Tough bearings offer longer service life under demanding mining conditions through NSK’s wealth of outstanding technologies.

Bearings for Mining Machinery

Choose NSK

NSK
The NSK brand, recognized around the world

From home electric appliances, automobiles, and large-scale equipment to the aerospace industry—NSK bearings are used in an extensive range of fields. NSK established its global-scale enterprise on technology that has met the exacting requirements of Japanese industry. We have also established R&D systems and support services to meet the diverse needs of our customers throughout the world. As a brand recognized around the world, NSK continues to lead the industry with its technical prowess.

NSK is on the move, across the globe

NSK is on the move, across the globe

Solution Provider NSK
NSK bearings offer mine operators longer service life under the most challenging operating conditions to maximize uptime and reduce maintenance costs for improved productivity at mining sites.

Durability and reliability are of paramount importance for mining machinery operating in remote locations such as mountains and deserts, where failure of a single component can impact the entire mining operation.

NSK has applied state-of-the-art technology to exceed the life and limiting speed of conventional bearings. Our superior bearings offer higher limiting speed and longer operating life, thereby reducing maintenance costs for mine operators.
Jaw Crusher

Material is crushed between two opposing jaw plates. One plate opens and shuts, crushing raw material against the stationary jaw plate.

Cone Crusher

Material is fed into the crusher cavity and processed by the eccentric rotating action of the inner cone against the outer cone. Work can be reduced to a diameter ranging from 50 mm to 100 mm.

Impact Crusher

As indicated by its name, this machine crushes ore through impact, and steadily reduces the size of the crushed particles through sharp, repeated impact with a rapidly spinning hammer, steel plate, or stick.

Vibrating Screen

The vibrating screen consists of a case with a shaft and housing installed inside, with springs supporting the case. The swing and rotation of the shaft is produced by the attached unbalanced weight, which generates vibration. This vibration sifts the material set on the screen on the top of the case.

CA Series Spherical Roller Bearings

CA series bearings are double-row self-aligning spherical roller bearings with a machined brass cage that have a high load capacity, superior durability, and are resistant to wear. The CA series are especially suitable for applications that operate under heavy or shock load conditions.

CA-VS Series Spherical Roller Bearings

CA-VS series bearings are CA series bearings that have been optimized for harsh vibrating applications, including vibrating screens and feeders.

Full-Complement Cylindrical Roller Bearings for Sheaves

Full-complement double-row cylindrical roller bearings featuring a thin-section profile and broad width specially designed for crane rope sheaves. Other applications include machinery operated at low-speed under a high load. These non-separable bearings can withstand heavy shock loads and moment loads, and have sufficient axial load capacity for use in sheaves.

Plummer Blocks

Plummer blocks are bearing housings that provide high rigidity and sealing capability for large machinery and heavy load applications. Plummer blocks are available in a wide range of types and models for various applications. The two global-standard types of plummer blocks, N and SD, are available from NSK for large-scale heavy-load applications.

HPS series bearings are double-row self-aligning spherical roller bearings capable of carrying heavy radial loads with moderate axial loads in either direction. The spherical profile of the rollers, the inner ring raceway, and the outer ring raceway, enable a self-aligning function that allows full capacity loading. The HPS series offers high performance standard-size bearings with longer operating life and higher limiting speeds than conventional bearings.

EW/EM Series Cylindrical Roller Bearings

EM and EW series bearings are cylindrical roller bearings capable of carrying particularly large radial loads and are suitable for high-speed applications. The EW series features a pressed steel cage and the EM series features a one-piece machined brass cage. Both cages offer high-load capacity for standard-size bearings, in addition to excellent functionality and longer operating life.

Hi-TF Bearings

Hi-TF bearings were developed with innovative materials and heat treatment technology for increased durability under harsh conditions. They combine long service life with good resistance to wear and seizure even under contaminated lubrication to achieve outstanding cost performance.

NSK bearings support construction machinery for the challenging task of raising efficiency and productivity of operations under harsh environments.

CRUSH  GRIND  SCREEN  BLAST

A Product Line that Matches Specific Applications
CA-VS Series Spherical Roller Bearings

The CA series is a standard-size bearing with a machined brass cage, tough and wear-resistant capabilities, and is ideal for applications operating under heavy or shock load conditions. NSK offers the U15 and VS units specifically for vibrating screens, feeders, and other vibrating applications.

