

# WASHING MACHINE

## Technical Information

Models : WA56H9000A\*

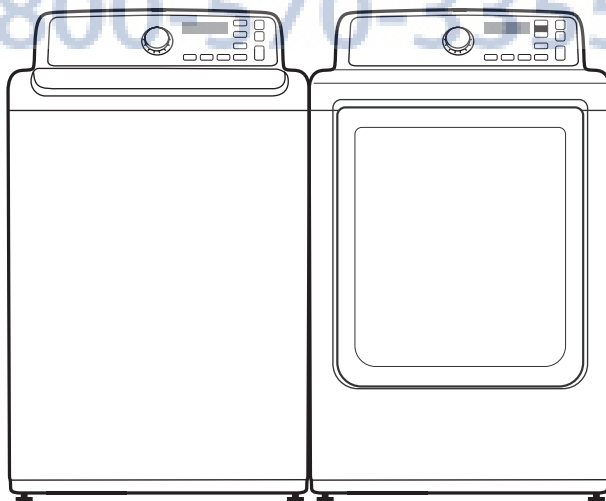
- Due to possibility of personal injury or property damage, always contact an authorized technician for servicing or repair of this unit.
- Refer to Service Manual for detailed installation, operating, testing, troubleshooting, and disassembly instructions.

### CAUTION

All safety information must be followed as provided in Service Manual.

### WARNING

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



Code No. : DC68-03132F\_EN

# ALIGNMENT AND ADJUSTMENTS

## WARNING

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### GENERAL ERROR FUNCTION

NO	Error Code (Diagnostic Code Error Image)	Description	Corrective Action
1	5E	The water level fails to drop below the Reset Water Level within 30 minutes.	Go to "Will Not Drain" Troubleshooting Section.
2	dE1	Door fails to Unlock / lock After 7 attempts.	Go to "Will Not Unlock / Lock" Troubleshooting Section.
3	4E	When the filling continues for more than 60 minutes or there is no change of water level for 5 minutes.	Go to "No Water Fill" Troubleshooting Section.
4	LE	A water level lower than the Reset water level is detected for 5 seconds during the Wash/Rinse cycle.	Go to "No Water Fill" Troubleshooting Section.
5	1E	Water Level Sensor Trouble. (When the input signal from the water level sensor is out of range, the unit will send out beeping sounds and halts the cycle.)	Go to "No Water Fill" Troubleshooting Section.
6	OE	A fault is detected in the water level sensor. Data (frequency) shows the water level is at or above the overflow water level. (When this condition is detected, the machine will automatically start draining water until the water level falls below the reset water level.)	First check to see that all of water valves are not stuck. If the water valves are OK, check water level.
7	UE	Unbalance or cabinet bump is detected during final spin.	Go to "Wet Clothes" Troubleshooting Section.
8	dE	Door is detected as open while it is trying to lock the door.	Go to "Quick Test Mode" and then do Door Lock/Unlock Test.
9	tE	This occurs when the water temperature sensor fault is detected continuously for 5 seconds.	Go to "Board Input Test" and check Water Temperature. Check loose or pinched wires. Replace PCB or thermistor.
10	3E	MICOM is attempting to drive the motor but is not getting any response signals from the hall sensor. Visual check shows motor is not running. (Locked, Defective Hall Sensor or Overload.)	Evaluate wire harness for loose or unhooked connections. Go to "Quick Test Mode" and test Motor.
11	4E	The hot/cold water hose connection is not correct.	Please connect the hot/cold water hose connection correctly.

