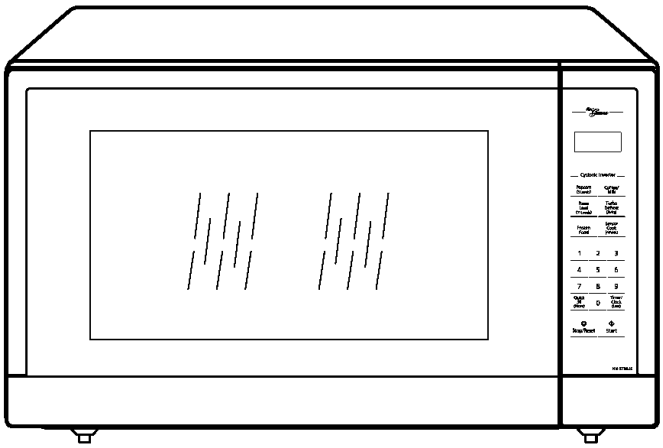
ORDER NO.PKATJX2401004CE
E1

Service Manual

Microwave Oven



NN-SD78LS
NN-ST77LS
NN-ST75LB
NN-ST75LW
NN-ST74LS

CWH (CANADA)

Specifications:

Model: / Specifications:	NN-SD78LS	NN-ST77LS	NN-ST75LB	NN-ST75LW	NN-ST74LS
Power Source:	120V AC Single Phase, 60Hz				
Power Consumption:	1460W	1460W	1460W	1460W	1460W
Output:	1200W	1200W	1200W	1200W	1200W
Microwave Frequency:	2450MHz				
Timer:	30 min. / Stage (P10 Power Level) ~ 3 Stage Maximum 99 min. 99 sec / Stage (Other Power Levels) ~ 3 Stage Maximum.....				
Outside Dimensions: (W X H X D)	555mm (21 7/8") X 304mm (11 15/16") X 493mm (19 7/16")				
Oven Cavity Dimensions: (W X H X D)	398mm (15 11/16") X 210mm (8 1/4") X 470mm (18 1/2")				
Oven Cavity Dimensions:	1.6 cu. ft.				
Weight:	Approx. 14.3 kg/31.5 lbs.				
PbF	This product with PbF				
Specfications subject to change without notice.					

⚠ WARNING

This Service Manual is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this Service Manual by anyone else could result in serious injury or death.

Panasonic®

Your safety and the safety of others are very important.

We have provided important safety messages in this manual and on your appliance. Always read and obey all safety messages.

This is the safety alert symbol. It is used to alert you to potential hazards that can kill or hurt you and others. The safety messages will follow the safety alert symbol and either the word "DANGER", "WARNING" or "CAUTION". These words mean:

⚠ **DANGER**	You can be killed or seriously injured if you don't immediately follow instructions.
⚠ **WARNING**	You can be killed or seriously injured if you don't follow instructions.
⚠ **CAUTION**	You can be exposed to a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

The safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tellyou what can happen if the instructions are not followed.

⚠ WARNING

1. This product should be serviced only by trained, qualified personnel.
2. Though this product has been manufactured in compliance with:
   "Federal Performance Standard 21 CFR Subchapter J"(D.H.H.S): U.S.A. models
   or "Radiation Emitting Devices Act"(Health and Welfare Canada): Canadian models
   it is very important all repairs should be made in accordance with procedures described in this manual to avoid being exposed to excessive microwave radiation.
3. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage."
4. If the unit cannot be repaired on site, advise the customer not to use until unit is repaired.
5. Any serviceman who learns of any accident pertaining to microwave radiation leakage including the oven operating with open door should immediately notify the appropriate address listed below and Center for Devices and Radiological Health, DHHS.

IN U.S.A AND PUERTO RICO (PNA)	Panasonic Corporation of North America Two Riverfront Plaza Newark, NJ 07102 Attention: Technical Hotline (800)572-2672	IN CANADA (PCI)	Panasonic Canada Inc. 5770 Ambler Drive, Mississauga, Ontario, L4W2T3 (905)624-5010

6. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts should be replaced only with the manufacture's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the orginal design.

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

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

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

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

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

(E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

⚠ CAUTION

About lead free solder (PbF)

Distinction of PbF PCB: PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

Caution:
- Pb free solder has a higher melting point than standard solder; Typically the melting point is 30 - 40˚C higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 370 ± 10˚C.
- Pb free solder will tend to splash when heated too high (about 600˚C). Use eyeware protection.

DANGER OF HIGH VOLTAGE AND HIGH TEMPERATURE (HOT/LIVE) OF THE INVERTER POWER SUPPLY (U)

⚠ WARNING

This Inverter board looks like a regular PCB. However, this PCB drives the magnetron tube with extremely high voltage and high current. Take cautionary measures when disassembling and troubleshooting the Inverter circuit. Improper handling can result in an electrical shock or burns, which might lead to injury or death.

IT HAS:

1. **Very high voltage and high current circuits.**
   It functions the same as the high voltage transformer and high voltage capacitor in ordinary microwave ovens.
2. **Aluminum heat sink that is energized with very high voltage and high heat energy.**
3. **Very high voltage which may remain in circuitry even when oven is off. High voltage charge may remain in the capacitors on the board.**

DO NOT:

* 1. **Do not touch circuitry because it has very hot (high voltage) circuitry. Even when replacing board, extreme care should be taken to avoid possible electric shock hazards. High voltage charge may remain in circuits.**

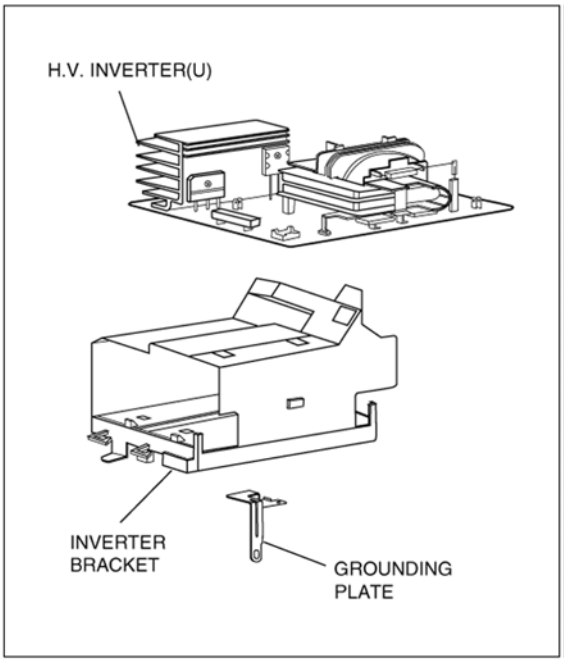
* 2. **Do not touch aluminum heat sink because it is energized with very high voltage and is also very hot in high heat energy.**

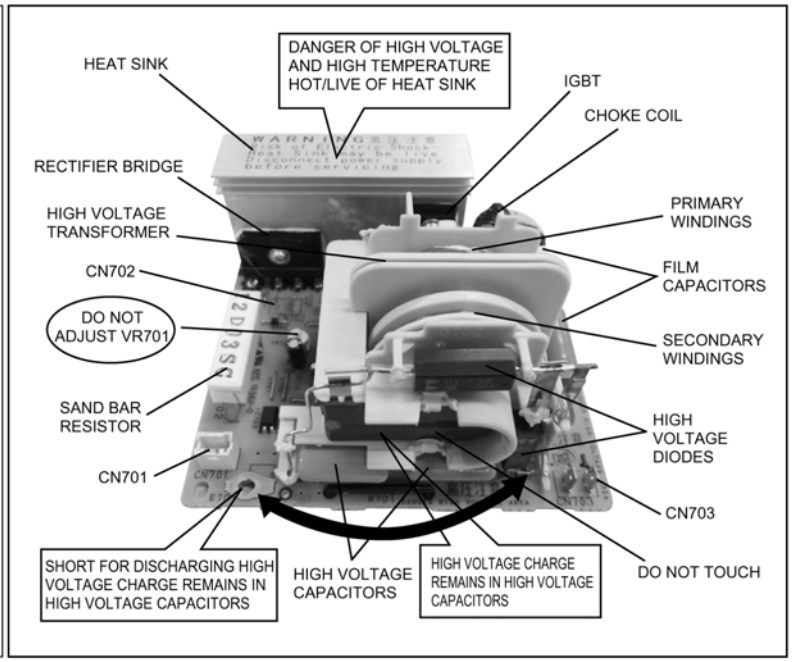
* 3. **Do not try to adjust or tamper with preset control on the Inverter board because it is very dangerous to adjust without proper test equipment.**

* 4. **Do not test oven while Inverter grounding plate or screws are loose. It is very dangerous to operate H.V. Inverter Circuit (U) with loose mounting screws or if improperly grounded.**

* 5. **For USA only:**
Do not try to repair Inverter PCB because it is very dangerous to repair. Replace as a complete High Voltage Inverter Circuit unit and return fully re-packed in original shipping box and shipping materials.

INVERTER POWER SUPPLY





CONTENTS

1 CHILD SAFETY DOOR LOCK

The microwave oven is equipped with an electronic child-safety function, to be more precise: the door lock function, which enables the oven door to be “locked” so that children or anyone unfamiliar with it cannot operate it accidentally. Distinguishing from that of child safety lock, the door lock does not lock access to the microwave function, it simply prevents burning by opening the door accidentally. Specifically, the electronic child-safety door lock is activated or deactivated through specific buttons on the control panel.

When plugged in, the door lock is automatically activated as soon as cooking starts. The window flashes "🔒" to indicate that the oven is locked. Follow below sequences to unlock the door, which must be finished within 10 seconds. If there is not any operation within 30 minutes from the end of cooking, the door would be unlocked automatically.

1.1. To unlock the unit during or after cooking

For SD78LS model:

Press **[Timer/Clock]** once.

For ST77LS/ST74LS/ST75LB/ST75LW models:

Press **[0]** once.

Press door opening button, the oven door is now unlocked. Open the door and take out the food with special care.

NOTE:

At the end of cooking, by default, the oven will enter into “Add Time” mode, if you prefer to add additional time after checking the food, press **[Add Time]** and set time, be sure to perform add time function within 1 minute.

1.2. To leave the door lock feature disengaged

Simply leave the door lock feature disengaged if you don´t need it temporarily, or follow the instruction to reactivate, the function setting should be under the circumstance that the oven door is unlocked and function setting must be finished within 10 seconds.

- **To deactivate:**

For SD78LS model:

Press **[Turbo Defrost]** once → Press **[Timer/Clock]** once → Press **[Popcorn]** once.

For ST77LS/ST74LS/ST75LB/ST75LW models:

Press **[Turbo Defrost]** once → Press **[Timer(More)]** once → Press **[Popcorn]** once.

A long beep will be heard, the door lock function is now invalid.

- **To reactivate:**

For SD78LS model:

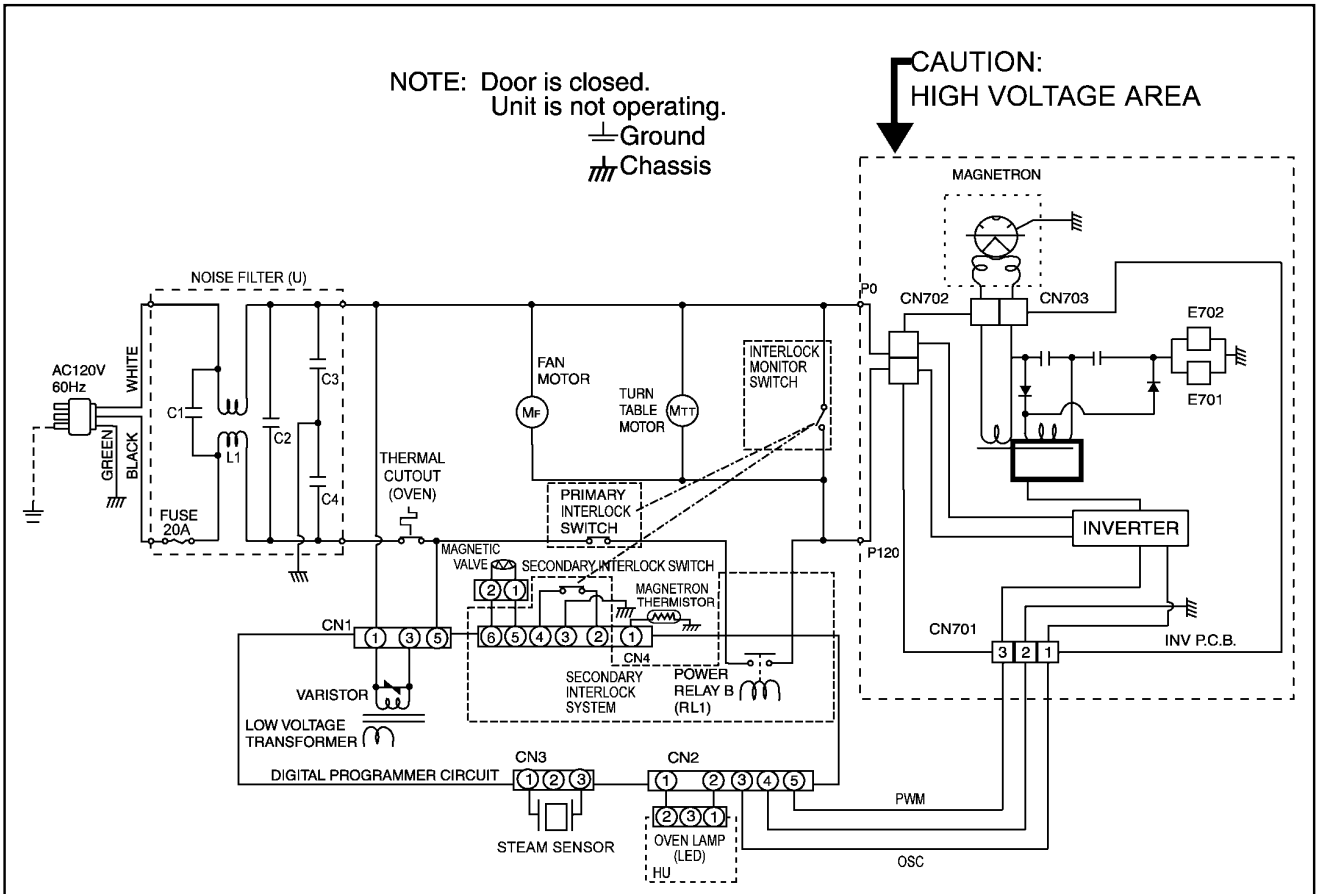
Press **[Turbo Defrost]** once → Press **[Timer/Clock]** once → Press **[Popcorn]** once.

For ST77LS/ST74LS/ST75LB/ST75LW models:

Press **[Turbo Defrost]** once → Press **[Timer(More)]** once → Press **[Popcorn]** once.

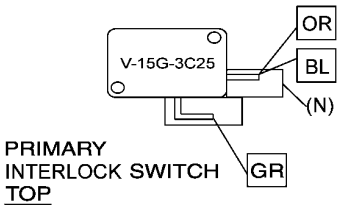
The window will flash "🔒", or replug the oven, both ways can reactivate the function.

2 SCHEMATIC DIAGRAM

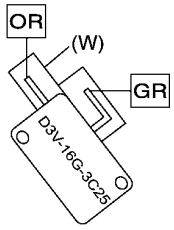


WIRING DIAGRAM

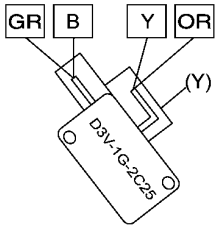
NOTE: * When replacing, check the lead wire color as shown.
***Colors shown by ( ) indicate colors of lead wire connector housing.**



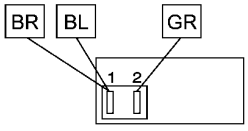
PRIMARY
INTERLOCK SWITCH
TOP



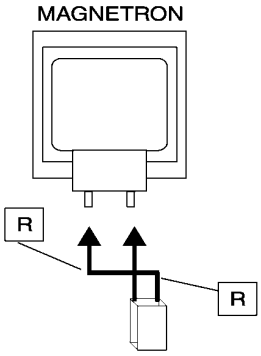
SECONDARY
INTERLOCK SWITCH
BOTTOM (OUTSIDE)

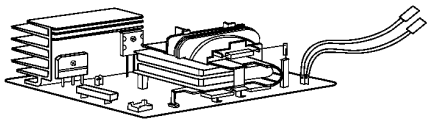


INTERLOCK
MONITOR SWITCH
BOTTOM (INSIDE)



POWER RELAY B (RL1)





HIGH VOLTAGE INVERTER

SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK
N	NATURAL

(S-CU7)
(S-CW0)
(S-CW1)
(S-CW2)

3 DESCRIPTION OF OPERATING SEQUENCE

3.1. Variable power cooking control

High Voltage Inverter Power Supply (U) controls output power by the signal from Digital Programmer Circuit (DPC). Power relay always stay on, but PWM (Pulse Width Modulation) signal controls microwave output power.

