

*Sunbeam*<sup>®</sup>

# Service Manual

## Microwaves



20060808

## Warning

**Before doing any repair service, cut the power to the oven and discharge the capacitor.**

## INTRODUCTION

This Microwave Oven Service Manual is printed in a loose-leaf format. Each part is divided into sections relating to a general group of components and each section is subdivided into various parts describing a particular component or service procedure.

The subdividing of the subject matter plus the loose leaf form will facilitate the updating of the manual as new or revised components and service procedures are introduced.

Each page of this service manual will be identified in the lower right hand corner and, as new or revised pages are published, it will be easy to keep the manual up to date by following the filing instructions on the cover letter.

This Service Manual is a valuable service tool and care should be taken to keep it up to date by prompt and proper filling of subsequent pages as they are issued.

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## **SAFETY PRECAUTIONS**

### **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 misaligned 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.

THIS MANUAL, AS WELL AS THE INFORMATION CONTAINED IN IT, IS TO BE USED ONLY BY AN AUTHORIZED SERVICE TECHNICIAN FAMILIAR WITH AND KNOWLEDGEABLE OF PROPER SAFETY AND SERVICING PROCEDURES AND POSSESSING HIGH QUALITY TEST EQUIPMENT ASSOCIATED WITH MICROWAVE AND ELECTRICAL APPLIANCE REPAIR.

ALL INDIVIDUALS WHO ATTEMPT REPAIRS BY IMPROPER MEANS OR ADJUSTMENT SUBJECT THEMSELVES AND OTHERS TO THE RISK OF SERIOUS OR FATAL INJURY.

# BEFORE SERVICING

Before servicing an operative unit, perform a microwave emission check as per the Microwave Measurement Procedure outlined in this service manual.

If microwave emissions level is in excess of the specified limit, contact us immediately at 1-866-866-6283. If the unit operates with the door open, service person should:

- 1) tell the user not to operate the oven and
- 2) contact us and Food and Drug Administration's Center for Devices and Radiological Health immediately. Service personnel should inform us of any certified unit found with emissions in excess of  $4\text{mW}/\text{cm}^2$ . The owner of the unit should be instructed not to use the unit until the oven has been brought into compliance.

# WARNING TO SERVICE PERSONNEL

Range units contain circuitry capable of producing very high voltage and current, contact with following parts may result in a severe, possibly fatal, electrical shock.

(Example)

High Voltage Capacitor, High Voltage Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness, Heating Elements, etc..

Read the Service Manual carefully and follow all instructions.

# PRECAUTIONS FOR USING LEAD-FREE SOLDER

## 1. Employing lead-free solder

The "Main PWB" of this model employs lead-free solder. This is indicated by the "LF" symbol printed on the PWB and in the service manual. The suffix letter indicates the alloy type of the solder.

Example:

Indicates lead-free solder of tin, silver and copper.

## 2. Using lead-free wire solder

When repairing a PWB with the "LF" symbol, only lead-free solder should be used. (Using normal tin/lead alloy solder may result in cold soldered joints and damage to printed patterns.)

As the melting point of lead-free solder is approximately  $40^{\circ}\text{C}$  higher than tin/lead alloy solder, it is recommend that a dedicated bit is used, and that the iron temperature is adjusted accordingly.

## 3. Soldering

As the melting point of lead-free solder (Sn-Ag-Cu) is higher and has poorer wettability, (flow), to prevent damage to the land of the PWB, extreme care should be taken not to leave the bit in contact with the PWB for an extended period of time. Remove the bit as soon as a good flow is achieved. The high content of tin in lead free solder will cause premature corrosion of the bit. To reduce wear on the bit, reduce the temperature or turn off the iron when it is not required.

Leaving different types of solder on the bit will cause contamination of the different alloys, which will alter their characteristics, making good soldering more difficult. It will be necessary to clean and replace bits more often when using lead-free solder. To reduce bit wear, care should be taken to clean the bit thoroughly after each use.

# 1 THE HEATING PRINCIPLE OF MICROWAVE

Microwave is one kind of radio wave whose wavelength is very short, frequency is very high. Therefore, it is called ultrahigh frequency electromagnetic wave. Microwave can heat food mainly result in the mutual affect of the food in the microwave field and the microwave field itself.

Under the affect of microwave field, the thermal effect mechanism produced from the mutual affect of the microwave and the food includes two aspects. One is Dielectric loss of polar molecule; the other is conductive loss of ion.

Usually, food is constituted of organism (plant and animal). The organism is formed by all kinds of polar water molecule, polar protein molecule, and all sorts of saltion. The center of gravity of the positive and negative charge in the molecule is not coinciding. In normal condition, the molecule is in irregular order due to its thermal action, thus the food do not appear polarity. (FIG.1-1a). Under the action of outer electric field, the positive end of the polar molecule trend to the negative electric field, the negative end of polar molecule trend to the positive electric field, and somewhat arrange in order through the direction of the electric field (FIG.1-1c). This phenomenon usually is called "TORQUE POLARITY". When the outer electric field apply for the opposite polarity, the polar molecule then arrange an opposite direction order accordingly (FIG.1-1b). If the direction of the outer electric field changed repeatedly, the polar molecule would repeatedly sway accordingly. During the swaying, it is understanding that the polar molecule would produce heat due to somewhat similar friction among them. When the electric field is applied for ultrahigh frequent microwave field from the outside, its direction would change tens billion times per second, so do the molecule. This kind of molecule swaying producing similar frictional heat from the interference and block of the action strength among the molecule, and changed to microscopic microwave heating. Microwave heating not only concerned the nature of the matter itself, but also closely connected with the electric strength and frequency. When the frequency is low, the molecule swaying rate and the acute degree of the mutual friction among the molecule is low, and would produce much heat. When the frequency is too high, as the swing of the polar molecule is with rotating inertia, it made the swing do not in line with the changing rhythm of the electric field because of the friction drag, thus, actually lowed the polar molecule swaying speed. The friction dragging degree is concerning about the magnelectric wave frequency, polar molecule shape, and the matter's sticky degree. To different matter's molecule, there is different special frequency zone. Those absorbing microwave energy from this zone are most capable to turn microwave energy to heat energy.

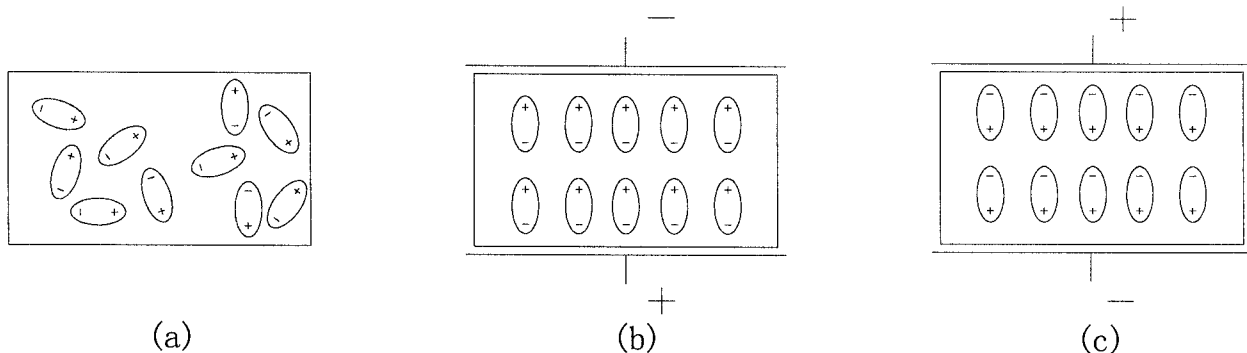


Fig. 1-1

Apart from the above said action, there is another action which is electric ion under the action of microwave field, act fiercely accompanied with the acceleration of electric field. The positive ion transfer to the negative polarity of the field while the negative ion does opposite. Accompanying with the changing electric field, the electric ion hanging accordingly. During the transferring, heat produced with the crash among the ion. This kind of action takes the main effect to those microwaves heating of high salt molecule.

No matter it is the polar molecule swaying or the ion transferring, they both are turning the microwave energy which the heating matter got from the microwave field to heat energy. From the analysis of theory, we can draw such a conclusion that the power which a unit of volume matter absorbed from the microwave field as the following formula:

$$P_a = KE f \text{Er} \text{tg } \delta$$

$P_a$  Stands for the power the heated matter adsorbed from the microwave field.

$K$  Stands for a constant

$E$  Stands for the microwave frequency.

$f$  Stands for the microwave frequency.

$\text{tg } \delta$  Stands for loss angle tangent of the heated matter.

$E_r$  Stands for relative dielectric constant of the heated matter.

## 2 THE STRUCTURE AND WORKING PRINCIPLE OF MICROWAVE OVEN.

Microwave oven can be classified to many kinds according to various construction, volume and control function. But anyhow, the main electric parts are all composed of high voltage rectification, cooling system. Microwave generator, electric control system and heating chamber (FIG.2-1). Its working process are as follows: 120V power frequency voltage transferred to the rectifier through electric control system, and then be changed to 4000V direct voltage by the rectifier, and be then transferred to the microwave generator, the generator starts working to transfer the microwave energy to the heating chamber for heating food through wave guide tube. At the same time, the electric control system set off the cooling system to cool the working rectifier and the microwave generator to keep the oven working steadily from a too high temperature. If something wrong with the cooling system cause the temperature too high, the control system would cut off the power automatically to prevent microwave generator being damaged from the high temperature. Now, we'd like to introduce the working principle of each part of the widely used model, mechanical control and touch control microwave oven.

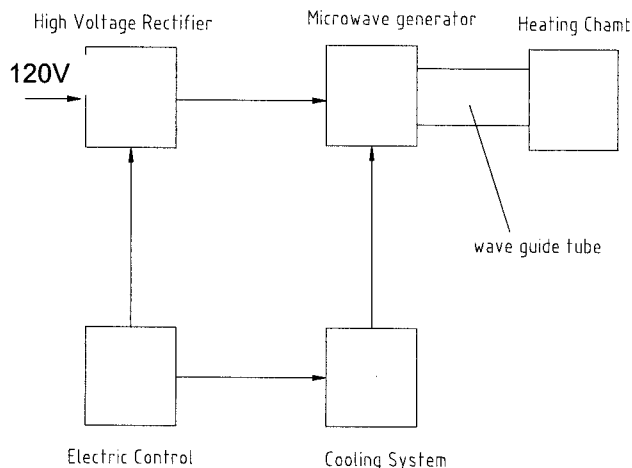


Fig.2-1

At the same time, the electric control system set off the cooling system to cool the working rectifier and the microwave generator to keep the oven working steadily from a too high temperature. If something wrong with the cooling system cause the temperature too high, the control system would cut off the power automatically to prevent microwave generator being damaged from the high temperature. Now, we'd like to introduce the working principle of each part of the widely used model, mechanical control and touch control microwave oven.

### 2.1 HIGH VOLTAGE RECTIFYING CIRCUIT.

At present, home use microwave oven adopt this high voltage rectifying circuit as shown at diagram 2-2. The circuit is a single phase, semi-wave, double voltage rectifying circuit. The circuit has only a high voltage capacitor, a high voltage diode, a magnetic leakage transformer besides the magnetron, is very simple.

The working principle of the circuit: 120V power boosted through the transformer, output about 2000V alternating high voltage current when the high voltage winding is at the positive half-circle, the high voltage winding is at the negative half-circle, the diode is cut off and the magnetron is conducted. The electricity charged at the positive half-circle of the capacitor is series connected with the positive phase of the winding voltage, and got a doubled, about 4000V direct high voltage, then transferred to between the cathode and the anode of the magnetron.

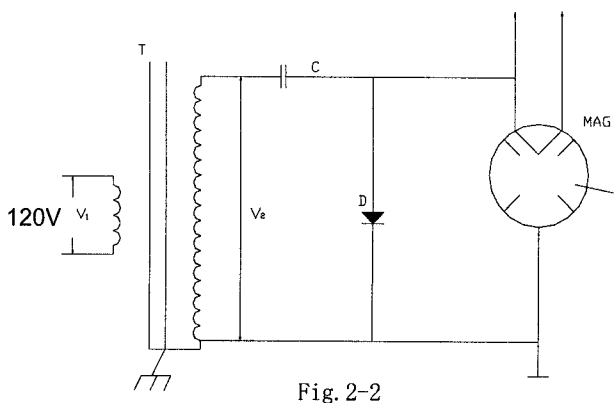


Fig. 2-2

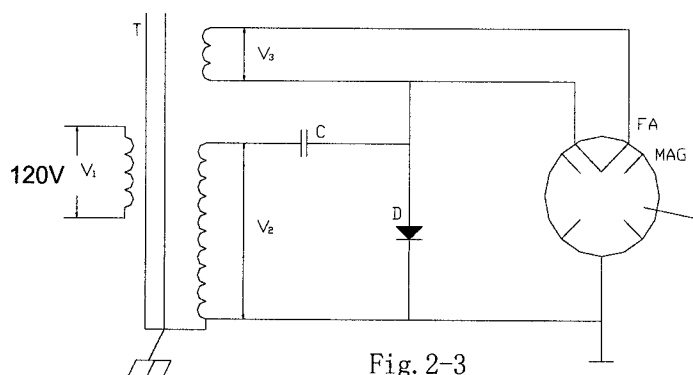


Fig. 2-3

## 2.2 MICROWAVE GENERATER.

Microwave generator is the heart of microwave oven. The quality of a microwave oven mostly depends on the quality of the microwave generator. A microwave generator is mainly composed of magnetron and its power supply circuit, FIG.2-3 is the typical circuit diagram of the present used microwave oven's generator. The power supply circuit is composed of rectifying circuit and filament circuit.

Usually, we adopt continuous wave magnetron. It can turn the direct energy which is applied to the magnetron after being high voltage rectified to microwave energy, the power supply circuit supply a direct high voltage between the cathode and anode of the magnetron, a filament voltage to the cathode filament of the magnetron.

The working process of the magnetron: When the anode volt-age gradually rises from zero, the anode current is approx.zero, the power is very small as well. When the anode voltage rises to "THRESHOLD" voltage value, the magnetron starts oscillating, and the anode current would increase obviously, provided the anode voltage rises a little more, the anode current would increase a lot (FIG.2-4), and would reach the rate value quickly.

If the anode voltage is undulating, it would cause the anode current swing fiercely, even made the magnetron stop oscillating. For keeping a steady output, the power supply circuit of the oven must supply a stead direct current voltage. The filament voltage of the magnetron must be supplied by an alternating current voltage. For simplifying the circuit, it would be supplied by the same leakage magnetic transformer with the anode power (high voltage power). The filament of the magnetron which the present used microwave ovens are all treated through some special technology, and all have the cold start character. But when in cold start, there still is a very strong surge electric field attached to the surface of the anode, and would be harmful to the anode. In order to reduce the surge voltage, the filament of the magnetron must be connected as the FIG.2-3 shown. In this figure, when the anode current of the magnetron circulates, the filament current should flow to the FA end from the lower end.

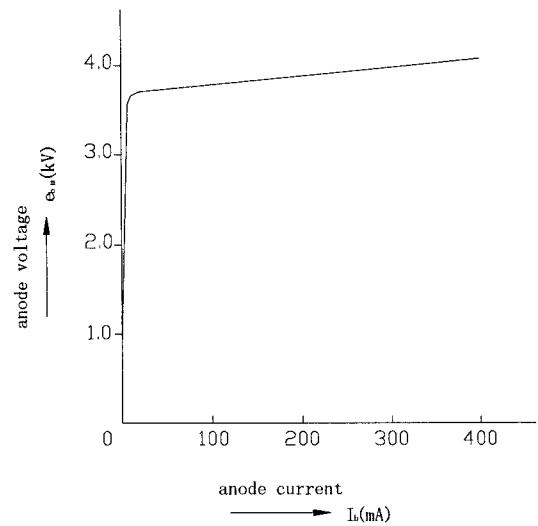


Fig. 2-4

## 2.3 COOLING SYSTEM

In the working process of the microwave oven, the magnetron often makes the anode temperature rise due to anode loss

caused by the electronics strike the oven surface and the heat radiate of the cathode. To prevent the anode temperature rise too high, thus affect the working steady and its life span, it is necessary to cool the magnetron. According to the different models and rate output of the magnetron, compelling wind cooling and flowing water-cooling can be adopted. Usually, the home used microwave oven adopts the compelling wind cooling method, and all are fixed with cooling fin.