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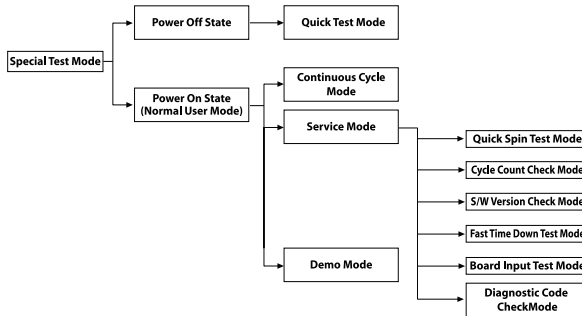
NO	Error Code (Diagnostic Code Error Image)	Description	Corrective Action
12	SUD Sd	Suds is detected during the washing session. ("SUD" or "Sd" is not an error. When it finishes washing, End and the "SUD" or "Sd" code will blink in turn.)	Guide a user to reduce amount of detergent used.
13	AE	Communication error between SUB PBA and MAIN PBA.	Check Main PBA, SUB PBA & Wire-harness. Replace PCB.
14	8E 8E2	If the MEMS communication error or MEMS trouble diagnosis error occur, this message will be displayed.	1. Check the MEMS sensor and PBA. 2. Check the wire connector terminals.
15	bE2	A button except the Power button is continually pressed.	Check whether either the Power switch or a tact switch is continually pressed.
16	4E2	The hot/cold water hose connection is not correct.	Please connect the hot/cold water hose connection correctly.
17	PE (Clutch Motor Error)	This error occurs when the position of the clutch is not detected. - If the position detection signal is not received 15 seconds after the clutch motor starts, the spin drum is shaken left and right and then the motor is restarted. If the motor position signal is not received even after 3 reattempts, a PE error occurs.	1. Check the clutch motor. 2. Check the assembly status of the clutch motor. 3. Check the wire connector terminals.
18	PE1 (clutch hall sensor error)	After the completion of the clutch position detection, and the clutch hall signal is invalid, the spin drum is shaken left and right and then the clutch hall signal is evaluated again. Thus, if the clutch hall signal is still invalid, the clutch position switching status is checked and then the operation is restarted. (If the 15 reattempts fail, this error occurs.)	1. Check the clutch hall sensor. 2. Check the wire connector terminals. 3. Check the clutch switching status. - Check the coupling assembly and disassembly status.
19	AE6	Communication error between INVERTER PBA and MAIN PBA.	Check INVERTER PBA & Wire Harness, Replace PCB.

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### TEST MODE



### Test Mode:

Each Test Mode is as follows in the coming pages. The test modes are modes unable to get an access once the washing cycle has started due to safety reasons.

### Quick Test Mode



### Definition of Quick Test Mode:

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

### How to Enter:

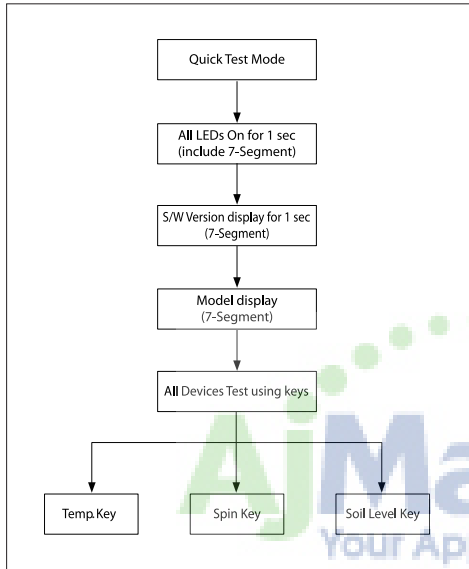
- Plug in the unit.
- Press Spin key, Soil level key and Power Key at the same Time.

# ALIGNMENT AND ADJUSTMENTS

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### Quick Test Mode:



1. All LED's light up and it sends out a Beep Sound when it enters into the Quick Test Mode. (Including 7-Segment)
2. Displays software version for a sec and Clear EEPROM.
3. When the version is displayed, turn the Jog-Dial so that the version disappears. Press the following keys to test the various components.
  - Temp. Key : Water Valve Test
  - Delay End : Door Lock / Unlock Test
  - Spin : Drain Pump / Circulation Pump Test
  - Soil Level Key : Heater Test

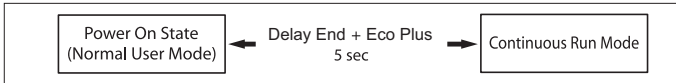
**800-570-3355**

# ALIGNMENT AND ADJUSTMENTS

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### Continuous Run Mode



#### Definition of Continuous Run Mode:

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

#### How to Enter:

- Press Delay End + Eco Plus Key together for 5 sec.

