

Operating instructions/accessories/component parts

Demag DC-Pro 1 - 15 chain hoist

Demag DCM-Pro 1 - 5 Manulift chain hoist

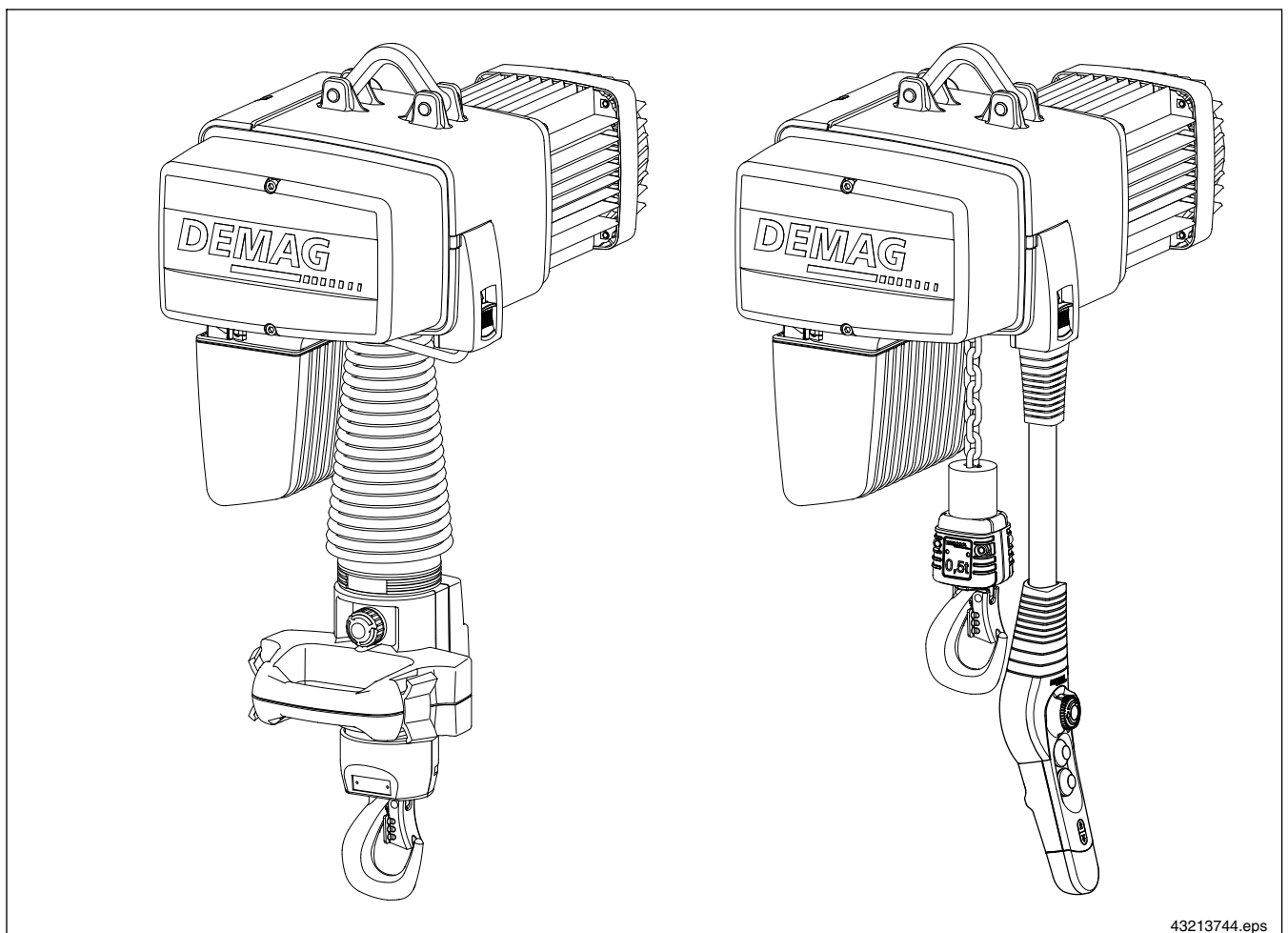


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1 General

1.1 DC-Pro chain hoist

You have purchased a Demag quality product.

This chain hoist was manufactured to European standards and regulations in accordance with state-of-the-art engineering principles. The EC machinery directive requirements are satisfied.

1.2 DC-Pro documents

Further documents are available for sub-assemblies/components in addition to these operating instructions. The corresponding documents are supplied as necessary or can be ordered separately – also for special designs or if additional order options are utilised which differ from these operating instructions.

Documents ¹⁾		Order no.
Technical data / catalogues	Demag DC-Pro 1 - 25 chain hoist Demag DCS-Pro 1 - 10 chain hoist	203 525 44
	Demag DC-Com chain hoist	203 571 44
	CF5-DC/DCM trolley	203 568 44
	U11-U34/DC/DCM/DK trolley	203 569 44
	E11-E34 DC travel drive (circuit diagrams)	203 698 44
	RU/EU56 trolley	203 691 44
	DC electrical accessories	203 656 44
	POLU box electrical accessories	203 682 44
	KBK classic (steel, powder-coated)	202 976 44
	KBK Aluline (anodised)	203 245 44
	Clamp-fitted buffer	203 313 44
Operating instructions/component parts	DC-Pro 1 - 15 chain hoist	214 741 44
	DC-Pro 16 - 25 chain hoist	211 033 44
	DC-Com chain hoist	214 802 44
	DCS-Pro chain hoist	214 827 44
	DC-Di chain hoist	211 068 44
	DC-Wind chain hoist	211 010 44
	PGS parallel gripper	214 095 44
Assembly – Adjustment – Dimensions	E11-E34 DC travel drive	214 810 44
	KDC chain hoist	211 017 44
	KDDC/UDDC articulated trolley	211 159 44
	DRC-DC radio control system	214 689 44
	DRC-DC quick-step instructions	211 045 44
	DC geared limit switches	211 011 44
	Friction force checking device	206 973 44
	DC PWM/3ST signal converter	211 094 44
	DSC-EX control pendant	214 832 44
	DSE10-C control pendant	214 998 44
	DC protective sleeve	203 673 44
	DC tandem box	211 108 44
	VG11-34 EU11-34 dual/output gearbox	211 122 44
Test and inspection booklet	DSC strain relief device	211 092 44
	DC test and inspection booklet	214 745 44
	Certificates	235 309 44

Tab. 3

1.3 Symbols/signal words

Important safety information and instructions are marked by corresponding symbols and signal words in these instructions.

Safety instructions and information must be followed. Exercise particular caution to ensure that accidents, injuries and damage are avoided in such cases.

Any locally applicable accident prevention regulations and general safety regulations must also be followed.

¹⁾ The documents can be ordered from the relevant Demag office.

The following symbols and instructions warn against possible injuries or damage and are intended to assist you in your work.

DANGER



This symbol indicates an immediate hazard which can result in serious injury or death.

- Follow these instructions at all times and be particularly careful and cautious.

WARNING



This symbol indicates a possibly hazardous situation which might result in serious injury or death.

- Follow these instructions at all times and be particularly careful and cautious.

CAUTION



This symbol indicates a possibly hazardous situation which might result in medium to light injury or damage.

- Follow these instructions at all times and be particularly careful and cautious.



Operating hazard for the machine

- This symbol indicates information on the appropriate use of the machine.
- This symbol in the operating instructions indicates all warnings which, if not complied with, may result in malfunctions or damage.

1.4 Information on the operating instructions

These operating instructions are designed to provide the owner and operator with useful instructions for transportation, putting into service, operation and maintenance of our chain hoists. These operating instructions are an integral part of the machine.

Persons entrusted with the various types of work must know and comply with the safety regulations and the operating instructions.

The machine may only be operated by personnel who are fully familiar with the operating instructions. In particular, they contain the "Safety" section and the relevant safety instructions in the working sections of these operating instructions.

The operating instructions must be available to operating personnel at all times to prevent operating errors and to ensure smooth and trouble-free operation of our products. They must be kept in the immediate vicinity.

Demag chain hoists are delivered ready for operation as a complete machine with a control pendant or as partly completed machinery without a control pendant.

Complete machine



Based on Machinery Directive 2006/42/EC, the chain hoist is also designated as a machine in the sense of a complete machine in the following.

For a chain hoist delivered ready for operation in the sense of a complete machine, we confirm conformity with the requirements of Directive 2006/42/EC by means of the attached EC declaration of conformity.

Partly completed machinery

These instructions inform the manufacturer of an installation with a chain hoist about:

- basic technical information,
- some typical risks,
- the assembly and operation of the chain hoist.

The instructions contained in this document may be used as the basis for the hazard analysis and operating instructions which must be compiled by the manufacturer of the installation in compliance with the Machinery Directive. For operation of the installation, the manufacturer of the installation must provide additional operating instructions as the result of a hazard analysis, as required, and inform the owner about any remaining hazards.

A declaration of incorporation is enclosed for a chain hoist supplied as partly completed machinery which is assembled with additional parts to form a machine that is ready for operation. The declaration of incorporation refers to the scope of delivery of the partly completed or non-assembled machinery. The owner must take additional measures to satisfy the safety requirements for the machine before the unit is put into operation.

Installation of a partly completed or non-assembled chain hoist to create machinery ready for operation must be carried out in compliance with the information provided by the manufacturer for the machinery. Installation and operating instructions contained in this document must be observed.

A conformity inspection in accordance with the Machinery Directive must be carried out for the assembled machine when it is ready for operation and a declaration of conformity must be produced. The information contained in the declaration of incorporation for the chain hoist may be used for the conformity inspection.

1.5 Liability and warranty

All information included in these instructions has been compiled on the basis of the relevant regulations, state-of-the-art engineering principles and our many years of experience.



These instructions must be read carefully before starting any work on and with the chain hoist, especially before it is put into service for the first time. The manufacturer assumes no liability for any damage which results from the following:

- non-compliance with the instructions,
- inappropriate use,
- untrained personnel,
- unauthorised conversions,
- technical modifications.

Wearing parts are not subject to liability for defects.

We reserve the right to incorporate technical modifications within the scope of improving the operating characteristics and further development of the product.

1.6 Copyright

These instructions are only intended to be used by people who work with or on the chain hoist.

Any and all content, texts, drawings, images and any other information are protected within the sense of copyright law and are subject to further industrial rights. Any misuse is an offence.

No part of this documentation, in whole or in part, may be reproduced, distributed, shown in public or used in any other way without specific prior consent. Infringements are an offence resulting in obligatory compensatory damages. Further rights reserved.

All industrial rights reserved.

1.7 Use of spare parts

We urgently recommend that only spare parts and accessories approved by us be used. Only then can we ensure the safety and normal service life of the installation.

Spare parts not approved by us may cause unpredictable hazards, damage, malfunctions or complete failure of the chain hoist.

The use of unauthorised spare parts may render null and void any claims for warranty, service, damages or liability against the manufacturer or his appointed personnel, dealers and representatives.

1.8 Definition of personnel

Manufacturer

The manufacturer is the person who:

1. manufactures the equipment under his or her own name and places it on the market for the first time;
2. resells other manufacturers' equipment under his or her own name, whereby the reseller is not considered to be the manufacturer provided the name of the manufacturer (as in 1.) appears on the equipment;
3. imports the equipment into the country and places it on the market for the first time or
4. exports equipment to another member state of the European Union and hands it over direct to a user there.

Owner

Owners (employer, company) are defined as persons who own the machine and who use it as intended or allow it to be operated by suitable and trained persons.

Operating personnel/operator

Operating personnel or machine operators are defined as persons assigned by the owner of the machine to operate the machine. This person must be trained by the owner in accordance with the tasks to be performed.

Trained person

Trained persons are defined as persons who have been instructed and trained for the tasks assigned to them and on the possible hazards resulting from inappropriate conduct. Personnel must be informed about the required protective devices, protective measures, relevant regulations, codes of practice, accident prevention regulations and operating conditions and must provide verification of their competence. This person must be trained by the owner in accordance with the tasks to be performed.

Specialist personnel

Specialist personnel are defined as persons assigned by the owner of the machine to carry out special tasks, such as installation, setting-up, maintenance and fault elimination. This person must be trained by the owner in accordance with the tasks to be performed.

Qualified electrician

Qualified electricians are defined as persons who, owing to their technical training, knowledge and experience of electric machines as well as knowledge of the relevant valid standards, codes of practice and regulations, are able to assess the tasks given to them and to identify and eliminate potential hazards. This person must be trained by the owner in accordance with the tasks to be performed.

Experienced technician

Experienced technicians are defined as persons who, owing to their technical training and experience, have sufficient knowledge in the field of the machine. They must be familiar with the relevant national industrial safety regulations, codes of practice, accident prevention regulations, directives and generally accepted engineering standards enabling them to judge the safe operating condition of machines.

Assigned expert engineer (in the Federal Republic of Germany according to BGV D8, Section 23, for determining the S.W.P.)

An assigned expert engineer is defined as an experienced technician specifically assigned by the manufacturer to determine the remaining duration of service (service life) of the machine (S.W.P. = safe working period) and to carry out a general overhaul of the machine.

Authorised expert engineer (according to BGV D6, Section 28 in the Federal Republic of Germany)

In addition to the expert engineers of the Technical Supervisory and Inspection Board, an authorised expert engineer for the inspection of machines is defined as an expert engineer authorised by the Industrial Employers' Mutual Insurance Association.

1.9 Test and inspection booklet

A test and inspection booklet filled in with all details must be available for the hoist (according to BGV D6 Section 28 in the Federal Republic of Germany). The results of the regular tests and inspections must be entered into the test and inspection booklet and must be certified by the inspector. Test and inspection booklet order no.:

⇒ Tab. 3, Page 7.

1.10 After-sales service

If you have any questions on our products or need technical information, please contact our after-sales service. Please keep the serial or order number (see test and inspection booklet, load capacity plate on the crane) for any correspondence or spare part orders. Specifying this data ensures that you receive the correct information or the required spare parts.

Demag Cranes & Components GmbH

Telephone: +49 (0) 180 5741268

www.demagcranes.com

2 Safety

2.1 General information on safety

The "Safety" chapter provides an overview of all important safety aspects for optimum protection of personnel as well as for safe and reliable operation of the machine.

At the time of its development and when it is placed on the market, the machine is built according to the state-of-the-art and is considered to be safe to operate. It may still be a cause of danger if it is not used correctly or as intended by suitably trained personnel.

Knowledge of the contents of the operating instructions is one of the requirements necessary to protect personnel from hazards and to avoid malfunctions and, therefore, to operate the machine safely and reliably.

Any conversions, modifications or additions to the machine are prohibited unless approved by Demag in writing.

2.2 Safety signs on the equipment

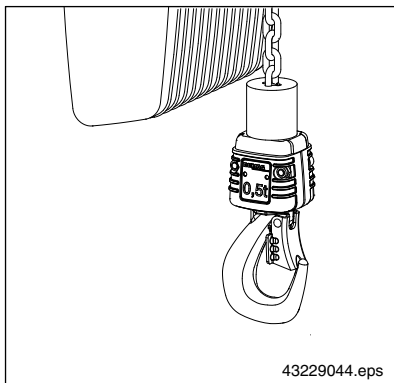


Fig. 2

Any pictograms, signs or labels on the machine must be obeyed and must not be removed. Pictograms, signs or labels that are damaged or no longer legible must be replaced immediately.

2.3 Intended use

The machine may only be used as intended and in compliance with the requirements for the owner and the following limitations as specified in these operating instructions. Any other use may result in a danger to life and limb and/or cause damage to the machine and/or load.

- Chain hoists are only intended for lifting, lowering and moving loads and may be used as stationary or travelling units.
- The suspension/support structure for the chain hoist must be designed to accommodate loads resulting from operation of the chain hoist. The maximum safe working load is the load capacity specified on the capacity plate. This must not be exceeded. The maximum permitted load capacity of the chain hoist includes the load and any load handling attachment.
- The machine may only be installed, used, operated, maintained and removed by trained personnel when in perfect working order. Personnel must meet the requirements according to ⇒ "Operating personnel requirements", Page 13.
- Intended use includes compliance with the safety instructions as well as any other instructions on assembly and disassembly, commissioning, function and operation, maintenance and fault elimination as well as compliance with the instructions on the machine safety devices, any possible remaining hazards and protection against hazards.
- The machine may only be used subject to the permissible technical data, ⇒ "Technical data", Page 16.
- The machine must be maintained regularly and appropriately by trained personnel in line with the specified deadlines and checked according to ⇒ "Maintenance schedule", Page 80. Wearing parts must be replaced in good time.
- UVV/BGV D8, Section 23 (2) and BGV D6, Section (1) guidelines must not be ignored.

No liability for inappropriate use

The manufacturer is exempt from any liability for use other than the purpose which is technically possible and acceptable according to these operating instructions. In particular, the manufacturer assumes no liability for damage due to inappropriate or any other prohibited use of the machine in the sense of the "Intended use" section.

No liability for structural modifications

The manufacturer is not liable for any unauthorised structural modifications which have not been agreed with him. This includes incorrect connection of the machine to devices or equipment that do not belong to our scope of delivery,

or the installation or use of third-party accessories, equipment or sub-assemblies that are not approved by the manufacturer.

Depending on the type and scope of the machine, it may be necessary to have an inspection carried out by an expert engineer before it is handed over to the owner.

DC-Pro chain hoists are designed for operation at temperatures from - 20 °C to + 45 °C. At extreme temperatures and in aggressive atmospheres or conditions differing from those specified in the "Operating conditions" section, the owner must implement special measures after consulting Demag.

Use of the control pendant

Powered lifting and lowering and, if applicable, cross-travel and long-travel motions are controlled by means of the corresponding control elements on the control unit. The slow speeds are intended for attaching the load, lifting it free and depositing it. Loads can be precisely positioned at slow speeds.

Short transport times can be achieved at higher speeds. They are suitable for travelling without a load or with a safely suspended load if no hazard can be caused by the faster motion sequences.



Inching (flick switching) must be avoided, as it causes increased wear and load sway.

2.4 Hazards that can be caused by the machine

The machine has been subjected to a hazard analysis. The design and execution based on this analysis corresponds to state-of-the-art engineering principles. However, residual risks remain.

DANGER



Live components

Danger to life and limb.

Electric energy may cause very severe injuries. Danger to life caused by electrical current if the insulation or individual components are damaged.

- Switch the machine off and secure it against restoration of the power supply before any maintenance, cleaning or repair work is carried out.
- Switch the power supply off before any work is carried out on the electric equipment. Check to ensure that the components to be replaced are de-energised.
- Do not remove any safety equipment or render it inoperative by modifications.

WARNING



Crushing hazard

Body parts can be crushed when loads are lifted or lowered.

Ensure that nobody is present in the immediate danger zone when loads are lifted or lowered.

WARNING



Suspended load. Falling parts.

Danger to life and limb if lifted loads are dropped.

Keep out of the danger zone at all times

- Keep a sufficient safety distance.
- Never step under a suspended load.

Certain work and practices are prohibited when using the machine as they may involve danger to life and limb and result in lasting damage to the machine. Observe the safety instructions in the sections:

- ⇒ "Assembly", Page 41
- ⇒ "Putting into service for the first time", Page 64
- ⇒ "Operation", Page 66
- ⇒ "Maintenance/repair", Page 74

2.5 Responsibility of the owner

Information on safety at work refers to the regulations of the European Union that apply when the machine is manufactured. The owner is obliged to ensure that the specified industrial safety measures comply with the latest rules and regulations and to observe new regulations during the entire service life of the machine. Local industrial safety legislation and regional regulations and codes of practice applicable at the site of operation of the machine must be observed outside the European Union.

General safety, accident prevention and environmental protection regulations that apply where the machine is in operation must be observed and complied with in addition to the safety instructions contained in these operating instructions.

The owner and any personnel authorised by him are responsible for correct operation of the machine and for clearly defining responsibilities for installation, operation, maintenance and cleaning. The operating instructions must be followed in full and without any limitations.

Special local conditions or applications may lead to situations which are not considered in these operating instructions. In such cases, the required safety measures must be defined and implemented by the owner. Necessary measures may also relate, for example, to the handling of hazardous materials or tools and the provision/wearing of personal protection equipment. The operating instructions must, if required, be supplemented by the owner with instructions relating to the organisation of work, working procedures, authorised personnel, supervising and reporting obligations, etc. For further information, see ⇒ "Safety instructions for operation", Page 66.

Furthermore, the owner must ensure that

- any further working and safety instructions resulting from the risk assessment of the machine workplaces are specified in operating procedures.
- personnel who work with or on the machine are provided with appropriate first-aid equipment. The personnel must be trained in the use of the first-aid equipment.
- the operating instructions are always kept available in the immediate vicinity of the machine for installation, operating and maintenance personnel.
- the personnel are trained in accordance with the work to be performed.
- the machine is only operated when in safe and proper working order.
- the safety devices are always kept freely accessible and are checked regularly.
- national regulations for the use of cranes and lifting appliances are observed.
- any specified regular checks and inspections are carried out on time and are documented.

The owner is urged to develop procedures and guidelines for any malfunctions, to instruct users and to affix these instructions at a suitable place where they can be easily seen.

2.6 Operating personnel requirements

Only authorised and trained personnel may work on the installation. The personnel must have received instruction on the installation functions and any hazards that may occur.

Every individual given the task of working on or with the installation must have read and understood the instructions before any work starts.

Persons under the influence of drugs, alcohol or medicines which affect their reactions must not work on or with the installation.

Age and job-specific regulations relevant at the place where the installation is operated must be observed for the selection of any personnel.

Personnel are obliged to report to the owner without delay any changes to the installation that impair safety.

For independent operation (operator) or maintenance (trained maintenance fitter) of the installation, the owner may only employ persons

- who are at least 18 years of age,
- who are mentally and physically suitable,
- who have been instructed in the operation and maintenance of the installation and who have proven their qualification to the owner in this respect.

2.7 Personal protection equipment

When work is carried out on or with the installation, the following is recommended to be worn according to the owner's risk assessment:

- Protective clothing, closely fitting working clothes (low tear strength, no loose sleeves, no rings or any other jewellery, etc.);
- safety shoes to protect against falling parts and against slipping;
- Safety helmet to be worn by everybody in the danger zone.

2.8 Emergency stop device

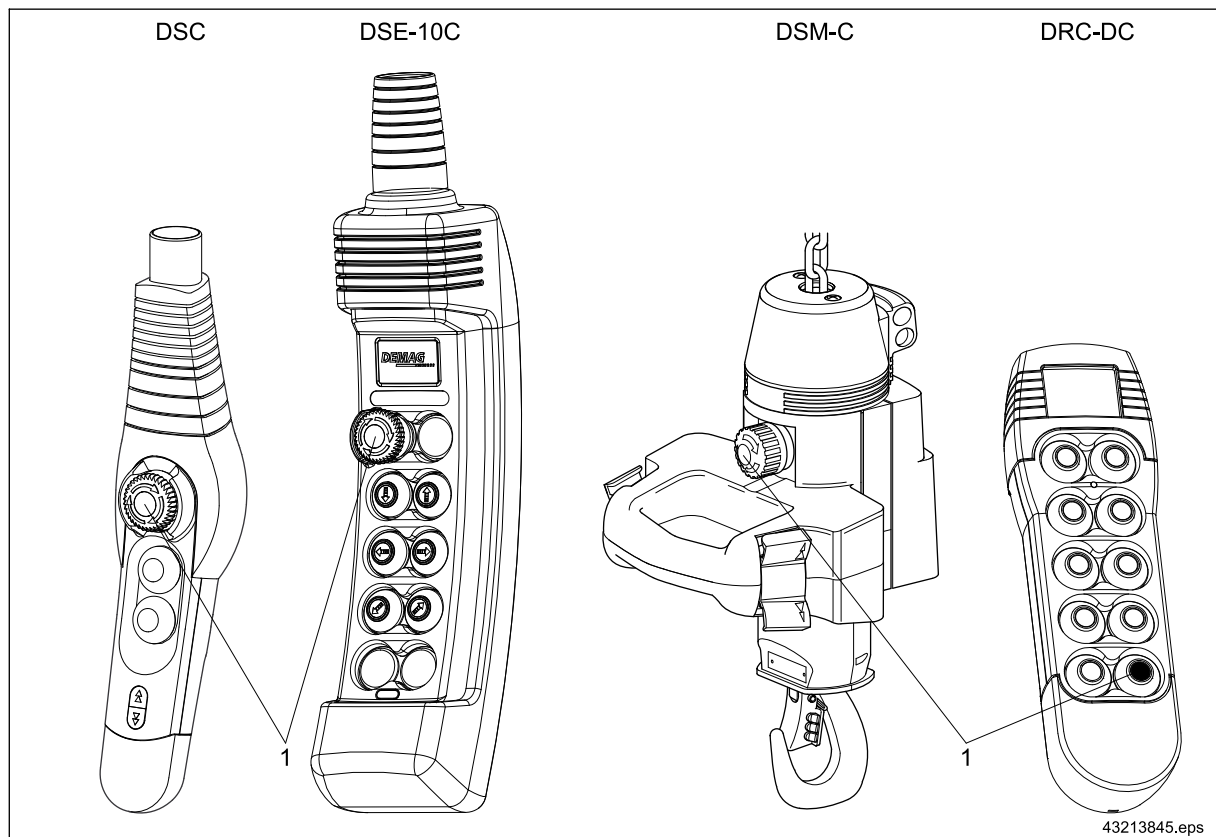


Fig. 3 Position of the emergency stop (1)

The machine is fitted with an emergency-stop device (1) to prevent damage and injuries. This is located on the control unit. The emergency-stop operating function must be checked regularly.

2.9 Regular inspections

The owner of the machine may be obliged to carry out regular inspections by national industrial safety legislation and regional regulations. In Germany, this is specified by the accident prevention regulations for winches, hoists and towing devices (BGV D8) and the accident prevention regulations for cranes (BGV D6), for example. These specify that

- the machine must be inspected before it is put into operation,
- the machine must be inspected regularly,
- the elapsed share of the theoretical safe working period must be calculated,
- a record of tests and inspections must be kept.

The owner is obliged to ensure that the machine complies with the latest rules and regulations and to observe new regulations at all times.

If no comparable inspection regulations or requirements apply at the place where the machine is operated, we recommend compliance with the above-mentioned regulations.

3 Technical data

3.1 Design overview

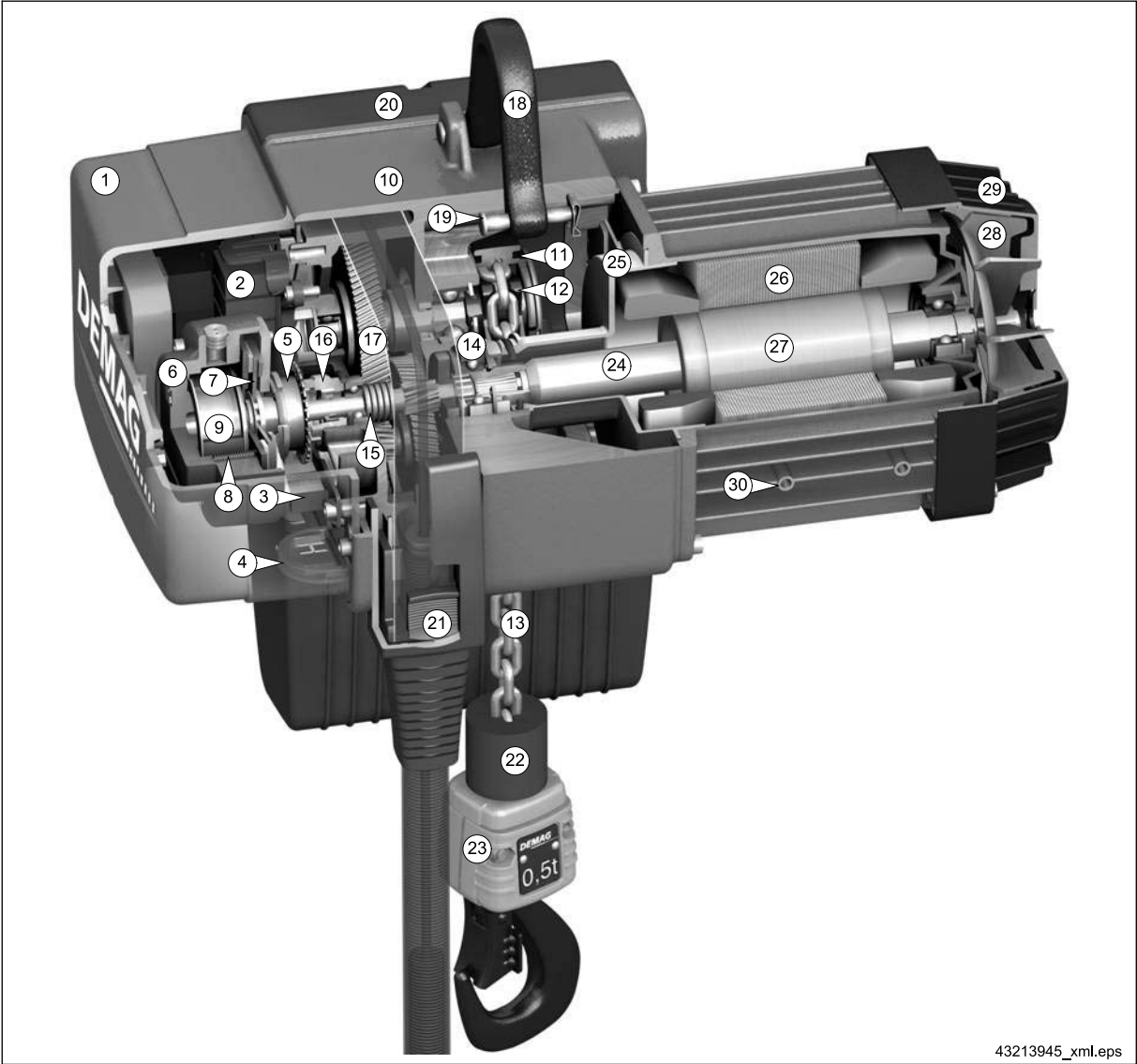


Fig. 4 Single-fall design

Item	Designation	Item	Designation	Item	Designation
1	Electric equipment cover	11	Chain guide	21	Adjusting mechanism for control cable
2	Control system	12	Chain sprocket	22	Cut-off buffer for operating limit switch
3	Elapsed operating time counter	13	Round section steel chain	23	Hook assembly with load capacity plate
4	Window	14	Slipping clutch	24	Motor shaft
5	Pulse wheel for speed monitoring	15	Dished washer pack	25	Winding head cap
6	Magnet brake	16	Slipping clutch adjusting nut	26	Stator
7	Brake disc with linings	17	DC 1 - 5 two-stage helical gearbox DC 10 and DC 15 three-stage helical gearbox	27	Rotor
8	Brake springs	18	Suspension bracket	28	Fan
9	Brake magnet	19	Suspension pin	29	Fan cover
10	Gearbox housing	20	Service cover	30	Mounting points

Tab. 4

3.2 Model code

E	K	L	D	DC-Pro	10 -	2000	2/1	H5	V6/1,5	380 - 415 /	50	24/6	200	220 - 480
														Travel drive voltage range/ voltage [V]
														Max. flange width of the trolley [mm]
														Travel speed [m/min]
														Frequency [Hz]
														Chain hoist voltage range [V]
														Lifting speed [m/min]
									V					2-stage= Main/creep lifting
									VS					Stepless = VS at nominal load up to VS_{max} in the partial load range
														Hook path [m]
														Reeving
														Load capacity [kg]
														Size ²⁾
														DC-Pro product range
														DC-Pro 2-stage chain hoist (Demag chain hoist)
														DCM-Pro 2-stage Manulift
														DCS-Pro Variable-speed chain hoist
														DCMS-Pro Variable-speed Manulift
														DCRS-Pro Stepless rocker switch
														DC-Pro product range
														DC-ProDC 2-stage chain hoist for direct control
														DC-ProCC 2-stage chain hoist for conventional contactor control
														DC-ProFC Variable-speed chain hoist for control by means of an external frequency inverter
														DC-Com product range
														DC-Com 2-stage chain hoist
			D											Articulated trolley
			L											Long trolley
	K													Low-headroom hoist
	U													Standard-headroom monorail hoist
														11 Trolley size load capacity [kg • 100]
														22
														34
														56
R														Push-travel trolley
E														Travel drive
C	F		5											Click-fit (push-travel trolley)

Tab. 5

Not all features of the mounting code can be combined.

