CENTAMAX
Assembly and operating instructions
004H-05600...30000-A0.. / -B0..
M004-00011-EN
Rev. 2
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1 General remarks

These assembly and operating instructions form a constituent part of the coupling delivery and must be kept in an easily accessible place at all times.

CENTA products are developed and produced to quality standard DIN EN ISO 9001:2000.

In the interests of further development, CENTA reserves the right to make technical changes.

---

IMPORTANT

CENTA is unable to accept liability for damage and operating faults caused by failure to observe the operating instructions.

These operating instructions are protected under copyright to CENTA Antriebe Kirschey GmbH.

In case of technical questions, please enquire with our head office:

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www.centa.info
2 Safety

The purpose of these operating instructions is to enable users to:

- use the coupling safely and correctly
- maximize efficiency
- ensure that care and maintenance are carried out correctly

For this reason, these operating instructions must be thoroughly read and understood prior to work on and with the coupling.

### WARNING

<table>
<thead>
<tr>
<th>Injury and material damage can occur as a result of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Failure to adhere to the safety and accident prevention regulations valid at the relevant installation site</td>
</tr>
</tbody>
</table>

The safety and accident prevention regulations valid at the installation site in question must be adhered to when performing any of the tasks described in these operating instructions.

2.1 Safety remarks

In these operating instructions, safety remarks are indicated by a pictogram and a signal word.

2.1.1 Signal words

The following signal words are used in the safety remarks:

- **DANGER**
  Denotes the immediate threat of danger.
  If not prevented, fatal or extremely serious injuries can result.

- **WARNING**
  Denotes a potentially dangerous situation.
  If not prevented, fatal or extremely serious injuries can result.

- **CAUTION**
  Denotes a potentially dangerous situation.
  If not prevented, minor injuries and/damage to property may result.

- **IMPORTANT**
  Denotes application tips and particularly useful information. This is not a signal word denoting a dangerous or damaging situation.
2.1.2 Pictograms
Possible pictograms in the safety precautions:

- Warning of a hazardous area
- Do not switch
- Use protective gloves
- Use protective goggles

2.2 Qualification of deployed personnel
All the work described in these operating instructions may only be performed by authorized persons with adequate training and instruction.

**WARNING**

*Injury and material damage can occur as a result of:*
- Work at the coupling which is not described in these instructions

Only carry out work which is described in these operating instructions.

2.3 Intended application

**WARNING**

*Injury and material damage can occur as a result of:*
- Application not in compliance with the intended use

The couplings are intended exclusively for use in accordance with the relevant design. They may only be used under the specified conditions.
WARNING

Injuries can occur as a result of:

- Contact with rotating parts

Shield the coupling in accordance with the applicable accident prevention regulations with an enclosure.

Exception:
The coupling is encased by the driving and driven units.

The scope of delivery provided by CENTA does not include a protective enclosure.

This enclosure must fulfill the following criteria:

- Provide protection against persons gaining access to rotating parts
- Restrain any rotating parts which may be work loose
- Guarantee sufficient ventilation for the coupling

This enclosure must be made of stable steel components. In order to ensure adequate ventilation for the coupling, the enclosure must be fitted with regular openings. For safety reasons, these openings must not exceed the dimensions outlined in table 2-1.

<table>
<thead>
<tr>
<th>Component</th>
<th>Circular openings [mm]</th>
<th>Rectangular openings [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top of the enclosure</td>
<td>Ø 8</td>
<td>□ 8</td>
</tr>
<tr>
<td>Side elements of the enclosure</td>
<td>Ø 8</td>
<td>□ 8</td>
</tr>
</tbody>
</table>

Table 2-1 Shape and size of ventilation holes

The enclosures must be positioned a minimum of 15 mm distant from rotating parts. The enclosure must be electrically conductive and be included in the equipotential bonding.

Before commencing long-term operation, the plant must successfully complete a test run.
2.4 Application not in compliance with the intended use

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury and material damage can occur as a result of:</td>
</tr>
<tr>
<td>• Inadmissibly high torque</td>
</tr>
<tr>
<td>• Inadmissibly high or low speeds</td>
</tr>
<tr>
<td>• Exceeding the specified ambient temperature</td>
</tr>
<tr>
<td>• Inadmissible ambient medium</td>
</tr>
<tr>
<td>• Inadmissible coupling enclosure</td>
</tr>
<tr>
<td>• Exceeding the admissible overall misalignment values</td>
</tr>
</tbody>
</table>

Only use the coupling for the specified application.

CENTA bears no liability for damage resulting from application not in compliance with the intended use of the equipment. Should there be a change of plant parameters, the coupling design must be reviewed by CENTA (address see chapter 1).
3 Delivery, transport, storage and disposal

3.1 Delivery
After delivery, the coupling:
- must be checked for completeness and correctness of the delivery.
- must be examined for possible transport damage (which must be reported immediately to the carrier).

3.2 Transport

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury and material damage can occur as a result of:</td>
</tr>
<tr>
<td>- Incorrect transportation of couplings</td>
</tr>
<tr>
<td>Ensure that the coupling is correctly transported.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material damage to coupling components can occur as a result of:</td>
</tr>
<tr>
<td>- Contact with sharp-edged objects</td>
</tr>
<tr>
<td>Protect coupling components for transportation. Only hoist coupling components with nylon belts or ropes. Always cushion parts when supporting them from below.</td>
</tr>
</tbody>
</table>

Following transportation damage:
- Check the coupling carefully for damage.
- Consult the manufacturer (Address see chapter 1).

