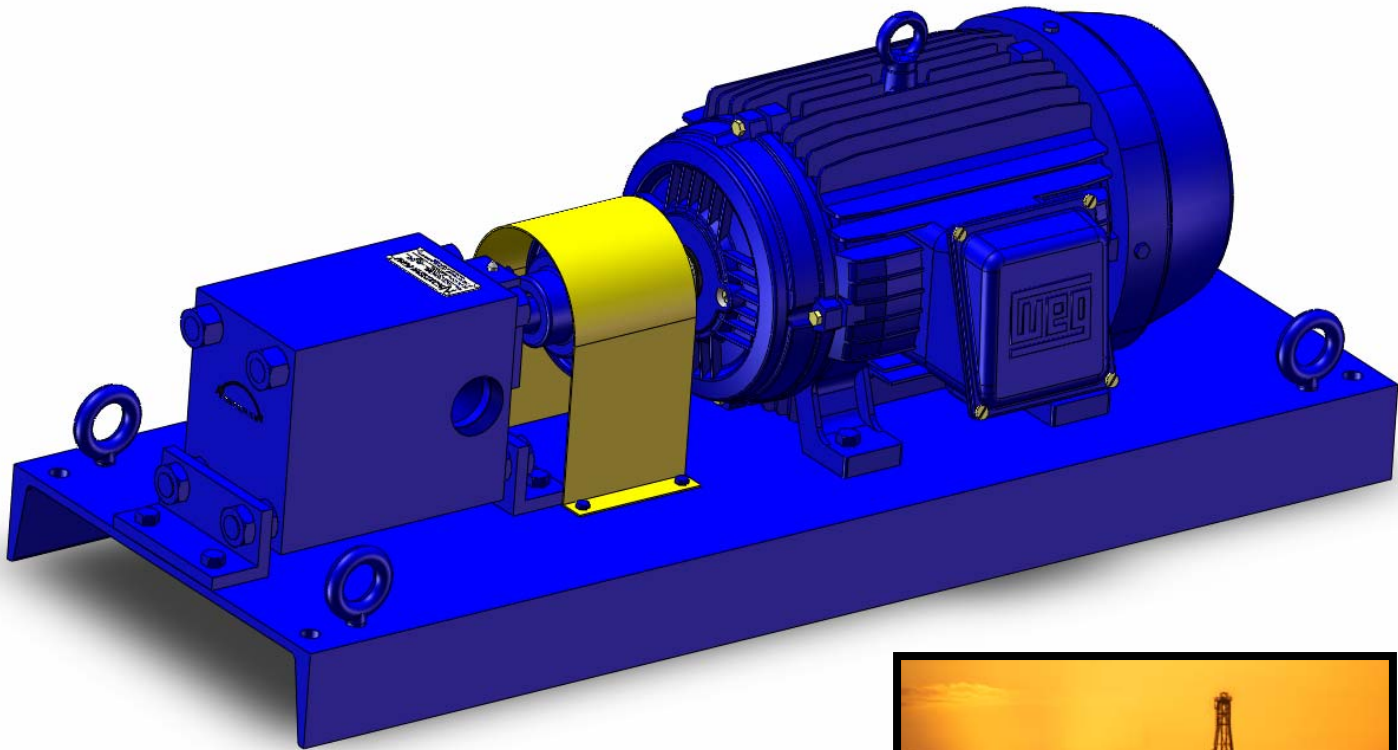


4800-15-D1776

Heavy Duty Gear Pump Assembly



SPECIAL PRODUCT INFORMATION

N **NORTHERN PUMP**
Division of McNally Industries LLC
340 W. Benson Avenue - Grantsburg, WI 54840
(800) 366-1410 ♦ www.northern-pump.com

More Custom Pumps in the Pipeline for Northern®

November 10, 2010 - Northern® Pump, a precision manufacturer of heavy-duty gear pumps, has completed nine custom pump unit assemblies for a U.S. based independent pipeline company. The Northern Model 4800-15-D1776 offers our customer a more effective and reliable pumping solution on a crude oil pipeline.

Northern® Pump provided a gear pump unit assembly that was customized to fit the exact crude oil application. The unit includes the pump assembly, explosion proof electric motor, coupling, and coupling guard. This complete unit was assembled and aligned at the factory, which will eliminate costly and tedious efforts during field installation. In addition, the modular design of this Northern® Pump makes it easy to operate and maintain in the field.