3.3 Selection table

Load capacity	Size ³⁾	Reeving	Group of mechanisms DIN EN 14492	Chain size	Lifting speed		Standard hook path ⁴⁾	Motor size ⁵⁾	Max. weight for hook path					
	Chain hoist				at 50 Hz	at 60 Hz			H	4 m	5 m	8 m		
[kg]	DC-Pro		FEM/ISO	[mm]	[m/min]	[m/min]	[m]		[kg]	[kg]	[kg]			
80	1	1/1	4m/M7	4,2x12,2	8,0/2,0	9,6/2,4	5 and 8	ZNK 71 A 8/2 ⁶⁾	-	22	24			
	2				16,0/4,0	19,2/4,8		ZNK 71 B 8/2		28	30			
	5			5,3x15,2	24,0/6,0 ⁷⁾	28,8/7,2		ZNK 80 B 8/2		22	24			
100	1			4,2x12,2	8,0/2,0	9,6/2,4		ZNK 71 A 8/2 ⁶⁾		28	30			
	2				16,0/4,0	19,2/4,8		ZNK 71 B 8/2		22	24			
	5			5,3x15,2	24,0/6,0 ⁷⁾	28,8/7,2		ZNK 80 B 8/2		28	30			
125	1			4,2x12,2	8,0/2,0	9,6/2,4		ZNK 71 A 8/2 ⁶⁾		22	24			
	2				16,0/4,0	19,2/4,8		ZNK 71 B 8/2		28	30			
	5			5,3x15,2	24,0/6,0 ⁷⁾	28,8/7,2		ZNK 80 B 8/2		22	24			
160	2			4,2x12,2	8,0/2,0	9,6/2,4		ZNK 71 B 8/2		28	30			
	5				16,0/4,0	19,2/4,8		ZNK 80 B 8/2		22	24			
				5,3x15,2	24,0/6,0 ⁷⁾	28,8/7,2		ZNK 100 A 8/2		48	52			
200	2		3m/M6	4,2x12,2	8,0/2,0	9,6/2,4		ZNK 80 B 8/2		28	30			
	5		4m/M7	5,3x15,2	16,0/4,0	19,2/4,8		ZNK 100 A 8/2		48	52			
	10			7,4x21,2	24,0/6,0 ⁷⁾	28,8/7,2		ZNK 100 B 8/2		56	60			
250	2		2m+ ⁸⁾ / M5+	4,2x12,2	8,0/2,0	9,6/2,4		ZNK 80 B 8/2		28	30			
	5		4m/M7	5,3x15,2	16,0/4,0	19,2/4,8		ZNK 100 A 8/2		48	52			
	10			7,4x21,2	24,0/6,0 ⁷⁾	28,8/7,2		ZNK 100 B 8/2		56	60			
315	5			5,3x15,2	8,0/2,0	9,6/2,4		ZNK 100 A 8/2		48	52			
	10			7,4x21,2	12,0/3,0	14,4/3,6		ZNK 100 A 8/2		48	52			
					24,0/6,0 ⁷⁾	28,8/7,2		ZNK 100 B 8/2		56	60			
400	5		3m/M6	5,3x15,2	8,0/2,0	9,6/2,4		ZNK 80 B 8/2		28	30			
	10		4m/M7	7,4x21,2	12,0/3,0	14,4/3,6		ZNK 100 A 8/2		48	52			
			3m/M6		24,0/6,0 ⁷⁾	28,8/7,2		ZNK 100 B 8/2		56	60			
500	5		2m+ ⁸⁾ / M5+	5,3x15,2	8,0/2,0	9,6/2,4		ZNK 80 B 8/2		28	30			
	10		4m/M7	7,4x21,2	12,0/3,0	14,4/3,6		ZNK 100 A 8/2		48	52			
			2m+ ⁸⁾ / M5+		24,0/6,0 ⁷⁾	28,8/7,2		ZNK 100 B 8/2		56	60			
4m/M7			6,0/1,5		7,2/1,8	ZNK 100 A 8/2		48		52				
			12,0/3,0		14,4/3,6	ZNK 100 B 8/2		56		60				
3m/M6			6,0/1,5		7,2/1,8	ZNK 100 A 8/2		48		52				
			12,0/3,0		14,4/3,6	ZNK 100 B 8/2		56		60				
2m+ ⁸⁾ / M5+			6,0/1,5		7,2/1,8	ZNK 100 A 8/2		48		52				
			2m+ ⁸⁾ ⁹⁾ / M5+		12,0/3,0	14,4/3,6		ZNK 100 A 8/2		48	52			
15	4m ¹⁰⁾ / M7		8,7x24,2	8,0/2,0	9,6/2,4	4	ZNK 100 B 8/2	71	72	77				
1250	10	2/1	4m/M7	7,4x21,2	6,0/1,5	7,2/1,8		5 and 8	-	65	73			
		1/1	1Am ¹¹⁾ / M4		8,0/2,0	9,6/2,4			56	60				
	15		3m ¹⁰⁾ / M6	8,7x24,2	8,0/2,0	9,6/2,4		4	71	72	77			
1600	10	2/1	3m/M6	7,4x21,2	6,0/1,5	7,2/1,8		5 and 8	-	65	73			
	15	1/1	2m+ ⁸⁾ ¹²⁾ / M5+	8,7x24,2	8,0/2,0	9,6/2,4		4	71	72	77			
2000	10	2/1	2m+ ⁸⁾ ⁹⁾ / M5+	7,4x21,2	6,0/1,5	7,2/1,8		5 and 8	-	65	73			
	15		4m ¹³⁾ / M7	8,7x24,2	4,0/1,0	4,8/1,2		4	83	86	96			
2500	10		1Am ¹¹⁾ / M4	7,4x21,2				5 and 8	-	65	73			
	15		3m/M6	8,7x24,2				4		83	86	96		
3200			2m+ ⁸⁾ ⁹⁾ / M5+											

Tab. 6

³⁾ Since 04/2006, the designation for sizes DC 10 and DC 20 have been changed to DC 10 1/1 and DC 10 2/1 respectively.

⁴⁾ Larger hook paths on request.

⁵⁾ Motor key data ⇒ "Hoist motor data ", Page 20.

⁶⁾ ZNK 71 A 8/2 with 380-415 V / 50 Hz only for first delivery; a ZNK 71 B 8/2 motor is supplied for replacement requirements.

Load capacity [kg]	Size	Reeving	Group of mechanisms DIN EN 14492 FEM/ISO	Lifting speed		Hook path H [m]	Motor size ⁵⁾	Max. weight for hook path	
	Manulift DCM-Pro			at 50 Hz [m/min]	at 60 Hz [m/min]			2,8 m [kg]	4,3 m [kg]
80	1	1/1	4m/M7	8,0/2,0	9,6/2,4	2,8 and 4,3	ZNK 71 A 8/2 ⁶⁾	22	24
	2			16,0/4,0	19,2/4,8		ZNK 71 B 8/2		
	5			24,0/6,0 ⁷⁾	28,8/7,2		ZNK 80 B 8/2	28	30
125	1			8,0/2,0	9,6/2,4		ZNK 71 A 8/2 ⁶⁾	22	24
	2			16,0/4,0	19,2/4,8		ZNK 71 B 8/2		
	5			24,0/6,0 ⁷⁾	28,8/7,2		ZNK 80 B 8/2	28	30
200	2		3m/M6	8,0/2,0	9,6/2,4		ZNK 71 B 8/2	22	24
	5		4m/M7	16,0/4,0	19,2/4,8		ZNK 80 B 8/2	28	30
250	2		2m+ ⁸⁾ / M5+	8,0/2,0	9,6/2,4		ZNK 71 B 8/2	22	24
	5		4m/M7	16,0/4,0	19,2/4,8		ZNK 80 B 8/2	28	30

Tab. 7

Lifting speeds until 03/2007 (no longer available)

Load capacity	Size	Reeving	Group of mechanisms	Lifting speed		Standard hook path ⁴⁾	Motor size ⁵⁾	Max. weight for hook path	
	Chain hoist		DIN EN 14492	at 50 Hz	at 60 Hz			5 m	8 m
[kg]	DC-Pro		FEM/ISO	[m/min]	[m/min]	[m]		[kg]	[kg]
160	5	1/1	4m/M7	12,0/3,0	14,4/3,6	5 and 8	ZNK 80 A 8/2 ¹⁴⁾	28	30
200									
250									
315									
400									
500			2m+ ⁸⁾ / M5+	6,0/1,5	7,2/1,8				

Tab. 8

Load capacity [kg]	Size	Reeving	Group of mechanisms DIN EN 14492 FEM/ISO	Lifting speed		Hook path H [m]	Motor size ⁵⁾	Max. weight for hook path	
	Manulift DCM-Pro			at 50 Hz [m/min]	at 60 Hz [m/min]			2,8 m [kg]	4,3 m [kg]
200	5	1/1	4m/M7	12,0/3,0	14,4/3,6	2,8 and 4,3	ZNK 80 A 8/2 ¹⁴⁾	28	30
250									

Tab. 9

⁷⁾ Only with operating limit switch for lifting; operating limit switch for lowering on request (the lower end position must not be approached in normal operation).

⁸⁾ 2m+ corresponds to 1900 hours at full load.

⁹⁾ Chain drive FEM 1Am according to EN 818-7

¹⁰⁾ Chain drive FEM 2m according to EN 818-7

¹¹⁾ Chain drive FEM 1Cm according to EN 818-7

¹²⁾ Chain drive FEM 1Bm according to EN 818-7

¹³⁾ Chain drive FEM 3m according to EN 818-7

¹⁴⁾ ZNK 80 A 8/2 only for first delivery; a ZNK 80 B 8/2 motor is supplied for replacement requirements.

3.4 Electric key values

3.4.1 Hoist motor data

Size	Motor size	No. of poles	P _N	CD F	η _N	Starts/h	Min./max. currents and start-up current				
			[kW]	[%]	[rpm]		I _{N min.} [A]	I _{N max.} [A]	I _{max.} ¹⁵⁾ [A]	I _A /I _{N max.}	cos φ _N
220-240 V, 50 Hz, 3 ~ (CE) ¹⁶⁾											
DC-Pro 1	ZNK 71 B 8/2	8	0,05	20	720	240	1,75	2,10	2,10	1,45	0,48
		2	0,18	40	2925	120	2,10	2,80	2,80	2,75	0,46
DC-Pro 2	ZNK 71 B 8/2	8	0,10	20	675	240	1,80	2,10	2,35	1,45	0,56
		2	0,37	40	2825	120	2,40	2,80	3,20	2,75	0,63
DC-Pro 5	ZNK 80 B 8/2	8	0,18	20	665	240	2,45	2,80	2,95	1,45	0,51
		2	0,72	40	2745	120	3,80	4,20	4,70	3,00	0,77
DC-Pro 10	ZNK 100 A 8/2	8	0,27	20	690	240	2,95	3,30	3,80	1,80	0,54
		2	1,10	40	2745	120	5,40	5,40	6,10	3,60	0,81
DC-Pro 10 DC-Pro 15	ZNK 100 B 8/2	8	0,57	20	675	240	-				
		2	2,30	40	2790	120					
380-415 V, 50 Hz, 3 ~ (CE) ¹⁶⁾											
DC-Pro 1	ZNK 71 A 8/2 ¹⁷⁾	8	0,05	20	700	240	0,95	1,10	1,10	1,20	0,66
		2	0,18	40	2840	120	1,20	1,40	1,40	2,60	0,57
	ZNK 71 B 8/2	8	0,05	20	720	240	1,00	1,20	1,20	1,45	0,48
		2	0,18	40	2925	120	1,20	1,60	1,60	2,75	0,46
DC-Pro 2	ZNK 71 B 8/2	8	0,10	20	675	240	1,00	1,20	1,35	1,45	0,56
		2	0,37	40	2825	120	1,40	1,60	1,85	2,75	0,63
DC-Pro 5	ZNK 80 B 8/2	8	0,18	20	665	240	1,40	1,60	1,70	1,45	0,51
		2	0,72	40	2745	120	2,20	2,40	2,70	3,00	0,77
DC-Pro 10	ZNK 100 A 8/2	8	0,27	20	690	240	1,70	1,90	2,20	1,80	0,54
		2	1,10	40	2745	120	3,10	3,10	3,50	3,60	0,81
DC-Pro 10 DC-Pro 15	ZNK 100 B 8/2	8	0,57	20	675	240	3,00	3,40	3,90	1,85	0,58
		2	2,30	40	2790	120	5,50	6,20	6,40	4,15	0,77
500-525 V, 50 Hz, 3 ~ (CE) ¹⁶⁾											
DC-Pro 1	ZNK 71 B 8/2	8	0,05	20	720	240	0,75	0,95	0,95	1,45	0,48
		2	0,18	40	2925	120	0,90	1,25	1,25	2,75	0,46
DC-Pro 2	ZNK 71 B 8/2	8	0,10	20	675	240	0,80	0,95	1,10	1,45	0,56
		2	0,37	40	2825	120	1,10	1,25	1,45	2,75	0,63
DC-Pro 5	ZNK 80 B 8/2	8	0,18	20	665	240	1,20	1,30	1,35	1,45	0,51
		2	0,72	40	2745	120	1,80	1,90	2,15	3,00	0,77
DC-Pro 10	ZNK 100 A 8/2	8	0,27	20	690	240	1,35	1,50	1,75	1,80	0,54
		2	1,10	40	2745	120	2,40	2,50	2,80	3,60	0,81
DC-Pro 10 DC-Pro 15	ZNK 100 B 8/2	8	0,57	20	675	240	2,50	2,70	3,10	1,85	0,58
		2	2,30	40	2790	120	4,60	4,90	5,10	4,15	0,77

Tab. 10

¹⁵⁾ I_{max} = maximum rated current for lowering motion.

¹⁶⁾ The tolerance of the voltage range must not exceed +/- 10%. The frequency tolerance must not exceed +/- 2%. Motors are designed in compliance with insulation class F.

¹⁷⁾ ZNK 71 A 8/2 with 380-415 V / 50 Hz only for first delivery; a ZNK 71 B 8/2 motor is supplied for replacement requirements.

Size	Motor size	No. of poles	P _N	CD F	n _N	Starts/h	Min./max. currents and start-up current				
			[kW]	[%]	[rpm]		I _{N min.} [A]	I _{N max.} [A]	I _{max.} ¹⁸⁾ [A]	I _A /I _{N max.}	cos φ _N
220-240 V, 60 Hz, 3 ~ (CE/CSA) ¹⁹⁾											
DC-Pro 1	ZNK 71 B 8/2	8	0,06	20	870	240	2,10	2,50	2,50	1,45	0,47
		2	0,22	40	3525	120	2,50	3,35	3,35	2,75	0,45
DC-Pro 2	ZNK 71 B 8/2	8	0,11	20	825	240	2,10	2,50	2,80	1,45	0,55
		2	0,44	40	3425	120	2,90	3,30	3,85	2,75	0,62
DC-Pro 5	ZNK 80 B 8/2	8	0,22	20	815	240	2,90	3,30	3,50	1,45	0,50
		2	0,86	40	3345	120	4,60	5,00	5,60	3,00	0,76
DC-Pro 10	ZNK 100 A 8/2	8	0,32	20	840	240	3,55	3,90	4,60	1,80	0,53
		2	1,30	40	3345	120	6,50	6,40	7,30	3,60	0,80
DC-Pro 10 DC-Pro 15	ZNK 100 B 8/2	8	0,68	20	825	240	-				
		2	2,80	40	3390	120					
380-400 V, 60 Hz, 3 ~ (CE) ¹⁹⁾											
DC-Pro 1	ZNK 71 B 8/2	8	0,06	20	870	240	1,35	1,60	1,60	1,45	0,47
		2	0,22	40	3525	120	1,70	2,00	2,00	2,75	0,45
DC-Pro 2	ZNK 71 B 8/2	8	0,11	20	825	240	1,50	1,60	1,80	1,45	0,55
		2	0,44	40	3425	120	1,80	2,00	2,30	2,75	0,62
DC-Pro 5	ZNK 80 B 8/2	8	0,22	20	815	240	1,80	1,95	2,00	1,45	0,50
		2	0,86	40	3345	120	1,75	2,90	3,20	3,00	0,76
DC-Pro 10	ZNK 100 A 8/2	8	0,32	20	840	240	2,40	2,70	2,90	1,80	0,53
		2	1,30	40	3345	120	3,80	4,00	4,60	3,60	0,80
DC-Pro 10 DC-Pro 15	ZNK 100 B 8/2	8	0,68	20	825	240	3,90	4,30	4,90	1,85	0,57
		2	2,80	40	3390	120	7,20	7,70	8,00	4,15	0,76
440-480 V, 60 Hz, 3 ~ (CE/CSA) ¹⁹⁾											
DC-Pro 1	ZNK 71 B 8/2	8	0,06	20	870	240	1,05	1,25	1,25	1,45	0,47
		2	0,22	40	3525	120	1,25	1,65	1,65	2,75	0,45
DC-Pro 2	ZNK 71 B 8/2	8	0,11	20	825	240	1,05	1,25	1,40	1,45	0,55
		2	0,44	40	3425	120	1,45	1,65	1,95	2,75	0,62
DC-Pro 5	ZNK 80 B 8/2	8	0,22	20	815	240	1,50	1,70	1,80	1,45	0,50
		2	0,86	40	3345	120	2,30	2,50	2,80	3,00	0,76
DC-Pro 10	ZNK 100 A 8/2	8	0,32	20	840	240	1,80	1,95	2,30	1,80	0,53
		2	1,30	40	3345	120	3,25	3,20	3,70	3,60	0,80
DC-Pro 10 DC-Pro 15	ZNK 100 B 8/2	8	0,68	20	825	240	3,10	3,50	4,00	1,85	0,57
		2	2,80	40	3390	120	5,70	6,40	6,60	4,15	0,76
575 V, 60 Hz, 3 ~ (CSA) ¹⁹⁾											
DC-Pro 1	ZNK 71 B 8/2	8	0,06	20	870	240	0,85		0,85	1,45	0,48
		2	0,22	40	3525	120	0,90		0,90	2,75	0,46
DC-Pro 2	ZNK 71 B 8/2	8	0,11	20	825	240	0,90		1,00	1,45	0,65
		2	0,44	40	3425	120	1,00		1,15	2,75	0,63
DC-Pro 5	ZNK 80 B 8/2	8	0,22	20	815	240	1,10		1,35	1,45	0,54
		2	0,86	40	3345	120	1,75		2,10	3,00	0,88
DC-Pro 10	ZNK 100 A 8/2	8	0,32	20	840	240	1,35		1,55	2,10	0,58
		2	1,30	40	3345	120	2,40		2,70	3,80	0,87
DC-Pro 10 DC-Pro 15	ZNK 100 B 8/2	8	0,68	20	825	240	2,40		2,70	1,85	0,62
		2	2,80	40	3390	120	4,40		4,50	4,15	0,83

Tab. 11

¹⁸⁾ I_{max} = maximum rated current for lowering motion.

¹⁹⁾ The tolerance of the voltage range must not exceed +/- 10%. The frequency tolerance must not exceed +/- 2%. Motors are designed in compliance with insulation class F.

Lifting speeds until 03/2007 (no longer available)

Size	Motor size	No. of poles	P _N	CD F	n _N	Starts/h	Min./max. currents and start-up current				
			[kW]	[%]	[rpm]		I _{N min.} [A]	I _{N max.} [A]	I _{max.} ²⁰⁾ [A]	I _A /I _{N max.}	cos φ _N
220-240 V, 50 Hz, 3 ~ (CE) ²¹⁾											
DC-Pro 5 DCM-Pro 5	ZNK 80 A 8/2	8	0,14	20	710	240	2,00	2,20	2,50	2,10	0,48
		2	0,56	40	2880	120	4,15	5,00	5,90	4,35	0,57
380-415 V, 50 Hz, 3 ~ (CE) ²¹⁾											
DC-Pro 5 DCM-Pro 5	ZNK 80 A 8/2	8	0,14	20	710	240	1,15	1,30	1,45	2,10	0,48
		2	0,56	40	2880	120	2,40	2,90	3,40	4,35	0,57
500-525 V, 50 Hz, 3 ~ (CE) ²¹⁾											
DC-Pro 5 DCM-Pro 5	ZNK 80 A 8/2	8	0,14	20	710	240	0,95	1,05	1,15	2,10	0,48
		2	0,56	40	2880	120	1,90	2,30	2,70	4,35	0,57
220-240 V, 60 Hz, 3 ~ (CE/CSA) ²¹⁾											
DC-Pro 5 DCM-Pro 5	ZNK 80 A 8/2	8	0,17	20	860	240	2,40	2,70	3,00	2,10	0,47
		2	0,67	40	3480	120	5,00	6,00	7,10	4,35	0,56
380-400 V, 60 Hz, 3 ~ (CE) ²¹⁾											
DC-Pro 5 DCM-Pro 5	ZNK 80 A 8/2	8	0,17	20	860	240	1,50	1,60	1,80	2,10	0,47
		2	0,67	40	3480	120	3,40	3,50	4,10	4,35	0,56
440-480 V, 60 Hz, 3 ~ (CE/CSA) ²¹⁾											
DC-Pro 5 DCM-Pro 5	ZNK 80 A 8/2	8	0,17	20	860	240	1,20	1,35	1,50	2,10	0,47
		2	0,67	40	3480	120	2,50	3,00	3,55	4,35	0,56
575 V, 60 Hz, 3 ~ (CSA) ²¹⁾											
DC-Pro 5 DCM-Pro 5	ZNK 80 A 8/2	8	0,17	20	860	240	0,91	1,00	1,00	2,10	0,46
		2	0,67	40	3480	120	1,90	2,25	2,25	4,35	0,65

Tab. 12

3.4.2 Mains connection delay fuse links

Voltage		220-240 V	380-415 V	500-525 V	220-240 V	380-400 V	440-480 V	575 V
Frequency		50 Hz			60 Hz			
Size	Motor size	[A]	[A]	[A]	[A]	[A]	[A]	[A]
DC-Pro 1	ZNK 71 A 8/2	6	6	6	6	6	6	6
	ZNK 71 B 8/2							
DC-Pro 2	ZNK 71 B 8/2	10	10	10	10	16	10	10
DC-Pro 5	ZNK 80 B 8/2							
DC-Pro 10	ZNK 100 A 8/2	-	16	10	-	15	15	10
	ZNK 100 B 8/2							
DC-Pro 15	ZNK 100 B 8/2	-	16	10	-	15	15	10

Tab. 13

CAUTION



For safety reasons, we recommend the use of 3-pole automatic circuit breakers/circuit breakers (to DIN EN 60898-1, tripping characteristic B or C) instead of separate fuse links. This arrangement ensures that all phases are disconnected from the power supply in the event of a short circuit.

Mains connection fuse link for lifting speeds until 03/2007 (no longer available)

Voltage		220-240 V	380-415 V	500-525 V	220-240 V	380-400 V	440-480 V	575 V
Frequency		50 Hz			60 Hz			
Size	Motor size	[A]	[A]	[A]	[A]	[A]	[A]	[A]
DC-Pro 5 DCM-Pro 5	ZNK 80 A 8/2	10	6	6	10	6	6	6

Tab. 14

20) I_{max} = maximum rated current for lowering motion.

21) The tolerance of the voltage range must not exceed +/- 10%. The frequency tolerance must not exceed +/- 2%. Motors are designed in compliance with insulation class F.

3.4.3 Supply cables

Supply cables ²²⁾ for 5% voltage drop Δ_U and starting current I_A

Voltage		220-240 V		380-415 V		500-525 V		220-240 V		380-400 V		440-480 V		575 V	
Frequency		50 Hz						60 Hz							
Size	Motor size	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]
DC-Pro 1	ZNK 71 A 8/2	1,5	89	1,5	100	1,5	100	1,5	76	1,5	100	1,5	100	1,5	100
	ZNK 71 B 8/2														
DC-Pro 2	ZNK 71 B 8/2		31		94		61		26		75		43		78
DC-Pro 5	ZNK 80 B 8/2														
DC-Pro 10	ZNK 100 A 8/2	-	-	46	-	-	2,5	36	-	-					
	ZNK 100 B 8/2														
DC-Pro 15	ZNK 100 B 8/2	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Tab. 15

Supply cables for lifting speeds until 03/2007 (no longer available)

Voltage		220-240 V		380-415 V		500-525 V		220-240 V		380-400 V		440-480 V		575 V	
Frequency		50 Hz						60 Hz							
Size	Motor size	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]	[mm²]	[m]
DC-Pro 5 DCM-Pro 5	ZNK 80 A 8/2	1,5	51	1,5	100	1,5	100	1,5	43	1,5	100	1,5	100	1,5	100

Tab. 16

²²⁾ The lengths of the supply lines are calculated on the basis of an earth-loop impedance of 200 mΩ.

3.5 Hook dimension C

DC-Pro chain hoist and DCM-Pro Manulift with suspension bracket

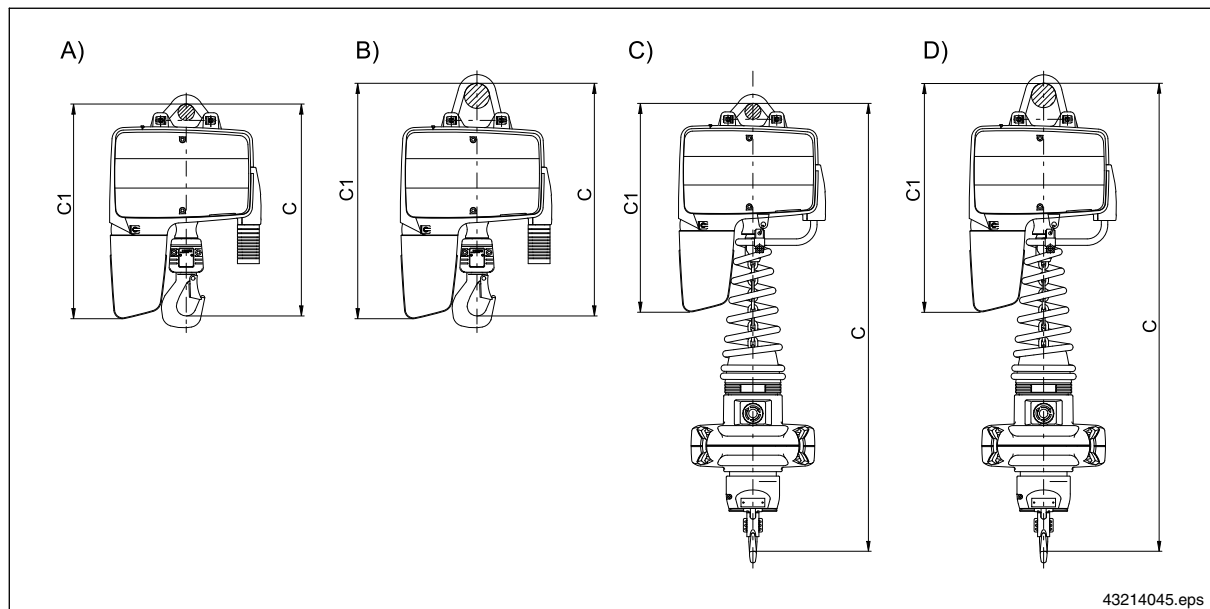


Fig. 5

A DC-Pro with short suspension bracket
B DC-Pro with long suspension bracket

C Manulift DCM-Pro with short suspension bracket
D Manulift DCM-Pro with long suspension bracket

Size	Reeving	Motor size	Short suspension bracket			Long suspension bracket					
			C ²³⁾	C ¹²⁴⁾		C ²³⁾	C ¹²⁴⁾				
				Chain collector			Chain collector box size				
				H5	H8		H5	H8	S	1	2
DC-Pro 1/2	1/1	ZNK 71 ...	326	335	365	364	373	403	-		
DCM-Pro 1/2 2,8 m			656			694					
DCM-Pro 1/2 4,3 m			726			764					
DC-Pro 5		ZNK 80 ...	378	395	425	416	435	465			
DCM-Pro 5 2,8 m			708			746					
DCM-Pro 5 4,3 m			778			816					
DC-Pro 10		ZNK 100 A 8/2	472	493	582	505	526	615			
		ZNK 100 B 8/2		582			615				
	2/1	ZNK 100 B 8/2	564		632	597		665			
DC-Pro 15	1/1	ZNK 100 B 8/2	-			580	-	663 (H9)	783 (H16)	863 (H26)	
	2/1					688		663 (H4)	783 (H8)	863 (H13)	

Tab. 17

²³⁾ Dimension C increases by 42 mm for chain hoists with $v=16/4$ or $v=12/3$; dimension C increases by 111 mm for DC 5 chain hoists with $v=24/6$; dimension C increases by 131 mm for DC 10 chain hoists with $v=24/6$.

