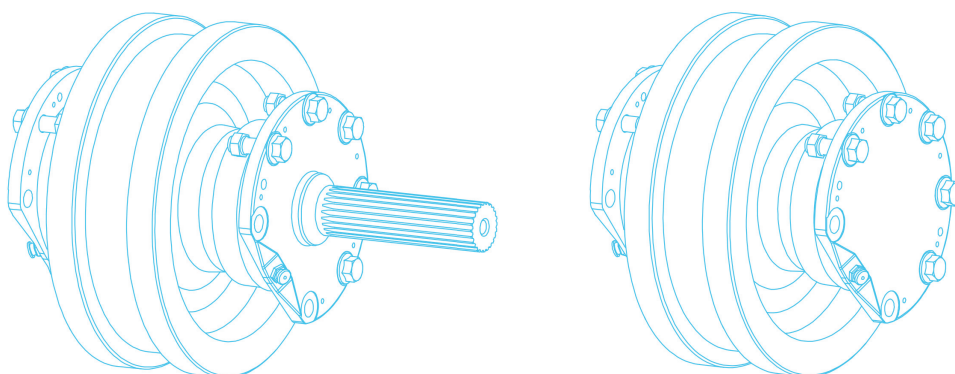


Installation and Maintenance Instructions

TITAN

WHEEL SET

SERIES KG 130



RAE/RNE 250, 315
RAEK/RNEK 250, 315



KARL GEORG

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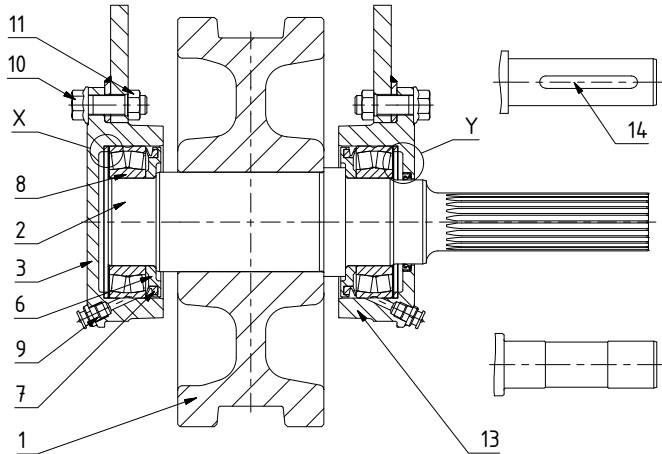
Before installing the wheel set and commissioning, read these Installation and Maintenance Instructions. Observe all directions and instructions. We accept no liability for damage and malfunctions caused as a result of non-observance of these instructions.

1. Technical construction RAE/RNE 250, 315

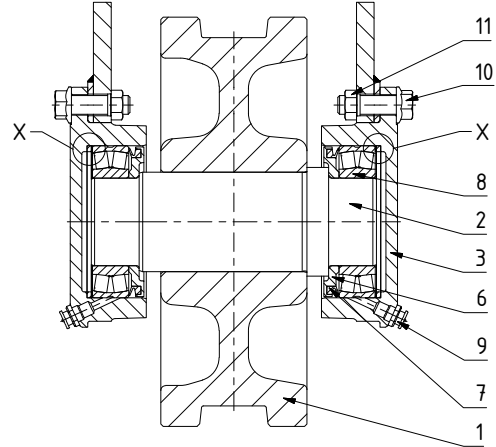
Installation version 1 and 2

Installation of corner bearing, delivered complete

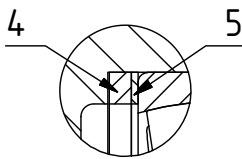
**Wheel set RAE
driven**



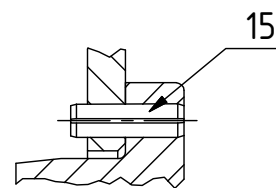
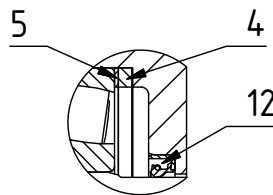
**Wheel set RNE
not driven**



Detail X



Detail Y



Parts list

Part	Number per wheel set		Designation
	RAE	RNE	
1	1	1	Crane wheel
2	1	1	Drive shaft/Idler shaft
3	1	2	Flanged bearing housing
4	2	2	Compensating disc \varnothing 130/120 x 3,5
5	2	2	Compensating disc \varnothing 130/120 x 1
6	2	2	Bearing cap
7	2	2	V-Ring V110A
8	2	2	Self aligning roller bearing DIN 635 - 222 15
9	2	2	Flat grease nipple DIN 3404 - M1 - G1/4
10	10	10	Locking screw M 16 x 50 - 10.9 ZT (Sperr-Ripp)
11	10	10	Retained nut M 16
12	1	0	Radial shaft seal DIN 3760 - B1 \varnothing 72/84 x 7
13	1	0	Flanged bearing housing with hole
14	1	0	Feather key DIN 6885/1 (Design depending on the drive shaft)
15	8	8	Locking pin ISO 8752 - \varnothing 12 x 30 (only for installation version 2)

1.1 Installation dimensions and hole pattern for the steel construction

Installation version 1

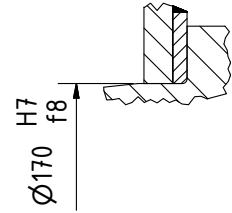
Installation of corner bearing, delivered complete Flange centering mechanically machined

For this installation version, the locating holes for the flanged bearing housing in the steel construction are mechanically machined with the tolerances of fit $\varnothing 170$ H7.

Thus, this eliminates extensive alignment of the wheel set and pinning of the flanged bearing housing after installation.

The wheel sets are complete, i.e. supplied as a ready-to-install unit.

Preparation of the steel construction in accordance with the hole pattern (Figure 1) is possible as a quick, corner bearing installation using commercial tools.



