

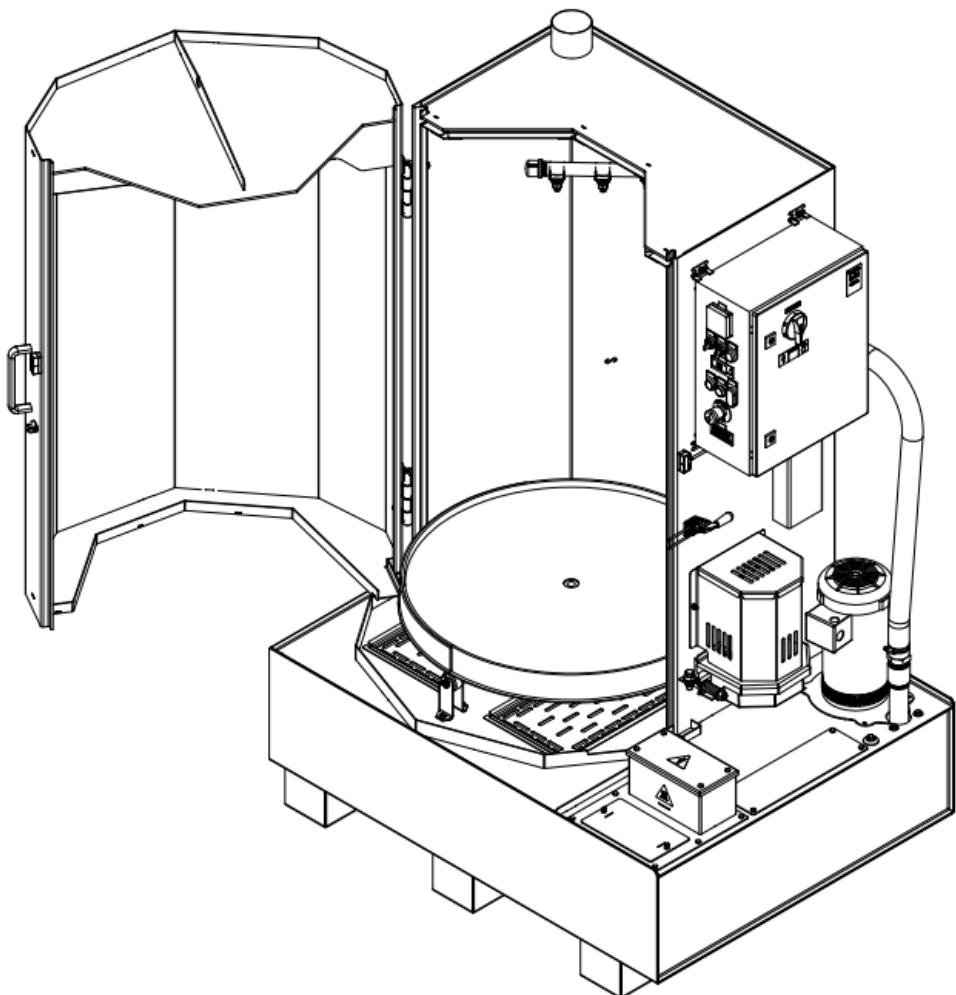


Graymills

Tempest Front-Load Spray Washer

Models **SWF3343**

Operations and Maintenance Instructions



Graymills Corporation
2601 S. 25th Ave., Broadview, IL 60155
www.graymills.com

SHIPPING INFO

Unpacking and Inspection

You should inspect your equipment for possible shipping damage.

Thoroughly check the equipment for any damage that might have occurred in transit, such as broken or loose wiring and components, loose hardware, and mounting screws, etc.

In the Event of Shipping Damage

According to the contract terms and conditions of the Carrier, the responsibility of the Shipper ends at the time and placement of shipment.

Notify the transportation company's local agent if you discover damage.

Hold the damaged goods and packing material for the examining agent's inspection. **Do not return any goods before the transportation company's inspection and authorization.**

File a claim with the transportation company. Substantiate the claim by referring to the agent's report. A certified copy of our invoice is available upon request. The original Bill of Lading is attached to our original invoice. If the shipment was prepaid, write us for a receipted transportation bill.

Advise customer service regarding your wish for assistance and obtain an RMA (return material authorization) number.

If the Shipment is Not Complete

Check the packing list as back-ordered items are noted on the packing list. You should have:

- Bill of lading
- Packing list
- User's Manual

Re-inspect the container and packing material to see if you missed any smaller items during unpacking.

If the Shipment is not Correct

If the shipment is not what you ordered, contact the parts and service department immediately. Have the order number and item number available. Hold the items until you receive shipping instructions.

Returns

Do not return any damaged or incorrect items until you receive shipping instructions from the customer service department.

