GLOBAL SOLUTIONS
DESIGNING, MANUFACTURING AND PACKAGING FOR THE OFFSHORE INDUSTRY
Double-reinforced, 50 Kip high strength, stress relieved, alloy-steel **Pump Frame** provides rigidity where its needed and longevity where its wanted. Heat treatment after fabrication removes residual stress and prevents distortion after final machining.

**Forced, welded and heat treated low alloy steel Connecting Rods** provide optimal operation integrity under continuous load. Fewer welds alloy for enhanced durability.

**Super Bolt & Nut** on Main Bearing cap provide significantly higher yield and tensile strength than the standard hex nut and eliminate the need for special tools not commonly available on drilling rigs.

Ultra compact, lightweight, harmonically balanced and aligned ground up innovative **Design** results in quiet, low vibration performance, lower operating and transport costs, and industry leading power to weight ratio.

Forged and heat treated, high strength alloy steel ANSI 4340, double helix **Gear** machined to **AGMA 10** & provide longer service life and stronger resistance against chipping under continuous load.

One piece forged, balanced, and heat treated alloy **Steel Crankshaft** delivers maximum service life. Bolted components alloy for easy repairs and optimal sustainability.

Forged **Pinion shaft** with machined gear made from high strength **ANSI 4340 steel forging** for enhanced rigidity and service life.

Interchangeable with **Multiple OEM fluid end modules & components** for savings in stocking inventory.

Premium SKF, Timken or equivalent **Bearings** with minimum L10 life of 30,000 hours at rated load.
Why Choose WORKFORCE™?

**Smaller Footprint, More Horsepower**

- National 12P-160
- Gardner Denver PZ/11
- EWECO E-1600
- WORKFORCE WF1600L

**Lighter Weight, More Robust**

- EWECO E-1600
- National 12P-160
- Gardner Denver PZ/11
- WORKFORCE WF1600L

**Balanced Performance, Longer Life**

- Gardner Denver PZ/11
- EWECO E-1600
- National 12P-160
- WORKFORCE WF1600L

**Lower Cost, Better Value**

- National 12P-160
- Gardner Denver PZ/11
- EWECO E-1600
- WORKFORCE WF1600L

**Pressure (PSI) with 7” Liner at Max Stroke**

- Gardner Denver PZ/11
- EWECO E-1600
- National 12P-160
- WORKFORCE 1600L

**Volume (GPM) with 7” Liner**

- Gardner Denver PZ/11
- EWECO E-1600
- National 12P-160
- WORKFORCE 1600L

**Estimated List Price with Comparable Deliverable**

- National 12P-160
- Gardner Denver PZ/11
- EWECO E-1600
- WORKFORCE WF1600L

Up to 30% less than Major Brands.
### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Input Power</td>
<td>1,600 HP (1194 kW)</td>
</tr>
<tr>
<td>Maximum Continuous Pinion Torque</td>
<td>15,180 lb-ft</td>
</tr>
<tr>
<td>Maximum strokes per minute</td>
<td>120</td>
</tr>
<tr>
<td>Stroke Length</td>
<td>11 inches (279.4 mm)</td>
</tr>
<tr>
<td>Gear Ratio</td>
<td>4.613 : 1</td>
</tr>
<tr>
<td>Maximum Piston Diameter &amp; Pressure</td>
<td>7 inches (177.8 mm) @ 3,741 PSI</td>
</tr>
<tr>
<td>Minimum Piston Diameter &amp; Pressure</td>
<td>5 inches (127 mm) @ 5,000 PSI *</td>
</tr>
<tr>
<td>Suction Manifold</td>
<td>10 inch with 150 pound flanges</td>
</tr>
<tr>
<td>Discharge Manifold</td>
<td>5 inch with 5,000 PSI flanges</td>
</tr>
<tr>
<td>Oil Capacity</td>
<td>120 gallons (450 liters)</td>
</tr>
<tr>
<td>Pump dry weight (including skid)</td>
<td>42,400 lbs (19,200 kg)</td>
</tr>
</tbody>
</table>

* Pressure ratings limited to fluid end and discharge flange capacity.

### Performance Characteristics

<table>
<thead>
<tr>
<th>WF1600L Performance Characteristics</th>
<th>Pinion HP</th>
<th>Pinion lb-ft</th>
<th>Pinion RPM</th>
<th>Strokes/min</th>
<th>GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>800</td>
<td>1,067</td>
<td>277</td>
<td>60</td>
<td>168</td>
</tr>
<tr>
<td></td>
<td>934</td>
<td>1,200</td>
<td>323</td>
<td>70</td>
<td>196</td>
</tr>
<tr>
<td></td>
<td>1,067</td>
<td>1,333</td>
<td>369</td>
<td>80</td>
<td>224</td>
</tr>
<tr>
<td></td>
<td>1,200</td>
<td>1,467</td>
<td>415</td>
<td>90</td>
<td>252</td>
</tr>
<tr>
<td></td>
<td>1,333</td>
<td>1,600</td>
<td>461</td>
<td>100</td>
<td>280</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>507</td>
<td>110</td>
<td>309</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>554</td>
<td>120</td>
<td>337</td>
</tr>
</tbody>
</table>

