

Maintenance Instructions

for

ABUS – Wire rope hoist		Size	Type	Overload protection device
Model	<input type="checkbox"/> D	<input type="checkbox"/> 800	<input type="checkbox"/> 2/1 <input type="checkbox"/> 4/1 <input type="checkbox"/> 6/1	<input type="checkbox"/> UELS
		<input type="checkbox"/> 1000		<input type="checkbox"/> USM
	<input type="checkbox"/> DB	<input type="checkbox"/> 2000		<input type="checkbox"/> ALS
		<input type="checkbox"/> 3000		<input type="checkbox"/> LIS-SM
	<input type="checkbox"/> DQA	<input type="checkbox"/> 5000		<input type="checkbox"/> LIS-AV
		<input type="checkbox"/> 6000		

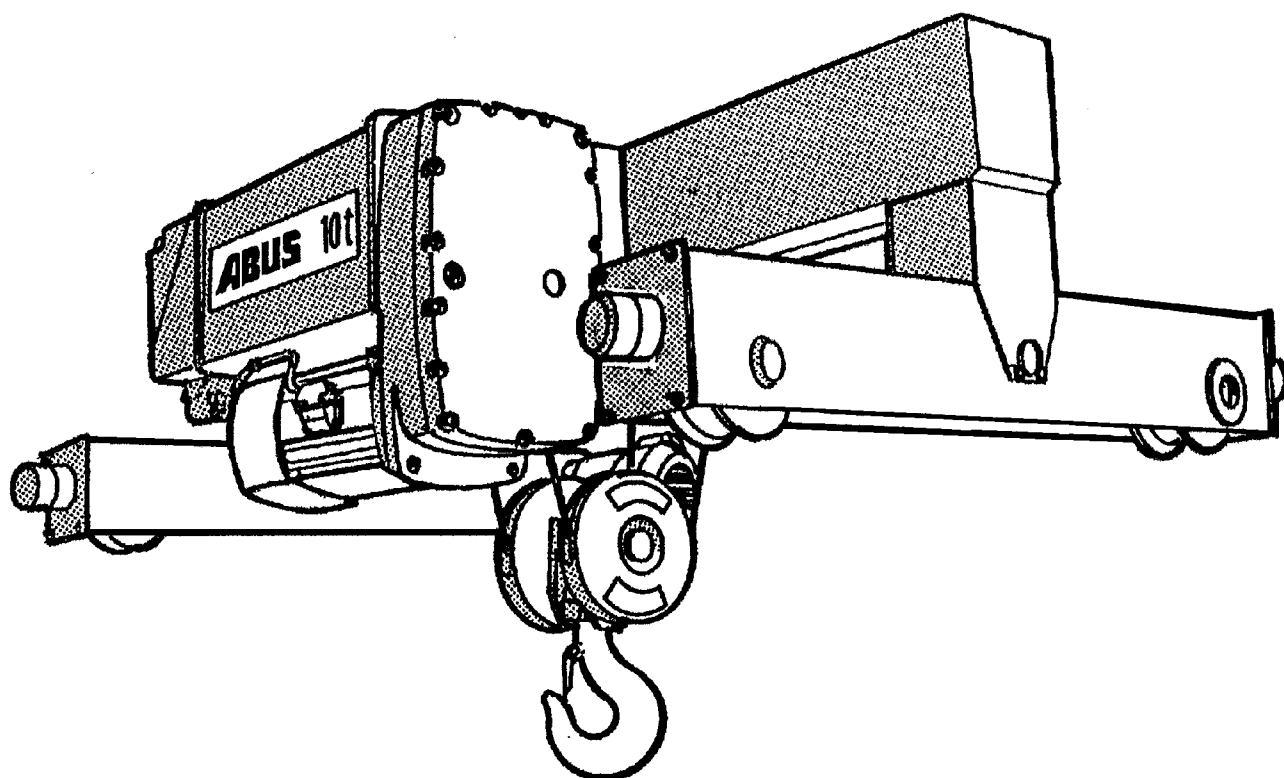
Serial No. _____

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These installation, operation and maintenance instructions are intended for use in an English-speaking country by English-speaking specialist personnel.



Explanations concerning type designations

GM 2063 H6 – 20 1. 41. 063. E 160

- track wheel diameter
- trolley; type: E; D, DQA, DB; Z, ZB; S; U
- model generation
- hook path (m)
- rope reeving 4/1
- motive power unit group 1 Am
- rope speed (m/min)
- type of motor
- load capacity (kg x 10⁻²)
- model size
- line of products

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7 Maintenance

The hoist must be inspected by an expert inspector at regular intervals determined in accordance with the operating and service conditions of the crane. Such inspections must be carried out at least once per year. The results of all inspections must be recorded in the crane test book. It is recommended that the crane should be maintained at least as frequently as it is inspected.

Operation in shifts affects both inspection and maintenance intervals.

Crane trolley wheel bearings and crane motor gear-boxes have permanent lubrication and do not require any maintenance.

Hoists must be maintained in accordance with the appropriate hoist operating instructions.

During maintenance, any excessively worn or faulty parts must be replaced.

For safe and reliable operation, it is essential to use only

genuine ABUS parts when replacing any components.

It is expressly stated that ABUS will only accept any warranty claims if only genuine ABUS parts have been used.

Irrespective of these requirements, the following maintenance schedule applies to the entire crane. The maintenance intervals stated are based on single shift operation in accordance with DIN 15020, with a 1AM FEM group. In more difficult conditions, more frequent maintenance will be necessary.

ABUS specialists will be pleased to assume responsibility for this maintenance work for you. Our experts are experienced in maintenance and have the right tools with them. Any wear parts are available either immediately or within a very short time.

Maintenance work may be performed by ABUS specialists either on the basis of individual orders or within the framework of a maintenance contract.

7.1 Action to Ensure Safe Operating Periods

The EU machinery directive requires precautions to prevent hazards due to fatigue and ageing on hoists. The following precautions have therefore been taken in order to achieve safe working periods (S.W.P.).

