OPERATOR MANUAL

Basil® 6000 Tunnel Cage Washer

(2005-08-17) **P122993-622**

A WORD FROM STERIS CORPORATION

This manual contains important information on proper use of the Basil® 6000 Tunnel Cage Washer. All personnel involved in the use of this equipment must carefully review and comply with the warnings, cautions, and instructions contained in this manual. These instructions are important to protect the health and safety of personnel operating a Basil 6000 Tunnel Cage Washer and should be retained in a conveniently accessible area for quick reference.

Equipment drawings have been furnished for utility and clearance space requirements. If missing, contact STERIS for replacement copies, giving the serial and model numbers of the unit.

Advisory

A listing of the *Safety Precautions* to be observed when operating and servicing this equipment can be found in Section 1 of this manual. Do not operate or service the washer until you have become familiar with this information.

To help ensure operators are adequately trained in the safe use of equipment, STERIS recommends:

- all personnel who operate or maintain the equipment are trained in its operation and in its safe use;
- personnel working with toxic chemicals and vapors (if applicable) have comprehensive training about the washer process, relevant health hazards, and methods to detect the escape of toxic materials;
- there is regular training of all personnel concerned with the operation and maintenance of the equipment; attendance records are maintained; and the evidence of understanding is demonstrated.

Indications For Use

The Basil 6000 Tunnel Cage Washer is a tunnel-type, conveyorized washer designed for thorough, efficient cleaning of cages, debris pans, bottles, feeder bowls, and miscellaneous items used in the care of laboratory animals.

Printed in Canada.

Service Information

A thorough preventive maintenance program is essential to help ensure safe and proper equipment operation. Customers are encouraged to contact STERIS concerning extended service maintenance agreements to give the washer planned maintenance, periodic inspections, and adjustments to help ensure low-cost peak performance. STERIS can provide information regarding these annual maintenance agreements.

STERIS carries a complete line of accessories for use in this equipment. A STERIS representative will gladly review these with you.

NOTE: Certain options may not be available in your area. Contact STERIS for product availability and ordering information.

Manufacturer:
Corporation STERIS
Canada
Beauport, Qc, CANADA

ISO 13485
Certified
Facility

The base language of this document is ENGLISH. Any translations must be made from the base language document.

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SAFETY PRECAUTIONS AND SYMBOLS

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The following *Safety Precautions* **must** be observed when operating or servicing this equipment. WARNING indicates the potential for personal injury and CAUTION indicates the potential for damage to equipment. For emphasis, certain *Safety Precautions* are repeated throughout the manual. **It is important to review ALL *Safety Precautions* before operating or servicing the unit.**

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:

- Always load baskets on appropriate loading cart or surface.
- In case of an emergency situation involving conveyors, always press EMERGENCY STOP pushbutton to stop all washer and conveyor operations.
- Regularly scheduled preventive maintenance is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.
- Repairs and adjustments to this equipment must be made only by STERIS or STERIS-trained service personnel. Nonroutine maintenance performed by unqualified personnel or installation of unauthorized parts could cause personal injury, result in improper equipment performance, void the warranty, or result in costly damage. Contact STERIS regarding service options.

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD:

- Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container, or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD:

- Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.
- Fasteners and star washers are used to ensure protective bonding continuity. Always reinstall any star washer which may have been removed during installation or servicing.
- POWER-OFF/STANDBY switch does not shut ac power off to the unit.

WARNING – BURN HAZARD:

- Before performing any service on the unit, wait until chamber and piping cool to room temperature.
- Do not adjust balancing valve while washer is operating.
- Do not reach into sump.
- Pipes may be extremely hot.
- Water discharge may be extremely hot.
- When unloading processed items from conveyor, wear appropriate Personal Protective Equipment (PPE). Clean items may be extremely hot or contain hot rinse water.

WARNING – SLIPPING HAZARD:

To avoid slippery floor conditions, immediately wipe up any spilled liquids or drippage. If spilled liquids or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

CAUTION – POSSIBLE EQUIPMENT DAMAGE:

Use nonabrasive cleaners when cleaning unit. Follow directions on container and rub in a back-and-forth motion (in same direction as surface grain). Abrasive cleaners will damage stainless steel. Cleaners rubbed in a circular motion or applied with a wire brush or steel wool will scratch and dull stainless steel. Do not use these cleaners on painted surfaces.

When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content can corrode stainless steel.

1.1 Symbols on Unit

Symbol	Definition
	Warning. Refer to Manual For Further Information.
	Transfer of Heat, Hot Surface.
	Protective Earth (Ground).
	Warning! Risk of Electrical Shock.

1.2 Symbols, Information on Nameplate

Symbol	Definition
MOD.	Model of the Unit.
SER.	Serial Number of the Unit.
kW	Power Rating of the Unit.
V	Voltage Rating of the Unit.
A	Amperage Rating of the Unit.
PH/Hz	Phase/Hertz – Frequency of the Unit.

INSTALLATION VERIFICATION

2

2.1 Installation Checklist

After washer has been installed by qualified service technicians, complete the following checklist to help ensure the installation is complete and correct. Contact STERIS and schedule a technician to test the installation and demonstrate proper equipment operation.

- ❑ Disconnect switches (not provided by STERIS) capable of being locked in OFF position only for maintenance purposes, installed in electrical supply lines near unit and in compliance with local occupational health and safety regulations, as well as electric and plumbing codes for any special requirements that may pertain to installation of this unit.
- ❑ Shutoff valves (not provided by STERIS) capable of being locked in OFF position only for maintenance purposes, installed on steam and water lines and in compilance with local occupational health and safety regulations, as well as electric and plumbing codes for any special requirements that may pertain to installation of this unit.

  NOTE: If the washer is installed next to other equipment, shutoff valves and disconnect switch should be placed so service can be shut off to any one unit.
- ❑ Washer positioned, as shown on equipment drawing, with required service clearance space and in relation to building supply lines.
- ❑ Building steam line provides maximum dynamic steam pressure and flow rate to washer as specified on equipment drawing.
- ❑ Building hot water line supplies water to washer at pressure and temperature specified on equipment drawing.
- ❑ If applicable, building cold water line supplies water to washer at pressure specified on equipment drawing.
- ❑ If applicable, building pure water line supplies water to washer at pressure specified on equipment drawing.
- ❑ Electrical supply for washer is as specified on equipment drawing.
- ❑ Condensate return is sized as specified on equipment drawing.
- ❑ Vent connections are sized as specified on equipment drawing.
- ❑ Wash pump pressure is within 25 to 60 psig.
- ❑ Proper supply and injection hoses are connected to wash pump.
- ❑ Rinse pump pressure is within 25 to 60 psig.
- ❑ Proper chemical supply and injection hoses are connected to rinse pump.
- ❑ Self-cleaning screen assembly functioning properly.
- ❑ All piping is leak-free.
- ❑ Wash section generates a small overflow.
- ❑ Rinse section generates a small overflow.
- ❑ Pre-wash spray correctly adjusted (approximately twelve inches above conveyor belt).
- ❑ Hydraulic hold-down system correctly balanced.

❑ Wash solution temperature heated at 140 °F minimum (60 °C minimum). Wash section steam coil functioning properly.

❑ Rinse water temperature maintained at 180 °F (82 °C). Rinse section steam coil functioning properly.

❑ Final Rinse water temperature maintained at 185 °F (85 °C) mean value.

❑ Optional Garb-el section is working properly.

❑ All gauges are functioning correctly.

❑ Drive system stop buttons on load- and unload-end control panels functioning properly.

❑ Optional photoelectric conveyor stop functioning properly.

❑ Cabinet joints are completely sealed, no leaks. (For verification, run unit for half an hour.)

IMPORTANT: *After a few weeks of operation, inspect unit for leaks. Retighten all clamps and connections.*

2.2 Technical Specifications

2.2.1 Voltage, Amperage, and Power Consumption

The **Basil® 6000 Tunnel Cage Washer** operates on:

- 208 V~, 60 Hz, three-phase
- 480 V~, 60 Hz, three-phase

The maximum current and power consumptions are:

	Model Numbers			
Voltage	**6024**	**6024D**	**6024G**	**6024GD**
208 V	30 Amp	40 Amp	50 Amp	60 Amp
480 V	15 Amp	20 Amp	25 Amp	30 Amp

	Model Numbers			
Voltage	**6036**	**6036D**	**6036G**	**6036GD**
208 V	30 Amp	40 Amp	50 Amp	60 Amp
480 V	15 Amp	20 Amp	25 Amp	30 Amp

2.2.2 Permissible Environmental Conditions

This equipment is designed to give optimal results in an environment where maximum relative humidity is 80% for temperatures up to 88 °F (31 °C), decreasing linearly to 50% relative humidity at 104 °F (40 °C).

2.2.3 Seismic Anchorage System

A seismic anchorage system is available for high-risk seismic zones.

2.3 Chemical Additives Specifications

The customer may select what chemical additives to use in the washer, however, to achieve optimal performance, the selected chemical additives must meet as a minimum, the following specifications:

Product Description	Use Dilution Range Oz/Gal (mL/L)	pH Range at Use Dilution	Other Applicable Requirements
Alkaline Chemicals	1/4 - 4 (2 - 32)	9.0 - 12.0	liquid, non foaming, and viscosity below 200 ssu.
Acidic Chemicals	1/4 - 4 (2 - 32)	3.0 - 6.0	liquid, non foaming, free-rinsing, and viscosity below 200 ssu.
Descalers	1/2 - 2 (4 - 16)	< 2.5	liquid, non foaming, phosphoric acid-based, and viscosity below 200 ssu.

Follow detergent label recommendations for concentration of chemical to use.

To achieve maximum cleaning efficiency, select chemical appropriate to soil type being processed. STERIS recommends the following chemicals:

- **Cage-Klenz® 100 Alkaline Cage Wash Detergent** - a liquid phosphate-free detergent formulated for the removal of urine scale, organic soils, and metal oxides from cage materials.
- **Cage-Klenz® 150 Alkaline Cage Wash Detergent** - a chlorinated alkaline detergent formulated for the cleaning of a broad spectrum of soils from cages and bottles.
- **Cage-Klenz® 180 Alkaline Cage Wash Detergent** - a general purpose detergent formulated for the removal of animal fats and oils, organic soils, and metal oxides from polycarbonate, stainless-steel, and aluminum animal cages.
- **Cage-Klenz® 200 Acid-Based Cage Wash Detergent** - a combination of phosphoric and citric acid film and scale remover for the removal of hard water scale, urine scale, and metal oxide from on all types of metal surfaces as well as plastics and glass.
- **Cage-Klenz® 220 Acid-Based Cage Wash Detergent** - a liquid, phosphate-free hydroxyacetic detergent formulated to loosen and remove hard water and urine scale, organic soils, and metal oxides from most metals and plastics (with the exception of aluminum).

- **Cage-Klenz® 250 Acid-Based Cage Wash Detergent** - a liquid phosphate-free citric acid-based cleaning compound for removal of hard water scale, urine scale, organic soils, and metal oxides from most types of metal surfaces as well as plastic and glass.
- **Cage-Klenz® 280 Acid-Based Cage Wash Detergent** - a cleaner for the removal of a wide spectrum of soils from most metals, plastics, and glass.
- **Liquid Descale Liquid Scale Remover** - for removing scale and other hard water deposits. For use in animal care centers.

NOTE: Certain products may not be available in your area. Contact STERIS for availability of these products and for ordering information.

IMPORTANT: *STERIS does not promote, recommend nor endorse the use of any other type of chemical additives in the processing of articles in the Basil 6000 Tunnel Cage Washer, such as drying agents, strong alkaline detergents (pH>12), alcohol rinses, and liquid germicides including hypochloric acid (bleach).*

3.1 Washer Sections

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this equipment can be found in Section 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

Before operating the unit, it is important to become familiar with the location and function of all major components and controls (see Figure 3-1).

Items are automatically conveyed through each chamber section, where the following functions occur:

Optional Garb-el station - disposal unit is installed on the load side of the conveyor. It provides a quick and easy bedding disposal before wash cycles into the tunnel washer. Fresh water supply eliminates bedding which passes through a hammermill pulverizer and then sent to drain.

Use cold water only, except where the Garb-el is used to dispose of large volumes of greasy plate scrappings. Hot water should be used in such cases for both sanitary and unit efficiency reasons.

Pre-wash section - water from the rinse recirculating tank is pumped through spray jet system then sent to drain.

Wash section - hot detergent solution recirculates through the spray jet system under pump pressure. Solution temperature is maintained by a steam coil located in the wash recirculating tank.

Rinse section - two rinse functions occur within the rinse chamber section:

- **Recirculated rinse** - hot water recirculates through the spray jet system under pump pressure. Water temperature is maintained by a steam coil located in the rinse recirculation tank.
- **Final rinse** - hot water from building supply, heated by the final rinse heat exchanger, is sprayed through a separate spray jet system. Water is not recirculated and falls to rinse recirculating tank.

Optional dryer section - hot air, heated by steam coils, is recirculated through the dryer chamber where an air knife blow-off system is removing surplus water from washer item.

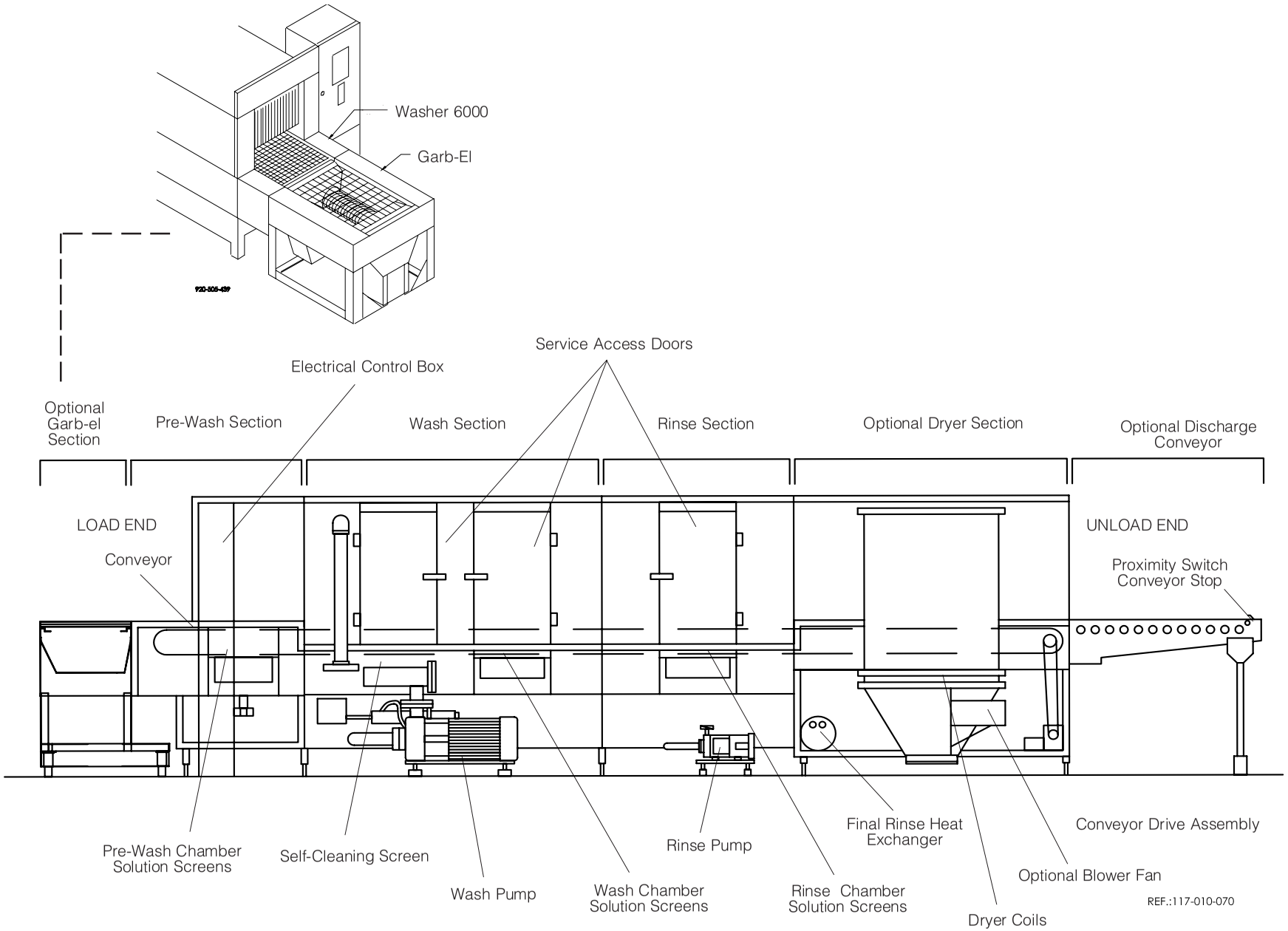


Figure 3-1. Side View of Washer

3.2 POWER-OFF/ STANDBY Switch

⚠ WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: POWER-OFF/ STANDBY switch does not shut ac power off to the unit.

The POWER-OFF/STANDBY switch supplies unit operation status to the washer control (see Figure 3-2). Setting the switch to POWER activates the control and permits unit operation. Setting the switch to OFF/STANDBY places control in a Standby mode. While in Standby mode, unit operation is not possible.

NOTE: Control should be placed in Standby mode after the last cycle of the day and when washer is not in use for an extended period of time.

