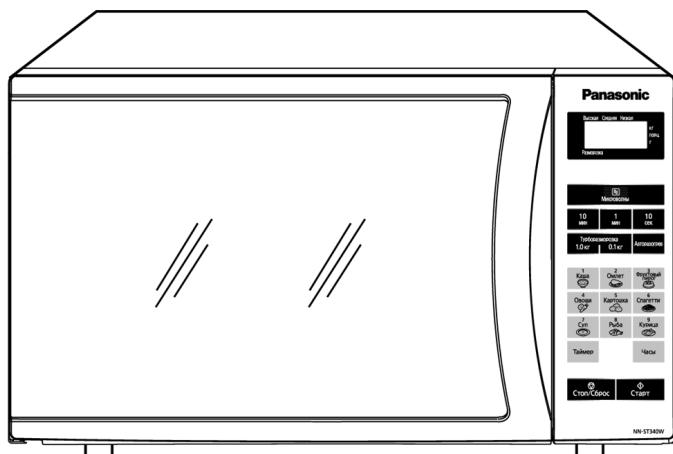


Service Manual

Microwave Oven



NN-ST340W NN-SM330W

KTE(UAE)

PTE(Iran)

KPQ(Kuwait, Doha, Qatar, Oman, Bahrain, Pakistan)

STM(Saudi Arabia)

ZPE (CIS Countries)

Specifications:

Model:	NN-ST340W	NN-SM330W
Specifications:		
Power Source:	230V-240V AC Single Phase, 50Hz ----- for KPQ model 220V AC Single Phase, 50Hz ----- for KTE, PTE, ZPE models 220V AC Single Phase, 50Hz/60Hz ----- for STM model	
Power Consumption:	1275W (KTE, PTE, ZPE) 1300W (KPQ) 1250W (STM, 50Hz) 1725W (STM, 60Hz)	1125W
Output:	800W	700W
Microwave Frequency:	2450MHz	
Timer:	ST340W: 30 Min. / Stage (HIGH Power Level) ~ 3 Stage Maximum 99 Min. 50 Sec. / Stage (Other Power Level) ~ 3 Stage Maximum SM330W: 30 Min.	
Outside Dimensions:	488mm(W) x 279mm(H) x 405mm(D)	
Oven Cavity Dimensions:	315mm(W) x 206mm(H) x 353mm(D)	
Net Weight:	12.5 kg	11.5 kg
PbF	This product with PbF	
Specifications subject to change without notice.		

WARNING

This service information 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 information by anyone else could result in serious injury or death.

WARNING

1. This product should be serviced only by trained, qualified personnel.
2. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage."
3. If the unit cannot be repaired on site, advise the customer not to use until unit is repaired.
4. 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 be replaced only with the manufacture's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the original design.

This service manual covers products for following markets.

When troubleshooting or replacing parts, please refer to the country/area identifications shown below for your applicable product specification.

KTE For UAE

PTE For Iran

KPQ For Kuwait, Doha, Qatar, Oman, Bahrain, Pakistan

STM For Saudi Arabia

ZPE For CIS Countries

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).

CONTENTS

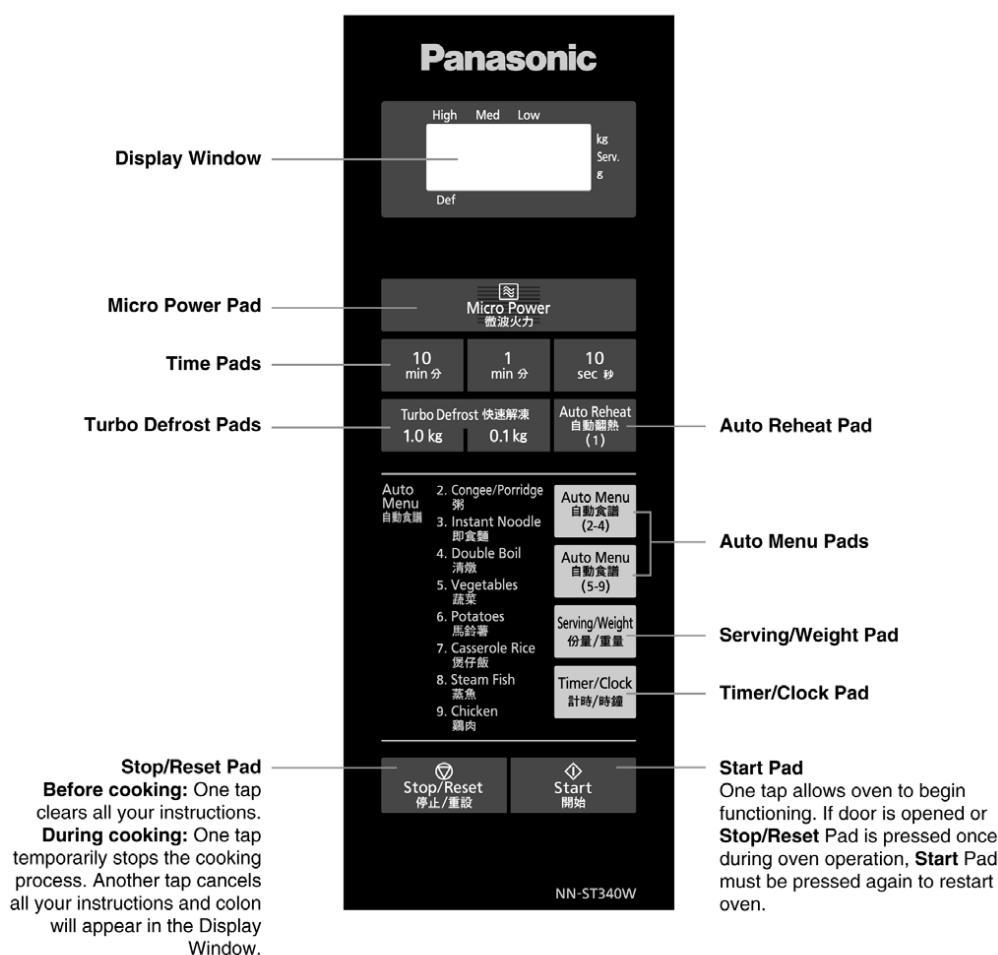
	Page		Page
1 FEATURE CHART	4	6.5. Door assembly	15
2 CONTROL PANEL	4	6.6. Turntable motor	17
2.1. NN-ST340W	4	7 COMPONENT TEST PROCEDURE	18
2.2. NN-SM330W	5	7.1. Primary, Secondary Latch Switch Interlocks	18
3 SCHEMATIC DIAGRAM	6	7.2. Short Switch & Monitor	18
3.1. NN-ST340W KTE/PTE/KPQ	6	7.3. High voltage transformer	18
3.2. NN-ST340W STM	7	7.4. High voltage capacitor	18
3.3. NN-ST340W ZPE	8	7.5. Magnetron	18
3.4. NN-SM330W KTE/PTE/KPQ	9	7.6. Diode	19
3.5. NN-SM330W ZPE	10	7.7. Variable power controller (NN-SM330W)	19
4 DESCRIPTION OF OPERATING SEQUENCE	11	7.8. Membrane keyboard (Membrane switch assembly) (NN-ST340W)	19
4.1. Variable power cooking control (NN-SM330W)	11	8 MEASUREMENTS AND ADJUSTMENTS	20
4.2. Variable power cooking control (NN-ST340W)	11	8.1. Adjustment of Primary latch switch, Secondary latch switch and Short switch.	20
4.3. Turbo Defrost, Auto Reheat, Auto Cook control (NN-ST340W)	11	8.2. Measurement of microwave output	20
5 CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING	12	9 TROUBLESHOOTING GUIDE	21
5.1. Check the grounding	12	9.1. NN-ST340W	21
5.2. Warning about the electric charge in the high voltage capacitor	12	9.2. NN-SM330W	23
5.3. Part replacement.	12	9.3. Trouble related to Digital Programmer Circuit (NN-ST340W)	24
5.4. When the 10 Amp fuse is blown due to the malfunction of the short switch:	12	9.4. How to check the semiconductors using an OHM meter	24
5.5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.	12	10 EXPLODED VIEW AND PARTS LIST	25
5.6. Verification after repair	12	10.1. EXPLODED VIEW	25
6 DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE	13	10.2. PARTS LIST	26
6.1. Magnetron	13	10.3. ESCUTCHEON BASE ASSEMBLY	28
6.2. Digital programmer circuit (D.P.C) & Membrane switch (NN-ST340W)	13	10.4. DOOR ASSEMBLY	30
6.3. Low voltage transformer and/or power relays (RY1) (NN-ST340W)	14	10.5. WIRING MATERIALS	31
6.4. Fan motor	15	10.6. PACKING AND ACCESSORIES	32
		11 DIGITAL PROGRAMMER CIRCUIT	33
		11.1. SCHEMATIC DIAGRAM (NN-ST340W)	33
		11.2. PARTS LIST (NN-ST340W)	35

1 FEATURE CHART

MODEL	NN-ST340W	NN-SM330W
FEATURE		
3 Stage Cooking	○	—
Microwave	○	○
Auto Weight Cook	○	—
Auto Weight Turbo Defrost	○	—
Timer	○	—
Clock	○	—
Child Safety Lock	○	—
Variable Power Control	—	○

2 CONTROL PANEL

2.1. NN-ST340W



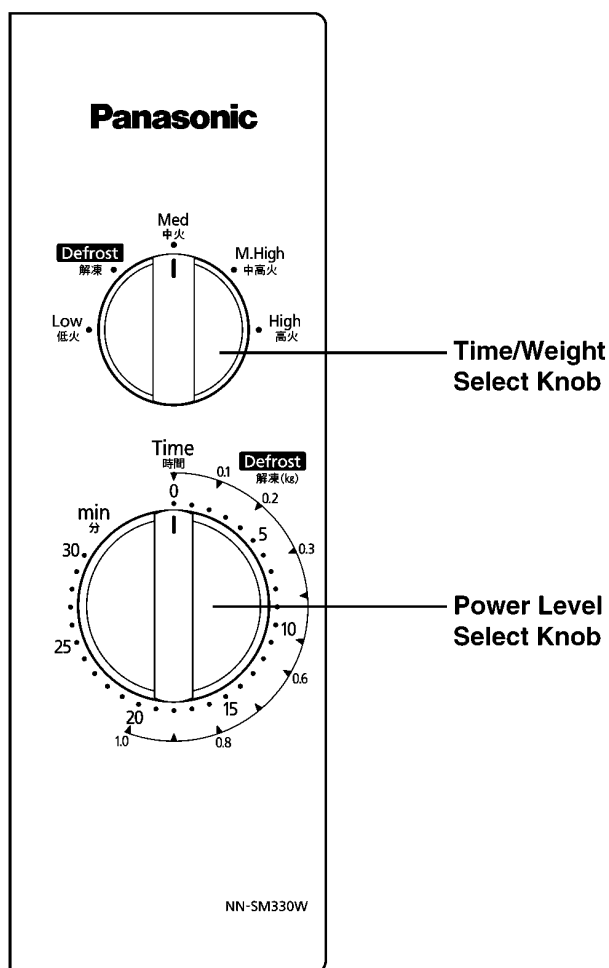
Beep Sound:

When a pad is pressed correctly, a beep will be heard. If a pad is pressed and no beep is heard, the unit did not or cannot accept the instruction. The oven will beep twice between programmed stages. At the end of any complete program, the oven will beep 5 times.

Note:

If no operation after cooking program setting, 6 minutes later, the oven will automatically cancel the cooking program. The display will return to clock or colon display.

2.2. NN-SM330W

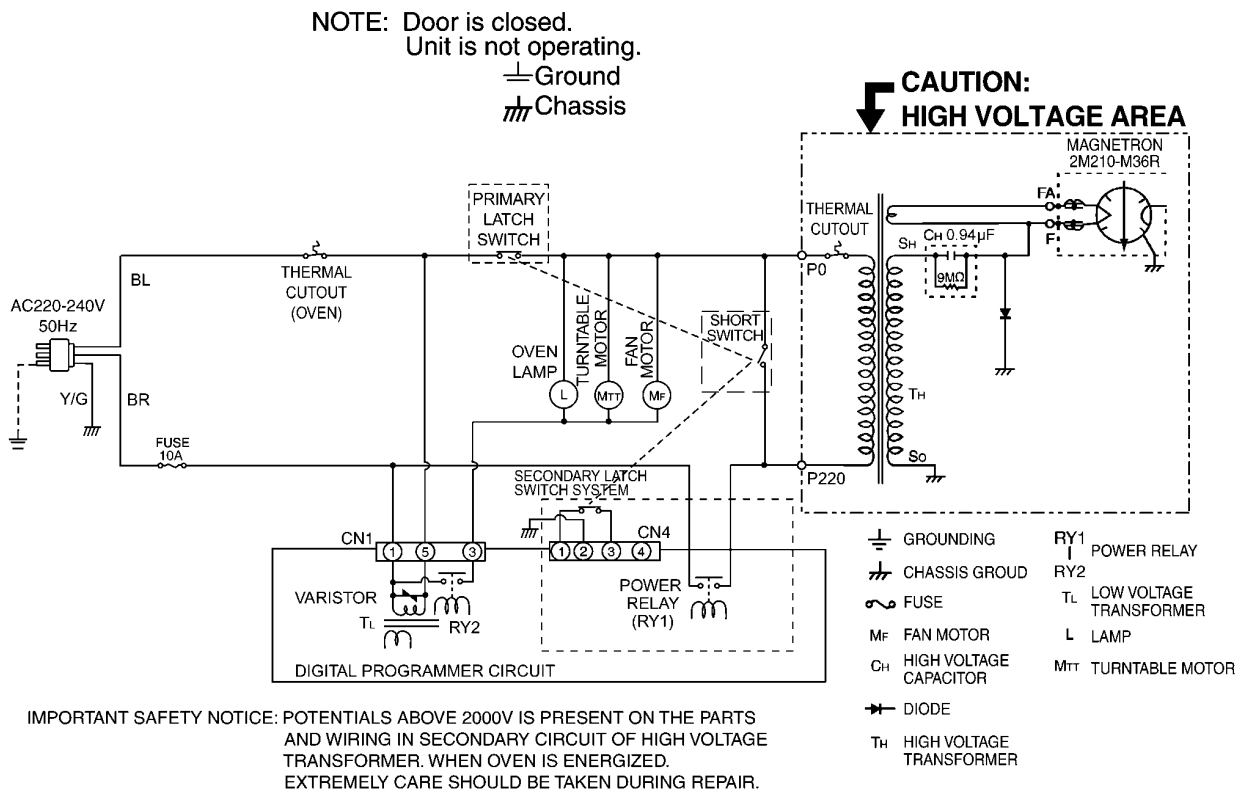


Pull Door Handle:

Pull to open the door. Opening the door during cooking will stop the cooking process without cancelling the program. Cooking resumes as soon as the door is closed. The oven light will turn on and stay on whenever the door is opened. It is quite safe to open the door at any time during a cooking program and there is no risk of microwave exposure.