#### Continuous Run Mode:

1. Press Delay End + Eco Plus Key for 5 sec during Power On State (Normal User Mode) .
2. Once in Continuous Run Mode, The seven segments will no longer display "0000" and will alternate between displaying the number of cycles of the completed course and the remaining time of the cycle.
3. The Continuous Run Mode will repeat the previous cycle until continuous run mode is cancelled.
4. During Continuous Run Mode, press Delay End + Eco Plus Key for 5 sec to return to normal user mode. The seven segments will no longer display the number of cycles and will display the maintenance time only.
5. If you exit Service Mode after entering it from Continuous Mode, the washing machine returns to Continuous Mode.
6. If power is lost in Continuous Run Mode (that is, when the power plug is disconnected or the Power key is pressed turning the washing machine off), the mode is released when the washing machine is turned on again.

### Service Mode

#### Definition of Service Mode:

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

#### How to Enter:

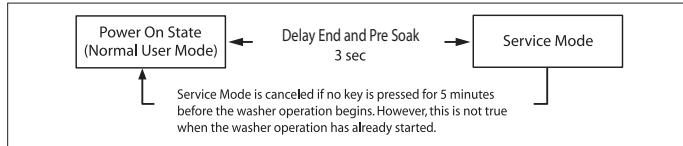
- To enter the Service Mode, press the Delay End and Pre Soak Keys for 3 seconds or until the unit sends out beeping sounds.

# ALIGNMENT AND ADJUSTMENTS

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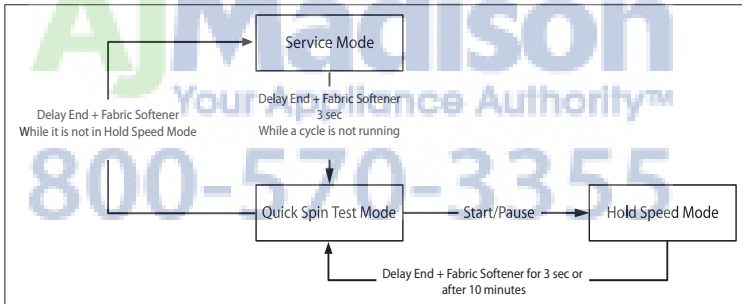
### Service Mode



#### Service Mode:

1. The washer must be on to go into the Service Mode.
2. The motor speed will be displayed when started (It displays 0 when the motor does not spin).
3. The present state of the machine will not be changed. (i.e., the current cycle in progress will not be interrupted and only the display will change)
4. To exit Service Mode, press Delay End and Pre Soak Keys for 3 second again, or Power Key. If no key is operated during Service Mode for 5 minutes, the machine will return to normal user mode.

### Quick Spin Test Mode



#### Definition of Quick Spin Test Mode:

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

#### How to Enter:

- During Service Mode, press the Delay End and Fabric Softener Keys for 3 seconds to enter Quick Spin Test Mode.
- Cannot enter once the washing cycle has started.

#### Quick Spin Test Mode:

As it enters into the Quick Spin Test Mode, it starts spinning and reaches its maximum RPM.

Once the Spin speed reaches the maximum RPM, the speed drops immediately.

To hold Quick Spin Test Mode (entering Hold Speed Mode), press the Start/Pause button. If the Start/Pause button is pressed during Quick Spin Test Mode, it will stop accelerating and hold its spinning speed for 10 minutes before going back to Quick Spin Test Mode.

Also, to cancel the hold and allow Quick Spin Test Mode to continue, press the Delay End and Fabric Softener Keys together for 3 seconds.

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

# ALIGNMENT AND ADJUSTMENTS

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### Cycle Count Check Mode



#### Definition of Cycle Count Check Mode:

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

#### How to Enter:

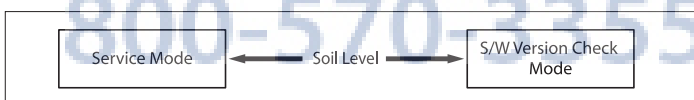
- To enter the Cycle Count Check Mode, press the Pre Soak Key during Service Mode.