The Northern® 4800-15-D1776 is designed to pump 45 Gallons per minute of Bakken Crude Oil at 500 PSI Discharge Pressure. Northern® Pump units that share this design are capable of producing discharge pressures well beyond 1000 PSI for crude oil service. This pump also features a steel housing with a vacuum Furnace Brazed Iron insert Cylinder housing to handle extreme pressures, with exceptional wear properties.

Northern® Pump continues to demonstrate the overall ability to deliver a critical custom pump project ahead of schedule. For more information on how Northern® Pump can help you achieve your operational goals contact our sales team at (800) 366-1410.





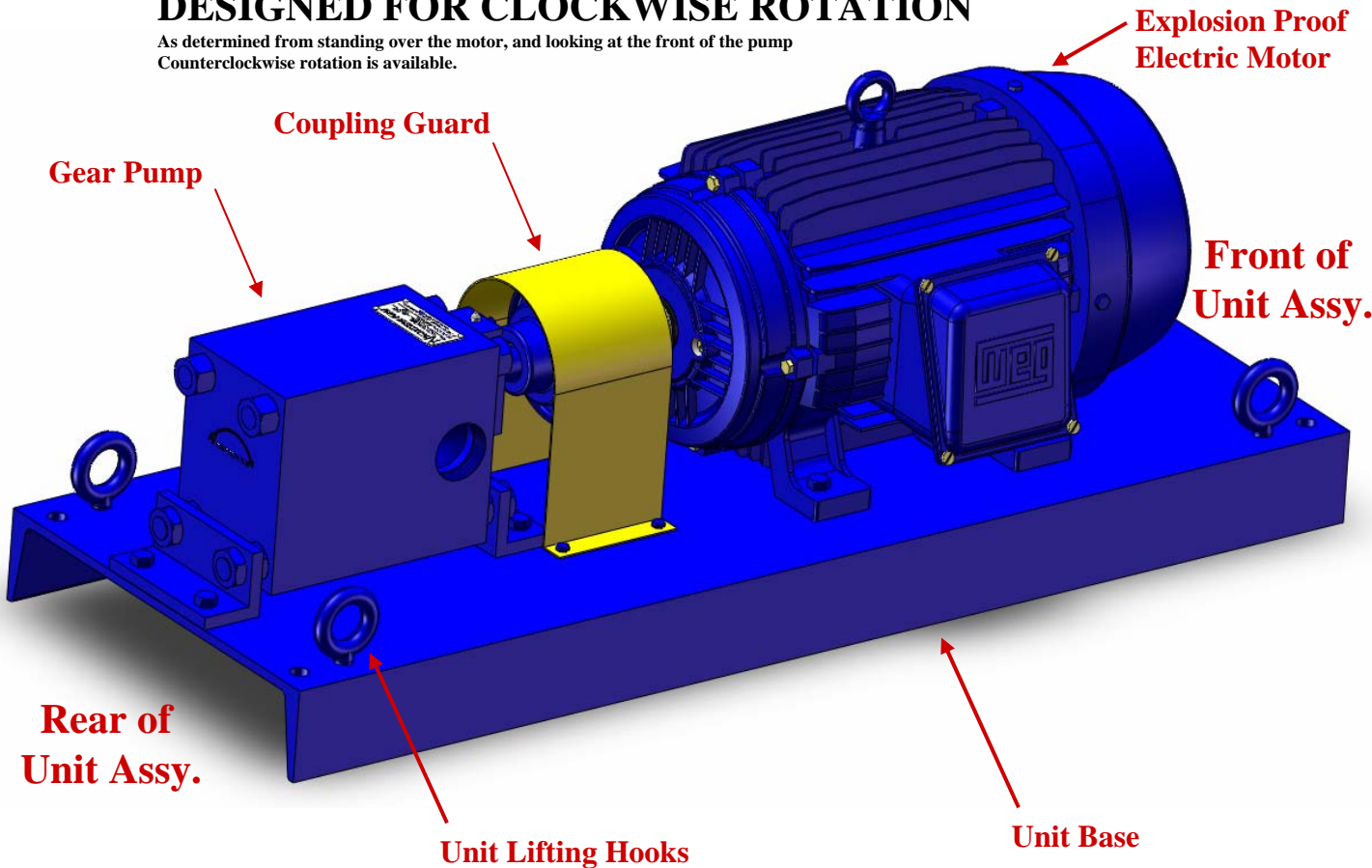
