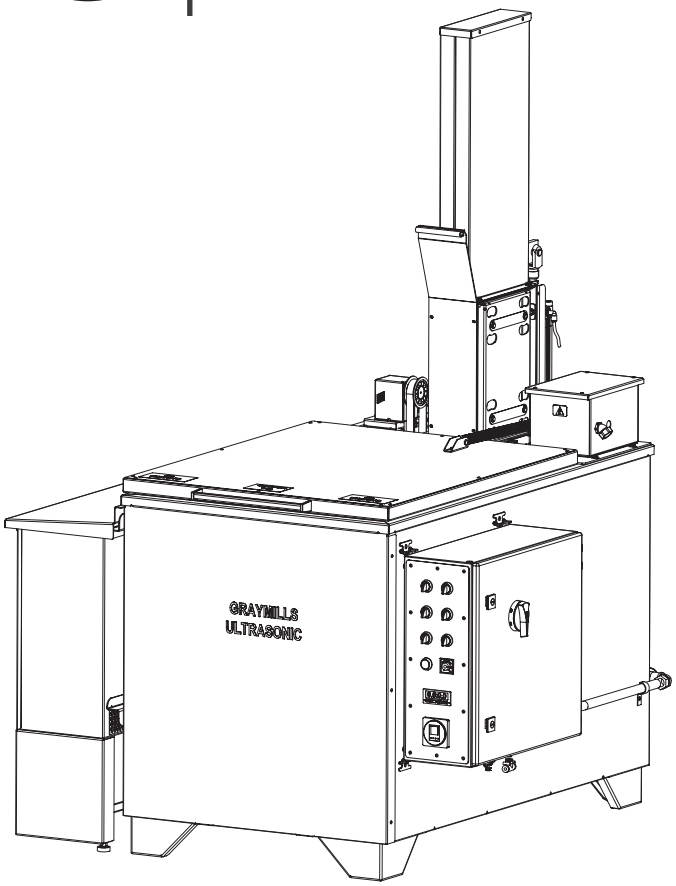
Graymills
PARTS WASHERS



Operation and Maintenance Instructions

For units manufactured after January 2015

TUSR24/36 SERIES LIFTKLEEN®

ULTRASONIC HEATED/AQUEOUS PARTS WASHER

Read all of the SAFETY INSTRUCTIONS in this manual BEFORE installing or using this equipment. Keep this manual handy for reference/training.

PRINCIPLES OF ULTRASONIC CLEANING

Ultrasonics is defined as a mechanical vibration above the range of human hearing (i.e., above 18,000 Hz.). Ultrasonic cleaning refers to the use of ultrasonic energy to assist in the cleaning of soiled objects while they are immersed in a cleaning fluid. Typical frequencies used in ultrasonic cleaning are 20kHz, 25 kHz, 40 kHz, and 80 kHz.

Every ultrasonic cleaning system consists of three basic components:

- An **Ultrasonic Generator** that converts 50 or 60 Hz electric power form the electric utility supply to a high frequency electric signal in the ultrasonic range.
- **Ultrasonic Transducers** to convert the ultrasonic electrical signal into mechanical vibrations.
- A **Tank** with the ultrasonic transducers bonded to its exterior and that contains the cleaning fluid and work pieces.

The tank is filled with a fluid suitable for the cleaning application. When the ultrasonic generator is activated, the transducers begin to vibrate at their natural frequency and couple the ultrasonic energy into the cleaning fluid. If sufficient energy is produced, the fluid molecules are pulled apart, creating microscopic “voids” or bubbles. This phenomenon is called cavitation. These cavitation bubbles increase and shrink in size in step with the ultrasonic frequency. Above a certain energy threshold, the bubbles will grow to an unstable size and then suddenly collapse, releasing a tremendous amount of energy into the fluid. If a soiled work piece is immersed in the fluid, the cavitation bubbles will tend to collapse on the surfaces of the parts. This creates a scrubbing action that literally “blasts” away the contaminants from the parts.

SAFETY WARNINGS

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 possible injury or death.

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

CAUTION, used without the safety alert symbol, is used to address practices not related to personal injury.

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.

SITE PREPARATION

Before installing the TUSR unit, careful consideration should be given to the place of operation. Place unit on a smooth, level surface.

CAUTION

The work area should be well ventilated.

Provide adequate lighting in the work area to allow observation of the cleaning process and the floor area around the machine.

Be sure to allow adequate room to bring work to and from the machine. Provide sufficient clearance around the machine for fluid changeovers and servicing.

SAFETY INSTRUCTIONS

NOTE: The instructions provided in this Operation Manual are for a typical usage of aqueous fluids in an ultrasonic washer. If your cleaning application differs from this norm, please contact the factory (773-248-6825) for compatibility and other recommendations.

Chemical Hazards

WARNING

- **USE ONLY NONFLAMMABLE, NON-COMBUSTIBLE, WATER-BASED ALKALINE CLEANING COMPOUNDS.**
- **If you have any questions regarding the correct fluids to use in this unit, call Graymills at (773) 248-6825 and ask for Customer Service. Graymills recommends our Aquatene® line of cleaning fluid. See page 11 for complete list.**
- **DO NOT CONTAMINATE CLEANING COMPOUNDS WITH ANY FLAMMABLE MATERIALS (MATERIALS WITH LESS THAN 104°F FLASH POINT), SUCH AS GASOLINE, ALCOHOL, ETC. DRAIN PARTS TO BE CLEANED OF ANY FLAMMABLE MATERIAL BEFORE PLACING INSIDE CLEANING TANK. EVEN SMALL QUANTITIES CAN CREATE A DANGEROUS FIRE HAZARD.**
- **Follow all directions, Warnings, Cautions and Dangers for the cleaning fluid being used.**
- **MAXIMUM OPERATING TEMPERATURE IS 160°F. HIGHER TEMPERATURES WILL CAUSE INCREASED RISK OF PERSONAL INJURY AND MAY DAMAGE THE UNIT. TEMPERATURE ABOVE 115°F CAN CAUSE SEVERE BURNS. EQUIPMENT ITSELF WILL BE HOT. USE CAUTION.**

WARNING

If any cleaning solutions are splashed on clothing, remove wet clothing promptly. Do NOT permit saturated clothing to remain in contact with skin. Consult the solution manufacturer's Material Safety Data Sheet (SDS) and a physician for appropriate actions to take.