INTRODUCTION

The Tempest SWF Front-Load spray wash cabinet offers hands-off cleaning that can be applied to simple and complex parts. It is designed for:

- Easy fixturing
- Frustration-free field service and repair
- Rapid cleanup between jobs.

Standard Features:

- Stainless steel sheet metal construction, including plumbing for machine longevity
- Easy-change nozzle saddles for quick cleaning
- Swing-down spray bar for better cleaning of shorter parts
- Digital temperature controls with real-time fluid temperature display
- Turntable jog button for parts-positioning
- Top-notch for overhead hoist loading and unloading of heavy parts
- 1/2" NPT in fitting in center of turntable for easy construction of parts tree
- Low liquid cutoff with stainless steel float switch to disable heaters and prevent damage to machine in a low liquid situation
- Removeable stainless chip/evaporation trays for easy access during tank cleanout
- 24/7 Heater and Skimmer controls for maximum efficiency (Skimmer optional)
- Digital cycle timer for precision process control
- No components on rear of machine so it can be placed against a wall
- 4" Vent collar on top of machine for ventilation
- Controls certified to UL508A

Optional Features:

- Oil Skimmer - A chemically-resistant 12" diameter skimming wheel to remove tramp oil from the top of the cleaning solution
- Auto Water Fill - Dual stainless steel float switches attached to a solenoid to maintain proper fluid levels
- Multiple filtration options to eliminate nozzle clogging and redepositing of debris on parts.
- Controls certified to CSA C22.2 #286

SAFETY WARNINGS / CAUTIONS

Read all the **SAFETY INSTRUCTIONS** on the machine and those in the manual **BEFORE** installing or using this equipment. Keep this manual handy for reference/training.

You will find various types of safety information on the following pages and on the labels attached to Graymills equipment. The following Safety Statements explain their meaning.

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid personal injury or death.
DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
CAUTION	CAUTION, without the safety alert symbol, is used to address practices not related to personal injury.

-  Read and understand the user manual and this label before operating this unit.
-  For indoor use only.
-  Do not operate above 150°F (65°C) fluid temperature; burns or scalding may result. Hot surfaces exist; allow heater and fluid to cool before repairing or cleaning.
-  To provide continued protection against risk of electrical shock, fire, and explosion, connect to properly grounded supply or outlets only.
-  Risk of explosion. This equipment has internal arcing and sparking parts, which shall not be exposed to flammable vapors. This equipment shall not be located in a recessed floor or below grade.
-  Use only non-flammable, non-combustible, water-based alkaline cleaning compounds with pH under 12.5 in this machine. Refer to user manual for a list of fluids which have been evaluated for use.
-  Do not contaminate cleaning solution with flammable fluids, even small amounts will create a hazardous condition.
Do not contaminate cleaning solution with combustible fluids, even small amounts may create a hazardous condition.
-  Hazardous voltage present. Disconnect power before repairing or cleaning.
-  Do not operate below minimum liquid level marking. Low liquid level may result in heater or motor failure, creating a potential fire hazard.
-  Operator shall wear appropriate PPE (personal protective equipment). Refer to cleaning fluid SDS (safety data sheet) for details. If any cleaning solutions are splashed on clothing, remove wet clothing promptly and thoroughly wash body areas that have been in contact with the solution. Do NOT permit saturated clothing to remain in contact with skin. Cleaning solutions may irritate skin and eyes. If splashed in eyes, flush thoroughly with water. Consult Safety Data Sheet (SDS) and a physician. Always wear appropriate safety items such as gloves, apron, safety glasses or goggles.
-  Floor may be slippery when wet, do not splash fluids out of tank.
-  Install unit on level surface. Do not overload the turntable. Load items evenly. Refer to user manual for weight load capacity specifications.
-  Never work with equipment you feel may be unsafe. Contact your supervisor immediately if you feel a piece of equipment is in an unsafe condition.

