
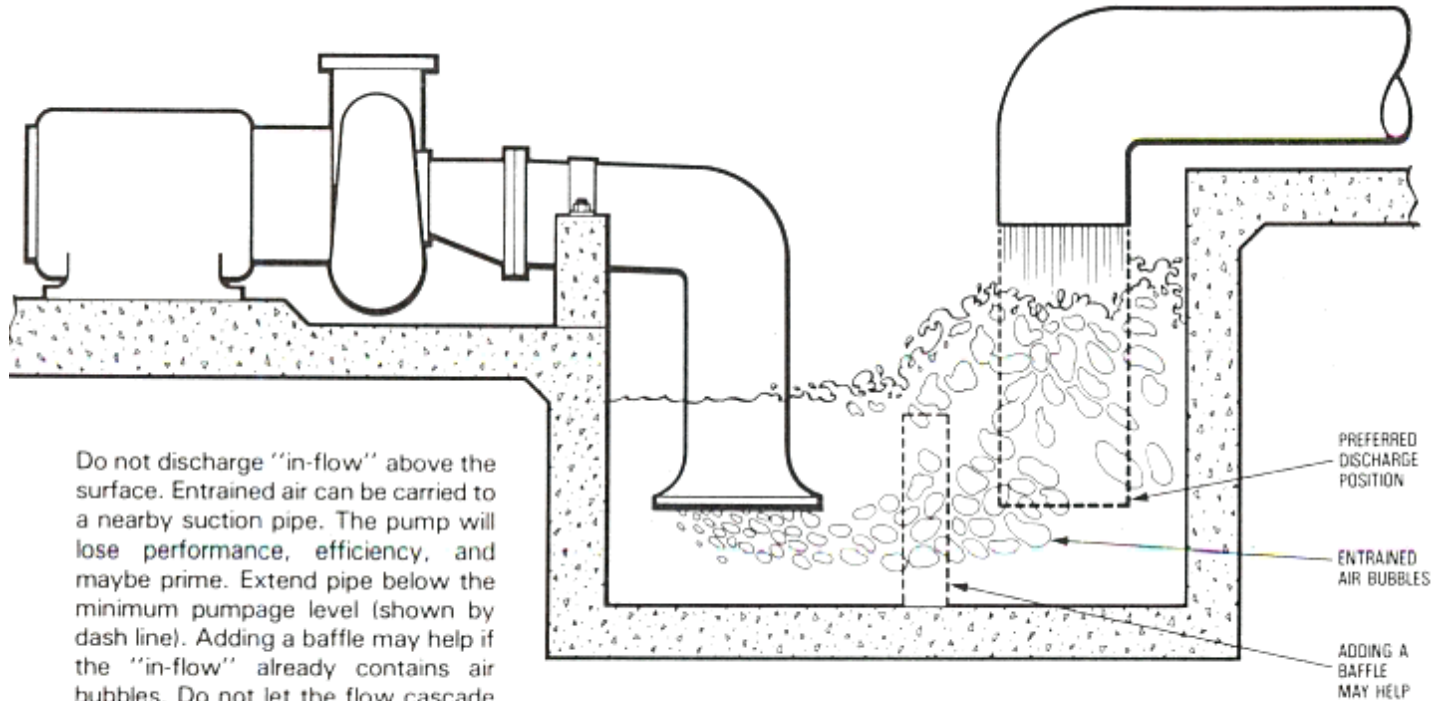


Start-up Checklist cont'd

- Does the impeller / shaft rotate freely?
- Is pump primed?
- Verify that rotational direction is correct for pump by **VERY** short “on-off” of power source.
- Slowly open discharge valve to obtain desired flow rate of pumping system.

 Do not start pump until above checks have been made and all start-up instructions in the pump I.O.M. have been complied with. Failure to do so may result in severe damage to equipment, cause personal injury, and may void warranty.

Air Entrainment



Do not discharge "in-flow" above the surface. Entrained air can be carried to a nearby suction pipe. The pump will lose performance, efficiency, and maybe prime. Extend pipe below the minimum pumpage level (shown by dash line). Adding a baffle may help if the "in-flow" already contains air bubbles. Do not let the flow cascade over the baffle.