Notes:
- All data subject to change without notice
- Data is based on 90% mechanical and 100% volumetric efficiency
- Achievable pressure will be limited by input power and fluid end module pressure limitations

### Standard Features

- Compact footprint with high horsepower to weight ratio
- Rigid, fabricated oilfield style frame and skid providing a stable platform for pump operation
- Bearings designed for minimum L10 life of 30,000 hours
- Gears designed to AGMA 8 and 10 specs
- Cast cross heads and guides to maximize longevity
- Fabricated crank shaft with forged core to minimize vibration and insure longevity
- High strength steel used in all drive components
- Alloy steel fluid end module with API standard valves and seats and components (PZ-10/11 style as standard)

### Options:

- Electrical lube and liner wash pump assemblies
- Discharge strainer cross assembly
- 20 gallon (K-20 style) pulsation dampener
- Pressure relief valve
- Discharge pressure gauge
- Centrifugal charge pump assembly
- Hydraulic seat puller
- Custom unitized package with diesel or electric (AC or DC) drive system
### WORKFORCE™ Triplex Pump

#### WORKFORCE™ MAKE THE DIFFERENCE

<table>
<thead>
<tr>
<th>WORK FORCE™</th>
<th>Common Generic Brands</th>
</tr>
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<tbody>
<tr>
<td>✓ <strong>Innovative Design</strong> - Compact, lightweight, harmonically balanced and aligned</td>
<td>• <strong>Design</strong> - Generally copied from antiquated designs. Functional, but are generally characterized to be unbalanced, heavy, large and comparatively lower power to weight ratio</td>
</tr>
<tr>
<td>✓ <strong>Frame</strong> - Robust, double reinforced 50 Kip high strength, heat treated, stress relieved low alloy steel, designed for discharge pressure up to 7500psi</td>
<td>• <strong>Frame</strong> - Uses a 32 Kip welded steel plate capable of handling discharge pressure to 5000psi on the power frame</td>
</tr>
<tr>
<td>✓ <strong>Crankshaft</strong> - Forged and heat-treated alloy steel, balanced, mounted to the power frame with double-row, self-aligning radial spherical roller bearings</td>
<td>• <strong>Crankshaft</strong> - Cast Alloy steel single or multi piece core with welded components</td>
</tr>
<tr>
<td>✓ <strong>Connecting Rod</strong> - Low alloy steel, forge-welded and heat-treated</td>
<td>• <strong>Connecting Rod</strong> - Cast, 3 piece welded steel Connecting Rods</td>
</tr>
<tr>
<td>✓ <strong>Bull Gear</strong> - Forged and heat-treated, alloy steel ANSI 4340, double helix gear machined to AGMA grade 10</td>
<td>• <strong>Bull Gear</strong> - Gear from ANSI 4140 steel, forged, machined to AGMA grade 8, teeth surface hardened to BHN 270-300</td>
</tr>
<tr>
<td>✓ <strong>Pinion Shaft</strong> - Forged and heat-treated, alloy steel ANSI 4340, double helix gear machined to AGMA grade 10, teeth surface hardened to BHN 360-400</td>
<td>• <strong>Pinion Shaft</strong> - Forged Pinion shaft, gear machined to AGMA 8, teeth surface hardened to BHN 320-350</td>
</tr>
<tr>
<td>✓ <strong>Bearing</strong> - Premium SKF, Timken or equivalent bearings typically with minimum L10 life of 30,000 hours at rated load</td>
<td>• <strong>Bearing</strong> - Chinese made bearings with L10 life of or less 15,000 hours under rated load</td>
</tr>
<tr>
<td>✓ <strong>Crosshead</strong> - Nodular ductile, cast iron with interchangeable slides</td>
<td>• <strong>Crosshead</strong> - Slides are not interchangeable</td>
</tr>
<tr>
<td>✓ <strong>Super Nut</strong> - on Main Bearing cap in lieu of Hex nuts</td>
<td>• <strong>Chinese made hex nut</strong> with generally inconsistent yield strength</td>
</tr>
<tr>
<td>✓ <strong>Lube System</strong> - AC Electrical system standard</td>
<td>• <strong>Generly used Lube system</strong> - not offered as standard</td>
</tr>
<tr>
<td>✓ <strong>Fluid End Modules</strong> - Interchangeable with Multiple OEM fluid end modules &amp; components</td>
<td>• <strong>Fluid End Modules</strong> - Interchangeable with only single OEM counterpart</td>
</tr>
<tr>
<td>✓ <strong>Rubber Sealing Components</strong> - American rubber components standard</td>
<td>• <strong>Rubber Sealing Components</strong> - Chinese made rubber components standard</td>
</tr>
</tbody>
</table>
- Localized Service through a Global Network
- Maintenance/Repair Service
- Alignment, Clearance & Tolerance Adjustments
- Internal Repair/Replacement Service
- Closed Circuit Pressure Testing
- Unitized Pump Packages with Diesel or Electric Drive
- Complete Pump Refurbishment
- 24x7x365 Technical Support

- API 7K, Q1 & ISO 9001 Certified
- World Class R&D Team
- Fully Stocked Local Inventories
- Wholly-owned Manufacturing Facilities
- Global Quality System

- Worldwide Immediate Parts Support
- Mature Global Supply Network
- Available Maintenance Agreements
- Rental Services
- In House Financing Available on Volume Orders

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