WASHING MACHINE
SERVICE MANUAL

⚠ CAUTION

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

MODEL : WT21VSS6

SAFETY PRECAUTION!

IMPORTANT SAFETY NOTICE!

This service information is intended for individuals possessing adequate backgrounds of electrical, electronic, and mechanical experience. Any attempt to repair this appliance may result in personal injury or property damage. The manufacturer or seller can not be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

⚠WARNING: To reduce the risk of fire, electric shock, or personal injury when using this appliance, follow basic precautions, including the following:

- **Wear gloves when working.**
  Failure to do this can result in serious injury.
- **The appliance is heavy. Two or more people are required when moving the appliance.**
  There is a risk of serious back injury or other injuries.
- **Certain internal parts are intentionally not grounded and may present a risk of electric shock only during servicing. Service personnel - Do not contact the following parts while the appliance is energized: Pump bracket, rotor, and heater.**
- **Disconnect this appliance from the power supply before servicing. Turning the controls to the off position does not disconnect this appliance from the power supply.**
  Failure to do this can result in shock.
- **Reconnect all grounded devices after servicing.**
  Failure to do this can result in shock.

CONTENTS

1. Specifications 3
2. Installation Instructions
   - 2-1. How to Adjust Level 4
   - 2-2. Connecting Water Supply Hose 6
   - 2-3. Connect the Drain Hose 7
3. Operating Instructions
   - 3-1. Identification of Parts 8
   - 3-2. Before Starting to Wash 9
   - 3-3. Function of Each BUTTON 16
   - 3-4. Washing Programs 18
   - 3-5. Care and Maintenance 19
4. Service Information
   - 4-1. Disassembly Instruction 21
   - 4-2. Wiring Diagram 28
   - 4-3. Test Running Without Water 29
   - 4-4. Troubleshooting By Common Washing Problems 30
   - 4-5. Troubleshooting Summary 31
   - 4-6. PCB Picture 32
   - 4-7. Troubleshooting with Error Code 33
   - 4-8. Other Troubleshooting 40
5. Component Testing Information.....42
   - 5-1. Filter Assembly (Line Filter) 42
   - 5-2. Door Lock Switch Assembly.....43
   - 5-3. Stator Assembly 45
   - 5-4. Pump Motor Assembly 46
   - 5-5. Inlet Valve Assembly 47
   - 5-6. Thermistor Assembly.....48
6. Exploded View 51
7. Replacement Part List 55

1. SPECIFICATIONS

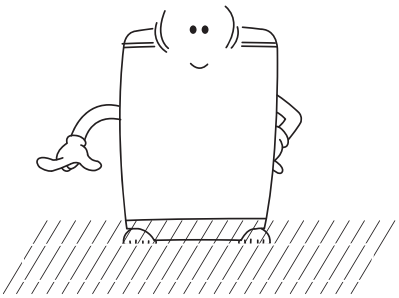
Model	WT21VSS6
Electrical	120 VAC@60 Hz.
Inner Tub	Stainless
Inlet Water Pressure	20 ~ 120 psi(138 ~ 827 kPa)
Rating of Fuse	120V/60Hz
Spin Speed	1100±50 rpm
Weight	137.3 lbs. (62.3 kg)
Cycles	Normal, Heavy Duty, Bulky, Bright Whites™, Sanitary, Allergiene™ , Perm.Press, Towels, Delicates, Speed Wash, Tub Clean, Download Cycle
Time Delay	1 – 19 Hr
Lid Interlock Switch	Magnet Sensor
Control Lock	Yes
Softener Dispenser	Yes
Detergent Dispenser	Yes
Bleach Inlet	Yes
Auto Power Off	Yes
Smart Rinse™with Jet Spray	Yes
Heater	Yes

2. INSTALLATION INSTRUCTIONS

2-1. HOW TO ADJUST LEVEL

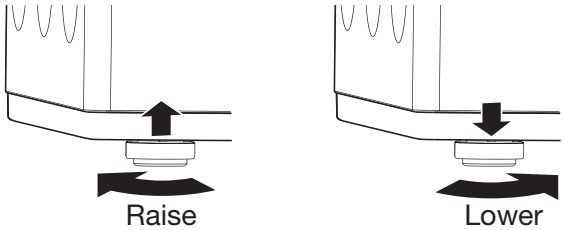
1 **Installation area**

- Install the washer on a firm, flat surface.
- If the washer is installed on an unsuitable floor, it could make considerable noise and vibrate.



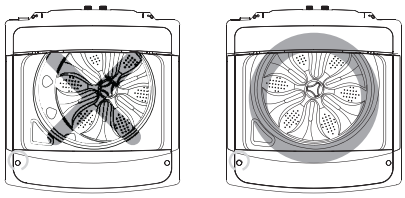
2 **Set Leveling feet**

- Adjust the leveling feet, Turn clockwise to raise the washer or counterclockwise to lower it.



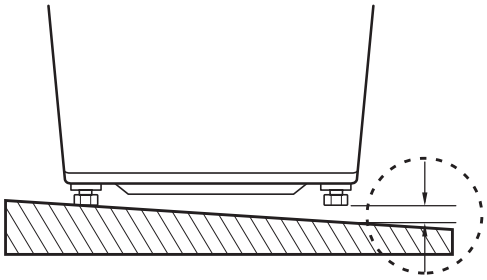
3 **Checking level**

- Open the lid, check if the washer is correctly leveled by looking down from the top. If the tub is not centered in the opening, then the washer is not level.



4 **Checking slope**

- If installation surface is tilted, the washer will vibrate. Do not install on a sloping floor.



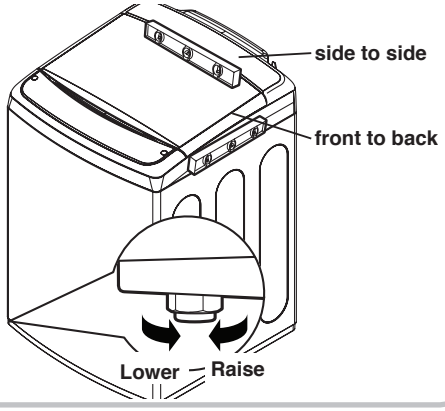
No shims. It would be dangerous. If the floor is that far from being level, it is a floor problem and not a washer problem.

⚠CAUTION

- The ventilating openings in the base area must not be obstructed by carpeting.
- Install the washing machine on a level and firm surface. There should be no more than 1° of variation.
- Wooden floors may need reinforcing to prevent the normal vibration which occurs with an unbalanced load.
- Do not install the washer on an inclined floor.
  Improper installation of the washer may cause noise and malfunctioning.

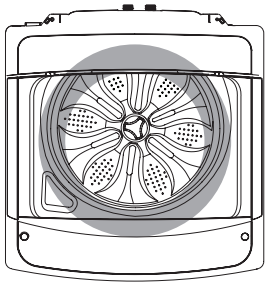
5 Horizontal setting

• If the washer is not level, adjust the leveling feet. Turn clockwise to raise, counterclockwise to lower.



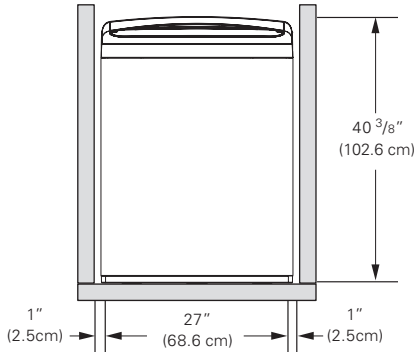
6 Confirming level

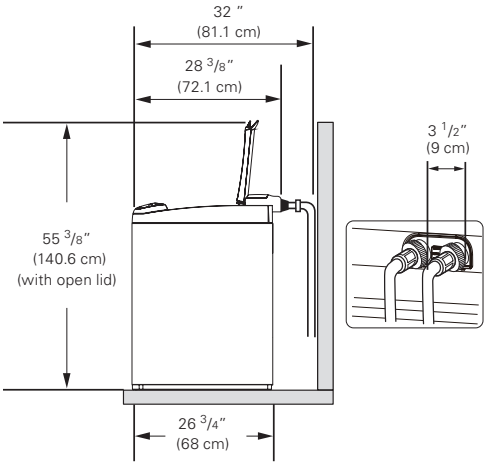
• Place the washer in original position, confirming the level.



7 Distance between the drain hose and the wall

• Distance between the drain hose and the wall should be more than 4 inches (10 cm,) and the distance between any other part and the wall should be more than 1 inches (2.5 cm.)





Do not install the washer in the following places.

• Where the washer is exposed to direct sunlight.
• Near a heater or heating appliance.
• Where the washer is exposed to freezing temperatures.
• In damp environments such as bathrooms or harmful environments.

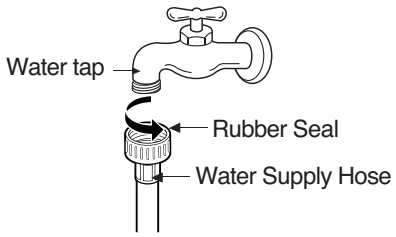
2-2. CONNECTING WATER SUPPLY HOSE

Before connecting the water supply hose to the water tap, check the hose type and then choose the correct instruction here below.

Screw Type

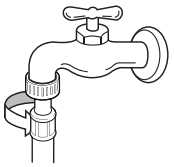
1 **Be sure there is a gasket in both ends of the hose.**

Push the water supply hose up so that the rubber packing within the hose can adhere completely to the tap.



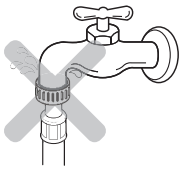
2 **Connect the water supply hose to the tap.**

Run a couple of gallons of water through the hoses into the drain or a bucket to flush any particulate or contaminate.

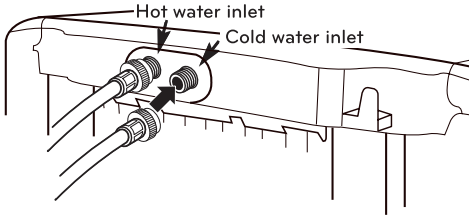


3 **Check water leakage.**

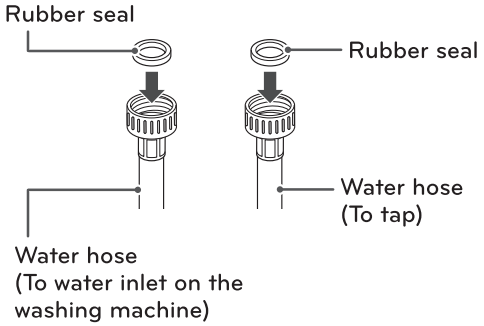
After connecting the hose, open the tap to check for any water leakage.



Connecting Water Supply Hose to the Machine

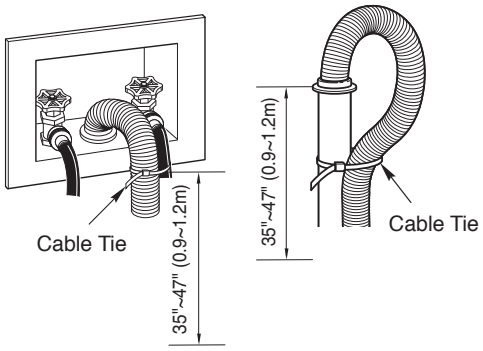


- Be sure there is a gasket in the end of the hose.
- Connect the hose to the appropriate inlet vale (hot or cold) of the washing machine and tighten if firmly.
- Turn on the water and check for leacks.
- Always install new hoses with a new washing machine Do not re-use old hoses.
- Relplace the hoses every five years.



2-3. CONNECT THE DRAIN HOSE

- Insert the end of the drain hose into the drain.
- If the drain is large enough for the flange on the hose to fit inside, then do not insert the flange more than 1-2 inches into the drain.
- Check that the drain hose is hungup over the edge of the laundry tub.
- Do not use an extension hose.



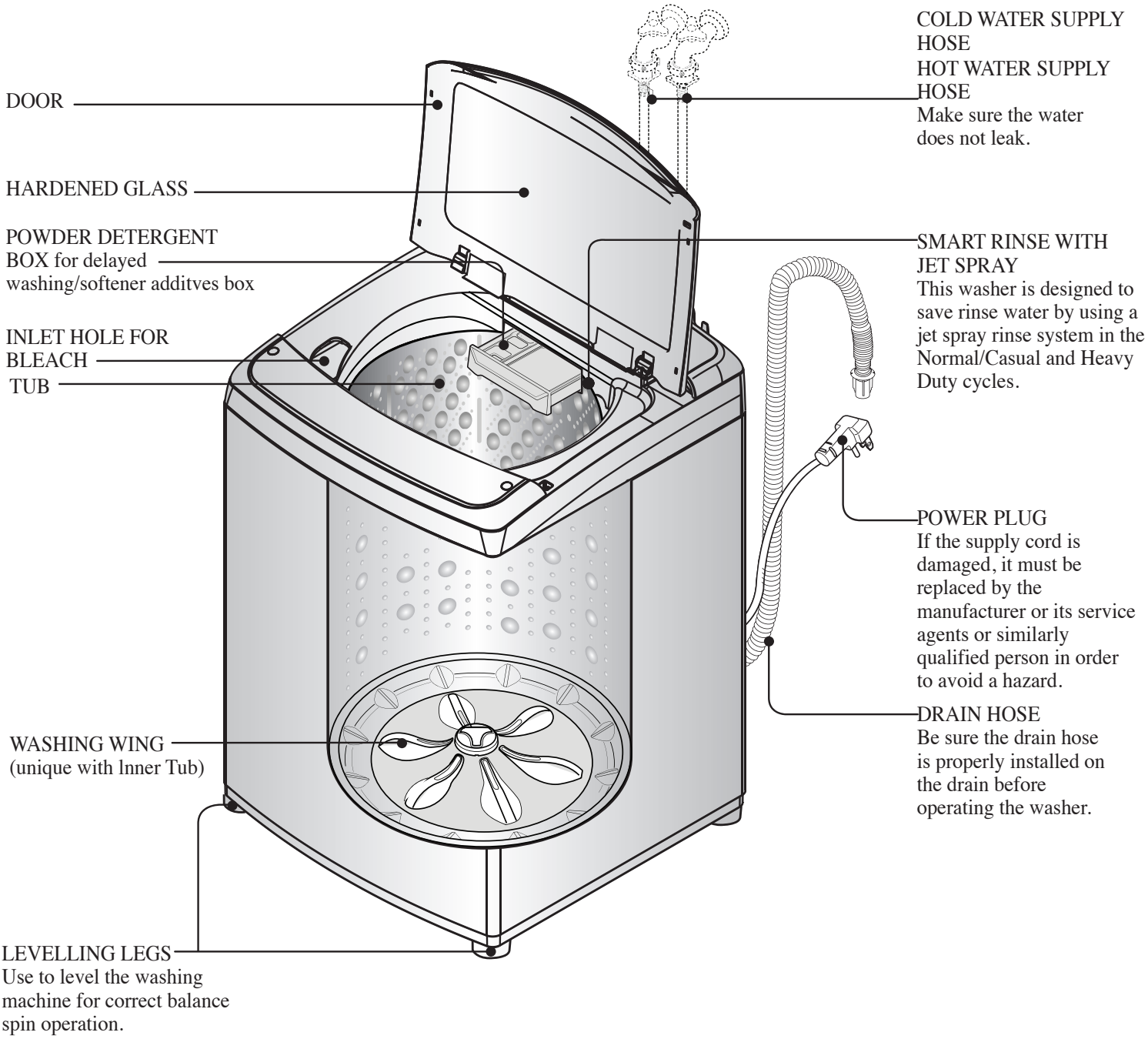
NOTE :
- The drain hose should always be properly secured to the drain or standpipe. Failure to secure the drain hose properly can result in flooding and property damage.
- The end of the drain hose should be placed 39" (99 cm) above the floor.
- The drain must be installed in accordance with any applicable local codes and regulations.
- Make sure that the water lines are not stretched, pinched, crushed, or kinked.
- Do not insert the drain hose more than 12” (30 cm) into the drain pipe to avoid siphoning and odor build-up.

⚠WARNING:

- The washer should never be installed or stored in a location subject to freezing temperatures. If the washer was exposed to freezing temperatures prior to installation, allow it to stand at room temperature for several hours before use. Damage to the water lines and internal mechanisms of the washer can result.
- Water supply pressure must be between 20 ~ 120 psi(138 ~ 827 kPa) If the water supply pressure is more than 120 psi, a pressure reducing valve must be installed. If you have uncontrolled water temperature and pressure you should fit a temperature and pressure relief valve to ensure that water temperature and water pressure remain within the safe limits. Consult a plumber or electrician if you are unable to adjust water temperature and or pressure. Failure to do so can result in damage to the machine.
- Plug the power cord of washer into a properly grounded outlet. Failure to do this can result in shock or serious injury.

