

SHARP® SERVICE MANUAL

S9809R8R50PHW

GRILL AND CONVECTION MICROWAVE OVEN

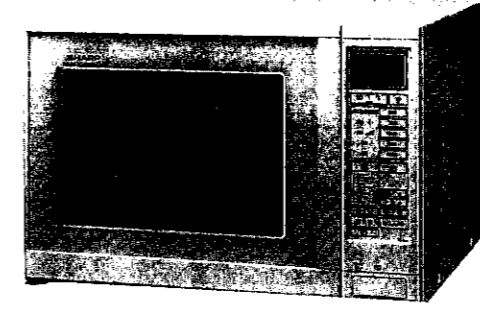
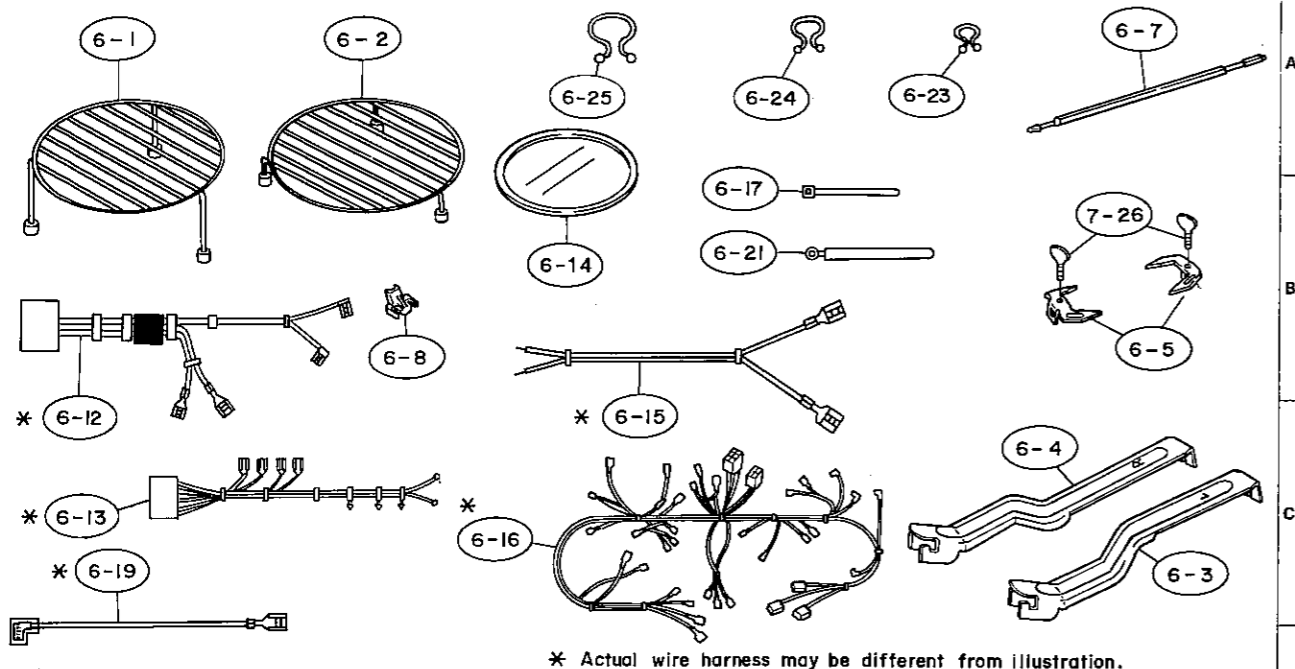


Photo R-8R50(W)

**MODELS R-8R50(W)
R-8R50(B)**

In interests of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.
(RD16101U)

MISCELLANEOUS



* Actual wire harness may be different from illustration.

PACKING AND ACCESSORIES

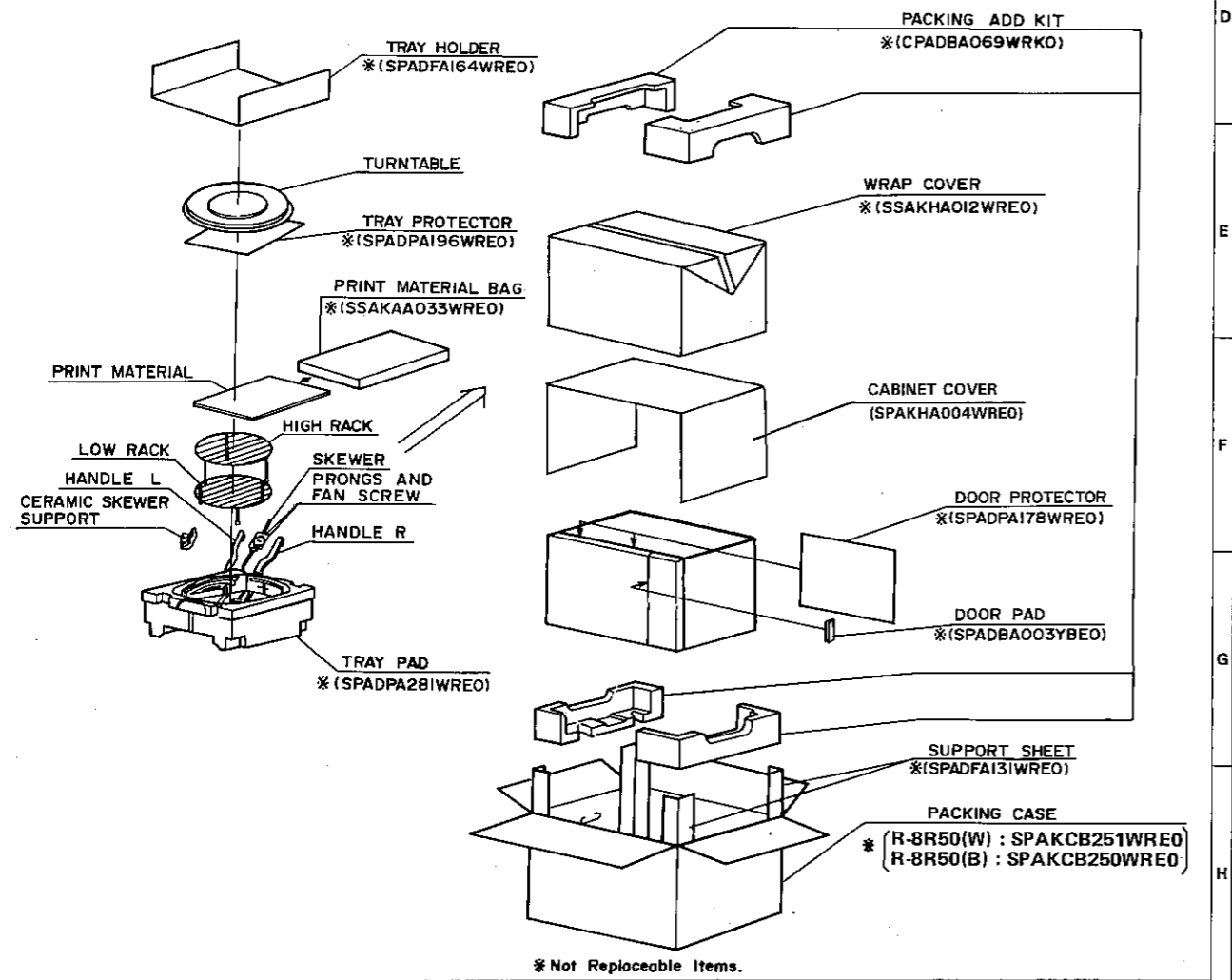
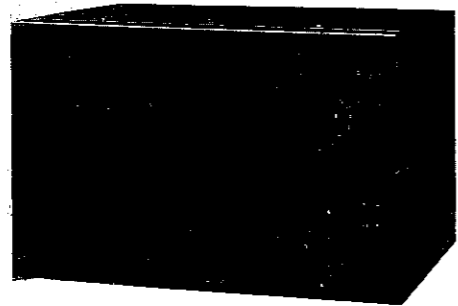
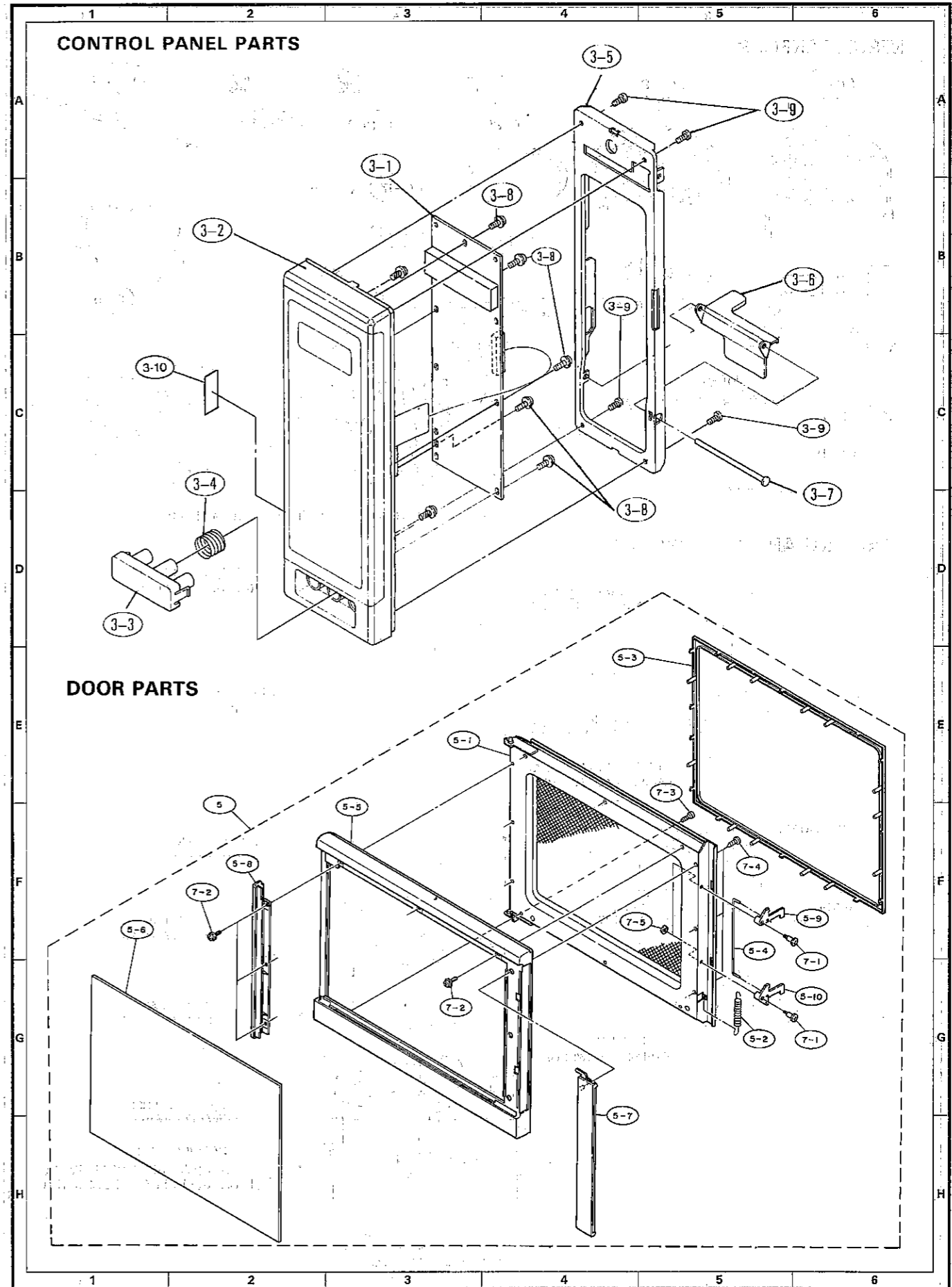


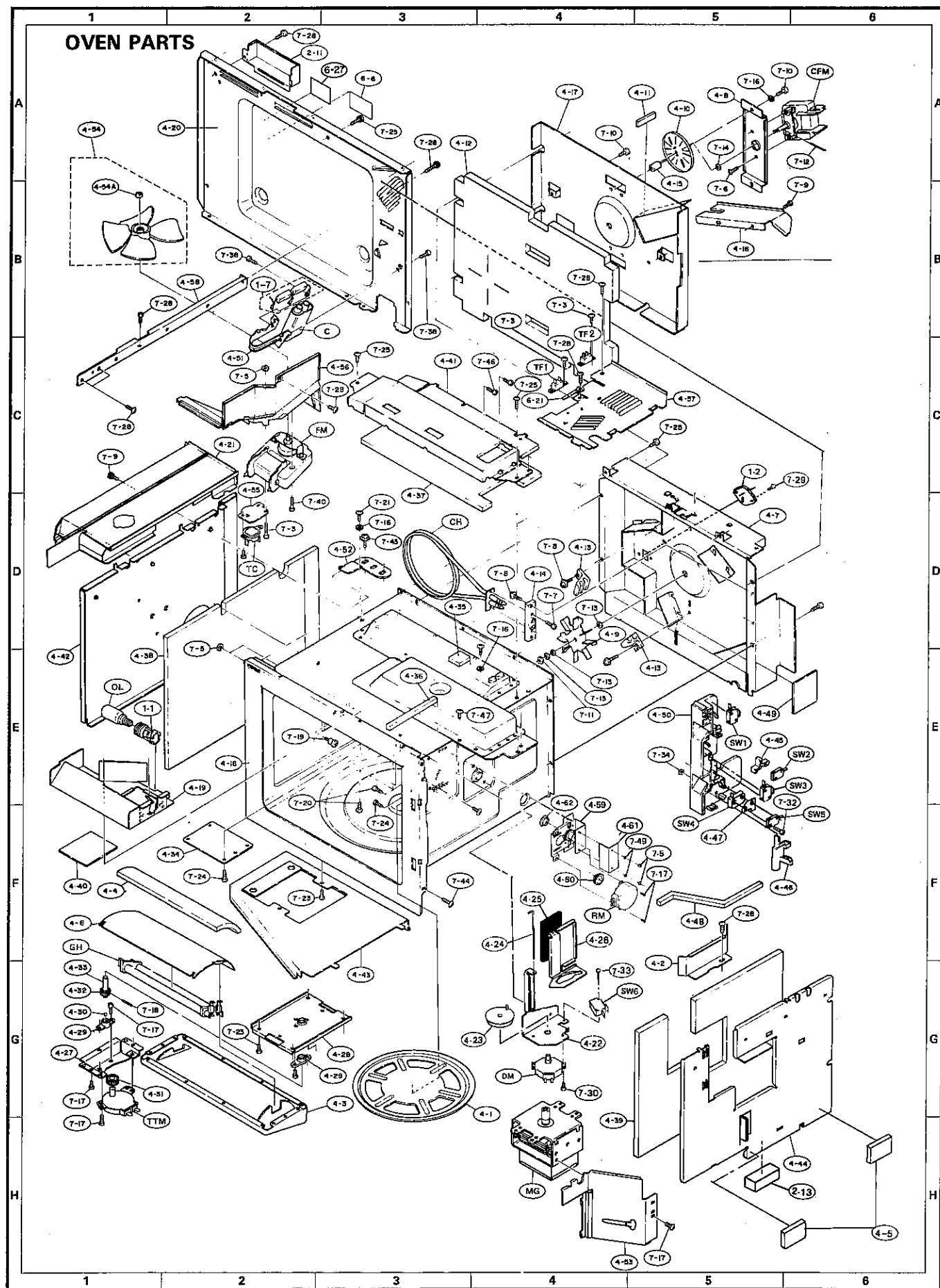
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R-8R50(B)





SERVICE MANUAL

SHARP

GRILL AND CONVECTION MICROWAVE OVEN

R-8R50(W)/ R-8R50(B)

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.

(RD36106U)

CAUTION MICROWAVE RADIATION

Service engineers 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.

(RD36203U)

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.

(RD51110u)

SHARP CORPORATION

OSAKA, JAPAN

(RD37201U)

PRODUCT SPECIFICATIONS

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT COMPONENTS

TROUBLESHOOTING CHART

TEST PROCEDURE

TOUCH CONTROL PANEL ASSEMBLY

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

TEST DATA TABLE AND TEST POINTS ON CONTROL UNIT

MICROWAVE MEASUREMENT

WIRING DIAGRAM

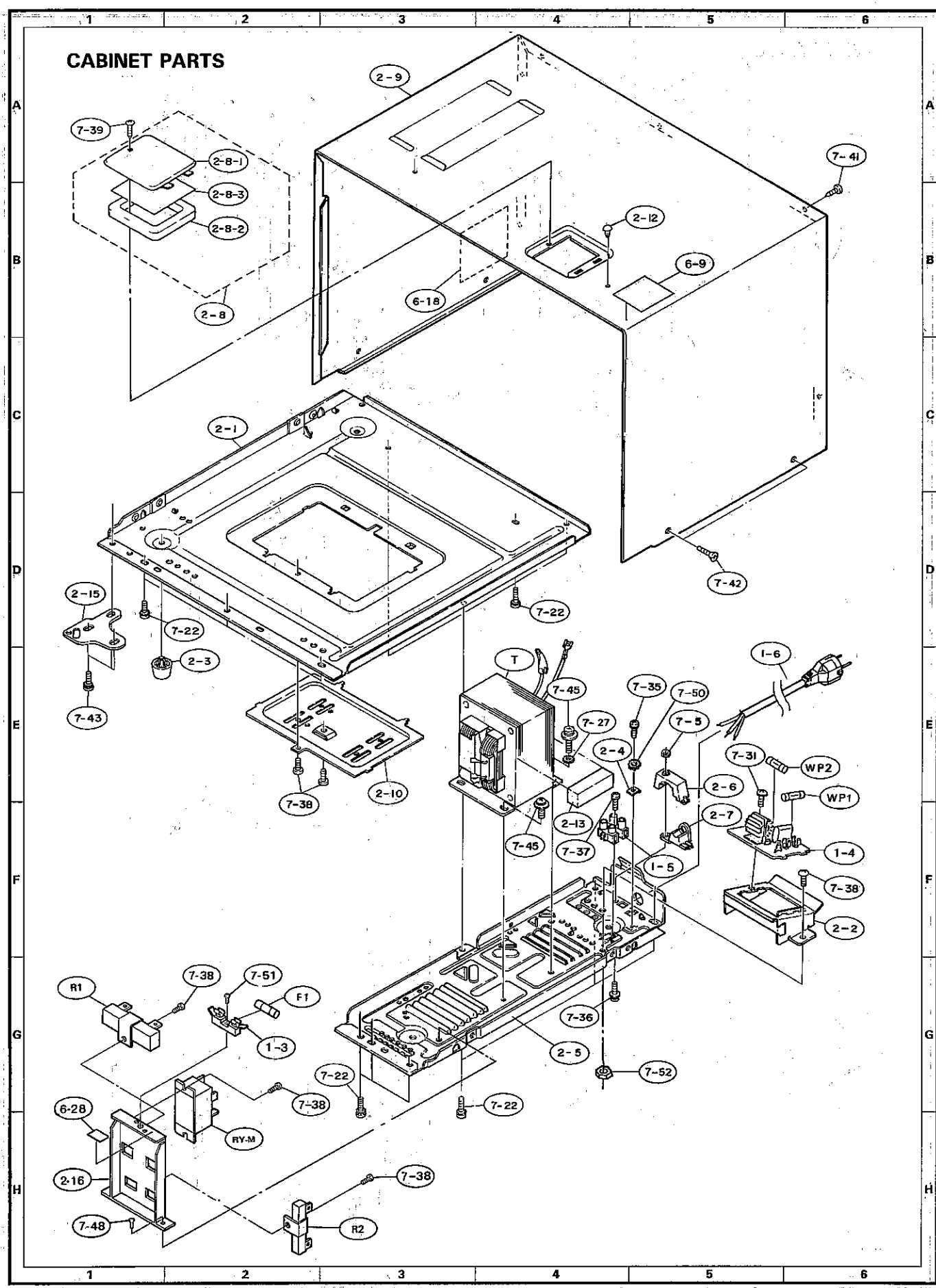
PRINTED WIRING BOARD

PARTS LIST

PRODUCT SPECIFICATIONS

ITEM	DESCRIPTION
Power Requirements	220 Volts 50 Hertz Single phase, 3 wire earthed
Power Consumption	Microwave cooking 1.5 kW Approx. 6.8A Dual cooking 1 3.0 kW Approx. 13.6A Dual cooking 2 2.5 kW Approx. 11.4A Convection cooking 1.6 kW Approx. 7.3A Grill cooking Max 2.6kW
Power Output	750 watts nominal of RF microwave energy (2 liter water load) Operating frequency of 2450MHz
Convection Heater Power Output	1.5kW
Grill Heater Power Output	1.0kW
Case Dimensions	Width 555 mm Height 380 mm including foot Depth 516 mm
Cooking Cavity Dimensions	Width 375 mm Height 254 mm Depth 385 mm
Turntable diameter	365mm
Control Complement	Touch Control System Timer (0 - 99 min. 90 sec.) Microwave Cooking Control Repetition Rate; <ul style="list-style-type: none"> HIGH Full power throughout the cooking time MED HIGH approx. 70% of Full Power MED approx. 50% of Full Power MED LOW (DEFROST) approx. 30% of Full Power LOW approx. 10% of Full Power Convection Temperature Control Range; 40 °C, 70 °C, 100 °C, 130 °C, 160 °C, 180 °C, 200 °C, 220 °C, 230 °C, 250 °C TIME keys DUAL COOK SELECTION key CONVECTION MODE/TEMPERATURE SETTING key MICROWAVE MODE/POWER SETTING key GRILL MODE key ROTISSERIE COOKING key EASY DEFROST key AUTO COOK key WEIGHT (NUMBER) ENTRY keys MORE(▲)/LESS(▼) keys MINUTE TIMER/HOLD key AUTO START/CLOCK SETTING key STOP/CLEAR key MINUTE PLUS/START key MAIN POWER OFF key
Set Weight	Approx. 30.0 kg

(RD44101U)



NOTE: Numbers and letters shown after sentences such as "RD44101U" are for factory use only.

