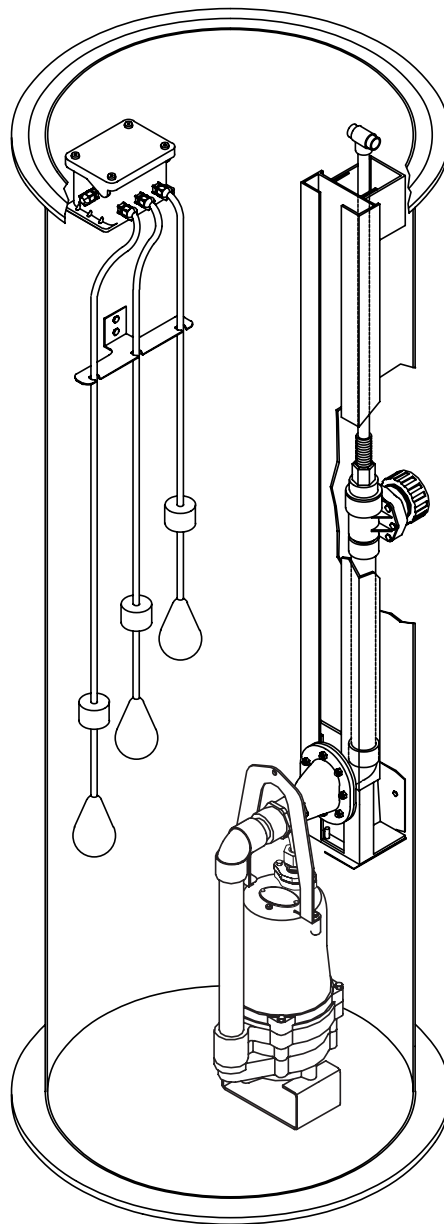




HYDROMATIC®

TRST

LOW PRESSURE SEWAGE SYSTEM



NOTE! To the installer: Please make sure you provide this manual to the owner of the pumping equipment or to the responsible party who maintains the system.



Pentair
Water™

General Information

Thank you for purchasing your Hydromatic® pump. To help ensure years of trouble-free operation, please read the following manual carefully.

Before Operation:

Read the following instructions carefully. Reasonable care and safe methods should be practiced. Check local codes and requirements before installation.

Attention:

This manual contains important information for the safe use of this product. Read this manual completely before using this product and refer to it often for continued safe product use. **DO NOT THROW AWAY OR LOSE THIS MANUAL.** Keep it in a safe place so that you may refer to it often.

Unpacking Pump:

Remove pump from carton. When unpacking unit, check for concealed damage. Claims for damage must be made at the receiving end through the delivery carrier. Damage cannot be processed from the factory.

WARNING: Before handling these pumps and controls, always disconnect the power first. Do not smoke or use sparkable electrical devices or flames in a septic (gaseous) or possible septic sump.

Systems Description:

Two basic models of the Hydromatic TRST grinder systems are covered by these instructions:

1. FBTRSTSG Factory built TRST simplex system utilizing a fiberglass basin.
2. FBTRSTDG Factory built TRST duplex system utilizing a fiberglass basin.

Factory built fiberglass basin systems are available in 24" minimum diameter basins for simplex systems and 36" minimum diameter basins for duplex systems.

In a TRST system, the pump is raised and lowered in the basin while being guided by a fiberglass guide rail. A hydraulic sealing flange at the pump discharge allows the pump to be removed without disconnecting piping or electrical connections.

Application:

These pump systems are basically designed for pumping sewage water with a pH ranging from 5 to 9, specific gravities from 0.9 to 1.1, viscosities ranging from 28 to 35 S.S.U. and temperatures up to 140° F.

WARNING: Pump is not to be installed in locations considered hazardous in accordance with the National Electric Code ANSI/NFPA 70.

Pump Models:

The TRST rail system may employ any UL approved Hydromatic 2 HP submersible grinder pump which utilizes cutter blades to grind solids into a slurry. Refer to the pump service manual

for all Hydromatic pumps when adjusting, dismantling, or repairing the pump.

Inspection:

Check to be sure that all items for your particular system are included. Check that the phase and voltage on the pump nameplate are correct as ordered and match available job site voltage.

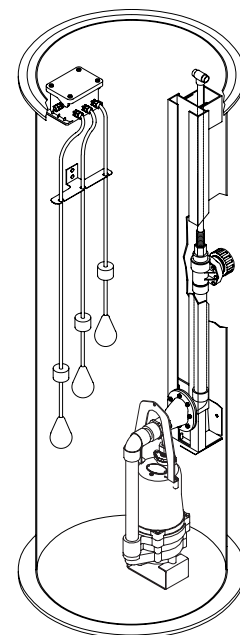
Codes:

WARNING: To reduce the risk of electric shock, electric installations shall be in accordance with the National Electric Code and all applicable local codes and ordinances.

