Fast Track Troubleshooting

Model: WA50K8600
WA45K7600

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.

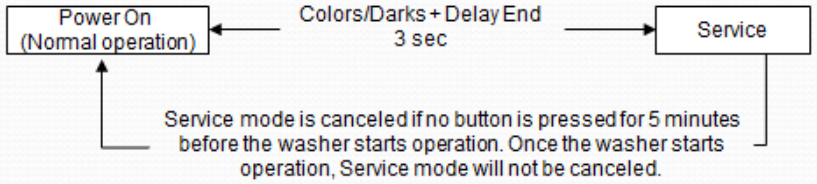
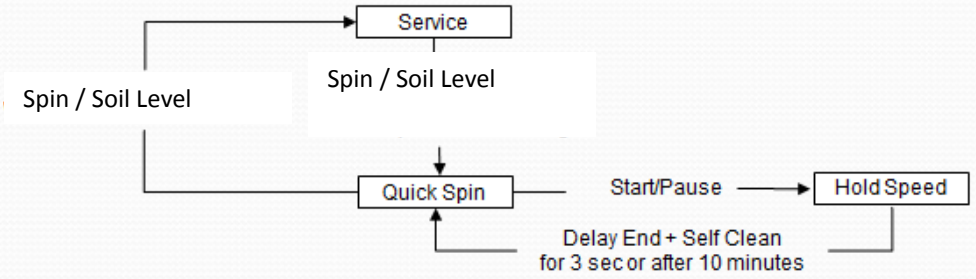
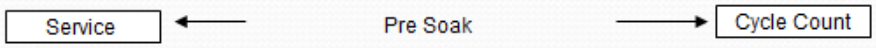
Publication #DR-
Production date: 6-1-16

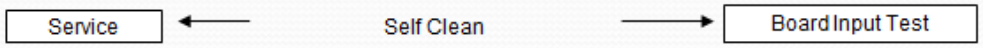
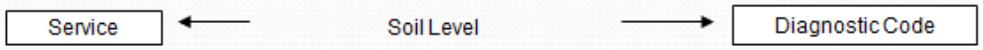
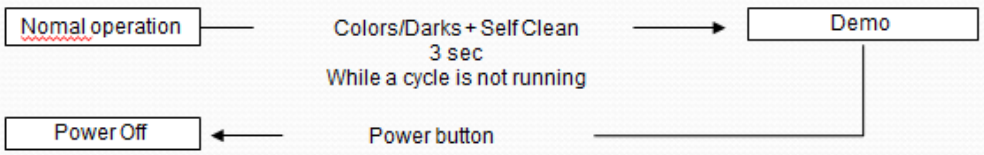
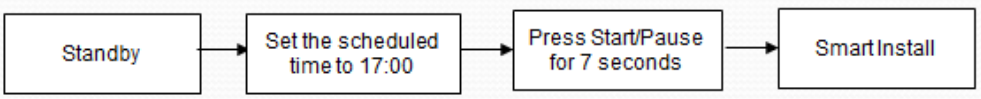
Support Information:
HELP: 1-888-751-4086 (Tech Sup. – ASC/SSD) - 1-866-894-0637 (Tech Sup. - FE/ME)
GSPN: http://gspn3.samsungcsportal.com/main.jsp
E-Learning: samsungasc.earlyconnect.com
MCP & E-Learning Support: **1-800-749-9421 – e-learning@sea.samsung.com**

Quick Test Mode

Unlock Test Mode= Temp + Soil level + Power (02 will display) Power off and enter test mode after unlocking

No	Mode	How to enter
1	Quick Test	Quick Test → - All LEDs On for 30 sec (include 7-Segment) - S/W Version displayed - Test all devices using buttons Spin + Soil Level + Power Spin: Drain Pump Test Soil Level : Heater Test

No	Mode	How to enter
2	Service	
3	Quick Spin Test	
4	Cycle Count Check	
5	S/W Version Check	

No	Mode	How to enter
6	Fast Time Down Test	
7	Board Input Test	
8	Diagnostic Code Check	
9	Demo	
10	Smart Install	

Unit Self diagnosis

1.1 Smart Install

• After installing a washing machine or after repair, a mode to verify that the installation has been completed successfully.

1.2 How to enter Smart Install

• Plug the power cord in and turn on the washing machine power by pressing the power button.
• Click the Delay End Button to set the time to "17:00".
• Press and hold the Start/Pause button for 7 seconds, until “AS" appears, you are now in Smart Install mode state.
• Press Start/Pause button to operate in automatic mode.
• Press Delay End button on the display state AS , operate in passive mode.

1.3 Smart Install automatic mode

• Automatically to activate all the sub-mode of the Smart Install. (Start / Pause button)

Sub Mode	Description
1	Progress door lock test
2	Progress drain pump operation test
3	Progress preliminary valve and bleach valve operation test
Co	Progress cold water valve operation test
Ho	Progress hot water valve operation test
6	Progress wash heater operation test
	Progress rinse operation test
7	Progress drain pump operation test
8	Progress spin operation test
9	Progress dry heater and drying fan operation test
10	Progress door unlock test
Ot(OK)	Smart Install automatic mode normally end

1.4 Smart Install manual mode

• In manual mode (Delay End), each time you press the Delay End button, to go into the next step.