7.1.1 Declaration of Theoretical Service Life D

The manufacturer or supplier of a standard hoist is required to state the theoretical service life D in the operating instructions. These values for ABUS electric chain hoists are given in the following table:

Theoretical service life D, (h)

	FEM groups	1Dm M1	1Cm M2	1Bm M3	1Am M4	2m M5	3m M6	4m M7	5m M8
Line	load group / load factor	Theoretical service life D (h)							
1	light 1 / L1 $K = 0.5$ ($Km_1 = 0.125 \equiv 0.5^3$)	800	1600	3200	6300	12500	25000	50000	100000
2	medium 2 / L2 $0.5 < K < 0.63$ ($Km_2 = 0.25 \equiv 0.63^3$)	400	800	1600	3200	6300	12500	25000	50000
3	heavy 3 / L3 $0.63 < K < 0.8$ ($Km_3 = 0.5 \equiv 0.8^3$)	200	400	800	1600	3200	6300	12500	25000
4	very heavy 4 / L4 $0.8 < K < 1$ ($Km_4 = 1 \equiv 1^3$)	100	200	400	800	1600	3200	6300	12500

7.1.2 Records of Service

The organisation operating the standard hoist is responsible for recording the actual type of service of the hoist and documenting it at least once per year in the test book.

If the actual operating conditions are not verified or such verification is not possible or operating conditions are only estimated, a full overhaul in accordance with Section 7.1.4 must be carried out 10 years after the delivery of the standard hoist or earlier.

7.1.3 Assessment of Safe Working Period (S.W.P.)

During each scheduled inspection, the inspector responsible for the inspection of the standard hoist must

determine whether the hoist is still being utilised within its safe working period (S.W.P.).

7.1.4 Action to Be Taken on Reaching Theoretical Service Life D

When a standard hoist has reached its theoretical service life, it must be overhauled by a specialist authorised by ABUS before it can continue in service.

During an overhaul, the authorised specialist must determine:

- which parts must be replaced (the oil in the hoist gearbox must be changed during all overhauls)
- the new theoretical service life D
- the new maximum interval before the next overhaul.

7.2 Maintenance Schedule

Work to be performed	daily	at scheduled inspections	every 10 years
Inspection			
Check functioning of brakes	X		
Check functioning of limit switches	X		
check rope for damage and wire breakage	X		
Edge protector available in bottom block and not faulty	X		
Check functioning of overload protection device In the case of electromechanical overload protection devices, grease the disc spring packages as required		X	
Maintenance			
Check oil level in hoist gearbox		X	
Change oil in hoist gear unit			X
Lifting brake, check clearance and adjust as appropriate		X	
Lubricate gears of hoist drive and rope drum			X
Trolley travel brake, check clearance and adjust as appropriate		X	
Lubricate gears of travel drives and wheels			X
Lubricate wire rope and rope drum		X	
Check rope mounts and guides		X	
Check bottom block and load hook suspension		X	
Check hooks for cracks and permanent deformation		X	
Check the condition of all buffers		X	
Check all bolted joints and welds Check the tightness of bolted joints, especially the tightening torques of the long bolts connecting the motor housing and the gearbox on hoist lifting and trolley travel motors		X	
Check power supply systems, especially current collectors (check rollers and sliding contacts for wear)		X	
Check wheels of trolleys (especially conditions of wheel flanges; no plastic deformation)		X	
Check electrical switchgear and wiring		X	
Check paintwork; repair if necessary		X	
Check any wind locks and lubricate joints		X	
Rope wedge protrusion (section 7.2.1)		X	

7.2.1 Rope wedge protrusion

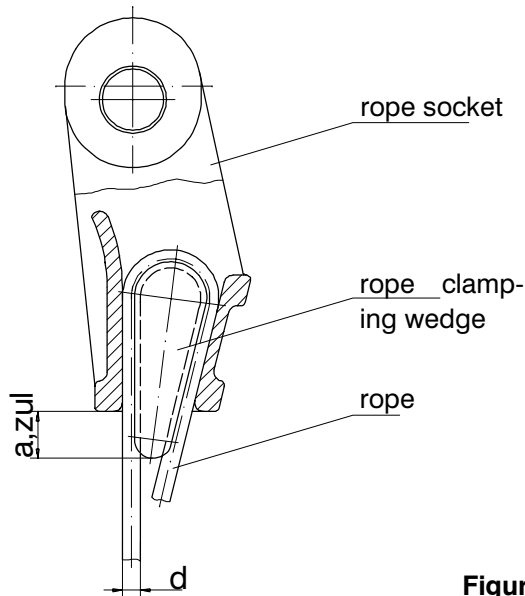


Figure 21

The maximum protrusions of the rope wedges are indicated in the table below.

Trolley type	d [mm]	a, zul [mm]
800.4	6.5	18 ⁺¹
1000.6	8.0	3 ⁺¹
2000.3	9.0	0
3000.4	11.0	16 ⁺²
5000.3	14.0	15 ⁺²
6000.3	16.2	24 ⁺²

The spacings must be checked during annual inspections. If the maximum **a dimension** is exceeded, the rope socket and wedge must be replaced.

7.3 Wire rope and rope guide

Wire rope and rope guide are parts subject to wear whose life can be increased by regular lubrication according to the maintenance schedule. Clean drum and rope guide before lubrication.

7.3.1 Replacement state of wear

Wire ropes must be immediately replaced in the following cases : breakage of a strand, opening of the rope structure, crushing, buckling, extreme wear, serious damage or considerable rust deposits.

In order to check the wire rope for breakages, the load must be removed and the rope be manually bent on the

workplace in order to better recognise wire breakages thus are more clearly visible. The bending radius should approximately correspond to the rope pulley radius.

ABUS–electric rope hoists are equipped with high–tensile ropes which have been developed for specific applications and which have a high degree of breaking strength, fatigue strength under reversed bending stresses, and structural resistance. When replacing a rope, make sure only original spare ropes are used. They can be directly obtained from our warehouse.

Wire ropes must be replaced if the number of visible wire breakages on one of the reference lengths achieves the value indicated in the table:

Type	Rope - Ø	Working up of the rope	Wire breaks on a rope length of 6x rope diameter				Wire breaks on a rope length of 30x rope diameter			
			1 Bm / 1 Am		2 m – 5 m		1 Bm / 1 Am		2 m – 5 m	
			Number of wire breaks	Rope length [mm]	Number of wire breaks	Rope length [mm]	Number of wire breaks	Rope length [mm]	Number of wire breaks	Rope length [mm]
GM 800.4	6.5	SKZ 8-P	3	39	6	39	6	195	12	195
GM 1000.6	8	SKZ 8-P	5	48	10	48	10	240	19	240
	8	D 1315 Z	5	48	10	48	10	240	19	240
GM 2000.3	9	SKZ 8-P	5	54	10	54	10	270	19	270
	9	D 1315 Z	5	54	10	54	10	270	19	270
GM 3000.4	11	SKZ 8-P	5	66	10	66	10	330	19	330
	11.3	D 1315 Z	5	68	10	68	10	339	19	339
GM 5000.3	14	SKZ 8-P	5	84	10	84	10	420	19	420
	14.3	D 1315 Z	5	86	10	86	10	429	19	429
GM 6000.3	16.2	SKZ 8-P	9	97	18	97	18	486	35	486
	16.1	D 1315 Z	5	97	10	97	10	483	19	483

