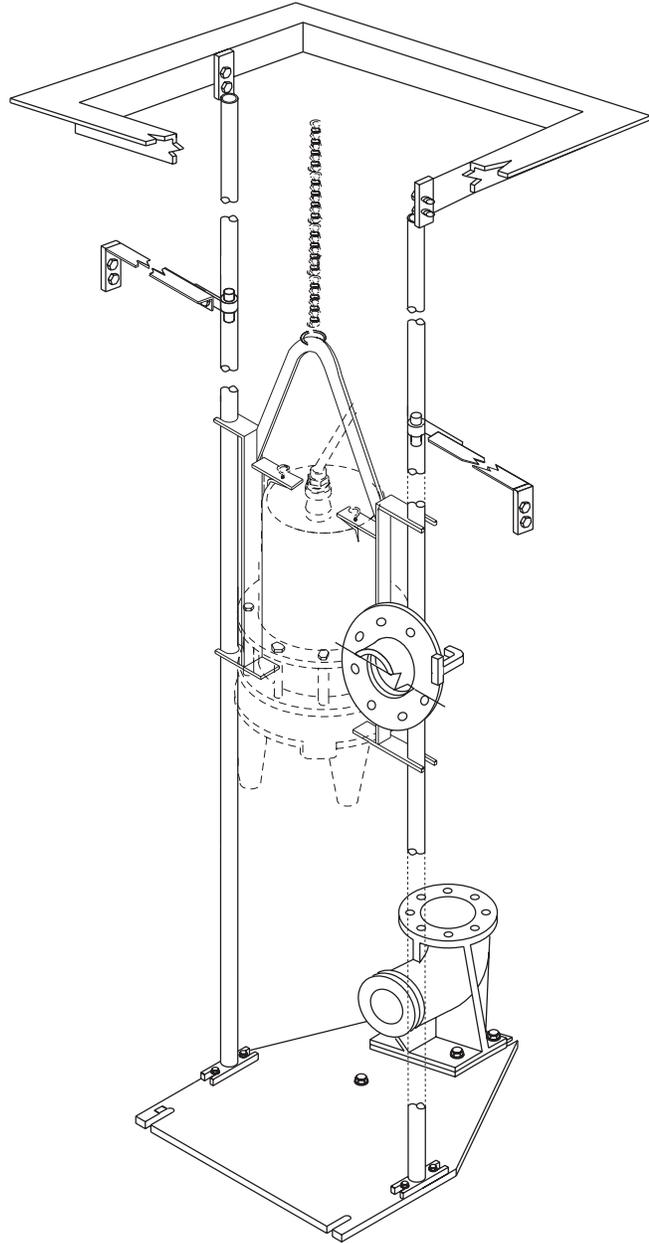




# HYDROMATIC®



# HYDR-O-RAIL SYSTEM

## INSTALLATION AND SERVICE MANUAL



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

# 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.**

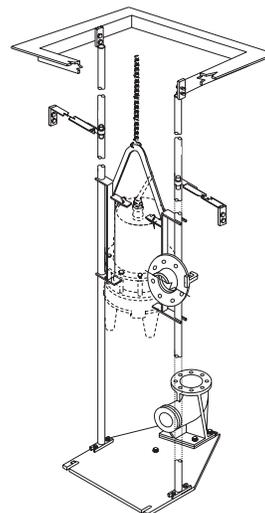
## CALIFORNIA PROPOSITION 65 WARNING:

**⚠ WARNING** This product and related accessories contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

## Systems Description:

In the Hydr-O-Rail System, the pump is raised and lowered in the basin on pipe rails. A unique, patented hydraulic sealing flange at the pump discharge allows the pump to be connected and removed from the discharge elbow with ease at any time without entering the wet well. There is no need to disconnect any piping or electrical connections to remove a pump for inspection or routine maintenance checks. A typical system will operate on float control switches. A bottom float control will turn off the pump(s). An additional float control per pump is then used to turn on the pump(s). In a multiple pump station, the pumps are automatically alternated if using a standard Hydromatic panel. Also, additional float controls may be used to indicate high and/or low water sump conditions.

