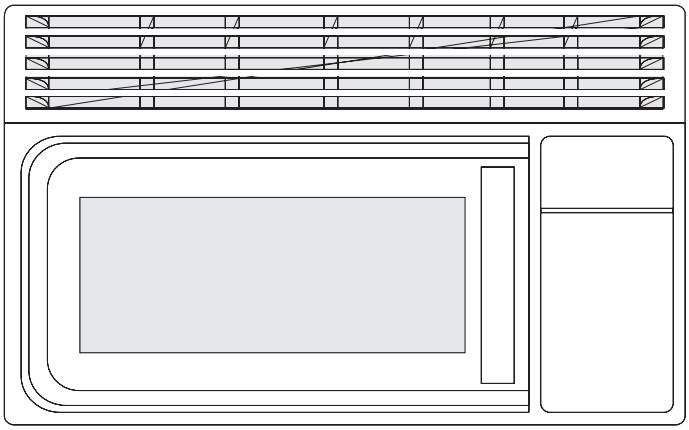
Frigidaire

Electrolux

ELECTROLUX HOME PRODUCTS NORTH AMERICA

OVER-RANGE MICROWAVE OVEN SERVICE MANUAL

MODEL - FMV158FM



SPECIFICATIONS	
Power Supply	120 VAC, 60 Hz
Input Power	1,650 W
Cooking Power	1,000 W (IEC 60705 Standard)
Frequency	2,450 MHz
Outer Dimensions (WxHxD)	29 7/8 “ x 15 5/8” x 15 1/16”
Cavity Volume	1.5 Cu Ft.
Net Weight	63.5 lbs.

! ATTENTION !

This service manual is intended for use by persons having electrical and mechanical training and a level of knowledge of these subjects generally considered acceptable in the appliance repair trade. Electrolux Home Products cannot be responsible, nor assume any liability, for injury or damage of any kind arising from the use of this manual.

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Contents

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(a) Do not operate or allow the oven to be operated with the door open.

(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
(1) Interlock operation,
(2) proper door closing,
(3) seal and sealing surfaces (arcing, wear, and other damage),
(4) damage to or loosening of hinges and latches,
(5) evidence of dropping or abuse.

(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.

(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

(e) A Microwave leakage check to verify compliance with the Federal performance standard should be performed on each oven prior to release to the owner.

Precaution

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

1-1 Safety precautions (⚠)

1. All repairs should be done in accordance with the procedures described in this manual. This product complies with Federal Performance Standard 21 CFR
2. Microwave emission check should be performed to prior to servicing if the oven is operative.
3. If the oven operates with the door open :Instruct the user not to operate the oven and contact the manufacturer and the center for devices and radiological health immediately.
4. Notify the Central Service Center if the microwave leakage exceeds 5 mW/cm2.
5. Check all grounds.
6. Do not power the MWO from a “2-prong” AC cord. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.
7. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including: nonmetallic control knobs and compartment covers.
8. Make sure that there are no cabinet openings through which people --particularly children--might insert objects and contact dangerous voltages. Examples: Lamp hole,ventilation slots.
9. Inform the manufacturer of any oven foundto have emission in excess of 5 mW/cm2 ,Make repairs to bring the unit into compliance at no cost to owner and try to determine cause. Instruct owner not to use oven until it has been brought into compliance.

   CENTRAL SERVICE CENTER
10. Service technicians should remove their watches while repairing an MWO.
11. To avoid any possible radiation hazard,replace parts in accordance with the wiring diagram. Also, use only the exact replacements for the following parts: Primary and secondary interlock switches, interlock monitor switch.
12. If the fuse is blown by the Interlock Monitor Switch: Replace all of the following at the same time: Primary, door sensing switch and power relay, as well as the Interlock Monitor Switch. The correct adjustment of these switches is described elsewhere in this manual. Make sure that the fuse has the correct rating for the particular model being repaired.
13. Design Alteration Warning: Use exact replacement parts only, i.e.,only those that are specified in thedrawings and parts lists of this manual. This is especially important for the Interlock switches, described above. Never alter or add to the mechanical or electrical design of the MWO. Any design changes or additions will void the manufacturer’s warranty. Always unplug the unit’s AC power cord from the AC power source before attempting to remove or reinstall any component or assembly.
14. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
15. Some semiconductor (“solid state”) devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs). Examples include integrated circuits and field-effect transistors. Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground.
16. Always connect a test instrument’s ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument’s ground lead last.
17. When checking the continuity of the witches or transformer, always make sure that the power is OFF, and one of the lead wires is disconnected.
18. Components that are critical for safety are indicated in the circuit diagram by shading, ⚠ or ⚠ .
19. Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

    NOTE : Connect the oven to a 20A. When connecting the oven to a 15A,make sure that circuit breaker can operate.

1-2 Special High Voltage Precautions

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

PRECAUTION

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

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

PRECAUTION

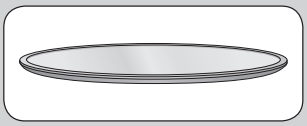
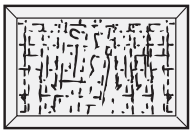
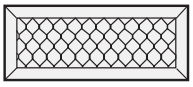
Servicemen should remove their watches whenever working close to or replacing the magnetron.

PRECAUTION

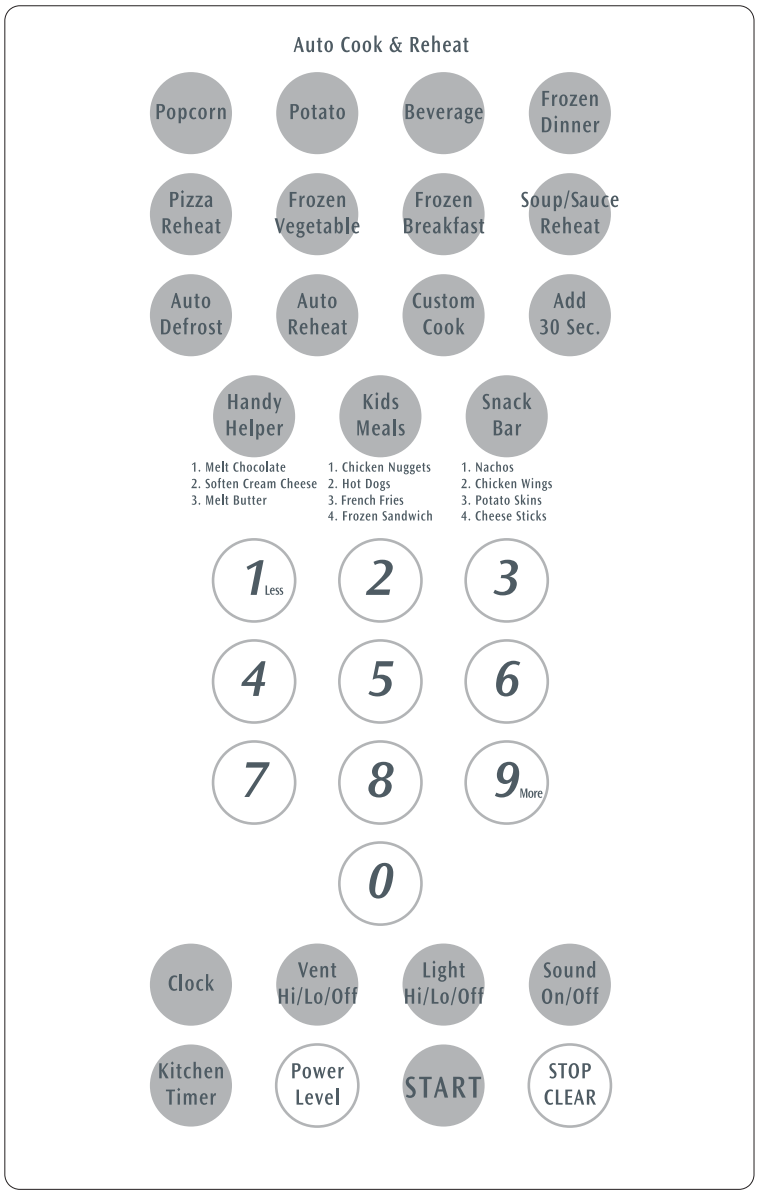
Never touch any circuit wiring with your hand nor with uninsulated tool during operation.