Cleaning solutions may irritate skin and eyes. Consult Material Safety Data Sheet (SDS) and a physician if splashed in eyes.

Always wear appropriate personal protective equipment such as gloves, apron, safety glasses or goggles.

If you have any questions regarding the recommended fluids to use in this unit, call Graymills at (773) 248-6825 and ask for Customer Service.

Electrical Hazards

WARNING

Before performing any maintenance, be sure to disconnect all electrical power going to unit.

Unit must be properly grounded to prevent electric shock hazard.

Since operator safety at all times is a priority, we strongly recommend that—whether or not required by local code—single phase units be connected only into a power supply equipped with a "Ground Fault Interrupter" (GFI).

All electrical connections should conform to national/local codes and be made by qualified personnel.

Should cord become cracked, frayed, or damaged in any way, it should be repaired/replaced immediately by a qualified electrician.

⚠CAUTION

Inspect all electrical cords and plugs each time unit is cleaned. Check heater and pump (option) and for wear or corrosion. Do NOT use if any wear or damage is noticed until impaired components are repaired or replaced.

Fill tank to recommended operating capacity range before connecting electricity. See the marking on the heater guard for maximum fill level.

Personal Hazards

⚠WARNING

If any cleaning solutions are splashed on clothing, remove wet clothing promptly. Do NOT permit saturated clothing to remain in contact with skin. Consult the solution manufacturer's Material Safety Data Sheet (SDS) and a physician for appropriate actions to take.

Cleaning solutions may irritate skin and eyes. Consult Material Safety Data Sheet (SDS) and a physician if splashed in eyes.

Always wear appropriate personal protective equipment such as gloves, apron, safety glasses or goggles.

If you have any questions regarding the recommended fluids to use in this unit, call Graymills at (773) 248-6825 and ask for Customer Service.

⚠WARNING

This unit has moving parts, pinch-points and close tolerances. Always stand clear of lift platform and lid when operating as the lid could unexpectedly open or the lift platform could be activated. Keep hands and fingers away from tank when operating platform.

⚠WARNING

To prevent injury, keep hands and body clear of the lid, lift platform and lift mechanism at all times.

⚠CAUTION

Do not use lid for storing tools or supplies as you install the machine.

When turning air on, off, or operating the lift platform, stay clear of the lid, the lift platform and operating mechanism. The lid could unexpectedly open or the lift platform could begin to operate during set up and testing.

Never operate unit without safety shroud (page 11, Figure 1, 1B) fully in place.

See Safety Procedure for CONNECTING AIR SUPPLY, page 4.

INSTALLATION

⚠WARNING

Have the required electrical service installed by a qualified electrician in compliance with all electrical codes.

Consult the name plate on the machine for the electrical service requirements.

ASSEMBLE TOWER SHROUD

The Tower Shroud has been packed inside the unit tank for shipping safety. When your unit has been positioned in its operating location, unpack the shroud, taking off wrapping materials.

1. Unscrew the 4 screws that are loosely in place on the roller assembly. Position the shroud in its proper location (see page 10, Figure 1, 1B). Reattach the screws. Tighten 4 lock washers, flat washers and screws using a 7/16 wrench.

CONNECTING TO POWER SOURCE

⚠WARNING

Unit must be properly grounded to prevent electric shock hazard.

All electrical connections should conform to national/local codes and be made by qualified personnel.

No external wiring is supplied on TUSR units. Electrical connections need to be made by a qualified electrician.

Since operator safety at all times is a priority, we strongly recommend that—whether or not required by local code—single phase units be connected only into a power supply equipped with a "Ground Fault Interrupter" (GFI).

Should an electrical cord become cracked, frayed, or damaged in any way, it should be repaired/replaced immediately by a qualified electrician.

FILLING THE TANK

⚠DANGER

ONLY NON-FLAMMABLE, WATER-BASED CLEANING COMPOUNDS CAN BE USED IN HEATED TANKS. DO NOT USE ANY FLAMMABLE, COMBUSTIBLE SOLVENTS, OR PETROLEUM-BASED PRODUCTS.

DO NOT CONTAMINATE CLEANING COMPOUNDS WITH ANY FLAMMABLE MATERIALS (MATERIALS WITH LESS THAN 104°F FLASH POINT), SUCH AS GASOLINE, ALCOHOL, ETC. DRAIN PARTS TO BE CLEANED OF ANY FLAMMABLE MATERIAL BEFORE PLACING INSIDE CLEANING TANK. EVEN SMALL QUANTITIES CAN CREATE A DANGEROUS FIRE HAZARD.

2. Fill the cleaning tank with the proper cleaning fluid. Follow the fluid manufacturer's recommendation when diluting the cleaning fluid with water. Make sure to leave approximately 6" of freeboard between the fluid surface and the top of the tank to prevent splashing. **FILL APPROXIMATELY TO THE MARKING ON THE HEATER GUARD FOR MAXIMUM FILL LEVEL.**

CAUTION

Always start with the lowest concentration of cleaning fluid. Additional concentrate can be added during operation to achieve the required cleaning performance.

