SHARP® SERVICE MANUAL

SY307R2395H//

COMMERCIAL

MICROWAVE OVEN

MODELS R-2275 R-2285

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

SHARP CORPORATION

CAUTION
MICROWAVE RADIATION

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

VARNING
MICKROVAGSSTRALING

Personal får inte utsättas för mikrovågsenergi som kan ustrala från magnetronen eller andre mikrovågsalstrande anordningar om dessa är felanslutna eller används på fel sätt.
Alla in-och utgångsanslutningar för mikrovågor, vagledare, flänsar och packningar måste vara fast anslutna.
Mikrovågsgeneratorn får inte arbeta utan att absorberande belastning är ansluten. Titta aldrig in i ën öppen vågledare eller antenn när mikrovågsgeneratorn är påkopplad eller laddad.

VAROITUS
MIKROAALTOSÄTELYÄ

Käyttäjä ei saa joutua alttiiksi mikroaaltoenergialle, jota voi säteillä magnetronista tai muusta mikroaaltoja kehittävästä laitteesta, jos sitä käytetään tai jos se kytketään väärin.
Kaikkien mikroaaltoliitäntöjen sekä syöttö-että ulostulopuolella, aaltoputkien laippojen ja tiivisteiden tulee olla varmistettuja.
Mikroaaltouunnia ei koskaan saa käyttää ilman kuormaa jossa mikroaaltoenergiaa kuluu.
Avoimeen aaltoputkeen tai antenniin ei koskaan saa katsoa virran ollessa kytkettynä.

ADVARSEL
MIKROBØLGESTRÅLING

Personell må ikke utsettes for mikrobølge-energi som kan utståles fra magnetronen eller andre mikrobølge-generende deler dersom apparatet feilbetjenes eller blir feiltikoplet.
Alle inn-og ut-tilkoplinger i forbindelse med mikrobølge-strålingen, bølgeledere, flenser og tetningsringer/pakninger må festes ordentlig.
Aldri bruk apparatet med mindre en mikrobålge-absorberende last er plassert i ovnsrommet.
Aldri se direkte inn i en åpen bølgeleder eller antenne imens apparatet er strømførende.

ADVARSEL
MIKROBØLGEBESTRÄLING

Man bør ikke udsætte sig for mikrobølgebestråling fra magnetronen eller andre mikrobølgefrembringende anordninger, hvilket kan ske hvis apparatet er forkert tilsluttet eller bruges forkert. Alle mikrobølgeindgange og-udgange, bølgeledere, flanger og tætningsstrimler må være forsvarligt udført.
Anvend aldrig ovnen uden en mikrobølgesabsorberende anordning. Se aldrig ind i en åben bølgeleder eller antenne, mens ovnen er i brug.

SERVICE MANUAL

SHARP

COMMERCIAL
MICROWAVE OVEN

R-2275 / R-2285

GENERAL IMPORTANT INFORMATION

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

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

WARNING

Note:	The parts marked "*" are used in voltage more than 250V. (Parts List)
Anm:	Delar märket med "*" har en spänning överstigande 250V.
Huom:	Huolto-ohjeeseen merkitty "tähdella" osat joissa jännite on yli 250 V.
Bemerk:	Deler som er merket "asterisk" er utsatt for spenninger over 250V til jord.
Bemærk:	"Dele mærket med stjerne benyttes med højere spænding end 250 volt.

WARNING

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

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

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

SHARP CORPORATION

OSAKA, JAPAN

PRODUCT DESCRIPTION

SPECIFICATION

ITEM	DESCRIPTION
Power Requirements	220-230 Volts 50 Hertz Single phase, 3 wire grounded
Power Consumption	2.0 kW Approx. 9A (R-2275) 2.7 kW Approx. 13A (R-2285)
Power Output	1200 watts (R-2275) / 1800 watts (R-2285) nominal of RF microwave energy (Method of IEC 705). Operating frequency of 2450MHz
Outside Dimensions	Width 510mm Height 335 mm including foot Depth 440 mm
Cooking Cavity Dimensions	Width 330 mm Height 210 mm Depth 330 mm
Control Complement	Touch Control System Microwave Power level 100% 50% 20% 10% Microwave power setting key Electronic timer (0 - 30 min.) Start Key
Set Weight	Approx. 30kg (R-2275) / Approx. 32kg (R-2285)

GENERAL INFORMATION

WARNING

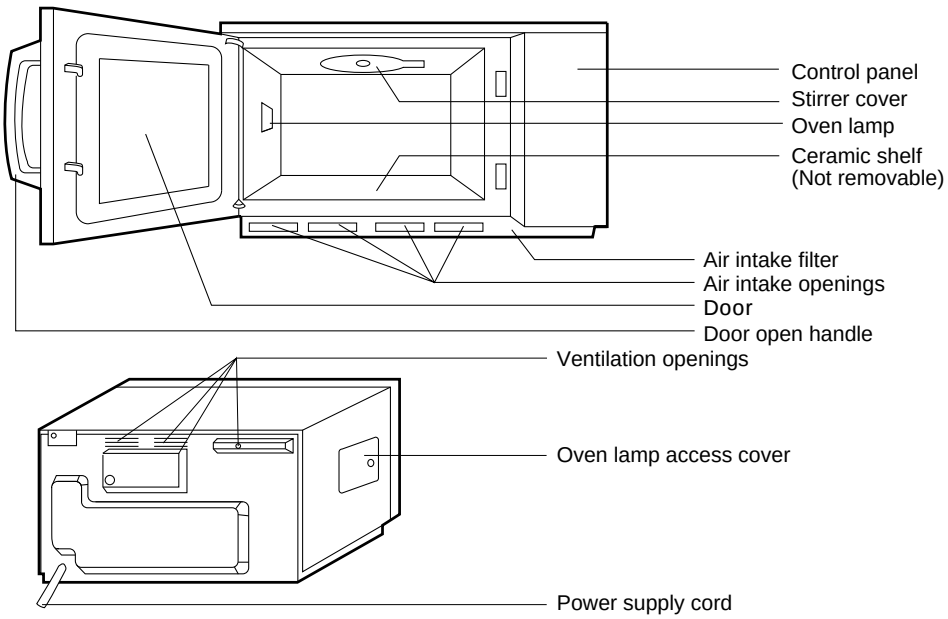
THIS APPLIANCE MUST BE EARTHED

IMPORTANT

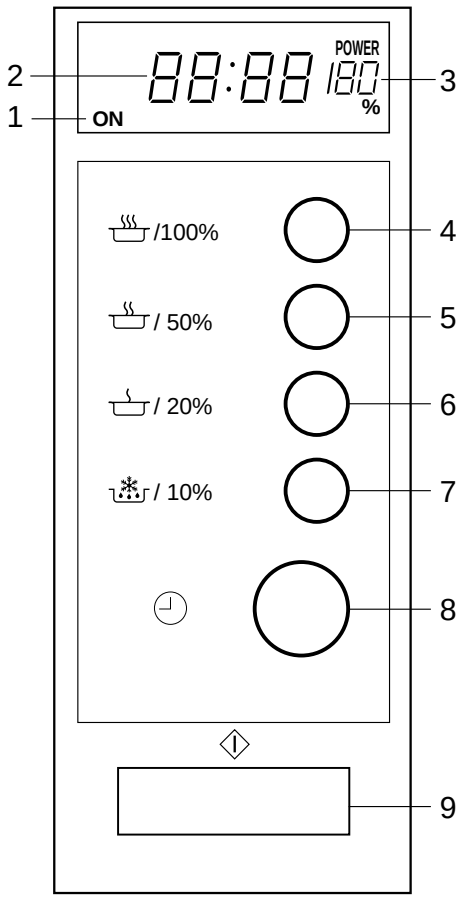
THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

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

APPEARANCE VIEW



CONTROL PANEL



DISPLAY AND INDICATORS

Check indicators after the oven starts to confirm the oven is operating as desired.

1. Cook indicator
   This indicator shows cooking in progress.
2. Digital display
3. Microwave power level indicator

OPERATING KEYS

4. Power 100%
5. Power 50%
6. Power 20%
7 Power 10%

MICROWAVE POWER LEVEL button

8. ELECTRONIC TIMER
   Rotate the knob to enter cooking time.
9. START button

OPERATION SEQUENCE

OFF CONDITION

Closing the door activates all door interlock switches (1st latch switch, 2nd latch switch, 3rd latch switch and stop switch)

IMPORTANT

When the oven door is closed, the monitor switch contacts COM-NC must be open. When the microwave oven is plugged in a wall outlet (220 -230 volts, 50Hz), the line voltage is supplied to the point A5+A7 in the control panel.

Figure O-1 on page 29 or 30

1. The digital display shows

NOTE: When the door is opened or after cooking, oven lamp and blower motor work for 1 minute.

MICROWAVE COOKING CONDITION

Touch MICROWAVE POWER LEVEL button and enter a desired cooking time with the rotating ELECTRONIC TIMER. And then touch START key

Function sequence Figure O-2 on page 29 or 30

CONNECTED COMPONENTS	RELAY
Oven lamp / Blower motor	RY1
High voltage transformer T1	RY3
High voltage transformer T	RY4

1. The line voltage is supplied to the primary winding of the high voltage transformer. The voltage is converted to about 3.3 volts A.C. output on the filament winding and high voltage of approximately 2000 volts A.C. on the secondary winding.
2. The filament winding voltage (3.3 volts) heats the magnetron filament and the high voltage (2000 volts) is sent to the voltagedoubling circuit, where it is doubled to negative voltage of approximately 4000 volts D.C..
3. The 2450 MHz microwave energy produced in the magnetron generates a 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.
4. When the cooking time is up, a signal tone is heard and the relays RY3+RY4 go back to their home position. The circuits to the high voltage transformers T1+T2 are cut off. The relay RY1 remains and oven lamp and blower motor work for 1 minute.
5. When the door is opened during a cook cycle, the switches come to the following condition.

		CONDITION	
		DURING	DOOR OPEN
SWITCH	CONTACT	COOKING	(NO COOKING)
1st latch switch	COM-NO	Closed	Open
Monitor switch	COM-NC	Open	Closed
2nd latch switch	COM-NO	Closed	Open
Stop switch	COM-NO	Closed	Open
3rd latch switch	COM-NO	Closed	Open

The circuits to the high voltage transformers T1+T2 are cut off when the 1st latch, 2nd latch, 3rd latch and stop switches SW1+SW2+SW3+SW5 are made open. The blower motor BM and remains on even if the oven door is opened after the cooking cycle has been interrupted, because the relay RY1 stays closed. Shown in the display is the remaining time, but the program is cancelled if the oven is not started within 3 minutes.

6. MONITOR SWITCH CIRCUIT
   The monitor switch SW4 is mechanically controlled by oven door, and monitors the operation of the 1st latch switch SW1.

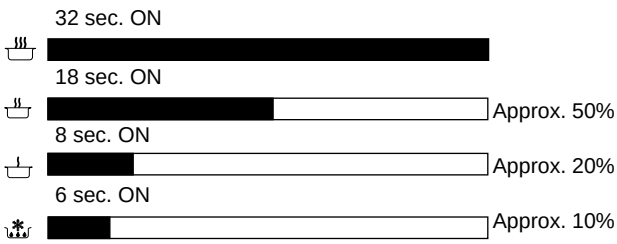
6-1. When the oven door is opened during or after the cycle of a cooking program, the 1st, 2nd, 3rd latch and stop switches SW1+SW2+SW3+SW5 must open their contacts first. After that the contacts (COM-NC) of the monitor switch SW4 can be closed.

6-2. When the oven door is closed, the contacts (COM-NC) of the monitor switch SW4 must be opened first. After that the contacts (COM-NO) of the 1st, 2nd, 3rd latch and stop switches SW1+SW2+SW3+SW5 must be closed.

6-3. When the oven door is opened and the contacts of the 1st latch switch SW1 remain closed, remains closed, the fuse F2 F6.3A will blow, because the monitor switch is closed and a short circuit is caused.

MICROWAVE VARIABLE COOKING

When the microwave oven is preset for variable cooking power, the line voltage is supplied to the high voltage transformers T1+T2 intermittently within a 32 second time base through the contacts of the relays RY3+RY4.
The following levels of microwaves power are given.



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.

TWO MAGNETRON OPERATION SYSTEM

Two magnetrons MG1+MG2 are equipped in order to get higher microwave power output. The primary windings of the high voltage transformers T1+T2 are connected so that each magnetron can be oscillated alternatively according to the frequency of the power supply. Refer to the Figure 1 and 2.

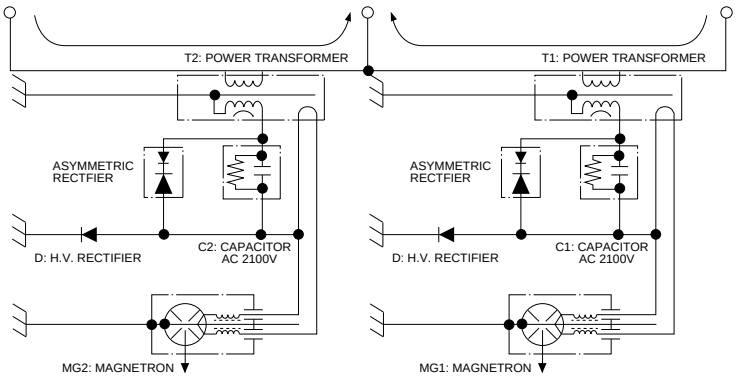


Figure S-1. High Voltage Circuit

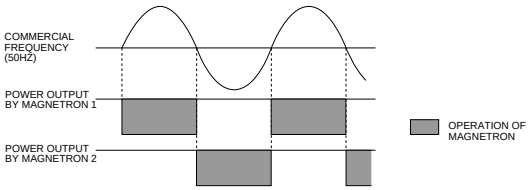


Figure S-2. Operation of Magnetron

FUNCTION OF IMPORTANT COMPONENTS

DOOR OPEN MECHANISM

1. The door release lever is pulled.
2. The upper latch head is lifted up by the linked door release lever.
3. The latch lever is lifted up by the door release lever.
4. The joint lever is lifted up by the latch lever.
5. The lower latch head is lifted up by the joint lever.
6. Now both latch heads are lifted up, so they can be released from the latch hook.
7. Now the door can be opened.

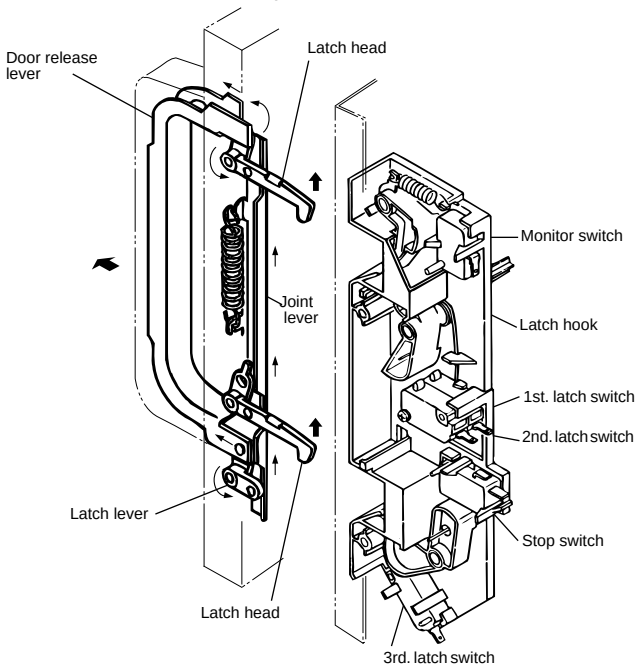


Figure D-1.Door Open Mechanism

1ST LATCH SWITCH SW1, 2ND LATCH SWITCH SW2, 3RD LATCH SWITCH SW3 AND STOP SWITCH SW5

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 SW4

The monitor switch is activated (the contacts opened) the upper latch head and switch lever A while the door is closed. The switch is intended to render the oven inoperative by means of blowing the fuse F2 F6.3A when the contacts of the 1st latch switch SW1 fail to open when the door is opened.

Function

1. When the door is opened, the monitor switch SW4 contacts close (to the ON condition) due to their being normally closed. At this time the 1st latch switch SW1 is in the OFF condition (contacts open) due to their being normally open contact switches.
2. As the door goes to a closed position, the monitor switch contacts are opened and 1st latch switch contacts are closed (On opening the door, each of these switches operate inversely.)
3. If the door is opened and the 1st latch switch contacts fail to open, the fuse F2 F6.3A blows simultaneously with closing of the monitor switch contacts.

CAUTION: BEFORE REPLACING A BLOWN FUSE F2 F6.3A TEST THE 1ST LATCH SWITCH, MONITOR SWITCH AND MONITOR RESISTOR FOR PROPER OPERATION. (REFER TO CHAPTER “TEST PROCEDURE”).

MONITOR RESISTOR

The monitor resistor prevents the fuse F2 F6.3A 250V bursting when the fuse F2 F6.3A 250V blows due to the operation of the monitor switch.

NOISE FILTER

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

SPECIAL FUSE / WEAK POINT F1

If the wire harness or electrical components are short-circuited, this special fuse / weak point F1 blows to prevent an electric shock or fire hazard.

FUSE F6.3A 250V F2

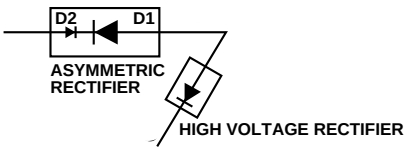
1. If the wire harness or electrical components are short-circuited, this fuse blows to prevent an electric shock or fire hazard.
2. The fuse also blows when 1st latch switch SW1 remains closed with the oven door open and when the monitor switch SW4 closes.

ASYMMETRIC RECTIFIER AND WEAK POINT / FUSE WP1 WP2

The asymmetric rectifier is solid state device that prevents current flow is both directions. And it prevents the temperature rise of the high voltage transformer by blowing the weak point / fuse WP1 or WP2 when the high voltage rectifier is shorted.