Accessory

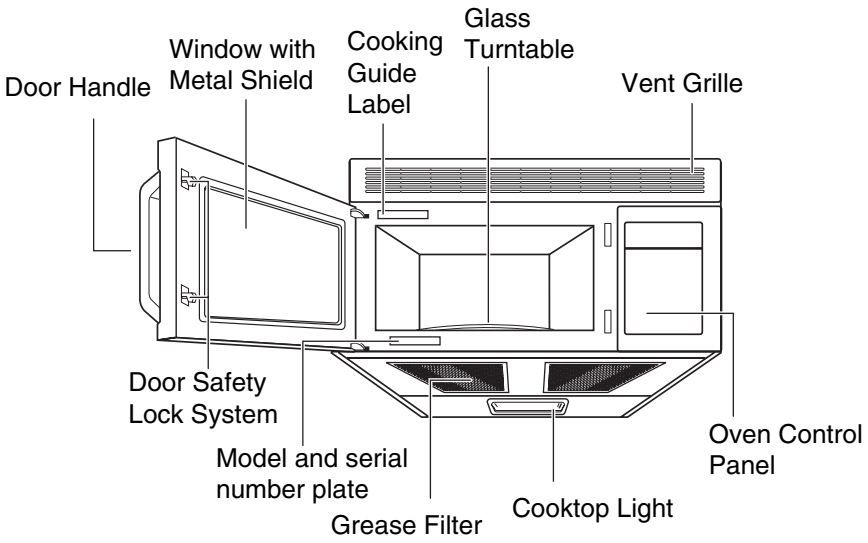
2-1 Accessory

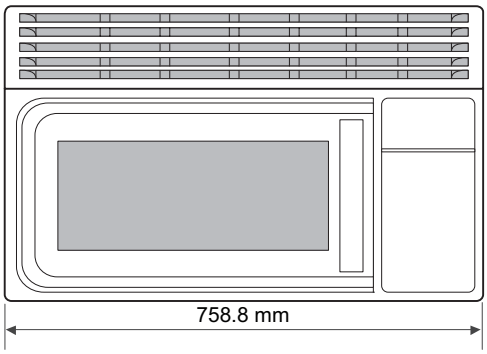
Item	Description	Code No.	Q'ty
	GLASS TRAY	DE74-20016A	1
	ROLLER GUIDE RING	DE92-90495A	1
	COUPLER	DE67-60012A	1
	HARDWARE-KIT	DE92-90505D	1
	GREASE FILTER	DE63-30011A	2
	CHARCOAL FILTER	DE63-00367A	1

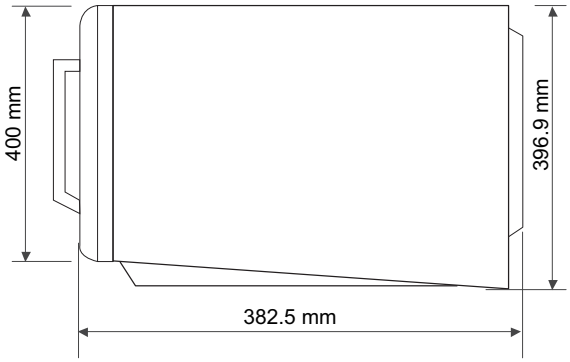
3-1 Control Panel



3-2 Features & External Views



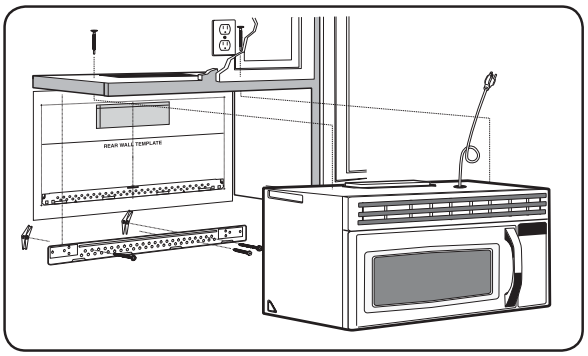




Installation

The Microwave Oven is supported by a special bracket assembly (mounting system) supplied with the oven. The bracket assembly must be mounted to the wall with toggle bolts through the wall, and a lag screw into a wall stud. After the bracket assembly is installed, the unit can be slid over the two rails of the bracket assembly. Two bolts are run down through the cabinet bottom and into the oven case to pull the oven up against the cabinet bottom.

NOTE : For easier removal and personal safety it is recommended that two people remove this product.



PRECAUTION

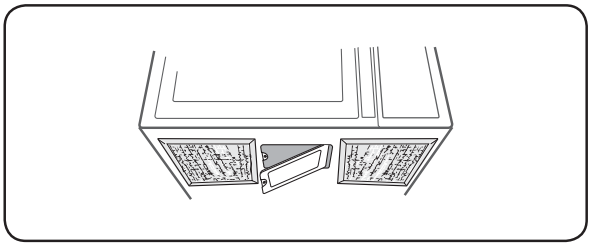
The mounting surface must be capable of supporting the cabinet load, in addition to the 64 pound product, plus additional loads of up to 50 pounds or a total weight of 114 pounds. This product cannot be installed to cabinet arrangements such as an island or peninsula. It must be mounted to both a top cabinet and wall.

VENT BLOWER

The vent or exhaust blower is located at the top of the oven. It is shipped for recirculating exhaust but can be changed to rear exhaust or vertical (See installation instrustions on how to change and/or blower section on how to remove).

COOKTOP LIGHTS

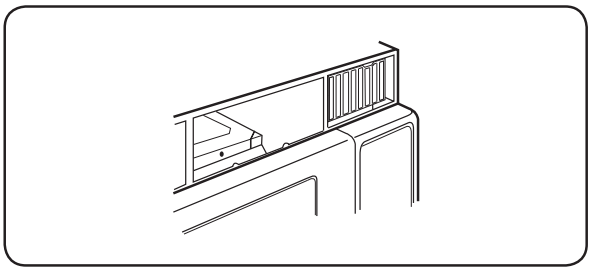
One 40-watt screw base incandescent bulb is located on the bottom. The bulb is user replaceable by removing one screw and lowering access cover. The bulb could be difficult to remove when replaced for the first time. a silicone glue is used to secure them during shipping.



OVEN LIGHT

A 40-watt screw base incandescent bulb is located in the top of the oven cavity at the front.

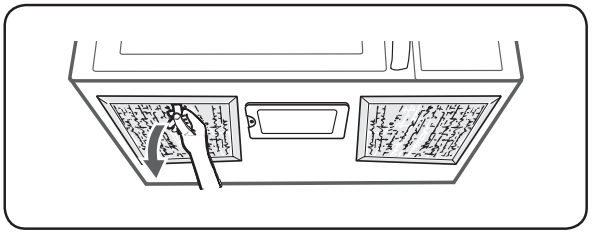
It is user replaceable by removing the top grill (3 screws. On the front of outer case.). The bulb is then accessible by removing a metal cover.



REUSABLE GREASE FILTERS

The metal filter trap grease released by foods on the cooktop. They also prevent flames from foods on the cooktop from damaging the inside of the microwave.

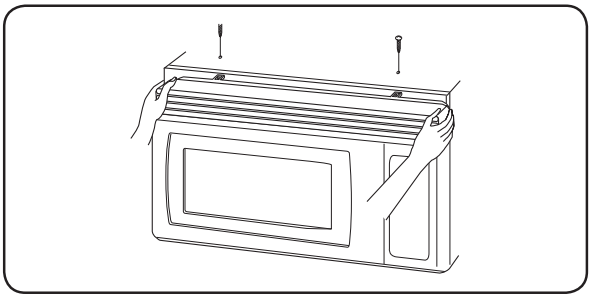
For this reason, the filter must ALWAYS be in place when the hood the vent fan is used. The grease filter should be cleaned once a month, or as needed.

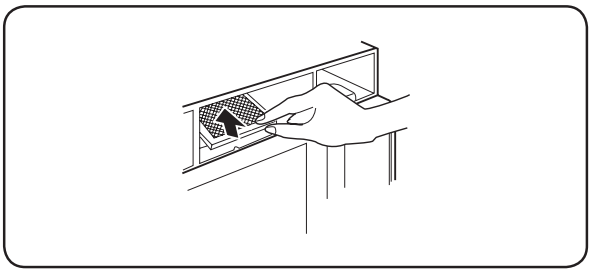


REMOVING CHARCOAL FILTER

To remove the charcoal filter, disconnect power at the main fuse or circuit breaker panel or pull the plug. Remove the top grille by removing the 2 screws that hold it in place.

Slide the filter towards the filter towards the front of the oven and remove it.





AUTOMATIC FAN

An automatic fan feature protects the microwave from too much heat rising from the cooktop below it. If you have turned the fan on you may find that you cannot turn it. The fan will automatically turn off when the internal parts are cool. If may stay on for 30 minutes or more after the cooktop and microwave controls are turned off.

GRILLE REMOVAL

The top full-width grille is removable for service to some components, such as : oven light, cavity T.C.O, vent motor capacitor and fuse.

TO REMOVE GRILLE:

1. Disconnect oven power.
2. Remove screws (3) from grille outer case.
3. Lift off grille.

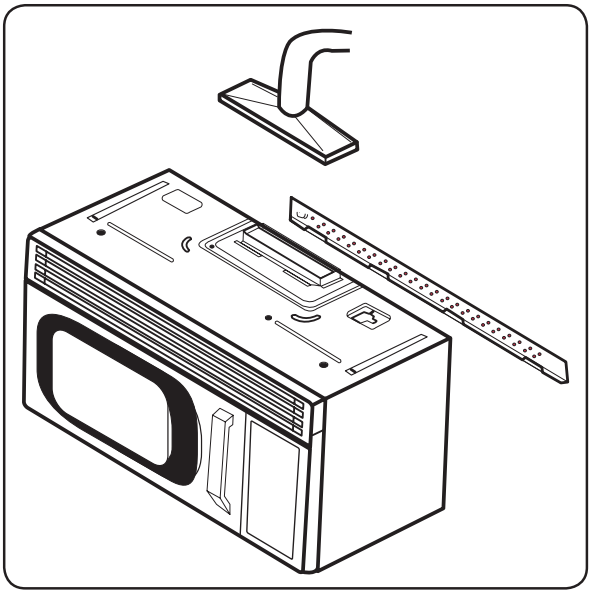
REMOVING OVEN FROM WALL (2 PEOPLE REQUIRED)

Oven is hooked on metal tabs at bottom of wall mounting plate and fastened to cabinet by (3) top cabinet bolts.

⚠ PRECAUTION

Oven weights 45.4 lbs. Requires 2 people for removal.

1. Disconnect power cord. Top vented models-disconnect duct and remove damper assembly.
2. Remove (3) top cabinet bolts.
3. Pull unit forward slowly providing adequate support to prevent dropping unit during removal of last top cabinet bolts.



Disassembly and Reassembly

MAGNETRON, MOTOR ASSEMBLY, VENT BLOWER AND HIGH VOLTAGE TRANSFORMER

Oven must be removed from wall.

