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# WASHING MACHINE SERVICE MANUAL

**▲ CAUTION**

READ THIS MANUAL CAREFULLY TO DIAGNOSE  
PROBLEMS CORRECTLY BEFORE SERVICING THE UNIT.

**MODEL : 796.488\*2800**



P/No.: MFL30599120

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# CONTENTS

1. SPECIFICATIONS .....	3
2. FEATURES AND TECHNICAL EXPLANATION .....	4
3. PARTS IDENTIFICATION .....	6
4. INSTALLATION AND TEST .....	7
5. OPERATION .....	10
5-1. CONTROL PANEL FEATURES .....	10
5-2. CYCLE GUIDE .....	12
5-3. SPECIAL FUNCTIONS .....	13
6. WIRING DIAGRAM / PROGRAM CHART .....	14
7. TEST MODE .....	16
7-1. SAFETY CAUTION .....	16
7-2. LOAD TEST MODE .....	16
7-3. HOW TO CHECK THE WATER LEVEL FREQUENCY .....	16
8. TROUBLESHOOTING .....	17
8-1. SAFETY CAUTION .....	17
8-2. ERROR MODE SUMMARY .....	17
8-3. TROUBLESHOOTING SUMMARY .....	19
8-4. TROUBLESHOOTING WITH ERROR .....	20
8-5. TROUBLESHOOTING ELSE .....	26
9. COMPONENT TESTING INFORMATION .....	30
9-1. FILTER ASSEMBLY (LINE FILTER) .....	30
9-2. DOOR LOCK SWITCH ASSEMBLY .....	31
9-3. STATOR ASSEMBLY .....	33
9-4. PUMP MOTOR ASSEMBLY .....	36
9-5. INLET VALVE ASSEMBLY .....	37
9-6. HEATER ASSEMBLY .....	38
9-7. THERMISTOR ASSEMBLY .....	39
10. DISASSEMBLY INSTRUCTIONS .....	40
11. EXPLODED VIEW .....	48
11-1. CABINET AND CONTROL PANEL ASSEMBLY .....	48
11-2. DRUM AND TUB ASSEMBLY .....	49
11-3. DISPENSER ASSEMBLY .....	50

# 1. SPECIFICATIONS

ITEM		F1141FD(0~9)
POWER SUPPLY		120V ~ 60Hz
PRODUCT WEIGHT		170 lbs. (77.1 kg)
ELECTRIC POWER CONSUMPTION	WASHING	280 W
	DRAIN MOTOR	80 W
	WASH HEATER	1000 W
REVOLUTION SPEED	WASH	42 rpm
	SPIN	1100 rpm
CYCLES		9
WASH / RINSE TEMPERATURES		5
SPIN SPEEDS		5
OPTIONS		Prewash, Stain Cycle, Quick Cycle, Easy Spin, Extra Rinse, My Cycle, Delay Wash
CUSTOM PROGRAM		Incorporated
WATER CIRCULATION		Incorporated
OPERATIONAL WATER PRESSURE		4.5-145 psi (30-1000 kPa)
CONTROL TYPE		Electronic
WASH CAPACITY		3.16 cu.ft (3.60 cu.ft.IEC)
DIMENSIONS		27" (W) X 29 -1/2" (D) X 42 -3/4" (H), 49 -4/5" (D, door open)
DELAY WASH		up to 12 hours (796.4884*800) and up to 13 hours (796.4885*800)
DOOR SWITCH TYPE		PTC + Solenoid
WATER LEVEL		5 steps (by sensor)
LAUNDRY LOAD SENSING		Incorporated
ERROR DIAGNOSIS		Incorporated
AUTO POWER OFF		Incorporated
CHILD LOCK		Incorporated
RLM ENABLE		-

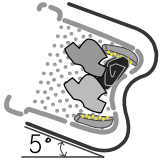
# 2. FEATURES & TECHNICAL EXPLANATION

## 2-1. FEATURES



### ■ Direct Drive System

The advanced Brushless DC motor directly drives the drum without belt and pulley.



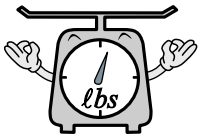
### ■ Tilted Drum and Large Door Opening

Tilted drum and large opening make it possible to load and unload clothing more easily.



### ■ Time-Released Dispenser

Detergent, fabric softener and bleach are dispensed separately at the right time during wash cycle.



### ■ Automatic Wash Load Detection

Automatically detects the load and optimizes the washing time.



### ■ Built-in Heater

The internal heater automatically heats the water to the optimum temperature on selected cycles.

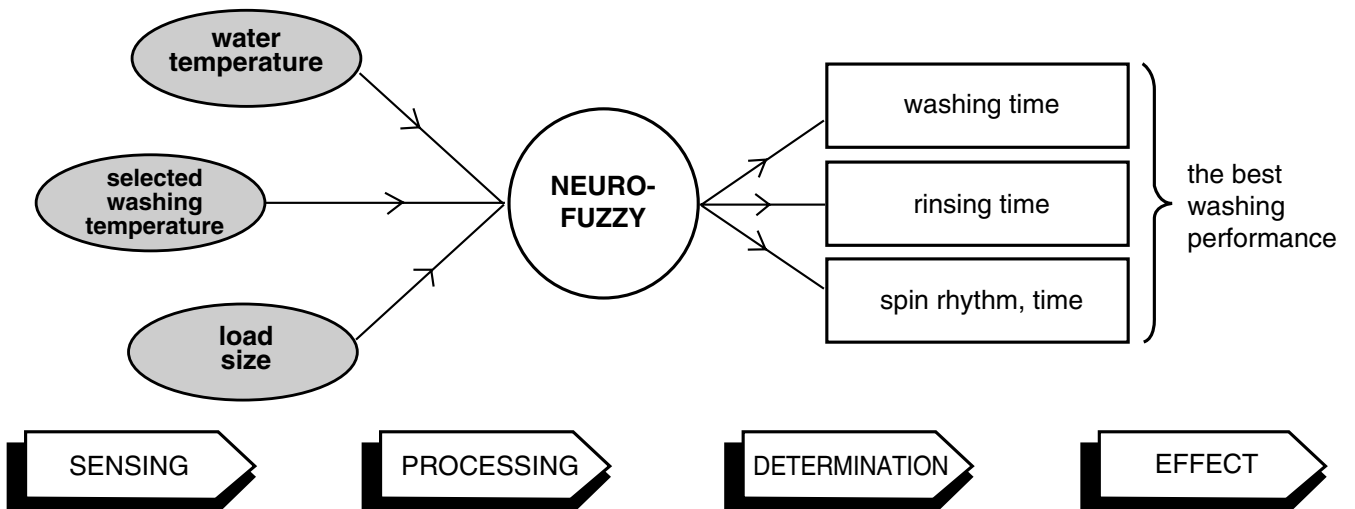


### ■ Child Lock

The Child lock prevents children from pressing any button to change the settings during operation.

## 2-2. NEURO FUZZY WASHING TIME OPTIMIZATION

To get the best washing performance, optimal time is determined by the water temperature, the selected washing temperature, and the size of the load.



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## 2-3. WATER LEVEL CONTROL

- This model incorporates a pressure sensor which can sense the water level in the tub.
- The water supply is stopped when the water level reaches the preset level, the washing program then proceeds.
- Spinning does not proceed until the water in the tub drains to a certain level.

## 2-4. DOOR CONTROL

- The door can be opened by pulling the door handle whenever washer is not in operation.
- When the cycle is completed, the DOOR LOCKED light will turn off.
- If a power failure has occurred while in operation, the door will unlock after 5 minutes.
- Clicking sounds can be heard when the door is locked/unlocked.



## 2-5. THE DOOR CAN NOT BE OPENED

- While program is operating
- When a power failed and power plug is taken out in operation
- While Door Lock lights turn on.
- While the motor is in the process of inertial rotating, through the operation is paused.

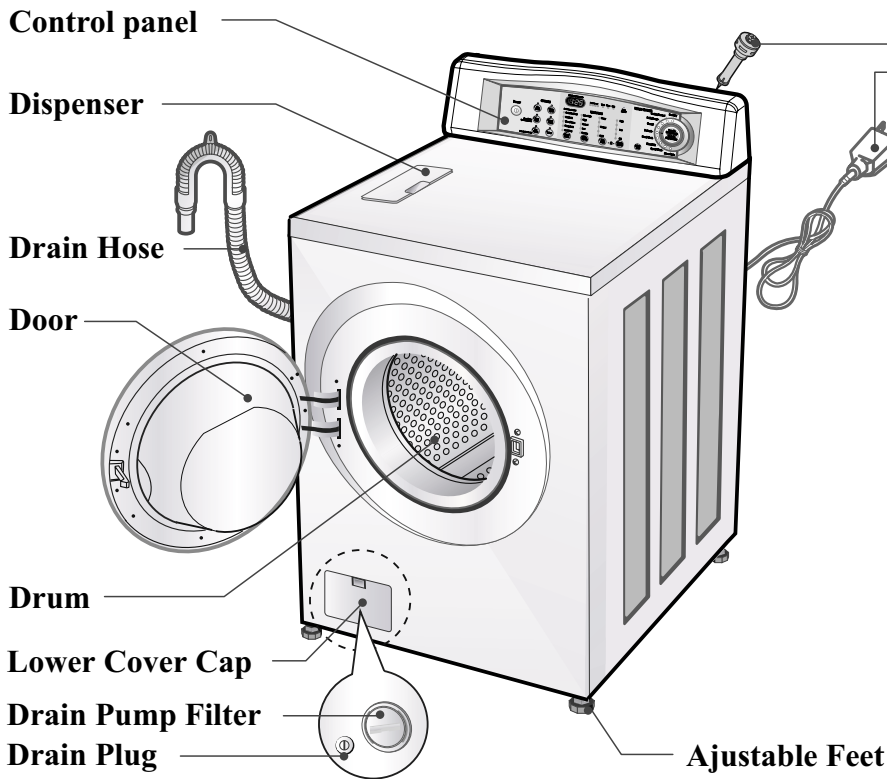
## 2-6. DOOR LOCKED LAMP LIGHTS

- When the frequency of water level is lower than 22.9 kHz  
(It can be canceled when the frequency is more than 23.8 kHz)
- When the temperature inside the tub is higher than 45 °C and water level is not 25.5 kHz  
(It can be canceled when the water level is 25.5 kHz or the temperature inside the tub is lower than 40 °C)

## 2-7. CHILD LOCK

- Use this option to prevent unwanted use of the washer. Press and hold OPTION button for 3 seconds to lock/unlock control.
- When child lock is set, “ ” blinks and all buttons are disabled except the Power  button.  
You can lock the controls of the washer while washing.

# 3. PARTS IDENTIFICATION

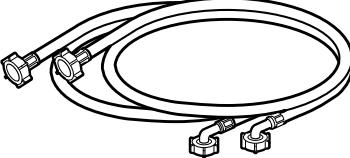


**Shipping Blots  
Power Plug**

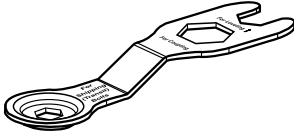
- If the supply cord is damaged, it must be replaced by the manufacturer or its authorized service technician in order to avoid a hazard.




## ■ ACCESSORIES



Hot/Cold(1 each)  
Hose



Wrench



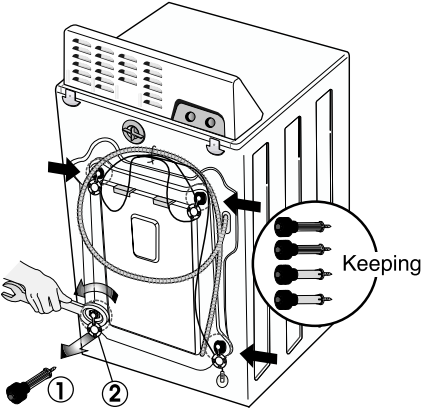
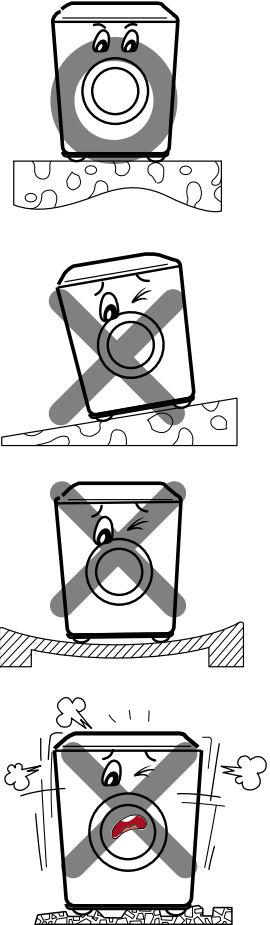
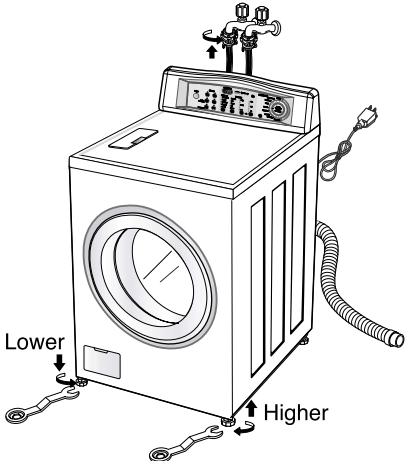
Tie strap  
to secure drain hose to standpipe  
inlet hose, or laundry tub

# 4. INSTALLATION

- 1 Before servicing, ask the customer what the trouble is.
- 2 Check the setup (power supply is 120V AC, remove the transit bolts, level the washer....).
- 3 Check with the troubleshooting guide.
- 4 Plan your service method by referring to the disassembly instructions.
- 5 Service the unit.
- 6 After servicing, operate the appliance to see whether it functions correctly.

## ■ STANDARD INSTALLATION

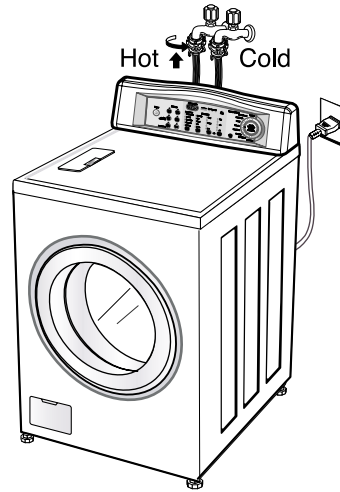
The appliance should be installed as follows:

REMOVE THE TRANSIT BOLTS	INSTALL THE APPLIANCE ON A FLAT AND FIRM SURFACE	ADJUST THE LEVELING
<ul style="list-style-type: none"> <li>• Remove the transit bolts (4 EA: ①) with the supplied wrench.</li> <li>• Keep the transit bolts and spanner for future use.</li> <li>• Insert the 4 caps (provided) into the hole.</li> </ul> 		<ul style="list-style-type: none"> <li>• Turn the leveling feet to adjust the appliance horizontally.</li> </ul>  <ul style="list-style-type: none"> <li>• The appliance goes up by rotating the feet clockwise.</li> <li>• The appliance come down by rotating the feet counterclockwise.</li> </ul>

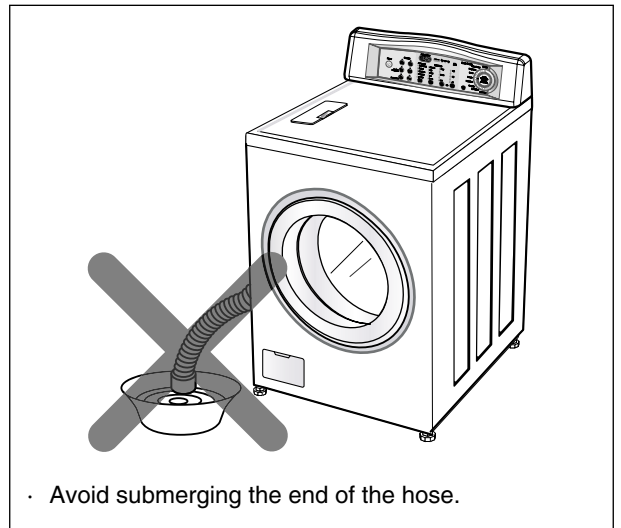
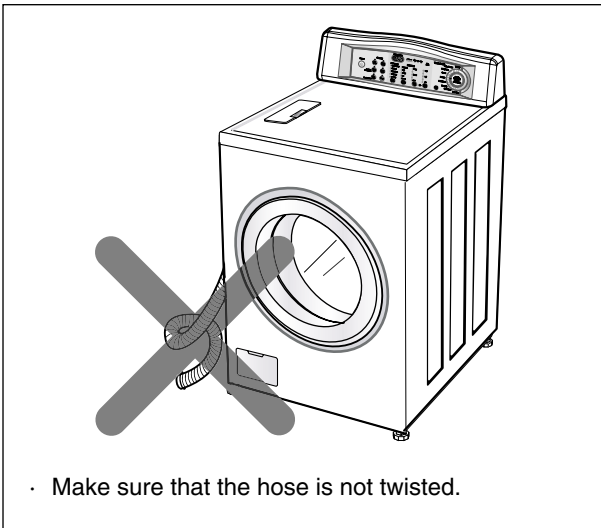


## ■ HOW TO CONNECT THE INLET HOSE

- Verify that the rubber washer is inside of the valve connector.
- Connect the inlet hose firmly to prevent leaks.