Sub Mode	Description
1	Progress door lock test
2	Progress drain pump operation test
3	Progress preliminary valve and bleach valve operation test
Co	Progress cold water valve operation test
Ho	Progress hot water valve operation test
6	Progress wash heater operation test
	Progress rinse operation test
7	Progress drain pump operation test
8	Progress spin operation test
9	Progress dry heater and drying fan operation test
10	Progress door unlock test
Ot(OK)	Smart Install automatic mode normally end

1.5 Smart Install end display

• If you enter the reservation (if there is no reservation button use Delay End) + Start / Pause button on the display states “AS"
• When Smart Install ends normally, it displays the "Ot (OK)".
• When Smart Install ends abnormally, or did not run it displays the “nG".

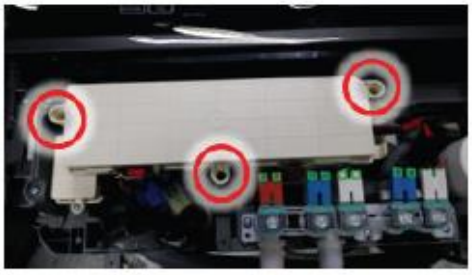
1.6 S/W version display

• Press farthest to the left button on the “AS" is displayed, you may see the S/W version.

1.7 Error code information display

• Press farthest to the right button in the “AS" display status, error code information display mode is activated and displays "Er".
• Rotation jog dial
• Rotate the Jog Dial in the CW direction and show a total of seven errors from last saved error, if one wheel to cycle marked by "Er", you can recognize the error code sequence.
-1 : Error Code - 2 : Course ID - 3 : Water Frequency - 4 : Water Temperature - 5 : Air Temperature - 6 : Spin Drum RPM - 7 : Progress - 8 : Step
- 9 : An error at the time of cycle count 10 : Total cycle count

Disassembly

Part	Figure	Description
	  	1. Remove the 2 screws holding the Cover T.C assembly. 2. Separate the both hooks. (Left and Right) 3. Separate the cover panel upward. If it is difficult to disassemble, Push Forward to disassemble hooks. (Be careful damage of hooks.)
Sub and Main PCB Assembly		4. Remove the 3 fixing screws and Seperate a connector on backside. When reassembling the PCB, take care that you do not damage the control-panel fixing hook. After replacing the sub PCB, check the key operation.
	 	5. Separate the cover pcb(m) and the wires connected to the main PBA. After reassembling the housing, check if the wires are properly connected. When disassembling and reassembling the housing, take care that you do not damage the part.

Troubleshooting Errors *1C , 5C *

1C Error - Water Level Sensor

Check Point Water level sensor/Harness/Sub PCB

Causes

① Faulty Water Level Sensor
② Sensor not connected properly
③ Sub PCB

Step 1

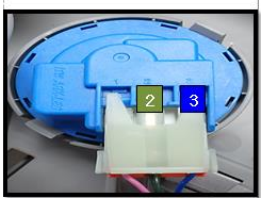
① Check the water level sensor terminal connections and contacts

② Check for torn or damaged wiring to pressure sensor

③ With pressure sensor connector removed, measure resistance of pressure sensor terminals
→ Pin 1 to 2 - open
→ Pin 1 to 3 - approx. 21 Ω
→ Pin 2 to 3 - open

Step 2

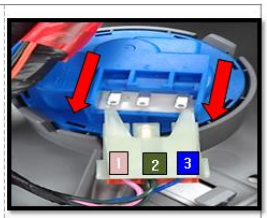
① Reinstall pressure sensor connector and check the frequency of the water level sensor with the washer on and the tub empty (no water)
→ Pin 2 to 3 - approx. 25.2KHz



Step 3

① Remove Sensor connector, turn on the washer and measure DC voltage at the connector
→ Pins 1 to 2 - approx. 2.5VDC
→ Pins 2 to 3 - 2.5VDC

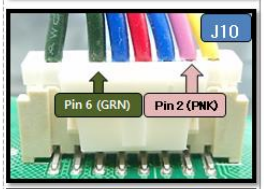
② If a voltage is missing or is out of range follow **step 4**

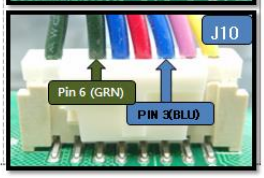


Step 4

① Leave Sensor connector removed with the unit on and check the water level sensor voltage supply at Sub PCB connector J10
→ Pin 2 to 6 - approx. 2.5VDC
→ Pin 3 to 6 - approx. 2.5VDC
→ Follow next step if missing or out of range

② Remove connector J10 from the Sub PCB and measure DC voltage going to the temperature sensor at the Sub PCB
→ Pin 2 to 6 - approx. 2.5VDC
→ Pin 3 to 6 - approx. 2.5VDC
→ If voltage is present and missing at sensor terminal, replace harness
→ If voltage is missing at the Sub PCB, replace the Sub PCB





5C Error-Drain Error

Check Point Drain Pump/Foreign material in Drain Pump/Frozen During Winter

Causes

① Foreign materials in drain pump
② Drain hose bent or kinked
③ Drain pump defective
④ Main PCB fault

Step 1

① Remove filter and check for lint build up or foreign objects.
→ Remove debris and test unit to see if it drains properly

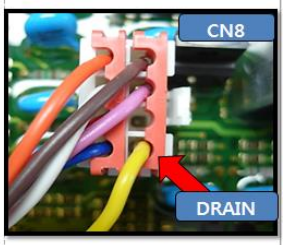
② Check behind the unit to verify proper routing of the drain hose
→ If hose is kinked re-arrange to prevent drain restrictions

③ Remove drain pump and check if foreign objects are stuck on the impeller.

