Graymills

OPERATION AND MAINTENANCE INSTRUCTIONS

TEMPEST 10 and Tempest 20S

WARNINGS/CAUTIONS

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

SAFETY

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:

⚠ The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ **DANGER** The **DANGER** Symbol means that failure to follow this safety statement **WILL** result in serious personal injury or death.

⚠ **WARNING** The **WARNING** Symbol means that failure to follow this safety statement **might** result in serious personal injury or death.

⚠ **CAUTION** The **CAUTION** Symbol means failure to follow this safety statement **might** result in personal injury or property damage.

NOTE The **NOTE** Symbol means that failure to follow these instructions could cause damage to the equipment or cause it to operate improperly.

⚠ CAUTION

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.

⚠ DANGER

**Never use a flammable or combustible fluid in the Tempest. Use only nonflammable, non-combustible, water-based, low foaming cleaning compounds in this machine. We recommend our low foaming Aquatene. Contact Graymills for specific details on the formula best suited for your application.
Do NOT contaminate cleaning fluid with any flammable or combustible material such as gasoline, alcohol, mineral spirits, etc. Drain parts to be cleaned of any flammable material or combustible material before placing inside cleaning tank. Even small quantities can create a dangerous fire hazard.**

⚠ CAUTION

Follow all directions, Warnings and Cautions for the cleaning material being used. 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. Industrial cleaners can cause irritation to some individuals.

Cleaning solutions may irritate skin and eyes. If splashed in eyes, flush thoroughly with water. Consult Material Safety Data Sheet (MSDS) and a physician. Always wear appropriate safety items such as gloves, apron, safety glasses or goggles when loading or unloading Tempest.

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

The illustrations used as **Figures** in the text are contained on Pages 13 through 15.

⚠ WARNING

Unit must be properly grounded to prevent electric shock hazard. Connect only to three prong outlet. Should cord become cracked, frayed or damaged in any way, it should be repaired/replaced immediately by a qualified electrician. Never use an extension cord. Since operator safety is at all times a priority, this unit is equipped with a Ground Fault Interrupter (GFI). Should plug or cord require replacement, it should be wired by a licensed electrician to the GFI in the control box. All electrical connections should conform to national/local codes and be made by qualified personnel.

Before performing any maintenance on this unit, be sure to disconnect electric power.

Prior to changing cleaning fluid or servicing the Tempest, make sure that all moving parts have stopped and that heating element and cleaning solution have cooled.

⚠ WARNING

Keep pump and motor clean and free of all contaminates. Never allow any liquids to come into contact with motor or electrical systems as an electric shock hazard could result.

Thermostat and pressure parameters have been factory set and must never be tampered with.

- **The Tempest 10 and Tempest 20S Units are preset to operate up to 600 PSI. Operating with pressure greater than 600 PSI can create a HAZARDOUS situation.**

NEVER aim spray directly at gloves or anything other than parts to be cleaned.

Do NOT start spray pump unless you have a firm grip on the nozzle. If nozzle is dropped, stop pump immediately. An unrestrained hose and nozzle could cause injury, damage to cabinet and parts in it, as well as break the window, causing possible injury. Restrain parts which might be violently moved by high pressure spray.

The Tempest units are equipped with a pressure relief valve (Figure 8, page 14). If hose should be blocked, relief valve will blow.

Pump operation is controlled by depressing an air switch foot pedal. For safety, if this must be replaced, use only the same air switch, not an electrically operated one.

There is a pump safety interlock switch in the door. Never open cabinet door when spray pump is operating, or try to override the safety switch. If switch fails, do NOT use Tempest until replaced.

Do NOT overload unit. Maximum capacity is 500 pounds.

Be careful to avoid hot areas within the cleaning chamber when opening unit.

Never operate unit with a cleaning solution reservoir level below minimum or activate heater when it is not immersed in liquid.

INSTALLATION AND OPERATION

SITE PREPARATION

Before installing, careful consideration should be given to the place of operation. Place unit on a smooth, level surface. Use leveling feet to correct for minor variations in floor.

⚠ CAUTION

The work area should be well ventilated.

Provide adequate lighting in the work area to permit viewing of the cleaning process and of the floor area around the machine. Be sure to allow adequate room to bring work to and from the machine. Use flooring or floor covering that does not become slippery when wet. Provide sufficient clearance around the machine for fluid changeovers and servicing.

