SHARP SERVICE MANUAL

S70224R895M//

MICROWAVE OVEN WITH GRILL AND CONVECTION

MODEL R-895(AL)M

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

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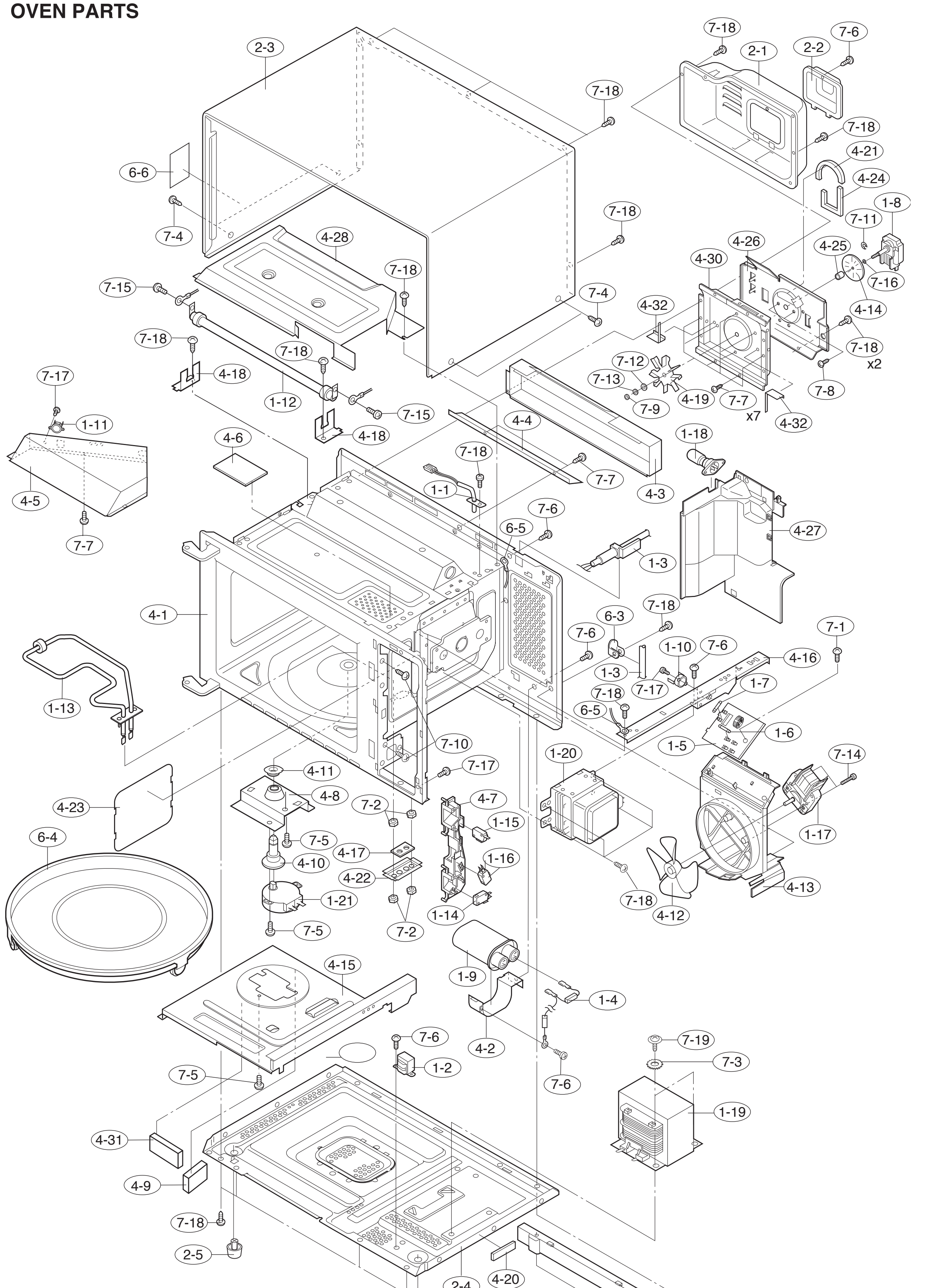
SHARP CORPORATION

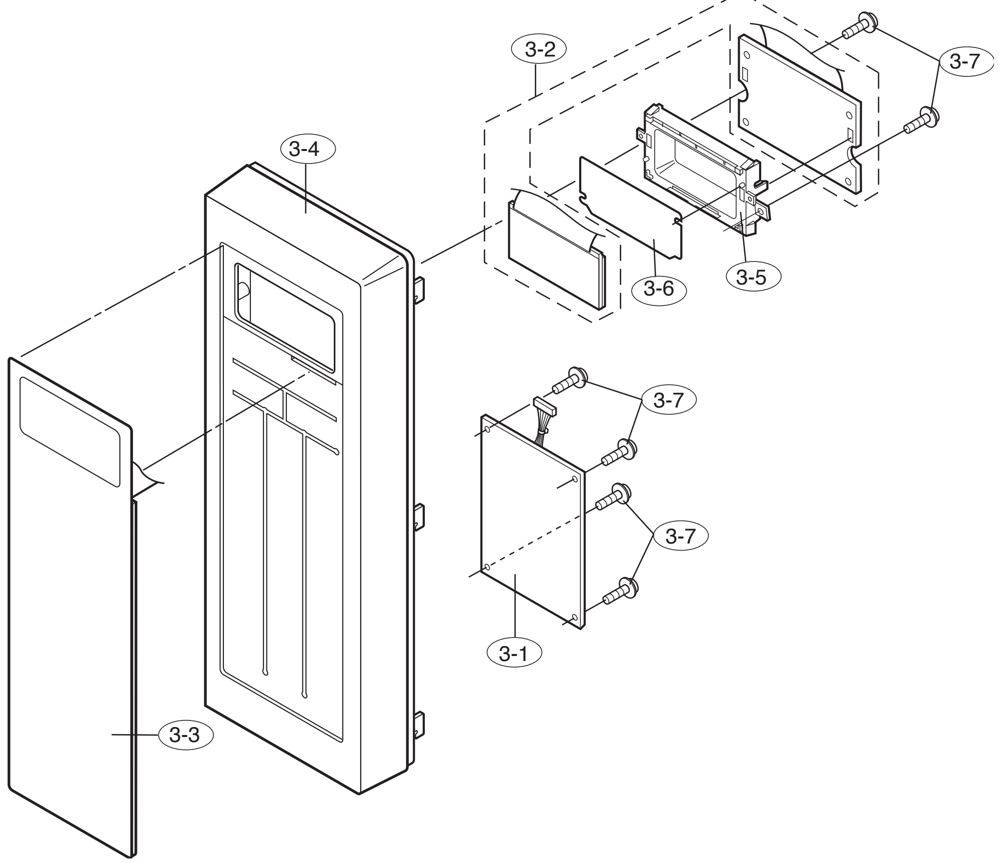
OVEN PARTS



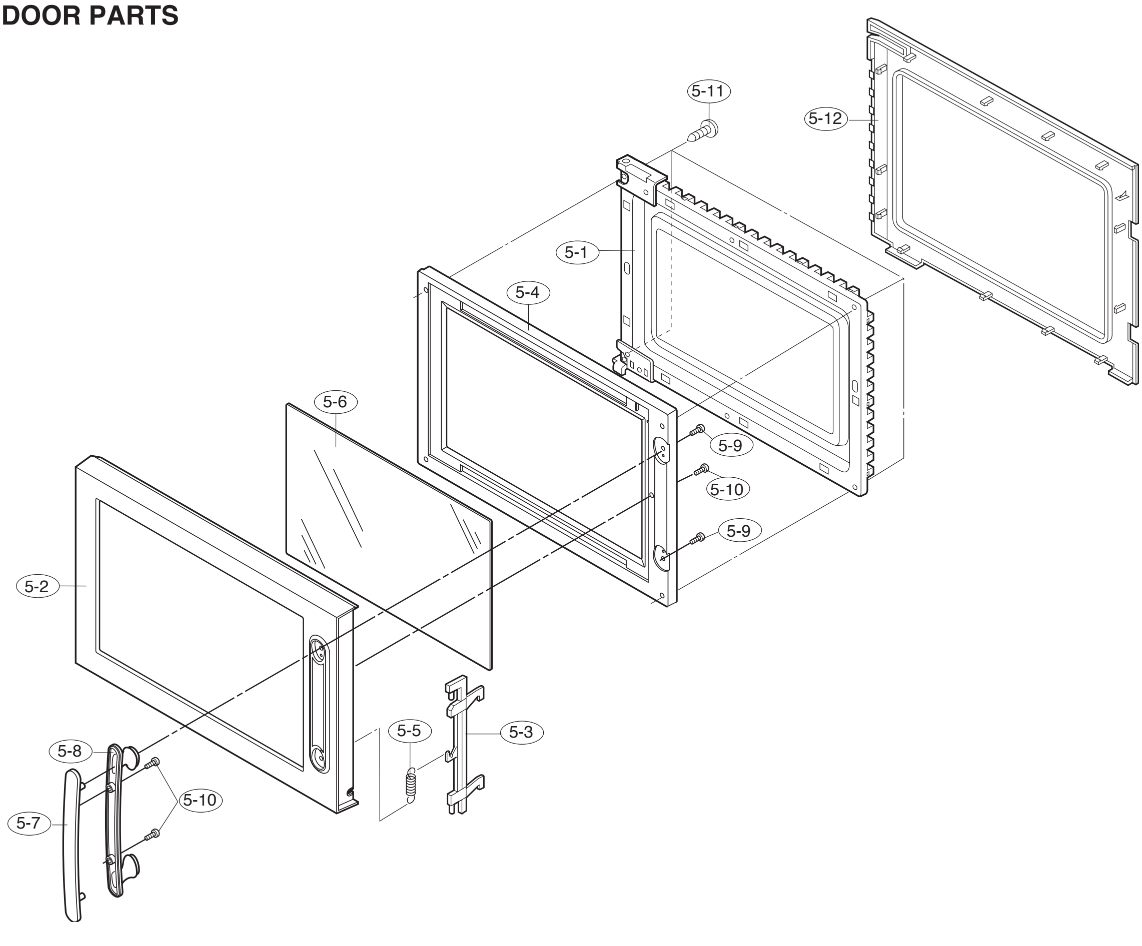
NOTE: In the event of removing the turntable motor cover this part should be refitted using screw connection: LX-EZA045WRE0 (7-20)

CONTROL PANEL AND DOOR PARTS

CONTROL PANEL PARTS

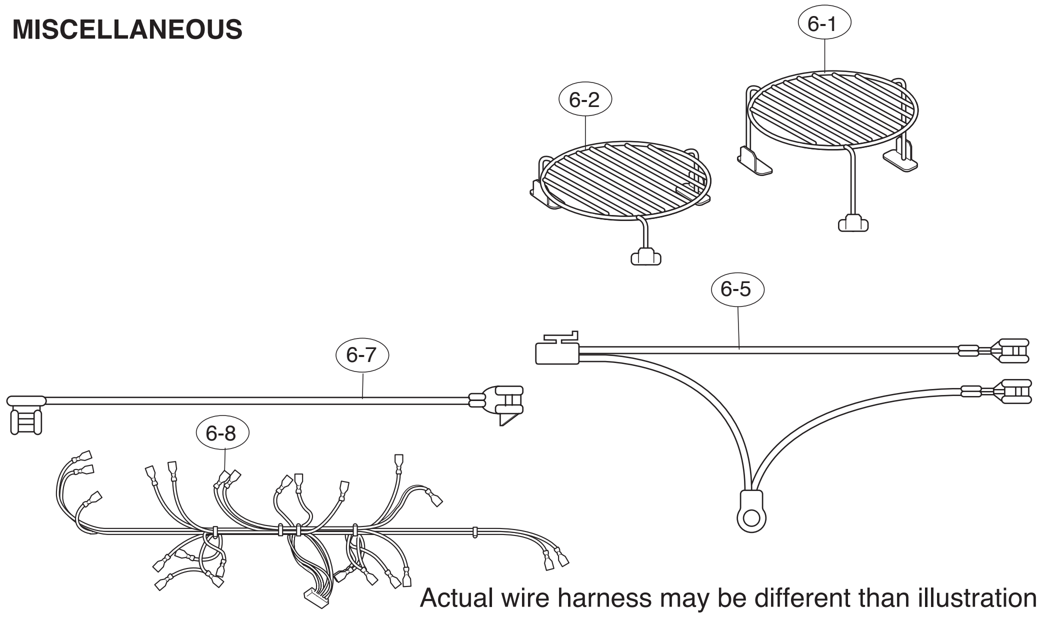


DOOR PARTS



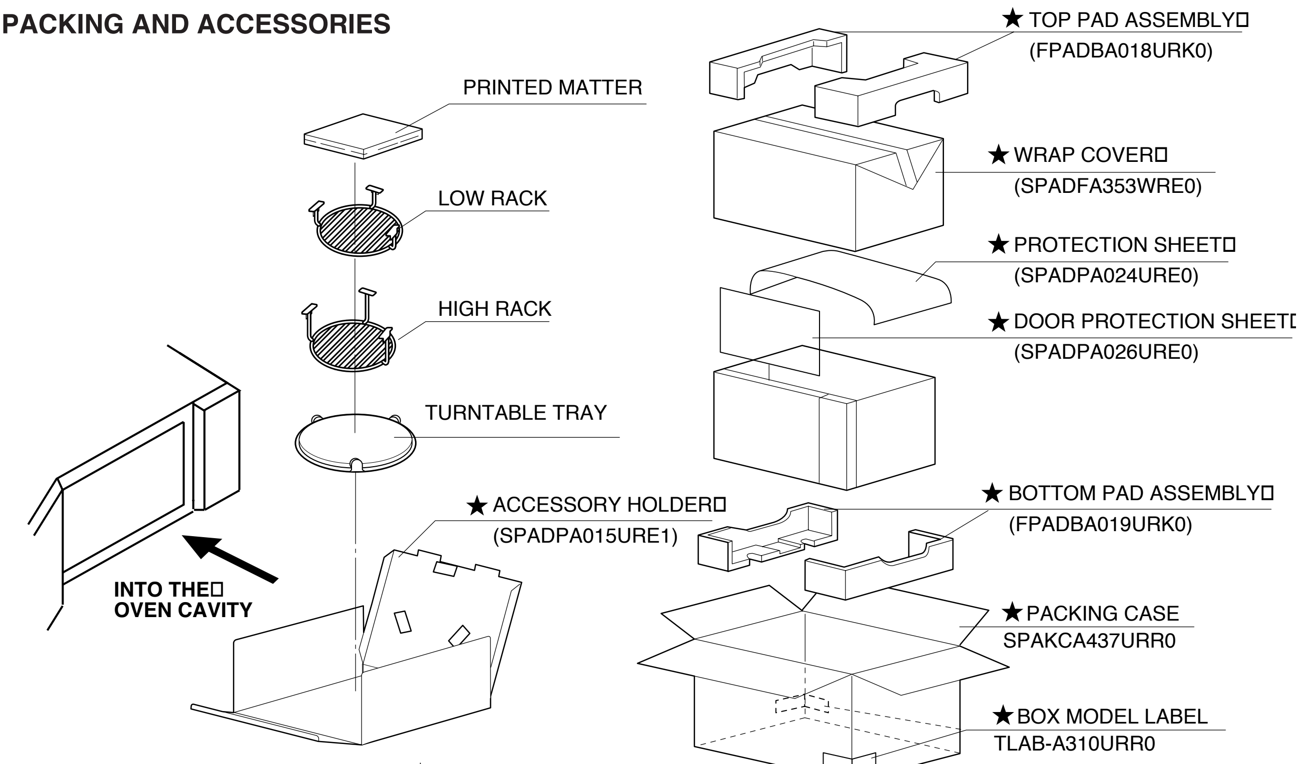
MISCELLANEOUS / PACKING & ACCESSORIES

MISCELLANEOUS



Actual wire harness may be different than illustration.

PACKING AND ACCESSORIES



★ **Not Replaceable Items.**

PARTS LIST

Note: The parts marked "∆" may cause undue microwave exposure. / The parts marked "*" are used in voltage more than 250V. / "§" Mark: Spare parts delivery section

	REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
				ELECTRIC PARTS		
	1- 1	FH-HZA075WRE0	U	Thermistor	1	AN
	1- 2	RTRN-A529WRE0	U	TC transformer	1	AV
	1- 3	QACCBA004URE3	U	Power supply cord	1	AT
*	1- 4	FH-DZA035WRE0	U	High voltage rectifier assembly	1	AP
	1- 5	FPWBFA309WRE2	U	Noise filter	1	AT
	1- 6	QFS-CA025WRE0	U	Fuse F8A	1	AC
	1- 7	QFS-BA009WRE0	U	Fuse 20A	1	AC
	1- 8	RMOTEA373WRE0	U	Convection motor	1	AV
*	1- 9	RC-QZA240WRE0	U	High voltage capacitor	1	AR
	1-10	RTHM-A098WRE0	U	Thermal cut-out 125˚C off(MG)	1	AH
	1-11	RTHM-A124WRZZ	U	Thermal cut-out 145˚C off 115˚C on (OVEN)	1	AH
	1-12	RHET-A255WRZZ	U	Top grill heating element	1	AT
	1-13	RHET-A248WRZ1	U	Bottom grill heating element	1	AW
	1-14	QSW-MA146WRZZ	J	Monitored latch switch	1	AC
	1-15	QSW-MA147WRZZ	J	Stop switch	1	AG
	1-16	QSW-MA146WRZZ	J	Monitor switch	1	AC
	1-17	RMOTEA002URE1	U	Fan motor	1	AW
	1-18	RLMPTA066WRE0	U	Oven lamp	1	AK
	1-19	RTRN-A019URE0	U	High voltage transformer	1	BF
*	1-20	RV-MZA243WRE1	U	Magnetron	1	BH
∆*	1-21	RMOTDA227WRE0	U	Turntable motor	1	AU
				CABINET PARTS		
	2- 1	GCABDA001URP2	U	Back plate	1	AQ
	2- 2	GCABDA002URP0	U	Sub back plate	1	AH
	2- 3	GCABUW045URP0	U	Outer case cabinet	1	AW
	2- 4	GDAI-A002URP0	U	Base plate	1	AR
	2- 5	GLEGPA057WRE1	U	Foot	2	AB
				CONTROL PANEL PARTS		
	3- 1	DPWBFA184URK0	U	Power unit	1	BC
	3- 1A	QCNCMA453DRE0	U	5-pin connector (CN-A)	1	AC
	3- 1B	QCNCMA414DRE0	U	2-pin connector (CN-B)	1	AB
	3- 1C	QCNCMA410DRE0	U	2-pin connector (CN-C)	1	AB
	3- 1D	QCNCMA230DRE0	U	4-pin connector (CN-E)	1	AC
	3- 1E	FW-VZA266DREZ	U	15pin wire harness (WH-1)	1	AH
	C1	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
	C2	VCEAG31VW108M	U	Capacitor 1000 uF 35V	1	AE
	C3	RC-KZA087DRE0	U	Capacitor 0.1 uF 50V	1	AB
	C4-5	VCEAG31VW106M	U	Capacitor 10 uF 35V	2	AB
	D1-7	VHD1SS270A/-1	U	Diode (1SS270A)	7	AA
	D11-14	VHD1N4005E/-2	U	Diode (1N4005E)	4	AA
	D11-14	VHD1N4004S/-1T	U	Diode (1N4004S) (Interchangeable)	4	AA
	Q2	VSKTA1274//-3	U	Transistor (KTA1274)	1	AA
	Q3	VSKRC243M//-3	U	Transistor (KRC243M)	1	AB
	R2	VRD-B12EF152J	U	Resistor 1.5K ohm 1/4W	1	AA
	R3-4	VRS-B13AA511J	U	Resistor 510 ohm 1W	2	AB
	R5	VRD-B12EF332J	U	Resistor 3.3K ohm 1/4W	1	AA
	R6	VRS-B13AA201J	U	Resistor 200 ohm 1W	1	AB
	RY1	RRLY-A117DRE0	U	Relay (DU18D1-1P(M)-R)	1	AG
	RY2	RRLY-A122DRE0	U	Relay (DU18D1-1P(M)-R-S)	1	AG
	RY3-4	RRLY-A113DRE0	U	Relay (DU24D1-1P(M)-R)	2	AG
	RY5-7	RRLY-B004MRE0	U	Relay (FTR-F3AA024E)	3	AL
	SP1	RALM-A014DRE0	U	Buzzer (PKM22EPT)	1	AG
	VRS1	RH-VZA034DRE0	U	Varistor (10G471K)	1	AD
	ZD2	VHEHZ201///-1	U	Zener diode (HZ20-1)	1	AB
	3- 2	DPWBFC239WRKZ	U	CPU unit	1	BC
	3- 3	FUNTKC135URE0	U	Key unit	1	AS
	3- 4	HPNLCA123URR0	U	Control panel frame	1	AV
	3- 5	LHLD-A007URF1	U	LCD holder	1	AD
	3- 6	PSHEPA647WRE0	U	LCD sheet	1	AL
	3- 7	XEPSD30P10XS0	U	Screw : 3mm x 10mm	6	AA
				OVEN PARTS		
	4- 1	DOVN-A023URK0	U	Oven cavity	1	BG
	4- 2	LBNDKA107WRP1	U	Capacitor holder	1	AD
	4- 3	FDUC-A003URY0	U	Air duct assembly	1	AL
	4- 4	LANGQA005URP0	U	Air separate angle B	1	AC
∆	4- 5	PDUC-A636WRP1	U	Air guide duct	1	AM
	4- 6	PFILWA001URP0	U	Lamp filter	1	AB
	4- 7	PHOK-A002URF1	U	Latch hook	1	AH
	4- 8	LANGQA014URP0	U	Turntable motor angle	1	AE
	4- 9	PCUSUA019URE0	U	Cushion	1	AA
	4-10	FANGTA003URY0	U	Turntable motor shaft assembly	1	AL
	4-11	PPACGA002URE0	U	Seal packing	1	AB
∆	4-12	NFANJA038WRE0	U	Fan blade	1	AF

