FOR SERVICE TECHNICIAN'S USE ONLY

⚠ DANGER

Electrical Shock Hazard

Only authorized technicians should perform diagnostic voltage measurements.

After performing voltage measurements, disconnect power before servicing.

Failure to follow these instructions can result in death or electrical shock.

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

Voltage Measurement Safety Information

When performing live voltage measurements, you must do the following:

- Verify the controls are in the off position so that the appliance does not start when energized.
- Allow enough space to perform the voltage measurements without obstructions.
- Keep other people a safe distance away from the appliance to prevent potential injury.
- Always use the proper testing equipment.
- After voltage measurements, always disconnect power before servicing.

IMPORTANT: Electrostatic Discharge (ESD) Sensitive Electronics

ESD problems are present everywhere. Most people begin to feel an ESD discharge at approximately 3000 V. It takes as little as 10 V to destroy, damage, or weaken the main control assembly. The new main control assembly may appear to work well after repair is finished, but a malfunction may occur at a later date due to ESD stress.

- **Use an anti-static wrist strap. Connect wrist strap to green ground connection point or unpainted metal in the appliance**

  -OR-

  Touch your finger repeatedly to a green ground connection point or unpainted metal in the appliance.
- **Before removing the part from its package, touch the anti-static bag to a green ground connection point or unpainted metal in the appliance.**
- **Avoid touching electronic parts or terminal contacts; handle electronic control assembly by edges only.**
- **When repackaging main control assembly in anti-static bag, observe above instructions.**

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.

Contents

WHIRLPOOL CONTROL PANEL (features and appearances may vary between models)

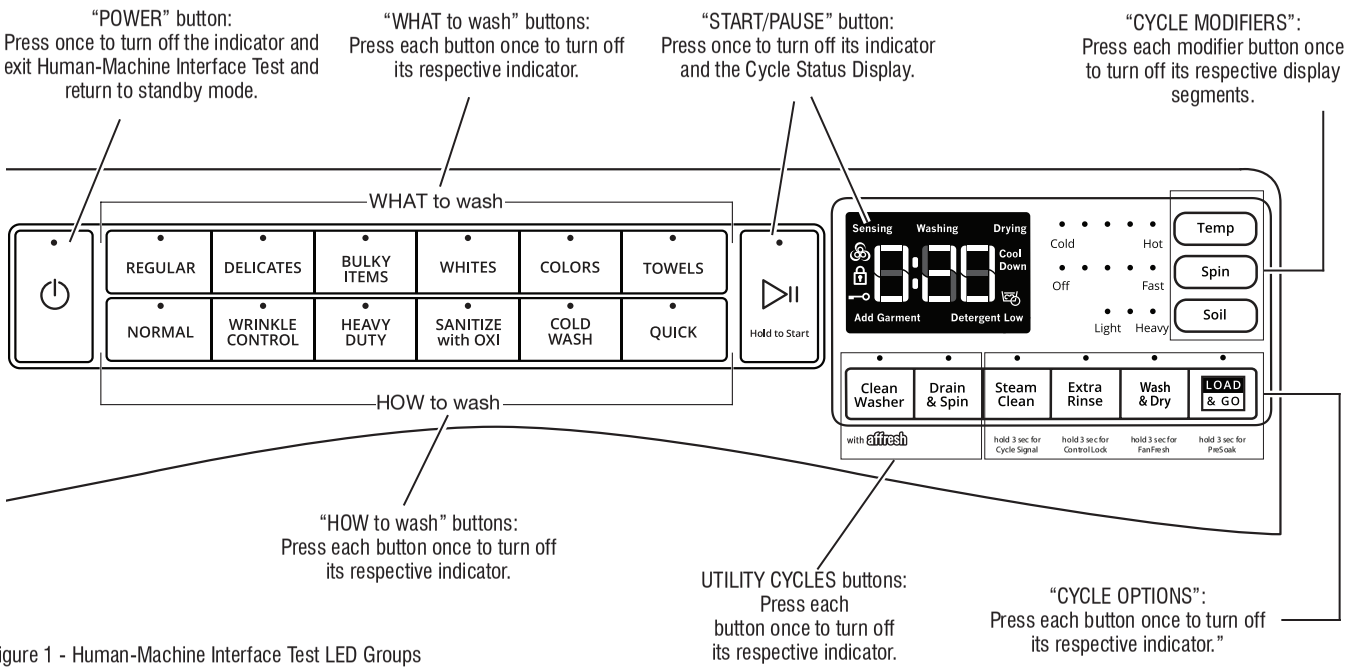


Figure 1 - Human-Machine Interface Test LED Groups

ABBREVIATIONS

ACU: Appliance Control Unit
IF: Interference Filter
HMI: Human-Machine Interface (PCB & housing)

DIAGNOSTIC GUIDE

Before servicing, check the following:

- Make sure there is power at the wall outlet.
- Has a household fuse blown, or circuit breaker or GFCI tripped? Was a regular fuse used? Inform customer that a time-delay fuse is required.
- Are both hot and cold water faucets open and water supply hoses unobstructed?
- Make sure drain hose is not sealed into drain pipe, and that there is an air gap for ventilation.
- All tests/checks should be made with a VOM (volt-ohm-milliammeter) or DVM (digital-voltmeter) having a sensitivity of 20,000 Ω per volt DC or greater.
- Resistance checks must be made with washer unplugged or power disconnected.
- **IMPORTANT:** Avoid using large diameter probes when checking harness connectors as the probes may damage the connectors upon insertion.
- Check all harnesses and connections before replacing components. Look for connectors not fully seated, broken or loose wires and terminals, pin insertion, or wires not pressed into connectors far enough to engage metal barbs.
- A potential cause of a control not functioning is corrosion or contamination on connections. Use an ohmmeter to check for continuity across suspected connections.
- **IMPORTANT:** Voltage checks must be made with all connectors attached to the boards. When checking line voltage, always complete the following steps: 1. Unplug washer or disconnect power. 2. Connect voltmeter to proper connectors. 3. Plug in washer or reconnect power and verify voltage. 4. Unplug washer or disconnect power.

SERVICE DIAGNOSTIC MODE

These tests allow service personnel to test and verify all inputs to the machine control electronics. You may want to do a quick and overall checkup of the washer with these tests before going to specific troubleshooting tests.

ACTIVATING SERVICE DIAGNOSTIC MODE

1. Be sure the washer is in standby mode (plugged in with all indicators off).
2. After initial power is applied, wait 30 seconds before activating Service Diagnostic mode.
3. Select any three (3) buttons (except POWER) and follow the steps below, using the same buttons. Remember the buttons and the order that the buttons were pressed.

Within 8 seconds,

- Press and Release the **1st** selected button,
- Press and Release the **2nd** selected button,
- Press and Release the **3rd** selected button;
- Repeat this 3 button sequence 2 more times.

4. If the Service Diagnostic mode has been entered successfully, all indicators on the console are illuminated for 5 seconds with "888" or "88" showing in the Estimated Time Remaining seven-segment display. If there are no saved fault codes, all indicators on the console will momentarily turn off and then only the seven-segment display will come back on and display "888" or "88".

NOTE: The Service Diagnostic mode will time out after 10 minutes of user inactivity, or shut down if AC power is removed.

SERVICE DIAGNOSTIC MENU		
	Button Press	**Function Behavior**
1st Button	- Momentary press	- Activates Human Machine Interface Test
	- Press and hold for 5 secs.	- Exits Service Diagnostic Mode
2nd Button	- Momentary press	- Activates Quick Diagnostic Test
	- Press and hold for 5 secs.	- Software Version Display
3rd Button	- Momentary press	- Displays Next Error Code
	- Press and hold for 5 secs.	- Clears the Error Codes

Activation with Saved Fault Codes

If there are saved fault codes, they will be listed on the display. Review the Fault/Error Codes on page 8-9 for the recommended procedure and how to display saved error codes. If there is no saved fault code, "888" or "88" will be displayed.

Indication: None of the indicators or display turn on.

Action: Select any cycle.

- If indicators come on, check the functionality for the three buttons used to activate the Service Diagnostic mode. Verify that the button responds and a beep sound is heard when pressed (make sure button sounds are active). If the button is faulty, it will not be possible to enter the diagnostic mode using that button. Replace the Human-Machine Interface and housing assembly. Refer to Component Removal on page 25.
- If no indicators come on after selecting the cycle, go to TEST #1, ACU Power Check, page 12.

HUMAN-MACHINE INTERFACE TEST (Figure 1)

NOTE: The Service Diagnostic mode must be activated before entering the Human-Machine Interface Test; see procedure on page 3.

Active Fault Code Display in Human-Machine Interface Test

If the display begins flashing while in Human-Machine Interface Test, it is displaying an active fault code. Active fault codes are codes that are currently detected. Only one active fault code can be displayed at a time.

Entry Procedure

Press and release the **1st** button used to activate Service Diagnostic mode. All console indicators turn on and "888" or "88" is displayed.

Human-Machine Interface Test

Pressing each button will turn off its corresponding indicator(s) or display segment as shown in Figure 1.

Rotating the cycle selector knob turns off each corresponding cycle indicator (on some models).

- If indicators do not turn off after pressing buttons, go to TEST #2: Human-Machine Interface on page 14.

Exit Procedure

To exit Human-Machine Interface Test, press and hold the **1st** button used to activate Service Diagnostic mode for 5 seconds, or press the **POWER** button. All indicators will turn off, and the machine will return to STANDBY mode.

