

SHARP SERVICE MANUAL

SX734R950APM/

CONVECTION MICROWAVE OVEN



MODEL **R-950A**

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

TABLE OF CONTENTS

	Page
CAUTION, MICROWAVE RADIATION	1
WARNING	1
PRODUCT SPECIFICATIONS	2
GENERAL INFORMATION	2
APPEARANCE VIEW	3
OPERATION SEQUENCE	4
FUNCTION OF IMPORTANT COMPONENTS	7
SERVICING	10
TEST PROCEDURE	12
TOUCH CONTROL PANEL ASSEMBLY	19
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE	24
MICROWAVE MEASUREMENT	30
WIRING DIAGRAM	31
PICTORIAL DIAGRAM	34
CONTROL PANEL CIRCUIT	35
PRINTED WIRING BOARD	36
PARTS LIST	37

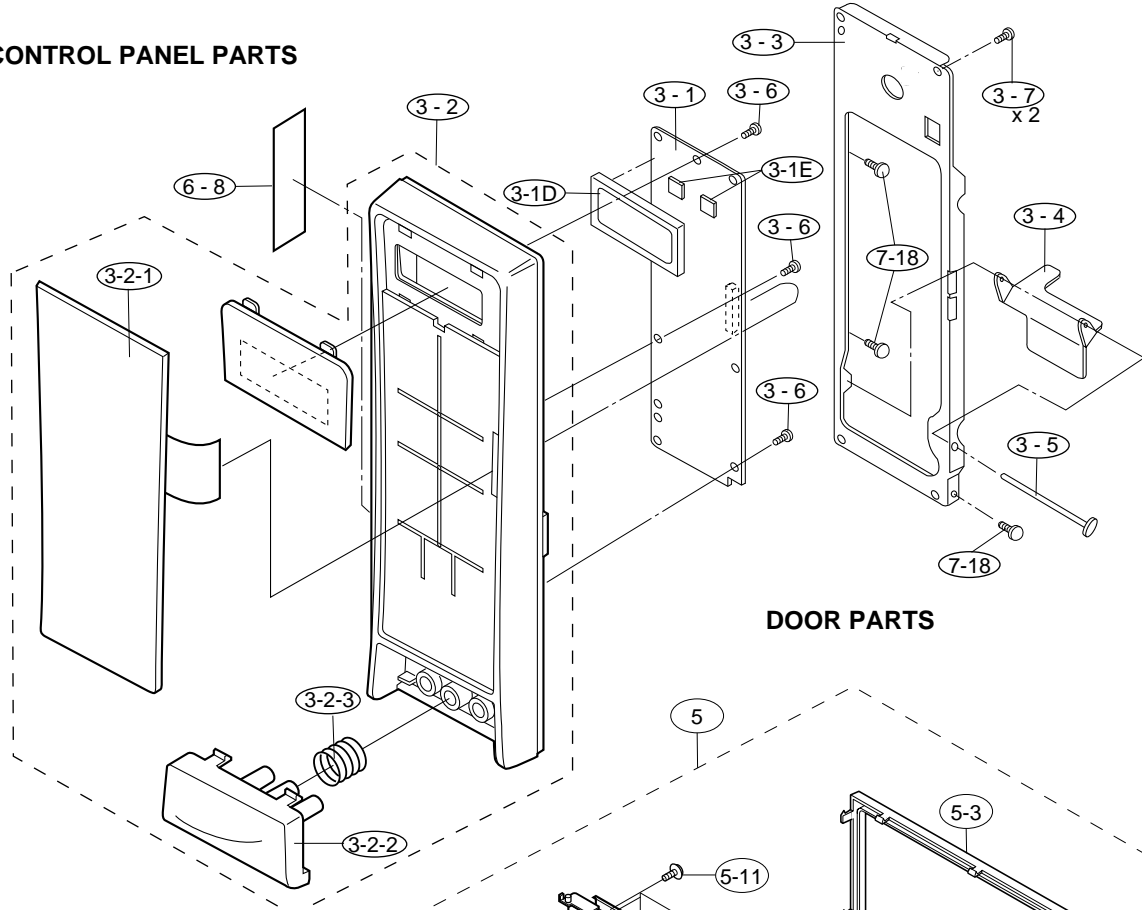
OVEN AND CABINET PARTS

This exploded view diagram illustrates the assembly of an oven and its cabinet. The diagram shows the following components and their assembly sequence:

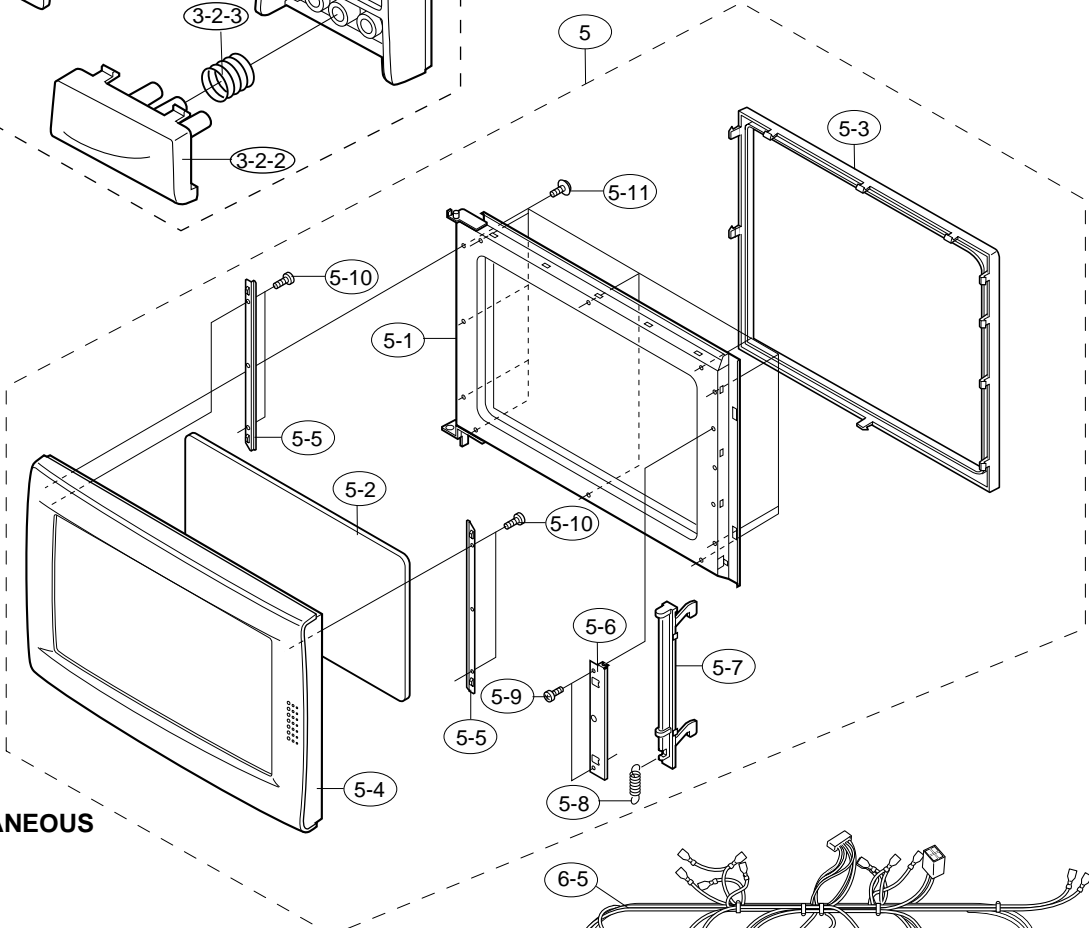
- Base and Support:** The assembly starts with the base plate (4-3) and legs (4-2). The base plate is secured with screws (7-11 x3) and a bracket (4-23). The legs are attached to the base plate using screws (7-8 x3) and brackets (2-3-1, 2-3-2).
- Oven Body:** The oven body (2-1) is positioned on the base. It is secured with screws (7-1 x9) and a bracket (4-22). The oven body is connected to the base plate using a bracket (4-1) and screws (7-1 x3).
- Control Panel:** The control panel (4-1) is attached to the oven body using screws (7-1 x3) and a bracket (4-22).
- Door and Hinge:** The oven door (4-36) is attached to the oven body using a hinge (4-30) and screws (7-1 x3). The door is secured with screws (7-17 x2) and a bracket (4-13).
- Interior Components:** The interior of the oven body is equipped with a burner (4-9), a burner valve (4-35), and a burner control (4-43). The burner is secured with screws (7-21 x2) and a bracket (4-11).
- Cabinet and Front Panel:** The cabinet (4-15) is attached to the oven body using screws (7-29) and a bracket (4-33). The front panel (4-16) is attached to the cabinet using screws (7-24 x5) and a bracket (4-32).
- Wiring and Connections:** The wiring (1-3) is connected to the oven body using a bracket (4-31) and screws (7-10, 7-17, 1-20, 1-16).
- Final Assembly:** The final assembly is completed by attaching the cabinet (4-15) and front panel (4-16) to the oven body (2-1).

The diagram includes numerous numbered callouts (e.g., 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-11, 1-12, 1-13, 1-14, 1-15, 1-16, 1-17, 1-18, 1-19, 1-20, 1-21, 1-22, 1-23, 1-24, 1-25, 1-26, 1-27, 1-28, 1-29, 1-30, 1-31, 1-32, 1-33, 1-34, 1-35, 1-36, 1-37, 1-38, 1-39, 1-40, 1-41, 1-42, 1-43, 1-44, 1-45, 1-46, 1-47, 1-48, 1-49, 1-50, 1-51, 1-52, 1-53, 1-54, 1-55, 1-56, 1-57, 1-58, 1-59, 1-60, 1-61, 1-62, 1-63, 1-64, 1-65, 1-66, 1-67, 1-68, 1-69, 1-70, 1-71, 1-72, 1-73, 1-74, 1-75, 1-76, 1-77, 1-78, 1-79, 1-80, 1-81, 1-82, 1-83, 1-84, 1-85, 1-86, 1-87, 1-88, 1-89, 1-90, 1-91, 1-92, 1-93, 1-94, 1-95, 1-96, 1-97, 1-98, 1-99, 1-100) indicating the specific parts and their assembly order.

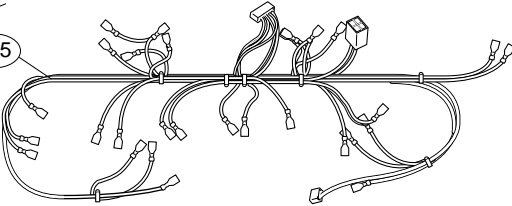
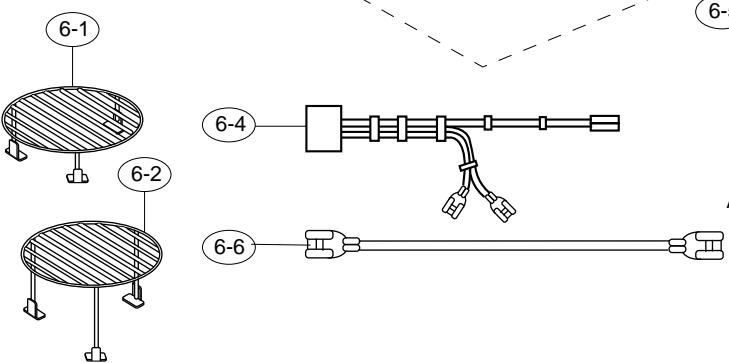
CONTROL PANEL PARTS



DOOR PARTS



MISCELLANEOUS



Actual wire harness may be different than illustration.

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
ELECTRICAL PARTS				
* 1- 1	FH-DZA058WRK0	High voltage rectifier assembly	1	AL
1- 2	FH-HZA041WRE0	Thermistor assembly	1	AN
1- 3	QACC-A084WRE0	Power supply cord	1	AD
1- 4	QFS-BA009WRE0	Fuse 20A	1	AH
1- 5	QFS-TA013WRE0	Temperature fuse 150°C (Magnetron)	1	AG
1- 6	FPWBFA312WRK0	Noise filter	1	AY
1- 7	QSOCLA022WRE0	Oven lamp socket	1	AG
1- 8	QSW-MA111WRE0	Monitor switch	1	AK
1- 9	QSW-MA110WRE0	2nd. interlock relay control switch and Damper switch	2	AK
1-10	QSW-MA110WRE0	1st. and lower latch switch	1	AK
* 1-11	RC-QZA192WRE0	High voltage capacitor	1	AX
1-12	RHET-A140WRE0	Convection heater	1	AY
1-13	RLMPTA069WRE0	Oven lamp	1	AK
1-14	RMOTDA191WRE0	Damper motor	1	AS
1-15	RMOTDA223WRE0	Turntable motor	1	AZ
1-16	RMOTEA303WRE0	Cooling fan motor	1	AX
1-17	RMOTEA284WRE0	Convection motor	1	AZ
1-18	RR-WZA022WRE0	Monitor resistor 0.8Ω 20W	1	AK
1-19	RTHM-A048WRE0	Thermal cut-out 170°C (Conv.)	1	AH
1-20	RTHM-A074WRE0	Thermal cut-out 95°C (Fan)	1	AH
* 1-21	RTRN-A543WRE0	Power transformer	1	BR
Δ * 1-22	RV-MZA222WRE0	Magnetron	1	BN
1-23	RHET-A191WRE0	Grill heater	2	AX
1-24	QFSHDA019WRE0	Fuse holder	1	AH
1-25	QFS-CQ001YBE0	Fuse 10A	1	AE
1-26	RTHM-A106WRE0	Thermal cut-out 125°C (Grill)	1	
CABINET PARTS				
2- 1	GCABUA463WRP0	Outer case cabinet	1	BF
2- 2	MLEVPA122WRF0	Switch lever	1	AD
2- 3	FDAI-A181WRY0	Base cabinet	1	AR
2-3-1	GCOVHA156WRP0	Turntable motor cover	1	AB
2-3-2	XHTSD40P08RV0	Screw; 4mm x 8mm	1	AA
2- 4	GLEGPA056WRE0	Foot	4	AD
2- 5	GCABDA088WRW0	Rear cabinet	1	AV
2- 6	LHLDKA009WRF0	Cord holder	1	AG
2- 7	LBNDKA036WRP0	Capacitor holder	1	AG
Δ 2- 8	FHNG-A092WRM0	Oven hinge (Lower)	1	AF
Δ 2- 9	PHOK-A043WRF0	Latch hook	1	AM
CONTROL PANEL PARTS				
3- 1	CPWBFA757WRK0	Control unit	1	BU
3- 1A	QCNCMA230DRE0	4-pin connector(A)	1	AC
3- 1B	QCNCMA267DRE0	6-pin connector(E)	1	AC
3- 1C	QCNCWA057DRE0	12-pin connector(G)	1	AF
3- 1D	RV-KXA078DRE0	Fluorescent display tube	1	BD
3- 1E	PCUSGA381WRP0	Cushion	2	AG
C1	RC-KZA087DRE0	Capacitor 0.1μF 50V	1	AB
C2	VCEAB31VW108M	Capacitor 1000μF 35V	1	AF
C5	RC-KZA087DRE0	Capacitor 0.1μF 50V	1	AB
C6	VCEAB31VW106M	Capacitor 10μF 35V	1	AA
C7-8	VCKYD11CY103N	Capacitor 0.01μF 16V	2	AH
C9	VCTYF31HF103Z	Capacitor 0.01μF 50V	1	AB
C10	RC-KZA087DRE0	Capacitor 0.1μF 50V	1	AB
C11	VCEAB31EW226M	Capacitor 22μF 25V	1	AA
C20	VCEAB31VW106M	Capacitor 10μF 35V	1	AA
C21	VCEAB31HW104M	Capacitor 0.1μF 50V	1	AM
C22	RC-KZA087DRE0	Capacitor 0.1μF 50V	1	AB
C30	VCKYD11CY103N	Capacitor 0.01μF 16V	1	AH
C50	VCKYD11CY103N	Capacitor 0.01μF 16V	1	AH
C60	VCKYD11CY103N	Capacitor 0.01μF 16V	1	AH
C70	RMPTEA009DRE0	Capacitor array 330pF x 4	1	AE
CF1	RCRS-A035DRE0	Ceramic resonator (CST4.19MGW)	1	AG
D1-4	VHD11ES1///-1	Diode (11ES1)	4	AB
D7	VHD1SS270A/-1	Diode (1SS270ATA)	1	AA
D20-26	VHD1SS270A/-1	Diode (1SS270ATA)	7	AA
D27	VHD1SS270A/-1	Diode (1SS270ATA)	1	AA
D30-31	VHD1SS270A/-1	Diode (1SS270ATA)	2	AA
D70-77	VHD1SS270A/-1	Diode (1SS270ATA)	8	AA
IC1	RH-IZA850DRE0	LSI	1	AW
Q3	VSKRA101M// -3	Transistor (KRA101M)	1	AB
Q4	VSDTA123ES/-3	Transistor (DTA123E)	1	AA