Consult the local inspector(s) before installation to avoid costly delays or rework.

Excavation Location:

Excavation location shall be made according to local codes and regulations. Care should be taken to avoid buried utility lines piping, and other buried structures and foundations.



Pump Installation

Installation Skill Requirements:

The installation of a TRST basin system is a specialized skill, which requires individuals with a basic understanding of excavating, pipe fitting, and electrical wiring. Hydromatic cannot assume responsibility for problems or damage resulting from inexperienced or undersupervised laborers. These instructions are meant only to be an installation guide; therefore, installation conditions not covered in these instructions rely on the experience and mechanical aptitude of those installing the system.

Grinder Pump Attachments:

Step 1

Attach the stainless steel foot bracket to bottom of the pump with two bolts and lock washers provided. See **Figure 1**.

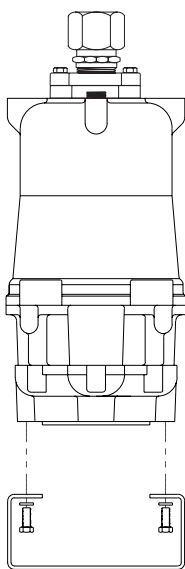


Figure 1

Step 2

Apply pipe thread sealant to discharge piping threads and screw assembly into the pump discharge. For vertical pump discharge systems, tighten piping until a measurable distance of 23-3/4" $\pm$ 1/8" from the floor to the center of the ball check valve discharge diaphragm hole is achieved. See **Figure 2**.

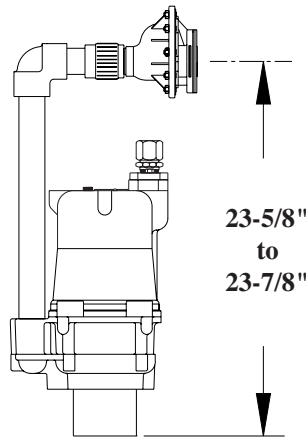


Figure 2

Step 3

Install the stainless steel lifting bail to pump with two bolts and two lock washers provided. Position the lifting bail with mounting tabs directed toward the ball check valve as shown. See **Figure 3**.

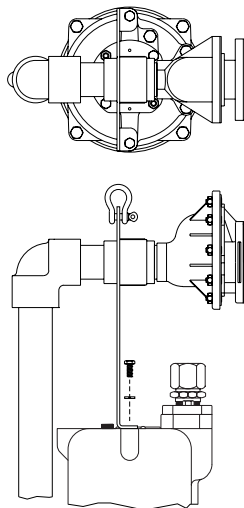


Figure 3

Step 4

Attach lifting chain, cable or rope as supplied to the lifting bail shackle. Tighten threaded shackle pin with pliers.

WARNING: To reduce risk of electric shock, do not connect conduit to pump.

Excavation :

Step 1

Determine appropriate excavation based on size of the basin, desired entrance point of the influent line, and entrance of power connection.

Step 2

Obtain proper backfill material. The backfill material provides as much as 90% of the basin's support under certain stress conditions. The installer must be positive that correct bed and backfill materials are utilized per instructions as follows:

- A. Clean and free flowing gravel with particle size not less than 1/8" nor more than 3/4" in diameter. Use this description when ordering or specifying as material varies upon geographical location. This material is commonly known as "pea gravel".
- B. Stone or gravel crushings with angular particle size of not less than 1/8", no more than 1/2" diameter, washed and free flowing, is acceptable as an alternative material.

CAUTION: In freezing conditions the backfill must be dry and free of ice. Do not use other backfill materials. The basin warranty is automatically void if materials other than the recommended bed and backfill materials are used.

Pump Installation

Step 3

The entire periphery, including under the basin, requires 4 to 6" of appropriate fill. The ideal basin pad is concrete in conjunction with anti-flotation tie-down studs. Basin anti-flotation tie-down kits are available from Hydromatic. If concrete pad is not used, the aggregate must be compacted to 85% standard proctor density. Concrete pad or aggregate surface must be leveled flat and free of voids to conform to the basin bottom. Basin bedding depth should be calculated such that the basin top will protrude 3" above the normal grade upon final installation.

CAUTION: If the basin is not tied down during installation, rain or flood conditions may cause the basin to float upward, causing damage to the basin or basin connections. Claims for this type of damage cannot be processed by Hydromatic.