3.3 Storage

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material damage to elastic elements and rubber parts can occur as a result of:</td>
</tr>
<tr>
<td>- Incorrect storage</td>
</tr>
<tr>
<td>These parts must be stored laid flat and so they cannot distort, and protected from ozone, heat, light, moisture and solvents.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMPORTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber parts are marked where possible with their production date. From this date, they may only be stored for a maximum of 5 years.</td>
</tr>
</tbody>
</table>
3.3.1 Storage location

Requirements imposed on the storage location:

- Moderately ventilated and low in dust
- Dry (max. 65% humidity)
- Temperature stabilized (-10°C to +25°C)
- Free of ozone-producing devices such as light sources and electric motors
- Free of UV light sources and direct sunlight
- Do not store solvents and disinfectants, fuels or lubricants, acids, chemicals etc. in the same location

For more details, refer to DIN 7716.

3.3.2 Storage of couplings / flexible elements

- Unpack the parts.
- Check the packaging for damage. Replace if necessary.
- Check that the wax protection on steel components is intact. If necessary, patch or renew.
- Package the parts (for prolonged periods of storage, enclose desiccant and weld into film).
- Place the parts into storage.

3.4 Disposal

**RECYCLING**

Ensure safe, environmentally responsible disposal of operating supplies and exchange parts. For this, locally provided recycling facilities and regulations must be utilized.

For disposal, the coupling parts must be separated where possible and sorted according to material type.
4 Technical description

4.1 Characteristics

- Highly torsional elasticity / backlash-free
- Linear curve
- Extreme high allowable energy loss
- Due to different shore hardness levels, the torsional rigidity can be adjusted to vibration-related requirements
- Dampens vibrations and impacts - compensates axial, radial and angular alignment errors
- Low-wear - durability - operational reliability - low maintenance
- Compact, short design - connection dimensions in accordance with SAE J 620 or for connection of two shafts
- Free axial movement
- Improved all-round ventilation (cooling) of the rubber element
- Suitable for high speeds
- Large admissible bores
- Simple mounting - axial plug-in capability
- Temperature-resistant

4.2 Specifications

Admissible ambient temperatures:

**NR:** -45°C to +80°C (temporary minimum temperature 100°C)

Ensure that suitable ventilation is provided in the mounting area of the coupling so that the admissible ambient temperature is not exceeded.

For further technical details, see the catalogue and the dimensions contained in the drawings.
Alignment of the units being connected

- Align the units being connected according to the existing installation situation.
  - At flanged drives: Checking the installation position of the units being connected, see chapter 5.1.
- At non flanged drives: Aligning the units being connected, see chapter 5.2.

**IMPORTANT**

The alignment must be recorded and has to be placed to the disposal of the operating company. This is to ensure verifying and modifying the alignment during operation and maintenance.

5.1 Checking the installation position of the units being connected

**WARNING**

Injury and material damage can occur as a result of:

- Connected units, which are out of permissible alignment tolerances, when assembled.

Make sure that the units being connected are within the permissible alignment tolerances of the coupling.

- Before starting the mounting, check whether the position of the units to be connected are within the permissible alignment tolerances of the coupling.

Therefor:

- Check the dimensions of the centrings of the units to be connected. Record this.
- Check the true running of the centrings of the units to be connected. Record this.
- From the results of the checked dimensions above, determine the misalignment of the units to be connected.
- Check, whether the determined misalignment values exceed the permissible axial, radial and angular tolerances of the coupling (see chapter 5.2).
- If a permissible tolerance is exceeded, the units to be connected must be corrected correspondingly.
- Before commissioning, ensure that the position of the units being connected are within the permissible alignment tolerances of the coupling.
5.2  Alignment of the units being connected

### IMPORTANT

- Align the units during the assembly.
- Align the units that are to be connected as accurately as possible. In this way, a long service life for the coupling and maximum operating misalignment values can be achieved. The overall misalignment is composed of the misalignment and the operating misalignment. The permissible overall misalignment values can be found in the corresponding catalogue and must not be exceeded.
- All permissible alignment tolerances apply to arrangements at operating temperatures. If the arrangement would be aligned at a different temperature, there would be additional deviations in the arrangement, which were produced by the difference between the aligning and operating temperature. For alignment, this has to be taken into account.
- After completion of assembly, check the alignment of the coupling again and if necessary correct.

5.2.1  Axial alignment

Determine the axial misalignment (see Fig. 5-1).

- Take installation length $L$ from the installation drawing.
- Align the units (installation dimension = $L \pm \Delta K_{A\ max}$).

Permissible axial alignment tolerance:

\[ \Delta K_{A\ max} = 1 \text{ mm} \]

![Fig. 5-1 Axial misalignment](image)
5.2.2 Radial alignment

**CAUTION**

Material damage to elastically installed engines can occur as a result of:

- Disregard to which extent the engine mounts may settle during alignment

During vertical alignment, take into account the extent by which the engine mounts settle. Please enquire about specifications for the degree of settling from the engine manufacturer or engine mounts manufacturer.

Measure the radial misalignment with a dial gauge (see Fig. 5-2).