SOFTWARE VERSION DISPLAY

Entry Procedure

To enter Software Version Display, press and hold the **2nd** button used to activate the Service Diagnostic mode for 5 seconds. Upon entry, the display will automatically cycle through the following information:

- ACU firmware revision code (C: major revision number, minor revision number, test revision number)
- Settings file revision code (S: flashes 4 times, each time showing 2 digits of the 8-digit number)
- MCU firmware revision code (n: major revision number, minor revision number, test revision number)
- HMI firmware revision code (U: major revision number, minor revision number, test revision number)
- Touch firmware revision code (t: major revision number, minor revision number, test revision number)

Exit Procedure

To exit Software Version Display, press the **POWER** button. All indicators will turn off, and the machine will return to STANDBY mode.

QUICK DIAGNOSTIC TEST

NOTE: The Service Diagnostic mode must be activated before entering the Quick Diagnostic Test; see procedure on page 3. If, at any point, the user presses the **POWER** button, the washer exits to STANDBY mode.

Active Fault Code Display in Quick Diagnostic Test

If the display begins flashing while in the Quick Diagnostic Test, it is displaying an active fault code. Active fault codes are codes that are currently detected. Only one active fault code can be displayed at a time.

Entry Procedure

To enter the Quick Diagnostic Test, press and release the **2nd** button used to activate the Service Diagnostic mode.

Successful Entry

The seven segment display will show '001' to indicate that the machine is ready to begin.

Load and Test Cycle Selection Procedure

Loads and the Quick Test Cycle are assigned function numbers. These are defined in the chart on page 5-6.

The seven segment display will indicate the current selected function number. Use the Soil and Temp buttons to select a function number. The Soil button will increment through the function numbers, and the Temp button will decrement through the function numbers.

Commanding Functions 'On' and 'Off' in Quick Diagnostic Test

With the desired function number on the seven segment display, the function can be toggled on by pressing the **START** button. If the selected function is currently active (commanded 'on'), the seven segment display will flash the function number at a 1 Hz rate (1 flash per second). To turn the load off, press the **POWER** button. The load will turn off and the machine will enter STANDBY mode.

The chart below indicates function and test cycle function numbers.

Exit Procedure

To exit Quick Diagnostics, press the **POWER** button, or press and hold the **1st** button used to activate Service Diagnostic mode for 5 seconds.

Load and Test Cycle Function Number

Enumeration	Washer Function	Description	Timeout
001	Cold 1 Valve	Fills the drum with cold water	5 min
002	Cold 2 Valve	Fills the drum with cold water	5 min
003	Hot Valve	Fills the drum with hot water	5 min
004	Drain Pump	Turns on the drain pump	5 min
005	Recirc. Pump	Turns on the recirculation pump	5 min
006	NA	Pauses the machine	1 min
007	Spin	Drains water (if necessary) Spins the drum at 820 RPM	5 min (after draining)
008	Heater	Adds cold water to the drum Turns on heater	5 min (after filling)
009	NA	Pauses the machine	1 min
010	Detergent Pump	Turns on the detergent pump	5 min
011	NA	Pauses the machine	1 min
012	Quick Test Cycle	See Quick Test Cycle table	7-8 min

NOTE: Some functions will not be available on all models

Quick Test Cycle Execution

When the Service Diagnostics Quick Test Cycle is activated, any function(s) that were manually commanded on will be turned off. The Quick Test Cycle will start and the seven segment display will flash '012' while the cycle runs.

NOTE: The basket must be empty during this test.

Step	Washer Function	Recommended Procedure	Est. Duration
1	Lock Door	If door does not lock, see TEST #4: Door Lock System, page 15.	10 sec
2	Drain (if necessary)	If pump does not turn on, see TEST #8: Drain Pump/ Recirculation Pump, page 17.	20 sec
3	Cold 1 Valve	If no water, see TEST #6: Water Inlet Valves, page 16.	10 sec
4	Cold 2 Valve	If no water, see TEST #6: Water Inlet Valves, page 16.	10 sec
5	Hot Valve	If no water, see TEST #6: Water Inlet Valves, page 16.	10 sec
6	Drain Pump	If pump does not turn on, see TEST #8: Drain Pump/ Recirculation Pump, page 17.	10 sec
7	Recirc. Pump	If pump does not turn on, see TEST #8: Drain Pump/ Recirculation Pump, page 17.	10 sec
8	Drain Pump	If pump does not turn on, see TEST #8: Drain Pump/ Recirculation Pump, page 17.	10 sec
9	Spin at 820 RPM	If drum does not spin, See Test #3: Motor Circuit, page 15.	5 min
10	Cold 1 Valve (fill to min fill level)	If no water, see TEST #6: Water Inlet Valves, page 16.	30 sec
11	Heater	If heater does not turn on, see TEST #9a: Wash Heating Element, page 18.	10 sec
12	Detergent Pump	If pump does not turn on, see TEST #11b: Drawer Bulk Dispenser Test, page 21.	10 sec
13	Tumble	If drum does not spin, See Test #3: Motor Circuit, page 15.	22 sec
14	End of Cycle Machine enters Standby Door Unlocks		
		Total time	Appx 7-8 minutes

NOTE: Each step may have a brief pause before the load turns on.

FAULT/ERROR CODES

(Refer to fault/error code charts on pages 8–9).

Fault/Error Code Display Method

Fault codes are displayed by showing F# and E#. All fault codes have an F# and an E#. The F# indicates the suspect System/ Category. The E# indicates the suspect Component system.

Up to ten Fault/Error codes may be stored. When the oldest fault code is displayed, the following press of the **3rd** button will result in a triple beep, then display of the most recent fault code. If each press of the **3rd** button results in a triple beep and the display shows "888" or "88", no saved fault codes are present.

Entry Procedure

The most recent fault code is shown as soon as Service Diagnostic mode is entered.

Advancing Through Saved Fault Codes

To view the next-most-recent fault code, press the **3rd** button used to activate the Service Diagnostic mode. Subsequent presses of the **3rd** button will advance the display through the saved fault codes.

Clearing Fault Codes

To clear fault codes, enter Service Diagnostic mode. Then press and hold the **3rd** button used to enter Service Diagnostic mode for 5 seconds. Once the fault codes are successfully erased, the seven segment display will show "888" or "88".

Exit Procedure

To exit Fault/Error Codes, press the **POWER** button. All indicators will turn off, and the machine will return to STANDBY mode.

FAULT/ERROR CODES

The fault codes below may be indicated under various conditions and can be accessed through Service Diagnostics.

Error Code	Problem	Checks & Tests
F0E1	Load in drum during Clean Washer cycle.	Run Clean Washer cycle only with an empty drum.
F0E2	Oversuds	Excessive suds in washer. Washer is running a suds reduction routine. If the washer is unable to correct the problem, this may indicate: ■ Not using HE detergent ■ Excessive detergent usage ■ Check pressure hose connection from tub to maintain control. Is hose pinched, kinked, plugged, or leaking air.
F0E4	High temp error, wash cycle.	Make sure inlet hose is connected to a cold water faucet. Check wash heat element. See TEST #9a: Wash Heating Element, page 18. Check temperature sensor. See TEST #10a: Wash Temperature Sensor, page 19.
F0E5	Off Balance Load.	Load could be unbalanced or too large. Avoid tightly packing the load. Avoid washing single items.
F1E1	Main relay open or shorted.	Main relay issue. Replace ACU. See TEST #1: ACU Power Check, page 12.
F1E2	MCU over- or under-voltage error.	Check household voltage. See TEST #3: Motor Circuit, page 15.
F3E1	Pressure sensor signal missing or out of range.	See TEST #7: Water Level Sensor, page 17.
F3E2	Wash NTC open or shorted.	See TEST #10a: Wash Temperature Sensor, page 19.
F3E5	Dry NTC fault.	Fault is displayed if dry temperature sensor is out of range, or open circuit or short circuit is detected. The was function is still operable, but the dry function will not operate. See TEST #10b: Dry Temperature sensor page 20.
F3E6	Accelerometer error.	Check ACU. See TEST #1: ACU Power Check, page 12.
F4E1	Wash heater relay error or no feedback signal.	Error is generated when the ACU cannot detect the temperature rise of the wash heater. See TEST #9a Wash heating element, page 18.
F4E2	Wash heater relay error.	See TEST #9a: Wash Heating Element, page 18.
F5E2	Lock failure.	See TEST #4: Door Lock System, page 15.
F5E3	Unlock failure.	See TEST #4: Door Lock System, page 15.
F5E4	Door not open error.	Make sure to open and close the washer/dryer door between cycles.
F6E1	No communication from the HMI detected by ACU.	See Test #2: Human-Machine Interface (HMI), page 14.
F6E2	No communication from the ACU detected by the HMI.	See Test #1: ACU Power Check, page 12.
F6E3	No communication from the MCU detected by the ACU.	Replace ACU. See TEST #1: ACU Power Check, page 12.

FAULT/ERROR CODES (cont.)