²⁴⁾ Higher lifting speeds may require the use of larger chain collector boxes, see \Rightarrow "Buffer arrangement", Page 106

DC-Pro chain hoist with trolley

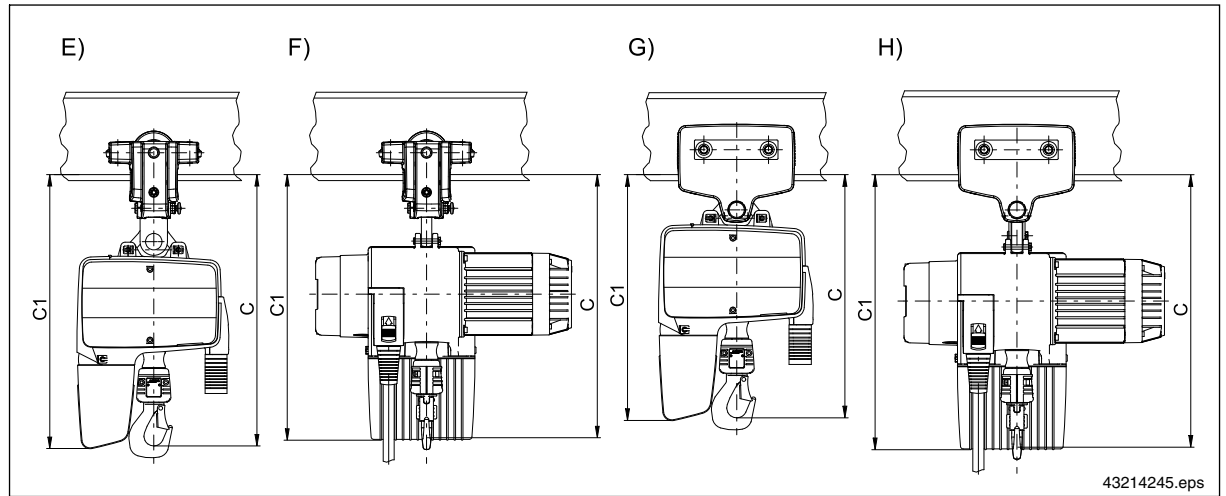


Fig. 6

E CF 5 trolley at right angles to the girder
F CF 5 trolley parallel to the girder

G U 11–U 34 trolley at right angles to the girder
H U 11–U 34 trolley parallel to the girder

Size	Reeving	Motor size	Trolley	at right angles to the girder ²⁵⁾						parallel to the girder ²⁵⁾								
				C ²⁶⁾	C ¹²⁷⁾					C ²⁶⁾	C ¹²⁷⁾							
					Chain collector box size						Chain collector box size							
					H5	H8	S	1	2		H5	H8	S	1	2			
DC-Pro 1/2	1/1	ZNK 71 ...	U 11	416	425	455				410	419	449						
			CF 5	406	415	445				400	409	439						
DCM-Pro 1/2 2,8m			U 11	746	425	455				740	419	449						
			CF 5	776	415	445				770	409	439						
DCM-Pro 1/2 4,3m			U 11	716	425	455				710	419	449						
			CF 5	844	415	445				838	409	439						
DC-Pro 5		ZNK 80 ...	U 11	468	487	517				462	481	511						
			CF 5	458	477	507				452	471	501						
DCM-Pro 5 2,8 m			U 11	798	487	517				792	481	511						
			CF 5	846	477	507				840	471	501						
DCM-Pro 5 4,3 m			U 11	868	487	517				862	481	511						
			CF 5	896	477	507				890	471	501						
DC-Pro 10		ZNK 100 A 8/2	U 11	557	578	667				581	602	691						
			U 22	569	590	679				593	614	703						
			ZNK 100 B 8/2	U 11	557	667				667	581	691				691		
				U 22	569	679				679	593	703				703		
	2/1	ZNK 100 B 8/2	U 22 U 34	661	679	729	685	703	753									
DC-Pro 15	1/1	ZNK 100 B 8/2	U 22 U 34	644			727 (H9)	847 (H16)	972 (H26)	676			759 (H9)	879 (H16)	1004 (H26)			
			RU 56	660			743 (H9)	863 (H16)	943 (H26)	692			775 (H9)	895 (H16)	975 (H26)			
			2/1	U 22 U 34			752	727 (H4)	847 (H8)	972 (H13)			784	759 (H4)	879 (H8)	1004 (H13)		
				RU 56			768	743 (H4)	863 (H8)	943 (H13)			800	775 (H4)	895 (H8)	975 (H13)		

Tab. 18

²⁵⁾ Dimensions C and C1 decrease when a short suspension bracket is used: by 38 mm for DC-Pro 1-5 and by 33 mm for DC-Pro 10, see also ⇒ "Suspension", Page 36.

²⁶⁾ Dimension C increases by 42 mm for chain hoists with $v=16/4$ or $v=12/3$; dimension C increases by 111 mm for DC 5 chain hoists with $v=24/6$; dimension C increases by 131 mm for DC 10 chain hoists with $v=24/6$.

²⁷⁾ Higher lifting speeds may require the use of larger chain collector boxes, see ⇒ "Buffer arrangement", Page 106

3.6 Noise emission/sound pressure level

Sound pressure level (L_{pAF}) according to DIN 45635 at a distance of 1 m from the chain hoist is:

Type		DC-Pro 1	DC-Pro 2	DC-Pro 5	DC-Pro 10	DC-Pro 15
Hoist speed up to	[m/min]	8	16	12	12	8
Sound pressure level	[dB (A)]	65+ ²	65+ ²	69+ ²	69+ ²	69+ ²

Tab. 19

These noise emission levels were measured under maximum load.

The following structural influences were not considered in the above measurements:

- transmission of noise via steel structures,
- reflection of noise from walls, etc.

3.7 Transportation, packing and storage

3.7.1 Safety instructions

WARNING



Falling parts

Risk of injury from falling parts during transport, loading and unloading operations.

- Do not walk under the suspended load. Keep a sufficient safety distance.
- Cordon off a large area around the working zone.

WARNING



Damage caused during transport

The chain hoist may be damaged or destroyed by inappropriate transport.

Attach lifting and handling equipment only at the correspondingly marked points.

3.7.2 Scope of delivery

If special designs or additional options are ordered or the latest technical modifications are incorporated, the actual scope of supply may differ from the data and information as well as from the illustrations described here. If you have any questions, please contact the manufacturer.

3.7.3 Transport inspection

- Check the delivery to ensure it is complete and for any transport damage immediately on receipt.
- If any transport damage is visible from the outside, do not accept the delivery or only on condition. Note the scope of damage in the shipping documents/delivery note of the forwarding company. Lodge a claim.
- Lodge a claim for any defects as soon as they are detected, since claims for damages may only be asserted within the relevant claim notification periods.

3.7.4 Packing

Demag chain hoists, the accessories and the trolleys are shipped in cardboard packing.

If no agreement has been made on the return of the packing material, separate the materials according to type and size and make it available for further use or recycling.



Environmental protection:

- Always dispose of packing materials in an environmentally compatible way and according to locally applicable disposal regulations.
- If required, utilise the services of a recycling company.

3.7.5 Storage

Until they are installed, the equipment and accessories must be kept closed and may only be stored under the following conditions:

- Do not store outdoors.
- Store in dry and dust-free places, relative air humidity: max. 60%.
- Do not expose to aggressive media.
- Protect against direct sunlight.
- Avoid mechanical vibrations.
- Storage temperature: -25 to +70 °C.
- Avoid strong temperature fluctuations (condensation).
- Oil all bare machine parts (rust protection).
- Check the general condition of all parts of the packing at regular intervals. If required, refresh or renew rust protection.
- If stored in a damp location, the equipment must be packed tight and protected against corrosion (use desiccant).

3.8 Surface protection and paint finish

As standard, the chain hoist is provided with corrosion protection (powder coating/paint finish) and supplied in the following colours:

Paint finish		
Chain hoist	RAL 5009	Azure blue
Hook assembly	RAL 1007	Daffodil yellow
Load hook and suspension bracket	RAL 9005	Jet black
Trolley	RAL 5009	Azure blue

Tab. 20

The chain hoist or trolley can be supplied with other paint finishes.

3.9 Operating conditions

CAUTION



Operational safety risk

Safe operation is only possible under the specified conditions. Contact the manufacturer if the operating conditions differ from those specified ⇒ "After-sales service", Page 10

The chain hoist and the trolley can be operated at:

Ambient temperature:	-20 °C to +45 °C,
Humidity:	max. 80 % relative humidity,
Height:	up to 1000 m above sea level,
Type of enclosure:	IP55,
Electromagnetic compatibility:	Resistance to interference in industrial environments, Interference emission for residential, commercial and light-industrial environments.

Tab. 21



Demag chain hoists operating outdoors should be provided with a cover for protection against the weather or chain hoists, trolleys and travel drives should be kept under shelter if they are not in use.

Special operating conditions may be agreed with the manufacturer in individual cases.

Such operating conditions may occur in the following applications, for example:

- Galvanising or electroplating facilities,
- Hygiene areas,
- Low or high temperature applications.

On request, suitably optimised equipment and important information for safe, low-wear operation can be supplied for these applications.

Cut-off springs need to be used under certain circumstances:

- **DC1-10 with 1/1 reeving** hook assembly – use of cut-off springs (optional)
 - for very high mechanical demands on the buffers, e.g. frequent contact with sharp edges,
 - for extreme ambient conditions (hot atmospheres, foundries, galvanising plants, etc.).
- **DC 10 with 2/1 reeving** DK10 aluminium bottom block with external cut-off springs (optional)
 - for extreme ambient conditions (hot atmospheres, foundries, galvanising plants, etc.).
- **DC 15** hook assembly/standard aluminium bottom block with external cut-off springs.

Reduced duty factor at increased ambient temperatures

If DC chain hoists are operated at ambient temperatures that differ from ⇒ Tab. 21, Page 28, the duty factor must be reduced:

Ambient temperature	-20 °C to +45 °C	>+45 °C to +50 °C	>+50 °C to +55 °C	>+55 °C to +60 °C
Chain hoist range	Duty factor [%]			
DC-Pro DCM-Pro DC-Com 1	20 / 40	15 / 35	15 / 25	10 / 20
DC-Com 2-10	15 / 25	15 / 25	15 / 25	10 / 20

Tab. 22

4 Technical description

4.1 Drive and brake

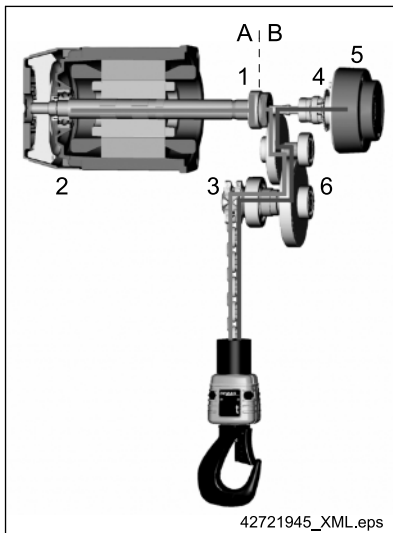
A robust pole-changing AC asynchronous motor is used as the hoist motor. The brake is arranged on the load side in such a way that the load is safely braked and held if the slipping clutch is tripped. The brake is released electrically. Pressure springs ensure that the brake is applied automatically when power to the motor is switched off or if there is a power failure. The motor is automatically switched off and, at the same time, the brake is applied at the upper and lower ends of the lifting path, when the slipping clutch is tripped and if errors occur.

The lifting drive first decelerates by switching from fast speed (2-pole winding) to creep speed (8-pole winding).

Mechanical braking occurs when the creep lifting speed has almost been reached.

The mechanical brake is applied as soon as the emergency-stop function is applied, regardless of the lifting speed. Wear of the mechanical brake is significantly reduced by electrical and regenerative braking of the motor. The brakes of DC 1 - 5 chain hoists are maintenance-free for up to 10 years, the brakes of DC 10 and DC 15 chain hoists for up to 5 years.

4.2 Gearbox and slipping clutch



A	Drives	B	Brakes
1	Slipping clutch	4	Speed detection
2	Motor	5	Brake
3	Chain drive	6	Gearbox

Tab. 23

The slipping clutch is arranged between the motor shaft and the gearbox input shaft. In connection with the limit stops on the chain, it performs the function of the emergency limit stop device for the highest and lowest hook position and protects the Demag chain hoist against overload. The additional electrical operating limit switches for the highest and lowest hook positions prevent the slipping clutch from being approached as an emergency limit stop device during normal operation. The slipping clutch also fulfills the EC Machinery Directive requirements for a load control device for load capacities as of 1000 kg.

The brake arranged on the load side prevents the load from slowly dropping when the unit is at rest. Monitoring of the slipping clutch and automatic cut-out of the drive if slip occurs increase the service life and protect the slipping clutch against overload and incorrect use. The gearbox and the slipping clutch are maintenance-free for up to 10 years.

Fig. 7 Parts in which the load is borne

4.3 Chain drive

The special Demag chain is of high-strength ageing-resistant material with a high degree of surface hardening, galvanised with additional surface treatment. The dimension tolerances of this chain have been precisely adapted to the chain drive. We therefore urgently recommend that the Demag special chain be used to ensure safe operation. The maximum service life of the chain can only be reached if the specified regular lubrications are correctly carried out. The entire chain drive is always replaced when a chain is replaced. A chain set which can be easily replaced is available for this purpose.

The chain set offers the following benefits:

- the optimum duration of service is ensured for the chain;
- certainty that the individual chain drive components are replaced when necessary;
- reduction in service costs by replacement and installation in one step; the motor and gearbox do not need to be disassembled.

4.4 Housing

The housing of the chain hoist is made of strong and light-weight die-cast aluminium. The fan cover on the motor, the service cover and the movable chain collector box are of particularly impact-resistant plastic material.

4.5 Electric equipment

4.5.1 Control system

The chain hoist is fitted with a 24 V contactor control system. The contactor control system is supplemented by an electronic system with programmed functions. This electronic system detects the control commands that are triggered by the operator with the control pendant. Permissible control commands generate switching commands for the contactors to control the hoist motor. The electronic system monitors the control sequence specified by the operator based on the speed feedback from the drive shaft, the operating limit switch contacts and, if applicable, from the thermal contacts in the motor. In there are any discrepancies, the chain hoist is automatically brought to a safe status and warning or error messages are generated. The positively disconnected emergency-stop contact on the control pendant immediately opens the circuit for the contactor supply so that the motor is de-energised and the brake is applied.

As standard, the control system features the following characteristics:

- Emergency limit switch for lifting and lowering;
- Plug-in connections for control pendant, power supply, motor connection, brake, operating limit switches;
- Connection for the E 11 – E 34 trolley control system;
- 7-segment display for operating hours, operating status and error messages;
- Infrared interface for wireless transmission of service data;
- Replaceable socket-mounted contactor.
- Signal transmission in steps with 24 V tri-state signals for controlled DC chain hoists (half-wave evaluation);

Demag control pendants are connected via plug-in connectors for manual control. Compact DSC control units, which are optimised for for Demag DC chain hoists without electric trolleys, are used for such applications; DSE-10C units are used for applications with electric trolleys.



Please refer to the information contained in the "DC electrical accessories" document ⇒ Tab. 3, Page 7 for integrating DC chain hoists into existing installations with contactor control. A Polu box with integrated contactor control is needed to control pole-changing AC motors (with or without a brake) of long and cross-travel units, see "Polu box electrical accessories" document ⇒ Tab. 3, Page 7.

4.5.2 7-segment display for operating status and fault display

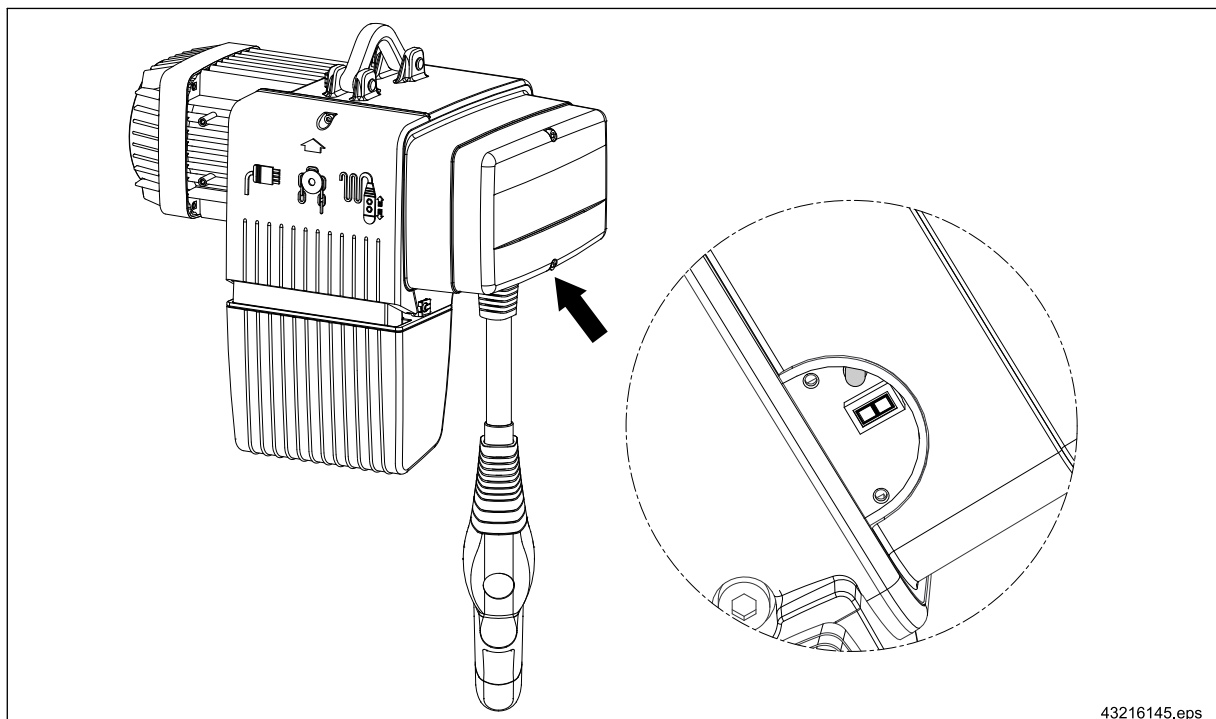


Fig. 8

The 7-segment display is arranged on the control board under the electrical equipment cover, it can be read through the window on the lower side of the chain hoist (arrow, lower side of electrical equipment cover).

The following data can be read:

- Software version \Rightarrow Fig. 9, Page 31,
- Operating hours \Rightarrow Fig. 10, Page 31,
- Operating statuses \Rightarrow Fig. 12, Page 32,
- Warning messages \Rightarrow "Warning messages", Page 119,
- Error messages \Rightarrow "Error messages", Page 121.

4.5.3 Software version, operating hours, number of cycles, operating statuses

Display of software version

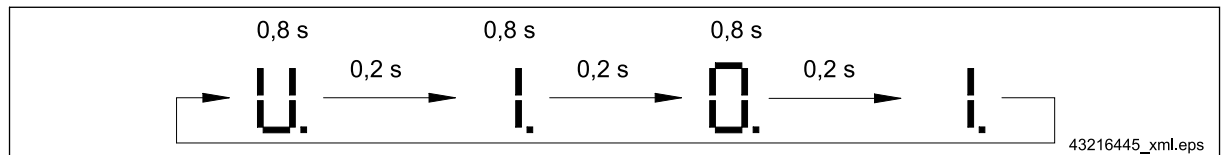


Fig. 9 Example: Software version 1.01

The software version is displayed every time power is switched on or after an emergency-stop (from software version 1.01).

Display of operating hours

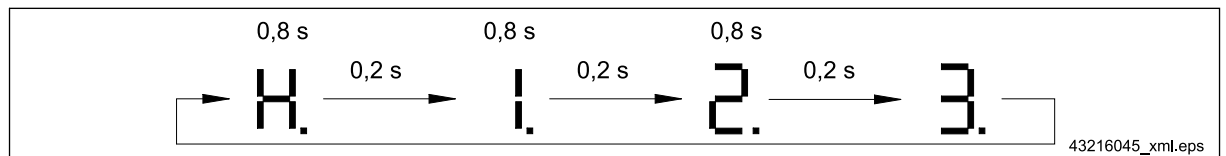


Fig. 10 Example: 123 hours of operation

The display appears after 3 seconds without any lifting motion.

If the control board has to be replaced, we recommend, if technically possible, that the details for the number of operating hours be read off and documented in the test and inspection booklet. The elapsed operating time counter starts at "zero" if a replacement control board is installed.

Display of the number of cycles of the K1 contactor

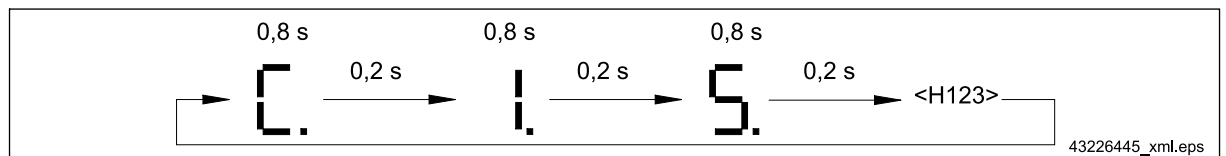


Fig. 11 Example: C 15 corresponds to $15 \times 100000 = 1,5 \text{ m}$ K1 switching cycles

The display alternates between showing this information and the number of hours of operation.

C 5 corresponds to $5 \times 100000 = 500000$ K1 switching cycles

For preventive maintenance, see \Rightarrow "Service life of the contactor", Page 76

Display of operating statuses

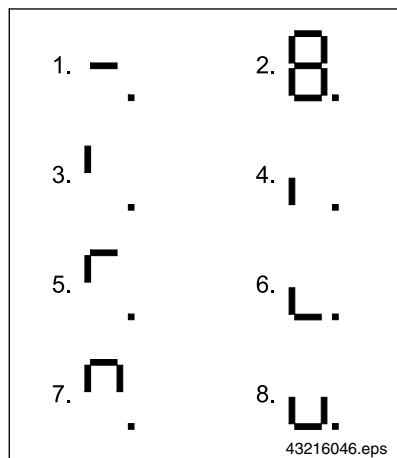


Fig. 12

No.	Function	No.	Function
1	Flashing: READY	2	Emergency stop pressed
3	LIFTING start-up	4	LOWERING start-up
5	LIFTING V1	6	LOWERING V1
7	LIFTING V2	8	LOWERING V2

Tab. 24

4.6 Central service enclosure

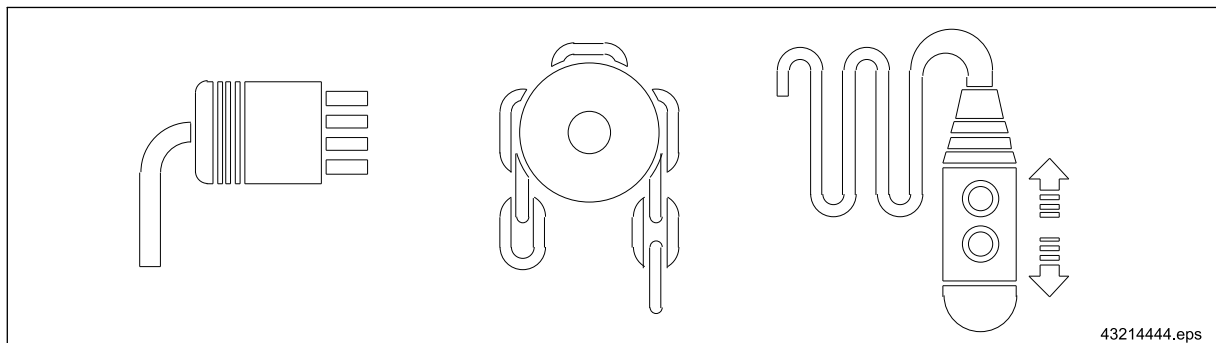


Fig. 13

All important service work can be carried out at a central point, the service enclosure. The relevant connectors for power supply, control pendant and travel drive are arranged under the impact-resistant plastic cover. The chain is also lubricated from this point.

In addition, any control cable length that is not required is kept under the cover.

The plastic cover also provides mechanical protection for the components fitted under it. The functions are indicated by pictograms fitted on the outside of the service cover. The service cover of the DC-Pro 15 is made of sheet metal and does not have any pictograms.

4.7 Control pendant/control cable height adjustment

The control cable is protected by a flexible, easily bent strain relief hose. Its suspension height can be specifically adapted to the requirements at the workplace at any time by means of an adjusting mechanism. To do this, it is not necessary to cut the cable conductors or to shorten the strain relief hose. The length of control cable that is not needed is stored under the service cover. The strain relief hose is fixed at the selected suspension height by means of a self-locking clamp mechanism. The control pendant can be adjusted to a different suspension height by unlocking the clamp mechanism.

The strain relief hose for the control pendant consists of an abrasion-resistant fabric hose with flame-protection impregnation.

The control cable is reinforced by means of elastic rubber filler material in the gripping area (0,8) of the strain relief hose.

4.8 Control pendant

DSC control pendants (lifting/lowering) or DSE-10C control pendants (2 to 3 axes) must be used for manual cable-connected control of the chain hoist. Both control pendants feature the same plug-in connection for the control cable. The control cable and the control pendant are connected by means of a bayonet lock.

The shock and impact-resistant DSC and DSE-10C housings are of made high-quality thermoplastic and are resistant to fuels, salt water, greases, oils and alkaline solutions; IP65 enclosure. Strong mineral (e.g. hydrochloric or sulphuric) acids may, however, corrode pendant switch housings. To avoid this, they must be replaced in good time. The rubber button caps may be subject to premature wear under aggressive operating conditions (contact with corrosive substances or special chemicals). Replace any damaged button caps in good time.

4.9 DCM Manulift with quick-release coupling

DCM Manulift units are equipped with DSM-C control units.

Main operating benefits include:

The spade handle which is used to guide, position and move the load horizontally. The right and left rocker switches (for lifting and lowering) both have the same functions. This enables the operator to grip the control handle conveniently with his or her right or left hand. The rocker switch can be actuated by thumb without the need for the operator to open his or her fist.

The lifting and lowering movements match the corresponding arrow symbols.

Two switching stages are available:

- Press the rocker switch until a stop is felt for slow lifting or lowering.
- Press the rocker switch until it comes up against the limit stop for fast lifting or lowering.
- Mechanical interlocking of the switching elements prevents movements in opposite directions being switched on simultaneously.

The rigid link between the DSM-C control unit and the load handling attachment provides a direct connection between the operator's hand and the load.

The integrated quick-release coupling allows load handling attachments to be removed and replaced within seconds when no load is applied. For further possible applications, see Demag DC-Pro chain hoist data ⇒ Tab. 3, Page 7.

Power is supplied to the DSM-C control unit through a wear-resistant helical cable.

The shock and impact-resistant housing is made of high-quality thermoplastic and is resistant to fuels, salt water, fats, oils and alkaline solutions; IP65 enclosure.

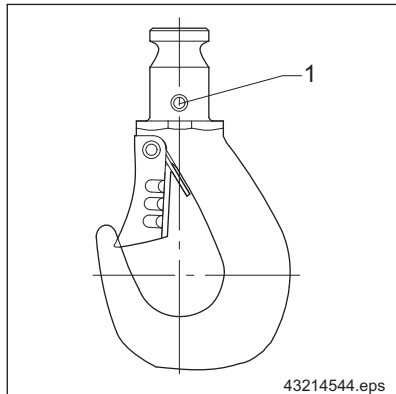


Fig. 14

Standard load hook

CAUTION



Swivel lock

Removal of swivel lock (1) constitutes a danger to life and limb.

The swivel lock of the load handling attachment must not be removed.

Accessories

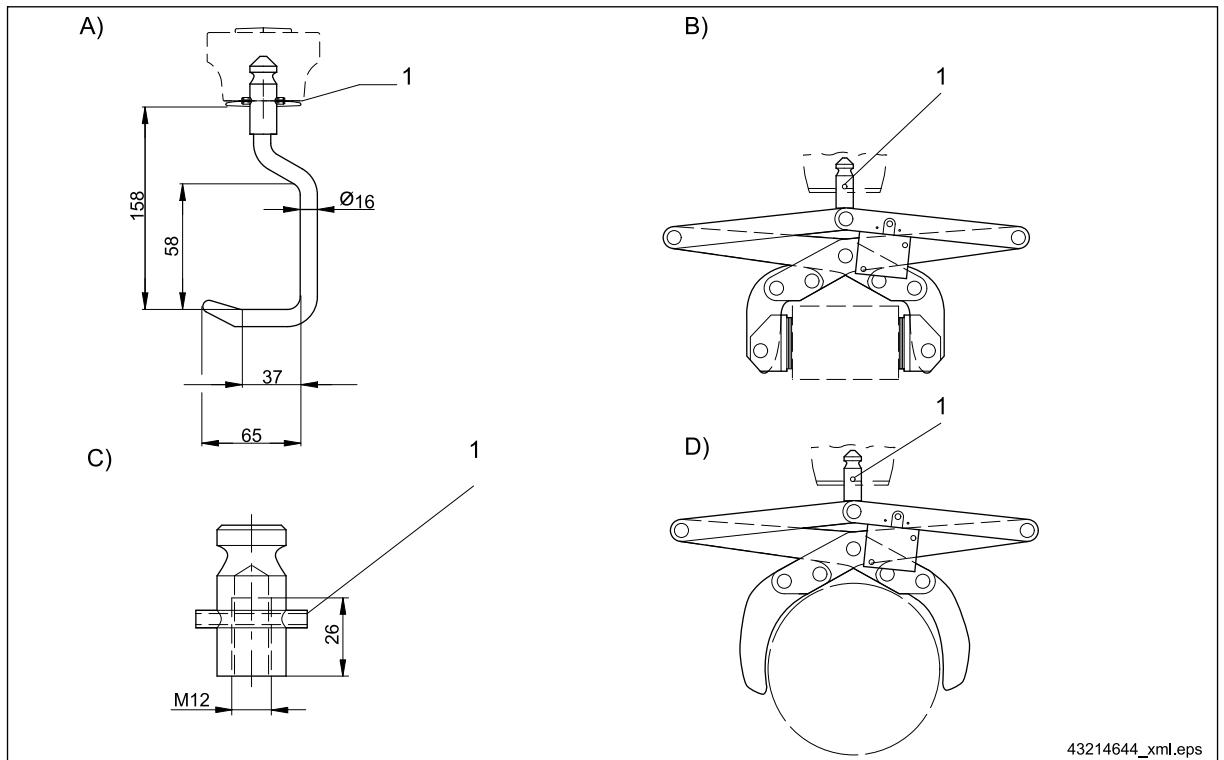


Fig. 15

- A Open hook
- B Pantograph tongs
- C Coupling pin

- D Pantograph tongs
- 1 Swivel lock



For further information, see "PGS parallel gripper" document ⇒ Tab. 3, Page 7 and "Demag DC-Pro chain hoist technical data" ⇒ Tab. 3, Page 7.

