

Assembly, Operating and Service Instructions
incl. Inspection Schedule
for ABM Chain Hoist

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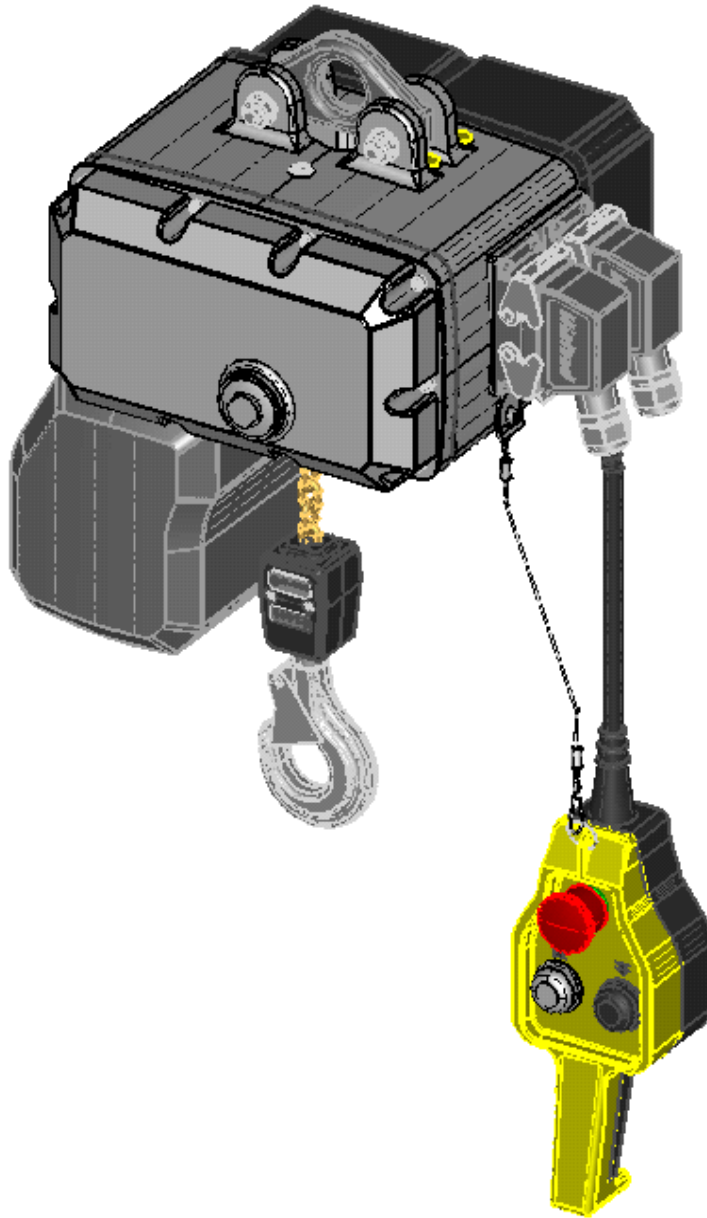
CH 1

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These Operating Instructions are intended for an English-language recipient country and an English-speaking skilled operative as the user.



These Assembly, Operating and Service Instructions are valid for the following types:

Model CH1

80.6 – 1	3m	160.6 - 1	3m
100.6 – 1	3m	200.6 – 1	3m
100.12 – 1	3m	250.6 – 1	1Am
125.6 – 1	2m	250.8 – 1	1Am
125.8 – 1	2m		
125.10 – 1	2m		
125.12 – 1	2m		

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1 General

1.1 How to Use These Instructions

These assembly, operating and service instructions must be read thoroughly and understood before the ABM Electric Chain Hoist is commissioned, and must be accessible by operators at all times during use. By its nature a hoist represents a potential hazard as a result of the lifting and handling of loads, and so Chapters 2 **Safety** and 6 **Testing and Servicing** should be read with particular care and attention. These instructions also contain danger, warning and safety advice and instructions – these are indicated by the following symbols:

Caution!



Hazard to persons. Failure to comply with these instructions can expose persons to direct risk or to risk from premature damage to the product.



Advice on the proper and efficient use of the chain hoist.

This hazard information must be complied with. Subject to technical modification without notice.

1.2 Proper Use

ABM Electric Chain Hoists are designed solely for lifting and also for the horizontal off-floor handling of loads when used in conjunction with travel trolleys. The Safe Working Load (SWL) as stated in the Inspection Schedule and on nameplates, the FEM classification and the operating time and number of switching operations must be observed. The chain hoists can be operated as hoists mounted on static supporting structures or as travelling hoists suspended from suitable running rails by means of manual or electric travel trolleys. In all cases the supporting structure must be adequately designed having regard to the SWL and dead weight of the hoists and the relevant regulations. The hoists are designed essentially for operation inside factory buildings within non-aggressive environments and at temperatures between -10°C and +40°C. Higher ambient temperatures will require a reduction in the maximum operating times. Operation above +80°C is not possible. Non-standard operating conditions and configurations must be specially inspected and agreed, and the manufacturer's approval may be necessary. Improper use includes:

- Exceeding the SWL
- Dragging loads at an angle
- Pulling jammed loads free, dragging or towing loads
- Catching falling loads
- Carrying persons with the load or load carrying devices

- 'Jogging' ('inching') operations
 - Slack chaining
 - Straight reversing, i.e. reversing the hoist while it is running
 - Intentionally running up against emergency limit switches
- (see also Chapter 2.2 "Safety Guidance for the User")

1.3 Regulations

ABM Electric Chain Hoists are designed, manufactured, tested and must be operated in accordance with European and German standards and regulations. The standards and regulations on which the product is based and which must be observed by the user are listed in the Certificate of Conformity (Point 12.2).

1.4 Warranty

ABM can accept no liability for damage to the crane or hoist caused by improper use or by work which has not been properly carried out or carried out by unskilled personnel, and can accept no liability for claims made by third parties.

Caution!



The terms of the warranty for the hoist are voided if the user alters parts arbitrarily, assembles the hoist other than as directed in these instructions or uses parts that are not ABM original parts.

It is essential for the safe operation of the product that only **ABM original parts** are used.

Safe operation within the stated service life can only be guaranteed when the chain hoist is operated according to its product classification and when these assembly, operating and service instructions are followed. Please refer to the Inspection Schedule or product data sheet for the drive group of your chain hoist. Information on the theoretical service life of the chain hoist will be found in the appropriate assembly, operating and service instructions.

1.5 Other Information



The Certificate of Conformity/Manufacturer's Declaration is given in the Inspection Schedule. (Item 12.2) The year of manufacture is shown on the product nameplate.

To ensure that the product performs its tasks reliably and satisfactorily it may only be operated, serviced and maintained by personnel who are duly appointed by the user and who are familiar these assembly, operating and service instructions and the relevant

safety regulations, e.g. Accident Prevention Regulations.

The assembly, operating and service instructions must be made available to the appointed personnel at all times.

ABM products are essentially maintenance-free.

The limited amount of service work that is necessary must be carried out carefully and according to the assembly, operating and service instructions and the service schedule.

2 Safety

2.1 Organisational Information

The operating, service and maintenance personnel must have read and understood the operating instructions before they start work.

The user has a duty to ensure that operation is safe and hazard-free. This can be assisted by a number of measures including:

- Providing and publishing the operating instructions
- Testing the product prior to commissioning and after major modifications
- Performing the routine tests and inspections
- Logging test results in the Inspection Schedule and keeping the Inspection Schedule in a safe place
- Keeping a record of elapsed service life

Only reliable, trained and properly appointed personnel may carry out work on or with the chain hoist.

The user has a duty to supervise the safety conscious handling of the chain hoist by his personnel.

2.2 Safety Information for the User



Caution!

A thorough knowledge of these assembly, operating and service instructions by operating and maintenance personnel is an essential of safe working practice.

Any and all arresting devices must be released before the start of operation.

The rotary "Emergency Stop" switch must be turned off in case of danger.

At the end of work, load carrying devices such as grippes and magnets must be detached, the empty hook pulled up and the chain hoist moved to its park position.

Any arresting device must be engaged and the rotary "Emergency Stop" switch turned off.

The relevant safety regulations, e.g. Accident Prevention Regulations (UVV) and official requirements, specifically the operating regulations for hoists, must be followed when operating and servicing the chain hoist.

In the Federal Republic of Germany these are the UVV (BGV D 8) "Winches, Hoists and Pulling Gear". In other countries the users of chain hoists must follow the safety instructions given below.

Safety instructions 1 – 37 are reproduced from or based closely on German Accident Prevention Regulation BGV D 8 "Winches, Hoists and Pulling Gear", Section III "Testing" and Section IV "Operation" (revised 01.04.1996). Safety instructions 38 – 40 summarise and/or reproduce the safety instructions for the operation of chain hoists as set out in German Accident Prevention Regulation BGV D 6 "Cranes", Section IV "Operation" (revised 01.10.1993).

If the user or company is governed by other national regulations for the use of chain hoists then the following instructions still apply unless expressly contradicted by the national regulations.

1. The user must ensure that chain hoists and their supporting structures are inspected and tested by an expert before first-time commissioning and before re-commissioning following major modifications.
2. The user must ensure that chain hoists and their supporting structures are inspected and tested at least once a year by an expert. He must also have them inspected by an expert at other times as the need arises depending on the conditions of use and internal company circumstances.
3. The inspection and test before first-time commissioning referred to in Point 1 includes examining for proper assembly and operational readiness.
4. During the inspection referred to in Point 2 the user must determine the elapsed proportion of the theoretical service life of chain hoists. He should appoint an expert to do this if necessary.
5. The user must ensure that records are kept of the results of the tests on chain hoists carried out in accordance with Points 1 to 4.
6. The results of tests on the chain hoist must be logged in an Inspection Schedule.