NOTE

The spray chamber and reservoir of the Tempest 20S unit are stainless steel. The base is carbon steel.

If you have purchased a heated Tempest 10 unit with a carbon steel cabinet, some uses of water-based cleaning materials will generate steam and water vapor. Surfaces inside the cabinet will be subject to rusting. This is surface rust and does not appreciably affect the service and use of the unit. We recommend that the door be left open when the unit is not in use. Leaving the door open when not in use may lessen condensation and rust inside the unit. If your cleaning requirements cannot tolerate any rust or contamination, please contact Graymills about stainless steel cabinets. Also, check with your cleaning fluid supplier to make sure your cleaning materials contain a rust inhibitor.

The Graymills warranty does not cover rusting of carbon steel parts.

INSTALLATION

1. Place Tempest on a firm, level surface near a 115V, 60Hz, 1-ph grounded electrical outlet.

For Tempest 10 Unit:

1. Disconnect Drain Pipe (Figure 1, page 13) and lower pipe into pail reservoir
2. Remove entire pail assembly from shelf.
3. Loosen snap ring securing ring to pail and remove lids (Figures 2 and 3, page 13)
4. Graymills recommends use of pail liners as a means of simplifying liquid changes and insuring reservoir's long life

⚠ **CAUTION**

Be careful to prevent liner from coming into contact with heater element as the plastic will melt on element and cause heater failure

5. Fill pail with low foam detergent and water, following mixing directions on recommended detergent package.

   NOTE:

   Excessive foaming caused by improper mixing ratios or use of improper detergents, can result in loss of pump prime and can damage heater and/or pump. Should foaming occur, skim off excessive foam and add water to proper level or add defoaming agents. If foaming continues, dispose of liquid and review detergent ratios and/or formulation
6. Replace lid and secure with snap ring.
7. Prime pump by filling intake hose completely with water, then connecting filter hose to pump.
8. Plug heater cord into lower socket in outlet box above pump shelf. Plug pump cord into upper socket (Figure 4, page 13).
9. Connect drain pimp (Figure 1, page 13) and close lower cabinet door.
10. Plug unit's power cord into 115V, 60 Hz, 1-ph grounded outlet.
11. Check GFI Switch to make sure it is ON (Figure 5, page 14).

For Tempest 20S Unit:

1. Fill 20-gallon cleaning solution reservoir to at least a 12" depth with appropriate cleaning solution. To protect equipment and personnel, the fluid level should never fall below 4" and must cover the coiled portion of the heating element and the thermostat's thermal bulb.
2. With door closed and latched, activate main power switch on the control panel.

OPERATION

⚠ CAUTION

At this time the pump is fully operational. Do NOT depress the foot pedal switch unless the spray hose is being gripped.

NOTE

Tempest is equipped with a safety interlock switch that prevents the pump from operating unless the cabinet door is closed and secured with door hasps. Never override safety interlock switch or operate this unit if the safety interlock switch is not functional.

1. Using the adjustable thermostat, set heat to desired temperature up to 120°F maximum. Allow approximately one hour for the heater to warm the solution to operating temperature.
2. Open spray chamber door and secure with door retaining latch (Figure 7, page 14). Carefully load parts into the cabinet, distributing weight as evenly as possible.

⚠ CAUTION

Tempest is equipped with a pressure relief valve in the spray cabinet that is intended as a safety device (Figure 8, page 14). When pressure is relieved, the valve automatically resets. Should pressure inside spray delivery system reach an unsafe level, relief valve will vent excess pressure back into cabinet. This valve must be kept clean and free of all contaminants to insure its proper functioning. Activation of the pressure relief valve is not expected during normal operation.

⚠ CAUTION

Adjustable nozzle should never be adjusted to a no-flow position as it may activate the pressure relief valve and cause possible mechanical failure of the pump. If no flow is desired, remove foot from foot pedal switch.

NOTE

Always completely lift parts into and out of cabinet. Never allow parts to rest on door opening as they will damage gasket material. Keep gaskets clean and free of contaminants. Failure to do so reduces gasket life and water sealing effectiveness.

3. Close door, secure door hasps, and turn on window blower with lighted rocker blower switch located on the control panel.
4. Place hands in gloves, secure the part, grip spray hose firmly, direct hose at parts and depress foot pedal to activate spray. Adjust nozzle for desired spray pattern.

NOTE

Do NOT allow pump to run dry. Running dry for more than 30 seconds can produce overheating and is harmful to the pump's bearing and piston seals.

