Super Low Friction Hub Bearing

Significant reduction of hub bearing rotational friction during vehicle operation,
Results in approximately 0.3% improved fuel economy!

**Features**

33% reduction in bearing rotational friction (compared with the conventional units)

(1) Newly developed low friction grease with improved ingredient composition and low viscosity made exclusively for bearings
(2) Minute dimples implemented to the seal lip sliding surface

**Applications**

- Axles for passenger cars

**Structure**

- Minute dimples in lip surface
- Low friction grease exclusively for bearings
EBW Driveshaft

Contributes to shorter development lead time for automobile manufacturers with an innovative new production method!

Features

Contributes to shorter development lead time for new models and higher reliability

1. Common outer ring cup section which had been different in vehicles in the past (only the stem is subject to individual designs)
2. Secure and high precision welding in a short time with electron beam welding

Applications

- Driveshafts for passenger cars

Structure

Characteristics of electron beam welding (compared with friction welding)

<table>
<thead>
<tr>
<th>Item</th>
<th>Electron beam welding</th>
<th>Friction welding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welding time</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Strength of welded section</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Concentric accuracy of welded section</td>
<td>○</td>
<td>△</td>
</tr>
<tr>
<td>Secondary processing after welding</td>
<td>Not required</td>
<td>Required</td>
</tr>
</tbody>
</table>

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Low Section High Strength Press Pulley

By optimally shaping the design and improving press molding, the industry's highest load resistance is achieved!

### Features

1. Steel sheets 1.5 times thicker than conventional press pulleys can be applied
   ⇒ Improves the pulley load resistance by two times or more
2. Low pulley section of approximately 70% of conventional products
   ⇒ Improves bearing operating life and load capacity
3. High durability under high temperature conditions and excellent wear resistance against foreign matters suitable for application in vehicles for emerging markets

### Applications

- Automobile engine accessory belt drive system

### Structure

- Optimal design achieved by utilizing analysis technology
- Improved press technology results in a reduced section and thicker sheets
- Revised thermal processing conditions for a stronger mold, preventing mold damage and seizure.
Long-life Needle Roller Bearing Unit

More than 10 times the operating life compared to conventional products with contaminated lubrication!

Features

Long-life roller bearing unit achieving more than 10 times the operating life with contaminated lubrication compared to conventional products

(1) Special (heat treatment) for rollers and shafts for longer operating life with contaminated lubrication
(2) Improved roller crowning shape to limit edge stress due to bearing installation error
(3) Optimal design for the cage pocket shape to reduce introduction of contaminants
(4) Added thrust washer discharge groove to improve contaminant discharge (oil discharge quantity: 6 times the conventional method)

Applications

Planetary reducers for construction and agricultural machinery

Structure

- Roller
- Shaft
- Cage
- Planetary gear (partially cut away)
- Thrust washer
- Gear and bearing cut away (planetary reducer)
- Swing drive (Reduction gear box)
- Final drive (Reduction gear box)
- Hydraulic excavator