- Attach the dial gauge to the hub.
- Set the sensor of the dial gauge radially against the centering.
- Turn the hub with dial gauge and flywheel slowly by 360°.
- Align the units (calculated deviation $\Delta K_{R_{\text{max}}}$).

Permissible radial alignment tolerance:

$\Delta K_{R_{\text{max}}}=\pm 0.2$ mm

*Fig. 5-2 Radial misalignment*
5.2.3 **Angular alignment**

Measure the angular misalignment with a dial gauge (see Fig. 5-3).

- Attach the dial gauge to the hub.
- Position the sensor of the dial gauge radially against flat surface at a distance R.
- Turn the hub with dial gauge and flywheel slowly by 360°.

The maximum dial gauge deflection must not exceed the value $2 \times S_w$ at any point. The permissible tolerance $S_{w \text{ max}}$ should be calculated according to formula 5-1 below.

- Align the units (calculated deviation $\leq \Delta K_{w \text{ max}}$).

Permissible angular alignment tolerance:

$$\Delta K_{w \text{ max}} = 0.15°$$

\[
S_w = R \cdot \tan(\Delta K_w)
\]

\[
S_w = R \cdot 0.0026
\]

*Formula 5-1 Calculated dimension $S_w$*
6 Mounting

6.1 General assembly instructions

Any work method which impairs the safety of the coupling is prohibited. The user undertakes to notify the manufacturer immediately of any changes occurring at the coupling which could impair safety (address see chapter 1).

---

**WARNING**

<table>
<thead>
<tr>
<th>Injuries can occur as a result of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Contact with rotating parts</td>
</tr>
</tbody>
</table>

Before starting work at the coupling, switch off the plant and secure against unintentional start-up.

---

**WARNING**

<table>
<thead>
<tr>
<th>Injury and material damage can occur as a result of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Assembly of the coupling in the wrong sequence</td>
</tr>
</tbody>
</table>

Only ever assemble the coupling in the described sequence.

---

**CAUTION**

<table>
<thead>
<tr>
<th>Material damage to coupling components can occur as a result of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Contact with sharp-edged objects</td>
</tr>
</tbody>
</table>

Protect coupling components for transportation. Only hoist coupling components with nylon belts or ropes. Always cushion parts when supporting them from below.

---

**CAUTION**

<table>
<thead>
<tr>
<th>Material damage can occur as a result of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Soiled joint surfaces</td>
</tr>
</tbody>
</table>

The surfaces that are to be joined must be free of dirt, preservatives and lubricants.

---

**CAUTION**

<table>
<thead>
<tr>
<th>Material damage to coupling components can occur as a result of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Anaerobic adhesives (e.g. Loctite) used for screw locking</td>
</tr>
</tbody>
</table>

This type of screw locking medium may not be in contact with rubber parts.
### IMPORTANT

- Screw preparation and tightening torque levels for screws item(s) 4 and 6 in accordance with CENTA data sheet D013-016 (see chapter 11.1).
- Screw preparation and tightening torque levels for screws item(s) B in accordance with CENTA data sheet D013-017 (see chapter 11.2).
- Use suitable lifting devices for assembly.
- The following assembly stages are described for coupling 004H-05600.
- Part illustration and marking may differ slightly from installation drawing and delivery state.
6.2 Mounting the outer part

WARNING

Injuries and material damages can occur as a result of:

- Incorrect screw firmness and tightening torque at screw connections on SAE flywheels
- Screws and tightening torques according to CENTA data sheet D013-017 (see Annex).

IMPORTANT

For design reasons, unmounted outer parts can be slightly out of round. These adjust to the centering fixture of the flywheel during the mounting.
Fig. 6-1 Mounting the outer part

<table>
<thead>
<tr>
<th>Item</th>
<th>Info</th>
<th>Designation</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>Outer part</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Washer</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td></td>
<td>Flywheel</td>
<td>Customer part</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>Screw</td>
<td>No scope of supply</td>
</tr>
</tbody>
</table>

- Push the outer part (3) into the centring of the flywheel (A).
- Screw the outer part (3) to the flywheel (A) using the screws (B) and washers (5).
  Screws (B) are not part of the CENTA scope of supply.
  Use the washers (5) provided.
6.3 Mounting the hub

- Mount the hub as appropriate for the supplied design.
- Supplied design, see installation drawing.
- Overview of possible hub design and chapters of mounting, see following table.

<table>
<thead>
<tr>
<th>Hub design</th>
<th>Mounting the hub with...</th>
<th>Mounting see chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Cylindrical bore and keyway" /></td>
<td>Cylindrical bore and keyway</td>
<td>6.3.1</td>
</tr>
<tr>
<td><img src="image2" alt="CENTALOC-clamping" /></td>
<td>CENTALOC-clamping</td>
<td>6.3.2</td>
</tr>
<tr>
<td><img src="image3" alt="CENTA-conical clamping - hub-taper (7) at the front side" /></td>
<td>CENTA-conical clamping - hub-taper (7) at the front side</td>
<td>6.3.3</td>
</tr>
<tr>
<td><img src="image4" alt="CENTA-conical clamping - hub-taper (7) at the back side" /></td>
<td>CENTA-conical clamping - hub-taper (7) at the back side</td>
<td>6.3.4</td>
</tr>
<tr>
<td><img src="image5" alt="Conical oil interference fit" /></td>
<td>Conical oil interference fit</td>
<td>6.3.5</td>
</tr>
</tbody>
</table>

Table 6-1 Overview of hub design
6.3.1 Mounting the hub with cylindrical bore and keyway

Fig. 6-2 Mounting the hub with cylindrical bore and keyway

<table>
<thead>
<tr>
<th>Item</th>
<th>Info</th>
<th>Designation</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>Hub</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Threaded pin</td>
<td>If ordered</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Shaft</td>
<td>Customer part</td>
</tr>
</tbody>
</table>

**CAUTION**

Material damage can occur as a result of:
- Incorrect heating of the hubs/flange hubs

Heat the hubs/flange hubs steadily in an oil bath, a fan oven, on an electric hot plate, inductive or with a flame (ring burner).