GENERAL DESCRIPTION

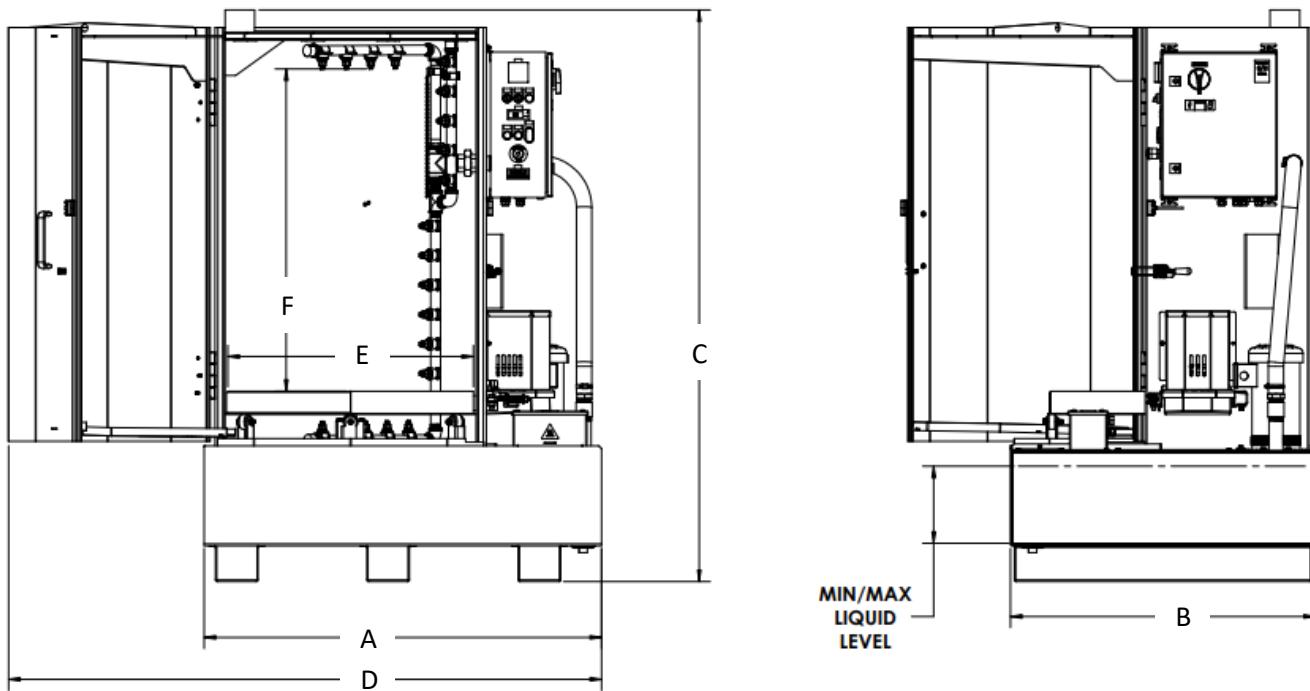
SPECIFICATIONS

The SWF parts cleaners operate at either 230V, 460V or 575V electrical supply. Models with “-B” suffix operate at 230VAC, 1Ph, 60 Hz, models with “-J” suffix operate at 230VAC, 3Ph, 60Hz, models with “-Y” suffix operate at 460VAC, 3Ph, 60 Hz, and models with “-Z” suffix operate at 575VAC, 3Ph, 60Hz electrical supply.

Graymills offers cleaning fluids for most of the cleaning problems found in plants and maintenance shops. Either of the following products work well in these parts cleaners.