REMOVING OVEN FROM WALL (2 PEOPLE REQUIRED)

Oven is hooked on metal tabs at bottom of wall mounting plate and to cabinet by (3) top cabinet bolts.

5-1 Replacement of High Voltage Transformer

Disconnect oven power.

Remove Grille & Control Box Assembly.

1. Discharge the high vol tage capacitor.
2. Disconnect all the leads.
3. Remove (4) Screws from the H.V.Trans.
4. Take out the H.V.Trans.

5-2 Replacement of Magnetron

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

1. Disconnect all lead wires from the magnetron.
2. Remove nuts (4) securing the magnetron to the wave guide.
3. Take out the magnetron very carefully.

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

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

⚠ PRECAUTION

During replacement, be certain R.F. anode gasket is in place around anode stub.

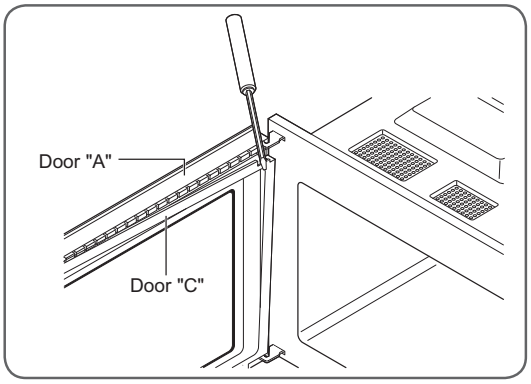
PERFORM MICROWAVE LEAKAGE TEST

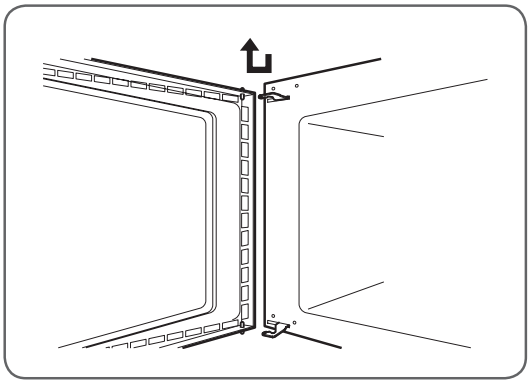
5-3 Replacement of Door Assembly

4-3-1 Removal of Door “C”

Insert flat screwdriver into the gap between Door “A” and Door “C” to remove Door “C”. Be careful when handling Door “C” because it is fragile.

Then remove the door assembly.

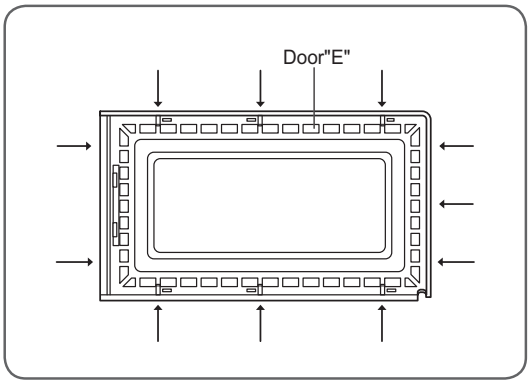




4-3-2 Removal of Door “E”

Following the procedure as shown in the figure, insert and bend a thin metal plate between Door “E” and Door “A” until you hear the ‘tick’ sound.

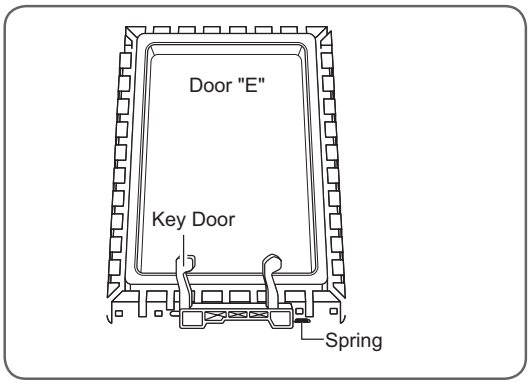
- Insertion depth of the thin metal plate should be 0.5mm or less.



4-3-3 Removal of Key Door & Spring

Remove pin hinge from Door “E”

Detach spring from Door “E” and key door.



5-3 Replacement of Door Assembly (Continued)

5-3-4 Reassembly Test

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

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

5-4 Replacement of Fuse

The fuse is located on the noise filter.

1. Disconnect power and remove grille.
2. Replace the fuse.
3. When 20A fuse blows out by the operation of interlock monitor switch failure, replace the primary interlock switch, secondary interlock switch, door sensing switch, interlock monitor switch and power relay.
4. When the above four switches operate properly, check if any other part such as the control circuit board, blower motor or high voltage transformer is defective.

5-5 Replacement of Drive Motor

1. Disconnect power and remove bottom plate screws(7).
2. Remove bottom plate and disconnect the turntable motor drive.
3. Remove turntable motor screws(2) and pull the turntable motor out.
4. When replacing the drive motor, be sure to remount it in the correct position with the coupler.
5. Connect all the leads to the drive motor.

5-6 Replacement of stirrer motor

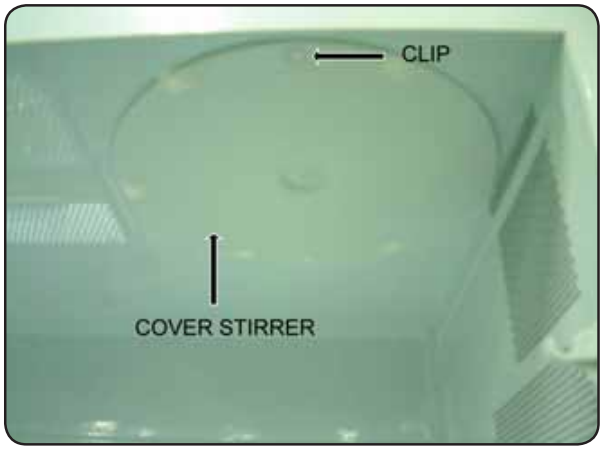
1. Disconnect power and remove grille screws(3).
2. Remove grille and the bracket duct upper screw(1).
3. Remove the bracket duct upper and disconnect the stirrer motor wire.
4. Remove stirrer motor screws(1) and pull the stirrer motor.

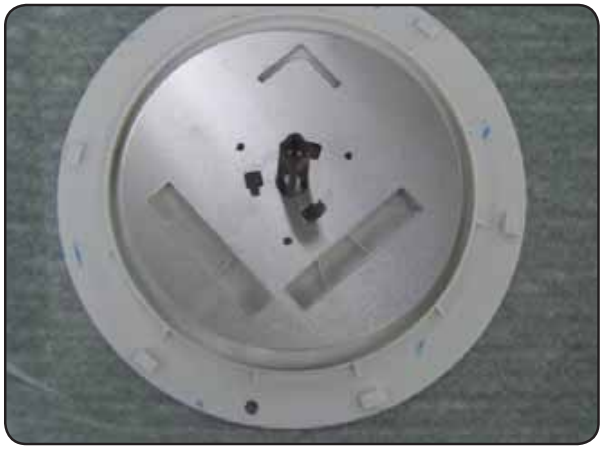
5-7 Removal of stirrer

The stirrer is motor driver and located on the upper side of the cavity. The oven uses a top feed wave guide.

The stirrer is located in the wave guide and the motor is located on the wave guide.

1. Disconnect power and open the door.
2. Remove the clip and turn the stirrer cover left.
3. Remove stirrer cover and the stirrer will come with it.





5-8 Replacement of Control Circuit Board

5-8-1 Removal of Control Box

1. Disconnect power and remove grille.
2. Be sure to ground any static electric charge in your body and never touch the control circuit.
3. Disconnect the connectors from the control circuit board.
4. Remove a screw securing the control box assembly.

5-8-2 Removal of P.C.B Assembly

1. Pull the lever end of the plastic fastener and remove the Flexible Printed Circuit(FPC) of membrane panel.
2. Remove screws (3) securing the control circuit board.
3. Lift up the control circuit board from the Ass'y control box.
4. When reconnecting the FPC connector, make sure that the holes on the connector are properly engaged with the hooks on the Plastic Fastener.

5-8-3 Removal of Window Display & Membrane Panel

1. Window display should not be disassembled as its mounting tabs will be broken.
2. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using of hair dryer is recommended for smoother removal.
3. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.

Alignment and Adjustments

PRECAUTION

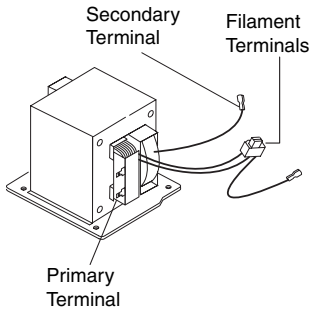
1. High voltage is present at the high voltage terminals during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

6-1 High Voltage Transformer

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

	SHV-U1650A
Secondary	120.5 Ω + 2%
Filament	Shows Continuity
Primary	0.43 Ω + 2%

(**Room** temperature = 20°C)



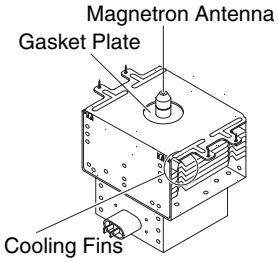
6-2 Low Voltage Transformer

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

Terminals	Resistance
	SLV-D2LED1U
1~2(Input)	379 Ω
4~5(Output 17V)	10.23 Ω
7~8(Output 2.7V)	31.91 Ω

6-3 Magnetron

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



6-4 High Voltage Capacitor

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

6-5 High Voltage Diode

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

6-6 Main Relay and Power Control RelayA

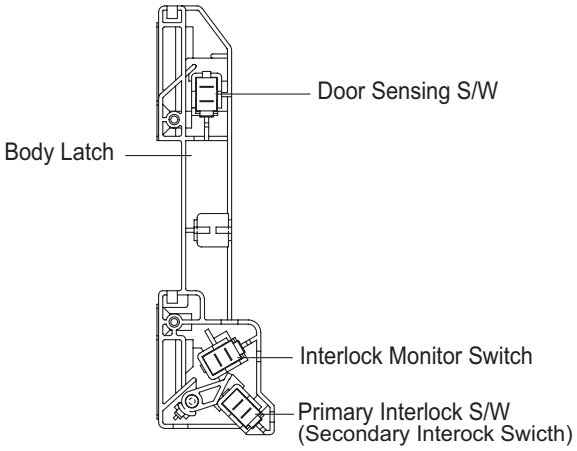
1. The relays are located on the PCB Ass'y. Isolate them from the main circuit by disconnecting the leads.
2. Operate the microwave oven with a water load in the oven. Set the power level set to high.
3. Check continuity between terminals of the relays after the start pad is pressed.