Error Code	Problem	Checks & Tests
F7E2	MC/MCU over temp error. MC/MCU over current error/internal failure.	Check for obstruction between spin basket and outer tub. Check harness continuity and connections between ACU and motor. See TEST #3: Motor Circuit, page 15.
F7E8	MC/Motor over temp error.	Check for obstruction between spin basket and outer tub. Check harness continuity and connections between ACU and motor. See TEST #3: Motor Circuit, page 15.
F7E9	Motor will not turn (Locked Rotor).	Check for obstruction between spin basket and outer tub. Check harness continuity and connections between ACU and motor. See TEST #3: Motor Circuit, page 15.
F7E10 OR F7EA	Motor disconnected error.	Check harness continuity and connections between ACU and motor. See TEST #3: Motor Circuit, page 15.
F7E12 OR F7EC	MC/MCU Overload.	Check for obstruction between spin basket and outer tub. Check harness continuity and connections between ACU and motor. See TEST #3: Motor Circuit, page 15.
F8E1	Valve failure.	See TEST #6: Water Inlet Valves, page 16.
F8E3	Overflow.	Make sure drain hose and drain pump filter are not plugged. Verify functionality of water inlet valve, water level sensor, and drain pump. See TEST #6: Water Inlet Valves, page 16. TEST #7: Water Level Sensor, page 17, and TEST #8: Drain Pump/Recirculation Pump, page 17.
F9E1	Long drain.	Check drain hose installation for proper height, check drain hose and filter for obstructions, and make sure drain hose is not sealed into drain pipe. Check functionality of Drain Pump/Recirculation Pump. See TEST #8: Drain Pump/Recirculation Pump, page 17.

TROUBLESHOOTING GUIDE #1

PROBLEM	POSSIBLE CAUSE	CHECKS & TESTS
WON'T POWER UP • No operation • No keypad response • No LEDs or display	Control lock is activated.	Check if the control lock LED is on. If so, press and hold to deactivate it.
	No power to washer.	Check power at outlet, check circuit breakers, fuses, or junction box connections.
	Connection problem between AC plug and ACU.	Check connections between the AC power cord and ACU for continuity.
	Connections between ACU and HMI.	Check connections and harness continuity between ACU and HMI.
	ACU problem.	See TEST #1: ACU Power Check, page 12.
	Human-Machine interface problem.	See TEST #2: Human-Machine Interface, page 14.
WON'T START CYCLE No response when Start is pressed.	Control lock is activated.	Check if the control lock LED is on. If so, press and hold to deactivate it.
	Three consecutive cycles were run without opening the door.	Open and close the door before starting the cycle.
IMPORTANT: Starting a cycle requires "Press and hold" of **START** button.	Door lock mechanism not functioning.	1. Door not closed due to interference. 2. Lock not closed due to interference. 3. See TEST #4: Door Lock System, page 15.
	Connections between ACU and HMI.	Check connections and harness continuity between ACU and HMI.
	Human-Machine interface problem.	See TEST #2: Human-Machine Interface, page 14.
	ACU problem.	See TEST #1: ACU Power Check, page 12.
HMI WON'T ACCEPT SELECTIONS	Control lock is activated.	Check if the control lock LED is on. If so, press and hold to deactivate it.
	Connections between ACU and HMI.	Check connections and harness continuity between ACU and HMI.
	Human-Machine interface problem.	See TEST #2: Human-Machine Interface, page 14.
	ACU problem.	See TEST #1: ACU Power Check, page 12.
DOOR WON'T LOCK	Door not closed.	Ensure that door is completely closed.
	Door lock obstructed.	Check mechanism for obstruction.
	Door lock mechanism not functioning.	See TEST #4: Door Lock System, page 15.
DOOR WON'T UNLOCK (See page 24 for manually unlocking the door lock system)	Reset washer.	Unplug and reconnect the power cord. Wait 2 minutes to see if the washer door unlocks.
	Misaligned, broken, or over-tightened door latch.	Check door lock mechanism and repair as necessary.
	Door lock mechanism not functioning.	See TEST #4: Door Lock System, page 15.
WON'T DISPENSE	No water supplied to washer.	1. Check water connections to washer. 2. Verify that hot and cold water supply is turned on.
	Dispenser clogged with detergent.	Clean obstruction from dispenser.
	Valve problem.	See TEST #6: Water Inlet Valves, page 16.
	Dispenser system problem.	See TEST #11a: Single Dose Dispenser, page 21.
WON'T FILL (Normal water level is only 2.5" to 5" [63.5 mm to 127 mm] inside tub)	No water supplied to washer or low water pressure.	1. Check water connections to washer. 2. Verify that hot and cold water supply is turned on.
	Plugged filter/screen, or plugged air trap.	Check for plugged filter or screen in the water valve or hoses. Remove the air trap and check for any trapped lint or material.
	Drain hose installation.	Check for proper drain hose installation. Is water siphoning out of the drain hose?
	Valve problem.	See TEST #6: Water Inlet Valves, page 16.
	Water level sensor problem.	See TEST #7: Water Level Sensor, page 17.
OVERFILLS	Drain hose/filter or air trap is plugged.	Check for hose, drain filter, and air trap obstructions.
	Valve(s) not shutting off.	See TEST #6: Water Inlet Valves, page 16.
	Water level sensor problem.	See TEST #7: Water Level Sensor, page 17.
	Drain Pump/Recirculation Pump problem.	See TEST #8: Drain Pump/Recirculation Pump, page 17.
DRUM WON'T ROTATE	Door is not locked. Is door locking after starting a cycle?	Verify harness connections and see TEST #4: Door Lock System, page 15.
	Garment or mechanical obstruction between drum and tub.	Try to move the drum while the washer is unpowered to see if it can move freely. If not, check for a garment or other object obstructing movement.
	Harness connections.	Check harness continuity and connections between ACU and motor.
	Motor problem.	See TEST #3: Motor Circuit, page 15.
MOTOR OVERHEATS	Mechanical friction.	Check for obstruction between spin basket and outer tub.
	Harness connections.	Check harness continuity and connections between ACU and motor.
	Motor problem.	See TEST #3: Motor Circuit, page 15.
WON'T DRAIN	Drain hose installation.	Check for proper drain hose installation. Make sure it is not inserted more than 4.5" (114 mm). Make sure drain hose is not sealed into drain pipe, and that there is an air gap for ventilation.
	Plugged drain hose or air trap.	Check drain hose and air trap for obstructions.
	Obstructions to drain pump.	Check and clean drain filter of obstructions.
	Harness connections.	Check harness continuity and connections between ACU and drain pump.
	Drain Pump/Recirculation Pump problem.	See TEST #8: Drain Pump/Recirculation Pump, page 17.

TROUBLESHOOTING GUIDE #2

PROBLEM	POSSIBLE CAUSE	CHECKS & TESTS
NO BUTTON SOUND	Button sound has been deactivated.	See TEST #2: Human-Machine Interface (HMI), page 14.
INCORRECT WATER TEMPERATURE	Water hose installation.	Make sure inlet hoses are connected properly and that valves are turned on fully. The hot and cold valves on the washer are labeled.
	No hot water dispensed.	Ensure that household hot water is present at the tap. Minimum: 120°F (49°C).
	Heating element problem.	See TEST #9a: Wash Heating Element, page 18.
	Temperature sensor problem.	See TEST #10a: Wash Temperature Sensor, page 19.
CLEAN WASHER LED FLASHING AT END OF WASH CYCLE	The washer has run 30 wash cycles and is indicating a reminder to execute the Clean Washer cycle.	Run the Clean Washer cycle. If not, the "Clean Washer" LED will stop flashing at the end of a wash cycle after running 3 more regular wash cycles. After 30 more wash cycles are completed, the "Clean Washer" LED will again flash at the end of a wash cycle, reminding the customer to run a Clean Washer cycle.
SANITIZE CYCLE LED FLASHING AT END OF WASH CYCLE (SANITIZE TEMP NOT ACHIEVED)	Water hose installation.	Make sure inlet hoses are connected properly and that valves are turned on fully. The hot and cold valves on the washer are labeled.
	No hot water dispensed.	Ensure that household hot water is present at the tap. Minimum: 120°F (49°C).
	Heating element problem.	See TEST #9a: Wash Heating Element, page 18.
	Temperature sensor problem.	See TEST #10a: Wash Temperature Sensor, page 19.
DRUM LIGHT DOES NOT TURN ON (on some models).	Door switch problem.	See TEST #4: Door Lock System, page 15.
	Harness connections.	Check harness continuity and connections between ACU and drum light.
	Drum light problem.	See TEST #5: Drum Light, page 16.
LEAKING	Supply hose connections.	Check hose connections and for damage to rubber gasket due to over-tightening.
	Drain hose installation.	Check for proper drain hose installation.
	Plugged drain hose or house drain pipe.	Check drain hose for obstructions and make sure house drain pipe is not blocked.
	Overloading the washer.	Overloading can partially push the door open.
	Internal hose connections.	Check internal hose connections for leakage.
	Check bellows.	Check for holes in the bellows. If there are none, remove, reposition, and reinstall the bellows. Make sure the bellows is not wrinkled.
	Dispenser leaking.	Check the dispenser for leakage from the front and from the plastic box itself.
	Ventilation tube leaking.	Make sure that the ventilation tube connected to the rear of the tub is installed properly.
	Heater leaking.	Make sure heater is seated and torqued down properly.
VIBRATION OR NOISE	Heater is loose.	Make sure heater is torqued down to 4.5 Nm ± 0.5 Nm.
	Shipping kit not removed.	Verify that shipping bolts and spacers are removed.
	Washer not level.	Level washer per installation instructions.
	Floor stability.	Weak floors can cause vibration and walking of the washer.
	Rubber feet not installed.	Install rubber feet on leveling legs.
	Leveling lock nuts not tightened.	Tighten leveling lock nuts.
	Clogged inlet screens making high-pitched noise.	Disconnect hoses and clean screens.
	Spring/damper installation.	Check for proper spring and damper placement and installation.
	Washer panel noise.	Inspect washer panels for bending, warpage, or damage. Check for loose fasteners.
	Ventilation hose becoming disconnected.	Verify connection of ventilation hose to the tub and to the back bracket.
	Water level sensor hose slapping on the tub.	Make sure the hose is fastened properly.
POOR WASH PERFORMANCE Please refer Use & Care Guide.	Oversuds.	1. Verify use of HE detergent. 2. Excessive detergent usage. 3. Check drain hose and filter for obstructions.
	Incorrect water level.	See "WON'T FILL", page 10.
	Clothes wet after cycle is complete.	1. Single or tangled items in the washer. 2. Oversuds (see above). 3. See "WON'T DRAIN", page 10.
	Load not rinsed.	1. Check proper water supply. 2. Not using HE detergent. 3. Verify that load is not bunched or bundled when placed in washer. 4. See TEST #6: Water Inlet Valves, page 16.
	Not cleaning clothes.	1. Verify that load is not bunched or bundled when placed in washer. 2. Not using HE detergent. 3. Not using correct cycle. 4. Not using dispensers.
	Fabric damage.	1. Washer overloaded. 2. Bleach was added incorrectly (directly into the tub rather than through the dispenser). 3. Sharp items in tub.
	Wrong option or cycle selection.	Refer customer to "Use & Care Guide".
POOR DRY PERFORMANCE Please refer Use & Care Guide (on some models)	Dry heater not working. Dry sensor not working. Blower not working.	See TEST #9b: Dry Heating Element, page 19. See TEST #10b: Dry Temperature Sensor, page 20. See TEST #13: Dry Blower Motor, page 24.

