interlock switches, interlock monitor switch.
12. If the fuse is blown by the Interlock Monitor Switch: Replace all of the following at the same time: Primary, door sensing switch and power relay, as well as the Interlock Monitor Switch. The correct adjustment of these switches is described elsewhere in this manual. Make sure that the fuse has the correct rating for the particular model being repaired.
13. Design Alteration Warning: Use exact replacement parts only, i.e.,only those that are specified in the drawings and parts lists of this manual. This is especially important for the Interlock switches, described above. Never alter or add to the mechanical or electrical design of the MWO. Any design changes or additions will void the manufacturer’s warranty. Always unplug the unit’s AC power cord from the AC power source before attempting to remove or reinstall any component or assembly.
14. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
15. Some semiconductor (“solid state”) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs). Examples include integrated circuits and field-effect transistors. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground.
16. Always connect a test instrument’s ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument’s ground lead last.
17. When checking the continuity of the witches or transformer, always make sure that the power is OFF, and one of the lead wires is disconnected.
18. Components that are critical for safety are indicated in the circuit diagram by shading,  or  .
19. Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.  
**NOTE** : Connect the oven to a 20A. When connecting the oven to a 15A,make sure that circuit breaker can operate.

# 1. Precaution

## 1-2 Special High Voltage Precautions

1. High Voltage Warning Do not attempt to measure any of the high voltages --this includes the filament voltage of the magnetron. High voltage is present during any cook cycle. Before touching any components or wiring, always unplug the oven and discharge the high voltage capacitor (See Figure 1-1)
2. The high-voltage capacitor remains charged about 30 seconds after disconnection. Short the negative terminal of the high-voltage capacitor to to the oven chassis. (Use a screwdriver.)
3. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.



### PRECAUTION

There exists HIGH VOLTAGE ELECTRICITY with high current capabilities in the circuits of the HIGH VOLTAGE TRANSFORMER secondary and filament terminals. It is extremely dangerous to work on or near these circuits with the oven energized.

DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.



### PRECAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.



### PRECAUTION

Never touch any circuit wiring with your hand nor with uninsulated tool during operation.

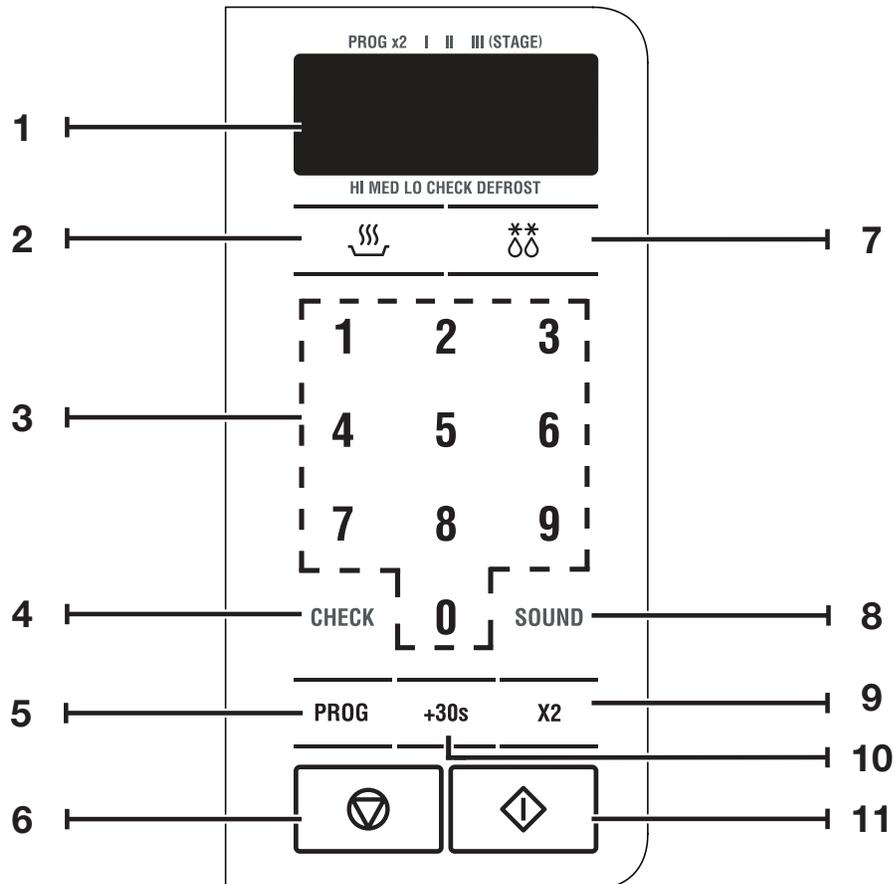
## 2. Specifications

### 2-1 Table of Specifications

Items		Model	
		Model Basic	Model New
Model Name		CM1069	CM1089
Power Consumption	Microwave	1,600W	1,600W
	Output Power	230V : 1,050W / 240V : 1,100W (IEC-705 TEST PROCEDURE)	230V : 1,050W / 240V : 1,100W (IEC-705 TEST PROCEDURE)
Operating Frequency		2,450MHz	2,450MHz
Cooling Method		Cooling fan motor	Cooling fan motor
Dimension ( W x H x D)	Outside	517 x 297 x 412mm	517 x 297 x 412mm
	Cavity	336 x 225 x 349mm	336 x 225 x 349mm
Volume		26liter	26liter
Weight	Net	17.5kg	17.5kg
	Gross	19.0kg	19.0kg

## 3. Operating Instructions

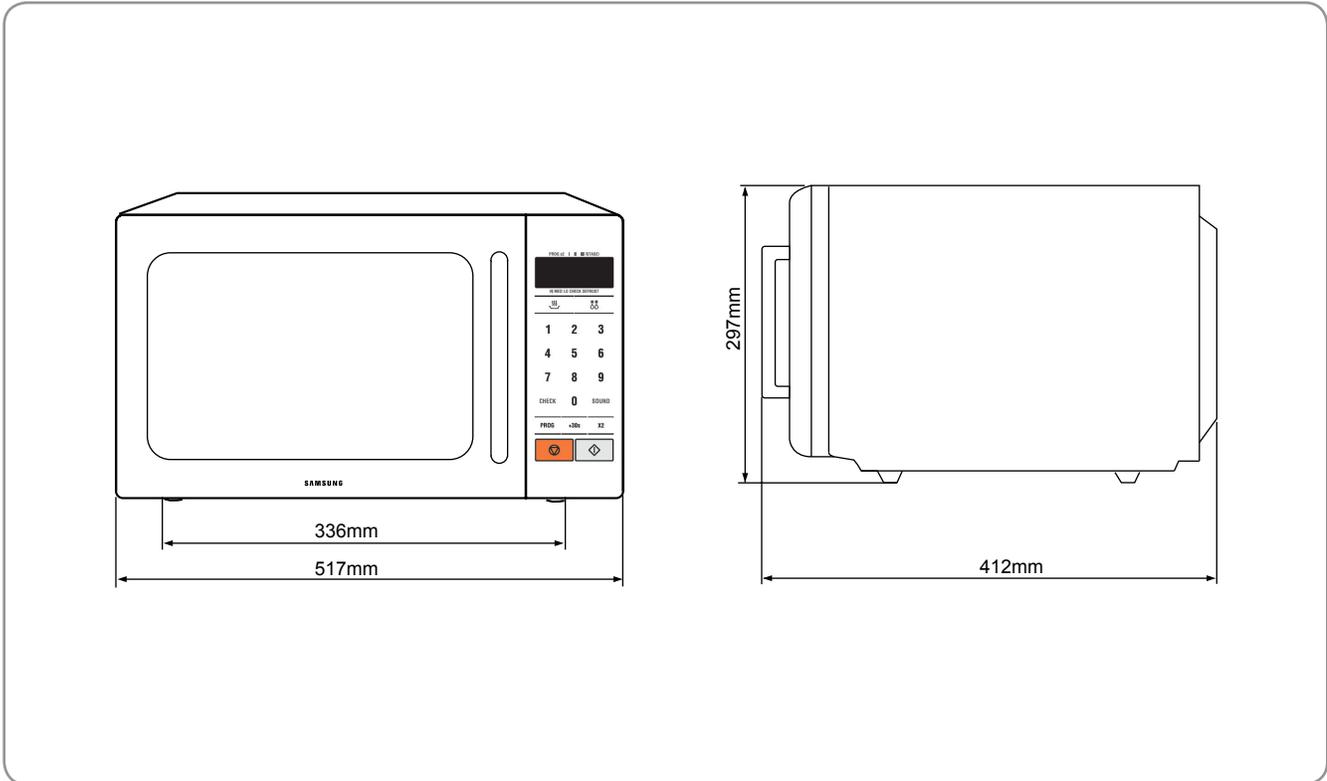
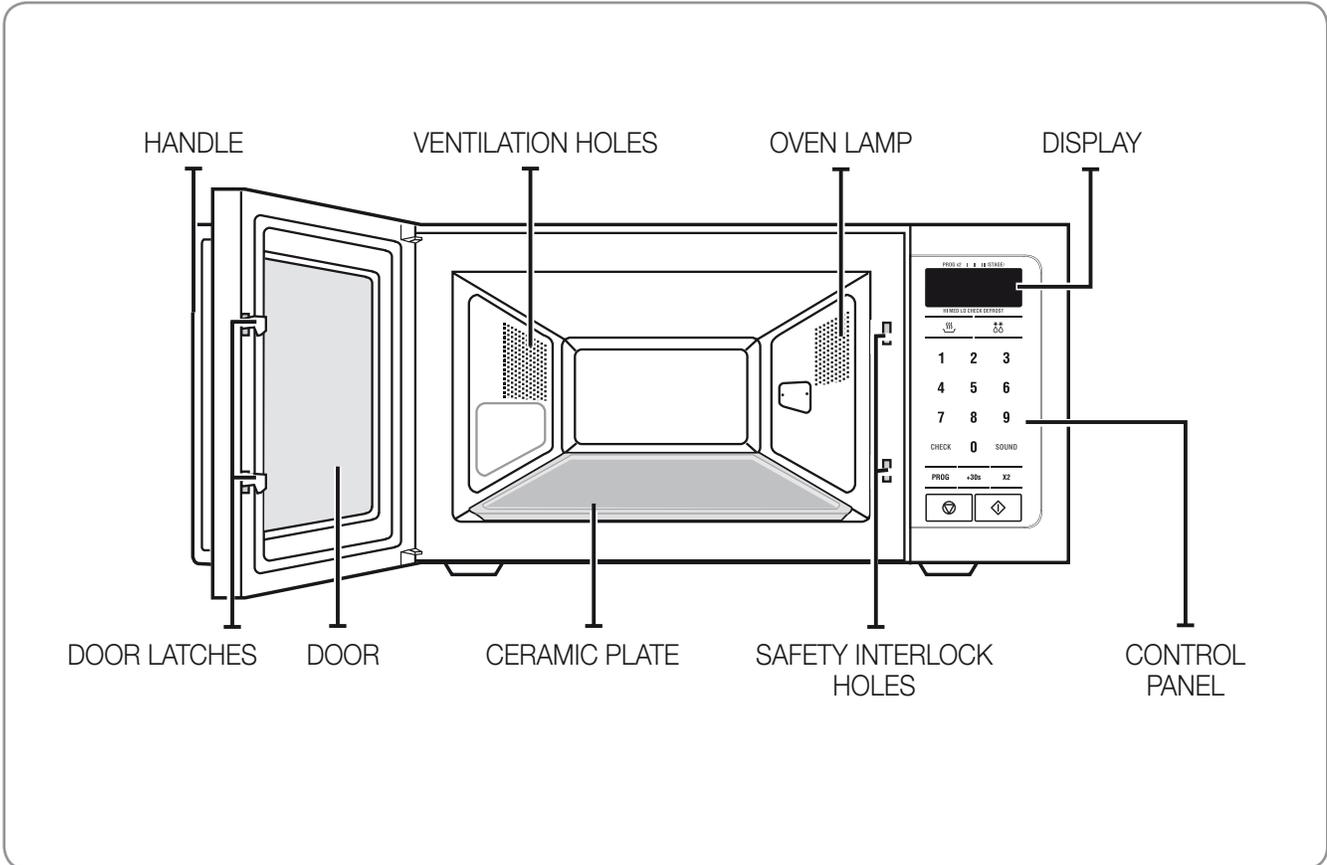
### 3-1 Control Panel