6-7 Adjustment of Primary Switch, Door Sensing Switch and Monitor Switch

PRECAUTION

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

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



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

6-8 Vent Exhaust Blower Motor

THIS COMPONENT REQUIRE REMOVAL OF MICROWAVE OVEN FROM INSTALLATION FOR SERVICING.

The blower is a two speed (HI-LO) capacitor run blower assembly located on top of the microwave oven. The blower is operated by low voltage relays located on the smart board.

The blower motor has 3 winding which can be tested for continuity from the front by removing the top grille and opening the control panel.

RUN CAPACITOR

The run capacitor is located behind the top grille above the control area. The capacitor is used for more torque and electrical phasing. Without the capacitor the blower might run but would be much slower.

TO TEST THE CAPACITOR

1. Remove grille, discharge capacitor and disconnect one capacitor lead.
2. Make appropriate capacitor check (with analog meter needle should rise then fall, cap is charging then discharging).

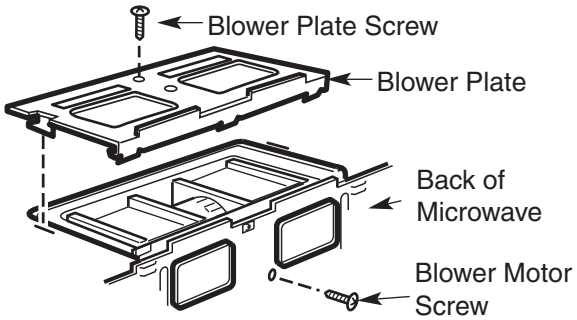
TO TEST BLOWER WINDINGS:

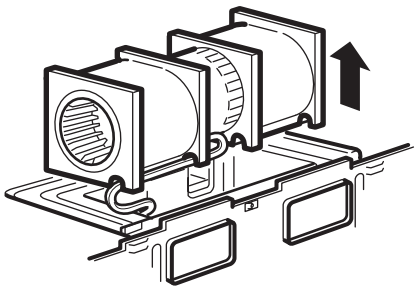
1. Disconnect power and remove grille.
2. Open control panel and discharfe capacitor.
3. Disconnent two wires to run capacitor. Continuity test across the two wires should ve approximately 75 ohms of resistance. This test allows you to read across all three windings at the same time.

TO REMOVE VENT BLOWER

1. Remove unit from its installation.
2. Remove 5 screws securing damper and motor assembly to top and back of unit and lift off. (1 screw is located under damper.)
3. Disconnect blower plug.

NOTE: Place blower wires in routing slots to avoid pinching of wires.





6-9 Thermal Cutout (TCO'S)

There are 4 different thermal cutouts in this unit with 4 different purposes. They are :

1. Oven thermal cutout (flame sensor), on cavity top.
2. Hood thermal cutout, inside control area on duct.
3. Bottom thermal cutout, on floor of control area.
4. Magnetron thermal cutout, on magnetron.

6-9-1 Oven Thermal Cutout(Flame sensor)

The oven thermal cutout(Cavity TCO) is located on the top side of the oven cavity beside exhaust duct with a temperature rating of 212°F(100°C) and is non-resetable.

The cutout is tightly held to the top of the oven cavity by a spring clip.

NOTE: If cutout cannot be removed from clip oven will have to be removed from installation and outer case removed.

6-9-2 Hood Thermal Cutout

This cutout will protect the touch control from excessive heat by turning the vent fan on at low speed. If the surface units of the range are used for long periods of time heat will build up and could damage the microwave control. In order to prevent this a thermal cutout is installed on the duct behind the control. This cutout will close (158°F/70°C - vent fan energized)and open (104°F/40°C - vent fan de-energized) depending on temperatures it sense.

To Remove hood Thermal Cutout :

1. Disconnect power and remove grille.
2. Remove control box assembly.
3. Remove two wire leads and unscrew one screw capturing cutout on duct.

NOTE: It this cutout were to open it would be difficult to detect. The only time it functions is during an overheat condition. It will be normally open when checked with an ohmmeter.

6-9-3 Bottom Thermal Cutout

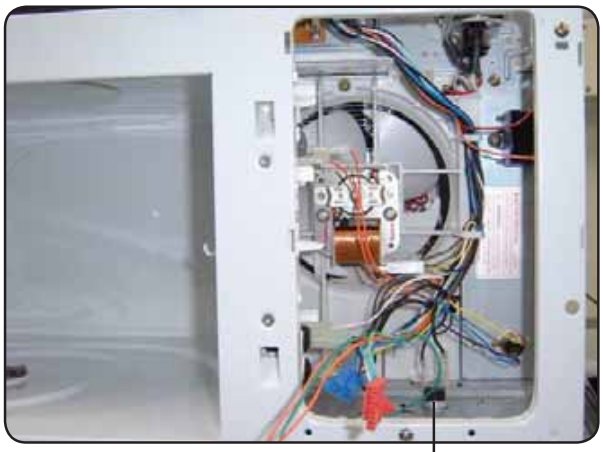
THIS COMPONENT REQUIRE REMOVAL OF MICROWAVE OVEN FROM INSTALLATION FOR SERVICING.

During a fire on the stove the heat could be intense enough to close the Hood Thermal Cutout and force the fan to run. While at moderate high temperature we do want it to run, however during a fire it is advantageous to NOT have the vent fan running. So if a fire were to start on the stove top the Bottom Thermal Cutout would open at 248°F(120°C) and remove all power to the microwave oven.

This cutout is designed to not be resetable.

To Remove Bottom Thermal Cutout :

1. Disconnect power and remove grille.
2. Remove control box assembly.
3. Remove two wire leads and unscrews one screw capturing cutout on base plate.



6-9-4 Magnetron Thermal Cutout

The magnetron thermal cutout is located above the leads to the magnetrons. It is designed to prevent damage to the magnetron if an overheated condition develops in the tube to cooling fan failure, obstructed air ducts, dirty or blocked air intake. Under normal operation, the magnetron thermal cutout remains closed. However, when abnormally high temperatures are reached within the magnetron, the magnetron thermal cutout will open at 320°F(160°C) causing the oven to shut down. After the temperature drops to 140°F(60°C) it will reset and cooking will be able to resume.

To Remove Magnetron Thermal Cutout :

1. See ‘Removing Magnetron’.

6-10 Output Power of Magnetron

PRECAUTION

MICROWAVE RADIATION

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

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

Equipment needed :

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

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

1. Fill the one liter glass vessel with water.
2. Stir water in glass vessel with thermometer, and record glass vessel's temperature ("T1", 10±1°C).
3. After moving the water into another glass vessel, place it in the center of the cooking tray. Set the oven to high power and operate for 45 seconds exactly. (3 seconds included as a holding time of magnetron oscillation:)
4. When heating is finished, stir the water again with the thermometer and measure the temperature ("T2").
5. Subtract T1 from T2. This will give you the water temperature rise. (ΔT)
6. The output power is obtained by the following formula;

$$\text{Output Power} = \frac{4.187 \times 1000 \times \Delta T + 0.55 \times Mcx(T2 - T1)}{42}$$

45	: Heating Time (sec)
42	: Counting Time (sec)
4.187	: Coefficient for Water
1000	: Water (cc)
ΔT	: Temperature Rise (T2-T1)
To	: Room Temperature
Mc	: Cylindrical borosilicate glass weight

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

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

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

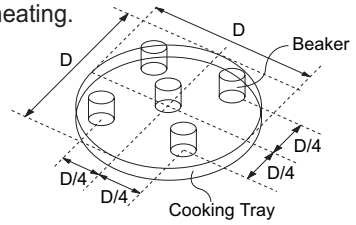
6-11 Microwave Heat Distribution - Heat Evenness

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

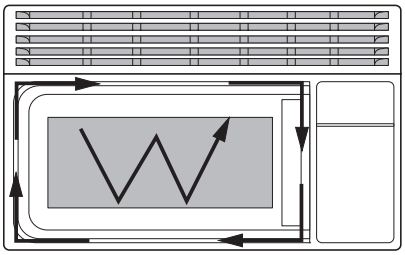
1. Prepare five beakers made of 'Pyrex', having 100 milliliters capacity each.
2. Measure exactly 100milliliters off water load with a measuring cylinder, and pour into each beaker.
3. Measure the temperature of each water load. (Readings shall be taken to the first place of decimals.)
4. Put each beaker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

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

The result should exceed 65%



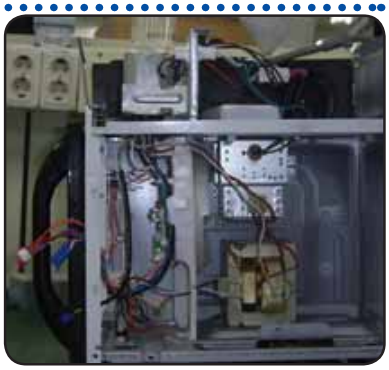
5-12 Procedure for Measurement of Microwave Energy Leakage



1. Pour 275±15cc of 20±5°C(68±9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
2. Start to operate the oven and measure the leakage by using a microwave energy survey meter.
3. Set survey meter with dual ranges to 2,450MHz.
4. When measuring the leakage, always use the 2 inch spacer cone with the probe. Hold the probe perpendicular to the cabinet door. Place the spacer cone of the probe on the door and/or cabinet door seam and move along the seam, the door viewing window and the exhaust openings moving the probe in a clockwise direction at a rate of 1 inch/sec. If the leakage testing of the cabinet door seam is taken near a corner of the door, keep the probe perpendicular to the areas making sure that the probe end at the base of the cone does not get closer than 5cm to any metal. If it gets closer than 5cm, erroneous readings may result.
5. Measured leakage must be less than 4mW/cm2 , after repair or adjustment.