3. OPERATING INSTRUCTION

3-1. IDENTIFICATION OF PARTS



3-2. BEFORE STARTING TO WASH

Care Labels

• Look for a care label on your clothes.
This will tell you about the fabric content of your garment and how it should be washed.
Sort clothes into loads that can be washed with the same wash cycle, water temperature, and spin speed.



Sorting

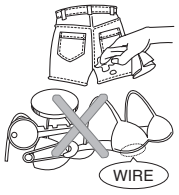
To get the best results, different fabrics need to be washed in different ways.

• **SOIL** (Heavy, Normal, Light)	Separate clothes according to the type and amount of soil.
• **COLOR** (Whites, Lights, Darks)	Separate white fabrics from colored fabrics.
• **LINT** (Lint producers, Collectors)	Separate lint producers and lint collectors.
Lint Producers	Terry cloth, Chenille, Towels, Diapers
Lint Collectors	Synthetics, Corduroy, Permanent Press, Socks



Check before Loading

• **Check all pockets to make sure that they are empty.** Things such as nails, hairclips, matches, pens, coins, and keys can damage both your washer and your clothes.
• **Mend any torn garments or loose buttons.** Tears or holes may become larger during washing.
• Remove belts, underwires, etc. to prevent damage to the machine or your clothes.
• **Pretreat any dirt and stains.**
• Make sure the clothes are washable in water.
• Check the washing instructions.
• Remove any paper or tissue in the pockets.
• Be sure the wire supports in undergarments are secure and will not become loose in the washer.



Pretreatment on stains or heavy soil

• Pretreat shirt collars and cuffs with a pre-wash product or liquid detergent when placing them in the washer.
Before washing treat special stains with bar soaps, liquid detergent, or a paste of water and powdered detergent.
• Use a pretreat soil and stain remover.
Treat stains AS SOON AS POSSIBLE. The longer they are left, the harder they are to remove.
(For more detail refer to page 14-15)

Loading

Do not wash fabrics containing flammable materials (waxes, cleaning fluids, etc.).

Load Size

The WATER LEVEL should just cover the clothes. Adjust the load size accordingly. Loosely load clothes no higher than the top row of holes in the washer tub. To add items after washer has started, press the **START** button and submerge additional items. Close the lid and press the Start button again to restart.

※ Do not wash waterproofed fabrics (such as skiing outfits, diapers, or nappy auto seat covers.)

Light and Large-sized clothing

Clothes like downs and woolens are lightweight, large, and float easily. Use a nylon net and wash them in a small amount of water. If the laundry floats during the wash cycle, it may become damaged. Use dissolved detergent to prevent the detergent from clumping.

※ Do not wash water-proof textilles (Skiing outfit, baby diaper, nappy automobile seat covers.)



Long laundry items

Use nylon bag nets for long, delicate items. For laundry with long strings or long length, a bag will prevent tangling during washing. **Fasten zippers, hooks, and strings** to make sure that these items don't snag on other clothes.

※ The nylon net bag can be purchased locally.



1) Using Water

Water Temperature

- The machine sets the appropriate temperature automatically according to the wash program .
  You can override the preset selection by pressing the **water temperature icon. Touch the arrow buttons up or down until your desired temperature setting is displayed.**
- The temperature of the water impacts the effectiveness of all laundry additives and, therefore, the cleaning results.
- We recommend temperatures of:
  - HOT 120°F (120-140°F) White items, diapers, underclothing and heavily soiled, colorfast items.
  - WARM 90°F (85-105°F) Most items
  - COLD 66°F (65-75°F) Only very bright colors with light soil.
- When washing in COLD water additional steps may be needed:
  - Adjust detergent amount and pre-dissolve detergent in WARM water
  - Pretreat spots and stains
  - Soak heavily soiled items
  - Use appropriate bleach

* Temperature below 18°C (65°F) will not activate laundry additives and may cause lint, residue, poor cleaning, etc. In addition, detergent manufactures and care labels define COLD water as 26~29°C (80-85°F).
  If the temperature of the water in the tub is too cold for your hands, the detergent will not activate and clean effectively.

Note

If iron is present in the water, the clothes may become an all-over yellow or they may be stained with brown or orange spots or streaks. Iron is not always visible. Installation of water softener or an iron filter may be necessary for severe cases.

2) Using Detergent

Detergent

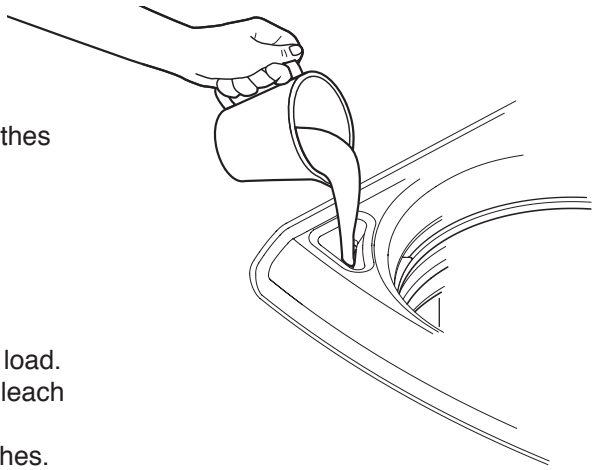
Follow the detergent package directions. Using too little detergent is a common cause of laundry problems. Use more detergent if you have hard water, large loads, greasy or oily soils or lower water temperature.

Choosing the Right Detergent

Your washing machine is designed for use with only High-Efficiency (HE) detergents. HE detergents are formulated specifically for HE machines and contain suds-reducing agents. Always look for the HE symbol when purchasing detergent. HE detergents produce fewer suds, dissolve more efficiently to improve washing and rinsing performance, and help to keep the interior of your washer clean. Using a regular detergent will cause unsatisfactory performance, oversudsing, machine build-up, and could damage the machine.

Using the Liquid Bleach Dispenser

The bleach dispenser automatically dilutes and dispenses liquid chlorine bleach at the proper time in the wash cycle.



1. Check clothing care labels for special instructions.
2. Measure liquid bleach carefully, following instructions on the bottle.
   - Never pour undiluted liquid chlorine bleach directly onto clothes or into the wash basket.
   - Do not pour powdered bleach into bleach dispenser.
   - Avoid overfilling or splashing when adding bleach to the dispenser. The maximum capacity of the bleach dispenser is one cup of bleach per wash cycle. Overfilling could result in premature dispensing of bleach.

   Do NOT add more bleach than is required for your particular load.
3. Before starting the washer, pour measured amount of liquid bleach directly into bleach dispenser. If you prefer to use powdered bleach, add it into the wash basket directly before adding clothes.

⚠WARNING Do NOT mix chlorine bleach with ammonia or acids, such as vinegar or rust / scale remover. Mixing chemicals like these can produce irritating and toxic fumes. Put the manufacturer's recommended amount of undiluted liquid chlorine bleach into the bleach dispenser. During the final portion of the wash cycle, two sequential flushes of the dispenser put all the bleach into the wash load and completely flush the dispenser to eliminate the carryover of bleach to a subsequent load. Any liquid remaining in the bleach dispenser at the end of the cycle is water, not bleach. To prevent unintentional self-siphoning of the bleach, never fill the dispenser higher than the maximum fill level marked on the dispenser. When adding bleach to the dispenser, be careful to avoid spilling it into the laundry load or leaving droplets of bleach around the dispenser. These things will damage your laundry items.

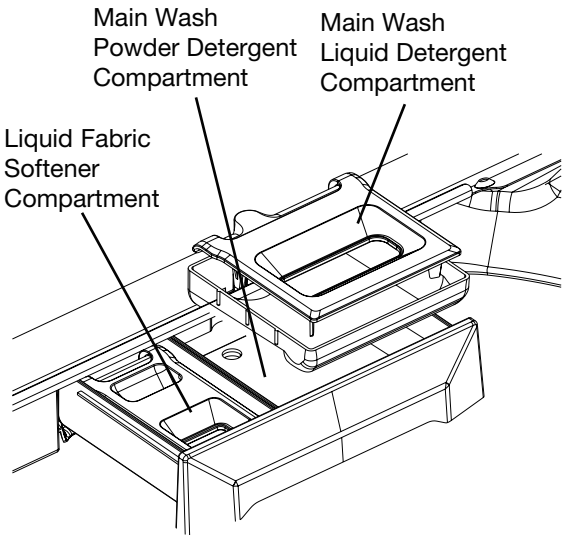
Using the Dispenser Drawer

ABOUT THE DISPENSER

The automatic dispenser consists of two compartments which hold:

- Liquid fabric softener.
- Liquid or powdered detergent.

All laundry products can be added at once in their respective dispenser compartments. They will be dispensed at the appropriate time for the most effective cleaning.
After adding the laundry products to the dispenser, close the dispenser drawer.
Close the dispenser drawer gently to avoid spilling or starting the siphoning action.



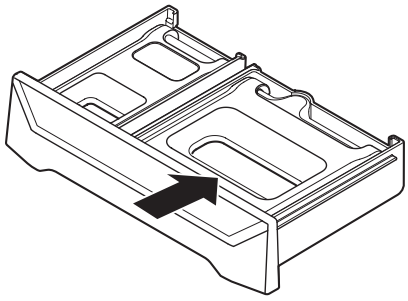
To add detergent, bleach, and fabric softener to the automatic dispenser:

❶ Open the dispenser drawer.
❷ Load the laundry products into the appropriate compartments.
❸ Close the lid slowly and smoothly to avoid spilling, splashing, or premature dispensing of the contents.

NOTE: It is normal for a small amount of water to remain in the dispenser compartments at the end of the cycle.
NOTE: Do not use powdered or liquid bleach in the dispenser drawer.

Adding Detergent

Add measured detergent to the detergent compartment of the dispenser drawer.



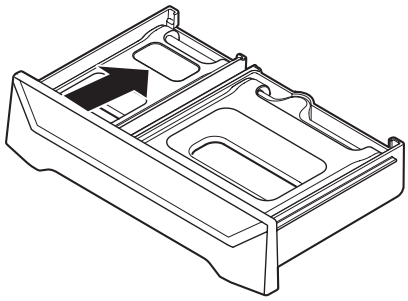
• **Do not exceed the maximum fill line.**

Detergent is flushed through the dispenser at the beginning of the wash cycle. Either powdered or liquid detergent can be used, but the drawer insert must be removed to use powder.

Detergent usage may need to be adjusted for water temperature, water hardness, size, and soil level of the load. Avoid using too much detergent in your washer, as it can lead to oversudsing and detergent residue being left on the clothes.

Adding Fabric Softener

Pour the recommended amount of liquid fabric softener into the left-hand compartment. Use only liquid fabric softener.



Dilute with water to the maximum fill line.

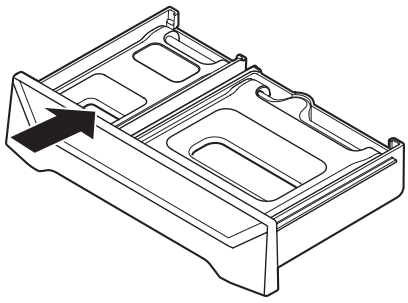
• **Do not exceed the maximum fill line.**

Overfilling can cause early dispensing of the fabric softener, which could stain clothes.

NOTE: Do not pour fabric softener directly on the wash load. It may stain the clothes.
If you use an ultra-thick fabric softener, you might want to dilute it with water so it dispenses easily.

Adding Wash Boost Additives

The wash boost dispenser may be used to clean heavily soiled or stained garments more efficiently.



If desired, place the additives for the wash boost setting in the right-hand compartment. Use only liquid additives.

• **Do not exceed the maximum fill line to avoid detergent buildup In clothing and the washer**

Overfilling can cause early dispensing of presoak additives, which could result in damaged clothes.

NOTE : Do not pour additives directly on the wash load. It may stain the clothes.

3) Special Guide for Stain Removal

⚠ WARNING

Do not use or mix liquid chlorine bleach with other household chemicals such as toilet cleaners, rust removers, acid, or products containing ammonia. These mixtures can produce dangerous fumes which can cause serious injury or death.

To reduce the risk of fire or serious injury to persons or property, comply with the basic warnings listed below:

- Read and comply with all instructions on stain removal products.
- Keep stain removal products in their original labeled containers and out of children's reach.
- Thoroughly wash any utensil used.
- Do not combine stain removal products, especially ammonia and chlorine bleach. Dangerous fumes may result.
- Never wash items which have been previously cleaned in, washed in, soaked in or spotted with gasoline, dry cleaning solvents, or other flammable or explosive substances because they give off vapors that could ignite or explode.
- Never use highly flammable solvents, such as gasoline, inside the home. Vapors can explode on contact with flames or sparks.

For successful stain removal:



- Remove stains promptly.
- Determine the kind of stain, then follow the recommended treatment in the stain removal chart below.
- To pretreat stains, use a prewash product, liquid detergent, or a paste made from powdered detergent and water.
- Use COLD water on unknown stains because HOT water can set stains.
- Check care label instructions for treatments to avoid on specific fabrics.
- Check for colorfastness by testing stain remover on an inside seam.
- Rinse and wash items after stain removal.

Stain Removal	
STAIN	TREATMENT
Adhesive tape, chewing gum, rubber cement	Apply ice. Scrape off excess. Place stain face down on paper towels. Saturate with prewash stain remover or nonflammable dry cleaning fluid.
Baby formula, dairy products, egg	Use product containing enzymes to pretreat or soak stains.
Beverages (coffee, tea, soda, juice, alcoholic beverages)	Pretreat stain. Wash using COLD water and bleach safe for fabric.
Blood	Soak the item in a bowl of COLD water for at least 30 minutes. Then launder as usual.
Candle wax, crayon	Remove all surface wax. Put the garment in the freezer for a couple of hours, then remove and break away as much wax as possible. Try a commercial removal product like Goo-Gone, Goop, or Go-Jo cleaner for the remaining wax stains. DO NOT ATTEMPT TO REMOVE WITH HEAT!
Chocolate	Pretreat or soak in WARM water using product containing enzymes. Wash using bleach safe for fabric.
Collar or cuff soil, cosmetics	Pretreat with prewash stain remover or rub with bar soap.
Dye transfer on white fabric	Use packaged color remover. Wash using bleach safe for fabric.
Grass	Pretreat or soak in WARM water using product containing enzymes. Wash using bleach safe for fabric.
Grease, oil, tar (butter, fats, salad, dressing, cooking oils, car grease, motor oils)	Scrape residue from fabric. Pretreat. Wash using hottest water safe for fabric. For heavy stains and tar, apply nonflammable dry cleaning fluid to back of stain. Replace towels under stain frequently. Rinse throughly. Wash using hottest water safe for fabric.
Ink	Some inks may be impossible to remove. Washing may set some inks. Use prewash stain remover, denatured alcohol, or nonflammable dry cleaning fluid.
Mildew, scorch	Wash with chlorine bleach if safe for fabric. Or, soak in oxygen bleach and HOT water before washing. Badly mildewed fabrics may be permanently damaged.
Mud	Brush off dry mud. Pretreat or soak with product containing enzymes.
Mustard, tomato	Pretreat with prewash stain remover. Wash using bleach safe for fabric.
Nail polish	May be impossible to remove. Place stain face down on paper towels. Apply nail polish remover to back of stain. Repeat, replacing paper towels frequently. Do not use on acetate fabrics.
Paint, varnish	WATER BASED Rinse fabric in cool water while stain is wet. Wash. Once paint is dry, it cannot be removed, OIL BASED AND VARNISH Use solvent recommended on can label. Rinse throughly before washing.
Rust, brown or yellow discoloration	For spots, use rust remover safe for fabric. For discoloration of an entire load, use phosphate detergent and nonchlorine bleach. Do not use chlorine bleach because it may intensify discoloration.
Shoe polish	LIQUID Pretreat with a paste of powdered detergent and water. Apply paste and scrape residue from fabric. Pretreat with prewash stain remover or nonflammable dry cleaning fluid. Rub detergent into dampened area. Wash using bleach safe for fabric.