TEST PROCEDURES

IMPORTANT: The following procedures may require the use of needle probes to measure voltage. Failure to use needle probes will damage the connectors. To ease the process of measuring voltage and resistance, test points for each pin are accessible through the slots in the plastic beneath each ACU connector.

To properly check voltage, complete the following steps:

1. Unplug washer or disconnect power.

2. Attach voltage measurement equipment to proper connectors.

3. Plug in washer or reconnect power and verify voltage reading.

4. Always unplug washer or disconnect power after completing voltage measurements.

TEST #1: ACU Power Check

This test checks for incoming and outgoing power to and from Appliance Control Unit (ACU). This test assumes that proper voltage is present at the outlet.

1. Unplug washer or disconnect power.

2. Remove top panel to access the machine electronics.

3. Visually check that all connections to the interference filter (IF) are securely connected. See Figure 2.

4. Visually check that all connections to the ACU are fully inserted. See Figure 3, page 13.

5. If both visual checks pass, go to step 6.

6. Plug in washer or reconnect power.

7. With a voltmeter set to **AC**, check for line voltage at the input of the interference filter. See Figure 2.

- If line voltage is present, go to step 8.
- If line voltage is not present, verify the continuity of the power cord. If it fails the continuity check, replace the power cord.

8. With a voltmeter set to **AC**, check for line voltage at the output of the interference filter. See Figure 2.

- If line voltage is present, go to step 9.
- If line voltage is not present, replace the interference filter.

9. With a voltmeter set to **AC**, check for input line voltage to the ACU across pins 1 and 2 of connector **J2** AC In (IF filter). See Figure 3, page 13.

- If line voltage is present, go to step 10.
- If line voltage is not present, check harnesses and connections between the filter and the ACU. Visually inspect inside connector housing for bent or damaged terminals. Repair as necessary.

10. Service LED/DC Supply

The ACU is equipped with a status LED. This LED indicates the health of the ACU. After the ACU is plugged in, the LED will blink rapidly for a few seconds, then will blink slowly (0.5s on, 0.5s off). This LED indicates the functionality of the microcontroller and power supply:

- If the LED is not lit, there is not 5 V DC supply to the microcontroller. Replace the ACU.
- If the LED is not blinking slowly within 30 seconds of being powered up, the microcontroller is not responding. Replace the ACU.
- **If the LED is blinking slowly (0.5s on, 0.5s off) during washer operation, the ACU is probably OK and the problem is elsewhere.**

Check HMI input voltage:

With the back panel removed, verify that there is 5 V between pins 2 and 4 at **J19**.

- If there is 5 V, go to step 11.
- If there is not 5 V, disconnect **J19** and check for 12.7 V between pin 1 and pin 4. If there is not 12.7 V, replace the ACU.

11. Unplug washer or disconnect power.

12. Reassemble all parts and panels.

13. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

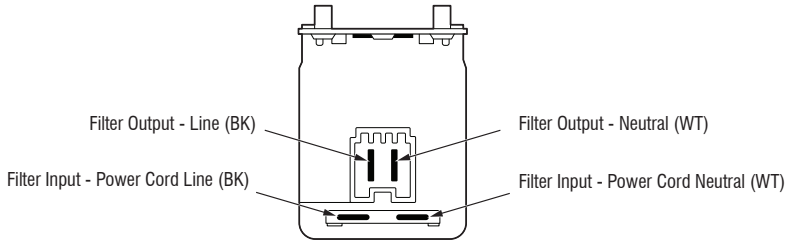


Figure 2 - Interference Filter (IF)

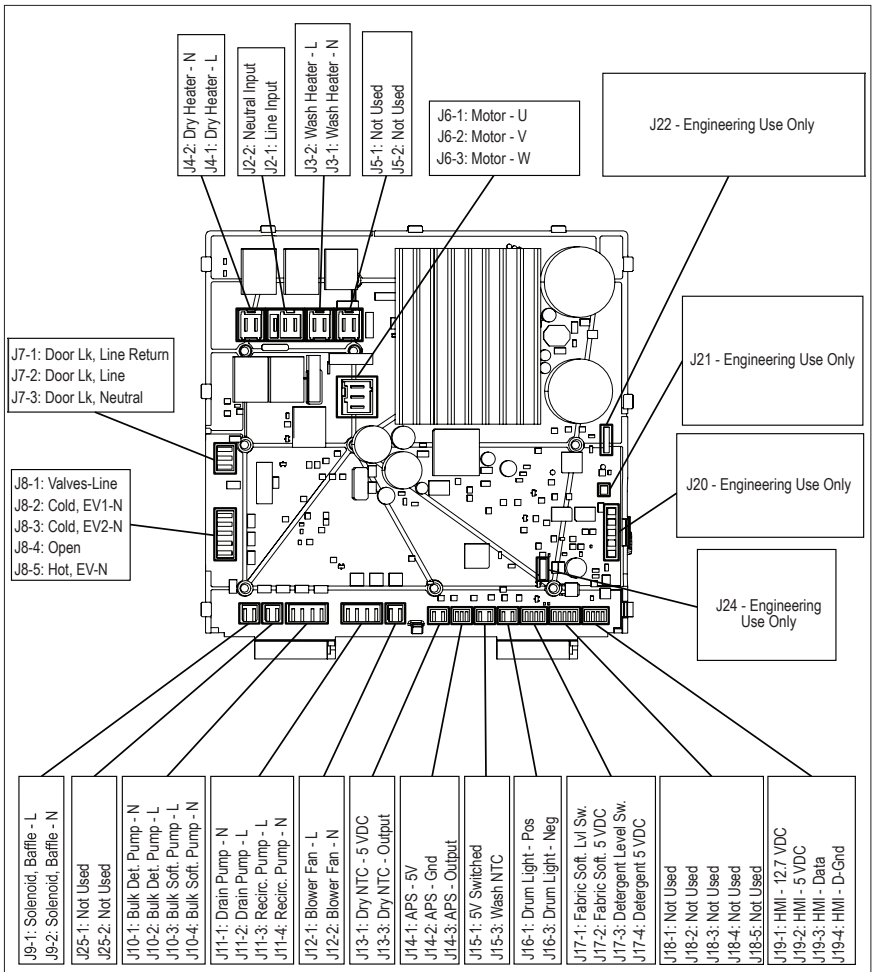


Figure 3 - Appliance Control Unit (ACU)

(Not all features are available on all models)

TEST #2: Human-Machine Interface (HMI)

This test is performed when any of the following situations occurs during the Human-Machine Interface Test (see page 4):

- ✓ **Some buttons do not light indicators**
- ✓ **No beep sound is heard**

None of the indicators or display turn on:

1. Unplug washer or disconnect power.

2. Remove the top panel to access the ACU.

3. Visually check that all ACU connectors are inserted all the way into the ACU. See Figure 3, page 13.

4. Remove console assembly. Do not pull on the wires between the console and ACU.

5. Visually check that all HMI connectors are inserted all the way into the HMI. See Figure 4, below.

6. Visually check that the HMI and housing assembly is properly inserted into the front console.

7. If all visual checks pass, perform TEST #1: ACU Power Check, page 12, to verify supply voltage and health of microcontroller.

- ➢ If supply voltages are present and microcontroller is functioning properly, replace the Human-Machine Interface and housing assembly.
- ➢ If supply voltages are not present and Service LED is off or blinking constantly, replace the ACU.