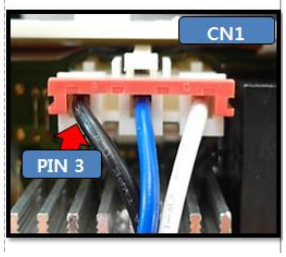
Note: *if unit is draining properly, no water on the tub after drain is completed and still get a drain error, check the water pressure sensor*

Step 2

① Remove power to the unit and measure resistance of the drain pump at the Main PCB connector CN8 pin 5 (yellow) and connector CN1 pin 3(black).
→ Approx. - 13.5Ω to 16.5Ω
→ If meter measures open, check harness
→ If harness is ok, replace drain pump.



② Measure voltage output from the Main PCB to the drain pump at the Main PCB connector CN8 pin 5(yellow) and connector CN1 pin 3 (black) only when in drain mode
→ 120VAC
→ If missing or out of range, replace the Main PCB.



Troubleshooting Errors *3C*

3C Error- Wash Motor Error/Hall Sensor Error

Check Point Wash Motor/Motor Hall Sensor/ Wire Harness

Causes

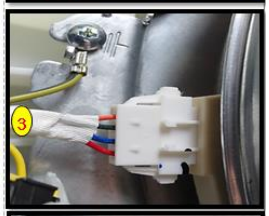
① Bad connections to the motor
② Faulty Wash Motor
③ Faulty Hall Sensor
④ Defective rotor or stator
⑤ Main PCB defective

Step 1

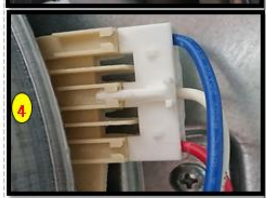
Check Motor and Hall Sensor connections

① Hall sensor connector properly seated at the Main PCB

② Motor connector properly seated at the Main PCB



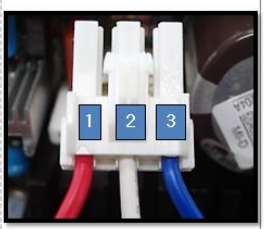
③ Hall sensor connector at motor Stator



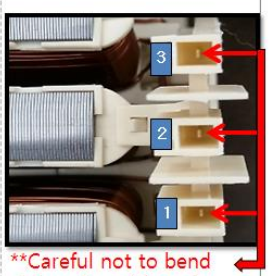
④ Motor connector at stator

Step 2

① Remove stator connector CN3 at Main PCB and measure resistance of the terminals
→ Pins 1 to 2 approx. 10Ω~13Ω
→ Pins 1 to 3 approx. 10Ω~13Ω
→ Pins 2 to 3 approx. 10Ω~13Ω
→ follow next step If reads abnormal



② Remove stator connector from stator and measure resistance.
→ Pins 1 to 2 approx. 10Ω~13Ω
→ Pins 1 to 3 approx. 10Ω~13Ω
→ Pins 2 to 3 approx. 10Ω~13Ω
→ Replace stator if resistance is out of range
→ If resistance is within range at stator and abnormal at the Main PCB connector, replace harness



Careful not to bend stator pins with meter leads

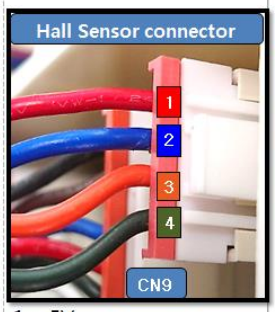
Step 3

① Measure DC voltage at the hall sensor connector CN9 on the Main PCB between
→ Pins 1 to 4 - 5VDC

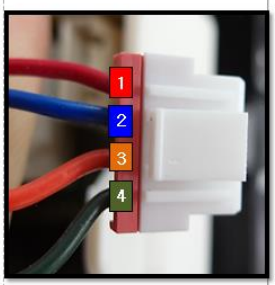
② Measure DC voltage on CN9 between Signal A to Ground
→ Pin 2 to 4 approx. - 0V~1.1V
→ Turn the tub by hand and voltage should fluctuate between 0V~1.1V
→ If missing or abnormal, check harness, if harness is ok, replace Stator

③ Measure DC voltage between Signal B to Ground
→ Pin 3 to 4 approx. - 0V~1.1V
→ Turn the tub by hand and voltage should fluctuate between 0V~1.1V
→ If missing or abnormal, check harness, if harness is ok, replace Stator

④ Remove power to the washer, then remove hall sensor connector from the Main PCB and measure resistance
→ Pins 1 to 2 - approx. 4.6KΩ
→ Pins 1 to 3 - approx. 4.6KΩ



1. 5V
2. Signal A
3. Signal B
4. Ground



Step 4

① Check rotor to see if any foreign object is restricting it from turning smoothly ex. A screw from the cabinet attracted to the magnet.

② Overloading unit with too much laundry can cause restriction to the motor causing a 3C error. Hall sensor is going read a lower than expected RPM triggering an error code.