5. If unit will be idle for an extended period, door should be latched in open position.
6. If equipment is used in near freezing conditions, protect pump after use by draining cleaning fluid, then pumping antifreeze solution through system. This will coat the pump interior. Use antifreeze with rust inhibitors. Follow this same procedure if Tempest unit will not be used for an extended period.

MAINTENANCE

⚠ WARNING

Disconnect all power sources to unit before performing any maintenance.

Changing the Cleaning Fluid

⚠ CAUTION

Be sure reservoir and liquid are cool.

For Tempest 10:

1. Open lower cabinet door. Unplug heater cord from lower socket in outlet box located at right front of inside lower cabinet (Figure 4, page 13). If unit is equipped with an oil skimmer, also unplug its cord from the adjacent outlet.
2. Disconnect drain pipe (Figure 1, page 13) and lower pipe into pail reservoir. Remove intake hose from pail reservoir.
3. Remove entire pail assembly from shelf.
4. Loosen snap ring securing lid to pail and remove lid. (Figure 2 and 3, page 13)
5. Remove pail liner and dispose of properly
6. Follow instructions in Installation Section for refilling pail with cleaning fluid.

For Tempest 20S:

1. Open lower cabinet door. Unplug heater cord from lower socket in outlet box located at right front of inside lower cabinet. If unit is equipped with an oil skimmer, also unplug its cord from the adjacent outlet
2. Remove drain and intake hose from reservoir. If unit is equipped with oil skimmer, also remove oil skimmer discharge hose.
3. Roll reservoir out from the base and properly dispose of used cleaning fluid.
4. If unit is equipped with an oil skimmer, remove excess oil from exterior tramp collector.

NOTE

A drain coupling has been provided in the reservoir. It is recommended to plumb a drain valve to this coupling to facilitate cleaning.

⚠ CAUTION

Always dispose of used cleaning fluid properly in accordance with the MSDS sheet, manufacturer's instructions and State and Federal regulations. Typically, this involves removing the oil from the top, metal chips and other solids from the bottom, bringing the pH to 9 or less.

Daily Maintenance

1. Check fluid level in cleaning solution reservoir daily. Assure level is at or above minimum level at all times.

⚠ CAUTION

Failure to keep cleaning solution reservoir full can result in heater failure, loss of pump prime, or over heating of the fluid.

NOTE

Heavy, constant use may warrant daily fluid changes.

2. Inspect filter bag on end of drain pipe daily. Filter bag is secured to drain pipe with a reusable plastic tie – there is a small plastic release lever on locking cube.(Figure 9, page 15) Properly dispose of any solid waste accumulation, rinse bag in water, and re-attach to drain pipe.

⚠ CAUTION

Do NOT operate unit without a filter bag.

3. Inspect heating element daily. Any foreign material should be removed by gently scrubbing.

NOTE

Do NOT neglect cleaning of the heating element. Failure to do so will cause premature failure. Do NOT allow oil or sludge to bake onto the heater element as premature heater burnout will result.

Weekly Maintenance

1. Check hoses weekly for wear and potential failure. Keep hose connections tightened.

2. Check nozzle for blockage and keep free of debris.

⚠ WARNING

Should hoses become loose, cracked or damaged in any way, they should be replaced immediately as personal injury or damage could occur to the unit.

⚠ CAUTION

Failure to keep hose connections tight can result in loss of pump prime.

⚠ WARNING

Loose drain pipe connections can cause leakage onto reservoir lid which could damage lid or create an electrical shock hazard.

As Necessary:

1. Should viewing window become soiled, clean with white vinegar. Excessive alkaline build-up will necessitate window replacement.
2. To prevent corrosive effects of detergent accumulation, it is recommended that painted surfaces always be kept clean.

Pump Lubrication

Pump main bearings are permanently lubricated. Lubricate cam bearings with Moly-Lithium No. 2 grease (wheel bearing grease) every 100 hours of operations or monthly.

NOTE

Use a push type operated grease gun, if available. If using a lever operated gun, work lever very slowly to prevent damaging bearing seals. Very little grease is required.

⚠ CAUTION

Do NOT use an air-powered grease gun. It develops too much pressure and will blow out bearing grease seals. The pump cavity should always be clear of excess grease for proper heat dissipation. Wipe out excess grease; do NOT wash out.