NOTE:

The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

Variable Power Cooking

POWER SETTING		OUTPUT POWER(%) APPROX.	MANUAL MICROWAVE DUTY	
			ON(SEC)	OFF(SEC)
HIGH	P10	100%	22	0
	P9	90%	22	0
	P8	80%	22	0
MEDIUM-HIGH	P7	70%	22	0
MEDIUM	P6	60%	22	0
	P5	50%	22	0
	P4	40%	22	0
MEDIUM-LOW	P3	30%	22	0
	P2	20%	15	7
	P1	10%	8	14

3.2. Inverter power supply circuit

The Inverter Power Supply circuit powered from the line voltage, 120V 60Hz AC input supplies 4,000V DC to the magnetron tube, and functions in place of the H.V. transformer, the H.V. capacitor and H.V. diode.

1. The AC input voltage 120V 60Hz is rectified to DC voltage immediately.
2. DC voltage will be supplied to the switching devices called IGBT. These devices are switched ON-OFF by the 20 to 40 kHz PWM (pulse width modulation) signal from the microcomputer in the DPC.
3. This drives the High voltage transformer to increase voltage up to 2,000V AC.
4. Then the half-wave doubler voltage rectifier circuit, consisting of the H.V. diodes and capacitors, generates the necessary 4,000V DC needed for the magnetron.
5. Output power of the magnetron tube is always monitored by the signal output from the current transformer built into the inverter circuit.
6. This signal is fed back to the microcomputer in the DPC to determine operating conditions and output necessary to control PWM signal to the Inverter Power Supply for control of the output power.

3.3. Inverter defrost

When the Auto Control feature is selected and the Start pad is tapped:

1. The digital programer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display window. Table shows the corresponding cooking times for respective serving by categories.

Inverter Turbo Defrost

SELECTED WEIGHT	COOKING TIME
1.0 LB	5 min.35 sec.

2. When cooking time in the display window has elapsed, the oven turns off automatically by a control signal from the digital programmer circuit.

3.4. Sensor cooking

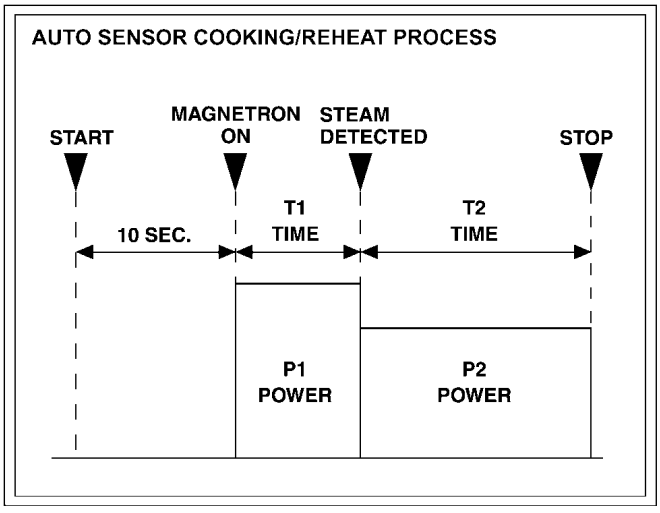
Auto sensor cooking without setting a power level or selecting a time. All that is necessary is to select an Auto Sensor Program before starting to cook.

Understanding Auto Sensor Cooking

As the food cooks, a certain amount of steam is produced. If the food is covered, this steam builds up and eventually escapes from the container. In Auto Sensor Cooking, a carefully designed instrument, called the steam sensor element, senses this escape of steam. Then, based upon the Auto Sensor Program selected, the unit will automatically determine the correct power level and the proper length of time it will take to cook the food.

NOTE:

Auto Sensor Cooking is successful with the foods and recipes found in the Auto Sensor Cooking Guide. Because of the vast differences in food composition, items not mentioned in the Cooking Guide should be prepared in the microwave oven using power select and time features. Please consult Variable Power Microwave Cookbook for procedures.



Explanation of the Auto Sensor Cooking process

1. During the first 10 second period there is no microwave activity. When calculating the T2 time by using the formula below make sure this 10 seconds is subtracted from the T1 time. In other words, T1 time starts at the end of the 10 second period.
2. **T1 time** The total amount of time it takes the microwave oven to switch to T2 time after the 10second period.
3. **T2 time** When the steam escapes from the cooking container placed in the oven, the steam sensor detects it and the microprocessor calculates the balance of cooking time. This T2 time is then shown in the display and begins counting down.

   Balance of cooking time (T2 time)

   The balance of cooking time which is called T2 time, can be calculated by the following formula.
   T2 time (in sec.) = T1 time X K factor

NOTE:

Remember, the T1 time starts after the 10 second period. The coefficient K is programmed into the microprocessor memory and they are listed in the following tables along with the P1 and P2 powers.

NOTE:

When "More" or "Less" pad is selected, the K factor varies resulting in T2 time to be increased or decreased.

Example of calculating the T2 time

Example 1: If the T1 time is measured to be 2 minutes and 40 seconds after the 10 second period.

T2 = T1 × K

= 2 min. and 40 sec. × 1.1

= 160sec. × 1.1

= 176 sec.

Category	P1 Power	P2 Power	K Factor Standard
Frozen Entrees	Power Level P6	Power Level P7	0.3

3.5. Sensor reheat

Auto Sensor Reheat is a quick and easy way to reheat refrigerated and room temperature foods.

Simply press the reheat pad. There is no need to select power level and cooking time.

NOTE:

The Auto Sensor Reheat process is similar as Auto Sensor Cooking process.

Balance of cooking time (T2 time)

The balance of cooking time which is called T2 time, can be calculated by the following formula.
T2 time (in sec.) = T1 time X K factor

NOTE:

Remember, the T1 time starts after the 10 second period. The coefficient K is programmed into the microprocessor memory and they are listed in the following tables along with the P1 and P2 powers.

NOTE:

When "More" or "Less" pad is selected, the K factor varies resulting in T2 time to be increased or decreased.

Example of calculating the T2 time

Example 1: If the T1 time is measured to be 2 minutes and 40 seconds after the 10 second period.

T2 = T1 × K

= 2 min. and 40 sec. × 1.1

= 160sec. × 1.1

= 176 sec.

Category	P1 Power	P2 Power	K Factor Standard
Sensor Reheat	Power Level P10	Power Level P6	0.4

3.6. Steam sensor and digital programmer circuit

In order to determine if the steam sensor function of the digital programmer circuit is working, do the following test.

1. Place a water load (100 cc) in the oven.
2. Tap Sensor Reheat pad.
3. Tap Start pad.
4. Steam Sensor detects steam about 1.5 to 2 minutes after the Start pad is tapped.
5. T1 time cooking automatically switches to remaining time for cooking (T2).
6. The remaining cooking time (T2) appears in display window. If the following cooking time appears, Steam Sensor function is normal.

T1 TIME	T2 TIME (Remaining cooking time)
50 Sec. ~ 2 Min.	0 Sec. ~ 24 Sec.

4 CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is a high voltage, high current device. It is free from danger in ordinary use, though extreme care should be taken during repair.

⚠ CAUTION

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

4.1. Check the grounding

Do not operate on a two wire extension cord. The microwave oven is designed to be grounded when used. It is imperative, therefore, to ensure the appliance is properly grounded before beginning repair work.

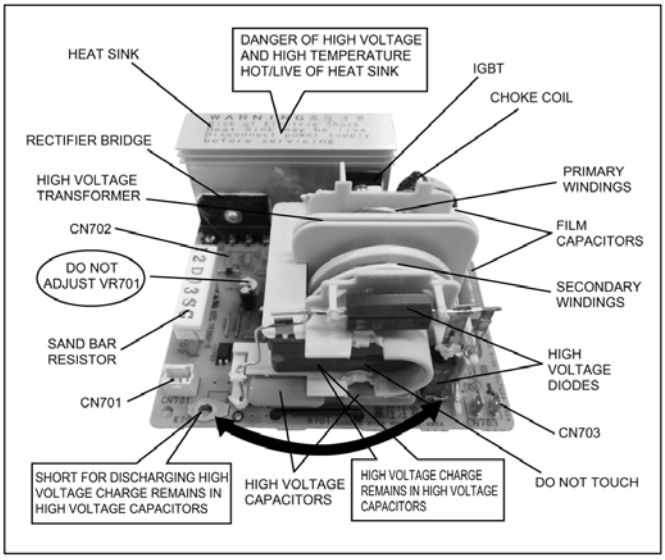
4.2. Inverter warnings

⚠ WARNING HIGH VOLTAGE AND HIGH TEMPERATURE (HOT/LIVE) OF THE INVERTER POWER SUPPLY (U)

The High Voltage Inverter Power Supply generates very high voltage and current for the magnetron tube. Though it is free from danger in ordinary use, extreme care should be taken during repair.

The aluminum heat sink is also energized with high voltage (HOT), do not touch when the AC input terminals are energized. The power device Collector is directly connected to the aluminum heat sink.

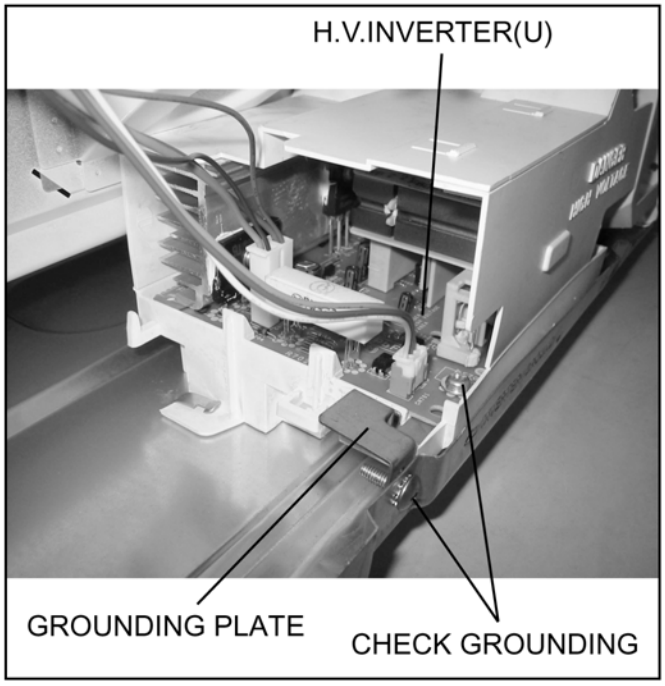
The aluminum heat sink may be HOT due to heat energy, therefore, extreme care should be taken during servicing.



H.V. Inverter warning

⚠ WARNING FOR INVERTER POWER SUPPLY (U) GROUNDING

Check the High Voltage Inverter Power Supply circuit grounding. The high voltage inverter power supply circuit board must have a proper chassis ground. The inverter grounding plate must be connected to the chassis. If the inverter board is not grounded it will expose the user to very high voltages and cause extreme DANGER! Be sure that the inverter circuit is properly grounded via the inverter grounding plate.

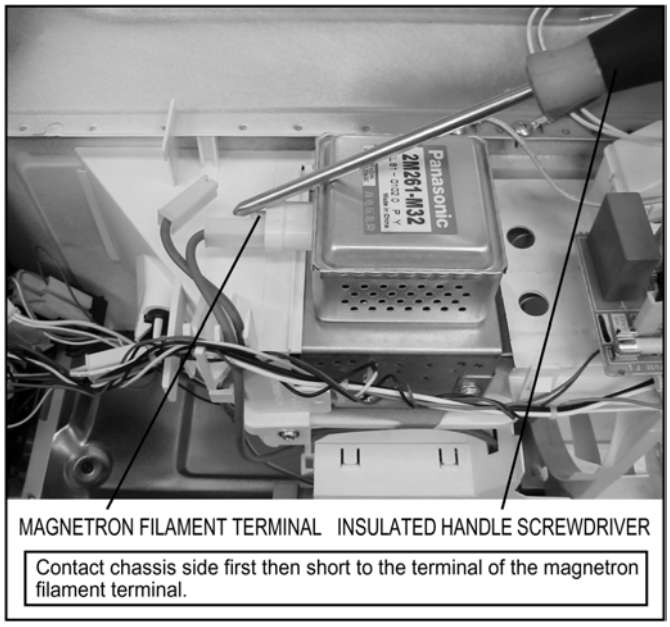


Grounding of the inverter circuit board

⚠ WARNING DISCHARGE THE HIGH VOLATGE CAPACITORS

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitors of the Inverter Power Supply circuit board.

When replacing or checking parts, remove the power plug from the outlet and short the inverter output terminal of the magnetron filament terminals to the chassis ground with an insulated handle screwdriver to discharge. Please be sure to contact the chassis ground side first and then short to the output terminal.



Discharging the high voltage capacitors

⚠ **WARNING**

There is high voltage present with high current capabilities in the circuits of the primary and secondary windings, choke coil and heat sink of the inverter. It is extremely dangerous to work on or near these circuits with the oven energized. DO NOT measure the voltage in the high voltage circuit including the filament voltage of the magnetron.

⚠ **WARNING**

Never touch any circuit wiring with your hand or with an insulated tool during operation.

4.3. Part replacement.

When troubleshooting any part or component is to be replaced, always ensure that the power cord is unplugged from the wall outlet.

4.4. When the 20A fuse is blown due to the malfunction of the interlock monitor switch:

⚠ **WARNING**

When the 20A 120V fuse is blown due to the malfunction of the interlock monitor switch, you must replace components (primary interlock switch, interlock monitor switch and power relay RL1). Also replace the secondary interlock switch when the continuity check reads shorted contacts.

1. This is mandatory. Refer to “measurements and adjustments” for the location of these switches.
2. When replacing the fuse, confirm that it has the appropriate rating for these models.
3. When replacing faulty switches, be sure the mounting tabs are not bent, broken or deficient in their ability to hold the switches.

4.5. Avoid inserting nails, wire etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any holes or gaps, because such objects may work as an antenna and cause microwave leakage.

4.6. Verification after repair

1. After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loosen or missing. Microwave energy might leak if screws are not properly tightened.
2. Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
3. Check for microwave energy leakage. (Refer to procedure for measuring microwave energy leakage).

CAUTION OF MICROWAVE RADIATION LEAKAGE

USE CAUTION NOT TO BECOME EXPOSED TO RADIATION FROM THE MICROWAVE MAGNETRON OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE

1. The following components have potentials above 2000V while the appliance is operated.
   - Magnetron
   - High voltage transformer (Located on inverter (U))
   - High voltage diodes (Located on inverter (U))
   - High voltage capacitors (Located on inverter (U))

   Pay special attention to these areas.
2. When the appliance is operated with the door hinges or magnetron installed incorrectly, the microwave leakage can exceed more than 5mW/cm^2. After repair or exchange, it is very important to check if the magnetron and the door hinges are correctly installed.

4.7. Sharp edges

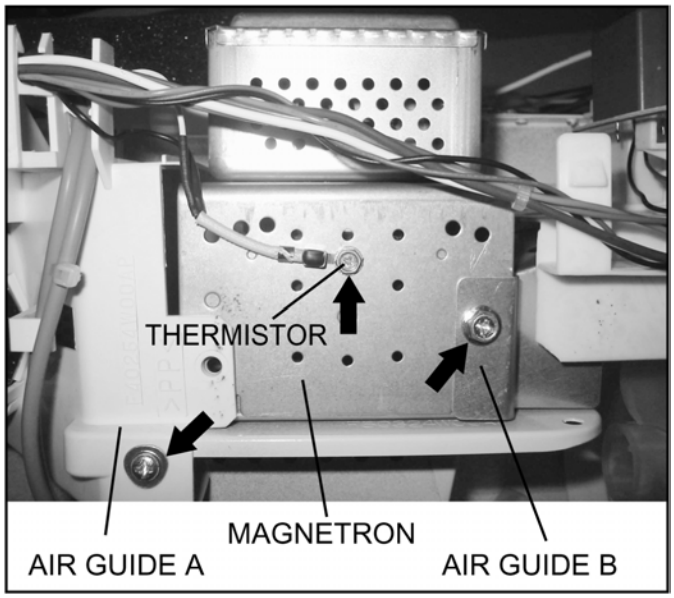
⚠ **CAUTION**

Please use caution when disassembling or reassembling internal parts. Some exposed edges may be sharp to the touch and can cause injury if not handled with care.

5 DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

5.1. Magnetron

1. Discharge high voltage charge.
2. Remove 1 screw holding air guide A on the oven cavity.
3. Remove 1 screw holding air guide B.
4. Remove 1 screw holding themistor.