Troubleshooting Errors *4C* *4C2*

4C Error- Water Supply Error

Check Point Water Supply Valve/Main PCB/Frozen During Winter

Causes

① Damaged harness
② Water supply valve fault
③ Frozen water supply during winter
④ Main PCB fault
⑤ Pressure sensor hose

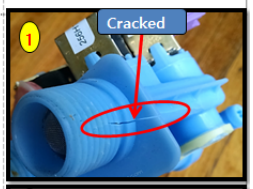
Step 1

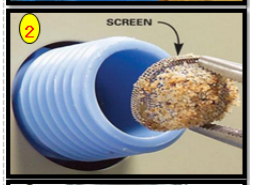
① Check for any physically damaged valves

② Look for any clogged valves.
→ Water calcification can cause restriction on water flow

③ A 3C error code can be caused by a flood safe water supply line previously installed.
→ Flood safe water hose can sometimes shut off the water supply even if there is not a leak

④ Frozen Valve during extreme cold weather conditions.
→ During extreme cold weather conditions, valves can freeze causing restriction to water flow
→ Advise customer to have unit installed at an appropriate location or this can cause valves to crack and leak when temperature rises and ice melts on the valve

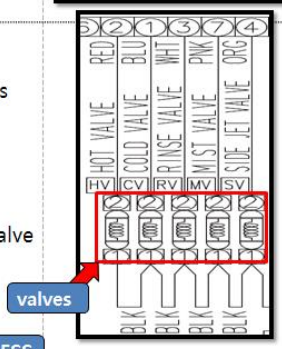




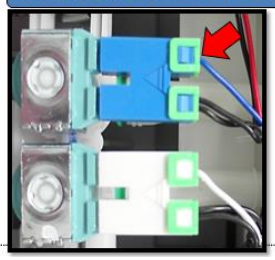
Step 2

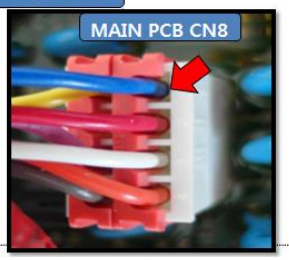
① Visually inspect water valve harness for damaged or torn wire
→ Repair or replace harness if damaged

② On the Main PCB connector CN8, locate the wire belonging to the valve you want to check and measure continuity
→ Continuity or less than 5Ω



EX. CHECKING THE COLD VALVE HARNESS

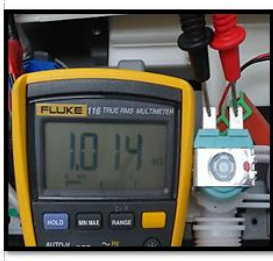


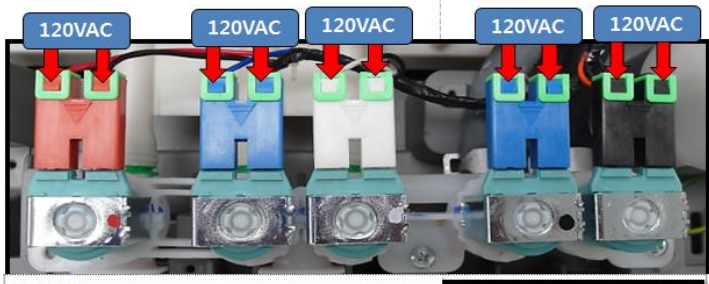


Step 3

① Check resistance across each valve terminal
→ Approx. - .09KΩ to 1KΩ

② When valve is operating, measure the voltage output of the Main PCB at the valve after verifying wire harness condition
→ 120VAC at valve terminal only when valve is activated
→ Replace Main PCB if 120VAC is not present





Step 4

① Visually inspect every inch of the pressure sensor hose for any damage or small holes.
→ Hose could have a very small hole and might be hard to notice unless you do a thorough inspection
→ Replace pressure sensor hose if damaged

② Check to make sure terminal is properly connected to the water level sensor

4C2 Error- Water Supply Error

Check Point Water Supply lines

Causes

① Reversed water supply
② Temperature sensor
③ Main PCB fault

Step 1

① Verify that water supply hoses are connected to the right valve

② Turn the washer on and start a cycle. Make sure that cold water is running into the cold water inlet and hot water into the Hot water inlet

③ Measure the temperature sensor resistance at room temperature
→ 13.5 kΩ at room temp

Troubleshooting Errors *UB/9C1/9C2/AC/BC2/DC*

UC/9C1/9C2 Error- Supply voltage error

Check Point Wall outlet/Power cord/Main PCB

Causes

① Supplied voltage lower than 110VAC
② Damaged power cord

Step 1

① Measure the voltage coming into the filter

② Check the output voltage of the filter, should be same as input, if output is abnormal, replace the filter

③ Check the frequency output of the filter, should be 60Hz

Note: if the incoming voltage and frequency to the Main PCB is normal, replace the Main PCB

DC Error - Door Open Error

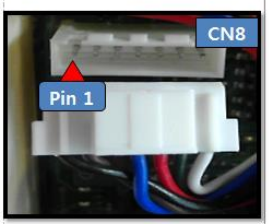
Check Point Door Switch/Switch Harness/Main PCB

Causes

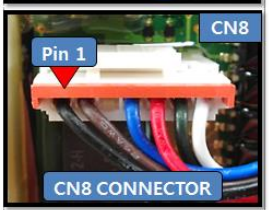
① Door Lock
② Damaged harness
③ Main PCB

