Fast Track Troubleshooting

Model: WA50**

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Bulletins:

Support Information:
HELP: 1-888-751-4086 (Tech Sup. – ASC/SSD)
1-866-894-0637 (Tech Sup. - FE/ME)
GSPN: http://service.samsungportal.com/EP/web/portal/jsp/EP_Default1.jsp
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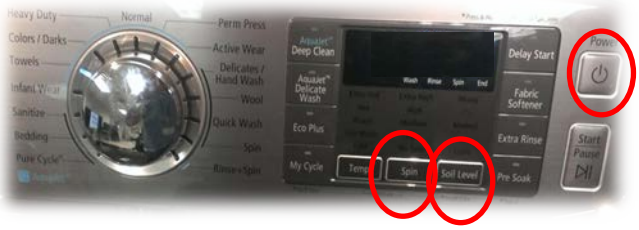
With the Power On

With the Power Off



Caution: Error codes must be retrieved from *Service Mode* **BEFORE** entering the *Quick Test mode or else they will be deleted*

Service Mode:

This mode allows more detailed operation tests and troubleshooting, to enter press *Delay Start & Pre Soak* simultaneously with the power on.

In Service Mode the following tests can be performed:

Quick Spin Test: Press and hold ***Delay Start & Softener Option*.**

Note: This accelerates the drum motor from 0 to max RPM in a few minutes. Stay with the washer during this test, out of balance detection may be bypassed. Press ***Start/Pause*** during the test to hold spinning speed for 10 minutes before going back to Quick Spin Test Mode. Press and hold the ***Delay Start & Softener Option*** to continue.

Cycle Count = Press ***Pre Soak*** to see how many times the unit was used.

Software # = Press ***Soil level*** to see the SW version information.

Fault Code Test = Press ***Spin*** to view the stored fault codes – then turn ***Jog Dial*** to view error codes. Push ***Start/Pause*** while the code is displayed to view the number of cycles since the error occurred, Push Start/Pause to go back to faults.

Peripheral (Main PCB) input Tests:
1. Select Eco Plus. Then turn the ***Jog-Dial*** so that the **Perm Press LED** is turned on. Next, press ***Start/Pause*** and Water Temperature will be displayed in Fahrenheit.
2. Select Eco Plus. Then turn ***Jog-Dial*** so that the **Delicates/Hand Wash LED** is turned on. The door status will be displayed (OP if open, CL if closed).
3. Select Eco Plus. Then turn ***Jog-Dial*** so that the **Quick Wash LED** is turned on. The door lock Switch status is be displayed (UL = unlocked, Lo = locked).
4. Select Eco Plus. Then turn ***Jog-Dial*** so that the **Pure Cycle LED** is turned on and Water Level Frequency will be displayed.

Quick Test Mode

To enter press Spin, *Soil, & Power* simultaneously with the power off.

1. All LED's light up and the washer beeps as it enters the Quick Test Mode.
2. After the displaying the software version, LCD will display Model information. If EEEE is displayed the PCB ass'y is defective.
3. When the version is displayed, turn the Jog-Dial CCW so that the version disappears. Press the following keys to test the various components:

Press ***Temp*** to cycle through the Water Valves circuit test (lock the door first) in this order: Pre-Wash, Bleach, Cold Main, Hot, & Steam, then off.

Press ***My Cycle*** to test Door Lock/Unlock circuit

Press ***Spin*** to test Circulation/Drain Pump.

Press ***Soil*** to test the Water/Steam Heater.

When either **Test or Spin** is displayed on the LCD, press ***Start/Pause*** to conduct the motor test.
In **Test mode**, you can test the clockwise and counterclockwise movement of the motor.
In **Spin mode,** you can test the motor at a high rpm.

EEPROM Clear Entering Quick Test Mode will clear EEPROM

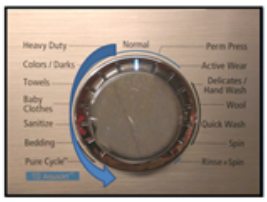
Testing the Water Level Sensor & Water Valves on the WA50 washer

The best way of checking the water valves and water level sensor on the WA50 is to put the washer machine into the quick test mode to activate each component.

