

SAMSUNG

Model: WF56H9100



Fast Track Troubleshooting

IMPORTANT SAFETY NOTICE – “For Technicians Only” This service data sheet is intended for use by persons having electrical, electronic, and mechanical experience and knowledge at a level generally considered acceptable in the appliance repair trade. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible, nor assume any liability for injury or damage of any kind arising from the use of this data sheet.

Bulletins:

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Support Information:

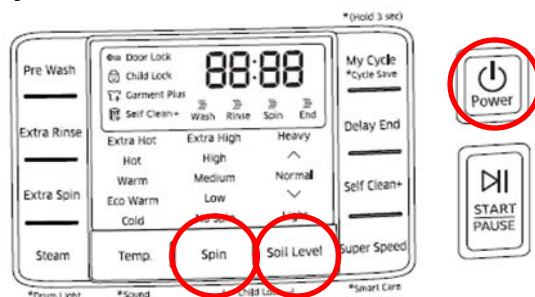
HELP: 1-888-751-4086 (Tech Sup. – ASC/SSD) - 1-866-894-0637 (Tech Sup. - FE/ME)

GSPN: <http://gspn3.samsungcsportal.com/main.jsp>

PLUS ONE: <http://my.plus1solutions.net/clientPortals/samsung>

QUICK TEST MODE: WITH POWER OFF - PRESS: Spin + Soil + POWER

TEST	FUNCTION	PRESS to Enter or Exit
1	Water Valve Test	TEMP **Door Lock Must be Activated 1st before running Component **
2	Door Lock	Spin
3	Heater	Super Speed
4	Drain Pump / Bubble Pump	Soil Level
5	EEPROM MEMORY CLEAR	When you Enter Quick Test Mode Memory will be clear



SERVICE MODE: WITH POWER ON - PRESS: Soil Level + Delay End

TEST	FUNCTION	PRESS To Enter or Exit
1	Cycle Count	Temp
2	Version	SOIL Level
3	Board Input Test (Move Jog dial to check LED) (See Chart at bottom)	Delay End
4	DIAGNOSTIC ERROR CODE CHECK (See Below)	SPIN - Turn dial either clockwise (c.w) or counter c.w.
5	SPIN TEST (RPM) (ref: NB***)	Delay End+ Temp for 3sec. (To Pause: press - START/PAUSE)



NB*** Spin Test will NOT test Hall Sensor in this mode.

NOTE: ALWAYS remember to offset counter weight when spin testing an empty machine

FACT: It is NORMAL for this unit to be unbalanced until 350-400 RPM.

Service mode Option 3:

Board Input Test Chart

LED	1 st LED is on	2 nd LED is on	3 rd LED is on	4 th LED is on	5 th LED is on
Display	Water temp. (°C)	Water temp. (°F)	Door status (OP:open, CL:close)	Door lock S/W status (UL:unlock, LO:lock)	Water Frequency

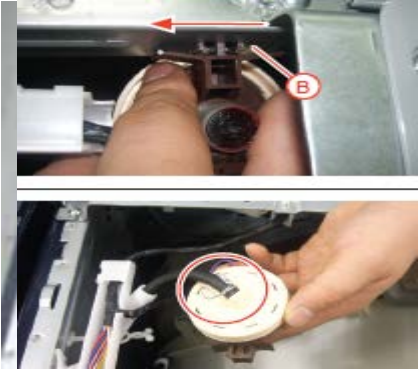
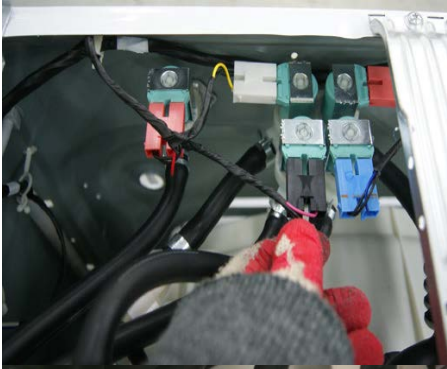
✓ Use the Board input test under service mode to test water temp, during normal wash operation.