7. The user may only entrust the assembly, servicing and unsupervised operation of the chain hoist to insured persons who are suitable and familiar with it.
8. Insured persons may not assemble, service or operate chain hoists unsupervised unless they have been appointed by the user for this purpose.
9. The User must ensure that the operating instructions supplied by the manufacturer is available and accessible to those insured persons to whom the assembly, servicing or unsupervised operation of the chain hoist has been entrusted.
10. If internal company circumstances so require, the user must produce readily understandable operating procedures in the language of the insured persons and based on the operating instructions supplied by the manufacturer, setting out measures for safe operation in accordance with company circumstances.
11. The insured persons must observe these operating instructions and procedures.
12. When assembling the chain hoist the user must ensure that its control stand is positioned or protected such that the chain hoist operator is not put at risk by the chain hoist, load carrying devices or the load itself.
13. The user must ensure that the chain hoist is only mounted on structures and suspensions that are capable of safely accepting the anticipated forces.
14. The user must ensure that the chain hoist is assembled, positioned or attached such that its position cannot be accidentally changed by the forces which occur during operation.
15. The user must ensure that the chain hoist is assembled or positioned such that load-carrying devices are not drawn across edges and the chain is not deflected to the side when it enters the chain hoist.
16. The chain hoist operator must ensure that load-carrying devices are not drawn across edges.
17. The user and chain hoist operator must ensure that the safe working load of the chain hoist is not exceeded.
18. Where loads are lifted by several chain hoists together, then the user must ensure that the chain hoists are selected and positioned such that individual chain hoists are not overloaded even when the load is unevenly distributed.
19. The chain hoist operator must test emergency stop equipment – except slipping clutches – at the beginning of each working shift.
20. If the chain hoist operator finds obvious defects with the chain hoist including the load carrying devices, rollers, equipment and supporting structure, he must rectify these immediately. If this is not his responsibility or if he does not possess the necessary skills he must take the chain hoist out of service if necessary and report the defect to the user.
21. The user must ensure that loads are not slung by being wrapped around with the lifting chain.
22. Insured persons must not sling loads by wrapping the lifting chain around them.
23. The chain hoist operator must not initiate any load movement until he is satisfied that the load is safely slung and that personnel have cleared the danger area, or after he has received a sign from the slinger.
24. The chain hoist operator must keep all movements by the loads and load carrying devices under observation.
25. If the chain hoist operator cannot observe all movements by the load or load carrying devices from the control stand, then the user must take precautions to ensure that persons are not at risk from the load or load carrying devices.
26. Where work is to be carried out on or beneath loads lifted with chain hoists, the user must ensure that the loads are additionally secured against dropping on stable supports before work commences.
27. Where work is to be carried out on or beneath loads lifted with the chain hoist, the chain hoist operator must additionally secure the loads against dropping on stable supports before work commences.
28. The chain hoist operator must not leave the control stand of the chain hoist when the load is suspended.
29. If contrary to Point 28 the chain hoist operator has to leave the control stand when the load is suspended, then the user must create the conditions whereby the danger area beneath the load can be protected.
30. If contrary to Point 28 the chain hoist operator has to leave the control stand when the load is suspended, then he must protect the danger area beneath the load.
31. The chain hoist operator must not carry persons with the load or load carrying devices.
32. The user must ensure that the chain hoist is not used to handle molten substances.
33. The chain hoist must not be used to handle loads which are jammed or which can become caught, snagged or obstructed as they move.
34. The chain hoist operator must not drive the chain hoist against emergency limits as part of normal operating practice.
35. The user must take the chain hoist out of service at the end of its theoretical service life.
36. Contrary to Point 35 the chain hoist may continue in operation provided an expert
 - a) confirms that there are no objections to continued operation, and
 - b) the conditions for continued operation have been established. These conditions must be recorded in the Inspection Schedule.
37. The user must ensure that continued operation complies with the conditions according to Point 36 b).
38. Insured persons may not carry out service and inspection work unless they are satisfied that the chain hoist has been switched off and locked out. They may only carry out service work that cannot be done from the ground from work stands or staging.

39. The user must direct and supervise the following safety precautions for all repairs and modifications to the chain hoist and for work in areas where persons may be at risk from the chain hoist:
- The chain hoist must be switched off and locked out.
 - If there is a risk from falling objects, then the danger area beneath the chain hoist must be protected with barriers or by posting safety assistants.
 - If the safety precautions described in a) and b) are not appropriate or not relevant or adequate for company reasons, then the user must direct and supervise other or additional safety precautions.
40. Following repairs or modifications, or work carried out within its danger area, the chain hoist may only be put into service when the user has approved the resumption of operation. Before giving his approval, the user or his representative must satisfy themselves that
- the work has definitely been completed
 - the complete chain hoist is in a safe condition
 - all personnel involved in the work have cleared the danger area.



Caution!

Where the chain hoist is suspended from a travelling trolley or crane, then the Accident Prevention Regulations BGV D 6 "Cranes" which are not reproduced here in full must be observed and complied with in addition to the safety instructions listed.

2.3 General Guidance on Hazards

The product is designed to be operated on industrial power systems. There are hazardous live bare parts and moving/rotating parts in the interior of the product while it is in operation.

Serious injury to persons and damage to property may result from

- the prohibited removal of covers
- improper use
- incorrect operation
- inadequate servicing and maintenance.

Failure to observe the safety information given in these instructions may cause injury or even death.

The product may constitute a danger to life and limb if it is operated or used by untrained or inadequately trained persons or if it is not operated for its intended purpose.

The user must ensure that his operator and maintenance personnel receive training in good time before they work with or on the product.

Owing to the risk of injury, e.g. from becoming caught or pulled into the product, this personnel must wear no loose clothing, loose long hair or jewellery, including rings (!).

No work of any kind with or on the product may be carried out by persons who are under the influence of narcotics, alcohol or medication which affects their ability to react.

Contact with concentrated acids or alkalis can attack plastic housings and cause dangerous corrosion of metal parts; any parts affected in this way must be promptly replaced. The product must not be used in areas subject to explosion hazards unless specifically prepared for this purpose.

During operation:

All actions specified in the instructions both before, during and after commissioning, and guidance on general safety, especially those affecting operational safety and accident prevention, must be strictly followed; failure to do so may cause accidents with fatal consequences.

The use of prohibited or unsuitable tools or equipment can cause injury. The movement or rotation of parts can cause pinch and/or shear hazards both on the product and between the product and parts of its surrounding area; adequate safety distances from moving or rotating parts should be maintained at all times to prevent persons from reaching into them and clothing, parts of the body or hair from being caught.

Extreme heat (e.g. from welding), sparks produced when using cleaning agents and naked flame in the vicinity of materials that are flammable or which can distort in heat (e.g. wood, plastics, oils, greases, electrical plant or cables) must be avoided, otherwise there is a risk of fire with the release of hazardous gases or damage to insulation etc.

2.4 Measures for Ensuring Safe Working Periods

The EC Machine Directive stipulates safety measures for avoiding hazards with hoists as a result of material fatigue and ageing. The following measures have therefore been taken to ensure safe working periods (S.W.P.).

2.4.1 Theoretical Service Life D

The manufacturer or supplier of the production hoist is required to state the theoretical service life D in his operating instructions. This is shown in the following table for ABM electric chain hoists.

Theoretical Service Life D (h)

	Drive Groups	1Dm M1	1Cm M2	1Bm M3	1Am M4	2m M5	3m M6	4m M7	5m M8
Line	Load populations / Factor of load spectrum	Theoretical Service Life D (h)							
1	light 1 / L1 $K = 0.5$ ($Km_1 = 0.125 = 0.5^3$)	800	1600	3200	6300	12500	25000	50000	100000
2	medium 2 / L2 $0.5 < K < 0.63$ ($Km_2 = 0.25 = 0.63^3$)	400	800	1600	3200	6300	12500	25000	50000
3	heavy 3 / L3 $0.63 < K < 0.8$ ($Km_3 = 0.5 = 0.8^3$)	200	400	800	1600	3200	6300	12500	25000
4	very heavy 4 / L4 $0.8 < K < 1$ ($Km_4 = 1 = 1^3$)	100	200	400	800	1600	3200	6300	12500

2.4.2 Record of Operating Performance

The user has a responsibility to ensure that the actual operating performance of the chain hoist is recorded and documented in the Inspection Schedule at least once a year.

Thereby, the user must record the load collectives and operating hours according to the FEM guideline FEM 9.755. A general overhaul has to be carried out by the user no later than 10 years after commissioning. This must be conducted by an authorised person and documented in the Inspection Schedule.

2.4.3 Assessment of the Safe Working Period (S.W.P.)

The expert responsible for inspecting the production hoist must check at every routine inspection whether the production hoist is still being used within the S.W.P.

2.4.4 Measures when the Theoretical Service Life D is Reached

1. The user must take the chain hoist out of service at the end of its theoretical service life.
2. Contrary to Point 1 the chain hoist may continue in operation provided an expert
 - a) confirms that there are no objections to continued operation, and
 - b) the conditions for continued operation have been established. These conditions must be recorded in the Inspection Schedule.
3. The user must ensure that continued operation complies with the conditions according to Point 2 b).

