A patented rotary oil seal for high torque/low speed applications improves performance in hydraulic motors.

Low-speed/high-torque (LSHT) hydraulic motors are one of the most cost-effective and dependable parts of a hydraulic system. Offering many advantages over a high-speed motor and gearbox speed reducer, LSHT motors give a large amount of power from a comparatively small drive envelope with low noise and vibration, easy reversal of direction and smooth starting torque.

Drawing from decades of experience in sealing fluid power applications, the HP20 seal provides the optimal solution for sealing the motor output shaft. Combined with a scraper, and manufactured from proprietary Trelleborg Sealing Solutions compounds, HP20 increases performance and offers more cost-effective operation. Customers are already enjoying the benefits of the HP20, with more than 2 million pieces delivering effective performance in applications worldwide.

The operating benefits are delivered through multiple design features. A metal retainer fits closely to the shaft, avoiding risks of extrusion at high pressures, while a pressure-balancing geometry offsets forces that can lift the lip from the rotating shaft. By not completely encasing the retainer, its back surface maintains contact with the housing increasing thermal conductivity and dissipating heat that could reduce seal life.

Application Examples

- Hydraulic drive motors
- Material handling
- Forestry and agriculture machinery
- Construction machinery
- Turf care
- Scissor lifts
- Winches

Special Features

- Metal retainer prevents lip extrusion at high pressures
- Pressure-balancing geometry provides a stable contact of the sealing lip on the shaft
- Retainer extends from the seal, contacting the housing plate, to increase thermal dissipation
- Available in HNBR (standard and low temperature), FKM and FKM-XploR Trelleborg proprietary compounds
- HNBR version operates with mineral oils according to DIN 51524-2 cat. HLP or ISO 11158 cat. HM (ISO 6743/4 cat. LHM) or ISO VG46 – BDS ISO 3448, purity class 16/13 – ISO4406-1999
- FKM version applicable to bio-degradable hydraulic oil applications, with compatibility testing available
TECHNICAL INFORMATION ABOUT HP20

General material data

<table>
<thead>
<tr>
<th>TSS compound</th>
<th>Rated hydraulic oil viscosity</th>
<th>Minimum working environment temperature</th>
<th>Maximum working oil temperature</th>
<th>Chemical compatibility with hydraulic oils</th>
</tr>
</thead>
<tbody>
<tr>
<td>H9T51 Low temperature HNBR</td>
<td>46 cSt</td>
<td>-30°C / -22°F</td>
<td>+80°C / +176°F</td>
<td>Mineral oils</td>
</tr>
<tr>
<td>V9T31 FKM FullR</td>
<td>46 cSt</td>
<td>-30°C / -22°F</td>
<td>+120°C / +248°F</td>
<td>Mineral oils, synthetic oils, bio-degradable oils</td>
</tr>
</tbody>
</table>

HP20 Rated Working Conditions

The test rig, which was specially developed for testing HP20, is equipped with two heads, which can be equipped with two different solutions for back-to-back testing. This test rig offers seal testing regimes in line with customer specifications for various parameters such as temperature, pressure and velocity. It also provides predictions on product lifetime and reliability within application conditions.

The test rig can be programmed with cycles made up of forty steps controlling the following parameters:

- Rotation speed
- Rotation direction
- Test time
- Fluid temperature
- Head pressure
- Lubrication flow

Testing heads: 2 (2 + 2 Seals)
Min. seal shaft diameter: 16 mm [0.63 in]
Max. seal bore diameter: 80 mm [3.15 in]
Shaft speed range: 0 to 7000 rpm
Max. oil pressurization: 250 Bar [3625 psi]
Max. oil temperature: 140°C [284°F]
Max. oil flow on each head: 4 L/min. [1 US gallon/min]
Rotating Shaft for Radial Seal Testing