<u>Simplex</u>	<u>Duplex</u>	<u>Triplex</u>
One pump	Two pumps	Three pumps
One discharge elbow/baseplate assembly	Two discharge elbow/baseplate assemblies	Three discharge elbow/baseplate assemblies
One hydraulic sealing flange	Two hydraulic sealing flanges	Three hydraulic sealing flanges
Two guide rails	Four guide rails	Six guide rails
One door & frame assembly	One door & frame assembly	Door & frame assembly
Electrical controls	Electrical controls	Four level controls
Two level controls	Three level controls	Four level controls



The hazardous location Hydr-O-Rail systems (optional) are designed for use with hazardous location pump models and intrinsically safe controls. The general equipment for a simplex, duplex and triplex system includes the following:

### **Pump Not Operating or in Storage:**

Pumps with carbon ceramic seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3 months or longer and prior to electrical start-up.

Pumps with tungsten carbide seals must have impellers manually rotated (6 revolutions) after setting non-operational for 3 weeks or longer and prior to electrical start-up.

## **Installation Instructions**

### **Codes:**

All codes must be observed. Consult the local inspector before installation to avoid costly delays. Hydromatic is not responsible for any expense incurred to meet local codes.

#### **1. Concrete Basin(s)**

Pour one or two concrete systems one for pumps and control, etc., and one for valves, if required or obtain pre-cast concrete rings. A 45 degree slope may be poured around the inside perimeter of the basin at the bottom to prevent solids buildup providing the slope does not interfere with the discharge elbow and pump locations. Before beginning the installation, please refer to "Installation Data," found in the Hydromatic

Engineered Catalog. Follow the Installation Drawing Data, taking into account the location of the discharge pipe, inlet pipe, controls, vent pipe, and the anchoring requirements of the baseplate assembly. (All of the above concrete work by others.)

#### **2. Discharge/Elbow Baseplate Installation**

See "Mounting Stud Location - Hydr-O-Rail System" illustration (Page 8) for the proper location of the discharge elbow/baseplate assembly on the basin bottom. Either cast 1/2" anchor bolts into sump bottom for pump baseplates with 1/2" nuts for securing, or drill holes for expansion lag screws to secure baseplate to sump bottom (furnished by others).

**NOTE: Each baseplate requires four anchors (furnished by others). Baseplates must be level.**

Before bolting the baseplates to the concrete sump, adjust the level with the baseplate leveling bolt and locknut located in the center of the plate. Use shims as necessary under appropriate mounting pad.

#### **3. Discharge Piping (all supplied by others)**

Install the discharge piping modules to the base plate discharge elbow using bolts, nuts, lock washers and gasket as required. Install the discharge piping which typically includes a vertical run of piping, sized to mate with the discharge elbow, a

90° elbow and a horizontal run of piping sized to mate with valve box piping or force main piping. The horizontal run of piping usually extends through the sidewall of the basin and should be grouted in place.

**NOTE: If using flanged connections be certain that adequate clearances are provided throughout for installation of bolts, nuts, lockwashers, and gaskets.**

If total run of vertical piping exceeds twelve (12) feet, install a piping brace at the approximate midpoint of the piping. Secure brace (i.e., U-bolt with angle iron strap and angle iron extensions) to both piping and wall of basin.

#### **4. Basin Cover(s)**

The basin cover for the sump and valve box can either be poured concrete or precast. If Hydromatic door and frame assemblies are used, locate the concrete openings with respect to the discharge elbow mounting studs per installation data. If the covers are poured, place the door and frame assembly inside the concrete form and position per installation data.

**NOTE: Provide a 5/8" x 4" cavity for guide rail clearance in sump concrete cover only.**

Anchor straps are provided on the door frames to secure them to the concrete. If precast covers are used, remove anchor straps from frame before installing into covers. Either cast four 3/8" anchor

bolts into the top of the precast cover or drill holes for expansion lag screws. Use either  $\frac{3}{8}$ " nuts or stainless steel bolts to secure door and frame assembly to cover. If valves are to be inside the wet well, provide accessways as required for the piping and valves to access piping shut-off valves (see installation data for general dimensions of the accessways). Accessways must be covered and secured with tamper-proof hardware (by others).

### 5. Guide Rail Installation

If Hydromatic doors and frame are not used, obtain suitable upper guide rail supports to locate and position the guide rails. If rails are longer than 15 feet, intermediate side rail guides must be installed at the approximate center of the rails. Cut the rails from standard galvanized steel pipe (furnished by others) to about half the total length of guide rail required. Check installation drawings for proper size. Insert intermediate side rail guides into tops of these pipes and slip pipes over round bar on baseplate. Cut the additional lengths of galvanized pipe to extend from intermediate guide to upper guide rail support. Remember to allow extra length so that rail will fit over upper, intermediate, and lower guide rail supports.