The rated peak reverse voltage of D1 of the asymmetric rectifier is 6 KV The rated peak reverse voltage of D2 of the asymmetric rectifier is 1.7 KV. D1 and D2 of the asymmetric rectifier or high voltage rectifier are shorted when the each peak reverse voltage goes beyond the each rated peak reverse voltage. (The process of the blowing the weak point / fuse WP1 or WP2)

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 high voltage transformer.
5. The large electric currents flow through the primary winding of the high voltage transformer.
6. The weak point / fuse WP1 or WP2 blows by the large electric currents.
7. The power supplying to the high voltage transformer is cut off.

THERMISTOR (EXHAUST)

The thermistor is a negative temperature coefficient type. The temperature in the exhaust duct is detected through the resistance of the thermistor.
If the temperature rises about 120˚C, the control panel will display “EE 7” and the oven will stop to avoid overheating and catching fire.

THERMISTOR (AIR INTAKE)

This thermistor detects air flow around it. When air intake filter is blocked by dust or blower motor is stalled, an air flow reduces and the touch control panel shows “FILTER” on display. To cancel “FILTER” indication, touch the START pad.

SURGE RELAYS RY-S1 AND RY-S2 AND SURGE RESISTORS R1 AND R2

When the START key is touched the contacts of the surge relays RY-S1 + RY-S2 close and the surge current flows through the surge resistors R1 + R2 for 200 msec after 20 msec. since the START key is touched the surge relays RY-S1+RY-S2 closes and supply the high voltage transformer with the line voltage. After 200 msec. the surge relays RY-S1 + RY-S2 open their contacts and gets out of function.
The surge resistors R1 + .R2 lets the current (peak current) flow when the oven is switched on. If surge resistors are defective, the home fuse or circuit breaker may break down when the oven is switched on.
CAUTION; THE SURGE RELAYS RY-S1+RY-S2 CLOSE FOR ONLY 200 MSEC. JUST WHEN THE OVEN GETS RESTARTED, BUT OPENS AGAIN. WITHIN THIS 200 MSEC., THE RELAYS RY-3 + RY-4 MUST CLOSE.

BLOWER MOTOR BM

The blower motor drives a blade which draws external cool air. This cool air is directed through the air vanes surrounding the magnetrons and cools the magnetrons. 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.

MG THERMAL CUT-OUTS 145˚ TC1, TC2

These thermal cut-outs protect the magnetrons against overheat. If their temperature go up higher than 145˚C because the blower motor is interrupted, the ventilation openings are blocked, the thermal cut-outs TC1+TC2 will open and the line voltage to the high voltage transformer T1+T2 will be cut off and the operations of the magnetrons MG1+MG2 will be stopped. The thermal cut-outs TC1+TC2 will close their contacts again when their temperatures go down lower than -20˚C.

BLOWER MOTOR THERMAL CUT-OUT 115˚C TC3

This thermal cut-out protect the blower motor against overheat. If its temperature goes up higher than 115˚C because the blower motor is locked or the ventilation openings are blocked, the contacts of the thermal cut-out TC3 will open and the line voltage to the control unit will be cut off and the operation of the oven will be stopped. The thermal cut-out TC3 will be close its contacts again when its temperature goes down lower than -20˚C.

OVEN TEMP. FUSE 150˚C TF

This temp. fuse protects the oven against overheat. If the temperature goes up higher than 150˚C because the food catches fire, the contacts of temp. fuse TF will open and the line voltage to the control unit will be cut off and the operation of the oven will be stopped. The defective temp. fuse must be replaced with a new rated one.

SERVICING

WARNING TO SERVICE PERSONNEL

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

REMEMBER TO CHECK 3D

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

WARNING AGAINST THE CHARGE OF THE HIGH-VOLTAGE CAPACITOR

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

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

REMEMBER TO CHECK 4R

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

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven tray, close the door and press Manual time Set key and set the microwave time for one (1) minute. Set the power level to 100% and push the START button. When the one minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out 3D checks and re-examine the connections to the component being tested.

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

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 F2 F6.3A in the 1st latch switch - monitor switch - monitor resisitor circuit, check the 1st latch switch, monitor switch and monitor resistor before replacing the fuse F2 F6.3A

TEST PROCEDURE		A	A	B	B	C	C	C	D	D	E	E	E	E	E	F	F	G	H	I	I
POSSIBLE CAUSE AND DEFECTIVE PARTS		MAGNETRON MG1	MAGNETRON MG2	HIGH VOLTAGE TRANSFOMER T1	HIGH VOLTAGE TRANSFOMER T2	H.V. RECTIFIER ASSEMBLY FOR MG1	H.V. RECTIFIER ASSEMBLY FOR MG2	H.V. WIRE HARNESS	H.V. CAPACITOR C1	H.V. CAPACITOR C2	1ST. LATCH SWITCH SW1	2ND. LATCH SWITCH SW2	3RD. LATCH SWITCH SW3	MONITOR SWITCH SW4	STOP SWITCH SW5	WEAK POINT / FUSE WP1	WEAK POINT / FUSE WP2	SPECIAL FUSE / WEAK POINT F1	FUSE F6.3A F2	THERMAL CUT-OUT 145°C TC1	THERMAL CUT-OUT 145°C TC2
CONDITION	PPROBLEM																				
OFF CONDITION	" . " does not appear on display when power cord is plugged into wall outlet.																	○	○		
	Control panel can not accept key in.														○						
	Fuse F2 F6.3A blows when the door is opened.										○										
	Home fuse browns when power cord is plugged into wall outlet.																				
	Special fuse F1 browns when power cord is plugged into wall outlet.																				
	Oven lamp and fan motor do not work for 1 minute whenever the door is opened or after cooking.																				
	"EE 7" appear in display																				
	"EE 6" appear in display																				
	Fuse F2 F6.3A browns when power cord is plugged into wall outlet.													○							
	Oven lamp does not light when door is opened. (Blower motor works)																				
	Blower motor does not work when door is opened. (Oven lamp lights)																				
ON CONDITION	"EE 1" appear in display	○		○		○		○	○							○				○	
	"EE 2" appear in display		○		○		○	○		○							○				○
	"EE 3" appear in display	○	○	○	○	○	○	○	○	○	○	○	○			○	○			○	○
	"EE 6" appear in display																				
	"EE 7" appear in display																				
	"EE 9" appear in display																				
	Both oven lamp and blower motor do not work.																				
	Oven lamp does not work.																				
	Blower motor do not work.																				
	Oven does not stop after end of cooking cycle or when STOP/CLEAR key is touched. (Oven lamp and blower motor stop)																				
	Home fuse blows when starting the oven.																				
	Oven goes into cook cycle but shuts down before end of cooking cycle. (Microwave power level is set at 10%.)														○			○	○		
	Oven seems to be operating but no heat is produced in oven load. (Microwave power level is set at 10%.)	○	○	○	○	○	○	○	○	○	○	○	○			○	○			○	○
	It passed more than 1 minute after cooking but oven lamp and blower motor go no working.																				
	"EE 8" appear in display																				
	"EE 0" appear in display																				

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
I	THERMAL CUT-OUT 115˚C TC3	O																						O				
I	TEMPERATURE FUSE 150˚C TF	O																					O	O				
J	SURGE RESISTOR R1, R2																						O					
J	MONITOR RESISTOR R3																											
K	SURGE RELAY RY-1																						O					
K	SURGE RELAY RY-2																						O					
L	THERMISTOR (EXHAUST)							O	O							O	O							O				
L	THERMISTOR (AIR INTAKE)																											O
	OVEN LAMP OR SOCKET										O									O								
M	BLOWER MOTOR											O	O	O	O						O			O				
N	NOISE FILTER	O			O	O																		O				
	POWER SUPPLY CORD	O			O																			O				
	FUSE HOLDER	O																						O				
	SHORTED WIRE HARNESS				O	O		O					O	O	O		O						O		O			
	OPENED WIRE HARNESS	O					O		O		O	O	O	O	O	O				O	O			O	O			
P	TOUCH CONTROL PANEL	O	O				O	O	O				O	O	O	O	O		O			O	O	O	O	O		
R	RELAY RY-1, RY-3, RY-4						O						O	O	O				O			O	O		O	O	O	
S	FOIL PATTERN	O																						O				
	BLOCKED VENTILATION OPENINGS												O	O	O		O							O	O			O
	BLOCKED BLOWER MOTOR											O	O	O	O		O							O	O			O
	MIS-ADJUSTMENT OF SWITCHES		O												O									O	O			
	HOME FUSE OR BREAKER	O																					O	O				
	NO POWER AT WALL OUTLET	O																						O				
	OVER THE MAX. COOKING TIME																	O										
	DUE TO PROGRAMME LOCK		O																									
	TEMPERATURE OF THERMISTOR (EXHAUST) IS HIGHER THAN 120˚C							O									O											
	TEMPERATURE OF THERMISTOR (EXHAUST) IS HIGHER THAN 90˚C IN 7 MINUTES AFTER STARTING THE OVEN.							O									O											

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
A	**MAGNETRON TEST**

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

CARRY OUT 3D CHECK

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

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

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

MICROWAVE OUTPUT POWER (IEC-705-1988)
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 x 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 x ΔT.

The formula is as follows;
P x t / 4.187 = V x Δ T P (W) = 4.187 x V x ΔT / t
Our condition for water load is as follows:
Room temperature.....around 20°C Power supply Voltage.....Rated voltage
Water load.....1000 g Initial temperature.....10±2°C
Heating time.....23 sec. (R-2285) / 35 sec. (R-2275) P=180xΔT (R-2285) / P=120xΔT (R-2275)

Measuring condition:
1. 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.
2. Temperature of the oven and vessel
   The oven and the empty vessel are at ambient temperature prior to the start the test.
3. Temperature of the water
   The initial temperature of the water is (10±2)°C.
4. Select the initial and final water temperature so that the maximum difference between the final water temperature and the ambient temperature is 5K.
5. Select stirring devices and measuring instruments in order to minimize addition or removal of heat.
6. The graduation of the thermometer must be scaled by 0.1°C at minimum and accurate thermometer.
7. The water load must be (1000±5) g.
8. "t" is measured while the microwave generator is operating at full power. Magnetron filament heat-up time is not included.

NOTE: The operation time of the microwave oven is "t + 2" sec. 2 sec. is magnetron filament heat-up time.

Measuring method:
1. Measure the initial temperature of the water before the water is added to the vessel.
   (Example: The initial temperature T1 = 11°C)
2. Add the 1 litre water to the vessel.
3. Place the load on the centre of the shelf.
4. Operate the microwave oven at HIGH for the temperature of the water rises by a value Δ T of (10 ± 2) K.
5. Stir the water to equalize temperature throughout the vessel.
6. Measure the final water temperature. (Example: The final temperature T2 = 21°C)
7. Calculate the microwave power output P in watts from above formula.

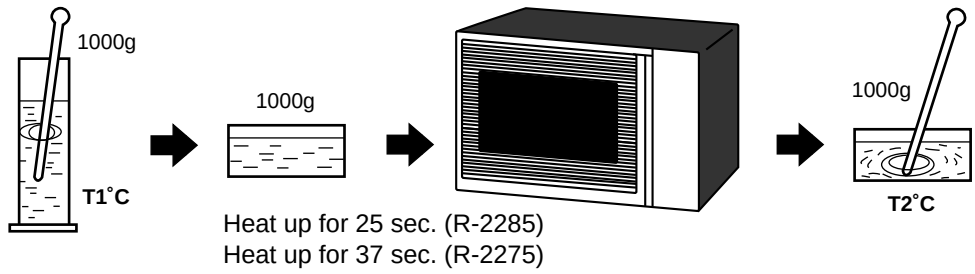
TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

Initial temperature ..... T1 = 11°C
Temperature after for R-2285 (23 + 2) = 25 sec. ..... T2 = 21°C
Temperature after for R-2275 (35 + 2) = 37 sec. ..... T2 = 21°C
Temperature difference Cold-Warm ..... ΔT = 10°C
Measured output power
The equation is "P = 180 x ΔT" for R-2285 ..... P = 180 x 10°C = 180 Watts
The equation is "P = 120 x ΔT" for R-2275 ..... P = 120 x 10°C = 120 Watts

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

CAUTION: 1°C CORRESPONDS TO 180 WATTS FOR R-2285AND 120 WATTS FOR R-2275. REPEAT MEASUREMENT IF THE POWER IS INSUFFICIENT.



B **HIGH VOLTAGE TRANSFORMER TEST**

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

CARRY OUT 3D CHECKS

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

	R-2285	R-2275
a. Primary winding	approx. 1.3 Ω	approx. 1.5 Ω
b. Secondary winding	approx. 83 Ω	approx. 98 Ω
c. Filament winding	less than 1 ohm	

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

CARRY OUT 4R CHECKS

C **HIGH VOLTAGE RECTIFIER ASSEMBLY TEST**

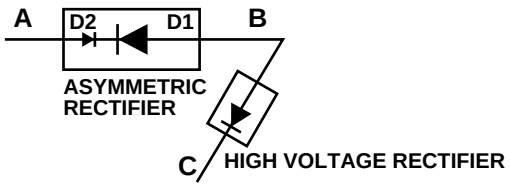
HIGH VOLTAGE RECTIFIER TEST

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 infinity in one direction and more than 100 kΩ in the other direction.

CARRY OUT 4R CHECKS



ASYMMETRIC RECTIFIER TEST

CARRY OUT 3D CHECKS.

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

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

CARRY OUT 4R CHECKS

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

D **HIGH VOLTAGE CAPACITOR TEST**

CARRY OUT 3D CHECKS

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

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

CARRY OUT 4R CHECKS

E **SWITCH TEST**

CARRY OUT 3D CHECKS

Isolate the switch to be tested and using an ohmmeter check between the terminals as described in the following table.

Table: Terminal Connection of Switch

Plunger Operation	COM to NO	COM to NC
Released	O.C.	S.C.
Depressed	S.C.	O.C.

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

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

CARRY OUT 4R CHECKS.

F **WEAK POINT / FUSE (WP1 OR WP2) TEST**

CARRY OUT 3D CHECKS.

If the weak point / fuse WP1 or WP2 is blown, there could be a short in the asymmetric rectifier or there is a ground in wire harness. A short in the asymmetric rectifier may have occurred due to short or ground in H.V. rectifier, magnetron, high voltage transformer or H.V. wire. Check them and replace the defective parts or repair the wire harness.

CARRY OUT 4R CHECKS

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

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER | **COMPONENT TEST**

G **SPECIAL FUSE / WEAK POINT (F1) TEST**

CARRY OUT 3D CHECKS

If the special fuse / weak point F1 is blown, there could be 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 special fuse / weak point with the correct value replacement.

H **FUSE F6.3A (F2) TEST**

CARRY OUT 3D CHECKS

If the fuse F2 F6.3A is blown when the door is opened, check the latch switch, monitor switch and monitor resistor.
If the fuse F2 F6.3 is blown by incorrect door switching replace the defective switch(es) and the fuse F2 F6.3A.

CARRY OUT 4R CHECKS

CAUTION: Only replace fuse with the correct value replacement.

I **TEMPERATURE FUSE OR THERMAL CUT-OUT TEST**

CARRY OUT 3D CHECKS

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

CARRY OUT 4R CHECKS

Table: Temperature Fuse or Thermal Cut-out Test

Parts Name	Temperature of "ON" condition (closed circuit). (˚C)	Temperature of "OFF" condition (open circuit). (˚C)	Indication of ohmmeter (When room temperature is approx. 20˚C.)
Oven temp. fuse 150˚C	This is not resetable type.	Above 150˚C	Closed circuit
Thermal cut-out 145˚C	Below -20˚C	Above 145˚C	Closed circuit.
Thermal cut-out 115˚C	Below -20˚C	Above 115˚C	Closed circuit

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

An open circuit oven temp. fuse 150˚C indicates that the oven cavity has over heated, this may be due to no load operation.

An open circuit thermal cut-out 145˚C 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 blower motor thermal cut-out 115˚C indicates the blower motor winding has overheated, this may be due to resisted ventilation or locked cooling fan.

J **MONITOR RESISTOR AND SURGE RESISTOR TEST**

CARRY OUT 3D CHECKS

Disconnect the leads from the monitor resistor or surge resistor.
Using an ohmmeter and set on a low range.
Check between the terminals of the monitor resistor or surge resistor as described in the following table.

Table: Resistance

Resistor	Resistance
Monitor resistor	Approx. 4.3Ω
Surge resistor	Approx. 10Ω

If incorrect readings are obtained, replace the monitor resistor or surge resistor.
CARRY OUT 4R CHECKS

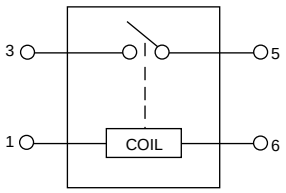
TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

K **SURGE RELAY TEST**

CARRY OUT 3D CHECKS

Disconnect the leads to terminals 1 and 6. connect an ohmmeter across the terminals 1 and 6, a reading of approximately 160 ohms should be indicated. If this is not the case then the relay coil is probably faulty and the relay should be replaced.



CARRY OUT 4R TESTS

Relay contact test for short circuit:

CARRY OUT 3D CHECKS

Isolate terminals 3 and 5 of the surge relay. Using an ohmmeter, check continuity between terminal 3 and 5. A reading of infinite resistance should be obtained. If this is not the case then the relay is probably faulty and should be replaced.

CARRY OUT 4R CHECKS

L **THERMISTOR (EXHAUST) TEST**

CARRY OUT 3D CHECKS

Disconnect connector-B from the CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to the leads of the thermistor.

Room Temp. ..... 20˚C - 30˚C
Resistance ..... Approx. 61.5kΩ - 39.5kΩ

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

CARRY OUT 4R CHECKS

THERMISTOR (AIR INTAKE) TEST

CARRY OUT 3D CHECKS

Disconnect connector-H from the CPU unit. Measure the resistance of the thermistor with an ohmmeter. Connect the ohmmeter leads to the leads of the thermistor.

