

N^{PC} NATIONAL PUMP COMPANY

A GORMAN-RUPP COMPANY

The Pump People[®]

VERTICAL TURBINE PUMPS

MARINE APPLICATIONS

- Liquid hydrocarbons
- Distillates
- Chemicals
- Ballast control for sea-going vessels



Bayou City Pump is a well-recognized brand of National Pump Company in the Marine Industry. Designed specifically for liquid barge transfer operations, our Marine series of vertical turbine barge pumps and peripheral equipment provides highly efficient operation to minimize barge unloading times. The pumps are designed for all liquid applications on inland and sea-going barge vessels.



OPERATING RANGE

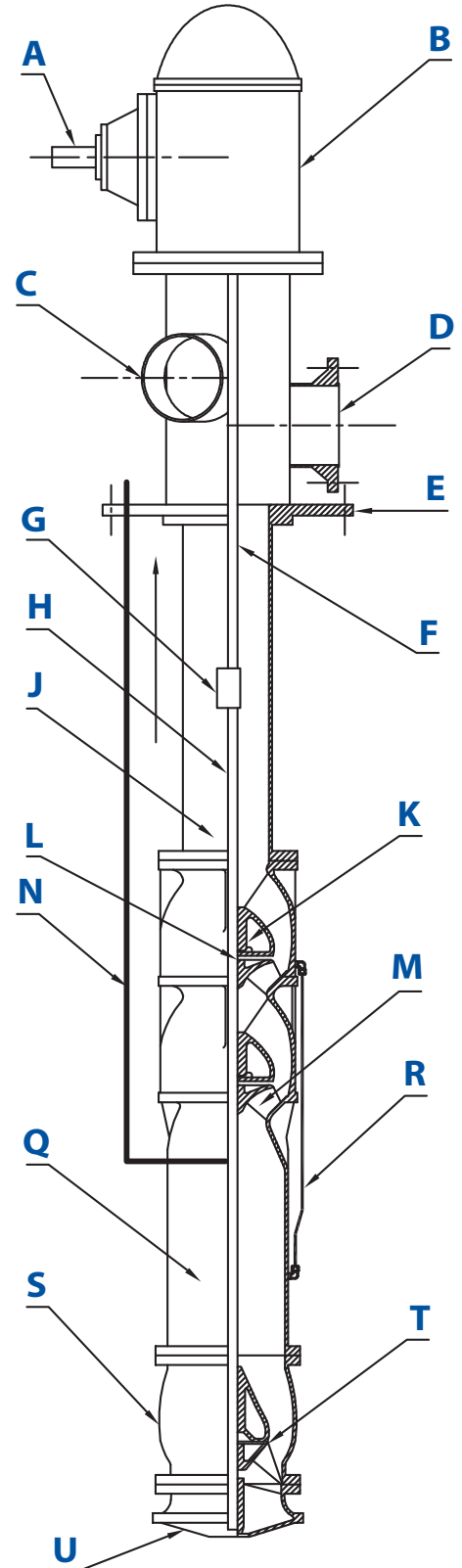
- Flows to 6,500 GPM
- Operating pressures – 120 psig typical for marine applications
- Higher flow and pressure models available on request