7.3.2 Removing the wire rope and the rope guide

Size GM 800.4; 1000.6; 2000.3; 3000.4
Model D, DB and DQA – Types 2/1 and 4/1

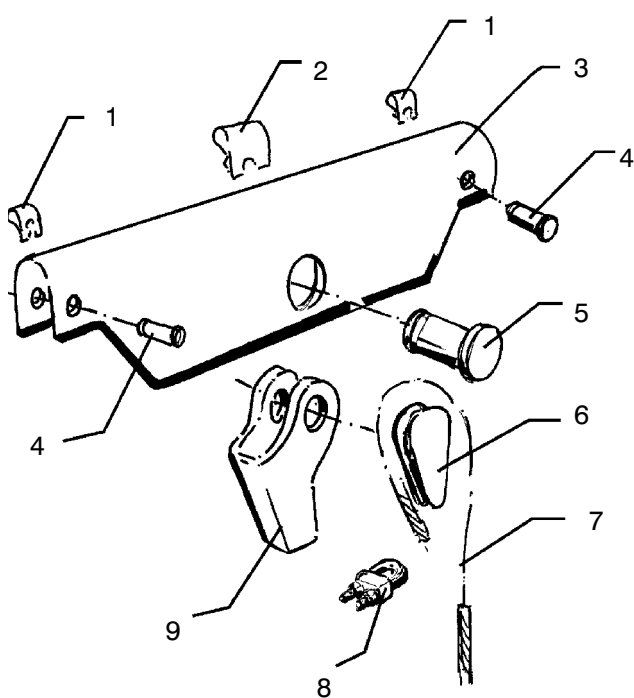


Figure 22

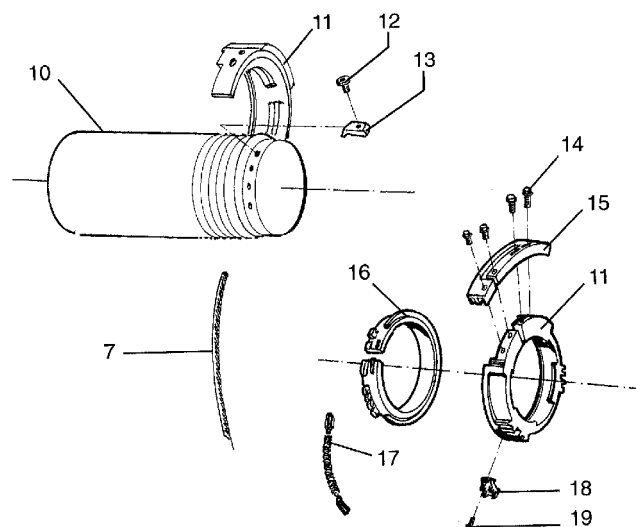


Figure 23

1. Lower the bottom block and place it e.g. on the working platform or on the floor.
2. Set the hoist limit switch so that a lowering beyond the lowest hook position becomes possible.
3. Remove the locking stud (4) at the fixed point tie-bar (3), take off the tie-bar, remove the rope sockets (2 and 5-9) and detach the rope ends (6,7,8).
4. Demount the catch (18,19) of the rope guide ring (11).

5. Turn the rope guide ring (11) until the joining tie (14,15) can be untightened and removed.
6. Expand the rope guide ring (11) and remove it.
7. Demount the extension spring (17) and remove the rope straining ring (16).
8. Completely reel off the rope and detach rope clamps (12,13).

Size GM 5000.3; 6000.3
Model DQA – Type 2/1

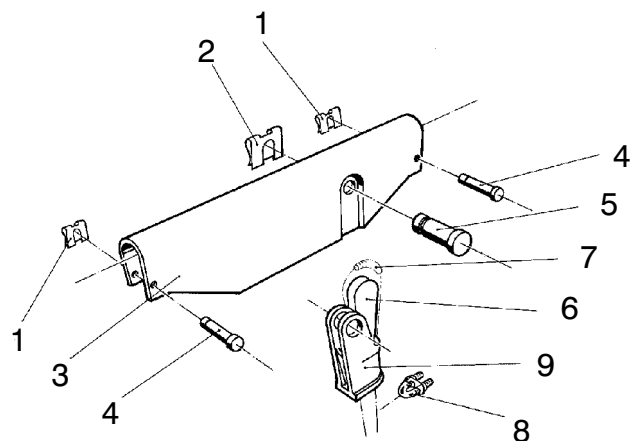


Figure 24

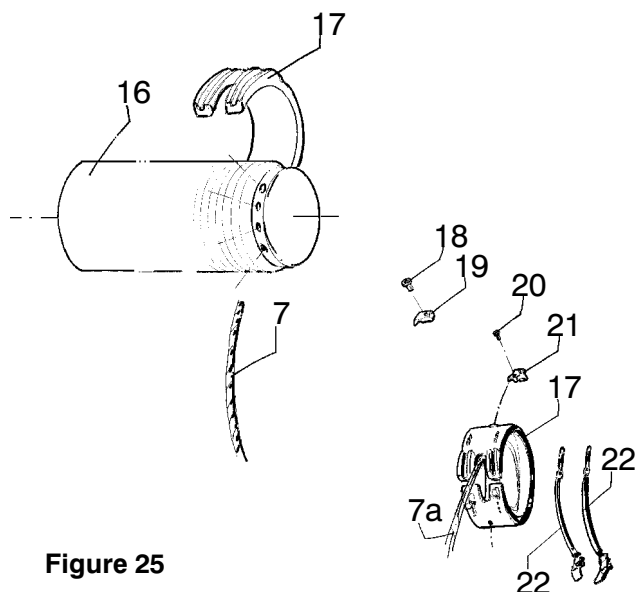


Figure 25

1. Lower the bottom block and place it on the working platform or floor.
2. Set the hoist limit switch so that a lowering beyond the lowest hook position becomes possible.
3. Remove the tie-bar (3) with its security elements, remove the rope sockets (2 and 5–9) and detach the rope end (6,7,8).
4. Demount the catch (20,21) of the rope guide ring (17).
5. Loosen the tensioning parts (22) and demount the rope guide (17).
6. Completely reel off the rope and detach rope clamps (18 and 19).