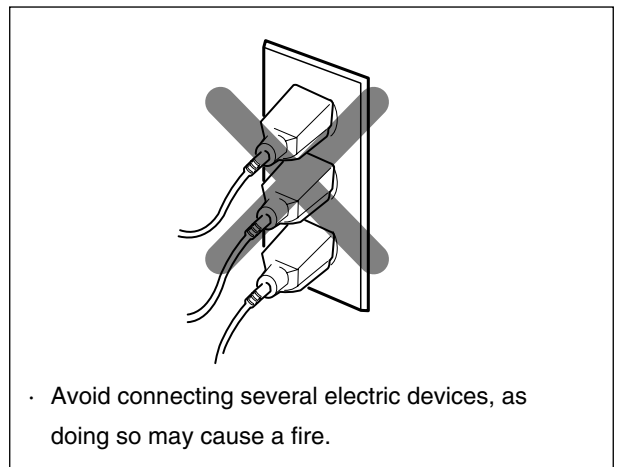
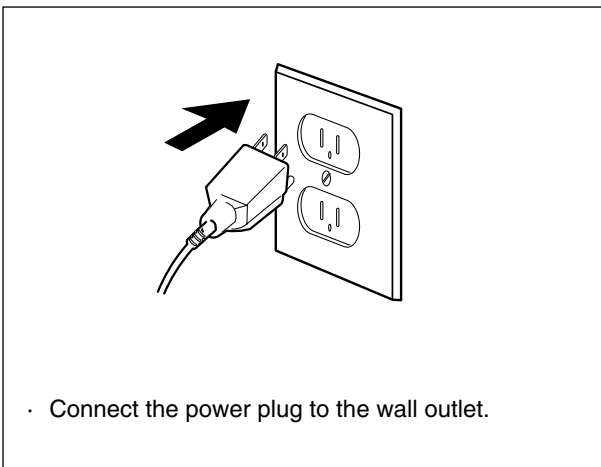


## ■ CONNECT THE DRAIN HOSE

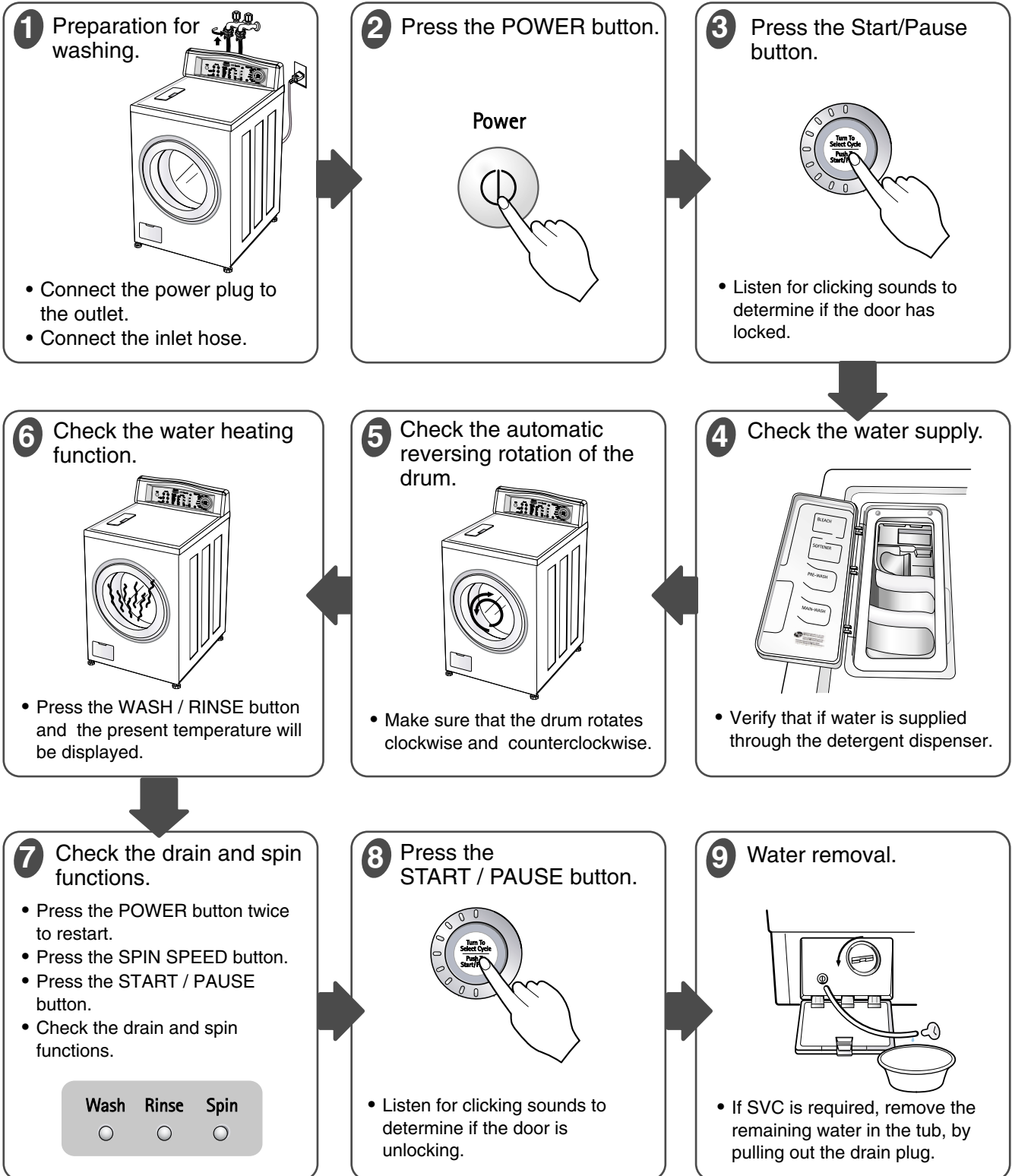


※ The end of the drain hose should be placed less than 96" from the floor.

## ■ CONNECT POWER PLUG



## 7 TEST OPERATION



# 5. OPERATION

## 5-1 CONTROL PANEL FEATURES

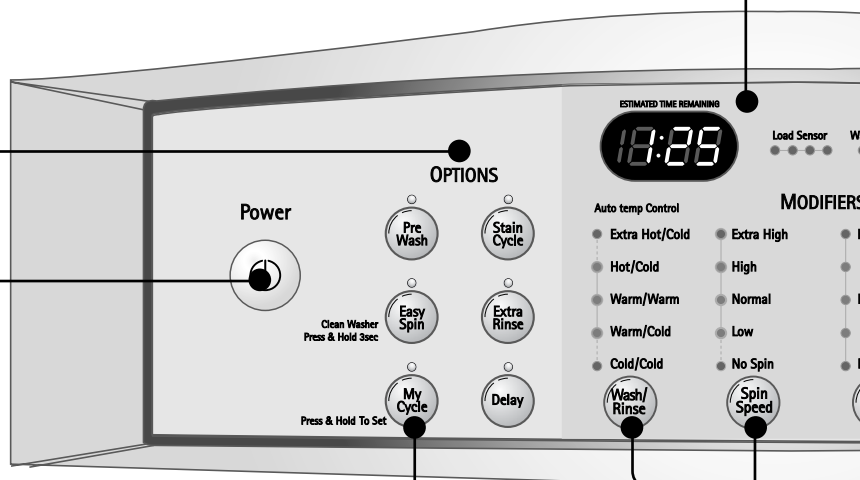
### ● POWER ON/OFF BUTTON

Press to turn the washer ON. Press again to turn the washer OFF.

**NOTE:** Pressing the ON/OFF button during a cycle will cancel that cycle and any load settings will be lost.

### ● TIME AND STATUS

The display shows the settings, estimated time remaining, options, and status messages for your washer.



### ● OPTION BUTTONS

The option buttons allow you to select additional cycle options and will light when selected. Certain buttons also allow you to activate special functions by pressing and holding the button for 3 seconds.

- Prewash: Use this option for loads that need pretreatment. It adds 16 minutes prewash and drain.
- Stain Cycle: Adds time to the wash and rinse cycles for better stain removal. Automatically provides a rinse.
- Easy Spin: Be used when there is a vibration problem, especially on wood floor installations.
- Extra Rinse: This option provides an additional rinse cycle.
- Delay Wash: Allows the start of any cycle to be delayed for 1~19(12, 9) hours.

### ● MY CYCLE BUTTON

Press the MY CYCLE button to save and recall a customized wash cycle for future use.

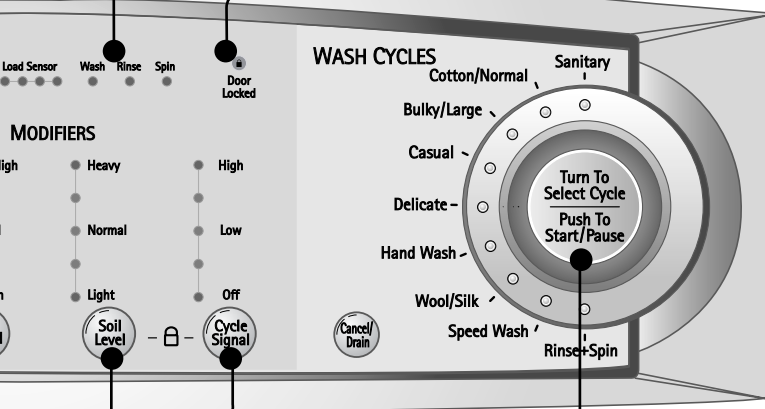
You can save the Cycle, Wash/Rinse Temperature, Spin Speed, and Soil Level settings, as well as other cycle options.

## ● STATUS INDICATOR

- These lights show elapsed time of the selected cycle.

## ● DOOR LOCKED lamp

- Lights whenever the door is locked.
- The door can be unlocked by pressing the Start / Pause button to stop the washer.



## ● CYCLE SELECTOR KNOB

Turn this knob to select the desired cycle. Once the desired cycle has been selected, the standard presets will be shown in the display. These settings can be adjusted using the cycle setting buttons anytime before starting the cycle.

Press this knob to START the selected cycle. If the washer is running, use this knob to PAUSE the cycle without losing the current settings.

**NOTE:** If you do not press the cycle selector knob within 4 minutes of selecting a cycle, the washer automatically turns off.

## ● CYCLE SETTING BUTTONS

Use these buttons to adjust the desired cycle options for the selected cycle.

- Select a water temperature based on the type of load you are washing.
- To change the spin speed, select the Spin Speed button until the desired setting is displayed.
- To change the soil level, select the Soil Level button until the desired setting is displayed.

## 5-2. CYCLE GUIDE

The cycle guide below shows the options and recommended fabric types for each cycle.

○ = Available option

Cycle	Fabric or Load Type	Modifiers			Options		
		Wash/Rinse Temperature	Spin Speed	Soil Level	Pre-Wash	Extra Rinse	Stain Cycle
Sanitary	Heavily soiled items, such as work clothes, diapers, etc.	Extra Hot/Cold	High	Normal			
			Extra High No Spin Low Normal	Heavy Light	○	○	○
Bulky/Lagre	Large items such as blankets and comforters	Warm/Cold	Low	Normal			
		Warm/Warm Hot/Cold Cold/Cold	Normal No Spin	Heavy Light	○	○	○
Cotton/Normal	Cotton, linen, towels, shirts, sheets, jeans mixed loads	Warm/Cold	Medium	Normal			
		Warm/Warm Hot/Cold Cold/Cold	Extra High No Spin Low Normal	Heavy Light	○	○	○
Casual	Dress shirts/pants, wrinkle-free clothing, poly/cotton blend clothing, tablecloths	Warm/Cold	Normal	Normal			
		Warm/Warm Hot/Cold Cold/Cold	High No Spin Low	Heavy Light	○	○	○
Delicates	Dress shirts/blouses nylons, sheer or lacy garment	Cold/Cold	Normal	Normal			
		Warm/Cold Warm/Warm	No Spin Low	Heavy Light	○	○	
Hand Wash	Items labeled "hand washable"	Cold/Cold	Low	Normal			
		Warm/Cold Warm/Warm	Medium No Spin	Light		○	
Wool / Silk	Machine washable woolsens with pure new wool only.	Warm/Cold	Low	Normal			
		Warm/Warm Cold/Cold	No Spin	Light			
Speed Wash	Lightly soiled clothing and small loads	Hot/Cold	Extra High	Light			
		Cold/Cold Warm/Cold Warm/Warm	No Spin Low Medium High	Normal Heavy		○	
Rinse+ Spin	Rinse and spin	Warm/Cold	High				
		Warm/Warm Hot/Cold Cold/Cold	Extra High No Spin Low Normal			○	

**NOTE :** To protect your garments, not every wash/rinse temperature, spin speed, soil level, or option is available with every cycle.

 = Default setting

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## 5-3. SPECIAL FUNCTIONS

The option buttons also activate special functions, including CHILD LOCK, CLEAN WASHER and MY CYCLE. Press and hold the option button marked with the special function for 3 seconds to activate.

### CHILD LOCK



Use this option to prevent unwanted use of the washer or to keep cycle settings from being changed while the washer is operating. Press and hold the SOIL LEVEL and CYCLE SIGNAL buttons for 3 seconds to activate or deactivate CHILD LOCK. CHILD LOCK will be shown in the display, and all controls are disabled. The washer can be locked during a cycle. Once CHILD LOCK is selected, the display will alternate between CL and the estimated time remaining.

### CLEAN WASHER



A buildup of detergent residue can occur in the wash tub over time and can lead to a mildewy or musty smell. The CLEAN WASHER cycle is specially designed to remove this buildup. The CLEAN WASHER cycle should be run once a month, or more often under heavy use conditions or if odor is present.

1. Press and hold the EASY SPIN button for 3 seconds to activate this cycle.
2. Fill the bleach dispenser to the MAX line with liquid chlorine bleach.
3. Press the Cycle Selector Knob to start the cycle.
4. After the cycle has ended, open the door and allow the drum interior to dry completely.

**NOTE:** Do NOT use this cycle with clothes, and do NOT add detergent or fabric softener.

### MY CYCLE



MY CYCLE allows you to store a frequently used wash cycle for easy selection and use. It allows you to save favorite temperature, spin speed, soil level and other options for a cycle and then recall them at the touch of a button.

#### To store My CYCLE :

1. Select a cycle.
2. Adjust the Wash/Rinse Temperature, Spin Speed and Soil Level to the desired setting.
3. Set any other desired options.
4. Press and hold the MY CYCLE button for 3 seconds. You will hear two beeps to confirm the settings have been stored.

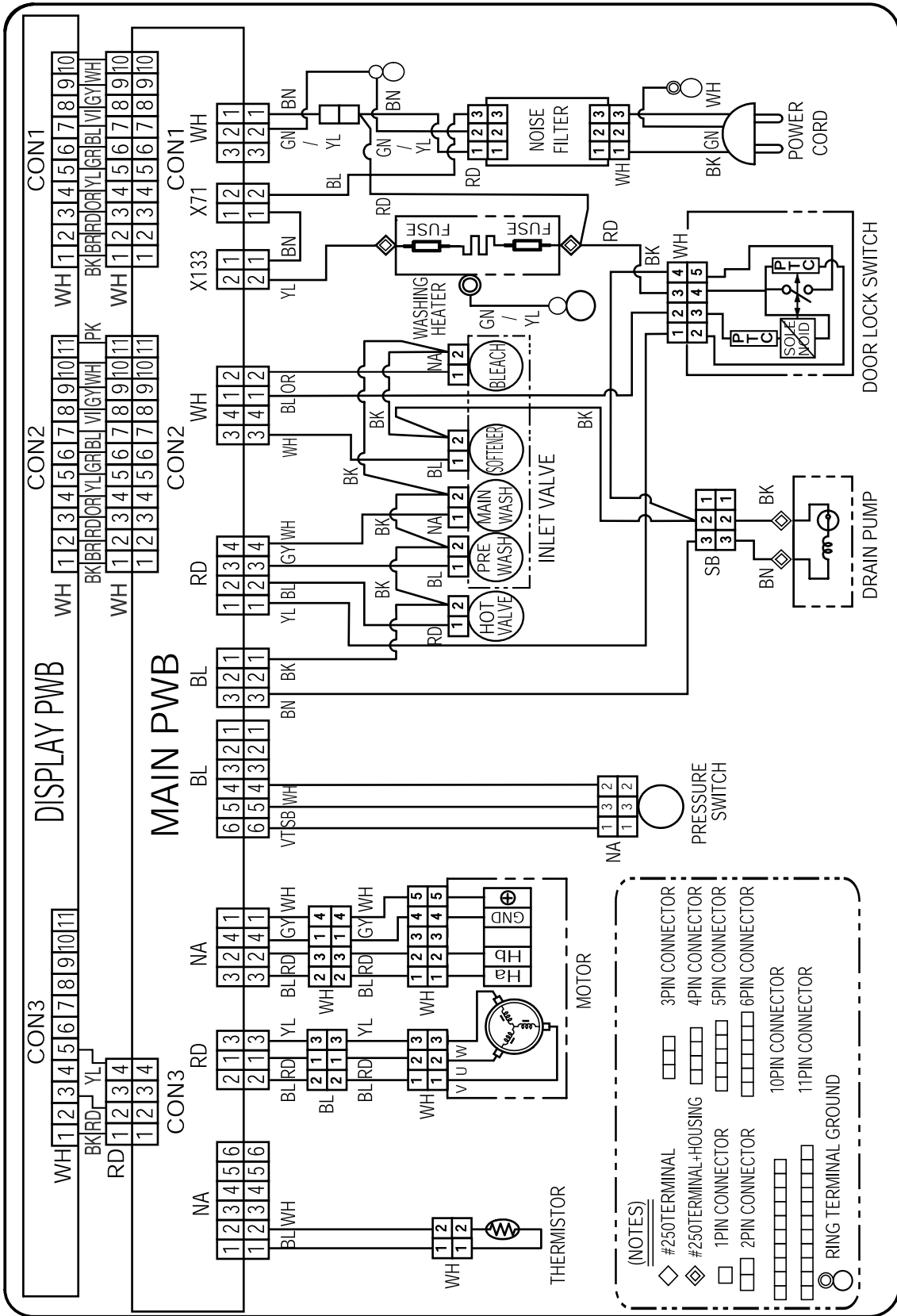
**IMPORTANT :** If you press and hold the MY CYCLE button for 3 seconds, you will overwrite any previously stored MY CYCLE.

