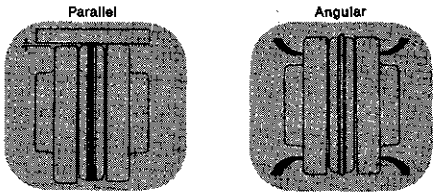


SURE-FLEX COUPLINGS, continued

5. Check parallel alignment by placing a straightedge across the two coupling flanges and measuring the maximum off-set at various points around the periphery of the coupling. **DO NOT** rotate the coupling. If the maximum off-set exceeds the figure shown under "Parallel" in Table 3, realign the coupling.
6. Check angular alignment with a micrometer or caliper. Measure from the outside of one flange to the outside of the other at intervals around the periphery of the coupling. Determine the maximum and minimum dimensions. **DO NOT** rotate the coupling. The difference between the maximum and minimum must not exceed the figure given under "Angular" in Table 3. If a correction is necessary, be sure to recheck the parallel alignment. (Note: For maximum life, keep misalignment values as near to zero as possible.)



NOTE: Periodically check elastomeric coupling sleeves for any visible evidence of deterioration. If deterioration is apparent, the coupling sleeve must be replaced.

TABLE 3 – MAXIMUM ALLOWABLE MISALIGNMENT
(Dimensions in inches)

SLEEVE SIZE	G DIMENSION	TYPES JES, JNS, E & N		TYPE H & HS*	
		PARALLEL	ANGULAR	PARALLEL	ANGULAR
3	3/8	.010	.035	—	—
4	5/8	.010	.043	—	—
5	3/4	.015	.056	—	—
6	7/8	.015	.070	.010	.016
7	1	.020	.081	.012	.020
8	1-1/8	.020	.094	.015	.025
9	1-7/16	.025	.109	.017	.028
10	1-5/8	.025	.128	.020	.032
11	1-7/8	.032	.151	.022	.037
12	2-5/16	.032	.175	.025	.042
13	2-11/16	.040	.195	.030	.050
14	3-1/4	.045	.242	.035	.060
16	4-3/4	.062	.330	—	—

NOTE: Values shown above apply if the actual torque transmitted is more than 1/4 the coupling rating. For lesser torque, reduce the above values by 1/2. *Type H sleeves (orange) should not be used as direct replacements for EPDM or Neoprene sleeves (black) or with J or B flanges.

7. If the coupling employs the two-piece sleeve with the wire ring, force the ring into its groove in the center of the sleeve. It may be necessary to pry the ring into position with a blunt screwdriver.
8. Check safety codes and install protective guards or shields as required.

Caution: Coupling sleeves may be thrown from the assembly when subjected to a severe shock load.

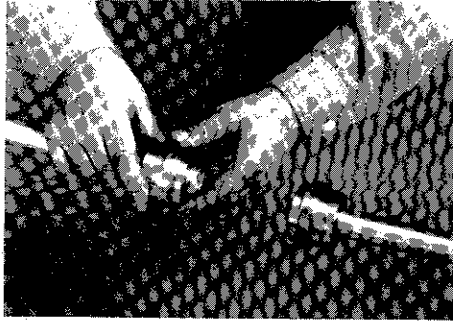
Reprinted with permission of T. B. Wood's Sons Co.

II-T Installation Rexnord Rex Omega Spacer Type Couplings

⚠ WARNING

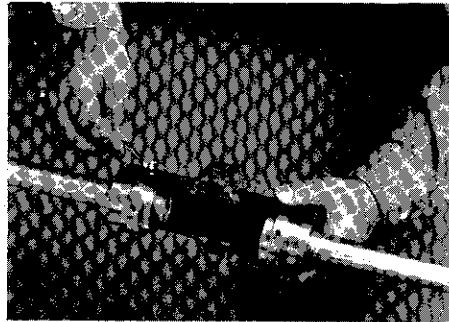
- Because of the possible danger to person(s) or property from accidents which may result from improper use or installation of products, it is extremely important to follow the proper installation and operational procedures.
- All rotating power transmission products are potentially dangerous and can cause serious injury. They must be properly guarded in compliance with OSHA standards for the speeds and applications in which they are used. It is the responsibility of the user to provide proper guarding.
- Failure to secure capscrews properly could cause coupling component(s) to become dislodged during operation; resulting in personal injury. **Do not start motor or job without the complete coupling being properly secured to driving and driven equipment shafts.**
- Before installing this coupling on any system containing sleeve bearings, herringbone gear sets or other devices sensitive to axial thrust, consult Rexnord.
- It is the responsibility of the user to consider the coupling's stiffness (available from Rexnord) as it relates to the drive system frequency.

STEP 1



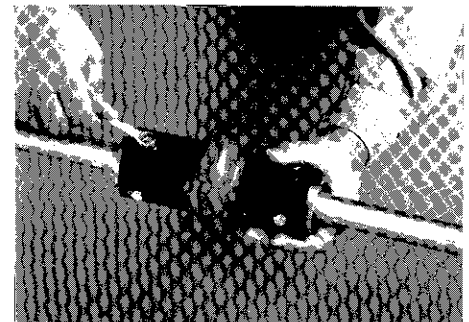
Inspect both driving and driven shafts and hub bores making sure they are free from dirt and burrs. Be sure they keys fit shafts properly. Mount both hubs to the shafts securing only one hub; the other hub should be loose for minor adjustment of spacing. Where tapered bushings are used, follow bushing manufacturer's instructions. If hub is bored for an interference fit, we recommend heating the hub in water, oil bath or an oven and quickly positioning it on the shaft. Do not spot heat hub as it may cause distortion.

STEP 2



Place half of the elastomer element around hubs and secure with self-locking capscrews. The elastomer element will space the other hub. It is important to have capscrew properly tightened. See Table 1 below for recommended capscrew torques and instructions. Now secure the other hub to the shaft.

STEP 3

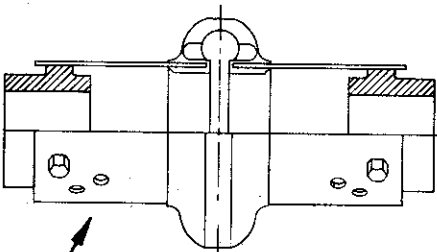


Mount other half of the elastomer element to hubs. Be sure to secure rings to the spacer element if provided. Tighten all capscrews to the recommended capscrew torques in Table 1 and your done!

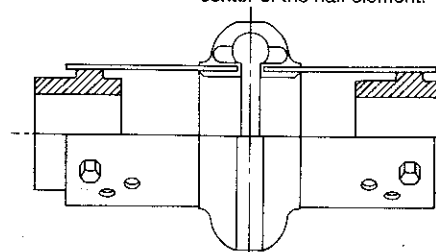
Spacer coupling installation is shown; the same procedure applies for the standard design coupling.