Note: The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
6-27	TCAUHA087WRR0	Belgium label	1	AB
6-28	TLABAA001WRR0	A018 label	1	AE

SCREW, NUTS AND WASHERS

7- 1	LX-BZ0202WRE0	Special screw	2	AB
7- 2	XCPSD30P08X00	Screw; 3mm x 8mm	6	AA
7- 3	XCPSD30P08000	Screw; 3mm x 8mm	7	AA
7- 4	XCPSD40P08000	Screw; 4mm x 8mm	3	AA
7- 5	XNESD40-32000	Nut; 4mm x 3.2mm	7	AA
7- 6	XBTSD40P05000	Screw; 4mm x 5mm	2	AA
7- 7	XBTWW40P12000	Screw; 4mm x 12mm	2	AA
7- 8	XCPWW30P12X00	Screw; 3mm x 12mm	4	AA
7- 9	XCTSD40P06000	Screw; 4mm x 6mm	4	AA
7-10	XCTWW40P12000	Screw; 4mm x 12mm	4	AA
7-11	XNEUW40-32000	Nut; 4mm x 3.2mm	1	AA
7-12	XPSSP20-20000	Pin; 2mm x 20mm	1	AA
7-13	XWHUW40-08000	Washer; 4mm x 0.8mm	2	AA
7-14	XWHUW50-08000	Washer; 5mm x 0.8mm	1	AA
7-15	XWSUW40-10000	Washer; 4mm x 10mm	1	AA
7-16	XWVUW40-04000	Washer; 4mm x 0.4mm	4	AA
7-17	XFPSD40P06000	Screw; 4mm x 6mm	10	AA
7-18	XPSUW20-12000	Pin; 2mm x 12mm	1	AA
7-19	LX-BZA087WRE0	Special screw	2	AF
7-20	LX-BZA061WRE0	Special screw	4	AC
7-21	LX-CZ0043WRE0	Special screw	14	AA
7-22	LX-CZ0047WRE0	Special screw	13	AA
7-23	XBPSD40P08000	Screw; 4mm x 8mm	6	AA
7-24	XBTUW40P06000	Screw; 4mm x 6mm	6	AA
7-25	XCTSD40P12000	Screw; 4mm x 12mm	13	AA
7-26	LX-BZA059WRE0	Special screw	2	AC
7-27	XWSSD50-06000	Washer; 5mm x 0.6mm	1	AA
7-28	XOTSD40P12000	Screw; 4mm x 12mm	9	AA
7-29	XCPWW30P08000	Screw; 3mm x 8mm	2	AA
7-30	XFPSD40P08000	Screw; 4mm x 8mm	2	AA
7-31	XFPSD40P08K00	Screw; 4mm x 8mm	1	AA
7-32	XBPSD30P26K00	Screw; 3mm x 2.6mm	2	AA
7-33	XBPSD30P16K00	Screw; 3mm x 1.6mm	1	AA
7-34	XNESD30-24000	Nut; 3mm x 2.4mm	2	AA
7-35	XBTSD40P08000	Screw; 4mm x 8mm	1	AA
7-36	XBPSD40P35XS0	Screw; 4mm x 35mm	1	AA
7-37	XFPSD30P15000	Screw; 3mm x 15mm	1	AA
7-38	XFTSD40P08TV0	Screw; 4mm x 8mm	7	AA
7-39	XHSSB40P08000	Screw; 4mm x 8mm	1	AA
	XHSSC40P08000	Screw; 4mm x 8mm	1	AA
		R-8R50(B)		
		R-8R50(W)		
7-40	XBPSD40P25000	Screw; 4mm x 25mm	2	AA
7-41	LX-BZA036WRE0	Special screw	5	AA
		R-8R50(W)		
7-42	LX-BZA037WRE0	Special screw	5	AA
		R-8R50(B)		
7-42	XHNSB40P12000	Screw; 4mm x 12mm	4	AA
		R-8R50(B)		
7-42	XHNSC40P12000	Screw; 4mm x 12mm	4	AA
		R-8R50(W)		
7-43	LX-CZA020WRE0	Special screw	5	AA
7-44	LX-CZ0052WRE0	Special screw	2	AA
7-45	XBPSD50P10KS0	Screw; 5mm x 10mm	2	AA
7-46	XBPUW40P08K00	Screw; 4mm x 8mm	2	AA
7-47	XFTSD40P10000	Screw; 4mm x 10mm	4	AA
7-48	XCTSD40P08000	Screw; 4mm x 8mm	1	AA
7-49	XWSSD40-10000	Washer; 4mm x 1mm	1	AA
7-50	XWVSD40-10000	Washer; 4mm x 1mm	1	AA
7-51	XFPSD30P10000	Screw; 3mm x 10mm	1	AA
7-52	LX-NZ0061WRE0	Special nut	1	AA

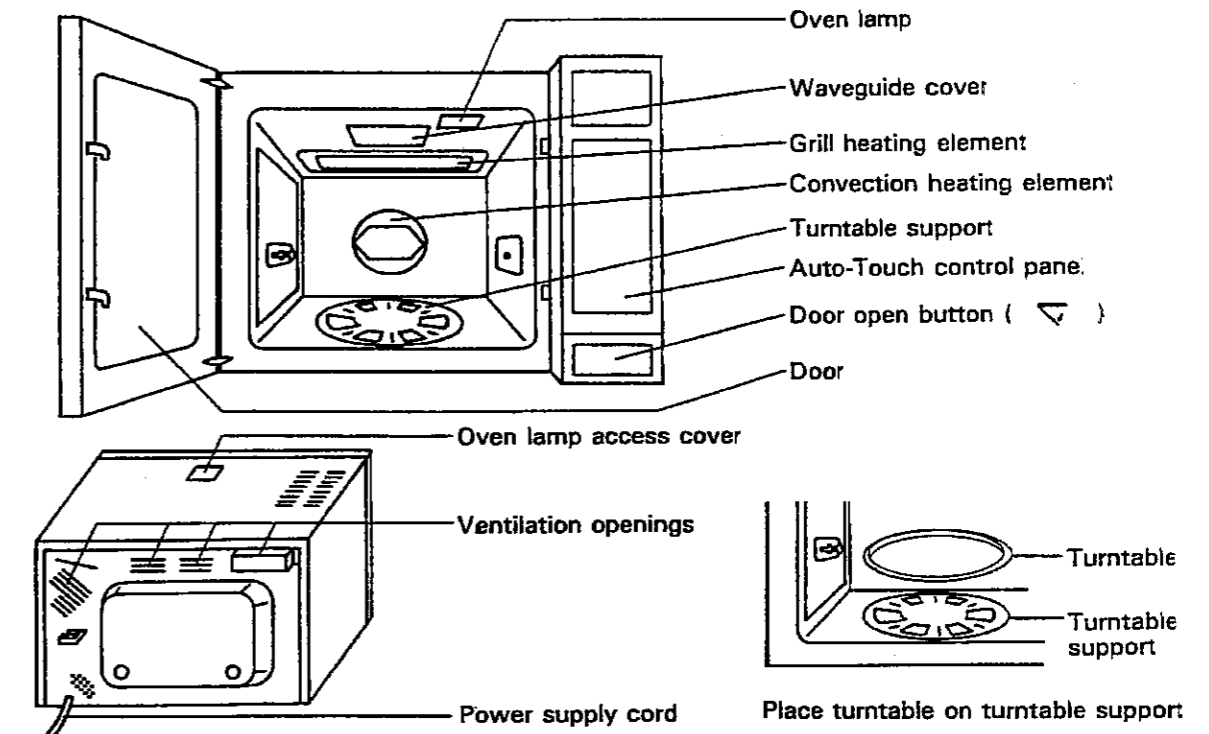
HOW TO ORDER REPLACEMENT PARTS

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

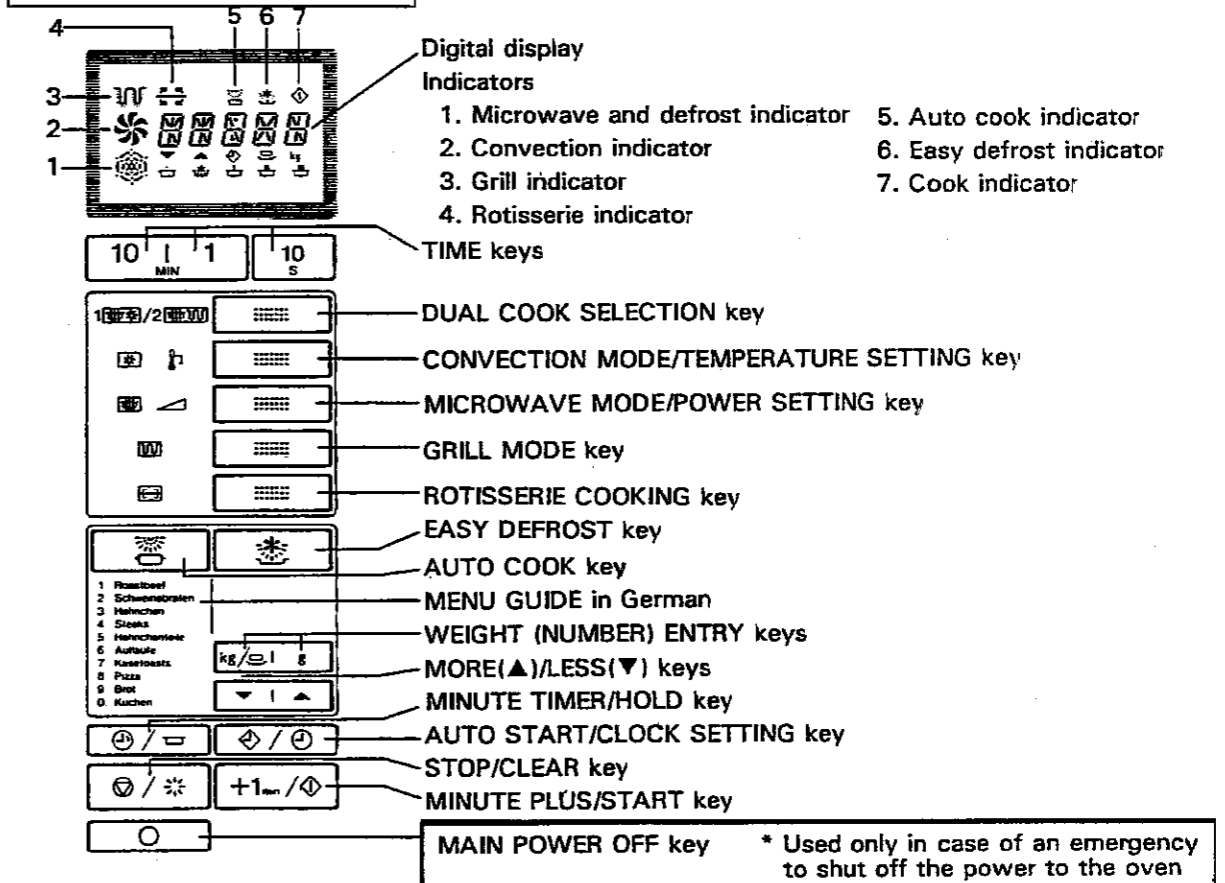
1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

(RDP1303U)

APPLIANCE VIEW



Auto-Touch Control Panel



OPERATING SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (Upper latch switch, Latch switch, Lower latch switch and stop switch).

IMPORTANT

When the oven door is closed, the monitor switch contacts COM-NC must be open. When the microwave oven is plugged in a wall outlet (220V 50Hz), 220 volts A.C. is supplied to the point A5+A7 in the control unit.

Figure O-1(a) on page 43 (After plugged in)






- The display flashes "88:88".
 - To set any programmes or set the clock, you must first touch the  key.
 -  appears in the display and the time counts up every minute.
- NOTE: When the oven door is opened, the oven lamp does not come on at this time. Because the main relay contacts are opened.

Figure O-1(b) on page 43 (After cooking)

- The contacts of mains relay will be closed when any progames is started.
 - After finished cooking, the contacts of mains relay are keeping close condition until the  (MAIN POWER OFF) key is touched
- NOTE: When the oven door is opened, the oven lamp comes on at this time.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter a desired cooking time with the touching  key and start the oven with touching  key.

Function sequence Figure O-2 on page 44

CONNECTED COMPONENTS	RELAY
All components (except the noise filter and control unit)	RY-M
Oven lamp	RY1
Power transformer	RY2
Fan motor	RY7
Turntable motor	RY10

- 220 volts A.C. is supplied to the primary winding of the power 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.
- 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..

- The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channeled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.
- When the cooking time is up, a signal tone is heard and the relays RY1+RY2+RY7+RY10 go back to their home position. The circuits to the oven lamp, power transformer, fan motor and turntable motor are cut off. But the contacts of mains relay RY-M remains closing.
- When the door is opened during a cook cycle, the switches come to the following condition.

SWITCH	CONTACT	CONDITION	
		DURING COOKING	DOOR OPEN (NO COOKING)
Upper Latch Switch	COM-NO	Closed	Open
Latch Switch	COM-NO	Closed	Open
Monitor Switch	COM-NC	Open	Closed
Lower Latch Switch	COM-NO	Closed	Open
Stop Switch	COM-NO	Closed	Open

The circuits to the power transformer, fan motor and turntable motor are cut off when the upper latch switch, latch switch, lower latch switch and stop switch are made open. The oven lamp remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relays RY1+RY-M stay closed. Shown in the display is the remaining time.

- MONITOR SWITCH CIRCUIT
The monitor switch SW3 is mechanically controlled by oven door, and monitors the operation of the lower latch switch SW4.
- 6-1 When the oven door is opened during or after the cycle of a cooking program, the latch, lower latch and stop switches SW2+SW4+SW5 must open their contacts first. After that the contacts (COM-NC) of the monitor switch SW3 can be closed and then contacts of the upper latch switch SW1 can be opened.
- 6-2 When the oven door is closed, the contacts (COM-NC) of the monitor switch SW3 must be opened first, and the contacts (COM-NO) of the upper latch switch SW1 must be closed. After that the contacts of the stop switch SW5, latch and lower latch switches SW2+SW4 are closed.
- 6-3 When the oven door is opened and the contacts of the lower latch switch SW4 remain closed, remains closed, the fuse F1 F6.3A will blow, because the monitor switch is closed and a short circuit is caused.

Note: The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
4-48	PCUSUA197WRP0	Magnetron duct cushion	1	AD
4-49	PCUSGA132WRP0	Convection unit cushion	1	AC
4-50	PHOK-A037WRP0	Latch hook	1	AR
4-51	LBNDKAO56WRP0	Capacitor holder	1	AG
4-52	MHNG-A145WRM0	Upper oven hinge R-8R50(B)	1	AF
	MHNG-A163WRM0	Upper oven hinge R-8R50(W)	1	AE
4-53	FDUC-A127WRY0	Magnetron air guide	1	AK
4-54	FFANJA018WRK0	Fan blade	1	AE
4-54-A	MSPRPO038YBEO	Fan retainer clip	1	AB
4-55	LANGQA171WRW0	Thermal cut-out angle	1	AC
4-56	PDUC-A312WRFO	Fan duct	1	AR
4-57	LANGKA369WRW0	Partition plate	1	AK
4-58	LANGTA179WRW0	Chassis support	1	AK
4-59	FANGQA086WRFO	Rotisserie motor angle assembly	1	AS
4-60	NGERHA074WRFO	Gear (C)	1	AC
4-61	PSLDM108WRW0	Rotisserie cover	1	AD
4-62	PSLDM113WRW0	Flange cover	1	AD

DOOR PARTS

5	CDORFA320WRK0	Door assembly, Complete R-8R50(B)	1	BX
	CDORFA321WRK0	Door assembly, Complete R-8R50(W)	1	BU
5- 1	DDORFA240WRY0	Door panel	1	BL
5- 2	MSPRTA093WRE0	Latch spring	1	AD
5- 3	FCOVHA009WRK0	Choke cover	1	AW
5- 4	NSFTTA029WRE0	Latch shaft	1	AC
5- 5	GWAKPA090WRFO	Door frame R-8R50(B)	1	AX
	GWAKPA091WRFO	Door frame R-8R50(W)	1	AX
5- 6	PGLSPA104WRE0	Door glass R-8R50(B)	1	AX
	PGLSPA105WRE0	Door glass R-8R50(W)	1	AX
5- 7	HDECQA103WRFO	Door sash right R-8R50(W)	1	AL
	HDECQA105WRFO	Door sash right R-8R50(B)	1	AN
5- 8	HDECQA104WRFO	Door sash left R-8R50(W)	1	AK
	HDECQA106WRFO	Door sash left R-8R50(B)	1	AN
5- 9	LSTPPA057WRFO	Upper latch head	1	AE
5-10	LSTPPA058WRFO	Lower latch head	1	AE

MISCELLANEOUS

6- 1	FAMI-A016WRK0	High rack	1	AQ
6- 2	FAMI-A017WRK0	Low rack	1	AP
6- 3	JHNDMA019WRE0	Handle (Left)	1	AK
6- 4	JHNDMA020WRE0	Handle (Right)	1	AK
6- 5	LANG-A009WRE0	Prongs	2	AF
6- 6	TSPCNB091WRRO	Name plate R-8R50(B)	1	AD
	TSPCNB092WRRO	Name plate R-8R50(W)	1	AD
6- 7	NSFTTA061WRE0	Skewer	1	AQ
6- 8	PGISHA009WRE0	Ceramic skewer support	1	AC
6- 9	TCAUHA088WRRO	High temperature caution	1	AC
6-10	TCADCA239WRRO	Cook book for convection and grill cooking	1	BA
6-11	TINSEA458WRRO	Operation manual (German/English/Dutch)	1	AL
	TINSEA462WRRO	Operation manual (French/Italian/Spanish)	1	AL
6-12	FW-VZA723WRE0	Branch harness (Convection motor harness)	1	AU
6-13	FW-VZA736WRE0	Control harness	1	AW
6-14	FTNT-A003WRHO	Turntable	1	AU
6-15	FW-VZA583WRE0	Terminal harness	1	AG
6-16	FW-VZA742WRE0	Main wire harness	1	BF
6-17	LBNDKAO49WRE0	Wire tie	1	AB
6-18	TCAUHA086WRRO	Caution label	1	AF
* 6-19	QW-QZA085WRE0	High voltage wire A	1	AH
6-20	TLABMA141WRRO	Cooking caution	1	AC
6-21	LBNDK0042WRE0	Wire holder E with silicon tube	1	AB
6-22	TLABMA212WRRO	Menu label (French/Italian/Spanish/Dutch) R-8R50(B)	1	AD
	TLABMA213WRRO	Menu label (French/Italian/Spanish/Dutch) R-8R50(W)	1	AD
6-23	LHLDWAO11WRE0	Purse lock M	1	AB
6-24	LHLDWAO12WRE0	Purse lock L	1	AB
6-25	LHLDWAO13WRE0	Purse lock LL	1	AC
6-26	TCADCA247WRRO	Cookbook for microwave cooking	1	AT