4.10 Suspension

Standard suspension

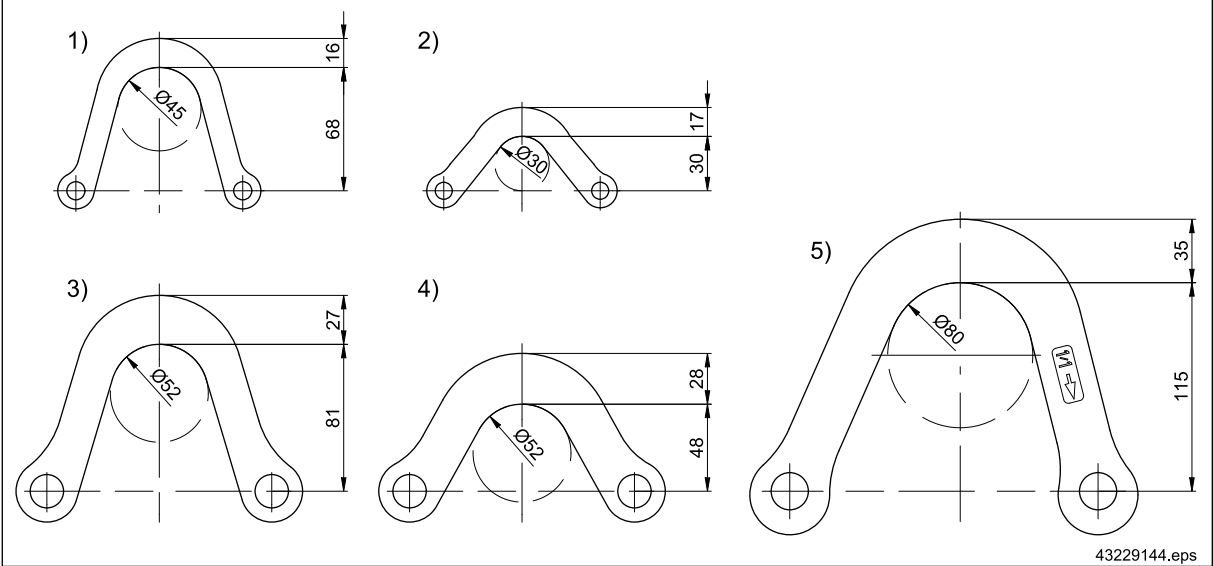


Fig. 16

DC-Pro 1-10 chain hoists are supplied with a long suspension bracket fitted as standard. The short suspension bracket is included for an improved C dimension, if required. Only one suspension bracket is available for DC-Pro 15 units.

The suspension bracket facilitates installation, since the chain hoist can be directly suspended from the trolley. It is not necessary to dismantle existing trolleys.

Chain hoists with short or long suspension brackets can be combined with trolleys from ⇒ Tab. 26, Page 37.

Optional suspension

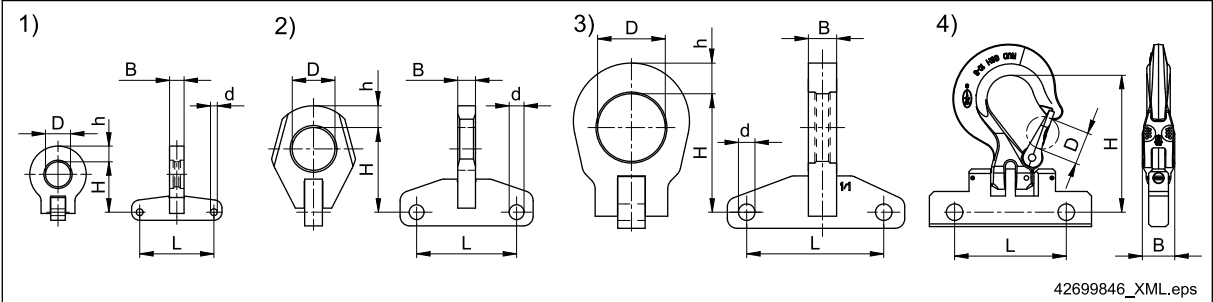


Fig. 17

Item	Designation	Size	Order no.	Dimensions [mm]					
				L	B	H	h	D	d
1	Suspension ring, for suspension parallel to the track girder	DC 1-5	718 278 45	92	18	62,5	19,5	31	8,4
2		DC 10	715 278 45	124	22	105	27	53	18,4
3		DC 15	721 278 45	170	35	147	38	84	20,5
4	Suspension hook, folding	DC 1-5	718 910 45	92	22	104	-	25	-
		DC 10	715 910 45	124	36	152	-	36	-
		DC 15	721 910 45	170	44,5	193	-	40	-
Not shown	Suspension bracket for KBK III	DC 15	721 870 45	Contour as for (5) in ⇒ Fig. 16, Page 36					

Tab. 25

Standard suspension assignment

Chain hoist load capacity [kg]					80-125	80-250	160-500	315-1250	1250-2500	1000-1600	2000-3200				
Reeving					1/1			2/1	1/1	2/1					
Trolley size	Trolley load capacity [kg]	Flange width [mm]	Flange thickness [mm]	Crossbar diameter [mm]	DC 1	DC 2	DC 5	DC 10		DC 15					
See ⇒ Fig. 16, Page 36															
RU 3	450	60-90	12	21	1+2	1+2	1+2 ²⁸⁾								
RU 6	450	58-143	20	30	1	1	1 ²⁸⁾								
		144-300	18	35	1	1	1+2								
	700	58-143	20	30	1+2	1+2	1+2								
		144-300	18	38	1	1	1								
RU / EU 11 DK	850	58-300	16	34											
	1350	58-143										45			
		144-300													
RU / EU 22 DK	2600	82-300	22	51								3+4	3+4	5	5 ²⁹⁾
RU / EU 36 DK	3600	106-300	30	56								5			
RU / EU 55 DK	5500	106-186		70											
		187-300		82,5											
CF 5	550	50-91	15	16	1+2	1+2	1+2	3+4 ³⁰⁾	3+4 ³¹⁾	5	5 ³²⁾				
U / EU 11 DC	1100	58-200	22	30											
U / EU 22 DC		201-310			30	40	1				1	1			
U / EU 34 DC	2200	201-310													
	3400	82-310	30	55						3 ³³⁾	3 ³³⁾	5	5		
RU / EU 56 DC	5600	98-200													
		201-310													
KBK															
Trolley	100	100			2	2	2								
	I	300													
	II	600										3+4 ³⁴⁾			
	III	1300										3			
Articulated frame (double trolley)	I	400			1	1	1								
	II	1200										3	3	35)	
	III	2600													
Load bar	100	200			1	1	1								
	I	600													
	II	1400-2200										3	3	35)	
	III	2600													
Crab frame	100	200			1	1	1								
	I	600													
	II	1200/2400										3	3	35)	
	III	3300												35)	

Tab. 26

²⁸⁾ up to 400 kg

²⁹⁾ up to 2500 kg

³⁰⁾ DC 10 - 1250 1/1 with U / EU 22 DC

³¹⁾ DC 10 - 2500 2/1 with U / EU 34 DC

³²⁾ up to 2200 kg

³³⁾ DC 10 with RU / EU 56 on request

³⁴⁾ up to 500 kg

³⁵⁾ Suspension bracket for KBK III = contour as for (5) in ⇒ Fig. 16, Page 36

4.11 Trolley

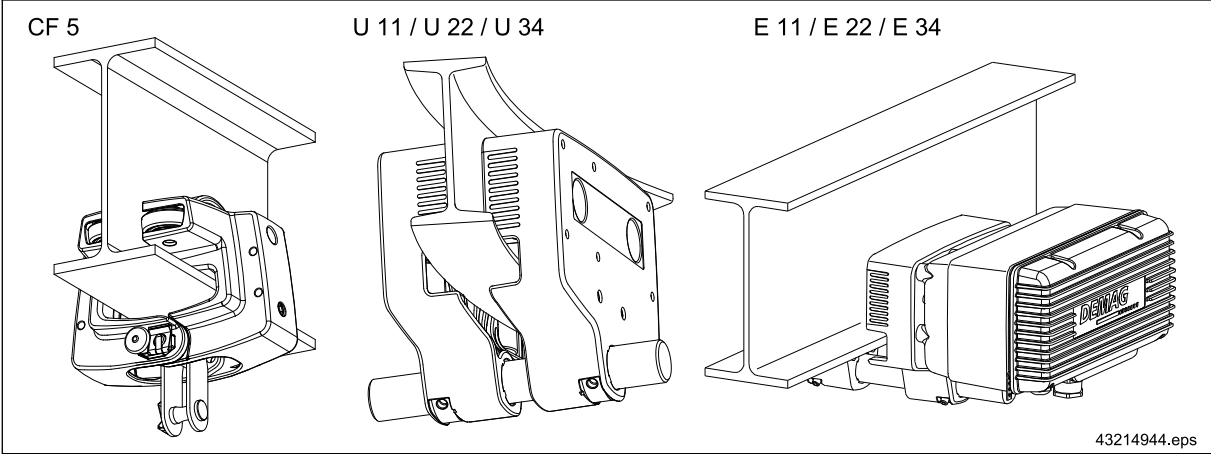


Fig. 18

WARNING



Overload
Danger to life and limb if the trolley is subjected to an overload.

The load capacity of the Demag chain hoist must not exceed the load capacity of the trolley.

I beam track

I beams with parallel or sloping flanges according to DIN 1025 may be used as tracks.
The track radius should be as large as possible to ensure good travel characteristics.
I beam tracks should be bent with the utmost care to obtain a clean, regular curve.
Hoist travel on I beam tracks must in no way be obstructed by protruding suspension pins, bolt heads, clamping plates and joint flanges, etc.
Resilient buffers should be mounted at travel wheel axle level at the ends of tracks to prevent the trolley from derailing (e.g. Demag clamp-fitted buffers).

For further information on the trolleys and the power supply, see ⇒ Tab. 3, Page 7.

Curve radii for trolleys

The specified curve radii apply for normal applications. Contact the manufacturer or his representative for frequent curve travel operation (e.g. automatic installations).

Curve radii in mm						
Trolley size	Load capacity	Runway girder				Travel wheel material
		Push travel		Electric travel		
	[kg]	Flange width ³⁶⁾ [mm]	Rmin [mm]	Flange width ³⁶⁾ [mm]	Rmin [mm]	
CF 5	550	50-91	800	-	-	Plastic
U 11 DC EU 11 DC	1100	58-310	1000	58-310	2000	Plastic ³⁷⁾
U 22 DC EU 22 DC	2200	82-200	2000	82-200	3000	Spheroidal-graphite cast iron
U 34 DC EU 34 DC	2200	201-310		201-310		Spheroidal-graphite cast iron
	3400	82-310		82-310		
RU 56 DC EU 56 DC	5600	98-310	2000 ³⁸⁾	98-310	2500 ³⁸⁾	

Tab. 27

³⁶⁾ Max. flange width 500 mm (except CF 5)

³⁷⁾ Steel travel rollers optional

³⁸⁾ From flange width 106 mm

Load capacity [kg]	Chain hoist size DC-Pro ³⁹⁾	Reeving	Possible cross-travel speeds in approx. ... m/min														
			V14/3		V12/4		V24/6		V40/10								
			Trolley	Travel drive	Trolley	Travel drive	Trolley	Travel drive	Trolley	Travel drive							
80 to 200	1 - 5	1/1	-	-	-	-	U 11 DC	E 11 DC	-	-							
200	10				EU 56 DC	ZBF 80 A 12/4	U 11 DC EU 56 DC	E 11 DC ZBF 71 A 8/2	EU 56 DC	ZBF 80 A 8/2							
250	2 - 5				-	-	U 11 DC	E 11 DC	-	-							
	10				EU 56 DC	ZBF 80 A 12/4	U 11 DC EU 56 DC	E 11 DC ZBF 71 A 8/2	EU 56 DC	ZBF 80 A 8/2							
315	5				-	-	U 11 DC	E 11 DC	-	-							
	10				EU 56 DC	ZBF 80 A 12/4	U 11 DC EU 56 DC	E 11 DC ZBF 71 A 8/2	EU 56 DC	ZBF 80 A 8/2							
400	5				-	-	U 11 DC	E 11 DC	-	-							
	10				EU 56 DC	ZBF 80 A 12/4	U 11 DC EU 56 DC	E 11 DC ZBF 71 A 8/2	EU 56 DC	ZBF 80 A 8/2							
500	5				-	-	U 11 DC	E 11 DC	-	-							
	10				-	-	U 11 DC	E 11 DC	-	-							
630	10				2/1 1/1 2/1 1/1 2/1 15 10 15 15	-	-	EU 56 DC	ZBF 80 A 12/4	U 11 DC EU 56 DC	E 11 DC ZBF 71 A 8/2	EU 56 DC	ZBF 80 A 8/2				
800																	
1000	10																
	15																
1250	10	2/1															
	10	1/1															
	15																
1600	10	2/1															
	15	1/1															
2000	10	2/1	U 34 DC	E 34 DC						EU 56 DC	ZBF 80 A 12/4					EU 56 DC	ZBF 71 A 8/2
	15																
2500	10																
	15																
3200	15																

Tab. 28



For further possible applications, see Demag DC-Pro chain hoist technical data.

- Supporting rollers must be fitted to the trolleys if an EU 56 DC travel drive is used with small flange widths.
- If several trolleys are operated on one girder, we recommend the use of trolley buffers to dampen any collisions between the trolleys.

KBK track

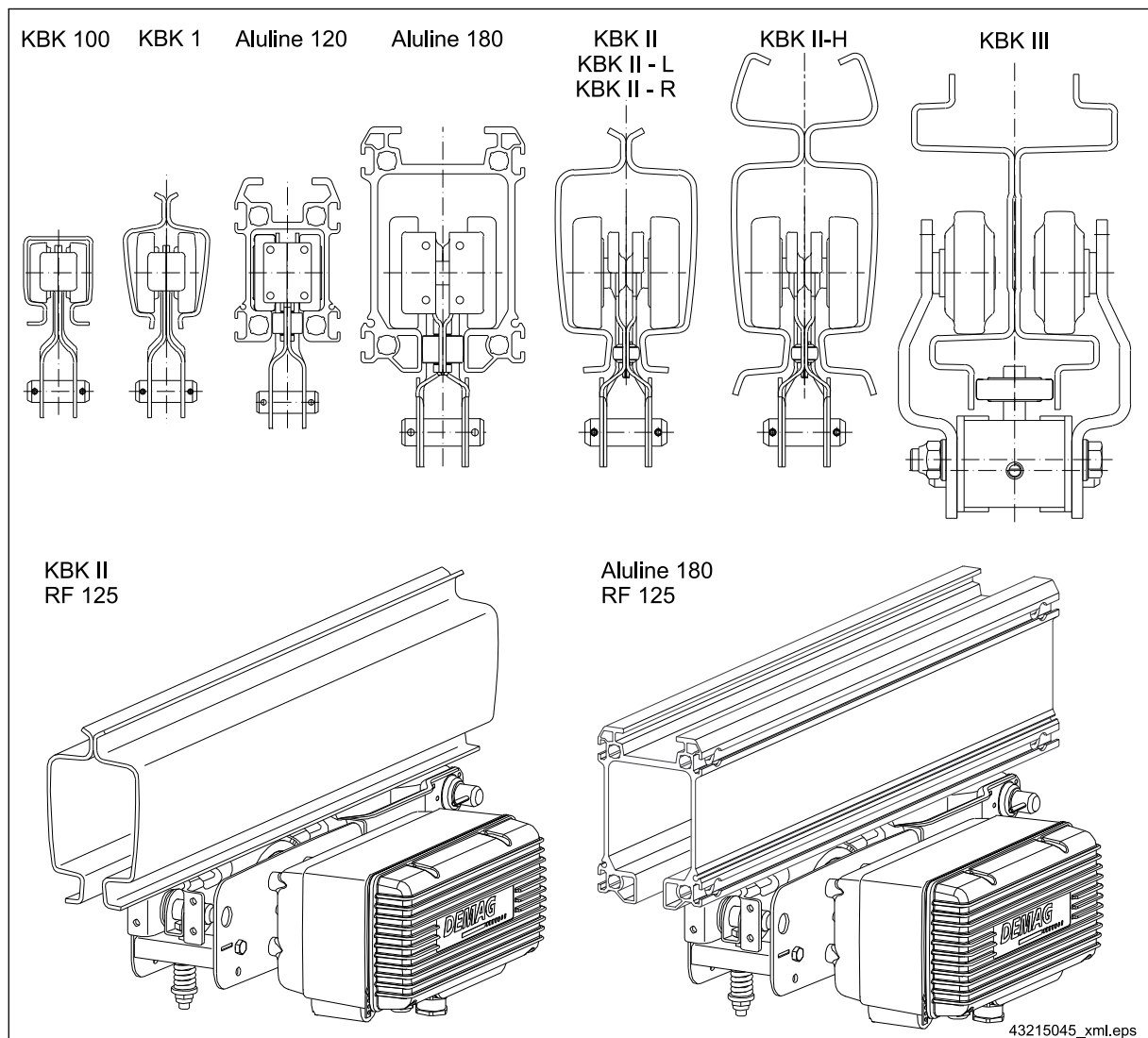


Fig. 19

When selecting a track, we recommend you specify the special profile sections of our Demag KBK crane construction kit track. They feature particularly quiet running characteristics, low rolling resistance and a low deadweight. The cold-rolled track sections feature a smooth running surface and offer the advantage of simple power supply by means of trailing cables or integrated conductor lines.

KBK profile sections can also be used for more complex installations, including curved sections, track switches and turntables.

Special fittings on the KBK profile sections, e.g. for terminal boxes or limit switches, avoid any obstruction by suspension pins, bolt heads, clamping plates and joint flanges.

For further information on the trolleys and the power supply, see ⇒ Tab. 3, Page 7.

5 Assembly

5.1 General

These operating instructions enable the owner to fit and/or refit or replace the DC-Pro unit himself. The owner must appoint a coordinator who is authorised to issue instructions before assembly work commences.



Despite detailed information, errors cannot be excluded when the installation is assembled by the customer. For this reason, we recommend that this work be carried out by our trained specialists or by persons authorised by us.

The wiring of the Demag chain hoist complies in all respects with current DIN VDE and accident prevention regulations.

Unauthorised intervention and modifications eliminate compliance with these regulations.

DANGER



Live components

Danger to life and limb.

It must be possible to switch off the power supply by means of a device to disconnect the power supply (e.g. mains connection or isolating switch with a padlock).



The chain hoists are supplied with power from an AC power network. The voltage and frequency of the AC power network must match the data specified on the rating plate of the chain hoist.

5.2 Safety instructions for assembly

DANGER



Incorrect assembly

Danger to life and limb.

Incorrect installation can result in severe injury and/or damage to property. Therefore, this work may only be carried out by authorised, instructed personnel who are familiar with the principle of operation of the machine in compliance with all safety regulations.

- Ensure sufficient working clearance before starting assembly work.
- Secure and fence off the working and danger zone.
- If an elevating work platform is used for assembly, only use appropriate attachments for the lifting of persons which ensure that work is carried out in a safe and stable position.
- Only suitable, tested and calibrated tools and accessories may be used for assembly or disassembly work.
- Wear protective equipment.
- Be careful when working on open components that have sharp edges. Risk of injury.
- Keep the working area clean and tidy. Store any unneeded machine or installation parts and tools in such a way that there is no risk of them falling.
- Fit components correctly and as intended. Comply with specified bolt tightening torques. Incorrectly fitted components may fall and cause severe injuries.
- Welding work may only be carried out by persons who are specially qualified. DIN welding work requirements must be fulfilled. The electrode holder and earth must be connected to the same assembly when welding work is carried out. Serious damage may otherwise be caused to the hoist.
- Customer-specific regulations must be observed.

DANGER



Live components

Danger to life and limb.

Work on electric equipment may only be carried out by qualified specialist personnel (⇒ "Definition of personnel", Page 9) in compliance with the safety regulations.

Switch off the electric power supply before starting work. The mains connection or isolating switch must be protected against unauthorised or accidental restoration of the power supply by means of a padlock.

Mechanical safety

All bolted connections must be correctly tightened.

Self-locking nuts must not be replaced by other types of nut. Self-locking nuts must be replaced when they have been tightened and untightened five times. The clamping torque of a self-locking nut must not be lower than the loosening torque specified by EN ISO 2320.

A sufficiently secure connection can only be guaranteed by tightening to the specified tightening torque.

Bolted connections must not be lubricated as otherwise the specified tightening torque values will be too high.

Check to ensure that pin connections are correctly fitted.

All installation and assembly work must be completed in accordance with the operating instructions and the hoist chain must be greased. Operation with defective or damaged chains results in a high risk of accidents with personal injuries and damage to the chain hoist and is therefore prohibited.

Any change or modification which prejudices safety must be reported to the nearest person responsible immediately.

Repairs may only be carried out by experienced technicians.

Ensure that all attachment points are freely accessible for inspections and servicing or that free access can be provided.

The control device (e.g. control pendant) must be marked in such a way that the direction of movement is clear and distinct. The arrow symbol on the switching elements must correspond to the direction of movement.

Electrical safety

The chain hoist operating instructions must be referred to when Demag chain hoists are used.

These operating instructions only contain standard circuit diagrams. Depending on the chain hoist type, an order-specific circuit diagram may apply.

Protective earth conductor

The protective earth conductor in insulated leads and cables must be coloured green and yellow along its entire length.

The protective earth conductor must not be connected to mounting bolts or screws.

Earth junctions and connections must be protected against accidental loosening (e.g. by using serrated lock washers to DIN 6798). It must be possible to disconnect each individual connection.

Protective earth conductors must not carry any current in normal operation.

The same number of protective earth connection points must be provided as electric power infeed and outfeed points. Continuity of the PE conductor connection must be checked.

Mains connection switch

A mains connection switch must always be provided for the mains power supply line to the machine. The mains connection switch must be arranged to disconnect all poles of your DC-Pro chain hoist from the mains supply.

Ensure that the mains connection switch is installed in an easily accessible position in the vicinity of your machine and that it is clearly marked.

Isolating switch

If two or more lifting appliances are fed from a common supply line, each one should be provided with an isolating switch. This makes it possible to carry out maintenance work on individual units, without affecting operation of the rest of the system.

Power supply

The power supply line/cable to be used depends on the motor size, see the "Hoist motor data" section.

5.3 DC-Pro chain hoist tightening torques

Tightening torques [Nm]	DC-Pro 1	DC-Pro 2	DC-Pro 5	DC-Pro 10		DC-Pro 15		
Reeving	1/1			1/1	2/1	1/1	2/1	
Motor	9,5			25,0				
Fan cover	4,0							
Gearbox cover	5,5					-		
2-piece gearbox housing	-					25		
Gearbox plug screw	-					15		
Gearbox vent valve	-					15		
Brake	5,5							
Operating limit switch	1,5			3,0				
Control set	3,0							
Electric equipment cover	9,5							
Service cover	5,5			7,5		25		
Limit stop	4,0		4,3					
Anchorage halves	-				10,5	-	25	
Guide plate	5,5					25		
Hook assembly	6,8		11,5	25,0	-	27,5	-	
Bottom block with external cut-off springs	-				55,0	-	55,0	
Bottom block with internal cut-off springs					Bottom block halves	52,0	-	
Guide section halves					5,5	-		
Bolt for chain retainer halves (Manulift)	5 - 6			-				
Control cable locking mechanism	11,0							

Tab. 29

CAUTION



Loose connections

Loose connections are a danger to life and limb and a risk of damage to the machine.

Metal nuts featuring a locking element (self-locking nuts) are mainly used for Demag chain hoists.

- Self-locking nuts must not be replaced by other types of nut.

5.4 Installation procedure

1. Unpack and dispose of the packing material in an environmentally compatible way ⇒ "Transportation, packing and storage", Page 26.
2. Check the delivery is complete ⇒ "Transport inspection", Page 26.
3. Connect the control pendant, if necessary ⇒ "Connecting the control pendant", Page 44.
4. Which suspension bracket is suitable for suspension? ⇒ "Suspending the chain hoist", Page 48.
5. Adjust the height of the control pendant ⇒ "Control pendant height adjustment", Page 46.
6. Connect to the power supply ⇒ "Mains connection", Page 50.
7. Set the lowest hook position, if necessary ⇒ "Adjusting the lower hook position", Page 63.
8. Carry out checks before putting the unit into operation for the first time ⇒ "Inspections before putting into service for the first time", Page 65.
9. The equipment is ready for operation ⇒ "Operation", Page 66.

5.5 Connecting the control pendant

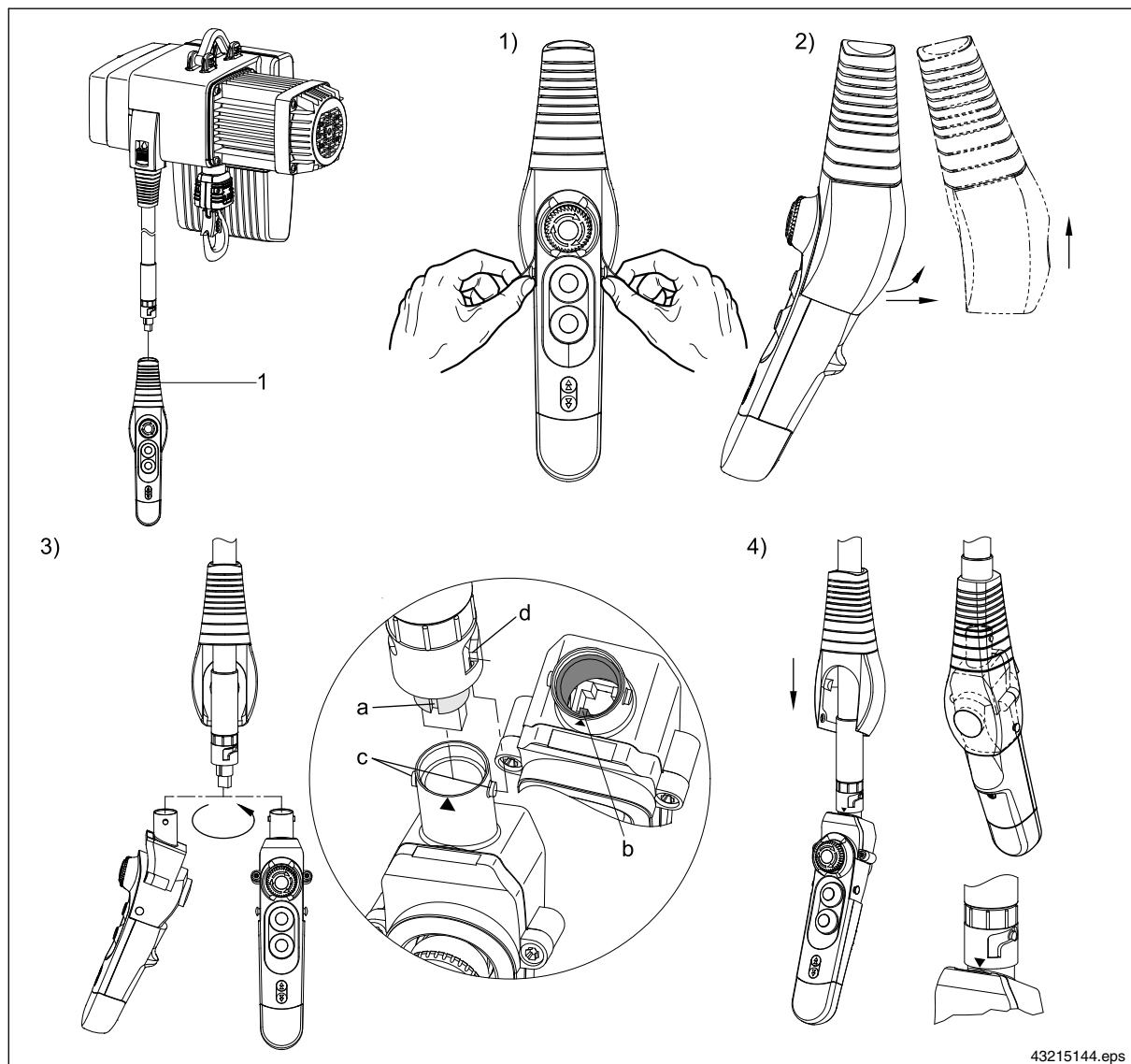


Fig. 20

The control pendant is of plug-in design. The connector on the end of the control cable is locked in the bayonet sleeve and can be turned. If a connector is not locked, it can be pulled out and must be locked again by pressure.

Unless the chain hoist is supplied with the control pendant fitted, connect the DSC control pendant with the control cable and lock the connection with the bayonet lock as follows:

1. Lift bend protection sleeve (1) on the control pendant off the two pins.
2. Then pull bend protection sleeve (1) off the control pendant.
3. Slide bend protection sleeve (1) onto the control cable. Plug the control cable into the control pendant and turn the bayonet lock until it is locked. Ensure that
 - groove (a) on the connector holder lines up with swivel lock (b) in the control pendant housing and
 - that the two pins (c) on the control pendant housing line up with bayonet lock (d).
4. Slide bend protection sleeve (1) over the control pendant again. Pay attention to the positioning markers. Press bend protection sleeve (1) firmly onto the control pendant.

The control pendant can be attached to the chain hoist or installed as a travelling unit, see ⇒ "Mobile control system", Page 47.

5.6 Control cable

5.6.1 Control cable technical data

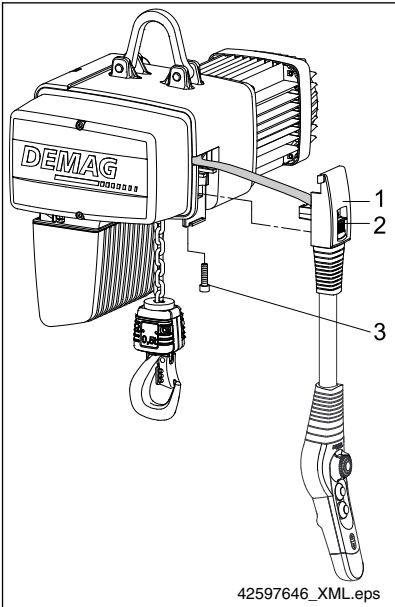


Fig. 21

Item	Designation	Tightening torque [Nm]
1	Hose pocket	-
2	Control cable retaining latch	-
3	Control cable retaining bolt	11

Hook path	H4	H5	H8	H11
Cable lengths	0,8 m - 2,8 m	0,8 m - 3,8 m	3,8 m - 6,8 m	6,8 m - 9,8 m

Tab. 30

The control pendant is supplied with standard cable lengths. The height can be adjusted by 2 or 3 m. Longer control cable lengths can be provided, for example, by using a 2TY control cable and DST-C or DSE-C control pendants.



- Ergonomic workplace.
- The suspension height can be adjusted by means of a self-locking mechanism at any time to suit individual requirements.
 - Adjust the suspension height of the control pendant in such a way that the operating elements are arranged at elbow height to obtain an ergonomic operating position.

