

# Training Bulletin

February 2011

## Models GFWS3500, GFWS3505, GFWS3600, GFWS3605, GFWS2400, and GFWS2405 GE HA Washer Upgrade

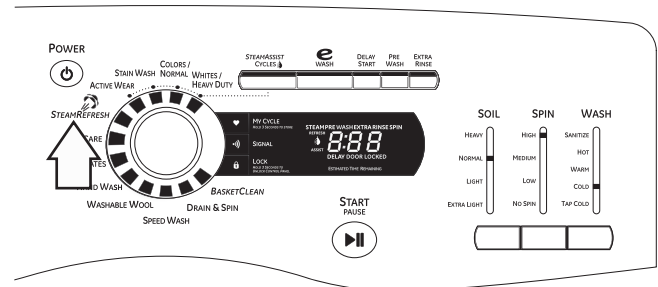
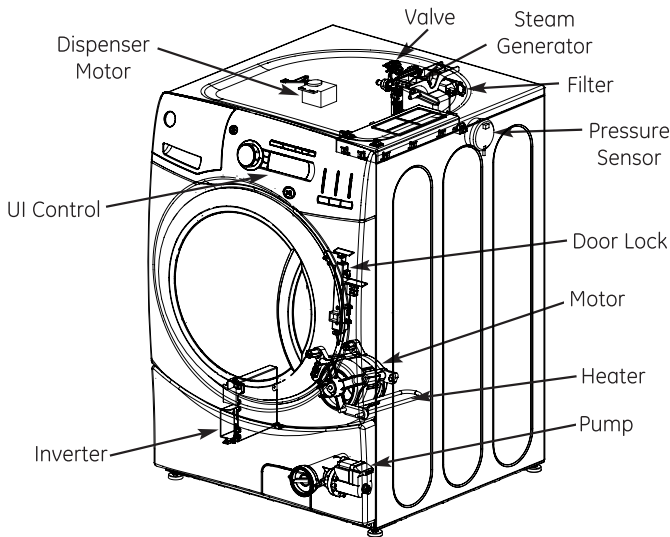
### INTRODUCTION

The new GE HA Washer Upgrade features include a larger 4.9 cu. ft. tilted wash basket, demo mode, service mode, model select plug, and adaptive vibration control. The GFWS3500/3600 series also has added a steam generator for **STEAMREFRESH** and **STEAMASSIST** washing cycle options.

### STEAM WASHING CYCLE OPTIONS

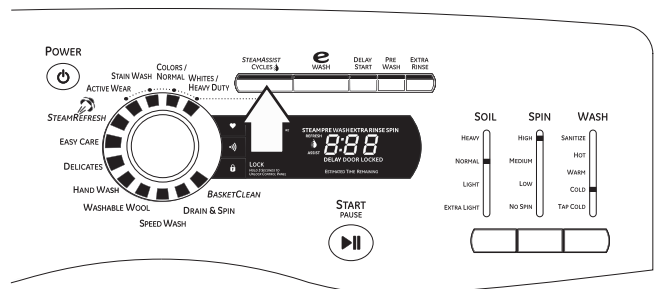
The GFWS3500 series has added a steam generator for **STEAMREFRESH** and **STEAMASSIST** washing cycle options. **STEAMREFRESH** helps reduce wrinkles and odors and rejuvenates fabrics, while **STEAMASSIST** penetrates fabrics to dissolve soils and help remove tough stains.

**STEAMREFRESH** can be used to de-wrinkle 1 to 5 cotton-blend items. This is **not** a wash cycle, but a cycle that applies only steam to the garments. The washer will beep upon completion of the cycle, and will continue to tumble for 30 minutes to keep wrinkles from setting in.



Press **START/PAUSE** button to remove the clothes. If the clothes are slightly damp after completion of the cycle, hang-dry clothes for 10 minutes before wearing.

