



PRODUCT DESCRIPTION

Product Range

The 8196 VSP sump pump product line is comprised of 24 models in 17 sizes. These pumps utilize the 8196 ANSI pump hydraulic ends, the sizes include the ST 1 x 1-1/2 - 6 thru 1-1/2 x 3 - 8 and the MT 2 x 3 - 8 thru the 4 x 6 - 13.

Performance Range

Capacities to: 1600 US Gallons Per Minute (365 Cubic Meters Per Hour)

Heads to: 310 Feet (95 meters)

Temperatures to: 180 degrees Fahrenheit (82 degrees Celsius).

Designs for higher temperatures will be announced at a later date.

Design Considerations

Interchangeability - - The 8196 VSP impellers, casings and thrust bearings are directly interchangeable with the standard design 8196 ANSI pumps of the same size. This offers our customers maximum interchangeability of parts for both their ANSI pump and Sump pump requirements.

Bearings - - The 8196 VSP bearing design includes a double row grease lubricated thrust bearing in a sealed bearing housing located above the mounting plate in the motor pedestal. The bearing housing is fitted with a grease fitting and a covered grease relief fitting. The sleeve bearings in the column bearing retainers and the adapter are available in optional flushing and lubrication designs for various application and service requirements.

Bearing Spacing - - The sleeve bearing spacing is designed to prevent allowing the pumps to operate within twenty-five percent of the critical frequency for each operating speed.

Impeller Seal - - The 8196 VSP standard design utilizes the standard ANSI pump impellers which are threaded on to the shaft. The design includes a Teflon O-Ring seal arrangement to isolate the threaded joint from the pumpage. This sealing arrangement protects the joint from corrosion and assures ease of maintenance.

Impeller Adjustment - - Readily accessible impeller adjusting bolts with lock nuts are located on the bearing housing in the motor pedestal. This provides a very convenient, quick and simple adjustment means for renewal of the impeller running clearance in order to help restore performance with wear.

Impeller Balancing - - After final trimming all VSP impellers are balanced. Balancing consists of a single-plane spin balance to ANSI S-2.19 / ISO 1940-1973E balance quality grade G6.3 specifications.

Pump Length - - The 8196 VSP pumps are available in standard length increments of 6 inches (15 centimeters) to a maximum pit depth of 20 feet (6.1 meters) for operating speeds of 1800 RPM and lower. For operating speeds greater than 1800 RPM the pumps are available for 12 foot 6 inch (3.8 meters) maximum pit depth. The minimum length available is for a minimum pit depth of 2 feet (0.76 meters).

Materials

The standard material groups include Iron, 316 Stainless Steel, CD4MCU Stainless Steel and Alloy 20 Stainless Steel. Modifications within these material groups are offered as available options to suit various requirements.



Peerless Pump Company
Indianapolis, IN 46207-7025

8196 VSP ESTIMATE SHEET

OPERATING CONDITIONS: GPM _____
 TDH _____ LIQUID _____
 TEMP _____ SP. GR _____ VISC _____
 VAPOR PRESS _____ PH _____ NPSHA _____

CUSTOMER _____
 FOR _____
 INQUIRY # _____ DUE DATE _____
 NO. OF PUMPS _____ PROPOSAL # _____

PUMP SELECTION REQUIREMENT: PIT DEPTH: [] DESIGN GPM: []
 PUMP SELECTION: SPECIFIED TDH _____ FT
 VSP SETTING LOSSES _____ FT ADJUSTED HEAD: []
 ADJUSTED HEAD _____ FT
 CURVE # _____

MOTOR SIZING: FOR DESIGN GPM @ ADJUSTED HEAD BHP _____
 FOR NON-OVERLOADING IMPELLER DIA.
 REQUIRED FOR ADJUSTED HEAD MAX BHP _____

MOTOR REQ'TS: HP _____ RPM _____ ENCLOSURE _____ FRAME SIZE []
 VOLTAGE _____ PH _____ HZ _____

| DESCRIPTION | LIST PRICE | DISC. MULT. | NET PRICE | APPROX. WT. |
|--|------------|-------------|-----------|-------------|
| MOTOR: PER ABOVE HP ___ RPM ___ ENCL ___ ADDERS: | | | | |
| BASIC PUMP: SIZE ___ GROUP ___ METALS ___ IRON ___ 316SS ___ OTHER ___ ADDERS: | | | | |
| ADDITION FOR PIT DEPTH SETTING: ___ FT ___ IN RPM ___ MTL ___ DISCH ___ SHAFT ___ SPECIAL OPTIONS: | | | | |
| OTHER: | | | | |
| DISTRIBUTION NET TOTAL: | | | | |
| FREIGHT FOB INDIANAPOLIS, IN # @ | | | | |

COMMENTS:

MARGIN TOTAL \$

PREPARED BY: _____
 DATE: _____



8196 VSP Model Designations

The Series 8196 VSP Sump Pump Line utilizes most of the 8196 ST and MT ANSI Pump Liquid Ends.

The 8196VSP Model and Group designations are determined by the combination of the ANSI pump hydraulic model and the sump pump motor frame size.

1. The 8196 ANSI pump liquid end (case and impeller) . . . for example, the corresponding ANSI pump models 2 x 3 - 6 ST, 2 x 3 - 8 MT and 3 x 4 - 13 MT become sump pump models 2 x 3 - 6 ST or STH, 2 x 3 - 8 MT1 or MTH and 3 x 4 - 13 MT2 or MTH.
2. ST pumps provided with motor frame sizes 256 and smaller -- these pumps are designated as Group ST and have 1-1/4 inch shafts and are furnished with the P-1 or P-2 motor pedestals depending on the motor frame size utilized.
3. The case size of MT pumps provided with motor frame sizes 256 and smaller -- all 8 inch and 10 inch sizes to and including the 3 x 4 - 10 are designated as Group MT1, the 4 x 6 - 10 and all the 13 inch sizes are denoted as Group MT2. Group MT1 pumps have 1-1/4 inch shafts and MT2 pumps have 1-11/16 inch column shafts, the larger shafting is used in the larger pumps which have higher inertia impellers. These pumps are supplied with the P-1 or P-2 motor pedestals depending on the motor frame size required.
4. ST and MT pumps provided with motor frame sizes 284 and larger -- these pumps are designated as Group STH and Group MTH respectively. The "H" denotes use of the larger pedestal sizes P-3 or P-4 as determined by the motor frame used. Pump Groups STH and MTH have 1-11/16 inch shafts and extra heavy thrust bearings.

| 8196 ANSI Liquid End | Motor Frame Size | Pedestal Size * | Pump Shaft Size | 8196 VSP Pump | |
|----------------------------|------------------------|-----------------------|-----------------------|------------------|-------|
| | | | | Size | Group |
| 1 x 1-1/2 - 6 ST | 143 - 256 | P - 1, 2 | 1-1/4 | 1 x 1-1/2 - 6 | ST |
| 1-1/2 x 3 - 6 ST | 143 - 256 | P - 1, 2 | 1-1/4 | 1-1/2 x 3 - 6 | ST |
| 2 x 3 - 6 ST | 143 - 256 | P - 1, 2 | 1-1/4 | 2 x 3 - 6 | ST |
| 1 x 1-1/2 - 8 ST | 143 - 256 | P - 1, 2 | 1-1/4 | 1 x 1-1/2 - 8 | ST |
| 1 x 1-1/2 - 8 ST | 284 - 365 | P - 3, 4 | 1-11/16 | 1 x 1-1/2 - 8 | STH |
| 1-1/2 x 3 - 8 ST | 143 - 256 | P - 1, 2 | 1-1/4 | 1-1/2 x 3 - 8 | ST |
| 1-1/2 x 3 - 8 ST | 284 - 365 | P - 3, 4 | 1-11/16 | 1-1/2 x 3 - 8 | STH |
| 2 x 3 - 8 MT | 143 - 256 | P - 1, 2 | 1-1/4 | 2 x 3 - 8 | MT1 |
| 2 x 3 - 8 MT | 284 - 365 | P - 3, 4 | 1-11/16 | 2 x 3 - 8 | MTH |
| 3 x 4 - 8G MT | 143 - 256 | P - 1, 2 | 1-1/4 | 3 x 4 - 8G | MT1 |
| 3 x 4 - 8 MT | 143 - 256 | P - 1, 2 | 1-1/4 | 3 x 4 - 8 | MT1 |
| 1 x 2 - 10 MT | 143 - 256 | P - 1, 2 | 1-1/4 | 1 x 2 - 10 | MT1 |
| 1-1/2 x 3 - 10 MT | 143 - 256 | P - 1, 2 | 1-1/4 | 1-1/2 x 3 - 1 | MT1 |
| 2 x 3 - 10 MT | 143 - 256 | P - 1, 2 | 1-1/4 | 2 x 3 - 10 | MT1 |
| 3 x 4 - 10 MT | 143 - 256 | P - 1, 2 | 1-1/4 | 3 x 4 - 10 | MT1 |
| 4 x 6 - 10 MT | 143 - 256 | P - 1, 2 | 1-11/16 | 4 x 6 - 10 | MT2 |
| 4 x 6 - 10 MT | 284 - 365 | P - 3, 4 | 1-11/16 | 4 x 6 - 10 | MTH |
| 1-1/2 x 3 - 13 MT | 143 - 256 | P - 1, 2 | 1-11/16 | 1-1/2 x 3 - 1 | MT2 |
| 2 x 3 - 13 MT | 143 - 256 | P - 1, 2 | 1-11/16 | 2 x 3 - 13 | MT2 |
| 2 x 3 - 13 MT | 284 - 365 | P - 3, 4 | 1-11/16 | 2 x 3 - 13 | MTH |
| 3 x 4 - 13 MT | 143 - 256 | P - 1, 2 | 1-11/16 | 3 x 4 - 13 | MT2 |
| 3 x 4 - 13 MT | 284 - 365 | P - 3, 4 | 1-11/16 | 3 x 4 - 13 | MTH |
| 4 x 6 - 13 MT | 143 - 256 | P - 1, 2 | 1-11/16 | 4 x 6 - 13 | MT2 |
| 4 x 6 - 13 MT | 284 - 365 | P - 3, 4 | 1-11/16 | 4 x 6 - 13 | MTH |

* P - 1, Frame 143 - 145; P - 2, Frame 182 - 256; P - 3, Frame 284 - 286; P - 4, Frame 324 - 365.