Size GM 5000.3; 6000.3
Model D and DB – Types 2/1 and 6/1

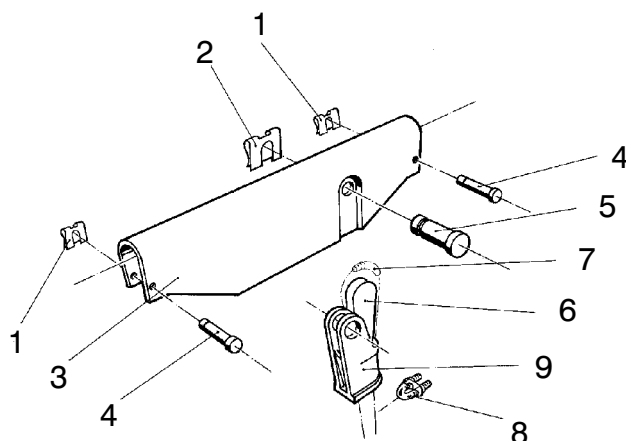


Figure 26

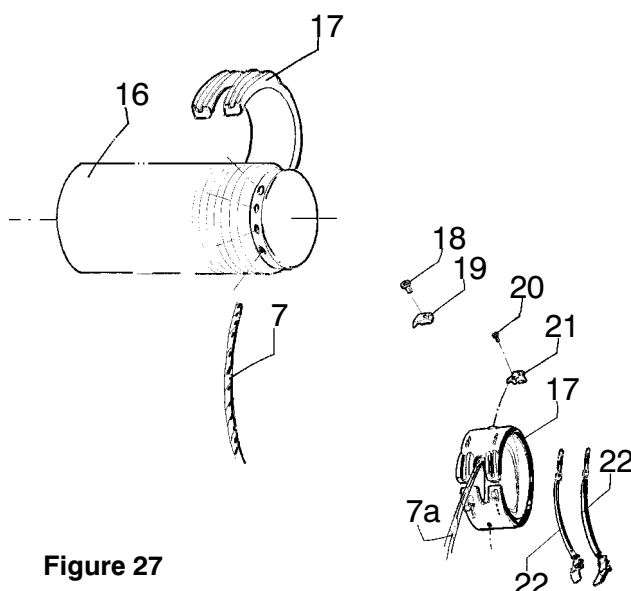


Figure 27

1. Lower the bottom block and place it on the working platform or floor.
2. Set the hoist limit switch so that a lowering beyond the lowest hook position becomes possible.
3. Remove the tie-bar (14) with its security elements, remove the rope sockets (6–12) and detach the rope end (6,7,8).
4. Demount the catch (20,21) of the rope guide ring (17).
5. Loosen the tensioning parts (22) and demount the rope guide (17).
6. Completely reel off the rope and detach rope clamps (18 and 19).

Size GM 5000.3; 6000.3
Model D, DB and DQA – Type 4/1 (Figure 26 and 27)

1. Lower the bottom block and place it on the working platform or floor.
2. Set the hoist limit switch so that a lowering beyond the lowest hook position becomes possible.

3. Remove the tie-bar (14) with its security elements, remove the rope sockets (6–12) and detach the rope end (6,7,8).
4. Demount the catch (20,21) of the rope guide ring (17).
5. Loosen the tensioning parts (22) and demount the rope guide (17).
6. Completely reel off the rope and detach rope clamps (18 and 19).

7.3.3 Installation of a new wire rope and of the rope guide

Size GM 800.4; 1000.6; 2000.3; 3000.4
Type 2/1 und 4/1 – (Figure 22 and 23)

1. Pay out the new original spare rope on the ground under the electric rope hoist. Make sure the rope is twist- and buckling-free.

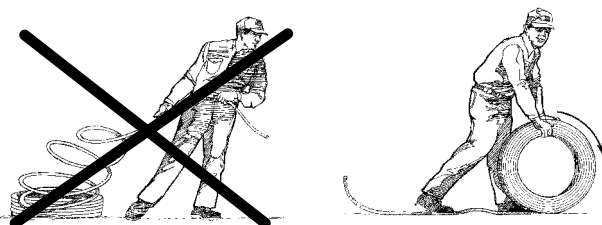


Figure 28

2. Clean the rope drum (10) and evenly spray it with chainlife S spray grease.
3. Push the wire rope (7) from below under the rope clamps (12, 13) so that the rope end protrudes by approx. 3 cm. Tighten the fastening screws according to the prescribed torques. **Pos. (9) at pictures chapter 3.3.5.**
4. Tautly wind the rope around the drum (10) by approx. 6–8 turns; make sure that the rope is twist-free.
5. Conduct the straining ring (16) over the drum and suspend the tension spring (17) in such a way that the straining ring firmly encloses the rope turns. The straining ring frame points towards the hoist gear.
6. Grease the rope drum around the rope guide ring with special grease PG 75.
7. Spread the rope guide ring (11) and lead it over the drum so that its threaded segments engage in the grooves of the rope drum and that the groove engages over the frame of the straining ring.
8. Pull the ending rope line through the guide aperture of the rope guide ring and fasten the joining tie (15).
9. Twist the rope guide until the guide edge engages in the slit of the catch (18) at the drum casing. Then fasten the catch on the rope guide ring. (11, 18, and 19)
10. Reeve the free rope end without twisting and fasten it in the rope sockets (2 and 5–9) of the fixed point tie-bar (3). **For reeving, see Figure 29.**

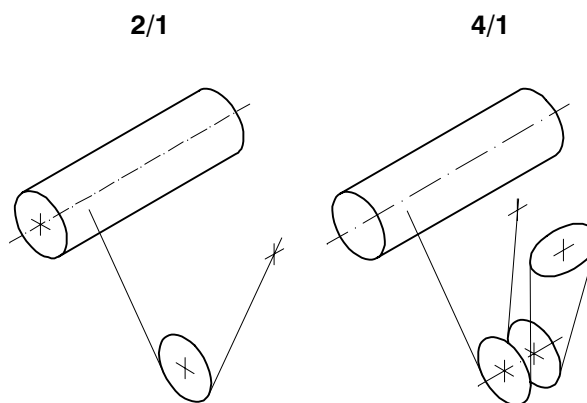


Figure 29

11. Suspend the fixed point tie-bar and install the locking stud. (1 and 4)
12. Install a rope clamp (8) at the free rope end.
13. Completely coil up the rope and adjust the hoist limit switch to the highest and lowest position. See section 10.