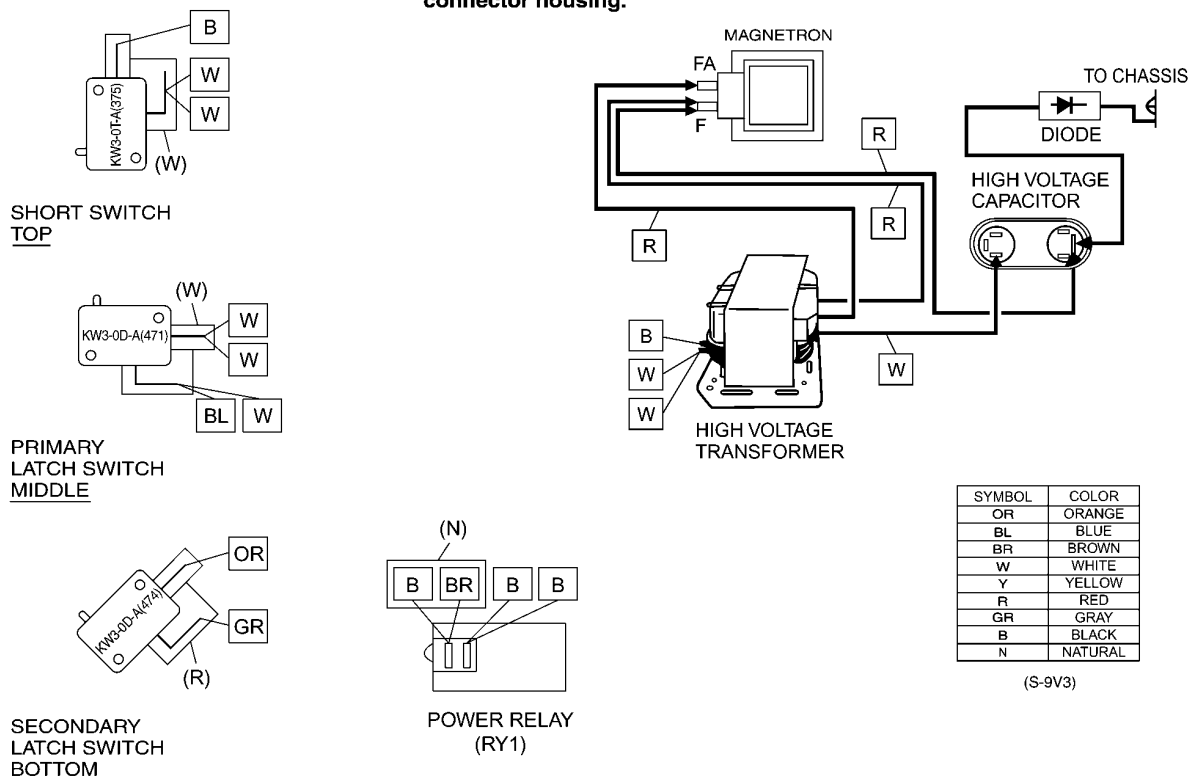
3 SCHEMATIC DIAGRAM

3.1. NN-ST340W KTE/PTE/KPQ



WIRING DIAGRAM

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

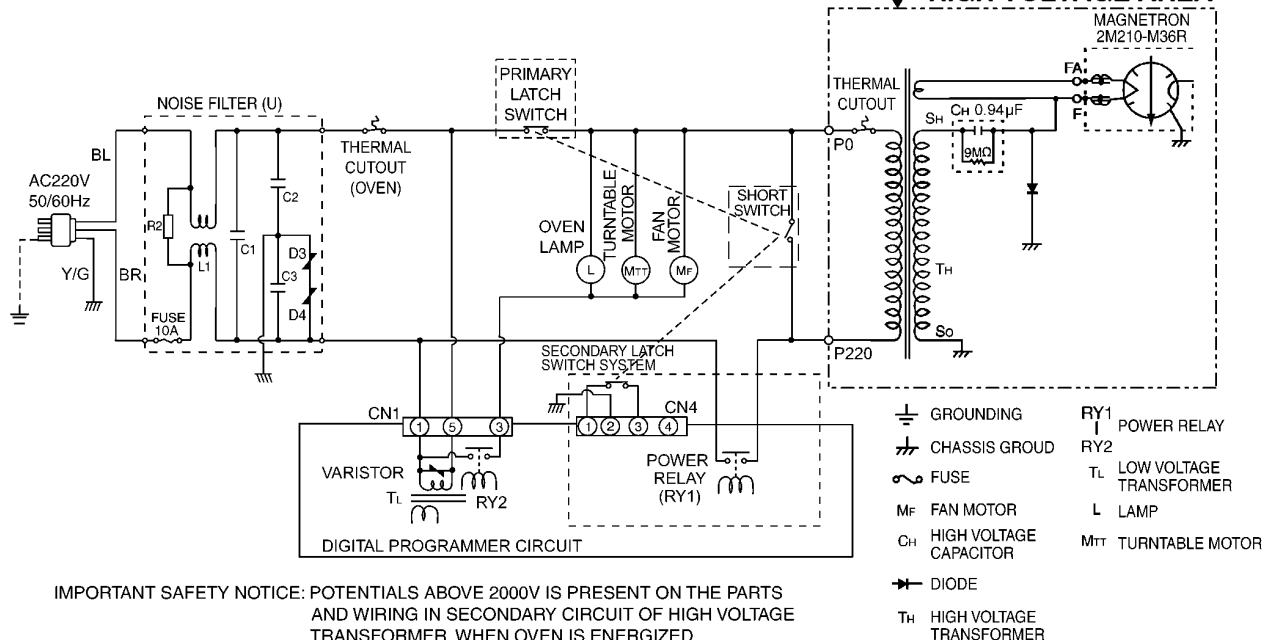


3.2. NN-ST340W STM

NOTE: Door is closed.
Unit is not operating.

⏏ Ground
⏏ Chassis

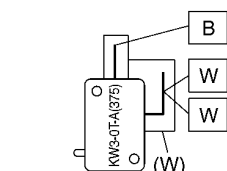
CAUTION:
HIGH VOLTAGE AREA



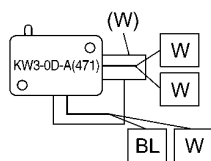
IMPORTANT SAFETY NOTICE: POTENTIALS ABOVE 2000V IS PRESENT ON THE PARTS AND WIRING IN SECONDARY CIRCUIT OF HIGH VOLTAGE TRANSFORMER. WHEN OVEN IS ENERGIZED. EXTREMELY CARE SHOULD BE TAKEN DURING REPAIR.

WIRING DIAGRAM

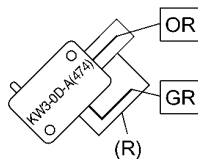
NOTE: *When replacing, check the lead wire color as shown.
*Colors shown by () indicate colors of lead wire connector housing.



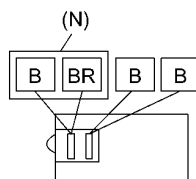
SHORT SWITCH
TOP



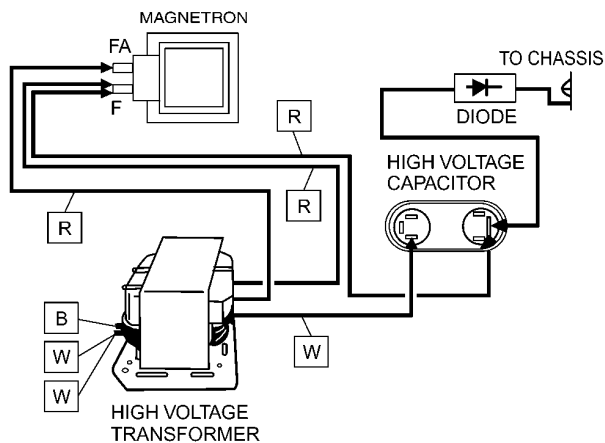
PRIMARY
LATCH SWITCH
MIDDLE



SECONDARY
LATCH SWITCH
BOTTOM



POWER RELAY
(RY1)



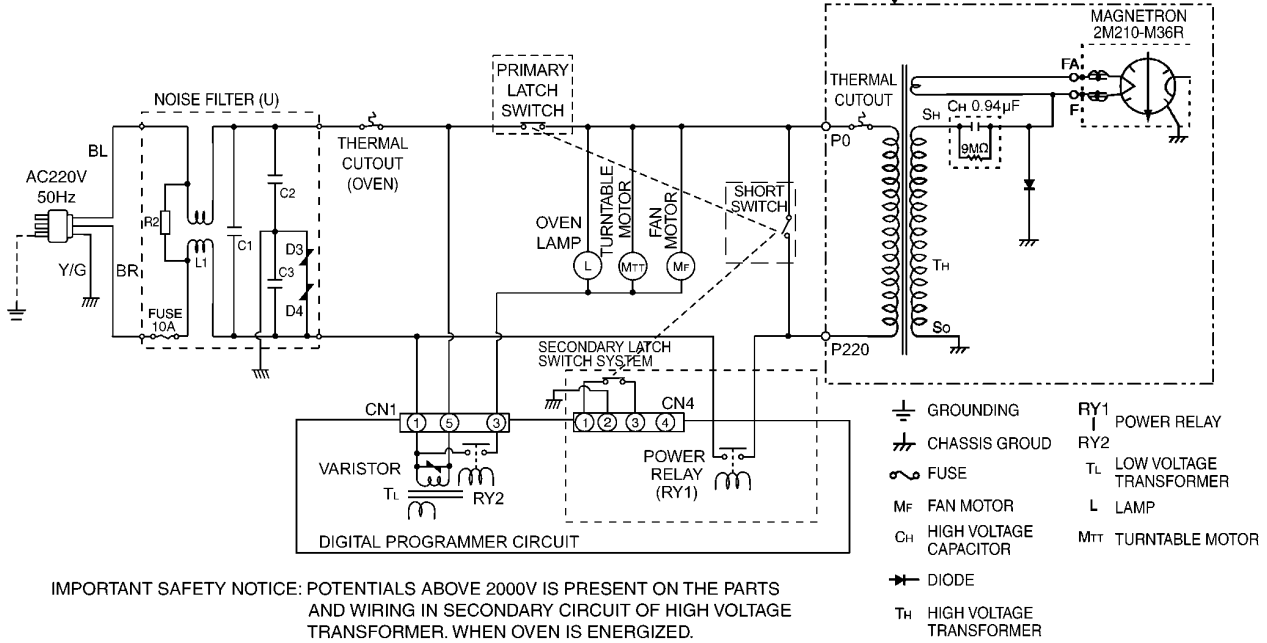
SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK
N	NATURAL

(S-9V3)

3.3. NN-ST340W ZPE

NOTE: Door is closed.
Unit is not operating.
⊥ Ground
≡ Chassis

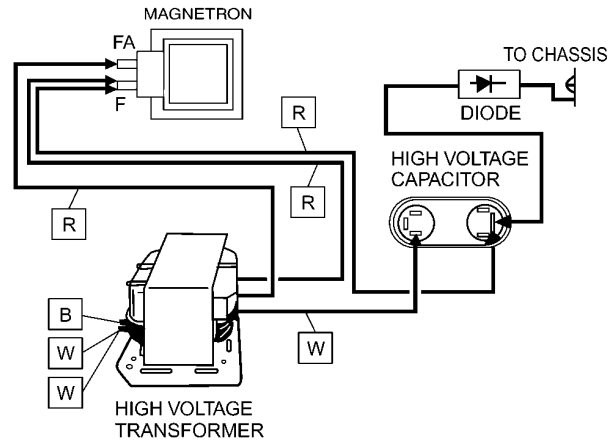
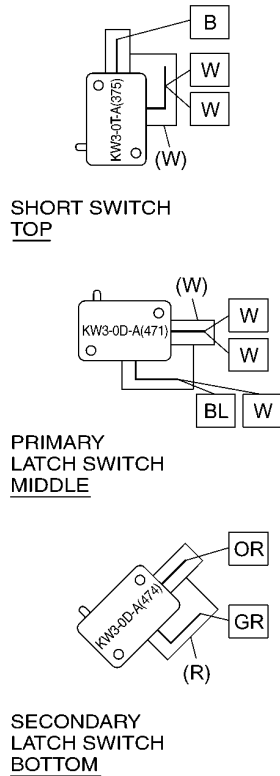
CAUTION:
HIGH VOLTAGE AREA



IMPORTANT SAFETY NOTICE: POTENTIALS ABOVE 2000V IS PRESENT ON THE PARTS AND WIRING IN SECONDARY CIRCUIT OF HIGH VOLTAGE TRANSFORMER. WHEN OVEN IS ENERGIZED. EXTREMELY CARE SHOULD BE TAKEN DURING REPAIR.