### 6. Intermediate Guide Rail Bracing

Sump depths of 15' and greater require intermediate guide rail bracing. The number of intermediate

guide rail braces required are as follows:

#### Sump Depths

15' – 30' 1 Intermediate Brace Required

30' – 45' 2 Intermediate Braces Required

Intermediate rail guides are supported from the size of the sump by either casting  $\frac{1}{2}$ " anchor bolts, with  $\frac{1}{2}$ " nuts for securing inside of sump or drill holes for expansion lag screws (all furnished by others). Insert round bar ends into upper and lower rails pipe. With the rails plumb and on correct center distance, drill  $\frac{9}{16}$ " holes in proper position and fasten rail guides to rail braces with screws, flat washers and nuts furnished by Hydromatic.

### 7. Exterior Piping

Install the inlet hub(s) in side of basin and install inlet piping in hub and grout, or install inlet pipe(s) directly into basin and grout. Install drain pipe from valve box (if required) to basin. Slope pipe to give proper drainage to basin. Install vent piping in side of basin (if required). Extend piping to a proper elevation above grade (as required by plans and specification and/or local codes). All piping furnished by others. See Installation Data for typical piping arrangement.

### 8. Pump and Sealing Flange

Assemble the Sealing Flange to the pump discharge flange

using a gasket between the two.

### 9. Pump Installation

Check all piping braces and supports for proper installation and tightness. Attach one end of the lifting cable or chain to the pump carrier and the other to a hook supplied on the inside hatch frame. Lower pump into the sump between the two guide rails. If clearance is not adequate to raise and lower the pump, adjust clearance by moving rails at top end or bottom. Pump discharge flange and hydraulic sealing flange lugs should slide over the discharge elbow flange. Clearance between the two should be no more than  $\frac{1}{8}$ ". Since the baseplate has been leveled when installed the discharge elbow and discharge piping should be similarly level. The heavy, neoprene rubber sealing diaphragm on the pump discharge should not touch the base discharge elbow flange when the pump is being installed or removed but not running. Its sole purpose is to flex, due to water pressure when the pump turns on, and form a leak-proof seal between the pump and discharge elbow. If the sealing diaphragm touches the discharge flange, or there is actual metal-to-metal contact between the faces, or the faces are not parallel, adjust the lower guide rail supports to obtain the  $\frac{1}{8}$ " clearance. The flexibility of the sealing

diaphragm will, in most cases, compensate for misalignment and incorrect clearance. It should, however, be checked and corrected.

## 10. Float Switches

Mount the float switch mounting bracket to the door and frame assembly using  $\frac{3}{8}$ " - 16 stainless steel screws. Include a dielectric gasket (by others) between dissimilar metals to avoid galvanic corrosion. Allow excess float cable to loop over mounting bracket. The sump level is controlled by Hydromatic float switch controls. The float is held in position in the sump by a weight attached to the power cord above the float. The cord supports the float and is adjusted for height from the surface. Simplex systems use two controls: one for pump off, one for pump on. Duplex systems use three controls: one at all pumps off, one set at one pump on, and one set for both pumps on. Triplex systems use four controls: one for all pumps off, one for lead pump on, one for lag pump on and one for standby pump on. Pumps alternate operation on each successive cycle with a Hydromatic Control Panel. The alarm level is usually set above the override level so the alarm will signal only if the override level is exceeded. However, some engineers prefer to have the alarm set below the override level as it is possible for one pump to

fail and the other to operate on the override level with the sump level never reaching the alarm level. Do not let floats rest against basin wall or bottom, or entangle with each other or pump(s).

## 11A. Control Panel on Mounting Stand

When the Control Panel mounting stand is used, either cast four  $\frac{1}{2}$ " anchor bolts into the concrete cover, or drill holes for expansion lag screws and attach stand (bolts or lag screws furnished by others). Bolt the panel to the panel stand. (Nuts, bolts, and washers are not supplied.) Make connections between the bottom of the control panel and the basin cover using flexible conduit and conduit seals (by others). When installing pump power cords, make certain that the cords do not rub against the pump or bottom of the basin. Shorten cords to suit the installation.