Always test a cleaning fluid with a sample part before cleaning a large workload.

APPLYING POWER

CAUTION

DO NOT RUN THIS UNIT WITHOUT FLUID IN TANK. RUNNING WITHOUT FLUID WILL IRREPARABLY DAMAGE THE ULTRASONIC GENERATORS.

3. Turn on the ROTARY DISCONNECT (Figure 2, 2F).
4. Using the TEMPERATURE CONTROLLER on the main control panel (2i), set the desired fluid temperature. Refer to the PREPARING FOR OPERATION section.
5. Remove the cover on the Generator Housing (Figure 1, 1A). At the rear, connect the power cables of the ultrasonic generator modules to the receptacles inside the Housing.
6. On the front of the generator modules, turn the POWER and FREQUENCY SWEEP controls to the maximum (fully clockwise) position.
7. Replace cover.

CONNECTING AIR SUPPLY

See Figures on page 10.

Provide the required compressed air supply to the installation site. Although the TUSR is equipped with a 1/4" air connection, it is recommended that a 3/8" to 1/2" supply be provided, depending upon the length of the supply line.

To insure smooth operation of the pneumatic lift, a filter-regulator is included in the air supply line. The TUSR lift mechanism requires an air supply pressure of 80 psig minimum and 100 psig maximum for proper operation (do NOT exceed 100 psig).

⚠CAUTION

While connecting the air supply (Figure 3) to the quick disconnect fitting (3A) on the rear of the lift column, make sure that the sleeve valve (3B) is pulled toward the quick disconnect fitting, thus disconnecting air from the lift mechanism. This will prevent sudden movement of the lift platform and sudden opening of the lid while the air is being connected.

1. After the air supply is connected, slowly slide the blue sleeve valve up toward the machine to turn on the air supply. (Follow Safety Procedure by keeping clear of lid and operating mechanisms.)

NOTE: Lift capacity is proportional to air supply pressure. Specified lift capacity is with 90 psig air inlet pressure. Example: Air inlet supply pressure of 70 psig will reduce lift capacity by 22%.

Turning On and Testing the Air Supply

2. Turn on the MAIN POWER switch (Figure 2,2A).
3. Hold the PLATFORM selector switch (2B) in UP position. The platform should rise and remain in the raised position.
4. Turn on the ultrasonic selector switch (2C).
5. Using the CYCLE TIMER dial (2J), turn it to clockwise to the 3.5 setting (approximately), which corresponds to about a 20 minute cycle. Using the Platform UP/DOWN selector switch (2B), briefly switch to the DOWN position. The platform will go down into the tank, the lid will close and the platform will agitate. The ultrasonics will turn on and the cycle will begin. During this time you will notice a change in the pitch and volume of the sound of the unit that indicates de-gassing is taking place. At the end of the cycle the ultrasonics will turn off and the platform will rise. **Run this cycle to de-gas the fluid**.

ADJUSTING PLATFORM PERFORMANCE

See Figure 4, page 10.

⚠WARNING

To prevent injury, keep hands and body clear of the lid, lift platform and lift mechanism at all times.

Units are preset to run smoothly and at optimal speed for a parts load of 45 pounds. If your parts are of similar weight, no adjustment is necessary. If your parts vary from this (either significantly less or more), you will need to make adjustments.

To adjust the lift platform speed:

⚠WARNING

This unit has moving parts, pinch-points and close tolerances. Always stand clear of lift platform and lid when operating as the lid could unexpectedly open or the lift platform operate. Keep hands and fingers away from tank when operating lift platform.

⚠CAUTION

Speed adjustments could make lid open and close rapidly. Make small adjustments, and be aware of potential sudden actions.

CAUTION

The platform agitation speed in an ultrasonic unit must be set to no more than 6 strokes per minute. Excessive platform agitation speed will prevent the ultrasonics from operating properly and will result in decreased cleaning performance.

1. Find two independent speed control muffler screws (Figure 4, 4A) under the gray control box (1E in Figure1, page 11). These are used to control the vertical speed of the lift platform. The "UP" and "DOWN" speeds of the platform should be equal when the platform holds the intended workload. To prevent the lid from slamming upon opening, adjust control muffler screws (4A) down to an appropriate speed.
2. First loosen the jam nut (4B) on the "UP" or "DOWN" speed control, as applicable.
3. Adjust the speed control muffler screw in half-turn adjustments with a thin bladed screwdriver. Screw the control out to increase platform speed and in to reduce speed. Retighten the jam nut after speed control adjustment has been made.
4. Using the platform UP and DOWN selector switch, raise and lower the work platform.

PREPARING FOR OPERATION

1. Set the 24/7 Heater Timer to allow heater power to be supplied. See page 8 for instructions. Press the "Low Liquid" push button. The amber light should turn off. If it does not, check the fluid level and add fluid if it is low. Turn the illuminated "HEATER" selector switch (2D) to the ON position. The red light should illuminate the fluid should begin heating.

CAUTION

Failure to keep coil immersed can cause heater to burn out.

2. The tank should be filled to approximately 6" below the rim. Follow all label directions for cleaning solution. Watch for splashing. **See the marking on the heater guard for maximum fill level.**
3. Select desired fluid temperature by setting the TEMPERATURE CONTROLLER on the heater control panel (Figure 2, 2I).

   Complete heat-up times vary with fluid amount and operating temperature required. For consistent fluid temperature throughout tank, oscillate platform while heating.

NOTE

In order to keep amp draw low, heater and ultrasonics will not run at the same time.

⚠WARNING

NEVER ATTEMPT TO ADJUST THERMOSTAT HIGHER THAN FACTORY SET MAXIMUM (160°F), AS A DANGEROUS SITUATION WILL BE CREATED.