**CAUTION**

Injuries can occur as a result of:
- Hot coupling components

Use suitable protective gloves.
IMPORTANT

For easier mounting of hubs and flange hubs, first heat them to a temperature of 170°-200°C.

- Push the hub (2) onto the shaft (C).

CAUTION

Material damage can occur as a result of:
  - Hot hubs/flange hubs

Before further mounting of hubs/flange hubs, allow them to cool to ambient temperature.

- Prepare the threaded pin (8) for mounting. Degrease the thread.
- Apply a screw locking medium (e.g. Loctite) to the thread of the threaded pin (8).
- Secure the hub (2) with the threaded pin (8; size acc. the installation drawing, tightening torque see table below).

<table>
<thead>
<tr>
<th>Threaded pin</th>
<th>M6</th>
<th>M8</th>
<th>M10</th>
<th>M12</th>
<th>M14</th>
<th>M16</th>
<th>M20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tightening torque [Nm]</td>
<td>7</td>
<td>16</td>
<td>30</td>
<td>50</td>
<td>70</td>
<td>120</td>
<td>200</td>
</tr>
</tbody>
</table>

Table 6-2 Tightening torques for threaded pins
6.3.2 Mounting the CENTALOC clamping hub

![Diagram of CENTALOC clamping hub]

Fig. 6-3 Mounting the CENTALOC clamping hub

<table>
<thead>
<tr>
<th>Item</th>
<th>Info</th>
<th>Designation</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>Hub assembly</td>
<td>Pre-mounted</td>
</tr>
<tr>
<td>2.1</td>
<td></td>
<td>Hub</td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td></td>
<td>Threaded pin</td>
<td></td>
</tr>
<tr>
<td>2.3 /2.4</td>
<td></td>
<td>Parallel pin DIN7</td>
<td>See installation drawing</td>
</tr>
<tr>
<td>2.5</td>
<td></td>
<td>Circlip DIN472</td>
<td>Design of the hub see installation drawing</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Shaft</td>
<td>Customer part</td>
</tr>
<tr>
<td>e</td>
<td></td>
<td>Shaft end</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td></td>
<td>Back side of circlip</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td></td>
<td>Shaft shoulder</td>
<td></td>
</tr>
</tbody>
</table>
Push the hub (2) as appropriate for the supplied design with / without circlip (2.5: see installation drawing) onto the shaft (C).

- **with circlip (2.5):**
  Push the hub assembly (2) onto the shaft (C), until the shaft end (e) touches the back side of the circlip (f).

**IMPORTANT**
Ensure that the hub is correctly positioned on the shaft (against shaft end). If necessary brace hub with washer against the shaft.

- **without circlip (2.5):**
  Push the hub assembly (2) onto the shaft (C) against the shaft shoulder (h).

**IMPORTANT**
Ensure that the hub is correctly positioned on the shaft (against shaft shoulder). If necessary brace hub with washer against the shaft.

- Secure the hub assembly (2) with the parallel pins (2.3 / 2.4) and the threaded pins (2.2, size acc. the installation drawing, tightening torque see chapter 6.3.1, table 6-1).
6.3.3 Mounting the CENTA-conical clamping hub; hub-taper (7) at the front side

Fig. 6-4 Mounting the CENTA-conical clamping hub; hub-taper (7) at the front side

<table>
<thead>
<tr>
<th>Item</th>
<th>Info</th>
<th>Designation</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>Hub</td>
<td>Pre-mounted</td>
</tr>
<tr>
<td>2.5</td>
<td></td>
<td>Circlip</td>
<td>Design of the hub see installation drawing</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Screw</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Hub-taper</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Shaft</td>
<td>Customer part</td>
</tr>
<tr>
<td>e</td>
<td></td>
<td>Shaft end</td>
<td></td>
</tr>
<tr>
<td>f</td>
<td></td>
<td>Back side of circlip</td>
<td></td>
</tr>
<tr>
<td>g</td>
<td></td>
<td>Forcing thread</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td></td>
<td>Shaft shoulder</td>
<td></td>
</tr>
<tr>
<td>j</td>
<td></td>
<td>Drilling</td>
<td></td>
</tr>
<tr>
<td>k</td>
<td></td>
<td>Conical surface</td>
<td></td>
</tr>
<tr>
<td>l</td>
<td></td>
<td>Shaft extension</td>
<td></td>
</tr>
</tbody>
</table>
Assembly and operating instructions
CENTAMAX
004H-05600...30000-A0.. / -B0..

IMPORTANT

The surfaces of the conical clamping connection and the hub-shaft connection must be free of oil, grease and dirt.

