

**SAMSUNG**

# WASHING MACHINE DRUM TYPE

**Basic Model :** **WF326LAS**

**(FRONTIER1-PJT)**

**Model Name :** **WF337AAW WF337AAL**

**WF337AAG WF337AAR**

**(FRONTIER2-PJT)**

**WF328AAW WF328AAG**

**WF328AAR**

**(FRONTIER3-PJT)**

**Model Code :** **WF337AAW/X\*\***

**WF328AAW/X\*\***

**WF328AAR/X\*\***

# ***SERVICE*** *Manual*

## WASHING MACHINE



**WF337AAW / WF328AAW**

## THE FEATURE OF PRODUCT

1. SilverCare Sanitization
2. Extra Large Capacity
3. High Efficiency Energy & Water Saving
4. Direct Drive Inverter Motor
5. Woolmark Certified

Refer to the service manual in the GSPN (see the rear cover) for the more information.

# CONTENTS

---

## 1. PRECAUTIONS

1-1. Safety Precautions.....	1-1
1-2. Precautions upon Installation .....	1-2

## 2. PRODUCT SPECIFICATIONS

2-1. FEATURES.....	2-1
2-2. SPECIFICATIONS OF PRODUCT .....	2-2
2-3. OVERVIEW OF THE WASHING MACHINE.....	2-3
2-4. THE COMPARATIVE SPECIFICATIONS OF PRODUCT.....	2-4
2-5. OPTION SPECIFICATIONS .....	2-5

## 3. OPERATING INSTRUCTIONS

3-1. OPTION SPECIFICATIONS .....	3-1
3-2. PROGRAMME CHART.....	3-3
3-3. MAIN FUNCTIONS.....	3-4
3-4. TECHNICAL POINT .....	3-6

## 4. ALIGNMENT AND ADJUSTMENTS

4-1. GENERAL ERROR FUNCTION.....	4-1
4-2. TEST MODE.....	4-2

## 5. ASSEMBLY AND DISASSEMBLY

5-1. TOOLS FOR DISASSEMBLY AND ASSEMBLY .....	5-1
5-2. DISASSEMBLY .....	5-2

## 6. TROUBLE SHOOTING

6-1. TROUBLE DIAGNOSIS .....	6-1
6-2. PROBLEM CHECKING AND METHOD OF PCB .....	6-10

## 7. EXPLODED VIEWS AND PARTS LIST

7-1. THE CONTROL PARTS.....	7-2
7-2. THE DOOR PARTS .....	7-6
7-3. THE TUB PARTS.....	7-10
7-4. THE FRAME PARTS .....	7-16
7-5. PARTS LIST (SA/SC others) .....	7- 20

# CONTENTS

---

## 8. BLOCK DIAGRAM

8-1. BLOCK DIAGRAM .....	9-1
--------------------------	-----

## 9. WIRING DIAGRAM

9-1. WIRING DIAGRAM.....	10-1
9-2. REFERENCE INFORMATION.....	10-2

## 10. PCB DIAGRAM

10-1. MAIN PCB LAYOUT .....	11-1
10-2. CONNECTOR & RELAY TERMINALS DESCRIPTION (MAIN PBA) .....	11-2
10-3. CONNECTOR & RELAY TERMINALS DESCRIPTION (SUB PBA) .....	11-3
10-4. SUB PCB LAYOUT (THE PRINCIPLE PART) .....	11-4
10-5. AG PBA CONNECTOR TERMINAL DESCRIPTION & LAYOUT (THE PRINCIPLE PART).....	11-5

## 11. SCHEMATIC DIAGRAMS

11-1. MAIN PCB.....	12-1
11-2. SUB PCB.....	12-2
11-3. AG PCB.....	12-3

## 12. CIRCUIT DESCRIPTIONS

12-1. OVERALL SYSTEM .....	13-1
12-2. POWER SUPPLY PART .....	13-2
12-3. DRIVING PART .....	13-3
12-4. SENSING PART .....	13-4
12-5. COMMUNICATION PART .....	13-5
12-6. DD MOTOR CONTROL CIRCUIT .....	13-6

## 13. REFERENCE INFORMATION

13-1. MODEL NAME .....	14-1
13-2. TERMINOLOGY.....	14-2
13-3. FABRIC CARE CHART .....	14-3
13-4. ELECTRICAL WARNINGS .....	14-4
13-5. Q & A .....	14-5

---

# 1. PRECAUTIONS

---

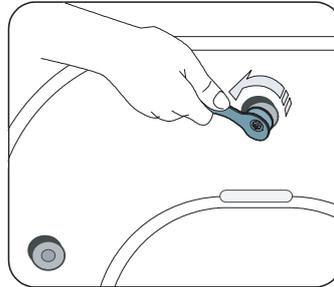
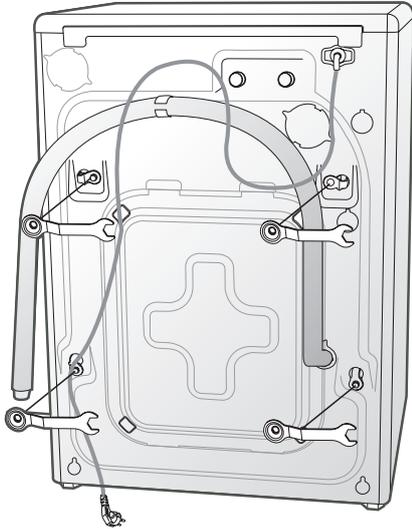
## 1-1. Safety Precautions

---

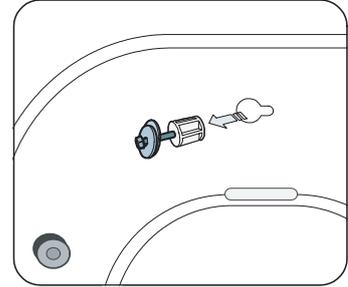
- 1. Do not allow the customer to repair the product.**
  - ☞ It may cause personal injury or product damage when the unit is serviced by unqualified personnel.
- 2. Disconnect power to the appliance before servicing.**
  - ☞ Be aware of the possibilities of an electric shock.
- 3. Do not use multi-plug.**
  - ☞ Power outlet may be overloaded causing the socket to overheat.
- 4. Check for any damage on power plug or power outlet.**
  - ☞ Replace it immediately if it has problem. (It may cause an electric shock or fire)
- 5. Make sure the product is properly grounded.**
  - ☞ May cause electric shock.
- 6. Do not clean the product with water.**
  - ☞ May cause electric shock / fire or shorten product life.
- 7. The wiring harness should be free from moisture and connected properly during serving.**
  - ☞ It should be proof against any external force.
- 8. Remove any dust or dirt in the product, wiring section and connections during servicing.**
  - ☞ Protect against possibilities of fire due to tracking etc.
- 9. Check for any water trace on electrical parts, harness, etc.**
  - ☞ Replace the parts and/or wipe dry with work towel.
- 10. Check the assembled status of the parts after servicing.**
  - ☞ Check if the product is assembled in the same status as before servicing.
- 11. Be sure not to pull on the power cord but to unplug it by holding the plug.**
  - ☞ Beware of possibility of electric shock or fire when the power cord is damaged.
- 12. Unplug the power plug from the outlet when the washing machine is not used.**
  - ☞ Beware of possibility of electric shock or fire while Electrical Storm.
- 13. Do not use or put flammable materials (including gasoline, alcohol, thinner etc) around the washing machine.**
  - ☞ Flammable materials may spark an explosion or fire.
- 14. Do not put a water containing bowl or wet laundry on the washing machine.**
  - ☞ It may cause an electric shock or fire, or shorten the product life if water penetrates into the washing machine.
- 15. Do not install the washing machine in a place where it is exposed to snow, Rain, or Moisture.**
  - ☞ It may cause an electric shock or fire and shorten the product life.
- 16. Do not press control buttons with pointed objects such as pins, needles, etc.**
  - ☞ It may cause an electric shock or other problems.
- 17. Check the washing machine is leveled horizontally on the floor and is installed properly.**
  - ☞ Vibration may shorten the product life.
- 18. Make sure to use connectors when connecting wires.**
  - ☞ If wires are connected without connectors, it may cause a tracking fire.
- 19. When the washing machine is to be laid down for servicing, put a pad on the floor and lay the product on its side slowly.**
  - ☞ If the wash machine is laid on its front, internal components may be damaged by the tub.  
Be sure to use 2 or more people to lay down the unit on its side for servicing.

## 1-2. Precautions upon Installation

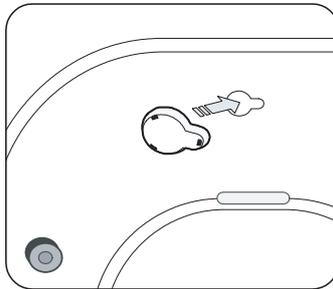
### ■ How to Remove Shipping Bolts



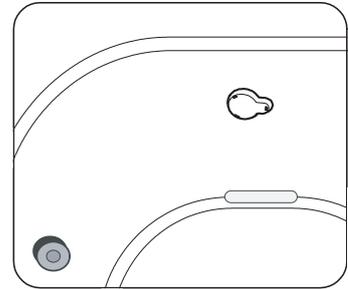
1. Remove the screws by using the supplied spanner.



2. Remove the shipping bolts from the back of the unit.



3. Fill the holes with the supplied plastic caps.

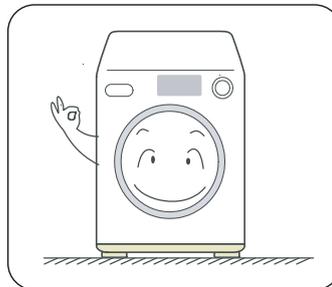


4. Keep the shipping bolts and screws for future use.

### ■ Precautions before Installation



The unit is quite heavy. So, make sure to have 2 or more personnel move it.



Make sure that the unit stands on a firm and leveled floor.



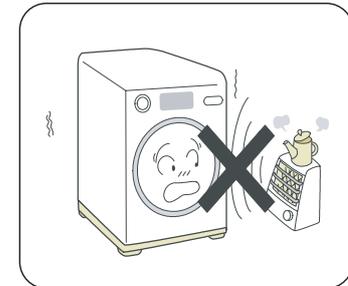
Keep it away from direct sunlight or high humidity, and install it in a place with good ventilation.



Install the unit at a place with a wall outlet easily accessible.



Keep the unit away from places in which it is freezing, especially in winter.



Keep the unit away from heat appliances such as a heater.

## 1-2. Precautions upon Installation

### ■ Grounding

- ▶ Make sure to ground the unit to prevent electric leakage or shock.

### With a grounded receptacle

- ▶ It does not need an additional grounding.

### ■ Water Drainage

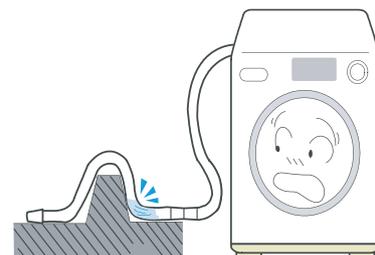
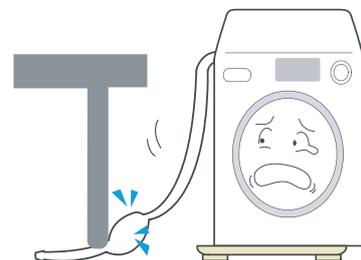
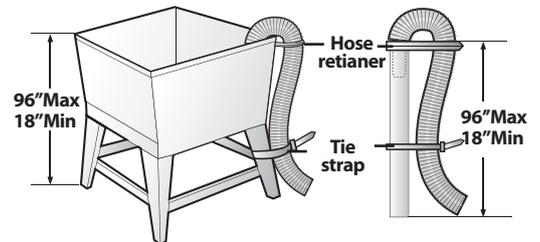
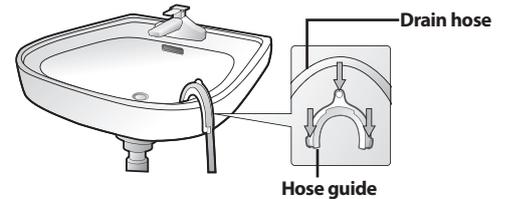
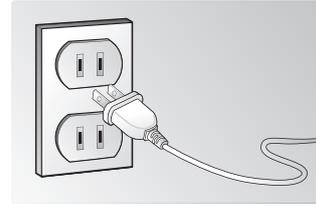
- ▶ Hook the drain hose over the Wash Basin or Laundry Tub or plug the end of the drain hose into the Standpipe
- Hook the drain hose over the Wash Basin or Laundry Tub or plug the end of the drain hose into the Standpipe.
- The outlet end of the drain hose must be at least 60-90cm (23-36") above the base of the machine.

- ▶ Seal the drain pipe connections
- If not, it may cause water leakage.

- ▶ Prevent water from siphoning away
- If the end of the drain hose is put in water, it could siphon away water during washing.  
So, make sure that the end of the drain hose is not put in water.

Note: Caution must always be exercised to avoid collapsing or damaging the drain hose.

For best performance the drain hose should not be restricted in any way, through elbows, couplings or excessive lengths.



---

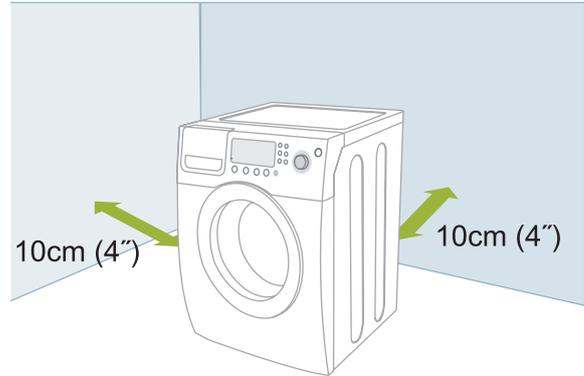
## 1-2. Precautions upon Installation

---

### ■ How to Level the Unit

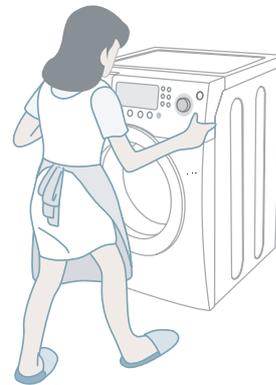
1. Select an installation place.

- ▶ Install the unit with 10cm (4") or more clearance from its surrounding walls.

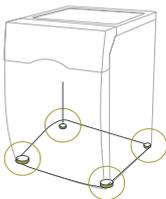


2. Check if the unit is leveled.

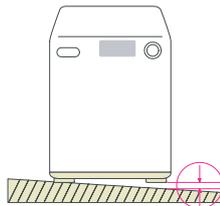
- ▶ If the unit wobbles, adjust the leveling legs.



3. Adjust the leveling legs.



- ▶ The 4 leveling legs should touch the floor all together.



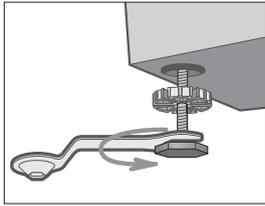
### When the unit is not leveled

- ▶ Lift up the unit a little bit and adjust the shortest.
- ▶ Turn the leveling bolt counter clockwise as shown in the picture above (The leveling leg gets longer.)

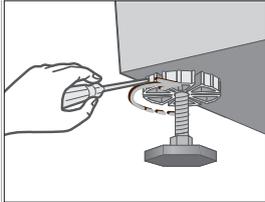
---

## 1-2. Precautions upon Installation

---



- ▶ Slide your Washer into position.



- ▶ Level your Washer by turning the leveling legs in or out as necessary by hand or wrench included with your Washer.  
When your Washer is level, tighten the nuts using the wrench or (-)driver.

**NOTE:** Your Washer must be leveled on all four sides. A carpenter's level should be used on all four corners of your Washer. It's a good idea after the first dozen washes to recheck your Washer's levelness.

---

## 2. PRODUCT SPECIFICATIONS

---

### 2-1. FEATURES

---

#### 1. SilverCare™ Sanitization

The winning combination! Samsung's silver nano technology combines the sanitizing effect of silver with state-of-the-art science for the ultimate in clean. Two plates of 99.9% pure silver are converted into silver ions through electrolysis. They penetrate deep into the wash water to kill bacteria and fungi. Even in cold, bleach-less water, the silver particles kill 99.9% of odor causing bacteria for a "super clean" wash. So washing in cold water is energy efficient and better for your clothes.

#### 2. Extra Large Capacity

Even bulky garments and blankets get super clean. The large 3.79 cu.ft. capacity leaves enough room for a more thorough, cleaner wash.

#### 3. High Efficiency Energy & Water Saving

Washing with Samsung's SilverCare™, even in cold water, sanitizes the laundry thereby saving 92% of the energy normally used with hot water sanitization.

#### 4. Direct Drive Inverter Motor

The power to handle anything! Our direct-drive inverter motor delivers power right to the washer tub from a variable speed, reversible motor. A beltless direct-drive motor generates a higher spin speed of 1,300rpm for more effective, quiet operation. The washer also has fewer moving parts, meaning fewer repairs.

#### 5. Woolmark Certified

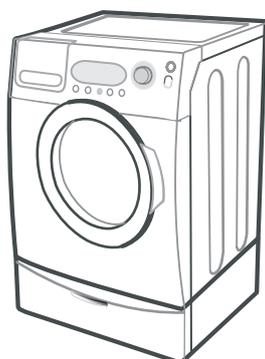
The machine wash wool cycle on the Samsung SilverCare™ machines has been tested and passed the required Woolmark Company specification for machine washable wool products. Fabrics should be washed according to the instructions on the garment label as specified by Woolmark and Samsung.

#### 6. Pedestal with Storage Drawers (Model No : WE357A7W/S/R/L/G)

An optional 15" pedestal is available to raise the washer for easier loading and unloading. It also offers a built-in storage drawer that can hold a 100 oz. bottle of detergent

#### 7. Stacking (Model No : SK-3A1/XAA)

Samsung washers and dryers can be stacked to maximize usable space. An optional stacking kit is available for purchase from your Samsung retailer.



<Pedestal with Storage Drawers>



<Stacking>

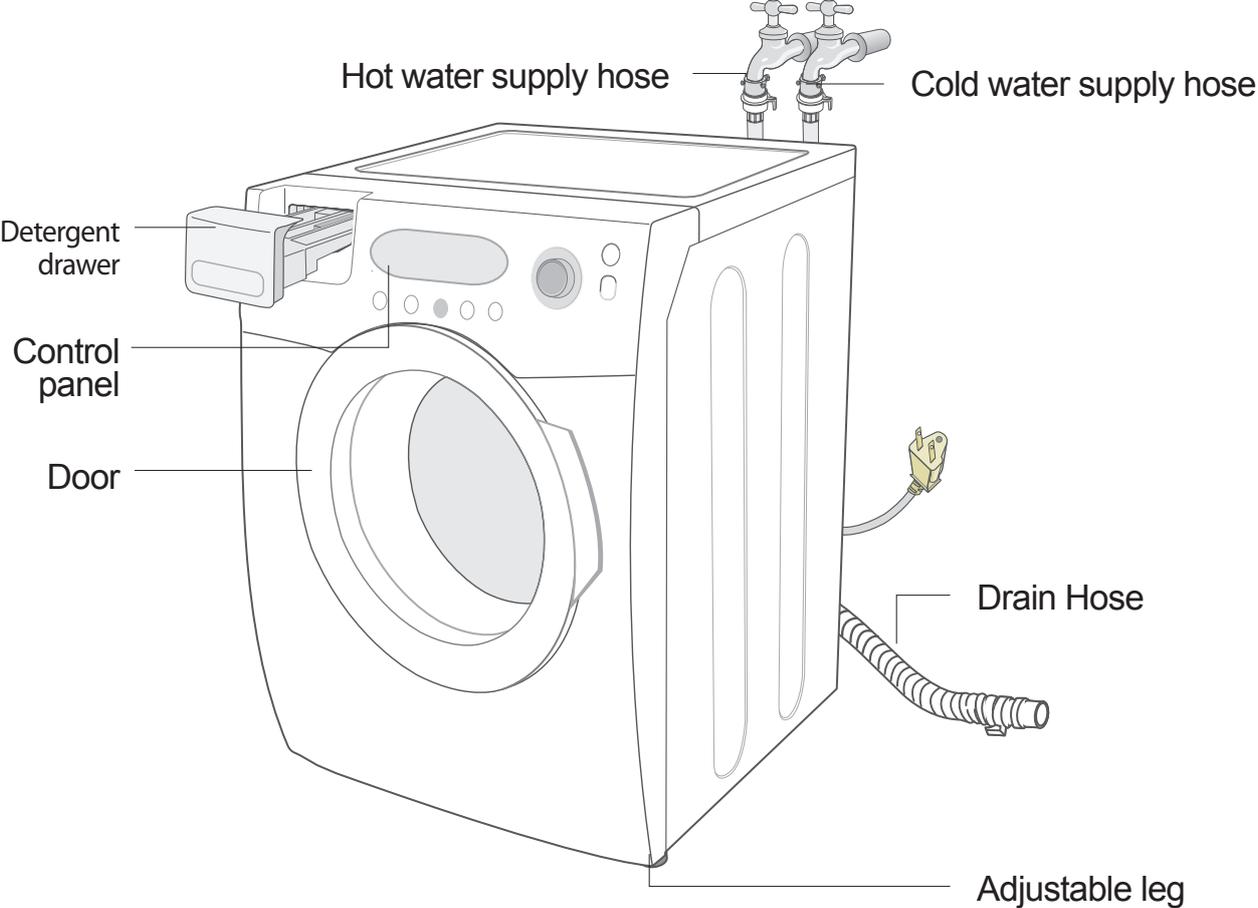
## 2-2. SPECIFICATIONS OF PRODUCT

TYPE	FRONT LOADING WASHER			
	Div	Inches (cm)	Div	Inches (cm)
DIMENSION	A. Height-Overall	38 (96.5)	C. Depth With Door Open 90°	51.18" (130)
	B. Width	27 (68.6)	D. Depth	31.1" (79)
	WATER PRESSURE		50kPa ~ 800kPa (7.25psi ~ 116 psi)	
WEIGHT		93kg (205 lb)		
CAPACITY		3.8 Cu.ft (IEC)		
POWER CONSUMPTION	WASHING	120V	226W	
	WASHING AND HEATING	120V	997W	
	SPIN	120V	379W	
	DRAIN	120V	41W	
SPIN REVOLUTION	WF337	1300rpm		
	WF328	1200rpm		

---

**2-3. OVERVIEW OF THE WASHING MACHINE**

---



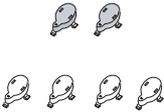
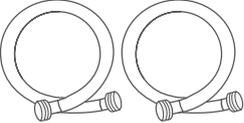
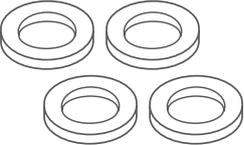
---

## 2-4. THE COMPARATIVE SPECIFICATIONS OF PRODUCT

---

Item	Samsung (WF337AA*) (WF328AA*)	Whirlpool (GHW9250M)	LG (WM2432HW)	Bosch (WFMC6400)
Capacity (Cu.ft)	3.8 (IEC)	3.8 (IEC)	3.72 (IEC)	2.93 (DOE)
Volume of Spinner (ℓ)	93.4	90	91	83
Motor	Direct Drive	3-Phase	Direct Drive	3-Phase
User Interface	LED	LED	LED	LCD (red)
Cycle Time	51	52	59	66
Wash Performance	1.01	1.00	0.99	1.02
Water Consumption/Cycle	48 Liter	56 Liter	49 Liter	61 Liter
Energy Consumption (W/O Heater Wh/Cycle)	128	105	114	189
RPM	1300 (WF337AAW) 1200 (WF328AAW)	1100	1200	1200
Noise	57 dB	59 dB	66 dB	62 dB

