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**Explosion-Protected Crane Components** — ↘ EN  
Operating and Maintenance Instructions

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⊕ II 2 G (ATEX) - Zone 1

⊕ II 2 D (ATEX) - Zone 21

**STAHL**  
Crane*Systems*



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## ***Fundamental information***

You have purchased a product manufactured by STAHL CraneSystems GmbH. These crane components have been constructed in compliance with the applicable standards and regulations.

**Inspect crane components for damage caused in transit immediately upon delivery.**

Report damage caused in transit and after consulting the manufacturer/supplier repair or have repaired before installation and commissioning.  
Do not install or commission a damaged crane component!

- **Assembly**
- **installation**
- **commissioning**
- **tests**
- **maintenance and elimination of faults**

**may only be carried out by an Ex-specialist**

### **Terms employed**

#### **User**

Whoever uses and employs the crane or has it operated by suitable trained personnel is considered to be the user (employer/company).

#### **Trained personnel**

Trained personnel are persons who have been instructed and trained in the duties with which they are entrusted and the risks which may arise from incorrect behaviour, have been advised on the necessary protective devices, precautions, applicable regulations, accident prevention regulations and prevailing conditions and have proven their ability.

#### **Skilled electrician**

A skilled electrician possesses knowledge and experience on electrical equipment arising from specialist training and, with knowledge of the applicable standards and regulations, is able to assess the work with which he is entrusted and detect and avoid possible risks.

#### **Definition of a qualified person:**

A qualified person is one with the necessary qualification, based on theoretical and practical knowledge of hoists, in particular with regard to explosion protection, for the required activities as listed in the operating instructions.

The person must be in a position to assess the safety of the installation in conjunction with the application.

Persons with the authority to undertake certain maintenance work on our products include service engineers of manufacturer and trained fitters with the corresponding certification.

#### **Seminars:**

Comprehensive understanding of material handling products is a prerequisite for the correct use of equipment. Competent and practically oriented, we impart the specialist knowledge required for the correct use, monitoring and care of your installation. Please ask for our seminar programme.

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## 1.1 Symbols



### **Safety at work**

This symbol marks all information on safety at work where risks to life and limb are entailed.

### **Explosion protection**

The explosion-protected crane complies with EC Directive 94/9/EC (ATEX 100a) and is constructed according to European norms. The components are certified by a designated institute (PTB). Mechanical explosion protection is designed and manufactured in accordance with the EN standards 13 463 presently in preparation. The documents are filed in a designated place. Certification has been ensured by means of a quality management system.



Components bearing this symbol are explosion-protected (protection class Ex, e: e.g. connection boxes and Ex, d: e.g. panel boxes for electrical equipment, motors and brakes). Work on these components may only be carried out by qualified personnel that has been especially trained on explosion protection. This applies also to work performed on mechanical components → mechanical explosion protection in accordance with ATEX.



### **Warning of suspended load**

It is forbidden for persons to stand under suspended loads. This entails risks to life and limb!



### **Warning of electrical voltage**

Covers such as hoods and caps which are marked with this symbol may only be opened by "qualified persons or suitably instructed personnel".



### **Safety in operation**

Information marked with this symbol must be observed to avoid damage to the crane or the goods transported.

In these operating instructions, these symbols mark particularly important information on risks and safety in operation.

## 1.2 Mechanical components

"Mechanical explosion protection" refers to all mechanical sub-assemblies (non-electrical sub-assemblies).

On overhead travelling cranes, this applies in particular to wheels.

These sub-assemblies have been manufactured in such a way, relating to the specific order, that they do not present any risks when used for the intended purpose. To ensure lifetime safety, these sub-assemblies must be inspected and serviced carefully in accordance with these operating instructions.

## 1.3 Operating instructions

Follow the operating instructions! Operating instructions are required by the EC Machinery Directive and EC Directive 94/9.

The operator is legally obliged to follow them by EC Directive 99/92.

## 1.4 Use for intended purpose

- Crane components are intended for the construction of cranes and similar installations. They may only be used in accordance with their design principles.
- Do not carry out any alterations or modifications. Additional fitments must be authorised by the manufacturer. The declaration of conformity may be invalidated.

### Not permitted:

- Exceeding the safe working load
- Pulling loads loose
- If the crane component forms "part of a machine," the person placing it on the market must ensure that the hoist meets the specific regulations of the application

## 1.5 Safety-conscious operation



The explosion-protected crane components are constructed according to the state of the art. In spite of this, dangers may arise from incorrect use or use for an unintended purpose.

- The operator is responsible for ensuring that work is carried out with safety in mind and avoiding risks. (EC Directive 99/92/EC, decree on safety in operation).
- Read the operating instructions before starting work.
- Before starting work, find out where the EMERGENCY STOP button is (usually in the control pendant).
- Report damage and defects to the explosion-protected crane component (abnormal noises, impaired braking function, deformations, ...) to the person responsible immediately. Do not use the component until the faults have been eliminated.

## 1.6 Organisational safety precautions

- Only direct persons to operate the system if they have been trained or instructed in its use. Observe the legal minimum age!
- At regular intervals, check that work is being carried out in a safety-conscious manner.
- Observe the intervals specified for periodic tests. File the test reports in the test log book.
- Store the operating instructions within easy reach where the crane is operated.
- Safety regulations and accident prevention regulations.

## 1.7 General regulations



- Statutory regulations relating to EC Directive 99/92.
- National regulations
- See also operating instructions of ASex, SHex wire rope hoists or STex chain hoists.

## 1.8 Installation, commissioning, maintenance and repairs

- **Installation, commissioning, maintenance and repairs may be carried out by qualified persons only**, see page 2.
- We recommend having installation carried out by personnel engaged by the manufacturer.
- Use only **original spare parts** for repairs, otherwise the guarantee will become invalid.
- Additional fitments must not prejudice safety.
- Our after-sales service will advise you on correct use of the equipment. Repairs will be carried out professionally, quickly and economically by our trained personnel.

## 1.9 Warranty

- The warranty will become invalid if these operating instructions are not observed for installation, operation, inspection and maintenance.
- Repairs and elimination of faults within the scope of the warranty may only be performed by qualified personnel (see page 2) after the manufacturer/supplier has been consulted and has given his approval.  
The warranty will become invalid if the crane is modified or original spare parts not used

## 1.10 Periodic tests



Explosion-protected crane components must be inspected by a **qualified person**, see page 2 at least once a year, possibly more frequently if so required by national regulations. The results of the test must be recorded and filed in the test log book. The periodic tests must be adapted to the use of the explosion-protected crane components. Intensive use entails shorter maintenance intervals.

**All tests must be initiated by the user (see page 2).**



The components ensuring explosion protection must be checked every 3 years at the latest. As a rule, some of these are checked during the annual inspection (e.g. installation, attachment...) If the ambient conditions are severe, the intervals between the periodic tests must be shortened as necessary.

## 1.11 After sales service

With the purchase of these crane components, you have decided on a high-quality product. Our after sales service will give you advice on its correct use.

In order to maintain the safety and constant availability of your crane components, we recommend concluding a maintenance agreement on the basis of which we will undertake the "periodic tests" on your behalf.

Repairs will be carried out professionally and quickly by our trained personnel

### 2.1 Assembly of endcarriage

#### 2.1.1 Endcarriage type KEH-B

The endcarriages for suspension cranes KEH-B are supplied in pairs dismantled .

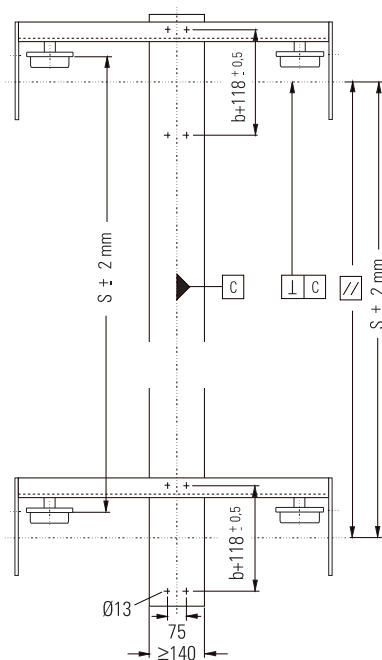
4 endcarriage side cheeks

1 set of bolt connection parts consisting of:

- connecting bolts for crane girder
- endcarriage connecting bolts
- rubber buffers with special fixing nut



Before assembly, please check that the capacity of the endcarriage is adequate for the intended application of the crane, see "Technical data".



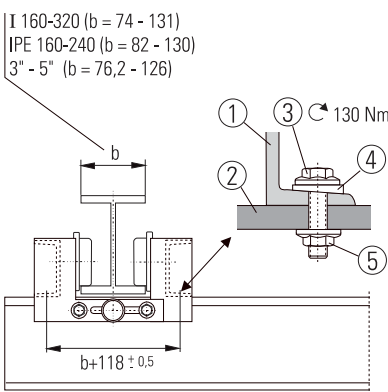
#### 2.1.2 Drilling crane girder connection

The distance between the holes along the length of the crane girder depends on the flange width of the crane runway and the span.

Mark and drill holes as per sketch.

#### 2.1.3 Assembly of endcarriage and crane girder

- Lay an inside and outside side cheek (1) on each crane girder (2) and bolt on loosely with the crane girder connection parts (3) - (5).
- Check that the side cheeks are parallel and at right angles and that the span is correct.
- Tighten bolt connection (3) - (5) as per specification with 130 Nm.



(1) Endcarriage side cheek

(2) Crane girder

(3) Locking bolt M12x40vz

(4) Limpet washer DIN 6918-13 tZn

(5) Locknut M12 vz



### 2.1 Assembly of endcarriage

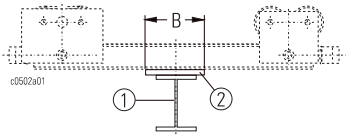
#### 2.1.4 Endcarriage type KEH-A

The endcarriage for suspension cranes KEH-A is supplied as standard fitted with wheelsets, end buffers, travel drive and endcarriage connection parts.

- Check that the capacity of the endcarriage is adequate for the intended application of the crane, see "Technical data".

#### 2.1.5 On assembly

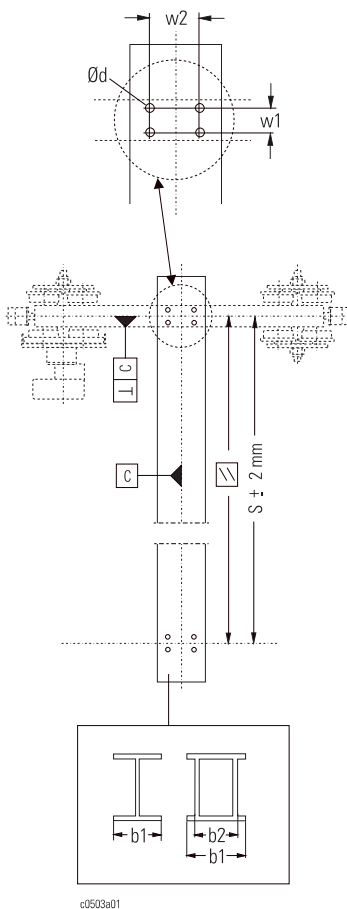
Perfect crane geometry is achieved by particularly careful assembly of endcarriage and crane girder. This guarantees smooth running of the crane causing little wear.



#### 2.1.6 Preparation of crane girder

If the width of the crane girder (1) is narrower than the minimum width specified (B), the crane girder must be widened by means of suitable shims (2) to ensure the necessary clearance to the bolt connections.

The contact surfaces between endcarriage and crane girder must be completely free of rust, dust, oil, paint, etc.!



#### 2.1.7 Drilling crane girder connection

The endcarriage is connected to the crane girder with a friction-locked non-slip connection. The precision essential for the connection holes can be ensured by:

1. using a drilling template made by yourself (advisable when building a large number of cranes) or
2. using the endcarriage itself as a template.

#### Procedure for 2:

- Lay both endcarriages onto the crane girder, align to ensure correct span and right angles
- Mark drilling pattern, remove endcarriages
- Drill connecting holes. **Pre-drilling a smaller hole increases accuracy!**

If the crane girder must be widened by means of shims, we recommend first drilling the shim and then welding it to the crane girder (see page 9, "Preparing crane girder").

KEH-A ..	Ød	w1	b1	w2	I		II	
					b2 ≤ 196		b2 ≤ 296	
					b1	w2	b1	w2
[mm]								
080 10.1E	13	62	≥180	120	≥350	250	-	-
080 18.1E								
080 25.1E	17	70	≥300	150	≥350	250	-	-
100 18.1E							≥450	350
100 25.1E								
125 25.1E	21	95			≥400	260	≥500	360
160 25.1E	25							

### 2.1 Assembly of endcarriage

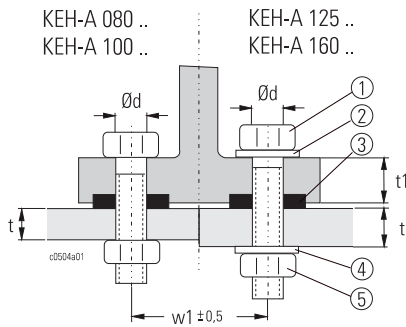
#### 2.1.8 Endcarriage type KEH-A (continued)

##### Assembly of endcarriage and crane girder

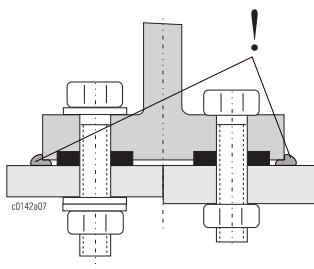
- Hammer washers (3) into the recesses in the endcarriage
- Fix bolt connection parts (1) and (5) (KEH-A 080, 100) or (1), (2), (4), (5) and (6) (KEH-A 125, 160).

##### Use only original connection parts!

- Remove rust, grease, paint, etc. from contact surfaces between endcarriage and crane girder
- Tighten bolt connections as specified
- Check span and that endcarriages are parallel and at right-angles.



KEH-A ..	t	t1	①	②	③	④	⑤	C *1 [Nm]
080 10.1E	10-23	20	M12x60 10.9 vz	-	25x13x8	-	M12-10 vz	130
080 18.1E								
080 25.1E	12-25	21	M16x70 10.9vz	-	36x17x8	-	M16-10 vz	330
100 18.1E								
100 25.1E								
125 25.1E	15-20	23	M20x80 DIN 6914vz	21 DIN 6916 vz	42x21x10	2x ② 1x ②	M20 DIN 6915 vz	450
	21-25							
160 25.1E	17-20	24	M24x85 DIN 6914vz	25 DIN 6916 vz	48x25x10	2x ② 1x ②	M24 DIN 6915 vz	800
	21-25							



#### 2.1.9 Outdoor application

- Seal gap between endcarriage and crane girder with sealant, see sketch.

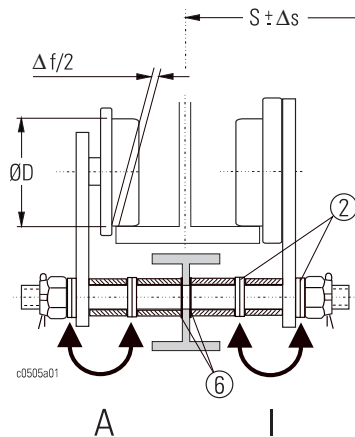
\*1 The values apply for galvanized, MoS2 coated original parts from STAHL CraneSystems

### 2.2 Adjustment to crane runway

#### Endcarriage type KEH-A

##### Adjusting flange width and correcting span

The endcarriages are adjusted in the works to the flange width specified in the order. This can be corrected by shifting distance washers (2). See tables page 12 - 15.



**The eccentricity arising must not exceed max. 3 mm, the total washer thickness of a travel unit must not be altered.**

The correction must be identical on both travel units of an endcarriage.

##### 2.2.1 Increasing play

By shifting distance washers (2) from outside to inside:

- Shift at (A) and (I).

Alternatively, adjusting washers (6) to DIN 988, see table, can be inserted between endcarriage section and spacer tubes.

Maximum thickness per side: 1 mm.

KEH-A ..	ØD	±Δf		±Δs	⊙
		[mm]			
080 ...	80	1,5/3	1,5/3/4,5/6	40 x 50 x s/ 42 x 52 x s	
100 ...	100				
125 ...	125	3	3/6	70 x 90 x s	
160 ...	160				

If only one side of an endcarriage is altered, the opposite side of the other endcarriage must be altered correspondingly :

- Left-hand endcarriage: inside
- Right-hand endcarriage: outside

If the play is altered on only one endcarriage, the other is subject to increased wear.

##### 2.2.2 Increasing span

By shifting distance washers (2) on one or both endcarriages from inside to outside on the inside of the crane runway, and from outside to inside on the inside of the crane runway.

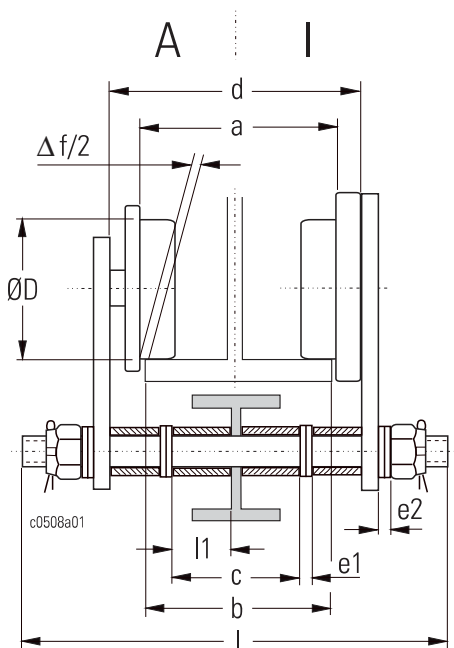
##### 2.2.3 Reducing span

By shifting distance washers (2) on one or both endcarriages from outside to inside on the inside of the crane runway, and from inside to outside on the outside of the crane runway.