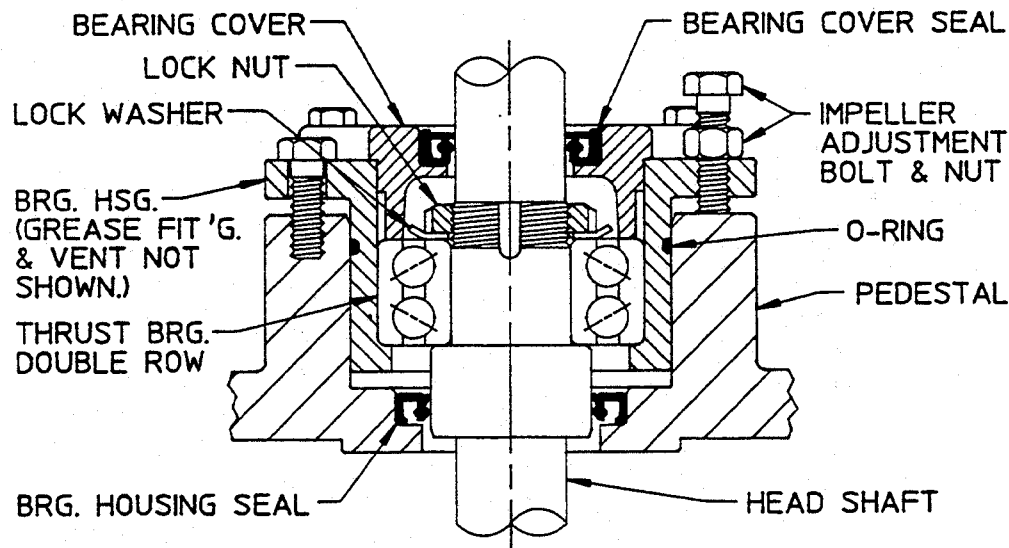
MATERIALS OF CONSTRUCTION

| Part - Item No. \ Material Group | IRON | 316 SS | CD4MCU | ALLOY 20 |
|---|--------------|----------------------------------|---------------|----------|
| Casing - 19 | Ductile Iron | 316 SS | CD4MCU | Alloy 20 |
| Impeller - 18 | Ductile Iron | 316 SS | CD4MCU | Alloy 20 |
| Adapter - 16 | CL 30 CI | 316 SS | | Alloy 20 |
| Strainer - 20 | CL 30 CI | 316 SS | | Alloy 20 |
| Discharge Elbow - 22 | CL 30 CI | 316 SS | | Alloy 20 |
| Bearing Retainer - 12 | CL 30 CI | 316 SS | | Alloy 20 |
| Column 11/15, Discharge Pipe - 23 | Steel | 316 SS | | Alloy 20 |
| Pump Shaft - 14, Shaft Coupling - 10 | Steel | 316 SS | | Alloy 20 |
| Head Shaft - 28 | Steel | 316 SS | | Alloy 20 |
| Below Plate (Wetted) Bolting | Steel | 18 - 8 SS | | Alloy 20 |
| Bearing Deflector (Not Shown) | | | Buna - N | |
| Impeller Seal (Not Shown) | | | Teflon O Ring | |
| Locknut Discharge Pipe - 25 | | | Cast Iron | |
| Motor Pedestal - 2 | | | Cast Iron | |
| Bearing Housing - 27, Bearing Cover - 4 | | | Cast Iron | |
| Mounting Plate - 7 | | Steel Standard, or as Specified | | |
| Above Plate Bolting | | Steel | | |
| Sleeve Bearing - 13 | | Carbon Standard, or as Specified | | |

TABLE A. Standard Construction - Standard Material Groups

| Part - Item Number | Optional Materials of Construction |
|-------------------------------------|------------------------------------|
| Lubrication Lines and Fittings - 24 | Steel, 316 SS |
| Discharge Flange - 26 | Cast Iron, 316 SS |
| Optional Sleeve Bearing - 13 | Bronze, Cast Iron, Teflon |
| | Cutless Rubber |
| | Viton |
| | Backing Steel, 316 SS |

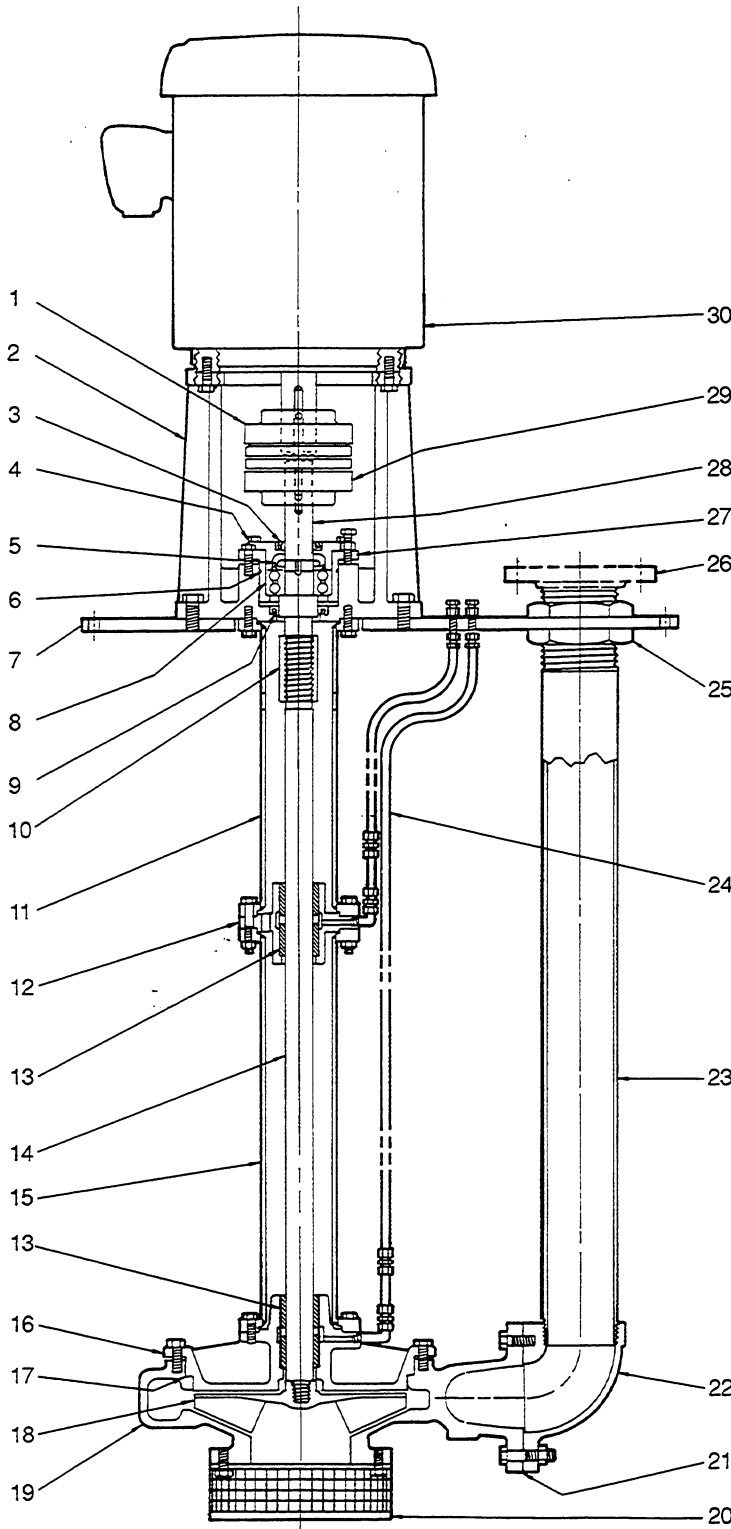
TABLE B. Optional Features - Standard Optional Materials



Thrust Bearing Detail



Construction Details
Typical Construction for a Two Column Section Pump



| No. | Description |
|-----|----------------------------|
| 1 | Coupling, Motor Half (42) |
| 2 | Pedestal, Motor (81) |
| 3 | Seal, Bearing Cover (45) |
| 4 | Cover, Bearing (37) |
| 5 | Locknut, Bearing (22) |
| 6 | O-Ring, Bearing Housing |
| 7 | Plate, Mounting |
| 8 | Bearing Thrust (18) |
| 9 | Seal, Bearing Housing (47) |
| 10 | Coupling, Shaft (70) |
| 11 | Column, Top (101) |
| 12 | Retainer, Bearing (193) |
| 13 | Bearing (39) ** |
| 14 | Shaft, Pump (6) |
| 15 | Column, Bottom (101) |
| 16 | Adapter (71) |
| 17 | Gasket, Adapter to Casing |
| 18 | Impeller (2) *** |
| 19 | Casing (1) |
| 20 | Strainer (209) |
| 21 | Gasket, Casing to Elbow |
| 22 | Elbow, Discharge (105) |
| 23 | Pipe, Discharge |
| *24 | Lubrication Lines |
| 25 | Locknut, Discharge Pipe |
| *26 | Flange, Discharge |
| 27 | Housing, Bearing (99) |
| 28 | Shaft, Head (10) |
| 29 | Coupling, Pump Half (44) |
| 30 | Motor |

Notations:

() Hydraulic Institute Item Number designation as applicable.

