

Operating Instructions

WHEEL SET KG 125 SERIES

**RAD/RND
400/500**

**WITH SELF-ALIGNING
ROLLER BEARINGS**



Wheel set KG 125

RAD / RND 400 / 500

with self-aligning roller bearings

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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 assembly 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 ± 8 mm for wheel set RAD / RND 400 and by ± 12 mm for wheel set RAD / RND 500 by replaceable compensating discs between roller bearing and circlip.

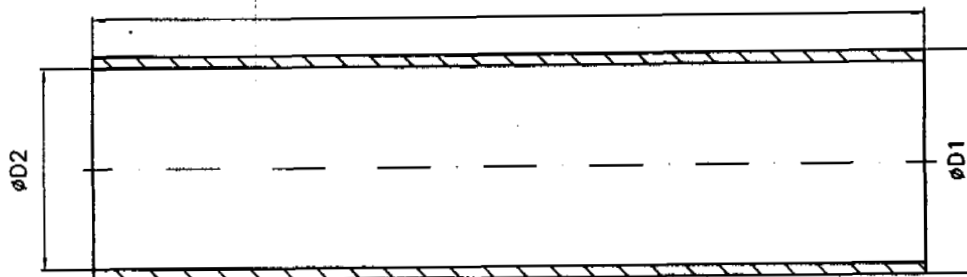
Delivery of the wheel sets RAD / RND is effected in component parts.

Attention

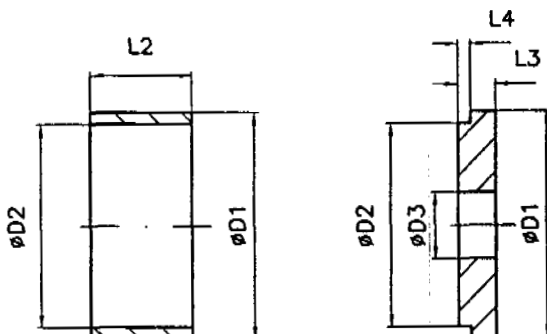
An assembly set is required for assembly and disassembly. Delivery of the wheel set RAD / RND 400 / 500 does not include these instruments (see instructions page 6).

The assembly set consists of:

- 1 Assembly tube long for RAD (40)
- 1 Assembly tube short for RND (40)
- 1 Hexagon head screw DIN 933 (41) ¹⁾
- 1 Hexagon head nut DIN 934 (42) ¹⁾
- 1 Disc (43) L1