#### To recall MY CYCLE :

1. Press and release the MY CYCLE button. The stored settings will be displayed.
2. Press and release the START/PAUSE button to start the cycle. The washer will start automatically.

**NOTE :** Once the MY CYCLE has been recalled, any of the memorized modifiers or options can be adjusted. However, if the Cycle Select Knob is rotated, the MY CYCLE will be canceled and the dial selection will be displayed.

# 6. WIRING DIAGRAM / PROGRAM CHART







## 7. TEST MODE

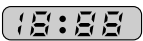
### 7-1. SAFETY CAUTION

- There's built-in AC 110V and DC power in output terminal of PWB assembly in common. Be careful electric shock when disconnecting parts while trouble shooting. (Wear Electro Static Discharge gloves when working.)
- After cutting off the power when changing PWB assembly, disconnect or assemble.
- Be careful static when handling PWB assembly, and use Electro Static Discharge plastic pack when delivering or keeping it.

### 7-2. LOAD TEST MODE.

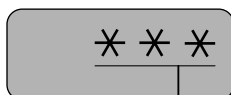
The washer must be empty and the controls must be in the off state.

1. Press the SPIN SPEED and SOIL LEVEL buttons simultaneously.
2. Press the Power (Ⓞ) button, while the above condition. Then buzzer will sound twice.
3. Press the Start/Pause (⏸) button repeatedly to cycle through the test modes.

Number of times the Start/Pause button is pressed	Check Point	Display Status
None	Turns on all lamps and locks the door.	 <sup>1)</sup>
1 time	Tumble clockwise.	rpm (40~50)
2 times	Low speed Spin.	600 rpm
3 times	High speed Spin.	1100 rpm
4 times	Inlet valve for prewash turns on.	Water level frequency (25~65)
5 times	Inlet valve for main wash turns on.	Water level frequency (25~65)
6 times	Inlet valve for hot water turns on.	Water level frequency (25~65)
7 times	Inlet valve for softener turns on.	Water level frequency (25~65)
8 times	Inlet valve for bleach turns on.	Water level frequency (25~65)
9 times	Tumble counterclockwise.	rpm (40~50)
10 times	Heater turns on for 3 sec.	Water temperature
11 times	Drain pump turns on.	Water level frequency (25~65)
12 times	Power off and unlock the door.	Turn off all lamps.

### 7-3. HOW TO CHECK THE WATER LEVEL FREQUENCY

- \* Press the SPIN SPEED and SOIL LEVEL button simultaneously.



- The digits indicate the water level frequency ( x.1 kHz ).  
For example, if the display indicate 241,  
the water level frequency is 241 x 0.1kHz = 24.1kHz.








# 8. TROUBLESHOOTING





## 8-1. SAFETY CAUTION

- There's built-in AC 120V and DC power in output terminal of PWB assembly in common. Be careful electric shock when disconnecting parts while trouble shooting. (Wear Electro Static Discharge gloves when working.)
- After cutting off the power when changing PWB assembly, disconnect or assemble.
- Be careful static when handling PWB assembly, and use Electro Static Discharge plastic pack when delivering or keeping it.

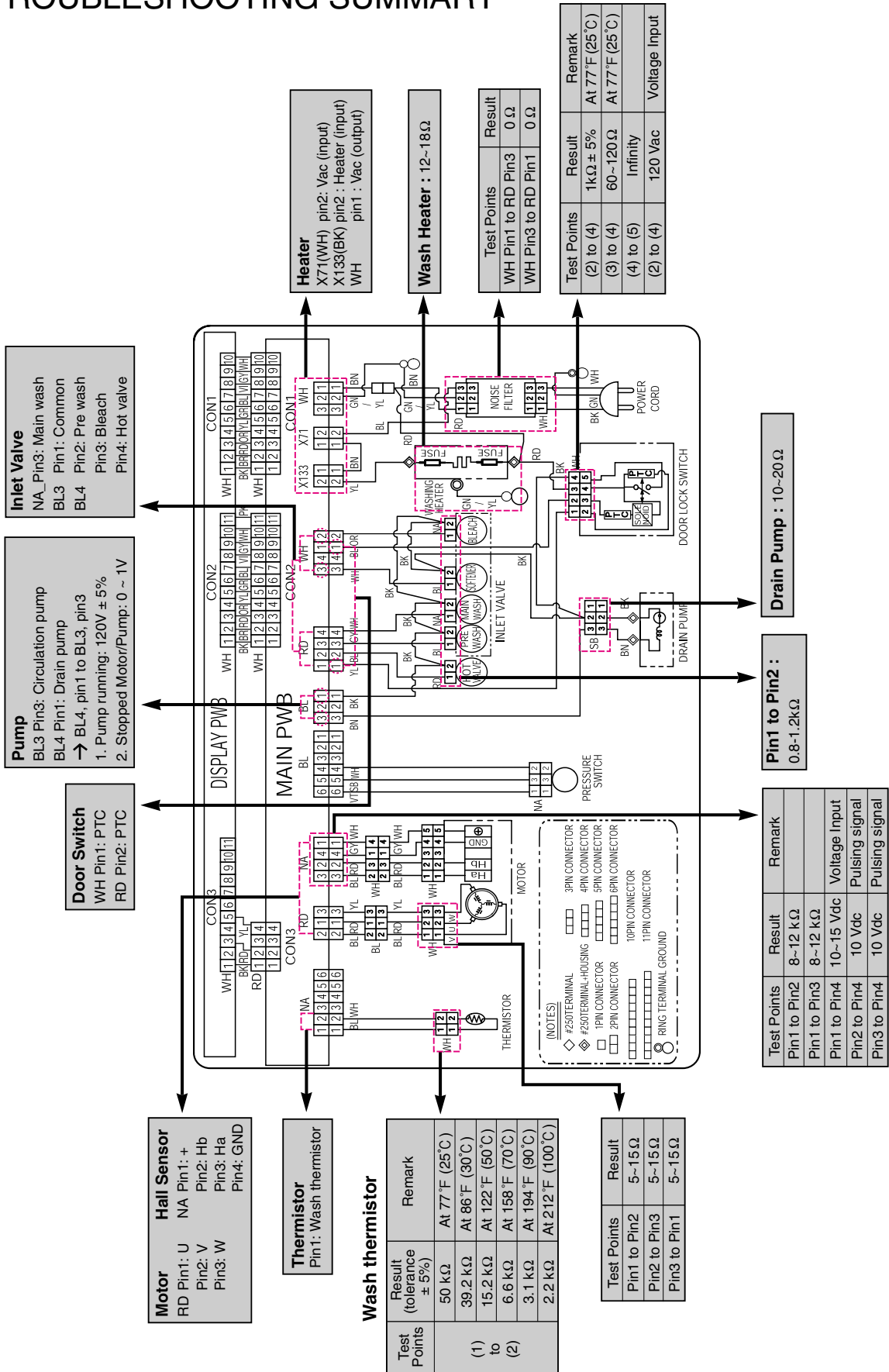
## 8-2. ERROR MODE SUMMERY

- If you press the START/PAUSE button when an error is displayed, any error except 『PE』 will disappear and the machine will go into the pause status.
- In case of 『PE』, 『LE』, 『dE』 if the error is not resolved within 20 sec., or the in case of other errors, if the error is not resolved within 4 min., power will be turned off automatically and the error code will blink. But in the case of 『FE』, power will not be turned off.

	ERROR	SYMPTOM	CAUSE
1	WATER INLET ERROR		<ul style="list-style-type: none"> <li>• Correct water level (2 level) is not reached within 8 minutes after water is supplied or it does not reach the preset water level within 25 minutes.</li> </ul>
2	IMBALANCE ERROR		<ul style="list-style-type: none"> <li>• The load is too small.</li> <li>• The appliance is tilted.</li> <li>• Laundry is gathered to one side.</li> <li>• Non distributable things are put into the drum.</li> </ul>
3	DRAIN ERROR		<ul style="list-style-type: none"> <li>• Not fully drained within 10 minutes.</li> </ul>
4	OVER FLOW ERROR		<ul style="list-style-type: none"> <li>• Water is overflowing (over 8 level).</li> <li>※ If 『FE』 is displayed, the drain pump will operate to the drain water automatically.</li> </ul>
5	PRESSURE SENEOR ERROR		<ul style="list-style-type: none"> <li>• The SENSOR SWITCH ASSEMBLY is out of order.</li> </ul>
6	DOOR OPEN ERROR		<ul style="list-style-type: none"> <li>• Door not all the way closed.</li> <li>• Loose electrical connections at Door switch and PWB Assembly.</li> <li>• The DOOR SWITCH ASSEMBLY is out of order.</li> </ul>
7	HEATING ERROR		<ul style="list-style-type: none"> <li>• The THERMISTOR is out order.</li> </ul>

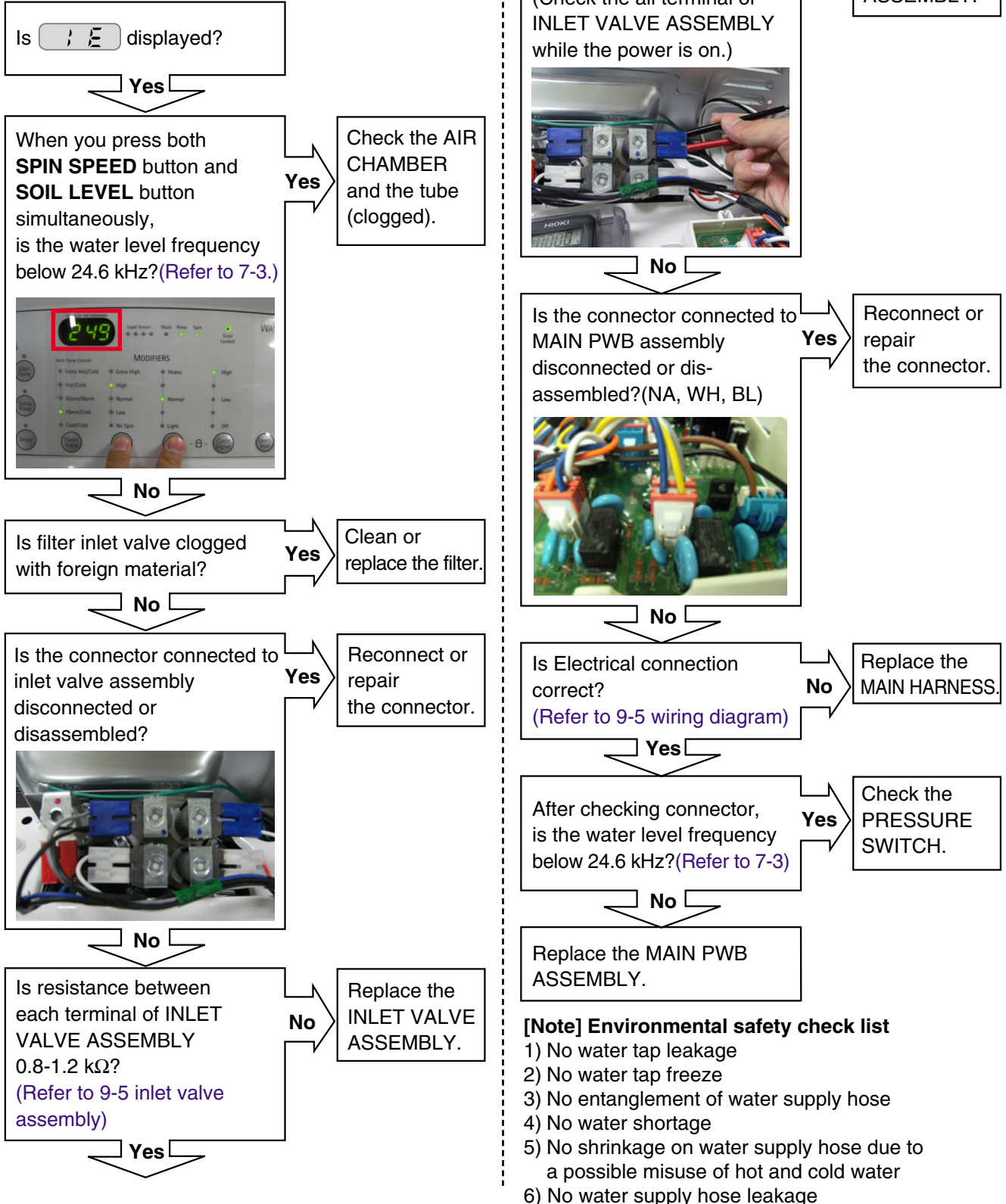
	<b>ERROR</b>	<b>SYMPTOM</b>	<b>CAUSE</b>
8	OVER CURRENT ERROR		<ul style="list-style-type: none"> <li>• MAIN PWB ASSEMBLY is out of order.</li> <li>• Winding in the STATOR ASSEMBLY is short-circuited.</li> </ul>
9	LOCKED MOTOR ERROR		<ul style="list-style-type: none"> <li>• The connector (3-pin, male, white) in the MOTOR HARNESS is not connected to the connector (3-pin, female, white) of STATOR ASSEMBLY.</li> <li>• The electric contact between the connectors (3-pin, male, white) in the MOTOR HARNESS and 4-pin, female, white connector in the MAIN PWB ASSEMBLY is bad or unstable.</li> <li>• The MOTOR HARNESS between the STATOR ASSEMBLY and MAIN PWB ASSEMBLY is cut (open circuited).</li> <li>• The hall sensor is out of order/defective.</li> </ul>
10	EEPROM ERROR		<ul style="list-style-type: none"> <li>• EEPROM is out of order.</li> </ul> <p>*Displayed only when the START / PAUSE button is first pressed in the Load Test Mode.</p>
11	POWER FAILURE		<ul style="list-style-type: none"> <li>• After the power supply is stopped while washing machine is working, the power is supplied rapidly.</li> </ul>