#### Cycle Count Check Mode:

1. Activate the Service Mode in advance.
2. When the Pre Soak key is pressed, the total number of washes will light up and a Self Clean LED will glow.
3. The maximum number of cycles will be 1999.  
The counter will roll over to 0 and start counting again after 1999.
4. The counting will be carried out at the end of the normal cycle.  
(For normal and Continuous Run cycles, the count is carried out at the end of the cycles.)
5. To exit the Cycle Count Check Mode, press the "Pre Soak" key again.

### S/W Version Check Mode

#### Definition of S/W Version Check Mode:



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

#### How to Enter:

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

#### S/W Version Check Mode:

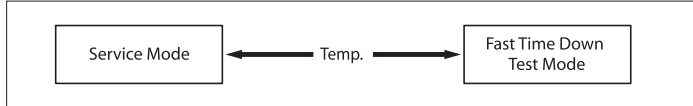
1. Activate the Service Mode in advance.
2. Press the Soil Level Key to bring up its software Version.  
EX) Generate dE49 at Version 49 (dE is Micom code, 49 is it's software version)
3. To exit the S/W Version Check Mode, press the Soil Level S/W once again.  
Then, it returns to the Service Mode with motor RPM illuminated.

# ALIGNMENT AND ADJUSTMENTS

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### Fast Time Down Test Mode



#### Definition of Fast Time Down Test Mode:

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

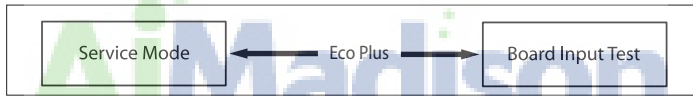
#### How to Enter:

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

#### Fast Time Down Test Mode:

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

### Board Input Test Mode



#### Definition of Board Input Test Mode:

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

#### How to Enter:

- To enter the Board Input Test Mode, press the Eco plus key during Service Mode.

#### Board Input Test Mode:

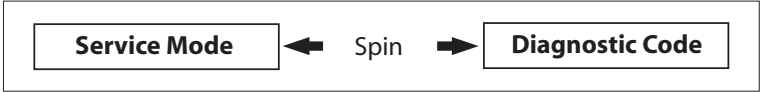
1. Activate the Service Mode first.
2. Press the key to start Board Input Test.
3. Turn the Jog-Dial so that the Normal cycle is turned on, and The Water Temperature will be displayed in Celsius.
4. Turn the Jog-Dial so that the Perm Press cycle is turned on, The Water Temperature will be displayed in Fahrenheit.
5. Turn the Jog-Dial so that the Delicates/Hand Wash cycle is turned on, The door status will be displayed (OP if open, CL if closed).
6. Turn the Jog-Dial so that the Quick Wash cycle is turned on, The Door Lock Switch status will be displayed (UL if unlocked, LO if locked).
7. Turn the Jog-Dial so that the Self Clean cycle is turned on, The Water Frequency will be displayed.

# ALIGNMENT AND ADJUSTMENTS

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### Diagnostic Code Check Mode



#### Definition of Diagnostic Code Check Mode:

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

#### How to Enter:

- To enter the Diagnostic Code Check Mode with code "d" flashing, press the Spin key during Service Mode.

#### Board Input Test Mode:

1. Activate the Service Mode first.
2. Press the "Spin key" key to start Error Code Check Mode with Code "d" flashing.
3. To cycle through the error codes, turn the Rotary Cycle Selector in one direction (either Clockwise or Counterclockwise).
4. Now, when turning the Rotary Selector Key in the same direction, it shows error codes from the latest.
5. When turning it in the opposite direction, it shows the error codes in the reverse order.