Basin System Handling:

Factory built fiberglass basin systems must not be dropped, dragged, rolled, or handled with sharp objects. Improper handling of basins may result in damage to the basin, damage to basin components, or leaks in the piping assemblies.

Basin Installation:

Step 1

Inspect the fiberglass guide rail to ensure it is securely fastened to the basin wall.

Step 2

An inlet grommet is the standard supplied influent connection device. If another type of inlet hub is used, refer to the directions included with the hub.

Inlet grommet: Determine point at which influent line will enter basin and, using a hole saw sized per chart below, drill a hole through the basin wall. Clean cut hole and apply a sealant coating to the cut section to prevent fiberglass deterioration. Insert the inlet grommet into the drilled hole.

Step 3

PIPE SIZE	HOLE SAW DIAMETER
4"	5"
6"	7"

Lifting of the basin may be done with a nylon or other non-damaging type material sling. Do not wrap a chain or steel cable around the basin as damage may result. Do not attach lifting mechanism around discharge hub(s) or electrical hub.

Step 4

Lower the basin into excavation, position and level properly. Mount basin with base anchor bolts if an anti-flotation tie-down kit is used. Inspect fiberglass basin and seal off any cuts or scratches to prevent fiberglass deterioration.

Step 5

Lubricate inside lip of inlet grommet with pipe soap. Clean outer end of influent pipe and push pipe through grommet. Ensure pipe does not protrude inside basin so as to interfere with pump removal or float switch operation.

Step 6

Close shut-off valve and make discharge line connection. It is recommended that an additional shut-off valve and redundant check valve, by installing contractor, be located outside the basin. This can be at any force main entrances - check local codes for specific requirements.

Step 7

If system is supplied with a float bracket, attach float switches to the float bracket by clamping strain relief bushings around the float cords, then inserting and twisting the bushings into the float bracket slots.

Step 8

After grinder pump attachments have been made, lower the pump unit down the guide rail to ensure the ball check valve's sealing flange aligns and connects properly with discharge elbow.

WARNING: Grinder basin systems must be vented in accordance with local plumbing codes. Do not remove the vent.

Pedestal Panel Mount Systems Installation:

Step 1

Ensure power source is off or disconnected.

Step 2

Place insulator strip or bushing onto sump cover opening to protect insulation on incoming cords.

Step 3

Insert all cords through the sump cover opening and then up through the pedestal. Mount the pedestal on sump cover with vent openings pointing downward.

Step 4

Route pump and control wires through pedestal, sealing block

and panel. Mount sealing block and panel to pedestal with hardware provided. Ensure pedestal gasket seals against panel, and tighten all cord nuts while leaving approximately 3" of play in the cords from the tank.

IMPORTANT: Any unused holes in the sealing block must be plugged to prevent the corrosive atmosphere of the basin from entering the control panel. Plug any unused hole(s) with the nylon plug(s) provided.

Junction Box and Direct Burial Cable Systems Installation:

Step 1

Ensure power source is off or disconnected.

Step 2

Push pump power/seal failure/heat sensor cord and float cords through cord grips in the junction box and tighten. To prevent corrosion or electrical short, plug any unused holes in junction box.

Step 3

Make all wiring connections inside junction box for all wires required to connect to the control panel.

Step 4

Junction Box Conduit Systems:

It is recommended that the customer furnish and install a conduit seal outside the basin to prevent surface water from entering the junction box.

Direct Burial Cable:

Incoming burial cable(s) must be fed through basin cord grip(s) then tightened.

Control Panel Wiring:

WARNING: To reduce risk of electric shock, electric installations shall be in accordance with the National Electric Code and all applicable local codes and ordinances.

Step 1

Ensure power source is off or disconnected.

Step 2

Connect pump power, seal failure/heat sensor, and float cords to panel terminals per the schematic provided with the control panel. The white, black and red pump power leads must be connected to the proper terminals in the control panel marked "W", "BK" and "R" or the pump will not operate. All conduits and cables entering the panel must be sealed.

NOTE: A Hydromatic approved control panel must be used or the pump warranty is void.

WARNING: To reduce risk of electric shock, pump is provided with grounding wire. Be certain that it is connected to ground. Properly connect the panel ground wire to a grounding rod. Improper grounding voids warranty.

WARNING: To reduce risk of electric shock, connect heat sensor leads to heat sensor circuits. Motor protection must be provided by the control panel. See nameplate on the pump for information necessary for proper selection of motor protection.

NOTE: Use copper, 60°C. wire insulation for all field wiring terminals.

WARNING: Metal back panel is to be connected to a good ground in accordance with local electrical codes.