Room Temp.	Resistance
15˚C	Approx. 3.14kΩ
20˚C	Approx. 2.57kΩ
25˚C	Approx. 2.11kΩ

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

CARRY OUT 4R CHECKS

M **MOTOR WINDING TEST**

CARRY OUT 3D CHECKS

Disconnect the leads from the motor. Using an ohmmeter, check the resistance between the two terminals.
Resistance of Blower motor should be approximately 32Ω.

If incorrect readings are obtained, replace the motor.

CARRY OUT 4R CHECKS

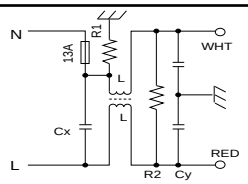
TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

N **NOISE FILTER TEST**

CARRY OUT 3D CHECKS

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



L (min)	Cx ± 20%	Cy ± 20%
1.0mH	1.0µF(R-2285) / 0.22µF (R-2275)	4700pF

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

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

CARRY OUT 4R CHECKS

O **TOUCH CONTROL PANEL ASSEMBLY TEST**

The touch control panel consists of circuits including semiconductors such as LSI 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 Switch Unit, troubleshooting by unit replacement is described according to the symptoms indicated.

1. Switch Unit
   The following symptoms indicate a defective switch unit. Replace the switch unit.
   a) When touching the select buttons, a certain button produces no signal at all.
   b) When touching the select buttons, sometimes a button produces no signal.
2. Control Unit
   The following symptoms may indicate a defective control unit. Replacing the control unit.

2-1 Programming problems.
   a) When touching the select buttons, a certain group of buttons do not produce a signal.

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

2-3 Other possible problems caused by defective control unit.
   a) Buzzer does not sound or continues to sound.
   b) Cooking is not possible.

Note: When defective components,(the Control Unit or Switch Unit) are replaed, the defective part or parts must be properly packed for return in the shipping carton. with its cushion material, in which the new replacement part was shipped to you.

P **SWITCH UNIT TEST**

1. CARRY OUT 3D CHECKS.
2. Remove the switch unit from the control panel, referring to control panel removal.
3. To test the switches (SW1-SW5) on the switch unit, check between the terminals of the connector CN-F as described in the following table by using ohmmeter when the switches are released and depressed.

Switches	Terminals	Released	Depressed
SW1	F1 - F4	O.C.	S.C.
SW2	F1 - F5	O.C.	S.C.
SW3	F2 - F4	O.C.	S.C.
SW4	F2 - F5	O.C.	S.C.
SW5	F3 - F4	O.C.	S.C.

O.C. : Open Circuit
S.C. : Short Circuit

TEST PROCEDURES (CONT'D)

PROCEDURE LETTER	COMPONENT TEST

4. If incorrect readings are obtained, replace the defective switch.
5. CARRY OUT 4R CHECKS

Q **RELAY TEST**

CARRY OUT 3D CHECKS

Remove the outer case and check voltage between Pin Nos. 5 and 7 of the connector (A) on the control unit with an A.C. voltmeter. The meter should indicate 220~230 volts, if not check control unit circuity.

RY1,RY2 and RY3 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.
DC. voltage indicated ..... Defective relay.
DC. voltage not indicated ..... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	APPROX. 18.0V D.C.	Oven lamp and Blower motor
RY2	APPROX. 17.5V D.C.	Power transformer 1
RY3	APPROX. 17.5V D.C.	Power transformer 2

CARRY OUT 4R CHECKS

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

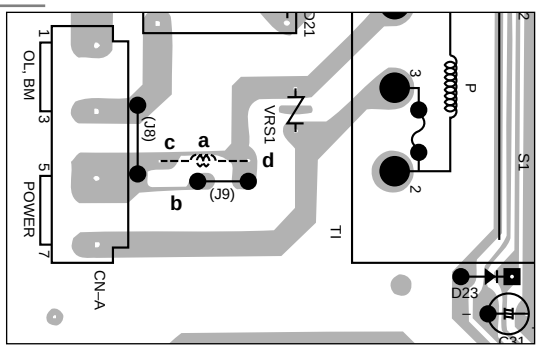
To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse. If the foil pattern is open, follow the troubleshooting guide given below for repair.

Problem: POWER ON, indicator does not light up.

CARRY OUT 3D CHECKS

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

NOTE: At the time of these repairs, make a visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance). If any abnormal condition is detected, replace the defective parts.



CARRY OUT 4R CHECKS

TOUCH CONTROL PANEL ASSEMBLY

OUTLINE OF TOIUCH CONTROL PANEL

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

(1) Control Unit
(2) Key Unit

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

1. Control Unit

Signal of key touch and oven function control are all processed by one microcomputer.

1) Power Supply Circuit

This circuit changes output voltage at the secondary side of the low voltage (T1) transformer to volatges required at each part by full wave rectifying circuit, constant voltage circuit, etc..

2) ACL Circuit

This is an Auto-clear Circuit, i.e., a reset circuit, which enables IC1 to be activated from initial state.

3) Power SYNC Signal Generating Circuit

This is a circuit for generating power SYNC signal by virtue of the secondary side output of transformer T1.This signal is used for a basic frequency to time processing and so on.

4) Clock Circuit

This is a circuit for controlling clock frequency required for operating IC1.

5) IC1 (Main Processor)

This is a one-chip microcomputer, responsible for controlling the entire control unit.

6) Display Circuit

This is a circuit for driving display tubes by IC1 output.

7) Switch Input Circuit

This is a circuit for transmitting switch input information to IC1.

8) Sound-body Driving Circuit

This is a circuit for driving sound body by IC1 output.

9) Relay Driving Circuit

This is a circuit for driving output relay by IC1 output.

10) Stop Switch Circuit

This is a circuit for driving IC1 to detect door opening/closing.

11) Exhaust Gas Temperature Detecting Circuit

This is a circuit for transmitting output change of thermistor (Temperature Sensor) to IC1.

12) High Voltage Monitoring Circuit.

This circuit detects problems in the magnetron / high voltage circuit by sensing a variation in the current flowing through the primary winding of the high voltage transformer.

During heating, the primary current of the high voltage transformers also flows through the primary winding of the current transformers CT1 and CT2. This causes a current to be induced in the secondary windings of CT1/CT2 and results in an AC voltage which is determined by R30/R31.

This AC voltage is then half wave rectified by D30/D31 and smoothed (filtered) by C30/C31.

This AC voltage is the input to the AN3 and AN4 ports of IC1, which determines if there is a magnetron / high voltage problem.

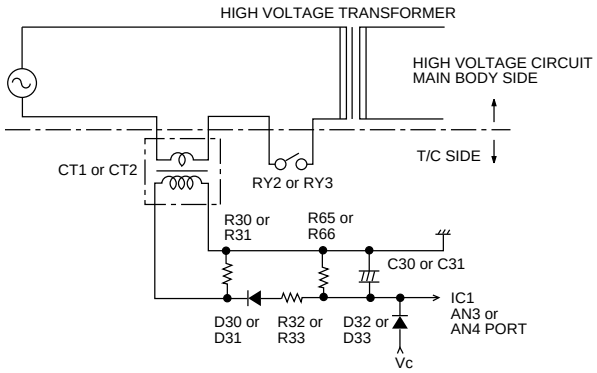


Figure T-1. High Voltage Monitoring Circuit

13) Fan Lock Detecting Circuit.

This is a circuit for transmitting output change of thermistor (Fan Lock Sensor) to IC1.

2. Switch Unit

The switch unit is composed of a matrix circuit in which when a switch it touched, one of signals P43 - P45 generated by the IC1, is passed through the switch and returned to the IC1 as one of signals P50 - P51.

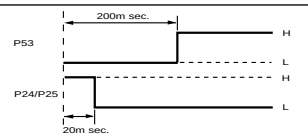
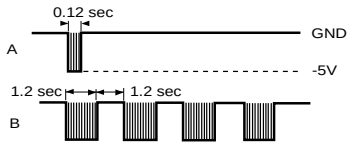
3. Encoder

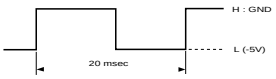
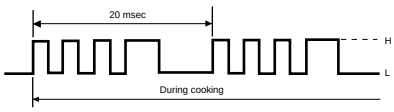
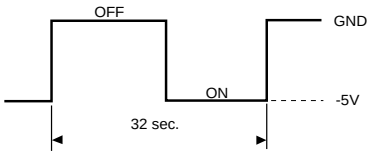
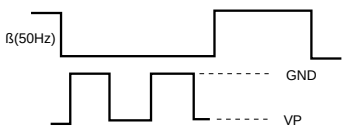
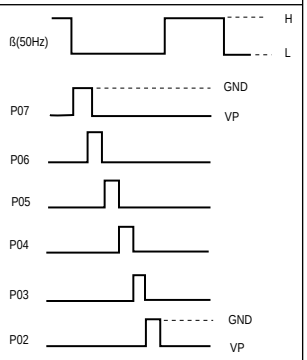
The encoder converts the signal generated by IC1 into the pulse signal, and the pulse signal is returned to the IC1.

DESCRIPTION OF LSI

LSI(IZA539DR)

The I/O signal of the LSI(IZA539DR) is 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: -35V** Vp voltage of power source circuit input.
3	AVSS	IN	**Reference voltage input terminal.** A reference voltage applied to the A/D converter in the LSI. Connected to VC.(-5V)
4	VREF	IN	**Reference voltage input terminal.** A reference voltage applied to the A/D converter in the LSI. Connected to GND.
5-7	AN7-AN5	IN	Terminal to switch the specification.
8	AN4	IN	A/D input for troubleshooting Magnetron 1.
9	AN3	IN	A/D input for troubleshooting Magnetron 2.
10	AN2	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.
11	AN1	IN	**Temperature measurement input: FAN LOCK 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.
12	P60	IN	**Input signal which communicates the door open/close information to LSI.** Door closed; "H" level signal (0V). Door opened; "L" level signal(-5.0V).
13	P55	OUT	**Power supply output at thermistor detecting circuit.** (Output -5V in cooking only, but apply high impedance to others to prevent thermistor from electrolytic corrosion ocurrence.)
14	P54	OUT	Terminal not used.
15	P53	OUT	**Surge limiting relay driving signal.** The surge limiting relay is designed to turn on 20 msec. earlier than the cook relays (RY2,RY3). 
16	P52	OUT	Terminal not used.
17	P51	IN	**Signal coming from switch unit.** When either one of switches SW2 and SW4 on the switch unit is pressed, a corresponding signal out of P44 and P43 will be input into P51.
18	P50	IN	**Signal similar to P51.** When either one of switches SW1,SW3 and SW5 on the switch unit is pressed, a corresponding signal out of P43,P44 and P45 will be input into P50.
19	P47	OUT	**Signal to sound buzzer.** This signal is to control the 2.5kHz continuous signal. A: Switch touch sound. B: Completion sound. 
20	P46	OUT	Terminal not used.
21	P45	OUT	**Switch strobe signal.** Signal is applied to the switch unit. A pulse signal is input to P50 terminal while switch SW5 is pressed.
22	P44	OUT	**Switch strobe signal.** Signal is applied to the switch unit. A pulse signal is input to P50 or P51 terminal while switch SW3 or SW4 is pressed.
23	P43	OUT	**Switch strobe signal.** Signal is applied to the switch unit. A pulse signal is input to P50 or P51 terminal while switch SW1 or SW2 is pressed.
24	P42	IN	**Signal coming from encoder.** When the encoder is turned, the contacts of encoder make pulse signals. And pulse signals are input into P42.

Pin No.	Signal	I/O	Description
25	INT1	IN	**Signal coming from encoder.** Signal similar to R42. Pulse signals are input into INT1.
26	INT0	IN	**Signal synchronized with commercial power source freqency.** This is basic timing for all time processing of LSI. 
27	RESET	IN	**Auto clear terminal.** Signal is input to reset the LSI to the initial state when power is supplied. Temporarily set to "L" level the moment power is supplied, at this time the LSI is reset. Thereafter set at "H" level.
28-29	P71-P70	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	OUT	**Oven lamp and cooling fan motor driving signal. (Square Waveform : 50Hz)** To turn on and off the shut-off relay (RY1). The Square waveform voltage is delivered to the RY1 relay driving circuit and relays(RY2,RY3 COOK RELAY) control circuit. 
34	P26	OUT	Terminal not used.
35-36	P25-P24	OUT	**Magnetron high-voltage circuit driving signal.** To turn on and off the cook relay. In100% power level operation, "L" level during cooking; "H" level otherwise. In other power level operation (50,20 or10%), "H" and "L" level is repeated according to power level. POWER LEVEL / ON / OFF 50% / 32 sec. / 14 sec. 20% / 8 sec. / 24 sec. 10% / 6sec / 26 sec. 
37-38	P23-P22	OUT	Terminal not used.
39-48	P21-P10	OUT	**Segment data signal.** The relation between signals and indicators are as follows: Signal Segment Signal Segment P01 ..... i P15 ..... f P00 ..... j,k P14 ..... e P21 ..... LB P13 ..... d P20 ..... UB P12 ..... c P17 ..... h P11 ..... b P16 ..... g P10 ..... a 
49-54	P07-P02	OUT	**Digit selection signal.** The relation between digit signal and digit are as follows: Digit signal Digit P07 ..... 1st. P06 ..... 2nd. P05 ..... 3rd. P04 ..... 4th. P03 ..... 5th. P02 ..... 6th. Normally, one pulse is output in every ß period, and input to the grid of the Fluorescent Display. 
55-56	P01-P00	OUT	**Segment data signal.** Signal similar to P21.
57-64	P37-P30	OUT	Terminal not used.

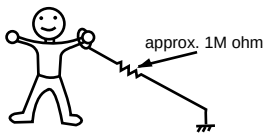
SERVICING

1. Precautions for Handling Electronic Components

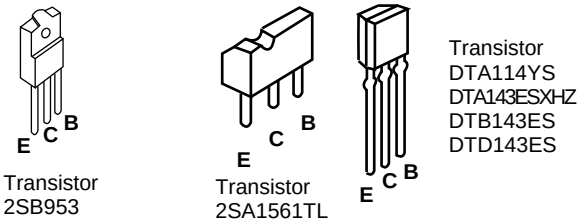
This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, 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



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.

SERVICE INFORMATION

IMPORTANT: When replace the magnetron MG1 and/or MG2, the relays RY2 and RY3 on control unit must bereplaced at the same time.

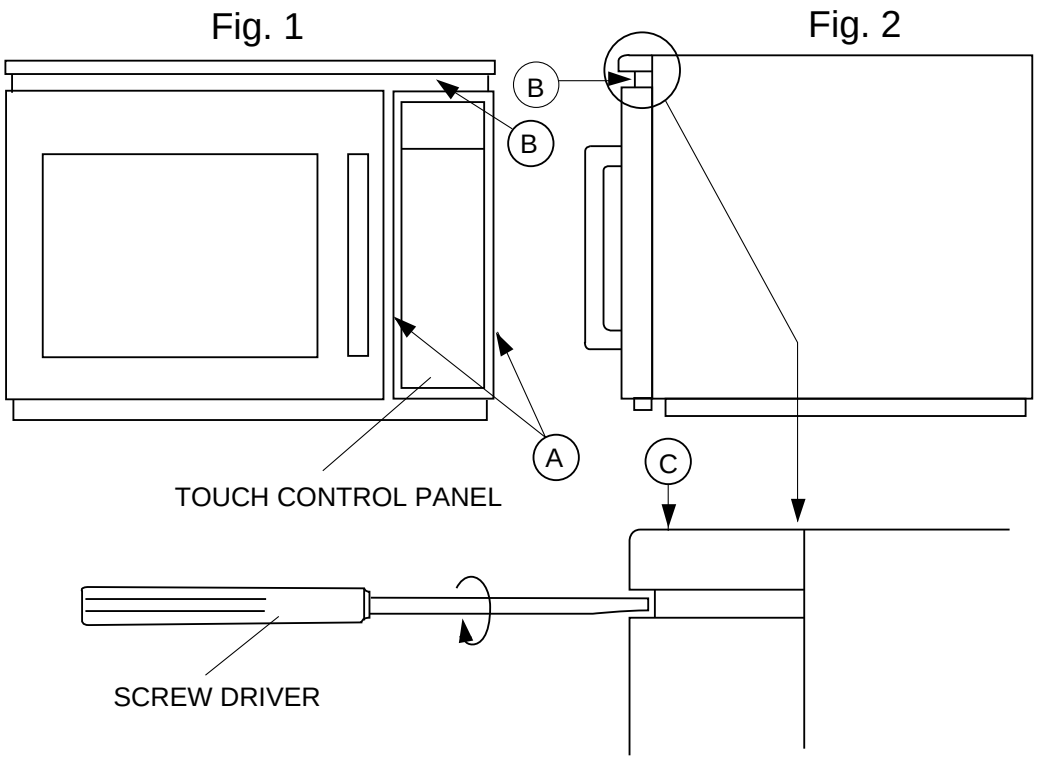
CAUTION FOR TOUCH CONTROL PANEL REMOVAL

1. Hold the lower end (Position A, Fig. 1) of the touch control panel ass'y firmly while sliding it down and toward you.

   CAUTION: DO NOT FORCE THE CONTROL UNIT TO SLIDE DOWN DURING REMOVAL. THIS MAY CAUSE DAMAGE TO THE CONTROL UNIT BY HITTING A RELAY (RY-3) OR THE TAB TERMINALS LOCATED AT THE FRONT OF THE OVEN CAVITY.

2. If the Touch Control Panel is hard to remove.

1, Insert a flat head screw driver into space B . (Fig. 1)
2, Rotate the screwdriver clockwise while holding position C of the Touch Control Panel. (Fig. 2)
CAUTION : TO AVOID DAMEGE TO TOUCH CONTROL PANEL, COVER THE TIP OF SCREWDRIVER WITH TAPE.
3, Resolder the Relay(RY-3) prior to reinstalling the Touch Control Panel.



COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

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

1. CARRY OUT 3D CHECKS.
2. Make sure that a definite" click" can be heard when the microwave oven door is unlatched. (Hold the door in a closed position, then pull the door release lever with one hand, 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.).

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

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

Do not operate the oven:

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

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

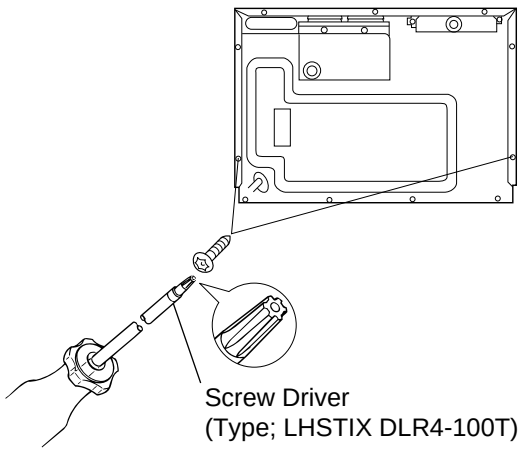
OUTER CASE REMOVAL

To remove the outer case, proceed as follows.

1. Disconnect oven from power supply.
2. Open the oven door and wedge it open.
3. Remove the two (2) screws from the lower portion of the oven cabinet back side using by special screw drive (Type; LHSTIX DLR4-100T).
4. Remove the nine (9) screws from rear and along the side edge of case.
5. Slide the entire case back about 1 inch (3cm) to free it from retaining clips on the cavity face plate.
6. Lift the entire case from the oven.
7. Remove the eleven (11) screws holding the rear cabinet to the oven.
8. Remove the rear cabinet.
9. Discharge the HV capacitor before carrying out any further work.
10. Do not operate the oven with the outer case removed.

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

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



HIGH VOLTAGE COMPONENTS REMOVAL
(High Voltage Capacitor and High Voltage Rectifier Assembly)

To remove the components, proceed as follows.

1. CARRY OUT 3D CHECKS
2. Remove two (2) screws holding earth side terminals of high voltage rectifier assemblies.
3. Remove two (2) screws holding capacitor holder to oven cavity rear and remove the capacitor holder.
4. Disconnect all the leads and terminals of high voltage rectifier assembly from high voltage capacitor.
5. Now, high voltage rectifier assembly should be free.

CAUTION

1. DO NOT REPLACE ONLY HIGH VOLTAGE RECTIFIER. WHEN REPLACE IT, REPLACE HIGH VOLTAGE RECTIFIER ASSEMBLY.
2. WHEN REPLACING HIGH VOLTAGE RECTIFIER ASSEMBLY, ENSURE THAT THE CATHODE (EARTH) CONNECTION IS SECURELY FIXED TO THE CHASSIS WITH A EARTHING SCREW.

6. Remove the H.V. cover from the two (2) high voltage capacitors.
7. Now, the two (2) high voltage capacitors are free.

MAGNETRON REMOVAL

1. CARRY OUT 3D CHECKS.
2. Carry out item 2 to item 16 of "HIGH VOLTAGE TRANSFORMER AND BLOWER MOTOR REMOVAL".
3. Remove the four (4) screws holding the magnetron to the oven cavity. Remove the magnetron from the oven cavity.
4. Now, the magnetron is free.

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

HIGH VOLTAGE TRANSFORMER AND BLOWER MOTOR REMOVAL

BLOWER MOTOR

1. CARRY OUT 3D CHECKS.
2. Remove the single (1) screw holding the air duct A to the air duct.
3. Remove the air duct A.
4. Disconnect the wire leads from the blower motor and the blowe motor thermal cut-out.
5. Remove the single (1) screw holding the blower motor to the oven cavity.
6. Release the HVC harness from the purse lock on the blower motor.
7. Remove the blower motor. Now, the blower motor is free.

HIGH VOLTAGE TRANSFORMER

8. Remove the single (1) screw holding the air guide C to the ove cavity.
9. Remove the air guide C from the oven cavity.
10. Remove the single (1) screw holding the stirrer duct to the oven cavity.
11. Remove the stirrer duct from the oven cavity.
12. Disconnect the wire leads from the high voltage transformer.
13. Disconnect the wire leads from the magnetron filament.
14. Release the wire leads from the hook of the air duct.
15. Remove the single (1) screw holding the air duct to the oven cavity.
16. Remove the air duct from the oven cavity.
17. Remove the two (2) screws holding the high voltage transformer to the bottom plate.
18. Remove the high voltage transformer. Now, the high voltage transformer is free.

CAUTION: WHEN THE NEW BLOWER MOTOR IS INSTALLED TWO PURSE LOCKS MUST BE FITTED IN IT BECAUSE IT DOES NOT HAVE ANY PURSE LOCKS.

CONTROL PANEL ASSEMBLY REMOVAL

CONTROL ASSEMBLY

1. Disconnect the oven from the power supply.
2. Remove the air intake filter assembly from the bottom plate.
3. Remove two (2) screws holding the control panel mounting angle to the bottom plate.
4. Pull down the control panel.
5. Disconnect connectors CN-A, CN-B, CN-H and TAB terminal (TAB1, 2, 3 and 4) from the control unit.
6. Now, the control panel assembly is free.

CONTROL UNIT

7. Disconnect connectors CN-J and CN-E from the control unit.
8. Remove six (6) screws holding the control unit to the control panel frame.
9. Now, the control unit is free.

SWITCH UNIT

10. Remove the three (3) screws holding the switch unit (Main) to the control panel frame.
11. Remove the two (2) screws holding the switch unit (Sub) to the control panel frame.
12. Now, the switch unit is free.

ROTARY ENCODER

10 Remove the two (2) screws holding the earth wire to the rotary encoder and control panel mounting angle.
11. Remove the two (2) screws holding the rotary encoder to the control panel frame.
12. Remove the knob from the rotary encoder shaft.
13. Now, the rotary encoder is free.

OVEN LAMP SOCKET REMOVAL

1. CARRY OUT 3D CHECKS
2. Remove the oven lamp.
3. 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.
4. Lift up the oven lamp socket.
5. Now, the oven lamp socket is free.

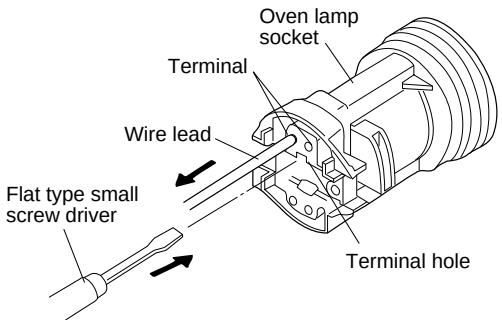


Figure C-1. Oven lamp socket

POWER SUPPLY CORD REPLACEMENT

1. CARRY OUT 3D CHECKS
2. Release the cord bushing from the rear cabinet.
3. Disconnect the brown and blue wires of the power supply cord from the noise filter.
4. Loosen the single (1) screw holding the earth angle and earth wire of power supply cord.
5. Remove the power supply cord.

Re-install

1. Insert the power supply cord into the cord bushing.
2. Connect the brown and blue wires of power supply cord into the terminals of noise filter, referring to pictorial diagram.
3. Insert the green/yellow wire of power supply cord into the earth angle, and tight the screw holding the earth angle.
4. Re-install the cord bushing to the rear cabinet.
5. Re-install the rear cabinet to oven cavity and the bottom plate with the eleven (11) screws and two (2) washers.
6. CARRY OUT 4R CHECKS.

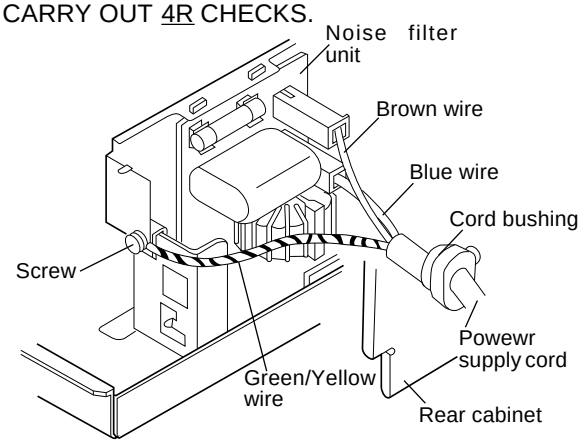


Figure C-2. Power supply cord replacement

1ST LATCH, 2ND LATCH, 3RD LATCH, MONITOR, AND STOP SWITCHES REMOVAL

1. CARRY OUT 3D CHECKS.
2. Remove the control panel from the oven cavity referring to “CONTROL PANEL REMOVAL”.
3. Remove the two (2) screws holding the latch hook to the oven cavity.
4. Open the door and pull the latch hook out of the oven cavity.
5. For 1st latch, 2nd latch or Monitor switch removal
   5-1. Disconnect the wire leads from the switch.
   5-2. Push the retaining tabs outward slightly and then pull the switch forwards and remove it from the latch hook.
6. For 1st latch and stop switches removal
   6-1. Disconnect the wire leads from the 1st latch and stop switches.
   6-2. Remove the single (1) screw and nut holding the 1st latch and stop switches to the latch hook.

CAUTION: WHEN THE 1ST LATCH SWITCH AND 2ND. LATCH SWITCH ARE INSTALLED, THE TWO (2) TABS OF THE LATCH HOOK SHOULD BE BROKEN.

1ST, 2ND, 3RD LATCH SWITCH, STOP SWITCH AND MONITOR SWITCH ADJUSTMENT

In case 1st latch switch, 2nd latch, stop switch, 3rd latch 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.
2. With the door closed, adjust the latch hook by moving it back and forward, or up and down. In and out play of the door allowed by the latch hook should be less than 0.5mm. The vertical position of the latch hook should be placed where the stop switch and 1st, 2nd, 3rd latch switches have activated with the door closed.
   The horizontal position of the latch hook should be placed where the monitor switch has activated with the door closed.
3. Secure the screws with washers firmly.
4. Make sure of the 1st, 2nd, 3rd latch switches, stop switch, and monitor switch operation. If those switches have not activated with the door closed, loose two (2) screws holding latch hook and adjust the latch hook position.

After adjustment, make sure of the following:

1. The stop switch and 1st, 2nd, 3rd latch switches interrupt the circuit before the door open when the door release lever is pulled, and then and monitor switch close the circuit when the door is opened.
2. Re-install outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

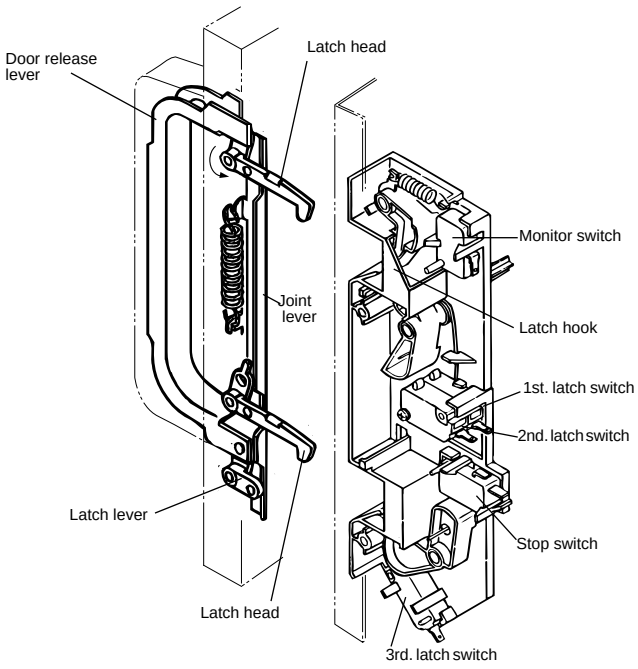


Figure C-3. Latch Switch Adjustments

DOOR REPLACEMENT AND ADJUSTMENT

DOOR REPLACEMENT

1. CARRY OUT 3D CHECKS
2. Remove four (4) screws holding the upper and lower oven hinge to the oven cavity.
3. Remove door assembly with upper and lower oven hinges by pulling it forward.
4. On re-installing new door assembly, secure the upper and lower oven hinges with the four (4) mounting screws to the oven cavity. Make sure the door is parallel with bottom line of the oven face plate and the latch head pass through the latch holes correctly.
5. CARRY OUT 4R CHECKS
   Note: After any service to the door, the approved microwave survey meter should be used to assure in compliance with proper microwave radiation stand-ards. (Refer to Microwave Measurement Procedure.)

DOOR ADJUSTMENT

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

1. Adjust door latch heads at a position where they smoothly catch the latch hook through the latch holes. Refer to latch switch adjustments.
2. Deviation of the door alignment from horizontal line of cavity face plate is to be less than 1.0 mm.
3. The door is positioned with its face depressed toward the cavity face plate.
4. Reinstall outer case and check for microwave leakage around the door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

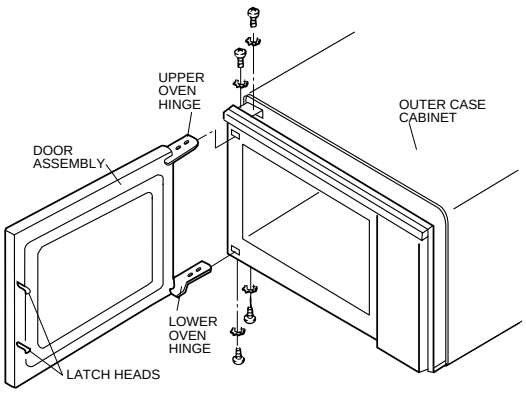


Figure C-4. Door Assembly Replacement and Adjustment

CHOKE COVER REMOVAL

1. Insert an iron plate (thickness of about 0.5 mm or flat type screw driver to the gap between the choke cover and door panel as shown figure to free the engaging part. The protect sheet may be used not to damage the door panel.
2. Lift up the choke cover, now cove is free.

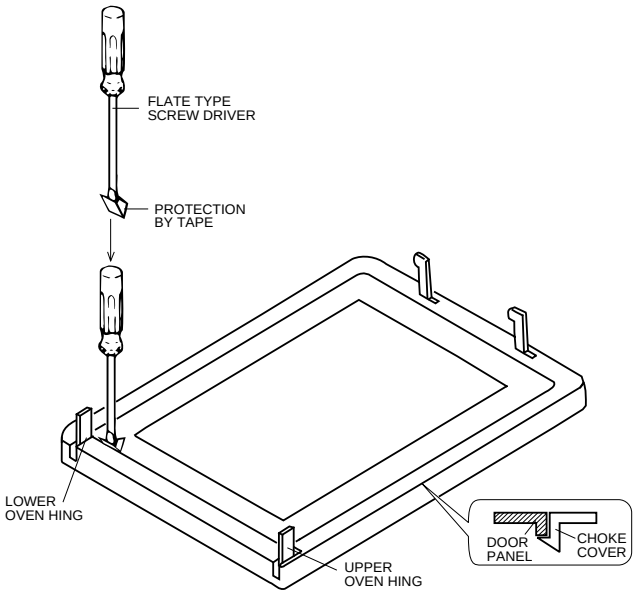


Figure C-5. Choke Cover Removal

DOOR COMPONENTS REMOVAL

Remove the door assembly, referring to from item 1 through item 3 of "DOOR REPLACEMENT".

1. Place the door assembly on a soft cloth with facing up.

(UPPER AND LOWER OVEN HINGE REMOVAL)

2. Remove the choke cover, referring to "CHOKE COVER REMOVAL".
3. Release the oven hinges from the door panel.
4. Now, the oven hinges are free.

(DOOR HANDLE REMOVAL)

5. Remove the two (2) screws holding the door handle to door.
6. Remove the door handle from the door panel.

(UPPER AND LOWER LATCH HEADS REMOVAL)

7. Remove the door release lever from the door assembly.
8. Remove the three (3) screws holding the joint plate to the door panel.
9. Release the latch spring from the tab of the joint lever and joint plate.
10. Release the latch heads from joint lever and joint plate.
11. Now, the latch heads are free.

(DOOR FRAME REMOVAL)

12. Set the four (4) tabs of the door frame upright.
13. Remove the door frame from the door panel. Now, door frame is free.

(DOOR GLASS REMOVAL)

14. Remove the four (4) screws holding the two (2) outside window fixing plates to the door panel.
15. Now, the door glass as free.

HOW TO RELEASE THE POSITIVE LOCK® CONNECTOR.

Procedure

1. Pushing the lever of positive lock® conductor.
2. Pull down the connector from the terminal.
3. Now, the connector is free.

Note: If the positive lock® has a insulation sleeve, first remove it. If you do not so, you can not push the lever of positive lock®.

CAUTION: THE POSITIVE LOCK® TERMINAL CAN NOT BE DISCONNECTED BY ONLY PULLING. BECAUSE ONCE YOU (SERVICE PERSONAL) HAVE CONNECTED THE POSITIVE LOCK® CONNECTOR TO THE TERMINAL, THE POSITIVE LOCK® CONNECTOR HAS BEEN LOCKED.

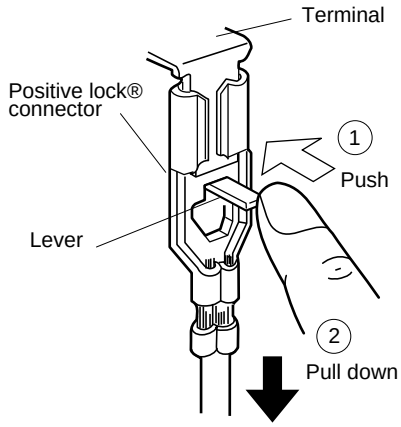


Figure C-6. How to release the positive lock connector.