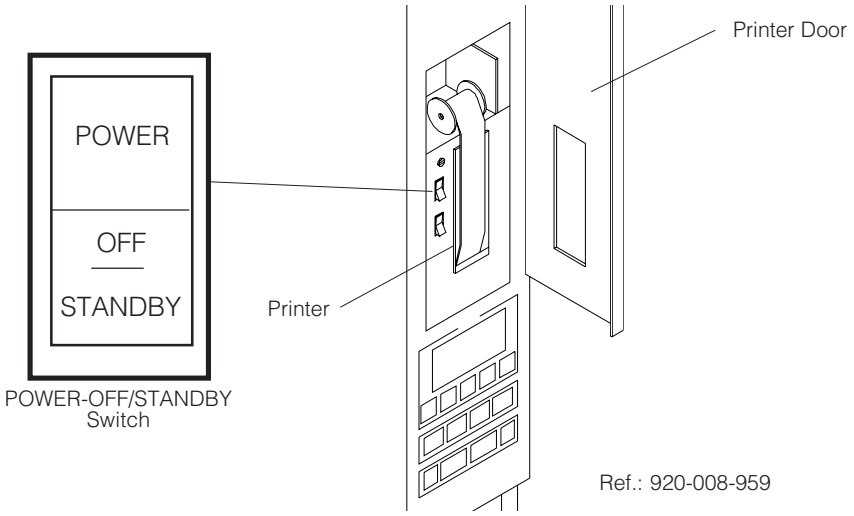


Figure 3-2. POWER-OFF/STANBDY Switch Location

3.3 Control Panel

The control panel is used to direct all washer functions (see Figure 3-3). The operator may program specific cycles, review and select cycles, start, stop or reset cycle operation, extend or by-pass cycle phases, and monitor cycle performance from the control panel.

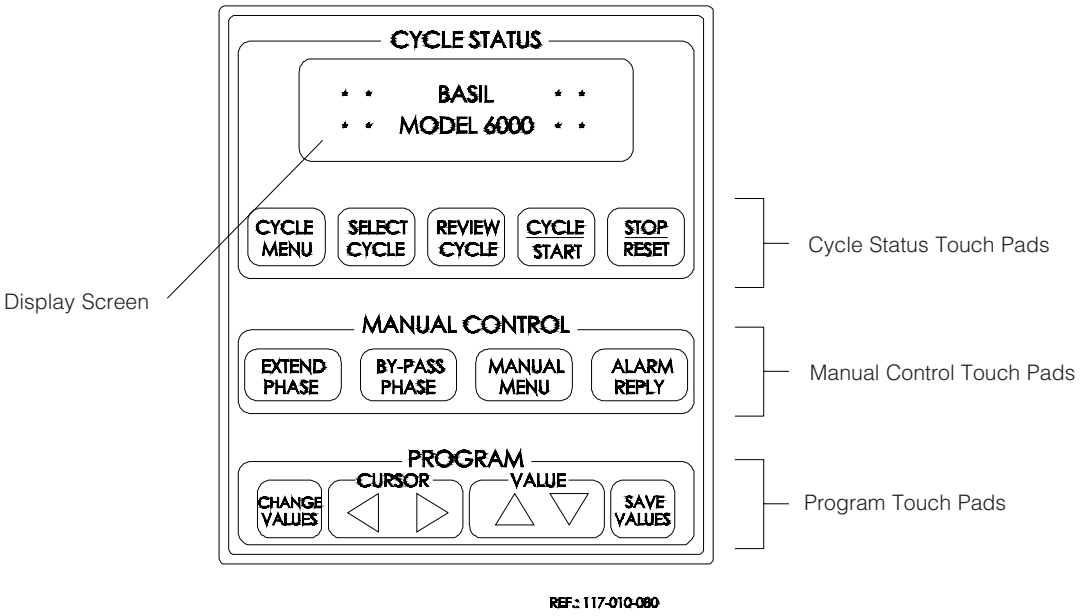


Figure 3-3. Control Panel

3.3.1 Display Screen

The two line alpha-numeric screen displays cycle program data on demand, in-cycle performance data, and operator instructions. Display screen also indicates certain abnormal conditions that may occur during a cycle.

3.3.2 Cycle Status Touch Pads

- **CYCLE MENU** touch pad - press to view the first cycle menu. Press again to advance the screen to the next cycle menu. Three menus are available, each with four cycles.

- **SELECT CYCLE** touch pad - press until the desired cycle name flashes.

  NOTE: When a displayed cycle name or phase value is selected, the corresponding word or digit flashes.

- **REVIEW CYCLE** touch pad - press to review the cycle phases and values programmed for the selected cycle.

- **CYCLE/START** touch pad - press once to display the name of the selected cycle. Press a second time to start the cycle.

  NOTE: The selected cycle name remains on the screen for five seconds after pressing CYCLE/START touch pad once. To start a cycle, CYCLE/START touch pad must be pressed a second time while the selected cycle name is displayed. If touch pad is not pressed within the five seconds, screen automatically returns to the cycle menu.

- **STOP/RESET** touch pad - press once to stop operation of the cycle. Press a second time to abort cycle and return screen to the cycle menu.

  NOTE: When cycle is stopped, press CYCLE/START touch pad once to resume cycle operation. Cycle operation resumes. When cycle is aborted, cycle operation is discontinued and cycle must be restarted.

3.3.3 Manual Control Touch Pads

- **EXTEND PHASE** touch pad - press to double the programmed treatment time while reviewing a cycle in Review Cycle mode, Refer to *Section 4, Operating Instructions,* for instructions on extending treatment time.

- **BY-PASS PHASE** touch pad - press to by-pass the programmed treatment time while reviewing a cycle in Review Cycle mode, Refer to *Section 4, Operating Instructions,* for instructions on by-passing treatment time.

- **MANUAL MENU** touch pad - press to view the washer functions which can be controlled manually.

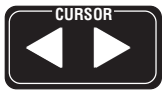
- **ALARM REPLY** touch pad - press to turn off alarm buzzer and acknowledge the displayed alarm message. Refer to *Section 7, Troubleshooting,* for specific alarm conditions and corrective actions.

3.3.4 Program Touch Pads

The Program touch pads allow the programming of twelve distinct cycles and changing of previously programmed cycle values to process different types of loads. Cycle programming may be limited by access code to ensure process integrity. Refer to *Section 5, Cycle and Control Value Programming,* for details on cycle programming and access code feature.

- **CHANGE VALUES** touch pad - press to access the Change Values mode. The Change Values mode allows authorized operators to change the user-programmable items. Refer to *Section 5, Cycle and Control Value Programming,* for details on the Change Values mode.

  NOTE: Examples of user-programmable items include cycle name, phase temperature, and questions regarding phase options.



- **CURSOR arrows (left or right)** - press until item to be changed (word, letter, or number) flashes.

- **VALUE arrows (up or down)** - depending on the item flashing (selected), press to either toggle between answer selections or scroll through the alphabet and numbers 0 through 9.

  NOTE: Alphabet includes characters for an underline and a space (■).

- **SAVE VALUES** touch pad - press to save changes made, exit the Change Values mode, and return screen to the cycle menu.

3.4 Printer

The printer records pertinent cycle data on 2-1/4-inch wide thermal paper (see Figure 3-4). Refer to *Section 6.6, Changing Printer Paper Roll,* for information on changing the paper roll and storing thermal paper.

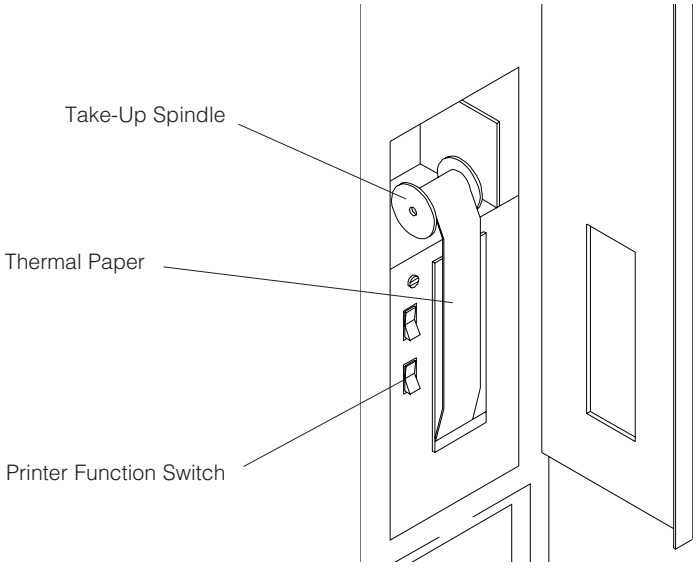


Figure 3-4. Printer Components

Sample Printouts (see Figures 3-5 and 3-6):

```
* CONTROL ON              HH:MM:SSP
                          YY/MM/DD
========================
          MODEL 6000
       S/N 3600000000
========================

========================
        CYCLE - CYCLE 1
========================

CYCLE START               HH:MM:SS
CYCLE DATE                YY/MM/DD
UNIT NUMBER               0000000
------------------------------------------------
TANKS DUMP IN XX DAY(S)
AT HH:MM:SS AM
------------------------------------------------
HH:MM:SS                  YY/MM/DD
------------------------------------------------
PHASE                      F
------------------------------------------------
AT HH:MM:SS
ALK. WASH                 SP=XXX.X
   ACTUAL TEMP.           XXX.X
ACID WASH TEMP. RANGE
   LO=XXX.X F             HI=XXX.XF
   ACTUAL TEMP.           151.3
RINSE                     SP=XXX.X
   ACTUAL TEMP.           XXX.X
FINAL RINSE               SP=XXX.X
   ACTUAL TEMP.           XXX.X

*CYCLE PAUSED            HH:MM:SS

*CYCLE ABORTED           HH:MM:SS
```

Figure 3-5. Sample Printout

- **POWER UP**

  When **POWER-OFF/STANDBY** switch is set to **POWER**, the generated printout lists time and date the control was turned on, unit serial number, unit title, and unit model.

- **CYCLE START**

  When **CYCLE/START** touch pad is pressed twice to begin the selected cycle, the generated printout lists name of the cycle started, time and date the cycle was started, the cycle number, unit number, and when the next tank dump will happen.

- **IN-CYCLE PERFORMANCE**

  During a cycle, the generated printout lists the phase in progress, the temperature (°F or °C), the time of the printout, the alkaline wash set point and tank temperature, the acid wash set point and tank temperature, the rinse set point and tank temperature, and the final rinse set point and tank temperature.

- **CYCLE STOP**

  When cycle is stopped, printer prints time at which cycle stop was requested.

- **CYCLE ABORT**

  When cycle is aborted, printer prints time at which cycle abort was requested.

- **ALARM CONDITION**

  When an alarm condition occurs, the generated printout lists the type of alarm and time it occurred (see Figure 3-6). Once the operator presses the **ALARM REPLY** touch pad, the generated printout lists the time the alarm was acknowledged.

```
------------------------------------------------
*ALARM                    HH:MM:SSP
------------------------------------------------
DET. TANK
TOO LONG IN FILL

ALARM ACKNOWLEDGED
AT HH:MM:SSP
```

Figure 3-6. Sample Alarm Printout

3.5 Unload Side Control Panel (Double-Door Units)

A remote control column is installed on the unload side of the unit. This remote control column is wired directly to the main control processor and includes a control panel. Most washer functions can be directed from this control panel, and the display screen concurrently shows the same cycle performance data as the load-side control panel. There is no printer on remote control column.

3.6 Safety System

Service doors are equipped with a safety switch to stop washer operation if one of doors is opened during a cycle and to prevent start of washer operation if door is not securely closed. Load-side and unload-side have a drive system **EMERGENCY STOP** pushbutton.

Load-side and unload-side control panels are also equipped with **STOP/ RESET** touch pads. Press touch pad once to stop cycle operation and twice to abort cycle.

3.7 Drive System Control

Additional controls affecting the drive system are located on the front of the electrical control box (see Figure 3-7).

- **MANUAL DRIVE SYSTEM** - position switch to ON to run conveyor only.
- **ADJUSTABLE BELT SPEED** - position dial to desired conveyor speed from low to high.
- **PROXIMITY SWITCH BYPASS** - position switch to ON to bypass proximity switch.

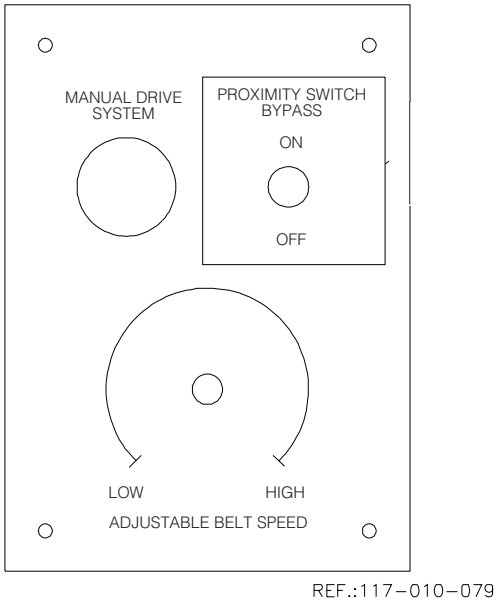


Figure 3-7. Drive Sytem Control

3.8 Hydraulic Hold-Down System

WARNING – BURN HAZARD: Do not adjust balancing valve while washer is operating.

Hydraulic hold-down system allows control of the water pressure exiting the spray jet systems during cycle operation. By decreasing the water pressure to the lower spray jets, the downward pressure from the upper jets will hold the product down on the conveyor (see *Section 6.15, Adjust Hydraulic Hold-Down System*).

System includes balancing valves installed in the water supply lines, located inside the wash, rinse and final rinse chambers, on opposite side of chamber from the access door (see Figure 3-8). Balancing valve is a ball valve with a blue handle.

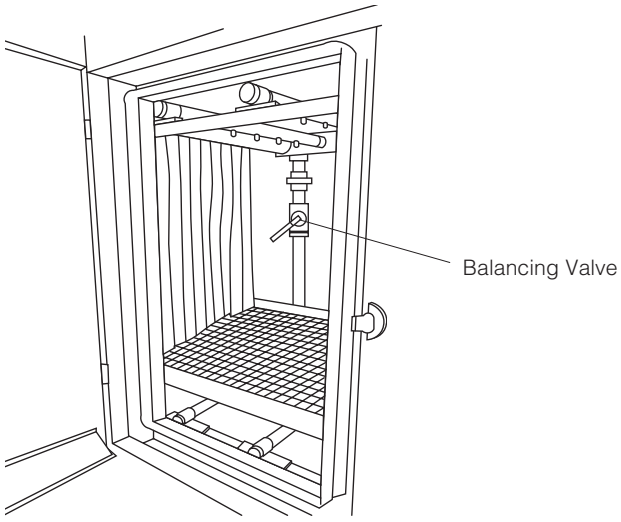


Figure 3-8. Spray System Balancing Valve

3.9 Garb-el Control Panel (Option)

The Garb-el control panel is used to direct Garb-el functions (see Figure 3-9).

- **GARB-EL AND DRIVE SYSTEM STOP** - pull to operate Garb-el and push to stop Garb-el and washer belt drive.

  IMPORTANT: *When Garb-el is placed in OFF position, feeder mechanism stops instantly but water and pulverizer mechanism continue to run for up to five minutes to provide extra flushing of the waste line.*

- **GARB-EL SYSTEM ON/OFF** - position to ON to run Garb-el. Feeder mechanism and pulverizer start simultaneously.

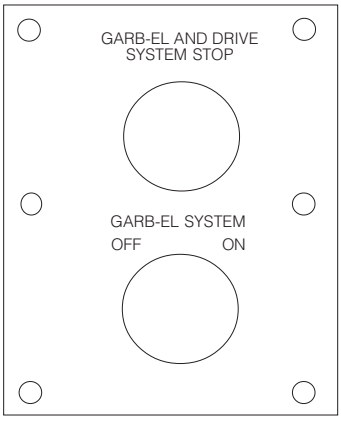


Figure 3-9. Garb-el Control Panel

4.1 Before Operating Washer

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container, or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

WARNING – BURN HAZARD: Do not reach into sump.

WARNING – SLIPPING HAZARD: To avoid slippery floor conditions, immediately wipe up any spilled liquids or drippage. If spilled liquids or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

CAUTION – POSSIBLE EQUIPMENT DAMAGE: When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content can corrode stainless steel.

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this equipment can be found in Section 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

1. Ensure building electrical supply disconnect switch (circuit breaker) is positioned to **ON**. Verify steam and water supply valves are open.
2. Open service access doors and ensure chambers are empty.
3. Verify chamber solution screens are clean and in place (see Figure 4-1) and screen access panels are secure.
4. Ensure all service access doors are closed securely.
5. Verify detergent supply (provided by customer). Ensure supply hose is correctly placed in detergent container.

   NOTE: Always use a non-foaming detergent for effective cleaning and proper pump and water level control operation. To achieve maximum cleaning efficiency, select detergent appropriate to soil type being processed.

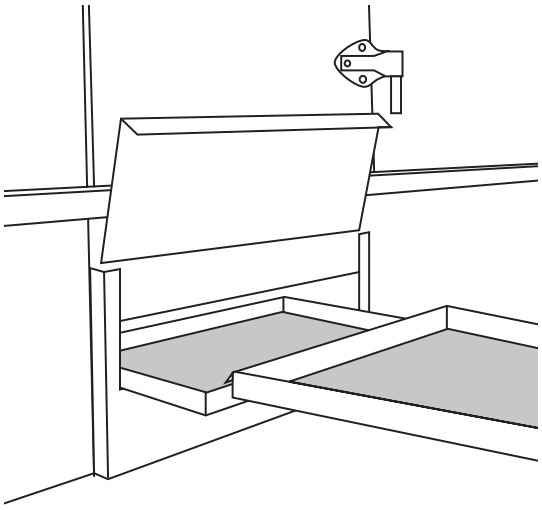


Figure 4-1. Two-Piece Solution Screen

4.2 Loading Unit

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Always load baskets on appropriate loading cart or surface.

If Garb-el option is not present, load items to be washed as follows:

1. Empty all soiled bedding from cages before placing them inside washer.
2. Load feeder bottles upside down in appropriate accessory.
3. Place items to be washed upside down on load table. Push slightly until conveyor belt inside pre-wash chamber routes items or accessory inside chamber.

   or

   If load-side conveyor option is present, place items upside down on conveyor. Conveyor transports items inside chamber automatically.

