

Operating Instructions

WHEEL SET KG 125 SERIES

**RA/RN
630**



Wheel set KG 125

RA / RN 630

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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 RA / RN is suitable for installation in steel constructions; the holding fixture boreholes in the carriage girder can be flame-cut or spindled out.

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 ± 12 mm for wheel set RA / RN 630 by replaceable compensating discs between roller bearing and circlip.

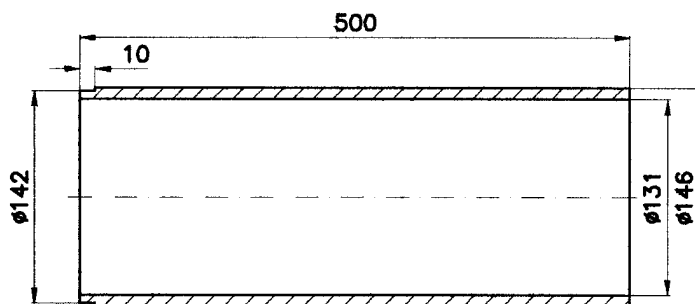
Delivery of the wheel sets RA / RN 630 is effected in component parts.

Attention

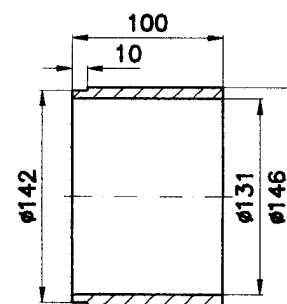
A hydraulic oil device and an assembly set are required for assembly and disassembly. Delivery of the wheel set RA / RN 630 does not include these instruments (see instructions page 6).

The assembly set consists of

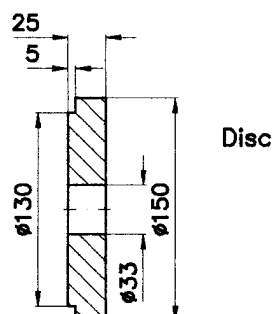
- 1 Assembly tube, long, for RA (40)
- 1 Assembly tube, short, for RN (40)
- 1 Disc (41)
- 1 Hexagon head screw M30 x 220, DIN 933 (42.1)
- 1 Hexagon head nut M30, DIN 934 (42.2)