Step 1

① Remove connector CN8 and measure DC voltages going to the lock switch
→ Pin 1 to 3 - approx. 12V
→ Pin 3 to 7 - approx. 5V
→ Replace Main PCB if voltage is missing



② Reconnect connector to CN8 and measure DC voltage going to the door lock reed switch pin 3 and 6
→ Door closed - approx. 5V
→ Door open - 0V
→ Check harness to the lock switch reading is abnormal
→ Replace door lock if harness is in good condition



Note: if sound is enabled on the washer, it makes a "ding" sound when you open and close the door

► CN8
1. DOOR LOCK MOTOR (+)
2. DOOR LOCK MOTOR (-)
3. GND
4. UNLOCK_CONTACT
5. LOCK_CONTACT
6. REED S/W
7. 5V_1

AC Error- Communication Error

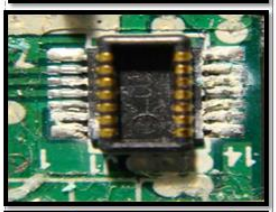
Check Point Main PCB/Sub PCB/Wire harness

Causes

① The signals between the Sub and Main PCB are not sensed
② Misconnection between the Sub and Main PCB.

Step 1

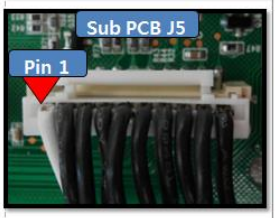
① Visually inspect the Sub PCB for moisture or water damage
→ Spilled detergent on the control panel can cause damage to the board causing communication errors



② Make sure connector CN5 at the Main PCB and J5 at the Sub PCB are properly seated

► CN5
1. CLUTCH SENSING
2. WATER LEVEL
3. STANDBY
4. TX
5. RX
6. SUB_RESET
7. 5V
8. GND
9. 12V
10. POWER ON

Verify output to Sub PCB

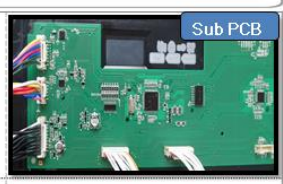


BC2 Error- Stuck button error

Check Point Sub PCB/Wire harness/Main PCB

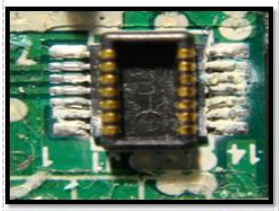
Causes

① Stuck button
② Defective Sub PCB



Step 1

① Check if the control panel is responding properly

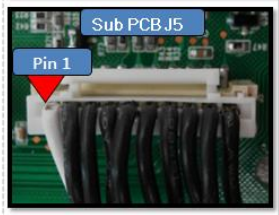


② Inspect the control panel for any damage that might be pressing down on a button
→ Any spills on the control panel can cause a malfunction to the touch panel

③ Visually inspect connector to make sure is connected properly to Sub PCB terminal

► CN5
1. CLUTCH SENSING
2. WATER LEVEL
3. STANDBY
4. TX
5. RX
6. SUB_RESET
7. 5V
8. GND
9. 12V
10. POWER ON

Verify output to Sub PCB



Troubleshooting Errors *DC1 / TC1 / TC2 / TC4 / LC / LC1 / OC*

DC1 Error - Door Lock Error

Check Point Door Switch/Switch Harness/Main PCB

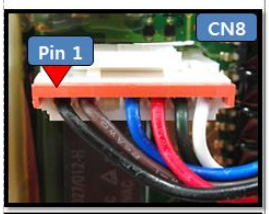
Causes

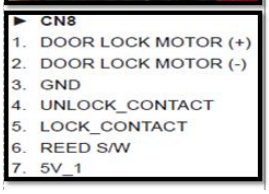
① Door Lock
② Damaged harness
③ Main PCB

Step 2

① Measure DC voltage going the unlock contact pins 3 and 4
→ Door unlocked - 5V
→ Door locked - 0V
→ Check harness if out of range
→ If harness is good, replace door lock

② Measure DC voltage going to the lock contact pins 3 and 5
→ Door locked - 5V
→ Door unlocked - 0V
→ Check harness if out of range
→ If harness is good, replace door lock





TC1/TC2/TC4 Temperature sensor Error

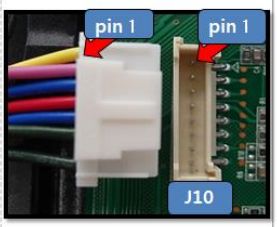
Check Point Temperature sensor

Causes

① Temperature sensor fault
② Temperature sensor disconnected
③ Damaged harness
④ Sub PCB

Step 1

① Verify that temperature sensor is properly connected at the connector and on the Sub PCB connector J10



① Check the supply voltage going to Temperature sensor at the Sub PCB J10
→ Pin 1 to 6 - approx. 5VDC
→ If missing replace Sub PCB

② Measure temperature sensor resistance on connector J10 of the Sub PCB
→ Pin 1(yellow) and 6(green) - approx. 68KΩ at room temp
→ If meter reads no resistance, check harness
→ If harness is not damaged, replace Temperature sensor

LC/LC1 Error-Water Leakage Error

Check Point Pressure sensor hose

Causes

① Damaged water pressure sensor hose
② Pressure sensor hose not connected properly

Step 1

① Visually inspect every inch of the pressure sensor hose for any damage or small holes.
→ Hose could have a very small hole and might be hard to notice unless you do a thorough inspection
→ Replace pressure sensor hose if damaged

② Verify that pressure sensor hose is properly connected to the pressure sensor and to the washer tub.