NORTHERN[®] PUMP

A Division of McNally Industries LLC

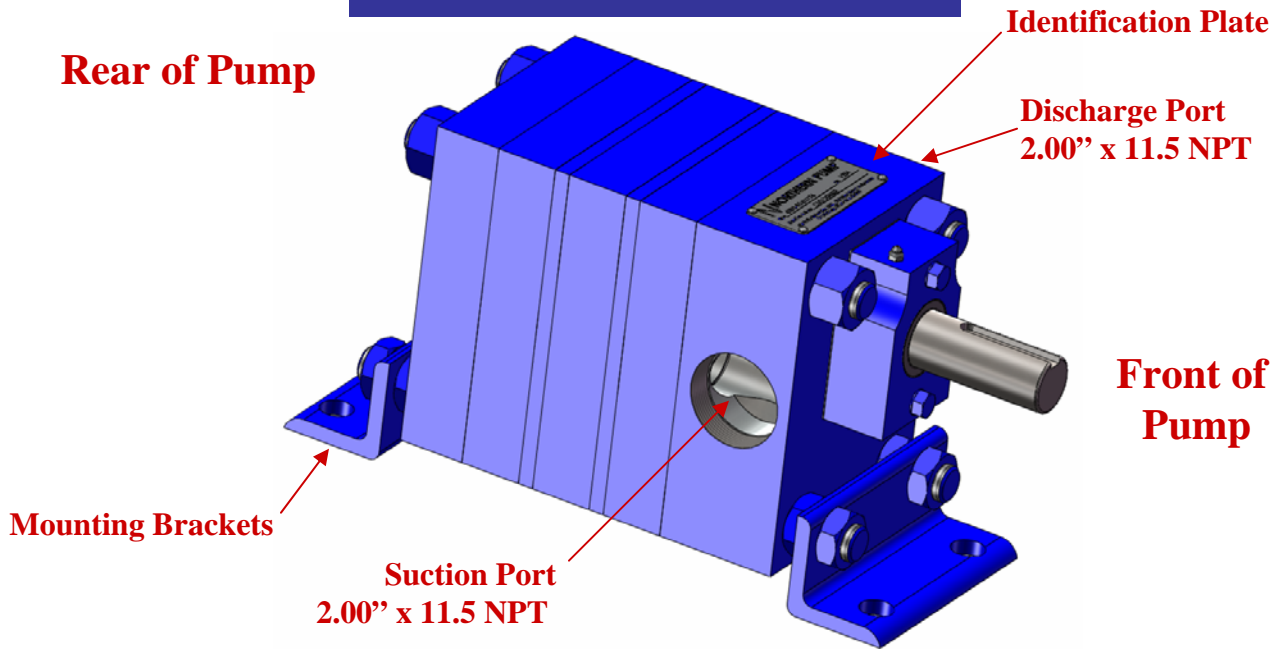
BASIC PUMP UNIT ASSEMBLY LAYOUT

DESIGNED FOR CLOCKWISE ROTATION

As determined from standing over the motor, and looking at the front of the pump
Counterclockwise rotation is available.



BASIC PUMP LAYOUT



SPECIAL DESIGN FEATURES & BENEFITS

4800-15-D1765



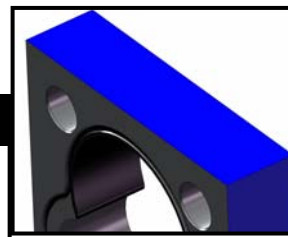
Feature
John Crane® Type 21 mechanical seal w/ Silicon Carbide face and Viton® elastomer

Benefit
Longer seal life
Commercially available
Easy replacement



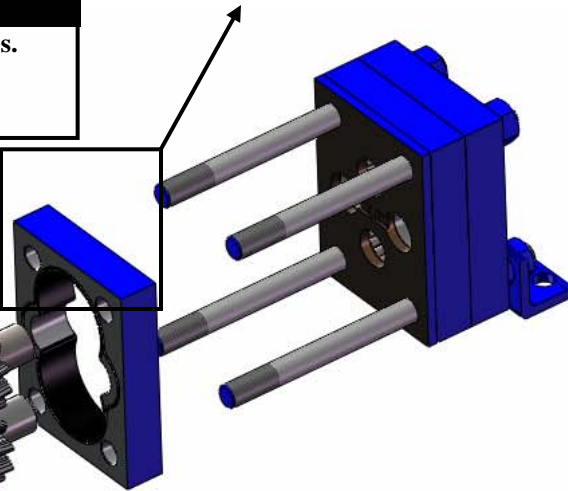
Feature
Carburized 8620 Alloy Steel Gears & shafts
Ground- AGMA Quality 13