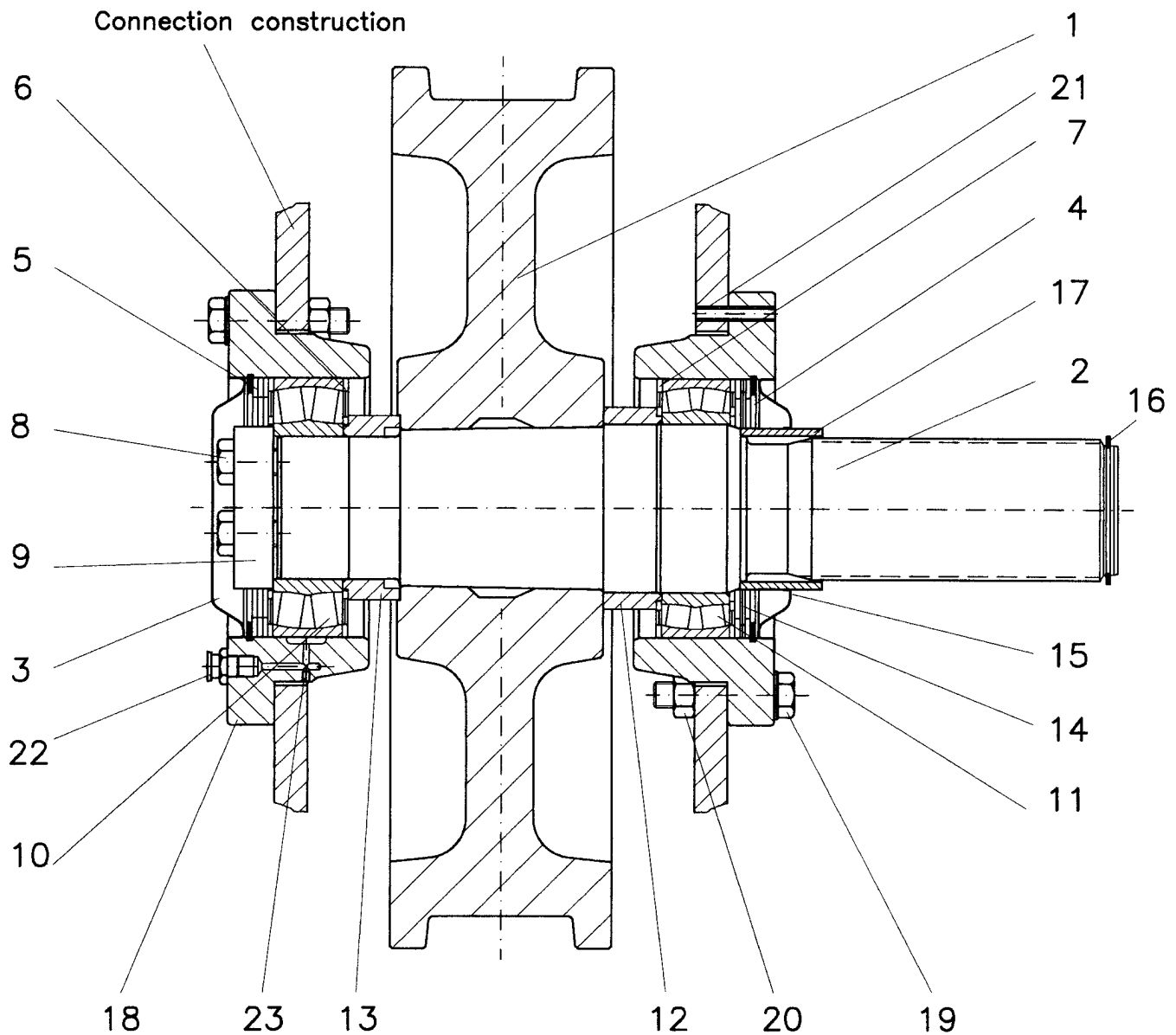
Assembly tube, long, for RA



Assembly tube, short, for RN

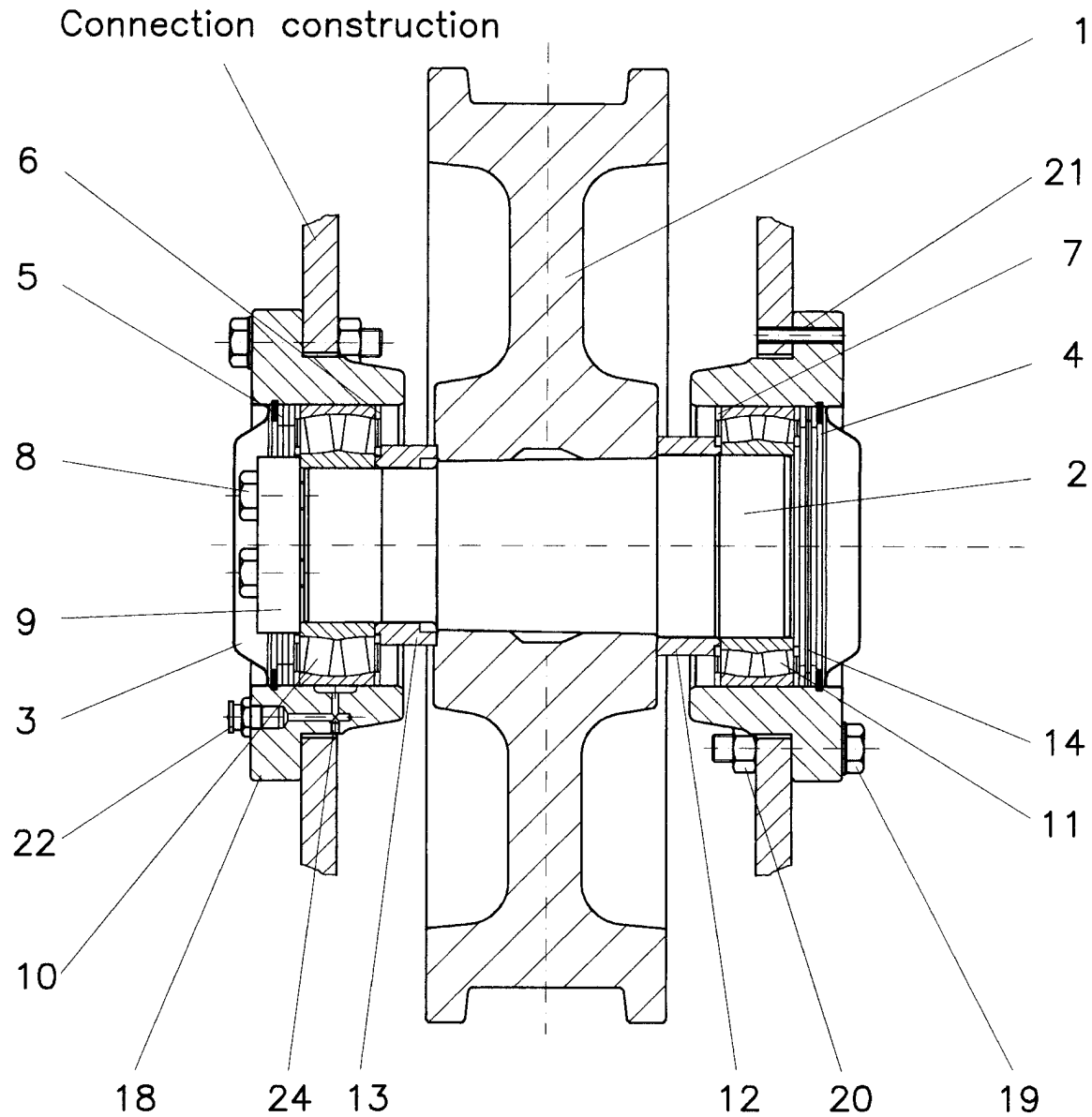


Technical construction RA 630



- | | |
|---------------------------------------|---------------------------------------|
| 1 Crane wheel $\varnothing 630$ | 13 Spacer 142/110x44 |
| 2 Drive shaft | 14 Compensating disc 180/200x1 |
| 3 Cover 200, without borehole | 15 Cover 200, with borehole |
| 4 Circlip I 200 | 16 Circlip A 100 |
| 5 Compensating disc 170/200x4 | 17 Spacer sleeve |
| 6 Sealing ring 128/200x4 | 18 Flanged bearing housing |
| 7 Sealing ring 143/200x4 | 19 Locking screw M20x90 |
| 8 Hexagon head screw M20x75 | 20 Retained nut M20 |
| 9 Tightening disc | 21 Clamping sleeve |
| 10 Self-aligning roller bearing 22222 | 22 Plane lubricating nipple M22 R3/8" |
| 11 Self-aligning roller bearing 23026 | 23 Set screw M6x8 |
| 12 Spacer 156/130x45 | |

Technical construction RN 630



- | | |
|---------------------------------------|---------------------------------------|
| 1 Crane wheel $\varnothing 630$ | 11 Self-aligning roller bearing 23026 |
| 2 Idler shaft | 12 Spacer 156/130x45 |
| 3 Cover 200, without borehole | 13 Spacer 142/110x44 |
| 4 Circlip I 200 | 14 Compensating disc 180/200x1 |
| 5 Compensating disc 170/200x4 | 18 Flanged bearing housing |
| 6 Sealing ring 128/200x4 | 19 Locking screw M20x90 |
| 7 Sealing ring 143/200x4 | 20 Retained nut M20 |
| 8 Hexagon head screw M20x75 | 21 Clamping sleeve |
| 9 Tightening disc | 22 Plane lubricating nipple M22 R3/8" |
| 10 Self-aligning roller bearing 22222 | 23 Set screw M6x8 |

Assembly and disassembly

General

A hydraulic pump with a working pressure of at least 3000 bar (for example SKF hydraulic oil device set 729101 B) and a reducing nipple M 16 / R ¼" are required for joining and detaching the taper pressure connection. In addition, an assembly set (see page 3) is required. Delivery does not include these instruments.

When using the hydraulic pump, the manufacturer's safety regulations are to be observed.

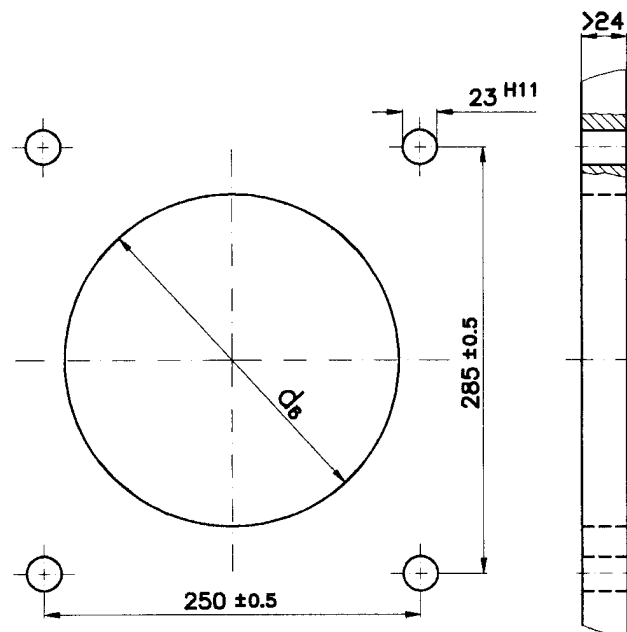
Attention

Some component parts have a high deadweight!

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

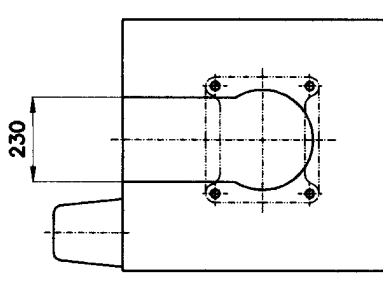
Installation and alignment of the wheel sets

Boreholes in the structural steelwork for the flanged bearing housings.



The structural steelwork of the carriage girders is ready. The holding fixture boreholes for the flanged bearing housings are flame-cut to $d_6 = 272^{+2}$ respectively spindled out to $d_6 = 268^{H7}$ according to the given wheel bases. The fastening holes 23^{H11} for the retained nuts M20 (20) are to be scribed and bored in their position to the centre d_6 .

