Service Manual

Programmable Washing Machine

DWF-5590DP
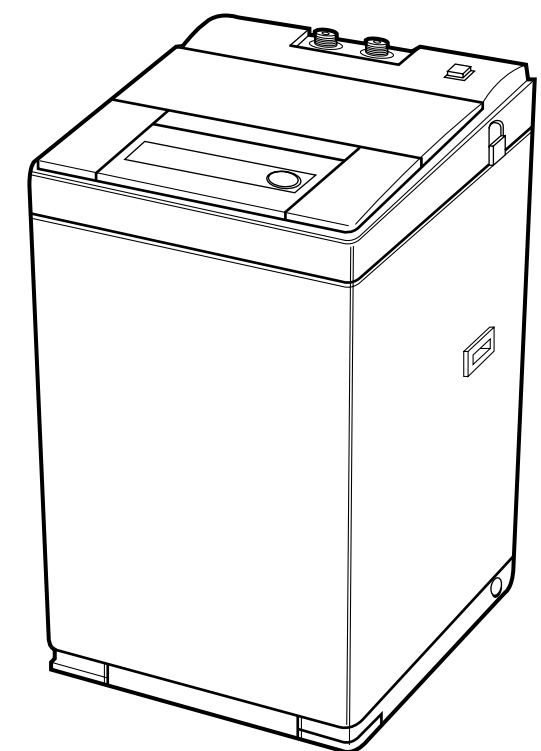
DAEWOO

DAEWOO ELECTRONICS CO., LTD.

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1. SPECIFICATIONS

SPECIFICATIONS

NO	ITEM	SPECIFICATIONS	
1	POWER SOURCE	AC 220~240V/50Hz	AC 110~127V/60Hz
2	POWER CONSUMPTION	INPUT: 380W, OUTPUT: 210W	
3	MACHINE WEIGHT	38kg (GROSS WEIGHT: 43kg)	
4	DIMENSION (WxHxD)	550x885x550 mm	
5	WASHING COURSE	FULL AUTOMATIC 8 OF COURSES (SOAK, SPEED, BLANKET, FUZZY, DRY, SILK, STRONG, NIGHT)	
6	WATER CONSUMPTION	NORMAL 146L	
7	WATER LEVEL SELECTOR	HIGH(52L), MID(44L), LOW(36L), E.LOW(28L)	
8	OPERATING WATER PRESSURE	$0.3{\sim}8kg/cm^2$ $(2.9N/cm^2{\sim}78.4N/cm^2)$	
9	REVOLUTION PER MINUTE	SPIN: 775R.P.M., WASH: 145R.P.M. (FOR 60Hz)	
10	PULSATOR	6 WINGS (ø 350mm)	
11	WATER LEVEL CONTROL	ELECTRICAL SENSOR	
12	OUTER CABINET	PCM(PRE-COATED METAL SHEET)	
13	ANTI-NOISE PLATE	§	
14	GEAR MACHANISM ASS'Y	HELICAL GEAR FOR LOW NOISE	
15	LINT FILTER	§	
16	SOFTENER INLET	§	
17	FUNCTION FOR SOAK WASH	§	
18	ALARM SIGNAL	§	
19	RESIDUAL TIME DISPLAY	§	
20	AUTO. WATER SUPPLY	§	
21	NEW WATER FLOW	WATER FLOW TO ADJUST THE UNBALANCED LOAD	
22	TRANSPARENT WINDOW	§	
23	FUNCTION FOR BUBBLE	§	
24	MAXIMUM MASS OF TEXTILE	5.5kg	

2. FEATURE AND TECHNICAL EXPLANATION

FEATURE AND TECHNICAL EXPLANATION

FEATURE OF THE WASHING MACHINE

1) The first air bubble washing system in the world.
2) Quiet washing through the innovational low-noise design.
3) The wash effectiveness in much more enhanced because of the air bubble washing system.
4) The laundry detergent dissolves well in water because of the air bubble washing system.
5) The adoption of the water currents to adjust the unbalanced load.
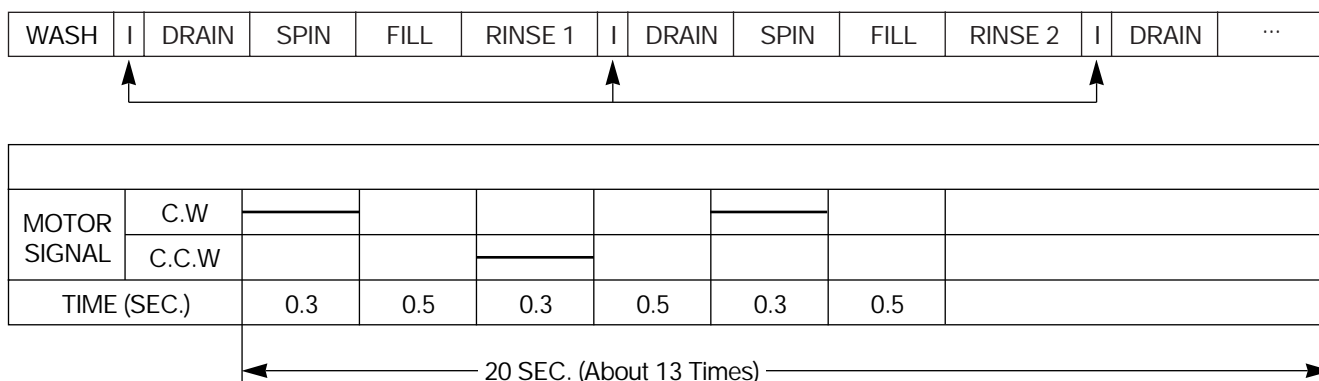6) One-touch operation system.

WATER CURRENT TO ADJUST THE UNBALANCED LOAD

It is a function to prevent eccentricity of the clothes after wash by rotating pulsator C.W and C.C.W for 20 seconds. (But, the DRY & SILK course have no operation of the water currents to adjust the unbalanced load.)

EFFECT

It reduces vibration and noise effectively while spinning.

WATER FLOW

WASH	I	DRAIN	SPIN	FILL	RINSE 1	I	DRAIN	SPIN	FILL	RINSE 2	I	DRAIN	···

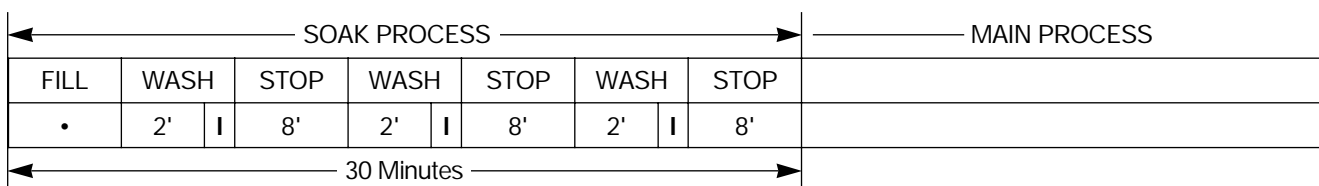| MOTOR SIGNAL	C.W						
	C.C.W						
TIME (SEC.)		0.3	0.5	0.3	0.5	0.3	0.5

20 SEC. (About 13 Times)

FUNCTION FOR SOAK WASH

DISPLAY THE RESIDUAL TIME

When the SOAK WASH is selected, the total wash time increases because 30 minutes for soak process are added to the time of main process.
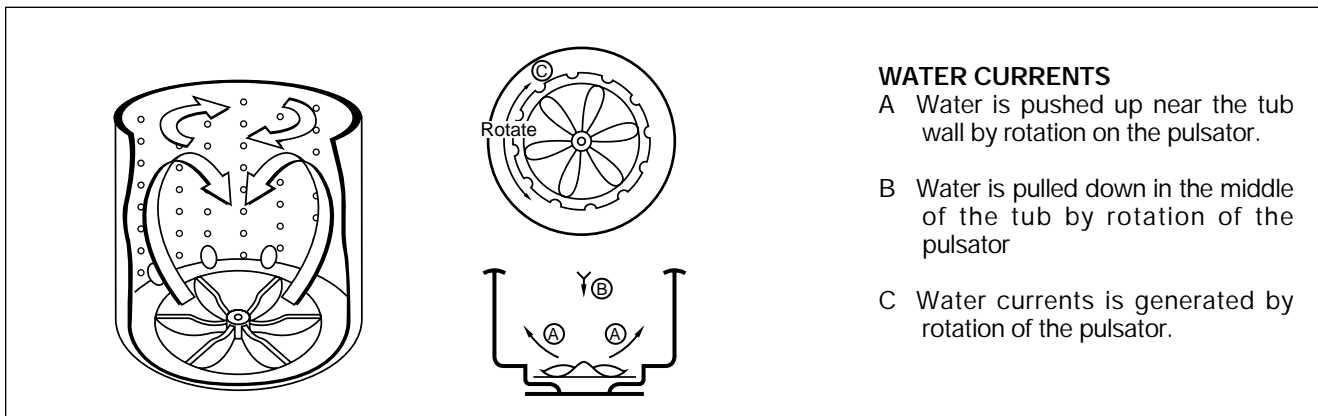
PROGRESS

SOAK PROCESS — MAIN PROCESS

FILL	WASH		STOP	WASH		STOP	WASH		STOP	
•	2'	I	8'	2'	I	8'	2'	I	8'	

30 Minutes

NOTE: ' I ' mark indicates the operation of the water currents to adjust the unbalanced load.

AUTOMATIC WATER SUPPLY SYSTEM FOR BLANKET WASH

The water level would be lowered because the blanket absorbs water at the beginning of washing. Therefore, after 30 seconds, the operation is interrupted to check the water level, and then the water is supplied again until the selected water level is reached.

PULSATOR SYSTEM

When the new shaped pulsator is rotated C.W or C.C.W at a high speed, it makes the 'heart-shaped' water currents as shown below.

Rotate

WATER CURRENTS

A Water is pushed up near the tub wall by rotation on the pulsator.

B Water is pulled down in the middle of the tub by rotation of the pulsator

C Water currents is generated by rotation of the pulsator.

AUTOMATIC DRAINING TIME ADJUSTMENT

This system adjusts the draining time automatically according to the draining condition.

Draining condition	Good draining	The washer begins spin process after drainage.
	Bad draining	Draining time is prolonged.
	No draining	Program is stopped and gives the alarm.

FUNCTIONAL PRINCIPLE

1) The micom can remember the time from the beginning of drain to reset point when the pressure switch reaches to "OFF" point.

Drain Time	Movement of the program
Less than 4 minutes	Continue draining.
More than 4 minutes	Program stops and gives the alarm with the blinked on display lamp.

2) In case of continuous draining, residual drain time is determined by micom.

Draining time as a whole = D + 60

(T sec.)

— Residual drain time.

— The time remembered by micom.

DRAINING TIME							(mm)	WATER LEVEL

T1=D1+60 (Sec.) T2=D2+60 (Sec.) T3=D3+60 (Sec.) T4=D4+60 (Sec.)
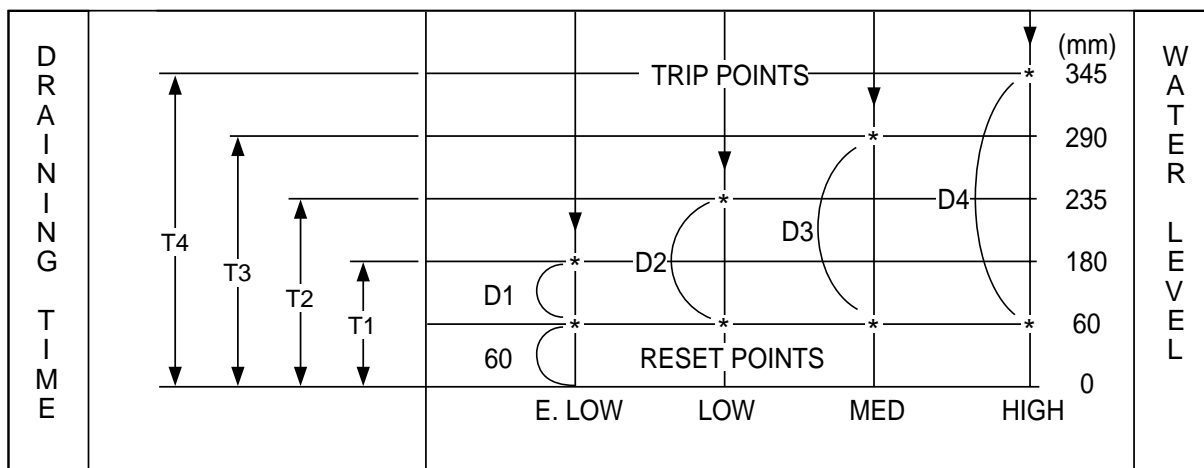
SOFTENER DISPENSER

This is the device to dispense the softener automatically by centrifugal force.
This is installed inside the auto-balancer.

FUNCTIONAL PRINCIPLE

1) Softener stays in room (A) when poured into softener inlet.
2) Softener moves from (A) to (B) by centrifugal force during intermittent spin process.
3) Softener flows from (B) to (C) during rinse process next to intermittent spin.
4) Softener moves from (C) to (D) by centrifugal force during second intermittent spin.
   After spin process is finished, the softener is added into the tub through softener outlet.

FLOW OF THE SOFTENER

	Wash	Intermittent Spin	Hold	Intermittent Spin	Rinse	Spin
Normal Course	Centrifugal force (A) ⟶ (B)		Flow in ⟶ (C)	Centrifugal force (D)	Flow in	

FLOW OF THE SOFTENER INSIDE OF THE BALANCER

Room inside the balancer	A	B	C	D
Centrifugal force ↑ Flowing by weight ⟶				
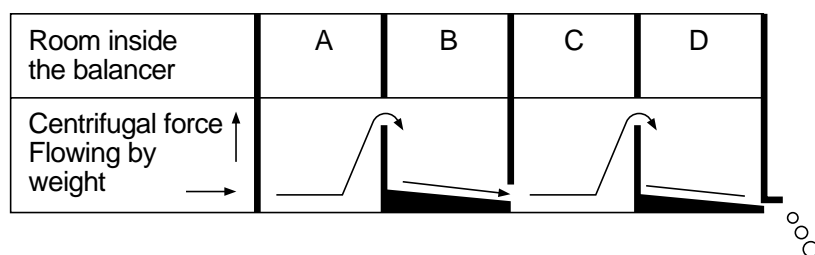
NOTE: Softener moves into the next room when r.p.m. of the tub is more than 100 r.p.m.