Benefit
Very Hard – Resistant to wear
Easy assembly/disassembly
Greater Basic Dynamic Capacity



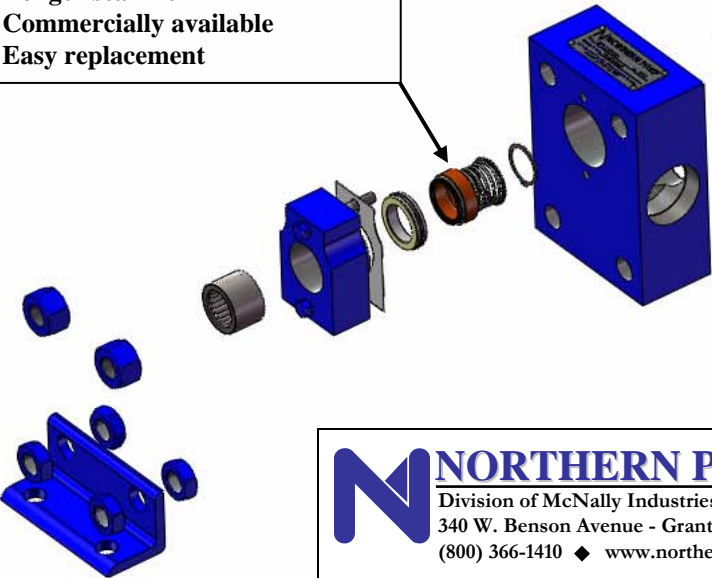
Feature
Aluminum Bronze Tool Steel liner pate between cylinder and bearing plate

Benefit
Enables close internal clearances.
Better volumetric efficiency
Cost effective repairs



Feature
Aluminum Bronze Tool Steel liner pate between cylinder and bearing plate

Benefit
Enables close internal clearances.
Better volumetric efficiency
Cost effective repairs



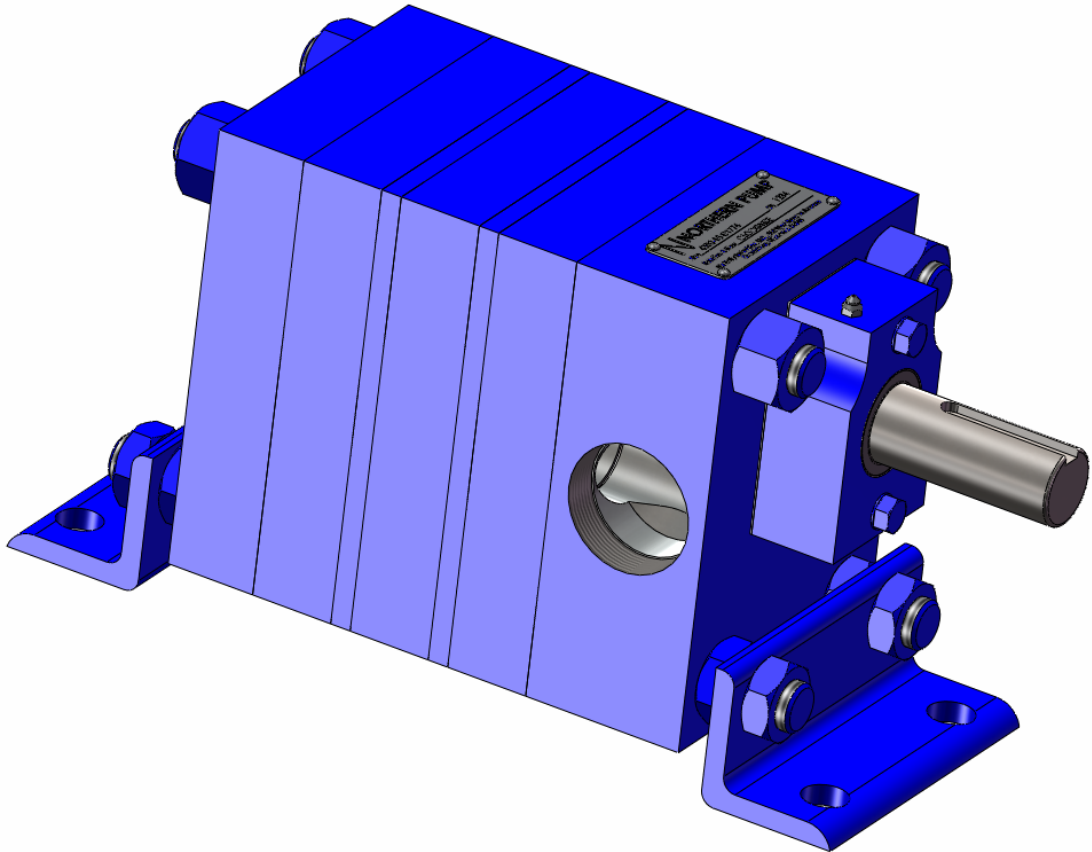
Feature
Viton® elastomer O-Ring Seals between all pump plates