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
Q20-23	VSKRA101M//-3	Transistor (KRA101M)	4	AB
Q24-25	VSKRA223M//-3	Transistor (KRA223M)	2	AB
Q26	VSKRC243M//-3	Transistor (KRC243M)	1	AB
Q27	VSKRA223M//-3	Transistor (KRA223M)	1	AB
Q40	VSKRA101M//-3	Transistor (KRA101M)	1	AB
Q60	VSKRC101M//-3	Transistor (KRC101M)	1	AB
Q90-91	VSKRA101M//-3	Transistor (KRA101M)	2	AB
R3-4	VRS-B13AA471J	Resistor 470 ohm 1W	2	AA
R7-8	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	2	AA
R10-11	VRS-B13AA180J	Resistor 18 ohm 1W	2	AA
R30	VRD-B12EF153J	Resistor 15k ohm 1/4W	1	AA
R31	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	1	AA
R40	VRD-B12EF332J	Resistor 3.3k ohm 1/4W	1	AA
R50	VRD-B12EF153J	Resistor 15k ohm 1/4W	1	AA
R51	VRD-B12EF472J	Resistor 4.7k ohm 1/4W	1	AA
R62	VRN-B12EK753F	Resistor 75k ohm(F) 1/4W	1	AA
R63	VRN-B12EK101F	Resistor 100 ohm(F) 1/4W	1	AA
R64	VRN-B12EK222F	Resistor 2.2k ohm(F) 1/4W	1	AA
R70-81	VRD-B12EF332J	Resistor 3.3k ohm 1/4W	12	AA
R90-94	VRD-B12EF104J	Resistor 100k ohm 1/4W	5	AA
RY1-3	RRLY-A083DRE0	Relay (OMIF-S-118LM)	3	AK
RY4-6	RRLY-A078DRE0	Relay (OJ-SS-118LM)	3	AG
RY7	RRLY-A083DRE0	Relay (OMIF-S-118LM)	1	AK
SP40	RALM-A014DRE0	Buzzer (PKM22EPT)	1	AG
T1	TRTNPA089DRE0	Transformer	1	AU
VRS1	RH-VZA032DRE0	Varistor (10G471K)	1	AE
ZD3	VHEHZ5C2///-1	Zener diode (HZ5C-2)	1	AA
ZD4	VHEHZ4A2///-1	Zener diode (HZ4A2)	1	AA
3- 2	DPNLCB460WRK0	Control panel frame with key unit	1	BE
3- 2-1	FUNTKA836WRE0	Key unit	1	BA
3- 2-2	JBTN-B060WRF0	Open button	1	AF
3- 2-3	MSPRCA050WRE0	Open button spring	1	AB
3- 3	LANGTA340WRW0	Control panel back plate	1	AK
3- 4	MLEVFA057WRW0	Open lever	1	AE
3- 5	NSFTTA042WRE0	Open shaft	1	AE
3- 6	XEPSD30P10XS0	Screw ; control unit mtg.	3	AA
3- 7	XCPSD40P12000	Screw ; control panel back plate mtg.	2	AA

OVEN PARTS

Δ	4- 1	FOVN-A402WRY0	Oven cavity assembly	1	BV
	4- 2	FROLPA072WRK0	Turntable support	1	AL
	4- 3	NTNT-A019WRH0	Turntable tray	1	AT
	4- 4	FBRGMA002WRE0	Bearing ass'y	1	AQ
	4- 5	PREFHA028WRW0	Thermal protection plate (left)	1	AR
	4- 6	LANGTA196WRW0	Bearing mounting plate	1	AD
	4- 7	LBNDK0054WRE0	Heater element holder	2	AB
	4- 8	LFIX-A013WRW0	Bearing holder plate	1	AB
	4- 9	NFANMA019WRW0	Convection fan	1	AE
	4-10	NPLYBA025WRF0	Pulley (F)	2	AC
	4-11	FDUC-A279WRK0	Heater duct assembly	1	AT
	4-12	PFPF-A138WRE0	Thermal protection sheet (left)	1	AK
	4-13	LANGQA410WRP0	Thermal cut-out mounting plate	1	AG
	4-14	PCUSUA167WRP0	Cushion	2	AF
	4-15	PCUSUA424WRP0	Cushion	1	AG
	4-16	PDUC-A680WRW0	Steam duct assembly	1	AY
	4-17	MCAMPA030WRF0	Damper cam	1	AC
	4-18	NSFTTA114WRE0	Damper shaft	1	AB
	4-19	FFTA-A034WRK0	Damper door ass'y	1	AM
	4-20	PDUC-A269WRW0	Damper duct	1	AK
	4-21	PCUSGA410WRP0	Cushion	1	AD
	4-22	NCPL-A021WRF0	Turntable coupling	1	AE
	4-23	PCOVPA301WRE0	Waveguide cover	1	AE
	4-24	PCUSUA197WRP0	Cushion	2	AD
	4-25	PGLSPA485WRE0	Light glass	1	AF
	4-26	PFPF-A139WRE0	Thermal protection sheet (Right)	1	AF
	4-27	PREFHA053WRW0	Thermal protection plate (Right)	1	AP
	4-28	PSKR-A153WRW0	Air guide (Bottom)	1	AK
	4-29	PSKR-A329WRW0	Divide plate (Right)	1	AM
	4-30	LANGQA407WRW0	Convection motor mounting plate	1	AG
	4-31	LANGQA369WRP0	Thermal cut-out mounting angle	1	AC
	4-32	NFANJA020WRE0	Fan blade	1	AE
	4-33	PDUC-A270WRF0	Cooling fan duct	1	AL
	4-34	LANGFA089WRW0	Chassis support	1	AE
Δ	4-35	MHNG-A165WRM0	Oven hinge (Upper)	1	AE
	4-36	NBLTKA005WRE0	Convection fan belt	1	AF
	4-37	LANGQA475WRP0	Noise unit angle	1	AR

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
4-38	PCUSUA196WRP0	Cushion	2	AD
4-39	PCUSUA425WRP0	Damper duct cushion	1	AG
4-40	PCUSGA236WRP0	Cushion	1	AC
4-41	PSKR-A171WRW0	Magnetron air guide	1	AE
4-42	PFPF-A064WRE0	Thermal protection sheet	1	AF
4-43	LANGQA397WRP0	Heater mounting angle	1	AG
4-44	PREFHA052WRW0	Grill cover	1	AK
4-45	QTANNA017WRW0	Short terminal	1	AD
4-46	PSHEPA487WRE0	Heater film	1	AA
4-47	PDUC-A689WRP0	Exhaust duct	1	AW
4-48	PSKR-A328WRP0	Grill duct cover	1	AR
4-49	PCUSGA493WRP0	Cushion	1	AB

DOOR PARTS

Δ	5	CDORFA779WRK0	Door panel assembly complete	1	BU
Δ	5- 1	DDORFA820WRY0	Door panel	1	BD
	5- 2	PGLSPA499WRE0	Door glass	1	AN
	5- 3	GCOVHA155WRF0	Choke cover	1	AP
	5- 4	GWAKPA526WRR0	Door frame	1	BD
	5- 5	LANGKA845WRW0	Glass bracket	2	AF
Δ	5- 6	LANGKA851WRT0	Latch angle	1	AF
Δ	5- 7	LSTPPA169WRF0	Latch head	1	AH
	5- 8	MSPRTA081WRE0	Latch head spring	1	AA
	5- 9	XCPSD40P08000	Screw; 4mm x 8mm	2	AA
	5-10	XEPSD30P08XS0	Screw; 3mm x 8mm	4	AA
	5-11	XEBSD30P08000	Screw; 3mm x 8mm	11	AA

MISCELLANEOUS

	6- 1	FAMI-A088WRM0	Low rack (Broiling trivet)	1	AW
	6- 2	FAMI-A087WRM0	High rack (Baking rack)	1	AW
	6- 3	TCADCA651WRR0	Cook book	1	BK
	6- 4	FW-VZB635WRE0	Thermistor harness	1	AT
	6- 5	FW-VZB623WRE0	Main wire harness	1	BD
*	6- 6	QW-QZA202WRE0	High voltage wire A	1	AK
	6 -7	TCAUHA054WRR0	Cord caution	1	AE
	6- 8	TSPCNC517WRR0	Name plate	1	AC
	6- 9	TCAUHA214WRR0	K caution label	1	AF
	6-10	TLABNA224WRR0	Menu label	1	AE
	6-11	TINSEA721WRR0	Operation manual	1	AP
	6-12	TLABSA061WRR0	M10A label	1	AC

SCREWS, NUTS AND WASHERS

	7- 1	XOTWW40P10000	Screw; 4mm x 10mm	16	AA
	7- 2	XOTSE40P12000	Screw; 4mm x 12mm	4	AA
	7- 3	XCTWW40P08000	Screw; 4mm x 8mm	2	AA
	7- 4	XHTSD40P08RV0	Screw; 4mm x 8mm	5	AA
	7- 5	LX-CZ0052WRE0	Special screw	2	AA
	7- 6	XWVSD60-07000	Washer; 6mm x 0.7 mm	1	AA
	7- 7	LX-WZA004WRE0	Washer	1	AA
	7- 8	LX-CZA020WRE0	Special screw	6	AA
	7- 9	XBPSD30P14K00	Screw; 3mm x 14mm	1	AA
	7-10	XBPSD40P25000	Screw; 4mm x 25mm	2	AA
	7-11	XBTWW40P06000	Screw; 4mm x 6mm	7	AA
	7-12	XCTSD40P08000	Screw; 4mm x 8mm	7	AA
	7-13	LX-CZA060WRE0	Special screw	1	AA
	7-14	XBPSD40P06KS0	Screw; 4mm x 6mm	2	AA
	7-15	LX-WZA022WRE0	Washer	1	AB
	7-16	XCPSD40P08000	Screw; 4mm x 8mm	5	AA
	7-17	XCPSD30P06000	Screw; 3mm x 6mm	9	AA
	7-18	XOTSD40P12RV0	Screw; 4mm x 12mm	11	AA
	7-19	XFPSD40P08K00	Screw; 4mm x 8mm	4	AA
	7-20	XPBWW30P05K00	Screw; 3mm x 5mm	2	AA
	7-21	XCBWW30P06000	Screw; 3mm x 6mm	4	AA
	7-22	XFPSD40P08000	Screw; 4mm x 8mm	5	AA
	7-23	XFPSD60P14JS0	Screw; 6mm x 14mm	2	AB
	7-24	XOTSD40P12000	Screw; 4mm x 12mm	8	AA
	7-25	XFPSD30P10000	Screw; 3mm x 10mm	1	AC
	7-26	XNESD40-32000	Nut; 4mm x 3.2mm	2	AA
	7-27	XNEUW40-32000	Nut; 4mm x 3.2mm	1	AA
	7-28	XWSUW40-10000	Washer; 4mm x 1 mm	1	AA
	7-29	LX-CZA029WRE0	Special screw	2	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

INFORMATION FOR PARTS CHANGE

The transistors will be changed as follows, and new parts will be used for products from December 1997.

Interchangeability

A. **OLD** ↔ **NEW**

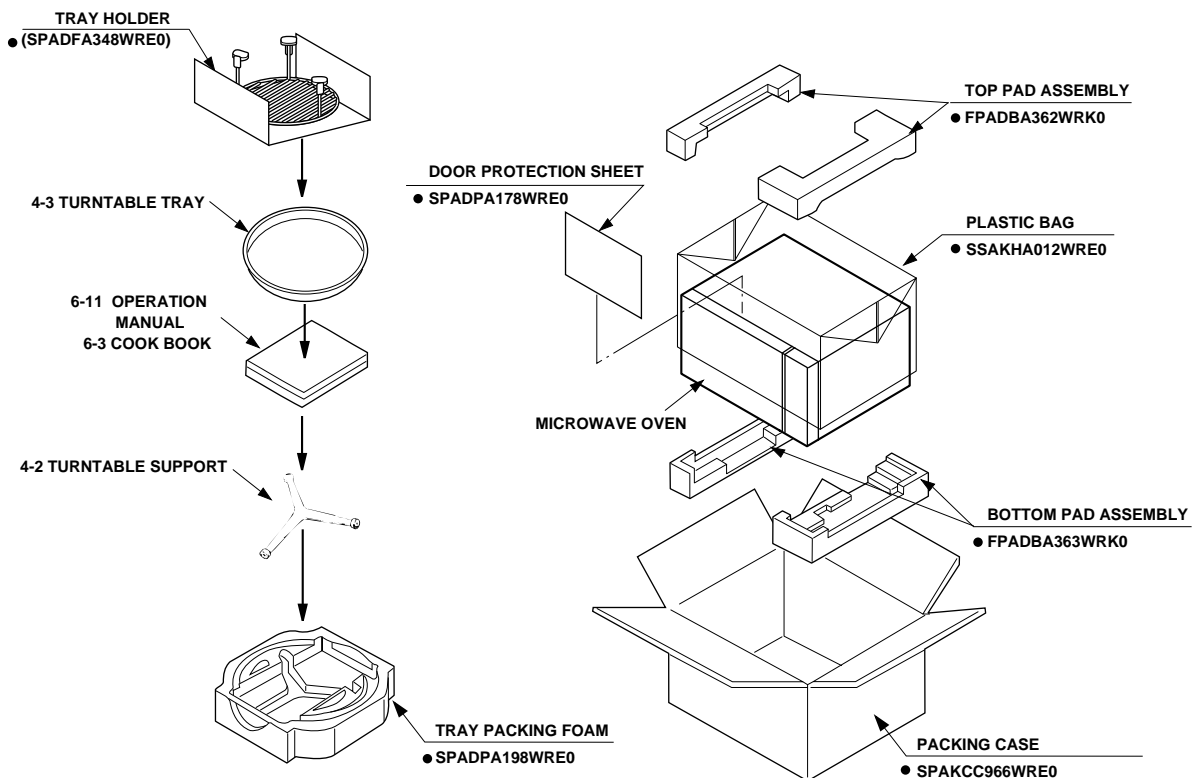
B. **OLD** → **NEW**

C. **OLD** ← **NEW**

D. **OLD** × **NEW**

REF.NO.	DESCRIPTION	REPLACEMENT PART NO.				Interchange-ability	EFFECTIVE FROM	CODE
		OLD No.	Q'ty	NEW No.	Q'ty			
Q3, Q40 Q20-Q23 Q90-Q91	Transistor	VSKRA101M/-3	8	VSDTA143ES/-3	8	A	DEC/ '97	AB
Q24-Q25 Q27	Transistor	VSKRA223M/-3	3	VSDTB143ES/-3	3	A	DEC/ '97	AC
Q26	Transistor	VSKRC243M/-3	1	VSDTD143ES/-3	1	A	DEC/ '97	AB
Q60	Transistor	VSKRC101M/-3	1	VSDTC143ES/-3	1	A	DEC/ '97	AC

PACKING AND ACCESSORIES



• Not replaceable items.

SERVICE MANUAL

SHARP

CONVECTION
MICROWAVE OVEN

R-950A

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.

CAUTION MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

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.

WARNING

Never operate the oven until the following points are ensured.

- (A) The door is tightly closed.
- (B) The door brackets and hinges are not defective.
- (C) The door packing is not damaged.
- (D) The door is not deformed or warped.
- (E) There is not any other visible damage with the oven.