HELPFUL HINT:

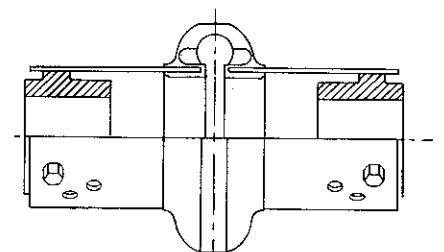
If the capscrew holes in the element do not line up properly with the hubs due to equipment misalignment, rotate the shafts (if possible) slightly as you install each capscrew. On larger coupling sizes, first install the capscrews that are located in the center of the half element.



Standard Method
Both hubs mounted outward.



Optional Method
One hub mounted inward; one hub mounted outward.

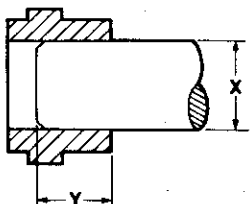


Optional Method
Both hubs mounted inward.

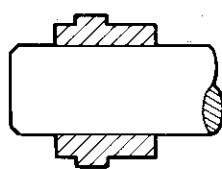
Additional mounting positions are possible with the optional assembly holes on the spacer element. Select the combination which most closely matches the dimension desired between shaft ends.

ALLOWABLE SHAFT ENGAGEMENTS

Shafts can be flush with the hub (not shown), recessed below the face of the hub, or extended beyond the hub face.



Dimension Y should be equal to, or greater than, .8 times dimension X.



The shaft may extend beyond the hub, as long as there is sufficient keyway length available.

TABLE 1

CPLG SIZE	TORQUE - DRY		
	IN. LBS.	FT. LBS.	Nm
2	204	17	23
3			
4			
5			
10			
20	360	30	40
30			
40			
50			
60			
70	900	75	100
80			
100			
120	3240	270	370
140			
	7080	590	800

RECOMMENDED CAPSCREW TORQUES FOR PROPER INSTALLATION

- IMPORTANT -

Capscrews have self-locking patches which should *not* be reused more than twice.

Capscrews can be further used with application of a thread-locking adhesive.

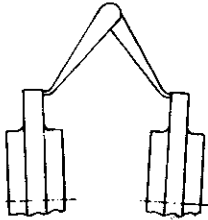
Do Not Lubricate Capscrew Threads

EQUIPMENT ALIGNMENT

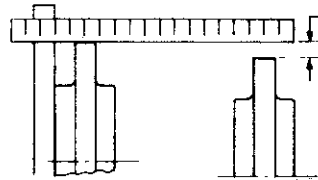
Coupling alignment is directly related to equipment and coupling life.

Although Omega couplings can withstand gross misalignment, care should be taken for best possible alignment to assure optimum performance. The caliper/straightedge alignment procedure is described below. If greater alignment accuracy is desired, a dial indicator method is recommended. There are occasions when equipment manufacturers require more specific alignment tolerances, in which case, the manufacturer's recommendations should be followed.

1. To correct for angular misalignment, use calipers to check the gap between hubs. Adjust or shim equipment until the gap is the same at all points around the hubs.
2. To correct parallel offset, place a straightedge across the hub flanges in two places at 90° to each other. Adjust or shim equipment until the straightedge lays flat on both sides.
3. Tighten down connected equipment and recheck alignment.
4. Install elastomer element, tightening all capscrews to the values shown in Table 1 as described on the reverse side.
5. If practical, recheck and tighten capscrews after several hours of operation.



ADJUST FOR ANGULAR MISALIGNMENT



ADJUST FOR PARALLEL OFFSET

PARALLEL OFFSET

DIMENSIONS AND PART NUMBERS

Coupling Part Numbers

FLEXIBLE ELEMENT			CAPSCREWS*						
Size	Spacer	Standard	Carbon Steel	Stainless Steel	Size-In	Metric Part Number	Size-MM	Qty	
2	00075	00005	00910	00938	1/4-20 x 3/8	01410	M6-1 x 10	8 + 8**	
3	00080	00010	00912	00940	1/4-20 x 1/2	01420	M6-1 x 12	8 + 8**	
4	00085	00015				01450			8 + 8**
5	00090	00020							8 + 8**
10	00095	00025	00918	00946				12 + 8**	
20	00100	00030	00920	00948	3/8-16 x 5/8	01460	M10-1.5 x 16	12	
30	00105	00035				01480			12
40	00110	00040	00924	00952					16
50	00115	00045						16	
60	00120	00050	00928	00956	1/2-13 x 7/8	01500	M12-1.75 x 25	16	
70	00125	00055							16
80	00130	00060							16
100	-	00065	00934	00965	3/4-10 x 1-1/2	01530	M20-2.5 x 40	20	
120	-	00070	00936	00967		01540			24
140	-	00071	85753	85702		01545		M24-3.0 x 40	32

Hubs*

Size	Rough Bore		Stock Bore (Part & Ranges)		Taper-Lock Hubs		Taper-Lock Bushing †	Q.D. Hubs †	Q.D. Bushing †	Standard Sleeve Ext. Steel
	STD ††	Steel	STD ††	Steel	Iron	Steel				
2	00215	69822	00220-00235	-	-	-	-	-	-	-
3	00240	69823	00245-00265	-	-	00730	1008	-	-	-
4	00270	69824	00275-00300	-	00800	00740	1008	00880	JA	69575
5	00305	69825	00310-00335	-	00805	00745	1108	00865	SH	69576
10	00340	69826	00345-00370	-	00810	00750	1310	00870	SDS	69577
20	00650	00375	00651-00659	00380-00400	00815	00755	1610	00875	SK	69578
30	00660	00405	00661-00668	00408-00425	00820	00760	2012	00880	SF	69579
40	00670	00430	00669-00679	00431-00455	00825	00765	2517	00885	E	69580
50	00680	00460	00681-00686	00461-00470	00830	00770	2517	00890	E	69581
60	00690	00475	00692-00698	00480-00495	00835	00775	3020	00895	F	69582
70	00700	00500	-	-	00840	00780	3535	00900	J	69583
80	00710	00525	-	-	00845	00785	4040	00905	M	69584
100	00720	00550	-	-	00850	**	4545	**	M	69834
120	00725	00575	-	-	00855	**	5050	**	N	69835
140	00727	00580	-	-	00857	**	7060	00908***	P	-

* Hubs are interchangeable for both the spacer and the standard coupling.