**STEAMASSIST** adds steam into the washer during **WHITES/HEAVY DUTY, COLORS/NORMAL, STAIN WASH** or **ACTIVE WEAR** cycles.



### DEMO MODE

To enter demo mode:

1. Turn the unit off (screen is blank).
2. Unplug the unit and wait 10 seconds.
3. Plug the unit back in.
4. Within 30 seconds after plugging the unit back in, press the **START/PAUSE** button 4 times within 3 seconds with the door open.

To exit demo mode: Repeat the above sequence.



GE Appliances  
General Electric Company  
Louisville, Kentucky 40225

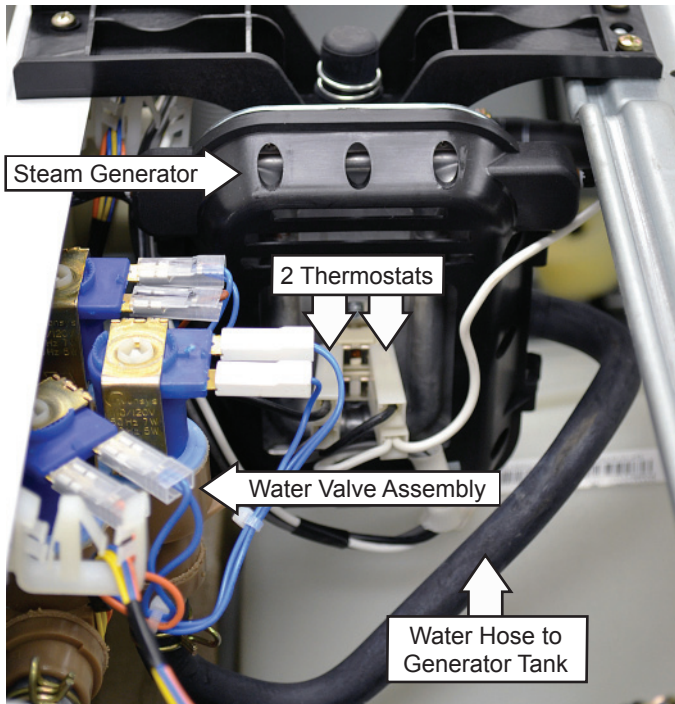
## STEAM GENERATOR

**WARNING:** Metal components of the steam generator are **NOT** grounded.

**WARNING:** The generator tank and steam output hose are very **HOT** while the generator is in operation.

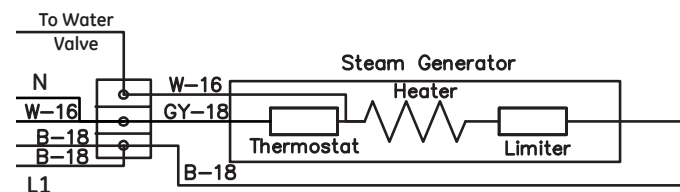
The steam generator is located in the center, rear of the machine and is mounted to the rear panel of the washer cabinet and to a cross support.

The steam generator assembly consists of a water tank and an electric heater, with two thermostats (cycling and safety) mounted to the side of the assembly.



### How it works:

The tank heater boils water to supply the steam. The cycling thermostat monitors the tank temperature and maintains it within the working range by activating the water valve that fills the tank.



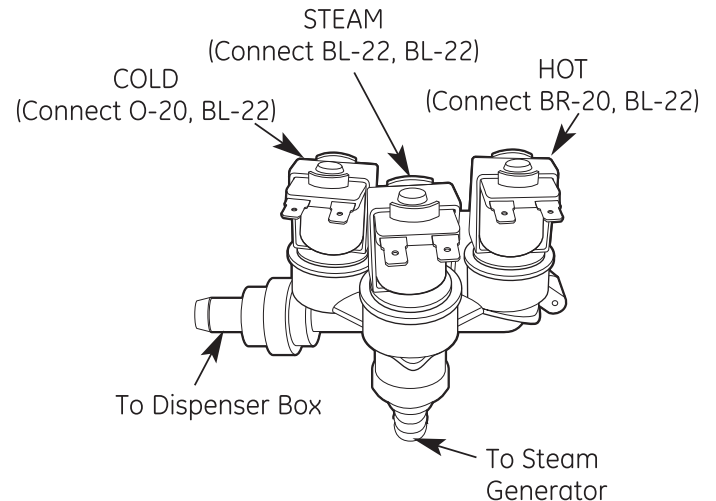
The white wire to the water valve (W-16) is at neutral potential as long as the cycling thermostat is closed. When the thermostat opens, W-16 picks up L1 potential through the limiter and heating element. This energizes the water valve supplying cold water to the generator.