### 2.2 Adjustment to crane runway

### Endcarriage type KEH-A

#### 2.2.4 Table for adjustment KEH-A 080



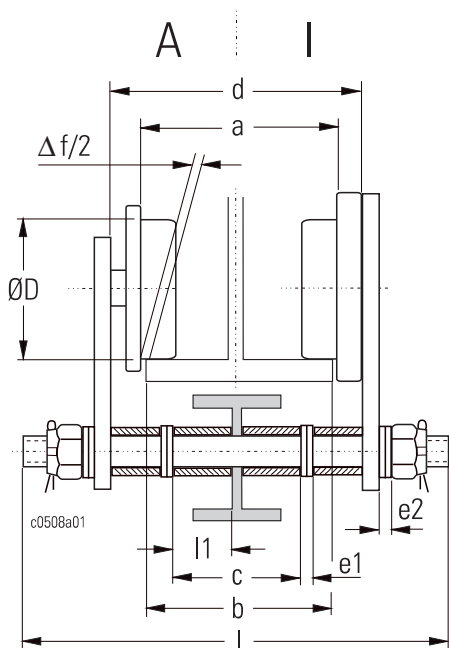
T	IPE	IPB	"	ØD	b	a	d	e1	e2	Δf	l	l1	c	*
[mm]														
-	140	-	-	80	73	76	130	4.5	22.5	3	304	25.4	60.4	8 x 3 mm + 2 x 1.5 mm
160	-	-	-		74	76	130	4.5	22.5	3.2				
-	-	-	3		76.2	79	133	6	21	3.9				
180	-	-	-		82	85	139	9	18	4.3				
-	180	-	-		82					3				
-	-	-	3,5		88.9	94	148	13.5	13.5	6.2				
200	-	-	-		90					5.3				
-	180	-	-		91					3				
220	-	-	-		98	100	154	16.5	10.5	3.4				
-	200	-	-		100	103	157	18	9	3				
-	-	-	4		101.6-102.4	106	160	19.5	7.5	5.6-4.3				
240	-	-	-		106	109	163	21	6	4.5				
-	220	-	-		110	115	169	24	3	5				
260	-	-	-		113	115	169	0	27	3.5	352	49.4	108.4	
280	-	-	-		119	121	175	3	24	3.6				
-	240	-	-		120	124	178	4.5	22.5	4				
-	-	-	5		124-126	127	181	6	21	3.7-1.7				
300	-	-	-		125					3.7				
320	-	-	-		131	133	187	9	18	3.8				
-	-	-	5,25		133-134	136	190	10.5	16.5	3.7-2.7				
-	270	-	-		135	139	193	12	15	4				
340	-	-	-		137					3.8				
-	-	140	-		140	145	199	15	12	5				
-	-	-	5,5		141.8-142.4					3.9-3.3				
360	-	-	-		143					3.9				
-	-	-	5,75		146-147	151	205	18	9	5.7-4.7				
380	-	-	-		149					4				
-	300	-	-		150	154	208	19.5	7.5					
-	-	-	6		152-154	157	211	21	6	5.7-3.7				
400	-	-	-		155	157	211	0	27	4.1	394	70.4	150.4	
-	330	160	-		160	163	217	3	24	3				
425	-	-	-		163	166	220	4.5	22.5	4.2				
-	-	-	6,5		165-167	169	223	6	21	4.7-2.7				
450	-	-	-		170	172	226	7.5	19.5	4.3				
-	360	-	-			175	229	9	18	5				
-	-	-	6,75		171-173					4.7-2.7				
475	-	-	-		178	181	235	12	15	5.4				
-	-	-	7		178-180	184	238	13.5	13.5	6.7-4.7				
-	400	180	-		180					4				
500	-	-	-		185	187	241	15	12	4.4				
-	450	-	-		190	196	250	19.5	7.5	6				
-	-	-	7,5		190-193					6.7-3.7				
550	-	-	-		200	203	257	0	27	5.6	440	93.4	196.4	
-	500	200	-			206	260	1.5	25.5	6				
-	-	-	8,25		209-212	215	269	6	21	6.7-3.7				
-	550	-	-		210					5				
600	-	-	-		215	218	272	7.5	19.5	5.8				
-	600	-	-		220	224	278	10.5	16.8	4				
-	-	-	9		228-230	233	287	15	12	5.7-3.7				
-	-	240	-		240	245	299	21	6	5				
-	-	260	-		260	266	320	1.5	25.5	6	500	123.4	256.4	
-	-	280	-		280	284	338	10.5	16.5	4				
-	-	300	-		300	305	359	21	6	5				

\* Washers per side A and I, number x thickness [mm]

### 2.2 Adjustment to crane runway

### Endcarriage type KEH-A

#### 2.2.5 Table for adjustment KEH-A 100



l	IPE	IPB	"	ØD	b	a	d	[mm]			l	l1	c	*
								e1	e2	Δf				
-	-	-	3,5	100	88.9*1	94	148	13.5	13.5	6.3	314	20.4	50.4	8 x 3 mm + 2 x 1,5 mm
200	-	-	-		90*1					5.4				
-	180	-	-		91*1					3				
220	-	-	-		98	100	154	16.5	10.5	3.5				
-	200	-	-		100	106	160	19.5	7.5	6				
-	-	-	4		101.6-102.4					5.7-4.4				
240	-	-	-		106	109	163	21	6	4.6				
-	220	-	-		110	115	169	24	3	5				
260	-	-	-		113	115	169	0	27	3.6	362	44.4	98.4	
280	-	-	-		119	121	175	3	24	3.7				
-	240	-	-		120	124	178	4.5	22.5	4				
-	-	-	5		124-126	127	181	6	21	3.8-1.8				
300	-	-	-		125					3.8				
320	-	-	-		131	133	187	9	18	3.9				
-	-	-	5,25		133-134	136	190	10.5	16.5	3.8-2.8				
-	270	-	-		135	139	196	12	15	4				
340	-	-	-		137					3.9				
-	-	140	-		140	145	199	15	12	5				
-	-	-	5,5		141.8-142.4					4.0-3.4				
360	-	-	-		143					4				
-	-	-	5,75		146-147	151	205	18	9	5.8-4.8				
380	-	-	-		149					4.1				
-	300	-	-		150	154	208	19.5	7.5	4				
-	-	-	6		152-154	157	211	21	6	5.8-3.8				
400	-	-	-		155	157	211	0	27	4.2	404	65.4	140.4	
-	330	160	-		160	166	220	4.5	22.5	6				
425	-	-	-		163					5.3				
-	-	-	6,5		165-167	169	223	6	21	4.8-2.8				
450	-	-	-		170	172	226	7.5	19.5	4.3				
-	360	-	-			175	229	9	18	5				
-	-	-	6,75		171-173					4.8-2.8				
475	-	-	-		178	181	235	12	15	5.4				
-	-	-	7		178-180	184	238	13.5	13.5	6.8-4.8				
-	400	180	-		180					4				
500	-	-	-		185	187	241	15	12	4.5				
-	450	-	-		190	196	250	19.5	7.5	6				
-	-	-	7,5		190-193					6.8-3.8				
550	-	-	-		200	203	257	0	27	5.7	450	88.4	186.4	
-	500	200	-			206	260	1.5	25.5	6				
-	-	-	8,25		209-212	215	269	6	21	6.8-3.8				
-	550	-	-		210					5				
600	-	-	-		215	218	272	7.5	19.5	5.9				
-	600	-	-		220	224	278	10.5	16.5	4				
-	-	-	9		228-230	233	287	15	12	5.8-3.8				
-	-	240	-		240	245	299	21	6	5				
-	-	260	-		260	266	320	1.5	25.5	6	510	118.4	246.4	
-	-	280	-		280	284	338	10.5	16.5	4				
-	-	300	-		300	305	359	21	6	5				

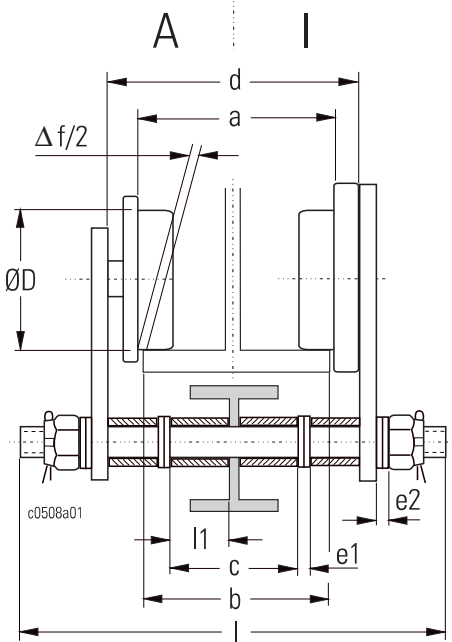
\* Washers per side A and l, number x thickness [mm]

\*1 Only on KEH-A 100 18

### 2.2 Adjustment to crane runway

### Endcarriage type KEH-A

#### 2.2.6 Table for adjustment KEH-A 125



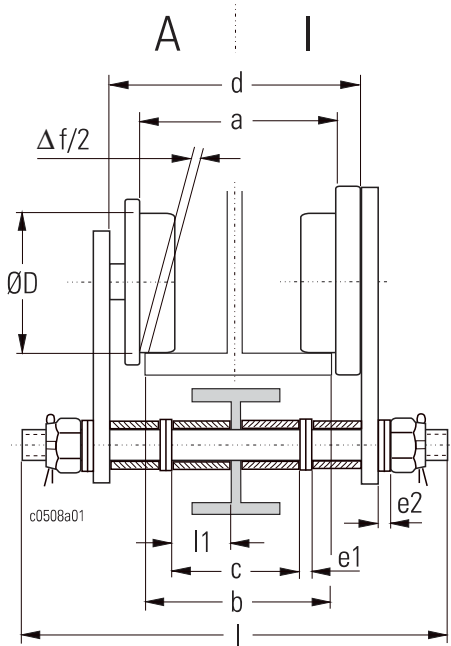
I	IPE	IPB	"	ØD	b	a	d	e1	e2	Δf	l	l1	c	*				
															[mm]			
280	-	-	-	125	119	121	197	0	58.5	3.8	493	37.9	86.2	17 x 3 mm + 1 x 7.5 mm				
-	-	-	5		124-126	127	203	3	55.5	3.9-1.9								
300	-	-	-		125					3.9								
320	-	-	-		131	133	209	6	52.5	4								
-	-	-	5,25		133-134	139	215	9	49.5	6.9-5.9								
-	270	-	-		135					4								
340	-	-	-		137													
-	-	-	5,5		141,8-142,4	145	221	12	46.5	4.1-3.5								
360	-	-	-		143					4.1								
-	-	-	5,75		146-147	151	227	15	43.5	5.9-4.9								
380	-	-	-		149					4.2								
-	300	-	-		150	154	230	16.5	42	4								
-	-	-	6		152-154	157	233	18	41.5	5.9-3.9								
400	-	-	-		155	157	233	18	41.5	4.2								
-	330	-	-		160	166	242	22.5	36	6								
425	-	-	-		163					5.4								
-	-	-	6,5		165-167	172	248	25.5	33	7.9-5.9								
450	-	-	-		170					4.4								
-	360	-	-		-	175	251	27	31.5	5								
-	-	-	6,75		171-173					4.9-2.9								
475	-	-	-		178	181	257	30	28.5	5.5								
-	-	-	7		178-180	184	260	31.5	27	6.9-4.9								
-	400	180	-		180					4								
500	-	-	-		185	187	262	33	25.5	4.6								
-	450	-	-		190	196	272	37.5	21	6								
-	-	-	7,5		190-193					6.9-3.9								
550	-	-	-		200	202	278	40.5	18	4.8								
-	500	200	-		-	205	281	42	16.5	5								
-	-	-	8,25		209-212	214	290	46.5	12	5.9-2.9								
-	550	-	-		210					4								
600	-	-	-		215	219	295	3	55.5	7					585	83.9	178.2	
-	600	-	-		220	225	301	6	52.5	5								
-	-	-	9		228-230	234	310	10.5	48	6.9-4.9								
-	-	240	-	240	246	322	16.5	42	6									
-	-	260	-	260	264	340	25.5	33	4									
-	-	280	-	280	285	361	36	22.5	5									
-	-	300	-	300	306	382	46.5	12	6									

\* Washers per side A and I, number x thickness [mm]

### 2.2 Adjustment to crane runway

#### Endcarriage type KEH-A

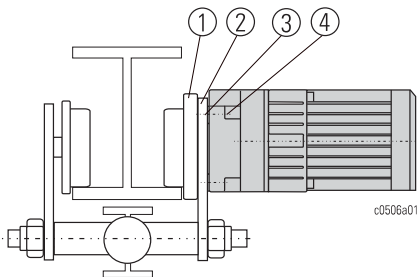
##### 2.2.7 Table for adjustment KEH-A 160



I	IPE	IPB	"	ØD	b	a	d	[mm]			l	l1	c	*				
								e1	e2	Δf								
280	-	-	-	160	119	121	197	0	52.5	4	493	37.9	86.2	15 x 3 mm + 1 x 7.5 mm				
-	-	-	5		124-126	127	203	3	49.5	4.1-2.1								
300	-	-	-		125					4.1								
320	-	-	-		131	133	209	6	46.5	4								
-	-	-	5,25		133-134	139	215	9	43.5	7.1-6.1								
-	270	-	-		135					4								
340	-	-	-		137					4.1								
-	-	-	5,5		141.8-142.4	145	221	12	40.5	4.3-3.7								
360	-	-	-		143					4.3								
-	-	-	5,75		146-147	151	227	15	37.5	6.1-5.1								
380	-	-	-		149	151	227	15	37.5	4.4								
-	300	-	-		150	154	230	16.5	36	4								
-	-	-	6		152-154	157	233	18	34.5	6.1-4.1								
400	-	-	-		155	157	233	18	34.5	4.4								
-	330	-	-		160	166	242	22.5	30	6								
425	-	-	-		163					5.5								
-	-	-	6,5		165-167	172	248	25.5	27	8.1-6.1								
450	-	-	-		170					4.6								
-	360	-	-		175	251	27	25.5	5									
-	-	-	6,75		171-173					5.1-3.1								
475	-	-	-		178	181	257	30	22.5	5.7								
-	-	-	7		178-180	184	260	31.5	21	7.1-5.1								
-	400	180	-		180					4								
500	-	-	-		185	187	262	33	19.5	4.8								
-	450	-	-		190	196	272	37.5	15	6								
-	-	-	7,5		190-193					7.1-4.1								
550	-	-	-		300	202	278	40.5	12	5								
-	500	200	-			205	281	42	10.5									
-	-	-	8,25		209-212	214	290	46.5	6	6.1-3.1								
-	550	-	-		210					4								
600	-	-	-		215	219	295	3	49.5	7.2					585	83.9	178.2	
-	600	-	-		220	225	301	6	46.5	5								
-	-	-	9		228-230	234	310	10.5	42	6.9-4.9								
-	-	240	-	240	246	322	16.5	36	6									
-	-	260	-	260	264	340	25.5	27	4									
-	-	280	-	280	285	361	36	16.5	5									
-	-	300	-	300	306	382	46.5	6	6									

### 2.3 Assembly of travel drive

In standard version, the endcarriages are supplied with travel drives. If a different travel drive is to be fitted, the suitability of the motor output must be checked. See Product Information "Ex crane components".



#### Assembly:

- Grease wheel gearing (1) (Grease GOOF-20, e.g. SHELL Special Gear Grease)
- Push travel drive into centering hole in travel unit side cheek (2)
- Fit distance rings (3) (25x11x5) (only on KEH-A 125 with FU-C 41)
- Screw in fixing screws (4) and tighten as specified (M8 = 25 Nm, M10 = 51 Nm)
- Electrical connection, see "Travel drives" in these operating instructions.

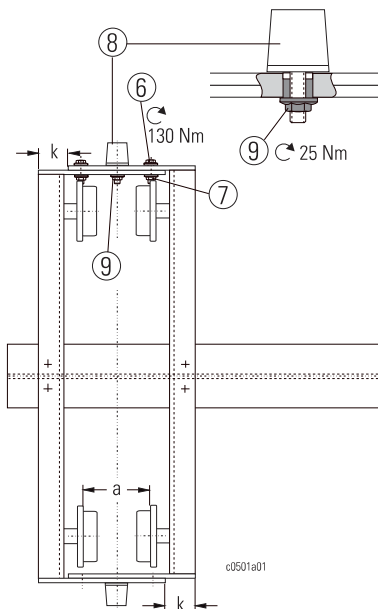
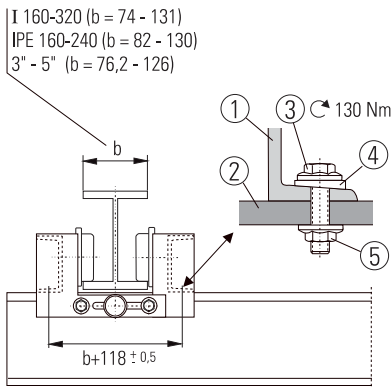
\* Washers per side A and I, number x thickness [mm]

### 2.4 Assembly of crane

#### 2.4.1 Crane with endcarriage type KEH-B 080

##### Crane runway accessible

- On the preassembled crane, see page 8, bolt the two side cheeks (1) not yet assembled to the crane girder (2) with parts (3) - (5). Screw down loosely.
- Bolt opposing side cheeks together (6) - (7), screw down loosely.
- Align newly assembled side cheeks to flange spacing (dimension a or k).
- Screw down all screws (3) - (5) and (6) - (7) as per specification with 130 Nm.
- Attach rubber buffer (8) by means of special nut (9), tightening torque 25 Nm; it must be in the centre of the crane runway.
- Raise crane
- Move crane onto crane runway from open end. Ensure the electrical connection is on the correct side.



$$a = b + 4 \text{ [mm]}$$

$$k = b - 72 \text{ [mm]}$$

##### Crane runway not accessible

- Lay preassembled crane, see page 8, under the crane runway so that the side for electrical connection of the crane is on the same side as the main power supply along the crane runway.
- Raise crane
- Set crane down on the crane runway with the two assembled endcarriage halves. Lash the endcarriage halves to the crane runway to prevent the crane slipping off.
- Bolt the endcarriage halves not yet assembled loosely to the crane girder and the endcarriage halves already assembled.
- Align the endcarriage halves just assembled to dimension "k" using a caliper gauge.
- Screw down all fixing screws (3) - (5) and (6) - (7) as per specification with 130 Nm.
- Set buffer (8) in the centre of the crane runway and attach it with special nut (9); tightening torque 25 Nm.



Check that the crane runs smoothly over the whole runway without jamming or increased friction at the wheel flanges. Increased friction at the flanges due to poor beam quality or incorrect trolley adjustment may lead to temperature rise or increased wear. This must be avoided at all costs.

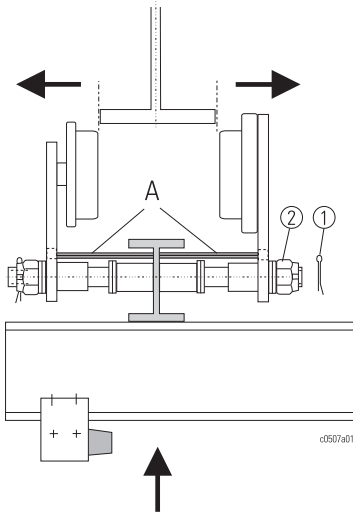


### 2.4 Assembly of crane

#### 2.4.2 Crane with endcarriage type KEH-A

##### End of crane runway accessible

- Raise crane, see page 38
- Push crane onto runway from open end. Take care that the electrical connection is on the correct side.

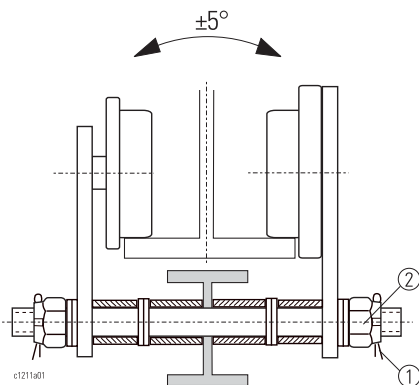


##### End of crane runway not accessible

- Lay crane under crane runway so that the electrical connection of the crane is on the same side as the main power supply along the crane runway
- Remove split pins (1) from the castellated nuts on the inside of the crane (2) and unscrew the castellated nuts (2)
- Pull the endcarriage side cheeks apart  
N.B.: A special mounting tool (A) prevents the side cheeks from pivoting when they have been unscrewed and thus facilitates assembly.
- Raise crane
- Lift crane onto crane runway, push endcarriage side cheeks together, tighten castellated nuts and set crane down on crane runway
- Tighten castellated nuts and **then unscrew them by 2 holes for split pin (M30+M36) or 4 holes for split pin (M48).**
- Fit split pin (4).

##### Caution:

The drive unit must be able to swivel to both sides by approx. 5°!



Check that the crane runs smoothly over the whole runway without jamming or increased friction at the wheel flanges. Increased friction at the flanges due to poor beam quality or incorrect trolley adjustment may lead to temperature rise or increased wear. This must be avoided at all costs.

### 2.5 Inspection and maintenance table



This section deals with the operational reliability, availability, and maintaining the value of your explosion-protected crane endcarriages. Although they are practically maintenance-free, the components subject to wear and the components important for explosion protection must be inspected regularly. This is required by the accident prevention regulations.

#### General information on inspection and maintenance

- Maintenance and repair work may only be carried out when the crane is not under load.
- Switch off and padlock main isolator.



**It is not permitted to work on live parts in areas exposed to explosion hazards!**

Inspection and maintenance may only be performed by qualified personnel especially trained on explosion protection, see page 2.

Please also note the "Safety instructions" on page 5.  
Wearing parts, see page 49.

No.	Inspection on commissioning*1	Daily inspection on starting work *2	Periodic inspections every 12 months *3	Periodic maintenance every 12 months *2	Maintenance after 10 years or general overhaul *4	<b>Inspection and maintenance table</b> (Classification: 1 Bm)	See page
1	•		•	•		Firm seating of bolt connections	43
2	•		•	•		Attachment of/damage to buffer	37
3	•		•	•		Check wheel for damage to circumference and flange Check runway and buffers	19
4			•			Travel drive: attachment	38
5	•	•	•			Check braking effect of travel drive	43
6	•			•	•	Wheel gearing: wear, lubrication (grease KP1K, e.g. Aralub PMD1)	
7	•					Oil level	38
8					•	Change gear oil/gear grease of travel drive	42
9			•	•		Power supply	

\*1 By a fitter engaged by the manufacturer

\*2 By the operator

\*3 Periodic maintenance every 12 months, possibly earlier if so prescribed by national regulations, to be performed by a fitter engaged by the manufacturer.