* Denotes Optional Feature

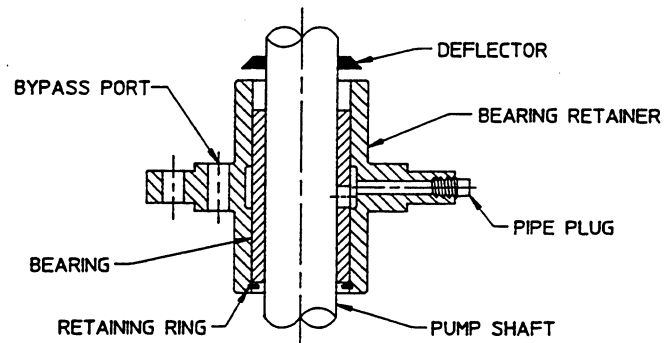
** Bearing deflector not shown. A deflector is mounted on the shaft above each sleeve bearing.

*** Impeller seal not shown. Impeller Hub is sealed at shaft connection by an O-Ring seal.

SLEEVE BEARING DESIGN OPTIONS TYPICAL FOR COLUMN BEARINGS AND ADAPTER BEARINGS

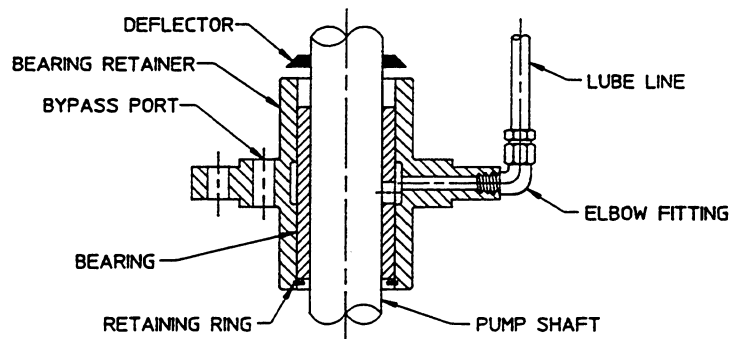
Design SB - 1

Standard Carbon sleeve bearing arrangement without external lubrication. Lubrication is by the pumped fluid present in the column. Upper bearings may possibly be started dry. This design is restricted to 1800 RPM maximum pump speed for clear abrasive free liquids.



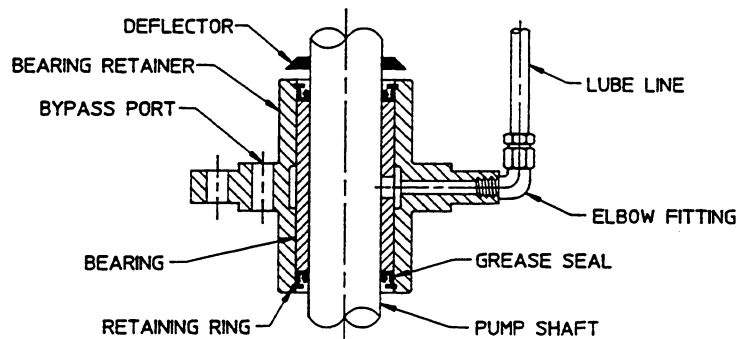
Design SB - 2

This optional arrangement provides for lubrication lines from the mounting plate to each sleeve bearing. The lines are furnished with grease fittings. However, the grease fittings may be removed and a pressurized external flushing source may be connected to the lubrication lines. Carbon, Teflon, Iron or Bronze bearings may be used. The Metallic bearings must have grease or other external lubrication.



Design SB - 3

This option features sealed sleeve bearings. The bearings are isolated from the pumpage thus providing a design for handling fluids with grit and abrasives. The bearings are Carbon and each bearing is grease lubricated thru an individual lube line from the mounting plate. The grease is fed by a pressurized (spring loaded) grease container on each line. This design is particularly suited where there is no adequate external flushing fluid available.





SLEEVE BEARING MATERIAL APPLICATION GUIDELINES

Carbon

8196 VSP sump pumps are provided with carbon guide bearings as standard. The carbon bearings properties and characteristics offer themselves suitable for a wide range of applications. Although the carbon bearings offers "dry" operation capability it is recommended for long life that the bearings be lubricated, as the addition of fluid will decrease the coefficient of friction between the bearings and the shaft. Most pumped product will provide sufficient lubrication properties for the carbon bearings. The noted exception is that the lubrication medium must not contain abrasives or solid particles.

Carbon bearings are suitable for:

1. A wide range of corrosive fluids and chemicals.
2. Dry operation, but overall life will be less than lubricated bearings.
3. Temperatures to 450 Fahrenheit.

Carbon bearings are not suitable for:

1. Lubrication with abrasive or solid particles.
2. Should be restricted to 1800 RPM maximum shaft rotating speed.

Carbon Filled Teflon

As with the standard carbon bearings the carbon filled Teflon bearings should be internally or externally lubricated for long life. The carbon filled Teflon bearings offer resistance to attack from most chemicals. Carbon filled Teflon bearings should not be used in an abrasive environment. There is rarely any advantage for using Teflon bearings over the carbon bearings.

Teflon bearings are not suitable for:

1. Lubrication with abrasive or solid particles.

Fluted Rubber

Metal backed rubber fluted bearings are recommended when particles are present within the pumped fluid. With rubber bearings the contaminants and solids particles are flushed away through the fluted grooves. Dependent on the application the rubber bearings are offered with 316 stainless steel or steel shells. Rubber bearings are not suitable for dry running, they must be lubricated at all times including prior to start-up. Corrosion resistant shafting is standard with rubber bearings.

Rubber bearings are suitable for:

1. Abrasive water service.
2. Temperatures to 150 Fahrenheit.

Rubber bearings are not suitable for:

1. Dry running.
2. Dry start-up.
3. Most oil solutions

Metallic (Bronze and Cast Iron)

These bearings must be externally lubricated and must be lubricated at all times including prior to start-up.

Bronze bearings are suitable for:

1. Non-abrasive service.
2. Neutral PH fluids.
3. Temperatures to 170 Fahrenheit.
4. Must be grease or clean flush lubricated.

Bronze bearings are not suitable for:

1. Fluids with abrasives.
2. Fluids with H₂S present.

Cast Iron bearings are suitable for:

1. Non-abrasive service.
2. Temperatures to 180 Fahrenheit.
3. Must be greased or clean flush

Cast Iron bearings are not suitable for:

1. Fluids with abrasives.
2. Water service, other materials are much more suited.



PUMP SELECTION INSTRUCTIONS

**VSP PUMP CURVE FRICTION HEAD LOSS ADJUSTMENTS
FOR PIT DEPTH SETTING**

Since the 8196 VSP sump pumps utilize the same hydraulic parts (casings and impellers) as the 8196 Process Pumps, all VSP pump curves show the same performance as the 8196 ANSI Process Pump curves. Therefore, VSP performance curves reflect the head conditions at the pump's casing flange. **NO ELBOW OR DISCHARGE PIPE FRICTION LOSSES ARE INCLUDED.**

In order to match the pump selection to the job requirements, the VSP pump elbow and discharge pipe losses need to be considered in the pump selection process. These losses are referred to as the VSP configuration friction losses which must be added to the specified head to adjust the curve performance at the casing discharge, in order to achieve the sump pump performance for the required pit depth setting.

The following pages provide the sump pump configuration elbow and discharge pipe friction loss charts. These charts should be used in calculating the pump performance curve total head necessary for establishing the impeller diameter and motor size for the customer's requirements.

Please note the following example:

CUSTOMER CONDITIONS - 1000 GPM AT 90 FEET OF HEAD, PUMP SETTING FOR A 10'-0" PIT DEPTH. MOTOR TO BE NON-OVERLOADING FOR THE IMPELLER REQUIRED. PUMPAGE SPECIFIC GRAVITY IS 1.0.

INITIAL SELECTION: 4X6-10 MT/MTH PUMP AT 1750 RPM (SECTION 9240, PAGE 39) VSP CURVE SHOWS 1000 GPM AT 90 FEET HEAD AT THE PUMP CASING FLANGE. REFERRING TO THE VSP CONFIGURATION FRICTION CHART, (SECTION 9205, PAGE 16) WITH A 10 FOOT PIT DEPTH PUMP SETTING AT 1000 GPM THE ADDITIONAL HEAD LOSSES TO BE ADDED ARE 15.4 FEET.

| | | |
|------------------|-----------------------|----------|
| SELECTION RECAP: | 1000 GPM @ | 90.0 FT |
| | ADDED FRICTION LOSSES | 15.4 FT |
| | TOTAL REVISED HEAD | 105.4 FT |

105.4 FEET IS THE TOTAL HEAD NECESSARY FOR THE PUMP SELECTED TO MEET THE CUSTOMER'S CONDITIONS.

NOTE: THE 4X6-10 PUMP AT 1750 RPM WILL NOT MEET THE REVISED HEAD CONDITIONS.

THEREFORE, THE 4X6X13 PUMP AT 1750 RPM (SECTION 9240, PAGE 59) WILL BE REQUIRED TO MEET THE 105.4 FT TOTAL HEAD NECESSARY. THIS PUMP WILL REQUIRE AN 11 INCH DIAMETER IMPELLER AND A 40 HP MOTOR.