## 2-5. OPTION SPECIFICATIONS

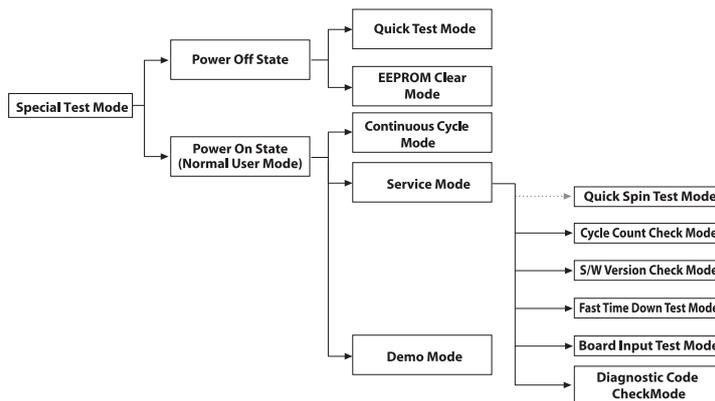
Item	Item Name	Code No.	Remark
	BOLT-SPANER	DC60-40146A	
	CAP-FIXER	DC61-10688A (4EA) DC61-10688B (2EA)	
	HOSE-WATER(H)	DC62-00075A	
	HOSE-WATER(C)	DC62-00075B	
	SEAL-WATER	DC62-40178A	
	MANUAL-BOOK	DC68-02440A	

## 4. ALIGNMENT AND ADJUSTMENTS

### 4-1. GENERAL ERROR FUNCTION

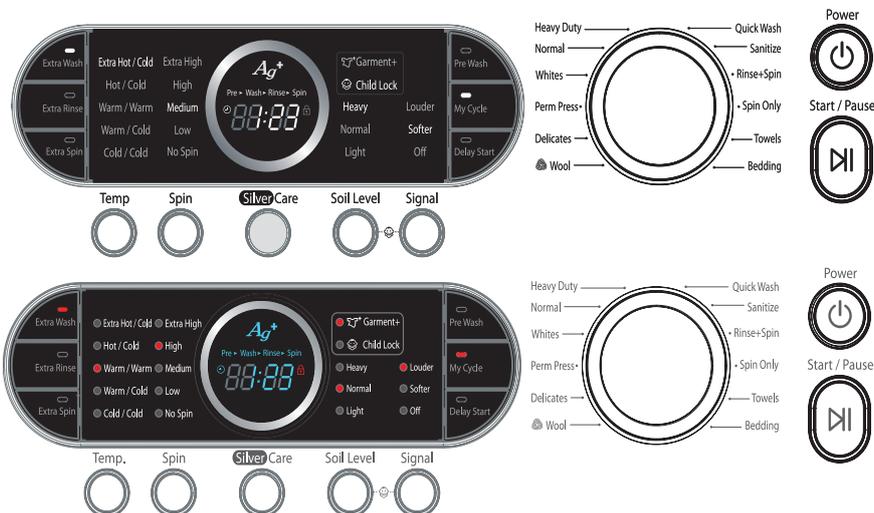
NO	LED Display	Diagnostic Code	Description	Corrective Action
1	nd	1	The water level fails to drop below the Reset Water Level within 15 minutes.	Go to "Will Not Drain" Troubleshooting Section.
2	LO	2	Door fails to unlock after 3 attempts.	Go to "Will Not Unlock" Troubleshooting Section.
3	nF	3	When the filling continues for more than 16 minutes or there is no change of water level for 3 minutes	Go to "No Water Fill" Troubleshooting Section.
4	FL	4	Door fails to lock after 3 attempts.	Go to "Will Not Lock" Troubleshooting Section.
5	LE	8	Water Level Sensor Trouble. (When the input signal from the water level sensor is out of range, the unit will send out beeping sounds and halts the cycle.)	Go to "No Water Fill" Troubleshooting Section.
6	OE	E	A fault is detected in the water level sensor. Data (frequency) shows the water level is at or above the overflow water level. (When this condition is detected, the machine will automatically start draining water until the water level falls below the overflow water level)	First check to see that all of water valves are not stuck. If water valves are OK, check water level sensor.
7	dc	10	Unbalance or cabinet bump is detected during final spin, which prevents the drum from spinning over 400 rpm. (Never exceeds 400 RPM due to unbalanced load)	Go to "Wet Clothes" Troubleshooting Section.
8	-	11	EEPROM Fault. (Program settings are being reset.)	Go to "EEPROM Clear Mode" If display shows "FAiL", Replace Machine Control Board.
9	E2	15	Jammed Key. (When key input signals are coming out for more than 30 seconds, it is regarded as a jam.)	Check all of keys. If A key is sensed to be pressed, all keys will do not respond.
10	dL	18	Door is detected as open when the motor is operating.	Check for loose wire connections. Go to "Quick Test Mode" and then do Door lock/Unlock Test and Motor Test.
11	dS	22	Door is detected as open while it is trying to lock the door.	Go to "Quick Test Mode" and then do Door Lock/Unlock Test
12	bE	25	Motor hall sensor signals come out without motor operation.	Replace Machine Control Board.
13	tE	29	Abnormal high/low temperature or resistance (Thermal sensor or PBA) resistance.	Go to "Board Input Test" and check Water Temperature. Check loose or pinched wires. Replace PCB or thermistor.
14	E3	2E	MICOM is attempting to drive the motor but is not getting any response signals from the hall sensor. Visual check shows motor is not running. (Locked, Defective Hall Sensor or Overload)	Evaluate wire harness for loose or unhooked connections. Go to "Quick Test Mode" and test Motor.
15	Sr	34	System Relay (Main Relay) Failure. (PCB does not notice the relay operation when there should be.)	Replace PCB.
16	Hr	36	Heater Relay Failure (No Heater Relay Check Signal)	Replace PCB
17	3E	3E	Over-current is detected. Motor won't turn. (IPM detects over-current.)	Evaluate wire harness for loose or unhooked connections. Go to "Quick Test Mode" to test Motor.
18	2E	91	Voltage for motor control bus is over specified limit.	Replace PCB
19	2E	92	Voltage for motor control bus is under specified limit.	Replace PCB
20	7E	7E	Silver Care Kit (Silver Care PCB) Failure.	Check Silver Care PCB ,Main PCB & Wire-harness
21	PF	-	It occurs when there is power failure during the washing. ("PF" is not an error. It is to inform the user of power failure.)	-
22	SUdS	-	Suds is detected during the washing session. ("SUdS" is not an error. If the washer is in suds period, "SUdS" will light up instead of remaining time.)	Guide a user to reduce amount of detergent usage.

## 4-2. TEST MODE



Test Mode:  
Each Test Mode for the Frontier 2 Washer is as follows in the coming pages. The test modes indicated by the red arrows are modes unable to get an access once the washing cycle has started due to safety reasons.

### 4-2-1. Quick Test Mode

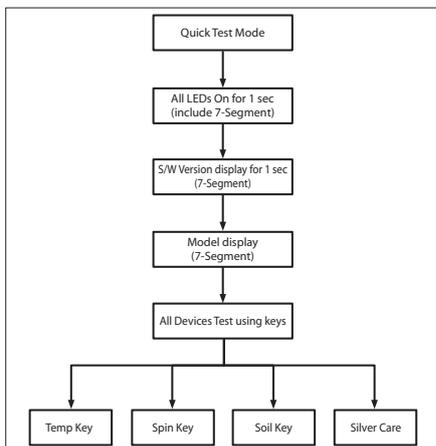


Definition of Quick Test Mode:

- Check operation of all LED's (Verify faulty LED).
- Check model and software version.
- Check different operating modes (e.g. water valve, motor, door, drain pump, etc.).

How to Enter:

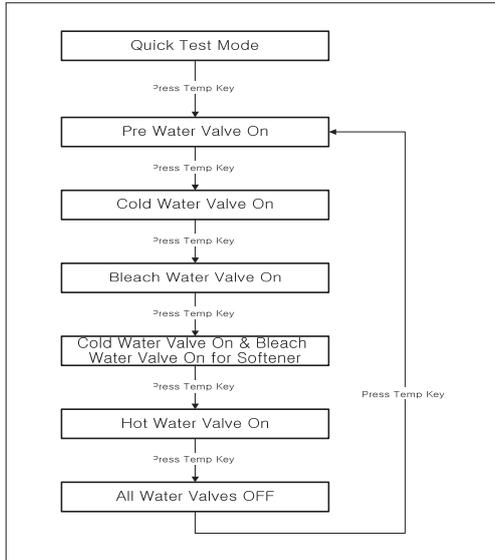
- Plug in and turn on the unit.
- Press Spin Key, Silver Care and Power Key at the same time.



Quick Test Mode:

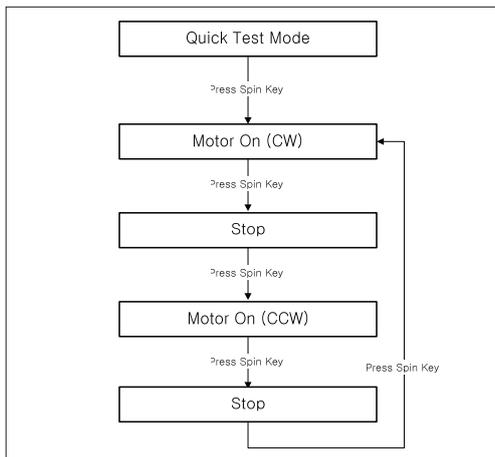
1. All LED's light up and it sends out Beep Sound when it enters into the Quick Test Mode. (Including 7-Segment)
2. Displays software version for a sec.  
(Ex. If S/W Version is 23, 7-Segment will display F223)
3. After displaying the software version, 7-Segment will display the following information for each model.
  - F1 : WF337AAW, WF337AAG, WF337AAL, WF337AAR
  - EEEE : Model option Error (Need to replace PCB Assy.)
4. When model information is being displayed, press the following keys to test various components.
  - Temp Key : Water Valve Test
  - Spin Key : Motor Test
  - Silver Care : Door Lock/Unlock Test
  - Soil Level : Drain Pump Test.

## 4-2-1. Quick Test Mode



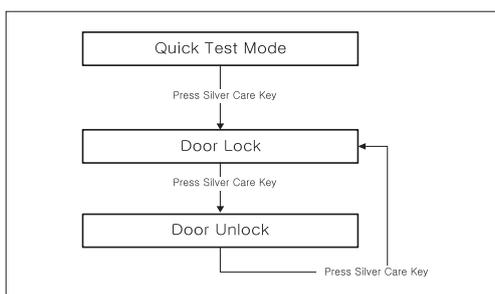
### Water Valve Test:

1. To enter the Water Valve Test, press the Temp Key while model information is being displayed during the Quick Test Mode.
2. Each time the Temp Key is pressed, it will cycle through the operations on the left flow chart.
3. If the Temp Key is pressed during All Water Valve OFF, the machine will return to the beginning as shown in the flow chart.
4. The door needs to be secured for the Water Valve to operate. Therefore, the door lock will be on during the water valve operation.
5. If there is any problem with Water Valve, PCB Assy. or Wire Harness, the water valves could not operate. So, to make sure for the water valves to operate, check visually if water comes out with each Water Valve On mode.



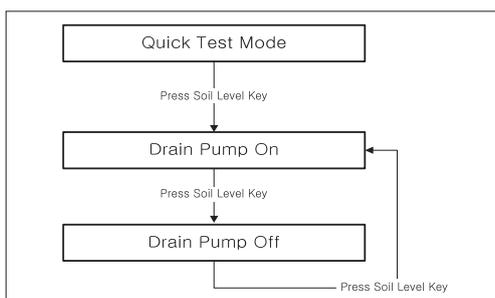
### Motor Test:

1. To enter the Motor Test, press the Spin Key while model information is being displayed during the Quick Test Mode.
2. Each time the Spin Key is pressed, it will cycle through the operations on the left flow chart.
4. The Door Lock will be on during the motor operation.
5. If there is any problem with Motor, PCB Assy. or Wire Harness, related error codes will be displayed.



### Door Lock/Unlock Test:

1. To check the Door Lock/Unlock operation, press the Silver Care Key while model information is being displayed during the Quick Test Mode.
2. Each time the Silver Care Key is pressed, it will cycle through the Door Lock/Unlock operations on the left flow chart.
3. If the Silver Care Key is pressed during Door Lock and Water Valve, Motor or Drain Pump operation, all of the operations will stop. And, when the Silver Care Key is pressed again, the door will be released.
4. If there is any problem with Door Switch, PCB Assy. or Wire Harness, related error codes will be displayed.



### Drain Pump Test:

1. To check the Drain Pump operation, press the Soil Level Key while model information is being displayed during the Quick Test Mode.
2. Each time the Soil Level Key is pressed, it will cycle through the operations on the left flow chart.
3. The Drain Pump operation is independent. Therefore, it will operate regardless of Door Lock/Unlock.
4. If there is any problem with Drain Pump, PCB Assy. or Wire Harness, the Drain Pump will not operate. So, its operation needs a visual inspection.

---

## 4-2-2. EEPROM Clear Check

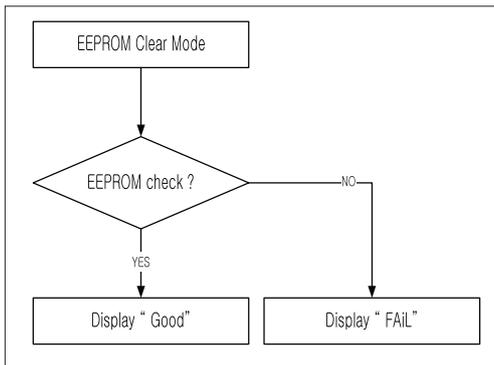
---

Definition of EEPROM Clear Mode:

- EEPROM initialization.
- All course/option settings are to be reset to default values after EEPROM initialization.
- When Service arises and it needs PCB replacement, EEPROM should be reset.

How to Enter:

- The unit needs to be on.
- Press Delay Start Key, Signal Key and Power Key at the same time.  
(Same for all Frontier 2 models.)



---

## 4-2-3. Continuous Run Mode

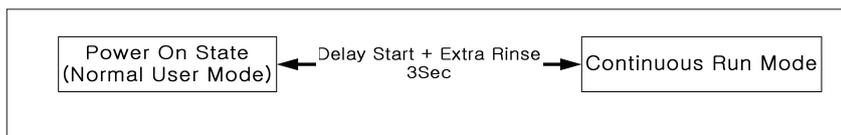
---

Definition of Continuous Run Mode:

- Will continuously repeat the current cycle until the Continuous Run Mode is cancelled.

How to Enter:

- Press Delay Start Key and Extra Rinse Key together for 3 sec.  
(Same for all Frontier 2 models.)



Continuous Run Mode:

1. Press Delay Start + Extra Rinse Key for 3 sec during Power On State (Normal User Mode) .
2. Once in Continuous Run Mode, 7-Segment will blink "cc" and the remaining time in turns.
3. The Continuous Run Mode will repeat the previous cycle until continuous run mode is cancelled.
4. During Continuous Run Mode, press Delay Start + Extra Rinse Key for 3 seconds to return to normal user mode. 7-segment will no longer display "cc", but only display the remaining time.
5. If you hold down the Signal and Extra Rinse keys for three (3) seconds in Continuous Cycle Mode, the washing machine enters Service Mode. However, Continuous Cycle Mode is still maintained. At this time, "CC" stops and changes its function to a speed display.
6. If you exit Service Mode after entering it from Continuous Mode, the washing machine returns to Continuous Mode.
7. If power is lost in Continuous Run Mode (that is, when the power plug is disconnected or the Power key is pressed turning the washing machine off), the mode is released when the washing machine is turned on again.

---

## 4-2-4. Service Mode

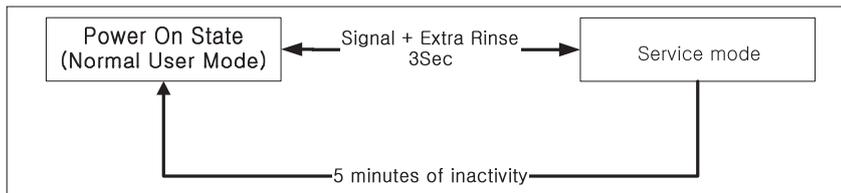
---

Definition of Service Mode:

- Service Mode enables service technicians to verify the operation of the washing machine and do troubleshooting.
- Service Mode can be entered during all washing cycle without interrupting the cycle except some of test modes.
- Various tests can be done with Service Mode. So, troubleshooting can be done based on the resulting diagnostic codes.

How to Enter:

- To enter the Service Mode, press the Signal and Extra Rinse Keys for 3 seconds or until the unit sends out beeping sounds.



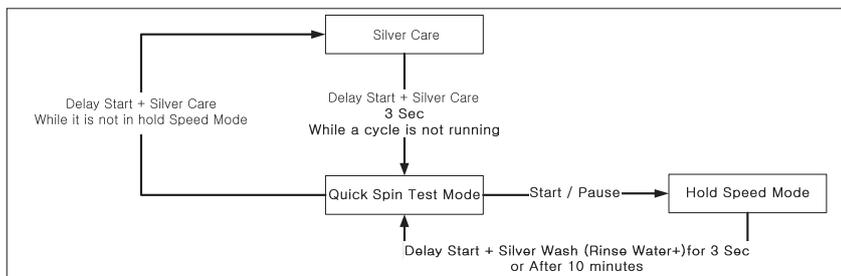
Service Mode:

1. The washer must be on to go into the Service Mode.
2. The motor speed will be displayed when started (It displays 0 when the motor does not spin).
3. The present state of the machine will not be changed. (i.e., the current cycle in progress will not be interrupted and only the display will change)
4. All LED's will be turned off except the "Door Lock" LED. It will continue to display the condition of the door lock.
5. To exit Service Mode, press Signal and Extra Rinse Keys for 3 second again, or Power Key. If no key is operated during Service Mode for 5 minutes, the machine will return to normal user mode.
6. Every test stops when you press the Start/Pause key. However, Service Mode is maintained.

---

## 4-2-5. Quick Spin Test Mode

---



Definition of Quick Spin Test Mode:

- Quick Spin Test Mode is to do Spin Check. (High RPM)

How to Enter:

- During Service Mode, press the Delay Start and Silver Care Keys for 3 seconds to enter Quick Spin Test Mode. (same for all Frontier 2 models.)
- Cannot enter once the washing cycle has started.

Quick Spin Test Mode:

As it enters into the Quick Spin Test Mode, it starts spinning and reaches to its maximum RPM. And then, it stays at its maximum speed for 2 minutes before it exits the Quick Spin Test Mode.

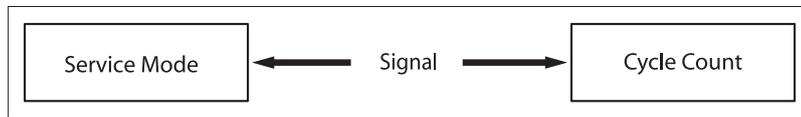
To hold Quick Spin Test Mode (entering Hold Speed Mode), press the Start/Pause button. If the Start/Pause button is pressed during Quick Spin Test Mode, it will stop accelerating and hold its spinning speed for 10 minutes before going back to Quick Spin Test Mode. Also, to cancel the hold and allow Quick Spin Test Mode to continue, press the Delay Start and Silver Wash Keys together for 3 seconds.

If you hold down the Delay Start and Silver Care keys for three (3) seconds when the washing machine is not in Hold Speed Mode, Quick Spin Mode is exited and Service Mode is restored.

---

## 4-2-6. Cycle Count Check Mode

---



Definition of Cycle Count Check Mode:

- Cycle Count Check Mode is to tally up the number of washings.

How to Enter:

- To enter the Cycle Count Check Mode, press the Signal Key during Service Mode.  
(same for all Frontier 2 models.)

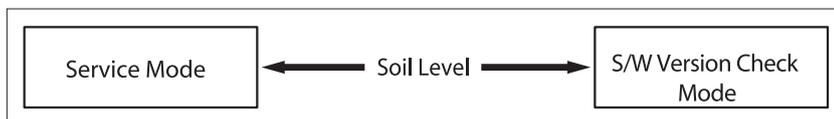
Cycle Count Check Mode:

1. Activate the Service Mode in advance.
2. When the Signal key is pressed, the total number of washings will light up and a signal LED will glow (Louder, Softer, Off LED).
3. The maximum number of cycles will be 9999.  
The counter will roll over to 0 and start counting again after 9999.
4. The counting will be carried out at the end of the normal cycle.  
(For normal and Continuous Run cycles, the count is carried out at the end of the cycles. The count is only carried out at the beginning for the Quick Spin cycle.)
5. To exit the Cycle Count Check Mode, press the "Signal" key again.

---

## 4-2-7. S/W Version Check Mode

---



Definition of S/W Version Check Mode:

- S/W Version Check Mode is to bring up S/W Version information.

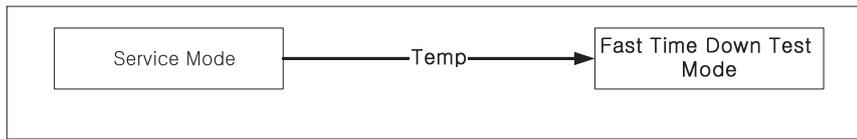
How to Enter:

- To enter the S/W Version Check Mode, press the Soil Level Key during Service Mode.

S/W Version Check Mode:

1. Activate the Service Mode in advance.
2. Press the Soil Level Key to bring up its software Version  
EX) Generate F005 at Version 05 (F0 is Micom code, 05 is it's software version)
3. To exit the S/W Version Check Mode, press the Soil Level S/W once again.  
Then, it returns to the Service Mode with motor RPM illuminating.

## 4-2-8. Fast Time Down Test Mode



Definition of Fast Time Down Test Mode:

- Fast Time Down Test Mode is to forward the program to the next cycle stage.

How to Enter:

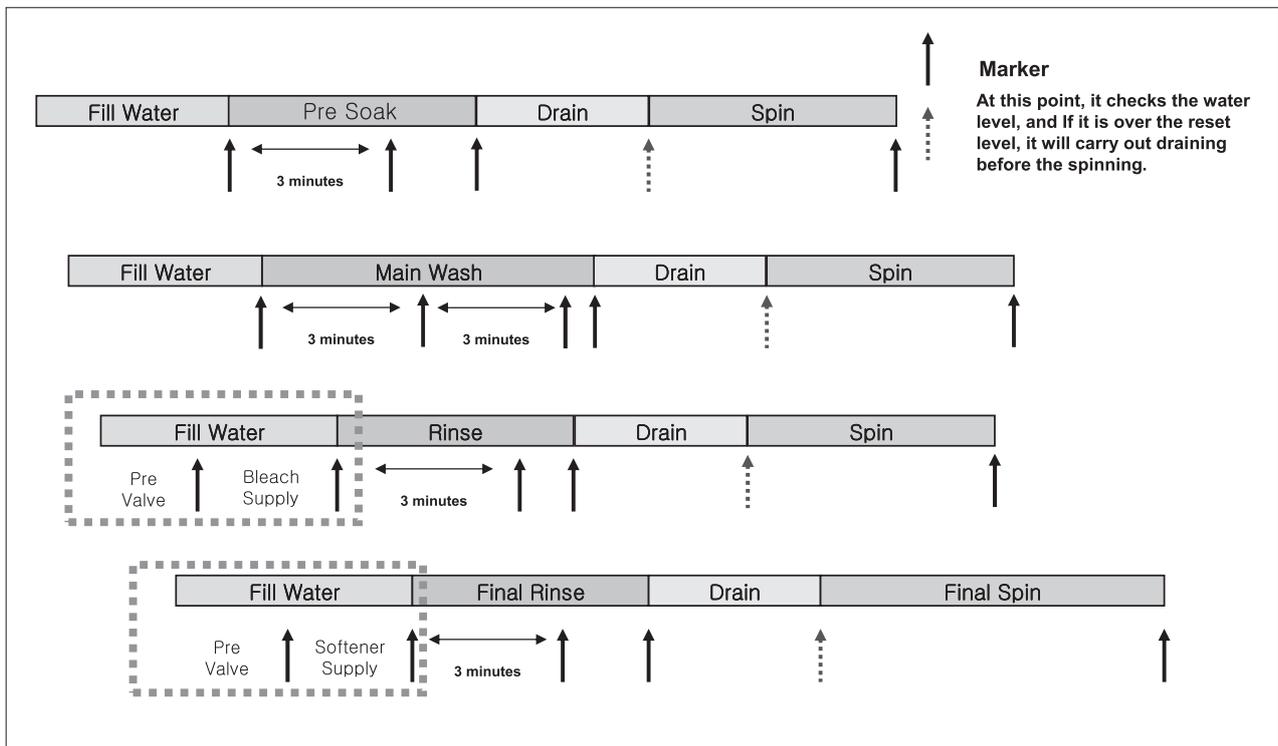
- To enter the Fast Time Down Test Mode, press the Temp key during Service Mode.