WIRING DIAGRAM

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



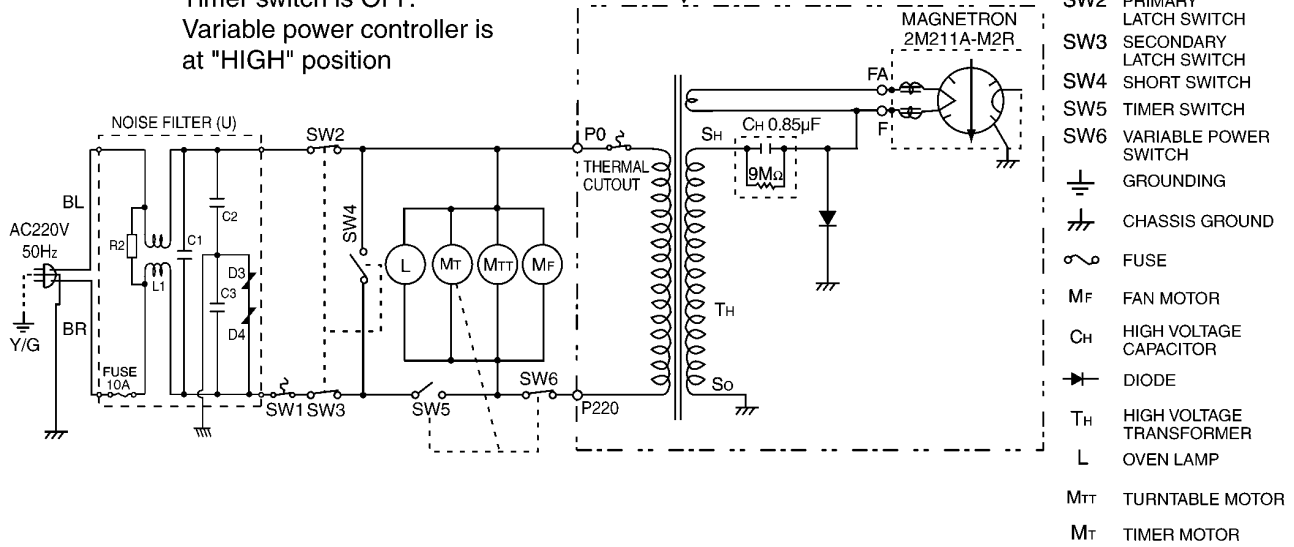
SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK
N	NATURAL

(S-9V3)

3.5. NN-SM330W ZPE

NOTE: Door is closed.
Timer switch is OFF.
Variable power controller is at "HIGH" position

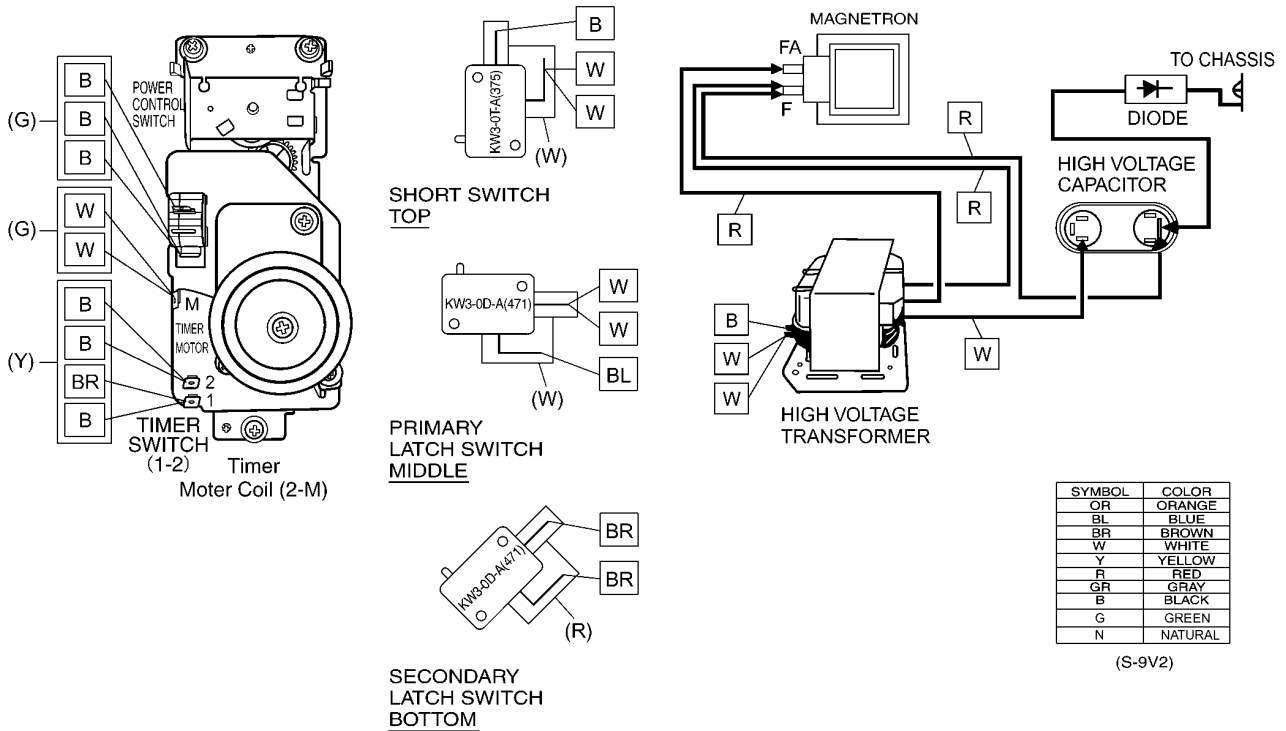
CAUTION:
HIGH VOLTAGE AREA



IMPORTANT SAFETY NOTICE: POTENTIALS ABOVE 2000V IS PRESENT ON THE PARTS AND WIRING IN SECONDARY CIRCUIT OF HIGH VOLTAGE TRANSFORMER. WHEN OVEN IS ENERGIZED. EXTREMELY CARE SHOULD BE TAKEN DURING REPAIR.

WIRING DIAGRAM

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



4 DESCRIPTION OF OPERATING SEQUENCE

4.1. Variable power cooking control (NN-SM330W)

The vari-power controller controls the ON-OFF time of the vari-power switch to vary the output power of the microwave oven from "Low" to "High". The vari-power controller is a part of the timer assembly. The timer assembly consists of timer motor, timer switch, vari-power switch and the combination of gears, cam and actuator level.

One complete cycle of the vari-power controller is 30 seconds, in which the vari-power switch is turned "ON" or "OFF" by the cam rotation in the 30 ± 2 second period.

By controlling the timing of the vari-power switch "ON" period, the 220 or 240V AC supplied to the high voltage transformer is interrupted intermittently so that the average output power of the microwave oven is varied.

Table shows the timing chart of vari-power switch operation in response to the power setting on the control panel.

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.	ON-OFF TIME OF POWER RELAY B (RY1)	
		ON(SEC)	OFF(SEC)
HIGH	100%	30	0
MEDIUM-HIGH	80%	23.2	6.8
MEDIUM	55%	16.5	13.5
DEFROST	35%	9.8	20.2
LOW	15%	5	25

4.2. Variable power cooking control (NN-ST340W)

The coil of power relay B (RY1) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay B contacts in order to vary the output power of the microwave oven from "Low" to "High" power. One complete ON and OFF cycle of power relay B is 22 seconds. The relation between indications on the control panel and the output of the microwave oven is as shown in table.

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.

50Hz Power Source

POWER SETTING	OUTPUT POWER(%) APPROX.	ON-OFF TIME OF POWER RELAY B (RY1)	
		ON(SEC)	OFF(SEC)
HIGH	100%	22	0
MEDIUM-HIGH	70%	17	5
MEDIUM	50%	13	9
DEFROST	30%	8	14
LOW	15%	5	17

60Hz Power Source

POWER SETTING	OUTPUT POWER(%) APPROX.	ON-OFF TIME OF POWER RELAY B (RY1)	
		ON(SEC)	OFF(SEC)
HIGH	100%	17	5
MEDIUM-HIGH	70%	13	9
MEDIUM	50%	10	12
DEFROST	30%	6	16
LOW	15%	4	18

4.3. Turbo Defrost, Auto Reheat, Auto Cook control (NN-ST340W)

When those Auto Control feature is selected and the Start Pad is tapped:

1. The digital programmer 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 or weight by categories.

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

Turbo Defrost

WEIGHT SELECTED	COOKING TIME
1.0KG	14 min.30 sec.

Auto Reheat

WEIGHT SELECTED	COOKING TIME
200g	2 min.00 sec.

Auto Cook

CATEGORY	WEIGHT SELECTED	COOKING TIME
Vegetables	250g	4 min.00 sec.

5 CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

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

⚠ CAUTION

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

5.1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be grounded when used. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

5.2. Warning about the electric charge in the high voltage capacitor

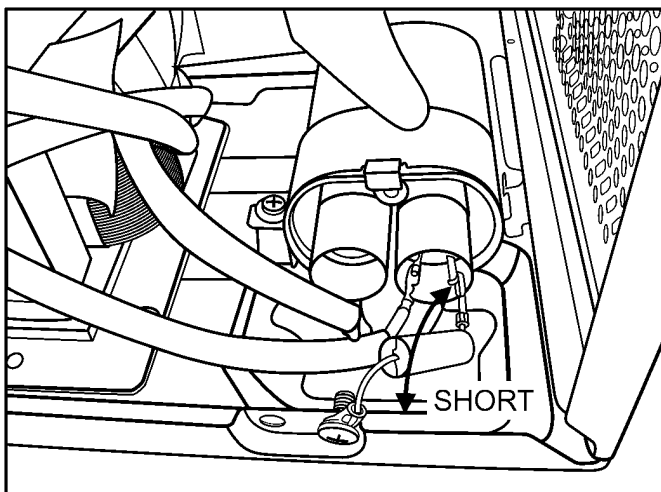
For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor. When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver to discharge. Please be sure to contact the chassis ground side first and then short to the output terminal.

⚠ WARNING

There is high voltage present with high current capabilities in the circuits of the primary and secondary winding and filament winding of the high voltage transformer. 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 filament voltage of the magnetron.

⚠ WARNING

Never touch any circuit wiring with your hand nor with an insulated tool during operation.



Contact chassis side first then short to the high voltage capacitor terminal.

5.3. Part replacement.

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

5.4. When the 10 Amp fuse is blown due to the malfunction of the short switch:

⚠ WARNING

When the 10 Amp fuse is blown due to malfunction of the short switch, replace all of the components (Primary latch switch, Secondary latch switch, Short switch).

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 mounting tabs are not bent, broken or deficient in their ability to hold the switches.

5.5. 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.

5.6. Verification after repair

1. After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor 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.

⚠ CAUTION OF

MICROWAVE RADIATION OF LEAKAGE

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

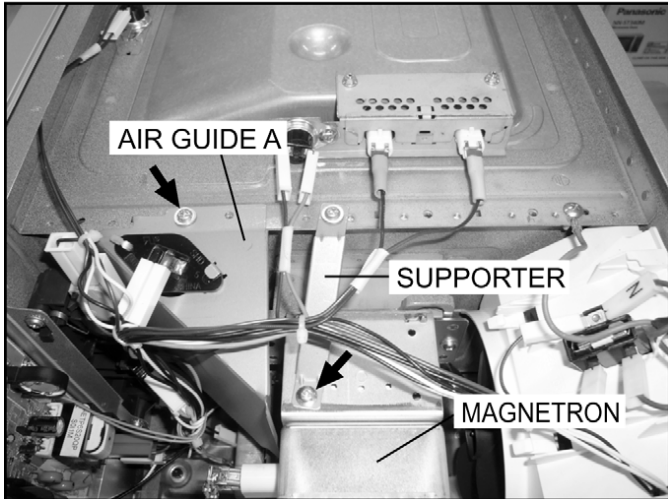
⚠ IMPORTANT NOTICE

1. The following components have potentials above 2000V while the appliance is operated.
 - * Magnetron
 - * High voltage transformer
 - * High voltage diode
 - * High voltage capacitor
 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/cm². After repair or exchange, it is very important to check if the magnetron and the door hinges are correctly installed.

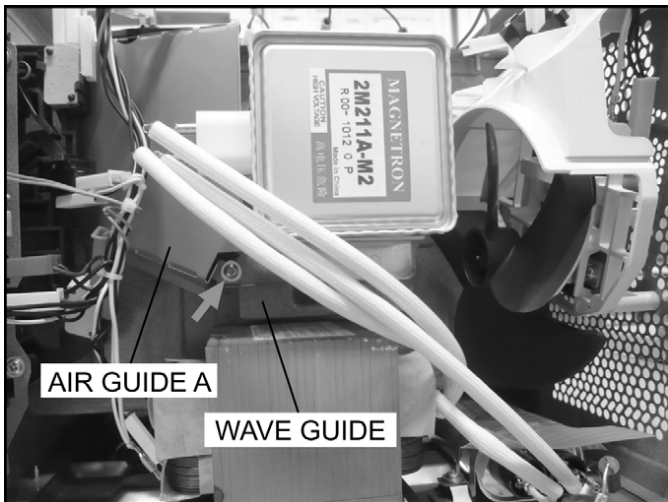
6 DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

6.1. Magnetron

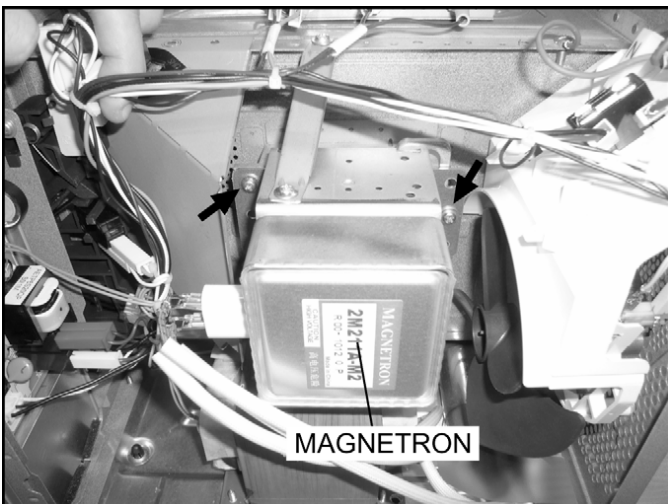
1. Discharge the high voltage capacitor.
2. Remove 1 screw holding supporter on the magnetron.
3. Remove 1 screw holding air guide A on cavity top plate.



