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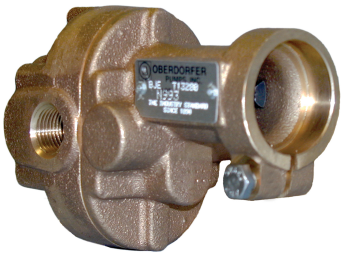
# BRONZE CLOSE COUPLED ROTARY GEAR PUMPS

## GEAR PUMPS SERIES N993



## FEATURES

- Rugged corrosion resistant bronze construction
- Compact close-coupled design
- Stainless steel shafts
- Durable bronze helical gears provide quiet operation
- Process lubricated carbon graphite bearings
- O-ring cover seal for maximum leak protection
- Nitrile Lip Seal -standard
- Easy field assembly to a variety of motor frames
- For compact AC motor pump units - see Close Coupled Bronze Adapterless Rotary Gear Pumps
- For Danfoss hydraulic motor driven pump units - see adapter 9960
- For bronze pedestal pumps and mechanical seal styles - see model N3000
- For close-coupled ductile iron pumps - see model C993

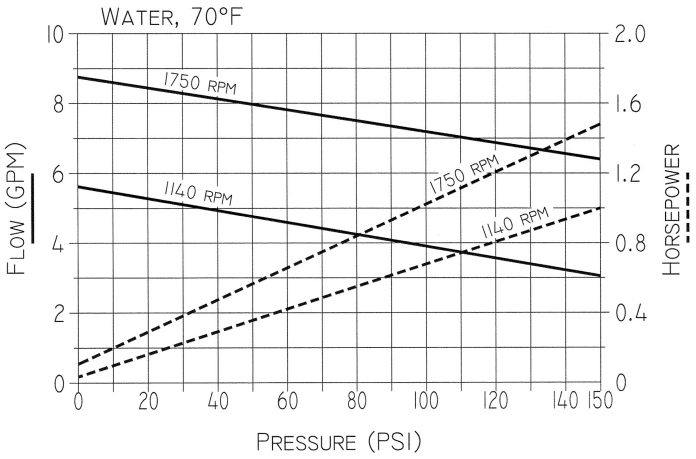
## DRIVE

Close coupled pumps are mounted directly to the electric motor by means of suitable adapter bracket. The pump drive shaft is connected to the motor shaft by a flexible coupling.

## LIQUIDS AND TEMPERATURE

These pumps are suitable for all liquids that are compatible with bronze. Most common liquids are water, oil, and mild chemicals in the pH range of 4 to 11. Viscous liquids require reduced shaft speeds of 1140 RPM or lower. (Consult factory.) Liquids containing solids, abrasives, powders, or paint pigments are definitely not recommended for gear pumps. If abrasives are unavoidable, use a very low shaft speed. The recommended liquid temperature range is from 32o F to 140o F for best pump life. If more extreme temperature conditions exist, factory should be consulted. Freezing of water-filled pumps can cause damage and must be avoided. Oils at low temperatures are very viscous requiring a lower speed or extra power.