Fast Time Down Test Mode:

1. Activate the Service Mode in advance.
2. To forward the program to the next cycle stage, press the Temp key.

Each stage is located at key points of a complete cycle as follows:

- End of Each Fill (Beginning of Wash or Rinse Tumble Session)
- Beginning of Drain Session
- Beginning of Spin Session (Here, it checks the water level. So, if it is over the reset level, it carries out draining before the spinning.)
- Beginning of Fill Session
- Beginning of Bleach Fill
- Beginning of Fabric Softener Fill
- Every 3 minutes during Wash and Rinse Tumble Session



---

## 4-2-9. Board Input Test Mode

---



### Definition of Board Input Test Mode:

- Board Input Test Mode is to display a specified input after a key press.

### How to Enter:

- To enter the Board Input Test Mode, press the Extra Wash key during Service Mode.  
(same for all Frontier 2 models.)

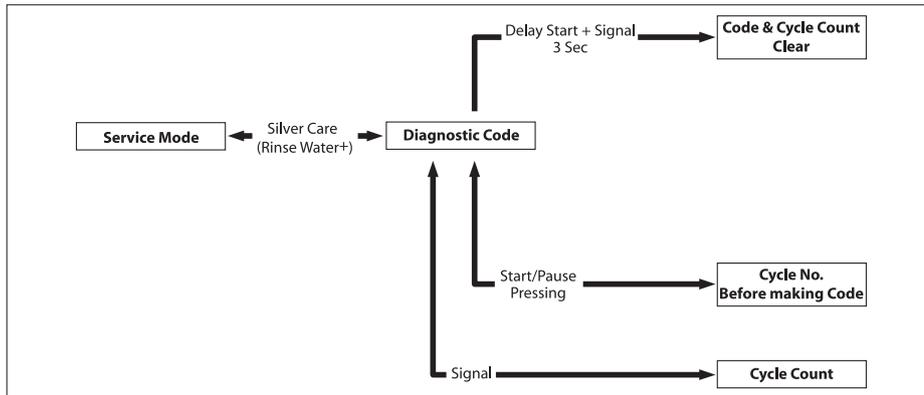
### Board Input Test Mode:

1. Activate the Service Mode first.
2. Press the Extra Wash key to start Board Input Test.
3. Water Temperature Display in Celsius Dial the Rotary Cycle Selector to "Heavy Duty" and press the Start/Pause dial.
4. Water Temperature Display in Fahrenheit Dial the Rotary Cycle Selector to "Normal" and press the Start/Pause dial.
5. Door Position (Open/Close) Display Dial the Rotary Cycle Selector to "Whites" and press the Start/Pause dial: "OP" will illuminate if open, "CL" if closed.
6. Door Status (Lock/Unlock) Display Dial the Rotary Cycle Selector to "Perm Press" and press the Start/Pause dial: "UL" will illuminate if unlocked, "LO" if locked.
7. Water Level Display (Frequency) Dial the Rotary Cycle Selector to "Quick Wash" and press the Start/Pause dial: If it illuminates "2435", it indicates 24.35 kHz.
8. AG Kit Status Dial the Rotary Cycle Selector to "Sanitize" and press the Start/Pause dial. Then, it will display the Ag Kit Status in 3 seconds: "-.-" if AG kit is operated properly. "7E" if AG kit is out of order (check wire harness & PCB)

---

## 4-2-10. Diagnostic Code Check Mode

---



Definition of Diagnostic Code Check Mode:

- Diagnostic Code Check Mode is to bring up the stored diagnostic codes (reference codes for service technicians).

How to Enter:

- To enter the Diagnostic Code Check Mode with code "d" flashing, press the Silver Care (Rinse Water +) during Service Mode.

Board Input Test Mode:

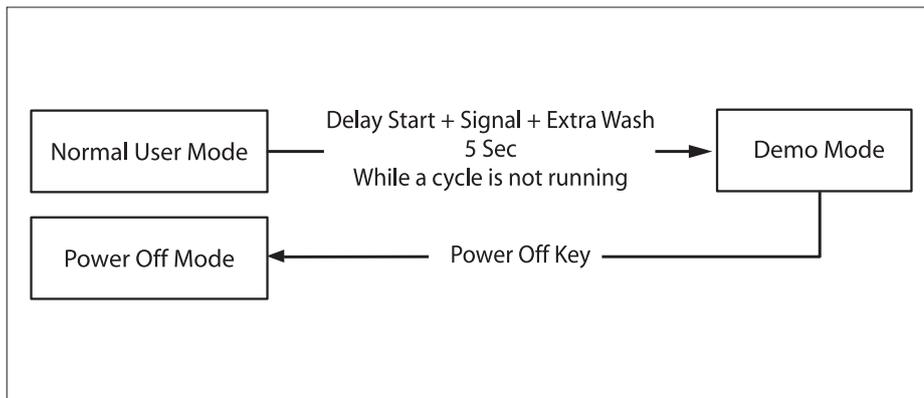
1. Activate the Service Mode first.
2. Press the "Silver Care (Rinse Water +)" key to start Diagnostic Code Check Mode with Code "d" flashing.
3. To cycle through the diagnostic codes (d1,d2,d3~d9), turn the Rotary Cycle Selector in one direction (either Clockwise or Counterclockwise).
4. Now, when turning the Rotary Selector Key in the same direction, it shows diagnostic codes from the latest (d1).
5. When turning it in the opposite direction, it shows the diagnostic codes in the reverse order.  
Ex) When it stops at d5 and turns backward, it shows from d4 down to "d".

Refer to Diagnostic Code.

---

## 4-2-11. Demo Mode

---

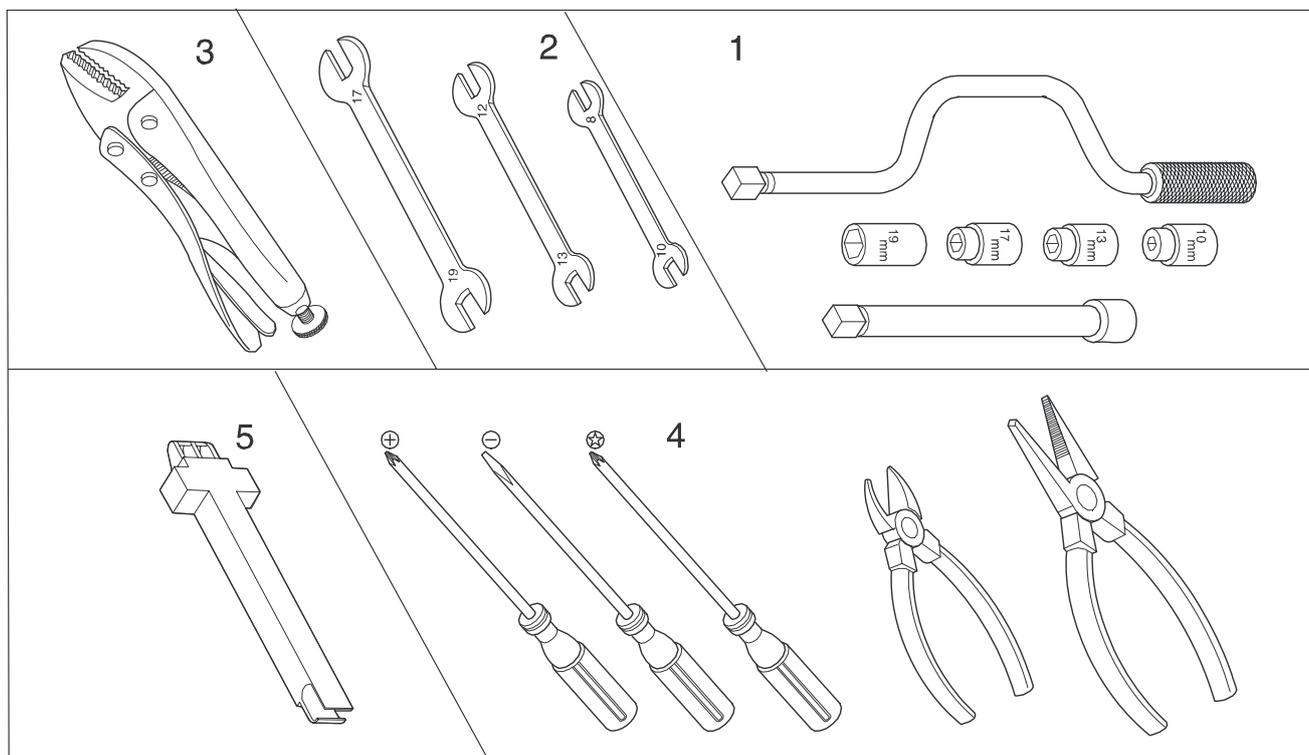


- Demo mode is entered when the Delay Start + Signal + Extra Wash buttons are held down for five (5) seconds simultaneously in the power on state.
- When entering Demo mode, the buzzer rings three (3) times and “- - -” is displayed on the 8888 segment display and all other LEDs are turned off. (Initial Demo mode)
- Demo mode consists of WASH, SPIN and LED modes.
- If the Temp button is pressed during the initial Demo mode, “WASH” blinks on the 8888 segment display and the washing machine enters WASH mode.
- If the Start/Pause button is pressed in WASH mode, the door is locked (Door Lock) and the motor rotates left and right at 45 RPM in a 7 sec on and 3-sec off cycle.
- WASH mode continues up to five (5) minutes once started. After the five (5) minutes have elapsed, “- - -” is displayed on the 8888 segment display and the initial Demo mode is maintained.
- If the Start/Pause button is pressed during a WASH mode operation, “- - -” is displayed on the 8888 segment display and the initial Demo mode is maintained.
- If the Spin button is pressed in the initial Demo mode, “Spin” blinks on the 8888 segment display and the washing machine enters SPIN mode.
- If the Start/Pause button is pressed in the SPIN mode, the door is locked (Door Lock) and a spin is operated at 1280 RPM. When the speed reaches 0 RPM, the No Spin, Low, Medium, High, and Extra High LEDs are turned on.
- During a spin operation, the No Spin LED turns on when the speed is lower than 400 RPM. The Low LED turns on between 400 RPM and 600 RPM. The Medium LED turns on between 600 RPM and 950 RPM. The High LED turns on between 950 RPM and 11 00 RPM. The High LED turns on at higher than 11 00 RPM.
- SPIN mode continues up to four (4) minutes once started. After the four (4) minutes have elapsed, “- - -” is displayed on the 8888 segment display and the initial Demo mode is maintained.
- If the Start/Pause button is pressed during a SPIN mode operation, “- - -” is displayed on the 8888 segment display and the initial Demo mode is maintained.
- If the Silver Care button is pressed during the initial Demo mode, “LED” is displayed on the 8888 segment display and the washing machine enters LED mode.
- If the Start/Pause button is pressed in LED mode, all LEDs are turned on. The LED mode continues up to thirty (30) seconds once started. After the thirty (30) seconds have elapsed, “- - -” is displayed on the 8888 segment display and the initial Demo mode is entered.
- If the Start/Pause button is pressed during an LED mode operation, “- - -” is displayed on the 8888 segment display and the initial Demo mode is entered.

## 5. ASSEMBLY AND DISASSEMBLY

### 5-1. TOOLS FOR DISASSEMBLY AND ASSEMBLY

NO.	TOOL		
1	Box driver	10mm 13mm 19mm	Heater (1) Motor (1), Balance (5), 2 holes of each left and right of the shock absorber 1 Pulley hole
2	Open End wrench	10, 13, 19mm	Replaceable for the box driver. Since the bolt runs idle when the box driver is used, use the box driver 17mm.
3	Vice pliers		Tool to protect the idle and abrasion of the bolt for the box driver.
4	Other(Driver, Nipper, Long nose)		General tools for the after service.
5	JIG for the Tub		1 (Disassemble and Assemble)

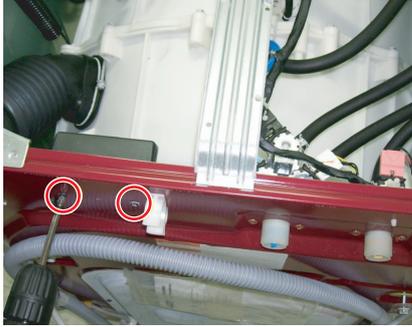
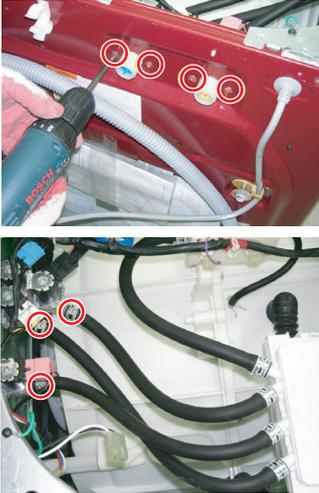


## 5-2. DISASSEMBLY

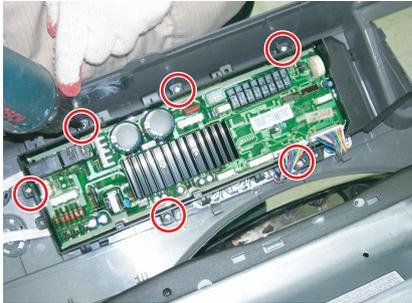
Warning! To avoid risk of electrical shock, personal injury or death, disconnect the power to the washing machine.

Part Name	Descriptive Picture	How To Do
<b>Top Cover</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove screws(2ea) at the back.</li> <li>3. Slide Top Cover back and lift it up.</li> </ol>
<b>Panel Control</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Top Cover</li> <li>3. Remove the screw(4ea)</li> </ol>
<b>Water Level Sensor</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Top Cover.</li> <li>3. Remove the screw(1ea).</li> <li>4. Disconnect the wire harness.</li> <li>5. Take out Pressure Hose.</li> </ol>
<b>Ag Kit</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Top Cover.</li> <li>3. Remove screws(2ea) from the rail.</li> <li>4. Disconnect the wire harness.</li> <li>4. Remove clamps and hoses.</li> </ol>

## 5-2. DISASSEMBLY

Part Name	Descriptive Picture	How To Do
<b>Ag PCB</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Top Cover.</li> <li>3. Flip open the PCB cover.</li> <li>4. Disconnect the wire harness.</li> <li>5. Remove screws (2ea) on the frame.</li> </ol>
<b>EMI Filter</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Top Cover.</li> <li>3. Remove the earth screw.</li> <li>3. Remove the acorn nut (13mm) and disconnect the wire harness.</li> </ol>
<b>Water Valve</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Top Cover.</li> <li>3. Remove two screws for each Single Hot and 3-Combo Cold Valve.</li> <li>4. Remove clamps and hoses.</li> </ol>
<b>Dispenser</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Top Cover.</li> <li>3. Remove Dispenser Drawer.</li> <li>4. Remove screws(3ea) on the top.</li> <li>5. Plug out all the connectors.</li> <li>6. Unscrew(6ea) PCB and separate it from Console.</li> </ol>

## 5-2. DISASSEMBLY

Part Name	Descriptive Picture	How To Do
Console		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Top Cover.</li> <li>3. Remove Dispenser Drawer.</li> <li>4. Remove screws(4ea) on the top.</li> <li>5. Plug out all the connectors.</li> <li>6. Unscrew(6ea) PCB and separate it from Console.</li> </ol>
Door		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove screws(2ea) and takeout Door Assy from Front Panel.</li> <li>3. Remove screws along the perimeter of Glass Retainer.</li> <li>4. Remove Glass Retainer.</li> <li>5. Remove Door Glass.</li> <li>6. Remove Hinge.</li> <li>7. Remove Outer Window Panel.</li> </ol>
Front Panel		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Top Cover, Dispenser, Console and Door.</li> <li>3. Snap up the boot at 6 o'clock and pull out the clamp spring.</li> <li>4. Pull the boot from the lip formed into the front opening.</li> </ol>
		<ol style="list-style-type: none"> <li>5. Remove screws(2ea) on the bottom.</li> <li>6. Remove screws(4ea) on the top.</li> </ol>

## 5-2. DISASSEMBLY

Part Name	Descriptive Picture	How To Do
<b>Front Panel</b>		7. Plug out the connectors to Door Lock.
		8. Lift out Front Panel.
<b>Boot</b>		<ol style="list-style-type: none"><li>1. Unplug the unit.</li><li>2. Knock the unit down to Front Panel (included).</li><li>3. Unscrew the boot clamp at 12 o'clock.</li><li>4. Pull out the boot.</li></ol>

## 5-2. DISASSEMBLY

Part Name	Descriptive Picture	How To Do
<b>Heater</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Knock the unit down to Front Panel (included).</li> <li>3. Remove the wire connectors.</li> <li>4. Remove the nut (10mm) in the center and take out Heater.</li> </ol>
<b>Motor</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. After removing screws(2ea) on Back Cover, take out Back Cover by sliding it up.</li> <li>4. Rotate Motor Cover to locate a slot in Stator. Insert a Phillips screwdriver into the slot to lock Stator.</li> <li>5. Remove the nut (19mm).</li> <li>6. Grab Motor Cover at 3 and 9 o'clock and pull it out.</li> <li>7. Remove the bolts (6ea, 10mm) securing Stator Coil to Tub.</li> <li>8. Remove the wire connectors.</li> </ol>
<b>Drain Pump</b>		<ol style="list-style-type: none"> <li>1. Unplug the unit.</li> <li>2. Remove Back Cover.</li> <li>3. Remove the wire connector.</li> <li>4. Remove Clamp and Drain Hose.</li> <li>5. Remove Clamp and Pump Hose.</li> <li>6. Remove the bolts (3ea, 13mm) securing Drain Pump to Cabinet Bottom.</li> <li>7. Remove the screw securing Drain Pump to the support bracket. Twist Drain Pump clockwise to remove.</li> </ol> <p>* Make sure to put an empty container under Drain Pump to hold water inside.</p>

---

## 6. TROUBLE SHOOTING

---

### 6-1. TROUBLE DIAGNOSIS

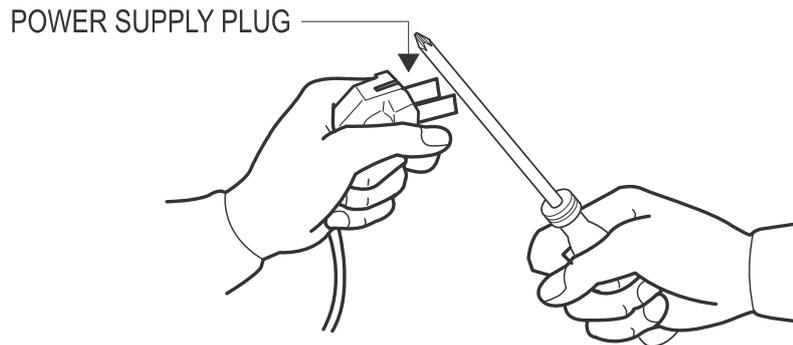
---

#### Caution for the Repair and Replacement

---

Please follow below instruction for the trouble diagnosis and parts replacement.

- 1) To reduce component damage due to static electricity, always observe anti static procedures.



- 2) Since AC220~240V is applied to the triac T1 and T2 on P.C.B, the electric shock may occur by touching and be careful of the HIGH VOLTAGE Hazzard.
- 3) Do not replace the Main PCB ASSY until you have reviewed all the technical information from the following pages.