HIGH QUALITY CONSTRUCTION

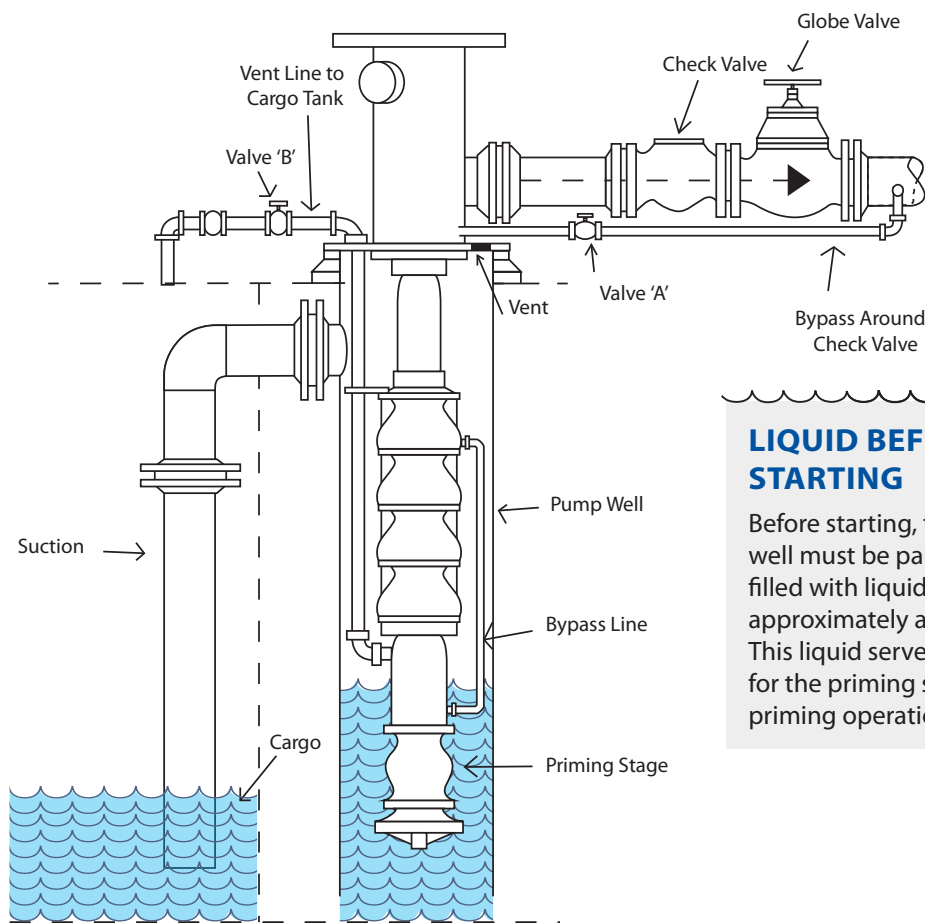
- All ductile iron construction for increased durability
- Heavy cast ductile iron or optional stainless steel impeller vanes to increase impeller life
- Self-priming stripper stage with bypass for air and vapors
- Highly efficient hydraulics with semi-open stripper stage impeller design
- Stainless steel split coupling for ease of seal or packing changes
- Custom designed discharge head improves onsite servicing of pump seal and hydraulics. Includes:
 - Large access windows for easy access to top shaft and packing or mechanical seal
 - Packed stuffing box with pressure bleed-off line
 - Cartridge type mechanical seal (optional) with over bearing adapter (OBA) for maximum protection of sealing area
 - 8" and 10" discharge flanges
- Heads and gears are coated with epoxy and top coated with enamel

MAJOR COMPONENT PARTS

REF#	DESCRIPTION	MATERIALS OF CONSTRUCTION
A	Input Gear Shaft w/5" x 5/16" KEYWAY	Steel
B	Right Angle Gear	Amarillo, Johnson or other
C	Discharge Head, Anti-Pollution, includes: - Stuffing Box or Mechanical Seal - Over Bearing Adapter (OBA)	Large 10" access ports, 2 places Mechanical Seal w/Viton, Teflon or Kalrez elastomers;
D	Discharge Flange	Discharge Sizes: 8", 10", 12", 14"
E	Base Flange/Soleplate	150# Steel
F	Head Shaft	416 SS-PSQ, 17-4 PH
G	Shaft Coupling	Sleeve type
H	Pump Shaft	416 SS-PSQ, 17-4 PH
J	Column Pipe	Flanged fabricated steel
K	Bearings/Bushings	High Grade Carbon Graphite, Bronze
L	Impeller fastening	Double Keyed
M	Impellers (standard)	Ductile Iron, 316 SS or Bronze
N	Vent Line - 1 inch (Burp chamber to ext. vent)	All Stainless Steel tubing and fittings NPT or flanged
Q	Burbe Chamber	Ductile Iron, 316 Stainless Steel
R	Bypass Line (2nd stage to Burb chamber)	All Stainless Steel tubing and fittings
S	Bowls	Ductile Iron, 316 Stainless Steel
T	Impeller (stripper)	Ductile Iron, 316 SS or Bronze
U	Strainer, suction bell	316 Stainless Steel
Not Shown	Bolting	316 Stainless Steel
Not Shown	Discharge Head Drain Line	LL Stainless Steel tubing, fittings, ball valves (self-closing or manual with check) Straight to Can or Tee arrangement (specify)