If the holding fixture boreholes for the flanged bearing housings are flame-cut, the flanged bearing housings are to be aligned in the carriage girder. The alignment of the flanges is made by levelling and optical-mechanical methods of measurement. The exact position of the flanges is fixed after alignment by clamping sleeves (21) (DIN 1481).

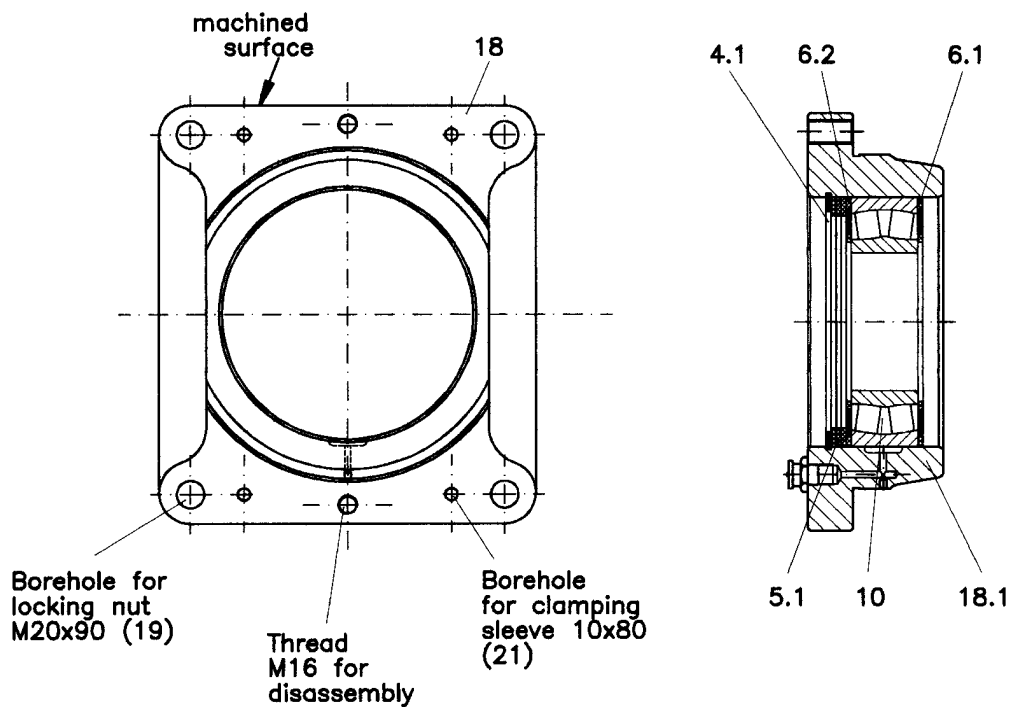


Picture no. 1

For the wheel set RA / RN 630 there is the possibility to assemble from the corner because of the sideways flattened flanged bearing housings. For a slotted carriage girder (see picture no. 1), installation and removal of the completely assembled wheel set can be effected after a 90°-rotation of the flanged bearing housings.

Assembly instruction

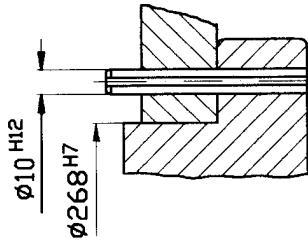
The following steps are to be made for assembly:



1. Fill the self-aligning roller bearing 22222 (10) with roller bearing grease.
2. Insert the self-aligning roller bearing (10) together with the sealing rings (6.1 and 6.2) and 3 compensating discs (5.1) (4 mm thick) into the flanged bearing housing (18.1) and assemble the circlip (4.1).

There are the following possibilities for fastening the flanged bearing housings:

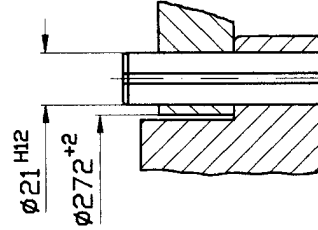
- a) Holding fixture boreholes for flanged bearing housings spindled out to $\varnothing 268^{H7}$



Borehole diameter 10^{H12} for clamping sleeve 10×80 , radial force is absorbed by snug fit.

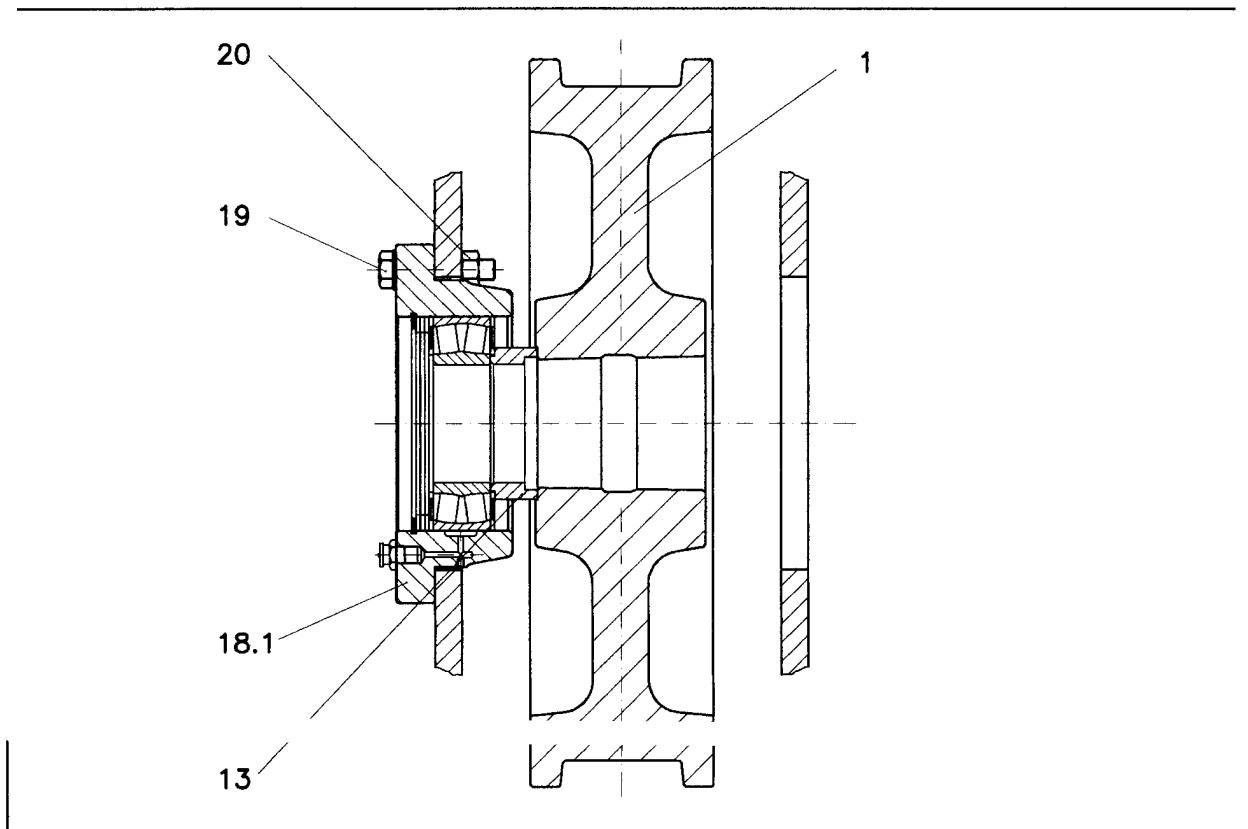
Later alignment not necessary if the outer sides of the carriage girders are machined in the region of the flanged bearing housings.

