

Operating Instructions

# **WHEEL SET KG 125 SERIES**

**RAD/RND  
400**

**WITH GROOVED BALL BEARINGS**



# Wheel set KG 125

## RAD / RND 400

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## Description

KARL GEORG maintenance-free wheel sets take over rail-born transport tasks in crane building, in conveyor technique and in machine building.

The assembly variant RAD / RND is suitable for direct installation in welded and mechanically machined steel constructions.

The drive shafts are available with tooth profile according to DIN 5480 or with feather keyway according to DIN 6885, suitable for hollow shaft gearboxes of your choice.

The middle track width can be corrected by  $\pm 12$  mm by replaceable compensating discs between roller bearing and circlip.

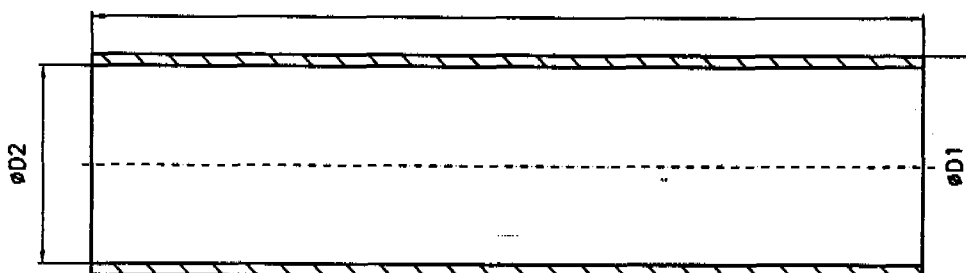
Delivery of the wheel sets RAD / RND is effected in component parts.

### Attention

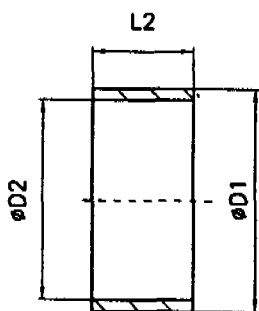
An assembly set is required for assembly and disassembly. Delivery of the wheel set RA / RN 400 / 500 does not include these instruments (see instructions page 6).

The assembly set consists of:

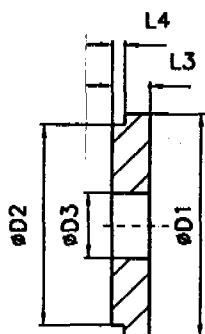
- 1 Assembly tube long for RA (40)
- 1 Assembly tube short for RN (40)
- 1 Hexagon head screw DIN 933 (41) <sup>1)</sup>
- 1 Hexagon head nut DIN 934 (42) <sup>1)</sup>
- 1 Disc (43) L1