5. Disconnect 2 high voltage lead wires from magnetron filament terminals.
6. Remove 4 screws holding the magnetron.

NOTE:

After replacement of the magnetron, tighten mounting screws properly in an x pattern, making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

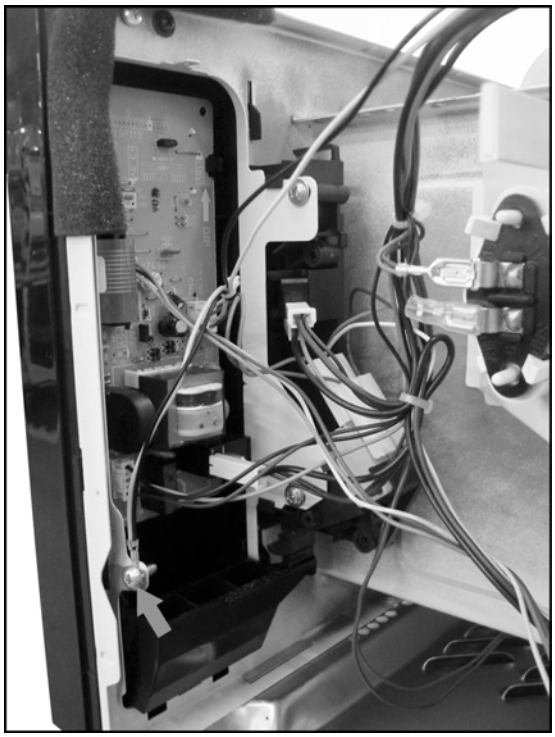
CAUTION
When replacing the magnetron, be sure the antenna gasket is in place.

5.2. Digital programmer circuit (D.P.C), membrane key board

⚠ **CAUTION:**

Be sure to ground any static electric charge built up in your body before handling the DPC.

1. Disconnect all connectors from D.P.C.
2. Remove 1 grounding screw.



3. Disconnect connector CN701 on H.V. Inverter board.
4. Remove 1 screw holding escutcheon base and slide the escutcheon base upward slightly.
5. Remove all screws holding D.P.C. board on escutcheon base.
6. Separate D.P.C board from tabs on the escutcheon base and remove D.P.C board.

To replace membrane key board

7. Use tools such as kinfe etc. to lift the edge of escutcheon sheet and peel off escutcheon sheet & key board membrane completely from escutcheon base.

NOTE:

1. **The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using a hair dryer is recommended for smoother removal.**
2. **When installing the new key board membrane, make sure that the surface of escutcheon base is clean to prevent a malfunction or shorted contacts.**

5.3. Low voltage transformer and/or power relays (RL1)

⚠ **CAUTION:**

Be sure to ground any static electric charge built up in your body before handling the DPC.

1. Replace D.P.C. board.

   (A) Using solder wick or a desoldering tool and 30W soldering iron carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.

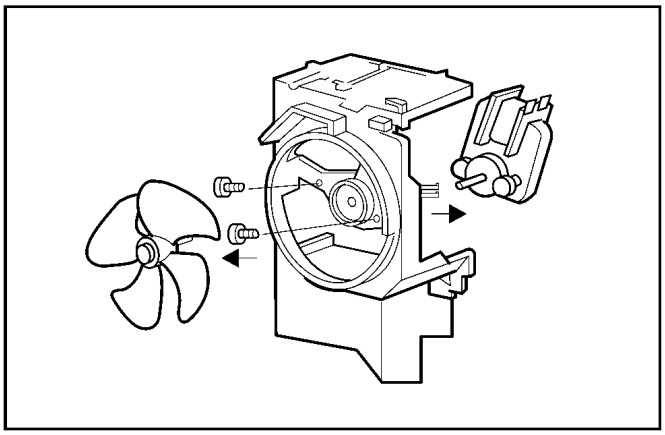
   ⚠ **CAUTION:**

   Do not use a soldering iron or desoldering tool of more than 30 watts on D.P.C. contacts.

   (B) With all the terminal pins cleaned and separated from D.P.C. contacts, remove the defective transformer/power relays, Replace components making sure all terminal pins are inserted completely resolder all terminal contacts carefully.

5.4. Fan motor

1. Disconnect 2 lead wires from fan motor terminals.
2. Remove 2 screws at location on oven attaching orifice assembly.
3. Remove orifice assembly from oven assembly.
4. Remove fan blade from the fan motor shaft by pulling it straight out.
5. Remove 2 screws holding fan motor to orifice.



5.5. Door assembly

1. Remove door C from door E by carefully pulling outward, starting from upper right hand corner using a flat blade screwdriver.
2. Separate door E from tabs on door A and remove door A.
3. Open Door E at the opening angle of approximately **10°(Note: The door cannot be removed if the opening angle is greater than 10°).**
4. Remove the door E from its hinges by pushing the door E upward and out.
5. Remove door screen B from door A.
6. Remove door key and door key spring.

To re-install components:

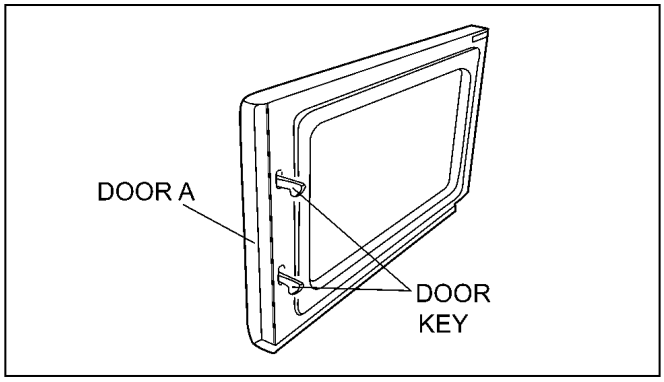
1. Place the door's lower hinge pin into the bottom hinge hole.
2. Use your left index finger to support the door's lower hinge pin while guiding the door's upper hinge pin into the top hinge hole.
3. Lower your finger to seat the door onto the hinges.
4. Replace other components.

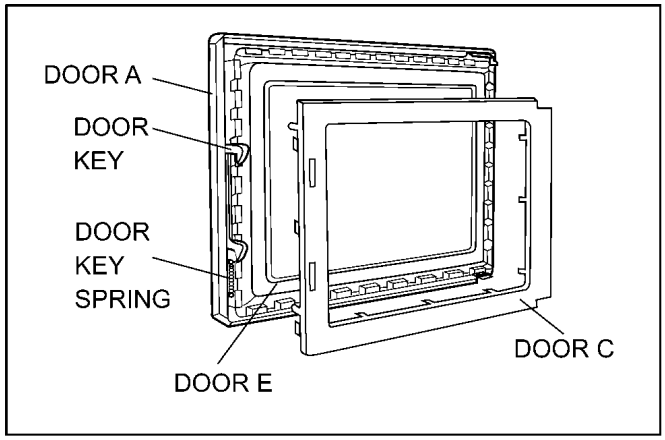
NOTE:

Adjust so that the upper portion of the door will touch firmly to the oven cavity front plate, without pushing the door. If the door assembly is not mounted properly, microwave power may leak from the clearance between the door and oven.

NOTE:

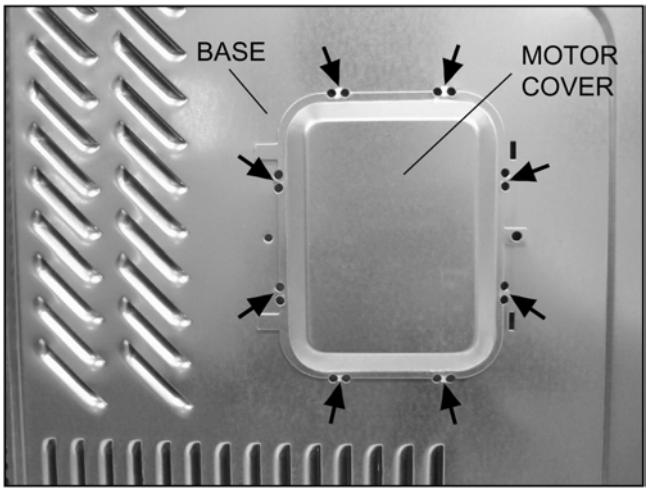
Always perform the microwave leakage measurement test after installation and adjustment of door assembly.





5.6. Turntable motor

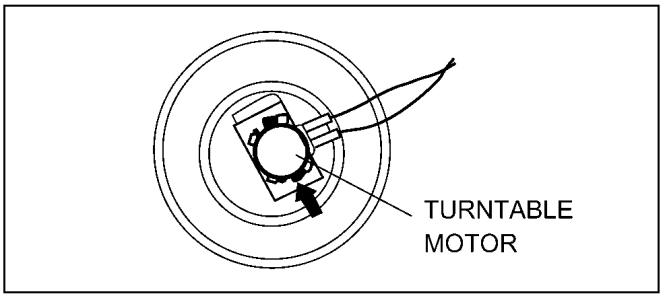
1. Remove the motor cover by breaking off at the 8 spots indicated by arrows with a cutter or the like.



⚠ **NOTE:**

After removing the motor cover, be sure that cut portions are properly trimmed or bent to the inside so that no sharp edges will be exposed to outside.

2. Disconnect 2 lead wires connected to the turntable motor.
3. Remove the turntable motor by removing screw.

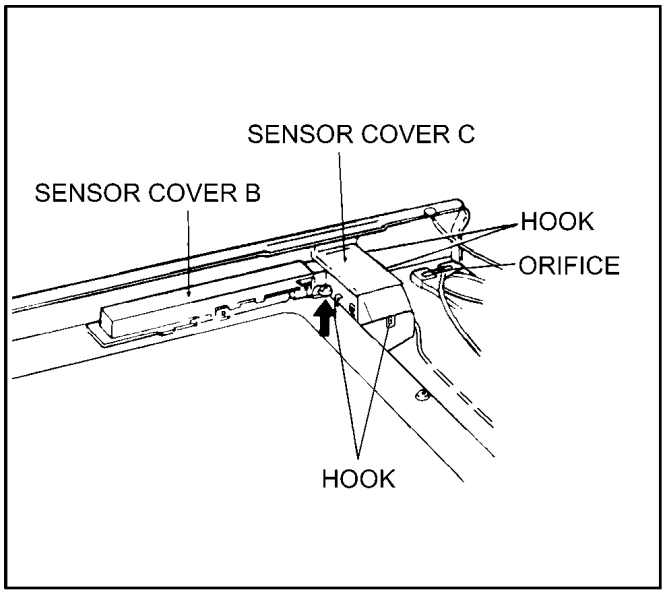


⚠ **NOTE:**

After reinstalling the new turntable motor and reconnecting the 2 lead wires, reinstall the motor cover by rotating it around 180, tucking the 2 tabs under the base in the 2 provided slots, then screw the single tab to the base using a 4mm × 6mm screw.

5.7. Steam sensor

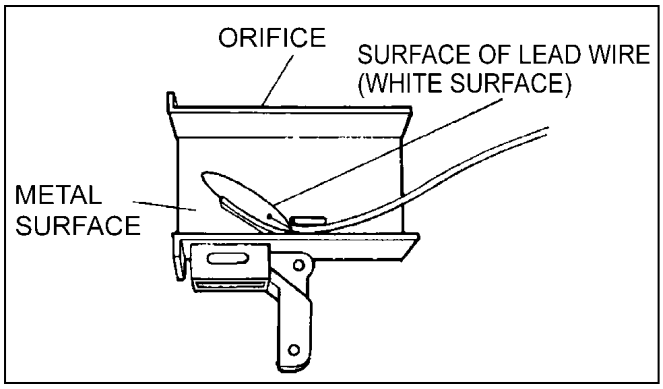
1. Disconnect connector CN2 from digital programmer circuit board.
2. Disengage catch hooks on sensor cover C from orifice.



3. Remove steam sensor from orifice.

⚠ **NOTE:**

When installing the steam sensor, make sure that the direction of steam sensor is as shown in figure.

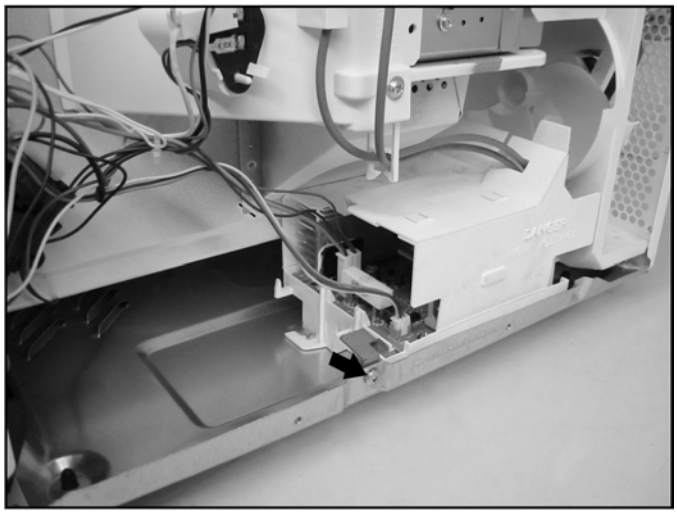


5.8. Inverter power supply

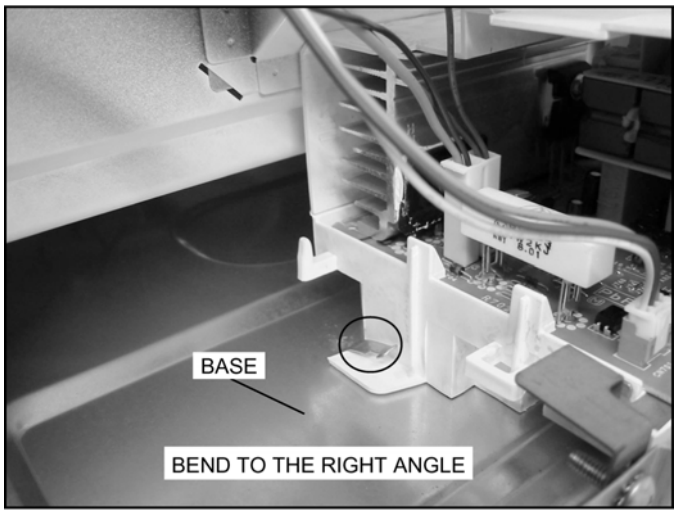
CAUTIONS

1. Always leave the grounding plate in place.
2. Always securely tighten the ground screw through the bottom of the chassis (base).
3. Securely connect 3 lead wire connectors.
4. Make sure the heat sink has enough space (gap) from the oven. Take special care not to dress any lead wire over the aluminum heat sink because it is hot.

1. Discharge high voltage charge.
2. Remove the H.V.lead wire from magnetron terminals.
3. Disconnect 2 connectors from CN701 & CN702 on H.V.Inverter(U).
4. Remove 1 screw holding grounding plate to the base.

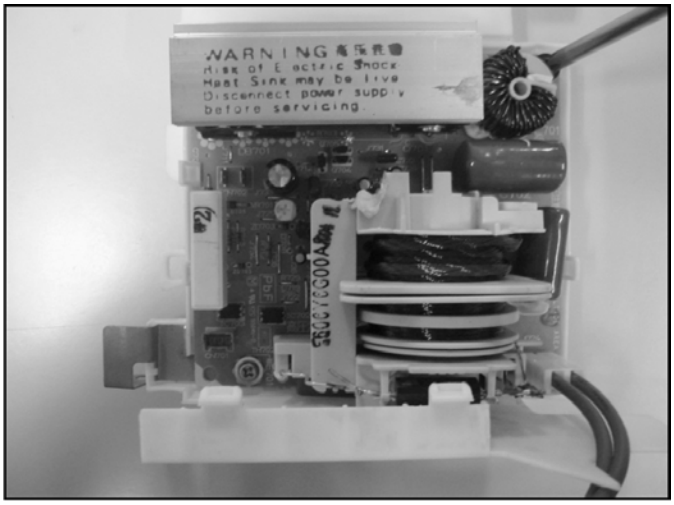


5. Bend back 1 locking metal tabs on the base.

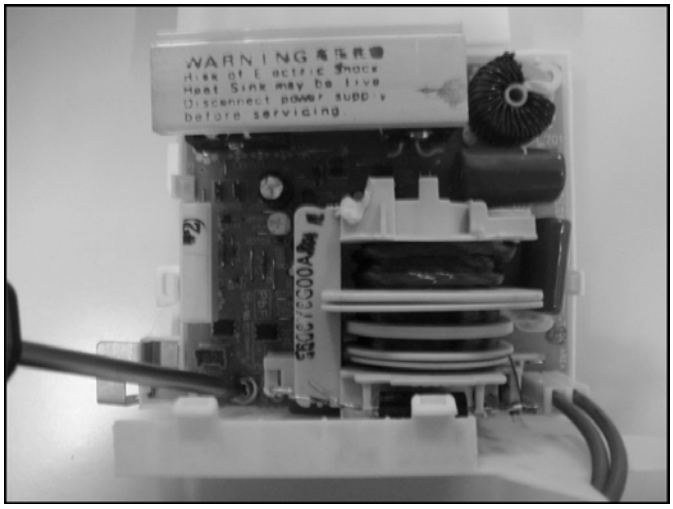


6. Press 1 encircled locking tab and then slide 4 locking tabs of Inverter bracket at the bottom of the base in direction of arrows.

7. Remove 1 screw holding H.V.Inverter to Inverter bracket.



8. Remove 1 screw holding grounding plate to H.V. Inverter.



6 COMPONENT TEST PROCEDURE

⚠ WARNING

1. High voltage is present at the output terminals of the High Voltage Inverter (U) including aluminum heat sink during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the power cord and discharge the high voltage capacitors.