Similarly, heavy-duty applications and adverse conditions (dirt, solvents, multi-shift operation etc.) necessitate shortening this inspection and maintenance interval.

\*4 In manufacturer's works.

### 2.6 Maintenance work

#### 2.6.1 Wheels, wheel drive and runway

- Visual inspection of wheels for wear. See tables for limits for wear.
- Visual inspection of wheel flanges for wear.  
A high degree of wear on the flanges indicates that the crane cants or is running with its weight heavily on one side. The causes of this must be ascertained and eliminated.
- Check roller bearings in wheel for uneven running and abnormal noises. Move trolley and spin wheels if possible.
- Visual inspection of crane runway for wear.  
The rails must be laid parallel within the permissible tolerances (see page 34) to prevent the crane jamming. Rail joints must provide a smooth surface to avoid impact and deformation.
- Inspection of buffer and buffer stop.  
Ensure that the buffer impact is taken up by the centre of the stop elements provided and that the materials exhibit no detrimental characteristics (rusty parts etc.).

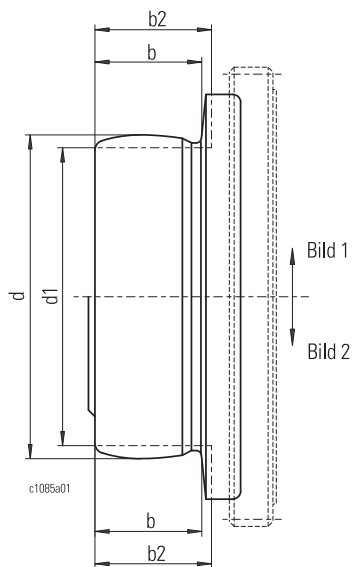
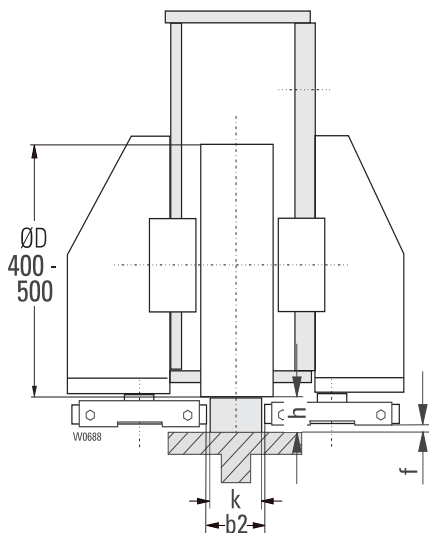
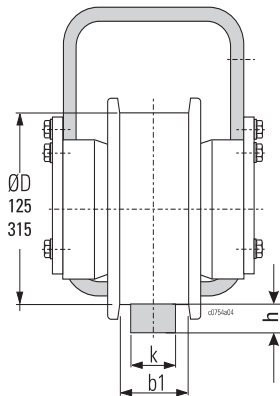


Fig.	Nominal value		Limit for wear	
	d [mm]	b [mm]	d1 [mm]	b2 [mm]
1	80	27,5	<b>76</b>	<b>29,5</b>
1	100	33	<b>95</b>	<b>35</b>
1	125	38	<b>119</b>	<b>40</b>
1	140	44,5	<b>133</b>	<b>47</b>
2		42,5		<b>45</b>
1	160	44,5	<b>152</b>	<b>47</b>
2	200	42,5	<b>190</b>	<b>45</b>

**If any one of the limits for wear d1, b2 (b\*-k) is attained, the part must be replaced.**

#### 3.1 Assembly of endcarriage

The endcarriage is supplied as standard fitted with wheelsets, end buffers, travel drive and endcarriage connection plates.

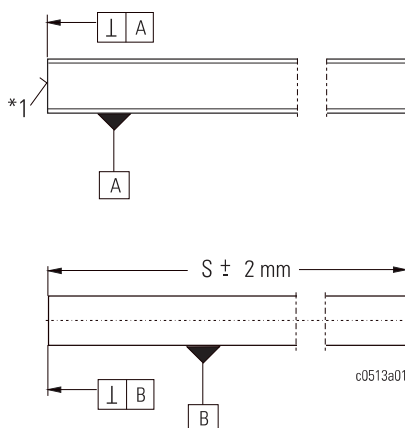


- Check that the capacity of the endcarriage is adequate for the intended application of the crane.
- Check that the wheel tread corresponds to the crane rail, see sketch and table.
- The rail joints must be even on both running and guide surfaces; grind down if necessary.
- Check that the crane runs smoothly over the whole runway without jamming or increased friction at the wheel flanges. Increased friction at the flanges due to poor beam quality or incorrect crab adjustment may lead to temperature rise or increased wear. This must be avoided at all costs.
- Check whether clearance (h) between top of rail and top of crane runway or, in the case of guide rollers, rail attachment corresponds to the value given in the table, see sketch and table.

ØD	k	b1	b2*2	h
[mm]				
125	40	50	50	≥ 30
	50	60	60	
160	40	52	52	≥ 30
	50	62	62	
200	40	54	54	≥ 30
	50	64	64	
315	60	74	74	≥ 30
	40	65	53	
400	60	75	63	≥ 45
	50	53	53	≥ 40*3
500	60	63	63	
	70	73	73	
	100	103	100	≥ 45

#### 3.1.1 On assembly

Perfect crane geometry is achieved by particularly careful assembly of endcarriage and crane girder. This guarantees smooth running of the crane causing little wear.



#### 3.1.2 Preparation of crane girder

- The ends of the crane girder must be cut off at right angles in both vertical and horizontal plane
- Length of crane girder  $S \pm 2$  mm
- Remove rust, dust, oil, paint and other impurities from the area to be welded
- Prepare welds as necessary.

\*1 Free of rust, dust, oil, paint and other impurities!

\*2 With guide rollers (option for D125 - D400)

\*3 Without guard plate (guard plate not required if clearance between bottom of guide roller and obstruction beneath is <15 mm over the whole crane path.

#### 3.1 Assembly of endcarriage

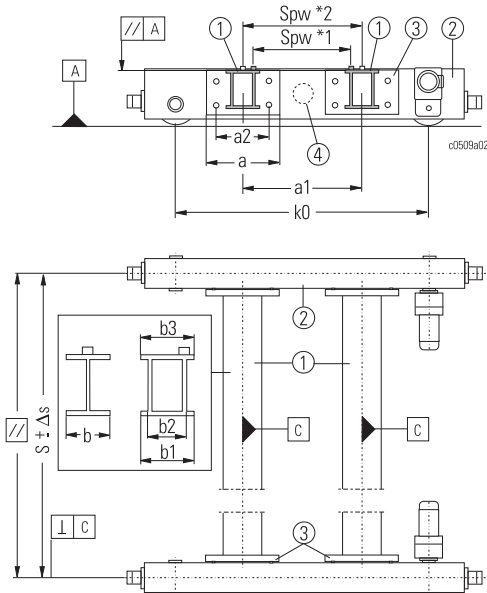
#### 3.1.3 Connection "at side"

##### Welding connection plate

Please observe the dimensions and information given in our Product Information "Ex hoists and crane components".

- Align crane girder (1) to endcarriage (2)
- Tack weld end of crane girder (1) to connection plate (3) bolted to endcarriage
- Remove covers (4) from handholes
- Remove connection plate(s) from endcarriage and weld to crane girder as specified.

KZL-...



- S ≤ 15 m: ΔS = ±5 mm
- S ≤ 20 m: ΔS = ±6 mm
- S ≤ 25 m: ΔS = ±8 mm
- S ≤ 30 m: ΔS = ±9 mm
- S ≤ 32,5 m: ΔS = ±9,5 mm

Type			I		II				
	k 0	Track gauge	a	b ≤ 300 mm		b1 = 300 mm b2 ≥ 250 ≤ 266 mm b3 ≤ 340 mm		b1 = 500 mm b2 ≥ 450 ≤ 466 mm b3 ≤ 540 mm	
				a 1	a 2	a 1	a 2	a 1	a 2
KZL-S ..	[mm]								
KZL-S 160.2.20.04.140	2000	1250	490	1250	400	1250	400	-	-
KZL-S 160.2.25.04.140	2500	1250	490	1250	400	1250	400	-	-
KZL-S 160.2.25.04.540				-	-	1506			
KZL-S 160.2.31.05.140	3150	1400	490	1400	400	1400	400	-	-
KZL-S 160.2.31.05.540				-	-	1656			
KZL-S 200.2.20.04.136	2000	1250	460	1250	360	-	-	-	-
KZL-S 200.2.25.05.136	2500	1400	460	1400	360	1400	360	-	-
KZL-S 200.2.25.05.156			660	-	-	-	-	1400	560
KZL-S 200.2.25.05.536			460	-	-	1656	360	-	-
KZL-S 200.2.31.05.136	3150	1400	460	1400	360	1400	360	-	-
KZL-S 200.2.31.05.156			660	-	-	-	-	1400	560
KZL-S 200.2.31.05.536			460	-	-	1656	360	-	-
KZL-S 200.2.31.05.556			660	-	-	-	-	1856	560
KZL-S 200.2.40.10.136	4000	2240	460	2240	360	2240	360	-	-
KZL-S 200.2.40.10.156		2240	660	-	-	-	-	2240	560
KZL-S 200.2.40.10.536		2240	460	-	-	2496	360	-	-
KZL-S 200.2.40.10.556		2240	660	-	-	-	-	2696	560
KZL-S 200.2.40.12.136		2500	460	2500	360	2500	360	-	-
KZL-S 200.2.40.12.156		2500	660	-	-	-	-	2500	560
KZL-S 200.2.40.14.136		2800	460	2800	360	2800	360	-	-
KZL-S 200.2.40.14.156		2800	660	-	-	-	-	2800	560
KZL-S 315.3.25.05.136	2500	1400	460	1400	360	1400	360	-	-
KZL-S 315.3.25.05.156			660	-	-	-	-	1400	560
KZL-S 315.3.25.05.536			460	-	-	1656	360	-	-
KZL-S 315.3.31.05.136	3150	1400	460	1400	360	1400	360	-	-
KZL-S 315.3.31.05.156			660	-	-	-	-	1400	560
KZL-S 315.3.31.05.536			460	-	-	1656	360	-	-
KZL-S 315.3.31.05.556			660	-	-	-	-	1856	560
KZL-S 315.3.40.10.136	4000	2240	460	2240	360	2240	360	-	-
KZL-S 315.3.40.10.156		2240	660	-	-	-	-	2240	560
KZL-S 315.3.40.10.536		2240	460	-	-	2496	360	-	-
KZL-S 315.3.40.10.556		2240	660	-	-	-	-	2696	560
KZL-S 315.3.40.12.136		2500	460	2500	360	2500	360	-	-
KZL-S 315.3.40.12.156		2500	660	-	-	-	-	2500	560
KZL-S 315.3.40.14.136		2800	460	2800	360	2800	360	-	-
KZL-S 315.3.40.14.156		2800	660	-	-	-	-	2800	560
KZL-E 315.5.31.05.136	3150	1400	460	1400	360	-	-	-	-
KZL-E 315.5.31.05.556			660	-	-	-	-	1856	560
KZL-E 315.5.31.07.136		1800	460	1800	360	-	-	-	-
KZL-E 315.5.31.07.156			660	-	-	1800	560	-	-
KZL-E 315.5.40.10.156	4000	2240	660	-	-	2240	560	-	-
KZL-E 315.5.40.10.556			-	-	-	-	-	2696	560
KZL-E 315.5.40.12.556		2500	660	-	-	-	-	2956	560
KZL-E 315.5.40.14.156		2800	-	-	-	2800	560	-	-
KZL-E 315.5.42.14.556	4260	2800	-	-	-	-	-	3256	560
KZL-E 315.5.42.14.156		2800	-	-	-	2800	560	-	-
KZL-E 315.5.42.16.156		3150	-	-	-	3150	560	-	-
KZL-E 315.5.45.14.556	4560	2800	-	-	-	-	-	3256	560

\*1 Track gauge on KZL-S 160...140, KZL-S 200...136, KZL-S 200...156, KZL-S 315...136, KZL-S 315...156

\*2 Track gauge on KZL-S 160...140, KZL-S 200...136, KZL-S 200...156, KZL-S 315...136, KZL-S 315...156

#### 3.1 Assembly of endcarriage

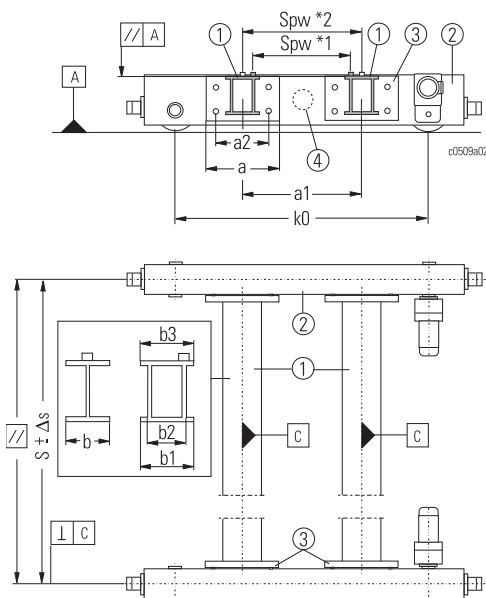
#### 3.1.3 Connection "at side" (continued)

##### Welding connection plate

Please observe the dimensions and information given in our Product Information "Ex hoists and crane components".

- Align crane girder (1) to endcarriage (2)
- Tack weld end of crane girder (1) to connection plate (3) bolted to endcarriage
- Remove covers (4) from handholes
- Remove connection plate(s) from endcarriage and weld to crane girder as specified.

KZL-... ..



Type				I		II			
	k 0	Spw	a	b ≤ 300 mm		b1 = 500 mm b2 ≥ 450 ≤ 466 mm b3 ≤ 540 mm		b1 = 700 mm b2 ≥ 650 ≤ 666 mm b3 ≤ 740 mm	
				a 1	a 2	a 1	a 2	a 1	a 2
KZL-S ..	[mm]								
KZL-C 400.x.31.140	3150	1400	550	1400	400	-	-	-	-
KZL-C 400.x.31.158	3150	1400	730	-	-	1400	580	-	-
KZL-C 400.x.31.558	3150	1400	730	-	-	1856	580	-	-
KZL-C 400.x.40.158	4000	2240	730	-	-	2240	580	-	-
KZL-C 400.x.40.558	4000	2240	730	-	-	2696	580	-	-
KZL-C 400.x.42.558	4260	2500	730	-	-	2956	580	-	-
KZL-C 400.x.45.558	4560	2800	730	-	-	3256	580	-	-
KZL-F 500.6.31.140	3150	1400	550	1400	400	-	-	-	-
KZL-F 500.6.31.158	3150	1400	730	-	-	1400	580	-	-
KZL-F 500.6.31.558	3150	1400	730	-	-	1856	580	-	-
KZL-F 500.6.40.158	4000	2240	730	-	-	2240	580	-	-
KZL-F 500.6.40.558	4000	2240	730	-	-	2696	580	-	-
KZL-F 500.6.42.158	4260	2500	730	-	-	2500	580	-	-
KZL-F 500.6.42.558	4260	2500	730	-	-	2956	580	-	-
KZL-F 500.6.44.578	4400	2240	930	-	-	-	-	2896	-780
KZL-F 500.6.45.158	4560	2800	730	-	-	2800	580	-	-
KZL-F 500.6.45.558	4560	2800	730	-	-	3256	580	-	-
KZL-F 500.6.46.578	4660	2500	930	-	-	-	-	3156	780
KZL-F 500.6.49.578	4960	2800	930	-	-	-	-	3156	780

S ≤ 15 m: Δs = ±5 mm

S ≤ 20 m: Δs = ±6 mm

S ≤ 25 m: Δs = ±8 mm

S ≤ 30 m: Δs = ±8 mm

#### 3.1 Assembly of endcarriage

#### 3.1.3 Connection "at side" (continued)

##### Assembly of endcarriage and crane girder

The contact surfaces between endcarriage and connection plates must be free of rust, dust, oil, grease, paint and other impurities. Remove surface rust with a wire brush.

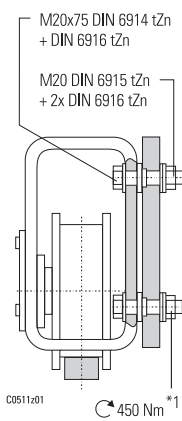
##### Caution!

Impurities on the contact surfaces may cause the bolt connections to loosen. **This could cause a fatal accident!**

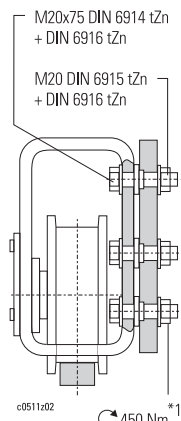
Use only original bolt connection parts!

- Bolt crane girder with connection plate welded to it to endcarriage, see sketches
- Grease thread and space between hexagonal nut and washer with molybdenum disulphide (e.g. Molycote)
- Screw down bolt connection as specified
- Check that wheel camber is right-angled
- Check span
- Close handholes with covers.

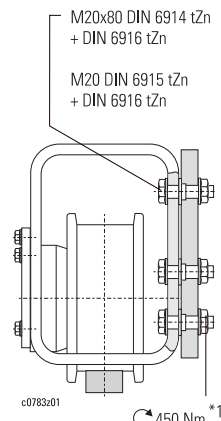
**KEL-S 125**



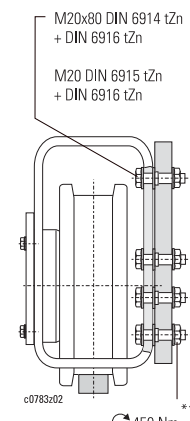
**KEL-S 160**



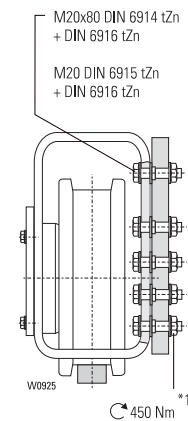
**KEL-S 200**



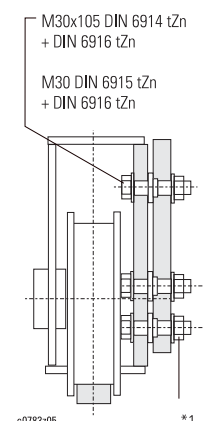
**KEL-S 315**



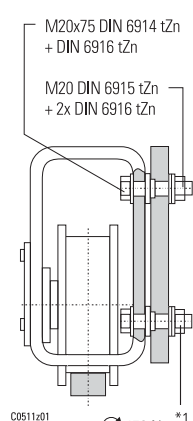
**KEL-E 315**



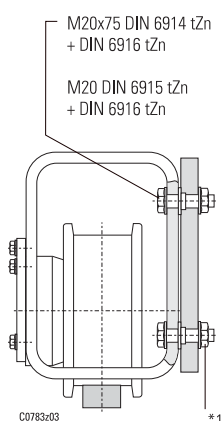
**KEL-C 400**



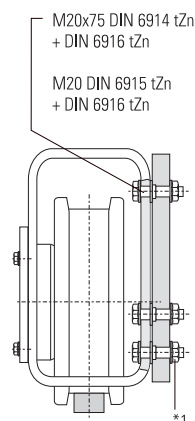
**KZL-S 160**



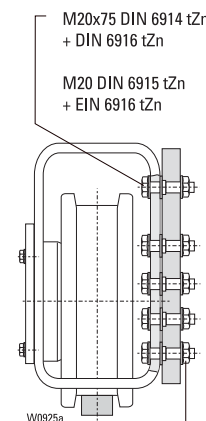
**KZL-S 200**



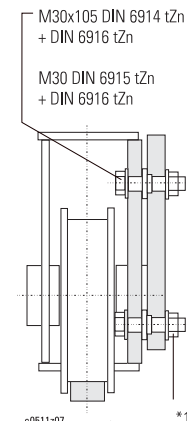
**KZL-S 315**



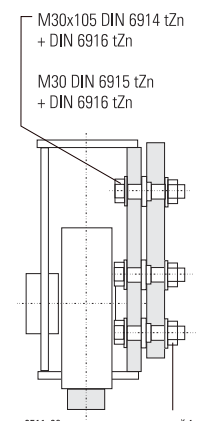
**KZL-E 315**



**KZL-C 400**

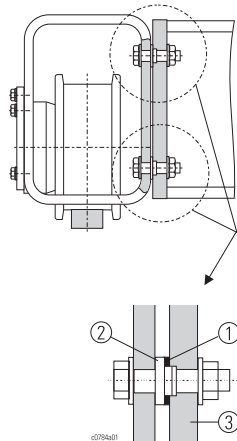


**KZL-F 500**



\*1 The values apply for galvanized, MoS2 coated original parts from STAHL CraneSystems

#### 3.1 Assembly of endcarriage

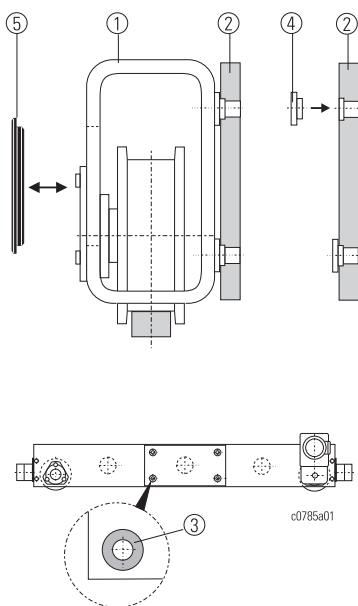


#### 3.1.3 Connection "at side" (continued)

##### Correcting span

The span can be increased by up to 4 mm:

- Insert adjusting washers (1) between connection plate (3) and flanged bushing (2). (Max. 2 mm on each endcarriage, minimum thickness 0.5 mm).