Assembly tube long for RAD



Assembly tube for RND

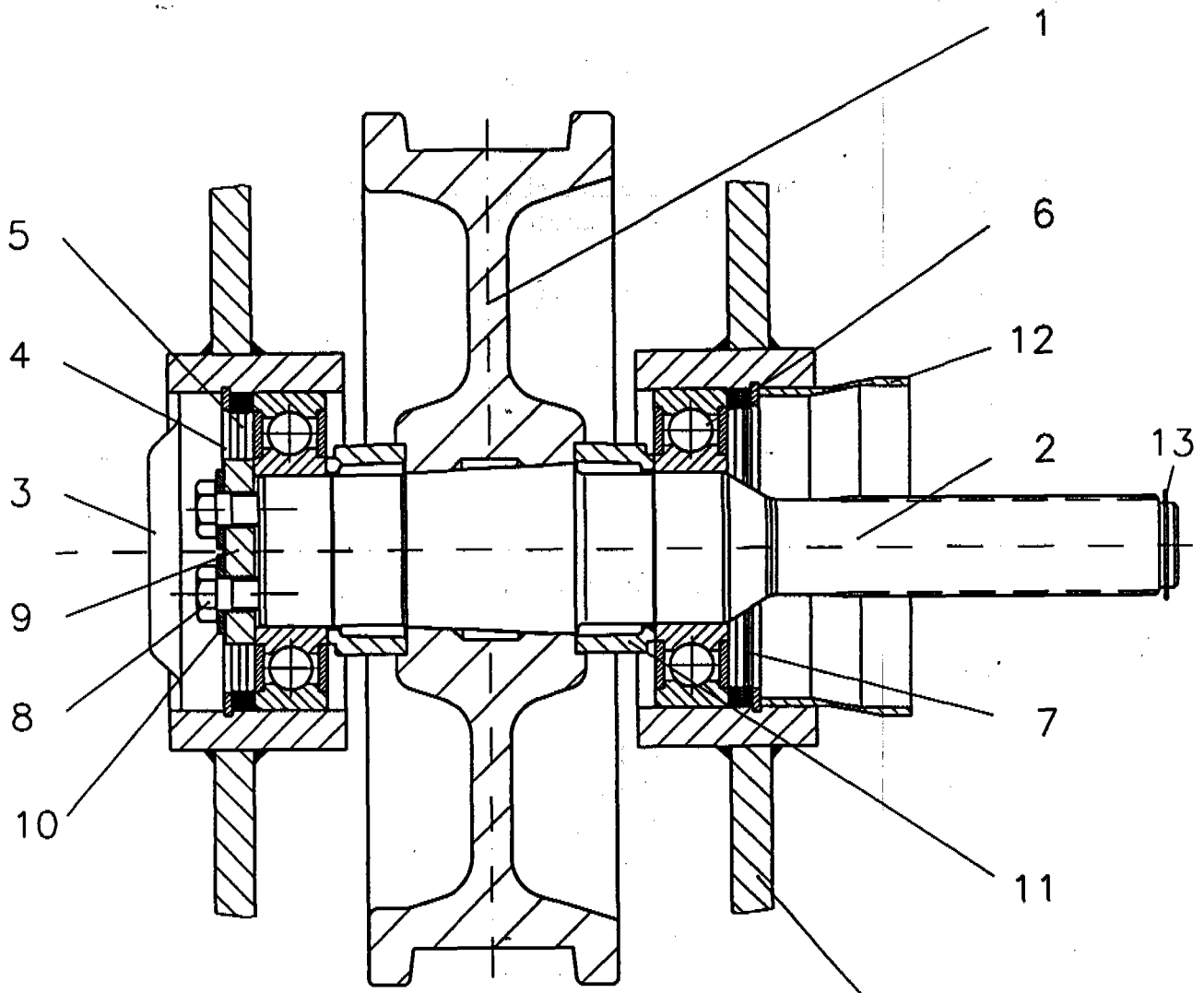


Disc

	L1	L2	L3	L4	øD1	øD2	øD3
RAD/RND 400	330	40	15	5	88,9	79,9	26

<sup>1)</sup> for further information see parts lists

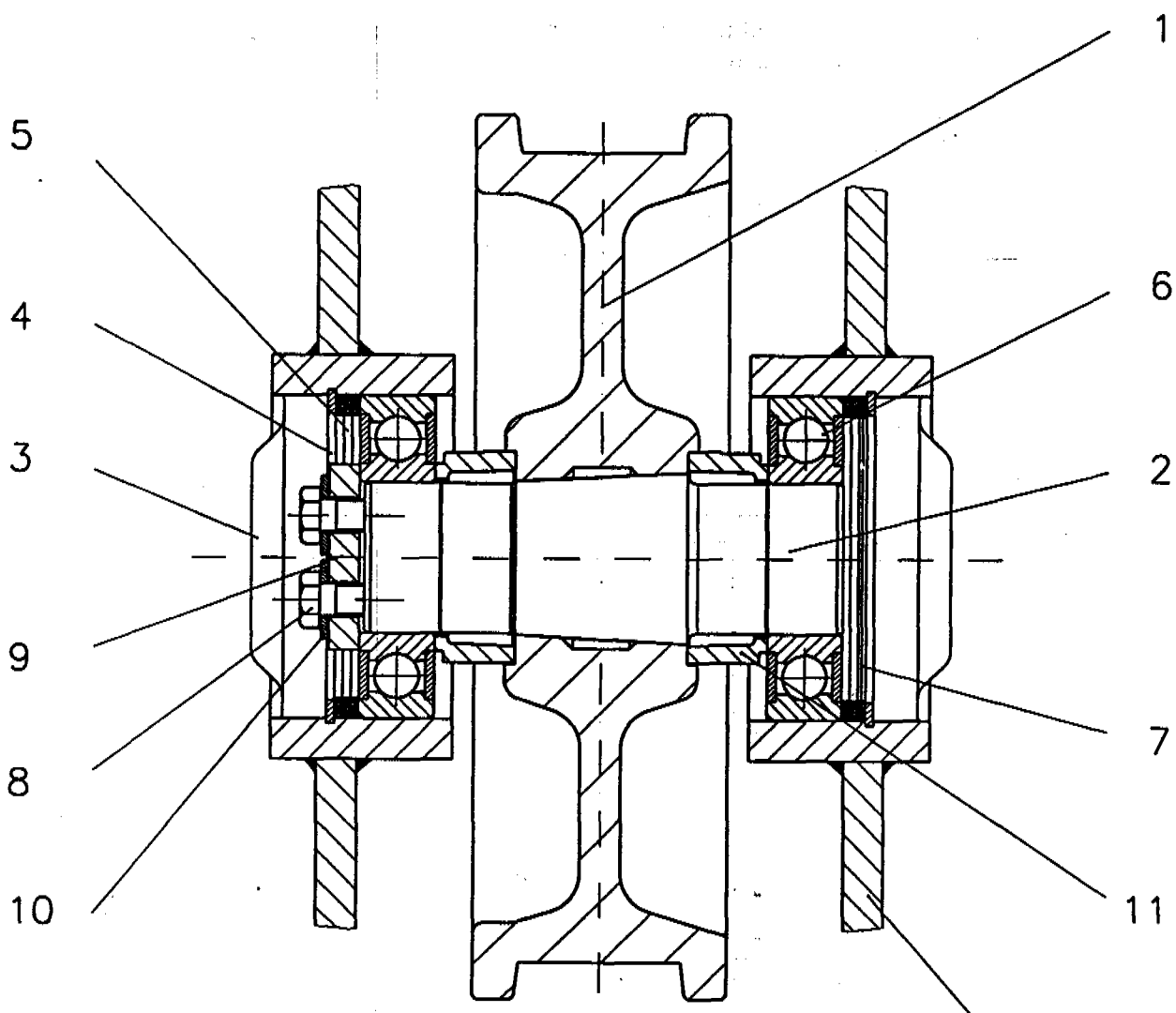
# Technical construction RAD 400



Connection construction

- |                                 |                      |
|---------------------------------|----------------------|
| 1 Crane wheel $\varnothing 400$ | 8 Hexagon head screw |
| 2 Drive shaft                   | 9 Tightening disc    |
| 3 Cover, without borehole       | 10 Disc spring       |
| 4 Circlip                       | 11 Spacer            |
| 5 Compensating disc, 4 mm       | 12 Protective bellow |
| 6 Grooved ball bearing          | 13 Circlip           |
| 7 Compensating disc, 1 mm       |                      |

# Technical construction RND 400



Connection construction

- |                                 |                           |
|---------------------------------|---------------------------|
| 1 Crane wheel $\varnothing 400$ | 7 Compensating disc, 1 mm |
| 2 Idler shaft                   | 8 Hexagon head screw      |
| 3 Cover, without borehole       | 9 Tightening disc         |
| 4 Circlip                       | 10 Disc spring            |
| 5 Compensating disc, 4 mm       | 11 Spacer                 |
| 6 Grooved ball bearing          |                           |

## Assembly and disassembly

### General

An assembly set (see page 3) is required for assembly respectively disassembly of the wheel sets RAD / RND 400. Delivery does not include these instruments.