- b) Holding fixture for flanged bearing housing flame-cut to $\varnothing 272^{+2}$

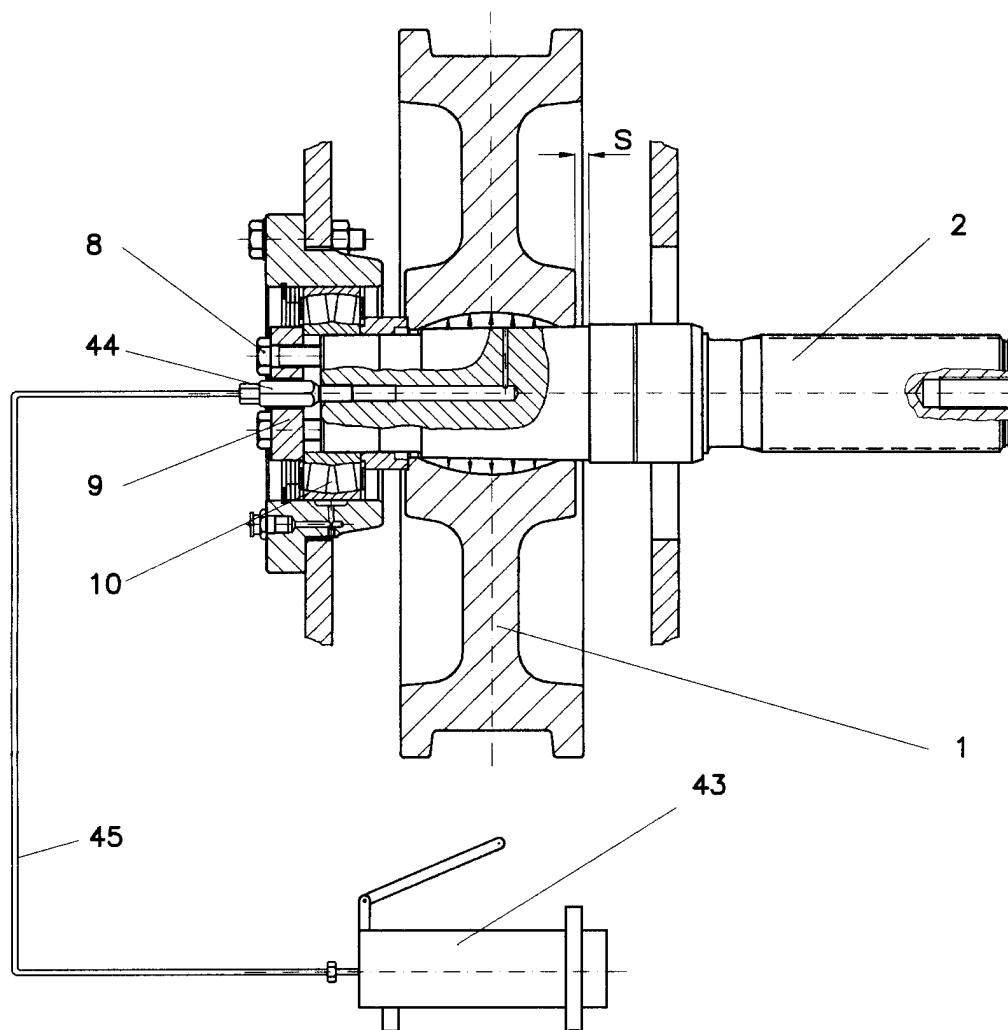


Borehole diameter 21^{H12} for clamping sleeve 21×80 , radial force is absorbed by clamping sleeve.

Measurement and alignment is necessary. The radial force transmission can also be effected by a square iron, welded on after alignment. Therefore the top edge of the flanged bearing housing is mechanically machined.



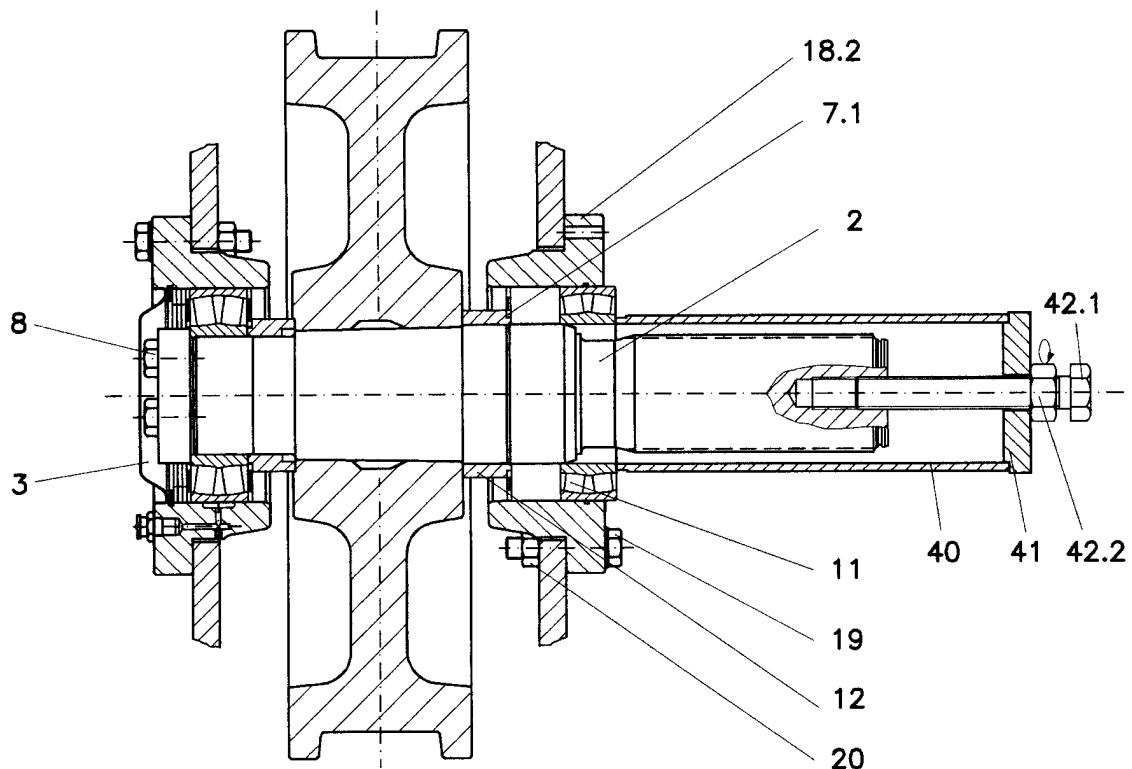
- Screw the outer flanged bearing housing (18.1) in the carriage girder with 4 locking screws M20 x 90 (19) and 4 retained nuts M20 (20). Screw the locking screws (19) one after another by a torque wrench to 800 Nm. Repeat this process until the prescribed torque is achieved at all screws (19). Pin the flanged bearing housing (18.1) with 4 clamping sleeves (21). If there are flame-cut holding fixture boreholes, bore holes for clamping sleeves in advance to $\varnothing 21$ and install clamping sleeves 21×80 .
- Roll the crane wheel (1) with the spacer (13) into the carriage.