Radial forces are absorbed through the tolerance fit

Hole pattern representation Installation of corner bearing installation (figure 1)

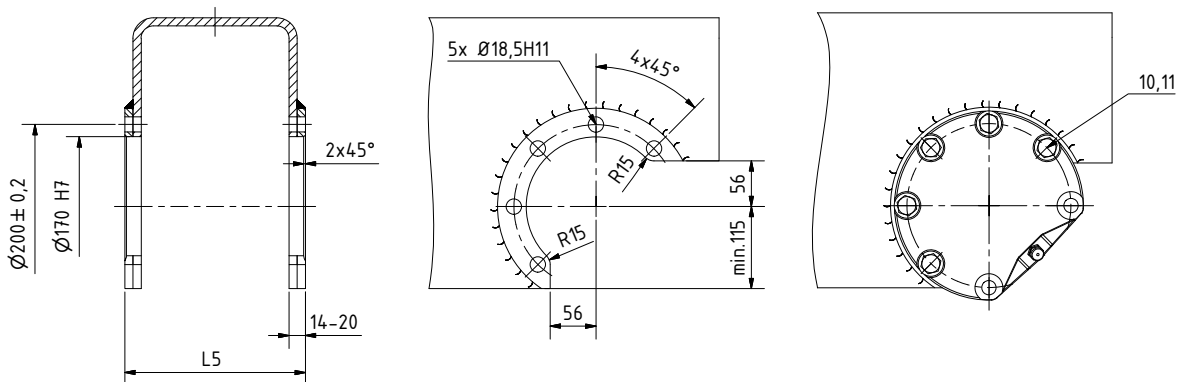


Table 1

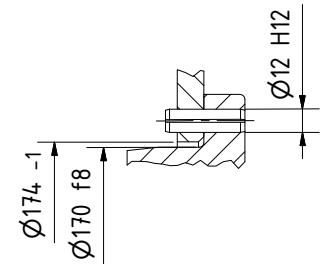
Wheel set	L5 +0,3	Number per flanged bearing housing	
		Locking screw with retained nut	Tightening torque
RAE/RNE 250	220	5 off M16x50	300 Nm
RAE/RNE 315	250	5 off M16x50	300 Nm

1.2 Installation dimensions and hole pattern for the steel construction

Installation version 2

Installation of corner bearing, delivered complete Flange centering flame-cutting

For this installation version, the locating holes for the flanged bearing housing in the steel construction is flame-cutting to $\varnothing 174 - 1$ mm. However, in this case, precise alignment of the wheel sets is necessary by displacing the flanged bearing housing after installation. The wheel sets are complete, i.e. supplied as a ready-to-install unit. Preparation of the steel construction is carried out in accordance with the hole pattern (Figure 2). After alignment, the exact position of the flanged bearing housing is fixed using the locking pins.



Radial forces are absorbed through locking pins

Hole pattern representation, corner bearing installation (Figure 2)