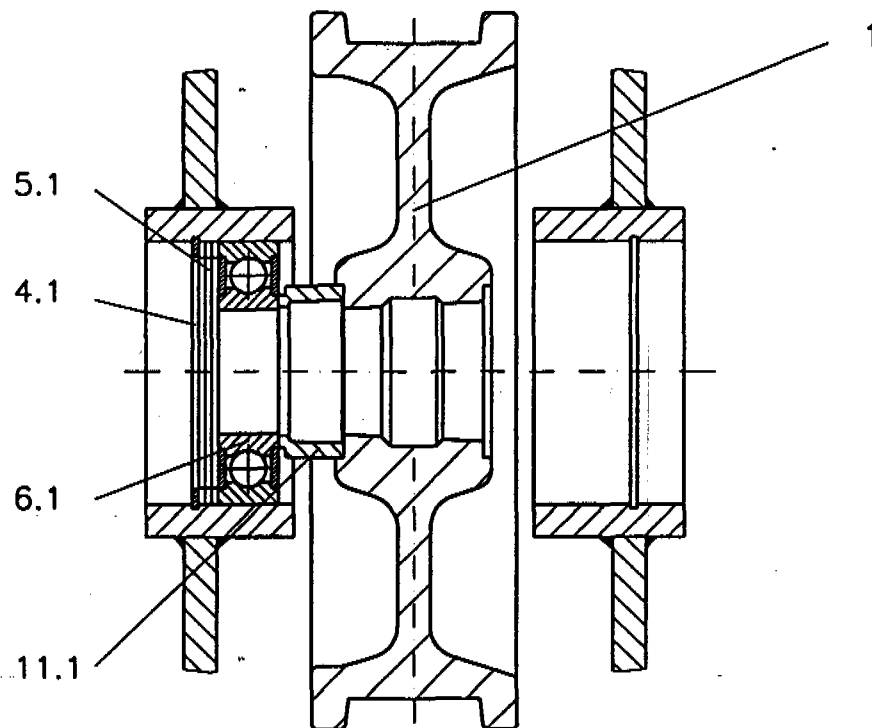
### Attention

Some component parts have a high deadweight!

Hoists are to be used for assembly and the relevant safety regulations (UVV) are to be observed.

### Assembly instructions

The following steps are to be made for assembly:

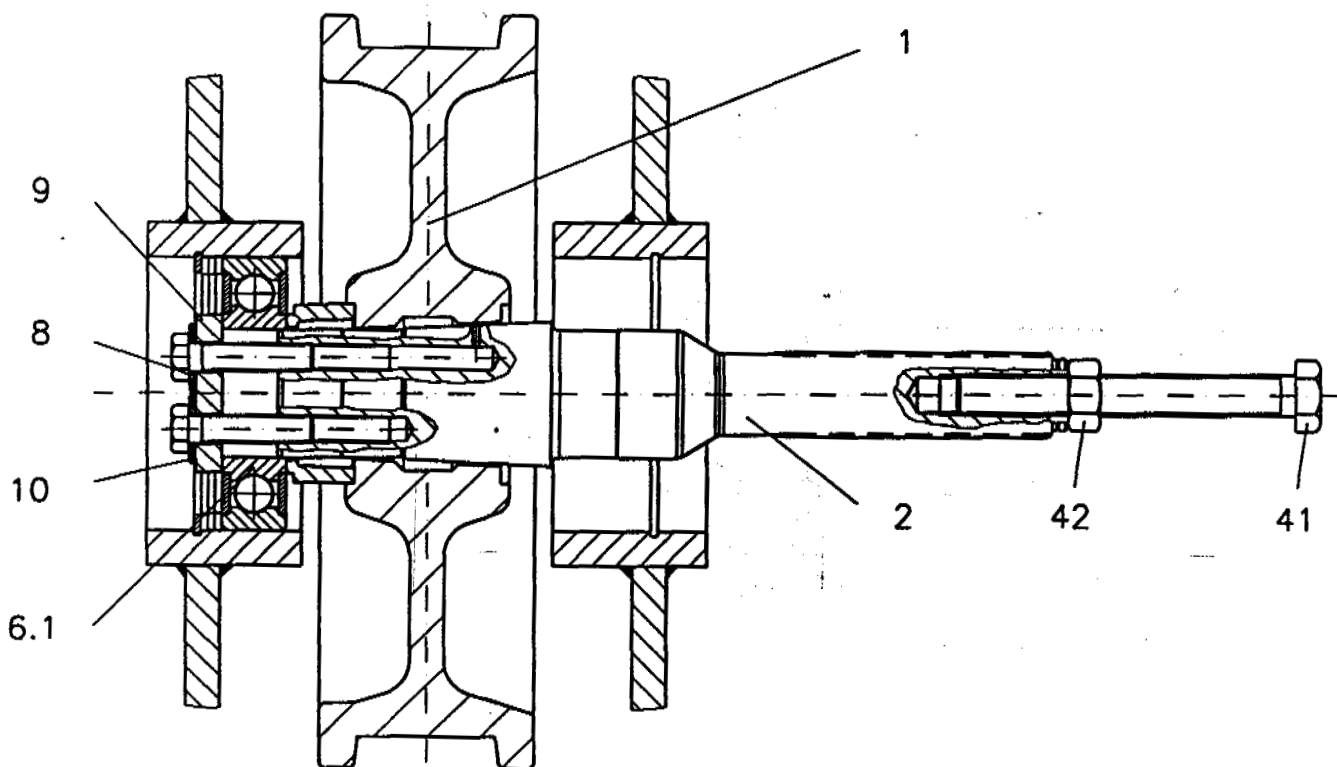


1. Insert the grooved ball bearing (6.1) and the compensating discs (5.1) (see table 1) into the carriage girder and assemble the circlip (4.1).