##### Off-standard designs

If undrilled endcarriages with connection plates, flanged bushings and bolt connection parts supplied loose are used, the endcarriages must first be drilled and the connection plates then bolted to them.

- Position the connection plate as shown in the Product Information "Ex hoists and crane components"
- Drill endcarriage (1). (The ready-drilled connection plates can be used as a template. Countersinks on the endcarriage are not necessary.)
- Remove paint, rust and other impurities from contact surfaces (3) on endcarriage for flanged bushings (4)
- Hammer flanged bushings (4) into countersinks of connection plate
- Remove covers (5) of handholes
- Bolt connection plate (2) to endcarriage (1) with bolt connection parts, see page 23.



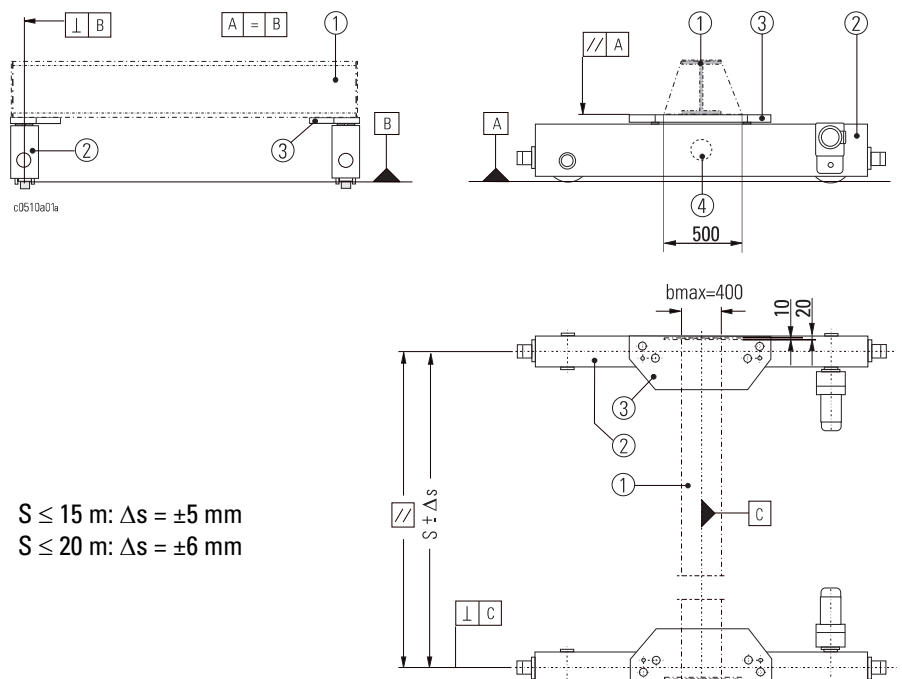
#### 3.1 Assembly of endcarriage

##### 3.1.4 Connection "at top"

###### Welding connection plate

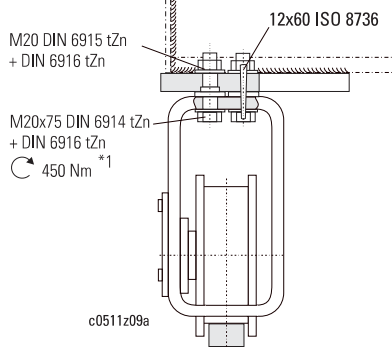
Please observe also dimensions and information given in our Product Information "Ex hoists and crane components".

- Align crane girder (1) with endcarriage (2)
- Tack-weld crane girder (1) to connection plate (3) bolted on endcarriage
- Remove covers (4) from handholes
- Remove connection plate(s) from endcarriage and weld to crane girder as specified.

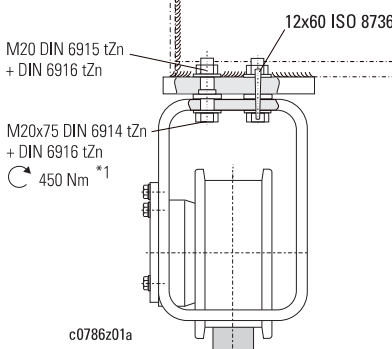


$S \leq 15 \text{ m: } \Delta s = \pm 5 \text{ mm}$   
 $S \leq 20 \text{ m: } \Delta s = \pm 6 \text{ mm}$

##### KEL-S 125.. KEL-S 160..



##### KEL-S 200..



###### Assembly of endcarriage and crane girder

The contact surfaces between endcarriage and connection plates must be free of rust, dust, oil, grease, paint and other impurities. Remove surface rust with a wire brush.



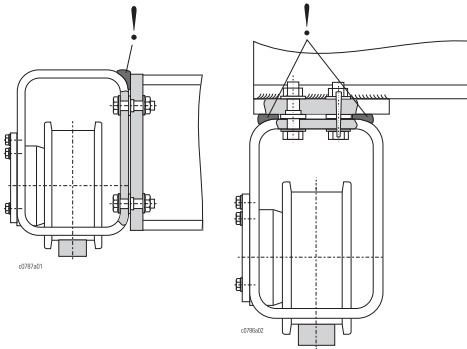
**Caution!** Impurities on the contact surfaces may cause the bolt connections to become loose. **This can cause a fatal accident!**

Use only original bolt connection parts!

- Bolt crane girder with connection plate welded to it to endcarriage, see sketches
- Tighten bolt connection as specified
- Check that wheel camber is right-angled
- Check span
- Use the holes ( $\varnothing 12$ ) in the connection plate as a template for the holes in the endcarriage profile (see sketch). Ream them with a taper reamer.
  - If the crane is to be transported fully assembled, insert the tapered pins (12x60) now.
  - If the crane is to be transported dismantled, insert the tapered pins (12x60) during final assembly on site.
- Tighten bolt connection as specified
- Close handholes with covers

\*1 Values apply for original STAHL CraneSystems parts, galvanised and greased with MoS2

#### 3.1 Assembly of endcarriage



#### 3.1.5 Outdoor application

- For outdoor applications, seal gap between connection plate and endcarriage with sealant at top and sides, see sketch.

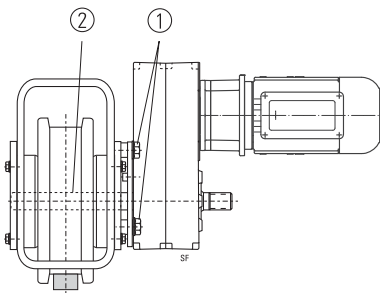
#### 3.2 Assembly of travel drive

The SF .. and SA-D travel drives are high-quality drives with smooth starting and braking characteristics as are particularly required for material handling.

The endcarriages are supplied as standard with travel drives. If a different travel drive is to be fitted, the suitability of the motor output must be checked.

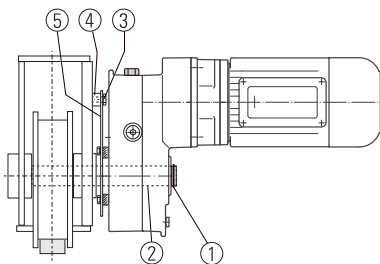
##### 3.2.1 Fitting travel drive SF ... ex.:

- Push travel drive into the greased hub of wheel (2)
- Bolt travel drive with torque support to endcarriage with bolts (1) (M8 = 25 Nm, M12 = 87 Nm, M16 = 215 Nm)
- Complete electrical connection as per circuit diagram (see sketch).
- The contact surfaces of the torque support must be free of paint.

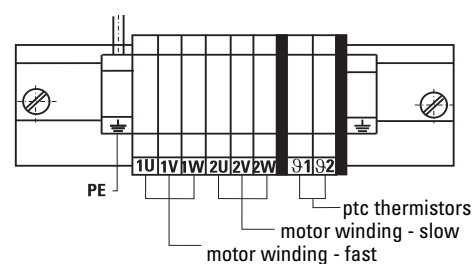


##### 3.2.2 Fitting travel drive SA-D ... ex.:

- Remove circlip (1)
- Grease gear profile (2) of wheel shaft. (Grease KP1K, e.g. Aralub PMD1)
- Push travel drive onto wheel shaft
- Bolt torque support (5) to endcarriage with bolts (3) and spacer part (4) (M12 = 87 Nm, M16 = 215 Nm)
- The contact surfaces of the torque support must be free of paint.
- Replace circlip (1)
- Complete electrical connection as per circuit diagram (see sketch).



Connection terminals 2 speeds



#### 3.3 Inspection and maintenance table



This section deals with the operational reliability, availability, and maintaining the value of your explosion-protected crane endcarriages. Although they are practically maintenance-free, the components subject to wear and the components important for explosion protection must be inspected regularly. This is required by the accident prevention regulations.

##### General information on inspection and maintenance

- Maintenance and repair work may only be carried out when the crane is not under load.
- Switch off and padlock main isolator.



It is not permitted to work on live parts in areas exposed to explosion hazards!

Inspection and maintenance may only be performed by qualified personnel especially trained on explosion protection, see page 2.

Please also note the "Safety instructions" on page 5.  
Wearing parts, see page 49.

No.	Inspection on commissioning*1	Daily inspection on starting work *2	Periodic inspections every 12 months *3	Periodic maintenance every 12 months *2	Periodic maintenance after 4000 operating hours or 48 months *1, *4	Maintenance after 10 years or general overhaul *5	Inspection and maintenance table (Classification: 1 Bm)	See page
1	•		•	•			Firm seating of bolt connections	43
2	•		•	•			Attachment of/damage to buffer	37
3	•		•	•			Check wheel for damage to circumference and flange Check runway and buffers Replace wheel if clearance (f) between bottom of guide roller and top of crane runway or rail attachment is <2 mm.	26 20
4			•				Travel drive: attachment, torque support	43
5	•	•	•				Check braking effect of travel drive	41
6			•	•			Measure brake displacement	41
7	•			•		•	Wheel gearing: wear, <b>lubrication</b> (grease KP1K, e.g. Aralub PMD1)	
8	•						Oil level	41
9					•		Lubricate self-aligning roller bearings (K.L-E 315)	
10						•	Change gear oil/gear grease of travel drive	43
11			•	•			Power supplies	

\*1 By a fitter engaged by the manufacturer

\*2 By the operator

\*3 Periodic maintenance every 12 months, possibly earlier if so prescribed by national regulations, to be performed by a fitter engaged by the manufacturer.

Similarly, heavy-duty applications and adverse conditions (dirt, solvents, multi-shift operation etc.) necessitate shortening this inspection and maintenance interval.

\*4 In the case of high ambient temperatures or danger of dirt accumulation the lubrication intervals must be reduced accordingly

\*5 In manufacturer's works.

#### 3.4 Maintenance work

##### 3.4.1 Wheels, wheel drive and runway

- Visual inspection of wheels for wear. See table for limits for wear.
- Visual inspection of wheel flanges for wear.  
A high degree of wear on the flanges indicates that the crane cants or is running with its weight heavily on one side. The causes of this must be ascertained and eliminated. The running characteristics can be improved by using a guide system. This avoids abrasion and the play of the track gauge can be reduced.
- Check roller bearings in wheel for uneven running and abnormal noises. Move trolley and spin wheels if possible.  
Visual inspection of crane runway for wear.  
The rails must be laid parallel within the permissible tolerances (see page 37) to prevent the crane jamming. Rail joints must provide a smooth surface to avoid impact and deformation.
- Inspection of buffer and buffer stop.  
Ensure that the buffer impact is taken up by the centre of the stop elements provided and that the materials exhibit no detrimental characteristics (rusty parts etc.).

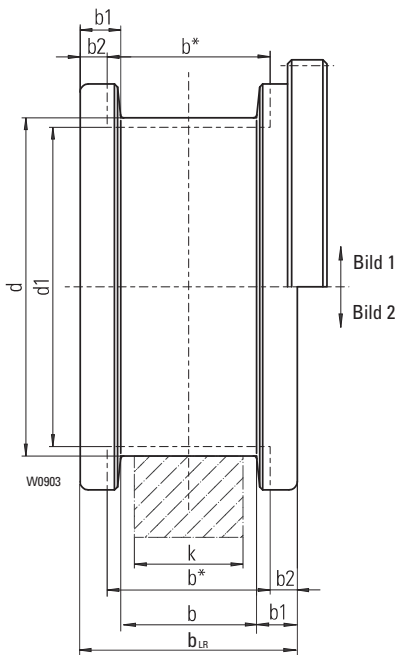
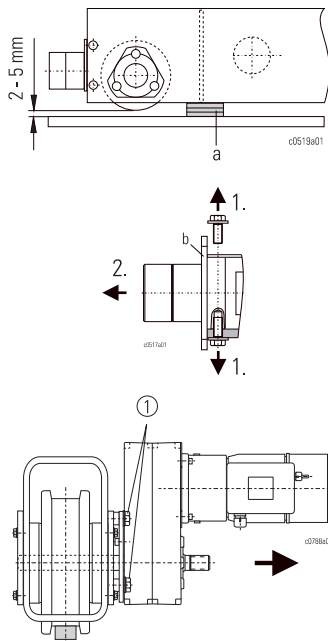


Fig.	d	b <sub>LR</sub>	Nominal value			Limit for wear				
			b	k		b <sub>1</sub>	d <sub>1</sub>	b <sub>2</sub>	max play=b*-k	
				min	max				k <sub>min</sub>	k <sub>max</sub>
[mm]										
1	100	80	50	40	45	15	95	5,5	13	13
			60	50	55	10		5,5	13	13
2	125	80	50	40	45	15	118,75	7	13	13
			60	50	55	10		7	13	11
2	160	85	52	40	45	16,5	152	8	16	16
			62	50	55	11,5		13,5	18	18
2	200	100	54	40	45	23	190	10,5	18	18
			64	50	55	18		10,5	18	18
			74	60	65	13		10,5	18	14
2	315	115	54	40	45	30,5 (29)	300	13,5	18	18
			64	50	55	25,5 (24)		13,5	18	18
			74	60	65	20,5 (19)		13,5	18	18
		130	64	50	55	33	305	13,5	18	18
			74	60	65	28		13,5	18	18
			84	70	75	23		13,5	18	18
			94	80	85	18		13,5	18	18
2	400	118,5	65	50	55	27,5 (26)	385	16	20	20
			75	60	65	22,5 (21)		16	20	20
			85	70	75	17,5 (16)		16	16,5	11,5
	500	120					485	-	-	-

If any one of the limits for wear d<sub>1</sub>, b<sub>2</sub> (b\*-k) is attained, the part must be replaced.

( ) for machined faces

#### 3.4 Maintenance work (continued)



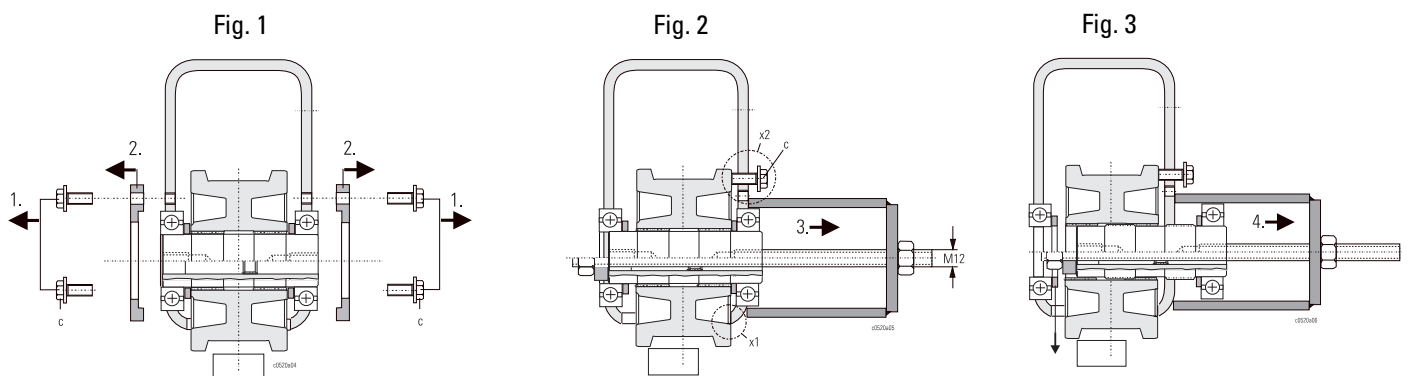
#### 3.4.2 Dismantling wheel

Before dismantling:

- Jack endcarriage up until the flanges are free. Then secure endcarriage with shims (a).
- Unscrew and pull out buffer plate (b).
- Removing SF ...ex, SA-D ... ex travel drive: Remove bolts (1) on torque support. Pull travel drive off wheel shaft.

#### 3.4.2 Dismantling wheel KEL-S 125.. and K.L-S 160..

- Unscrew bolts of bearing covers, Fig. 1
- Move wheel and bearing with puller until wheel rests against recess in endcarriage section (x1), Fig. 2
- Screw bolt of bearing cover (c) into threaded hole of endcarriage section until it rests against wheel (x2), Fig. 2
- Pull off wheel shaft, rescue spacer ring, Fig. 3
- Roll wheel forwards out of endcarriage.



#### 3.4 Maintenance work (continued)

##### 3.4.2 Dismantling wheel K. L-S 200 and K. L-S 315

- Unscrew bolts of bearing covers, Fig. 4
- Press bearing covers off with 2 bolts, Fig. 5
- Roll wheel forwards out of endcarriage.

Fig. 4

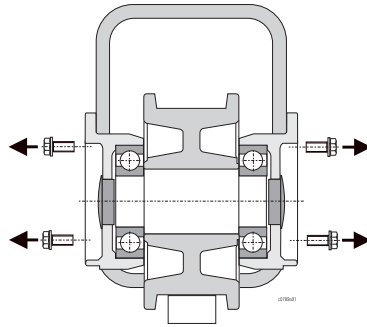
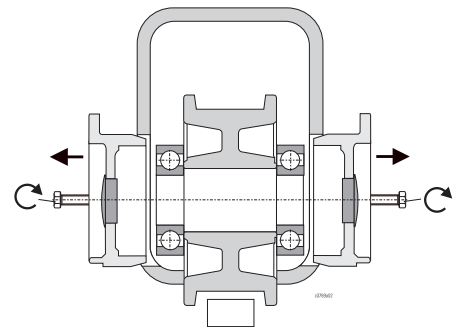


Fig. 5



##### 3.4.2 Dismantling wheel K.L-E 315

- Remove plastic cap and circlip from wheel shaft, Fig. 8 and 9.
- Pull wheel shaft out of wheel on drive side, Fig. 8 and 9.
- Remove bolts of bearing flanges, except the top centre bolt on the endcarriage side (to secure bolt), Fig. 6-9.
- Press bearing flanges off with 2 bolts, Fig. 7 und 9.
- Roll wheel forwards out of endcarriage.