HOW TO CHECK MOVEMENT

Pour a reasonable amount of "MILK" into softener dispenser and operate the washer with no load. In final rinse cycle, make sure that the milk is added into the tub through softener outlet.
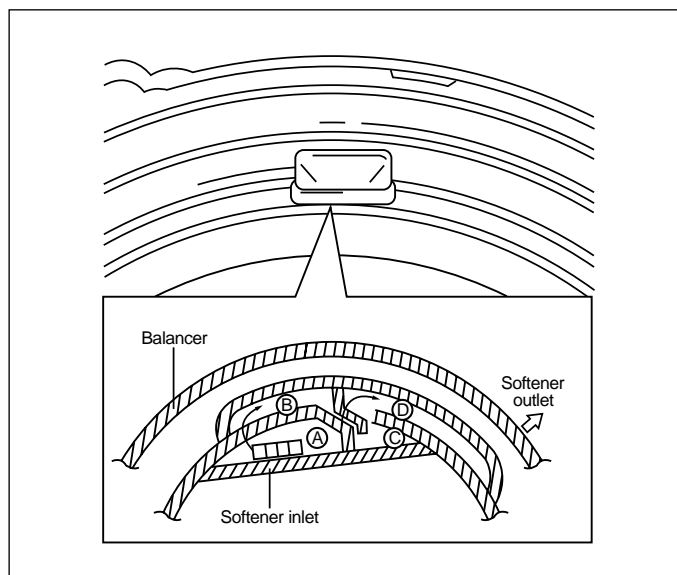
AUTOMATIC UNBALANCE ADJUSTMENT

This system is to prevent abnormal vibration during intermittent spin and spin process.

FUNCTIONAL PRINCIPLE

1) When the lid is closed, the safety switch contact is "ON" position.
2) In case that wash loads get uneven during spin, the outer tub hits the safety switch due to the serious vibration, and the spin process is interrupted.
3) In case that P.C.B. ASS'Y gets "OFF" signal from the safety switch, spin process are stopped and rinse process is started automatically by P.C.B. ASS'Y.
4) If the safety switch is operated due to the unbalance of the tub, the program is stopped and the alarm is given.

Contact of safety switch Lid closing

Lid opening

Contact lever A

Position of unbalanced load(OFF)

Normal(ON)
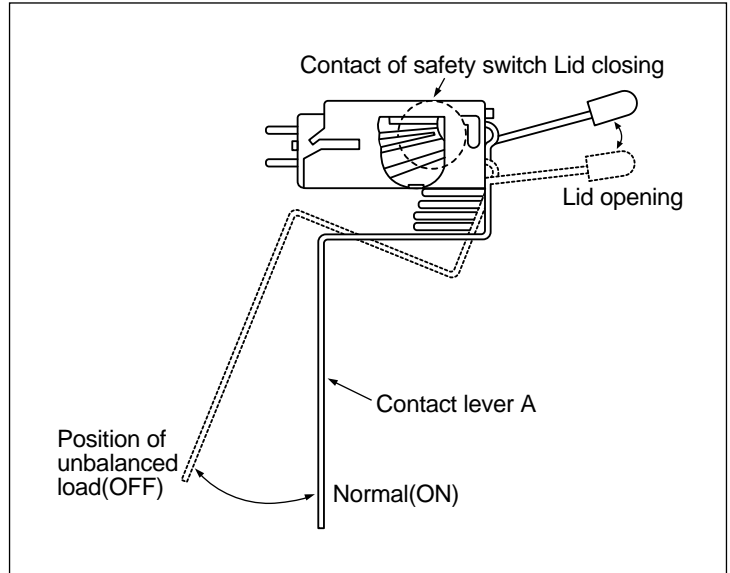
NOTE:
The alarm finished when you close the lid after opening it. Check the unbalance of the wash load and the installation condition.

CIRCULATING-WATER COURSE AND LINT FILTER

CIRCULATING-WATER

The washing and rinsing effects have been improved by adopting the water system in which water in the tub is circulated in a designed pattern.
When the pulsator rotates during the washing or rinsing process, the water below the pulsator vanes creates a water currents as shown in figure.
The water is then discharged from the upper part of the tub through the water channel.
About 40L/min. water is circulated at the 'high' water level, standard wash load and standard water currents.

Filter

Tub

Water channel

Outer tub

Pulsator
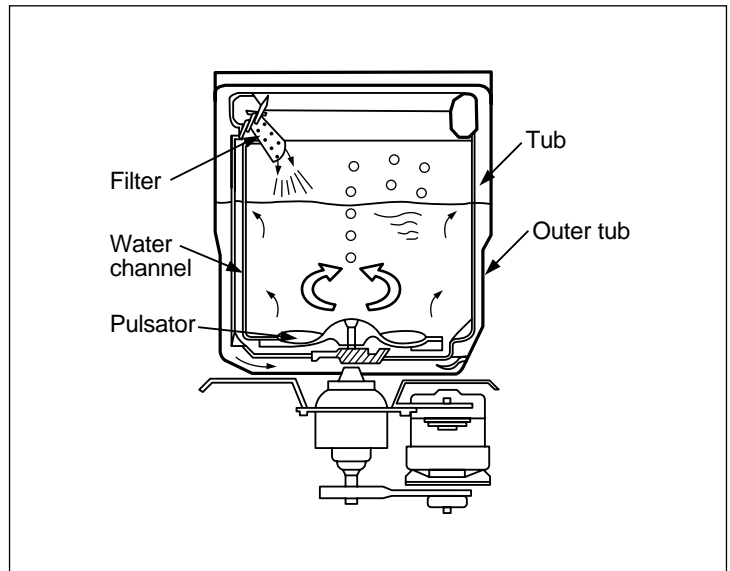
LINT FILTER
Much lint may be obtained according to the kind of clothes to be washed and some of the lint may also sticks to the clothes.

To minimize this possibility a lint filter is provided on the upper part of the tub to filter the wash water as it is discharged from the water channel. It is good to use the lint filter during washing.

Bleach inlet   Filter   Pulsator
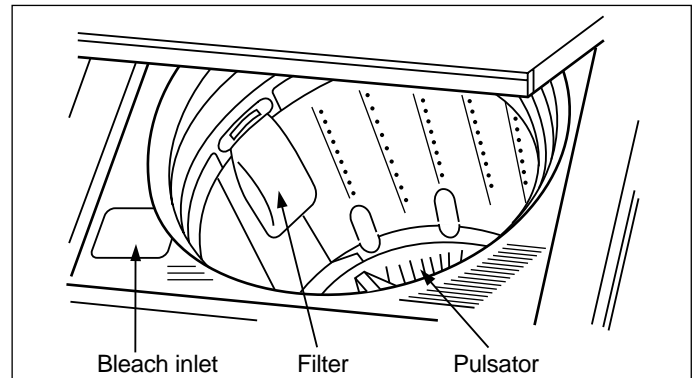
HOW TO CLEAN THE LINT FILTER
1) Pull the filter frame upward.
2) Turn the lint filter inside out, and wash the lint off with water.
3) Return the filter as it was, and fix the filter frame to the slot.

RESIDUAL TIME DISPLAY
When the START/HOLD button is pressed, the residual time (min.) is displayed on the time indicator, and it will be counted down according to the process.

When operation is finished, the TIME INDICATOR will light up 🔲 .
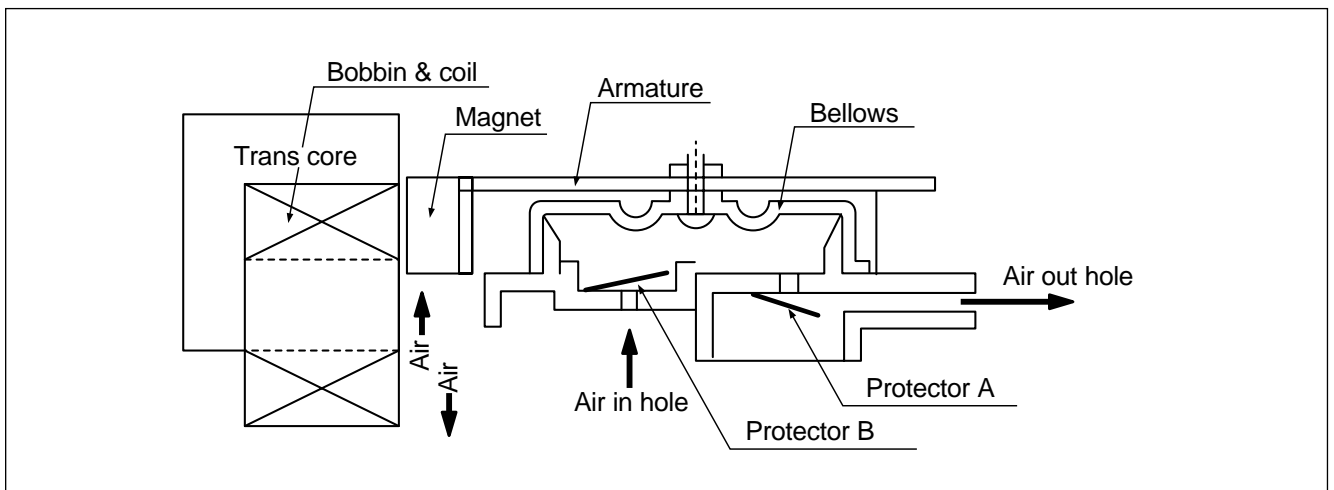
DRAIN MOTOR
STRUCTURE
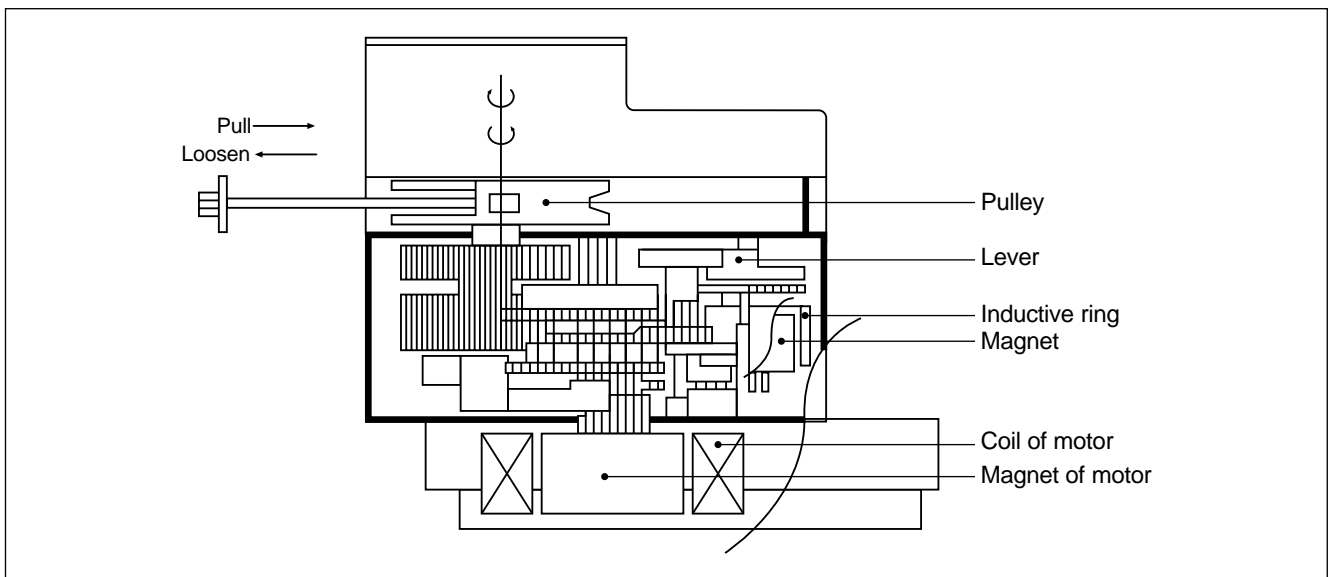
FUNCTIONAL PRINCIPLE
1) When the DRAIN MOTOR connected to the power source (AC 220V), the DRAIN MOTOR rotates with 900 r.p.m and revolves the pulley by gear assembly for reducing.
2) When the pulley is rotated, the pulley winds the wire to open the drain valve.
3) Therefore, rotation of pulley is changed to the linear moving of wire.
4) The wire pulls the brake lever of Gear Mechanism Ass'y within 5 seconds.
5) After the wire pulled, gear assembly is separated from motor and condition of pulling is held by operation of the lever.
6) When the power is turned off, the drain valve is closed because the wire returns to original position.

GEAR MECHANISM ASS'Y

The proper water currents is made by the rotation of pulsator at a low speed (about 145 r.p.m) to prevent the damage to the small sized clothes.
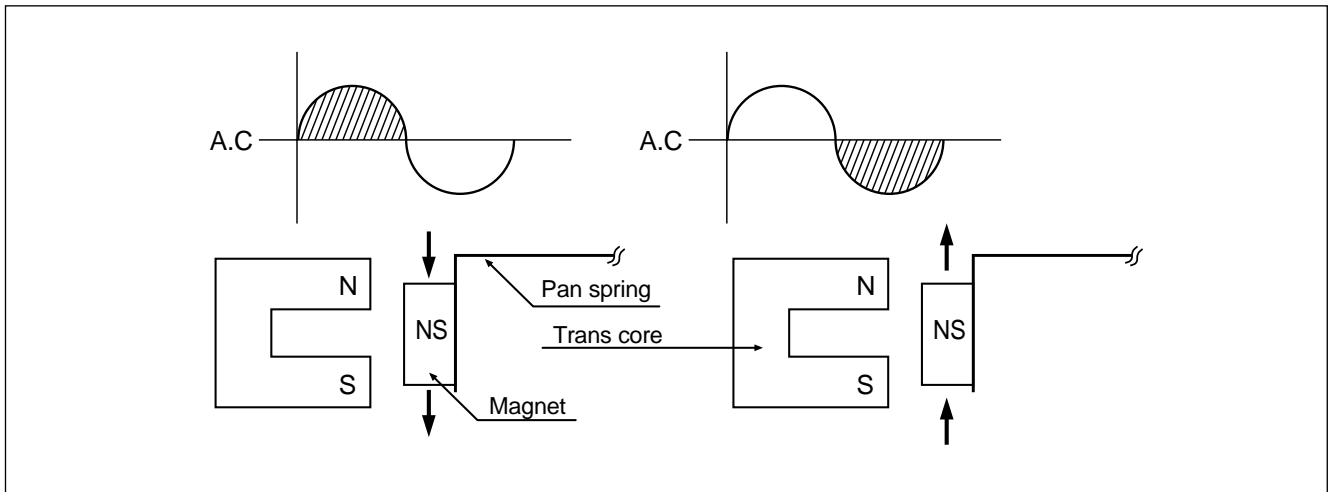
Pulsator shaft

Spinner shaft

Inner clutch spring

Planetary gear

Brake lever

Clutch spring

Clutch boss

Spinner pulley

Planetary gear

Sun gear

Internal gear

Pulsator

Planetary

Motor

1 revolution

5.2 revolutions

Spinner pulley

V-belt

Motor
1490 r.p.m. 60(Hz)

V.belt

Spinner Pulley
775 r.p.m.