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure. / The parts marked "*" are used in voltage more than 250V. / "§" Mark: Spare parts delivery section

	REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
	4-13	PDUC-A637WRF2	U	Fan duct	1	AL
	4-14	NFANMA002URP0	U	Cooling fan	1	AF
	4-15	GCOVHA001URP1	U	Bottom heater cover	1	AM
	4-16	LANGFA155WRP7	U	Chassis support	1	AF
	4-17	PPACGA001URE0	U	Heater packing	1	AD
	4-18	LANGQA008URP0	U	Grill heater angle	2	AD
	4-19	NFANMA001URP0	U	Convection fan	1	AD
	4-20	PSPAGA001WRE0	U	Vibration proof cushion	1	AA
	4-21	PCUSUA006URE0	U	Air cushion B	1	AA
	4-22	PCOVQA002URP0	U	Heater cover	1	AD
	4-23	PCOVPA308WRE1	U	Waveguide cover	1	AE
	4-24	PCUSUA015URE0	U	Back plate cushion	1	AB
	4-25	PPIP-A001UR10	U	Pipe	1	AE
	4-26	PCOVQA001URP0	U	Rear heat cover	1	AP
	4-27	PDUC-A606WRF1	U	Air intake duct	1	AK
	4-28	PDUC-A008URP0	U	Exhaust duct	1	AK
	4-29	PSKR-A308WRF0	U	Rear barrier	1	AH
Δ	4-30	PDUC-A003URP0	U	Convection duct	1	AL
Δ	4-31	PCUSUA012URE0	U	Air defect cushion	1	AB
Δ	4-32	LANGQA004URP0	U	Convection air angle	2	AN
				DOOR PARTS		
	5- 1	DDORFA766WRK0	U	Door panel assembly	1	BE
	5- 2	GWAKPA103URR0	U	Door frame	1	AU
	5- 3	LSTPPA017URF0	U	Latch head	1	AG
	5- 4	LHLD-A012URF0	U	Glass holder	1	AB
	5- 5	MSPRTA197WREZ	U	Latch spring	1	AC
	5- 6	PGLSPA027URE0	U	Front door glass	1	AN
	5- 7	JHNDPA012URT0	U	Door handle A	1	AK
	5- 8	JHNDPA013URT0	U	Door handle B	1	AR
	5- 9	XETSD40P30000	U	Screw : 4mm x 30mm	2	AA
	5-10	XEBSD30P08000	U	Screw : 3mm x 8mm	3	AA
	5-11	XEBSD30P06000	U	Screw : 3mm x 6mm	4	AA
	5-12	GCOVHA365WRF3	U	Choke cover	1	AM
				MISCELLANEOUS		
	6- 1	FAMI-A072WRK2	U	High rack	1	AT
	6- 2	FAMI-A095WRK1	U	Low rack	1	AR
	6- 3	LHLDKA008WRF1	U	P-clip	1	AA
	6- 4	CTNT-A005URK0	U	Turntable tray	1	AY
	6- 5	FW-VZA061URE1	U	Stop switch harness	1	AE
	6- 6	TCAUHA001WRR1	U	Caution label	1	AC
	6- 7	QW-QZA210WRE1	U	High voltage wire B	1	AD
	6- 8	FW-VZA098URE0	U	Main harness	1	AX
	6- 9	TINS-A286URR0	U	Quick start guide	1	AD
*	6-10	TINS-A285URR0	U	Operation manual	1	AS
				SCREWS,NUTS AND WASHERS		
	7- 1	XHPSD40P08K00	U	Screw: 4mm x 8mm	1	AA
	7- 2	LX-NZ0061WRE0	J	M4 Flange nut	4	AA
	7- 3	XWWSD50-06000	J	Washer: 5mm x 0.6mm	1	AA
	7- 4	XOTSE40P10000	J	Screw: 4mm x 10mm	4	AA
	7- 5	XHPSD40P06000	J	Screw: 4mm x 6mm	3	AA
	7- 6	XHTSD40P08RV0	J	Screw: 4mm x 8mm	6	AA
	7- 7	XOTWW40P06000	J	Screw: 4mm x 6mm	10	AA
	7- 8	XBTSD40P05000	U	Screw: 4mm x 5mm	2	AA
	7- 9	XNEUW40-32000	J	Nut: 4mm x 3.2mm	1	AA
	7-10	XOTSD40P12RV0	J	Screw: 4mm x 12mm	2	AA
	7-11	XRESE40-06000	U	Ring	1	AA
	7-12	XWHUW40-08000	U	Washer: 4mm x 0.8mm	1	AA
	7-13	XWSUW40-10000	U	Washer: 4mm x 1.0mm	1	AA
	7-14	XEPSD40P25000	J	Screw: 4mm x 25mm	2	AA
	7-15	XBPWW30P05K00	J	Screw: 3mm x 5mm	2	AA
	7-16	XWHUW50-08000	J	Washer: 5mm x 0.8mm	1	AA
	7-17	XEBSD30P06000	U	Screw: 3mm x 6mm	3	AA
	7-18	LX-CZA001URE0	U	Special screw	24	AA
	7-19	XFPSD50P10KS0	U	Screw: 5mm x 10mm	2	AB
	7-20	LX-EZA045WRE0	J	Special screw (TTM cover mounting screw)	1	AA

HOW TO ORDER REPLACEMENT PARTS

To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION

SERVICE MANUAL

SHARP®

MICROWAVE OVEN WITH
GRILL AND CONVECTION

R-895(AL)M

GENERAL IMPORTANT INFORMATION

This Manual has been prepared to provide Sharp Corp. Service engineers with Operation and Service Information.

It is recommended that service engineers carefully study the entire text of this manual, so they will be qualified to render satisfactory customer service.

WARNING
MICROWAVE RADIATION

Personnel should not be exposed to the microwave energy which may radiate from the magnetron or other microwave generating devices if it is improperly used or connected. All input and output microwave connections, waveguides, flanges and gaskets must be secured. Never operate the device without a microwave energy absorbing load attached. Never look into an open waveguide or antenna while the device is energized.

WARNING

Never operate the oven until the following points are ensured.
(A) The door is tightly closed.
(B) The door brackets and hinges are not defective.
(C) The door packing is not damaged.
(D) The door is not deformed or warped.
(E) There is not any other visible damage with the oven.

Servicing and repair work must be carried out only by trained service engineers.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to potentials above 250V.

All the parts marked "∆" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

Never operate the Grill and/ or Bottom heater with the oven outer cabinet removed. (Because air flow is eliminated, and the excess heat generated on adjacent components). **It can cause permanent damage or a fire.**

SHARP CORPORATION

OSAKA, JAPAN

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts will result in electrocution.
High voltage capacitor, High voltage transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

1) Disconnect the supply.
2) Door opened, and wedged open.
3) Discharge high voltage capacitor.

WARNING: AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is, of the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the High voltage transformer. Ensure that these leads remain isolated from other components and the oven chassis. (Use insulation tape if necessary.) When the testing is completed carry out 3D checks and reconnect the leads to the primary of the High voltage transformer.

REMEMBER TO CHECK 4R

1) Reconnect all leads removed from components during testing.
2) Replace the outer case (cabinet).
3) Reconnect the supply.
4) Run the oven. Check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

When all service work is completed, and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test should be carried out.

PRODUCT DESCRIPTION

SPECIFICATION

ITEM	DESCRIPTION		
Power Requirements	230 - 240 Volts / 50 Hertz / Single phase, 3 wire earthed		
Power Consumption	Microwave cooking 1.50 kW Approx. 6.5 A		
	Convection cooking 1.91 kW Approx. 8.0 A		
	Grill cooking	Top Grill mode .... 1.25 kW	Approx. 5.2 A
		Bottom Grill mode .... 0.70 kW	Approx. 2.9 A
		Top and Bottom mode .... 1.90 kW	Approx. 7.9 A
	Dual cooking	Micro and Top Grill .... 2.70 kW	Approx. 11.5 A
		Micro and Bottom Grill .... 2.15 kW	Approx. 9.2 A
		Micro and Convection .... 2.16 kW	Approx. 9.3 A
Power Output	900 W nominal of RF microwave energy (measured by method of IEC 60705) Operating fequency 2450 MHz		
Top Grill heating element Power Output	1200 W		
Bottom heating element Power Output	650 W		
Case Dimensions	Width 520 mm	Height 309 mm (including foot)	Depth 482 mm
Cooking Cavity Dimensions	Width 353 mm	Height 207 mm	Depth 357 mm
Turntable diameter	325 mm		
Control Complement	Touch Control System Clock (1:00 - 12:59) / Timer (0 - 99 minutes 90 sec.) Microwave Power for Variable Cooking Repetition Rate; 100 (HIGH) .... Full power throughout the cooking time 70 (MEDIUM HIGH) .... approx. 70% of FULL Power 50 (MEDIUM) .... approx. 50% of FULL Power 30 (MEDIUM LOW) .... approx. 30% of FULL Power 10 (LOW) .... approx. 10% of FULL Power Convection temperature control range: 250˚C, 230˚C, 220˚C, 200˚C, 180˚C, 160˚C, 130˚C, 100˚C, 70˚C and 40˚C TIME keys, BREAKFAST key, PIZZA key, EXPRESS COOK keys EXPRESS DEFROST keys, MEAL IN ONE keys POWER LEVEL key, GRILL key, DUAL CONV./GRILL key CONV. (˚C) key, LESS/MORE keys, WEIGHT keys INFO key, STOP/CLEAR key, START/AUTO MINUTE key KITCHEN TIMER/CLOCK SET key		
Net Weight	Approx. 19 kg		

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice

GENERAL INFORMATION

WARNING

THIS APPLIANCE MUST BE EARTHED

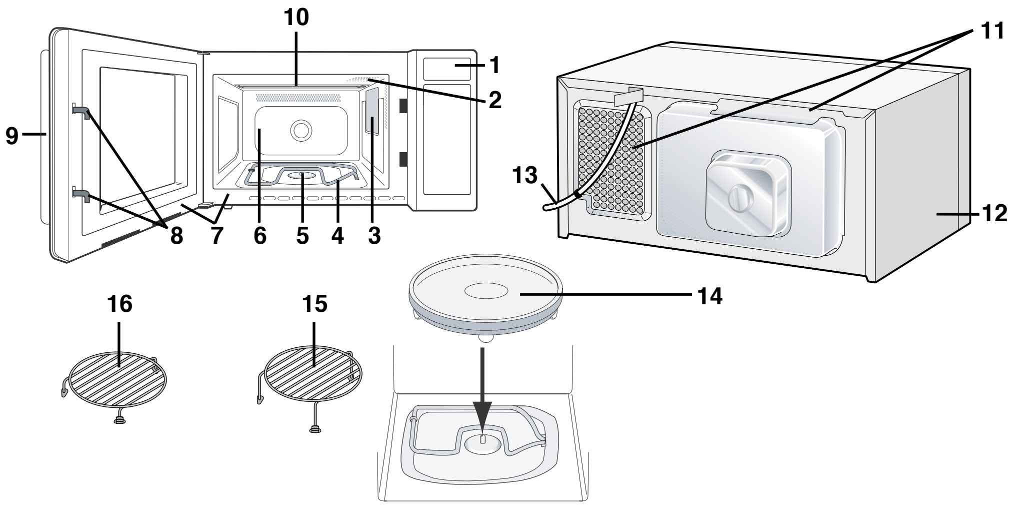
IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW : EARTH
BLUE : NEUTRAL
BROWN : LIVE

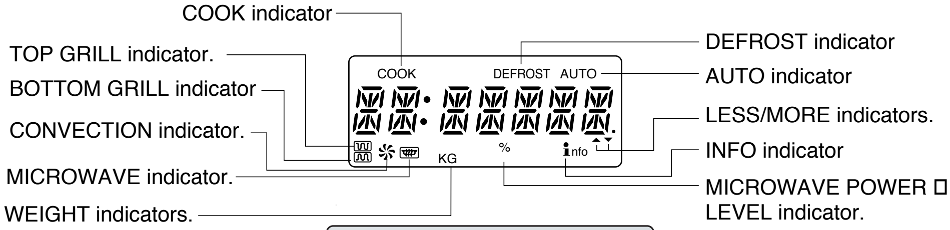
APPEARANCE VIEW

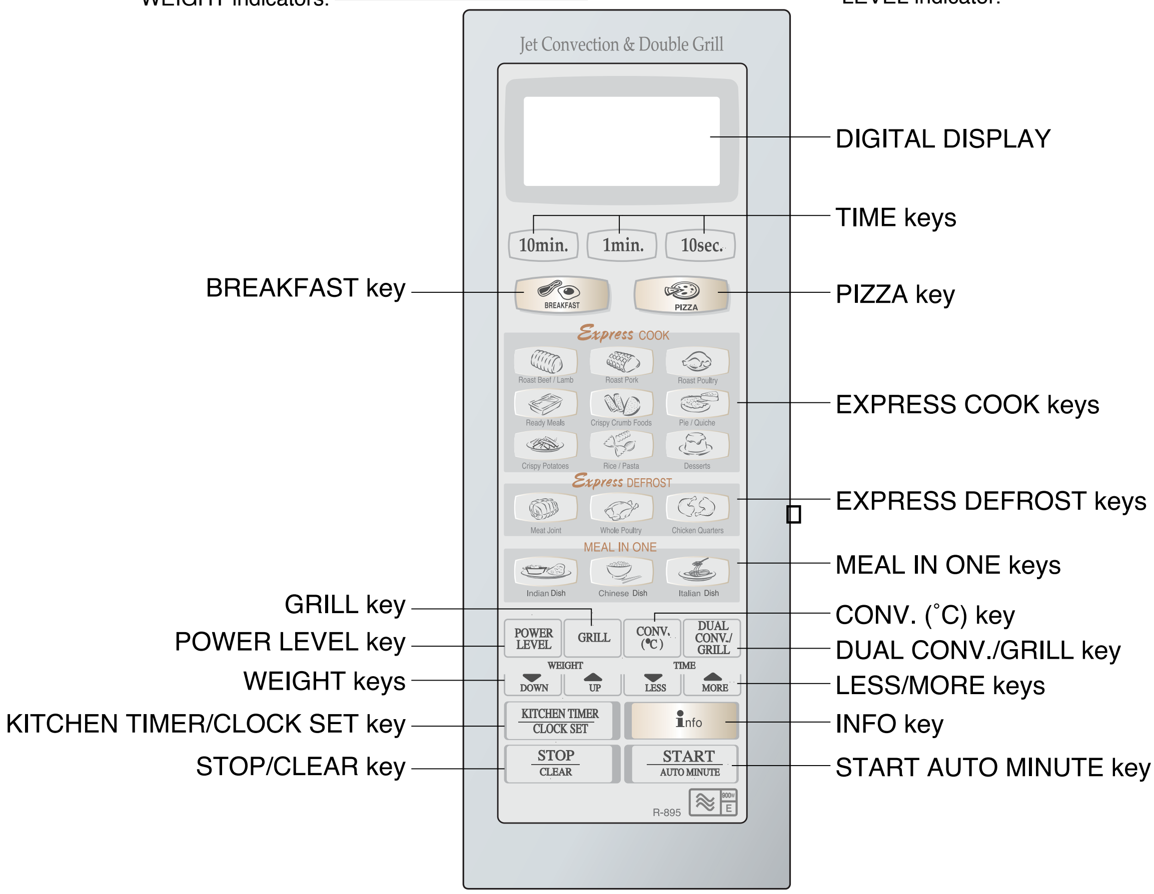
OVEN
1. Control panel
2. Oven lamp
3. Waveguide cover
4. Bottom grill heating element (Bottom Grill)
5. Turntable motor shaft
6. Oven cavity
7. Door seals and sealing surfaces
8. Door latches
9. Door opening handle
10. Top grill heating element (Top Grill)
11. Ventilation openings
12. Outer cabinet
13. Powercord
14. Turntable tray
15. High rack
16. Low rack



CONTROL PANEL

DIGITAL DISPLAY





NOTE: If the clock has been set, some one-touch cooking features such as "AUTO MINUTE" are disabled after three minutes when the oven is not used. These features are automatically enabled when the door is opened and closed or the STOP/CLEAR key is pressed.

OPERATION SEQUENCE

OFF CONDITION

Closing the door activates the monitored latch switch and the stop switch.

IMPORTANT:

When the oven door is closed, the contacts COM-NC of the monitor switch must be open. When the microwave oven is plugged in a wall outlet (230 - 240V / 50Hz), the line voltage is supplied to the noise filter.

Figure O-1 on page 31

1. The control unit is not energized. The display shows nothing (Fig. O-1 (a)).
2. Open the door. The contacts (COM-NC) of the monitored latch switch are closed and the control unit is energized. Then contacts of relays RY1 and RY5 are closed, and the oven lamp will light and the display will show "ENERGY SAVE MODE TO CANCEL ENERGY SAVE MODE SET THE CLOCK" (Fig. O-1(b)).
3. Close the door. The contacts (COM-NC) of the monitored latch switch are opened and the contacts of relay RY1 are opened and the oven lamp will be turned off. The display will show " . 0". (Fig. O-1(c)).

NOTE: Energy save mode

1. If the oven has not been used for more than 3 minutes, the contacts of the relay RY5 will be opened and the control unit will not be energized. Open and close the door, the control unit will resume.
2. If the clock is set, this energy save mode does not work.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time by touching the TIME keys and start the oven by touching START key.

Function sequence Figure O-2 on page 32

CONNECTED COMPONENTS	RELAY
Oven lamp, Turntable motor	RY1
High voltage transformer	RY2
Fan motor	RY6

1. The line voltage is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltage doubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a wavelength of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
4. When the cooking time is up, a signal tone is heard and the relays RY1 + RY2 + RY6 go back to their home position. The circuits to the oven lamp, high voltage transformer, fan motor and turntable motor are cut off.
5. When the oven door is opened during a cooking cycle, the switches come to the following condition.