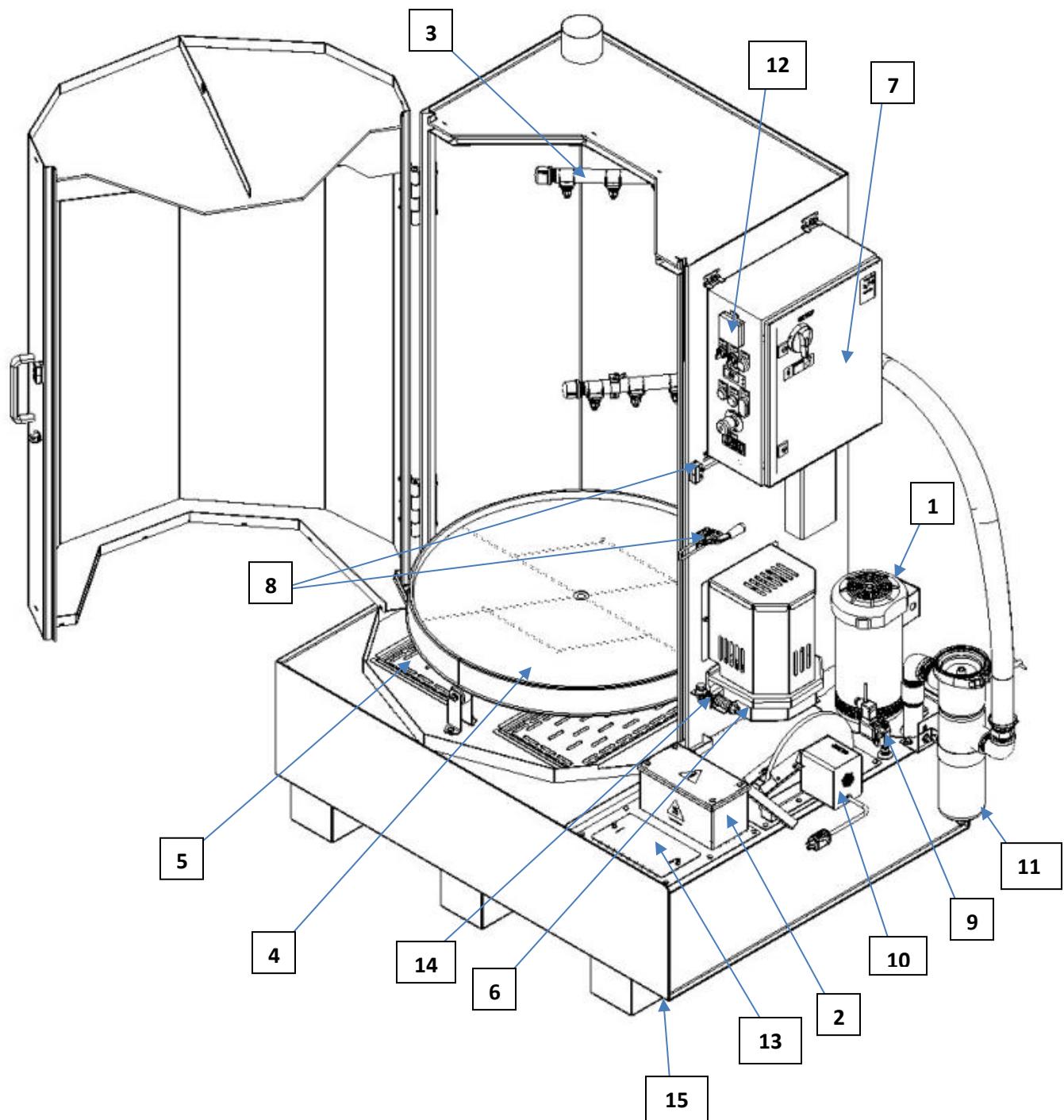
- Super Aquatene™ GM390 Concentrate is a heavy-duty, low foam water-based detergent specially formulated for cleaning ferrous metals. Contains a mild corrosion inhibitor.
- Aquatene™ 571 GM571 Powder, specially formulated for cleaning aluminum and non-ferrous metals.

GENERAL DIMENSIONS



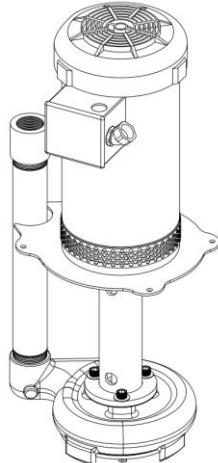
MODEL	A	B	C	D	E	F	MAX	MIN
SWF3343	54"	42"	78"	82"	33"	43"	90 GAL	60 GAL

FEATURES



Pump (Item # 1)

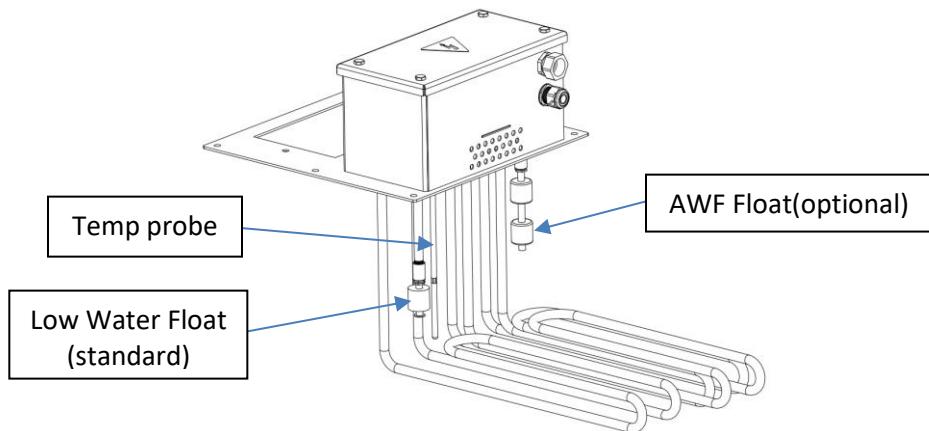
The parts washer is outfitted with a three horsepower, high speed centrifugal-style pump; a critical component responsible for generating the high-pressure and flow spray within the cabinet.



Heater Box (Item # 2)

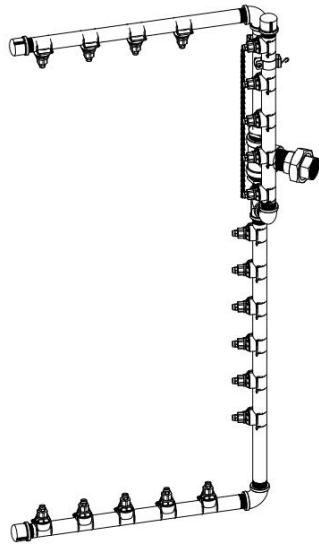
The heater box is a crucial component of the parts washer, housing three heating elements controlled by a digital thermostat in the control box.