Cooling system includes fan motor, air duct, air entrance, air vent etc. The flowing direction of the cooling wind should. Be parallel to the cooling fin of the magnetron. Generally, we adopt the method of air blast rather than air absorb. And all the cabinet of the oven is with air entrance and air vent, the hot wind blowing through the magnetron is guided with air tube to improve the cooling effect. In the technical parameter chart of the magnetron, it usually will give out the requirement of cooling wind. A shortage of cooling wind would damage the character of the magnetron, even burn out the magnetron. The amount that the fan blasted should not be less than the requirement. When fix the fan, attention must be paid to prevent the cool wind from blowing directly to the glass part of the magnetron to avoid blasting.

## 2.4 ELECTRIC CONTROL SYSTEM.

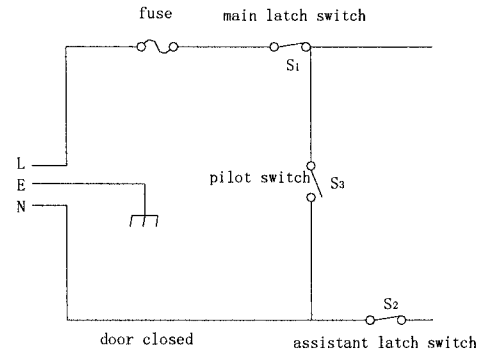
To those mechanical control microwave oven, electric control system mainly composes of interlock switch, timer, power distributor and thermal cutout, etc. The electric control system of those tough control microwave oven is

mainly composed of interlock switch, computer controller and thermal cutout, etc.

### 2.4.1 DOOR INTERLOCK SWITCH

Drawing 2-5(a) is the circuit and construction diagram of the door interlock switch. It mainly consists of latch switch (S1, S2), pilot switch (S3), door hook and starting mechanism of the door interlock switch, and S4 computer board switch.

There fixed hooks on the oven door, and opened two rectangle hole at the corresponding place at the right of the oven and the hook. Inside each rectangle hole, there fixed a micro switch. When the oven door closed, the two hook on it would insert into the rectangle hole, and just push down several micro switches. At that time, S1, S2 are closed, S4 computer board's switch is closed too, S3 is cut off, and the microwave oven is under preparation of working. To that mechanical control microwave oven, no sooner you turn the time switch to set the heating time than the power would be supplied to the back to start the oven. To those touch control microwave oven, hardly do you set the heating time and power, and touch the start button when the power would supplied to the back to start the oven. When press down the door release button, S1, S2 are cut off, S3 is closed, and the microwave oven would stop operating immediately. Provided due to some man - made or the appliance itself reasons, when the door is open, S1, S2 and S4 are closed, due to the pilot switch (S3) still at conducted condition would make the 120V voltage short-circuited and fused the fuse, and will never let the microwave oven working when the door is open. From this we can understand the function of the interlock switch is when the door is unclosed, the oven wouldn't work, when the door is opened when the oven is working, it would stop the working immediately (FIG.2-5b).



(a)

Fig. 2-5

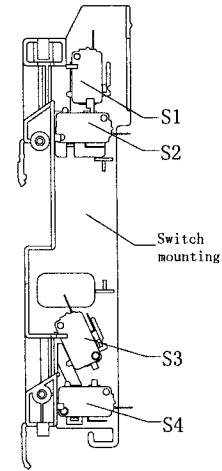


Fig.2-5b

### 2.4.2 TIME AND POWER DISTRIBUTOR

Time and power distributor is mainly composed of timer motor and two sets of gear switch S4 and S5. When the timer is at zero position, the gear switches are cut off, when the heating time is settled, the gear switch is closed. When started the oven, the time motor starts working. When it reaches the settled time, it would cut off the gear switch (S4) to step the oven working. The gear switch (S5) is designed for controlling the output of the magnetron. It mainly by the method which make the magnetron working internally at the same working point to change the output of the magnetron. This method was called "CONDUCTION RATIO CONTROL". But there is another method which is called "ELECTRIC LEVEL CONTROL" which is through changing the working point (such as anode voltage or magnetic field) to change the output of the magnetron. Because of conduction ratio control method is low cost, high function and high reliability, it is widely used for those microwave oven which have the power control

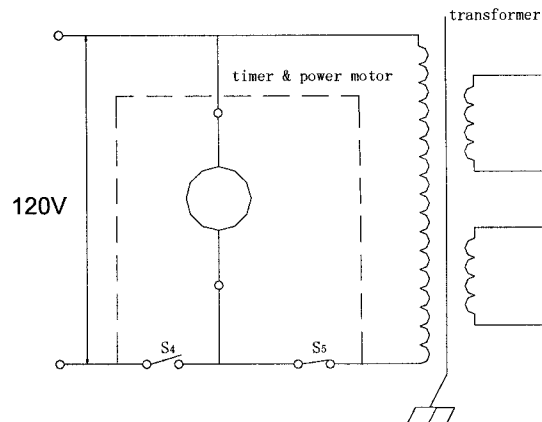


Fig. 2-6

function.

### 2.4.3 THERMAL CUTOUT

Thermal cutout actually is a thermal sensor switch, usually, it is fixed on the shell of the magnetron, and series connected with the primary circuit of the magnetron to control the power input. At normal condition, the thermal cutout is always conducted (FIG.2-8). When something wrong with the cooling system that cause some abnormal conditions, such as molding or thermal breakdown, which made the temperature of the magnetron reach the limit value. Then, the thermal cutout would work to turn off the power to prevent the magnetron from being damaged.

### 2.4.4 HEATING CHAMBER

Heating chamber is the place where the microwave and the food affect mutually. There are lots kinds of chamber. Accord-ing to the working characters, it can be classified to carton type, cavity type, radiation type, slow type (surface wave type), etc. The present adopt chamber for food cooking microwave oven is the typical carton type heating. (FIG.2-8). The heating chamber is mainly composed of oven door and oven cavity. From the microwave theory, it is a microwave resonant cavity that can contain many kinds of oscillating models simultaneously. Microwave enters into the oven cavity through the wave guide and the coupling appliance, and most of its energy is absorbed by the food after it is reflected in the cavity repeatedly, those which haven't been absorbed will be reflect to the magnetron. A good designed oven cavity should have a good impedance matching with the magnetron, the energy should be less reflect, and distribute evenly in the oven cavity, improve the heating efficiency. Generally, at the same input power, the larger the cavity, the less the energy density a unit volume would have in the oven, and the more energy on the inside wall of the cavity would lose, thence, it would certainly slow down the heating speed, low the heating efficiency. Moreover, too big of the cavity would either waste the material or appears very heavy. The material for cavity usually use non - magnetic stainless steel or zinc - plating steel, and have no high requirements for the conducting rate. The inside coating of the cavity requires beautiful in look, durable when use (should be resistant against damp, heat, acid and alkali), it should also comply with the food health requirements.

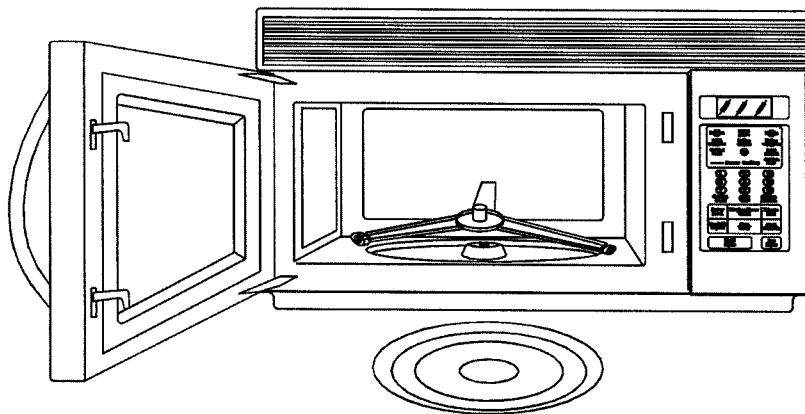


Fig 2-8

To improve the heating evenness there often fixed a turntable glass tray at the bottom of the cavity (FIG. 2-8). It is through changing the relative place of the microwave and the heating matter to improve the heating evenness. The turntable tray is usually made of heat – resistant glass, the glass contains some dielectric loss, it can, somewhat, protect the magnetron when the cavity loading less.

There often fixed a dust – proof, low – loss and heat – resistant dielectric cover (such as mica sheet). Sometimes, an impedance matching metal stick was fixed near the coupling or in the wave guide.

The door is designed for inspecting, taking and placing the heating food, it is also one side of the cavity (FIG .2 - 8). It is the most liable place where microwave leakage occurs. Especially, after a long time using, the microwave leakage would enlarge at the hinge and the hook. Anyway, mechanic damage would also cause large amount of microwave leakage. Therefore, the main methods designed for preventing microwave leakage of the door are as

follows:

1) Assemble a layer of steel filament or a thin metal plate with many holes at the middle of the window to made it is possible to observe the heating as well as shielding the microwave.

2) The widely used seal measurement at present is to assemble a current – resistant construct between the door and the doorframe. FIG.2-9 is the typical construction fig of the door. It was designed according to the theory of “THE TRANSFERING LINE ONE-FOURTH WAVE LENGTH IMPEDANCE CHANGER”. Although there is no connecting point from a mechanical point. It is sealed at the seam from the point of electricity, so it is called “CURRENT-RESISTANT”. Recently, with the installation of noise filter in the current resistant trough, the effect to restrain the microwave leakage (include high subharmonic) have been much improved.

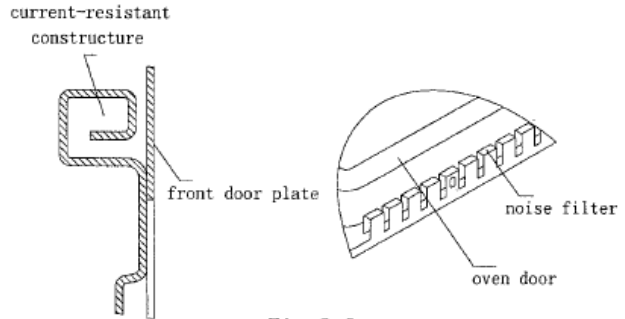


Fig. 2-9

### 3 TYPICAL CIRCUIT ANALYSIS OF MICROWAVE OVEN

We have introduced the structure and the working principle of the microwave oven previously. We shall analyze the complete set circuit of the microwave oven link with the practical circuit at this chapter.

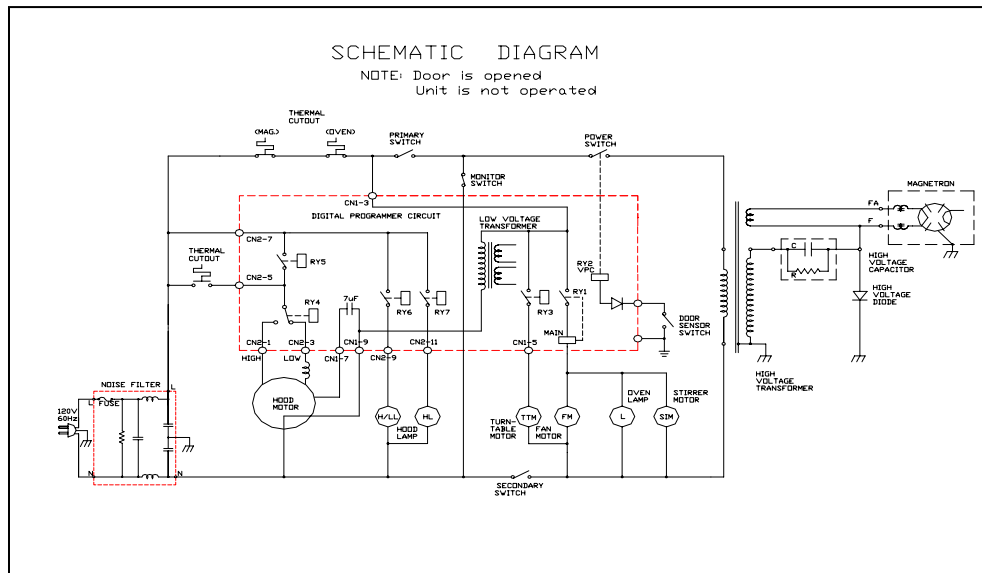


Fig.3-1 is the practical circuit diagram of a brand microwave oven. Its corresponding working conditions are as follows: The door closed, SW1(primary switch) and SW2 (secondary switch) turned on, SW3 (monitor switch) closed, power control relay has no power, R1, R2 is cut off. When cooking, touch the starting switch to power the timer and the power relay. RY1, RY2 closed the power supply to the anode of the magnetron and the filament, changing the power frequency electric energy to microwave energy, the microwave energy then transferred to the heating chamber for food heating. At the same time, the lamp turned on, the fan motor begins to cool the

magnetron. The turntable motor set off to drive the food around and making the food heated evenly. The microcomputer begins reckon the time, when it reached the sets time, power relay are cut off, the power of the lamp, all the motor and the magnetron are cut off, the food – heating process ended. During the heating, if the door was opened, the interlock S1, S2 will cut off, S3 will close, all the motors and the magnetron will also be cut off, the lamp will turn on, the oven stop heating immediately. If heating need go on, just push down the starting button and closed the door, the oven will continue its working. When something wrong with the fan motor or the air vent was blocked that breakdown the cooling system, the magnetron temperature would rise high very quickly. When the temperature reached the working point of the thermal cutout (S6), S6 will be cut off immediately to cut off the power supply to the magnetron and the magnetron will stops working right away. The PC board is cut off to prevent the magnetron from being damaged by overheating. When the thermal cutout is cut off, the magnetron, motors and the lamp would stop working simultaneously. Moreover, the thermal cutout has the self - resuming character, when the temperature lowered, it will resume to close condition.

Circuit diagram of computer controlled microwave ovens:

Circuit diagram for mechanical controlled microwave ovens:

## 4 HOW TO ASSEMBLE AND DISASSEMBLE MICROWAVE OVEN COMPONENTS

In the following pages, we will introduce the ways in which the various parts of a typical microwave oven can be disassembled and assembled.

### 4.1 THE CABINET

1. plug out of power source.

2. take the following steps to disassemble the cabinet:

- (1) 4-1 (a) take off the screws and separate the shutters from front of the oven as the illustration shows.
- (2) 4-1 (b) screw loose of the two shaft (don't have to take off), take out the oven from the installation board.
- (3) 4-1 (c) screw out 4 tapping screws, and push out the cabinet in the direction of the arrowhead.