If Garb-el option is present, load items to be washed as follows:

1. Place Garb-el **ON/OFF** switch to **ON** (see Figure 3-9).
2. Place cage containing soiled bedding upside down on Garb-el screen. Cage is shaken to empty soiled bedding into grinder hopper.

   IMPORTANT: *Do not cram or pack the waste in grinder hopper.*

3. Push cage on washer load table until conveyor belt inside pre-wash chamber routes cage inside chamber.

   or

   If load-side conveyor option is present, push cage slightly on conveyor so cage is loaded automatically inside pre-wash chamber.

4.3 EMERGENCY STOP Pushbutton

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: In case of an emergency situation involving conveyors, always press EMERGENCY STOP pushbutton to stop all washer and conveyor operations.

There is a red **EMERGENCY STOP** pushbutton located at each end of the unit. Both pushbuttons stop the drive belt. Also, unload-end **EMERGENCY STOP** pushbutton stops dryer section.

If Gab-el option is present, press Garb-el and drive system **STOP** pushbutton (see Figure 3-9) to stop washer conveyor and Garb-el operations simultaneously.

4.4 Cycle Operation

⚠ WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: POWER-OFF/ STANDBY switch does not shut ac power off to the unit.

Cycle Phase	Temperature
Pre-wash	Same as Rinse Tank
Alk. Wash *OR* Acid Wash	140°F (60°C) 140°F (60°C)
Rinse	180°F (82°C)
Final Rinse	180°F (82°C)
Drying	Manually Adjusted

Table 4-1. Demonstration Cycle Phase Values

The Basil® 6000 Tunnel Cage Washer is equipped with a microcomputer control capable of storing parameters for twelve distinct cycles. Authorized operators have capability of customizing/programming all the cycles to meet specific washing needs. For instructions on cycle programming or changing cycle parameters, refer to *Section 5, Cycle and Control Value Programming*.

On initial receipt of washer, each cycle is set with a basic demonstration cycle consisting of sections of the unit, for example Pre-Wash, Alkaline Wash, Rinse, Final Rinse, and Dry. Refer to **Table 4-1** for phase values of the demonstration cycle.

To begin cycle operation:

1. Set **POWER-OFF/STANDBY** switch, located behind printer door, to **POWER**.

   Unit name temporarily appears, then display shows first cycle menu:

CYCLE 1	**CYCLE 2**
CYCLE 3	**CYCLE 4**

   _ *Indicates flashing position*

   and printer message is:

   ```
   * CONTROL ON                    HH:MM:SS
                                   MM:DD:YY
   ============================

       MODEL 6XXX
       S/N 36XXXXXXXXXX

   ============================
   ```

2. Press **CYCLE MENU** touch pad until desired cycle menu appears. Display shows:

CYCLE 9	**CYCLE 10**
CYCLE 11	**CYCLE 12**

   _ *Indicates flashing position*

3. Press **SELECT CYCLE** touch pad until desired cycle name flashes. Display shows:

CYCLE 9	**CYCLE 10**
CYCLE 11	**CYCLE 12**

   _ *Indicates flashing position*

4. When desired cycle name is flashing, press **CYCLE/START** touch pad. Name of selected cycle appears and remains displayed for five seconds. Display shows:

CYCLE 9	**CYCLE 10**
CYCLE 11	**CYCLE 12**

   __ *Indicates flashing position*

5. To start selected cycle, press **CYCLE/START** touch pad a second time while selected cycle name is displayed.

   *NOTE: If **CYCLE/START** touch pad is not pressed a second time while the selected cycle name is displayed, display automatically returns to the cycle menu.*

   Once selected cycle is started, printer message is:

```
==============================
        CYCLE  - CYCLE 01
==============================
  CYCLE START              HH:MM:SS
  CYCLE DATE               MM:DD:YY
  UNIT NUMBER           36XXXXXXXX
 ------------------------------------------------------
  TANKS DUMP IN XX DAYS
  AT HH:MM:SS AM
 ------------------------------------------------------
```

   Washer automatically progresses through selected cycle.

   NOTE: When operating the unit, note the following:

   1) If temperature guarantee feature is selected, belt stops if the solution/ water temperature in chamber sump is lower than the set point. There is a G after temperature on the display if the guarantee is on.

   *2) Cycle operation may be halted at any time by pressing **STOP/RESET** touch pad once. To resume cycle operation, press **CYCLE/START** touch pad.To abort cycle operation, press **STOP/RESET** touch pad a second time.*

   During cycle, display alternates between following messages, every four seconds:

ALK. TEMP =	**XXX.X F**
ACID* TEMP =	**XXX.X F**

   **RINSE if acid is not present.*

   and:

RINSE TEMP =	**XXX.X F**
FINAL RINSE* =	**XXX.X F**

   **Only if unit has two wash chambers.*

   NOTE: If proximity switch conveyor stop option is provided, washer must be equipped with the discharge conveyor option. Proximity switch conveyor stop can only be installed in the optional discharge conveyor.

   Printer records tank temperatures on a timed interval set in operating values menu. In each section, the following occurs:

   - **PRE-WASH**

     Hot water from the rinse tank is sprayed on load and goes down the drain.

   - **ACID OR ALKALINE WASH**

     Heated detergent solution from the alkaline or acid sump is pumped through the spray header, over and under the load, then falls back into the alkaline or tank sump to be recirculated.

- **RINSE**

  Heated water from the rinse sump is pumped through the spray header over and under the load, then falls back into the rinse sump to be recirculated.

- **FINAL RINSE**

  Hot water from building supply is fed through an instantaneous heat exchanger, through the final rinse spray header, and falls into the rinse tank.

  NOTE: If temperature guarantee feature is selected for the Final Rinse, the display shows a G after the Final Rinse temperature. The belt only runs if the temperature is greater or equal to set point.

- **DRYING (OPTION)**

  Hot air recirculates through drying section. An air knife blow-off system removes surplus water from washed items.

4.5 Stop Cycle

1. Press **STOP/RESET** touch pad to immediately halt operation of cycle in progress. Display indicates cycle was stopped:

PRESS STOP TO ABORT
OR START TO RESUME

and printer message is:

*CYCLE PAUSED HH:MM:SSP

2. Press **CYCLE/START** touch pad to resume cycle operation. Display shows:

ALK. TEMP =	**XXX.X F**
ACID TEMP =	**XXX.X F**

and:

RINSE TEMP =	**XXX.X F**
FINAL RINSE =	**XXX.X F**

and printer message is:

*CYCLE RESUMED HH:MM:SSP

4.6 Abort Cycle

1. Press **STOP/RESET** touch pad to halt cycle in progress.

2. Press **STOP/RESET** touch pad a second time to abort cycle. Display indicates cycle was aborted:

CYCLE ABORTED...

and printer message is:

*CYCLE ABORTED HH:MM:SSP

Control automatically returns to selected cycle menu. Display shows:

CYCLE 1	**CYCLE 2**
CYCLE 3	**CYCLE 4**

__Indicates flashing position.

4.7 Control Conveyor Belt, Pumps, and Drain Operations

The user may manually control certain washer functions by accessing the Manual Control mode when a cycle is not in progress.

1. Press **MANUAL MENU** touch pad to access Manual Control mode:

MANUAL CONTROL MODE

and to display menu of available manual functions:

RUN BELT	**PUMPS**
TNK DUMP	

__Indicates flashing position.

2. Use **SELECT CYCLE** touch pad to move around menu.

3. When desired choice is flashing, press **CYCLE/START** touch pad.

4. Pressing **STOP/RESET** touch pad will return you to cycle menu.

4.7.1 Run Belt (or Stop Belt)

Used to energize/de-energize drive belt motor. If RUN BELT is flashing and **CYCLE/START** touch pad is pressed, display shows:

PRESS START TO RUN BELT DRIVE

If STOP BELT is flashing and **CYCLE/START** touch pad is pressed, display shows:

BELT DRIVE STOPPED

Program returns to Manual Control mode main menu.

4.7.2 Pumps

If PUMPS is flashing and **CYCLE/START** touch pad is pressed, and access code is turned on, display shows:

DO YOU KNOW ACCESS CODE? NO

__Indicates flashing position.

1. Use **VALUE arrows** (up or down) to change NO to YES. Display shows:

ENTER ACCESS CODE=0000

__Indicates flashing position.

If access code is entered correctly, display shows:

WASH	**RINSE**
DRYER	**ALL**

__Indicates flashing position.

2. Use **SELECT CYCLE** touch pad to select pump(s).

3. Press **CYCLE/START** touch pad to energize. Desired pump(s) is (are) energized and then control returns to Pumps menu.
   - WASH: energizes alkaline and acid pumps.
   - RINSE: energizes rinse pump.
   - DRYER: energizes dryer blower and dryer steam.
   - ALL: energizes all of the above.

4. Press **STOP/RESET** touch pad to turn off all pumps and return to Manual Mode menu.

Used to open selected drain ball valve during tank drain time set. If TANK DUMP is flashing and **CYCLE/START** touch pad is pressed, display shows:

WASH TANK	**RINSE**
ALL TANKS	**ALK/RINSE**

__Indicates flashing position.

4.7.3 Tank Dump

1. Use **SELECT CYCLE** touch pad to select tank(s).

2. Press **CYCLE/START** touch pad to start. Desired tank(s) dumps and then control return to Tank Dump menu. Displays shows (typical):

WASH TANK DUMP
TIME = MM:SS

and printer message is:

```
 MM:SS PM                    YY/MM/SS
============================
 =      MANUAL TANK(S) DUMP     =
============================
```

WARNING – BURN HAZARD: Water discharge may be extremely hot.

- ALK.: opens alkaline drain ball valve for TANK DRAIN time.
- RINSE: opens rinse drain ball valve for TANK DRAIN time.
- ACID: opens acid drain ball valve for TANK DRAIN time.
- ALL: opens all drain ball valves for TANK DRAIN time.

NOTE: Tank drain time can be modified in Change Values mode (see Section 5.2, Change Values Mode).

3. When selected tank has been drained, it is possible to refill it. Display shows:

REFILL TANK(S)?
YES

__Indicates flashing position.

4. Use **VALUE arrows** (up or down) to select YES or NO.

   If YES is selected, tank starts filling and heating.

   If NO is selected, the tank drain ball valve(s) closes, so unit can be powered down and tanks rinsed out. In power up, ball valve(s) closes and tanks fill and heat.

4.8 Shutdown Procedure

At the end of a work session, the washer should be shut down and cleaned thoroughly. Refer to *Section 6, Routine Maintenance,* for complete cleaning instructions and scheduled minor maintenance.

1. Access Manual Control mode and drain tanks as explained in *Section 4.7.3, Tank Dump*.
2. Position **POWER-OFF/STANDBY** switch to **OFF/STANDBY**.
3. Position building electrical disconnect switch (circuit breaker) to **OFF** and close building supply valves.
4. Clean unit as described in *Section 6.3, Daily Cleaning Procedures*.
5. Ensure building electrical disconnect switch is positioned to **ON** after completion of cleaning and minor maintenance procedures.

   NOTE: Leaving disconnect switch in OFF position overnight will shorten life span of battery backed-up control memory.

4.9 Proximity Switch Conveyor Stop

A proximity switch, located at the end of the optional discharge conveyor, stops the conveyor drive system when an item reaches the end of the conveyor (see Figure 4-2).

⚠ WARNING – BURN HAZARD: When unloading processed items from conveyor, wear appropriate Personal Protective Equipment (PPE). Clean items may be extremely hot or contain hot rinse water.

⚠ WARNING – SLIPPING HAZARD: To avoid slippery floor conditions, immediately wipe up any spilled liquids or drippage. If spilled liquids or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

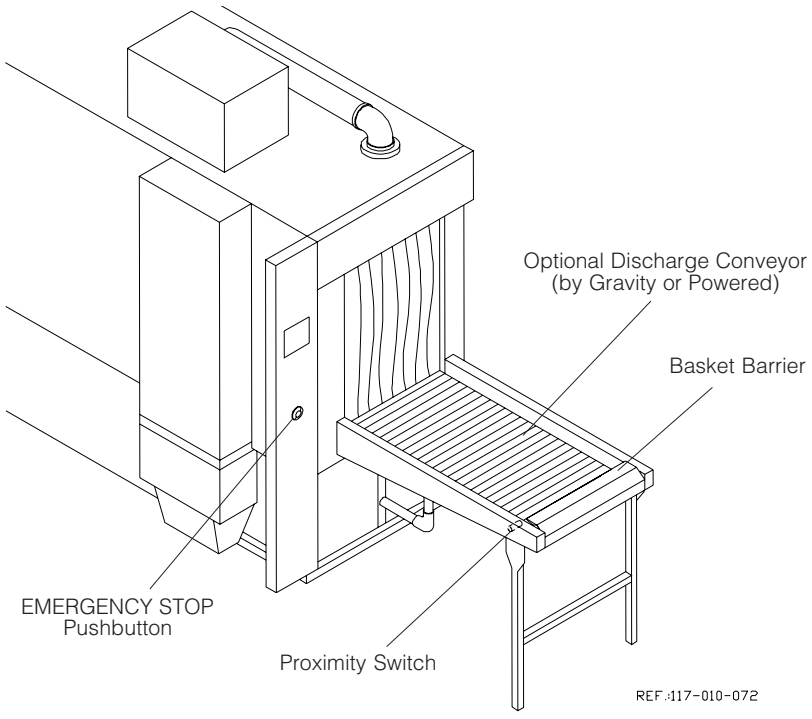


Figure 4-2. Optional Discharge Conveyor

4.10 Dryer Section (Option)

A stainless-steel hot air dryer section is built into washer at the unload end (see Figure 4-3). During normal cycle operation, hot air recirculates through this section. Recirculated air temperature is adjustable up to 210 °F (99 °C). An air-knife blow-off system removes surplus water from washed items.

WARNING – BURN HAZARD: When unloading processed items from conveyor, wear appropriate Personal Protective Equipment (PPE). Clean items may be extremely hot or contain hot rinse water.

WARNING – SLIPPING HAZARD: To avoid slippery floor conditions, immediately wipe up any spilled liquids or drippage. If spilled liquids or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

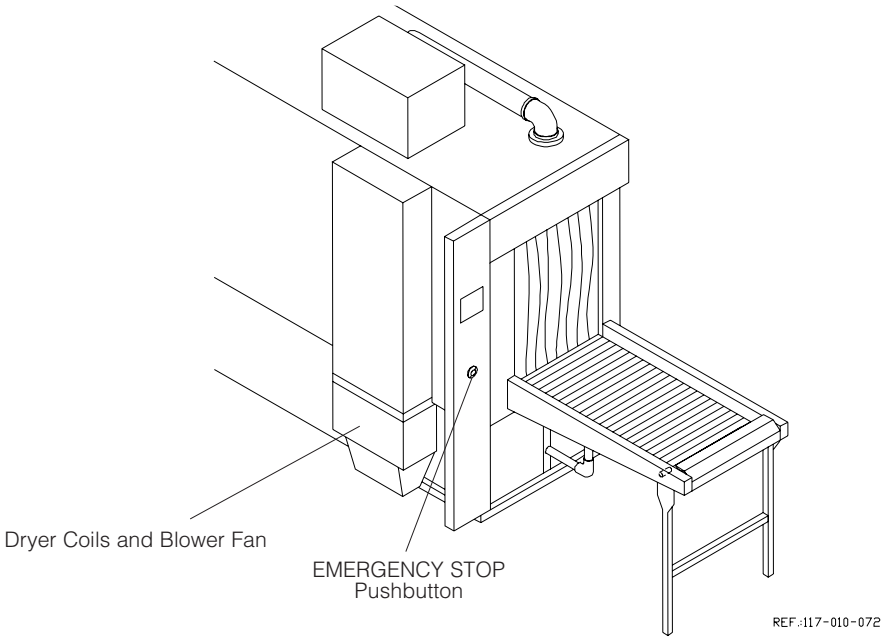


Figure 4-3. Dryer Section (Option)

5.1 Program Touch Pads

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this equipment can be found in Section 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

The microprocessor control of the Basil® 6000 Tunnel Cage Washer allows the adjustment of previously programmed cycles to process different types of loads. All program changes are made using the program touch pads on the washer control panel.

Program touch pads function as follows (see Figure 5-1):

- **CHANGE VALUES** touch pad - press to access Change Values mode.
- **CURSOR arrows (left or right)** - press until item to be changed (word, letter, or number) flashes.
- **VALUE arrows (up or down)** - depending on the item flashing (selected), press to either toggle between answer selections or scroll through the alphabet and numbers 0 through 9.

  NOTE: Alphabet includes characters for an underline and a space (■).
- **SAVE VALUES** touch pad - press to save changes made, exit the Change Values mode, and return screen to the cycle menu.

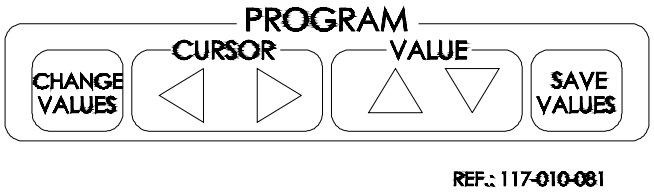


Figure 5-1. Program Touch Pads

5.2 Change Values Mode

The Change Values mode allows authorized operators to change both the cycle values and general operating values. In Change Values mode, the cycles may be altered and saved as custom cycle programs to meet specific washer needs.

5.2.1 Programming Cycle Values

⚠ WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: POWER-OFF/ STANDBY switch does not shut the ac power off the unit.

The following procedure is based on a washer equipped with certain optional features. This washer displays messages pertaining to specific optional functions. The specific optional messages change the sequence of messages and additional messages are shown in the following pages to accommodate various washer configurations.