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

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

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

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

SHARP CORPORATION

OSAKA, JAPAN

PRODUCT SPECIFICATIONS

APPEARANCE VIEW

OPERATING SEQUENCE

FUNCTION OF IMPORTANT
COMPONENTS

SERVICING AND
TROUBLESHOOTING CHART

TEST PROCEDURE

TOUCH CONTROL PANEL
ASSEMBLY

COMPONENT REPLACEMENT
AND ADJUSTMENT PROCEDURE

MICROWAVE MEASUREMENT

WIRING DIAGRAM

PARTS LIST

PRODUCT SPECIFICATIONS

ITEM	DESCRIPTION
Power Requirements	220 Volts 50 Hertz Single phase, 3 wire earthed
Power Consumption	1600 W (Microwave) 3150 W (Microwave + Convection) 1600 W (Convection) 2600 W (Microwave + Grill) 1050 W (Grill, 2600 W initially)
Power Output	900 watts (IEC-705) Operating frequency of 2450MHz
Convection heater	1500 W
Grill heater	1000 W
Case Dimensions	Width 627mm Height 378mm Depth 492mm
Cooking Cavity Dimensions	Width 410mm Height 245mm Depth 410mm
Control Complement	Touch Control System Clock (1:00 - 12:59) Timer (0 - 99 min. 99 sec.) Microwave Power for Variable Cooking Repetition Rate; 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 COOKING FUNCTION Temperature for Variable Cooking CONVECTION 40 to 250°C Temp. control SIMUL CONVECTION 230°C with 30% of microwave power GRILL COOKING FUNCTION GRILL Grill cooking SIMUL GRILL Grill cooking with 30% of microwave power HELP pad AUTO REHEAT pad AUTO COOK pad AUTO ROAST pad AUTO GRILL pad AUTO BAKE pad MORE. LESS pads POWER LEVEL pad EASY DEFROST pad KITCHEN TIMER pad NUMBER and TEMPERATURE pads STOP/CLEAR pad CLOCK pad INSTANT COOK/START pad
Set Weight	Approx. 29 kg

GENERAL INFORMATION

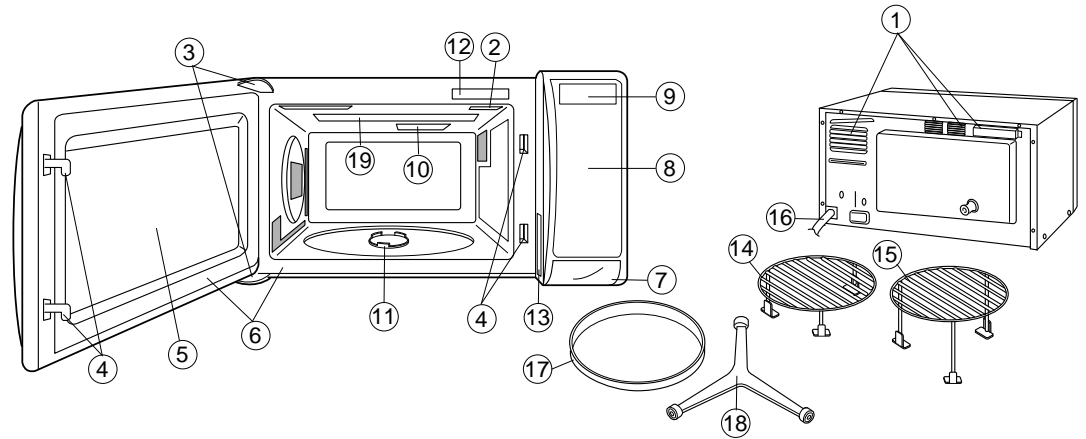
WARNING
THIS APPLIANCE MUST BE EARTHED

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

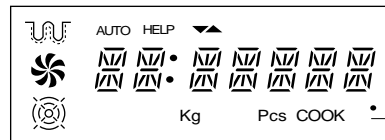
GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

APPEARANCE VIEW

1. Ventilation opening
2. Oven lamp
3. Door hinges
4. Door safety latches
5. See through door
6. Door seal and sealing surfaces
7. Door open button
8. Touch control panel
9. Digital readout
10. Wave guide cover
11. Coupling
12. Menu label
13. Rating label
14. low rack
15. High rack
16. Power supply cord
17. Turntable
18. Roller stay
19. Grill heater



TOUCH CONTROL PANEL



Indicator

AUTO COOK PAD
Press to cook 5 popular menus.

AUTO ROAST PAD
Press to select 3 popular Roast menus.

MORE (▲), LESS (▼) PADS
Press to increase/decrease the time in one minute increments during cooking or to alter the cooking result for the Automatic operations.

CONVECTION COOKING FUNCTION PADS
Press to cook with one of 3 function.

GRILL COOKING FUNCTION PADS
Press to cook with either function.

POWER LEVEL PAD
Press to select microwave power setting. If not pressed, HIGH is automatically selected.

NUMBER AND TEMPERATURE PADS
Press to enter cooking times, clock time or convection temperature.

STOP/CLEAR PAD
Press to clear during programming. Press once to stop operation of oven during cooking; press twice to cancel cooking program.

HELP PAD

Press to select auto start, information guide on/off, child lock, demonstration modes or info on pad. Press to get cooking information.

AUTO REHEAT PAD

Press to select 4 popular Reheat menu.

AUTO BAKE PAD

Press to select 3 popular Baked menus.

AUTO GRILL PAD

Press to select 3 popular Grill menus.

KITCHEN TIMER PAD

Press to set timer.

EASY DEFROST PAD

Press to defrost meat by entering weight.

INSTANT COOK/START PAD

Press once to cook for 1 minute at HIGH or increase by 1 minute multiples each time this pad is pressed during Microwave, Convection, Grill or Simul cooking. Press to start oven after setting programs.

CLOCK PAD

Press to set Clock

OPERATION SEQUENCE

The following is a description of component functions during oven operation.

Relay and Components Connection

RELAY	CONNECTED COMPONENT
RY1	Oven lamp/ Turntable motor
RY2	Power transformer
RY3	Convection heater
RY4	Damper motor
RY5	Convection motor
RY6	Fan motor
RY7	Grill heater

OFF CONDITION

Closing the door activates all door interlock switches: 1st. latch switch and 2nd. interlock relay control switch. (In this condition, the monitor switch contacts are closed.)

When oven is plugged in a wall outlet (220V, 50Hz), rated voltage is supplied to the control unit. (Figure O-1):

1. The display flashes "SHARP", "MICRO-", "WAVE", "OVEN".

To set any programmes or set the clock, you must first touch the STOP/CLEAR pad.

" : " appears in the display and the time counts up every minute.

NOTE: When the oven door is opened, the oven lamp comes on at this time.

2. A signal is input to the control unit, energizing the coil of shut-off relay (RY4). RY4 contacts close, completing a circuit to the damper motor. The damper motor now operates moving the damper to the open position, thereby closing the contacts of damper switch inputs a signal to the control unit. The coil of relay RY4 is de-energized, opening its contacts, thereby turning off the damper motor.

MICROWAVE COOKING CONDITION

HIGH COOKING

Enter cooking time by pressing the NUMBER pads and then select microwave cooking and power level by pressing the POWER LEVEL pad. When the START pad is touched, the following operations occur:

1. The contacts of relays are closed and components connected to relays are turned on (RY1, RY2, RY6). (Figure O-2)
2. Rated voltage 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 2260 volts A.C. on the high voltage winding.
3. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2260 volts) is sent to the voltage doubling circuit.
4. The 2450 MHz microwave energy produced in the magnetron generates a wave length of 12.24 cm. This energy is channelled through the waveguide (transport channel) into the oven cavity, where the food is placed to be cooked.

5. Upon completion of the cooking time, the power transformer, oven lamp, etc. are turned off and the generation of microwave energy is stopped. The oven will revert to the OFF condition..

6. When the door is opened during a cook cycle, the monitor switch, 1st. latch switch and 2nd. interlock relay control switch are activated with the following results. The circuits to the turntable motor, cooling fan motor and high voltage components are de-energized, the oven lamp remains on and the digital read-out displays the time still remaining in the cook cycle when the door was opened.

7. The monitor switch is electrically monitoring the operation of the 1st. latch switch and 2nd. interlock relay control switch and is mechanically associated with the door so that it will function in the following sequence.

- 1) When the door opens from a closed position, the 1st. latch switch and the 2nd. interlock relay control switch open their contacts, and then the monitor switch contacts close.
- 2) When the door is closed, from the open position, the monitor switch contacts first open, and then the contacts of the 1st. latch switch and 2nd. interlock relay control switch must be closed.

If the common and normal open contacts of 1st. latch switch and the 2nd. interlock relay fail with their contacts closed when the door is opened, the closing of the monitor switch contacts will form a short circuit through the fuse, 1st. latch switch and the 2nd. interlock relay, causing the monitor fuse to blow.

MEDIUM HIGH, MEDIUM, MEDIUM LOW, LOW COOKING

When variable cooking power is programmed, the rated voltage is supplied to the power transformer intermittently through the contacts of the relay (RY2) which is operated by the control unit within a 32-second time base. Microwave power operation is follows:

VARI MODE	ON TIME	OFF TIME
HIGH (100% power)	32 sec.	0 sec.
MED HIGH (approx. 70% power)	24 sec.	8 sec.
MED (approx. 50% power)	18 sec.	14sec.
MED LOW (approx. 30% power)	12 sec.	20 sec.
LOW (approx. 10% power)	6 sec.	26 sec.

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.

CONVECTION COOKING CONDITION

PREHEATING CONDITION (Figure O-3)

Press the PREHEAT pad and then select preheating temperature by pressing the temperature pad. When the START pad is touched, the following operations occur:

1. The coil of shut-off relays RY1+RY5+RY6 are energized, the oven lamp, cooling fan motor, turntable motor and convection motor are turned on.
2. The coil of relay (RY4) is energized by the CPU 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 CPU unit de-energizing the relay (RY4) and opening the circuit to the damper motor.

3. The coil of heater relay (RY3) is energized by the CPU unit and the main supply voltage is added to the convection heater.
4. When the oven temperature reaches the selected preheat temperature, the following operations occur:
 - 4-1. The heater relay (RY3) is de-energized by the CPU unit temperature circuit and thermistor, opening the circuit to the convection heater.
 - 4-2. The oven will continue to function for 30 minutes, turning the convection heater on and off, as needed to maintain the selected preheat temperature. The oven will shutdown completely after 30 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. Press the CONVECTION pad and then enter the cooking temperature by pressing the temperature pad. And then enter the cooking time by pressing the NUMBER pads. When the START pad is touched, the following operations occur:

1. The numbers of the digital read-out start the count down to zero.
2. The oven lamp, turntable motor, cooling fan motor and convection motor are energized.
3. Heater relay (RY3) is energized (if the cavity temperature is lower than the selected temperature) and the main supply voltage is applied to the convection heater to return to the selected cooking temperature.
4. Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor, convection motor and convection heater are de-energized. At the end of the convection cycle, if the cavity air temperature is above 118°C, the circuit to (RY6) will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until the temperature drops below 118°C, at which time the relay will be de-energized, turning off the fan motor. Relay (RY5) will however, open as soon as the convection cycle has ended, turning off the convection fan motor. This will now cool and allow the damper door to open.
5. At the end of the convection cook cycle, shut-off relay (RY4) 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 (RY4).

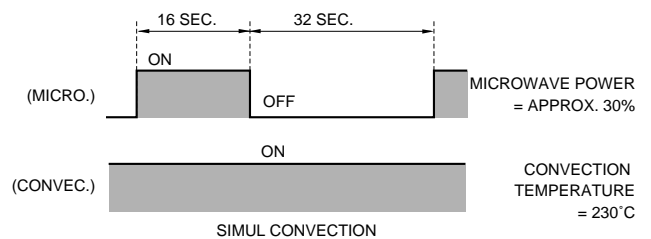
SIMUL CONVECTION COOKING CONDITION (Figure O-5)

Press the SIMUL CONVEC pad. And then enter cooking time by pressing the NUMBER pads. When the START pad is touched, the following operations occur:

1. The numbers of the digital read-out start the count down to zero.
2. The shut-off relays (RY1+RY5+RY6) are energized, turning on the oven lamp, turntable motor, cooling fan motor and convection motor.

3. The shut-off relay (RY4) is energized. The damper door is closed from the open position.
4. The power supply voltage is added to the convection heater and power transformer at the same time.
5. The convection heater operates through the heater relay (RY3) contacts and the power transformer operates through the cook relay (RY2) contacts.
6. Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor, convection motor and power transformer are de-energized. At the end of the cooking cycle, if the cavity air temperature is above 118°C, the circuit to (RY6) will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until the temperature drops below 118°C, at which time the relay will be de-energized, turning off the fan motor.

The relationship between the convection and microwave power operations are as follows.



NOTE:

- 1) The simul convection is programmed for 230°C with 30% microwave power. The microwave power and convection temperature can be changed, but the High (100%) and 250°C can not be selected.
- 2) The relay (RY2) is operated by the CPU unit to supply within a 48 second time base microwave energy.
- 3) During simul convection operation, the convection heater is energized only if the cavity temperature drops below the set temperature.
- 4) The ON and OFF time ratio does not correspond with the percentage of microwave power, because approx. 2 seconds are needed for heating of the magnetron filament.
- 5) "SIMUL" means "Simultaneous".

GRILL COOKING CONDITION (Figure O-4)

Press the GRILL pad and then enter the cooking time by pressing the number pads. When the START pad is touched, the following operations occur:

1. The coil of shut-off relays RY1+RY6+RY7 are energized, the oven lamp, cooling fan motor and turntable motor are turned on.
2. The coil of relay (RY4) is energized by the CPU 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 CPU unit de-energizing the relay (RY4) and opening the circuit to the damper motor.
3. The coil of relay (RY7) is energized by the CPU unit and the main supply voltage is added to the grill heater.
4. At the initial period, the relays RY3 and RY5 are energized and the convection heater and convection motor are energized until the cavity air temperature reaches 220°C.
5. When the temperature exceeds 220°C, the convection

heater and convection motor are turn off.

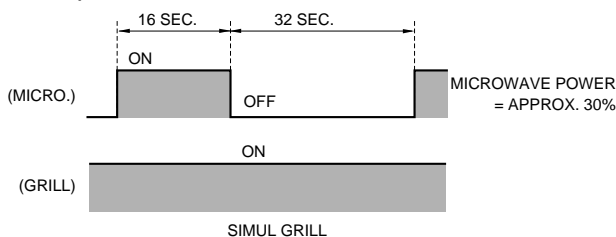
6. Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor and grill heater are de-energized. At the end of the grill cycle, the circuit to RY6 will be maintained to continue operation of the cooling fan motor for 3 minutes if the grill cooking time is longer than 2 minutes, and if the cavity air temperature is above 118°C, the circuit to (RY6) will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until the temperature drops below 118°C, at which time the relay will be de-energized, turning off the fan motor.
7. At the end of the grill cook cycle, shut-off relay (RY4) 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 (RY4).

SIMUL GRILL COOKING CONDITION (Figure O-6)

Press the SIMUL GRILL pad. And then enter cooking time by pressing the NUMBER pads. When the START pad is touched, the following operations occur:

1. The numbers of the digital read-out start the count down to zero.
2. The shut-off relays (RY1+ RY6) are energized, turning on the oven lamp, turntable motor and cooling fan motor.
3. The shut-off relay (RY4) is energized.
The damper door is closed from the open position.
4. The power supply voltage is added to the grill heater and power transformer at the same time.
5. The grill heater operates through the relay (RY7) contacts and the power transformer operates through the cook relay (RY2) contacts.
6. Upon completion of the cooking time, the audible signal will sound, and oven lamp, turntable motor, cooling fan motor, grill heater and power transformer are de-energized. At the end of the simul grill cycle, the circuit to RY6 will be maintained to continue operation of the cooling fan motor for 3 minutes if the grill cooking time is longer than 2 minutes, and if the cavity air temperature is above 118°C, the circuit to (RY6) will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until the temperature drops below 118°C, at which time the relay will be de-energized, turning off the fan motor.

The relationship between the convection and microwave power operations are as follows.



NOTE:

- 1) The Simul Grill is programmed with 30% microwave power. The microwave power can be changed.
- 2) The relay (RY2) is operated by the CPU unit to supply within a 48 second time base microwave energy.
- 3) During Simul Grill operation, the grill heater is energized continuously. But after the Simul Grill cooking exceeds 20 minutes, the RY2 will be de-

energized automatically turning off the power transformer to protect the oven.

- 4) The ON and OFF time ratio does not correspond with the percentage of microwave power, because approx. 2 seconds are needed for heating of the magnetron filament.
- 5) "SIMUL" means "Simultaneous".

AUTO COOK/AUTO REHEAT

AUTO COOK/AUTO REHEAT will automatically compute and set the microwave power and cooking time. Select the menu by touching the AUTO COOK/AUTO REHEAT pad. Enter the weight / quantity by touching the Number pads. When the START pad is touched, the oven works on Microwave cooking mode according to the special cooking sequence.