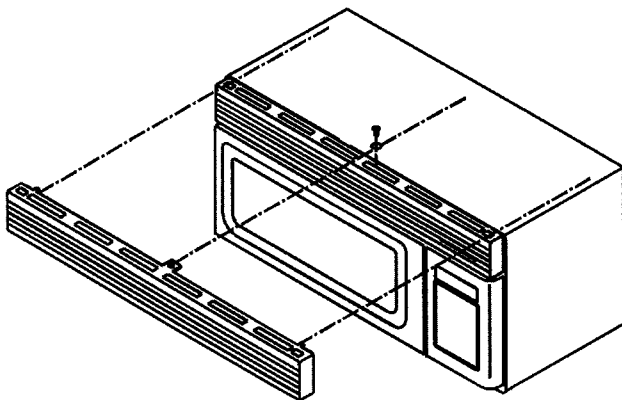


图 4-1(a)

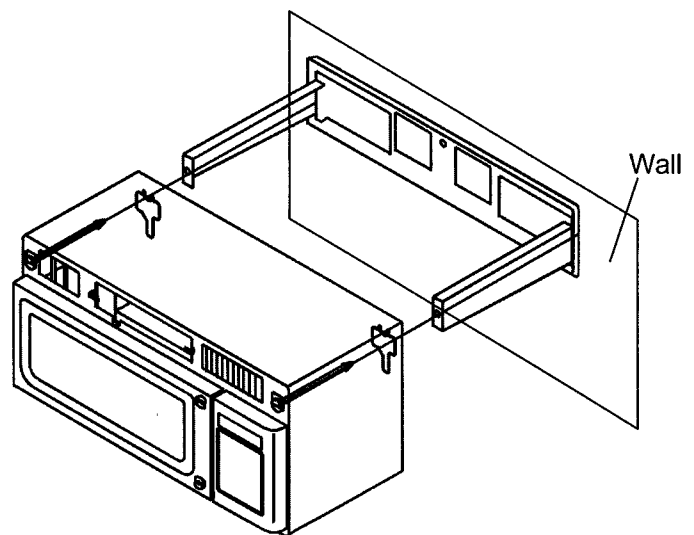


图 4-1(b)

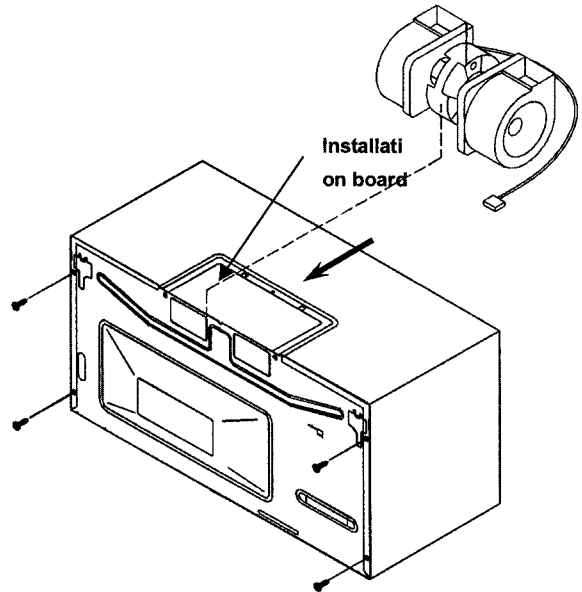
3.replacement of the cabinet.

- (1) smoothly put the cabinet onto the oven cavity and push forward.
- (2) Check whether the up, right and left troughs have been inserted with the curved rim of the oven . If the cabinet and the oven are not tallied exactly, then it should be reassembled or those untallied parts should be smoothed.
- (3) put the oven onto the installation board and push forward and screw tight the screws.

- (4) install the shutter onto the front of the oven. And screw tight the tapping screws.

## 4.2 FAN MOTOR

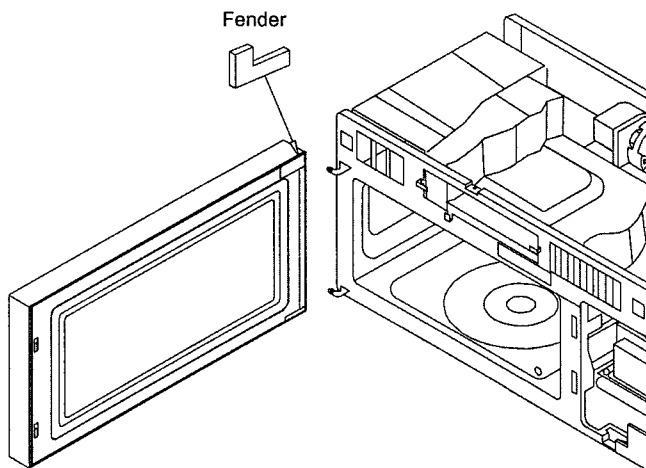
- 1、 Plug out of power source.
- 2、 Following the preceding steps to take off the oven from installation board.
- 3、 The steps below shows how to take off the fan motor:
  - (1)、 take off the installation board by taking off the screws 4-1c.
  - (2)、 take out the motor from the space opened.
- 4、 To install the fan motor:
  - (1)、 insert the motor from the open space back of the oven's cabinet. 4-1c
  - (2)、 shut off the space with the installation board. Check that the screws all in place and tight.



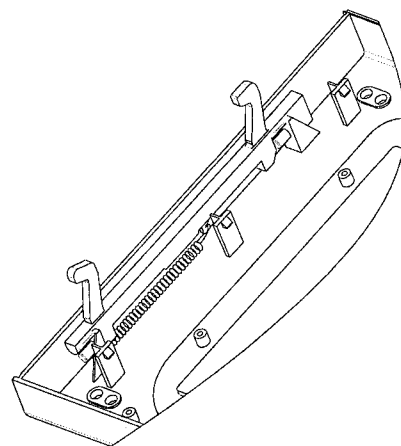
4-1 (c)

## 4.3 THE DOOR COMBINATION

1. plug out of power source.
2. following the preceding steps to take off the oven from the back installation board and take off the cabinet.
3. take the following steps to take off the door combination:
  - (1) take out the fender below the lower hinge (the inverted buckle connects these), and then uplift the door combination to take off the components. 4-2.
  - (2) pick open the buckle catch surrounding the cover plank (made of plastics and brittle so to be careful, and take off the cover plank.
  - (3) take off the door assembly after taking off the screws.
  - (4) take off the spring of the door hook and then the hook. 4-3
  - (5) take off the press mat from the location pole, and then move the door window in the direction of the door hook. 4-4
- (6) screw off door frame and the handle, take off the door handle parts.



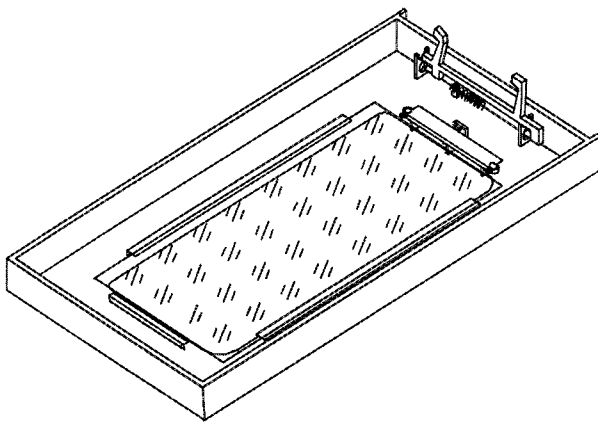
4-2 door assembly



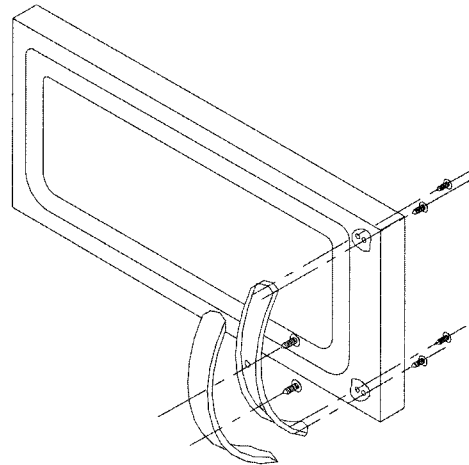
4-3 door hook

### Installation of door combination

- (1) screw the front and back parts of the handle together, and then assemble the handle into the installation tabs of the door frame with screws. 4-5
- (2) snap the door window board into three inner slots of the door frame, and aim the two holes of the press mat into the location pole of the door frame and press it onto the door window. (after installation, the silk face is up).
- (3) place the door combination into the door frame, buckle into the door frame, and screw tight of the screws between door frame and door.
- (4) Apply proper silicon grease or lubricating grease onto the axis of the door hook and install it onto the door frame, and then hook spring ( one end of the spring fastened into the hook of the door frame and the other end onto the groove of the hook.) , check that the door function properly. 4-3
- (5) press the cover board between the door and the door frame. Make sure that doorframe is hooked into the square holes of the cover board and the surface of the cover is not higher then the door.
- (6) aim the axis into the little holes of the hinge, and press the door combination down, and then hook into the hinge and install the fender. Check that the door open and close properly. 4-2
- (7) stick inner piece onto the inside of the door and check there is no air bubble between and close the door.



4-4 door assembly



4-5 door handle

## 4.4 THE CONTROL PANEL AND THE DOOR RELEASE MECHANISM.

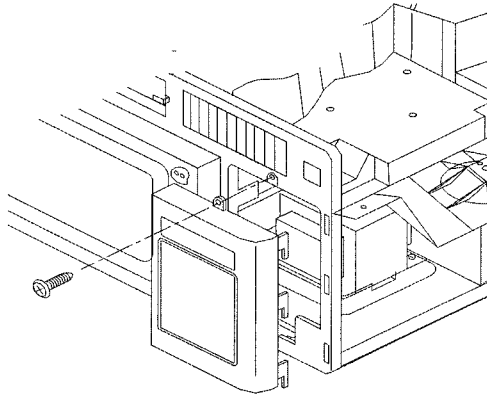
Pull out the power plug.

Take off the cabinet.

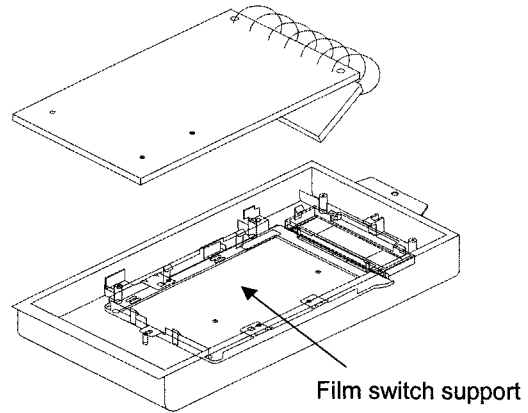
Discharge between one end of the capacitor and the baseboard with a screwdriver.

4. take off the control board.

- (1) plug out connector to the computer board.
- (2) loosen screws between control board and front board, lift the control board and take off the control board. 4-6
- (3) loosen the screws fastening the circuit board, take off the film switch plugs and take off the circuit board. 4-7.
- (4) loosen screws fastening the support of the film switch. Open the four invert buckles and take off the film switch support. 4-7.



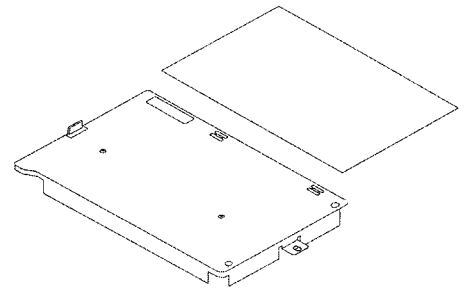
4-6 control board



4-7 circuit board

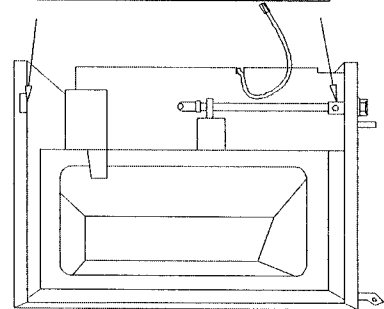
5. the steps to install the control panel

- (1) paste fast the film switch to the surface of its support.4-8.
- (2) put the screen and the film switch in their respective place on the board, and buckle tight the rim, and then with tapping screws fastening the film switch onto the control board. 4-7.
- (3) (3) place the circuit board onto the film switch support and screw tight and plug in the computer board.
- (4) fasten the control board with the front board with tapping screws. 4-6.
- (5) plug in the connector to the computer board.



4-8 film switch

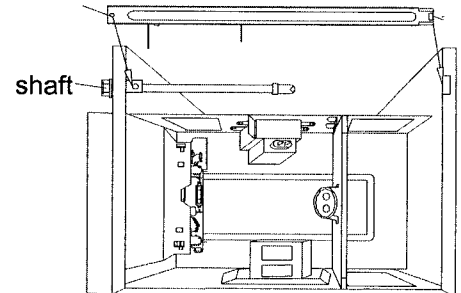
Groove left shaft screw



**4.5 LEFT AND RIGHT SHAFT**

- 1、 firstly, proceed with the first 3 steps of this section.
- 2、 plug out the terminal of the temperature sensor from left shaft, and loosen the screw to take off the left shaft from groove.
- 3、 loosen the screws fastening the right shaft, and take off the right shaft.

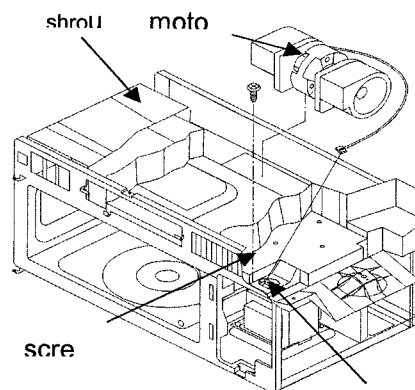
screw hole left shaft



4-9 left and right shaft

**4.6 FAN SHROUD.**

1. firstly, proceed with the first 3 steps of this section.
2. plug out of the fan motor from out of power source and screw off the fan shroud. 4-10
3. take off the fan motor's parts.



4-10 disassembles the fan sock

#### 4.7 CAPACITOR

1. firstly, proceed with the first 3 steps of this section and 5, 6.

2. steps involved in taking off the capacitor.

(1) plug off conductor to the capacitor.

(2) take off the screw fastening the capacitor holder to the cavity and the right base plate, and take off the capacitor assembly.

(3) screw off capacitor holder and take off the capacitor. 4-11

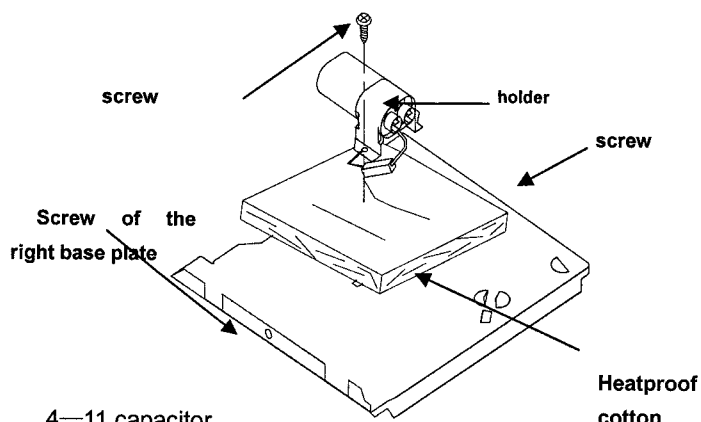
3. to assemble the capacitor.

(1) firstly, put onto the capacitor holder heatproof cotton, and paste a piece of insulation film and afterward screw fast

the capacitor onto the holder. 4-11

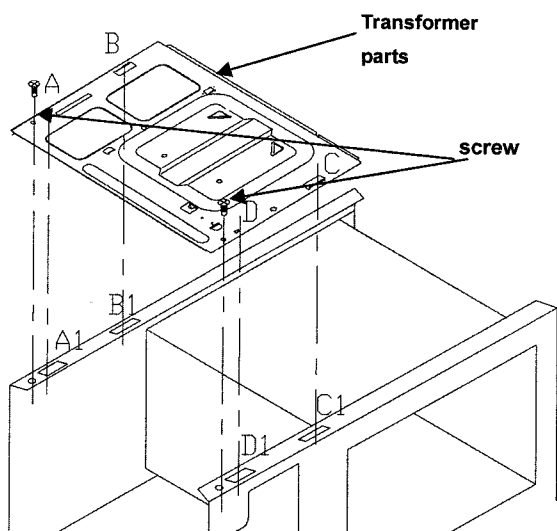
(2) place the capacitor holder between the cavity and the right baseplate and screw fast.

(3) plug in the terminal of the conductor.