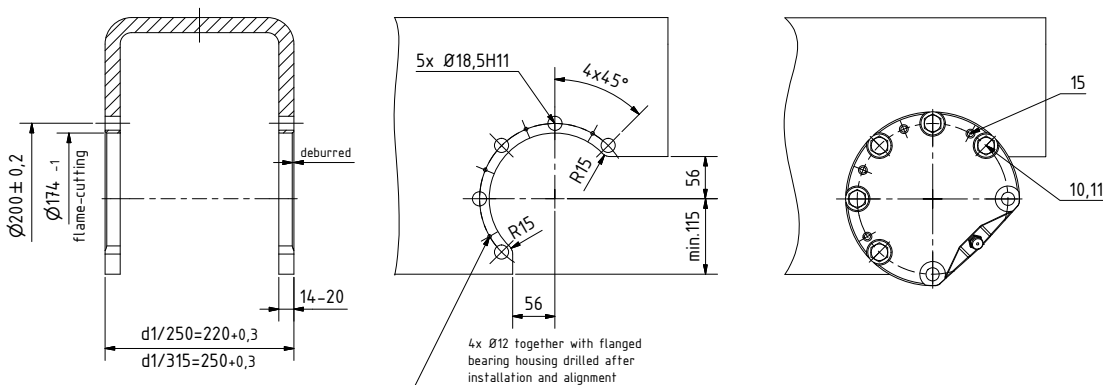


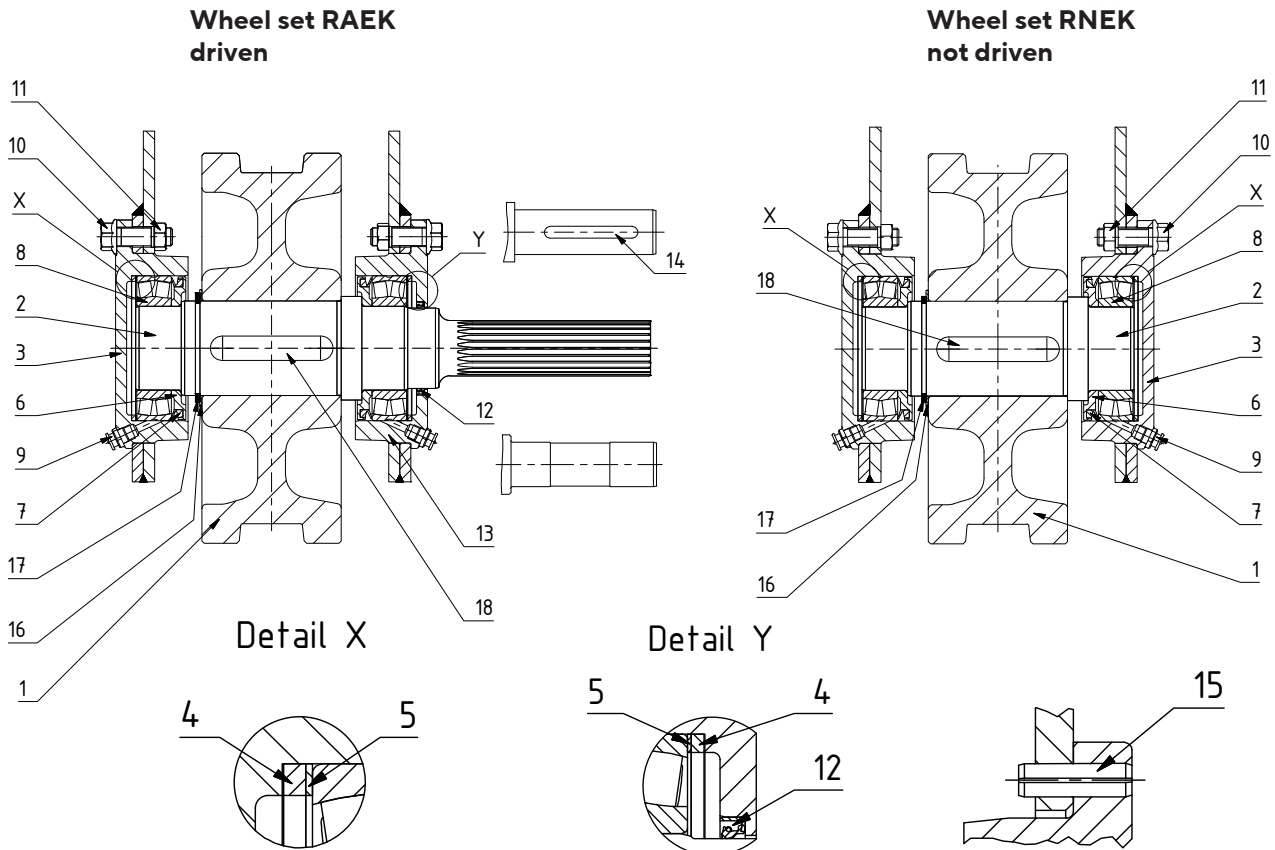
Table 2

Wheel set	L5 +0,3	Number per flanged bearing housing		
		Locking pin	Locking screw with retained nut	Tightening torque
RAE/RNE 250	220	4 off 12x30	5 off M16x50	300 Nm
RAE/RNE 315	250	4 off 12x30	5 off M16x50	300 Nm

2. Technical construction RAEK/RNEK 250, 315

Installation version 3 and 4

Installation of box girder, supplied as individual parts



Parts list

Part	Number per wheel set		Designation
	RAEK	RNEK	
1	1	1	Crane wheel
2	1	1	Drive shaft/Idler shaft
3	1	2	Flanged bearing housing
4	2	2	Compensating disc $\varnothing 130/120 \times 3,5$
5	2	2	Compensating disc $\varnothing 130/120 \times 1$
6	2	2	Bearing cap
7	2	2	V-Ring V110A
8	2	2	Self aligning roller bearing DIN 635 - 222 15
9	2	2	Flat grease nipple DIN 3404 - M1 - G1/4
10	10	10	Locking screw M 16 x 50 - 10.9 ZT (Sperr-Ripp)
11	10	10	Retained nut M 16
12	1	0	Radial shaft seal DIN 3760 - B1 $\varnothing 72/84 \times 7$
13	1	0	Flanged bearing housing with hole
14	1	0	Feather key DIN 6885/1 (design depending on the drive shaft)
15	8	8	Locking pin ISO 8752 - $\varnothing 12 \times 30$ (only for version 4)
16	1	1	Disc DIN 988 - $\varnothing 85/105 \times 2$
17	1	1	Circlip DIN 471 - $\varnothing 85 \times 4$ (heavy-duty design)
18.1 ($\varnothing 250$)	1	1	Feather key DIN 6885/1 - A 22 x 14 x 100
18.2 ($\varnothing 315$)	1	1	Feather key DIN 6885/1 - A 22 x 14 x 110

2.1 Installation dimensions and hole pattern for the steel construction

Installation version 3

Box girder installation, delivered in individual parts

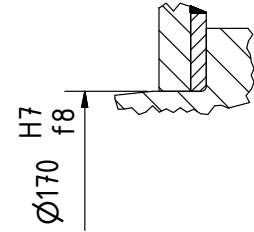
Flange centering mechanically machined

For this installation version, the locating holes for the flanged bearing housing in the steel construction are mechanically machined with the tolerances of fit $\varnothing 170$ H7.

Thus, this eliminates extensive alignment of the wheel set and pinning of the flanged bearing housing after installation.

The wheel sets are supplied as individual parts.

Preparation of the steel construction in accordance with the hole pattern (Figure 3) is possible as a quick, box girder installation using commercial tools.



Radial forces are absorbed through the tolerance fit

Hole pattern representation, box girder installation (Figure 3)

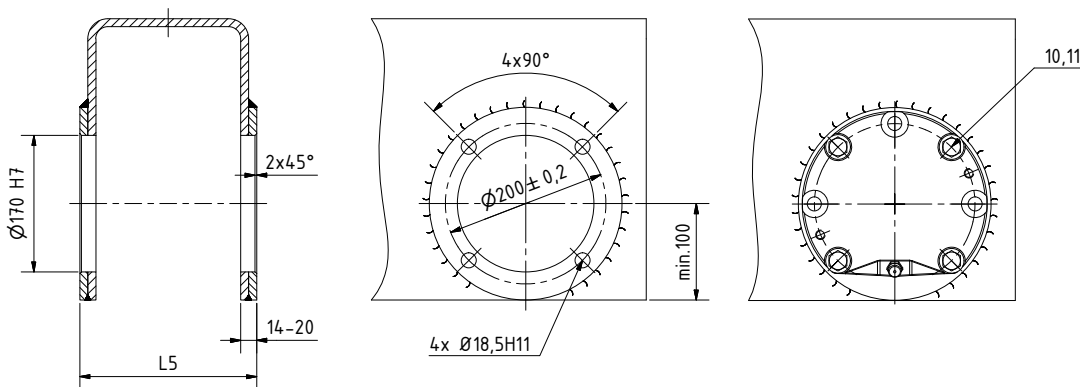


Table 3

Wheel set	L5 +0,3	Number per flanged bearing housing	
		Locking screw with retained nut	Tightening torque
RAEK/RNEK 250	220	5 off M16x50	300 Nm
RAEK/RNEK 315	250	5 off M16x50	300 Nm

2.2 Installation dimensions and hole pattern for the steel construction

Installation version 4

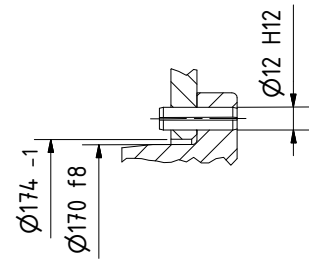
Box girder installation, delivered in individual parts

Flange centering, flame-cutting

For this installation version, the locating holes for the flanged bearing housing in the steel construction are flame-cutting to $\varnothing 174$ -1.