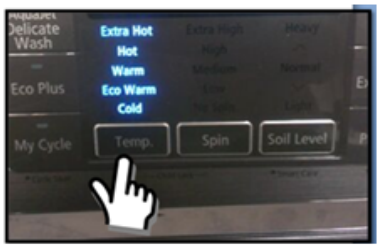
(WA50 Model)

Step1. With the power off, hold the **Spin** + **Soil Level** + **Power** to enter quick test mode. If done correctly all LED's will light up, let go of all the buttons at this point. The Version number will be displayed.

Step2. Turn the Jog dial so the version number disappears



Step3. Put the setting into Colors / Darks, a 4 digit number will be displayed as shown in the image below.

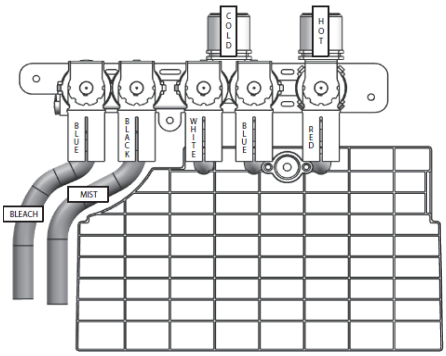


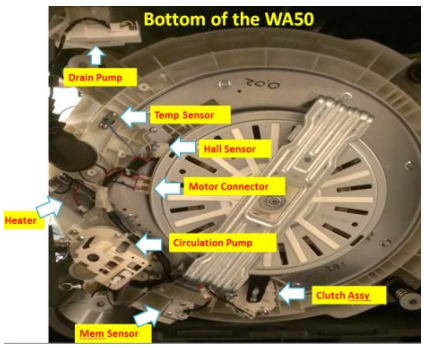
Step4. Press the **Temp Key** to turn on the water valves. After turning the water valves on the displayed number should drop. With no water the number will be between 2550 – 2600. If you leave the valves running the number will stop around 2400. After the water is shut off (including any dripping), the number should eventually stop moving..

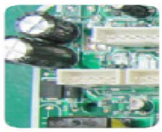
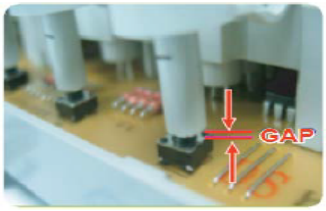
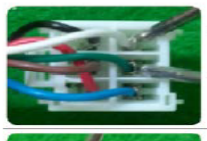
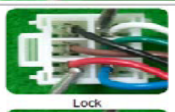
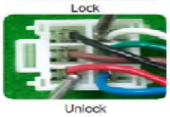
If water is being added to the tub and the displayed number does not move, the water pressure hose might be blocked or disconnected

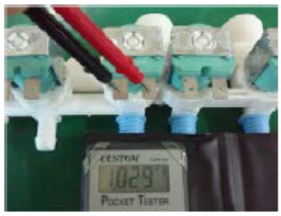
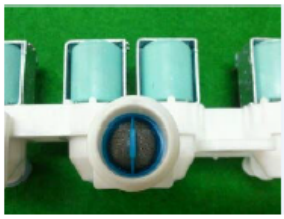
If the digits continue to fluctuate and do not stop after the water has stopped filling the tub, the water pressure hose might be leaking (Replace hose)

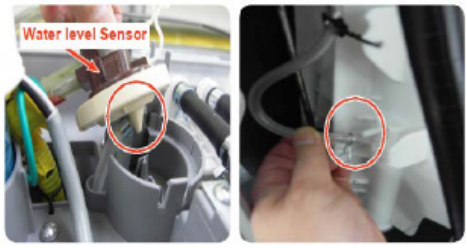
If the Water Level Sensor is defective or the connection is bad a 1E error will be displayed at startup.