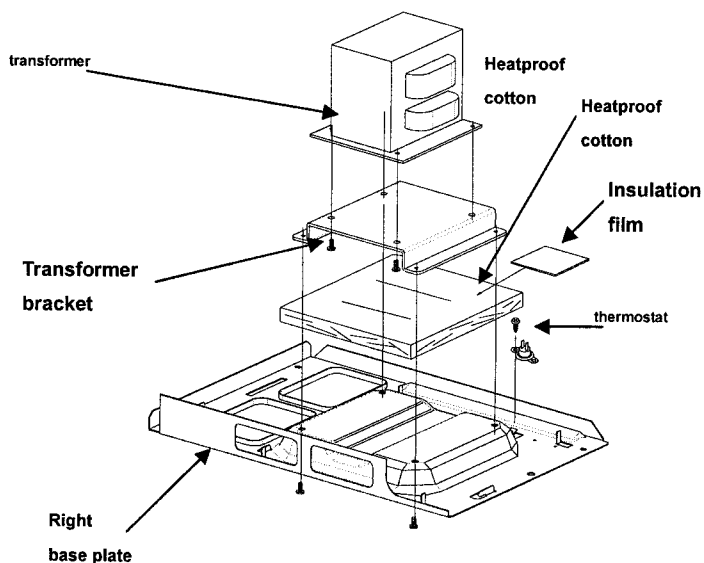


4-11 capacitor

#### 4.8 TRANSFORMER



4-12 transformer parts assembly



4-13 transformer

1、 firstly, proceed as the first 3 steps of section 1. and sections 5,6,7.

2、 take off transformer parts.

(1) take out base plate after take off the screws between cavity and the base plate. 4-14

(2) plug out all the connectors on the transformer and capacitor.

(3) take off the screws between capacitor and right base plate and cavity and take out capacitor and then right base plate, and take off transformer parts. 4-12.

(4) loosen the screw between transformer bracket and the right base plate, take off the bracket and heatproof cotton, loosen the screw fastening the transformer and take off the transformer. 4-13.

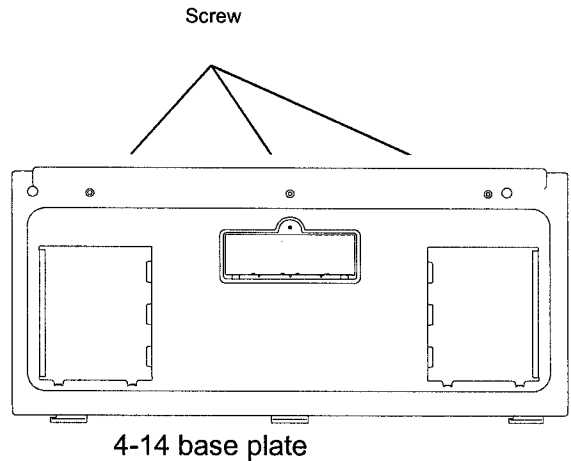
3、 replace the transformer

(1) 4-13, fasten the transformer onto the transformer bracket, and screw on.

(2) place heatproof cotton onto the right base plate, and place the bracket onto the heatproof cotton, then use screws to fasten the transformer bracket onto the right base plate. 4-13.

(3) 4-12 install the transformer parts onto the cavity, and fasten the screws.

(4) plug in all the connectors of the transformer.



#### 4.9 THE MAGNETRON.

1、 proceed with the steps in section 8.

2、 steps to take off the magnetron.

(1) plug out the two conductors from the thermostat on the magnetron as well as the conductors from the filament of the magnetron.

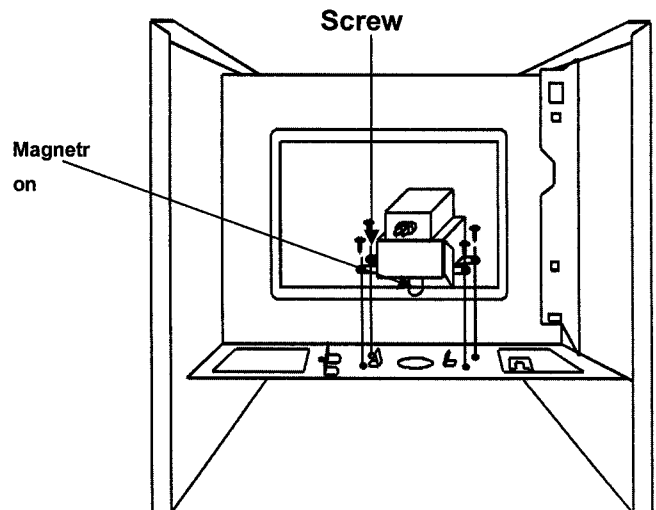
(2) loosen the screws fastening the magnetron and take off the magnetron. 4-9.

3、 steps to install the magnetron.

(1) check that the washer made of brass wires in place of the bottom of the magnetron. There is danger of insupportable microwave leakage due to inadequate earthing of the magnetron and the cavity if without the brass wires.

(2) carefully aim the magnetron's antenna to the installation hole and spin the screws to fasten the magnetron. 4-9

(3) plug in the filament and the thermostat.



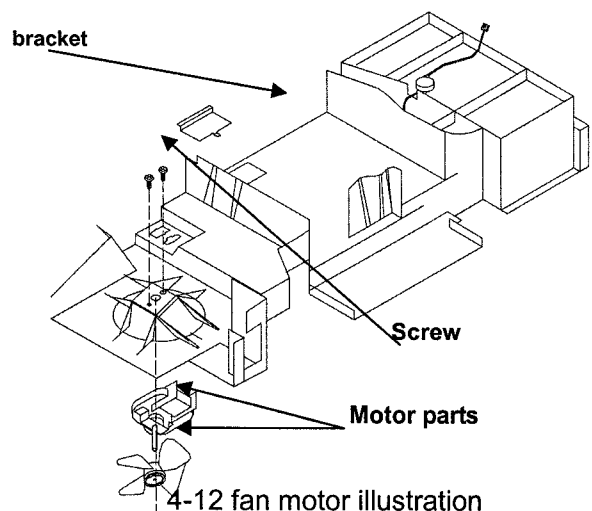
#### 4.10 THE FAN MOTOR.

十、 steps to take off the fan motor.

1. firstly, proceed as the first 3 steps of this section and the 5, 6 sections.

2. take off the fan motor

(1) plug out the two connectors of the fan motors, and take off the screws between the fan shroud and the cavity and



take out the parts.

(2) 4-12 take off the screws fastening the fan motor and fan shroud, and take off the fan motor and fan blade from the fan shroud.

3. steps to install the fan motor.

(1) install the fan motor and fan blade onto the fan blade as 4-12 shows, and fasten with tapping screws. Takenote that the axis of the motor is not bend in any way and the blades are not bend. Manually spin the blades to see if it work properly.

(2) place the fan shroud onto the cavity and connect to the fan motor's two terminals and with tapping screws fastening the fan shroud onto the cavity.

#### 4.11 THE DIODE

1. proceed as the first 3 steps of this section and sections 5, 6, 7.

2. steps to take off the diode.

(1) plug out the terminals connecting diode to the capacitor.

(2) loosen the screws and take off the diode.

3. steps to install the diode.

(1) one end of the diode is inserted into one of the capacitor's three connecting pieces.

(2) fasten the diode's earthing piece with a screw. ( take notice of the polarity of the diode.)

#### 4.12 THE TURNTABLE

1. firstly, proceed with the first 3 steps of section 1.

2. steps to take off the turntable.

(1) take the glass tray, roller ring and the shaft out of the cavity.

(2) place the oven upside down, loosen the screws fastening the base plate and the cavity and take off the base plate. 4-14.

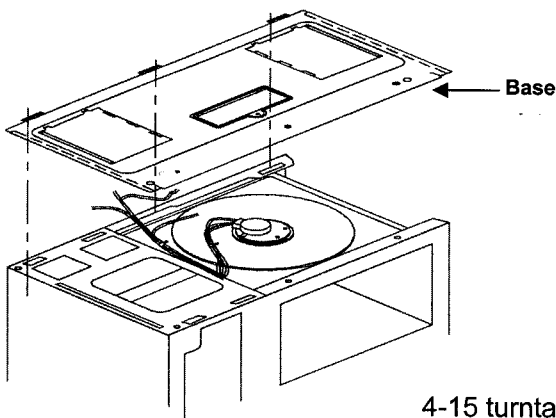
(3) plug out the conductor connecting the turntable motor, loosen the screws fastening the turntable motor, and take off the motor. 4-15.

2. steps to install the turntable motor.

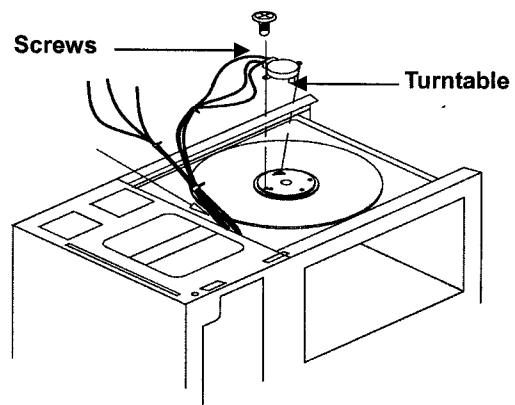
(1) place the turntable motor onto the cavity frame, insert the shaft of the motor into the installation hole, and fasten the necessary screws and plug in the conductor. 4-15.

(2) snap in the tabs of the base plate to the grooves of the cavity frame, and on the other side fasten the baseplate onto the cavity with screws. 4-14.

(3) turn the oven upright again, and place in roller ring and glass tray.

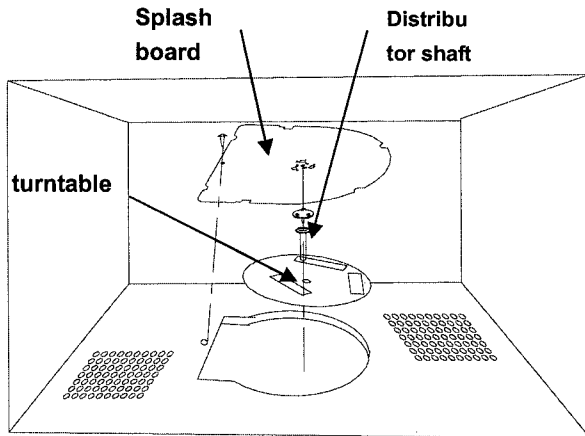


4-15 turntable

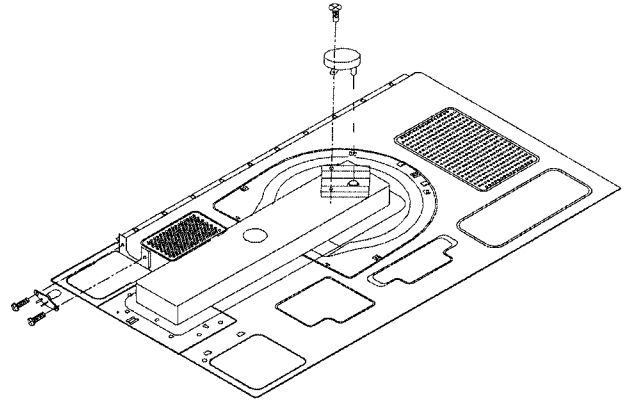


#### 4.13 DISTRIBUTOR ASSEMBLY

1. proceed with the first 3 steps of this section and the sections 5,6.
- (1) loosen the screws fastening the turntable motor, and take off the turntable motor from the cavity frame. 4-17
- (2) place the oven upside down, dismantle the plastic pin fastening the splash proof board and cavity and take out the splash proof parts. 4-16.
- (3) take off the distributor socket from off the splash proof board, and take the shaft and turntable apart. 4-16.



4-16 distributor turntable



4-17 distributor motor

### 3. steps to install the distributor assembly

- (1) set the microwave oven upside down, 4-16, assemble the distributor turntable, shaft, socket and the splash proof board, and then install the splash proof board to the cavity frame and fastening it with plastic pins. 4-16.
- (2) set the oven upright again, install the distributor motor on top of the oven cavity, fasten the motor's shaft to the installation hole with screws and then check if the turntable assembly work properly. 4-17.

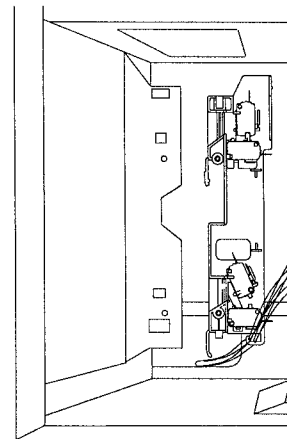
## 4.14 STEPS TO TAKE OFF THE INTERLOCK SWITCHES

1. proceed with section 6.
2. steps to take off the interlock switches.
  - (1) plug out the interlock switch and the monitor switch.
  - (2) loosen the screws fastening the switch mounting, and take off the switch mounting.
  - (3) take the interlock switches and the monitor switch from off the switch mounting. 4-18.
  - (4) take off the switch rotary arm and the action lever from the mounting 4-18

### 3. steps to install the switch mounting.

Install according to the schematic diagram of the interlock switch mounting.

- (1) place the rotary arm and the action lever into the switch mounting.
- (2) place the interlock switches and the monitor switches into the switch mounting ( take note that their respective positions of the interlock switches and the monitor switch. )
- (3) fasten the switch mounting onto the front board. 4-18.



4-18 interlock switches

(4) check the door hook and the switch mounting if their coordination is reliable. Close the door fast and push the door frame up and down to see if the door parts are loose. If there is occurrence of loosed parts of the door, then adjust the switch mounting of its position. If the upper door hook loosens, push the door inward and loosen the up screw so to push the switch mounting inward and then fasten the screws fast. The same with the occurrence of the lower door hook, if it is loose, then loosen the screw to the lower part of the switch. After the adjustment of the switch mounting, the door parts should function properly and with no or little loose.

## 5 BREAKDOWN ANALYSIS AND THE MEANS OF OVERHAULING

Before overhauling a microwave oven, you should judge the breakdown and the cause correctly, then you can repair it with corresponding ways. The overhauling must be proceed in order, any hasty conclusion is not recommendable, otherwise over-working would be done when repair. The microwave oven may occur compound breakdown due to all kinds of different reasons, thus, when overhaul, they all should be taken into consideration. Special attention must be given to the microwave leakage and the electric insulation when examine because they may do harmful to the repairing staff.

### 5.1 EXAMINING THE BREAKDOWN CAUSES.

How to examine a microwave oven with breakdown? A better means which demonstrated in practical operating are through inspecting and listening. On the basis of large amounts of perceptual knowledge, you can judge and analyse the break down quickly and correctly.

#### 5.1.1 INSPECTION.

Inspect whether the oven shape is disordered and where is the disordered position, If any. It is normal if the cabinet disordered a little, but abnormal if the oven, the door disordered, the door hook broken, the door crooked, or there are too much looseness between the door and the oven after the door is closed .

#### 5.1.2 LISTENING.

Listening to the sound of the oven operating and the noise of the fan. Minor "wen wen" noise, cycling "kala" noise and "shishi" noise should be considered as normal. But it is abnormal if the following noises occur:

- (1) Sound "wen wen " noise.
- (2) Long time "shishi" noise.
- (3) Strike sound like "Pipa pipa"

### 5.2 SPOT EXAMINING STEPS OF THE MICROWAVE OVEN

#### 5.2.1 EXAMINE THE MICROWAVE INSULATING RESISTANCE

Measure the insulating resistance with a avometer or a megaohmmeter the value should not be less than 2 megaohms. Otherwise, part examination should be taken at once. Such as checking whether the motor, the thermal cutout, the transformer or the capacitor are electricity leaking.