## 11B. Control Panel Mounted Remote from Basin

If the Control Panel is remotely located, instead of on the mounting stand at the basin, install coupling through basin wall. Screw protective bushing from inside basin into coupling (all furnished by others). Make connections outside the station using wiring, conduit seals (potted) and conduit to remotely located Control Panel (conduit and seals not furnished). Insert the power and sensor cords through

the coupling provided with bushing. Grout in coupling going through sump wall (by others). When installing pump power cords make certain that cords do not rub against pump or on bottom of basin. Shorten cords to suit the installation. See Manual item #H-03-000 or the "Installation and Service Manual" on the electrical Control Panel system.

### Electrical Connection:

Make all the connections in compliance with N.E.C. and/or local codes. Connect the control panel ground wire to a good ground. Ground wire must be grounded properly per N.E.C. and/or local codes. All electrical connections are to be made by qualified electricians.

**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 basin.**

## Pump Operations

See Pump Installation and Service Manual for submersible pump operation on starting system. Clean all trash and sticks from basin and connect pump to piping.

**Removing Pump from Basin for Servicing:**

**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 basin.**

## Pump Maintenance

To remove a pump from a standard installation (control panel mounted on basin cover), the power to the control panel is first turned off. Close the plug valve. Lift out the pump from the basin by means of the chain or cable. Disconnect the flexible conduit, power and sensor cords from the control panel terminals. Pull the pump cord down through the pipe coupling while holding the cord on the underside of the basin cover so the cords do not fall into the basin. For reinstalling the pump, reverse the above procedure.

### Removing Float Controls for Replacement:

To remove a float for replacement from a standard installation (control panel mounted on basin cover), the power is first turned off to the control panel. Disconnect the float leads from the terminals in the control panel. Disconnect the flexible conduit from the control panel. Remove the flexible conduit and the float control leads from the control panel. Pull the cord through the pipe coupling while holding the cords on the underside of the basin cover so the cords do not fall into the basin. Remove flexible conduit from potting head. Break out potting from the potting head and remove the float wire. Remove float cord from float cord mounting bracket and remove float from basin. Replace 3900 float by reversing removal

procedure. Repot the leads in the potting head according to N.E.C and/or local codes.

For the removal of the pumps and float controls from systems with the control panel mounted remote from basin cover, see the Pump Installation and Service Manual.

**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 basin.**

## Pump Troubleshooting

The following is a list of common problems and possible solutions. Refer to Pump Installation and Service Manual for any necessary adjusting, dismantling or repair work required on the pump.

For Control Panel troubleshooting chart, refer to Control Panel Installation and Service Manual.

**Pump runs but does not pump down the basin with the selector switch on either Hand or Automatic position.**

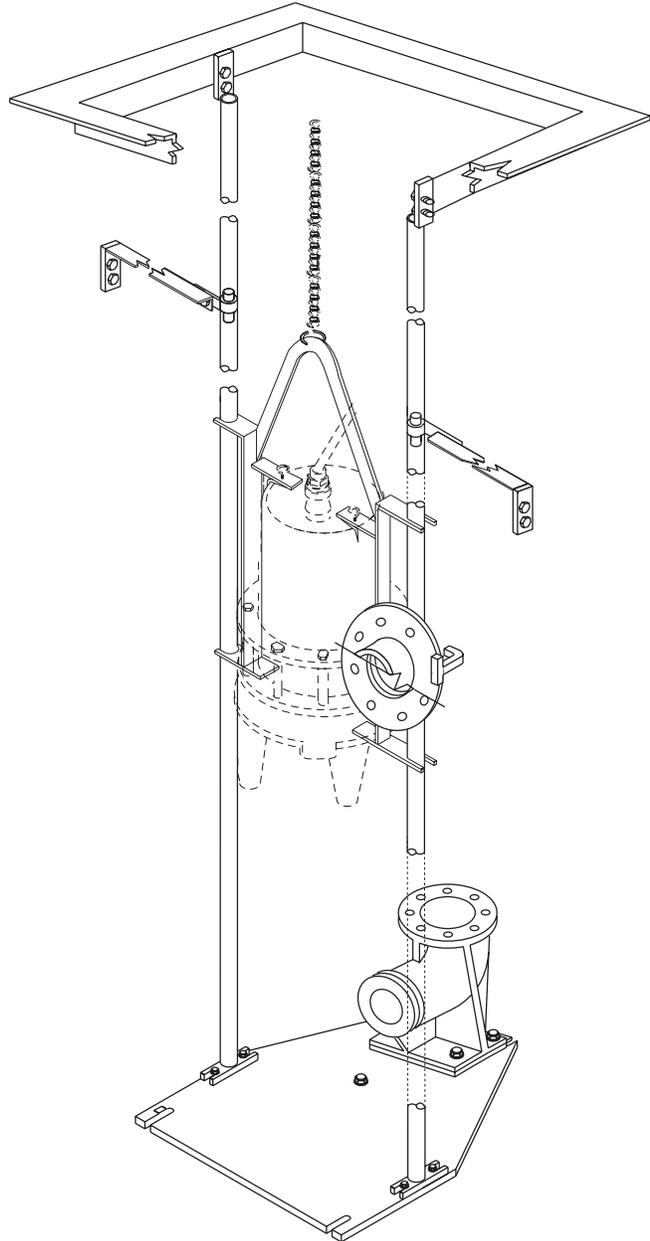
1. Impeller may be clogged. Amperage higher than nameplate will indicate this.
2. Pump rotation may be wrong. Reversing any two line leads on three phase pumps will reverse the rotation.
3. Discharge plug valve may be closed.
4. Plugging anywhere from impeller to sealing flange. This is evident if no water runs out of sealing flange after raising