	5.1	5.2	7
RAD / RND 400	3 x 4 mm thick	2 x 4 mm thick	4 x 1 mm thick

Table 1: Number and thickness of the compensating discs

2. Roll the crane wheel (1) with the spacer (11.1) into the carriage.

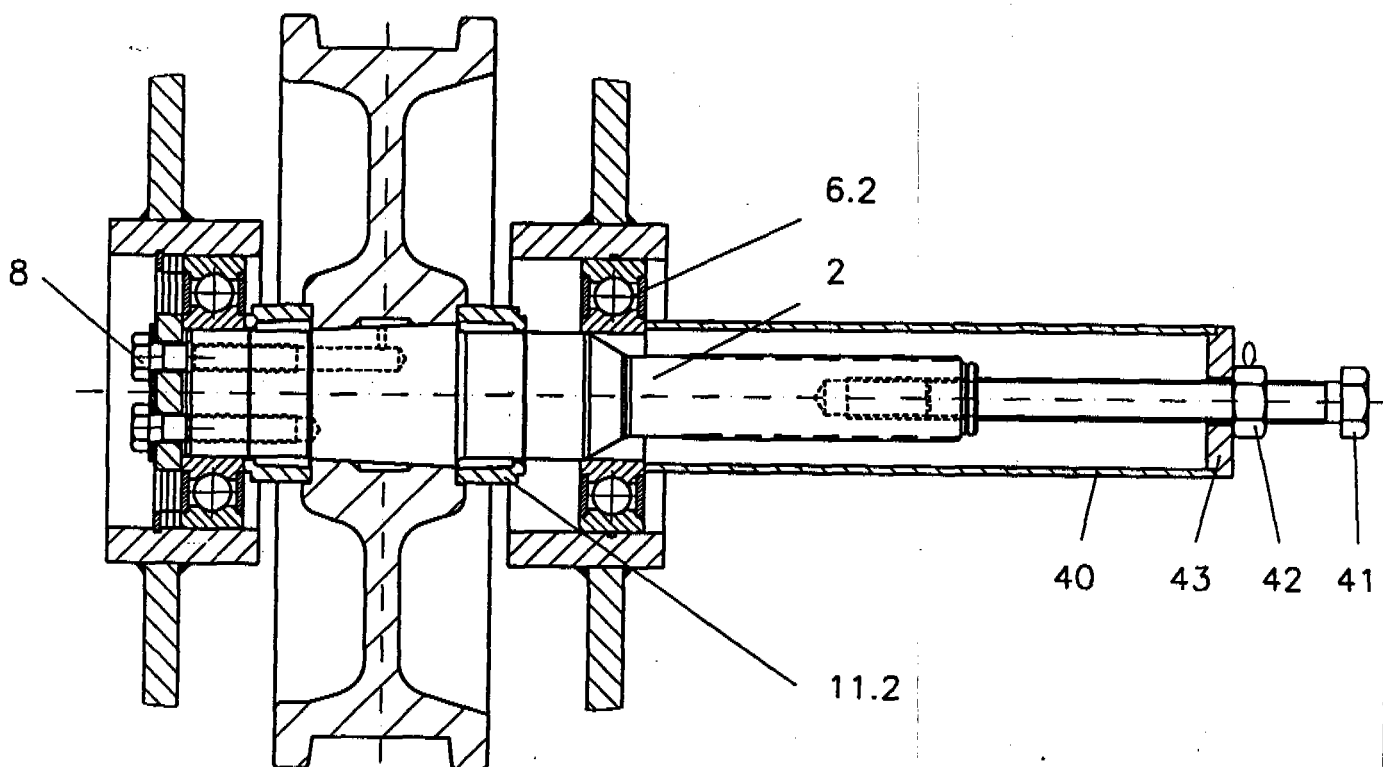


3. Push the crane wheel shaft (2) into the crane wheel (1).

#### Attention

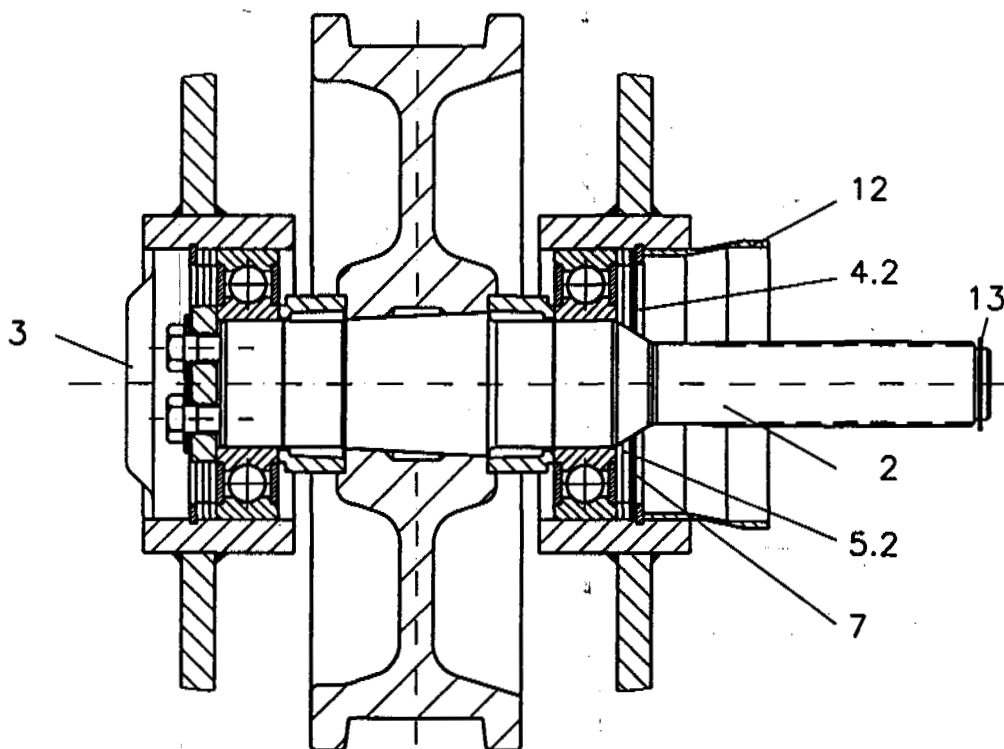
The crane wheel cone and the crane wheel shaft are specially coated. Attention is to be paid that the coating is not damaged when assembling the crane wheel shaft. In case of damage the coating is to be renewed. (Coating with Molykote sliding varnish 321 R. The instructions of the manufacturer are to be observed!). Crane wheel cone and shaft cone should not get into contact with oil or grease.

4. Insert the tightening disc (9) and the disc spring (10) and tighten the shaft (2) by the hexagon head screw (8) into the bearing (6.1). For counteracting, screw the hexagon head screw (41) on the opposite side into the shaft (2) and lock it with the hexagon head nut (42).