6.1. Primary, Secondary Interlock Switch & Power Relay RL1

1. Unplug lead connectors to Power Relay RL1 and verify open circuit of the Power Relay RL1 1-2 terminals.
2. Unplug lead connectors to Primary Interlock Switch and Secondary Interlock Switch.
3. Test the continuity of switches at door opened and closed positions with ohm meter (low scale).

   Normal continuity readings should be as follows.

	Door Closed	Door Opened
Primary Interlock Switch	0Ω (Close)	∞Ω(Open)
Secondary Interlock Switch	0Ω (Close)	∞Ω(Open)
Power Relay RL1	∞Ω (Open)	∞Ω(Open)

6.2. Interlock Monitor Switch

1. Unplug lead wires from Inverter Power Supply (U) primary terminals.
2. Connect test probes of ohm meter to the disconnected leads that were connected to Inverter Power Supply (U).
3. Test the continuity of Interlock Monitor Switch with door opened and closed positions using lowest scale of the ohm meter.

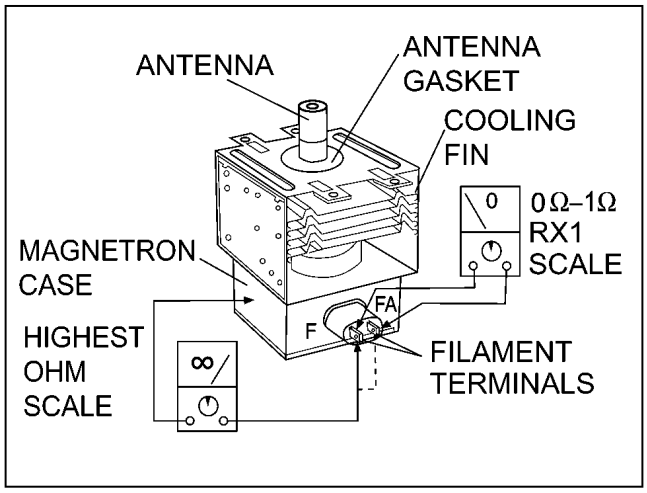
   Normal continuity readings should be as follows.

Door Opened	Door Closed
0Ω (Close)	∞Ω (Open)

6.3. Magnetron

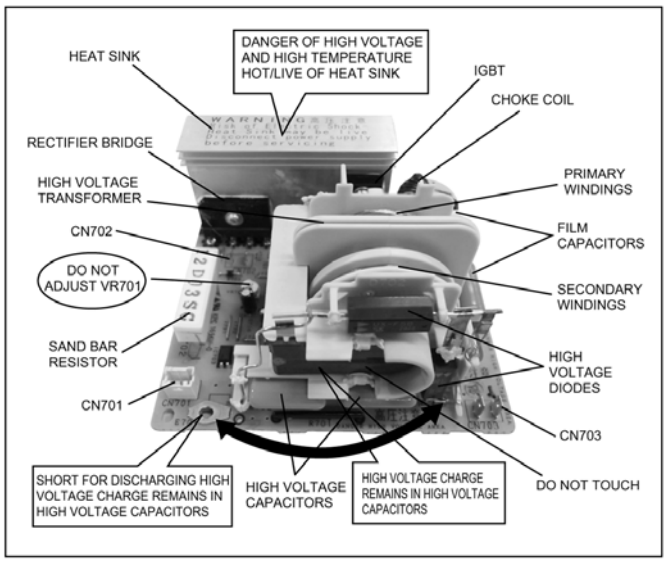
Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.

1. Isolate magnetron from the circuit by disconnecting the leads.
2. A continuity check across magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.



6.4. Inverter power supply (U)

DO NOT try to REPAIR H.V. Inverter power supply (U). Replace complete H.V. Inverter(U) Unit.



WARNING: HIGH VOLTAGE

Test if failure codes H95, H97 or H98 appear when performing the following procedure. It is recommended to use an AC line input current ammeter for testing.

Test 1

1. With the oven unit's AC power supply cord is unplugged from the wall outlet, unplug the 2 pin H.V. connector CN703 from the magnetron tube.
2. Place 1 liter of water load into oven cavity.
3. Plug in the oven's AC power supply cord into outlet.
4. Program DPC.

   For ST77LS/ST74LS/ST75LB/ST75LW models

   a. Press [Clock] once.
   b. Press [Timer] once.
   c. Press [Start] once.
   d. Press [Power Level] once.

   For SD78LS model

   a. Press [Timer/Clock] twice.
   b. Press [Start] once.
   c. Press [Power Level] once.
5. Program oven at High power for 1 minute and press [Start].
   a. After approximately 23 seconds, oven stops operating.
   b. During oven operation, the input current is approximately 0.5 to 1A. If both a and b are OK, proceed to test 2.

	INPUT CURRENT	FAILURE CODE
Unplug CN703	0.5 to 1A	Oven stops in 23 seconds after started.

Test 2

Continued from Test 1

1. Unplug the oven's AC power supply cord from outlet.
2. Unplug 3 pin connector CN701. CN703 remains unplugged.
3. Plug in the oven's AC power supply cord into outlet.
4. Program DPC.

   For ST77LS/ST74LS/ST75LB/ST75LW models

   a. Press [Clock] once.
   b. Press [Timer] once.
   c. Press [Start] once.
   d. Press [Power Level] once.

   For SD78LS model

   a. Press [Timer/Clock] twice.
   b. Press [Start] once.
   c. Press [Power Level] once.
5. Program oven at High power for 1 minute and press [Start].
   a. After approximately 3 seconds, oven stops operating.
   b. During oven operation, the input current is approximately 0.4A.

	INPUT CURRENT	FAILURE CODE
Unplug CN701	≈ 0.4A	Oven stops in 3 seconds after started.

If both a and b check OK, the Inverter Power Supply (U) can be determined to be OK.

6.5. Temperature thermistor

The thermistor that is attached to the magnetron detects the temperature of the magnetron and will stop magnetron operation when overheating is detected. A normal thermistor´s resistance is 35KΩ to 110KΩ for an ambient temperature range of 10-30 degree C.

If the resistance reading is out of the range stated here, the thermistor is detective and must be replaced.

It is also possible to display thermistor level by taking the following steps.

1. Program the DPC into TEST MODE
   a. **For SD78LS model**

      Plug-in oven → press [Time/Clock] twice → press [Start] once → press [Power Level] once.

   b. **For ST77LS/ST74LS/ST75LB/ST75LW models**

      Plug-in oven → press [Clock] once → press [Timer] once → press [Start] once → press [Power Level] once.
2. Program oven at Standing Time for 1 minute and press [Start] button.
3. Press [Power Level] 4 times, the thermistor level reading will shown on the display.

   The normal reading should be in the range of 20-200.

7 MEASUREMENTS AND ADJUSTMENTS

⚠ WARNING

* For continued protection against radiation hazard, replace only with identical replacement parts (For touch models part No. J61415G10XN, Type No. V-15G-3C25 for primary interlock switch; Part No. J61414T00AP, Type No. D3V-16G-3C25 for secondary interlock switch and Part No. J61784T00AP, Type No. D3V-1G-2C25 for interlock monitor switch.)
* When the 20 Amp. fuse is blown due to the malfunction of the interlock monitor switch, you must replace power relay RL1 (part No. K6B1AYY00129, Type No. JQC-25F), the primary interlock switch and the interlock monitor switch. Also replace the secondary interlock switch when the continuity check reads shorted contacts. Then follow the installation procedures below.
* Interlock switch replacement: In replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.
* Refer to schematic diagram to ensure proper connection.

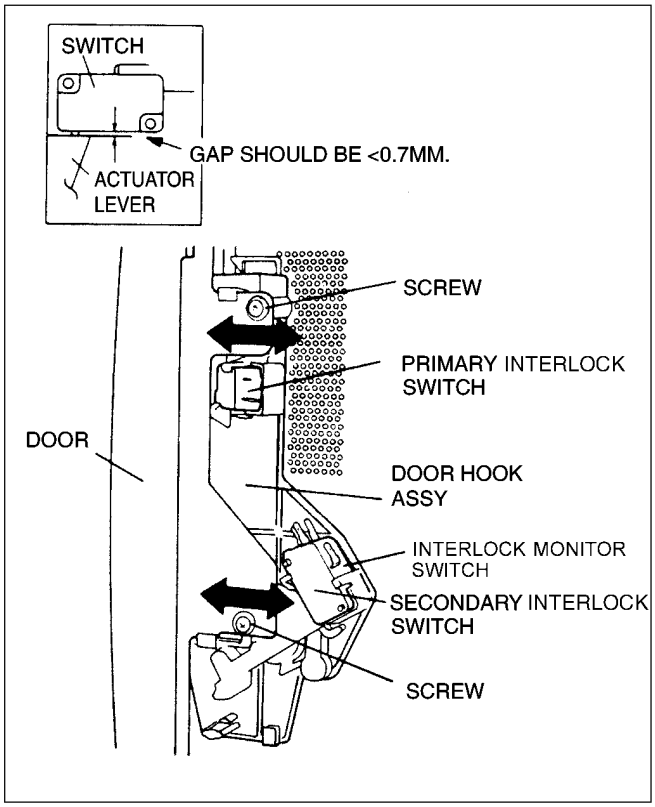
7.1. Adjustment of primary interlock switch, secondary interlock switch and interlock monitor switch.

1. Mount the Primary Interlock Switch, the Secondary Interlock Switch and the Interlock Monitor Switch to the door hook assembly as shown in illustration.

   NOTE:

   No specific individual adjustments during installation of the Primary Interlock Switch, Secondary Interlock Switch or Interlock Monitor Switch to the door hook are required.

2. When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of the arrows in the illustration so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.
3. Reconnect the interlock monitor switch and check the continuity of the monitor circuit and all interlock switches again by following the component test procedures.



7.2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

*1 liter beaker *Glass thermometer
*Wrist watch or stopwatch

NOTE:

Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurately as possible.

1. Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the water's temperature. (recorded as T1).
2. Place the beaker on the center of glass tray.
   Set the oven for High power and heat it for exactly one minute.
3. Stir the water again and read the temperature of the water. (recorded as T2).
4. The normal temperature rise at High power level for each model is as shown in table.

TABLE (1L-1min. test)

RATED OUTPUT	TEMPERATURE RISE
1200W	Min. 18.5°F(10.3°C)

8 PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE

⚠ WARNING

Check for radiation leakage after every servicing. Should the leakage be more than 2 mW/cm^2 (1mW/cm^2 for Canada) inform PSTC, PPR, or PCI immediately. After repairing or replacing any radiation safety device, keep a written record for future reference, as required by D.H.H.S. and Health and Welfare Canada regulation. This requirement must be strictly observed. In addition, the leakage reading must be recorded on the service repair ticket while in the customer's home.

NOTE:

The U.S. Government standard is 5 mW/cm^2 while in the customer's home. 2mW/cm^2 stated here is our own voluntary standard. (1mW/cm^2 for Canada)

8.1. Equipment

- Electromagnatic radiation monitor
- Glass thermometer 212°F or 100°C
- 600cc glass beaker

8.2. Procedure for measuring radiation leakage

Note before measuring:

- Do not exceed meter full scale deflection. Leakage monitor should initially be set to the highest scale.
- To prevent false readings, the test probe should be held by the grip portion of the handle only and moved along the shaded area in Figure no faster than 1 inch/sec (2.5cm/sec).
- Leakage with the outer panel removed: less than 5mW/cm^2.
- Leakage for a fully assembled oven with door normally closed: less than 2mW/cm ^{2} (1mW/cm ^{2} for Canada).
- Leakage for a fully assembled oven [Before the latch switch (primary) is interrupted] while pulling the door: less than 2mW/cm ^{2}.

1. Pour 275 ± 15cc (9ozs^s± 1/2oz) of 20°C ± 5°C (68° ± 9°F) water in a beaker which is graduated to 600cc, and place in the center of the oven.
2. Set the radiation monitor to 2450MHz and use it following the manufacturer´s recommended test procedure to assure correct results.
3. When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.
4. Tap the start button or set the timer and with the magnetron oscillating, measure the leakage by holding the probe perpendicular to the surface being measured.

8.2.1. Measurement with the outer panel removed.

Whenever you replace the magnetron, measure for radiation leakage before the outer panel is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring around the magnetron.

⚠ WARNING

Do not touch any high voltage parts.
Doing so can lead to personal injury or death.

8.2.2. Measurements with a fully assembled oven.

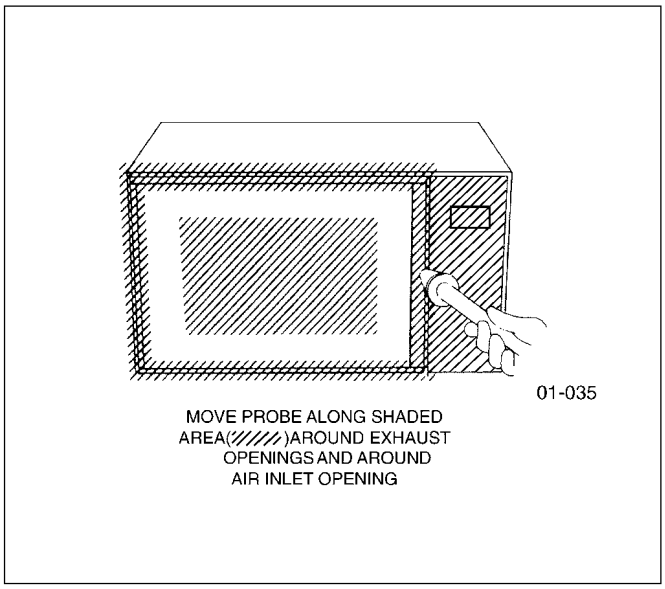
After all components, including outer panel are fully assembled, measure for radiation leakage around the door periphery, the door viewing window, the exhaust opening, control panel and air inlet openings.

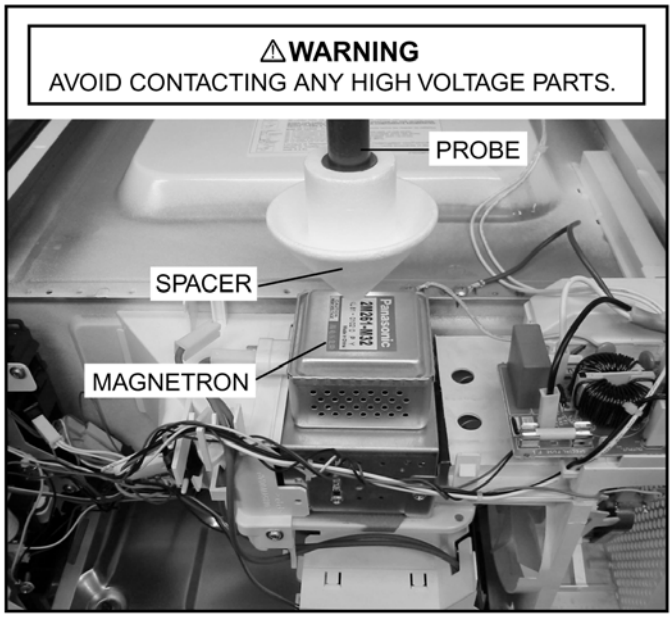
8.3. Record keeping and notification after measurement

- After any adjustment or repair to a microwave oven, a leakage reading must be taken. Record this leakage reading on the repair ticket even if it is zero.

  A copy of this repair ticket and the microwave leakage reading should be kept by repair facility.
- Should the radiation leakage be more than 2 mW/cm^2 (1mW/cm^2 for Canada) after determining that all parts are in good condition, functioning properly, and genuine replacement parts as listed in this manual have been used, immediately notify PSTC, PPR or PCI.

8.4. At least once a year, have the radiation monitor checked for calibration by its manufacturer.





9 TROUBLESHOOTING GUIDE

DANGER: HIGH VOLTAGES ⚠

1. **DO NOT RE-ADJUST PRESET CONTROL on the H.V.Inverter (U).** It is very dangerous to repair or adjust without proper test equipment because this circuit generates very large current and high voltage. Operating a misaligned inverter circuit is dangerous.
2. Ensure proper grounding before troubleshooting.
3. Be careful of the high voltage circuitry, taking necessary precautions when troubleshooting.
4. Discharge high voltage remaining in the H.V.Inverter (U).
5. When checking the continuity of the switches or the H.V.Inverter, disconnect one lead wire from these parts and then check continuity with the AC plug removed. Doing otherwise may result in a false reading or damage to your meter. When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be damaged or the connector cannot be removed.
6. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel. Always touch ground while working on this panel to discharge any static charge in your body.
7. 120V AC is present on the digital programmer circuit (Terminals of power relay's and primary circuit of Digital Programmer Circuit). When troubleshooting, be cautious of possible electrical shock hazard.

Before troubleshooting, operate the microwave oven following the correct operating procedures in the instruction manual in order to find the exact cause of any trouble, since operator error may be mistaken for the oven's malfunction.

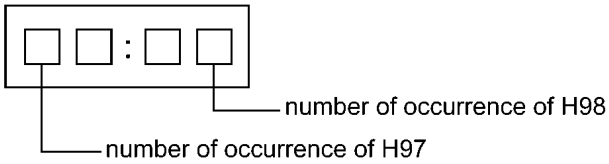
H97 & H98 error code display

If 3 times H97 or 2 times H98 exist, microwave oven can not be used any more, even if the defective parts already be replaced & un-plug and plug-in again.