Note: The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
RY10				
RY2-4,9	RRLY-A013DRE0	Relay (OMI-SH-112D)	4	AM
SP40	RALM-A011DRE0	Buzzer (PKT2226P)	1	AH
T1	RTRNPA046DRE0	Transformer	1	AT
VRS1	RH-VZA010DRE0	Varistor (15G471K-T)	1	AE
ZD1	VHERD16EB3/-1	Zener diode (RD16EB3)	1	AB
ZD3	RH-EZA105DRE0	Zener diode (RD4.3ESB2)	1	AA
3- 2	FPNLCA676WRK0	Control panel frame with key unit : R-8R50(W)	1	BH
	FPNLCA675WRK0	Control panel frame with key unit : R-8R50(B)	1	BH
3- 3	JBTN-A482WRF0	Open button : R-8R50(W)	1	AE
	JBTN-A481WRF0	Open button : R-8R50(B)	1	AE
3- 4	MSPRDA009WRE0	Open button spring	1	AA
3- 5	LANGTA181WRW0	Control panel back plate	1	AM
3- 6	MLEVFA057WRW0	Open lever	1	AD
3- 7	NSFTTA042WRE0	Open shaft	1	AD
3- 8	XHPSD30P12XS0	Screw; control unit mounting	5	AA
3- 9	XTTSD40P12000	Screw; control panel back plate mounting	4	AA
3-10	TSPCQA074WRRO	Front label R-8R50(W)	1	AB
	TSPCQA073WRRO	Front label R-8R50(B)	1	AB

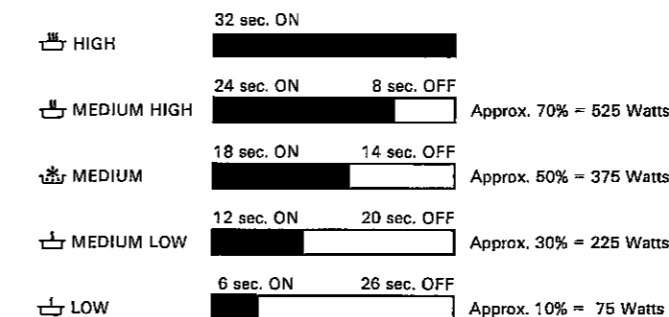
OVEN PARTS

4- 1	FSRAHA011WRY0	Turntable support	1	AU
4- 2	PSKR-A170WRP0	Air partition plate	1	AG
4- 3	FCOVQA001WRY0	Grill heater box	1	AW
4- 4	PFPF-A032WRE0	Thermal protection sheet (Grill)	1	AP
4- 5	PCUSGA249WRP0	Rubber cushion	1	AA
4- 6	PREFHA020WRE0	Grill reflector	1	AM
4- 7	FDUC-A128WRW0	Convection fan duct	1	BA
4- 8	LANGQA124WRW0	Convection motor mounting plate	1	AG
4- 9	NFANMA011WRP0	Convection fan	1	AD
4-10	NFANMA012WRP0	Auxiliary fan	1	AC
4-11	PCUSGA133WRP0	Convection duct cushion	1	AC
4-12	PFPF-A111WRE0	Thermal protection sheet (convection)	1	AW
4-13	PGISHA017WRE0	Convection heater insulator (A)	2	AF
4-14	PGISHA018WRE0	Convection heater insulator (B)	1	AE
4-15	PPIFPA006WRE0	Pipe	1	AD
4-16	PSKR-A145WRW0	Ventilation barrier plate	1	AG
4-17	PSLDHA052WRW0	Thermal cover (convection)	1	AQ
4-18	DOVN-A219WRY0	Oven cavity	1	BY
4-19	LANGQA170WRW0	Oven lamp mounting plate	1	AR
4-20	FCABDA013WRY0	Rear cabinet	1	AZ
4-21	FDUC-A145WRW0	Steam duct	1	AU
4-22	LANGTA183WRW0	Damper mounting plate	1	AF
4-23	MCAMPA025WRP0	Damper cam	1	AE
4-24	NSFTTA057WRE0	Damper shaft	1	AD
4-25	PCUSGA137WRP0	Damper cushion	1	AC
4-26	PFTA-A014WRW0	Damper plate	1	AH
4-27	LANGQA134WRW0	Turntable motor mounting plate	1	AK
4-28	LANGTA194WRW0	Shaft fixing plate	1	AH
4-29	LFLG-A001WRE0	Shaft supporting bracket	2	AG
4-30	NBALSA005WRE0	Ball (A)	1	AB
4-31	NGERHA033WRP0	Gaer (A)	1	AB
4-32	NGERHA034WRP0	Gear (B)	1	AB
4-33	NSFTTA032WRE0	Turntable shaft	1	AG
4-34	PCOVPA157WRE0	Waveguide cover	1	AD
4-35	PCUSGA237WRP0	Waveguide cushion	1	AB
4-36	PCUSUA107WRP0	Water proof cushion	1	AC
4-37	PFPF-A112WRE0	Thermal protection sheet (Upper)	1	AP
4-38	PFPF-A113WRE0	Thermal protection sheet (Left)	1	AW
4-39	PFPF-A114WRE0	Thermal protection sheet (Right)	1	AV
4-40	PGLSPA101WRE0	Oven lamp screen glass	1	AE
4-41	PSLDHA048WRW0	Thermal cover (Upper)	1	AT
4-42	PSLDHA049WRW0	Thermal cover (Left)	1	AP
4-43	PSLDHA050WRW0	Thermal cover (Bottom)	1	AQ
4-44	PSLDHA063WRW0	Thermal cover (Right)	1	AQ
4-45	MLEVPA113WRP0	Upper latch lever	1	AD
4-46	MLEVPA114WRP0	Lower latch lever	1	AF
4-47	PZETEA033WRP0	Switch sheet	1	AC

ROAST, SIMMER, DEFROST, WARM COOKING

When the microwave oven is preset for variable cooking power, 220 volts A.C. power is supplied to the power 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.

SETTING



NOTE: The ON/OFF time ratio does not exactly correspond to the percentage of microwave power, because approx. 2 seconds are needed for heating up the magnetron filament.

EASY DEFROST COOKING

(Refer to the chart in the cookbook.)

The EASY DEFROST key for automatic defrosting function in 5 defrosting stages. What should be done is enter the weight of food with the weight entry touch key $\frac{100}{\text{g}}$. Once the oven starts, it will cook according to the special cooking sequence.

CONVECTION COOKING CONDITION

PREHEATING CONDITION (Figure O-3)

Program desired convection temperature by touching the $\frac{100}{\text{g}}$ (CONVECTION MODE) key.

When the $\frac{100}{\text{g}}$ START key is touched, the following operations occur:

- The coil of shut-off relays RY1, RY7, RY8 and RY10 are energized, the oven lamp, cooling fan motor, turntable motor and convection motor are turned on.
- The coil of relay RY5 is energized by the control unit. The damper is moved to the closed position, opening the damper switch contacts. The opening of the damper switch contacts sends a signal to the LSI on the control unit de-energizing the relay RY5 and opening the circuit the damper motor.

- The coil of shut-off relay RY3 is energized by the control unit and the mains supply voltage is added to the convection heating element.
- When the oven temperature reaches the selected preheat temperature, the following operations occur:
 - The shut-off relay RY3 is de-energized by the control unit temperature circuit and thermistor, opening the circuit to the convection heating element.
 - The oven will continue to function for 15 minutes, turning the convection heating element on and off, as needed to maintain the selected preheat temperature. The oven will shut-down completely after 15 minutes.

CONVECTION COOKING CONDITION (Figure O-3)

When the preheat 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 and convection temperature by touching the $\frac{100}{\text{g}}$ (CONVECTION MODE) key. When the $\frac{100}{\text{g}}$ START key is touched, the following operation occur:

- The numbers of the digital readout start the count down to zero.
- The oven lamp, turntable motor, cooling fan motor and convection motor are energized.
- Relay RY3 is energized (if the cavity temperature is lower than the selected temperature) and the mains supply voltage is applied to the convection heating element to return to the selected cooking temperature.
- Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor and convection motor, are de-energized. At the end of the convection cycle, if the cavity air temperature is above 118 °C, the circuit to RY-7 will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor unit the temperature drops below 118 °C, at which time the relay will be de-energized, turning off the fan motor. Relay RY-6 will however, opens as soon as the convection cycle has ended, turning off the convection fan motor.
- At the end of the convection cook cycle, shut-off relay RY-5 is energized turning on the damper motor. The damper is returned to the open position, closing the damper switch contacts which send a signal to the control unit, de-energizing shut-off relay RY-5.

GRILL COOKING CONDITION (Figure O-4)

In this condition the food is cooked by grill heating element energy. And at the initial period (approximately 10 minutes) the convection heating element is also activated.

Program desired cooking time and grill mode by touching (TIME) keys and (GRILL MODE) key.

When the (START) key is touched, the following operations occur:

- The numbers of the digital readout start the count down to zero.
- The damper motor is turned on to close the damper.
- The oven lamp, turntable motor, cooling fan motor, and convection motor are energized.
- The relay (RY4) is energized.
- The relay (RY3) and (RY6) are energized, if the cavity temperature is lower than 230 °C. When the cavity temperature reaches 230 °C, RY3 and RY6 are de-energized.
- Now, the food is grilled by the grill heating element (and convection heating element).
- If the temperature of oven cavity becomes more than 250 °C, the grill heating element is stopped to be heated. The temperature becomes less than 250 °C, the grill heating element is heated again.

DUAL COOKING CONDITION

DUAL COOKING 1 (Figure O-5) (Microwave and Convection)

Program desired cooking time and DUAL 1 mode by touching the (TIME) keys and (DUAL COOK SELECTION) key.

When the (START) key is touched, the following operations occur:

- The numbers of the digital readout start the count down to zero.
- The damper motor is turned on to close the damper.
- The oven lamp, turntable motor, cooling fan motor, and convection motor are energized.
- Relay RY3 is energized (if the cavity temperature is lower than the selected temperature) and the mains supply voltage is supplied to the convection heating element.
- The relay RY2 is energized and the microwave energy is generated by the magnetron.
- Now, the food is cooked by the microwave and convection heating element energy simultaneously.

DUAL COOKING 2 (Figure O-6) (Microwave and Grill)

Program desired cooking time and DUAL 2 mode by touching the (TIME) keys and (DUAL COOK SELECTION) key, twice.

When the (START) key is touched, the following operations occur:

- The numbers of the digital readout start the count down to zero.
- The damper motor is turned on to close the damper.
- The oven lamp, turntable motor and fan motor motor are energized.
- Relay RY4 is energized and the mains supply voltage is supplied to the grill heating element.
- The relay RY2 is energized and the microwave energy is generated by the magnetron.
- Now, the food is cooked by the microwave and grill heating element energy simultaneously.

ROTISSERIE COOKING (Figure O-7)

When the (ROTISSERIE COOKING) key is touched before touching the (START) key, the following operations also occur:

- Relay RY8 is energized and mains supply voltage is supplied to the rotisserie motor.
- The turntable motor does not rotate in Rotisserie Cooking condition.

The Figure O-7 is the Oven Schematic in case that Dual2 cooking mode is programmed and Rotisserie cooking mode is programmed.

AUTO COOK PROGRAM

Keep on touching the (AUTO COOK) key until the desired cooking program appears in the display. Then using the (WEIGHT ENTRY) key, enter the weight (see the chart in the cookbook) and touch the (START) key. The cooking time, grill mode, dual mode, convection mode, microwave mode and rotisserie cooking mode are automatically computed and selected based on the programs.

Note: The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
CONTROL PANEL PARTS				
3- 1	CPWBFA253WRK0	Control unit	1	BX
3- 1A	QCNCMA078DRE0	4-pin connector (A)	1	AD
3- 1B	QCNCMA088DRE0	5-pin connector (B)	1	AC
3- 1C	QCNCMA129DRE0	4-pin connector (C)	1	AC
3- 1D	QCNCMA035DRE0	8-pin connector (E)	1	AD
3- 1E	QCNCWA030DRE0	12-pin connector (G)	1	AE
3- 1F	QCNCMA131DRE0	3-pin connector (K)	1	AC
3- 1G	RV-KXA023DRE0	Fluorescent display tube	1	AX
C1	RC-KZA064DRE0	Capacitor 0.1 μF 50V	1	AB
C2	RC-EZA192DRE0	Capacitor 1000 μF 35V	1	AD
C3	RC-EZA062DRE0	Capacitor 3.3 μF 50V	1	AB
C4	VCKYB11EX153N	Capacitor 0.015 μF 25V	1	AA
C5	VCEAB31CW476M	Capacitor 47 μF 16V	1	AA
C6, 20, C30, 60, C61, 70	VCKYD11CY103N	Capacitor 0.01 μF 16V	6	AA
C8	RC-KZA063DRE0	Capacitor 0.1 μF 25V	1	AA
C9	VCEAB31CW107M	Capacitor 100 μF 16V	1	AB
C10	VCEAB31EW226M	Capacitor 22 μF 25V	1	AA
C21	RC-KZA062DRE0	Capacitor 0.015 μF 50V	1	AA
C80	VCEAB31HW474M	Capacitor 0.47 μF 50V	1	AA
C81	VCEAB31HW335M	Capacitor 3.3 μF 50V	1	AA
CF1	RCRS-A012DRE0	Ceramic resonator (4.00MHZ)	1	AD
D1-5, D8, 9	VHD11ES1///-1	Diode (11ES1)	7	AB
D7, D55-58, D70, D80-91, D93-96,	VHD1SS270A/-1	Diode (1SS270A)	24	AA
D100, D101				
IC1	RH-IZA207DRE0	LSI	1	AW
Q1	VS2SB793///-4	Transistor 2SB793	1	AC
Q20, 40, Q61, Q85-88, Q101	RH-TZA046DRE0	Transistor DTA143ES	8	AB
Q30	RH-TZA063DRE0	Transistor 2SA933S	1	AB
Q60	VS2TC114ES/-3	Transistor DTC114ES	1	AB
Q80	VS2TA114YS/-3	Transistor DTA114YS	1	AB
Q81, 89, Q100	VS2TD143EA/-4	Transistor DTD143EA	3	AC
Q82-84	RH-TZA097DRE0	Transistor DTB143ES	3	AC
R1	VRD-B12HF391J	Resistor 390 Ω 1/2W	1	AA
R4	VRD-B12HF621J	Resistor 620 Ω 1/2W	1	AA
R7, 81, 87	VRD-B12EF6R2J	Resistor 6.2 Ω 1/4W	3	AA
R12	VRD-B12EF113J	Resistor 11k Ω 1/4W	1	AA
R13	VRD-B12EF163J	Resistor 16k Ω 1/4W	1	AA
R20, 31	VRD-B12EF153J	Resistor 15k Ω 1/4W	2	AA
R30, 60, R80, 201	VRD-B12EF102J	Resistor 1k Ω 1/4W	4	AA
R40, 90, R91, R93-96,	VRD-B12EF332J	Resistor 3.3k Ω 1/4W	11	AA
R100-103				
R61	VRD-B12EF472J	Resistor 4.7k Ω 1/4W	1	AA
R62	VRN-B12EK154F	Resistor 150k Ω(F) 1/4W	1	AA
R63	VRN-B12EK470F	Resistor 47 Ω(F) 1/4W	1	AA
R64	VRN-B12EK332F	Resistor 3.3k Ω(F) 1/4W	1	AA
R65, R202	VRD-B12EF273J	Resistor 27k Ω 1/4W	2	AA
R70	VRD-B12EF101J	Resistor 100 Ω 1/4W	1	AA
R71	VRD-B12EF512J	Resistor 5.1k Ω 1/4W	1	AA
R200	VRD-B12EF105J	Resistor 1M Ω 1/4W	1	AA
RY1, 5-8,	RRLY-A020DRE0	Relay (OJ-SH-112LM)	6	AH

PARTS LIST

Note: The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
ELECTRIC PARTS				
	<i>off</i>			
*C	RC-QZA101WRE0	High voltage capacitor	1	AX
*MG	RV-MZA096WRE0	Magnetron	1	BP
*T	RTRN-A231WRE0	Power transformer	1	BU
CH	RHET-A025WRE0	Convection heating element	1	AW
GH	FHET-A005WRK0	Grill heating element	1	AW
CFM	RMOTEA147WRE0	Convection fan motor	1	AW
FM	RMOTEA148WRE0	Fan motor	1	AW
DM	RMOTDA043WRE0	Damper motor	1	AQ
RM	RMOTDA111WRE0	Rotisserie motor	1	AX
TTM	RMOTDA103WRE0	Turntable motor	1	AX
SW1	QSW-MA047WRE0	Upper latch switch (V-5230R)	1	AF
SW2	QSW-MA047WRE0	Latch switch (V-5230R)	1	AF
SW3	QSW-MA048WRE0	Monitor switch (V-5220R)	1	AG
SW4	QSW-MA047WRE0	Lower latch switch (V-5230R)	1	AF
SW5	QSW-MA047WRE0	Stop switch (V-5230R)	1	AF
SW6	QSW-MA038WRE0	Damper switch	1	AG
F1	QFS-CA007WRE0	Fuse F6.3A	1	AD
WP1	QFS-CA017WRE0	Weak point A017	1	AF
WP2	QFS-CA018WRE0	Weak point A018	1	AD
TF1	QFS-TA004WRE0	Magnetron temp. fuse 145 °C	1	AG
TF2	QFS-TA004WRE0	Grill temp. fuse 145 °C	1	AG
TC	RTHM-A014WRE0	Thermal cut-out 104 °C	1	AK
R1	RR-WZA010WRE0	Monitor resistor 0.8 Ω 20W	1	AC
R2	RR-WZA009WRE0	Surge resistor 10 Ω/20W	1	AG
RY-M	RRLY-A015WRE0	Mains relay	1	AQ
OL	RLMPTA028WRE0	Oven lamp	1	AM
1- 1	QSOCLA011WRE0	Oven lamp socket	1	AH
1- 2	FH-HZA007WRE0	Thermistor	1	AH
1- 3	QFSHDA002WRE0	Fuse holder	1	AE
1- 4	FPWBFA197WRE0	Noise filter	1	AZ
1- 5	QTANNA001WRE0	Cord connector	1	AF
1- 6	QACCVA009WRE0	Power supply cord	1	AX
*1- 7	FH-DZA020WRK0	High voltage rectifier assembly	1	AZ

CABINET PARTS

2- 1	GDAI-A112WRW0	Bottom plate	1	AW
2- 2	FANGQA073WRY0	Noise filter angle	1	AM
2- 3	GLEGPA019WRE0	Foot	4	AD
2- 4	LANGQA167WRM0	Earth angle	1	AC
2- 5	FANGTA133WRY0	Unit chassis	1	AV
2- 6	LSTPPA066WRF0	Cord anchorage (Upper)	1	AD
2- 7	LSTPPA067WRF0	Cord anchorage (Lower)	1	AD
2- 8	FFTASA022WRK0	Oven lamp access cover ,complete R-8R50(B)	1	AL
	FFTASA023WRK0	Oven lamp access cover ,complete R-8R50(W)	1	AD
2- 8-1	GFTASA022WRP0	Oven lamp access cover R-8R50(B)	1	AG
	GFTASA023WRP0	Oven lamp access cover R-8R50(W)	1	AG
2- 8-2	PCUSGA077WRP0	Cushion	1	AC
2- 8-3	PSLDPA005WRP0	Lamp reflector	1	AD
2- 9	GCABUA196WRP0	Outer case cabinet R-8R50(B)	1	BH
	GCABUA197WRP0	Outer case cabinet R-8R50(W)	1	BD
2-10	GCOVHA153WRW0	Turntable motor cover	1	AD
2-11	LANGKA308WRW0	Steam cover	1	AG
2-12	PCAPHA006WRE0	Cabinet cap brown R-8R50(B)	2	AC
	PCAPHA007WRE0	Cabinet cap white R-8R50(W)	2	AC
2-13	PCUSGA236WRP0	Trans. cushion	2	AC
2-15	MHNG-A146WRM0	Lower oven hinge R-8R50(B)	1	AG
	MHNG-A164WRM0	Lower oven hinge R-8R50(W)	1	AH
2-16	LANGQA131WRW0	Relay angle	1	AG

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door can be opened by pushing the open button on the control panel. When the open button is pushed, the open lever pushes lower latch lever. The lower latch lever pushes lower latch head on the door upward. The upper latch head is linked with the lower latch lead, so now, the door can be opened.