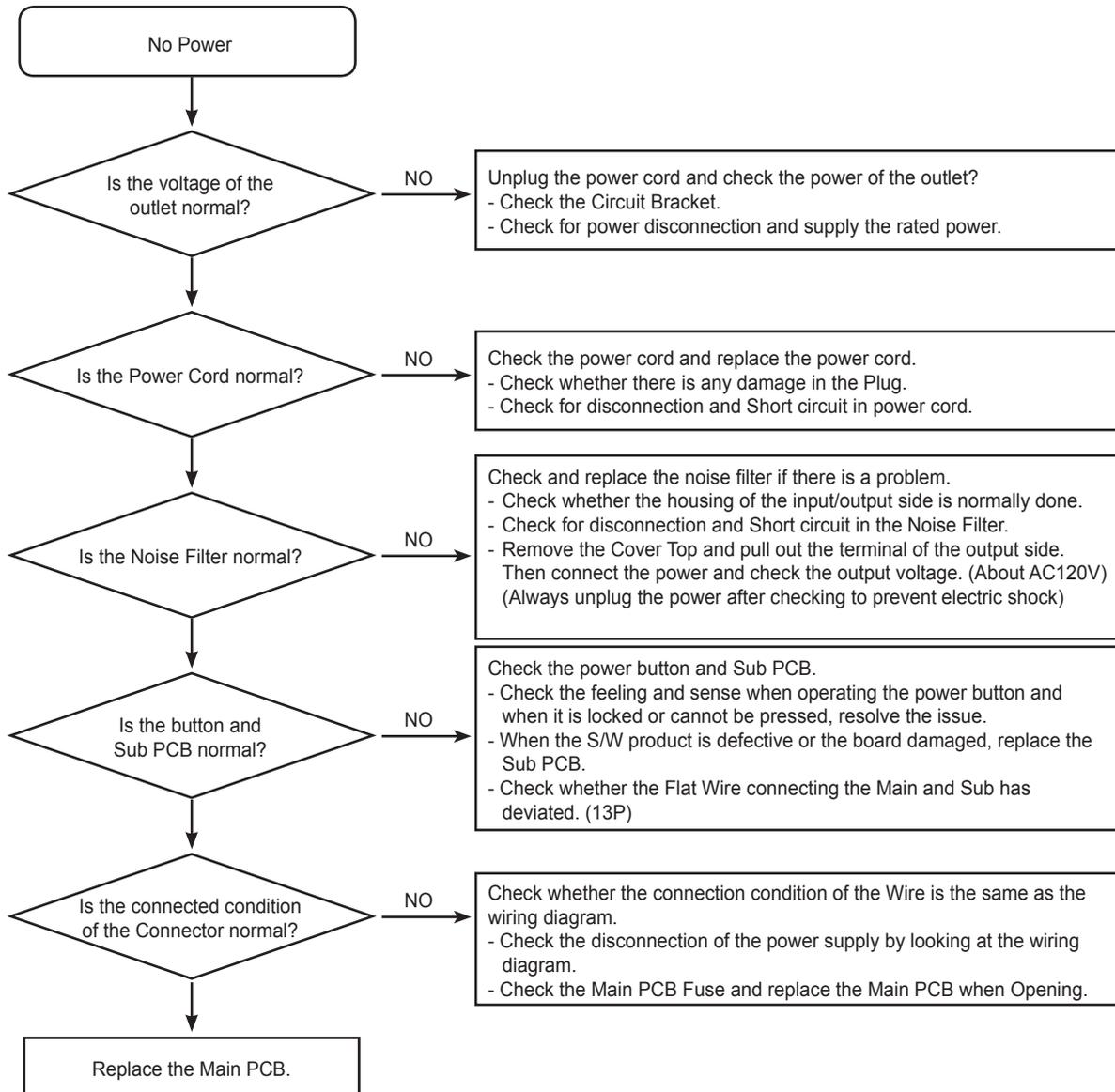
---

## 6-1. TROUBLE DIAGNOSIS

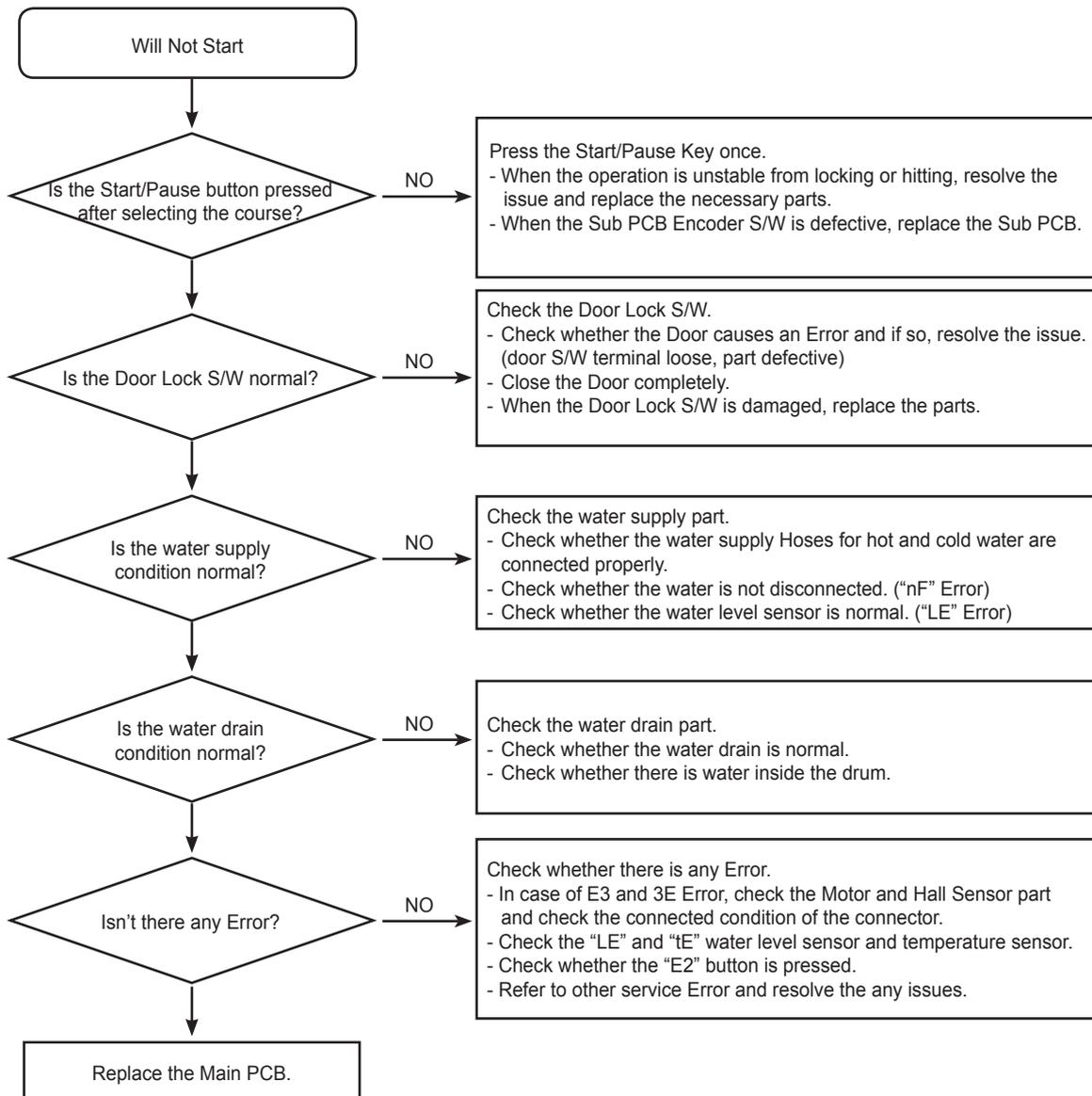
---

### WARNING

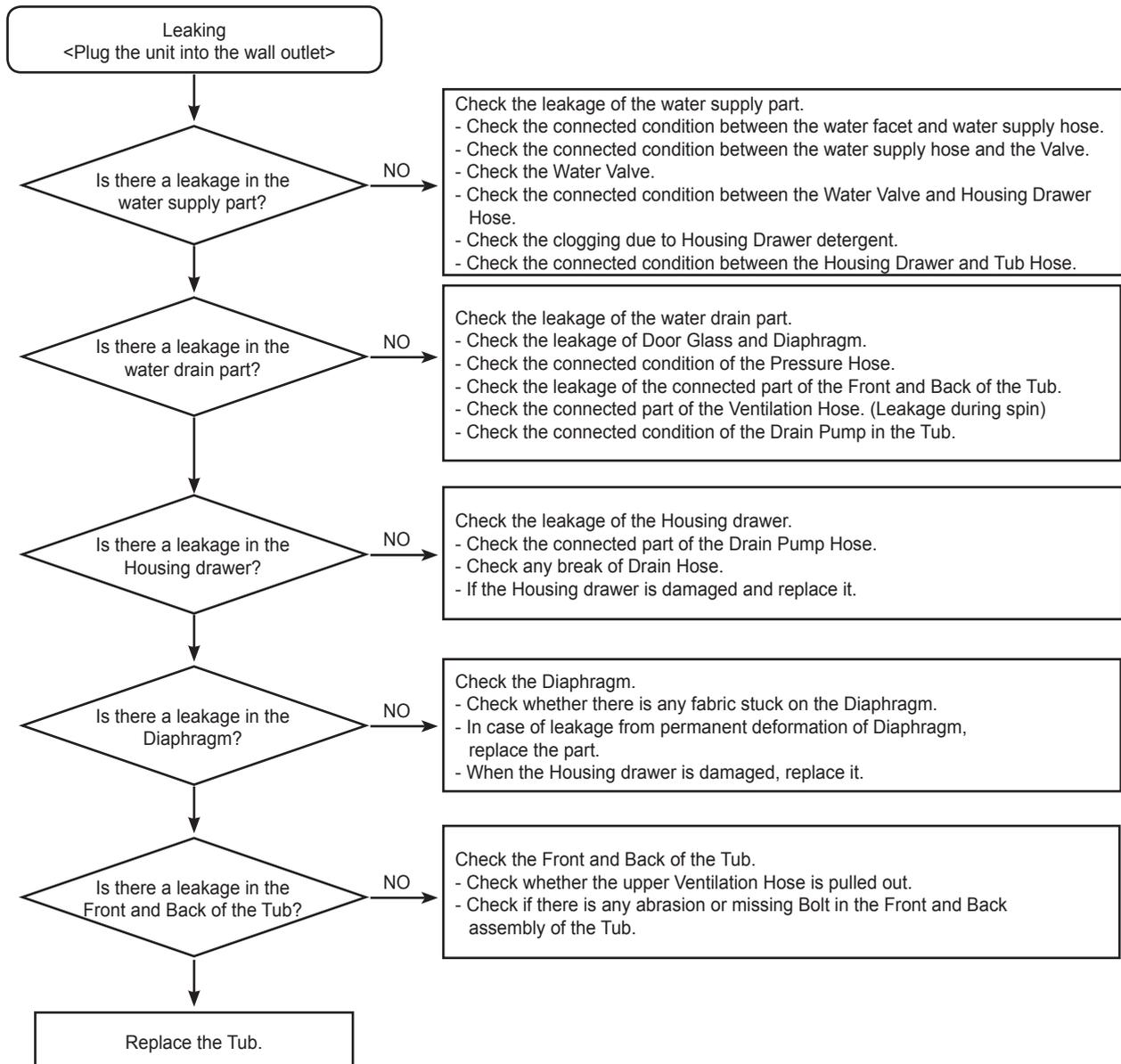
To avoid risk of electrical shock, personal injury or death, disconnect power to unit before servicing, unless testing requires power.



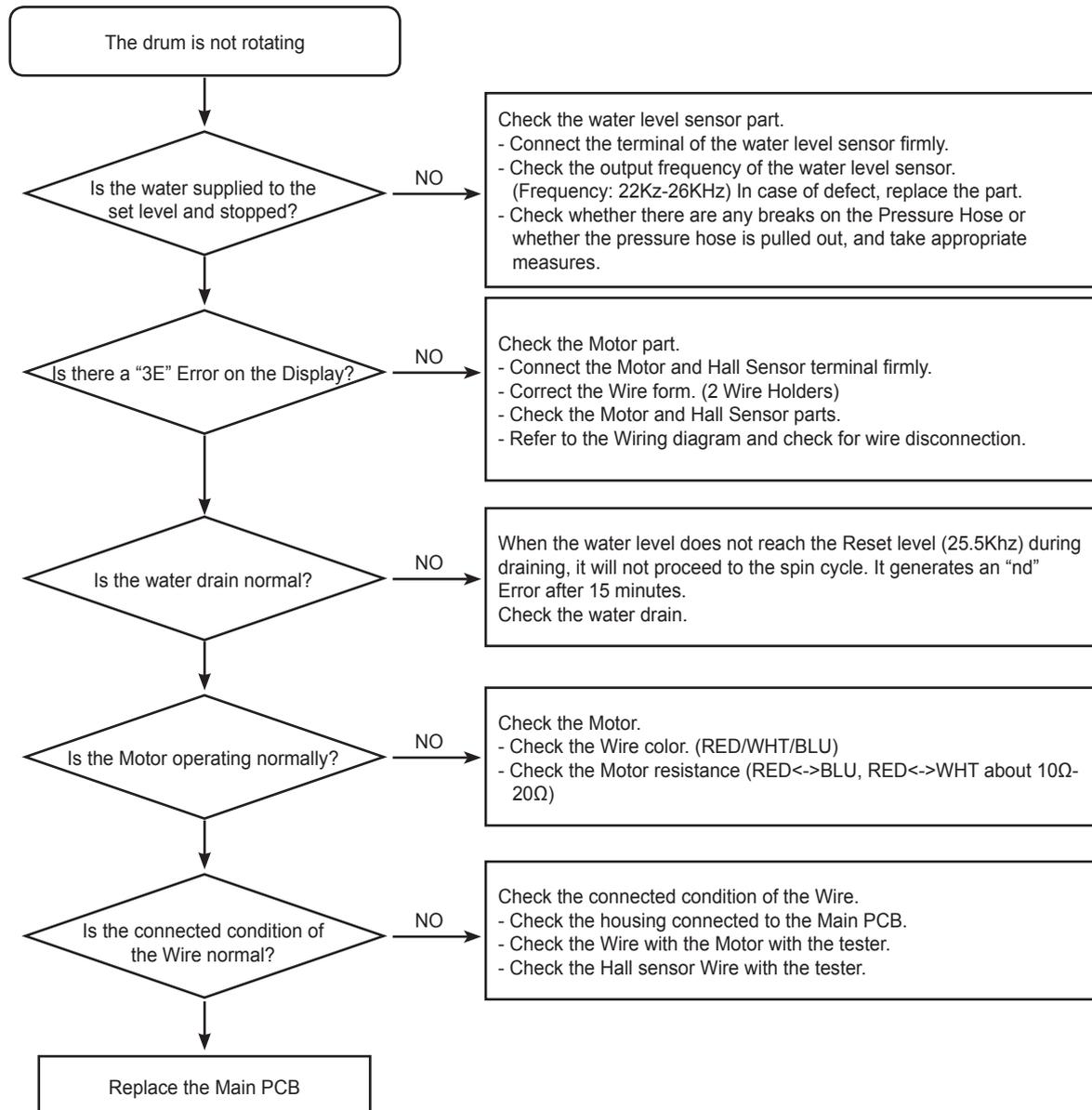
## 6-1. TROUBLE DIAGNOSIS



## 6-1. TROUBLE DIAGNOSIS



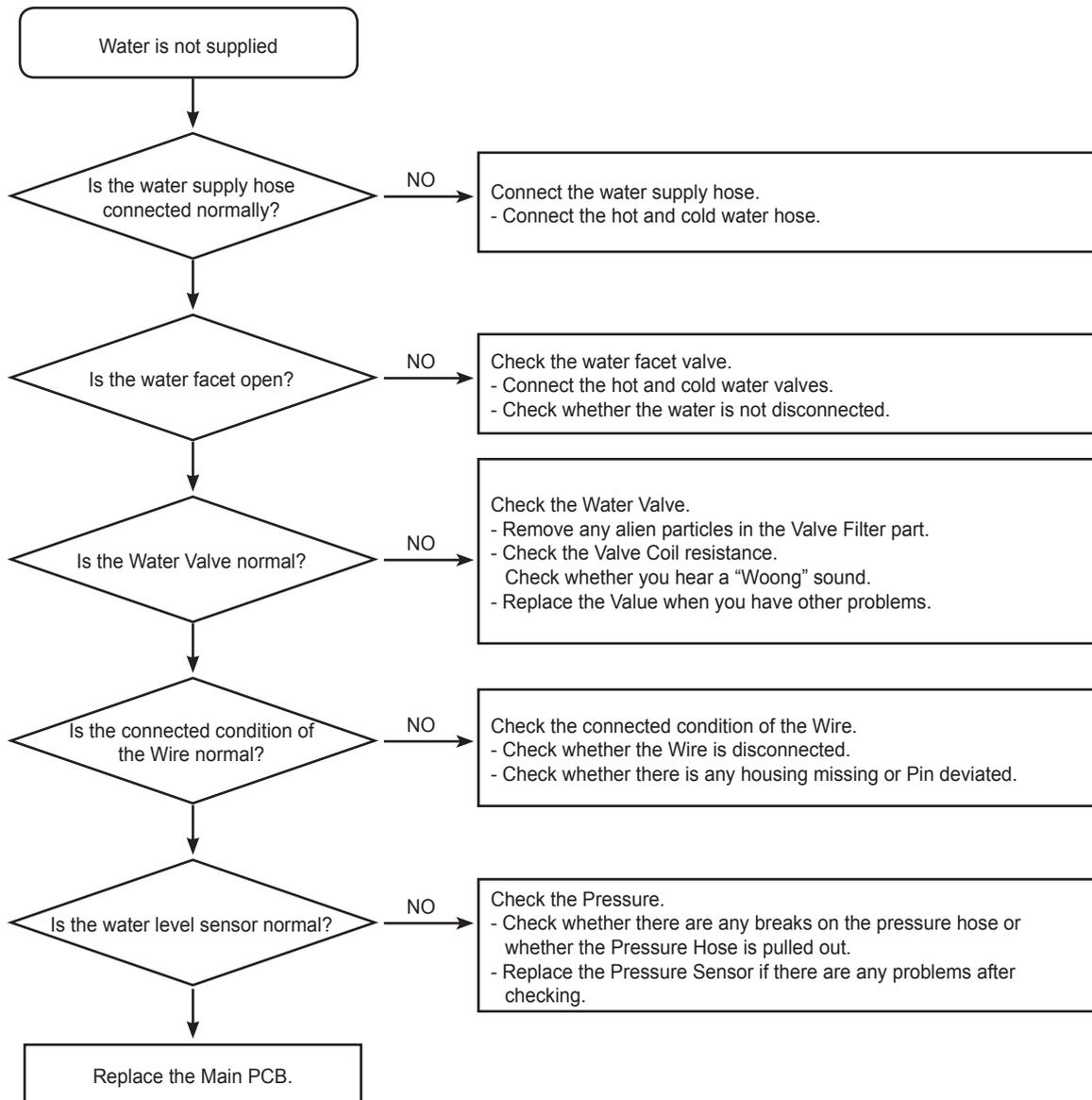
## 6-1. TROUBLE DIAGNOSIS



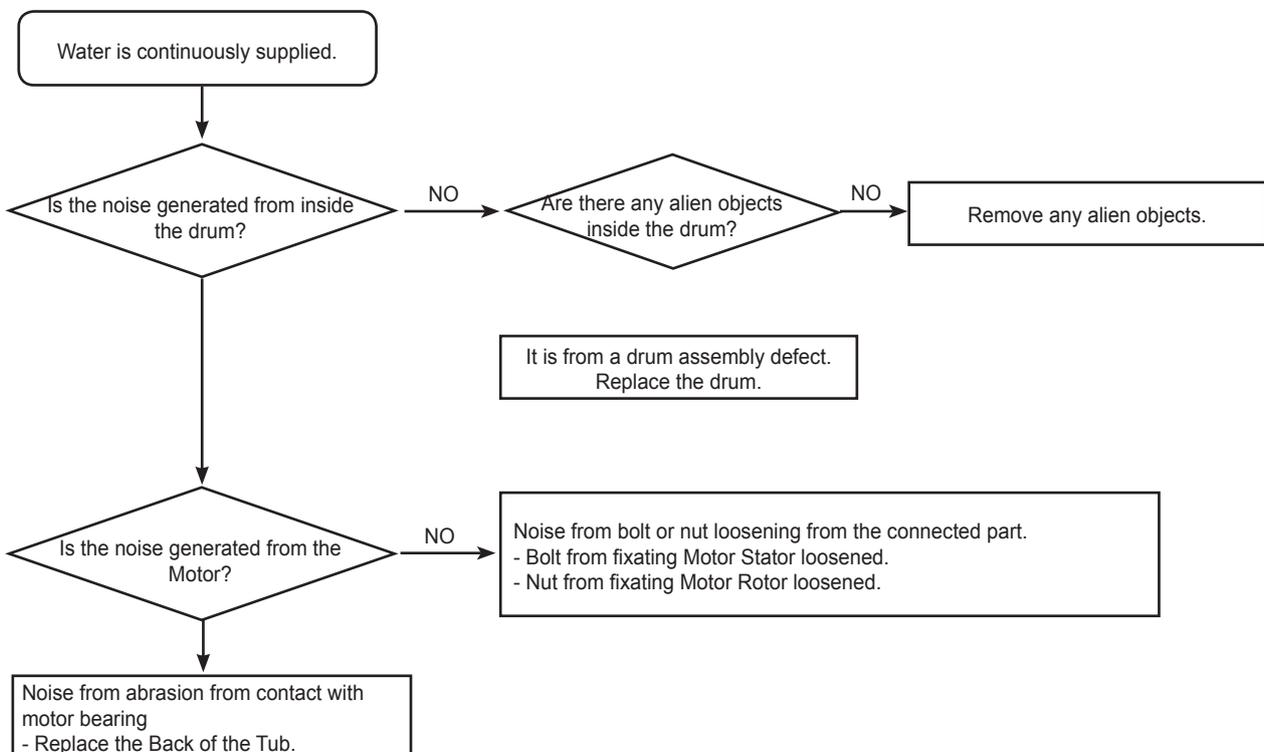
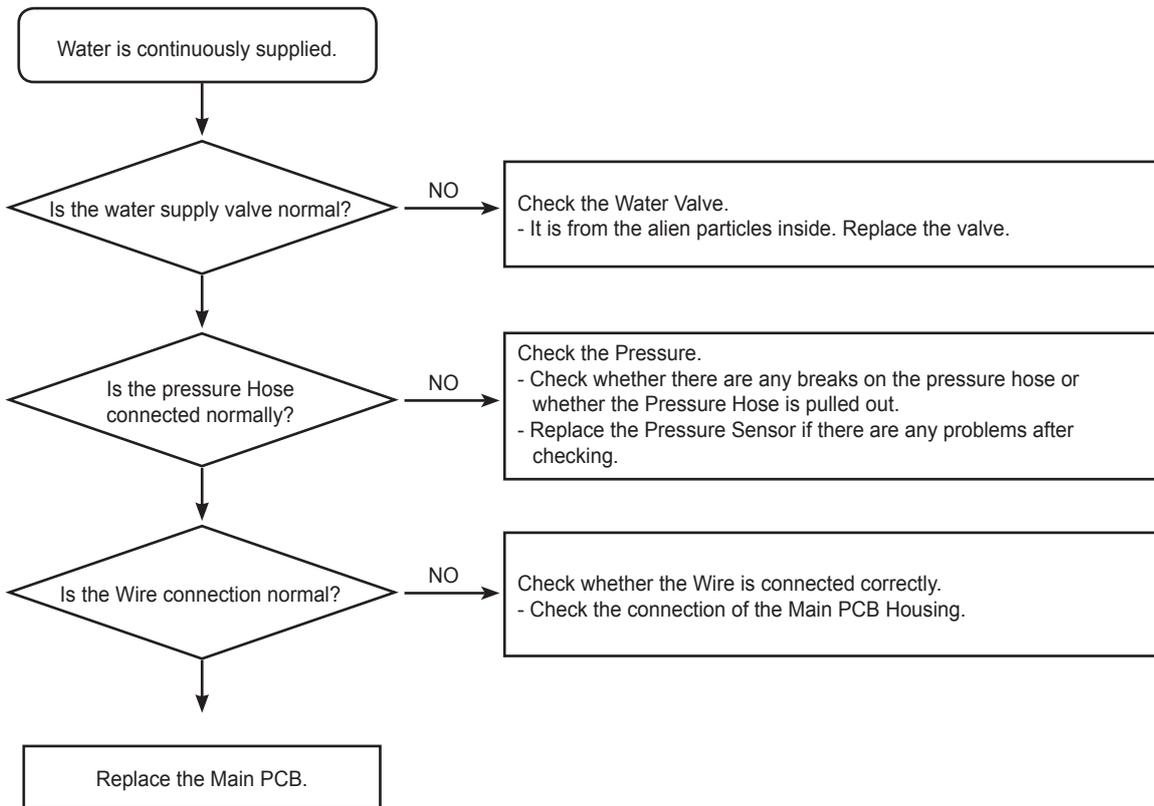
---