How to reset for the service:

Please take the following steps

1. Plug-in oven.
2. Press [Stop/Reset] once.
3. Open the door.
4. Keep pressing [Start] for more than 2 seconds until buzzer beeps.
5. Press [Stop/Reset] three times, oven will show the total usage time of magnetron.
6. Press [Power Level] once, oven will show the total number of occurrence of H97 & H98.



7. Keep pressing [Start] for more than 2 seconds (until buzzer beeps) to reset.
8. While finish resetting, one beeps, and show "End".
9. Press [Stop/Reset] to return to initial stage.

Magnetron usage time display

Oven has magnetron usage time display function but it will not be activated in normal operation mode.

To show magnetron usage time result, please take the following steps:

1. Plug-in oven.
2. Press [Stop/Reset] once.
3. Open the door.
4. Keep pressing [Start] for more than 2 seconds until buzzer beeps.
5. Press [Stop/Reset] three times, oven will show the total usage time of magnetron.

(note1:the magnetron usage time is kept in L.S.I. memory.)

(note2:Magnetron usage time display is in hours.)

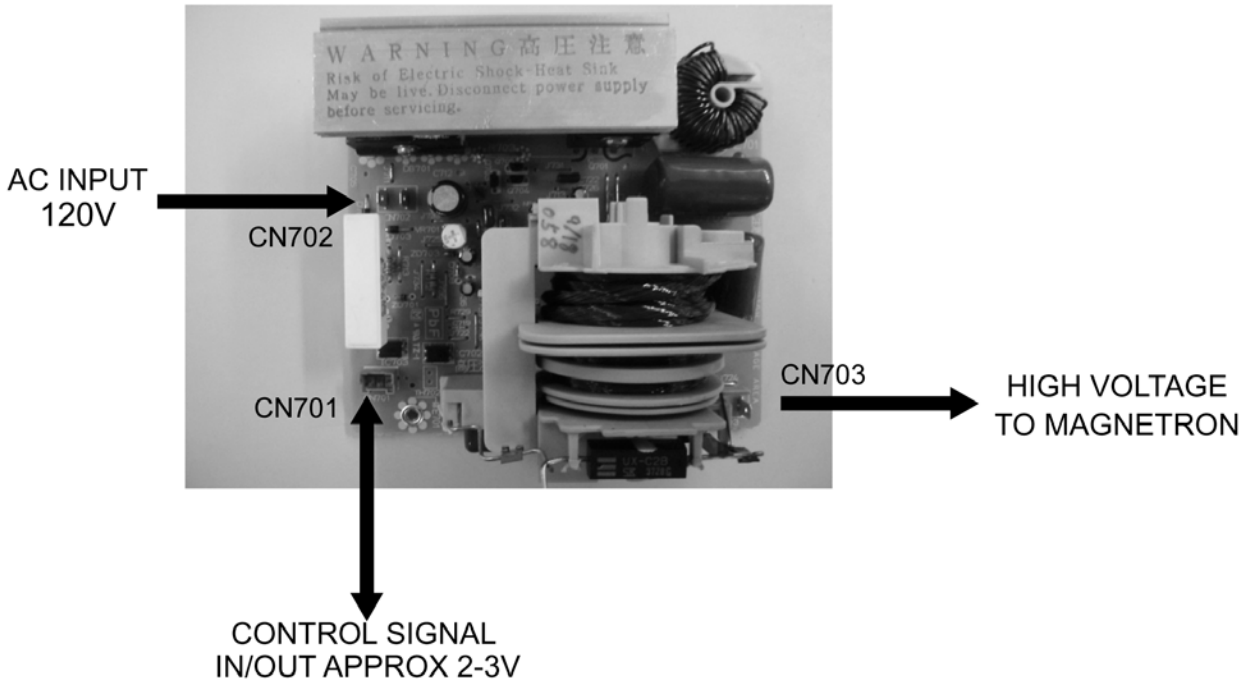
NOTE:

To clear the recorder of L.S.I. memory.

a. Press [Start] for more than 2 seconds until buzzer beeps.
b. While finish resetting, one beeps and show "End".
c. Press [Stop/Reset] to return to initial stage.

9.1. (Troubleshooting) Oven stops operation during cooking

	SYMPTOM	CAUSE	CORRECTIONS
1.	**Oven stops in 3 seconds** after pressing [Start]	No 120V AC is supplied to H.V.Inverter (U) CN702 terminals	1. Interlock Switch 2. Power relay RL1 3. Loose lead wire connector CN701, CN702 4. H.V. Inverter (U)
	Oven stops in 23 seconds after pressing [Start]	H.V.Inverter (U) operates by the control signals from DPC but magnetron is not oscillating	1. Magnetron 2. Loose lead wire connector CN703 3. H.V. Inverter (U)
	Oven stops in 10 seconds after pressing [Start] (Auto sensor cooking)	Steam sensor circuit is not functioning	1. Steam sensor 2. DPC 3. Open or loose wiring of sensor terminal from connector CN2 on DPC
2.	No display and no operation at all. Fuse is blown.	Most probably loose connection of connectors, or door latch mechanism is not adjusted properly	1. Allign door, Door Interlock Switches 2. Loose wiring connectors

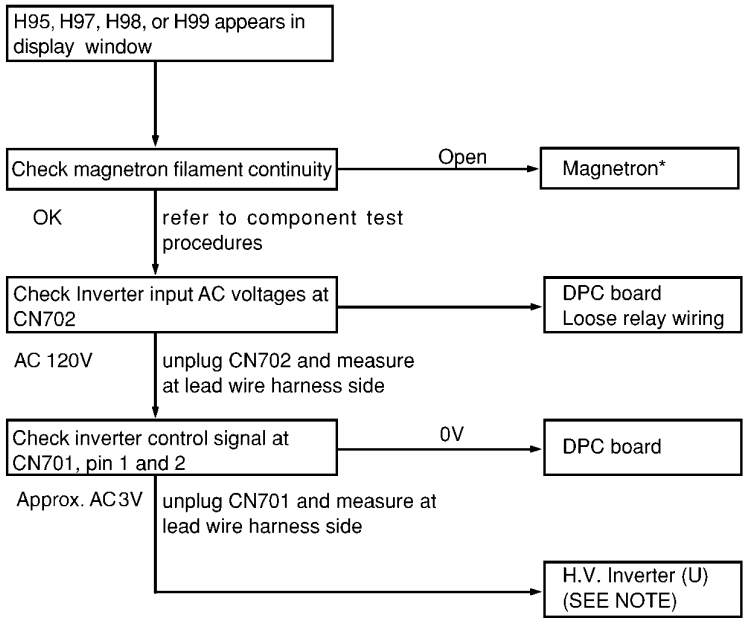


9.2. (Troubleshooting) Other problems

	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness 2. Open thermal cutout / thermistor 3. Open low voltage transformer 4. Defective DPC	Check thermal cutout is defective.
2.	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary interlock switch 3. Defective interlock monitor switch (NOTE 1) 4. Defective Inverter Power Supply (U)	Check adjustment of primary, secondary interlock switch and interlock monitor switch including door.
		NOTE 1: Replace components (primary interlock switch, interlock monitor switch and power relay RL1). Also replace the secondary interlock switch when the continuity check reads shorted contacts.	
3.	Oven does not accept key input (Program)	1. Key input is not in proper sequence 2. Defective DPC or defective membrane switch	Refer to operation procedure. Refer to DPC troubleshooting.
4.	Fan motor turns on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary interlock switch 2. Defective secondary interlock switch 3. Door switch CN4	Adjust door and interlock switches.
5.	Timer starts count down but no microwave oscillation. (No heat while oven lamp and fan motor turn on)	1. Off-alignment of primary interlock switch 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will cause lower magnetron filament voltage and cause magnetron to have lower output and/or be intermittent. 3. Defective high voltage component H.V. Inverter Power Supply (U) Magnetron 4. Open or loose wiring of power relay RL1 5. Defective primary interlock switch 6. Defective DPC or power relay RL1	Adjust door and interlock switches. Check high voltage component according to component test procedure and replace if it is defective. Refer to DPC troubleshooting
6.	Oven can program but timer does not start countdown.	1. Open or loose wiring of secondary interlock switch 2. Off-alignment of secondary interlock switch 3. Defective secondary interlock switch	
7.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit.(Intermittent oscillation) 3. Aging change of magnetron	Consult electrician
8.	Fan motor turns on and turntable motor rotates when door is opened.	1. Low voltage transformer on DPC.	
9.	Oven does not operate and return to plugged in mode as soon as [Start] pad is pressed.	1. Defective DPC	Check grounding connector on escutcheon base.
10.	Loud buzzing noise can be heard.	1. Loose fan and fan motor	
11.	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor 2. Defective turntable motor	
12.	Oven stops operation during cooking.	1. Open or loose wiring of primary and secondary interlock switch 2. Operation of thermal cutout	Adjust door and interlock switches.

9.3. Troubleshooting of inverter circuit (U) and magnetron

This oven is programmed with a self diagnostics failure code system which will help for troubleshooting. H95, H97, H98 and H99 are the provided failure codes to indicate magnetron and inverter circuit problem areas. This section explains failure codes of H95, H97, H98 and H99. First, you must program the DPC into TEST MODE, **For ST77LS/ST74LS/ST75LB/ST75LW model**s: press [Clock] once → press [Timer] once → press [Start] once → press [Power Level] once, **For SD78LS model:** press [Timer/Clock] twice → press [Start] once → press [Power Level] once. Program unit for operation. H95, H97, H98, H99 appears in display window a short time after [Start] is pressed and there is no microwave oscillation.



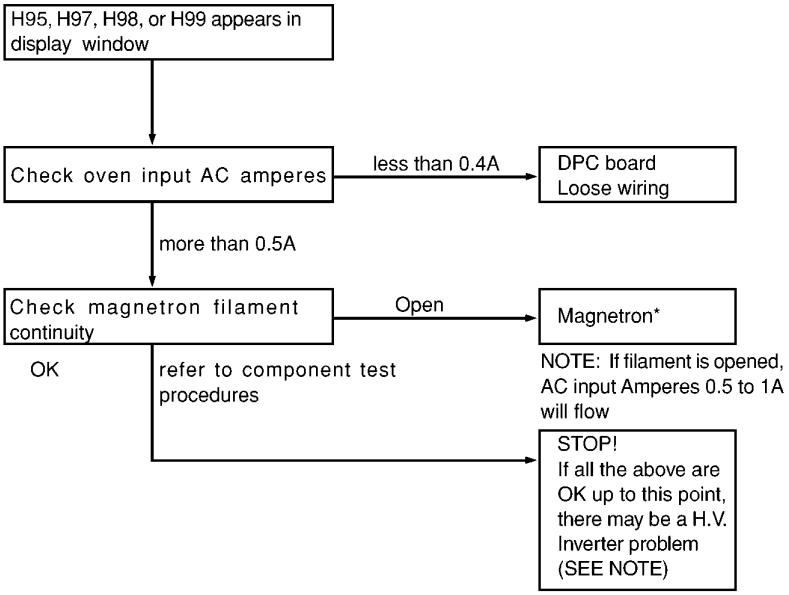
⚠ WARNING: DO NOT try to repair this Inverter Power Supply (U) and also DO NOT RE-ADJUST PRESET CONTROL on the board. It is very dangerous to repair or adjust without proper test equipment because this circuit generates very high voltage and very large current. Off alignment of inverter board operation is dangerous. Operating a misaligned Inverter circuit is dangerous due to the very high voltage and current that is produced by this board. Defective boards must be replaced with a new one.

* Check magnetron filament for open or short to case before proceeding to determine a good magnetron.

NOTE: After check, unplug unit to reset to normal operation mode.

Alternate way to troubleshoot oven with AC Ampere meter used

H95, H97, H98, H99 appears in display window a short time after [Start] is pressed and no microwave oscillation with AC Ampere meter used for troubleshooting.



NOTE: After check, unplug unit to reset to normal operation mode.

9.4. Trouble related to Digital Programmer Circuit

9.4.1. NN-ST77LS/ST74LS

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in	1	Fuse pattern of D.P.C.	Normal	→Step2
			Open	Replace D.P.C. or Fuse Pattern
	2	Low voltage transforment (L.V.T.) secondary voltage	Abnormal 0V	L.V.T. (T10)
			Normal	→Step3
	3	IC1 pin 13 voltage	Abnormal	IC10
			Normal=5V	IC1, Display
No key input	1	Touch switch continuity	Abnormal	Touch switch
			Normal	IC1
No beep sound	1	IC1 pin 49 voltage	Abnormal	IC1
			Normal=5V	BZ210, Q210
No microwave oscillation at any power	1	IC1 pin 51 voltages while operation at high power	Abnormal	IC1
			Normal=5V	→Step2
	2	Collector of Q227 voltage	Abnormal	Q227 and/or Q225, Q226
			Normal≈0.7V	→Step3
	3	Short circuit between collector of Q227 and emitter of Q225	Still not turn on	RL1
			RL1 turns on	Q227 and/or Q225, Q226
Dark or unclear display	1	Replace display and check operation	Normal	Display
			Abnormal	IC1
Missing or lighting of unnecessary segment	1	Replace IC1 and check operation	Normal	IC1
			Abnormal	Display
H95/H97/H98 appears in window and oven stops operation.Program High power for 1 minute and conduct following test quickly, unless H95/H97/H98 appears and oven stops	1	Unplug CN702 (2 pin) connector and measure voltage between terminals	Abnormal=0V	1. Interlock Switch 2. D.P.C. /Power Relay
			Normal=120V	→Step2
	2	Unplug CN701 (3 pin) connector and measure pin1 voltage	Abnormal=0V	D.P.C.
			Approx. AC 3V	Magnetron

9.4.2. NN-SD78LS, ST75LB, ST75LW

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in	1	Fuse pattern of D.P.C.	Normal	→Step2
			Open	Replace D.P.C. or Fuse Pattern
	2	Low voltage transforment (L.V.T.) secondary voltage	Abnormal 0V	L.V.T.
			Normal	→Step3
	3	IC1 pin 13 voltage	Abnormal	IC10
			Normal=5V	IC1, CX320, Display
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC1
No beep sound	1	IC1 pin 49 voltage	Abnormal	IC1
			Normal=5V	BZ210, Q210
No microwave oscillation at any power	1	IC1 pin 51 voltages while operation at high power	Abnormal	IC1
			Normal=5V	→Step2
	2	Collector of Q227 voltage	Abnormal	Q227 and/or Q225, Q226
			Normal≈0.7V	→Step3
	3	Short circuit between collector of Q227 and emitter of Q225	Still not turn on	RL1
			RL1 turns on	Q227 and/or Q225, Q226
Dark or unclear display	1	Replace display and check operation	Normal	Display
			Abnormal	IC1
Missing or lighting of unnecessary segment	1	Replace IC1 and check operation	Normal	IC1
			Abnormal	Display
H95/H97/H98 appears in window and oven stops operation.Program High power for 1 minute and conduct following test quickly, unless H95/H97/H98 appears and oven stops	1	Unplug CN702 (2 pin) connector and measure voltage between terminals	Abnormal=0V	1. Interlock Switch 2. D.P.C. /Power Relay
			Normal=120V	→Step2
	2	Unplug CN701 (3 pin) connector and measure pin1 voltage	Abnormal=0V	D.P.C.
			Approx. AC 3V	Magnetron

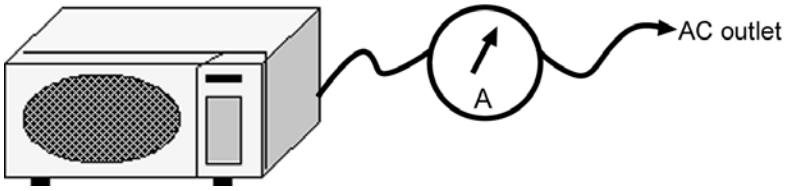
9.5. SIMPLE WAY OF H.V. INVERTER/MAGNETRON TROUBLESHOOTING

Purpose:

Simple way **(3/23 seconds rule)** of identifying whether it's Magnetron, Inverter or others.

Set-up:

The unit under question is connected through the Ammeter as shown below.



Procedure:

Follow the matrix table below to identify the problem source.

Note:

Do not replace both Inverter board and Magnetron simultaneously and automatically without going through this procedure.

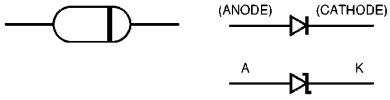
Power will:	Ammeter reading is:	To do:	Remedy:
Shut off in 23 seconds after "Start".	1. Between 0.5A and 1.0A.	Check and repair open magnetron circuit	Open magnetron wiring between Inverter and magnetron terminal.
	2. Between 1.0A and 2.0A.	Check continuity of D702 in Inverter PCB.	
		⇩	
		1. D702 shorted	Replace **H.V.Inverter**(F606Y9X90AP)
		2. D702 is OK	Replace **magnetron**
Shut off in 3 seconds after "Start"	1. Less than 0.5A	Check open circuit: Interlock Switch, DPC, Power Relay and CN701	Replace defective component(s), or correct switch, cables and connectors.