Assembly tube long for RAD



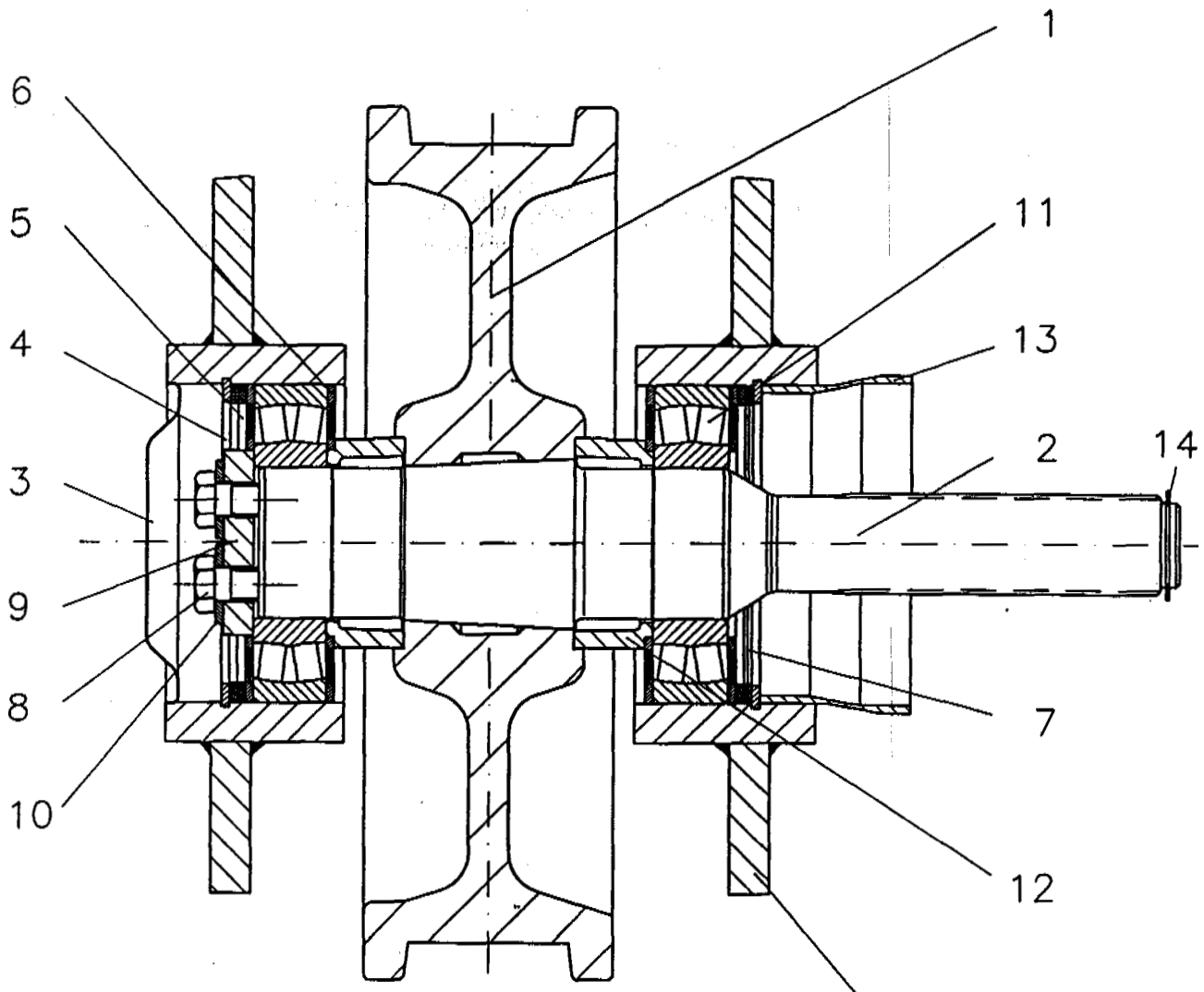
Assembly tube for RND

Disc

	L1	L2	L3	L4	øD1	øD2	øD3
RAD/RND 400	330	40	15	5	88,9	79,9	26
RAD/RND 500	440	45	20	7	101,6	92,6	26

¹⁾ for further information see parts list

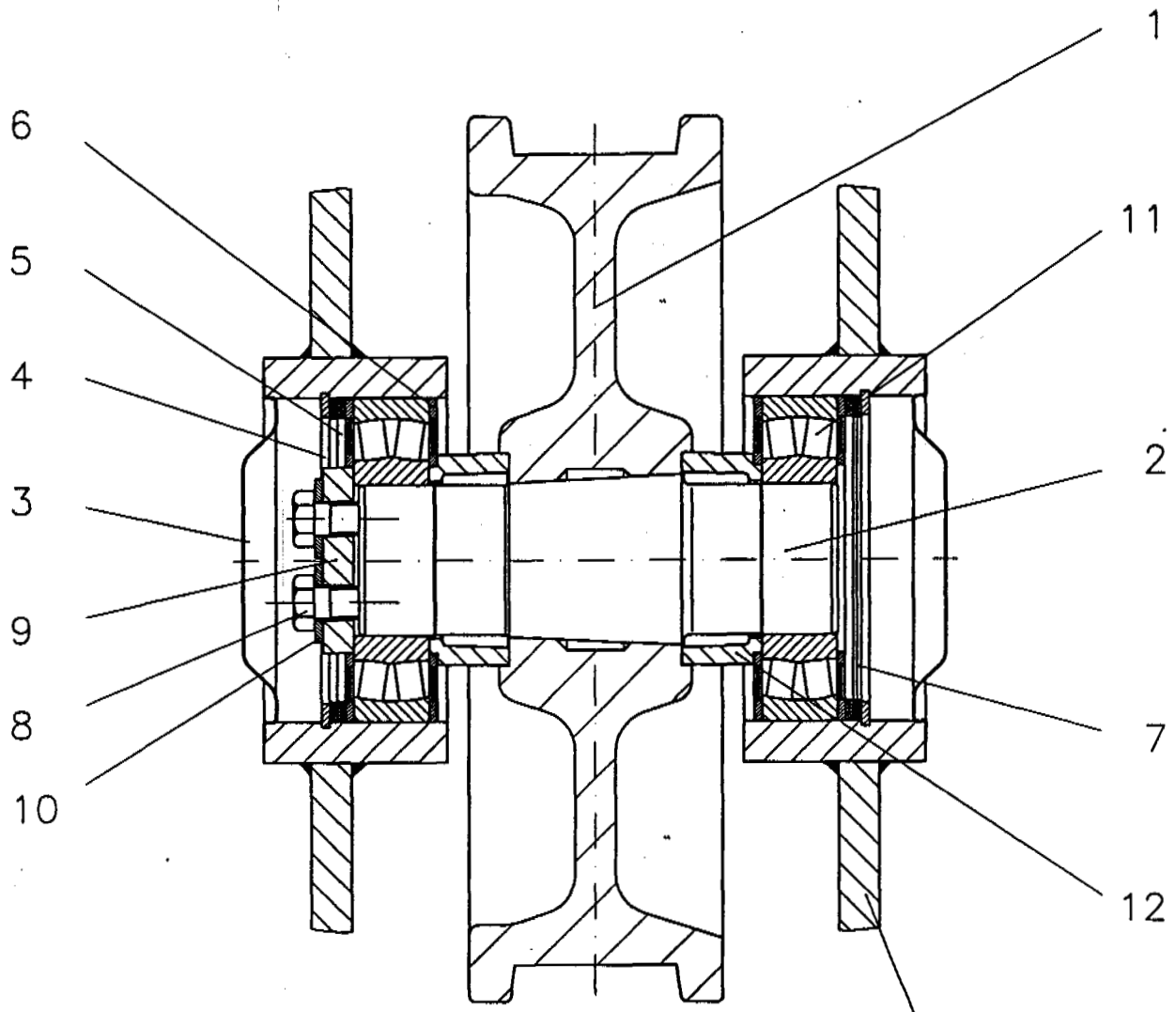
Technical construction RAD 400 / 500



Connection construction

- | | |
|---------------------------|---------------------------------|
| 1 Crane wheel | 8 Hexagon head screw |
| 2 Drive shaft | 9 Tightening disc |
| 3 Cover, without borehole | 10 Disc spring |
| 4 Circlip | 11 Self-aligning roller bearing |
| 5 Compensating disc, 4mm | 12 Spacer |
| 6 Sealing ring | 13 Protective bellow |
| 7 Compensating disc, 1mm | 14 Circlip |

Technical construction RND 400 / 500



Connection construction

- | | |
|---------------------------|---------------------------------|
| 1 Crane wheel | 7 Compensating disc, 1mm |
| 2 Idler shaft | 8 Hexagon head screw |
| 3 Cover, without borehole | 9. Tightening disc |
| 4 Circlip | 10 Disc spring |
| 5 Compensating disc, 4mm | 11 Self-aligning roller bearing |
| 6 Sealing ring | 12 Spacer |

Assembly and disassembly

General

An assembly set (see page 3) is required for assembly respectively disassembly of the wheel sets RAD / RND 400 / 500. Delivery does not include these instruments.