OPTIONAL AIR BLOW-OFF

An internal air blow-off is an option of the Tempest 20S. The air is supplied from the Customer's compressed air system, 150 PSI maximum. The hose and nozzle are to be used for drying off parts but are also useful for cleaning and drying the chamber.

OPTIONAL OIL SKIMMER

The Oil Skimmer is another option of the Tempest 20S. Its purpose is to remove tramp oil from the top of the reservoir and should be operated as necessary. The skimmer is most effective when the unit is not in operation

so that the reservoir is placid and the oil has had a chance to cool and separate allowing it to float to the top of the cleaning solution.

The oil skimmer mounts to the lid of the main reservoir. The skimmer's electrical cord should be plugged into the provided outlet located at right inside front of lower cabinet. Feed discharge tube through hole in cabinet wall making sure flow is directed into the tramp oil collection container. This container is conveniently located so that its level can be easily monitored. Monitor and empty as necessary.

Once the unit is plugged in and the discharge hose is in place, start operation by activating the lighted oil skimmer rocker switch located on the main control panel. When oil is removed from the main reservoir, the tramp oil collection container is full, or the process is to be stopped, simply move the rocker switch to the off position.

MAINTENANCE

Oil skimmer is constructed of premium quality materials and components and will normally provide years of trouble-free service.

After a period of use, the belt may stretch slightly. The spring loaded lower tail pulley will automatically compensate for minor belt stretch. Occasionally you may have to replace the belt due to wear or damage. To install a replacement belt:

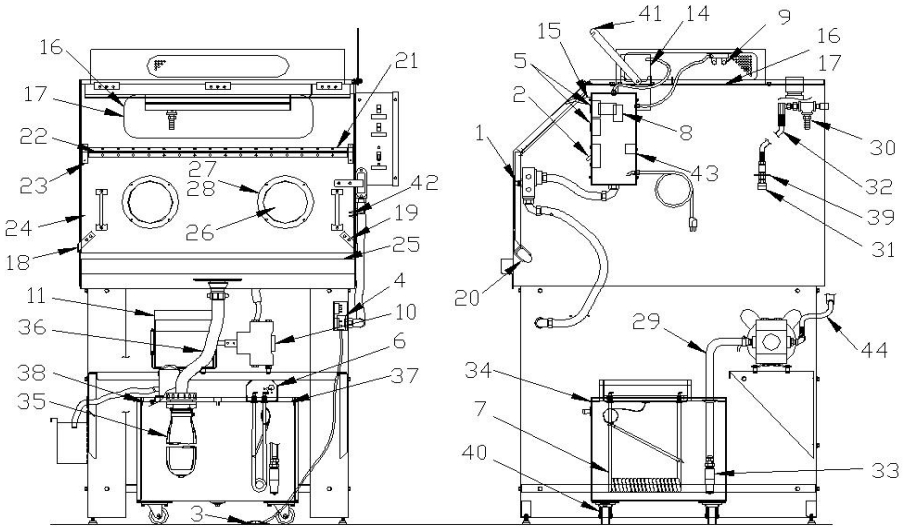
1. Depress the spring-loaded lower pulley and remove the worn or damaged belt from the skimmer.
2. First place one end of the replacement belt over the lower tail pulley on the skimmer.
3. Stretch the belt slightly and place the other end over the drive pulley on the motor end. Make sure that the belt is placed behind the belt scraper.

NOTE

To avoid belt damage and to provide the longest service life, do not over stretch the belt.

Replacement belts may be ordered by calling Graymills Customer Service. Provide model number of oil skimmer when ordering.

