Technical Data Sheet (TDS)

PUMA PREMIUM MOTOR OIL 15W-40

Heavy duty diesel engine oil

Puma Diesel Engine Oils are high quality multi-grade long drain lubricating oils, primarily manufactured from Group II base oils. Specially developed for use in all types of high output normally-aspirated and supercharged diesel engines operating under very severe duty or which are subject to deposit formation or excessive wear due to design characteristics or to the fuel employed. These oils are formulated from selected base stocks with high Viscosity Index and Low Pour Point. These oils are treated with a large percentage of additives to impart superior detergency together with high dispersant, anti-oxidant, anti-corrosion, anti-wear and anti-foam properties.

Designed to Perform

Anti-wear Protection – Longer Equipment Life
Proven Anti Wear Additive packages provide greater resistance to sliding wear thus ensuring efficiency and long life of all moving parts of which greatly reduce the need for engine servicing and overhauls.

Multi-grade Performance
Suitable for all year use in most climatic conditions. An enhanced Viscosity index improver allows for the Engine oil to give excellent protection during cold start-ups and extremely hot conditions

Oxidation Resistance - Longer Oil Life
It has extremely good oil life and lubricant stability even when subjected to unusually high thermal stresses; this property minimizes sludge and deposit formation, thus preventing blocking of ports, valves and controls, while guaranteeing that the oil remains properly fluid. Maintenance costs are therefore reduced and the useful service life of the oil is extended.

High Detergency – Increased Engine Cleanliness
It has excellent detergency properties, making it particularly suitable for use in supercharged engines. It also has high dispersant properties. The lubricant is thus very resistant to the formation of lacquer and varnish, as well as sludge and other engine deposits. It helps prevent ring sticking and keeps pistons clean, while maintaining soot deposits in suspension ready to be filtered.

Antifoam – Increased Performance
Easy release of entrained air which will prevent difficulties with pumps and controls which can cause irregularities in performance and other problems arising from the compressibility of air bubbles.

Low Pour Point - Easy Start Up
Which allows for easy start-up of diesel engines even at low temperatures, without circulation or regulation problems.

Anti-corrosion & Anti-rust Properties
It has particularly good anticorrosion properties which effectively protect the engine from corrosion from combustion moisture and acids. These additives inhibit the oxidation of internal surfaces of the engine and therefore prevent operating difficulties and breakdown of the oil caused by metallic oxides that would otherwise form within the engine.

Demulsibility – Engine Life Extension
Prevents the formation of water in oil emulsion which enters the system through leakage or condensation. The fluids therefore maintain their lubricating power and anticorrosion performance even under these circumstances.

Puma Premium Motor Oil 15W-40
Meets the requirements of the following specifications:
- API : CI-4+/SL
- ACEA : E3/B4
- MB 228.3
- MAN : 3275-1
- RENAULT TRUCK : RLD-2
- DEUTZ : DQC III-10
- Volvo VDS-3
- Caterpillar : ECF-2
- CUMMINS : CES 20077/20078
- MACK : EO-N
- MTU : Type 2
Technical Data Sheet (TDS)

Typical Physical Characteristics

<table>
<thead>
<tr>
<th>Property</th>
<th>Temp</th>
<th>Units</th>
<th>Test Methods</th>
<th>15W-40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity Grade</td>
<td></td>
<td>SAE</td>
<td></td>
<td>15W-40</td>
</tr>
<tr>
<td>Kinematic Viscosity</td>
<td>@ 40°C</td>
<td>cSt</td>
<td>ASTM D445</td>
<td>112.6</td>
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<tr>
<td>Kinematic Viscosity</td>
<td>@ 100°C</td>
<td>cSt</td>
<td>ASTM D445</td>
<td>14.6</td>
</tr>
<tr>
<td>Viscosity CCS (15W)</td>
<td>@ -20°C</td>
<td>mPa.s (cP)</td>
<td>ASTM D5293</td>
<td>7000</td>
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<td>Viscosity Index</td>
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<td>ASTM D4292</td>
<td>136.4</td>
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<tr>
<td>Flash Point (COC)</td>
<td>°C</td>
<td></td>
<td>ASTM D92</td>
<td>230</td>
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<tr>
<td>Pour Point</td>
<td>°C</td>
<td></td>
<td>ASTM D97</td>
<td>-18</td>
</tr>
<tr>
<td>Density</td>
<td>@ 15 °C</td>
<td>kg/m³</td>
<td>ASTM 4052</td>
<td>0.870</td>
</tr>
</tbody>
</table>

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur.

Health & Safety Environment

- This product is unlikely to present any significant health and safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.
- Avoid contact with eyes and skin, use proper impervious gloves with used oil. After skin contact, wash immediately with soap and water. Guidance on health and safety is available on the appropriate Material Safety Data Sheet (MSDS) which can be obtained from lubricants@pumaenergy.com.

Protect the Environment

- Take used oil to an authorized collection point. Do not discharge used or new oil into drains, soil or water.

Additional Information

- Technical advice on any applications not covered here may be obtained from your Puma Energy Representative.