Benefit
Higher pressure capacity
Easy assembly/disassembly
Reliable sealing



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Pump Materials of Construction

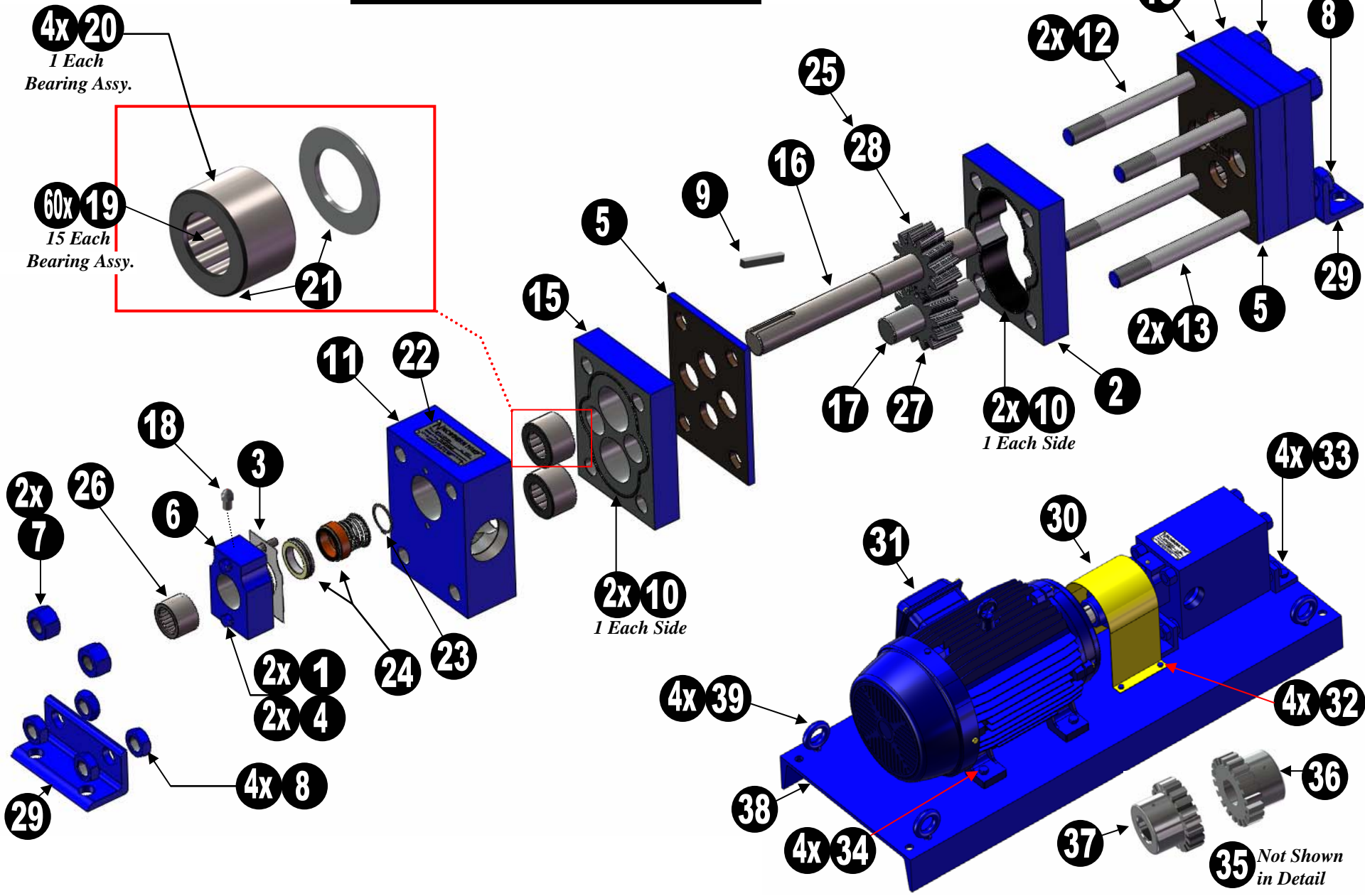


Pump Gears Aircraft Quality 8620 Alloy Steel
Pump Shafts Aircraft Quality 8620 Alloy Steel
Pump Cylinder Steel with Cast Iron Insert
Bearing Plates Steel used with Wear Plates
Liner Plates Aluminum Bronze
Shaft Bearings AISI 52100 Steel Roller Type
Mounting Brackets ASTM A36 Structural Steel
Shaft Seal Type 21 Mechanical Seal
End Plate Carbon Steel
Pump Studs Carbon Steel

Exploded Diagram

4800-15-D1765

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NORTHERN[®] PUMP

A Division of McNally Industries LLC

Bill of Material List - 4800-15-D1765

FIND #	ITEM NUMBER	DESCRIPTION	QTY
1	11490007	WASHER, LOCK	2
2	1174-4800-15	CYLINDER	1
3	1282-4800	GASKET	1
4	13430007-36	CAP SCREW, HEX HEAD	2
5	1393-4800	PLATE, LINER	2
6	1519-4800	HOUSING, BEARING & SEAT	1
7	15410014	HEAVY HEX WHOLE NUT	4
8	15420014	HEAVY HEX JAM NUT	8
9	17500006-40	END KEY	1