Planetary Gear 1/5.2

Pulsator
145 r.p.m.

Directly

Tub
775 r.p.m.
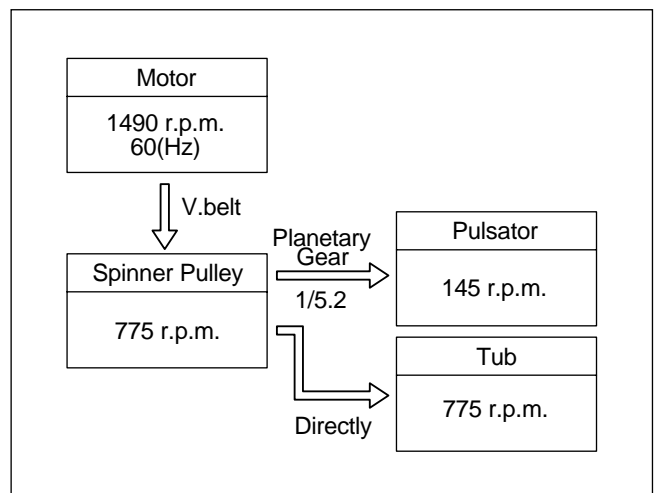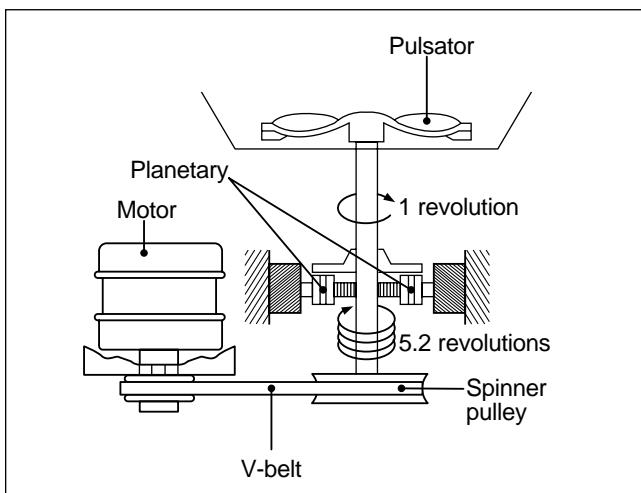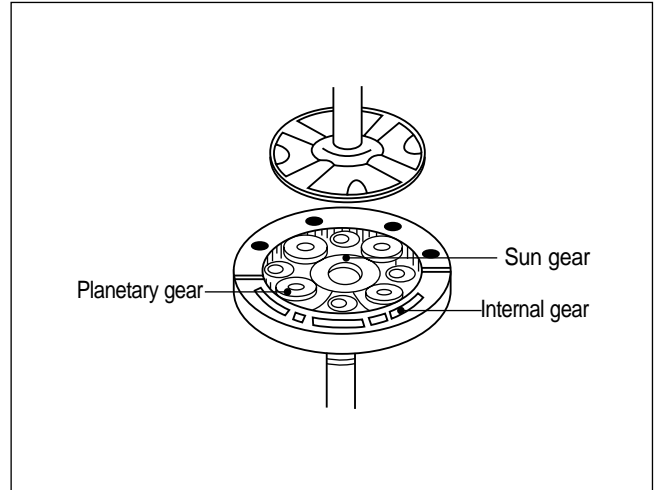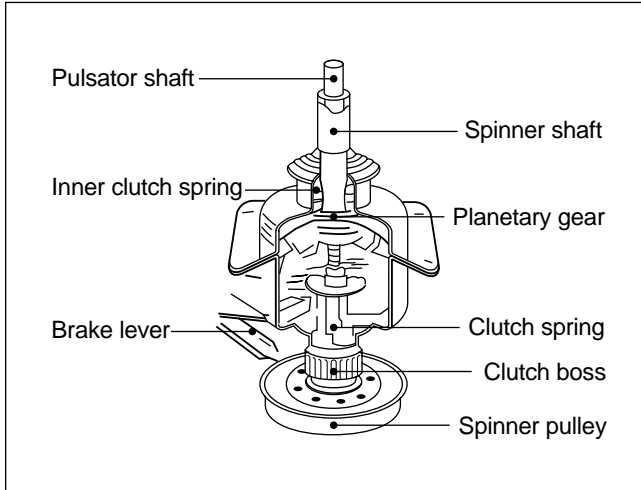
PRINCIPLE OF BUBBLE GENERATOR
STRUCTURE

Bobbin & coil

Magnet

Armature

Bellows

Trans core

Air out hole

Air

Air

Air in hole

Protector A

Protector B

PRINCIPLE OF INTAKE & OUTLET OF THE AIR
INTAKE : ARMATURE moves up, and BELLOWS inhales the air. At the same time, protector B is open and A is close.
OUTLET: ARMATURE moves down, and BELLOWS exhausts the air. At the same time, protector B is close and A is open.

FUNCTIONAL PRINCIPLE OF TRANS & MAGNET
• The phase of A.C electric power changes to 60 cycle/second.
• The magnetic pole of trans core is changed by the change of the phase of A.C electric power.
• The core repeats push and pull (3600 times/min.) of the armature magnet.

FUNCTIONAL PRINCIPLE OF BUBBLE WASHING MACHINE
CROSS SECTION
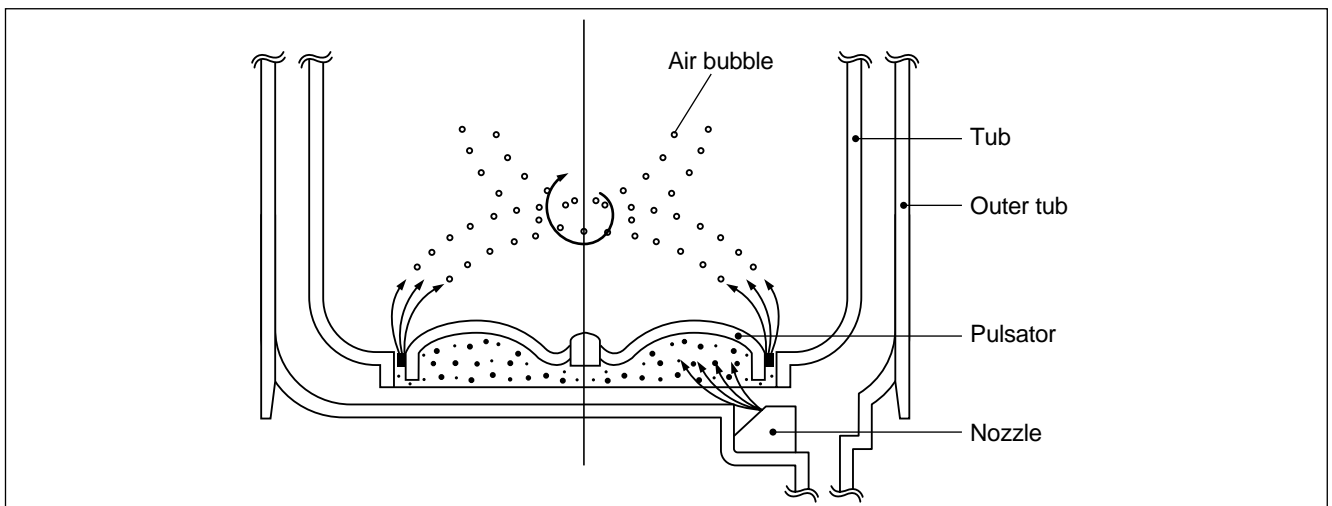
FUNCTIONAL PRINCIPLE
Bubble generator supplies the air from the bottom of outer tub to the inner space of pulsator, the air is dispersed by the rotation of pulsator. Air-bubble is created by the centrifugal force, and rises up.

3. STRUCTURE OF THE WASHING MACHINE

STRUCTURE OF THE WASHING MACHINE

• HOT WATER TAP
After using the washer, close the water tap and turn off the power.

• SOFTENER INLET
Pour softener into the softener inlet just before wash and it will be added into the tub automatically just before the final rinse.

• BLEACH INLET

• CONTROL PANEL

• SCREW COVER

• TUB

•ADJUSTABLE LEGS

• COLD WATER TAP
After using the washer, close the water tap and turn off the power.

• GUIDE DRAIN HOSE

• POWER SWITCH

• HOOK HOLE

• LINT FILTER

• DRAIN HOSE

• HANDLE

• POWER CORD

ACCESSORIES

Inlet Hose (2 Pcs)	Water Tap Adapter (2 Pcs)	Drain Hose Clamp	Hose Fixture	Drain Hose	Guide Drain Hose
	In case of screw-shaped inlet hoses, water tap adapters will not be provided.				

4. FUNCTION OF THE CONTROL PANEL

FUNCTION OF THE CONTROL PANEL

CONTROL PANEL

It has micom sensor.
As the buttons are pressed, the lamps indicating
the selection of you desired washing program will light up.

Power Switch

• Press this switch to turn the power ON or OFF.

• After turning off the power, wait for more than 3 seconds and then turn it on again.

POWER

Cancel Button

• With this button, you can arbitrarily choose course by proper combination with the right three buttons.
• If you want the washer to operate differently from presetting time or to operate separately among the three stages, you first push this button and other buttons sequentially.

Display

• The "TIME" part lamp indicates the residual time and the number of rinsing and spinning times until wash is over.
• The "COURSE", "TEMP", and "LEVEL" part lamps are turned on according to the buttons of the control panel.

Start/Hold Button

• Press this button to begin operation or to stop operation temporarily.
• Operation and temporary stop are repeated as it is pressed.

DAEWOO AUTOMATIC
WASHER
AERO FUZZY & AIR POWER

DRY CLEANING EFFECT

TIME   COURSE   TEMP.LEVEL

SOAK WASH RINS SPIN   FUZ. DRY SILK SOAK   HOT H.
    WARM M.
    SPEE STRO NIGHT BLAN   L.
MIN. TIME MIN.   COLD S.

START/HOLD

CANCEL   WASH   RINSE   SPIN   COURSE   WASH TEMP   WATER LEVEL

Wash Selector

• The above three buttons can be used to bring the three washing stages under control.

Course Selection Button

• This button is used to select the washing course according to the type of the clothes being washed.
• You can choose one of the eight courses by pressing this button until your desired course indicator light comes on.

Temperature Selection Button

• This button is used to select the water temperature according to the clothes being washed.
• Press this button until your desired temperature indicator light comes on, and it will repeat following signs:
COLD ¤A WARM ¤A HOT

Water Level Selector

• This selector is used to select the washing water level according to the size of the wash load.

5. DIRECTION FOR INSTALLATION AND USE

DIRECTION FOR INSTALLATION AND USE

TO INSTALL THE WASHING MACHINE
SELECTION OF THE INSTALLING PLACE
Install the washer on a horizontal solid floor.
If the washer is installed on an unsuitable floor, it could make considerable noise and vibration.

Never install in these places

- The place where it would be exposed to direct sunlight.
- The place nearby a heater or heat appliance.
- The place where it would be supposed to be frozen in winter.
- The kitchen with coal gas and a damp place like a bathroom.

- The proper installation of the washing machine can increase the wash effectiveness and the life of it.

INSTALLATION OF THE UNDER BASE COVER

After installing the washing machine, close the under-base cover.

① The packing box opened, there is a under-base cover at the bottom of the back.
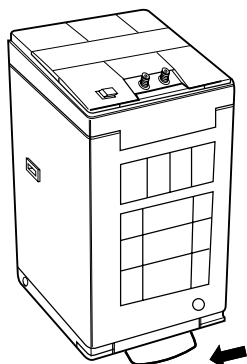
② Push the under-base cover into the end, which decreases the noise made by this washer.
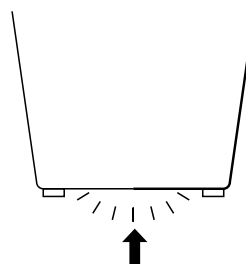
If the washer is installed on an unsuitable floor, it could make considerable noise and vibration, and could cause a malfunction.
Use the height adjust rubber to adjust the washing machine so that it sits properly.

HOW TO INSTALL ON AN INCLINED PLACE

① Height Setting	② Check the Horizontal Status
• After controlling the height by turning the adjustable legs, let the washer put down to the ground.	• Check the position of tub above the center of the washer.

NOTES:
The opening must not be obstructed by carpeting when the washing machine is installed on a carpeted floor.

HOW TO CONNECT THE INLET HOSE

IN INSTALLING THE INLET HOSE

Be careful not to mistake in supplying hot and cold water.

In using only one water tap, connect the inlet hose to the cold water inlet.

① Pull down the collar of the inlet hose to separate it from the water tap adapter.
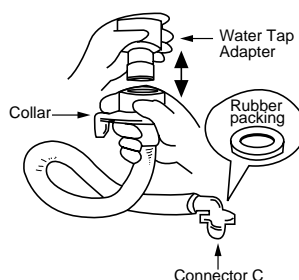
② Loosen the four screw at the water tap adapter, but don't loosen the screws until they are separated from the water tap adapter.
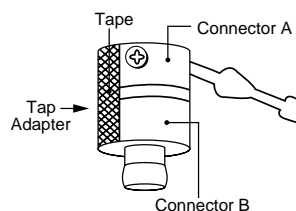
③ Connect the water tap adapter to the water tap, and tighten the four screws evenly while pushing up the adapter so that the rubber packing can stick to the water tap tightly.
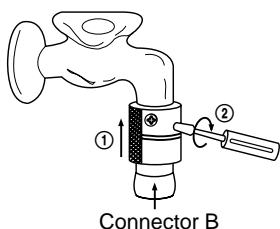
④ Remove the tape, and screw connector B into connector A tightly.
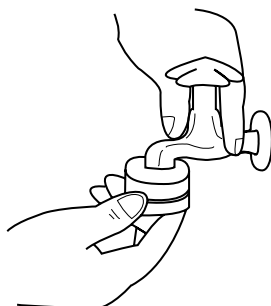
⑤ Connect the inlet hose to the water tap adapter by pulling down the collar of the hose end.
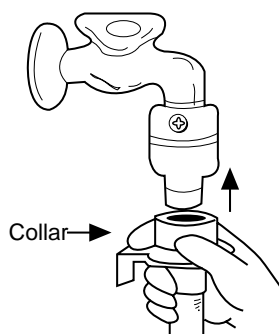
⑥ Connect the connector C of the inlet hose to the water inlet of the washer by turning it clock-wise to be fixed tightly.