9.6. H.V.INVERTER BOARD MAIN PARTS LIST (F606Y9X90AP)

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
DB701		B0FBCR000004	BRIDGE DIODE	1	20A,600V
L701		F5020W100AP	CHOKE COIL	1	
Q701		B1JAGV000017	TRANSISTOR SI	1	1150V
T701	⚠	F609A8X00AP	H.V. TRANSFORMER	1	Including:C706,C707,D701,D702
C701		F0C2H284A020	CAPACITOR	1	0.28µF/600VDC
C702		F0C2E455A331	CAPACITOR	1	4.5µF/250VDC

9.7. How to check the semiconductors using an OHM meter

Diode



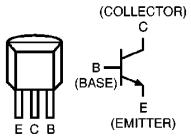
	FORWARD	REVERSE
A-K	SMALL	∞

Transistor

NPN Transistor

2SC·····

2SD·····

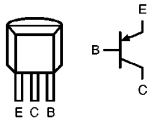


	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

PNP Transistor

2SA·····

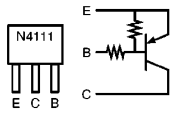
2SB·····



	FORWARD	REVERSE
B-E	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

Digital Transistor

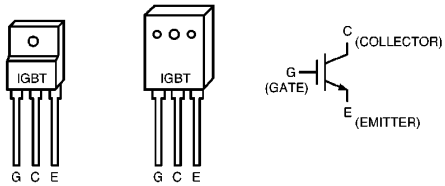
PNP Transistor



	FORWARD	REVERSE
E-B	10kΩ ~ 30kΩ	10kΩ ~ 30kΩ
C-B	50kΩ ~ 90kΩ	∞
C-E	40kΩ ~ 80kΩ	∞

IGBT

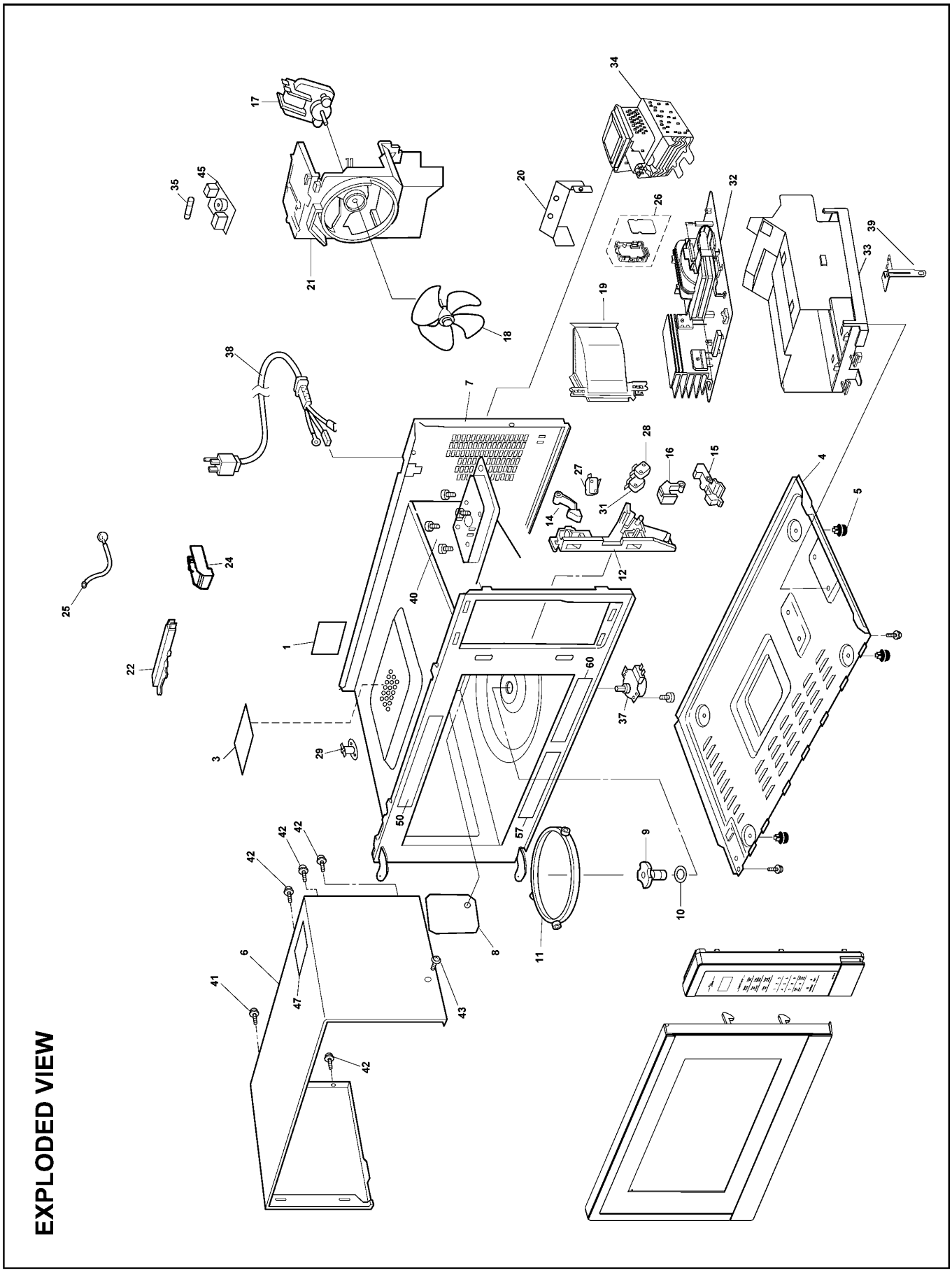
(INSULATED GATE BIPOLAR TRANSISTOR)



	FORWARD	REVERSE
E-C	SMALL	∞
E-G	∞	∞
C-G	∞	∞

10 EXPLODED VIEW AND PARTS LIST

10.1. EXPLODED VIEW



10.2. PARTS LIST

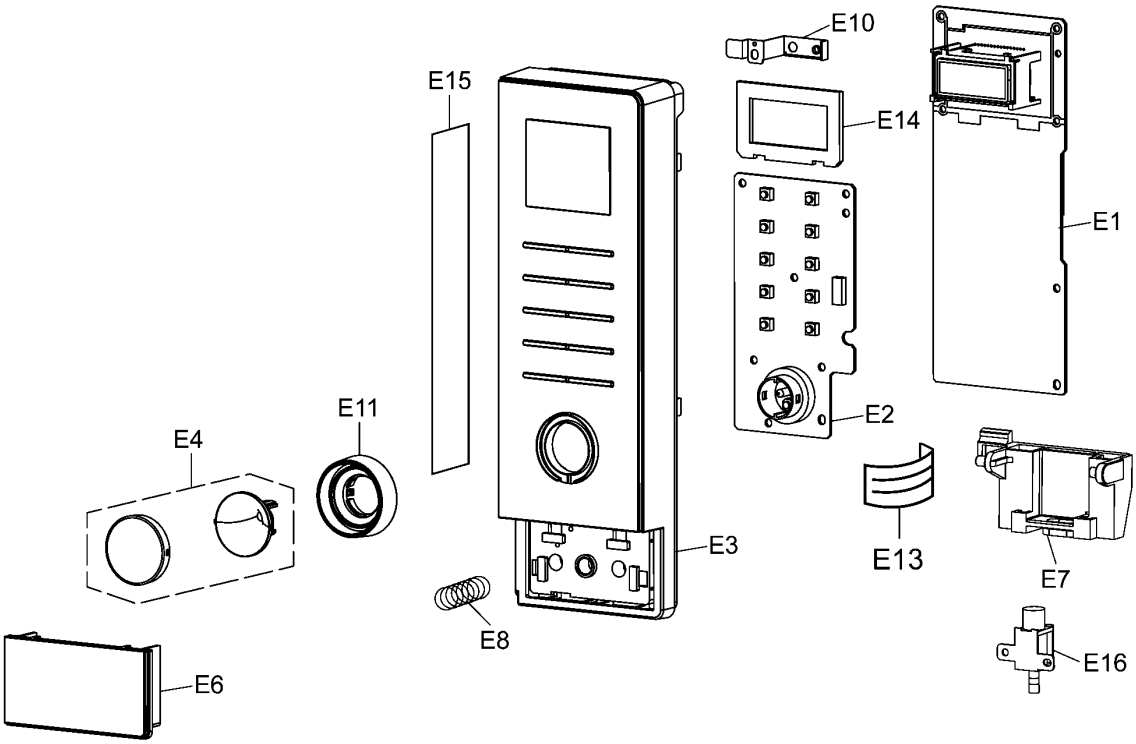
NOTE:

1. When ordering replacement part(s), please use part number(s) shown in this part list.
   Do not use description of the part.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacture's specified parts.

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
1		F00067600CP	CAUTION LABEL	1	
3		F00338F00AP	FUSE LABEL	1	
4		F10016H60APG	BASE	1	
5		F10084T00APS	RUBBER FOOT	4	
6		F10095X00SAP	CABINET BODY	1	SD78LS CWH
6		F10095X20SCP	CABINET BODY	1	ST77LS CWH, ST74LS CWH
6		F10095X20BCP	CABINET BODY	1	ST75LB CWH
6		F10095X20HCP	CABINET BODY	1	ST75LW CWH
7	⚠	F200ABX50SAP	OVEN (U)	1	
8		F2055BP20AP	COVER	1	
9		F2131BX50AP	PULLY SHAFT	1	
10		F2177-F80	WASHER	1	
11		F290DBX50AP	ROLLER RING (U)	1	
12	⚠	F30206G30CP	DOOR HOOK	1	
14		F31366G30CP	HOOK LEVER A	1	
15		F31376G30CP	HOOK LEVER B	1	
16		F31386G30CP	HOOK LEVER C	1	
17		F400ACV20AP	FAN MOTOR	1	AC120V,SINGLE PHASE,60Hz
18		F40084T00AP	FAN BLADE	1	
19		F4025CV20AP	AIR GUIDE A	1	
20		F40264T60APG	AIR GUIDE B	1	
21		F4144CV20AP	ORIFICE	1	
22		F6450CU00AP	SENSOR COVER B	1	
24		F6543CV20AP	SENSOR COVER C	1	
25		F607S4M00AP	STEAM SENSOR	1	
26		F612EBP20AP	LAMP (U)	1	LED LAMP INSIDE
27	⚠	J61415G10XN	MICRO SWITCH	1	(PRIMARY INTERLOCK SWITCH)
28	⚠	F61415U30XN	MICRO SWITCH	1	(SECONDARY INTERLOCK SWITCH)
29	⚠	F61456N60AP	THERMAL CUTOUT	1	150+10/-0°C OPEN, -20°C CLOSE
31	⚠	F61785U30XN	MICRO SWITCH	1	(INTERLOCK MONITOR SWITCH)
32	⚠	F606Y9X90AP	H.V.INVERTER (U)	1	
33		F6585CV20AP	INVERTER BRACKET	1	
34	⚠	2M261-M32JP	MAGNETRON	1	
35	⚠	F62308F20AP	FUSE	1	20A
37		F6326CV20AP	TURNTABLE MOTOR	1	
38	⚠	F900C5Y40CP	AC CORD W/PLUG	1	
39		F66626H60AP	GROUNDING PLATE	1	
40		XTWTN4+12T	SCREW	4	FOR MAGNETRON
41		XTWFA4+12D	SCREW	1	FOR CABINET BODY
42		XTTBFE4T10A0	SCREW	4	FOR CABINET BODY
43		XTT4+8RDN	SCREW	1	FOR CABINET BODY SIDE (EXCEPT ST75LB CWH)
43		XTTFA4+6BFZ	SCREW	1	FOR CABINET BODY SIDE (ST75LB CWH)
45		F607XBY70CP	NOISE FILTER	1	
47		F02448N40AP	CAUTION LABEL	1	
50		F00067C50CP	CAUTION LABEL	1	
57		F0334CK10CP	MENU LABEL	1	SD78LS CWH
57		F0334CK20CP	MENU LABEL	1	ST77LS CWH, ST74LS CWH, ST75LB CWH, ST75LW CWH
60		F0006CU00CW	CAUTION LABEL	1	

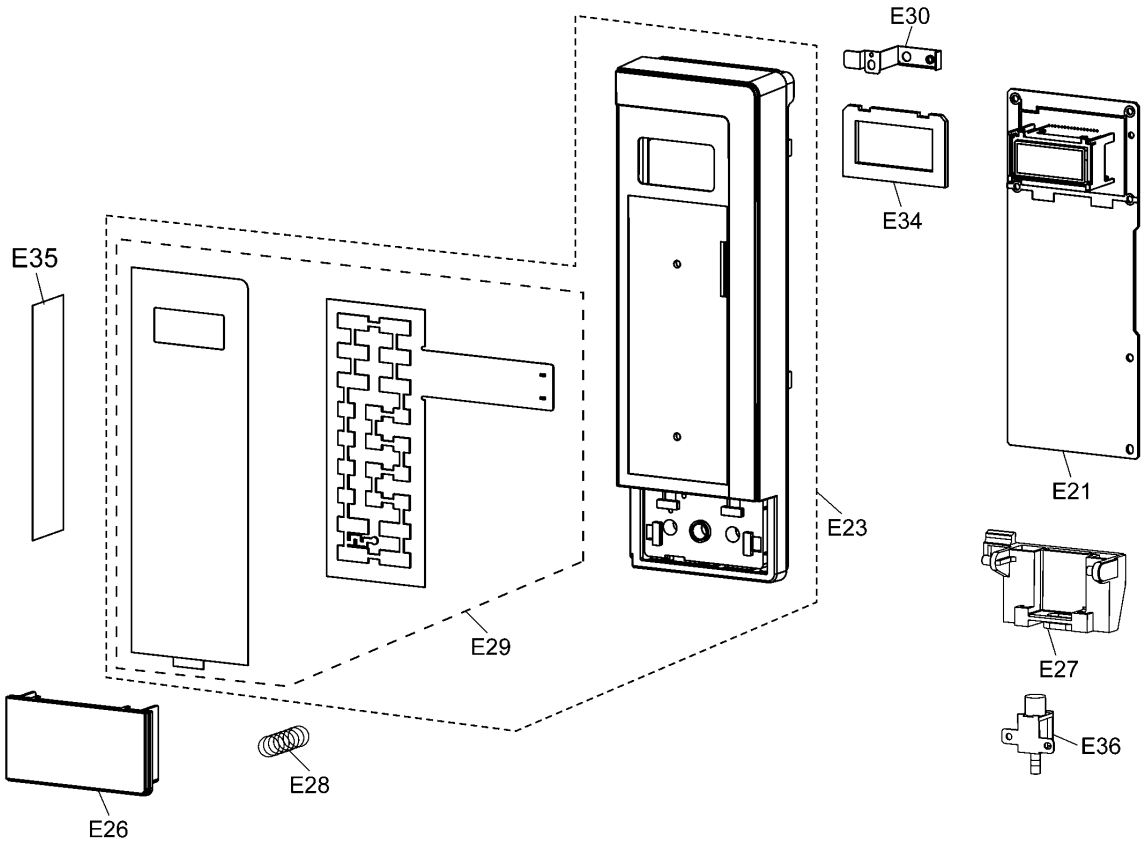
10.3. ESCUTCHEON BASE ASSEMBLY

10.3.1. NN-SD78LS CWH



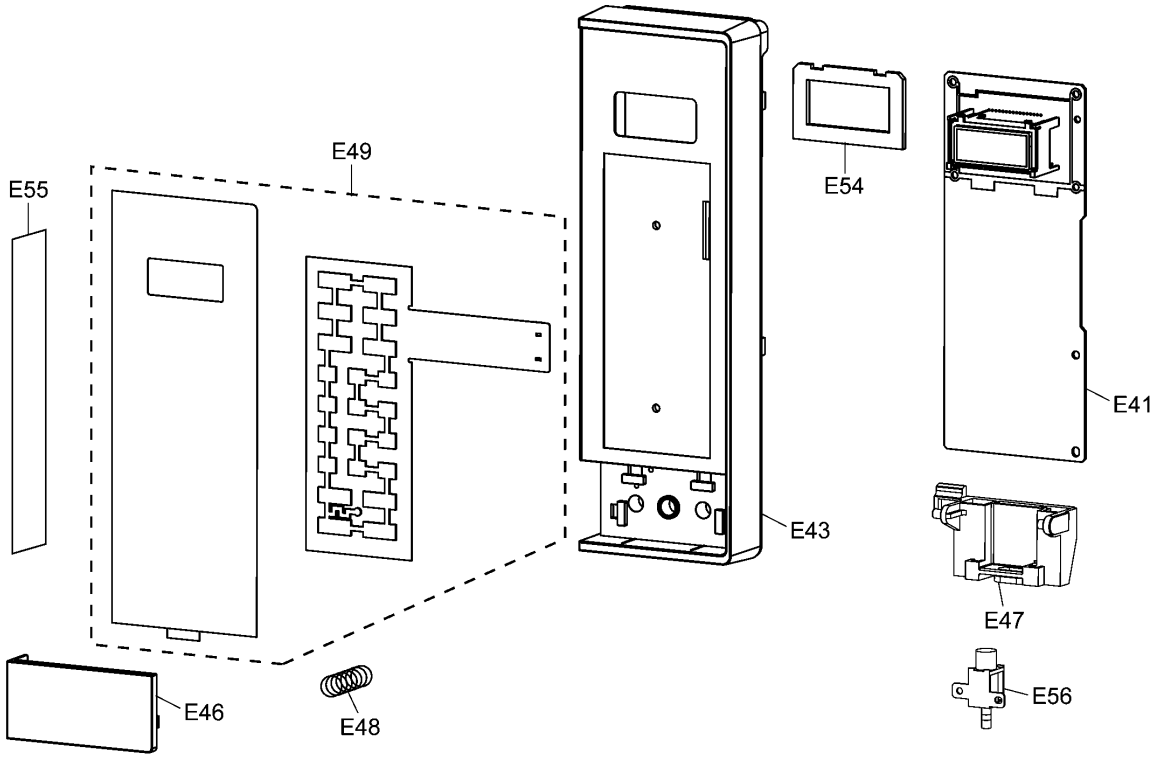
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
E1		F603LCW00CW	D.P.CIRCUIT (AU)	1	SD78LS CWH
E2		F605QCK10AP	D.P.CIRCUIT (FU)	1	SD78LS CWH
E3		F800LCW00SCP	ESCUTCHEON BASE (U)	1	SD78LS CWH
E4		F804NCK10SAP	START BUTTON (U)	1	SD78LS CWH
E6		F891PCK10SAP	DOOR OPENING BUTTON (U)	1	SD78LS CWH
E7		F8256CU70AP	DOOR OPENING LEVER	1	
E8		F80375K00AP	COOK BUTTON SPRING	1	
E10		F90098N00AP	GROUNDING PANEL	1	SD78LS CWH
E11		F8039CD00SBP	DIAL	1	SD78LS CWH
E13		F6616CK10AP	FLAT CABLE	1	SD78LS CWH
E14		F8284CA00QP	CHSHION RUBBER	1	
E15		F0007CW00SCW	NAME PLATE	1	SD78LS CWH
E16		F800FCU00AP	SOLENOID VALVE	1	