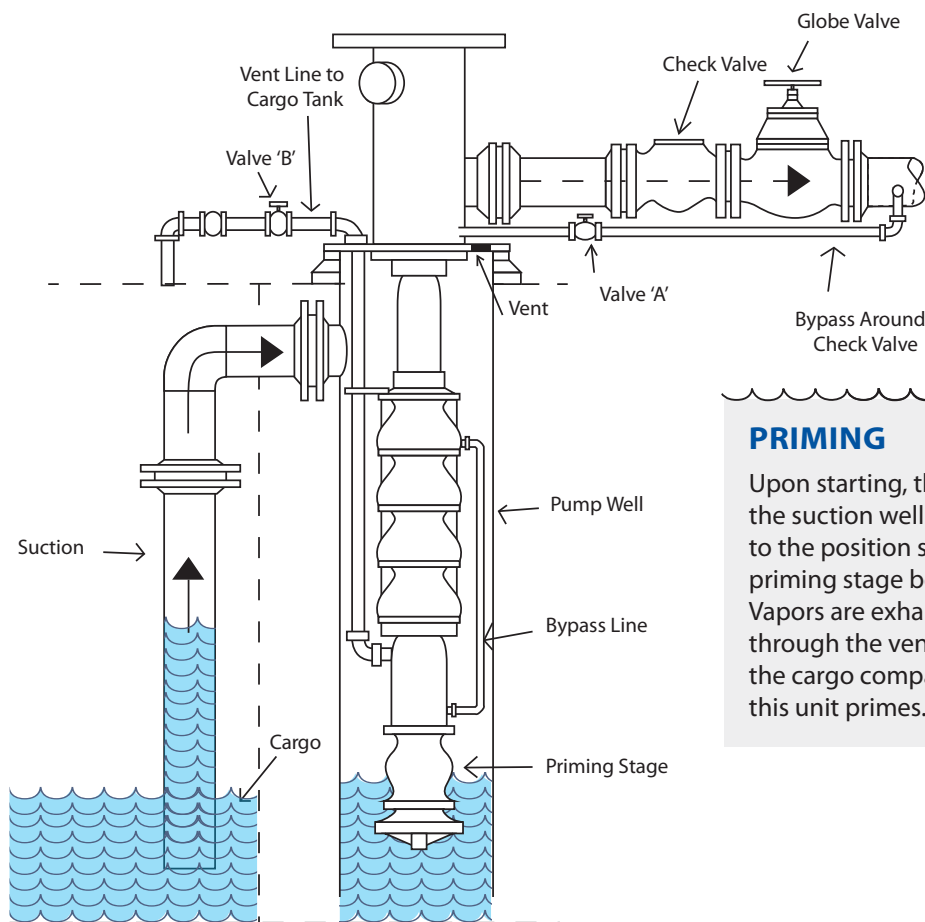


PUMP OPERATION



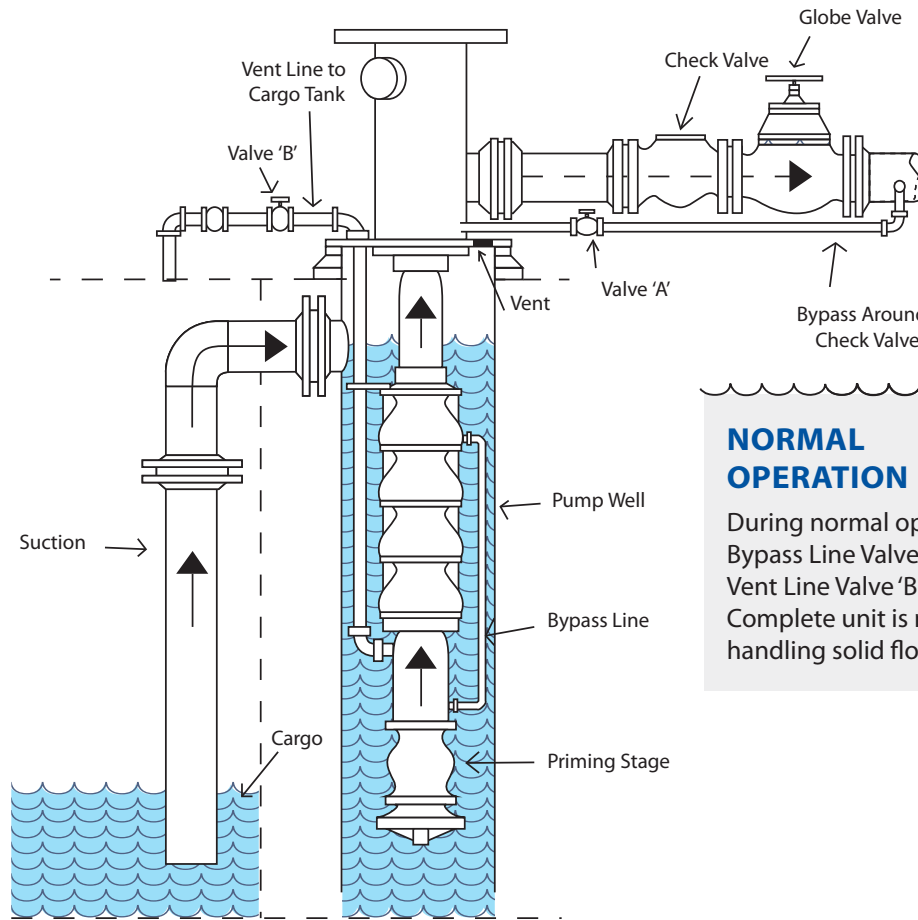
LIQUID BEFORE STARTING

Before starting, the suction well must be partially filled with liquid to a level approximately as shown. This liquid serves as a seal for the priming stage during priming operations.