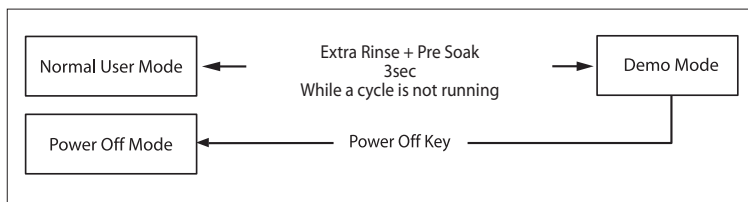
  
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## ALIGNMENT AND ADJUSTMENTS

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### Demo Mode



- Demo mode is entered when the Extra Rinse + Pre Soak buttons are held down for three (3) seconds simultaneously in the power on state.
- When entering Demo mode, the buzzer rings three (3) times and “- - -” is displayed on the 7 segment display and all other LEDs are turned off. (Initial Demo mode)
- Demo mode consists of WASH, SPIN and LED modes.
- If the Temp. button is pressed during the initial Demo mode, “USH” blinks on the 7 segment display and the washing machine enters WASH mode.
- If the Start/Pause button is pressed in WASH mode, the door is locked (Door Lock) and the motor rotates left and right at 110 RPM in a 1.1 sec on and 1.3 sec off cycle.
- WASH mode continues up to five (5) minutes once started. After the five (5) minutes have elapsed, “- - -” is displayed on the 7 segment display and the initial Demo mode is maintained.
- If the Start/Pause button is pressed during a WASH mode operation, “- - -” is displayed on the 7 segment display and the initial Demo mode is maintained.
- If the Spin button is pressed in the initial Demo mode, “SPn” blinks on the 7 segment display and the washing machine enters SPIN mode.
- If the Start/Pause button is pressed in the SPIN mode, the door is locked (Door Lock) and a spin is operated at 950 RPM .
- SPIN mode continues up to four (4) minutes once started. After the four (4) minutes have elapsed, “- - -” is displayed on the 7 segment display and the initial Demo mode is maintained.
- If the Start/Pause button is pressed during a SPIN mode operation, “- - -” is displayed on the 7 segment display and the initial Demo mode is maintained.
- If the Soil Level button is pressed in the initial Demo mode, “LED” blinks on the 7 segment display and the washing machine enters LED mode.
- If the Start/Pause button is pressed in LED mode, all LEDs are turned on. The LED mode continues up to thirty (30) seconds once started. After the thirty (30) seconds have elapsed, “- - -” is displayed on the 7 segment display and the initial Demo mode is entered.
- If the Start/Pause button is pressed during an LED mode operation, “- - -” is displayed on the 7 segment display and the initial Demo mode is entered.

# ALIGNMENT AND ADJUSTMENTS

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## TROUBLE DIAGNOSIS

- As the micom wash machine is configured in a complicate structure, there might be the need for a service call.

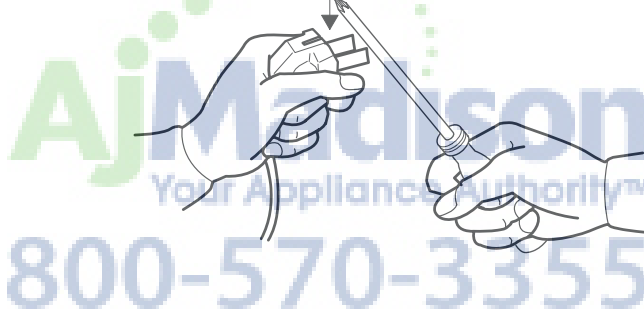
The below information is prepared for exact trouble diagnosis and suitable repair guide.

### Caution for the Repair and Replacement

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

- 1) Some electronic components are damaged by the charged static electricity from the resin part of the machine or the human body. Prepare by grounding the human body to the ground or remove the potential difference of the human body and machine by contacting the power supply plug when executing a PCB contact.

POWER SUPPLY PLUG



- 2) Since AC120V is applied to the triac T1 and T2 on P.C.B, electric shock may occur by touching and be careful that the strong and weak electricity are not mixed.
- 3) As the P.C.B assembly is designed for no trouble, do not replace the P.C.B assembly by the wrong diagnosis and follow the procedure of the trouble diagnosis when the micom is not operating normally.