3 Technical Description

3.1 Functional Description

3.1.1 Layout

The illustration shows the external parts of the chain hoist

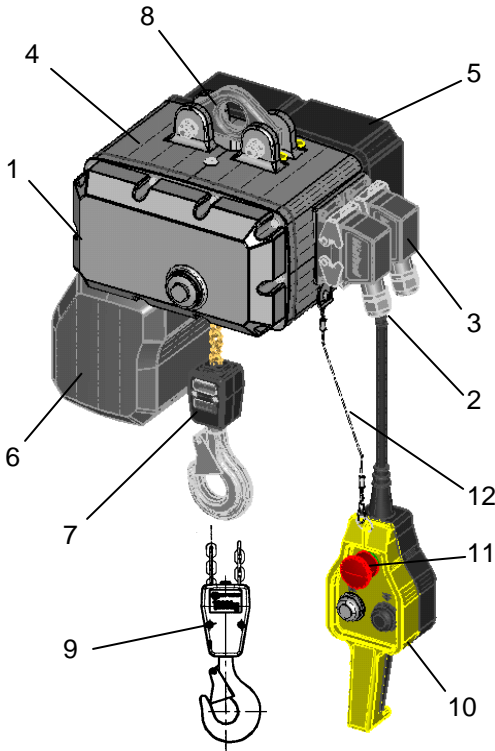


Figure 1

Schematic of Chain Path

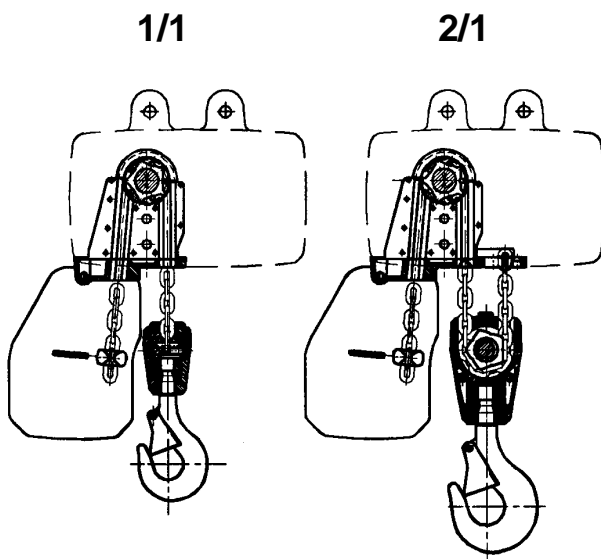


Figure 2

1. Gear cover
2. Pendant socket
3. Isolation plug
4. Chain hoist
5. Brake cover
6. Chain bucket
7. 1-fall hook block
8. Suspension eye
9. 2-fall hook block
10. Pendant control
11. Rotary "Emergency Stop" switch
12. Strain relief

3.1.2 Drive

The hoisting motor is a three-phase single-winding brake motor. When the motor is shut down or in the event of a power failure the load is held by an electromagnetic spring-loaded disc brake. A short stopping distance is achieved by means of a special electrical circuit.

3.1.3 Gearbox

The motor drives the chain drive across a multi-stage helical gearbox running in an oil bath.

The first gear pair incorporates a slipping clutch for overload limiting and is an emergency limiter device which is set at the factory according to the rated load and the shock factors to be allowed for.

3.1.4 Chain Drive

The high-tensile round steel chain is driven by a five-lobe chainwheel. The close tolerance chain guide and chainwheel are specially designed and matched to ensure especially low-wear, low-noise operation. The chain drive is designed to DIN EN 818-7 (FEM 9.671). The chain is grade DAT(8 SS)

3.1.5 Suspension

The suspension eye is attached to the body of the chain hoist by two stud bolts and can be used to suspend the hoist from a trolley or as a static unit.

3.1.6 Lower Load Carrying Device

The load is carried by a loadhook which complies with DIN 15401 and which rotates in a hook housing. With single fall operation the load end of the chain is positively clamped in the hook housing and secured by means of a fully heat-treated straight pin. In the two-fall version the chain is guided over a chainwheel in the bottom block and attached to an anchor on the housing.

3.1.7 Chain Bucket

A chain bucket made from impact and fracture resistant plastic is mounted beneath the static chain exit on the housing to hold the chain. Different sizes are available for short and long hook travel.

3.1.8 Hoist Control

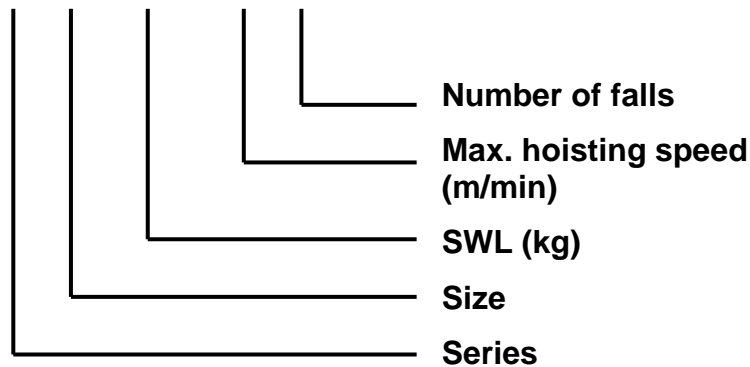
The hoist is usually controlled with the ABM pendant which is directly connected to the chain hoist by quick-release connectors.

Contact control is available as an option to the standard direct control.

3.2 Specifications

3.2.1 Explanation of Type Designation

CH 1 100 . 6 - 1



3.2.2 CH1 Motor Data

3.2.2.1 Motor Data single speed Motor

The chain hoist CH1 is also available as a single speed chain hoist. The electrical data are available, if necessary, through the datasheet. They can also be requested at ABM-Greifengerger.

3.2.2.2 Motor Data dual speed Motor

Operating voltage 3PH	[V]	220 - 240	380 - 415	460 - 500
Frequency	[Hz]	50	50	50
Load factor (FEM)	[%]	60	60	60
Switching rate (FEM)	[c/h]	360	360	360

CH1 80.6 – 1, CH1 100.6 – 1, CH1 125.6 – 1

	[m/min]	1.5/6	1.5/6	1.5/6
Hoisting speed	[m/min]	1.5/6	1.5/6	1.5/6
Motor rating	[kW]	0.04/0.15	0.04/0.15	0.04/0.15
Motor speed	[r.p.m.]	690/2920	690/2920	690/2920
Starting current	[A]	1.90/8.10	1.10/4.70	0.90/3.90
Nominal current	[A]	1.04/1.73	0.60/1.00	0.50/0.83
Power factor – starting		0.86/0.92	0.86/0.92	0.86/0.92
Power factor – nominal		0.50/0.60	0.50/0.60	0.50/0.60

CH1 100.12 - 1, CH1 125.12 - 1

	[m/min]	3.0/12	3.0/12	3.0/12
Hoisting speed	[m/min]	3.0/12	3.0/12	3.0/12
Motor rating	[kW]	0.07/0.30	0.07/0.30	0.07/0.30
Motor speed	[r.p.m.]	660/2860	660/2860	660/2860
Starting current	[A]	1.90/8.10	1.10/4.70	0.90/3.90
Nominal current	[A]	1.04/1.73	0.60/1.00	0.50/0.83
Power factor – starting		0.86/0.92	0.86/0.92	0.86/0.92
Power factor – nominal		0.56/0.75	0.56/0.75	0.56/0.75

CH1 125.8 - 1

	[m/min]	2/8	2/8	2/8
Hoisting speed	[m/min]	2/8	2/8	2/8
Motor rating	[kW]	0.07/0.30	0.07/0.30	0.07/0.30
Motor speed	[r.p.m.]	660/2860	660/2860	660/2860
Starting current	[A]	1.90/8.10	1.10/4.70	0.90/3.90
Nominal current	[A]	1.04/1.73	0.60/1.00	0.50/0.83
Power factor – starting		0.86/0.92	0.86/0.92	0.86/0.92
Power factor – nominal		0.56/0.75	0.56/0.75	0.56/0.75

CH1 125.10 - 1

	[m/min]	2.5/10	2.5/10	2.5/10
Hoisting speed	[m/min]	2.5/10	2.5/10	2.5/10
Motor rating	[kW]	0.07/0.30	0.07/0.30	0.07/0.30
Motor speed	[r.p.m.]	660/2860	660/2860	660/2860
Starting current	[A]	1.90/8.10	1.10/4.70	0.90/3.90
Nominal current	[A]	1.04/1.73	0.60/1.00	0.50/0.83
Power factor – starting		0.86/0.92	0.86/0.92	0.86/0.92
Power factor – nominal		0.56/0.75	0.56/0.75	0.56/0.75

CH1 160.6 - 1, CH1 200.6 - 1, CH1 250.6 - 1

	[m/min]	1.5/6	1.5/6	1.5/6
Hoisting speed	[m/min]	1.5/6	1.5/6	1.5/6
Motor rating	[kW]	0.07/0.30	0.07/0.30	0.07/0.30
Motor speed	[r.p.m.]	660/2860	660/2860	660/2860
Starting current	[A]	1.90/8.10	1.10/4.70	0.90/3.90
Nominal current	[A]	1.04/1.73	0.60/1.00	0.50/0.83
Power factor – starting		0.86/0.92	0.86/0.92	0.86/0.92
Power factor – nominal		0.56/0.75	0.56/0.75	0.56/0.75

CH1 250.8 - 1

	[m/min]	2/8	2/8	2/8
Hoisting speed	[m/min]	2/8	2/8	2/8
Motor rating	[kW]	0.09/0.36	0.09/0.36	0.09/0.36
Motor speed	[r.p.m.]	640/2830	640/2830	640/2830
Starting current	[A]	2.10/8.70	1.20/5.00	1.00/4.20
Nominal current	[A]	1.12/1.90	0.65/1.10	0.54/0.92
Power factor – starting		0.85/0.90	0.85/0.90	0.85/0.90
Power factor – nominal		0.61/0.82	0.61/0.82	0.61/0.82

3.2.3 Bolt Torque Settings

Tighten all bolts using a torque wrench!

	Bolt size	Strength grade	Torque setting
Chain guide	M6	8.8	5 Nm
Chain anchor	M6	12.9	12 Nm
Brake cover	M5	8.8	2 Nm
Hook housing	M5	10.9	8 Nm
Hook housing	M6	10.9	15 Nm
Bottom block	M6	10.9	15 Nm
Strain relief clamp	M6	8.8	6 Nm
Stud bolt for suspension eye	M10	10.9	49 Nm
Brake	M4	8.8	3 Nm

3.2.4 Main Fuse and Cable Ratings

Guideline value for approx. 5% voltage drop

		Supply Cable for		
		220-240V 50Hz	380-415V 50Hz	460-500V 50Hz
Motor rating max.	(kW)	up to 0.5	up to 0.5	up to 0.5
Cable size	(mm ²)	1,5	1,0	1,0
Supply cable length max. for above cable size, direct control, without trolley	(m)	40	120	160
Fuse rating, Utilisation category gL	(A)	10	6	6

Note:

The maximum supply cable lengths given in the table are for guidance only and produce a voltage drop of approx. 5% at the chain hoist.