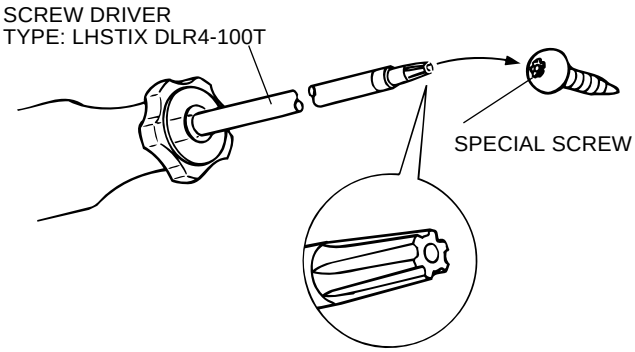
EXHAUST COVERS A AND B REMOVAL

(Exhaust cover A)

1. Remove the single (1) special screw holding the exhaust cover A to the rear cabinet, using the special driver LHSTIX DLR4-100T.
2. Release the tab of the exhaust cover A from the hole of the rear cabinet, and remove the exhaust cover A.
3. Now, the exhaust cover A is free.

(Exhaust cover B)

1. Remove the single (1) special screw holding the exhaust cover B to the rear cabinet, using the special driver LHSTIX DLR4-100T).
2. Release the tab of the exhaust cover B from the hole of the rear cabinet, and remove the exhaust cover B.
3. Now, the exhaust cover A is free.



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

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.

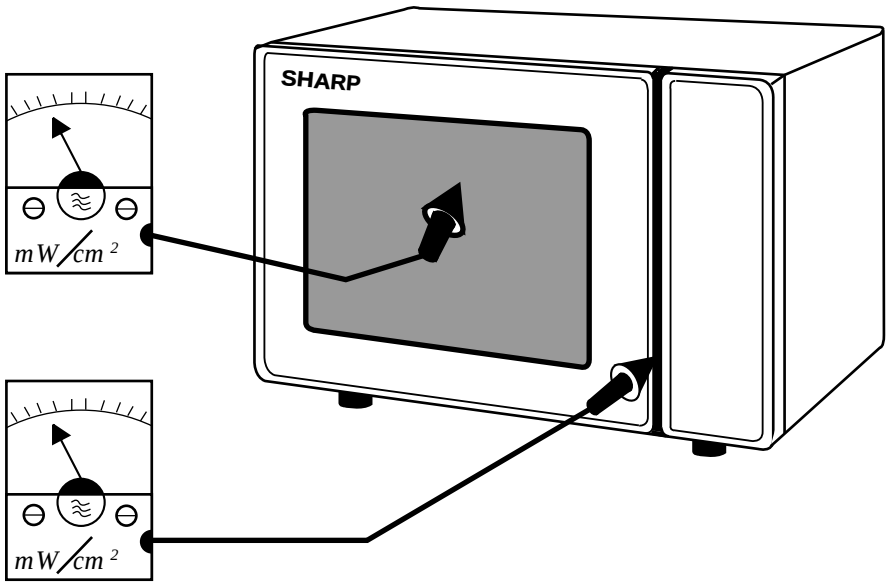
REQUIREMENT

The safety switch must prevent microwave radiation emission in excess of 5mW/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 ± 15ml of water initially at 20 ± 5˚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 that 2.5cm/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

TEST DATA AT A GLANCE

Parts	Symbol	Value / Data
Weak point (R-2285)	WP1	A018
Weak point (R-2285)	WP2	A018
Weak point (R-2285)	F1	A017
Fuse (R-2275)	WP1	M6.3A
Fuse (R-2275)	WP2	M6.3A
Special fuse (R-2275)	F1	13A
Fuse	F2	F6.3A 250V
Thermal cut-out (Mag)	TC1	145˚C
Thermal cut-out (Mag.)	TC2	145˚C
Thermal cut-out (Blower motor)	TC3	115˚˚C
Oven temp. fuse	TF	150˚C
Thermistor (Exhaust)		Approx. 61.5kΩ at 20˚C, 39.5KΩ at 30˚C
Thermistor (Air intake)		Approx. 3.14kΩ at 15˚C, 2.57KΩ at 20˚C, 2.11KΩ at 25˚C
Surge resistor	R1	10Ω 20W
Surge resistor	R2	10Ω 20W
Monitor resistor	R3	4.3Ω 20W
Oven lamp	OL	250V 25W
Surge relay	RY-S1	Approx. 160Ω
Surge relay	RY-S2	Approx. 160Ω
High voltagr capacitor	C1	1.07μF (R-2285)/ 0.94μF (R-2275), AC 2100V
High voltagr capacitor	C2	1.07μF (R-2285)/ 0.94μF (R-2275), AC 2100V
High voltage transformer	T1	Filament winding < 1Ω Secondary winding Approx. 83Ω (R-2285) / 98Ω (R-2275) Primary winding Approx. 1.3Ω (R-2285) / 1.5Ω (R-2275)
High voltage transformer	T2	Filament winding < 1Ω Secondary winding Approx. 83Ω (R-2285) / 98Ω (R-2275) Primary winding Approx. 1.3Ω (R-2285) / 1.5Ω (R-2275)
Magnetron	MG1	Filament winding < 1Ω Filament winding - chassis ∞ Ω
Magnetron	MG2	Filament winding < 1Ω Filament winding - chassis ∞ Ω

TEST POINT ON CONTROL UNIT

In/Out pit terminal	Test Point	Volt	Resistance (Disconnect the power plug and close the door.)
Input terminal (Power suplly)	A5- A7	225V	Approx. 680Ω
Output terminal (Stop switch)	B1- B2		0
Output terminal (Themistor)	B1- B3	DC. 5V	Approx. 61.5 kΩ at 20˚C , 39.5 kΩ at 30˚C
Output terminal (Oven lamp +Blower motor)	A1- A7	225V	Approx. 26Ω
Output terminal (Surge relay)	B4- B5	DC. 12V	Approx. 80Ω
Output terminal (Earth)	B1- Chassis		0

WARNING: DISCONNECT THE PLUG WHEN MEASURING RESISTANCE.