- Preparing the hub-taper (7), hub (2) and the shaft (C) for mounting:
  - Clean and degrease the drilling (j) and the conical surface (k) of the hub-taper (7).
  - Clean and degrease the conical surface (k) of the hub (2).
  - Clean and degrease the shaft extension (l) of the shaft (C).

- Insert the hub-taper (7) into the hub (2).
- Screw the hub-taper (7) with screws (6) loosely into the hub (2).
- Push the hub-taper (7) as appropriate for the supplied design with / without circlip (2.5: see installation drawing) onto the shaft (C).
  - with circlip (2.5):
    Push the hub-taper (7) with the hub (2) onto the shaft (C), until the shaft end (e) touches the back side of the circlip (f).

IMPORTANT

Ensure that the hub-conus is correctly positioned on the shaft (against shaft end). If necessary brace hub-conus with washer against the shaft.

- without circlip (2.5):
  Push the hub-taper (7) with the hub (2) onto the shaft (C) against the shaft shoulder (h).

IMPORTANT

Ensure that the hub-conus is correctly positioned on the shaft (against shaft shoulder). If necessary brace hub-conus with washer against the shaft.

- Evenly tighten screws (6) in three steps crosswise, until the tightening torque (see installation drawing) has been achieved for all screws.
  Step 1: 40 % of the specified tightening torque.
  Step 2: 60 % of the specified tightening torque.
  Step 3: 100 % of the specified tightening torque.
- Check the tightening torques of the screws (6) one after the other.
6.3.4 Mounting the CENTA-conical clamping hub; hub-taper (7) at the back side

![Diagram of mounting the CENTA-conical clamping hub]

**Fig. 6-5** Mounting the CENTA-conical clamping hub; hub-taper (7) at the back side

<table>
<thead>
<tr>
<th>Item</th>
<th>Info</th>
<th>Designation</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>Hub</td>
<td>Pre-mounted</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Screw</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Hub-taper</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Shaft</td>
<td>Customer part</td>
</tr>
<tr>
<td>g</td>
<td></td>
<td>Forcing thread</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td></td>
<td>Shaft shoulder</td>
<td></td>
</tr>
<tr>
<td>j</td>
<td></td>
<td>Drilling</td>
<td></td>
</tr>
<tr>
<td>k</td>
<td></td>
<td>Conical surface</td>
<td></td>
</tr>
<tr>
<td>l</td>
<td></td>
<td>Shaft extension</td>
<td></td>
</tr>
</tbody>
</table>
IMPORTANT
The surfaces of the conical clamping connection and the hub-shaft connection must be free of oil, grease and dirt.

Preparing the hub-taper (7), hub (2) and the shaft (C) for mounting:
- Clean and degrease the drilling (j) and the conical surface (k) of the hub-taper (7).
- Clean and degrease the conical surface (k) of the hub (2).
- Clean and degrease the shaft extension (l) of the shaft (C).
- Insert the hub-taper (7) into the hub (2).
- Screw the hub (2) with screws (6) loosely into the hub-taper (7).
- Push the hub-taper (7) with the hub (2) onto the shaft (C) against the shaft shoulder (h).

IMPORTANT
Ensure that the hub-conus is correctly positioned on the shaft (against shaft shoulder). If necessary brace hub-conus with washer against the shaft.

- Evenly tighten screws (6) in three steps crosswise, until the tightening torque (see installation drawing) has been achieved for all screws.
  Step 1: 40 % of the specified tightening torque.
  Step 2: 60 % of the specified tightening torque.
  Step 3: 100 % of the specified tightening torque.
- Check the tightening torques of the screws (6) one after the other.
6.3.5 Mounting the hub with conical oil interference fit

**WARNING**

Injury and material damage can occur as a result of:

- Non-compliance with the operating instructions for the hydraulic pumps

Before carrying out work with the hydraulic pumps, do not fail to read their operating instructions. Only ever work with hydraulic pumps as described in their operating instructions.

**WARNING**

Injury and material damage can occur as a result of:

- Hydraulic fluid spraying out

Use protective goggles.

---

*Fig. 6-6 Mounting the hub with conical oil interference fit*
Assembly and operating instructions

CENTAMAX

004H-05600...30000-A0.. / -B0..

---

<table>
<thead>
<tr>
<th>Item</th>
<th>Info</th>
<th>Designation</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td>Hub</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>Screw plug</td>
<td>G(\frac{1}{4}) or G(\frac{3}{4}) see installation drawing</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>Shaft</td>
<td>Customer part</td>
</tr>
<tr>
<td>a</td>
<td></td>
<td>Thread</td>
<td>G(\frac{1}{4}) or G(\frac{3}{4}) see installation drawing</td>
</tr>
</tbody>
</table>

---

**IMPORTANT**

We recommend the following mounting fluids:

- For mounting:
  - Oil with a viscosity 300 mm\(^2\)/s at 20°C, e.g. SKF LHMF300
- For dismantling:
  - Oil with a viscosity 900 mm\(^2\)/s at 20°C, e.g. SKF LHDF900

- Lightly oil the cone of the shaft (C).
- Push the hub (2) onto the shaft (C).
- Remove the screw plug (10) from the hub (2).
- Connect the pump for expanding the hub to the hub (2) at thread G\(\frac{1}{4}\) or G\(\frac{3}{4}\) (a).
- Screw the pump for pushing on the hub to the shaft.
- Build up the oil pressure to push on the hub.