10.3.2. NN-ST77LS, ST74LS CWH



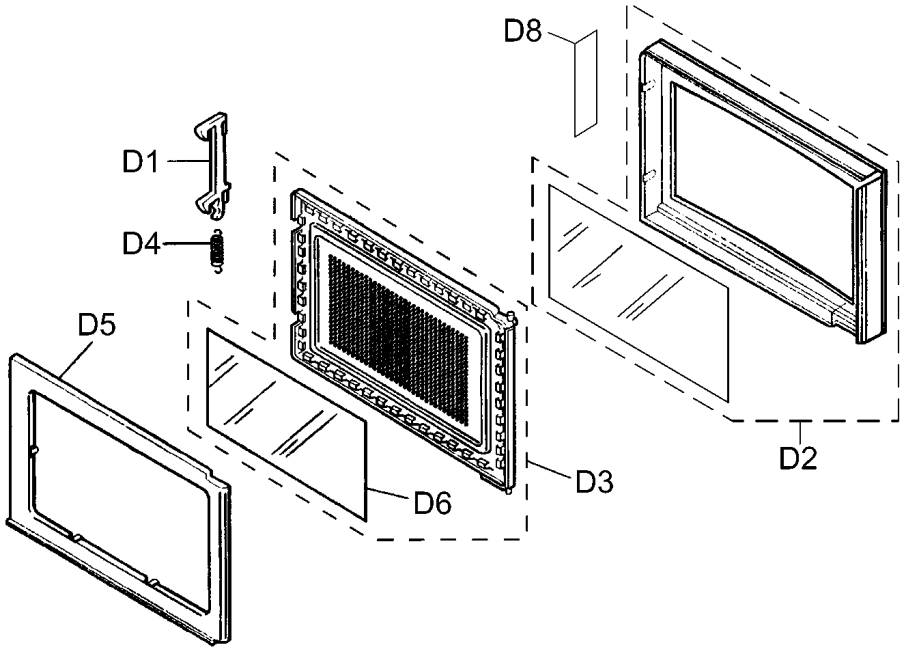
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
E21		F603LCW20CW	D.P.CIRCUIT (AU)	1	ST77LS CWH, ST74LS CWH
E23		F800LCW20SCW	ESCUTCHEON BASE (U)	1	ST77LS CWH
E23		F800LCW10SCW	ESCUTCHEON BASE (U)	1	ST74LS CWH
E26		F891PCK10SAP	DOOR OPENING BUTTON (U)	1	ST77LS CWH, ST74LS CWH
E27		F8256CU70AP	DOOR OPENING LEVER	1	
E28		F80375K00AP	COOK BUTTON SPRING	1	
E29		F630YCW20BCW	MEMBRANE SWITCH (U)	1	ST77LS CWH
E29		F630YCW10BCW	MEMBRANE SWITCH (U)	1	ST74LS CWH
E30		F90098N00AP	GROUNDING PANEL	1	ST77LS CWH, ST74LS CWH
E34		F8284CA00QP	CHSHION RUBBER	1	
E35		F0007CW20SCW	NAME PLATE	1	ST77LS CWH
E35		F0007CW10SCW	NAME PLATE	1	ST74LS CWH
E36		F800FCU00AP	MAGNETIC VALVE	1	

10.3.3. NN-ST75LB, ST75LW CWH



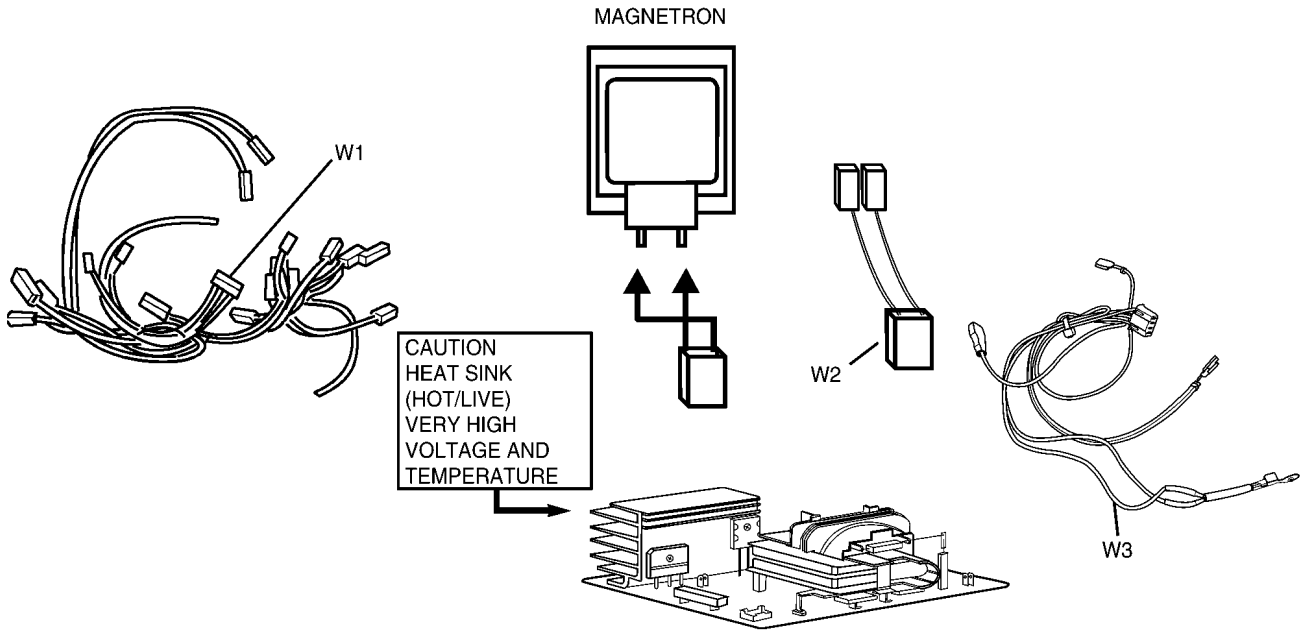
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
E41		F603LCU70CW	D.P.CIRCUIT (AU)	1	ST75LB CWH, ST75LW CWH
E43		F8034CK40BAP	ESCUTCHEON BASE	1	ST75LB CWH
E43		F8034CK40HAP	ESCUTCHEON BASE	1	ST75LW CWH
E46		F8072CK40BAP	DOOR OPENING BUTTON	1	ST75LB CWH
E46		F8072CK40HAP	DOOR OPENING BUTTON	1	ST75LW CWH
E47		F8256CU70AP	DOOR OPENING LEVER	1	
E48		F80375K00AP	COOK BUTTON SPRING	1	
E49		F630YCU70BCW	MEMBRANE SWITCH (U)	1	ST75LB CWH
E49		F630YCU70BCP	MEMBRANE SWITCH (U)	1	ST75LW CWH
E54		F8284CA00QP	CHSHION RUBBER	1	
E55		F0007CU70BCW	NAME PLATE	1	ST75LB CWH
E55		F0007CU70HCW	NAME PLATE	1	ST75LW CWH
E56		F800FCU00AP	SOLENOID VALVE	1	

10.4. DOOR ASSEMBLY



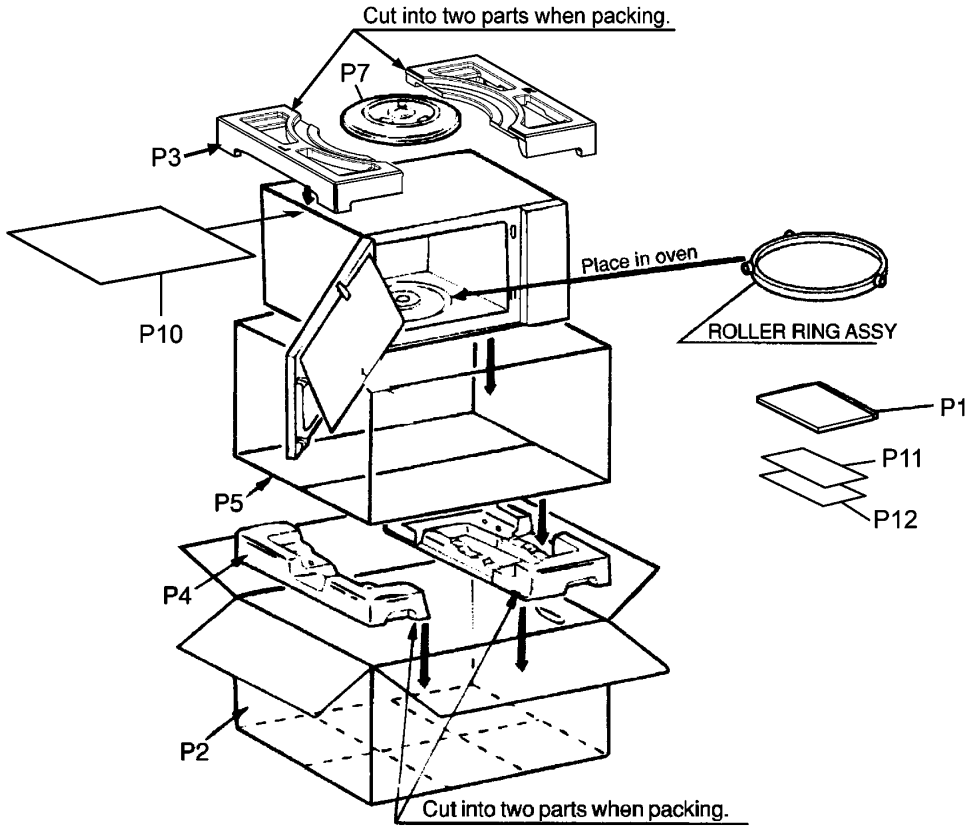
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
D1		F30186P40CP	DOOR KEY A	1	
D2	⚠	F301ACK10SAP	DOOR A (U)	1	SD78LS CWH
D2	⚠	F301ACK20SCP	DOOR A (U)	1	ST77LS CWH
D2	⚠	F301ACK20SAP	DOOR A (U)	1	ST74LS CWH
D2	⚠	F302ACK40BCP	DOOR A (U)	1	ST75LB CWH
D2	⚠	F302ACK40HCP	DOOR A (U)	1	ST75LW CWH
D3	⚠	F302KBK00AP	DOOR E (U)	1	SD78LS CWH, ST77LS CWH, ST74LS CWH
D3	⚠	F302KBF20AP	DOOR E (U)	1	ST75LB CWH, ST75LW CWH
D4		F30216P40AG	DOOR KEY SPRING	1	
D5	⚠	F3085BF20AP	DOOR C	1	
D6	⚠	F31454W00AP	DOOR SCREEN A	1	
D8		F04114180CP	HC LABEL	1	

10.5. WIRING MATERIALS



Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
W1		F030ABP40CP	LEAD WIRE HARNESS	1	
W2		F030EBY70CP	H.V.LEAD WIRE	1	
W3		F0353CU80AP	LEAD WIRE HARNESS U	1	(INCLUDING MAGNETRON THERMISTOR)