CAUTION

Unit comes set at 140°F from the factory. The proper cleaning temperature will be in the range from 115°F to 160°F. Always use the lowest cleaning temperature that will produce the desired cleaning performance.

4. If pump option was purchased, turn on (Figure 2, 2H)
5. Follow instructions under OPERATION.

OPERATION

See Figure 2 on page 10 for control locations and functions.

Follow all Safety Procedures and Warnings/Cautions listed below and in previous sections.

⚠DANGER

A flammable or combustible solvent must never be used in a heated parts cleaner. Use only water-based cleaners. Drain parts which may have flammable or unsafe fluids in them.

⚠CAUTION

Operating the heaters or ultrasonics with a dry tank or insufficient fluid level will permanently damage the heaters or the ultrasonic transducers.

1. All power to unit should be ON, started per previous instructions in this manual.
2. Set the CYCLE TIMER for the desired cycle time. Refer to instructions, page 7.

⚠CAUTION

Keep clear of lift platform. To prevent injury, be sure that everyone is away from lid and platform before starting.

Larger parts may be loaded directly on the lift platform. Use appropriate techniques for loading or lifting heavy parts.

3. Turn UP/DOWN Platform switch (2B) to "UP" to raise the lift platform to the uppermost position and open the lid.

CAUTION

Do NOT exceed weight limit (TUSR24: 150lb, TUSR36: 200lb). Make sure that parts do not extend beyond height of curved lift bar.

4. Load the parts to be cleaned in a parts basket or directly on the work platform. Arrange parts to allow free fluid flow to all areas of the work. Make sure that concave or hollow parts can fill and drain completely when lowered into or raised from the cleaning fluid.

NOTE

Units are preset to run smoothly and at optimal speed for a parts load of 45 pounds. If your parts are of similar weight, no adjustment is necessary. If your parts vary from this (either significantly less or more), you will need to make adjustments.

NOTE

Ultrasonics can only reach where the cleaning fluid reaches.

5. Turn and release the lift platform UP/DOWN selector switch (2B) to DOWN position. Keep clear. The timer will start, the lift platform will lower into the tank, lid will close, and the platform will begin agitating up and down with an approximately 3" stroke. For a time-controlled soak, lift platform may be held stationary at lower position by rotating and holding the selector switch (2B) in the down position for several seconds.

CAUTION

Running ultrasonic transducers adds heat to the fluid. Always monitor temperature of the fluid using the TEMPERATURE CONTROLLER (2i). Should fluid become too warm, raise platform, turn off ultrasonic transducers and allow cleaning fluid to cool.

Unit is equipped with a Low Liquid Level sensor. If it should fail, **liquid could evaporate enough to damage heater coil.**

6. At the end of the pre-set cycle time the ultrasonics will shut off. The platform will rise to the top and the lid will open.
7. Allow fluid on cleaned parts to drain back into the tank before removing from the platform.

⚠CAUTION

Clean up fluid spills immediately. Aqueous cleaning fluids may create a slippery surface.

NOTE: Because of the wide range of applications, the required cleaning time usually will be determined by experience under actual use conditions. See TIPS AND GUIDELINES, page 9, for additional information.

CAUTION

Turn heater off if unit is to be idle for extended periods (overnight or weekends).

WHEN MACHINE NOT IN USE

When the unit is not in use, it is recommended that the lift platform be sent to the lower position and lid closed (this will reduce fluid evaporation). In order to maintain this position indefinitely, rotate and hold the Platform selector switch (page 11, Figure 2,2B) down until the platform is at its lowermost position. Turn off the MAIN POWER (2A) briefly, and turn back ON. This will keep the platform down, and will allow the

24/7 Heater Timer to follow its settings and turn heater on as programmed.

NOTE
Turning off the MAIN POWER will not disrupt the settings of the 24/7 Heater Timer or Temperature Controller.

MAINTENANCE

⚠WARNING

This machine utilizes dangerous high voltage to operate the ultrasonic transducers. Only qualified trained personnel should attempt any repairs or servicing of the ultrasonic components. Disconnect all power before servicing the ultrasonic generators or tank heaters.

If in doubt about any servicing procedures, contact Graymills' customer service department at 773-248-6825.

⚠WARNING

Before performing any repairs or internal maintenance on this machine, disconnect the electrical power supply and the compressed air supply going to the unit. Review "Connecting Air Supply." Follow all lock-out procedures (see instructions at left). Be sure liquid is cool.

Lock Out Procedures

1. When performing any maintenance tasks on the TUSR, be sure that the master on/off air line valve is in the "OFF" position.
2. Disconnect the main air supply to the rack and/or lid cylinders to remove residual air pressure.
3. Turn electric power to machine "OFF" at rotary disconnect (1F).
4. Unplug and/or disconnect all power to the machine.

Daily Checklist

- Check the fluid level in the tank. Maintain the fluid level at about 6" below the tank rim.
- Listen for any air leaks. Loosing air from system may cause unit to operate at less than optimal levels.
- Check around the machine for fluid leaks. Repair any fluid leaks immediately.
- Inspect all electrical cords and plugs. Replace worn or frayed cables or damaged plugs immediately.
- Do not allow the TUSR Sonic Liftkleen to sit on a wet surface. Wipe or mop up spilled liquids and cleaning fluid.
- Remove any parts that may have dropped into the tank.
- Remove any floating oil from the cleaning fluid daily.

Weekly Checklist

- Check the air hose and connector for damage or wear. Replace damaged air hose or fitting immediately.
- Inspect the drain valve and fittings for leaks. Repair any leaks immediately. Replace the drain valve if necessary.
- Check the lift mechanism for smooth operation. For problems with the lift mechanism, refer to the TROUBLESHOOTING Section, page 9.
- After ensuring that heaters are cool, lift out heater module and inspect heating element. Any foreign materials should be removed by gentle scrubbing with a wire bristle brush or equivalent.