Series 8196VSP
Industrial Sump Pumps



Peerless Pump Company
 Indianapolis, IN 46207-7026

VSP PUMP CONFIGURATION LOSSES

**ELBOW AND DISCHARGE PIPE FRICTION HEAD LOSSES
 IN FEET FOR VARIOUS PIT DEPTH SETTINGS**

PUMP DISCHARGE - 2 INCH, CASING DISCHARGE - 1 INCH

PUMP MODELS: 1X1-1/2-6 ST

**1X1-1/2-8 ST
 1X1-1/2-8 STH**

1X2-10 MT

| PIT DEPTH | FLOW RATE (GPM) | | | | | | | | |
|-----------|-----------------|-----|-----|-----|------|------|------|------|------|
| | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 |
| 2'-0" | 0.5 | 2.0 | 4.4 | 7.9 | 12.3 | 17.7 | 24.1 | 31.4 | 39.8 |
| 2'-6" | 0.5 | 2.0 | 4.5 | 7.9 | 12.4 | 17.8 | 24.2 | 31.6 | 40.0 |
| 3'-0" | 0.5 | 2.0 | 4.5 | 8.0 | 12.5 | 17.9 | 24.4 | 31.9 | 40.3 |
| 3'-6" | 0.5 | 2.0 | 4.5 | 8.0 | 12.5 | 18.1 | 24.6 | 32.1 | 40.6 |
| 4'-0" | 0.5 | 2.0 | 4.6 | 8.1 | 12.6 | 18.2 | 24.7 | 32.3 | 40.9 |
| 4'-6" | 0.5 | 2.0 | 4.6 | 8.1 | 12.7 | 18.3 | 24.9 | 32.5 | 41.1 |
| 5'-0" | 0.5 | 2.1 | 4.6 | 8.2 | 12.8 | 18.4 | 25.1 | 32.7 | 41.4 |
| 5'-6" | 0.5 | 2.1 | 4.7 | 8.3 | 12.9 | 18.6 | 25.2 | 32.9 | 41.7 |
| 6'-0" | 0.5 | 2.1 | 4.7 | 8.3 | 13.0 | 18.7 | 25.4 | 33.2 | 42.0 |
| 6'-6" | 0.5 | 2.1 | 4.7 | 8.4 | 13.1 | 18.8 | 25.6 | 33.4 | 42.2 |
| 7'-0" | 0.5 | 2.1 | 4.8 | 8.4 | 13.2 | 18.9 | 25.7 | 33.6 | 42.5 |
| 7'-6" | 0.5 | 2.1 | 4.8 | 8.5 | 13.2 | 19.1 | 25.9 | 33.8 | 42.8 |
| 8'-0" | 0.5 | 2.2 | 4.8 | 8.5 | 13.3 | 19.2 | 26.1 | 34.0 | 43.1 |
| 8'-6" | 0.6 | 2.2 | 4.9 | 8.6 | 13.4 | 19.3 | 26.2 | 34.3 | 43.3 |
| 9'-0" | 0.6 | 2.2 | 4.9 | 8.7 | 13.5 | 19.4 | 26.4 | 34.5 | 43.6 |
| 9'-6" | 0.6 | 2.2 | 4.9 | 8.7 | 13.6 | 19.6 | 26.6 | 34.7 | 43.9 |
| 10'-0" | 0.6 | 2.2 | 5.0 | 8.8 | 13.7 | 19.7 | 26.8 | 34.9 | 44.2 |
| 10'-6" | 0.6 | 2.2 | 5.0 | 8.8 | 13.8 | 19.8 | 26.9 | 35.1 | 44.4 |
| 11'-0" | 0.6 | 2.2 | 5.0 | 8.9 | 13.9 | 19.9 | 27.1 | 35.3 | 44.7 |
| 11'-6" | 0.6 | 2.3 | 5.1 | 8.9 | 13.9 | 20.0 | 27.3 | 35.6 | 45.0 |

Subject to change without notice



VSP PUMP CONFIGURATION LOSSES

ELBOW AND DISCHARGE PIPE FRICTION HEAD LOSSES
IN FEET FOR VARIOUS PIT DEPTH SETTINGS

PUMP DISCHARGE - 2 INCH, CASING DISCHARGE - 1 INCH

PUMP MODELS: 1X1-1/2-6 ST

1X1-1/2-8 ST

1X2-10 MT

1X1-1/2-8 STH

| PIT DEPTH | FLOW RATE (GPM) | | | | | | | | |
|-----------|-----------------|-----|-----|-----|------|------|------|------|------|
| | 20 | 40 | 60 | 80 | 100 | 120 | 140 | 160 | 180 |
| 12'-0" | 0.6 | 2.3 | 5.1 | 9.0 | 14.0 | 20.2 | 27.4 | 35.8 | 45.3 |
| 12'-6" | 0.6 | 2.3 | 5.1 | 9.1 | 14.1 | 20.3 | 27.6 | 36.0 | 45.5 |
| 13'-0" | 0.6 | 2.3 | 5.1 | 9.1 | 14.2 | 20.4 | 27.8 | 36.2 | 45.8 |
| 13'-6" | 0.6 | 2.3 | 5.2 | 9.2 | 14.3 | 20.5 | 27.9 | 36.4 | 46.1 |
| 14'-0" | 0.6 | 2.3 | 5.2 | 9.2 | 14.4 | 20.7 | 28.1 | 36.6 | 46.3 |
| 14'-6" | 0.6 | 2.4 | 5.2 | 9.3 | 14.5 | 20.8 | 28.3 | 36.9 | 46.6 |
| 15'-0" | 0.6 | 2.4 | 5.3 | 9.3 | 14.6 | 20.9 | 28.4 | 37.1 | 46.9 |
| 15'-6" | 0.6 | 2.4 | 5.3 | 9.4 | 14.6 | 21.0 | 28.6 | 37.3 | 47.2 |
| 16'-0" | 0.6 | 2.4 | 5.3 | 9.5 | 14.7 | 21.2 | 28.8 | 37.5 | 47.4 |
| 16'-6" | 0.6 | 2.4 | 5.4 | 9.5 | 14.8 | 21.3 | 28.9 | 37.7 | 47.7 |
| 17'-0" | 0.6 | 2.4 | 5.4 | 9.6 | 14.9 | 21.4 | 29.1 | 37.9 | 48.0 |
| 17'-6" | 0.6 | 2.4 | 5.4 | 9.6 | 15.0 | 21.5 | 29.3 | 38.2 | 48.3 |
| 18'-0" | 0.6 | 2.5 | 5.5 | 9.7 | 15.1 | 21.7 | 29.4 | 38.4 | 48.5 |
| 18'-6" | 0.6 | 2.5 | 5.5 | 9.7 | 15.2 | 21.8 | 29.6 | 38.6 | 48.8 |
| 19'-0" | 0.6 | 2.5 | 5.5 | 9.8 | 15.3 | 21.9 | 29.8 | 38.8 | 49.1 |
| 19'-6" | 0.6 | 2.5 | 5.6 | 9.9 | 15.3 | 22.0 | 29.9 | 39.0 | 49.4 |
| 20'-0" | 0.7 | 2.5 | 5.6 | 9.9 | 15.4 | 22.2 | 30.1 | 39.3 | 49.6 |

Series 8196VSP
Industrial Sump Pumps



Peerless Pump Company
 Indianapolis, IN 46207-7025

VSP PUMP CONFIGURATION LOSSES

**ELBOW AND DISCHARGE PIPE FRICTION HEAD LOSSES
 IN FEET FOR VARIOUS PIT DEPTH SETTINGS**

PUMP DISCHARGE - 2 INCH, CASING DISCHARGE - 1-1/2 INCH

PUMP MODELS: 1-1/2X3-6 ST

1-1/2X3-8 ST

1-1/2X3-10 MT

1-1/2X3-13 MT

1-1/2X3-8 STH

| PIT DEPTH | FLOW RATE (GPM) | | | | | | | | | |
|--------------|-----------------|-----|-----|-----|-----|-----|-----|------|------|------|
| | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 225 | 250 | 275 |
| 2'-0" | 0.2 | 0.4 | 0.7 | 1.2 | 1.8 | 2.5 | 3.4 | 4.4 | 5.7 | 7.1 |
| 2'-6" | 0.2 | 0.5 | 0.8 | 1.3 | 2.0 | 2.8 | 3.7 | 4.9 | 6.2 | 7.7 |
| 3'-0" | 0.2 | 0.5 | 0.9 | 1.5 | 2.2 | 3.0 | 4.1 | 5.3 | 6.7 | 8.3 |
| 3'-6" | 0.2 | 0.6 | 1.0 | 1.6 | 2.4 | 3.3 | 4.4 | 5.7 | 7.2 | 8.9 |
| 4'-0" | 0.3 | 0.6 | 1.1 | 1.7 | 2.6 | 3.6 | 4.7 | 6.1 | 7.8 | 9.6 |
| 4'-6" | 0.3 | 0.7 | 1.2 | 1.9 | 2.8 | 3.8 | 5.1 | 6.6 | 8.3 | 10.2 |
| 5'-0" | 0.3 | 0.7 | 1.3 | 2.0 | 3.0 | 4.1 | 5.4 | 7.0 | 8.8 | 10.8 |
| 5'-6" | 0.3 | 0.8 | 1.4 | 2.2 | 3.1 | 4.3 | 5.8 | 7.4 | 9.3 | 11.5 |
| 6'-0" | 0.4 | 0.8 | 1.4 | 2.3 | 3.3 | 4.6 | 6.1 | 7.8 | 9.8 | 12.1 |
| 6'-6" | 0.4 | 0.9 | 1.5 | 2.4 | 3.5 | 4.9 | 6.4 | 8.3 | 10.4 | 12.7 |
| 7'-0" | 0.4 | 0.9 | 1.6 | 2.6 | 3.7 | 5.1 | 6.8 | 8.7 | 10.9 | 13.3 |
| 7'-6" | 0.4 | 1.0 | 1.7 | 2.7 | 3.9 | 5.4 | 7.1 | 9.1 | 11.4 | 14.0 |
| 8'-0" | 0.5 | 1.0 | 1.8 | 2.8 | 4.1 | 5.6 | 7.4 | 9.5 | 12.0 | 14.6 |
| 8'-6" | 0.5 | 1.1 | 1.9 | 3.0 | 4.3 | 5.9 | 7.8 | 10.0 | 12.5 | 15.2 |
| 9'-0" | 0.5 | 1.1 | 2.0 | 3.1 | 4.5 | 6.2 | 8.1 | 10.4 | 13.0 | 15.9 |
| 9'-6" | 0.5 | 1.2 | 2.1 | 3.2 | 4.7 | 6.4 | 8.5 | 10.8 | 13.5 | 16.5 |
| 10'-0" | 0.5 | 1.2 | 2.1 | 3.4 | 4.9 | 6.7 | 8.8 | 11.2 | 14.0 | 17.1 |
| 10'-6" | 0.6 | 1.3 | 2.2 | 3.5 | 5.1 | 6.9 | 9.1 | 11.7 | 14.6 | 17.7 |
| 11'-0" | 0.6 | 1.3 | 2.3 | 3.6 | 5.3 | 7.2 | 9.5 | 12.1 | 15.1 | 18.4 |
| 11'-6" | 0.6 | 1.4 | 2.4 | 3.8 | 5.4 | 7.5 | 9.8 | 12.5 | 15.6 | 19.0 |