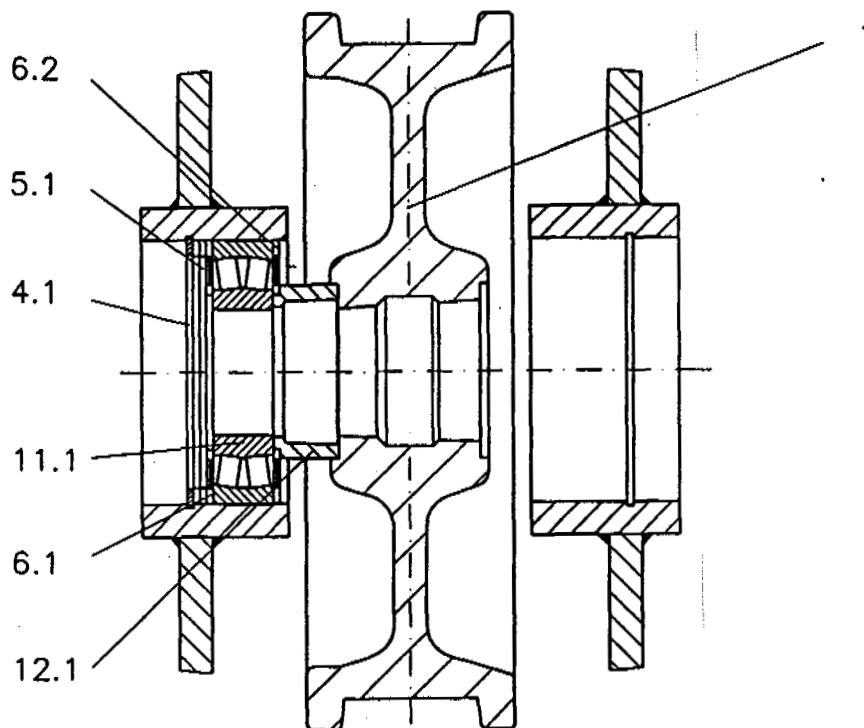
Attention

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:

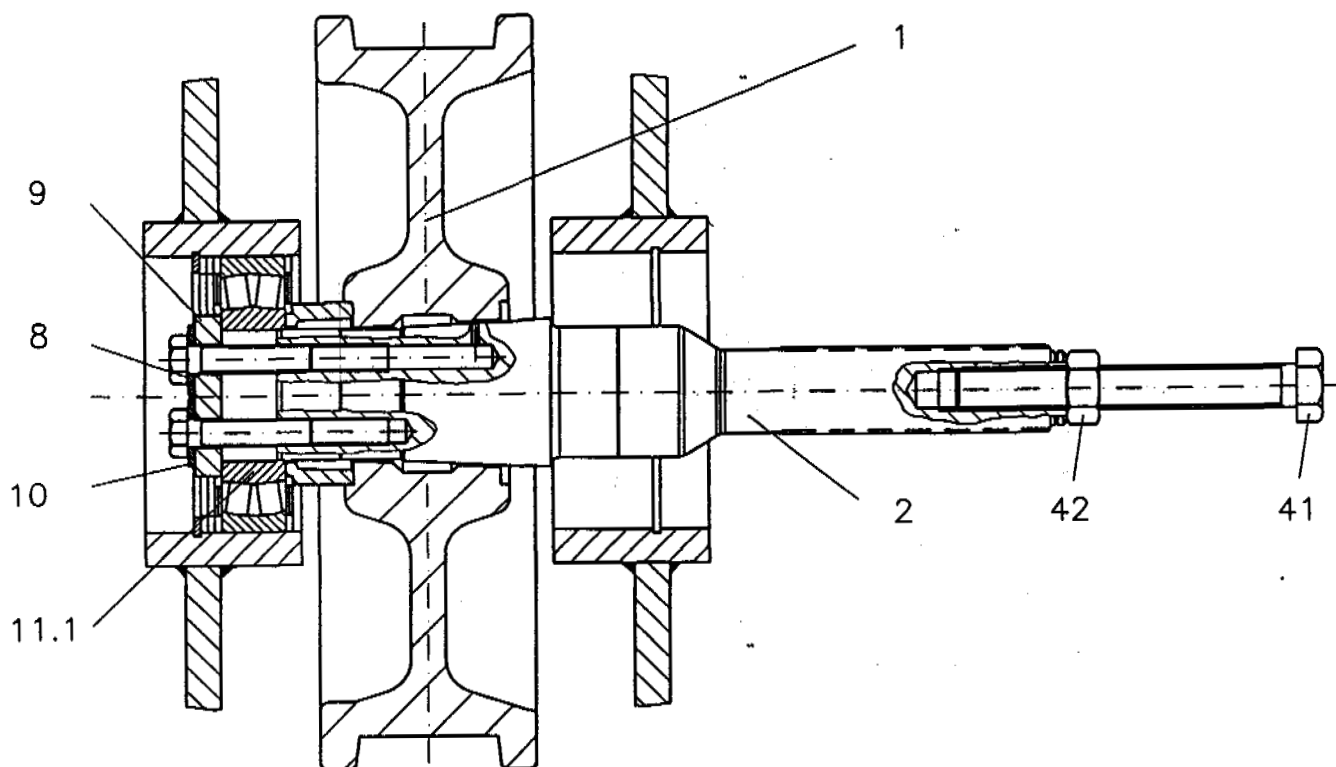


1. Fill the self-aligning roller bearing (11.1) with roller bearing grease.
2. Insert the self-aligning roller bearing (11.1), together with the sealing ring (6.1) and the compensating discs (5.1, 7.1) (see table 1) into the carriage girder and assemble the circlip (4.1).

	5.1	5.2	7.1	7.2
RAD / RND 400	2 x 4 mm thick	1 x 4 mm thick	-	4 x 1 mm thick
RAD / RND 500	3 x 4 mm thick	2 x 4 mm thick	1 x 1 mm thick	5 x 1 mm thick