Tempest 20S Parts List



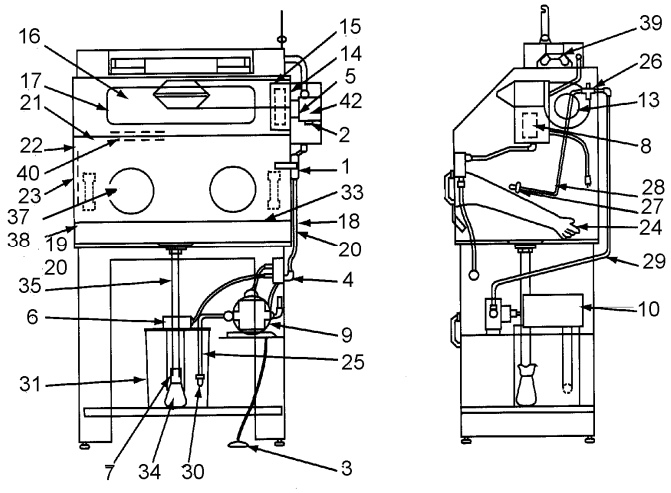
Ref #	Part No	Description
Electrical		
1	770-07011	Door Safety Switch (Push Type)
2	770-04190	Main Control Switch
3	770-07024	Foot Pedal
4	770-07025	Foot Control Switch (inside)
5	770-90905	Skimmer Switch
6	780-91124	Thermostat
7	780-38043	Heater
8	780-07010	Relay - 30 Amp
9	772-07017	Light Assembly
43	777-09499	Switch, GFI
Pump and Motor		
10	390-90894	Piston Pump
11	369-90893	Pump Motor - 1 HP
12*	743-07172	Piston Pump Valve Assy Kit
13**	743-07171	Piston Pump Stack and Guide Kit
Blower System		
14	738-90723	Solenoid Valve
15	769-91188-81	Air Spray Nozzle
Door & Water Containment Systems		
16	769-27325	Tank Window-Tempered Glass
17	603-28824	Window Seal Gasket
18	712-27373	Door Clamp Bracket (left)
19	712-274441	Door Clamp Bracket (right)
20	769-07015	Door Clamp Bracket (side latch)
21	605-27358-81	Piano Hinge
22	745-07046	Hinge Seal Gasket
28	680-38578-81	Glove, Inner Ring
45	764-02614-11	Hinge, 2 ¼" Long

Ref#	Part No	Description
23	745-91198	Seal, P-Shaped, 36" long
24	603-28730	Door Gasket
25	745-27905-72	36" Filler
26	605-27346	Gloves (one pair)
27	610-27311	Plastic Rings to Support Gloves
28	680-38578-81	Glove Inner Ring
41	601-38065	Door Catch
42	769-07620	Gripper Clip, Hose
Spray System		
29	729-07239	Reservoir to Pump Hose
30	738-07018	Pressure Relief Valve
31	769-91072	Spray Washer Nozzle
32	728-07007	Hose Assy, 56"
33	738-07243	Foot Valve
34	430-38070-81	Reservoir
35	742-07412	110 Mesh Filter Bag
36	729-07379	Neo Hose, 18"
37	621-38072-81	Lid, Thermostat/Heater Lid, Drain
38	420-38164-81	
39	680-29015-81	Nozzle Washer Handle
40	761-07726	Caster, Swivel
44	728-91073	Hose Assembly, 56"
46	647-38053-81	Thermostat Box

*Item 12 includes 4 each: O-Rings, Valve Seats, Valve Poppets, Valve springs, Spring Retainers

**Item 13 includes 4 O-Rings and 2 each: Piston Cap Screw, Washers, Rubber

Tempest 10 Parts List



Ref#	Part No	Description
Electrical		
1	770-07011	Door Safety Switch (Push Type)
2	770-04190	Main Control Switch
3	770-07024	Foot Pedal
4	770-07025	Foot Control Switch (inside lower housing)
5	770-09192	Blower Switch
6	780-91124	Thermostat
7	780-38043	Heater
8	780-07010	Relay - 30 Amp
39	772-07017	Light Bulb
43	777-09499	Switch, GFI
Pump and Motor		
9	390-90894	Piston Pump
10	369-90893	Pump Motor – 1 HP
11*	743-07172	Piston Pump Valve Assy. Kit
12**	743-07171	Piston Pump Stack and Guide Kit
Blower System		
13	315-07059	Blower Motor 1/8 H.P.
14	769-07020	Blower Wheel
15	435-35984	Air Duct Filter Pad Assy.- 6-1/2" dia.
41	432-27316-23	Duct Outlet Assembly
Door & Water Containment Systems		
16	769-27325	Tank Window - Tempered Glass
17	603-28824	Window Seal Gasket
18	712-27373	Door Clamp Bracket (right front)
19	712-27444	Door Clamp Bracket (left front)
20	769-07015	Door Clamp Bracket (side latch)
40	764-02614-11	Piano Hinge
21	745-07046	Hinge Seal Gasket (37" Required)
22	764-02614-11	Hinge Gasket-End Support (Mylar) 2.5" x 1.5"
23	603-28730	Door Gasket