5. If the crane wheel is tightly at the stop of the shaft, the hexagon head screws (8) are to be tightened one after another by a torque wrench to 290 Nm. This process is to be repeated until the required torque of 290 Nm is achieved at all screws (8).
6. Insert spacer (11.2) and grooved ball bearing (6.2). The grooved ball bearing (6.2) is to be pressed on the crane wheel shaft (2) to the stop at the spacer (11.2) by assembly tube (40), disc (43), hexagon head screw (41) and hexagon head nut (42).
7. Remove the assembly tube (40), disc (43) and hexagon head screw (41) with hexagon head nut (42).





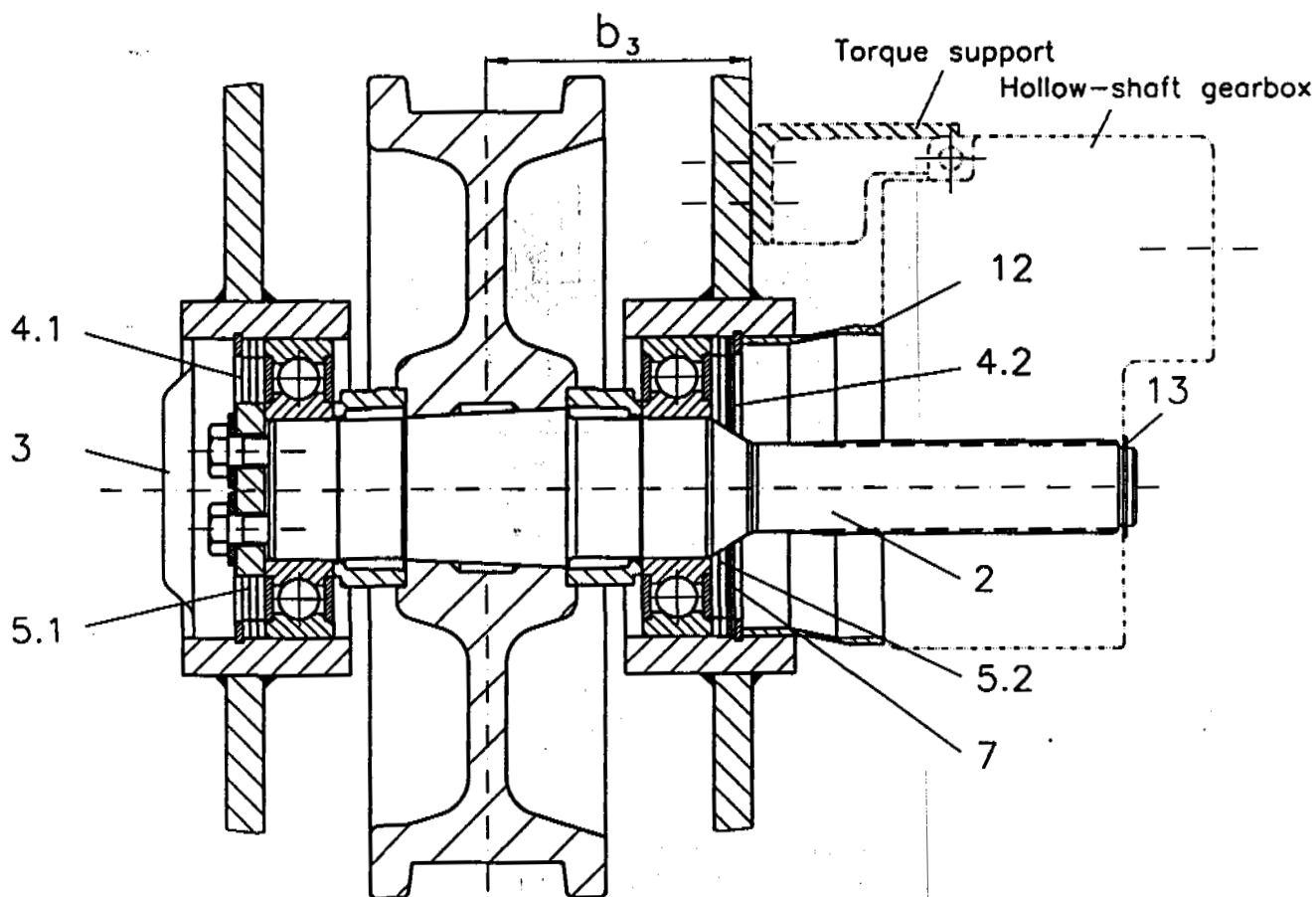
8. Insert the remaining compensating discs (5.2, 7) (see table 1) until the hollow-space between grooved ball bearing and circlip groove is filled up. Assemble the circlip (4.2). Assemble the cover (3) by light hammer blows on the centre edge. Insert the protective bellow (12).
16. Push the drive on the drive shaft (2), assemble the circlip (13) and fasten the drive at the torque support according to manufacturer's instructions.

**Attention:**

Pay attention to greatest possible cleanliness when assembling. The cone borehole of the crane wheel and the taper of the shaft have to be free from contamination. The roller bearings as well are to be preserved from any dirt and dust.

Proceed analogous for assembly of the wheel set RN, but use a shorter assembly tube.

## Correction of the middle track width



1. Detach the hollow-shaft gearbox at the torque support, remove the circlip (13) and draw the drive off the drive shaft (2).
2. Remove the cover (3) and the protective bellow (12).
3. Jack up the crane to relieve the crane wheels.
4. Remove the circlips (4.1, 4.2) and take out the required number of compensating discs (5.1, 5.2, 7).

Move the entire driving unit by the required dimension to the right or to the left.