• Please check the rubber packing inside the connector C of the inlet hose.

• FOR SCREW-SHAPED TAP

① Connect the inlet hose to the water tap by screwing the connector D tightly.
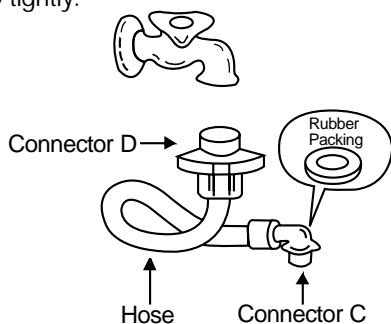
② Connect the connector C of the inlet hose to the water inlet of the washer by turning it clockwise to be fixed tightly.

• Please check the rubber packing inside the connector C of the inlet hose.
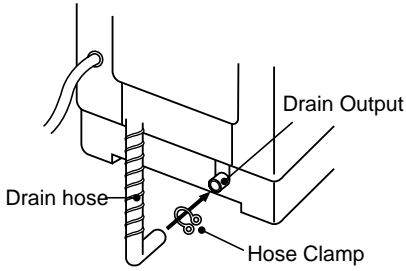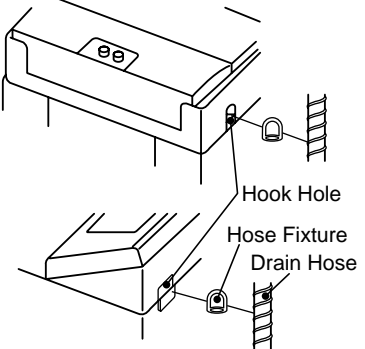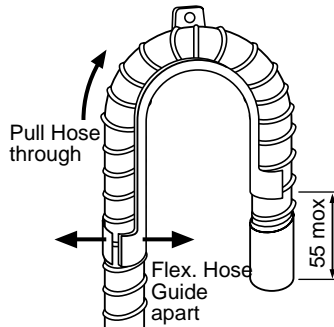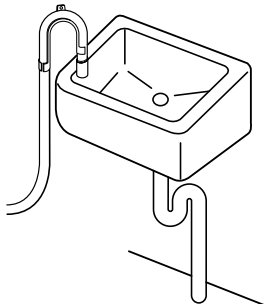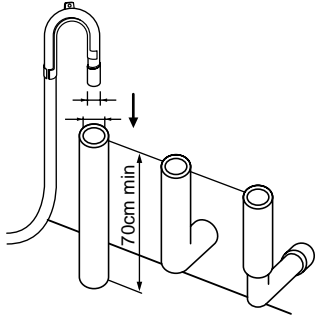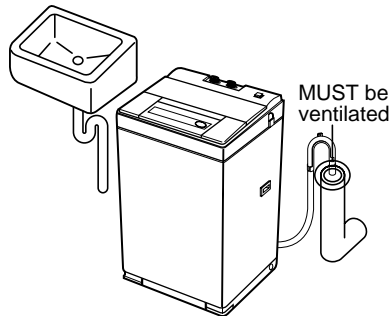
HOW TO INSTALL THE DRAIN HOSE

NOTE IN USING THE DRAIN HOSE
Never forget to install drain hose before operating this washing machine.
There are a drain hose, a hose clamp, a hose fixture and a hose guide in the washing machine.

① Connect the drain hose to the drain outlet at the back side of the washing machine, and fasten it tightly with the clamp supplied.	② Insert the hose fixture into hook hole at the side of the body, and fix the drain hose by inserting it into the hose fixture.	③ Attach the hose guide, included in the accessory kit, to guide the drain hose over the tub or standpipe.
Drain Output Drain hose Hose Clamp	Hook Hole Hose Fixture Drain Hose	Pull Hose through Flex. Hose Guide apart 55 mox
④ Hook the drain hose to the edge of the tub, paying attention that there are no bends or constractions along the drain hose.	Or, connect the drain hose to a standpipe of a diameter greater than that of the drain hose and at a height of min. 70cm.	⑤ Position the washing machine next to the wall.
	70cm min	MUST be ventilated
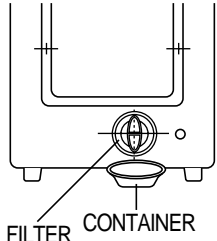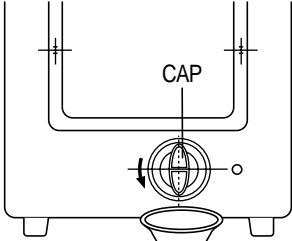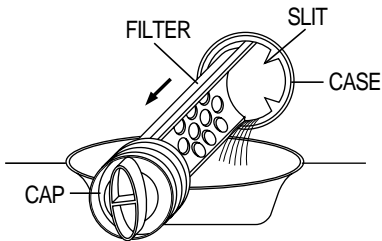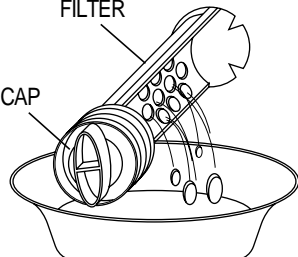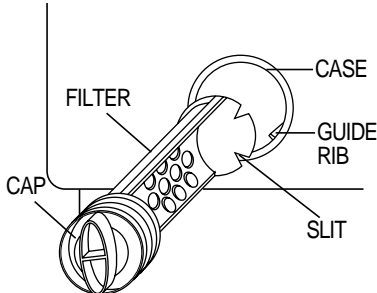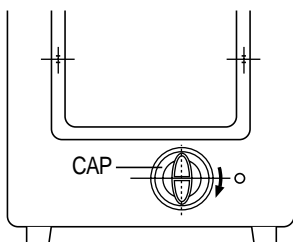
NOTES:
1. Keep the drain hose fixed tightly in the hose fixture, or let the highest point of the drain hose be more than 1m above the floor.
   If not so, the water in the washer could be drained during operation
2. Be sure that the height of the drain hose must be less than 1.5m above the floor.
   If not so, the water in the washer could not drain.
3. The hose guide MUST be fitted to the drain hose. The drain hose sould not extend more than 55mm from the end of the hose guide. This is to prevent 'SYPHONING'.
   If necessary the drain hose can be trimmed to length.

HOW TO CLEAN DRAIN FILTER

In this washer machine, the drain filter is equipped at the back side of it.
This drain filter is to screen the foreign stuffs such as threads, coins, pins, buttons etc..
And this should be cleaned frequently (every 5 times of use) for its smooth operation.
Drain problem could be caused if the drain filter is not cleaned at proper time.
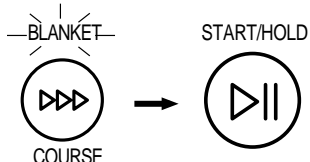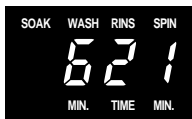Please keep it clean.
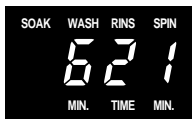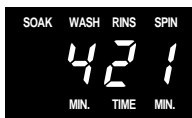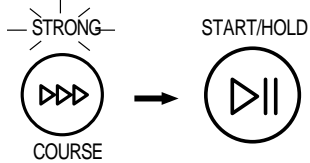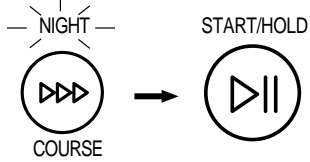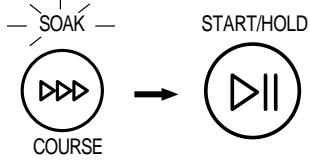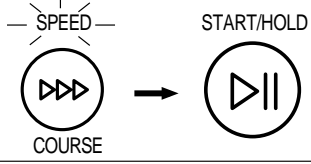
In case you clean the drain filter, please follow the instructions as below.

① Remove the remained water	② Unscrew the cap.	③ Release the filter assembly
• Put down the remained water in the hose. And put a container under the filter to collect water.	• Turn the cap counter clockwise.	• Pull out the filter assembly off the case of the main body.

④ Remove the foreign stuffs	⑤ Put the filter assembly back	⑥ Lock the cap.
• Clean the drain filter removing the foreign stuffs.	• Put in the filter along the guiding prominence of the case. Please note the right position of the filter adjusting the groove to the guide rib.	• Turn the cap clockwide tightly.

NOTES: During the operation, the "OE" signal means drain error can be displayed on the control panel.
In this case, the main cause of that problem is the blocking of the drain filter.
If you clean the drain filter following above instructions, you could continue the normal operation of the washing machine to reset the program, please turn the power off and on again.

6. PROCEDURE OF FULL-AUTOMATIC WASHING
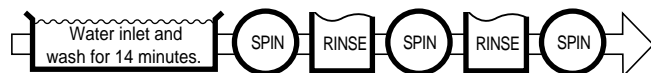
PROCEDURE OF FULL-AUTOMATIC WASHING

	¤ Full-Automatic	¤Ł Select the Course	¤Ø Procedure of Pressing the Button
Prepare for washing. ¡Ø Pressing the power switch ¡Ø Put the clothes into the tub. ¡Ø Select the washing course.	**BLANKET** SOAK WASH RINS SPIN **1425** MIN. TIME MIN.	This selection is effective for blanket, curtain, carpet, etc.. * 3 kg's limitation for one-time-wash.	—BLANKET— START/HOLD ▷▷▷ ▷❙❙ COURSE
	FUZZY (SENSOR)	This selection is for general washing.	— FUZZY — START/HOLD ▷❙❙
	DRY SOAK WASH RINS SPIN **621** MIN. TIME MIN.	This selection is effective for delicate clothes. * Just follow the washing procedure. * 1.5kg's limitation for one-time-wash.	— DRY — ▷▷▷ COURSE Put the exclusive detergent, dryten of 26g into the tub for dilution with water.
	SILK SOAK WASH RINS SPIN **421** MIN. TIME MIN.	This selection is effective for some clothes made of silk. * Do not put in the wash marked with 'dry-cleaning'. * 1kg's limitation for one-time-wash.	— SILK — ▷▷▷ COURSE Put the exclusive detergent, dryten of 26g into the tub for dilution with water.
	STRONG SOAK WASH RINS SPIN **1425** MIN. TIME MIN.	The selection is effective for blue-jean, climbing clothes, ruck-sack, sports wear, etc..	—STRONG— START/HOLD ▷▷▷ ▷❙❙ COURSE
	NIGHT SOAK WASH RINS SPIN **3039** MIN. TIME MIN.	This selection is for a night-washing housewife who has no opportunity at day time.	— NIGHT — START/HOLD ▷▷▷ ▷❙❙ COURSE
	SOAK SOAK WASH RINS SPIN **4425** MIN. TIME MIN.	This course is used to increase the wash effect by keeping the clothes soaked sufficiently in the wash water.	— SOAK — START/HOLD ▷▷▷ ▷❙❙ COURSE
	SPEED SOAK WASH RINS SPIN **1013** MIN. TIME MIN.	This selection is effective for washing light or less dirty wash.	— SPEED — START/HOLD ▷▷▷ ▷❙❙ COURSE

* As far as putting the power plug out, the selections for hot and cold water are remembered after washing. At next washing time, the remembered lamp will light on.

## ¤Œ Procedure of Washing (Washing machine does it automatically.)

Water inlet and wash for 14 minutes. SPIN RINSE SPIN RINSE SPIN
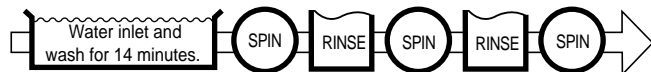
A Blanket course's water flow is (R) (R) (L) (L) (R) (L)

Water inlet and wash for 14 minutes. SPIN RINSE SPIN RINSE SPIN

Artificial brain computer controls full procedure proper to wash load automatically.

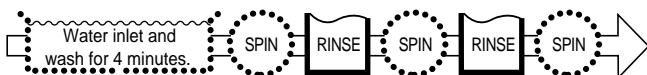| Buzzer signal to notify you can put the sensible clothes into the diluted water with Dryten. |

START/HOLD
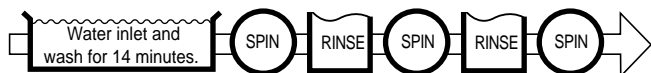Water inlet and wash for 6 minutes. SPIN RINSE SPIN RINSE SPIN
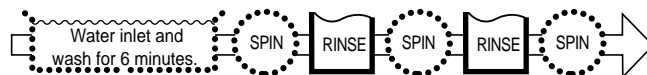
A part of dotted line is decreasing rotation velocity.
Because protect clothes from damage.

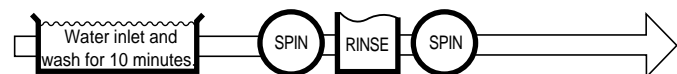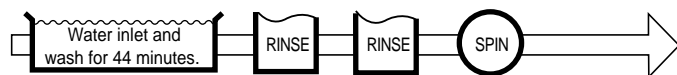| Buzzer signal to notify you can put the sensible clothes into the diluted water with Dryten. |

START/HOLD
Water inlet and wash for 4 minutes. SPIN RINSE SPIN RINSE SPIN

A part of dotted line is decreashing rotation velocity.
Because protect clothes from damage.

Water inlet and wash for 14 minutes. SPIN RINSE SPIN RINSE SPIN

A strong course's water flow is (R) (L) (R) (L) (R) (L) (R) (L) (R) (L)

Water inlet and wash for 30 minutes. RINSE RINSE RINSE SPIN

Water inlet and wash for 44 minutes. RINSE RINSE SPIN

Water inlet and wash for 10 minutes. SPIN RINSE SPIN

End of washing informed by buzzer.

After 10 minutes later from the end of the washing the power switch is turned off automatically.

After Washing: • Close the water tap and separate it from the inlet-hose.
If not so, the autovalve is out of order by the water pressure.
• Take off plug.

7. DIRECTIONS FOR DISASSEMBLY AND ADJUSTMENT

## DIRECTIONS FOR DISASSEMBLY AND ADJUSTMENT

WARNING
BEFORE ATTEMPTING TO SERVICE OR ADJUST ANY PART OF THE WASHING MACHINE, DISCONNECT THE POWER CORD FROM THE ELECTRIC OUTLET.