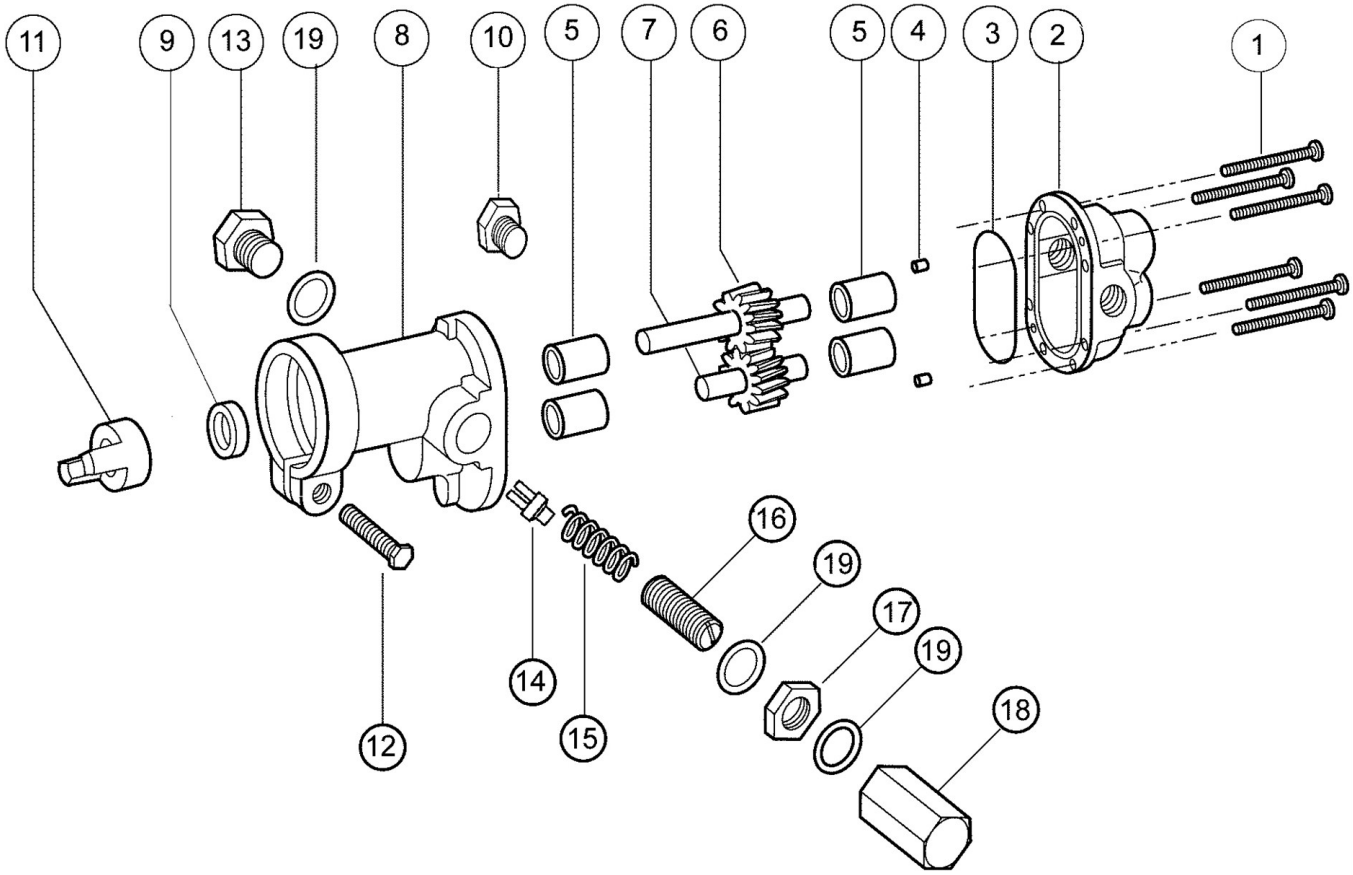
## PERFORMANCE



## SUCTION LIFT

As a general rule, the suction lift should be kept at an absolute minimum by placing the pump as close to the liquid source as possible. A gear pump in new condition can lift 20 feet of water in the suction line. A foot valve (preferably with built-in strainer) is recommended at the beginning of the suction line. For a first start-up, the pump should be primed to avoid dry running. Minimum size of the suction pipe is the size of the pump inlet port. For longer suction lines (over 3 feet) or for viscous liquids, the pipe should be at least one size or two sizes larger than the pump inlet port.