OC Error-Overflow Error

Check Point Pressure sensor hose/ Water level sensor/harness

Causes

① Broken Water pressure sensor hose

② Faulty water pressure sensor

Step 1

① Visually inspect every inch of the pressure sensor hose for any damage or small holes.
→ Hose could have a very small hole and might be hard to notice unless you do a thorough inspection
→ Replace pressure sensor hose if damaged

② Check to make sure terminal is properly connected to the water level sensor

③ During the winter season, if the pressures sensor water hose freezes, it can also cause an OC Error.

④ OC overflow error occurs when water level detection does not work and water is supplied to unit continually.
→ If the pressure sensor, hose and harness checks out ok, replace the Main PCB

Troubleshooting Errors *UB / SUD*

UB Error-Unbalance Error

Check Point Laundry contents/improper installation

Causes

① Improperly loaded laundry
② Uneven basket
③ Defective damper

Step 1

① Check how the consumer is loading the washer
→ Instruct the customer to press pause, reposition the load or remove a few items and press start to resume wash cycle

② Make sure the unit is properly level and that floor where unit is installed is solid and even

③ Inspect dampers for any physical abnormalities

④ UB occurs when the hall sensor reads abnormal spinning of the tub and does not indicate a defective hall sensor.

⑤ Find the source causing the unit to be unbalance: improperly loaded laundry, unit not leveled due to uneven floor, broken or bent leg

SUD Error-Over suds error

Check Point Detergent use

Causes

① Too much detergent
② Wrong detergent type being used

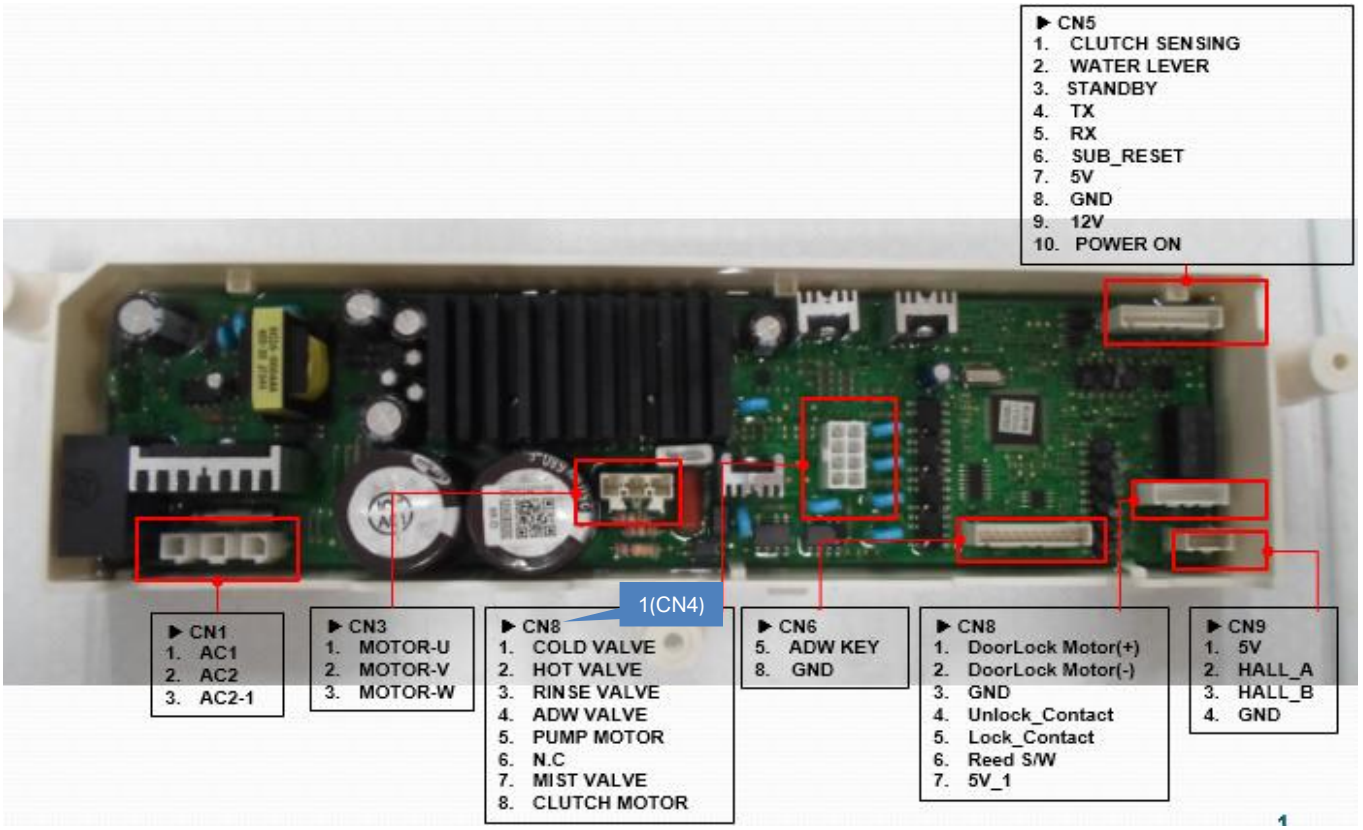
Step 1

① Instruct customer to use the proper amount of detergent as indicated by the detergent manufacturer.