1. Set **POWER-OFF/STANDBY** switch, located behind printer door, to **POWER**. Unit name temporarily appears, then display shows first cycle menu:

CYCLE 1	**CYCLE 2**
CYCLE 3	**CYCLE 4**

__Indicates flashing position.

2. Press **CYCLE MENU** touch pad until desired cycle menu appears. Display shows:

CYCLE 9	**CYCLE 10**
CYCLE 11	**CYCLE 12**

__Indicates flashing position.

3. Press **SELECT CYCLE** touch pad until desired cycle name flashes. Display shows:

CYCLE 9	**CYCLE 10**
CYCLE 11	**CYCLE 12**

__ Indicates flashing position.

4. When desired cycle name is flashing, press **CHANGE VALUES** touch pad to access Change Values mode. Printer message is:

*CHANGE VALUE HH:MM:SSP

and first Change Values display appears:

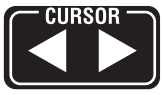
CHANGE CYCLE NAME
CYCLE 10

__ Indicates flashing position.

NOTE: When changing values, note the following:

*1) If access code feature is enabled and the selected cycle is locked out, the access code sequence appears after **CHANGE VALUES** touch pad is pressed.*

*2) Change Values mode may be exited at any time by pressing **SAVE VALUES** touch pad. Control saves changed values and returns to selected cycle menu.*



5. To change cycle name, press **CURSOR arrows** (left or right) touch pad to advance flashing position one space at a time. Press **VALUE arrows** (up or down) touch pad to select desired letter, number, punctuation, or space. Cycle name can be a maximum of nine characters including spaces.

*NOTE: Pressing **CURSOR arrows** (left or right) or **VALUE arrows** (up or down) repeatedly in one direction cycles through all available positions or letters and numbers.*

6. Press **CHANGE VALUES** touch pad. Alkaline wash selection appears. Display shows:

ALK. WASH THIS CYCLE? YES

__Indicates flashing position.

7. Press **VALUE arrows** (up or down) to toggle between YES and NO. Selecting NO by-passes alkaline wash tank function during cycle (go to **Step 17**). Selecting YES provides alkaline wash during cycle.

   *NOTE: Change Values mode may be exited at any time by pressing **SAVE VALUES** touch pad. Control saves changed values and returns to selected cycle menu.*

8. Press **CHANGE VALUES** touch pad. Alkaline wash tank temperature display appears:

CYCLE 1 SP = 140.0 F **ALKALINE WASH TANK**

__ Indicates flashing position.

9. To enter Wash temperature set point, press **CURSOR arrows** (left or right) to select position and **VALUE arrows** (up or down) to select desired number (0-9). Temperature set point is input as any number value to 1/10th of a degree.

   NOTE: When changing values, note the following:

   1) With any tank temperature guarantee feature enabled, the belt does not start unless set point is reached. It is important set point be an attainable value.

   *2) Change Values mode may be exited at any time by pressing **SAVE VALUES** touch pad. Control saves changed values and returns to selected cycle menu.*

10. Press **CHANGE VALUES** touch pad. Alkaline wash tank temperature guarantee option appears. Display shows:

GUARANTEE ALK. TEMP? NO

__ Indicates flashing position.

11. Press **VALUE arrows** (up or down) to toggle between YES and NO. Selecting NO starts belt as soon as cycle starts. Selecting YES guarantees acid wash tank temperature is equal to or greater than programmed set point before belt starts.

    NOTE: With any temperature guarantee feature enabled, the belt does not start unless set point is reached.

12. Press **CHANGE VALUES** touch pad. Display shows:

ACID WASH THIS CYCLE? YES

__ Indicates flashing position.

13. Press **VALUE arrows** (up or down) to toggle between YES and NO. Selecting NO by-passes acid wash tank function during cycle. Selecting YES provides acid wash during cycle.

    *NOTE: Change Values mode may be exited at any time by pressing **SAVE VALUES** touch pad. Control saves changed values and returns to selected cycle menu.*

14. Press **CHANGE VALUES** touch pad. Acid wash tank temperature guarantee option appears. Display shows:

GUARANTEE ACID TEMP?
NO

__ Indicates flashing position.

15. Press **VALUE arrows** (up or down) to toggle between YES and NO. Selecting NO starts belt as soon as cycle starts. Selecting YES guarantees acid wash tank temperature is equal to or greater than programmed set point before belt starts.

    NOTE: When changing values, note the following:

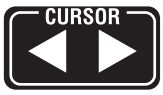
    1) With any temperature guarantee feature enabled, the belt does not start unless set point is reached.

    *2) Change Values mode may be exited at any time by pressing **SAVE VALUES** touch pad. Control saves changed values and returns screen to selected cycle menu.*

16. Press **CHANGE VALUES** touch pad. Rinse tank temperature option appears. Display shows:

CYCLE 1	**SP=180.0 F**
RINSE TANK	

__Indicates flashing position.



17. To enter rinse temperature set point, press **CURSOR arrows** (left or right) to select position and **VALUE arrows** (up or down) to select desired number (0 to 9). Temperature set point is input as any number value to 1/ 10^{th} of a degree.

    NOTE: When changing values, note the following:

    1) With any tank temperature guarantee feature enabled, the belt does not start unless set point is reached. It is important set point be an attainable value.

    *2) Change Values mode may be exited at any time by pressing **SAVE VALUES** touch pad. Control saves changed values and returns screen to selected cycle menu.*

18. Press **CHANGE VALUES** touch pad. Rinse tank temperature guarantee option appears. Display shows:

GUARANTEE RINS TEMP
NO

__ Indicates flashing position.

19. Press **CHANGE VALUES** touch pad. Final rinse temperature display appears:

CYCLE 1 SP=180.0 F **FINAL RINSE**

__ *Indicates flashing position.*

20. To enter final rinse temperature set point, press **CURSOR arrows** (left or right) to select position and **VALUE arrows** (up or down) to select desired number (0-9). Temperature setpoint is input as any number value to 1/10th of a degree.

    NOTE: When changing values, note the following:

    1) With any tank temperature guarantee feature enabled, the belt does not start unless set point is reached. It is important set point be an attainable value.

    2) Change Values mode may be exited at any time by pressing SAVE VALUES touch pad. Control saves changed values and returns screen to selected cycle menu.

21. Press **CHANGE VALUES** touch pad. Final rinse temperature guarantee option appears. Display shows:

GUARANTEE FINAL RINS **NO**

__ *Indicates flashing position.*

22. Press **VALUE arrows** (up or down) to toggle between YES and NO. Selecting NO starts belt as soon as cycle starts. Selecting YES guarantees final rinse water temperature is equal to or greater than programmed set point, before belt starts.

    NOTE: When changing values, note the following:

    1) With any temperature guarantee feature enabled, the belt does not start unless set point is reached.

    *2) Change Values mode may be exited at any time by pressing **SAVE VALUES** touch pad. Control saves changed values and returns to selected cycle menu.*

23. Press **CHANGE VALUES** touch pad. Display shows:

DRY THIS CYCLE? **YES**

__ *Indicates flashing position.*

24. Use **CURSOR arrows** (left or right) and **VALUE arrows** (up or down) to turn dryer section **ON** or **OFF**.

25. Press **CHANGE VALUES** touch pad. Print cycle values option appears. Display shows:

PRINT CYCLE VALUES? **NO**

__ *Indicates flashing position.*

26. Press **VALUE arrows** (up or down) to toggle between YES and NO. Selecting YES generates a printout of cycle phase values once **SAVE VALUES** touch pad or **CHANGE VALUES** touch pad is pressed.

27. At any point during change values sequence, operator has the option to either continue in Change Values mode or to save values and exit Change Values mode.

- To exit Change Values mode, press **SAVE VALUES** touch pad. Control saves changed values and returns to selected cycle menu. Display shows:

CYCLE 9	**CYCLE 10**
CYCLE 11	**CYCLE 12**

__ Indicates flashing position.

- To continue in Change Values mode, press **CHANGE VALUES** touch pad. Change operating values option appears. Display shows:

CHANGE OPERATING VALUES?	**NO**

__Indicates flashing position.

NOTE: Refer to Section 5.2.2, Programming Operating Values, for details on continuing in the Change Values mode.

5.2.2 Programming Operating Values

The following procedure is based on a washer equipped with certain optional features. This washer shows messages pertaining to specific optional functions. The specific optional messages change the sequence of messages and additional messages are shown in the following pages to accommodate various washer configurations.

NOTE: The demonstration cycle is set with the access code feature OFF.

1. Set **POWER-OFF/STANDBY** switch, located behind printer door, to **POWER**. Unit name temporarily appears, then display shows first cycle menu:

CYCLE 1	**CYCLE 2**
CYCLE 3	**CYCLE 4**

__ *Indicates flashing position.*

2. Press **CHANGE VALUES** touch pad to access Change Values mode.

   NOTE: Access to operating values may be made through any cycle.

   First change values display appears:

CHANGE CYCLE NAME
CYCLE 1

__ *Indicates flashing position.*

*NOTE: Change Values mode may be exited at any time by pressing **SAVE VALUES** touch pad. Control saves changed values and returns to selected cycle menu.*

3. Press **CHANGE VALUES** touch pad several times to advance through phase values displays until print cycle values option appears. Display shows:

PRINT CYCLE VALUES?
NO

__ *Indicates flashing position.*

4. Press **VALUE arrows** (up or down) to toggle between YES and NO.

   *NOTE: Selecting YES generates a printout of the cycle phase values once **SAVE VALUES** touch pad or **CHANGE VALUES** touch pad is pressed.*

5. Press **CHANGE VALUES** touch pad. Change operating values option appears. Display shows:

CHANGE OPERATING	
VALUES?	**NO**

__ *Indicates flashing position.*

6. Press **CHANGE VALUES** touch pad**.** Display shows:

PRINTER ENABLED?
YES

__ *Indicates flashing position.*

7. Press **VALUE arrows** (up or down) to toggle between YES and NO.

8. Press **CHANGE VALUES** touch pad**.** If timed printout option is **ON**, display shows:

PRINTOUT = MM:SS

__ Indicates flashing position.

9. Use **CURSOR arrows** (left or right) and **VALUE arrows** (up or down) to set time interval between printing out tank temperature and tank temperature details.

10. Press **CHANGE VALUES**. Date and time display appears:

DATE	**YY/MM/JJ**
TIME	**HH:MM:SSA**

__Indicates flashing position.

11. To enter correct date and time, press **CURSOR arrows** (left or right) to advance flashing position one space at a time. Press **VALUE arrows** (up or down) to select desired number (0-9). Date is input as two-digit numerical values for Year/Month/Day. Time is input as Hour/Minute/Seconds.

    NOTE: Pressing **CURSOR arrows** *(left or right) or* ***VALUE arrows*** *(up or down) repeatedly in one direction cycles through all available positions or letters and numbers.*

12. Press **CHANGE VALUES** touch pad. Automatic dump day and time interval appears. Display shows:

AUTO DUMP	**T= XX DAYS**
DUMP AT= HH:MM	

__ Indicates flashing position.

13. Use **CURSOR arrows** (left or right) and **VALUE arrows** (up or down) to set automatic day interval between dumps and time at which dumping occurs.

5.3 Programming Values With Access Code Enabled

The access code feature is used to prevent unauthorized changes to the parameters of designated cycles and/or operating values. With this feature, access to cycle values may be selectively limited to authorized operators, depending on the security needs of the washer environment. When access code is enabled, only authorized operators can change operating values regardless of cycles locked out.

The following procedure provides examples of how to access Change Values mode when the access code feature is enabled.

1. When desired cycle name is flashing, press **CHANGE VALUES** touch pad to access Change Values mode. Printer message is:

   * CHANGE VALUE HH:MM:SSP

   and, if selected cycle is locked out, display shows:

   DO YOU KNOW ACCESS CODE? NO

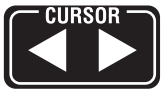
   __ *Indicates flashing position.*

2. Press **VALUE arrows** (up or down) to toggle between YES and NO. If NO is selected, control returns to cycle menu once **CHANGE VALUES** touch pad is pressed.

3. Press **CHANGE VALUES** touch pad. If YES was selected, display shows:

   ENTER ACCESS CODE
   CODE=0000

   __ *Indicates flashing position.*



4. To enter access code, press **CURSOR arrows** (left or right) to advance flashing position one space at a time. Press **VALUE arrows** (up or down) to select desired number (0 - 9). If an incorrect access code is entered, control returns to cycle menu once **CHANGE VALUES** touch pad is pressed.

   *NOTE: Pressing **CURSOR arrows** (left or right) or **VALUE arrows** (up or down) repeatedly in one direction cycles through all available positions or letters and numbers.*

5. Press **CHANGE VALUES** touch pad. First change values display appears:

   CHANGE CYCLE NAME
   CYCLE 1

   __*Indicates flashing position.*

   At this point, operator has access to all phase values displays of selected cycle and operating values displays. Sequence and procedures for changing cycle phase and operating values are the same as previously discussed.

   NOTE: If access code feature is enabled and selected cycle is not locked out, only the operating values are protected by access code. The access code message sequence occurs after the date and time display. After entering correct access code, the operator has access to remaining operating values displays.

5.4 Review and Print Specific Cycle Program

All cycle programs may be reviewed by accessing the Cycle Review mode when a cycle is not in progress. The Cycle Review mode allows the user to review and printout the cycle values programmed for the specific cycle selected.

1. Press **CYCLE MENU** touch pad until desired cycle menu appears. Display shows:

CYCLE 5	**CYCLE 6**
CYCLE 7	**CYCLE 8**

__Indicates flashing position.

2. Press **SELECT CYCLE** touch pad until desired cycle name flashes. Display shows:

CYCLE 5	**CYCLE 6**
CYCLE 7	**CYCLE 8**

__Indicates flashing position.

3. Press **REVIEW CYCLE** touch pad to access Cycle Review mode, and review selected cycle.

4. Continue to press **REVIEW CYCLE** touch pad to sequentially review selected cycle. At end of review, display shows:

PRINT CYCLE VALUES?	
REVIEW=YES	**STOP=NO**

5. To generate a printout of reviewed cycle phases and values, press **REVIEW CYCLE** touch pad. Display returns to first phase of selected cycle:

CYCLE 6	**T = XXX.XF**
ALK. TANK	**SP = XXX.XF**

and printer message is:

```
============================
==   CYCLE PROGRAM REVIEW   ==
==       CYCLE E - CYCLE 6      ==
============================
REVIEW TIME                HH:MM:SS
REVIEW DATE                YY/MM/DD
UNIT NUMBER                0000000
PHASE                              F
------------------------------------------------------
ALK. WASH                  SP=XXX.X
     ACTUAL TEMP.            = XXX.X
     TANK LIM LO           LP=XXX.X
     TANK LIM HI           HP=XXX.X
ACID WASH TEMP. RANGE
     LO=XXX.X  HI=XXX.X
     ACTUAL TEMP.            = 177.X
     TANK LIM LO           LP=XXX.X
     TANK LIM HI           HP=XXX.X
RINSE                      SP=XXX.X
     TANK LIM LO           LP=XXX.X
     TANK LIM HI           HP=XXX.X
     ACTUAL TEMP.            = XXX.X
FINAL RINSE                SP=XXX.X
     ACTUAL TEMP.            = XXX.X
------------------------------------------------------
```

*NOTE: At this point, user may either initiate the selected cycle or exit the Cycle Review mode. To initiate selected cycle, press **CYCLE/START** touch pad twice. To exit the Cycle Review mode, press **CYCLE MENU** touch pad. Control exits the mode and returns display to the selected cycle menu.*

6. To by-pass printout option, press **STOP/RESET** touch pad. Control exits Cycle Review mode and display returns to selected cycle menu. Display shows:

CYCLE 5	**CYCLE 6**
CYCLE 7	**CYCLE 8**

__Indicates flashing position.

6.1 General

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Regularly scheduled preventive maintenance is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.

WARNING – BURN HAZARD: Before performing any service on the unit, wait until chamber and piping cool to room temperature.

WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:

- **Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practice standards.**
- **Fasteners and star washers are used to ensure protective bonding continuity. Always reinstall any star washer which may have been removed during installation or servicing.**

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this equipment can be found in Section 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

Procedures described in this section must be performed at regular intervals as indicated. The indicated frequencies are minimums and should be increased with increased usage of the equipment. If a problem occurs, refer to *Section 7, Troubleshooting*.

A sample preventive maintenance schedule is included in this section. Use the sample schedule as a guide to establish a facility preventive maintenance record for your washer.

This section also includes procedures for the adjustment, repair, or replacement of selected washer components. Exploded views and assembly drawings showing various parts and assemblies referred to can be found in the Illustrated Parts Breakdown (P910000-020).

6.2 Preventive Maintenance Schedule

It is important, for the proper and efficient operation of the washer, to set up a schedule of periodic inspection and maintenance following established institutional practices. Close attention should be paid to conditions in the operating environment which affect the frequency of some maintenance procedures indicated (e.g. mineral content of water supply, frequency of washer usage).

The following schedule should be used as a guide to properly maintain the washer. These procedures should be carried out only by STERIS or STERIS-trained service technicians. Contact STERIS when service is required. Preventive Maintenance is not covered under warranty.