The power cable sizes and maximum cable lengths should be determined by the user when additional loads are in use (e.g. power trolley). The voltage drop at the chain hoist should not exceed 5% of operating voltage.

3.2.5 Loadings

The maximum loading for the track or suspension consists of the weight of the chain hoist as shown below and the SWL of the chain hoist. The figures are based on a hook drop of 3 metres.

3.2.5.1 Weights – CH1

Chain hoist type			Static chain hoist
CH1 80.6 - 1	CH1 100.6 - 1	CH1 125.6 - 1	30 kg
CH1 160.6 - 1	CH1 200.6 - 1	CH1 250.6 - 1	
CH1 125.8 - 1	CH1 250.8 - 1		
CH1 125.10 - 1			
CH1 100.12 - 1	CH1 125.12 - 1		

For longer hook drops the weight increases by 0.54 kg per metre of chain.

3.2.5.2 Overload Limiter

The slipping clutch incorporated in the gearbox acts as both overload limiter and overload protection. It is set at the factory to a factor of 1.3 to 1.4 the stated rated load. These values must be taken into consideration when designing the supporting structure.

3.2.6 Noise Emission Levels

Because the distance from the workplace to the noise source cannot normally be precisely defined with hoists, the sound power level is given below as well as the sound pressure level, given here for a distance of 3 m. The sound pressure level (under free-field conditions) can be calculated from the sound power level for any distance.

Chain hoist model	Sound pressure level L _P , m, db(A) at 3m	Sound power level L _W , m, db(A)
CH1	55	72

The measurements were carried out by reference to DIN 45635, Part 61 using the substitution method with a sound power source.

3.3 Lubricants

3.3.1 Lubricants Used in the Chain Hoist

The service life of the gearbox oil and ball-bearing grease is designed for the first safe working period (S.W.P.) of the chain hoist. All gearboxes are filled with the required amount of lubricant at the factory.

Component	Lubricant Standard designation	Type	Quantity
Gearbox, CH 1	ATF Typ II D	DEA Deafluid 4011	1100 cm ³
Return wheel in bottom block		Klüber NBU 8 EP	
Chain	Engine oil	SAE 20W50	

3.3.2 Alternative Lubricants

For DEA Deafluid 4011

- Shell Super ATF
- DEA 5060
- ESSO ATF D 21611
- or equivalent oils of other suppliers with standard designation ATF Type II D to DIN 51502



Caution!

Synthetic lubricants must not be mixed together with mineral lubricants

4 Assembly and Commissioning

4.1 Delivery Condition

Unless otherwise stated, the chain hoist is delivered with the suspension eye mounted, retracted chain and loadhook as well as the chain store fitted. Additional assembly operations are described below. Should the suspension eye, chain with loadhook or chain store not be attached to the chain hoist on delivery, then these items must be assembled as described in Points 4.3 to 4.5.

The chain hoist must be stored in a clean dry place if not to be assembled immediately.

4.2 Electrical System



Caution!

Work on the electrical system must be carried out by a qualified electrician and with the chain hoist isolated from the supply.

We are able to offer you connections that are simple, fast and electrically safe by the consistent use of plug-and-socket connections.

ABM chain hoists are equipped with pre-assembled quick-release connectors that are ready to operate as standard.

The chain hoist must be operated from a three-phase power supply with a clockwise phase sequence. If the directions of movement do not match the symbols on the pendant control then two phases in the supply lead must be interchanged, e.g. terminals 1 and 2 in connector Q(O). Details of the control system are shown in the attached circuit diagram.

Check first that the voltage and frequency ratings shown on the nameplate match your supply specifications.

4.2.1 Supply Lead (Main Power Supply)

The sizes of the supply leads from the sub-distribution board via the mains connection switch or a plug-and-socket connection to the chain hoist must be decided by the user. The size of the supply lead must be selected such that the voltage at the chain hoist does not fall below the lower limit of the voltage range.

See Point 3.2.4 for the main fuse rating and cable cross-sections.

4.2.2 Mains Connection Switch (not supplied)

VDE 0100 Part 726/6.1 requires hoists to be isolated and locked out by means of a mains connection switch or plug-and-socket connector.

The mains connection switch must be located off the chain hoist, its purpose being to isolate the main power supply for repair and maintenance work. If necessary this switch/connector may also be used for Emergency Stop or Emergency Off. The mains connection can be locked out with up to three padlocks to prevent unauthorised use.

4.2.3 Isolation Plug (Mains Disconnect)

The purpose of the mains disconnect – to shut down and isolate the chain hoist for repairs and maintenance work – is achieved by the isolation plug.

This is part of the chain hoist and carries the equipment identifier (BMK) “X1”.

The chain hoist is isolated for repairs and maintenance by pulling the isolation plug.

4.2.4 Pendant Control

The pendant control is supplied loose with its control cord and plug connected.

(Figure 1, Item 10)

Different pendant controls are used for direct control and contactor control – the pendants are wired differently.

Simultaneous operation of the control buttons in opposite directions is prevented by the mechanical interlocking of the switch elements.

The function of **Emergency Stop** from the floor/operating position as required by VDE 0100, Part 726, is provided by the **red** rotary button.



Caution

‘Emergency Stop’ is not the same as ‘Emergency Off’, i.e. only the power supply to the drives is interrupted and the brakes engage - the equipment is still connected to the supply.

Emergency Stop is operated by hitting the red button; this button is reset by turning clockwise.

Emergency Stop must be operated in the following cases:

- when the hoist operator leaves the control stand.
- if the movement drives cease to obey the normal control commands and can cause danger as a result.

4.2.4.1 Optional Pendant Control

See circuit diagram in **Figure 4a** (single speed) and **Figure 4b** (dual speed)

In the standard configuration the control position is immediately adjacent to the hoist. The pendant pushbutton control unit is suspended from the chain hoist, and plug X2 “Pendant” is connected to the chain hoist directly.

A. Installing the pendant control

Pendant control with external strain relief.

Fit the “Pendant” plug (X2) with the pendant connector ready to use into the base of the left hand connector (X2). The pendant unit hangs by a strain relief wire which must be shorter than the control cable to take the pendant’s weight. The working height of the pendant unit should be set to approx. 100 cm above floor level.

The wire is mounted under the left hand connector in a special recess provided in the housing.

When assembling (see Figure 3), the guard and wire end loop are placed over the screw and the screw is then fitted into the recess provided (see Section 3.2.3 for torque setting).

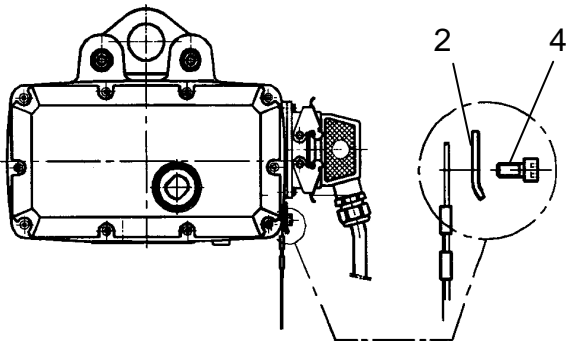


Figure 3

B. Connecting the power supply

If a power supply cable is already fitted, insert the “Power Supply” connector (X1) into the right hand socket (X1) and secure with the clips (**Figure 1, Item 3**); insert the power plug (CEE) into a CEE socket with a clockwise phase sequence. The chain hoist can now be operated.

4.2.5 Low voltage control

The layout and mounting of the pendant control and mains connection is the same as for direct control variant described in Section 4.2.4.1.

In place of the standard electrical system with terminal box and brake electronics in the chain hoist control cubicle there is a low voltage control comprising of control transformer, reversing contactors, high-speed contactors and rectifiers. (Refer to the circuit diagram in the chain hoist).

The motor power is not switched in the pendant directly and so only the 48V control voltage is present in the pendant.

The contactor control is rated for the operating voltage range of the chain hoist.

The control voltage is still 48V.

Otherwise, the electrical data are indicated with the data for the standard hoist.

4.2.6 Low voltage control variants

The following variants of the low voltage control are available as standard:

- Contactor control for “lifting and lowering for single speed”, star-connected, L/L1 speed. For circuit diagram see Figure 22a; for component mounting plan see Figure 22b.
- Low voltage control for “lifting and lowering for dual speed”, star-connected, L/L star. For circuit diagram see Figure 23a; for component mounting plan see Figure 23c.
- Low voltage control for “lifting and lowering for dual speed”, delta-connected, L/L delta. For circuit diagram see Figure 23b; for component mounting plan see Figure 23c.
- Low voltage control for “lifting, lowering and crosstravel for dual speed”, star-connected, L/L/T star. For circuit diagram see Figure 24a; for component mounting plan see Figure 24c.
- Low voltage control for “lifting and lowering for dual speed”, delta-connected, L/L/T delta. For circuit diagram see Figure 24b; for component mounting plan see Figure 23c.

4.2.5.2 Fuse replacement

The control circuit of the low voltage control system has secondary protection by fuse F1 (0.5A slow, 5x20) and is earthed at one end (Figures 22 to 24). The fuses are released by applying gentle pressure with a screwdriver to the fuse cap and turning it 1/6 of a turn counterclockwise.

4.3 Assembly of Chain and Hook

If the chain or hook have to be assembled, this should be done as described below. Chain replacement is described in **Chapter 6.5**.

- Attach threading aid **(4)** (e.g. cable tie or thin wire) to the last chain link and introduce into outer hole of the chain guide above the chain store.
- The first chain link runs vertically around the sprocket, the weld **(3)** on vertical chain links must face outwards.
- Pull the chain into the guide until resistance is felt, then feed the chain with the motor. Keep the chain under tension until the end of the chain emerges from the guide, and then remove the threading aid.
- For 1-fall chains (1/1), fit the emerging end of the chain into the hook housing and secure it with the straight pin **(2)**. Now assemble the two halves of the hook housing and tighten to the torque settings given in Section 3.2.3.
- For 2-fall chains (2/1), feed the chain through the bottom block and attach the end of the chain to the anchor. To do this, unscrew the anchor, insert the last chain link into it and secure using the pin **(1)**. Ensure that the chain is not twisted. The torque settings for the anchor bolts given in Section 3.2.3 must be observed.
- Fit the chain stop **(5)** to the last-but-one link at the free end of the chain using the taper sleeve **(6)**.