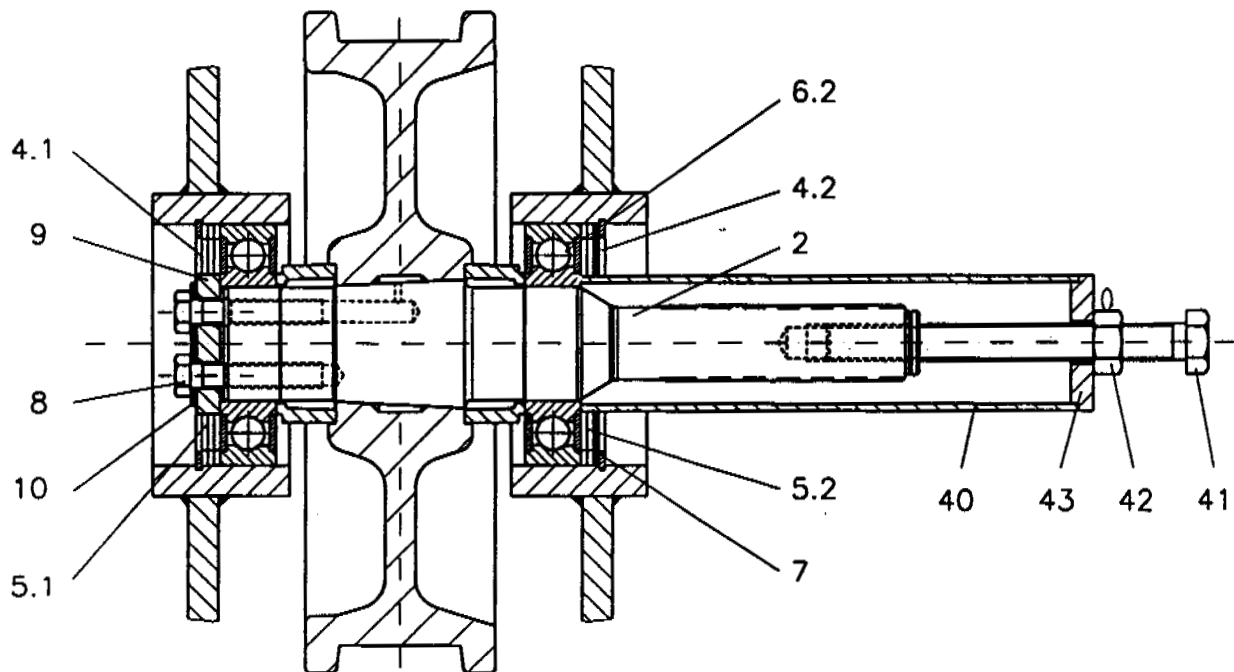
Maximum traversing possibility of the dimension  $b_3$ :

RA / RN 400	$140 \pm 12$ mm
-------------	-----------------

5. Fill up the hollow-space between sealing rings and circlip grooves with compensating discs (5.1, 5.2, 7) according to the traversing way and assemble the circlips (4.1, 4.2).
6. Insert the cover (3) and the protective bellow (12).
7. Push the drive on the drive shaft (2), assemble the circlip (13) and screw the hollow shaft gearbox at the torque support.

## Disassembly instructions

1. Detach the hollow-shaft gearbox at the torque support, remove the circlip (13) and draw the drive off the drive shaft (2).
2. Remove the cover (3) and the protective bellow (12).
3. Jack up the crane to relieve the crane wheels.



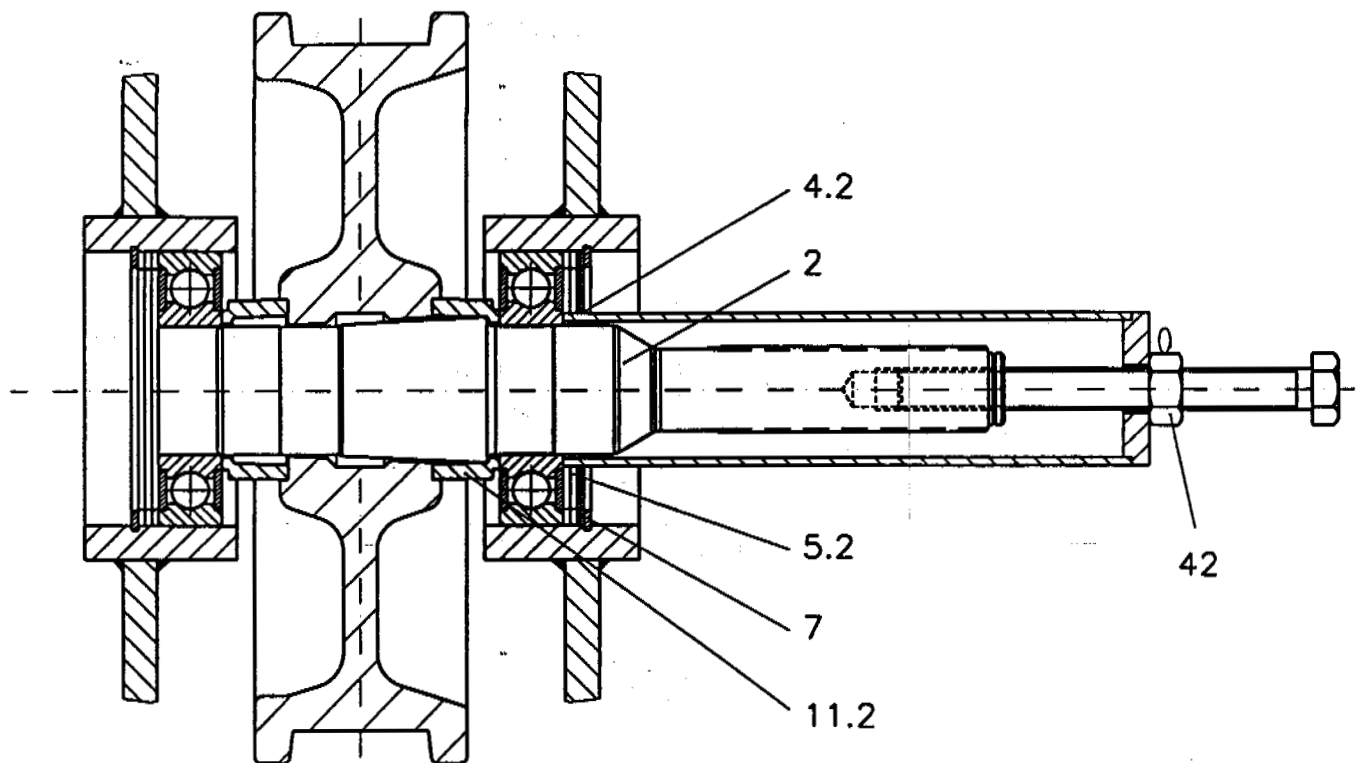
4. Detach the hexagon head screw (8) and remove it with disc spring (10) and tightening disc (9).
5. Fasten the assembly tube (40) and the disc (43) by the hexagon head screw (41) and the hexagon head nut (42) against the grooved ball bearing (6.2).