TYPICAL DUPLEX – 230 VOLTS – SINGLE PHASE SCHEMATIC

NOTE: Use copper, 60°C. wire insulation for all field wiring terminals.

WARNING: Disconnect power supply before servicing.

WARNING: Metal back panel is to be connected to a good ground in accordance with local electrical codes.

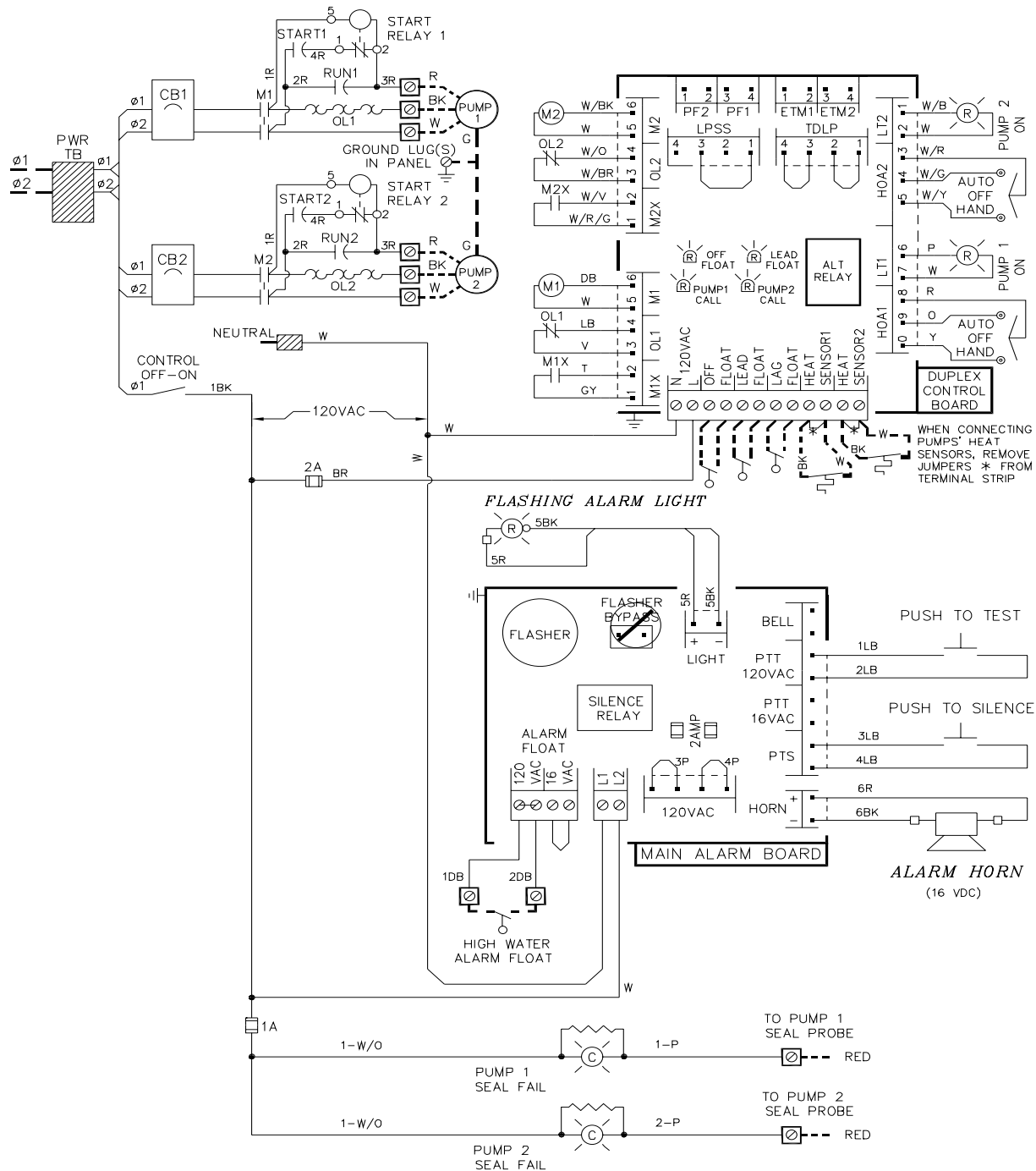


Figure 5

Final Backfill for Fiberglass Basin Systems:

Refer to section "Excavation" for proper backfill materials. Ensure backfill material is free of rocks, clods, and debris. See **Figure 6**.

CAUTION: In freezing conditions the backfill must be dry and free of ice. Support for all piping and electrical lines must be provided during backfilling.