Features

- Highly resistant to heavy or shock loads.
- Long service life for vibrating applications.
- Easy to install.
- Excellent self-aligning ability.
- Preventive measure against shaft deflection.

EW/EM Series Cylindrical Roller Bearings

The EW and EM series of high-load capacity, standard-size cylindrical roller bearings deliver outstanding performance across a wide range of applications. High-load capacity is achieved by using more rollers than conventional bearings based on an innovative NSK concept. We also offer standard-size cylindrical roller bearings for today’s needs that provide longer service life and low-noise and low-vibration performance through an optimally designed one-piece cage with high rigidity and low wear. This cage feature is incorporated in the EW series as a pressed steel cage and in the EM series as a one-piece machined brass cage.

Features

- Compared to the NSK’s conventional type:
  - Approximately twice the bearing life
  - 30% to 40% less noise and vibrations
  - Cage strength increased 1.5 to 2 times
  - 10% to 25% higher limiting speed

Series offers bearing inner bore dimensions ranging from 25 mm to 65 mm

EM Series (machined cage)

CA-VS Series spherical roller bearings

Features
- High-precision outer ring
- High-strength cage

Hi-TF Bearings

Bearings manufactured from NSK’s Hi-TF material have been specifically designed for outstanding toughness under harsh operating conditions, surpassing even NSK’s earlier TF bearings. Hi-TF bearings are capable of handling the foreseeable needs of the future as well as meeting today’s requirements.

Features

- Achieves longer bearing life even under harsh conditions with excellent resistance to wear, seizure, and heat
- High limiting speed
- Increased dynamic load rating to maximum of 25%
- 20% higher limiting speed
- Maximum 20% higher limiting speed

HPS Spherical Roller Bearings

Bearings are expected to reduce maintenance costs and enhance performance for a variety of equipment. HPS spherical roller bearings satisfy these requirements by fully utilizing NSK’s experience and expertise to deliver longer life and higher limiting speed.

Features

- Compared to the conventional EA Series:
  - Maximum 2 times bearing life
  - Maximum 20% higher limiting speed

HPS bearings are available with inner bore dimensions ranging from 40 mm to 130 mm

Hi-TF Bearings

Bearing life

Maximum 2 times

Increased dynamic load rating to maximum of 25%

Limiting speed

Maximum 20% higher

Hi-TF Bearings

Bearing life under boundary-lubrication conditions

Number of repetitions of stress, cycles

Cumulative failure probability %

E1259

Hi-TF

E1206

Hi-TF

E1237

Hi-TF

E1238

Hi-TF
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CA-VS Series Spherical Roller Bearings

### Dimensional tolerance and radial clearance

NSK’s U15 specifications stabilize the load distribution by controlling the internal clearance and the dimensional tolerance of the bearing.

- The dimensional tolerance bearing is set at 1/2 relative to the outer diameter tolerance and the internal diameter tolerance.
- The radial internal clearance is set at 2/3 relative to the standard.

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<th>Bearing numbers</th>
<th>Bore diameter (mm)</th>
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#### Dimensions of oil grooves and holes

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\*Internal clearance of C3 and C4 is standard specification for the CA-VS series.
### Table 1: Dimensions of oil grooves and holes

<table>
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<tr>
<th>Number of oil grooves and holes</th>
<th>Unit mm</th>
<th>Cylindrical bore</th>
<th>Tapered bore</th>
<th>(d_F) (d_G) (d_S) (d_H) (d_{max})</th>
<th>(Y) (Y) (Y) (Y) (Y)</th>
<th>(X) (Y) (Y) (Y) (Y)</th>
<th>(F_{s} / F_{a})</th>
<th>(F_{a} / F_{a})</th>
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</table>

Note (1) The suffix K indicates that the bearing has a tapered bore (taper 1:12).

### Static load factors

- \(P_{s} = F_{s} \times Y_{1} \times Y_{2}\)

- The values for \(X\), \(Y_{1}\), and \(Y_{2}\) are given in the table below.