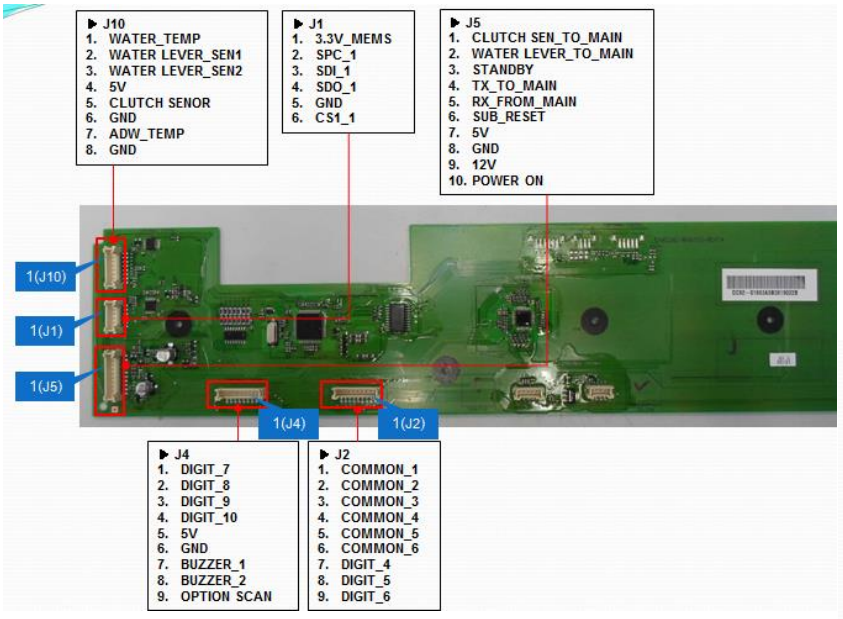
② Use detergent type as indicated by the owner's manual, HE (high efficiency) or regular detergent.

③ The only source of having too many suds on the washer is adding too much soap or using the wrong type of detergent.