### Technical Specifications:

- Tank Heater  
1000W/120VAC/8.3A/15Ω
- Cycling Thermostat  
Opens at 266°F and resets at 221°F.
- Safety Limiter  
Opens at 403°F and is a one-shot device.

## WATER VALVE

The new triple water valve has an additional low-flow cold water valve which feeds the steam generator unit. This valve is controlled by the steam generator cycling thermostat (See strip circuit). The thermostat opens at 266°F when the unit is depleted of water. With the cycling thermostat open, 120VAC is fed through the limiter and the heater element. This energizes the valve coil and replenishes the steam generator unit with cold water until the cycling thermostat closes at 221°F and the steam process begins again.



## ENERGY SAVINGS WASH (e WASH)

Use e WASH to save energy on specified wash cycles. e WASH cannot be used with STEAMREFRESH, STAIN WASH and BASKET CLEAN.

The changes to the cycles include reducing the default wash temperatures to the coldest possible temperature and increasing the spin speed to the highest possible spin speed. Differences may occur on some cycles, such as the delicate cycle where high spin speeds might cause damage to clothing.

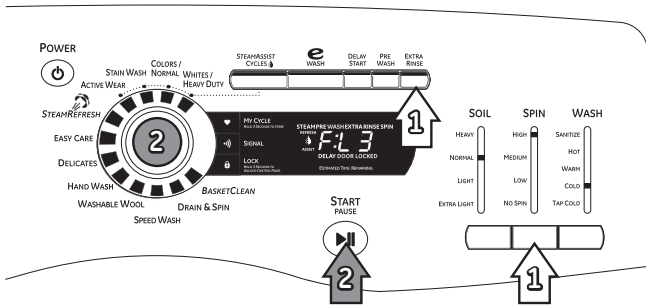
The unit will also spin the clothes out **twice** at the end of the cycle. This gets a little bit extra water out of the clothes. Spinning the clothes out an extra time requires less energy than removing an equivalent amount of

## ADAPTIVE VIBRATION CONTROL (AVC)

Using information about the typical resonance of a floor type, this AVC system can reduce vibration and improve spin performance in some installations by adapting the spin cycle. The default configuration is specially designed to provide optimal performance across the widest range of floor types (concrete, second floor wood, tile, etc). Adjustable AVC settings allow for slightly different spin RPM settings that can reduce vibration due to resonance.

### To select Adaptive Vibration Control floor type:

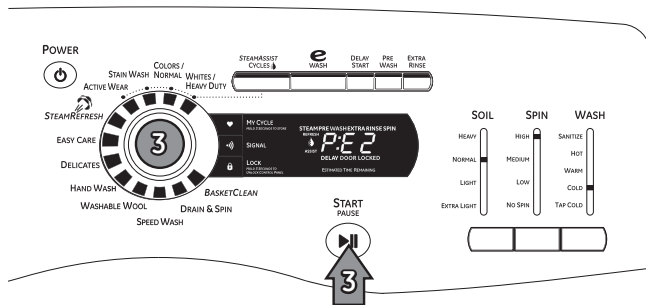
1. With the unit power off, simultaneously press and hold for 3 seconds the **EXTRA RINSE** and **SPIN** buttons.
2. Rotate the cycle knob to **FL1**, **FL2**, **FL3**, or **FL4** and then press the **START/PAUSE** button to make the selection.