the pump. Pull the pump from the basin to find the clog.

5. Plugging beyond the sealing flange. This is evident if water does run out when pump is operating when disconnecting the sealing flange from the discharge elbow. Remove the check valve, clean out cover and plug valve and other piping, if necessary, inside valve box to find clog. Reassemble all valves and piping. If the basin is still not pumped down after the pump is lowered again and the sealing flange is reconnected, proceed in a logical manner to locate and clear the plugging.
6. Discharge head may be too high. Check elevation against design point of pump.
7. Improper discharge flow. Check for correct impeller size and proper voltage.
8. Check for possible broken or clogged forced main.

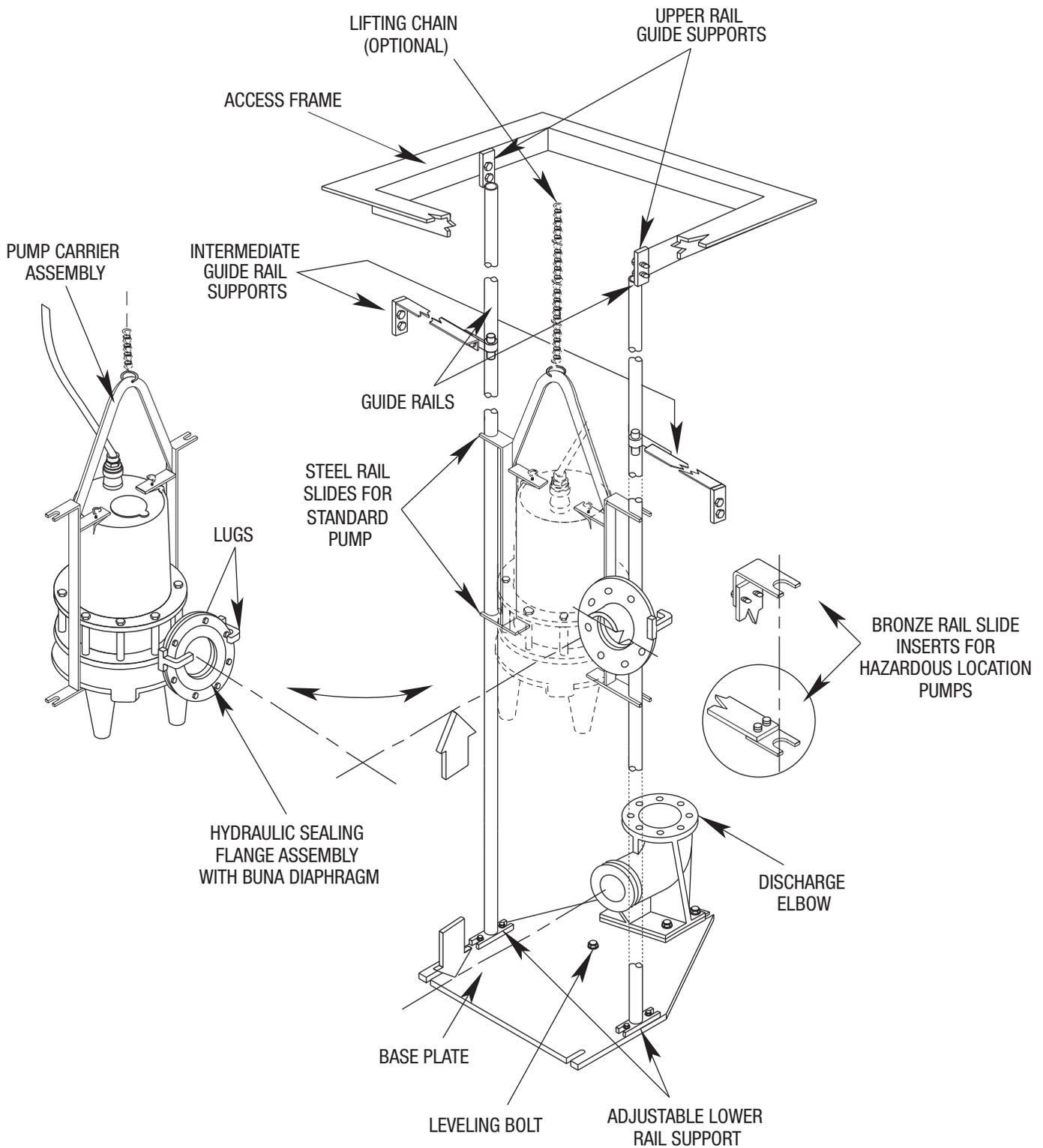
**Basin level is pumped down with selector switch on Hand position, but is not pumped down with selector switch on Automatic position.**