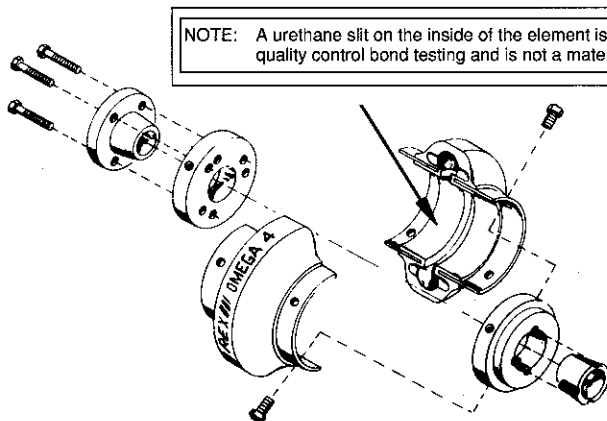
** Consult Factory

*** Iron

† Not supplied by Rexnord.

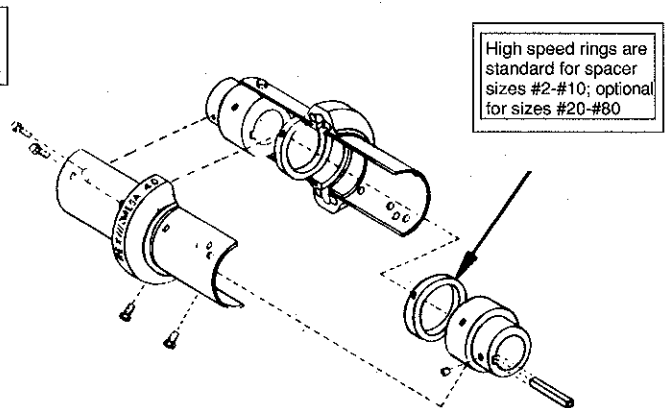
†† Standard hub material specifications: High strength sintered steel (Sizes #2 - #10), and Cast Iron (Sizes #20 and above).

REX OMEGA STANDARD COUPLING



NOTE: A urethane slit on the inside of the element is the result of our quality control bond testing and is not a material defect.

REX OMEGA SPACER COUPLING



High speed rings are standard for spacer sizes #2-#10; optional for sizes #20-#80

NOTE: Omega hubs are interchangeable with either standard or spacer flex elements; i.e., taper bushed hubs can be used with spacer elements and finished straight bore hubs can be used with standard elements.

ELEMENT REPLACEMENT: If element replacement is required, it is important to change both half elements, never replace just one half element. This is important because the element stiffness properties may change over time, and elements are packaged in weight matched pairs for better balance on high speed applications.

II-U. Stuffing Box

1. Packing: Stuffing box packing is installed at the factory. Gland bolt nuts should be installed finger tight only. Packing cannot run dry, it must be lubricated. If the pumpage is clean, cool fluid, it may be used through a bypass off the discharge to the lantern ring connection to lubricate the packing. If the pumpage is dirty or hot, it is not suitable to lubricate the packing. An external source must be utilized, unless the bypass is equipped with proper separator, filter, and/or cooling system. This must be piped into the lantern ring connection, also (refer to packing recommendations).

2. Mechanical Seals: When mechanical seals are supplied, they are installed and adjusted at the factory. They must not run dry or in abrasives. Connect recirculation, flush and/or cooling lines as required, following instructions on the seal print supplied for the unit.

SECTION III-OPERATION

III-A. Startup

1. Check List

a. Lubrication- Pump bearings are normally oil lubricated. **(THE BEARINGS ARE NOT LUBRICATED AT THE FACTORY.)** These pumps are supplied with an oiler which maintains a constant oil level in the bearing frame. Locate oiler as shown on the outline drawings supplied for the unit. For correct adjustment of oiler see Fig. 6

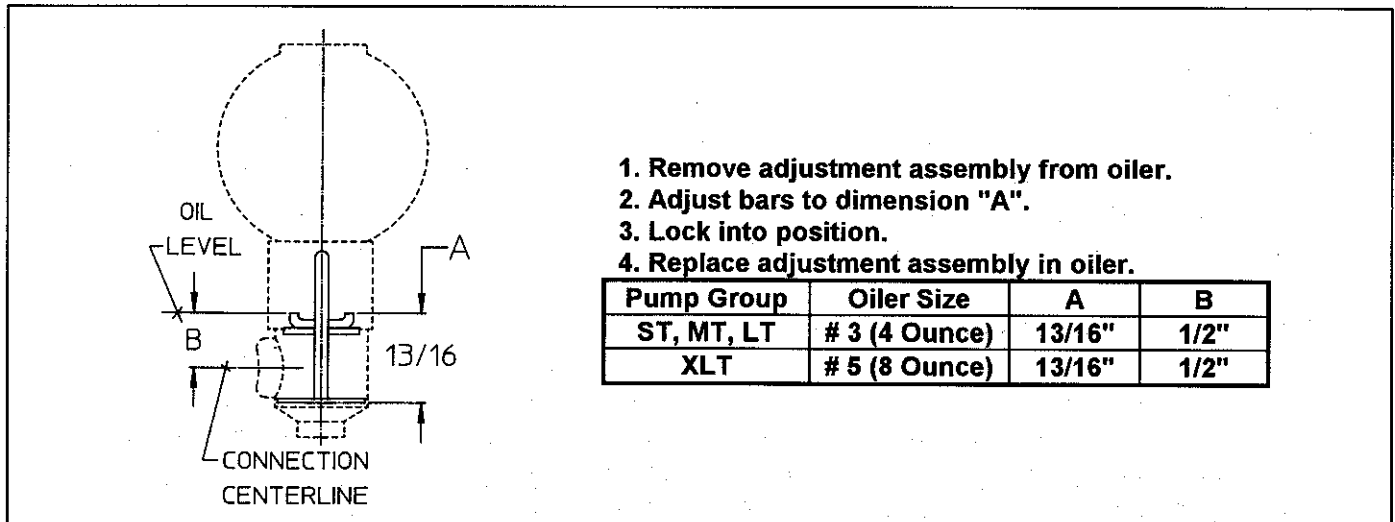


FIGURE 6. OIL LUBRICATED BEARINGS

b. Oil- A high quality turbine type oil with rust and oxidation inhibitors should be used. Under normal operating conditions, an oil of 300 SSU viscosity at 100° F. (approximately SAE 20) should be used. Fill oiler bottle and replace in oiler housing. Repeat until oil remains visible in bottle. Do not add oil through the vent or breather. Optional grease lubricated bearings are lubricated at the factory and need lubrication only after 2,000 hours of operation, or every 3 months, which ever occurs first. On pumps supplied with greased-for-life bearings, no additional lubrication is required for the life of the bearing.

c. Free Rotation- Rotate shaft by hand to make sure it is free. Drag from packing or seal is normal, but if pump cannot be rotated by hand or binding or rubbing is noticed, correct before starting pump.