FL1	Default*
FL2	Concrete Floor
FL3	Wood Floor 1
FL4	Wood Floor 2

\* The Default setting is acceptable for most installations.

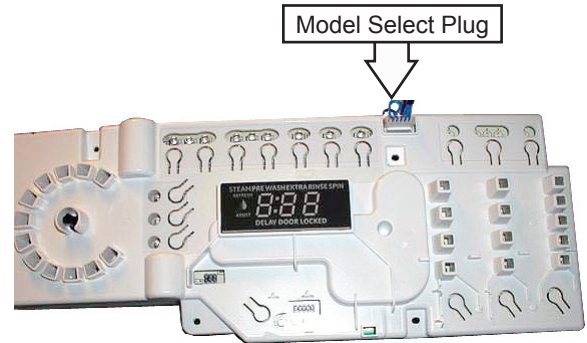
3. Rotate the cycle knob to **PE1** if the washer is on a pedestal, or **PE2** if it is not, and then press the **START/PAUSE** button to make the selection.



The washer can be returned to the default configuration at any time using the same procedure.

## MODEL SELECT PLUG

Both the 3500/3600 and the 2400 models have a model select plug located on the user interface board. This plug is not shown on the schematic.



To determine if the correct model select plug is assembled in the 3500/3600 models:

- Turn the unit on.
- Turn the knob to **STEAMREFRESH**.
- The time on the display should read **0:17**.

GFWS3500  
GFWS3505  
GFWS3600  
GFWS3605

▶ M-6	M-4/M-5	
▶ M-5	M-6	
▶ M-4	M-6	
▶ M-3	M-2	
▶ M-2	M-3	
M-1		

To determine if the correct model select plug is assembled in the 2400 models:

- Turn the unit on.
- Turn the knob to **ACTIVE WEAR**.
- The time on the display should read **1:04**.

GFWS2400  
GFWS2405

	M-7	
▶ M-6	M-5	
▶ M-5	M-6	
▶ M-4	M-2	
	M-3	
▶ M-2	M-4	
M-1		

**Important:** When changing the model select plug, disconnect the unit, change the model select plug, then reconnect the unit. The computer will reset and reread the new model number. If the unit is connected to power when changing the model select plug, no model change will be recorded and the washer will continue to act as the model it was originally.

**Note:** If for some reason there is no model plug in the user interface board, the 3500/3600 model unit will test the same. The 2400 model unit will read **0:17** for **ACTIVE WARE**.

## **SERVICE MODE**

### **To enter service mode:**

While the unit is idle and the screen is blank, press: **EXTRA RINSE-DELAY START-EXTRA RINSE-DELAY START-EXTRA RINSE**.

### **To exit service mode:**

Press the **POWER** button when in the service mode menu screen.

### **Service Mode Selections:**

**Note:** See mini-manual for individual test sequences.

#### **1. Error Codes**

Checks for any error codes reported by the controls.

#### **2. Version Information**

Checks the software version.

#### **3. EEPROM Test**

Checks the memory on both the user interface control board and the power board.

#### **4. UL Test**

Verifies all LEDs and Display operate correctly.

#### **5. Pump Test**

Test runs drain pump.

#### **6. Water Level Sensor**

Fills to all 3 levels, then pumps out water.

#### **7. Temperature and Heater**

Verifies that both the thermistor and heater are working correctly.

#### **8. Tumble Test**

Verifies washer tumbles (i.e., Wash Cycle).

#### **9. Spin Test**

Verifies washer spins. No out-of-balance detection will be performed here, so the washer will spin up regardless of any out-of-balance condition in the drum.

#### **10. Dispenser Test**

Verifies the dispenser motor works and can locate all 4 dispenser positions.