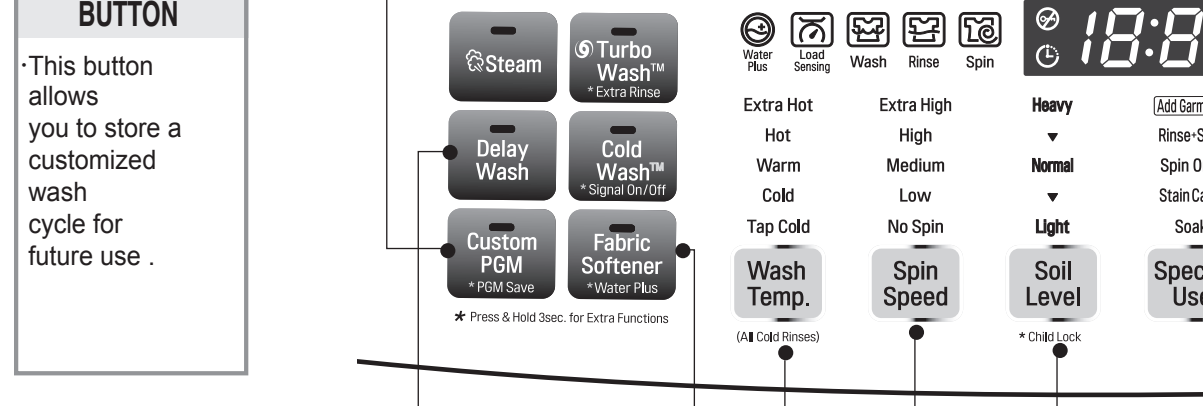
3-3. FUNCTION OF EACH BUTTON

Load Sensing

·It operates in all cycles.
·During being detected by the sensor, the LOADSENSING LED flashes.
·It automatically sensing the size of the load.
·During this step, the washing machine selects optimized washing algorithm.

Custom Program BUTTON

·This button allows you to store a customized wash cycle for future use .



Delay Wash (Selection) BUTTON

·Delayed finishing time.
·The time increases when the button is pushed.
·The following settings are indicated as the button is pushed 1 ▶ 2 ▶3 ▶ 4 ▶ ... 19▶
Reservation off ▶ 1 ...
·To cancel delay time, turn the power switch off or push DELAY WASH button until off.

Fabric Softener

·Causes the dispensing of fabric softener in the final rinse cycle.

Wash / Temp.

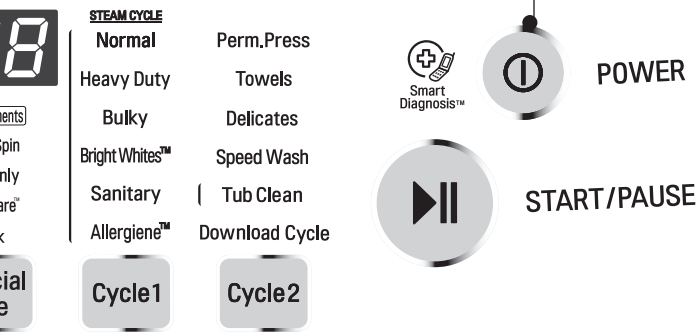
·Select to select Wash Temperature.
·Pressing the button allows The selection of TAP COLD ▶COLD ▶WARM ▶ EXTRA HOT respectively. Default setting is Warm.

Note

The time shown on the display is the estimated cycle time. If the sensors and microprocessor elect to make changes during the cycle, the display will be adjusted accordingly.

POWER

Power on.
Push again, power goes off
Power goes off automatically after the wash is finished.
After turning the power on, the unit will automatically turn off if nothing is selected.



START/ PAUSE BUTTON

Use to start or pause the wash cycle.
Changes while be made to the wash settings while the machine is paused.
Repeats start and pause by pushing the button.

Spin Speed

Spin speed can be selected from No Spin to Extra high. Default is High.

Soil Level

Allows a selection to be make for the strength of the wash action.
Power option selections light up in sequence as follows Normal ☒ Heavy ☒ Light ☒ Normal as the button is pushed. This can be selected for any program.
Adjustment can be made while washing.
Default SOIL LEVEL is Normal.

3-4. WASHING PROGRAMS.

CYCLE GUIDE

The cycle guide below shows the default settings, available options and recommended fabric types for each cycle. Allowable modifier adjustments are shown below the default setting for each cycle.

● = AVAILABLE OPTION

= Default Setting

Cycle	Fabric or Load Type	Wash Temp.	Spin Speed	Soil Level	Steam	Turbo Wash™	Soak	Stain Care™	Cold Wash™	Extra Rinse	Water Plus	Fabric Softener
Normal	Cotton, linen, towels, shirts, sheets, jeans, mixed loads	Warm Extra Hot Hot Cold Tap Cold	High Extra High Medium No Spin	Normal Heavy Light	●	●	●	●	●	●	●	●
Heavy Duty	Heavy soiled cotton fabrics	Warm Hot Cold Tap Cold	High Extra High Medium Low No Spin	Heavy Normal Light	●	●	●	●		●	●	●
Bulky	Large items such as blankets and comforters	Warm Hot Cold Tap Cold	High Extra High Medium Low No Spin	Normal Heavy Light	●		●		●	●		●
	* Use the Bulky cycle for items such as pillows, comforters, pet bedding and other articles which have difficultly absorbing water. DO NOT WASH EXCESSIVELY LARGE ITEMS. If large/bulky items do not fit easily into the tub, there may not be enough room for them to move during washing. Keep like items together; do not mix large bulky items with smaller clothing items. Failure to follow these instructions may result in damage to the clothing or to the washer.											
Bright Whites™	White fabrics	Hot Warm	Medium Extra High High Low No Spin	Heavy Normal Light	●	●	●			●	●	●
Sanitary	Heavily soiled underwear, work clothes, diapers, etc. (less than 11 lbs.)	Extra Hot	High Extra High Medium Low No Spin	Heavy Light Normal	●	●	●			●	●	●
Allergiene™	Cotton, underwear, pillow covers, bed sheets, baby wear. (less than 12 lbs.)	Extra Hot	High Extra High Medium Low No Spin	Heavy Normal Light	●					●	●	

CYCLE GUIDE

The cycle guide below shows the default settings, available options and recommended fabric types for each cycle. Allowable modifier adjustments are shown below the default setting for each cycle.

= AVAILABLE OPTION
= Default Setting

Cycle	Fabric or Load Type	Wash Temp.	Spin Speed	Soil Level	Steam	Turbo Wash™	Soak	Stain Care™	Cold Wash™	Extra Rinse	Water Plus	Fabric Softener
Perm.Press/ Casual	Dress shirts/pants, wrinklefree clothing, poly/cotton blend clothing, table- cloths	Warm Extra Hot Hot Cold Tap Cold	High Extra High Medium Low No Spin	Normal Light						●	●	●
Towels	Towels, shirts, sheets, jeans, mixed loads	Warm Hot Cold Tap Cold	High Extra High Medium Low No Spin	Normal Heavy Light		●	●	●	●	●	●	●
Delicates	Dress shirts/ blouses, nylons, sheer or lacy garments (less than 8 lbs.)	Tap Cold Warm Cold	Low High Medium No Spin	Light Heavy Normal			●			●	●	●
Speed Wash	Lightly soiled and small loads	Warm Cold Tap Cold	High Extra High Medium Low No Spin	Light Heavy Normal		●	●			●	●	
Tub Clean	Refer to page 27.	Hot	High	Light	●							
Download Cycle	Refer to page 22.											

NOTE:

To protect your garments, not every wash/rinse temperature, spin speed, soil level, or option is available with every cycle. A chime will sound and the LED will not light if the selection is not allowed.

*When a cycle is selected, the default time for that cycle is displayed. This time will change as modifiers or options are selected. Once the START/PAUSE button is pressed, the washer will measure the size of the load. The estimated time may change once the load size has been measured. The washer automatically adjusts the wash time for the amount of laundry, water pressure, water and other operating conditions.

3-5. CARE AND MAINTENANCE

When There Is The Possibility Of Freezing Temperatures

- Close the water taps and remove the water supply hoses.
- Remove the water which remains in the water supply.
- Lower the drain hose and drain the water in the sump and the drain hose by running a spin cycle.

If Frozen

- Remove the water supply hose and immerse it in HOT water. (40° C or 104° F).
- Pour approximately 2 liters (½ gallon) of HOT water (40° C or 104° F) into the sump and allow it to stand for at least 10 minutes.
- Connect the water supply hose to the water tap. Run an Express Wash cycle to confirm that the machine fills, drains, and operates properly.

Wash Inner-Tub	Leave the lid open after washing to allow moisture to evaporate. If you want to clean the inner-tub use a clean soft cloth dampened with liquid detergent, then rinse. (Do not use harsh or gritty cleaners.)
Inlet Hoses	Hoses connecting washer to faucet should be replaced every 5 years.
Exterior	Immediately wipe off any spills. Wipe with damp cloth. Avoid hitting surface with sharp objects.
Long Vacations	Be sure water supply is shut off at faucets. Drain all water from hoses if weather will be below freezing.

Cleaning The Inside Of Your Washer

If you use fabric softener or do regular COLD water washing, it is very important that you clean the inside of your washer occasionally as described below.

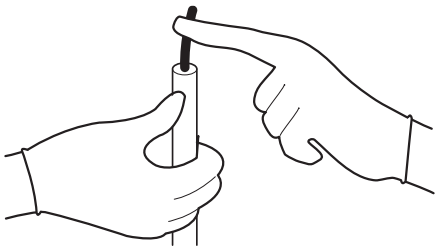
- Fill your washer with HOT water.
- Add 1 cup of bleach.
- Let it operate for several minutes.
- Stop the washer, open the lid, and leave it to soak overnight.
- After soaking, drain the washer and run it through a normal cycle.

Products That Might Damage Your Washing Machine

- Concentrated bleaches and diaper sanitizer will cause damage to the paintwork and components of your washer.
- Hydrocarbon solvents, i.e. gasoline, kerosene, paint thinners, and lacquer thinners, etc. can dissolve plastic and blister paint.
  (Be careful when washing garments stained with these solvents as they are flammable; DO NOT put them in washer or dryer.)
- Some pretreatment sprays or liquids can damage your washer's control panel.
- Use of dyes in your washer may cause staining of the plastic components. The dye will not damage the machine but we suggest you thoroughly clean your washer afterwards. We do not recommend the use of dye strippers in your washer.
- Do not use your washer lid as a work surface.

4. SERVICE INFORMATION

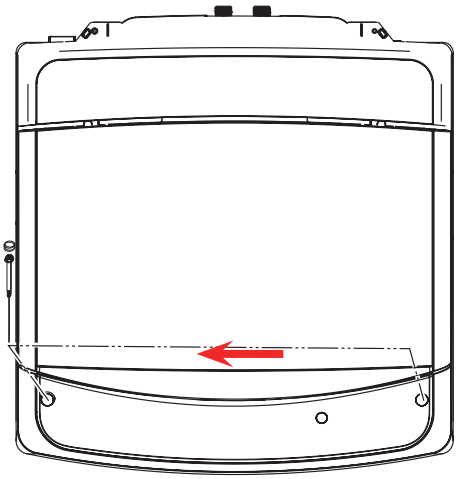
4-1. DISASSEMBLY INSTRUCTION



▶ Be sure to unplug the power to repair and replace electric parts.

ESD (ElectroStatic DIscharge) WARNING

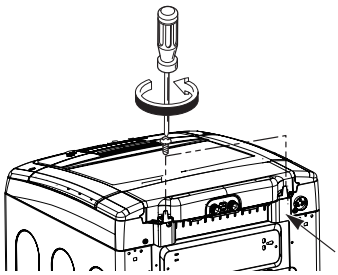
Be sure to follow proper ESD and grounding precautions for diagnosis and repair. If this is not possible, touch the ground wire on a regular basis to remove any static charge built up on your person.

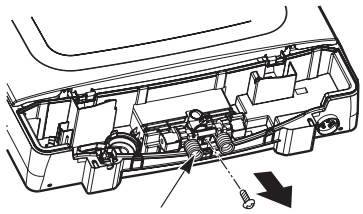


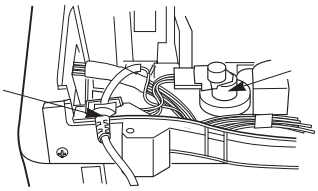
1) Remove front panel and main PCB assembly

① Remove 2 cap and 2 screw attaching the front panel.
② Push the front panel left and pull the front panel forward.

③ Disassemble the protective cover.
④ Disconnect the leads from controller.







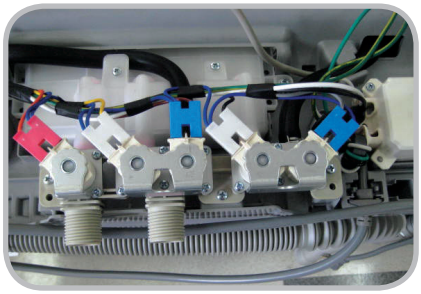
2) Disassembly of the Noise Filter, Power Cord, Inlet Valve, Pressure Switch, and Dispenser Housing.

① Remove 2 screw attaching the panel on the back.
② Disassemble the rear panel.



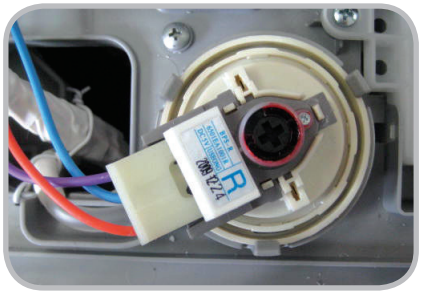
Noise Filter and Power Cord

① Remove the two screws attaching the noise filter.
② Disconnect both connectors in the noise filter.
Remove the power cord from the noise filter.



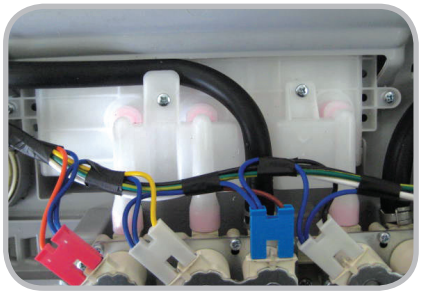
Inlet Valve

① Disconnect the leads from the inlet valve and remove three screws.
② Remove the hoses and output pipes from the input valve.
③ Remove the inlet valve.



Pressure Switch

① Disconnect the leads from pressure switch and detatch the pressure switch from the machine.
② Disconnect the pressure tube from the pressure switch.



Dispenser Housing

① Remove the hoses and output pipes from the input valve.
② Disassemble the connector pipe and the dispenser housing.



3) Disassembly of Top Cover and Lid

① Remove 2screws attaching the back side of top cover.



② Remove 2screws that assembly the top cover with the front panel.



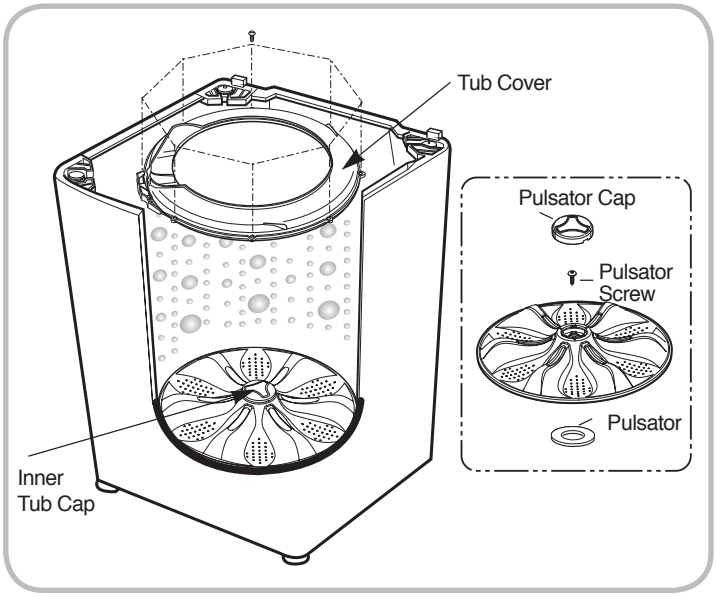
③ Lift the top cover at the front of the washer.

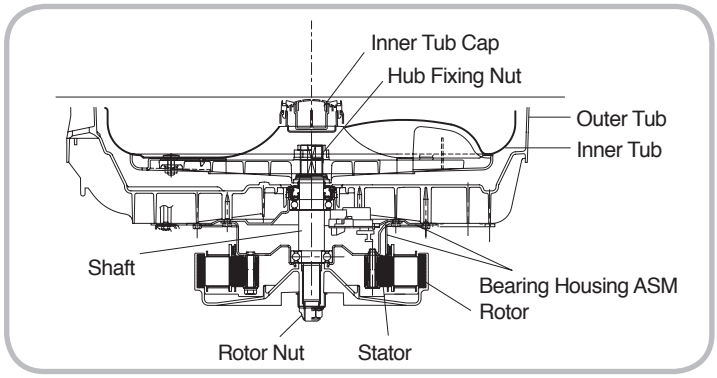


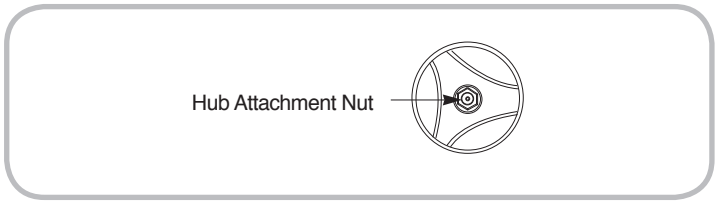
④ Remove the hinge cover and 6 hinge screw.