Fig. 6

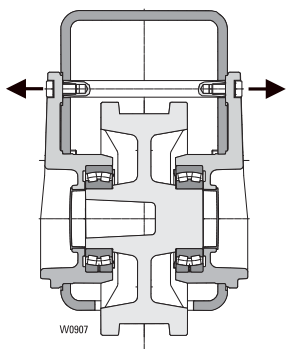


Fig. 7

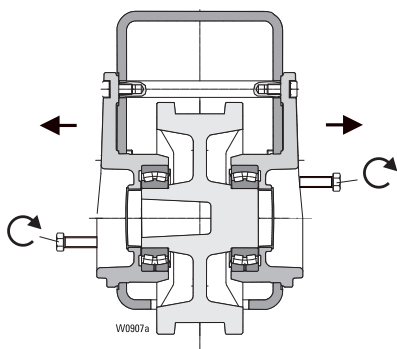


Fig. 8

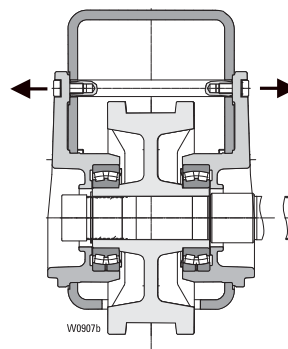
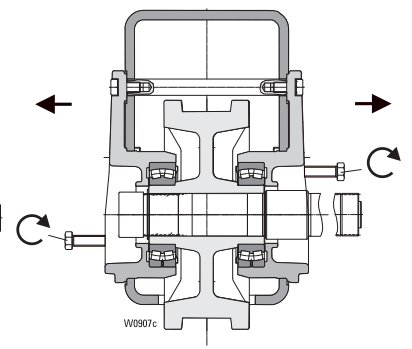


Fig. 9



#### 3.4 Maintenance work (continued)

##### 3.4.2 Dismantling wheel K. L-C 400 and KZL-F 500

- Remove bearing covers and circlips, Fig. 6
- Remove wheel shaft off with puller, Fig. 7. **Caution:** The wheel axle can only be removed towards the side with the visible marking groove and the wheel shaft only towards the travel drive side.
- Roll wheel forwards out of endcarriage.

Fig. 10

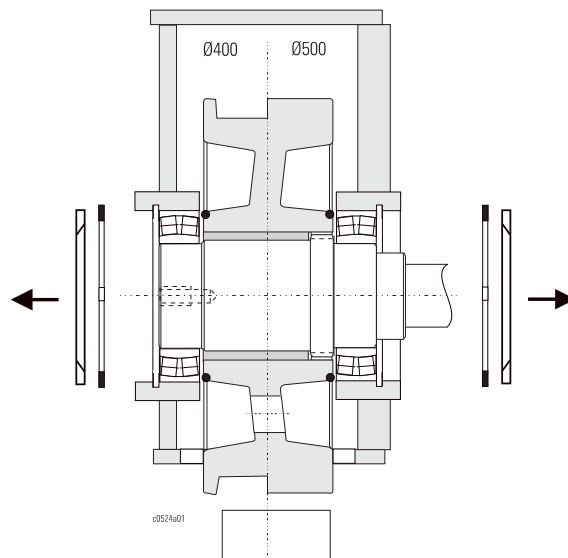
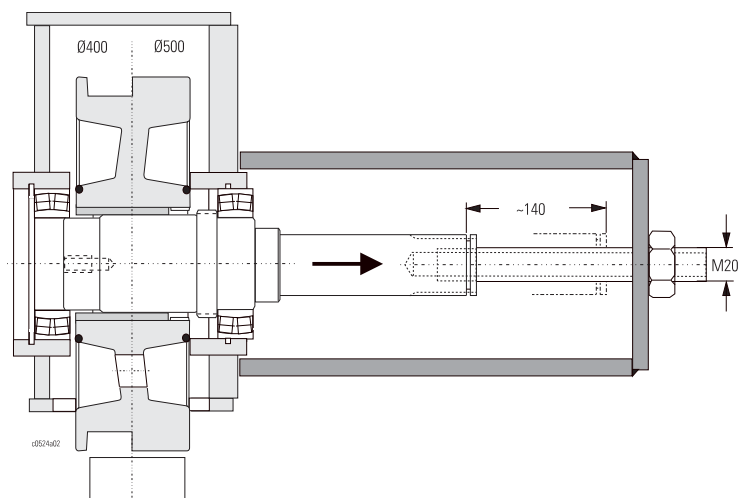


Fig. 11



#### 3.4 Maintenance work (continued)

##### 3.4.3 Refitting wheel KEL-S 125.. and K.L-S 160.. after replacing bearing

- Grease bearing seats and gearing of wheel axle/shaft. (Grease KPF 1K, e.g. Aralub PMD1)
- Press spacer ring and bearing onto wheel axle/shaft as far as collar, Fig. 1
- Roll wheel into endcarriage from front
- Insert wheel axle/shaft with bearing and spacer ring into wheel until the gearing touches (!), Fig. 1
- Insert wheel axle/shaft into hole in wheel, Fig. 2
- Fit spacer ring and bearing to shaft, Fig. 3
- Fit bearing covers, Fig. 4
- Lower endcarriage onto crane runway

Fig. 1

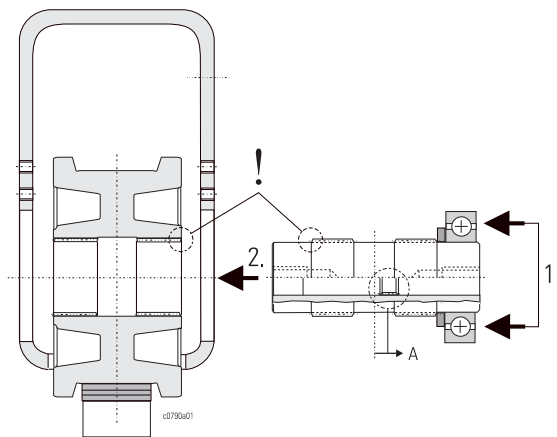


Fig. 2

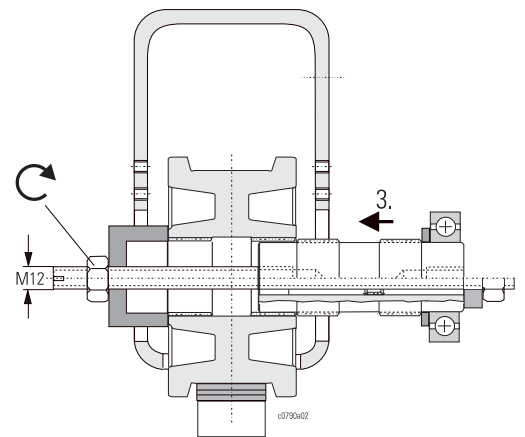


Fig. 3

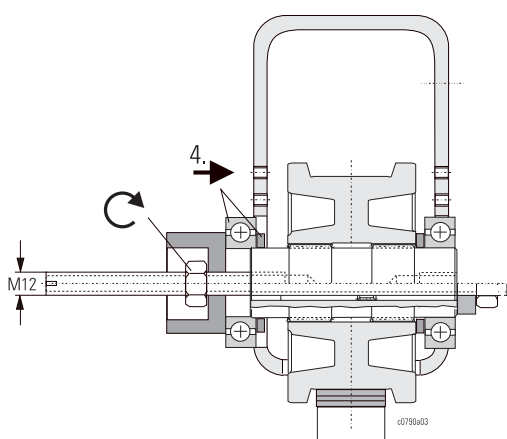
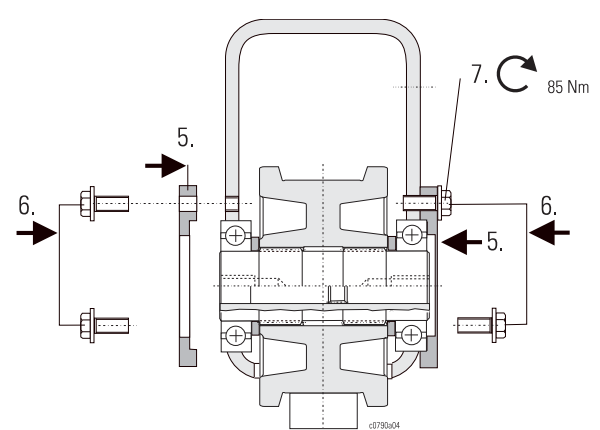


Fig. 4





#### 3.4 Maintenance work (continued)

##### 3.4.3 Refitting wheel K. L-S 200.. and K. L-S 315.. after replacing bearing

- Press bearing onto wheel axle/shaft as far as collar
- Roll wheel into endcarriage from the front
- Fit flange bearings, Fig. 5
- Bolt on flange bearings. The collars of the flange bearings must lie flat on the endcarriage, Fig. 6

Fig. 5

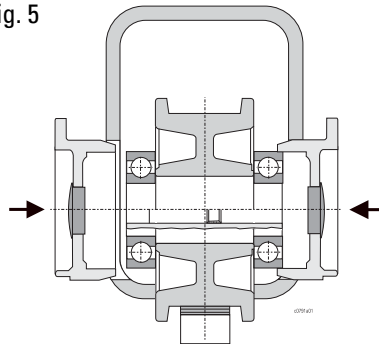
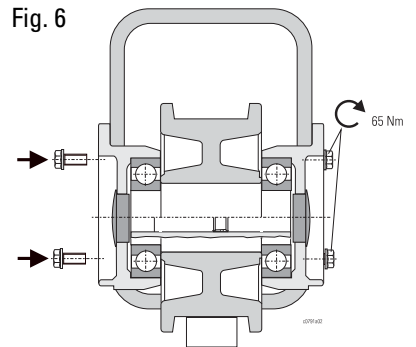


Fig. 6



##### 3.4.3 Refitting wheel K. L-E 315.. (non-driven) after replacing bearing

- Grease seat of bearing on shaft, Fig. 7.  
(Grease KFP 1K, e.g. Aralub PMD 1).
- Slip Nilos rings onto wheel and press self-aligning roller bearing over inside ring onto the wheel as far as collar. **Caution!** Do not tilt bearing to avoid damaging the Nilos rings.
- Roll wheel into endcarriage from the front.
- Fit bearing flanges, Fig. 7.
- Secure bearing flanges with screws. The eyes of the bearing flanges must lie flush in the countersinks on the endcarriage, Fig. 8.

Fig. 7

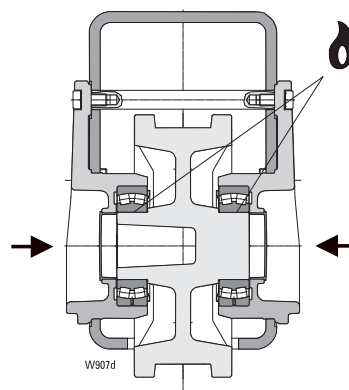
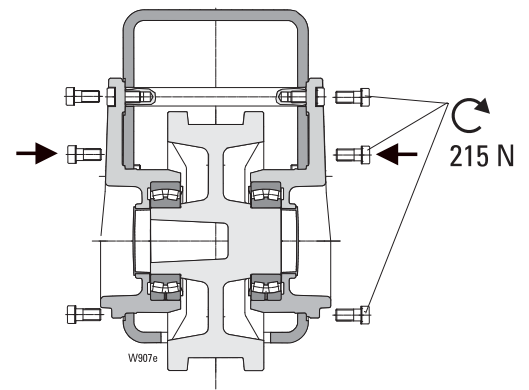


Fig. 8



#### 3.4 Maintenance work (continued)

##### 3.4.3 Refitting wheel K. L-E 315.. (driven) after replacing bearing

- Grease seats of bearings and teeth of wheel and wheel shaft, Fig. 9. (Grease KFP 1K, e.g. Aralub PMD 1).
- Slip Nilos rings onto wheel and press self-aligning roller bearing over the inside ring onto wheel as far as collar. **Caution!** Do not tilt bearing to avoid damaging the Nilos rings.
- Completely fill bearing and half-fill space with grease (See lubrication table for type)
- Roll wheel into endcarriage with the spline profile towards the outside of the endcarriage.
- Fit bearing flanges, Fig. 9.
- Secure bearing flanges with screws. The eyes of the bearing flanges must lie flush in the countersinks on the endcarriage, Fig. 10.
- Push shorter end of wheel shaft into wheel from the connection plate side as far as collar.
- On outside of endcarriage, fit circlip into groove on wheel shaft near bearing and fit plastic cap onto wheel shaft.

Fig. 9

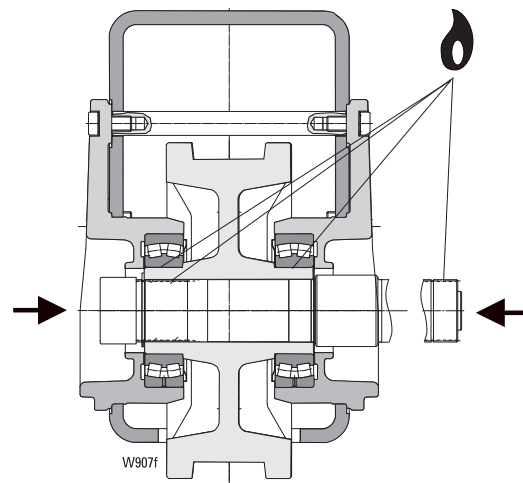
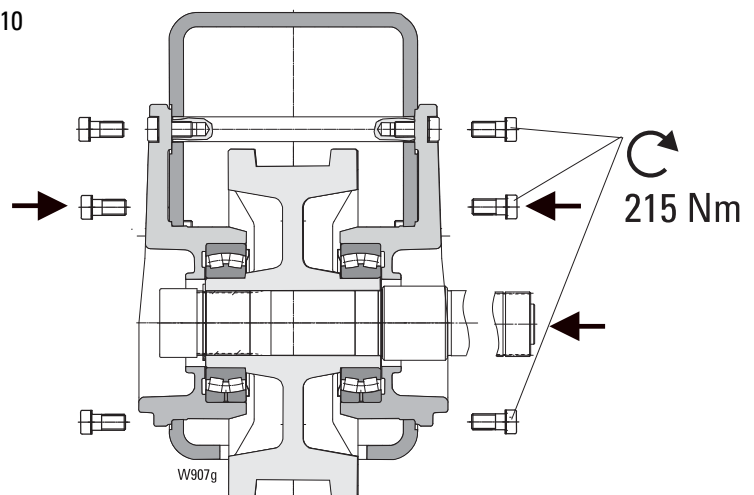


Fig. 10



#### 3.4 Maintenance work (continued)

##### 3.4.3 Refitting wheel KZL-C 400.. and KZL-F 500.. (FE-A 400-..) after replacing bearing

Caution! When fitting, do not tilt the outer ring of the self-aligning roller bearing against the inside ring!

- If necessary, replace the two gaskets (d) on the wheel.
- Grease bearing seats and gearing of wheel axle/shaft (Grease KPF 1K, e.g. Aralub PMD1).
- Push bearing onto wheel axle/shaft up to collar (wheel axle - marking groove, wheel shaft on drive side), Fig. 11
- Insert bearing into bearing bushing of endcarriage, Fig. 11
- Roll wheel into endcarriage from the front
- Insert wheel axle/shaft into wheel until the gear profile touches (!), Fig. 11
- Insert wheel axle/shaft until the end is flush with the bearing (!), Fig. 12
- Fit circlips, Fig. 13
- Completely fill bearing and half-fill space with grease (See lubrication table for type)
- Replace bearing covers, Figs. 13 and 14
- Lower endcarriage onto crane runway.

Fig. 11

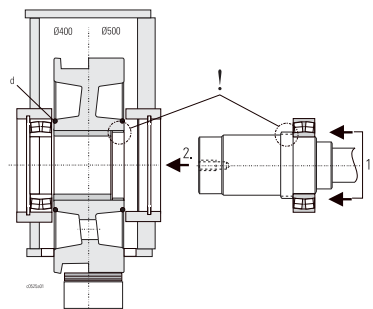


Fig. 12

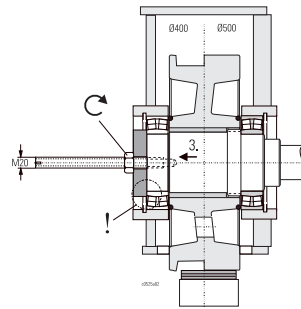


Fig. 13

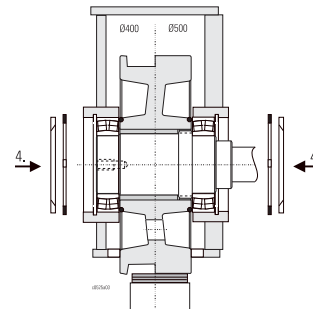
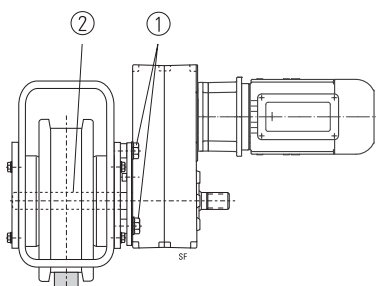
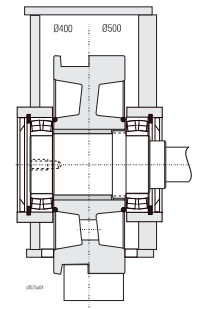
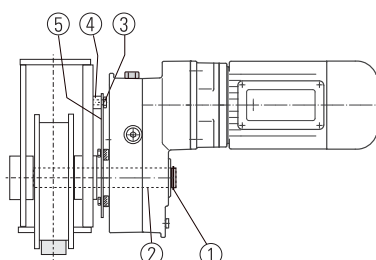


Fig. 14



##### 3.4.4 Fitting travel drive SF.. ex

- Push travel drive into greased hub of wheel (2)
- Bolt travel drive with torque support to endcarriage with bolts (1), tightening torques: M8 = 25 Nm (SF 15...), M12 = 70 Nm (SF 25... + SF 35...)
- The contact surfaces of the torque support must be free of paint.



##### 3.4.5 Fitting travel drive SA-D ... ex

- Remove circlip (1)
- Grease gearing (2) of wheel shaft. (Grease KPF 1K, e.g. Aralub PMD1)
- Push travel drive onto wheel shaft.
- Bolt torque support (5) to endcarriage with bolts (3) and spacer part (4). (M12=87 Nm, M16=215 Nm)
- The contact surfaces of the torque support must be free of paint.
- Fit circlip (1) on wheel shaft

#### 3.4 Maintenance work (continued)

##### 3.4.6 Fitting buffer plate

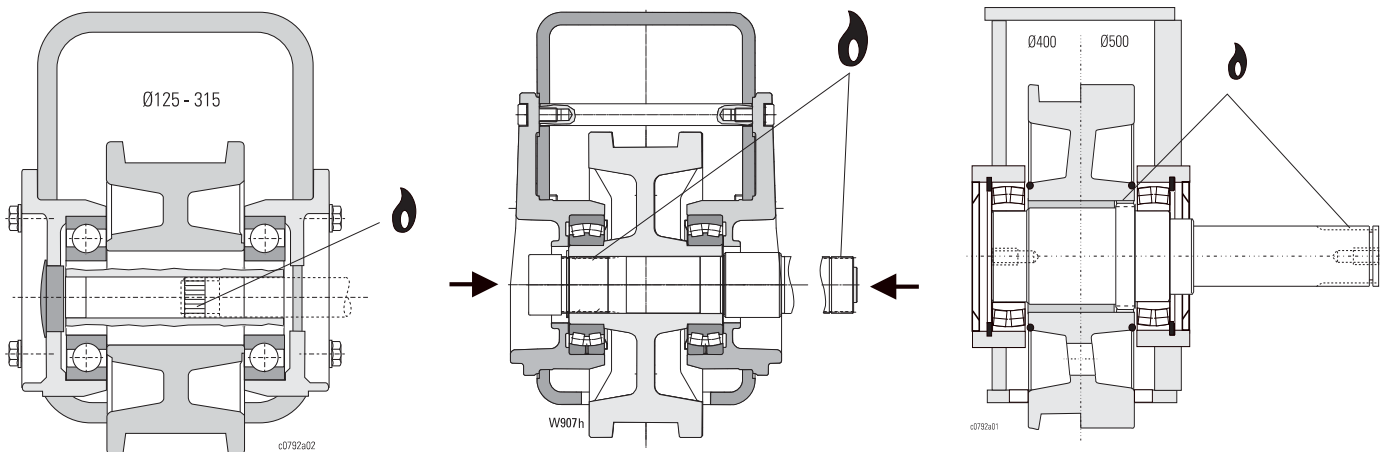
- Push buffer plate (b) into endcarriage section and bolt on, tightening torque 32 Nm (M12) or 740 Nm (M24).