#### **11. Vibration Test**

Tests the washer vibration by spinning to the extra high spin speed as fast as possible. There is no output reading for this test. No out-of-balance detection will be per-

formed. The washer will spin up regardless of an out-of-balance load placed in the drum.

A change in the AVC setting may show some improvement in the vibration that would stem from allowing the unit to dwell at different spin speeds. This new AVC setting may move the unit out of a resonance with the floor, thus somewhat dampening the vibration of the unit.

#### **12. Steam**

Tumbles while operating the steam generator.

#### **13. Out of Balance (OBO)**

Spins at a low RPM and outputs the out-of-balance reading of the inverter in Decagrams (OOB weight of Grams x 10).

It should be in the 0-10 range. For service, any number below 15 is normal Out of Balance. Any number between 15 and 20 is marginally acceptable. A number greater than 20 (with the unit empty) means an abnormal Out of Balance is detected (>0.44 lbs. OOB).

Getting the unit to an acceptable level may be difficult. If the unit is empty and it is reading high out of balance numbers, check the following:

- **Basket** - If the basket is "Out of Round", it might be causing a high reading. Check this by spinning the basket by hand and watching the gap between the basket and the gasket. If it's not staying reasonably constant, then the basket is damaged and needs replaced.
- **Inverter** - It's also possible that the inverter needs replaced but less likely.
- **Levelness** - Even on a less-than-adequate floor, this OOB number should be very low, but it would be best to check the levelness of the unit as well.

#### • **14. AutoSpin Profile**

Tests each spin speed of the washer. No out-of-balance detection will be performed here, so the washer will spin up regardless of any out-of-balance condition in the drum.

#### **15. Hot Water Test**

Verifies hot-water valve turns on and off.

#### **16. Cold water Test**

Verifies cold-water valve turns on and off.

#### **17. Slow Acceleration Test**

Slowly accelerates to the maximum spin speed. No out-of-balance detection will be performed, so the washer will spin up regardless of any out-of-balance condition in the drum.

## ERROR CODES

**Note:** There is no maximum number of error codes that the unit will hold. Once an error code has been tripped, it will be stored until it is cleared. The unit will not output how many times that error has been tripped.