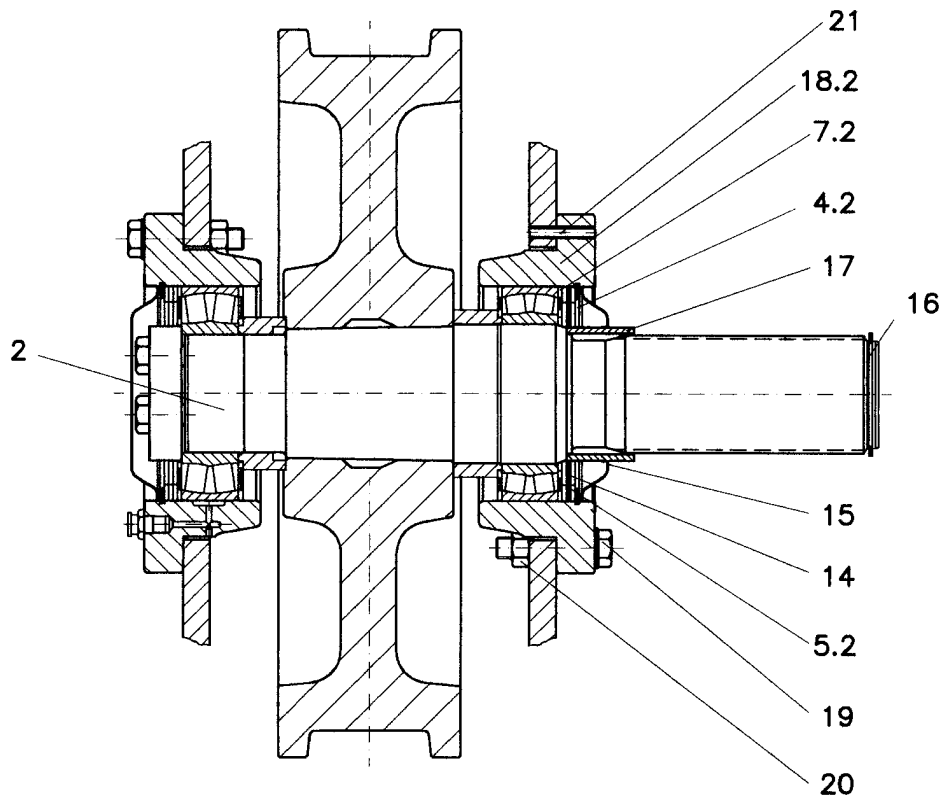
5. Push the crane wheel shaft (2) into the crane wheel (1).
6. Insert the tightening disc (9) and tighten the shaft (2) by the hexagon head screws (8) into the bearing (10).
The crane wheel shaft (2) has to be tightened the remaining way $s = 9 - 13$ mm by hydraulic oil pressure connection, so that crane wheel and shaft have a non-positive connection.
7. Screw the reducing nipple (44) into the oil pressure borehole M16 of the crane wheel shaft (2).
8. Bleed the hydraulic pump (43) and operate until oil comes out at the end of the high-pressure tube (45) without bubbles.
9. Connect the hydraulic pump (43) by the high-pressure tube (45) in the thread R $\frac{1}{4}$ " of the reducing nipple (44).
10. Operate the hydraulic pump (43) (working pressure 3000 bar) until oil comes out between crane wheel and shaft and tighten one after another the hexagon head screws (8) at the same time.
11. Keep the oil pressure constant by repeated pumping and tighten the crane wheel shaft (2) to the stop ($s = 0$) by permanent tightening of the hexagon head screws (8).

Attention

If the shaft cannot be tightened closer to its final position in spite of tightening the hexagon head screws (8), only pump for a short time to widen the cone.



12. If the crane wheel is tightly at the stop of the shaft, the three hexagon head screws (8) are to be tightened one after another by a torque wrench to 580 Nm. This process is to be repeated until the prescribed torque is achieved at all screws.
13. Drain the oil from the piston chamber (see operating instructions of the hydraulic pump), remove the hydraulic oil device set (43, 45) and the reducing nipple (44). Insert the cover (3) by light hammer blows on the centre edge.
14. Insert inner flanged bearing housing (18.2) into the carriage girder and screw it solid with 4 locking screws M20 x 90 (19) and 4 retained nuts M20 (20).
15. Insert spacer (12) and sealing ring (7.1) as well as the grease-filled self-aligning roller bearing 23026 (11). The self-aligning roller bearing (11) is to be pressed on the crane wheel shaft (2) to the stop at the spacer (12) by assembly tube (40), disc (41), hexagon head screw (42.1) and hexagon head nut (42.2).
16. Remove the assembly tube (40), disc (41) and hexagon head screw (42.1) with hexagon head nut (42.2).
17. Install all 4 wheels according to point 1 - 16.
18. Alignment of the wheel sets by optical-mechanical methods of measurement. Examination of the wheel bases and the height dimensions as well as axial parallel in plan view and in elevation.



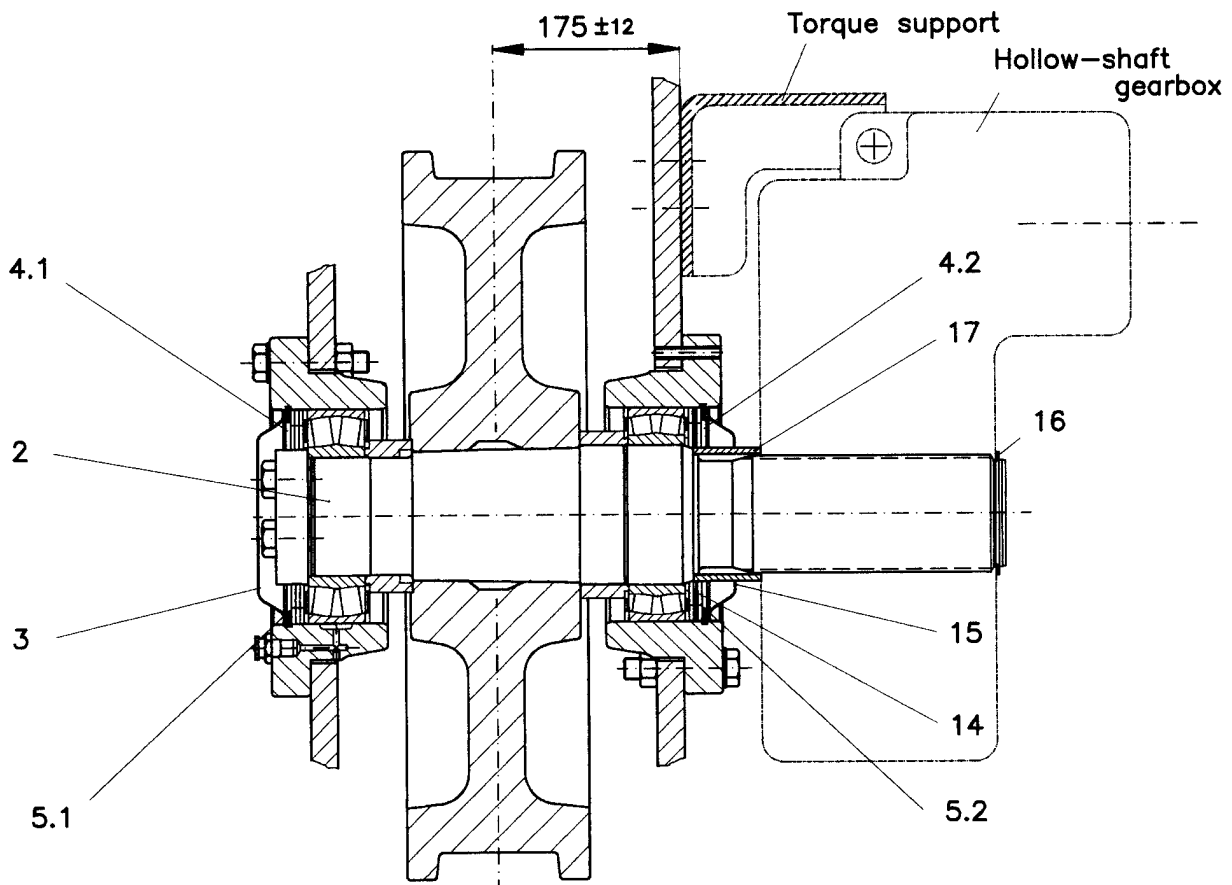
19. Tighten the locking screws (19) of the inner flanged bearing housing (18.2) one after another by a torque wrench to 800 Nm. Repeat this procedure until the prescribed torque is achieved at all screws (19). Pin the flanged bearing housing (18.2) with 4 clamping sleeves (21). If necessary, bore holes for the clamping sleeves (see point 3).
20. Insert the sealing ring (7.2) and the remaining compensating discs (5.2, 14) (4 respectively 1 mm thick) until the hollow-space between sealing ring and circlip groove is filled up. Assemble the circlip (4.2), insert the cover (15) and the spacer sleeve (17).
21. Push the drive on the drive shaft (2), assemble the circlip (16) 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 greased 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 (16) and draw the drive off the drive shaft (2).
2. Remove the covers (3, 15) and the spacer sleeve (17).
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, 14).