5.6.2 Handling the control cable

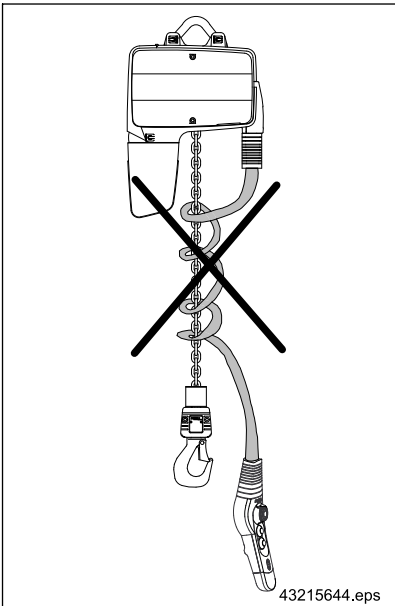


Fig. 22



Do not allow the control cable to be wound around the chain when lifting motions are performed.

Optional snag protection can be used for the upper part of the control cable.

Designation	Order no.
Protective sleeve with fitting material	720 085 45

Tab. 31

5.6.3 Control pendant height adjustment

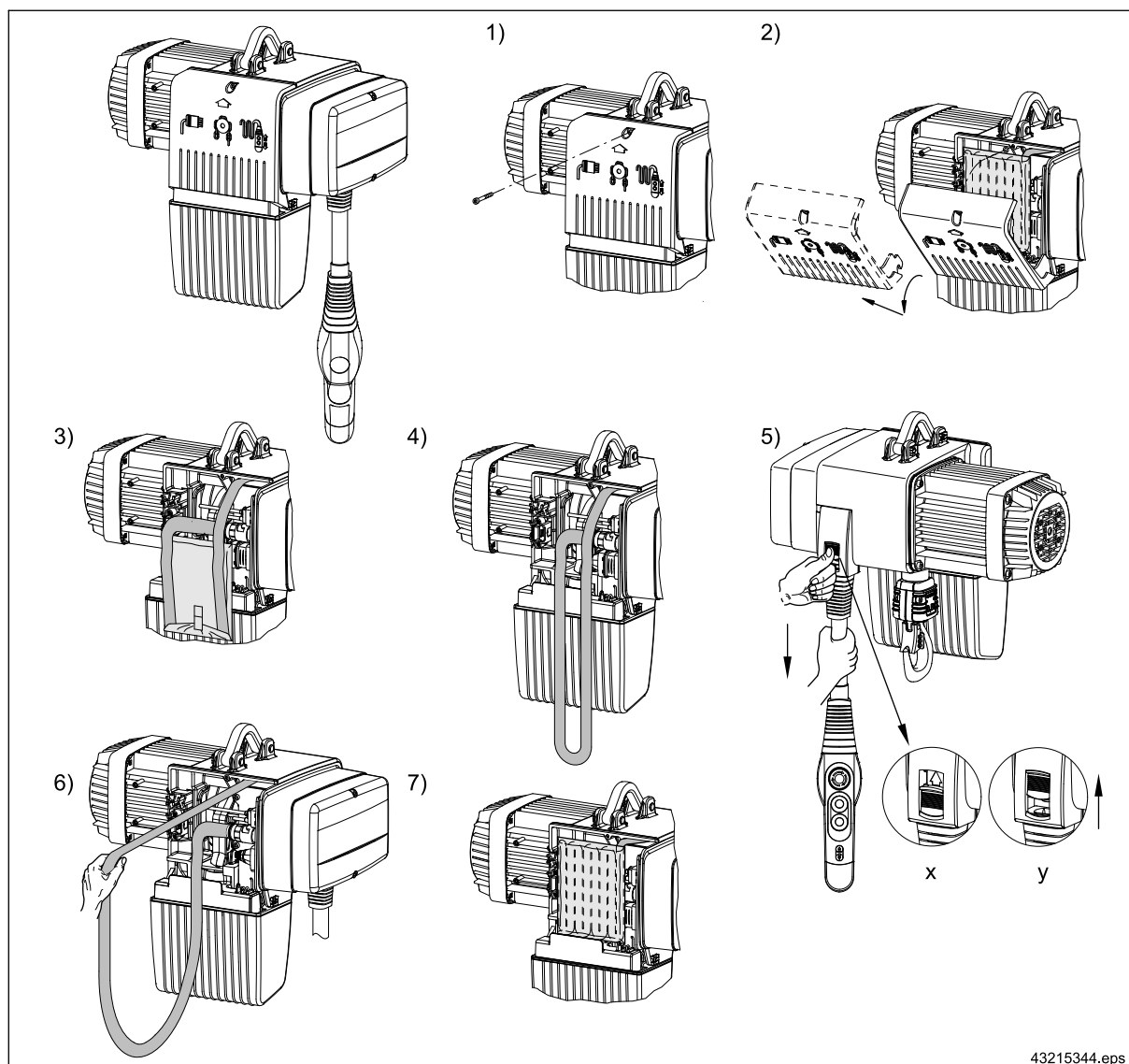


Fig. 23

- x Control cable locking mechanism engaged
- y Control cable locking mechanism released

1. Undo the screws of the service cover.
2. Open and disconnect the service cover.
3. Remove and open the bag with the control cable.
4. Take the control cable out of the bag.
5. Slide the latch of the control cable locking mechanism upwards and hold it in place. At the same time, pull the control cable until the correct height has been reached for the control pendant.
6. If the control pendant is positioned too low, pull on the control cable hose behind the service cover. Slide the latch of the control cable locking mechanism downwards and lock the retainer by a short, strong pull on the control cable above the control pendant.
7. Lay the remaining control cable in loops and store it in the bag. The bag must be located behind the edge of the chain collector box. Close the service cover (tightening torque = 5,5 Nm).

5.6.4 Mobile control system

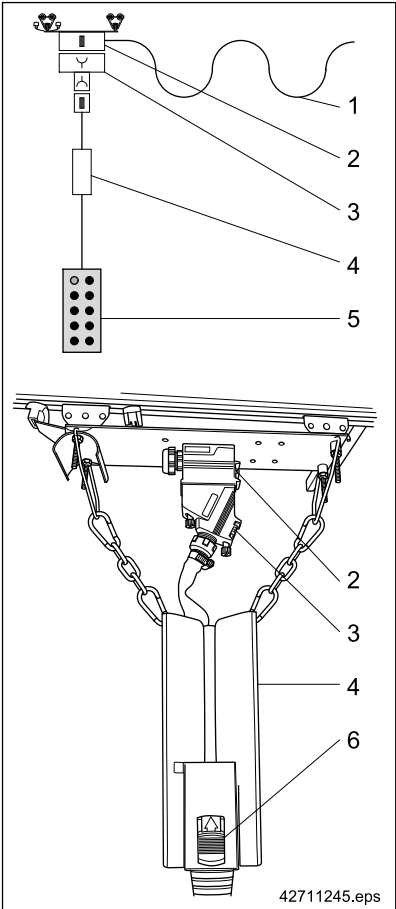


Fig. 24

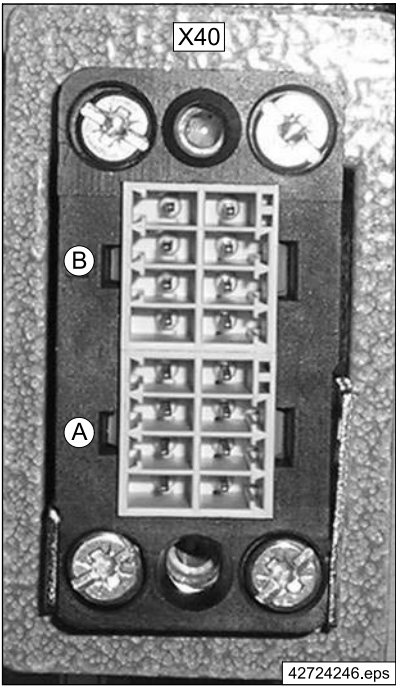


Fig. 25

Component parts			
Item	Designation	comprising	Part no.
1	11-pole + PE flat cable		720 139 45
2	Connector enclosure cpl.	Socket enclosure	720 187 45
		Mounting frame	
		VC-AMS8 pin insert	
		Flat cable union	
3	Connector adapter cpl.	Bayonet lock	720 087 45
		VC-MP-1-R-M25 bush enclosure	
		VC-TR1/2M bush frame	
		VC-TFS8 socket insert	
4	Cable collector		720 065 45
5	DSE-10C control pendant		773 352 45
6	Control cable locking mechanism		-

Tab. 32

H4, H5, H8, H11 height-adjustable standard control cables are used together with the cable collector.

X40 plug connector pin assignment					
Signal	Cond.	PIN		Cond .	Signal
-	-	B4	B8	11	Reference potential (24 V)
PE	PE	B3	B7	-	-
-	-	B2	B6	-	-
Special 2 (horn)	8	B1	B5	10	Right
Left	4	A4	A8	7	Lowering
Lifting	3	A3	A7	9	Control voltage (24 V, STS)
Emergency stop	2	A2	A6	6	Reverse
Forwards	1	A1	A5	5	Special 1 (F1/F2)

Tab. 33

5.7 Suspending the chain hoist

5.7.1 Supporting structure

DANGER



Overload
Danger to life and limb if the supporting structure is overloaded.

The support superstructure must be designed for the maximum load caused by operation of the chain hoist when it is used as intended.

Hoist units that have a load capacity ≥ 1000 kg must be provided with overload protection according to DIN EN 14492-2.

DC-Pro chain hoists are used with a slipping clutch which directly acts as overload protection. The slipping clutch must be adjusted according to the load capacity of the chain hoist. For information on adjustment, see "Friction force checking device" document \Rightarrow Tab. 3, Page 7.

According to DIN EN 14492-2, the force limitation factor for DC-Pro chain hoists with a load capacity equal to or greater than 1000 kg is:

$\phi_{DAL} = 1,6$

Specification of the supporting structure must allow for the static and dynamic forces that occur when the overload protection device is tripped.

5.7.2 Suspension bracket

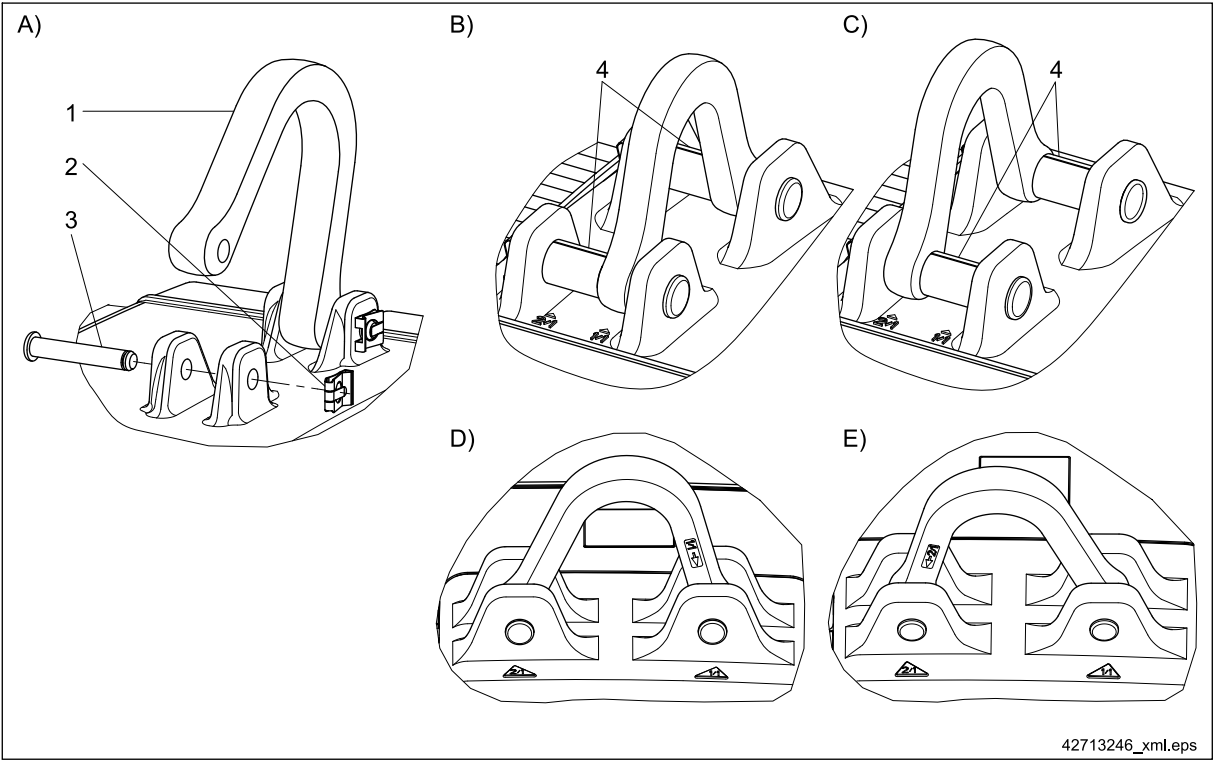


Fig. 26

Fig.	Designation	Item	Designation
A)	DC-Pro 1-5 suspension bracket opened	1	Suspension bracket
B)	DC-Pro 10, 1/1 reeving	2	Retaining clip
C)	DC-Pro 10, 2/1 reeving	3	Pin
D)	DC-Pro 15, 1/1 reeving	4	Spacer tube (DC-Pro 10)
E)	DC-Pro 15, 2/1 reeving		

Tab. 34

WARNING



Overload

Danger to life and limb if the components are overloaded.

- The suspension/support structure for the chain hoist must be designed to accommodate the loads.

DANGER



Chain hoist may fall

Danger to life and limb and risk of damage.

Do not move the chain hoist or leave it unsupervised when the suspension bracket is open.

The chain hoist is delivered with the long suspension bracket (DC-Pro 1-10) fitted to the chain hoist. The enclosed short suspension bracket (DC-Pro 1-10) may be fitted for an improved C dimension.

Installation:

1. Remove the retaining clip and pin on one side.
2. Attach the suspension bracket (DC 10, DC 15 according to the reeving arrangement) to the superstructure/ trolley.
3. Insert the pin through the suspension and the suspension bracket (and through additional spacer tube (4) for DC 10) and secure with the retaining clip.



Make sure that the suspension bracket is fitted to match the reeving arrangement of the chain hoist. The chain hoist will hang at an angle if the suspension bracket is installed incorrectly. Suspension of the chain hoist at an angle results in premature wear of the chain drive. If special fittings are installed on the chain hoist, make sure that they are counter-balanced.

5.8 Plug screw, vent valve

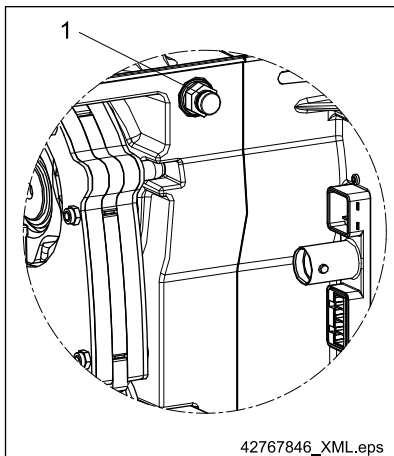


Fig. 27



Before putting the chain hoist into operation, remove plug screw (1) (plug and O ring) and fit the vent valve included in the supply. See also ⇒ "Gearbox/oil change", Page 112

Tightening torques [Nm]	DC-Pro 15
M16 plug screw	15
M16 vent valve	15

Tab. 35

5.9 Mains connection

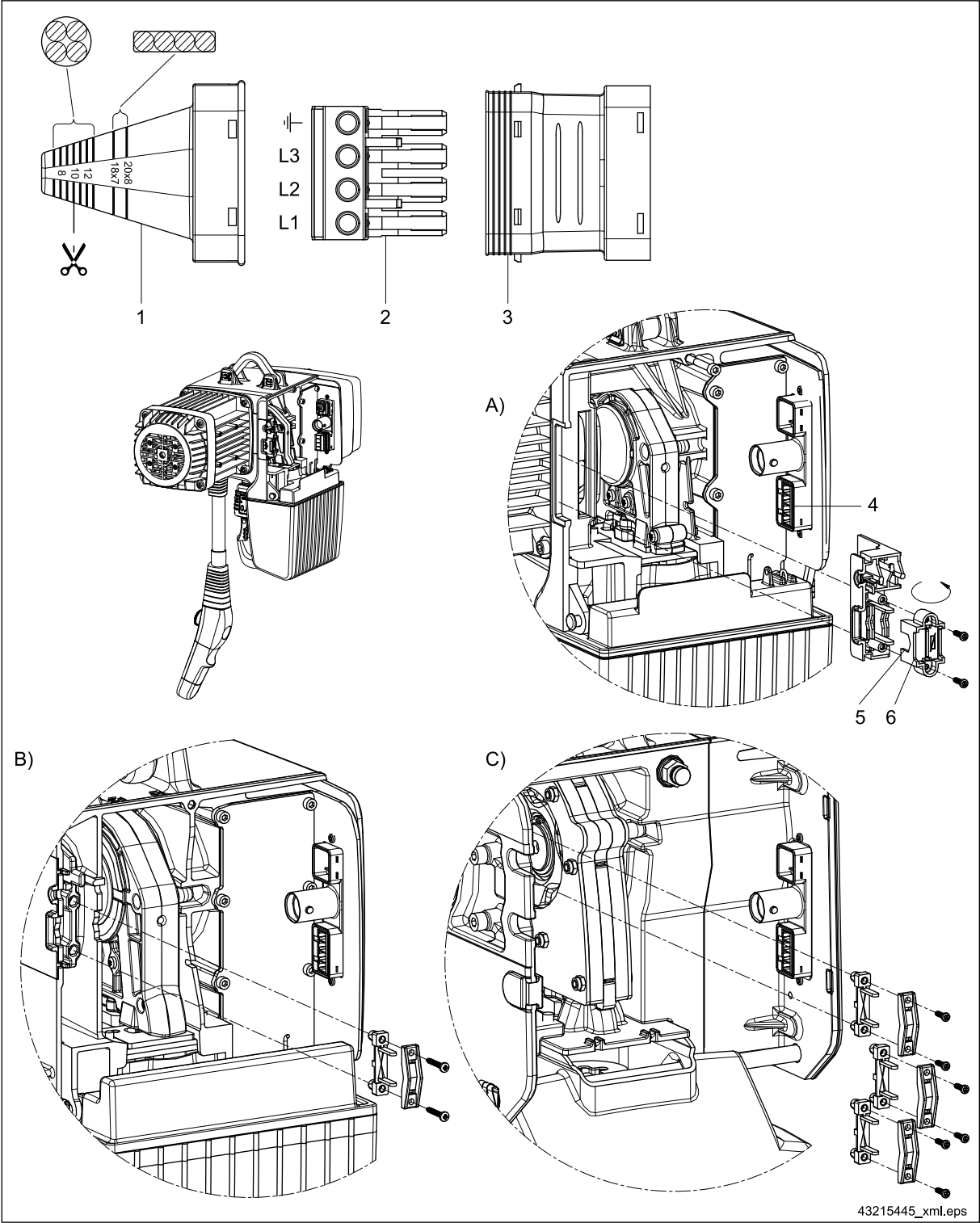


Fig. 28

Item	Designation	Item	Designation	Item	Designation
A)	Strain relief attachment DC-Pro 1 - 5	1	Sealing sleeve	4	Mains connection
B)	Strain relief attachment DC-Pro 10	2	4-pole connector	5	Recess for round cable
C)	Strain relief attachment DC-Pro 15	3	Connector enclosure	6	Recess for flat cable

Tab. 36

The mains connection cable, the mains connection fuse links and any devices to disconnect and switch the power-feed must be available on site in order to connect the chain hoist to the power supply. A 4-lead cable with a PE earth conductor which complies with the table in \Rightarrow "Hoist motor data ", Page 20 is required for the power supply.

Please note that the length of the supply cable specified for a given cross section must not be exceeded in order to avoid excessive voltage drop and malfunctions during start-up of the motor caused by undervoltage.

Connection to the electric supply

- First check to ensure that the voltage and frequency specified on the rating plate match your mains supply. Ensure that the mains connection cable is not connected to the power supply and secured against accidental restoration of the power supply.
- Remove the service cover to connect the supply cable.
- Use the mains connection set included in the delivery for the plug connection to the mains connection cable.
- Cut sleeve (1) to match the shape of the mains cable.
- In the area marked 7 to 13 for round cable; in the area marked 18x7 to 20x8 for flat cable. The system is designed for cable cross-sections of 4x1,5 mm² or 4x2,5 mm².
- Slide sleeve (1) onto the mains cable. Make sure sleeve (1) tightly encloses the cable for the specified enclosure requirements.
- Connect the mains cable on connector (2) to terminals L1, L2, L3 and to the PE. If required, use the wire end sleeves included in the delivery.
- Slide connector (2) into housing (3) until it latches and close housing (3) with sleeve (1).
- Then insert connector (2) into the control system until the housing (3) latches with the card bracket.
- Finally insert the mains cable into the opening in the gearbox housing and secure it with the strain relief clamp. For DC-Pro 1 to 5 units, the strain relief clamp must be turned to match the shape of the cable depending on the cable type (flat or round cable).



- All housing parts must be securely latched to ensure the unit is sealed.
- Check continuity of the earth lead connection after the mains cable has been connected and before the chain hoist is put into operation.
- The mains connector must never be disconnected under load.

Phase sequence for connection to the AC power network

The chain hoist is configured for connection to clockwise R-S-T phases. The lifting and lowering buttons correspond to the movements of the load hook if the R-S-T mains phases are connected to L1-L2-L3 in the specified sequence. Then check the direction of movement as described below. If the phase sequence of the connection cable is unknown, connection with the correct phases is established in this way.

Checking the direction of movement

The chain hoist must be connected to the power supply to check whether all phases are correctly connected. Switch on the power supply, unlock the emergency stop and actuate the "Lifting" pushbutton on the control pendant. The load hook must now move upwards.

WARNING



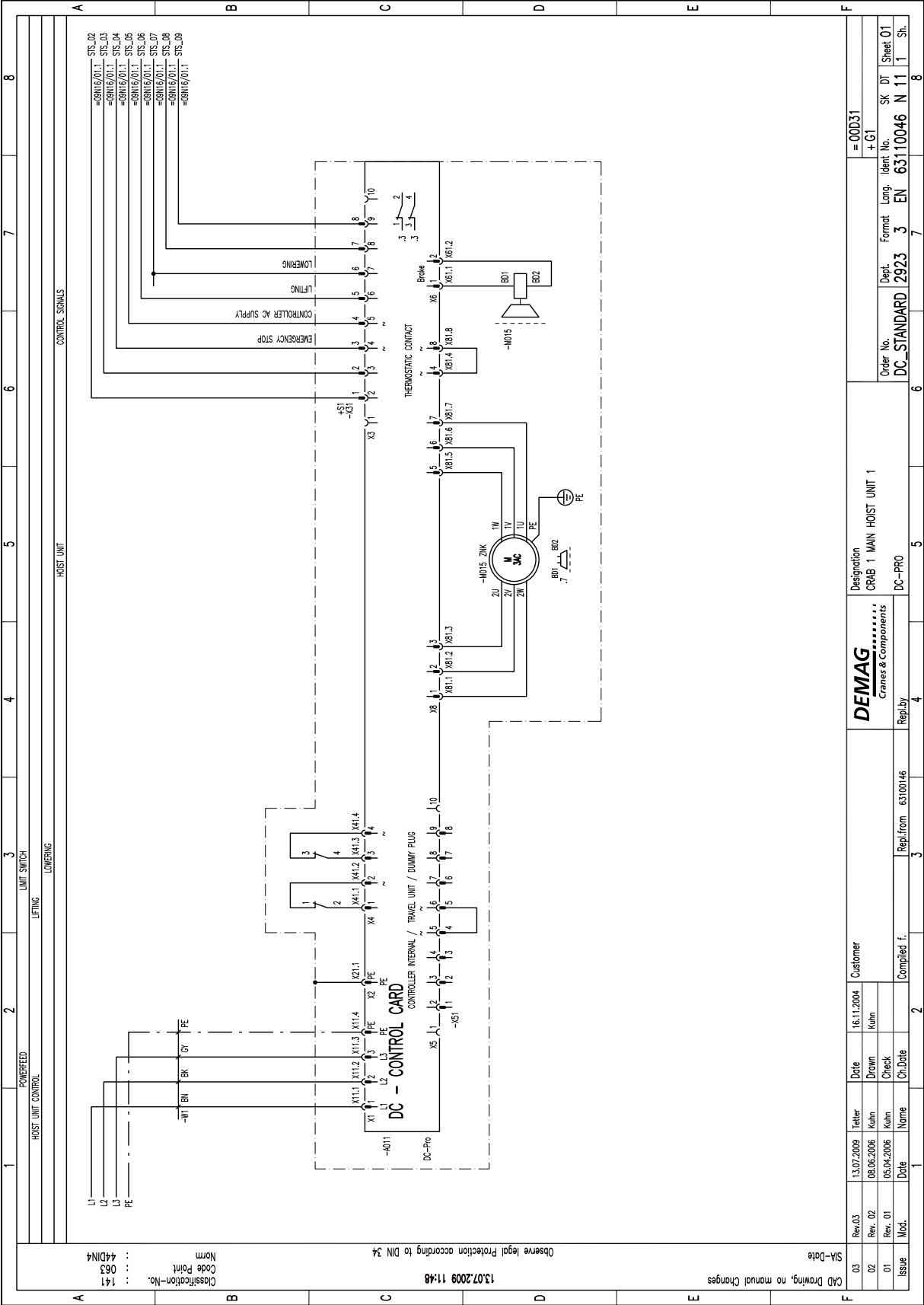
Incorrect direction of movement

Danger to life and limb if the direction of movement is wrong.

- If the direction of movement is not correct, disconnect the power supply at the mains connection switch and check to ensure that it is not live.
- Swap phases L2 and L3 of the supply cable at the mains connection switch.

5.10 Circuit diagrams and control boards

5.10.1 DC-Pro 1 - 15 solo hoist circuit diagram



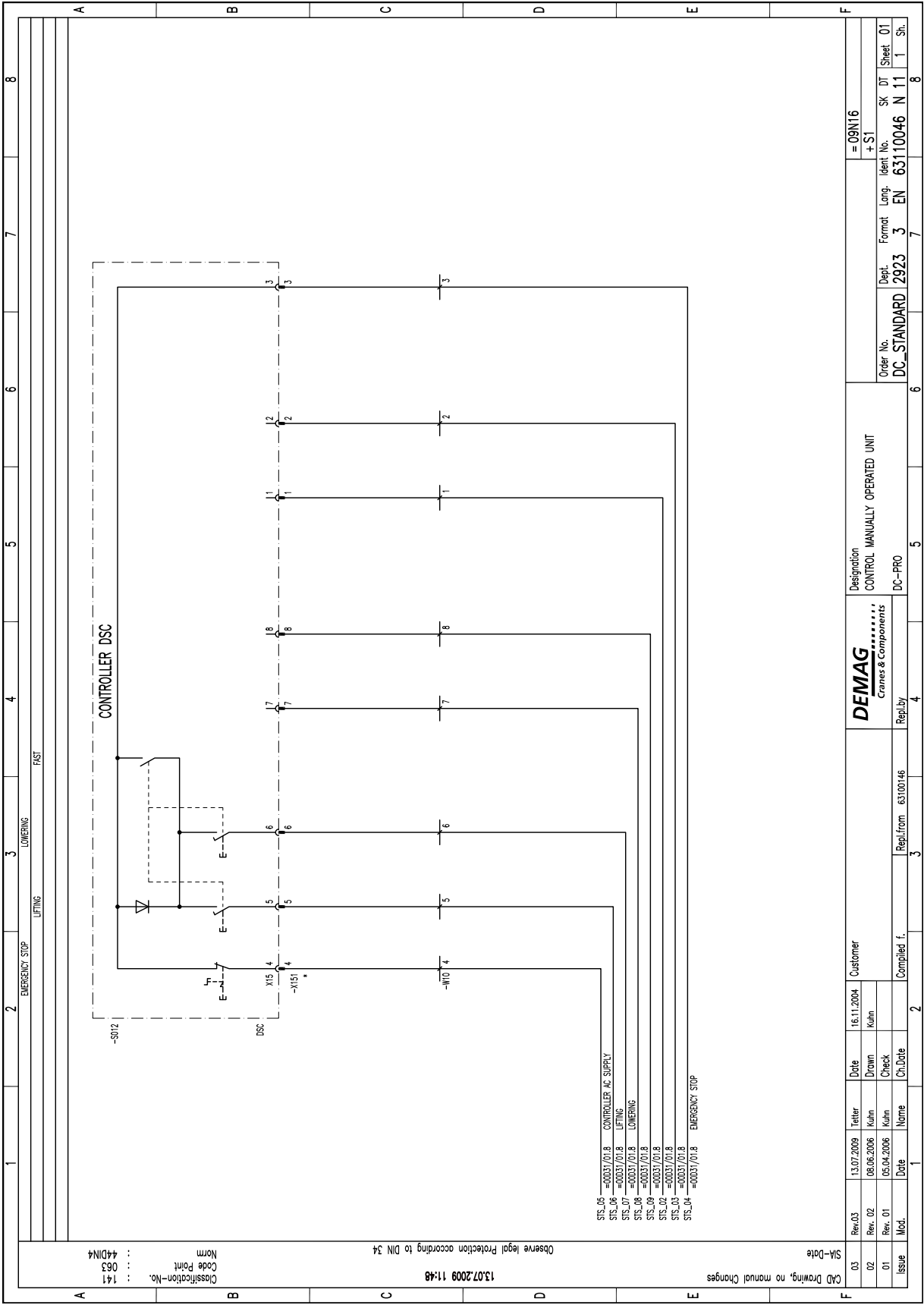
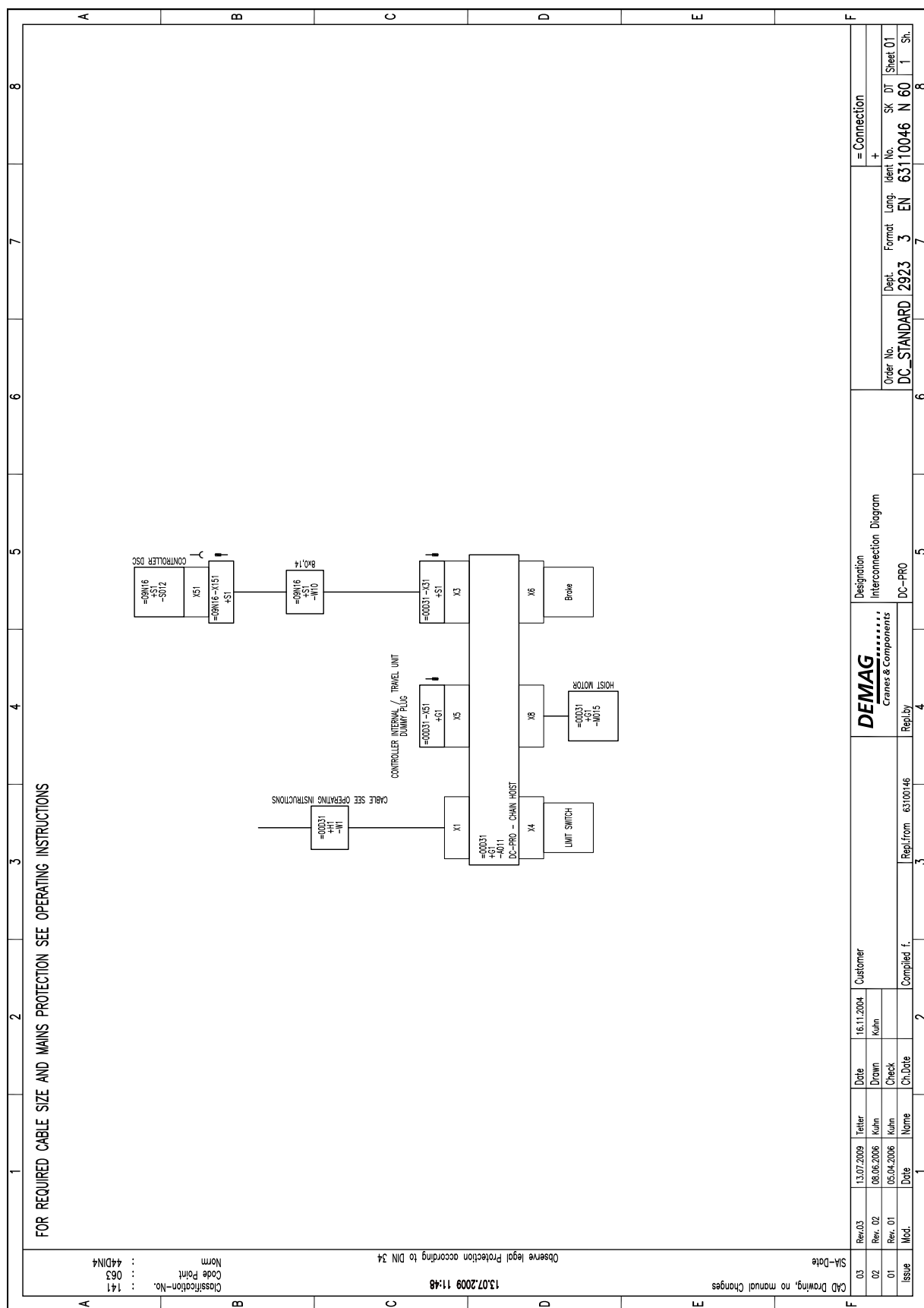