Table 1: Number and thickness of the compensating discs

3. Insert the sealing ring (6.2) and roll the crane wheel (1) with the spacer (12.1) into the carriage.

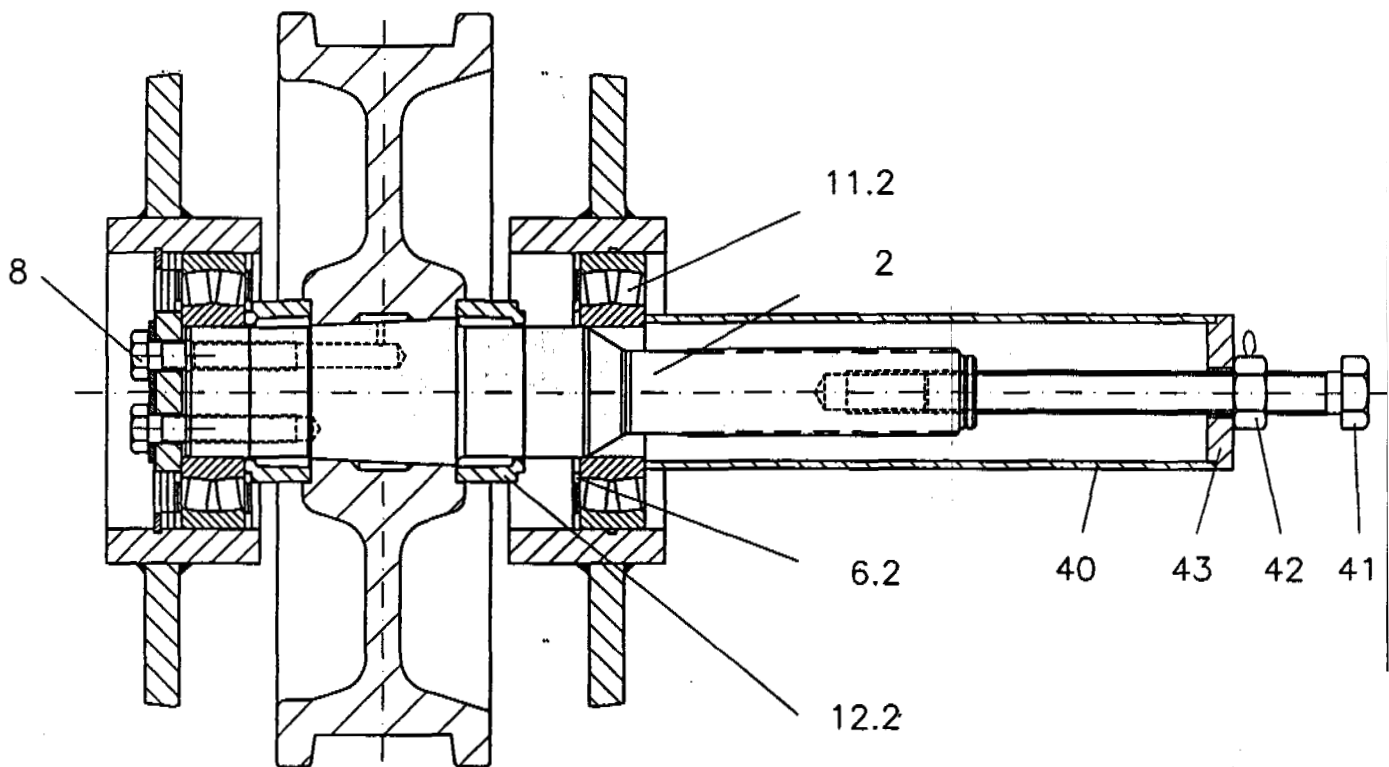


4. Push the crane wheel shaft (2) into the crane wheel (1).

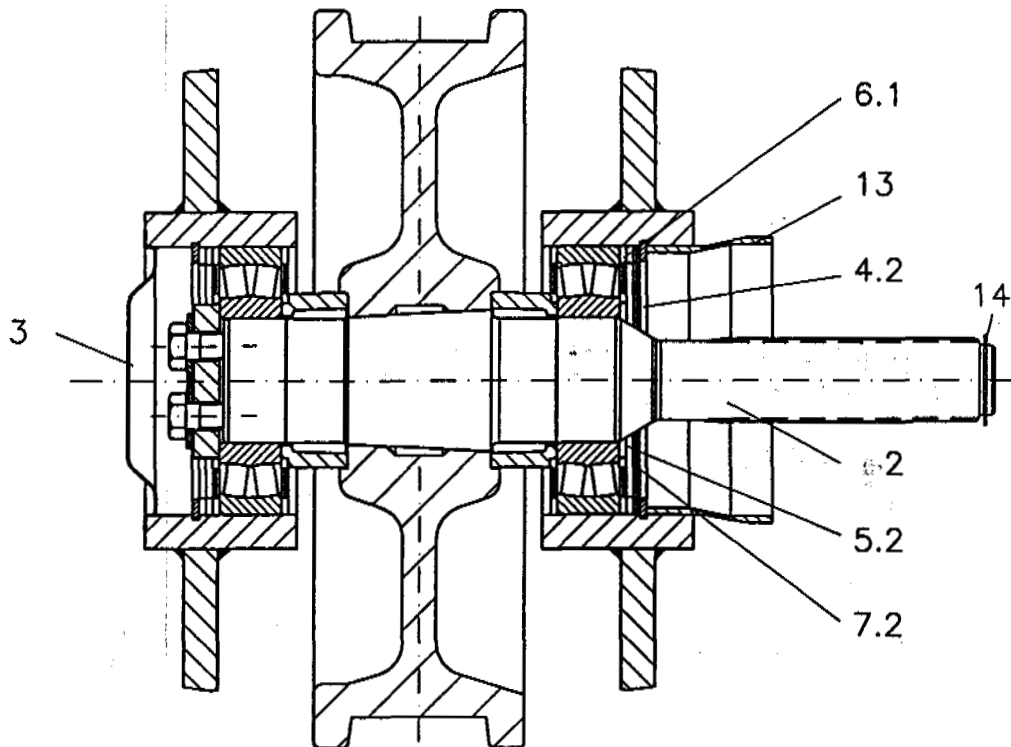
Attention

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.

5. Insert the tightening disc (9) and the disc spring (10) and tighten the shaft (2) by the hexagon head screw (8) into the bearing (11.1). 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).



6. 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 prescribed torque of 290 Nm is achieved at all screws (8).
7. Insert spacer (12.2), sealing ring (6.2) as well as the grease-filled self-aligning roller bearing (6.2). The self-aligning roller bearing (11.2) is to be pressed on the crane wheel shaft (2) to the stop at the spacer (12.2) by assembly tube (40), disc (43), hexagon head screw (41) and hexagon head nut (42).
8. Remove the assembly tube (40); disc (43) and hexagon head screw (41) with hexagon head nut (42).