Maximum allowable leakage is 5mW/cm2 .
4mW/cm2 is used to allow for measurement and meter accuracy

5-13 Check for Microwave Leakage



1. Remove the outer panel.
2. Pour 275±15cc of 20±5°C(68±9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
3. Start the oven at the highest power level.
4. Set survey meter dual ranges to 2,450MHz.
5. Using the survey meter and spacer cone as described above, measure near the opening of magnetron, the surface of the air guide and the surface of the wave guide as shown in the following photo.(but avoid the high voltage components.) The reading should be less than 4mW/cm2 .

5-14 Note on Measurement

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

5-15 Leakage Measuring Procedure

5-15-1 Record keeping and notification after measurement

1) After adjustment and repair of a radiation preventing device, make a repair record for the measured values, and keep the data.
2) If the radiation leakage is more than 4mW/cm2 after determining that all parts are in good condition, functioning properly and the identical parts are replaced as listed in this manual notify that fact to ;

CENTRAL SERVICE CENTER

5-15-2 At least once a year have the microwave energy survey meter checked for accuracy by its manufacturer.

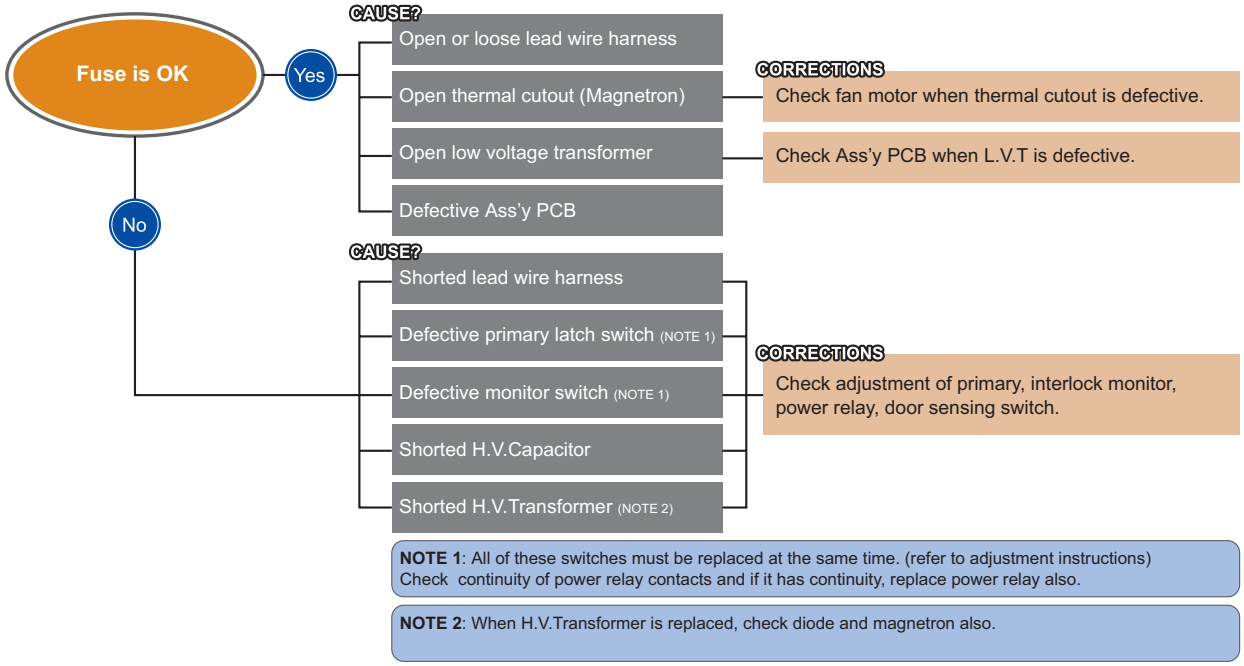
Troubleshooting

PRECAUTION

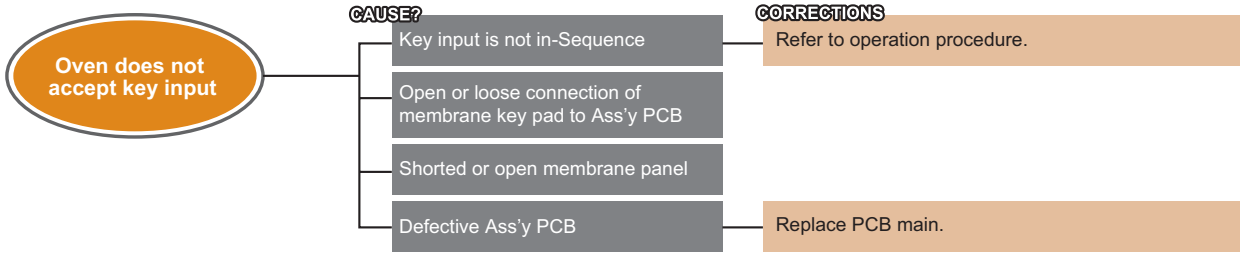
1. CHECK GROUNDING BEFORE CHECKING FOR TROUBLE.
2. BE CAREFUL OF THE HIGH VOLTAGE CIRCUIT.
3. DISCHARGE THE HIGH VOLTAGE CAPACITOR.
4. WHEN CHECKING THE CONTINUITY OF THE SWITCHES OR TRANSFORMER, DISCONNECT ONE LEAD WIRE FROM THESE PARTS AND THEN CHECK CONTINUITY WITHOUT THE POWER SOURCE ON. TO DO OTHERWISE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

7-1 Electrical Malfunction

Oven is dead. (No display and no operation at all.)



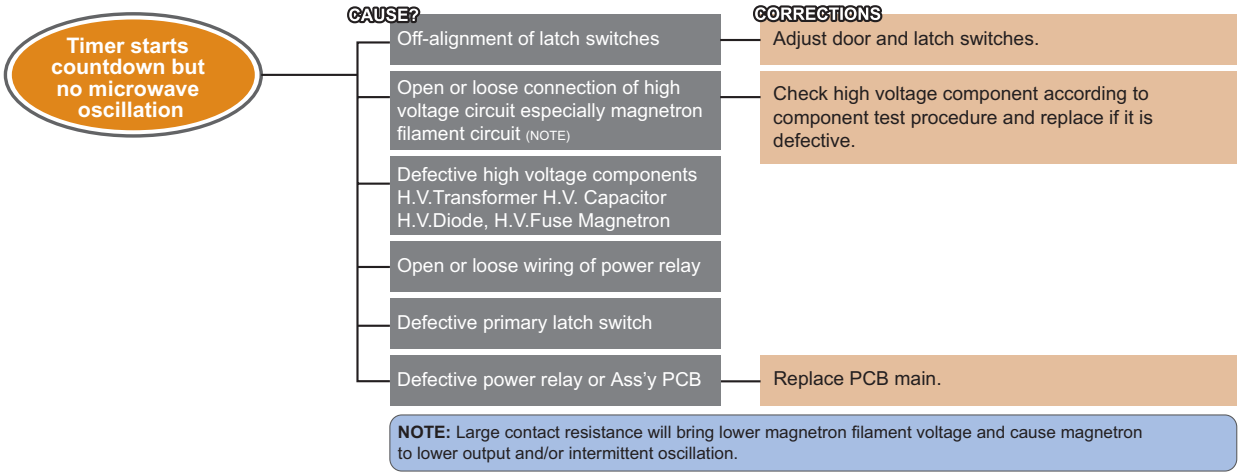
Oven does not accept key input (Program)



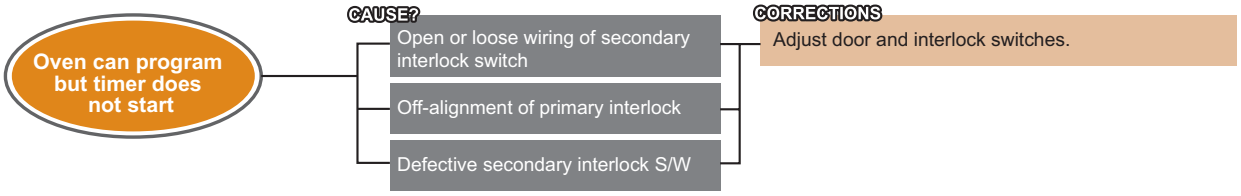
Troubleshooting

Timer starts countdown but no microwave oscillation.

