

Analysis of technical features of the Demay HD-500

1. The power end frame is made of high strength steel with heavy fabricated center bearing carriers that are integral.
2. The bronze bull gear is rated at 550 HP continuous-duty. It is mounted directly over the large Timken roller bearing giving it maximum support for load capacity. The gear and steel pinion have a ratio of 8.0:1.
3. The plunger is a one-piece self-aligned designed to reduce misalignment. It is QPQ coated 56 Rockwell C for maximum lubricity and corrosion resistance. Power end seals are double lipped for retention of gear oil as well as reducing chances of water, dirt, or other foreign materials getting into the power end. The packing system is the latest technology in seal design. It incorporates improved materials that lower friction, increase the temperature and media ranges and extend the life of drilling and well service packing. The Demay packing is good for -50 degrees F to +300 degrees F. The header ring is internally lubricated and uses HNBR material that offers improved media and abrasion resistance. The pressure ring is made from Peek material which gives maximum extrusion resistance.
4. Demay uses four main bearings. The outer bearings are large bore Timken- type roller bearings designed to give maximum radial load while providing over 50,000 lbs. of thrust load from each bearing. The center two bearings are large bore cylindrical bearings used to stabilize the crankshaft under high loads.
5. Our crankshaft is made of alloy forged steel which is heat treated, stress relieved, and machine balanced.
6. Connecting rods are forged, machined, aircraft aluminum. They are drilled for internal lubrication to the wrist pin.
7. Crossheads are made from heat treated alloy castings. The guides are replaceable high grade bronze to insure long lasting wear characteristics which are lubricated by the power end's internal lube system.
8. There are three individual fluid-ends. This is a time tested system which allows repairs in the field when necessary. Each fluid-end is made of high alloy, fine grain forged, and heat treated steel. All metal parts are QPQ coated for maximum lubricity and corrosion resistance. All internal rubber parts are HNBR, valves springs are ASTM 313 stainless steel. The fluid-ends are attached by the exclusive Demay x-spacers that keep contaminants from reaching the power end. Fluid-ends are available for plungers from 3 3/8", 4", 4 1/2", 5", to 6" Pressures range from 6,250 to 20,000 PSI.

Demay International uses the latest CNC machining technology in all manufacturing processes

Specifications and Data

Power End

Companion Flange	1800 Series Spicer
Input Spline	3"-10
Input Rotation	Clockwise
Input Speed	Maximum 2100 RPM
Gear Train	Steel worm and bronze ring w/ 8.0:1 ratio
Crankshaft	Forged steel & balance
Connecting Rods	Three forged aluminum split caps and insert bearings
Crossheads	Three cast alloy steel
Case	High-strength steel weldment
Bearing type	2 (two) tapered outboard, 2 (two) cylindrical inboard
Oil System	Gear pump driven off worm, standard
Oil Filter	Replaceable disposable twin canister elements
Oil Capacity	22 gallons
Oil Pressure	80- 100 PSI

Fluid End

Fluid End Type	Horizontal Tri-plex, three-piece forged steel
Plunger Type	Single acting one-piece
Valve Type	Double – guided, carburized, high-contact
Valve Seats	Carburized and replaceable
Pressure Packing	Long life, CDI short stack
Discharge Flanges	Straight blank, elbow flanges w/ 1502 connections
Oil Lube System	External Tuthill 100gpm

Fluid End Weights (lbs)

Discharge Pressure (PSI)

		Fluid End	Max Working Pressure
3-3/8- inch	1,725	3-3/8	20,000
4- inch	1,550	4	15,000
4-1/2- inch	1,591	4-1/2	11,200
5- Inch	1,528	5	9,000
6- Inch	1,467	6	6,250

Volume and Horsepower Formula

This formula is used to calculate volume for the HD-500 Pump

$$\text{Volume} = \frac{\text{Engine RPM} \times \text{Plunger Diameter}^2}{\text{Constant (514.7)} \times \text{Transmission Reduction} \times \text{Worm Gear Reduction}}$$

$$\text{Example: } \frac{1625 \times 4.5^2}{514.7 \times 1 \times 8} = \frac{32906.25}{4117.6} = 7.991 \text{ BPM}$$

This formula is used to calculate hydraulic horsepower requirements

$$\text{Hydraulic Horsepower (HHP)} = \frac{\text{Pressure} \times \text{Volume}}{\text{Constant (40.8)}}$$

$$\text{Example: } \frac{2500 \times 8}{40.8} = \frac{20000}{40.8} = 490 \text{ HHP}$$

HD-500 Performance Ratings

<u>Plunger size</u>	<u>Maximum Working Pressure</u>	<u>Maximum Rate</u>
3.38 inch	20,000 PSI	6.0 bbl/min
4.0 inch	14,000 PSI	8.5 bbl/min
4.5 inch	11,200 PSI	10.7 bbl/min
5.0 inch	9,000 PSI	13.2 bbl/min
6.0 inch	6,250 PSI	19.2 bbl/min