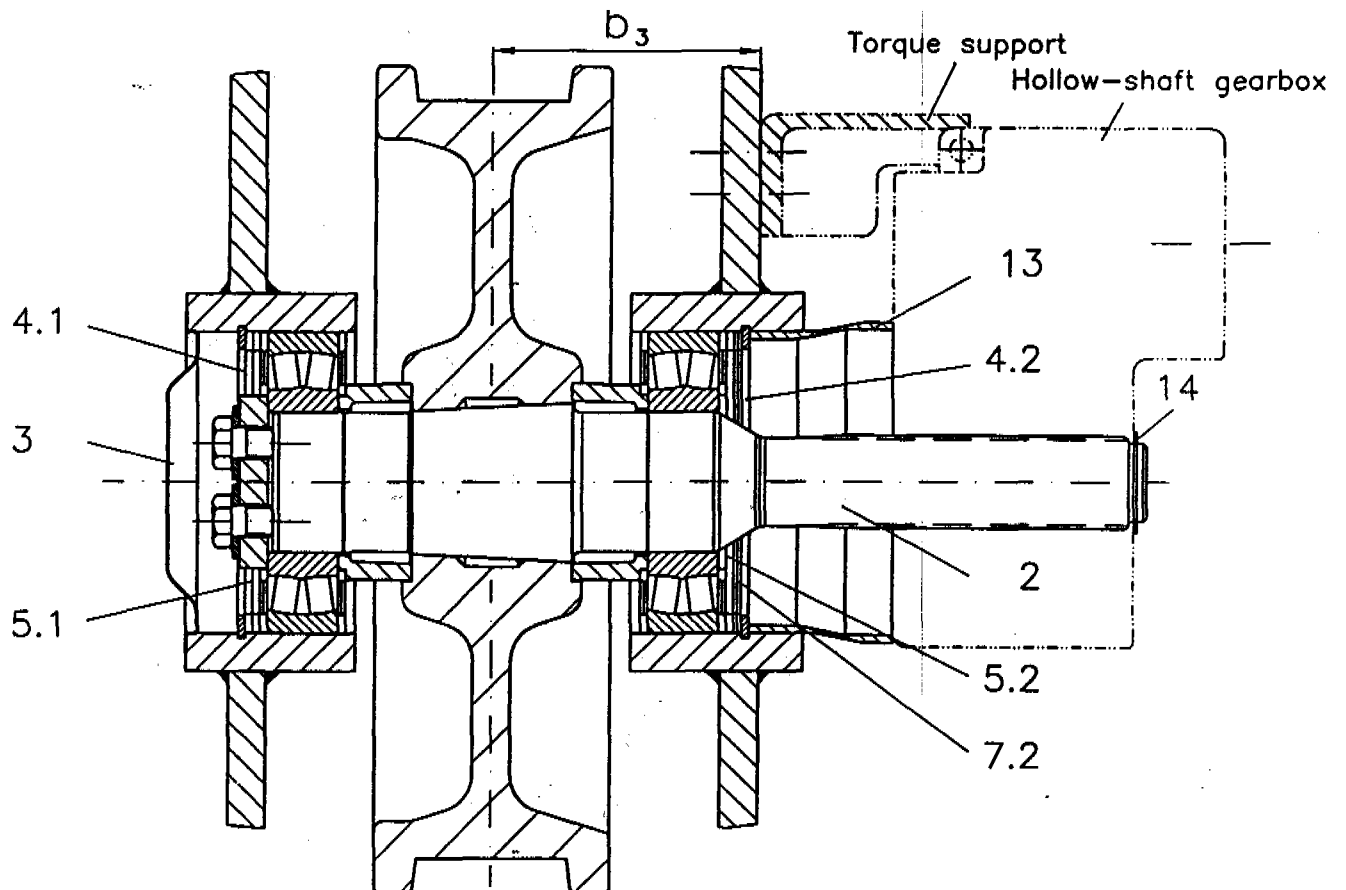
9. Insert sealing ring (6.1). The hollow-space between sealing ring and circlip groove is to be filled up with the remaining compensating discs (5.2, 7.2) (see table 1). Assemble the circlip (4.2). Assemble the cover (3) by light hammer blows on the centre edge. Insert the protective bellow (13).
10. Push the drive on the drive shaft (2), assemble the circlip (14) and fasten the drive at the torque support according to manufacturer's instruction.

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 RAD, 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 (14) and draw the drive off the drive shaft (2).
2. Remove the cover (3) and the protective bellow (13).
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, 7.1, 7.2).

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

Maximum traversing possibility of the dimension "b₃":

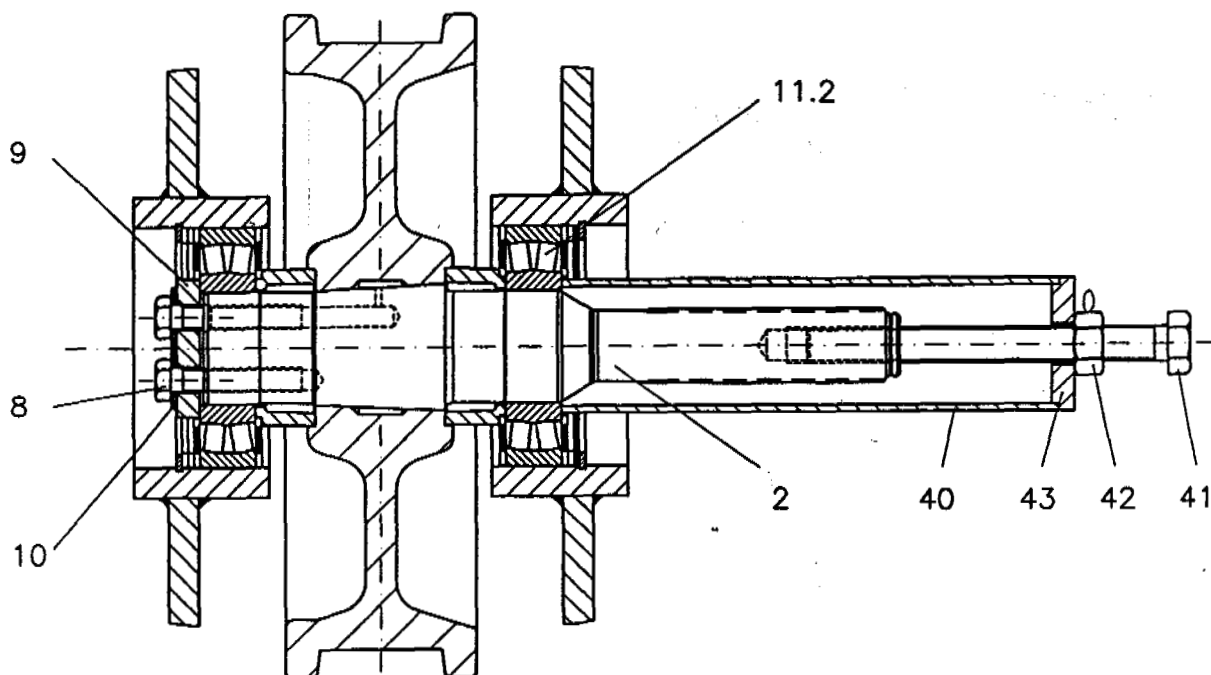
RAD / RND 400: 140 ± 8 mm

RAD / RND 500: 160 ± 12 mm

5. Fill up the hollow-space between sealing rings and circlip grooves with compensating discs (5.1, 5.2, 7.1, 7.2) according to the traversing way and assemble the circlips (4.1, 4.2).
6. Insert the cover (3) and the protective bellow (13).
7. Push the drive on the drive shaft (2), assemble the circlip (14) 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 (14) and draw the drive off the drive shaft (2).
2. Remove the cover (3) and the protective bellow (13).
3. Jack up the crane to relieve the crane wheels.