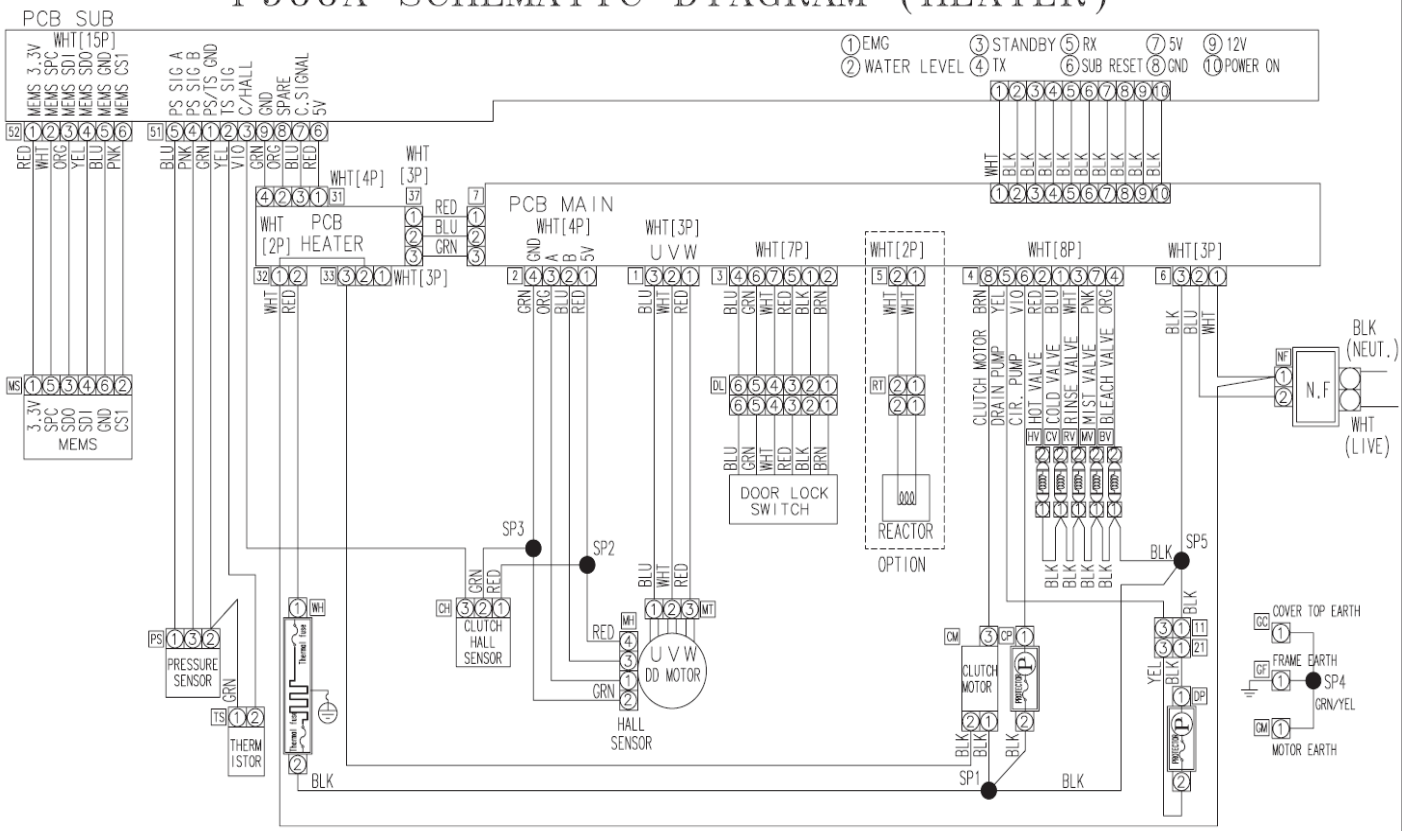
Error Type	Error Mode	Causes	Corrective Actions	Description of Photo
Water Level Sensor	**1E**	• Water level sensor fault. • Incorrect connections of the water level sensor terminal. • The hose part for the water level sensor is folded. • Main PCB fault.	• Check the water level sensor terminal connections and contacts. • An error occurs if an incorrect water level sensor is used. Make sure to check the material code. (Abnormal operation) • If the water level sensor is faulty, replace it. • If the error persists despite taking the action above, replace the PBA.	► Check the water level sensor frequency. 1. Check it after the water level sensor and the connector are connected. Checking Part : Blue Color Wire Orange Color Wire 2. Frequency: Approx. 26.4 KHz without water (Min 25.9KHz) 
Washing Motor Error and Hall Sensor Error	**3E**	· Washing motor fault · Washing motor hall sensor fault · Incorrect connections of the washing motor/hall sensor connector · Washing motor rotor and stator fault · Main PCB fault	• Check the motor connector terminal connections and contacts. • 3E is displayed because overloading occurs due to too much laundry. • If the hall sensor terminal is faulty, replace the hall sensor. • Check whether the stator of the motor cover is damaged. • Check for coil disconnections due to foreign material. • If the PBA control circuit is faulty, replace the PBA.	► Check the motor Winding Coil • Plug out the connector and read resistances at any two of the three terminals on Motor : Should be 19.3Ω (at 25oC)  ► Check the motor Hall Sensor • Check the resistance on the main PCB motor(Between pins 2 and 4, 3 and 4 of the four (4) pins) - Resistance : Approx. 2 to 4 MΩ - Check the voltage when the power is on. CN1 1-5V-1 2-Hall-A 3-Hall-B 4-GND 5-Clutch Hall IC 
Switch Error (Main Relay Error)	**E2**	• The Power button is continually pressed. • A button other than the Power button is continually pressed.	• Check whether either the Power switch or a tact switch is continually pressed. • Check whether the service PBA holding screws are fastened too tight. If they are fastened too tight, loosen them a little. • If the main PBA switching IC on/off error has occurred, replace the main PBA. • The “E2” error occurs if the main relay connections are incorrect. Check the connections. If there is no error in the connections, replace the main PBA.	Check the contact between the control panel buttons and their corresponding tact switch. - There must be a gap between a control panel button and its corresponding micro switch. Otherwise, an error occurs after approx. 30 seconds has passed. 
Door Error	**dS FL LO**	• Door-Lock SW fault • Reed SW fault • Main PCB fault	• Check the Door-Lock SW terminal connections and contacts. • Bring the probe of tester into contact with two terminals of Door-Lock SW.[DS Error] In state of Door Close, Check Reed SW Resistance.[FL Error] In state of Door Unlock, Check Motor Resistance. And In state of Door Lock, Check Door Lock Contact Resistance.[LO Error] In state of Door Unlock, Check Motor Resistance and Door Unlock Contact Resistance. • If Resistance is satisfied with Spec, Replace the PBA.	 1. Check the resistance for Reed SW (Checking Part : White-Green Wire) - Resistance: Approx 0.2Ω between the terminals of Reed SW.  2. Check the resistance for Motor (Checking Part : Black-Brown Wire) - Resistance: 33Ω to 46Ω between the terminals of Motor.   3. Check the resistance for Lock/Unlock Contact (Checking Part : Lock White-Red Wire Unlock White-Blue Wire) - Resistance: Resistance: Approx 0.2Ω between the terminals of Contact. ☑ Check the Door Lock/ Unlock state.