- Heating Elements: 9kW of heat, allowing the machine to heat up at a rate of approximately 40°F per hour (at 90 gallons (full)).
- Low Liquid Float Switch: A float switch is integrated into the heater box to safeguard the machine. If the fluid level drops below a certain point the float switch automatically shuts off power to prevent damage and potential burnout.
- Automatic Water Fill (Optional): For machines equipped with Automatic Water Fill, a second double float is present within the heater box to maintain optimal fluid level for use with the oil skimmer.



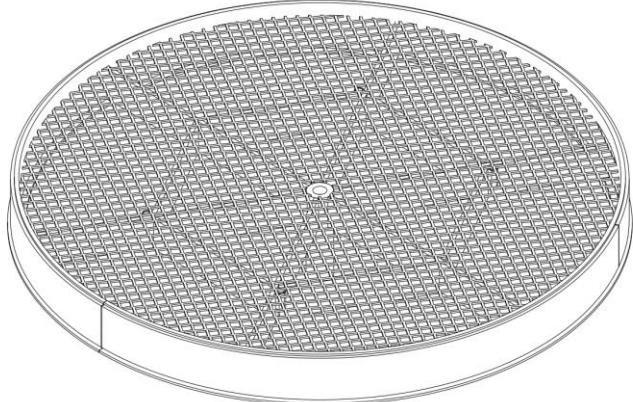
Spray Manifold (Item # 3)

The spray manifold serves as the distribution network for the cleaning fluid, directing it to all the removable saddles and nozzles responsible for cleaning the parts within the parts washer. It features an adjustable arm, typically positioned upright, which can be pivoted down and secured with its chain to accommodate shorter parts.



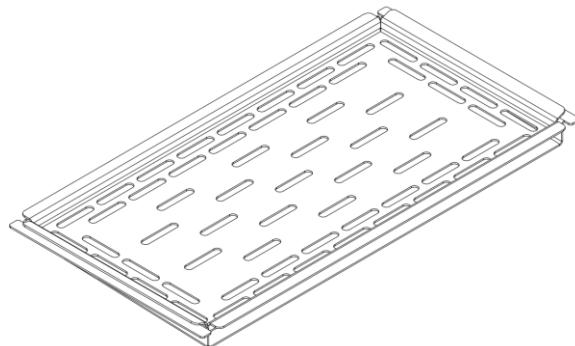
Turtable (Item # 4)

The turntable is the designated area where parts are positioned on an expanded metal grate for cleaning within the machine. It operates by rotating on three nylon rollers and is driven by a gear motor via a urethane coated drive wheel. The turntable can be easily removed to access the chip and drain trays beneath it, facilitating maintenance and cleaning operations. It is equipped with four 1/4-20 threaded hex couplings and a center 1/2 inch NPT female center hub for customer constructed fixturing.



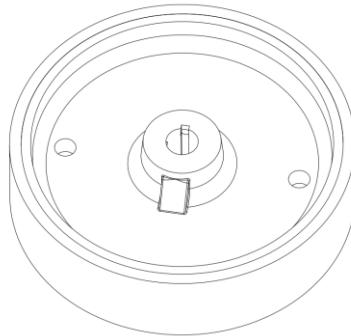
Chip and Drain trays (Item # 5)

Located beneath the turntable, the chip and drain trays play a critical role in maintaining the cleanliness and functionality of the machine. These trays serve as a barrier, minimizing evaporation and allowing fluid to drain back into the tank while effectively straining out large particulate matter. It is essential to periodically remove and clean these trays to prevent the accumulation of cleaning fluid in the bottom of the machine cabinet.



Drive Wheel (Item # 6)

The drive wheel, connected to the gear motor, plays a crucial role in rotating the turntable within the parts washer. It achieves rotation by engaging with the rough circumference of the turntable. If observed to be slipping, the tension against the turntable can be adjusted using the tensioner mechanism (see Item # 14). The tensioner spring should be compressed a minimum of $\frac{1}{2}$ ". It is essential to apply only sufficient tension to smoothly spin the turntable without slipping, as excessive tension can lead to premature failure of the rubber coating on the wheel. Never apply lubrication to the surface of the wheel.



Control Box (Item # 7)

The control box serves as the central hub for all operations within the parts washer.