- |                       |                           |
|-----------------------|---------------------------|
| 1. DISPLAY            | 7. DEFROST BUTTON         |
| 2. POWER LEVEL BUTTON | 8. SOUND BUTTON           |
| 3. NUMBER BUTTONS     | 9. DOUBLE QUANTITY BUTTON |
| 4. CHECK BUTTON       | 10. +30S BUTTON           |
| 5. PROGRAMME BUTTON   | 11. START BUTTON          |
| 6. STOP/CANCEL BUTTON |                           |

# 3. Operating Instructions

## 3-2 Features & External Views

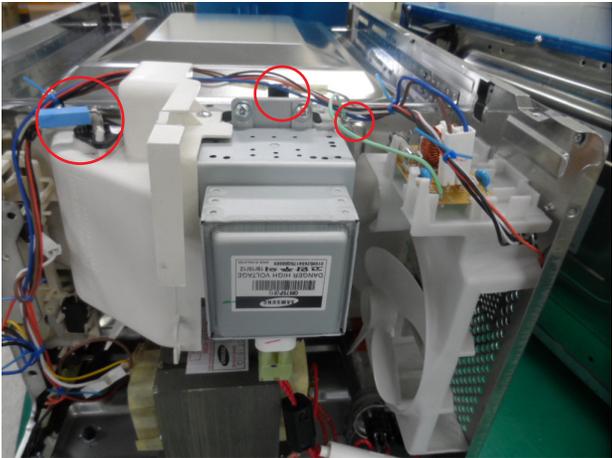


# 4. Disassembly and Reassembly

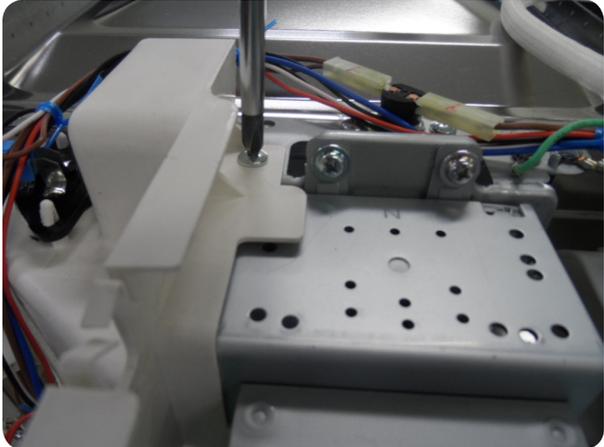
## 4-1 Replacement of Magnetron, Motor Assembly and Lamp

Remove the magnetron including the shield case, permanent magnet, choke coils and capacitors (all of which are contained in one assembly).

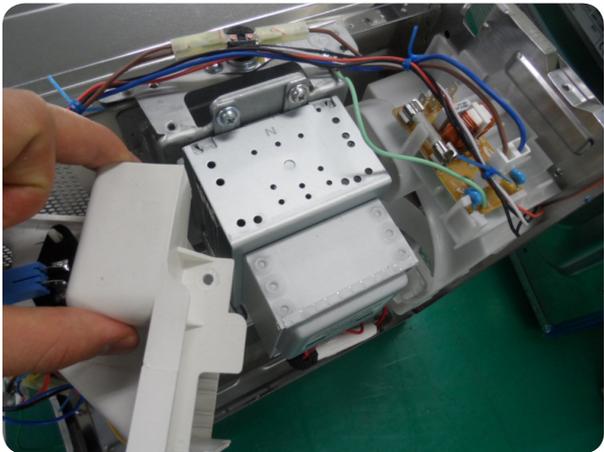
1. Disconnect all lead wires from the magnetron and lamp.



2. Remove a screw securing air cover.



3. Remove the air cover.



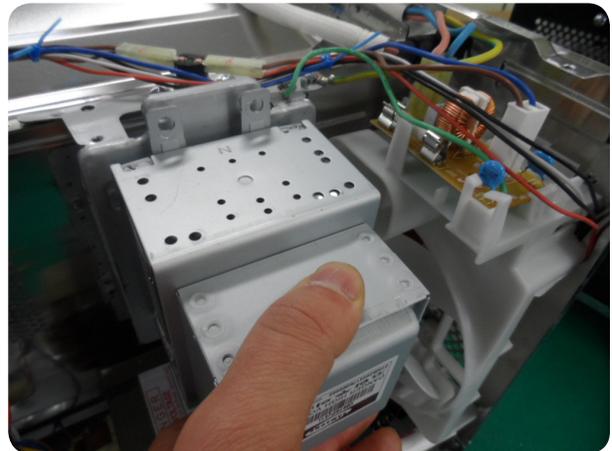
## 4. Disassembly and Reassembly

### 4-1 Replacement of Magnetron, Motor Assembly and Lamp (Continued)

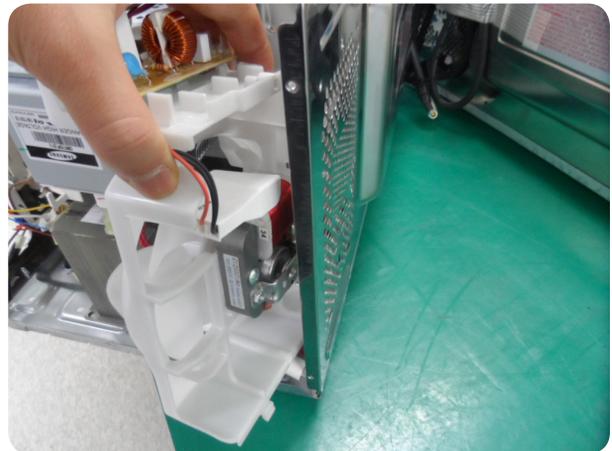
4. Remove screws securing the magnetron to the wave guide.



5. Take out the magnetron very carefully.



6. Remove screws from the back panel.
7. Take out the fan motor.



## 4. Disassembly and Reassembly

### 4-1 Replacement of Magnetron, Motor Assembly and Lamp (Continued)

8. Remove the oven lamp from hole of air cover.



**NOTE1:** When removing the magnetron, make sure that its antenna does not hit any adjacent parts, or it may be damaged.

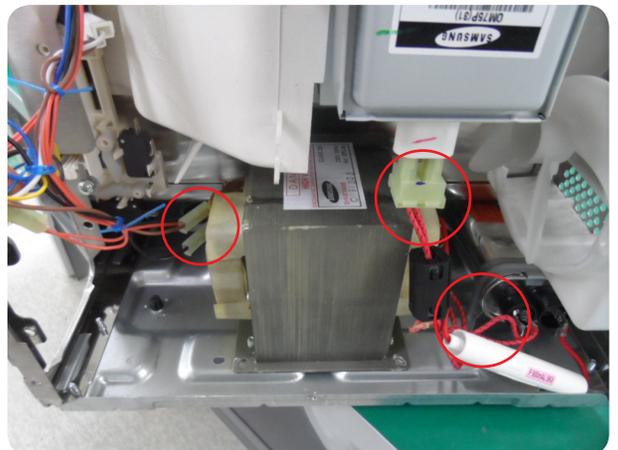
**NOTE2:** When replacing the magnetron, be sure to remount the magnetron gasket in the correct position and make sure the gasket is in good condition.

### 4-2 Replacement of High Voltage Transformer

1. Discharge the high voltage capacitor.



2. Disconnect all the leads.



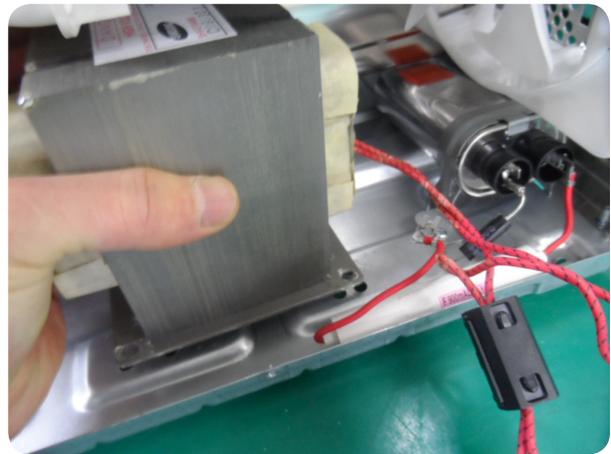
## 4. Disassembly and Reassembly

### 4-2 Replacement of High Voltage Transformer (Continued)

3. Remove the mounting bolts.



4. Replace the High Voltage Transformer



5. After replace, reconnect the leads correctly and firmly.



#### PRECAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.



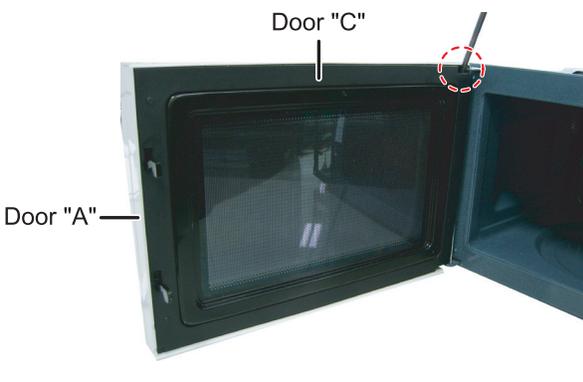
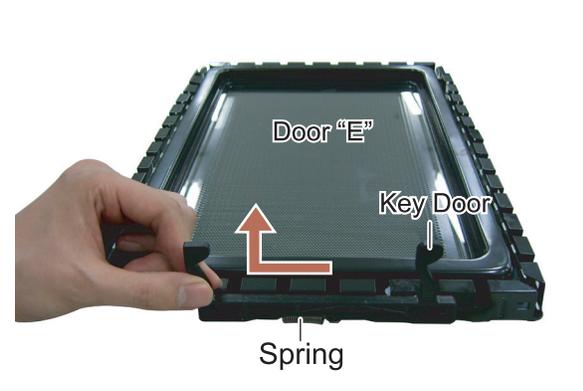
#### PRECAUTION

There exists HIGH VOLTAGE ELECTRICITY with high current capabilities in the circuits of the HIGHVOLTAGE TRANSFORMER secondary and filament terminals. It is extremely dangerous to work on or near these circuits with the oven energized.

DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

## 4. Disassembly and Reassembly

### 4-3 Replacement of Door Assembly

Parts	Disassembly Photo	Explanation
<p><b>Removal of Door "C"</b></p>		<p>Insert flat screwdriver into the gap between Door "A" and Door "C" to remove Door "C". Be careful when handling Door "C" because it is fragile. Then remove the door assembly.</p>
<p><b>Removal of Door Assembly</b></p>		<p>Lift up the Door Assembly from Cavity.</p>
<p><b>Removal of Door "E"</b></p>		<p>Following the procedure as shown in the figure, insert and bend a thin metal plate between Door "E" and Door "A" until you hear the 'tick' sound.</p> <ul style="list-style-type: none"> <li>• Insertion depth of the thin metal plate should be 0.5mm or less.</li> </ul>
<p><b>Removal of Key Door &amp; Spring</b></p>		<p>Remove pin hinge from Door "E" Detach spring from Door "E" and key door.</p>

## 4. Disassembly and Reassembly

### 4-3 Replacement of Door Assembly (Continued)

#### 4-3-1 Reassembly Test

After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

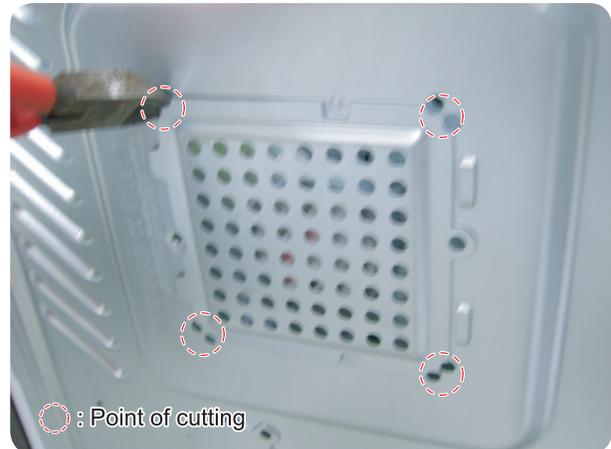
1. When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
2. Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave energy may leak from the space between the door and oven.
3. Do the microwave leakage test.

### 4-4 Replacement of Fuse

1. Disconnect the oven from the power source.
2. When 10A fuse blows out by the operation of interlock monitor switch failure, replace the primary interlock switch, door sensing switch, monitor switch and power relay.
3. When the above three switches operate properly, check if any other part such as the control circuit board, blower motor or high voltage transformer is defective.

### 4-5 Replacement of Drive Motor

1. Take out the glass tray, guide roller from oven cavity, disconnect power.
2. Remove turn table motor cover from case bottom.  
**CAUTION** : Remove sharp edge after cover removal.



3. Disconnect leads from motor.
4. Remove the screws securing motor to bottom of oven cavity.



## 4. Disassembly and Reassembly

### 4-5 Replacement of Drive Motor (Continued)

6. Lift out the motor.
5. When replacing the motor, be sure to remount it in the correct position.

**NOTE :** The shaft of motor should fit tip coupler.



6. When reassemble a drive motor cover. give a turn in a 180° and fix with a screw.

**NOTE :** Bring the spare screw from service center.

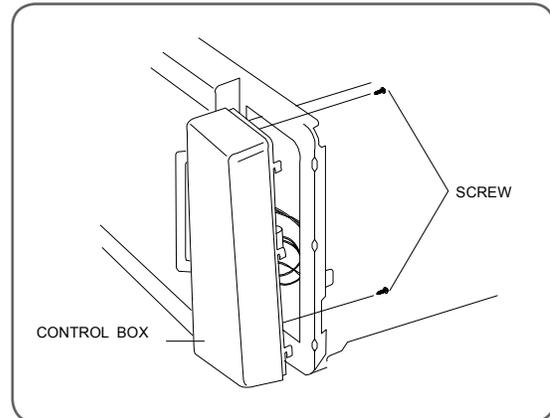
**COVER FIXING SCREW :  
MATCHINE SCREW(6006-001170)**

## 4. Disassembly and Reassembly

### 4-6 Replacement of Control Circuit Board

#### 4-6-1 Removal of Control Box Assembly

1. Disconnect the connectors from the control box assembly.
2. Remove screws securing the control box assembly.
3. Remove the circuit tail of switch membrane from circuit board.
4. Remove the screw securing the circuit board.



## 5. Alignment and Adjustments



### PRECAUTION

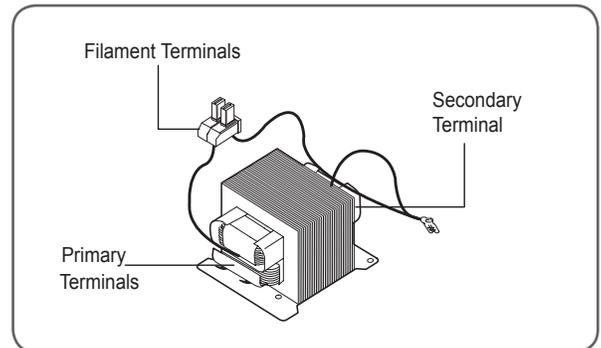
1. High voltage is present at the high voltage terminals during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

### 5-1 High Voltage Transformer

1. Remove connectors from the transformer terminals and check continuity.
2. Normal resistance readings are as follows:

Secondary	Approx. 90Ω
Filament	Approx. 0Ω
Primary	Approx. 1.2Ω

(Room temperature = 20°C)



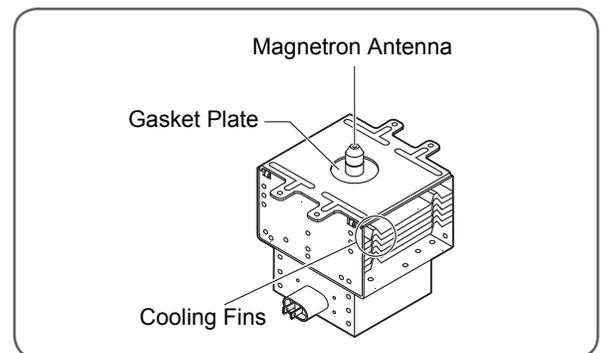
### 5-2 Low Voltage Transformer

1. The low voltage transformer is located on the control circuit board.
2. Remove the low voltage transformer from the PCB Ass'y and check continuity.
3. Normal resistor reading is shown in the table.

Terminals	Resistance
1~2(Input)	1,713Ω
3~4(Output 2.9V)	4.32Ω
5~6(Output 13V)	39.1Ω

### 5-3 Magnetron

1. Continuity checks can indicate only an open filament or a shorted magnetron. To diagnose an open filament or shorted magnetron.
2. Isolate the magnetron from the circuit by disconnecting its leads.
3. A continuity check across the magnetron filament terminals should indicate one ohm or less.
4. A continuity check between each filament terminal and magnetron case should read open.



### 5-4 High Voltage Capacitor

1. Check continuity of the capacitor with the meter set at the highest resistance scale.
2. Once the capacitor is charged, a normal capacitor shows continuity for a short time, and then indicates 9MΩ.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant 9MΩ.
5. Resistance between each terminal and chassis should read infinite.

## 5. Alignment and Adjustments

### 5-5 High Voltage Diode

1. Isolate the diode from the circuit by disconnecting its leads.
2. With the ohm-meter set at the highest resistance scale, measure across the diode terminals. Reverse the meter leads and read the resistance. A meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode (otherwise an infinite resistance may be read in both directions). The resistance of a normal diode will be infinite in one direction and several hundred K $\Omega$  in the other direction.

### 5-6 Main Relay and Power Control RelayA

1. The relays are located on the PCB Ass'y. Isolate them from the main circuit by disconnecting the leads.
2. Operate the microwave oven with a water load in the oven. Set the power level set to high.
3. Check continuity between terminals of the relays after the start pad is pressed.

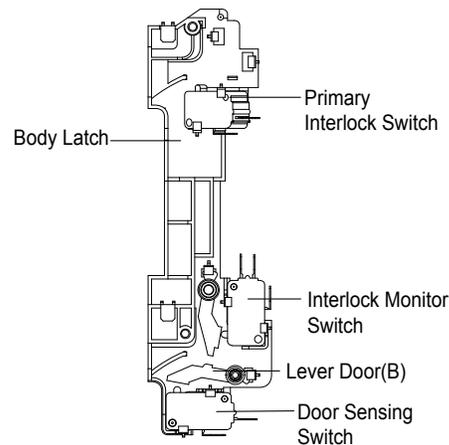
### 5-7 Adjustment of Primary Switch, Door Sensing Switch and Monitor Switch



#### PRECAUTION

For continued protection against radiation hazard, replace parts in accordance with the wiring diagram and be sure to use the correct part number for the following switches: Primary and secondary interlock switches, and the interlock monitor switch (replace all together). Then follow the adjustment procedures below. After repair and adjustment, be sure to check the continuity of all interlock switches and the interlock monitor switch.

1. When mounting Primary switch and Interlock Monitor switch to Latch Body, consult the figure.
2. No specific adjustment during installation of Primary switch and Monitor switch to the latch body is necessary.
3. When mounting the Latch Body to the oven assembly, adjust the Latch Body by moving it so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the Latch Body to the oven assembly.
4. Reconnect to Monitor switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.
5. Confirm that the gap between the switch housing and the switch actuator is no more than 0.5mm when door is closed.
6. Interlock Switch Replacement - When replacing faulty switches, be sure switch mounting tabs are not bent, broken or otherwise deficient in their ability to secure the switches in place.



	Door Open	Door Closed
Primary Interlock switch	$\infty$	0
Monitor switch(COM-NC)	0	$\infty$
Monitor switch(COM-NO)	$\infty$	0
Door Sensing S/W (Secondary Interlock S/W)	$\infty$	0

## 5. Alignment and Adjustments

### 5-8 Output Power of Magnetron



#### PRECAUTION

##### MICROWAVE RADIATION

PERSONNEL SHOULD NOT ALLOW EXPOSURE TO MICROWAVE RADIATION FROM MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

The output power of the magnetron can be measured by performing a water temperature rise test.