Error Type	Error Mode	Causes	Corrective Actions	Description of Photo
Water Supply Error	**nF**	— • Water supply value fault • Main PCB fault • Freezing in the winter season	• If the water supply valve has a wire disconnected, replace it. • Check whether the water supply valve is clogged with foreign material and whether water is supplied continually. • Check whether no water is supplied because of freezing in the winter season. • If the PBA relay operates abnormally, replace the PBA	1. Check the resistance for the water supply valve. - Resistance : 0.9KΩ to 1.1KΩ between the terminals of the Water Supply Valve. 2. Check whether there is foreign material in the Water supply valve filter.  
Drain Error	**nd**	• Freezing in the winter season • Foreign materials in the drain pump • Poor physical connection • Drain pump fault • Main PCB fault	• If the drain pump revolutions are restrained due to freezing in the winter season, check the method to remove the freezing and remove as directed. • Check whether the revolutions of the drain pump motor are restrained by foreign material, and remove as directed. • Check the wire connectors on Main PCB and Drain Pump ASSY. The connector or wire may have poor physical connection. • Check the drain pump resistance.	Check the drain pump resistance. (Resistance : 13.5 ~ 16.5Ω) 
Communication Error	**AE**	• The signals between the sub and main PBAs are not sensed. • Incorrect wire connections between the sub and main PBAs.	• Check the wire connections and terminal contacts between the sub and main PBAs. • Check for disconnected wires. • Check whether the sub PBA is short-circuited because of moisture. • If the main PBA's communication circuit is faulty, replace it.	-