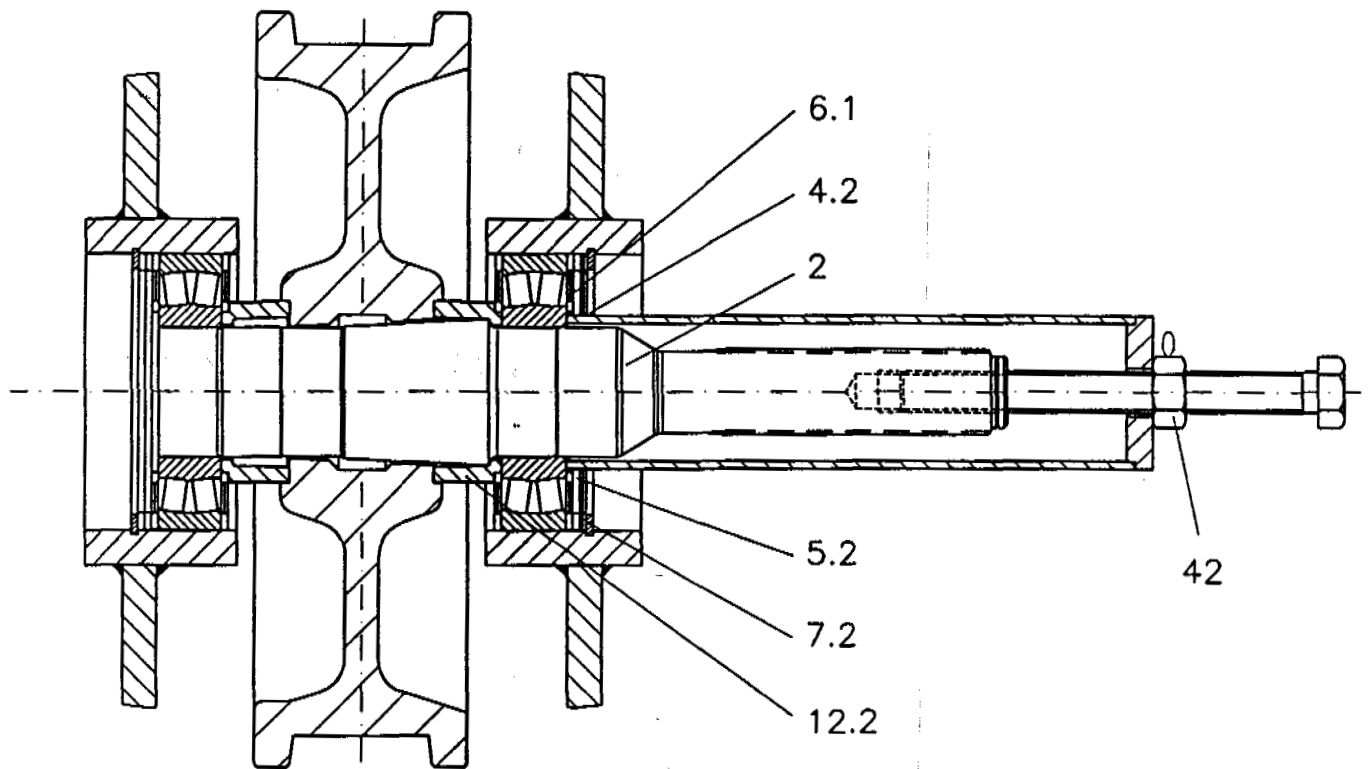
4. Detach the hexagon head screw (8) and remove it with disc spring (10) and tightening disc (9).
5. Fasten the assembly tube (40) and the disc (43) by the hexagon head screw (41) and the hexagon head nut (42) against the self-aligning roller bearing (11.2).