##### 3.4.7 Lubrication

When replacing wheels and during a general overhaul, the gearing between wheel shaft, wheel and travel drive must be lubricated.

Lubricant: KPF 1K Aralub PMD1.

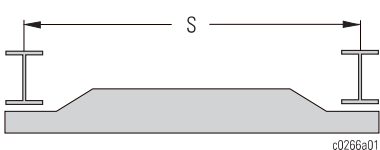
See "Travel drive" for lubrication of travel drive.



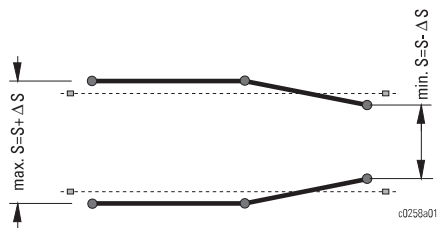
## 4.1 Checking crane runway



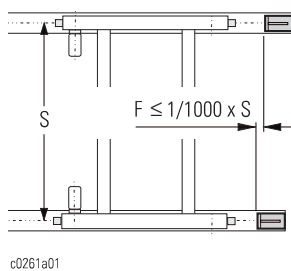
- $S \leq 15 \text{ m: } \Delta S = \pm 5 \text{ mm}$
- $S \leq 20 \text{ m: } \Delta S = \pm 6 \text{ mm}$
- $S \leq 25 \text{ m: } \Delta S = \pm 8 \text{ mm}$
- $S \leq 30 \text{ m: } \Delta S = \pm 9 \text{ mm}$
- $S \leq 32,5 \text{ m: } \Delta S = \pm 9,5 \text{ mm}$



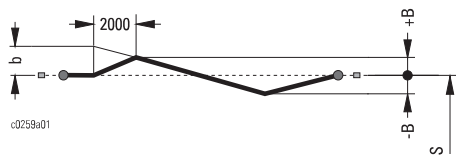
$\Delta S = \pm 3 \text{ mm}$



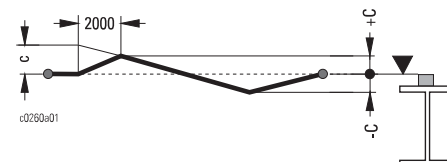
- Check the dimensions and clearance of the runway, see sketches.
- Compare the crane rail or flange width of the crane runway with the wheel width/guide roller setting or flange width set on the endcarriages. see tables for adjustment.
- Fit stable end stops to the ends of the crane runway.  
The front edges of the crane runway end stops must be flush with each other and be at right-angles to the crane runway, see sketch.
- Ensure that the running surfaces are free of oil, grease, paint or other dirt.
- Ensure that the junctions in the crane rails are even, if necessary grind down.
- The crane runway must comply with the requirements of DIN 4132.



max  $F = 20 \text{ mm}$



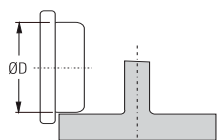
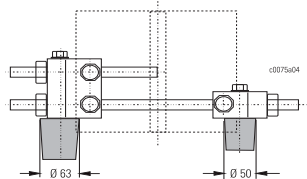
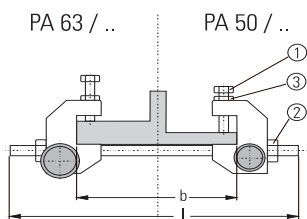
$B = \pm 10 \text{ mm}$   
 $b = \pm 1 \text{ mm}$



$C = \pm 10 \text{ mm}$   
 $c = \pm 1 \text{ mm}$

## 4.2 Runway end stops

PA .. runway end stops are flanged onto the lower flange of a single girder crane and can be adjusted to different girder profiles:



- Position buffer stop on crane girder at right-angles and according to plan.
- Screw (1) down loosely.
- Screw (2) down loosely.
- Screw (1) down with MA = 215 Nm.
- Screw (2) down with MA = 215 Nm.
- Lock (1) with nuts (3).

Type	b max.	l	max.	E max. *3	Trolley *1	Ø D
	[mm]	[mm]	[kg]	[Nm]	[kg]	[mm]
PA 50/200	200	350	3200	200	700	100
PA 50/300	300	450				125
PA 50/500	500	650				125
PA 63/200	200	350	10000 (16000) *2	440	3200 (3600) *2	125
PA 63/300	300	450				160
PA 63/500	500	650				200

\*1 Weight of trolley incl. counterweight

\*2  $\leq I 140: M10.., \geq I 160: M12..$

\*3  $E = 0,1415 \cdot mka \cdot v^2 \cdot x \text{ (Nm)}$

mka (t), v (m/min)

x = with travel limit switch: 0.72

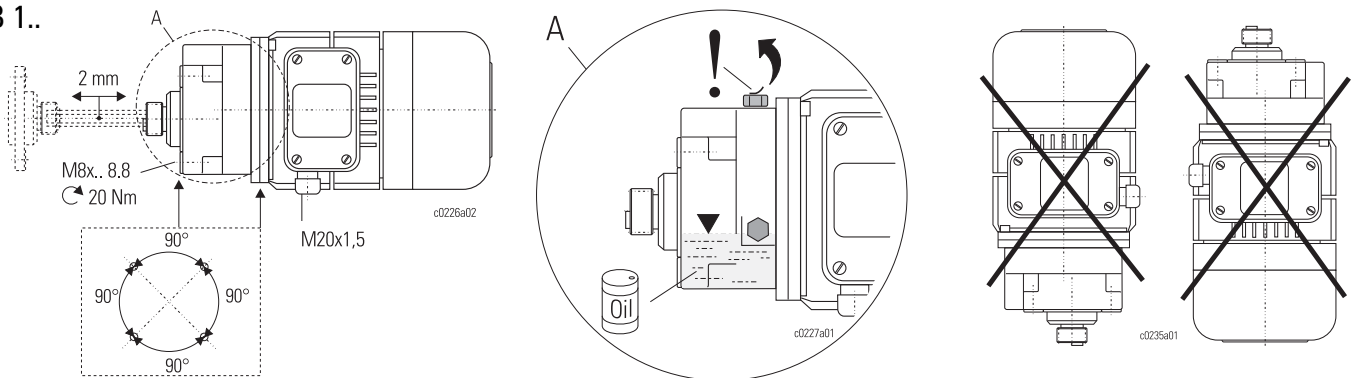
x = without travel limit switch: 1.0

The travel drives are high-quality drives with smooth starting and braking characteristics as is required in particular for material handling.

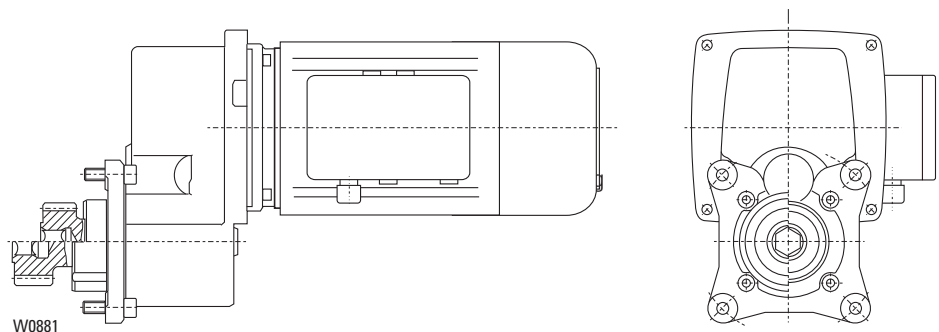
## 5.1 Assembly

- Ensure correct assembly position. The gear vent plug must always be at the highest point of the gear
- Remove sticker from vent plug.
- Tighten fixing bolts with specified torque
- Check oil level before commissioning
- Complete electrical connection according to circuit diagram (see sketches).

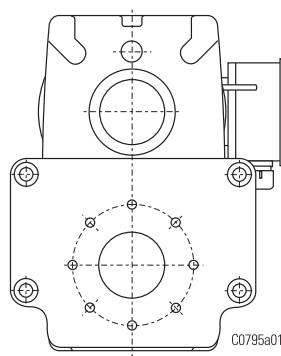
### FU-B 1..



### SF 11..

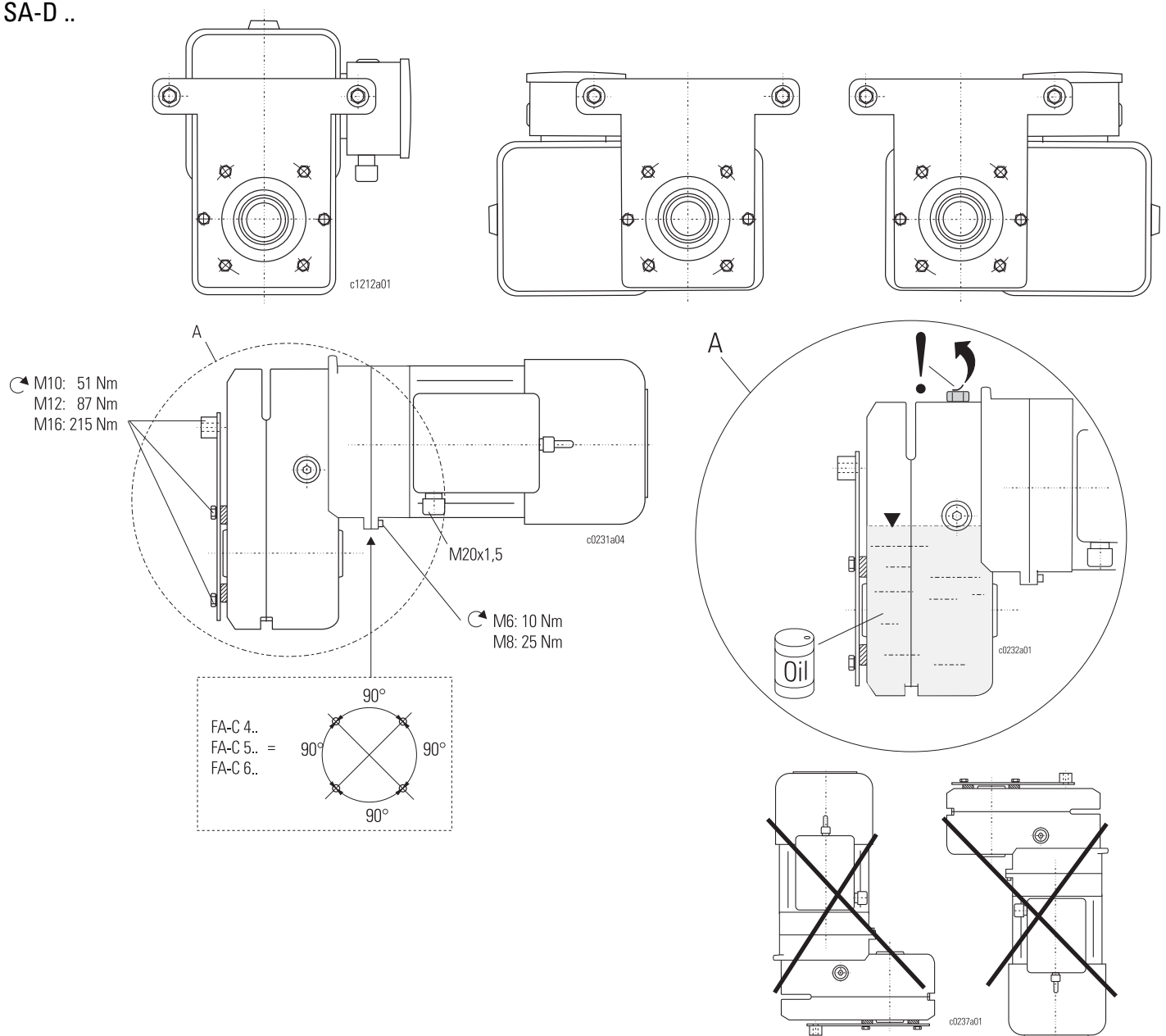


### SF 15; 25; 35 ..

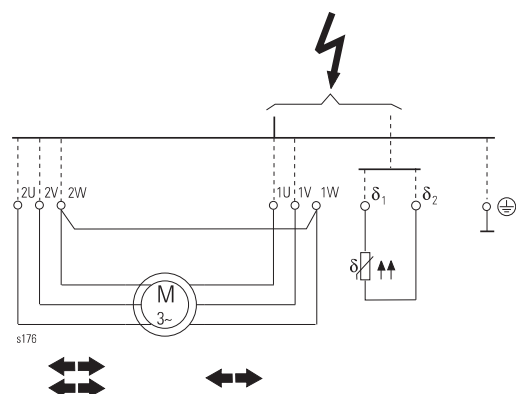
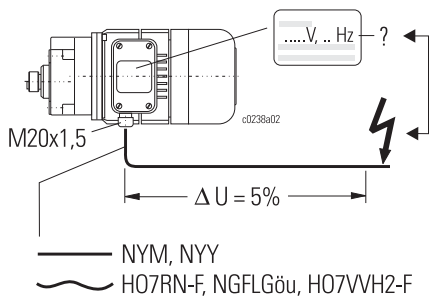


## 5.1 Assembly (continued)

SA-D ..



## 5.2 Electrical connection



## 5.3 Inspection and maintenance table



This section deals with the operational reliability, availability, and maintaining the value of your explosion-protected travel drives. Although they are practically maintenance-free, the components subject to wear and the components important for explosion protection must be inspected regularly. This is required by the accident prevention regulations.

### General information on inspection and maintenance

- Maintenance and repair work may only be carried out when the crane is not under load.
- Switch off and padlock main isolator.



**It is not permitted to work on live parts in areas exposed to explosion hazards!**

Inspection and maintenance may only be performed by qualified personnel especially trained on explosion protection, see page 2.

Please also note the "Safety instructions" on page 5. Wearing parts, see page 49.

No.	Inspection on commissioning*1	Daily inspection on starting work *2	Periodic inspections every 12 months *3	Periodic maintenance every 12 months *2	Maintenance after 10 years or general overhaul *4	<b>Inspection and maintenance table</b> (Classification: 1 Bm)	See page
1	•		•	•		Firm seating of bolt connections	
2			•			Travel drive: attachment, torque support	39
3	•	•	•			Check braking effect of travel drive	41
4	•					Oil level	39
5					•	Change gear oil/gear grease of travel drive	
6			•	•		Power supply	

\*1 By a fitter engaged by the manufacturer

\*2 By the operator

\*3 Periodic maintenance every 12 months, possibly earlier if so prescribed by national regulations, to be performed by a fitter engaged by the manufacturer.

Similarly, heavy-duty applications and adverse conditions (dirt, solvents, multi-shift operation etc.) necessitate shortening this inspection and maintenance interval.

\*4 In manufacturer's works.



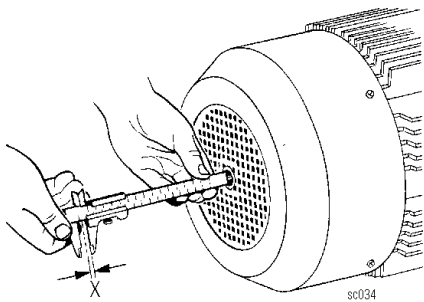
## 5.4 Maintenance work

Check brake at regular intervals. The intervals must be adapted in accordance with the application. Too great a brake displacement will lead to a high temperature rise in the motor and mechanical damage.

- Move trolley into a secure position.

### 5.4.1 Testing brake

- Measure displacement of motor shaft, switching motor on briefly, see sketch



The displacement of the motor shaft is the difference between the dimension fan cover → motor shaft when running (L1) and fan cover → motor shaft when standing still (L2) ( $X = L1 - L2$ ). The dimensions L1, L2 differ for different motors. The minimum displacement must not be less than X min. to prevent the brake disc touching during normal operation. The max. displacement must not exceed X max..

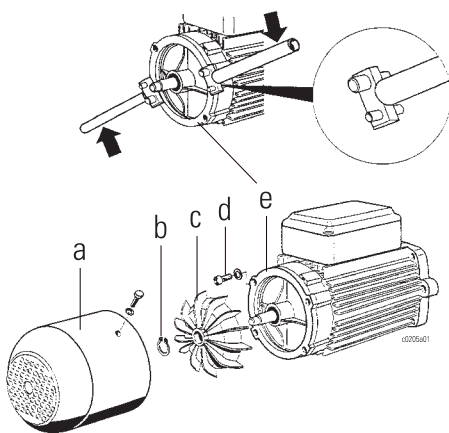
	Travel motor		
	A05	A1 ex	A2ex
X min	0.7	0.7	0.7
X max	2.5	2.5	2.5

### Adjusting brake

1. Measure displacement of motor shaft.
2. Remove fan cover (a), fanwheel (c) and unscrew screws (d).
3. Rotate motor cover (e) clockwise, keeping the holes aligned, until the minimum permissible brake displacement has been reached. One rotation of the motor cover reduces the brake displacement by 2 mm.

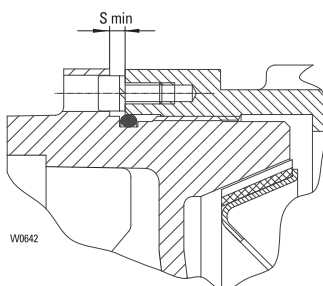
**Do not use force when rotating the cover. The Ex joints could be damaged!**

4. Replace motor cover with screws (d).
5. Push fanwheel (c) onto motor shaft and lock with lock washer (b).
6. Replace fan cover (a).



- We recommend using our special tool for rotating the motor cover. see sketch

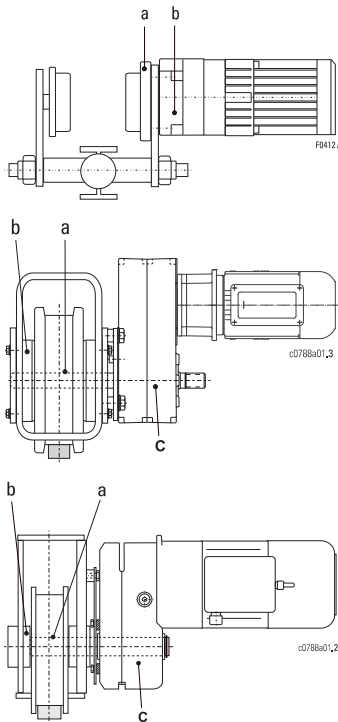
- If dimension S min. has been reached, replace brake disc.



	Travel motor		
	A05 ex	A1 ex	A2 ex
S min	0.8	0.8	3.2

**All socket head cap screws must be grade 8.8.**

## 5.4 Maintenance work



### 5.4.2 Gear

The gear has a long service life. All bearing points have roller bearings. The gearing is hardened, hard-machined and has high safety factors.

- During annual maintenance, check whether any oil has leaked (puddle of oil underneath the gear, drops of oil on the gearbox). If any loss of oil is ascertained, the oil must be changed and repairs scheduled if necessary.
- Note any gear noises from the crane when under load and without load. Rough, noisy running, knocking sounds indicate possible faults. If any faults are detected, repairs must be scheduled. If there is any uncertainty, a fresh diagnosis can be made after consulting experts, e.g. from the manufacturer.

### 5.4.3 Changing oil/grease of travel drive Lubricating toothed boss of wheel

The SF 15.. travel drive has a gear with grease lubrication, the FU-B1 .., SF 25.., SF 35.. and SA-D... have gears with oil lubrication (b). The toothed boss (a) is lubricated with grease (see table).