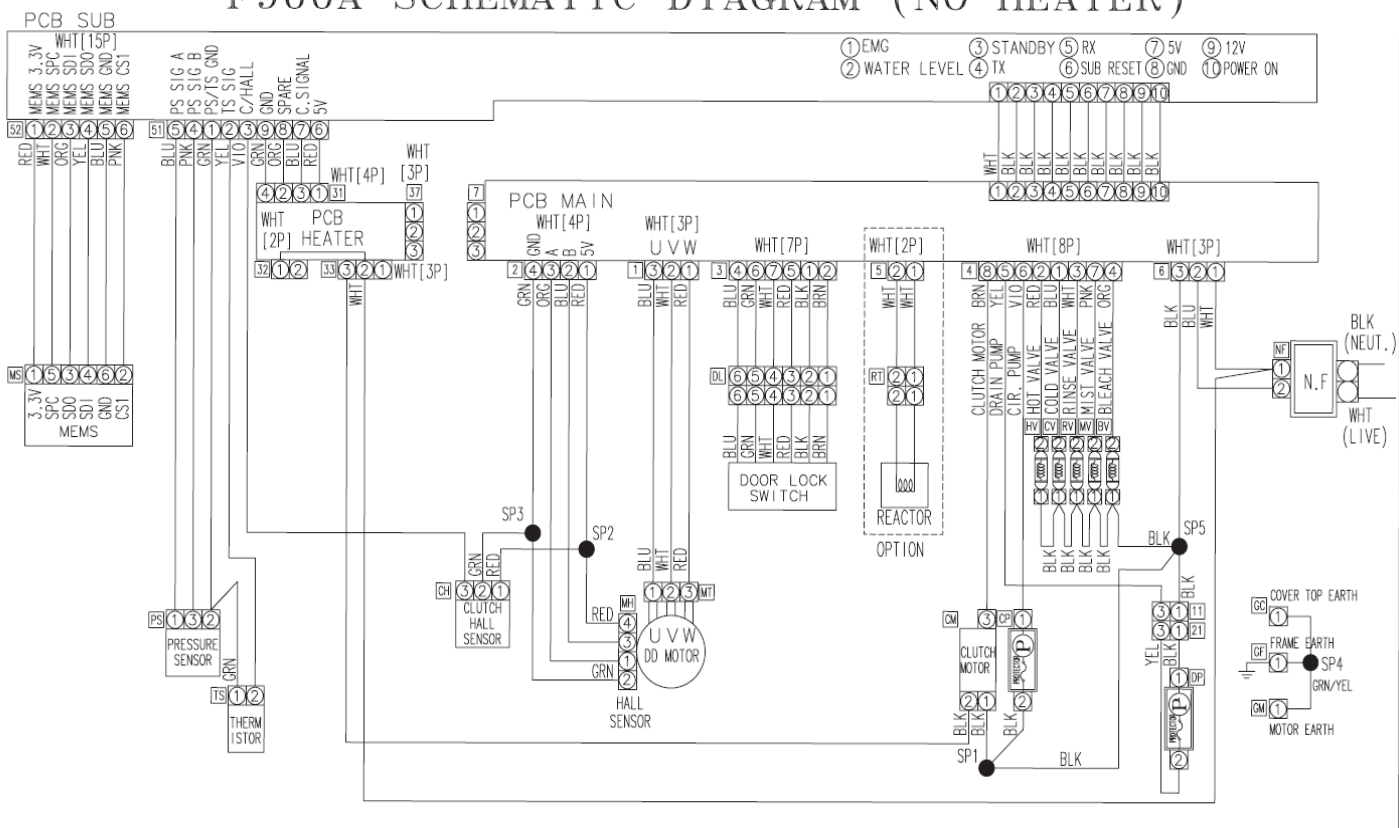
Error Type	Error Mode	Causes	Corrective Actions	Description of Photo
Water Leakage Error	**LE**	• Check for any leakage. • Foreign material in the DV case • Fault of a hose or incorrect part engagement in the product.	• Check for any leakage on the base, Hose, Valve and Tub connections and take any required action. • During natural draining, this error occurs when the drain bellows are clogged with foreign material. Remove the foreign material. • Check the drain motor operation. Replace if it does not operate normally.	
Overflow Error	**OE**	• Water level sensor fault • Freezing in the winter season	• If the water level sensor has a functional error, replace it. • Check the hose. This error occurs if it is torn or has a hole. • This error occurs if water is frozen in the winter season. Use hair dryer to defrost hose. Consider relocating the unit to warmer location.	
Temperature Sensor Error	**tE**	• Washing temperature sensor fault • Faulty and incorrect connections of sensor • Main PCB Fault • Freezing in the winter season	• Check the connections of the temperature sensor. • If the temperature sensor has a functional error, replace it.	Check the thermistor resistance (Resistance at 20~30°C: 66.187~36.941kΩ) 
Unbalance Error	**dc**	• Motor hall sensor fault • Caused by the laundry contents	•Check the type of laundry. Check whether it may cause an unbalanced situation. •- Educate the consumer in this case is to press pause reposition the load or remove a few items. Press start to continue and complete the wash cycle.	-