Submergence

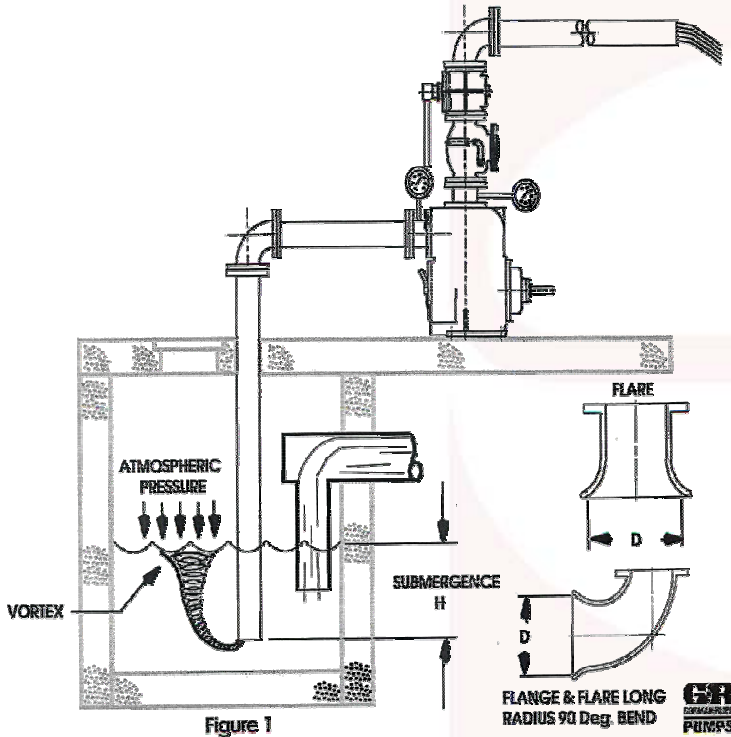
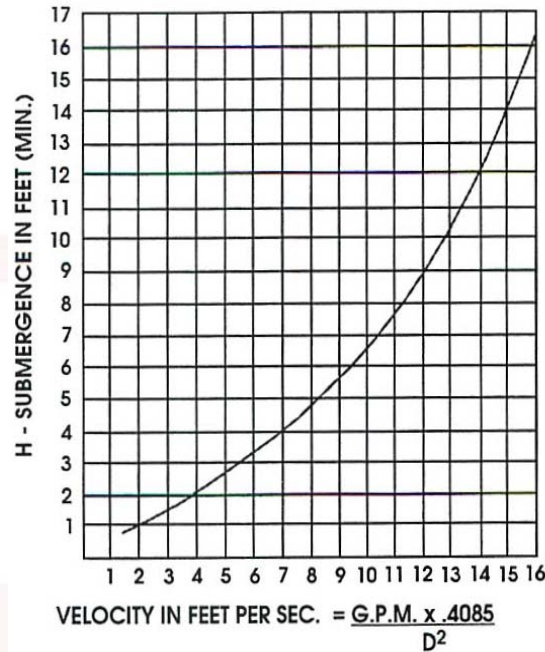