## 6-1. TROUBLE DIAGNOSIS

---



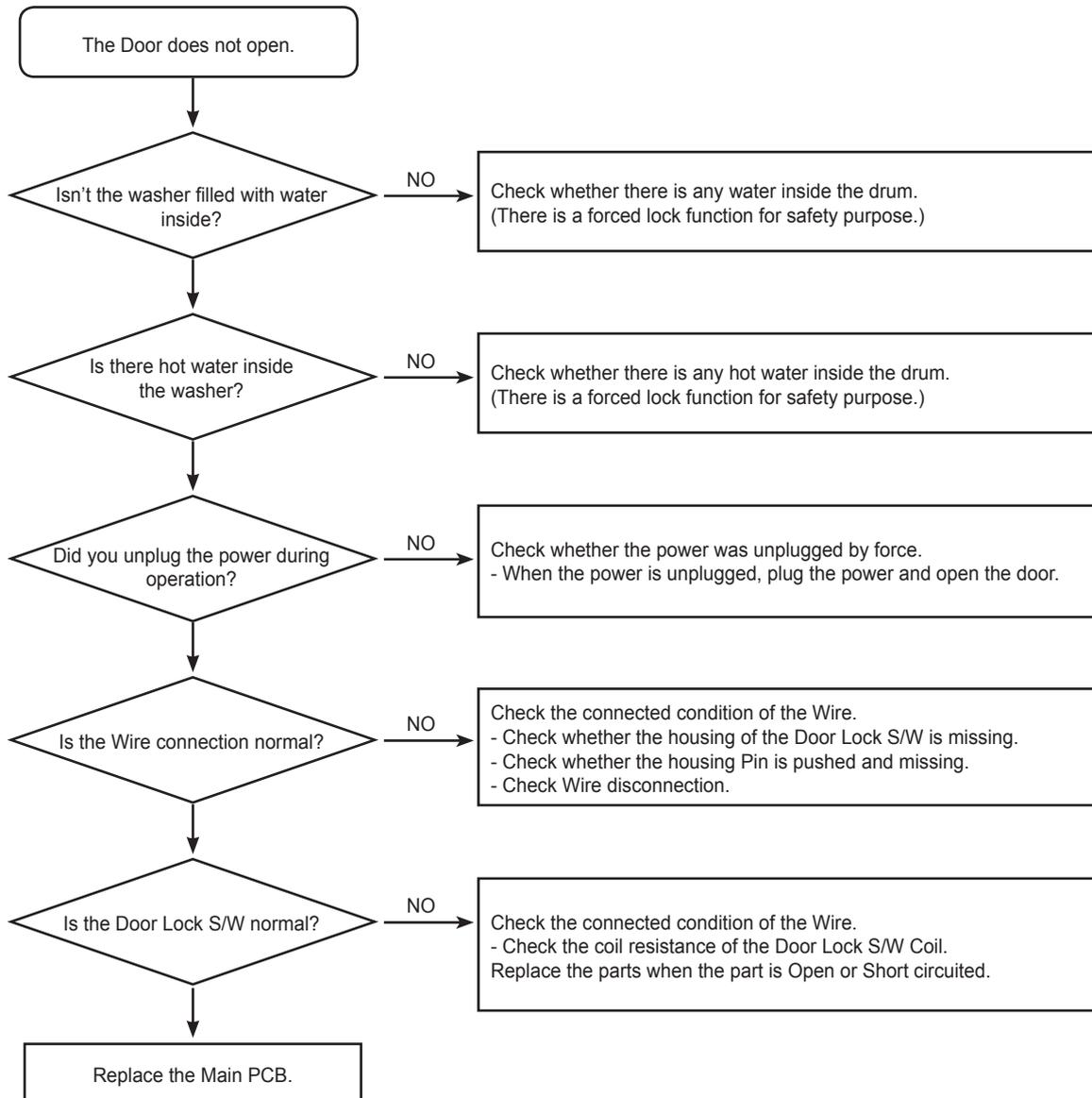
## 6-1. TROUBLE DIAGNOSIS



---

## 6-1. TROUBLE DIAGNOSIS

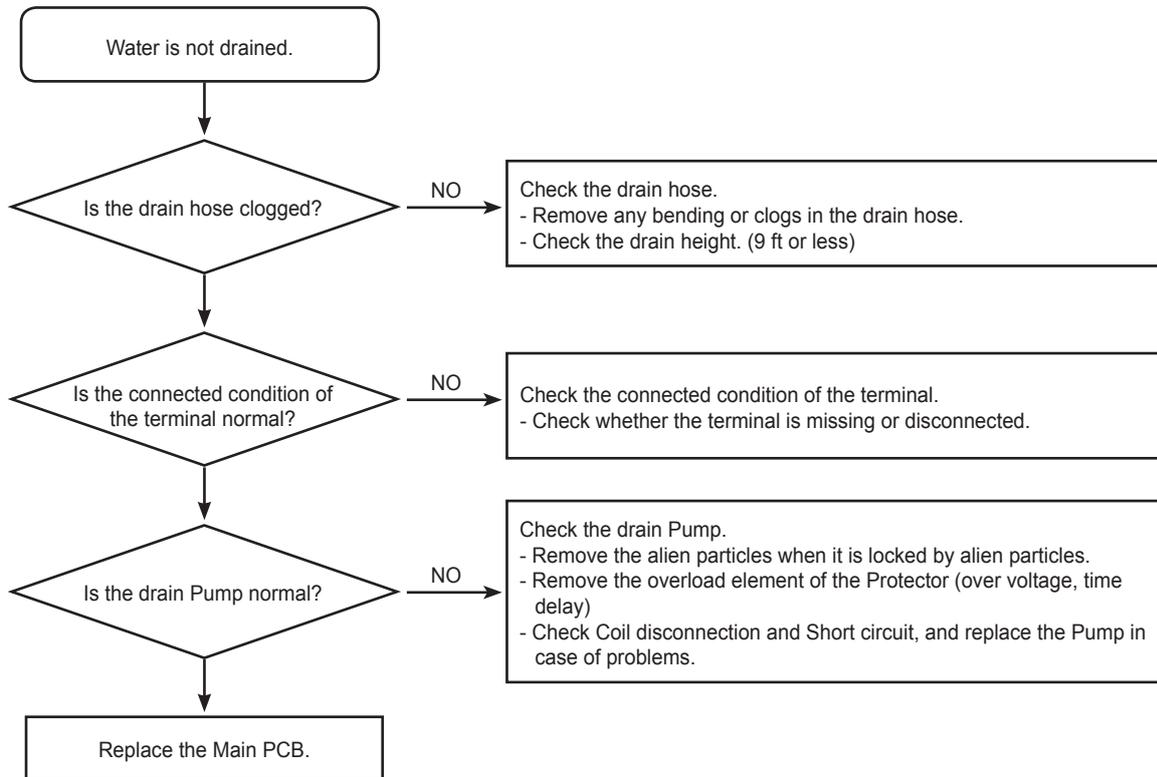
---



---

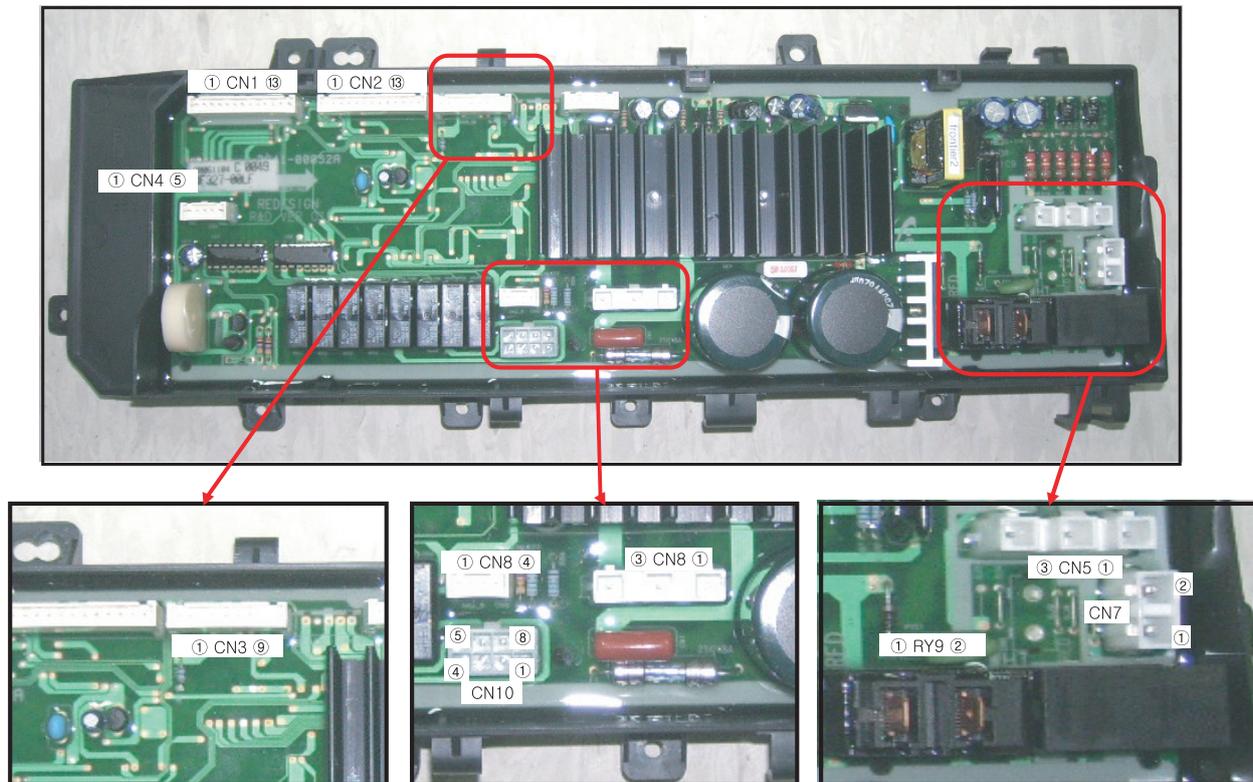
## 6-1. TROUBLE DIAGNOSIS

---



## 6-2. PROBLEM CHECKING AND METHOD OF PCB

-If you plug in the power cord and turn Power S/W on, memorized data is displayed.  
If any data is not displayed, check the followings.



### Thermistor Check

Check Voltage at Pin #6 and #3 of CN3  
Tester Check = DC2.5V  
If it reads 5V, check if its connector is engaged properly.

### Door Switch Check

Check Voltage at Pin #6 and #4 of CN3  
When Door Open = DC5V  
When Door Close = DC0V

### Water Sensor Check

Check Voltage and Frequency at Pin #6 and #7 of CN3  
Reset water level = DC2.5V, 25.8KHz  
Check Voltage and Frequency at Pin #6 and #8 of CN3  
Reset water level = DC2.5V, 25.8KHz

### Sump Sensor Check

Check Voltage at Pin #4 and #2 of CN8  
Tester Check = DC0V or 3.75V  
Check Voltage at Pin #4 and #3 of CN8  
Tester Check = DC0V or 3.75V

### Motor Check

Resistance at Pin #1 and #2 of CN9 = 11.6Ω  
Resistance at Pin #1 and #3 of CN9 = 11.6Ω  
Resistance at Pin #2 and #3 of CN9 = 11.6Ω

### Door Lock Check

Check Voltage at Pin #1 of CN5 and Pin #7 of CN10  
When Door Lock = AC120V  
Check Voltage at Pin #1 of CN5 and Pin #2 of CN7  
When Door Lock = AC120V

### Door Unlock Check

Check Voltage at Pin #1 of CN5 and Pin #8 of CN10  
When Door Unlock = AC120V

### Drain Motor Check

Check Voltage at Pin #1 of CN5 and Pin #6 of CN10  
When Drain Pump operates = AC120V

### Water Valve Check

Check Voltage at Pin #1 of CN5 and Pin #1,2,3,4 of CN10  
When each Valve operates = AC120V

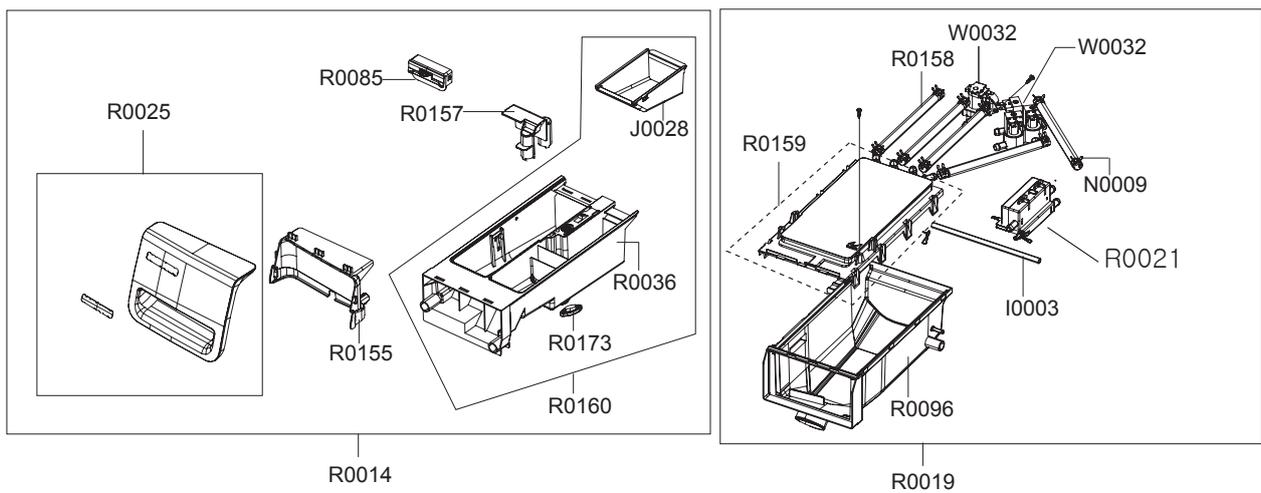
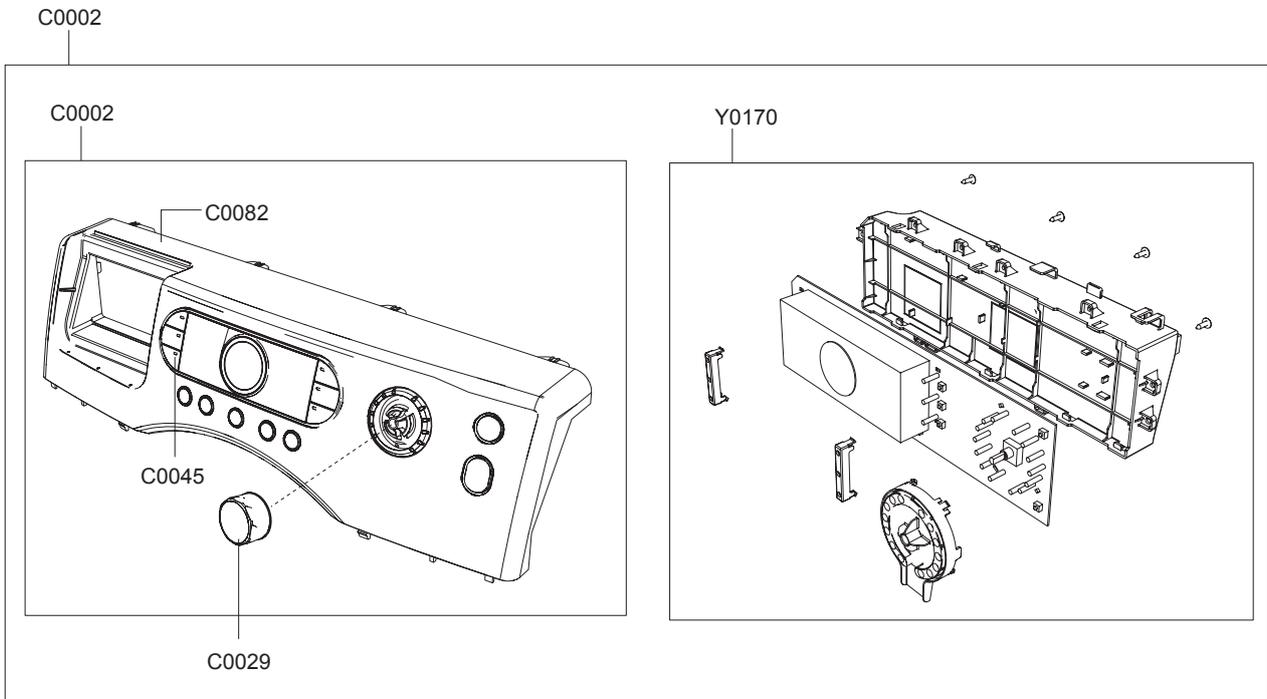
### AC Power Check

Check Voltage at Pin #1 and #3 of CN5  
Check Voltage at Pin #1 of CN5 and Pin #1 of CN6  
Tester Check = AC120V

### Heater Relay Check

Check Voltage at Pin #1 of CN5 and Pin #2 of RY9  
When Heater Relay operates = AC120V

## 7-1. THE CONTROL PARTS

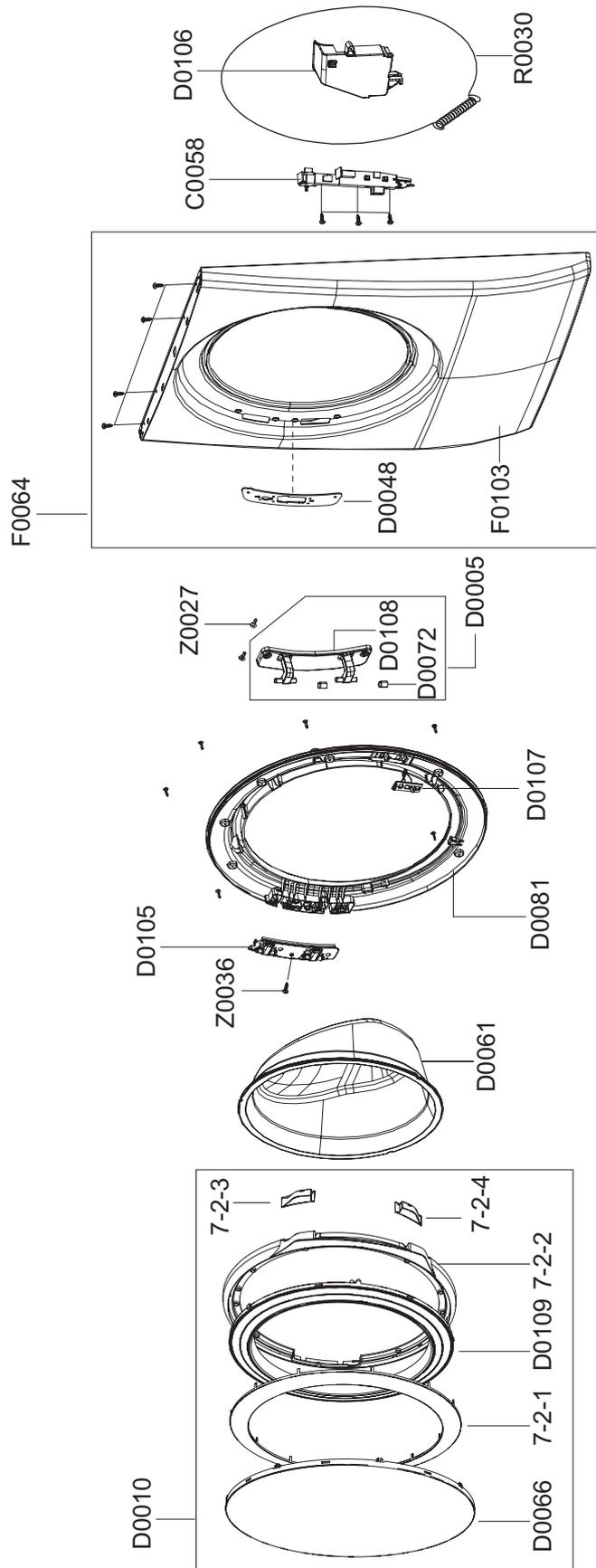


► **MODEL CODE: WF328AAW/XAA**

**Service Bom (SA: SERVICE AVAILABLE, SNA: SERVICE NOT AVAILABLE)**

Location.No	CODE-NO	DESCRIPTION	SPECIFICATION	Un	Q'TY	SA/SNA
C0002	DC97-12597M	ASSY-PANEL CONTROL	WF318ANW/XAA,FRONTIER	PC	1	SNA
C0002	DC97-12607L	ASSY-S.PANEL CONTROL	WF318ANW/XAA,FRONTI	PC	1	SA
C0029	DC97-12954C	ASSY-KNOB ENCODER	WF337AAW/XAA,NEW	PC	1	SA
C0045	DC64-01381A	BUTTON-PUSH(O)	WF337AAW,ABS,-,-,BLK,-	PC	1	SA
C0082	DC64-01360A	PANEL-CONTROL	WF337AAW,ABS,-,-,-,WHT,W	PC	1	SNA
I0003	DC67-00089F	HOSE-WATER	WF326LAW,EPDM,ID5,OD9,T2,L190	PC	1	SA
J0028	DC61-01267A	CASE-PRE WASH	WINGS-PJT,PP(TB53),-,-,-,W	PC	1	SC
N0009	DC65-00008A	CLAMPER HOSE	SEW-DR605,SK5,-,-,YEL,ID14.	PC	10	SA
R0014	DC97-12610A	ASSY-DRAWER	WF327LAW,FRONTIER II	PC	1	SA
R0019	DC97-07125M	ASSY-HOUSING DRAWER	WF337AAW,MAIN/HOT/BL	PC	1	SA
R0025	DC97-12611A	ASSY-PANEL DRAWER	WF327LAW,FRONTIER II	PC	1	SA
R0036	DC61-01170A	BODY-DRAWER	GW-PJT,PP(TB-53),-,-,-,WHT	PC	1	SNA
R0085	DC61-01171A	GUIDE-LIQUID	GW-PJT,ABS,-,-,-,WHT,-	PC	1	SA
R0096	DC61-01167D	HOUSING-DRAWER(L)	WF337AAW,PP(TB-53),-,-	PC	1	SA
R0155	DC64-01356A	HANDLE-DRAWER	FRONTIER II,ABS,-,-,-,-,-	PC	1	SNA
R0157	DC67-00121B	CAP-RINSE	MAH9700,PP(TB53),-,-,-,MUNSELL	PC	1	SA
R0158	DC67-00051B	HOSE-DRAWER	Q1636GW/XEU,EPDM,ID9.0,OD14.	M	1.48	SA
R0159	DC97-08800A	ASSY-S.HOUSING DRAWER	MAH9700AWW,-	PC	1	SA
R0160	DC97-08774A	ASSY-S.DRAWER	MAH9700AWW,-	PC	1	SA
R0173	DC63-00516A	COVER-DETERGENT	GW-PJT,PP(TB-53),-,-,-,-	PC	1	SNA
W0032	DC62-00142G	VALVE-WATER	V-0119,NYLON #6,123x55x55,1~	PC	1	SA
W0032	DC62-30314K	VALVE-WATER	V-0117,NYLON #6,83x45,1~8(10	PC	1	SA
Y0170	MFS-WF318A-T0	ASSY-PCB PARTS	FRONTIER3 PJT	PC	1	SA

## 7-2. THE DOOR PARTS

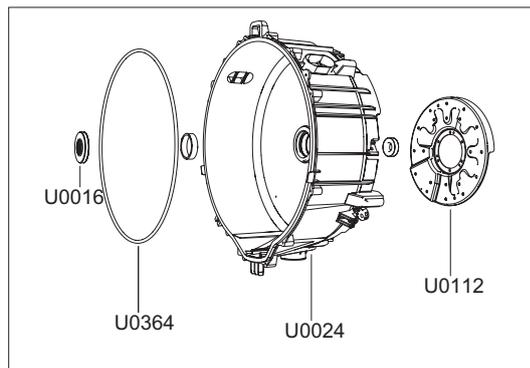
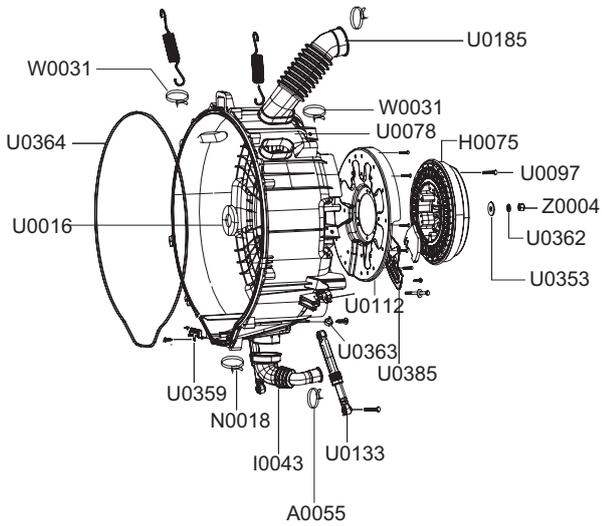
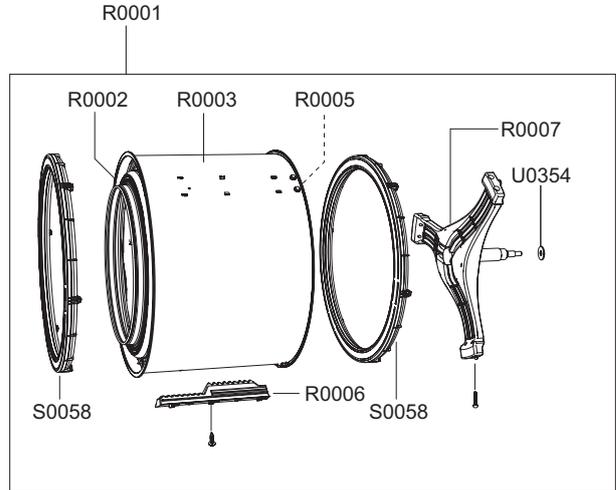
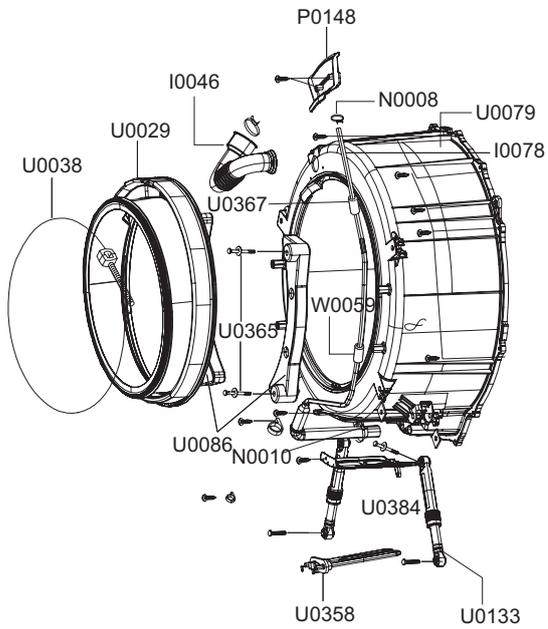


► **MODEL CODE: WF328AAW/XAA**

**Service Bom (SA: SERVICE AVAILABLE, SNA: SERVICE NOT AVAILABLE)**

Location.No	CODE-NO	DESCRIPTION	SPECIFICATION	Un	Q'TY	SA/SNA
C0058	DC64-00519B	DOOR-LOCK S/W	GW-PJT,PP-GF,-,-,-,BLK,1	PC	1	SA
D0005	DC97-10718A	ASSY-HINGE DOOR	FRONTIER-PJT,SINGLE	PC	1	SA
D0010	DC97-12609E	ASSY-COVER DOOR	DV328AEW,DRYER/WHT	PC	1	SNA
D0048	DC61-01222A	BRACKET-HINGE	27-DRYER,HGI,T2.0,-,-,-,-	PC	1	SA
D0061	DC64-00504B	DOOR-GLASS	SEW-HW125,SODALIME,-,-,-,-,-	PC	1	SC
D0066	DC64-01354A	DOOR-SAFETY	WF337AAW,PET,T2.5,-,-,-,SILK	PC	1	SNA
D0072	DC61-00891A	GUIDE-HINGE	HAUZEN(DOM),POM,-,-,-,WHT,HI	PC	4	SA
D0081	DC61-01520A	HOLDER-GLASS	WF326LAW,PP(TB53),T2.8,-,-,-	PC	1	SA
D0105	DC61-01576A	SUPPORT-HINGE	FRONTIER-PJT,STS430,T1.2,-	PC	1	SA
D0106	DC63-00693A	COVER-DOOR SWITCH	FRONTIER,PP(V0),-,-,-,-	PC	1	SA
D0107	DC66-00326A	LEVER-DOOR	TS85-PJT,POM,-,W24,L54,-,WHT,	PC	1	SA
D0108	DC61-01532A	HINGE-DOOR	WF326LAW,ZNDC,T3.8,-,-,-,-,FR	PC	1	SA
D0109	DC63-00789A	COVER-DOOR(I)	WF337AAW,ABS,-,-,-,-,-,FT2	PC	1	SA
F0064	DC97-10340A	ASSY-FRAME FRONT	WF316LAW,NEAT-WHT/FRONT	PC	1	SA
F0103	DC61-01518A	FRAME-FRONT	WF326LAW,SECC,-,-,-,WHT,T0.8,W	PC	1	SNA
R0030	DC97-04973B	ASSY-WIRE DIAPHRAGM	SEW-HFR1637AR,STS304	PC	1	SNA
Z0027	6001-001773	SCREW-MACHINE	TH,+,-,M5,L12,PASS,STS430,	PC	2	SA
Z0036	6001-001668	SCREW-MACHINE	TH,+M5,L16,PASS,STS430,FP	PC	1	SA
7-2-1	DC64-01366B	DECORATION-DOOR	DV337AEW,STS430,-,-,-,-,-	PC	1	SNA
7-2-2	DC63-00773C	COVER-DOOR(O)	DV328AEW,ABS,-,-,-,-,-,WHT	PC	1	SNA
7-2-3	DC63-00781A	COVER-HANDLE(U)	WF337AAW,ABS,-,-,-,-,-,G	PC	1	SNA
7-2-4	DC63-00780A	COVER-HANDLE(L)	WF337AAW,ABS,-,-,-,-,-,G	PC	1	SNA