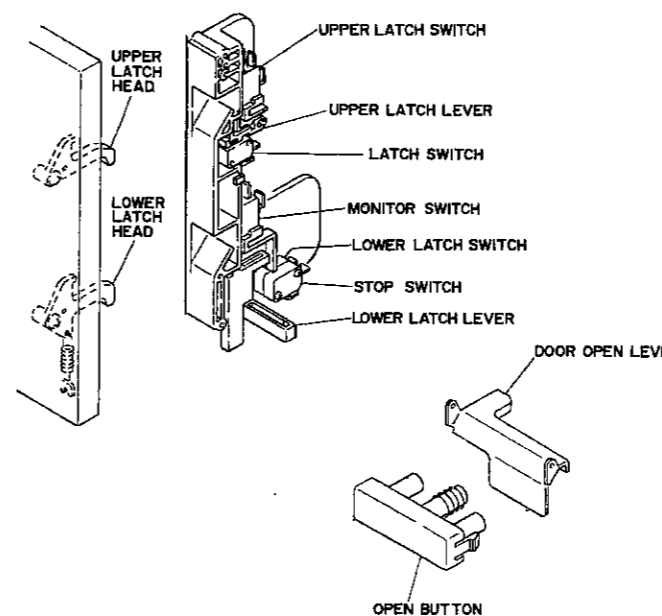


Figure D-1. Door Open Mechanism

LOWER LATCH SWITCH SW4 AND LATCH SWITCH SW2

- When the oven door is closed, the contacts COM-NO must be closed.
- When the oven door is opened, the contacts COM-NO must be opened.

UPPER LATCH SWITCH SW1

- When the oven door is closed, the contacts COM-NO must be closed.
- When the oven door is opened, the contacts COM-NO must be opened.

STOP SWITCH

- This switch must make a contact when the door is closed, and open it when the door is opened.

MONITOR SWITCH SW5

The monitor switch is activated (the contacts opened) by the lower 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(F6.3A) F1 when the contacts of the lower latch switch SW4 fail to open when the door is opened.

Function

- When the door is opened, the monitor switch SW3 contacts close (to the ON condition) due to their being normally closed. At this time the lower latch switch SW4 is in the OFF condition (contacts open) due to their being normally open contact switches.

- As the door goes to a closed position, the monitor switch contacts are first opened and upper latch switch contacts are closed and then the lower latch switch, latch switch and stop switch contacts close. (On opening the door, each of these switches operate inversely.)
- If the door is opened and the lower latch switch contacts fail to open, the fuse F1 (F6.3A) blows simultaneously with closing of the monitor switch contacts.

CAUTION: BEFORE REPLACING A BLOWN FUSE F1 F6.3A TEST THE LOWER LATCH SWITCH, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

MONITOR RESISTOR

The monitor resistor prevents the fuse M8A 250V bursting when the fuse F1 F6.3A 250V blows due to the operation of the monitor switch.

NOISE FILTER

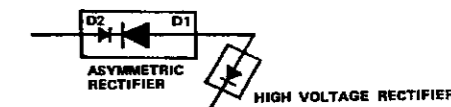
The noise filter assembly prevents radio frequency interference that might flow back in the power circuit.

WEAK POINT WP1 A017

If the wire harness or electrical components are shortcircuited, this weak point WP1 A017 blows to prevent an electric shock or fire hazard.

ASYMMETRIC RECTIFIER

The asymmetric rectifier is solid state device that prevents current flow in both directions. And it prevents the temperature rise of the power transformer by blowing the fuse F1 F6.3A 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 1.5 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 fuse F1 F6.3A.)

- The high voltage rectifier is shorted by any causes when microwave cooking or dual cooking.
- The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.5 KV in the voltage doubler circuit.
- D2 of the rectifier is shorted.
- The large electric currents flow through the high voltage winding of the power transformer.
- The large electric currents beyond F6.3A flow through the primary winding of the power transformer.
- The fuse F1 F6.3A blows by the large electric currents.
- The oven stops its operation.

WEAK POINT WP2 A018

1. If the wire harness or electrical components are short-circuited, this weak point **WP2 A018** blows to prevent an electric shock or fire hazard.
2. The weak point also blows when the asymmetric rectifier, H.V. rectifier, H.V. wire harness, H.V. capacitor, magnetron or secondary winding of power transformer is shorted.

FUSE F1 F6.3A 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 lower latch switch **SW4** remains closed with the oven door open and when the monitor switch **SW3** closes.

TEMPERATURE FUSE TF1 145 °C

This fuse protects the magnetron against overheat. If the temperature goes up higher than 145 °C because the fan motor is interrupted, the air inlet duct is blocked or the ventilation openings are obstructed, the fuse blows and puts the oven out of operation. The defective fuse must be replaced with new rated one.

TEMPERATURE FUSE TF2 145 °C

This fuse protects the oven against overheat. If the temperature goes up higher than 145 °C because the fan motor is interrupted or the ventilation openings are obstructed, the fuse blows and interrupts the circuits to the grill heating element, convection heating element, convection fan motor, rotisserie motor, turntable motor and power transformer. The defective fuse must be replaced with new rated one.

THERMAL CUT-OUT TC 104 °C

The thermal cut out protects the oven against overheat during grill cooking, convection cooking or dual (combination) cooking. If the temperature rises above 104 °C because the fan motor is interrupted, the air inlet duct is blocked or the ventilation openings are obstructed, the thermal cut-out opens and switches off the electric components which are connected by the activated relays. When the oven cools itself down to the operating temperature of 84 °C. The contacts of the thermal cut-out will close again and the electrical components which are connected by the activated relays will be in function again.

THERMISTOR

The thermistor is a negative temperature coefficient type. The temperature in the oven cavity is detected through the resistance of the thermistor, and then the control unit causes the heater relay to operate, thus the current to the heating element is turned ON/OFF.

SURGE RELAY RY9 AND SURGE RESISTOR R2 10 Ω/20W

When the **START** key is touched the contacts of the surge relay **RY9** close and the surge current flows through the surge resistor **R2** for 200 msec. After about 8 sec. since the **START** key is touched

the relay **RY2** closes and supplies the power transformer with 220V. After 200 msec. The surge relay **RY9** opens its contacts and gets out of function. The surge resistor **R2** lets the current (peak current) flow when the oven is switched on. If surge resistor is defective, the home fuse or the fuse **F1**, Weak point **WP1** or **WP2** may break down when the oven is switched on (Microwave mode/ Dual mode).

CAUTION; THE SURGE RELAY **RY9** CLOSES FOR ONLY 200 MSEC. JUST WHEN THE OVEN GETS RESTARTED, BUT OPENS AGAIN. WITHIN THIS 200 MSEC., THE RELAY **RY-2** MUST CLOSE:

MAINS RELAY RY-M

1. When once the **START** key is touched, the contacts of the mains relay **RY-M** are kept closed. through the surge resistor **R2** for 200 msec.
2. If the **(MAIN POWER OFF)** key is touched, the contacts of the mains relay **RY-M** are opened, and all electrical components except the control unit and noise filter turned off.

1. When the **START** key is touched again, the contacts of the mains relay **RY-M** are closed again.

CAUTION; THE **(MAIN POWER OFF)** KEY SHOULD BE USED ONLY IN CASE OF AN EMERGENCY TO SHUT OFF THE POWER TO THE OVEN.

If the **(MAIN POWER OFF)** KEY IS USED IN CASE OF NORMALY OPERATION, THE CONVECTION FAN, CONVECTION FAN DUCT, CONVECTION FAN MOTOR OR ANY OTHER PARTS MAY BE DAMAGED.

TURNTABLE MOTOR

The turntable motor drives the turntable supporting plate to rotate the turntable.

CONVECTION MOTOR

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

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 channeled through the oven cavity to remove steam and vapors given off from the heating foods. It is then exhausted through the exhausting air vents at the oven cavity.

GRILL HEATING ELEMENT

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

CONVECTION HEATING ELEMENT

The convection heating element is located at the rear of the oven cavity. It is intended to heat air driven by the convection fan. The heated air is kept in the oven and force-circulated and reheated by the convection heating element.

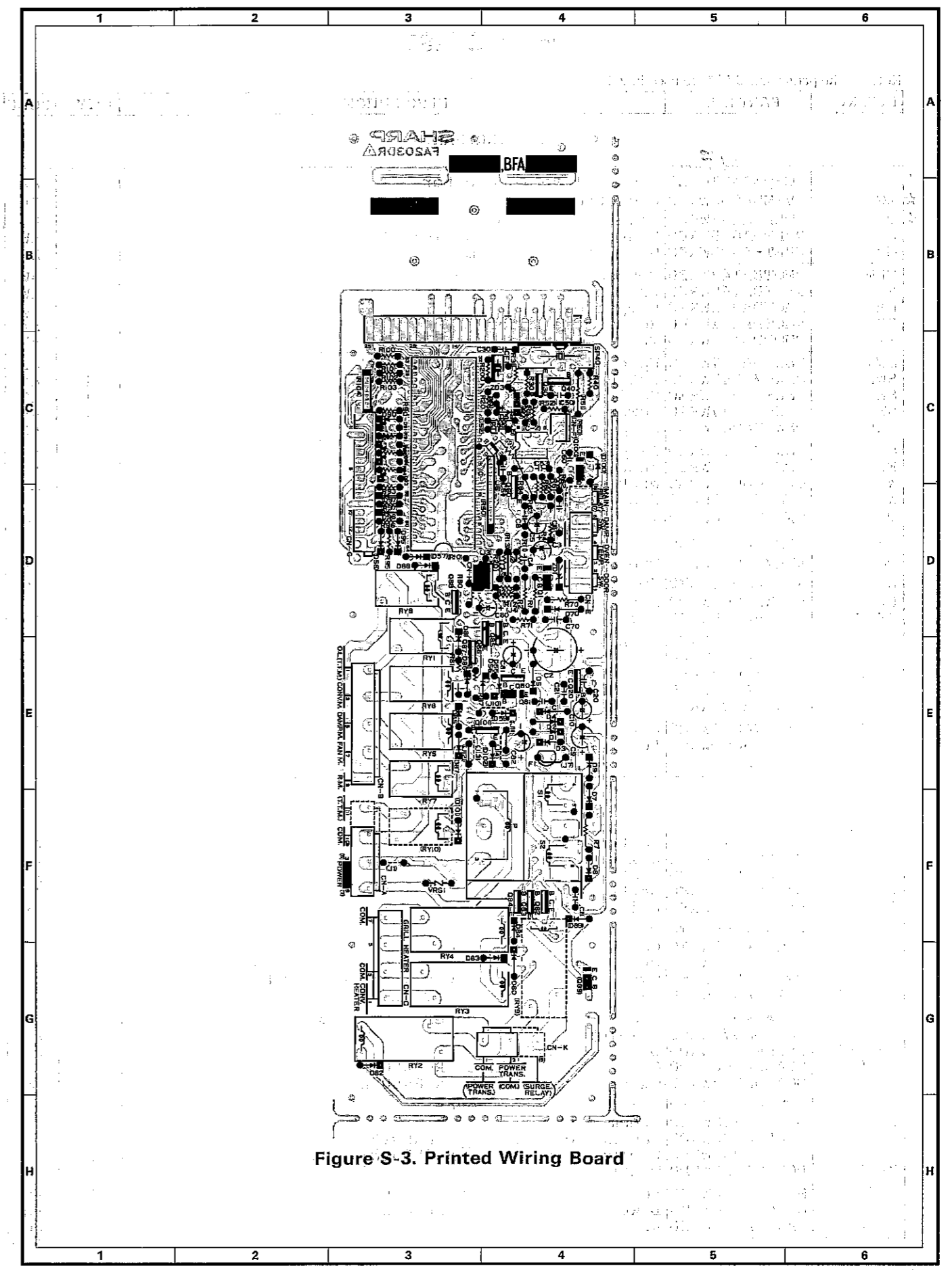


Figure S-3. Printed Wiring Board

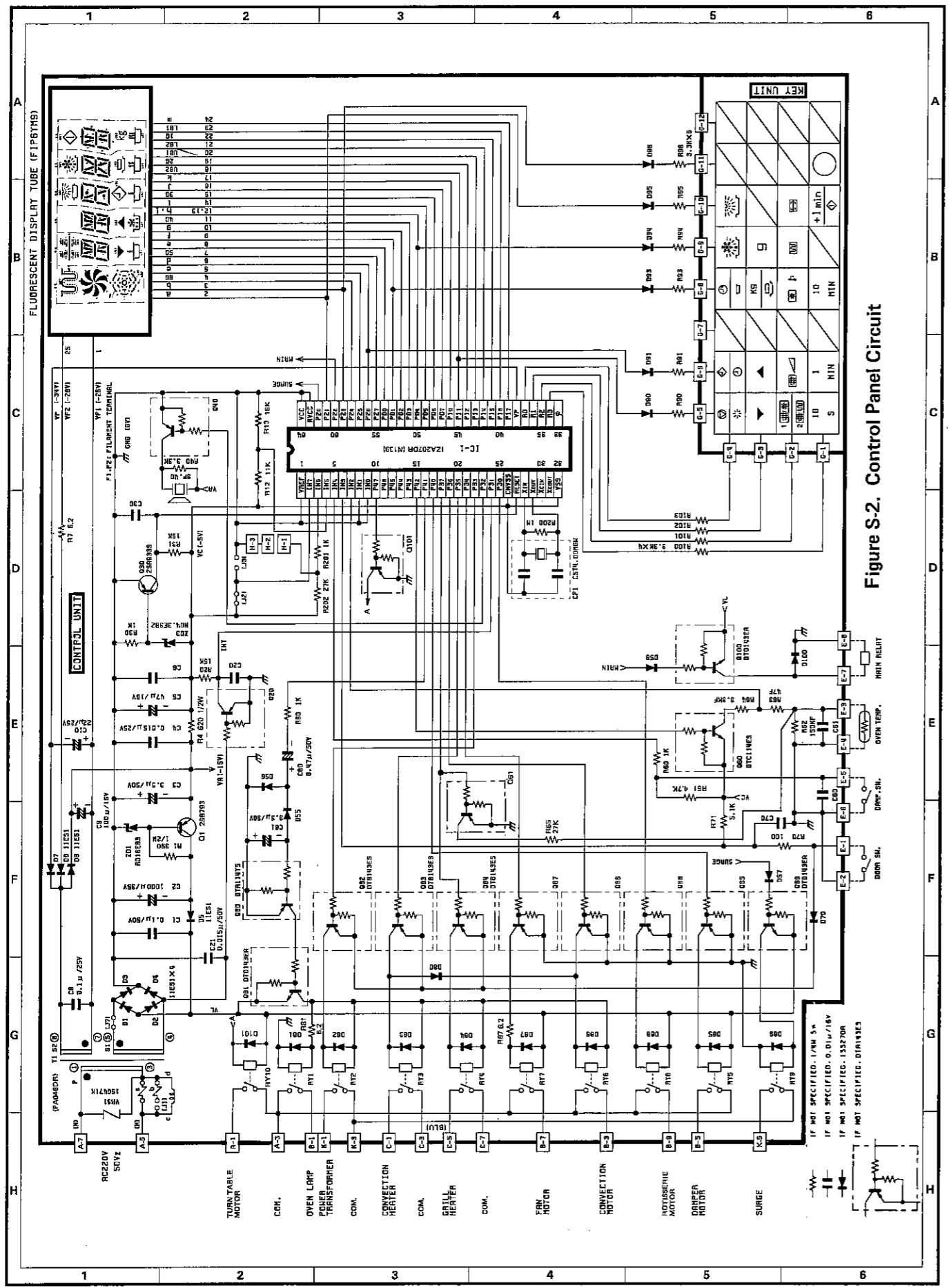


Figure S-2. Control Panel Circuit

CONVECTION COOKING SYSTEM

This oven is designed with a hot air heating system where food is not directly heated up by the convection heating element, but is instead heated by forced circulation of the hot air produced by the convection heating element.

The air heated by the convection heating element is circulated through the convection passage provided on the outer casing of the oven cavity by 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 side 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.

Without leaving the oven, this hot air is reheated by the convection heating element, passes through the convection passage and enters the inside of the oven cavity again, in a continuing cycle.

In this way, the hot air circulates inside the oven cavity to raise its temperature and, at the same time, comes into contact with the food being cooked.

When the temperature inside the oven cavity reaches the selected temperature, the convection heating element is de-energized. When the temperature inside the oven cavity drops below the selected temperature, the convection heating element is energized again. In this way, the inside of the oven cavity is maintained at approximately the selected temperature.

When the convection time reaches "0", the convection heating element is deenergized and the convection fan stops operating and the oven shuts off.

At the high temperature (more than 118 °C), the fan motor remains rotating. Automatically the fan motor will be shut down at low temperature (less than 118 °C).

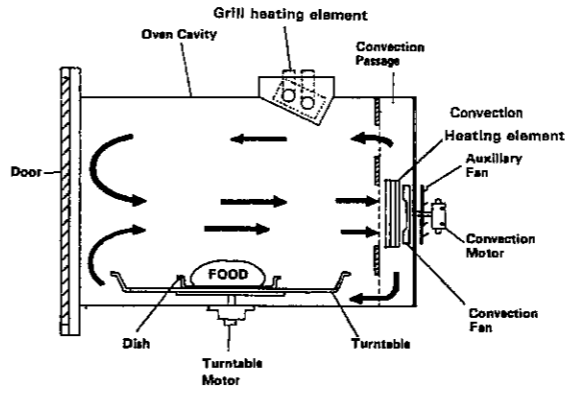


Figure D-2 Convection Cooking System

DAMPER OPEN-CLOSE MECHANISM

Usually, the damper is in the open position except during convection cooking, grill cooking, dual cooking. Damper position is set automatically by damper motor, damper switch, motor cam and damper shaft.

These components are operated by a signal that judges if microwave cooking, convection cooking, grill cooking or dual cooking operation is selected by the control unit.

Microwave Cooking:



Damper is in the open position, because a portion of cooling air is channeled through the cavity to remove steam and vapors given off from the heating foods.

It is then exhausted at the top of the oven cavity into a condensation compartment.

Convection Cooking:

Damper is in the closed position, so that no hot air will be allowed to leak out the oven cavity.

Damper Operation

1. When power supply cord is plugged in:
 - 1-1. When power supply cord is plugged in and any cooking programs are started, a signal is sensed in the control unit, and operates shut-off relay (RY5).
 - 1-2. Contacts of shut-off relay (RY5) close, the damper motor is energized, opening the damper door.
 - 1-3. When the damper is moved to the open position by the damper cam, damper switch is closed (ON position).
 - 1-4. The signal of damper switch is re-sensed in the control unit and shut-off relay (RY5) is turned off.
 - 1-5. The 220 volts A.C. to the damper motor is stopped and the motor turns off.
2. When oven is microwave cooking: Damper is in the open position.
3. When oven is convection cooking:
 - 3-1. Damper motor is energized by touching the  (CONVECTION MODE) key and  (MINUTE PLUS/START) key.
 - 3-2. When damper is in the closed position (damper switch is OFF), its signal is sensed by the control unit, and shut-off relay (RY5) is de-energized.
 - 3-3. The damper is held in the closed position during the convection cooking operation.
 - 3-4. At the end of the convection cooking, shut-off relay (RY5) is energized, and the damper is returned to the open position.