However, in this case, precise alignment of the wheel sets is necessary by displacing the flanged bearing housing after installation. The wheel sets are supplied as individual parts.

Preparation of the steel construction is carried out in accordance with the hole pattern (Fig. 4). After alignment, the exact position of the flanged bearing housing is fixed using the locking pins.



Radial forces are absorbed through locking pins

Hole pattern representation, corner bearing installation (Figure 4)

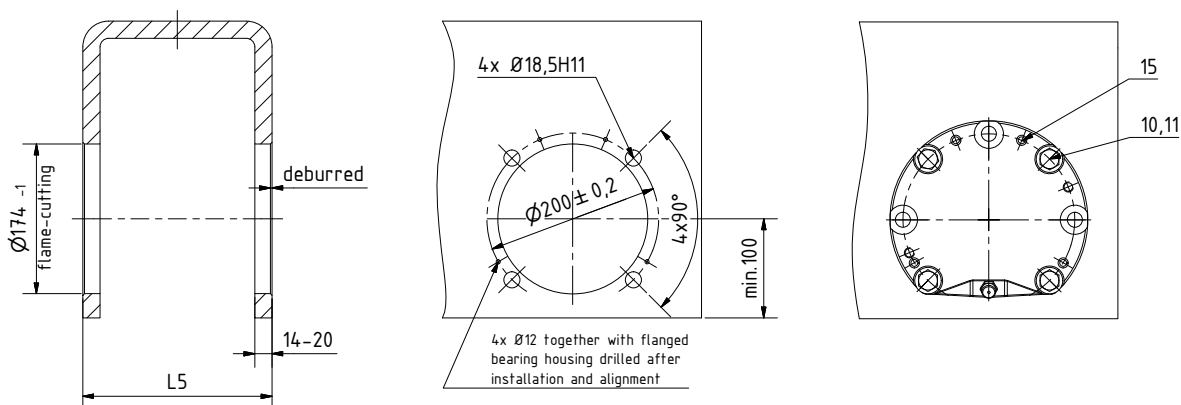


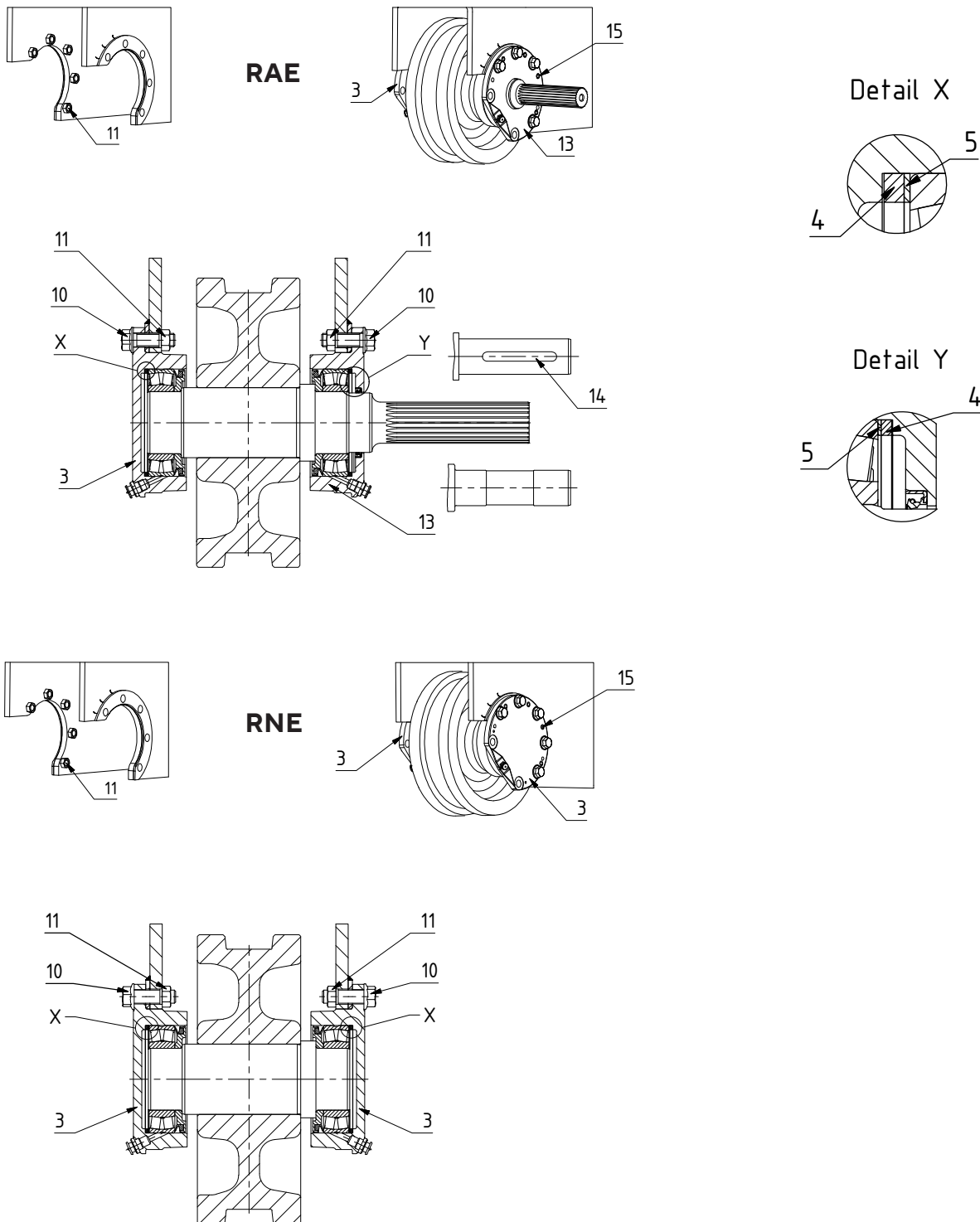
Table 4

Wheel set	L5 +0,3	Number per flanged bearing housing		Tightening torque
		Locking pin	Locking screw with retained nut	
RAEK/RNEK 250	220	4 off 12x30	5 off M16x50	300 Nm
RAEK/RNEK 315	250	4 off 12x30	5 off M16x50	300 Nm

3. Installation of Wheel sets RAE/RNE 250, 315

Installation version 1 and 2

Installation of corner bearing, delivered complete



Using interchangeable compensating discs (4/5) the position of the wheel to the rail and thus the average track dimension can be changed.

