Re-seal the sampling points with the plugging elements.
Re-seal the end of the tube after grease retrieval.
Cut off the tube at the marked point and seal also the cut point (Fig. 9).
Place the sample into a separately identified sample container and send it to RE.
RE will send the collected grease samples to a qualified institute for analysis. The result and the RE comments will be passed on to the customer.

The measured axial reduction or tilting clearances are entered into the table together with the result of the later grease sample analysis. Allocation of these values permits to make statements on the actual condition of the rolling system.

Wear Curves
The two diagrams show the principle of bearing wear progression (Fig. 10). Maximum permissible wear indicationom 2% Fe-content (200,000 ppm).

Test Certificate for Rothe Erde Slewing Rings
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Bearing Inspection

Reflex Ero slip rings are designed according to national and international standards to ensure proper functioning. When selecting slip rings, it is crucial to consider the required speed, the number of contacts, and the operating environment. Proper selection and installation are essential to maintain the reliability and longevity of the system.

To determine the condition of a bearing, it is essential to conduct regular inspections. These inspections should be performed under standard conditions, including steady running and a steady load. In case of heavy wear, the bearing may be damaged, affecting the system's performance and leading to system failure.

The maximum permissible increase of the bearing clearances

The first measurement should always be carried out when the equipment is put into operation in order to obtain a base value for subsequent repeat measurements. The measurements should be repeated every six months as a minimum or whenever wear indicates that the condition of the bearing has changed. In case of wear, the bearing should be replaced.

In cases where it is impossible to measure the tilting clearance, the axial reduction measurement is recommended. The measurement is based on the position of the bearing in the system. The tilting angle is measured as shown in Fig. 2.

In case of heavy wear, the bearing may be damaged, affecting the system's performance and leading to system failure. In such cases, the bearing should be replaced. If the lubrication system is not functioning properly, the lubrication point should be checked.

Check the bolts. Mark the respective positions around the circumference while keeping the boom in a specified position. Record the base values obtained in tabular form (test certificate). The measurements should be repeated every six months as a minimum or whenever wear indicates that the condition of the bearing has changed. In case of wear, the bearing should be replaced.

In cases where it is impossible to measure the tilting clearance, the axial reduction measurement is recommended. The measurement is based on the position of the bearing in the system. The tilting angle is measured as shown in Fig. 2.

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Check the bolts. Mark the respective positions around the circumference while keeping the boom in a specified position. Record the base values obtained in tabular form (test certificate). The measurements should be repeated every six months as a minimum or whenever wear indicates that the condition of the bearing has changed. In case of wear, the bearing should be replaced.

An additional measurement of the axial reduction can be taken. The tilting clearance can be affected by the position of the bearing in the system. The bearing should be replaced in case of heavy wear.
### Bearing Inspection

Reflex Eccle slaming rings are designed according to customer-specified loads and applications. To determine the condition of a bearing and thereby its expected service life before the slaming rings should be subjected to periodic inspections during their operating life.

**Load Measurement**

For assessing the condition of a bearing, we recommend that its normal wear rate is determined. The wear present in the raceway system depends on the change in the axial load of the bearing. Depending on the individual obstructions, wear can be determined either by measuring the tilting clearance or by performing regular measuring tests. Another means of wear assessment is to group sample analysis.

**Tilting Clearance Measurement**

For equipment allowing this, we recommend to measure the tilting clearance in order to determine the wear. The first measurement must be performed when the equipment is put into operation in order to obtain a base value for subsequent repeat measurements.

Check the tilts. The measuring points to be marked around the circumference while keeping the boom in a specified position.

The measurements are then taken between the lower mating support and the axis of the bearing. An additional measurement of the axial reduction resp. the tilting clearance has to be effected every 12 months. The first measurement should be repeated every 12 to 24 months as a minimum, always under identical conditions.

An additional measurement of the axial reduction resp. the tilting clearance has to be effected every 12 months. Therefore, 5 grease samples have to be taken. State grease type. Collect grease samples. Grease samples set (Fig. 8). An axial reduction resp. the tilting clearance has to be effected every 12 months. Therefore, 5 grease samples have to be taken. State grease type. Collect grease samples. Grease samples set (Fig. 8). Check the wear. The first measurement should be repeated every 12 to 24 months as a minimum, always under identical conditions.

The first measurement should be performed when the equipment is put into operation in order to obtain a base value for subsequent repeat measurements.