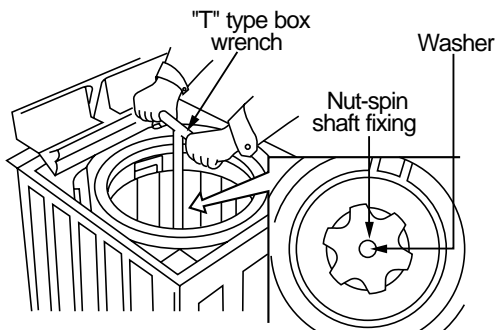### GEAR MECHANISM ASS'Y REPLACEMENT

- Raise the top plate on the outer cabinet.
- Loosen four screws mounting outer tub cover and remove outer tub cover from the tub ass'y
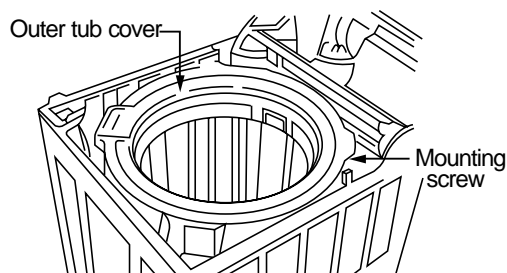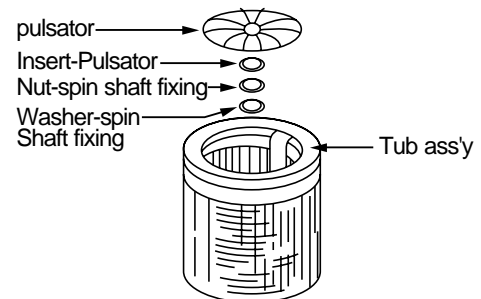

- Loosen the pulsator mounting screw and remove pulsator.
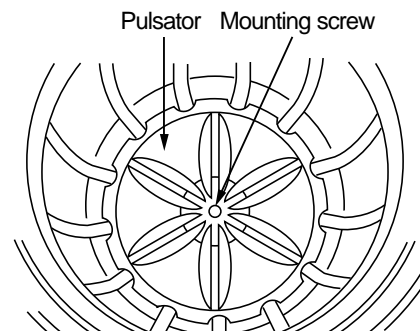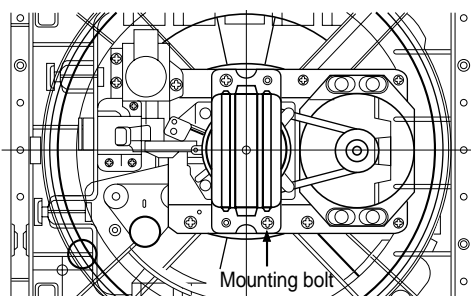

- Remove the pulsator washer.
- Remove the spinner shaft flange nut by using 'T' type box wrench.

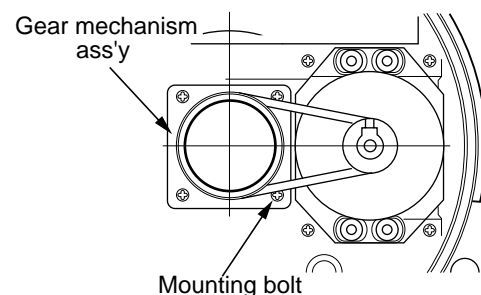- Remove the tub ass'y.

- Lay the front of the washer on the floor.
- Remove four bolts mounting the plate-gear protect by using a box wrench and remove plate-gear protect.
- Remove the V-belt.

- Remove four bolts mounting the gear mechanism ass'y by using a box wrench.
- Pull out the gear machanism ass'y.

NOTE: To assemble the gear mechanism ass'y, reverse the disassembly procedure.

DRAIN MOTOR

- Lay the front of the washer on the floor.
- Remove three bolts mounting the drain motor.
- Take out the wire of drain motor from the link brake.

Link brake   Wire

Drain Motor
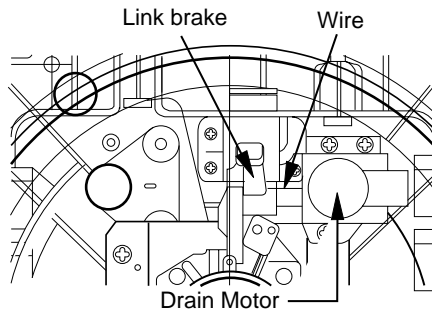
BRAKE ADJUSTMENT

- Loosen the adjustment bolt and turn the adjustment bolt until the end of the bolt touches to the brake lever.
- Tighten the lock nut and apply a small amount of paint-lock.

Adjustment bolt   Brake lever

Gear mechanism ass'y

Clutch lever
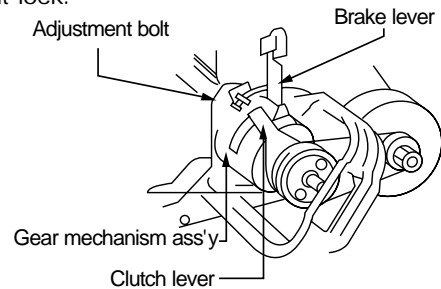
NOTE:
1. The brake adjustment has been made at the factory, so that it is not to re-adjust. However, in case of insufficient brake operation, perform the upper procedure.
2. Overtightening of the adjustment bolt will cause poor brake performance.
3. Undertightening of the adjustment bolt will cause continuous braking and, thereby, cause the problems of the motor during the spin cycle.

9. PRESENTATION OF THE P.C.B ASS'Y

PRESENTATION OF THE P.C.B ASS'Y

CONCERNING ERROR MESSAGE

MESSAGE	CAUSE	SOLUTION
OE	Improper installation of drain hose.	Install drain hose properly.
	The drain hose is blocked up by foreign matter.	Remove foreign matter from drain hose.
	Drain motor is inferior.	Change drain motor.
IE	The water tap is closed.	Open the water tap.
	The water inlet filter clogged.	Clean the water inlet filter.
	It passes over the 30 minutes, yet it doesn't come to assigned water level.	Check whether or not it comes to the assigned water level.
UE	Wash loads get uneven during spin.	Re-set wash loads evenly.
	Poor installation of the unit.	Install properly.
LE	The lid is opened.	Close the lid.
	The safety switch is inferior.	Change the safety switch.
E8	The load sensing is inferior. After the load sensing operates about 15 seconds, the message is displayed during 0.5 second and water level is always fixed 'high'.	Change the P.C.B ASS'Y.
E9	The water level sensing is inferior. The message is displayed continuously and a sound beep repeatly. The operation of machine is holding.	Check the water level sensor and the contact parts of the connector.
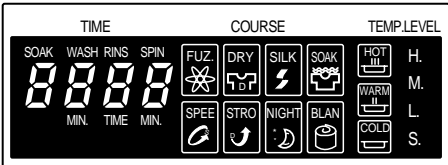
• Water-stop function
  ① If the water level sensor was inferior, then the machine displays error message 'E9' and is holding.
  ② If the water inlet valve was inferior and water inlet was not stopped, then drain pump act not to overflow.

CONVENIENT TEST FUNCTION

COURSE 1
Keep pushing three button (WASH, RINSE, SPIN) together and turn on the power switch.

	DISPLAY	FUNCTION
1	A B L5 5	A : Display of Load Data B : Display of Model Initial lighting status.
2	L0	LO: display that temparature sensor is not installed.
3		ALL LED light 8 times and go back to first stage.

COURSE 2
Processing COURSE 1, Push the SPIN button according to table, then you can check each part quickly.

Times to push the SPIN button		DISPLAY	FUNCTION
1st time	A	d151	Pulsator rotate without water in the tub and bubble pump on.
2nd time	B	d152	Drain ¡ Spin ¡ Cold water ¡ Hot water ¡ Pulsator rotate (right) ¡ Pulsator rotate (left) ¡ Pump ¡ Auto power off.
3rd time	C	d153	B course continues forever without auto power off.

MINUTE EXPLANATION DIAGRAM FOR EACH PARTS

MICOM IC (64 DIP)

Pin name	Pin	Pin	Pin name
P10/S00	1	64	P07
P11/SI0/SB0	2	63	P06
P12/SCK0	3	62	P05
P13/S01	4	61	P04
P14SI1/SB1	5	60	P03
P15/SKC1	6	59	P02
P16/BUZ	7	58	P01
P17/PWM	8	57	P00
TEST1	9	56	S29
RES	10	55	S28
XT1	11	54	S27
XT2	12	53	S26
VSS	13	52	S25
CF1	14	51	S24
CF2	15	50	S23
VDD	16	49	S22
P80/AN0	17	48	S21
P81/AN1	18	47	S20
P82/AN2	19	46	S19
P83/NT3	21	45	S18
P7/INT0	21	44	S17
P71/INT1	22	43	S16
P72/INT2/T0IN	23	42	VP
P73/INT3/T0IN	24	41	VDDVPP
S0/T0	25	40	S15/T15
S1/T1	26	39	S14/T14
S2/T2	27	38	S13/T13
S3/T3	28	37	S12/T12
S4/T4	29	36	S11/T11
S5/T5	30	35	S10/T10
S6/T6	31	34	S9/S9
S7/T7	32	33	S8/T8

LC866016C-5508
SANYO

ROM: 16384 x 8 bit
RAM: 384 x 8 bit

LOAD DRIVE UNIT
(CW WASH, CCW WASH, DRAINAGE, HOT WATER, COLD WATER, BUBBLE, AUTO OFF)

1) CIRCUIT DIAGRAM AND EXPLANATION
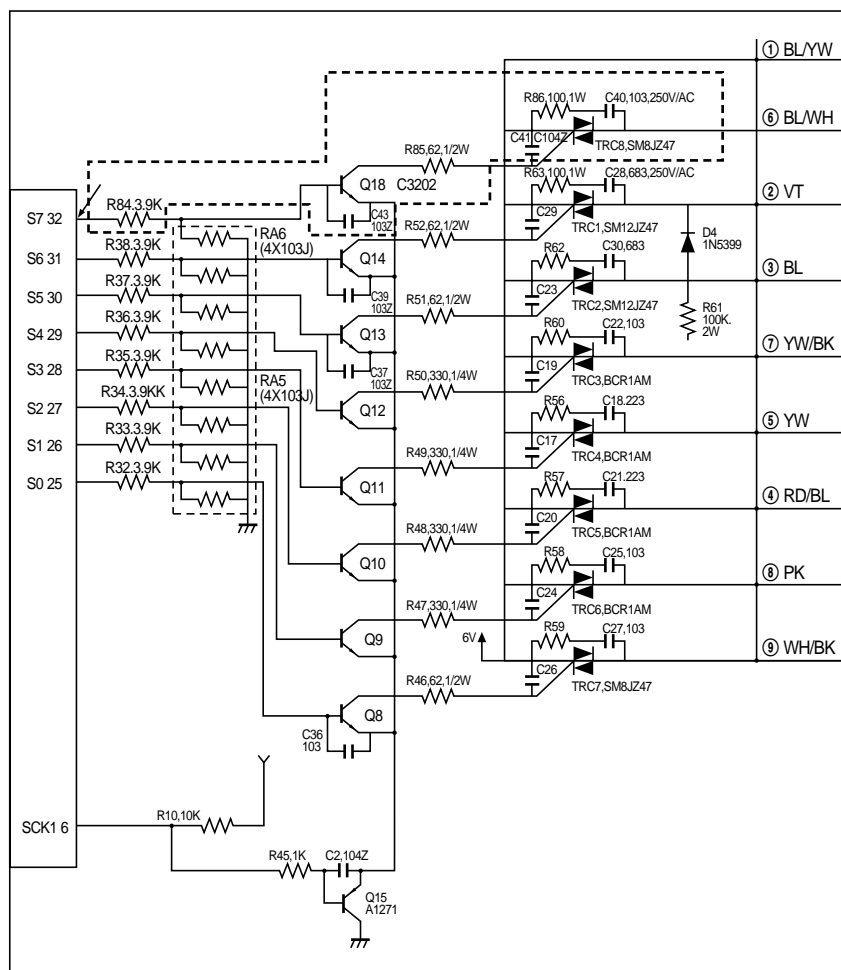
- Controlling load of button input in MICOM terminal, it is selected to 'L' or 'H'. It is selected to 'H' in running load case and in 'L' case, load driving is finished. In clockwise rotation of washing motor, as MICOM No. 31 is changed 0V to 5.4V, TR(Q14, C3202Y) is turn on. And then, the TRIAC1(SM12JZ47) is turn on, the source of electric power is supplyed to washing motor for clockwise rotation. The TRIAC, as switching element, force to 'ON' or 'OFF' by use of the Q14(C3202Y). In the rest loads, when the MICOM terminal voltage changes 0V to 5.4V, each TRIAC DRIVE TR is active, and then TRIAC switches the source of electric power to loads.

- The purpose of using the MICOM terminal No. 6 Q15(A1271Y) is that the Q15 prevents the instant supply of electric power supply to loads, in case MICOM's action is wrong by means of pushing initial power switch.

2) DETAIL EXPLANATION OF CIRCUIT ACTION (ACTION OF CW WASH)
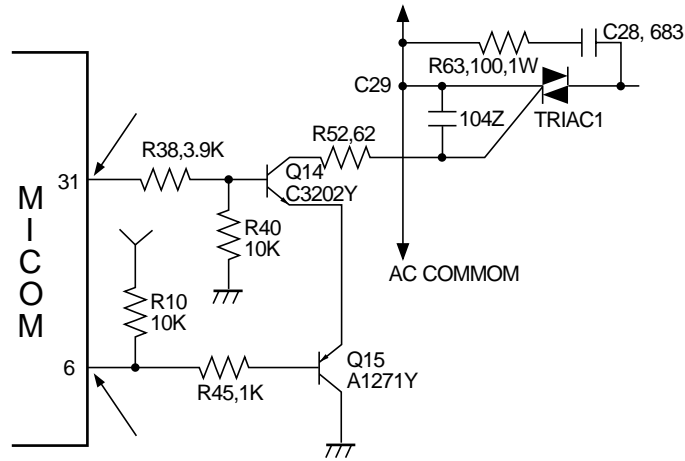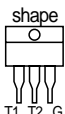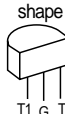
- In case MICOM terminal No. 31 is 'H' and No. 6 is 'L', Q14(C3202Y) & Q15 (A1271Y) turn on and control the TRIAC. The resistance, as 62 Ω & 1/2W, of R52 is used to limit the GATE current of the TRIAC.