2. Priming

When the pump is first put in operation, it should be primed with the pumped liquid through the 1-1/2 inch (1 inch on ST) priming connection. Fill until liquid is level with the inside of the suction pipe. On subsequent starts, enough liquid is retained in the casing to allow repriming. During the priming cycle, a self priming pump does not develop full pressure. **When priming against pressure, such as in a system with a check valve, it will be necessary to vent air with an air vent valve or continuous bleed line connected to the top of the discharge piping between discharge flange and check valve.**

During the priming cycle, the stuffing box will normally be below atmospheric pressure. On pumps supplied with conventional stuffing box packing, air may be drawn into casing and interfere with priming. Sealing by use of liquid from an outside source, or by use of a grease lubricator is recommended.

3. Startup

- a. **Valves** - be sure suction valve is fully open. Normally, discharge valve should be at least partially closed for flow control.
- b. **Rotation Check** - if not already done, uncouple the unit and jog the motor to check for proper rotation (refer to Section II-N).

III-B. Operation Checks - Inspect pump carefully and frequently during the first few hours of operation. If packing runs hot, shut pump down, allow box to cool, loosen gland if necessary. (Do not loosen gland until packing has cooled.) Mechanical seal may weep slightly, but should be "run-in" in a few hours. Be sure all auxiliary lines (cooling, flushing, sealing, etc.) are functioning properly. Check pump bearings for excessive heating. Check complete unit for excessive vibration and unusual noises. Do not run pump at greatly reduced flow because damage can result.

III-C. Shutdown Procedure - Back flow through the pump will cause reverse rotation. If back flow is excessive, and there is a possibility of the pump being turned on during this period of reverse rotation, then Precautions should be taken to prevent the back flow. This can be done by installing a check valve in the discharge line, or by closing a discharge valve immediately prior to shutting down the pump. **NOTE: IT IS NOT RECOMMENDED THAT THE PUMP RUN LONGER THAN ABSOLUTELY NECESSARY AGAINST A CLOSED DISCHARGE VALVE.**

SECTION IV - PREVENTIVE AND CORRECTIVE MAINTENANCE

IV-A. Lubrication

Oil lubricated units require only that oil be visible in reservoir or the oiler. Grease lubricated units should be regreased at startup and every 2,000 hours or 3 month intervals, whichever occurs first. Use a sodium or lithium grease and fill until grease comes out grease relief fittings. Follow motor and coupling manufacturers' lubrication instructions.

IV-B. Stuffing Box

1. Packing Type Stuffing Box: Periodically inspect stuffing box to see that there is sufficient leakage to lubricate the packing and maintain a cool box. Never restrict the leakage from the packing as this will cause damage to both packing and shaft sleeve. Draw up gland nuts slowly and evenly and only while pump is running. After pump has been in operation for some time and the packing has been completely "run-in", a leakage of 40 to 60 drops per minute of the liquid should be allowed to flow from the stuffing box at all times for cooling and lubricating the packing and shaft sleeve.

2. Mechanical Seal Type Stuffing Boxes: This type of box requires no attention other than to make sure that the circulating lines do not become clogged.

IV-C. Vibration

It is a good practice to periodically monitor vibration of the pump. Normally, the vibration level will be well within accepted standards. Of equal importance is that the vibration level not increase. If a problem with vibration is encountered, refer to Trouble Shooting, Section VII.

IV-D. Alignment-Final - Alignment should be checked after unit has reached operating temperature, following startup. Repeat alignment procedures outlined in Section II-F. Check alignment again after one week of operation.

IV-E. Performance

If performance or priming capability deteriorates, refer to Trouble Shooting, Section VII.

SECTION V-DISASSEMBLY AND RE-ASSEMBLY

V-A. Disassembly

1. Prepare pump for disassembly as follows:

- a. Lock out power supply to motor.
- b. Shut off valves controlling flow to and from pump.
- c. Flush pump of all corrosive or toxic liquid, if required.
- d. Remove all auxiliary tubing and piping.
- e. Disconnect coupling and remove coupling spacer.
- f. Drain oil.
- g. On units with packed stuffing box, unbolt and remove split gland (107).

2. Disassemble pump as follows:

- a. place sling from hoist through eyebolt (132). On ST units, place sling through frame (228A) above shaft (122).
- b. Remove frame foot hold down bolts.
- c. Remove bolts (370) holding frame (228A) or frame adapter (108) to casing (100).
- d. Slide back pull-out assembly from casing, using jacking bolts (418) provided.
- e. Remove casing gasket (351)
- f. Unscrew impeller (101) from shaft (122). The threads are right hand. Remove O-ring (412A). which seals between the impeller and shaft or sleeve.
- g. (1) On units with outside mechanical seal, remove gland stud nuts (355) and carefully slide gland

toward bearing frame (228A)

- (2) On units with inside mechanical seal, loosen set screws holding rotary portion of seal to shaft and slide seal toward bearing frame (228A) . remove gland stud nuts and carefully slide off studs.
- h. Remove stud nuts (370H) which hold stuffing box cover (184) to frame adapter. Pull stuffing box cover from frame or adapter. Slide sleeve (if any) off shaft.
- i. On units with mechanical seal, loosen set screws holding rotary portion of seal to shaft, and carefully slide seal and gland assembly off shaft. On units having a shaft sleeve, it is not necessary to remove rotary portion of seal from sleeve unless replacement of seal is required.
- j. Slide deflector (if any) (123) off shaft
- k. Scribe shaft at coupling hub for proper positioning of hub during re-assembly and remove hub.
- l. Remove bearing housing bolts (370C). Using impeller adjustment bolts (370D) for jacking, remove shaft and bearing assembly from frame. This will Include the shaft, both bearings (112A) and (168A), and bearing housing (134A). Do not lose or damage O-ring (496).
- m. Remove inboard bearing (168A) using a bearing puller. ***Never use a hammer to drive shaft through bearing!*** Protect bearing from contamination.
- n. Remove bearing housing retaining ring (361A) and slide bearing housing off ball bearing. Do not damage oil seal (332A).
- o. Straighten tang in lock washer and remove bearing locknut (136) and lock washer. Remove ball bearing (112A) using a bearing puller. Protect bearing from contamination.
- p. On units with stuffing boxes, remove Lantern ring (105) and packing rings (106) from stuffing box cover (184).