### 7-3. THE TUB PARTS



► **MODEL CODE: WF328AAW/XAA**

**Service Bom (SA: SERVICE AVAILABLE, SNA: SERVICE NOT AVAILABLE)**

Location.No	CODE-NO	DESCRIPTION	SPECIFICATION	Un	Q'TY	SA/SNA
A0055	DC61-00219D	CLIP-HOSE	SK-5,SW-50A1S,ID33 OD35,MFZNT,	PC	1	SNA
A0055	DC61-00219E	CLIP-HOSE	ID34,SK-5,OD37.2,ZPC2,-	PC	1	SNA
H0075	DC31-00049A	MOTOR BLDC-DRUM	POM1300,0~1200,-,DC310V,	PC	1	SA
I0043	DC67-00126A	HOSE-DRAIN	GW-PJT,EPDM,OD 68,-,T2.0,-,BL	PC	1	SA
I0046	DC67-00265A	HOSE-DRAWER TUB	MACH,EPDM,-,-,-,BLK,-	PC	1	SA
I0078	DC67-00124A	HOSE-PRESSURE	GW-PJT,EPDM,-,-,-,BLK,-	PC	1	SA
N0008	DC61-70029C	SPRING-CLIP	SEW-HW125,HSWR67,CD1.2,ID8.5	PC	1	SA
N0010	DC65-00009A	CLAMPER HOSE	TS85-PJT,HSWR,-,-,YEL,OD24/	PC	1	SA
N0018	DC65-00014A	CLAMPER HOSE	GW-PJT,HSWR,-,ID82,ZPC2,HOS	PC	1	SA
R0021	DC97-14728A	ASSY GUIDE-WATER	FRONTIER II,PP,-,-,-,-	PC	1	SA
R0001	DC97-12604B	ASSY-DRUM	SEW-HFR179ATS,FRONTIER2MC-PJT	PC	1	SA
R0002	DC66-00451A	DRUM-FRONT	ZEUS-PJT,STS430,-,OD582,ID400	PC	1	SNA
R0003	DC66-00485A	DRUM-WRAPPER	WF337AAR/XAA,STS430,-,OD561	PC	1	SNA
R0005	DC66-00452A	DRUM-BACK	ZEUS-PJT,STS430,-,OD582,ID581,	PC	1	SNA
R0006	DC66-00453A	DRUM-LIFTER	ZEUS-PJT,PP(TI42),-,-,L314.2	PC	3	SA
R0007	DC97-12528A	ASSY-FLANGE SHAFT	FRONTIER II,-	PC	1	SNA
S0058	DC97-12135A	ASSY-BALANCER	ZEUS-PJT,-	PC	2	SNA
U0016	DC62-00156A	SEAL-OIL	TS85-PJT,NBR(SD45.5),BLK,-,-,-	PC	1	SA
U0024	DC61-01450A	TUB-BACK	GW-PJT,FRPP(GF15%),PI 602,PI 6	PC	1	SNA
U0029	DC64-00802A	DOOR-DIAPHRAGM	GW-PJT,EPDM,T1.5,-,-,-,GR	PC	1	SA
U0038	DC97-04981D	ASSY-CLAMP DIAPHGRAM	WINGS-PJT,HSWR/ZPC4	PC	1	SA
U0078	DC97-11526A	ASSY-SEMI TUB BACK	WF326LAS,HEATER/VENT-	PC	1	SNA
U0079	DC97-08650F	ASSY-SEMI TUB FRONT	WF337AAW,15%/HEATER/	PC	1	SA
U0086	DC67-00139A	WEIGHT-BALANCER(F)	GW-PJT,GC,-,-,-,RED,F	PC	2	SA
U0097	6011-001548	BOLT-ETC	M7.5,L30,ZPC(YEL),SWRCH18A,HEX	PC	20	SA
U0112	DC61-01338B	BRACKET-HOUSING BEARING	DR130,SBHG1-A(GI	PC	1	SA
U0133	DC66-00470A	DAMPER-SHOCK	FRONTIER II,STEEL+PP+RUBBER	PC	2	SA
U0133	DC66-00470A	DAMPER-SHOCK	FRONTIER II,STEEL+PP+RUBBER	PC	2	SA
U0185	DC67-00155A	HOSE-O.F(I)	WINGS-PJT,EPDM,-,-,T2.0,-,BL	PC	1	SA
U0320	6011-001556	BOLT-HEX	M4,L60,ZPC3(WHT),SM10C,-	PC	1	SNA
U0353	DC60-60044A	WASHER-PLAIN	-,ID10.5,OD30,T3,-,STS304	PC	1	SA
U0353	DC60-60044A	WASHER-PLAIN	-,ID10.5,OD30,T3,-,STS304	PC	2	SA
U0353	DC60-60044A	WASHER-PLAIN	-,ID10.5,OD30,T3,-,STS304	PC	2	SA
U0354	6031-001523	WASHER-WAVE	SK5,-,ID35,OD45,T0.6,ZPC2,-	PC	1	SA
U0358	DC47-00006G	HEATER	-,GW-PJT,STS316L,900W,7.18~7.8	PC	1	SA
U0359	DC61-01482A	BRACKET-HEATER	GW-PJT,STS430/304,T0.5,W9	PC	1	SA
U0362	DC60-60049A	WASHER-SPRING	-,ID10.5,OD18,T2.5,-,SIR	PC	1	SA
U0363	DC65-20008C	CABLE CLAMP	DA-8N,NYLON#66,-,-,NTR,ID13.	PC	1	SA
U0363	DC65-20008C	CABLE CLAMP	DA-8N,NYLON#66,-,-,NTR,ID13.	PC	2	SA
U0364	DC69-00804A	PACKING-TUB	GW-PJT,EPDM-FORM,-,PI8,W624,	PC	1	SA
U0365	DC97-02412A	ASSY-BOLT	SWF-P12,MOTOR, M8*L62	PC	4	SA

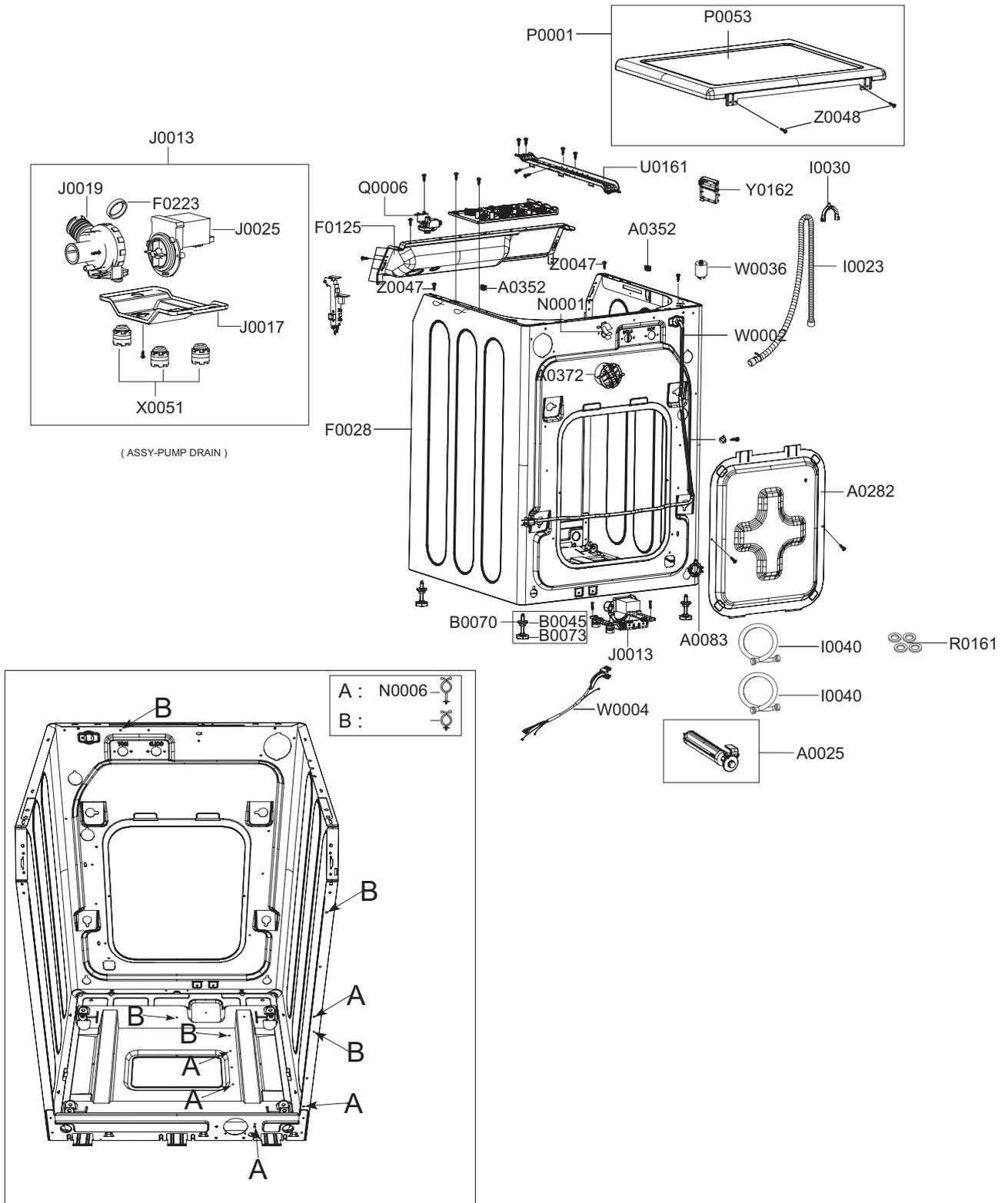
---

► **MODEL CODE: WF328AAW/XAA**

**Service Bom (SA: SERVICE AVAILABLE, SNA: SERVICE NOT AVAILABLE)**

Location.No	CODE-NO	DESCRIPTION	SPECIFICATION	Un	Q'TY	SA/SNA
U0367	DC63-10003E	SPONGE-HOSE AIR	GW-PJT,HB22-GREY,-,T130,	PC	1	SA
U0384	DC61-01414A	BRACKET-TUB(F)	WINGS-PJT,SBHG1-A,T0.4,-,	PC	1	SA
U0385	DC61-01431B	BRACKET-TUB(B)	WINGS-PJT,SBHG1-A,T0.4,-,	PC	1	SA
W0031	DC72-00001D	BAND-RING	WINGS-PJT,HSWR,T2.4,-,-,YEL,ID	PC	1	SA
W0031	DC72-00055A	BAND-RING	27" Washer,HSWR,#2/ M4x35,-,-,	PC	1	SA
W0059	DC63-10002D	SPONGE-HARNESS	-,PU-FOAM,-,T10,W100,L80,	PC	4	SA
Z0004	DC60-50148B	NUT-HEX	SM20C(NYLON),M12,-,-,ZPC3(YEL)	PC	1	SA

## 7-4. THE FRAME PARTS



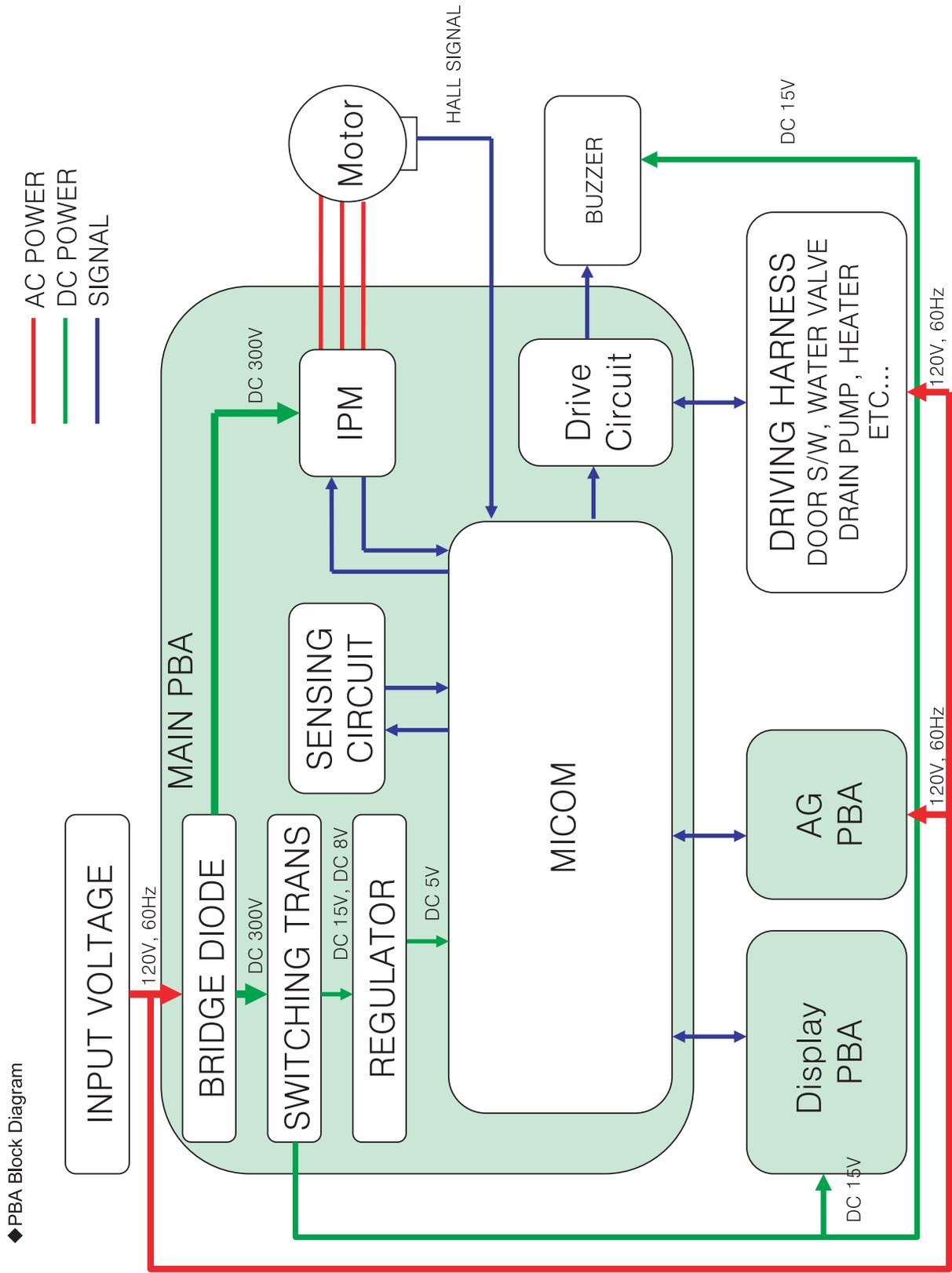
► **MODEL CODE: WF328AAW/XAA**

**Service Bom (SA: SERVICE AVAILABLE, SNA: SERVICE NOT AVAILABLE)**

Location.No	CODE-NO	DESCRIPTION	SPECIFICATION	Un	Q'TY	SA/SNA
A0025	DC97-07448B	ASSY-FIXER TUB	WF337AAW,YELLOW	PC	4	SA
A0083	DC61-00274A	GUIDE-HOSE	P/PV/M,PP,-,-,-,WHT,FRAME/DRA	PC	1	SA
A0282	DC63-00522A	COVER-BACK	GW-PJT,GI,T0.4,W426,L507,-,-,-	PC	1	SA
A0352	DC61-01548A	GUIDE-SPRING	GW-PJT,POM,-,-,-,NTR,-	PC	2	SA
A0372	DC97-08740D	ASSY-CAP O.F	WF337AAW,FRONTIER2	PC	1	SA
B0045	DC61-01652A	LEG-RING	K4-PJT,Nylon66+GF30,NON,SIL,L1	PC	1	SNA
B0070	DC97-12560A	ASSY-LEG	WF206LNW,MARS-PJT	PC	4	SA
B0073	DC61-01747A	LEG-RUBBER	MARS,BUTYL+SWRCH10A,-,GRY+YEL	PC	1	SA
F0028	DC97-06995J	ASSY-FRAME	WF327LAW,FRONTIER II	PC	1	SNA
F0125	DC61-01166A	FRAME-PLATE(U)	GW-PJT,EGI,-,-,-,T1.6,-,-	PC	1	SA
F0223	DC62-00202A	VALVE-CHECK	WINGS,EPDM,PO30,1~10BAR,BLK,	PC	1	SA
I0023	DC97-12534B	ASSY-HOSE DRAIN(I)	WF337AAW,L1920/BLOW-S	PC	1	SA
I0030	DC62-10278A	HOSE-HANGER	-,PP(JS20),-,-,-,-,NTR,-	PC	1	SA
I0040	DC62-00075A	HOSE-WATER(H)	-,NBR+NYLON,ID10.2,OD16.5,	PC	1	SA
I0040	DC62-00075B	HOSE-WATER(C)	-,NBR+NYLON,ID10.2,OD16.5,	PC	1	SC
J0013	DC96-01414A	ASSY-PUMP DRAIN	WF337AAW,FRONTIER II	PC	1	SA
J0017	DC61-01853A	BRACKET-PUMP	WF337AAW,SGCC(GI),T1.2,-,-,-	PC	1	SA
J0019	DC61-01871A	CASE-PUMP	WF337AAW,PP(5113MF6),-,-,-,WHT	PC	1	SNA
J0025	DC31-00054A	PUMP-DRAIN	-,120V,60Hz,40mm,80W/3600RPM	PC	1	SNA
N0001	DC61-00133A	CLAMPER HOSE	P1291,PP(BJ-730),ID24.5,OD2	PC	1	SNA
N0006	DC61-40081A	HOLDER-WIRE	DAWH-2NC,NYLON66,-,-,-,-,NTR	PC	4	SA
N0006	DC61-40081A	HOLDER-WIRE	DAWH-2NC,NYLON66,-,-,-,-,NTR	PC	4	SA
P0001	DC97-08634S	ASSY-COVER TOP	WF327LAW,FRONTIER II	PC	1	SA
P0053	DC63-00523G	COVER-TOP	WF206LNW,SECC(EGI),T0.8,-,-,-,-	PC	1	SNA
Q0006	DC97-03716C	ASSY-SENSOR PRESSURE	SEW-3HW123,DN-S14T/	PC	1	SA
R0161	DC62-40178A	SEAL-WATER	-,NR,BLK,-,-,-,-,ID12XOD25XT3	PC	4	SA
U0161	DC61-01200B	GUIDE-WIRE	WF206LNW,SGCC(GI),T0.8,-,-,-,-	PC	1	SA
W0002	DC96-00757A	ASSY POWER CORD	GW-PJT,GW,UL/CSA,3/16AWG	PC	1	SA
W0004	DC96-01043E	ASSY-M.WIRE HARNESS	FRONTIER 2,AG KIT/NO	PC	1	SA
W0036	DC29-00013A	FILTER-EMI	LFT-215G,WINGS_PJT,250VAC,15A	PC	1	SA
X0051	DC99-00815A	ASSY-CUSHION PUMP	WF206LNW,MARS-PJT	PC	3	SA
Y0162	MES-AG3MOD-S2	ASSY PCB PARTS(S)	MES-AG3MOD-S2	PC	1	SA
Z0047	6009-001458	SCREW-SPECIAL	CH,+,-,M4,L10,ZPC3(BLK),SW	PC	2	SA
Z0048	6009-001476	SCREW-HEX	HEX,+,-,M5,L10,ZPC3(BLK),SWRCH	PC	2	SA