1. Floats are not hanging free in the basin or are covered with debris. Pump the level down with the selector switch on Hand, so that the floats can be observed. Relocate and clean all floats as necessary.
2. If this is a new installation and original start-up, the floats may be miswired into the control panel. Recheck the wiring diagrams and schematics in the panel. If the start and stop floats are hooked in reverse, 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, clean them and lay them on the ground. Lift up the stop (lower) float in the left hand, the start (upper) float in the right hand and with the bulbs hanging free, turn selector switch to Automatic. Lower the left hand until the float hits the ground and lies on its side. Nothing should happen. After lowering the right hand in the same manner, the pump should start. When raising the right hand to suspend the float, the pump should continue to run. The pump should stop when raising the left hand to suspend the float. If this procedure does not cause the pump to operate as described, either order new float switches or replace alternator relay.



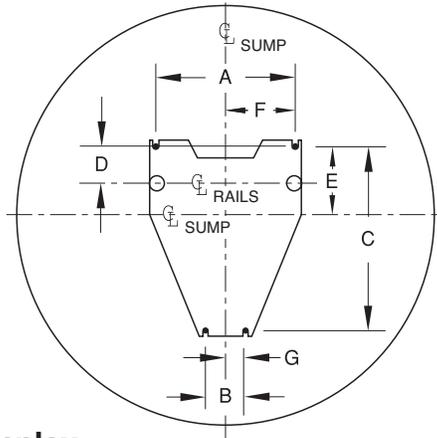
# HYDR-O-RAIL SYSTEM

## Instructions for Assembly

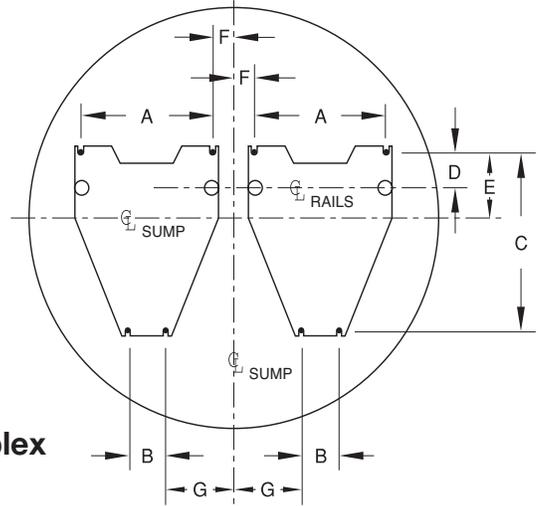


# HYDR-O-RAIL Mounting Stud Locations

NOTE: For a triplex installation maintain the same clearance distance between the base plates as the duplex installations.