EASY DEFROST COOKING

The EASY DEFROST key is a special function key to defrost meats and poultry faster and better. EASY DEFROST key has 4 defrost stages. EASY DEFROST automatically defrosts roast beef, etc. When EASY DEFROST is selected and the food weight is entered by using the number pads, the oven will cook according to the special cooking sequence. (Figure O-2)

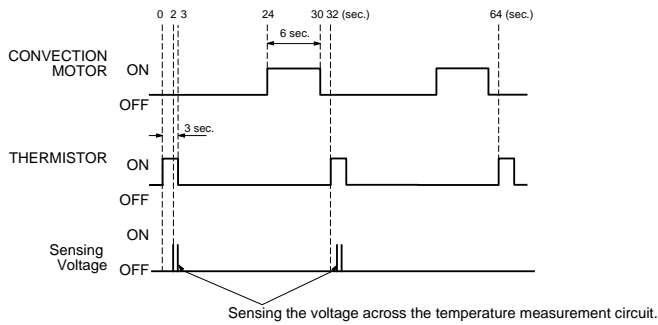
FIRE SENSING FEATURE (MICROWAVE MODE)

This model incorporates a sensing feature which will stop the oven's operation if there is a fire in the oven cavity during microwave cooking. This accomplished by the LSI repeatedly measures the voltage across the temperature measurement circuit (thermistor) during it's 32-seconds time base comparing the obtained voltage measurements. If the most recent voltage measured is 300mV grater than the previous voltage measured, the LSI judges it as a fire in the oven cavity and switches off the relays to the power transformer, fan motor and convection motor. The LSI also stops counting down and closes the damper door so that no fresh air will enter the oven cavity. Please refer to the following section for a more detailed description.

Operation

Please refer to the timing diagrams below.

1. The thermistor operates within a 32-seconds time base and it is energized for three (3) seconds and off for 29 seconds. Two (2) seconds after the thermistor is energized, the voltage across the temperature measurement circuit is sampled by the LSI and twenty one (21) seconds after the thermistor is cut off the LSI turns on the cooling fan for six (6) seconds.
2. The above procedure is repeated. If the difference between the first voltage measured (in step 1) and the voltage measured when the procedure is repeated (step 2) is greater than 300mV the LSI makes the judgment that there is a fire in the oven cavity and will switch off the relays to the power transformer, fan motor and convection motor. The LSI also stops counting down and closes the damper door so that no fresh air will enter the oven cavity.
3. Once the fire sensor feature has shut the unit down, the programmed cooking cycle may be resumed by pressing the "START" pad or the unit may be reset by pressing the "CLEAR" pad.



AUTO ROAST/ AUTO GRILL/ AUTO BAKE

AUTO ROAST/ AUTO GRILL/ AUTO BAKE will automatically compute and set the cooking mode, oven temperature, microwave power and the cooking time. Select the menu by touching the AUTO ROAST, AUTO GRILL, or AUTO BAKE pad, and enter the weight/ quantity by touching the number pads. When the START pad is touched, the oven works on Simul Cooking mode, Convection Cooking mode or Grill Cooking mode according to the special cooking sequence.

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

The door is opened by pushing the open button on the control panel, refer to the Figure D-1.

When the open button is pushed, the open lever pushes up the switch lever, and then the switch lever pushes up the latch head. The latch heads are moved upward and released from latch hook. Now the door will open.

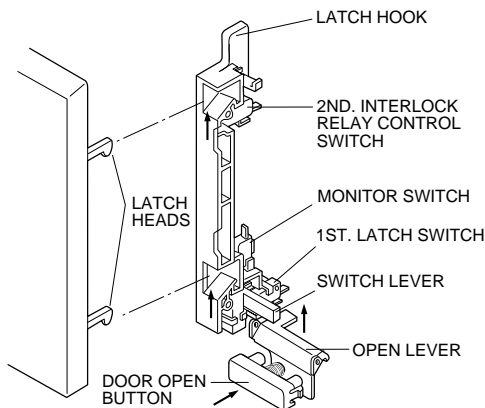


Figure D-1. Door Open Mechanism

1ST. LATCH SWITCH, 2ND. INTERLOCK RELAY CONTROL SWITCH

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

MONITOR SWITCH

1. When the door is closed, the contacts (COM-NC) must be opened.
2. When the oven door is opened, the contacts (COM-NC) must be closed.
3. If the oven door is opened and the contacts (COM-NC) of 1st. latch switch and 2nd. interlock relay fail to open, the fuse M8A blows simultaneously with closing the contacts (COM-NC) of the monitor switch.

CAUTION: BEFORE REPLACING A BLOWN FUSE M8A TEST THE 1ST. LATCH SWITCH, 2ND. INTERLOCK RELAY, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION. (REFER TO CHAPTER "TEST PROCEDURE").

THERMAL CUT-OUT 170°C (CONV.)

The thermal cut-out protect the convection motor or outer case cabinet against overheating. If its temperature of the thermal cut-out goes up higher than 170°C because the convection fan or cooling fan is interrupted, the ventilation openings are obstructed or other abnormal matter occurs, thermal cut-out will open and switch off the oven. When the oven cools itself down to the operating temperature of 155°C, the contacts of the thermal cut-out will close again.

THERMAL CUT-OUT 125°C (GRILL)

This thermal cut-out protects the outer case cabinet against overheating. If the temperature goes up higher than 125°C because the fan motor is interrupted or the ventilation openings are blocked, the thermal cut-out will open and line voltages to the all electrical parts will be cut off and the operation of the oven will be stopped. The defective thermal cut-out must be replaced with a new one.

THERMAL CUT-OUT 95°C (FAN MOTOR)

The thermal cut-out protect the fan motor against overheating. If its temperature goes up higher than 95°C because the fan motor is locked or the ventilation operating are blocked, the contacts of the thermal cut-out will open and switch off all electrical parts. When the thermal cut-out cools itself down to 75°C, the contacts of the thermal cut-out will close again.

TEMPERATURE FUSE 150°C (MG)

This fuse protects the magnetron against overheating. If the temperature goes up higher than 150°C because the

fan motor is interrupted, the air inlet duct is blocked or the ventilation openings are obstructed, the fuse blows and cuts off the power supplying to all electrical parts. The defective fuse must be replaced with new rated one.

FUSE M10A 250V

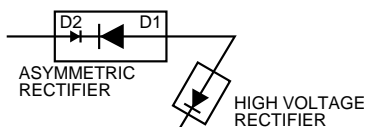
1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. The fuse also blows when 1st. latch switch and 2nd. interlock relay remain closed with the oven door open and when the monitor switch closes.
3. The fuse M10A also blows when asymmetric rectifier, H.V. rectifier, H.V. wire harness, H.V. capacitor, magnetron or secondary winding of power transformer is shorted.

FUSE 20A

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

ASYMMETRIC RECTIFIER

The asymmetric rectifier is a solid state device that prevents current flow in both directions. And it prevents the temperature rise of the power transformer by blowing the fuse M10A when the high voltage rectifier is shorted.



The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV. The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of blowing the fuse M10A.)

1. The high voltage rectifier is shorted by any causes when microwave cooking.
2. The peak reverse voltage of D2 of the rectifier goes beyond the rated peak reverse voltage 1.7 KV in the voltage doubler circuit.
3. D2 of the rectifier is shorted.
4. The large electric currents flow through the high voltage winding of the power transformer.
5. The large electric currents beyond 10A flow through the primary winding of the power transformer.
6. The fuse M10A blows by the large electric currents.
7. The power supply to the power transformer is cut off.

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 heating element relay to operate, thus the current to the heating element is turned ON/OFF.

MONITOR RESISTOR

The monitor resistor prevents the fuse M10A 250V bursting when the fuse M10A 250V blows due to the operation of the monitor switch.

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

CONVECTION HEATER

The convection heater is located at the left side 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 heater.

GRILL HEATER

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

CONVECTION COOKING SYSTEM

This oven is designed with a hot air heating system where food is not directly heated by the convection heater, but is heated by forced circulation of the hot air produced by the convection heater. The air heated by the convection heater 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 left 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 left side wall. Without leaving the oven, this hot air is reheated by the convection heater, 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 heater is de-energized. When the temperature inside the oven cavity drops below the selected temperature, the convection heater 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 heater is de-energized and the convection fan stops operating and the oven shuts off. 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 RY6 will be maintained (by the thermistor circuit) to continue operation of the cooling fan motor until the temperature drops below 118°C, at which time the relay will be de-energized, turning off the fan motor. Relay RY5 will however, open as soon as the convection cycle has ended, turning off the convection fan motor. This will now cool and allow the damper door to open.

DAMPER OPEN-CLOSE MECHANISM

Usually, the damper is in the open position except during convection 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 or convection cooking operation is selected by the CPU unit.

Microwave Cooking:

Damper is in the open position, because a portion of cooling air is channelled through the cavity to remove steam and vapours 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, a signal is sensed in the control unit, and operates shut-off relay (RY4).
 - 1-2. Contacts of shut-off relay (RY4) 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 (RY4) is turned off.
 - 1-5. The rated voltage 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, temperature and START pads.
 - 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 (RY4) 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 (RY4) is energized, and the damper is returned to the open position.

NOTE: If the damper door is not in the proper position, closed during convection or open during microwave, the control unit will stop oven operation after 1 minute.

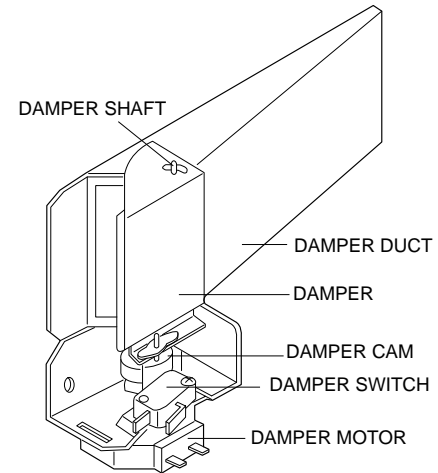


Figure D-2. Damper Mechanism

NOISE FILTER

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

Cooking Mode	Operation of Damper
Microwave cooking	OPEN
Convection cooking	CLOSE
Grill cooking	CLOSE
Simul Convection cooking	CLOSE
Simul Grill cooking	CLOSE

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. High voltage capacitor, Power transformer, Magnetron, High voltage rectifier assembly, High voltage harness.

REMEMBER TO CHECK 3D

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

WARNING: AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

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

Sharp recommend that wherever possible fault-finding is carried out with the supply disconnected. It may in, some cases, be necessary to connect the supply after the outer case has been removed, in this event carry out 3D checks and then disconnect the leads to the primary of the 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 microwave leakage test should be 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 M10A in the 1st. latch switch -2nd. interlock relay - monitor switch - monitor resistor circuit, check the 1st. latch switch, 2nd. interlock relay, 2nd. interlock relay control switch, monitor switch and monitor resistor before replacing the fuse M10A.

11

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
A	MAGNETRON TEST <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>NEVER TOUCH ANY PART IN THE CIRCUIT WITH YOUR HAND OR AN INSULATED TOOL WHILE THE OVEN IS IN OPERATION.</p> </div> <p>CARRY OUT <u>3D</u> CHECK.</p> <p>Isolate the magnetron from high voltage circuit by removing all leads connected to filament terminal.</p> <p>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.</p> <p>To test for short filament to anode condition, connect ohmmeter between one of the filament terminals and the case of the magnetron (ground). This test should be indicated an infinite resistance. If a low or zero resistance reading is obtained then the magnetron should be replaced.</p> <p>MICROWAVE OUTPUT POWER (IEC 705)</p> <p>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 IEC 705, 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 $P \times t / 4.187$ 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 $V \times \Delta T$.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>The formula is as follows;</p> $P \times t / 4.187 = V \times \Delta T \quad P (W) = 4.187 \times V \times \Delta T / t$ <p>Our condition for water load is as follows:</p> <p>Room temperature.....around 20°C Power supply Voltage.....Rated voltage</p> <p>Water load.....1000 g Initial temperature.....10±2°C Heating time.....47 sec.</p> <p>$P = 90 \times \Delta T$</p> </div> <p>Measuring condition:</p> <ol style="list-style-type: none"> Container The water container must be a cylindrical borosilicate glass vessel having a maximum material thickness of 3 mm and an outside diameter of approximately 190 mm. Temperature of the oven and vessel The oven and the empty vessel are at ambient temperature prior to the start the test. Temperature of the water The initial temperature of the water is (10±2)°C. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5°C. Select stirring devices and measuring instruments in order to minimize addition or removal of heat. The graduation of the thermometer must be scaled by 0.1°C at minimum and accurate thermometer. The water load must be (1000±5) g. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included. <p>NOTE: The operation time of the microwave oven is "t + 2" sec. 2 sec. is magnetron filament heat-up time.</p> <p>Measuring method:</p> <ol style="list-style-type: none"> Measure the initial temperature of the water before the water is added to the vessel. (Example: The initial temperature T1 = 11°C) Add the 1 litre water to the vessel. Place the load on the centre of the shelf. Operate the microwave oven at HIGH for the temperature of the water rises by a value ΔT of (10 ± 2)°C. Stir the water to equalize temperature throughout the vessel. Measure the final water temperature. (Example: The final temperature T2 = 21°C) Calculate the microwave power output <u>P</u> in watts from above formula.

TEST PROCEDURES

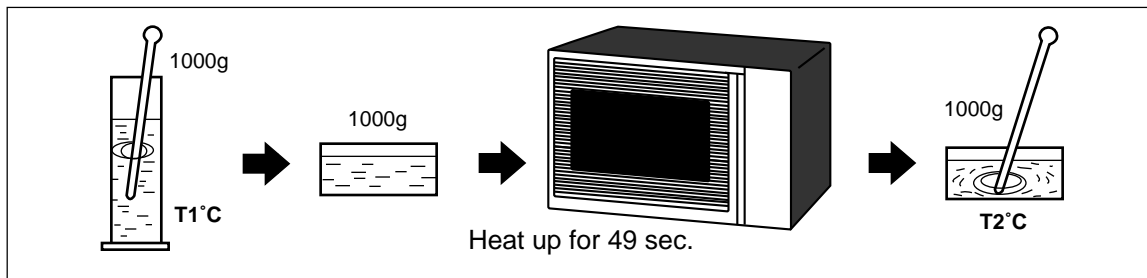
PROCEDURE LETTER

COMPONENT TEST

Initial temperature $T1 = 11^{\circ}\text{C}$
 Temperature after $(47 + 2) = 49$ sec. $T2 = 21^{\circ}\text{C}$
 Temperature difference Cold-Warm $\Delta T1 = 10^{\circ}\text{C}$
 Measured output power
 The equation is " $P = 90 \times \Delta T$ " $P = 90 \times 10^{\circ}\text{C} = 900$ Watts

JUDGMENT: The measured output power should be at least $\pm 15\%$ of the rated output power.

CAUTION: 1°C CORRESPONDS TO 90 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 of the high-voltage 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 approx. $1.0\ \Omega$
- b. Secondary winding approx. $66\ \Omega$
- c. Filament winding less than $1\ \Omega$

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

CARRY OUT 4R CHECKS.

C

HIGH VOLTAGE RECTIFIER ASSEMBLY TEST

HIGH VOLTAGE RECTIFIER TEST

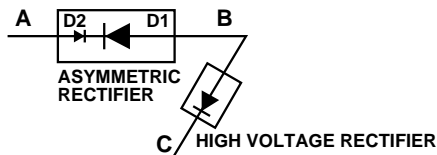
CARRY OUT 3D CHECKS.

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 $100\ \text{k}\Omega$ 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 can be tested using an ohmmeter set to its highest range across the terminals A+B of the asymmetric rectifier and note the reading obtained. Reverse the meter leads and note this second reading. If an open circuit is indicated in both direction then the asymmetric rectifier is good. If an asymmetric rectifier is shorted in either direction, then the asymmetric rectifier is probably faulty and must be replaced with high voltage rectifier. When the asymmetric rectifier is defective, check whether magnetron, high voltage

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

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.

A. Isolate the high voltage capacitor from the circuit.

B. Continuity check must be carried out with measuring instrument which is set to the highest resistance range.

C. A normal capacitor shows continuity for a short time (kick) and then a resistance of about 10MΩ after it has been charged.