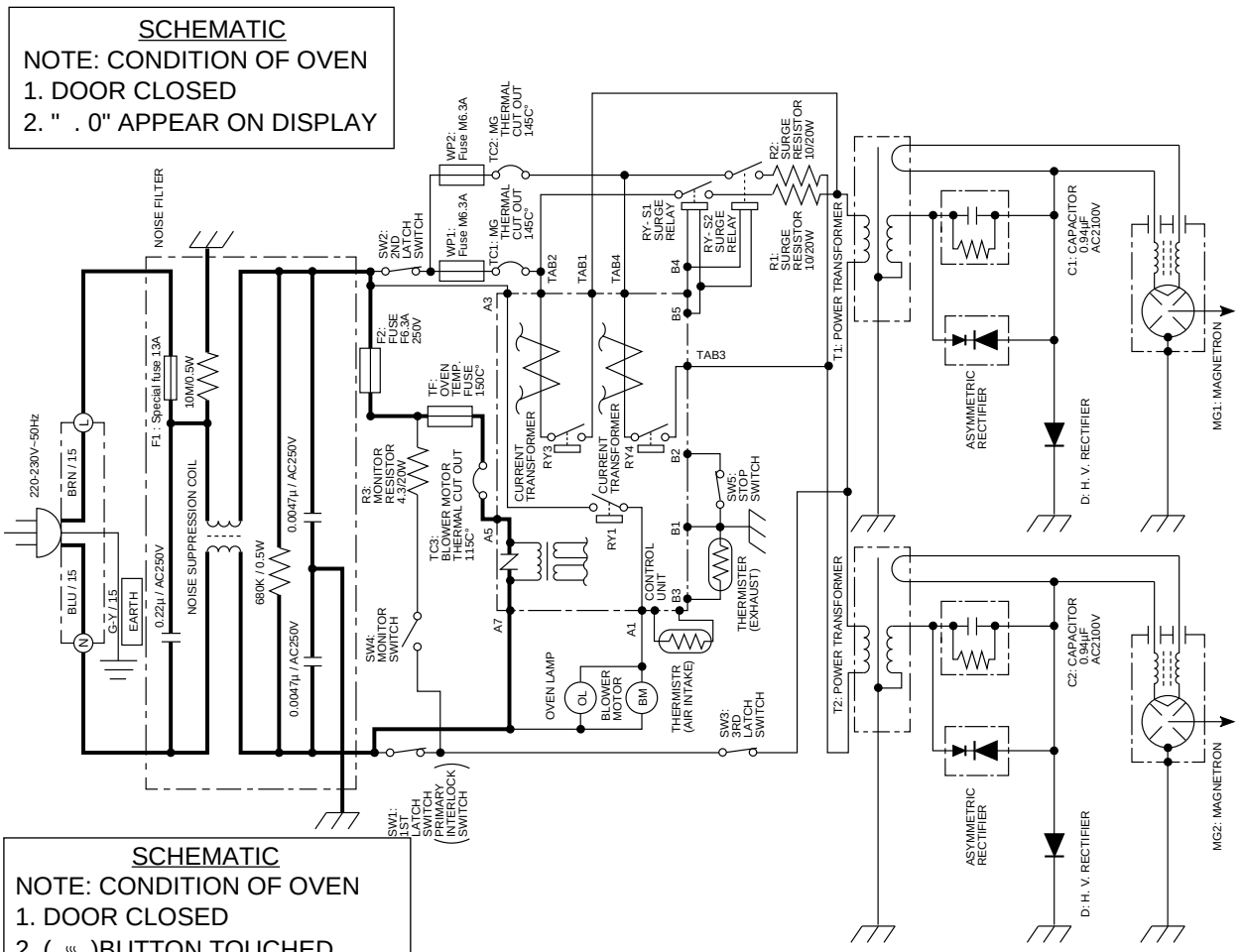


Figure O-1. Oven Schematic – OFF Condition for R-2275

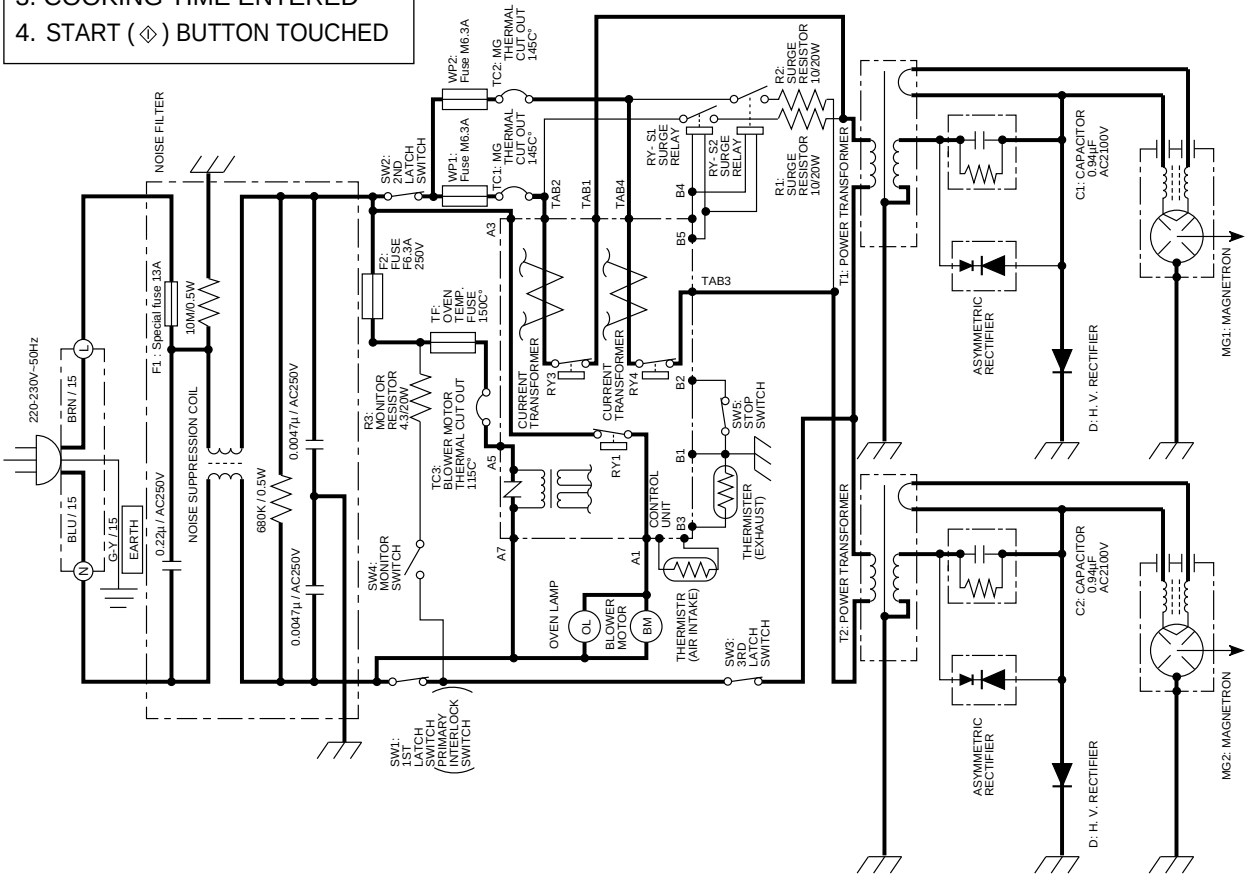


Figure O-2. Oven Schematic – ON Condition for R-2275

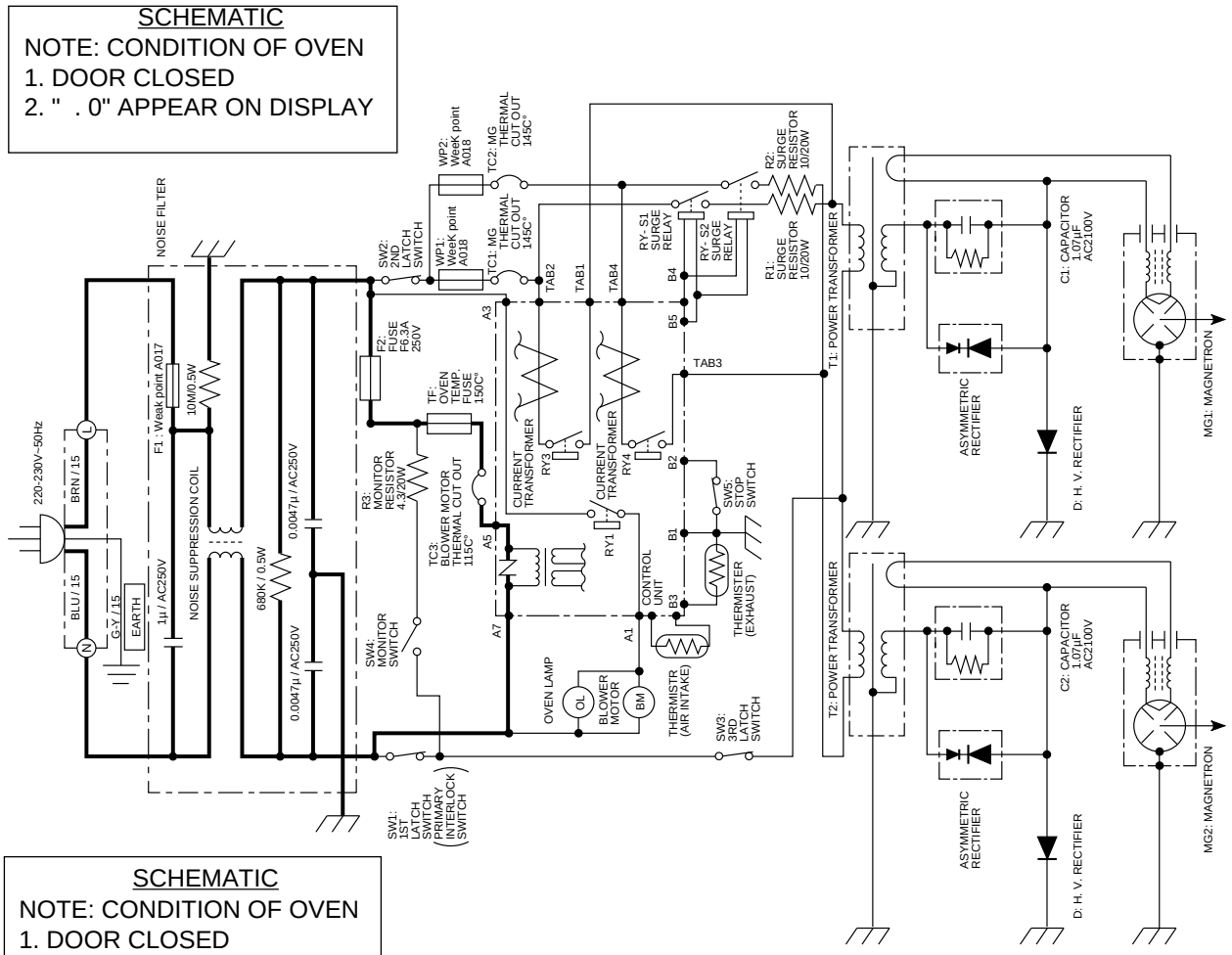


Figure O-1. Oven Schematic – OFF Condition for R-2285

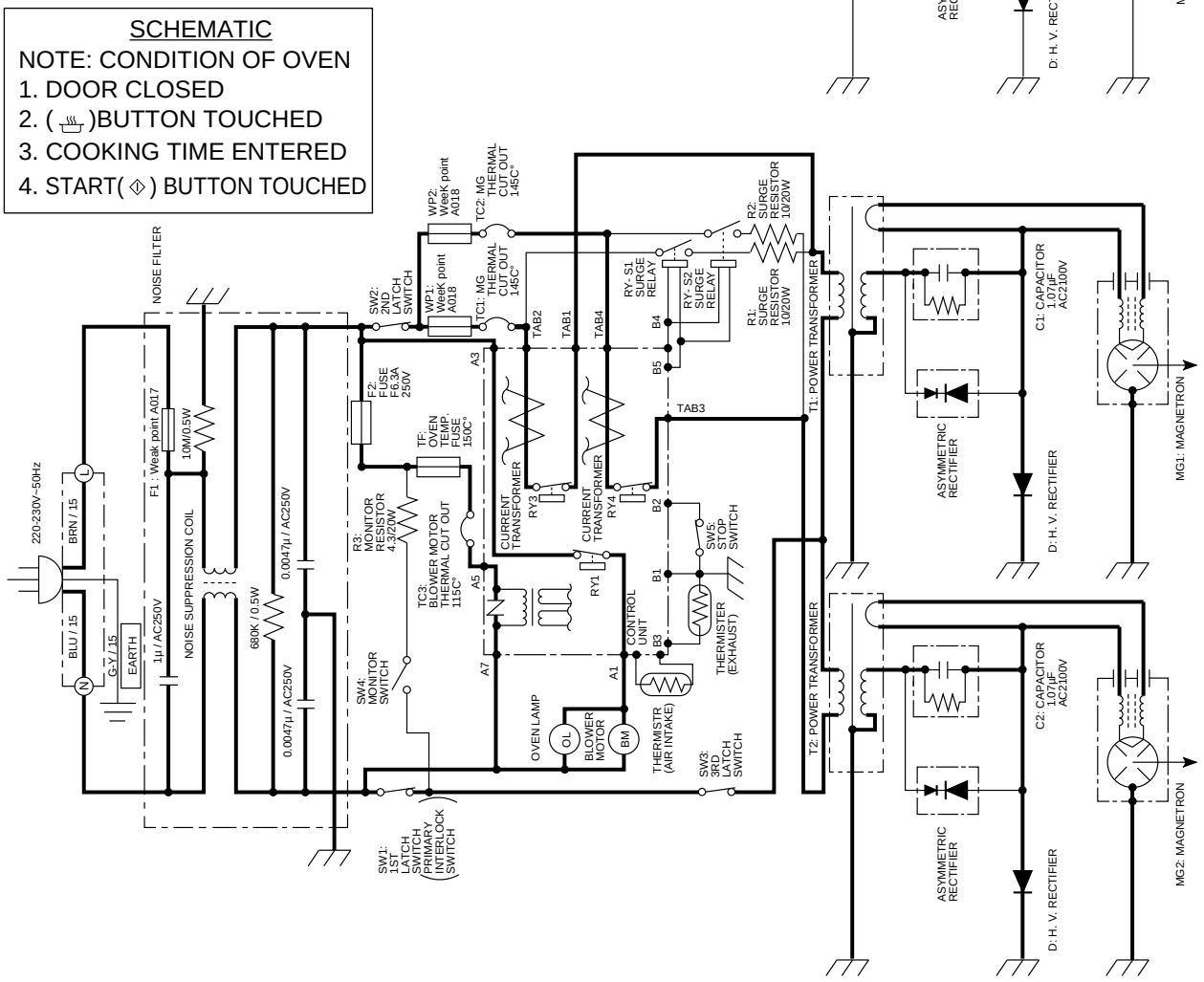


Figure O-2. Oven Schematic – ON Condition for R-2285

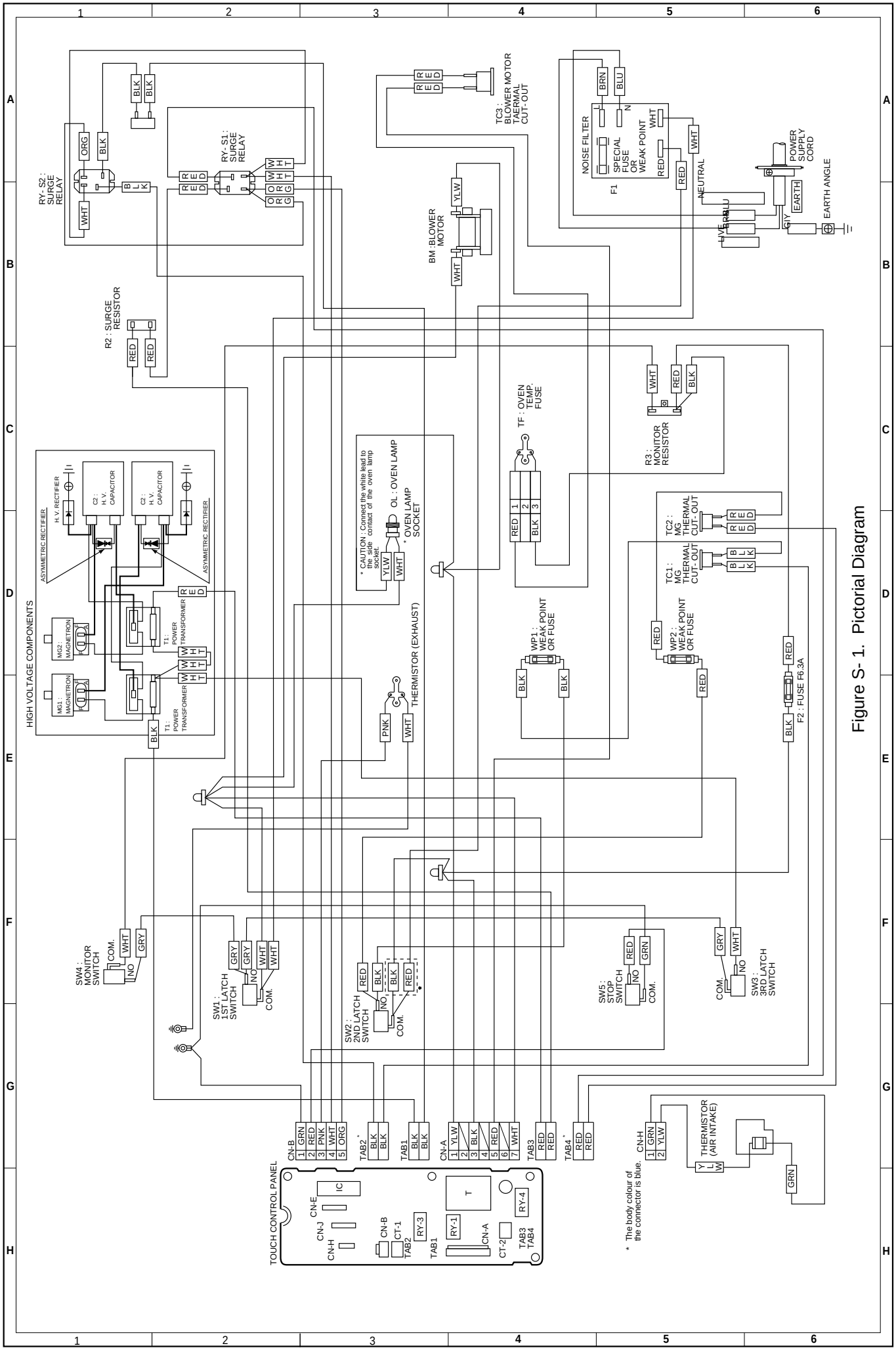


Figure S- 1. Pictorial Diagram

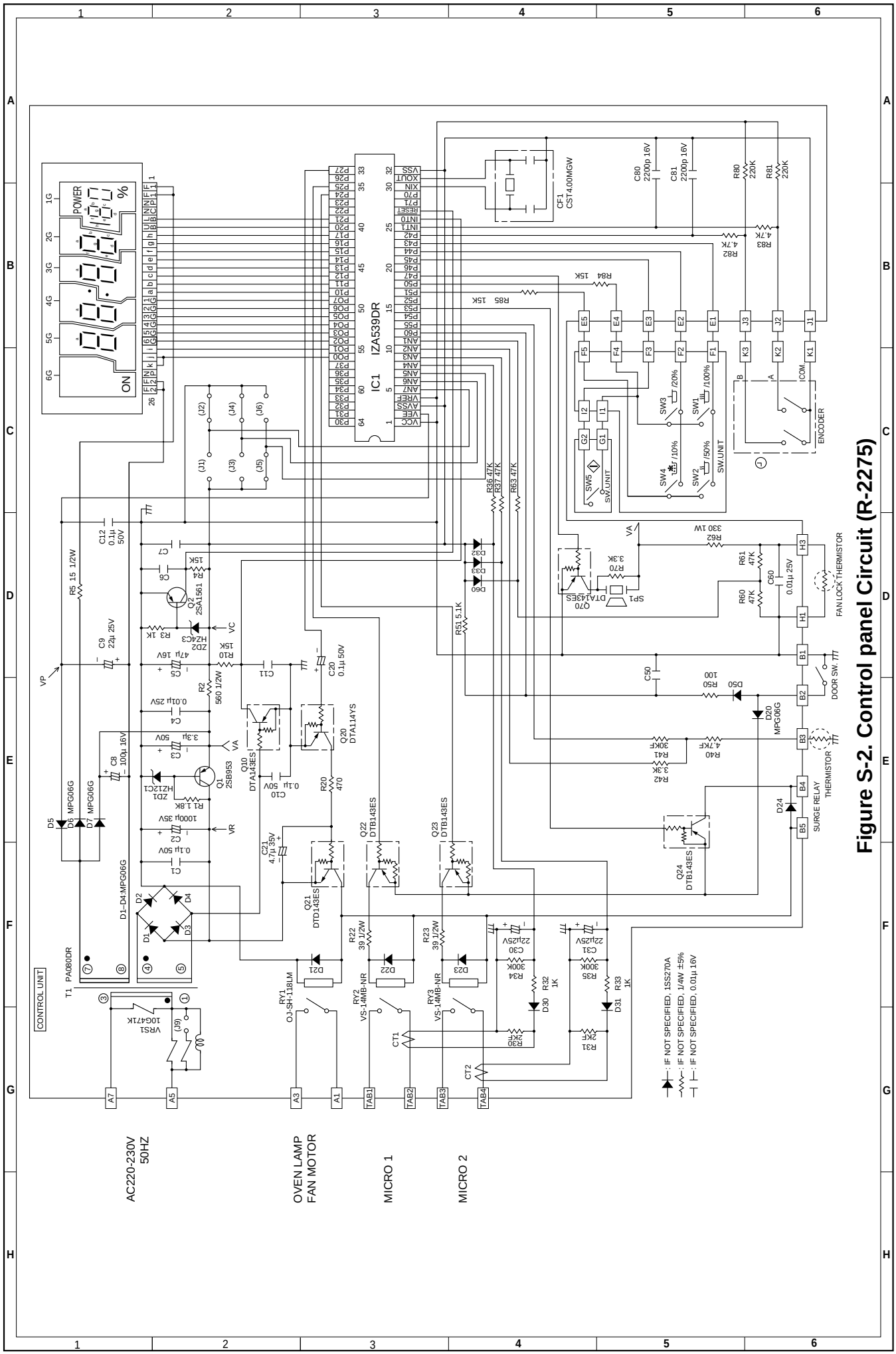


Figure S-2. Control panel Circuit (R-2275)

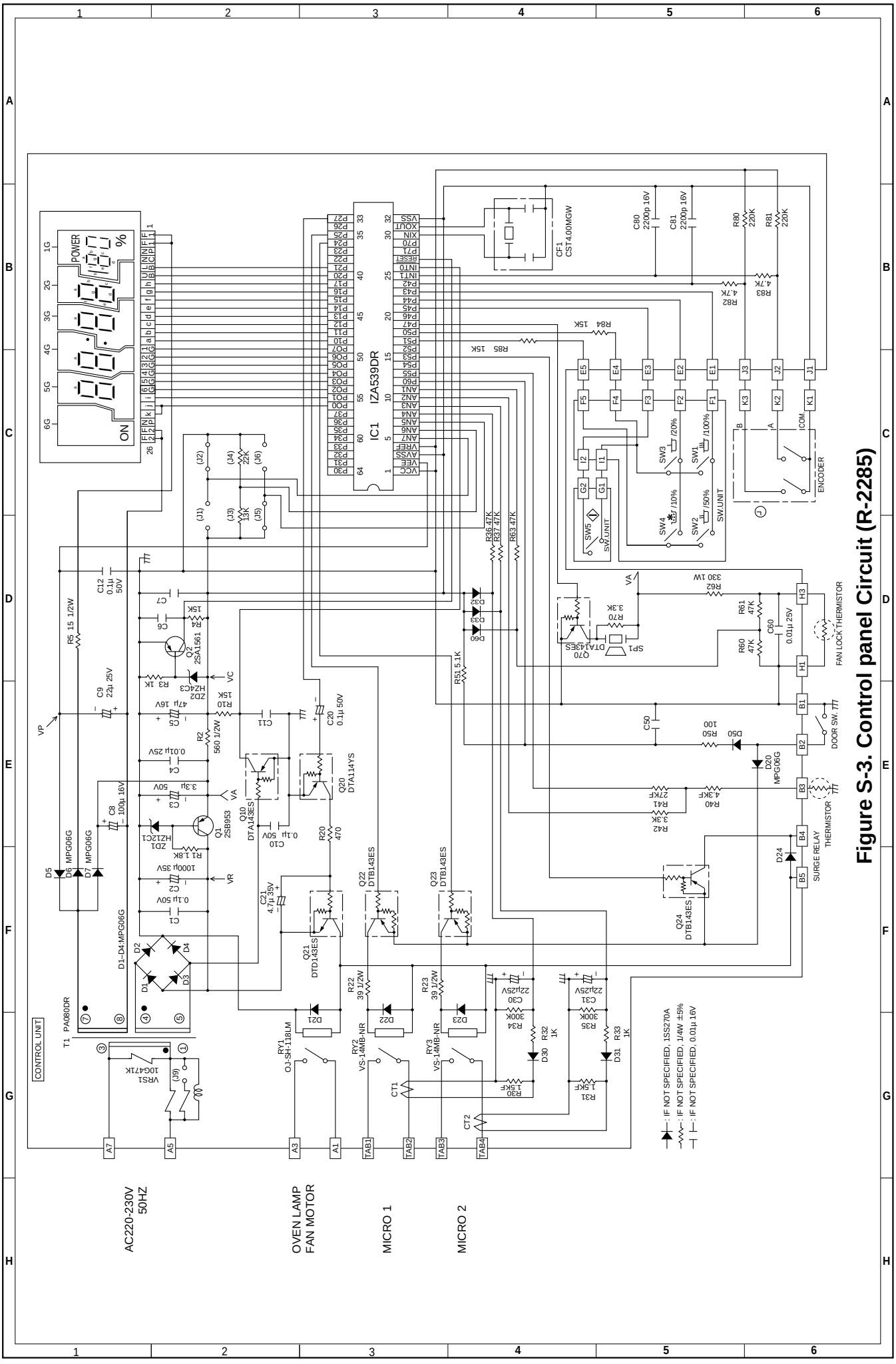


Figure S-3. Control panel Circuit (R-2285)