Equipment needed :

- Two 1-liter cylindrical borosilicate glass vessel (Outside diameter 190 mm)
- One glass thermometer with mercury column

**NOTE:** Check line voltage under load. Low voltage will lower the magnetron output. Make all temperature and time tests with accurate equipment.

1. Fill the one liter glass vessel with water.
2. Stir water in glass vessel with thermometer, and record glass vessel's temperature ("T1", 10±1°C).
3. After moving the water into another glass vessel, place it in the center of the cooking tray. Set the oven to high power and operate for 41 seconds exactly. (3 seconds included as a holding time of magnetron oscillation:)
4. When heating is finished, stir the water again with the thermometer and measure the temperature ("T2").
5. Subtract T1 from T2. This will give you the water temperature rise. ( $\Delta T$ )
6. The output power is obtained by the following formula;

$$\text{Output Power} = \frac{4.187 \times 1000 \times \Delta T + 0.55 \times M_c \times (T_2 - T_1)}{38}$$

41 : Heating Time (sec)  
38 : Counting Time (sec)  
4.187 : Coefficient for Water  
1000 : Water (cc)  
 $\Delta T$  : Temperature Rise (T2-T1)  
To : Room Temperature  
Mc : Cylindrical borosilicate glass weight

7. Normal temperature rise for this model is 9°C to 11°C at 'HIGH'.

**NOTE 1:** Variations or errors in the test procedure will cause a variance in the temperature rise. Additional power test should be made if temperature rise is marginal.

**NOTE 2:** Output power in watts is computed by multiplying the temperature rise (step 5) by a factor of 91 times the of centigrade temperature.

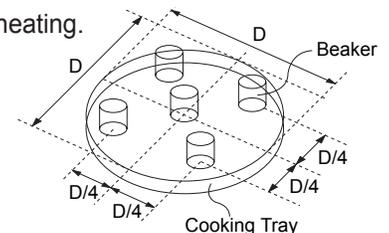
### 5-9 Microwave Heat Distribution - Heat Evenness

The microwave heat distribution can be checked indirectly by measuring the water temperature rise at certain positions in the oven:

1. Prepare five beakers made of 'Pyrex', having 100 milliliters capacity each.
2. Measure exactly 100 milliliters off water load with a measuring cylinder, and pour into each beaker.
3. Measure the temperature of each water load. (Readings shall be taken to the first place of decimals.)
4. Put each beaker in place on the cooking tray as illustrated in figure below. Start heating.
5. After heating for 2 minutes, measure the water temperature in each beaker.
6. Microwave heat distribution rate can be calculated as follows:

$$\text{Heat Distribution} = \frac{\text{Minimum Temperature Rise}}{\text{Maximum Temperature Rise}} \times 100(\%)$$

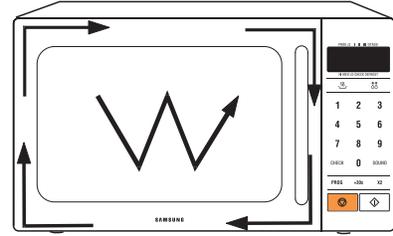
The result should exceed 65%



## 5. Alignment and Adjustments

### 5-10 Procedure for Measurement of Microwave Energy Leakage

1. Pour  $275 \pm 15$ cc of  $20 \pm 5^\circ\text{C}$  ( $68 \pm 9^\circ\text{F}$ ) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
2. Start to operate the oven and measure the leakage by using a microwave energy survey meter.
3. Set survey meter with dual ranges to 2,450MHz.
4. When measuring the leakage, always use the 2 inch spacer cone with the probe. Hold the probe perpendicular to the cabinet door. Place the spacer cone of the probe on the door and/or cabinet door seam and move along the seam, the door viewing window and the exhaust openings moving the probe in a clockwise direction at a rate of 1 inch/sec. If the leakage testing of the cabinet door seam is taken near a corner of the door, keep the probe perpendicular to the areas making sure that the probe end at the base of the cone does not get closer than 5cm to any metal. If it gets closer than 5cm, erroneous readings may result.
5. Measured leakage must be less than  $4\text{mW}/\text{cm}^2$  , after repair or adjustment.

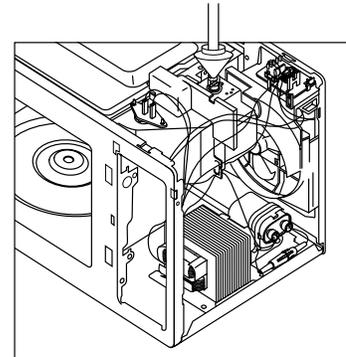


**Maximum allowable leakage is  $5\text{mW}/\text{cm}^2$  .**

**$4\text{mW}/\text{cm}^2$  is used to allow for measurement and meter accuracy**

### 5-11 Check for Microwave Leakage

1. Remove the outer panel.
2. Pour  $275 \pm 15$ cc of  $20 \pm 5^\circ\text{C}$  ( $68 \pm 9^\circ\text{F}$ ) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
3. Start the oven at the highest power level.
4. Set survey meter dual ranges to 2,450MHz.
5. Using the survey meter and spacer cone as described above, measure near the opening of magnetron, the surface of the air guide and the surface of the wave guide as shown in the following photo.( but avoid the high voltage components.) The reading should be less than  $4\text{mW}/\text{cm}^2$  .



### 5-12 Note on Measurement

1. Do not exceed the limited scale.
2. The test probe must be held on the grip of the handle, otherwise a false reading may result when the operator's hand is between the handle and the probe.
3. When high leakage is suspected, do not move the probe horizontally along the oven surface; this may cause damage to the probe.
4. Follow the recommendation of the manufacturer of the microwave energy survey meter.

## 5. Alignment and Adjustments

### 5-13 Error Code Numbering Rule

1. ERROR CODE NUMBERING RULE is applied to a microwave oven and an oven.(CMO, OTR, Grill, Convection, Commercial etc.)
2. All sensors and devices have their own number. ex) Gas Sensor = 1, Temp. Sensor = 2, ...
3. Of each device, No.1 and No.2 refer to "Open Error" (not sensed) and "Short Error", respectively.
4. For unusual cases, errors can be indicated in letters after discussion in advance. ex) Key Short Error (-SE-)
5. Error code not mentioned below should be discussed in advance and approved by P/L and numbered, reported to relevant departments.
6. This numbering rule has been applied to models to have been developed since January, 1, 2005. (But, GE or Customize model are excluded.)



DEVICE	ERROR CASE
0- Others	1- Open
1- Gas Sensor	2- Short
2- Temp. Sensor	•
3- Weight Sensor	•
4- Easy/PH Sensor	•
5- EEPROM	
•	
•	
•	

### 5-14 Error Code List

#### Gas Sensor

Error Code	Gas Sensor Error Case (E-1X)
E-11	Open
E-12	Short
E-13	T1 Max Time Error
E-14	Dry Up / No Load

#### Temp Sensor

Error Code	Temp. Sensor Error Case (E-2X)
E-21	Open
E-22	Short
E-23	T1 Max Time Error (Preheating not completed)
E-24	Over temperature error
E-25	In case abnormal temperature is sensed at Micro Cook
E-26	In case the temperature is not over the fixed AD in first 3 minutes after cooking by heater starts.

## 5. Alignment and Adjustments

### Weight Sensor

Error Code	Gas Sensor Error Case (E-1X)
E-31	Open (When value of HEX is above "FF" for 5 seconds)
E-32	Short
E-33	In case the initial value of HEX is under "14" for 30 seconds while a weight sensor in operation.
E-34	In case the initial value of K calculated by a weight sensor is above and under "±28" as value of HEX.
E-35	In case the value of A is "-" as a weight sensor calculates.
E-36	In case the door opens during sensor cooking.

### Easy/Ph Sensor

Error Code	Easy/PH Sensor Error Case (E4)
E-41	Open
E-42	Short
E-43	T1 Max Time Error
E-44	Dry Up
E-45	Cooling Error (3minutes)
E-46	Primary Open Error(3minutes)
E-47	The door opens during cooking

### Eeprom Error

Error Code	EEPROM Error Case (E-5X)
E-51	Open (Sense Failure)
E-53	Read/Write Error
E-54	Zero not to be set

### Humidity Sensor

Error Code	Humidity Sensor Error Case (E-6X)
E-61	Open
E-62	Short
E-63	T1 Max Time Error

### Others

Error Code	Others (E-0X, Letter)
-SE-	Key Short Error (10 seconds)
E-01	The door opens in case the door should not be opened.
E-02	Cooking Time Setting Over Error (MWO)
E-03	Cooking Time Setting Over Error (Grill)
E-04	Cooking Time Setting Over Error (Convection)
E-05	Cooking Time Setting Over Error (Combination)
E-06	It fails to sense that the swing heater has stopped for 20 seconds during cooking.
E-08	In case function of MWO starts with spit inserted into cavity inside.
E-09	In case the damper is not set to be positioned for 2 minutes.

## 6. Troubleshooting



### PRECAUTION

1. CHECK GROUNDING BEFORE CHECKING FOR TROUBLE.
2. BE CAREFUL OF THE HIGH VOLTAGE CIRCUIT.
3. DISCHARGE THE HIGH VOLTAGE CAPACITOR.
4. WHEN CHECKING THE CONTINUITY OF THE SWITCHES OR TRANSFORMER, DISCONNECT ONE LEAD WIRE FROM THESE PARTS AND THEN CHECK CONTINUITY WITHOUT THE POWER SOURCE ON. TO DO OTHERWISE MAY RESULT IN A FALSE READING OR DAMAGE TO YOUR METER.
5. DO NOT TOUCH ANY PART OF THE CIRCUIT OR THE CONTROL CIRCUIT BOARD, SINCE STATIC DISCHARGE MAY DAMAGE IT. ALWAYS TOUCH GROUND WHILE WORKING ON IT TO DISCHARGE ANY STATIC CHARGE BUILT UP.

### 6-1 Electrical Malfunction

Parts	Cause	Diagnosis	Remedy
Fuse blows out when door is opened.	Defective primary interlock switch are winding.	Check continuity of the primary switch terminals with wire removed using a multimeter. If there is continuity inter between switch terminals when door is opened, the switch is defective.	Replace the primary interlock switch
	Defective in terlock monitor switch	Check continuity of the monitor switch terminals with wire removed by using a multimeter. If there is continuity between switch terminals the door is closed, the switch is defective.	Replace the interlock monitor switch
Fuse is Open	Layer short of the secondary coil of H. V. Transformer	The fuse will not blow right away, but if it blows in a few seconds, then there is a layer short If the fuse blows with H. V. Trans secondary open, the transformer may be faulty.	Replace H.V. Transformer
Oven lamp does not light.	1) Fuse blown out	Check fuse.	Replace the fuse.
	2) Poor contact of power cord.	Check continuity of power supply cord. Also check whether the power cord is securely wired.	Adjust or replace the power supply cord
	3) Defective lamp	The fan motor rotates, but lamp does not light.	Replace the lamp.
	4) Defective timer contacts	Check the terminals of timer for continuity, turning the timer knob ON and OFF repeatedly.	Replace the timer.
	5) Thermal cutout S/W open	In this case the oven lamp and fan do not turn on	Replace the thermal cutout S/W
Fan does not operate.	1) Defective fan motor.	If 230V is found at motor terminals, the motor should be replaced.	Replace the motor.
	2) Defective con tacts of timer	The oven lamp does not light and fan motor does not operate.	Replace the timer.