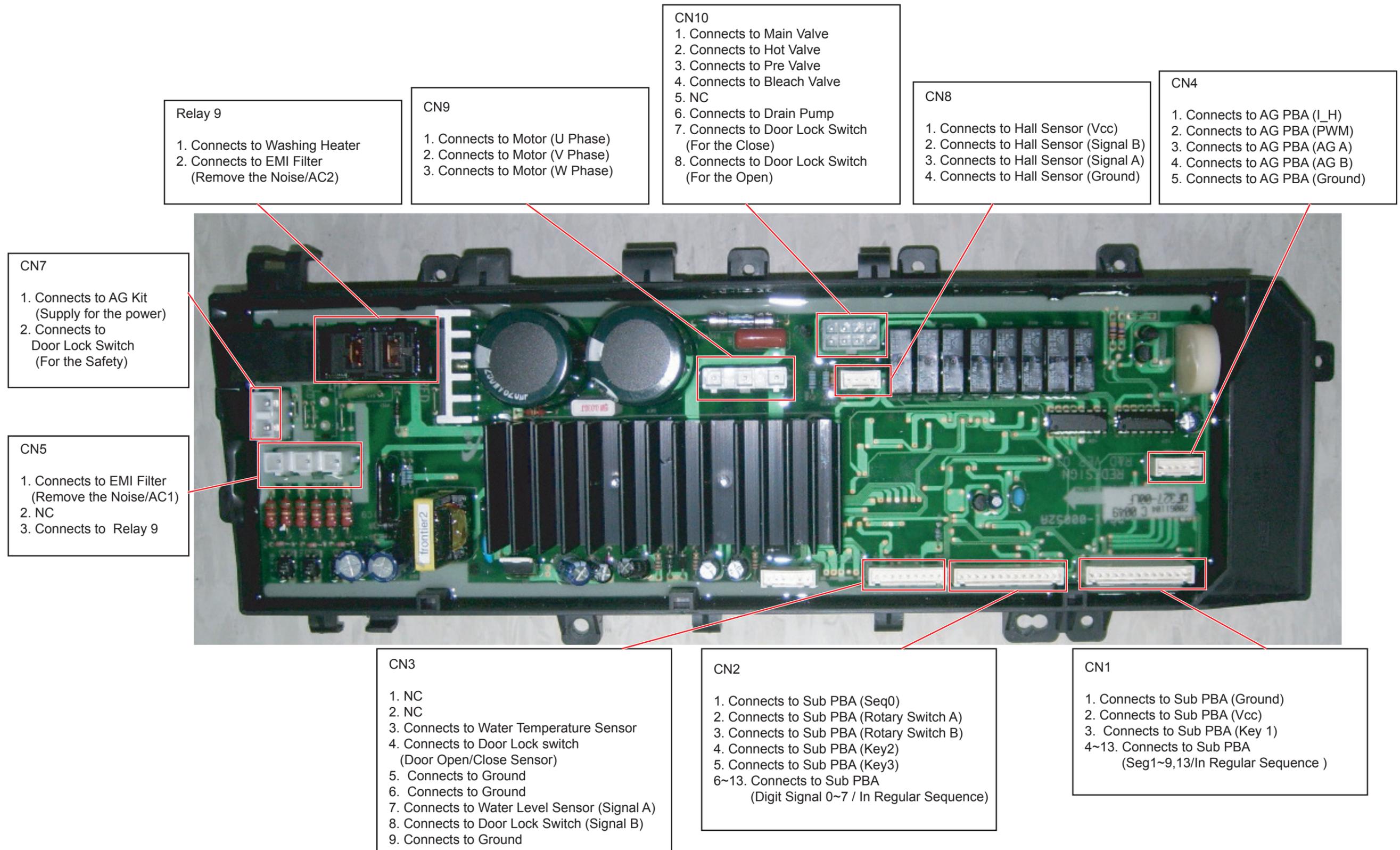
## 8. BLOCK DIAGRAM

### 8-1. BLOCK DIAGRAM

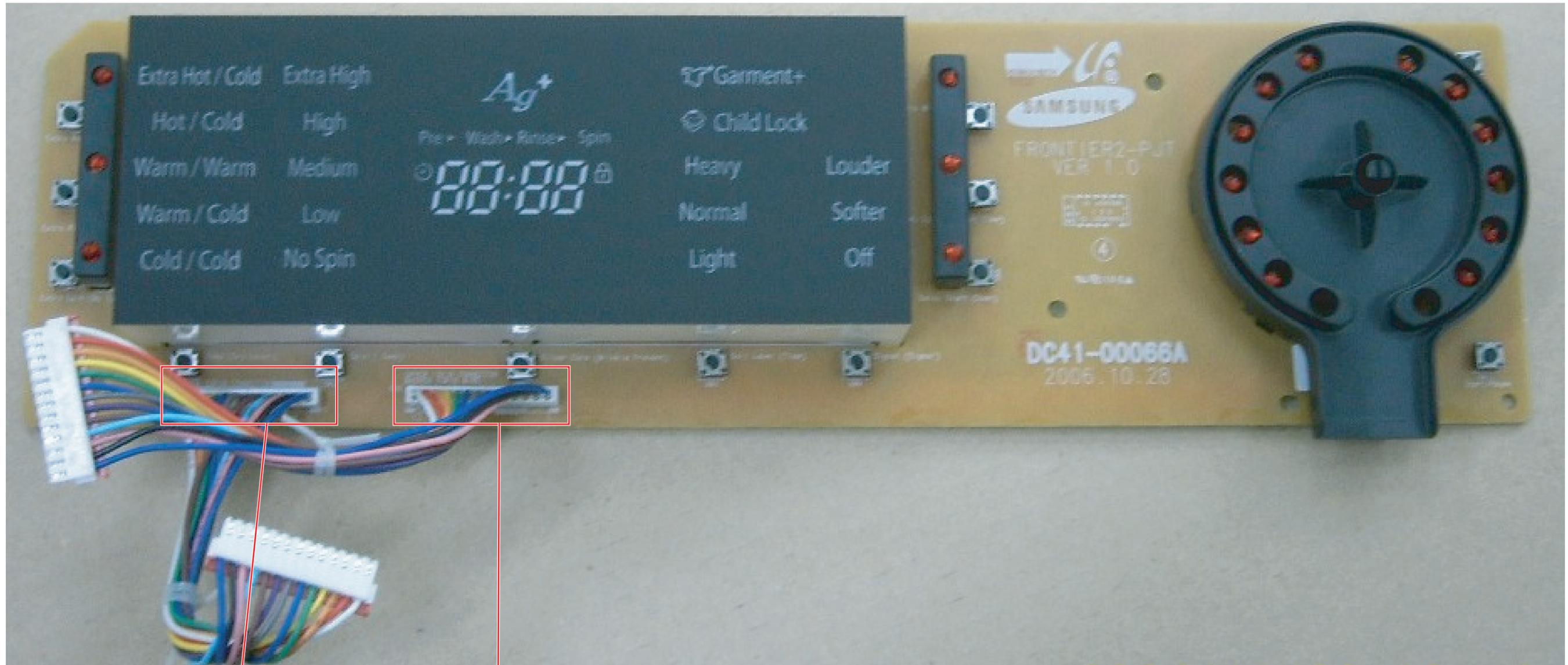




## 10-2. CONNECTOR & RELAY TERMINALS DESCRIPTION (MAIN PBA)



### 10-3. CONNECTOR & RELAY TERMINALS DESCRIPTION (SUB PBA)



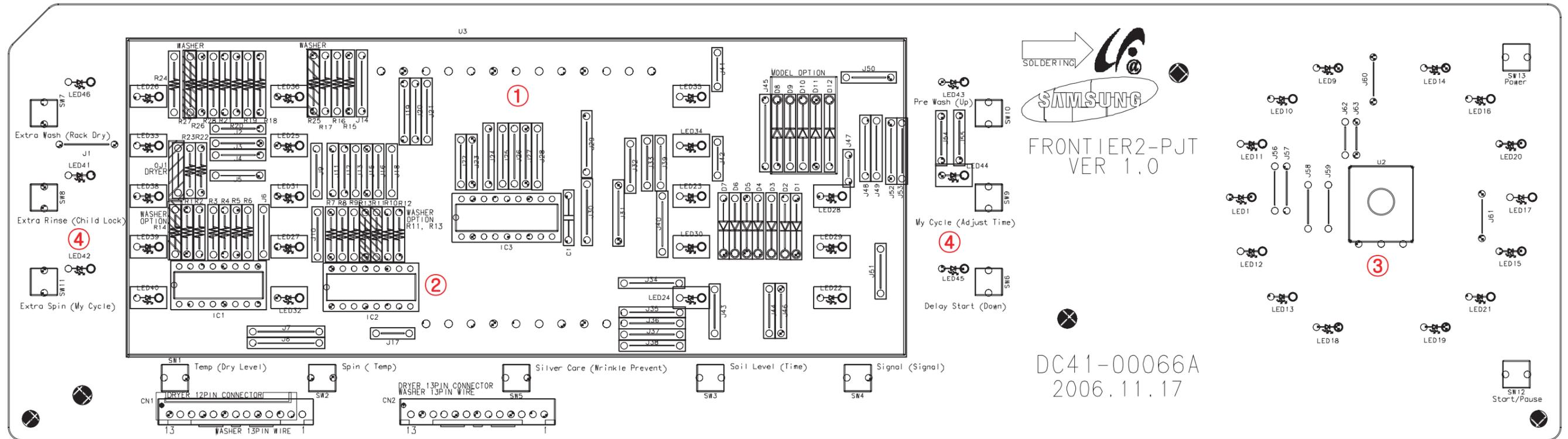
#### CN1

1. Connects to Main PBA (Ground)
2. Connects to Main PBA (Vcc)
3. Connects to Main PBA (Key 1)
- 4~13. Connects to Main PBA (Seg1~9,13/In Regular Sequence )

#### CN2

1. Connects to Main PBA (Seq0)
2. Connects to Main PBA (Rotary Switch A)
3. Connects to Main PBA (Rotary Switch B)
4. Connects to Main PBA (Key2)
5. Connects to Main PBA (Key3)
- 6~13. Connects to Main PBA (Digit Signal 0~7 / In Regular Sequence)

## 10-4. SUB PCB LAYOUT (THE PRINCIPLE PART)



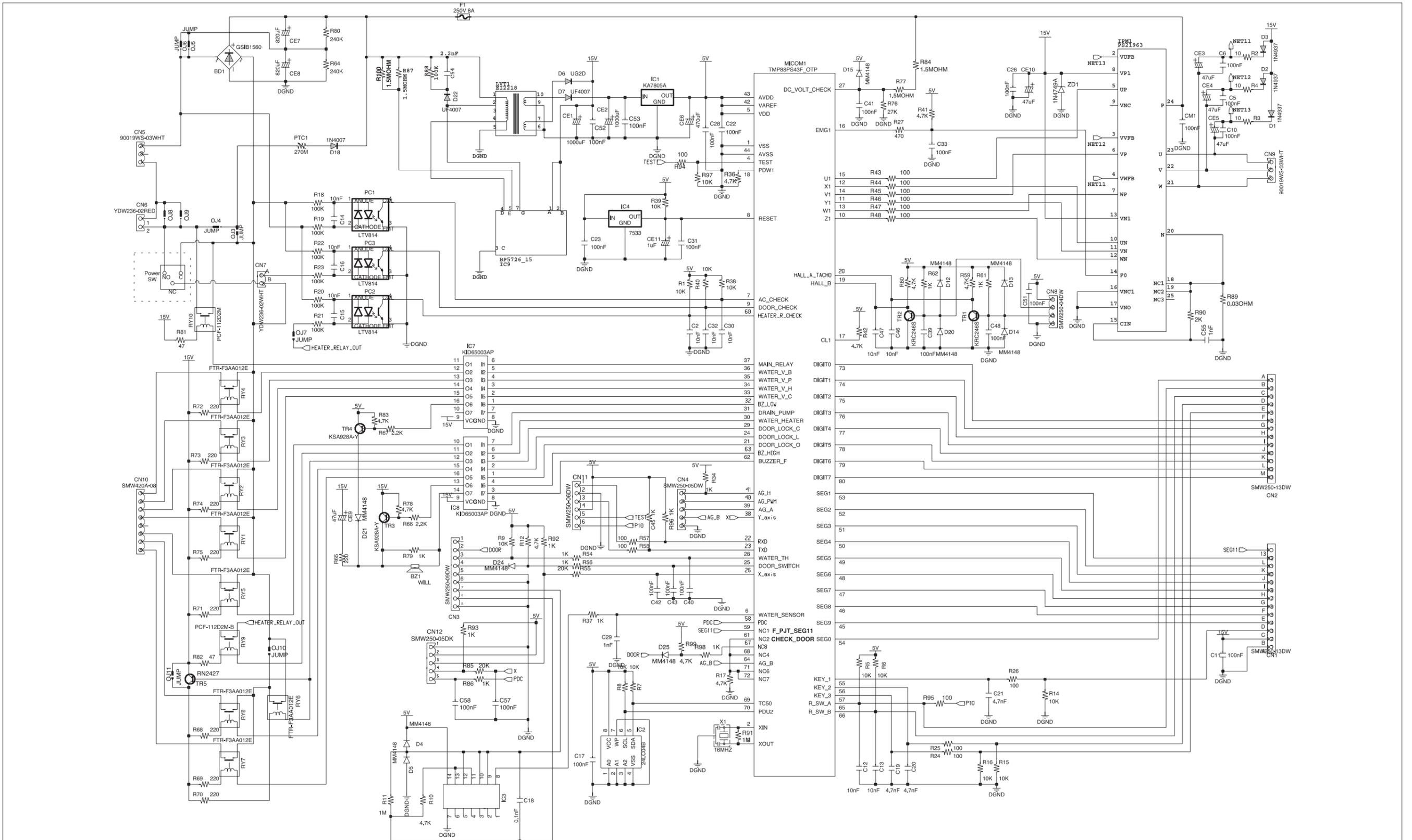
Item	Part No.	Description
1	U3	Display the Course
2	IC1~3	<ul style="list-style-type: none"> <li>✓ Drive the LED &amp; Display</li> <li>✓ Supply the Current to the Acting Current</li> </ul>
3	U2	✓ Rotary Switch (For the Selecting a Course)
4	LED & Key	<ul style="list-style-type: none"> <li>✓ Input the Detail Course</li> <li>✓ Display the Resent Course</li> </ul>



# 11. SCHEMATIC DIAGRAMS

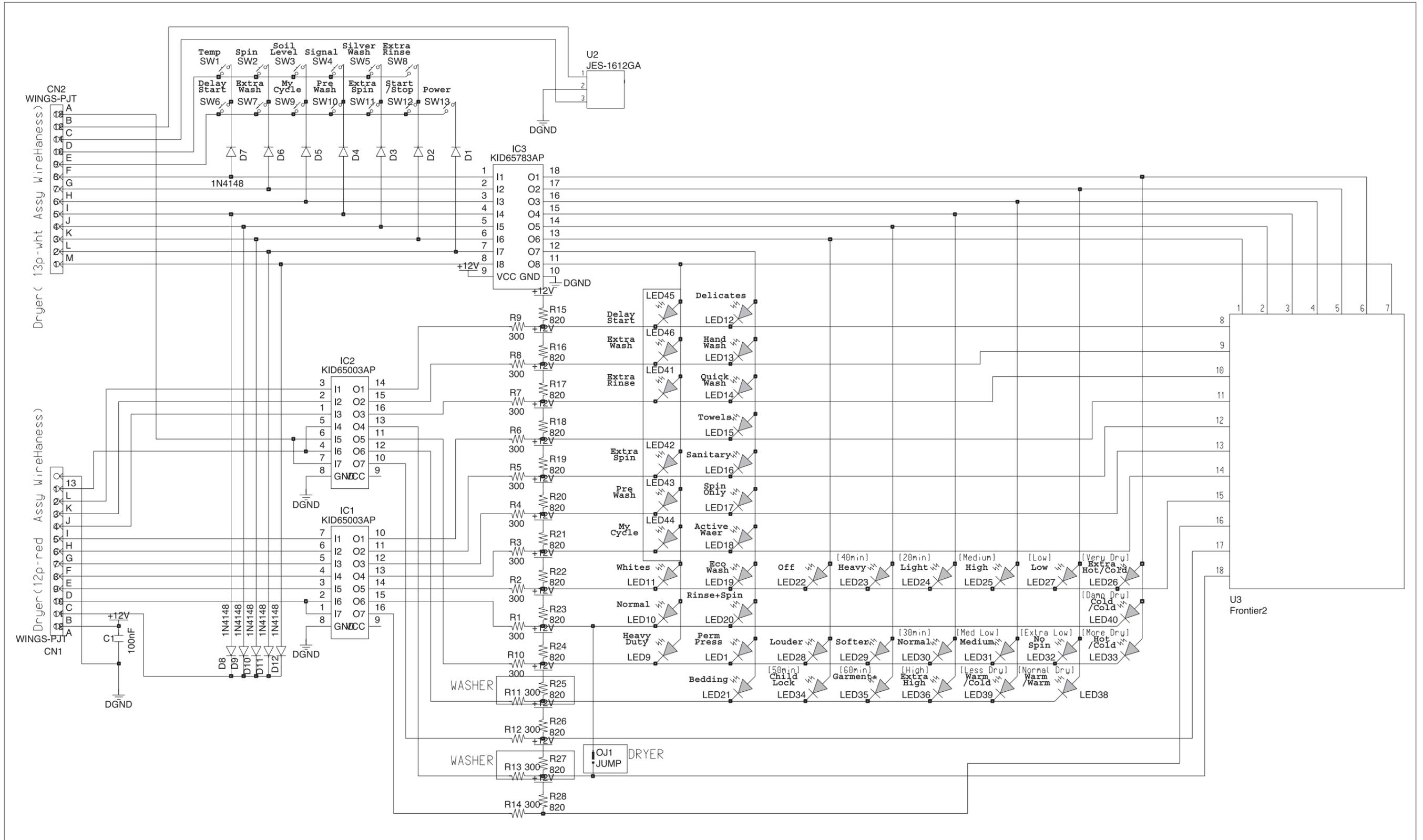
## 11-1. MAIN PCB

\* This Document can not be used without Samsung's authorization.



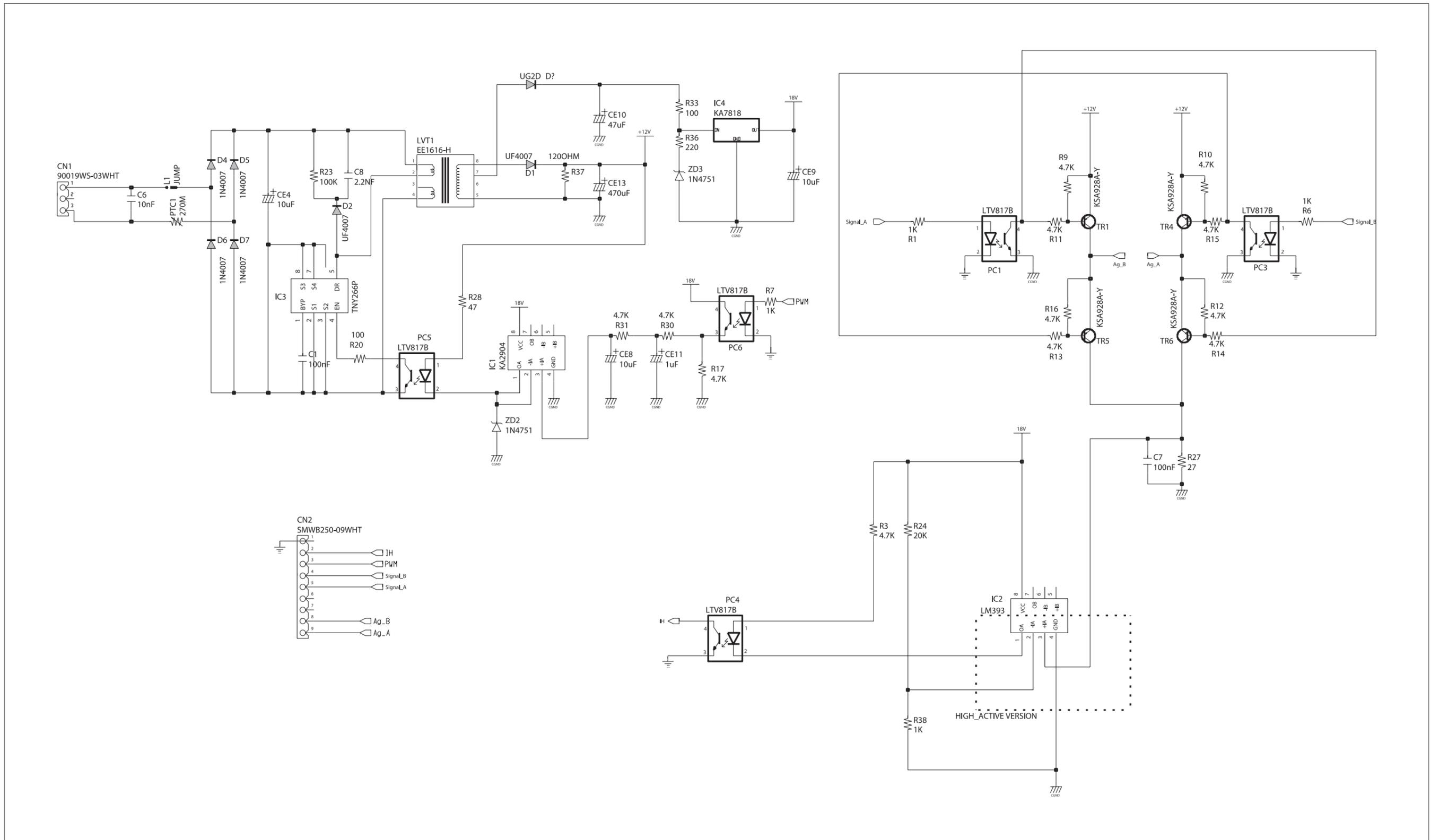
# 11-2. SUB PCB

\* This Document can not be used without Samsung's authorization.



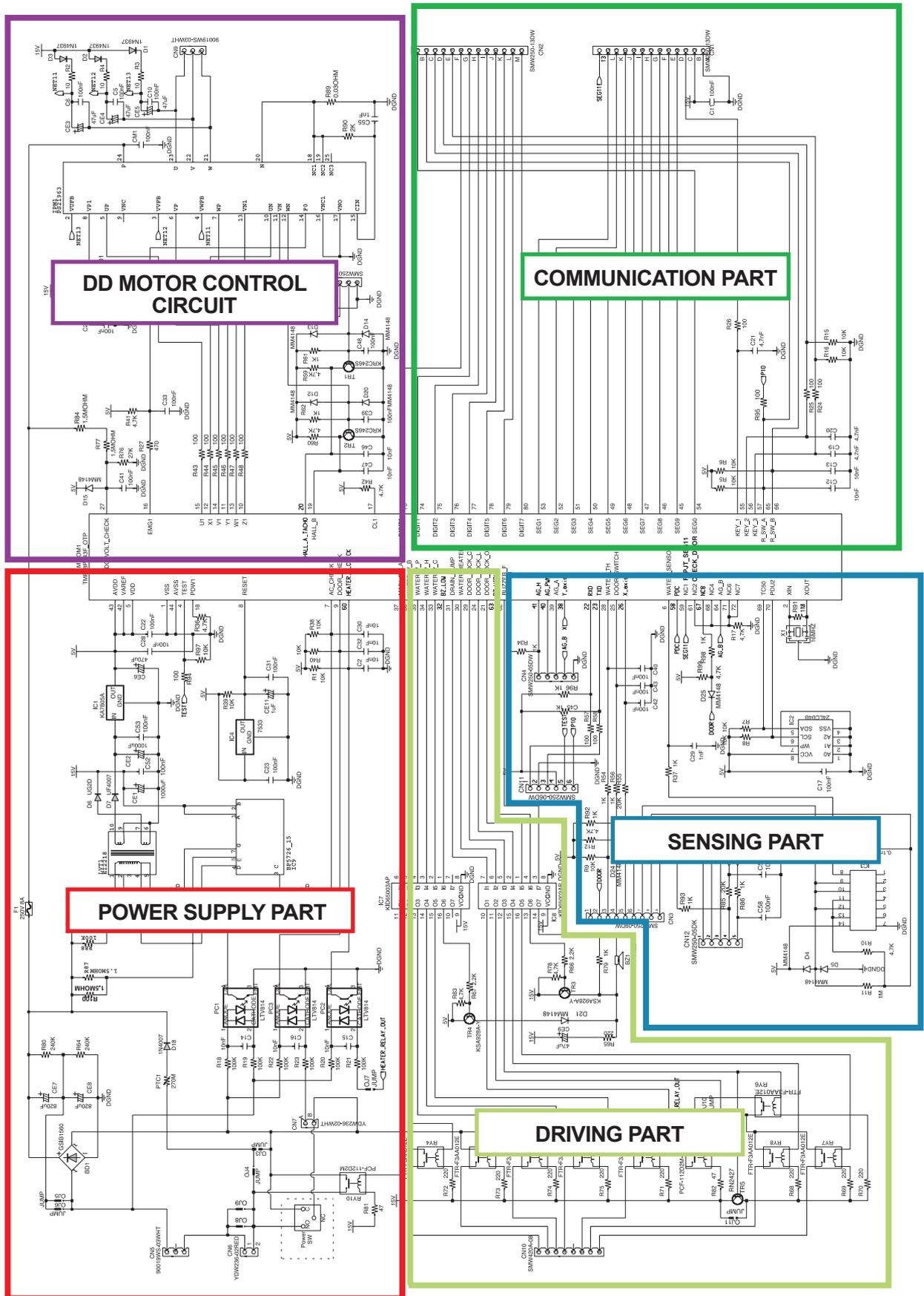
### 11-3. AG PCB

\* This Document can not be used without Samsung's authorization.