nF	The hot/cold water hose connection is not correct.	Please connect the hot/cold water hose connection correctly.
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 usage.
nFI	The hot/cold water hose connection is not correct.	Please connect the hot/cold water hose connection correctly.
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.
PEI (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. This, 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.

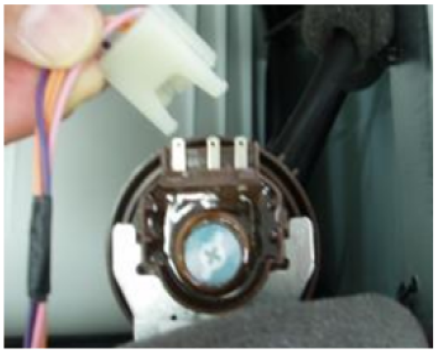
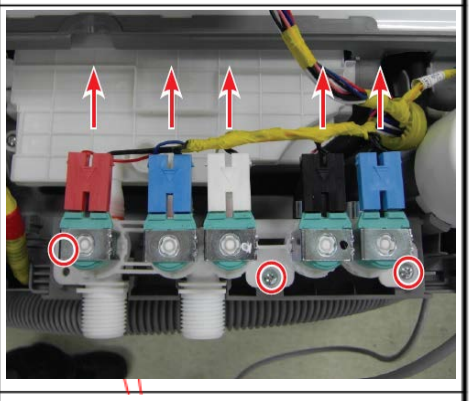
F900A SCHEMATIC DIAGRAM (HEATER)

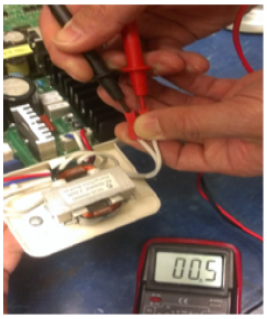


F900A SCHEMATIC DIAGRAM (NO HEATER)