Table 5

Wheel set	Number per flanged bearing housing Thickness of compensating disc	max. adjustment option
RAE/RNE 250	1 x 3,5 mm and 1 x 1,0 mm	± 4,5 mm
RAE/RNE 315	1 x 3,5 mm and 1 x 1,0 mm	± 4,5 mm

3.1 Installation procedure, installation version 1

Installation of corner bearing, delivered complete

Flange centering mechanically machined

1. Manufacture the steel construction in accordance with 1.1 (refer to Page 4).
2. From the inside, install retained nuts M 16 (11) in the prefabricated holes \varnothing 18.5 mm in the steel construction.
3. Insert the complete wheel set into the steel construction
4. Use the locking screws (10) and attach both flanged bearing housings (3,13) to the steel construction, tightening torque 300 Nm (in accordance with Table 1 on Page 4)
5. Relubricate both roller bearings



However, this simple installation process is only applicable if the dimension of the steel construction (clearance of the flanged bearing housing) has been manufactured exactly as given in Figure 1 on Page 4 ($L5 +0.3$ mm). If the installation dimension is exceeded by more than 1 mm, the difference must be compensated by installing the corresponding compensating discs (4, 5). Thereby, there is less axial play.



If the installation dimension ($L5 +0.3$ mm) has been manufactured smaller, before installing the flanged bearing housing, it is **mandatory** to remove the appropriate compensating discs (4, 5). Only thus can constraining forces on the self-aligning roller bearings be prevented and thus, damage caused by the forces. After assembly, both flanged bearing housings must rest on the steel construction. The wheel set should then have a minimum axial play of 0.1 mm.

3.2 Installation procedure, installation version 2

Installation of corner bearing, delivered complete

Flange centering, flame-cutting

1. Manufacture the steel construction in accordance with 1.2 (refer to Page 5).
2. From the inside, install retained nuts M 16 (11) in the prefabricated holes \varnothing 18.5 mm in the steel construction.
3. Insert the complete wheel set into the steel construction
4. Attach both flanged bearing housings (3,13) to the steel construction using the locking screws (10), thereby, only hand tighten the bolts.
5. Using suitable measurement tools, accurately align all wheel sets of the system by moving the flanged bearing housing.
6. Once alignment is complete, fully tighten the locking screws (10) to the tightening torque of 300 Nm (in accordance with Table 2 on Page 5).
7. Open up the predrilled holes \varnothing 5 mm in all flanged bearing housings together with the steel construction to \varnothing 12 mm (in accordance with Figure 2 on Page 5).
Subsequently, tap in the locking pins (15). Thereby, the flanged bearing housing can be released at any time and accurately installed again.
8. Relubricate both roller bearings.

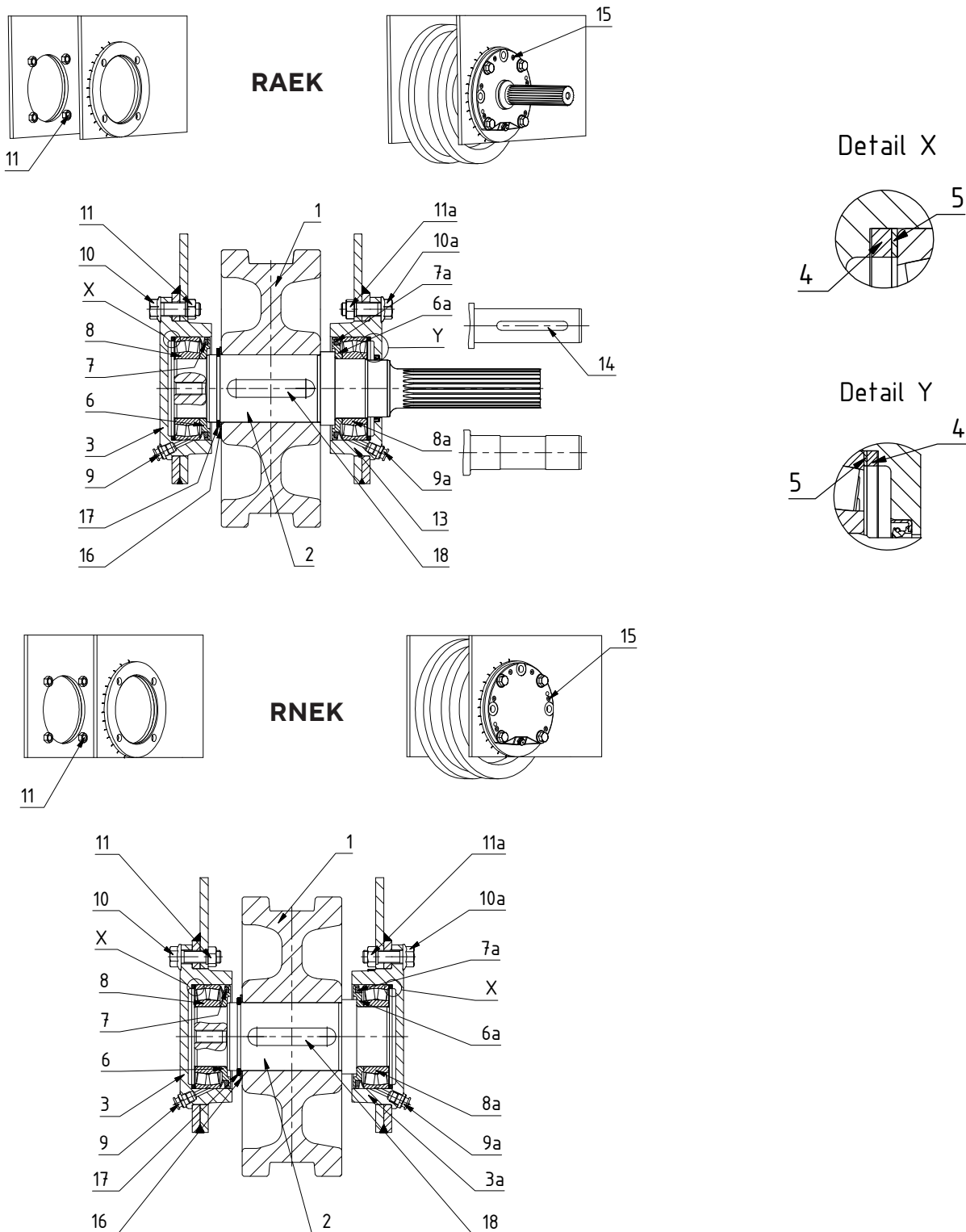


If the dimension of the steel construction ($L5 +0.3$ mm) has not been manufactured accurately in accordance with Figure 2 on Page 5, appropriate compensating discs (4, 5) must be removed from or installed in the flanged bearing housing, in accordance with 3.1. To prevent constraining forces acting on the self-aligning roller bearings, make sure that there is small axial play.