#### 5.2.2 EXAMINATION OF THE RESISTANCE VALUE OF THE MICROWAVE OVEN.

Close the door, set the time (the oven is at operating condition but the power plug haven't been plugged in ), measure the two feet (L - N) of the power plug with R×1 grade of an avometer, the resistance value should be about 2.5 ohm. If open circuit occurs, then you must check whether the 8A fuse is broken, the primary winding of the transformer is open circuit, the thermal cutout is open circuit or not, you must check whether the interlock device is put through or all the plugs are connected well. If short circuit occurred or the resistance

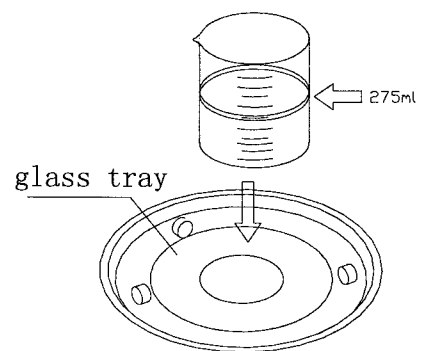
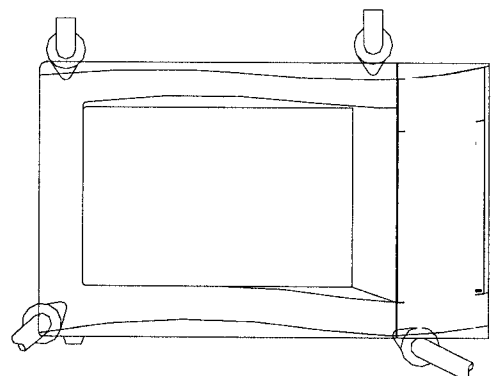


Fig. 5-1



less than 1.5 ohms, you should check whether the primary winding of the power transformer is short – circuited or part short – circuited.

### 5.2.3 EXAMINATION OF MICROWAVE LEAKAGE.

Measure the microwave leakage with a microwave leakage measure. Place a graduate of 275ml water at the middle of the glass tray of the oven (FIG.5 - 1). Close the door, power set high, time set to 3 minutes, press the starting button to operate the oven. After rectified the microwave leakage measure, measure around the door crack, those hole position of the window and the air vent at four sides of the oven with the probe of the measure. When measure, the moving speed of the probe should not exceed 25mm per second, and the measuring direction should be the same with the outing direction of the probe should not exceed 25mm per second, and the measuring direction should be the same with the outing direction of the microwave leakage (FIG.5 - 2)..

When measuring the ultimate value of microwave leakage of all the measure position should not exceed 1 milliwatt/cm<sup>2</sup>, of should be considered as abnormal.

### 5.2.4 EXAMINE WHEN THE OVEN AT OPERATING, BUT THE FOOD CAN'T BE HEATED.

(1) Examine when the lamp is on, the glass tray is cycling, the fan operating in normal:

Take off the cabinet, starting the oven, measure the plug of the transformer with an avometer to see whether it is enough to 120V. If it is enough to 120V, then the secondary high voltage of the transformer should be examined as FIG.5 – 3.

Measure it with the 2500V-alternating grade of model 500 avometer. One rod of the avometer connects the iron core of the transformer, the other rod connects the secondary high voltage plug (FIG.5 - 4). The avometer reading should be about 2100V (when measure, be careful with the high voltage). If no voltage at all, it indicates that the transformer has broken, and should be replaced by a new one. If it is enough to 2100V, then check the filament voltage of the transformer with alternating 10V grade of an avometer, the value should be about 3.4V (FIG.5 - 5).

If there is no voltage at all, it indicates the transformer has broken, and should be replaced by a new one. If it is enough to 3.4V, check the filament resistance of the magnetron, measure the filament plug with the R×1 grade of a avometer (FIG.5 - 6). If it is open – circuited, it indicates the magnetron has broken, and should be replaced by a new one. It is normal if the resistance very small. Then check whether the magnetron steel has broken, if broken, replace with a new magnetron.

If there is no problem with the magnetron, check the high voltage diode then. Measure the diode with R×10K grade of an avometer, the “+” rod end of the avometer connect the cathode of the diode, the “-” rod end of the avometer connect the anode of the diode (FIG.5 - 7).

The avometer reading should be about 150 thousand ohms. The change the rod to different electrode, the reading should be “∞” . If the reading is very small, and near to short circuit, it indicates the high voltage diode has been punctured, and should be replaced by a new one.

If the high voltage diode is OK, then check the forwarding plug

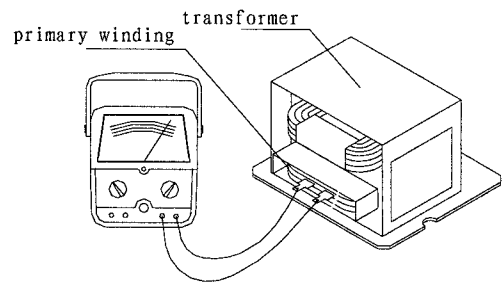


Fig. 5-3

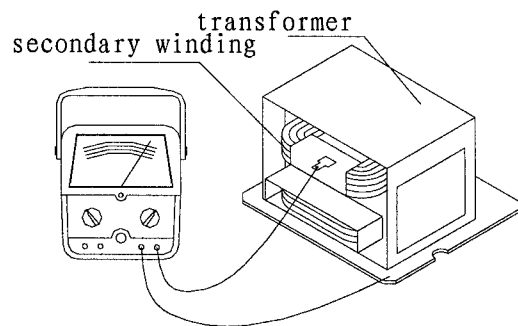


Fig. 5-4

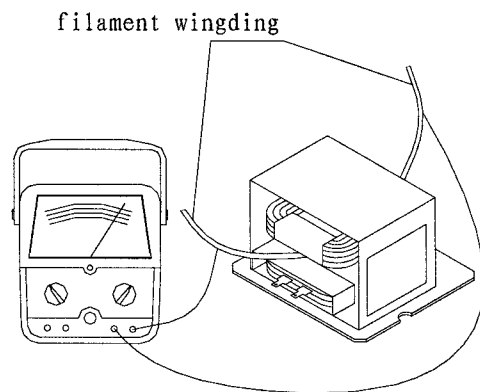
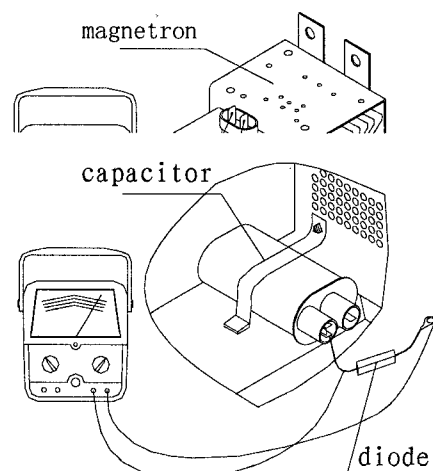


Fig. 5-5



of the transformer to see whether it is enough to 120V. If it is not enough, check the micro – switch of the time and power distributor. Connect the two rods of the avometer to the 1,2 place of the timer with R×1K grade. It is normal if the reading is “0” when at cut off condition. If the reading is “∞”, it indicates the micro switch has broken, and the timer should be replaced by a new one. If all the above examination shows normal ,then check whether the terminal plug of the magnetron and the capacitor have loosened, if it is loosened, pinch it tightly with a pliers.

### 5.2.5 EXAMINE THE STARTING AND THE 8A FUSE OF THE MICROWAVE OVEN.

Pull out the power plug, take off the cabinet, discharge the capacitor, measure the resistance value of the primary winding and the secondary winding of the transformer with an avometer (FIG.5 – 10 and FIG.5 - 9). The resistance value of the primary winding should be about 2.2 ohms, the secondary winding should be about 130 ohms. Otherwise, it indicates the transformer has broken, and should be replaced by a new one.

If the transformer is normal, then the high voltage capacitor should be checked. Pull out the connecting plug of the capacitor, and measure it with R×1 grade of an avometer, the two rods of the avometer connect the two polarity of the capacitor. When they just connected, the reading of the avometer should be zero, then increases to nine megaohm slowly. Change the rod to different polarity, the reading repeat from zero to nine megaohm (FIG.5 - 11), it means the capacitor is normal. If the indicator of the avometer can't point out from zero to nine megaohms, it indicates the high voltage capacitor has broken, and should be replaced by a new one.

If it is normal between the two pole of the capacitor, then the insulation between the capacitor pole and the cabinet should be measured with R×10K grade of an avometer. The resistance value should be “∞” (FIG.5 - 12). If it is short circuited or have a number reading, it indicates that the capacitor has been punctured or electricity leaked, and should be replaced by a same model, same capacity one.

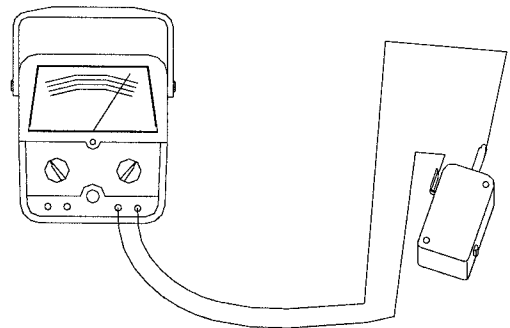


Fig. 5-8

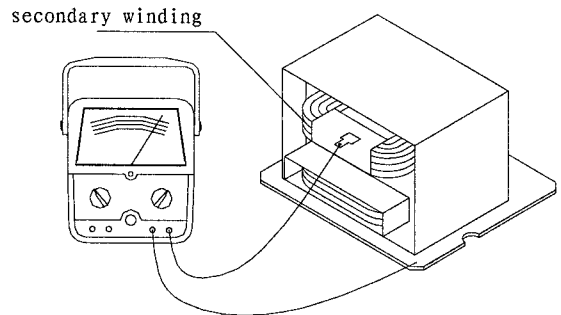


Fig. 5-9

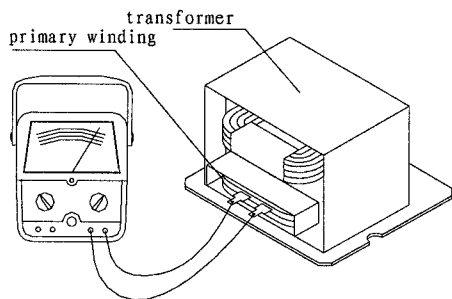


Fig. 5-10

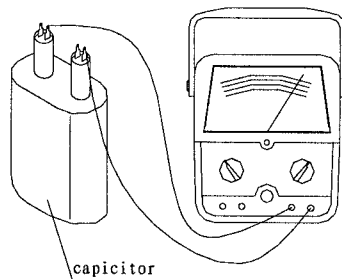


Fig. 5-11

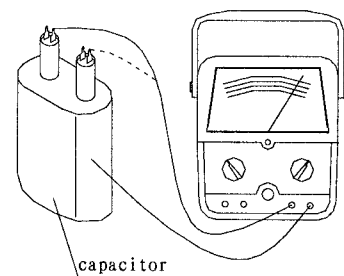


Fig. 5-12

If the resistance value of the capacitor's two pole are “∞”, the capacitor is normal. Then check the earth of the magnetron's two filaments to see whether they are short – circuited (FIG.5 - 13). If they are short – circuited and the filament strikes the shell of the magnetron, it indicates the magnetron has broken, and should be replaced by a new, same model one.

If the magnetron is also normal, then test the pilot switch. Pull out the two plugs of the switch. Measure it with the R×1 grade of avometer, the two rod connect the plug of the switch, the resistance value should be “∞” (FIG.5 - 8).

Then press down the pilot switch with a screwdriver, if the

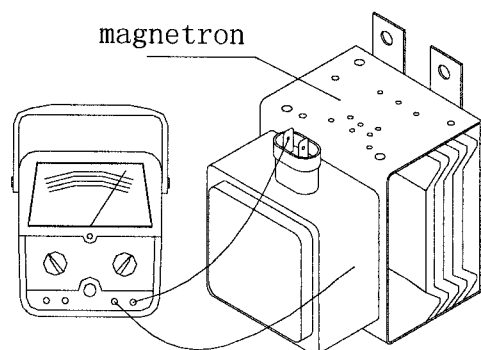


Fig. 5-13

reading of the avometer pointed to zero, it indicates the pilot switch has broken, and should replace it with a new, same model one.

### 5.3 REPAIRING METHOD OF SEVERAL BREAKDOWN

1. Repair when there occurred large amounts microwave leakage. There are many factors which may cause microwave leaking. Following mentioned may be the main causes of microwave leakage:

- (1) The door deformed, the hinge loosed or damaged that caused the door can not close tightly.
- (2) The door pressing cover or the embed piece damaged or come off.
- (3) Obvious damage or uneven of the oven.
- (4) There are filth between the door and the oven.
- (5) The door and the oven are serious loosed after the door closed.
- (6) The crack of the door shielding net cover.

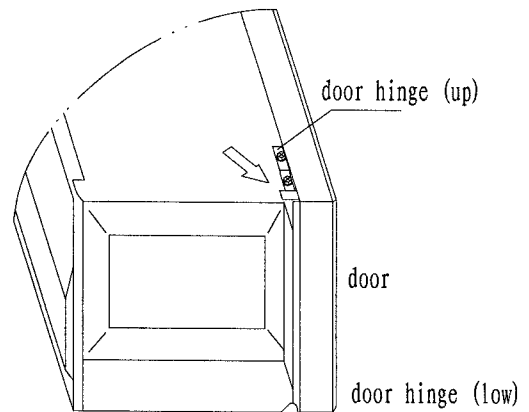


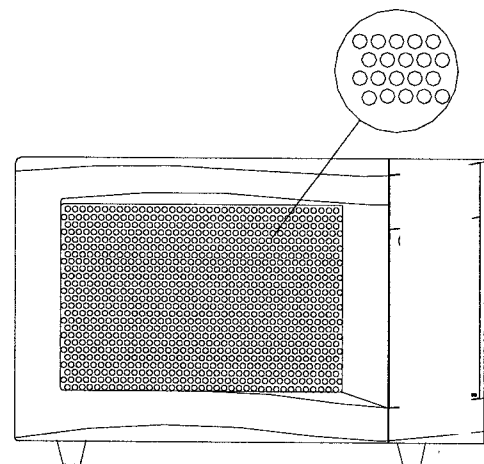
Fig.5-14

Before repairing, check whether the above listed point are existed, if not, can you start the microwave oven. Place a graduate of about 275ml water at the middle of the glass tray, close the door, time set at 3 minutes, power at high, make the oven operating in normal. Rectify the microwave leakage measure, measure the amount of the microwave leakage around the oven with its probe. If there are places which the leakage exceeds the standard requirement, then repair them accordingly. If the leakage amount exceeds 1 milliwatt/cm<sup>2</sup> at the left door crack, then pull out the power plug, take down the cabinet, adjust the screws of the hinge (up and low) as figure5-14 to less the gap between the door and the oven. Then measure again, the leakage amount should be less than 1 milliwatt/cm<sup>2</sup>. Generally, it should be controlled below 0.75 milliwatt/cm<sup>2</sup> with some allowance.

If the leakage occurred at the right door crack, adjust the screws which fix the interlock holder and the hook. If the leakage is the larger side at the right – above of the oven, then adjust the upper screw as FIG.5 – 15. Loosen out the screw, push the door close to the oven to hook the door hook with the plastic parts, then tighten the Screw again. If the leakage is larger at the right – below, then adjust the lower screw as FIG. 5 – 15. Loosen the screw, push the door close to the oven to hook the door hook with the switch holder tightly, then tighten the screw again, and open and close the door repeatedly, to check whether the door can operate flexibly, whether the hook and the switch are in their normal position. If it is not in position, then adjust the door hook and the switch holder repeatedly to make them to normal position, to put through the interlocks, to cut off the pilot switch, to less the loose between the door and the oven, then measure the leakage with microwave measure again.

If the leakage still exceeds standard requirement, then inspect whether the right oven is even or not, if not, smooth it. Then adjust the door and the oven to eliminate their loose to the ultimate.

If there still exist microwave leakage, measure near the magnetron with the probe of the microwave leakage mea-sure. If the leakage is larger, the oven should be turned off and check whether the four screws which fix the magnetron have been loosed, if loosed, twist them tightly with socket wrench. If the four screws are fixed, then the magnetron should be taken down to check the copper filament weaved washer of the magnetron has been placed well or whether the wave guide housing coupling has been oxidized or have lacquer on it. If do have, scrape the oxidized layer or the lacquer off. When fix the magnetron, the copper filament weaved washer must be placed well, the screws must be twist tightly. Then turn on the oven and measure again until it comply with the requirement. If the microwave leakage is larger at those hole position of the window board. The oven should be turned off to inspect whether there are crack among them (fig.5 - 16). If several holes formed a crack, it would enlarge the microwave



leakage.

leakage.

leakage. If that is the case, it indicates the door has broken, and should be replaced with a new door.