Switch	Contact	Condition During Cooking	Condition Oven Door Open(No cooking)
Monitored latch switch	COM-NO	Closed	Opened
	COM-NC	Opened	Closed
Stop switch	COM-NO	Closed	Opened
Monitor Switch	COM-NO	Closed	Opened
	COM-NC	Opened	Closed

The circuit to the high voltage transformer is cut off when the contacts of relay RY2, and the contacts (COM-NO) of the monitored latch switch and monitor switch are made open. The circuit to the fan motor is cut off when the relay RY6 is made open. The circuit to the turntable motor is cut off when the contacts (COM-NO) of the monitored latch switch are made open. The relay RY2 and RY6 are made open when the door is opened. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stays closed. Shown in the display is remaining time.

6. MONITOR SWITCH CIRCUIT
   The monitor switch is mechanically controlled by the oven door, and monitors the operation of the monitored latch switch.

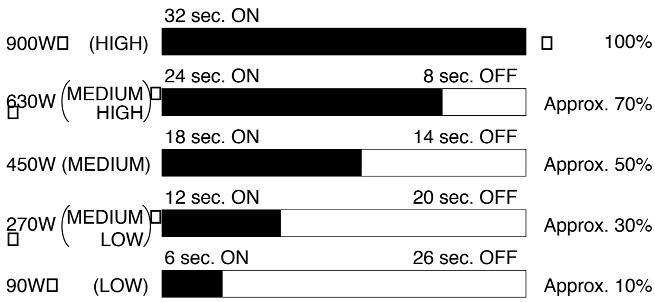
6-1. When the oven door is opened during or after the cycle of a cooking program, the monitored latch switch and stop switch must open their contacts (COM-NO) first. After that the contacts (COM-NC) of the monitor switch and monitored latchcan be closed.

6-2. When the oven door is closed, the contacts (COM-NC) of the monitor switch SW3 must be opened and the contacts (COM-NO) of monitor switch must be closed. After that the contacts (COM-NO) of the monitored latch switch and the stop switch are made closed, and the contacts (COM-NC) of the monitored latch switch are made open.

6-3. When the oven door is opened and the contacts (COM-NO) of the monitored latch switch remain closed, the fuse F8A will blow. Because the relay RY1 and monitor switch are closed and a short circuit is caused.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When the microwave oven is preset for variable cooking power, the line voltage is supplied to the high voltage transformer intermittently within a 32-second time base through the relay contact which is coupled with the current-limiting relay RY2. The following levels of microwave power are given.



Note: The On/Off time ratio does not exactly correspond to the percentage of microwave power, because approx. 3 seconds are needed for heating up the magnetron filament.

GRILL COOKING CONDITION

TOP GRILL (Figure O-3a)

In this condition the food is cooked by the top grill heating element . Programme the desired cooking time by touching the TIME keys and touh the GRILL key once. When the STARTkey is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.

3. The relay RY3 is energized and the main supply voltage is applied to the top grill heating element .
4. Now, the food is cooked by the top grill heating element.

BOTTOM GRILL (Figure O-3b)
In this condition the food is cooked by bottom grill heating element energy. Programme the desired cooking time by touching the TIME keys and touch the GRILL key twice. When the STARTkey is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY4 is energized and the main supply voltage is applied to the bottom grill heating element .
4. Now, the food is cooked by the bottom grill heating element .

TOP AND BOTTOM GRILL (Figure O-3c)
In this condition the food is cooked by top and bottom grill heating elements energy. Programme the desired cooking time by touching the TIME keys and touch the GRILL key three times. When the STARTkey is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY4 is energized and the main supply voltage is applied to the bottom grill heating element.
4. The relay RY3 is energized and the main supply voltage is applied to the top grill heating element.
5. Now, the food is cooked by the top and bottom grill heating elements.

CONVECTION COOKING CONDITION

PRE-HEATING (Figure O-4)
Programme the desired convection temperature by touching CONVECTION TEMPERATURE key. When the STARTkey is touched, the following operations occur:

1. The coil shut-off relays RY1 and RY6 are energized, the oven lamp, cooling fan motor and turntable motor are turned on.
2. The coil shut-off relays RY3 and RY4 are energized by control unit and the main supply voltage is added to the top and bottom heating elements.
3. When the oven temperature reaches the selected pre-heat temperature, the following operations occur:

3-1. The coil shut-off relays RY3 and RY4 are energized by control unit temperature circuit and thermistor, opening the circuit to the top and bottom grill heating elements.

3-2. The oven will continue to function for 30 minutes, turning the top and bottom heating elements on and off, as needed to maintain the selected pre-heat temperature. The oven will shut-down completely after 30 minutes.

CONVECTION COOKING (Figure O-4)
When the pre-heat temperature is reached, a beep signal will sound indicating that the holding temperature has been reached in the oven cavity. Open the door and place the food to be cooked in the oven. Program desired cooking time by touching the TIME keys and program convection temperature by touching the CONVECTION TEMPERATURE key . When the START key is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor, turntable motor and convection motor are energized.

NOTE: When the convection temperature 40˚C is selected, the convection motor is not energized.

3. The relays RY3 and RY4 are energized (if the cavity temperature is lower than selected temperature) and the main supply voltage is applied to the top and bottom heating elements to return to the selected cooking temperature.
4. Upon completion of the cooking time, the audible signal will sound, and the oven lamp, turntable motor, cooling fan motor, convection motor, top and bottom heating elements are de-energized. At the end of convection cycle, if the cavity air temperature rises above 120˚C, the circuit to the relay RY6 will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until temperature drops below 105˚C, at that time the relay RY6 will be de-energized, turning off the fan motor.

DUAL COOKING CONDITION

MICROWAVE AND CONVECTION (Figure O-5a)
Programme the desired cooking time by touching the TIME keys. Touch the DUAL CONVECTION/GRILL key once. Select the microwave power level by touching the MICROWAVE POWER LEVEL key. And select the convection temperature by touching the CONVECTION TEMPERATURE key.
When the STARTkey is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor, turntable motor and convection motor are energized.
3. The relay RY3 will be energized and the main supply voltage is applied to the top grill heatier.
4. The relay RY4 is energized (if the cavity temperature is lower than selected temperature) and the main supply voltage is applied to the bottom heating elementer.
5. The relay RY2 is energized and the microwave energy is generated by magnetron.
6. Now, the food is cooked by microwave and convection energy simultaneously.

MICROWAVE AND TOP GRILL (Figure O-5b)
Programme the desired cooking time by touching the TIME keys. Touch the DUAL CONVECTION/GRILL key twice. Select the microwave power level by touching the MICROWAVE POWER LEVEL key. When the STARTkey is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY3 is energized and the main supply voltage is applied to the top grill heating element.
4. The relay RY2 is energized and the microwave energy is generated by magnetron.
5. Now, the food is cooked by microwave and top grill simultaneously.

OPERATION SEQUENCE

MICROWAVE AND BOTTOM GRILL (Figure O-5c)

Programme the desired cooking time by touching the TIME keys. Touch the DUAL CONVECTION/GRILL three times. Select the microwave power level by touching the MICROWAVE POWER LEVEL key. When the STARTkey is touched, the following operations occur:

1. The numbers on the digital readout start the count down to zero.
2. The oven lamp, cooling fan motor and turntable motor are energized.
3. The relay RY4 is energized and the main supply voltage is applied to the bottom grill heating element.
4. The relay RY2 is energized and the microwave energy is generated by magnetron.
5. Now, the food is cooked by microwave and bottom grill simultaneously.

ON/OFF TIME RATIO

In grill cooking, convection cooking or dual cooking, the top heater, bottom heater or magnetron operate whithin a 54 second time base. The following table is the ON / OFF time ratio at each power output of the top heaters, bottom heater or magnetron.

POWER OUTPUT	ON TIME	OFF TIME
100%	54 sec.	0 sec.
90%	49 sec.	5 sec.
80%	45 sec.	9 sec.
70%	40 sec.	14 sec.
60%	36 sec.	18 sec.
50%	29 sec.	25 sec.
40%	24 sec.	30 sec.
30%	18 sec.	36 sec.
20%	13 sec.	41 sec.
10%	9 sec.	45 sec.

AUTOMATIC COOKING

PIZZA
BREAKFAST
EXPRESS COOK
EXPRESS DEFROST
MEAL IN ONE

Above functions are automatic cooking. They automatically work out the correct cooking mode and cooking time and/or cooking temperature. They will cook according to the special cooking sequence.

AUTO POWER CONTROL OPERATION

The magnetron, top or bottom heating elements, the fan motor or the convection motor will operate in accordance with following specification.

1. OUTPUT POWER CONTROL (MANUAL COOK)

OPERATION MODE	DEVICE	POWER CONTROL
MICROWAVE (100%) SINGLE OPERATION	Microwave	100% 20min, then 70%
TOP GRILL (100%) SINGLE OPERATION	Top heater	100% 15min, then 50%
BOTTOM GRILL (100%) SINGLE OPERATION	Bottom heater	100% 15min, then 50%
TOP(100%)/BOTTOM(100%) DUAL OPERATION	Top heater	100% 6min then 70% and 70% 9min then 50%
	Bottom heater	100% 6min then 70% and 70% 9min then 50%
MICRO(100%)/TOP GRILL(100%) DUAL OPERATION	Microwave	100% 20min, then 70%
	Top heater	100% 15min, then 50%
MICRO(70 - 10%)/TOP GRILL(100%) DUAL OPERATION	Microwave	-
	Top heater	100% 15min, then 50%
MICRO(100%)/BOTTOM GRILL(100%) DUAL OPERATION	Microwave	100% 20min, then 70%
	Bottom heater	100% 15min, then 50%
MICRO(70 - 10%)/BOTTOM GRILL(100%) DUAL OPERATION	Microwave	-
	Bottom heater	100% 15min, then 50%
Repeat Cook	Microwave Top heater Bottom heater	In case same cooking mode is repeated within 1min 15sec (including stop, end), oven calculates total cooking time and reduce the power level.

2. OUTPUT POWER CONTROL (AUTO COOK)

Repeat Auto Cook		The power level is not reduced 1 time cooking. But only in case same menu is repeated within 1min 15sec, the power level of micro and grill is reduced from 100% to 70% in 20mins after starting of last cooking. (Even if the time of the last cooking is longer than 20mins, the power level isn't reduced on the last cooking, and it is reduced from the beginning of the next cooking.) However, in time calculated from the start of the 1st cooking, even if the Cook mode changed, when repetition cooking of the menu with which 100% of top & bottom heaters continues are performed, as shown in the following table, the power down of the cooking of the 2nd henceforth is carried out. (The 1st cooking is not applied)

OPERATION SEQUENCE

3. COOLING FAN OPERATION

OPERATION MODE	DEVICE	POWER CONTROL
PREHEAT	Cooling	60%
CONV.	Cooling fan	60% 60 min. then 100%
Others	Cooling fan	100%
After cooking	Cooling fan	The cooling fan continues to rotate when Oven temperature is more than 120˚C. Then, it stops when it is less than 105˚C
	Indication	NOW COOLING is indicated during the cooling fan movement after operation is finished. (It isn't indicated during a fan movement to stop on the way.)

4. CONVECTION POWER SETTING

PREHEATING

TEMP		250˚C, 230˚C, 220˚C, 200˚C, 180˚C, 160˚C, 130˚C, 100˚C, 70˚C, 40˚C
HEATING ELEMENT	TOP	100%
	BOTTOM	100%
COOLING FAN		60%
CONV. FAN		0%

CONVECTION

TEMP			250˚C	230˚C	220˚C	200˚C	180˚C	160˚C	130˚C	100˚C	70˚C	40˚C
★WITHOUT PREHEATING	HEATING ELEMENT	TOP	50%	40%	40%	30%	20%	10%	10%	10%	10%	10%
		BOTTOM	100%	90%	80%	70%	70%	60%	50%	40%	30%	20%
★WITH PREHEATING	HEATING ELEMENT	TOP	50%	40%	40%	30%	20%	10%	10%	10%	10%	10%
		BOTTOM	90%	70%	60%	50%	50%	50%	50%	40%	30%	20%
COOLING FAN			60% 60min, then 100%									
CONV. FAN			100%									0%

DUAL CONVECTION

TEMP			250˚C	230˚C	220˚C	200˚C	180˚C	160˚C	130˚C	100˚C	70˚C	40˚C
★WITHOUT PREHEATING	HEATING ELEMENT	TOP	50%	40%	40%	30%	20%	10%	10%	10%	10%	10%
		BOTTOM	100%	90%	80%	70%	70%	60%	50%	40%	30%	20%
★WITH PREHEATING	HEATING ELEMENT	TOP	50%	40%	40%	30%	20%	10%	10%	10%	10%	10%
		BOTTOM	90%	70%	60%	50%	50%	50%	50%	40%	30%	20%
MICRO			10%,30%,50%									
COOLING FAN			100%									
CONV. FAN			100%									0%

NOTE ★The oven temp was checked by the thermometer when each stages are started .
If the oven temp is same or higher than 105˚C, the oven was judged as "with preheating".
When the oven temp is lower than 105˚C or the cooling fan stops, the oven was judged as "without preheating".

FUNCTION OF IMPORTANT COMPONENTS

The door can be opened by pulling the door handle. When the handle is pulled, the latch head is pulled, the latch head is moved upward, and released from the latch hook now the door can be opened.

MONITORED LATCH SWITCH

1. When the oven door is closed, the contacts (COM-NO) of the switch must be closed. And the contacts (COM-NC) must be opened.
2. When the oven door is opened, the contacts (COM-NO) of the switch must be opened. And the contacts (COM-NC) must be closed.

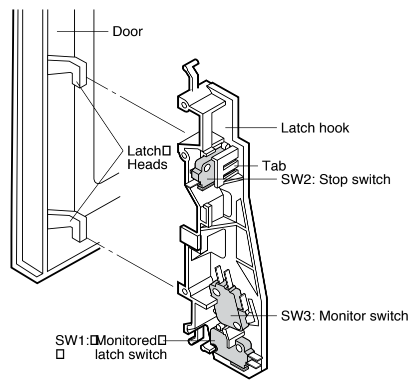


Figure D-1. Door Open Mechanism

FUNCTION OF IMPORTANT COMPONENTS

STOP SWITCH

1. When the oven door is closed, the contacts (COM-NO) of the switch must be closed.
2. When the oven door is opened, the contacts (COM-NO) of switch must be opened.

MONITOR SWITCH

The monitor switch is activated (the contacts opened) by the upper latch head on the door while the door is closed. The switch is intended to render the oven inoperative by means of blowing the fuse F8A when the contacts of the monitored latch switch fail to open when the door is opened.

Function

1. When the door is opened, the contacts (COM-NC) of monitor switch close (to the ON condition) due to their being normally closed and contacts (COM-NO) open. At this time the contacts (COM-NO) of monitored latch switch is in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch contacts (COM-NC) are opened and contacts (COM-NO) closed and then contacts (COM-NO) of monitored latch switch and stop switch are closed.(On opening the door, each of these switches operate inversely.)
3. If the door is opened and the monitored latch switch contacts (COM-NO) fail to open, the fuse F8A blows immediately after closing of the monitor switch (COM-NC) contacts.

CAUTION: BEFORE REPLACING A BLOWN FUSE F8A, TEST THE MONITORED LATCH SWITCH AND MONITOR SWITCH FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

FUSE 15A 250V

If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.

FUSE F8A 250V

1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. The fuse also blows when the monitored latch switch remains closed with the oven door open and when the monitor switch contact (COM-NC) closes.
3. The fuse also blows when the asymmetric rectifier, H.V. rectifier,.H.V. wire harness, H.V. capacitor, magnetron or secondary winding of high voltage transformer is shorted.

TC TRANSFORMER

T/C transformer converts A.C. line voltage into low voltage to drive the control unit.

THERMAL CUT-OUT 125˚C (MG)

This thermal cut-out protects the magnetron against overheat. If the temperature goes up higher than 125˚C because the fan motor is interrupted or the ventilation openings are blocked, the thermal cut-out will open and line voltage to the high voltage transformer will cut off and operation of the magnetron will be stopped. The defective thermal cut-out must be replaced with a new one.

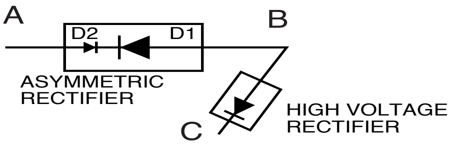
THERMAL CUT-OUT 145˚C (OVEN)

This thermal cut-out protects against overheat ing /fire inside the oven. The cut-out contacts will open when temperatures exceed 145˚C.When the cut-out cools itself down to the operating temperature of 115˚C, the contacts of the thermal cut-out will close again.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is solid state device that prevents current flow is both directions. And it prevents the temperature rise of the high voltage transformer by blowing the fuseF8A when the high voltage rectifier is shorted.

The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of the blowing the fuseF8A.)



1. The high voltage rectifier is shorted by some fault when microwave cooking or dual cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the high voltage transformer.
5. The large electric currents beyond 8A flow through the primary winding of the high voltage transformer.
6. The fuse F8A blows by the large electric currents.
7. The power supplying to the high voltage transformer is cut off.

NOISE FILTER

The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

TURNTABLE MOTOR

The turntable motor rotates the turntable.

FAN MOTOR

The fan motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetron and cools the magnetron. This air is channelled through the oven cavity to remove steam and vapours given off from heating food. It is then exhausted through the exhausting air vents of the oven cavity.

CONVECTION MOTOR

The convection motor drives the convection fan and provide the heated air.

TOP GRILL HEATING ELEMENT

The grill heating element is provided to brown the food and is located on the top of the oven cavity.

BOTTOM GRILL HEATING ELEMENT

The grill heating element is provided to brown the food and is located at the base of the oven cavity.

CONVECTION COOKING SYSTEM

This oven is designed with a hot air heating system where food is heated be forced circulation of the hot air produced by the grill heaters. The air heated be the grill heating elements is circulated through the convectin passage provided on the outer casing of the oven cavity be means of the convection fan which is driven by the convection motor. It then enters the inside of the oven through the vent holes provided on the back of the oven. Next, the hot air heats the food on the turntable and leaves the oven cavity through the vent in the oven cavity rear wall. In this way, the hot air ciculates inside the oven cavity to raise its temperature and at the same time, comes into contact with the food cooked. When the temperature inside the oven cavity reaches the selected temperature, the heating elements are de-energized. When the temperature inside the oven cavity drops below the selected temperature, the elements are energized again. In thia way, the inside of the oven is maintained at approximately the selected temperature. When the convection time reaches "0", the heating elements are de-energzed and the convection fan stops operating and the oven shuts off. At that time if the cavity air temperature has rised above 120°C, the fan remains rotating. Automatically the fan motor will shut down at low temperature (less than 105°C).

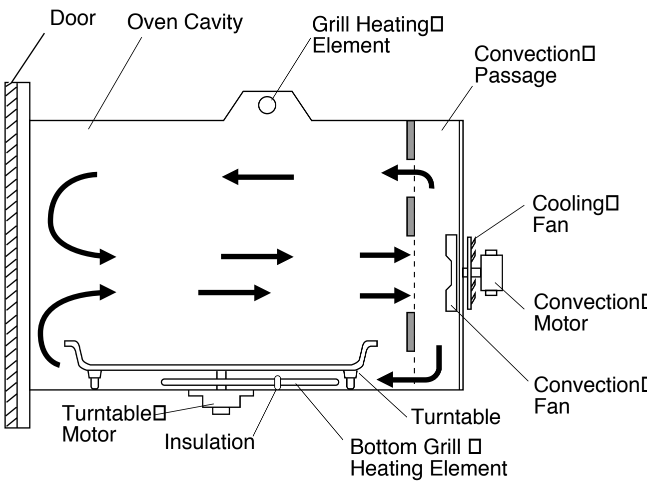
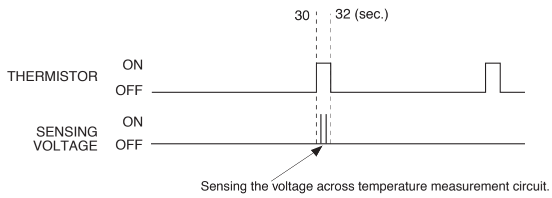


Figure D-2. Convection Cooking system

FIRE SENSING FEATURE

The oven will stop its operation when there is a fire in the oven cavity in microwave cooking condition.
LSI measures the voltage across the temperature measurement circuit intermittently within 32-seconds time base since the oven is started in microwave cooking condition. The oven will stop its operation when the difference of the voltage is more than 0.781 volts in microwave cooking condition.