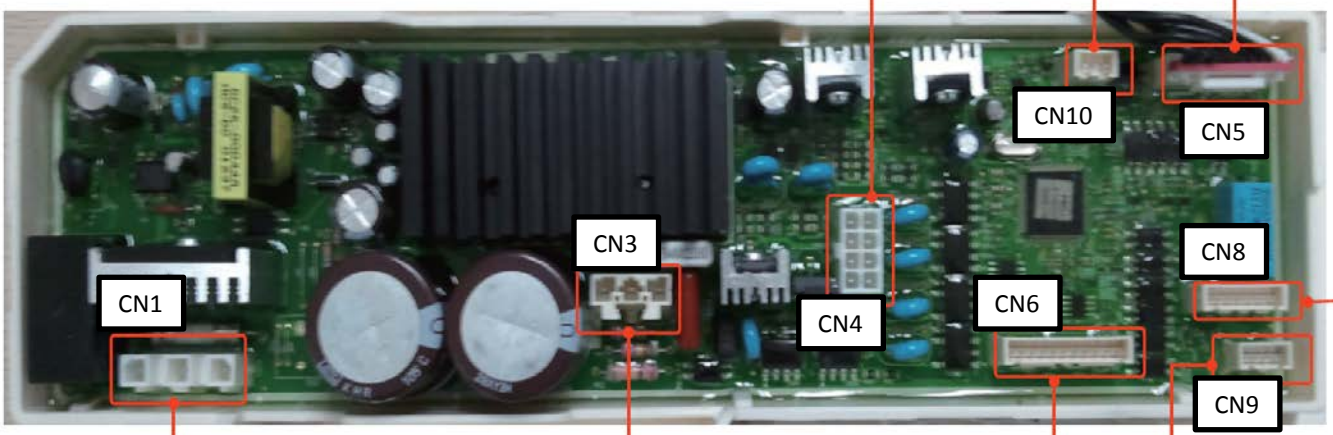


Components Check

Door Lock S/W	Water Level Sensor	Water Valve
		
1.Check the door switch resistance. 2.Check the resistance after the power is off. 3.The resistance across No.1 and No.3 of the Door Lock Switch must be approximately 40 to 57Ω.	1.Check the water level sensor frequency. 2.Check it after the water level sensor and the connector are connected. 3.Frequency: Approx. 26.4 kHz with no load.	1.Check the resistance for the water supply valve. Resistance: 1.0K to 1.2K ohms 2.Check whether there is foreign material in the water supply valve diaphragm. 3.If above test is ok, activate the ''water valve test'' and check the voltage of each valve for 110V. If voltage is NG change main pcb.

Drain Motor	Drum Motor	Reactor
		
Resistance : Approximately 174Ω between the terminals for the Water Supply Valve.	Plug out the connector and read resistances at any two of the three terminals on Motor : Should be 15 Ω	Check resistance approximately 0.5Ω If no resistance is found the reactor is bad and the unit will not turn on

Main PCB



▶ CN4
1. Bleach Valve
2. Rinse Valve
3. Hot Valve
4. Cold Valve
5. Pump
6. N.C
7. Mist Valve
8. Clutch

▶ CN10
1. 5V
2. GND
3. Wash heater

▶ CN5
1. Water Level
2. Standby
3. TX
4. RX
5. Sub Reset
6. 5V
7. GND
8. 12V
9. Power On

▶ CN1
1. AC1
2. AC2
3. AC2-1

▶ CN3
1. Motor_U
2. Motor_V
3. Motor_W

▶ CN6
1. Flash Micom

▶ CN9
1. 5V
2. Hall_A
3. Hall_B
4. GND

▶ CN8
1. Door Lock Motor
2. Door Lock Motor
3. GND
4. Unlock Contact
5. Lock Contact
6. Reed Switch
7. 5V_1

Hall Sensor Check
Check Voltage at Pin #4 and #3 of CN9
Tester Check = DC0.6V
Check Voltage at Pin #4 and #2 of CN9
Tester Check = DC0.6V

Motor Check
Resistance at Pin #1 of CN3 and GND = 226kΩ
Resistance at Pin #2 of CN3 and GND = 226kΩ
Resistance at Pin #3 of CN3 and GND = 226kΩ

Drain Motor_Pump Check
Check Voltage at Pin #3 of CN1 and Pin #5 of CN4
When Drain Pump operates = AC 120V