8. Reassemble all parts and panels.

9. Plug in washer or reconnect power.

10. Perform the "Human-Machine Interface Test" (see page 4) to verify repair.

Some buttons do not light indicators:

1. Unplug washer or disconnect power.

2. Remove the top panel to access the ACU and Human-Machine Interface (HMI).

3. Visually check that the HMI and housing assembly is properly inserted into the front console.

4. If visual check passes, replace the HMI and housing assembly.

5. Reassemble all parts and panels.

6. Plug in washer or reconnect power.

7. Perform the "Human-Machine Interface Test" (see page 4) to verify repair.

No beep sound is heard:

Press the **Cycle Signal** button to change the volume of the button sounds and the tone played at the completion of a cycle.

NOTE: Some models may not have a dedicated button for this feature. Instead, press & hold the **Steam Clean** button. If no beep sound persists, follow these steps:

1. Unplug washer or disconnect power.

2. Remove the top panel to access the ACU.

3. Visually check that all ACU connectors are inserted all the way into the ACU. See Figure 3, page 13.

4. Remove console assembly. Do not pull on the wires between the console and ACU.

5. Visually check that all HMI connectors are inserted all the way into the HMI. See Figure 4, below.

6. If all visual checks pass, replace the HMI and housing assembly.

7. Reassemble all parts and panels.

8. Plug in washer or reconnect power and perform the "Human-Machine Interface Test" (see page 4) to verify repair.

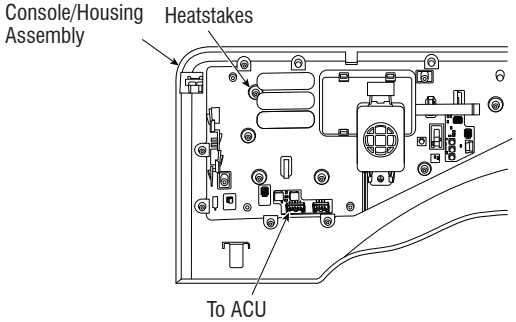


Figure 4 - Human-Machine Interface (HMI), Console/Housing Assemblies

NOTE:
To replace the Human-machine Interface (HMI) entire Console/Housing assembly needs to be replaced.

TEST #3: Motor Circuit

This test checks the motor, appliance control unit (ACU), and wiring.

1. Check the motor and electrical connections by performing the "Quick Diagnostic Test" on page 5. The following steps assume that this step was unsuccessful.

2. Unplug washer or disconnect power.

3. Check to see if basket will turn freely.

- If basket turns freely, go to step 4.
- If basket does not turn freely, determine what is causing the mechanical friction or lockup.

4. Remove the top to access the ACU.

5. Perform TEST #1: ACU Power Check, page 12, then visually check that connector **J6** is inserted all the way into the ACU. Refer to Figure 3, page 13.

- If visual checks pass, go to step 6.
- If visual checks fail, reconnect **J6** and repeat step 1.

6. Check the motor windings. Disconnect the motor harness from the ACU, **J6**. With an ohmmeter, verify the resistance values as shown below:

Motor Harness	Windings
Pins 1 & 2	6 - 20 Ω
Pins 2 & 3	6 - 20 Ω
Pins 1 & 3	6 - 20 Ω

- If the values are outside the range or open, replace stator assembly; otherwise, reconnect the motor harness and go to step 7.

7. Plug in washer or reconnect power.

8. Run the "Quick Diagnostic Test" on page 5. **IMPORTANT:** Door must be closed and locked to run motor.

9. To test the motor, advance the enumeration on the seven-segment display until it shows '007'.

10. Unplug washer or disconnect power.

11. Reassemble all parts and panels.

12. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

TEST #4: Door Lock System

Check the relays and electrical connections to the door lock by performing the "Quick Diagnostic Test" on page 5. The following steps assume the door cannot lock or unlock during that test. Perform the following checks if the washer does not lock (or unlock).

1. Check door lock mechanism for obstruction or binding. Repair as necessary.

2. Unplug washer or disconnect power.

3. Remove top panel to access machine electronics.

4. Visually check that the **J7** (door switch / door lock) connector is inserted all the way into the ACU. Refer to Figure 3, page 13.

- If visual check passes, go to step 5.
- If any of the connectors are not inserted properly, reconnect and retest door lock.

5. Disconnect the **J7** connector from the ACU. **NOTE:** To measure the door lock switch in the "locked" position, plug in washer or reconnect power. Press the **POWER** button, select any cycle, and then press and hold **START**. Actuation of the door lock solenoid should be heard after a few seconds. At that point, unplug the washer and disconnect **J7** from the ACU and ensure door is closed and measure resistance across pins 2 & 3. Resistance should measure 60–90 Ω.

- If resistance values are good, go to step 6.
- If any of the measurements are out of range, check the harness of the suspected component between the ACU and door lock mechanism for continuity.
- If the harness and connections are good, replace the door lock mechanism. **IMPORTANT:** To minimize risk of damage to door lock/switch wires, remove the door lock mechanism screws before removing the front panel.

6. If the preceding steps did not correct the lock problem, replace the ACU and retest door lock mechanism.

a. Unplug washer or disconnect power.

b. Replace the ACU.

c. Reassemble all parts and panels.

d. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

TEST #5: Drum Light (on some models)

This test is performed if the drum LED does not light.

1. Unplug washer or disconnect power.

2. Remove the top panel to access ACU and Human-Machine interface (HMI).

3. Verify the drum light connector (**J16**) is securely connected to the ACU. See Figure 3, page 13.

4. Check harness and connections between the drum light and the ACU.

- If the connections are OK, go to step 5.
- If not, repair or replace as needed.

5. Unplug the drum light from the harness that goes into the ACU.

6. Plug in washer or reconnect power.

7. With a voltmeter set to VDC, measure the voltage across **J16**, pins 1 and 3. If the drum LED driver is working properly, you should measure 2.9-3.5 VDC.

- If the voltage is present, replace the drum LED.
- If the voltage is not present, replace the ACU.

8. Unplug washer or disconnect power.

9. Reassemble all parts and panels.

TEST #6: Water Inlet Valves

This test checks the electrical connections to the valves and the valves themselves. Water valve names and locations are as follows:

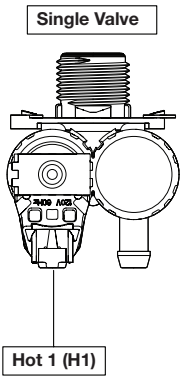


Figure 5a - Water Inlet Valve (Single Valve)

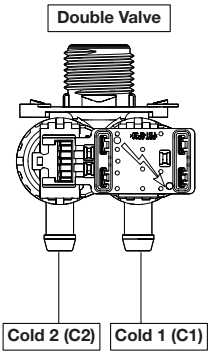


Figure 5b - Water Inlet Valve (Double Valve)

1. Check the relays and electrical connections to the valves by performing the "Quick Diagnostic Test" on page 5. The following steps assume one or more of the valves did not turn on.

2. For the valve(s) in question, check the individual solenoid coils:

a. Unplug washer or disconnect power.

b. Remove top panel to access machine electronics.

c. Remove connectors **J8** from ACU. Refer to ACU diagram on page 13.

d. Check harness connections to the solenoid valves. Verify continuity in harness between ACU and solenoid valves.

3. Check valve coil resistance at the valves, or across the following connector pinouts:

Valve	Pinout
Cold 1 Fill Valve	J8, pins 1 & 2
Hot 1 Fill Valve	J8, pins 1 & 5
Cold 2 Fill Valve	J8, pins 1 & 3

Resistance should be 1100–1350 Ω.

- If resistance readings are outside the range or open, replace the valve assembly.
- If resistance readings are within range, reconnect connector to **J8** connector to the ACU. Go to step 4.

4. Plug in washer or reconnect power.

5. With a voltmeter set to **AC**, attach the leads across the pins of the suspect valve (see chart in step 3). Run the "Quick Diagnostic Test" and check for line voltage across the pins of the valve. **NOTE:** Refer to the "Quick Diagnostic Test" on page 5 to determine when the cold and hot valves are actuated.

- If line voltage is present and valve still does not activate, replace valve assembly.
- If line voltage is not present, replace the ACU.

6. Unplug washer or disconnect power.

7. Reassemble all parts and panels.

8. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

TEST #7: Water Level Sensor

This test checks the water level sensor, ACU, and wiring. **NOTE:** Usually, if the water level sensor malfunctions, the washer will generate error code (F3E1).

1. Check the functionality of the water level sensor by running a small load cycle. The valves should turn off automatically after sensing the correct water level in the tub. The following steps assume that this step was unsuccessful.

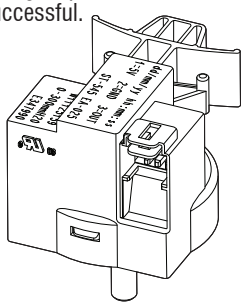


Figure 6 - Water Level Sensor

2. Press **START/PAUSE** to pause the cycle and then press **POWER**. The cycle will cancel and drain the water from the tub.

3. Unplug washer or disconnect power.

4. Remove top and rear panels to access tub, air trap, and pressure hose connections. Water level sensor is located at top right center of cabinet.

5. Check connections from tub to air trap, air trap to pressure hose, and pressure hose to water level sensor.

6. Check to ensure hose is routed correctly in the lower cabinet and not pinched or crimped.

7. Verify there is no water, suds, or debris in the hose or air trap. Disconnect hose from water level sensor, clean air trap port and remove and blow into hose to clear water, suds, or debris.

8. Check hose for leaks. Replace if needed.

9. Visually check that connector **J14** is inserted all the way into the ACU (refer to Figure 3, page 13). Also check that the water level sensor harness is securely connected to the sensor.