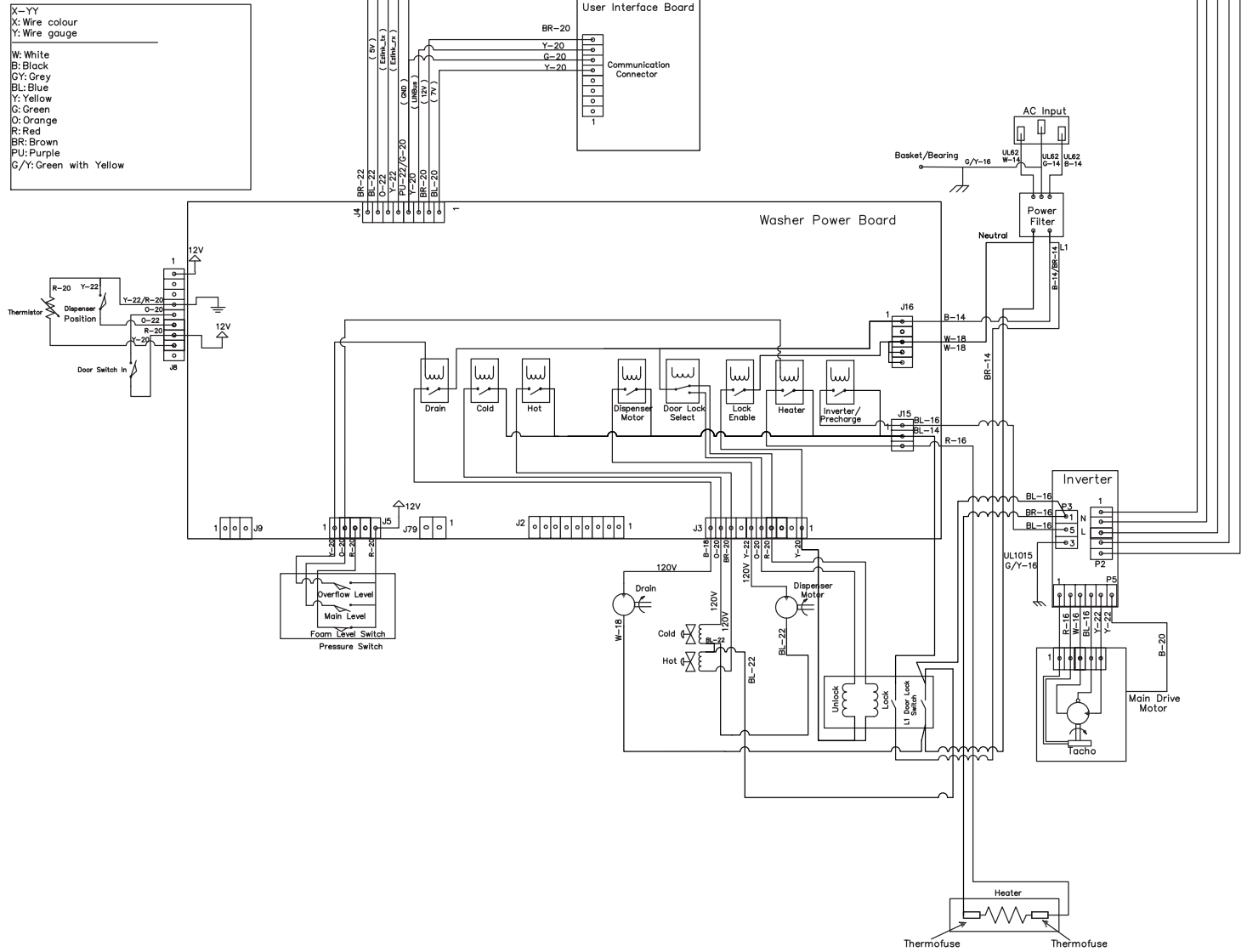
Error Code	Description	Action
E1, E2	Internal problem with UI or MC board	<ul style="list-style-type: none"> <li>Replace board as necessary.</li> </ul>
E4, E5	Thermistor short or open. Water temperature sensor problem	<ul style="list-style-type: none"> <li>Check integrity of wiring and connections between main control and thermistor assembly.</li> <li>Using ohmmeter, measure Thermistor resistance. If outside expected range, replace thermistor assembly.</li> </ul> <p><b>IF ABOVE STEPS DO NOT CLEAR THE PROBLEM:</b></p> <ul style="list-style-type: none"> <li>Replace the main control.</li> </ul>
E6	Pressure switch. Water level sensor problem	<ul style="list-style-type: none"> <li>Check integrity of wiring and connections between main control and water level sensor.</li> <li>Check integrity of water level sensor, replace if necessary.</li> <li>Check drain system.</li> </ul> <p><b>IF ABOVE STEPS DO NOT CLEAR THE PROBLEM:</b></p> <ul style="list-style-type: none"> <li>Replace the main control.</li> </ul>
Error Code	Description	Action
E7	Slow fill problem	<ul style="list-style-type: none"> <li>Ensure manual water valves are fully open.</li> <li>Check if water strainers on solenoid valve assembly are clogged.</li> <li>Check for obstructions inside inlet water hoses.</li> <li>Ensure solenoid valves do not leak when the valves are de-energized and the washer is powered down.</li> <li>Measure coil resistance for both valves. If outside range (1000–1250 ohms at room temp.), replace solenoid valve assembly.</li> </ul> <p><b>IF ABOVE STEPS DO NOT CLEAR THE PROBLEM:</b></p> <ul style="list-style-type: none"> <li>Replace solenoid valve assembly.</li> </ul>
E8	Drain system problem (Pump-out time has exceeded 500 seconds.)	<ul style="list-style-type: none"> <li>Ensure pump strainer is clean and free of debris.</li> <li>Check for obstruction inside the drain hose.</li> <li>Check pump impeller blades and bearing; if evidence of blade damage or seized bearings are present, replace the pump.</li> <li>Check the electrical connections at the pump motor and harness.</li> <li>Measure pump motor resistance. If outside range (9–14 ohms at room temperature), replace the pump.</li> </ul>
E9	Dispenser motor problem	<ul style="list-style-type: none"> <li>Check for obstruction in dispenser mechanism and linkages.</li> <li>Check the electrical connections at the motor feedback switch and in the harness.</li> <li>Check the electrical connections of water valves in the harness.</li> </ul> <p><b>IF ABOVE STEPS DO NOT CLEAR THE PROBLEM:</b></p> <ul style="list-style-type: none"> <li>Replace dispenser motor assembly.</li> </ul>
E10	Communication problem between main control and inverter	<ul style="list-style-type: none"> <li>Check integrity of wiring and connections between main control and inverter.</li> <li>Clear error code and run a cycle.</li> <li>If fault persists and reappears, replace the main control.</li> </ul>
E11 E12 E13	Door lock assembly problems	<ul style="list-style-type: none"> <li>Check integrity of wiring and connections between main control and DOOR LOCK mechanism.</li> <li>Investigate DOOR LOCK mechanism. Check door microswitch operation, lock and unlock solenoid continuity, and contact integrity. Replace DOOR LOCK mechanism if necessary.</li> </ul> <p><b>IF ABOVE STEPS DO NOT CLEAR THE PROBLEM:</b></p> <ul style="list-style-type: none"> <li>Replace the main control.</li> </ul>
E14	Overflow level was reached	<ul style="list-style-type: none"> <li>Check valve for any signs of leaks.</li> <li>Check integrity of water level sensor. Replace if necessary.</li> </ul>
E15	Open circuit in motor phases detected. No speed information present, bridge turned off immediately. Motor will coast down. Drive will preserve non-zero speed info during the stop check stage.	<ul style="list-style-type: none"> <li>Check integrity of wire connections between the inverter and the motor.</li> <li>Clear fault and run cycle. If fault persists and reappears, replace the inverter.</li> </ul>