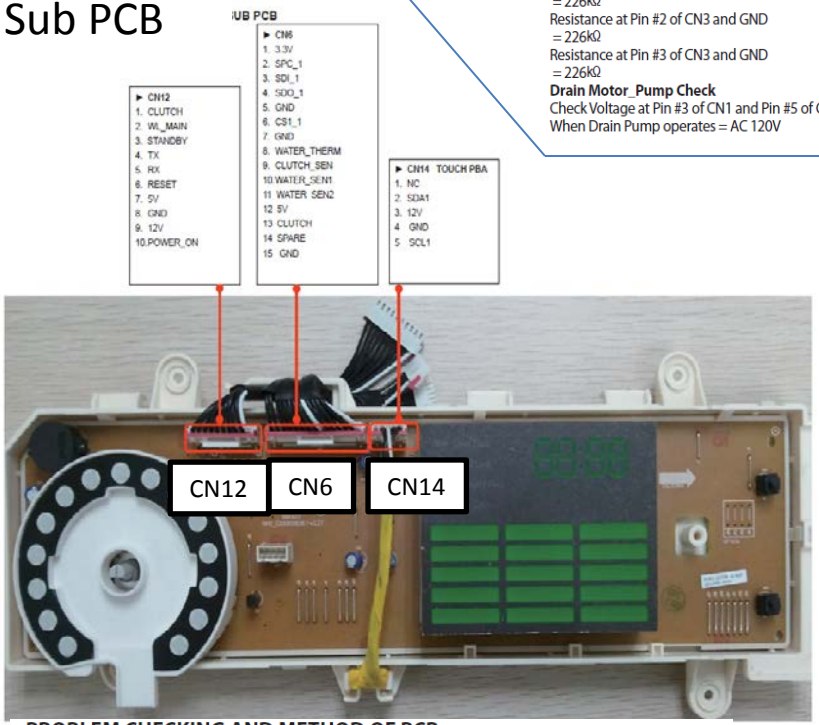
Water Valves/ Check
Check Voltage at Pin #3 of CN1 and Pin #1,2,3,4 of CN4
When Valves operates = AC 120V

Clutch-Motor
Check Voltage at Pin #3 of CN1 and Pin #8 of CN4
When Valves operates = AC 120V

AC Power Check
Check Voltage at Pin #1 and #3 of CN1
Tester Check = AC 120V

Door Lock Check
Check Voltage at Pin #3 and #5 of CN8
When Door Lock = DC 6.5V

Sub PCB



▶ CN12
1. CLUTCH
2. WL_MAIN
3. STANDBY
4. TX
5. RX
6. RESET
7. 5V
8. GND
9. 12V
10. POWER_ON

▶ CN6
1. 3.3V
2. SPC_1
3. SDI_1
4. SDO_1
5. GND
6. CS1_1
7. GND
8. WATER_THERM
9. CLUTCH_SEN
10. WATER_SEN1
11. WATER_SEN2
12. 5V
13. CLUTCH
14. SPARE
15. GND

▶ CN14 TOUCH PBA
1. NC
2. SDA1
3. 12V
4. GND
5. SCL1

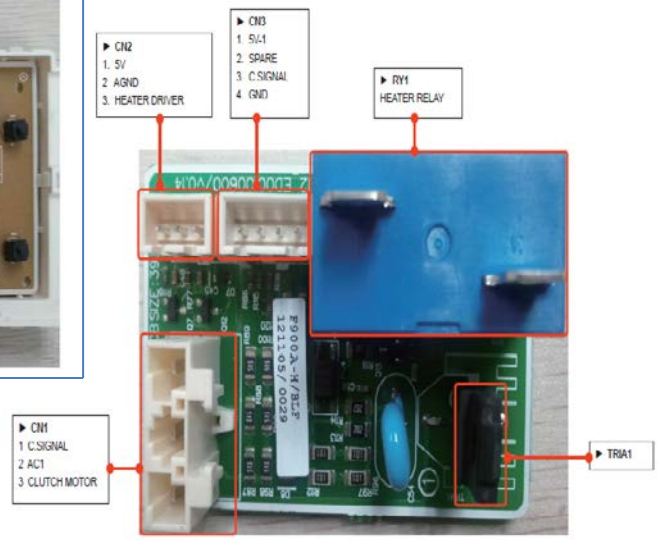
PROBLEM CHECKING AND METHOD OF PCB

- 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 = 47kΩ

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

Heater PCB



▶ CN2
1. 5V
2. AGND
3. HEATER DRIVER

▶ CN3
1. 5V-1
2. SPARE
3. C.SIGNAL
4. GND

▶ RY1
HEATER RELAY

▶ CN1
1 C.SIGNAL
2 AC1
3 CLUTCH MOTOR

▶ TRIA1