4. Remove 1 screw holding air guide A on the wave guide, then remove the air guide A.



5. Remove 2 screws holding the magnetron.



NOTE:

After replacement of the magnetron, tighten mounting screws properly, 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.

CAUTION

When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high voltage transformer should be connected to "FA terminal" and the lead wire from high voltage capacitor should be connected to "F terminal".

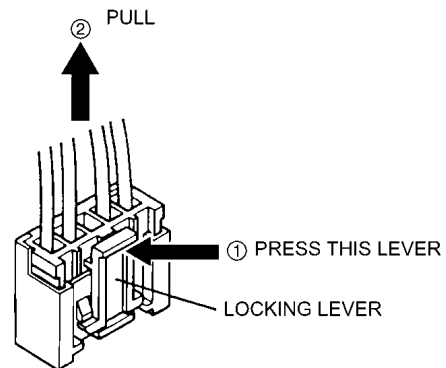
6.2. Digital programmer circuit (D.P.C) & Membrane switch (NN-ST340W)

NOTE:

Be sure to ground any static electric charge built up on your body before handling the D.P.C.

1. Remove 1 screw holding escutcheon base on cavity front plate.
2. Disconnect all connectors from D.P.C. board.

HOW TO DISCONNECT SPECIAL LOCK CONNECTOR



3. Disconnect red case connector from secondary latch switch.
4. Remove 5 screws holding D.P.C. board on escutcheon base.

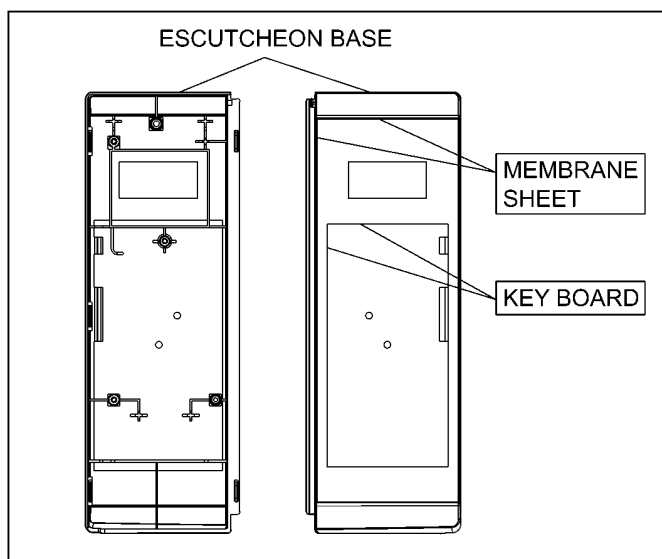
5. Separate D.P.C board from tabs on the escutcheon base and remove D.P.C board.

To replace membrane key board

6. Remove 1 screw holding back plate and bracket on escutcheon base, then remove back plate and bracket.
7. Use tools such as knife etc. to lift the edge of membrane sheet and peel off escutcheon sheet & key board membrane completely from escutcheon base.

NOTE:

- a. 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.
- b. When installing the new key board membrane, make sure that the surface of escutcheon base is clean to prevent a malfunction or shorted contacts.



6.3. Low voltage transformer and/or power relays (RY1) (NN-ST340W)

NOTE:

Be sure to ground any static electric charge built up on your body before handling the D.P.C.

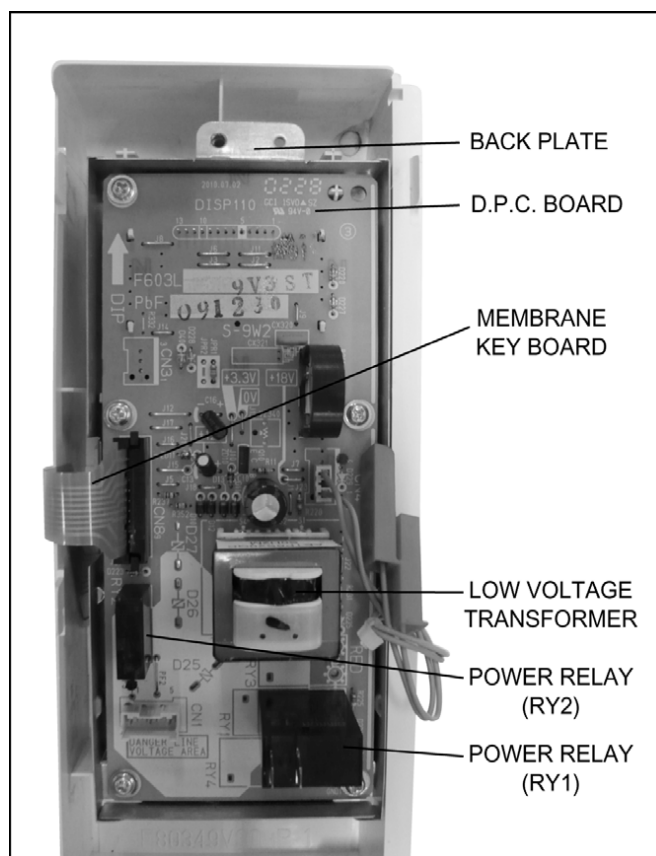
1. Disconnect all connectors from D.P.C. board.
2. Remove 5 screws holding D.P.C. board on escutcheon base.
3. Replace D.P.C. board.

(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.

NOTE:

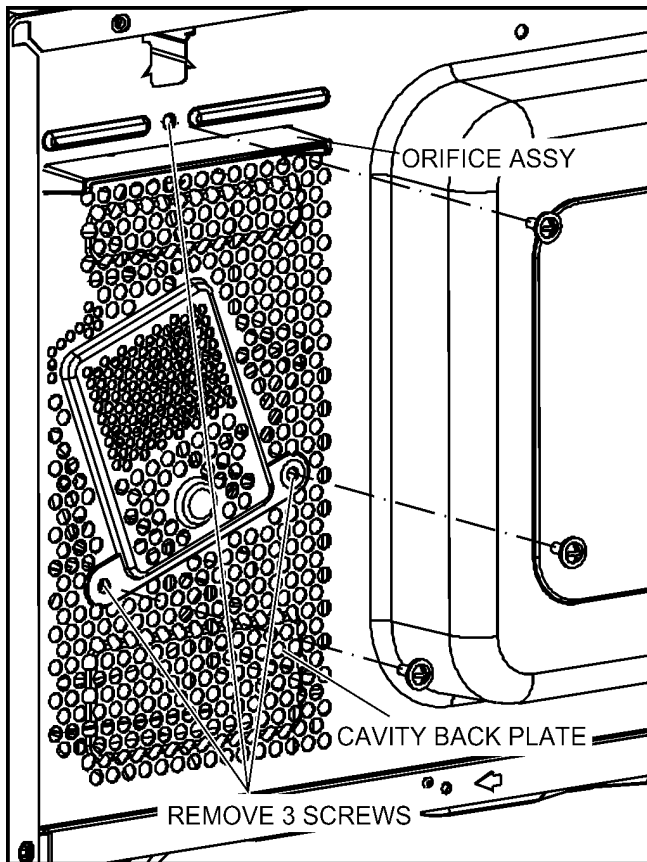
Do not use a soldering iron or desoldering tool of more than 30 watts on D.P.C. contacts.

(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.

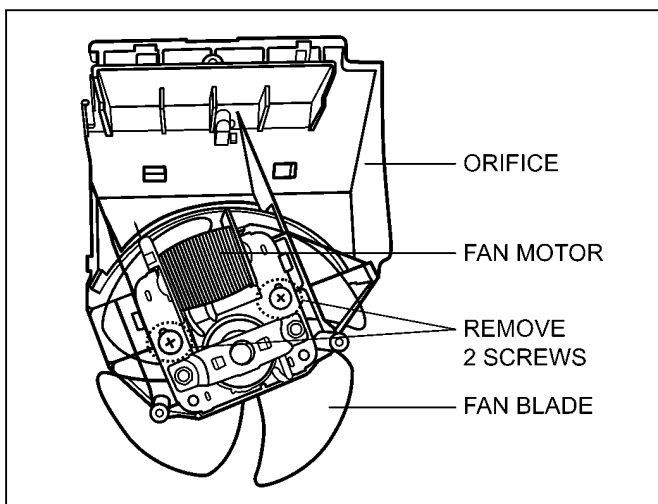


6.4. Fan motor

1. Disconnect 2 lead wires from fan motor terminals.
2. Remove 3 screws holding orifice assy and detach the orifice assy from oven assy.

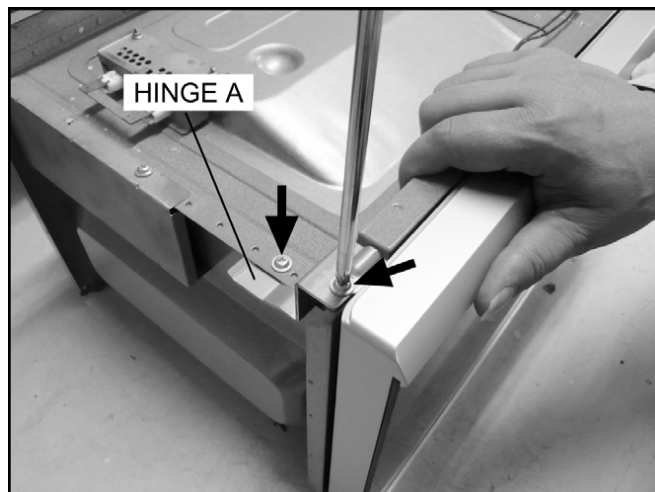


3. Remove fan blade from the motor shaft by pulling it straight out.
4. Remove 2 screws holding fan motor on orifice assy and detach the fan motor from orifice assy.



6.5. Door assembly

1. Support the door, remove 2 screws holding hinge A.



2. Open the door, remove door(U) and hinge A from cavity.

NOTE:

Support the door before opening.



3. Remove door C from door A (U) & door E by carefully pulling outward starting from upper right hand corner using a flat blade screwdriver.
4. Separate door E from tabs on door A (U) and remove door A (U).

5. Remove door key and door key spring from door E.

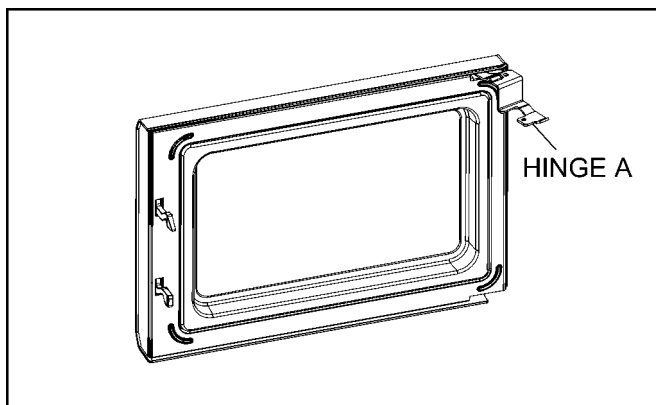
6. Replace other components.

To re-install components:

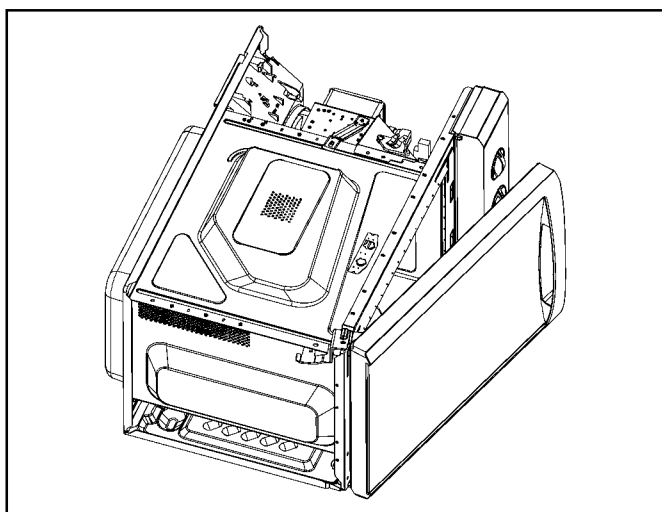
NOTE:

After replacement of the defective component parts of the door, reassemble it properly and adjustment so as to prevent an excessive microwave leakage. Adjustment of the door assembly (Refer page 20).

7. Place the hole of hinge A into the door's upper hinge pin.



8. Use your left index finger to support the door's lower hinge pin while guiding the door's hinge A into the cavity slot. Then lower your finger to seat the door onto the hinge.



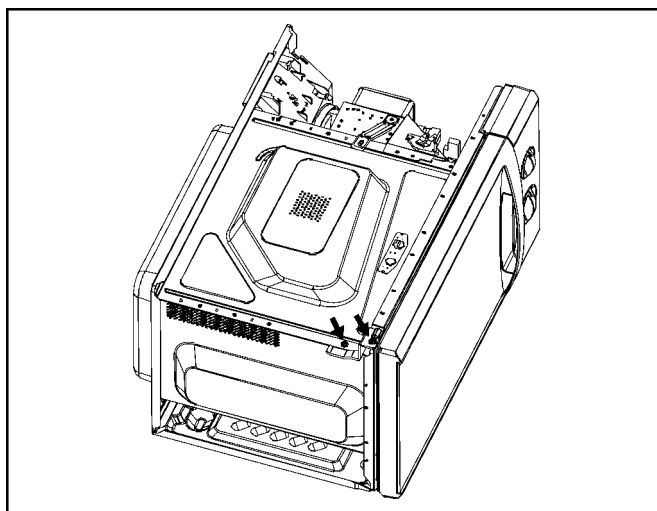
NOTE:

Door alignment is crucial. If door is misaligned, apply pressure until alignment is achieved.

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.