V-B. Inspection and Parts Replacement Guidelines

- 1. Casing-**Check for sediment in priming chamber.
- 2. Impeller-**Replace if it shows excessive erosion, corrosion, extreme wear, or vane breakage. Replace impeller O-ring. O-ring groove and impeller hub must be in good condition. Check impeller balance if possible. Reduction in hydraulic performance and reduced mechanical seal, packing or thrust bearing life may be caused by excessive impeller wear. If a larger diameter impeller than originally furnished is required, this may be done by re machining the inner volute to remove the part of the cutwater necessary to accommodate the larger diameter impeller. There should be a .015" clearance between impeller vane tips and the volute cutwater. ***Note: If a smaller diameter impeller is to be used than what was originally furnished, a new inner volute must also be installed, otherwise the self-priming characteristics will be adversely affected.***
- 3. Shaft-**Check for runout (.005" max.) to see that shaft has not been bent. On pumps without shaft sleeves, shaft surface in stuffing box area must be smooth and free of grooves. Bearing seats and oil seal area must be smooth and free of scratches or grooves. Shaft threads must be in good condition. Metalize or replace shaft if necessary.
- 4. Shaft Sleeve-**Sleeve surface in stuffing box must be smooth. If grooved, replace.
- 5. Mechanical Seal-**Seal faces, gaskets, and shaft sealing members must be in perfect condition or leakage may result. Replace worn or damaged parts.
- 6. Ball Bearings-**Replace if worn, loose or rough and noisy when rotated.
- 7. Oil Seals-**Replace if worn or otherwise damaged.
- 8. General-**All parts should be clean before assembly. All burrs should be removed.

V-C. RE-ASSEMBLY Procedures- This procedure covers re-assembly of pump after complete disassembly. Make sure all directions outlined in Section V-B have been followed.

1. Oil shaft at thrust bearing fit on coupling end of shaft (122). Slide thrust (coupling end) bearing (112A) on shaft as far as possible by hand. Place pipe or driving sleeve over shaft, making sure it rests against inner face only. Make sure bearing is "square" on shaft. Tap or press evenly until bearing is seated firmly against shaft shoulder. Do not mar the shaft.
2. Place lock washer and bearing locknut (136) on shaft and tighten firmly. Bend "tang" of lock washer into slot in locknut.
3. Slide bearing housing (134A), with O-ring (496) in place, on shaft and over bearing (112A) as far as possible. Do not damage oil seal (332A).
4. Insert retaining ring (361A) into groove in bearing housing (134A). Flat side of retaining ring must be against bearing (112A).
5. Oil inboard bearing seat on shaft. Slide inboard ball bearing (168A) on shaft (122) as far as possible by hand. Continue as in Step 1 above.
6. Place a small amount of O-ring lubricant on inside of bearing frame (228A) at bearing housing (134A), at inboard bearing seats (168A), on O-ring (496), and on inboard oil seal (333A) Carefully slide shaft assembly into bearing frame. Do not damage inboard oil seal (333A). Screw bearing housing bolts (370C) about 1/2" into bearing frame (228A).
7. Slide deflector if any, (123) on shaft (122).
8. If unit has packed stuffing box, place stuffing box cover (184) against adapter (108), making sure that studs (370H) are aligned with proper holes in adapter. Replace nuts and firmly tighten. Slide sleeve (if any) on shaft. Make sure grooves in end of sleeve engage drive pin on shaft. Continue assembly at Step 10, (page 22).
9. If unit has mechanical seal:

The following instructions refer to pumps equipped with mechanical seals, either with or without sleeves. If the unit has a single inside or double seal, a preliminary impeller adjustment must be performed to assure proper positioning of mechanical seal.

- (A) Position sleeve (126), if any, on shaft (122) and engage groove in sleeve with drive pin (469) on shaft. Place stuffing box cover (184) against frame (228). Make sure studs (370H) align with proper holes in frame. Firmly tighten nuts or bolts.
- (B) Screw impeller (101) with O-ring (412A) in place on shaft. Make sure that shaft assembly extends through stuffing box cover (184) so that the impeller will NOT contact face of stuffing box cover.
- (C) Using impeller adjusting bolts (370C and 370D), adjust the impeller clearance until a .020" (0.51mm) feeler gauge can be inserted between the back of the impeller and the face of the stuffing box cover.

The following instructions are for three basic seal types: Single Inside, Single Outside, and Double Seals. Refer to seal manufacturer's drawing seal type and positioning dimension. Follow pertinent procedures.

a. Single Inside Seal

- (1) Scribe the shaft (122) or shaft sleeve (126) lightly at the face of the stuffing box.
- (2) Remove the impeller and stuffing box.

- (3) Assemble the gland (250) with gaskets and stationary seat and slide the assembly over the shaft (122) or shaft sleeve (126).
- (4) Slide the rotary portion of the seal on the shaft (122) (or shaft sleeve) (126) establishing its location from the scribe line to the dimension as shown on the seal manufacturer's drawing. Tighten set screws.
- (5) Reinstall the stuffing box cover and tighten. Do not damage the seal parts.
- (6) Reinstall the impeller with O-ring.
- (7) Slide the gland assembly against the stuffing box and tighten the nuts evenly. Do not damage the seal parts.
- (8) Refer to step 12 for further assembly details.

b. Double Seals

- (1) Scribe the shaft (122) or shaft sleeve (126) lightly at the face of the stuffing box.
- (2) Remove the impeller and stuffing box.
- (3) Assemble the gland (250) with gaskets and stationary seat and slide the assembly over the shaft (122) or shaft sleeve (126).
- (4) Slide the rotary portion of the seal on the shaft (122) or shaft sleeve (126) establishing its location from the scribe line to the dimension as shown on the seal manufacturer's drawings. Tighten set screws.
- (5) Place inboard stationary seat and gaskets into bottom of stuffing box.
- (6) Re-install the stuffing box cover and tighten. Do not damage seal parts.
- (7) Re-install the impeller with O-ring.
- (8) Slide the gland assembly against the stuffing box and tighten the nuts evenly. Do not damage seal parts.
- (9) Refer to step 12 for further assembly details.

c. Single Outside Seals

Preliminary impeller adjustment is not necessary with this type of mechanical seal.

- (1) If unit has shaft sleeve (126), slide on shaft (122) and engage groove in sleeve with drive pin (469) on shaft.
- (2) Lubricate rotary portion of seal and slide on shaft sleeve. Do not tighten set screws.
- (3) Assemble gland (250), gaskets, and stationary seat and slide assembly on shaft or sleeve.
- (4) Place stuffing box cover (184) against frame making sure that the studs (370H) align with the proper holes in frame. Firmly tighten nuts.
- (5) Screw impeller with O-ring on shaft make sure impeller does not make contact with stuffing box cover. If the impeller does hit, use impeller adjusting cap screws to correct.
- (6) Place gland assembly against face of stuffing box and firmly tighten stud nuts.
- (7) Slide rotary portion toward gland until it contacts stationary seat. Compress the rotary. Tighten screws.

(V-C RE-ASSEMBLY- Continued)

10. Screw impeller (101) with O-Ring (412A) in place, on the shaft (122).
11. On units with stuffing box packing (106), repack stuffing box as outlined in Section 11-F. Assemble gland stud nuts finger tight.
12. Install and position coupling hub at scribe mark on shaft.