NOTE: If the damper is not in the proper position, closed during convection, grill and dual cooking or opened during microwave, the control unit will stop oven operation after 1 minute.

ROTISSERIE COOKING SYSTEM

All the surfaces of the food will be able to be cooked without turning over by rotating the food which the skewer is inserted into.

ROTISSERIE MOTOR

The rotisserie motor is located on the on the right side wall of the oven cavity
The skewer is rotated by the rotisserie motor assembly.

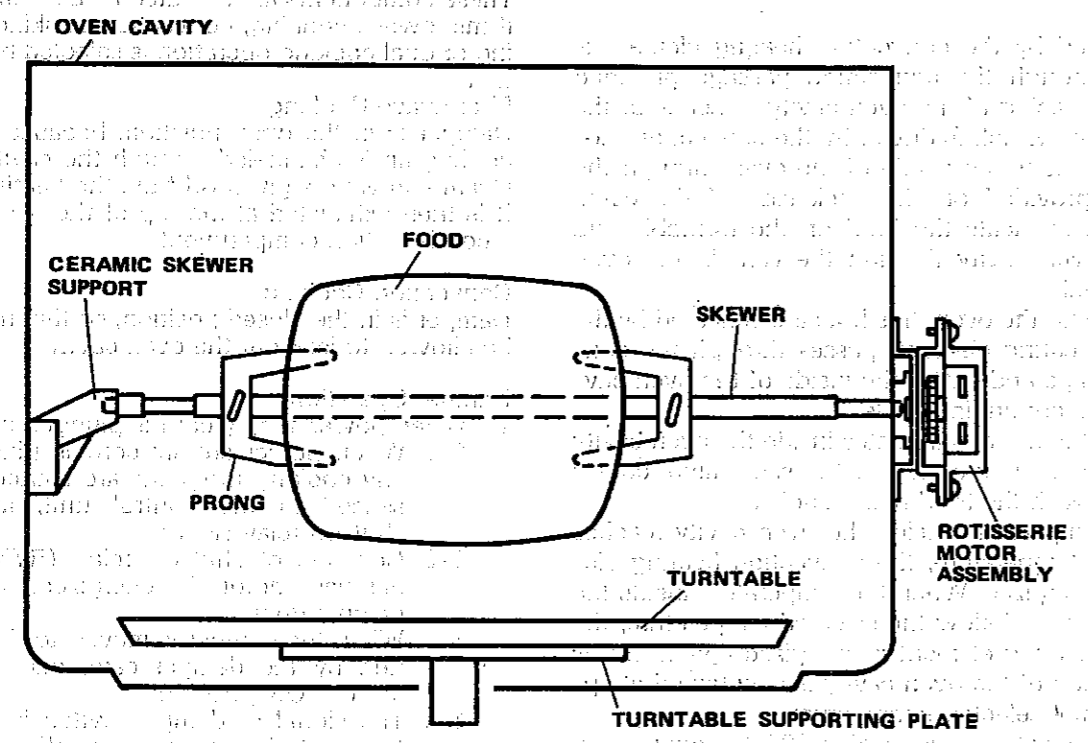


Figure D-3. Rotisserie Mechanism

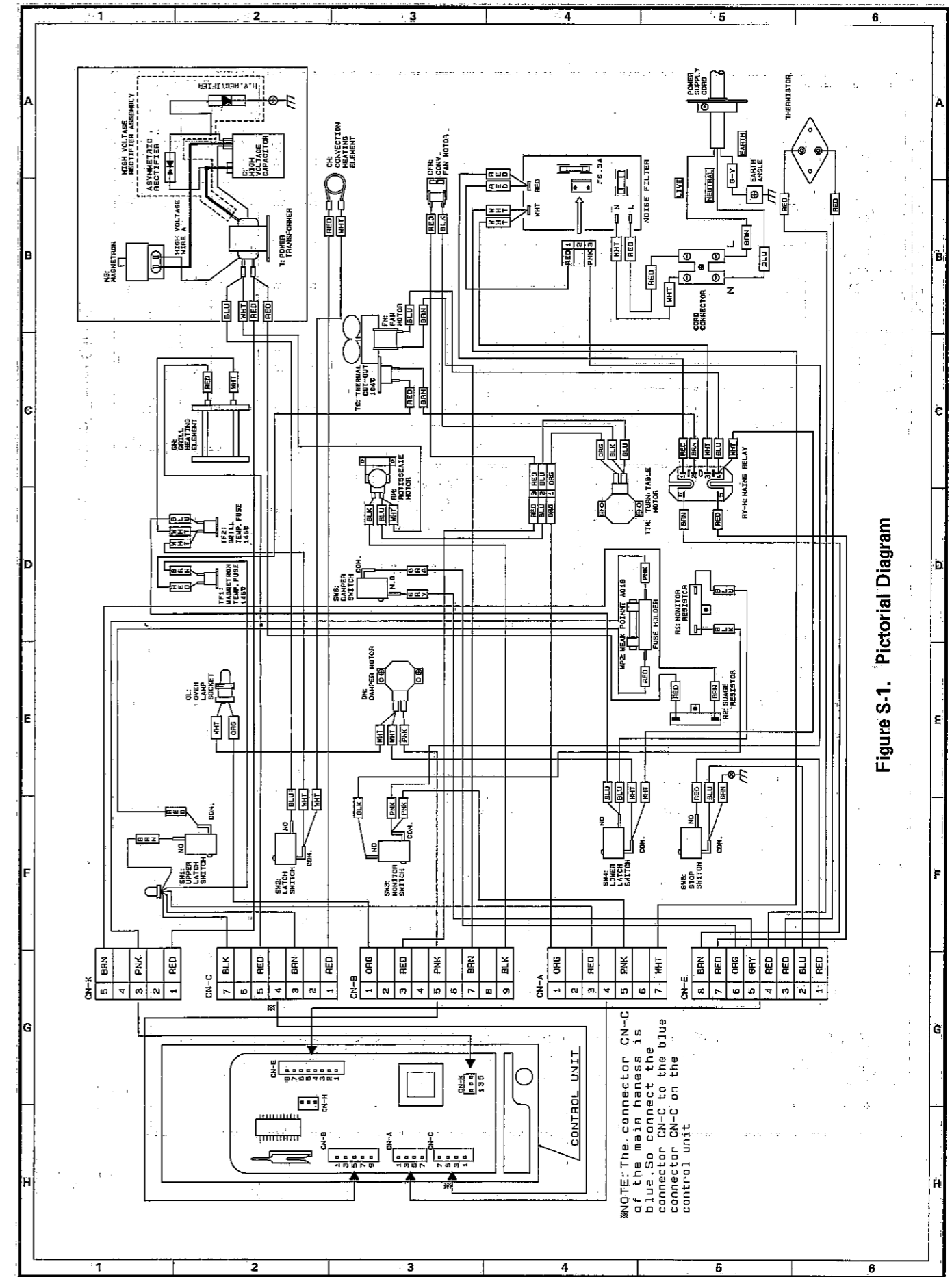


Figure S-1. Pictorial Diagram

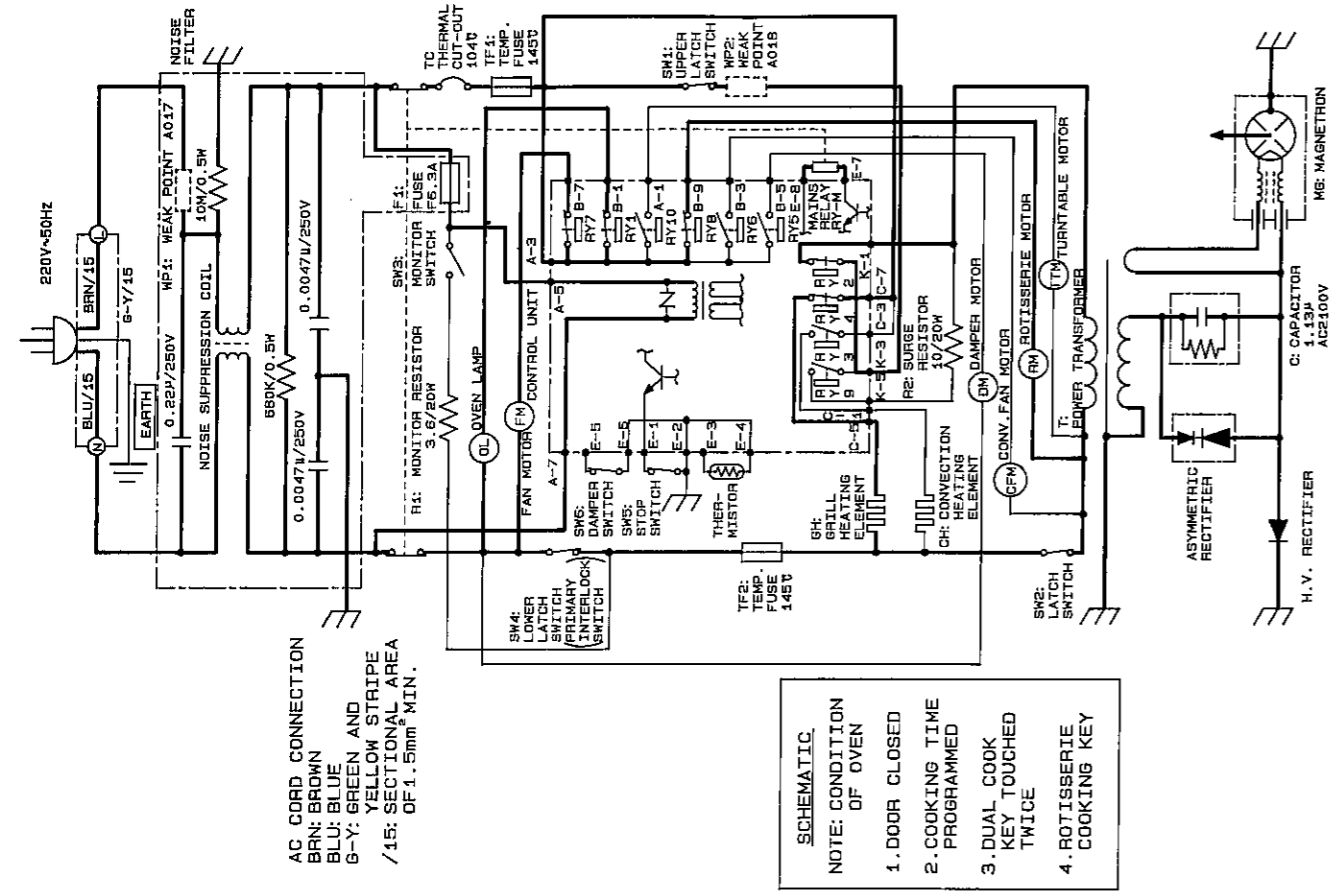


Figure O-7. Oven Schematic - Rotisserie Cooking on Dual 2 Cooking

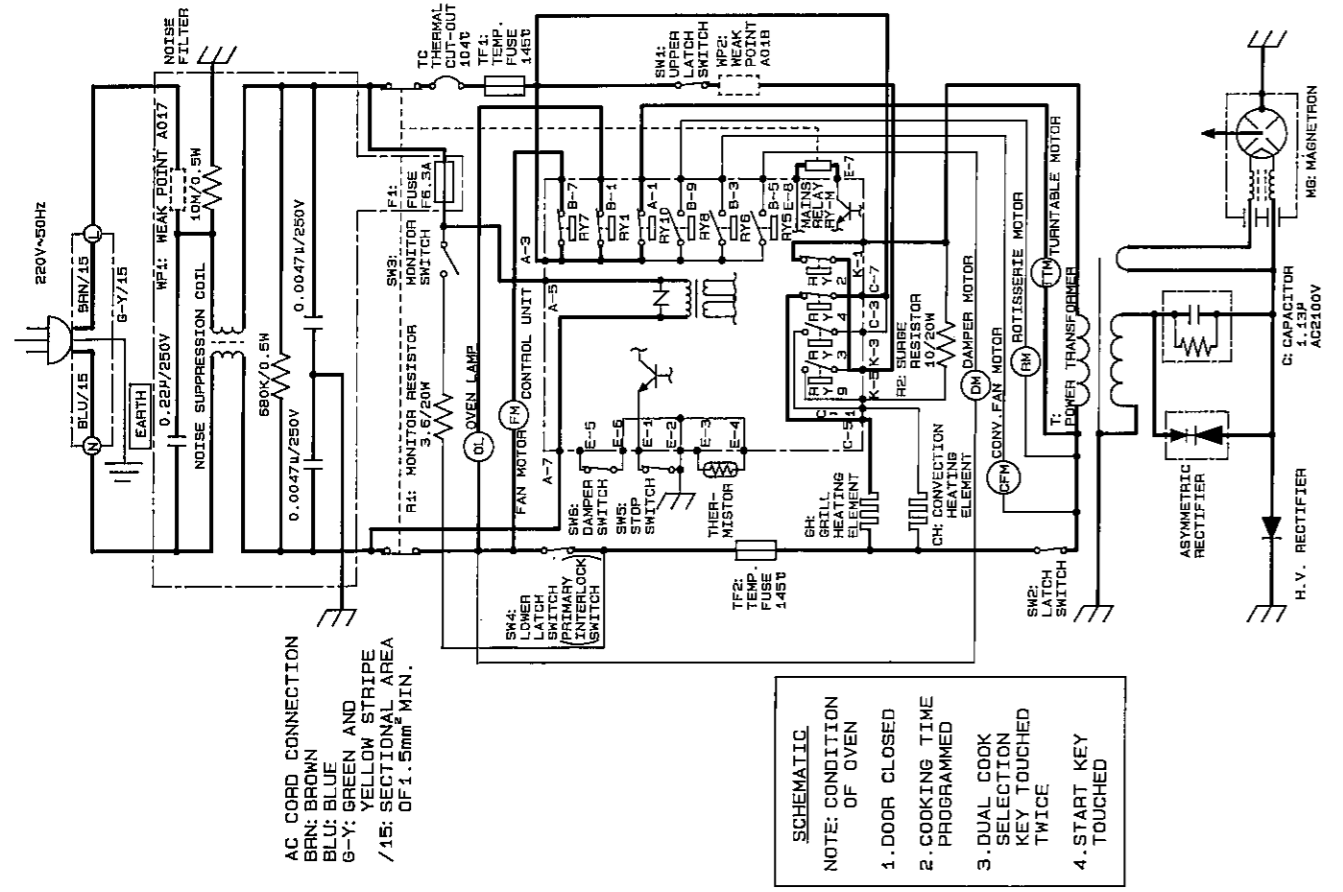


Figure O-6. Oven Schematic - Dual 2 Cooking (Microwave and Grill) Condition

SERVICING

WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with any part of the high voltage circuit will result in electrocution.

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 power 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 power transformer.

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

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 microwave timer for two (2) minutes. Set the power level to HIGH and push the START button. 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.

TROUBLESHOOTING GUIDE

When troubleshooting the microwave oven, it is helpful to follow the Sequence of Operation in performing the checks. Many of the possible causes of trouble will require that a specific test be performed. These tests are given a procedure letter which will be found in the "Test Procedure" section.

IMPORTANT: If the oven becomes inoperative because of a blown fuse F1 (F6.3A) in the lower latch switch - monitor switch - monitor resistor circuit, check the lower latch switch, monitor switch and monitor resistor before replacing the fuse F1 (F6.3A).

Z011-DZ0C		TEST PROCEDURE		POSSIBLE CAUSE AND DEFECTIVE PARTS													
ON CONDITION (COMMON MODE)	PROBLEM	A	B	C	D	E	E	E	F	G	G	G	H	H			
		MAGNETRON	POWER TRANSFORMER	H.V. RECTIFIER ASYMMETRIC RECTIFIER ASSEMBLY	H.V. HARNESS	HIGH VOLTAGE CAPACITOR	UPPER LATCH SWITCH	LOWER LATCH SWITCH	STOP SWITCH	DAMPER SWITCH	MONITOR SWITCH	MONITOR RESISTOR	GRILL TEMP. FUSE 145°C TF2	MAGNETRON TEMP. FUSE 145°C TF1	THERMAL CUT-OUT 104°C	FAN MOTOR	TURNTABLE MOTOR
ON CONDITION (COMMON MODE)	Display operates properly but all electrical parts do not operate.																
	Home fuse blows when the (START) key is touched.																
	Oven stops after about 1 minute since (START) key is touched.																
	Oven goes into cook cycle but shuts down before end of cooking cycle.																
MICROWAVE COOKING CONDITION	After cooking, the temperature of oven cavity is higher than 118°C but the fan motor does not operate.																
	Oven seems to be operating but little or no heat is produced in oven load. (Microwave power level is set at HIGH.)																
	Oven does not seem to be operating properly when MEDIUM HIGH, MEDIUM, MEDIUM LOW or LOW is set. (Oven operates properly at HIGH.)																
CONVECTION COOKING CONDITION	Oven goes into cook cycle but shuts down before end of cycle.																
	Convection heating element does not operate.																
GRILL COOKING CONDITION	Oven seems to be operating but temperature in the oven cavity is lower or higher than preset one.																
	Grill heating element does not operate.																
DUAL 1, 2 COOKING CONDITION	Though the temperature of the oven cavity is higher than 230°C convection heating element does not stop to heat. Or though the temperature of oven cavity is lower than 230°C convection heating element does not stop to heat.																
	Oven goes into cooking cycle but shuts down before end of cooking cycle.																
DUAL 1 COOKING CONDITION	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 of the oven cavity is lower or higher than preset one.																
DUAL 2 COOKING CONDITION	Convection heating element does not operate.																
	Grill heating element does not operate.																

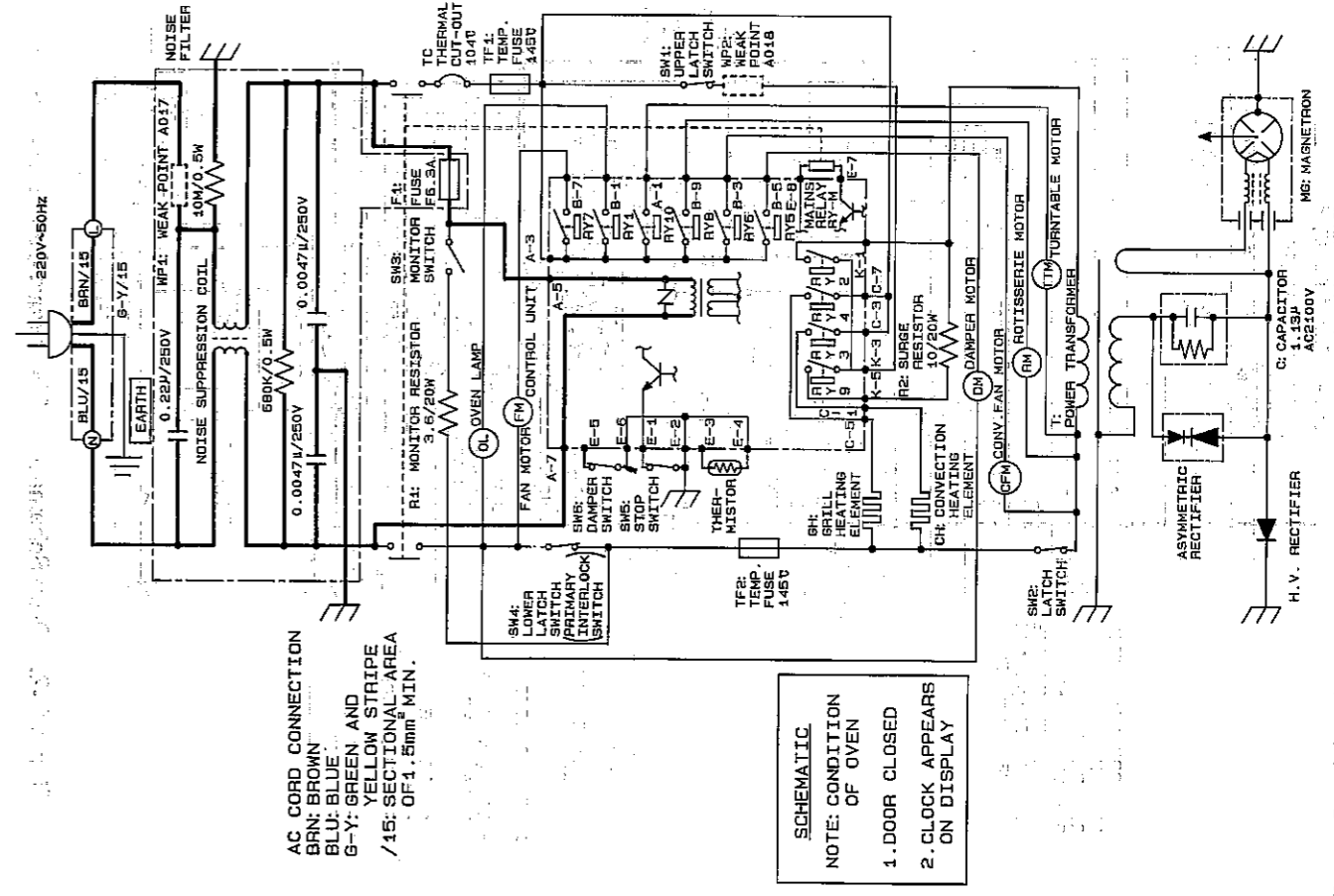


Figure O-1 (a). Oven Schematic - Off Condition after plugged (The mains relay is also in Off condition.)