2. Means of repair when the oven can heat, but the turntable glass can't move

Firstly, check whether the turntable holder is placed correctly. If it is correct, then pull out the power plug and take down the turntable combination, measure the resistance value of the turntable motor R×1K grade of a avometer. If it is open – circuited, it indicates the turntable motor has broken, and should be replaced by a new, same model one. If the resistance value is between 15 –22 K, it indicates the turntable motor is normal. Then check the connecting shaft weave. If the plastics which the shaft insert in has broken, a new shaft weave should replace it .

3. Repair when the oven can heat, but the lamp is not on.

Pull out the power plug, take down the cabinet an discharge the capacitor.

Pull out the two terminal plugs of the lamp. Measure the two plugs of the lamp with the R×100 grade of a avometer.

If it is open – circuited, it indicates the lamp has broken, and should be replaced by a same model one.

4.Means of repair when the oven stop working after several minutes operating.

The phenomenon indicates the thermal cutout is playing its protective role, and you should check whether the fan is working in normal. Turn off the oven, pull out the power plug, take down the cabinet, discharge the capacitor, then turn the fan with hand to see whether it is moving flexibly. If not, it indicates that the oil bearing of the fan motor has run off the oil, and should take down the fan combination to repair the motor. Loosen the two screws which fix the bearing out the shaft and the bearing, and rinse them with kerosene (ATTENTION: The bearing can only be wiped with a silk which moistened with kerosene rather than be washed in the kerosene because there are felt on it. If the felt are soaked with kerosene, then the engine oil can not be sucked up. ). After the bearing being cleaned, the felt should be refueled fully with engine oil (for when the oven is operating, the engine oil empty into the oil bearing slowly). Fix the bearing cover with two screws, turn the fan around till it can move flexibly. Then install them to the oven, and plug in the two terminal plugs.

If the fan can move flexibly, then the winding of the fan motor should be examined. Measure the winding with R×100 grade of a avometer, if it is open – circuited, it indicates the winding of the fan motor has broken, and should be re-placed by a new, same model one.

## **5.4 THE CHARACTERS REQUIREMENTS OF MICROWAVE AFTER IT HAS BEEN REPAIRED**

After being repaired, the microwave oven should have a 30 minutes trial operation. It can be used only when it has been demonstrated that it is in good conditions of safety, heating and defrosting. The oven must have the following identifications when it at trial operating:

### **5.4.1 INSULATION:**

Before conducted, measure the insulation resistance among those electric metal parts and the nonelectric metal cabinet with a 500V.D.C. Megaohmmeter. The resistance value should not be less then 2 megaohm.

Testing condition: Door closed, power at “high”, time set at 3 minutes. This is the operating condition of the oven, but the power plug is not connected.

### **5.4.2 MICROWAVE LEAKAGE:**

Microwave leakage can not be tell by watching or touching. To be responsible for the user, the amount of microwave leakage should be measured strictly, and should not exceed 5 milliwatt/cm<sup>2</sup>, according to the IEC STANDARD. Some countries stipulate that the maximum microwave leakage should not exceed 1 milliwatt/cm<sup>2</sup>. For safety concern, we must control the leakage under 1 milliwatt/cm<sup>2</sup> after the oven being repaired, otherwise, it should be repaired again. Test must be proceeded completely and comply with the following procedures:

Put a graduate of about 275ml water at the middle of the turntable glass tray of the oven, insert the power plug, close the door, power set high, time set 3 minutes to make the oven in operation. Rectify the microwave leakage measure first, measure around the door crack the metal net of the door and the air vent with the probe of the measure when measuring, the moving speed of the probe should not exceed 25mm/sec. The measuring direction of the probe must be the same with the outgoing direction of the microwave leakage.

### **5.4.3 MICROWAVE HEATING.**

Place a graduate of about 250ml water on the turntable tray. Close the door, power set high, time set 4 minutes (To those 700W microwave oven) to make the oven operating in normal. When the bell of the timer rings, open the oven door, the water should have boiled. If it have not been boiled yet, but is very hot, check whether the

voltage is less than 120V. If the voltage below 120V but the water can be boiled after a little more time beating, it is normal.

#### **5.4.4 MICROWAVE DEFROST:**

Place a graduate of about 200ml water on the turntable glass tray of the oven, power set middle, time set 4 minutes to make the oven operating in normal. When the bell of the time ring, open the door. It would be normal if the water is lukewarm.

## **6 CRITICAL PARTS SERVICING**

### **6.1 IMPORTANT THINGS TO DO PRIOR TO CRITICAL PARTS SERVICING:**

The following instructions are CRITICAL to the owner's safety. Be sure to follow all the instructions. Contact the manufacturer or distributor if you have any question.

1. If the oven is operative prior to servicing, a Microwave Leakage Test (a. k. a. Microwave Emission Check) should be performed prior to servicing the oven Refer to Section 7.3, Microwave Leakage Test. For the detailed check procedures.
2. In the event that any microwave oven found to have microwave emission level in excess of 4 mW/cm<sup>2</sup>. The following procedures should be followed:
  - (1). Inform the distributor; importer, or manufacturer the finding. Record it in the logbook as well.
  - (2). Repair the unit at no cost to the owner.
  - (3). Investigate the oven and ascertain the cause of the excessive leakage.
  - (4). Hold the oven in your facility and instruct the owner not to use the unit until the oven has.
3. In the event that the oven operates with the door open. The following procedures should be followed:
  - (1). Tell the user not to operate the oven.
  - (2). Hold the oven in your facility until it is investigated and repaired.
  - (3). Contact the manufacturer and CDRH (FDA) immediately.

### **6.2 INTERLOCK ASSEMBLY REPLACEMENT AND ADJUSTMENT.**

1. If you suspect defective primary, secondary or monitor interlock switches, use your ohmmeter (digital or analog type) to check the electrical continuity.
2. Make sure the power cord is pulled out and the high-voltage capacitor is discharged before the electrical continuity check.
3. Set the ohmmeter to "Low Resistance" range and connect both leads (alligator clips) to the switch terminals.
4. Open the door and notice the meter reading the primary or secondary interlock switch should show an "infinite" resistance when the door is open. Replace it when it is defective. The monitor interlock should show a "zero or near zero" resistance when the door is open. When the door is closed, the readings will be opposite.
5. If the oven has been rendered inoperative due to the failure of the monitored safety (primary and /or secondary ) interlock(s). You should replace all of the monitored safety interlock switched and the monitor switch.
6. Refer to Chapter 4, Sections I and X for how to remove and assemble the interlock and monitor switches.
7. Always refer to Section 0.4 for adequate wiring diagram. Monitor interlock must always be installed. Repeat Step 6.2.4 to check electrical continuity.
8. Perform required checks and tests as described in Chapter 7 before releasing the oven to the owner.

## **7 COMMON BREAKDOWN OF MICROWAVE OVEN AND MEANS OF REPAIRING**

PHENOMENON	CAUSE	REPAIRING MEANS
1. When starting the oven, the lamp is not on, the turntable tray can't rotate and the food can't be heated	8A fuse broken. The primary and secondary winding of the transformer are short – circuited. The earthing or the polarity of the polarity of the capacitor is punctured. The pilot switch can't cut off. The interlock switch hasn't closed. The power plug and the socket are not in good connection. The door hook broken.	Change a new fuse. Change a new transformer. Change a new capacitor. Change a new pilot switch. Change a new interlock switch. Adjust the connection or replace it by a new one. Change a new hook.
2. When starting the oven, the lamp is on, the turntable rotating, the fan cycling but the food can't be heated.	The primary and secondary winding, the filament of the transformer are open – circuit-ed. The magnetron filament is open – circuited, the magnetic steel of the magnetron broken or the magnetron is air leaking. Time and power distributor broken. The plugs of the magnetron or the capacitor loosed.	Change a new transformer. Change the magnetron. Change the time power distributor or the micro-switch. Fix them.
3. The food can be heated, but the lamp is not on	The lamp broken. The plug falls off.	Change a new lamp Insert the plug again
4. The food can be heated but the turntable tray is not rotating.	The turntable motor broken The plug fall off Connecting shaft weave broken	Change the turntable motor Inset the plug securely Change the weave
5. The oven can heat within 2-3 minutes, but can not heat from the fourth minutes	The winding of the fan motor in open-circuited. The fan falls off The plug of the fan motor falls off The turntable shaft is griped with the mo-tor bearin The cooling vent blocked	1.Change the fan motor 2.Change the fan 3.Insert the plug 4.Overhauling them 5.Repairing it
6. When starting the oven, it can't heat, and with "wenwen" noise.	The high voltage diode was punctured	Change a new diode
7. The oven can heat, but with sound "shishi" noise	The iron core of the transformer loosed	Change a new transformer
8. Large amount of microwave leakage	The door deformed The door metal net cracked The gap of the door crack is too large The welding point of the oven falls off The screws which fix the magnetron loosed The wave guide connection oxidized The magnetron copper filament washer is too thin cause the wave guide opening not in good earth.	Mend the door Change the door Adjust the gap Change the oven Tighten the screws Scrape the oxidized and tighten the screws Thick the copper filament washer
9. The door can't open	After long time using, the wear and the rust –eaten enlarged the gap of the door shaft	Adjust the hinge to rectify the position of the door.

	and the shaft hole, thus cause the door crooked. The door hook broken.	Change the hook.
10. The door release button fall off	Worn out and aged after long time operating	Overhaul it or renew it
11. Electricity leaking	The earthing insulation resistance of all the motors or the transformer are less than 2 megahms.	Test where is the leaking place, then repair it or change those damaged components.



# MICROWAVE OVEN/HOOD SYSTEM

Model: SNM1501RAW

SNM1501RAQ

SNM1501RAB

SNM1502RAS

## INSTALLATION INSTRUCTIONS

Please read all instructions thoroughly before installing the Microwave Oven/Hood System. Two people are recommended to install this product.

If a new electrical outlet is required, its installation should be finished by a qualified electrician before the Microwave Oven/Hood is installed. See 3 ELECTRICAL GROUNDING INSTRUCTIONS on page 2.

### 1. MOUNTING SPACE

This Microwave Oven/Hood requires a mounting space on a wall as shown in Figure 1. It is designed to be used with standard 12-inch wall cabinets.

If the space between the wall cabinets is 36 or 42 inches, a Filler Panel Kit can be used to fill the gap. The metal filler panels come in pairs, each either 3 or 6 inches wide. The Filler Panel Kit should be installed before the Microwave Oven/Hood is installed.

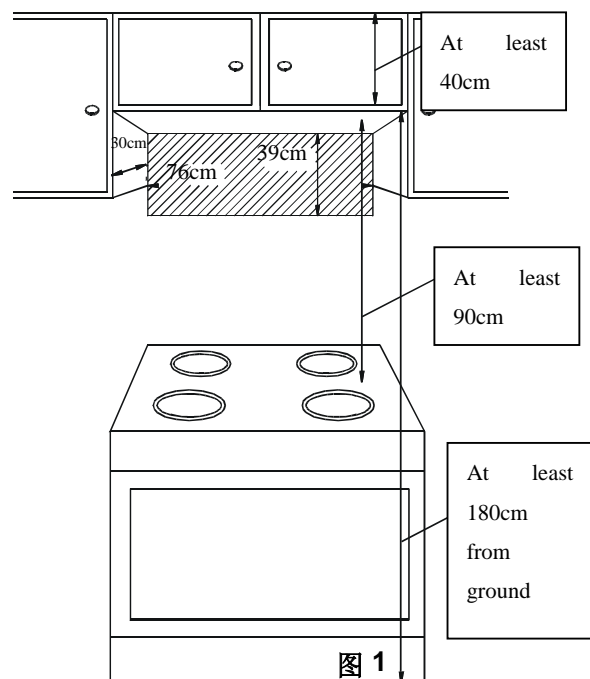


Fig. 1

## 2. WALL CONSTRUCTION

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This Microwave Oven/Hood should be mounted against and supported by a flat vertical wall. The wall must be flat for proper installation. If the wall is not flat, use spacers to fill in the gaps. Wall construction should be a minimum of 2" × 4" wood studing and 3/8" or thicker dry wall or plaster/lath. The mounting surfaces must be capable of supporting weight of 110 pounds---the oven and contents---and the weight of all items which would normally be stored in the top cabinet above the unit.

The unit should be attached to a minimum of one 2" × 4" wall stud.

To find the location of the studs, one of the following methods may be used:

- A. Use a stud finder, a magnetic device which locates the nails in the stud.
- B. Use a hammer to tap lightly across the mounting surface to find a solid sound. This will indicate stud location.

The center of the stud can be located by probing the wall with a small nail to find the edge of the stud and then placing a mark halfway between the edges. The center of any adjacent studs will normally be 16 or 24 inches to either side of this mark.

## 3. ELECTRICAL GROUNDING INSTRUCTIONS

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This appliance must be grounded. This oven is equipped with a cord having a grounding wire with a grounding plug. It must be plugged into a wall receptacle that is properly installed and grounded. In the event of an electrical short circuit, grounding reduces risk of electric shock by providing an escape wire for the electric current.

**WARNING** – Improper use of the grounding plug can result in a risk of electric shock.

The oven is equipped with a 3-prong grounding plug. **DO NOT UNDER ANY CIRCUMSTANCES CUT OR REMOVE THE GROUNDING PIN FROM THE PLUG.**

The power supply cord and plug must be connected to a separate 230Volt AC, 50Hz, 15 Amp, or more branch circuit, single grounded receptacle. The receptacle should be located inside the cabinet directly above the Microwave Oven/Hood mounting location.

NOTE:

- 1. If you have any questions about the grounding or electrical instructions, consult a qualified electrician or service personnel.
- 2. Neither the manufacturer nor the dealer can accept any liability for damage to the oven or personal injury resulting from failure to observe the correct electrical connection procedures.

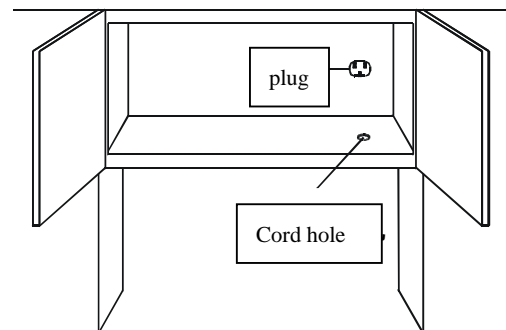


Fig. 2

## 4. HOOD EXHAUST DUCT

When the hood is vented to the outside, a hood exhaust duct is required. All ductwork must be a metal; absolutely do not use plastic duct. Check that all connections are made securely. Please read the following carefully:

**Exhaust connection** - The hood exhaust has been designed to connect to a standard 3-1/4"×10" rectangular duct. If round duct is required, a rectangular-to-round adapter must be used.

**Rear exhaust:** If a rear or horizontal exhaust is to be used, care should be taken to align the exhaust with the space between the studs, or wall should be prepared at the time it is constructed by leaving enough space between wall studs to accommodate exhaust.

**Maximum duct length:** for satisfactory air movement, the total duct length of 3-1/4"×10" rectangular or 6" diameter round duct should not exceed 140 feet.

Elbows, adapters, wall, roof caps, etc. present additional resistance to air flow and are equivalent to a section of straight duct which is longer than their actual physical size. When calculating the total length, add the equivalent lengths of all transitions and adapters plus the length of all straight duct sections. Figure 4 shows the approximate feet of equivalent length of some typical ductwork parts. Use the values in parentheses for calculating air flow resistance equivalent, which should total less than 140 feet.