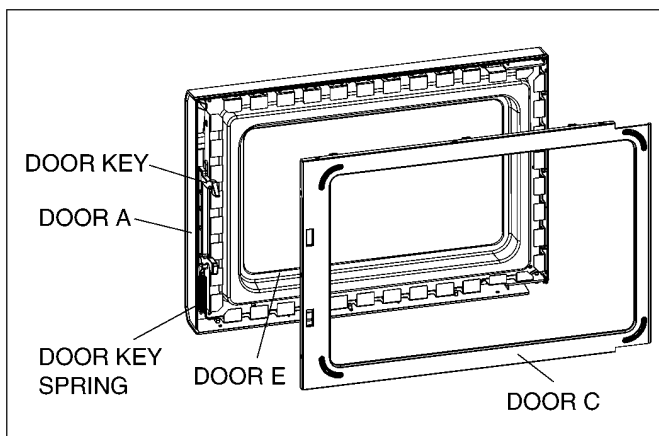
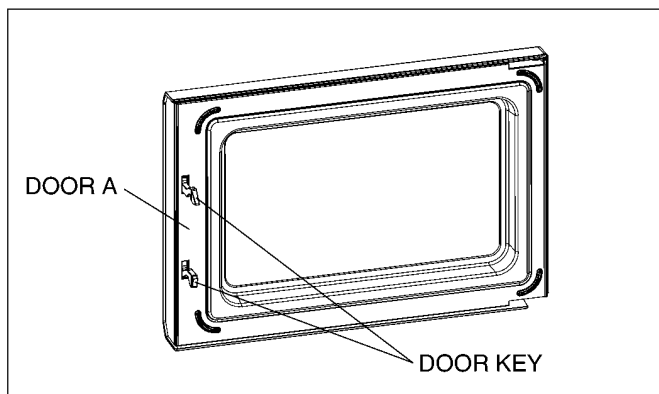
9. Tighten 2 mounting screws.



Be sure the gap between door E and cavity front plate will be 0.3~0.7mm.

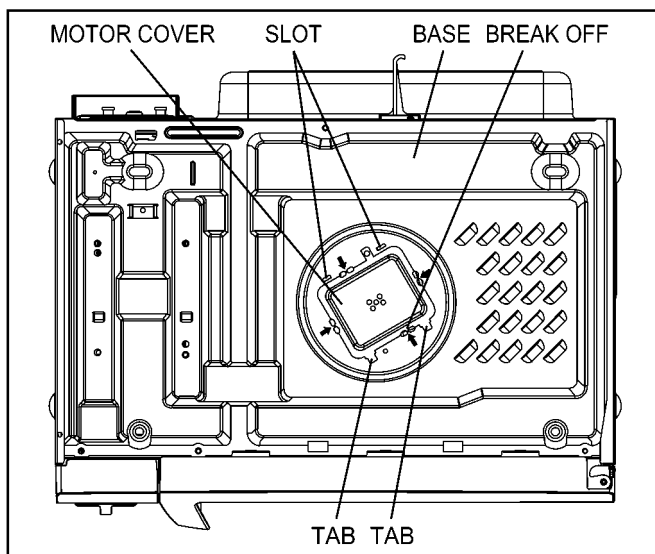
NOTE:

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



6.6. Turntable motor

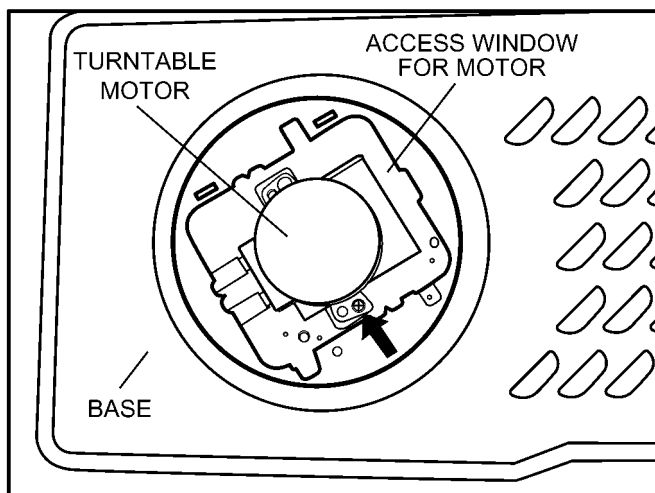
1. Remove the motor cover by breaking off at the 4 spots indicated by arrows with a cutter or the like.



NOTE:

After removing the motor cover, be sure that cut portions are properly trimmed off 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 1 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 into the 2 provided slots, then screw the single tab to the base using a 4mm x 6mm screw.

7 COMPONENT TEST PROCEDURE

⚠ WARNING

1. High voltage is present at the high voltage terminal of the high voltage transformer 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 capacitor (see page 12).

7.1. Primary, Secondary Latch Switch Interlocks

1. Unplug lead connectors to Primary Latch Switch and Secondary Latch Switch.
2. Test the continuity of switches at door opened and closed positions with ohm meter (low scale).

Normal continuity readings should be as follows.

	Door Opened	Door Closed
Primary Latch Switch	$\infty \Omega$ (open)	0 Ω (close)
Secondary Latch Switch	$\infty \Omega$ (open)	0 Ω (close)
Power Relay B	$\infty \Omega$ (open)	$\infty \Omega$ (open)

7.2. Short Switch & Monitor

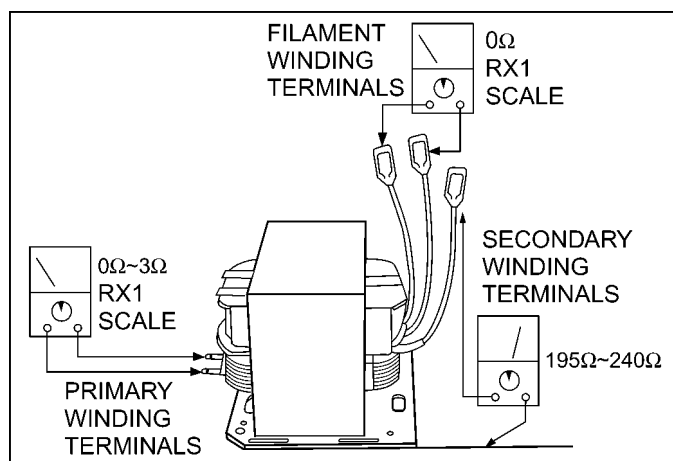
1. Unplug lead wires from H.V.transformer primary terminals.
2. Connect test probes of ohm meter to the disconnected leads of the H.V. Transformer.
3. Test the continuity of Short Switch with door opened and closed positions using lowest scale of the ohm meter.

Normal continuity readings should be as follows.

Door Opened	Door Closed
0 Ω (close)	$\infty \Omega$ (open)

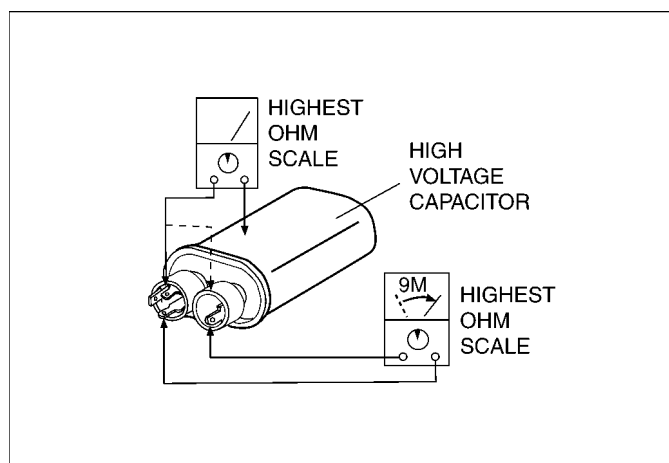
7.3. High voltage transformer

1. Remove connectors from the transformer terminals and check continuity.
2. Normal (cold) resistance readings should be as follows:
Secondary winding..... Approx. 195 Ω ~240 Ω
Filament winding..... Approx. 0 Ω
Primary winding..... Approx. 0 Ω ~3 Ω



7.4. High voltage capacitor

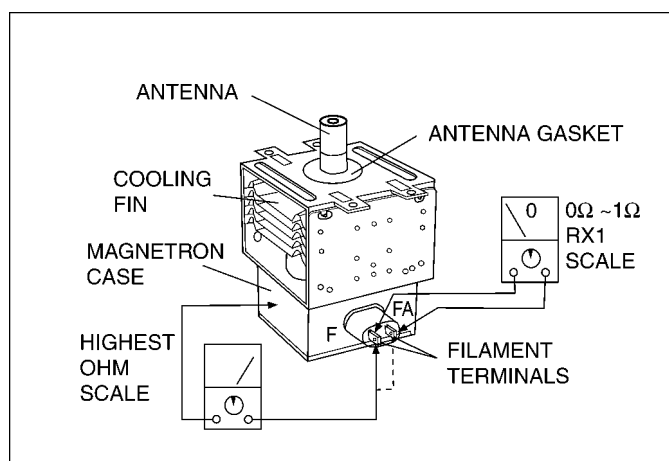
1. Check continuity of capacitor with meter on highest OHM scale.
2. A normal capacitor will show continuity for a short time, and then indicate 9M Ω once the capacitor is charged.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant 9M Ω .
5. Resistance between each terminal and chassis should be infinite.



7.5. Magnetron

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

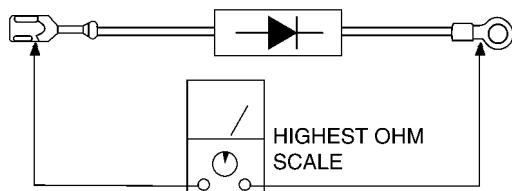
1. Isolate magnetron from the circuit by disconnecting the leads.
2. A continuity check across magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.



7.6. Diode

1. Isolate the diode from the circuit by disconnecting the leads.
2. With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading. Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions.

A normal diode's resistance will be infinite in one direction and several hundred K Ω in the other direction.



NOTE: OHMMETER SHOULD HAVE A MINIMUM 6 VOLT BATTERY.

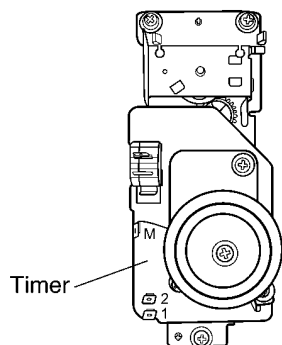
FORWARD	REVERSE
SEVERAL HUNDRED K Ω	$\infty \Omega$

7.8. Membrane keyboard (Membrane switch assembly) (NN-ST340W)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

7.7. Variable power controller (NN-SM330W)

- Isolate variable power switch from the circuit by disconnected 2 leads.
- In order to check if variable power controller is operating normally, follow the test procedures below.
 1. Select any power other than "High" and start the oven.
 2. Check continuity between both terminals of the variable power switch.
 3. Variable power controller (timer and variable power switch) is working properly if the ohm meter reads open and 0 Ω within 30 $\pm$ 1 seconds interval as shown in table on P.11.



8 MEASUREMENTS AND ADJUSTMENTS

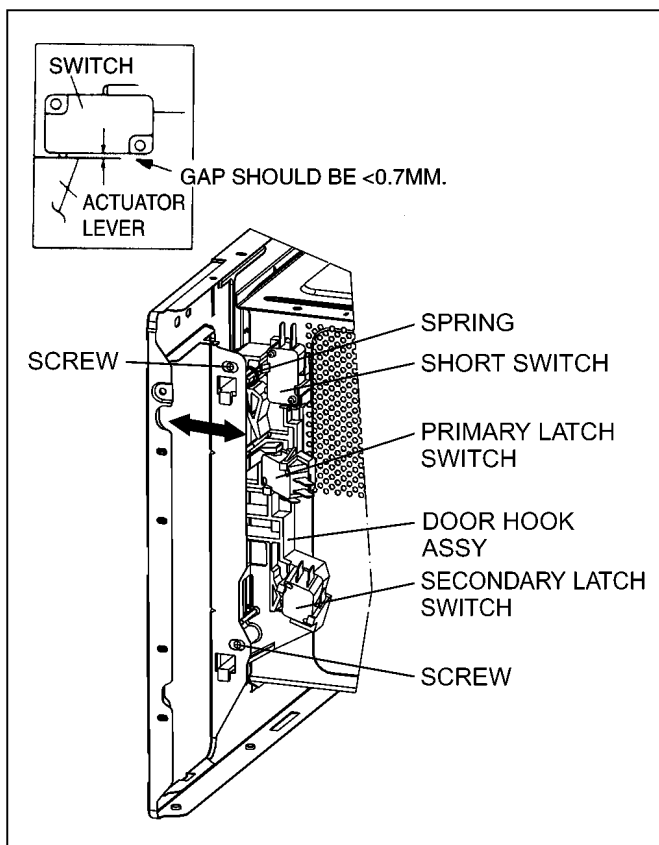
8.1. Adjustment of Primary latch switch, Secondary latch switch and Short switch.

1. Mount the Primary latch switch, the Secondary latch switch and the Short switch to the door hook assembly as shown in ILL.

NOTE:

No specific individual adjustments during installation of the Primary latch switch, Secondary latch switch or Short 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 short switch and check the continuity of the monitor circuit and all latch switches again by following the component test procedures.



8.2. 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
700W	Min. 6.0°C
800W	Min. 7.0°C

9 TROUBLESHOOTING GUIDE

9.1. NN-ST340W

DANGER: HIGH VOLTAGES

1. Ensure proper grounding before troubleshooting.
2. Be careful of high voltage circuit.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do 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.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel. Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. 220-240V AC is present on the digital programmer circuit (Terminals of power relay's and primary circuit of low voltage transformer). 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.