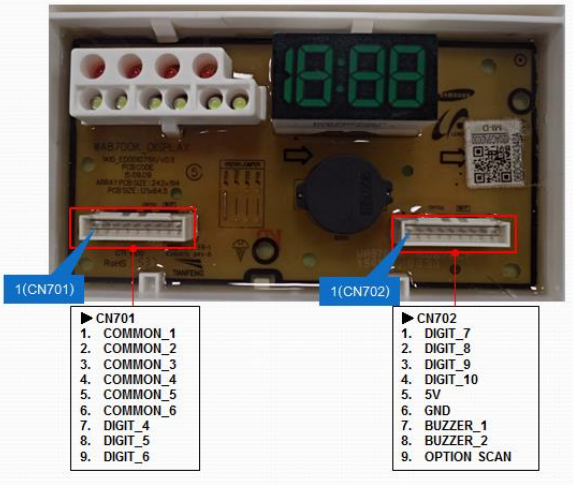
Main



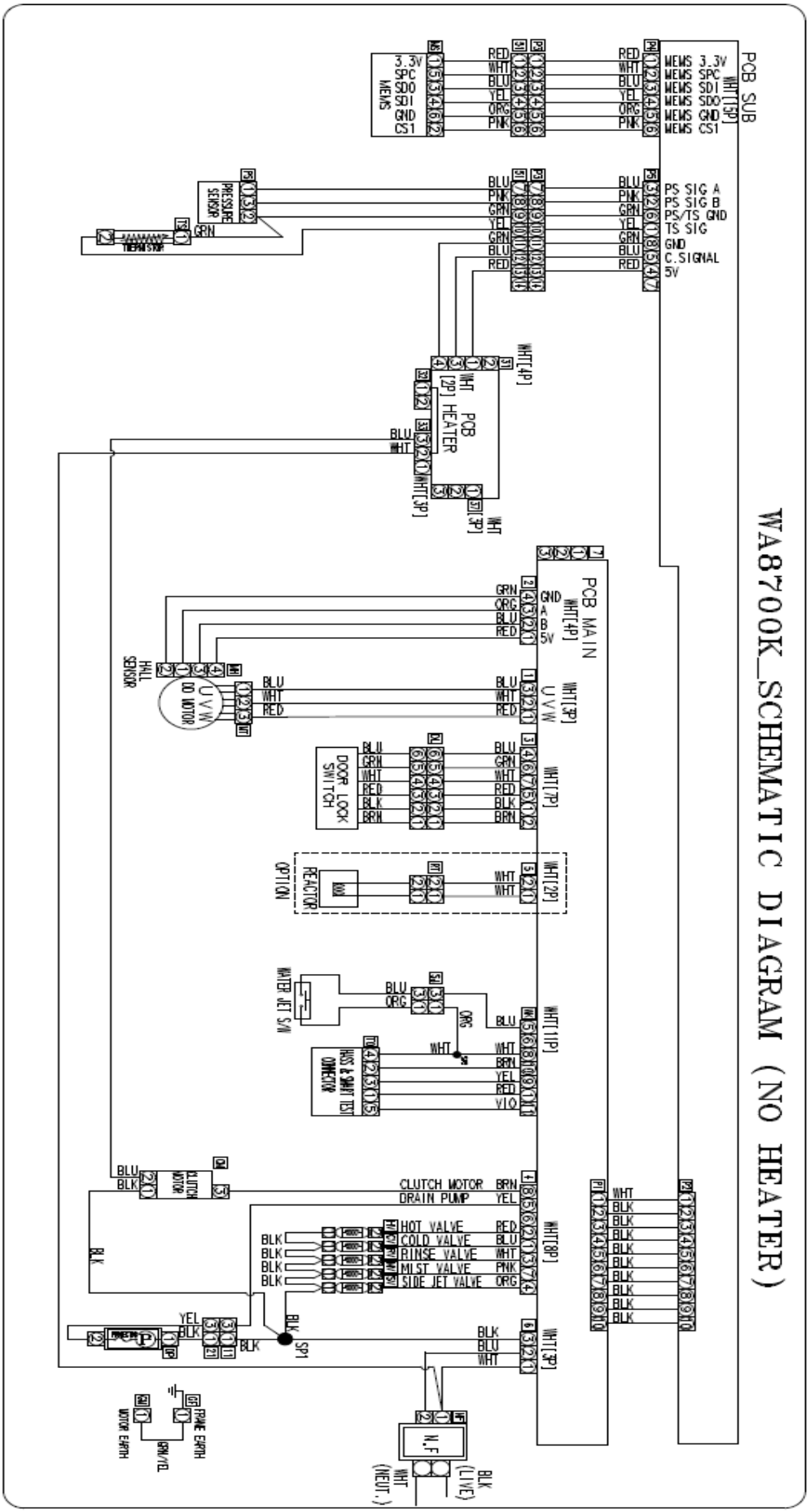
Touch PCB



Display



Wire Diagram



Reference

PROBLEM	SOLUTION
Will not start.	• Make sure the door is firmly closed. • Make sure your washer is plugged in. • Make sure the water source faucets are open. • Make sure to press the Start/Pause Button to start your washer. • Make sure the Child Lock is not activated. See page 24. • Before your washer starts to fill, it will make a series of clicking noises to check the door lock and do a quick drain. • Check the fuse or reset the circuit breaker
Has no water or not enough water.	• Turn both faucets on fully. • Make sure the door is tightly closed. • Straighten the water inlet hoses. • Disconnect hoses and clean the screens. Hose filter screens may be clogged. • Open and close the door, then press the Start/Pause Button.
Has detergent remains in the automatic dispenser after the wash cycle is complete.	• Make sure your washer is running with sufficient water pressure. • Make sure the Detergent Selector dial is in the upper position when using granular detergent.
Vibrates or is too noisy.	• Make sure your washer is set on a level surface. If the surface is not level, adjust your washer feet to level the appliance. • Make sure that the shipping bolts are removed. • Make sure your washer is not touching any other object. • Make sure the laundry load is balanced.
Stops	• Plug the power cord into a live electrical outlet. • Check the fuse or reset the circuit breaker. • Close the door and press the Start/Pause Button to start your washer. For your safety, your washer will not tumble or spin unless the door is closed. • Before your washer starts to fill, it will make a series of clicking noises to check the door lock and do a quick drain. • There may be a pause or soak period in the cycle. Wait and it may start. • Check the screens on the inlet hoses at the faucets for obstructions. Clean the screens periodically.
temperature water.	• Make sure the temperature selection is correct. • Make sure the hoses are connected to the correct faucets. Flush water lines. • Check the water heater. It should be set to deliver a minimum 120 °F (49 °C) hot water at the tap. Also check the water heater capacity and recovery rate. • Disconnect the hoses and clean the screens. The hose filter screens may be plugged. • As your washer is filling, the water temperature may change as the automatic temperature control feature checks incoming water temperature. This is normal. • While your washer is filling, you may notice just hot and/or just cold water going through the dispenser when you have selected cold or warm wash temperatures. This is a normal function of the automatic temperature control feature as your washer determines the temperature of the water.
Door locked or will not open.	• Press the Start/Pause Button to stop your washer. • Your washer door will remain locked during the heating portion of the Sanitize Cycle. • It may take a few moments for the door lock mechanism to disengage.
Does not drain and/or spin.	• Check the fuse or reset the circuit breaker. • Straighten the drain hoses. Eliminate kinked hoses. If there is a drain restriction, call for service. • Close the door and press the Start/Pause Button. For your safety, your washer will not tumble or spin unless the door is closed. • Make sure the debris filter is not clogged.
Load is too wet at the end of the cycle.	• Use the High or Extra High spin speed. • Use high efficiency detergent to reduce over-sudsing. • The load is too small. Very small loads (one or two items) may become unbalanced and not spin out completely.
Leaks water.	• Make sure the door is firmly closed. • Make sure all hose connections are tight. • Make sure the end of the drain hose is correctly inserted and secured to the drainage system. • Avoid overloading. • Use high efficiency detergent to prevent over-sudsing.
Has excessive suds.	• Use high efficiency detergent to prevent over-sudsing. • Reduce the detergent amount for soft water, small or lightly soiled loads. • Non-HE detergent is NOT recommended.
Has an odor.	• Excessive suds collect in nooks and crannies and can cause foul odors. • Run cleansing cycles to sanitize the machine periodically. (Sanitize Cycle or Self Clean+) • Clean the door seal (Diaphragm). • Dry the interior of your washer after the total cycle has finished.