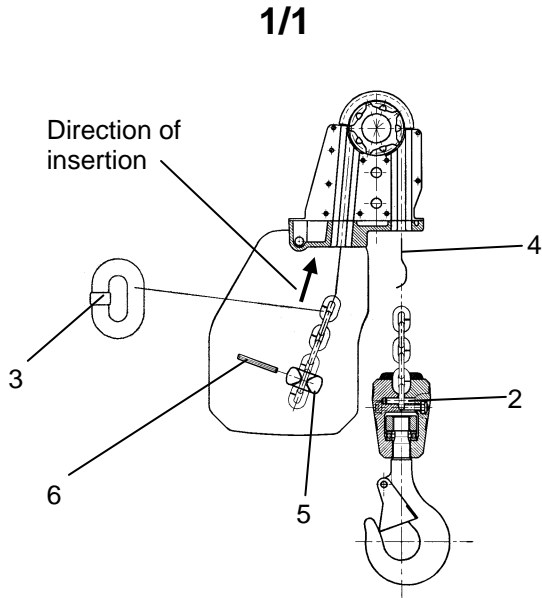


Figure 5

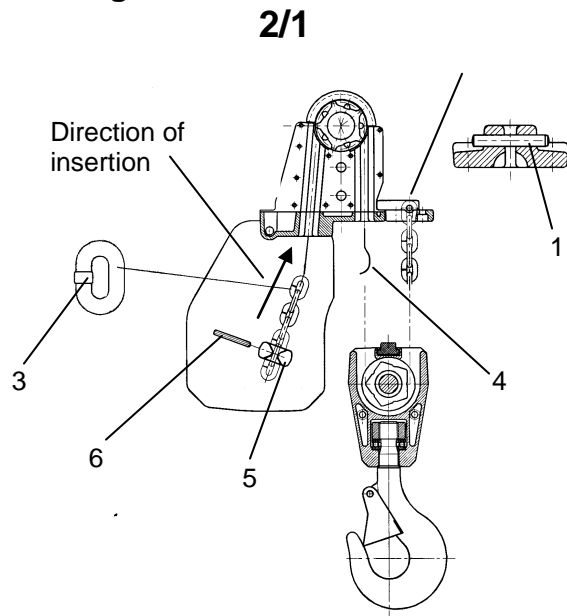


Figure 6

4.4 Chain Store

The chain store – **Figure 7, Item 1** – must be fitted before the chain hoist is commissioned. Thread the pin (**2**) through the holes provided in the container and the housing, then secure it by fitting the retaining clips (**3**) in the grooves machined into both ends of the pin.

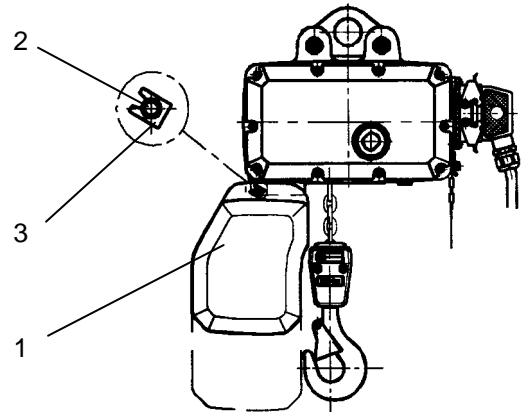


Figure 7

Remember that the chain store must be assembled correctly otherwise it may constitute a hazard.

4.5 Suspension Eye

Refer to **Figure 8**. The suspension eye (**1**) is fitted on top of the chain hoist housing by means of two stud bolts (**2**) mounted in the four lugs provided.

Each stud bolt is secured with compression stop nuts (**3**). A washer (**4**) must be fitted under the bolt head and the nut.

The torque settings for the nuts (**3**) are given in **Table 3.2.3**.

The nuts should also be secured with **LOCTITE 243** thread-lock.

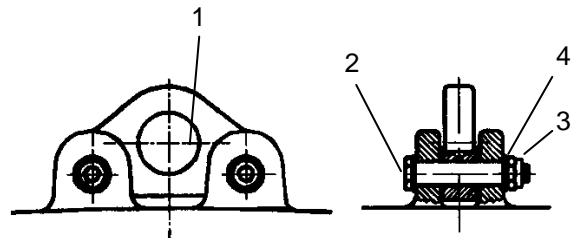


Figure 8

4.6 Commissioning

Before first-time commissioning it is essential to carry out the acceptance test described in **Point 6.1.1** based on the test criteria listed in **Point 6.2**.

The chain hoist can be operated once its readiness for operation has been properly confirmed.

5 Operation

5.1 Pendant Control

The chain hoist and any electric travelling trolley are controlled using the pendant. Any other forms of control must be referred to the supplier. The ergonomic design of the pendant facilitates single-handed operation. The hoist motor is controlled with the two-stage pushbutton (pole-changing motor) or single-stage pushbutton (non pole-changing motor). The pendant incorporates a mechanical interlock to prevent opposing movements from being operated simultaneously. Jog controls should be avoided where possible as they can cause serious contact erosion and premature wear to the switchgear.

The following functions can be performed with the pendant:

- Pushbutton released => Stopped
- Pushbutton depressed half-way (figure 9)
=> Precision speed / slow
- Pushbutton depressed fully (figure 10)
=> Main speed / fast



Figure 9

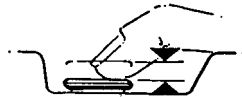


Figure 10

- Red emergency stop button pressed (figure 11)
=> Function stop, even if other button is pressed
- Turn red emergency stop button clockwise (figure 12)
=> Function reset

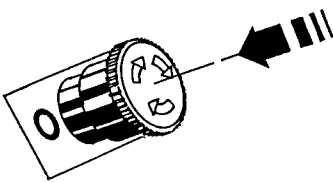


Figure 11

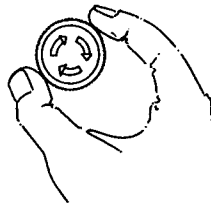


Figure 12

5.2 Attaching Loads

Loads may only be lifted using the loadhook. The chain must not be run across edges; under no circumstances may it be used as a sling.

Chain slings or webbing slings should be used as necessary.

When lifting the load the operator must ensure that the load is correctly attached to the hook and that the safety catch is closed.

If the bottom block lay on the load or on the floor before the load is lifted, then jamming by the chain must be prevented.

The operator or an assistant must keep the bottom block and the hook in view while lifting is in progress.

The load should be lifted at slow speed until the chain is taut so as to minimum wear on the hook, chain and suspension.

The chain hoist must never be used to pull loads at an angle, and the hoist must be positioned directly above the load for this reason.

Pulling loads free, dragging or towing loads with the chain hoist is prohibited.

6 Testing and Servicing

6.1 Acceptance and Testing

(User's responsibility)



Caution!

Where the acceptance and test procedure is not carried out by the user himself and he entrusts these tasks to third parties, then he is responsible for appointing suitable personnel and for initiating / carrying out the test.

The select expert must satisfy the following requirements:

- He must possess a thorough knowledge of the mechanical and electrical systems of chain hoists
- He must have adequate experience in the operation, assembly, servicing and maintenance of chain hoists
- He must be versed in such codes of practice, directives and safety regulations, e.g. accident prevention regulations, as relate to equipment acceptance procedures. The requirements of relevant national regulations must be followed in individual cases, e.g. Accident Prevention Regulation BGV D 8 "Winches, Hoists and Pulling Gear" in Germany.

6.1.1 Acceptance Test before First-Time Commissioning

The user must ensure that the chain hoist including its supporting structure is inspected and tested by an expert before it is operated for the first time.

The personnel necessary for the test, e.g. hoist operator, slinger etc., must be qualified for this type of work and must be made available by the user. Those involved in the test must be able to communicate with one another without misunderstanding. The user must provide suitable equipment if direct communication between slinging and operating positions is not possible.

The following items in particular should be checked as part of the acceptance test:

- The inspection schedule should be checked against its contents list
- The assembled equipment must be checked for compliance with technical requirements
- Check for compliance with mandatory safety requirements, e.g. accident prevention regulations

- Safety devices and safety measures and all brakes to be tested for efficiency
- Check for compliance with mandatory safety distances

The chain hoist and supporting structure must not display any defects which affect operation or which compromise the safety of personnel.

- The results of the tests must be recorded in the Inspection Schedule.
- The expert must decide whether commissioning can proceed.
- Any defects revealed during the course of the test must be remedied by the user; the expert must decide whether a re-test is required once defects have been remedied.



Caution!

The acceptance test as described in this section does not affect any tests required under national regulations which must also be performed as required (e.g. the requirements of BGV D 6 "Cranes" must also be applied when the chain hoist is used in a crane).

If national test regulations require test loads higher than 1.1 times nominal under dynamic loading and 1.2 times nominal under static loading, then these must be referred to the chain hoist manufacturer before the tests are carried out.

6.1.2 Acceptance Test after Major Changes

A further acceptance test as described in Point 6.1.1 must be carried out by an expert before operation following major changes.

Major changes include:

- Moving the chain hoist to a different supporting structure
- Welding work on members of the supporting structure
- Design changes to the supporting structure



Caution!

If the chain hoist is used in a crane, then the requirements for a further acceptance test according to BGV D6 "Cranes" must also be complied with.

6.1.3 Routine Tests

Depending on its conditions of use (level of capacity utilisation, frequency of use and environmental conditions), the chain hoist and its supporting structure must be tested by an expert as required **and at least once a year**.

For example, a hoist which is in virtually constant use close to maximum capacity will require testing more frequently than a hoist that is only used for occasional erection work and for which an annual test is perfectly adequate. Dusty and aggressive environments can also require shorter test intervals. Test intervals other than the maximum of 1 year between tests must therefore be decided by the user based on his specific requirements, and he should consult the manufacturer if in doubt.

The results of these tests must be recorded in the Inspection Schedule.