10	19120163-40	O'RING, ROUND SECTIONAL	6
11	2201-4800	PLATE, PACKING	1
12	28062-11	STUD, PUMP	2
13	28062-12	STUD, PUMP	2
14	3001-4800	PLATE, END	1
15	31342-4800	PLATE, BEARING	2
16	4009-4800-15	SHAFT, DRIVE	1
17	4080-4800-15	SHAFT, DRIVEN	1
18	56732	GREASE FITTING	1
19	5711-4800	ROLLER, BEARING	60
20	5720-4800	SLEEVE, BEARING	4
21	5730-4800	WASHER, BEARING, OUTER	8
22	57455	NAMEPLATE AND PINS (4)	1
23	61902	RETAINING RING	1
24	6914-4800	MECHANICAL SEAL & SEAT,	1
25	70000-03	WOODRUFF KEY	1
26	80848	BEARING, ROLLER - Seal Support	1
27	8669-4800-15	PUMP GEAR, HELICAL, R.H.	1
28	8689-4800-15	PUMP GEAR, HELICAL, L.H.	1
29	7021-4800	BRACKET, MOUNTING	2
30	7784-4000	GUARD, COUPLING, 6.25 DROP	1
31	02018XP3E256T	WEG ELECT. MOTOR, 20 HP	1
32	13430004-08	CAP SCREW, HEX HEAD CG	4
33	13430008-16	CAP SCREW, HEX HEAD PU	4
34	13430008-20	CAP SCREW, HEX HEAD MT	4
35	20520000	COUPLING COVER & GRID ASSY	1
36	20521371-06	COUPLING HUB, 50T20 - PUMP	1
37	20521625-06	COUPLING HUB, FALK 50T20 MOTOR	1
38	G-1600-9-BPL	UNIT BASE (Included 4 x 39)	1
39	19210012-32	EYEBOLT, DROP FORGED	4