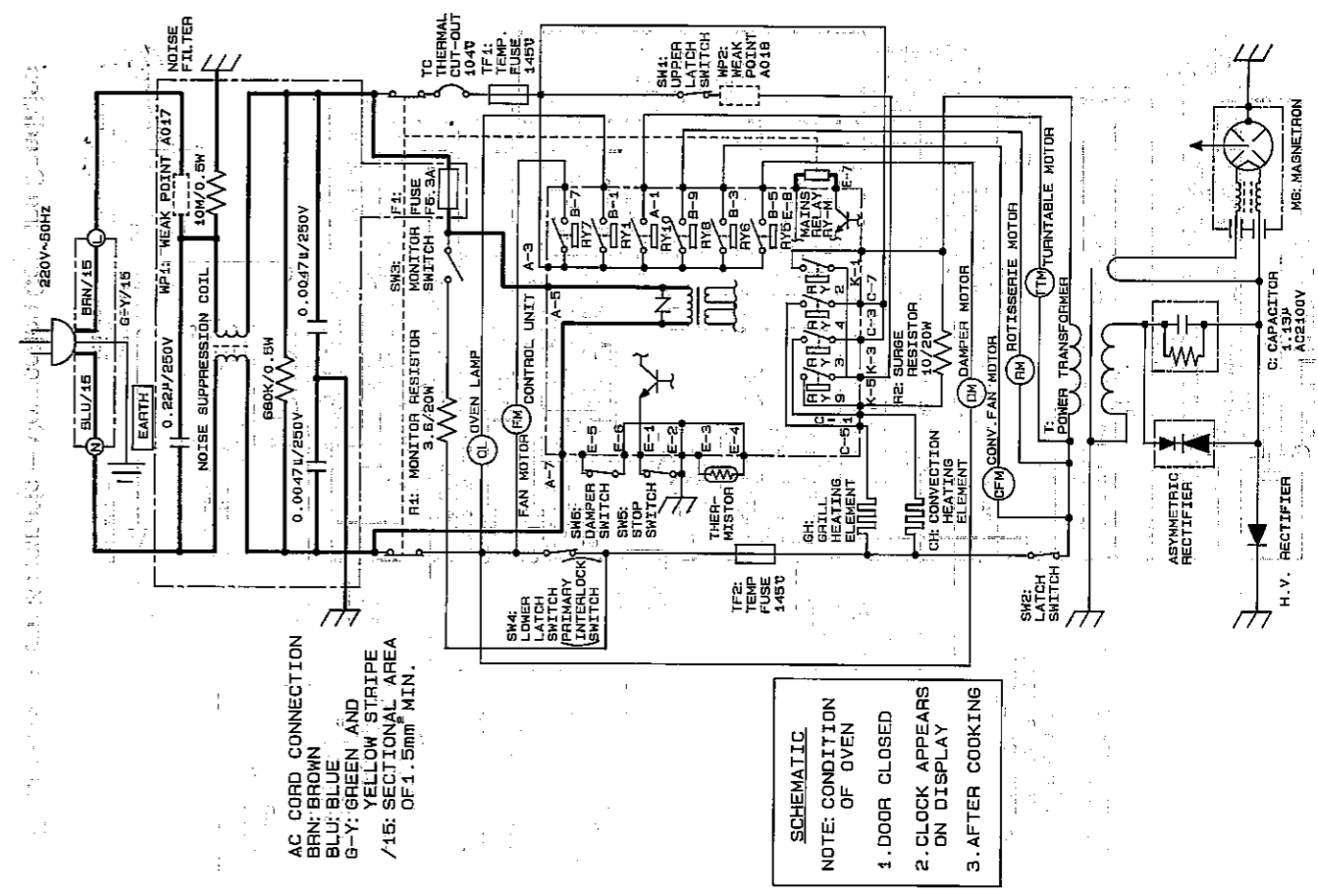


Figure O-1 (b). Oven Schematic - Off Condition after cooking (The mains relay is in ON condition.)

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 3 CHECKS

Isolate the magnetron from the high voltage circuit by removing all leads connected to the 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 a short circuit 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 following test procedure should be carried out with the microwave oven in a fully assembled condition (outer case fitted).

Microwave output power from the magnetron can be measured by way of substitution, i.e. it can be measured by using water load how much it can be absorbed by the water load. To measure the microwave output power in the microwave oven, the relation of calorie and watt is used.

When P(W) heating works for t(second), approximately $P \times t / 4.2$ calorie is generated. On the other hand, if the temperature of the water with V(ml) rises ΔT (°C) during this microwave heating period, the calorie of the water is $V \times \Delta T$.

The formular is as follows;

$$P \times t / 4.2 = V \times \Delta T$$

$$P (W) = 4.2 \times V \times \Delta T / t$$

Our condition for the water load is as follows:

Room temperature ... around 20 °C, Power supply Voltage ... 220 volts.
Water load ... 2000 ml, Initial temperature ... 10 ± 1 °C, Heating time ... 1min. 52sec
 $P = 75 \times \Delta T$

Measuring method:

- The two water containers must be prepared.
The water container must be one (1) litre beaker made of Pyrex® glass and its diameter approximately 12cm.
- Put the one (1) litre water into each beaker (Each beaker has one litre water). The initial temperature of the water should be 10 ± 1 °C.
- Mark T1 on the one beaker and mark T2 on the other one. And stir the water and measure the temperature of water the thermometer and note them. The graduation of the thermometer must be scaled by 0.1 °C at minimum and an accurate mercury thermometer is recommended.

Example: The initial temperature T1 = 10 °C, T2 = 11 °C

- Place the two (2) beakers at right and left, side by side, on the center of the oven cavity.
- Set the timer to three (3) minutes and start the oven at HIGH.
- The time must be measured with stopwatch or wristwatch.
- After 1 minute and 52 seconds, stop the oven by opening the door.
- Put the two (2) beakers out of the oven cavity and measure the temperature of the water by stirring the water with thermometer and note them.

TEST DATA TABLE

Parts	Symbol	Value / Data
Fuse	F1	F6.3A
Weak point A017	WP1	Approx. 20A
Weak point A018	WP2	Approx. 10A
Surge resistor	R2	10 Ω 20W
Monitor resistor	R1	3.6 Ω 20W
Temp. fuse	TF1	145 °C
Temp. fuse	TF2	145 °C
Thermal cut-out	TC	104 °C
Mains relay	RY-M	Approx. 75 Ω
Grill heating element	GH	Approx. 48 Ω Insulation resistance > 10M Ω
Convection heating element	CH	Approx. 30 Ω Insulation resistance > 10M Ω
Oven lamp	OL	230V 20W E14
High voltage capacitor	C	1.13 μF AC 2100V
Thermistor		Approx. 326 k Ω -- 175 k Ω At 20 °C -- 30 °C
Magnetron	MG	Filament < 1 Ω Filament - chassis ∞ ohm.
Power transformer	T	Filament winding < 1 Ω Secondary winding Approx. 58.8 Ω Primary winding Approx. 0.89 Ω

TEST POINTS ON CONTROL UNIT (on "ON" CONDITION)

In/Out put terminal	Test point	Volt	Resistance (Disconnect the power plug)
Input terminal (power supply)	A5 - A7	220V	Approx. 683 Ω
Input terminal (stop switch)	E1 - E2		0
Input terminal (Thermistor)	E3 - E4	DC. 5V	Approx. 91k Ω at 20 °C -- 30 °C
Input terminal (Damper switch)	E5 - E6		0
Output terminal (Grill heating element)	A7 - C5	220V	∞
Output terminal (Convection heating element)	A7 - C1	220V	∞
Output terminal (Oven lamp)	A7 - B1	220V	∞
Output terminal (Fan motor)	A7 - B7	220V	∞
Output terminal (Turntable motor)	A7 - A1	220V	∞
Output terminal (Damper motor)	A7 - B5	220V	∞
Output terminal (Rotisserie motor)	A7 - B9	220V	∞
Output terminal (Convection fan motor)	A7 - B3	220V	∞
Output terminal (Power transformer)	A7 - K1	220V	∞
Output terminal (Mains relay)	E7 - E8	DC. 12V	Approx. 75 Ω
Output terminal (Earth)	E2 - Chassis		0

CHOKE COVER REMOVAL

1. Insert an iron plate(thickness of about 0.5mm) or flat type screw driver to the gap between the choke cover and door panel as shown figure to free the engagind part.
2. Lift up the choke cover, now cover is free.

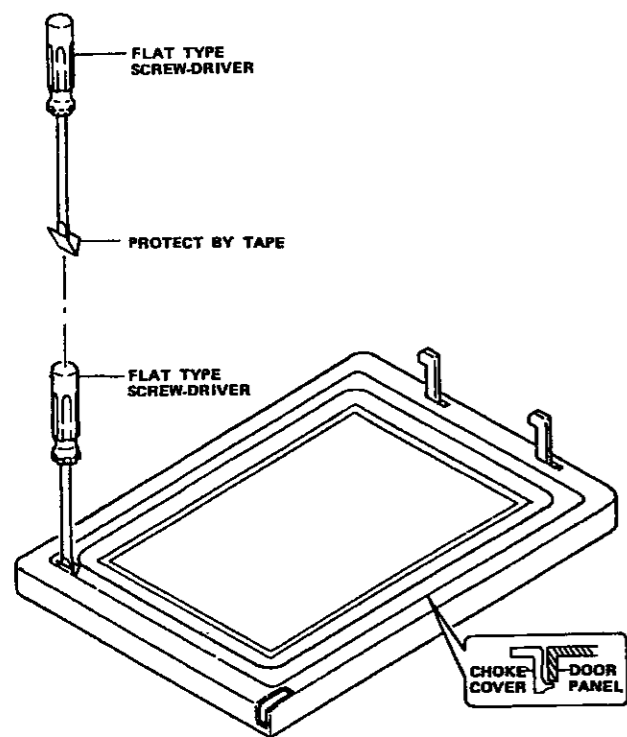


Figure C-5. Choke Cover Removal

DOOR PARTS REMOVAL

Remove the door assembly, referring to from item 1 through item 4 of "DOOR REPLACEMENT".

POSITION OF PURSE LOCK

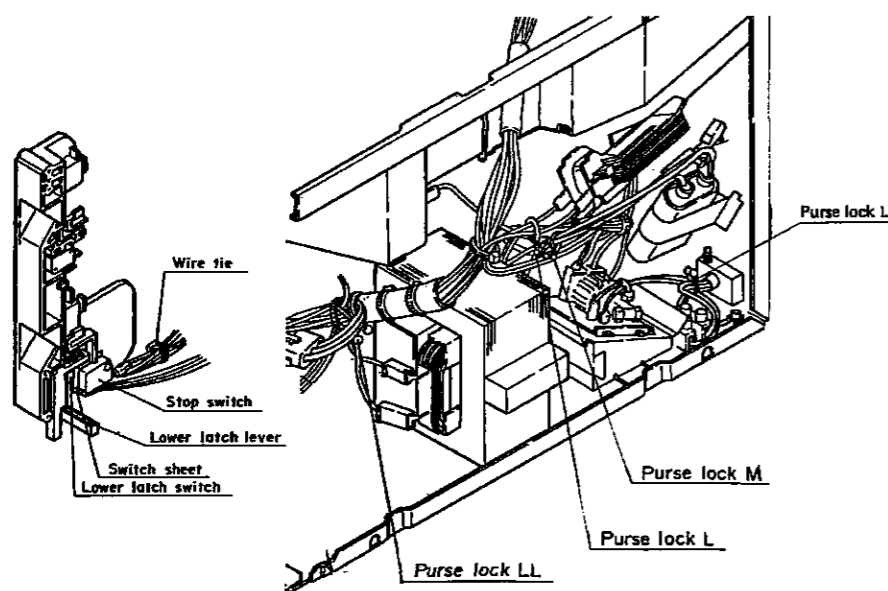


Figure R-1. The position of purse lock

1. Place the door assembly on a soft cloth with facing up.
2. Remove the choke cover, referring to "CHOKE COVER REMOVAL".
3. Remove the three (3) screws holding the door sash right to the door panel assembly.

DOOR SASH REMOVAL

4. Pull the middle part of the door sash right and release the lower tab of the door sash right from the door frame.
5. Release the upper tab of the door sash right from the door frame. Now, the door sash right is free.

DOOR GLASS REMOVAL

6. Slide the door glass to the right side until stopped by door frame.
7. Slide the door glass up until stopped by the door frame.
8. Release the lower part of the door glass from the door frame at first, and then release the upper part of the door glass from the door frame. Now, the door glass is free.

DOOR FRAME REMOVAL

9. Remove the nine (9) screws holding the door frame to the door panel.
10. Release the door frame from the door panel, now the door frame is free.

UPPER AND LOWER LATCH HEADS REMOVAL

11. Release the latch spring from the tabs of the door panel.
12. Remove the two (2) screws and nuts holding the upper and lower latch heads to the door panel.
13. Release the latch heads with latch shaft and latch spring from the door panel.
14. Release the upper and lower latch heads from the latch shaft.
15. Release the latch spring from the lower latch head.
16. Now, the latch heads are free.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

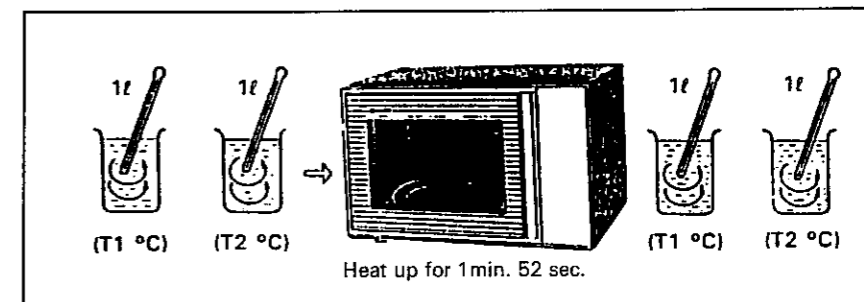
COMPONENT TEST

Example: T1 = 20 °C, T2 = 21 °C

Initial temperature	T1 = 10 °C T2 = 11 °C
Temperature after 1 min. 52 sec.	T1 = 20 °C T2 = 21 °C
Temperature difference Cold-Warm	ΔT1 = 10 °C ΔT2 = 10 °C
Mean temperature rise ΔT	ΔT = (ΔT1 + ΔT2) / 2 = (10 °C + 10 °C) / 2 = 10 °C
Measured output power The equation is as follows: P = 75 x ΔT	P = 75 x 10 °C = 750 Watts

NOTE: The measured output power should be at least ±15 % of the rated output power.

CAUTION: 1 °C CORRESPONDS TO 75 WATTS.
REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B POWER TRANSFORMER TEST

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

CARRY OUT 3D CHECKS.

Disconnect the leads to the primary winding of the power 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 windings. The following readings should be obtained :-

- a. Primary winding -----0.893 ohms approximately.
- b. Secondary winding -----58.8 ohms approximately.
- c. Filament winding -----less than 1 ohm.

If the reading obtained are not as stated above, then the power transformer is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST
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C HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

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 k Ω in the other direction.

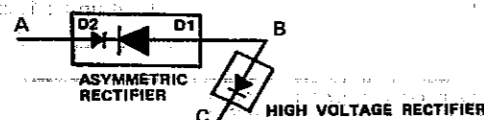
CARRY OUT 4R CHECKS

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. Connect the ohmmeter 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 a asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with the high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage rectifier, high voltage wire or filament winding of the power 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.

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

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

CARRY OUT 4R CHECKS

UPPER LATCH, LOWER LATCH, LATCH, STOP AND MONITOR SWITCHES ADJUSTMENT

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

- CARRY OUT 3D CHECKS
- Loosen the two (2) screws holding the latch hook to the oven cavity front flange.
- With 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 upper latch switch and monitor switch have activated with the door closed. The vertical position of the latch hook should be placed where the lower latch and stop switches and latch switch have activated with the door closed.
- Secure the screws with washers firmly.
- Make sure of the upper latch switch, latch switch, lower latch and stop switches and monitor switch operation. If those switches have not activated with the door closed, two (2) screws holding latch hook to oven cavity front flange and adjust the latch hook position.

After adjustment, make sure of following:

- In and out play of door remains less than 0.5 mm when latched position. First check latch hook position.

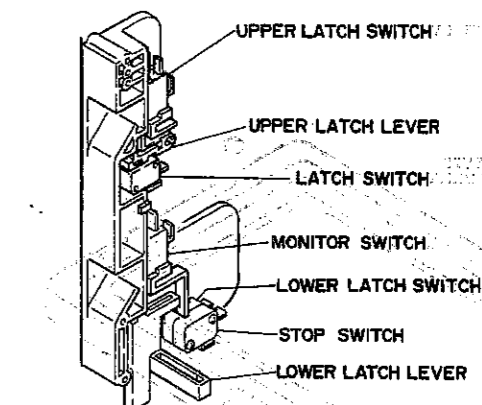


Figure C-3 Latch Switches Adjustment

DOOR REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT

- CARRY OUT 3D CHECKS
- Remove five (5) screws holding the upper and lower oven hinge to the oven cavity. The lower oven hinge is now free.
- Remove door assembly with upper oven hinge by pulling it forward.
- Separate the door assembly and upper oven hinge. Door assembly is now free.
- Re-install upper oven hinge to the new door assembly.
- On re-installing new door assembly, secure the upper and lower oven hinges with the five (5) mounting screws to the oven cavity. Make sure the door is parallel with bottom line of the oven face plate and the latch head pass through the latch holes correctly.
- CARRY OUT 4R CHECKS

Note: After any service to the door, and approved microwave survey meter should be used to assure in compliance with proper microwave radiation standards. (Refer to Microwave Measurement Procedure.)

DOOR ADJUSTMENT

When removing and/or loosening hinges such as in door replacement, the following adjustment criteria are taken. Door is adjusted to meet the following three conditions by keeping screws of hinge loose.