The stressing in the connection can be detached by hammer blows on the running surface of the crane wheel.

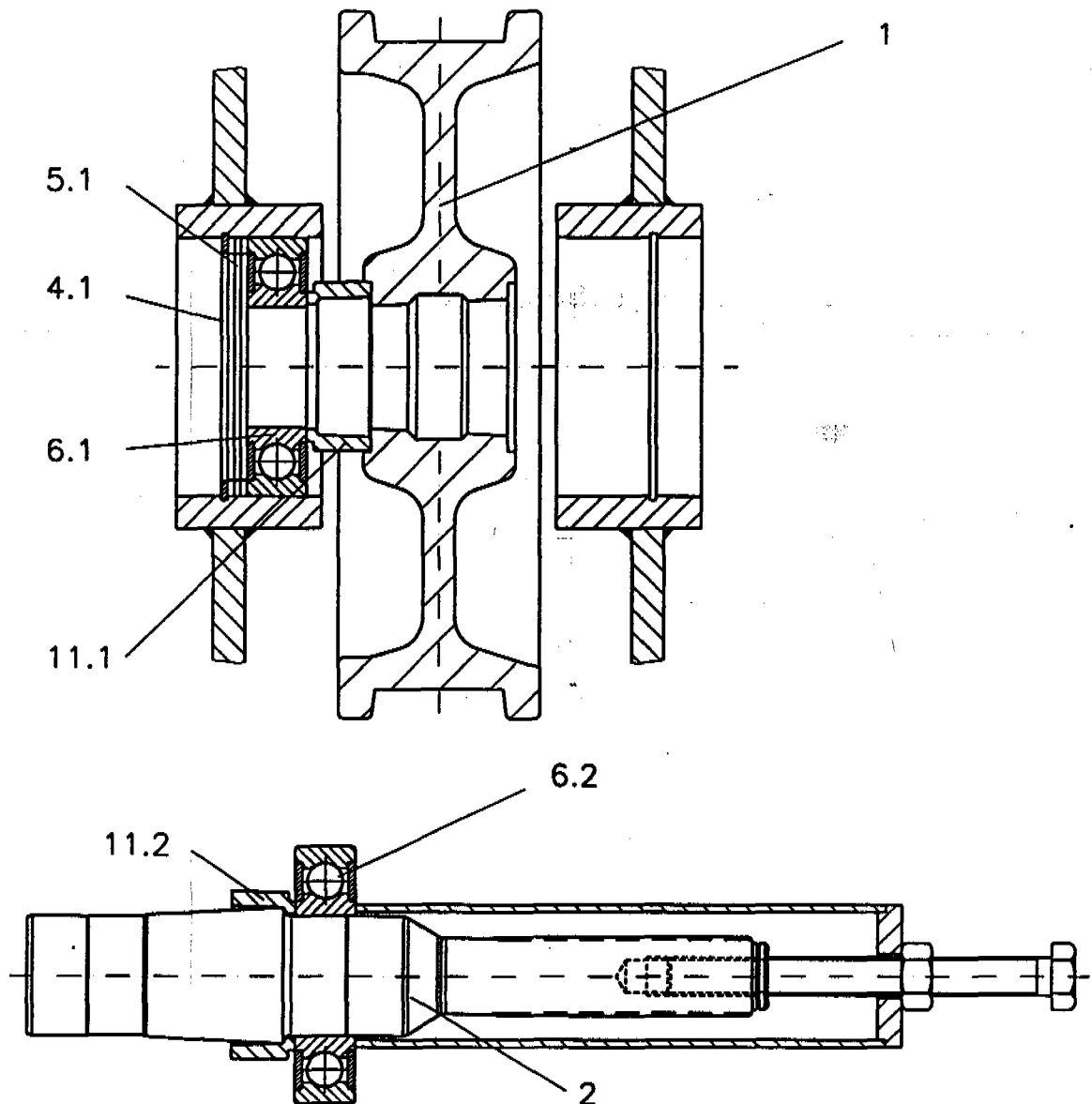
Detaching of the taper pressure connection crane wheel - shaft can also be effected hydraulically by the hydraulic pressure connection of the shaft. A hydraulic pump with a pressure of at least 3000 bar and a reducing nipple M 16 / R  $\frac{1}{4}$ " are required for this procedure. The nipple is to be screwed into the 60°-countersunk oil pressure borehole M 16 of the shaft.

Detaching of the taper pressure connection crane wheel - shaft is effected by widening the crane wheel cone by a hydraulic pump. For that, oil is pressed with high pressure (3000 bar) through the crane wheel shaft (2) into the taper connection, so that it loosens itself under prestressing. By operating the hydraulic pump and tightening the hexagon head nut (42) at the same time, draw the crane wheel shaft out of the cone.

**Attention:** For safety reasons the circlips (4.1, 4.2) and the compensating discs (5.1, 5.2, 7) have to remain installed when detaching the taper pressure connection.



6. Draw the crane wheel shaft (2) by tightening the hexagon head nut (42) until the crane wheel shaft (2) stops at the spacer (11.2).
7. Take out the circlip (4.2) and the compensating discs (5.2, 7).



8. Draw the crane wheel shaft (2) together with the grooved ball bearing (6.2) and the spacer (3.2) entirely out of the crane wheel (1) and the grooved ball bearing (6.1). If necessary, use the assembly set together with the withdrawal pot (44) (fastened against the carriage girder) for this purpose.

10. Roll the crane wheel (1) with the spacer (11.1) out of the carriage girder.

If a replacement of the grooved ball bearing (6.1) is necessary, detach circlip (4.1) first and after that remove compensating discs (5.1). The grooved ball bearing (6.1) can be pressed out to the inside now.

The grooved ball bearing (6.2) can be drawn by a withdrawal tool off the crane wheel shaft (2).

Proceed analogous for disassembly of the wheel set RN, but use a shorter assembly tube.

## Maintenance

### *Roller bearings*

The grooved ball bearings are greased for service life and therefore they are maintenance-free.

### *Crane wheel*

The running surface and the wheel flanges are to be examined for wear quarterly. If the wear of the wheel flanges and the running surface diameter is more than 10 mm, the corresponding crane wheel is to be replaced.