10. Check the harness between the ACU and water level sensor for continuity.

- If there is continuity, go to step 11.
- If there is no continuity, repair or replace as necessary.

11. Plug in washer or reconnect power.

12. With a voltmeter set to **DC**, connect black probe to ACU connector **J14**, pin 2 (GND) and red probe to **J14**, pin 1 (+5 V [Vcc]).

- If +5 V DC is present, replace the water level sensor. (Before replacing the sensor, make sure that there is NO water remaining in the tub or there will not be an accurate water level measurement and an error code may appear. Drain the tub by running a drain & spin cycle with the sensor plugged into **J14** but with the hose removed).
- If+5 V DC is not present, perform TEST #1: ACU Power Check on page 12.

13. If the preceding steps did not correct the problem, replace the ACU.

a. Unplug washer or disconnect power.

b. Replace the ACU.

c. Reassemble all parts and panels.

d. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

TEST #8: Drain Pump/ Recirculation Pump

Perform the following checks if washer does not drain.

1. Check for obstructions in the usual areas. Clean and then perform step 2.

2. Check the Drain Pump/ Recirculation Pump and electrical connections by performing the "Quick Diagnostic Test" on page 5. The following procedures assume that this step was unsuccessful.

3. Unplug washer or disconnect power.

4. Remove top panel to access machine electronics.

5. Visually check that the **J11** connector is inserted all the way into the ACU. Refer to ACU diagram on page 13.

- If visual check passes, go to step 6.
- If connector is not inserted properly, reconnect **J11** and repeat step 2.

6. Remove connector **J11** from the ACU. With an ohmmeter, measure the resistance across connector pins.

Motor	ACU PINS	Resistance
Drain Pump	J11.1 - J11.2	18.5-21.5Ω
Recirculation Pump	J11.3 - J11.4	36-46Ω

7. Resistance should be within given range at room temperature.

- If the reading is infinite (open), go to step 8.
- If the reading is correct, go to step 12.

8. Open bulk drawer and remove pump filter cap. Remove bulk drawer, front panel and backer to access Drain Pump/Recirculation Pump. Verify that pump, pump filter, drain hose, recirculation hose/nozzle, and pressure switch hose are free from obstructions.

9. Visually check the electrical connections at the Drain Pump/ Recirculation Pump.

- If visual check passes, go to step 10.
- If connections are loose, reconnect the electrical connections and repeat step 2.

10. With an ohmmeter, check harness for continuity between the drain pump and ACU.

- If there is continuity, go to step 11.
- If there is no continuity, replace the lower machine harness and repeat step 2.

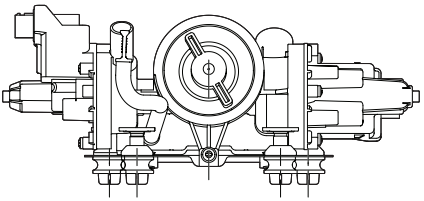


Figure 7 - Drain Pump/Recirculation Pump Assembly

11. With an ohmmeter, measure the resistance across the two pump terminals.

- If the reading is infinite (open), replace the drain pump assembly.
- If the reading is correct, go to step 12.

Motor	ACU PINS	Resistance
Drain Pump	J11.1 - J11.2	18.5-21.5Ω
Recirculation Pump	J11.3 - J11.4	36-46Ω

12. If the preceding steps did not correct the drain problem, replace the ACU.

- Unplug washer or disconnect power.
- Replace the ACU.
- Reassemble all parts and panels.
- Plug in washer or reconnect power and perform the "Quick Diagnostic Test" on page 5 to verify repair.

TEST #9a: Wash Heating Element (on some models)

This test checks the heating element, wiring, and ACU.

1. Unplug washer or disconnect power.

2. Remove top panel to access machine electronics.

3. Disconnect connector **J3** from the ACU. Refer to ACU diagram on page 13.

4. Using an ohmmeter, measure the resistance across pins 1 and 2 of connector **J3**.

- If the resistance is 7-30 Ω, the heating element and wiring are good; go to step 8.
- If the resistance is open, go to step 5.

5. Remove back panel to access the heating element.

6. Disconnect the wire connectors from the heating element. See Figure 8.

7. Using an ohmmeter, measure the resistance across the two heating element terminals.

- If the resistance is 7-30 Ω, the heating element is good; replace the lower main harness.
- If the resistance is open, replace the heating element.

8. If the preceding steps did not correct the heating element problem, replace the ACU.

a. Unplug washer or disconnect power.

b. Replace the ACU.

c. Reassemble all parts and panels.

d. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

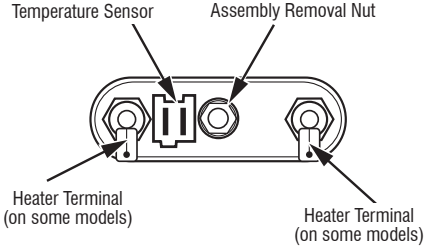


Figure 8 - Heater/Temperature Sensor Assembly

TEST #9b: Dry Heating Element (on some models)

This test checks the dry heating element wiring, and ACU.

1. Unplug washer/dryer or disconnect power

2. Remove top panel to access machine electronics and dry heating element.

3. Disconnect connector **J4** from the ACU.

4. Using an ohmmeter, measure the resistance across pins 1 and 2 of connector **J4**.

- If the resistance is 7–50 Ω, the heating element and wiring are good, go to step 9.
- If the resistance is open, go to step 5.

5. Remove top panel to access the heating element.

6. Disconnect the wire connectors from the heating element. See Figure 9.

7. Using an ohmmeter, measure the resistance across the two heating element terminals.

- If the resistance is 7–50 Ω, the heating element is good; go to step 8.
- If the resistance is far out of range or open, replace the Heater Channel Assembly. **NOTE:** The dry heater element cannot be replaced separately from the Heater Channel Assembly.

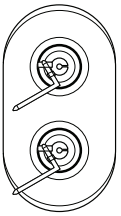


Figure 9 - Dry Heating Element Assembly

8. Check harness continuity between the **J4** on the ACU and the two dry heater terminals.

- If the harness shows open, replace upper harness.
- If the harness continuity is good, go to step 9.

9. If the preceding steps did not correct the heating element problem, replace the ACU.

a. Unplug washer or disconnect power.

b. Replace the ACU.

c. Reassemble all parts and panels.

d. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

TEST #10a: Wash Temperature Sensor

This test checks the temperature sensor, wiring, and ACU.

1. Unplug washer or disconnect power.

2. Remove top panel to access machine electronics.

3. Disconnect connector **J15** from the ACU. Refer to Figure 3, page 13.

4. Using an ohmmeter, measure the resistance across pins 1 and 3 of wash temperature sensor connector **J15**. Refer to the following chart.

- If the resistance is within the specified range, go to step 8.
- If the resistance is infinite or close to zero, go to step 5.

THERMISTOR SENSOR RESISTANCE

Approx. Temperature		Approx. Resistance
°F	°C	(KΩ)
-4	-20	197.3
14	-10	111.6
32	0	65.5
59	15	31.5
77	25	20.0
86	30	16.1
104	40	10.6
122	50	7.1
140	60	4.9
158	70	3.4
176	80	2.4
194	90	1.8
212	100	1.3
248	120	0.7
302	150	0.3

5. Remove the back panel to access the temperature sensor.

6. Disconnect the wash temperature sensor connector from the heating element. See Figure 8, page 19.

7. Using an ohmmeter, measure the resistance across pins of the temperature sensor (on the heating element).

- If the resistance is within the specified range, the sensor is good; replace the lower main harness.
- If the resistance is open, replace the temperature sensor.

8. If the preceding steps did not correct the temperature sensor problem, replace the ACU.

a. Unplug washer or disconnect power.

b. Replace the ACU.

c. Reassemble all parts and panels.

d. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

TEST #10b: Dry Temperature Sensor (on some models)

The ACU monitors the heater channel temperature using the dry temperature sensor and cycles the dry heater relay on and off to maintain the desired temperature.

NOTE: Begin with an empty washer at ambient temperature.

1. Unplug washer or disconnect power.

2. Remove top panel to access machine electronics.

3. Remove connector **J13** from the ACU and measure the resistance between J13-1 and J13-3 at the connector.

The following table gives temperatures and their associated resistance values.

THERMISTOR SENSOR RESISTANCE

Approx. Temperature		Approx. Resistance
°F	°C	(KΩ)
-4	-20	183.4
14	-10	107.2
32	0	63.8
59	15	31.1
77	25	20.0
86	30	16.2
104	40	10.7
122	50	7.2
140	60	5.0
158	70	3.5
176	80	2.5
194	90	1.8
212	100	1.3
248	120	0.7
302	150	0.4

- If the resistance is infinite or close to zero, go to step 4.
- If it is within range, go to step 6.

4. Disconnect the dry temperature sensor connector from the NTC.

5. Using an ohmmeter, measure the resistance across pins of the dry temperature sensor.

- If the resistance is within the specified range, the sensor is good; replace the main harness.
- If the resistance is far out of range or open, replace the temperature sensor.

6. If the preceding steps did not correct the dry temperature sensor problem, replace the ACU.

TEST #11a: Single Dose Dispenser

Perform the following checks if the washer will not dispense detergent, bleach, or fabric softener.

