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U.S. Fluid Tech Corp.

# OWNERS MANUAL

## HY-FLO Series

CAST IRON END SUCTION CENTRIFUGAL PUMPS

**IMPORTANT**

Read these instructions before installing your new pump



THIS MANUAL CONTAINS THE NECESSARY INSTRUCTIONS FOR THE PROPER ASSEMBLY, INSTALLATION AND MAINTENANCE OF THE PUMPS.

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HY-FLO SERIES CAST IRON END SUCTION CENTRIFUGAL PUMPS

# 1. UNPACKING THE EQUIPMENT

Check the contents of each box for missing items and for damage that may have occurred during shipment. Report any loss and damage at once.

# 2. PLANNING THE INSTALLATION


The pump should be located on a level firm foundation, putting it as near as possible to the level of the liquid that is to be pumped.


*Don't forget to read the engine manual, before starting the unit.*

## Pump location

Place the pump on a firm place that will absorb any vibration and provide a permanent and rigid support. This place should allow appropriate ventilation for the engine.

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## Suction and discharge hoses

The suction and discharge should have a male adapter to connect the hose quick couplings. The fittings should have the same diameter as the suction diameter.
Use Teflon tape to prevent leakage on the joins.

Connect the hose couplings to the suction and discharge fittings. Be sure to use strongly reinforced hose on the suction side. Tighten hose couplings firmly. Hose or pipes should be supported independently and not carried by the pump.

# 3. INSTALLATION

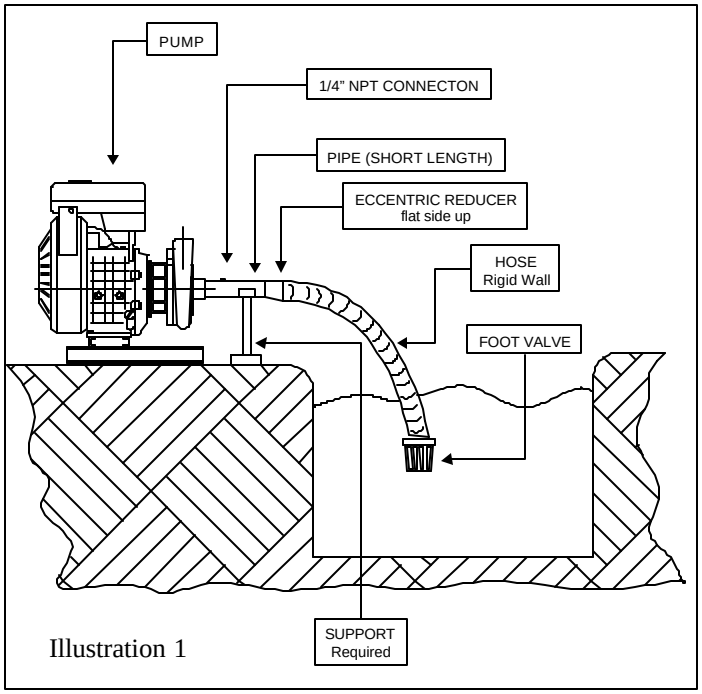



Illustration 1





## Connecting suction lift

### SUCTION CONNECTION

The suction hose must be kept free of air leaks, particularly when the suction line is long and the static suction is high. It is advisable to keep the suction hose short, setting the pump as near as possible to the liquid.


- ✓ *Use pipe, or reinforced hose to make suction connections. Hose must have sufficient strength to resist collapsing under the atmospheric pressure.*
- ✓ *The pump need strainer / foot valve. Use it to prevent solids from being drawn into the pump, and to maintain pump prime.*
- ✓ *Align properly pipes and fittings.*
- ✓ *Independently support pipes and fittings to reduce strain on the pump casing.*
- ✓ *Use Teflon tape on the joins to prevent leakage.*
- ✓ *Suction pipes, hoses or fittings should be at least one commercial pipe size larger that opening in pump inlet.*


- o Suction hose sloping downward to pump inlet will trap air which will reduce performance and may cause pump to lose priming.
- o Suction hose that is undersize will create excess friction losses that may cause cavitation and reduction of pump performance.
- o Excess fittings and bends in suction line results in trapped air, reduced performance and high friction losses.

## DISCHARGE CONNECTION

Refer to illustration No. 2 for discharge specifications.