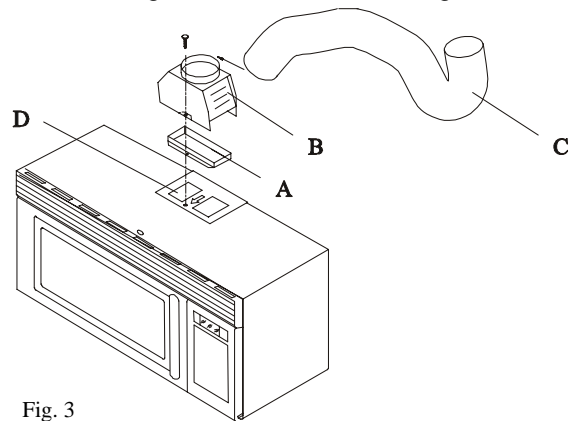


Fig. 3

## 5. TOOLS RECOMMENDED FOR INSTALLATION

- Phillips screwdriver
- Electric drill
- 1/2", 5/8" and 3/32" Drill bits
- 1-1/2" Wood bit or metal hole cutter (if metal cabinet is used)
- Saw to cut exhaust opening (if needed)
- Protective drop cloth for product and range – you may also use carton for protection
- Scissors
- Pencil
- Tape Measure
- Tape

## 6. INSTALLATION HARDWARE

The INSTALLATION HARDWARE items are in a small carton packed below the oven.

ITEM	NAME	QUANTITY
1	Inflating stopper	8
2	Tapping screws 4x25mm	8
3	Top Cabinet Screw 5x60 mm	2
4	Flat Washer 30 mm diameter	2
5	Power Cord Hanger	1
6	Grommet	1
7	Tapping Screw 4x12 mm	1
8	Exhaust Damper Assembly	1
9	Metal Exhaust Hood	1
10	Filter assembly	2
11	Air filter	1

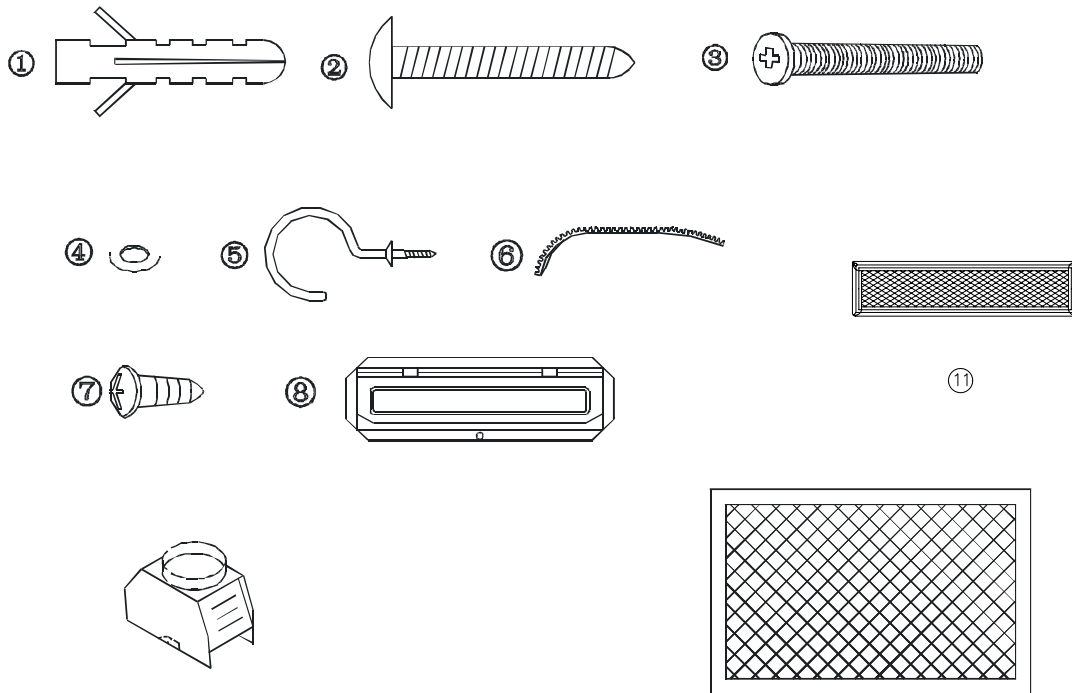


图 Fig. 4

## 7 PREPARATION OF THE OVEN

Open the bottom of the carton, remove oven, all packing materials, Installation Instructions, Wall Template, Top Template and Charcoal Filter; however, **DO NOT REMOVE THE WAVEGUIDE COVER**, which is located on the ceiling in the oven cavity.

**CHECK THE OVEN.**

Check the oven for any damage, such as misaligned or bent door, damaged door seals and sealing surfaces, bent or loose door hinges and latches and dents inside the cavity or on the door.

If there is any damage, do not operate the oven and contact your dealer.

Remove and save Screw (A) as shown in Figure 5.

Push down carefully on the tabs (B) and (C) at the ends of the Louver to disengage it. Pull the Louver away from the unit and set aside.

Loosen the two Mounting Screws (D) which lock the Mounting Plate to the rear side of the oven. Remove the Mounting Plate. See Figure 6.

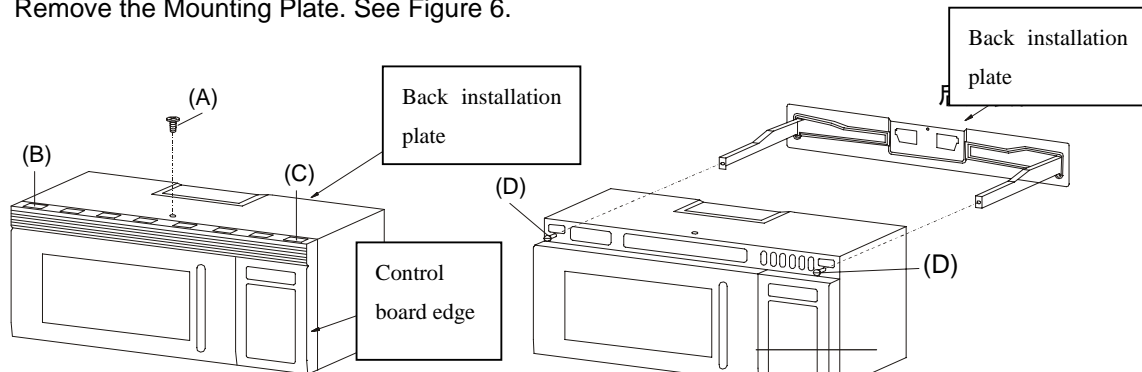


Fig. 5

Fig. 6

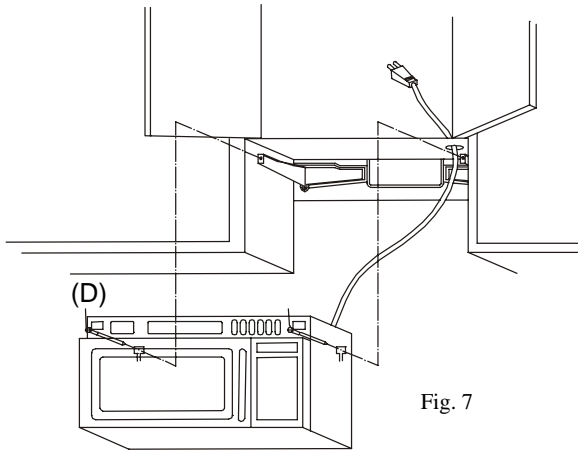


Fig. 7

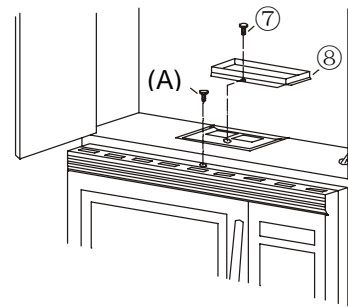


Fig. 8

## 8 VENTILATION SYSTEM

This Microwave Oven/Hood is designed for adaptation to three types of hood ventilation systems. Select the type required for your installation.

- A. Recirculating — non-vented, ductless. Follow installation procedure A. Recirculating requires the use of the Charcoal Filter 11, which is packed under the oven in the carton.
- B. Horizontal Exhaust — outside ventilation. Follow installation procedure B.
- C. Vertical Exhaust — outside ventilation. Follow installation procedure C.

### (A) RECIRCULATING: Non-vented, Ductless Operation

The unit is shipped assembled for recirculating. Attach the Charcoal Filter to the upper side of the oven by sliding into the tabs. See Figure 9.

NOTE:

1. The Exhaust Damper Assembly 11 is not required for recirculating operation.
2. The Charcoal Filter should be replaced every 6 to 12 months, depending on use.
3. The Charcoal Filter is also sold as an accessory.

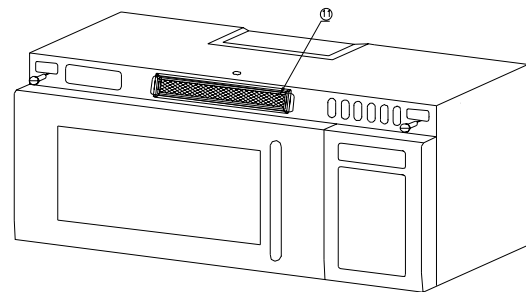


Fig. 9

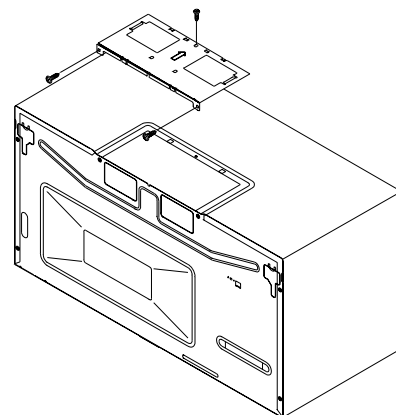


Fig. 10

### (B) HORIZONTAL EXHAUST: Outside Ventilation

1. Remove and save 2 screws from back edge and 1 screw from the top center of Fan Cover Bracket. Remove Fan Cover Bracket by sliding it in the opposite direction of the arrow on the Fan Cover Bracket, as shown in Figure 10.

2. Withdraw Hood Fan Unit carefully along with the lead wire out of the outer case.
3. Rotate the Hood Fan Unit and turn end-over-end so that the fan blade openings are facing the back of the oven. Replace Hood Fan Unit into the oven. Be carefully not to pinch the lead wire between the inner bracket and the Hood Fan Unit. See Figure 11.
4. Put the lead wire into the outer case.
5. Replace the Fan Cover Bracket by sliding it into the slits in the same direction as the arrow on the Fan Cover Bracket. Make sure the fan blades are visible through the rear openings in the oven before proceeding. See Figure 12. Attach Fan Cover Bracket to unit with 3 screws, which were removed in Step 1 above. See Figure 13. The Hood Fan Unit is now rotated for horizontal exhaust operation.
6. Attach the Exhaust Damper Assembly to the back of the Mounting Plate by sliding it into the slits in the same direction as the arrow. See Figure 12. Using Tapping screw 4 × 12 from the INSTALLATION HARDWARE, tighten into place.

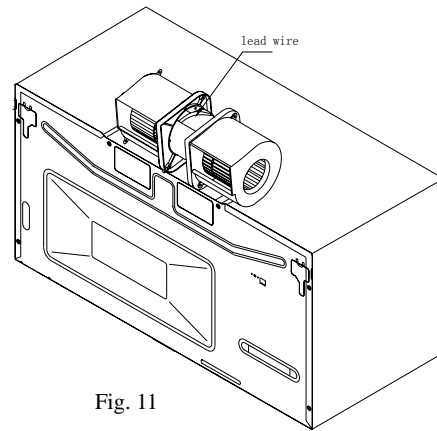
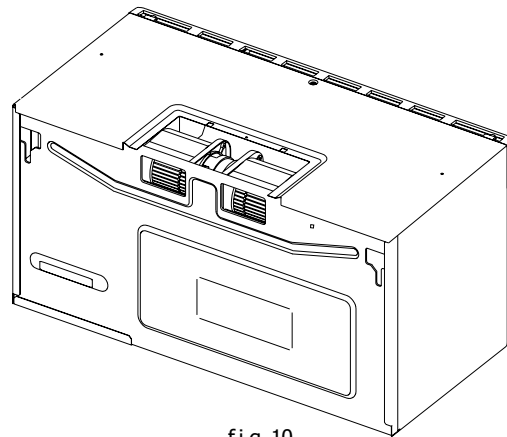


Fig. 11



fi a. 10

Fig. 12

**(C) VERTICAL EXHAUST: Outside Ventilation**

1. Remove and save 2 screws from back edge and 1 screw from the top center of the Fan Cover Bracket. Remove Fan Cover Bracket by sliding it in the opposite direction of the arrow on the Fan Cover Bracket as shown in Figure 10 on page 5.
2. Withdraw Hood Fan Unit carefully and slip wires out of Wire Box. CAUTION: Do not pull or stretch hood fan wiring.
3. Turn the Hood Fan Unit end-over-end. Rotate the Hood Fan Unit 90 degrees so that the fan blade openings are facing upward. Figure 12
4. Replace the Fan Cover Bracket by sliding it into the slits in the same direction as the arrow on the Fan Cover Bracket. Make sure the fan blades are visible through the top openings in the oven before proceeding. Attach the Fan Cover Bracket to unit with 3 screws, which were removed in Step 1 above. See Figure 13. The Hood Fan Unit is now rotated for vertical exhaust operation.
5. Attach the Exhaust Damper Assembly to the fan cover on the top of the outer case cabinet after mounting the oven.

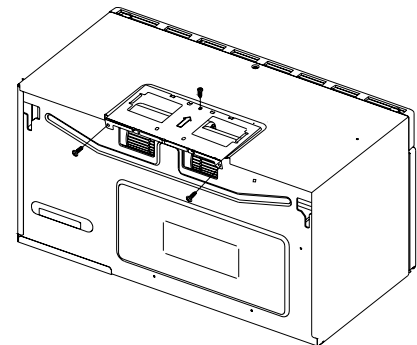


Fig. 13

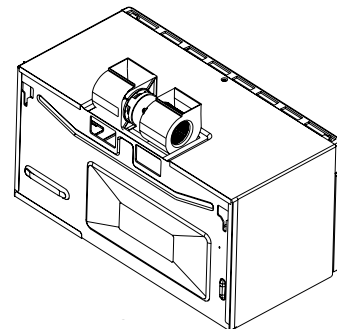


Fig. 14

## 8 MOUNTING OVEN TO WALL

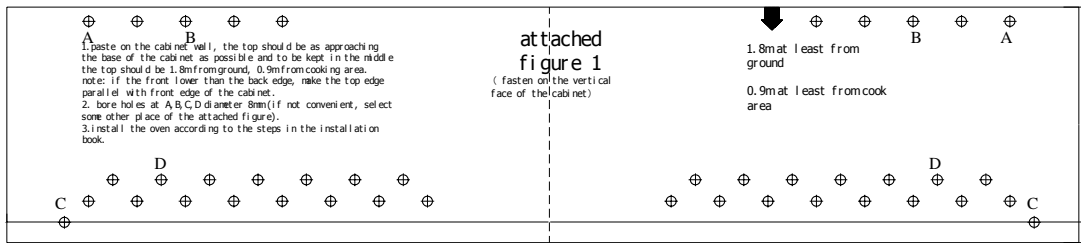


Fig. 15

1. Tape Wall Template on the wall. The top should be as close to the base of the cabinet as possible and should be kept in the middle. The top should be 1.8m from ground, 0.9m from cooking area.  
Note: if the front is lower than the back edge, make the top edge parallel with front edge of the cabinet.
2. Bore holes at A, B, C, D diameter 8mm (if not convenient, select different locations according to the mounting template).