# 8-3. TROUBLESHOOTING SUMMARY

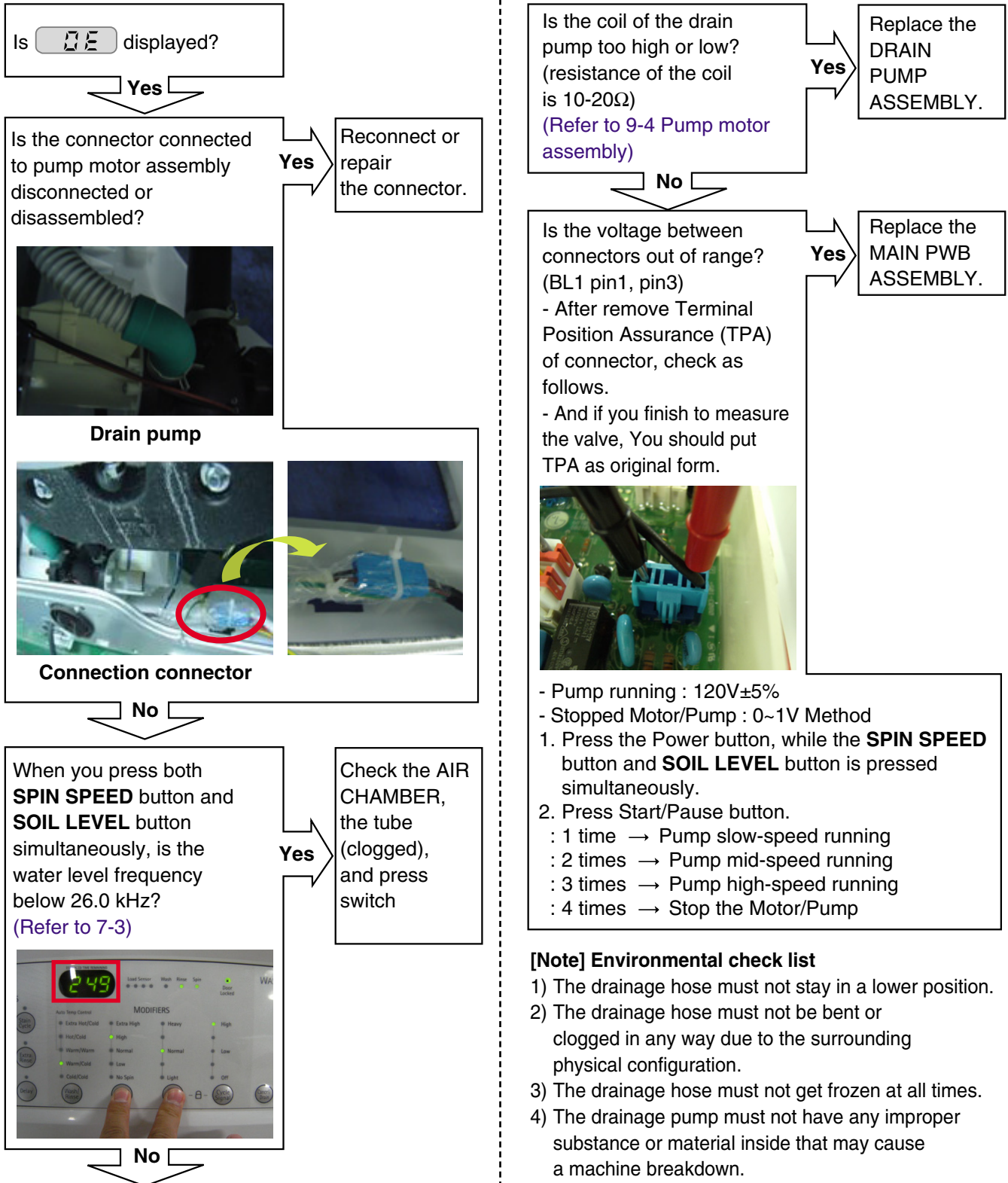


## 8-4. TROUBLESHOOTING WITH ERROR

### INLET VALVE ERROR



## DRAIN ERROR



- [Note] Environmental check list**
- 1) The drainage hose must not stay in a lower position.
  - 2) The drainage hose must not be bent or clogged in any way due to the surrounding physical configuration.
  - 3) The drainage hose must not get frozen at all times.
  - 4) The drainage pump must not have any improper substance or material inside that may cause a machine breakdown.

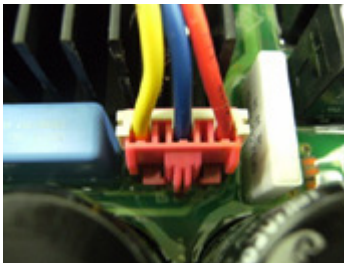


## LOCKED MOTOR ERROR

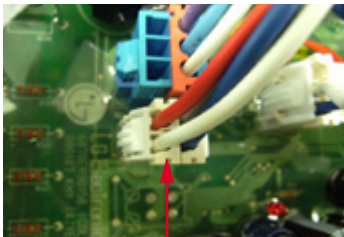
Is **LE** displayed?

Yes

Check the connectors below.  
Is the connector disconnected or disassembled?  
(motor hall sensor connector, motor drive connector)  
- **part of main PWB assembly (RD4, NA1)**

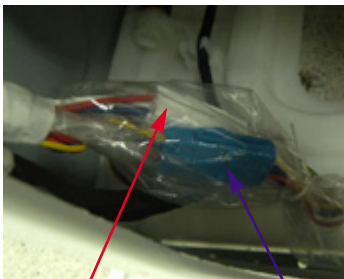


Motor Drive (RD4)



Hall sensor (NA1)

- part of wire



Hall Sensor Motor Drive

Reconnect the connector.  
(connector / wire / motor)

Yes

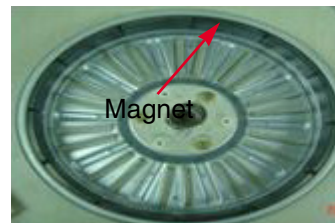
- part of motor



Motor

Yes

Is rotor magnet cracked?



Magnet

Yes

Replace the ROTOR

No

Is the resistance values in the range of 5 to 15  $\Omega$ ?  
(U-V, V-W, W-V)  
:U=1, V=2, W=3)  
- After pull out the RD4 connector, check the terminal of the connector in wire. (Red 3P, male)

No

Replace the STATOR



Yes

Is hall sensor out of order? (Refer to 9-3 Stator assembly/Hall sensor.)

Yes

Replace the Hall sensor

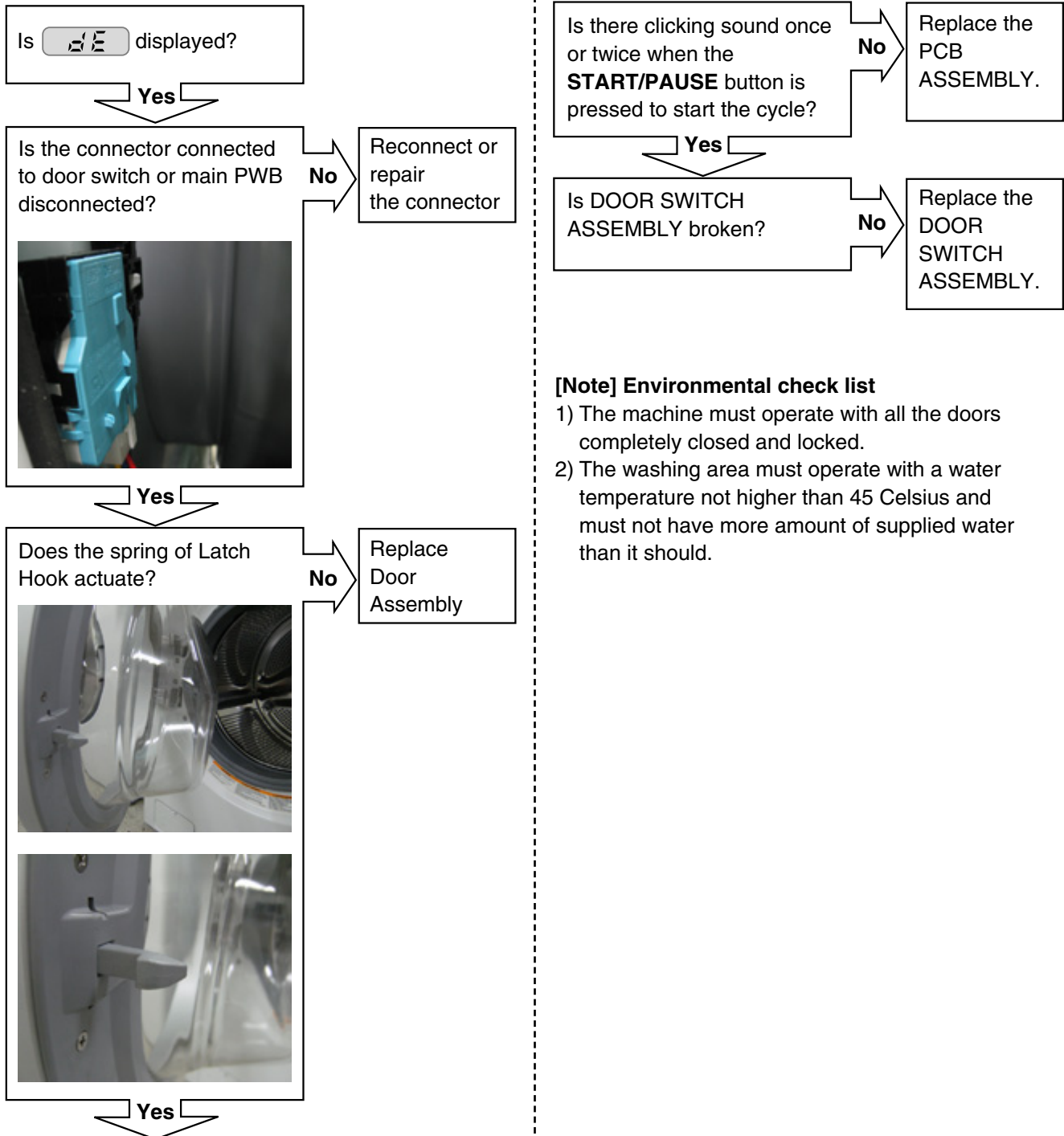
No

Check the IPM in the controller.

No

Replace the MAIN PWB ASSEMBLY

## DOOR OPEN ERROR

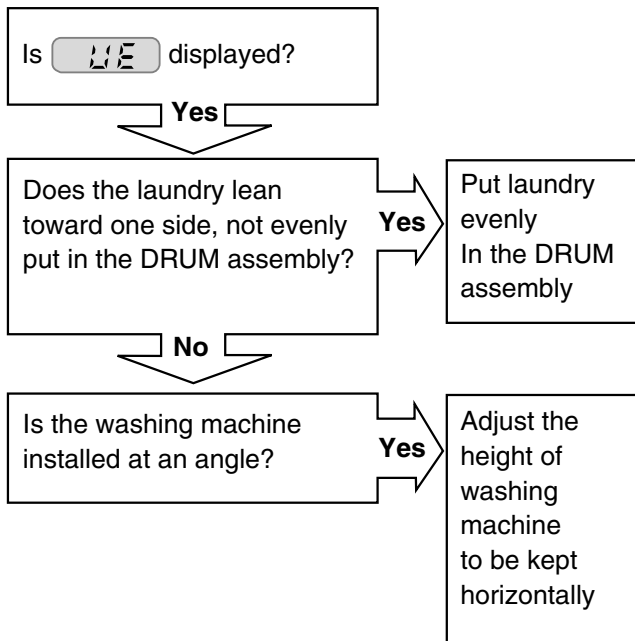


### [Note] Environmental check list

- 1) The machine must operate with all the doors completely closed and locked.
- 2) The washing area must operate with a water temperature not higher than 45 Celsius and must not have more amount of supplied water than it should.



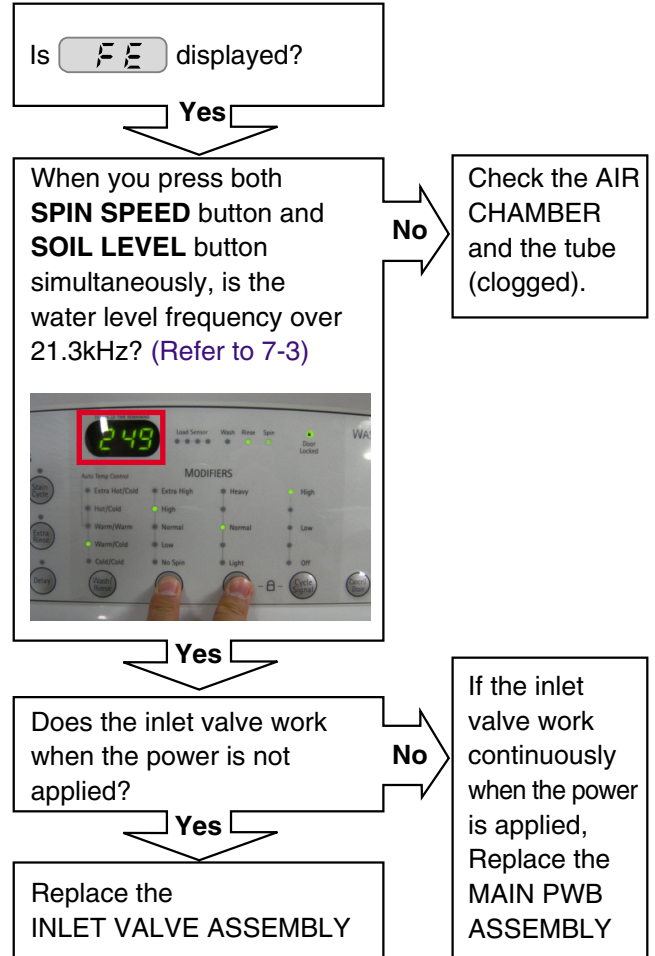
## UNBALANCE ERROR



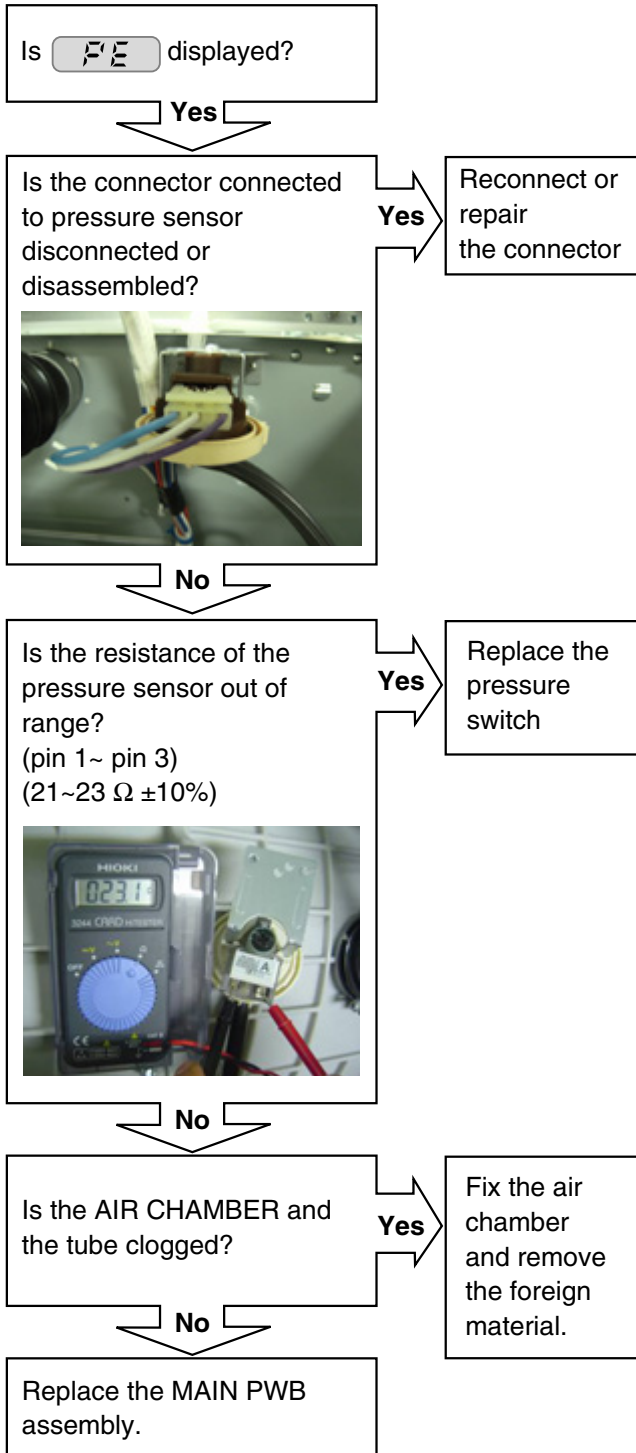
### [Note] Environmental check list

- 1) Removal of transportation-based fixed bolt.
- 2) Confirmation on the material to see if it is capable of handling two different types of blanket materials.