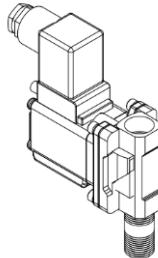
Door Latch and Safety Switch (Item # 8)

The machine is equipped with a magnetic safety interlock switch, an essential safety feature designed to prevent the pump from operating unless the cabinet door is securely closed and latched. Do not override the safety interlock switch or operate the unit if the safety interlock switch is not functional. When the door is open the only functions available are the oil skimmer and turntable jog.

Automatic Water Fill (Optional – Field Upgradable) (Item # 9)

If your machine is equipped with an Automatic Water Fill (AWF) system, it includes a solenoid valve located immediately in front of the pump. Connect to a fresh water source via the $\frac{1}{4}$ " NPT port. The AWF system is designed to maintain the fluid level within a 2" zone by utilizing the double float switch in the heater box assembly.

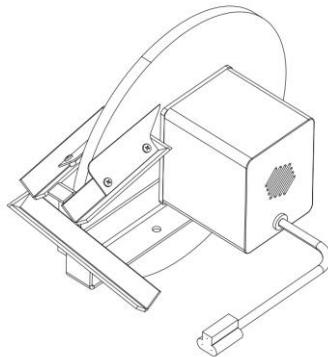
Whenever tank level drops below the low float, the blue AWF light on panel illuminates. The AWF solenoid energizes and fills until both the high and low float lift. Once satisfied the blue light goes OFF and fill solenoid de-energizes, shutting off inbound water.



Skimmer (Optional – Field Upgradable) (Item # 10)

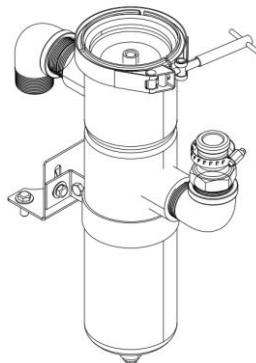
The Oil Skimmer is an optional feature designed to remove tramp oil from the wash fluid. It enhances the cleanliness and efficiency of the cleaning process by removing tramp oils. It is essential to ensure that the skimmer wheel is at least partially submerged at all times during operation.

The skimmer works best when the machine is not in use by using the channel 2 settings on the 24/7 timer.



Filter (Optional – Field Upgradable) (Item # 11)

If equipped, the filter serves the vital function of removing particulates from the cleaning fluid, preventing clogged nozzles and providing better cleaning. It utilizes a disposable 50 micron bag-style filter media that requires periodic checking and cleaning for optimal performance. Before performing any maintenance on the filter, it is crucial to power down the machine and let the fluid cool to a safe level.



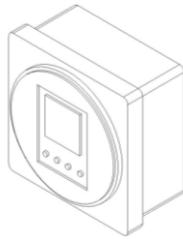
Changing element: Warning may be Hot!:

- 1) Power Down: Before accessing the filter, ensure that the machine is powered down to prevent any risk of injury or damage.
- 2) Accessing the Filter: Loosen the t-bolt on the filter cap collar sufficiently to unlatch the collar and access the filter housing cap.
- 3) Removing the Filter: Carefully remove the filter housing cap to access the bag-style filter media. Check the filter for any signs of clogging or damage.

- 4) Cleaning or Replacing the Filter: If the filter is dirty or damaged, replace the bag-style filter media.
- 5) Replacing the O-Ring: Before reassembling, ensure the large o-ring under the cap is properly seated. If the o-ring appears worn or damaged, replace it with a new one to prevent leaks.
- 6) Reassembly: Replace the filter housing cap and securely tighten the collar using the t-bolt.
- 7) Checking for Leakage: Once the machine is restarted, inspect the filter cap for any signs of leakage. If leakage is observed, further tighten the t-bolt until the leakage stops. If leaking persists, open canister and confirm o-ring condition and position.

24/7 Timer (Item # 12)

The heater and optional skimmer are automatically controlled by a 24/7 timer. It is a weekly 2-channel timer. The heater is set on channel 1 and the skimmer on channel 2. Ensure the dip switches OU1 and OUT2 are both set for TIMER (UP). See the machine's electrical schematic for programming details.



A complete manual is available online at:

https://assets.omron.eu/downloads/manual/en/h5s_instruction_manual_en.pdf

INSTALLATION

- The machine is intended for indoor use only.
- Do not place it outdoors or in environments where it may be exposed to varying weather conditions.
- Place the unit on a smooth, level surface to ensure stability during operation. Securely place the machine to prevent accidental tipping or movement during operation. Avoid placing it near edges or in areas prone to vibrations.
- Choose a well-ventilated area to prevent overheating and ensure proper air circulation around the machine.
- Maintain sufficient clearance around the machine to allow for proper airflow and ventilation.
- Select a location that provides adequate access to all sides of the cleaning system for maintenance purposes. Ensure easy access to essential components such as the heater, pump, and electrical box. This accessibility is necessary for routine maintenance, troubleshooting, and repairs.
- Ensure that the machine is installed near a power outlet compatible with its electrical requirements.
- If the machine is equipped with an Automatic Water Fill feature, it will require a water source. Ensure that a suitable water source is available nearby and that proper plumbing connections can be made.