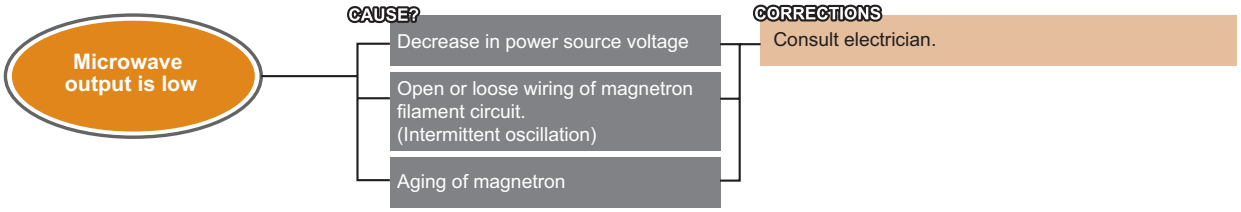
(No heat while oven lamp and fan motor turn on.)



Oven can program but timer does not start.



Microwave output is low. (Oven takes longer time to cook food.)

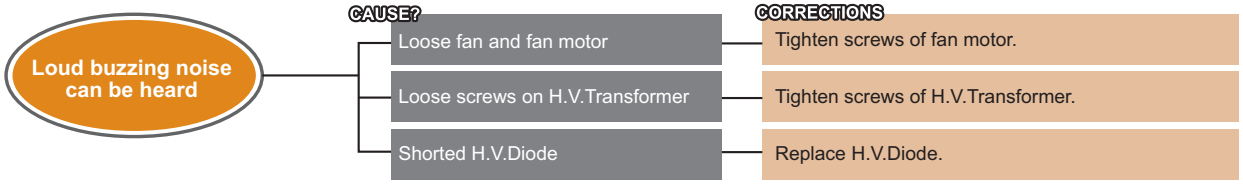


Fan motor turns on when plugged in.

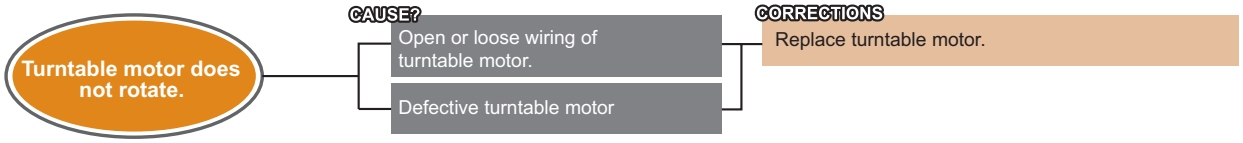
Oven does not operate and return to the plugged in mode.

Troubleshooting

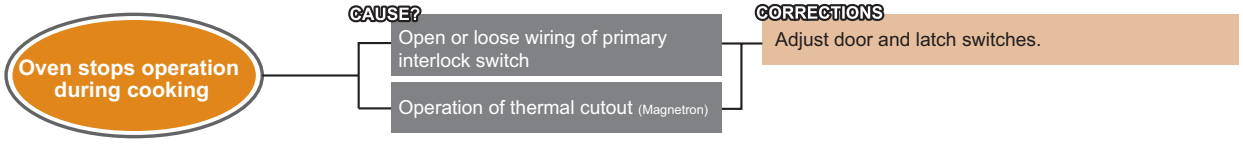
Loud buzzing noise can be heard.



Turntable motor does not rotate.

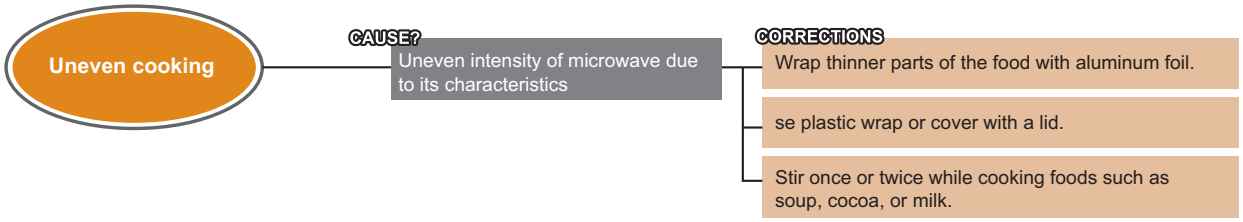


Oven stops operation during cooking.

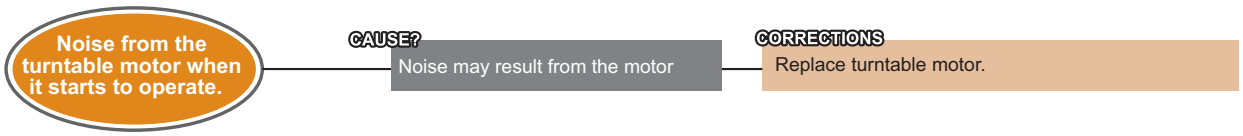


Sparks.

Uneven cooking.



Noise from the turntable motor when it starts to operate.



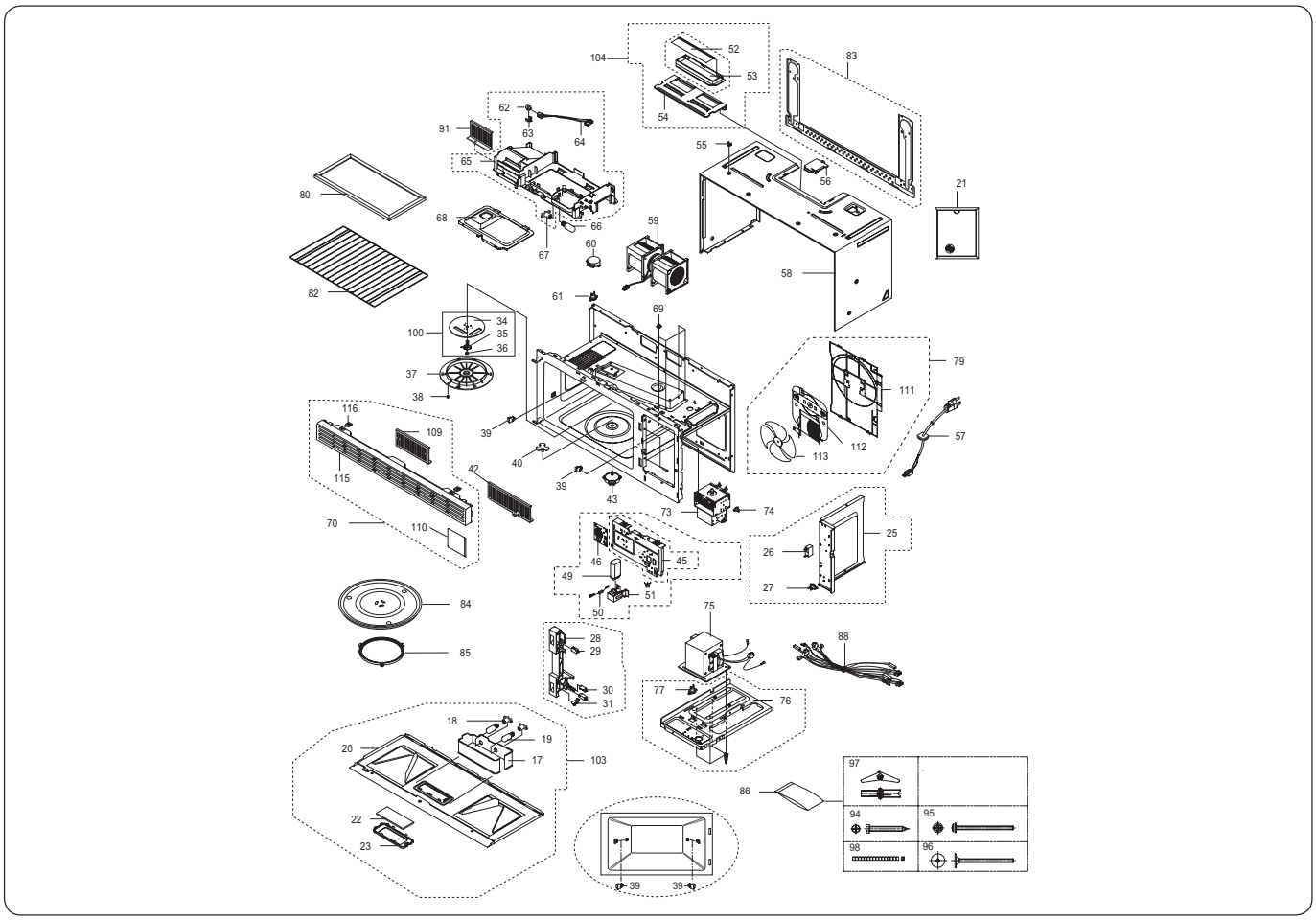
7-2 Error Code List

Error Code	Others (E-0X, Letter)
-SE-	Key Short Error (10 seconds)

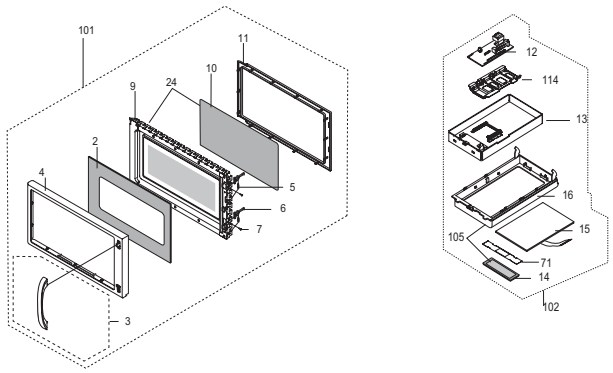
Exploded Views and Parts List

8-1 Exploded Views

Main Parts



Door & Control part



8-2 Main Parts List

(S.N.A : SERVICE NOT AVAILABLE)