- The resistance R38 (3.9KΩ, 1/4W) and R45 (1KΩ, 1/4W) control the base current of Q14 & Q15 in order as TR forces to turn on sufficiently.

- The ceramic condenser C29 between T1 and the GATE of the TRIAC is used for preventing the wrong action by means of the noise.

- The R63 (100Ω, 1W) and C28 (683K) between the T1 and T2 of the TRIAC is used for protecting the TRIAC, it is usually called SNUBBER CIRCUIT.

- The waveform of MICOM Pin No. 31 & 6.
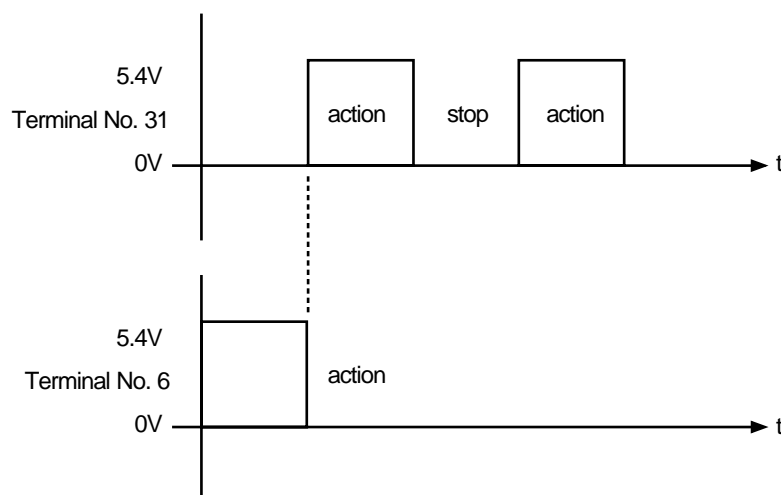
3) CAUTION AND CHECKING FOR A/S

• If load is active as soon as the power switch is 'ON', check the driving TRIAC of load.

SM12JZ47 (12A), SM8JZ47 (8A)		BCR1AM-12L	
shape T1 T2 G	• CHECK the resistance of the T1 & T2 of the TRIAC. (∞Ω). • CHECK the total parts without fail, in case the TRIAC has a short circuit.	shape T1 G T2	• CHECK the resistance of the T1 & T2 of the TRIAC. (∞Ω). • CHECK the total parts without fail, in case the TRIAC has a short circuit.

• Check the MICOM output terminal, if the load doesn't act although the TRIAC isn't anything wrong.

• Sometimes it is happened that the TRIAC DRIVE TR has a short circuit or an open circuit. In this case, being measured the resistance between the TR E & C with tester, the resistance value should be near the ∞ Ω. If not, the DRIVE TR is out of order.

• If the ceramic condenser (C17, C19, C20, C23, C24, C26, C29) using by protecting the noise between the GATE & T1 of each TRIAC has a short circuit, it has no voltage drop between the T1 and GATE. Therefore, the TRIAC is not turn on.

• If MICOM terminal No. 6 is not active from 5.4V to 0V, all DRIVE TR of the TRIAC are not turn on. Therefore, if the TRIAC is out of order, to begin with, check the MICOM terminal No. 6 and TR Q15(A1271) necessarily.

• The TRIAC's names and the values of the snubber & resistance of the total parts.

LOAD	TRIAC'S NAME	THE GATE'S RESISTANCES OF LIMITED CURRENTS	THE VALUES OF THE SNUBBER	THE RESISTANCES OF TOTAL PARTS
CW WASH	SM12JZ47 BCR 12PM-14L	63Ω, 1/2W	100Ω, 1W+683K AC 250V	
CCW WASH	SM12JZ47 BCR12PM-14L	62Ω, 1/2W	100Ω, 1W+683K AC 250V	
DRAINAGE	BCR1AM-12L	330Ω, 1/4W	100Ω, 1W+103K AC 250V	
HOT & COLD WATER	BCR1AM-12L	330Ω, 1/4W	100Ω, 1/W+223K AC 250V	
BUBBLE GENERATOR	BCR1AM-12L	330Ω, 1/4W	100Ω, 1W+103K AC 250V	
FUNCTION OF POWER AUTO OFF	SM8JZ47 BCR8PM-14L	62Ω, 1/2W	100Ω, 1W+103K AC 250V	

WATER LEVEL SENSOR UNIT
**1) CIRCUIT DIAGRAM**
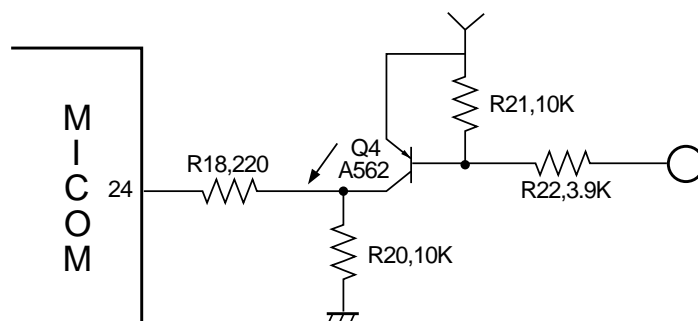
2) EXPLANATION OF CIRCUIT
- Push the power switch. And, in order to carry on the action of course selection, input the selection of frequency according to each water level selection.
- The frequency of water level sensor in each water level becomes square wave and is sended to the MICOM.

WATER LEVEL NAME	FREQUENCY	WATER LEVEL	DWF-5590
PUMPING	22.11 KHz	375 ; 15	-
HIGH	22.46 KHz	345 ; 15	52L
MEDIUM	23.08 KHz	290 ; 15	44L
LOW	23.71 KHz	235 ; 15	36L
SMALL	24.33 KHz	180 ; 15	28L
RESET	25.05 KHz		
0	25.30 KHz		

If the water level is selected 'HIGH' in washing, water supply proceeds until inputing the frequency 22.70 KHz of 'HIGH' in the MICOM terminal No. 24. Being finished the water supply, washing process is proceeded. After the washing process, water level reaches to RESET point, and then after the (D)+ 60 seconds, the spin process begins.

- The value of the frequency between the MICOM terminal No. 24 and the GND.
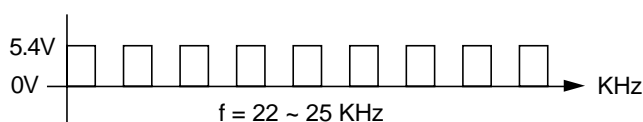
3) CAUTION FOR A/S
- The output of the frequency in the WATER LEVEL SENSOR varies in accordance with temperature and using condition. If it doesn't input the output of the WATER LEVEL SENSOR in the MICOM, the error message is displayed as 'E9'. In case of proceeding the water supply continuously in 'HIGH' water level, it is desirable to change the WATER LEVEL SENSOR because of the defect in the WATER LEVEL SENSOR.
- Check the TR Q4(A1270Y).
- Being checked with tester, the value of the voltage reaches about 4V.
- As the frequency is lower, the water level is higher.

ELECTRIC POWER SUPPLY UNIT
1) CIRCUIT DIAGRAM

REGULATOR

D1, 1N4003   7806   D6, 1N4003   220V

16

C32 | C13 | C34 | C32 | C31 | C33

104Z | 3300µF 10V | 410µF 16V | 104Z | 104Z | 220µF 35V

D5, 1N4003   COMMON
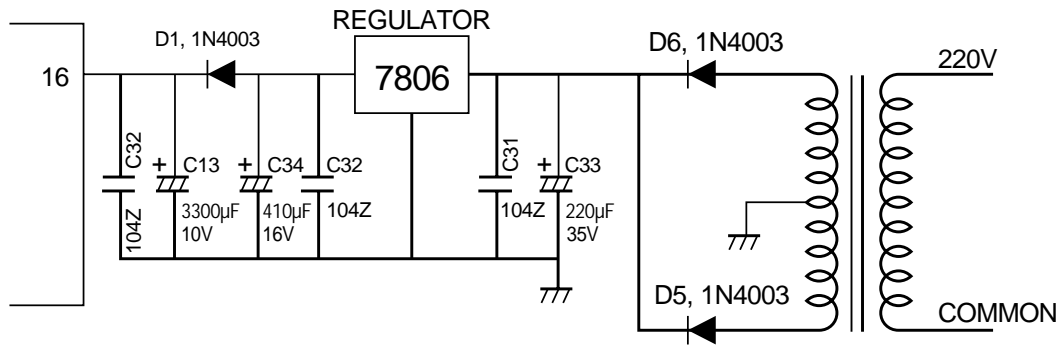
2) EXPLANATION OF CIRCUIT
  • The primary voitage of the transformer sets 220V, the secondary voltage of the transformer is full wave rectified by use of the D7 (1N4003) & D8 (1N4003)

① The gray & red (The waveform in secondary part of the transformer)

f=60Hz

Vpeak=11.4V
Vrms=8V
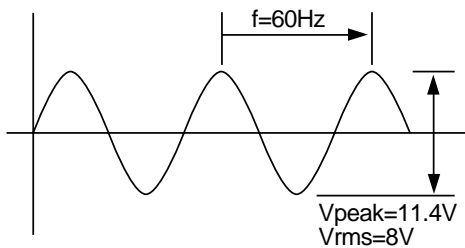
④ The waveform of output in the REGULATOR I.C. 7806.

6V

0V
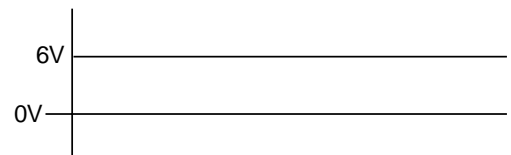
② Measuring the waveform in case of the removing condenser by the removal ripple C33.

0V
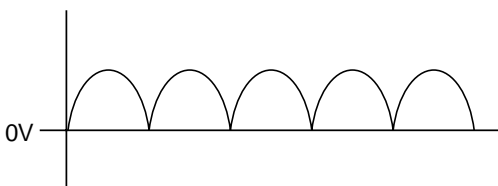
⑤ The waveform after passing the D2.

5.4V

0V
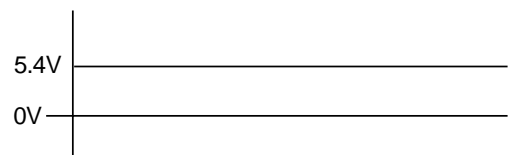
③ It is removed the ripple with attaching the C33 (2200¥F).

12V

- The Electrolytic condenser C13(3300μF, 10V) and diode D2 is used in order that at instant power supply failure circuit should remember the contents of the program. It happens that the MICOM terminal No. 16 has instant interruption of electric power, yet the MICOM is not discharged electricity because of the diode D2.

- The measurement of voltage

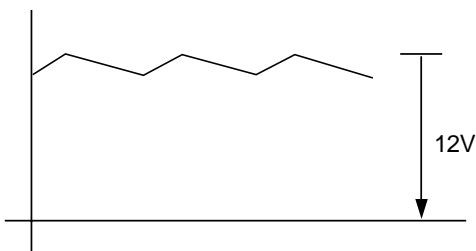|	EFFECTIVE VALUE ①	②	③	④	⑤
82.5V	5.2V	7.9V	7.9V	5.97V	5.4V
119V	7.2V	11V	11V	5.97V	5.4V
137.5V	9.3V	14.1V	14.1V	5.98V	5.4V
165V	5.3V	7.6V	7.6V	5.96V	5.4V
220V	7.6V	10.6V	10.6	5.98V	5.4V
275V	9.7V	13.7V	13.7V	5.98V	5.4V

3) CAUTION FOR A/S
- Measure the voltage of input terminal REGULATOR I. C. of 7806 with tester. And, compare the measuring value with the voltage table.
- Check the condenser in case the electrolytic condenser and ceramic condenser have short circuit. The reason is that it happerns no electric power supply.

```
        7806
INPUT         OUTPUT
        GND
```
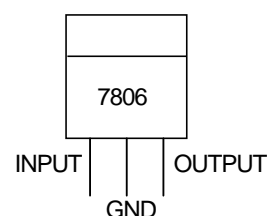
INTERRUPT UNIT
1) CIRCUIT DIAGRAM
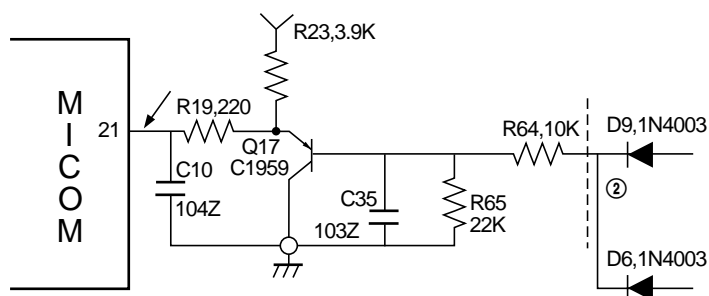
2) EXPLANATION OF CIRCUIT
The INTERRUPT UNIT is necessary to reduce the generation of surge, by use of being voitage 'ON' from the zero voltage.

- The waveform of the part ①

f=60Hz

Vpeak=11.4V
Vrms=8V
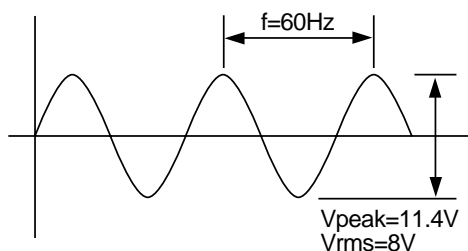
- The waveform of the part ② (in case of cutting the part of the dotted line)

0V
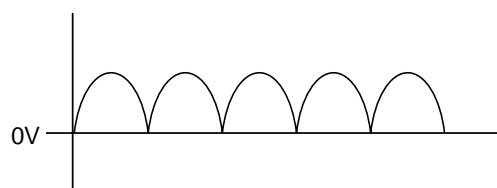
- After connecting the part of the dotted line & waveform measurement
- The waveform measurement in the MICOM No. 21
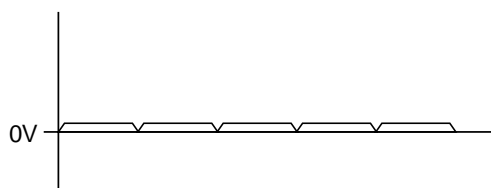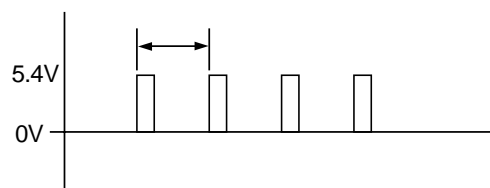
The waveform of the secondary part in transformer passes through the diode D6, D9 (1N4003), and then the voltage is divided by means of the resistance R64 & R65. This voltage gives force to input the pulse to the MICOM terminal No. 21 on the ground of action of the TR Q17 (C3202Y).