CAUTION

When the machine is empty of fluid, it can be moved into location using a forklift or pallet jack.

Never attempt to move the machine with fluid in the tank as this can cause instability and potential damage to the equipment.

Do not lift the machine by the eyelet on top of the door! This eyelet is intended for assembly purposes only.

All electrical connections must conform to local, state, and federal regulations. Electrical work should be performed by qualified personnel to ensure safety and compliance with applicable standards.

Ensure the pump is rotating counterclockwise looking down on the fan end of the motor. Incorrect rotation will lead to performance issues.

MACHINE OPERATION

Adding fluid

- 1) Loosen the cover plate thumb screws and remove the cover plate.
- 2) To prevent foaming, fill the machine approximately half-way before adding detergent. Continue to fill until approximately 2 inches below the tank deck. Do not overfill.
- 3) Alternatively, fluid can be poured into the floor of the cabinet through chip trays if necessary.

Fluid can also be evacuated either via the 1.5" NPT floor drain or through the cover plate opening with an evacuation pump.

<https://www.graymills.com/evacc-service-pumps.html>

Loading parts

External surfaces of the machine may be hot. Wear gloves when interacting with the machine or handling recently cleaned parts to prevent burns.

- 1) Load parts onto the turntable, ensuring to distribute the weight as evenly as possible. This helps to maintain balance during the cleaning process and ensures thorough cleaning of all parts.
- 2) If necessary, set the movable spray bar to the desired position for effective cleaning. Make certain the provided chain is in position to prevent bar movement during operation.

Initiating cleaning cycle

Morning Start-up

- 1) Pull the E-stop pushbutton on the control panel. Temperature Control Display illuminates. Low Water RESET Pushbutton illuminates' amber.
- 2) Press Low Water RESET pushbutton. If the unit has an adequate level of cleaning solution in the tank, the cycle timer display will illuminate, and the amber light will go OFF. If the cleaning solution is not up to the set temperature and there is sufficient fluid in the tank, the heater will begin operating. Let tank fluid heat to setpoint.

Each Cleaning Cycle

- 1) Load parts. It is handy to rotate the turntable by pressing JOG during placement.
- 2) Close and securely latch door.
- 3) Set cycle timer to desired cleaning time.
- 4) Press Wash Cycle START button. The cycle timer display switches from OFF to displaying seconds and begins counting down. Pump starts and will run until Wash Cycle STOP is pressed or Cycle timer reaches 0.
- 5) Wait for steam to clear. Cycle timer display goes OFF indicating Washing is disabled. Unload parts.

MAINTENANCE

Daily

- Check the cleaning fluid level. Ensure that the float switch is functioning properly and that the heater elements are submerged below the fluid level. If necessary, add fluid to maintain the proper level. If the machine is equipped with an Automatic Water Fill valve, confirm that the water source valve is open to allow for automatic refilling.
- Inspect the turntable drive wheel for excessive wear. Ensure that the turntable spins without slipping. If needed, tighten the spring tensioner mechanism to maintain proper tension. If the urethane coating thickness is less than 1/8 inch at any point, replace the drive wheel to maintain optimal performance.
- Inspect all plumbing joints, hoses, and hose connections for leakage. Tighten or replace any components as necessary to prevent fluid leaks and maintain the integrity of the system.
- Inspect the chip and drain trays for any excessive debris. If cleaning fluid is pooling in the cabinet and not freely draining back into the tank, clean the chip and drain trays to ensure unobstructed drainage and prevent overflow issues.

Monthly



Shut the machine down and allow it to cool to a safe level before removing the heater box.

- Check the heater elements for scale buildup. To remove the heater box, simply remove the six bolts that secure it and lift it out of the tank. Take care not to damage the heater elements or float switches during this process. If scale buildup is present, gently scrub it away with a wire brush to ensure optimal heating efficiency.

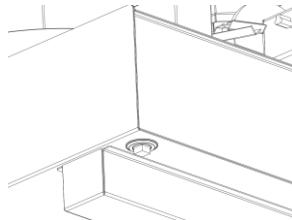
- Inspect all nozzle tips to ensure they are free of debris or buildup. If necessary, unclip, remove, and clear with a wire.
- Check the filter element replace it as necessary to ensure proper filtration and prevent loss of cleaning performance.