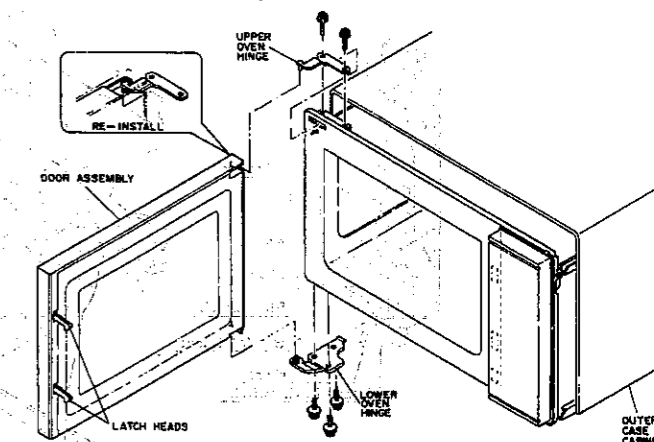


Figure C-4. Door Assembly Replacement and Adjustment

TEST PROCEDURES (CONT'D)

POWER SUPPLY CORD REPLACEMENT

Removal

1. CARRY OUT 3D CHECKS
2. Remove the purse lock L holding the terminal harness and wire leads of power supply cord.
3. Loosen the two (2) screws holding the brown and blue wires of the power supply cord to the cord connector.
4. Loosen the single (1) screw holding the earth angle and earth wire of power supply cord.
5. Loosen the single (1) screw and nut holding the cord anchorages to the unit chassis.
6. Remove the power supply cord.

Re-install

1. Insert the power supply cord into the cord anchorages.
2. Insert the brown and blue wires of power supply cord into the terminals of cord connector, referring to pictorial diagram. And tight the screws of it.
3. Insert the earth wire of power supply cord into the earth angle, and tight the screw holding the earth angle.
4. Tight the single (1) screw and nut holding the cord anchorages.

5. Hold the terminal harness and wire leads of power supply cord by purse lock L.
6. CARRY OUT 4R CHECKS

Note: Above step 5 is important, then must be done after replacing power supply cord.

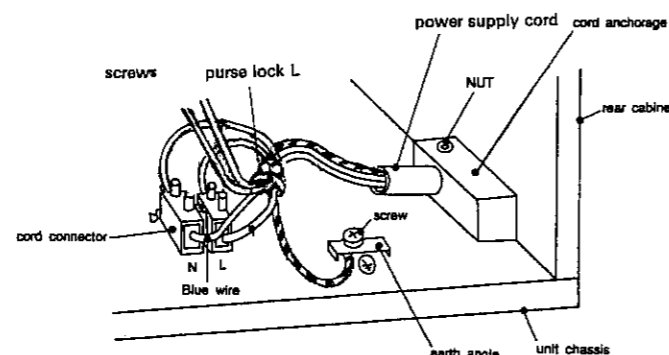


Figure C-2. Replacement of Power Supply Cord

DAMPER MOTOR AND DAMPER SWITCH REMOVAL

1. CARRY OUT 3D CHECKS
2. Remove the three(3) screws holding the chassis support to the rear cabinet, waveguide frange and control panel back plate.
3. Remove the single(1) screw holding the fan duct to the chassis support.
4. Remove the chassis support.
5. Remove the single(1) screw holding the magnetron air guide to the magnetron.
6. Remove the magnetron air guide.
7. Disconnect the leads from damper motor and damper switch.

8. Remove the three(3) screws holding the damper mounting plate to the oven cavity.
9. Remove the damper mounting plate from the oven cavity.
10. Remove the two(2) screws holding the damper motor to the damper mounting plate. Now, the damper motor is free.
11. Remove the two(2) screws holding the damper switch to the damper mounting plate. Now, the damper switch is free.

UPPER LATCH, LOWER LATCH, LATCH, STOP AND MONITOR SWITCHES REMOVAL

1. CARRY OUT 3D CHECKS
2. Remove the single (1) screw holding the relay angle and release the relay angle from the unit chassis.
3. Disconnect the connectors CN-A, B, C, E, K, from the connector unit.
4. Disconnect the wire leads from the all switches on latch hook.
5. Remove the two (2) screws holding the latch hook to the oven cavity flange, and remove the latch hook.
(For removing upper latch switch, monitor switch or latch switch)
6. Push the retaining tab slightly and remove the switch from the latch switch. (For removing lower latch switch or stop switch)
7. Remove the two (2) screws and nuts holding the lower latch switch and stop switch to latch hook. Now it is free.

Re-install

1. Re-install the upper latch switch, latch switch and monitor switch in place, referring to Figure C-3
2. Re-install the lower latch switch and stop switch in place with the two (2) screws and nuts, referring to Figure C-3
3. Re-install the latch hook to the oven cavity flange with the two (2) screws.
4. Re-connect the wire leads to each switch, referring to chapter "Pictorial Diagram" correctly.
5. RE-connect the connectors CN-A, B, C, E, K to the connector unit.
6. Re-install the relay angle to the unit chassis with the single (1) screw.
7. Make sure that each switch operates properly, referring to chapter "Test Procedure", and "Switches Adjustment".

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	O.C.	S.C.
Depressed	S.C.	O.C.

COM; Common terminal, NO; Normally open terminal, NC; Normally closed terminal
S.C.; Short circuit, O.C.; Open circuit

If incorrect readings are obtained, make the necessary switch adjustment or replace the switch.

CARRY OUT 4R CHECKS.

F

MONITOR RESISTOR AND SURGE RESISTOR TEST

CARRY OUT 3D CHECKS.

Disconnect the leads from the monitor resistor or surge resistor. Using an ohmmeter and set on a low range.

Check between the terminals of the monitor resistor or surge resistor as described in the following table.

Table: Resistance

Resistor	Resistance
Monitor resistor	Approx. 3.6 Ω
Surge resistor	Approx. 10 Ω

If incorrect readings are obtained, replace the monitor resistor or surge resistor

CARRY OUT 4R CHECKS.

G

TEMPERATURE FUSE OR THERMAL CUT-OUT TEST

CARRY OUT 3D CHECKS

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

CARRY OUT 4R CHECKS

Table: Temperature Fuse or 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.)
Temp. fuse 145 °C (Magnetron or Grill)	This is not resetable type.	Above 145 °C	Closed circuit
Thermal cut-out 104 °C	Below 84 °C	Above 104 °C	Closed circuit.

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

TEST PROCEDURES (CONT'D)

PROCEDURE
LETTER

COMPONENT TEST

An open circuit magnetron temperature fuse indicates that the magnetron has overheated, this may be due to restricted ventilation, cooling fan failure or a fault condition within the magnetron or HV circuit.

An open circuit grill temp. fuse indicates that the grill heating element has over heated, this may be due to resisted ventilation or cooling fan failure.

An open circuit thermal cut-out indicates that the fan motor winding has overheated, this may be due to resisted ventilation or locked cooling fan.

H MOTOR WINDING TESTCARRY 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 136 ohms
Turntable motor	Approximately 15.62 kohms
Convection fan motor	Approximately 140 ohms
Rotisserie motor	Approximately 16.7 kohms
Damper motor	Approximately 11.1 kohms

If incorrect readings are obtained, replace the motor.
(Also refer to test procedure I)

CARRY OUT 4R CHECKS**I LIVE TEST FOR MOTOR WINDINGS**

CAUTION: The following procedure requires the oven to be connected to the supply and should only be used if the relevant "cold" checks for the motor under test are inconclusive.

1. CARRY OUT 3D CHECKS
2. Disconnect the leads from the primary of the power transformer. Make sure that the leads remain isolated from other oven components and chassis. (Use insulation tape if necessary.)
3. Connect a voltmeter, set to 250V AC, across the motor terminals. (Refer to the relevant motor test procedure or pictorial diagram for the correct terminal numbers.)
4. Arrange the meter in a position where it can be read during the test. (Do not touch the meter, meter leads or oven circuitry while the oven is active.)
5. Close the oven door.
6. Set the relevant timer for about three (3) minutes, set the power level to HIGH and push the START button.
7. Note the reading on the meter and carefully observe the motor under test to see if it is turning.
8. CARRY OUT 3D CHECKS
9. Remove test meter leads.
10. Reconnect the leads to the primary of the power transformer.

If a reading of 220 volts AC was obtained (step 7) but the motor was not turning then it is faulty and should be replaced. If the meter indicated that no supply was present then the wiring to the motor should be checked for continuity.

TURNTABLE MOTOR REMOVAL

1. Disconnect the oven from power supply.
2. Remove two(2) screws holding the turntable motor cover to the base cabinet and turntable motor mounting plate, and remove the cover.
3. Disconnect wire leads from the turntable motor.
4. Remove the two (2) screws holding the turntable motor to the turntable motor mounting plate and remove the motor.
5. Remove the gear(A) located to the turntable motor shaft.
6. The turntable motor is now free.

ROTISSERIE MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire harness (main) from the rotisserie motor.
3. Remove two (2) screws holding the rotisserie motor to rotisserie motor angle assembly.
4. Remove the gear (C) from the rotisserie motor shaft.
5. Now, the rotisserie motor assembly is free.

GRILL HEATING ELEMENT REMOVAL

1. CARRY OUT 3D CHECKS
2. Remove the two(2) screws holding the wire leads to the grill heating element.
3. Remove the two(2) screws holding the rear cabinet to the convection fan duct.
4. Remove the two(2) screws holding the steam duct to the thermal cover (left).
5. Remove the steam duct from the oven cavity.
6. Remove the two(2) screws holding the thermal cover (upper) to the oven cavity.
7. Remove the one(1) screw holding the partition plate and wire holder-E to the thermal cover (upper).
8. Remove the thermal protection sheet (upper) and thermal cover (upper).
9. Remove the fourteen(14) screws holding the grill heater box to the oven cavity.
10. Remove the thermal protection sheet (grill).
11. Release the grill reflector from tabs on the grill heater box.
12. Now the grill heating element is free.

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS
2. Pull the wire leads from the oven lamp socket by pushing the terminal hole of the oven lamp socket with the flat type small screw driver.
3. Lift up the tab of the oven lamp mounting plate holding the oven lamp socket.
4. Lift up the oven lamp socket.
5. Now, the oven lamp socket is free.

CAUTION: When replacing the oven lamp socket, replace it so that the side where the black dot is put faces upward.

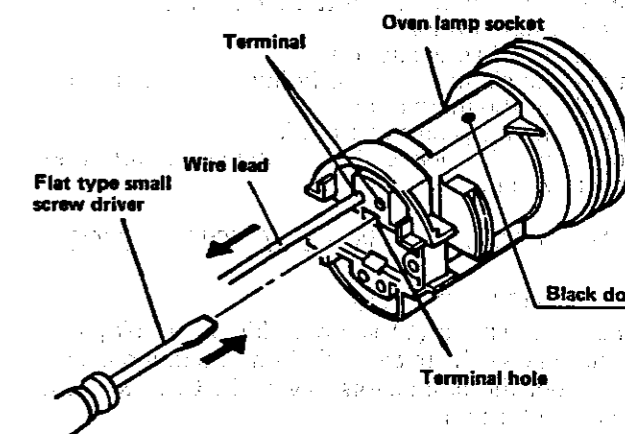


Figure C-1. Oven lamp socket

TEST PROCEDURES (CONT'D)

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect leads from magnetron. Remove one (1) screw holding the magnetron air guide to magnetron.
3. Carefully remove four (4) screws holding magnetron to waveguide, when removing the screws holding the magnetron to prevent it from falling.
4. Remove the magnetron from the waveguide with care so the magnetron antenna should 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 REMOVAL

1. CARRY OUT 3D CHECKS
2. Remove one (1) screw holding earth wire to the frange of oven cavity
3. Disconnect the connectors CN-A, B, C, E, K of main harness, branch harness and control harness.
4. Remove the four (4) screws holding the control panel plate to the oven cavity, the unit chassis and chassis support and remove the control panel
5. Lift up the control panel assembly and pull it forward. Now, the control panel assembly is free.

CONTROL UNIT AND KEY UNIT REMOVAL

1. Remove the control panel from the oven cavity, referring to "CONTROL PANEL REMOVAL".
2. Remove the four (4) screws holding the panel frame to the back plate.
3. Separate the panel frame and back plate.
4. Remove the five (5) screws holding the control unit to the panel frame.
5. Lift up the control unit, and disconnect the key connector from the control unit.
6. Now, the control unit and frame assembly are separated.

FAN MOTOR

1. Remove the magnetron from the waveguide, referring to "MAGNETRON REMOVAL".
2. Disconnect the wire leads from the fan motor and thermal cut-out.
3. Loose the two (2) screw holding the partition plate to oven cavity, and slide the partition plate to the rear cabinet.
4. Remove the single (1) screw holding the fan duct to the chassis support.
5. Release the fan duct from the oven cavity and rear cabinet.
6. Remove the fan blade from the fan motor.
7. Remove the two(2) screws and two(2) nuts holding the fan motor and the thermal cut-out angle.
8. Now, the fan motor is free.

CONVECTION HEATING ELEMENT OR CONVECTION FAN MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the one(1) screw holding the capacitor holder to the rear cabinet and release the capacitor holder from the rear cabinet.
3. Remove the seven(7) screws holding the rear cabinet to the convection fan duct, bottom plate, unit chassis and chassis support.
4. Release the tabs of the fan duct from the rear cabinet.
5. Remove the rear cabinet from the oven.
6. Disconnect the wire leads from the convection heating element, convection motor and thermistor.
7. Remove the two(2) screws holding the thermistor to convection fan duct.
8. Remove the two(2) screws holding the steam duct to thermal cover (left), and remove the steam duct.
9. Remove the twelve(12) screws holding the convection fan duct to the oven cavity, bottom plate and partition plate.
10. Remove the convection fan duct from the oven.

CONVECTION HEATING ELEMENT

11. Remove the two(2) screws holding the two convection heating element insulator (A) to the convection fan duct and remove the insulator (A).
12. Remove the two(2) screws holding the convection heating element to the convection insulator (B).
13. Now, the convection heating element is free.

CONVECTION FAN MOTOR

11. Remove the one(1) nut holding the convection fan, washers, pipe and auxiliary fan to the convection fan motor shaft.
12. Remove the two(2) screws and washers holding the convection motor mounting plate to the thermal cover (Convection).
13. Remove the pin on the convection fan motor shaft.
14. Remove the two(2) screws holding the convection motor mounting plate to the convection fan motor.
15. Now, the convection fan motor is free.

PROCEDURE
LETTER

COMPONENT TEST

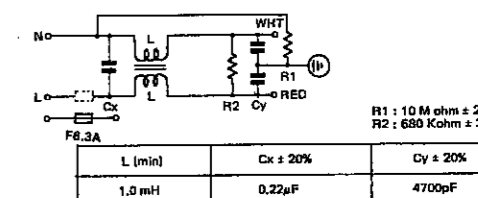
J

NOISE FILTER TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the terminals of the noise filter.

Using an ohmmeter, check between the terminals as described in the following table.



MEASURING POINTS	INDICATION OF OHMMETER
Between N and L	Approximately 680k Ω
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

If incorrect readings are obtained, replace the noise filter unit. CARRY OUT 4R CHECKS

K

BLOWN FUSE F1 F6.3A

CARRY OUT 3D CHECKS

If the ovens internal fuse F1_F6.3A is blown when the door is opened, check the lower latch switch, monitor switch and monitor resistor.

If the fuse F1_F6.3A is blown by incorrect door switching replace the defective switch(s) and the fuse F1_F6.3A.

CARRY OUT 4R CHECKS

CAUTION: Only replace fuse with the correct value replacement.

L

BLOWN WEAK POINT A017

CARRY OUT 3D CHECKS

If the weak point WP1_A017 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 weak point with the correct value replacement.

M

BLOWN WEAK POINT A018

CARRY OUT 3D CHECKS

If the weak point WP2_A018 is blown, there is a short in the asymmetric rectier or there is a ground in wire harness. A short in the asymmetric rectifier may be occured due to short or or ground in H.V. rectifier, magnetron, power transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

CAUTION: Only replace weak point with the correct value replacement.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER: **N** COMPONENT TEST

CONVECTION HEATING ELEMENT AND GRILL HEATING ELEMENT TEST

CARRY OUT 3D CHECKS

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

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 heater

Parts name	Resistance
Convection heating element	Approximately 30 Ω
Grill heating element	Approximately 48 Ω

2. Insulation resistance

Disconnect the wire leads to the heating element to be tested. Check the insulation resistance between the element and cavity using a 500V - 100M Ω insulation tester. The insulation resistance should be more than 10M Ω 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

PROCEDURE LETTER: **O** THERMISTOR TEST

CARRY OUT 3D CHECKS

Disconnect connector-E from the CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to Pin No's E-4 and E-5.

Room Temp.	Resistance
68 °F(20 °C) - 86 °F(30 °C)	Approx. 326k Ω - 175k Ω

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

CARRY OUT 4R CHECKS

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

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

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite "click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position with one hand, then push the door open button with the other, this causes the latch heads to rise, it is then possible to hear a "click" as the door switches operate.)
3. 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 is 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, DOOR PARTS', when carrying out any of the following removal procedures:

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 screws from rear and along the side edge of case.
4. Slide the entire case back about 1 inch (3cm) to free it from retaining clips on the cavity face plate.
5. Lift the entire case from the oven.

6. Discharge the HV capacitor before carrying out any further work.
 7. Do not operate the oven with the outer case removed.
- N.B.; Step 1,2 and 6 form the basis of the 3D checks.

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

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. Remove one (1) screw holding capacitor holder to rear cabinet.
3. Remove one (1) screw holding earth side terminal of high voltage rectifier assembly, and remove capacitor holder.
4. Remove the purse lock M holding the high voltage wires.
5. Disconnect all the leads and terminals of high voltage rectifier assembly from high voltage capacitor.

Disconnect the high voltage wire of high voltage rectifier assembly from the power transformer.

6. Now high voltage rectifier assembly and capacitor should be free.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CAPACITOR HOLDER WITH A EARTHING SCREW.

POWER TRANSFORMER REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect the wire leads from power transformer
3. Disconnect the leads from magnetron filament.
4. Remove the purse lock M holding the high voltage wires.

5. Disconnect the leads of the power transformer from high voltage capacitor and magnetron.
6. Remove the two (2) screws holding the transformer to unit chassis.
7. Remove the transformer.

SERVICING

1. Precautions for Handling Electronic Components

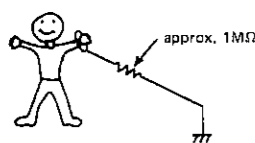
This unit uses PMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed.

PMOS 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 charged in clothes, etc, and sometimes it is not fully protected by the built-in protection circuit.

1) When storing and transporting, thoroughly wrap them in aluminum foil.

Also wrap PW boards containing them in aluminum 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
2SB793Transistor
DTD143EATransistor
2SA933S
DTA143ES
DTA114YS
DTB143ES
DTC114ES

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing the touch control panel of the microwave oven and the cautions you must consider when doing so.

To carry the servicing, power supply to the touch control panel is available either from the power line of the oven proper itself or from an external power source.

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

CAUTION:

THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL ALIVE TO GIVE YOU DANGER DURING SERVICING.

[Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven proper to keep you from touching the high tension transformer, or unplug the primary terminal (connector) of the high power transformer to turn it off; and the end of such connector shall be insulated with an insulating tape. After servicing, be sure to replace the leads to their original locations.

A. On some models, the power supply cord between the touch control panel and the oven proper is so short that they can't be separated from each other.

For those models, therefore, check and repair all the controls (with the sensor-related ones included) of the touch control panel while keeping it in contact with the oven proper.

B. On some models, on the other hand, the power supply cord between the touch control panel and the oven proper is so long that they may be separated from each other. For those models, therefore, it is allowed to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to that with the oven door being closed.

As to the sensor-related controls of the touch control panel, their checking is allowed if the dummy resistor(s) whose resistance is equal to that of those controls is used.

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

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about such an operational state that is equivalent to that with the oven door being closed. And connect an external power source to the power input terminal of the touch control panel, and then it is allowed to check and repair the controls of the touch control panel; as in the case of (1)-B above, it is here also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required when servicing the touch control panel assembly.

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

5. Other Precautions

- 1) When turning on the power source of the control unit, remove the aluminum foil applied for preventing static electricity.
- 2) Connect the connectors of the indicator and key units to the control unit taking care that the lead wires are not twisted.
- 3) After aluminum foil is removed, take extra care that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
- 4) Attach connectors, electrolytic capacitors, etc. to PW board, taking care that all connections are tight.
- 5) Be sure to use specified components where high precision is required.