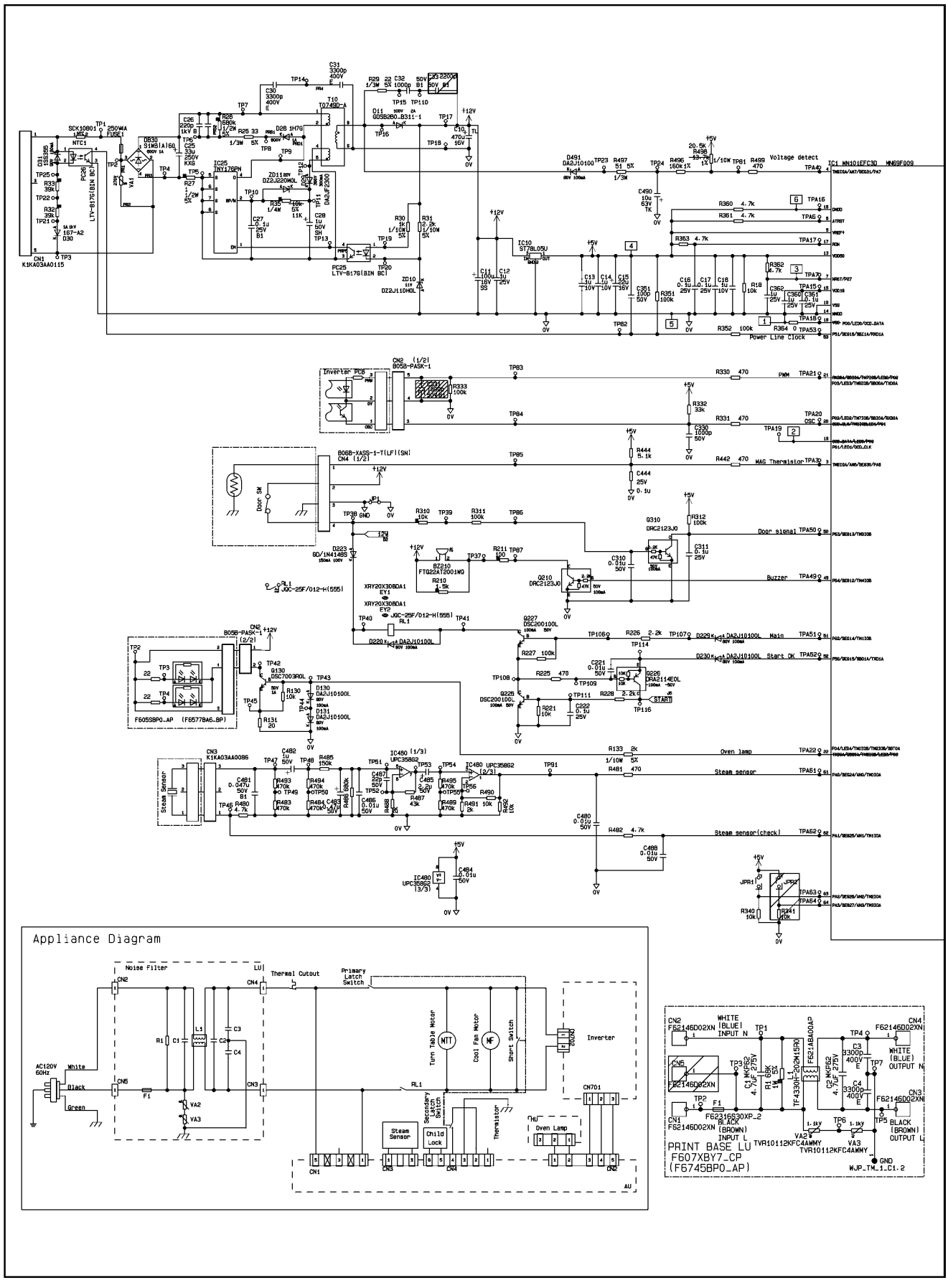
10.6. PACKING AND ACCESSORIES

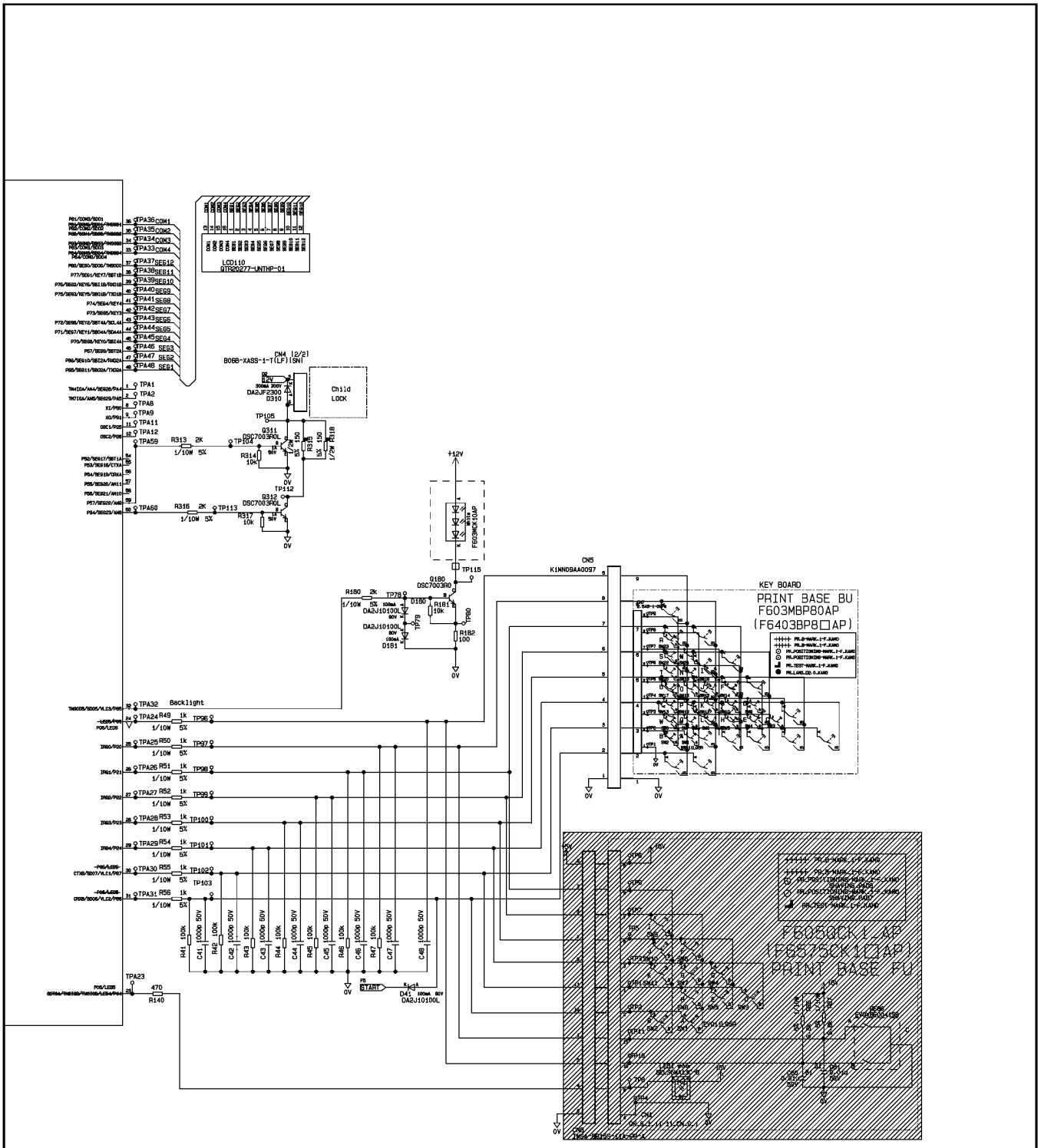


Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
P1		F0003CW00CW	OWNER'S MANUAL	1	SD78LS CWH
P1		F0003CW10CW	OWNER'S MANUAL	1	ST77LS CWH, ST74LS CWH, ST75LB CWH, ST75LW CWH
P2		F0102CW00SCW	PACKING CASE,PAPER	1	SD78LS CWH
P2		F0102CW20SCW	PACKING CASE,PAPER	1	ST77LS CWH
P2		F0102CW10SCW	PACKING CASE,PAPER	1	ST74LS CWH
P2		F0102CU70BCW	PACKING CASE,PAPER	1	ST75LB CWH
P2		F0102CU70HCW	PACKING CASE,PAPER	1	ST75LW CWH
P3		F0104BP80AP	UPPER FILLER	1	
P4		F0105BP80AP	LOWER FILLER	1	
P5		F01067C50AP	P.E.BAG	1	
P7		F06014W00AP	COOKING TRAY	1	
P10		F01924U00AP	SHEET	1	
P11		F0445CW00SCW	OVERLAY	1	SD78LS CWH
P11		F0445CW20SCW	OVERLAY	1	ST77LS CWH
P11		F0445CW10SCW	OVERLAY	1	ST74LS CWH
P11		F0445CU70BCW	OVERLAY	1	ST75LB CWH
P11		F0445CU70HCW	OVERLAY	1	ST75LW CWH
P12		F04317D00CP	INSTALLATION NOTICE	1	

11 DIGITAL PROGRAMMER CIRCUIT

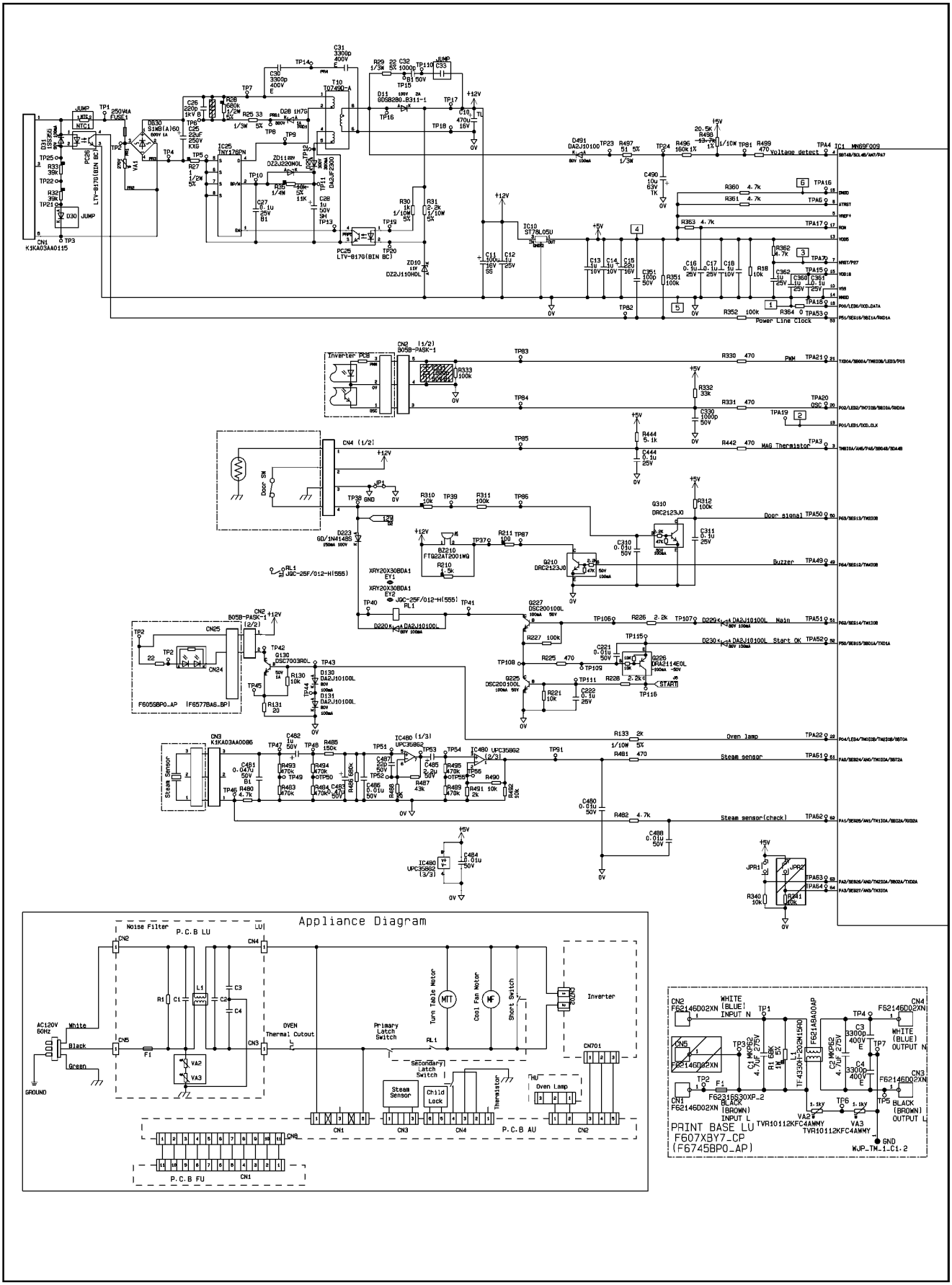
11.1. SCHEMATIC DIAGRAM (NN-ST77LS/ST74LS CWH)

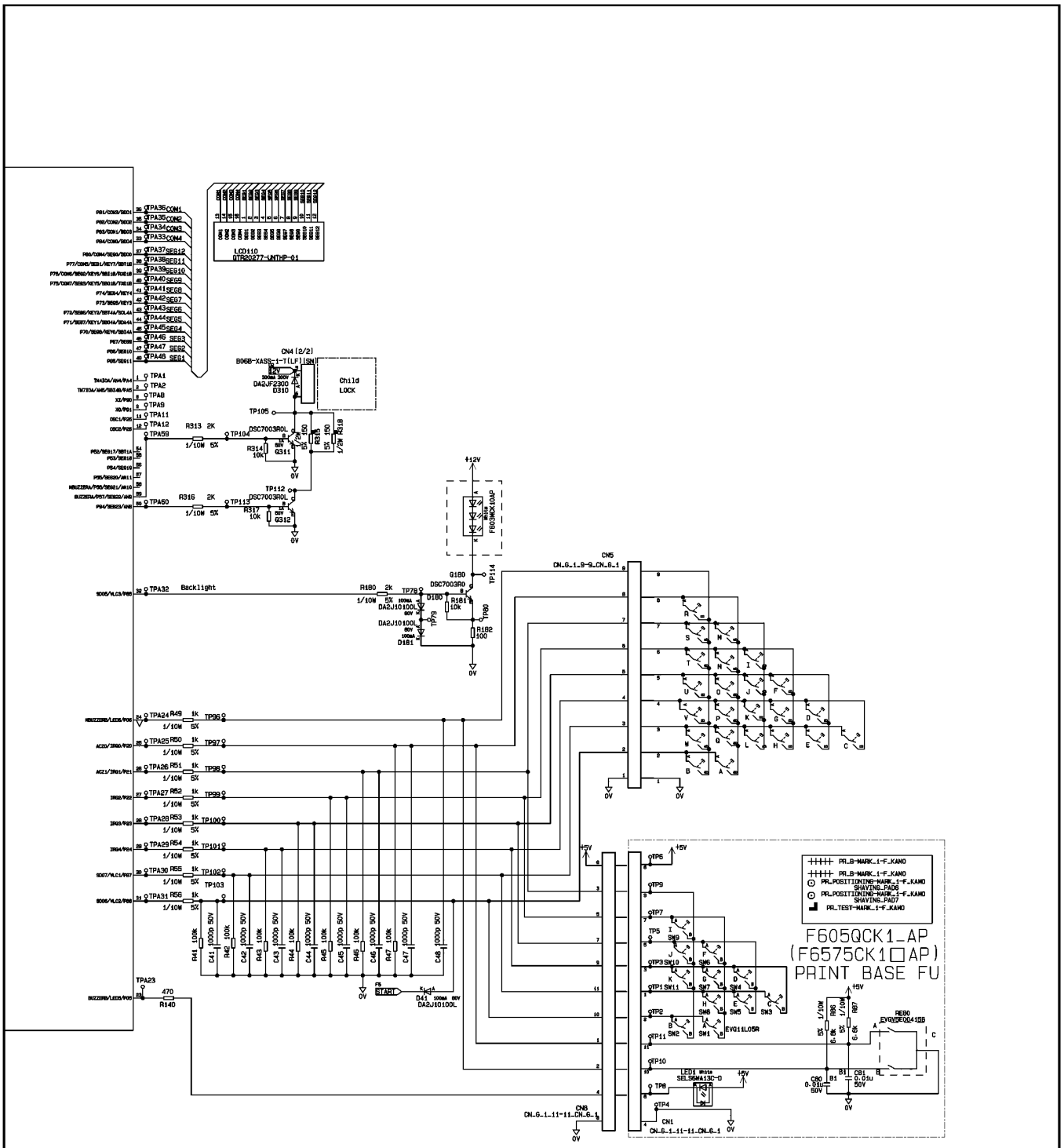




Model No.	P.C.B AU	JPR1	P.C.B LU
NN-SN76LSATH	F603LCW20AT	10K	F607XBY60AP
NN-ST77LSCWH	F603LCW20CW	Open	F607XBY70CP
NN-ST74LSCWH			

11.2. SCHEMATIC DIAGRAM (NN-SD78LS/ST75LB/ST75LW CWH)





Model No.	P.C.B AU	JPR1	P.C.B LU	P.C.B FU	MCU IC1
NN-SD78LSATH	F603LCW00AT	Short	F607X9S00CP	F605QCK10AP (Button)	MNCW0F50ADR
NN-SD77PSATH					
NN-SD78LSCWH	F603LCW00CW	Open	F607XBY70CP		
NN-SN75LBATH	F603LCU70AT	10K	F607X9S00CP (No VA2/VA3)	——— (Touch)	MNCU7F50ADS
NN-SN75LWATH					
NN-SN74PBATH					
NN-SN74PWATH					
NN-ST75LBCWH	F603LCU70CW	Open	F607XBY70CP (With VA2/VA3)		
NN-ST75LWCWH					

11.3. PARTS LIST

11.3.1. NN-SD78LS CWH

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
BZ210		L0DDEA000014	BUZZER	1	2.0KHz
LCD110		L5AYBYY00112	LCD	1	
DISP HOLDER		F6617BP80AP	LCD HOLDER	1	
		F6752BP80AP	DIFFUSION SHEET	1	
VA1		D4EAY2710001	VARISTOR	1	270V
IC1		MNCW0F50ADR	L.S.I.	1	
IC10		C0DBGYY05981	IC	1	VOLTAGE-STABILIZED
IC25		C0DAZYY00046	IC	1	
IC480		C0ABBA000230	IC	1	
PC25,PC26		B3PAA0000751	IC	2	
RL1		K6B1AYY00129	POWER RELAY	1	
T10		G4DYA0000894	SWITCH POWER SUPPLY	1	120V
RE80		K9AA015Y0131	REVOLVING ENCODER	1	
SW1-SW11		K0H1BA000691	SWITCH	11	
FUSE1		K5G402YA0159	FUSE	1	4A,250V

11.3.2. NN-ST77LS/ST74LS CWH

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
BZ210		L0DDEA000014	BUZZER	1	2.0KHz
LCD110		L5AYBYY00112	LCD	1	
DISP HOLDER		F6617BP80AP	LCD HOLDER	1	
		F6752BP80AP	DIFFUSION SHEET	1	
VA1		D4EAY2710001	VARISTOR	1	270V
IC1		MNCU7F50ADS	L.S.I.	1	
IC10		C0DBGYY05981	IC	1	VOLTAGE-STABILIZED
IC25		C0DAZYY00046	IC	1	
IC480		C0ABBA000230	IC	1	
PC25,PC26		B3PAA0000751	IC	2	
RL1		K6B1AYY00129	POWER RELAY	1	
T10		G4DYA0000894	SWITCH POWER SUPPLY	1	120V
FUSE1		K5G402YA0159	FUSE	1	4A,250V

11.3.3. NN-ST75LB/ST75LW CWH

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
BZ210		L0DDEA000014	BUZZER	1	2.0KHz
LCD110		L5AYBYY00112	LCD	1	
DISP HOLDER		F6617BP80AP	LCD HOLDER	1	
		F6752BP80AP	DIFFUSION SHEET	1	
VA1		D4EAY2710001	VARISTOR	1	270V
IC1		MNCU7F50ADS	L.S.I.	1	
IC10		C0DBGYY05981	IC	1	VOLTAGE-STABILIZED
IC25		BPA8616P	IC	1	
IC480		C0ABBA000230	IC	1	
PC25,PC26		B3PAA0000751	IC	2	
RL1		K6B1AYY00129	POWER RELAY	1	
T10		G4DYA0000894	SWITCH POWER SUPPLY	1	120V
FUSE1		K5G402YA0159	FUSE	1	4A,250V

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S-CU7,S-CW0
S-CW1,S-CW2
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