No.	Part Code	Part Description	Q'ty
1		ASSY CAVITY-COATING	1
2		SCREEN-DOOR "B"	1
3		ASSY-HANDLE	1
4		DOOR-A	1
5		SPRING-KEY	2
6		DOOR-KEY	2
7		PIN-HINGE	2
9		ASSY DOOR-E	1
10		FILM-DOOR	1
11		DOOR-C	1
12		ASSY PCB PARTS	1
13		ASSY-BKT C/PANEL	1
14		WINDOW-DISPLAY	1
15		SWITCH MEMBRANE	1
16		CONTROL-PANEL	1
17		BRACKET-BOTTOM LAMP	1
18		HOLDER-LAMP	2
19		LAMP-INCANDESCENT	2
20		BASE-BOTTOM	1
21		FILTER-AIR	2
22		GLASS-COOKTOP LAMP	1
23		COVER-GLASS	1
24		ASSY DOOR-E(SUB)	1
25		DUCT-SIDE	1
26		CAPACITOR-MOTOR	1
27		THERMOSTAT	1
28		LATCH-BODY	1
29		SWITCH-MICRO	2
30		SWITCH-MICRO	1
31		LEVER-SWITCH LOWER	1
34		BLADE-STIRRER	1
35		HOLDER-STIRRER	1
36		HOLDER-TIP	1
37		COVER-STIRRER	1
38		BUTTON-LOCKING	1
39		HOLDER-RACK	4
40		COUPLER	1
42		COVER-FRONT	1
43		MOTOR-SYNCHRONOUS	1
45		BRACKET-AIR GUIDE-A	1
46		ASSY NOISE FILTER	1
49		C-OIL	1

8-2 Main Parts List

(S.N.A : SERVICE NOT AVAILABLE)

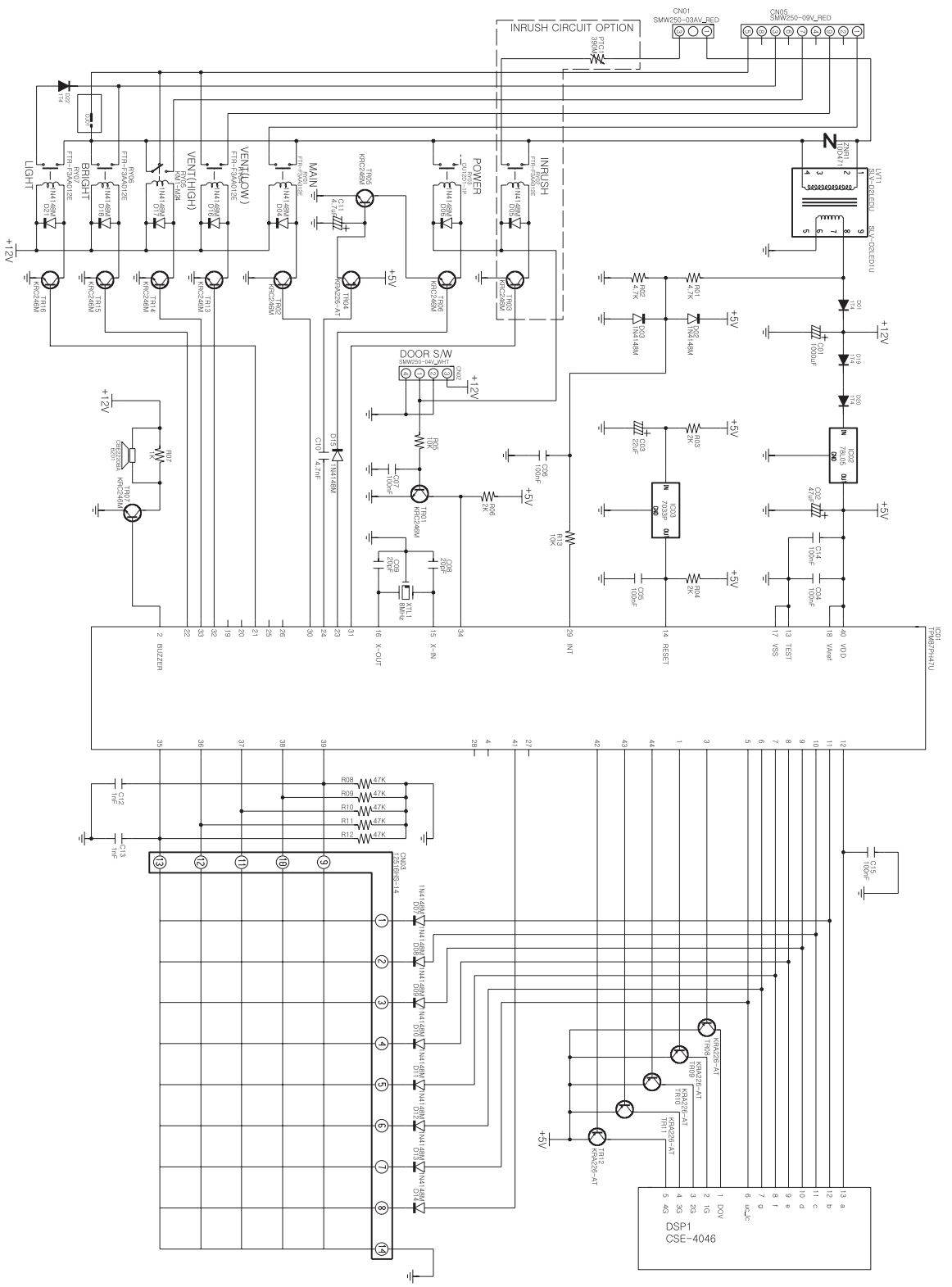
No.	Part Code	Part Description	Q'ty
50		ASSY-HVD	1
51		BRACKET-HVC	1
52		COVER-DAMPER	1
53		DAMPER-MAIN	1
54		BRACKET-V/T MOTOR	1
55		ASSY-HOLDER NUT	1
56		BRACKET-POWER CORD	1
57		ASSY POWER CORD	1
58		PANEL-OUTER	1
59		MOTOR-VENTILATION	1
60		MOTOR-SYNCHRONOUS	1
61		THERMOSTAT	1
62		SENSOR-GAS	1
63		HOLDER-SENSOR	1
64		WIRE HARNESS-S	1
65		DUCT-UPPER	1
66		LAMP-INCANDESCENT	1
67		HOLDER-LAMP	1
68		ASSY-BKT DUCT UPPER	1
69		NUT-FLANGE	4
70		ASSY-GRILLE	1
71		FILM WINDOW	1
73		ASSY-MAGNETRON	1
74		THERMOSTAT	1
75		TRANS-H.V	1
76		BASE-PLATE	1
77		THERMOSTAT	1
79		ASSY-MOTOR FAN	1
80		FILTER-CHARCOAL	1
82		RACK WIRE	1
83		ASSY-PLATE MOUNTING	1
84		TRAY-COOKING	1
85		ASSY-GUIDE ROLLER	1
86		ASSY-HARD WARE	1
88		WIRE HARNESS-A	1
91		BRACKET-FILTER	1
94		SCREW-LAG	2
95		BOLT-TOGGLE	4
96		BOLT-FLAT	3
97		NUT-TOGGLE	4
98		GROMMET	2
100		ASSY-STIRRER	1

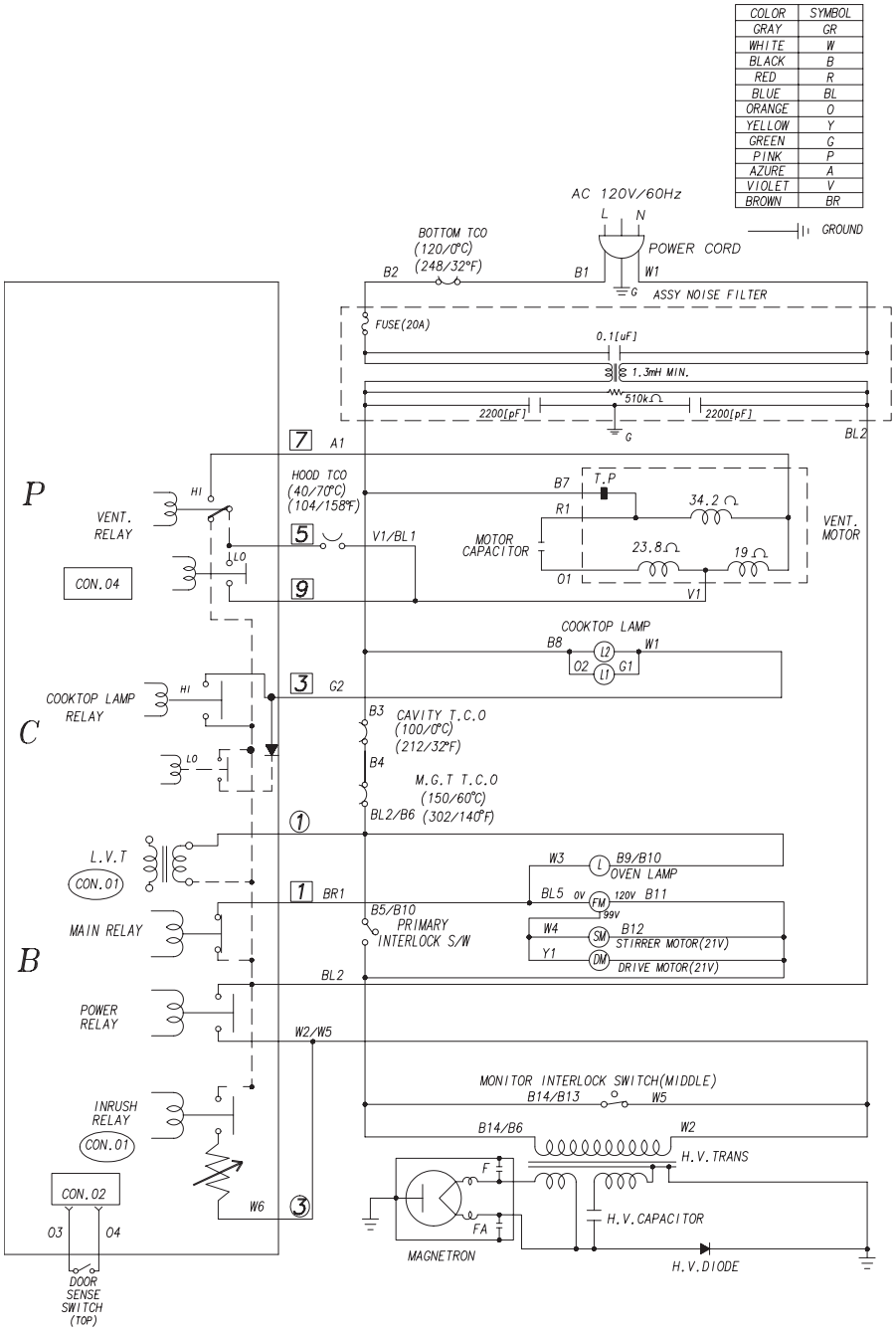
8-2 Main Parts List

(S.N.A : SERVICE NOT AVAILABLE)