---

**WARNING**

**Material damage can occur as a result of:**

- Insufficient expanding pressure in the hub

If the expanding pressure is too low, the necessary pushing pressure is too high.

- Build up the oil pressure for expanding the hub slowly.
- Build up the oil pressure alternately until the lift path (p up) of the hub (2) is reached (for p up and reference faces, see installation drawing).
- Decrease the oil pressure for expanding the hub.
- Remove the pump for expanding the hub from the hub (2).
- Maintain the oil pressure for pushing on the hub for one hour.
- Decrease the oil pressure for pushing on the hub.
- Remove the pump for pushing on the hub from the shaft.
- Turn the hub (2), allow the oil to run out of the thread G¼ or G¾ (a) and dispose of it correctly.
- Screw the screw plug (10) into the hub (2).

**IMPORTANT**

Do not place a load on the hub for 24 hours.
6.4 Mounting the rubber element

**IMPORTANT**

Ensure during installation that the rubber element is in the right position. The right position is depending on the design and can be found in the installation drawing. Otherwise, correct assembling of the coupling is not guaranteed.

Fig. 6-7 Mounting the rubber element
Assembly and operating instructions

CENTAMAX

004H-05600...30000-A0.. / -B0..

Mount the rubber element according to the supplied design (see installation drawing):

- Push the rubber element (1) onto the centring of the hub (2).
- Screw the rubber element (1) with screws (4) to the hub (2).

<table>
<thead>
<tr>
<th>Item</th>
<th>Info</th>
<th>Designation</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rubber element</td>
<td>See installation drawing</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Hub</td>
<td>See installation drawing</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Screw ISO4762-10.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6.5 Connecting the driving and driven units

**IMPORTANT**
The toothing on the rubber element must be free of oil and grease. If necessary, use soap or talcum powder.

- Turn the rubber element towards the flange until it is possible to push the toothing of the rubber element into the toothing of the flange.
- Push the driving unit with the flange and driven unit with the rubber element together.
- Screw the driving and driven units together according to the manufacturer’s specifications.
###  6.6 After completed mounting

<table>
<thead>
<tr>
<th><strong>WARNING</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Injury and material damage can occur as a result of:</strong></td>
</tr>
<tr>
<td>- Loose screw connections</td>
</tr>
<tr>
<td>Before commissioning, the tightening torque levels of all screws must be checked and corrected if necessary.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CAUTION</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor damage can occur as a result of:</strong></td>
</tr>
<tr>
<td>- High axial forces at the axial bearings of the crank shaft</td>
</tr>
<tr>
<td>Prior to commissioning the system, ensure that the crank shaft has axial play.</td>
</tr>
</tbody>
</table>

Before commencing long-term operation, the plant must successfully complete a test run.
7 Operation

WARNING

Injury and material damage can occur as a result of:
- Worn coupling components

If the running noises change and/or vibrations occur turn the plant off immediately.

Determine the fault and its root cause, and remedy. The troubleshooting process is simplified by the table in the next chapter. On principle in case of a fault, an analysis of the entire plant should be performed.

7.1 Operating faults, root causes and remedy

<table>
<thead>
<tr>
<th>Faults</th>
<th>Possible root causes</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to all kinds of remedies</td>
<td></td>
<td>• Switch off the plant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Disconnect the driving and the driven units</td>
</tr>
<tr>
<td>Running noises or vibrations in the unit</td>
<td>Loose screws</td>
<td>• Check screw torque levels and correct</td>
</tr>
<tr>
<td>Rubber element damaged</td>
<td>Inadmissibly high torque</td>
<td>• Replace defective parts</td>
</tr>
<tr>
<td></td>
<td>Damage due to rotary oscillation:</td>
<td>• Eliminate the cause for inadmissibly high torque</td>
</tr>
<tr>
<td></td>
<td>• Motor idle running speed too low</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cylinder failure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inadmissibly high ambient temperature:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Embrittlement of the rubber element NR,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>surface cracks on both sides under 45°</td>
<td></td>
</tr>
<tr>
<td>After all remedies</td>
<td></td>
<td>• Connect the driving and the driven units</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Trial run</td>
</tr>
</tbody>
</table>

Table 7-1 Troubleshooting table

In case of uncertainty or if you have questions, please contact our head office (address see chapter 1).
8 Care and maintenance

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injuries can occur as a result of:</td>
</tr>
<tr>
<td>• Contact with rotating parts</td>
</tr>
<tr>
<td>Before starting work at the coupling, switch off the plant and secure against unintentional start-up.</td>
</tr>
</tbody>
</table>

➢ The coupling requires low maintenance, and has to be maintained according to the existing installation situation.

➢ At flanged drives:
  We recommend a visual inspection if the driving and driven units have to be separated.

➢ At non flanged drives:
  It is possible to perform a visual inspection during the regular scheduled maintenance intervals for the complete unit. Every 12 month a visual inspection is strictly required.

8.1 Work to be performed

8.1.1 Cleaning the coupling

➢ Remove any loose dirt from the coupling.

8.1.2 Visual inspection of the coupling

➢ Inspect the coupling for cracks, chips or missing parts.

➢ Replace faulty and missing parts.