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

Maximum traversing possibility for wheel set RA / RN 630 ± 12 mm

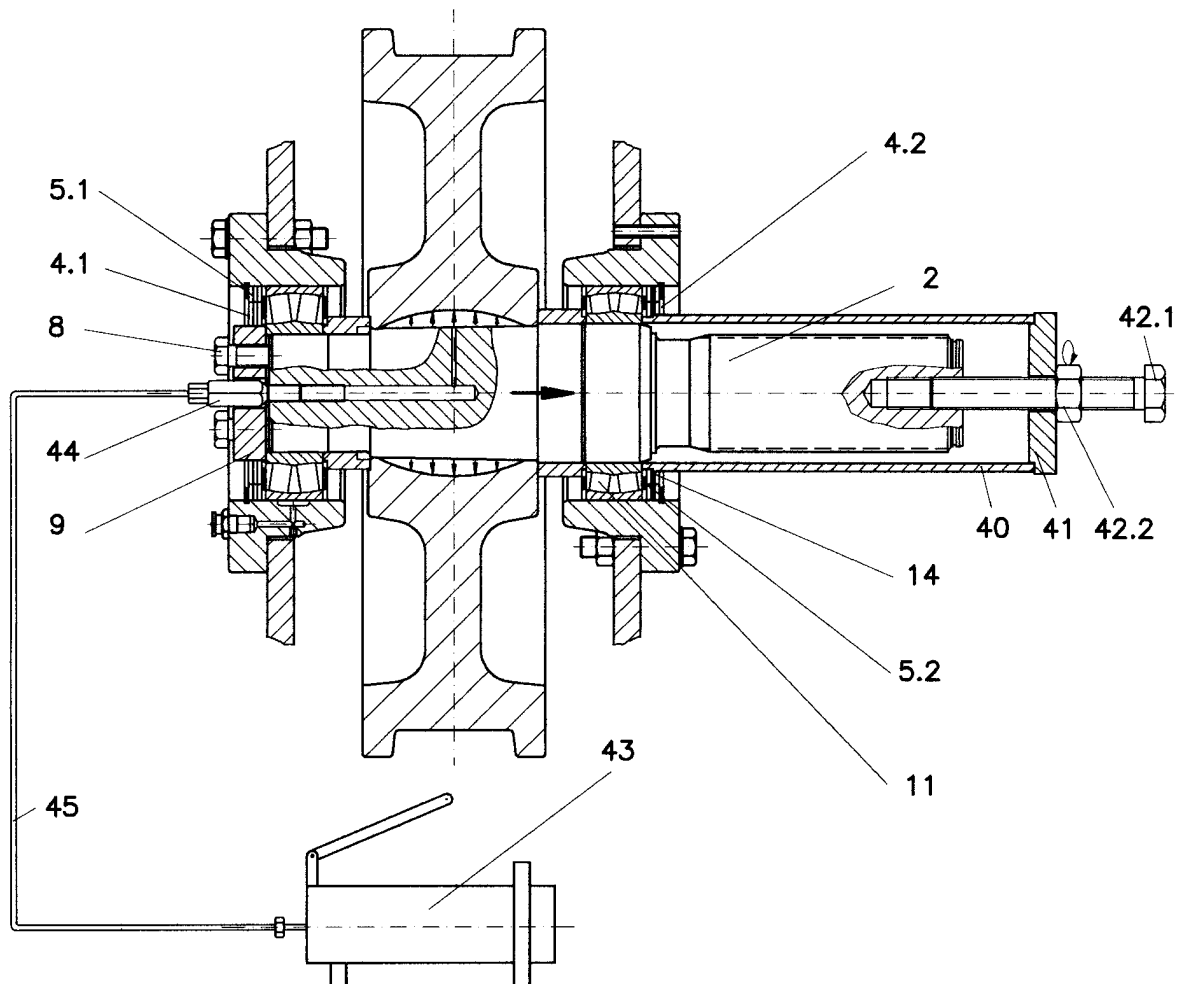
5. Fill up the hollow-space between sealing rings and circlip grooves with compensating discs (5.1, 5.2, 14) according to the traversing way and assemble the circlips (4.1, 4.2).
6. Insert the covers (3, 15) and the spacer sleeve (17).
7. Push the drive on the drive shaft (2), assemble the circlip (16) and screw the hollow shaft gearbox at the torque support.

Disassembly instructions

Detach the hollow shaft gearbox at the torque support, remove the circlip (16) and draw the drive off the drive shaft (2).