CAUTION

Neglecting the cleaning of the heating element will cause premature failure.

Do NOT allow oil or sludge to bake onto the heater element, as premature heater burnout will result. Warranty is voided if this occurs.

- Clean tank weekly or as necessary to remove accumulated debris from sides and bottom. Timing will depend on amount of use and soil accumulation. See CLEANING TANK section.
- Wipe the tank cabinet with a damp (NOT WET) cloth to remove accumulated detergent residues and soils. Detergent residue may produce permanent stains on the metal surfaces.

As Necessary

- To prevent damage to painted surfaces, wipe up any cleaning fluid spills immediately.
- When the cleaning action of the detergent solution diminishes, drain the tank and recharge with fresh fluid. See FLUID CHANGEOVER section.
- Lubricate roller wheels as necessary. Check at least once a month.

FLUID CHANGEOVER

⚠CAUTION

Operating the heaters or ultrasonics with a dry tank or insufficient fluid level will permanently damage the heaters or the ultrasonic transducers.

⚠CAUTION

Be sure to disconnect power and allow the fluid to cool before draining the fluid.

⚠CAUTION

Always dispose of used cleaning fluid properly. Refer to the cleaning chemical manufacturer's package label for instructions. Follow all local codes and regulations.

1. Drain cleaning fluid from tank. Dispose of responsibly, according to local environmental regulations.
2. Remove debris from bottom of tank.
3. Refill with new cleaning fluid. The tank should be filled to approximately 6" below the rim. Follow all label directions. Watch for splashing.

CLEANING TANK

⚠CAUTION

Be sure to disconnect power and allow the fluid to cool before draining the fluid.

The cleaning tank should be cleaned periodically to remove the accumulated debris from the sides and bottom. This should be done at least weekly, or more often if soil accumulation is high.

1. Place the POWER, HEATER and ULTRASONICS switches in the "OFF" position.
2. Turn the rotary disconnect to (1F) "OFF."
3. Drain cleaning fluid from tank. Dispose of responsibly, according to local environmental regulations.

4. Using a stiff brush or sponge, wash out the tank interior using a mild detergent solution. Rinse thoroughly and repeat as needed.
5. Refill with new cleaning fluid. The tank should be filled to approximately 6" below the rim. Follow all cleaning fluid label directions. Watch for splashing.
6. Turn rotary disconnect switch to ON and resume parts cleaning operations.

REPLACING ROLLER WHEELS

⚠CAUTION

Always follow lock-out procedures during maintenance and replace safety shroud before operation.

1. Remove clips (5D) from one side of housing on all four shafts.
2. Remove the "Factory Set Plates". These plates are required to be reinstalled to assist in keeping the proper tension against the vertical shaft and rollers.
3. Release pressure on back rollers (5A) by loosening 3/8-16 jam nuts (5F) locking 3/8-16 bolts (5E) pushing against back roller shafts.
4. Once nuts are loose, back out the 3/8-16 bolts about 1/4 to 1/2" to relieve pressure off rollers.
5. Remove the Roller Cover by removing 4 screws.
6. Push shaft out through housing and roller spacers (5B) and V-Groove rollers (5A).
7. Inspect roller bearing, grease rollers at this time. Graymills rcommends the use of a marine grade grease for this application.
8. Damaged bearings or rollers should be replaced.
9. Inspect vertical shaft for wear; damaged vertical shaft should be replaced.
10. Replace with new parts and reassemble.

CYCLE TIMER INSTRUCTIONS

NOTE:

Operator must set the Cycle Timer for each use of the TUSR.

1. Set TIMER (Figure 2, 2J, page 11) to desired cleaning cycle duration by adjusting the front dial. The markings on the front of the TIMER control unit correspond to tenths of the duration displayed in the upper window: 10 is the full duration, 5 is half duration, 1 is 1/10th, and so on. Timer is factory set with 10 = one hour.

⚠CAUTION

Never leave or store anything on top of the lid as it will automatically raise at the end of the time cycle causing anything left on top of the lid to spill or fall to the ground.

The lid will open automatically without user interaction. Keep clear of the lid while the automatic cleaning cycle is in progress.

2. For a time-controlled soak, lift platform may be held stationary at lower position by holding the Platform UP/DOWN switch (2B) in the down position until the lift platform has completely descended and stopped moving.
3. The CYCLE TIMER's LED indicator provides cycle progress indication. Off before timing, the LED blinks at an increasing rate as the cycle progresses; once every 3.5 seconds during the first 10% of the cycle, twice during the second 10%, and so on. When cycle is nearly complete, the LED will flash continuously until the cycle is completed. When the timer duration has finished, the lid will open and lift platform will rise to the load/unload position.

To Override Timed Cycle

A cycle can be manually overridden by selecting the platform switch(2B) and holding "UP" for several seconds. The lid will open and the lift platform will rise to the load/unload position.

This does not end the timer duration (timer is still counting).

If the timer ends while the lift platform is up, no change will result. However, sending the lift platform down to resume cleaning will not establish a new timer cycle if the previous one is still in effect. The lid will open and lift platform will rise as prescribed by the original timer cycle.

To establish a new timer cycle, send the lift platform UP to the load/unload position and turn the MAIN POWER switch (2A) off and back on. Upon turning the selector switch (2B) to "DOWN," a new timer cycle will start.

Adjusting Timer Units

⚠WARNING

Before performing any maintenance, be sure to disconnect all electrical power going to unit.

The duration units displayed in the upper window of CYCLE TIMER control can be adjusted to any one of six intervals: 1 or 10 seconds, 1 or 10 minutes, 1 or 10 hours. This unit adjustment allows you to set the timer for long or short operational ranges.