D. A short-circuited capacitor shows continuity all the time.

E. An open capacitor constantly shows a resistance about 10 MΩ because of its internal 10MΩ resistance.

F. When the internal wire is opened in the high voltage capacitor shows an infinite resistance.

G. The resistance across all the terminals and the chassis must be infinite when the capacitor is normal.

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

CARRY OUT 4R CHECKS.

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	COM; Common terminal
Released	Open Circuit	Short Circuit	NO; Normally open terminal
Depressed	Short Circuit	Open Circuit	NC; Normally close terminal

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

CARRY OUT 4R CHECKS.

F

BLOWN FUSE M10A

CARRY OUT 3D CHECKS.

1. If the fuse M10A is blown, there could be shorts or grounds in electrical parts or wire harness. Check them and replace the defective parts or repair the wire harness.

2. If the fuse M10A is blown when the door is opened, check the 1st. latch switch, 2nd interlock relay control switch, 2nd interlock relay, monitor switch and monitor resistor.

If the fuse M10A is blown by incorrect door switching, replace the defective switch(es) and the fuse M10A.

3. If the fuse M10A is blown, there could be short in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may have occured due to short 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 fuse M10A with the correct value replacement.

G

FUSE 20A

CARRY OUT 3D CHECKS.

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

CARRY OUT 4R CHECKS.

CAUTION: Only replace fuse 20A with the correct value replacement.

TEST PROCEDURES

PROCEDURE LETTER

COMPONENT TEST

H

TEMPERATURE FUSE AND 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 two terminals as described in the table below.

CARRY OUT 4R CHECKS.

Table: Temperature Fuse and Thermal cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit) (°C)	Temperature of "OFF" condition (open circuit) (°C)	Indication of ohmmeter (When room temperature is approx. 20°C)
Thermal cut-out 170°C	Below 155°C	Above 170°C	Closed circuit.
Temp. fuse 150°C	This is not resetable type.	Above 150 °C	Closed circuit
Thermal cut-out 125°C	This is not resetable type.	Above 125°C	Closed circuit.
Thermal cut-out 95°C	Below 75°C	Above 95°C	Closed circuit.

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

An open circuit thermal cut-out 170°C (CONV.) indicates that the convection motor has over heated, this may be due to locked convection fan or cooling fan.

An open circuit temperature fuse 150°C (MG) indicates that the magnetron has overheated, this may be due to resistricted ventilation, cooling fan failure or a fault condition within the magnetron or HV circuit.

An open circuit thermal cut-out 125°C (GRILL) indicates that the outer case cabinet has overheated, this may be due to resistricted ventilation or cooling fan failure.

An open circuit thermal cut-out 95°C (FM) indicates that the fan motor winding has overheated, this may be due to blocked ventilation or locked cooling fan.

I

CONVECTION HEATER AND GRILL HEATER TEST

CARRY OUT 3D CHECKS.

Before carring out the following tests make sure the heater is cool completely.

1. Resistance of heater

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

Table: Resistance of heater

Parts name	Resistance
Convection heater	Approximately 32Ω
Grill heater	Approximately 24Ω x 2 = 48Ω

2. Insulation resistance

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

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

CARRY OUT 4R CHECKS.

J

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-3 and E-4 of the thermistor harness.

Room Temp. 20°C - 30°C

Resistance Approx. 350kΩ - 155kΩ

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

CARRY OUT 4R CHECKS.

TEST PROCEDURES

PROCEDURE
LETTER

COMPONENT TEST

K

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 295 Ω
Turntable motor	Approximately 19.2 k Ω
Convection fan motor	Approximately 210 Ω
Damper motor	Approximately 11 k Ω

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS.

L

MONITOR RESISTOR TESTCARRY OUT 3D CHECKS.

Disconnect the leads from the monitor resist. Using an ohmmeter and set on a low range. Check between the terminals of the monitor resistor.

The resistance of monitor resistor is approx. 0.8 ohms.

If incorrect readings are obtained, replace the monitor resistor.

CARRY OUT 4R CHECKS.

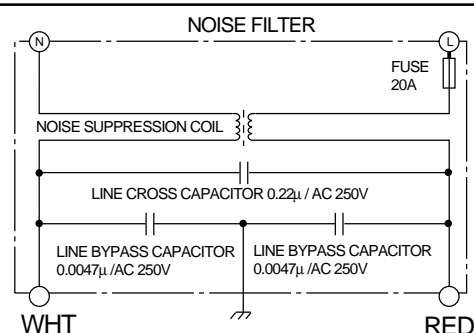
M

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.

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



MEASURING POINT	INDICATION OF OHMMETER
Between N and L	Open circuit
Between terminal N and WHITE	Short circuit
Between terminal L and RED	Short circuit

CARRY OUT 4R CHECKS.

N

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 and troubleshooting by unit replacement is described according to the symptoms indicated.

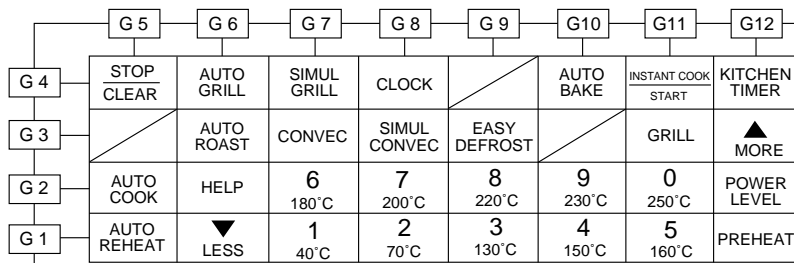
1. Key Unit. Note: Check key unit ribbon connection before replacement.
The following symptoms indicate a defective key unit. Replace the key unit.
 - a) When touching the pads, a certain pad produces no signal at all.
 - b) When touching a number pad, two figures or more are displayed.
 - c) When touching the pads, sometimes a pad produces no signal.
2. Control Unit.
The following symptoms indicate a defective control unit. Replace the control unit.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
2-1	In connection with pads.
	a) When touching the pads, a certain group of pads do not produce a signal.
	b) When touching the pads, no pads produce a signal.
2-2	In connection with indicators.
	a) At a certain digit, all or some segments do not light up.
	b) At a certain digit, brightness is low.
	c) Only one indicator does not light.
	d) The corresponding segments of all digits do not light up; or they continue to light up.
	e) Wrong figure appears.
	f) A certain group of indicators do not light up.
	g) The figure of all digits flicker.
2-3	Other possible troubles caused by defective control unit.
	a) Buzzer does not sound or continues to sound.
	b) Clock does not operate properly.
	c) Cooking is not possible.
	d) Proper temperature measurement is not obtained.

O KEY UNIT TEST

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



P RELAY TEST

Remove the outer case and check voltage between Pin No 7 of the 4-pin connector (A) and the common terminal of the relay RY1 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 operation 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. 21.0V D.C.	Oven lamp / Turntable motor
RY2(COOK)	APPROX. 20.0V D.C.	Power transformer
RY3(HEATER)	APPROX. 20.0V D.C.	Convection heater
RY4	APPROX. 21.0V D.C.	Damper motor
RY5	APPROX. 21.0V D.C.	Convection motor
RY6	APPROX. 21.0V D.C.	Cooling fan motor
RY7	APPROX. 21.0V D.C.	Grill heater

TEST PROCEDURES

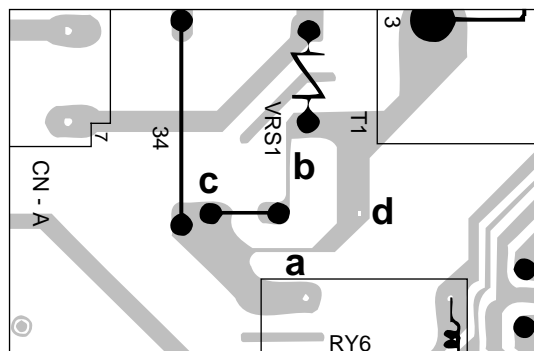
PROCEDURE LETTER	COMPONENT TEST
Q	PROCEDURES TO BE TAKEN WHEN THE FOIL PATTERN ON THE PRINTED WIRING BOARD (PWB) IS OPEN

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.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated voltage is not applied between Pin No. 7 of the 4-pin connector (A) and the common terminal of the relay RY1.	Check supply voltage and oven power cord.
2	The rated voltage is applied to primary side of power transformer.	Power transformer or secondary circuit defective. Check and repair.
3	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder.
4	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d".

NOTE: *At the time of making these repairs, make a visual inspection of the varistor. check for burned damage and examine the 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.



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 the signals communicated among them are explained below.

Key Unit

The key unit is composed of a matrix, signals generated in the LSI are sent to the key unit through P10-P17. When a key pad is touched, a signal is completed through the key unit and passed back to the LSI through R24-R27 to perform the function that was requested.

Control Unit

Control unit consists of LSI, power source circuit, synchronizing signal circuit, ACL circuit, buzzer circuit, temperature measurement circuit, relay 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 the voltages necessary for the control unit from the AC line voltage.

3) Synchronizing Signal Circuit

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

4) ACL Circuit

A circuit to generate a signals which resetting the LSI to the initial state when power is applied.

5) Buzzer Circuit

The buzzer is responds to signals from the LSI to emit noticing sounds (key touch sound and completion sound).

6) Temperature Measurement Circuit : (OVEN THERMISTOR)

The temperature in the oven cavity is sensed by the thermistor. The variation of resistance according to sensed temperature is detected by the temperature measurement circuit and the result applied to LSI. The LSI uses this information to control the relay and display units.

7) Door Sensing Switch

A switch to inform 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, turntable motor 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.


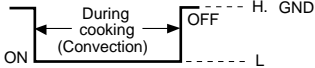
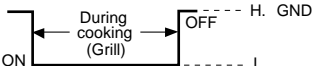
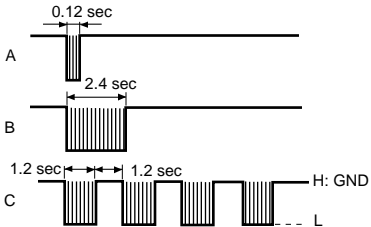
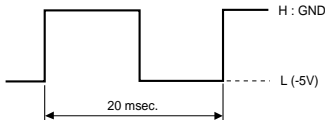
The Fluorescent Display has 8-digits, 17-segments are used for displaying figures.

DESCRIPTION OF LSI

LSI(IZA850DR):

The I/O signals of the LSI(IZA850DR) are detailed in the following table.

Pin No.	Signal	I/O	Description																		
1	VCC	IN	Connected to GND.																		
2	VEE	IN	Anode (segment) of Fluorescent Display light-up voltage: -30V. Vp voltage of power source circuit input.																		
3	AVSS	IN	Power source voltage: -5V. VC voltage of power source circuit input.																		
4	VREF	IN	Reference voltage input terminal. A reference voltage applied to the A/D converter in the LSI. Connected to GND.(0V)																		
5-6	AN7-AN6	IN	Terminal not used.																		
7-9	AN5-AN3	IN	Heating constant compensation terminal.																		
10	AN2	IN	Input signal which communicates the door open/close information to LSI. Door closed; "H" level signal(0V). Door opened; "L" level signal(-5V).																		
11	AN1	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).																		
12	AN0	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.																		
13	P55	OUT	Digit selection signal. The relationship between digit signal and digit are as follows; <table><tr><th>Digit signal</th><th>Digit</th></tr><tr><td>P03</td><td>1st.</td></tr><tr><td>P02</td><td>2nd.</td></tr><tr><td>P01</td><td>3rd.</td></tr><tr><td>P00</td><td>4th.</td></tr><tr><td>P37</td><td>5th.</td></tr><tr><td>P36</td><td>6th.</td></tr><tr><td>P35</td><td>7th.</td></tr><tr><td>P55</td><td>8th.</td></tr></table> <p>Normally, one pulse is output in every β period, and input to the grid of the Fluorescent Display.</p>	Digit signal	Digit	P03	1st.	P02	2nd.	P01	3rd.	P00	4th.	P37	5th.	P36	6th.	P35	7th.	P55	8th.
Digit signal	Digit																				
P03	1st.																				
P02	2nd.																				
P01	3rd.																				
P00	4th.																				
P37	5th.																				
P36	6th.																				
P35	7th.																				
P55	8th.																				
14	P54	OUT	Oven lamp and turntable motor driving signal. (Square Waveform : 50Hz) To turn on and off the shut-off relay(RY1). The square waveform voltage is delivered to the relay(RY1) driving circuit. 																		
15	P53	OUT	Convection motor driving signal. To turn on and off shut-off relay(RY5). "L" level during CONVECTION and during back up for GRILL; "H" level otherwise. 																		
16	P52	OUT	Cooling fan motor driving signal. To turn on and off shut-off relay(RY6). "L" level during both microwave and convection cooking; "H" level otherwise. 																		
17	P51	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.																		

Pin No.	Signal	I/O	Description																																																
			<div>ON / OFF time ratio in Microwave cooking (a 32 second time base)</div> <table><tr><th>VARI MODE</th><th>ON TIME</th><th>OFF TIME</th></tr><tr><td>HIGH (100% power)</td><td>32 sec.</td><td>0 sec.</td></tr><tr><td>MED HIGH (approx. 70% power)</td><td>24 sec.</td><td>8 sec.</td></tr><tr><td>MED (approx. 50% power)</td><td>18 sec.</td><td>14 sec.</td></tr><tr><td>MED LOW (approx. 30% power)</td><td>12 sec.</td><td>20 sec.</td></tr><tr><td>LOW (approx. 10% power)</td><td>6 sec.</td><td>26 sec.</td></tr></table> <div>ON / OFF time ratio in Simul Convection cooking or Simul Grill cooking (a 48 second time base)</div> <table><tr><th>VARI MODE</th><th>ON TIME</th><th>OFF TIME</th></tr><tr><td>HIGH (100% power)</td><td>48 sec.</td><td>0 sec.</td></tr><tr><td>MED HIGH (approx. 70% power)</td><td>36 sec.</td><td>12 sec.</td></tr><tr><td>MED (approx. 50% power)</td><td>26 sec.</td><td>22 sec.</td></tr><tr><td>MED LOW (approx. 30% power)</td><td>16 sec.</td><td>32 sec.</td></tr><tr><td>LOW (approx. 10% power)</td><td>8 sec.</td><td>40 sec.</td></tr></table>	VARI MODE	ON TIME	OFF TIME	HIGH (100% power)	32 sec.	0 sec.	MED HIGH (approx. 70% power)	24 sec.	8 sec.	MED (approx. 50% power)	18 sec.	14 sec.	MED LOW (approx. 30% power)	12 sec.	20 sec.	LOW (approx. 10% power)	6 sec.	26 sec.	VARI MODE	ON TIME	OFF TIME	HIGH (100% power)	48 sec.	0 sec.	MED HIGH (approx. 70% power)	36 sec.	12 sec.	MED (approx. 50% power)	26 sec.	22 sec.	MED LOW (approx. 30% power)	16 sec.	32 sec.	LOW (approx. 10% power)	8 sec.	40 sec.												
VARI MODE	ON TIME	OFF TIME																																																	
HIGH (100% power)	32 sec.	0 sec.																																																	
MED HIGH (approx. 70% power)	24 sec.	8 sec.																																																	
MED (approx. 50% power)	18 sec.	14 sec.																																																	
MED LOW (approx. 30% power)	12 sec.	20 sec.																																																	
LOW (approx. 10% power)	6 sec.	26 sec.																																																	
VARI MODE	ON TIME	OFF TIME																																																	
HIGH (100% power)	48 sec.	0 sec.																																																	
MED HIGH (approx. 70% power)	36 sec.	12 sec.																																																	
MED (approx. 50% power)	26 sec.	22 sec.																																																	
MED LOW (approx. 30% power)	16 sec.	32 sec.																																																	
LOW (approx. 10% power)	8 sec.	40 sec.																																																	
18	P50	OUT	<div>Damper motor relay driving signal.</div> <div>To turn on and off shut-off relay(RY4).</div> <div></div>																																																
19	P47	OUT	<div>Convection heater driving signal.</div> <div>To turn on and off shut-off relay(RY3). "L" level during convection cooking and during back up for GRILL ; "H" level otherwise. During convection cooking, the signal becomes "H" level when the temperature of the oven cavity exceeds the pre-determined temperature.</div> <div></div>																																																
20	P46	OUT	<div>Segment data signals.</div> <div>The relation between signals and indicators are as follows:</div> <table><tr><td>Signal</td><td>Segment</td><td>Signal</td><td>Segment</td><td>Signal</td><td>Segment</td><td>Signal</td><td>Segment</td></tr><tr><td>P23</td><td>..... P1</td><td>P16</td><td>..... P6</td><td>P12</td><td>..... P10</td><td>P06</td><td>..... P14</td></tr><tr><td>P22</td><td>..... P2</td><td>P15</td><td>..... P7</td><td>P11</td><td>..... P11</td><td>P05</td><td>..... P15</td></tr><tr><td>P21</td><td>..... P3</td><td>P14</td><td>..... P8</td><td>P10</td><td>..... P12</td><td>P04</td><td>..... P16</td></tr><tr><td>P20</td><td>..... P4</td><td>P13</td><td>..... P9</td><td>P07</td><td>..... P13</td><td>P46</td><td>..... P17</td></tr><tr><td>P17</td><td>..... P5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	Signal	Segment	Signal	Segment	Signal	Segment	Signal	Segment	P23 P1	P16 P6	P12 P10	P06 P14	P22 P2	P15 P7	P11 P11	P05 P15	P21 P3	P14 P8	P10 P12	P04 P16	P20 P4	P13 P9	P07 P13	P46 P17	P17 P5						
Signal	Segment	Signal	Segment	Signal	Segment	Signal	Segment																																												
P23 P1	P16 P6	P12 P10	P06 P14																																												
P22 P2	P15 P7	P11 P11	P05 P15																																												
P21 P3	P14 P8	P10 P12	P04 P16																																												
P20 P4	P13 P9	P07 P13	P46 P17																																												
P17 P5																																																		
21	P45	OUT	Terminal not used.																																																
22	P44	OUT	<div>Grill heater driving signal.</div> <div>To turn on and off shut-off relay(RY3). "L" level during grill cooking; "H" level otherwise. During grill cooking, the signal becomes "H" level when the temperature of the oven cavity exceeds the predetermined temperature.</div> <div></div>																																																
23	P43	OUT	<div>Signal to sound buzzer.</div> <div>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 (30 minutes) is elapsed.</div> <div></div>																																																
24	P42	OUT	<div>Timing signal output terminal for temperature measurement(OVEN THERMISTOR).</div> <div>"H" level (GND) : Thermistor OPEN timing. "L" level (-5V) : Temperature measuring timing.(Convection cooking and back up for Grill)</div>																																																
25	INT1	IN	<div>Signal to synchronize LSI with commercial power source frequency.</div> <div>This is the basic timing for all real time processing of LSI.</div> <div></div>																																																
26	P40	IN	Connected to GND.																																																
27	RST	IN	<div>Auto clear terminal.</div> <div>Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.</div>																																																