3) CAUTION FOR A/S
- When the phenomenon of no electric power supply happens, to begin with check the electric power supply unit, and then check the INTERRUPT UNIT. It is desirable to measure Q17 (C3202Y) with tester and C10 (C103Z).

RESET UNIT
1) CIRCUIT DIAGRAM
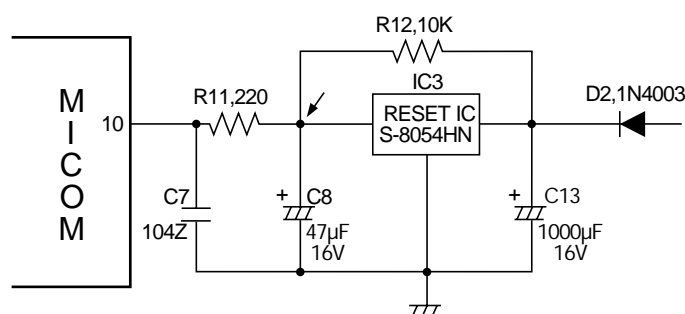
2) EXPLANATION OF CIRCUIT
- The RESET unit is a hardware circuit, of which all programs are initialized, when the power switch is 'ON'. Here, the reason why uses RESET I. C. is that the RESET UNIT prevents the MICOM from incorrect action. Also, R11 & C7 (104Z), as a RC fiter, is used in order to absorb the noise.
- The waveform measurement of the part ① with being 'ON' the power switch.
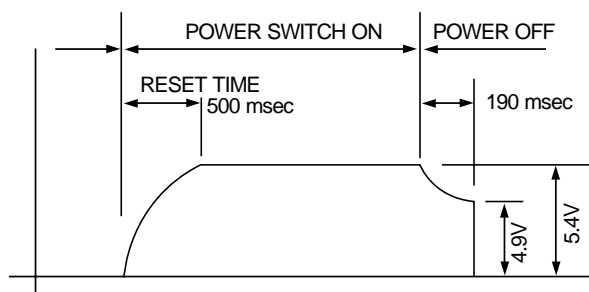
3) CAUTION FOR A/S
- Check the output of the RESET I. C. and judge whether or not it is something wrong.
    1. OUTPUT
    2. INPUT (VDD)
    3. GROUND
- The R12 and C8 turn on the accurate RESET value with controlling the RC time constant.

BUZZER UNIT
1) CIRCUIT DIAGRAM
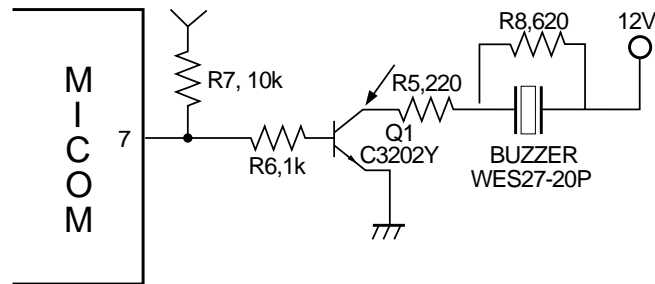
2) EXPLANTION OF CIRCUIT
- After the button action and total process ends, BUZZER is active.
- It is active directly with offering an output the frequency waveform of 2 KHz from the MICOM terminal No. 7
- The R7 is 'PULL UP' resistance, and R8 is restrict resistor of Q1 base current, and R5 is resistance of excess current under phenomenon of short circuit, when the electric current changes abruptly according to the condenser component of piezoelectric element, and R8 remove the phenomenon of abnormal oscillation by preventing the collector floating state of Q1.
- The waveform in the part of the BUZZER DRIVE TR Q1 collector.
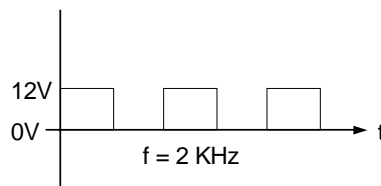
BUZZER INPUT UNIT
1) CIRCUIT DIAGRAM
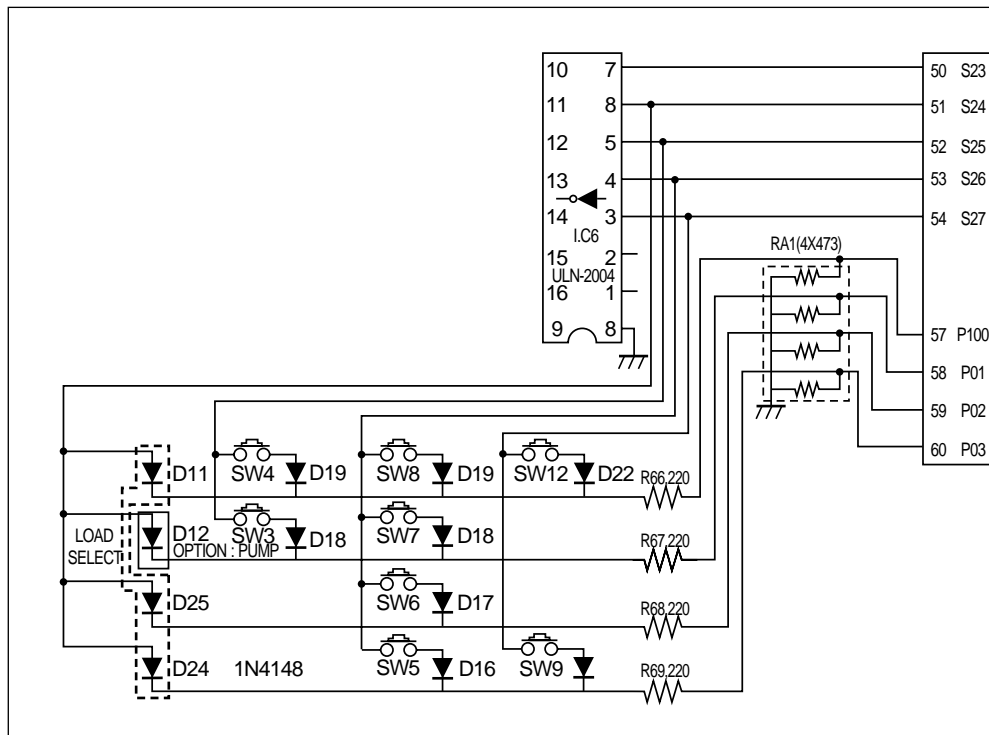
• Part of the button scan
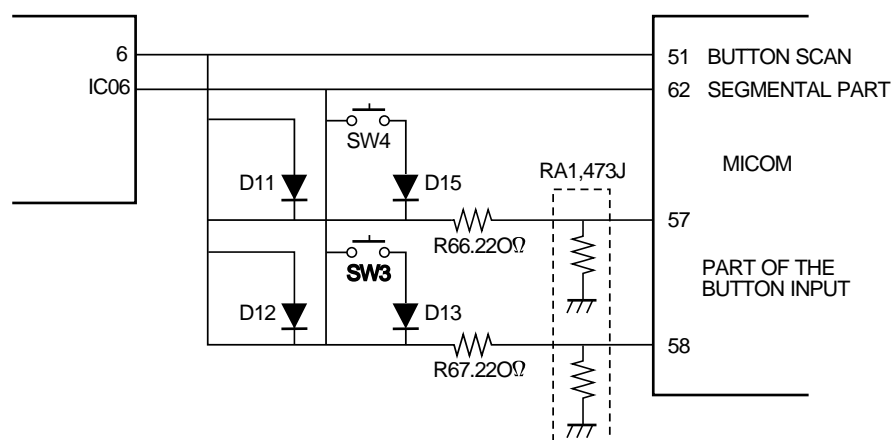
The system of the BUTTON SCAN is in wide use for the method of the DUTY output part in L. E. D DRIVE yet here. It is in use for the method of the segmental output.
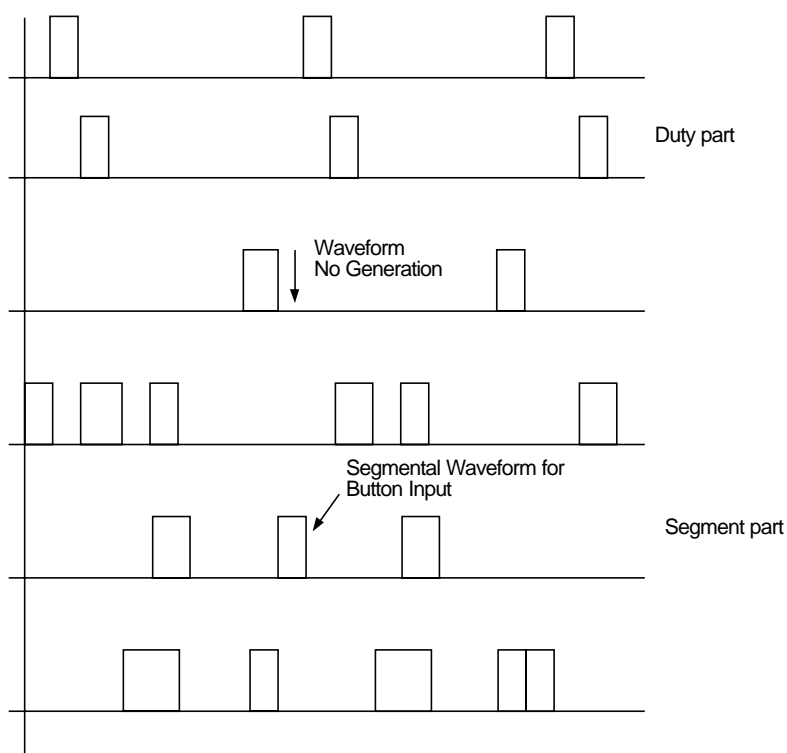
• Though the period of the DUTY part is 1/9, the last 9th part does not generate the waveform and checks the button input with getting out the segmental output at the same time.
• RA1 (473J, 47KΩ) is a 'PULL DOWN' resistance for preventing floating action.
• D15 prevents the L. E. D from turning on unnecessarily with forming the closed loop like a threaden line at the time of button push.

OSCILLATION UNIT
1) CIRCUIT DIAGRAM
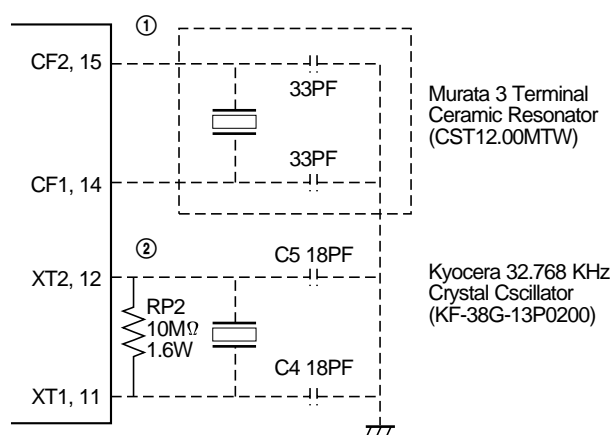
2) EXPLANATION OF CIRCUIT
- As the OSCILLATION UNIT is a basic part of the MICOM DRIVE. If the oscillation doesn't generate, we are able to consider that the MICOM is destroyed.
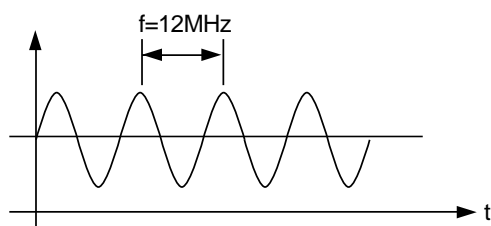
–The waveform between the part of ① and the GND.   –The waveform between the part of ② and the GND.
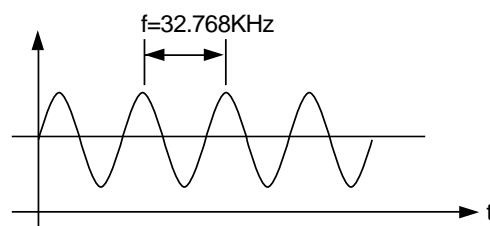
- Specification of oscillator

TYPE OF OSCILLATOR	MAKER	NAME OF OSCILLATOR	CONDENSER	
			C1	C2
12MHz CERAMIC RESONATOR	MURATA	CST 12.00 MTW	33PF	33PF
32.768KHz CRYSTAL OSCILLATOR	KYOCERA	KF-38G-13P0200	18PF	18PF

It is in general use for the MICOM maker's recommendatory value of condenser which is fit for MICOM's characteristics.

- The R82(18MΩ, 1/4W) is in use to get rid of the initial abnormal oscillatory phenomenon of the 32.768 KHz crystal oscillator.

SAFETY SWITCH UNIT
1) CIRCUIT DIAGRAM

R4,3.9KΩ

R3.220Ω

Safety
S/W

C1
104Z
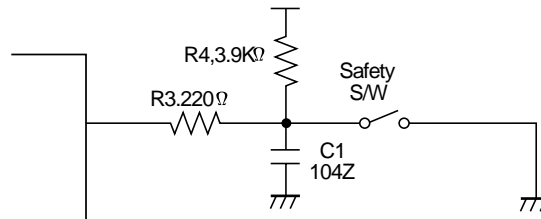
2) EXPLANATION OF CIRCUIT
- The MICOM terminal No. 63 gets into 'L' at the state of the closed lid. If the lid is opened in spining stage, the MICOM generates error signal as 'LE'.
- Case of range 40 mSEC~300 mSEC in spining time: It is regarded that washing clothes should be inclined. Accordingly washing time increases 8 minutes and rinsing action takes place another one time. Case of above 400 mSEC: It is regarded that the lid should be open. Therefore it is displayed as 'LE'.

3) CAUTION FOR A/S
- Be level with the ground.
- The 'UE' error occurs in case of not being level with the ground.
- The waveform between the MICOM terminal No. 63 and the GND.

