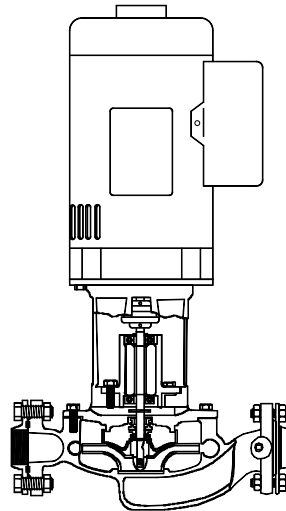


**OPERATION & MAINTENANCE INFORMATION
FOR
MODEL HVGT & HVGTB IN-LINE CENTRIFUGAL PUMPS**



MODEL HVGT & HVGTB

The Thrush In-Line Centrifugal Pump has been carefully assembled and factory tested to provide years of trouble-free service. In order to assure the service intended, the following information is provided to enable proper installation, operation and maintenance of the HVGT / HVGTB pump. The Thrush HVGT/HVGTB pump uses standard GTB replacement parts for easy parts replacement. The motor and bearing assembly have sealed ball bearings and never have to be oiled or greased. The motor is also resilient mounted for reliable quiet operation. The pump comes with the standard Type 21 seal, stainless steel shaft and external water slinger for added bearing assembly life in case of seal failure.

INSTALLATION

LOCATION

The pumps should be located as close to the liquid source as possible so that the suction line can be short and direct. It should be located in a clean, open area, where it is easily accessible for inspection, lubrication and repair. Pumps installed in dark, dirty areas or in cramped locations are often neglected which can result in premature failure of both the pump and the drive.

Adequate provisions should be made for electrical wiring to the pump motor. A switch and overload protection should be installed near the pump. The flexible electrical conduit should be used in connecting motor wiring.

MOUNTING

Thrush In-Line pumps conserve floor space, simplify piping and can be serviced without disconnecting piping. The proper installation of these pumps is to install them as a part of the piping. The pumps must be free to travel with the expansion and contraction of the piping. In-line installation eliminates the problems normally encountered in aligning piping to a base mounted unit.

SUPPORT OF THE HVGT SERIES PUMPS SHOULD ALWAYS BE CONNECTED TO THE PIPING RATHER THAN TO THE PUMP CASING. The line-mounted feature eliminates the need for installing flexible pipe connectors at either the pump suction or discharge. Isolating valves should be installed at both the pump suction and discharge to permit servicing of the pump without draining the entire system. Make certain the space around the pump is sufficient to give clearance for removing the pump assembly from the casing. Also the space around the pump should be large enough for general accessibility and ventilation. The same criteria and formula for selecting piping supports are used with the additional consideration that the weight of the pump is concentrated at one point in the piping.

PIPING

The piping practices you follow will directly affect the efficiency and power consumption of your pump. Pay particular attention to the seemingly insignificant details involved in piping for they make the difference between a good and bad installation. **BOTH THE SUCTION AND THE DISCHARGE PIPING SHOULD BE INDEPENDENTLY SUPPORTED NEAR THE PUMP. LIBERAL USE OF PIPE HANGERS AND SUPPORT BLOCKS WILL PREVENT EXCESSIVE STRAIN ON THE PUMP CASING AND ON THE PIPE JOINTS.** The suction diameter should be at least the same diameter as the suction nozzle on the pump and preferably larger. All joints must be tight to maintain prime on the pump.

SUCTION PIPING

Long radius elbows should be used in place of standard elbows wherever possible, because of their superior flow characteristics. Elbows installed in any position at the suction nozzle have a tendency to distribute the liquid unevenly in the impeller eye and may cause a reduction in capacity which creates an undesirable thrust condition or create noisy operation. Eccentric reducers should be installed directly at the suction nozzle, with the taper at the bottom to prevent air pockets from forming. Straight taper reducers should never be used in a horizontal suction line because of the air pocket that is formed at the leg of the reducer and the pipe.

DISCHARGE PIPING

The discharge piping diameter should be the same as, or larger than, the discharge nozzle diameter. The size of the discharge pipe to be used is dependent upon its application.

