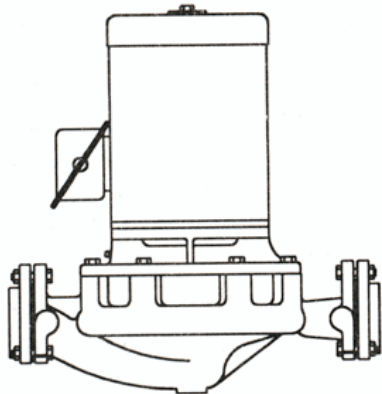
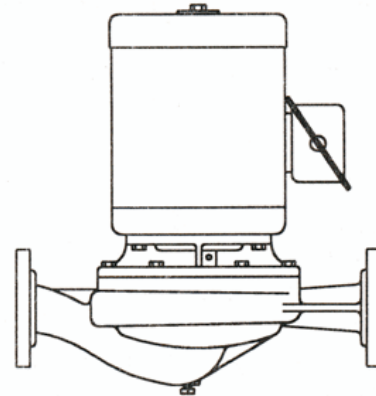




OPERATING & MAINTENANCE INFORMATION FOR MODEL GTV, TVB & OLD STYLE TV IN-LINE CENTRIFUGAL PUMPS



GTV



TVB & OLD STYLE TV

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 driver.

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, simplifies piping and can be serviced without disconnecting piping. They are designed to be installed in either the vertical or horizontal position. The proper installation of these pumps is to install them as 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 bas mounted unit. **SUPPORT OF THE GTV, TVB, AND OLD STYLE TV 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 above the pump is sufficient to give clearance for lifting 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 followed will directly affect the efficiency and power consumption of the 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 THE 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, preferably larger. Use of a smaller diameter pipe will result in loss of head due to friction. 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 pipe 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. PROPER SUPPORTS SHOULD BE INSTALLED FOR THE PIPING TO KEEP ITS WEIGHT OFF THE PUMP CASING.

NOTE: Centrifugal pumps should never be started dry 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. (See Figure 1-A) The liquid source is located above the pump and all that is necessary to prime the pump is to open the air vent or plug in the pump casing and to crack the isolating valve in a 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.

SUCTION LIFT

A foot valve should be used for priming on suction lift applications. (See Figure 1-B) The foot valve (located at the bottom end or foot of the suction piping) functions as a check valve that allows flow in one direction only, toward the pump. Otherwise, all the liquid may drain from the pump and suction piping into the sump after shutdown.

Initial priming is accomplished by completely filling the suction piping and pump casing with the liquid to be pumped. This can be done by removing the air vent valve or plug at the top of the pump casing, and inserting a pipe nipple in the orifice with an appropriate increaser to accommodate a hose connection. A priming line can also be inserted in the discharge piping between the check valve and the pump, or the priming can be done with a bucket and funnel. The important thing is to completely fill the suction pipe and pump casing with liquid. When the pump is started, the vacuum created by pumping the liquid from its source, forces liquid into the suction piping, thus opening the valve and keeping it open until the pump is shut down. When the pump is shut down, the liquid being pumped reverses its flow causing the valve to close. The liquid is now trapped in the suction piping and pump casing, thus maintaining a prime on the pump.

VACUUM PRIMING

Vacuum priming consists of removing air from the pump casing and suction piping and drawing liquid into them by means of a vacuum-creating device. The types of vacuum equipment range from a simple hand pump to a complex central priming system. The specific priming requirements will govern what type of vacuum primer used.

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.