# TROUBLE SHOOTING

## WARNING

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## TROUBLE DIAGNOSIS

### Will Not Start

- Plug the unit into the wall outlet. Check for proper voltage.
- Check fuse or reset circuit breaker.
- Push any key to turn on the washer and press the Start/Pause key to run the washer.
- Close door and push the Start/Pause key to run the washer.
- Check if washer is in a pause, soak or suds process. Wait briefly and it may start. (If the washer is in suds period, Suds will light up instead of remaining time.)
- Check for restricted drain system. (If there is an electrical problem in the drain system, "nd" error will occur after 30 minutes.)
- Check the Water Supply.
- Check the line or water valve screen filter.
- Check if PCB connectors are assembled properly.
- Check if CN2 terminals on PCB are in good condition. (Refer to PCB Connector Check.)
- Replace PCB.

### Leaking

- Make sure inlet hose connections are not leaking. Check for rubber gasket damage due to over tightening.
- Check the standpipe for leaking. Wrap a dry rag around the standpipe opening. If the rag becomes wet, the leak is the fault of home plumbing and not the machine.
- Be sure the standpipe is capable of accepting the flow of water from the washer.
- Make sure the end of the drain hose is correctly inserted and secured to the drain standpipe.
- Check internal hose connections (fill, drain systems, dispenser hoses & clamps).
- Check rubber boot. Remove, reposition and reinstall, if necessary.
- Check for a possible kinked dispenser hose to the outer tub. Hot water pressurization may force door open.

### Will Not Spin

- Make sure to close the door completely.
- Check for water left inside the washer. If so, go to "Will Not Drain".
- Perform Quick Test Mode or Quick Spin Test. Does the washer spin? (Before the test, empty the unit inside.) If it doesn't tumble after the above, change PCB. When the problem persists, change the motor.
- Perform Quick Test Mode or Quick Spin Test. Does the washer spin? If it does, Check Possible unbalanced load scenario in normal mode.
- Check for loose connections at PCB, Water Level Sensor, Motor, Hall Sensor Wire Harness. (CN6,CN2,CN6-1) (Refer to the Component Testing Procedure.)
- Check motor windings resistance. (CN6-1 Pin1&3 = 13.4 ohms (at  $\pm 5\%$  25°C/77°F)  
Pin1&3 = 13.4 ohms (at  $\pm 5\%$  25°C)  
Pin1&3 = 13.4 ohms (at  $\pm 5\%$  25°C)

# TROUBLE SHOOTING

## WARNING

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## TROUBLE DIAGNOSIS

### No Water Fill

- Perform Quick Test Mode. Check all of the Water Valves visually. (Cold Water Valve, Bleach Water Valve, Softener dispenser using Cold & Bleach Water Valve, and Hot Water Valve.)
- Check if the water taps are turned on fully.
- Check the Water Valves and the Water Level Sensor (Refer to PCB Connector Check).
- Check if there is any kink in the inlet hoses.
- Check if the inlet screens are clogged up.
- Check if the water has enough pressure. If so, find out its contributors.
- Check if there is any frozen area in the unit. (Drain Hose, etc.).
- Measure the resistance of the Water Valve Coil. (It should read 1.18K ohms. Check Pin#4 of Power Relay and pin #1,2,3,4 of CN401)
- Check Pressure S/W and PCB for loose connections. (Refer to PCB Connector Check.)

### Tub Full of Suds

- Go to "Will Not Drain" and "Will Not Spin" and check the draining.
- Check PCB and Drain Pump for any loose wire connection.
- Perform Quick Test Mode or Board Output Test to drain.
- Use HE (High-Efficiency) or low sudsing detergent specially formulated for front load washers. This type of detergent will not affect cleaning performance in a Top Load Washer.
- Reduce the amount of detergent for that specific load size and soil level. Keep in mind that towels create more suds generally.
- Reduce the amount of detergent when water is soft, or laundry is small or lightly soiled.
- Do one more washing cycle with cold water and a tablespoon of salt without detergent.