	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 3. Open low voltage transformer 4. Defective DPC	Check fan motor if thermal cutout is defective.
2.	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Shorted H.V. capacitor 5. Shorted H.V. transformer (NOTE 2) 6. Shorted diode NOTE 1: All of these switches must be replaced at the same time. Check continuity of power relay (RY1 & RY2)'s contacts (between 1 and 2) and if it has continuity, replace power relay B (RY1 & RY2) also. NOTE 2: When H.V. transformer is replaced, check diode and magnetron also.	Check adjustment of primary, secondary latch switch and short switch including door.
3.	Oven does not accept key input(Program)	1. Key input is not proper in-sequence 2. Open or loose connection of membrane key pad to DPC (Flat cable or rubber connector) 3. Shorted or open membrane key board 4. Defective DPC	Refer to operation procedure. Refer to DPC troubleshooting.
4.	Fan motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch 2. Defective secondary latch switch	Adjust door and latch switches.
5.	Timer starts count down but no microwave oscillation. (No heat while oven lamp and fan motor turn on)	1. Off-alignment of latch switches 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 lower output and/or be intermittent. 3. Defective high voltage component H.V. transformer H.V. capacitor H.V. diode Magnetron 4. Open or loose wiring of power relay (RY1) 5. Defective primary latch switch 6. Defective DPC or power relay (RY1)	Adjust door and latch 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 count-down.	1. Open or loose wiring of secondary latch switch 2. Off-alignment of secondary latch switch 3. Defective secondary latch switch	Adjust door and latch switches.
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 rotates when door is opened.	1. Shorted primary latch switch.	

	SYMPTOM	CAUSE	CORRECTIONS
9.	Oven does not operate and return to plugged in mode as soon as start pad is pressed.	1. Defective DPC	Check the grounding lead wire and D.P.C. board.
10.	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V. transformer	
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 latch switch 2. Operation of thermal cutout	Adjust door and latch switches.
13.	10A fuse is blown.	1. Shorted lead wire harness 2. Defective short switch 3. Defective primary latch switch 4. Shorted H.V. capacitor 5. Shorted H.V. diode 6. Defective magnetron 7. Shorted H.V. transformer 8. Defective power relays 9. Defective DPC	Check adjustment of latch switches and door Replace H.V. Diode Replace Magnetron Replace H.V. Transformer

9.2. NN-SM330W

DANGER: HIGH VOLTAGES

1. Ensure proper grounding before troubleshooting.
 2. Be careful of high voltage circuit.
 3. Discharge high voltage capacitor.
 4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do 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.

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.

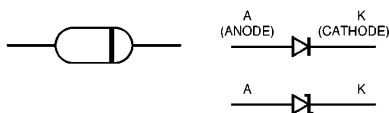
	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK.	1. Open or loose lead wire harness 2. Open thermal cutout	Check fan motor if thermal cutout is defective.
2.	No operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Shorted H.V. capacitor 5. Shorted H.V. transformer (NOTE 2) 6. Shorted diode NOTE 1: All of these switches must be replaced at the same time. NOTE 2: When H.V. transformer is replaced, check diode and magnetron also.	Check adjustment of primary, secondary latch switch and short switch including door.
3.	Fan motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch 2. Defective secondary latch switch	Adjust door and latch switches.
4.	Oven lamp and fan motor operate normally but no microwave oscillation	1. Off-alignment of latch switches 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 lower output and/or be intermittent. 3. Defective high voltage component H.V. transformer H.V. capacitor H.V. diode Magnetron 4. Defective primary latch switch	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective.
5.	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
6.	Fan motor turns on and turntable rotates when door is opened.	1. Shorted primary latch switch.	
7.	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V. transformer	
8.	Turntable motor does not rotate.	1. Open or loose wiring of turntable motor 2. Defective turntable motor	
9.	Oven stops operation during cooking.	1. Open or loose wiring of primary and secondary latch switch 2. Operation of thermal cutout	Adjust door and latch switches.
10.	10A fuse is blown.	1. Shorted lead wire harness 2. Defective short switch 3. Defective primary latch switch 4. Shorted H.V. capacitor 5. Shorted H.V. diode 6. Defective magnetron 7. Shorted H.V. transformer	Check adjustment of latch switches and door Replace H.V. Diode Replace Magnetron Replace H.V. Transformer

9.3. Trouble related to Digital Programmer Circuit (NN-ST340W)

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 transform (L.V.T.) secondary voltage	Abnormal 0V	L.V.T.
			Normal	→Step3
	3	IC1 pin23 voltage	Abnormal	Q11, ZD11, Q10, ZD10
			Normal=3.3V	IC1, CX320, Display
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC1
No beep sound	1	IC1 pin 1 voltage	Abnormal	IC1
			Normal=3.3V	BZ210, Q210
Power relay RY2 does not turn on even though the program had been set and the start pad is tapped	1	IC1 pin 2 voltage while operation	Abnormal	IC1
			Normal=3.3V	→Step2
	2	Collector of Q223 voltage	Abnormal	Q223
			Normal≈0.7V	RY2
No microwave oscillation at any power	1	IC1 pin 20 voltages while operation at high power	Abnormal	IC1
			Normal=3.3V	→Step2
	2	Collector of Q220 voltage	Abnormal	Q220 and /or Q221, Q222, Q225, Q227
			Normal≈0.7V	→Step3
	3	Short circuit between collector and emitter of Q220	Still not turn on	RY1
			RY1 turns on	Q220 and /or Q221, Q222, Q225, Q227
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

9.4. How to check the semiconductors using an OHM meter

Diode



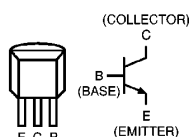
	FORWARD	REVERSE
A-K	SMALL	∞

Transistor

NPN Transistor

2SC.....

2SD.....

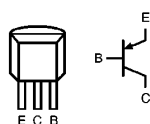


	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

PNP Transistor

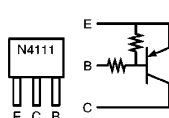
2SA.....

2SB.....



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

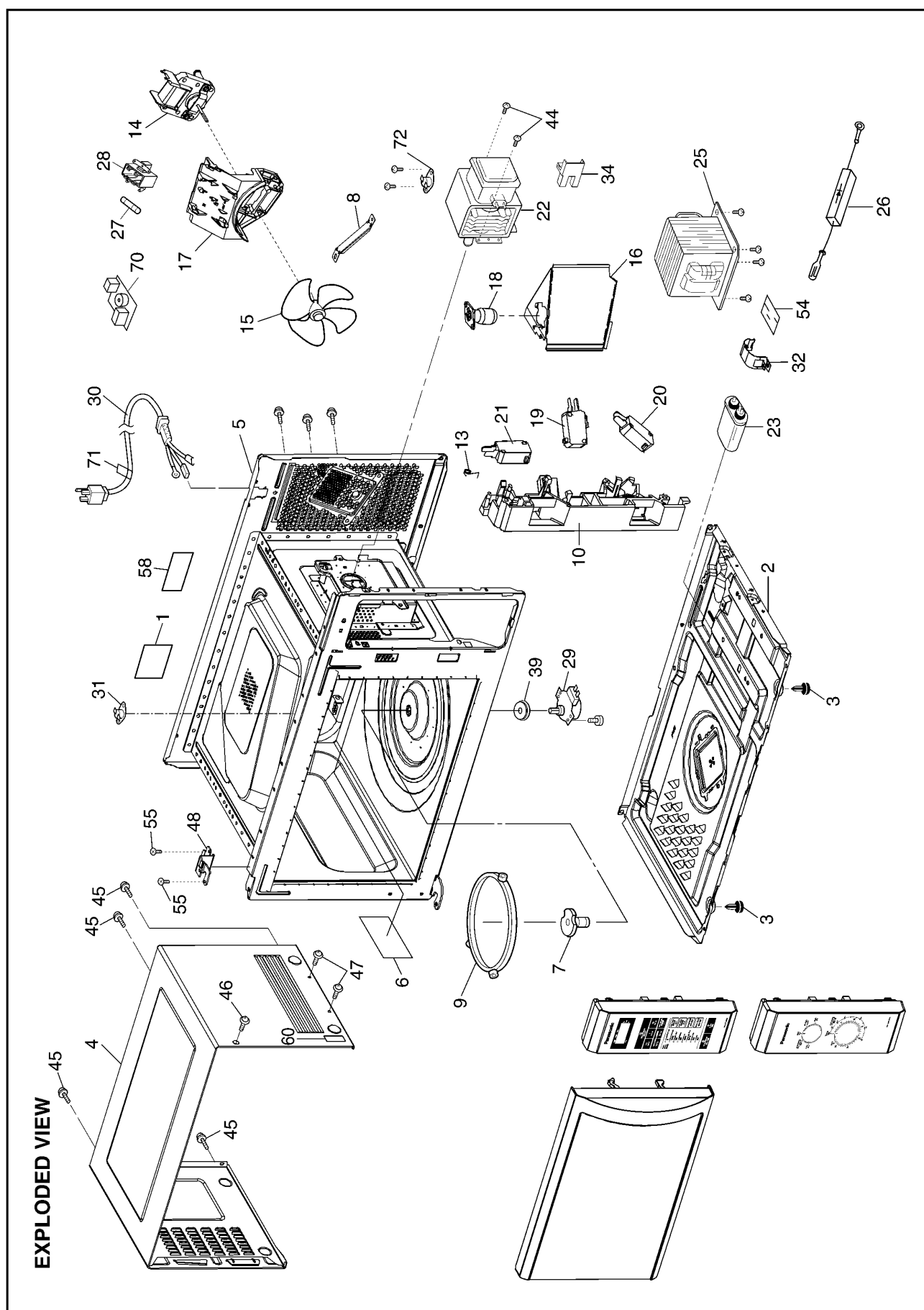
Digital Transistor PNP Transistor



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

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.

NOTE:

“A” parts are supplied by MOBU (Japan)

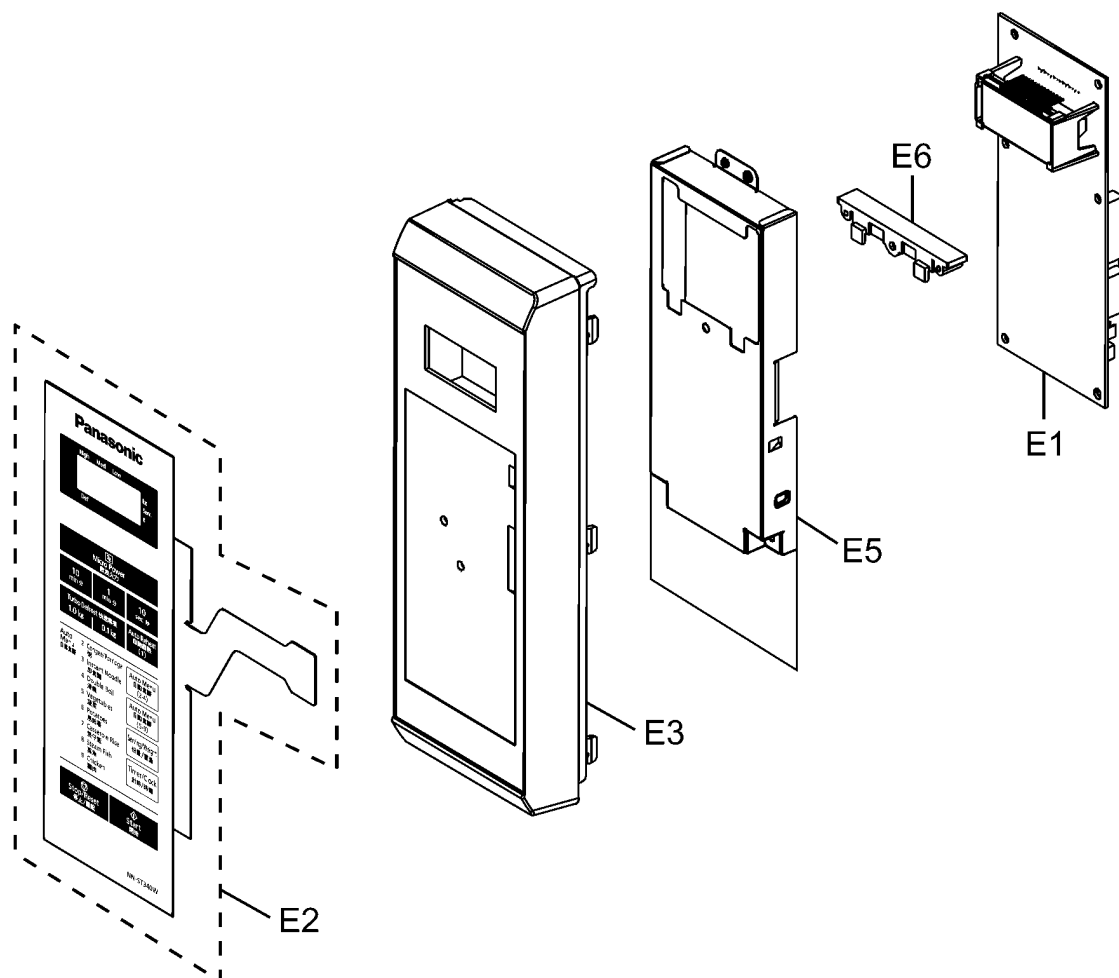
“F” parts are supplied by PHAMOS (China)