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

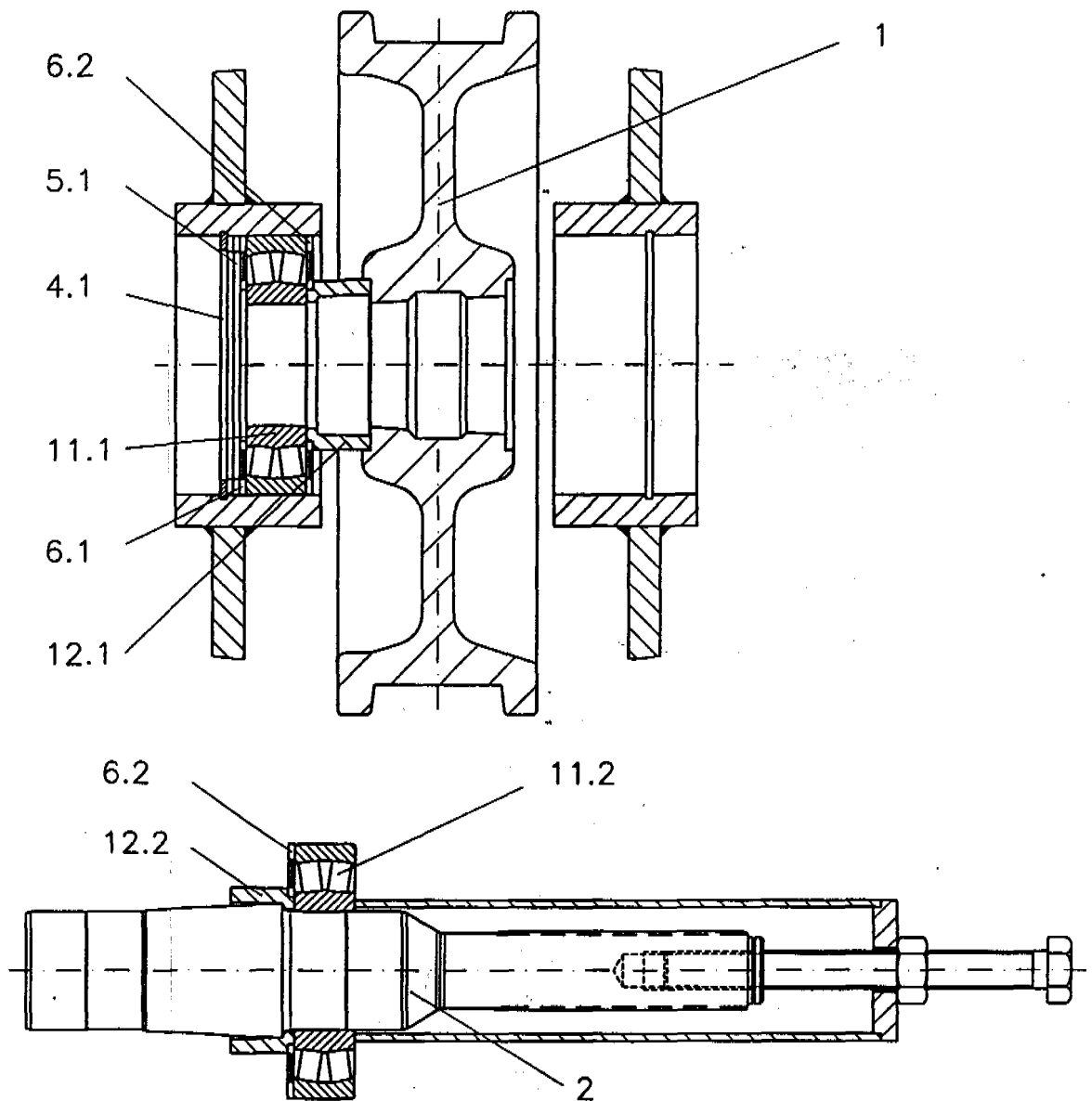
Detaching of the taper pressure connection crane wheel - shaft can also be effected hydraulically by the hydraulic pressure connection of the shaft. A hydraulic pump with a pressure of at least 3000 bar and a reducing nipple M 16 / R 1/4" are required for this procedure. The nipple is to be screwed into 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, 7.1, 7.2) 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 stops at the spacer (12.2).
7. Take out the circlip (4.2), the sealing ring (6.1) and the compensating discs (5.2, 7.2).



8. Draw the crane wheel shaft (2) together with the self-aligning roller bearing (11.2), the sealing ring (6.2) and the spacer (12.2) entirely out of the crane wheel (1) and the self-aligning roller bearing (11.1) If necessary, use the assembly set together with the withdrawal pot (44) (fastened against the carriage girder) for this purpose.
9. Roll the crane wheel (1) with the spacer (12.1) out of the carriage girder, remove the sealing ring (6.2).

If a replacement of the self-aligning roller bearing (11.1) is necessary, detach circlip (4.1) first and after that remove the compensating discs (5.1, 7.1) and the sealing ring (6.1). The self-aligning roller bearing (11.1) can be pressed out to the inside now.

The self-aligning roller bearing (11.2) can be drawn by a withdrawal tool off the crane wheel shaft (2).

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

Roller bearings

The self-aligning roller bearings are to be filled with suitable roller bearing grease before assembly. The lubricant has to be absolutely faultless, clean and suitable for roller bearings.

Recommendation:

Lithium soap grease (EP-alloyed)

Consistency class 2

Drop point approximately 190°C

Application temperature - 30 / + 140°C

for example: DEA Glissando EP 2
 or comparable products

The self-aligning roller bearings are to be relubricated after approximately 2000 operating hours. Relubrication can only be effected if the circlips (4.1, 4.2), the compensating discs (5.1, 5.2, 7.1, 7.2) and the sealing rings (6.1) were disassembled before.

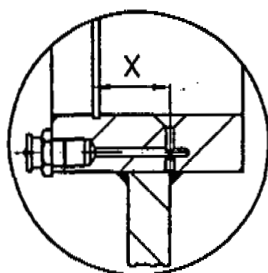
Dirty self-aligning roller bearings because of extreme operation conditions are to be disassembled according to the instructions in the chapter disassembly instructions (page 11 pp.). After that the bearings are to be cleaned properly and are to be filled with suitable roller bearing grease before assembling again.

For harder environmental conditions the lubricant is to be replaced in due course. The used lubricant is to be disposed without causing ecological damages!

If much grease comes out because of damaged seals (because of outer influences), relubrication is necessary in shorter intervals. If the seal is considerably damaged, it should be replaced and the bearing should be examined for damages.

The indicated maintenance intervals are suited to normal operating conditions. The maintenance intervals are to be shortened for extreme operating conditions and contaminations.

The roller bearings of wheel set RAD / RND 400 and 500 can be relubricated by lubricating nipples in the bearing housing. For this the customer has to intend corresponding lubrication boreholes with lubricating nipples in the bearing housing.



Picture no. 1

For non-uniform distributed compensating discs the dimension x mm is to be corrected.
 $x = 35$ mm for RAD/RND 400 *
 $x = 41$ mm for RAD/RND 500

*Please contact us for further informations

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 screw (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).