13. Place casing gasket (351) against shoulder in casing.
14. Slide the pullout assembly into the casing (100). Install frame-to-casing bolts (370) and tighten evenly while rotating shaft (122) by hand. If impeller ceases to turn freely stop tightening operation and adjust the impeller setting with the adjusting bolts (370C and 370D) before resuming tightening of frame-to-casing bolts (370).
15. Reset impeller clearances.
 - (a) Loosen bolts (370C and 370D).
 - (b) Tighten bolts (370C) while turning shaft until impeller starts to rub against casing.
 - (c) Loosen bolts (370C) until a 0.015" (0.375 mm) feeler can be placed between the bolt head and the bearing housing. If desired, a dial indicator can be used instead of a feeler gauge to check that the bearing housing has been moved the correct 0.015" (0.375 mm) distance.
 - (d) Tighten bolts (370D) evenly. Bearing housing shaft and impeller will be jacked to proper clearance from casing. Tighten bolts (370C) and jam nuts on bolts (370D)-

V-D. Additional Details

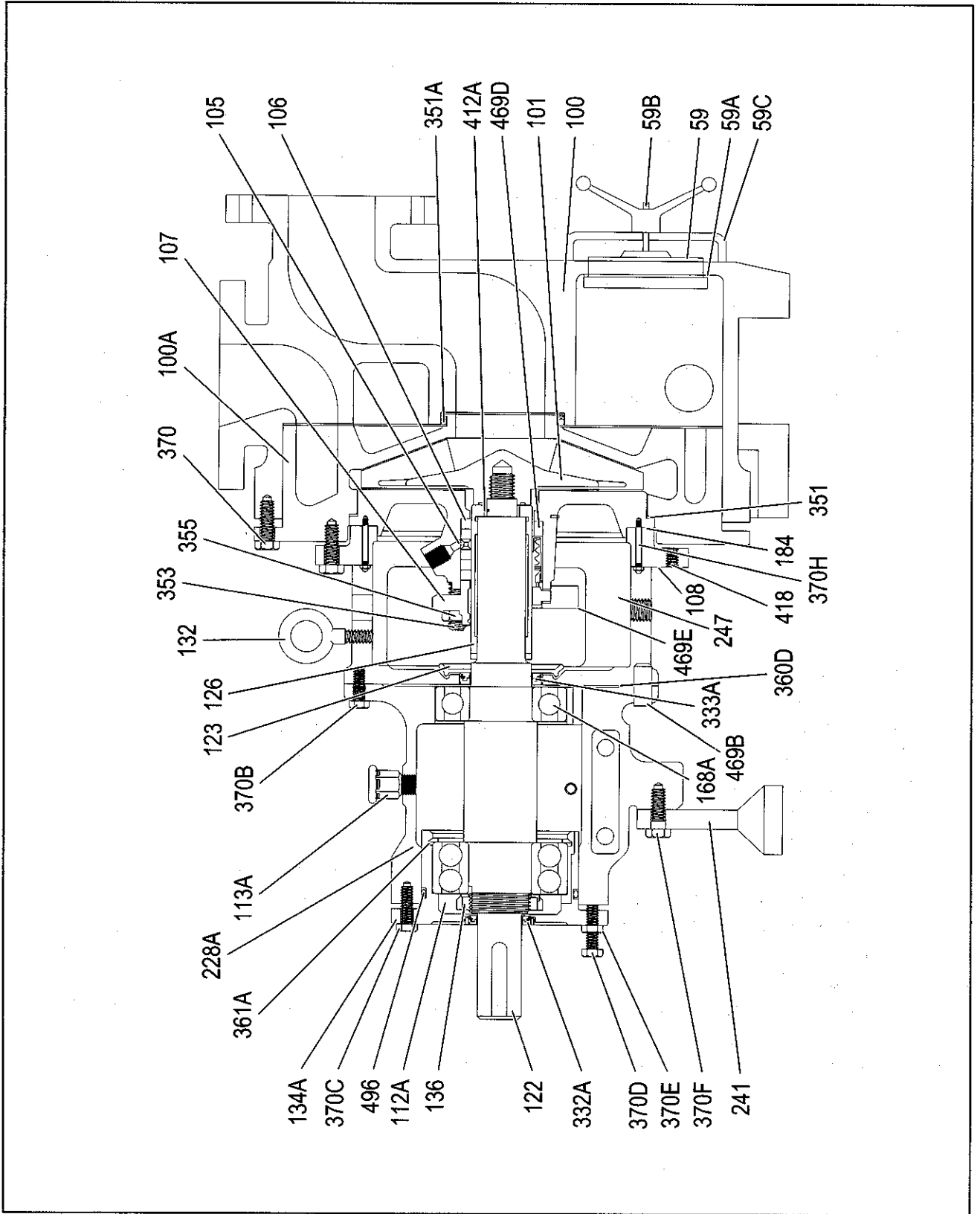
An alternate method for setting inside mechanical seals is the "Modified Vise grip Method".

1. Follow assembly up to step 7.
2. Assemble the gland with stationary seat and gaskets.
3. Install the shaft sleeve, if used on the shaft, and engage groove in sleeve with drive pin (469) on shaft.
4. Slide gland assembly over the shaft or shaft sleeve.
5. Install the stuffing box cover and impeller. Establish a preliminary rotor adjustment (refer to Section V-C Step 9).
6. Slide gland assembly against stuffing box. Do not bolt the gland to the stuffing box.
7. Clamp the modified vise grip on the shaft or sleeve directly behind and against the gland.
8. Leave the vise grip in place and remove the impeller and stuffing box cover.
9. Lubricate the rotary portion of seal and slide it on the shaft until it comes in contact with the stationary seat in the gland.
10. Compress rotary portion of seal to correct dimension as shown on seal manufacturer's drawing. Tighten set screws.
 - I 1. Remove vise grip and reinstall stuffing box cover and tighten.
12. Reinstall impeller with O-ring.
13. Slide the gland assembly against the stuffing box and tighten nuts evenly.
14. Refer to Section V-C Step 12, etc.