Semi-Annual

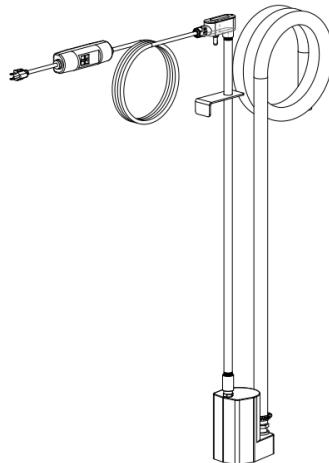


Shut the machine down and allow it to cool to a safe level before draining fluid.

- Graymills recommends that fluid be fully drained from the machine and replaced at least semi-annually to maintain optimal performance.
- Fluid can be drained via the drain plug located on the right front floor of the machine (Item # 15).



- Alternatively, fluid can be pumped out through the cover plate (Item # 13) via an evacuation pump.



- Always dispose of used cleaning fluid properly in accordance with the Safety Data Sheet (SDS), manufacturer's instructions, and local/state/federal regulations regarding hazardous waste disposal. Ensure that the disposal method chosen is compliant with all relevant regulations.

TROUBLESHOOTING

CONDITION	POSSIBLE CAUSE	CORRECTION
Pump doesn't run	Water level too low (PB1 will be lit)	Add fluid and press PB1
	Pump motor overload is tripped	Reset overload in control box
Low pressure at nozzles	Clogged nozzles	Clean nozzles
	Clogged filter	Replace filter element
Cycle Timer will not illuminate	Door not closed	Close and latch door
	Door Switch out of position or malfunctioning	Adjust or replace Door Switch
	Water level too low (PB1 will be lit)	Add fluid and press PB1
No/Insufficient Heat	Temperature setpoint too low	Raise setpoint on thermostat
	Water level too low (PB1 will be lit)	Add fluid and press PB1
	Heat elements scaled over	Clean element
	Heat elements burnt out	Replace element
Turntable doesn't spin	Spring tension too low	Adjust tension
	Worn Drive Wheel	Replace Wheel
	Overload tripped	Reset overload in control box

REPLACEMENT PARTS

DESCRIPTION	PART NUMBER
Drive Wheel (3/4" ID)	597-46133
Magnetic Safety Switch	770-95098
Nozzle Tip (3 GPM)	739-95109
Nozzle Saddle (1/4" NPT)	739-95133
Turntable Roller	574-46039
Turntable Center Block	597-46021
Pump Impeller kit	401-35373
Door Latch	769-95015
Low-Level Float Switch	770-93918-81
Heater	780-95004 (230V 1ph)
	780-95125 (460V 3ph)
	780-95126 (575V 3ph)
Temperature Sensor RTD	770-93899-81
AWF Solenoid Valve (optional)	738-93579
Filter Media Bag 50-Micron (optional)	742-93368-50
Dual Low-Level Float Switch (optional)	770-95128-81

WARRANTY INFORMATION

Graymills Corporation warrants that the equipment manufactured and delivered, when properly installed and maintained, shall be free from defects in workmanship and will function as quoted in the published specification. Graymills does not warrant process performance, nor assume any liability for equipment selection, adaptation, or installation.

Warranty does not apply to damages or defects caused by shipping, operator carelessness, misuse, improper application or installation, abnormal use, use of add-on-parts or equipment which damages or impairs the proper function of the unit, and modifications made to the unit. Warranty does not apply to expendable parts needing replacement periodically due to normal wear and tear.

A new Warranty period shall not be established for repaired or replaced materials or products. Such items shall remain under Warranty for only the remainder of the Warranty period of the original material or product.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, WHETHER ORAL, WRITTEN, EXPRESSED, IMPLIED OR STATUTORY. GRAYMILLS CORPORATION MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE AFORESTATED OBLIGATION ARE HEREBY DISCLAIMED BY GRAYMILLS CORPORATION AND EXCLUDED FROM THIS SALE. Graymills warranty obligations and Buyer remedies (except to title), are solely and exclusively stated herein. In no case will Graymills be liable for consequential damages, loss of production, or any other loss incurred due to interruption of service.

Graymills' obligation under this Warranty shall be limited to:

1. Repairing or replacing (at Graymills sole discretion) any non-conforming or defective component within one year from the date of shipment from Graymills.
2. Repairing or replacing (at Graymills sole discretion), components supplied by, but not manufactured by Graymills, to the extent of the warranty given by the original manufacturer.
3. This warranty does not cover rusting of a mild-steel parts cleaner used with aqueous (water-based) materials. Buyer must give Graymills prompt notice of any defect or failure.

Buyer must give Graymills prompt notice of any defect or failure.

If you believe you have a Warranty claim, contact Graymills at (773) 477-4100. Any return material must have an RMA number on the outside of the package and shipping prepaid or shipment will be refused. Graymills will promptly examine the material and determine if it is defective and within the Warranty period.