4. Installation of the wheel sets RAEK/RNEK 250, 315

Installation version 3 and 4

Installation of box girder, supplied as individual parts



Using interchangeable compensating discs (4/5) the position of the wheel to the rail and thus the average track dimension can be changed.

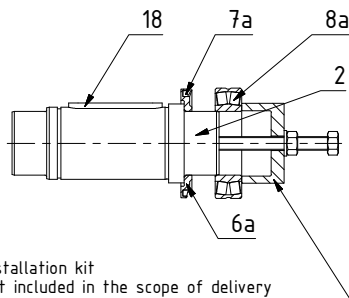
Table 6

Wheel set	Number per flanged bearing housing Thickness of compensating disc	max. adjustment option
RAEK/RNEK 250	1 x 3,5 mm and 1 x 1,0 mm	± 4,5 mm
RAEK/RNEK 315	1 x 3,5 mm and 1 x 1,0 mm	± 4,5 mm

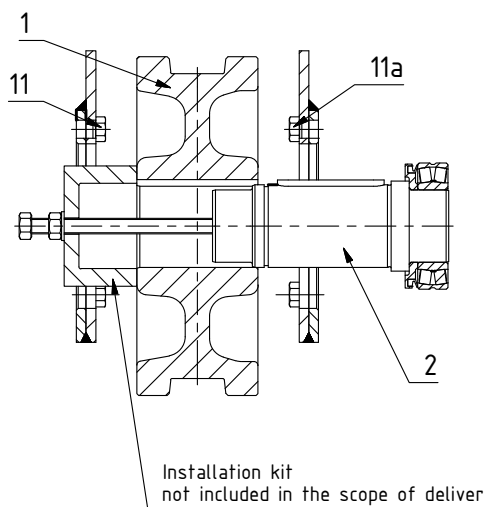
4.1 Installation procedure, installation version 3

Box girder installation, delivered as individual parts

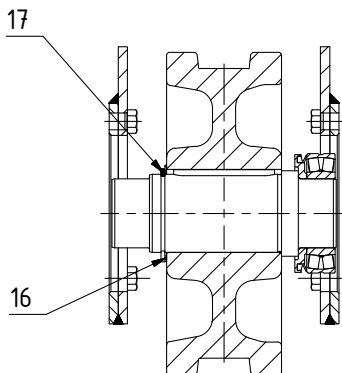
Flange centering mechanically machined



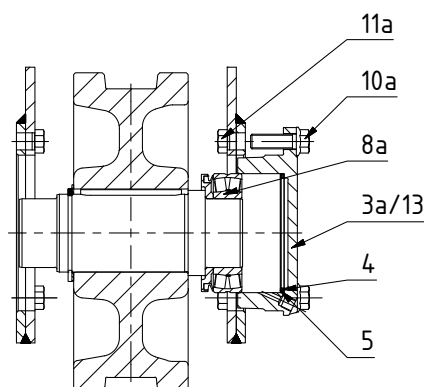
1. Manufacture the steel construction in accordance with 2.1 (refer to Page 7).
2. From the inside, install retained nuts (11, 11a) in the prefabricated holes $\varnothing 18.5$ mm in the steel construction.
3. Install the bearing cap (6a) with V-Ring (7a) and self-aligning roller bearing (8a) on the collar side of the drive and idler shaft (2) (refer to note for installation kit).
4. Install the feather key (18) in the groove of the drive and idler shaft (2).



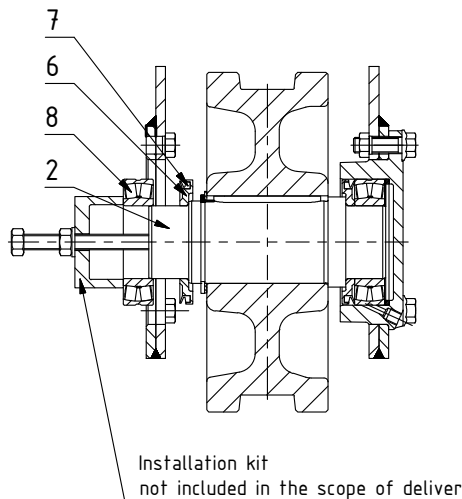
5. Roll the crane wheel (1) into the box girder.
6. Push or pull in the drive and idler shaft (2) into the crane wheel (1) until the shaft collar rests on the hub of the crane wheel (refer to note for installation kit)



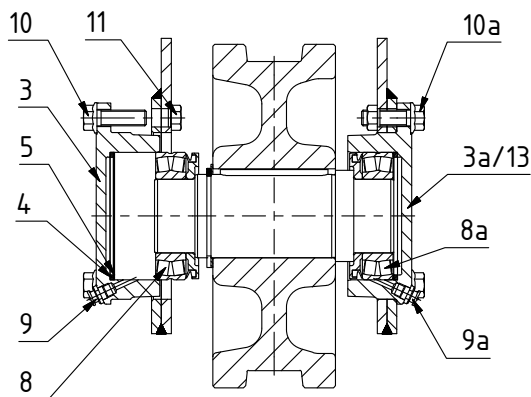
7. Install the disc (16) and circlip (17).



8. Install one compensating disc (4) and one compensating disc (5) in the flanged bearing housing (3a/13).
9. Push the flanged bearing housing (3a) and flanged bearing housing (13) with installed radial shaft seal (12) over the self-aligning roller bearing (8a) and attach to the steel construction using the locking screws (10a) and retained nut (11a).



10. Install the bearing cover (6) with V-Ring (7) and self-aligning roller bearing (8) on the other side of the drive and idler shaft (2) (refer to note for installation kit).