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
1		F00079V30HKT	NAME PLATE	1	ST340W KTE
1		F00079V30HPT	NAME PLATE	1	ST340W PTE
1		F00079V30HKP	NAME PLATE	1	ST340W KPQ
1		F00079V30HST	NAME PLATE	1	ST340W STM
1		F00079V30HZP	NAME PLATE	1	ST340W ZPE
1		F00079V20HKT	NAME PLATE	1	SM330W KTE
1		F00079V20HPT	NAME PLATE	1	SM330W PTE
1		F00079V20HKP	NAME PLATE	1	SM330W KPQ
1		F00079V20HZP	NAME PLATE	1	SM330W ZPE
2		F10019V00XP	BASE	1	
3		F10084T00APS	RUBBER FOOT	2	
4		F10099V00HXP	CABINET BODY	1	
5	△	F200A9V00XP	OVEN	1	
6		F20559V00XP	COVER	1	
7		F21319W00XP	PULLY SHAFT	1	ST340W
7		F21316E70XP	PULLY SHAFT	1	SM330W
8		F20349V00XP	SUPPORTER	1	
9		F290D9W00XP	ROLLER RING (U)	1	ST340W
9		F290D6S10XP	ROLLER RING (U)	1	SM330W
10	△	F30209V00XP	DOOR HOOK	1	
13		F30799V00XP	SPRING	1	
14		F400A9V00XP	FAN MOTOR	1	KTE, PTE, STM, ZPE
14		F400A9W40YP	FAN MOTOR	1	KPQ
15		F4008-1N00	FAN BLADE	1	
16		F40259V00XP	AIR GUIDE A	1	
17		F41449V00XP	ORIFICE	1	
18		F612E7X50BP	INCANDESCENT LAMP (U)	1	
19	△	F61425U30XN	MICRO SWITCH B	1	(PRIMARY LATCH SWITCH)
20	△	F61415U30XN	MICRO SWITCH A	1	ST340W (SECONDARY LATCH SWITCH)
20	△	F61425U30XN	MICRO SWITCH B	1	SM330W (SECONDARY LATCH SWITCH)
21	△	F61789V00XP	SHORT SWITCH	1	(SHORT SWITCH)
22	△	2M210-M36R	MAGNETRON	1	ST340W
22	△	2M211A-M2R	MAGNETRON	1	SM330W
23	△	F60909V30HP	H.V. CAPACITOR	1	ST340W (0.94μF/2100V)
23	△	F60909V00XP	H.V. CAPACITOR	1	SM330W (0.85μF/2100V)
25	△	F621B9V30HP	H.V. TRANSFORMER	1	ST340W KTE/PTE/ZPE
25	△	F621B9V30YP	H.V. TRANSFORMER	1	ST340W KPQ
25	△	F621B9V30ST	H.V. TRANSFORMER	1	ST340W STM
25	△	F621B9V00XP	H.V. TRANSFORMER	1	SM330W KTE/PTE/ZPE
25	△	F621B9V20YP	H.V. TRANSFORMER	1	SM330W KPQ
26	△	F62025G10XN	DIODE	1	
27	△	F62309W40HP	FUSE	1	10A
28		F62319V00XP	FUSE HOLDER	1	
29		F63266S30XP	TURNTABLE MOTOR	1	
30	△	F900C9V20HP	AC CORD W/PLUG	1	KTE, KPQ, STM
30	△	F900C9V20ZP	AC CORD W/PLUG	1	PTE, ZPE
31	△	F61459V00XP	THERMAL CUTOFF	1	130°C OPEN, -20°C CLOSE
32		F60379V00XP	CAPACITOR BRACKET	1	
34		F60706S10XP	INSULATE BRACKET	1	
39		F21766S10XP	SEAL	1	

Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
44		XTWFL4+12T	SCREW	2	FOR MAGNETRON
45		XTWBFE4+8D	SCREW	4	FOR CABINET BODY
46		XTC4+10BFN	SCREW	1	FOR CABINET BODY SIDE (UPPER SIDE)
47		XTTFL4+6BN	SCREW	2	FOR CABINET BODY SIDE (LOWER SIDE)
48		F30069V00XP	HINGE A	1	
54		F60709V00XP	INSULATION SHEET	1	
55		XTWFA4+12LR	SCREW	2	FOR HINGE A
58		F00066V00HP	CAUTION LABEL	1	EXCEPT ZPE
58		F00066W10ZP	CAUTION LABEL	1	ZPE
70		F692Y9W40ZP	NOISE FILTER (U)	1	STM,ZPE
71		F02395E20KN	CORD CAUTION LABEL	1	KTE,PTE,KPQ,STM
72	⚠	F61456S10XP	THERMAL CUTOUT	1	180°C OPEN,60°C CLOSE

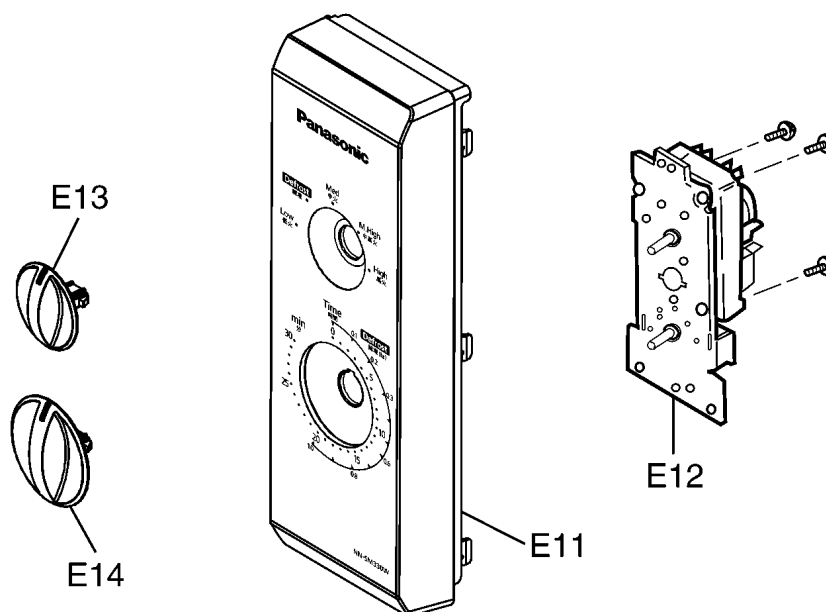
10.3. ESCUTCHEON BASE ASSEMBLY

10.3.1. NN-ST340W



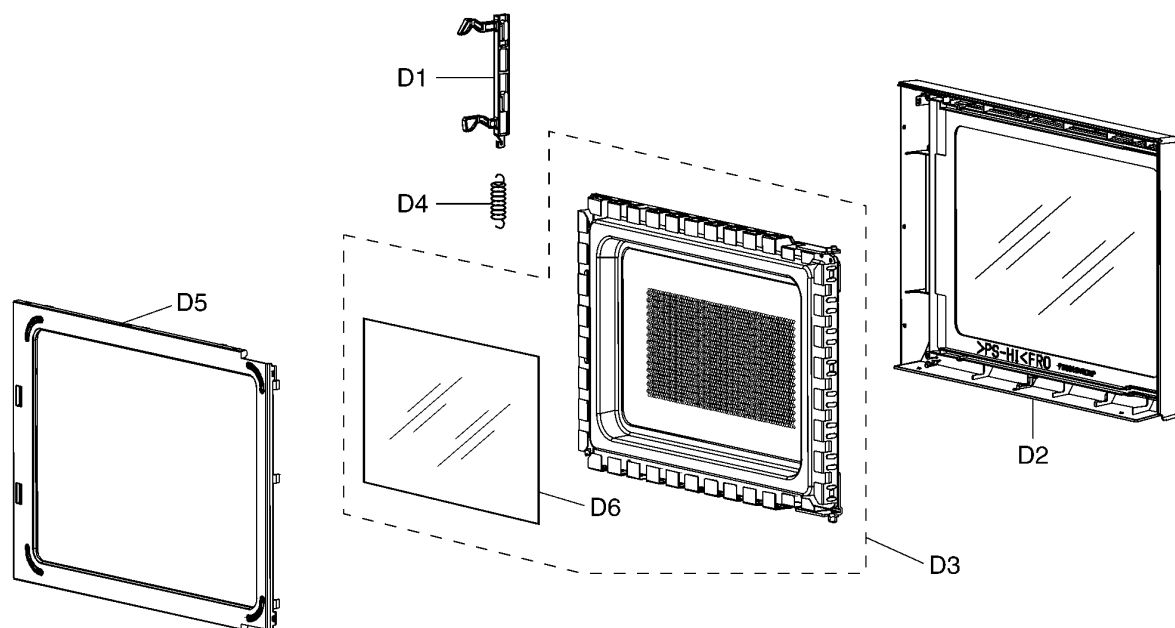
Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
E1	F603L9V30KT	D.P.CIRCUIT (AU)	1	ST340W KTE/PTE
E1	F603L9V30KP	D.P.CIRCUIT (AU)	1	ST340W KPQ
E1	F603L9V30ST	D.P.CIRCUIT (AU)	1	ST340W STM
E1	F603L9V30ZP	D.P.CIRCUIT (AU)	1	ST340W ZPE
E2	F630Y9V30BKT	MEMBRANE SWITCH	1	ST340W KTE/PTE/KPQ/STM
E2	F630Y9V30BZP	MEMBRANE SWITCH	1	ST340W ZPE
E3	F80349V30HHP	ESCUTCHEON BASE	1	ST340W
E5	F81279V30AP	BACK PLATE	1	ST340W
E6	F66139V30HP	BACKSTOP	1	ST340W

10.3.2. NN-SM330W



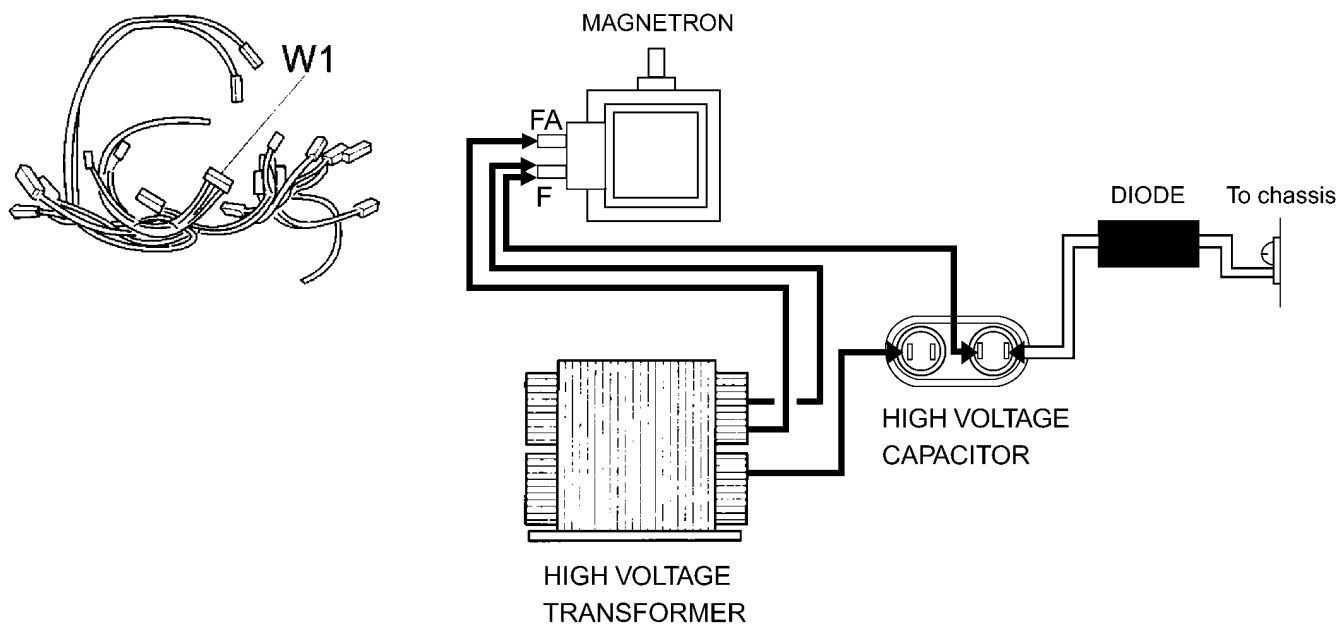
Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
E11	F80349V20HKT	ESCUTCHEON BASE	1	SM330W KTE/PTE/KPQ
E11	F80349V20HZP	ESCUTCHEON BASE	1	SM330W ZPE
E12	F60019V00XP	TIMER	1	SM330W
E13	F80209V00HXP	TIMER KNOB	1	SM330W
E14	F83929V00HXP	TIMER KNOB	1	SM330W

10.4. DOOR ASSEMBLY



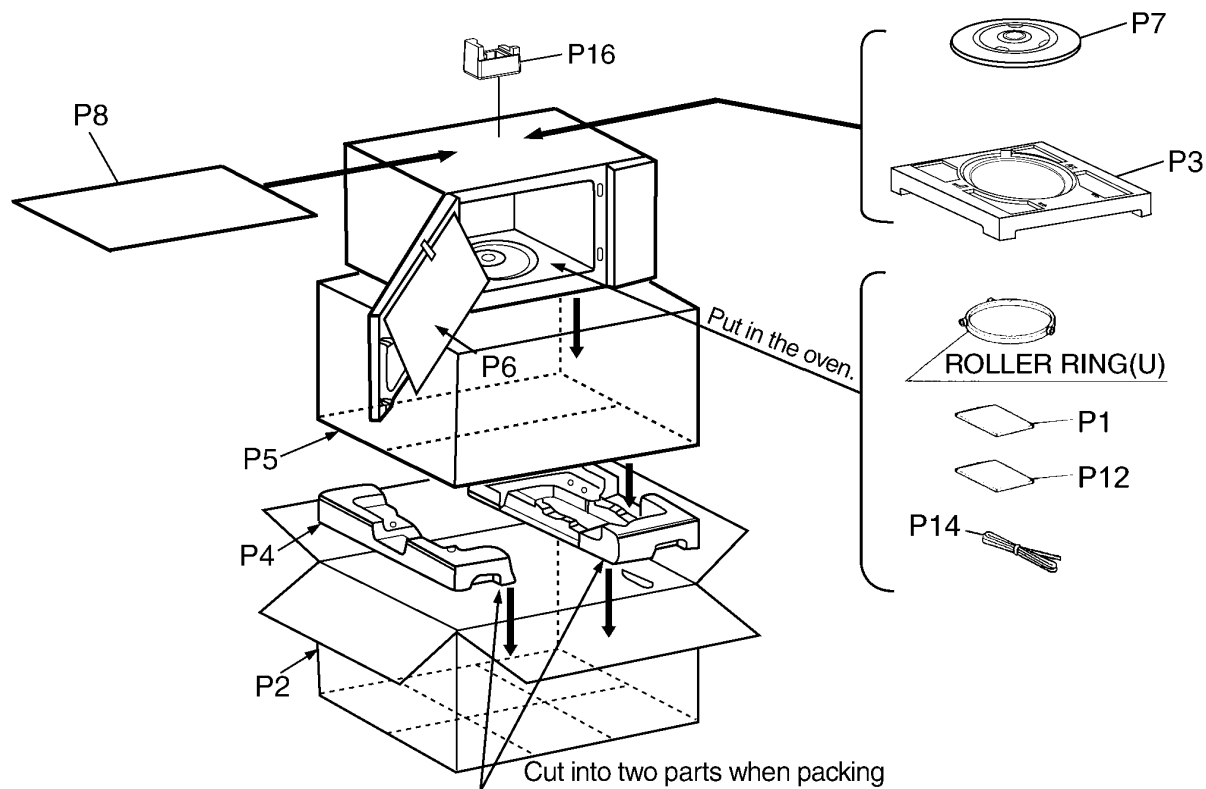
Ref. No.		Part No.	Part Name & Description	Pcs/Set	Remarks
D1		F30189V00XP	DOOR KEY A	1	
D2	⚠	F302A9V00HXP	DOOR A (U)	1	
D3	⚠	F302K9V00XP	DOOR E (U)	1	
D4		F30215G10XN	DOOR KEY SPRING	1	
D5	⚠	F30859V00XP	DOOR C	1	
D6	⚠	F31459W00XP	DOOR SCREEN A	1	