Ref#	Part No	Description
33	745-27905-72	36" Filler
24	605-27346	Gloves (One Pair)
37	610-27311	Plastic Rings to Support Gloves
38	680-38578-81	Glove, inner ring
Spray System		
25	729-07239	Pail-to-Pail Hose
26	738-07018	Pressure Relief Valve
27	769-91702	Spray Washer Nozzle
28	728-07038	Spray Cabinet Hose Assembly, 42" Long
29	728-07007	External Hose Assembly, 56" Long
34	430-38070-81	Reservoir
30	738-07243	Foot Valve
31	435-29819	10-Gallon Pail
32	749-07207	10-Gallon Pail, Baggie Liners, One Dozen
34	742-07412	110 Mesh Filter
35	729-07379	Neoprene Hose
36	615-27675	10-Gallon Lid

*Item 11 includes 4 each: O-rings, Valve Seats Valve Poppets, Valve Springs, Spring Retainers

**Item 12 Includes 4 O-rings and 2 each: Piston Cap Screw, Washers, Rubber

Table of Figures


FIG. 1

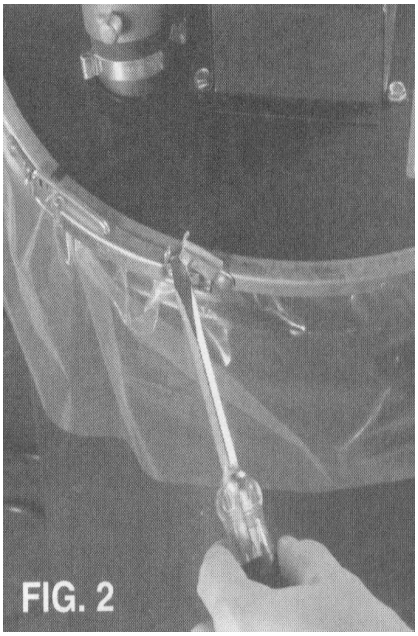


FIG. 2


FIG.3

FIG. 4

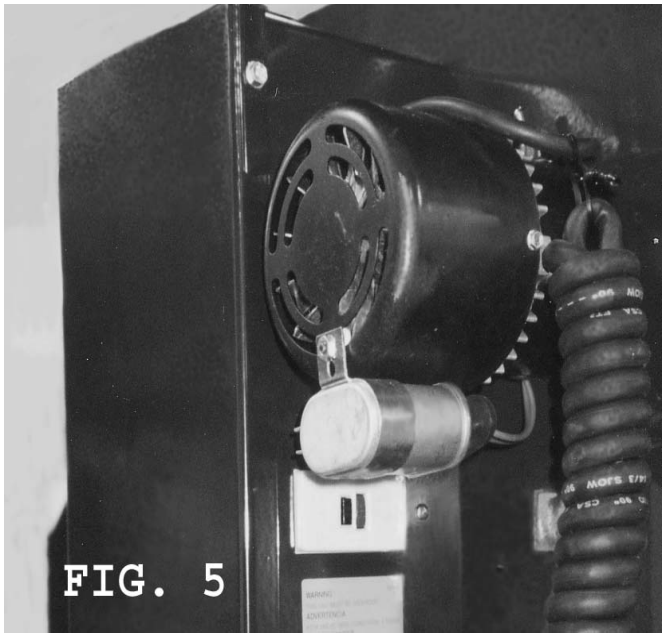
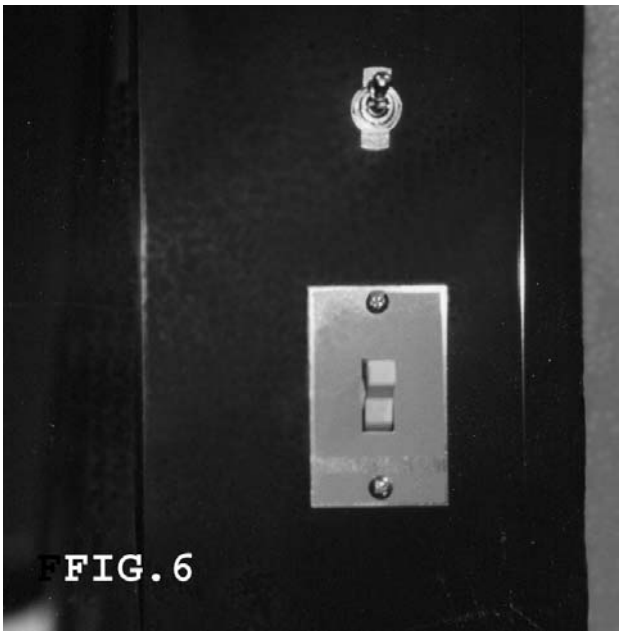