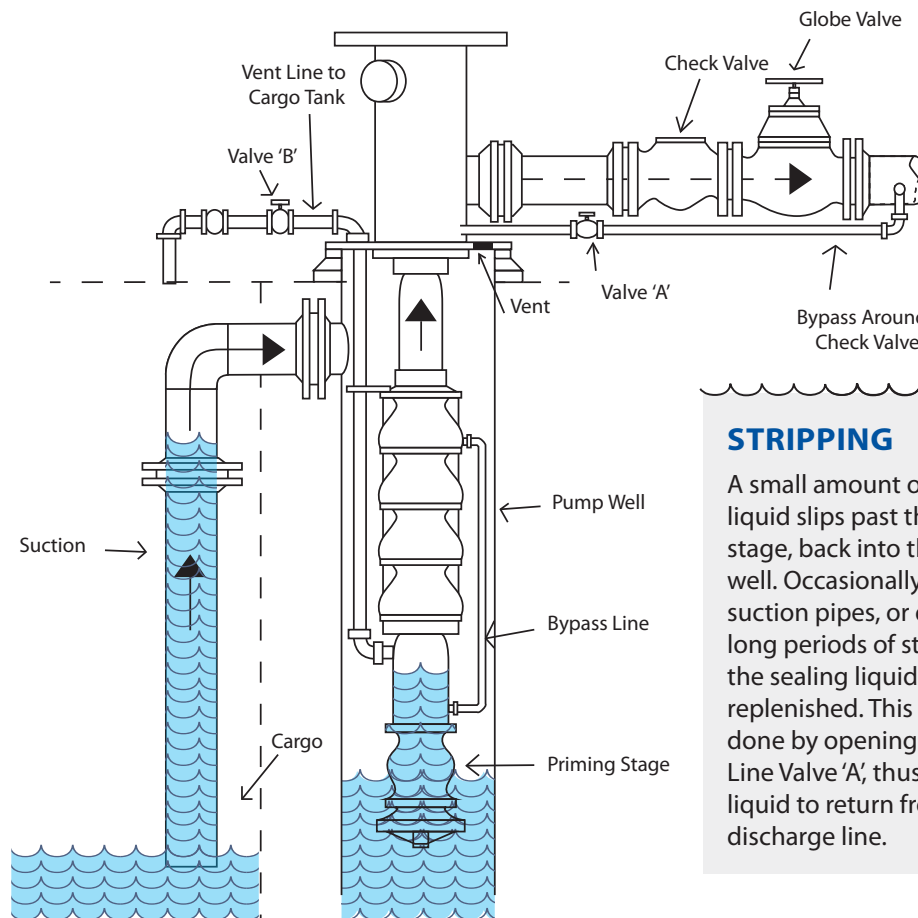
PRIMING

Upon starting, the liquid in the suction well is forced to the position shown, the priming stage being sealed. Vapors are exhausted through the vent line into the cargo compartment as this unit primes.