5.4V

0V

Lid is closed

Lid is open

t

LOAD SENSOR UNIT
1) CIRCUIT DIAGRAM

TRIAC

MOTOR

RUNNING CONDENSOR

5.4V

6V

IC4

D5

M
I
C
O
M

23

R13, 220

①

Q3
A562

R39,10K

R53, 10K

Q16
C1959

R55, 10K

1N4148

PC817

22

R14, 220

C12
104Z

R17
10K

R54
3.9K
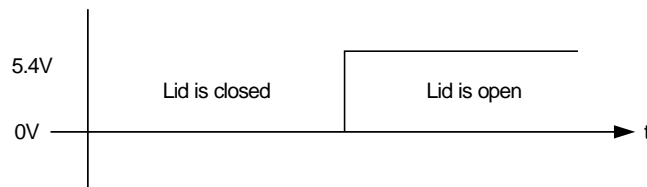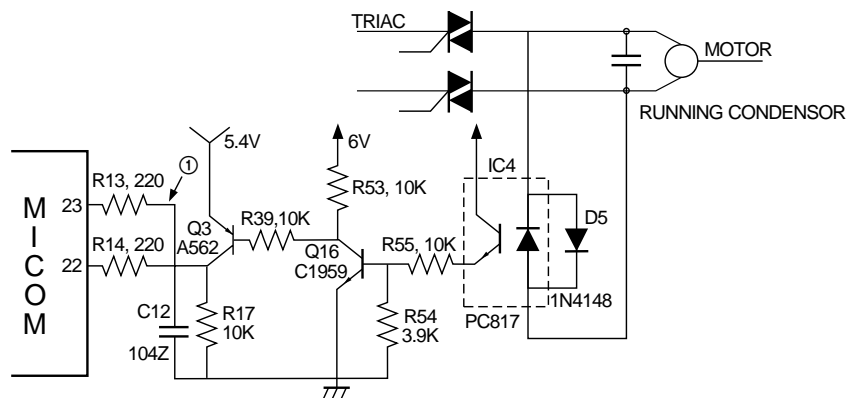
2) EXPLANATION OF CIRCUIT
- After TRIAC is off, RUNNING CONDENSOR discharges the voltage charged in it and sinwave is generated at this time. MICOM starts to check every 0.224ms the time from 2nd falling edge to 3rd falling edge. Photo coupler (IC4) of PCB converts the sinwave into clock pulse (times X 0.224ms) and send it to MICOM terminal No. 22 & 23. MICOM checks the clock pulse and counts the periodic time and judges the water level after comparing with data which is already memorized in the MICOM.
- The waveform between the part of ① and GND (Waveform of pulse)

triac on

triac off

5.4V

0

1st

2nd

3nd

(time X 0.224ms)

• The element which has an effect on data of LOAD SENSOR
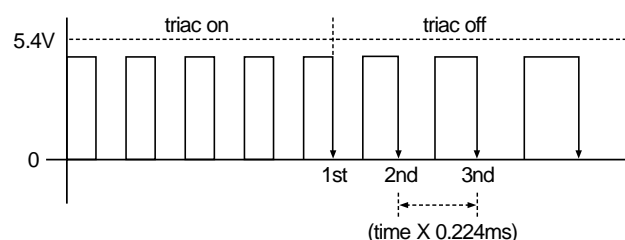
CONDITION	SPECIFICATION
VOLTAGE	220V AC
CAPACITY OF CONDENSER	13.5 μF
TENSION OF BELT	450 gf

DISPLAY UNIT

1) CIRCUIT DIAGRAM

2) EXPLANATION OF CIRCUIT

- The MICOM terminal No. 33~40 amplifies the source current to produce the 'H' by use of the buffer UDN-2981A. And the MICOM terminal No. 43~54 sufficiently amplifies the sink current by use of the DRIVE I.C. ULN-2004A.
- The waveform between the part of ① and the GND (part of the DUTY).
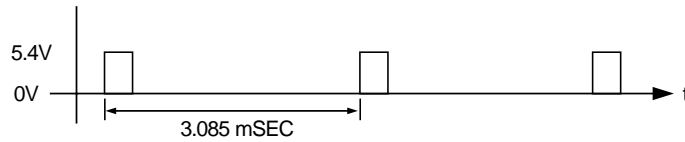
The division rate of the DUTY is 1/9. And as part of the DUTY treats the black time between the square waves, it prevents the phenomenon of faint lighting of L.E.D unnecessarily due to the phenomenon of fold in delay time of the IC 8 between the input and the output.

- The equivalent circuit of DRIVE IC & BUFFER IC.
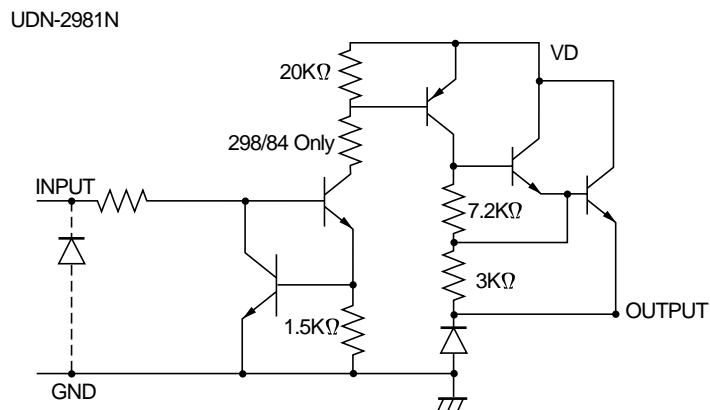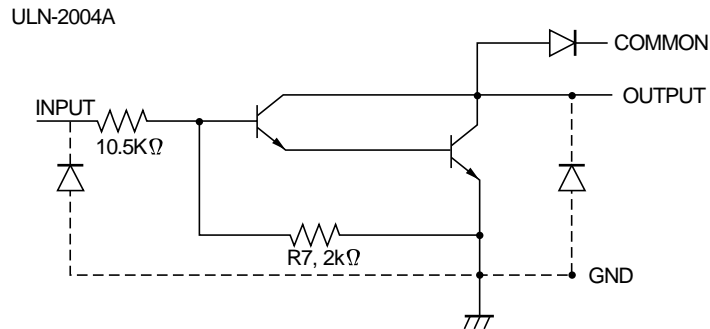
- If the light of the DISPLAY unit is does not appear, check the circuit using the oscilloscope.

PARTS LIST (DWF-5590DP SERIES)

REF No.	PART CODE	PART NAME	DESCRIPTION	Q'TY	REMARK
P01	3614508200	PLATE T	ABS	1	ONLY
P02	3614203000	PANEL F	ABS	1	ONLY
P03	3614207700	PANEL B	ABS	1	ONLY
P04	3611703401	DOOR B	ABS	1	ONLY
P05	3611403100	COVER DOOR	ABS	1	COMMON 6670
P06	3615500500	WINDOW DISPLAY	ABS	1	COMMON 6670
P07	PRESSWEG00	PCB ASSY	DWF-5590DPN, DPM	1	
P07	PRPSSWGM00	PCB ASSY	DWF-5590DPT, DPS	1	
P08	5EP4054821	TRANS POWER	T3-V2F (220-240V/50Hz)	1	
P08	5EP4054801	TRANS POWER	T3-V2(220-240V/50Hz)	1	
P08	5EP4054811	TRANS POWER	T3-V1(110V/60Hz)	1	
P09	3612709360	HARNESS AS	DWF-5590	1	ONLY
P10	3610016000	ASSY PUMP BUBBLE	AC 220-240V/50Hz	1	
P10	3610016020	ASSY PUMP BUBBLE	AC 110V/60Hz	1	
P11	3615103800	SPRING RIGHT	SUS 304 D=1.8	1	COMMON 6670
P12	3616600600	BUTTON START	SILICON	1	COMMON 6670
P13	3612300100	GASKET	SILICON	2	COMMON 6670
P14	3610064500	ASSY CAP VALVE	COLD	1	COMMON 6670
P14	3610064700	ASSY CAP VALVE	HOT	1	COMMON 6670
P15	3619001600	SWITCH POWER	SOL. 220V	1	
P15	3619002000	SWITCH POWER	SOL. 240V	1	
P15	3619002300	SWITCH POWER	SOL. 110V	1	
P16	3615403830	VALVE INLET (WARM)	AC 220-240V/50Hz	1	COMMON 6670
P16	3615403630	VALVE INLET (WARM)	AC 110V/60Hz	1	COMMON 6670
P17	3615403710	VALVE INLET (COLD)	AC 220-240V/50Hz	1	COMMON 6670
P17	3615403510	VALVE INLET (COLD)	AC 110V/60Hz	1	COMMON 6670
P18	3619006300	SWITCH SAFETY AS	DC 15V, 10mA	1	
P19	3611601900	DECORATOR	PC FILM 0.254T	1	ONLY
P20	3610901000	CAP	CR	2	COMMON 6670
P21	3611504100	CUSHIONG DOOR	CR	4	COMMON 6670
P22	3619000700	SWITCH PRESSURE	KANBAYASHI (PS-D6)	1	
P23	3611703501	DOOR A	ABS	1	ONLY
P24	3616001200	SPECIAL BOLT	T1 TRS 5X73 MFZN	2	
P25	7122401608	SCREW TAPPING	T2S TRS 4X16 SUS	2	
P26	3611411300	COVER WASH	ABS	1	ONLY
B01	3612200800	FRAME T	PP	1	ONLY

REF No.	PART CODE	PART NAME	DESCRIPTION	Q'TY	REMARK
B02	3610801600	CABINET	PCM 0.7T	1	ONLY
	3610801610		PCM 0.7T		
B03	3610303200	BASE U	PP	1	ONLY
B04	3611404400	COVER BACK	PP	1	ONLY
B05	3614501900	PLATE UPPER	PP	1	COMMON 6670
B06	3617700400	LEG FIX	RUBBER BUTYL	2	COMMON 6670
B07	4509M10032	FIXTURE	PP	2	COMMON 6670
B08	7122502011	SCREW TAPPING	T2S TRS 5X20 MFZN	2	
B09	3612000200	FIXTURE LEG	PPG	2	COMMON 6670
B10	3618900700	UNIT LEG	RUBBER+BOLT	2	COMMON 6670
B11	3613000600	HOLDER LEG	ABS	2	COMMON 6670
B12	3963513430	MOTOR SHADED POLE	AC 220-240V/50Hz	1	
	3963821530		AC 120V/60Hz		
	3618907230		AC 127V/60Hz		
B13	3612600700	HANDLE CABINET	PP	2	COMMON 6670
B14	3613203101	HOSE AS	DWF-5230PN	1	
B15	3611200200	CLAMP B	SW 2.6D ZN8-C	1	
B16	3610045630	ASSY CONDENSER	11.4µF+60µH, CONNECTOR	1	
	3610076130		54µF+60µH, CONNECTOR		
	3610076230		41.6µF+60µH, CONNECTOR		
B17	3611901800	FILTER LINT	PP	1	E-TYPE
B18	3614002000	PACKING	NBR	1	E-TYPE
B19	3616004300	SPECIAL WASHER	PE	1	E-TYPE
B20	3610903800	CAP FILTER	PP	1	E-TYPE
B21	3611109700	CASE FILTER	PP	1	E-TYPE
B22	3611109700	COVER PUMP	UL/CSA HIPS,FRPS	1	E-TYPE
T01	7122401211	SCREW TAPPING	T2S TRS 4X12	MFZN	4
T02	3611407500	COVER TUB *0	PP	1	ONLY
T03	4505E32030	SPECIAL SCREW	6X26.5	1	
T04	4505E32050	RING 0	D5.5	1	COMMON 5570
T05	3610055900	PULSATOR AS	DWF-5570	1	COMMON 5570
T06	4507D83080	SPECIAL NUT	SUS 304	1	COMMON 5570
T07	4509L83070	SPECIAL WASHER	SUS 304 T2.0 P144	1	COMMON 5570
T08	3619800900	SUSPENSION AS	DWF-5590, L=107, YL	2	ONLY
T09	3619801000	SUSPENSION AS	DWF-5590, L=95, WH	2	ONLY
T10	4505E36000	BALANSER AS	2.750kg	1	
T11	3610085500	ASSY FILTER	PP(NYLON 74X130)	1	COMMON 5570
T12	4505E05021	FLANGE TUB	ADC-10	1	COMMON 5570

REF No.	PART CODE	PART NAME	DESCRIPTION	Q'TY	REMARK
T13	3618802400	TUB *0	PP	1	ONLY
T14	4500D83100	NOZZLE AS	ABS+POLY-URETHANE	1	COMMON ALL
T15	7122401208	SCREW TAPPING	T2S TRS 4X12 SUS	2	
T16	4500D08170	HOSE	ID=8.0, 0D=12.0	1	L=330mm
T17	4500D08180	CLAMP	SWC	1	
T18	3611502800	CUSHION DOWN	P.O.M	2	
T19	3611502000	CUSHION UPPER	P.O.M	2	
T20	7650804211	BOLT HEX	6B-1 8X42 S.P/W MFZN	4	
T21	3610302900	BASE	SECEN 1.6T	1	
T22	3966010140	MOTOR SYNCHRONOUS	AC 220-240V/50Hz	1	
	450ED45040		AC 110/50Hz		
T23	4505E83100	SPECIAL BOLT BASE	6.5X23	2	
T24	3617303801	GEAR MECHANISM	GM-5570, DIA=102	1	COMMON 5570
T25	3617801000	LINK BRAKE	P.O.M	1	COMMON 5570
T26	7640801611	BOLT HEX	6B-1 8X16 SW MFZN	4	
T27	7122401208	SCREW TAPPING	T2S TRS 4X12 SUS	1	
T28	4505E83120	SCREW BASE FIX	SM 5X13	2	
T29	4505E83100	SPECIAL BOLT BASE	6.5X23	8	
T30	3611201000	CLAMP	HSW3, D2.6, MFZN	2	
T31	3613212100	HOSE DRAIN I	LDPE0EVA, L-184	1	ONLY
T32	3618301300	PROTECTOR GEAR	SECEN 1.6T	1	ONLY
T33	7640061611	BOLT HEX	6B-1 6X16 SW MFZN	2	
T34	4507D20011	PULLEY MOTOR	ADC-12 DS=10 DP=53 50Hz	1	
	3618401100		ADC-12 DS=10 DP=48.5 60Hz		
T35	3616000702	SPECIAL BOLT-PULLEY	6B-1 6X20 SM20CK (ZN)	1	
T36	7393600011	NUT HEX	6N-3-6 MFZN	1	
T37	4507D34020	BELT V	M20	1	
T38	4505E05030	GUIDE FILTER	PP	1	
T39	3618801000	TUB ¡I	PP	1	COMMON 5570
T40	3964310140	MOTOR CONDENSER	AC220~240V/50Hz	1	CONNECTOR
	3964720110		AC127V/60Hz		
	3964220610		AC110V/60Hz		