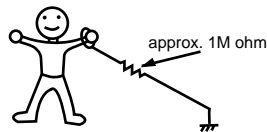
Pin No.	Signal	I/O	Description
28/29	XCIN/XCOUT	OUT	Terminal not used.
30	XIN	IN	Internal clock oscillation frequency setting input. The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.
31	XOUT	OUT	Internal clock oscillation frequency control output. Output to control oscillation input of XIN.
32	VSS	IN	Power source voltage: -5V. VC voltage of power source circuit input.
33	P27	IN	Signal coming from touch key. When any one of G-1 line keys on key matrix is touched, a corresponding signal from P17 - P17 will be input into P27. When no key is touched, the signal is held at "L" level.
34	P26	IN	Signal similar to P27. When any one of G-2 line key on key matrix is touched, a corresponding signal will be input into P26.
35	P25	IN	Signal similar to P27. When any one of G-3 line key on key matrix is touched, a corresponding signal will be input into P25.
36	P24	IN	Signal similar to P27. When any one of G-4 line key on key matrix is touched, a corresponding signal will be input into P24.
37-40	P23-P20	OUT	Segment data signal. Signal similar to P46.
41	P17	OUT	Segment data signal. Signal similar to P46. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P24-P27 terminal while one of G-12 line keys on key matrix is touched.
42	P16	OUT	Segment data signal. Signal similar to P46. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P24-P27 terminal while one of G-11 line keys on key matrix is touched.
43	P15	OUT	Segment data signal. Signal similar to P46. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P24-P27 terminal while one of G-10 line keys on key matrix is touched.
44	P14	OUT	Segment data signal. Signal similar to P46. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P24-P27 terminal while one of G-9 line keys on key matrix is touched.
45	P13	OUT	Segment data signal. Signal similar to P46. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P24-P27 terminal while one of G-8 line keys on key matrix is touched.
46	P12	OUT	Segment data signal. Signal similar to P46. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P24-P27 terminal while one of G-7 line keys on key matrix is touched.
47	P11	OUT	Segment data signal. Signal similar to P46. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P24-P27 terminal while one of G-6 line keys on key matrix is touched.
48	P10	OUT	Segment data signal. Signal similar to P46. Key strobe signal. Signal applied to touch-key section. A pulse signal is input to P24-P27 terminal while one of G-5 line keys on key matrix is touched.
49-53	P07-P03	OUT	Segment data signal. Signal similar to P46.
54-56	P02-P00	OUT	Digit selection signal. Signal similar to P55.
57-59	P37-P35	OUT	Digit selection signal. Signal similar to P55.
60-64	P34-P30	OUT	Terminal not used.

SERVICING

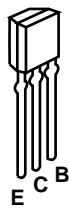
1. Precautions for Handling Electronic Components

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

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



2. Shapes of Electronic Components



Transistor
DTA123ES
KRA101M
KRA223M
KRC101M
KRC243M

3. Servicing of Touch Control Panel

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

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

CAUTION:

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

Therefore, when checking the performance of the touch control panel, put the outer cabinet on the oven to avoid touching the high voltage transformer, or unplug the primary terminal (connector) of the high voltage transformer to turn it off; the end of such connector must 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 itself is so short that the two can't be separated.

For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

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

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

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

4. Servicing Tools

Tools required to service the touch control panel assembly.

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

5. Other Precautions

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

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

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

1. Disconnect the oven from power supply.
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 leads 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.).
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal or damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

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.

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:

WARNING FOR WIRING

To prevent an electric shock, take the following manners.

1. Before wiring,
 - 1) Disconnect the power supply.
 - 2) Open the door and wedge the door open.
 - 3) Discharge the high voltage capacitor and wait for 60 seconds.
2. Don't let the wire leads touch to the following parts;
 - 1) High voltage parts:
Magnetron, High voltage transformer, High voltage capacitor and High voltage rectifier assembly.
 - 2) Hot parts:
Convection heater, Grill heater, Oven lamp, Magnetron, High voltage transformer and Oven

cavity.

- 3) Sharp edge:
Bottom plate, Oven cavity, Weveguide flange, Chassis support and other metallic plate.
- 4) Movable parts (to prevent a fault)
Fan blade, Fan motor, Switch, Switch lever, Open button.
3. Do not catch the wire leads in the outer case cabinet.
4. Insert the positive lock connector certainly until its pin is locked. And make sure that the wire leads should not come off even if the wire leads is pulled.
5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.

OUTER CASE REMOVAL

To remove the outer case, proceed as follows.

1. Disconnect the 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 H.V. capacitor before carrying out any further work.

7. Do not operate the oven with the outer case removed. N.B.; Step1, 2 and 6 from the basis of the 3D checks.

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

POWER TRANSFORMER REPLACEMENT

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from power transformer.
3. Disconnect the filament leads of the power transformer from the magnetron and high voltage capacitor.
4. Disconnect the high voltage leads of capacitor from the transformer.
5. Remove the two (2) screws and one (1) washer holding the transformer to the base cabinet.
6. Remove the transformer.

RE-INSTALL

1. Rest the transformer on the base cabinet with its primary terminals toward rear cabinet.
2. Insert the two edges of the transformer into two metal tabs of the base cabinet.
3. Make sure the transformer is mounted correctly to the corners underneath those tabs.
4. After re-installing the transformer, secure the transformer with two screws to the base cabinet, one is with outertooth washer and the other is without outer-tooth washer.

5. Re-connect the wire leads (primary and high voltage) and high voltage lead to the transformer and filament leads of transformer to the magnetron and capacitor, referring to the "Pictorial Diagram".

6. Re-install the outer case and check that the oven is operating properly.

NOTE: LIVE(ORANGE) WIRE MUST BE CONNECTED TO THE CABINET-SIDE OF THE POWER TRANSFORMER.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS
2. Disconnect filament lead of transformer and high voltage wire lead from magnetron.
3. Take off three (3) screws secured the chassis support to oven cavity and waveguide.
4. Remove the cooling fan assembly refer to "Cooling Fan Removal"
5. Carefully remove four (4) mounting screws holding the magnetron and magnetron air guide to waveguide.

When removing the screws hold the magnetron and magnetron air guide to prevent it from falling.

6. 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.

ASYMMETRIC RECTIFIER AND HIGH VOLTAGE RECTIFIER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove one (1) screw holding the high voltage rectifier terminal to the capacitor holder.
3. Disconnect the high voltage rectifier assembly from the capacitor.

CAUTION: WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE EARTHING SIDE TERMINAL MUST BE SECURED FIRMLY WITH AN EARTHING SCREW.

HIGH VOLTAGE CAPACITOR REMOVAL

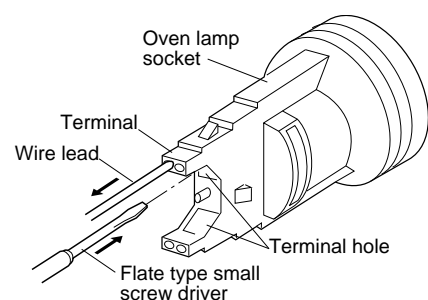
1. CARRY OUT 3D CHECKS.
2. Disconnect the high voltage wire leads and rectifier assembly from the high voltage capacitor and magnetron.
3. Disconnect filament lead of transformer from high voltage capacitor.
4. Disconnect high voltage wire leads of capacitor from

transformer.

5. Remove one (1) screw and washer holding the high voltage rectifier from the capacitor holder.
6. Remove one (1) screw holding capacitor holder to rear cabinet.
7. Remove the high voltage capacitor from the holder.

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 oven lamp mounting plate holding the oven lamp socket.
4. Slide the oven lamp socket left-ward.
5. Now, the oven lamp socket is free.



HEATER UNIT ASSEMBLY REMOVAL (CONVECTION HEATER/ THERMISTOR)

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from oven thermal cut-out, convection motor, thermistor and convection heater. Remove convection motor ass'y refer to "Convection Motor Removal No.3 to No.5".
3. Remove eleven (11) screws holding heater duct to the oven cavity.
4. Release two (2) snap bands holding wire harness to the thermal protection plate (left).
5. The heater unit is now free.

HEATING ELEMENT AND THERMISTOR

1. Remove two (2) screws holding convection heater to heater duct.
2. Loosen two (2) screws holding holders to heater duct and take convection heater out of heating element holders.
3. Heating element is free.
4. Remove two (2) screws holding thermistor to heater duct.
5. Thermistor is free.

GRILL HEATER REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the two (2) screws holding grill duct cover to the steam duct and the divide plate (right).
3. Remove the grill duct cover from the oven cavity.
4. Remove the one (1) screw holding the divide plate (right) to the oven cavity, and remove the one (1) screw holding the thermistor harness to the divide plate (right).
5. Remove the divide plate (right) from the oven cavity.
6. Remove four (4) screws holding steam duct to the oven cavity.
7. Remove the steam duct from the oven cavity.
8. Disconnect the wire leads from the grill heaters.
9. Lay down the two (2) tabs holding the grill cover to the oven cavity.
10. Remove the grill cover from the oven cavity by sliding it toward the magnetron.
11. Make the tabs of heater mounting plate straight.
12. Remove the heater mounting plate, grill heaters and the short terminal together from the grill cover.
13. Remove the heater mounting plate from the grill heating elements.
14. Remove two (2) screws holding the short terminal to the grill heaters.
15. Now, the grill heaters are free.

CONTROL PANEL ASSEMBLY AND CONTROL UNIT REMOVAL

To remove the control panel, proceed as follows:

1. CARRY OUT 3D CHECKS
2. Disconnect connector CN-A, CN-E and CN-F from the control unit.
3. Disconnect the wire leads from relays RY1, RY2 and RY3.
4. Remove one (1) screw holding the control panel back plate to the chassis support.
5. Remove the one (1) screw holding the bottom edge of the back plate to the cabinet base.
6. Remove two (2) screws holding the back plate to the oven cavity flange.
7. Lift up and pull the control panel forward.

Replacement of individual component is as follows:

CONTROL UNIT AND KEY UNIT

1. Disconnect the flat ribbon cable from the control unit.

2. Remove the two (2) screws holding the panel frame to the back plate.
3. Separate the panel frame and back plate.
4. Remove the three (3) screws holding the control unit to the panel frame.
5. Lift up the control unit .
6. Now, the control unit and frame assembly are separated.

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

TURNTABLE MOTOR AND/OR COUPLING REMOVAL

1. Disconnect the oven from power supply.
2. Remove one (1) screw holding the turntable motor cover to the base cabinet and take off the turntable motor cover.
3. Disconnect wire lead from the turntable motor.
4. Remove the two (2) screws holding the turntable motor to the mounting plate of the oven cavity bottom.
5. Pull the turntable coupling out of the oven cavity.
6. Turntable coupling and motor will be free.

CONVECTION MOTOR REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect wire leads from the convection motor. Remove the convection fan belt and pulley(M).
3. Remove two (2) screws holding the convection motor mounting angle to the heater duct and base cabinet.
4. Take out the convection motor assembly from the unit. The convection motor assembly is now free.
5. Remove two (2) screws and nuts holding the motor to mounting angle.
6. Convection motor is now free.

DAMPER ASSEMBLY REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove cooling fan motor and magnetron refer to "Cooling Fan Motor Removal" and "Magnetron Removal".
3. Disconnect wire leads from damper motor and damper switch.
4. Remove two(2) overside screws holding damper motor angle to thermal protection plate (right).
5. Damper assembly is free.
6. Remove one (1) screw holding damper motor to damper motor angle and one (1) screw holding damper switch to damper motor angle.
7. Damper motor and switch are free.

FAN MOTOR REPLACEMENT

REMOVAL

1. CARRY OUT 3D CHECKS.
2. Disconnect the wire leads from the fan motor and thermal cut-out.
3. Remove the three (3) screws holding the chassis support to rear cabinet, control panel back plate and waveguide.

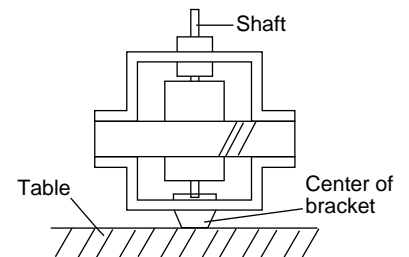
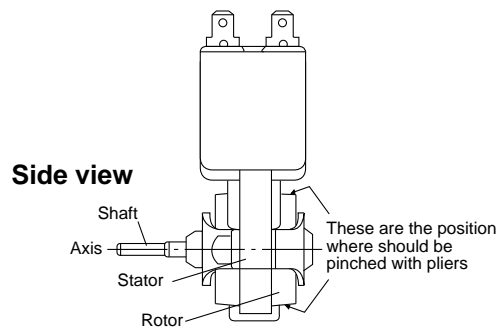
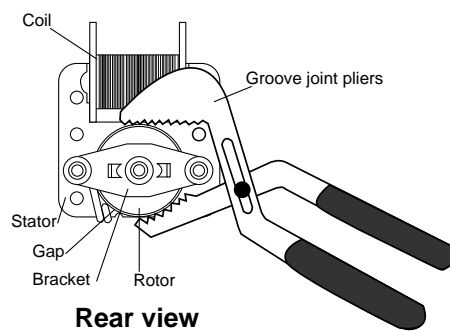
4. Remove one (1) tab holding the fan duct to air guide .
5. Remove the fan motor assembly from the oven cavity.
6. Remove the fan blade assembly from the fan motor shaft according to the following procedure.
- 1) Hold the edge of the rotor of the fan motor by using a pair of grove joint pliers.

CAUTION:

- * **Make sure that any pieces do not enter the gap between the rotor and the stator of the fan motor. Because the rotor is easy to be shaven by pliers and metal pieces may be produced.**
 - * **Do not touch the pliers to the coil of the fan motor because the coil may be cut or injured.**
 - * **Do not transform the bracket by touching with the pliers.**
- 2) Remove the fan blade assembly from the shaft of the fan motor by pulling fan retainer clip and rotating the fan blade with your hand.
 - 3) Now, the fan blade will be free.