#### Abutment and fillet dimensions (mm)

<table>
<thead>
<tr>
<th>Constant</th>
<th>Axial load factors</th>
<th>Mass</th>
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<td>(e)</td>
<td>(Y_{1})</td>
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### Notes

1. The suffix K indicates that the bearing has a tapered bore (taper 1:12).
2. The suffix indicates that the bearing has an oil groove and holes.
3. (The numbers and dimensions of oil grooves and holes are shown in Tables 1 and 2.)
EW Cylindrical Roller Bearings

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<th>NUP</th>
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<th>D (mm)</th>
<th>B (mm)</th>
<th>r (min)</th>
<th>r1 (min)</th>
<th>F0 (N)</th>
<th>C0 (N)</th>
<th>Ca (N)</th>
<th>Grease (min)</th>
<th>Oil (min)</th>
<th>Limiting speeds (min⁻¹)</th>
<th>d1 (min)</th>
<th>d2 (max)</th>
<th>d3 (min)</th>
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</table>
The following are also available: 1. N and NF type bearings  2. Cages with an outside diameter of less than 650 mm (Please contact NSK for details.)
## EM Cylindrical Roller Bearings

### NU, NJ, NUP Types

1. **N and NF type bearings**
2. **Cages with an outside diameter of less than 650 mm**

#### Bearing numbers

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The following are also available: 1. N and NF type bearings 2. Cages with an outside diameter of less than 650 mm (Please contact NSK for details.)
Recommended fitting and bearing internal clearance

When a crane sheave and wheel are used with an outer ring rotating load, bearing fitting and radial internal clearance are as follows:

Handling precautions

Be sure to push on the end face of the outer ring when mounting the bearing into a sheave. When mounting the bearing on a shaft, push on the end face of the inner ring.

<table>
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<tr>
<th>Load conditions</th>
<th>Tolerance range class of shaft</th>
<th>Tolerance range class of housing</th>
<th>Recommended internal clearance</th>
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<td>Outer ring rotating</td>
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<td>P7</td>
<td>C3</td>
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<td>Normal load or heavy load</td>
<td>G6 or H6</td>
<td>N7</td>
<td>C3</td>
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<td>Light load or fluctuating load</td>
<td>G6 or H6</td>
<td>M7</td>
<td>CN</td>
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Note 1. Bearings No. DS indicates seal is included.
2. Shield type can be provided upon request. Please contact NSK for details.
3. For specification higher than RS-5022, please contact NSK.
4. Grease is factory-packed into the bearing. NSK recommends lithium grease for replenishing.
5. Bearing without snap ring groove, or without snap rings are also available upon request.
Bearing Maintenance and Inspection

Maintenance

Bearings and operating conditions must be periodically inspected and maintained to maximize bearing life to prevent mechanical failure, ensure reliable operation, reduce productivity, and enhance cost performance.

Maintenance should be performed regularly according to work standards that may vary according to machine operating conditions.

Operating conditions should be monitored, lubricant replenished, or changed, and the machine periodically disassembled and overhauled.

1. Inspection under operating conditions

Review lubricant properties, check operating temperatures, and inspect for any vibrations and bearing noise to determine bearing replacement periods and replenishment intervals of the lubricant.

2. Inspection of the bearing

Be sure to thoroughly examine bearings during periodic machine inspections and part replacement. Check the raceway for any damage and confirm if the bearing can be reused or should be replaced.

Table 1 Bearing irregularity causes and countermeasures

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<th>Countermeasures</th>
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<td>Improve the fit, internal clearance, preload, or position of housing shoulder.</td>
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<tr>
<td>Incorrect mounting</td>
<td>Improve machining accuracy, alignment accuracy or mounting accuracy of shaft and housing, or use the correct mounting method.</td>
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<tr>
<td>Insufficient or improper lubricant</td>
<td>Replenish the lubricant or select another lubricant.</td>
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<tr>
<td>Contact of rotating parts</td>
<td>Modify the labyrinth seal.</td>
<td></td>
</tr>
<tr>
<td>Flaws, corrosion, or scratches on raceways caused by foreign particles</td>
<td>Replace or clean the bearing, improve sealing conditions, or use clean lubricant.</td>
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</tr>
<tr>
<td>Flaws, or flaking on balls</td>
<td>Replace the bearing.</td>
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</tr>
<tr>
<td>Excessive clearance</td>
<td>Improve the fit, clearance, or preload.</td>
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</tr>
<tr>
<td>Contamination by foreign particles</td>
<td>Replace or clean the bearing, improve the seals, and use clean lubricant.</td>
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<tr>
<td>Flaws or flaking on balls</td>
<td>Replace the bearing.</td>
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<tr>
<td>Easiness of small clearance</td>
<td>Improve the fit, clearance, or preload.</td>
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<tr>
<td>Excessive amount of lubricant</td>
<td>Reduce the amount of lubricant and select stiffener grease.</td>
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<tr>
<td>Insufficient or improper lubricant</td>
<td>Replenish lubricant or select a proper one.</td>
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</table>

Abnormal load

Replace the bearing. Improve the fit, internal clearance, preload, or position of housing shoulder.