Table 6-1. Preventive Maintenance Schedule

Recommended frequency of inspection is indicated in the right column. Usage, and utility conditions may require more or less frequent inspections. Tasks are defined on a yearly basis.		**Suggested Frequency**
1.0	**PREPARATION FOR PREVENTIVE MAINTENANCE**	
1.1	Discuss equipment operation with department personnel.	6 X/year
1.2	Inspect printouts for signs of trouble.	6 X/year
1.3	If required, install test equipment.	6 X/year
1.4	When necessary, shut off all building services and drain all lines.	6 X/year
2.0	**DOOR ASSEMBLIES (EACH DOOR)**	
2.1	Inspect door for ease of operation.	6 X/year
2.2	Inspect condition of door gasket for wear. Replace if necessary.	6 X/year
3.0	**CHAMBER COMPONENTS**	
3.1	Inspect spray jets. Align and clean as necessary.	6 X/year
3.2	Inspect spray headers. Flush out as necessary.	6 X/year
3.3	Remove hard water deposits from recirculating tank and/or chamber interior.	6 X/year
3.4	Inspect water level sensing probes. Clean as necessary.	6 X/year
3.5	Verify proper water level in recirculating tank.	3 X/year
4.6	Check piping system for leaks. Repair if necessary.*	6 X/year
4.0	**EACH SUPPLY-LINE STRAINER**	
	Inspect supply-line strainers for debris. Clean as necessary.*	2 X/year
5.0	**EACH STEAM TRAP**	
5.1	Inspect steam trap for proper operation.	6 X/year
5.2	Rebuild steam trap as required.	As required

** Contact STERIS for this service. Service charges may be incurred. Consult your warranty for details.*

Table 6-1. Preventive Maintenance Schedule (Cont'd)

Recommended frequency of inspection is indicated in the right column. Usage, and utility conditions may require more or less frequent inspections. Tasks are defined on a yearly basis.		Suggested Frequency
6.0	**EACH VALVE***	
6.1	Inspect each valve. Clean if necessary.	2 X/year
6.2	Inspect each solenoid valve for proper operation. Replace if necessary.	2 X/year
6.3	Rebuild each solenoid valve based on history of unit failure.	2 X/year
6.4	Inspect check valves. Clean or replace as necessary.	2 X/year
6.5	Inspect each throttling valve for proper operation. Adjust if necessary.	2 X/year
6.6	Inspect each hydraulic hold down balancing valve. Adjust if necessary.	2 X/year
7.0	**PUMP MOTOR***	
7.1	Inspect pump seal for leakage. Replace if necessary.	3 X/year
7.2	Verify proper pump rotation.	6 X/year
7.3	Check for noise and vibration.	6 X/year
7.4	Grease pump motor bearings where applicable.	1 X/year
8.0	**SELF-CLEANING SCREEN***	
	Inspect self-cleaning screen. Disassemble and remove debris from screen as necessary.	6 X/year
9.0	**CONVEYOR DRIVE SYSTEM***	
9.1	Inspect drive clutch. Adjust if necessary.	6 X/year
9.2	Grease conveyor bearings.	2 X/year
9.3	Verify roller guides for wear. Replace if necessary.	6 X/year
9.4	Verify belt tension and speed. Adjust if necessary.	2 X/year
10.0	**MICROCOMPUTER CONTROL SYSTEM***	
10.1	Calibrate temperature set points.	2 X/year
10.2	Replace battery backed RAM chip as required.	As required
10.3	Replace printer paper as required.	As required
11.0	**ELECTRICAL CONTROL BOX***	
11.1	Verify all sockets for proper seating of electrical components.	6 X/year
11.2	Inspect wiring, terminals, and socket connections for damage or fraying.	6 X/year
12.0	**OPTIONAL DRYER SECTION***	
12.1	Lubricate dryer blower motor.	1 X/year
12.2	Grease blow off chains and bearings.	2 X/year

** Contact STERIS for this service. Service charges may be incurred. Consult your warranty for details.*

Table 6-1. Preventive Maintenance Schedule (Cont'd)

Recommended frequency of inspection is indicated in the right column. Usage, and utility conditions may require more or less frequent inspections. Tasks are defined on a yearly basis.		Suggested Frequency
13.0	**OPTIONAL GARB-EL SECTION – INTEGRATED**	
13.1	Grease Garb-el chains and bearings.	2 X/year
13.2	Inspect spray jets. Align and clean as necessary.	6 X/year
13.3	Verify Garb-el belt tension. Adjust if necessary.	2 X/year
14.0	**FINAL TEST***	
14.1	Clean lint and dirt from components.	6 X/year
14.2	Run machine through two cycles to verify proper operation. Verify all displays and printouts.	6 X/year
14.3	Remove all test equipment installed for inspection.	6 X/year
14.4	Install any panel or cover removed during inspection.	6 X/year
14.5	Inspect work area and washer to ensure removal of all materials used during inspection.	6 X/year

** Contact STERIS for this service. Service charges may be incurred. Consult your warranty for details.*

6.3 Daily Cleaning Procedures

WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

WARNING – BURN HAZARD: Before performing any service on the unit, wait until chamber and piping cool to room temperature.

- **Chamber Solution Screen**

NOTE: Clean chamber solution screens while they are still wet, before foreign matter dries.

1. Lock disconnect switch in **OFF** position and close building supply valves.
2. Remove access panel from side of cabinet section.
3. Slide screens out of chamber and separate screen pieces as they appear (see Figure 6-1).
4. Remove any debris from screens.
5. Slide screens back into chamber. Ensure screen pieces are hooked together (see Figure 6-1).
6. Replace access panel and re-energize washer utilities.

- **Garb-el (Option)**

After each day of use, run Garb-el for several minutes until both the feed hopper and the grinding chamber are clear of waste material. This procedure flushes out the sewer line.

In addition, wash down hopper interior using a few pails of water or a hose. Disinfectants may be used. Ensure to use disinfectants that will not damage metal or stainless steel.

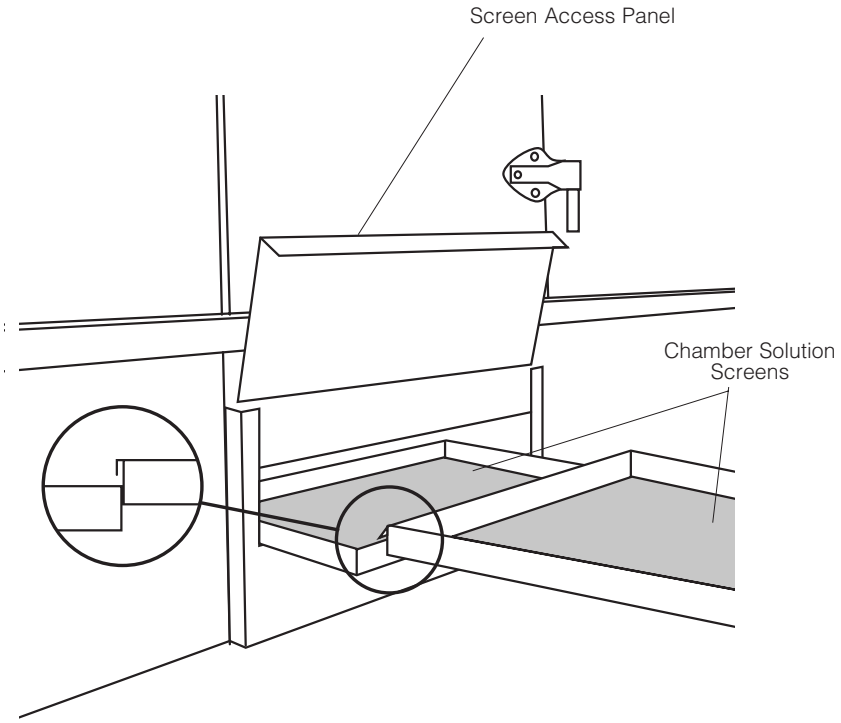


Figure 6-1. Two-Piece Solution Screen

6.4 Weekly Cleaning Procedures

6.4.1 Clean Washer Interior

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container, or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

WARNING – SLIPPING HAZARD: To avoid slippery floor conditions, immediately wipe up any spilled liquids or drippage. If spilled liquids or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

CAUTION – POSSIBLE EQUIPMENT DAMAGE: Use nonabrasive cleaners when cleaning unit. Follow directions on containers and rub in a back-and-forth motion (in same direction as surface grain). Abrasive cleaners will damage stainless steel. Cleaners rubbed in a circular motion or applied with a wire brush or steel wool will scratch and dull stainless steel. Do not use these cleaners on painted surfaces.

1. Wash chamber using a mild detergent solution.
2. Rinse with tap water and dry with a lint-free cloth.
3. If interior is stained, use a general purpose cleaner to remove general stains or a stainless-steel stain remover for stubborn stains, as follows:
   a. Using a damp cloth or sponge, apply cleaner in a back and forth motion, in same direction as surface grain.
   b. Thoroughly wipe off cleaner.
   c. Polish surface with a clean, dry, and lint-free cloth.

6.4.2 Clean Spray Jets and Headers

⚠ WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

⚠ WARNING – BURN HAZARD: Before performing any service on the unit, wait until chamber and piping cool to room temperature.

⚠ WARNING – SLIPPING HAZARD: To avoid slippery floor conditions, immediately wipe up any spilled liquids or drippage. If spilled liquids or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

1. Lock disconnect switch in **OFF** position and close building supply valves.
2. Remove top and bottom spray headers one at a time (see Figure 6-2). Lift header up until locator pins clear positioning holes and pull header out of O-ring connector.
3. Insert a wire (smaller diameter than a jet nozzle) into those spray jet nozzles that appear clogged, and push debris through nozzles into header.

   NOTE: Jet nozzles are factory aligned to provide maximum washing efficiency. Do not move the spray jets when cleaning.
4. Remove plug from end of header and rinse header under running water to clean out debris.
5. Replace plug and reinstall header in proper location. Ensure header is pushed into O-ring connector and each locator pin is seated in its proper hole.

   NOTE: Locator pins are aligned with specific positioning holes. Do not force header into incorrect positioning holes.
6. Re-energize washer utilities.

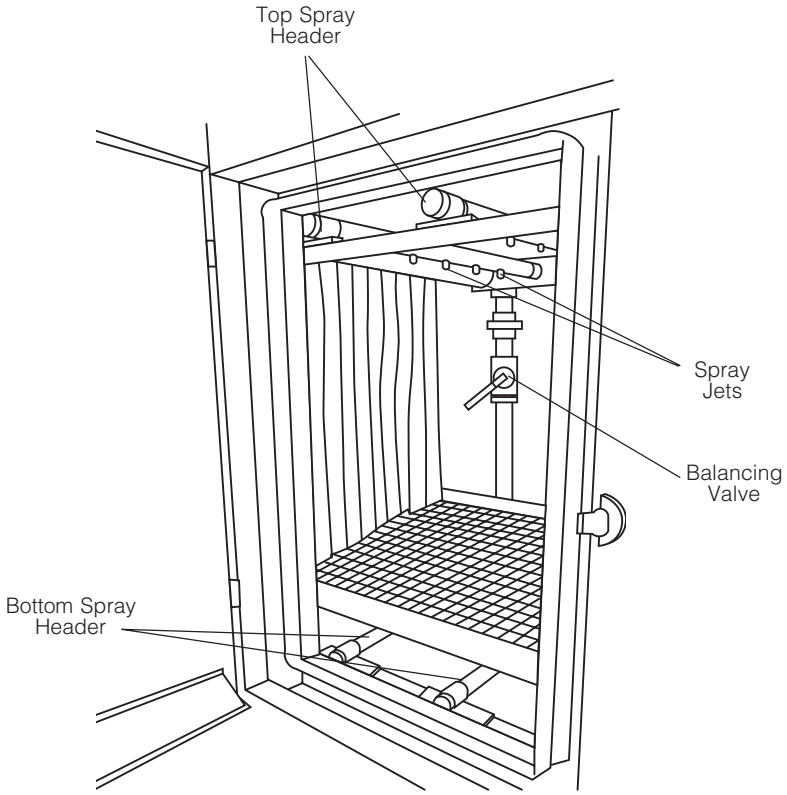


Figure 6-2. Spray Header Removal

6.5 Monthly Cleaning Procedure

NOTE: Depending on the hardness of water being used, it may be necessary to remove hard water deposits more often. Remove deposits from chamber and material handling accessories whenever deposits become visible.

6.5.1 Remove Hard Water Deposits From Chamber and Accessories

⚠ WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container, or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

⚠ WARNING – SLIPPING HAZARD: To avoid slippery floor conditions, immediately wipe up any spilled liquids or drippage. If spilled liquids or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

1. If desired, place empty accessory rack in chamber.
2. Turn off detergent supply pump (by others).
3. Pour one quart of descaling liquid into chamber sump and close door.
4. Press **MANUAL MENU** touch pad to access Manual Control mode.
5. Select and start PUMP/DRIVE function.
6. Let washer run for 15 minutes, then press **STOP/RESET** touch pad.
7. Once hard water deposits are removed, select and start DRAIN function to drain descaler solution from sump (see *Section 4.7.3, Tank Dump*).
8. Manually fill and drain chamber sump again to remove any residue.
9. Press **STOP/RESET** touch pad to exit Manual Control mode and turn on detergent supply pump.

6.5.2 Clean Building Supply-Line Strainers

WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

WARNING – BURN HAZARD:

- **Before performing any service on the unit, wait until chamber and piping cool to room temperature.**
- **Pipes may be extremely hot.**

NOTE: Piping tools are required. Contact facility maintenance technician.

1. Set **POWER-OFF/STANDBY** switch to **OFF/STANDBY**. Lock disconnect switch in **OFF** position and close building supply valves.
2. Remove hex caps from each strainer body.
3. Pull out strainer screen from body.
4. Using a wire brush or steel wool, scrape all rust and residue from strainer screen and body. Ensure all perforations are clear, by poking open with a wire. Replace screen if damaged or corroded.
5. Verify no dirt or other particles remain in strainer body and insert screen into strainer body.
6. Using pipe joint sealing compound, replace and tighten hex cap.
7. Verify all pipe connections are tight and leak free after reassembly.
8. Re-energize washer utilities.

6.5.3 Clean Wash Temperature Control Probe

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container, or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

1. Lock disconnect switch in **OFF** position and close building supply valves.
2. Lower water level in wash recirculating tank to below probe opening.
3. Loosen compression fitting nut and remove probe from recirculating tank.
4. Using a rag dampened with acid or descaler, remove hard water deposits from probe.
5. Reinstall probe and tighten compression fitting nut.
6. Re-energize washer utilities.

WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

WARNING – BURN HAZARD: Before performing any service on the unit, wait until chamber and piping cool to room temperature.

6.5.4 Clean Rinse Temperature Control Probes

WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

WARNING – BURN HAZARD: Before performing any service on the unit, wait until chamber and piping cool to room temperature.

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container, or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

1. Lock disconnect switch in **OFF** position and close building supply valves.
2. Lower water level in rinse recirculating tank to below probe opening.
3. Loosen compression fitting nut and remove probe from recirculating tank.
4. Using a rag dampened with acid or descaler, remove hard water deposits from probe.
5. Reinstall probe and tighten compression fitting nut.
6. Re-energize washer utilities.

6.5.5 Clean Water Level Sensing Probes

WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

WARNING – BURN HAZARD: Before performing any service on the unit, wait until chamber and piping cool to room temperature.

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container, or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

1. Lock disconnect switch in **OFF** position and close building supply valves.
2. Remove wires from each of two probes in wash and rinse recirculating tanks.

   NOTE: Make note of wire locations for reassembly. Reversing wires can cause washer to malfunction.
3. Lower water level in each tank below probe openings.
4. Remove probes. Using a rag dampened with acid or descaler, remove hard water deposits from each probe.
5. Reinstall probes and attach wires in original positions.
6. Re-energize washer utilities.

6.6 Changing Printer Paper Roll

See Figure 6-3.

NOTE: Do not operate printer without paper.

1. Open printer door.
2. Grasp remaining paper and pull it upward and out of printer.
3. Remove take-up spindle from its drive mechanism by pulling it to left.
4. Remove paper roll from take-up spindle and set empty take-up spindle aside.
5. Lower platen and remove lower paper spindle by pulling it straight forward.
6. Place new paper roll onto lower spindle with paper feeding downward from back of paper roll.

   NOTE: Verify paper roll is positioned correctly. Thermal printer does not print if the paper roll is inserted backwards. Use only STERIS thermal paper (P129359-008). Damage to printer mechanism can occur if paper of different width or thickness is used.
7. Place lower spindle (with new paper roll) back into position by pressing from front until it snaps into place.
8. Pull four or five inches of paper out from roll and tear corners off end.
9. Slide tab of paper roll into printer from back (with platen still in down position) until it exits from front of printer.
10. Grasp tab of paper, pull up 10 to 12 inches of paper, and feed this paper through opening in platen.
11. Insert tab of new paper roll into slot of take-up spindle and rotate spindle to secure paper in slot.
12. Raise platen back up into position and snap in place under catch.
13. Press take-up spindle back onto drive mechanism and allow motor to rotate spindle to verify paper is secured to take-up roll.
14. Set **POWER-OFF/STANDBY** switch to **OFF/STANDBY** position then to **POWER** to verify paper is correctly routed into mechanism and printer prints. Printer does not print if thermal paper was placed on wrong side.
15. Close printer door.

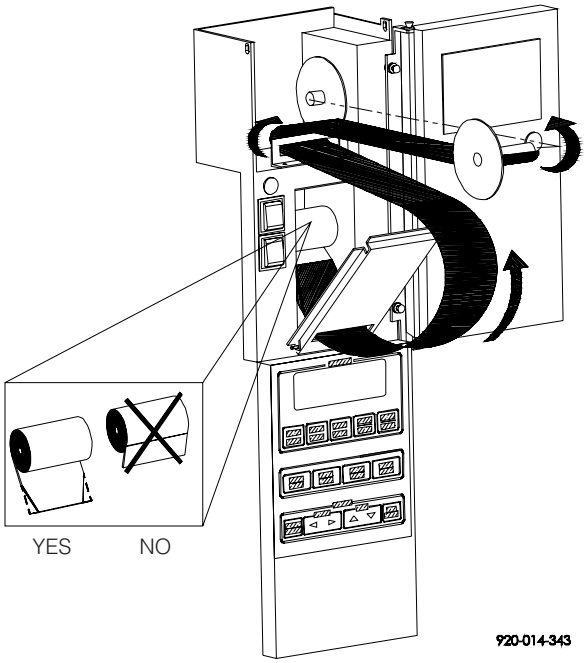


Figure 6-3. Changing Printer Paper Roll

6.7 Storing Thermal Paper

Thermal paper is subject to fading with time, humidity, and exposure to light.

It is the manufacturer's recommendation that thermal paper be stored in a dark place with an average ambient temperature of less than 77 °F (25 °C) and a relative humidity less than 65%. Under these conditions, the paper remains readable for at least five years. It is recommended that if the printed data is to be retained for periods of time longer than five years (6 to 25 years), an additional photocopy should be made for record retention. In any case, a duplicate set of records should be maintained in the files of the engineering or maintenance departments.