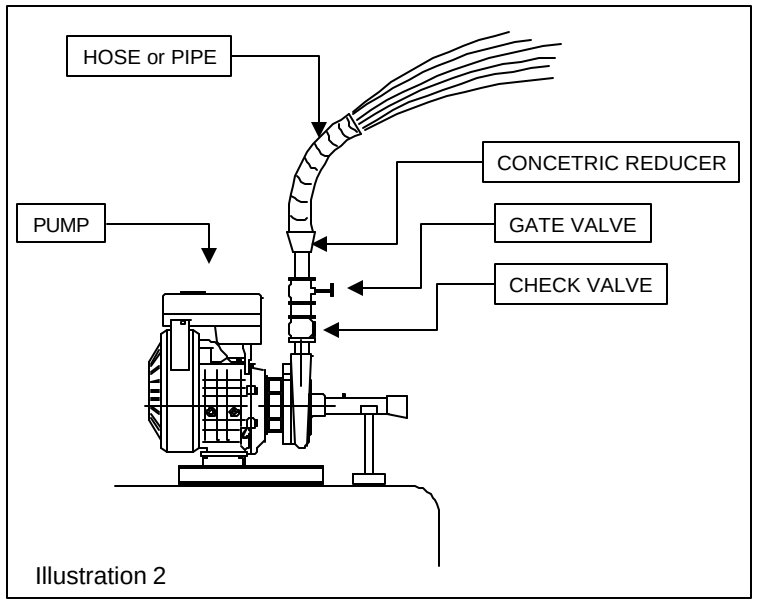



Illustration 2

- ✓ *For optimum pump performance the pump should be used with pipe, tubing or reinforced hose to make discharge connection. The hose must have sufficient strength to support the pump discharge pressure.*
- ✓ *Discharge pipe should have same diameter that pump discharge, or one nominal pipe size larger than discharge opening in pump.*
- ✓ *Maintain proper size throughout discharge system, using as few elbows and tees as possible to keep friction loss to a minimum.*





- o Avoid excess friction loss caused by numerous fittings, insufficient pipe diameter, and sharp turns in pipe run.
- o Some swing type check valves may permit build-up of reverse velocity before closing, causing hydraulic shock (water hammer).
- o Do no force pipe alignment that can cause flange stress.

## 4. PRIMING

The pump must be primed before starting. Follow the instructions given below:

- Remove the filling plug, fill the pump casing and suction pipe or hose with water completely to force all air out .
- Slowly rotate the shaft to allow any air trapped in the impeller to escape.
- When all air has been forced out of the pump and suction pipe or hose, replace the filling plug. Use pipe joint compound on plug threads and tighten as necessary to prevent leakage.

## 5. BEFORE STARTING

**CAUTION**

- *Do not operate the pump without liquid as serious damage could occur. Many pump components depend upon the liquid for lubrication.*
- *Consult the maintenance section of this manual for lubrication instructions before operating the pump.*

1. A strainer / foot valve should be attached to the suction hose or pipe to prevent large solids to damage the impeller. Keep the strainer / foot valve clean, and if possible, lift it away from the sediment.
2. Fill the engine crankcase with oil as specified in the engine manual.
3. Fill the fuel tank with regular gasoline.

### START UP

Start the engine, following instructions in the engine manual.

### RUNNING THE ENGINE

High suction lifts, require high engine speed and low lifts require lower engine speed. Therefore, on shallow lifts or when there is little liquid to pump, save fuel by reducing the engine's speed (See engine manual).





**CAUTION**

- *The engine must be filled with oil before starting don't forget to read*

## 6. STORAGE


Unscrew the drain plug to allow all the water in the pump to get out. Make sure the pump is empty before replacing the drain plug.

**Storage**: When pump is out of service for long periods, drain it and store in a dry, well ventilated room. Pull engine hard against compression so valves will be sealed (Never run pump dry for more than half a minute or shaft seal may be damaged).

Read the engine storage instructions in the engine manual.

## 7. MAINTENANCE

The Hy-Flo Series pumps are designed to operate efficiently for years, but like all other machinery, they require regular inspection and care.

The purpose of regular inspection and maintenance is to prevent breakdowns and to obtain the longest service life possible.

- This pump does not need external lubrication, because the internal parts are lubricated by the liquid that is being pumped.
- You should periodically inspect the complete installation to find any leaks, or other problems.
- You should clean the whole unit periodically.
- If you notice any internal noise, remove the casing to inspect the internal pump parts if you found any damage, you should consult immediately with the technical service.
- Protect engine against heat, dirt and moisture. Protect the engine from the sun, provide ample cross ventilation. Keep engine vents and surrounding area clean. Avoid sweeping or stirring up dust near the engine while it is running. Avoid storing (or spilling) pool chemicals near the engine. Provide protection from rain, snow, lawn sprinklers etc. Avoid splashing water near the engine.





## 8. TROUBLESHOOTING

If difficulties are experienced, in the majority of cases they can be traced to well-known causes.

We suggest you check these points first to save needless expense.

*If the pump fails to prime*:

- Make sure that pump casing and suction pipe or hose are full of cool liquid.
- Examine suction hose or pipe connections. Air leaks in the suction line and connections to pump are the most frequent causes of priming trouble. Use new gasket in hose coupling. New couplings sometimes require two gaskets. Hose lining may also become loose and clog the hose.
- Be sure screen foot valve is not clogged, there are no parts or valves to become clogged or out of adjustment.
- The only requirement is that the pump and suction pipe or hose are full of liquid.
- Keep your pump unit clean and properly serviced. Care in this respect will repay in many years of trouble-free operation.