Routine tests should comprise the following items as a minimum requirement:

- Check the identity of the product against the details in the Inspection Schedule
- Check the condition of components and equipment for damage, signs of wear and corrosion and other deterioration
- Check that safety devices and brakes are complete and operate correctly
- Check the supporting structure
- Determine how much of the theoretical service life has elapsed
- Re-test following rectification of defects that affect safety.



Caution!

The user must take the chain hoist out of service at the end of its theoretical service life. Continued operation is only permitted when an expert has confirmed that there are no objections to continued operation and the conditions for continued operation have been determined. These conditions must be recorded in the Inspection Schedule.

The user must ensure that the conditions for continued operation are complied with.

6.2 Inspection and Service Schedule

Item	Inspection Criterion	Inspection times		
		Before first commissioning	daily	Routine inspection
Brake	Function test	X	X	X
	Check air gap between lining and hub			X
Slipping clutch	Function test	X		X
Chain	Visual check		X	X
	Lubricate	X	X	X
	Measure for wear			X
Chain store	Check attachment	X		X
Hook housing/Bottom lock	Visual check			X
	Check return wheel roller bearing			X
Loadhook	Check bearing	X	X	X
	Safety catch operation	X	X	X
	Check for distortion and wear			X
Suspension eye/hook	Correct mounting of twist lock	X		X
	Check for distortion and wear			X
Controls	Function test	X	X	X
	Condition of power supply			X
Optional lift limit switch	Function test	X	X	X
Chain hoist	Theoretical service life "Measures for Ensuring Safe Working Periods"; see Chapter 2.4			X

6.3 Servicing the Brake

6.3.1 Checking the Brake

Despite the brake lining's very long service life the brake must be checked regularly and adjusted as necessary depending on the severity of use. Brake wear can be checked by watching how far the load runs on when being lowered, i.e. the user should observe and measure the distance by which the load runs on after the brake is applied. The brake should be adjusted if this distance is at all noticeable.

The air gap should be checked as part of normal routine servicing as described in Section 6.1.3 and adjusted as required. The condition of the brake lining and brake hub including the key fit should also be examined. This is done by first removing the brake cover, then slackening the solenoid retaining screws and removing the solenoid. Following inspection, the solenoid is refitted and the air gap set as described in Section 6.3.2.

The thickness of the brake lining must not be below the following minimum limits:

Type	Brake lining thickness	
	new	minimum
CH1	11 mm	8,0 mm

6.3.2 Adjusting the Brake

The brake cover is attached to the housing by six Allen screws.

Once the brake cover has been removed the brake will be found in the left hand side of the housing. Use a feeler gauge **(3)** to measure the air gap – this must not exceed 0.6 mm, and is adjusted as follows:

1. Slacken the Allen screws **(1)**
2. Turn the adjuster sleeves in or out as required **(2)**
3. Tighten the Allen screws **(1)**
4. Measure the new gap with a feeler gauge **(3)**
5. Repeat the process until the desired gap (0.2 mm) has been achieved
6. Always remember to tighten the Allen screws **(1)** when adjustment is complete

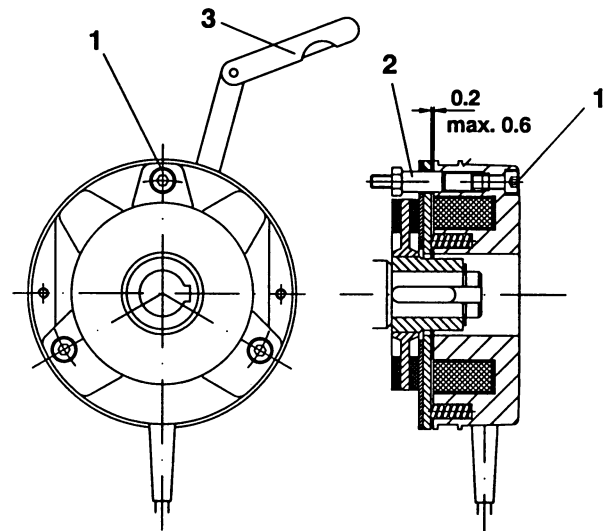


Figure 13

The complete brake disc (brake lining and back plate) must be replaced when the lining has been adjusted twice because of load.

6.3.3 Brake Lining Replacement

Slacken the mounting screws and remove the body of the brake. The brake disc sits on a splined hub and it can now be withdrawn.

Now mount the new brake disc and re-assemble in reverse order of dismantling. Following brake lining replacement the air gap must be adjusted as described above in section 6.3.2.

6.4 Servicing the Slip Clutch

The slip clutch requires no adjustment under normal operating conditions. The clutch runs in an oil bath and the linings are virtually wear-free. The initial set-up is done in the factory and any subsequent adjustment must be carried out by authorised service personnel. Increasing the release torque above the factory setting is not permitted.

Correct operation of the slip clutch can be determined by checking whether the hoist raises the rated load promptly without a delay and / or that the load does not drop back during raising. The slip clutch may require adjustment after a long period of severe operating conditions.

To adjust, proceed as follows:

1. Slacken the screw plug **(1)** on the gear case **(2)** with a 19 mm open-end spanner and remove.

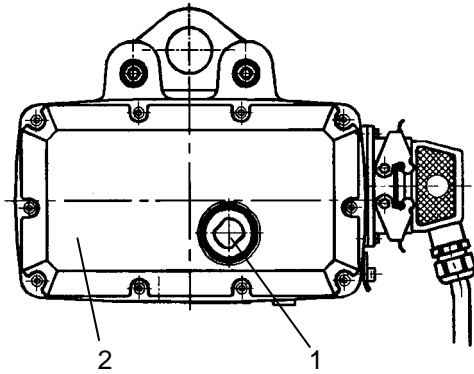


Figure 14

2. Adjust the clutch by turning the locknut clockwise (17 mm spanner).



3. If the chain moves during adjustment, it must be locked in position where it enters the chain guide.

4. Check the adjustment by lifting/lowering the test load a number of times. The slip clutch must be adjusted so that it can still just lift 1.3 to 1.4 times the rated load.
5. Repeat from step 2 if adjustment is not sufficient.
6. After adjusting, check the O ring on the screw plug and replace if necessary.
7. Tighten the screw plug.



Caution!

The slip clutch should never be used as a hook travel limiter for normal operation. A dedicated limit switch must be used for this purpose as required by regulations.

Do not under any circumstances undo the Allen screws in the gearbox cover as this will allow gear oil to leak out!

6.5 Chain Care and Replacement

6.5.1 Chain Care

The life of the chain depends largely on the condition of the lubricant. The inspection and servicing intervals will vary according to environmental influences and the severity of use.

A daily visual check on the chain (see Point 6.2) will indicate the quality of the lubrication, and the chain should be oiled accordingly or an oil change carried out. Soiled chains must be cleaned before oiling. Chains should be lubricated in the relaxed condition to ensure that the oil can flow into the joints.

We recommend the use of a standard commercially available engine oil, e.g. 20W/50, as the lubricant.

6.5.2 Inspecting the Chain

A decision to replace the chain should take account of the following criteria:

- Chain length
- Surface damage
- Corrosion.

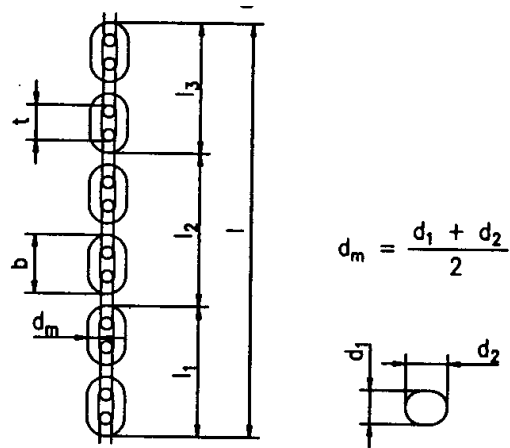


Figure 15

Type		CH1
Chain size	d x t	5 x 15
Min. link thickness in joint	dm	4,5
Max. internal pitch	t	15,9
Max. length over 11 t	l	178,5

Measuring the chain length over 11 links (Figure 15) can be done directly or in stages. Staged measurement is done on 2 x 3 and 1 x 5 links. The chain should be pre-tensioned slightly when measuring. The three measured values L1 + L2 + L3 should not exceed the stated limit "L" when added together. If any of the stated limit measurements is exceeded the chain must be replaced by a new original ABM approved chain.

The chain must also be replaced if there is any surface damage such as nicks or necking, or signs of corrosion.



Caution!

Corrosion significantly reduces the safe working load of the chain and can be the immediate cause of chain failure.

6.5.3 Chain Replacement

The chain may need to be replaced when worn after a long period of service or if the lifting height is modified. Please ensure that the new chain is lubricated before or immediately following replacement.



Important Note!

Use only ABM Approved Chains!

The chain is replaced by attaching the old chain to the new one. Proceed as follows:

- Remove the chain store and chain stop.
- Attach new chain to the old chain with a C link (**Figure 16, Item 6**).
- The position of the weld (**Figure 16, Item 5**) must be as shown.
- Feed the new chain through using the “Lower” control function.
- For single-fall chains (1/1) open the hook housing, insert the last chain link, secure it with the pin and re-assemble the hook housing. The screw torque settings given in Point 3.2.3 must be followed without fail.
- For two-fall chains (2/1) the chain is fed through the bottom block and the last chain link is attached to the chain anchor. To do this, unscrew the anchor, insert the last link and secure with the pin.
- Take care not to twist the chain when fitting. The screw torque settings for the chain anchor given in Point 3.2.3 must be followed without fail. The pin should be replaced whenever the chain is replaced.
- Finally re-assemble the chain stop and chain store.