NORMAL OPERATION

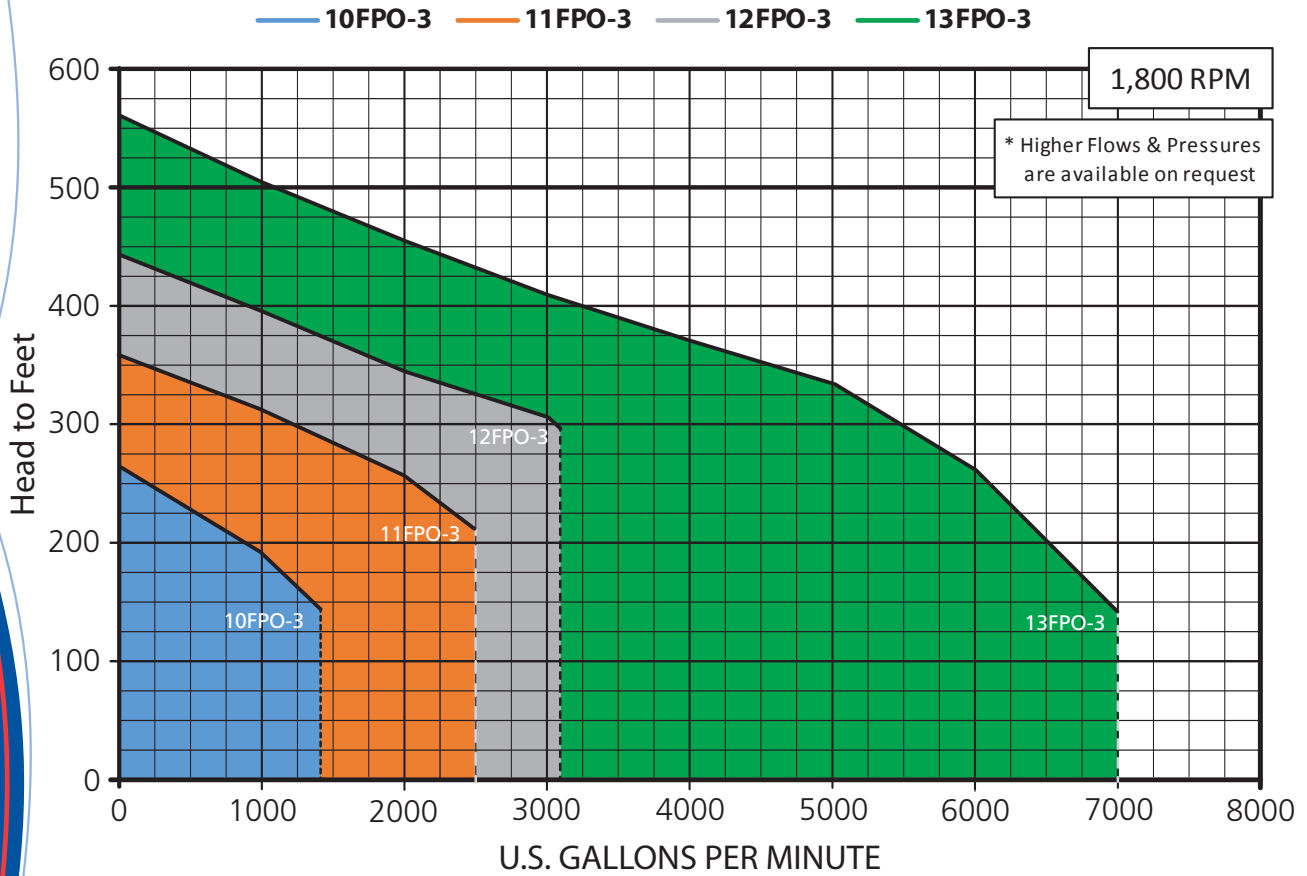
During normal operation, Bypass Line Valve 'A' and Vent Line Valve 'B' are closed. Complete unit is now handling solid flow of liquid.