Timer is factory set at 10 = 1 hour, 1 = 6 minutes.

To make adjustment, open the junction box with the controls, take off the relay that is attached to it, release the bracket holding the timer in place. Slide out timer, adjust the duration using the adjustment screw on the top of the timer control unit. Using a Phillips screwdriver, turn the adjustment screw until the desired measure is displayed in the window of the control unit.

Reverse the process to reassemble the timer.

Restore power to unit. Note that 24/7 Timer will need to be reset with correct time, day, and programs.

24/7 HEATER TIMER

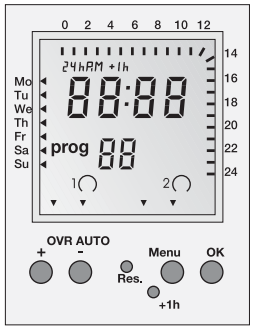
⚠CAUTION

The connection and installation of electrical devices may only be carried out by a qualified electrician.

Switch-off commands have priority over switch-on commands.

The user can define individualized programming or use the pre-set programs.

BUTTONS AND FUNCTIONS



+/- : Up or down adjustment keys. By pressing the button longer than 2 seconds you can adjust the timer in steps of 5 units

OVR AUTO: The "-" key is also the Override/Auto key

Res. : Reset. For initial setup of timer, 24 hour selection, time, day. This is a recessed switch; use a pin or other small tool to access.

Menu: To scroll programs and terminate settings.

OK: To set selection or move through programming.

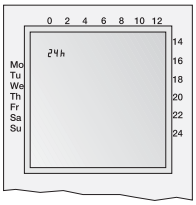
+1h: Recessed switch. Use to quickly reset time for Daylight or Standard time changes. 1 push adds an hour; 2 deletes and hour from the current time.

First Time Set-Up

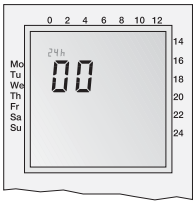
Set the following values to current/actual. This is for initial set-up or if electricity to unit has been disconnected:

- 24h or am/pm
- Time (hour and minutes)
- Week day:
- Pre-set programs

1. Access the **Reset** switch. This activates the set-up procedure for the Timer.
2. 24h will blink. Approve or use +/- key to move to am/pm. Press OK to select.

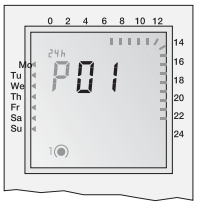


3. Hour will blink. Select hour (+/-) and confirm with OK.



4. Minutes will blink. Select minutes (+/-) and confirm with OK.
5. Day will blink. Select today's day (+/-) and confirm with OK.
6. Program 01 will display with preset ON settings To select as is, press OK.

   To adjust, use the "+/-" keys to change the time. Confirm with OK.



7. Program 02 will display with preset OFF setting. Press OK to confirm as is; use "+/-" keys to change the time. Press OK to changes.
8. Program 03, to program another time to begin a new heat cycle, will appear for setting. Press "+/-" to adjust, or Menu to leave without setting.

- Timer can have up to 20 settings stored. Delete/clear unused settings to have memory space for new settings.
- To delete a program, use "MENU" to scroll to the correct program. Select "-" key. Confirm with "OK". Programs are deleted in ON-OFF pairs. If a single ON setting is deleted, the corresponding OFF setting is automatically deleted.

To override Heater Timer settings

There will be times when the user will want to disrupt the 24/7 Heater Timer settings. To do this, push the OVR AUTO button. This will disable the Heater Timer, and will force the heating circuit on, without regard for settings in 24/7 Heater Timer.

Be sure to watch TEMPERATURE CONTROLLER to avoid overheating.

To return to settings, push OVR AUTO button again. Timer function will resume.

TIPS AND GUIDELINES

- Choose a workbasket with the largest openings possible without allowing parts to fall through.
- For extremely small parts, a solid bottom basket with weep holes is preferred.
- If the parts tend to "nest" or stick together, gentle agitation or tumbling will insure that the cleaning fluid reaches all the surfaces.
- Hollow or concave parts should be positioned so that they fill and drain completely during the cleaning cycle.

NOTE:

Remember that the ultrasonics can only reach where the cleaning fluid reaches.

CAUTION

Always test a cleaning fluid with a sample part before cleaning a large workload.

TROUBLESHOOTING GUIDE

PROBLEM	PROBABLE CAUSES	REMEDY
Lift platform does not oscillate	Air valve assembly improperly adjusted	Check sensors in back on cylinder: sensors have indicators; verify light illuminates when platform passes.
		Remove 2 hoses from main valve. Ensure air is passing through from cylinder. Bad valves should be replaced.
Lift platform does not remain in down position	Part has fallen under platform, preventing it from reaching lowest position of travel	Remove four slotted screws and platform grid, permitting access to lift part from tank.
	Not enough air pressure: 80 psig min., 100 psig max.	Check air supply, hoses, and connectors. Adjust as necessary.
	Sensor may have loosened and is at the bottom of the cylinder	Check position of lower limit switch. Reattach sensor if necessary.
"UP" speed is different from "DOWN" speed	Speed control muffler is improperly adjusted.	Adjust the speed control muffler screws (Fig.4A) at the rear of the lift column. **Adjust muffler by half turns. Even small adjustments can make a big difference. See instructions on page 4.** Tighten jam nuts (Fig.4B) when finished.
Lift platform does not come to "UP" position	Overloaded. Load exceeds recommended weight capacity.	Open lid and use chain hoist to remove heavy part.
	Part weight exceeds speed control muffler setting	Reset setting for appropriate weight. See ADJUSTING PLATFORM SPEED, page 4
	Diminished air pressure	Check and adjust air pressure and muffler
Heated units do not reach desired fluid temperature	Heating element dirty	Clean element
	Heater element burned out	Replace heater element
	Thermostat defective	Replace thermostat
Lift platform bangs at full top or bottom position	Air cylinder cushion screws require adjustment	Screw in air cylinder cushion screws to reduce banging
Rollers are squeaking	Bearings need grease.	Grease rollers
	Rust on wheels and/or vertical bar	Spray lubricant on wheels and/or vertical bar
Lid won't open, rack not lifting	Air pressure may be too low to lift load and lid	Increase air pressure to 100 psig
If your problem is not listed above or problems persist, please contact Graymills for further assistance.1-888-472-9645		