Size GM 5000.3; 6000.3
Types 2/1, 4/1 and 6/1 (Figure 26 and 27)

1. Pay out the original spare rope on the ground under the electric wire rope hoist. Make sure the rope is twist- and buckling-free.

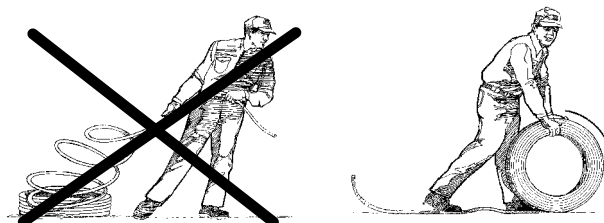


Figure 30

2. Clean the rope drum (16) and evenly spray it with chainlife S spray grease.
3. From below, push the wire rope (7) underneath the rope clamps (18, 19) until the rope end protrudes by approx. 3 cm. Tighten the fastening screws according to the prescribed torques. **Pos. (9) at pictures chapter 3.3.5**
4. Tautly wind the rope around the drum (16) by approx. 6–8 turns. Make sure the rope is twist-free.
5. Grease the rope drum around the rope guide ring with the special grease PG 75.
6. Spread the rope guide (17) and lead it over the drum (16) in such a way that its threaded segments engage in the grooves of the rope drum and that the ending rope line (7a) exits through the guide slit.
7. Suspend tension parts (22) and adjust them by turning the eye bolt until the rope guide ring is fitting tight.
8. Twist the rope guide ring (17) until the guide edge engages in the aperture of the catch (21) at the

drum casing. Then fasten the catch on the rope guide ring (20).

9. Reeve the free rope end without twisting and fasten it in the rope socket (6,8,9,10,11,15) of the fixed point tie-bar (14). For reeving, see figure 31.

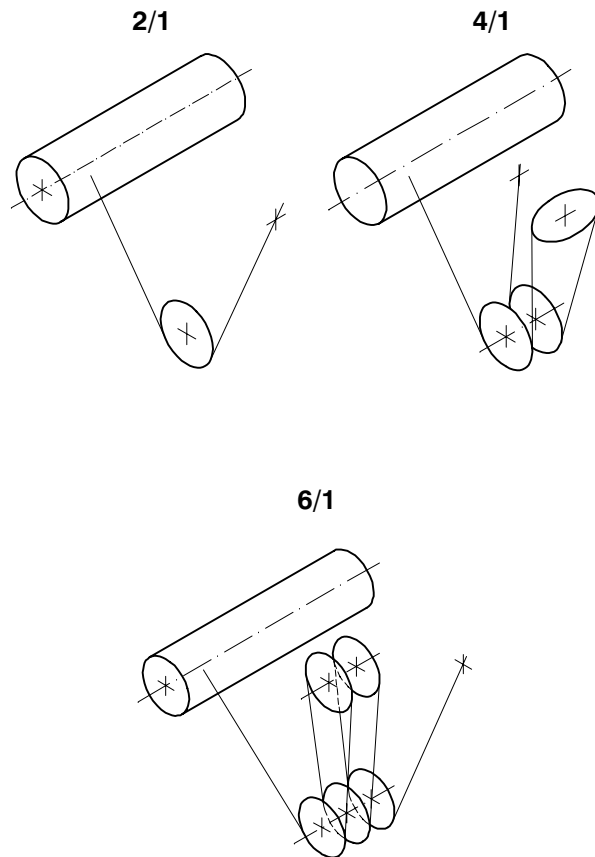


Figure 31

10. Fit the fixed cross member (14) to the cross member mounting using bolts (13) and bearing bushings (12) and fasten it in place with the lid and screws (10,11).

Attach a rope clamp (8) to the free rope end.

11. Entirely coil up the rope and adjust the limit switch to the highest and lowest position. See section 10.

7.3.4 Elimination of stretch twisting on non-twisting ropes D 1315 Z

Where non-twisting ropes are used, a tendency to twist develops over the course of time. The result is that the ropes twist when the bottom block is unloaded.

To eliminate this tendency to twist, the bottom block must be lowered to the ground, the rope lock released and the rope turned 180° "tighter". The rope must then be attached firmly to the bottom block again. The effectiveness of the action taken must be checked by raising and lowering the hoist without a load.

It may be necessary to repeat this procedure several times. Each time the rope is turned, the twist on the bottom block will be reduced.

Non-twisting ropes, types D 1315 Z are used on the following electric wire rope hoists:

Type GM	Reeving	Hook path [m]
1000.6	2/1	24
2000.3	2/1	24
3000.4	2/1	20 , 30
5000.3	2/1	30 , 37
6000.3	2/1	30 , 37

The rope type is given in the rope certificate included in the test book.

7.4 Hoisting gear brake

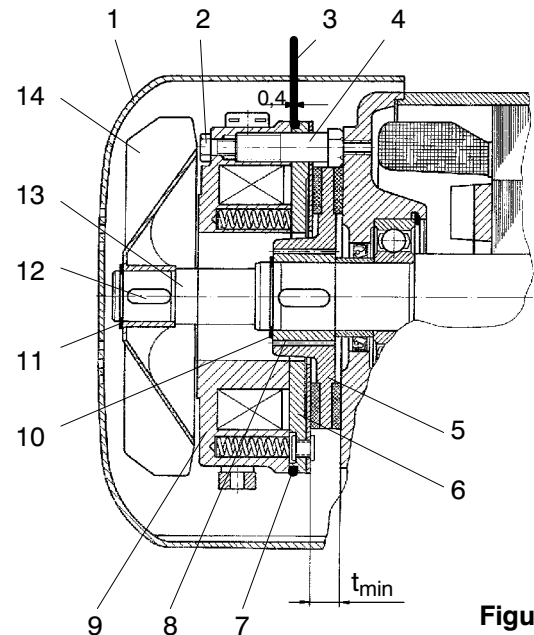


Figure 32

The hoisting gear brake is a magneto-electric disk brake. In order to guarantee safe release, the brake is equipped with an air-gap limiter. The air-gap of the brake must be checked regularly and adjusted to its optimum value of 0.4 ± 0.05 mm (1/64th inch.). This ensures optimum brake performance and minimum wear. In order to prevent the brake lining thickness from falling below the minimum value t_{min} , the screw-in depth of the socket screws (4) in the magnet assembly (9) is limited.