VSP PUMP CONFIGURATION LOSSES

ELBOW AND DISCHARGE PIPE FRICTION HEAD LOSSES
IN FEET FOR VARIOUS PIT DEPTH SETTINGS

PUMP DISCHARGE - 2 INCH, CASING DISCHARGE - 1-1/2 INCH

PUMP MODELS: 1-1/2X3-6 ST 1-1/2X3-8 ST 1-1/2X3-10 MT 1-1/2X3-13 MT
1-1/2X3-8 STH

| PIT DEPTH | FLOW RATE (GPM) | | | | | | | | | |
|-----------|-----------------|-----|-----|-----|-----|------|------|------|------|------|
| | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 225 | 250 | 275 |
| 12'-0" | 0.6 | 1.4 | 2.5 | 3.9 | 5.6 | 7.7 | 10.1 | 12.9 | 16.1 | 19.6 |
| 12'-6" | 0.7 | 1.5 | 2.6 | 4.0 | 5.8 | 8.0 | 10.5 | 13.4 | 16.6 | 20.3 |
| 13'-0" | 0.7 | 1.5 | 2.7 | 4.2 | 6.0 | 8.2 | 10.8 | 13.8 | 17.2 | 20.9 |
| 13'-6" | 0.7 | 1.6 | 2.8 | 4.3 | 6.2 | 8.5 | 11.1 | 14.2 | 17.7 | 21.5 |
| 14'-0" | 0.7 | 1.6 | 2.8 | 4.4 | 6.4 | 8.8 | 11.5 | 14.6 | 18.2 | 22.1 |
| 14'-6" | 0.8 | 1.7 | 3.0 | 4.6 | 6.6 | 9.0 | 11.8 | 15.1 | 18.7 | 22.8 |
| 15'-0" | 0.8 | 1.7 | 3.0 | 4.7 | 6.8 | 9.3 | 12.2 | 15.5 | 19.3 | 23.4 |
| 15'-6" | 0.8 | 1.8 | 3.1 | 4.9 | 7.0 | 9.5 | 12.5 | 15.9 | 19.8 | 24.0 |
| 16'-0" | 0.8 | 1.8 | 3.2 | 5.0 | 7.2 | 10.0 | 12.8 | 16.3 | 20.3 | 24.7 |
| 16'-6" | 0.9 | 1.9 | 3.3 | 5.1 | 7.4 | 10.1 | 13.2 | 16.8 | 20.8 | 25.3 |
| 17'-0" | 0.9 | 1.9 | 3.4 | 5.3 | 7.6 | 10.3 | 13.5 | 17.2 | 21.4 | 25.9 |
| 17'-6" | 0.9 | 2.0 | 3.5 | 5.4 | 7.8 | 10.6 | 13.8 | 17.6 | 21.9 | 26.6 |
| 18'-0" | 0.9 | 2.0 | 3.5 | 5.5 | 7.9 | 10.8 | 14.2 | 18.0 | 22.4 | 27.2 |
| 18'-6" | 0.9 | 2.1 | 3.6 | 5.7 | 8.1 | 11.1 | 14.5 | 18.5 | 22.9 | 27.8 |
| 19'-0" | 1.0 | 2.1 | 3.7 | 5.8 | 8.3 | 11.4 | 14.8 | 18.9 | 23.4 | 28.4 |
| 19'-6" | 1.0 | 2.2 | 3.8 | 5.9 | 8.5 | 11.6 | 15.2 | 19.3 | 24.0 | 29.1 |
| 20'-0" | 1.0 | 2.2 | 3.9 | 6.1 | 8.7 | 11.9 | 15.5 | 19.7 | 24.5 | 29.7 |



VSP PUMP CONFIGURATION LOSSES

ELBOW AND DISCHARGE PIPE FRICTION HEAD LOSSES
IN FEET FOR VARIOUS PIT DEPTH SETTINGS

PUMP DISCHARGE - 2 INCH, CASING DISCHARGE - 2 INCH

PUMP MODELS: 2X3-6 ST

2X3-8 MT
2X3-8 MTH

2X3-10 MT

2X3-13 MT
2X3-13 MTH

| PIT DEPTH | FLOW RATE (GPM) | | | | | | | | |
|-----------|-----------------|-----|-----|------|------|------|------|------|------|
| | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 |
| 12'-0" | 0.6 | 2.3 | 5.0 | 8.8 | 13.5 | 19.4 | 26.3 | 34.1 | 43.1 |
| 12'-6" | 0.6 | 2.4 | 5.2 | 9.2 | 14.0 | 20.1 | 27.2 | 35.2 | 44.7 |
| 13'-0" | 0.6 | 2.5 | 5.4 | 9.5 | 14.6 | 20.8 | 28.2 | 36.7 | 46.4 |
| 13'-6" | 0.7 | 2.5 | 5.6 | 9.8 | 15.1 | 21.6 | 29.2 | 38.0 | 48.0 |
| 14'-0" | 0.7 | 2.6 | 5.8 | 10.2 | 15.6 | 22.3 | 30.2 | 39.3 | 49.6 |
| 14'-6" | 0.7 | 2.7 | 6.0 | 10.5 | 16.1 | 23.0 | 31.2 | 40.6 | 51.3 |
| 15'-0" | 0.7 | 2.8 | 6.2 | 10.9 | 16.6 | 23.8 | 32.2 | 41.9 | 52.9 |
| 15'-6" | 0.8 | 2.9 | 6.4 | 11.2 | 17.1 | 24.5 | 33.2 | 43.2 | 54.5 |
| 16'-0" | 0.8 | 3.0 | 6.6 | 11.5 | 17.6 | 25.2 | 34.2 | 44.5 | 56.2 |
| 16'-6" | 0.8 | 3.1 | 6.8 | 11.9 | 18.2 | 26.0 | 35.2 | 45.8 | 57.8 |
| 17'-0" | 0.8 | 3.2 | 7.0 | 12.2 | 18.7 | 26.7 | 36.2 | 47.1 | 59.4 |
| 17'-6" | 0.9 | 3.2 | 7.1 | 12.5 | 19.2 | 27.4 | 37.2 | 48.4 | 61.1 |
| 18'-0" | 0.9 | 3.3 | 7.3 | 12.9 | 19.7 | 28.2 | 38.2 | 49.7 | 62.7 |
| 18'-6" | 0.9 | 3.4 | 7.5 | 13.2 | 20.2 | 28.9 | 39.2 | 51.0 | 64.3 |
| 19'-0" | 0.9 | 3.5 | 7.7 | 13.5 | 20.7 | 29.6 | 40.2 | 52.3 | 66.0 |
| 19'-6" | 1.0 | 3.6 | 7.9 | 13.9 | 21.2 | 30.4 | 41.2 | 53.5 | 67.6 |
| 20'-0" | 1.0 | 3.7 | 8.1 | 14.2 | 21.8 | 31.1 | 42.2 | 54.8 | 69.2 |