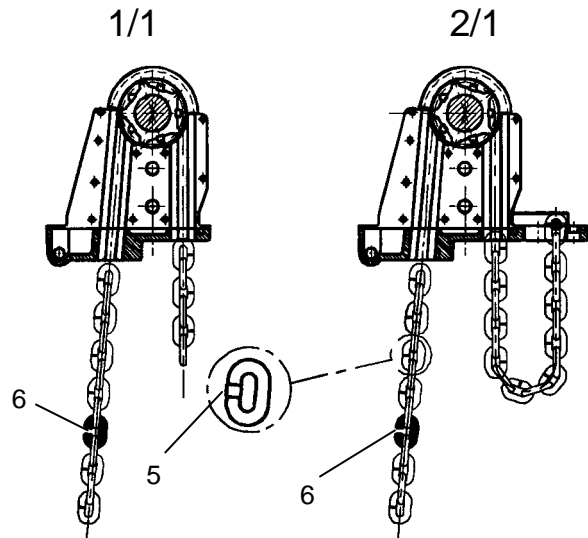


Figure 16

Normal chain maintenance should include routine checks for wear and tear, and chain lubrication should also be changed every 100 operating hours. Heavily soiled chains must be cleaned before lubricating. Normal commercial 20W/50 engine oil is the recommended lubricant.

Always lubricate the chain in the relaxed condition to ensure that oil film can enter the joints.

6.6 Testing and Servicing Load Carrying Devices

Load carrying devices should be inspected as a normal part of routine safety checks. A regular visual examination of the external parts is sufficient, i.e. buffer pad, hook and safety catch. Replace the buffer pad if cracked or distorted. The hook housing or bottom block will have to be dismantled for this purpose.

The hook will also have to be replaced if the following guideline values for widening “e” and main section “f” are not achieved.

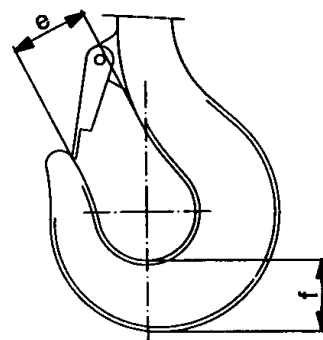


Figure 17

CH1 Types

Hook size	Ø12		
Max. expansion "e"	26.4 mm		
Min. main section "f"	18.1 mm		
Types	CH1 80.6 - 1	CH1 100.6 - 1	CH1 125.6 - 1
	CH1 160.6 - 1	CH1 200.6 - 1	CH1 250.6 - 1
	CH1 125.8 - 1	CH1 250.8 - 1	
	CH1 125.10 - 1		
	CH1 100.12 - 1	CH1 125.12 - 1	

The hook bearing is tested by rotating the hook manually with a load attached. The complete hook must be replaced if there is any defect.

6.6.1 Hook Housing

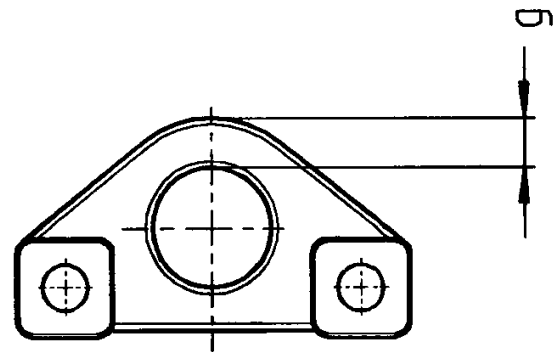
No replacement is necessary in the hook housing other than the parts described in Section 6.6.

6.6.2 Bottom Block

The bottom block houses a return wheel for the chain. To check the condition of the chain wheel's ball bearings, open the bottom block by removing the two socket head screws. Take out the chain and hook together with the hook bearing. The smooth running of the wheel can now be checked by placing it in one half of the bottom block and spinning it by hand. To check the bearing pin for surface damage, lift the return wheel and its bearing off the pin. If any of these parts is damaged, replace both halves of the bottom block, the bearing pin and the wheel including its ball-bearing.

Renew lubrication as required.

6.7 Suspension Eye



Type	Eye dia.	Min. eye thickness "g"
CH1	36	12,5 mm

Measure the eye thickness g. If g is less than as shown in the above table, replace the eye. It must also be replaced if cracked or damaged.

7 Trouble-Shooting Chart

The faults listed in the chart must be rectified by a specialist technician



Caution!

The chain hoist must be isolated from the supply prior to executing any work on its electrical system

Fault	Possible cause	Remedy	Remarks
Chain hoist fails to operate	No supply	Check current collector Check EMERGENCY STOP button and contactor K1	Contactor K1 with contactor control only
	Lift limit switch of hoist has tripped	Check phase angle Check operation of lift limit switch Check setting of lift limit switch	Only when chain hoist fitted with lift limit switch
	No control voltage	Check control fuse on control transformer	With contact control only
Motor fails to run in either direction and does not 'hum' even when pendant is operated	No supply	Check voltage	
	Mains connection not correct	Connet all 3 phases correctly	
	Faulty fuse Q/R connectors, mains connection of pendant not properly connected or fused	Replace fuse Push Q/R connectors home and secure with retaining clips	Refer to circuit diagram
	Faulty contact in pendant, open circuit in supply wiring or in pendant or possibly in travel drive	Check wiring for open circuit, replace control cable if necessary	
Motor fails to run in either direction but 'hums' when pendant is operated	Faulty supply connection or main fuse blown	Check mains connection	
	Faulty contactor	Replace contactor	With contactor control only
Motor labouring	Brake fails to release, motor running against closed brake	Refer to brake faults	
Hoist moves in one direction only	Faulty switching element in pendant	Check element and replace as necessary	
	Open circuit	Check control cable	
	Faulty contactor	Replace contactor	With contactor control only
	Lift limit switch (if fitted) was operated	Check limit switch	Only with lift limit switch fitted



Caution!
Motor winding can burn out

Fault	Possible cause	Remedy	Remarks
Brake fails to release	No supply to brake coil, no a.c. supply at rectifier input	Check connections and repair as necessary Check motor	
	Rectifier not correctly connected or faulty	Check d.c. supply at brake coil (approx. 90 Vdc); connect rectifier correctly or replace	Refer to circuit diagram
	Brake coil without continuity and faulty	Replace brake coil	Refer to operating instructions
Excessive stopping distance	Air gap at maximum (limit of wear has been reached)	Adjust brake	Refer to operating instructions
Chain hoist fails to lift load	Overload protection has tripped	Check setting and adjust as necessary Reduce load to SWL	
Chain wearing too fast	No or inadequate chain lubrication. Chain is entraining solid dust particles due to severe conditions. Chainwheel and/or chain guide worn from extreme operating conditions or excessive period of use	Oil chain regularly. Regularly clean and degrease chain then lubricate, replace with new parts	Refer to service schedule. Check chainwheels and guides for wear when replacing worn chains
Excessive 'rattle' in chain drive	Chain is over its wear limit, chain too long incorrect chain fitted	Replace chain with a new original ABM chain	Check chain regularly according to service or inspection schedule
Load occasionally drops back when lifting with nominal load	Slipping clutch set too loose	Adjust clutch as described in Point 6.4	Follow operating instructions carefully

8 Repairs



Caution!

All repairs must be carried out by skilled personnel.

ABM Electric Chain Hoists may only be serviced and maintained by trained and authorised engineers.

ABM can accept no liability for damage due to repairs carried out incorrectly or by unauthorised personnel.

Please note that only ABM Original Spare Parts should be used to ensure that warranty claims can be processed.

The ABM Service Centre can be reached at the following numbers:

Phone: 09231 / 67-210
Fax: 09231 / 63221

9 Disposal, Recycling, Decommissioning

ABM products are capable of environmentally friendly disposal/recycling after use.

Details about disposal and recycling of the various components of the hoist are given in the table below.

Product	Materials	Disposal
Housing, chainwheel, chain, suspension eye, motors, gearbox, loadhook	Metals	Grade different materials, recycle by melting down
Brake linings, slipping clutch lining	Composites	Remove to special sites complying with local statutory requirements
Covers, chain guide	Plastics	Recycle, incinerate
Lubricants	Oils and greases	Treat or dispose according to waste legislation, e.g. incinerations
Cables, housings, connectors, pendant control	Rubber, PVC, silicone, polychlorophen	Grade different materials, recycle
Electronic units	Plastics, metals, electrolytes	Remove to special sites complying with local statutory requirements

Painted products: depending on the type of coating these items should be sent for recycling or

removed to special disposal sites in accordance with local statutory requirements regulations.

10 Instructions for Adjusting a Lift Limit Switch

If required, the ABM Chain Hoist can be fitted with a lift limit switch GTES51-67 or GTES51-180.

This will make it possible to set any desired switching points, e.g. to limit top and bottom hook positions. The function of emergency limit stop is provided by the slipping clutch built into the chain hoist.

Top and bottom switching points are preset when the chain hoist is supplied with a factory-fitted limit switch.

These switching points can be adjusted at setscrews .1 and .2 using a 4 mm dia. screwdriver or 4 mm Allen key. The table below gives the hook travel per single turn of the setscrew.

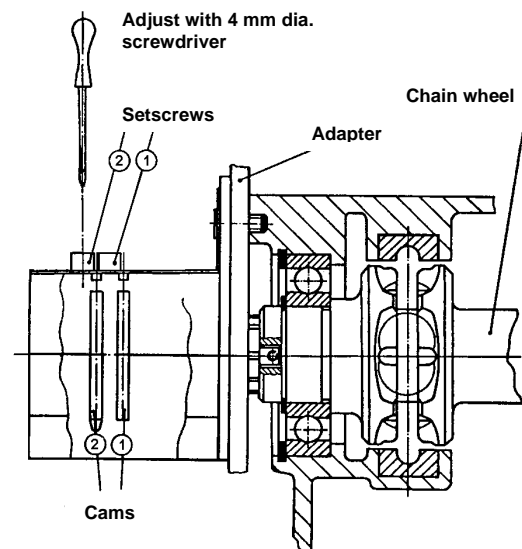


Figure 19

Chain Hoist CH1: Lift Limit Switch Adjustment Table

Sling legs	Hook travel	Lift limit switch type	Hook travel per rotation of setscrew 1 and 2 [mm]
1	<= 9 m	GTES 51-67	92
	>= 9 m	GTES 51-180	250
2	<= 4 m	GTES 51-67	46
	>= 4 m	GTES 51-180	125

Adjusting the switching points

Setscrew .1 “Switching Point 1 (Raise)”

The switching point can be set to anywhere between the top and bottom limits of hook travel. To make the adjustment, first move the hook to the desired position, e.g. by turning setscrew .1 counter-clockwise. Now turn setscrew .1 clockwise until the switch contact is heard to throw. 114 turns of the setscrew are equivalent to 360° on the cam wheel. Check the switching point by approaching this hook position twice (1. precision lift, 2. main lift), and adjust again as necessary. The hook must not touch the housing and trip the slipping clutch.