10.5. WIRING MATERIALS



Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
W1	F030A9V30HP	LEAD WIRE HARNESS	1	ST340W KTE/PTE/KPQ
W1	F030A9V30ZP	LEAD WIRE HARNESS	1	ST340W STM/ZPE
W1	F030A9V00XP	LEAD WIRE HARNESS	1	SM330W KTE/PTE/KPQ
W1	F030A9V20ZP	LEAD WIRE HARNESS	1	SM330W ZPE

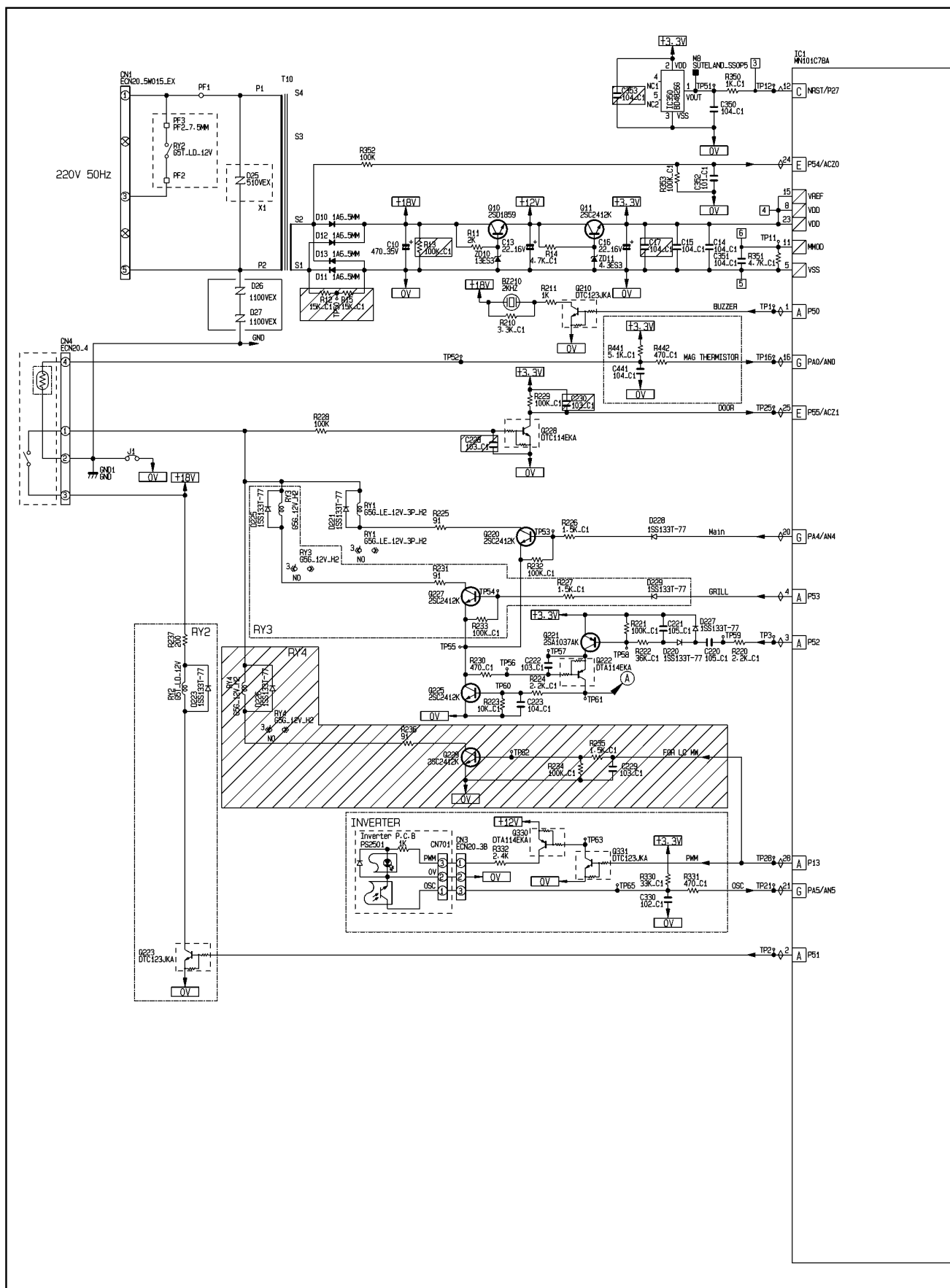
10.6. PACKING AND ACCESSORIES

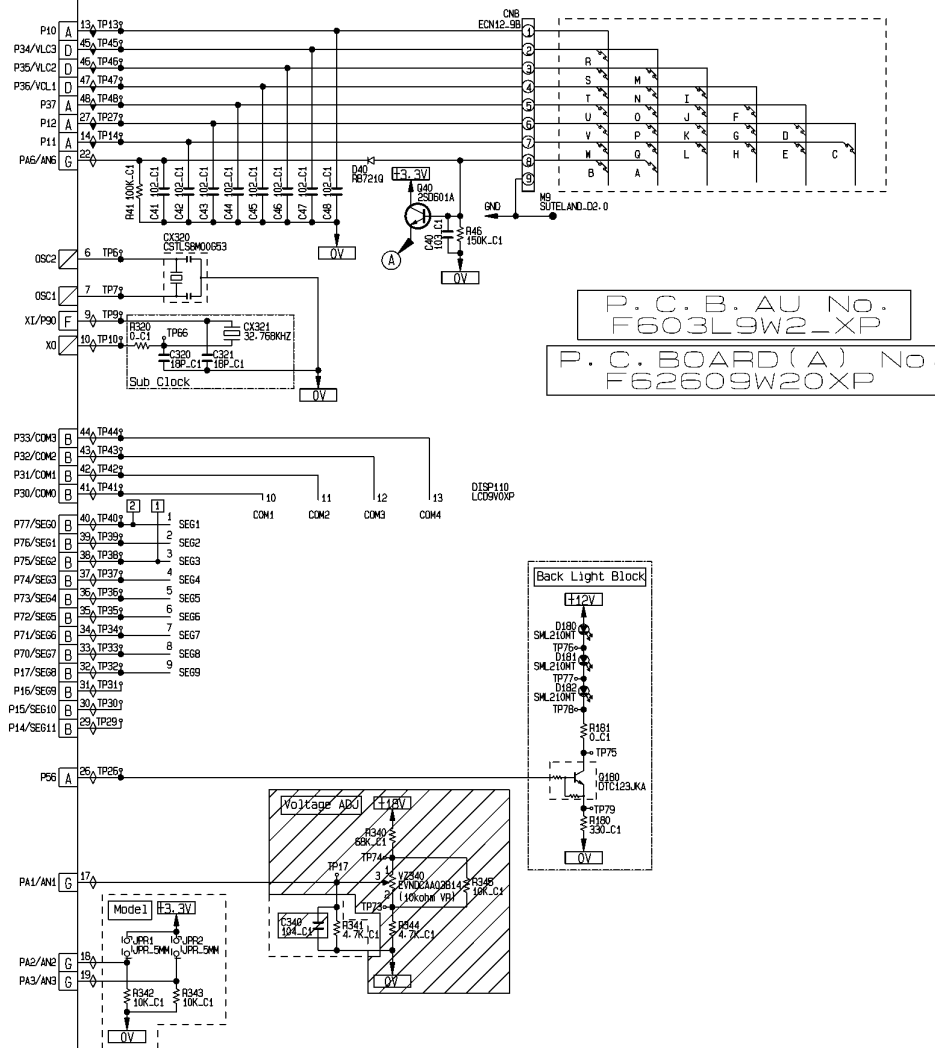


Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
P1	F00039V20KP	INSTRUCTION MANUAL	1	ST340W KTE/PTE/KPQ/STM SM330W KTE/PTE/KPQ
P1	F00039V20ZP	INSTRUCTION MANUAL	1	ST340W ZPE, SM330W ZPE
P2	F01029V30HKT	PACKING CASE, PAPER	1	ST340W KTE/PTE
P2	F01029V30HKP	PACKING CASE, PAPER	1	ST340W KPQ/STM
P2	F01029V30HZP	PACKING CASE, PAPER	1	ST340M ZPE
P2	F01029V20HKT	PACKING CASE, PAPER	1	SM330W KTE/PTE
P2	F01029V20HKP	PACKING CASE, PAPER	1	SM330W KPQ
P2	F01029V20HZP	PACKING CASE, PAPER	1	SM330W ZPE
P3	F01049V00XP	UPPER FILLER	1	
P4	F01059V00XP	LOWER FILLER	1	
P5	F01068100XN	P.E. BAG	1	
P6	F01075G10XN	DOOR SHEET	1	
P7	F06019W00XP	COOKING TRAY	1	ST340W
P7	F06016D00XN	COOKING TRAY	1	SM330W
P8	F01924T00AP	SHEET	1	
P12	F04459V30HKT	OVERLAY	1	ST340W KTE/PTE/KPQ/STM
P16	F01099V20HP	FOAM	1	KTE, PTE, KPQ, STM

11 DIGITAL PROGRAMMER CIRCUIT

11.1. SCHEMATIC DIAGRAM (NN-ST340W)





	P. C. B. AU No.	JPR2	JPR1	RY2	RY3	RY Type	INVERTER	MAG THERMISTOR	Sub CLOCK	T10	C10	R11	R225 R231	R237	D25	R341
LC	F603L9V30HP	OPEN	OPEN	○	—	12V	—	—	—	6S200P	470uF 35V	2K	91	200	○	—
	F603L9V30YP	OPEN	68K	○	—		—	—	—						—	
	F603L9V30YT	OPEN	30K	○	—		—	—	○						—	
	F603L9V30ZP	OPEN	10K	○	—		—	—	—						—	
	F603L9V30KT	OPEN	6.2K	○	—		—	—	—						—	
	F603L9V30ST	OPEN	3.3K	○	—		—	—	—						—	
	F603L9V30KP	OPEN	1.5K	○	—		—	—	—						○	
	F603L9W20XP	OPEN	SHORT	○	○	18V	—	—	—	5L010P	220uF 50V	10K	47	—	○	4.7K
INV	F603L9W40HP	OPEN	OPEN	—	○		○	○	—						—	
	F603L9W40YP	OPEN	68K	—	○		○	○	—						—	
	F603L9W40YT	OPEN	10K	—	○		○	○	○						○	
	F603L9W40ZP	OPEN	1.5K	—	○		○	○	○						—	
	F603L9W40PK	OPEN	SHORT	—	○		○	○	—						—	
	F603L9W40TU	OPEN	3.3K	—	○		○	○	—						○	

11.2. PARTS LIST (NN-ST340W)

Ref. No.	Part No.	Part Name & Description	Pcs/Set	Remarks
BZ210	L0DDEA000014	BUZZER	1	2.0KHz
C10	F2A1V471B281	AL CHEM CAPACITOR	1	470 μ F/35V
C13,C16	F2A1C220B624	AL CHEM CAPACITOR	2	22 μ F/16V
CX320	H2B800400007	CERAMIC RESONATOR	1	8.00MHz
DISP110	L5AYAY000070	LCD	1	
	F66179V30HP	LCD HOLDER	1	
D40,D220,D221,D223,D225,D228	B0AACK000004	DIODE	6	
D10-D13	B0EAKT000025	DIODE	4	
D25	D4EAY511A036	ZENER RESISTOR	1	510V (KTE,PTE,KPQ)
D26,D27	D4EAY112A036	ZENER RESISTOR	2	1100V (KTE,PTE,KPQ)
IC1	MN101C78ALA	L.S.I.	1	KTE,PTE,KPQ,STM
IC1	MN101C78ALA1	L.S.I.	1	ZPE
IC350	C0EBE0000401	IC	1	
Q10	B1BAAJ000003	TRANSISTOR	1	
R211	D0AE102JA155	CARBON FILM RESISTOR	1	1K Ω ,1/4W,5%
R11	D0AE202JA155	CARBON FILM RESISTOR	1	2K Ω ,1/4W,5%
R237	D0AE201JA155	CARBON FILM RESISTOR	1	200 Ω ,1/4W,5%
R225	D0AE910JA155	CARBON FILM RESISTOR	1	91 Ω ,1/4W,5%
R228,R352	D0AE104JA155	CARBON FILM RESISTOR	2	100K Ω ,1/4W,5%
RY1	K6B1AGA00258	POWER RELAY	1	
RY2	K6B1AGA00119	POWER RELAY	1	
ZD10	B0BA01000049	ZENER DIODE	1	
ZD11	B0BA4R400002	ZENER DIODE	1	
T10	G4C2AAH00001	LOW VOLTAGE TRANSFORMER	1	