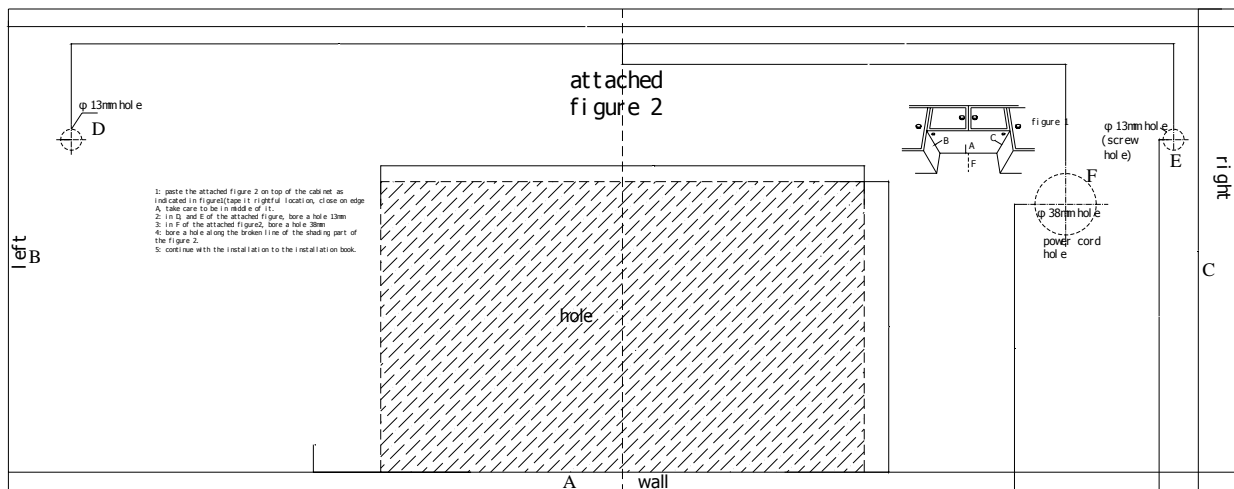


Fig. 16

1. Tape the Top Template to the underside of the cabinet as indicated in figure 1
2. In D and E of the attached figure, bore a hole 13mm
3. In F of the attached figure 2, bore a hole 38mm
4. Bore a hole along the broken line of the shading part of figure 2
5. Install the oven according to the steps in Figures 7 & 8 on Page 5.

## CHECK LIST FOR INSTALLATION

1. Make sure the unit has been installed according to all of the Installation Instructions, the Top Template and Wall Template.
2. Remove all packing material from the oven.
3. Plug in the power cord.
4. Read the Operation Manual.
5. Keep the Installation Instructions for local electrical inspector's use.

**Catalogo de  
Partes**

**Spare Parts  
Catalog**

**Sunbeam OTR Microwave Part List - Models SNM1501RAB, SNM1501RAQ, SNM1501RAW**

<b>P/N</b>	<b>Description</b>	<b>Available</b>	<b>Qty.</b>
SBP01	Door	Not Available	1
SBP02	Door Window	Not Available	1
SBP04	Capacitor Holder	Not Available	1
SBP05	Fan Shroud	Not Available	1
SBP06	Fan Blade	Y	1
SBP07	Door Frame	Not Available	1
SBP08	Choke Cover	Not Available	1
SBP10	Shaft	Y	1
SBP12	Glass Tray	Y	1
SBP16	Cavity	Not Available	1
SBP18	Outer Enclosure	Not Available	1
SBP21	Lamp Socket	Y	1
SBP23	Micro Switch Mounting	Not Available	1
SBP25	Transformer Bracket	Not Available	1
SBP27	Base Plate	Not Available	1
SBP29	Control Panel	Not Available	1
SBC14W	POWER CORD WHT	Y	1
SBC14B	POWER CORD BLK	Y	1
SBP34	Handle	Not Available	
SBP34B	Handle - Black	Y	1
SBP34W	Handle - White	Y	1
SBP34Q	Handle - Bisque	Y	1
SBP81	Control Panel Board Holder	Not Available	1
SBP82	Panel Window	Y	1
SBP83	Glass Plate	Y	1
SBP84	Window Frame	Not Available	
SBP84W	Window Frame - WHITE	Y	1
SBP84Q	Window Frame - BISQUE	Y	1
SBP84B	Window Frame - BLK	Y	1
SBP85	Charcoal Filter	Y	2
SBP86	Capacitor Holder	Not Available	1
SBP87	Wind Shield	Not Available	1
SBP88	Right Fan Shroud	Y	1
SBP89	Right Exhaust Fan	Y	1
SBP90	Right Fan Holder	Y	1
SBP91	Left Fan Holder	Y	1
SBP92	Left Exhaust Fan	Y	1
SBP93	Flexible Washer	Y	1
SBP94	Left Fan Shroud	Y	1

SBP95	Back Mounting Plate	Not Available	1
SBP96	Mounting Plate	Not Available	1
SBP97	Pad	Not Available	1
SBP98	Left & Right Joining Bar	Not Available	2
SBP99	Exhaust Air Filter	Y	1
SBC02	H.V. Diode	Y	1
SBC03	H.V. Capacitor	Y	1
SBC04	Noise Filter Board	Y	1
SBC05	Fan Motor	Y	1
SBC06	Lamp	Y	1
SBC07	Thermostat Magnetron 180	Y	1
SBC08	Magnetron	Y	1
SBC09	Micro Switch A	Y	1
SBC10	Micro Switch A	Y	1
SBC11	Micro Switch A	Y	1
SBC26	Micro Switch B	Y	1
SBC12	Transformer	Y	1
SBC13	Wiring Harness	Y	1
SBC14	Power Cord	Not Available	
SBC15	Turntable Motor	Y	1
SBC17	Control Panel Circuit Board	Y	1
SBC18Q	Thin Film Panel Cover Black	Y	1
SBC18B	Thin Film Panel Cover Black	Y	1
SBC18W	Thin Film Panel Cover White	Y	1
SBC18	Thin Film Panel Cover	Not Available	
SBC19	Thermostat Cavity 140	Y	1
SBC25	Exhaust Fan Motor	Y	1
SBC27	Fuse Noise Filter Board	Y	1
SBC30	Thermostat 60	Y	1
SBP100	Mounting Screw	Not Available	1
SBP101	Deflector Turn Plate	Y	1
SBP102	Linker	Y	1
SBP103	Spatter Guard	Not Available	1
SBP104	Deflector Turn Plate Holder	Y	1
SBP105	Louver	Not Available	1
SBP106	Left Bottom Enclosure	Not Available	1
SBP107	Light Shield	Y	1
SBP108	Door Latch	Y	1
SBP109	Door Spring	Y	1
SBP110	Spring	Y	1
SBP112	Inflating stopper	Not Available	4
SBP113	Flat Washer	Not Available	2

SBP114	Power Cord Hanger	Not Available	1
SBP115	Exhaust Damper Assembly	Y	1
SBP116	Metal Exhaust Hood	US\$1.00	1
SBP117	screws 4x25	Not Available	8
SBP118	Screw 5x60	Not Available	2
SBP119	Screw 4x12	Not Available	1
SBB01	Upper Foam Cushion	Not Available	1
SBB02	Turntable Cushion	Not Available	1
SBB03	Plastic Bag	Not Available	1
SBB04	Manual	Not Available	1
SBB05	Protection Film	Not Available	1
SBB06	Plastic Bag	Not Available	1
SBB07	Lower Cushion	Not Available	1
SBB08	Carton	Not Available	1
SBB09	Wall mount. Template	Y	1
SBB10	Cabinet mount. Temp.	Y	1

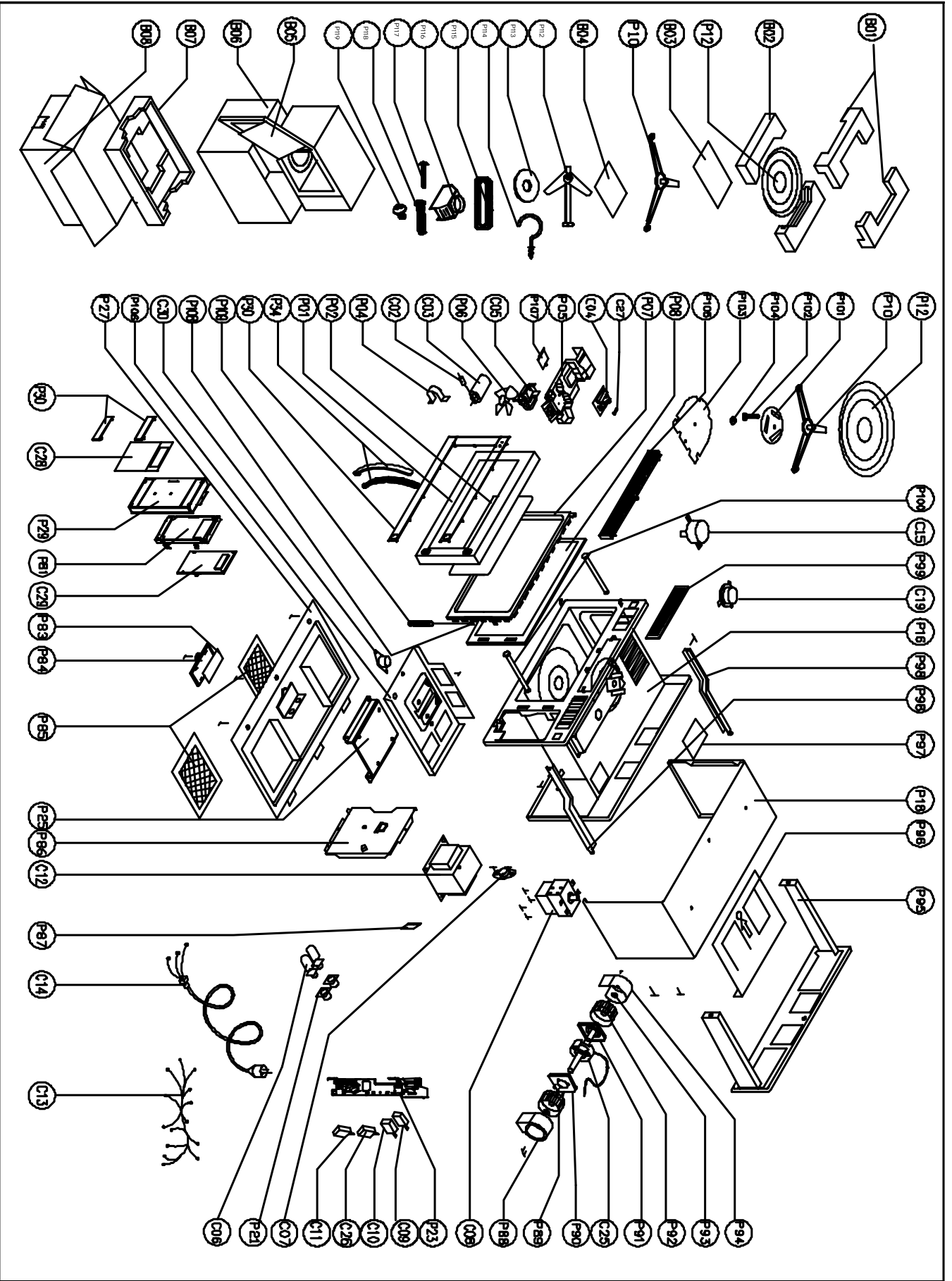


**Sunbeam OTR Microwave Part List - Stainless model - SNM1502RAS**

<b>P/N</b>	<b>Description</b>	<b>Available</b>	<b>Qty.</b>
SBP01	Door	Not Available	1
SBP02	Door Window	Not Available	1
SBP04	Capacitor Holder	Not Available	1
SBP05	Fan Shroud	Not Available	1
SBP06	Fan Blade	Y	1
SBP07	Door Frame	Not Available	1
SBP08	Choke Cover	Not Available	1
SBP10	Shaft	Y	1
SBP12	Glass Tray	Y	1
SBP16	Cavity	Not Available	1
SBP18	Outer Enclosure	Not Available	1
SBP21	Lamp Socket	Y	1
SBP23	Micro Switch Mounting	Not Available	1
SBP25	Transformer Bracket	Not Available	1
SBP27	Base Plate	Not Available	1
SBP29	Control Panel	Not Available	1
SBC14W	POWER CORD WHT	N/A	
SBC14B	POWER CORD BLK	Y	1
SBP34	Handle	Not Available	
SBP34B	Handle - Black	N/A	1
SBP34S	Handle - Stainless	Y	1
SBP34Q	Handle - Bisque	N/A	1
SBP81	Control Panel Board Holder	Not Available	1
SBP82	Panel Window	Y	1
SBP83	Glass Plate	Y	1
SBP84	Window Frame	Not Available	
SBP84W	Window Frame - WHITE	N/A	
SBP84Q	Window Frame - BISQUE	N/A	
SBP84B	Window Frame - BLK	Y	1
SBP85	Charcoal Filter	Y	2
SBP86	Capacitor Holder	Not Available	1
SBP87	Wind Shield	Not Available	1
SBP88	Right Fan Shroud	Y	1
SBP89	Right Exhaust Fan	Y	1
SBP90	Right Fan Holder	Y	1
SBP91	Left Fan Holder	Y	1
SBP92	Left Exhaust Fan	Y	1
SBP93	Flexible Washer	Y	1
SBP94	Left Fan Shroud	Y	1
SBP95	Back Mounting Plate	Not Available	1
SBP96	Mounting Plate	Not Available	1
SBP97	Pad	Not Available	1
SBP98	Left & Right Joining Bar	Not Available	2
SBP99	Exhaust Air Filter	Y	1
SBC02	H.V. Diode	Y	1
SBC03	H.V. Capacitor	Y	1
SBC04	Noise Filter Board	Y	1
SBC05	Fan Motor	Y	1

SBC06	Lamp	Y	1
SBC07	Thermostat Magnetron 180	Y	1
SBC08	Magnetron	Y	1
SBC09	Micro Switch A	Y	1
SBC10	Micro Switch A	Y	1
SBC11	Micro Switch A	Y	1
SBC26	Micro Switch B	Y	1
SBC12	Transformer	Y	1
SBC13	Wiring Harness	Y	1
SBC14	Power Cord	Not Available	
SBC15	Turntable Motor	Y	1
SBC28	Control Panel Circuit Board	Y	1
SBC18Q	Thin Film Panel Cover Bisque	N/A	
SBC18B	Thin Film Panel Cover Black	Y	1
SBC18W	Thin Film Panel Cover White	N/A	
SBC18	Thin Film Panel Cover	Not Available	
SBC19	Thermostat Cavity 140	Y	1
SBC25	Exhaust Fan Motor	Y	1
SBC27	Fuse Noise Filter Board	Y	1
SBC30	Thermostat 60	Y	1
SBP100	Mounting Screw	Not Available	1
SBP101	Deflector Turn Plate	Y	1
SBP102	Linker	Y	1
SBP103	Spatter Guard	Not Available	1
SBP104	Deflector Turn Plate Holder	Y	1
SBP105	Louver	Not Available	1
SBP106	Left Bottom Enclosure	Not Available	1
SBP107	Light Shield	Y	1
SBP108	Door Latch	Y	1
SBP109	Door Spring	Y	1
SBP110	Spring	Y	1
SBP112	Inflating stopper	Not Available	4
SBP113	Flat Washer	Not Available	2
SBP114	Power Cord Hanger	Not Available	1
SBP115	Exhaust Damper Assembly	Y	1
SBP116	Metal Exhaust Hood	Y	1
SBP117	screws 4x25	Not Available	8
SBP118	Screw 5x60	Not Available	2
SBP119	Screw 4x12	Not Available	1
SBB01	Upper Foam Cushion	Not Available	1
SBB02	Turntable Cushion	Not Available	1
SBB03	Plastic Bag	Not Available	1
SBB04	Manual	Not Available	1
SBB05	Protection Film	Not Available	1
SBB06	Plastic Bag	Not Available	1
SBB07	Lower Cushion	Not Available	1
SBB08	Carton	Not Available	1
SBB09	Wall mount. Template	Y	1
SBB10	Cabinet mount. Temp.	Y	1

SNM1502RAS Microwave Oven Explode Drawing (UL)



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