Incorrect mounting

Improve machining accuracy, alignment accuracy or mounting accuracy of shaft and housing, or use the correct mounting method.

Insufficient or improper lubricant

Replenish the lubricant or select another lubricant.

Contact of rotating parts

Modify the labyrinth seal.

Flaws, corrosion, or scratches on raceways caused by foreign particles

Replace or clean the bearing, improve sealing conditions, or use clean lubricant.

Flaws or flaking on balls

Replace the bearing.

Excessive clearance

Improve the fit, clearance, or preload.

Contamination by foreign particles

Replace or clean the bearing, improve the seals, and use clean lubricant.

Easiness of small clearance

Improve the fit, clearance, or preload.

Excessive amount of lubricant

Reduce the amount of lubricant and select stiffener grease.

Insufficient or improper lubricant

Replenish lubricant or select a proper one.

Abnormal load

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Incorrect mounting

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Contact of rotating parts

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Flaws or flaking on balls

Replace the bearing.

Easiness of small clearance

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Excessive amount of lubricant

Reduce the amount of lubricant and select stiffener grease.

Insufficient or improper lubricant

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Abnormal load

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Incorrect mounting

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Improve the fit, clearance, or preload.

Excessive amount of lubricant

Reduce the amount of lubricant and select stiffener grease.

Insufficient or improper lubricant

Replenish lubricant or select a proper one.
Running Traces and Applied Loads

As the bearing rotates, the raceways of the inner ring and the outer ring make contact with the rolling elements. This results in a darkening of both the rolling elements and raceways. It is normal for the running trace to be marked on the raceway, and the extent and shape of this running trace provides a useful indication of loading conditions. It is possible to determine from careful observation of the running traces whether the bearing is carrying a radial load, a large axial load, or a moment load, or if there are extreme rigidity variations of the housing. Unexpected load applied to the bearing, excessive mounting error, or others can also be determined, providing a clue to the investigation of causes for bearing failure. Typical running traces of deep groove ball bearings are shown in Fig. 1, and representative running traces of roller bearings are shown in Fig. 2.

![Running traces of deep groove ball bearings](image1)

![Running traces of roller bearings](image2)

Bearing Damage and Countermeasures

**Flaking**

<table>
<thead>
<tr>
<th>Damage condition</th>
<th>Possible causes</th>
<th>Countermeasures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flaking occurs when fragments of bearing material chip off from the smooth surface of the raceway or rolling elements due to rolling fatigue, thereby creating regions having rough and coarse texture.</td>
<td>Excessive load</td>
<td>Reconfirm the bearing application and check the load conditions</td>
</tr>
<tr>
<td></td>
<td>Incorrect mounting (misalignment)</td>
<td>Improve the mounting method</td>
</tr>
<tr>
<td></td>
<td>Moment load</td>
<td>Improve the sealing mechanism, prevent rust during non-running</td>
</tr>
<tr>
<td></td>
<td>Entry of foreign matter, water penetration</td>
<td>Use a lubricant with a proper viscosity, improve the lubrication method</td>
</tr>
<tr>
<td></td>
<td>Poor lubrication, improper lubricant</td>
<td>Check the precision of shaft and housing</td>
</tr>
<tr>
<td></td>
<td>Unsuitable bearing clearance</td>
<td>Check the bearing internal clearance</td>
</tr>
<tr>
<td></td>
<td>Improper precision for shaft or housing, unevenness in housing rigidity, large shaft bending</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Progression from rust, corrosion pits, smearing, dens (brinelling)</td>
<td></td>
</tr>
</tbody>
</table>