At least a 4 - 6 inch wide band of compacted aggregate must be placed in successive layers (6" lifts) around the entire periphery of the basin. Carefully compact aggregate under all piping and electrical lines. Cover grade should slope down 3" to the normal surrounding grade. Care must be taken to prevent damage to any influent, discharge, or electrical connections made to the basin.

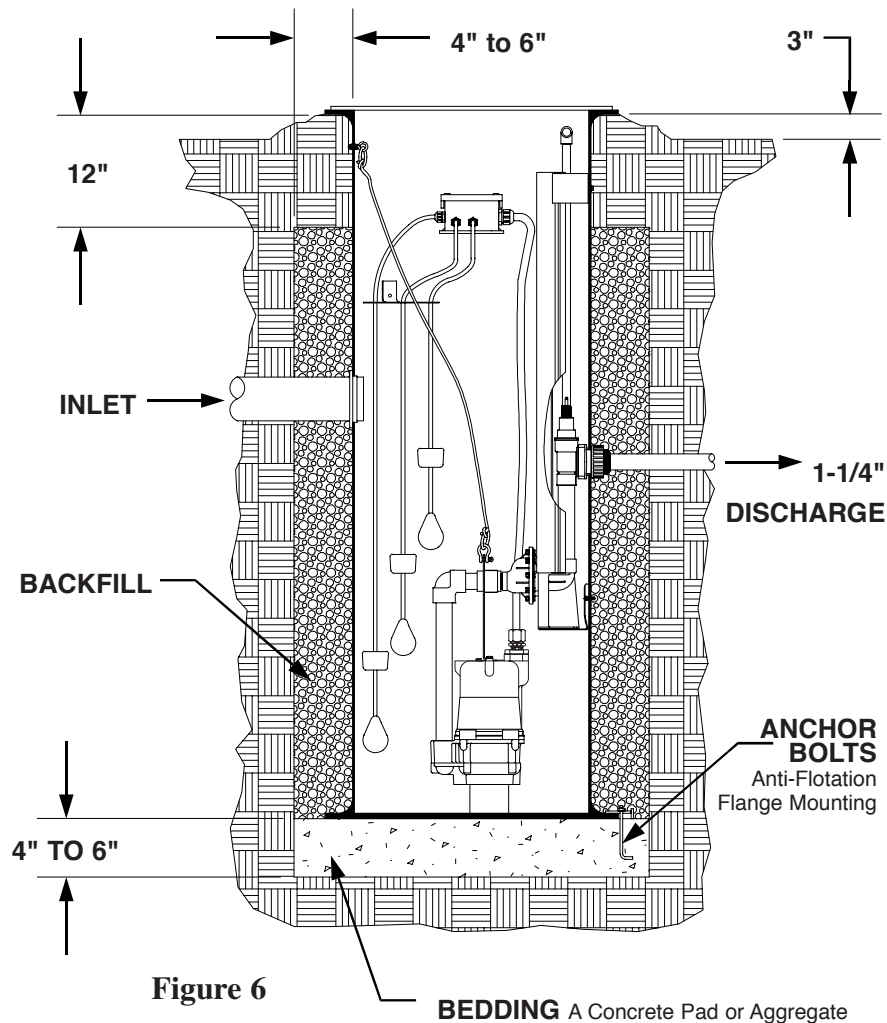


Figure 6

BEDDING A Concrete Pad or Aggregate

Pump Operations

Preoperation:

Step 1

Remove pump from basin.

WARNING: Hazardous moving parts. To reduce the risk of injury, disconnect power before servicing pump.

Step 2

With power off, turn radial cutter with a screwdriver to be sure it rotates freely. If necessary to adjust, refer to the pump service manual.

Step 3

Stand clear from pump and with power on, check for proper operation of pump by turning H-O-A switch to Hand momentarily and then Off.

IMPORTANT: Do not leave pump in basin unless it is placed in operation. If a pump has been out of service for an extended period of time, with the power off, rotate the impeller by turning the radial cutter with a screwdriver to be sure it rotates freely.

Start-up:

Step 1

Run clear water into the basin until motor housing is covered.

Step 2

Open the shut-off valve to the discharge line.

CAUTION: Do not use excessive force when operating the shutoff valve or damage to the valve or valve handle may occur. The valve is closed when a noticeable stop is felt upon closing. The valve is completely open upon 9 full counterclockwise turns from the closed position.

Step 3

Check for proper voltage of incoming power with a voltmeter.

Step 4

Ensure H-O-A switch is in the Off position and turn on main breaker.

Step 5

Start the pump by turning the H-O-A switch to the Hand position.