Thermal paper begins to develop color at about 158 °F (70 °C), however, under humid conditions, it might begin to develop at an accelerated rate. If stored for 24 hours at 140 °F (60 °C), the paper will show some signs of development. It will also show signs of development if stored for 24 hours at 113 °F (45 °C) and a relative humidity of 90%.

Do not store thermal paper next to other chemically treated papers - such as pressure sensitive paper or other type of recording round charts - as this may cause fading in print. If thermal paper is to be stored in the same area, always ensure it and other chemically treated papers are kept in separate envelopes.

Thermal paper discolors when exposed to direct sunlight.

6.8 Replace Detergent Container

(Automatic Detergent Injection System)

1. Lift supply hose and low level sensor out of detergent container.
2. Replace detergent container.
3. Insert supply hose and low level sensor in new detergent container.

   IMPORTANT: *Ensure supply and low level sensor are inserted in proper detergent container.*

6.9 Replace Detergent Squeeze Tube

(Automatic Detergent Injection System)

IMPORTANT: *It is recommended to disconnect and reconnect one detergent pump at a time.*

1. Set **POWER-OFF/STANDBY** switch to **OFF/STANDBY**. Lock disconnect switch in **OFF** position and close building supply valves.
2. Locate detergent supply pump.
3. Remove clamps and disconnect supply and injection hoses from squeeze tube (see Figure 6-4).
4. Remove screws from pump cover and lift off pump cover.
5. Grasp one end of squeeze tube and pull tube out of pump. Discard tube.
6. Clean all pump surfaces.
7. Lubricate new squeeze tube (P117950-583). Liberally apply lubricant (P117950-599) over tube surface to within two inches of each end.
8. Insert one end of squeeze tube into pump. Feed tube through pump by manually rotating roller block.
9. Spread lubricant over rollers in roller block.
10. Replace pump cover and fasten with screws previously removed.
11. Connect supply and injection hoses to ends of squeeze tube and attach clamps.

    IMPORTANT: *Ensure supply and injection hoses are connected to proper detergent pump (squeeze tube).*

12. Re-energize washer utilities.

    NOTE: Detergent supply pump automatically primes once energized. Ensure proper pump is priming.

⚠ WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container, or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

⚠ CAUTION – POSSIBLE EQUIPMENT DAMAGE: When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content can corrode stainless steel.

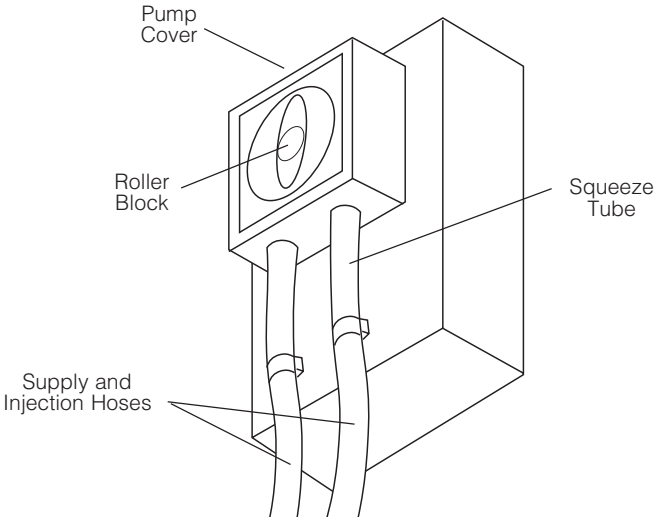


Figure 6-4. Detergent Supply Pump

6.10 Replace Cabinet Door Gasket

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Repairs and adjustments to this equipment must be made only by STERIS or STERIS-trained service personnel. Nonroutine maintenance performed by unqualified personnel or installation of unauthorized parts could cause personal injury, result in improper equipment performance, void the warranty, or result in costly damage. Contact STERIS regarding service options.

WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

1. Lock disconnect switch in **OFF** position and close building supply valves.
2. With cabinet access door open, remove old gasket from around door opening (see Figure 6-5).
3. Insert new gasket on door lip of chamber door frame.
4. Starting at top center of door opening, press gasket in place. Work gasket around entire opening, pressing and smoothing gasket as it is installed.
5. When gasket is completely installed around metal lip, overlap installed gasket, with remaining gasket, by three inches and cut off the excess.
6. Starting at top center, press and smooth gasket again.
7. Re-energize washer utilities.

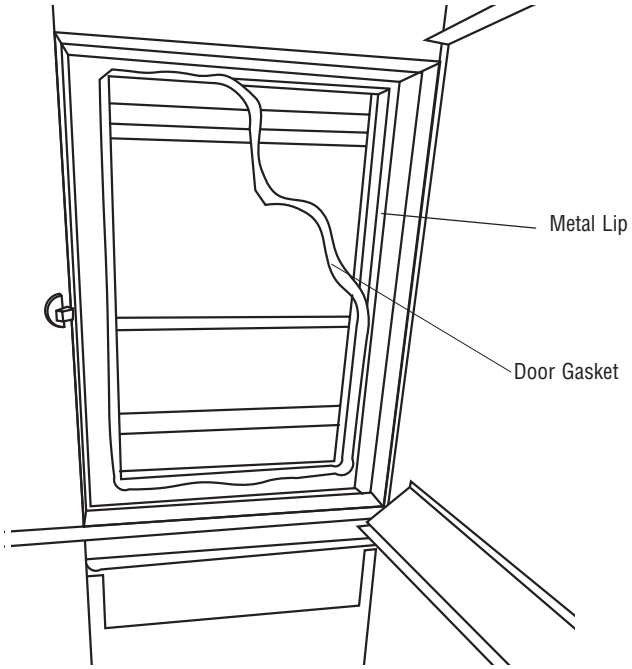


Figure 6-5. Replace Door Gasket

6.11 Adjust Conveyor Drive Clutch

1. If washer is running, press **STOP/RESET** touch pad.
2. Open cabinet access doors and verify nothing is blocking conveyor movement. Close access doors.
3. Start conveyor belt by turning on manual drive system power switch, located on back of electrical control box.
4. From unload-end control panel, push drive system **EMERGENCY STOP** pushbutton (see Figure 4-3).
5. Lock disconnect switch in **OFF** position and close building supply valves.
6. Remove chain guard to access drive motor gear reducer (see Figure 6-6).
7. Loosen Allen head setscrews on adjusting nut.
8. Torque adjusting nut to 65 ft/lb (average setting).
9. Tighten setscrews and reinstall chain guard.
10. Re-energize washer utilities.
11. Pull out drive system **EMERGENCY STOP** pushbutton and verify correct adjustment. When correctly adjusted, drive clutch will disengage and stop belt movement if the conveyor belt is obstructed.

If conveyor belt slips, repeat procedure and increase torque setting by 5 lb. Increments until satisfied with adjustment.

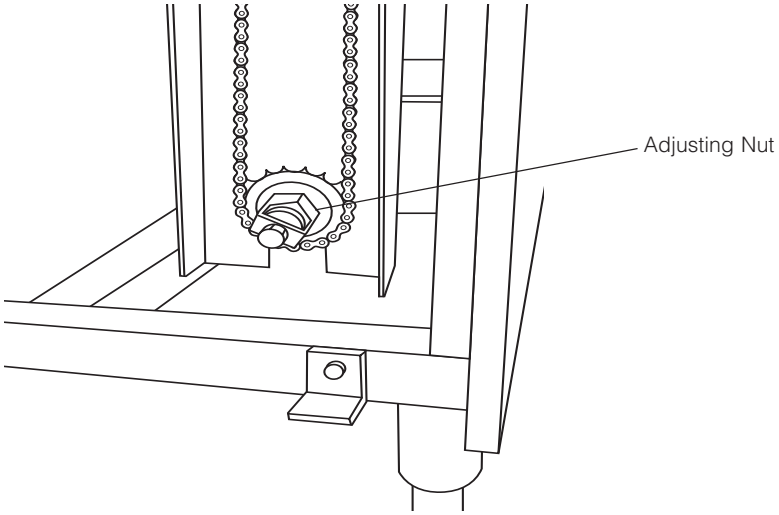


Figure 6-6. Conveyor Drive Clutch

6.12 Grease Conveyor Bearings

Conveyor bearings must be greased twice a year as follows:

1. Locate conveyor grease fittings, two at each end of washer (see Figure 6-7).
2. Apply a high temperature molybdenum grease.

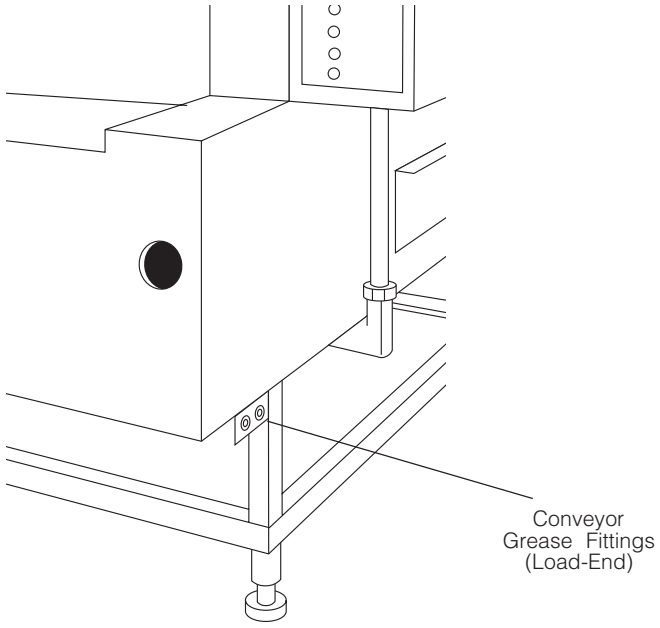


Figure 6-7. Conveyor Grease Fittings

6.13 Final Rinse Temperature Controls

The final rinse water temperature can be controlled manually by regulating the flow of steam and hot water through the final rinse heat exchanger.

Adjust final rinse water temperature between 185 and 195 °F (85 and 91 °C) as follows:

1. If washer is running, press **STOP/RESET** touch pad.
2. Completely close steam throttling valve and open fully final rinse water throttling valve (see Figure 6-8).
3. If necessary, allow solution/water in recirculating tanks to reach set temperatures.
4. Press **CYCLE START** touch pad.
5. Verify reading on heat exchanger temperature gauge. Gauge indicates temperature of final rinse water after water passes through heat exchanger.
6. Slowly open steam throttling valve until temperature gauge reads desired temperature.
7. If gauge does not reach desired temperature after steam throttling valve is fully open, slowly close final rinse water throttling valve until desired temperature is reached.

   ***IMPORTANT**: Final rinse water flow must be re-balanced if the final rinse water throttling valve is adjusted (closed) while setting the final rinse water temperature.*

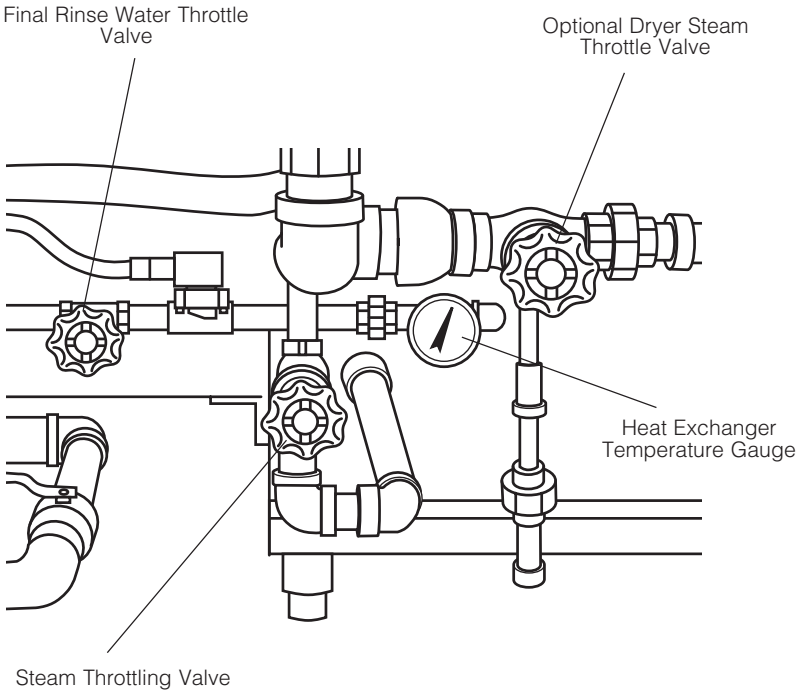


Figure 6-8. Final Rinse Temperature Controls

6.14 Balance Final Rinse Water Flow

⚠ WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMGE HAZARD: Repairs and adjustments to this equipment must be made only by STERIS or STERIS-trained service personnel. Nonroutine maintenance performed by unqualified personnel or installation of unauthorized parts could cause personal injury, result in improper equipment performance, void the warranty, or result in costly damage. Contact STERIS regarding service options.

⚠ WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

⚠ WARNING – BURN HAZARD:

- **Before performing any service on the unit, wait until chamber and piping cool to room temperature.**
- **Pipes may be extremely hot.**

1. Completely close pre-wash and wash tap valves (see Figure 6-9).
2. Ensure manual wash and rinse drain valves are closed.
3. Using a pipe wrench, remove observation caps from wash and rinse drain spouts (see Figure 6-10).
4. Press **CYCLE START** touch pad.
5. Observe wash and rinse overflows. At this time, there should be no overflow from wash section. Rinse section should be generating a heavy overflow.
6. Adjust wash water level as follows:
   a. Fully open wash tap valve. Once overflow is observed, completely close valve then reopen valve one turn (360°) only.
   b. Allow washer to run for three minutes while observing wash overflow.
   c. If wash section generates a small overflow (trickle), adjustment is correct. If a heavy overflow is produced, partially close the wash tap valve. If no overflow exists, open tap valve in 1/4-turn increments until correct overflow is observed.

   NOTE: After each adjustment, allow washer to run for three minutes and recheck overflow.
7. Adjust pre-wash water spray as follows:
   a. Open pre-wash tap valve two turns.
   b. Carefully observe pre-wash spray by opening neoprene curtain on load end.
   c. Pre-wash spray is adjusted correctly if bottom jets spray water up to twelve inches higher than conveyor belt. If water is sprayed out of chamber, partially close pre-wash tap valve. If water is not sprayed high enough (twelve inches above conveyor belt), open tap valve in one turn increments until correct spray is obtained.
8. Allow washer to run for ten minutes.
9. Observe wash and rinse overflows. At this time, wash section should be generating a small overflow (trickle) and rinse section should be generating at least a small overflow. If no overflow exists from rinse section, decrease pre-wash water spray.

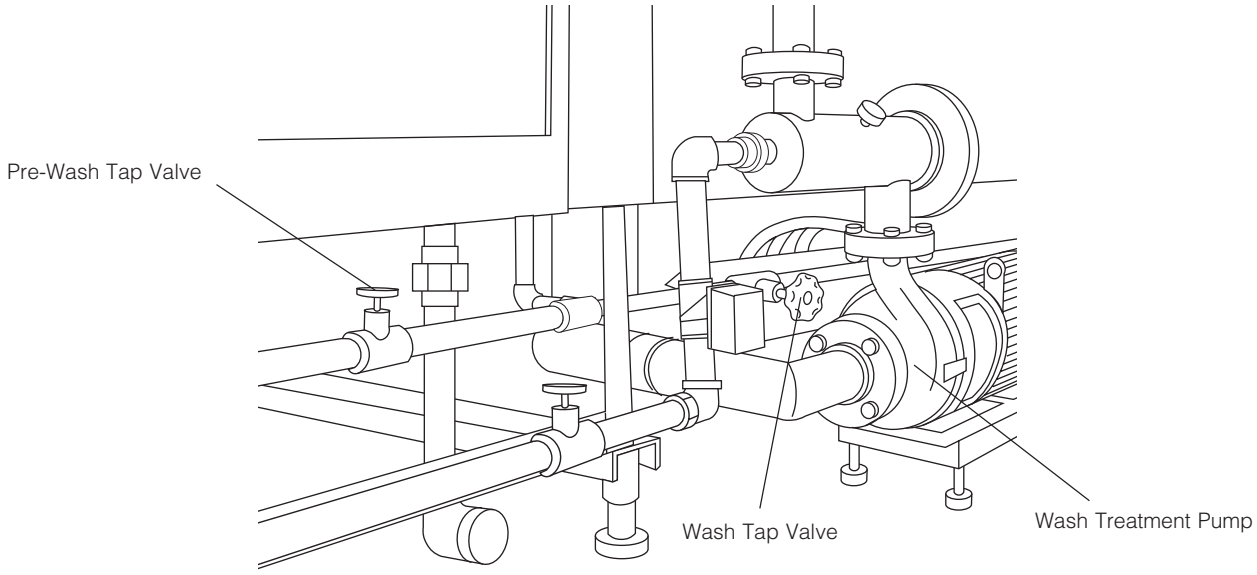


Figure 6-9. Close Pre-Wash and Wash Tap Valves

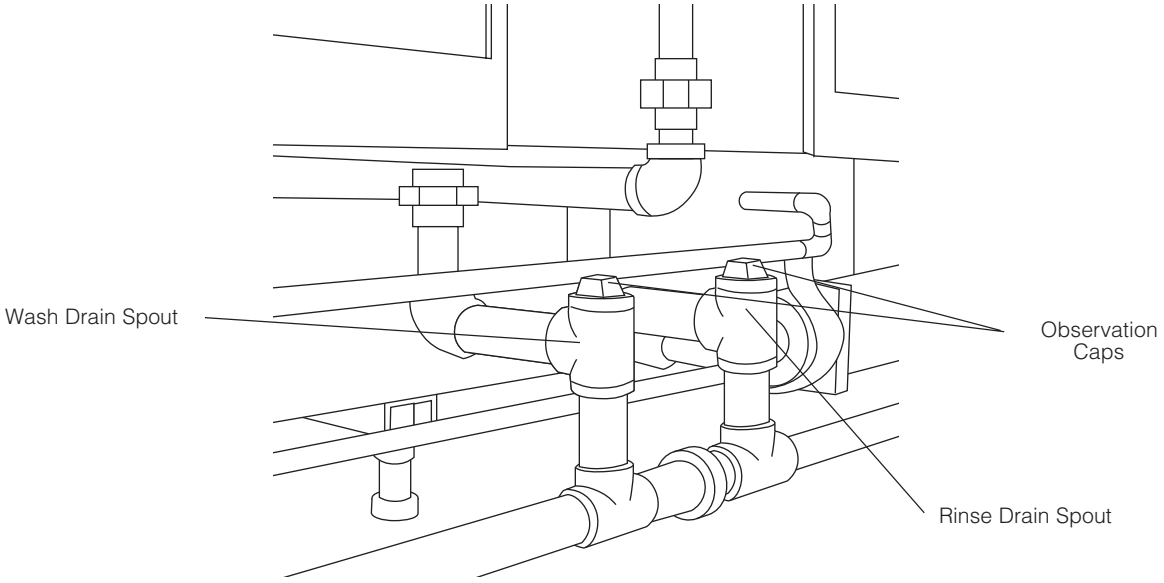


Figure 6-10. Observation Caps

6.15 Adjust Hydraulic Hold-Down System

WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

WARNING – BURN HAZARD:

- **Before performing any service on the unit, wait until chamber and piping cool to room temperature.**
- **Do not adjust balancing valve while washer is operating.**
- **Pipes may be extremely hot.**

Hydraulic hold-down system allows manual control of the solution/water pressure exiting the spray jet systems during cycle operation. The water pressure to the upper and lower spray jets can be controlled by adjusting the balancing valves, located inside the wash and rinse chambers.