1. Check water supply to washer. Check water hose connections to and inside the washer.

2. Verify that dispenser drawer is not clogged with detergent.

3. Unplug washer or disconnect power.

4. Remove the top panel to access the machine electronics.

5. Verify that all valves are working through TEST #6 on page 16. See TEST #6 for valve descriptions. The water is dispensed as follows:

- Detergent Dispenser: Through valves Cold 1 and Hot 1 (hot and cold water)
- Bleach: Through valve Cold 2 (only cold water)
- Fabric Softener: Through valves Cold 1 and Cold 2. Both valves need to be functioning for water to be dispensed through this dispenser.

6. If the quick diagnostic test shows that the valves are functioning and a problem persists, replace the dispensing system.

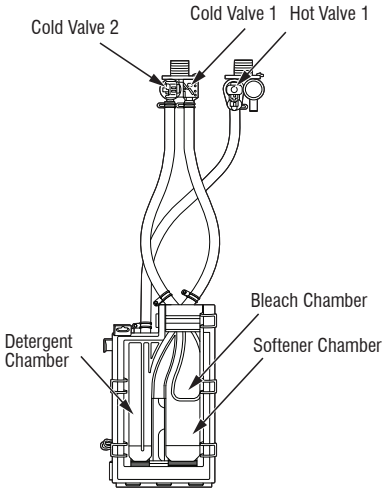


Figure 10 - Dispenser system,valves and chambers

TEST #11b: Drawer Bulk Dispenser (on some models)

Perform the following checks if the washer will not dispense detergent or fabric softener.
Open bulk drawer from the unit.

DISPENSER TANKS, FITTINGS, AND HOSES

1. Verify that the tanks are not clogged with detergent.

- If the tanks are clogged, remove from unit and fill/rinse them thoroughly with the aid of hot water to clean build-up from tanks.
- Inspect docking interface on the tanks after rinsing to ensure build-up is removed from the area. If build remains, remove retainer and rinse with hot water.

2. Check the Drain Pump/ Recirculation Pump filter for foreign objects or lint.

- Remove the Bulk drawer by pulling downward and upward the drawer rail's retention tabs.

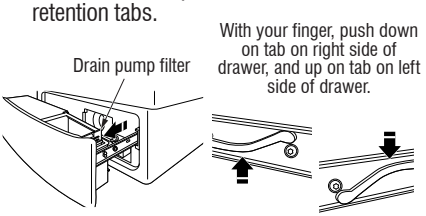


Figure 11 - Removing the Bulk drawer

➢ Remove the emergency drain hose from the backer and allow it to drain. Remove filter from pump housing.

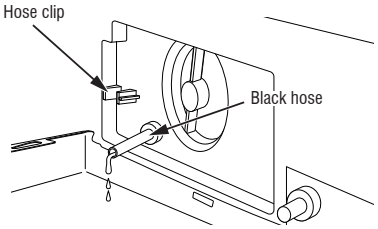


Figure 12 - Removing the drain hose

3. Check dispensing hoses connections to the Drain Pump/Recirculation Pump and to the dispenser tanks are not kinked/ unattached or clogged.

➢ Remove the top panel, console, drawer (when applicable), remove below retainer in order to remove the front panel and have access to the bulk backer assembly.

4. Check/clean recirculation nozzle for lint accumulation.

➢ Verify that nozzle located on the below allows recirculation water/additives to flow freely.

DOSING PUMP TEST

NOTE: Tanks must be placed into dispenser drawer for pump to operate.

1. Unplug washer or disconnect power.

➢ Remove the dispenser drawer by pulling downward and upward the drawer rail's retention tabs.

➢ Remove the top panel, console, drawer (when applicable), remove below retainer in order to remove the front panel and have access to the bulk backer assembly.

2. Visually check that connector **J10** is inserted all the way into the ACU (refer to Figure 3, page 13). Also check that the harness is securely connected to the detergent dosing pump connector(s) located on top of the backer.

➢ If visual check passes, go to step 3.

➢ If connector(s) are not inserted properly, reconnect **J10** or connector(s) on top of backer and retest.

3. With an ohmmeter, check harness for continuity between the dosing pump(s) and the ACU.

➢ If there is continuity, go to step 4.

➢ If there is no continuity, replace the lower harness and retest.

4. Disconnect the suspected pump connector. With an ohmmeter, measure the resistance across pins 1 & 3 of the pump. Resistance should be between **1.6 to 1.96 kΩ**.

➢ If the resistance is infinite (open), replace the dosing pump.

➢ If the resistance is in the correct range, go to step 5.

5. If the preceding steps did not correct the problem, replace the ACU.

a. Unplug washer or disconnect power.

b. Replace the ACU.

c. Reassemble all parts and panels.

d. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

TEST #11c: Drawer Bulk Dispenser Level Sensing (on some models)

NOTE: This procedure applies to both single and dual tank systems.

Perform the following checks if the washer cannot detect the level of the detergent or softener in the tank.

1. Save customer's detergent or softener in spare container. When tank is empty, you should 'hear' the float moving up and down when the container is rotated. If stuck, thoroughly rinse the tank with warm water. Fill tanks with water to test floats. Reinstall bulk dispenser tank in dispenser assembly and check for proper operation.

➢ If float is damaged, replace the entire bulk dispenser tank. Dispenser tanks are not serviceable.

➢ If float is working, but detergent/softener level is not detected, go to step 2.

2. Unplug washer or disconnect power.

3. Remove top panel to access machine electronics.

4. Visually check that the **J17** connector is inserted all the way into the ACU.

- If visual check passes, go to step 5.
- If connector is not inserted properly, reconnect **J17** and retest.

5. With an ohmmeter, check harness for continuity between the **J17** of the ACU and the level sensor connectors.

- If there is continuity, go to step 6.
- If there is no continuity, replace the lower harness and retest.

6. To test either the **detergent or fabric softener level sensor**, disconnect the appropriate level sensor connector on top of the bulk backer assembly. Using an ohmmeter, connect leads across pins 1 and 2, or 3 and 4 of the connector. With the bulk tank removed, the sensor should read open.

7. While watching the ohmmeter, place a magnet above the appropriate sensor cavity. The magnet should close the sensor (less than **3 Ω**).

- If the resistance still reads open, replace the detergent level sensor, otherwise continue to step 8.

8. If the preceding steps did not correct the problem, replace the ACU.

a. Unplug washer or disconnect power.

b. Replace the ACU.

c. Reassemble all parts and panels.

d. Perform the "Quick Diagnostic Test" to verify repair.

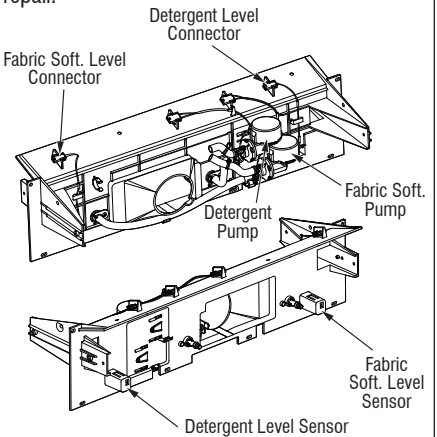


Figure 13 - Drawer Bulk Dispenser Components

TEST #12: Vent Baffle Solenoid (on some models)

This test is performed if the vent fan does not activate.

1. Check rear vent for obstruction that could prevent the fan from opening.

2. Check the vent baffle solenoid and electrical connections by performing the "Quick Diagnostic Test". The following procedures assume that this step was unsuccessful.

3. Unplug washer or disconnect power.

4. Remove the top panel to access the machine electronics.

5. Visually check that connector **J9** is inserted all the way into the ACU (refer to Figure 3, page 13). Also check that the solenoid harness is securely connected to the solenoid.

- If visual check passes, go to step 6.
- If connector is not inserted properly, reconnect **J9** and repeat step 2.

6. With an ohmmeter, measure the resistance across the two solenoid terminals. Resistance should be less than 20 MΩ.

- If the resistance is infinite (open), replace the solenoid.

7. With an ohmmeter, measure the resistance across the two fan terminals. Resistance should be less than 10 MΩ.

- If the resistance is infinite (open), replace the vent fan assembly.
- If the resistance is in the correct range, go to step 8.

8. If the preceding steps did not correct the problem, replace the ACU.

a. Unplug washer or disconnect power.

b. Replace the ACU.

c. Reassemble all parts and panels.

d. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

TEST #13: Dry Blower Motor (on some models)

This test is performed if the blower fan does not activate.

1. Check the dry blower motor and electrical connections by performing the "Quick Diagnostic Test". The following procedures assume that this step was unsuccessful.

2. Unplug washer or disconnect power.

3. Remove the top panel to access the machine electronics.

4. Visually check that connector **J12** is inserted all the way into the ACU (refer to Figure 3, page 13). Also check that the blower motor harness is securely connected to the motor.

- If visual check passes, go to step 5.
- If connector is not inserted properly, reconnect **J12** and repeat step 1.

5. With an ohmmeter, check harness for continuity between the blower motor and the ACU.

- If there is continuity, go to step 6.
- If there is no continuity, replace the upper machine harness and repeat step 1.

6. With an ohmmeter, measure the resistance across the two blower motor terminals. Resistance should be **9-11 Ω**.

- If the resistance is **9-11 Ω** go to step 7.
- If the resistance is much less or much greater than **9-11 Ω**, replace the Heater Channel Assembly. **NOTE:** The blower motor cannot be replaced separately from the Heater Channel Assembly.