Step 6

Check the pump amperage with clamp on ammeter on black pump lead. Readings higher than nameplate indicate clogged pump, miswiring, or improper voltage. If basin is not being pumped down and amperage readings are considerably lower than nameplate, then the pump is air locked.

NOTE: Nameplate amperage is rated at the largest impeller diameter trim. Pumps with smaller diameter impellers will draw slightly less amps than nameplate. If pump is air locked, refer to the trouble check list section 4 in this manual. If pump does not run, check that the white, black and red pump power leads are properly connected to the terminals in the control panel marked "W", "BK" and "R".

Step 7

Float Adjustment for Simplex Systems:

Adjust floats so that the pump starts when the water level is just above the pump motor housing, and the pump shuts off when the water level is 2 inches above the pump volute discharge.

Float Adjustment for Duplex Systems:

Adjust floats so the lead pump will start when the water level is just above the motor housing. The lag pump start float should be 5 to 6 inches above the lead pump start float. Adjust pump shut-off so that water level is within 2 inches above pump volute discharge. Pumps should alternate starting, between each other, upon successive pump-down cycles. To check lag pump level, set both H-O-A switches to Off position and allow water to surpass the lag pump level, then set both H-O-A switches to Auto position and both pumps should start. Turn off one pump and be sure second pump starts when lag pump level is reached on second trial. If pumps fail to cycle in this manner, retrace control float wiring to panel.

Step 8

Ensure H-O-A switch(s) is set to Auto when system is placed into service.

Pump Troubleshooting

WARNING: Hazardous moving parts. To reduce risk of injury, disconnect power before servicing pump.

WARNING: To reduce risk of electric shock, pump is provided with grounding wire. Be certain that it is connected to ground.

WARNING: To reduce risk of electric shock, do not remove pump cord or strain relief.

The following list describes possible problems and possible solutions. Refer to the pump and panel installation and service manuals for details regarding any necessary adjusting, dismantling or repair work.

Pump Runs but Does Not Pump Down the Basin with the H-O-A Switch in Either Hand or Automatic Position.

1. *Cutters may be clogged.*
An amperage higher than the nameplate may indicate this problem.
2. *Discharge gate valve may be closed.*
3. *Pump may be air locked.*

Fill basin approximately 10 inches or more above the ball check valve assembly. Raise pump assembly so that the ball check valve disengages the discharge elbow (approximately 6 inches). Stand clear from the sump opening to avoid spray and turn pump on for a brief second to clear trapped air in the volute.

Pump Troubleshooting

4. *Clogging anywhere from cutters to check valve.* This is evident if no water is discharged out of the check valve after raising the pump to disconnect the sealing flange. Pull pump assembly and check for cause of clogging.
5. *Discharge head may be too high.* Check elevation against design point of pump.
6. *Clogging exists beyond the sealing flange.* This is evident if water is discharged through the check valve when raising the pump from the disconnect sealing flange. Inspect system basin piping or discharge piping from basin to locate clogging.

Basin Level Is Pumped Down with H-O-A on Switch Hand Position, but Is Not Pumped Down with H-O-A Switch on Automatic Position.

1. *Floats are not hanging free in the basin or are dirty.* Pump the level down with the H-O-A switch on Hand, so that the floats can be observed. Relocate and clean float(s) as necessary.
2. *If this is a new installation and original start-up, the floats may be miswired into the control panel.* If the On and Off float are reversed, the pump will short cycle on and off and will not pump the level down.
3. *Floats or alternator are malfunctioning.* Pull the floats out of the basin and hang the Off and On floats from your hand. Turn the H-O-A switch to Auto. Tilt the Off float so that the large end is above the cord

end – nothing should happen. While keeping the Off float tilted, tilt the On float in the same manner – the pump should come on. Suspend the On float again from your hand – the pump should continue to run. Finally, suspend the Off float – the pump should stop running. If this procedure does not cause the pump to operate as described, either replace the float(s) or replace the alternator relay if the system is duplex.

Seal Failure Light Comes On.

This may indicate that the lower seal has failed and has allowed water to enter the seal housing and made contact with the seal failure probe. Or this may indicate that a control circuit has become grounded. Check out all control circuit wiring for moisture. If this is not the case, then the pump must be pulled for maintenance. Refer to pump installation and service manual for replacing the lower seal.

Pump Run Light Stays On.