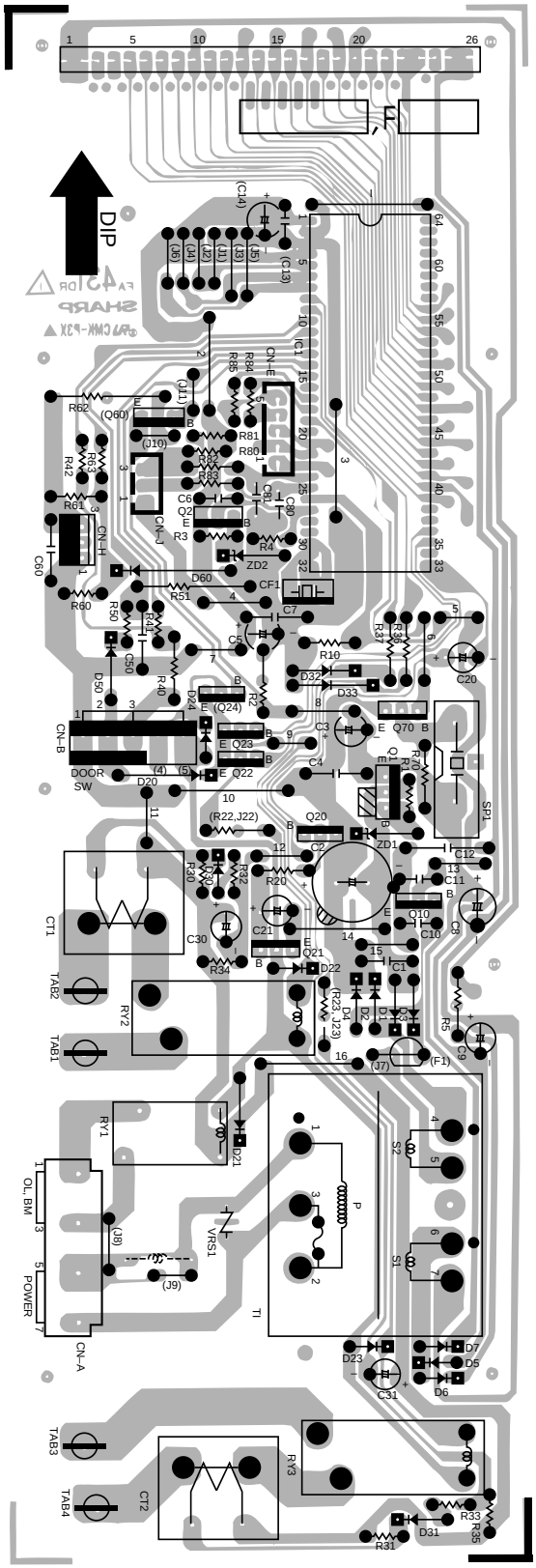


Figure S-4. Printed Wiring Board

PARTS LIST

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

	REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
				ELECTRICAL PARTS		
	BM	FMOTEA215WRK0		Blower motor assembly (Class B)	1	BM
*	C1	RC-QZA169WRE0		High voltage capacitor [R-2275]	1	AW
*	C1	RC-QZA165WRE0		High voltage capacitor [R-2285]	1	AX
*	C2	RC-QZA169WRE0		High voltage capacitor [R-2275]	1	AW
*	C2	RC-QZA165WRE0		High voltage capacitor [R-2285]	1	AX
*	D	FH-DZA049WRK0		HV rectifier assembly with HVC harness assembly	1	AX
	WP1	QFS-C0019WRE0		Weak point [R-2275]	1	AE
	WP1	QFS-CA018WRE0		Weak point [R-2285]	1	AD
	WP2	QFS-C0019WRE0		Weak point [R-2275]	1	AE
	WP2	QFS-CA018WRE0		Weak point [R-2285]	1	AD
	F1	QFS-CA009WRE0		Special fuse 13A [R-2275]	1	AF
	F1	QFS-CA017WRE0		Weak point [R-2285]	1	AF
	F2	QFS-CA007WRE0		Fuse F6.3A	1	AD
△*	MG1	RV-MZA220WRE0		Magnetron [R-2275]	1	BK
△*	MG1	RV-MZA193WRE0		Magnetron [R-2285]	1	BK
△*	MG2	RV-MZA220WRE0		Magnetron [R-2275]	1	BK
△*	MG2	RV-MZA193WRE0		Magnetron [R-2285]	1	BK
	OL	RLMPTA028WRE0		Oven lamp	1	AK
	R1	RR-WZA005WRE0		Surge resistor 10Ω/ 20 W	1	AG
	R2	RR-WZA005WRE0		Surge resistor 10Ω/ 20 W	1	AG
	R3	RR-WZA020WRE0		Monitor resistor 4.3Ω 20W	1	AF
	RY-S1	RRLY-A014WRE0		Surge relay	1	AP
	RY-S2	RRLY-A014WRE0		Surge relay	1	AP
	SW1	QSW-MA095WRE0		1st latch switch	1	AF
	SW2	QSW-MA095WRE0		2nd latch switch	1	AF
	SW3	QSW-MA095WRE0		3rd latch switch	1	AF
	SW4	QSW-MA086WRE0		Monitor switch	1	AF
	SW5	QSW-MA085WRE0		stop switch	1	AF
*	T1	RTRN-A404WRE0		High voltage transformer [R-2275]	1	BQ
*	T1	RTRN-A397WRE0		High voltage transformer [R-2285]	1	BQ
*	T2	RTRN-A404WRE0		High voltage transformer [R-2275]	1	BQ
*	T2	RTRN-A397WRE0		High voltage transformer [R-2285]	1	BQ
	TC1	RTHM-A037WRE0		Magnetron thermal cut-out 145˚C	1	AG
	TC2	RTHM-A037WRE0		Magnetron thermal cut-out 145˚C	1	AG
	TC3	RTHM-A058WRE0		Blower motor thermal cut-out 115˚C	1	AG
	TF	FFS-TA001WRK0		Oven temp. fuse 150&do.C assembly	1	AL
	1- 1	DH-HZA006WRK0		Thermistor assembly	1	AN
	1- 2	QACCVA060WRE0		Power supply cord	1	BG
	1- 3	QFSHDA002WRE0		Fuse holder	3	AF
	1- 4	QSOCLA011WRE0		Oven lamp socket	1	AH
	1- 5	FPWBFA213WRE0		Noise filter [R-2275]	1	AU
	1- 5	FPWBFA207WRE0		Noise filter [R-2285]	1	AW
	1- 6	FFILNA003WRK0		Thermistor assembly (Air intake)	1	AQ
	1- 7	RFIL-A002WRE0		FE Clamp [R-2285]	2	AP
				CABINET PARTS		
	2- 1	PSHEGA003WRE0		Rubber sheet A	2	AE
	2- 2	PSHEGA004WRE0		Rubber sheet B	2	AE
	2- 3	FFTASA064WRY0		Oven lamp access cover assembly, complete	1	AN
	2- 3-1	PREFHA051WRP0		Lamp reflector	1	AG
	2- 3-2	PCUSU0407WRP0		Cushion	1	AA
	2- 4	GCABUA425WRP0		Outer case cabinet	1	BH
	2- 5	FCOVHA031WRY0		Exhaust cover A	4	AQ
	2- 6	PZETEA069WRP0		Cabinet insulation sheet	1	AF
	2- 7	FCOVAA054WRY0		Rear cabinet assembly	1	AX
	2- 8	FCOVHA030WRY0		Exhaust cover B	1	AG
				CONTROL PANEL PARTS		
	3- 1	DPWBFB193WRU0		Control unit [R-2285]	1	BT
	3- 1	DPWBFB197WRU0		Control unit [R-2275]	1	BT
	3- 1A	QCNCMA308DRE0		4-pin connector (A)	1	AC
	3- 1B	QCNCMA316DRE0		5-pin connector (B)	1	AC
	3- 1C	QCNCMA039DRE0		3-pin connector (H)	1	AB
	3- 1D	QCNCMA381DRE0		5-pin connector (E)	1	AD
	3- 1E	QCNCMA338DRE0		3-pin connector (J)	1	AB
	3- 1F	QLUG-A002PRE0		Tab terminal (TAB1-4)	4	AB

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

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
3- 1G	RV-KXA053DRE0		Fluorescent display tube	1	AW
3- 1H	PCUSGA400WRP0		Cushion	2	AC
C1	VCKYD11HF104Z		Capacitor 0.1 uF 50V	1	AB
C2	RC-EZA192DRE0		Capacitor 1000 uF 35V	1	AD
C3	VCEAB31HW335M		Capacitor 3.3 uF 50V	1	AA
C4	VCKYB11EX103N		Capacitor 0.01 uF 25V	1	AA
C5	VCEAB31AW476M		Capacitor 47 uF 10V	1	AA
C6-7	VCKYD11CY103N		Capacitor 0.01 uF 16V	2	AA
C8	VCEAB31CW107M		Capacitor 100 uF 16V	1	AB
C9	VCEAB31EW226M		Capacitor 22 uF 25V	1	AA
C10	VCKYD11HF104Z		Capacitor 0.1 uF 50V	1	AB
C11	VCKYD11CY103N		Capacitor 0.01 uF 16V	1	AA
C12	VCKYD11HF104Z		Capacitor 0.1 uF 50V	1	AB
C20	VCEAB31HW104M		Capacitor 0.1 uF 50V	1	AM
C21	VCEAB31VW475M		Capacitor 4.7 uF 35V	1	AA
C30-31	VCEAB31EW226M		Capacitor 22 uF 25V	2	AA
C50	VCKYD11CY103N		Capacitor 0.01 uF 16V	1	AA
C60	VCKYB11EX103N		Capacitor 0.01 uF 25V	1	AA
C80-81	RC-KZA129DRE0		Capacitor 22 pF 50V	1	AB
CF1	RCRS-A010DRE0		Ceramic resonator CST4.00MGW	1	AD
D1-4	RH-DZA006CBE0		Diode (MPG06G)	4	AA
D5	VHD1SS270A/-1		Diode (1SS270A)	1	AA
D6-7	RH-DZA006CBE0		Diode (MPG06G)	2	AA
D20	RH-DZA006CBE0		Diode (MPG06G)	1	AA
D21-24	VHD1SS270A/-1		Diode (1SS270A)	4	AA
D30-33	VHD1SS270A/-1		Diode (1SS270A)	4	AA
D50	VHD1SS270A/-1		Diode (1SS270A)	1	AA
D60	VHD1SS270A/-1		Diode (1SS270A)	1	AA
IC1	RH-IZA539DRE0		LSI	1	AX
Q1	VS2SB953-PQ-4		Transistor (2SB953)	1	AG
Q2	VS2SA1561TL-3		Transistor (2SA1561TL)	1	AA
Q10	VSDTA143ES/1B		Transistor (DTA143ESXHZ)	1	AB
Q20	VSDTA114YS/-3		Transistor (DTA114YS)	1	AB
Q21	VSDTD143ES/-3		Transistor (DTD143ES)	1	AC
Q22-24	VSDTB143ES/-3		Transistor (DTB143ES)	3	AC
Q70	VSDTA143ES/1B		Transistor (DTA143ESXHZ)	1	AB
R1	VRD-B12EF182J		Resistor 1.8k ohm 1/4W	1	AA
R2	VRD-B12HF561J		Resistor 560 ohm 1/2W	1	AA
R3	VRD-B12EF102J		Resistor 1.0k ohm 1/4W	1	AA
R4	VRD-B12EF153J		Resistor 15k ohm 1/4W	1	AA
R5	VRD-B12HF150J		Resistor 15 ohm 1/2W	1	AA
R10	VRD-B12EF153J		Resistor 15k ohm 1/4W	1	AA
R20	VRD-B12EF471J		Resistor 470 ohm 1/4W	1	AA
R22-23	VRD-B12HF390J		Resistor 39 ohm 1/2W	2	AA
R30-31	VRN-B12EK202F		Resistor 2k ohm 1/4W [R-2275]	2	AA
R30-31	VRN-B12EK152F		Resistor 1.5k ohm 1/4W [R-2285]	2	AA
R32-33	VRD-B12EF102J		Resistor 1.0k ohm 1/4W	2	AA
R34-35	VRD-B12EF304J		Resistor 300k ohm 1/4W	2	AA
R36-37	VRD-B12EF473J		Resistor 47k ohm 1/4W	2	AA
R40	VRN-B12EK472F		Resistor 4.7k ohm 1/4W [R-2275]	1	AA
R40	VRN-B12EK432F		Resistor 4.3k ohm 1/4W [R-2285]	1	AA
R41	VRN-B12EK303F		Resistor 30k ohm 1/4W [R-2275]	1	AA
R41	VRN-B12EK273F		Resistor 27k ohm 1/4W [R-2285]	1	AA
R42	VRD-B12EF332J		Resistor 3.3k ohm 1/4W	1	AA
R50	VRD-B12EF101J		Resistor 100 ohm 1/4W	1	AA
R51	VRD-B12EF512J		Resistor 5.1k ohm 1/4W	1	AA
R60-61	VRD-B12EF473J		Resistor 47k ohm 1/4W	2	AA
R62	VRS-B13AA331J		Resistor 330 ohm 1W	1	AA
R63	VRD-B12EF473J		Resistor 47k ohm 1/4W	1	AA
R70	VRD-B12EF332J		Resistor 3.3k ohm 1/4W	1	AA
R80-81	VRD-B12EF224J		Resistor 220k ohm 1/4W	2	AA
R82-83	VRD-B12EF472J		Resistor 4.7k ohm 1/4W	1	AA
R84-85	VRD-B12EF153J		Resistor 15k ohm 1/4W	2	AA
RY1	RRLY-A078DRE0		Relay (OJ-SH-118LM)	1	AG
RY2-3	RRLY-A059DRE0		Relay (VS14MB-NR-SH6)	2	AK
SP1	RALM-A007DRE0		Buzzer (PKM22EPT-CA)	1	AF
T1	RTRNPA080DRE0		Touch control transformer	1	AU
CT1-2	RTRN-A060DRE0		Current transformer	2	AH
VRS1	RH-VZA034DRE0		Varistor (10G471K)	1	AD
ZD1	VHEHZ12C1//-1		Zener diode (HZ12C1)	1	AA

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

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
ZD2	VHEHZ4C3///-1		Zener diode (HZ4C-3)	1	AA
3- 2	FPNLCB059WRK0		Control panel frame with key unit assembly	1	BE
3- 2-1	GMADIA067WRF0		Display window	1	AE
3- 2-2	HDECAA196WRP0		Decorative metal fittings	1	AS
3- 2-3	HPNLCB155WRF0		Control panel	1	BA
3- 3	LANGTA243WRW0		Control panel mounting angle	1	AF
3- 4	XEPSD30P10XS0		Screw; control unit mounting	11	AA
3- 5	XEPSD40P12000		Screw; control panel mounting angle mounting	1	AA
3- 6	XFPSD40P08K00		Screw; decoration panel mounting for earth	1	AA
3- 7	PCUSUA303WRE0		Water-proof cushion	1	AA
3- 8	JKNBKA510WRM0		Knob	1	AE
3- 9	LANGTA304WRP0		Rotary encoder mounting plate	1	AD
3- 10	RVR-BA016WRK0		Rotary encoder	1	AY
3- 11	JBTN-A895WRM0		Select button	4	AE
3- 12	JBTN-A896WRM0		Start button	1	AE
3- 13	DPWBFB195WRU0		Switch unit assembly	1	AP
3- 13-1	FW-VZA165DRE0		Lead wire harness (2-pin)	1	AF
3- 13-2	FW-VZA166DRE0		Lead wire harness (5-pin)	1	AH
3- 13-3	QSW-PA025DRE0		Tact switch (SW1-SW5)	5	AD
3- 14	PCUSUA404WRP0		Select cushion	4	AC
3- 15	PCUSGA401WRP0		Cushion	1	AD
3- 16	MSPRPA082WRE0		Spring	1	AD
3- 17	PCUSUA407WRP0		Water proof cushion B	1	AB
3- 18	PCUSUA408WRP0		Water proof cushion C	1	AC
3- 19	PCUSUA406WRP0		Water proof cushion A	1	AB
3- 20	PSHEGA005WRP0		Water proof sheet	1	AE
3- 21	QW-VZA122WRE0		Earth wire	1	AC
3- 22	XEPSD30P08XS0		Screw; 4mm x 8mm	2	AA

OVEN PARTS

	4- 1	FGLSPA021WRY0		Ceramic shelf	1	BD
Δ	4- 2	FOVN-A290WRY0		Oven cavity assembly	1	BV
	4- 3	PFILWA051WRP0		Oven lamp filter	1	AC
	4- 4	MLEVPA153WRF0		Switch lever A	1	AC
	4- 5	MLEVPA154WRF0		Switch lever B	1	AC
	4- 6	MLEVPA155WRF0		Switch lever C	1	AC
	4- 7	MSPRCA075WRE0		Switch spring A	1	AB
	4- 8	MSPRCA076WRE0		Switch spring B	3	AB
Δ	4- 9	PHOK-A081WRF0		Latch hook	1	AN
	4-10	LANGQA251WRW0		Noise filter angle	1	AF
Δ	4-11	MHNG-A216WRM0		Lower oven hinge	1	AG
Δ	4-12	MHNG-A215WRM0		Upper oven hinge	1	AG
	4-13	FCOVPA019WRY0		Stirrer cover assembly	1	AS
	4-14	FFANMA013WRY0		Stirrer fan assembly	1	AX
	4-15	FFIL-A003WRK0		Air intake filter assembly	1	AU
	4-16	HDECEA002WRP0		Decoration sash	1	AS
	4-17	HDECQA146WRM0		Corner cap left	1	AE
	4-18	HDECQA147WRM0		Corner cap right	1	AE
	4-19	LANGQA370WRP0		Oven lamp mounting plate	1	AD
	4-20	LANGQ0382WRM0		Earth angle	1	AB
	4-21	LBNDKA075WRP0		Capacitor holder	1	AD
	4-22	LANGKA679WRM0		Fixing angle S	1	AD
	4-23	PDUC-A499WRF0		Air duct A	1	AG
	4-24	PGIDHA053WRP0		Air guide E [R-2275]	1	AD
	4-25	PCUSGA270WRP0		Fan cushion B	2	AB
	4-26	LBSHC0006YBE0		Cord bushing	1	AD
	4-27	PZETEA070WRP0		HV cover	1	AF
	4-28	PRDAFA006WRP0		Radiator plate [R-2285]	1	AC
	4-29	PCUSUA056WRP0		Orifice cushion	1	AA
	4-30	PDUC-A500WRF0		Water-proof duct	1	AN
	4-31	PCUSUA378WRP0		Oven cushion	1	AB
	4-32	PCUSUA200WRP0		Cushion	3	AA
	4-33	PCUSUA228WRP0		Oven lamp cushion	1	AC
	4-34	PDUC-A379WRF0		Exhaust duct	1	AL
	4-35	PDUC-A380WRW0		Stirrer duct	1	AV
	4-36	PDUC-A536WRF0		Air duct	1	AM
	4-37	FANGKA188WRY0		Air guide AK	1	AG
	4-38	PCLIC0018WRE0		Clip L	1	AB
	4-39	PGIDHA048WRP0		Air guide C [R-2285]	1	AE
	4-40	PCUSUA303WRE0		Water-proof cushion	2	AA

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

	REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
	4-41	FDAI-A162WRT0		Bottom plate	1	BB
	4-42	PCUSGA045WRP0		Cushion	1	AA
	4-43	PZETEA047WRP0		Insulation sheet	1	AC
	4-45	LANGQA372WRP0		Thermal cut-out angle	1	AB
	4-46	PCUSG0257WRP0		Water cushion S	1	AA
	4-47	PCUSUA268WRP0		Frame cushion	1	AA
	4-48	PCUSU0498WRP0		Water-proof cushion	1	AB
	4-49	PCUSU0143YBP0		Door cushion S	1	AC
	4-50	PCUSU0333WRP0		Heat-proof cushion	1	AB
	4-51	PCUSU0373WRP0		Duct cushion	1	AA

DOOR PARTS

Δ	5	DDORFA652WRK0		Door assembly, complete	1	BT
	5- 1	FCOVAA053WRY0		Door frame	1	BC
Δ	5- 2	FDORFA262WRT0		Door panel	1	BH
	5- 3	FHNDMA006WRY0		Door release lever	1	AH
	5- 4	JHNDMA031WRM0		Door handle	1	AW
	5- 5	PGID-0024WRF0		Handle guide	4	AC
	5- 6	PGID-0025WRF0		Handle spacer	1	AC
	5- 7	FANGKA164WRY0		Joint plate	1	AH
	5- 8	FLEVFA018WRY0		Joint lever	1	AG
Δ	5- 9	LSTPCA001WRM0		Latch head	2	AK
	5-10	MLEVPA156WRF0		Latch lever	1	AC
	5-11	MSPRCA074WRE0		Latch spring	1	AB
	5-12	GCOVHA217WRF0		Choke cover	1	AM
	5-13	LANGKA454WRP0		Outside window fixing plate	2	AD
	5-14	PPACGA125WRP0		Door case packing	2	AB
	5-15	PSPA-A072WRP0		Door spacer	2	AD
	5-16	PCUSGA057WRP0		Handle cushion	1	AA
	5-17	PCUSGA276WRP0		Door glass cushion	2	AC
	5-18	PGLSPA354WRE0		Door glass	1	AW
	5-19	PSHEPA428WRE0		Inside film	1	AF
	5-20	HBDGCA062WRE0		Sharp badge [R-2275]	1	AH
	5-20	HBDGCA061WRE0		Sharp badge [R-2285]	1	AH