The type and quantity of oil or grease can be seen from the table.

Position of lubrication point		Type of lubricant	Designation	Quantity	Characteristics, makes	Order. No.
a	Toothed boss of wheel	Grease	KPF 1K	50 gr	Soap base: Lithium + MoS2 Dripping point: approx. 185°C (180°C) Penetration: 310-340 (310-340) Operating temperature: -20° to +120°C, (-50° to +150°C), e.g.: Aral Fett P 64037*, Aralub PMD1, BP Multi-purpose Grease L21M, Esso Multi-purpose Grease M, Mobil Grease Special, Shell Retimax AM *1, Texaco Molytex Grease EP2, Fuchs Renolit FLM2, (Fuchs Renolit FLM2)	
b	Wheel bearingl	Grease	KP 2 N-20 (KP 1 G-30)		Soap base: Lithium Dripping point: approx. +260°C (+170°C) Penetration: 265-295 (310-340) Operating temperature: -20° to +140°C (-30° to +140°C) e.g.: Klüberlub BE 41-542* (LGWM1)	
c	SU-A 1.4.1. SU-A 1.4.2.	Grease	KPOK	130 gr 200 gr	Soap base: Lithium + MoS2 Dripping point: approx. +180°C Penetration: 355-385 Operating temperature: -30° to +130°C e.g.: Aral Fett P64037*, Aralub PMD0, Tribol Molub-Aloy Mehrzweckfett	32 250 09 65 0 (0.75 kg)
	SF 1. 1.. SF 1. 2..	Grease	KPF 0K-20	100 gr 200 gr	Soap base: Lithium + MoS2 Dripping point: ca. +180°C Penetration: 355-385 Operating temperature: -30° to +130°C e.g.: Aral Grease P64037*, Aralub PMD0, Tribol Molub-Aloy Multi-purpose grease	32 250 09 65 0 (0.75 kg)
	Gear SF 25.. Gear SF 35.. Gear SA-. 5.. Gear SA-. 6..	Oil	CLP 460	1000 ml 1500 ml 1000 ml 3000 ml	Viscosity: 460 cSt/40°C (240 cSt/40°C) Pourpoint: -20°C (-40°) Flash point: +265°C (+270°C) e.g.: Fuchs Renep Compound 110*, Aral Degol BG 460, BP Energol GR-XP 460, Esso Spartan EP 460, Mobil Gear 634, Shell Omala Oel 460, Texaco Meropa 460, (Shell Tivela Oil 82)	32 250 07 65 0 (1 kg)

( ) = Lubricants for low operating temperatures, max. -30°C

\* Factory filling

\*1 Only down to -20°C

### 6.1 Tightening torques for bolt connections

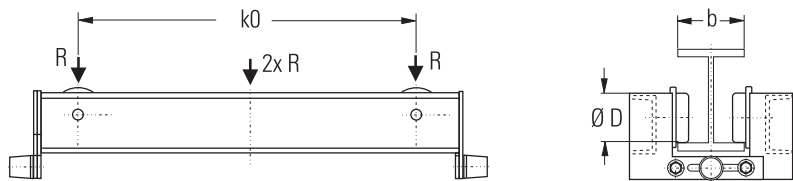
The following is a summary of the most important bolt connections and the tightening torques necessary for safe connection.

No.	Position of bolt connection		Type	Bolt connection		
	Part 1 1	Part 2		Thread	Grade	Tightening torque [Nm]
1	Endcarriage	Bearing cover	KEL-S 125 K.L-S 160 K.L-S 200	M10	100	85
			K.L-S 315	M12	100	85
2	Endcarriage	Buffer plate	K.L-S ...	M12	8.8	32
			KZL-C 400	M24		740
			KZL-F 500	M24		740
3	Endcarriage	Guide roller holder/ antiderail device	K.L-S ...	M12	8.8	87
			KZL-C 400	M24		740
			KZL-F 500	M24		740
4	Endcarriage	Bearing plate	K.L-S ...	M20	10.9	450*
			KZL-C 400	M30		1650
			KZL-F 500	M30		1650
5	Endcarriage	Buffer plate Guide roller holder-buffer bracket/ antiderail device	K.L-S ...	M12	8.8	87
			KZL-C 400			
			KZL-F 500			
6	Guide roller holder/antiderail device	Holder	KEL-S 125 K.L-S 160	M12	100	130
			K.L-S 200 K.L-S 315	M16	100	330
7	Guide roller holder	Guide roller/wheel	KEL-S 125 K.L-S 160	M8	8.8	25
			K.L-S 200 K.L-S 315	M10	8.8	51
8	Travel drive torque support	Endcarriage	SF 15..	M8	8.8	25
			SF 25..	M12	8.8	70
			SF 35..	M12		70
			SA-D..	M12		87
			SA-D..	M16		215
9	Travel drive torque support	Travel drive gear housing	SF 15..	M8	8.8	25
			SF 25..	M10	8.8	51
			SF 35..	M10		51
			SA-D..	M12		87
			SA-D..	M16		215
10	All other bolt connections		M6		8.8	10
			M8			25
			M10			51
			M12			87
			M16			215
			M20	8.8		430
			M24			740
M30			1500			
M36			2600			

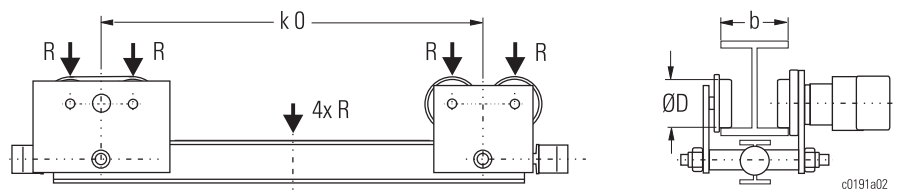
## 6.2 Endcarriages for suspension cranes

Endcarriage (pair)							Travel drives *5						
Ø d1	R perm. *	L1	k0	b	Type	⊕ kg *3 *4	mF <sub>zul.</sub> 50 Hz *4	↔				Type	⊕ kg *4
								50 Hz		60 Hz			
(mm)	(kg)	(m)	(mm)	(mm)		(kg)	(kg)	(m/min)	(kW) *1	(m/min)	(kW) *1		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
80	750	8	500	74-131	KEH-B 080.05.0	50	-	-	-	-	-	-	-
80	1000	8	1000	74-300	KEH-A 080.10.1	200	5000	10/40	2x 0,06/0,32	12,5/50	2x 0,08/0,39	2x FU-B 125339ex	30
			14		1800	KEH-A 080.18.1	268						
		20	2500		KEH-A 080.25.1	380	9400	5/20	2x 0,06/0,32	6,3/25	2x 0,08/0,39	2x FU-B 125326ex	30
		20	2500		KEH-A 080.25.2	394	10000	10/40	4x 0,06/0,32	12,5/50	4x 0,08/0,39	2x FU-B 125339ex	60
100	1600	14	1800	98-300	KEH-A 100.18.1	370	6000	10/40	2x 0,06/0,32	12,5/50	2x 0,08/0,39	2x FU-B 125339ex	30
			20		2500	KEH-A 100.25.1	500						
		14	1800		KEH-A 100.18.2	370	10600	5/20	2x 0,06/0,32	6,3/25	2x 0,08/0,39	2x FU-B 125326ex	30
		20	2500		KEH-A 100.25.2	500	12000	10/40	4x 0,06/0,32	12,5/50	4x 0,08/0,39	2x FU-B 125339ex	60
125	2500	20	2500	119-300	KEH-A 125.25.1	780	14600	10/40	2x 0,15/0,68	12,5/50	2x 0,18/0,82	2x SF 11211113ex	94
							13700	5/20	2x 0,06/0,32	6,3/25	2x 0,08/0,39	2x SF 11217503ex	90
							29100		2x 0,15/0,68		2x 0,18/0,82	2x SF 11217113ex	94
160	3625	20	2500	119-300	KEH-A 160.25.1	1060	17700*5	10/40	2x 0,15/0,68	12,5/50	2x 0,18/0,82	2x SF 11211113ex	94
											2x SF 11211103ex	94	
							15600	5/20	2x 0,06/0,32	6,3/25	2x 0,08/0,39	2x SF 11217503ex	90
							35400		2x 0,15/0,68		2x 0,18/0,82	2x SF 11217113ex	94

KEH-B 080



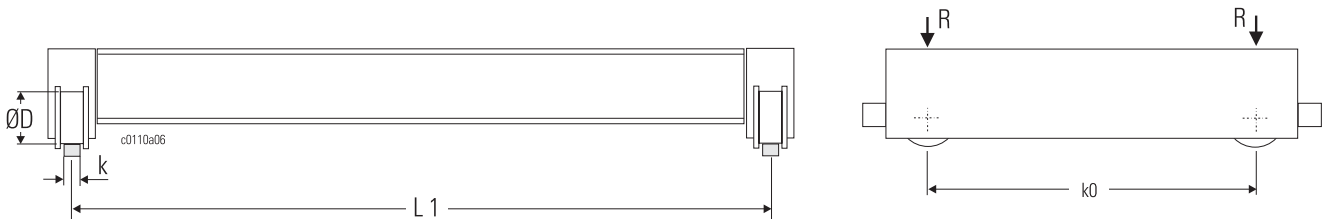
KEH-A ...



- \* Per wheel pair. Rough estimation: Centre load on endcarriage for KEH-A..= 4 x Rzul
- \*1 20/40 % DC, further motor data see page 49
- \*2 Please state "b" when ordering
- \*3 Without travel drive
- \*4 For 1 pair of endcarriages
- \*5 Dead weight of crane mKr =4000 k

6.3 Endcarriages for single girder overhead travelling cranes

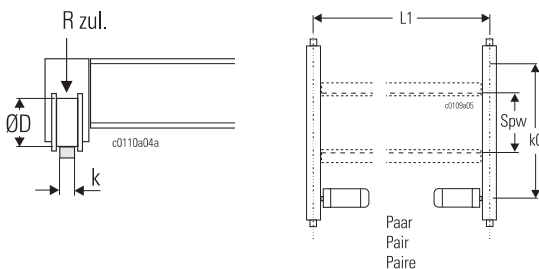
Endcarriage (pair)											Travel drives (pair)							
Ø D	R perm. *	k 0	L 1 perm.	Type *2	*5	R id perm. at travel speeds				kg	50 Hz		60 Hz		mF perm. 50 Hz	Type	kg	
	(H2/B3)					↔	k=40 *3	k=50 *3	k=60 *3		↔	↔	*4	2x....				*4
mm	kg	mm	m			m/min	kg			kg	m/min	kW *1	m/min	kW *1	kg			
1	2	3	4	6		7	8	9	10	13	14	15	16	17	18	19		20
125	3640	1250	9.5	KEL-S 125.1.12.	xxx	10/40	3060	3470	-	224	10/40	2x0.06/0.32	12.5/50	2x0.08/0.39	6400	SF 15220503ex	82	
	3640	1600	12	KEL-S 125.1.16.	xxx	12.5/50	2880	3220	-	256	10/40	2x0.15/0.68	12.5/50	2x0.18/0.82	14500	SF 15220113ex	86	
	3640	2000	15	KEL-S 125.1.20.	xxx	5/20	3520	3640	-	296	5/20	2x0.06/0.32	6.3/25	2x0.08/0.39	11000	SF 15226503ex	82	
	3640	2500	18.5	KEL-S 125.1.25.	xxx	6.3/25	3410	3640	-	344	5/20	2x0.06/0.32	6.3/25	2x0.08/0.39	11000	SF 15226503ex	82	
160	5510	1600	12	KEL-S 160.2.16.	xxx	10/40	4180	5230	-	366	10/40	2x0.06/0.32	12.5/50	2x0.08/0.39	7000	SF 25222503ex	96	
	5510	2000	15	KEL-S 160.2.20.	xxx	12.5/50	3940	4930	-	416	10/40	2x0.15/0.68	12.5/50	2x0.18/0.82	17300	SF 25222113ex	100	
	5510	2500	18.5	KEL-S 160.2.25.	xxx	5/20	4660	5510	-	482	5/20	2x0.06/0.32	6.3/25	2x0.08/0.39	12100	SF 25228503ex	96	
	4370	3150	23.5	KEL-S 160.2.31.	xxx	6.3/25	4520	5510	-	570	5/20	2x0.06/0.32	6.3/25	2x0.08/0.39	12100	SF 25228503ex	96	
200	8520	2000	15	KEL-S 200.2.20.	xxx	10/40	5450	6820	7920	447	10/40	2x0.15/0.68	12.5/50	2x0.18/0.82	20400	SF 25224113ex	100	
	7740	2500	18.5	KEL-S 200.2.25.	xxx	12.5/50	5230	6540	7350	746	10/40	2x0.25/1.20	12.5/50	2x0.32/1.45	36000	SF 25224103ex	96	
	6320	3150	23.5	KEL-S 200.2.31.	xxx	5/20	6000	7500	8540	875	5/20	2x0.06/0.32	6.3/25	2x0.08/0.39	13000	SF 25230503ex	96	
	4300	4000	30	KEL-S 200.2.40.	140	6.3/25	5830	7290	8540	939	5/20	2x0.15/0.68	6.3/25	2x0.18/0.82	28800	SF 25830113ex	120	
315	12610	2000	15	KEL-S 315.3.20.	140	..50	8870	11090	16190	934	10/40	2x0,15/0,68	12,5/50	2x0,18/0,82	27500	SF 35228113ex	142	
	11040	2500	18,5	KEL-S 315.3.25.	140	...40	9160	11450	13710	1047	10/40	2x0,25/1,20	12,5/50	2x0,32/1,45	41800	SF 35228103ex	158	
	9120	3150	23,5	KEL-S 315.3.31.	140	...25	9730	12540	13710	1221	5/20	2x0,15/0,68	6,3/25	2x0,18/0,82	38900	SF 35834113ex	162	
	6700	4000	30	KEL-S 315.3.40.	140	...20	10010	12160	13710	1410	5/20	2x0,15/0,68	6,3/25	2x0,18/0,82	38900	SF 35834113ex	162	
	13500	2500	18,5	KEL-E 315.5.25.	140	..50	-	-	-	1352	10/40	2x0,15/0,68	12,5/50	2x0,18/0,82	28400	SA-D5728113ex	156	
	12000	3150	23,5	KEL-E 315.5.31.	140	...40	-	-	-	1544	10/40	2x0,25/1,20	12,5/50	2x0,32/1,45	44400	SA-D5728103ex	156	
	10500	4000	30	KEL-E 315.5.40.	140	...25	-	-	-	1796	10/40	2x0,40/2,00	6,3/25	2x0,50/2,40	75600	SA-D5728203ex	172	
						...20	-	-	-		5/20	2x0,08/0,32	6,3/25	2x0,08/0,32	20800	SA-D5734503ex	152	
					...20	-	-	-		5/20	2x0,15/0,68	6,3/25	2x0,18/0,82	58200	SA-D5734113ex	156		
					...20	-	-	-		5/20	2x0,25/1,20	6,3/25	2x0,32/1,45	102800	SA-D5734103ex	156		



- \* Rough estimation: Centre load on endcarriage = 2 x Rzul  
Rail material min. ST52-3/S355
- \* 120/40 % DC, further motor data see page 49
- \*2 with flanged wheels
- \*3 Rid zul for flat rails
- \*4 For 1 pair
- \*5 xxx = 140: connection "at side"  
xxx = 259: connection "at top"

6.4 Endcarriages for double girder overhead travelling cranes

Endcarriage (pair)													Travel drives (pair)								
Ø D	R perm. (H2/B3)	k0	Spw	L1 per m.	Type *2 *5	R id perm. at travel speeds					kg	50 Hz		60 Hz		mF perm. 50 Hz *4	Type 2x.....	kg			
						k=40 *3	k=50 *3	k=60 *3	k=70 *3	k=100 *3		m/min	kg	m/min	kW *1				m/min	kW *1	kg
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
160	5510	2000	1250	15	KZL-S 160.2.20.04.140	10/40	4180	5230	-	-	-	458	10/40	2x0.06/0.32	12.5/50	2x0.08/0.39	7000	SF 25222503ex	96		
		2500	1250	18.5	KZL-S 160.2.25.04.140	12.5/50	3940	4930	-	-	-	524		2x0.15/0.68		2x0.18/0.82	17300	SF 25222113ex	100		
		2500	1250	18.5	KZL-S 160.2.25.04.540							524									
		3150	1400	23.5	KZL-S 160.2.31.05.140	5/20	4660	5510	-	-	-	612	5/20	2x0.06/0.32	6.3/25	2x0.08/0.39	12100	SF 25228503ex	96		
		3150	1400	23.5	KZL-S 160.2.31.05.540	6.3/25	4520	5510	-	-	-	612									
200	8520	2000	1250	15	KZL-S 200.2.20.04.136	10/40	5450	6820	7450	-	-	652	10/40	2x0.15/0.68	12.5/50	2x0.18/0.82	20400	SF 25224113ex	100		
		2500	1400	18.5	KZL-S 200.2.25.05.136	12.5/50	5230	6540	6910	-	-	731		2x0.25/1.20		2x0.32/1.45	36000	SF 25224103ex	116		
		2500	1400	18.5	KZL-S 200.2.25.05.156							731									
		2500	1400	18.5	KZL-S 200.2.25.05.536	5/20	6000	7500	9000	-	-	731	5/20	2x0.06/0.32	6.3/25	2x0.08/0.39	13000	SF 25230503ex	96		
		3150	1400	23.5	KZL-S 200.2.31.05.xxx	6.3/25	5830	7290	8710	-	-	907		2x0.15/0.68		2x0.18/0.82	28800	SF 25830113ex	120		
		4000	2240	30	KZL-S 200.2.40.10.xxx							1000									
		4000	2500	30	KZL-S 200.2.40.12.136							1000									
		4000	2500	30	KZL-S 200.2.40.12.156							1000									
		4000	2800	30	KZL-S 200.2.40.14.136							1000									
		4000	2800	30	KZL-S 200.2.40.14.156							1000									
315	13680	2500	1400	18.5	KZL-S 315.3.25.05.136							1043	10/40	2x0.15/0.68	12.5/50	2x0.18/0.82	27500	SF 35228113ex	142		
		2500	1400	18.5	KZL-S 315.3.25.05.156							1043		2x0.25/1.20		2x0.32/1.45	41800	SF 35228103ex	158		
		2500	1400	18.5	KZL-S 315.3.25.05.536							1043									
		3150	1400	23.5	KZL-S 315.3.31.05.xxx	...50	8870	10480	13190	-	-	1249	5/20	2x0.15/0.68	6.3/25	2x0.18/0.82	38900	SF 35834113ex	162		
		4000	2240	30	KZL-S 315.3.40.10.xxx	...40	9160	11290	13710	-	-	1434									
		4000	2500	30	KZL-S 315.3.40.12.136	...25	9730	12160	13710	-	-	1434									
		4000	2500	30	KZL-S 315.3.40.12.156	...20	10010	12510	13710	-	-	1434									
		4000	2800	30	KZL-S 315.3.40.14.136							1434									
		4000	2800	30	KZL-S 315.3.40.14.156							1434									
	315	22000	3150	1400	23.5	KZL-E 315.5.31.05.136	1606							10/40	2x0.15/0.68	12.5/50	2x0.18/0.82	28400	SA-D5728113ex	156	
			3150	1400	23.5	KZL-E 315.5.31.05.556	1675								2x0.25/1.20		2x0.32/1.45	44400	SA-D5728103ex	156	
			3150	1400	23.5	KZL-E 315.5.31.05.156	1675								2x0.40/2.00		2x0.50/2.40	75600	SA-D5728203ex	172	
			3150	1800	23.5	KZL-E 315.5.31.07.136	1606														
			3150	1800	23.5	KZL-E 315.5.31.07.156	1675								5/20	2x0.06/0.32	6.3/25	2x0.08/0.39	20800	SA-D5734503ex	152
			4000	2240	30	KZL-E 315.5.40.10.156	1926	...50	-							2x0.15/0.68		2x0.18/0.82	58200	SA-D5734113ex	156
			4000	2240	30	KZL-E 315.5.40.10.556	1926	...40	-							2x0.25/1.20		2x0.32/1.45	102800	SA-D5734103ex	156
			4000	2500	30	KZL-E 315.5.40.12.556	1926	...25	-												
			4000	2800	30	KZL-E 315.5.40.14.156	1926	...20	-												
400	19600	3150	1400	23.5	KZL-C 400.9.31.140	10/40	-	15000	17990	-	-	1952	10/40	2x0.15/0.68	12.5/50	2x0.18/0.82	29800	SA-D5730103ex	156		
		3150	1400	23.5	KZL-C 400.9.31.158	12.5/50	-	14570	17490	-	-	1952		2x0.25/1.20		2x0.32/1.45	46800	SA-D5730103ex	156		
		3150	1400	23.5	KZL-C 400.9.31.558							1952		2x0.40/2.00		2x0.50/2.40	79600	SA-D5730203ex	172		
		4000	2240	30	KZL-C 400.9.40.158	5/20	-	16370	19600	-	-	2210	5/20	2x0.6/0.32	6.3/25	2x0.08/0.39	16600	SA-D5736503ex	152		
		4000	2240	30	KZL-C 400.9.40.558	6.3/25	-	15920	19100	-	-	2210		2x0.15/0.68		2x0.18/0.82	59400	SA-D5736113ex	156		
		4260	2500	32	KZL-C 400.9.42.558							2288		2x0.25/1.20		2x0.32/1.45	84800	SA-D5736103ex	156		
500	29600	3150	1400	26	KZL-F 500.6.31.140	10/40	-	19290	23150	27010	29600	2490	10/40	2x0.25/1.20	12.5/50	2x0.32/1.45	49200	SA-D6732103ex	296		
		3150	1400	26	KZL-F 500.6.31.yyy	12.5/50	-	18740	22490	26240	29600	2490		2x0.40/2.00		2x0.50/2.40	83400	SA-D6732203ex	354		
		4000	2240	32	KZL-F 500.6.40.yyy							2822									
		4260	2500	34	KZL-F 500.6.42.yyy	5/20	-	20790	24950	29110	29600	2858	5/20	2x0.15/0.68	6.3/25	2x0.18/0.82	62200	SA-D6738113ex	280		
		4400	2240	35	KZL-F 500.6.44.578	6.3/25	-	20460	24550	28640	29600	2958		2x0.25/1.20		2x0.32/1.45	88800	SA-D6738103ex	296		
		4560	2800	36	KZL-F 500.6.45.yyy							3248									
		4660	2500	37	KZL-F 500.6.46.578							3336									
		4960	2800	39	KZL-F 500.6.49.578							3436									