1. Within a 32-seconds base, the thermistor is energized for 2 seconds. At that time, the voltage across the temperature measurement circuit is measured.
2. The oven carries out the procedure above again. If the second voltage is 0.781V higher than first voltage, LSI judges it is a fire in the oven cavity and stop the oven.
3. When LSI judges it is a fire in the oven cavity, LSI will switch off the relays to high voltage transformer and fan motor and LSI stops countring down.



OPEN JUDGE BY THERMISTOR

1. If the temperature of the thermistor does not rise to more than 40°C after 4 minutes and 15 seconds from when the oven is started in oven cooking mode, dual cooking mode or grill (top and bottom) cooking mode, the oven is turned off.
2. When the thermistor or the wire harness to the thermistor is opened, the oven is turned off after 4 minutes and 15 seconds because this condition is same as above

TROUBLESHOOTING GUIDE

TEST PROCEDURE	POSSIBLE CAUSE AND DEFECTIVE PARTS / PROBLEM	Fuse F8A blows when the door is opened.	Home fuse blows when power cord is plugged into wall outlet.	Fuse 15A blows when power cord is plugged into wall outlet.	Nothing appears in display when power cord is plugged into wall outlet and the door is opened and closed.	Display does not operate properly when STOP/CLEAR key is touched.	Oven lamp does not light when door is opened. (Display operates.)	Oven does not start when the START key is touched. (Display operates.)	Oven lamp does not light and turntable motor does not operate.	Fan motor does not operate. (Oven lamp lights.)	Convection fan motor does not operate. (Oven lamp lights.)	Turntable motor does not operate. (Oven lamp lights.)	Oven or any electrical parts (except fan motor) does not stop when cooking time is 0 or STOP/CLEAR key is touched.	Oven stops after 4 minutes and 15 seconds since START key is touched. (Except Microwave mode)	Display operates properly but all electrical parts do not operate.	Oven goes into cook cycle but shuts down before end of cooking cycle.	After cooking, the temperature of oven cavity is higher than 105˚C but fan motor does not operate.	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power control is set at HIGH)	Oven does not seem to be operating properly during variable cooking condition except HIGH cooking condition.	Oven goes into cook cycle but shuts down before end of cooking cycle.	Convection cooking mode does not heat.	Oven seems to be operating but the temperature in the oven cavity is lower or higher than preset one.	Grill heating element does operate.	Oven goes into cook cycle but shuts down before end of cooking cycle.	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power does not seem to be generated properly)	Oven seems to be operating but the temperature in the oven cavity is lower or higher than preset one.	Top and Bottom Grill heating elements do not heat.	Top or Bottom Grill heating element does not heat.
	CONDITION	OFF CONDITION						COOKING CONDITION (COMMON MODE)										MICROWAVE COOKING CONDITION			CONVECTION COOKING CONDITION		GRILL COOKING CONDITION	DUAL COOKING CONDITION (COMMON MODE)		DUAL COOKING CONDITION (MICRO./CONV.)		DUAL COOKING CONDITION (MICRO./GRILL)
	BLOCKED COOLING FAN									●						●				●				●				
	BLOCKED CONVECTION FAN										●					●						●				●		
	NO POWER AT WALL OUTLET				●																							
	HOME FUSE OR BREAKER		●																					●				
	MIS-ADJUSTMENT OF SWITCHES					●		●				●						●					●		●		●	●
Q	BLOCKED VENTILATION OPENINGS															●				●				●				
	OPENED WIRE HARNESS				●	●	●	●	●	●	●	●		●	●			●		●	●		●	●	●		●	●
	SHORTED WIRE HARNESS		●	●			●											●			●			●	●			
	OVEN LAMP OR SOCKET						●		●																			
	POWER SUPPLY CORD		●		●																							
P	FOIL PATTERN ON P.W.B.				●																							
O	RELAY RY7										●		●		●													
O	RELAY RY6									●			●		●										●			
O	RELAY RY5				●																							
O	RELAY RY4												●		●						●	●				●	●	●
O	RELAY RY3												●		●								●			●	●	●
O	RELAY RY2												●		●			●	●						●			
O	RELAY RY1	●					●		●				●		●													
N	KEY UNIT					●		●					●															
M	TOUCH CONTROL PANEL				●	●	●	●					●	●			●	●	●		●	●		●	●	●		
	TC TRANSFORMER				●																							
L	BTTOM GRILL HEATING ELEMENT																				●	●				●	●	●
L	TOP GRILL HEATING ELEMENT																						●				●	●
K	FUSE F8A	●																●							●			
J	FUSE 20A			●	●																							
I	NOISE FILTER			●	●																							
H	CONVECTION FAN MOTOR										●					●						●				●		
H	FAN MOTOR									●						●				●				●				
H	TURNTABLE MOTOR								●			●																
G	THERMAL CUT-OUT 145˚C (OVEN)				●											●								●				
G	THERMAL CUT-OUT 125˚C (MG)				●											●				●				●				
F	THERMISTOR													●		●	●			●	●	●		●		●		
E	MONITOR SWITCH														●			●			●		●		●		●	●
E	STOP SWITCH					●	●	●					●															
E	MONITORED LATCH SWITCH	●			●							●			●										●		●	●
D	HIGH VOLTAGE CAPACITOR																	●							●			
	H.V. HARNESS																	●							●			
C	H.V. RECTIFIER ASSEMBLY																	●							●			
B	HIGH VOLTAGE TRANSFORMER																	●							●			
A	MAGNETRON																	●							●			

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
A	MAGNETRON TEST

NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.

CARRY OUT 3D CHECKS.

Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.

To test for an open circuit filament use an ohmmeter to make a continuity test between the magnetron filament terminals, the meter should show a reading of less than 1 ohm.

To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.

MICROWAVE OUTPUT POWER
The power output of this oven is rated using the method specified by IEC 60705. Full details of how to curry out this procedure can be found in the Sharp Technical Training notes which is available from Sharp Parts Centre (part number SERV-LITMW01).

The IEC-60705 procedure must be carried out using laboratory-type procedures and equipment.
These requirements make the procedure unsuitable for routine performance checks.

NOTE: The following test method gives an indication of the output power only, it cannot be used to establish the actual/rated output power. If the true output power is required, then the IEC705 test method must be used.

Alternative simplified method:
1. Place 2 litres of cold water (between 12°C and 20°C) in a suitable container.
2. Stir the water and measure the temperature in °C. Note temperature as T1.
3. Place the container in the microwave and heat the water for 1 minute and 36 seconds on full power.

NOTE: The operation time of the microwave oven includes "3" sec. (3 sec. is magnetron filament heat-up time.)

4. When the 1 minute and 36 seconds is completed, remove the container and stir the water. Note temperature as T2.
5. Calculate the output power using the following formula:
   R.F. Power Output = (T2 - T1) x 90.

NOTE: The result from this test should be within the allowance of 2000cc alternative method. (±10%).

MICROWAVE LEAKAGE TEST

This oven should be tested for microwave leakage on completion of any repair or adjustment, following the procedure described in the Sharp Technical Training notes (part number SERV-LITMW01). The maximum leakage permitted in BS EN 60335-2-25 is 50W/m^2 (equivalent to 5W/m^2), however it is not normal to detect any significant leakage, therefore, any leakage which is detected should be investigated.

It is essential that only leakage detectors with current calibration traceable to National Physical Laboratories are used.

Suitable leakage detectors: CELTEC A100
APOLLO X1

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

B **HIGH VOLTAGE TRANSFORMER TEST**

> **WARNING: High voltage and large currents are present at the secondary winding and filament winding of the high voltage transformer. It is very dangerous to work near this part when the oven is on. NEVER make any voltage measurements of the high-voltage circuits, including the magnetron filament.**

CARRY OUT 3D CHECKS.
Disconnect the leads to the primary winding of the high voltage transformer. Disconnect the filament and secondary winding connections from the rest of the HV circuitry. Using an ohmmeter, set on a low range, it is possible to check the continuity of all three winding. The following readings should be obtained:-

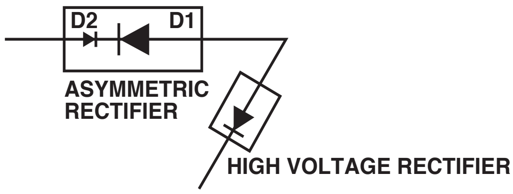
a. Primary winding .... approximately 1.9 Ω
b. Secondary winding .... approximately 124 Ω
c. Filament winding .... less than 1 Ω

If the readings obtained are not stated as above, then the high voltage transformer is probably faulty and should be replaced.
CARRY OUT 4R CHECKS.

C **HIGH VOLTAGE RECTIFIER TEST**

CARRY OUT 3D CHECKS.
Isolate the high voltage rectifier assembly from the HV circuit. The high voltage rectifier can be tested using an ohmmeter set to its highest range. Connect the ohmmeter across the terminal B+C of the high voltage rectifier and note the reading obtained. Reverse the meter leads and note this second reading. The normal resistance is infinite in one direction and more than 100 kΩ in the other direction.

CARRY OUT 4R CHECKS.



ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.

Isolate the high voltage rectifier assembly from the HV circuit. The asymmetric rectifier can be tested using an ohmmeter set to its highest range across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both directions then the asymmetric rectifier is good. If the asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the high voltage transformer is shorted.

CARRY OUT 4R CHECKS.

NOTE: FOR MEASUREMENT OF THE RESISTANCE OF THE RECTIFIER, THE BATTERIES OF THE MEASURING INSTRUMENT MUST HAVE A VOLTAGE AT LEAST 6 VOLTS, BECAUSE OTHERWISE AN INFINITE RESISTANCE MIGHT BE SHOWN IN BOTH DIRECTIONS.

D **HIGH VOLTAGE CAPACITOR TEST**

CARRY OUT 3D CHECKS.

A. Isolate the high voltage capacitor from the circuit.
B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.
C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.
D. A short-circuited capacitor shows continuity all the time.
E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.
F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.
G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

If incorrect reading are obtained, the high voltage capacitor must be replaced.

CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

E **SWITCH TEST**

CARRY OUT 3D CHECKS.
Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	Open circuit	Short circuit
Depressed	Short circuit	Open circuit

COM; Common terminal,
NO; Normally open terminal
NC; Normally close terminal

If incorrect readings are obtained,replace the switch.

CARRY OUT 4R CHECKS.

F **THERMISTOR TEST**

CARRY OUT 3D CHECKS.
Disconnect the connector B from CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to Pin No's C1 and C3 of the thermistor harness.

Room Temperature	Resistance
20˚C - 30˚C	Approximately 359.9 kΩ - 152 kΩ

If the meter does not indiicate above resistance, replace the thermistor.

CARRY OUT 4R CHECKS.

G **THERMAL CUT-OUT TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of the thermal cut-out. Then using an ohmmeter, make a continuity test across the two terminals as described in the below.

Table: Thermal Cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit). (˚C)	Temperature of "OFF" condition (open circuit). (˚C)	Indication of ohmmeter (When room temperature is approx. 20˚C.)
Thermal cut-out 125˚C	This is not resetable	Above 125˚C	Closed circuit
Thermal cut-out 145˚C	Below 115˚C.	Above 145˚C	Closed circuit

If incorrect readings are obtained, replace the thermal cut-out.

An open circuit thermal cut-out (MG) indicates that the magnetron has overheated, this may be due to resistricted ventilation, cooling fan failure.

An open circuit thermal cut-out (OVEN) indicates that the oven cavity has overheated, this may be due to no load operation,or excessive heat / fire inside the oven.

CARRY OUT 4R CHECKS.

H **MOTOR WINDING TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals as described in the table below.

Table: Resistance of Motor

Motors	Resistance
Fan motor	Approximately 293 Ω
Turntable motor	Approximately 15 kΩ
Convection fan motor	Approximately 288 Ω

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

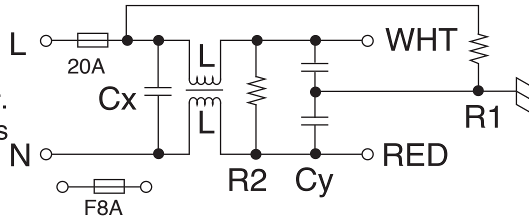
TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

I **NOISE FILTER TEST**

CARRY OUT 3D CHECKS.

Disconnect the leads from the terminals of noise filter. Using an ohmmeter, check between the terminals as described in the following table.



L (min)	Cx ± 20%	Cy ± 20%	R1	R2
1.0mH	0.22μF	4700pF	10 MΩ	680kΩ

MEASURING POINTS	INDICATION OF OHMMETER
Between N and L	Approx. 680 kΩ
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

If incorrect readings are absorbed, replace the noise filter unit.

CARRY OUT 4R CHECKS.

J **BLOWN FUSE 20A**

CARRY OUT 3D CHECKS.
If the fuse 20A is blown, there is a shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS.

CAUTION: Only replace fuse with the correct value replacement.

K **BLOWN FUSE F8A**

CARRY OUT 3D CHECKS.

1. If the fuse F8A is blown when the door is opened, check the monitored latch switch and monitor switch.
2. If the fuse F8A is blown by incorrect door switching replace the defective switch(es) and the fuse F8A.
3. If the fuse F8A is blown, there could be shorts in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may be occurred due to short or ground in H.V. rectifier, magnetron, high voltage transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS.

CAUTION: Only replace fuse F8A with the correct value replacement.

L **GRILL HEATING ELEMENT (TOP) AND BOTTOM HEATING ELEMENTS TEST**

CARRY OUT 3D CHECKS.

Before carrying out the following tests make sure the heating element is cool completely.

1. Resistance of heating element.
   Disconnect the wire leads to the heating element to be tested. Using ohmmeter with low resistance range. Check the resistance across the terminals of the heating element as described in the following table.

Table: Resistance of heating element

Parts name	Resistance
Grill heating element (top)	Approximately 48 Ω
Bottom heating element	Approximately 92 Ω

2. Insulation resistance.
   Disconnect the wire leads to the heating element to be tested. Check the insulation resistance between the element terminal and cavity using a 500V - 100MΩ insulation tester. The insulation resistance should be more than 10 MΩ in the cold start.

If the results of above test 1 and/or 2 are out of above specifications, the heating element is probably faulty and should be replaced.

CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

M **TOUCH CONTROL PANEL ASSEMBLY TEST**

The control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance can not be performed with only a voltmeter and ohmmeter.
In this service manual, the control panel assembly is divided into two units, Control Unit and Key Unit, and also the Control unit is divided into two units, CPU unit and Power unit, and troubleshooting by replacement is described according to the symptoms indicated.

1. Key Unit Note : Check Key unit ribbon connection before replacement.
   The following symptoms indicate a defective key unit. Replace the key unit.
   a) When touching the pads, a certain pad produces no signal at all.
   b) When touching a number pad, two figures or more are displayed.
   c) When touching the pads, sometimes a pad produces no signal.
2. Control Panel
   The following symptoms indicate a defective control unit. Before replacing the control unit perform the key unit test (Procedure N) to determine if control unit is faulty.

2-1 In connection with pads
   a) When touching the pads, a certain group of pads do not produce a signal.
   b) When touching the pads, no pads produce a signal.

2-2 In connection with indicators
   a) At a certain digit, all or some segments do not light up.
   b) At a certain digit, brightness is low.
   c) Only one indicator does not light up.
   d) The corresponding segments of all digits do not light up; or they continue to light up.
   e) Wrong figure appears.
   f) A certain group of indicators do not light up.
   g) The figure of all digits flicker.

2-3 Other possible troubles caused by defective control unit.
   a) Buzzer does not sound or continues to sound.
   b) Clock does not operate properly.
   c) Cooking is not possible.
   d) Proper temperature measurement is not obtained.

N **KEY UNIT TEST**

If the display fails to clear when the STOP/CLEAR pad is depressed, first verify the ribbon cable is making good contact, verify that the stop switch operates properly; that is the contacts are closed when the door is closed and open when the door is open. If the stop switch is good, disconnect the flat ribbon cable that connects the key unit to the control unit and make sure the stop switch is closed (either close the door or short the stop switch connecter). Use the Key unit matrix indicated on the control panel schematic and place a jumper wire between the pins that correspond to the STOP/CLEAR pad making momentary contact. If the control unit responds by clearing with a beep the key unit is faulty and must be replaced. If the control unit does not respond, it is a faulty and must be replaced. If a specific pad does not respond, the above method may be used (after clearing the control unit) to determine if the control unit or key pad is at fault.
CARRY OUT 4R CHECKS.

	G 8	G 7	G 6	G 5	G 4	G 3	G 2	G 1
G 9	Pie/ Quiche	Crispy Crumb Foods	Rice/ Pasta	Crispy Potatoes	Ready Meals	10sec.	1min.	10min.
G10	Desserts	PIZZA	Italian Dish	Roast Pork	Roast Beef/ Lamp	Chinese Dish	GRILL	BREAKFAST
G11	Chicken Quarters	▲ MORE	▼ LESS	Roast Poultry	START / AUTO MINUTE	▲ UP	POWER LEVEL	▼ DOWN
G12	Whole Poultry	DUAL CONV. / GRILL	Indian Dish	STOP / CLEAR	Meat Joint	KITCHEN TIMER / CLOCK SET	CONV (˚C)	info

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

O **RELAY TEST**

CARRY OUT 3D CHECKS.

Remove the outer case and check voltage between Pin Nos. 1 and 3 of the 4 pin connector (E) on the control unit with an A.C. voltmeter.
The meter should indicate 230-240 volts, if not check oven circuit.

Relay Test
Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation, grill operation, convection operation or dual operation.

DC. voltage indicated .... Defective relay.
DC. voltage not indicated .... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	Approx. 18.0V D.C.	Oven lamp / Turntable motor
RY2	Approx. 18.0V D.C.	High voltage transformer
RY3	Approx. 24.0V D.C.	Grill (Top) heating element
RY4	Approx. 24.0V D.C.	Bottom heating element
RY5	Approx. 24.0V D.C.	Touch control transformer
RY6	Approx. 24.0V D.C.	Fan motor
RY7	Approx. 24.0V D.C.	Convection motor

CARRY OUT 4R CHECKS..

P **PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN**

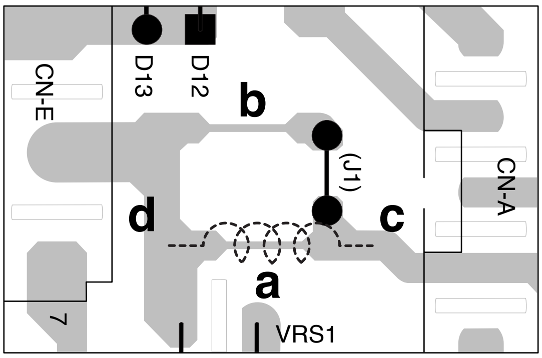
To protect the electronic circuits, this model is provided with a fine foil pattern added to the input circuit on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.
Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present between Pin Nos. 1 and 3 of the 4-pin connector (E).	Check supply voltage and oven power cord.
2	The rated AC voltage is present at primary side of low voltage transformer.	Low voltage transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d". (CARRY OUT 3D CHECKS BEFORE REPAIR)

NOTE: *At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short circuit (check primary coil resistance).