STRIPPING

A small amount of sealing liquid slips past the priming stage, back into the suction well. Occasionally, with long suction pipes, or during long periods of stripping, the sealing liquid must be replenished. This is usually done by opening the Bypass Line Valve 'A', thus permitting liquid to return from the discharge line.

MAJOR COMPONENT PARTS



NPC PERFORMANCE - 3 STAGE PUMPS				
Pump Nominal Size	10"	11"	12"	13"
NPC Model	10FPO	11FPO	12FPO	13FPO
# of Stages	3	3	3	3
Bowl Diameter	11.5"	13.5"	15.5"	19.25"
Impeller Diameter (Maximum)	Qty 2 @ 8.625"	Qty. 2 @ 10"	Qty 2 @ 11.375"	Qty, 3 @ 13.925"
Impeller Stripper Diameter	Full	Full	Full	—
Speed (rpm)	1800	1800	1800	1800
Flow (GPM) @ BEP	1200	2200	3125	5200
Flow (GPM) Max	1400	2500	3300	7000
Head (ft) @ BEP	195	288	295	345
Efficiency (%) @ BEP	81%	77%	80.5%	88%
BHP MAX	74	190	290	500

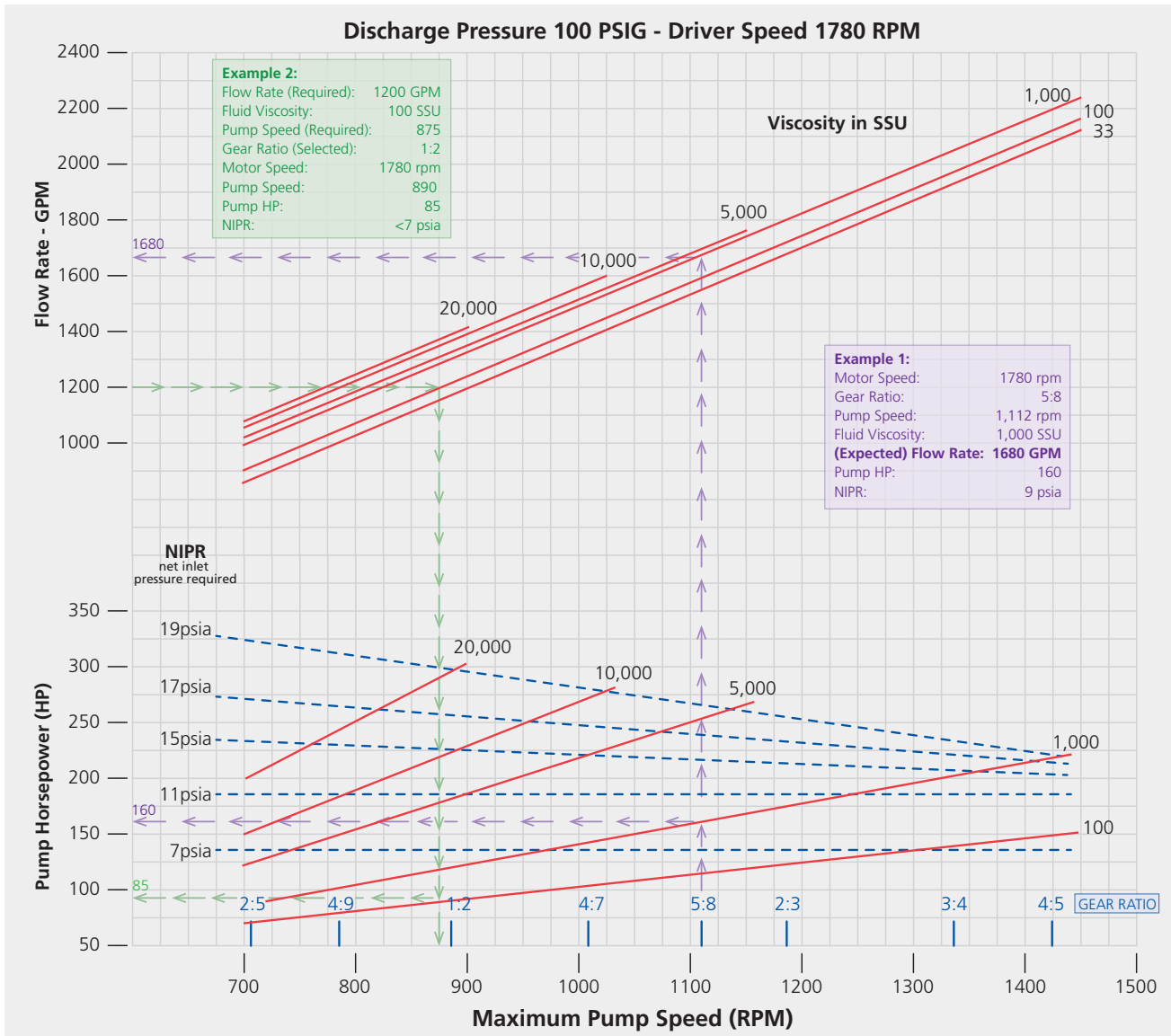
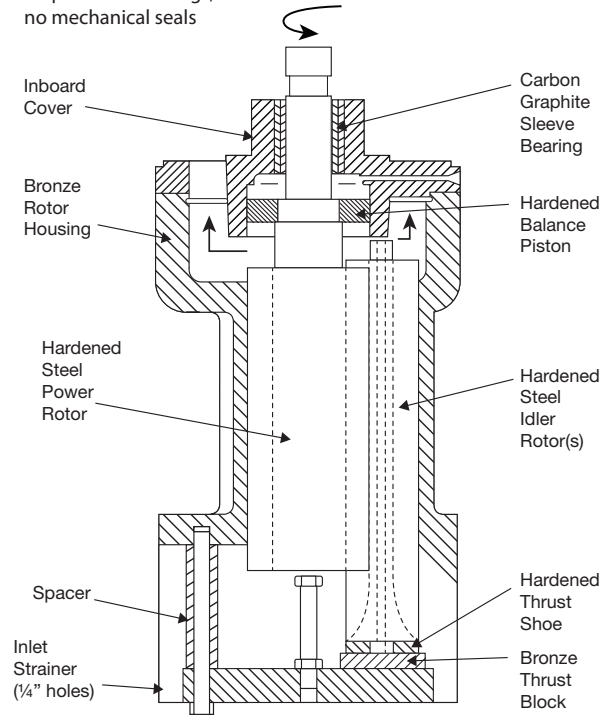
FOUR SCREW PUMP