- \* Rail material min. ST52-3/S355
- \* 120/40% DC, further motor data see page 49
- \*2 KZL-S./KZL-E.. with flanged wheels KZL-F.. see sketch
- L: with guide rollers
- R: without guide rollers
- \*3 Rid zul for flat rails
- \*4 For 1 pair
- \*5 Connection plate:  
xxx = .136; .156; .536; .556  
yyy = .158; .558

## 7.5 Travel drives

<b>..A..ex</b>	<b>380...415 V, 50 Hz</b>
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Code	Type	P		n1	TN	TA	TH	TB	Jrot	Jschw	IN	IK	cos φ N	cos φ K	ED	Ac T3	Wmax	PB
		kW	1/min	Nm	Nm	Nm	Nm	kgm <sup>2</sup>	kgm <sup>2</sup>	A	A			%		J/br	W	
53	2/8A05..ex	0.06 0.32	500 2540	1.20 1.20	2.30 2.65	1.58 2.14	1.27	0.0006	0.0054	1.0 1.1	1.1 3.4	0.69 0.86	0.79 0.89	20 40	540	-	-	
503	2/8A05..ex	0.06 0.32	500 2540	1.20 1.20	2.30 2.65	1.58 2.14	1.27	0.0006	0.0054	1.0 1.1	1.1 3.4	0.69 0.86	0.79 0.89	20 40	540	-	-	
103	2/8A1..ex	0.25 1.20	580 2780	4.14 4.14	6.00 11.2	5.62 9.99	5.1	0.0039	0.0159	1.6 2.6	2.5 13.5	0.65 0.86	0.74 0.77	20 40	360	-	-	
113	2/8A1..ex	0.15 0.68	620 2840	2.30 2.30	5.60 7.10	4.95 6.93	3.34	0.0039	0.0159	1.6 2.5	2.1 10.3	0.56 0.66	0.79 0.87	20 40	300	-	-	
203	2/8A2..ex	0.40 2.00	550 2760	6.92 6.92	12.0 20.0	11.4 16.9	9.39	0.0046	0.0274	2.7 4.8	4.2 21.9	0.54 0.85	0.66 0.77	20 40	350	-	-	

<b>.A..ex</b>	<b>380...415 V, 60 Hz</b>
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Code	Type	P		n1	TN	TA	TH	TB	Jrot	Jschw	IN	IK	cos φ N	cos φ K	ED	Ac T3	Wmax	PB
		kW	1/min	Nm	Nm	Nm	Nm	kgm <sup>2</sup>	kgm <sup>2</sup>	A	A			%		J/br	W	
53	2/8A05..ex	0.08 0.39	670 3140	1.20 1.20	2.70 3.00	1.83 2.50	1.27	0.0006	0.0054	1.5 1.6	1.7 4.9	0.66 0.87	0.78 0.90	20 40	500	-	-	
503	2/8A05..ex	0.08 0.39	670 3140	1.20 1.20	2.70 3.00	1.83 2.50	1.27	0.0006	0.0054	1.5 1.6	1.7 4.9	0.66 0.87	0.78 0.90	20 40	500	-	-	
103	2/8A1..ex	0.32 1.45	750 3380	4.14 4.14	6.50 11.9	5.46 9.99	5.1	0.0039	0.0159	2.2 3.4	3.4 18.6	0.61 0.87	0.72 0.74	20 40	330	-	-	
113	2/8Axx..ex	0.18 0.82	750 3420	2.30 2.30	6.40 8.40	5.01 6.81	3.34	0.0039	0.0159	2.2 3.2	2.2 10.8	0.53 0.62	0.73 0.85	20 40	270	-	-	
203	2/8A2..ex	0.50 2.40	680 3330	6.92 6.92	12.5 20.9	9.73 15.4	9.39	0.0046	0.0274	3.4 6.0	5.3 30.6	0.53 0.84	0.64 0.75	20 40	330	-	-	

Ac	[(c:h) x s]	Switching frequency factor
cos φ K		Power factor (short circuit)
cos φ N		Power factor (nominal)
ED	[%]	Duty cycle
IK	[A]	Short circuit current
IN	[A]	Rated current
Jrot	[kgm <sup>2</sup> ]	Moment of inertia, rotor
Jschw	[kgm <sup>2</sup> ]	Moment of inertia, centrifugal mass
n1	[1/min]	Motor r.p.m.
PB	[W]	Coil output (brake)
P	[kW]	Motor output
TA	[Nm]	Motor starting torque
TB	[Nm]	Braking torque (motor shaft)
TH	[Nm]	Run-up torque (motor shaft)
TN	[Nm]	Rated motor torque
Wmax	[J/Br]	Max. permissible friction energy (brake)

6.6 Conditions of use

The components are designed for use in industry and for the ambient conditions usual in industry.

Special measures must be taken for particular applications such as e.g. high degree of chemical pollution, outdoor use, offshore application, etc.

The manufacturer will be pleased to advise you.

**Equipment classification**

**Zone 1**

Equipment group II  
Category 2G

**Zone 21**

Equipment group II  
Category 2D

**Explosion protection**

**Zone 1**

⊕ II 2 G Ex de IIB T4  
⊕ II 2 G ck T4  
(Ex de IIC T4)

**Zone 21**

⊕ II 2D tD A21 IP66 120°C  
⊕ II 2D ck T120°C

**Protection against dust and humidity in acc. with EN 60 529**

**Zone 1**

IP 54 (IP66)

**Zone 21**

IP66

**Permissible ambient temperatures**

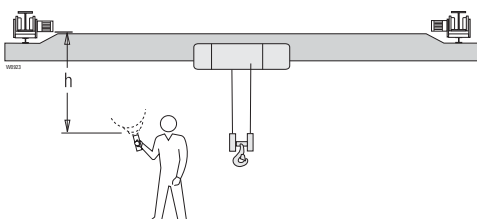
**Zone 1**

-20°C ... +40°C (+60° as option)

**Zone 21**

-20°C ... +40°C (+60° as option)

6.7 Sound pressure level



**- Travel drives**

Measured at a distance of 1 m from the crane contour.

The mean sound pressure level calculated for one operating cycle (50% with nominal load, 50% without load) can be seen in the tables.

Instead of stating an emission value based on a workplace, the values from the tables at measuring distance "h" can be used.

**Indoors**

Type of travel drive	[db (A)] +/- 3				
	h [m]				
	1 m	2 m	4 m	8 m	16 m
FU-B ..	76	73	70	67	64
SF .. 2	74	71	68	65	62
SF .. 8	78	75	72	69	66
SA-D ..	74	71	68	65	62

**Outdoors**

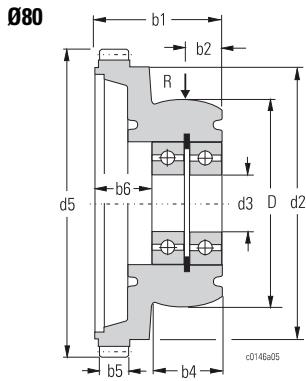
Type of travel drive	[db (A)] +/- 3				
	h [m]				
	1 m	2 m	4 m	8 m	16 m
FU-B ..	76	70	64	58	52
SF .. 2	74	68	62	56	50
SF .. 8	78	72	66	60	54
SA-D ..	74	68	62	56	50



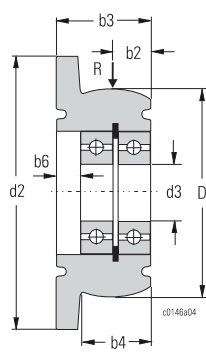
## 7.1 Wheels

### Wheels with 1 flange

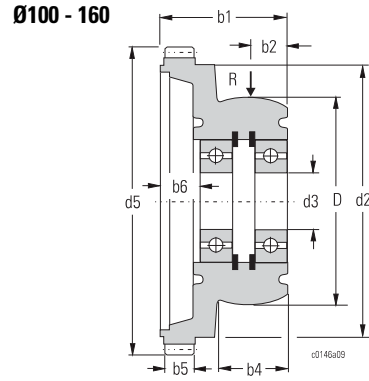
(Fig. A3)



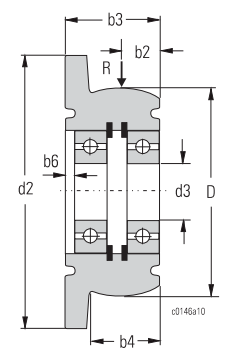
(Fig. B3)



(Fig. A4)

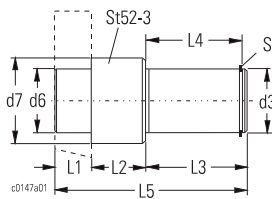


(Fig. B4)



ØD	Fig.	Order No.	Ød2	Ød3	Ød5	b1	b2	b3	b4	b5	b6	m		z	kg	R max.	*3	Ball bearings
												*1	*2					
mm			mm	mm	mm	mm	mm	mm	mm	mm	mm			kg	kg			
80	A3	03 250 02 40 0	99,5	20	115	52	11	-	27,5	13,5	26,4	2,5	44	1,5	800	GGG70	2x 6004-2RS	
	B3	03 250 02 41 0	100	-	-	-	-	36	-	-	10,4	-	-	1,1	-	-	-	
100	A4	04 250 03 40 0	125	30	140	58	14	-	33	13,5	12,5	2,5	54	2,5	1250	GGG70	2x 6006-2Z	
	B4	04 250 02 41 0	-	-	-	-	-	45	-	-	0	-	-	2,1	-	-	-	
125	A4	05 250 03 40 0	154	35	174	70	16,5	-	38	20	22	3	56	4,4	2000	GGG70	2x 6007-2Z	
	B4	05 250 02 41 0	-	-	-	-	-	50	-	-	2	-	-	3,4	-	-	-	
160	A4	06 250 03 40 0	200	40	222	76,5	18	-	44,5	22	26	3	72	8,0	3200	GGG70	2x 6208-2Z	
	B4	06 250 03 41 0	-	-	-	-	-	56,5	-	-	6	-	-	6,5	-	-	-	

Wheel axle



ØD	Order No.	L1	L2	L3	L4	L5	Ød3	Ød6	Ød7	kg	S
80	03 254 10 10 0	8	29	29	26,95	66	20	20	28	0,3	20 x 1.2 DIN 471
100	04 254 06 10 0	11	15	49	46,5	75	30	30	36	1,0	30 x 1.5 DIN 471
125	05 254 07 10 0	19	28	53	49,5	100	35	35	48	2,0	35 x 1.5 DIN 471
160	06 254 06 10 0	25	32	55	52,25	112	40	40	68	3,5	40 x 1.75 DIN 471

\*1m = module  
\*2z = number of teeth  
\*3 material

## 7.2 Wheels / guide roller

### Wheels for K.L.. endcarriages for overhead travelling cranes

Fig. 1

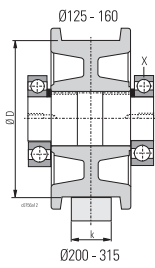
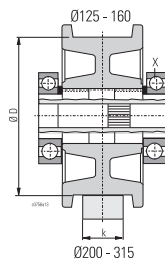


Fig. 2



ØD [mm]	Fig.	Order No.	Endcarriage	k *1 [mm]
125	1 + 2	24 254 10 01 0	KEL-S125	40
	1 + 2	24 254 11 01 0		50
160	1 + 2	24 254 20 01 0	K.L-S160	40
	1 + 2	24 254 21 01 0		50
200	1	07 257 00 05 0	K.L-S200	40
	1	07 257 01 05 0		50
	1	07 257 02 05 0		60
	2	07 257 04 01 0		40
	2	07 257 05 01 0		50
	2	07 257 06 01 0		60
	5	07 257 03 05 0		-
	6	07 257 08 01 0		-
315	1	09 257 00 05 0	-	40
	1	09 257 01 05 0	K.L-S315	50
	1	09 257 02 05 0		60
	2	09 257 06 01 0		40
	2	09 257 07 01 0		50
	2	09 257 08 01 0		60
2	09 257 09 01 0	-		
315	1	09 257 15 05 0	K.L-E315	50
	1	09 257 16 05 0		60
	1	09 257 17 05 0		70
	1	09 257 18 05 0		80
	2	09 257 15 01 0		50
	2	09 257 16 01 0		60
	2	09 257 17 01 0		70
	2	09 257 18 01 0		80
	5	09 257 19 05 0		-
	6	09 257 19 01 0		-
400	3	24 254 62 01 0	KZL-C400	50
	4	24 254 63 01 0		60
		24 254 64 01 0		70
	5 + 6	24 254 60 01 0		-
500	5 + 6	24 254 70 01 0	KZL-F500	50 ..100

Fig. 3

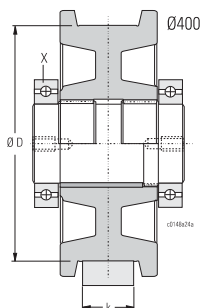


Fig. 4

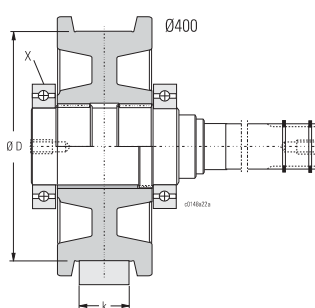


Fig. 5

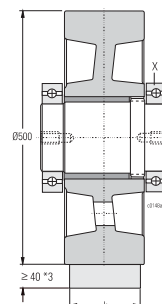
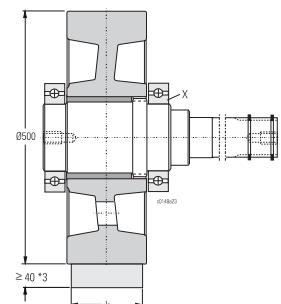
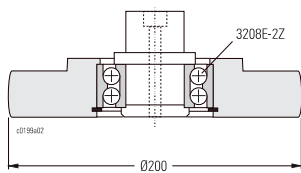


Fig. 6



\*1 Please state "k" when ordering  
\*3 With guide rollers

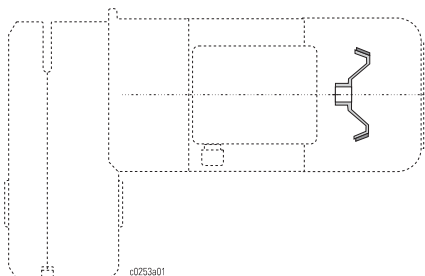
### 7.3 Guide rollers



ØD [mm]	Order No.	Endcarriage
62	573 000 0	KEL-S125
62	573 000 0	K.L-S160
125	27 710 00 58 0	K.L-S200
125	27 710 00 58 0	K.L-S315
200	39 710 00 58 0	K.L-E315
200	30 712 00 93 0	KZL-C400
200	30 712 00 93 0	KZL-F500

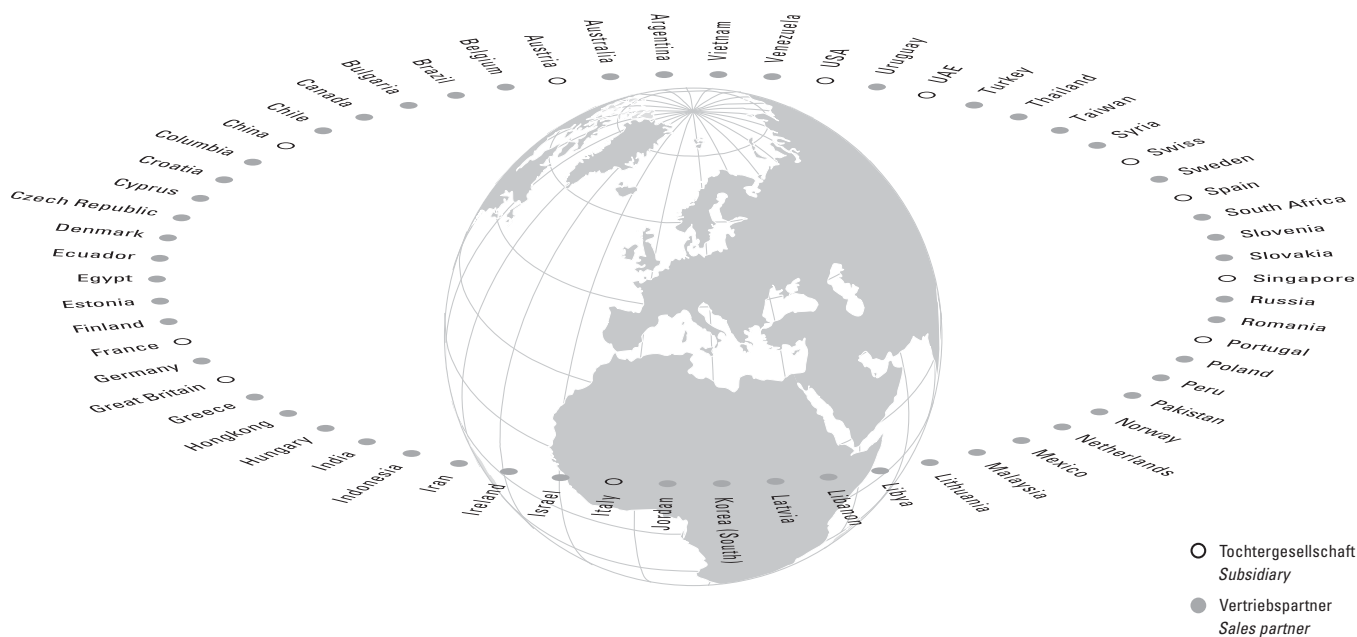
### 7.4 Brake discs for travel drives

FU-B../SF../SA-D ..



See also "Maintenance work" page 43.

Travel drive	FU-B../SF../SA-D ..		
Motor type	A05ex	A1ex	A2ex
Order number	35 330 20 18 0	41 330 20 18 0	42 330 20 18 0 0



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