If any abnormal condition is detected, replace the defective parts.



CARRY OUT 4R CHECKS.

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOUCH CONTROL PANEL

The touch control section consists of the following units as shown in the touch control panel circuit.

(1) Key Unit
(2) Control Unit (The Control unit consists of Power unit and CPU unit.)

The principal functions of these units and signals communicated among them are explained below.

Key Unit
The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit from P40, P41, P72, P73, P74, P75, P76 and P77.
When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through P50 - P53 to perform the function that was requested.

Control Unit
Control unit consists of LSI, power source circuit, synchronizing signal circuit, reset circuit, buzzer circuit, relay circuit, temperature measurement circuit, indicator circuit and back light circuit.

1) LSI
This LSI controls the temperature measurement signal, key strobe signal, relay driving signal for oven function and indicator signal.

2) Power Source Circuit
This circuit generates voltage necessary in the control unit.

Symbol	Voltage	Application
VC	-5.2V	LSI(IC1)

3) Synchronizing Signal Circuit
The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) Reset Circuit
A circuit to generate a signal which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit
The buzzer is responsive to signals from the LSI to emit audible sounds (key touch sound and completion sound).

6) Stop Switch
A switch to “tell” the LSI if the door is open or closed.

7) Relay Circuit
To drive the magnetron, grill heating element, bottom heating element, convection motor, fan motor, turntable motor, touch control transformer and light the oven lamp.

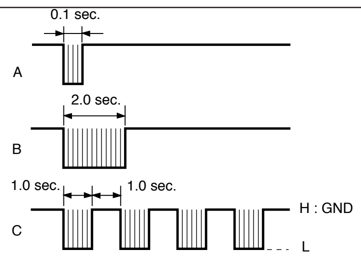
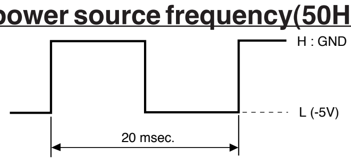
8) Back Light Circuit
A circuit to drive the back light (Light emitting diodes LD1 - LD10).

9) Indicator Circuit
This circuit consists 7-digits, 39-segments and 3-common electrodes using a Liquid Crystal Display.

10)Temperature Measurement Circuit : (OVEN THERMISTOR)
The temperature in the oven cavity is sensed by the thermistor. The variation of resistance according to sensed temperature is detected by the temperature measurement circuit and the result applied to LSI. The LSI uses this information to control the relay and display units.

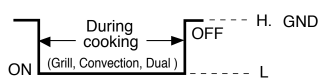
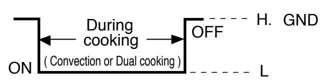
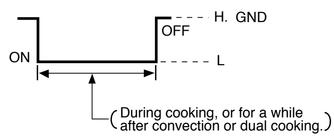
DESCRIPTION OF LSI

The I/O signal of the LSI are detailed in the following table.

Pin No.	Signal	I/O	Description
1	C1	IN	Terminal not used.
2	VL1	IN	**Power source voltage input terminal.** Standard voltage for LCD.
3	AN7	IN	Terminal to change the on timing of the cook relay (RY2).
4-5	AN6-AN5	IN	**Heating constant compensation terminal.**
6	AN4	OUT	Terminal not used.
7	AN3	IN	**Temperature measurement input: OVEN THERMISTOR.** By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into the temperature by the A/D converter built into the LSI.
8	AN2	IN	**Input signal which communicates the door open/close information to LSI.** Door closed; "H" level signal. Door opened; "L" level signal.
9	AN1	IN	**Heating constant compensation terminal.**
10	AN0	IN	Terminal to change functions to the Models.
11	P57	OUT	**Timing signal output terminal for temperature measurement(OVEN THERMISTOR).** "H" level (GND) : Thermistor OPEN timing. "L" level (-5V) : Temperature measuring timing. (Oven cooking)
12	P56	OUT	Terminal not used.
13	P55	OUT	**Timing signal output terminal for temperature measurement(OVEN THERMISTOR).** "H" level (GND) : Thermistor OPEN timing. "L" level (-5V) : Temperature measuring timing. (Oven cooking)
14	P54	OUT	Terminal not used.
15	P53	IN	**Signal coming from touch key.** When any one of G12 line keys on key matrix is touched, a corresponding signal from P40, P41, P72, P73, P74, P75, P76 and P77 will be input into P53. When no key is touched, the signal is held at "L" level.
16	P52	IN	**Signal similar to P53.** When any one of G11 line keys on key matrix is touched, a corresponding signal will be input into P52.
17	P51	IN	**Signal similar to P53.** When any one of G10 line keys on key matrix is touched, a corresponding signal will be input into P51.
18	P50	IN	**Signal similar to P53.** When any one of G9 line keys on key matrix is touched, a corresponding signal will be input into P50.
19-22	P47-P44	IN/OUT	Terminal not used.
23	TOUT	OUT	**Signal to sound buzzer.** A: Tact switch touch sound. B: Completion sound. C: When the temperature of the oven cavity reaches the preset temperature in the preheating mode, or when the preheating hold time (30 minutes) is elapsed. 
24	INT2	IN	**Signal to synchronized LSI with commercial power source frequency(50Hz).** This is basic timing for time processing of LSI. 
25	P41	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P50-P53 terminal while one of G8 line key on matrix is touched.

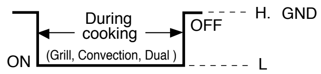
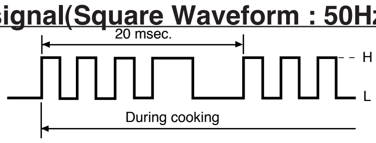
DESCRIPTION OF LSI

The I/O signal of the LSI are detailed in the following table.

Pin No.	Signal	I/O	Description
26	P40	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P50-P53 terminal while one of G7 line key on matrix is touched.
27	P77	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P50-P53 terminal while one of G6 line key on matrix is touched.
28	P76	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P50-P53 terminal while one of G5 line key on matrix is touched.
29	P75	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P50-P53 terminal while one of G4 line key on matrix is touched.
30	P74	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P50-P53 terminal while one of G3 line key on matrix is touched.
31	P73	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P50-P53 terminal while one of G2 line key on matrix is touched.
32	P72	OUT	**Key strobe signal.** Signal applied to touch-key section. A pulse signal is input to P50-P53 terminal while one of G1 line key on matrix is touched.
33	P71	IN/OUT	Terminal not used.
34	P70	IN	Connected to VC.
35	RESET	IN	**Auto clear terminal.** Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "Hμ…level.
36	XCIN	IN	Connected to VC.
37	XCOUT	OUT	Terminal not used.
38	XIN	IN	**Internal clock oscillation frequency input setting.** The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.
39	XOUT	OUT	**Internal clock oscillation frequency control output.** Output to control oscillation input of XIN.
40	VSS	IN	**Power source voltage: -5V.** VC voltage of power source circuit input.
41	P27	OUT	**Bottom heating element driving signal.** To turn on and off the relay (RY4). "L" level during grill cooking, convection cooking or dual cooking, "H" level otherwise. The heater relay turns on and off within a 54 second time base in accordance with the special program in LSI. 
42	P26	OUT	**Convection motor driving signal.** To turn on and off shut-off relay (RY7). "L" level during convection or dual cooking, "H" level otherwise. (Relay RY7 does not turn on at preheating mode.) 
43	P25	OUT	**Fan motor driving signal.** To turn on and off the fan motor relay (RY6). "L" level during cooking, or for a while after convection or dual cooking. "H" level otherwise. 
44	P24	OUT	Terminal not used.
45	P23	OUT	**Touch control transformer driving signal.** To turn on and off the shut off relay (RY5). If the oven has not been used for more than 2 minutes, the relay RY5 will be turned off. The relay RY5 will be turned on when the oven door is opened and closed.

DESCRIPTION OF LSI

The I/O signal of the LSI are detailed in the following table.

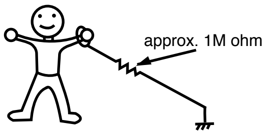
<table>
<tr><th>Pin No.</th><th>Signal</th><th>I/O</th><th>Description</th></tr>
<tr><td>46</td><td>P22</td><td>OUT</td><td><u>Magnetron high-voltage circuit driving signal.</u>
To turn on and off the cook relay (RY2). In 100% operation, the signals hold "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (70%, 50%, 30%, 10%) the signal turns to "H" level and "L" level in repetition according to the power level.
ON/OFF time ratio in Micro cooking
(a. 32second time base)
<table>
<tr><th>MICRO COOK</th><th>ON</th><th>OFF</th></tr>
<tr><td>100%</td><td>32 sec.</td><td>0 sec.</td></tr>
<tr><td>70%</td><td>24 sec.</td><td>8 sec.</td></tr>
<tr><td>50%</td><td>18 sec.</td><td>14 sec.</td></tr>
<tr><td>30%</td><td>12 sec.</td><td>20 sec.</td></tr>
<tr><td>10%</td><td>6 sec.</td><td>26 sec.</td></tr>
</table>
ON/OFF time ratio in Micro cooking
(a. 54second time base)
<table>
<tr><th>MICRO COOK</th><th>ON</th><th>OFF</th></tr>
<tr><td>100%</td><td>54 sec.</td><td>0 sec.</td></tr>
<tr><td>70%</td><td>40 sec.</td><td>14 sec.</td></tr>
<tr><td>50%</td><td>29 sec.</td><td>25 sec.</td></tr>
<tr><td>30%</td><td>18 sec.</td><td>36 sec.</td></tr>
<tr><td>10%</td><td>9 sec.</td><td>45 sec.</td></tr>
</table></td></tr>
<tr><td>47</td><td>P21</td><td>OUT</td><td><u>Grill (TOP) heating element driving signal.</u>
To turn on and off the grill heating element relay (RY3). "L" level during grill cooking, convection cooking or dual cooking. "H" level otherwise. The heater relay turns on and off within a 54 second time base in accordance with the special progrom in LSI.

</td></tr>
<tr><td>48</td><td>P20</td><td>OUT</td><td><u>Oven lamp and turntable motor driving signal(Square Waveform : 50Hz).</u>
To turn on and off shut-off relay (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit.

</td></tr>
<tr><td>49-50</td><td>P17-P16</td><td>OUT</td><td>Terminal not used.</td></tr>
<tr><td>51-80</td><td>SEG39-SEG10</td><td>OUT</td><td><u>Segment data signal.</u>
Connected to LCD.
The relation between signals are as follows:
<table>
<tr><th>LSI signal (Pin No.)</th><th>LCD (Pin No.)</th><th>LSI signal (Pin No.)</th><th>LCD (Pin No.)</th></tr>
<tr><td>SEG 0 (90)</td><td>SEG39 (51)</td><td>SEG21 (69)</td><td>SEG19 (19)</td></tr>
<tr><td>SEG 1 (89)</td><td>SEG38 (50)</td><td>SEG22 (68)</td><td>SEG18 (18)</td></tr>
<tr><td>SEG 2 (88)</td><td>SEG37 (49)</td><td>SEG23 (67)</td><td>SEG17 (17)</td></tr>
<tr><td>SEG 3 (87)</td><td>SEG36 (48)</td><td>SEG24 (66)</td><td>SEG16 (16)</td></tr>
<tr><td>SEG 4 (86)</td><td>SEG35 (47)</td><td>SEG25 (65)</td><td>SEG15 (15)</td></tr>
<tr><td>SEG 5 (85)</td><td>SEG34 (46)</td><td>SEG26 (64)</td><td>SEG14 (14)</td></tr>
<tr><td>SEG 6 (84)</td><td>SEG33 (45)</td><td>SEG27 (63)</td><td>SEG13 (13)</td></tr>
<tr><td>SEG 7 (83)</td><td>SEG32 (44)</td><td>SEG28 (62)</td><td>SEG12 (12)</td></tr>
<tr><td>SEG 8 (82)</td><td>SEG31 (43)</td><td>SEG29 (61)</td><td>SEG11 (11)</td></tr>
<tr><td>SEG10 (80)</td><td>SEG30 (30)</td><td>SEG30 (60)</td><td>SEG10 (10)</td></tr>
<tr><td>SEG11 (79)</td><td>SEG29 (29)</td><td>SEG31 (59)</td><td>SEG 9 (9)</td></tr>
<tr><td>SEG12 (78)</td><td>SEG28 (28)</td><td>SEG32 (58)</td><td>SEG 8 (8)</td></tr>
<tr><td>SEG13 (77)</td><td>SEG27 (27)</td><td>SEG33 (57)</td><td>SEG 7 (7)</td></tr>
<tr><td>SEG14 (76)</td><td>SEG26 (26)</td><td>SEG34 (56)</td><td>SEG 6 (6)</td></tr>
<tr><td>SEG15 (75)</td><td>SEG25 (25)</td><td>SEG35 (55)</td><td>SEG 5 (5)</td></tr>
<tr><td>SEG16 (74)</td><td>SEG24 (24)</td><td>SEG36 (54)</td><td>SEG 4 (4)</td></tr>
<tr><td>SEG17 (73)</td><td>SEG23 (23)</td><td>SEG37 (53)</td><td>SEG 3 (3)</td></tr>
<tr><td>SEG18 (72)</td><td>SEG22 (22)</td><td>SEG38 (52)</td><td>SEG 2 (2)</td></tr>
<tr><td>SEG19 (71)</td><td>SEG21 (21)</td><td>SEG39 (51)</td><td>SEG 1 (1)</td></tr>
<tr><td>SEG20 (70)</td><td>SEG20 (20)</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>81</td><td>SEG9</td><td>OUT</td><td>Terminal not used.</td></tr>
<tr><td>82-90</td><td>SEG8-SEG0</td><td>OUT</td><td><u>Segment data signal.</u>
Connected to LCD. Signal is similar to SEG39.</td></tr>
<tr><td>91</td><td>VCC</td><td>IN</td><td>Connected to GND.</td></tr>
<tr><td>92</td><td>VREF</td><td>IN</td><td>Connected to GND.</td></tr>
<tr><td>93</td><td>AVSS</td><td>IN</td><td>Connected to VC.</td></tr>
<tr><td>94</td><td>COM3</td><td>OUT</td><td>Terminal not used.</td></tr>
<tr><td>95</td><td>COM2</td><td>OUT</td><td><u>Common data signal: COM3.</u>
Connected to LCD (Pin No. 35).</td></tr>
<tr><td>96</td><td>COM1</td><td>OUT</td><td><u>Common data signal: COM2.</u>
Connected to LCD (Pin No. 34).</td></tr>
<tr><td>97</td><td>COM0</td><td>OUT</td><td><u>Common data signal: COM1.</u>
Connected to LCD (Pin No. 33).</td></tr>
<tr><td>98-99</td><td>VL3-VL2</td><td>IN</td><td><u>Power source voltage input terminal.</u>
Standard voltage for LCD.</td></tr>
<tr><td>100</td><td>C2</td><td>IN</td><td>Terminal not used.</td></tr>
</table>

SERVICING

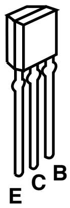
1. Precautions for Handling Electronic Components

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc., and sometimes it is not fully protected by the built-in protection circuit.
In order to protect CMOS LSI.

1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap PW boards containing them in aluminium foil.
2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components



Transistor
KRC243M
KTA1274

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so.
To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven :

CAUTION:
THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD .

Therefore, before checking the performance of the touch control panel,

1) Disconnect the power supply cord, and then remove outer case.
2) Open the door and block it open.
3) Discharge high voltage capacitor.
4) Disconnect the leads to the primary of the power transformer.
5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6) After that procedure, re-connect the power supply cord.

After checking the performance of the touch control panel,

1) Disconnect the power supply cord.
2) Open the door and block it open.
3) Re-connect the leads to the primary of the power transformer.
4) Re-install the outer case (cabinet).
5) Re-connect the power supply cord after the outer case is installed.
6) Run the oven and check all functions.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated.
For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

B. On some models, the power supply cord between the touch control panel and the oven is long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if the dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel; it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

1) Soldering iron: 30W
(It is recommended to use a soldering iron with a grounding terminal.)
2) Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
3) Others: Hand tools

5. Other Precautions

1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING: Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.

1. Disconnect oven from power supply.
2. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.
Do not operate the oven if any of the following conditions exist;

1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal or damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:

1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

Please refer to 'OVEN PARTS, CABINET PARTS, CONTROL PANEL PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

WARNING FOR WIRING

To prevent an electric shock, take the following measures.

1. Before wiring,
   1) Disconnect the power supply.
   2) Open the door and wedge the door open.
   3) Discharge the high voltage capacitor and wait for 60 seconds.
2. Don't let the wire leads touch to the following parts;
   1) High voltage parts:
      Magnetron, High voltage transformer, High voltage capacitor and High voltage rectifier assembly.
   2) Hot parts:
      Top heating element, Bottom heating element, Oven lamp, Magnetron, High voltage transformer and Oven cavity.
   3) Sharp edge:
      Bottom plate, Oven cavity, Waveguide flange, Chassis support and other metallic plate.
   4) Movable parts (to prevent a fault)
      Fan blade, Fan motor, Switch, Turntable motor.
3. Do not catch the wire leads in the outer case cabinet.
4. Insert the positive lock connector certainly until its pin is locked. And make sure that the wire leads should not come off even if the wire leads is pulled.
5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.

OUTER CASE REMOVAL

To remove the outer case proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the two (2) screws holding the back plate to the oven cavity rear plate. Remove the back plate
4. Remove the air duct assembly from the oven cavity rear plate.
5. Remove the air duct assembly
6. Remove the eight (8) screws from rear and along the side edge of case.
7. Slide the entire case back about 3 cm to free it from retaining clips on the cavity face plate.
8. Lift the entire case from the oven.
9. Discharge the H.V. capacitor before carrying out any further work.
10. Do not operate the oven with the outer case removed.

N.B.; Step 1, 2 and 9 form the basis of the 3D checks.

CAUTION: DISCHARGE HIGH VOLTAGE CAPACITOR BEFORE TOUCHING ANY OVEN COMPONENT OR WIRING.

CAUTION: WHEN THE OUTER CASE CABINET IS RE-INSTALLED, INSTALL IT BEFORE THE BACK PLATE IS INSTALLED, OR THE OUTER CASE CABINET WILL BE DEFORMED.

HIGH VOLTAGE COMPONENTS REMOVAL (HIGH VOLTAGE CAPACITOR AND HIGH VOLTAGE RECTIFIER ASSEMBLY)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS.
2. Disconnect the filament lead of the high voltage transformer and the high voltage transformer secondary wire from the high voltage capacitor.
3. Disconnect the high voltage wire B from the magnetron.
4. Remove one (1) screw holding earth side terminal of the high voltage rectifier assembly.
5. Remove one (1) screw holding fan duct to the oven cavity rear plate.
6. Remove one (1) screw holding capacitor holder to the oven cavity rear plate.
7. Release the capacitor holder from the fan duct.
8. Remove the high voltage capacitor from the capacitor holder.
9. Disconnect the high voltage wire B and the high voltage rectifier assembly from the high voltage capacitor.
10. Disconnect the high voltage rectifier assembly from the high voltage wire B.
11. Now, the high voltage rectifier assembly and the high voltage capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RETIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

HIGH VOLTAGE TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the filament leads of high voltage transformer from high voltage capacitor and the magnetron.
3. Disconnect the high voltage transformer secondary wire from the high voltage transformer.
4. Disconnect the main wire harness from the high voltage transformer.
5. Remove the two (2) screws and one (1) washer holding the transformer to the base plate.
7. Remove the transformer.
8. Now the high voltage transformer is free.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the H.V. wire B and filament lead of the transformer from the magnetron.
3. Remove the one (1) screw holding the chassis support to the magnetron.
4. Move the air intake duct to left.
5. Carefully remove four (4) screws holding the magnetron to the waveguide. When removing the screws hold the magnetron to prevent it from falling.
6. Remove the magnetron from the waveguide with care so the magnetron antenna is not hit by any metal object around the antenna.