## OVER FLOW ERROR



## PRESSURE SENSOR ERROR

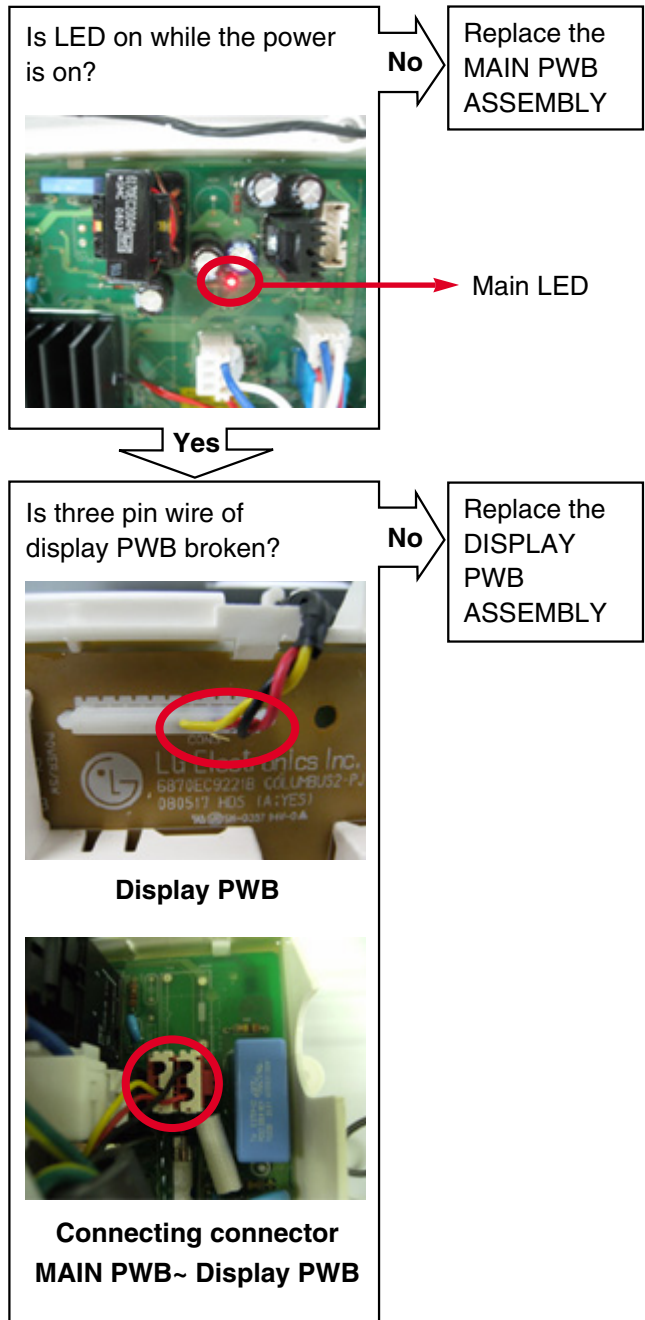
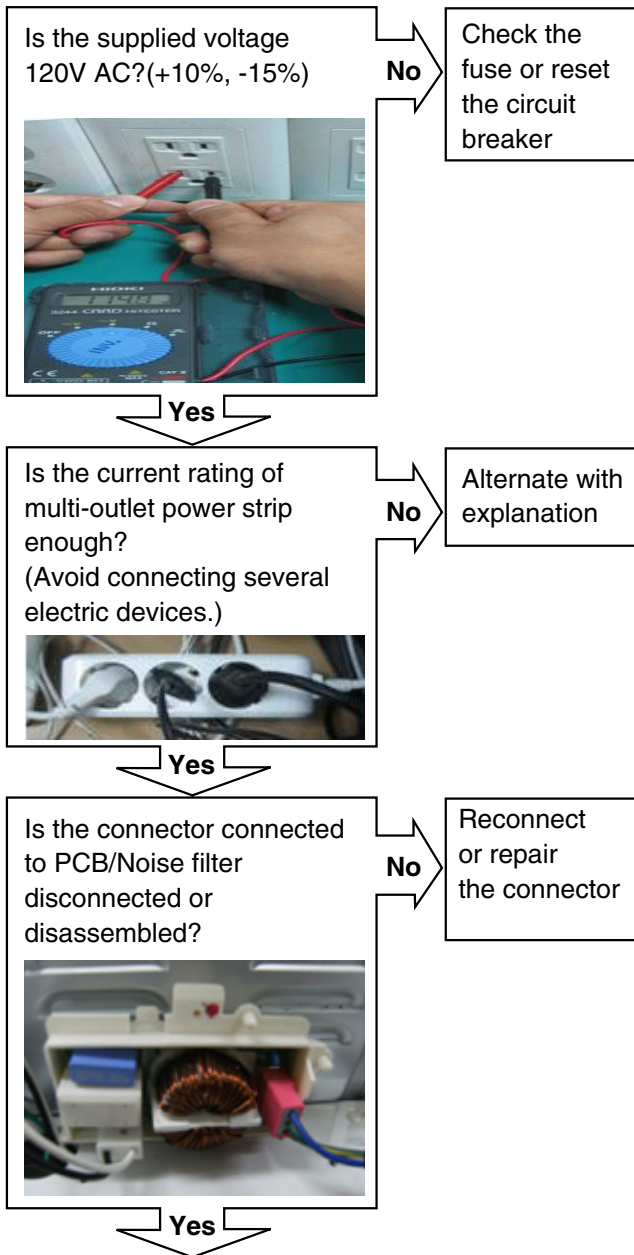


## 8-5. TROUBLESHOOTING ELSE

### ⚠ CAUTION

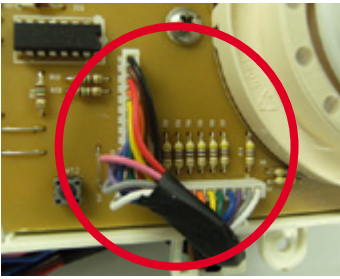
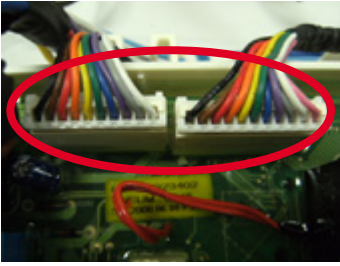
1. Be careful of electric shock if disconnecting parts while troubleshooting.
2. First of all, check the connection of each electrical terminal with the wiring diagram.
3. If you replace the MAIN PWB ASSEMBLY, reinsert the connectors correctly.

### NO POWER



## BUTTON DOESN'T WORK

Is the connector connected to Main PWB / Display PWB disconnected or disassembled?



Yes

Reconnect or Repair the connector

No

Is the button of panel stuck? Or Did the lever broke down?



Yes

Repair the button or lever.

No

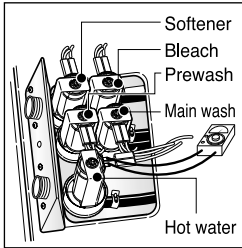
Is the display PCB broken? (check the buzzer sound and LED light while push the button.)



Yes

Replace the DISPLAY PWB ASSEMBLY

## DETERGENT DOES NOT FLOW IN



Is water supplied?

**NO**

Refer to  
NO WATER SUPPLY

**YES**

Are receptacles correctly connected to the terminals of the INLET VALVE ASSEMBLY?

**NO**

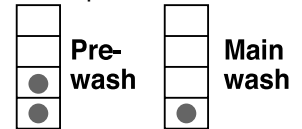
Check the wiring.

**YES**

Has detergent been put in the correct compartment of the dispenser?

**NO**

Put the detergent in the correct place.



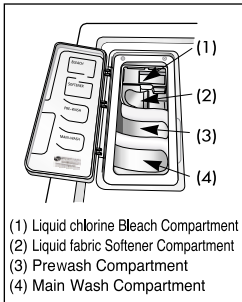
● : Detergent

**YES**

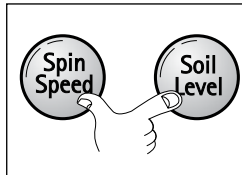
Is the detergent caked or hardened?

**NO**

Clean the dispenser.



## SPIN TROUBLE

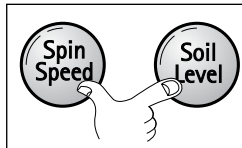


Check during spin if the frequency of the water level is 248 or more.

**NO**

Check the SENSOR SWITCH ASSEMBLY or HOSE(Pressure). If the problem is on the SENSOR SWITCH ASSEMBLY or the HOSE, replace the SENSOR SWITCH ASSEMBLY or the HOSE.

**YES**

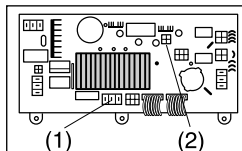


Press the START/ PAUSE button 2 times in QC Test mode, is the drum spinning at low speed?

**YES**

Normal

**NO**

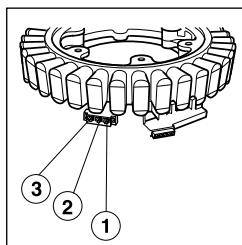


Is it disconnected, or disassembled?  
[Red:3pin (1), NA:4pin (2)]

**YES**

Correct the connection.

**NO**



Check the motor connector, Is the resistance of the terminal the same as the figure?

MOTOR TERMINAL

¥N	¥M	¥L
----	----	----

Resistance of terminal:

¥L-¥M / ¥M-¥N / ¥N-¥L : About 5Ω - 15Ω

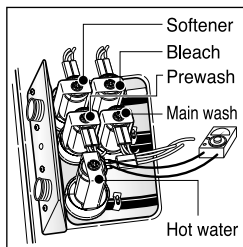
**NO**

Replace the STATOR ASSEMBLY

**YES**

Replace the MAIN PWB ASSEMBLY

## SOFTENER / BLEACH DOES NOT FLOW IN



Is water supplied?

**NO**

Refer to  
NO WATER SUPPLY

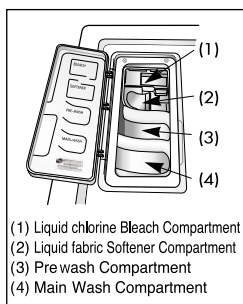
**YES**

Are the plugs correctly connected to the terminals of the INLET VALVE ASSEMBLY?

**NO**

Check the wiring on the dispenser.

**YES**

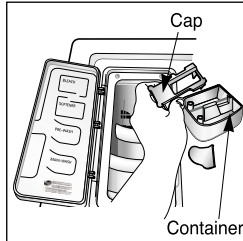


Is softener / bleach put in the correct compartment of the drawer?

**NO**

Put it in the correct compartment.

**YES**

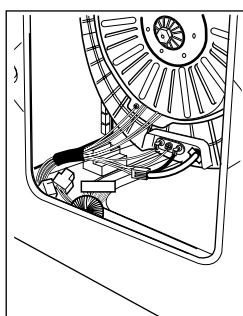


Is the softener / bleach cap clogged?

**YES**

Clean the cap and container.

## ABNORMAL SOUND



Is the motor bolt loosened?

**YES**

Secure the bolt.

**NO**

Is there friction noise coming from the motor?

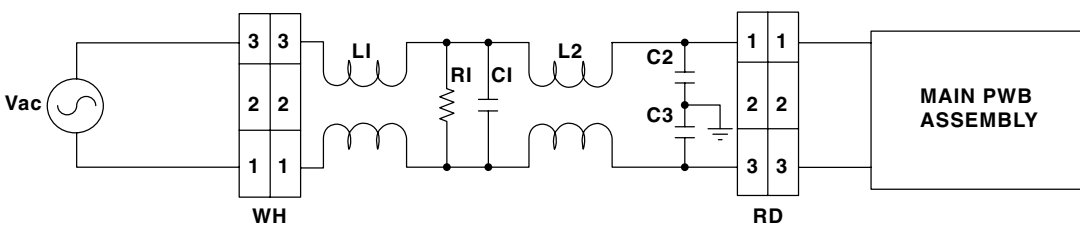
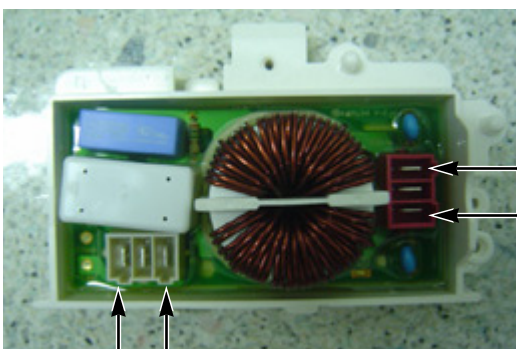
**YES**

Check hall sensor.  
Replace If defective.  
Then check stator.  
Replace if necessary.  
Check rotor for broken magnets.  
Replace rotor if necessary.

# 9. COMPONENT TESTING INFORMATION

**▲ WARNING** When Resistance (Ohm) checking the Component, be sure to turn the power off, and do voltage discharge sufficiently.

## 9-1. FILTER ASSEMBLY (LINE FILTER)

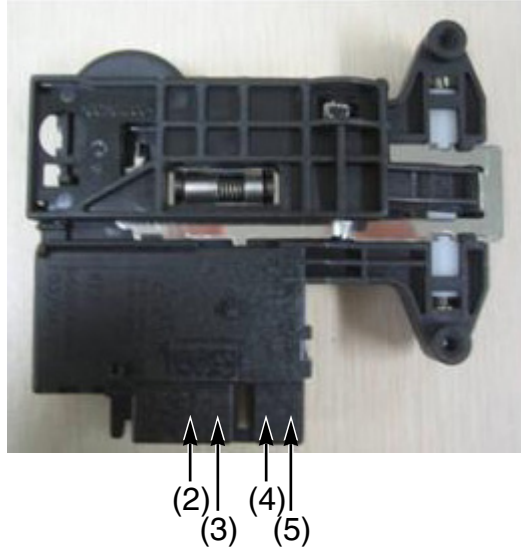
<p><b>Wiring diagram</b></p>	<p style="text-align: center;"><b>Circuit in the MAIN PWB / Wiring Diagram</b></p> 						
<p><b>Test points and Result</b></p>	 <p style="text-align: center;">(1) (3) WH</p> <p style="text-align: right;">(3) (1) RD</p> <table border="1" data-bbox="614 1545 1093 1702"> <thead> <tr> <th>Test Points</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>WH (1) to RD (3)</td> <td>0 Ω</td> </tr> <tr> <td>WH (3) to RD (1)</td> <td>0 Ω</td> </tr> </tbody> </table>	Test Points	Result	WH (1) to RD (3)	0 Ω	WH (3) to RD (1)	0 Ω
Test Points	Result						
WH (1) to RD (3)	0 Ω						
WH (3) to RD (1)	0 Ω						

## 9-2. DOOR LOCK SWITCH ASSEMBLY

<p><b>Wiring diagram</b></p>	<p style="text-align: center;"><b>Circuit in the MAIN PWB / Wiring Diagram</b></p>
<p><b>Function</b></p>	<p>The Door Lock Switch Assembly consists of a Heating PTC, a Bimetal, a Protection PTC, and a Solenoid. It locks the door during a wash cycle.</p> <ol style="list-style-type: none"> <li>1. Operation for door closing <ul style="list-style-type: none"> <li>- After the system turns on, PTC heating starts up through terminal 2~4's authorizing the power on.</li> <li>- After PTC heating starts up and before solenoid operation is driven, force the system to the off position through CAM.</li> <li>⇒ Door close</li> <li>- Authorizing one impulse through terminal 3~4 (PTC &amp; solenoid) will make the door locked.</li> <li>- Door lock is detected when switches in terminal 4~5 are set closed.</li> <li>⇒ CAM rotation will forcibly clear off the connection.</li> <li style="padding-left: 20px;">The maximum, allowable number of impulse authorizations is 2.</li> <li>⇒ Upon the third authorization of the impulse, the position of CAM goes back to the door-open position.</li> <li>- Authorizing the impulse occurs in 4.5 seconds upon input for max performance and two authorization processes are allowed at most.</li> <li>⇒ Normal operation period of PTC heating: 1.5 – 5 seconds. (Defects from the development process.)</li> </ul> </li> <li>2. Operation for door opening <ul style="list-style-type: none"> <li>- With a temporary stop, door automatically opens by CAM rotations after authorizing the impulse from the terminal 3 ~ 4 and the power turns off – maximum of 3 times of the authorizing period.</li> <li>- Upon the fourth authorization of the impulse, the position of CAM goes back to the door-close position.</li> </ul> </li> </ol>



**Test points**



**Result**

Test Points	Result	Remarks
(2) to (4)	$1k\Omega \pm 50\%$	At 77°F (25°C)
(3) to (4)	60-120 $\Omega$	At 77°F (25°C)
(4) to (5)	Infinity	
(2) to (4)	120 Vac	Voltage Input

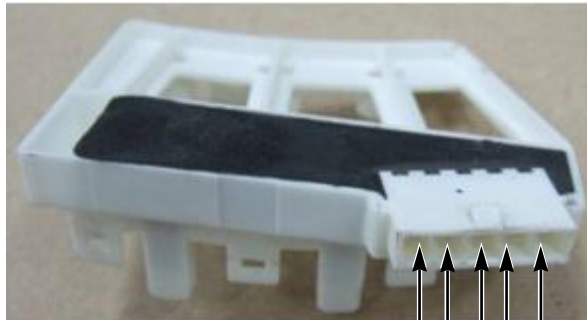
## 9-3. STATOR ASSEMBLY

<p><b>Wiring diagram</b></p>	<p style="text-align: center;"><b>Circuit in the MAIN PWB / Wiring Diagram</b></p>								
<p><b>Function</b></p>	<p>The DD motor can be driven from stopped to maximum speed in infinite steps in either direction.</p> <p>There are 36 poles on the stator; 12 permanent magnets spaced around the rotor. There are no brushes to wear out. Unlike a more traditional brushless motor, the rotor surrounds the stator rather than being attached to it.</p>								
<p><b>Test points (Windings)</b></p>									
<p><b>Result (Windings)</b></p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Test Points</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>(1) to (2)</td> <td>5-15 Ω</td> </tr> <tr> <td>(2) to (3)</td> <td>5-15 Ω</td> </tr> <tr> <td>(3) to (1)</td> <td>5-15 Ω</td> </tr> </tbody> </table>	Test Points	Result	(1) to (2)	5-15 Ω	(2) to (3)	5-15 Ω	(3) to (1)	5-15 Ω
Test Points	Result								
(1) to (2)	5-15 Ω								
(2) to (3)	5-15 Ω								
(3) to (1)	5-15 Ω								

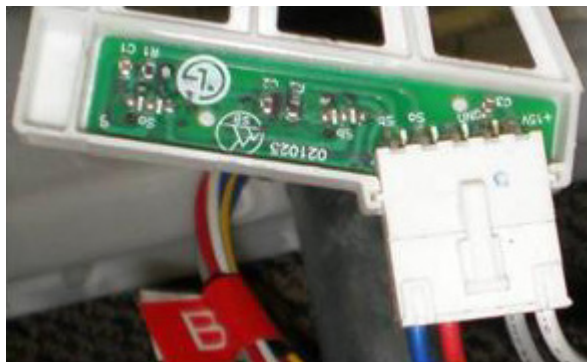
The hall sensor determines the speed and direction of the motor. It also can read that the load is off balance when the drum speed fluctuates.