## 9. ASSEMBLY PROCESS

- **BEFORE ASSEMBLING (only for pump ends).**

1. Check that engine flange and shaft measures are in accordance with diameter and threaded shaft.
2. All units are partially assembled. In the box there are bags with the necessary screws and accessories to complete the assembly.
3. When opening the box be sure that the parts do not show evidence of damage during transportation.
4. After unpacking the units, all the parts should be placed on a smooth, dry and clean surface.
5. Read carefully all instructions given below before assembling the unit.

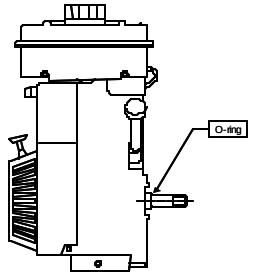
- **ALL MODELS**

1. Place the engine (1) with the shaft facing up vertically. Clean the matching surfaces. Clean the engine shaft and coat its surface with a small amount of grease.
2. Put the water slinger (2) on the shaft as close as possible to the engine oil seal.
3. Place the ceramic part of the mechanical seal (6) on the back plate so that the white shiny surface is visible. To make this operation easier, put oil in the elastic ring of the seal. Do not hit or damage in any way the ceramic part of the seal. Insert the seal using finger pressure only.



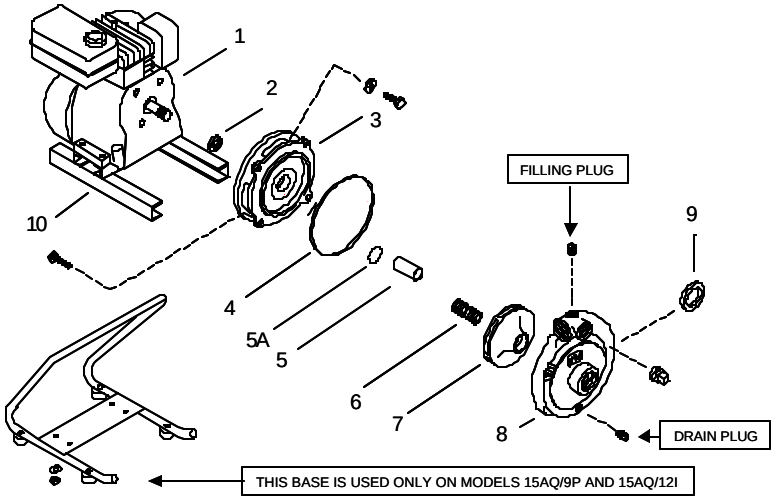


4. Stretch the O-ring (5A) and place it on the engine shaft. as shown in the picture below:




5. Place the back plate (3) on the engine, checking a close fit between the back plate and engine flange. Before fixing the parts, be sure that the position of the back plate is correct with the nameplate place up.
6. Tighten the screws locker washers on, to fix the back plate to the engine flange. Tighten the screws well and evenly in an “X” sequence.
7. Clean the shaft sleeve surface (5). Place the rotating part of the mechanical seal (6), on the shaft sleeve. To make this operation easier, put oil in the elastic ring of the mechanical seal.
8. Then, put this assembly (Shaft sleeve-Rotating part) on the engine shaft. Check for a close fit between the white shiny surface of the ceramic part and the carbon ring of the mechanical seal.
9. Fit the impeller (7) on the shaft, with a clockwise rotation and be sure that the impeller is screwed up to the shaft sleeve.
10. After cleaning the surfaces thoroughly, place the gasket (4) in the back plate.
11. Place the casing (8) on the back plate.
12. Tighten the casing with the washers and screws provided. Tighten the screws well and evenly in an “X” sequence.
13. Place the drain and filling plugs.

# 10. PARTS LIST




| PARTS LIST | | | | | | | |
|---|---|---|---|---|---|---|---|
| ITEM No | DESCRIPTION | MODEL | | | | | |
| | | 15AQ/9P | 15AQ/12I | 20AG/20I | 30AG/18V | 30AG/24V | 40AG/24V |
| 1 | ENGINE | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | WATER SLINGER | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | BACK PLATE | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | BACK PLATE GASKET | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | SHAFT SLEEVE | 1 | 1 | 1 | 1 | 1 | 1 |
| 5A | O-RING | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | MECHANICAL SEAL | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | IMPELLER | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | CASING | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | WEAR RING | | | 1 | 1 | 1 | 1 |
| 10 | BASE | 1 | 1 | 1 | 1 | 1 | 1 |

The serial number located on the pump's nameplate, identifies the pump's model and is required for reference when ordering spare parts.



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