CAUTION: WHEN REPLACING THE MAGNETRON, BE SURE THE R.F. GASKET IS IN PLACE AND THE MAGNETRON MOUNTING SCREWS ARE TIGHTENED SECURELY.

CONTROL PANEL ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads and the connectors from the control unit.
3. Remove the one (1) screw holding the control panel assembly to the oven cavity front plate.
4. Lift up the control panel assembly and pull it forward. Now the control panel assembly is free.

NOTE:
1. Before attaching a new key unit, wipe off remaining adhesive on the control panel frame surfaces completely with a soft cloth soaked in alcohol.
2. When attaching the key unit to the control panel frame, adjust the upper edge and right edge of the key unit to the correct position of control panel frame.
3. Stick the key unit firmly to the control panel frame by rubbing with soft cloth not to scratch.

FAN MOTOR REPLACEMENT

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the noise filter to the chassis support.
3. Release the noise filter from the tabs of the fan duct.
4. Remove the one (1) screw holding the chassis support to the oven cavity front flange.
5. Remove one(1) screw holding the chassis support to the magnetron.
6. Remove the chassis support from the oven cavity.
7. Disconnect the wire leads from the fan duct.
8. Remove the one (1) screw holding the capacitor holder to the oven cavity back plate.
9. Release the tabs of the capacitor holder from the fan duct.
10. Remove the one (1) screw holding the fan duct to the oven cavity back plate.
11. Remove the fan duct from the oven.
12. Remove the fan duct from the fan motor shaft according to the following procedure.
    1) Hold the edge of the rotor of the fan motor by using a pair of groove joint pliers.

    CAUTION:
    - **Make sure that no swarf from the rotor enters the gap between the rotor & startor of the fan motor.**
    - **Avoid touch the coil of the fan motor with the pliers as the coil may become cut or damaged.**
    - **Avoid deforming the bracket whilst using the pliers.**

    2) Remove the fan blade assembly from the shaft of the fan motor by pulling and rotating the fan blade with your hand.
    3) Now, the fan blade is free.

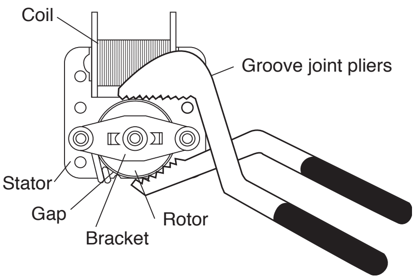
    CAUTION:
    - **Do not reuse the removed fan blade as the fixing hole may be oversize.**
12. Remove the two (2) screws holding the fan motor to the fan duct.
13. Now, the fan motor is free.

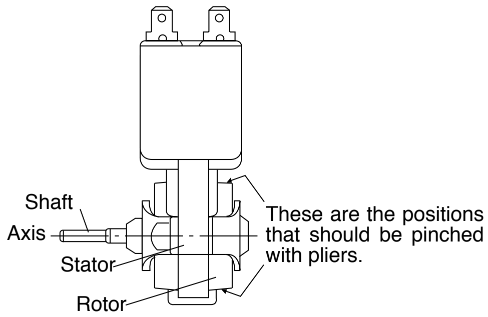
INSTALLATION

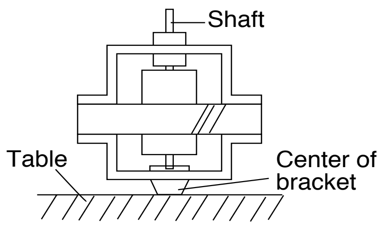
1. Install the the fan motor to the fan duct with the two (2) screws.
2. Install the fan blade to the fan motor shaft according to the following procedure.
    1) Hold the centre of the bracket which supports the shaft of the fan motor on a flat table.
    2) Apply the screw lock tight into the hole (for shaft) of the fan blade.
    3) Install the fan blade to the shaft of fan motor by pushing the fan blade with a small, light weight, ball peen hammer or rubber mallet.

    CAUTION:
    - **Do not hit the fan blade when installing because the bracket may be deformed.**
    - **Make sure that the fan blade rotates smoothly after installation.**
    - **Make sure that the axis of the shaft is not slanted.**
3. Insert the tabs of the capacitor holder to the fan duct.
4. Install the fan duct to the oven cavity back plate with the one (1) screw.
5. Install the capacitor holder to the oven cavity back plate with the one (1) screw.
6. Re-install the chassis support to the oven cavity with the one (1) screw.
7. Re-fit the one(1) screw to secure the chassis support to the magnetron.
8. Install the noise filter to the fan duct and the chassis support with the one (1) screw.
9. Re-connect the wire leads to the fan motor.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE







TURNTABLE MOTOR REPLACEMENT

Removal

2. Remove the turntable from the oven cavity.
3. Turn the oven over.
4. Cut the four (4) bridges holding the turntable motor cover to the base plate with cutting pliers as shown in Figure C-2(a).

CAUTION: DO NOT DROP THE TURNTABLE MOTOR COVER INTO THE OVEN AFTER CUTTING THE BRIDGES. BECAUSE IT WILL DAMAGE THE WIRE LEADS OF THE MOTOR AND IT IS DIFFICULT TO REMOVE IT OUT OF THE OVEN.

5. Remove the turntable motor cover from the base plate.
6. Disconnect the wire leads from the turntable motor.
7. Remove the one (1) screw holding the turntable motor to the turntable motor angle.
8. Bend the turntable motor retaining tab back to release the motor.
9. Remove the turntable motor from the turntable motor angle. Now, the turntable motor is free.

Re-install

1. Remove the any sharp edges on the turntable motor cover and the base plate with the cutting pliers.
2. Re-install turntable motor by locating shaft onto turntable motor shaft to the turntable motor angle with the one (1) screw.
3. Bend the turntable motor retaining tab forward to secure the motor.
4. Re-connect the wire leads to the turntable motor.
5. Insert the two (2) tabs of the turntable motor cover into the slits of the base plate as shown in Figure C-2(b).
6. Re-install the turntable motor cover to the base plate with the screw (LX-EZA045WRE0) as shown in Figure C-2(b).

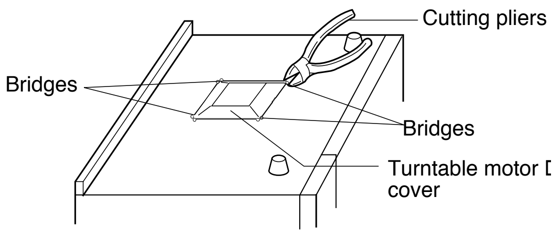


Figure C-1(a). Turntable motor cover removal

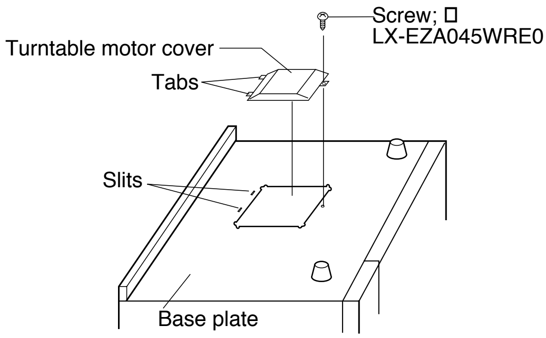


Figure C-1(b). Turntable motor cover re-install

POSITIVE LOCK® CONNECTOR REMOVAL

1. CARRY OUT <u>3D</u> CHECKS.
2. Push the lever of positive lock® connector.
3. Pull down on the positive lock® connector.

CAUTION: WHEN YOU (SERVICE ENGINEERS) CONNECT THE POSITIVE LOCK® CONNECTORS TO THE TERMINALS, CONNECT THE POSITIVE LOCK® SO THAT THE LEVER FACES YOU.

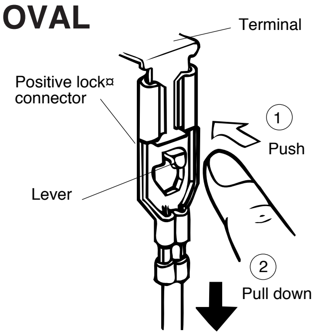


Figure C-2. Positive lock®connector

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the two(2)wires leads as Positive lock® connector removal above.
3. Lift up the oven lamp from its retaining clips.
4. Now, the oven lamp is free.

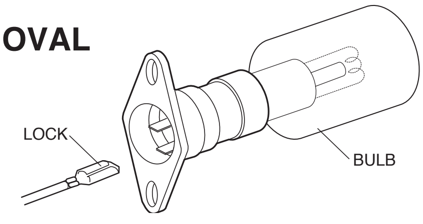


Figure C-3. Oven lamp

POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS.
2. Remove the one (1) screw holding the green/yellow wire to the cavity back plate.
3. Disconnect the leads of the power supply cord from the noise filter, referring to the Figure C-4(a).
4. Release the power supply cord from the rear cabinet.
5. Now, the power supply cord is free.

Re-install

1. Insert the moulding cord stopper of power supply cord into the square hole of the cavity backplate, referring to the Figure C-4(b).
2. Install the earth wire lead of power supply cord to the oven cavity with one (1) screw and tight the screw.
3. Connect the brown and blue wire leads of power supply cord to the noise filter correctly, referring to the Pictorial Diagram.

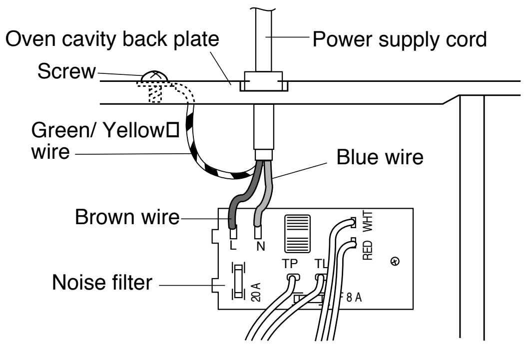


Figure C-4 (a) Replacement of Power Supply Cord

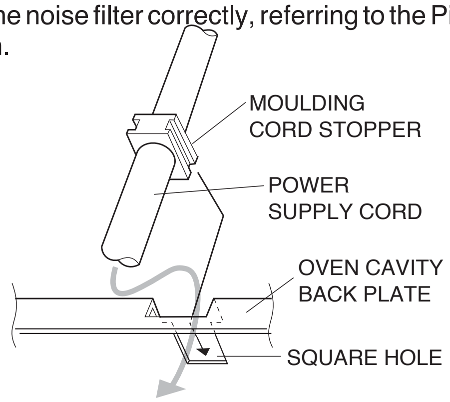


Figure C-4(b). Power Supply Cord Replacement

TOP HEATING ELEMENT REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the two (2) screws holding the two (2) terminals of the main wire harness to the top heating element.
3. Remove the two (2) screws holding the two (2) grill heater angles to the top of the oven cavity.
4. Remove the two (2) grill heater angles from the oven cavity.
5. Remove the top heating element from the top of the oven cavity.
6. Now the top heating element is free.

BOTTOM HEATING ELEMENT REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the turntable motor cover from the base plate, referring to "TURNTABLE MOTOR REPLACEMENT".
3. Disconnect the wire leads from the bottom heating element.
4. Remove the two (2) nuts holding the heater cover and heater packing to the bottom heater.
5. Remove the heater cover and the heater packing from the bottom heating element.
6. Re-move the two(2) nuts holding the bottom heating element to the oven cavity.
7. Remove the bottom heating element from the oven cavity .

MONITORED LATCH SWITCH, MONITOR SWITCH AND STOP SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel assembly referring to "CONTROL PANEL ASSEMBLY REMOVAL".
3. Disconnect the leads from all switches.
4. Remove the two (2) screws holding the latch hook to the oven cavity.
5. Remove the latch hook.
6. Remove the switch(es) from the latch hook by pushing the retaining tab backwards slightly and turning the switch(es) on the post.
7. Now the switch(es) is free.

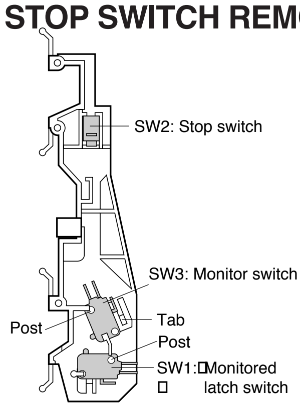


Figure C-5. Switches

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

MONITORED LATCH SWITCH, STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

If the monitored latch switch, stop switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

1. CARRY OUT 3D CHECKS.
2. Loosen the two (2) screws holding the latch hook to the oven cavity front flange.
3. With the door closed, adjust the latch hook by moving it back and forward or up and down. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The horizontal position of the latch hook should be placed where the monitor switch has activated with the door closed. The vertical position of the latch hook should be placed where the monitored latch switch and stop switch have activated with the door closed.
4. Secure the screws with washers firmly.
5. Make sure that all switches operate. If the latch head has not pushed the plungers of the monitor switch with door closed, adjust the latch hook position.
   At that time, the latch head should have pushed the plungers of the monitored latch switch and stop switch. If the latch head has not pushed the plungers of the monitored latch switch and stop switch with door closed, loose two (2) screws holding latch hook to oven cavity front flange and adjust the latch hook position.

After adjustment, make sure of following:

1. In and out play of door remains less than 0.5 mm when latched position. First check the latch hook position, pushing and pulling upper portion of the door toward the oven face. Then check the lower latch hook position, pushing and pulling lower portion of the door toward the oven face. Both results (play of the door) should be less than 0.5mm.
2. The contacts (COM-NO) of the stop switch and the monitored latch switch open within 1.8mm gap between right side of cavity face plate and door when door is opened.
3. When the door is closed, the contacts (COM-NO) of the stop switch close.
4. When the door is closed the contacts (COM-NC) of the monitor switch and monitored latch switch open. And the contacts (COM-NO) of their switches close.
5. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

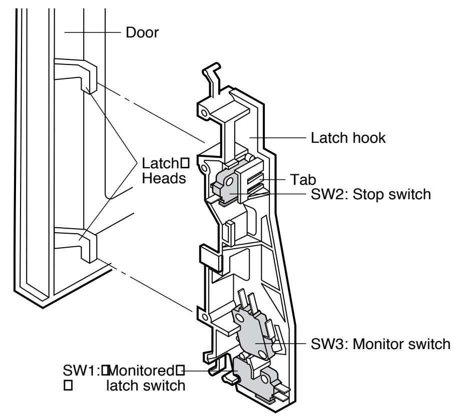


Figure C-6 Latch Switches Adjustment

DOOR REPLACEMENT

REMOVAL

1. Disconnect the oven from the power supply.
2. Pull open the door slightly.
3. Insert a putty knife (thickness of about 0.5mm) into the gap between the choke cover and door frame as shown in Figure C-7 to free engaging parts.
4. Release choke cover from door panel.
5. Now choke cover is free.

NOTE: When carrying out any repair to the door, do not bend or warp the slit choke (tabs on the door panel assembly) to prevent microwave leakage.

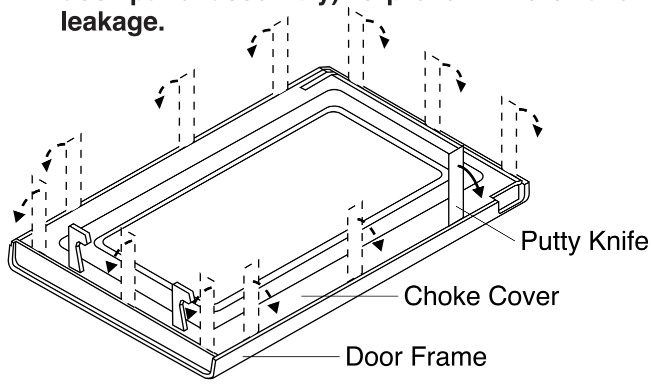


Figure C-7. Door Disassembly

6. Lift the door upwards.
7. Now, door sub assembly is free from oven cavity.
8. Remove the four (4) screws holding the door panel to the door frame.
9. Now, door panel is free.
10. Slide latch head upward and remove it from door frame with releasing latch spring from door frame and latch head.
11. Now, latch head and latch spring are free.
12. Remove the glass stopper from the door frame.
13. Slide the front door glass leftwards and then slide upwards to release the tabs holding it.
14. Now, the front door glass is free

RE-INSTALL

1. Re-install the front door glass to the door frame as follows.
   a) Insert the upper edge of the front door glass into the four (4) tabs of the door frame.
   b) Slide the front door glass downwards and insert the lower edge of the front door glass into the four (4) tabs of the door frame.
   c) Slide the front door glass rightwards and insert the right edge of the front door glass into the three (3) tab of the door frame.
2. Re-install the glass stopper to the door frame.
3. Re-install the latch spring to the latch head. Re-install the latch spring to the door frame. Re-install latch head

to door frame.
4. Re-install door panel to door frame by fitting two (2) tabs of glass stopper to two (2) holes of door panel.
5. Hold the door panel to the door frame with four (4) screws.
6. Located door panel hinge pins into cavity hinge location hole.
7. Re-install choke cover to door panel by clipping into position.

Note: After any service to the door;

(A) Make sure that the monitor switch, monitored latch switch and stop switch are operating properly. (Refer to chapter "Test Procedures".).

(B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards. (Refer to Microwave Measurement Procedure.)

After any service, make sure of the following :
1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through centre of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not of themselves, indicate a leakage of microwave energy from oven cavity.

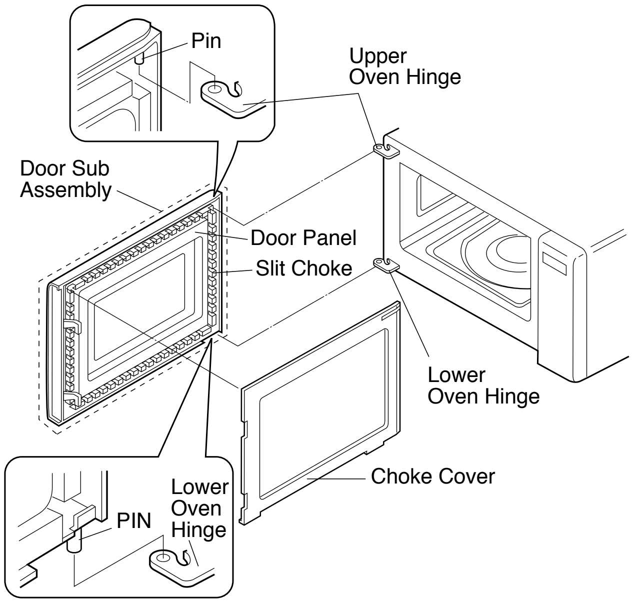


Figure C-8. Door Replacement

After any repair, the microwave oven must be checked for microwave leakage to ensure continued safe operation. BS EN 60335-2-25 specifies that the maximum permitted leakage with a load of 275 ml is 50 W/m^2 (equivalent to 5 mW/cm^2) at a distance of 5 cm from the oven.

PREPARATION

The following items are required to carry out this test:-

1. A low form of 600 ml beaker made from an electrically non-conductive material, such as glass or plastic, with an inside diameter of approximately 8.5 cm. This must contain 275 ± 15 ml of water, at an initial temperature of 20 ± 2˚C.
2. A leakage detector which has been calibrated within the preceding 12 months to a stand whose accuracy can be traced to National Physical Laboratory Standards.