GENERAL INSTRUCTIONS

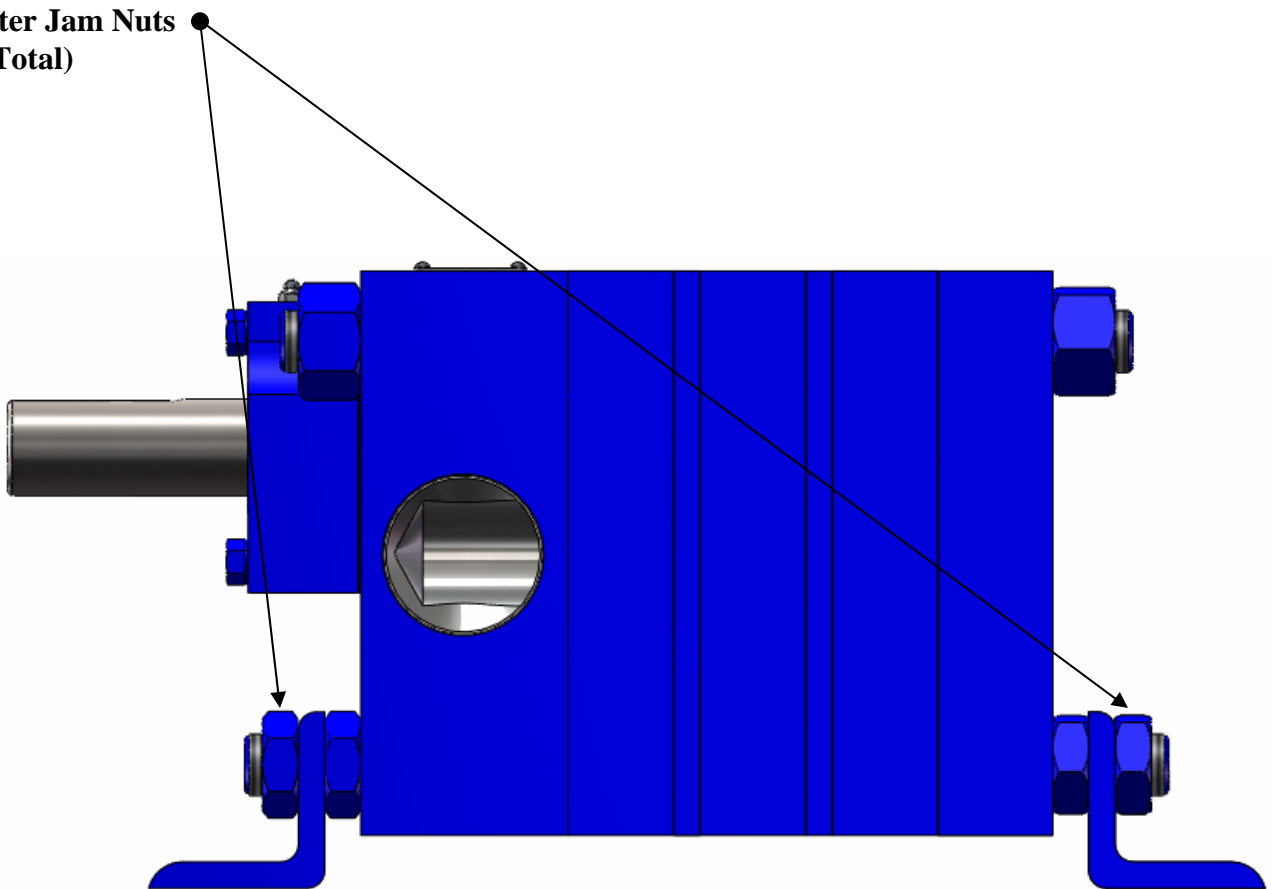
This gear pump is a positive displacement, rotary pump with two gears of equal size. The pump has clearances of a few thousandths of an inch, at the edge and sides of each gear, and can be modified during manufacturing to facilitate slight changes in horsepower required, torque required, or to increase or reduce flow.

The inlet of the pump is next to the side where the two gears are coming out of mesh; the discharge is on the side where the two gears are entering into mesh. The pump transfers fluid trapped in the spaces between adjacent gear teeth and the cylinder from the inlet to the discharge side of the pump. Many variations of this pump are possible.

Studs fasten the components of the pump assembly together. The mating surfaces of all plates are ground to a very smooth finish and are sealed by O-Rings. The studs also serve as dowels for ensuring alignment of the plates. The torque applied is to a predetermined specification. When installing the pump, if modification of the mounting brackets is required, only loosen and remove the two outer nuts.