11. Install one compensating disc (4) and one compensating disc (5) in the flanged bearing housing (3).
12. Push the flanged bearing housing (3) over the self-aligning roller bearing (8) and use the locking screws (10) and retained nut (11) to attach to the steel construction.
13. Install the lubrication nipples (9a and 9) in both flanged bearing housings (3/13).
14. Fully tighten all locking screws (10a and 10) to both flanged bearing housings with a tightening torque of 300 Nm (in accordance with Table 3 on Page 7).
15. Using suitable roller-bearing grease, lubricate the self-aligning roller bearings (8a and 8) through the lubrication nipples (9a and 9) until the lubricant escapes from the seals (refer to Chapter 5).



However, this installation process is only applicable if the dimension of the steel construction (clearance of the flanged bearing housing) has been manufactured exactly as given in Figure 3 on Page 7 ($L5 + 0.3 \text{ mm}$).

If the installation dimension is exceeded by more than 1 mm, the difference must be compensated by installing the corresponding compensating discs (4, 5). Thereby, there is less axial play.



If the installation dimension ($L5 + 0.3 \text{ mm}$) has been manufactured smaller, before installation, it is **mandatory** to remove the appropriate compensating discs (4, 5) from the flanged bearing housing. Only thus can constraining forces on the self-aligning roller bearings be prevented and thus, damage caused by the forces. After assembly, both flanged bearing housings must rest on the steel construction. The wheel set should then have a minimum axial play of 0.1 mm.

Installation kit:

There is a M16 threaded hole on both ends of the shafts to make it easier to pull the drive and idler shaft into the crane wheel and draw the self-aligning roller bearing onto the drive and idler shaft.

An installation kit with spacer tubes, discs, bolts, nuts etc. is not included in the scope of delivery and, depending on the design and length of the drive shafts, must be manufactured by the customer.

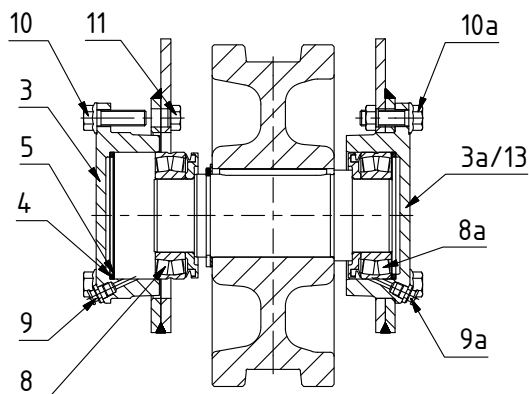
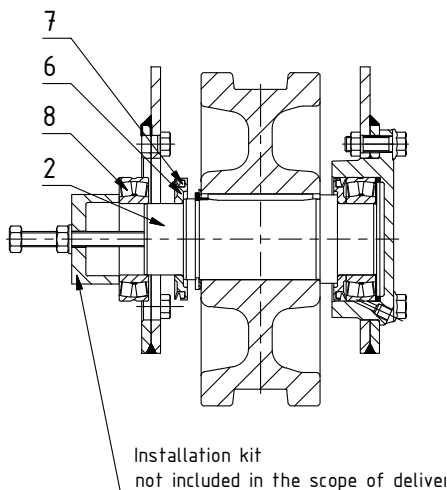
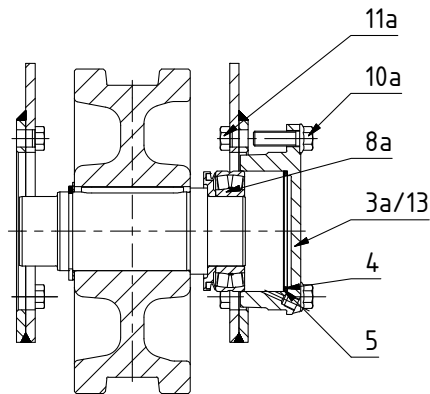
4.2 Installation procedure, installation version 4

Box girder installation, delivered in individual parts

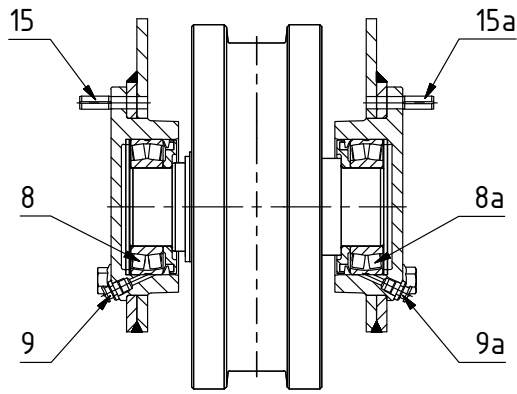
Flange centering, flame-cutting



From Point 2 to 8, the installation procedure for installation version 4 is identical to the installation procedure for installation version 3 (refer to Page 13).



1. Manufacture the steel construction in accordance with 2.2 (refer to Page 8).
2. to 8. refer to Page 13
9. Push the flanged bearing housing (3a) and flanged bearing housing (13) with installed radial shaft seal (12) over the self-aligning roller bearing (8a) and attach to the steel construction using the locking screws (10a) and retained nut (11a), thereby, only hand tighten the screws.
10. Install the bearing cap (6) with V-Ring (7) and self-aligning roller bearing (8) on the other end of the drive and idler shaft (2) (refer to note for installation kit).
11. Install one compensating disc (4) and one compensating disc (5) in the flanged bearing housing (3).
12. Push the flanged bearing housing (3) over the self-aligning roller bearing (8) and use the locking screws (10) and retained nut (11) to attach to the steel construction, thereby, only hand tighten the screws.
13. Install the lubrication nipples (9a and 9) in both flanged bearing housings (3/13).
14. Using suitable measurement tools, accurately align all wheel sets of the system by moving the flanged bearing housing.
15. Once alignment is complete, fully tighten the locking screws (10, 10a) on all flange bearing housings to the tightening torque of 300 Nm (in accordance with Table 4 on Page 8).



16. Open up the predrilled holes $\varnothing 5$ mm in all flanged bearing housings together with the steel construction to $\varnothing 12$ mm (in accordance with Figure 4 on Page 8). Subsequently, tap in the locking pins (15, 15a). Thereby, the flanged bearing housing can be released at any time and accurately installed again.
17. Fill the self-aligning roller bearings (8, 8a) with grease through the lubrication nipples (9, 9a) (refer to Chapter 5).