1. During unit operation, observe items as they appear at unload end of washer.
2. If items are flipped from original loading position, adjust balancing valves as follows:
   a. Press **STOP/RESET** touch pad.
   b. Open wash and rinse cabinet access doors.
   c. Locate balancing valves, usually a two-inch ball valve with a blue handle (see Figure 6-11).
   d. Slowly turn wash and rinse valve handles up toward horizontal position to reduce water pressure to lower spray jets.
   e. Close cabinet doors.
3. Load items on conveyor and press **CYCLE START** touch pad. Observe items as they appear at unload end of washer.
4. If items are still flipping, repeat **Steps 2 and 3** until satisfied with adjustment.

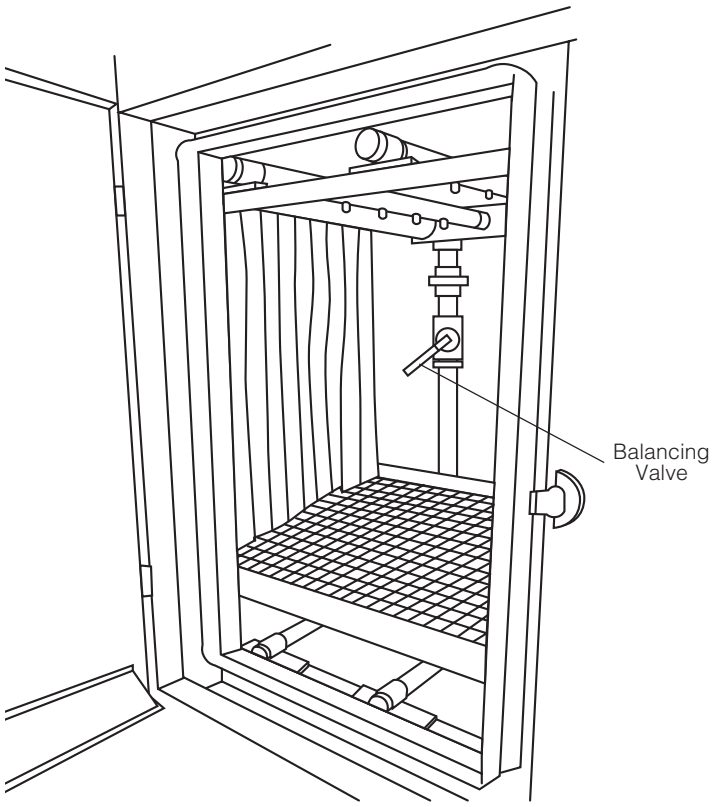


Figure 6-11. Balancing Valve Location (Typical)

6.16 Lubricate Pump Motor

⚠ WARNING – BURN HAZARD: Pipes may be extremely hot.

⚠ WARNING – SLIPPING HAZARD: To avoid slippery floor conditions, immediately wipe up any spilled liquids or drippage. If spilled liquids or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

Pump motor must be lubricated once a year. When necessary, grease can be completely renewed by forcing out old grease with new grease.

1. If possible, place a pan under motor to catch old grease.

   NOTE: Motor should be lubricated while warm.

2. Thoroughly wipe off housing around fill and drain plugs.
3. Remove fill and drain plugs (see Figure 6-12). Clear drain hole of any hardened grease which may have accumulated.

   NOTE: Depending on model and year of pump, motor may be equipped with one or two grease fittings. If motor is not provided with grease fittings, no lubrication is necessary.

4. Using a low pressure grease gun, add recommended grease through fill hole until it starts to come out of drain hole.

   NOTE: Use only fresh, uncontaminated lubricant.

5. Run motor for ten to twenty minutes to expel any excess grease.
6. Thoroughly clean the fill and drain plugs before replacing them.

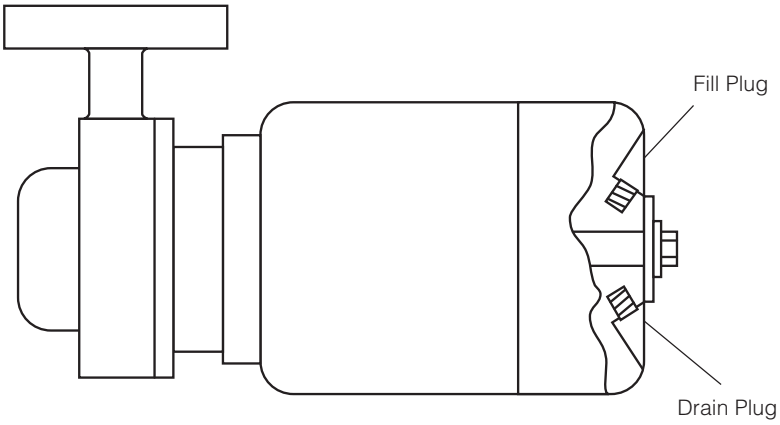


Figure 6-12. Lubricate Pump Motor

6.17 Inspect and Clean Self-Cleaning Filter

⚠ WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

⚠ WARNING – BURN HAZARD:

- **Before performing any service on the unit, wait until chamber and piping cool to room temperature.**
- **Do not adjust balancing valve while washer is operating.**
- **Pipes may be extremely hot.**

Self-cleaning screen must be inspected and manually cleaned once a month.

1. Lock disconnect switch in **OFF** position and close building supply valves.
2. Remove three bolts and loosen fourth on vertical plate directly above pump (see Figure 6-13).
3. Move plate to one side and remove Teflon gasket.
4. Remove screen by pulling straight out on handle (see Figure 6-13).
5. Rinse screen to remove any debris and inspect for damage.
6. Carefully reinsert screen in assembly housing and replace gasket. Reposition plate over gasket and evenly tighten all four bolts.

   NOTE: The gasket should last for several inspection procedures. When necessary, order replacement gasket (P764324-398) from STERIS.
7. Re-energize washer utilities.

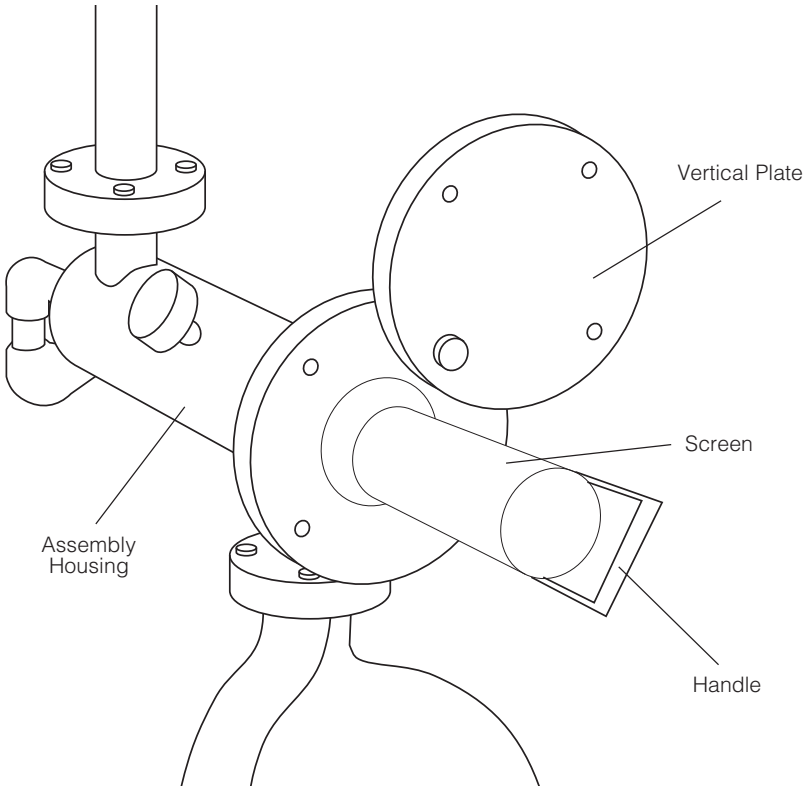


Figure 6-13. Self-Cleaning Screen Assembly

6.18 Lubricate Blower Motor (Option)

⚠ WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

⚠ WARNING – BURN HAZARD:

- **Before performing any service on the unit, wait until chamber and piping cool to room temperature.**
- **Do not adjust balancing valve while washer is operating.**
- **Pipes may be extremely hot.**

Blower motor must be lubricated once a year. When necessary, grease can be completely renewed by forcing out old grease with new grease.

1. If possible, place a pan under motor to catch old grease.

   NOTE: Motor should be lubricated while warm.

2. Thoroughly wipe off housing around fill and drain plugs.
3. Remove fill and drain plugs (see Figure 6-14). Clear drain hole of any hardened grease which may have accumulated.

   NOTE: Depending on model and year of blower, motor may be equipped with one or two grease fittings. If motor is not provided with grease fittings, no lubrication is necessary.

4. Using a low pressure grease gun, add recommended grease through fill hole until it starts to come out of drain hole.

   NOTE: Use only fresh, uncontaminated lubricant.

5. Run motor for ten to twenty minutes to expel any excess grease.
6. Thoroughly clean fill and drain plugs before replacing them.

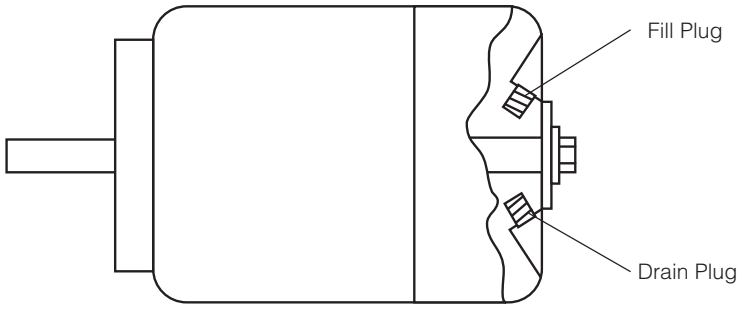


Figure 6-14. Blower Motor

6.19 Adjust Dryer Temperature Controls (Dryer Section Option)

Temperature of recirculated hot air is adjustable up to 210 °F (99 °C) by controlling the amount of steam supplied to the radiator (see Figure 6-15).

1. **To increase temperature**, turn steam valve counter-clockwise.
2. **To decrease temperature,** turn steam valve clockwise.

A temperature gauge is provided to monitor air temperature.

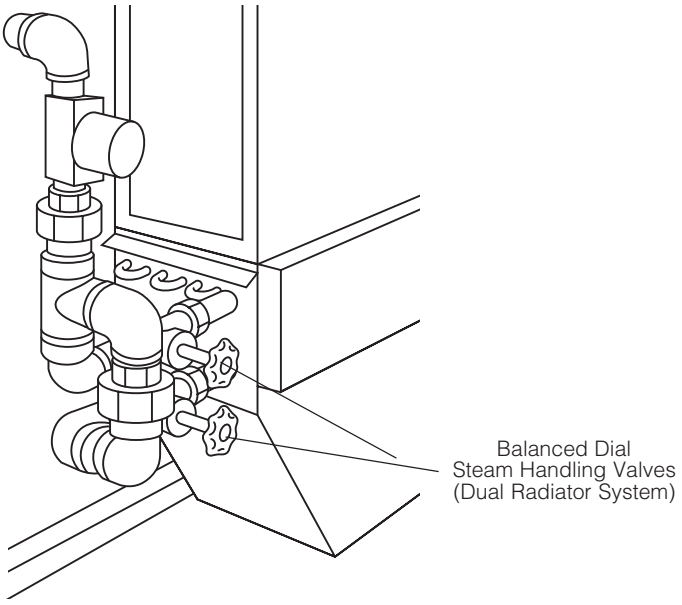


Figure 6-15. Dryer Temperature Control

6.20 Belt Speed Control

Conveyor belt speed can be adjusted using the adjustable belt speed dial, located on the back of the electrical control box (see Figure 6-16).

Adjustment is made by turning dial towared low or high, to select desired speed. Belt speed is variable from two to ten feet per minute.

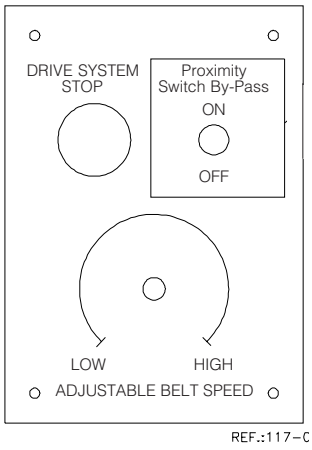


Figure 6-16. Drive System Control

TROUBLESHOOTING

7

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMGE HAZARD: Repairs and adjustments to this equipment must be made only by STERIS or STERIS-trained service personnel. Nonroutine maintenance performed by unqualified personnel or installation of unauthorized parts could cause personal injury, result in improper equipment performance, void the warranty, or result in costly damage. Contact STERIS regarding service options.

WARNING – ELECTRICAL SHOCK AND/OR BURN HAZARD: Disconnect all utilities to washer before servicing. Do not service the washer unless all utilities have been properly locked out. Always follow local electrical safety-related work practice standards.

WARNING – BURN HAZARD:

- **Before performing any service on the unit, wait until chamber and piping cool to room temperature.**
- **Pipes may be extremely hot.**

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this equipment can be found in Section 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

This section contains detailed information on the types of washer malfunctions likely to occur, and possible causes and corrective actions.

If you are unable to correct the problem with use of the following Troubleshooting Charts, or if a problem occurs that is not described on the charts, please call STERIS. A factory-trained technician will promptly place your washer in proper working condition.

NOTE: Never allow unqualified persons to service the washer.

Table 7-1. Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
1. No power.	1. Building electrical supply disconnect switch (circuit breaker) to **OFF** position. Position switch to **ON**. 2. Incomplete or loose electrical connection. Inspect all wiring connections. Complete or tighten as necessary. 3. Fuse in power supply failed. Replace fuse. 4. Power supply failed. Replace power supply. 5. Power switch failed. Replace power switch.
2. Washer does not start.	1. **POWER-OFF/STANDBY** switch to **POWER**. 2. Hot water supply valve closed. Open water supply valve. 3. Water level sensing probe malfunction. Verify operation. Clean or replace as necessary. 4. Building supply-line strainers clogged. Clean strainers. 5. Incomplete or loose electrical connection. Inspect all wiring connections. Complete or tighten as necessary. 6. Blown fuse. Replace fuse.
3. Washer does not stop.	Manual drive system or optional dryer system power switches on. Turn manual switches off.
4. Insufficient or no spray volume generated through wash and rinse spray jets.	1. Spray jets clogged. Clean spray jets and headers. 2. Spray header plugs missing. Replace plugs. 3. Self-cleaning screen clogged. Remove debris from screen. 4. Loose hose connection on pump suction pick-up pipe. Tighten hose clamps or replace as necessary. 5. Water level sensing probe malfunction. Verify operation. Clean or replace as necessary.
5. Insufficient or no spray volume generated through final rinse spray jets.	1. Supply valves not fully open. Open building and washer supply valves. 2. Spray jets clogged. Clean spray jets and headers. 3. Spray header plugs missing. Replace plugs. 4. Building supply-line strainers clogged. Clean strainers. 5. Final rinse water flow incorrectly set. Balance final rinse water flow. 6. Final rinse water solenoid valve fails. Repair or replace as necessary.

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
6. Too much water entering chamber. Excess amount of water going to overflow drain.	1. Water level sensing probe malfunction. Verify operation. Clean or replace as necessary. 2. Fill solenoid valve remains open. Repair or replace valve as necessary. 3. Poor electrical connection between water level sensing probe and control. Inspect connections and tighten if necessary.
7. Insufficient water entering chamber.	1. Hot water supply valve closed. Open water supply valve. 2. Manual drain valve open. Close valve. 3. Water level sensing probe malfunction. Verify operation. Clean or replace as necessary. 4. Building supply-line strainers clogged. Clean strainers.
8. Pump runs with insufficient or no pump pressure.	1. Water level sensing probe malfunction. Verify operation. Clean or replace as necessary. 2. Pump suction pick-up pipe clogged. Clean pick-up pipe. 3. Water temperature in excess of 195 °F (91 °C). Lower temperature set point. 4. Self-cleaning screen clogged. Remove debris from screen. 5. Loose hose connection on pump suction pick-up pipe. Tighten hose clamps or replace as necessary. 6. Too much soap in wash recirculating tank. Drain wash recirculating tank, refill with fresh water, and decrease detergent injection rate.
9. Pump runs with too much pressure.	1. Self-cleaning screen clogged. Remove debris from screen. 2. Spray jets clogged. Clean spray jets and headers. 3. Drain line plugged. Flush out line.
10. Recirculating tank does not drain completely.	1. Drain opening at bottom of recirculating tank plugged. Flush out drain opening. 2. Drain line plugged. Flush out line. 3. Defective drain valve. Repair or replace as necessary.