Table 1: Single-row ball bearings in contact with elastomer rings (standard versions, Fig. 3)

<table>
<thead>
<tr>
<th>Diameter</th>
<th>Track Diameter</th>
<th>Track</th>
</tr>
</thead>
<tbody>
<tr>
<td>6000</td>
<td>4750</td>
<td>4500</td>
</tr>
<tr>
<td>7500</td>
<td>5250</td>
<td>5000</td>
</tr>
<tr>
<td>5000</td>
<td>3750</td>
<td>3500</td>
</tr>
<tr>
<td>4000</td>
<td>2750</td>
<td>2500</td>
</tr>
<tr>
<td>3000</td>
<td>2000</td>
<td>1750</td>
</tr>
</tbody>
</table>

Table 2: Three-row roller bearing slewing rings (standard versions, Fig. 3)

<table>
<thead>
<tr>
<th>Diameter</th>
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</tbody>
</table>

Table 3: Single-row ball bearings in contact with elastomer rings (standard versions, Fig. 3)

<table>
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<td>1750</td>
</tr>
</tbody>
</table>

In case of heavy wear the time intervals between two measurements should be shortened. In the event that the difference between the last measurement and the most recent exceeds the maximum values shown in tables (3), please consult Rothe Erde. To control slaming rings, a basic measurement has to be performed when putting into operation (measurement of the axial reduction resp. the tilting clearance) and entered into the table. Copy to IBC. In parallel, first grease samples have to be taken. State grease type. Collect grease samples. An additional measurement of the axial reduction resp. the tilting clearance has to be effected every 12 months. Therefore, 5 grease samples have to be taken. State grease type. Collect grease samples. Grease samples set (Fig. 8). An axial reduction resp. the tilting clearance has to be effected every 12 months. Therefore, 5 grease samples have to be taken. State grease type. Collect grease samples. Grease samples set (Fig. 8).

Grease sample collection

Between the measuring intervals, the bearing samples from the sampling joints (Fig. 9 and 10).

- The sampling port of the sampling device is in order the boom.
- Three-axes bearings have one additional port for the retaining grease outlet by 90°.
- Saw the boom into the main working direction.
- Front and rear plastic plates, which is fixed in the sections.
- 120 mm length each and provide connection to the suction system into the borehole up to the raceway area (Fig. 10).
- While rotating the slaming bearing, collect the grease samples.
- 1, 2 and 3 from the sampling groove always in a different direction.
- Analysically, collect the grease samples. 4, 5 and 6 from the returning groove (Fig. 10).

Grease sampling set.

- Three-axes bearing sampling rig with grease sampling posts, please consult Rothe Erde.
- Grease sampling set.
- Single-axes bearing sampling rig with grease sampling posts.
- Three-axes bearing sampling rig with grease sampling posts.
- Single-axes bearing sampling rig with grease sampling posts.
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Bearing Inspection

Refine Erie slewing rings are designed to accommodate specified loads and applications. To determine the condition of a bearing and thereby its service life, the slewing rings should be subjected to periodic inspections during their operating life.

**Wear Measurement**

For assessing the condition of a bearing, we recommend that its normal wear rate is determined. The wear present in the raceway system depends itself by a change in the associated load. Depending on the individual obstructions, wear can be determined either by measuring the tilting clearance and/or the axial reduction of the bearing – and thereby its expected service life—the slewing rings must be performed when the wear has occurred. If the wear is found to have heavier, record the base values obtained and entered into the table. Copy to IOC. In parallel, fresh grease samples have to be taken.

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The measurements should be subjected to periodic service life—the slewing rings must be performed when the wear has occurred. If the wear is found to have heavier, record the base values obtained and entered into the table. Copy to IOC. In parallel, fresh grease samples have to be taken.

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**Tilting Clearance Measurement**

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**Maximum permissible increase of the bearing clearances**

In case of heavy wear the time intervals between measurements should be shortened. If the deviation from the base measure exceeds the maximum values shown in Tables 1 through 4, please consult Rohde Erde. To control slewing rings, a base measurement has to be performed when pushing it into operation (measurement of the axial reduction or the tilting clearance) and entered into the table. Copy to IOC. In parallel, fresh grease samples have to be taken.

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Grease sample analysis and bearing wear measurement require a thorough examination of the system.

- Re-seal the sampling parts with the plugs provided.
- Re-seal the ends of the tube after grease removal.
- Cut off the tube at the marked positions and seal it (Fig. 9).
- Place the samples into appropriately identified sample containers and send it to RE.

RE will send the collected grease samples to a qualified institute for analysis. The result and the RE comments will be passed on to the customer.

The measured axial reduction or tilting clearances are entered into the table together with the result of the later grease sample analysis. Allocation of these values permits to make statements on the actual condition of the raceway system.

Wear Curves

The two diagrams show the principle of bearing wear progression (Fig. 10). Maximum permissible wear indication 2% Fe-content (20,000 ppm).

Test Certificate for Rothe Erde Slewing Rings

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Internet: www.rotheerde.com

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Customer:   Application:   Location:
RE drawing-no.:   RE-order-no.:   Year of manufacture:
Date
Service-hours

Repeated measurements (every 12 months)
Measuring point Basic         1         2         3         4         5         6         7

Boom 180° offset
Boom 180° offset
Boom 180° offset
Boom 180° offset

Grease type
Greasing system
Quantity/interval
Remarks
Grease-sample no.
Fe-magn. particle (%)

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Re-seal the sampling ports with the plugging elements.
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Test Certificate for Rothe Erde Slewing Rings
Rothe Erde Slewing Rings.
Bearing Inspection Offshore Cranes.

Fig. 9:
Production of the sample sections. Slewing Rings – General Diagnosis.

Fig. 10:
Wear curves 1) limit values see tables 1 through 3.
Allocation of these values permits to make statements on the actual condition of the raceway system.

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