⑤ Pull the hinge to the left and right and Remove the hinge.







4) Disassembly of Tub Cover and Pulsator

① Remove 8 screws and take off the tub cover.
② Remove the pulsator cap.
③ Remove the pulsator screws.
④ Remove the pulsator washer.

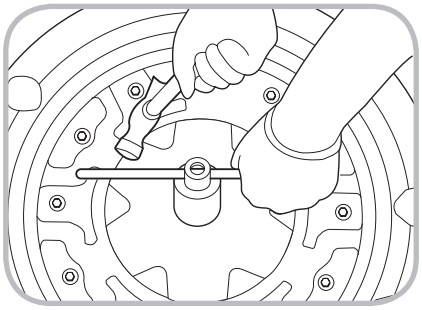
5) Assemble the service tool (38 mm wrench)

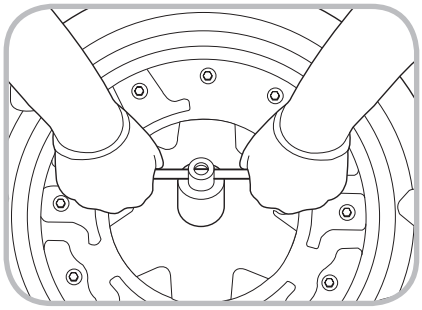




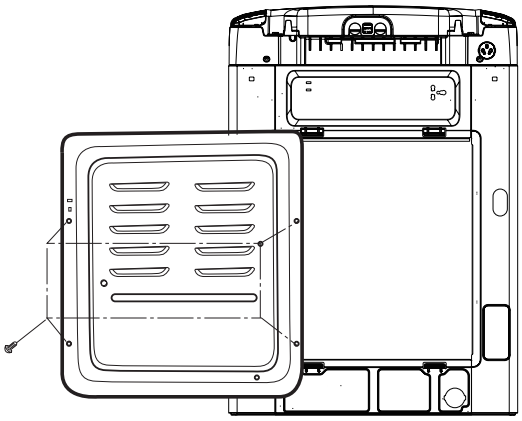


6) Remove the hub attachment nut. (38 mm)





① Hit the bar using the hammer. ② Disconnect hub nut and disassemble the inner tub.



7) Disassembly of the Back Cover and Drain Pump

① Remove the screws that attach the back cover and take it off.
② Disconnect the leads and the drain hose from the drain pump.
③ Remove the pump attachment screws and the lead connector. Take the pump assembly out of the washer.

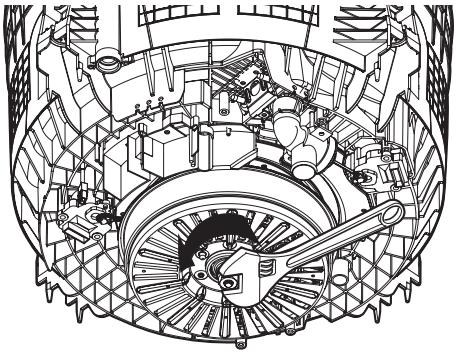


8) Disassembly of Damper Assembly

① Remove the top cover and the back cover of the washing machine.
② Pull out the hinge which connect the horizontal damper with outer tub.(To disassembly the horizontal damper, take the horizontal damper out of the holder.)



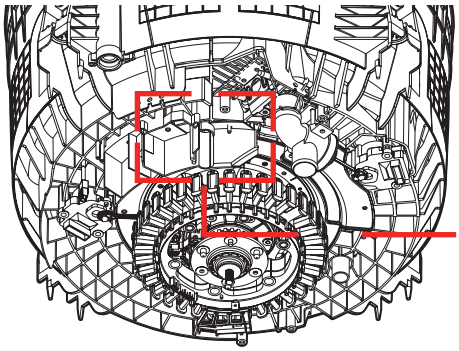
③ As shown in the drawing, lift the damper assembly and remove it along with the outer tub assembly.
④ Damper assembly shall not be disassembled. Replace damper as assembly.



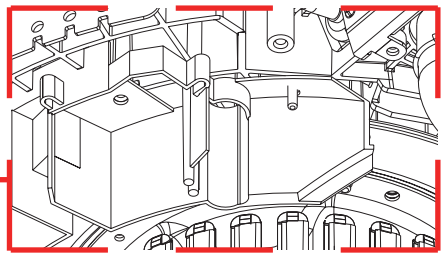
9) Disassembly of Rotor and Stator

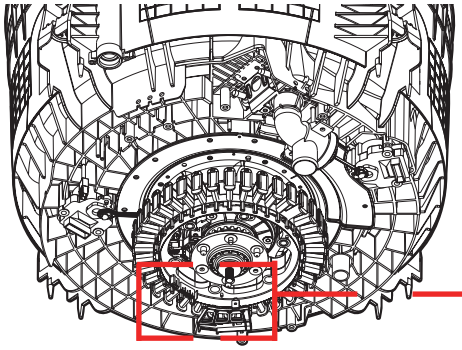
① Use a wrench (M24) to remove the nut that connects the rotor to the shaft.
(The torque should be 200 kgf/cm or 88 foot-pounds.)

② Remove the rotor by pulling it straight off the splined shaft.

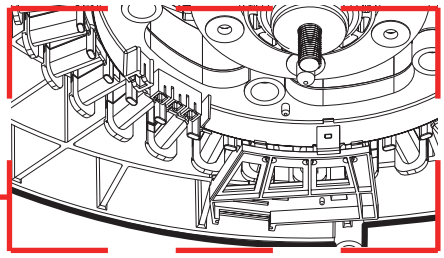


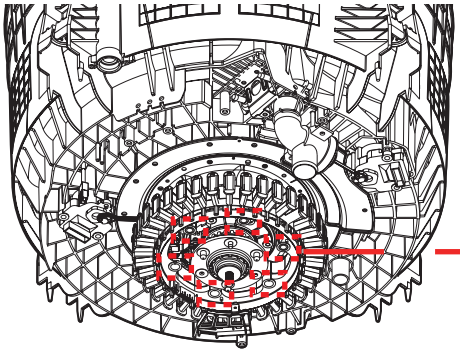
③ Remove the screws that secure the water guide.



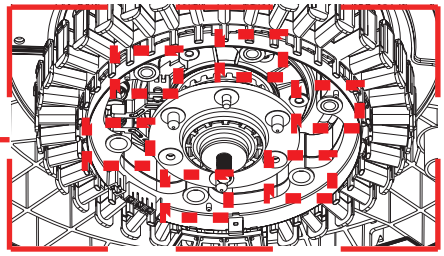


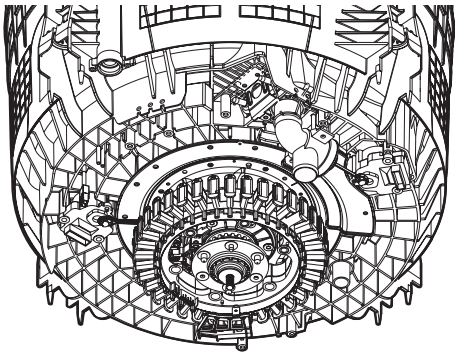
④ Disconnect the stator connection before removing the stator in the subsequent step.



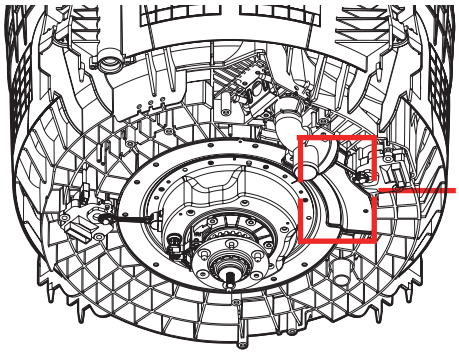


⑤ Remove the six screws securing the rotor.
⑥ Check the position of the snap ring, being sure it faces the rotor and stator.

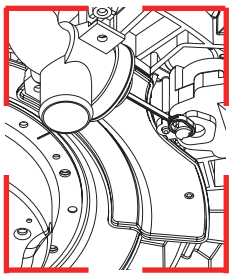


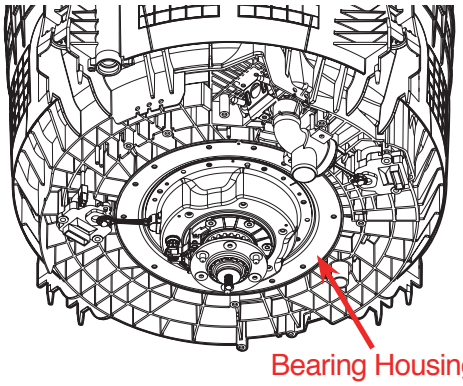


⑦ To keep from dropping the stator, loosen the six bolts almost all the way; then hold the stator in one hand while removing the bolts with the other.
⑧ Be careful during removal and replacement to avoid cutting, nicking, or pinching any of the wires. This could cause a short or electrical noise in the machine.

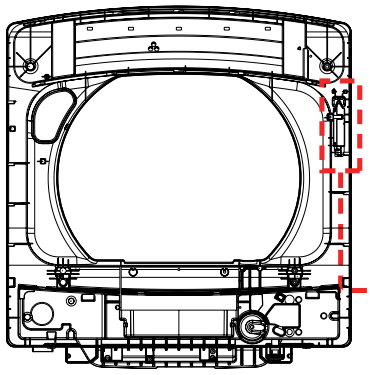


⑨ Remove four screws to release the tub bracket.



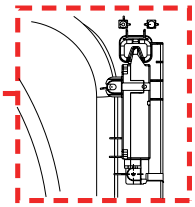


⑩ Remove 17 screws to release the bearing housing. Pull the housing away from the tub, but do not pry it with a screwdriver to avoid damage.

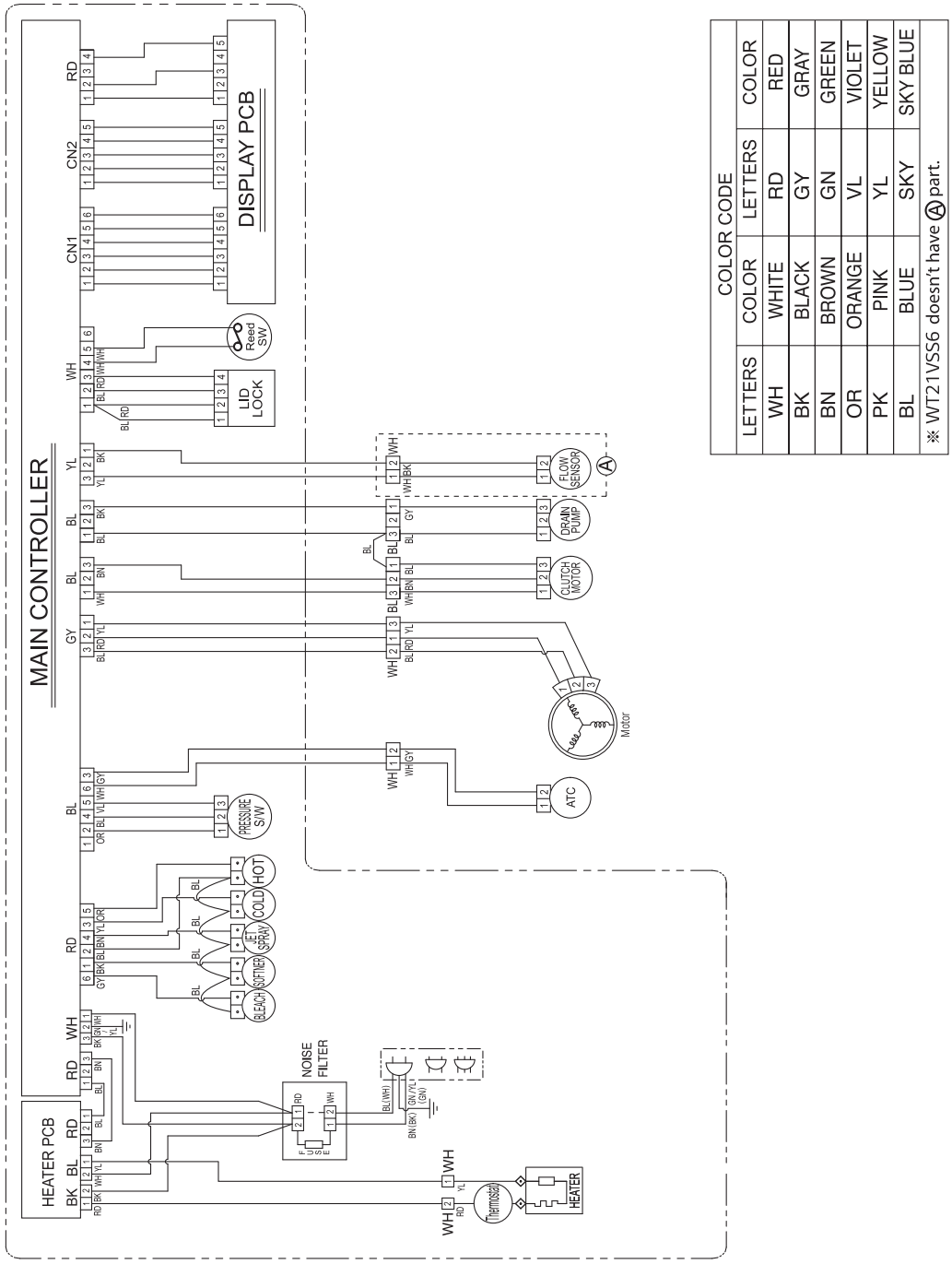


10) Disassembly of Door Lock Switch

① Remove the two door lock attachment screws.
② Remove the door switch and remove the attachment tube.



4-2. WIRING DIAGRAM



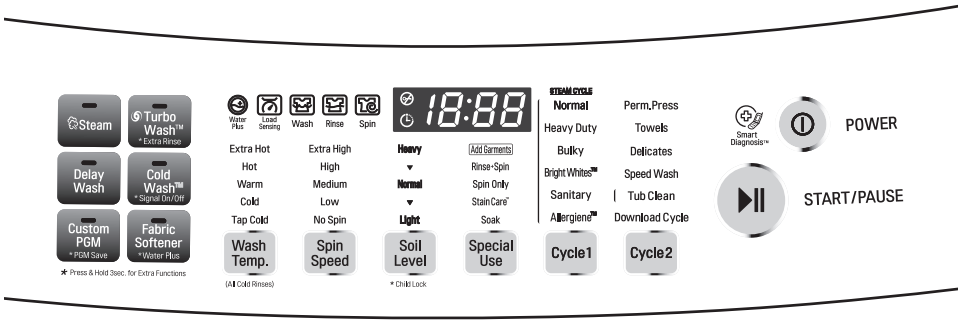
4-3. TEST RUNNING WITHOUT WATER

1) SAFETY CAUTION

- The main power board assembly has exposed live 120 VAC and live DC voltages. Use care when disconnecting connectors during troubleshooting and testing. (Wear electrostatic discharge gloves when handling the board.
- Unplug the power when handling the board assembly. (Wear electrostatic discharge gloves when handling the board. Store the board in an ESD [ElectroStatic Discharge] plastic bag.)

2) SERVICE MODE

The washer must be empty and the controls must be plugged in an d turned off.



- Press and hold the SPIN SPEED and Water Plus button: then press the POWER button. The buzzer will sound twice.
- Press the Start/Pause button to advane to the subsequent test mode step.