   Recommended instruments are:

   Apollo "XI"
   Celtec "A100"

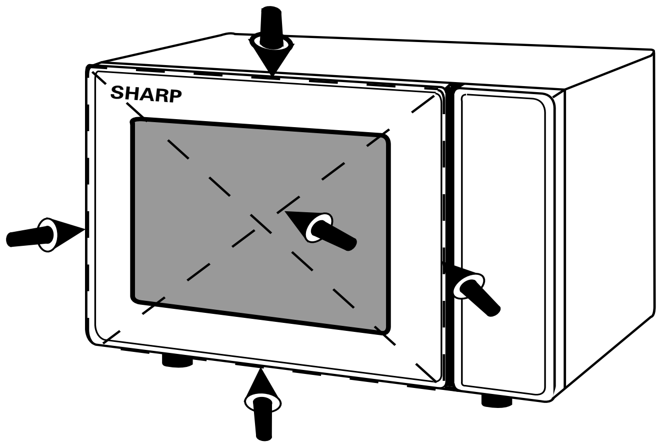
Before commencing the test, check that the leakage detector is functioning and adjusted according to the manufacturer's instructions, and any spacers are fitted to ensure that measurement is taken 5cm from the surface of the oven.

Dotted line indicates the path taken by the leakage detector.

PROCEDURE

1. Place the beaker containing the water load in the oven cavity at the centre of the turntable. The placing of this standard load in the oven is important, not only to protect the oven, but also to ensure that any leakage it is not disguised by too large a load absorbing energy.
2. Close the oven door, and with the power level set to FULL, turn the oven ON with the timer set for a few minutes operation. Should the water begin to boil before the test has been completed, it should be replaced.
3. As shown in the diagram below, move the probe slowly (not faster than 2.5 cm/sec.);-

a) around the edge of the door following the gap
b) across the face of the door
c) across any vents in the oven's sides, rear or top



Microwave leakage measurement at 5 cm distance

Whilst the maximum leakage permitted in BS EN 60335-2-25 is 50 W/m^2 (equivalent to 5 mW/cm^2), it is not normal to detect any significant leakage, and therefore any detected leakage should be investigated.

SCHEMATIC DIAGRAMS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. PLUGGED IN OVEN.
3. NOTHING APPEARS ON DISPLAY.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE
G-Y : GREEN AND YELLOW STRIPE
/15 : SECTIONAL AREA OF 1.5mm² MIN.
"★" Indicates components with potential above 250 V.

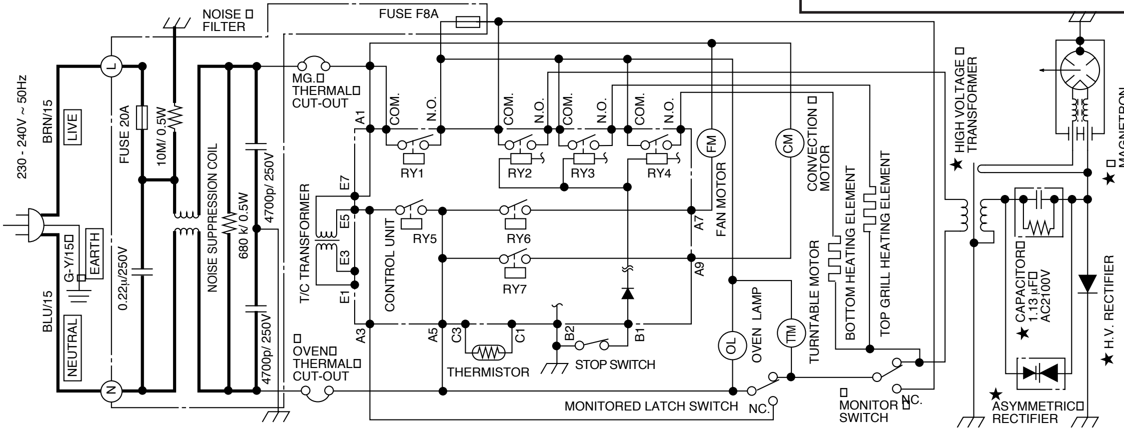


Figure O-1(a) Oven Schematic-OFF Condition right after the oven is plugged in.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR OPENED.
2. "ENERGY SAVED MODE" APPEARS ON DISPLAY.

Note:
AC CORD CONNECTION
BRN : BROWN
BLU : BLUE
G-Y : GREEN AND YELLOW STRIPE
/15 : SECTIONAL AREA OF 1.5mm² MIN.
"★" Indicates components with potential above 250 V.

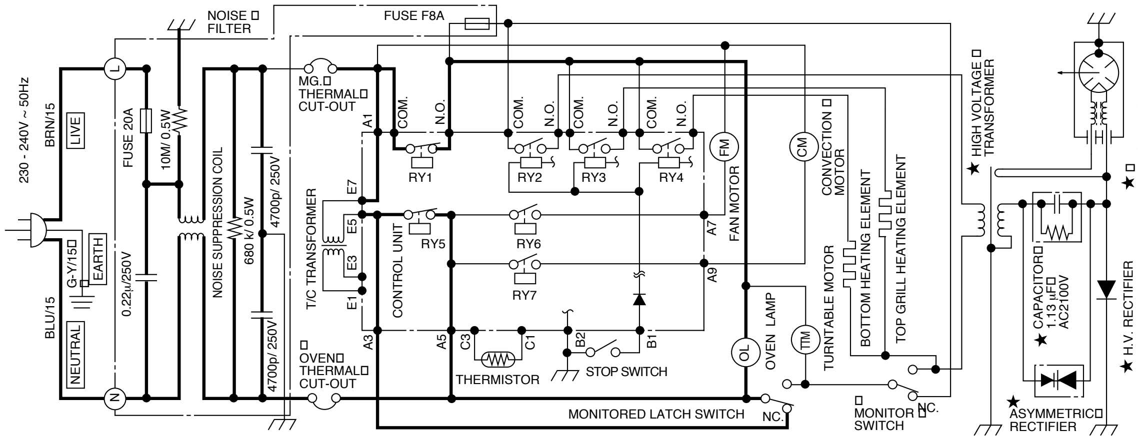


Figure O-1(b) Oven Schematic-OFF Condition when the oven door is opened.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. " . O" APPEARS ON DISPLAY.

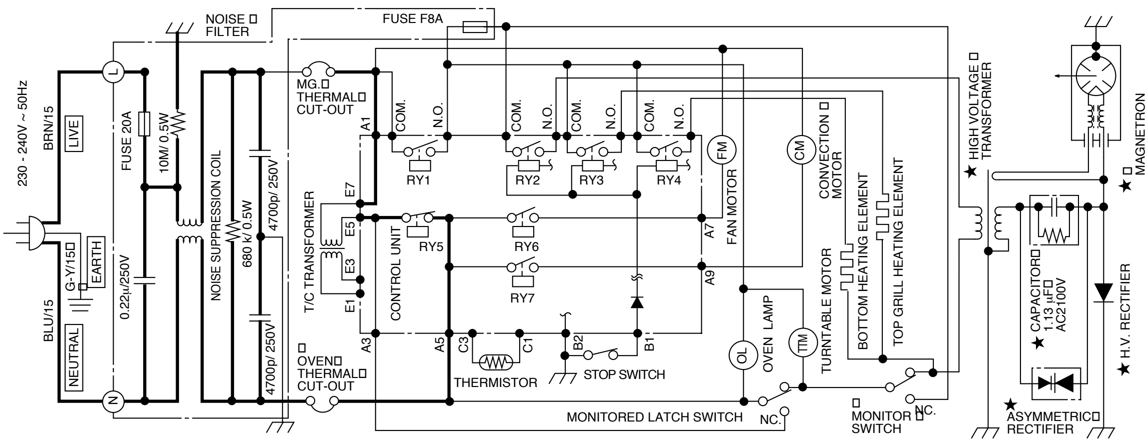


Figure O-1(c) Oven Schematic-OFF Condition after the oven door is closed.

SCHEMATIC DIAGRAMS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. STRAT KEY TOUCHED.

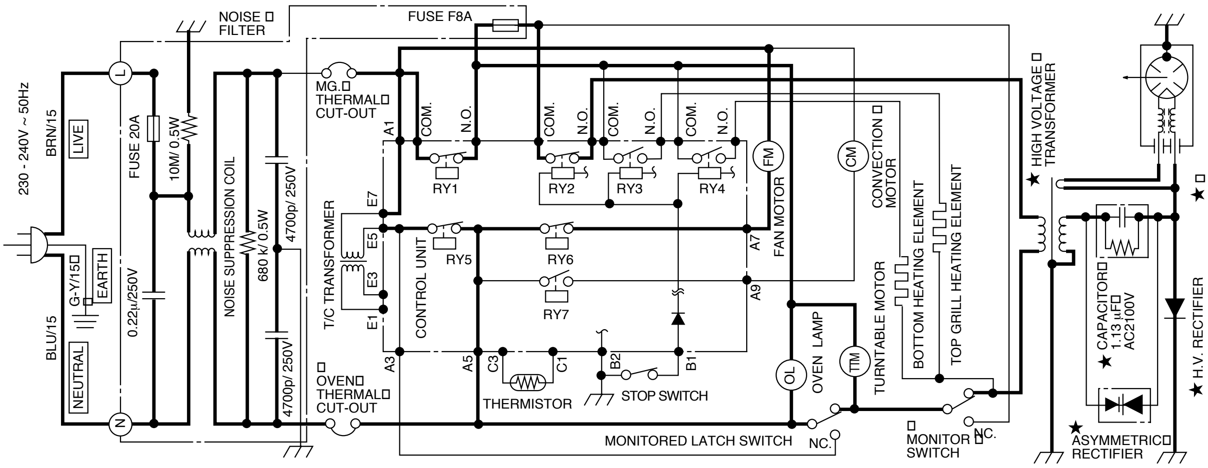


Figure O-2 Oven Schematic-Microwave cooking Condition

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. TOP GRILL MODE SELECTED.
4. STRAT KEY TOUCHED.

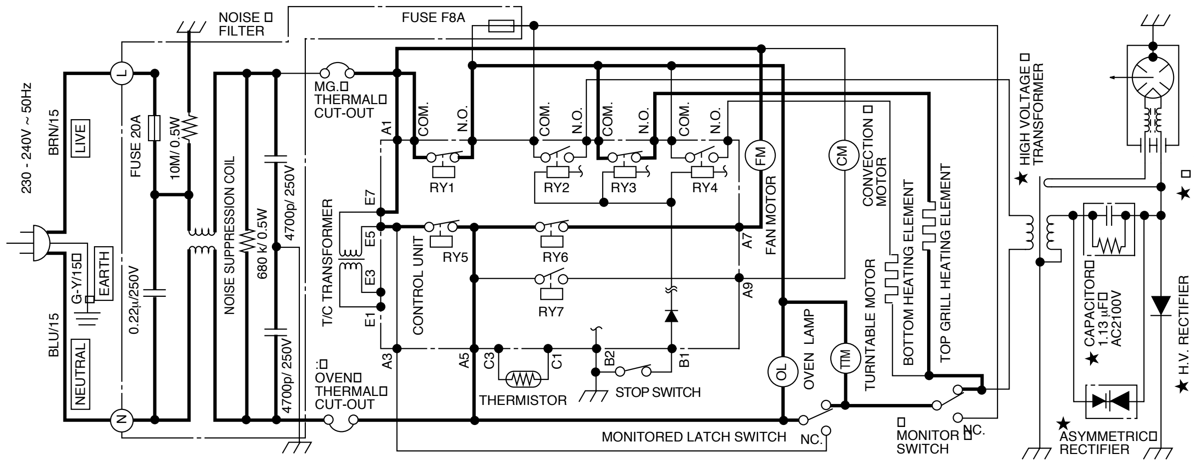


Figure O-3(a) Oven Schematic-Grill cooking Condition (TOP GRILL mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. BOTTOM GRILL MODE SELECTED.
4. STRAT KEY TOUCHED.

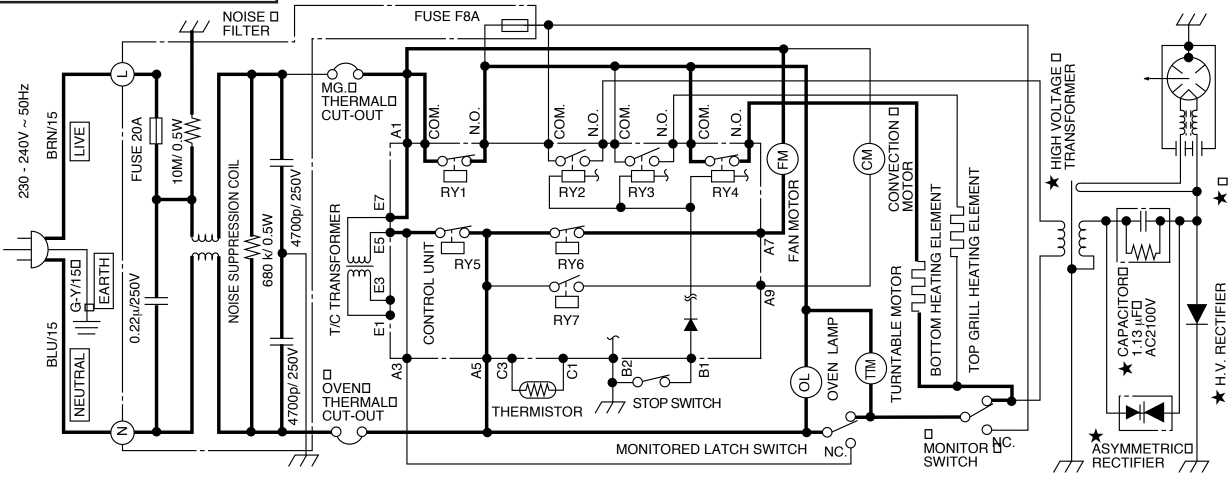


Figure O-3(b) Oven Schematic-Grill cooking Condition (BOTTOM GRILL mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. TOP & BOTTOM GRILL MODE SELECTED.
4. STRAT KEY TOUCHED.

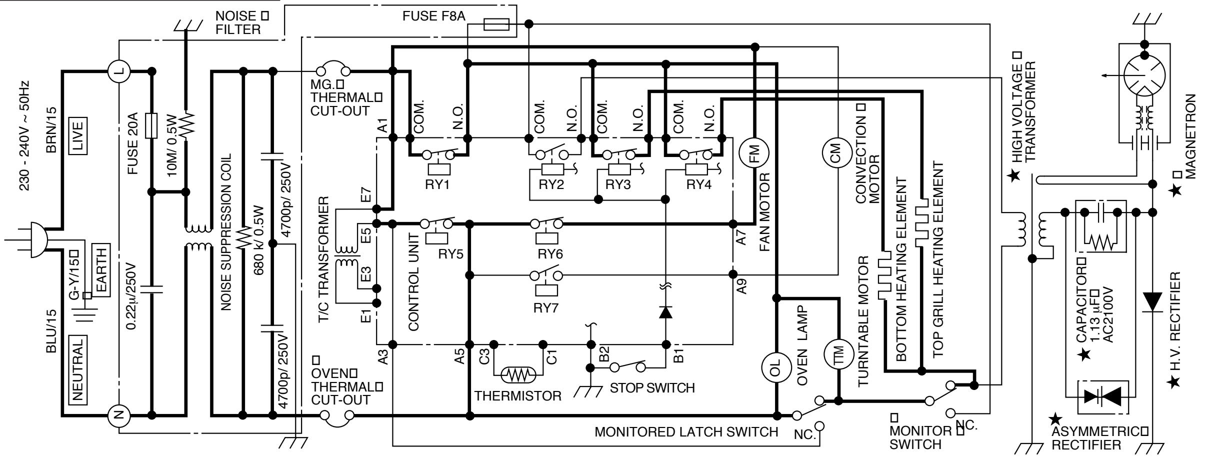


Figure O-3(c) Oven Schematic-Grill cooking Condition (TOP AND BOTTOM GRILL mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. CONVECTION TEMPERATURE SELECTED.
4. STRAT KEY TOUCHED.

NOTE: The top heating element, bottom heating element, fan motor and convection motor will be turned on and off according to the temperature.
See "AUTO POWER CONTROL SPEC.

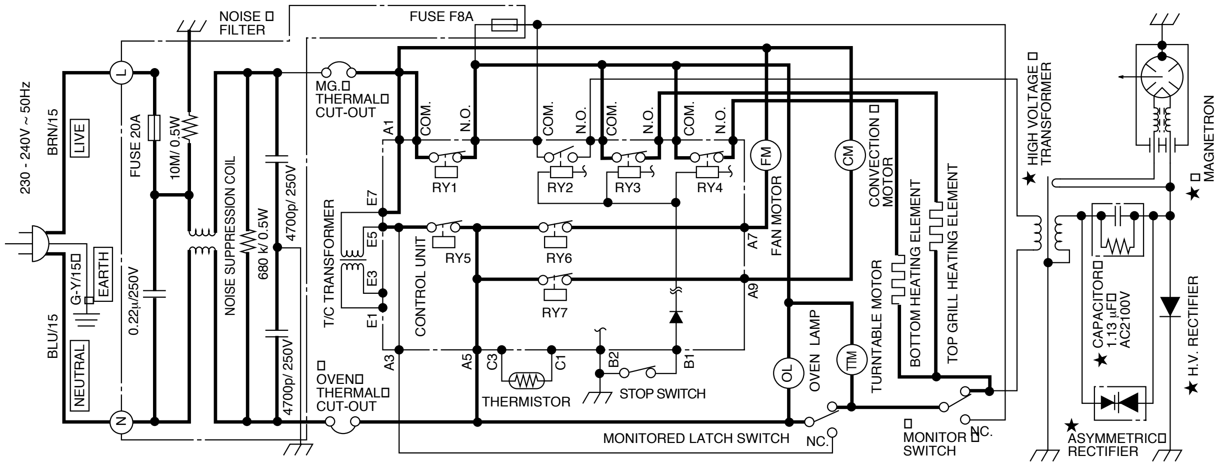


Figure O-4 Oven Schematic-Convection Condition

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. DUAL KEY TOUCHED ONCE.
4. MICROWAVE POWER LEVEL ENTERED.
5. CONVECTION TEMPERATURE SELECTED.
6. STRAT KEY TOUCHED.

NOTE: The top heating element, bottom heating element, magnetron, fan motor and convection motor will be turned on and off according to the temperature or microwave power level. See "AUTO POWER CONTROL SPEC.

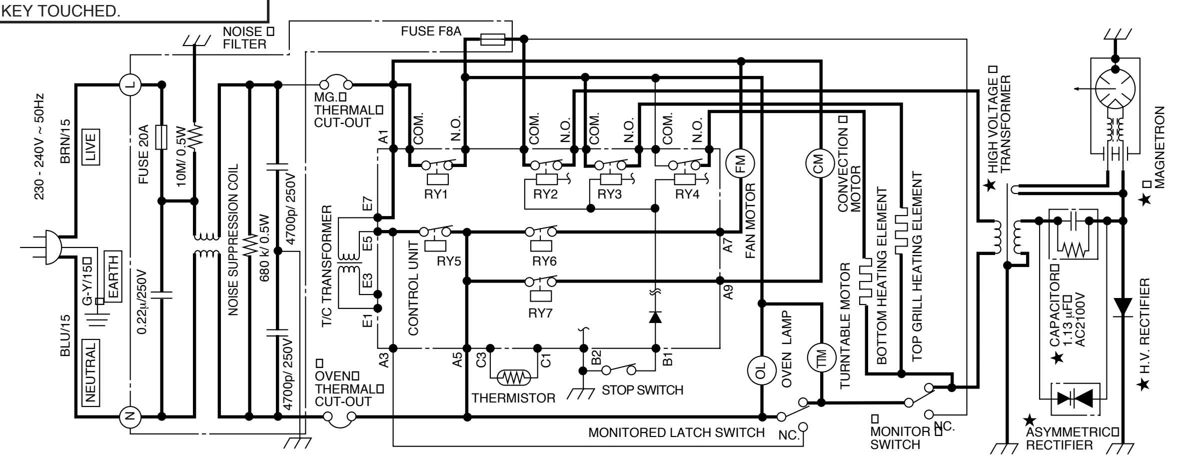


Figure O-5(a) Oven Schematic-Dual cooking Condition (Microwave and Convection mode)

SCHEMATIC DIAGRAMS

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. DUAL KEY TOUCHED TWICE.
4. MICROWAVE POWER LEVEL ENTERED.
5. STRAT KEY TOUCHED.