Service mode Option 4:

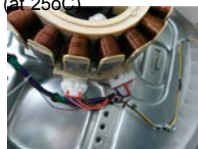
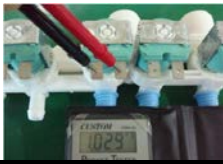
DIAGNOSTIC ERROR CODE CHECK

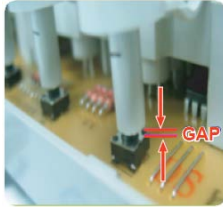
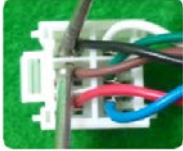
- Activate the SERVICE MODE first (ref: above).
- Press the **SPIN** key to start DIAGNOSTIC CODE check mode. “d” will start flashing.
- To cycle through the diagnostic codes (d1, d2, d3, etc.), turn the rotary cycle selector (knob) either clockwise or counter clockwise.
- When turning the rotary selector key (knob) in one direction, it shows diagnostic codes from the latest (d1).
- Now when turning the knob in the opposite direction it shows the diagnostic codes in the reverse order. E.g. When it stops at “d5” and then turn backwards, it shows from “d4” to “d”. (Refer to Diag. Code interpretation).

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
	
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

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. - Check it after the water level sensor and the connector are connected. Checking Part : Blue Color Wire Orange Color Wire - 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. 
Water Supply Error	4E	- 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	- Check the resistance for the water supply valve. - Resistance : 0.9KΩ to 1.1KΩ between the terminals of the Water Supply Valve. - Check whether there is foreign material in the Water supply valve filter. 
Drain Error	5E	- 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.	
Switch Error (Main Relay Error)	bE2	• 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 "bE2" 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	dE1 dE	• 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.[dE Error] In state of Door Close, Check Reed SW Resistance.[dE1 Error] In state of Door Unlock, Check Motor Resistance. And In state of Door Lock, Check Door Lock Contact Resistance.[dE1 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. Lock Unlock

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	UE	• 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.	-

Additional Error codes

9E1/9E2	High/Low voltage detected.	Restart the cycle. If the code reappears, call customer service.
AE	A Communication error between the SUB(Sensor) PBA and the MAIN PBA	Call customer service.
AE4	A Communication error between the WIFI PBA and the MAIN PBA	Call customer service.
AE3	A Communication error between the DR Module and the MAIN PBA	Call customer service.
AE5	A Communication error between the LCD PBA and the MAIN PBA	Call customer service.
AE6	A Communication error between the Inverter PBA and the Main PBA	Call customer service.
8E	A MEMS sensor problem.	Call customer service.
SF1 SF2 SF3	A system error	Call customer service.

Foaming Detected	SUdS	- This occurs when too much foaming is detected. It is also displayed while foaming is removed. When the removal is finished, the normal cycle proceeds. "Sud" or "SUdS" is displayed when too much foaming is detected and "End" is displayed when the removal of the foaming is finished. (This is one of the normal operations. It is an error for preventing non-sensing faults.)	
Mems PBA Error Detected	8E1	- Error detected in the Mems PBA or data error detected. Check the wire connections. Replace if necessary. 1. Check the wire connections. 2. Replace the Mems PBA.	
	8E2		
	Sd 8E		
System Error	SF1	- Micro Controller Operation Fail.	Replace Assy PCB.
	SF2		
	SF3		

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 electrical problem in drain system, “NO Draining” error will occur after 15 minutes.)
- Check Water Supply.
- Check the line or water valve screen filter.
- Check if PCB connectors are assembled LCD / LED properly.
- Check if CN6 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 standpipe for leak. Wrap a dry rag around the standpipe opening. If the rag becomes wet, the leak is the fault of home plumbing.
- 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 the rubber boot. Remove, reposition and reinstall, if necessary.
- Check for a possible kink in the dispenser hose to the outer tub. Hot water pressurization may force the door open

No Tumble

- Start normal cycle with an empty machine and allow a fill to check tumble.
- Perform Quick Spin Test. (Before test, make sure that the tumbler is empty.)
- Check for loose connections at Machine Control Board, Pressure Switch, Motor, Tech Harness and Motor Control.
- Check motor windings resistance. CN8 pins 1 & 3 = 11.6ohms $\pm 7\%$, Pins 1 & 2 = 11.6ohms $\pm 7\%$, Pins 2 & 3 = 11.6 ohms $\pm 7\%$
- Faulty Main Control Board.
- Faulty motor

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. (CN7,CN5,CN6)
- Check motor windings resistance. CN8 Pin1&3 = 11.6 ohms $\pm 7\%$, Pin1&2 = 11.6ohms $\pm 7\%$, Pin2&3 = 11.6 ohms $\pm 7\%$