Series 8196VSP
Industrial Sump Pumps



VSP PUMP CONFIGURATION LOSSES

**ELBOW AND DISCHARGE PIPE FRICTION HEAD LOSSES
 IN FEET FOR VARIOUS PIT DEPTH SETTINGS**

PUMP DISCHARGE - 4 INCH, CASING DISCHARGE - 3 INCH

**PUMP MODELS: 3X4-8G MT
 3x4-8MT**

3X4-10MT

**3X4-13MT
 3X4-13MTH**

| PIT DEPTH | FLOW RATE (GPM) | | | | | | | | |
|-----------|-----------------|-----|-----|-----|------|------|------|------|------|
| | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| 2'-0" | 1.2 | 2.7 | 4.8 | 7.4 | 10.7 | 14.5 | 19.0 | 24.0 | 29.7 |
| 2'-6" | 1.2 | 2.7 | 4.8 | 7.5 | 10.8 | 14.7 | 19.2 | 24.2 | 29.9 |
| 3'-0" | 1.2 | 2.7 | 4.8 | 7.6 | 10.9 | 14.8 | 19.3 | 24.4 | 30.2 |
| 3'-6" | 1.2 | 2.7 | 4.9 | 7.6 | 11.0 | 14.9 | 19.5 | 24.7 | 30.4 |
| 4'-0" | 1.2 | 2.8 | 4.9 | 7.7 | 11.1 | 15.0 | 19.6 | 24.9 | 30.7 |
| 4'-6" | 1.2 | 2.8 | 5.0 | 7.7 | 11.2 | 15.2 | 19.8 | 25.1 | 30.9 |
| 5'-0" | 1.3 | 2.8 | 5.0 | 7.8 | 11.2 | 15.3 | 20.0 | 25.3 | 31.2 |
| 5'-6" | 1.3 | 2.8 | 5.0 | 7.9 | 11.3 | 15.4 | 20.1 | 25.5 | 31.4 |
| 6'-0" | 1.3 | 2.9 | 5.1 | 7.9 | 11.4 | 15.6 | 20.3 | 25.7 | 31.7 |
| 6'-6" | 1.3 | 2.9 | 5.1 | 8.0 | 11.5 | 15.7 | 20.5 | 25.9 | 32.0 |
| 7'-0" | 1.3 | 2.9 | 5.2 | 8.1 | 11.6 | 15.8 | 20.6 | 26.1 | 32.2 |
| 7'-6" | 1.3 | 2.9 | 5.2 | 8.1 | 11.7 | 15.9 | 20.8 | 26.3 | 32.5 |
| 8'-0" | 1.3 | 3.0 | 5.3 | 8.2 | 11.8 | 16.1 | 21.0 | 26.5 | 32.7 |
| 8'-6" | 1.3 | 3.0 | 5.3 | 8.3 | 11.9 | 16.2 | 21.1 | 26.7 | 33.0 |
| 9'-0" | 1.3 | 3.0 | 5.3 | 8.3 | 12.0 | 16.3 | 21.3 | 26.9 | 33.2 |
| 9'-6" | 1.4 | 3.0 | 5.4 | 8.4 | 12.1 | 16.4 | 21.4 | 27.1 | 33.5 |
| 10'-0" | 1.4 | 3.1 | 5.4 | 8.5 | 12.2 | 16.6 | 21.6 | 27.3 | 33.7 |
| 10'-6" | 1.4 | 3.1 | 5.5 | 8.5 | 12.3 | 16.7 | 21.8 | 27.5 | 34.0 |
| 11'-0" | 1.4 | 3.1 | 5.5 | 8.6 | 12.4 | 16.8 | 21.9 | 27.8 | 34.2 |
| 11'-6" | 1.4 | 3.1 | 5.6 | 8.7 | 12.5 | 16.9 | 22.1 | 28.0 | 34.5 |



VSP PUMP CONFIGURATION LOSSES

ELBOW AND DISCHARGE PIPE FRICTION HEAD LOSSES
IN FEET FOR VARIOUS PIT DEPTH SETTINGS

PUMP DISCHARGE - 4 INCH, CASING DISCHARGE -3 INCH

PUMP MODELS: 3x4-8G MT
3X4-8MT

3X4-10-MT

3X4-13MT
3X4-13-MTH

| PIT DEPTH | FLOW RATE (GPM) | | | | | | | | |
|-----------|-----------------|-----|-----|-----|------|------|------|------|------|
| | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 |
| 12'-0" | 1.4 | 3.2 | 5.6 | 8.7 | 12.6 | 17.1 | 22.3 | 28.2 | 34.8 |
| 12'-6" | 1.4 | 3.2 | 5.6 | 8.8 | 12.6 | 17.2 | 22.4 | 28.4 | 35.0 |
| 13'-0" | 1.4 | 3.2 | 5.7 | 8.9 | 12.7 | 17.3 | 22.6 | 28.6 | 35.3 |
| 13'-6" | 1.4 | 3.2 | 5.7 | 8.9 | 12.8 | 17.4 | 22.8 | 28.8 | 35.5 |
| 14'-0" | 1.5 | 3.3 | 5.8 | 9.0 | 12.9 | 17.6 | 22.9 | 29.0 | 35.8 |
| 14'-6" | 1.5 | 3.3 | 5.8 | 9.1 | 13.0 | 17.7 | 23.1 | 29.2 | 36.0 |
| 15'-0" | 1.5 | 3.3 | 5.9 | 9.1 | 13.1 | 17.8 | 23.3 | 29.4 | 36.3 |
| 15'-6" | 1.5 | 3.3 | 5.9 | 9.2 | 13.2 | 18.0 | 23.4 | 29.6 | 36.5 |
| 16'-0" | 1.5 | 3.4 | 5.9 | 9.3 | 13.3 | 18.1 | 23.6 | 29.8 | 36.8 |
| 16'-6" | 1.5 | 3.4 | 6.0 | 9.3 | 13.4 | 18.2 | 23.7 | 30.0 | 37.0 |
| 17'-0" | 1.5 | 3.4 | 6.0 | 9.4 | 13.5 | 18.3 | 23.9 | 30.2 | 37.3 |
| 17'-6" | 1.5 | 3.4 | 6.1 | 9.5 | 13.6 | 18.5 | 24.1 | 30.4 | 37.6 |
| 18'-0" | 1.5 | 3.5 | 6.1 | 9.5 | 13.7 | 18.6 | 24.2 | 30.7 | 37.8 |
| 18'-6" | 1.6 | 3.5 | 6.2 | 9.6 | 13.8 | 18.7 | 24.4 | 30.9 | 38.1 |
| 19'-0" | 1.6 | 3.5 | 6.2 | 9.6 | 13.9 | 18.8 | 24.6 | 31.1 | 38.3 |
| 19'-6" | 1.6 | 3.5 | 6.2 | 9.7 | 14.0 | 19.0 | 24.7 | 31.3 | 38.6 |
| 20'-0" | 1.6 | 3.6 | 6.3 | 9.8 | 14.1 | 19.1 | 24.9 | 31.5 | 38.8 |

Series 8196VSP
 Industrial Sump Pumps



Peerless Pump Company
 Indianapolis, IN 46207-7025

VSP PUMP CONFIGURATION LOSSES

**ELBOW AND DISCHARGE PIPE FRICTION HEAD LOSSES
 IN FEET FOR VARIOUS PIT DEPTH SETTINGS**

PUMP DISCHARGE - 4 INCH, CASING DISCHARGE -4 INCH

**PUMP MODELS: 4x6-10MT
 4x6-10MTH**

**4X6-13MT
 4X6-13MTH**

| PIT DEPTH | FLOW RATE (GPM) | | | | | | | |
|--------------|-----------------|-----|-----|------|------|------|------|------|
| | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 | 1600 |
| 2'-0" | 0.5 | 1.8 | 4.1 | 7.3 | 11.4 | 16.4 | 22.3 | 29.2 |
| 2'-6" | 0.5 | 1.9 | 4.2 | 7.5 | 11.6 | 16.8 | 22.8 | 29.8 |
| 3'-0" | 0.5 | 1.9 | 4.3 | 7.6 | 11.9 | 17.1 | 23.3 | 30.4 |
| 3'-6" | 0.5 | 2.0 | 4.4 | 7.8 | 12.1 | 17.5 | 23.8 | 31.1 |
| 4'-0" | 0.5 | 2.0 | 4.5 | 7.9 | 12.4 | 17.8 | 24.3 | 31.7 |
| 4'-6" | 0.5 | 2.0 | 4.6 | 8.1 | 12.7 | 18.2 | 24.8 | 32.3 |
| 5'-0" | 0.5 | 2.1 | 4.7 | 8.3 | 12.9 | 18.6 | 25.3 | 32.9 |
| 5'-6" | 0.5 | 2.1 | 4.8 | 8.4 | 13.2 | 18.9 | 25.7 | 33.6 |
| 6'-0" | 0.5 | 2.2 | 4.9 | 8.6 | 13.4 | 19.3 | 26.2 | 34.2 |
| 6'-6" | 0.6 | 2.2 | 4.9 | 8.8 | 13.7 | 19.6 | 26.7 | 34.9 |
| 7'-0" | 0.6 | 2.3 | 5.0 | 8.9 | 13.9 | 20.0 | 27.2 | 35.5 |
| 7'-6" | 0.6 | 2.3 | 5.1 | 9.1 | 14.2 | 20.4 | 27.7 | 36.1 |
| 8'-0" | 0.6 | 2.3 | 5.2 | 9.2 | 14.4 | 20.7 | 28.2 | 36.8 |
| 8'-6" | 0.6 | 2.4 | 5.3 | 9.4 | 14.7 | 21.1 | 28.7 | 37.4 |
| 9'-0" | 0.6 | 2.4 | 5.4 | 9.6 | 14.9 | 21.4 | 29.2 | 38.0 |
| 9'-6" | 0.6 | 2.5 | 5.5 | 9.7 | 15.2 | 21.8 | 29.6 | 38.7 |
| 10'-0" | 0.6 | 2.5 | 5.6 | 9.9 | 15.4 | 22.2 | 30.1 | 39.3 |
| 10'-6" | 0.7 | 2.5 | 5.7 | 10.1 | 15.7 | 22.5 | 30.6 | 40.0 |
| 11'-0" | 0.7 | 2.6 | 5.8 | 10.2 | 15.9 | 22.9 | 31.1 | 40.6 |
| 11'-6" | 0.7 | 2.6 | 5.9 | 10.4 | 16.2 | 23.2 | 31.6 | 41.2 |