After that, the following steps are to be made:

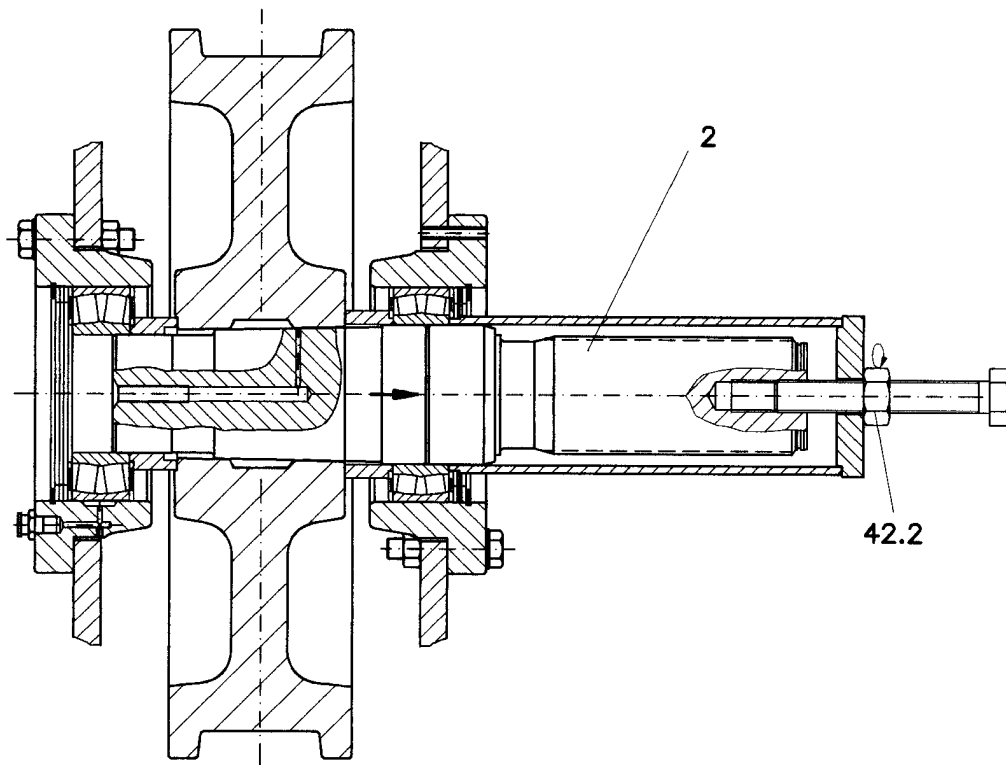
1. Remove the covers (3, 15) and the spacer sleeve (17).
2. Jack up the crane to relieve the crane wheels.



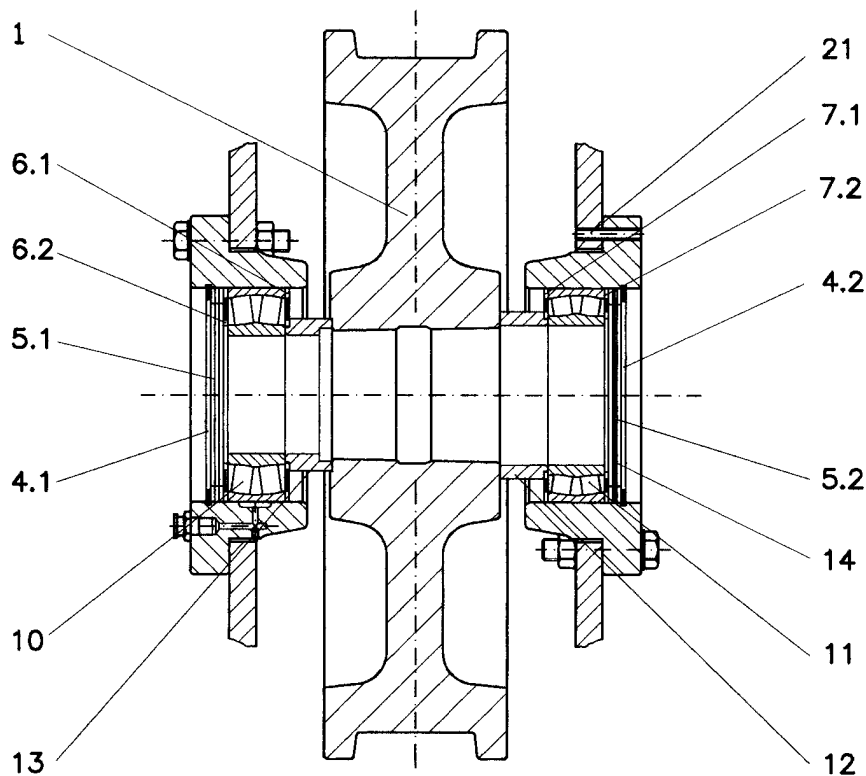
3. Detach the hexagon head screw (8) and unscrew them approximately 5 mm.
4. Fasten the assembly tube (40) and the disc (41) by the hexagon head screw (42.1) and the hexagon head nut (42.2) against the self-aligning roller bearing 23026 (11).
5. Connect the bled hydraulic pump (43) (see assembly instructions) with high-pressure tube (45) and reducing nipple (44) in the oil pressure borehole M16 of the crane wheel shaft (2).

Attention: For safety reasons the tightening disc (9), the hexagon head screws (8) as well as the circlips (4.1, 4.2) and the compensating discs (5.1, 5.2, 14) have to remain installed when detaching the taper pressure connection.

6. Detaching of the taper pressure connection crane wheel - shaft is effected by widening the crane wheel cone by a hydraulic pump (43). 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 (42.2) at the same time, draw the crane wheel shaft out of the cone.



7. Remove the hydraulic device set (43, 44, 45), the tightening disc (9) and the hexagon head screws (8).
8. Draw the crane wheel shaft (2) entirely out of the crane wheel and the self-aligning roller bearings by tightening the hexagon head nut (42.2).



9. Take out circlip (4.2), compensating discs (5.2, 14), sealing rings (7.1, 7.2), self-aligning roller bearing 23026 (11) and spacer (12).

10. Roll the crane wheel (1) with the spacer (13) out of the carriage girder.

If a replacement of the self-aligning roller bearing 22222 (10) is necessary, detach circlip (4.1) first and after that remove compensating discs (5.1) and sealing rings (6.1, 6.2). The self-aligning roller bearing (10) can be pressed out to the inside now.

The flanged bearing housings have a thread bore M16 at the top and underneath for making disassembly easier. By screwing 2 hexagon head screws M16 x 100 DIN 933 the housing is easily pressed out of the carriage girder respectively out of the clamping sleeves (21).

Proceed analogous for disassembly of RN 630, but use a shorter assembly tube.

Maintenance

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)

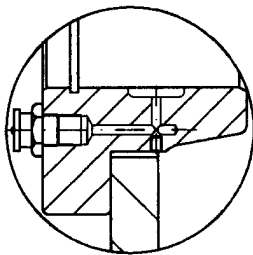
Consistency class 2

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



Picture no. 2

The roller bearings can be relubricated by lubricating nipples in the flanged bearing housing (see picture no. 2).

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.

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 all three hexagon head screws (8) (580 Nm) and all 8 locking screws (19) (800 Nm) 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).