CAUTION:

- * **Do not use this removed fan blade again. Because the hole(for shaft) of it may become bigger than a standard one.**
7. Remove the two (2) screws and nuts holding the fan motor and thermal cut-out mounting angle from the fan duct.



8. Now, the fan motor is free.

INSTALLATION

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

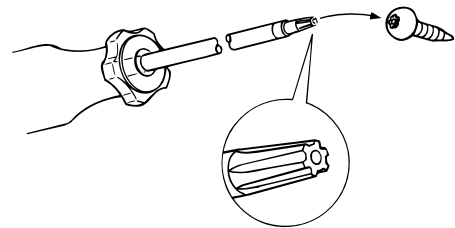
CAUTION:

- * **Do not hit the fan blade strongly when installed because the bracket may be transformed.**
 - * **Make sure that the fan blade rotates smooth after installed.**
 - * **Make sure that the axis of the shaft is not slanted.**
3. Install the fan duct to the air guide.
 4. Install the chassis support to the oven cavity with three (3) screws.
 5. Connect the wire leads to the fan motor and the thermal cut-out, referring to the pictorial diagram.

CORD HOLDER REMOVAL

1. Remove the one (1) special screw holding the cord holder to the rear cabinet, using the special driver LHSTIX DLR4-100T.
2. Now, the cord holder is free.

NOTE: When securing or loosening the special screw, LHSTIX DLR4-100T type screw driver should be used.



POWER SUPPLY CORD REPLACEMENT

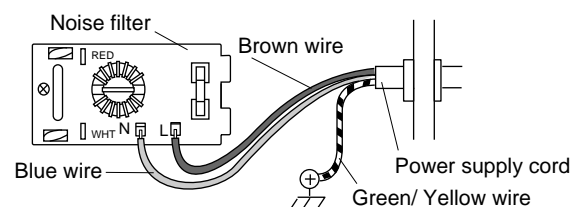
Removal

1. CARRY OUT 3D CHECKS.
2. Disconnect the brown and blue wire leads of the power supply cord from the noise filter.
3. Remove the single (1) screw holding the green/yellow wire lead to the base plate.
4. Remove the power supply cord from the hole in the rear cabinet.
5. Remove the AC plug from the power supply cord.
6. Now, the power supply cord is free.

Re-install

1. Insert the power supply cord into the hole of the rear cabinet.
2. Earth the green/yellow wire lead of the power supply

- cord to the bottom plate with the single (1) screw.
3. Connect the brown and blue wire leads of the power supply to the noise filter referring to the Pictorial Diagram.
4. Connect the AC plug to the power supply cord. (Connect the green/ yellow wire to the earth terminal, blue wire to the neutral and brown wire to the live terminal.)
5. CARRY OUT 4R CHECKS.



1ST. LATCH SWITCH, 2ND. INTERLOCK RELAY CONTROL SWITCH AND MONITOR SWITCH REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove control panel assembly, refer to "Control Panel Removal".
3. Disconnect wire leads from each of the switches.
4. Remove two (2) screws holding latch hook to oven flange.
5. Remove latch hook assembly from oven flange.
6. Push downward on the one (1) stopper tabs holding each of the switches place.
7. Switches are free.
At this time switch lever will be free, do not lose it.

Re-install

1. Re-install switch lever and each switch in its place, refer to Figure C-1.
2. Re-connect the wire leads to each switches and fuse holder.
Refer to the pictorial diagram.
3. Secure the latch hook (with two (2) mounting screws) to the oven flange.
4. Make sure that monitor switch is operating properly. Refer to chapter "Test Procedure" and Adjustment procedure.

1ST. LATCH SWITCH, 2ND. INTERLOCK RELAY CONTROL SWITCH AND MONITOR SWITCH ADJUSTMENT

If 1st. latch switch, 2nd. interlock relay control switch and monitor switch do not operate properly due to a mis-adjustment, the following adjustment should be made.

1. Loosen the two (2) screws holding the latch hook to the flange on the oven front face.
2. With the door closed, adjust the latch hook by moving it back and forth and then adjust the latch hook by moving it back and forth. In and out play of the door allowed by the latch hook should be less than 0.5 mm. The vertical position of the latch hook should be adjusted so that the 1st. latch switch and 2nd. interlock relay control switch are activated with the door closed. The horizontal position of the latch hook should be adjusted so that the plunger of the monitor switch is pressed with the door closed.
3. Secure the screws with washers firmly.
4. Now, make sure all switches operations. If each switch has not been activated with the door closed, loose the screws holding the latch hook to the oven cavity front flange and adjust the latch hook position.

After the adjustment, make sure of the following:

1. The in and out play of the door remains less than 0.5

mm at latched position.

2. The 1st. latch switch and 2nd. interlock relay control switch interrupt the circuit before the door can be opened.
3. The monitor switch contacts close when the door is opened.
4. Re-install the outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

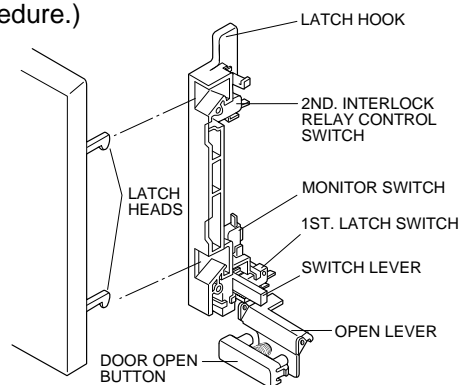


Figure C-1. Latch Switches Adjustment

DOOR DISASSEMBLY

Remove door assembly, refer to "Door Replacement".

Replacement of door components are as follows:

1. Place door assembly on a soft cloth with latches facing up.
- Note: As the engaging part of choke cover and door panel are provided at several places, do not force any particular part.
2. Insert an putty knife (thickness of about 0.5mm) into the gap between the choke cover and corner portion of door panel as shown figure C-2 to free engaging parts.
 3. Lift up choke cover.
 4. Now choke cover is free from door panel.

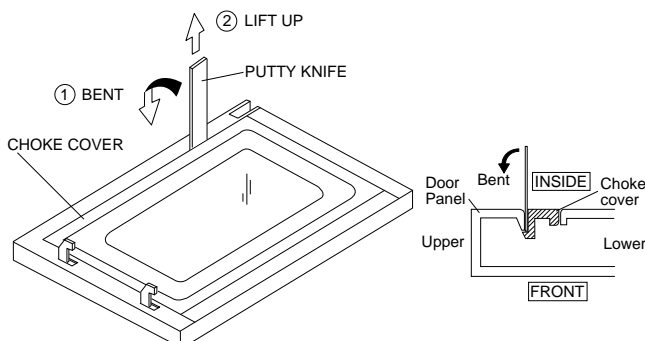


Figure C-2. Door Disassembly

DOOR REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT

1. Disconnect oven from power supply and remove outer case. Remove turntable tray and roller stay from oven cavity.
2. Remove three (3) screws holding lower oven hinge.
3. Remove lower oven hinge from oven cavity bottom flange.
4. Remove door assembly from upper oven hinge on the oven.
5. Door assembly is now free.

Note: When individual parts are replaced, refer to "Door Disassembly".

6. On re-installing door, insert the upper oven hinge into the door hinge pin.
Then while holding door in place.
7. Make sure door is parallel with oven face lines (left and upper side lines) and the door latch heads pass through the latch holes correctly.
8. Insert the lower oven hinge into oven cavity bottom flange and then engage the door hinge pin. Then secure the lower oven hinge firmly with three (3) mounting screws.

Note: After any service to the door;

- (A) Make sure that the upper and lower latch switches are operating properly.
(Refer to chapter "Test Procedures".)
- (B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards.

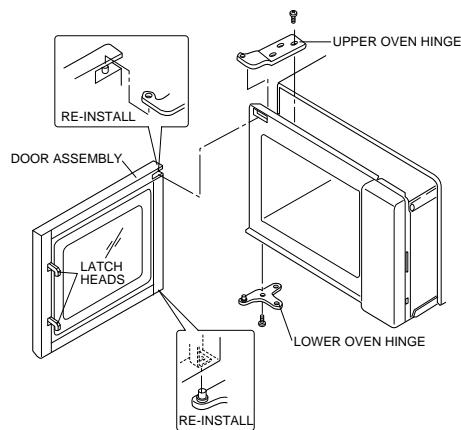
DOOR ADJUSTMENT

The door is adjusted by keeping the screws of each hinge loose. The lower oven hinge can be loosened.

After adjustment, make sure of the following :

1. Door latch heads smoothly catch the latch hook through the latch holes, and the latch head goes through the center of the latch hole.
2. Deviation of the door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. The door is positioned with its face depressed toward the cavity face plate.
4. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from the oven cavity during the cook cycle. This function does not require that the door be air-tight, moisture (condensation)-tight or light-tight. Therefore, the occasional appearance of moisture, light or the sensing of gentle warm air movement around the oven door is not abnormal and do not of themselves, indicate a leakage of microwave energy from the oven cavity. If such were the case, your oven could not be equipped with a vent, the very purpose of which is to exhaust the vapor-laden air from the oven cavity.



MICROWAVE MEASUREMENT

After adjustment of door latch switches, monitor switch and door are completed individually or collectively, the following leakage test must be performed with a survey instrument and it must be confirmed that the result meets the requirements of the performance standard for microwave oven.

REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of $5\text{mW}/\text{cm}^2$ at any point 5cm or more from external surface of the oven.

PREPARATION FOR TESTING:

Before beginning the actual test for leakage, proceed as follows;

1. Make sure that the test instrument is operating normally as specified in its instruction booklet.

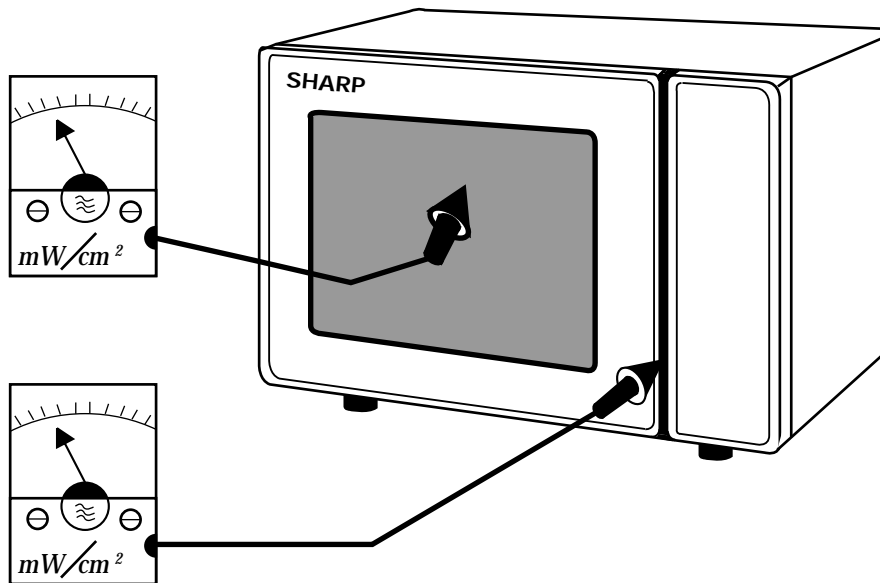
Important:

Survey instruments that comply with the requirement for instrumentations as prescribed by the performance standard for microwave ovens must be used for testing.

Recommended instruments are:

NARDA 8100
NARDA 8200
HOLADAY HI 1500
SIMPSON 380M

2. Place the oven tray into the oven cavity.
3. Place the load of $275 \pm 15\text{ml}$ of water initially at $20 \pm 5^\circ\text{C}$ in the centre of the oven tray. The water container should be a low form of 600 ml beaker with inside diameter of approx. 8.5cm and made of an electrically non-conductive material such as glass or plastic.
The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4. Close the door and turn the oven ON with the timer set for several minutes. If the water begins to boil before the survey is completed, replace it with 275ml of cool water.
5. Move the probe slowly (not faster than $2.5\text{cm}/\text{sec.}$) along the gap.
6. The microwave radiation emission should be measured at any point of 5cm or more from the external surface of the oven.



Microwave leakage measurement at 5 cm distance

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. CLOCK APPERARS ON DISPLAY

NOTE: ★ indicates components with potential above 250V.

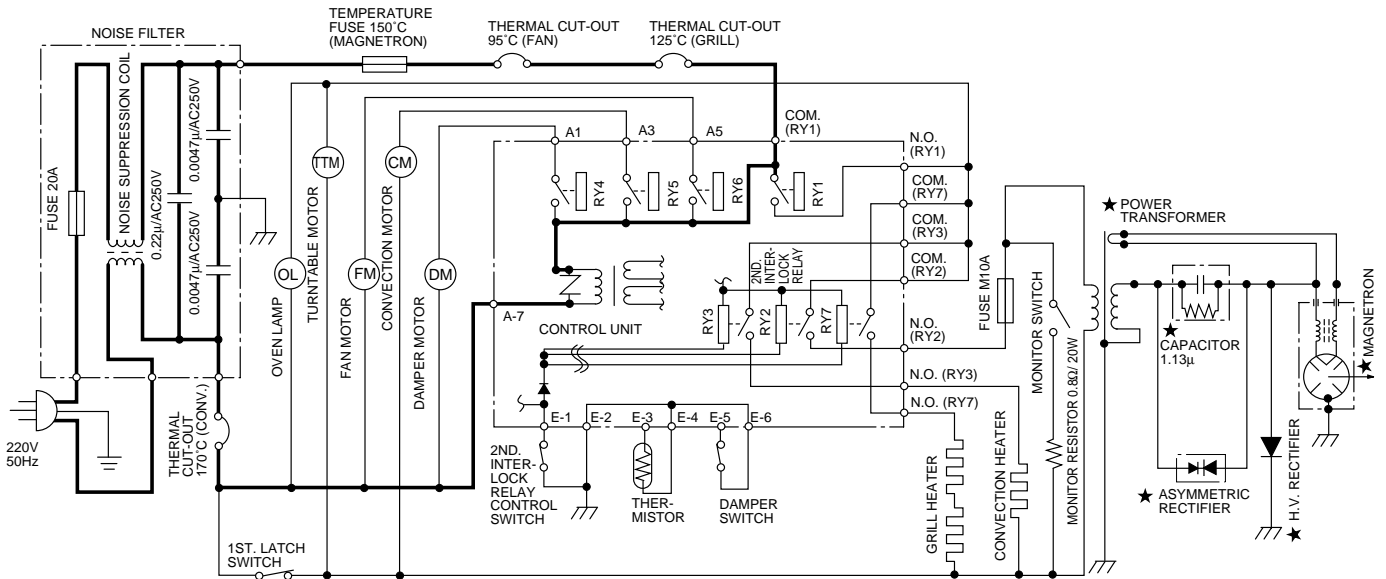


Figure O-1. Oven Schematic-OFF Condition

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. COOKING TIME PROGRAMMED.
3. START PAD TOUCHED.

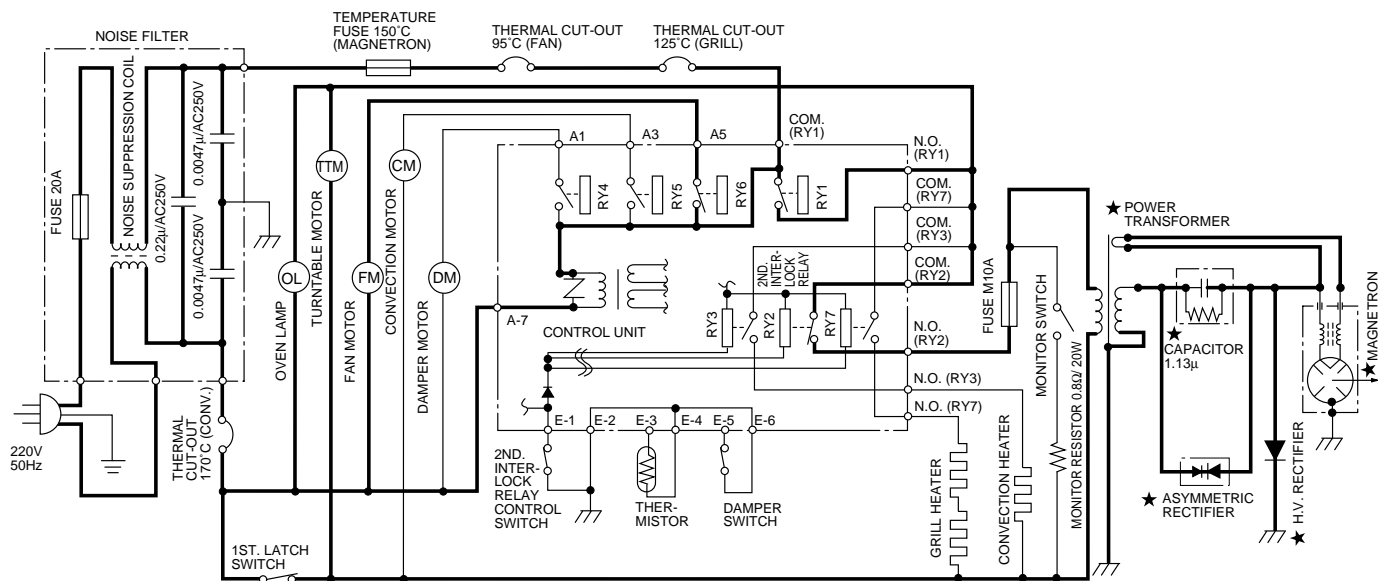


Figure O-2. Oven Schematic-Microwave Cooking or Easy Defrost Condition

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. CONVECTION PAD TOUCHED.
3. DESIRED TEMP. PAD TOUCHED.
4. COOKING TIME PROGRAMMED.
5. START PAD TOUCHED.