## 6. Troubleshooting

### 6-1 Electrical Malfunction

Parts	Cause	Diagnosis	Remedy
Microwave turns off during cooking cycle.	1) Too small a load	If a small amount of food is heated for a long time, period of microwave may turn off during operation.	To increase the oven water into water into the oven.
	2) Defective magnetron thermal cutout S/W	Check to see if the magnetron thermal cutout switch is activated at a temperature higher than 90 °C.	Replace thermal cutout switch.
properly shock is felt.	Incomplete grounding	Make sure that grounding of the power supply cord has been done properly.	Rewire.
Door doe not operate properly	1) Broken door hinges	Remove the cabinet for inspection. Check the door hinge.	Replace door hinges.
	2) Missing or loose screw	Check if the screws are secured well to the door hinge.	Fasten or tighten.
Magnetron thermal cutout switch OFF	2) Defective fan motor	If the fan motor does not operate with 230V applied to the terminal, the motor may be faulty.	Replace fan motor.
	3) Too small a load or no load	If a small amount of food is heated repeatedly over a long period of time, microwave turns off during operation.	To increase the oven load, place a glass of water into the oven.

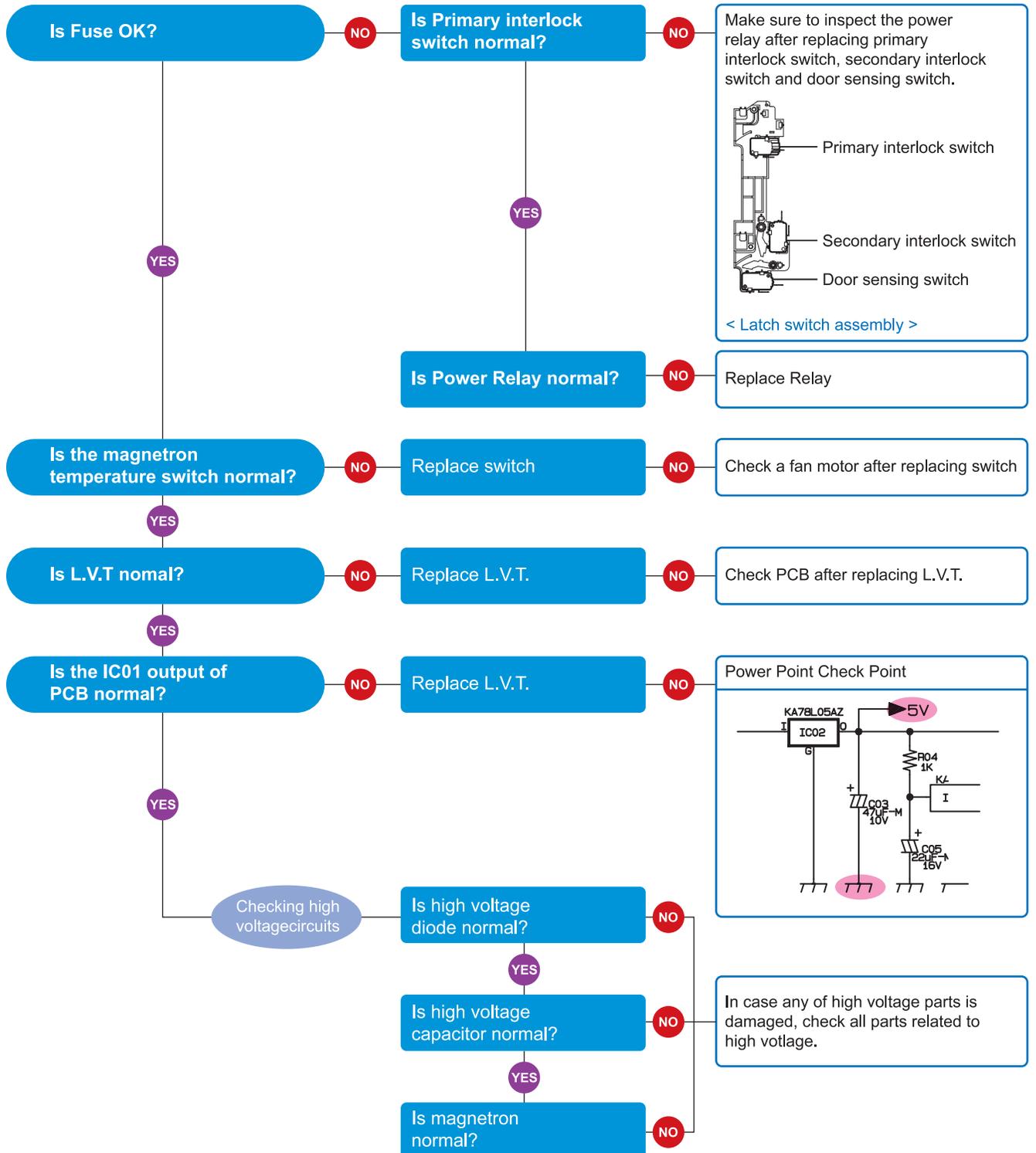
# 6. Troubleshooting

## 6-1 Electrical Malfunction (Continued)

**Oven does not operate.**      **\*Inspection method**

**Caution**

1. Be careful of high voltage circuits.
2. Discharge high voltage capacitor.

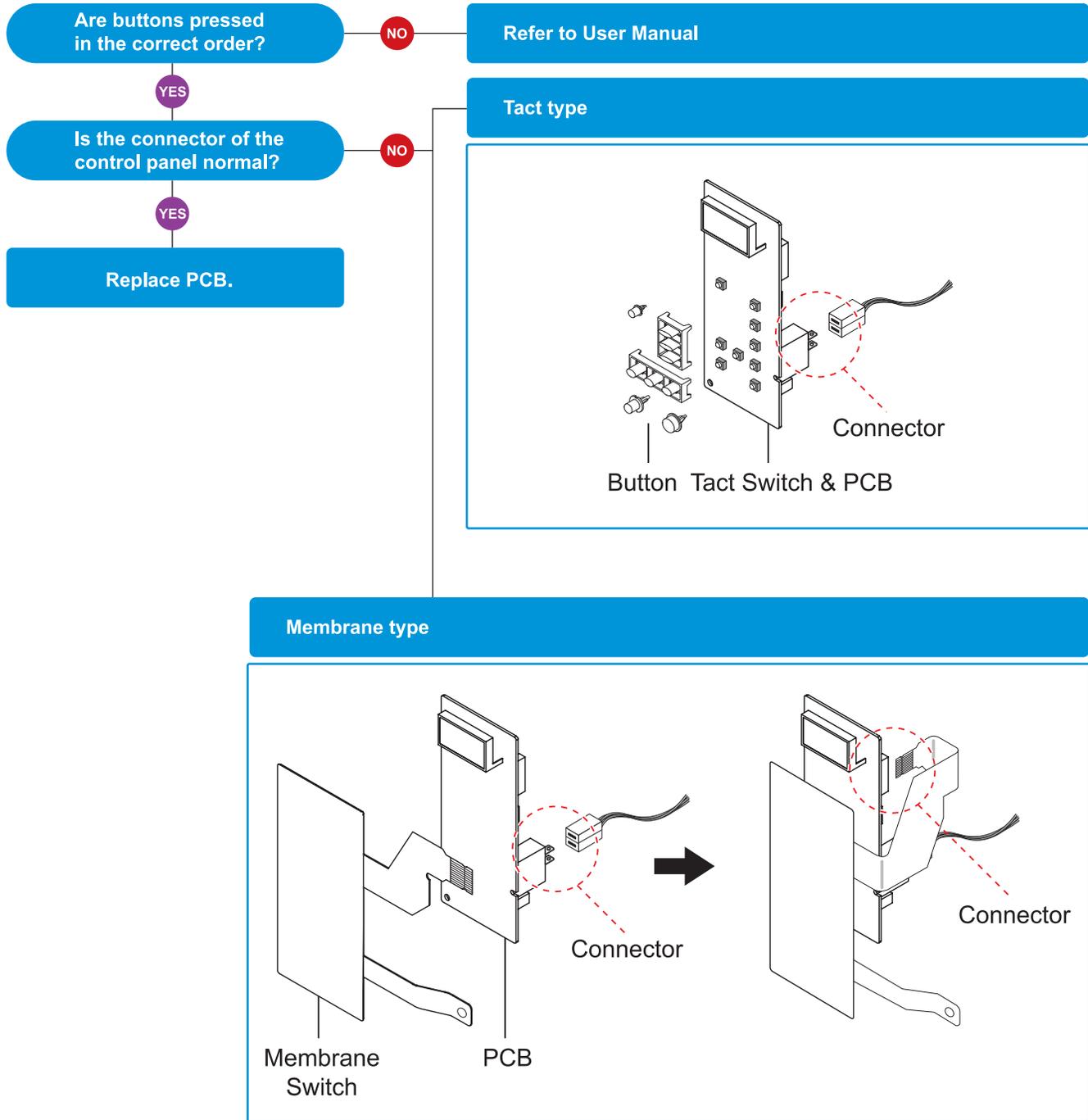


# 6. Troubleshooting

## 6-1 Electrical Malfunction (Continued)

Buttons of the control panel do not work.

\*Inspection method



# 6. Troubleshooting

## 6-1 Electrical Malfunction (Continued)

Food is not heated even though an oven works.

\*Inspection method

Is the latch switch operating normally?

NO

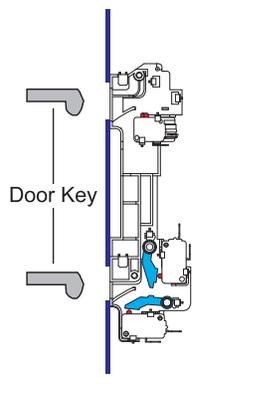
Method to control latch switch

YES

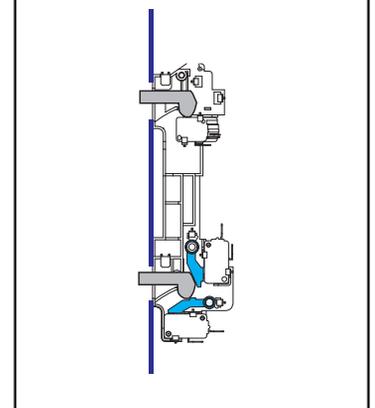
Checking high voltage circuits

Refer to "Checking high voltage circuits" on the previous page.