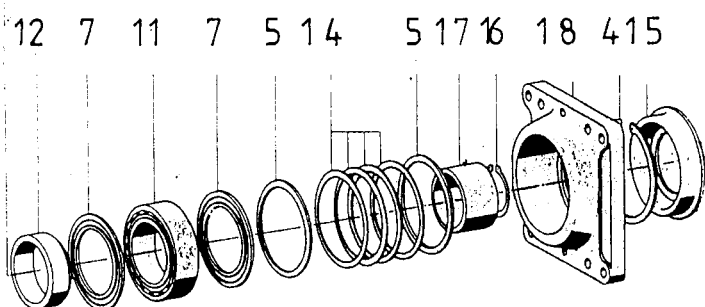
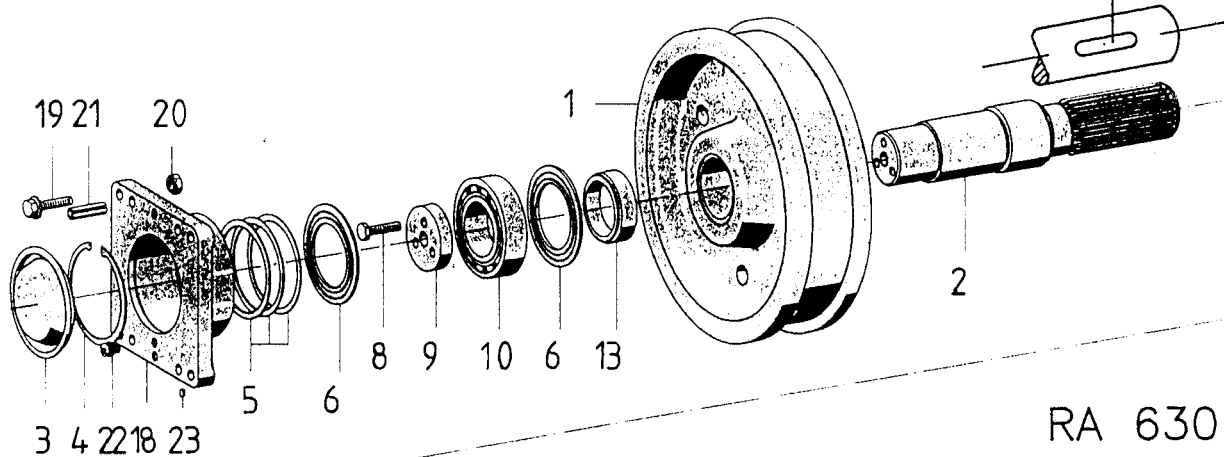
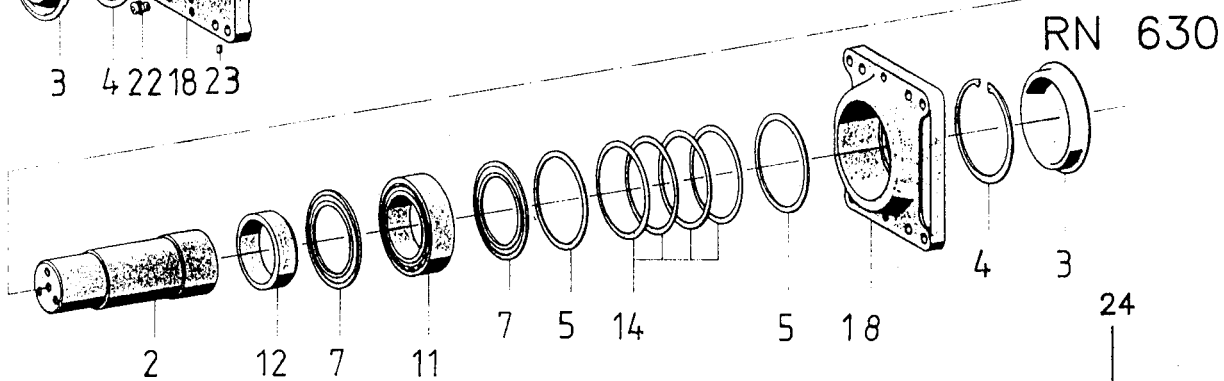
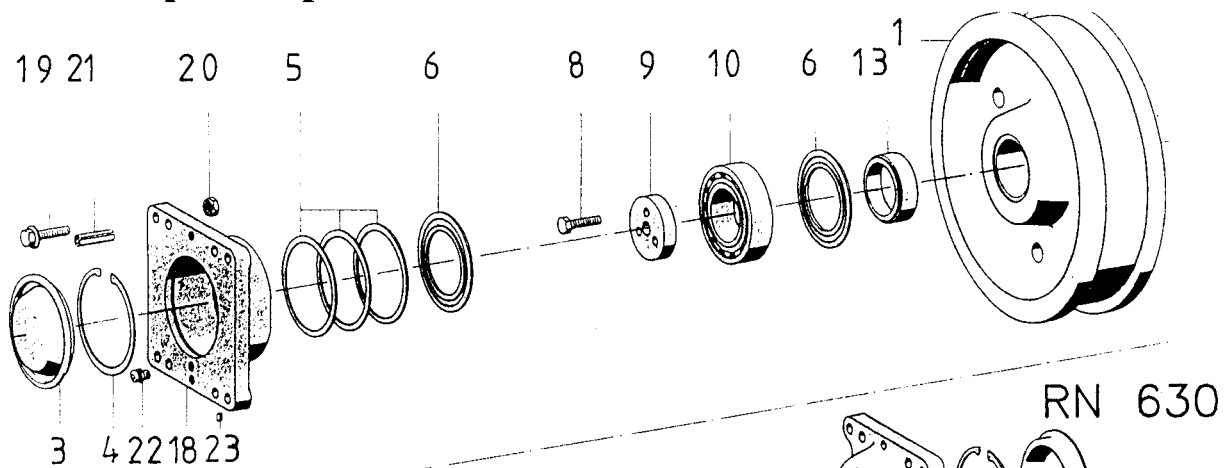
Torsion angle $\leq 60^\circ \Rightarrow$ screw is all right

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

Component parts



Parts list RA / RN 630

Number of pieces for

Part no.	RA	RN		
1	1	1	Crane wheel diameter 630 x b ₁	GGG - 70
2	1	-	Drive shaft W 110 x 3 x 35 (AF 18) or drive shaft W 85 x 3 x 27 (AF 12)	42 Cr Mo 4 V 42 Cr Mo 4 V
2	-	1	Idler shaft	C 45
3	1	2	Cover 200, without borehole	
4	2	2	Circlip I 200	DIN 472
5	5	5	Compensating disc 170/200 x 4	
6	2	2	Sealing ring 128/200 x 4	
7	2	2	Sealing ring 143/200 x 4	
8	3	3	Hexagon head screw M20 x 75	DIN 933 - 10.9
9	1	1	Tightening disc	
10	1	1	Self-aligning roller bearing 22222	DIN 635
11	1	1	Self-aligning roller bearing 23026	DIN 635
12	1	1	Spacer 156/130 x 45	
13	1	1	Spacer 142/110 x 44	
14	6	6	Compensating disc 180/200 x 1	
15	1	-	Cover 200, with borehole	
16	1	-	Circlip A 100 (AF 18) or circlip A 75 (AF 12)	DIN 471 DIN 471
17	1	-	Spacer sleeve 63 mm long (AF 18) or spacer sleeve 32 mm long (AF 12)	
18	2	2	Flanged bearing housing	GGG - 50
19	8	8	Locking screw M20 x 90	Durlok 12.9
20	8	8	Retained nut M20	
21	8	8	Clamping sleeve 10 x 80	DIN 1481
	8	8	Clamping sleeve 21 x 80	DIN 1481
22	2	2	Plane lubricating nipple M22 / R $\frac{3}{8}$ "	
23	2	2	Set screw M6 x 8	DIN 551
24	1	-	Feather key (only for hollow shaft gearbox with feather key connection)	DIN 6885
44	1	1	Reducing nipple M 16 / R $\frac{1}{4}$ "	



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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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