DESIGN EXPERTISE, OPERATING EFFICIENCY, PROVEN RELIABILITY

- Flows: to 2,200 GPM
- Viscosity: 33 to 20,000 SSU
- Pressure: to 150 PSIG
- Temperature: to 300° F
- Predictable performance for all variations of cargo characteristics and dockside piping arrangements
- Vapor locking eliminated by positive displacement design
- Constant offloading rates at higher efficiencies
- Versatility in product handling from light No. 2 oil to asphalt
- High suction lift capability for total stripping of tank
- Increased reliability and longer service life due to hydraulically balanced design for long life of internal components

PUMP CROSS SECTION

Simple design - no timing gears, no precision bearings, no mechanical seals



REPAIR CAPABILITIES

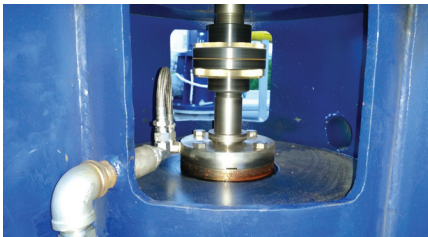
The National Pump Company Pasadena, Texas manufacturing facility maintains a service and repair center for pump products in the marine and water markets. Serving the Houston area and Gulf Coast region's industrial community, we provide repair services 24 hours a day, 7 days a week.

We are capable of performing repairs both in-house and on-site for the following industrial pumping systems:

- Marine
- Petrochemical
- Midstream and upstream oil and gas
- Public Utilities and facilities

We repair many makes and models of vertical pumps, some include, but are not limited to:

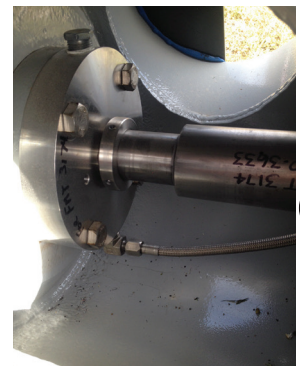
- Vertical turbine
- Bilge, ballast and fire water pumps
- In-line and right angle gear boxes



Our in-house, full service, heavy industrial machine shop facilitates quick turnaround on all repairs. We provide value to our customers by quickly repairing and returning to service critical pumping systems for both domestic and international markets.

Our repair facility and machine shop consists of:

- Heavy industrial equipment for large pumping systems
- In-house welding
- Fabrication capabilities
- Heavy cranes
- Hydraulic presses and cleaning systems
- Large inventory of pump parts for quick re-bowl work
- CNC horizontal boring mill
- Vertical boring mill
- Multiple lathes
- Milling machine with digital readout/position indicator
- Multiple overhead cranes, including 10 ton crane hoist



TEST CAPABILITIES

National Pump maintains three (3) test facilities in Glendale, Arizona; Lubbock, Texas; and Olive Branch, Mississippi. Test capabilities include:

PERFORMANCE

Flows to: 20,000 USGPM
 Heads to: 1,730 feet (750 psi)
 Horsepower: 5 - 1,000 HP @ 3,600 rpm
 1,800 rpm, 900 rpm
 Voltage: 460V & 4160V

TEST TYPES

Bowl Assembly performance
 String test (job pump & motor)
 Mechanical Run
 NPSH
 Hydrostatic
 Vibration
 Witnessed & non-witnessed



Delivering Pump and Pump Systems
 Reliability, Quality
 and Service Since 1969



Creating Quality Pump Systems and Satisfied Customers

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