No Water Fill

- Perform Quick Test Mode. Check all of the Water Valves visually. (Pre Wash Valve, Cold Water Valve, Bleach Water Valve, Softener dispenser using Cold & Bleach Water Valve, and Hot Water Valve.)
- Check if water taps are turned on fully.
- Check Water Valves and Water Level Sensor (Refer to PCB Connector Check)
- Check if there is any kink in inlet hoses.
- Check if inlet screens are clogged up.
- Check if 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 Water Valve Coil. (It should read 1.18K ohms. Check Pin # 1 of CN6 and PIN# 1, 2, 7, 8, 9 of CN1)
- Check Pressure S/W and PCB for loose connections. (Refer to PCB Connector Check).

Will Not Lock

- Door is not aligned or closed properly.
- Perform Quick Test Mode. Check Door Lock. Check the output voltage of Door Lock Coil. If it reads 120V, change Door Lock Switch, and if not, change PCB. (Refer to PCB Connector Check.)
- Read Lock Switch and PCB (CN6 & CN1). (Refer to PCB Connector Check.)
- Try Door Lock and check for 120V to Door Lock Connector. If 120V present, change Main Control Board and if not, change Door Lock switch.

Will Not Unlock

- Check if the door is being pushed out, which may keep it from unlocking.
 - Door locks itself when the water level is too high. Opening door will result in water draining from door opening.
 - Check the following with Board Input Test Mode. Water Level (frequency): Over 23.80 KHz. If so, refer to “Will Not Drain”.
- Temperature (Inside Drum): Higher than 60°C/140°F. If so, wait until it drops. When everything normal, check PCB connectors & Door Lock Switch.
- Drain manually after removing the plastic drain hose holder.
 - Display shows “The door will not unlock”. Turn unit off and on. If “The door will not unlock” keeps illuminating, check PCB & Door Lock Switch.
 - Read Lock Switch and PCB (RY7 & CN10). (Refer to PCB Connector Check.)
 - Perform Quick Test Mode. Check Door Lock. Check the output voltage of Door Lock Coil. reads 120V, change Door Lock Switch, and if not, change PCB. (Refer to PCB Connector Check.)

Will Not Drain

- Check for any kink on the drain hose. If any, straighten it 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. ($14.2 \pm 7\%$ Ohms)
- Check the pump at CN1(PIN3) 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.
- Make sure the domestic water heater is set to deliver water lower than 120°F (49°C) hot water at the tap. Also check water heater capacity and recovery rate.
- 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 level 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).

No Key Operation

- Option and Function buttons respond differently according to each cycle.
- Child Lock is being activated. To exit, hold down Soil Level Key and Signal 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.

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.

Checking the Inverter Board Test 1



Step 1: Put your **black** lead on the stator motor CN6 Pin1 and **Red** lead measure CN2 pin 1- 2 -3 -4 all measurements should be approx 4.6.

Step 2: Put your **black** lead on the stator motor CN6 Pin 1 and **Red** lead measure CN1 pin 1-2-3 all measurements should be approx 4.6.