VSP PUMP CONFIGURATION LOSSES

ELBOW AND DISCHARGE PIPE FRICTION HEAD LOSSES
IN FEET FOR VARIOUS PIT DEPTH SETTINGS

PUMP DISCHARGE - 4 INCH, CASING DISCHARGE - 4 INCH

PUMP MODELS: 4X6-10MT
4X6-10MTH

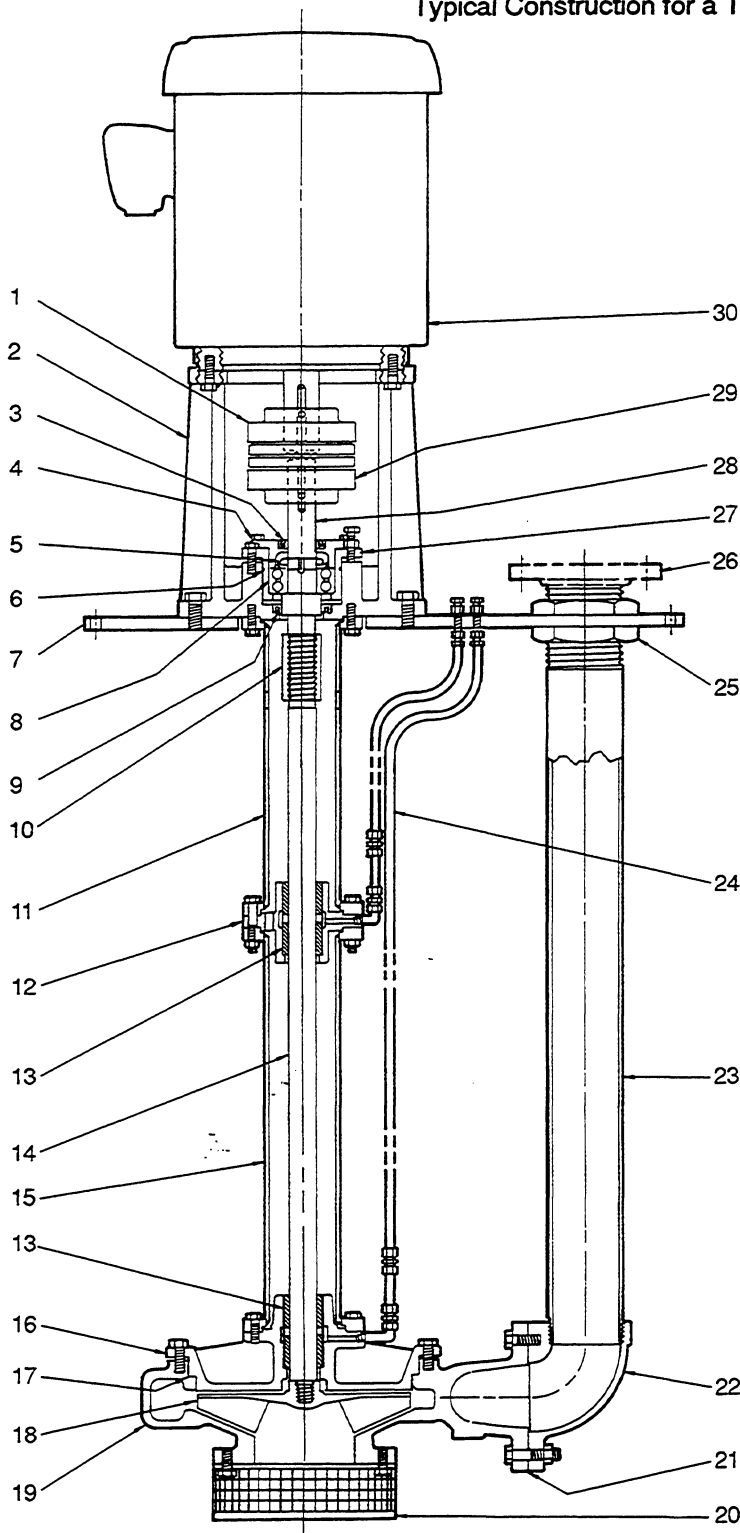
4X6-13MT
4X6-13MTH

| PIT DEPTH | FLOW RATE (GPM) | | | | | | | |
|-----------|-----------------|-----|-----|------|------|------|------|------|
| | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 | 1600 |
| 12'-0" | 0.7 | 2.7 | 6.0 | 10.5 | 16.4 | 23.6 | 32.1 | 41.9 |
| 12'-6" | 0.7 | 2.7 | 6.1 | 10.7 | 16.7 | 24.0 | 32.6 | 42.5 |
| 13'-0" | 0.7 | 2.8 | 6.2 | 10.9 | 16.9 | 24.3 | 33.1 | 43.1 |
| 13'-6" | 0.7 | 2.8 | 6.2 | 11.0 | 17.2 | 24.7 | 33.6 | 43.8 |
| 14'-0" | 0.7 | 2.8 | 6.3 | 11.2 | 17.4 | 25.0 | 34.0 | 44.4 |
| 14'-6" | 0.7 | 2.9 | 6.4 | 11.3 | 17.7 | 25.4 | 35.0 | 45.0 |
| 15'-0" | 0.8 | 2.9 | 6.5 | 11.5 | 17.9 | 25.8 | 35.0 | 45.7 |
| 15'-6" | 0.8 | 3.0 | 6.6 | 11.7 | 18.2 | 26.1 | 35.6 | 46.3 |
| 16'-0" | 0.8 | 3.0 | 6.7 | 11.8 | 18.4 | 26.5 | 36.0 | 46.9 |
| 16'-6" | 0.8 | 3.1 | 6.8 | 12.0 | 18.7 | 26.8 | 36.5 | 47.6 |
| 17'-0" | 0.8 | 3.1 | 6.9 | 12.2 | 18.9 | 27.2 | 37.0 | 48.2 |
| 17'-6" | 0.8 | 3.1 | 7.0 | 12.3 | 19.2 | 27.6 | 37.5 | 48.8 |
| 18'-0" | 0.8 | 3.2 | 7.1 | 12.5 | 19.4 | 27.9 | 37.9 | 49.5 |
| 18'-6" | 0.8 | 3.2 | 7.2 | 12.6 | 19.7 | 28.3 | 38.4 | 50.1 |
| 19'-0" | 0.8 | 3.3 | 7.3 | 12.8 | 19.9 | 28.6 | 38.9 | 50.7 |
| 19'-6" | 0.9 | 3.3 | 7.4 | 13.0 | 20.2 | 29.0 | 39.4 | 51.4 |
| 20'-0" | 0.9 | 3.4 | 7.5 | 13.1 | 20.4 | 29.4 | 39.9 | 52.0 |



CONSTRUCTION

Typical Construction for a Two Column Section Pump



| No. | Description |
|-----------------------------|----------------------------|
| 1 | Coupling, Motor Half (42) |
| 2 | Pedestal, Motor (81) |
| 3 | Seal, Bearing Cover (45) |
| 4 | Cover, Bearing (37) |
| 5 | Locknut, Bearing (22) |
| 6 | O-Ring, Bearing Housing |
| 7 | Plate, Mounting |
| 8 | Bearing Thrust (18) |
| 9 | Seal, Bearing Housing (47) |
| 10 | Coupling, Shaft (70) |
| 11 | Column, Top (101) |
| 12 | Retainer, Bearing (193) |
| 13 | Bearing (39) ** |
| 14 | Shaft, Pump (6) |
| 15 | Column, Bottom (101) |
| 16 | Adapter (71) |
| 17 | Gasket, Adapter to Casing |
| 18 | Impeller (2) *** |
| 19 | Casing (1) |
| 20 | Strainer (209) |
| 21 | Gasket, Casing to Elbow |
| 22 | Elbow, Discharge (105) |
| 23 | Pipe, Discharge |
| <input type="checkbox"/> 24 | Lubrication Lines |
| 25 | Locknut, Discharge Pipe |
| <input type="checkbox"/> 26 | Flange, Discharge |
| 27 | Housing, Bearing (99) |
| 28 | Shaft, Head (10) |
| 29 | Coupling, Pump Half (44) |
| 30 | Motor |

Notations:

() Hydraulic Institute Item Number designation as applicable.

Denotes Optional Feature Included

** Bearing deflector not shown. A deflector is mounted on the shaft above each sleeve bearing.

*** Impeller seal not shown. Impeller Hub is sealed at shaft connection by an O-Ring seal.

Customer: _____ Ref.: _____ Item: _____

Peerless Ref: _____ By: _____ Date: _____



MATERIALS OF CONSTRUCTION

| Basic Material Group Designation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--|--------------------------|----------------------------------|--------------------------|
| Part - Item Number | IRON | 316 SS | CD4MCU | ALLOY 20 |
| Casing - 19 | Ductile Iron | 316 SS | CD4MCU | Alloy 20 |
| Impeller - 18 | Ductile Iron | 316 SS | CD4MCU | Alloy 20 |
| Adapter - 16 | CL 30 CI | 316 SS | | Alloy 20 |
| Strainer - 20 | CL 30 CI | 316 SS | | Alloy 20 |
| Discharge Elbow - 22 | CL 30 CI | 316 SS | | Alloy 20 |
| Bearing Retainer - 12 | CL 30 CI | 316 SS | | Alloy 20 |
| Column 11/15, Discharge Pipe - 23 | Steel | 316 SS | | Alloy 20 |
| Pump Shaft - 14, Shaft Coupling - 10 | Steel | 316 SS | | Alloy 20 |
| Head Shaft - 28 | Steel | 316 SS | | Alloy 20 |
| Below Plate (Wetted) Bolting | Steel | 18 - 8 SS | | Alloy 20 |
| Bearing Deflector (Not Shown) | Buna - N | | | |
| Impeller Seal (Not Shown) | Teflon O Ring | | | |
| Locknut Discharge Pipe - 25 | Cast Iron | | | |
| Motor Pedestal - 2 | Cast Iron | | | |
| Bearing Housing - 27, Bearing Cover - 4 | Cast Iron | | | |
| Mounting Plate - 7 | <input type="checkbox"/> Steel Standard | | <input type="checkbox"/> (SPL.) | |
| Above Plate Bolting | Steel | | | |
| Sleeve Bearing - 13 | <input type="checkbox"/> Carbon Standard | | <input type="checkbox"/> Special | |

| Part - Item Number | Optional Materials of Construction | | | |
|-----------------------------------|---|------------------------------------|---------------------------------|--|
| Lubrication Lines & Fittings - 24 | <input type="checkbox"/> Steel | <input type="checkbox"/> 316 SS | | |
| Discharge Flange - 26 | <input type="checkbox"/> Cast Iron | <input type="checkbox"/> 316 SS | | |
| Optional Sleeve Bearings - 13 | <input type="checkbox"/> Bronze | <input type="checkbox"/> Cast Iron | <input type="checkbox"/> Teflon | |
| | <input type="checkbox"/> Cutless Rubber | | Backing | |
| | <input type="checkbox"/> Viton | <input type="checkbox"/> Steel | <input type="checkbox"/> 316 SS | |

Denotes the basic standard Material Group. When an item has a circled material designation beyond the basic group or a check in the optional material selections the actual material included for that item is so indicated.