**Possible causes**

- Excessive load
- Incorrect mounting (misalignment)
- Moment load
- Entry of foreign matter, water penetration
- Poor lubrication, improper lubricant
- Unsuitable bearing clearance
- Improper precision for shaft or housing, unevenness in housing rigidity, large shaft bending
- Progression from rust, corrosion pits, smearing, dens (brinelling)

**Countermeasures**

- Reconfirm the bearing application and check the load conditions
- Improve the mounting method
- Improve the sealing mechanism, prevent rust during non-running
- Use a lubricant with a proper viscosity, improve the lubrication method
- Check the precision of shaft and housing
- Check the bearing internal clearance

**Part:** Inner ring of an angular contact ball bearing

**Symptom:** Flaking occurs around half of the circumference of the raceway surface

**Cause:** Incorrect lubrication due to entry of cutting coolant into bearing

**Part:** Inner ring of a spherical roller bearing

**Symptom:** Flaking of only one raceway over its entire circumference

**Cause:** Excessive axial load

**Part:** Inner ring of an angular contact ball bearing

**Symptom:** Flaking occurs diagonally along raceway

**Cause:** Improper alignment between shaft and housing during mounting

**Part:** Inner ring of a spherical roller bearing

**Symptom:** Flaking of only one row of raceway

**Cause:** Incorrect lubrication
### Bearing Damage and Countermeasures

**Cracks**

<table>
<thead>
<tr>
<th>Damage condition</th>
<th>Possible causes</th>
<th>Countermeasures</th>
</tr>
</thead>
</table>
| Cracks in the raceway ring and rolling elements. | • Excessive interference  
• Excessive load, shock load  
• Progression of flaking  
• Heat generation and fretting caused by contact between mating parts and raceway ring  
• Heat generation due to creep  
• Improper taper angle of tapered shaft  
• Improper cylindricality of shaft  
• Interference with bearing chamfer due to a shaft corner radius that is larger than bearing chamfer dimension | • Correct the interference  
• Check the load conditions  
• Improve the mounting method  
• Use an appropriate shaft shape |
| Continued use under this condition leads to larger cracks or fractures. | | |

**Smearing**

<table>
<thead>
<tr>
<th>Damage condition</th>
<th>Possible causes</th>
<th>Countermeasures</th>
</tr>
</thead>
</table>
| Smearing is surface damage which occurs from a collection of small seizures between bearing components caused by oil film rupture and/or sliding. Surface roughening occurs along with melting. | • High speed and light load  
• Sudden acceleration/deceleration  
• Improper lubricant  
• Entry of water | • Improve the preload  
• Improve the bearing clearance  
• Use a lubricant with good oil film formation ability  
• Improve the lubrication method  
• Improve the sealing mechanism |

### Possible causes

- High speed and light load
- Sudden acceleration/deceleration
- Improper lubricant
- Entry of water

### Countermeasures

- Improve the preload
- Improve the bearing clearance
- Use a lubricant with good oil film formation ability
- Improve the lubrication method
- Improve the sealing mechanism

---

**Part:** Outer ring of a double-row cylindrical roller bearing  
**Symptom:** Thermal cracks occur on the outer ring side face  
**Cause:** Abnormal heat generation due to contact sliding between mating part and face of outer ring

**Part:** Outer ring of a cylindrical roller bearing  
**Symptom:** Smearing occurs circumferentially on raceway surface  
**Cause:** Roller slipping due to excessive grease filling

**Part:** Cross section of a fractured inner ring in a spherical roller bearing  
**Symptom:** Origin is directly beneath the raceway surface  
**Cause:** Improper lubrication

**Part:** Convex rollers of a spherical roller bearing  
**Symptom:** Smearing occurs at the center of the rolling surface  
**Cause:** Incorrect lubrication

**Part:** Inner ring of a spherical roller bearing  
**Symptom:** Axial cracks occur on rolling surface  
**Cause:** Improper lubrication
### Seizure

<table>
<thead>
<tr>
<th>Damage condition</th>
<th>Possible causes</th>
<th>Countermeasures</th>
</tr>
</thead>
</table>
| When sudden overheating occurs during rotation, the bearing becomes discolored, and the raceway rings, rolling elements, and cage soften, melt, and deform as damage accumulates. | • Incorrect lubrication  
• Excessive load (excessive preload)  
• Excessive rotational speed  
• Excessively small internal clearance  
• Entry of water and foreign matter  
• Poor precision of shaft and housing, excessive shaft bending | • Investigate the lubricant and lubrication method  
• Reinvestigate the suitability of the bearing type selected  
• Investigate the preload, bearing clearance, and fitting  
• Improve the sealing mechanism  
• Check the precision of the shaft and housing  
• Improve the mounting method |