SECTION V-E-PARTS LIST WITH MATERIALS OF CONSTRUCTION

Parts List and Materials of Construction --Peerless Pump Series 8796 Self Priming Process Pumps							
Item No.	Qty per pump	Part Description	All Ductile Iron	All 316 Stn Steel	All CD4M	Alloy 20 Stn Steel	Hastelloy B or C
59	1	Cover Oval Cleanout	Ductile Iron	316 ss	CD4M	Alloy 20	Hastelloy
59A	1	Gasket	ECH-Sponge	ECH-Sponge	ECH-Sponge	ECH-Sponge	ECH-Sponge
59B	1	Wing Nut	Steel	Steel	Steel	Steel	Steel
59C	1	Hand Hole Brace	Steel	Steel	Steel	Steel	Steel
100	1	Casing	Ductile Iron	316 ss	CD4M	Alloy 20 ss	Hastelloy
100A	1	Inner Volute	Ductile Iron	316 ss	CD4M	Alloy 20 ss	Hastelloy
101	1	Impeller	Ductile Iron	316 ss	CD4M	Alloy 20 ss	Hastelloy
105	1	Lantern Ring	TFE	TFE	TFE	TFE	TFE
106	1 Set	Stuffing Box Packing	PTFE-aramid	PTFE-aramid	PTFE-aramid	PTFE-aramid	PTFE-aramid
107	1	Packing Gland	316 ss	316 ss	Alloy 20 ss	Alloy 20 ss	Hastelloy
108	1	Frame Adapter	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron
112A	1	Ball Bearing-Outboard	Steel	Steel	Steel	Steel	Steel
113A	1	Bearing Frame Breather	Steel	Steel	Steel	Steel	Steel
122	1	Pump Shaft for Sleeve	SAE 4140	SAE 4140	SAE 4140	SAE 4140	316 ss
123	1	Deflector Used with Lip Seal Construction	Nylon -Glass Ref.	Nylon -Glass Ref.	Nylon -Glass Ref.	Nylon -Glass Ref.	Nylon -Glass Ref.
126	1	Shaft Sleeve	316 ss	316 ss	CD4M	Alloy 20 ss	Hastelloy
132	1	Eye Bolt	Steel	Steel	Steel	Steel	Steel
134A	1	Bearing Housing	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron
136	1	Bearing Locknut	Steel	Steel	Steel	Steel	Steel
168A	1	Ball Bearing Inboard	Steel	Steel	Steel	Steel	Steel
184	1	Stuffing Box Cover-Std.	Ductile Iron	316 ss	CD4M	Alloy 20 ss	Hastelloy
228A	1	Bearing Frame	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron
241	1	Bearing Frame Foot	Cast Iron	Cast Iron	Cast Iron	Cast Iron	Cast Iron
247	1	Drip Basin	-	316 ss	316 ss	316 ss	316 ss
251	1	Constant Level Oiler (not shown)	Glass/White Metal	Glass/White Metal	Glass/White Metal	Glass/White Metal	Glass/White Metal
332A	1	Oil Seal- Cplg End Labrynth Isolator	Brz/Buna Rubber	Brz/Buna Rubber	Brz/Buna Rubber	Brz/Buna Rubber	Brz/Buna Rubber
333A	1	Oil Seal- Inboard End Labrynth Isolator	Brz/Buna Rubber	Brz/Buna Rubber	Brz/Buna Rubber	Brz/Buna Rubber	Brz/Buna Rubber
351	1	Gasket-Adapt to Stuff Box	Veg Fiber	Veg Fiber	Veg Fiber	Veg Fiber	Veg Fiber
351A	1	O ring ,Volute to Casing	Viton	Viton	Viton	Viton	Viton
353	2	Gland Stud	316 ss	316 ss	316 ss	316 ss	Monel
355	2	Nut , Gland Stud	316 ss	316 ss	316 ss	316 ss	316 ss
360D	1	Gasket-Brg Frm to Adapter	Veg Fiber	Veg Fiber	Veg Fiber	Veg Fiber	Veg Fiber
361A	1	Ret Ring-Brg Housing	Steel	Steel	Steel	Steel	Steel
370	4 to 24	Cap Screw-Frm/Adapt to Casing	Steel	304 ss	304 ss	304 ss	304 ss
370H	2	Stud & Nut, Cover to Adapr	304 ss	304ss	304 ss	304 ss	304 ss
370B	4	Cap Scr-Adp/Adpt Rg to Fr	Steel	Steel	Steel	Steel	Steel
370C	3-to 4	Tap Bolt Brg Housing	Steel	Steel	Steel	Steel	Steel
370D	3 to 4	Tap Bolt w/Jam Nut Imp Adjusting	Steel	Steel	Steel	Steel	Steel
370F	1 to 2	Cap Screw-Frame Foot	Steel	Steel	Steel	Steel	Steel
370H	2	Stud & Nut Cvr to Adpt	304 ss	304 ss	304 ss	304 ss	304 ss
412A	1	"O" Ring - Impeller	TFE	TFE	TFE	TFE	TFE
418	2-3	Tap Bolt - Jacking	Steel	Steel	Steel	Steel	Steel
469B	2	Dowel Pin-Frm to Adpt	Steel	Steel	Steel	Steel	Steel
469D	1	Drive Pin -Shaft Sleeve	420 ss	420 ss	420 ss	420 ss	420 ss
469E	1	Seal Gland	316 ss	316 ss	CD4M	Alloy 20 ss	Hastelloy
496	1	"O" Ring- Brg Housing	Buna Rubr	Buna Rubr	Buna Rubr	Buna Rubr	Buna Rubr
503	1	Adapter Ring (not shown) Model 1.5x1.5 8ST only	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron

SECTION V-F-CROSS SECTIONAL DRAWING



SECTION VI-PUMP SIZE COMPARISON CHART

MODEL 8796		MODEL 8196	
1-1/2x1-1/2x8	ST	1x1-1/2x8	ST
2x2x10	MT	1x2x10	MT
3x3x10	MT	2x3x10	MT
4x4x10	MT	3x4x10	MT
3x3x13	MT	2x3x13	MT
4x4x13	MT	3x4x13	MT

SECTION VII-TROUBLE SHOOTING

Problems		Possible Causes & Corrections
A	No liquid delivered not enough liquid delivered, or not enough pressure	10, 11, 12, 13, 14, 18, 19, 20
B	Pump works a while and then quits	4, 5, 7, 8, 9, 11, 12, 20
C	Pump takes too much power	6, 13, 14, 15, 16, 21, 22, 23, 24, 31
D	Pump is noisy or vibrates	15, 16, 17, 28, 31
E	Pump leaks excessively at stuffing box	8, 24, 25, 26, 27
F	High bearing temperature	15, 16, 17, 29, 30, 31
G	Stuffing box overheating	8, 24, 25, 26, 27
H	Pump does not prime	7, 8, 32, 33, 34

Causes & Corrective Measures

1. Pump not primed or properly vented-check and see if casing and suction pipe are completely filled with liquid
2. Speed too low-check whether motor wiring is correct and receives full voltage or turbine receives full steam pressure.
3. System discharge head too high-check system head (particularly friction losses).
4. Suction lift too high-check NPSH available (suction piping too small or long may cause excessive friction losses). Check with vacuum or compound gauge.
5. Impeller or piping obstructed-check for obstructions.
6. Wrong direction of rotation-check rotation.
7. Air pocket or leak in suction line-check suction piping for air pockets and/or air leaks.
8. Stuffing box packing or seal worn allowing leakage of air into pump casing-check packing or seal and replace as required. Check for proper lubrication.
9. Not enough suction head for hot or volatile liquids-increase suction head, consult factory.
10. Foot valve too small-install correct size foot valve.
11. Foot valve or suction pipe not immersed deep enough-consult factory for proper depth. Use baffle to eliminate vortices.
12. Entrained air or gases in liquid-consult factory.