PROPER PIPING ALIGNMENT IS ESSENTIAL BEFORE CONNECTION IS MADE. PIPING ALIGNMENT SHOULD NEVER BE ACHIEVED BY FORCE, THIS COULD PRODUCE STRAIN ON THE PIPING AND THE PUMP CASING. NOTE: Centrifugal pumps should never be started or run dry. Operating a pump dry will cause scoring of the mechanical seals, resulting in premature seal failure. To prevent the pump from being run dry, it should be primed before starting.

PRIMING THE PUMP

The pump will not operate satisfactorily until it is primed. All air must be expelled from the suction piping and pump casing and replaced by the liquid to be pumped. There are several methods of priming pumps. The one selected will depend on the specific requirements.

FLOODED SUCTION PRIMING

This method of priming a pump is relatively simple. The liquid source is located above the pump and all that is necessary to prime the pump is to open the air vent valve or plug in the pump casing and to crack the isolating valve in the suction line. The suction line and pump should be filled slowly until a steady stream of liquid is observed flowing from the air vent. After the pump is operating, it is recommended that the air vent valve or plug be opened again to insure that all air has been expelled from the pump casing.

STARTING THE PUMP

The discharge isolating valve should be partially closed when the pump is started in order to avoid possible water hammer and initial power draw. As soon as the pump is up to operating speed, the discharge isolating valve should be opened to the desired position. The motor should turn clockwise when viewed from the motor end and counter-clockwise when viewed from the casing end.

LUBRICATION

The bracket is permanently lubricated and will never need oil. The standard motors have sleeve bearings and need to be oiled every 3 months with SAE#20 non-detergent oil. If the option for a ball bearing motor was selected, the motor is permanently lubricated.

MAINTENANCE AND SERVICE

SEAL REPLACEMENT

1. It is unnecessary to disconnect piping or casing to service GT Series or the MP pumps. All service and maintenance can be performed by removing pump assembly from casing.
2. Disconnect wiring to the motor
3. Remove casing bolts connecting casing (2) and bracket (5) and entire pump assembly can be withdrawn from casing.
4. Remove impeller acorn nut by turning it counter-clockwise. Pull off the impeller by wedging around its periphery and slip out the impeller key from its shaft groove.
5. Slide spring-loaded carbon rotating face off impeller shaft
6. Remove seal seat and O-ring from bracket. Clean seal cavity if required.
7. Press new seal seat into seal seat cavity.
8. Install new rotating seal assembly.
9. Insert key into shaft keyway.
10. Install impeller on shaft and tighten acorn nut securely.
11. Remove old casing gasket and clean off any pieces that may have been broken off on the casing. Put new gasket on pump casing.
12. Lower pump assembly into casing. Use caution to properly align impeller into casing so that
13. Re-connect motor wiring. Check motor rotation to insure proper operation.

MOTOR REPLACEMENT

1. Disconnect wiring.
2. Loosen coupling (10) at impeller shaft
3. Loosen motor cradle and slide apart.
4. Remove coupling and place on new motor shaft.
5. Tighten motor bolts.
6. Fit flexible sleeve into coupling flanges and tighten to shaft.

CARTRIDGE REPLACEMENT

1. Shut off power to motor and disconnect wiring to motor.
2. Close shut off valves on suction and discharge of pump.
3. Loosen coupling on pump shaft.
4. Remove motor and cradle assembly from bracket. It is not necessary to remove motor from cradle.
5. Remove eight screws holding bracket to body and remove bracket from pump body.
6. Remove impeller nut then remove impeller and key from shaft.
7. Remove seal assembly from shaft per seal replacement instruction.
8. Remove cartridge bolts that fasten bearing cartridge to bracket, remove cartridge, and replace with new cartridge bearing assembly.
9. Re-install seal per instructions, install impeller, key and tighten impeller nut.
10. Replace gasket if necessary; bolt bracket to pump body, re-attach motor and cradle to bracket.
11. Align and tighten coupling.