FIG. 5



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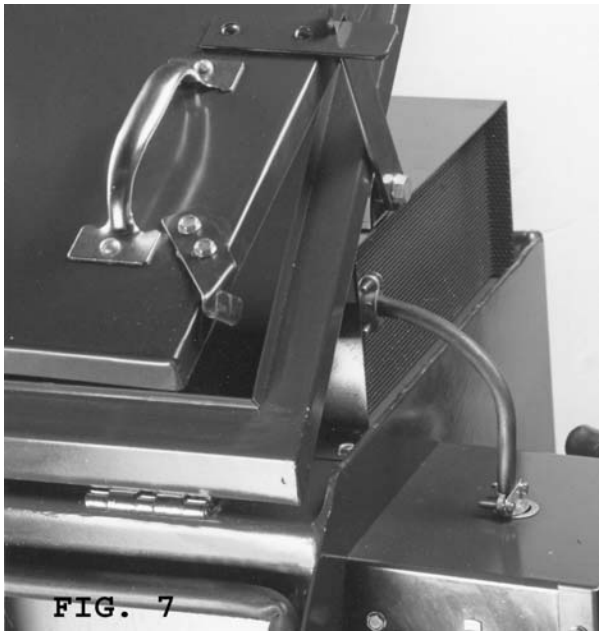

FIG. 7

FIG. 8

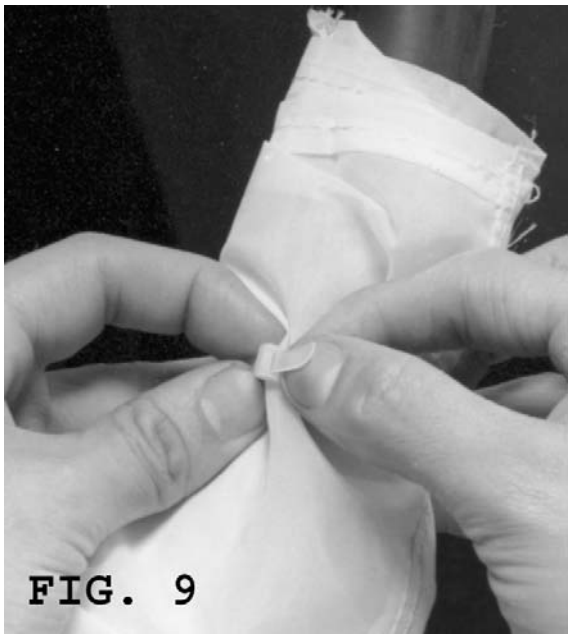

FIG. 9

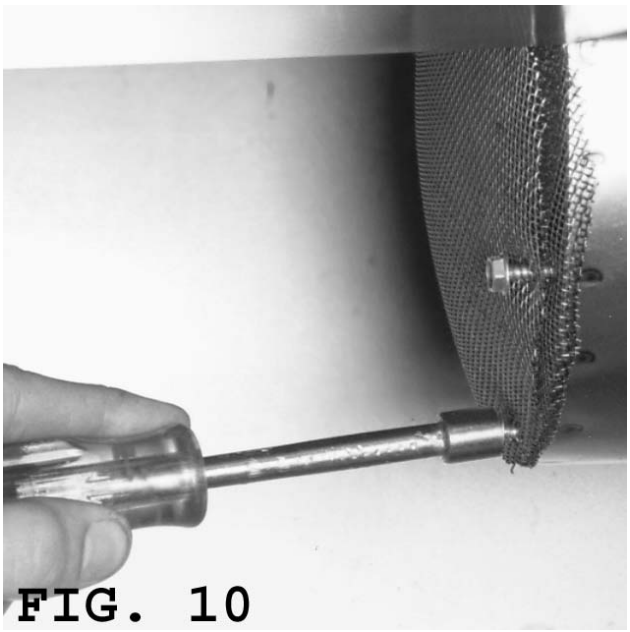

FIG. 10

WARRANTY

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:

(a) Repairing or replacing (at **Graymills** sole discretion) any non-conforming or defective component within one year from the date of shipment from **Graymills**.

(b) 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.

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

If you believe you have a Warranty claim, contact **Graymills** at (773) 248-6825. 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.