**Test point**  
**and**  
**Result**  
**(Hall**  
**Sensor)**

**- Voltage Testing Hall Sensor at Stator**



(2) (4)  
(1) (3) (5)



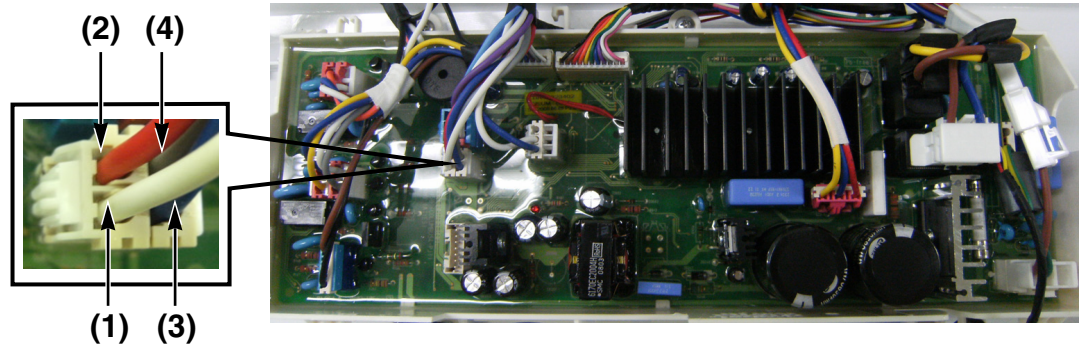
If measuring voltage from the Main PCB Assembly to the Hall Sensor, use the following steps:

1. Unplug power cord.
2. Remove rear washer panel.
3. Locate Hall sensor connector on the stator behind the rotor.
4. Place meter leads on terminals 5 to 4, white to gray.
5. Plug in power cord, close door, and press power button.  
DO NOT PRESS START!
6. You should measure 10 to 15 Vdc. If 10 to 15 Vdc is present, control board, white wire, and gray wire are OK! If not follow testing output voltages on control board in next section.

7. To measure output signal voltage from the hall sensor, carefully move test leads to terminals 1 to 4, blue and gray. Slowly rotate motor rotor by hand. You should read a pulsing 10 Vdc. If 10 Vdc is measured from 1 to 4, move lead on blue wire to red wire, terminal 2. Repeat rotating motor rotor by hand. You should read a pulsing 10 Vdc from red to gray.
8. If pulsing 10 Vdc is measured from 1 to 4 and 2 to 4, hall sensor is OK! If either test netted only 9 to 10 Vdc without changing (no pulsing) the hall sensor is likely defective. Disconnect power by unplugging washer and ohm check hall sensor to verify failure of the hall sensor.

**Test Point  
and  
Result  
(Hall  
Sensor)**

**- Voltage Testing Hall Sensor from the Main PCB Assembly**



1. Unplug power cord.
2. Remove rear panel.
3. Remove Washer Top.
4. Remove Main PCB Assembly cover as shown in Figure below.
5. Locate the white Hall Sensor 4 wire connector using wiring diagram wire colors as your guide.
6. Plug in power cord, close door, and press power button. **DO NOT PRESS START!**
7. Place meter leads on White & Gray wires. You should read 10 to 15 Vdc output from the Main PCB Assembly to the Hall sensor. If no 10 to 15 Vdc is measured the control board is defective.
8. Place meters leads on Blue to Gray. Turn motor rotor slowly by hand. You should measure a pulsing 10 Vdc. Place meter leads on Red to Gray. Turn motor rotor slowly by hand. You should measure a pulsing 10 Vdc. If both tests measure a pulsing 10 Vdc, hall sensor and harness OK. If either or both tests measures 9 to 10 volts, but does not pulse or change, Hall sensor has failed and must be replaced. IF zero (0) voltage is measured on either test, check red & blue wires for continuity. Repair or replace harness as needed.

Test Points	Result	Remarks
(1) to (2)	8-12 kΩ	
(1) to (3)	8-12 kΩ	
(1) to (4)	10-15 Vdc	Voltage Input
(2) to (4)	10 Vdc	Pulsing Signal
(3) to (4)	10 Vdc	Pulsing Signal

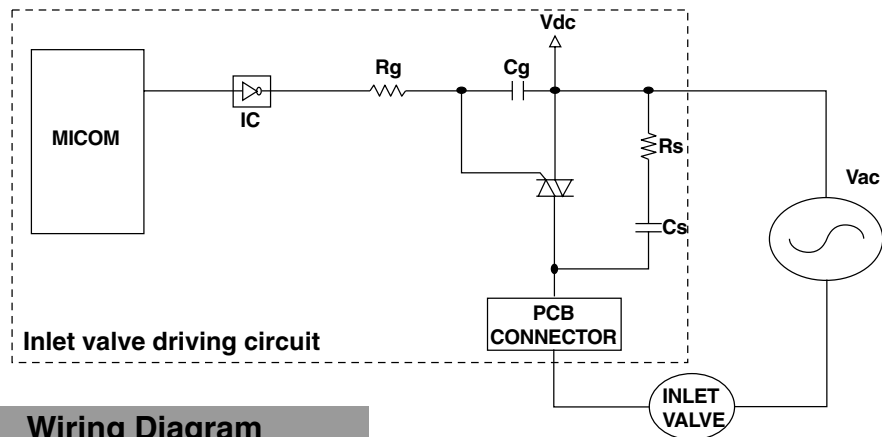
## 9-4. PUMP MOTOR ASSEMBLY

<p><b>Wiring diagram</b></p>	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid gray; padding: 5px; background-color: #f0f0f0; width: 45%;"> <p style="text-align: center;"><b>Circuit in the MAIN PWB</b></p> <p style="text-align: center;">Pump Driving circuit</p> </div> <div style="border: 1px solid gray; padding: 5px; background-color: #f0f0f0; width: 45%;"> <p style="text-align: center;"><b>Wiring Diagram</b></p> <p style="text-align: center;">DRAIN PUMP</p> </div> </div> <p style="text-align: center;">* Each circuits of loads in wiring diagram are all same.</p>						
<p><b>Object</b></p>	<p style="text-align: center;">For Drain</p>						
<p><b>Function</b></p>	<p>Two pump motors are used to drain the tub and to circulate the water / detergent solution.</p>						
<p><b>Test points</b></p>	<p style="text-align: center;"><b>Drain Pump</b></p> <div style="display: flex; align-items: center;"> <div style="margin-left: 20px;"> </div> </div>						
<p><b>Result</b></p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" style="text-align: center;">Drain Pump</th> </tr> <tr> <th style="width: 50%;">Test Points</th> <th style="width: 50%;">Result</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">(1) to (2)</td> <td style="text-align: center;">10-20 Ω</td> </tr> </tbody> </table>	Drain Pump		Test Points	Result	(1) to (2)	10-20 Ω
Drain Pump							
Test Points	Result						
(1) to (2)	10-20 Ω						

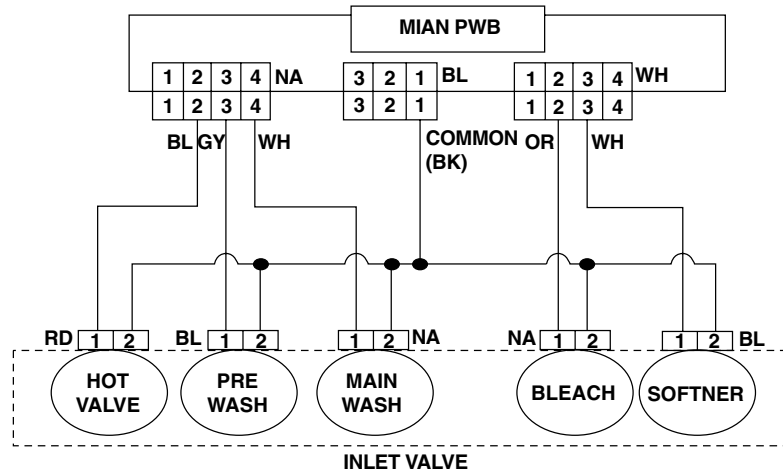
## 9-5. INLET VALVE ASSEMBLY

### Wiring diagram

#### Circuit in the MAIN PWB



#### Wiring Diagram



\* Each circuits of loads in wiring diagram are all same.

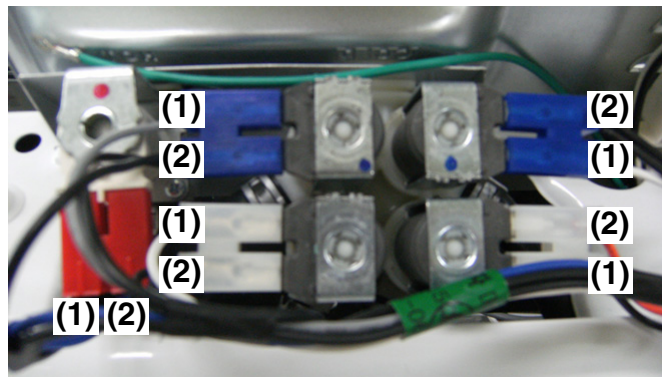
### Function

Depending on the cycle and water temperature, the controller will energize the hot or cold water valve solenoids to meet the selected water temperature.

### Test points

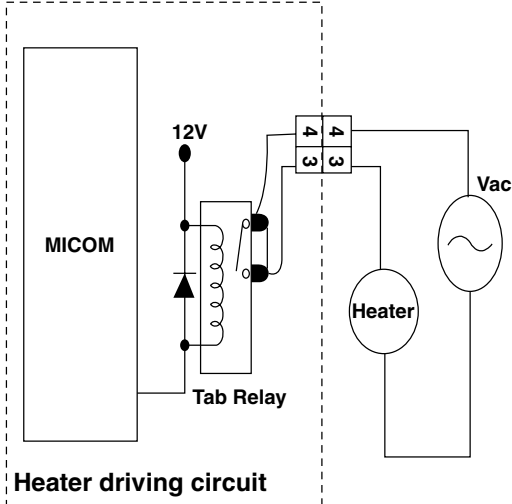
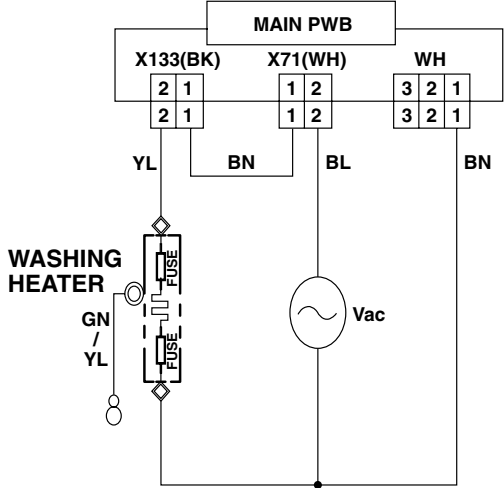
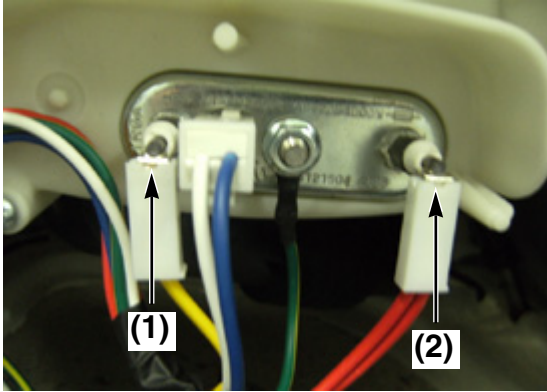
After pull out the connector of defective valve, check the resistance.

### and Result

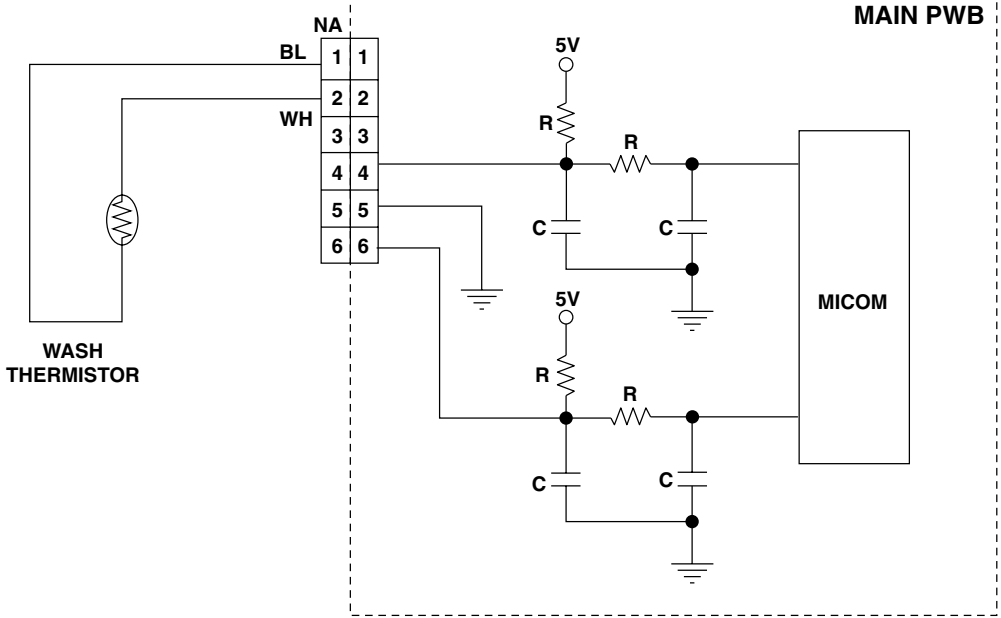
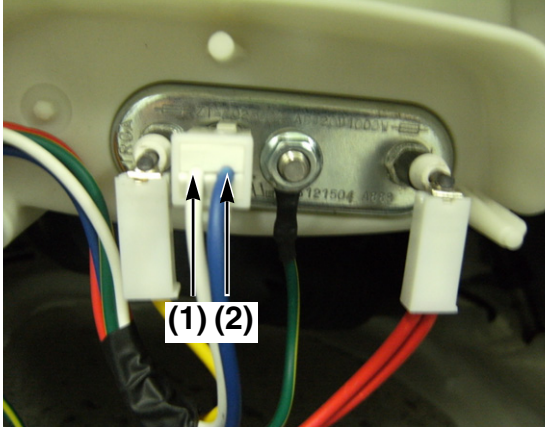


Test points	(1)-(2)
Result	0.8-1.2 kΩ

## 9-6. HEATER ASSEMBLY

<p><b>Wiring diagram</b></p>	<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid gray; padding: 5px; background-color: #f0f0f0;"> <p style="text-align: center;"><b>Circuit in the MAIN PWB</b></p>  <p style="text-align: center;"><b>Heater driving circuit</b></p> </div> <div style="border: 1px solid gray; padding: 5px; background-color: #f0f0f0;"> <p style="text-align: center;"><b>Wiring diagram</b></p>  </div> </div> <p style="text-align: right; margin-top: 10px;">* Each circuits of loads in wiring diagram are all same.</p>						
<p><b>Function</b></p>	<p>1. The Wash Heater is designed to raise the wash water to the desired temperature selection during certain wash cycles.</p>						
<p><b>Test points &amp; Result</b></p>	<div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 20px;"> <p style="text-align: center;"><b>Wash Heater</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2" style="text-align: center;">Wash Heater</th> </tr> <tr> <th style="text-align: center;">Test Points</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">(1) to (2)</td> <td style="text-align: center;">12-18 Ω</td> </tr> </tbody> </table> </div> </div>	Wash Heater		Test Points	Result	(1) to (2)	12-18 Ω
Wash Heater							
Test Points	Result						
(1) to (2)	12-18 Ω						