7.4.1 Adjustment of the air-gap

1. Remove the ventilator cowl (1) with the motor being switched off.
2. Remove locking ring (11)
3. Pull off fan (14)
4. Press out 0-ring (7)
5. Loosen 3 fastening screws (2) by half a turn
6. Screw 3 socket screws (4) about one turn into magnet assembly (9) (screws-in depth limited)
7. Place distance plates (3) (thickness: 0.4 ± 0.05 mm) between anchor plate (6) and magnetic body (9) each next to the 3 socket screws (4); tighten the fastening screws (2) so that the distance plates (3) can still be removed.
8. Unscrew the 3 socket screws (4) from the magnet assembly (9) until they make firm contact with the motor bearing shield.

9. Tighten the fastening screws (2) at a torque of 25 Nm. Then check the evenness of the air gap (at approx. 6 places and readjust, if required).
10. Press in O-ring (7)
11. Place the fan (14) on the motor shaft (13) and lock with locking ring (11)
12. Install the ventilator cowl (1)
13. Do a trial run to check the brake.

7.4.2 Dismounting the brake

1. Lower the bottom block and place it on the working platform, the ground, etc.
2. Remove ventilator cowl (1) with the motor being switched off.
3. Remove locking ring (11)
4. Pull off fan (14).
5. Remove feather key (12).
6. Press out O-ring (7).
7. Open the plug-in connection for the power feed to the brake.
8. Unscrew the fastening screws (2).
9. Remove magnet assembly (9) complete with anchor disk (6) and socket screws (4).
10. Remove brake rotor (5).
11. Remove locking ring (10).
12. Pull off catch hub (8) by means of the pull-off device.

7.4.3 Installation of the brake

1. Slightly grease the motor shaft (13), install catch hub (8) and secure with locking ring (10).
2. Push brake rotor (5) on the catch hub (8) and check whether it can be slightly axially displaced.
3. Mount the magnetic body (9) complete with anchor disk (6) and socket screws (4) and slightly tighten by means of the 3 fastening screws (2).
4. Screw 3 socket screws (4) into the magnet assembly (9)
5. Place distance plates (3) (thickness: $0.4 \pm 0,05$ mm) between the anchor plate (6) and the magnetic body (9) each next to the 3 socket screws (4); tighten the fastening screws (2) so that the distance plates (3) can still be removed.
6. Unscrew the 3 socket screws (4) from the magnet assembly (9) until they make firm contact with the motor bearing shield.
7. Tighten the fastening screws (2) at 25 Nm. Then check the evenness of the air gap (at approx. 6 points) and readjust, if necessary.
8. Press in the O-ring (7).
9. Push on the ventilator (14) and secure with locking ring (11).
10. Install the ventilator cowl (1).
11. Do a trial run to check the brake.

7.4.4 Replacement of Brake Rotor and Anchor Disk

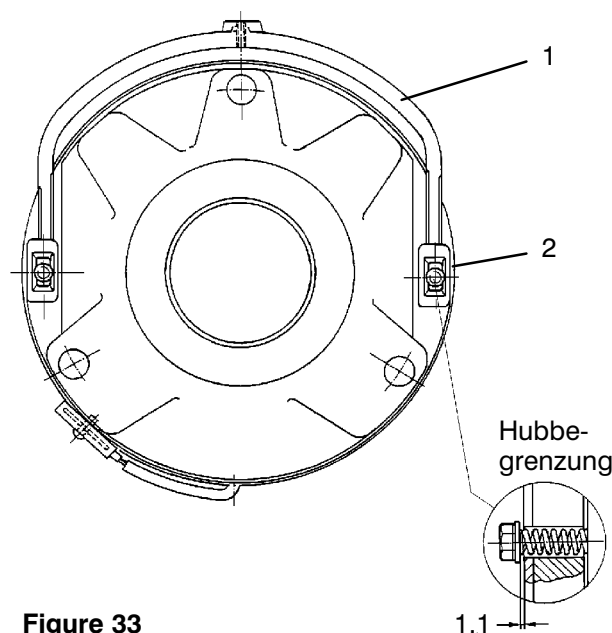


Figure 33

If the brake lining is worn below t_{\min} (see table) and it is no longer possible to adjust the clearance, the brake rotor (Figure 32, Item 5) and the anchor disk (Figure 32, Item 6) must both be replaced.

For the replacement of the brake rotor and anchor disk, the following work is necessary:

Dismantling of the brake in accordance with sub-section 7.4.2

Dismantling of the anchor disk in accordance with the following instructions:

1. Screw the socket screws (Figure 32, Item 4) on the dismantled brake into the magnet assembly up to the stop.
2. Remove and destroy the lifting travel limiting screws (Figure 33, Item 2) (The emergency lowering bar (Figure 33, Item 1) will then be released.)
3. Remove and destroy the socket screws (Figure 32, Item 4) (This releases the load on the springs between the anchor disk (Figure 32, item 6) and the magnet assembly (Figure 32, Item 9))
4. Remove anchor disk.

To install the new anchor disk, proceed in reverse order. The socket screws (Figure 32, Item 4) and the lifting travel limiting screws (Figure 33, Item 2) must be replaced.

The clearance between the anchor disk and the magnet assembly (Figure 32, item 9) must be set to 1.1 mm with the brake dismantled using the lifting travel limiting screws (Figure 33, Item 2)

Assemble the brake in accordance with sub-section 7.4.3

Wear table for brake linings (lifting motor)

Type	t_{\min} (mm)	
	L 6	H 6
800.4	9.3	9.3
1000.6	9.3	9.3
2000.3	9.3	11.3
3000.4	11.3	12.3
5000.3	12.3	13.8
6000.3	13.8	—

7.4.5 Emergency Lowering of Load



Caution!

The hoist must be disconnected from the power supply before the following steps are taken!

Figure 32 / 33

If it is necessary to lower the load in an emergency following a power failure or problems with the hoist motor or brake coil, the following steps must be taken:

1. Remove fan cover (**Figure 32, Item 1**)
2. Screw stud bolt into emergency lowering bar (**Figure 33, Item 1**)
3. Release the brake by carefully moving the lowering bar and lower the load slowly.