Figure 1

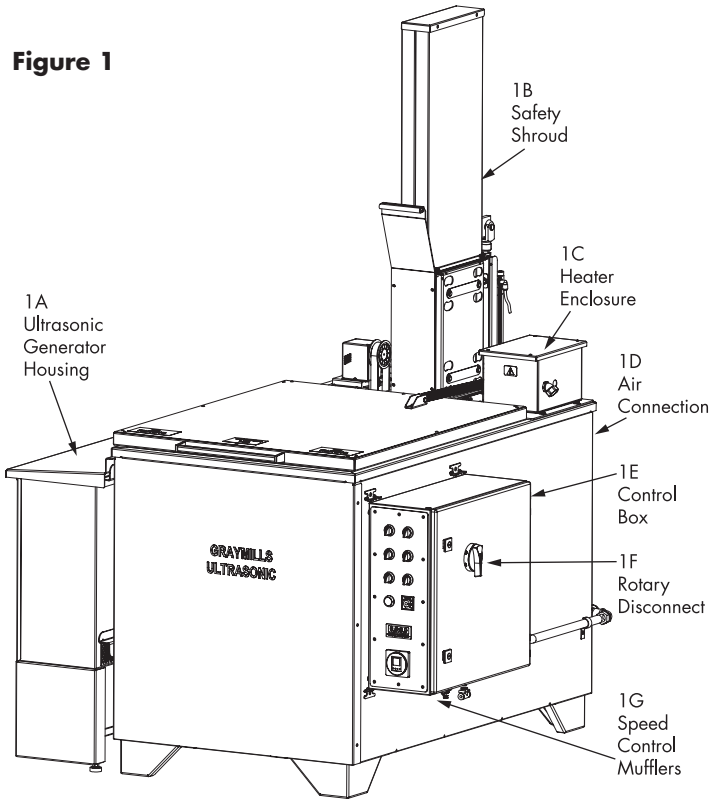
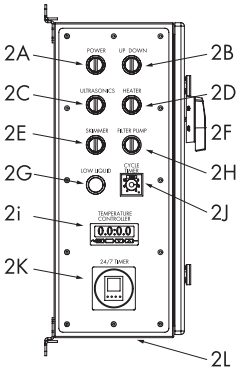


Figure 2
Control Box



No.	Control	Function
2A	Main Power	Turns the control power on or off. Green light illuminates when on.
2B	UP/DOWN platform switch	Sends platform up or down. Sending platform down starts timed cycle
2C	Ultrasonic ON/OFF	Turns ultrasonics on or off
2D	Heater ON/OFF	Turns heater on. Red light illuminates when on.
2E	Oil Skimmer ON/OFF	Turns skimmer on or off
2F	Rotary Disconnect	Turns off power to unit and control box. Disrupts all presettings.
2G	Illuminated Low Liquid Push Button	Amber light on when fluid level is low. Adding fluid and pressing will reset this.
2H	(Optional) Filter Pump ON/OFF	Turns optional pump filter on or off
2i	Temperature Controller	Monitors and controls temperature of fluid
2J	Cycle Timer Dial	Adjusts the time of the cycle. 10 equals one hour.
2K	24/7 Timer	Controls day and time of heater on and off
2L	Platform speed control mufflers	Location of adjustment controls for platform speed

Figure 3—Connecting
Air Supply

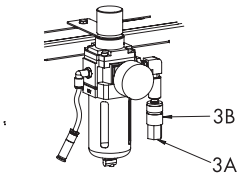


Figure 4—Adjusting
Platform Speed

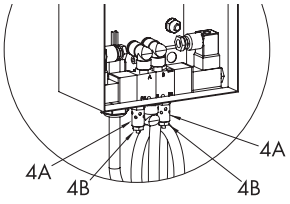
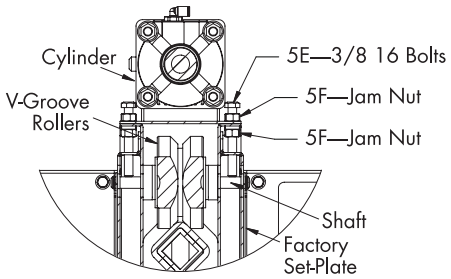
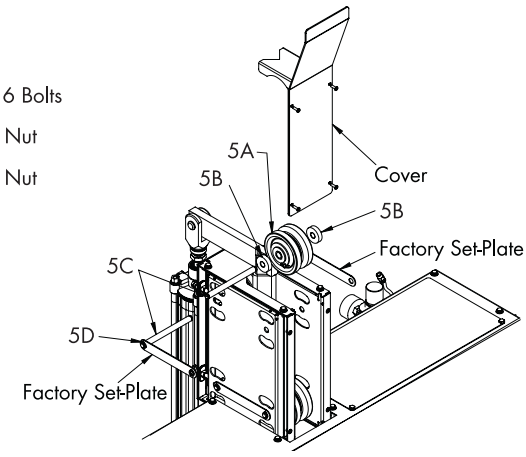