Fig. 31





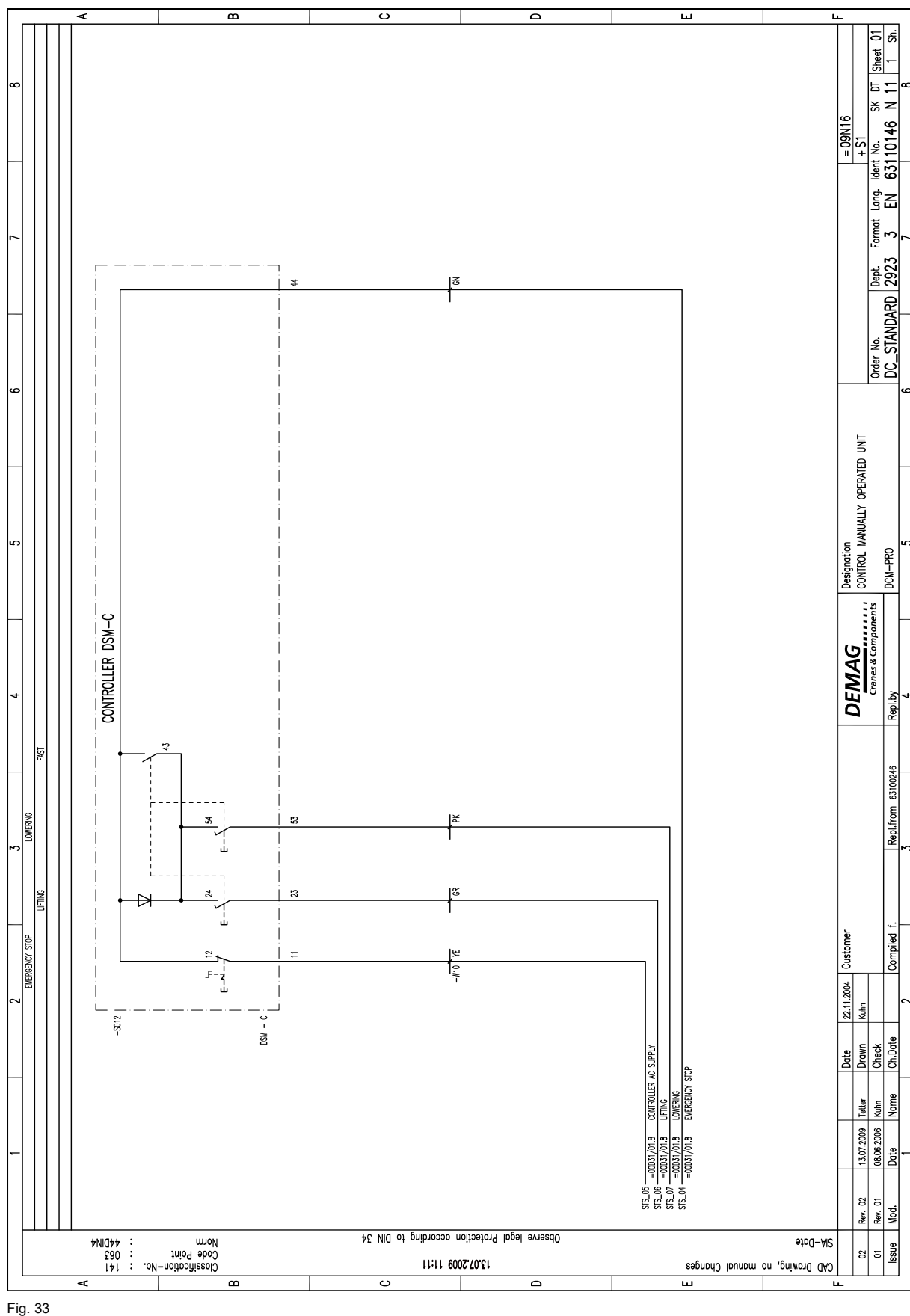
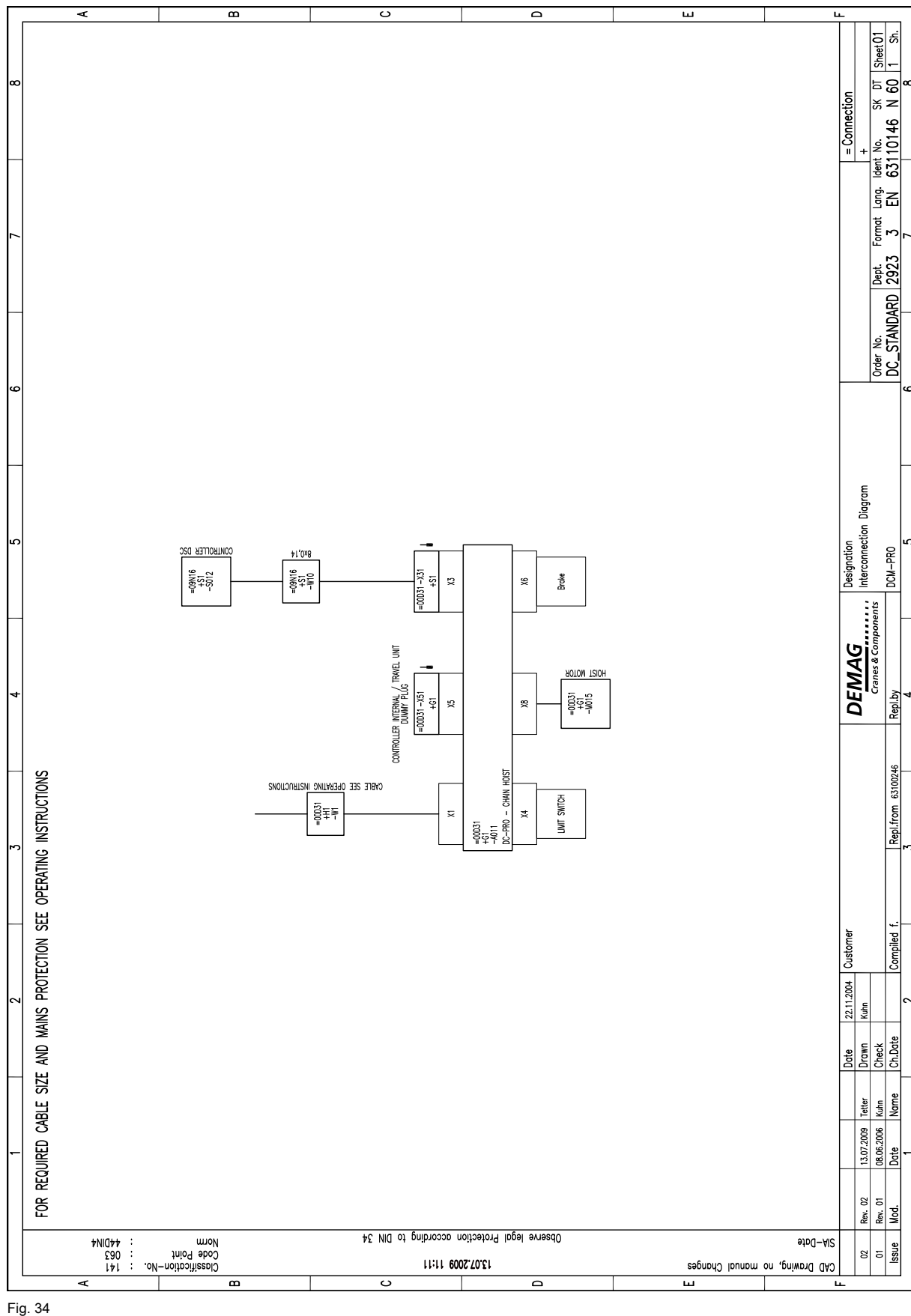


Fig. 33



5.10.3 **Circuit diagram with E 11 - E 34 travel drive**

For further circuit diagrams with E 11-E 34 travel drives, see ⇒ Tab. 3, Page 7 E 11-E 34 DC travel drive technical data.

For further information on E 11-E 34 travel drives, see ⇒ Tab. 3, Page 7 E 11-E 34 DC travel drive assembly instructions.

For further information on cross-travel limit switch part no. 716 663 45, see ⇒ Tab. 3, Page 7 E 11-E 34 DC travel drive operating instructions.

5.10.4 **Control board**

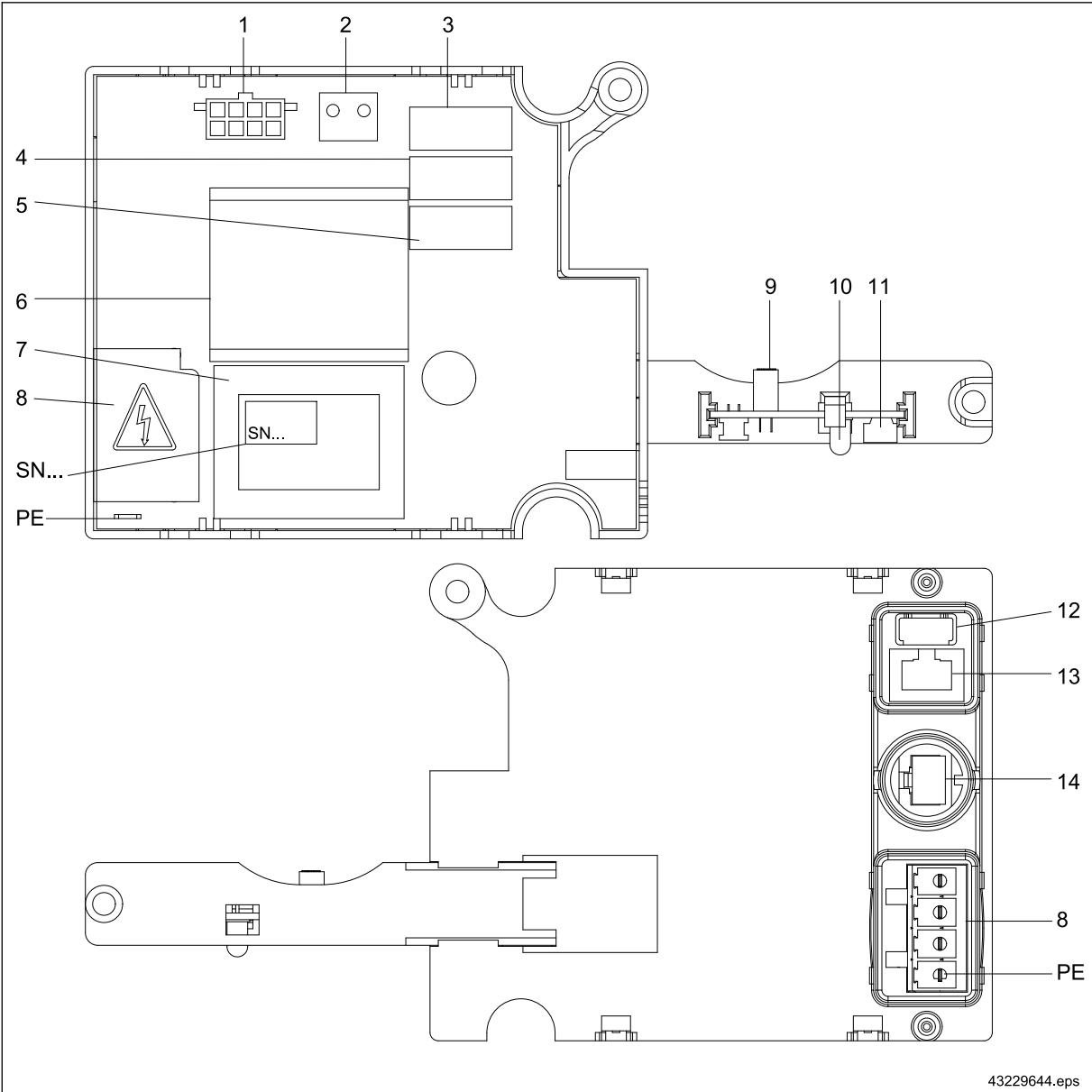


Fig. 35

Item	Designation	Terminal strip	Function
1	Plug-and-socket connector	X8	Motor
2	Plug-and-socket connector	X6	Brake
3	Relay		Fast/slow
4	Relay		Lifting/lowering
5	Relay		Lifting/lowering (from 2009)

Item	Designation	Terminal strip	Function
6	Contactors		On/off
7	Transformer		
8	Plug-and-socket connector	X1	Line
9	Fork light barrier		Pulse generator
10	IR transmitter diode		IR interface
11	7-segment LED		Multi-function display, e.g.: elapsed operating time counter, status indicator, error code display
12	Plug-and-socket connector	X4	Lifting limit switch
13	Dummy plug	X5	(Optional) trolley
14	Plug-and-socket connector	X3	Control cable
SN...	Serial number		Label with: - Serial no. "SN ..." - Modification version "MV ..." - Production date calendar week/year "***/**"

Tab. 37

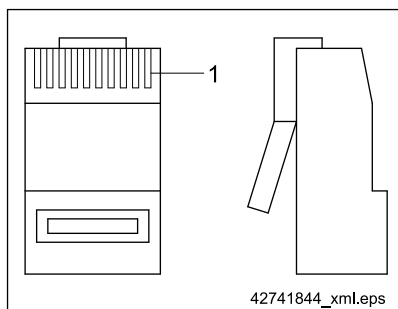


Fig. 36 Pin 1 (1)

RJ45 connector	Function assignment	
PIN	Control cable X3 (14)	Trolley X5 (13)
1	Special F1	Special F1
2	Crane forwards	Crane forwards
3	Crane backwards	Crane backwards
4	Emergency stop	Emergency stop
5	Control pendant supply	Control pendant supply
6	Lifting	24 V AC from chain hoist
7	Lowering	Control pendant reference potential
8	Trolley right	Trolley right
9	Trolley left	Trolley left
10	Special F2	Special F2

Tab. 38

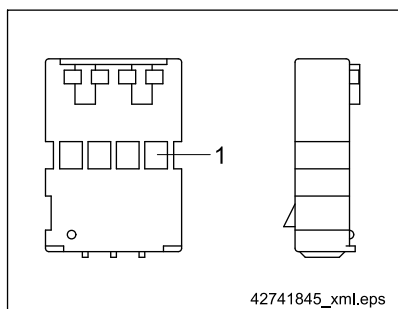


Fig. 37 Pin 1 (1)

PIN	Function assignment
PIN	Lifting limit switch X4 (12)
1	Lifting
2	
3	Lowering
4	

Tab. 39

5.11 Programming parameters with the control pendant

5.11.1 General

Parameters can be programmed to adapt the chain hoist to specific application requirements. The parameters can be programmed using the control pendant together with the 7-segment display on the underside of the chain hoist.

5.11.2 Meaning of the keys



Fig. 38

1	"Lifting" - Accept selection	2	"Lowering" - Move to next parameter or selection value	3	"Emergency stop" - End parameter programming (changes are saved)
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Tab. 40

5.11.3 Meaning of the parameters

From software version SW 2.10, the following parameters can be programmed:

Display of parameter no.	Parameter name	Display of parameter value	Remark
0	-		
1	-		
2	Hoist only V2 speed	n.	Default V1/V2
		Y.	V2
3	Lock the control pendant	n.	Default Control pendant is locked when several keys are actuated.
		Y.	Priority is given to the first button that is pressed if the lifting and lowering buttons are actuated together.
4	Time-controlled start-up (e.g. for tandem operation)	n.	Default Speed-dependent start-up
		Y.	Time-controlled start-up
5	-		
6	-		
7	-		
8	-		
9	-		

Tab. 41

5.11.4 Starting parameter programming mode

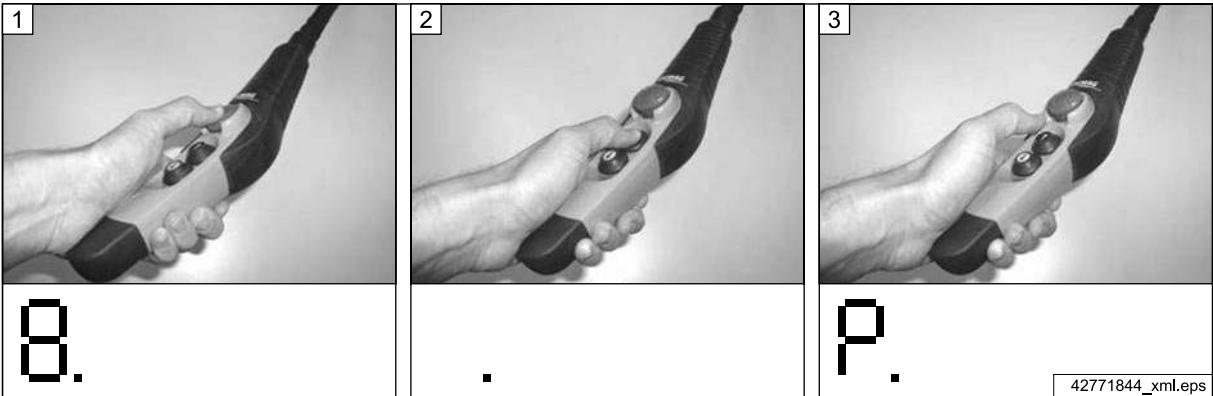


Fig. 39

1st step: Actuate emergency stop.	2nd step: Press and hold down the "Lifting" button and unlock emergency stop. Wait for approx. 10 seconds.	3rd step: When "P." is displayed, release the "Lifting" button.
7-segment display: 8.	7-segment display: (displays a dot)	7-segment display: P.

Tab. 42

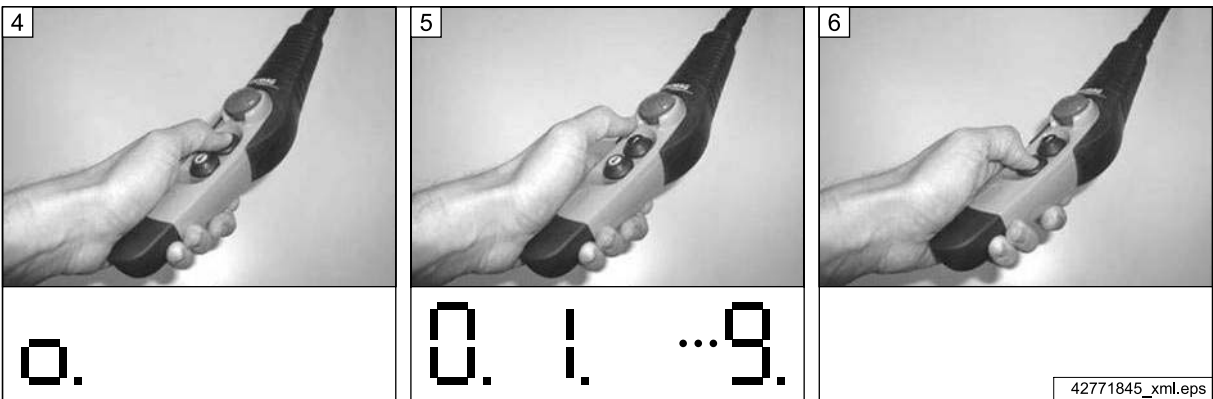


Fig. 40

4th step: "P." disappears after approx. 2 seconds. Press the "Lifting" button again and hold it down until "o." (for O.K.) is displayed.	5th step: Release the button. Parameter programming mode is now active. When parameter programming mode has been activated, figures "0." to "9." are each successively displayed for 2 seconds.	6th step: Press the "Lowering" button to scroll through the menu items faster. Each figure represents a parameter, see ⇒ "Meaning of the parameters", Page 60.
7-segment display: o.	7-segment display: 0. → 1. ... 9.	7-segment display:

Tab. 43

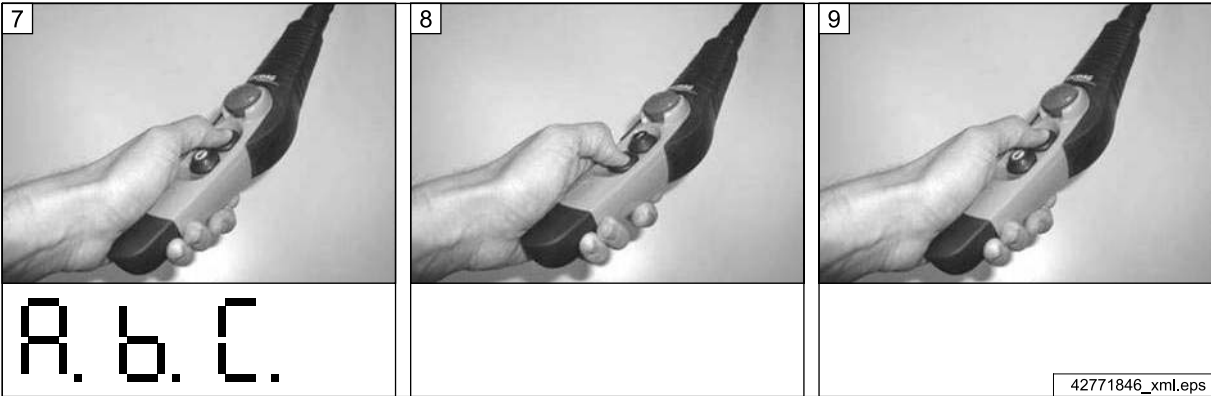


Fig. 41

7th step: Press the "Lifting" button to select the currently displayed parameter. The value selection menu for the parameter opens at the same time. The currently set values are symbolically displayed with the characters "A.", "b.", "C." etc. For the meaning of the characters, see ⇒ "Meaning of the parameters", Page 60.	8th step: To set a different value, press the "Lowering" button until the required value is shown in the display.	9th step: The value is again selected by using the "Lifting" button, the system then also returns to parameter selection mode.
7-segment display: A. b. C.	7-segment display:	7-segment display:

Tab. 44



Fig. 42

10th step: The unit returns to normal operating mode when the "Emergency stop" button is pressed. All changes are first saved.
7-segment display:

Tab. 45

5.12 Adjusting the lower hook position

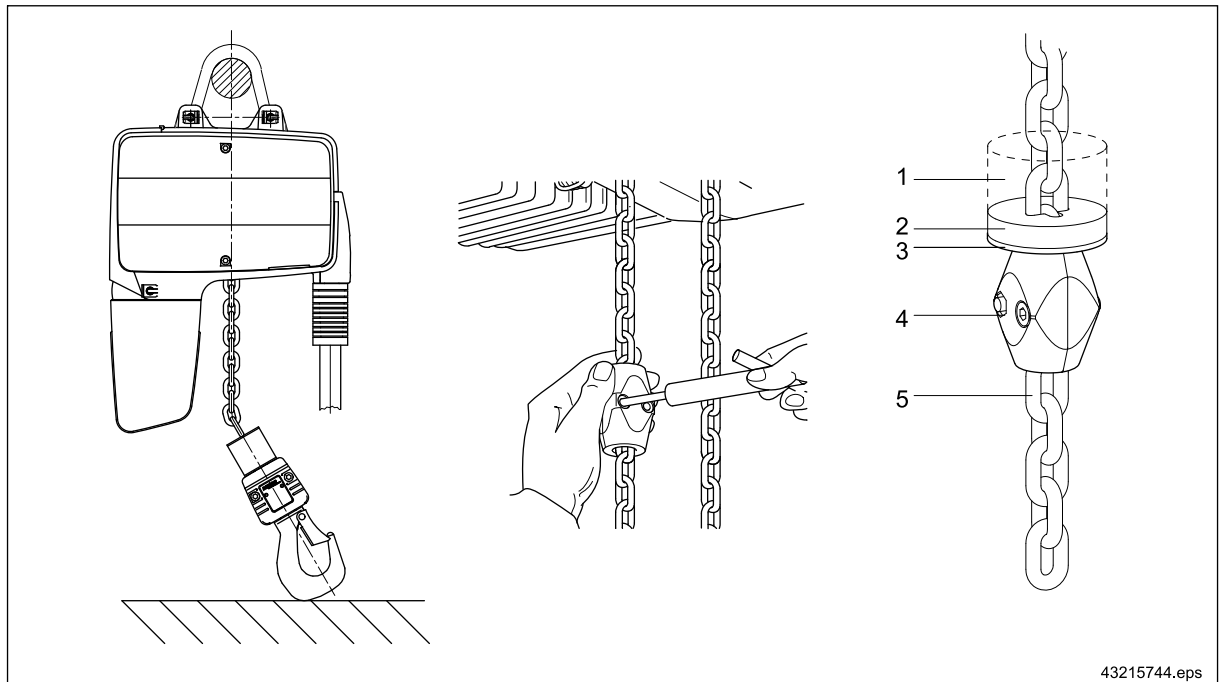


Fig. 43

Item	Designation	Item	Designation
1	Buffer (limit switch option)	4	Limit stop
2	Damping plate	5	Unloaded chain fall
3	Buffer plate		

Tab. 46

Ensure that the hook assembly touches the ground in the lower hook position when determining the hook path/lifting height. The chain hoists are provided with a hook path of 5 m or 8 m as standard.



Secure the limit stop to the 5th link at the dead (unloaded) end of the chain.

- Follow the order of assembly. See also ⇒ "Buffer arrangement", Page 106

Tightening torques [Nm]	DC-Pro 1	DC-Pro 2	DC-Pro 5	DC-Pro 10	DC-Pro 15
Limit stop	4,0		4,3		

Tab. 47

To reduce the hook path, proceed as follows:

1. Position the hook as shown in the diagram.
2. Stop the chain hoist by actuating the emergency stop or the mains connection switch and secure it against switching on again.
3. Remove the chain collector box ⇒ "Removing the chain collector box", Page 83.
4. Remove the limit stop on the chain collector box end.
5. Attach the limit stop directly behind the damping plate. The unloaded chain fall behind the limit stop must consist of at least 5 chain links.
6. Place the chain in the collector box and re-connect it to the chain hoist.
7. Switch the chain hoist on and check adjustment of the lower hook position by moving the hook and run the chain once through over entire adjusted hook path.

6 Putting into service for the first time

6.1 Safety instructions when putting into service for the first time

The machine may only be handed over when its safety has been verified by means of a corresponding check
⇒ "Checks on entering service, handover", Page 65.

WARNING



Safe operation of the machine is not yet ensured when it is first put into operation.

Machines may only be put into service if they have been installed/assembled according to the assembly instructions.

- Machines may only be put into operation by qualified personnel.
- Check installation/operation of the safety devices before commissioning.
- Check to ensure that the mains voltage and frequency match the details specified on the rating plate.
- Move the trolleys by hand and check that they can be moved without resistance by hand over the entire length of the track section (if fitted).
- Ensure sufficient working clearance before starting assembly work.
- Secure and fence off the working and danger zone.
- Wear protective equipment.

Only trained personnel may be employed when the installation is first put into operation since:

- it may be necessary to render safety devices or features inoperative when adjustments or function checks are carried out,
- work may need to be performed in the danger zone when the installation is first put into operation.

6.2 Inspection regulations

WARNING



Non-compliance with operating and maintenance regulations

Danger to life and limb.

Compliance with all inspection regulations is an essential aspect of ensuring safe operation of the machine.

Required tests and inspections must be carried out.

All inspections must be arranged and documented by the owner at the specified intervals/points of time.

- Inspection in accordance with relevant national regulations, e.g. UVV/BGV D6 for cranes; UVV/BGV D8 for winches, hoists and towing devices in Germany.

The owner is responsible for ensuring that power-driven chain hoists are inspected by an expert engineer before they are first put into service and before they are put into service again after major modifications have been carried out. This also applies to manually operated or semi-powered chain hoists that have a load capacity of more than 1000 kg.

- Adjustment, maintenance and inspection activities and inspection deadlines including specifications concerning the replacement of parts/assemblies prescribed in the operating instructions must be observed.
- Please refer to ⇒ "Noise emission/sound pressure level", Page 26 for sound pressure level measurement values to DIN 45 635.

This work may only be carried out by specialist personnel.