**Part:** Inner ring of a spherical roller bearing  
**Symptom:** Discoloration and melting of raceway; worn particles from the cage were rolled and attached to the raceway  
**Cause:** Insufficient lubrication

**Part:** Inner ring of an angular contact ball bearing  
**Symptom:** Raceway discoloration; melting occurs at ball pitch intervals  
**Cause:** Excessive preload

**Part:** Convex rollers of a spherical roller bearing  
**Symptom:** Discoloration and melting of roller rolling surface, adhesion of abrasion fragments from cage  
**Cause:** Insufficient lubrication

### Fretting

**Damage condition**  
Wear occurs due to repeated sliding between two surfaces (bore, shaft, roller, etc.)  
Fretting occurs at fitting surface and also at contact areas between raceway and rolling elements.  
Fretting corrosion is another term used to describe the reddish brown or black wear debris.

**Possible causes**  
• Incorrect lubrication  
• Vibration with a small amplitude  
• Insufficient interference

**Countermeasures**  
• Use a proper lubricant  
• Apply preload  
• Check the interference fit  
• Apply a film of lubricant to the fitting surface

**Part:** Inner ring of a deep groove ball bearing  
**Symptom:** Fretting occurs on the bore surface  
**Cause:** Vibration

**Part:** Inner ring of an angular contact ball bearing  
**Symptom:** Notable fretting occurs over entire circumference of bore surface  
**Cause:** Insufficient interference fit

**Part:** Outer ring of a double-row cylindrical roller bearing  
**Symptom:** Fretting occurs on the raceway surface at roller pitch intervals

**Part:** Outer ring of an angular contact ball bearing  
**Symptom:** Cage is damaged by melting; balls becomes discolored and melted  
**Cause:** Excessive preload
## Bearing Damage and Countermeasures

### Wear

<table>
<thead>
<tr>
<th>Damage condition</th>
<th>Possible causes</th>
<th>Countermeasures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wear is surface deterioration due to sliding friction at the surface of the raceway, rolling elements, roller end faces, rib face, cage pockets, etc.</td>
<td>• Entry of foreign matter • Progression from rust and electrical corrosion • Incorrect lubrication • Sliding due to irregular motion of rolling elements</td>
<td>• Improve the sealing mechanism • Clean the housing • Filter the lubrication oil thoroughly • Check the lubricant and lubrication method • Prevent misalignment</td>
</tr>
</tbody>
</table>

### Creep

<table>
<thead>
<tr>
<th>Damage Condition</th>
<th>Possible causes</th>
<th>Countermeasures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creep is a phenomenon in bearings where relative slipping occurs at the fitting surfaces and thereby creates a clearance at the fitting surface. Creep causes a shiny appearance, occasionally with scoring or wear.</td>
<td>• Insufficient interference or loose fit • Insufficient sleeve tightening</td>
<td>• Check the interference, and prevent rotation • Correct the sleeve tightening • Investigate the shaft and housing precision • Preload in the axial direction • Prevent axial movement of ring • Apply adhesive to the fitting surface • Apply a film of lubricant to the fitting surface</td>
</tr>
</tbody>
</table>

### Reference catalog

Please refer to the following catalogs for details of each product.

- HPStSpherical Roller Bearings (CAT. No. E1259)
- Cylindrical Roller Bearings EW Series (CAT. No. E1238)
- Cylindrical Roller Bearings EM Series (CAT. No. E1237)
- Large Hi-TF Bearings (CAT. No. E1202)
- Full Complement Cylindrical Roller Bearings for Crane Sheaves (CAT. No. E1206)
- Rolling Bearings (CAT. No. E1102)
- Large Size Rolling Bearings (CAT. No. E128)
- Needle Roller Bearings (CAT. No. E1419)
- Handling Instructions for Bearings (CAT. No. E9010)
- Handling Instructions for Spherical Roller Bearings (CAT. No. E9003)
- New Bearing Doctor (CAT. No. E7005)
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