## 9-7. THERMISTOR ASSEMBLY

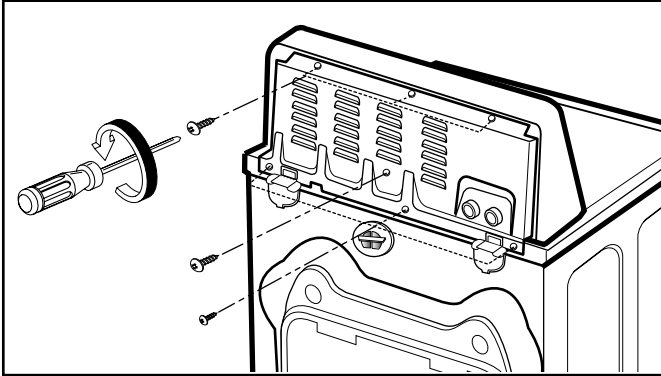
<p><b>Wiring diagram</b></p>	<p style="text-align: center;"><b>Circuit in the MAIN PWB / Wiring Diagram</b></p> 																	
<p><b>Function</b></p>	<p>The thermistor (temperature sensor) is used to monitor water temperature in the tub or Steam Generator.</p>																	
<p><b>Test points</b></p>	 <p style="text-align: center;"><b>Wash Thermistor</b></p> <table border="1" data-bbox="928 1332 1465 1724"> <thead> <tr> <th>Test Points</th> <th>Result (tolerance <math>\pm 5\%</math>)</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td rowspan="2">(1) to (2)</td> <td>50 k<math>\Omega</math></td> <td>At 77°F (25°C)</td> </tr> <tr> <td>39.2 k<math>\Omega</math></td> <td>At 86°F (30°C)</td> </tr> <tr> <td rowspan="4">(2)</td> <td>15.2 k<math>\Omega</math></td> <td>At 122°F (50°C)</td> </tr> <tr> <td>6.6 k<math>\Omega</math></td> <td>At 158°F (70°C)</td> </tr> <tr> <td>3.1 k<math>\Omega</math></td> <td>At 194°F (90°C)</td> </tr> <tr> <td>2.2 k<math>\Omega</math></td> <td>At 212°F (100°C)</td> </tr> </tbody> </table>	Test Points	Result (tolerance $\pm 5\%$ )	Remarks	(1) to (2)	50 k $\Omega$	At 77°F (25°C)	39.2 k $\Omega$	At 86°F (30°C)	(2)	15.2 k $\Omega$	At 122°F (50°C)	6.6 k $\Omega$	At 158°F (70°C)	3.1 k $\Omega$	At 194°F (90°C)	2.2 k $\Omega$	At 212°F (100°C)
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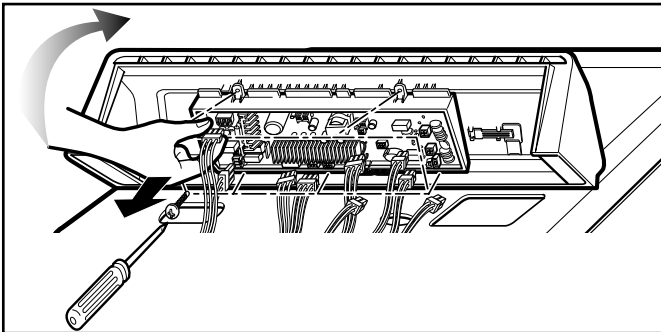
# 10. DISASSEMBLY INSTRUCTIONS

※ Disassemble and repair the pulling out power plug from the outlet.

## CONTROL PANEL ASSEMBLY

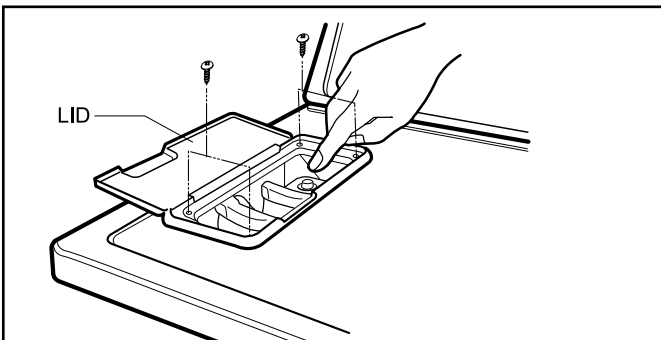


1. Remove 7 screws on the Rear Frame.
2. Disassemble the Rear Frame.

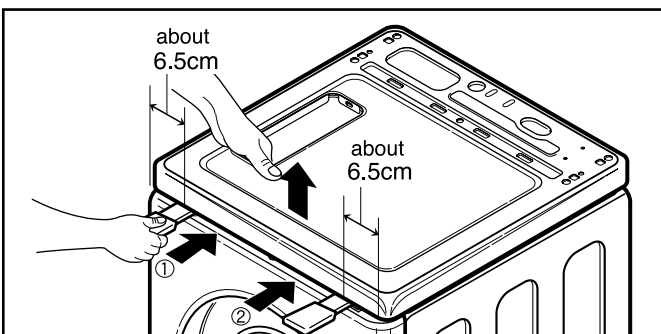


3. Pull the Control panel forward.
4. Disconnect connectors.
5. Remove 5 screws.
6. Disassemble the controller assembly.

## TOP PLATE



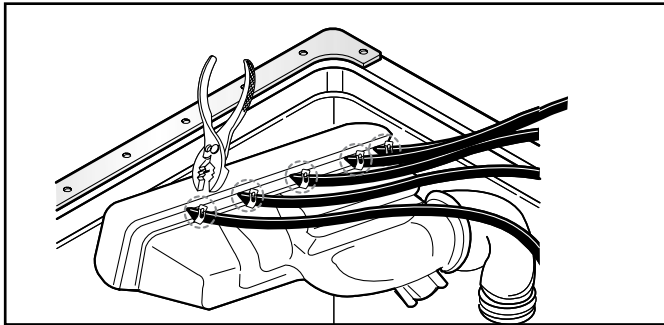
1. Open the Lid.
2. Remove 4 screws.
3. Disassemble the Lid Assembly.
4. Pull down the Dispenser by pushing hooks.



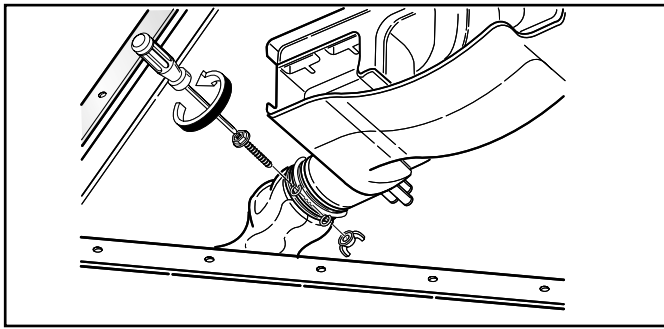
5. Put a hand into the dispenser hole and hold the top plate.
6. Push backward using an opener and lift the top plate.

i Do first left side (¥L).

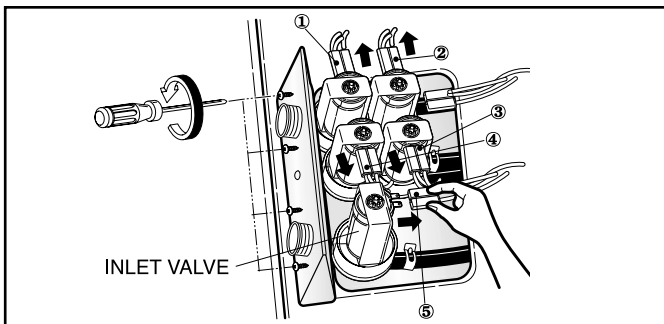
## DISPENSER ASSEMBLY



1. Disassemble the 5 hose clamps.
2. Release the 5 hoses.



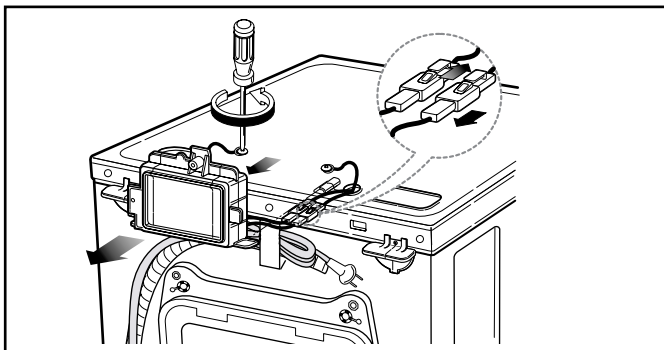
3. Remove the nut at the lower part of the dispenser.



4. Remove the 4 screws on the holder.
5. Disassemble the 5 connectors from the valves.

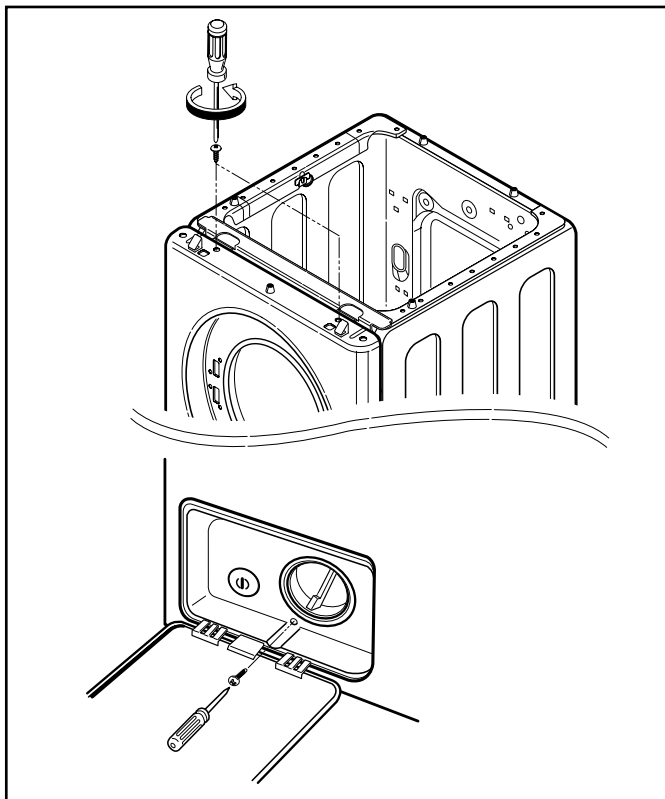
Wire color : ¥LWH-BK ¥MOR-BK  
¥NWH-BK ¥OGY-BK  
¥PBL-BK

## NOISE FILTER

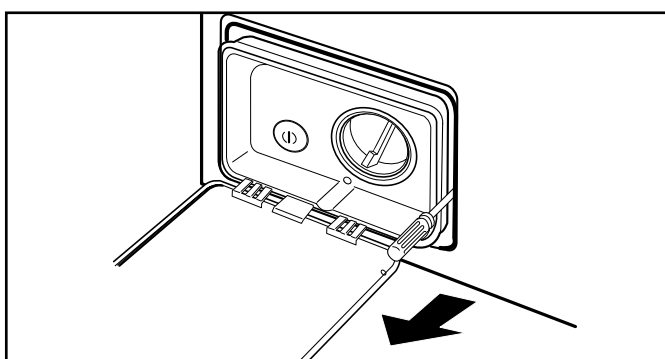


1. Remove the screw from the top plate.
2. Unplug the 2 connectors.

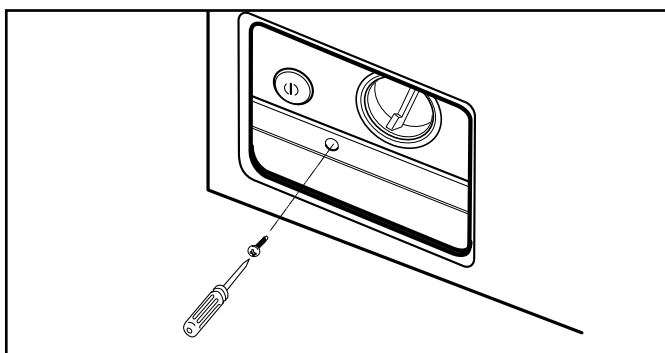
## CABINET COVER



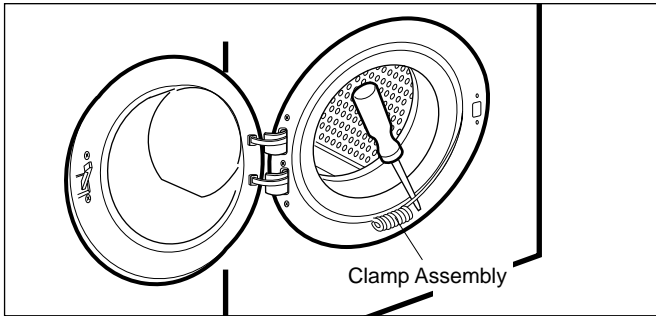
1. Unscrew the 2 screws from upper side of the cabinet cover.
2. Unscrew the screw from filter cover.



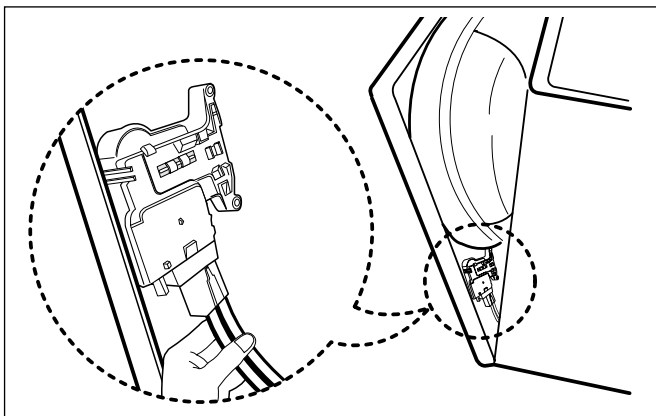
3. Put a flat (-) screwdriver into the hinge slots at the bottom of the cover and pry it out.



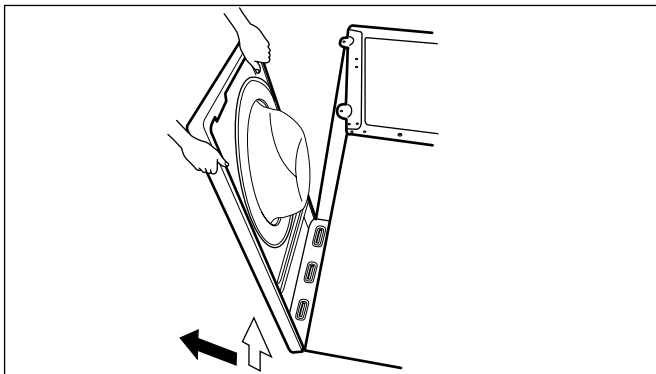
4. Unscrew the 1 screws from the lower side of the cabinet cover.



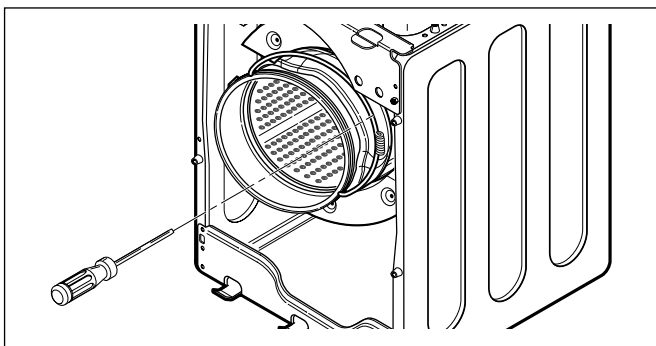
5. Open the door.
6. Disassemble the clamp assembly using a flat (-) screwdriver.
7. Separate the clamp assembly from cabinet cover.



8. Tilt the cabinet cover.
9. Disconnect the door switch connector.

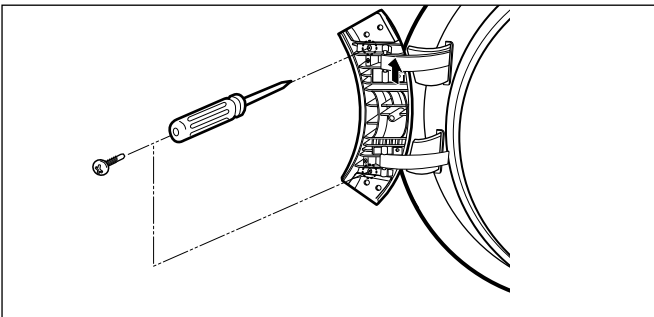
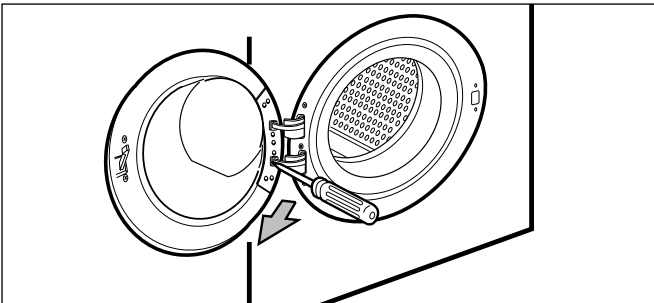
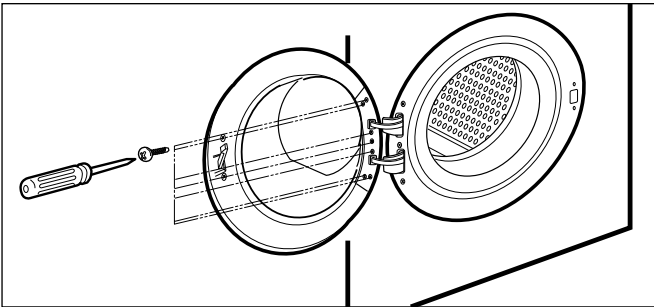


10. Lift and separate the cabinet cover.



11. Disassemble the clamp assembly using a flat (-) screwdriver.
12. Disassemble the Gasket.

## DOOR



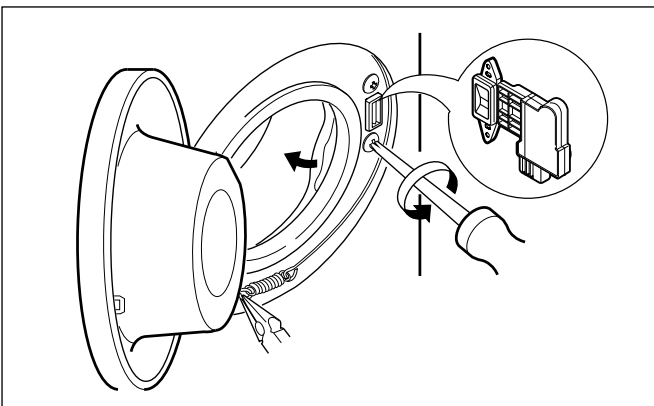
1. Open the door.
2. Unscrew the 7 screws from the hinge cover.