8.1.3 Visual inspection of the rubber elements

<table>
<thead>
<tr>
<th>IMPORTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchange the rubber elements:</td>
</tr>
<tr>
<td>• In the event of damage, but at the standard maintenance interval of the engine at the latest.</td>
</tr>
</tbody>
</table>
Fig. 8-1 Visual inspection at the rubber elements

Pay attention to cracks / adherence of rubber and metal parts in the zones marked by arrows (a). Should the cracks be 3 mm or deeper, the rubber element must be exchanged (d). Wear of 3-4 mm to the round teeth on the load side is admissible (c). At a standstill, there is a distance of 1-2 mm between the adapter and the rubber element. At operational speed, the centrifugal force presses the rubber toothing against the adapter (b).

8.1.4 Inspection of the screw connections
➢ Check the tightening torque levels of all screws and if necessary, correct.

8.2 Replacing defective parts
➢ Remove the coupling as described in chapter 9.
➢ Replace wearing parts.
➢ Mount the coupling as described in chapter 6.
9 Dismantling

9.1 General dismantling instructions

Any work method which impairs the safety of the coupling is prohibited. The user undertakes to notify the manufacturer immediately of any changes occurring at the coupling which could impair safety (address see chapter 1).

**IMPORTANT**

The coupling is dismantled in reverse order to the assembly process. Please refer to the illustrations in chapter 6.

**WARNING**

Injuries can occur as a result of:
- Contact with rotating parts
Before starting work at the coupling, switch off the plant and secure against unintentional start-up.

**WARNING**

Injury and material damage can occur as a result of:
- Dismantling of the coupling in the wrong sequence
Only ever dismantle the coupling in the described sequence.

**WARNING**

Injury and material damage can occur as a result of:
- Falling coupling components
Secure coupling components against falling to the floor.

**CAUTION**

Material damage to coupling components can occur as a result of:
- Contact with sharp-edged objects
Protect coupling components for transportation. Only hoist coupling components with nylon belts or ropes. Always cushion parts when supporting them from below.

**IMPORTANT**

Use suitable lifting devices for dismantling.
9.2 Disconnecting the driving and driven units

See Fig. 6-8 or 6-9:

- Loosen and remove the screws of the connection of the driving and driven units.
- Pull driving and driven units apart.

9.3 Dismantling the rubber element

See Fig. 6-7:

- Loosen and remove the screws (4) of the connection rubber element (1) and hub (2).
- Remove the rubber element (1) off the hub (2).

9.4 Dismantling the hub (if necessary)

- Dismantle the hub as appropriate for the supplied design (see installation drawing).
  - For the hub with cylindrical bore and keyway, see chapter 9.4.1.
  - For the CENTALOC clamping hub, see chapter 9.4.2.
  - For the CENTA-conical clamping hub, see chapter 9.4.3.
  - For the hub with conical oil interference fit, see chapter 9.4.4.

9.4.1 Dismantling the hub with cylindrical bore and keyway

See Fig. 6-2:

- Loosen the threaded pins (8; if existing) and remove off the hub (2).
- Remove the hub (2) from the shaft (C).

9.4.2 Dismantling the CENTALOC clamping hub

See Fig. 6-3:

- Loosen the threaded pins (2.2).
- Remove the hub assembly (2) from the shaft (C).
9.4.3 Dismantling the CENTA-conical clamping hub  
See Fig. 6-5 or 6-4:
- Loosen the screws (6) and screw them out equally about 10mm.
- For each forcing thread (g) screw out a screw (6) and screw them loose into the forcing thread (g).
- Force away the hub (2) by screws (6) of the forcing threads.
- Remove the hub (2) with hub-taper (7) off the shaft (C).

9.4.4 Dismantling the hub with conical oil interference fit  
See Fig. 6-6:

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Injury and material damage can occur as a result of:</strong></td>
</tr>
<tr>
<td>- Non-compliance with the operating instructions for the hydraulic pumps</td>
</tr>
<tr>
<td>Before carrying out work with the hydraulic pumps, do not fail to read their operating instructions. Only ever work with hydraulic pumps as described in their operating instructions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Injury and material damage can occur as a result of:</strong></td>
</tr>
<tr>
<td>- Hydraulic fluid spraying out</td>
</tr>
<tr>
<td>Use protective goggles.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Injuries and material damages can occur by:</strong></td>
</tr>
<tr>
<td>- Suddenly loosening hubs</td>
</tr>
<tr>
<td>Secure the hub with a hydraulic tool against sudden axial loosening.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMPORTANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>We recommend the following mounting fluids:</td>
</tr>
<tr>
<td>- For mounting: Oil with a viscosity 300 mm²/s at 20°C, e.g. SKF LHMF300</td>
</tr>
<tr>
<td>- For dismantling: Oil with a viscosity 900 mm²/s at 20°C, e.g. SKF LHDF900</td>
</tr>
</tbody>
</table>
- Remove the screw plug (10) from the hub (2).
- Connect the pump \( (p_{\text{max}} = 3000 \text{ bar}) \) to the thread G\(\frac{1}{4}\) or G\(\frac{3}{4}\) (c) of the hub (2) to expand the hub.
- Screw the pump to the shaft (C), in order to hold the hub.
- Repeat the following mounting section, until the hub is completely released from the shaft:
  - Build up oil pressure in order to hold the hub.
  - Build up oil pressure to expand the hub \( (p_{\text{max}} = 2000 \text{ bar}) \).
  - Slowly reduce the oil pressure for holding the hub.
  - Reduce the oil pressure for expanding the hub.
- Remove the pump for holding the hub from the shaft (C).
- Remove the pump for expanding the hub from the hub (2).
- Turn the hub (2), drain oil out of the thread G\(\frac{1}{4}\) or G\(\frac{3}{4}\) (c) and dispose correctly.
- Screw the screw plug (10) into the hub (2).
- Remove the hub (2) from the shaft (C).