Number of times the START/PAUSE button is pressed	Check Point	Display Status
None	Main program version	t1 and main program version
1 time	Display program version	t2 and display program version
2 time	None	t3
3 time	Inlet valve for detergent turns on.(Cold Water)	A and water level frequency(268 ~ 233)
4 time	Inlet valve for detergent turns on.(Hot Water)	b and water level frequency(268 ~ 233)
5 time	Inlet valve for softener turns on.(Cold Water)	C and water level frequency(268 ~ 233)
6 time	Inlet valve for jet spray turns on.(Cold Water)	d and water level frequency(268 ~ 233)
7 time	Inlet valve for bleach turns on.(Cold Water)	E and water level frequency(268 ~ 233)
8 time	Heater check (on heater model)	t4 and the coefficient of flood sensing
9 time	Pressure Switch check,Alpha Check	t5 and alpha RPM
10 time	Drain pump and agitate (pulsator) check	t6 and water level frequency(268 ~ 233)
11 time	Load sensing Check	t7 and the coefficient of load sensing
12 time	Agitate (tub) check	t8 and RPM
13 time	Spin Check	t9 and RPM
14 time	Off • Unlocks the door • Turns off all LED	None

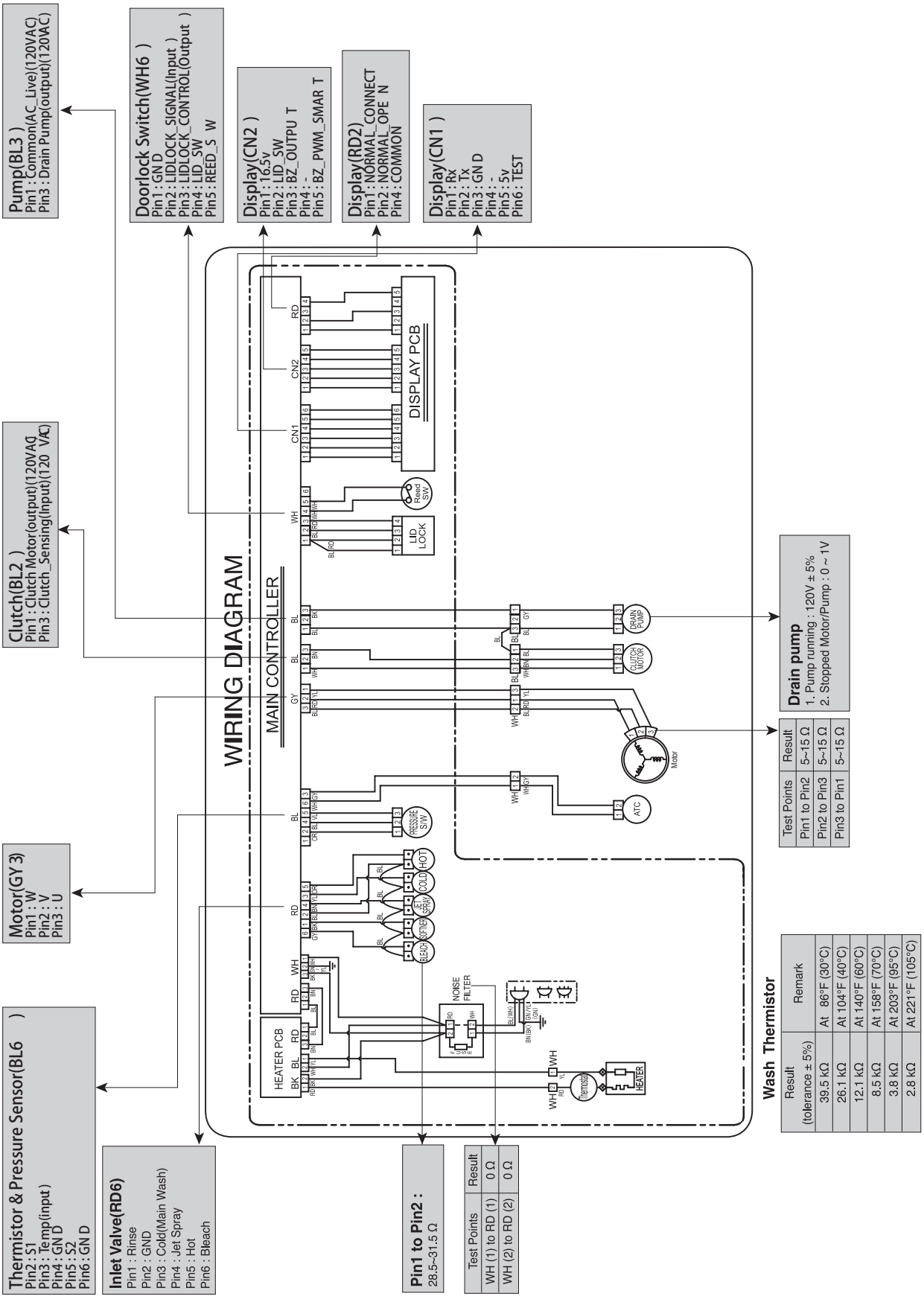
4-4. TROUBLESHOOTING BY COMMON WASHING PROBLEMS

Many washing problems involve poor soil and stain removal, residues of lint and scum, and fabric damage. For satisfactory washing results, follow these instructions.
Use ONLY powdered or liquid HE (High Effificiency) detergents. Do NOT use flakes scraped from a soap cake or bar, flakes, soap ribbons (available in some markets,) detergent tablets, plastic pouches, magic laundry balls, or anything other than powdered or liquid HE detergent products. Do not use soap of any kind. Do not use other types of detergent or soap products, such as hand soap, dishwashng liquid, or any others.

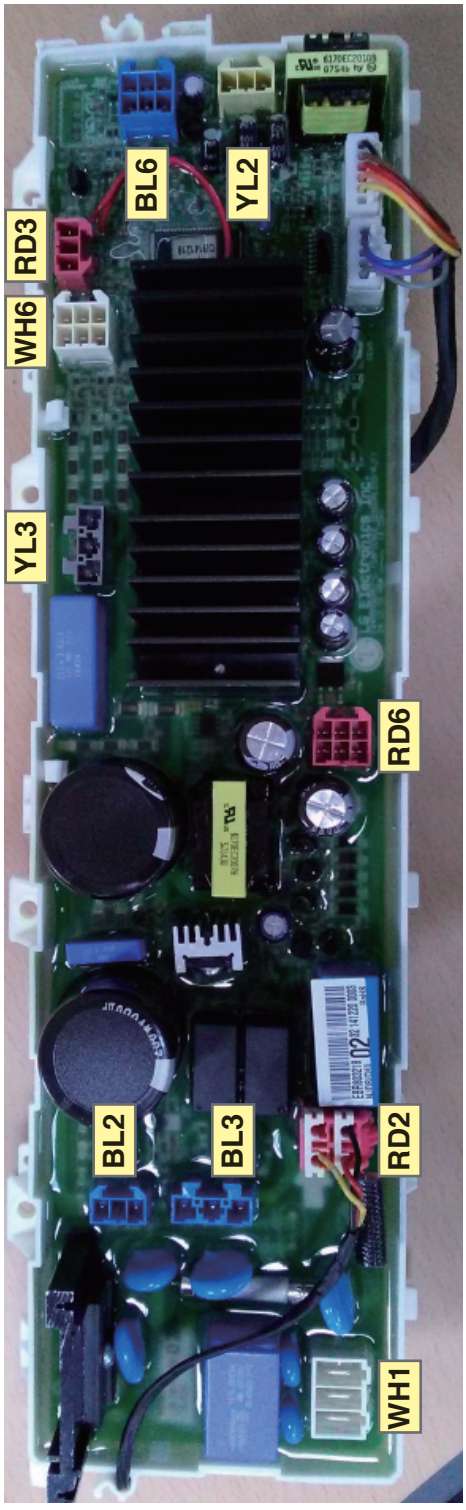
WASHING PROBLEM

Problems	Possible Causes	Solutions and Preventive Measures
Poor soil removal	· Insufficient detergent · Wash water temperature too low · Incorrect wash cycle · Laundry missorted · Stains not properly pretreated	· Use correct amount of detergent for load size, amount of soil and water hardness. · Use WARM or HOT water for normal soil. Different water temperature may be required according to soil type. *(refer to page 10)* · Reduce load size. · Wash with heavy or soak & heavy wash cycle for heavy soiled laundry. · Separate heavily soiled items from lightly soiled ones. · Pretreat stain and heavy soil according to directions shown on page 15.
Blue Stains	· Undiluted fabric softener dispensed directly onto fabric	· Pretreat the stain with detergent or a stain removal agent. · Do not overfill fabric softener dispenser and do not pour liquid fabric softener directly onto fabric. See page 13 for more instructions.
Black or gray marks on clothes	· A buildup caused by the interaction of fabric softener and detergent can flake off and mark clothes · Not enough detergent	· Keep the recommendations against scum (waxy buildup). · Use correct amount of detergent for load size, soil level, and water hardness.
Yellow or brown rust stains	· Iron or manganese in water supply, water pipes, or water heater	· To restore discolored load of whites, use rust remover safe for fabric. · Install nonprecipitating water softener or an iron filter in your water supply system for an ongoing problem. · Before washing, run water for a few minutes to clear lines.
Lint	· Incorrect sorting · Tissues left in pocket · Overloading the washer	· Wash lint-producing items, like flannel sheets, towels, and the like separately from dark fabrics and fabrics that tend to collect lint. Remove all items, including tissues and papers, from the pockets of items to be washed. See page 9 for sorting information. · Do not overload the washer.
Residue or Detergent	· Overloading the washer · Undissolved detergent · Excessive detergent	· Do not overload the washer. · Some detergents need to be pre-dissolved, check the detergent instructions. Try pre-dissolving the detergent. · Increase water temperature using HOT water safe for fabric. · Use proper amount of detergent.
Holes, tears, or snags	· Incorrect use of chlorine bleach. · Unfastened zippers, hooks, buckles · Ribs, tears and broken threads · Overloading the washer · Degradation of fabric	· Never pour chlorine bleach directly on fabric. See page 11 for adding liquid bleach. · Fasten zippers, hooks, and buckles. · Remove objects in pockets. See page 9 for caring before loading. · Do not overload the washer.

4-5. TROUBLESHOOTING SUMMARY



4-6. PCB Picture



4-7. TROUBLESHOOTING WITH ERROR CODE

ERROR	ERROR DECISION BASIS	CAUSE FOR ERROR OCCURRENCE	REMEDY
WATER SUPPLY	· WATER LEVEL dose not rise to the set level in within 30 minutes. NO INLET lamp blinks 	· Water faucet is closed? · Water supply is interrupted. · Inlet valve is clogged with dirts. · Connector has bad contact to the inlet valve. · RED 6-pin connector has a bad connection at the main board.	· Open water faucet. Wait until water supply is resumed. · Clean or replace filter. · Correct the connector contact. · Same as above.
DRAINAGE	· Water is not completely drained within 12 minutes. 	· Is the drain hose located properly? · Drain hose is folded or clogged due to freeze or dirt. · Defective drain pump or the WHITE 6-pin connector to the main board has a bad connection.	· Drain hose properly positioned at 0.9 ~ 1.2 m (36 ~ 48 inches) above the floor. · Make sure the drain hose is not plugged with a foreign object. · Check drain pump motor contact. Replace the pump if necessary.
UNBALANCE	· Laundry unbalance during spin. 	· Laundry in the INNER TUB is filled unevenly. · Washer is tilted.	· Load the washer as evenly as possible. · Adjust the leg.
LID OPEN	· LID is opened in the course of intermittent spin, normal spin or processing reservation. 	· Lid is opened during intermittent spin or normal spin? · Lid is opened while processing reservation? · Check the connections to the lid switch and at the WHITE 6-pin connector at the main board.	· Close the lid. · Close the lid. · Check the connections. · If the connection is good, check the lead wire and replace it if necessary.

ERROR	ERROR DECISION BASIS	CAUSE FOR ERROR OCCURRENCE	REMEDY
PRESSURE SENSOR	· Pressure switch has a bad connection or the switch has failed. 	· Check the connections at the pressure switch and at the BLUE 6-pin connector at the main board. · Check the pressure sensor (21~23Ω ±10%) and connection	· Reseat the connector. · Replace the switch.
OVER FLOW ERROR		· Check the valves to be sure there is no input leakage. Then check the drain hose and make sure the drain pipe is between 0.9 ~ 1.2 m (36 and 48 inches) above the floor. · Check for blockages and leaks in the air hose between the tub and the pressure switch. · Check and repair any air leakages at the air hose connector on the outer tub and at any connecting parts.	· Install the drain hose between 0.9 ~ 1.2 m (36 and 48 inches) above the floor. · Replace pressure sensor switch · Remove the foreign objects in pressure sensor switch air hose.
MOTOR ERROR		· Check the connections at the hall sensor and at the BLUE 6-pin connector on the main board. · Check the connections at the stator and at the yellow 3-pin or BLUE 6-pin connector on the main board. Test the stator to determine it is not defective. · Test hall sensor to determine it is not defective. · Turn the drum to verify the bearings are not locked.	· Replace the stator if necessary. · Replace the hall sensor if necessary. · Replace the bearings if necessary.
LID LOCK ERROR		· Check the lid lock SW trying locking · Check the balance of the lid	· If trying, replace the Lid lock SW or not trying replace the Main PCB · Replace the lid or se the balance

ERROR	ERROR DECISION BASIS	CAUSE FOR ERROR OCCURRENCE	REMEDY
THERMISTOR	· Thermistor has a bad connection or failed 	· Check the connections at the Thermistor and at the WHITE 3-pin connector at the main board · Test thermistor to determine it is not detective	· Reseat the connector. · Replace the thermistor if necessary.
AC, MOTOR (CLUTCH MOTOR)	· AC motor has a bad connection or failed · Clutching is failed -.Coupling get out of gear. -.Coupling is broken. 	· Check the connections at the AC motor and at the WHITE 6-pin connector at the main board · Test AC motor or coupling to determine it is not detective	· Reseat the connector. · Replace the AC motor if necessary. · Replace the coupling or Clutch housing if necessary.
MOTOR		· Check Foreign objects, such as coins, pins, clips, etc., being caught between the wash plate and the inner basket.	·Turn off the washer and then press the Power button.· Press the spin speed button without selecting a cycle to drain and spin the load.· When the spin is complete, remove the clothes and then find and remove any objects caught in the wash plate.

DRAIN ERROR

Is OE displayed?



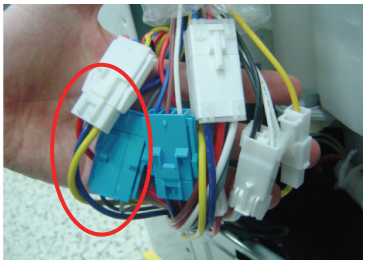
Yes

Is the connector connected to pump motor assembly disconnected or disassembled?

Yes → Reconnect or repair the connector



Drain pump



Connection connector

No

When you enter the SVC Mode, is the water level frequency below 26.0 kHz?

Yes → Check the AIR CHAMBER, the tube (clogged), and press switch

Is the coil of the drain pump too high or low? (resistance of the coil is 10-20 Ω)

Yes → Replace the DRAIN PUMP ASSEMBLY.

No

Is the voltage between connectors out of range? (BL3 pin3)
- After remove Terminal Position Assurance of connector, check as follows.

Yes → Replace the MAIN PCB ASSEMBLY.



Pump running : 120V±5%
Stopped Motor/Pump : 0~1V
Method
1. Enter the SERVICE Mode.
2. Press START/PAUSE button.
   : 1 time Main version
   : 2 times Display version
   : 3 times Inlet valve check mode
   : 4 times Cold valve, bleach valve
   : 5 times Rinse valve, hot valve
   : 6 times Jet spray valve
   : 7 times Heater check
   : 8 times Alph check
   : 9 times Pump check

[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?



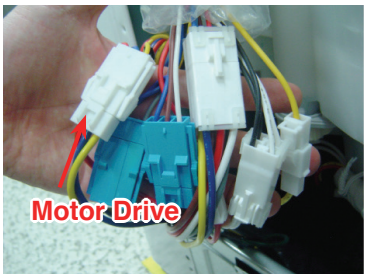
Yes

Check the connectors below.
Is the connector disconnected or disassembled?
(motor drive connector)
- **Part of main PCB assembly (YL3)**



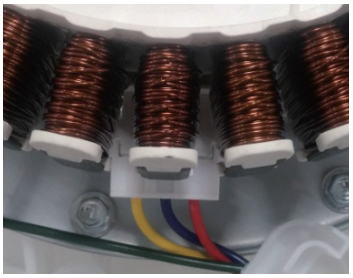
Motor Drive

- **Part of wire**



Yes → Reconnect the connector (connector / wire / motor)

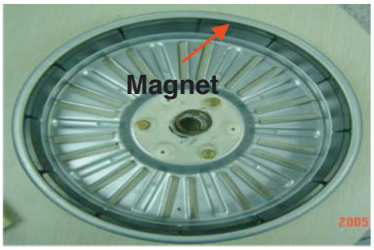
- **Part of motor**



Motor

No

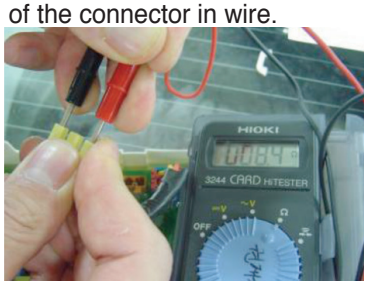
Is rotor magnet cracked?