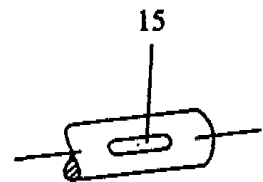
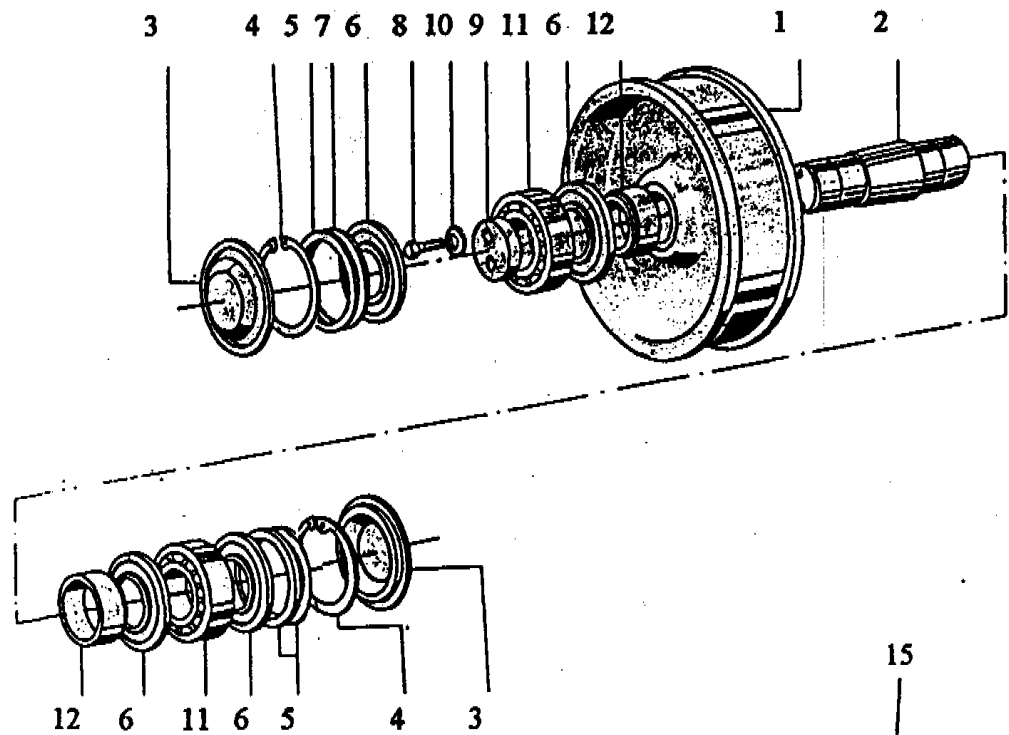
Torsion angle $\leq 60^\circ \Rightarrow$ screw is all right

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

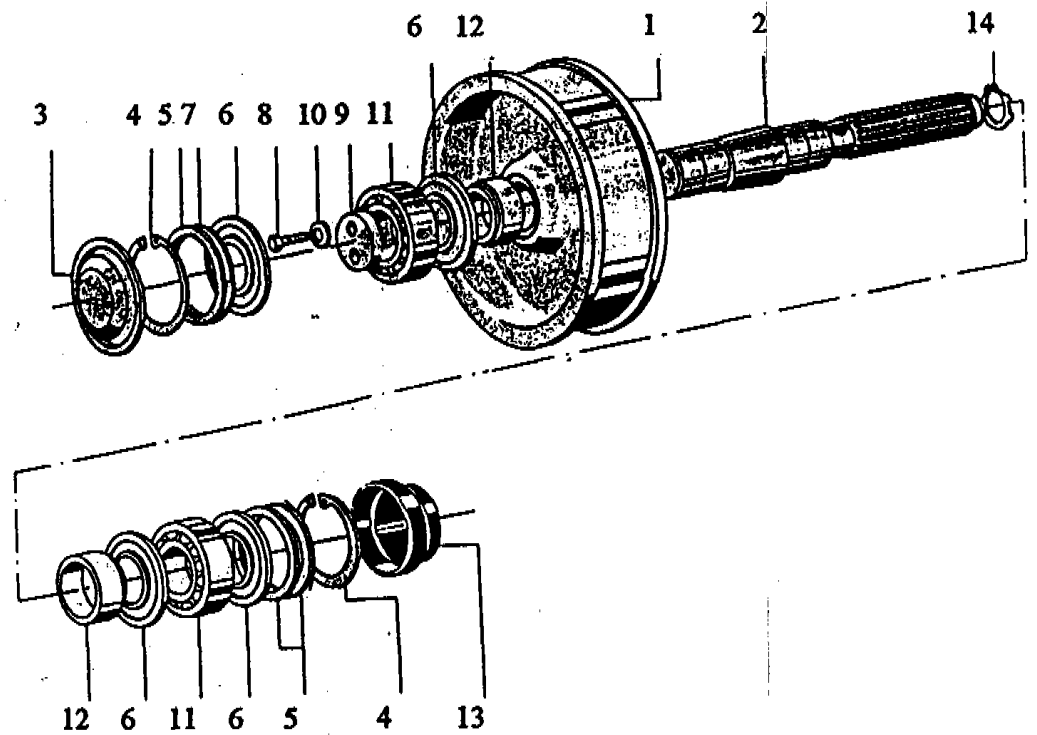
Reference standards and guidelines

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

RND 400 / 500



RAD 400 / 500



Parts list RAD / RND 400

Number of pieces for

Part no. RAD RND

1	1	1	Crane wheel Ø 400 x b ₁	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	3	3	Compensating disc 160 / 140 x 4	
6	4	4	Sealing ring 160 / 93 x 4	
7	4	4	Compensating disc 160 / 140 x 1	
8	2	2	Hexagon head screw M16 x 45	DIN 933 - 10.9
9	1	1	Tightening disc	
10	2	2	Disc spring 16	DIN 6796
11	2	2	Self-aligning roller bearing 213 15	DIN 635
12	2	2	Spacer	
13	1	-	Protective bellow	
14	1	-	Circlip AK 42 (AF 08) or circlip AK 58 (AF 10)	DIN 983 DIN 983
15	1	-	Feather key A 14 x 9 x 90 (FA 70) or feather key A 18 x 11 x 110 (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 240 (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

Parts list RAD / RND 500

Number of pieces for

Part no. RAD RND

1	1	1	Crane wheel Ø 500 x b ₁	GGG - 70
2	1	-	Drive shaft W 85 x 3 x 27 (AF 12) or drive shaft FA 100	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	4	4	Sealing ring 160 / 103 x 4	
7	6	6	Compensating disc 160 / 140 x 1	
8	3	3	Hexagon head screw M16 x 70	DIN 933 - 10.9
9	1	1	Tightening disc	
10	3	3	Disc spring 16	DIN 6796
11	2	2	Self-aligning roller bearing 222 18	DIN 635
12	2	2	Spacer	
13	1	-	Protective bellow	
14	1	-	Circlip AK 75 (AF 12)	DIN 983
15	1	-	Feather key A 22 x 14 x 140 (FA 100)	DIN 6885

1)

41	1	1	Hexagon head screw M20 x 200 (FA 100) or hexagon head screw M24 x 240 (AF 12, idler shaft)	DIN 933 DIN 933
42	1	1	Hexagon head nut M20 (FA 100) or hexagon head nut M24 (AF 12, idler shaft)	DIN 934 DIN 934

Notes:



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

Thus, no claims can be derived from the information, figures and descriptions given in these operating instructions.

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