(Causes & Corrective Measures - Continued)

13. Impeller clearance too great - check for proper clearance.
14. Impeller damaged-inspect and replace as required.
15. Rotating parts bind-check internal wearing parts for proper clearances.
16. Shaft bent-straighten or replace as required.
17. Coupling or pump and driver misaligned-check alignment and realign if required.
18. Impeller diameter too small-consult factory for proper impeller diameter.
19. Improper pressure gauge location-check correct position and discharge nozzle or pipe.
20. Casing gasket damaged-check gaskets and replace as required.
21. Speed too high-check motor winding voltage or steam pressure received by turbine.
22. Head lower than rating; pumps too much liquid-consult factory. Install throttle valve, trim impeller diameter.
23. Liquid heavier than anticipated-check specific gravity and viscosity.
24. Stuffing box not properly packed (insufficient packing, not properly inserted or run in, packing too tight)-check packing and repack stuffing box.
25. Incorrect packing or mechanical seal-consult factory.
26. Damaged mechanical seal-inspect and replace as required. Consult factory.
27. Shaft sleeve scored-re-machine or replace as required.
28. Cavitation-increase NPSH available Consult factory.
29. Pump capacity too low-consult factory for minimum continuous flow.
30. Excessive vibration.
31. Improper bearing lubrication or bearings worn out-inspect and replace as required.
32. Check valve in discharge line-install vent line from pump discharge to check valve.
33. Back pressure in discharge line-eliminate any receiver tank "down legs" and "U" shaped loops in discharge piping.
34. No initial casing fill.

SECTION VIII-A-ORDERING SPARE PARTS

To insure against possible long and costly downtime periods, especially on critical services, it is advisable to have spare parts on hand.

1. For critical services: It is recommended that a "back pull-out assembly" be kept on hand. This is a group of assembled parts which includes all parts except the casing and the coupling.
 - a. If this unit is equipped with stuffing box packing, the following parts should be on hand:
 - (1) Stuffing box packing (item 106)-one set.
 - (2) Stuffing box gland packing (item 107)-one set.
2. An alternative, though not as desirable as that stated above, can be used on non-critical services. This involves having on hand parts that are most likely to wear and can be used as needed. See Section VI-A, Parts List, for these recommended spares.

VIII-B. Instructions for Ordering Spare Parts

Repair orders will be handled with the minimum of delay if the following directions are followed:

1. Give model number, size of pump, and serial number. These can be obtained from the nameplate on the pump.
2. Write plainly the name, part number, and material of each part required. These names and numbers should agree with those on the sectional drawing in Section VI.
3. Give the number (quantity) of parts required.
4. Give complete shipping instructions.

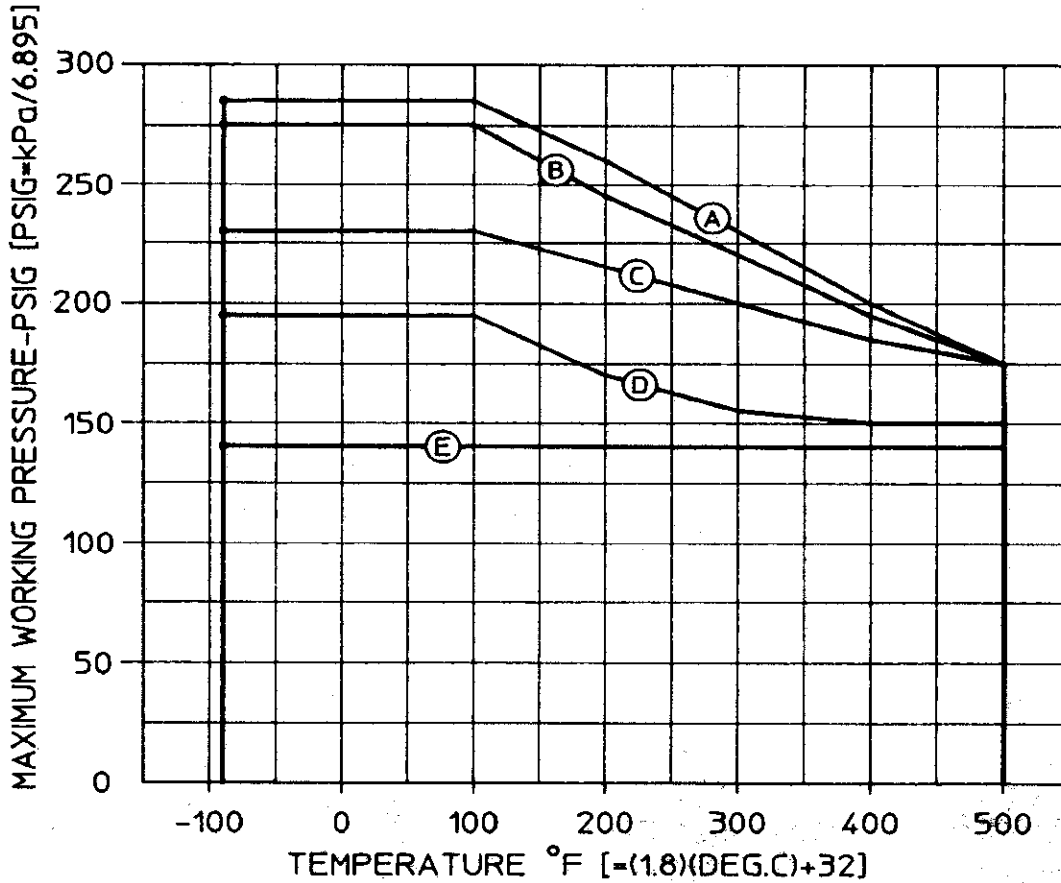
Notice:

Materials of construction, specifications, dimensions, design features and application information , where shown in this bulletin, are subject to change without notice by Peerless Pump Company at their option.

SECTION VIII-C-PRESSURE/TEMPERATURE RATING LIMITS

**HORIZONTAL PROCESS PUMPS SINGLE STAGE END SUCTION SELF-PRIMING
Type 8796 (Frame Mounted)**

**150 Lb ANSI Flanges
Pressure/Temperature Ratings**



CURVE	MATERIAL	CURVE	MATERIAL
A	DUCT. IRON	B	316 S.S.
A	CAST STEEL	B	317 S.S.
A	CD4MCU	C	ALLOY 20
A	HAST. B	D	MONEL
A	HAST. C	E	NICKEL
A	TITANIUM		

CONTACT FACTORY FOR SUCTION PRESSURES OVER 160 PSIG.



Peerless Pump Company
2005 Dr. Martin Luther King Jr. Street
Indianapolis, IN 46202
Phone: (317) 925-9661 • Fax: (317) 924-7388

Phone: (317) 925-9661 • Fax: (317) 924-7388