However, this installation process is only applicable if the dimension of the steel construction (clearance of the flanged bearing housing) has been manufactured exactly as given in Figure 4 on Page 8 ($L5 + 0.3$ mm).

If the installation dimension is exceeded by more than 1 mm, the difference must be compensated by installing the corresponding compensating discs (4, 5). Thereby, there is less axial play.



If the installation dimension ($L5 + 0.3$ mm) has been manufactured smaller, it is mandatory to remove the appropriate compensating discs (4, 5). Only thus can constraining forces on the self-aligning roller bearings be prevented and thus, damage caused by the forces.

After assembly, both flanged bearing housings must rest on the steel construction. The wheel set should then have a minimum axial play of 0.1 mm.

Installation kit:

There is a M16 threaded hole on both ends of the shafts to make it easier to pull the drive and idler shaft into the crane wheel and draw the self-aligning roller bearing onto the drive and idler shaft.

An installation kit with spacer tubes, discs, bolts, nuts etc. is not included in the scope of delivery and, depending on the design and length of the drive shafts, must be manufactured by the customer.

5. Commissioning, Maintenance and Servicing

Recurring check

in accordance with UVV (Accident Prevention Regulations) cranes BGV D6 § 26 Para. 1 (VBG 9) and the basic principles for specialist examinations (ZH 1/27)

Lubrication and maintenance



The wheel sets RAE/RNE are supplied as complete units. The self-aligning roller bearings are filled with roller-bearing grease Multifak EP 2 (Texaco).

The wheel sets RAEK/RNEK are supplied as individual parts. The self-aligning roller bearings **must** be filled with grease after installation.

Type of lubrication: lubricating using grease
 Lubricant: Multifak EP 2 (Texaco) or equivalent roller bearing grease from another manufacturer (suitable for use at temperatures of -30 °C to +90 °C)

For use at temperatures to -50 °C, we recommend the roller-bearing grease Renolit Unitemp 2 (Fuchs) or an equivalent, frost-resistant grease from another manufacturer.
 For temperatures of more than 90 °C, use appropriate temperature-resistant seals and suitable high-temperature lubricants.

Re-lubrication: After every 2000 operating hours through the lubrication nipple through the flanged bearing housing

Change lubricant: Annually

Before attaching the gear motor, apply a layer of suitable assembly grease to the drive shafts with gearing or feather key.

Servicing

Replace damaged seals (V-Rings and radial shaft seals).

Running surfaces and flange wear of the crane wheel:
 Inspection every 3 months

If there is wear on the running surfaces of more than 8 mm and at a wheel flange width of less than 10 mm, replace the crane wheel.

Use a torque wrench and check the specified tightening torques of all locking screws after 3 months operating time.
 Subsequently, annually within the framework of the recurring check.

The maintenance intervals given are reference values that must be adapted in extreme operating conditions.

EG-Einbauerklärung *Declaration of Incorporation*

im Sinne der EG-Richtlinie 2006/42/EG, Anhang II B für unvollständige Maschinen
according to EC directive 2006/42/EC, Annex II B, in respect of incomplete machinery

Name und Anschrift des Herstellers / *Name and address of the manufacturer:*

Karl Georg GmbH
Karl-Georg-Straße 3
D - 57612 Ingelbach-Bahnhof

Hiermit erklären wir, dass die nachstehend beschriebene unvollständige Maschine:
Herewith we declare, that the partly completed machinery described below:

Produktbezeichnung/ product denomination : **Titan Radsatz KG130**
Titan Wheelset KG 130

Serien- / Typenbezeichnung / model / type : **RAEKOF / RNEKOF 500 - 630**

Baujahr/ Year of manufacture : **2024**

alle grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EG erfüllt, soweit es im Rahmen des Lieferumfangs möglich ist. Ferner erklären wir, dass die speziellen technischen Unterlagen gemäß Anhang VII Teil B dieser Richtlinie erstellt wurden.
is complying with all essential requirements of the Machinery Directive 2006/42/EC, as far as the scope of delivery allows. Additional we declare that the relevant technical documentation is compiled in accordance with part B of Annex VII.

Folgende harmonisierte Normen sind angewandt / *the following harmonized standards have been applied:*

- DIN EN ISO 12100, Sicherheit von Maschinen/ *Safety of Machinery*
- DIN EN 13001 Teil 1...3-8, Krane - Konstruktion allgemein/ *Cranes - general design*
- DIN EN 13135, Krane - Sicherheit/ *Safety of cranes*

Der Hersteller verpflichtet sich die technische Dokumentation zur unvollständigen Maschine einzelstaatlichen Stellen auf begründetes Verlangen in PDF-Form zu übermitteln.

The manufacturer undertakes to submit the technical documentation relating to the incomplete machine to the relevant national authorities in PDF format on request.

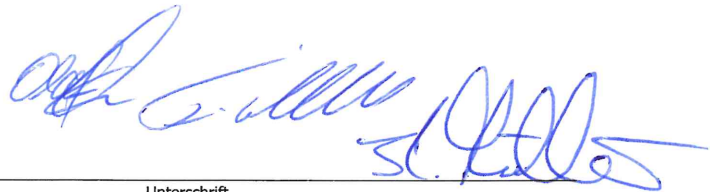
Bevollmächtigter für die Zusammenstellung der relevanten technischen Unterlagen (EU-Adresse):
The person authorised to compile the relevant technical documentation (must be established within EU):

Herr (Mr.) Michael Kubalski, QM (*Quality Department*)

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine oder Anlage, in welche die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Richtlinie 2006/42/EG über Maschinen entspricht und die EG-Konformitätserklärung gemäß Anhang II A ausgestellt ist.
The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of Directive 2006/42/EC on Machinery, where appropriate, and until the EC Declaration of Conformity according to Annex II A is issued.

D-57612 Ingelbach/Bhf., 04.01.2024

Hees, Olaf, GF
Winkel, Tim, GF
Müller, Kevin, GF



Ort, Datum
Place, Date

Name, Vorname, Funktion
surname, first name, function

Unterschrift
Signature

Notes:



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

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

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