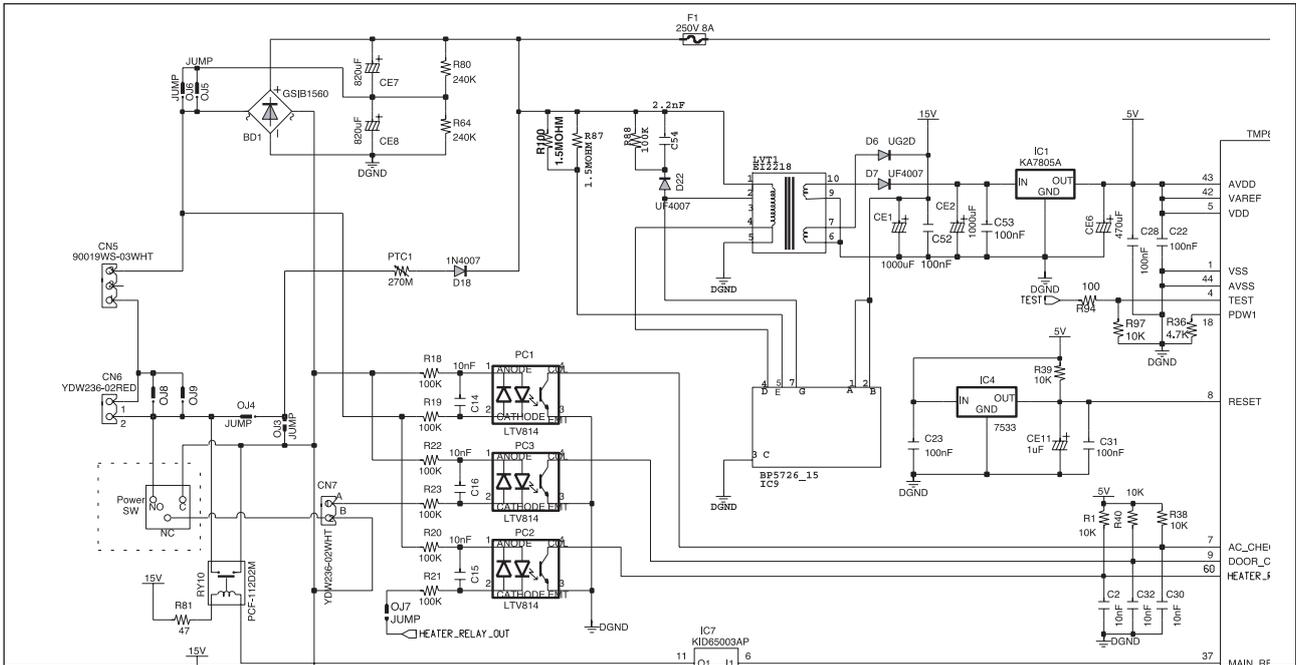


# 12. CIRCUIT DESCRIPTIONS

## 12-1. OVERALL SYSTEM



## 12-2. POWER SUPPLY PART



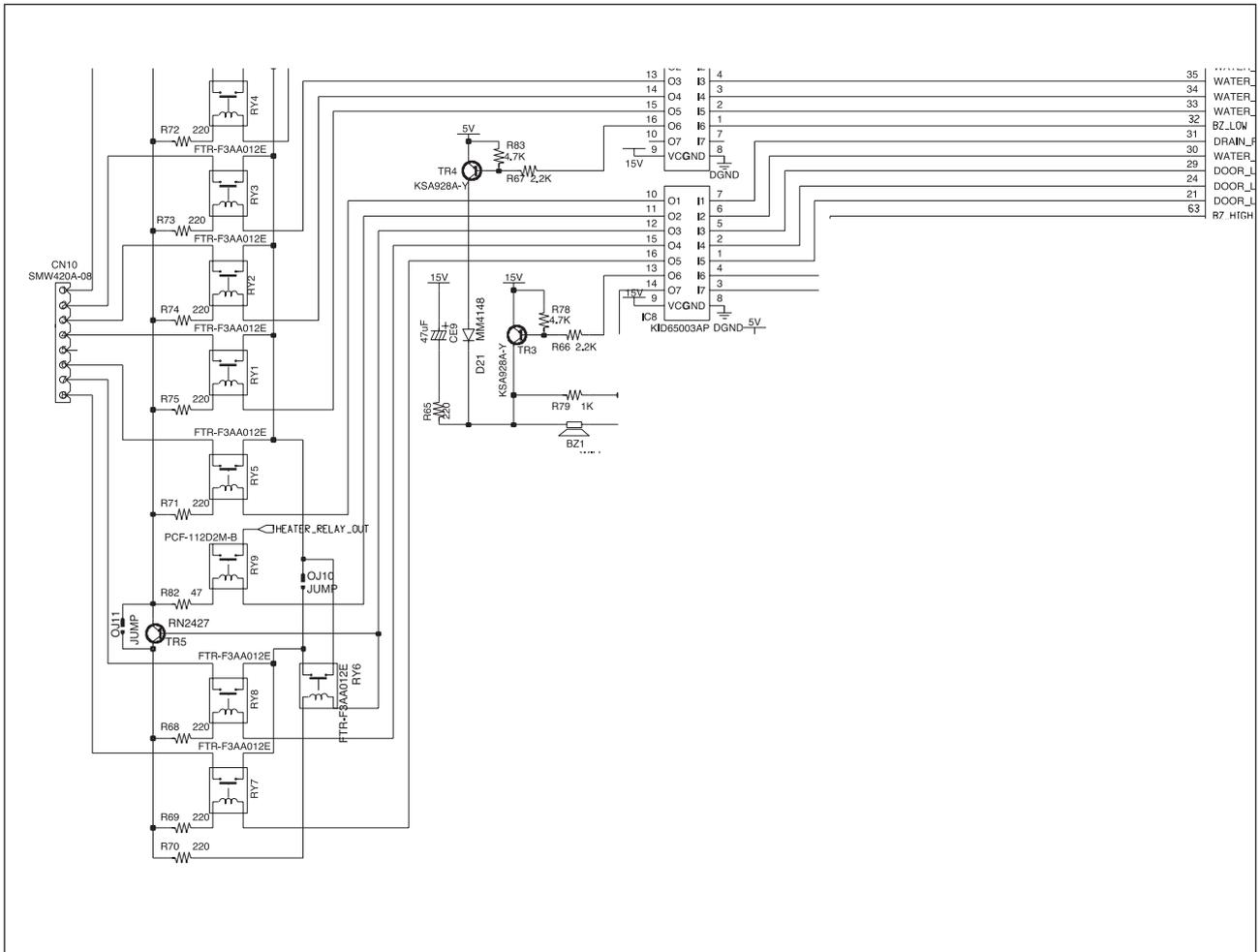
### ► Function

- Generates constant DC voltages of 15V and 5V, etc. necessary to control the circuits by transforming high AC input voltages.
- The circuit of this part is constructed using a switching transformer.

### ► Description

- Generates DC voltages by transforming AC inputs through a diode (bridge).
- The switching transformer implements voltages of 15V and 8V.
- A constant 5V is output at the IC1 output terminal.

## 12-3. DRIVING PART



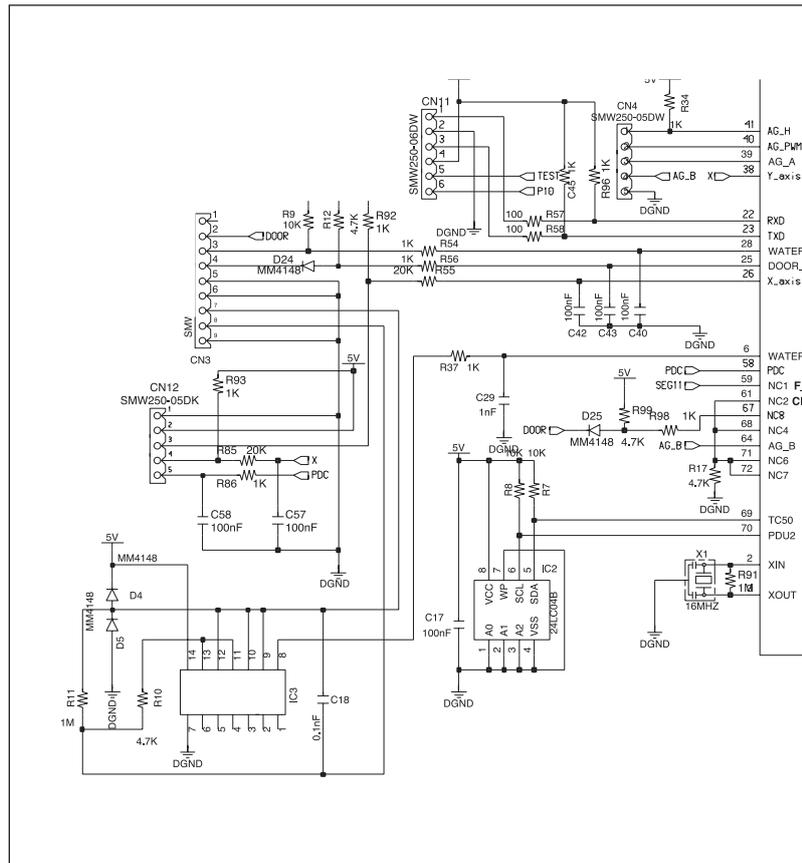
### ► Function

Controls the electrical harness parts of the set.

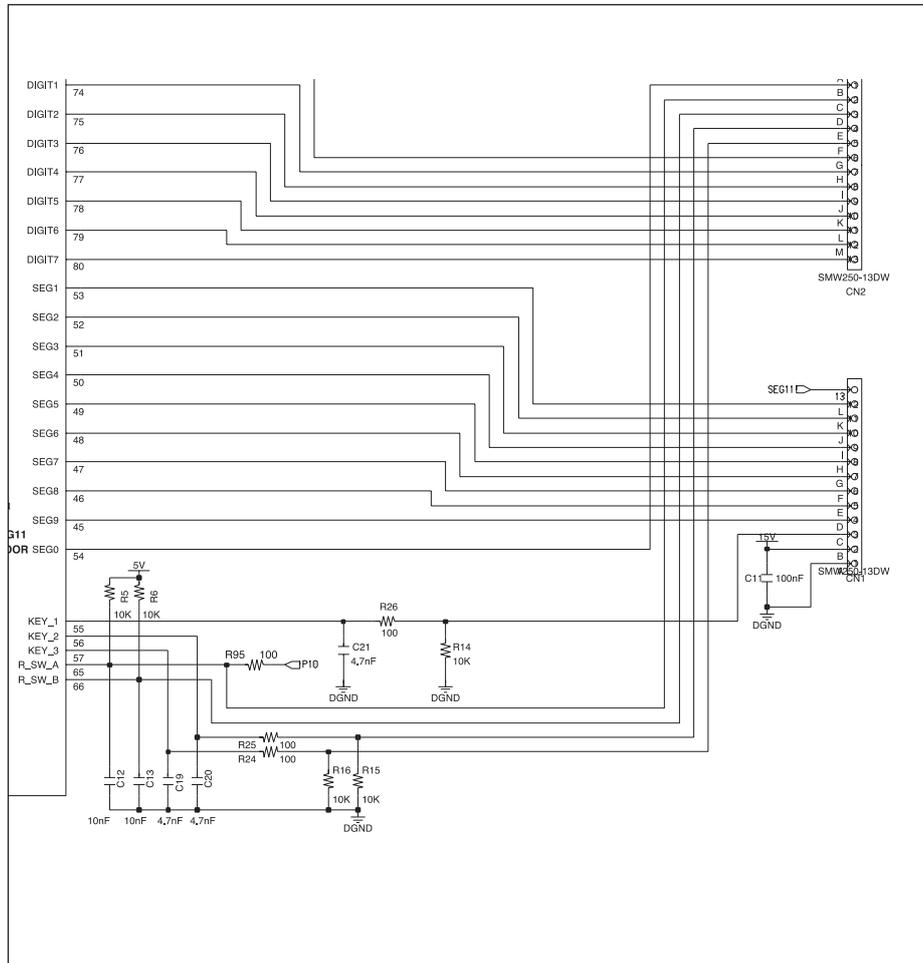
### ► Description

- MICOM sends a high signal to the port of a target harness to operate.
- If a high signal enters as IC7 and IC8 input, the output terminal decreases.
- At this time, a relay operates to supply power to the target harness.

## 12-4. SENSING PART



## 12-5. COMMUNICATION PART



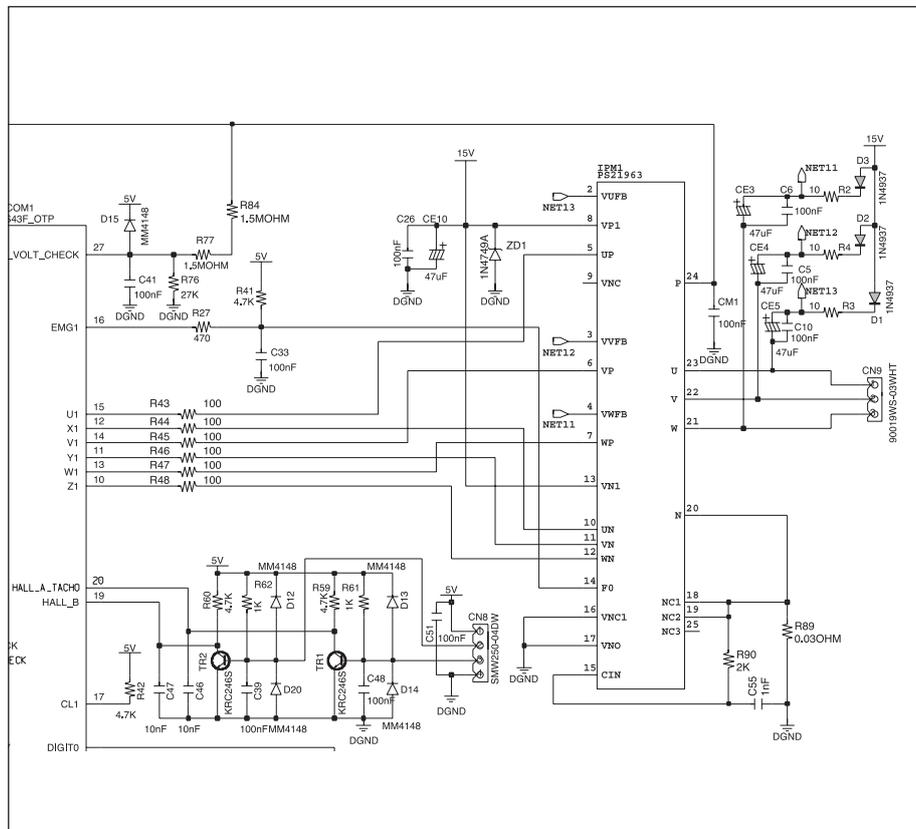
### ► Function

- Communications circuit for controlling the display of the SUB PCB.
- Control circuit for the encoder and switch of the SUB PCB.

### ► Description

- Input/Output ports of the MICOM for controlling the LED, display, and switch of the SUB PBA.

## 12-6. DD MOTOR CONTROL CIRCUIT



### ► Function

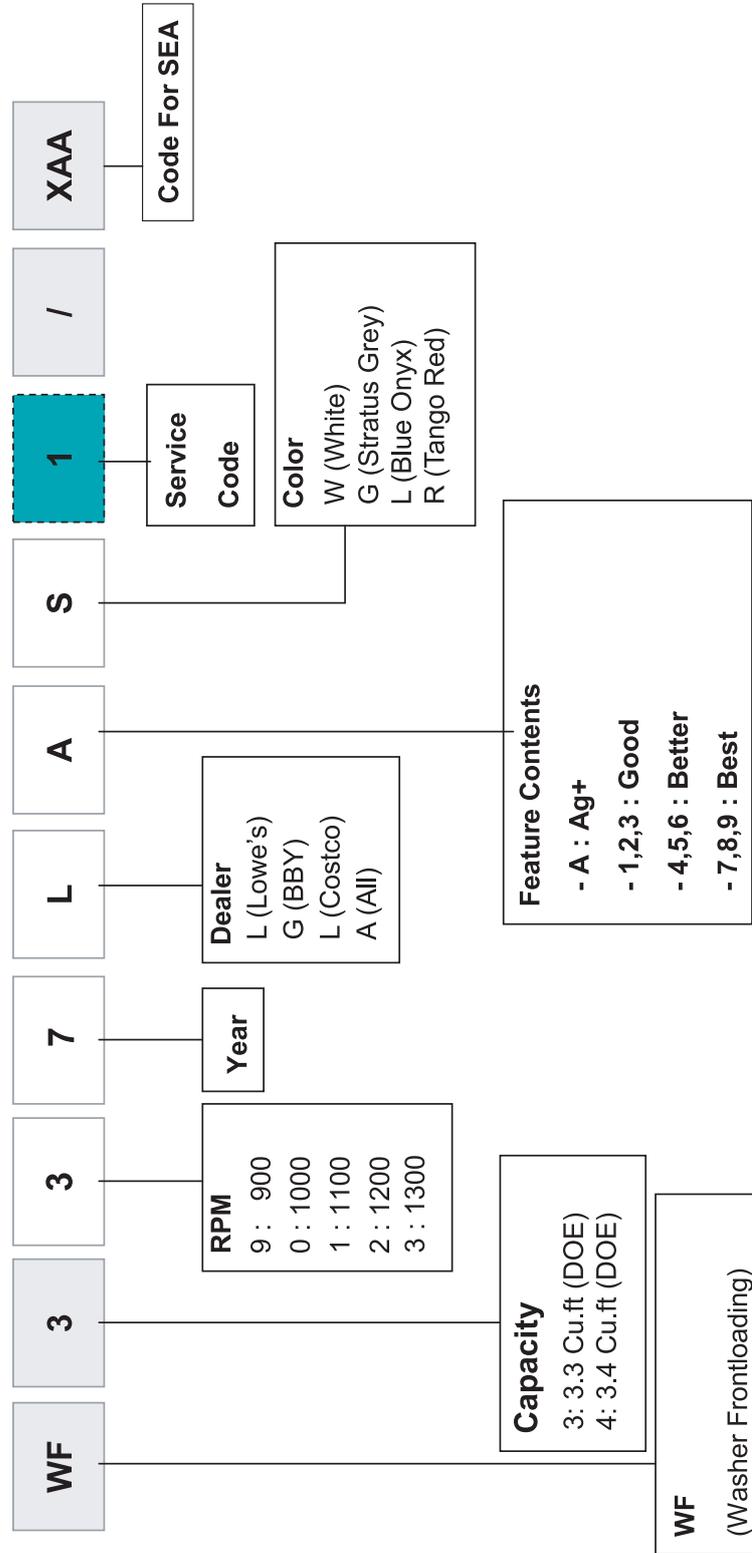
- Inverter control of DD motor
- Detect motor rpm using Hall\_IC in the DD\_MOTOR
- Detect DC\_LINK voltage
- Detect condition (such as excess current) of motor control part

### ► Description

- PWM output will be available at PIN no. 10~15 with reference to active high when using INVERTER control of DD\_MOTOR
- IPM will give Lo signal to 16 PIN on the MICOM through F0 for abnormal cases such as over 16A is generated in the IPM or upper phase current is controlled less than 10.5V.
- Depending on the ON/OFF condition of HALAL\_IC inside the DD\_MOTOR, High/Low signal will be put through PIN 19 and 20 on the MICOM, and ROTOR position of DD\_MOTOR and rpm will be detected
- 10% of DC\_LINK voltage will be put into PIN 28, and will detect A/D function DC\_LINK voltage inside the MICOM

# 13. REFERENCE INFORMATION

## 13-1. MODEL NAME



---

## 13-2. TERMINOLOGY

---

- 1) **ASSY-MAIN PCB (Imbalance Sensor)**
  - To prevent the laundry from gathering on one side of the tube causing noise and vibration, the washing machine uses an imbalance detection device that evenly disentangles the laundry before the hydrating cycle starts.
- 2) **DOOR-LOCK S/W**
  - Prevents the door from being opened while a cycle is in progress. For safety purposes, it keeps the door locked even in pause mode or after the washing cycle unless the water level frequency is greater than 24.8Khz (anti-overflow level) or the inside-tube temperature is less than 65°C in the hydrating cycle, and 55°C in the washing cycle.
- 3) **SENSOR-PRESSURE (Anti Over-Flow)**
  - When the water supplied is more than 2/3 of the tube capacity due to a malfunction of the water supply valve, this device automatically starts water-draining and displays “OVER-FLOW ERROR(E3)” on the LED.
- 4) **THERMISTOR**
  - Keeps sensing and controlling the temperature inside the tube to keep it below your settings.
- 5) **ASSY-THERMAL FUSE (Anti Over-Heat)**
  - When the washing heater is overheated due to an error in the thermistor or any other malfunction, the assy-thermal fuse (built in the heater) is automatically activated to disconnect the power for your and the product’s safety.
- 6) **ASSY-MAIN PCB (Sensitive Laundry Protection)**
  - To avoid any damage to sensitive laundry, the tube temperature is detected and “ERROR(E8)” is displayed on the LED for Wool or Lingerie courses when the temperature is over 50°C.
- 7) **THERMOSTAT (Anti Over-Heat)**
  - When the heater (drier) overheats from an error in the thermistor or any other malfunction, the thermostat (installed on the drying duct) is automatically activated to disconnect the power for your or product’s safety
- 8) **CHILD LOCK**
  - Prevents children from playing with the washing machine.
- 9) **PRE-WASH**
  - The machine does a preliminary wash of about 10 minutes prior to the main wash. This is particularly effective for cleaning badly stained laundry.

### 13-3. FABRIC CARE CHART

The following symbols provide garment care directions without words. The care label will include, in order, four symbols: washing, bleaching, drying and ironing, or dry cleaning when necessary. The use of symbols ensures consistency among garment manufacturers of domestic and imported items. Follow care label directions to maximize garment life and reduce laundering problems.

Wash Cycle		Special Instructions		Warning symbols for laundering	
	Normal		Line Dry/ Hang to Dry		Do Not Wash
	Permanent Press/Wrinkle Resistant/ Wrinkle Control		Drip Dry		Do Not Wring
	Gentle/Delicates		Dry Flat		Do Not Bleach
	Hand Wash	<b>Heat Setting</b>			Do Not Tumble Dry
<b>Water Temperature**</b>			High		No Steam (added to iron)
	Hot		Medium		Do Not Iron
	Warm		Low		
	Cold		Any Heat		
<b>Bleach</b>			No Heat/Air		
	Any Bleach (when needed)	<b>Iron-Dry or Steam Temperatures</b>			Line Dry/ Hang to Dry
	Only Non-Chlorine (color-safe) Bleach (when needed)		High		Drip Dry
	Tumble Dry Cycle		Medium		Dry Flat
<b>Normal</b>			Low		
	Permanent Press/ Wrinkle Resistant/ Wrinkle Control	<b>Dryclean</b>			For machine-washable wool. Loads should be under 8 pounds.
	Gentle/ Delicates		Dry clean		
			Do Not Dry clean		

\*\* The dot symbols represent appropriate wash water temperatures for various items. The temperature range for Hot is 105° - 125° F/ 41° - 52°C, for Warm 85° - 105° F/29° - 41° C and for Cold 60° - 85° F/16° - 29° C. (Wash water temperature must be a minimum of 60° F/16°C for detergent activation and effective cleaning.)

The clothes Washer may not ensure these temperatures because the actual water temperatures entering your Washer are dependent on water heater settings and regional water supply temperatures. For example, cold water entering the home in the northern states during winter may be 40° F/4° C which is too cold for effective cleaning. The water temperature in this situation will need to be adjusted by selecting a warm setting, adding some hot water to the MAX FILL line or using your Washer's heating option, if available.

---

## 13-4. ELECTRICAL WARNINGS

---

To reduce the risk of fire, electrical shock, and other injuries, keep these safety precautions in mind:

- Operate the appliance only from the type of power source indicated on the marking label.  
If you are not sure of the type of power supplied to your home, consult your appliance dealer or local power company.
- Use only a grounded or polarized outlet. For your safety, this appliance is equipped with a polarized alternating current line plug having one blade wider than the other.  
This plug will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still doesn't fit, contact your electrician to replace your outlet.
- Protect the power cord. Power supply cords should be routed so that they are unlikely to be walked on or pinched by items placed on or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the unit.
- Do not overload the wall outlet or extension cords. Overloading can result in fire or electric shock.

---

## 13-5. Models

---

<b>Models</b>	<b>Remark</b>
WF337AAW	3 (1300rpm), A (All), A (Ag+), W (White)
WF337AAG	3 (1300rpm), A (All), A (Ag+), G (Stratus Grey)
WF337AAL	3 (1300rpm), A (All), A (Ag+), L (Blue Onyx)
WF337AAR	3 (1300rpm), A (All), A (Ag+), R (Tango Red)
WF328AAW	2 (1200rpm), A (All), A (Ag+), W (White)
WF328AAG	2 (1200rpm), A (All), A (Ag+), G (Stratus Grey)
WF328AAR	2 (1200rpm), A (All), A (Ag+), R (Tango Red)

---

**13-6. Q & A**

---

<b>NO.</b>	<b>Question</b>	<b>Answer</b>
1	How long does it take for the door to unlock?	It takes approximately 2-3 seconds for the door to unlock.
2	The cycle is complete and "End" is displayed. How do I set another cycle?	When "End" is displayed, the Power button should be pressed or door should be opened before selecting another cycle. The display will show "End" until washer is turned off. To turn off washer, the Power button should be pressed or the door should be opened
3	What should I do when Information Code ("dc") lights up?	When the Information Code is displayed, press the Start/Pause dial and then restart the cycle. For more information, refer to the Owner's Manual
4	There is a small amount of water left in Detergent Drawer after the load is complete. Is this normal?	It is normal for a small amount of water remaining in Detergent Drawer after it completes washing. Bleach is usually flushed out into the tub at the beginning of the washing. Also, its compartment is washed again during the following rinse cycle, removing any remnants.
5	When I went back to my washer, it was turned off. What happened?	Power button may have been accidentally bumped or pushed. Reset the cycle and start the washer. Make sure the unit is plugged into a live electrical outlet. Check house fuse or circuit breaker.
6	The washer door gets locked after a power failure. How can I open it?	If the power fails while the door is locked, the door will remain locked until the power comes back on. If the power comes back on while the door is still locked, the cycle will resume where it left off. If the door is unlocked, "PF" will display and the washer will pause. Press Power Off and restart the cycle.
7	The washer door does not unlock when there is water in the tub. How can I open it?	The water must be drained from the tub for the door to be opened. Set the rotary dial to Spin Only and press the Start/Pause dial. The door will open 2-3 seconds after the Spin or Drain cycle is completed.