\*Door open

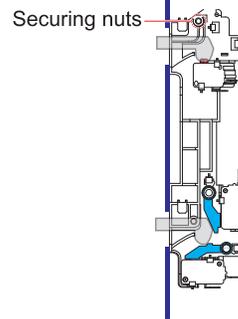


\*Door closed



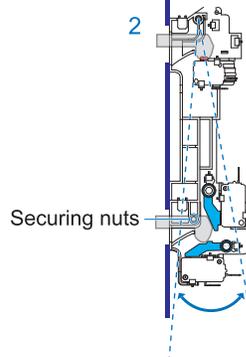
Method to control latch switch

1



1. Loosely tighten the nuts to check whether the primary interlock switch works by slightly moving latches to right and left. Then firmly tighten nuts.

2



2. Loosely tighten the nuts to check whether the secondary interlock switch and door sensing switch works by slightly moving latches to right and left. Then firmly tighten nuts.

## 6. Troubleshooting

### 6-2 Unsatisfactory Cooking

Parts	Cause	Diagnosis	Remedy
Food is not heated.	1) Open cathode of magnetron	Check the terminals with a multimeter to see if the heater circuit is open.	Replace magnetron.
	2) Defective H. V. Diode	Check the H. V. Diode for continuity in the reverse and normal directions using meter. If there is continuity in the reverse direction, the H. V. Diode may be faulty. (In this event H. V. Capacitor will be hot)	Replace H. V. Diode.
	3) Shorted magnetron	Connect megger leads to quick-connect terminal & body of the magnetron if there is continuity, the magnetron may be fuse will be blown) faulty. (In this case the main fuse will be blown)	Replace magnetron.
	4) Defective magnetron	If there is a crack in the magnetron antenna (dome), the magnetron is defective.	Replace magnetron.
	5) Poor contact of primary interlock switch	Check if the screws are secured well to the door hinge. and pressing it ON and OFF repeatedly.	Replace or adjust.
	6) Open coil of H. V. Transformer	Check the continuity of primary coil and secondary coil. If there is no continuity, H. V. Transformer is defective.	Replace the H. V. Transformer.
	7) Shorted H. V. capacitor	Check the continuity of capacitor. If the capacitor shorts, the fuse blows	Replace the H. V. Capacitor.
	8) Monitor Fuse out	Check the monitor fuse (on the noise filter)	Replace the Monitor fuse

### 6-3 Part Check List

Symptom	Related Parts	Check Points	Remedy
Microwave cooking does not work.	H.V.Transformer	1) Check if the primary and secondary coil is open or shorted. * Resistance of primary coil: . 1.2Ω Approx. Resistance of secondary coil: Approx. 90Ω 2) Check if the MGT Heater Voltage is approx. 3.3V AC. <b>Caution : High voltage !</b>	Replace.
	H.V.Capacitor	Check continuity of capacitor between two terminals with H.V.wire lead removed. The resistance should be approx. 10MW, it's failure..	Replace.
	H.V.Diode	1) If there is no continuity in forward, direction the H.V.Diode is open. 2) If there is continuity in reverse direction, it's shorted.	Replace.
Fan motor does not rotate.	Fan motor	Check if the motor coil is open.	Replace.



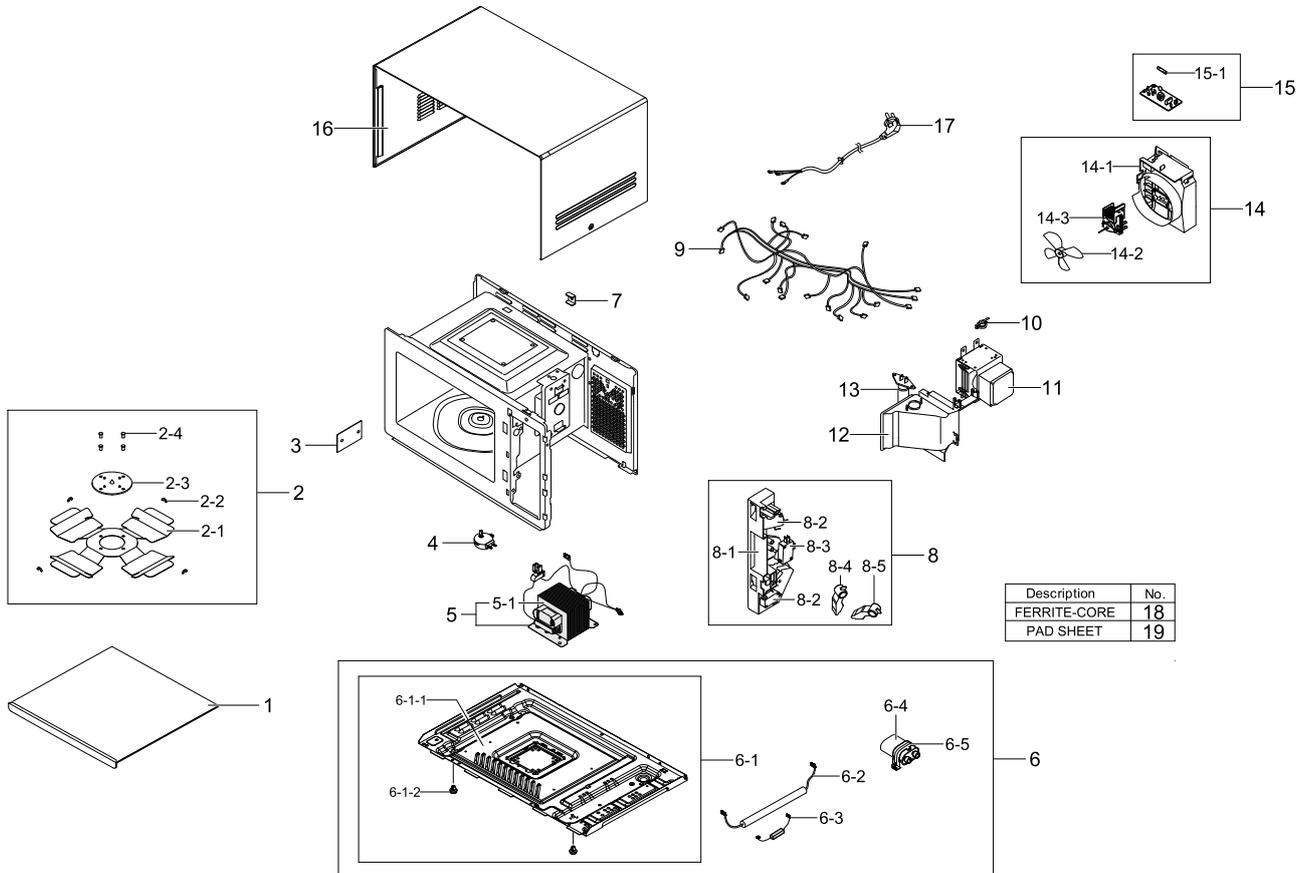
## 8. Reference

### 8-1 Model name standard

Baoad Classification	Distinguisher	Middle Classification	Distinguisher	Product Code	Full Name
USA CMO	M	CMO (Counter-top MWO)	W	MW	USA CMO(EPOXY CAVITY)
		UTC (Under The Cabinet)	U	MU	USA UTC
		Browner, Grill	G	MG	USA GRILL
		Convection	C	MC	USA CONVECTION
		Sensor	S	MS	USA CMO SENSOR
		DC MWO	D	MD	USA DC MWO
		Hospital MWO	H	MH	USA Hospital MWO
		Ceramic Enamel	E	ME	USA CMO(CERAMIC ENAMEL)
USA RV	R	SOLO	M	RM	USA RV SOLO
		CONVECTION	C	RC	USA RV CONVECTION
		BUILT-IN	B	RB	USA RV BUILT-IN
USA Junior	SJ	-	-	SJ	USA Junior MWO
USA OTR	SM	SOLO	H	SMH	USA OTR SOLO
		CONVECTION	V	SMV	USA OTR CONVECTION
EUROPE Epoxy Cavity	M	SOLO	1	M1	EUROPE SOLO(EPOXY CAVITY)
		GRILL	2	M2	EUROPE GRILL(EPOXY CAVITY)
EUROPE Ceramic Enamel	CE	SOLO	1	CE1	EUROPE SOLO(CERAMIC ENAMEL)
		GRILL	2	CE2	EUROPE GRILL(CERAMIC ENAMEL)
EUROPE Quartz GRILL	G2	-	-	G2	EUROPE Quartz GRILL
EUROPE Power Grill	PG	-	-	PG	POWER GRILL
EUROPE Convection	CK	-	-	CK	EUROPE CONVECTION
	C	-	-	C	EUROPE CONVECTION
EUROPE Fully Built-In	F	SOLO	W	FW	EUROPE SOLO FULLY BUILT-IN
		GRILL	G	FG	EUROPE GRILL FULLY BUILT-IN
		CONVECTION	C	FC	EUROPE CONVECTION FULLY BUILT-IN