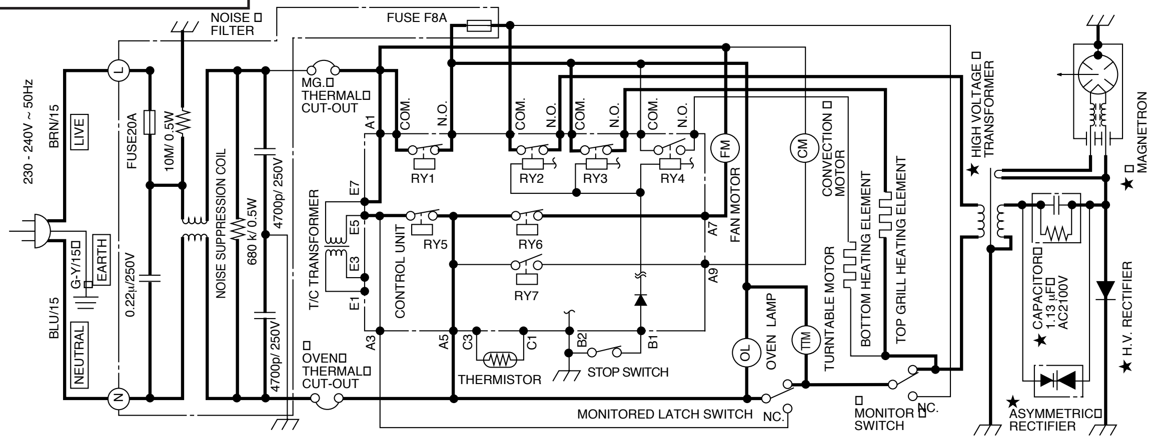


Figure O-5(b) Oven Schematic-Dual cooking Condition (Microwave and Top Grill mode)

SCHEMATIC
NOTE: CONDITION OF OVEN
1. DOOR CLOSED.
2. COOKING TIME ENTERED.
3. DUAL KEY TOUCHED THREE TIMES.
4. MICROWAVE POWER LEVEL ENTERED.
5. STRAT KEY TOUCHED.

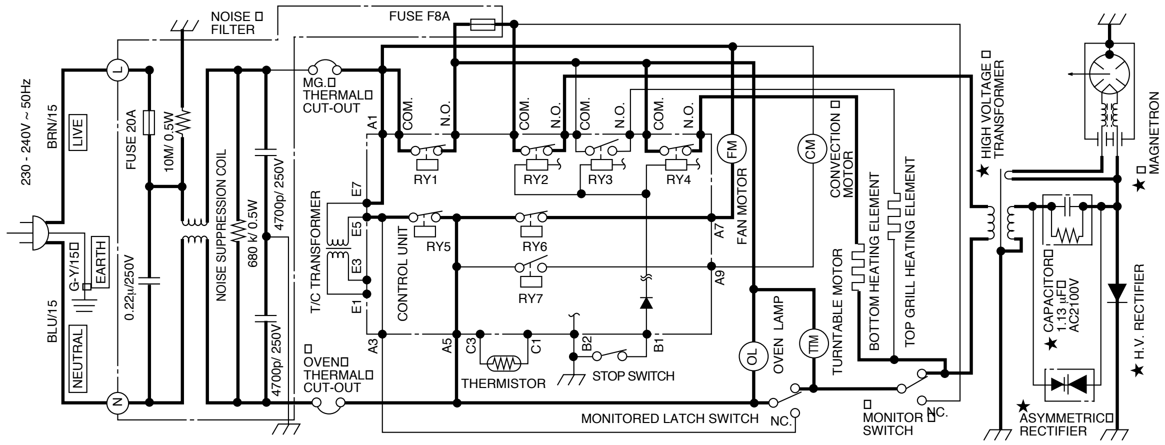


Figure O-5(c) Oven Schematic-Dual cooking Condition (Microwave and Bottom Grill mode)

PICTORIAL DIAGRAM

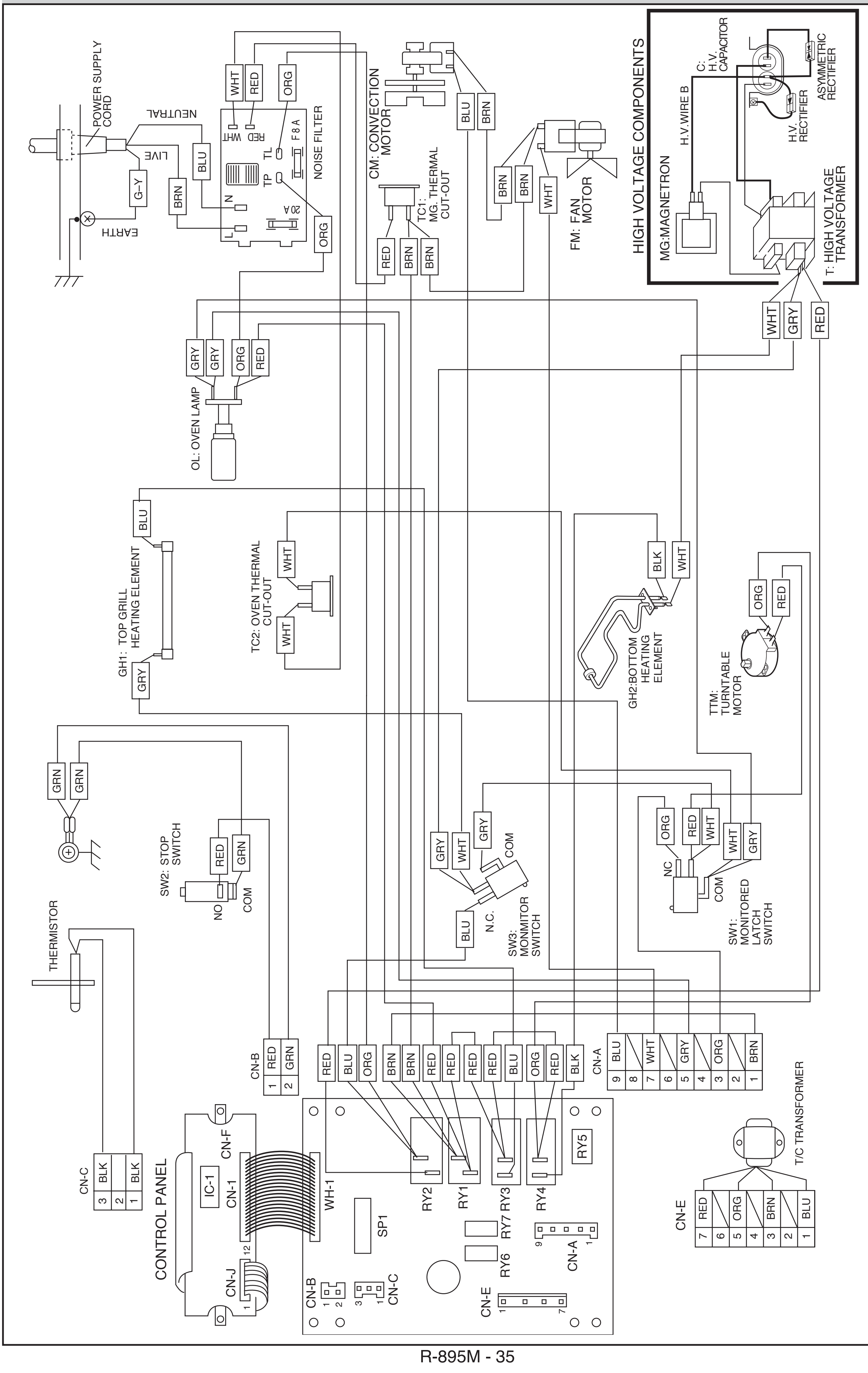
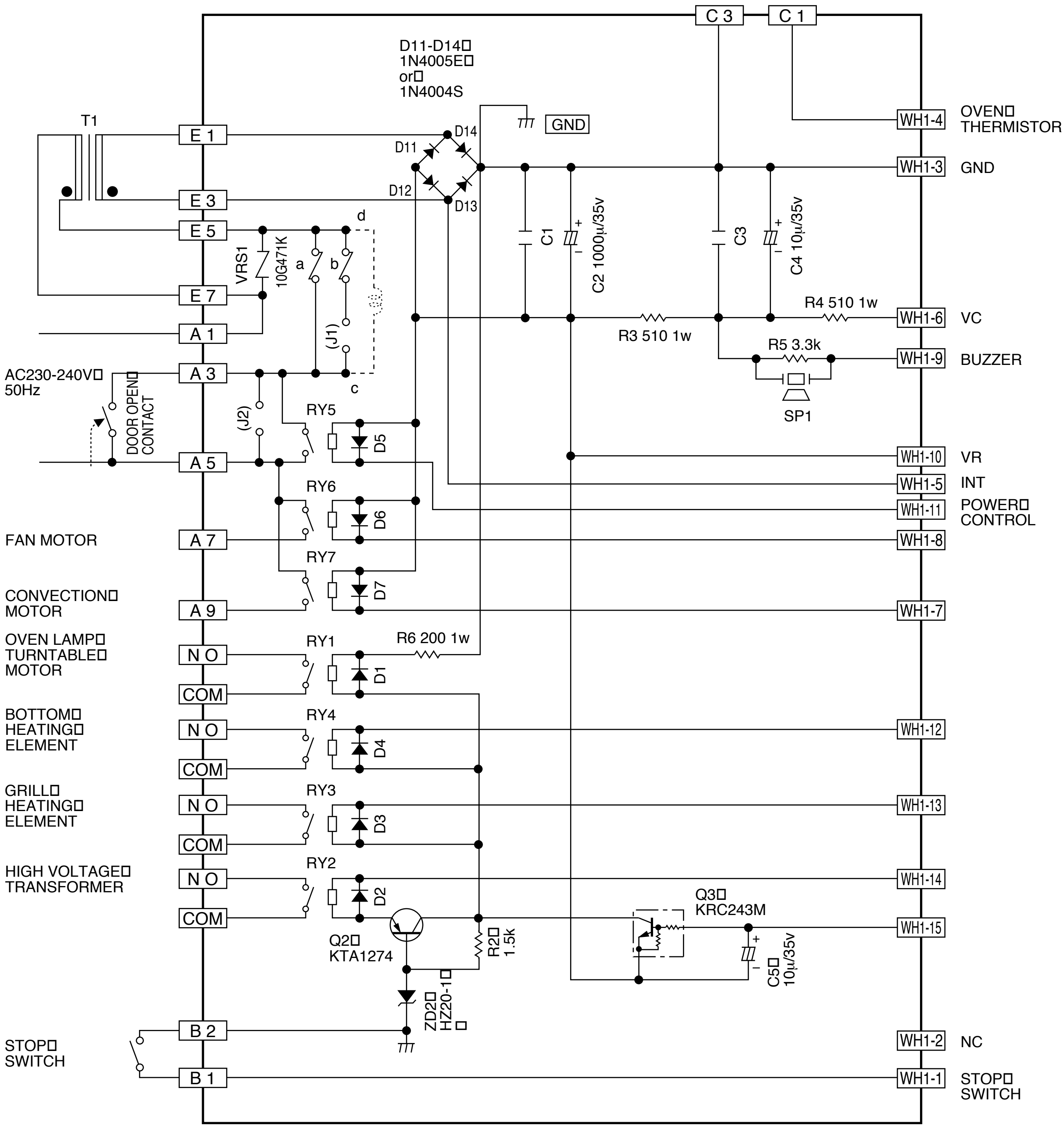


Figure S-1. Pictrorial Diagram

POWER UNIT CIRCUIT DIAGRAM



NOTE 1.

—⋀⋀⋀— : IF NOT SPECIFIED, 1/4W ± 5%

⊣ ⊢ : IF NOT SPECIFIED, 0.1μF / 50V

—▶|— : IF NOT SPECIFIED, 1SS270A

NOTE 2.

WH1-n 15P WIRE HARNESS

Figure S-2. Power Unit Circuit

CPU UNIT CIRCUIT DIAGRAM

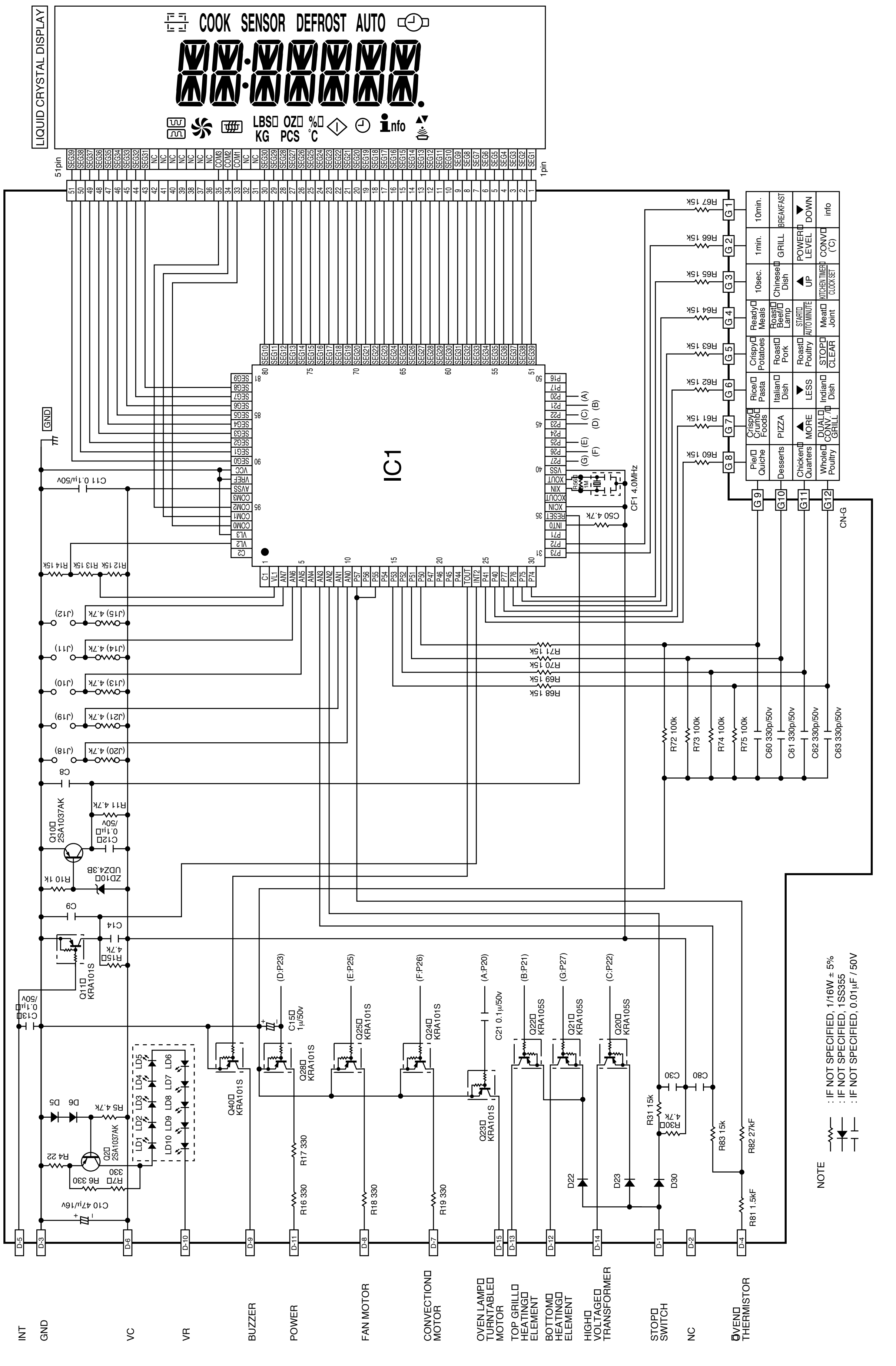


Figure S-3. CPU Unit Circuit

PRINTED WIRING BOARD OF POWER UNIT DIAGRAM

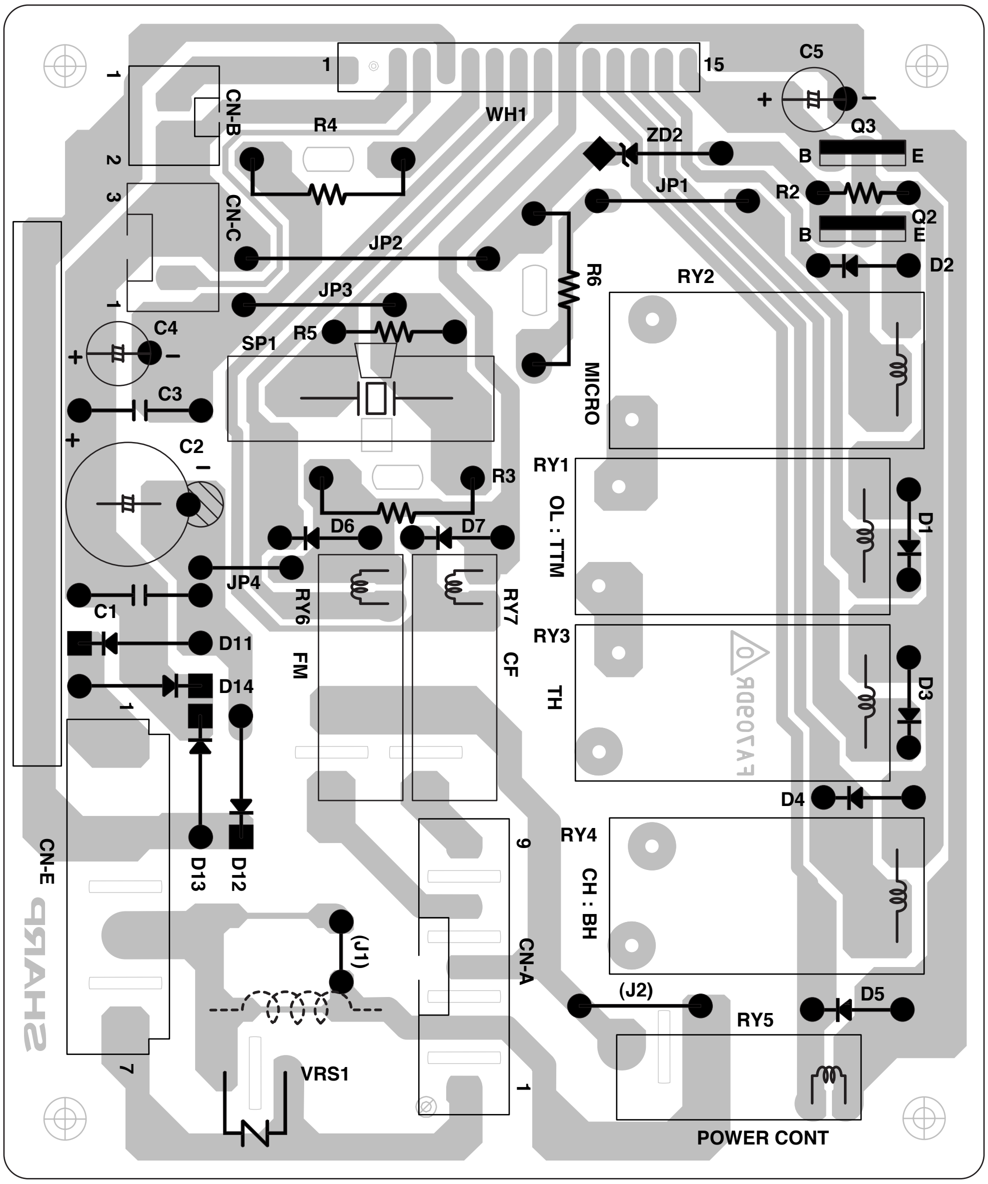


Figure S-4. Printed Wiring Board of Power Unit