CHART OF RECOMMENDED MINIMUM SUBMERGENCE VS. VELOCITY



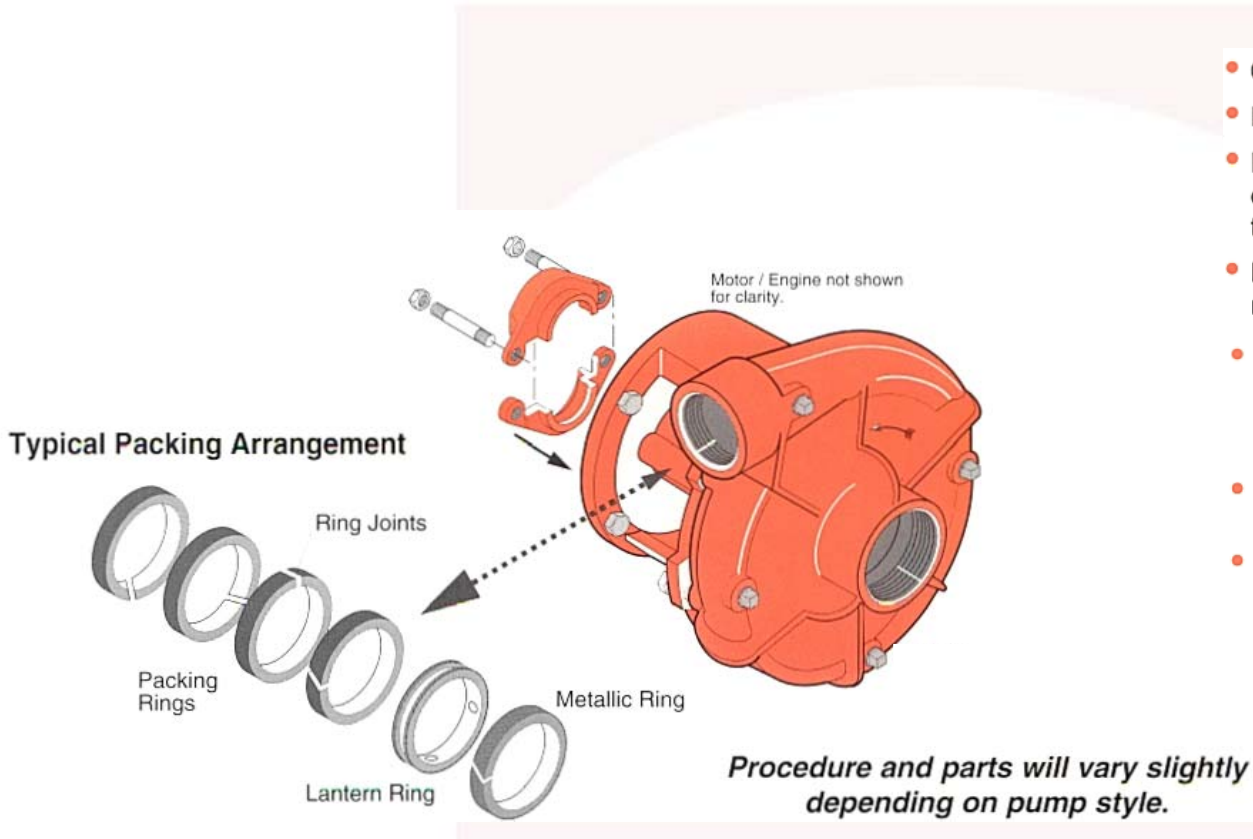
Inadequate submergence will lead to vortex formation. In extreme cases, the vortex tail will trail from suction inlet permitting air entry into the pump suction see Figure 1.

Entrained air in pumped liquid will cause a reduction in pump delivery. Noisy operation and vibration usually accompanies this condition. Broken impeller shafts may occur in extreme cases due to uneven loading of impeller. Motor loads may be decreased.

Well developed vortices are visible on the surface. However, just because they cannot be seen does not mean that this condition cannot be present and affecting the pump performance.

Where 'D' is in inches

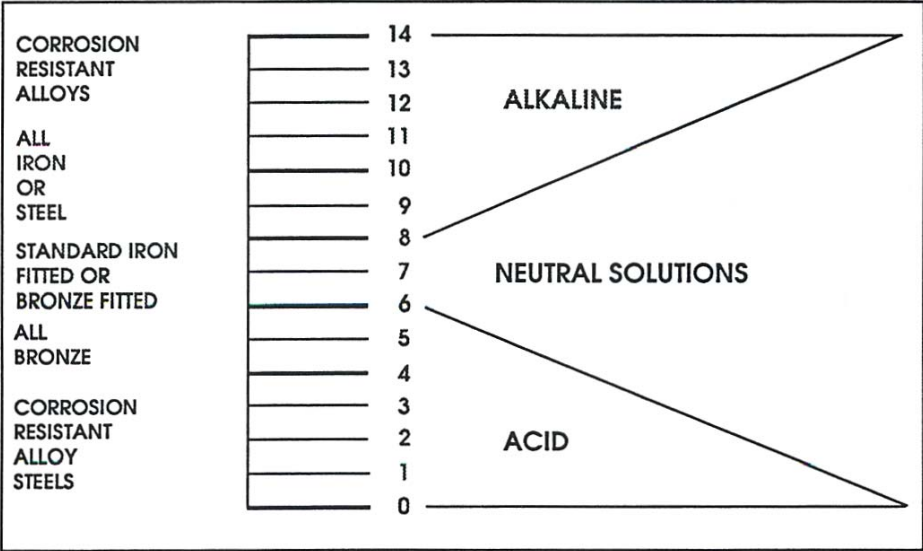
Installing New Packing



- Clean shaft sleeve and Packing Gland.
- Inspect shaft sleeve for wear, replace if needed.
- Install new packing rings in stuffing box by placing over shaft sleeve and pushing them in as far as they will go.
- Rotate ring joint 90 degrees when installing each ring as shown.
- Slide packing gland into position, then gently and evenly tighten nuts to force rings into place and seat (do not overtighten). Loosen nuts again to hand tight.
- Start primed pump and allow packing to leak liberally.
- Evenly tighten gland nuts one complete turn at a time until leakage is reduced to 40 to 60 drops per minute.