# 1. MAIN

## Exploded View



Description	No.
FERRITE-CORE	18
PAD SHEET	19

## Parts List

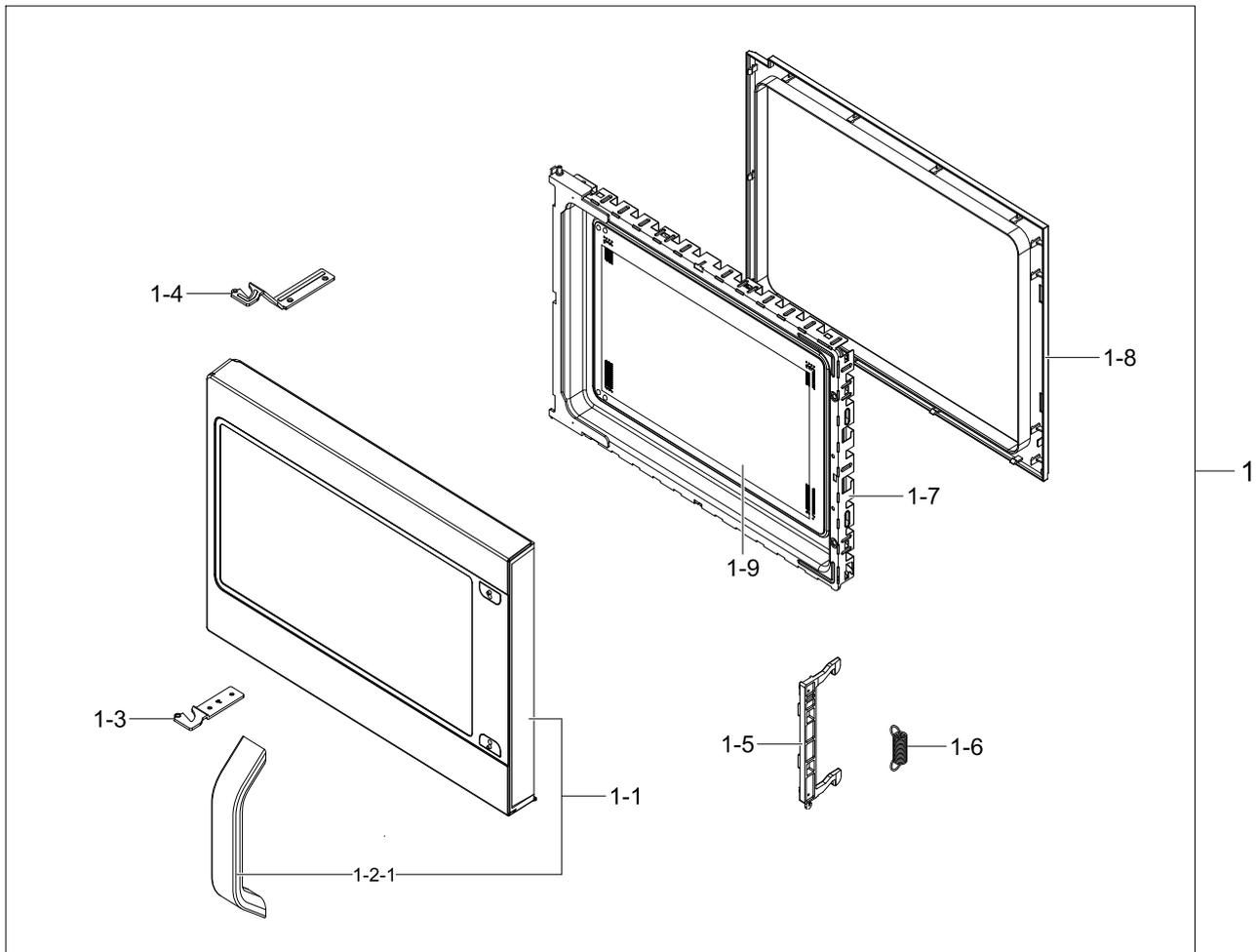
No.	Lvl.	Loc.	Material Code	Description & Specification	SNA	Qty.
1	2	T002	DE97-00191A	ASSY-TRAY CERAMIC; CM1049,-,T3.2,COMMERCIAL	SA	1
2	2	P001	DE97-00190A	ASSY STIRRER; CM1049,ALS	SA	1
2-1	3	T036	DE31-00009A	BLADE-STIRRER; CM1030M,ALP1050,T0.8	SNA	1
2-2	3	T074	DE60-80043A	SPACER-STIRRER; TEFLON,W6.3,T2	SNA	4
2-3	3	T037	DE61-00098A	HOLDER-STIRRER; CM1030M,TEFLON,WHT	SNA	1
2-4	3	M078	DE69-90054A	CLIP-STIRRER; 5mm,TEFLON-PFA,CM1819/29	SA	4
3	2	M051	DE71-00163A	COVER-CEILING; CM1049,MICA SHEET,T0.5,W12	SA	1
4	2	M049	DE31-10173C	MOTOR SYNCHRONOUS; SEMI-COMM,21V,16.7/20R	SA	1
5	1		DE96-00964C	ASSY POWER PACK; CM1079-A/XEU,0.8 CU.FT	SA	1
5-1	2	M038	DE26-00051B	TRANS H.V; SHV-E1049B,230V,50Hz,2360V/3.4	SA	1
6	2	M155	DE96-00240G	ASSY BASE PLATE; SEMI COMM 1059/1069,-,-,	SA	1
6-1	3	M045	DE96-00042A	ASSY BASE PLATE SUB; -,-,-,3RD-1.0,SEPARA	SA	1

Exploded Views and Parts List

No.	Lvl.	Loc.	Material Code	Description & Specification	SNA	Qty.
6-1-1	4	M048	DE80-10001G	BASE-PLATE; 3RD,GI-SGCC,T0.6,W345,L565	SNA	1
6-1-2	4	M047	DE61-40066A	FOOT; PP,BLK	SA	2
6-2	3	M042	DE91-70061H	ASSY H.V.FUSE; -,THV060T-0900-H,5KV0.90A,	SA	1
6-3	3	M527	DE59-00002A	DIODE-H.V; MWO ALL,2CL4512H,-,450mA 13KV,	SNA	1
6-4	3	M039	2501-001285	C-OIL; 1.13uF,2100V(CLASS P),AL CAN TYPE,	SA	1
6-5	3	M040	DE61-00419A	BRACKET-HVC; CM1049,EGI-SECC,T0.8	SNA	1
7	2	M011	DE61-50541A	BRACKET-EARTH; GI-SGCC,T1.0,W15,L8	SNA	1
8	1	B022	DE94-01862D	ASSY BODY LATCH; MC455TCRCSR/XE,CONTRABAS	SNA	1
8-1	2		DE72-00137G	LATCH-BODY; AMC6158/JMC9158,PBT	SA	1
8-2	2	B048	3405-001034	SWITCH-MICRO; 125/250VAC,16A,200gf,SPST-N	SA	2
8-3	2	B046	3405-001032	SWITCH-MICRO; 125/250VAC,16A,200GF,SPDT	SA	1
8-4	2	B010	DE66-00093A	LEVER-SWITCH(A); NC2000,PP,NTR,HANDLE	SA	1
8-5	2	B011	DE66-00094A	LEVER-SWITCH(B); NC2000,PP,NTR,HANDLE	SA	1
9	1	W002	DE39-00396A	WIRE HARNESS-A; CM1069,230V/50HZ,STANDBY	SA	1
10	2	M457	DE47-20173A	THERMOSTAT; NT-101,125/250V,905,605,1	SA	1
11	2	M035	OM75P(31)ESGN	ASSY-MGT; ASSY-MGT		1
12	2	M037	DE71-60016E	COVER-AIR; CM1049,PP,FH44N,SEMI-COM	SA	1
13	2	M036	4713-001524	LAMP-INCANDESCENT; 230V,20W	SA	1
14	2	M020	DE96-00108C	ASSY MOTOR FAN; CM1059/XEU,230V50HZ,2500R	SA	1
14-1	3	P109	DE71-00061A	COVER-MOTOR; 2 & 2 PROJECT,PP,TB53,2 & 2 PROJ	SA	1
14-2	3	H096	DE31-90051A	BLADE-FAN; -,PP,-,D130,-,T,-	SA	1
14-3	3	M023	DE31-10177C	MOTOR FAN; SMF-1049EA,-,-,230V50Hz,15mm,-	SNA	1
15	2	M017	DE96-00010C	ASSY NOISE FILTER; -,SN-3WED(12),250V12A,	SA	1
15-1	3	M019	3601-001019	FUSE-CARTRIDGE; 250V,12A,SLOW-BLOW,CERAMI	SA	1
16	1	M001	DE64-01740A	PANEL-OUTER; CM1059/1069,STAINLESS-ST5430	SA	1
17	1	M015	DE96-00180C	ASSY POWER CORD; BSI,Flag,250V/13A,H07RN-	SA	1
18	2	M052	DE73-90027A	FERRITE-CORE; T13.8,NI-ZN,BNF-14(K150),L2	SA	1
19	2		DE69-00909A	PAD SHEET; ALL MODEL CMO,HDPE,T0.03,W400,	SA	1

## 2. ASSY DOOR

### Exploded View



### Parts List

No.	Lvl.	Loc.	Material Code	Description & Specification	SNA	Qty.
1	1	D049	DE94-03005A	ASSY DOOR; CM1089,STSS,MANDOLIN	SA	1
1-1	2	D037	DE94-03002A	ASSY DOOR A; CM1089,STSS,MANDOLIN	SA	1
1-2-1	3	D019	DE64-02745A	HANDLE-DOOR; COMMERCIAL,AL,MANDOLIN	SNA	1
1-3	2	D010	DE61-80003A	HINGE-LOWER; ME6144W/XSA,SSEC,T2.3,W26,L7	SA	1
1-4	2	D009	DE61-80002A	HINGE-UPPER; WHT,SSEC,T2.3,W26,L77,ZPC3	SA	1
1-5	2	D011	DE64-00264A	KEY-DOOR; 3RD-W NEW,POM,-,-,BLK,-,-	SA	1
1-6	2	D007	DE61-00199A	SPRING-KEY; M1977,HSWR-SWRH,D6,25 1/4,25	SC	1
1-7	2	D004	DE92-50127H	ASSY DOOR E; -,-,BLACK,COATING,T0.8	SC	1

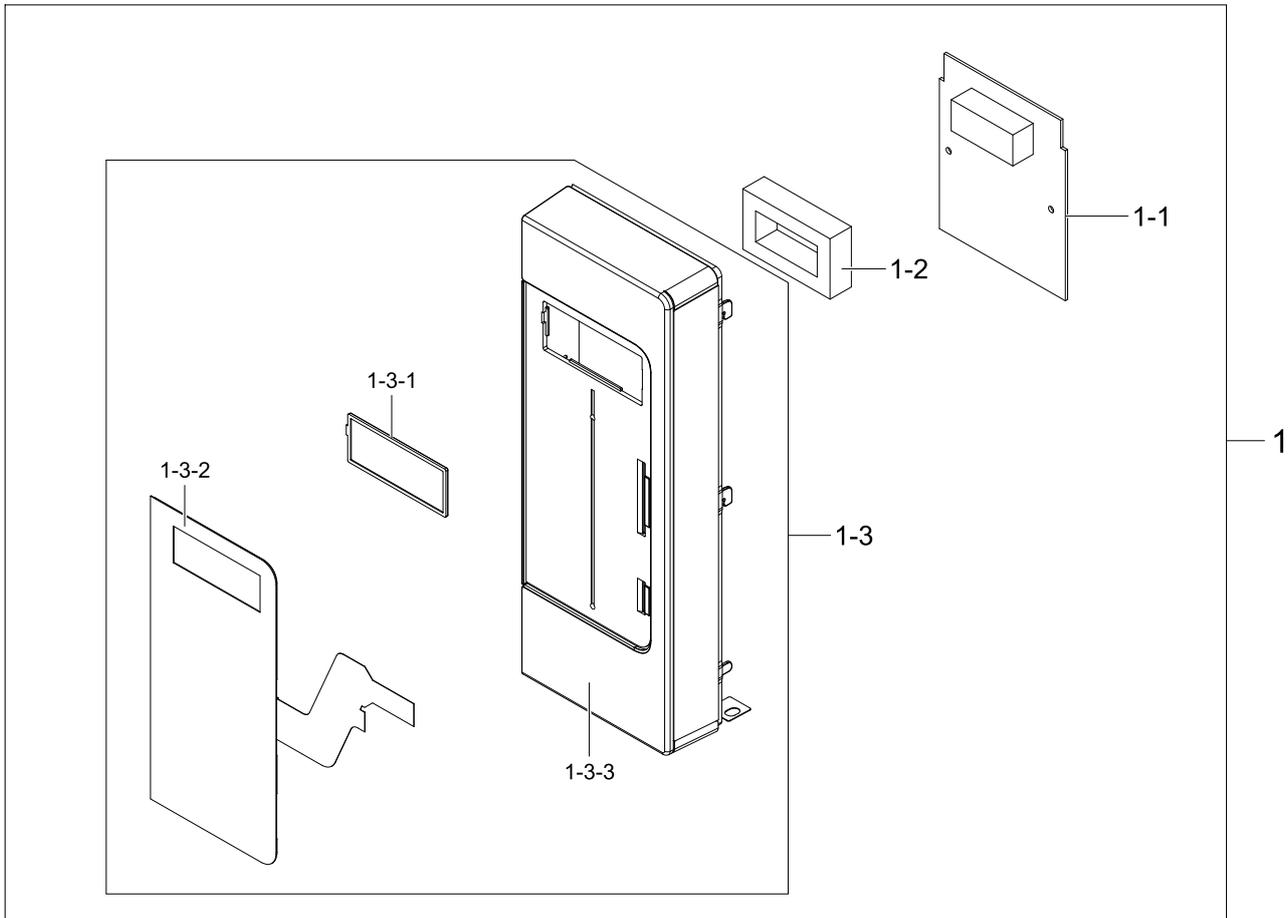
Exploded Views and Parts List

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No.	Lvl.	Loc.	Material Code	Description & Specification	SNA	Qty.
1-8	2	D006	DE64-40012D	DOOR-C; JES1036NL02,ROH,EMBO HEIGHT 0.8mm	SA	1
1-9	2	D005	DE01-00002B	FILM-DOOR; CM1089,PET,T0.15,W290,L169,NTR	SA	1