### Wet Clothes

- Unbalance due to not enough load. Put additional articles of laundry in load.
- Due to excessive suds by using general detergent. Use HE (High-Efficiency) detergent or reduce its quantity.
- Low Spin Speed or Drain Only was selected.
- Go to "Will Not Spin".

### Will Not Lock

- Perform the Quick Test Mode. Check the Door Lock. Check the resistance of the door lock. It should have approx 0.2 ohm between the terminal of contact (white-red wire), and if not, change the pcb (refer to pcb connector check).
- Read Lock Switch and PCB (CN301, CN302). (Refer to PCB Connector Check.)

### Will Not Unlock

- Display shows "DE1". Turn off and on the unit. If "DE1" keeps illuminating, check PCB and Door Lock Switch.
- Read Lock Switch and PCB (CN301, CN302). (Refer to PCB Connector Check.)
- Perform Quick Test Mode. Check Door Lock. Check the resistance for door unlock if Approx 0.2 ohm between the terminal of contact (white-blue wire), and if not, change pcb (refer to pcb connector check).

# TROUBLE SHOOTING

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## TROUBLE DIAGNOSIS

### No Key Operation

- Option and Function buttons respond differently according to each cycle.
- Child Lock is being activated. To exit, hold down Spin level key and soil level key simultaneously until it sends out a beeping sound.
- When "End" illuminates on the display, only Power button works. Press Power button and make new cycle selections.

### Will Not Drain

- Check for any kinks in the drain hose. If any, straighten out.
- Check for any restriction in the drain hose.
- Close the door and press the Start/Pause Button. For safety reasons, the washer does not tumble or spin with the door open.
- When it is freezing outside, check if it is frozen inside the drain hose.
- Check if the water level signal input is correct. Go to Board Input Test Mode.
- Go to Quick Test Mode and do Drain Pump Test.
- Check if there is any twist in the hose (the one between Tub and Drain Pump).
- Check if it reads AC 120V at the pump when a spin cycle is selected.
- Read the winding resistance of the pump motor. ( $15 \pm 10\%$  Ohms)
- Check the pump at Pin#4 of Power Relay and pin #10 of CN401 on PCB. It should read AC 110~120V. (Refer to PCB Connector Check)

### Wrong Water Temperature

- Check if both of the water taps are fully open.
- If the water heater is located far from the washer, screw out the hot water tap and let its water pass until you get hot water.
- Too Hot/Too Cold: Reduced amount of water is supplied while PCB controls the influx to regulate the actual temperature of the water in the tub. This may appear to be significantly hotter/colder than expected.
- Check if the temperature selection is correct.
- Disconnect inlet hoses from the Water Valve and remove any residue in the inlet screens.

### Noisy and/or Vibration/Walking

- Check if the washer is leveled and the lock nuts are tightened up on the bottom plate.
- Check if all of the shipping bolts and spacers are removed from the back panel.
- Check if load is big enough and there is no unbalance. If there is not enough load, put in a few towels to balance it.
- Check if the motor is fastened enough.
- Remove various trouble contributors (such as a coat of dust on the floor).

### Buttons do not Respond

- Option and Function buttons respond differently according to each cycle.
- Child Lock feature has been selected. To disable feature press and hold Temp. and Spin simultaneously until a beep is heard.
- When display shows "End", only the Power button will function. Press Power and make new cycle selections.