6.3 Inspections before putting into service for the first time

The owner is obliged to carry out the following checks before the unit is put into operation for the first time:

Activity	Section	Check
Check continuity of the PE conductor connection	-	X
Check emergency stop device	-	X
Check direction of movement	⇒ "Mains connection", Page 50	X
Check 7-segment display	⇒ "7-segment display for operating status and fault display", Page 30, ⇒ "Software version, operating hours, number of cycles, operating statuses", Page 31	X
Check chain lubrication (under arduous conditions, the chain must be lubricated more frequently)	⇒ "Available hoist chains", Page 89	X
Check function of the lifting motion operating limit switch	⇒ "Checking operating limit switches", Page 83	X
Check function of the lowering motion operating limit switch	⇒ "Checking operating limit switches", Page 83	X
Check cut-off buffer/cut-off spring/operating limit switch actuator	⇒ "Checking the cut-off buffers/cut-off springs", Page 105, ⇒ "Checking the operating limit switch actuator", Page 84	X
Check control cable and control pendant housing for damage	-	X
Check operation of the brake	-	X
Check hook and hook safety catch	⇒ "Checking the load hook", Page 96	X

Tab. 48

6.4 Checks on entering service, handover

WARNING



Unauthorised operation

Danger to life and limb if the machine is operated without previous inspection.

Machines may only put into service if they have been checked for compliance with the corresponding accident prevention regulations.

By means of suitable measures carried out by the owner or on his behalf, the owner must ensure that the load handling attachments and machinery ready for operation function in complete safety before they are first put into service. The specified measures must allow for the static and dynamic features of the machinery.

The following checks must be carried out when the installation enters service:

- The supporting structure must be in good condition and the load capacity of the chain hoist must be checked.
- Safety devices must be complete and effective.
- Clearances and safety distances must be maintained.
- The emergency-stop device must be checked by actuating the emergency stop.

When the unit is first put into operation, it must be checked to ensure that it is used as intended in all possible applications, in each case with the maximum permissible load. Operation of the safety devices must be checked (e.g. by lifting an overload). At the same time, the behaviour of the chain hoist must be checked when it is not used correctly.

Various checks of the machine must be carried out before it is handed over:

- Check to ensure it is suitable for operation
- Acceptance inspection

The test and inspection records can be compiled as soon as safe operation of the chain hoist is ensured. The test and inspection records (test and inspection booklet; observe relevant national regulations) must be handed over when the machine is handed over.

The machine may be used as intended after it has been handed over.

7 Operation

7.1 Safety instructions for operation

WARNING



Inappropriate operation

Risk of injury due to inappropriate operation.

Incorrect operation may result in severe injury or damage to property. The equipment may only be operated by authorised and instructed personnel in compliance with all accident-prevention and safety regulations. National regulations for the use of cranes and lifting appliances must be observed and followed.

- The owner must arrange for operating personnel to be trained.

WARNING



Crushing hazard

There is a risk of injury due to parts of the body being crushed/sheared or clothing or hair becoming entangled when loads are lifted or lowered.

- Do not touch the chain.
- Do not reach between the upper and lower chain entry point.
- Do not reach into the area of the Manulift coupling when the quick-release coupling is connected.
- Do not reach between the load hook opening and the load handling attachment when loads are lifted.
- There must be nobody present in the immediate danger zone when the load is set down.

WARNING



Risk of burns

There is a risk of burns from contact when the chain hoist is in operation.

Do not touch hot motor housings.

WARNING



Suspended load. Falling parts.

Danger to life and limb if lifted loads are dropped.

Keep out of the danger zone at all times

- Keep a sufficient safety distance.
- Never step under a suspended load.
- Loads must not be lifted above persons.
- Wear protective equipment.

WARNING



Non-compliance with operating regulations/industrial safety regulations

Danger to life and limb if relevant regulations are disregarded.

Machinery may only be operated in compliance with relevant national operating regulations, e.g. BGV D6 (VBG 9) for cranes in Germany.

- If required, apply a copy of the relevant operating regulations, part no. 214 748 44, at a suitable place where operators can read them at any time (e.g. at the mains connection switch).

The machine must not be put into operation or must be taken out of service immediately if any defects or irregularities relating to operating safety and reliability or functions are detected.

Safety devices must not be rendered inoperative or modified contrary to their intended use.

Ensuring safe operation

Special local conditions or special applications may lead to situations which were not known when this chapter was written. In this case, the owner must ensure safe operation or take the machine out of service until measures for safe operation have been clarified and implemented in agreement with Demag or other responsible bodies. In the event of a stoppage (e.g. if defects regarding safe and reliable operation are detected, in emergency situations, in the event of operating malfunctions, for repairs and maintenance purposes, if damage is detected or after finishing work), the operator must carry out all prescribed safety measures or observe that they are automatically carried out. Work on electric equipment may only be carried out by qualified electricians.

7.2 Switching on

7.2.1 Checks when starting work

Before putting the machine into operation, the operator must be satisfied that it is in safe and correct operating condition.

Ensure that nobody is endangered by operation of the machine before it is switched on or put into operation. If the operator notices persons who may be exposed to a risk to their health or personal safety by operation of the installation, he must stop operation immediately and may not resume operation until the persons are outside the danger zone.

The chain hoist must be taken out of service without delay if there are any defects which endanger safe and reliable operation. Defects relevant to safety in this sense are, for example:

- Damage to electric devices, cables or insulation,
- Delayed operation or failure of brakes and safety devices,
- Missing covers or housing parts or
- Damage to the chain or to supporting parts.

Anybody who identifies an immediate danger of personal injury must actuate the emergency stop without delay. This also applies if damage occurs to parts of machinery or equipment which makes an immediate stoppage necessary. If the chain hoist has been stopped by an emergency stop due to safety-related defects, it must be secured against being returned to operation until an experienced technician is satisfied that the cause of the hazard situation has been eliminated and that operation of the machine is possible without any hazard.

Before starting work:

- Wear protective equipment.
- Ensure that nobody is present in the danger zone of the equipment.

7.2.2 Function checks

Instructions for users where the BGV D06 accident prevention regulations apply:

In accordance with BGV D06, the crane operator must also check operation of the emergency-stop device when he or she starts work. This does not apply to slipping clutches used as an emergency-stop device which do not need to be checked when work begins (BGV D06, Section 30). DC chain hoists are fitted with a slipping clutch as an emergency-stop device which does not need to be checked by the crane operator, therefore a device to by-pass the limit switches which are approached during normal operation is not fitted.

The following main functions of the machine must be checked before work begins:

Activity	Section	Check
Check emergency stop device	-	X
Check 7-segment display	⇒ "7-segment display for operating status and fault display", Page 30, ⇒ "Software version, operating hours, number of cycles, operating statuses", Page 31	X
Check chain lubrication (under arduous conditions, the chain must be lubricated more frequently)	⇒ "Available hoist chains", Page 89	X
Check function of the lifting motion operating limit switch	⇒ "Checking operating limit switches", Page 83	X
Check cut-off buffer/cut-off spring/operating limit switch actuator	⇒ "Checking the cut-off buffers/cut-off springs", Page 105	X
Check control cable and control pendant housing for damage	-	X
Check operation of the brake	-	X
Check hook and hook safety catch	⇒ "Checking the load hook", Page 96	X

Tab. 49

7.3 Operation

7.3.1 General

DANGER



Danger of broken chain and falling load

The chain may break and loads may fall if the emergency limit position limiter is frequently approached.

The chain hoist slipping clutch provides the emergency limit position limiter function for chain hoists that are not fitted with an operating limit switch or which have a defective operating limit switch. This emergency limit position limiter may only be approached in exceptional cases, i.e. it must not be approached in normal operation. High additional loads occur in the chain when the slipping clutch is tripped.

For this reason, the "operating limit switch for lifting" function must be checked every day.

WARNING



Overload

Danger to life and limb.

Higher loads than those specified on the load capacity plate must not be handled.

- Do not exceed the maximum permissible load capacity of the hoist.
- Only use load handling attachments which are adequately dimensioned.
- Only use load handling attachments for their intended purpose.

WARNING



Movable parts may start moving.

Danger to life and limb.

The control pendant is designed to be suspended from its connecting cable. It may only be used as suspended equipment. It must not be deposited in/on transport containers, workbenches, etc., or in any other way.

Important information for operation

Observe the following during operation:

Safety during operation

- Take the machine out of service immediately if functional defects or irregularities are detected.
- The operator is obliged to check the machine for any visible damage at least once per shift and to report any damage immediately.
- Do not render safety devices inoperative.
- Do not approach limit stops in normal operation, e.g.: emergency-stop devices (emergency limit switches), emergency limit stop devices (slipping clutch or emergency limit switch), track and limit buffers to stop movement of the crab or crane, hook assembly or bottom block against limit stops. Continuously approaching these limits may result in severe damage and may even break the hoist chain.
- Pay attention to all regulations regarding the correct loading of chains.
- Do not reach into rotating parts and maintain a sufficient safety distance to prevent clothing, parts of the body or hair becoming entangled.

Load pick-up

- The load handling attachment and load must be flexibly suspended. Rigid connections cause uncontrolled forces to be transmitted and lead to fatigue fracture. To protect the chain from unwanted torsion when the load turns, movement of the hook assembly/bottom block must not be restricted.
- The bottom block must not be twisted or turned over for 2/1 reeving arrangements; chain links facing the same direction must be arranged opposite each other without being twisted.

- When attaching the load, ensure that the load or load attachment does not slip off the hook and that the load does not fall over, fall apart, slip or roll off when it is picked up or set down.
- When the load is lifted, the hook must move to an upright position to ensure that the safety catch is not subjected to a load by the load handling slings and, as a result, damaged.
- Do not use the equipment to transport persons.
- The load capacity specified on the load capacity plate indicates the highest permissible load, which must not be exceeded. This is the sum of the load to be lifted and the load handling attachment. Only approved load handling attachments may be used. The load capacity of the load handling attachment must not be exceeded.

Moving the load

- For lifting and travel motions, adopt a position that provides a clear view of the danger zone or use a second person who can observe the danger zone.
- Push-travel hoists/trolleys/cranes may only be moved by pulling or pushing the load, bottom block or load hook assembly. Never pull on the control pendant.
- Push-travel loads must be guided by hand. The load must never be thrown or hurled.
- Do not handle suspended loads above persons.
- Do not pull or drag suspended loads at an angle. The chain drive mechanism may be damaged at angles of 4° or more.
- Do not pull free fixed or obstructed loads with the chain hoist.
- Do not leave suspended loads unsupervised.
- Do not allow the chain to pass over edges and do not use the chain as a load bearing sling.
- Do not allow loads to drop when the chain is in a slack condition.
- Vibration from the load being transported (e.g. when the load is deposited on vibrating machinery) must not be transmitted to the lifting equipment.
- Chain hoists must be suspended in such a way that they do not collide with stationary equipment and structures, e.g. when slewing cranes are turned.
- Do not pick the load up at full speed.
- Avoid inching (e.g. giving short pulses to the motor).

Load distribution

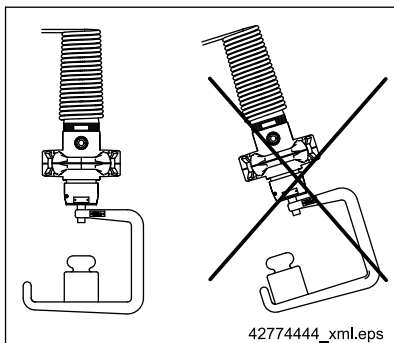


Fig. 44

WARNING



Load may be dropped

The introduction of bending stresses will cause the load-bearing element to break and the load to be dropped in the long term.

The load must always be introduced into the Manulift unit below the centre of the quick-release coupling. This means that the switch must be suspended in an exactly vertical position also when a load is attached. In addition, no bending moments may be transmitted to the Manulift unit.



Fig. 45

Emergency-stop device operating function

When the emergency stop is actuated, the hoist motor is immediately disconnected from the electrical power supply, the mechanical brake is applied and it brings any movement to standstill.

Operation can only be resumed by unlatching the emergency stop when no lifting or lowering commands are applied (off-position interlock).

The effectiveness of the emergency-stop function depends on the good operating condition of the mechanical brake. Unusually long braking distances may indicate excessive wear of the brake. In this case, the brake must be inspected by an experienced technician without delay.

Slipping clutch operating function

The chain hoist is fitted with a slipping clutch that is tripped if an overload occurs. The brake is then automatically applied and the motor is switched off. Only lowering motion remains possible after the slipping clutch has tripped. Therefore, an overload cannot be lifted from the ground. A load that is already suspended can be safely deposited by actuating the lowering button. When the lowering motion has been completed, lifting is possible again. If the slipping clutch already trips at rated load, the slipping force must be measured by an experienced technician and re-adjusted, as required.

Lifting path limiter operating function

Only motion in the opposite direction remains possible after the lifting path limiter has tripped. The lifting path is limited by limit stops at the ends of the chain. Consequently, the slipping clutch acts as an emergency-stop device, the brake is automatically applied and the motor is switched off. A warning message is shown on the display if the emergency-stop device is tripped. Operating limit switch contacts prevent travel against the emergency limit stop device; they are actuated by elastic buffers on the limit stop and switch the motion off before the emergency limit stop device is reached.

CAUTION



Premature wear of the chain guide and chain.

Danger of falling load.

Avoid uneven loads on the chain falls. This results in damage to the chain guide and causes the chain to break.

Blocked chains or large play between the chain and the chain sprocket will destroy the chain guide.

- **Eliminate any knots or blockages in the chain before lifting/lowering.**

7.3.2 Manulift

Belt sling

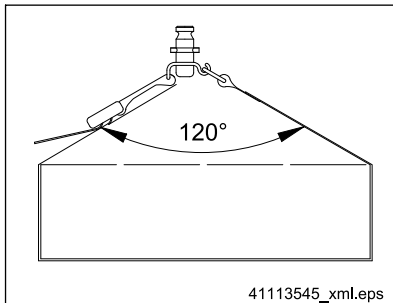


Fig. 46

CAUTION



Falling load

Observe the following to ensure that belt slings are used safely:

- Belt slings should uniformly support loads over their entire width
- The angle between the legs must not exceed 120°
- They must not be used for handling loads which have sharp edges or coarse surfaces
- Loads that have temperatures higher than 50° C must not be transported
- Belt slings must not come into contact with chemicals.

Belt slings are used for handling asymmetrical or large-area parts (e.g. discs). The loose end must be pulled to tighten the belt to ensure that the part to be handled cannot drop out. When the transport operation is finished, the loop can be released and the belt can be opened by raising the suspension eye.

Pantograph tongs

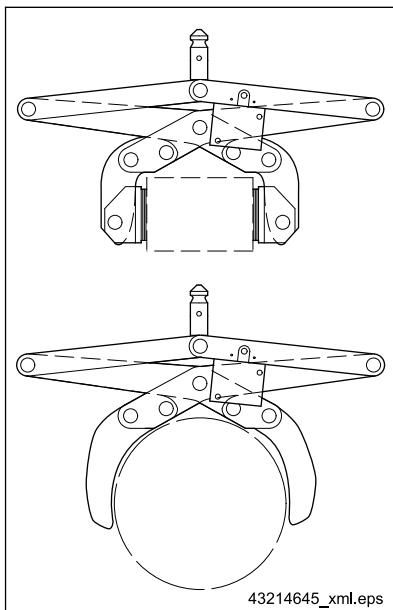


Fig. 47

CAUTION



Load falling out

Observe the following to ensure that pantograph tongs are used safely:

- Loads must always be picked up at their centre of gravity
- Jaw surfaces must be in full contact with the load or grip it from below
- Tongs must never be used for handling bar stock and compressible goods
- When pantograph tongs are used which hold the load by contact pressure (rubber-lined jaws), the surfaces of the loads to be handled must be free of oil or grease and must be dry
- The jaw capacity of the tongs must be suitable for the dimensions of the load to be handled. The permissible jaw capacity is indicated by a coloured mark.

To grip the load, the open tongs are set down on the part to be handled. This automatically unlocks the tongs. The jaws close and the load is gripped when the tongs are lifted.

To deposit the load, the tongs must be lowered until the jaws automatically lock in the open position. The open tongs can then be lifted off the load.

The tongs are locked and unlocked (opened and closed) by their own dead weight. The tongs do not need to be actuated by hand.

Open hook

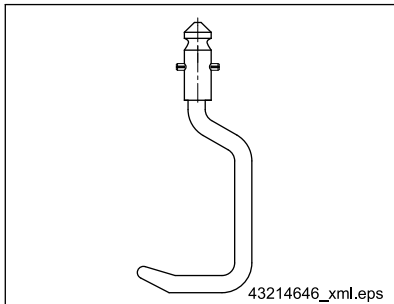


Fig. 48

CAUTION



Falling load

Observe the following to ensure that open hooks are used safely:

- Loads to be picked up must only be supported by the horizontal part of the hook to prevent them from slipping off.
- The hook throat must remain horizontal even under load.
- Loads must never be handled with the tip of the hook.

7.4 Emergency stop

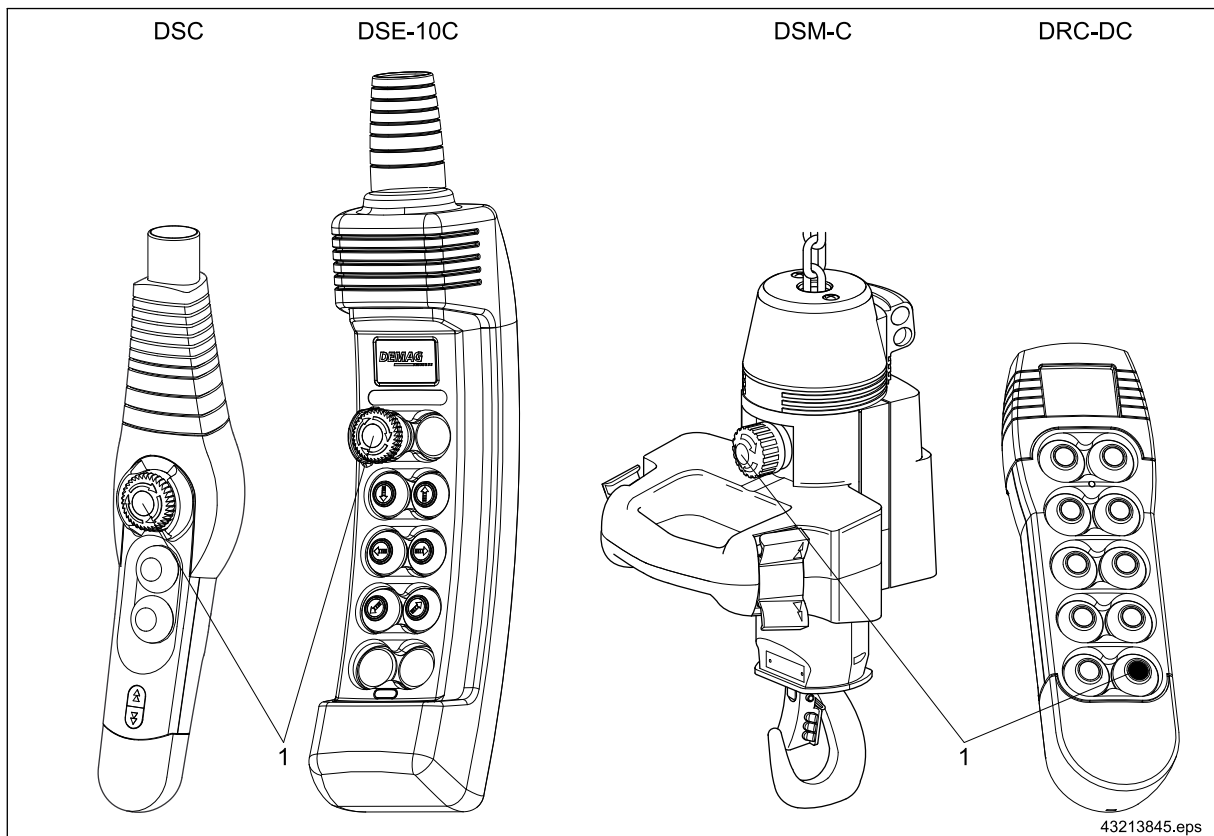


Fig. 49 Position of the emergency stop (1)

WARNING



Unauthorised, negligent or accidental switching-on.

Danger to life and limb.

Check to ensure that the reason for the emergency stop has been eliminated before the machine is switched on again.

The emergency-stop device must not be used to switch the machine off in normal operation.

Every chain hoist is fitted with an emergency-stop device with which all motions can be stopped in the event of a hazard.

The emergency-stop button is arranged in a clearly visible position on the control pendant. Anybody who identifies an immediate danger of personal injury must actuate the emergency stop without delay. This also applies in the case

of damage that occurs to parts of the machine and equipment which makes it necessary to stop and secure the machine immediately.

- To actuate the emergency stop, press the button until it reaches the end stop. It then locks automatically and the chain hoist is shut down.
- To unlock the actuated emergency stop, turn the pushbutton in the direction of the arrows (clockwise) and release it.

Following an emergency stop, do not switch the machine on again until a trained person is satisfied that:

- the cause which led to actuation of this function has been rectified and
- continued operation of the machine constitutes no further hazard.

Control pendant

Demag chain hoists can be equipped with various control pendants, as required. Refer to the relevant documents for operation of the control pendant and button assignments, see ⇒ Tab. 3, Page 7.

7.5 Taking out of operation

7.5.1 Taking the unit out of service when faults occur

The machine must be switched off immediately if the following faults occur:

- If electric devices and cables as well as parts of the insulation are damaged.
- Brake and safety device failure.

7.5.2 Taking the unit out of service at the end of the shift

The following measures must be taken when finishing work or leaving the working area:

- Position the hoist unit outside the travel area.
- Move the unloaded hoist unit into its resting position.
- Actuate the emergency stop.
- Switch the hoist unit power supply off at the mains connection or isolating switch.



The chain hoist must be disconnected from the power supply when finishing work or leaving the working area. However, if the chain hoist is continuously connected to the power supply, the following must be considered:

- The chain hoist is not protected against unauthorised or accidental switching-on and, therefore, it is not protected against unintended movements.
- Damage may be caused by an electrical surge if lightning strikes.
- The power-supply line and the electrical cabling and wiring must be checked with particular care and at shorter intervals.
- The control system of the chain hoist consumes approx. 1,1 VA when at standstill.

7.5.3 Taking the unit out of service for maintenance and repairs

1. Switch off the mains connection switch or isolating switch before commencing maintenance work.
2. Secure the mains connection switch with a padlock to prevent unauthorised or accidental reconnection to the supply.
3. Only carry out maintenance work on the chain hoist when the load has been removed.
4. Stop all moving parts and ensure that they cannot start moving while maintenance work is being carried out.
5. Observe the relevant accident prevention regulations, instructions concerning intended use and statutory regulations for operation and maintenance.
6. Observe relevant safety regulations when repairing electric equipment.

8 Maintenance/repair

8.1 Safety instructions for maintenance and repair work

The following sections contain a description of maintenance work that is necessary for optimum and uninterrupted operation of the equipment.

DANGER



Live components

Danger to life and limb.

Work on electric equipment may only be carried out by qualified specialist personnel (⇒ "Definition of personnel", Page 9) in compliance with the safety regulations.

Switch off the electric power supply before starting work. The mains connection or isolating switch must be protected against unauthorised or accidental restoration of the power supply by means of a padlock.

WARNING



Risk of burns

Risk of burns from contact after the chain hoist has been in operation.

Do not touch hot motor housings. Allow the motor to cool down before performing any maintenance or repair work.

WARNING



Inappropriate maintenance work

Danger to life and limb. Risk of material damage.

Maintenance and repair work may only be carried out by authorised, instructed personnel (⇒ "Definition of personnel", Page 9) in compliance with the safety regulations.

- Secure and fence off the working and danger zone.
- If an elevating work platform is used for maintenance work, only use appropriate attachments for the lifting of persons which ensure that work is carried out in a safe and stable position.
- Only suitable, tested and calibrated tools and accessories may be used for maintenance work.
- Only use approved spare parts, see also ⇒ "Use of spare parts", Page 9.
- Wear protective equipment.
- Be careful when working on open components that have sharp edges. Risk of injury.
- Keep the working area clean and tidy. Store any unneeded machine or installation parts and tools in such a way that there is no risk of them falling.
- Fit components correctly and as intended. Comply with specified bolt tightening torques. Incorrectly fitted components may fall and cause severe injuries.
- Welding work may only be carried out by persons who are specially qualified. DIN welding work requirements must be fulfilled. The electrode holder and earth must be connected to the same assembly when welding work is carried out. Otherwise serious damage may be caused to the hoist. Trolleys must not be welded or drilled.
- Customer-specific regulations must be observed.

CAUTION



Loose connections

Loose connections are a danger to life and limb and a risk of damage to the machine.

Metal nuts featuring a locking element (self-locking nuts) are mainly used for Demag chain hoists.

- Self-locking nuts must not be replaced by other types of nut.

CAUTION



Risk of injury.

Oils and lubricants may pose a health hazard.

Contact with these media may result in serious damage to health (poisoning, allergies, skin irritations, etc.).

CAUTION



Risk of injury.

Leaking oils and lubricants are hazards due to the increased risk of slipping.

Spilt oils and lubricants must be absorbed immediately by means of sawdust or oil absorbent and disposed of in an environmentally compatible way.

8.2 Basic maintenance requirements

General information on maintenance/repairs

The specified inspection and maintenance intervals (\Rightarrow "Maintenance schedule", Page 80) apply to normal chain hoist operating conditions. All wearing parts must be checked in the course of the annual inspection.

If routine maintenance reveals that the intervals are too long, they should be adapted to the specific operating conditions.

Electric components

Only fuse links with the specified amperage and tripping characteristics may be used in the electric circuits. Defective fuse links must not be bridged.

Pay attention to the following when working on machinery or machine equipment:

1. Wear personal protection equipment.
2. Before starting any maintenance work, switch off the mains connection switch and protect it against unauthorised or accidental reconnection to the power supply by locking it with a padlock.
3. Ensure that the chain hoist is switched off, checked that it is de-energised and, in special cases, isolated.
4. Only carry out maintenance work on the chain hoist when the load has been removed.
5. Ensure that there is sufficient freedom of movement. Keep the working area clean and tidy. Loose parts or tools left lying around may cause accidents.
6. Stop all moving parts and ensure that they cannot start moving while maintenance work is being carried out.
7. Observe the relevant accident prevention regulations, instructions concerning appropriate use and statutory regulations for operation and maintenance.
8. Observe the relevant safety regulations when repairing electric equipment.
9. Reinstall safety devices as required by relevant regulations and check them for correct operation after finishing maintenance work.

Maintenance work which is not possible from the ground may only be carried out from work stands or platforms. The danger zone below the chain hoist must be fenced off if there is a risk of falling objects.

Instructions for maintenance work in the course of operation

If maintenance work has to be carried out on the chain hoist in the course of operation, special safety precautions must be taken depending on the operating situation. In each individual case, the owner or the person assigned by him must check whether the maintenance work may be carried out in the course of operation without risk of personal injury and, taking into account the local conditions, must implement all necessary safety precautions.

Replace damaged or deformed spring clip fasteners and split sleeves.

Defective bolted connections must be replaced.

Ensure that operating and auxiliary materials and replaced parts are disposed of in an environmentally friendly manner.

After finishing maintenance work

Re-install safety devices as required by relevant regulations and check them for correct operation after finishing maintenance work.



Carry out a test run at partial load after the chain hoist has been fully re-assembled. Ensure that the chain runs smoothly during the test run.

8.3 Regular inspections

8.3.1 Required tests and inspections

WARNING



Non-compliance with operating and maintenance regulations

Danger to life and limb.

Required tests and inspections must be carried out.

- An annual inspection, e.g. as specified in German accident prevention regulations UVV/BGV D8 Section 23 (2) and BGV D6 (1) must be carried out.
- Adjustment, maintenance and inspection activities and inspection deadlines including specifications concerning the replacement of parts/assemblies prescribed in the operating instructions must be observed.

This work may only be carried out by specialist personnel.

Hoists and cranes must be inspected by an experienced technician at least once a year. Regular inspections mainly consist of a visual inspection and a function check which should include a check to determine the condition of components and equipment regarding damage, wear, corrosion or other alterations and a check to determine the integrity and efficiency of safety devices.

The regular inspection must be carried out in accordance with BGV D6 and BCG 905 "Principles for the inspection of cranes" in Germany.

It may be necessary to remove parts in order to inspect wearing parts. Defective parts and components and parts close to failure must be replaced.

Load-bearing media and suspensions must be inspected along their entire length, including those parts which cannot normally be seen. A function and brake test with a load (test load that is close to the maximum permissible load capacity) must be carried out.

Please also see ⇒ "S.W.P. measures for achieving safe working periods", Page 77 and ⇒ "Maintenance schedule", Page 80.



Updating the test and inspection booklet

- All inspections must be arranged and documented in the test and inspection booklet by the owner.

8.3.2 Service life of the contactor

The switchgear is subject to wear when the chain hoist is operated. Its service life has been rated for the specified loading group. Premature wear may occur if units are frequently started and stopped.

DC-Pro chain hoist	Motor size	Display value C for U_{nom} 380 - 575 V	Display value C for U_{nom} 220 - 240 V
1	ZNK 71	80	80
2		80	60
5	ZNK 80	60	50
10	ZNK 100 A	50	20
10 / 15	ZNK 100 B	20	-

Tab. 50

Display value C specifies the expected service life of the contactor multiplied by 100000. This value was determined under normal operating conditions. For other conditions, the service life of the contactor may be shorter or longer, ⇒ "Software version, operating hours, number of cycles, operating statuses", Page 31.

We recommend that the contactor or the control module be replaced when the relevant display value has been reached, ⇒ "Replacing the contactor on the control board", Page 113.

8.3.3 S.W.P. measures for achieving safe working periods

8.3.3.1 General

The safety and health provisions of the EC Machinery Directive make it a legal requirement to eliminate special hazards which may be caused, for example, by fatigue and ageing.

This requirement is also reflected in the third supplement to German accident prevention regulations UVV/BGV D8 (VBG 8) of 1.4.1996.

This requirement obliges the owner of serial hoist units to determine the actual duration of service of the chain hoist on the basis of the operating hours, load spectra and/or recording factors. This is based on FEM 9.755/06.1993 Measures for achieving safe working periods for powered serial hoist units (S.W.P.).

The objective of this rule is to determine measures for achieving safe working periods over the entire duration of service, although, according to the state-of-the-art, the hoist units are designed for specific periods of operation. Premature failure cannot, however, be ruled out.

The following items have been taken from FEM rule 9.755 with reference to the electric chain hoist:

1. The actual duration of service determined on the basis of operating time and load must be documented at least once per year.
2. Operating time T_i (number of operating hours) can be estimated or read on an elapsed time indicator.
3. Load k_{mi} (load spectrum) must be estimated.
4. The value determined for operating time T_i using an elapsed time indicator must be multiplied by the type of recording factor $f = 1,1$.
5. The value determined for the estimated operating hours and load spectrum must be multiplied by the type of recording factor $f = 1,2$.
6. The actual duration of service S is calculated as: $S = k_{mi} \times T_i \times f$
7. A general overhaul must be carried out when the theoretical duration of service is reached.
8. All checks and inspections and the general overhaul must be arranged by the owner of the hoist unit.