1. *H-O-A switch may be in Hand position.*
2. *Lower float may have failed causing the pump to continue operating below the Off level.*
3. *Pump may be air locked.*
4. *Cutters may be clogged.*

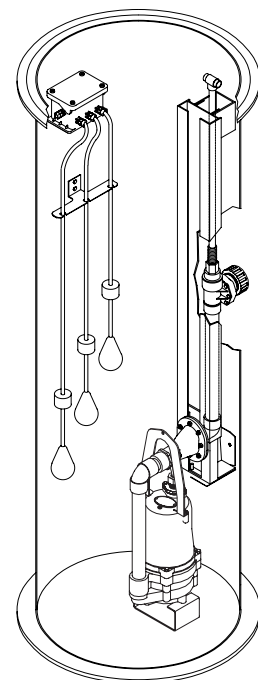
Circuit Breaker Trips When Pump Tries To Start.

1. *Short circuit in pump motor.*
2. *Water may have entered the motor housing through either worn-out mechanical seals or O-rings.*

3. *Start component(s) failure.* Check start capacitor and start relay for failure.
4. *Pump may be miswired to panel.* Check to ensure the white, black, and red pump power leads are connected correctly to panel.

Overload Trips, Is Manually Reset, and Then Trips Again.

1. *Cutters may be clogged.* It is possible that the pump stalled during operation, and starting and stopping cleared the cutters. If resetting the overloads solves this problem, return the H-O-A switch to Auto and observe operation.
2. *Pump motor may have failed.*
3. *Start component(s) failure.* Check start capacitor and start relay for failure.
4. *Pump may be miswired to panel.* Check to ensure the white, black, and red pump power leads are connected correctly to panel.



TRST Parts List

ORDERING REPLACEMENT PARTS: Product improvements are made from time to time. The latest part design will be furnished as long as it is interchangeable with the old part. When ordering replacement parts, always furnish the following information: (1) pump serial number, (2) pump model and size, (3) part description, (4) part number, (5) impeller diameter (if ordering impeller), (6) quantity required, and (7) shipping instructions.

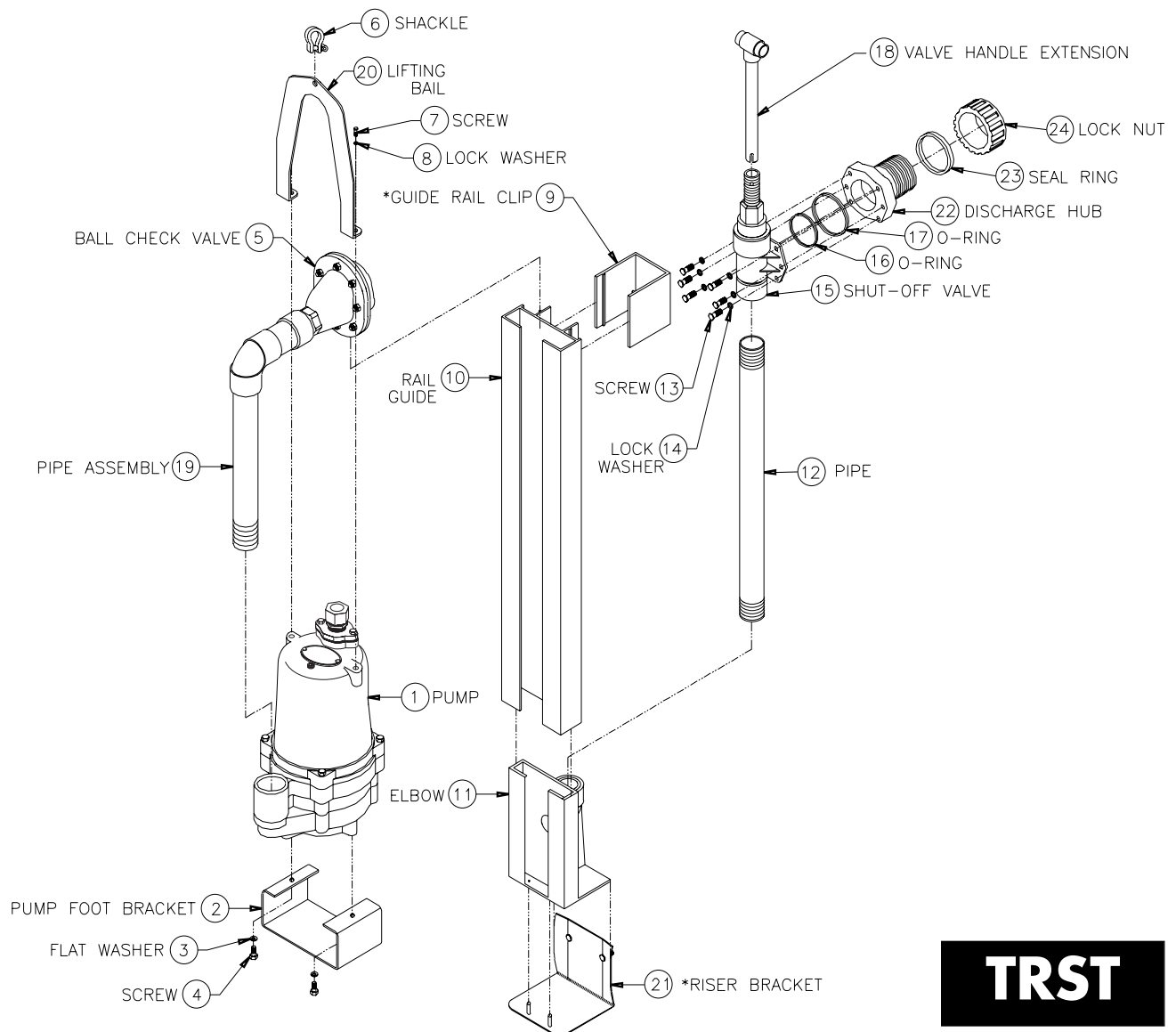
Ref. No.	Part No.	Part Description	Qty.
1	RTF	Pump	1
2	13712-001-3	Pump Foot Bracket	1
3	156-023-1	Flat Washer	1
4	101-022-1	Screw	2
5	12745-200-5	Ball Check Valve	1
6	11945-000-1	Shackle	1
7	176-005-1	Screw	2
8	177-004-1	Lock Washer	2
9	13325-100-3	*Guide Rail Clip	1