Yes → Replace the ROTOR

No

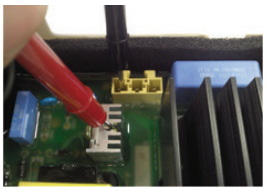
Is the resistance values in the range of 5 to15 Ω?
(U-V, V-W, W-V
:U=1, V=2, W=3)
- After pull out the YL3 connector, check the terminal of the connector in wire.



No → Replace the STATOR

Yes

Check the IPM in the controller. Is IPM short?



Yes → Replace the MAIN PCB ASSEMBLY

UNBALANCE ERROR

Is **UE** displayed?



Yes

Does the laundry lean toward one side, not evenly put in the DRUM assembly?

Yes → Put laundry evenly In the DRUM assembly

No

Is the washing machine installed at an angle?

Yes → Adjust the height of washing machine to be kept horizontally

OVER FLOW ERROR

Is **FE** displayed?



Yes

When you enter the service mode, is the water level frequency over 21.0 kHz?

No → Check the AIR CHAMBER and the tube (clogged).

Yes

Does the inlet valve work when the power is not applied?

No → If the inlet valve works continuously when the power is applied, replace the MAIN PCB ASSEMBLY

Yes

Replace the INLET VALVE ASSEMBLY

PRESSURE SENSOR ERROR

Is **PE** displayed?



Yes

Is the connector connected to pressure sensor disconnected or disassembled?

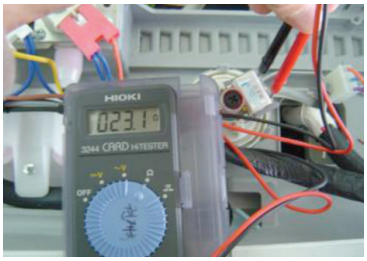
Yes → Reconnect or repair the connector



No

Is the resistance of the pressure sensor out of range? (pin 1~ pin 3) (21~23 Ω±10%)

Yes → Replace the pressure switch



No

Is the AIR CHAMBER and the tube clogged?

Yes → Fix the air chamber and remove the foreign material

No

Replace the MAIN PCB assembly

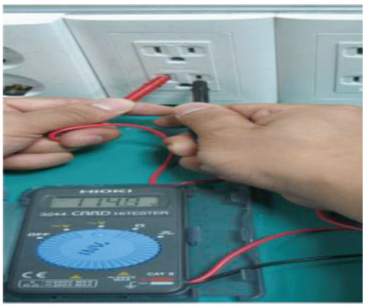
4-8. OTHER TROUBLESHOOTING

⚠ 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 PCB assembly, reinsert the connectors correctly.

NO POWER

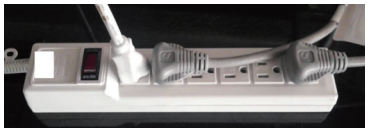
Is the supplied voltage 120V AC?(+10%, -15%)



No → Check the fuse or reset the circuit breaker

Yes

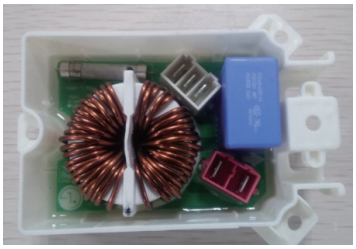
Is the current rating of multi-outlet power strip enough? (Avoid connecting several electric devices)



No → Alternate with explanation

Yes

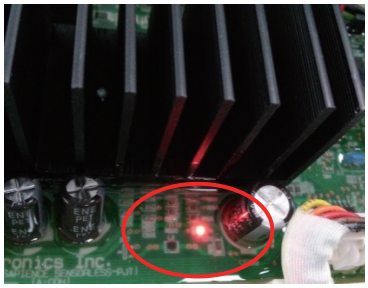
Is the connector connected to PCB/Noise filter disconnected or disassembled?



No → Reconnect or repair the connector

Yes

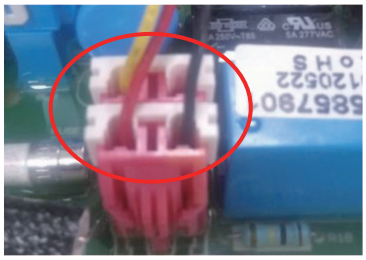
Is LED on while the power is on?



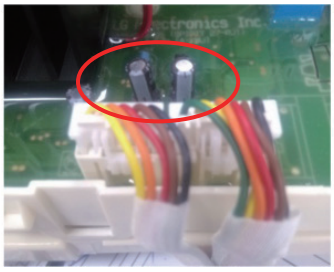
Yes → Replace the MAIN PCB ASSEMBLY

No

Is three pin wire of display PCB broken?



Display PCB



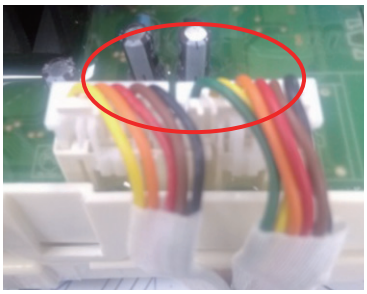
Connecting connector MAIN PCB~ Display PCB

Yes → Replace the DISPLAY PCB ASSEMBLY

POWER BUTTON DOESN'T WORK

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

Yes → Reconnect or repair the connector



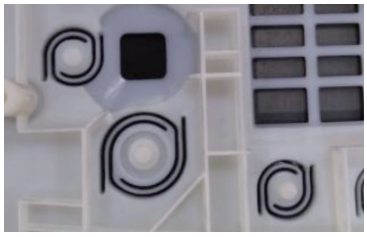
Connecting connector Main PCB~ Display PCB

No

Is the button of panel stuck?

Yes → Repair the button





No

Is the display PCB broken? (check the buzzer sound and LED light while touch the LCD)

Yes → Replace the DISPLAY PCB ASSEMBLY

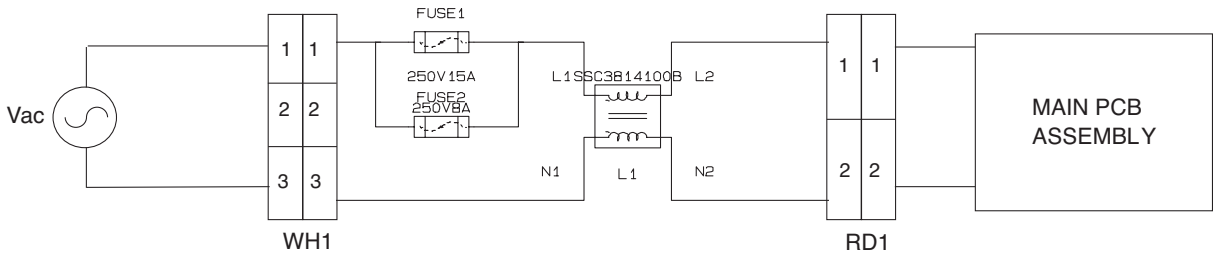
5. COMPONENT TESTING INFORMATION

⚠ WARNING When resistance (Ohm) checking the component, be sure to turn the power off, and do voltage discharge sufficiently.

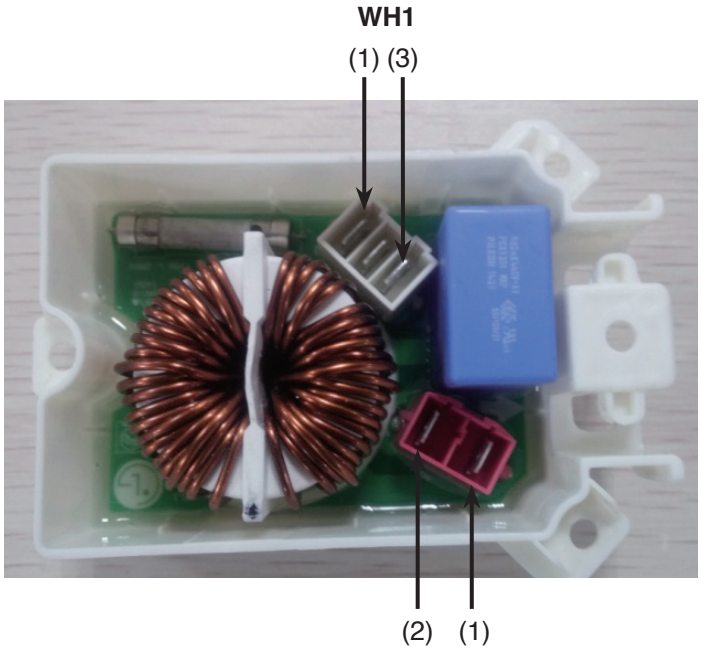
5-1. Filter Assembly (Line Filter)

Wiring diagram

Circuit in the MAIN PCB / Wiring Diagram

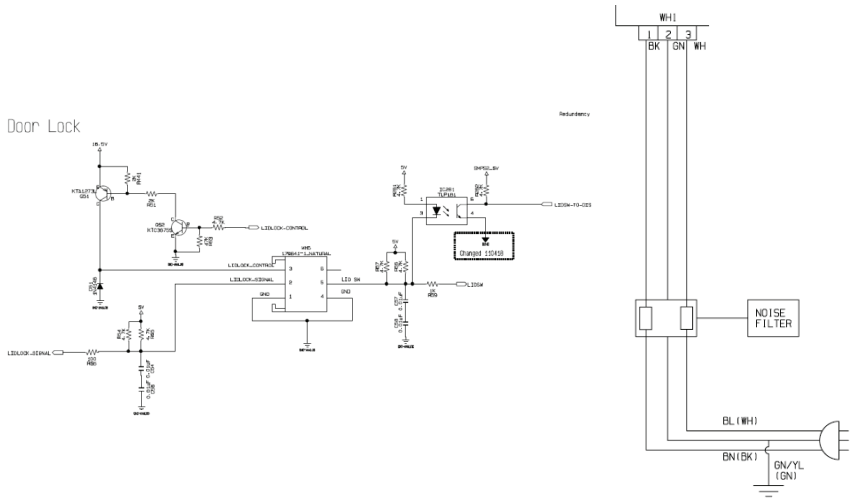


Test points and Result

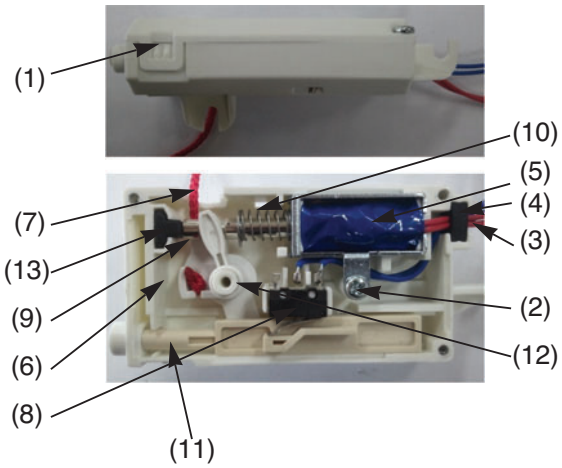


Test Points	Result
WH (1) to RD (1)	0 Ω
WH (3) to RD (2)	0 Ω

5-2. Door Lock Switch Assembly.

Wiring diagram	**Circuit in the MAIN PCB / Wiring Diagram** 
Function	The Door Lock Switch Assembly consists of a Solenoid, Plunger, Level, Key, Sol-spring and Micro Switch. It locks the door during a wash cycle. **1. Door lock operation** - When a cycle is started, the PCB sends the door lock signal if Reed switch detects that the door is closed. - 16.5V is supplied to Solenoid. - Magnetic force that is caused by solenoid operation inserts Plunger into Solenoid. - The Level that connected with plunge is pushed out the key. - The key must be in the proper position for the PCB to sense that the door is locked, otherwise the dL error code will be displayed. - If the latch does not extend far enough, the PCB will display the dL error code. This can happen, for example, if the solenoid does not operate. **Note:** The door will attempt to lock 3 times. If it does not successfully lock, the solenoid will drive the latch to the open position. **2. Door unlock operation** - When the cycle ends, or if the cycle is paused, the PCB sends an unlock pulse to the solenoid. -The key will attempt to unlock three times. If it fails to sense that the door is unlocked, the solenoid will be driven to the lock position.

Test points

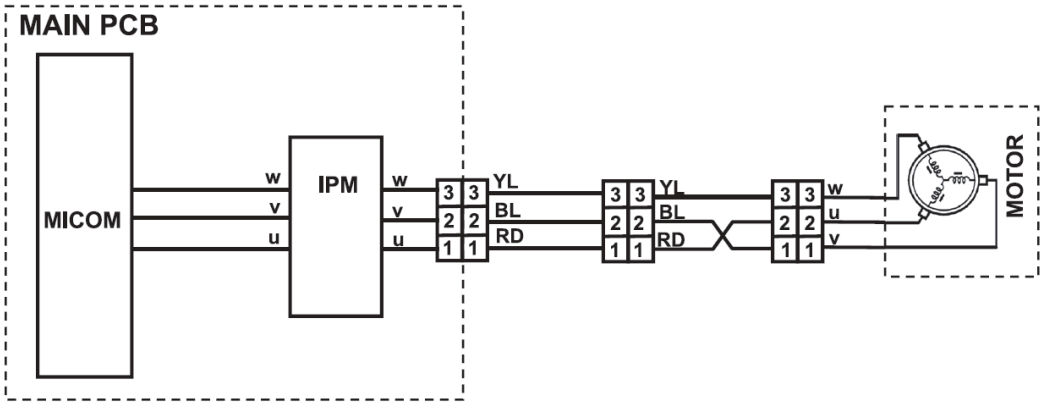


No.	Parts
1	COVER
2	SCREW
3	LEAD WIRE
4	PACKING
5	SOLENOID
6	CASE
7	HAND WIRE
8	MICRO SW
9	SOL-SPRING
10	PLUNGER
11	KEY
12	LEVER
13	RUBBER CASE

5-3. STATOR ASSEMBLY

Wiring diagram

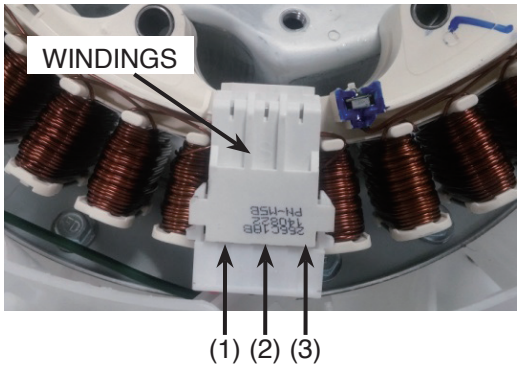
Circuit in the MAIN PCB / Wiring Diagram



Function

The DD motor can be driven from stopped to maximum speed in infinite steps in either direction. 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.