## ERROR CODES (CONT.)

Error Code	Description	Action
E16 E18 E19 E20 E21 E27 E28	Inverter operation above design limits	<ul style="list-style-type: none"><li>• Ensure all 4 shipping bolts have been properly removed.</li><li>• Remove all foreign objects that may be lodged between inner basket and outer tub.</li><li>• Look for signs of seized bearing(s) on basket and drum motor. Replace components as necessary.</li><li>• Inspect condition and mounting of door gasket. Replace and remount as necessary.</li><li>• Ensure inner basket (drum) can rotate freely.</li></ul> <p><b>IF ABOVE STEPS DO NOT CLEAR THE PROBLEM:</b></p> <ul style="list-style-type: none"><li>• Replace inverter or motor.</li></ul>
E3 E17 E22 E23 E24 E25	Inverter internal problems	<ul style="list-style-type: none"><li>• Measure AC outlet voltage; ensure correct range (120 to 132 VAC).</li><li>• Check electrical connections at the inverter.</li><li>• Check harness integrity between main control and inverter</li><li>• Unplug the unit, wait 30 seconds, then restart the unit.</li><li>• If the fault persists and reappears, replace the inverter.</li></ul>
E26	Problem with the communication between main control and the user interface control.	<ul style="list-style-type: none"><li>• Check the integrity of the wiring between the main control board and the user interface.</li><li>• Clear the fault and run the cycle. If fault persists and reappears, replace the main control.</li></ul>

# SCHEMATICS

## Models GFWS2400 and GFWS2405



## Models GFWS3500, GFWS3505 GFWS3600 and GFWS3605

**Note:** The 3500/3600 model series incorporates a steam water valve and a steam generator shown here in this partial schematic.