Ref. No.	Part No.	Part Description	Qty.
10	14068-XXX-3	Rail Guide	1
11	12720-101-1	Elbow	1
12	12331-XXX-3	Pipe	1
13	176-003-1	Screw	6
14	177-004-1	Lock Washer	6
15	12777-200-5	Shut-Off Valve	1
16	150-051-1	O-Ring	1
17	150-052-1	O-Ring	1
18	13294-XXX-5	Valve Handle Extension	1

Ref. No.	Part No.	Part Description	Qty.
19	12746-211-5	Pipe Assembly G1X/G1LX	1
*19	12746-225-5	Pipe Assembly HPG	1
20	14116-004-3	Lifting Bail	1
21	13578-000-5	*Riser Bracket	1
22	12726-001-1	Discharge Hub	1
23	14082-000-1	Seal Ring	1
24	14079-000-1	Lock Nut	1

* Refer to factory for 30" diameter duplex systems. XXX Part number changes per tank depth.

Notes: S — Parts in Seal Kit C — Parts in Carbide Seal Kit I — Parts in Impeller Kit R — Parts in Rebuild Kit *Consult Factory



TRST

WARRANTY

Hydromatic® warrants to the original purchaser of each Hydromatic product(s) that any part thereof that proves to be defective in material or workmanship within one year from date of installation or 18 months from manufacture date, whichever comes first, will be replaced at no charge with a new or remanufactured part, F.O.B. factory. Purchaser shall assume all responsibility and expense from removal, reinstallation and freight. Any item(s) designated as manufactured by others shall be covered only by the express warranty of the manufacturer thereof. This warranty does not apply to damage resulting from accident, alteration, design, misuse or abuse. The pump must be installed, operated and maintained in accordance with the published instructions of the appropriate Installation & Service Manual.

All dual seal non-clogs and 3–5 HP grinders must have seal failure and heat sensors attached and functional for Warranty to be in effect. If a seal failure should occur, Hydromatic will cover only the lower seal and labor thereof. Labor is based on Authorized Service Center contract allowance. If the heat sensor is not attached and functional, Warranty is void. If the seal failure sensor is not attached and functional, Warranty is void.

If the material furnished to the Buyer shall fail to conform to this contract or to any of the terms of this written warranty, Hydromatic shall replace such nonconforming material at the original point of delivery and shall furnish instruction for its disposition. Any transportation charges involved in such disposition shall be for the Buyer's account. The Buyer's exclusive and sole remedy on account or in respect of the furnishing of material that does not conform to this contract or to this written warranty, shall be to secure replacement thereof as aforesaid. Hydromatic shall not in any event be liable for the cost of any labor expended on any such material or for any incidental or consequential damages to anyone by reason of the fact that such material does not conform to this contract or to this written warranty.

ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED TO THE SAME EXTENT AS THE EXPRESS WARRANTY CONTAINED HEREIN. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

MANUFACTURER EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ARISING IN CONNECTION WITH THIS PRODUCT, INCLUDING WITHOUT LIMITATION, WHETHER IN TORT, NEGLIGENCE, STRICT LIABILITY CONTRACT OR OTHERWISE. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.



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