3. Put a flat (-) screwdriver into the opening of the hinge, and pull out the hinge cover.

4. Unscrew the screws from the door.
5. Disassemble the door upward / downward.

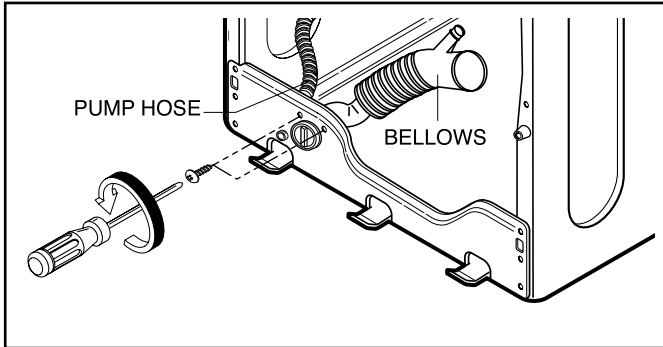
! Be careful ! The door is heavy.

## DOOR SWITCH ASSEMBLY



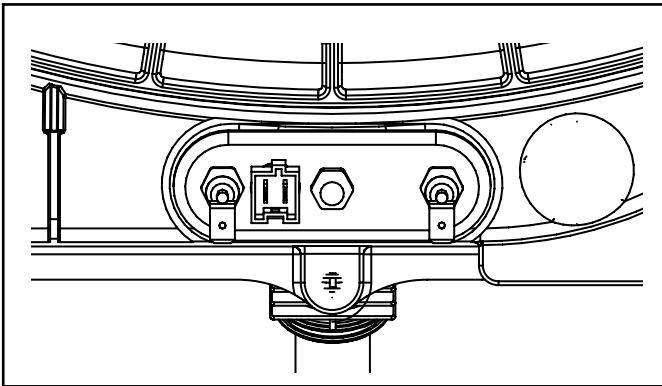
1. Open the door.
2. Disassemble the clamp assembly.
3. Unscrew the 2 screws from cabinet cover.

## PUMP



1. Disassemble the cabinet cover.
2. Separate the pump hose and the bellows from the pump assembly.
3. Disassemble the pump assembly in arrow direction.

## HEATER&THERMISTOR



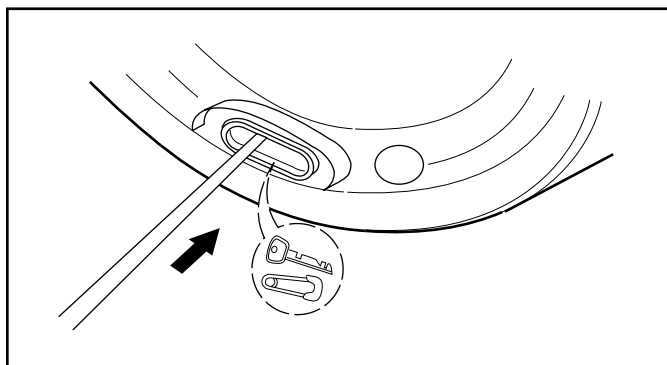
1. Disassemble the back cover.
2. Separate 2 connectors from the heater.
3. Loosen the nut and pull out the heater.

### ⚠ CAUTION

- When assembling the heater, insert the heater into heater clip on the bottom of the tub.
- Tighten the fastening nut so the heater is secure.

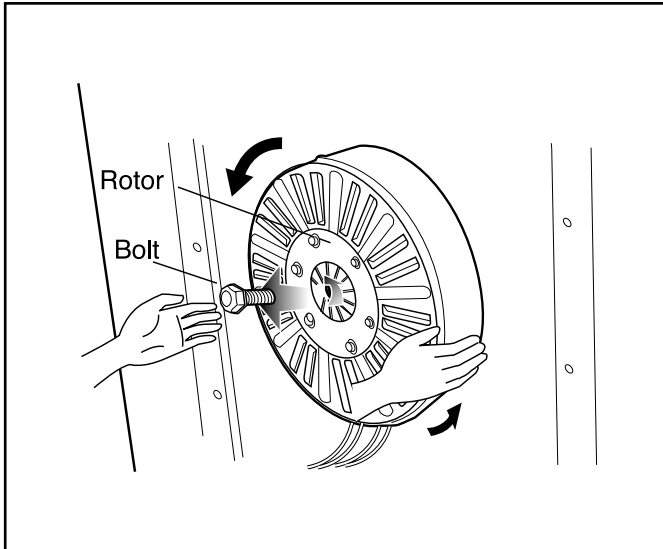
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## WHEN FOREIGN OBJECT IS STUCK BETWEEN DRUM AND TUB

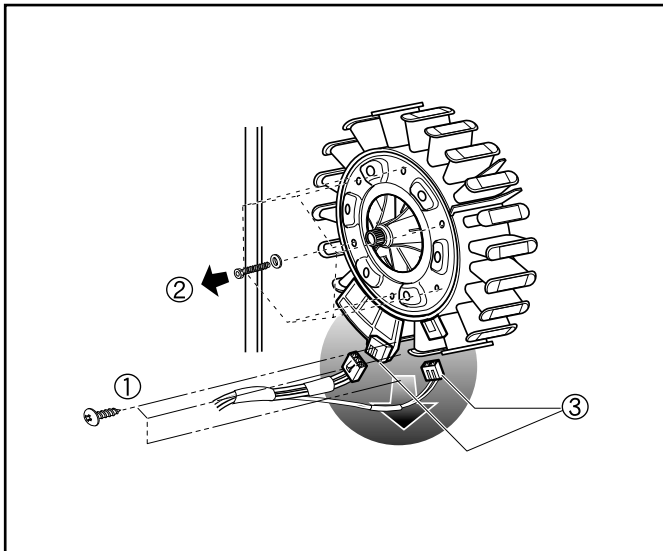


1. Disassemble the back cover.
2. Separate the heater from the tub.
3. Remove any foreign objects (wire, coin, etc.) by inserting a long bar in the opening.

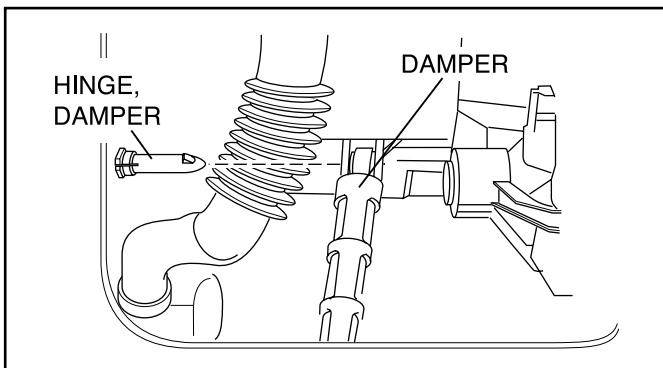
## MOTOR / DAMPER



1. Disassemble the back cover.
2. Loosen the bolt.
3. Pull out the Rotor.



4. Unscrew the 2 screws from the tub bracket.
5. Loosen the 6 bolts on the stator.
6. Unplug the 2 connectors from the stator.



1. Disassemble the damper hinges from the tub and base.

### ※ NOTE

- If you pull the dampers apart, they must be replaced. If you do not separate them, they can be re-used.

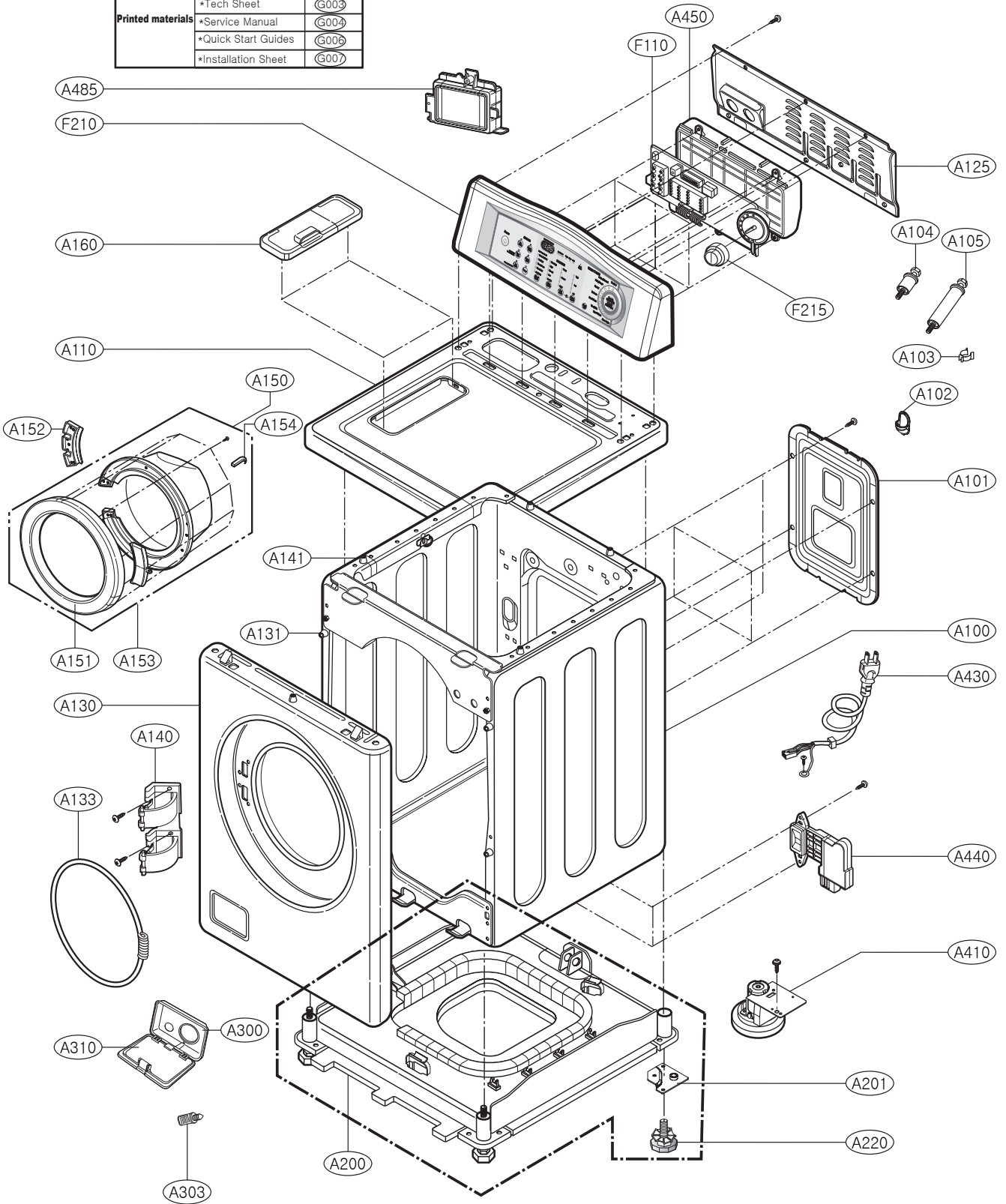


# 11. EXPLODED VIEW

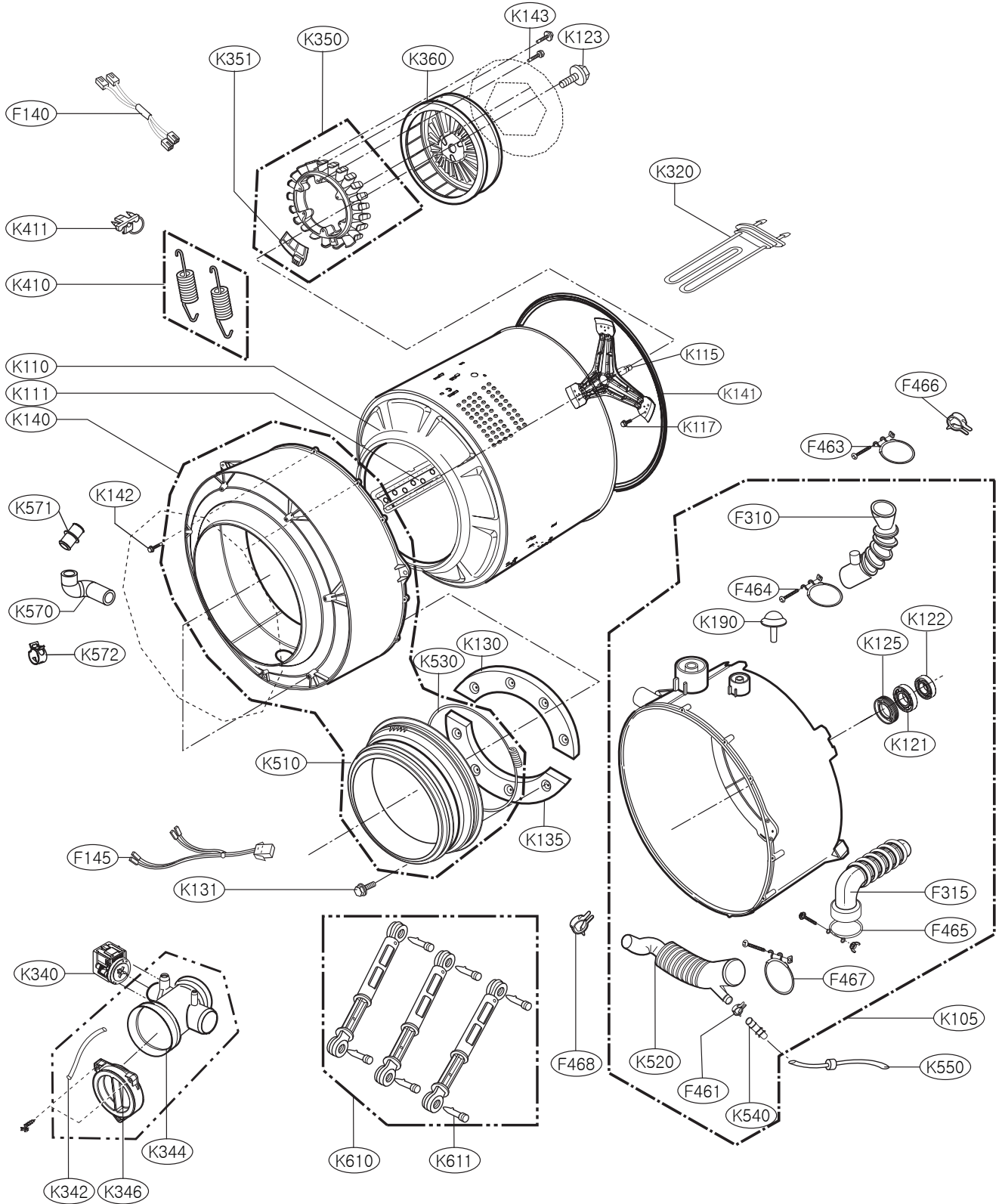
## 11-1. CABINET & CONTROL PANEL ASSEMBLY

**"The following parts are not illustrated"**

	Description	Loc No.
	*Owner's Manual	(G001)
	*Energy Label	(G002)
	*Tech Sheet	(G003)
Printed materials	*Service Manual	(G004)
	*Quick Start Guides	(G006)
	*Installation Sheet	(G007)



# 11-2. DRUM & TUB ASSEMBLY



- ※ In case of replacing THERMISTOR of HEATER ASSEMBLY(K320), replace HEATER ASSEMBLY(K320), HEATER ASSEMBLY(K320) includes THERMISTOR.
- ※ In case of replacing BEARING,BALL(K121,K122) and GASKET(K125), replace TUB ASSEMBLY,OUTER(K105), TUB ASSEMBLY,OUTER(K105) includes BEARING,BALL(K121,K122) and GASKET(K125).
- ※ Part Assembly(K142) includes 10 screws.

# 11-3. DISPENSER ASSEMBLY