No.	Part Code	Part Description	Q'ty
101		ASSY-DOOR	1
102		ASSY-CONTROL BOX	1
103		ASSY-BASE BOTTOM	1
104		ASSY-HOOD DAMPER	1
105		ASSY-CONTOL PANEL	1
109		BKT-GRILLE	1
110		BKT-LEFT	1
111		COVER-MOTOR	1
112		FAN-MOTOR	1
113		FAN BLADE	1
114		HOLDER-LED	1
115		GRILLE	1
116		CLIP GRILLE	2

Schematic Diagrams



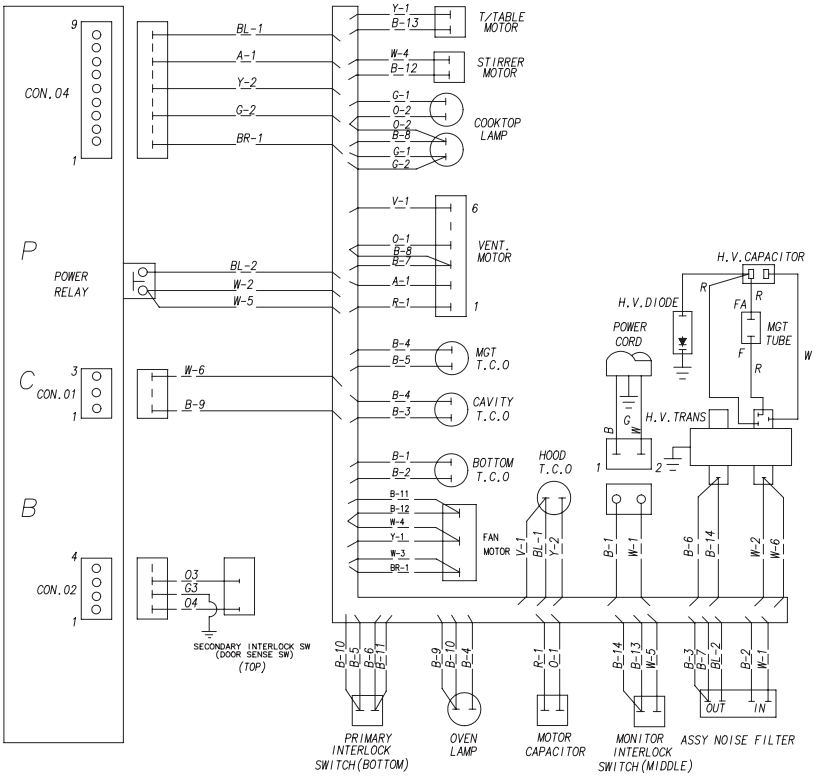

COLOR | SYMBOL
GRAY | GR
WHITE | W
BLACK | B
RED | R
BLUE | BL
ORANGE | O
YELLOW | Y
GREEN | G
PINK | P
AZURE | A
VIOLET | V
BROWN | BR
AC 120V/60Hz
L
N
GROUND
POWER CORD
BOTTOM TCO
(120/0°C)
(248/32°F)
B2
B1
W1
G
ASSY NOISE FILTER
FUSE(20A)
0.1[uF]
1.3mH MIN.
510kΩ
2200[pF]
2200[pF]
BL2
7
A1
P
HOOD TCO
(40/70°C)
(104/158°F)
B7
T.P
R1
34.2Ω
VENT.
MOTOR
VENT.
RELAY
HI
LO
5
V1/BL1
MOTOR
CAPACITOR
23.8Ω
19Ω
01
V1
CON.04
9
COOKTOP LAMP
B8
L2
W1
02
G1
L1
COOKTOP LAMP
RELAY
HI
3
G2
C
B3
CAVITY T.C.O
(100/0°C)
(212/32°F)
LO
B4
M.G.T T.C.O
(150/60°C)
(302/140°F)
BL2/B6
1
L.V.T
CON.01
W3
L
B9/B10
OVEN LAMP
1
BR1
BL5
0V
FM
120V
99V
B11
MAIN RELAY
B5/B10
PRIMARY
INTERLOCK S/W
W4
SM
B12
STIRRER MOTOR(21V)
Y1
DM
DRIVE MOTOR(21V)
B
BL2
POWER
RELAY
W2/W5
MONITOR INTERLOCK SWITCH(MIDDLE)
B14/B13
W5
INRUSH
RELAY
CON.01
B14/B6
W2
H.V.TRANS
F
CON.02
W6
3
FA
H.V.CAPACITOR
03
04
MAGNETRON
H.V.DIODE
DOOR
SENSE
SWITCH
(TOP)

COLOR	SYMBOL
GRAY	GR
WHITE	W
BLACK	B
RED	R
BLUE	BL
ORANGE	O
YELLOW	Y
GREEN	G
PINK	P
AZURE	A
VIOLET	V
BROWN	BR

GROUND

HARNESS LEADS

PARTS LEADS



12-1 Customer inquiry cases and countermeasures

Symptom	Cause	Countermeasures
Air is evacuated from the oven.	• The vent of the oven is designed to be placed on the bottom of the product, and air is evacuated from the oven.	• In the past, the vent was placed on the back panel of the oven. Since the oven was placed near the wall of a kitchen, the wall behind the oven was discolored. Thus, the vent of a new oven is placed on the bottom of the product, and air is evacuated from the oven.
The oven works automatically whenever the power is turned on.	• It may happen due to power failure or abnormal voltage. • It may happen when the door does not close completely.	• Connect the power plug three seconds after disconnecting the power plug. • Close the door completely => Press the Cancel button => Press the Start button.
Heating	• In many cases, it may happen when the power level is incorrectly set. • It may happen when the door does not close completely. • It may happen when the oven is out of order.	• Select HIGH by rotating the Cooking Power Control knob. - KEEP WARM: This function is used to warm the cooked food for a certain time period, not to heat the food. - MEDIUM/LOW: This function is used to cook the food slowly. • Close the door completely. => Press the Cancel button. => Press the Start button. • Contact the nearest Samsung after-sales service center.
Ground	• Ground problem may happen when the oven is placed in a humid area and the over is not grounded. • Ground is not provided by an extended electric outlet.	• If the oven is placed in a humid area, buy an electric wire in a store selling electrical products. (Electric wires for home use are also allowed) Ground the oven through the electric wire. • Buy an electric wire in a store selling electrical products. (Electric wires for home use are also allowed) Ground the oven through the electric wire.
Turn table occasionally rotates in reverse order.	• Turntable has been designed to rotate in either direction since 1994.	• In the past, the gear of the turntable was easily worn by turning it during cleaning. Now, the turntable of the oven is designed to rotate in both directions to prevent damage during cleaning. (Rotation direction is set when the oven initially operates.)
The oven sometimes beeps.	• The oven beeps every minute unless the food is in the oven after the food is cooked completely. • The oven occasionally beeps during cooking.	• Open and close the door again. (Beeping sounds indicate that the food is ready to be removed from the oven after cooking is complete.)

12-1 Customer inquiry cases and countermeasures (Continued)

Symptom	Cause	Countermeasures
Strange popping sounds are produced while fish is cooked.	• Since fish is salty and maintains its moisture, it is cooked while making a series of soft popping sounds. (The liquid may come out of the fish when the fish is cooked.)	• Food with bones such as fish (e.g. mackerel) and pork (e.g. pork chops) is cooked while making a series of soft popping sounds. Wrap the food completely so that food particles or spattered oils do not stick to the oven walls or floor.
Strange smell is produced in the oven.	• It may happen when food particles stuck to oven walls or floor.	• Clean the inside of the oven. => Remove strange smell through the Deodorant button => If the strange smell still remains, place a piece of lemon on the turntable and operate the oven for 5 minutes by pressing the Deodorant button.(However, the smells produced from the food exposed such as herbal remedies are not removed.)
Error	• Errors are classified with Failure and Non-failure.	• Refer to the section of ERROR in User Manual.
Accessory		• Visit the nearest Samsung Service Center or local dealer to buy accessories. Before visiting, check the model name printed on the lower right side of the front panel of the oven.
Number does not appear on the display screen.	• It happens when the power saving function is activated.	• Since the government recommends the reduction of electricity, the power saving function is performed for number display like that power cord is unplugged when the oven is not used. (Numbers are displayed when another button is pressed or when the door opens.)