Figure 5—V-Groove
Roller Maintenance





REPLACEMENT PARTS LIST

LIFTER KIT ASSEMBLY

TUSR2420	TUSR3626	
Part Number	*Part Number*	*Description*
746-92612	746-92515	Air Cylinder
729-90678	729-90678	1/4" Polyethylene Tubing
746-06374	746-06374	Speed Control/Muffler
738-92279	738-92279	Solenoid Valve, 5- Port
770-92280	770-92280	Cylinder Sensors

V-ROLLER PARTS

Part Number	*Description*
761-92495	V-Groove Roller (4A)
573-41187-41	Spacer (4B)
569-41175-88	Shaft (4C)
756-06286	Clip (4D)

REPLACEABLE CONTROL PARTS

Part Number	*Description*
746-06374	Speed Control Muffler
738-92867	5 Way Solenoid Valve
770-92588	Illuminated green selector switch
770-93024	Illuminated red selector switch
770-93002	Illuminated amber momentary push button
770-92586	2 position maintained selector switch
770-92967	3 position momentary selector switch
782-92606	Cycle Timer
770-93008	24/7 Heater Timer
771-93018	Temperature Controller
780-92976	Switch Labels

PUMP AND MOTOR

Consult factory. Have pump model number on hand.

AVAILABLE OPTIONS AND ACCESSORIES

OAP-25 To extend life of heated fluids, order Graymills Oil Absorbent Pads (Part No. OAP-25) which are ideal for surface oil removal.

OSEP-5S Graymills Oil Separator may be used to perform continuous oil separation during operation, wetted parts stainless steel.

RECOMMENDED CLEANING FLUIDS

All of the listed water-based cleaning fluids are concentrates. All mix with tap water.

GM330C5 Aquatene™ 330 5 gal pail

GM330C55 Aquatene™ 330 55 gal drum

GM360C5 Super Aquatene™ 360, 5 gal pail

GM360C55 Super Aquatene™ 360, 55 gal drum

GM390C5 Aquatene™ 390 Low Foam 5 gal pail

GM390C55 Aquatene™ 390 Low Foam 55 gal drum

GM880-5 Super Biotene™ 5 gal pail

SPECIFICATIONS	24" Tank Model	36" Tank Model
Inside Tank Dimensions	24"L x 20 1/2"W x 18"D	34" x 25 1/2"W x 24"D
Liquid Immersion Depth	12"	18"
Overall Dimensions	38"L x 25"W x 66"H	55"L x 30"W x 75"H
Liquid Capacity	47 gals.	118 gals.
Drain	2" NPT	2" NPT
Lift Platform Dimensions	22" x 19"	32" x 24"
Weight Capacity	150 lbs. @ 90 PSI	200 lbs. @ 90 PSI
Agitation Stroke Length	3"	3"
Strokes per minute	60 - 80	60 - 80
Air Inlet	1/4" NPT	1/4" NPT
Heater	6.75 kW	6.75 kW
Thermostat Range	60° - 160°F	60° - 160°F
Heat-up Time	11 min per 10° change*	28 min per 10° change*

* Time is based on full tank. Fluid levels and chemistry will affect heating time. Your results may vary.

NOTE All units require direct wiring by user in compliance with all electrical codes. Separate fused disconnect switch is recommended on all models.

WARRANTY

Graymills Corporation warrants that the equipment manufactured and delivered hereunder when properly installed and maintained shall be free from defects in workmanship. This warranty does not apply to damages or defects caused by operator carelessness, misuse, abuse, improper application, or abnormal use; the use of add-on parts or equipment which damages or impairs the proper function of the unit and modifications made by Buyer.

Graymills' obligation under this warranty shall be limited to:

1. Replacing or repairing pumps, motors, tanks and structural parts within one year from the date of installation or 13 months from the date of shipment, whichever occurs first. The decision to replace rather than repair shall be made by **Graymills Corporation**;
2. ULTRASONIC EQUIPMENT – On parts cleaners equipped with ultrasonics, the ultrasonic transducers are guaranteed against cracking, depolarizing or becoming detached from the radiating surface for a period of ten (10) years from the date of shipment from **Graymills**. This warranty does not cover transducer failure that results from operating the equipment with insufficient liquid in the tank as evidenced by inspection by **Graymills**.
3. Replacing or repairing components supplied by but not manufactured by **Graymills**, to the extent such components are warranted by the original manufacturer's warranty and provided that Buyer gives **Graymills** prompt written notice within ninety days of any defect or failure and satisfactory proof thereof.
4. This warranty does not cover rusting of a mild-steel parts cleaner used with aqueous (water-based) materials. On ultrasonic equipment, the finish of the stainless steel tank interior or the immersible transducer radiating surface is excluded from this warranty as erosion of these surfaces occurs normally during the course of operation.

Before **Graymills** can repair or replace a defective part under warranty, call **Graymills** for a Return Merchandise Authorization number (RMA number must appear on outside of package or it will be refused and returned). Upon prepaid return to **Graymills**' factory, **Graymills**' examination must disclose such part to be defective.

This warranty does not apply to expendable parts needing replacement periodically due to normal wear. 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 materials or products. **Graymills** warrants that the equipment will function mechanically as quoted in the published specification. **Graymills** does not warrant process performance nor does **Graymills** assume any liability for equipment selection, adaptation, or installation.

The foregoing warranties are in lieu of all other warranties whether oral, written, expressed, implied, or statutory. Implied warranties of fitness for a particular purpose and merchantability shall not apply. **Graymills**' warranty obligations and Buyer's remedies thereunder (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
PARTS WASHERS

3705 N Lincoln Avenue Chicago, IL 60613
773-248-6825 fax 773-477-8673
info@graymills.com **www.graymills.com**