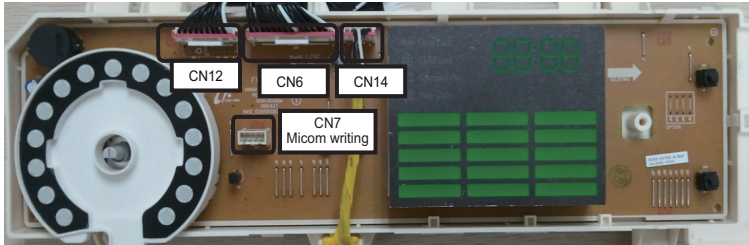
# TROUBLE SHOOTING

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### PROBLEM CHECKING AND METHOD OF PCB

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

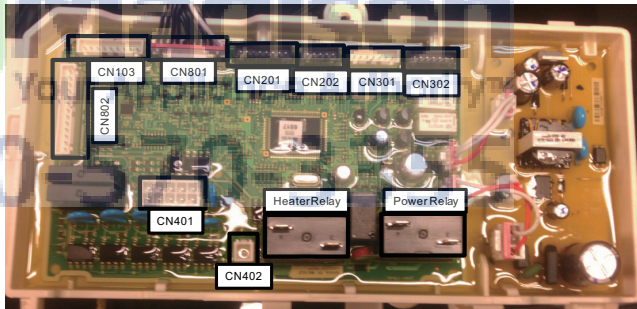
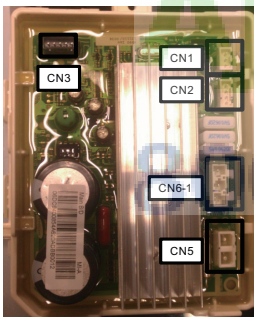


#### Thermistor Check

Check Resistance at Pin #8 and #7 of CN6  
Tester Check = 47k $\Omega$

#### Water Sensor Check

Check Frequency at Pin #10 and #15 of CN6  
Reset frequency = 25.6KHz  
Check Frequency at Pin #11 and #15 of CN6  
Reset frequency = 25.6KHz



#### Hall Sensor Check

Check Voltage at Pin #4 and #3 of CN2  
Tester Check = DC0.6V  
Check Voltage at Pin #4 and #2 of CN2  
Tester Check = DC0.6V

#### Motor Check

Resistance at Pin #1 of CN6-1 and GND = 226k $\Omega$   
Resistance at Pin #2 of CN6-1 and GND = 226k $\Omega$   
Resistance at Pin #3 of CN6-1 and GND = 226k $\Omega$

#### Drain Motor\_Pump Check

Check Voltage at Pin#4 of Power Relay and pin #10 of CN401  
When Drain Pump operates = AC 120V

#### Water Valves/ Check

Check Voltage at Pin#4 of Power Relay and pin #1,2,3,4 of CN401  
When Valves operates = AC 120V

#### Clutch-Motor

Check Voltage at Pin#4 of Power Relay and pin #5 of CN401  
When Valves operates = AC 120V

#### AC Power Check

Check Voltage at Pin#4 of Power Relay and pin #4 of Heater Relay  
Tester Check = AC 120V

#### Door Lock Check

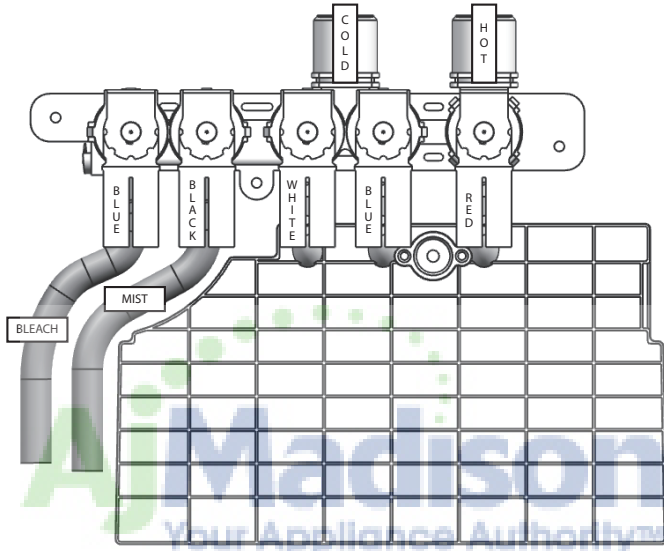
Check Voltage at Pin #3 and #7 of CN 301, Pin #3 and #7 of CN 302  
When Door Lock = DC 6.5V



# WATER FLOW DIAGRAM

## WARNING

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



**MEMO**