### 9.5 Dismantling the outer part (if necessary)

See Fig. 6-1:
- Loosen the screws (B) of the connection outer part (3) and flywheel (A) and remove along with the washers (5).
- Pull the outer part (3) out of the centring of the flywheel (A) and remove it.

### 9.6 Reassembling the coupling

- Reassemble the coupling as described in chapter 6.
10 Wearing and spare parts

<table>
<thead>
<tr>
<th>WARNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury and material damage can occur as a result of:</td>
</tr>
<tr>
<td>- Mounting and/or utilization of non-original CENTA parts</td>
</tr>
<tr>
<td>Never use parts from other manufacturers.</td>
</tr>
</tbody>
</table>

A stock of the most important wearing and spare parts is the most important condition to ensure that the coupling is functional and ready for operation at all times.

We only provide a warranty for CENTA original parts.

Wearing part of this coupling:
- Rubber element

When ordering a spare, specify:
- Order no.
- Coupling order no.
- Drawing no.
11 Annex

11.1 CENTA data sheet D013-016 (unlubricated screw connections)

Validity:
For all non-dynamically stressed screw connections with not lubricated shank bolts in accordance with ISO 4014, ISO 4017 and ISO 4762 (DIN 912) with metric standard thread in accordance with DIN ISO 262, unless other specifications are given on CENTA documents.

Preparation of parts that are to be screwed together:
The joining areas must be free of dirt, preservatives and lubricants.

Preparation of screws that ARE NOT secured with liquid screw locking medium:
Use screws as delivered.

Preparation of screws that ARE secured with liquid screw locking medium:
Remove all grease from the thread.

Screw tightening method:
Screw in (by hand with torque wrench).

<table>
<thead>
<tr>
<th>d</th>
<th>Strength class</th>
<th>Tightening torques [Nm] ±5%</th>
<th>[in lbs] ±5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>M6</td>
<td>8.8</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>10.9</td>
<td>14</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>12.9</td>
<td>17</td>
<td>150</td>
</tr>
<tr>
<td>M8</td>
<td>8.8</td>
<td>23</td>
<td>205</td>
</tr>
<tr>
<td></td>
<td>10.9</td>
<td>34</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>12.9</td>
<td>40</td>
<td>350</td>
</tr>
<tr>
<td>M10</td>
<td>8.8</td>
<td>46</td>
<td>410</td>
</tr>
<tr>
<td></td>
<td>10.9</td>
<td>68</td>
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### 11.2 CENTA data sheet D013-017 (SAE flywheel screw connection)

**Validity:**
For all dynamically non-stressed screw connections on SAE flywheels with headless screws according to ISO 4014, ISO 4017 and ISO 4762 (DIN 912) with standard metric thread according to DIN ISO 262 and further threads indicated in the following table, if no deviating data are specified in CENTA documents.

**Preparation of components to be screwed**
Joining areas must be free of dirt, preservative and lubricant agents.

**Preparation of oiled screws:**
Additionally lubricate screws under the screw head and on the thread with motor oil.
Use tightening torque for **oiled** screws.

**Preparation of non-oiled screws:**
Use screws as delivered.
Use tightening torque for **non-oiled** screws.

**Screw tightening procedure:**
rotating (by hand with torque wrench).

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<th>Flywheel SAE J620c</th>
<th>Thread size</th>
<th>Strength class</th>
<th>Tightening torques for</th>
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<td>oiled screws</td>
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<td>[in lbs] ±5%</td>
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</table>

CENTA Antriebe Kirschey GmbH

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11.3 CENTA data sheet D004-901  
Declaration of incorporation according to the EC Machinery Directive 2006/42/EC, Appendix II B

Manufacturer: CENTA Antriebe Kirschey GmbH  
Bergische Straße 7  
42781 Haan / GERMANY

Contact: Phone +49-2129-912-0  
Fax +49-2129-2790  
centa@centa.de  
www.centa.info

We herewith declare that the incomplete machine
Product: Highly elastic coupling CENTAMAX-HTC  
Model / series code: CM-HTC / 004H  
Installation size: 5600...30000  
Design: all  
Serial number: according to shipping documents, if applicable

- provided this is possible as far as the scope of supply is concerned - complies with the following basic requirements of the Machinery Directive 2006/42/EC Appendix I, subchapters 1.1.2, 1.1.3, 1.1.5, 1.3.2, 1.3.3, 1.3.4 and 1.5.4.

In addition, we declare that the special technical documents for this incomplete machine were compiled according to Appendix VII Part B and undertake to forward these to the market monitoring authorities by request via our "Documentation Department".

Commissioning of the incomplete machine is interdicted until the incomplete machine has been incorporated in a machine and the latter complies with the provisions of the EC Machinery Directive and the EC Declaration of Conformity according to Appendix II A is on hand.

The declaration is invalidated by every modification to the delivered parts.

Authorised representative for the compilation of the relevant technical documents:  
by order of Gunnar Anderseck  
(Authorised Person Documentation)

Declaration of incorporation was issued:  
by proxy Dipl.-Ing. Jochen Exner  
(Design Management)

Haan, 08.12.2009