Test points (Windings)



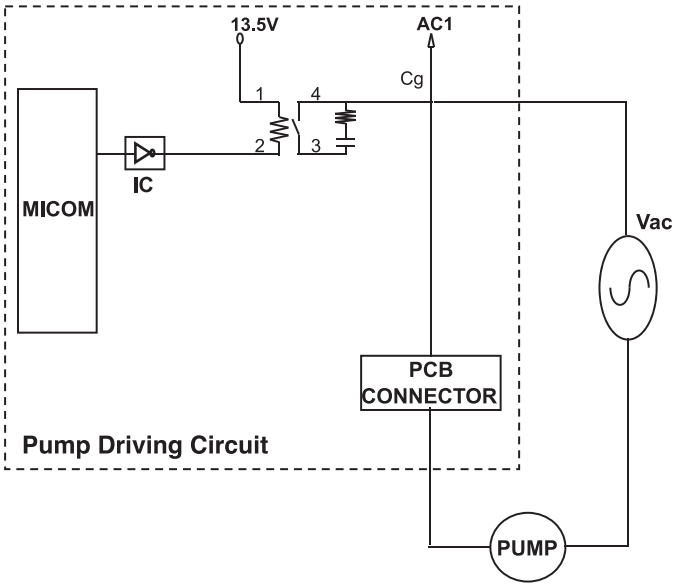
Result (Windings)

Test Points	Result
(1) to (2)	5-15 Ω
(2) to (3)	5-15 Ω
(3) to (1)	5-15 Ω

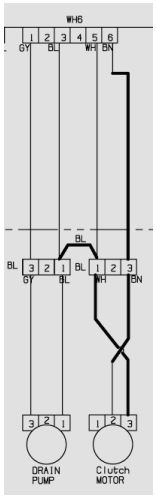
5-4. PUMP MOTOR ASSEMBLY

Wiring diagram

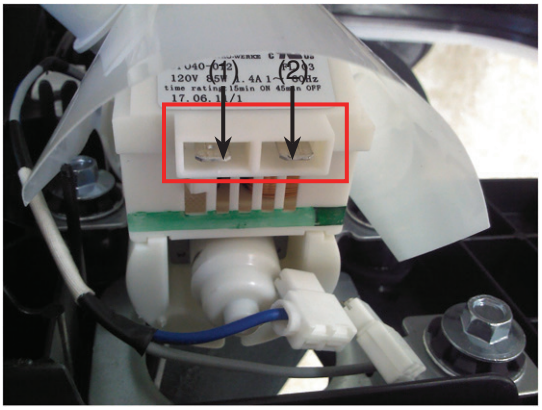
Circuit in the MAIN PCB



Wiring Diagram



Test points and Result

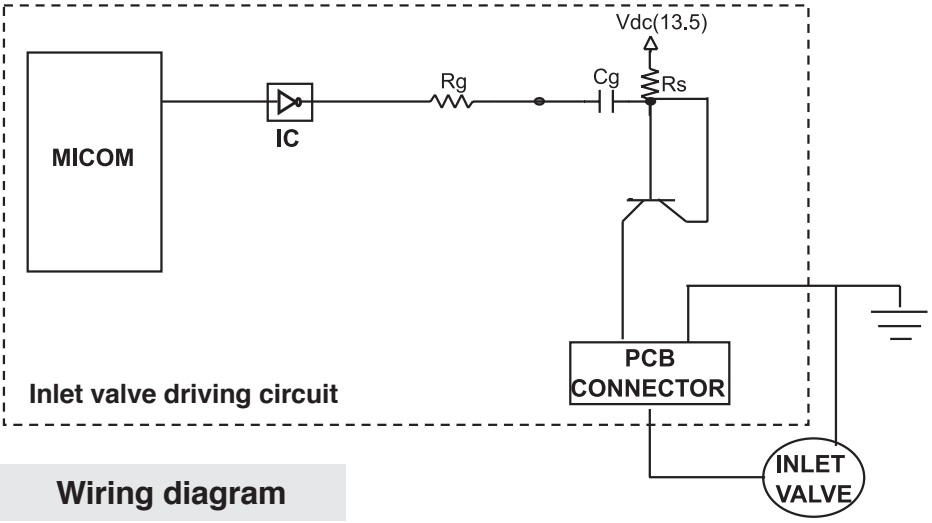


Test Points	Result	Remarks
(1) to (2)	10.9 Ω±5%	Resistance

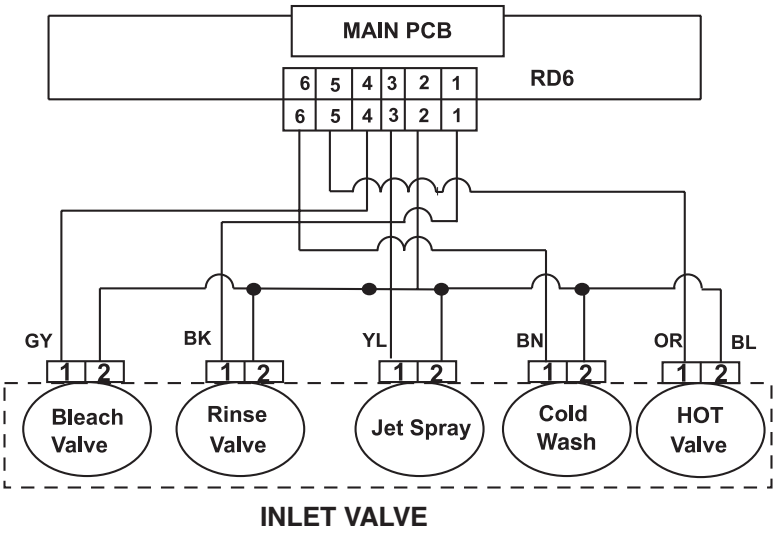
5-5. INLET VALVE ASSEMBLY

Wiring diagram

Circuit in the MAIN PCB



Wiring diagram



INLET VALVE

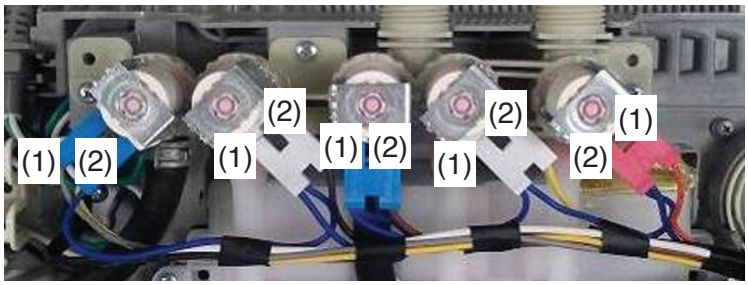
* All valves operate at 13.5 VDC.

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.

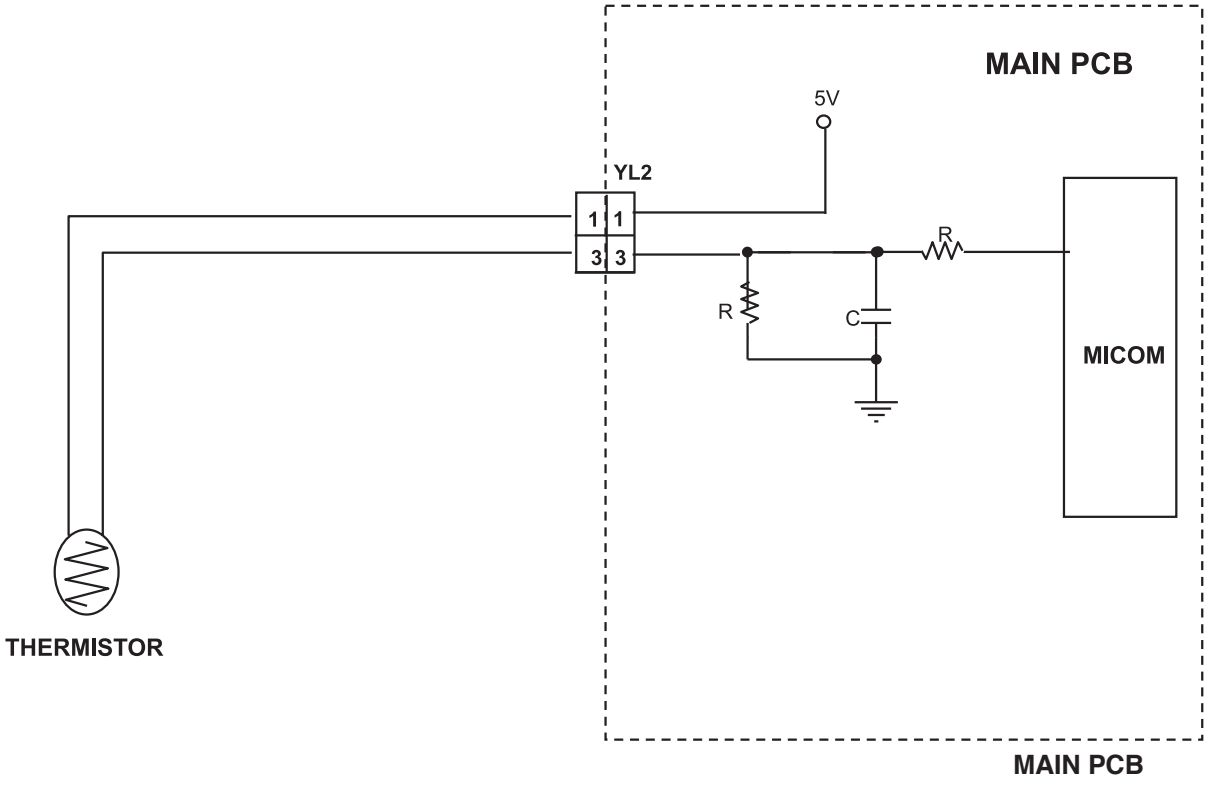
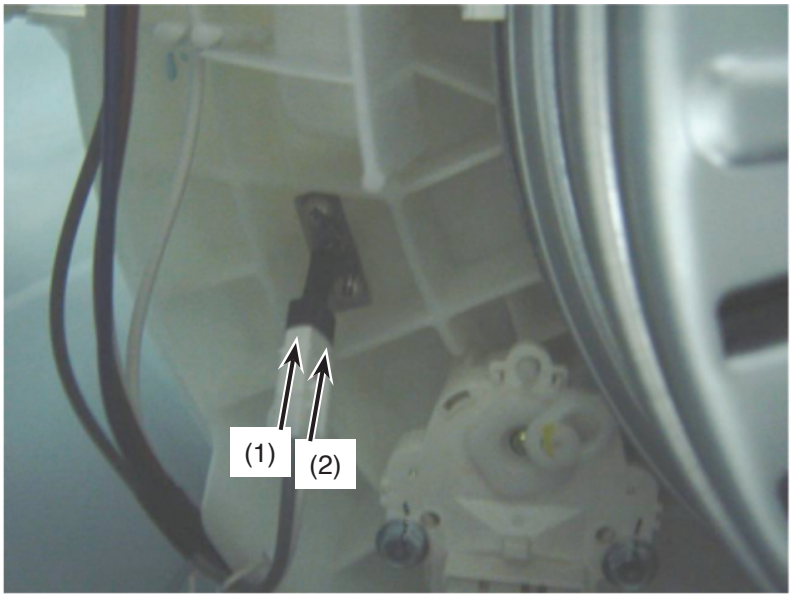
Test points and Result

After unplugging the connector of the defective valve, check the resistance.



Test Points	(1)-(2)
Result	24±10% [Ω]

5-6. THERMISTOR ASSEMBLY

Wiring diagram	**Circuit in the MAIN PCB / Wiring Diagram** 
Function	The thermistor (temperature sensor) is used to monitor water temperature in the tub.
Test points	 **Wash Thermistor**

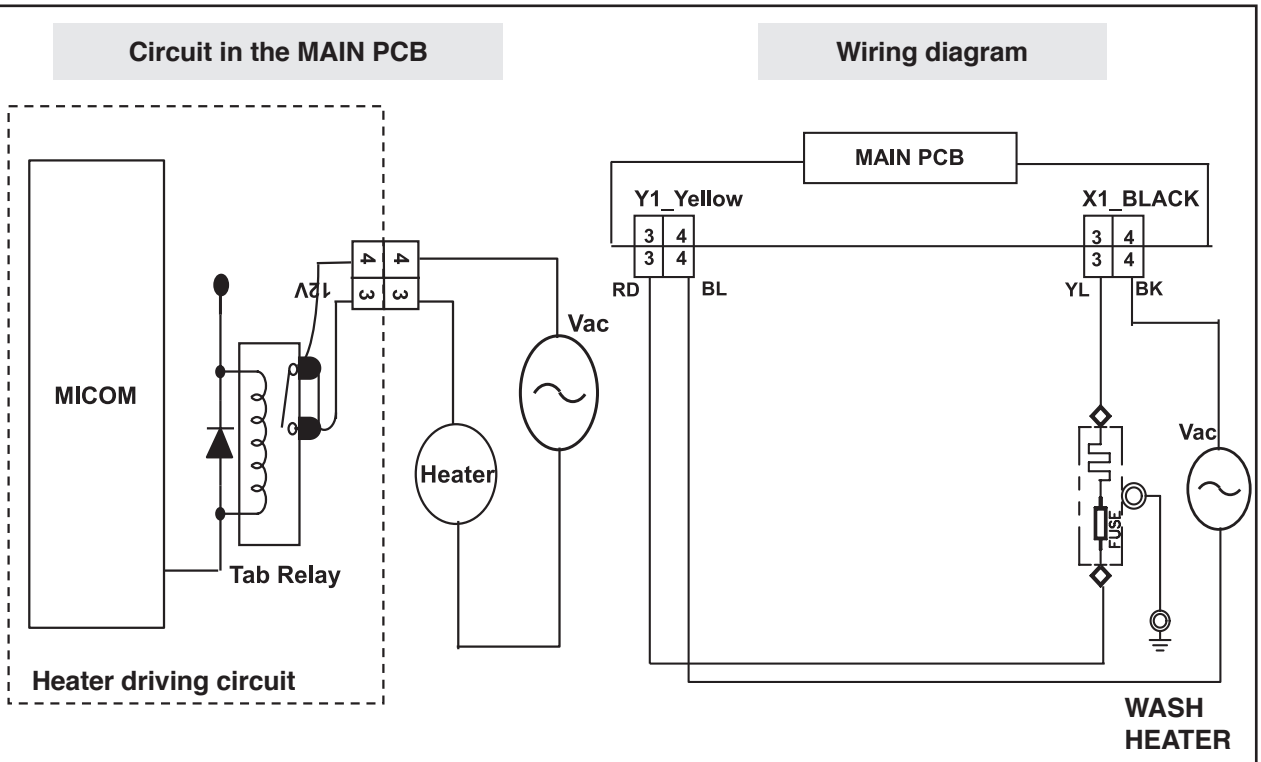
Result

Wash Thermistor

Test Points	Result [kΩ]			Remarks
	The lowest limit	standard	The upper limit	
(1) to (2)	70.519	76.531	82.848	At 86℉ (30℃)
	46.997	50.584	54.307	At 104℉ (40℃)
	22.285	23.623	24.978	At 140℉ (60℃)
	15.803	16.635	17.467	At 158℉ (70℃)
	6.984	7.471	7.971	At 203℉ (95℃)
	5.180	5.573	5.981	At 221℉ (105℃)

5-6. HEATER ASSEMBLY

Wiring diagram

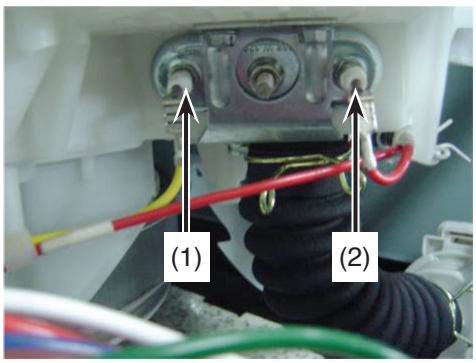


* Each circuits of loads in wiring diagram are all same.

Function

1. The Wash Heater is designed to raise the wash water to the desired temperature selection during certain wash cycles.
2. The Steam generator heater is designed to make the water to the steam during steam cycles.