## EXPLODED VIEW AND PARTS LIST

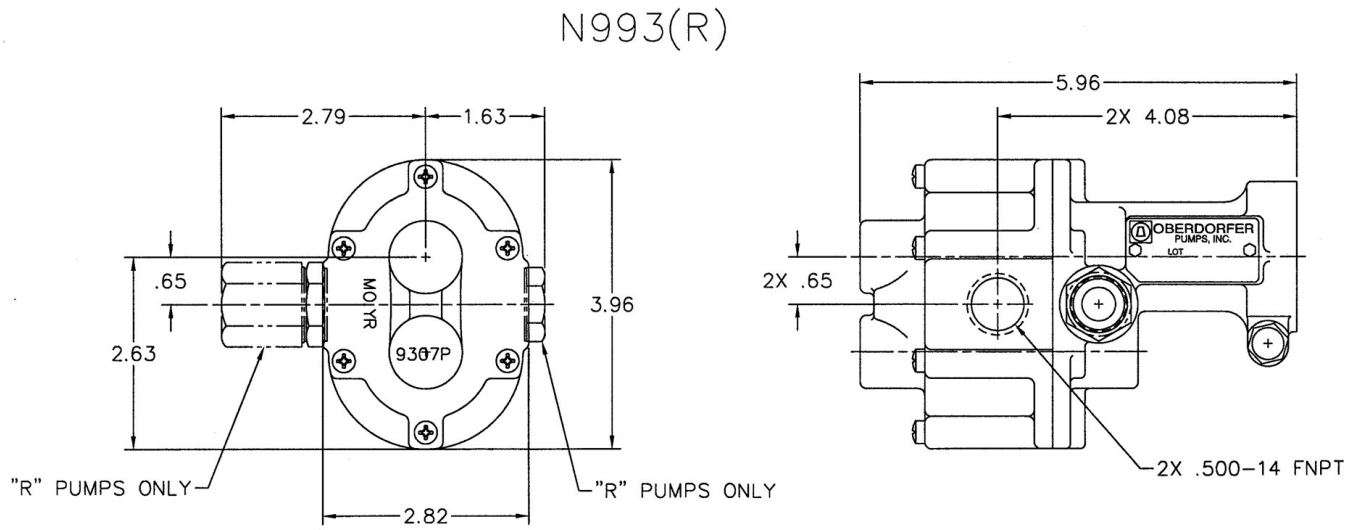



| Pump No. | 1 Screw | 2 Body | 3[2] O-Ring | 4 Dowel Pin | 5[2] Bearing | 6[2] Drive Gear Assy. | 7[2] Idle Gear Assy. | 8 Cover | 9[1,2] Lip Seal | 10 Cap Plug | 11 Coupling Half | 12 Screw | 13 Plug Nut | 14 Poppet | 15 Spring | 16 Adj. Screw | 17 Locknut | 18 Bypass Nut | 19 Fiber Washer |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 Req'd | 1 Req'd | 1 Req'd | 2 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 1 Req'd | 3 Req'd |
| N993 | 9837-20 | 9307ND5N | 9797-038 | 8885 | 5024 | 32950 | 32937 | 9308NN2N | 5007 | 9346 | 5604 | 5595 | --- | --- | --- | --- | --- | --- | --- |
| N993R | 9837-20 | 9307ND5N | 9797-038 | 8885 | 5024 | 32950 | 32937 | 9308NN3B | 5007 | 9346 | 5604 | 5595 | 1838 | 6535 | 6301 | 5237 | 5240 | 5239 | 6533 |

**[1]Seal # 5007 is Standard Buna N, # 7580 is Viton®*-Teflon®***

**[2]Repair Kits contain items 3, 5, 6, 7 & 9. Repair Kit for N993® is #12070.**

## DIMENSIONS




## ROTATION AND RELIEF VALVE

If the discharge line contains any throttling devices such as a shut-off valve, a spray nozzle or other restrictive device, it is necessary to have a relief valve in the system which returns the liquid to the suction side or to the tank. The relief valve is also available as part of the pump itself (R-model pumps). However, built-in relief valves are only good for intermittent service. If used continuously, the pump will overheat. A built-in relief valve is strictly a safety device against overpressure. It will not work successfully as a pressure or flow control device. For this purpose a separate relief valve in the pressure line must be used. Unless otherwise specified, the pump motor unit is supplied by the factory for shaft rotation counterclockwise from pump shaft end. Reversing motor will reverse “in and “out” ports and also requires changing relief valve location. The relief valve is always on the inlet side of this pump series. The factory pressure setting is 50 PSIG. To increase pressure, turn the relief valve adjusting screw in a clockwise direction.

## SHAFT SEALS

Close coupled gear pumps are normally supplied with a Nitrile lip seal. A lip seal made of fluoroelastomer is available as an option. For a fluoroelastomer Seal, add S5 to the pump model number.

## ADDITIONAL

| Pump | Description |
|---|---|
| N993 | Standard pump with 1/2" ports |
| N993R | Pump with 1/2" ports & relief valve |
| N993S5 | Pump with Viton®* lip seal |
| N993RS5 | Pump with Viton®)* lip seal & relief valve |

**3/8" NPT Ports Available, add "-03" suffix**