7. Remove the Heater Channel Assembly.

8. Confirm that the blower wheel is not obstructed and turns freely.

- If the blower wheel is obstructed, remove debris and re-assemble to washer.
- If the blower wheel is not obstructed but does not turn freely, replace the Heater Channel Assembly. **NOTE:** The blower motor cannot be replaced separately from the Heater Channel Assembly.
- If the blower wheel turns freely, replace the ACU.

9. Reassemble all parts and panels.

10. Plug in washer or reconnect power and perform the "Quick Diagnostic Test" to verify repair.

MANUALLY UNLOCKING THE DOOR

HOW TO MANUALLY OPEN DOOR

Before removing the top of the washer/dryer as described below, refer to the failure "Door will not unlock" in the "Troubleshooting" section.The door may unlock by itself after the failure condition no longer exists.
If the door still cannot be opened, perform the following:

Before Opening Door:

- Turn off and unplug the washer/dryer.
- Close the water faucets.
- Wait until water and laundry have cooled down when washing with high temperatures.

Always drain the water before opening the door by:

- Following the instructions in the "Cleaning the Drain Pump Filter/Draining Residual Water" section.

To Unlock and Open Washer/Dryer Door:

1. Remove the top of the washer/dryer by removing the three 1/4" hex screw with T20 option screws in the back. Slide top back and up.

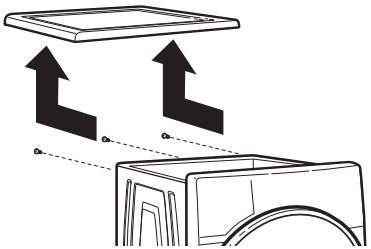


Figure 14a - Manually unlocking the door

2. Locate the locking mechanism on the right-hand side of the washer/dryer interior about half-way down. Press down on locking mechanism until the latch is released. The door can now be opened and the laundry removed, if needed.

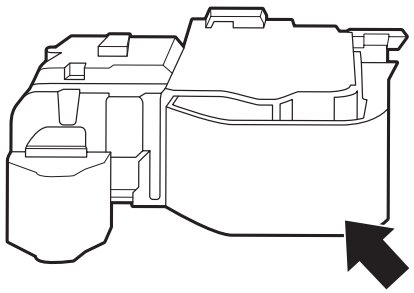


Figure 14b - Manually unlocking the door

COMPONENT REMOVAL

NOTE: Instructions are provided only for those components where removal is not obvious. Unplug washer or disconnect power before removing components.

Components accessible through top panel:

- Appliance Control Unit (ACU) – Remove the screw (rear of product) securing the ACU to the side panel. Slide the ACU assembly toward the front of the washer to remove.
- Dispensing System – 1) Remove top panel. 2) Remove dispenser drawer. 3) Remove the two screws on both sides of the drawer opening. 4) Slide assembly back to remove.
- Interference Filter
- Water Level Sensor – Disconnect pressure hose and twist sensor 90° to remove.
- Human-Machine Interface/Console – 1) Remove top panel. 2) Remove dispenser drawer. 3) Remove the two screws on both sides of the drawer opening. 4) Remove the two screws (top of console) securing the console to the mounting bracket. 5) Slide the console up and off the bracket.
- Water Valve Assembly –
  1) Remove screws in back bracket.
  2) Remove hose clips and remove water valve assembly.
  3) Rotate water valve 55° to remove; Hot Valve must be removed prior to Cold Valve.
- Drum Light (pushing it out through the bellows)

Components accessible through back panel:

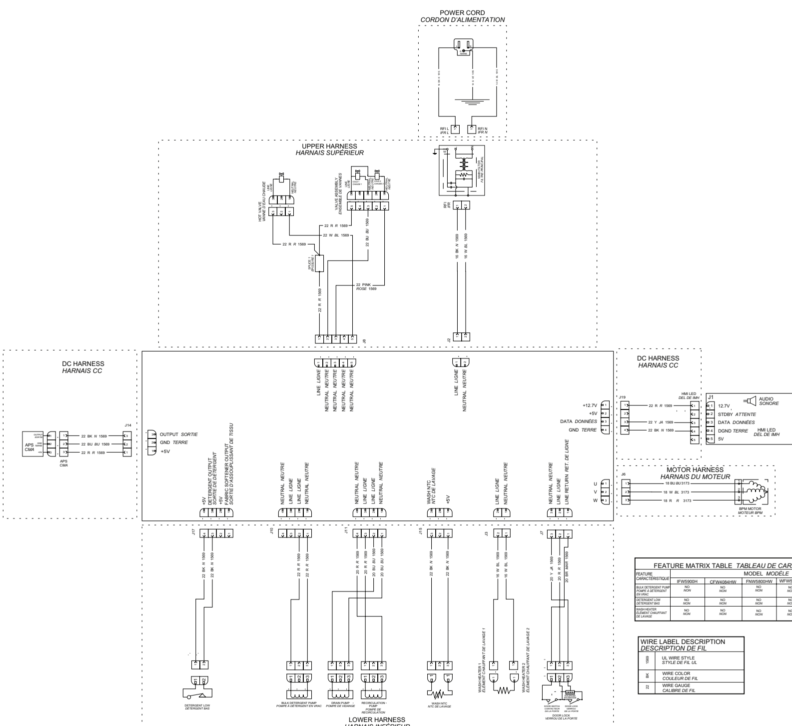
- Drive Motor
- Heater/Temp Sensor Assembly –
  1) Locate assembly beneath tub.
  2) To release grip on tub, loosen the center nut to decompress gasket.
  3) Firmly pull assembly from tub.
  4) Fully seat the new heater in tub.
  5) Torque the center nut to a value of 4.5 Nm ± 0.5 Nm (39.9 in-lbs ± 4.4 in-lbs).

Components accessible through front panel:

- Door Switch/Lock Assembly
- Drain and Recirculation Pumps/Drain Filter
- Bulk Pumps and Sensors.

WIRING DIAGRAM

IMPORTANT: Electrostatic discharge may cause damage to machine control electronics. See page 1 for ESD information.



FEATURE MATRIX TABLE *TABLEAU DE CARACTÉRISTIQUES*						
FEATURE *CARACTÉRISTIQUE*	MODEL *MODÈLE*					
	IFW5900H	CFW4084HW	FNW5800HW	WFW560CH	WFW5620H	WFW6620H
BULK DETERGENT PUMP *POMPE À DÉTERGENT EN VRAC*	NO *NON*	NO *NON*	NO *NON*	NO *NON*	YES *OUI*	YES *OUI*
DETERGENT LOW *DÉTERGENT BAS*	NO *NON*	NO *NON*	NO *NON*	NO *NON*	YES *OUI*	YES *OUI*
WASH HEATER *ÉLÉMENT CHAUFFANT DE LAVAGE*	NO *NON*	NO *NON*	NO *NON*	NO *NON*	NO *NON*	YES *OUI*

WIRE LABEL DESCRIPTION *DESCRIPTION DE FIL*	
1569	UL WIRE STYLE *STYLE DE FIL UL*
BK	WIRE COLOR *COULEUR DE FIL*
22	WIRE GAUGE *CALIBRE DE FIL*

Figure 15 - Wiring Diagram

(Not all features are available on all models)

WIRING DIAGRAM

IMPORTANT: Electrostatic discharge may cause damage to machine control electronics.
See page 1 for ESD information.

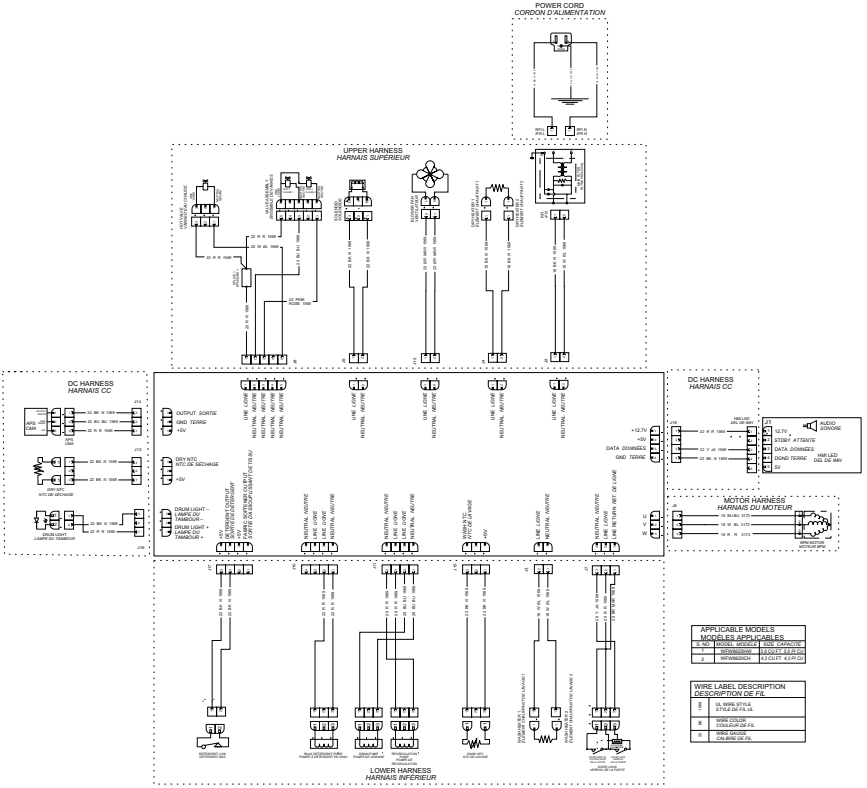


Figure 16 - Wiring Diagram

(Not all features are available on all models)