Customer: _____ Ref.: _____ Item: _____

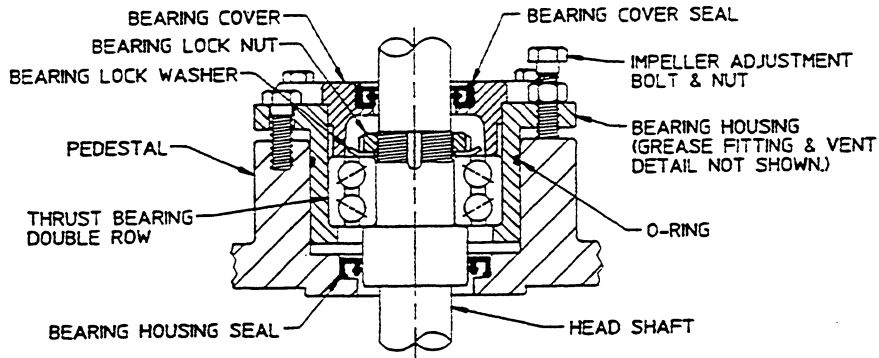
Peerless Ref.: _____ By: _____ Date: _____



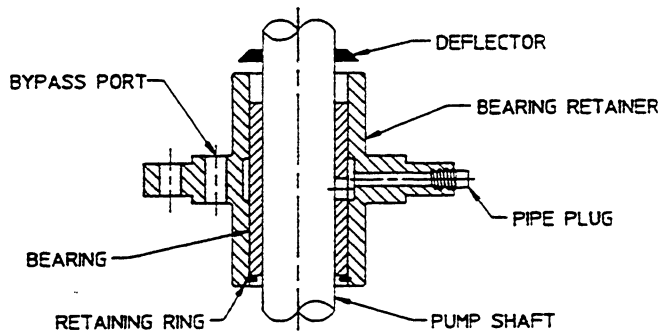
BEARING CONSTRUCTION

FOR PUMPS PROVIDED WITH STANDARD CONFIGURATION SLEEVE BEARINGS

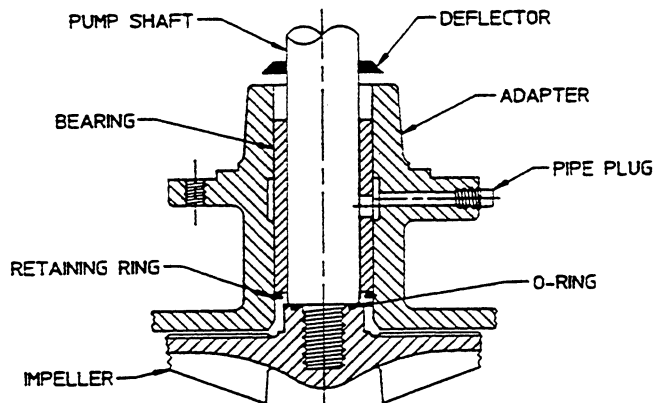
Sleeve Bearing Design SB - 1



THRUST BEARING DETAIL



BEARING RETAINER DETAIL



ADAPTER BEARING HOUSING DETAIL

Customer: _____ Ref.: _____ Item: _____

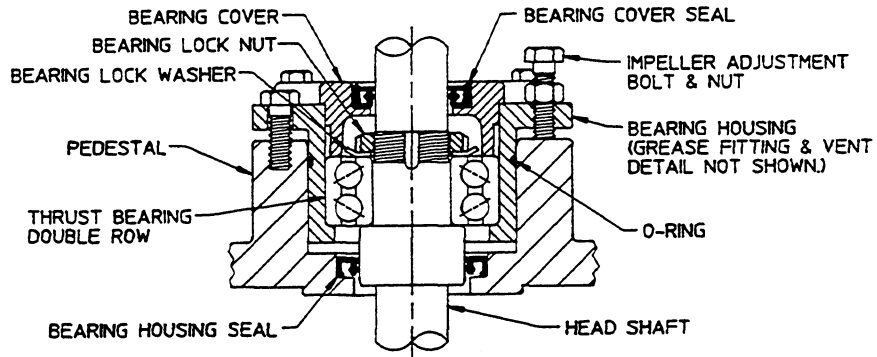
Peerless Ref.: _____ By: _____ Date: _____



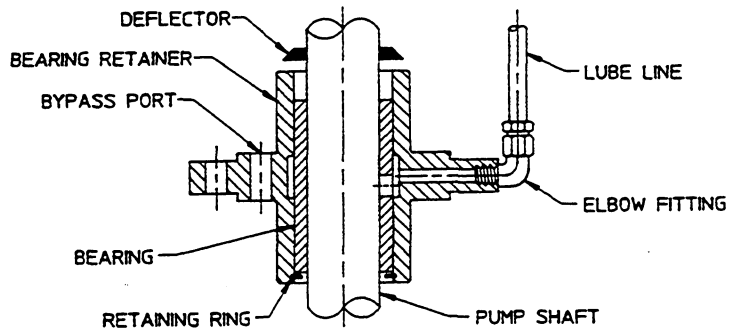
BEARING CONSTRUCTION

FOR PUMPS PROVIDED WITH LUBRICATION LINES FROM THE MOUNTING PLATE
TO EACH SLEEVE BEARING

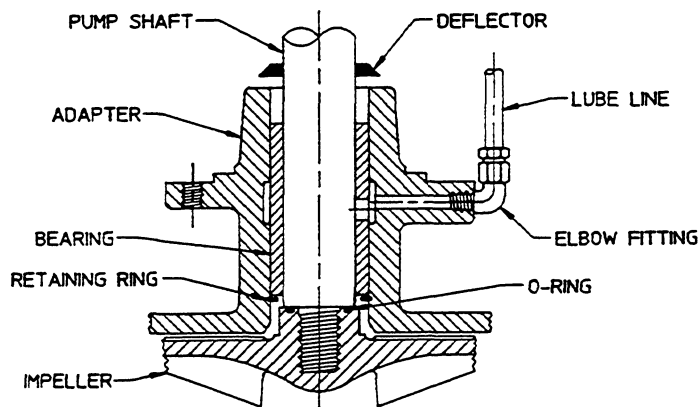
Sleeve Bearing Design SB - 2



THRUST BEARING DETAIL



BEARING RETAINER DETAIL



ADAPTER BEARING HOUSING DETAIL

Customer: _____ Ref.: _____ Item: _____

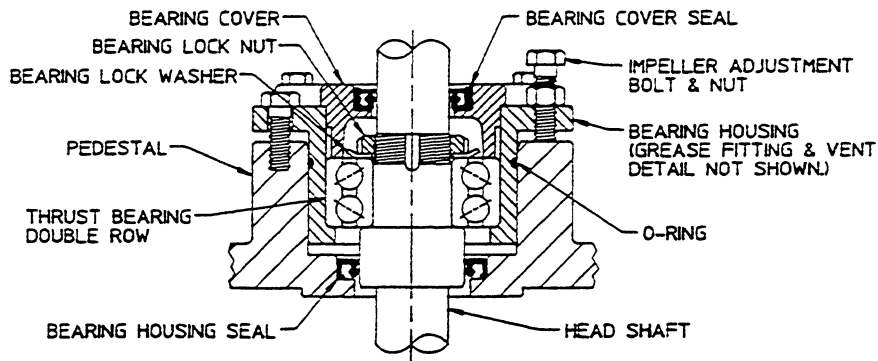
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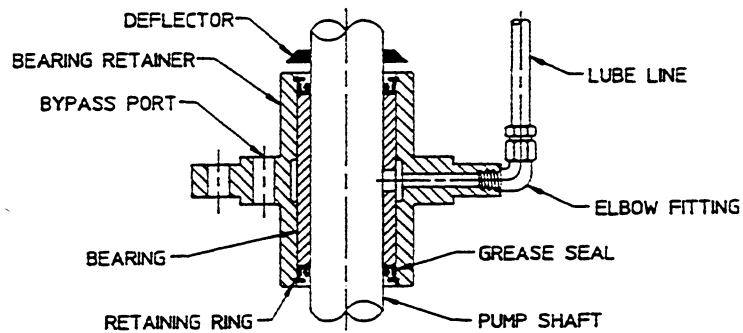
BEARING CONSTRUCTION

FOR PUMPS PROVIDED WITH SEALED SLEEVE BEARING CONSTRUCTION WITH LUBRICATION LINES FROM THE MOUNTING PLATE

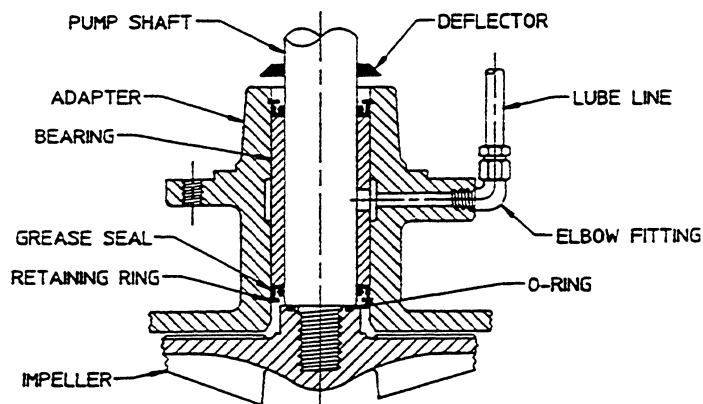
Sleeve Bearing Design SB - 3



THRUST BEARING DETAIL



BEARING RETAINER DETAIL



ADAPTER BEARING HOUSING DETAIL

Customer: _____ Ref.: _____ Item: _____

Peerless Ref.: _____ By: _____ Date: _____