### 3. ASSY CONTROL BOX

#### Exploded View



#### Parts List

No.	Lvl.	Loc.	Material Code	Description & Specification	SNA	Qty.
1	1	C082	DE94-03004A	ASSY CONTROL BOX; CM1089,230V 50HZ,STSS S	SNA	1
1-1	2	F316	DE92-03494B	ASSY PCB MAIN; CM1089/X,RCS-SMS1020-05,Y,	SA	1
1-2	1	B022	DE94-01862D	ASSY BODY LATCH; MC455TCRCSR/XE,CONTRABAS	SNA	1
1-3	2	C001	DE94-03003A	ASSY CONTROL PANEL; CM1089,STSS ST-430 0.	SA	1
1-3-1	3	C009	DE64-02746A	WINDOW DISPLAY; COMMERCIAL,SAN,69,39,MAND	SNA	1
1-3-2	3	C004	DE34-00413A	SWITCH MEMBRANE; CM1089-MANDORIN,PET,230V	SA	1
1-3-3	3	C005	DE64-02751A	CONTROL-PANEL; COMMERCIAL,ABS,106.3,281,4	SNA	1

## 8. Reference

### 8-1 Model name standard (Continued)

(Blue Color) : Not Used

Baoad Classification	Distinguisher	Middle Classification	Distinguisher	Cavity / type	Distinguisher	Full Name
CHINA	C	SOLO / CMO	M	CERAMIC ENAMEL	E	CME / CMC / CMW / CMS
		Inverter SOLO	I			CIE / CIC / CIW / CIS
		Grill / Browner	G	CERAMIC ENAMEL(Clay)	C	CGE / CGC / CGW / CGS
		Quartz Grill / Browner	Q			CQE / CQC / CQW / CQS
		Conv.	C	Epoxy	W	CCE / CCC / CCW / CCS
		TBMO / Power Grill	T			CTE / CTC / CTW / CTS
		Commercial	O			COE / COC / COW / COS
KOREA	D	SOLO / CMO	M	CERAMIC ENAMEL	E	DME / DMC / DMW / DMS
		Inverter SOLO	I			DIE / DIC / DIW / DIS
		Grill / Browner	G	CERAMIC ENAMEL(Clay)	C	DGE / DGC / DGW / DGS
		Quartz Grill / Browner	Q			DQE / DQC / DQW / DQS
		Conv.	C	Epoxy	W	DCE / DCC / DCW / DCS
		TBMO / Power Grill	T			DTE / DTC / DTW / DTS
		Commercial	O			DOE / DOC / DOW / DOS
EUROPE	-	SOLO / CMO	M	CERAMIC ENAMEL	E	ME / MC / MW / MS
		Inverter SOLO	I			IE / IC / IW / IS
		Grill / Browner	G	CERAMIC ENAMEL(Clay)	C	GE / GC / GW / GS
		Quartz Grill / Browner	Q			QE / QC / QW / QS
		Conv.	C	Epoxy	W	CE / (CC) / (CW) / <b>CST</b>
		TBMO / Power Grill	T			TE / (TC) / <b>TM</b> / <b>TST</b>
		Commercial	O			OE / OC / OW / OS
USA	A	SOLO / CMO	M	CERAMIC ENAMEL	E	AME / (AMC) / AMW / AMS
		Inverter SOLO	I			AIE / AIC / AIW / AIS
		Grill / Browner	G	CERAMIC ENAMEL(Clay)	C	AGE / (AGC) / AGW / AGS
		Quartz Grill / Browner	Q			AQE / AQC / AQW / AQS
		Conv.	C	Epoxy	W	ACE / ACC / ACW / ACS
		TBMO / Power Grill	T			ATE / ATC / ATW / ATS
		Commercial	O			AOE / AOC / AOW / AOS
CHINA	C	Fully Built-In	F	SOLO(MW ONLY)	W	CFW / CFG / CFC / CFI / CFT
KOREA	D			GRILL	G	DFW / DFG / DFC / DFI / DFT
EUROPE	-			CONVECTION	C	DFW / DFG / DFC / DFI / DFT
USA	A			INVERTER	I	FW / FG / FC / FI / <b>FPG</b>
				TBMO / Power Grill	T	AFW / AFG / AFC / AFI / AFT
USA OTR		SM		SOLO(MW ONLY)	H	SMH / <b>SMB</b> / SMV / SMI / <b>STB</b>
EUROPE OTR		EM		GRILL	G	EMH / EMG / EMV / EMI / EMT
CHINA OTR		UM		CONVECTION	V	UMH / UMG / UMV / UMI / UMT
KOREA OTR		PM		INVERTER	I	PMH / PMG / PMV / PMI / PMT
				TBMO / Power Grill	T	

**CST** : EUROPE STSS Conv.

**TST** : EUROPE TBMO with STSS cavity

**TM** : EUROPE TBMO with epoxy cavity

**FPG** : EUROPE FBI POWER GRILL

**SMB** : USA Grill OTR

**STB** : USA TBMO OTR

## 8. Reference

### 8-2 Customer inquiry cases and countermeasures

Symptom	Cause	Countermeasures
The oven works automatically whenever the power is turned on.	<ul style="list-style-type: none"> <li>It may happen due to power failure or abnormal voltage.</li> <li>It may happen when the door does not close completely.</li> </ul>	<ul style="list-style-type: none"> <li>Connect the power plug three seconds after disconnecting the power plug.</li> <li>Close the door completely =&gt; Press the Cancel button =&gt; Press the Start button.</li> </ul>
Heating	<ul style="list-style-type: none"> <li>In many cases, it may happen when the power level is incorrectly set.</li> <li>It may happen when the door does not close completely.</li> <li>It may happen when the oven is out of order.</li> </ul>	<ul style="list-style-type: none"> <li>Select HIGH/MEDIUM/LOW by pressing the Power Level button. <ul style="list-style-type: none"> <li>- MEDIUM/LOW: This function is used to cook the food slowly.</li> </ul> </li> <li>Close the door completely. =&gt; Press the Cancel button. =&gt; Press The Start button.</li> <li>Contact the nearest Samsung after-sales service center.</li> </ul>
Ground	<ul style="list-style-type: none"> <li>Ground problem may happen when the oven is placed in a humid area and the oven is not grounded.</li> <li>Ground is not provided by an extended electric outlet.</li> </ul>	<ul style="list-style-type: none"> <li>If the oven is placed in a humid area, buy an electric wire in a store selling electrical products. (Electric wires for home use are also allowed) Ground the oven through the electric wire.</li> <li>Buy an electric wire in a store selling electrical products. (Electric wires for home use are also allowed) Ground the oven through the electric wire.</li> </ul>
The oven sometimes beeps.	<ul style="list-style-type: none"> <li>The oven beeps every minute unless the food is in the oven after the food is cooked completely.</li> <li>The oven occasionally beeps during cooking.</li> </ul>	<ul style="list-style-type: none"> <li>Open and close the door again. (Beeping sounds indicate that the food is ready to be removed from the oven after cooking is complete.)</li> </ul>
Strange popping sounds are produced while fish is cooked.	<ul style="list-style-type: none"> <li>Since fish is salty and maintains its moisture, it is cooked while making a series of soft popping sounds. (The liquid may come out of the fish when the fish is cooked.)</li> </ul>	<ul style="list-style-type: none"> <li>Food with bones such as fish (e.g. mackerel) and pork (e.g. pork chops) is cooked while making a series of soft popping sounds. Wrap the food completely so that food particles or spattered oils do not stick to the oven walls or floor.</li> </ul>

## 8. Reference

### 8-2 Customer inquiry cases and countermeasures (Continued)

Symptom	Cause	Countermeasures
Strange smell is produced in the oven.	<ul style="list-style-type: none"><li>It may happen when food particles stuck to oven walls or floor.</li></ul>	<ul style="list-style-type: none"><li>Clean the inside of the oven. =&gt; Remove strange smell through the Deodorant button =&gt; If the strange smell still remains, place a piece of lemon on the turntable and operate the oven for 5 minutes by pressing the Deodorant button.(However, the smells produced from the food exposed such as herbal remedies are not removed.)</li></ul>
Error	<ul style="list-style-type: none"><li>Errors are classified with Failure and Non-failure.</li></ul>	<ul style="list-style-type: none"><li>Refer to the section of ERROR in User Manual.</li></ul>
Accessory		<ul style="list-style-type: none"><li>Visit the nearest Samsung Service Center or local dealer to buy accessories. Before visiting, check the model name printed on the lower right side of the front panel of the oven.</li></ul>
Number does not appear on the display screen.	<ul style="list-style-type: none"><li>It happens when the power saving function is activated.</li></ul>	<ul style="list-style-type: none"><li>Since the government recommends the reduction of electricity, the power saving function is performed for number display like that power cord is unplugged when the oven is not used. (Numbers are displayed when another button is pressed or when the door opens.)</li></ul>



### **GSPN (GLOBAL SERVICE PARTNER NETWORK)**

<b>Area</b>	<b>Web Site</b>
Europe, CIS, Mideast & Africa	<a href="http://gspn1.samsungcsportal.com">gspn1.samsungcsportal.com</a>
Asia	<a href="http://gspn2.samsungcsportal.com">gspn2.samsungcsportal.com</a>
North & Latin America	<a href="http://gspn3.samsungcsportal.com">gspn3.samsungcsportal.com</a>
China	<a href="http://china.samsungportal.com">china.samsungportal.com</a>