Setscrew .2 “Switching Point 2 (Lower)”

The switching point can be set to anywhere between the top and bottom limits of hook travel. To make the adjustment, first move the hook to the desired position, e.g. by turning setscrew .2 clockwise. Now turn setscrew .2 counter-clockwise until the switch contact is heard to throw. 114 turns of the setscrew are equivalent to 360° on the cam wheel. Check the switching point by approaching this hook position twice (1. precision lift, 2. main lift), and adjust again as necessary. The chain stop must not touch the housing and trip the slipping clutch.

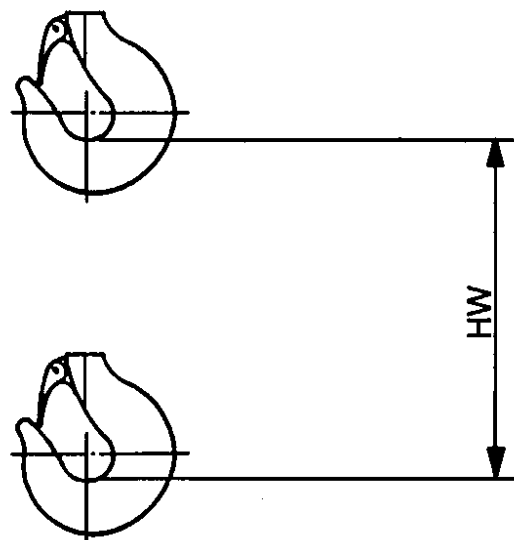
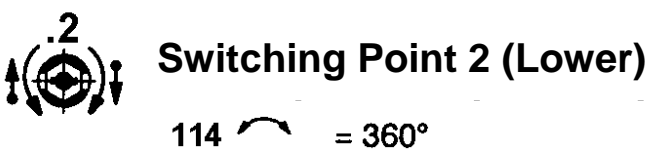
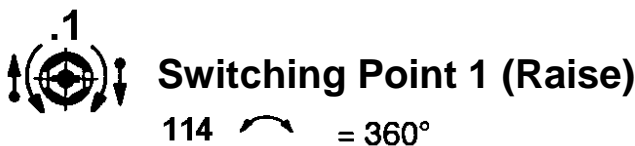


Figure 20

11. Inspection Schedule for Chain Hoist CH1

11.1 Master Sheet for Chain Hoist CH1 with Specifications

To be completed by the customer	
Company:	_____.
	_____.
	_____.
Date commissioned:	_____.
Location	_____.

Manufactured by: ABM-Greiffenberger Antriebstechnik GmbH
Friedenfelser Strasse 24
D-95615 Marktredwitz

Type:	CH1 80.6 – 1	CH1 100.6 - 1	CH1 125.6 - 1
	CH1 160.6 – 1	CH1 200.6 - 1	CH1 250.6 - 1
	CH1 125.8 – 1	CH1 250.8 - 1	
	CH1 125.10 – 1		
	CH1 100.12 – 1		CH1 125.12 - 1

Serial number:	see nameplate
A .No.:	see nameplate
Year:	see nameplate
Group DIN 15020 / FEM:	see nameplate
No. of falls:	see nameplate
Electrical data:	see nameplate
SWL:	see nameplate
Lift height:	see nameplate
Lifting speed:	see nameplate
Control:	electrical
Location:	in factory shop
Chain:	RDT 5x15 H 80 D (Part no. 7101929) or HE KN ABM-G80 RAS – 5x15 (Part no. 27863)
Load hook size:	see Point 6.6
Brake:	disc brake

11.2 Certificate of Conformity

Valid when this chain hoist is operated as a standalone machine.

Manufacturer's Certificate

Valid when this chain hoist is incorporated in another machine. The chain hoist must not be used until it has been certified that the machine in which the chain hoist is to be incorporated complies in full with the requirements of the stated EC Directives in the version valid at the time of issue.

We
Address: ABM-Greiffenberger Antriebstechnik GmbH
Friedenfelser Strasse 24
D-95615 Marktredwitz

hereby certify that the product **ABM Chain Hoist CH1**

in the version we supply complies with the following relevant requirements in the version valid at the time of issue when used for its intended purpose:

- | | |
|----------------------------|--|
| - EC Machine Directive | 98/37/EC; 98/79/EC |
| - EC Low Voltage Directive | 73/23/EEC; 93/68/EEC |
| - EC Directive on EMC | 89/336/EEC; 91/263/EEC; 92/31/EEC; 93/68/EEC |

Harmonised standards used:

- | | |
|---------------------------------|---|
| - EN 292 T1 T2 | Safety of Machines |
| - EN 60204-1 | Electrical Equipment of Machines |
| - EN 60204-32 | Rules for Hoists |
| - EN 61000-6-4 and EN 61000-6-3 | Electromagnetic Compatibility, Emissions |
| - EN 61000-6-1 and EN 61000-6-2 | Electromagnetic Compatibility, Noise Immunity |
| - EN 954-1 | Safety related parts for controllers |
| - DIN EN 60034-1 | Electrical Rotating Machines |
| - DIN EN 60034-5 | IP Enclosure Classes |
| - DIN 5684 | Round-steel-chain for Hoists |
| - DIN 15400 and DIN 15401 | Load hooks for Hoists |

Applied national standards and technical specifications:

- | | |
|--------------------------|--|
| - IEC 364 | Electrical Systems |
| - IEC947-5-1 | Low-Voltage Switchgear |
| - FEM 9.511 | Classification of Drives |
| - FEM 9.671 | Quality. Selection Criteria and Requirements of Chains |
| - FEM 9.683 | Selection of Lifting and Travelling Motors |
| - FEM 9.755 | Measures for Achieving Safe Working Periods |
| - FEM 9.751 | Power-Operated Production Hoists , Safety |
| - BGV D 8 Revd. 01.04.96 | Winches, Hoists and Pulling Gear |

As required by the EC Machine Directive

- the CE symbol is affixed to the chain hoist
- the technical documentation is held at the manufacturer's works.

Marktredwitz, den 31.07.2003

.....
Dr. Stefan Beer
Managing Director

.....
Manfred Dollinger
Managing Director


The contents of this certificate complies with EN 45014
ABM-Greiffenberger Antriebstechnik GmbH operates a Quality Management System according to
DIN EN ISO 9001 (08.94)

11.3 First Inspection of Chain Hoist CH1 (or Inspection following Relocation)

Preliminary Inspection

The calculations and design documentation for the above chain hoist comply with the requirements of the applicable design standards and accident prevention regulations.

Leipzig, 20.12.1999



.....
Dr.-Ing. Fickenscher



Manufacture Inspection

The manufacture of the above chain hoist complies with the verified manufacturing documents.

Marktredwitz, 08.02.2000


.....
Dr.-Ing. Fickenscher



Acceptance Test

Follow-Up Test

11.4 Annual Inspections of the Chain Hoist

Inspection results	Inspected by	Date

11.5 Load Hook/Suspension Eye

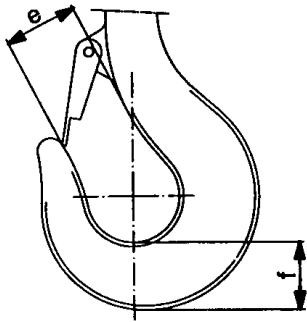


Figure 22

Inspection interval: At least once annually
Type: Single hook (DIN 15401)

An original of the acceptance test for forged load hooks (according to DIN15404) is held at the manufacturer's works

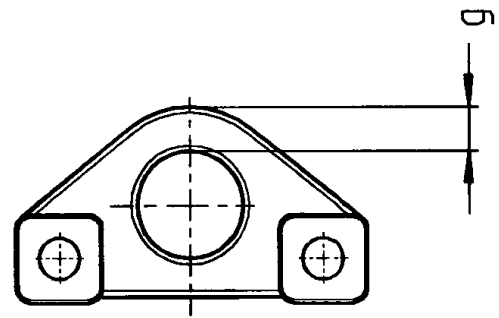


Figure 23

Inspection interval: At least once annually
Type: Suspension eye CH1

Fitted on: by:	Markings zeichnung	" e " [mm]	" f " [mm]	" g " [mm]	Safe work- ing load [kg]	Remarks

11.6 Chain

Chain hoist	CH 1		$d_m = \frac{d_1 + d_2}{2}$
Standard designation	RDT 5x15 H 80 D or HE KN ABM-G80 RAS – 5x15		
Wire gauge	5 mm		
Pitch	15 mm		
Link thickness in joint "dm"	min.	4,5 mm	
Internal pitch "t"	max.	15,9 mm	
Length over 11 links "l"	max.	178,5 mm	
Finish	Galvanised		
Material	Special chain steel		
SWL per leg	max.	500 kg	
Production test load	min.	20 kN	
Breaking load	min.	32 kN	
Percentage elongation after fracture	min.	10%	
Weight per metre	0,54 kg/m		

The original of the supplier's test certificate is held at the manufacturer's works. This works certificate complies with DIN EN 10204. Measuring the chain length over 11 links (Figure) can be done directly or in stages. Staged measurement is done on 2 x 3 and 1 x 5 links. The chain should be pre-tensioned slightly when measuring. The three measured values l1 + l2 + l3 should not exceed the stated limit "l" when added together. If any of the stated limit measurements is exceeded the chain must be replaced by a new original ABM chain.

Inspected on: by:	Length over 11 links [mm]	Dim. t [mm]	Dim. dm [mm]	Safe work- ing load [kg]	Remarks