Materials of Construction

pH Factor: pH value of a liquid is a measure of its corrosive qualities, either acidic or alkaline or, more correctly stated, it is a measure of hydrogen ion concentration. A pH of 7 is neutral, below 7 is acidic, above 7 is alkaline.



| pH VALUE | MATERIAL OF CONSTRUCTION |
|----------|----------------------------|
| 10 to 14 | Corrosion Resistant Alloys |
| 8 to 10 | All Iron |
| 6 to 8 | Bronze Fitted |
| 4 to 6 | All Bronze |
| 0 to 4 | Corrosion Resistant Alloys |

Preventative Maintenance Schedule

Weekly

- record suction/discharge gauge readings for all pumps.
- record elapsed time meter readings.
- check air flow indicator to ensure proper bubbler system air flow.
- monitor station during at least one pump down cycle to check for proper pump and control operation along with leaks.
- check oil levels in seal and bearing chambers.
- check belts for wear and tension.
- check sump pump, blower, and dehumidifier for proper operation (dry pit operation).

Monthly

- exercise all isolation valves.
- make sure check valves open and close properly (clean the seat area if necessary).
- lubricate air release valves and check for proper operation.
- retension and align belt drives if necessary (after initial run/tension intervals).
- check impeller to wear plate clearance (depending on application, this may need to be done quarterly, monthly or every couple of weeks).
- clean air pump filter.

Preventative Maintenance Schedule cont'd

Annually

- change oil in pump seal chamber and bearing chamber if applicable (depending on application, this may need to be done semiannually, quarterly, monthly or every couple of weeks).
- grease motor bearings, in accordance with motor manufacturer's recommended schedule
- test alarms for proper operation.

Motor Maintenance

1. INSPECTION

Inspect motor at regular intervals. Keep motor clean and vent opening clear.

2. LUBRICATION

a. **Frame 143T thru 256T** are furnished with double sealed ball bearings, prelubricated prior to installation. Grease fittings are not supplied and bearings are designed for average 100,000 hours operation under standard conditions. (See table 2 below.)

b. **Frame 284T thru 587JZ** are furnished with double shielded or open ball or roller bearings. (Depending on HP size and/or speed.)
It is necessary to relubricate anti-friction bearing motors periodically. (See table 2 below.)

These motors are supplied with provision for greasing and have been lubricated prior to test, however before start-up it is recommended to apply approximately 30 grams (1 oz.) of grease.

Motor Maintenance cont'd

Table 2. Frequency of Relubrication

| SYNC. R.P.M. RANGE | FRAME RANGE | TYPE OF SERVICE | |
|-----------------------|----------------|---------------------------------|----------------------|
| | | STANDARD (8Hr day operation) | (24Hr day operation) |
| 3600 | 143T - 256T | * 5 years | * 5 years |
| | 284TS - 256TS | 210 days | 70 days |
| | 324TS - 587USS | 150 days | 50 days |
| 1800 | 143T - 256T | * 7 years | * 3 years |
| | 284T - 326T | 4 years | 1.5 years |
| | 364T - 365T | 390 days | 130 days |
| | 404T - 447TZ | 270 days | 90 days |
| | 505US - 587UZ | 210 days | 70 days |
| 1200 | 143T - 256T | * 7 years | * 3 years |
| | 284T - 326T | 4 years | 1.5 years |
| | 364T - 447TZ | 390 days | 130 days |
| | 505US - 587UZ | 270 days | 90 days |

NOTES:

1. Remarks * : We recommend changing bearings after these operations, but if not changeable, you can relubricate by removing the seal, cleaning and refilling the bearing and the cavity with recommended grease.
2. For easy service (1 Hr/day operation) multiply tabled value by 2.
3. For very severe service (High vibration, shock) 1/3 of tabled value.

Motor Maintenance cont'd

3. INSPECTIONS FOR LUBRICATING

Motors (284T - 587UZ) are furnished with grease fittings. Before greasing, be sure fittings are clean and free from dirt. Remove relief plug or plate and using a low pressure grease gun, pump in the required grease until new grease appears at the relief hole. Relubrication intervals is specified in table 2 above. After relubricating, allow motor to run for 10 minutes before replacing relief hardware.

4. RECOMMENDED GREASE

Use the following greases or some equivalent lithium based greases unless a special grease is specified on the nameplate.

MOBILUX #2
ALVANIA #2

MOBIL OIL CO.
SHELL OIL CO.

BEACON 325
CHEVRON SRI NO. 2

EXXON
STD. OIL CO. OF CALIF.