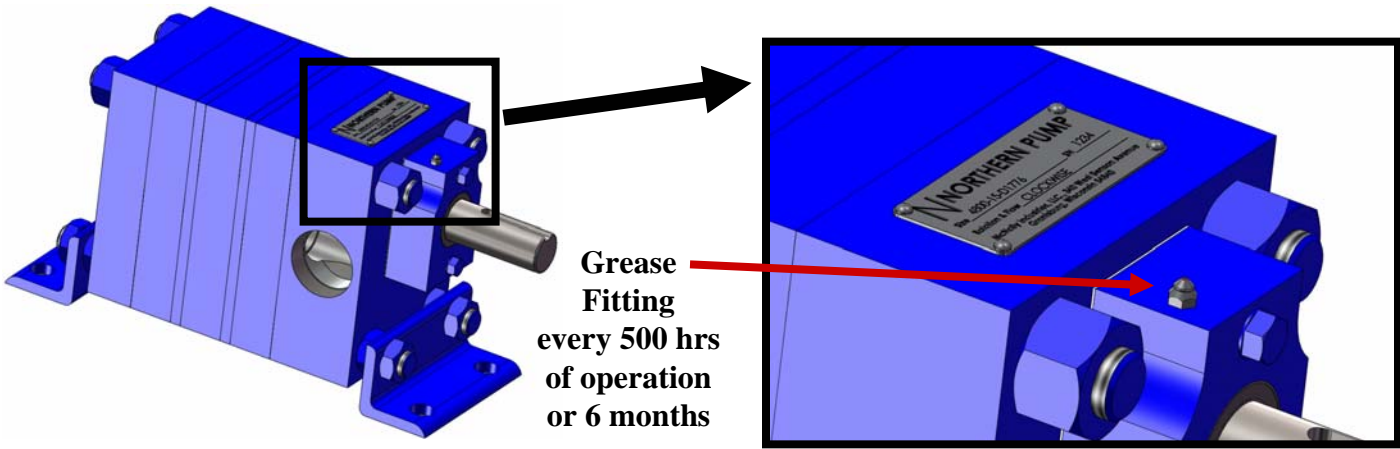
See (Figure 1-1)

**Outer Jam Nuts
(4 Total)**



(Figure 1-1)

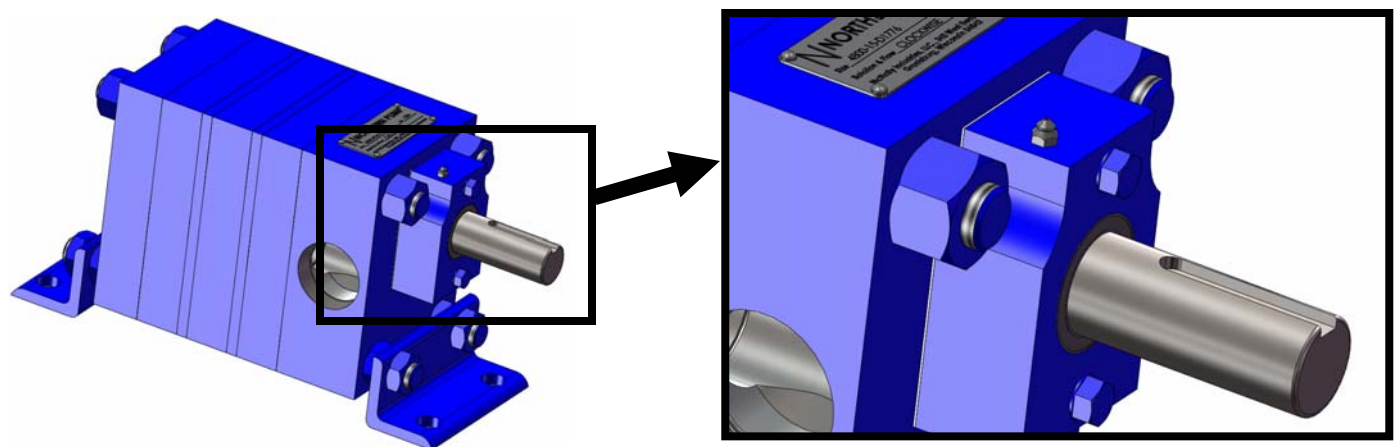
This pump is equipped with a John Crane type 21 mechanical seal. The mechanical seal support bearing is a Steel Roller type bearing. Grease seal housing bearing on pumps equipped with mechanical seals with general purpose bearing grease every 6 months or every 500 hours of operation, whichever occurs first. The bearing has been greases at the factory, and should not need to be greased during initial run. Replace mechanical seals if leaking occurs. The production will be constructed with a Carbon Graphite bearing in the place of a steel roller bearing. This would eliminate the need for additional lubrication and the grease fitting. (Figure 1-3)



(Figure 1-3)

The shaft diameter is $1.371 \pm .0002$ ". The use of a 1.3750" nominal diameter coupling is acceptable. However, it is recommended to use a coupling with a diametrical dimension of $1.371 + .0005$ ".

A .375" nominal keyway and end key are provided with the pump unit.



(Figure 1-4)