NOTE: ★ indicates components with potential above 250V.

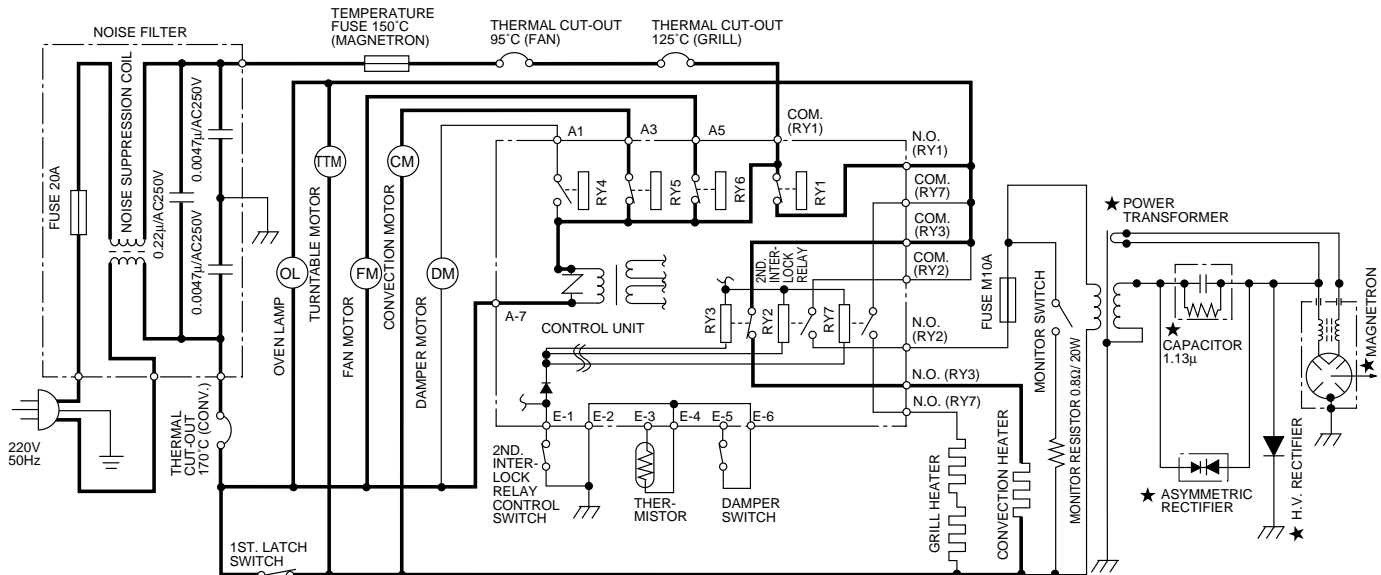


Figure O-3. Oven Schematic-Convection Cooking Condition

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. GRILL PAD TOUCHED.
3. COOKING TIME PROGRAMMED.
4. START PAD TOUCHED.

NOTE: At the initial period, the relays RY3 and RY5 are energized, and the convection heater and the convection motor are energized until the cavity air temperature reaches 220°C

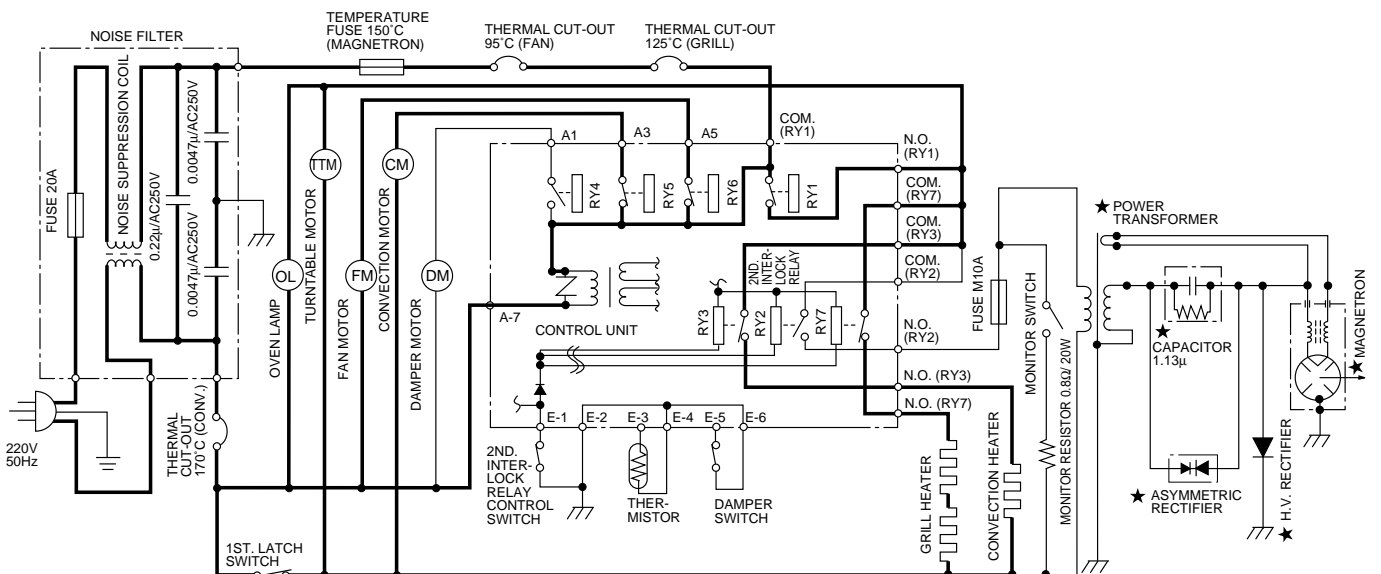


Figure O-4. Oven Schematic-Grill Cooking Condition

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. SIMUL CONVECTION PAD TOUCHED.
3. COOKING TIME PROGRAMMED.
4. START PAD TOUCHED.

NOTE: ★ indicates components with potential above 250V.

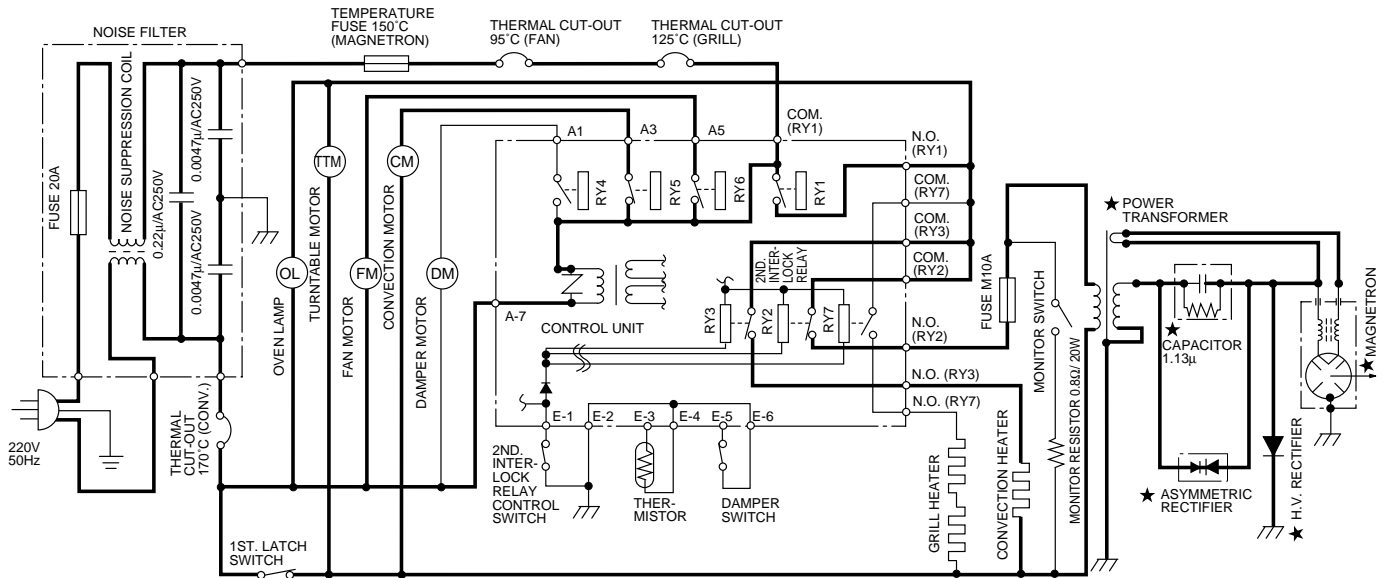


Figure O-5. Oven Schematic-Simul Convection Cooking Condition

SCHEMATIC

NOTE: CONDITION OF OVEN

1. DOOR CLOSED.
2. SIMUL GRILL PAD TOUCHED.
3. COOKING TIME PROGRAMMED.
4. START PAD TOUCHED.

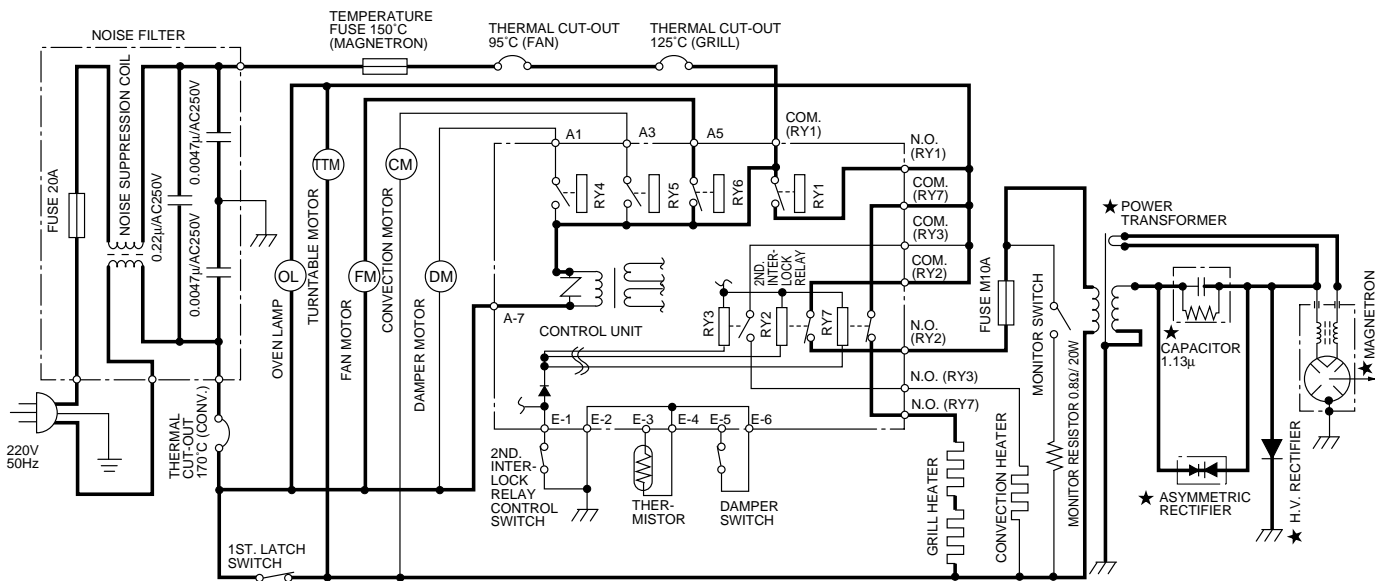


Figure O-6. Oven Schematic-Simul Grill Cooking Condition

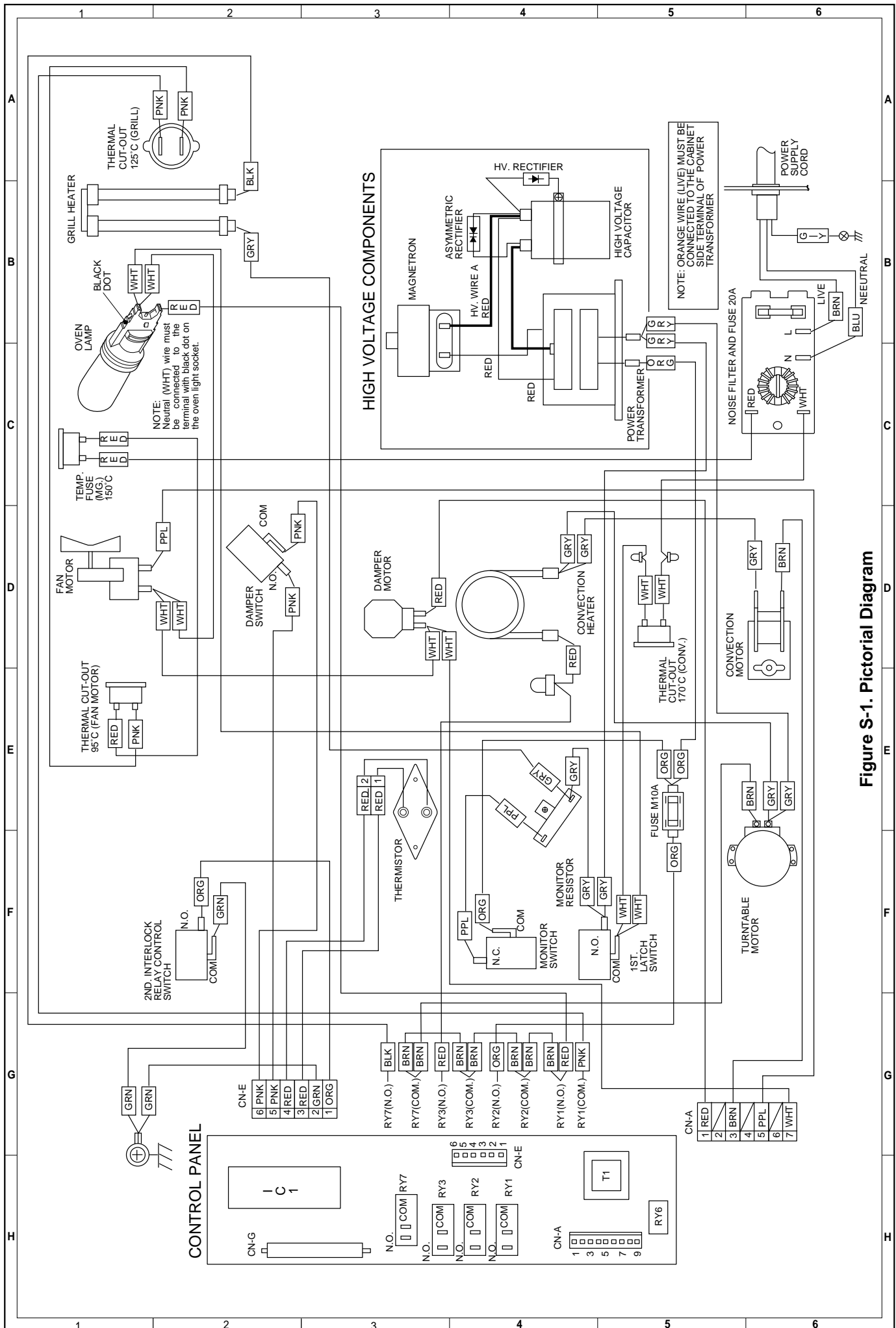


Figure S-1. Pictorial Diagram