### *Screwing*

The prescribed torque of the hexagon head screws (8) is to be examined after 2 - 3 months, after that yearly within the scope of the recurrent inspection according to UVV - cranes § 26 I (VBG 9) and the principles for expert inspections (ZH1/27).

Torsion angle  $\leq 60^\circ \Rightarrow$  screw is all right

Torsion angle  $> 60^\circ \Rightarrow$  screw is to be replaced

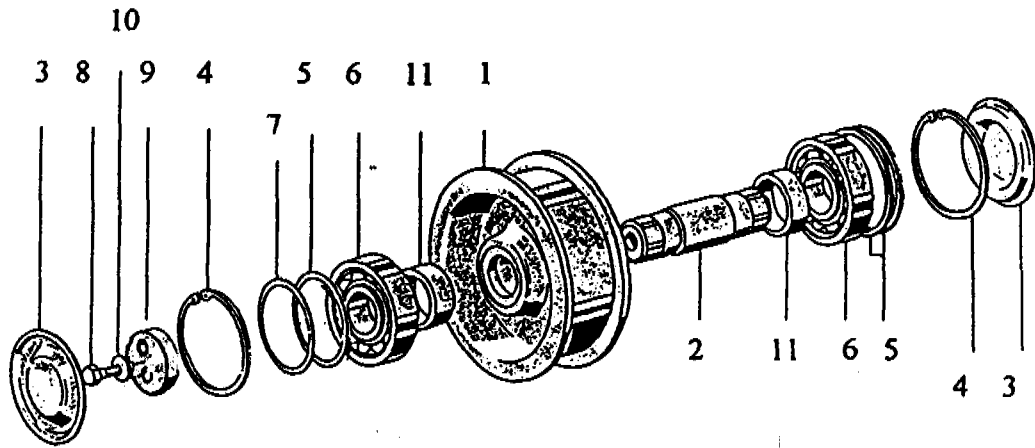
### Reference standards and guidelines

DIN 7168	Generally applicable tolerance limits (free-size tolerances), linear and angular measures
DIN 8570	Free-size tolerances for welded structures
Sheet 1	Linear measures and angles
Sheet 3	Form and position
VDI 3571	Manufacturing tolerances for bridge cranes
VDI 3576	Rails for crane installations, rail connections, rail clamps, tolerance limits

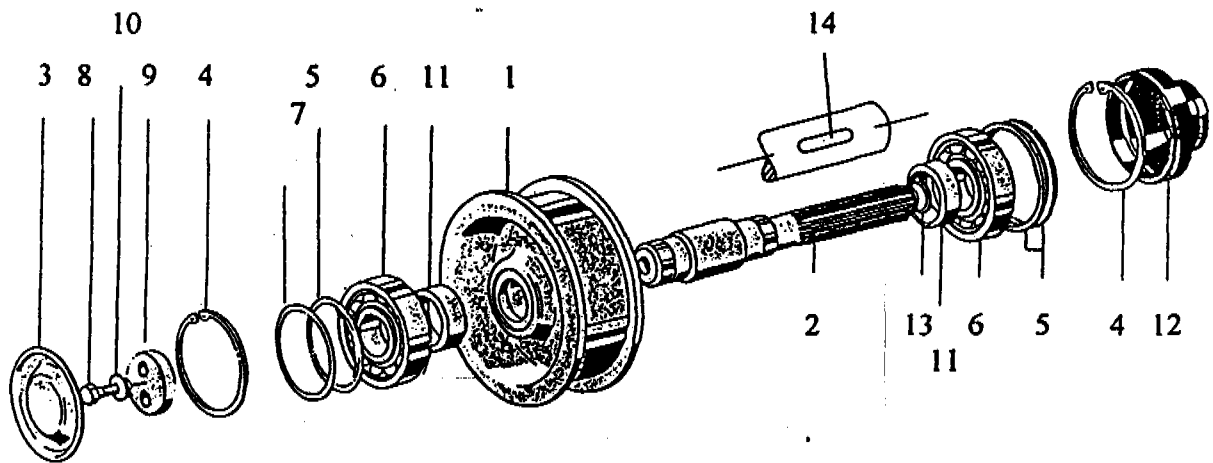
**Notes:**

# Component parts

## RND 400



## RAD 400





## Parts list RAD / RND 400

*Number of pieces for*

*Part no. RAD RND*

1	1	1	Crane wheel Ø 400 x b <sub>1</sub>	GGG - 70
2	1	-	Drive shaft W 50 x 2 x 24 (AF 08) or drive shaft W 65 x 2 x 31 (AF 10) or drive shaft FA 70 or drive shaft FA 80	42 Cr Mo 4 42 Cr Mo 4 42 Cr Mo 4 42 Cr Mo 4
2	-	1	Idler shaft	C 45
3	1	2	Cover 160, without borehole	
4	2	2	Circlip I 160	DIN 472
5	5	5	Compensating disc 160 / 140 x 4	
6	2	2	Grooved ball bearing 6315 - 2 RS	DIN 625
7	4	4	Compensating disc 160 / 140 x 1	
8	2	2	Hexagon head screw M16 x 70	DIN 933 - 10.9
9	1	1	Tightening disc	
10	2	2	Disc spring 16	DIN 6796
11	2	2	Spacer	
12	1	-	Protective bellow	
13	1	-	Circlip AK 42 (AF 08) or circlip AK 58 (AF 10)	DIN 983 DIN 983
14	1	-	Feather key A 14 x 9 x 90 (FA 70) or feather key A 18 x 6 x 60 (FA 80)	DIN 6885 DIN 6885
1)				
41	1	1	Hexagon head screw M16 x 200 (FA 70) or hexagon head screw M20 x 200 (FA 80) or hexagon head screw M24 x 140 (AF 08, AF 10, idler shaft)	DIN 933 DIN 933 DIN 933
42	1	1	Hexagon head nut M16 (FA 70) or hexagon head nut M20 (FA 80) or hexagon head nut M24 (AF 08, AF 10, idler shaft)	DIN 934 DIN 934 DIN 934

**Notes:**

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Subject to alterations by the manufacturer for the purposes of further technical development!

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