**Simplex**



**Duplex**

Pump Discharge Size	A	B	C	D
3	13½"	3"	23⅜"	5"
* 4	23⅝"	6½"	30⅟ <sub>16</sub> "	8"
** 6	29⅞"	6½"	38⅟ <sub>16</sub> "	8"
8	29⅟ <sub>16</sub> "	16"	43½"	6"
12	36⅟ <sub>16</sub> "	29"	52⅟ <sub>32</sub> "	7"

## SIMPLEX

Pump Discharge Size	F	G
3	6¾"	1½"
* 4	11 <sup>21</sup> / <sub>32</sub> "	3¼"
** 6	14 <sup>15</sup> / <sub>16</sub> "	3¼"
8	14 <sup>27</sup> / <sub>32</sub> "	7"
12	18 <sup>1</sup> / <sub>32</sub> "	9"

## DUPLEX

Pump Discharge Size	F	G
3	4⅜"	9⅝"
* 4	1 <sup>15</sup> / <sub>32</sub> "	9⅞"
** 6	1 <sup>3</sup> / <sub>16</sub> "	12⅞"
8	3 <sup>9</sup> / <sub>32</sub> "	11⅟ <sub>8</sub> "
12	6 <sup>3</sup> / <sub>32</sub> "	15⅟ <sub>8</sub> "

Pump Discharge Size	Sump Dia.	E	
		Simplex	Duplex
3	4'- 0"	5"	NA
	4'- 6"	***	7¼"
* 4	4'- 0"	15½"	NA
	4'- 0"	15½"	NA
	5'- 0"	12½"	11½"
	5'- 6"	9½"	11½"
	6'- 0"	***	10"
	6'- 6"	***	6"
	7'- 0"	***	3"
** 6	5'- 6"	18"	NA
	6'- 0"	15"	NA
	6'- 6"	12"	NA
	7'- 0"	9"	17"
	7'- 6"	***	14"
	8'- 0"	***	10½"
	9'- 0"	***	4"
8	6'- 0"	20½"	NA
	6'- 6"	17½"	NA
	7'- 0"	14½"	NA
	7'- 6"	11½"	NA
	8'- 0"	***	19"
	9'- 0"	***	13"
	10'- 0"	***	7"
12	8'- 0"	26"	NA
	9'- 0"	20"	NA
	10'- 0"	14"	NA
	10'- 6"	***	19½"
	11'- 0"	8"	16½"
	11'- 6"	***	13½"
	12'- 0"	***	10½"
	12'- 6"	***	7½"
	13'- 0"	***	4½"
	13'- 6"	***	1½"

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## STANDARD LIMITED WARRANTY

Pentair Hydromatic® warrants its products against defects in material and workmanship for a period of 12 months from the date of shipment from Pentair Hydromatic or 18 months from the manufacturing date, whichever occurs first – provided that such products are used in compliance with the requirements of the Pentair Hydromatic catalog and technical manuals for use in pumping raw sewage, municipal wastewater or similar, abrasive-free, noncorrosive liquids.

During the warranty period and subject to the conditions set forth, Pentair Hydromatic, at its discretion, will repair or replace to the original user, the parts that prove defective in materials and workmanship. Pentair Hydromatic reserves the right to change or improve its products or any portions thereof without being obligated to provide such a change or improvement for prior sold and/or shipped units.

Start-up reports and electrical schematics may be required to support warranty claims. Submit at the time of start up through the Pentair Hydromatic website: <http://forms.pentairliterature.com/startupform/startupform.asp?type=h>. Warranty is effective only if Pentair Hydromatic authorized control panels are used. All seal fail and heat sensing devices must be hooked up, functional and monitored or this warranty will be void. Pentair Hydromatic will cover only the lower seal and labor thereof for all dual seal pumps. Under no circumstance will Pentair Hydromatic be responsible for the cost of field labor, travel expenses, rented equipment, removal/reinstallation costs or freight expenses to and from the factory or an authorized Pentair Hydromatic service facility.

This limited warranty will not apply: (a) to defects or malfunctions resulting from failure to properly install, operate or maintain the unit in accordance with the printed instructions provided; (b) to failures resulting from abuse, accident or negligence; (c) to normal maintenance services and parts used in connection with such service; (d) to units that are not installed in accordance with applicable local codes, ordinances and good trade practices; (e) if the unit is moved from its original installation location; (f) if unit is used for purposes other than for what it is designed and manufactured; (g) to any unit that has been repaired or altered by anyone other than Pentair Hydromatic or an authorized Pentair Hydromatic service provider; (h) to any unit that has been repaired using non factory specified/OEM parts.

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