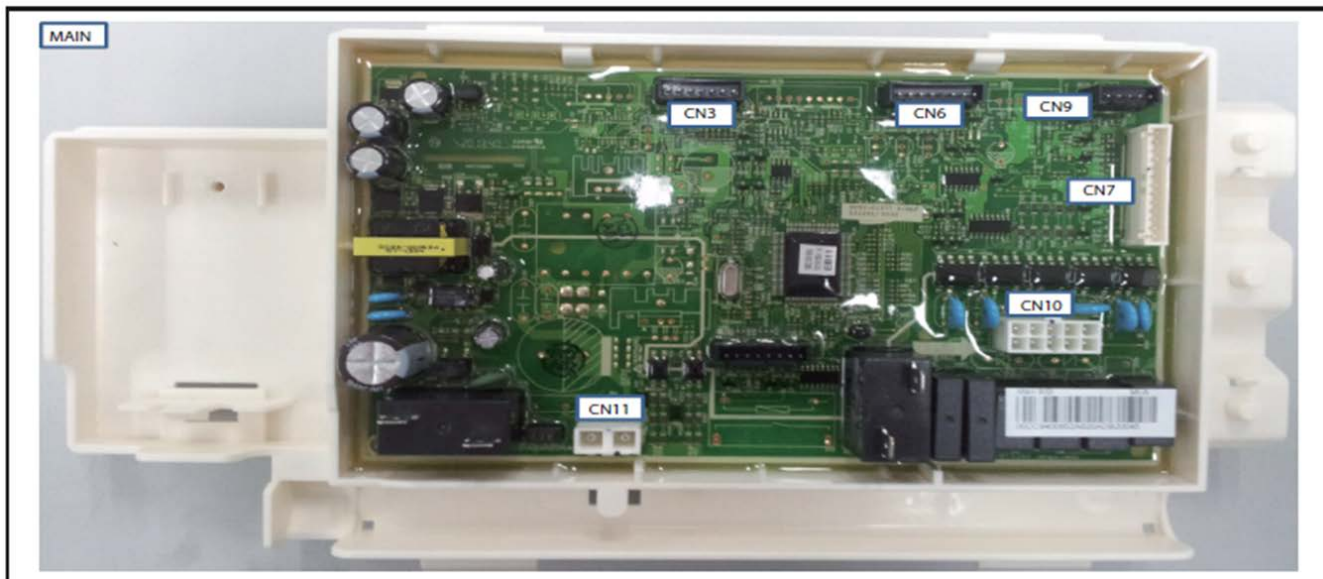
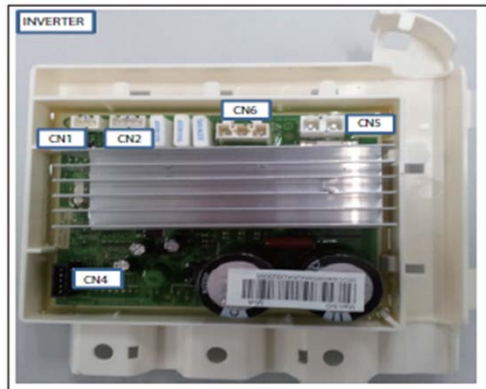
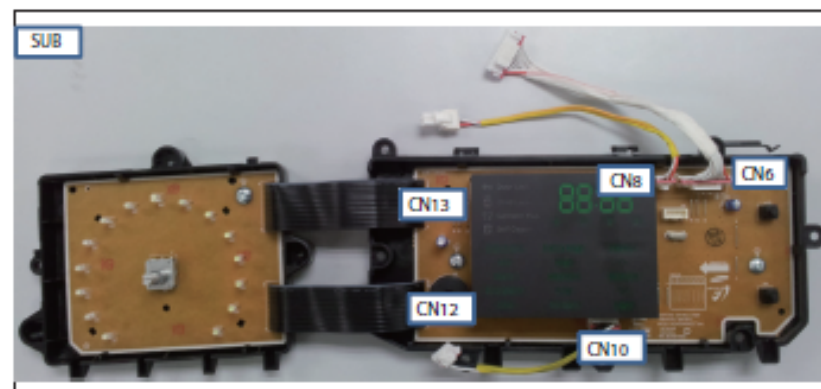
Step 3: Move the **black** lead to CN6 Pin2 and repeat steps above.

Step 4: Move the **black** lead to CN6 Pin3 and repeat steps above.

All measurements should be around 4.6 ohms.

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.



Door Lock Check (MAIN)

Check Voltage at Pin #2 of CN10 and Pin #3 of RY7
When Drain Motor operates = AC 120V

Drain Motor Check (MAIN)

Check Voltage at Pin #5 of CN10 and Pin #3 of RY7
When Drain Motor operates = AC 120V

CIRCLE Motor Check (MAIN)

Check Voltage at Pin #4 of CN10 and Pin #3 of RY7
When Circulation Motor operates = AC 120V

Water Valve Check (MAIN)

Check Voltage at Pin #10 of CN10 and Pin #3 of RY7
When Circulation Motor operates = AC 120V

AC Power Check (MAIN)

Check Voltage at Pin #1 of CN11 and Pin #4 of Power RY7
Tester Check = AC 120V

Wash Heater Relay Check (MAIN)

Check Voltage at Pin #3 of RY2 and Pin #3 of RY7
When Heater Relay operates = AC 120V

Hall Sensor Check (INVERTER)

Check Voltage at Pin #4 and #2 of CN2
Tester Check = DC 0V or 1.3V
Check Voltage at Pin #4 and #3 of CN2
Tester Check = DC 0V or 1.3V

Motor Check (INVERTER)

Resistance at Pin #1 and #2 of CN6 = 12Ω
Resistance at Pin #1 and #3 of CN6 = 12Ω
Resistance at Pin #2 and #3 of CN6 = 12Ω