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
11. Low water wash light on.	1. Manual wash drain valve open. Close valve. 2. Too much detergent. Drain wash recirculating tank, refill with fresh water, and decrease detergent injection rate. 3. Final rinse water flow incorrectly set. Balance final rinse water flow. 4. Water level sensing probe malfunctions. Verify operation. Clean or replace as necessary.
12. Low water rinse light on.	1. Manual rinse drain valve open. Close valve. 2. Supply valves not fully open. Open building and washer supply valves. 3. Building supply-line strainers clogged. Clean strainers. 4. Final rinse water flow incorrectly set. Balance final rinse water flow. 5. Water level sensing probe malfunctions. Verify operation. Clean or replace as necessary. 6. Final rinse water solenoid valve fails. Repair or replace as necessary.
13. Vapor escaping around door(s).	1. Exhaust dampered too much. Adjust dampering system. 2. Exhaust system off. Verify operation. 3. Spray jets misaligned. Realign jets toward load surfaces. 4. Spray header plugs missing. Replace plugs.
14. Water leaks from washer.	1. Cabinet joints leaking. Seal joints where necessary. 2. Cabinet door gasket worn or defective. Replace gasket. 3. Spray jets misaligned. Realign jets away from doors. 4. Piping leaking. Verify hose clamps, valves, and piping. Tighten connections as necessary.
15. Foam in wash recirculating tank.	1. Detergent is foaming. Use recommended products. 2. Too much detergent injected into wash recirculating tank. Verify injection rate. 3. Debris collecting in recirculating tank. Drain and refill tank more often.

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
16. Items come out dirty.	1. Empty detergent container. Refill or replace container. 2. Incorrect detergent used. Use recommended products. 3. Spray jets clogged. Clean spray jets and headers. 4. Spray header plugs missing. Replace plugs. 5. Too much detergent injected into wash recirculating tank. Verify injection rate. 6. Spray jets misaligned. Realign jets toward load surfaces. 7. Pump suction pick-up pipe clogged. Clean pick-up pipe. 8. Loose hose connection on pump suction pick-up pipe. Tighten hose clamps or replace as necessary. 9. Water level sensing probe malfunction. Verify operation. Clean or replace as necessary. 10. Self-cleaning screen clogged. Remove debris from screen. 11. Temperature set point too low. Raise temperature set point. 12. Drain line plugged. Flush out line. 13. Manual drain valve clogged. Clean valve. 14. Not enough pressure on lower spray jets. Adjust hydraulic hold down system. 15. Too much steam pressure. Adjust steam throttling valve, at heat exchanger, to 185 – 195 °F (85 – 91 °C). 16. Not enough final rinse water. Open final rinse water throttling valve, at heat exchanger, to 185 – 195 °F (85 – 91 °C).
17. Conveyor not moving.	1. Conveyor jammed. Check for obstructions. 2. Drive system **EMERGENCY STOP** pushbutton pushed in. Pull out pushbutton. 3. Solution/water temperature below optional temperature guarantee set point. Allow solution/water in recirculating tanks to reach temperature. 4. Manual drain valve open. Close valve. 5. Poor electrical connection between drive system and control. Inspect connections and tighten if necessary. 6. Water level sensing probe malfunction. Verify operation. Clean or replace as necessary. 7. Drive clutch loose. Tighten clutch assembly. 8. Blown fuse. Replace fuse. 9. Drive chain broken. Replace chain. *Continued...*

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
17. *(Cont'd)*	10. Worn drive gear in reduction gear box. Replace gear. 11. Temperature control probe malfunction. Verify operation. Clean or replace as necessary. 12. Coveyor stop proximity switch was activated.
18. Wash solution not reaching temperature.	1. Steam supply valve closed. Open steam valve. 2. Temperature set point too high. Lower temperature set point. 3. Temperature control probe malfunction. Verify operation. Clean or replace as necessary. 4. Poor quality steam supply. Provide quality as specified on equipment drawing. 5. Exhaust damper (provided by customer) open too wide. Adjust damper position. 6. Steam valve stuck closed. Clean valve. Repair or replace if necessary. 7. Steam strainer clogged. Clean strainer.
19. Washer overheating.	1. Water temperature in excess of 195 °F (91 °C). Lower temperature set point. 2. Steam valve stuck open. Clean valve. Repair or replace if necessary. 3. Temperature control probe malfunction. Verify operation. Clean or replace as necessary.
20. Final rinse water not heating.	1. Steam supply valve closed. Open steam valve. 2. Steam strainer clogged. Clean strainer. 3. Low dynamic steam pressure. Provide steam at pressure specified on equipment drawing. 4. Leaking steam unions. Tighten unions. 5. Not enough steam pressure. Adjust steam throttling valve at heat exchanger. 6. Too much water volume. Adjust final rinse water throttling valve at heat exchanger. 7. Poor electrical connection between final rinse steam valve and control. Inspect connections and tighten if necessary. 8. Final rinse steam solenoid valve fails. Repair or replace as necessary.

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
21. Final rinse water overheating.	1. Too much steam pressure. Adjust steam throttling valve at heat exchanger. 2. Not enough final rinse water. Open final rinse water throttling valve at heat exchanger. 3. Final rinse water solenoid valve fails. Repair or replace as necessary.
22. Recirculating rinse water not reaching temperature.	1. Steam-supply valve closed. Open steam valve. 2. Temperature set point too high. Lower temperature set point. 3. RTD malfunction. Verify operation. Clean or replace as necessary. 4. Poor quality steam supply. Provide quality as specified on equipment drawing. 5. Exhaust damper (provided by customer) open too wide. Adjust damper position. 6. Steam strainer clogged. Clean strainer. 7. Steam valve stuck closed. Clean valve. Repair or replace if necessary.
23. Items flipping during cycle operation.	1. Conveyor jammed. Check for obstructions. 2. Too much pressure on lower spray jets. Adjust hydraulic hold-down system.
24. If drying option is present, items are not sufficiently dried.	1. Air temperature too low. Adjust steam throttling valves at radiator. 2. Conveyor belt speed too high. Lower belt speed. 3. Steam solenoid valve malfunctions. Verify operation. Repair or replace as necessary. 4. No air recirculation. Verify blower operation. Repair or replace as necessary. 5. Steam trap dirty. Clean trap. 6. Steam strainer clogged. Clean strainer. 7. Poor quality steam supply. Provide quality as specified on equipment drawing.
25. If Garb-el option is present, Garb-el is backing up.	1. Blades on hammermill worn (cannot grind properly). Blades are worn when cutting edges are rounded. Edges are at 90^{O} angle when new. 2. Hammermill blades are full of rubber bands or plastic. 3. Mill screen holes are worn, elongated, or broken. 4. Verify proper rotation of hammermill. 5. Verify plumbing system is not clogged.

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
26. If Garb-el option is present, hammermill is noisy.	1. Grinder shaft bearings are defective or worn. 2. Blades are broken. 3. Remove belts to ensure noise is not from main motor.
27. If Garb-el option is present, hammermill vibration.	1. Mill out of balance (possibly because of accumulation of rubber bands). 2. Blades are broken. 3. Bent or twisted hammermill blades. 4. Worn hammermill.
28. If Garb-el option is present, hammermill is leaking around shaft.	Seal(s) defective.
29. If Garb-el option is present, auger (worn screw) does not turn.	1. Shear pin is broken. 2. Feeder overload switch is kicked out. 3. Defective feeder motor. 4. Defective capacitor (a bad capacitor can also cause a good feeder motor to run in wrong direction). 5. When installing a new motor, verify fan to ensure it runs freely.
30. If Garb-el option is present, auger (worn screw) drags.	Worn feeder bearings.
31. If Garb-el option is present, water leaks where auger shaft enters hopper.	Faulty seal and/or thrust plate.

Table 7-2. Troubleshooting Chart - Alarms and/or Printouts

PROBLEM	POSSIBLE CAUSE AND CORRECTION
1. Display shows: **PRESS STOP TO ABORT OR START TO RESUME** and printout message: CYCLE PAUSED 00:00:00	**STOP/RESET** touch pad was pressed. Press **CYCLE START** touch pad to resume cycle operation, or press **STOP/RESET** touch pad again to abort cycle operation.
2. Display shows: **DRIVE STOPPED LOAD END** or **DRIVE STOPPED UNLOAD END**	One of **EMERGENCY STOP** pushbuttons was pushed in. 1. Press **ALARM REPLY** touch pad to silence buzzer. 2. Pull **EMERGENCY STOP** pushbutton to resume cycle, or press **STOP/RESET** touch pad twice to abort cycle operation.
3. Unload end proximity switch has been tripped. Display shows: **UNLOAD END FULL**	Unload end proximity switch has been tripped. Remove cage from end to silence buzzer and resume operation.
4. Display shows: **TANKS FILLING...**	Upon startup of cycle, if all tanks are not full, processing will not start until they are.
5. Display shows: **TANKS HEATING...**	Tank temperature has not reached GUARANTEED set point in allotted time. Belt drive stopped and will not resume until GUARANTEED temperature is reached.
6. Display shows: **F. RINSE HEATING...**	Final rinse water temperature has not reached GUARANTEED set point in allotted time. Belt drive stopped and will not resume until GUARANTEED temperature is reached.
7. Display shows: **BACKFLUSH**	Back flush ball valve opening/closing. Belt drive will stop because spray may not be at full pressure.
8. Display shows: **MAINTENANCE DUE! CALL SERVICE** and printout message: MAINTENANCE DUE!	Press **ALARM REPLY** touch pad to silence buzzer. Call STERIS.*

** Service charges may be incurred. Consult your warranty for details.*

Table 7-2. Troubleshooting Chart - Alarms and/or Printouts (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
9. Display shows: **ALK. TANK** **TOO LONG IN FILL** and printout message: ALK. TOO LONG IN FILL	Alkaline tank float did not signal full after tank fill time. 1. Press **ALARM REPLY** touch pad to silence buzzer. Verify tank fill time and alkaline tank full float. 2. Press **CYCLE/START** touch pad to resume or **STOP/RESET** touch pad to abort cycle.
10. Display shows: **RINSE TANK** **TOO LONG IN FILL** and printout message: RINSE TANK TOO LONG IN FILL	Rinse tank float did not signal full after tank fill time. 1. Press **ALARM REPLY** touch pad to silence buzzer. Verify tank fill time and rinse tank full float. 2. Press **CYCLE/START** touch pad to resume or **STOP/RESET** touch pad to abort cycle.
11. Display shows: **ALK. TANK** **FAILED TO REACH TEMP.** and printout message: ALK. TANK FAILED TO REACH TEMP	Alkaline Tank temperature did not reach set point within tank heat time. Press **ALARM REPLY** touch pad to silence buzzer. Verify alkaline tank steam system and tank heat time.
12. Display shows: **UNKNOWN** **FAILURE DETECTED** and printout message: UNKNOWN FAILURE DETECTED FAILURE NO. = XX	Alarm failure flag set to an unknown alarm. 1. Press **ALARM REPLY** touch pad to silence alarm. 2. Call STERIS.*
13. Display shows: **SERVICE DOOR** **OPEN WHILE PROCESSING** and printout message: SERVICE DOOR OPEN WHILE PROCESSING	One of the service doors was opened while pumps were running. 1. Press **ALARM REPLY** touch pad to silence buzzer. Verify all service doors to see if any opened by accident. 2. Verify all service door contacts. 3. Close door and press to resume or press **STOP/RESET** touch pad to abort.

** Service charges may be incurred. Consult your warranty for details.*

Table 7-2. Troubleshooting Chart - Alarms and/or Printouts (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
14. Display shows: **PH TOO HIGH** **CHECK INJ SYSTEM** and printout message: PH TOO HIGH CHECK INJ SYSTEM	pH above high pH setpoint after pH Neutralizer (option) time timeout. 1. Press **ALARM REPLY** touch pad to silence buzzer. Verify alkaline neutralization injection time and alkaline neutralizer injection system. 2. Press **CYCLE/START** touch pad to resume or **STOP/RESET** touch pad to abort cycle.
15. Display shows: **PH TOO LOW** **CHECK INJ SYSTEM** and printout message: PH TOO LOW CHECK INJ SYSTEM	pH below low pH setpoint after pH Neutralizer (option) time timeout. 1. Press **ALARM REPLY** touch pad to silence buzzer. Verify acid neutralization injection time and acid neutralizer injection system. 2. Press **CYCLE/START** touch pad to resume or **STOP/RESET** touch pad to abort cycle.
16. Display shows: **ALK. TANK** **RTD FAILURE** and printout message: ALK. TANK RTD FAILURE	Alkaline tank RTD reading below 35 °F (2 °C). 1. Press **ALARM REPLY** touch pad to silence buzzer. 2. Press **STOP/RESET** touch pad to abort cycle. Verify alkaline tank RTD (RTD #1), replace RAM and/or RTD, and recalibrate alkaline tank RTD.
17. Display shows: **ALK. TANK WATER** **TEMP. TOO HIGH** and printout message: ALK. TANK WATER TEMP. TOO HIGH	Alkaline tank RTD reading above 205 °F (96 °C) (failure). 1. Press **ALARM REPLY** touch pad to silence buzzer. 2. Press **STOP/RESET** touch pad to abort cycle. Verify alkaline tank RTD (RTD #1), replace RAM and/or RTD, and recalibrate alkaline tank RTD.
18. Display shows: **RINSE TANK** **RTD FAILURE** and printout message: RINSE TANK RTD FAILURE	Rinse tank RTD reading below 35 °F (2 °C). 1. Press **ALARM REPLY** touch pad to silence buzzer. 2. Press **STOP/RESET** touch pad to abort cycle. Verify rinse tank RTD (RTD #3), replace RAM and/or RTD and, recalibrate rinse tank RTD.
19. Display shows: **RINSE TANK WATER** **TEMP. TOO HIGH** and printout message: RINSE TANK WATER TEMP. TOO HIGH	Acid tank RTD reading above 205 °F (96 °C) (failure). 1. Press **ALARM REPLY** touch pad to silence buzzer. 2. Press **STOP/RESET** touch pad to abort cycle. Verify rinse tank RTD (RTD #3), replace RAM and/or RTD, and recalibrate rinse tank RTD.

** Service charges may be incurred. Consult your warranty for details.*

Table 7-2. Troubleshooting Chart - Alarms and/or Printouts (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
20. Display shows: **F. RINSE** **RTD FAILURE** and printout message: F. RINSE RTD FAILURE	Final rinse tank RTD reading below 35 °F (2 °C). 1. Press **ALARM REPLY** touch pad to silence buzzer. 2. Press **STOP/RESET** touch pad to abort cycle. Verify final rinse tank RTD (RTD #2), replace RAM and/or RTD, and recalibrate acid tank RTD.
21. Display shows: **F. RINSE WATER** **TEMP. TOO HIGH** and printout message: F. RINSE WATER TEMP. TOO HIGH	Final rinse tank RTD reading above 205 °F (96 °C) (failure). 1. Press **ALARM REPLY** touch pad to silence buzzer. 2. Press **STOP/RESET** touch pad to abort cycle. Verify final rinse tank RTD (RTD #2), replace RAM and/or RTD, and recalibrate rinse tank RTD.
22. Display shows: **CONC. TOO LOW** **CHECK INJ SYSTEM** and printout message: CONC. TOO LOW CHECK INJ SYSTEM	Conductivity setpoint was not reached during set injection time. Call STERIS.*
23. Display shows: **ALKALINE / ACID** **DETERGENT EMPTY** and printout message: ALKALINE/ACID DETERGENT EMPTY	Corresponding detergent container empty. Press **ALARM REPLY** touch pad to silence alarm. Replace by new detergent container (see *Section 6.8, Replace Detergent Container*).
24. Display shows: **ALKALINE / ACID** **NEUTRALIZER EMPTY** and printout message: ALKALINE / ACID NEUTRALIZER EMPTY	Corresponding neutralizer container empty. Press **ALARM REPLY** touch pad to silence alarm. Replace by new neutralizer container (see *Section 6.8, Replace Detergent Container*).
25. Display shows: **WASH CHAMBER** **TOO LONG IN DRAIN** and printout message: WASH CHAMBER TOO LONG IN DRAIN	Wash chamber was too long to drain. Press **ALARM REPLY** touch pad to silence alarm. Call STERIS.*

** Service charges may be incurred. Consult your warranty for details.*

Table 7-2. Troubleshooting Chart - Alarms and/or Printouts (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
26. Display shows: **ALK. CHAMBER TOO LONG IN DRAIN** and printout message: ALK. CHAMBER TOO LONG IN DRAIN	Alkaline chamber was too long to drain. Press **ALARM REPLY** touch pad to silence alarm. Call STERIS.*
27. Display shows: **RINSE CHAMBER TOO LONG IN DRAIN** and printout message: RINSE CHAMBER TOO LONG IN DRAIN	Rinse chamber was too long to drain. Press **ALARM REPLY** touch pad to silence alarm. Call STERIS.*
28. Display shows: **THORNTON CONTROLLER NOT RESPONDING** and printout message: THORNTON CONTROLLER NOT RESPONDING	Thornton controller failure to communicate with conductivity sensor or pH sensor. Press **ALARM REPLY** touch pad to silence alarm. Call STERIS.*

** Service charges may be incurred. Consult your warranty for details.*