7.5 Trolley brakes AZP

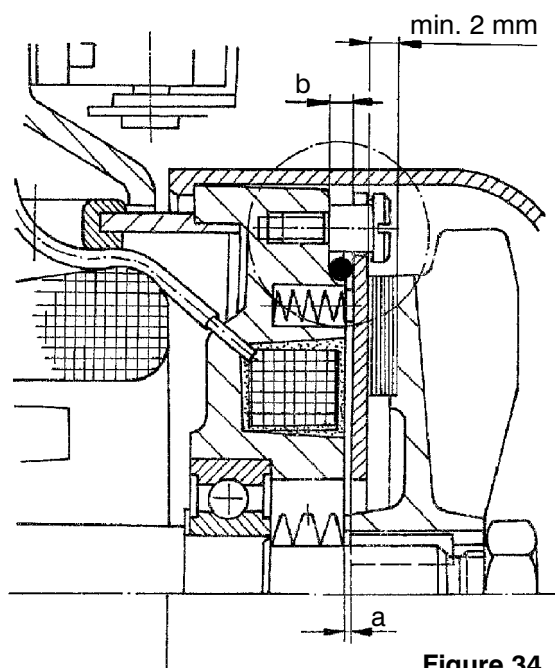


Figure 34

The brakes of the drives are electro-magnetic disk brakes. In order to guarantee a safe release, the brakes are equipped with an air gap limiter. The optimum air gap width (**a**) is 0.4 ± 0.05 mm. With increasing wear of

the brake lining, the air gap also becomes wider and must thus be regularly checked and re-adjusted to achieve its optimum value (**a**) = 0.4 ± 0.05 mm. This value assures optimum brake performance and minimum wear.

If the minimum thickness of 2 mm of the brake lining has been reached, **the brake lifter wing with brake lining as well as the anchor disk** must be exchanged. The difference in clearance between the two travel drives must not exceed 0.1 mm.



Caution !

All work on the brakes must be performed by specialists.

7.5.1 Adjustment of the air gap

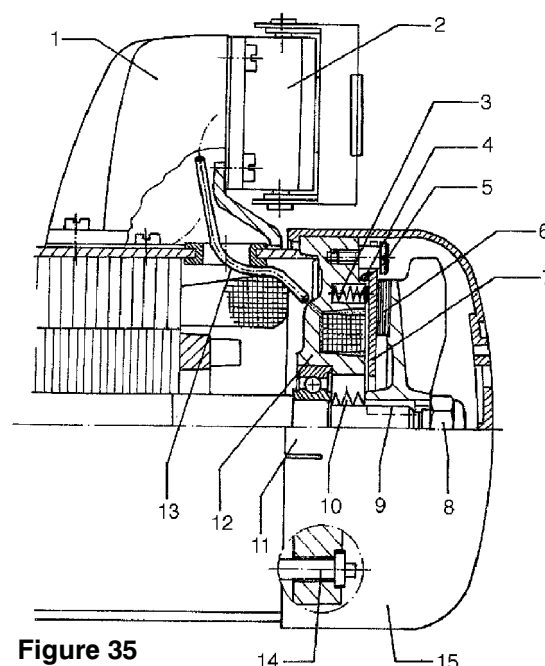


Figure 35

1. Remove the fan cowl (**15**) with the motor being switched off. For this purpose, pull the snaps (**11**) outwards and release them from their lock. The fan cowl can then be pulled off in axial direction.
2. By means of the selflocking adjustment nut (**8**), turn the brake fan blade (**6**) and the anchor plate (**7**) against the pressure springs (**3**) and the O-ring (**4**) so that the control dimension $b = 3,1 (+ 0,2 \text{ mm})$ between the anchor plate (**7**) and the brake bearing shield (**12**) will be observed. When tightening or unscrewing the self-locking nuts (**8**), the fan blade (**6**) must be held tight.
3. Mount the fan cowl (**15**).
4. Do a trial run to check the brakes.

7.5.2 Replacing the brake lifter wing with brake lining, adjusting nut and the anchor disk

1. Remove the fan cowl (**15**) with the motor being switched off. For this purpose, pull the snaps (**11**) outwards and release them from their lock. The fan cowl can then be pulled off in axial direction.

2. Hold the fan blade **(6)** and unscrew the self-locking adjusting nut **(8)**.
3. Pull off the brake fan blade **(6)**.
4. Unscrew the lift-limiting screws **(5)** and remove anchor disk **(7)**.
5. When fastening the new anchor disk **(7)** with the lift-limiting screws **(5)** see to a correct fitting of the pressure springs **(3)** and the O-ring **(4)**.
6. Clean the motor shaft and slightly grease it.
7. Mount the new brake fan blade with brake lining **(6)**, hold it while fitting the new self-locking adjusting nut **(8)**.
8. Set the air gap as described under 7.5.1
9. Mount the fan cowl **(15)**.
10. Do a trial run to check the brakes.

7.5.3 Dismounting the brake bearing plate and the brake

1. Remove the complete gear motor and place it on the ground with the drive shaft pointing downwards.
2. Loosen the plug insert **(2)** and detach the brake cable from clamps 7 and 8.
3. Hold brake fan blade **(6)** and unscrew the self-locking adjusting nut **(8)**.
4. Pull off the fan blade **(6)**.
5. Loosen 4 screws **(14)** and pull off brake bearing plate **(12)** against the motor shaft.
6. Pull the brake connecting cable from the protecting sleeve **(13)**.
7. Leave the feather key **(9)** at its place, this helps to keep the spring washers **(10)** prestressed.
8. If they are still in a good condition, the O-ring **(4)**, pressure springs **(3)**, and anchor plate **(7)** can be re-used after loosening the hoist limiting screws. The anchor plate **(7)** must be free of grease.

7.5.4 Mounting the brake bearing plate and the brake

1. Push the brake connection cable through the protecting sleeve **(13)** into the terminal box **(1)**.
2. Fasten the brake bearing plate **(12)** with four screws **(14)**. Tighten the screws **(14)** stepwise and transversely to avoid jamming of the brake bearing plate. Observe the indicated tightening torques.
3. Bolt the brake connection cable to the clamps 7 and 8.
4. Fit the plug insert **(2)**.
5. Insert pressure springs **(3)**.
6. Insert O-ring **(4)** without twisting.
7. Fasten the anchor plate **(7)** with the hoist-limiting screws **(5)**. Fix the hoist-limiting screws with "Loctite 242".
8. Fit brake fan blade **(6)** and hold it while inserting the self-locking adjusting nut **(8)**.
9. For adjustment of the air gap **(a)**, see 7.5.1
10. Tightening torque of the screws **(14)**, quality 8.8

M 5	$T_A = 5 \text{ Nm}$
M 6	$T_A = 7 \text{ Nm}$

7.6 Changing Lubricant

All motors have permanent lubrication suitable for normal operating conditions (see Section 6.2 "Normal Operation").

It is only necessary to change the lubricant if the crane system is overhauled.