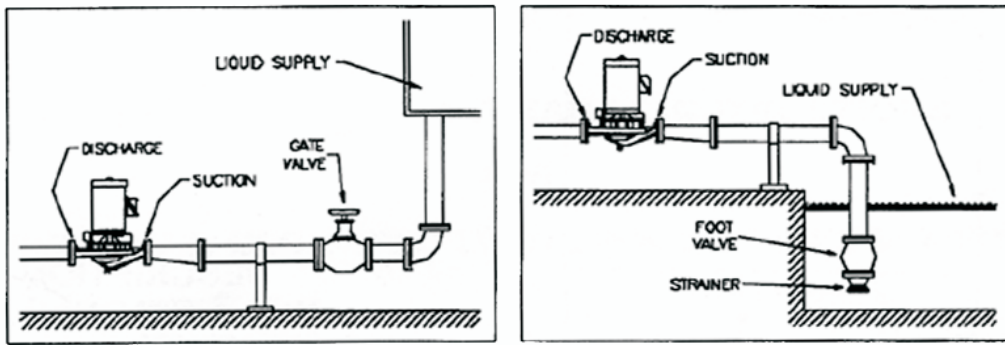


Figure 1 - A & B

MAINTENANCE AND SERVICE

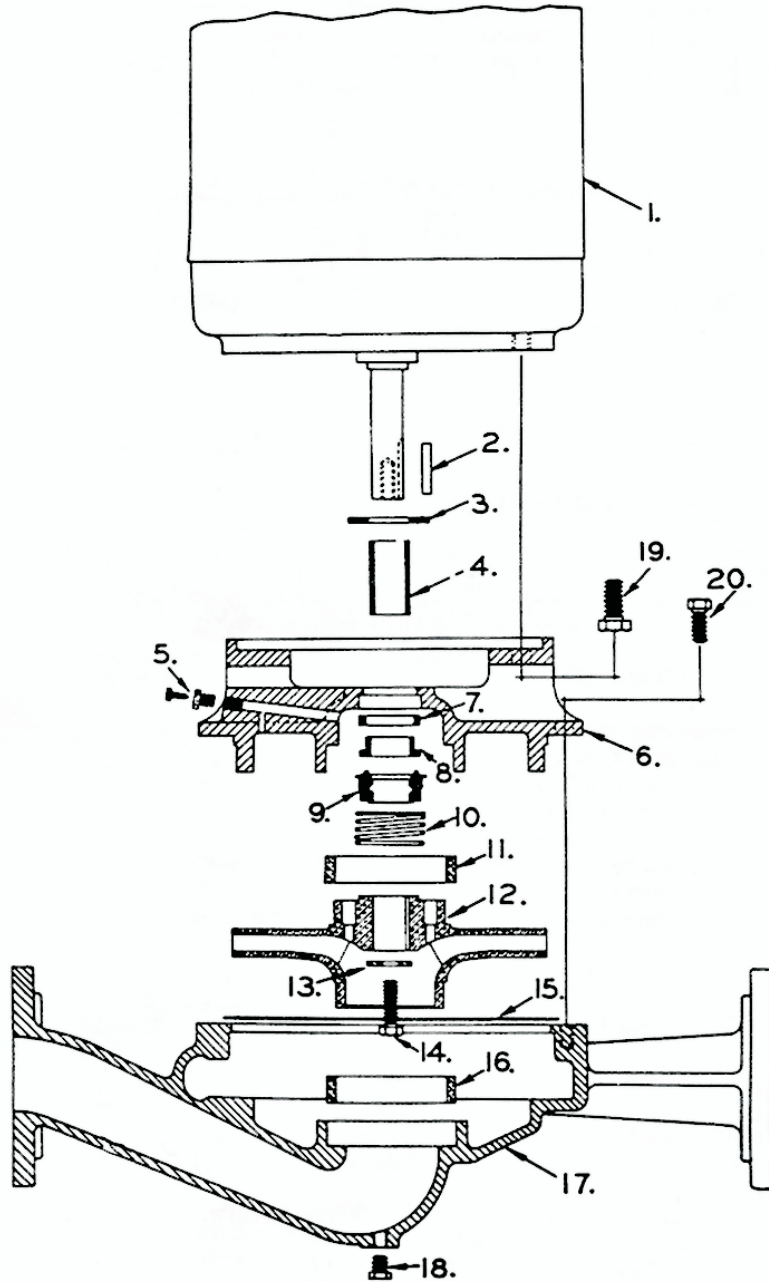
PUMP DIS-ASSEMBLY

1. It is unnecessary to disconnect piping or casing to service GTV, TVB, and Old Style TV Series pumps. All service and maintenance can be performed by removing pump assembly from casing.
2. Disconnect wiring to the motor.
3. Remove bolts (20), connecting casing (17) and adapter (6) and entire pump assembly can be withdrawn from casing by lifting the motor.
4. Remove impeller bolt (14) 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 (9 & 10) off impeller shaft.
6. Remove seal seat (8) and O-ring (7) from bracket. Clean seal cavity if required.
7. Inspect shaft sleeve (4) for damage. Replace if necessary.
8. The GTV, TVB, and Old Style TV shaft sleeve is a sweat fit to the motor shaft. To remove existing sleeve, heat with torch until sleeve can be slid easily off the motor shaft. The same procedure is used to install a new sleeve. Heat new sleeve until it slides on motor shaft. Allow cooling before installing new seal.

PUMP RE-ASSEMBLY

1. Lightly lubricate seal O-ring (7) with water-soluble soap and press stationary seal assembly into adapter (6). (Do not use oil or grease).
2. Slide seal assembly (9 & 10) onto shaft sleeve. Lubricate bellows with water-soluble soap.
3. Replace impeller key (2) in shaft groove.
4. Replace impeller cap screw and tighten by turning clockwise
5. Remove old casing and adapter gasket and clean off any pieces that may have been broken off on the casing. Put new gasket on adapter.
6. Lower pump assembly into casing. Use caution to properly align impeller into casing so that it will be damaged. Tighten up cap screws evenly and in rotation.
7. Fill pump casing with water and vent all air by loosening air vent plug (5).
8. Re-connect motor rewiring. Check motor rotation to insure proper operation. The motor should turn clockwise when viewed from the motor end and counter-clockwise when viewed from the casing end.

PARTS LIST FOR GTV, TVB & OLD STYLE TV MODEL PUMPS



DESCRIPTION

1. Motor, 1750 RPM, Type TV
2. Motor Shaft Key
3. Water Slinger (part of motor)
4. Bronze Motor Shaft Sleeve
5. Air Vent Plug
6. Adapter/bracket
7. O-Ring
8. Ni-Resist Seal
9. Carbon Seal Assembly
10. Stainless Steel Seal Spring
11. Bronze Wear Ring (Optional)
12. Closed Bronze Impeller
13. Impeller Washer
14. Impeller Bolt
15. Casing Gasket
16. Bronze Wear Ring (Optional)
17. Casing
18. Drain Plug
19. Motor Bolt (4)
20. Casing Bolt (8)

*Check with factory for availability of parts.