TEST PROCEDURES (CONT'D)

PROCEDURE
LETTER

COMPONENT TEST

P

MAINS RELAY TEST

CARRY OUT 3D CHECKS

Disconnect the leads to terminals 5 and 6. connect an ohmmeter across the terminals 5 and 6, a reading of approximately 75 ohms should be indicated. If this is not the case then the relay coil is probably faulty and the relay should be replaced.

CARRY OUT 4R TESTS

Relay contact test for open circuit:

Before proceeding with this part of the test, check the relay coil as outlined above.

WARNING: This test requires the oven to be operated with supply connected. Follow the instruction below carefully.

1. CARRY OUT 3D CHECKS
2. Disconnect the leads to the primary of the power transformer.
3. Disconnect the leads from terminals 1 and 2 of the mains relay, make sure that these leads remain isolated from other components and the oven chassis (use insulation tape if necessary). Do not disconnect leads from terminal 3 and 4.
4. Securely clip the leads of an ohmmeter across terminals 1 and 2 of the mains relay. (Make sure the meter can be read easily without being touched during test)
5. Close the door of the oven.
6. Connect the supply.
7. Set the MICROWAVE TIMER to 1 minute and press the START key
8. Without touching the meter or any part of the oven make a note of the reading indicated.
9. Set the MICROWAVE TIMER to 0 (zero).
10. CARRY OUT 3D CHECKS
11. Disconnect the meter from terminals 1 and 2 of the mains relay, clip instead to terminals 3 and 4. And reconnect the leads to terminals 1 and 2.
12. Repeat steps 5, 6, 7, 8, and 9.
13. CARRY OUT 3D CHECKS
14. Disconnect the meter leads and reconnect the leads to the primary of the power transformer.

Check results:

Both meter reading should show continuity (short circuit), if either or both the readings show open circuit then the relay contacts are probably faulty and the relay should be replaced.

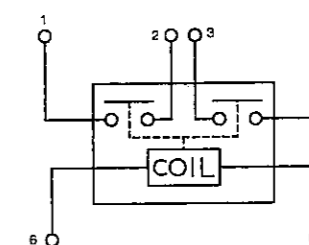
CARRY OUT 4R CHECKS

Relay contact test for short circuit:

CARRY OUT 3D CHECKS

Isolate terminals 1 and 2, 3 and 4 of the mains relay. Using an ohmmeter, check continuity between terminal 1 and 2 then 3 and 4. A reading of infinite resistance should be obtained. If this is not the case then the relay is probably faulty and should be replaced.

CARRY OUT 4R CHECKS



TEST PROCEDURES (CONT'D)

PROCEDURE LETTER **Q** **RELAY TEST**

RELAY TEST

CARRY OUT 3D CHECKS

Disconnect the leads from the primary of the power transformer. Make sure that the leads remain isolated from other oven components and chassis. (Use insulation tape if necessary.) Reconnect the supply.

Check voltage between Pin Nos. 5 and 7 of the 4-pin connector (A) on the control unit with an A.C. voltmeter. The meter should indicate 220 volts, if not check oven circuit.

Shut-off, Cook and Heater Relay Test

These relays are operated by D.C. voltage. Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking or convection cooking 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. 13 V.D.C.	Oven lamp
RY2	Approx. 12 V.D.C.	Power transformer
RY3	Approx. 12 V.D.C.	Convection heater
RY4	Approx. 12 V.D.C.	Grill heater
RY5	Approx. 13 V.D.C.	Damper motor
RY6	Approx. 13 V.D.C.	Convection motor
RY7	Approx. 13 V.D.C.	Cooling fan motor
RY8	Approx. 13 V.D.C.	Rôtisserie motor
RY9	Approx. 12 V.D.C.	Surge resistor
RY10	Approx. 13 V.D.C.	Turntable motor

CARRY OUT 4R CHECKS

(RD82R06U)

PROCEDURE LETTER **R** **TOUCH CONTROL PANEL ASSEMBLY TEST**

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

1. Key Unit.

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 Unit

The following symptoms indicate a defective control unit. Replace the control unit.

2-1 Programming problems.

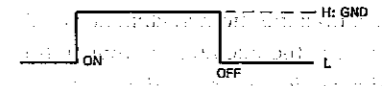
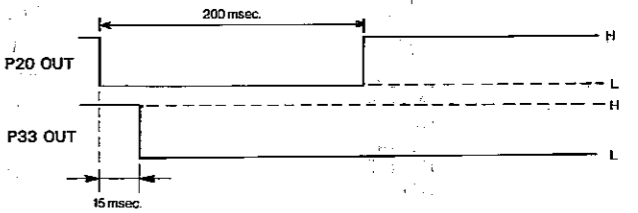
- a) When touching the pads, a certain group of pads do not produce a signal.

2-2 Display problems.

- a) For a certain digit, all or some segments do not light up.
- b) For 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 problems caused by defective control unit.

- a) Buzzer does not sound or continues to sound.

Pin No.	Signal	I/O	Description
59	P23	OUT	<p>1) Segment data signal. Signal similar to P17.</p> <p>2) Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R0—R3 terminal while one of G-11 line keys on key matrix is touched.</p>
60	P22	OUT	<p>Mains relay driving signal. To turn on and off the mains relay.</p> 
61	P21	OUT	<p>1) Segment data signal. Signal similar to P17.</p> <p>2) Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R0—R3 terminal while one of G-10 line keys on key matrix is touched.</p>
62	P20	OUT	<p>Surge limiting relay driving signal. The surge limiting relay is designed to turn on 15 msec. earlier than the cook relay (RY2).</p> 
63	AVCC	IN	Connected to GND.
64	VSS	IN	Connected to GND.

Pin No.	Signal	I/O	Description
46	P10	OUT	<u>Segment data signal.</u> Signal similar to P17.
47	P07	OUT	<u>Segment data signal.</u> Signal similar to P17.
48	P06	OUT	<u>Digit selection signal.</u> Signal similar to P15.
49	P05	OUT	<u>Segment data signal.</u> Signal similar to P17.
50	P04	OUT	<u>1) Segment data signal.</u> Signal similar to P17. <u>2) Key strobe signal.</u> Signal applied to touch-key section. A pulse signal is input to R0 – R3 terminal while one of G-9 line keys on key matrix is touched.
51	P03	OUT	<u>Digit selection signal.</u> Signal similar to P15.
52	P02	OUT	<u>Segment data signal.</u> Signal similar to P17.
53	P01	OUT	<u>1) Segment data signal.</u> Signal similar to P17. <u>2) Key strobe signal.</u> Signal applied to touch-key section. A pulse signal is input to R0 – R3 terminal while one of G-8 line keys on key matrix is touched.
54	P00	OUT	<u>Segment data signal.</u> Signal similar to P17.
55	P27	OUT	<u>Digit selection signal.</u> Signal similar to P15.
56	P26	OUT	<u>1) Segment data signal.</u> Signal similar to P17. <u>2) Key strobe signal.</u> Signal applied to touch-key section. A pulse signal is input to R0 – R3 terminal while one of G-6 line keys on key matrix is touched.
57	P25	OUT	<u>Segment data signal.</u> Signal similar to P17.
58	P24	OUT	<u>Digit selection signal.</u> Signal similar to P15.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER

COMPONENT TEST

- 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 problems 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.

(RD82S02U)

S 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 primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

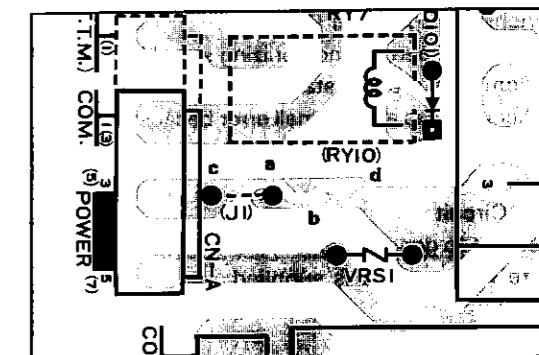
Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS

Disconnect the leads from the primary of the power transformer. Make sure that the leads remain isolated from other oven components and chassis. (Use insulation tape if necessary.) Reconnect the supply.

STEPS	OCCURANCE	CAUSE OR CORRECTION
1	The rated voltage is not applied to POWER terminal of CPU connector (CN-A)	Check supply voltage and oven power cord.
2	The rated voltage is applied to primary side of T/C transformer.	T/C transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire 1 and solder. (CARRY OUT 3D CHECKS BEFORE REPAIR)
4	Pattern at "a" and "b" are broken.	*Insert the coil RFLNA003DRE0 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 burn damage and test the T/C transformer with an ohmmeter 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

(RD82X05U)

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 principal functions of these units and signal 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 through P01, P04, P11, P21, P23 and P26.


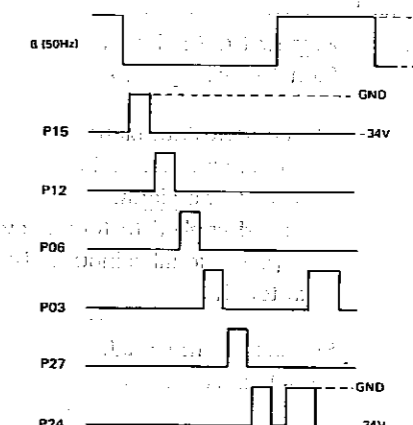
When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through R0 - R3 to perform the function that was requested.

Control Unit

Control unit consists of LSI (IZA207DR), power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit, temperature measurement circuit, and indicator 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 voltages [VC: +5V, VF1: -25V, VF2: -28V, VA: -15V and Vp: -34V] necessary in the control unit.
- 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) ACL Circuit
A circuit to generate signals resetting the LSI to the initial state when power is supplied.
- 5) Buzzer Circuit
The buzzer is responsive to signals from the LSI to emit noticing sounds (key touch sound and completion sound).

- 6) Temperature Measurement Circuit [1]: Oven
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 result of detecting is given to LSI controlling the relay and display.
- 7) Door Switch
A switch to "tell" the LSI if the door is open or closed.
- 8) Relay Circuit
To drive the magnetron, convection heater, grill heater, fan motor, convection motor, damper motor, rotisserie motor, turntable motor, surge relay, main relay and light the oven lamp.
- 9) Indicator Circuit
Indicator element is a Fluorescent Display.
Basically, a Fluorescent Display is triode having a cathode, a grid and an anode. Usually, the cathode of a Fluorescent Display is directly heated and the filament serves as cathode. The Fluorescent Display 6-digits, 17-segments.

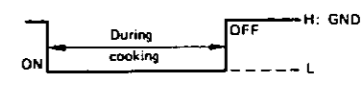
Pin No.	Signal	I/O	Description																																				
39	P17	OUT	Segment data signals. The relation between signals and indicators are follows: <table style="width: 100%; border: none;"> <tr> <td>Signal</td> <td>Segment</td> <td>Signal</td> <td>Segment</td> </tr> <tr> <td>P17</td> <td>m</td> <td>P04</td> <td>h, l</td> </tr> <tr> <td>P16</td> <td>LB1</td> <td>P02</td> <td>g</td> </tr> <tr> <td>P14</td> <td>LB2</td> <td>P01</td> <td>f</td> </tr> <tr> <td>P13</td> <td>UB1</td> <td>P00</td> <td>e</td> </tr> <tr> <td>P11</td> <td>UB2</td> <td>P26</td> <td>d</td> </tr> <tr> <td>P10</td> <td>k</td> <td>P25</td> <td>c</td> </tr> <tr> <td>P07</td> <td>j</td> <td>P23</td> <td>b</td> </tr> <tr> <td>P05</td> <td>i</td> <td>P21</td> <td>a</td> </tr> </table> 	Signal	Segment	Signal	Segment	P17	m	P04	h, l	P16	LB1	P02	g	P14	LB2	P01	f	P13	UB1	P00	e	P11	UB2	P26	d	P10	k	P25	c	P07	j	P23	b	P05	i	P21	a
Signal	Segment			Signal	Segment																																		
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P10	k	P25	c																																				
P07	j	P23	b																																				
P05	i	P21	a																																				
40	P16																																						
41	P15	OUT	Digit selection signal. The relation between digit signal and digit are as follows: <table style="width: 100%; border: none;"> <tr> <td>Digit signal</td> <td>digit</td> <td>Digit signal</td> <td>digit</td> </tr> <tr> <td>P15</td> <td>1st</td> <td>P03</td> <td>4th</td> </tr> <tr> <td>P12</td> <td>2nd</td> <td>P27</td> <td>5th</td> </tr> <tr> <td>P06</td> <td>3rd</td> <td>P24</td> <td>6th</td> </tr> </table> Normally, one pulse is output in every 8 period, and input to the grid of the Fluorescent Display. 	Digit signal	digit	Digit signal	digit	P15	1st	P03	4th	P12	2nd	P27	5th	P06	3rd	P24	6th																				
Digit signal	digit	Digit signal	digit																																				
P15	1st	P03	4th																																				
P12	2nd	P27	5th																																				
P06	3rd	P24	6th																																				
42	P14	OUT	Segment data signal. Signal similar to P17.																																				
43	P13																																						
44	P12	OUT	Digit selection signal. Signal similar to P15.																																				
45	P11	OUT	1) Segment data signal. Signal similar to P17. 2) Key strobe signal. Signal applied to touch-key section. A pulse signal is input to R0 - R3 terminal while one of G-5 line keys on key matrix is touched.																																				

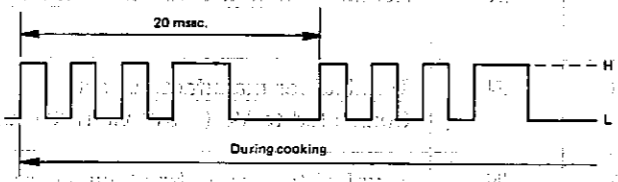
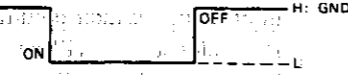
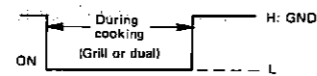
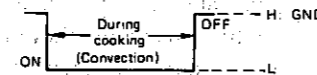
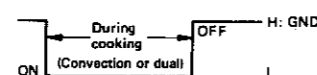
Pin No.	Signal	I/O	Description
26	CNVSS	IN	Connected to Vc.
27	RESET	IN	Auto-clear terminal. Signal is input to reset the LSI to the initial state when power is supplied. Temporarily set to "L" level the moment power is supplied, at this time the LSI is reset. Thereafter set at "H" level.
28	XIN	IN	Internal clock oscillation frequency setting input. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.
29	XOUT	OUT	Internal clock oscillation frequency control output. Output to control oscillation input of XIN.
30	XCIN	IN	Terminal not used.
31	XCOU	OUT	
32	Vss	IN	Power source voltage: -5V. VC voltage of power source circuit input.
33	ϕ	OUT	Terminal not used.
34	R3	IN	Signal coming from touch-key. When either one of G-1 line keys on key matrix is touched, a corresponding signal out of P01, P04, P11, P21, P23 and P26 will be input into R3. When no key is touched, the signal is held at "L" level.
35	R2	IN	Signal similar to R3. When either one of G-2 line keys on key matrix is touched, a corresponding signal will be input into R2.
36	R1	IN	Signal similar to R3. When either one of G-3 line keys on key matrix is touched, a corresponding signal will be input into R1.
37	RO	IN	Signal similar to R3. When either one of G-4 line keys on key matrix is touched, a corresponding signal will be input into RO.
38	VP	IN	Anode (segment) of Fluorescent Display light-up voltage: -34V. VP voltage of power source circuit input.

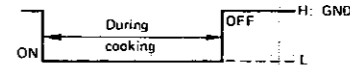
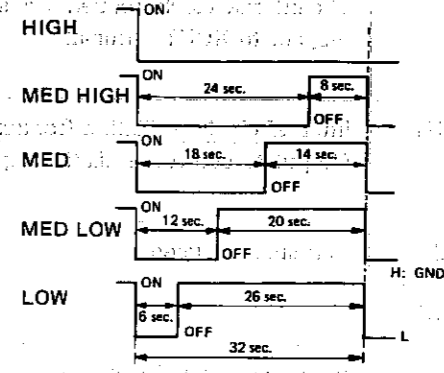
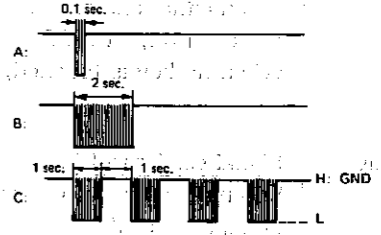
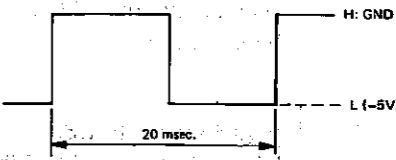
DESCRIPTION OF LSI

LSI (IZA207DR)

The I/O signal of the LSI (IZA207DR) is detailed in the following table.

Pin No.	Signal	I/O	Description
1	VREF	IN	Reference voltage input terminal. A reference voltage applied to the A/D converter in the LSI. Connected to GND. (0V)
2	IN7	IN	Heating constant compensation terminal.
3	IN6	IN	Terminal for manufacture test. Connected to Vc (-5V) via R201 and R202.
4	IN5	IN	Terminal to change functions according to the model. Signal in accordance with the model in operation is applied to set up its function.
5	IN4	IN	Input signal which communicates the damper open/close information to LSI. Damper opened; "H" level signal (0V: GND) Damper closed; "L" level signal (-5V: VC)
6	IN3	IN	Input signal which communicates the door open/close information to LSI. Door closed; "H" level signal (0V) Door opened; "L" level signal (-5V)
7	IN2	IN	Temperature measurement input: OVEN THERMISTOR. By inputting DC voltage corresponding to the temperature detected by the thermistor, this input is converted into temperature by the A/D converter built into the LSI.
8	IN1	IN	Terminal not used. Connected to GND.
9	IN0	IN	Terminal not used. Connected to GND.
10	P47		Turntable motor driving signal. To turn on and off shut-off relay (RY10). "L" level during cooking (Except rotisserie cooking mode); "H" level otherwise. 
11	P46	OUT	Terminal not used.
12	P45		
13	P44		
14	P43		

Pin No.	Signal	I/O	Description
15	P42	OUT	Timing signal output terminal for temperature measurement (OVEN). "H" level (GND) : Temperature measuring timing. (convection and grillcooking). "L" level (-5V) : Thermistor OPEN timing.
16	P41	OUT	Oven lamp driving signal (Square waveform: 50Hz). To turn on and off shut-off relay (RY1). The Square waveform voltage is delivered to the RY1 driving circuit and relays (RY2-4, 6) control circuit. 
17	P40	OUT	Damper motor relay driving signal. To turn on and off the shut-off relay (RY5). 
18	P37	OUT	Grill heater driving signal. To turn on and off the grill heater relay (RY4). "L" level during grill or dual cooking; "H" level otherwise. 
19	P36	OUT	CONVECTION MOTOR driving signal. To turn on and off shut-off relay (RY6). "L" level during CONVECTION; "H" level otherwise. 
20	P35	OUT	Convection heater driving signal. To turn on and off the convection heater relay (RY3). "L" level during convection or dual cooking; "H" level otherwise. During convection cooking, the signal becomes "H" level when the temperature of the oven cavity exceeds the predetermined temperature. 

Pin No.	Signal	I/O	Description
21	P34	OUT	Cooling fan motor driving signal. To turn on and off shut-off relay (RY7). "L" level during cooking; "H" level otherwise. 
22	P33	OUT	Magnetron high-voltage circuit driving signal. To turn on and off the cook relay (RY2). In High operation, the signals holds "L" level during microwave cooking and "H" level while not cooking. In other cooking modes (MED HIGH, MED, MED LOW, LOW) the signal turns to "H" level and "L" level in repetition according to the power level. 
23	P32	OUT	Signal to sound buzzer. A : Key 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 (15 minutes) is elapsed. 
24	P31	IN	Signal synchronized with commercial power source frequency. This is the basic timing for all time processing of LSI. 
25	P30	OUT	Rotisserie motor driving signal. To turn on and off shut-off relay (RY8). "L" level during cooking; "H" level otherwise. 