Teat points



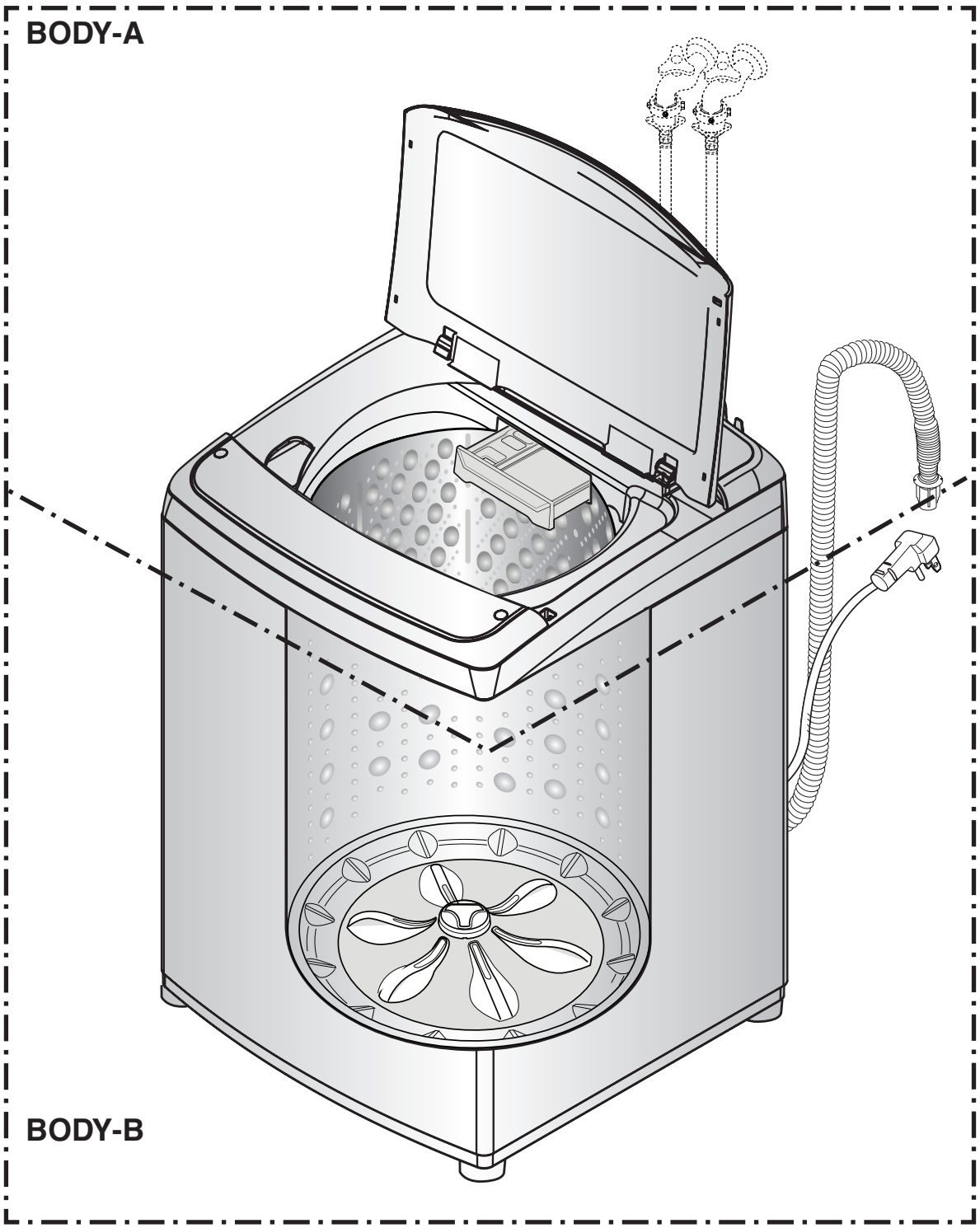
Wash Heater

Result

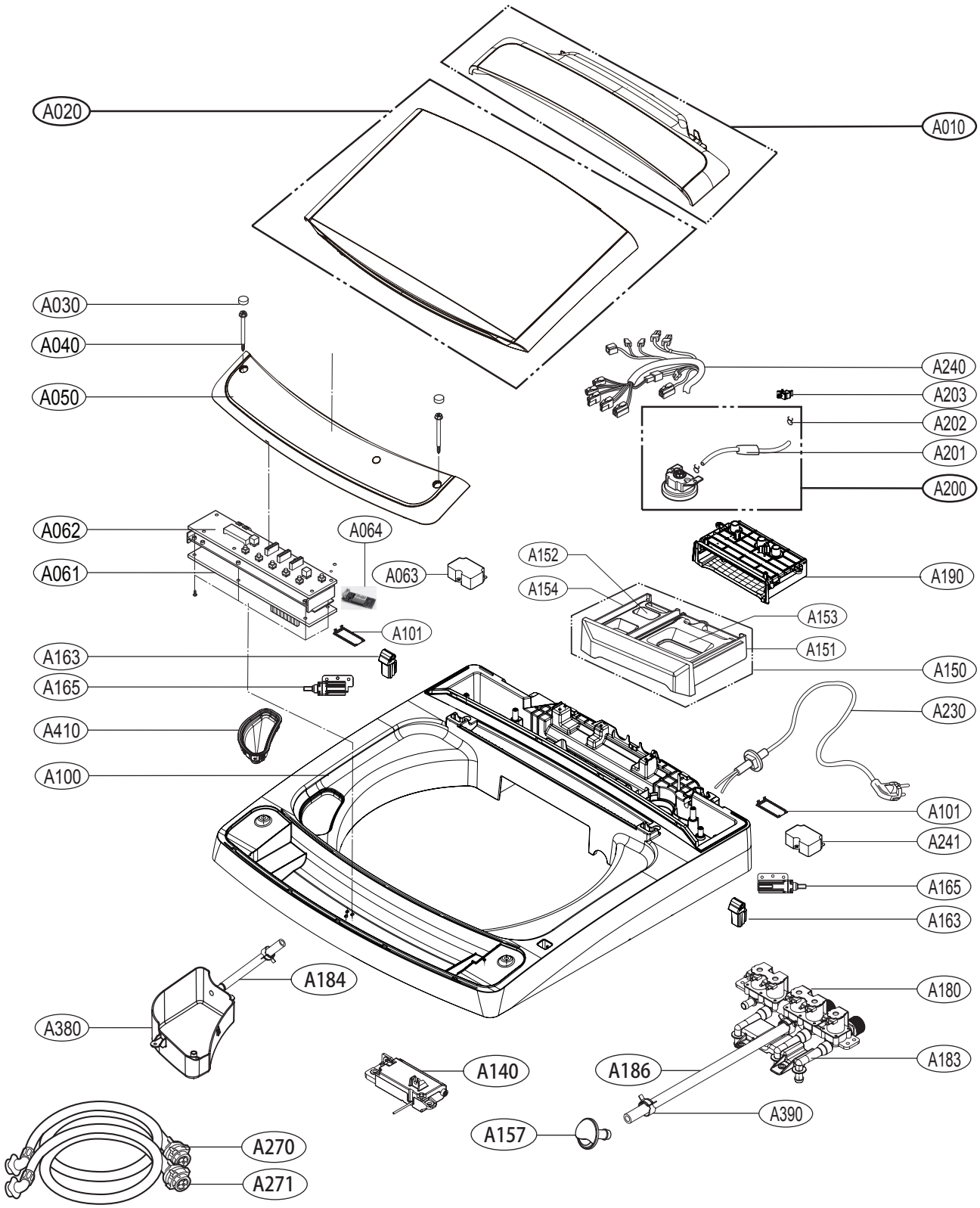
Wash Heater

Test Points	Result
(1) to (2)	12-18 kΩ

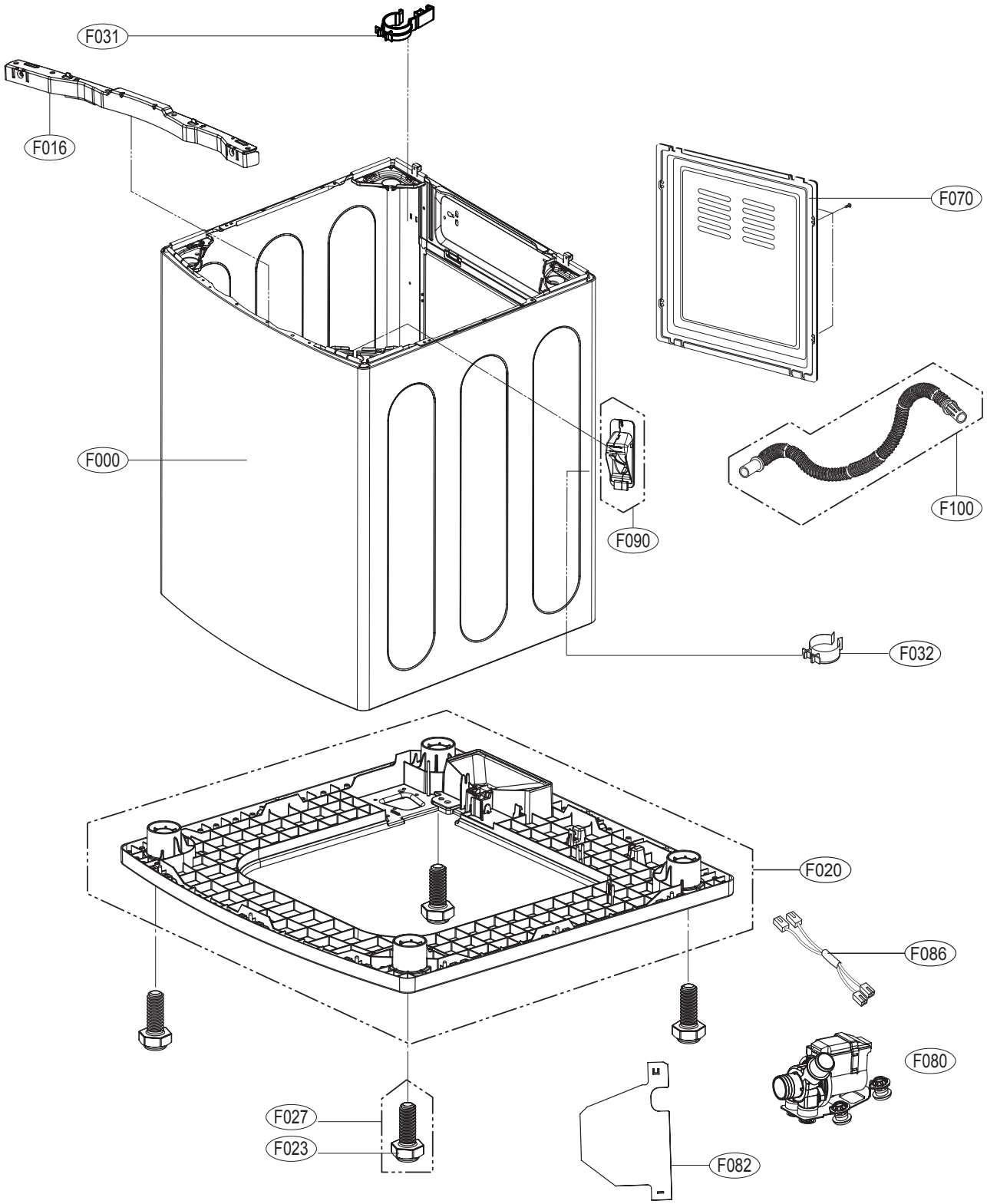
6. EXPLODED VIEW



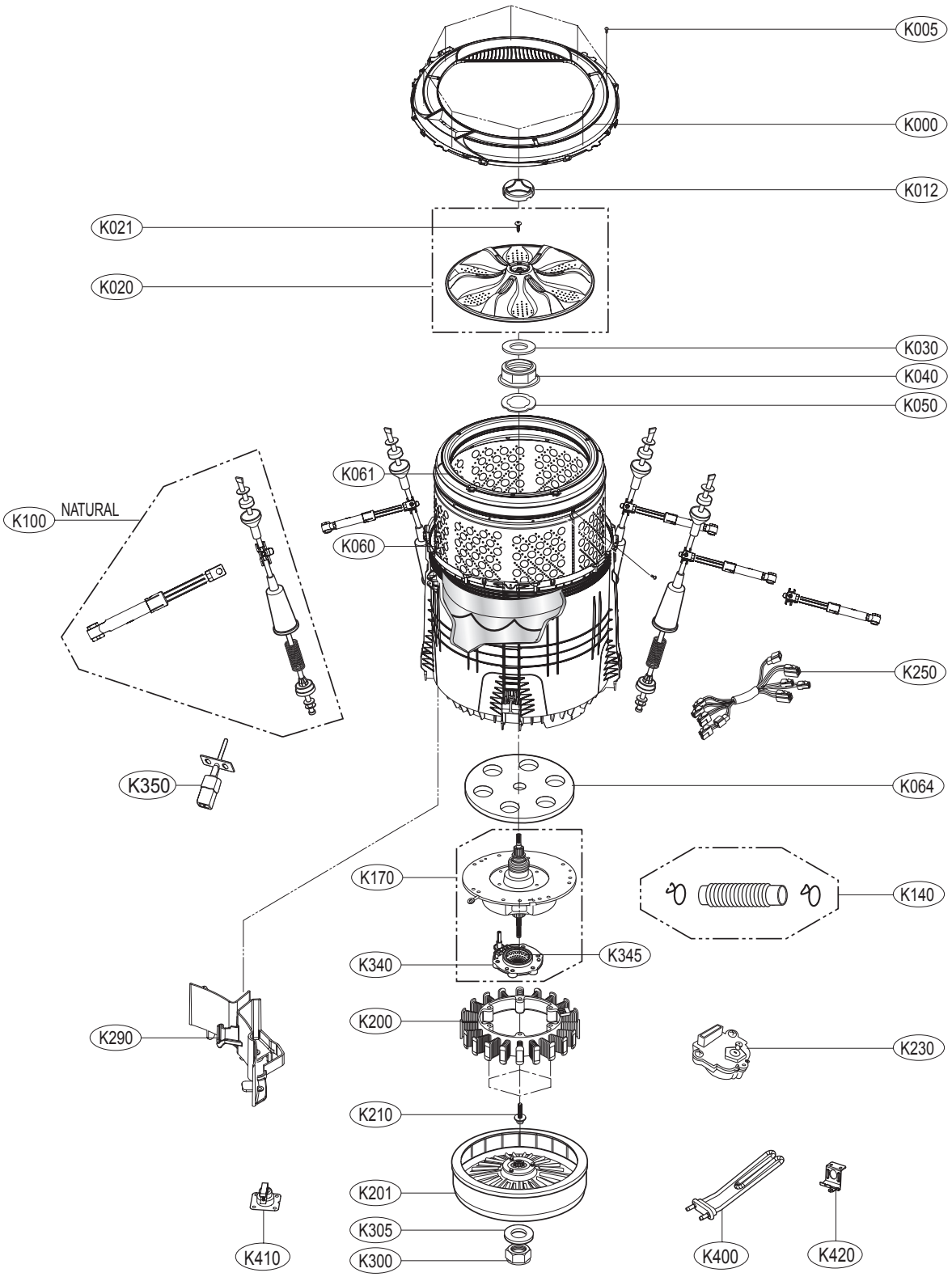
6-1 EXPLODE VIEW OF OUTER CASE ASSEMBLY



6-2. EXPLODED VIEW OF OUTER CASE ASSEMBLY

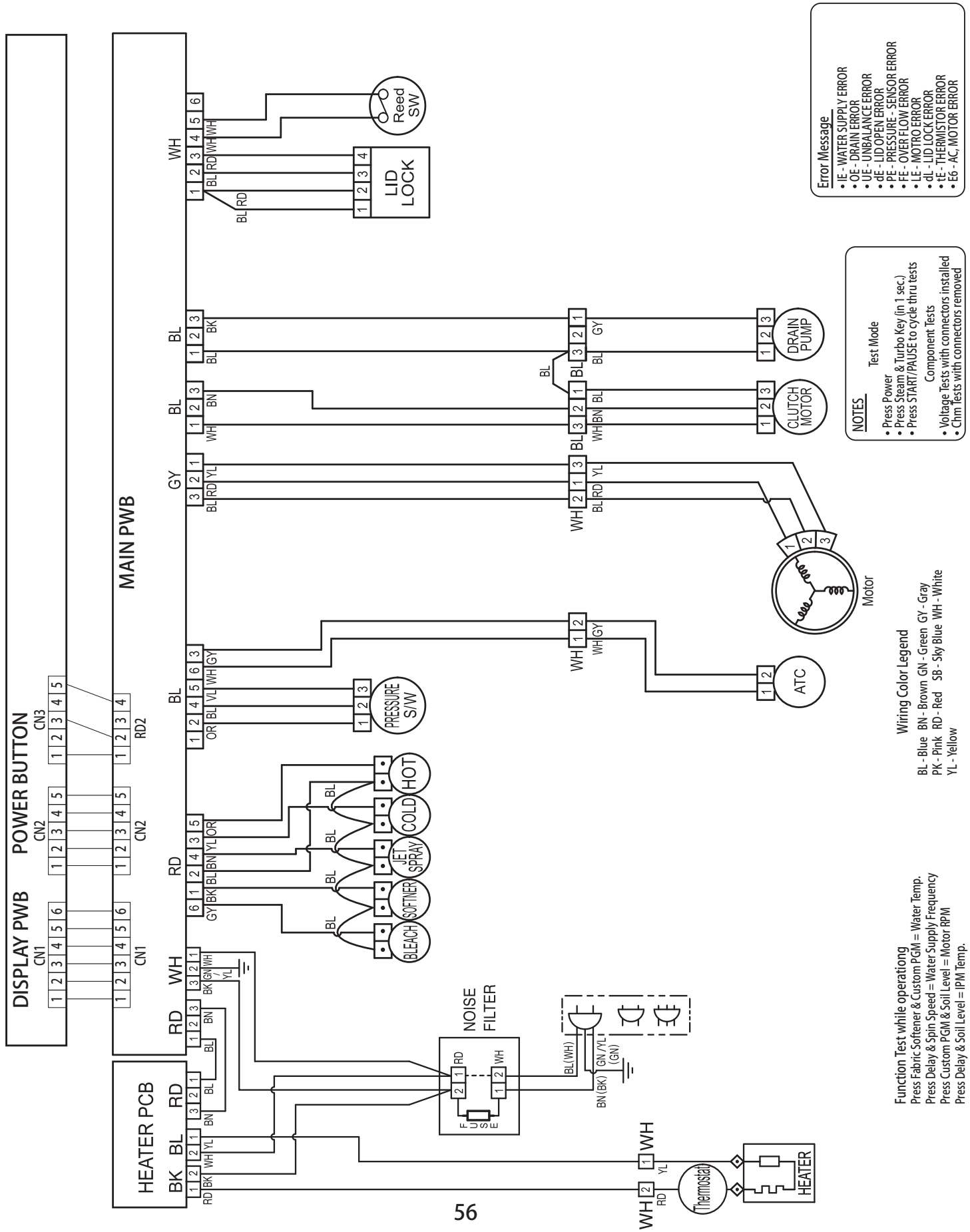


6-3. EXPLODED VIEW OF TUB ASSEMBLY



7. REPLACEMENT PART LIST

8. Wiring Diagram





3828EN9007Q