MISCELLANEOUS

	6- 1	TINSMA003WRR0		Operation manual	1	AL
	6- 2	TLABPA034WRR0		Earth label	1	AC
	6- 3	FW-VZB254WRE0		Switch harness	1	AM
	6- 4	FW-VZB246WRE0		Main harness	1	BB
	6- 5	LHLDW0017YBE0		Wire saddle M [R-2285]	1	AA
	6- 6	TCAUHA176WRR0		H caution label	1	AC
	6- 7	TSPCNB959WRR0		Name plate [R-2275]	1	AH
	6- 7	TSPCNB958WRR0		Name plate [R-2285]	1	AH
	6- 8	TLABS0057WRR0		Fuse label M6.3A [R-2275]	2	AA
	6- 8	TLABSA054WRR0		Fuse label F10A [R-2285]	2	AB
	6- 9	TCAUHA082WRR0		Caution label	1	AC
	6-10	TCAUHA083WRR0		Belgium label	1	AB
	6-11	LHLDWA004BDE0		Purse lock with snap	1	AB
	6-12	TLABSA008WRR0		Fuse label F6.3A	1	AA
	6-13	LHLDWA013JBE0		Cable clip	1	AA
	6-14	LHLDWA029WRE0		Cord holder	2	AB
	6-15	LHLDWQ004YBE0		Purse lock L	1	AA
	6-16	LHLDWQ005YBE0		Purse lock LL	2	AA

SCRERWS, NUT AND WASHERS

	7- 1	XFPSD40P08K00		Screw 4mm x 8mm	8	AA
	7- 2	XHTSD40P08RV0		Screw 4mm x 8 mm	9	AA
	7- 3	LX-CZA057WRE0		Special screw	5	AA
	7- 4	XWWSD50-06000		Washer 5mm x 0.6mm	6	AA
	7- 5	XBPSD40-10000		Screw 4mm x 10mm	5	AB
	7- 6	LX-CZA038WRE0		Special screw	3	AA
	7- 7	LX-EZA004WRE0		Special screw	1	AA
	7- 8	XBPSD50P12KS0		Screw 5mm x 12mm	4	AB
	7- 9	XOTWW40P10000		Screw 4mm x 10mm	13	AA
	7-10	XFTSD40P08000		Screw 4mm x 8mm	1	AA
	7-11	XFPSD40P08000		Screw 4mm x 8mm	8	AA
	7-12	XOTSF40P12000		Screw 4mm x 12mm	4	AA
	7-13	XCPSD30P08X00		Screw 3mm x 8mm	2	AA
	7-14	XJPSD40P10000		Screw 4mm x 10mm	2	AA

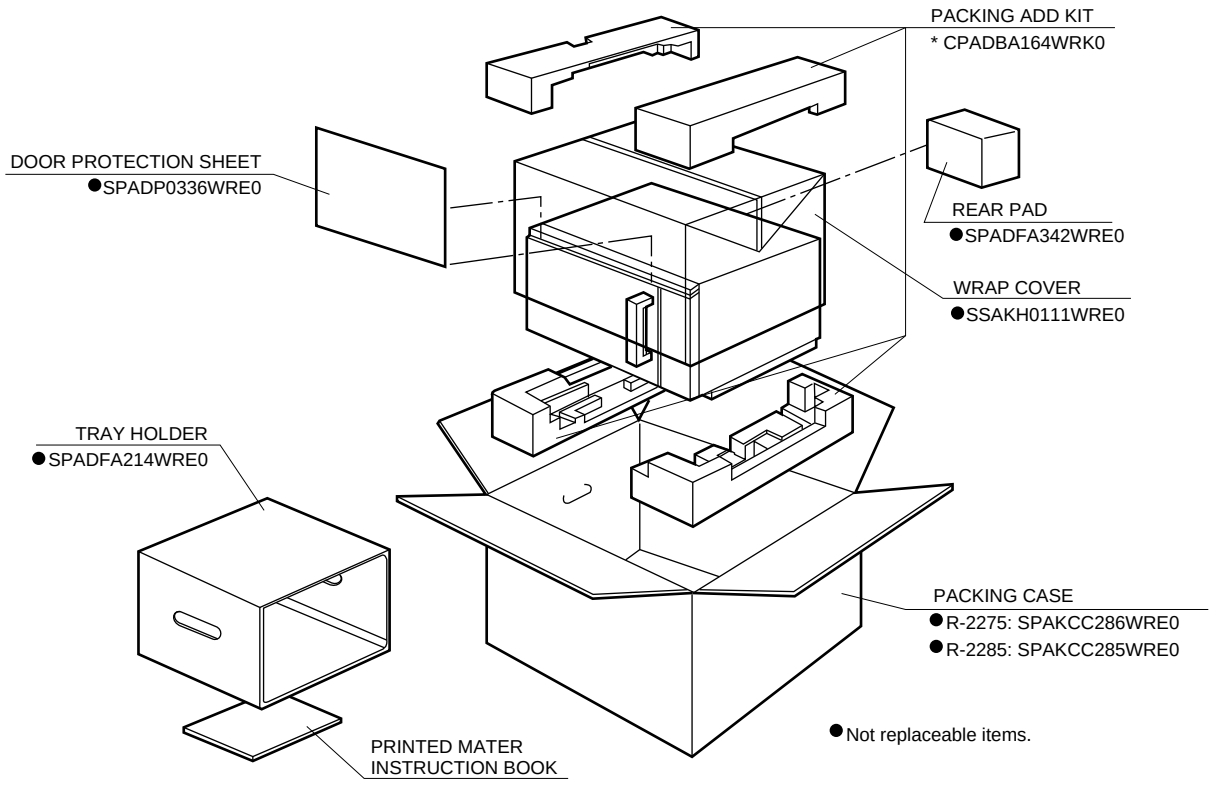
Note: The parts marked "∆" may cause undue microwave exposure. / The parts marked "*" are used in voltage more than 250V. / "§" Mark: Spare parts delivery section

REF. NO.	PART NO.	§	DESCRIPTION	Q'TY	CODE
7-15	XONSC40P10000		Screw 4mm x 10mm	5	AA
7-16	XFPSD30P10000		Screw 3mm x 10mm	3	AA
7-17	XOTSC40P12000		Screw 4mm x 12mm	5	AB
7-18	XOTSD40P12000		Screw 4mm x 12mm	5	AA
7-19	XWWSD40-10000		Washer 4mm x 1mm	6	AA
7-20	XNESD30-24000		Nut 3mm x 2.4mm	1	AA
7-21	XCBWW30P08000		Screw 3mm x 8mm	4	AA
7-22	XBPSD40P10K00		Screw 4mm x 10mm	2	AA
7-23	XOTSD40P12RV0		Screw 4mm x 12mm	2	AA
7-24	XBPSD30P28KS0		Screw 3mm x 28mm	1	AA
7-25	XWSSD40-10000		Washer 4mm x 1mm	1	AA
7-26	XEPSD30P10XS0		Screw 3mm x 10mm	4	AA
7-27	LX-BZA048WRE0		Special screw	4	AA
7-28	XFTSD40P12000		Screw 4mm x 12mm	3	AA
7-29	XFPSD40P06K00		Screw 4mm x 6mm	3	AA
7-30	LX-WZA035WRE0		Special washer	1	AA

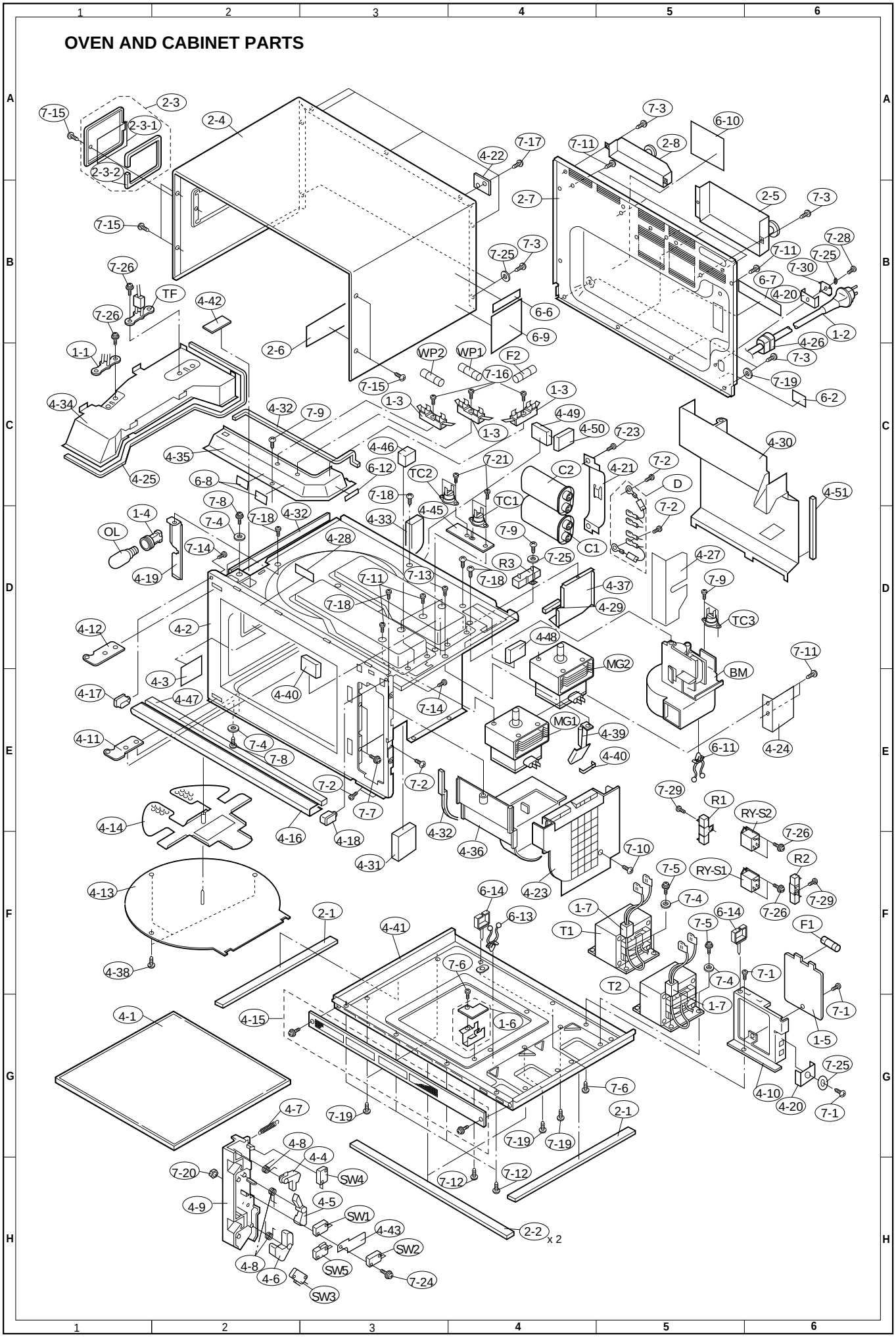
HOW TO ORDER REPLACEMENT PARTS

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

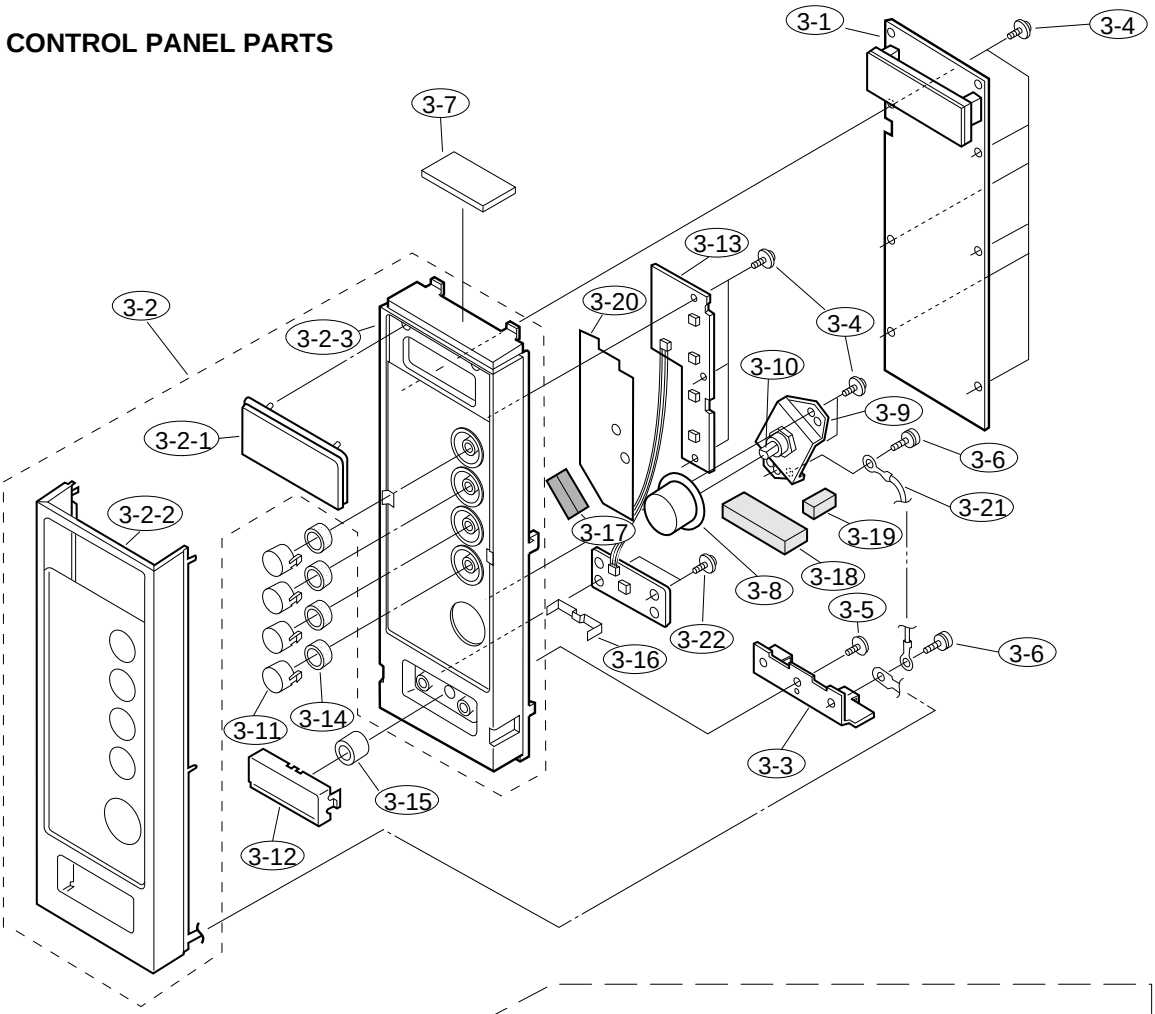
1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4.DESCRIPTION



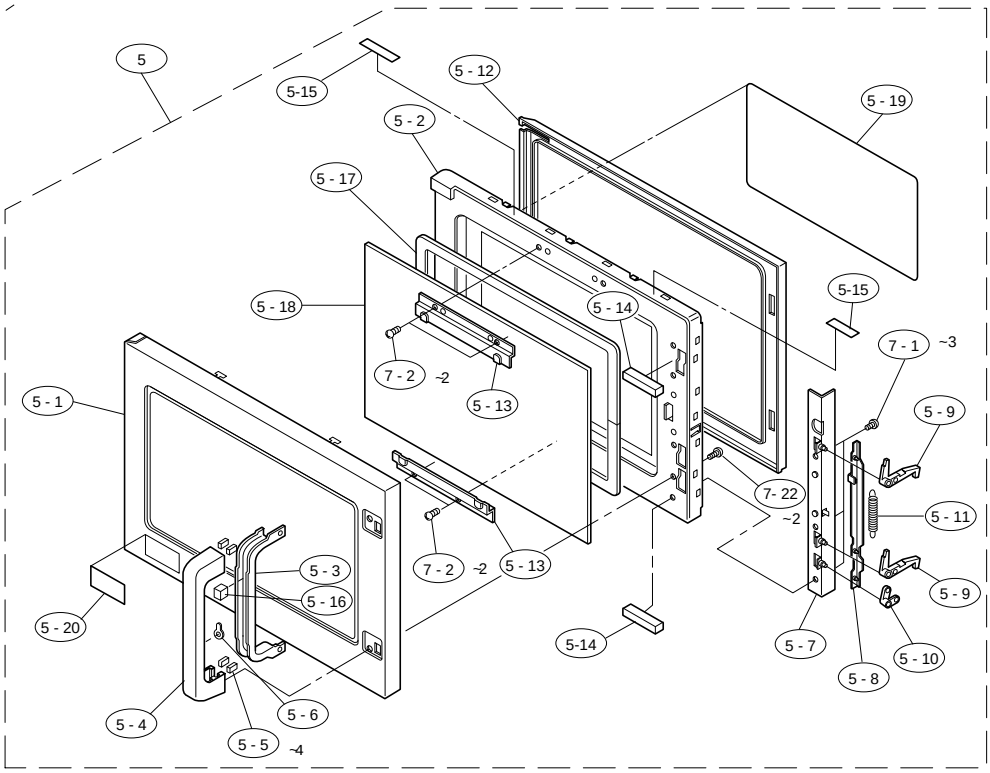
OVEN AND CABINET PARTS



CONTROL PANEL PARTS



DOOR PARTS



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