Under abnormal operating conditions, it may be necessary to change the lubricant at appropriate intervals.

To change the lubricant on crane travel motors, the gearbox must first be removed and the gearbox components and housing must be cleaned using suitable proprietary cleaning compounds.

The gearbox must then be filled with the new lubricant and closed.





Lubricant quantities and grades are given in chapter 3.3.2 and in the lubricants table in section 11.



Used lubricant must be brought to a used oil collection point or disposed of properly.

7.7 Problems, Causes and Remedies

All the malfunctions described below must be remedied by a **specialist**.

Problem	Possible cause	Remedy	Remarks
Crane does not run	Mains power not available	Check current collector(s) Check emergency OFF-button and contactor K1	
	Emergency limit switch of hoist has tripped	Check phase sequence Check functioning of emergency limit switch Check setting of limit switch	
	No control voltage	Check control voltage fuse on control transformer	
Motor does not turn in any direction and does not hum when the pendant control is operated	Mains power not available	Check voltage	
	Mains connection not properly made	Connect all three phase conductors correctly	
	Faulty fuses Plug-in connectors for Plug-in connectors for control not properly inserted or not locked	Replace fuses Insert connectors firmly and lock using bracket	Follow wiring diagram
	Loose contacts in pendant control, broken wires in power supply line or in pendant control or, possibly, on travel drive	Check wires for breakage; if necessary replace control cable	 Caution! All work must be performed with all equipment disconnect from the power supply
 Motor does not turn in any direction but hums when the pendant control is operated WARNING Motorwindings may burn out	Faulty mains connection or mains fuse	Check mains connection	
	Faulty contactor	Replace contactor	 Caution! All work must be performed with all equipment disconnect from the power supply
Motor starts slowly	Break does not release, motor runs against closed brake	See brake problems	
	Crane span deviates from specification	Check play on wheel flanges	
Crane movement only possible on one direction	Faulty switch element in pendant control	Check and if necessary replace switch element	
	Broken wires	Check control cable	
	Faulty contactor	Replace contactor	
	Gradient an crane track too steep	Re-align crane track	
	Travel limit switch (if installed) was operated	Check limit switch	
Brake does not release	No power on brake coil, no AC voltage at rectifier input	Check and repair connections Check motor	 Caution! Pull mains connector out before starting work!
	Rectifier faulty or incorrectly connected	Check DC voltage at brake coil; connect rectifier correctly or replace rectifier	Follow wiring diagram
	Brake coil has no electrical continuity and is fault	Replace brake coil	Follow operating instructions

Problem	Possible cause	Remedy	Remarks
Braking distance too long	Max. clearance reached (limit on lining wear)	Set brake and adjust clearance	Follow operating instructions
	Gradient an crane track too steep	Re-align crane track	
Hoist does not lift the load	Overload safety device actuated	Check or correct setting Reduce load to maximum load capacity	
Type 2/1 bottom block with long hook path turns when unloaded	A stretch twist has formed in the rope	Take action described in Section 7.4.4 to eliminate twist.	

7.8 Repairs



Caution !

All repairs must be carried out only by **specialist personnel!**

ABUS cranes, electric wire rope hoists and electric chain hoists must be repaired and maintained only by qualified, authorized personnel.

ABUS will assume no liability whatsoever for loss or damage due to or in connection with repairs to cranes

or hoists not properly performed or performed other than by authorized personnel.



We recommend that repair and maintenance work should be performed by ABUS service personnel.

We must point out that you will only retain your warranty rights if only genuine ABUS spare parts are used.

Our service department and the responsible technicians will be at your disposal for all further questions.

11 Lubricants table

The lubrication has to be executed according to the maintenance schedule (**see section 7.2**)

☐: Established from the production. When the lubricant is changed, the mechanism has to be washed. In case of relubricating with a grease with other basis, the old grease has to be taken way before.

Product	Lubrication place	Lubrication way	Observation	Aral	BP	DEA	Dexron	ESSO	Klüber	Mobil	Moly-cote	Moly Paul	Optimol	Shell	Texaco	Kuhbier	Standard indication
Electric Wire rope hoists	Hoisting gears	Filling of Lubricant	Use of temperature over 0°C	Degol BG 680	Energol GR-XP 680	Falcon CLP 680		Spartan EP 680	Klüberoil GEM 1-680	Mobilgear 636				Omala Oil 680	Meropa 680		CLP ISO VG 680 DIN 51502
			Use of temperature below 0°C	Degol BG 220	Energol GR-XP 220	Falcon CLP 220		Spartan EP 220	Klüberoil GEM 1-220	Mobilgear 630				Omala Oil 220	Meropa 220		CLP ISO VG 220 DIN 51502
	Trolley drives	Filling of grease	E100 – E160 AZP130 AZP160		Energrease LS 0	Glissando EP 0			Centoplex CX 4/375					Alvania EP (LF) 1			KOK-35 GOK-35 DIN 51502
			AZP200 AZP280	Aralub SKA 00					Klüber-synth UH 1-14/1600								GP HC 00 K-30 DIN 51502
		Filling of Lubricant	AZF400 – 500	ATF 22	Autran DX II	Deafluid 4011 or 5060	II D od. II E 25233	ATF D 21611						Donax TA			ATF Type II D
	External splines connection, joint and plug bolt, locating pin	Grease, with the hand	Wheel, drum, wall side			Glissando M EP 2			Klüberpaste 46 MR 401		DX	PBC		Retinax LX2			No DIN norms existant
	Rope guide		Locking ring, guide						Isoflex Topas L 32		PG 75						KHC 2 K-60 DIN 51502
	Wire rope, rope drum, disk spring assemblies	Lubricant can	Chain			Unolit EP 1			Grafloscon S 1 Plus			Chainlife S	KL 23	Malleus GL 95			Machine lubricant
	Chain sprocket																
	Gearing	Filling of Lubricant		ATF 22	Autran DX II	Deafluid 4011 od. 5060	II D od. II E 25233	ATF D 21611						Donax TA			ATF Type II D
Jib motor	Gearing	Filling of Lubricant	G 50-100	Degol GS 220					Syntheso D 220 EP	Glygoyle 30				Tivela Oil WB			CLP PG DIN 51502
	External splines connection	Grease, with the hand		Multi-purpose grease F	Multi-purpose grease L 21 M			Multi-purpose grease M	Unimoly GL 402	Mobilgrease Special				Retinax EPX2	Texalube F	Kuhbinol Spezialfett 3261	Multipurpose grease NGLI2 m. Feststoff MoS ₂ KF2