A general overhaul is defined as:

Inspection of the machinery for the purpose of detecting all defective components and/or components and parts close to failure and the replacement of all such components and parts. Following a general overhaul, the machinery is in a condition similar to that of the same machinery in new condition as far as the principle of operation and performance values are concerned.

For electric chain hoists classified according to FEM 9.511, the following theoretical durations of service apply (converted into full load hours):

Group of mechanisms	1Cm	1Bm	1Am	2m	2m+	3m	4m
Duration of service/full load hours [h]	200	400	800	1600	1900	3200	6300

Tab. 51

The actual duration of service is considerably increased if the chain hoist is only operated with partial loads. For a hoist unit operated on average with half load, for example, this results in an 8-fold increase in the actual duration of service; with operation at one quarter of the full load, a 64-fold increase.

8.3.3.2 Calculating the actual duration of service S

The actual duration of service S of the electric chain hoist can be determined as follows:

$$S = k_{mi} \times T_i \times f$$

k_{mi} : Actual load spectrum factor

T_i : Number of operating hours

f : Factor depending on the type of recording

Calculating the number of hours of operation (operating time) T_i (by the owner)

The operating time can be calculated by means of an elapsed time indicator or according to the following method:
Operating time per inspection interval:

$T_i =$	$\frac{(\text{lifting} + \text{lowering}) \times \text{cycles/h} \times \text{operating time/day} \times \text{days/inspection interval}}{60 \times \text{hoist speed}}$
---------	--

Tab. 52

Only lifting and lowering movements are counted, long and cross-travel times are not considered.

Estimating load spectrum factor k_{mi} (by the owner)

To simplify estimation, each type of load can be grouped together into k_m load spectrum modules. The types of load are simplified and quoted as 1/4, 1/2, 3/4 load and full load.

Dead loads are added to the loads. Loads up to 20% of the rated load capacity are not considered.

The operating time for each type of load is divided up within the inspection interval (e.g. 1 year) in terms of percentage.

The following bar diagram shows the k_m load spectrum modules for the load conditions without load up to full load in time increments of 5 and 10%. Larger shares of the time period must be correspondingly added together.

Load spectrum factor k_{mi} can be obtained by adding together the individual k_m load spectrum modules.

Diagram

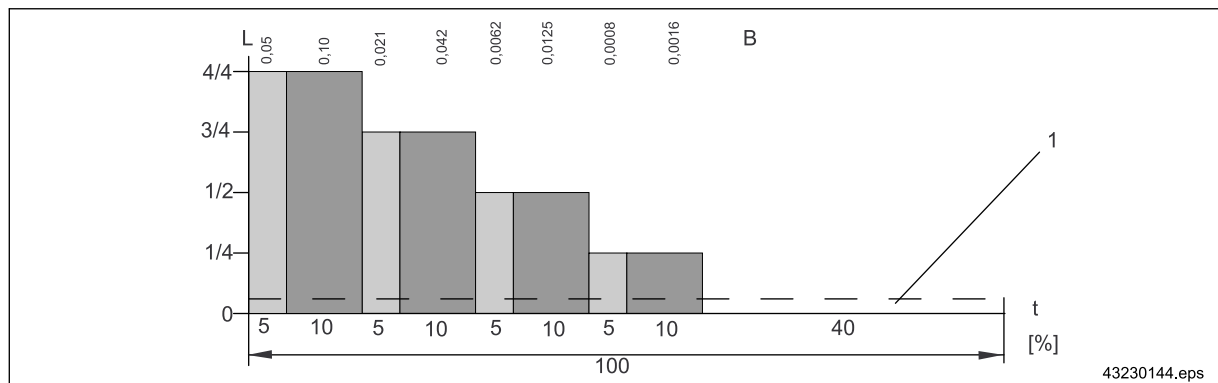


Fig. 50

B	Load	L	Load	t	Time	1	Dead load
---	------	---	------	---	------	---	-----------

Tab. 53

Factor depending on the type of recording

- $f = 1,1$

For calculating the operating hours using an elapsed time indicator (included in the DC-Com standard scope of delivery).

- $f = 1,2$

For estimating the operating hours and the load spectrum.

8.3.3.3 Example: DC-Pro 10-1250 1/1 H5 V8/2 in 1Am

Lifting speed	8/2 m/min
No. of cycles per hour	10 cycles/h
Lifting and lowering	(2+2) m/cycle = 4 m/cycle
Operating time per day	8 h/day
Days per inspection interval	250 days/inspection interval

Tab. 54

Calculation

$$T_i = \frac{10 \cdot 4 \cdot 8 \cdot 250}{60 \cdot 8}$$

Tab. 55

With operating time read: 167

With operating time estimated: 166,6

In the operating time as read/estimated above, the chain hoist has transported the following loads:

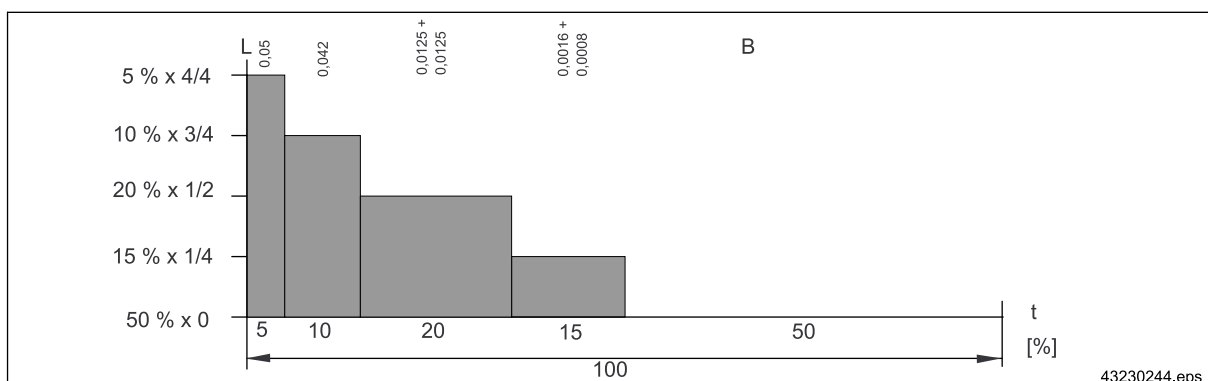


Fig. 51

B	Load	L	Load	t	Time
---	------	---	------	---	------

Tab. 56

Adding the load spectrum modules k_m together results in the load spectrum factor $k_{mi} = 0,119$

Thus, the actual duration of service amounts to $S [h] = k_{mi} \times T_i \times f =$

- With operating time read $0,119 \times 167 \times 1,1 = 21,9$
- With estimated operating time $0,119 \times 166,6 \times 1,2 = 23,8$

For classification in FEM group of mechanisms 1Am (see DC-Pro data plate) with a theoretical duration of service of 800 hours (see table below) the hoist has a theoretical remaining duration of service of

- With operating time read 778,1 hours
- With estimated operating time 776,2 hours

Documentation:

Enter these values in your test and inspection booklet or crane installation test and inspection booklet. This entry may appear as follows:

Date		Operating hours	Load [%] km factor					Load spec- trum factor		Actual duration of service	Theoretical duration of service	Remaining use
From	To	T_i value [h]	full	3/4	1/2	1/4	none	k_{mi}	f	S [h]	D [h] Group of mech.	D - S [h]
3.1.-	30.12.-	Read 167	5	10	20	15	50	0,119	1,1	21,9	800/1Am	778.1
			0,05	0,042	0,025	0,002	-					
3.1.-	30.12.-	Estimated 166,6	5	10	20	15	50	0,119	1,2	23,8	800/1Am	776,2
			0,05	0,042	0,025	0,002	-					

Tab. 57

8.3.4 GO general overhaul



The chain hoists are designed for a period of use of at least 10 years until the first general overhaul is carried out. This is based on the condition that the specified group of mechanisms is not exceeded by the actual duration of service. When the actual duration of service has reached the theoretical duration of service relevant for the given group of mechanisms, further operation of the chain hoist is only permitted after a general overhaul has been carried out.

The theoretical duration of service D (hours at full load h) depends on the Group of Mechanisms classification of the chain hoist. The actual duration of service should be determined every year according to FEM 9.755. You can arrange to have the actual service life calculated as part of the annual inspection by our after-sales service.

The owner must arrange for a GO general overhaul to be carried out when 90% of the theoretical duration of service has elapsed – if the chain hoists are correctly classified after 8 to 10 years. A general overhaul must be carried out by the end of the theoretical duration of service.

During the general overhaul, the following parts must be replaced in addition to the checks and work specified in the inspection and maintenance schedule:

- Gearbox housing with installed gear parts,
- Gear oil and gearbox cover with seal,
- Connecting elements,
- Shaft sealing rings, bearings, plugs,
- Brake.

The small parts (screws, washers, etc.) to be replaced when maintenance and assembly work is carried out are not listed separately. The general overhaul carried out by the manufacturer or a specialist company authorised by him satisfies the requirement to be met for continued operation of the chain hoist.

The requirements of relevant accident prevention regulations and BGV D8 (VBG 8) are, therefore, satisfied.

The installation may continue to be used when an expert engineer has entered the conditions for further utilisation into the test and inspection booklet. Completion of the general overhaul must be confirmed in the test and inspection booklet and a further period of utilisation in accordance with FEM 9.755 must be entered.

8.4 Maintenance schedule

Activity	Section	Before first putting into operation	Before starting work	During the annual inspection
Check continuity of the PE conductor connection	-	X		
Check emergency stop device	-		X	X
Check direction of movement	⇒ „Mains connection“, Page 50	X		
Check 7-segment display	⇒ „7-segment display for operating status and fault display“, Page 30, ⇒ „Software version, operating hours, number of cycles, operating statuses“, Page 31	X	X	
Check chain lubrication (under arduous conditions, the chain must be lubricated more frequently)	⇒ „Available hoist chains“, Page 89 ⇒ „Lubricating the hoist chain“, Page 94	X	X	X
Check function of the lifting motion operating limit switch	⇒ „Checking operating limit switches“, Page 83	X	X	X
Check function of the lowering motion operating limit switch	⇒ „Checking operating limit switches“, Page 83	X		X
Check cut-off buffer/cut-off spring/operating limit switch actuator	⇒ „Checking the cut-off buffers/cut-off springs“, Page 105 ⇒ „Checking the operating limit switch actuator“, Page 84	X	X	X
Check control cable and control pendant housing for damage	-	X	X	X
Check operation of the brake	-	X	X	X
Check hook and hook safety catch	⇒ „Checking the load hook“, Page 96	X	X	X
Read the C switching cycles	⇒ „Service life of the contactor“, Page 76			X

Activity	Section	Before first putting into operation	Before starting work	During the annual inspection
Read operating hours to determine the remaining safe working period	⇒ „7-segment display for operating status and fault display“, Page 30 ⇒ „S.W.P. measures for achieving safe working periods“, Page 77			X
Check electric switchgear and wiring	-			X
Check operation of the slipping clutch	⇒ „Checking the slipping clutch“, Page 111			X
Check adjustment of the slipping clutch	⇒ „Adjusting the slipping clutch“, Page 111	Every 10 years ⁴⁰⁾		
Check brake wear	⇒ „Brake“, Page 109	Every 10 years ⁴¹⁾ ⁴⁰⁾		
Grease brake V sealing ring				X
Check suspension, suspension bracket and securing elements (clip, etc.)	⇒ „Suspension“, Page 82			X
Check fastening bolts on hook assembly/bottom block	-			X
Check hooks for cracks, deformation and wear	⇒ „Checking the load hook“, Page 96			X
Check hook safety catch for deformation	-			X
Check hook bearing for wear	-			X
Check rubber lip in the bottom block	⇒ „Replacing the bottom block (standard for DC 10) with internal cut-off springs for 2/1 reeving“, Page 98			X
Check sprocket of chain guide, chain sprocket of bottom block, chain guide, guide plate	⇒ „Chain drive“, Page 85			X
Check that the chain and chain collector box are properly secured	-			X
Check the chain for deformation, damage, cracks, pitting, reduction in the thickness of the links or increase in pitch due to wear, elongation caused by deformation	⇒ „Checking the hoist chain“, Page 86			X
Check securing elements (clips, bolts, etc.) for tight fit and corrosion	-			X
Check and apply or supplement corrosion protection, as required	-			X
Check the electric enclosure and gearbox for leakage	-			X
Check trolley, crossbar and condition of buffers	⇒ „Checking the cut-off buffers/cut-off springs“, Page 105			X
Oil change	⇒ „Gearbox/oil change“, Page 112	Every 10 years ⁴⁰⁾		
Manulift				
Check the quick-release coupling (Manulift) for connection of the load handling attachment	⇒ „Checking the quick-change coupling“, Page 99	X	X	
Check automatic tongs to ensure they close and lock correctly (if fitted)			X	
Check colour marking for gripping range on the pantograph tongs			X	
Check load handling attachments for deformation, cracks, damage caused by corrosion, safety device malfunctions			X	
Check load and chain attachment in control unit (Manulift) including retaining bolts	⇒ „Manulift“, Page 99			X
The cylindrical pins fitted in the quick-release coupling (Manulift) must be checked for wear and breakage	⇒ „Checking the quick-change coupling“, Page 99			X
General overhaul				
The general overhaul should coincide with the annual inspection.		When 90% of the theoretical duration of service is reached ⇒ „S.W.P. measures for achieving safe working periods“, Page 77		
Fit chain hoist-specific Demag GO set		X		
The small parts (screws, washers ...) to be replaced when maintenance and assembly work is carried out are not listed separately. The checks and work specified in the inspection and maintenance schedule must be carried out during the general overhaul.				

Tab. 58

⁴⁰⁾ For use according to FEM classification

⁴¹⁾ DC-Pro 10 and DC-Pro 15 every 5 years

8.5 Maintenance work

8.5.1 Suspension

If a check or inspection reveals that these components are worn beyond the specified dimensions or if cracks can be seen in these parts, they must be replaced at once.

Suspension bracket

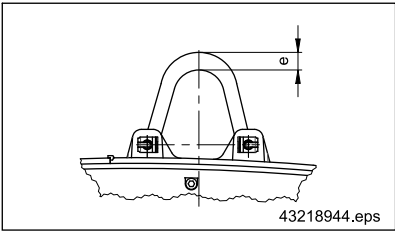


Fig. 52

Chain hoist	DC 1 / 2 / 5		DC 10		DC 15
Suspension bracket	short	long	short	long	long
Suspension bracket min. dimension e [mm]	15,3	14,4	25,2	24,3	31,5

Tab. 59

Suspension ring

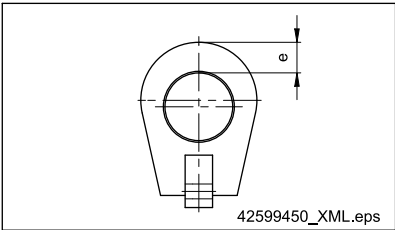


Fig. 53

Chain hoist	DC 1 / 2 / 5	DC 10	DC 15
Suspension ring turned 90° (chain hoist parallel to girder) min. dimension e [mm]	17,55	24,3	34,2

Tab. 60

8.5.2 Electric equipment cover

The electric equipment cover must be held in place when it is opened. Do not allow the electric equipment cover to fall against its retainer.
When the electrical equipment cover is closed again, ensure that the retainer does not snag and does not block the inspection window.

8.5.3 Removing the chain collector box



Fig. 54

- Unscrew and remove service cover (1).
- Place bag (2) with the control cable on the top of the chain hoist.
- Disconnect spring (3) and place it in the recess in the chain collector box.
- Remove retaining spring (4) from pin (5) and remove the pin. While doing so, hold the chain collector.
- Place chain collector box (6) on the ground.

8.5.4 Operating limit switches

8.5.4.1 Checking operating limit switches

DANGER



Danger of broken chain and falling load

The chain may break and loads may fall if the emergency limit position limiter is frequently approached.

The chain hoist slipping clutch provides the emergency limit position limiter function for chain hoists that are not fitted with an operating limit switch or which have a defective operating limit switch. This emergency limit position limiter may only be approached in exceptional cases, i.e. it must not be approached in normal operation. High additional loads occur in the chain when the slipping clutch is tripped.

For this reason, the "operating limit switch for lifting" function must be checked every day.

If an operating limit switch is defective, the hoist motor is switched off when the electronic speed monitoring function of the slipping clutch is tripped. For this reason, cut-off in the upper hook position is not a reliable indicator for correct operation of the operating limit switch. If cut-off by the operating limit switch fails, a warning message is output, see ⇒ "Warning messages", Page 119.

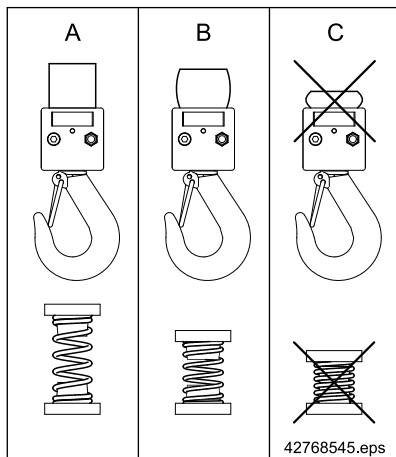


Fig. 55 Buffer with **limit switch not actuated** (A), buffer with **limit switch actuated** (B), **defective buffer** with limit switch actuated (C).

Checking the operating limit switch for lifting: raise the hook assembly or bottom block until it is approximately 10 cm below the highest hook position. Then raise it to the highest hook position at creep lifting speed until the chain hoist automatically switches off.

- **1/1 reeving:**

It must only be possible to compress the buffer or cut-off springs on the hook assembly by a small amount after the unit has switched off.

- **2/1 reeving:**

It must only be possible to compress the upper part of a bottom block with internal cut-off springs onto the lower part by a small amount so that approx. 20 mm of the black part of the bottom block remains visible.

It must also only be possible to compress the springs on a bottom block with external cut-off springs by a small amount after the unit has switched off.



If the buffer or cut-off springs are strongly compressed, it may be assumed that the hoist motor will not be switched off by the limit switch, but by the speed-monitoring function of the slipping clutch. This may cause the chain to break if the limit position is frequently approached.

Checking the operating limit switch for lowering

The "Operating limit switch for lowering" must be checked at least once per year.

Proceed as follows:

- Remove the chain collector box ⇒ "Removing the chain collector box", Page 83
- Check as described above for the "Operating limit switch for lifting".

Optional geared limit switch

If an optional geared limit switch is fitted, the hoist unit must be switched off before the bottom block or hook assembly come into contact with the chain hoist guide plate. To check this function, the upper hook position must be approached at high lifting speed (without a load). When the hoist unit has been switched off, there must be a minimum distance of at least 20 mm between the bottom block or hook assembly and the chain hoist guide plate.

8.5.4.2 Checking the operating limit switch actuator

The operating limit switch actuator must be checked for any external damage, e.g. a bent actuator plate.

8.5.5 Chain drive

8.5.5.1 Checking the sprocket wheel

Since the chain sprocket is usually replaced together with the chain set, no further check is necessary under normal conditions.
However, if you notice any uneven or harsh running in the chain drive mechanism, this may indicate wear.

8.5.5.2 Checking the chain guide

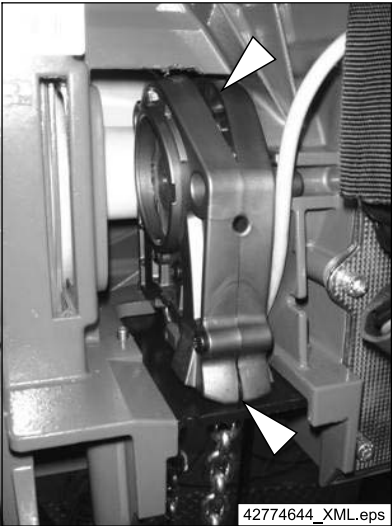


Fig. 56 Example of a defective chain guide

The chain drive can move easily on the drive shaft, i.e. lateral play of approx. ± 2 mm is normal. A defective chain guide must be replaced immediately:

- Open the service cover.
- Check the chain guide for any damage, e.g. ruptured guide section halves or loose bolts.

8.5.5.3 Checking the guide plate

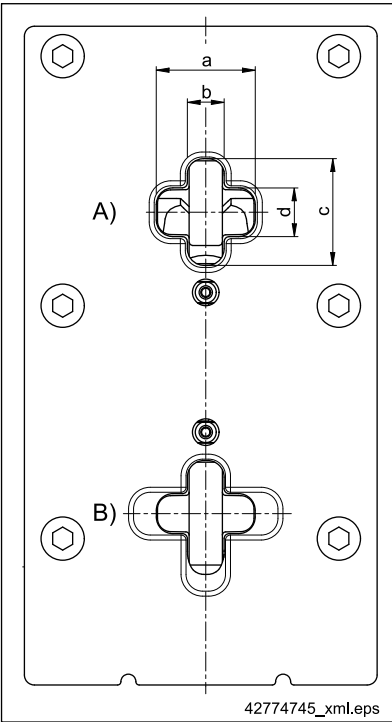


Fig. 57

Maximum guide plate dimensions [mm]	a	b	c	d
DC 1 / 2	16,0	5,5	16,8	6,8
DC 5	19,4	6,8	21,0	8,9
DC 10	26,7	9,4	28,8	12,0
DC 15	31,1	11,5	33,4	15,3

Tab. 61

If a check or inspection reveals that it is worn beyond the specified dimensions or if cracks can be seen on the guide plate, it must be replaced.

Multiple fitting and removal of the guide plate retaining bolts may damage the thread in the aluminium housing in such a way that a tight fit of the bolts can no longer be ensured. A "Guide plate accessories" set is available to do this (part no. 717 830 45), see also "DC 1 - 15 guide plate accessories" document \Rightarrow Tab. 3, Page 7.

8.5.5.4 Checking the hoist chain

Checking wear or deformation of the original Demag chain



In addition to selecting the correct hoist unit for the given application, owners of chain hoists are obliged by relevant regulations – such as DIN 685 part 5 – to check the round-section steel chain continuously in operation to ensure optimum operating safety and, therefore, to avoid any accidents.

For single-shift operation, operation according to FEM classification and for chain hoist operating conditions according to ⇒ "Operating conditions", Page 28, the chain should be checked once a year (see inspection and maintenance schedule).

If routine maintenance reveals that the intervals are too long, they should be adapted to the specific operating conditions.

Visual inspection of the chain



Fig. 58 Chain wear

Carry out a visual inspection of the chain before starting work. If the chain displays deformation, damage, cracks, pitting from corrosion, reduction in the link thickness or increase in pitch dimension due to wear or elongation as a result of plastic deformation, the chain must be replaced immediately.

Measuring wear or deformation of the original Demag chain

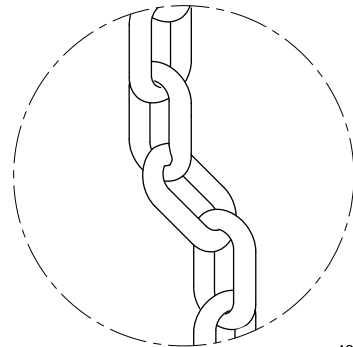
Two methods can be used to measure wear or deformation of the original Demag chain:

- Measuring with a calliper gauge:
 - wear of a single chain link ⇒ Fig. 59, Page 86;
 - on 11 chain links ⇒ Fig. 60, Page 87.
- Measuring with a chain gauge:
 - on 11 chain links ⇒ Fig. 61, Page 88.

Measuring wear of a single chain link with a calliper gauge



Fig. 59



The chain link contact areas must be visually checked for traces of wear. If the chain hangs at angle when no load is attached to it, for example, this usually indicates wear of an individual chain link.

Measure the diameter of the chain link material in the chain link contact area using a calliper gauge, if required. For minimum link diameter values, see ⇒ "Tab. 62", Page 87.

Measuring with a calliper gauge on 11 chain links

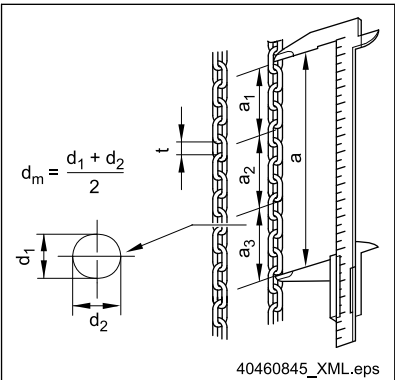


Fig. 60

A partial load must be suspended from the load hook when measuring the chain over 11 links.
Measurements on 11 chain links may be taken in steps of 2 x 3 and 1 x 5 chain links.
The sum total of the 3 readings taken, i.e. $a_1 + a_2 + a_3$ must not exceed the specified limit a . Otherwise the chain must be replaced.
Demag is stamped on every 12th link of genuine Demag chains.
Do you find that, on fitting a new chain, it does not run smoothly over the sprocket? Please contact our after-sales service centre.
We strongly recommend that you use genuine Demag chains. This will ensure that the safety and service life of the chain hoist is guaranteed.

Demag chain hoist	DC-Pro 1/2	DC-Pro 5	DC-Pro 10	DC-Pro 15
Chain designation d x t	4,2 x 12,2	5,3 x 15,2	7,4 x 21,2	8,7 x 24,2
Limit dimensions according to DIN 685 part 5				
Measurement over the outside of 11 chain links, maximum dimension $a = a_1 + a_2 + a_3$	144,7 mm	180,3 mm	253 mm	289 mm
Overall length of 1 chain link measured on the inside, maximum dimension t	12,8 mm	15,9 mm	22,4 mm	25,5 mm
Measurement of the chain link diameter, min. dimension $d_m = 0,9 \times d$	3,8 mm	4,8 mm	6,7 mm	7,8 mm

Tab. 62

Measuring with a chain gauge on 11 chain links

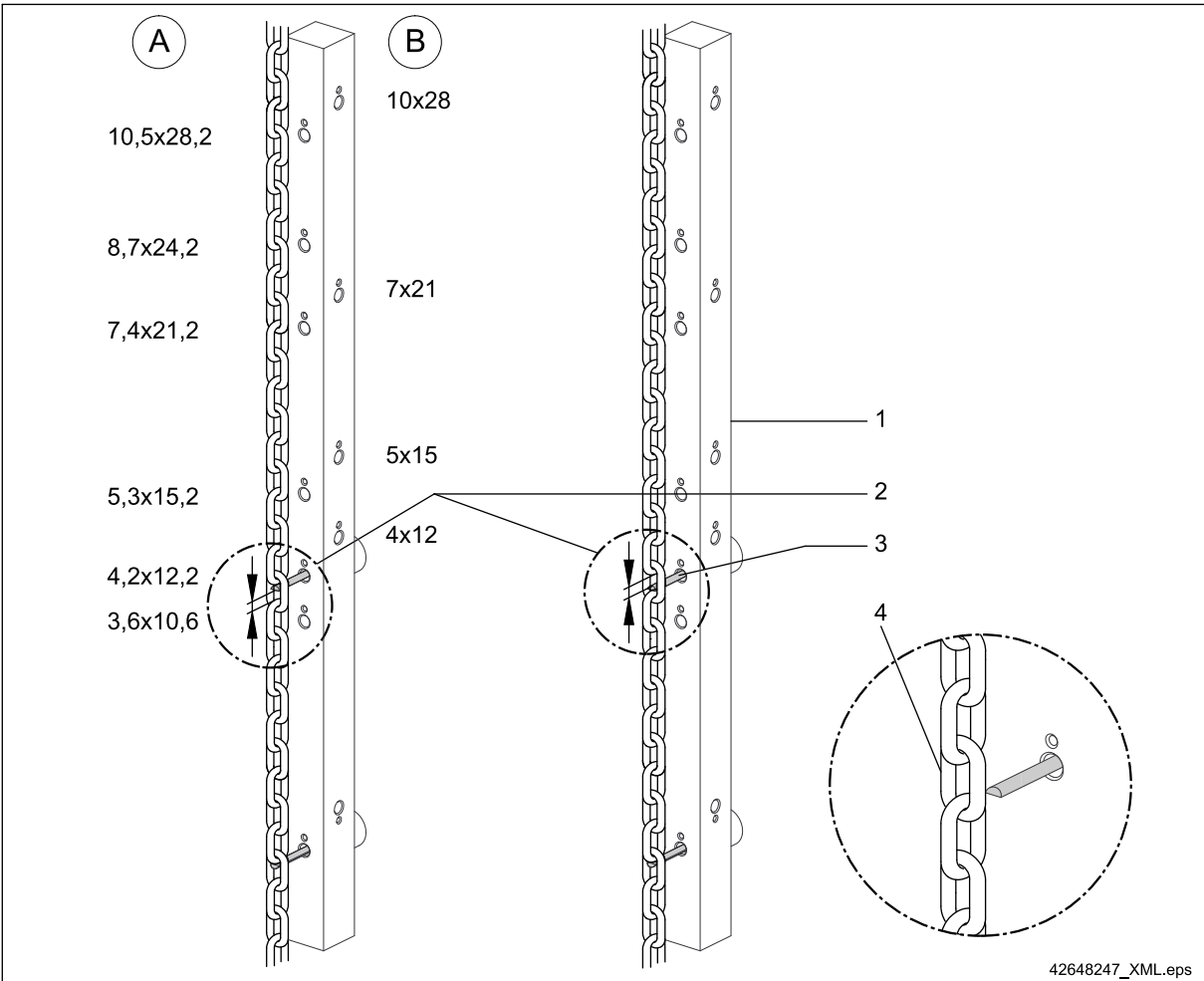


Fig. 61

A	DC / DK / PK new chain	2	It does not yet need to be discarded. The chain does not yet need to be replaced. The chain needs to be replaced if the measuring pin can no longer be inserted into the 11th chain link.
B	PK old chain	3	Measuring pin
1	Chain gauge, part no. 836 025 44	4	11th chain link; the chain is ready to be discarded. The chain must be replaced.

Tab. 63

A partial load must be suspended from the load hook when measuring the chain over 11 links.

8.5.5.5 Chain set scope of supply

The chain must be replaced when the permissible chain wear limit is reached (determining the wear limit of the chain, see ⇒ "Checking the hoist chain", Page 86). A chain set is always supplied when a new standard RDC/TDK chain is ordered. The chain set includes the following parts:

- Chain,
- Sprocket,
- Chain guide with plate and cap,
- Chain guide plate,
- Buffers for upper and lower hook position,
- Tube of Demag chain grease,
- Retaining ring.

The chain guide is pre-assembled, the chain is already fitted in the chain guide.

8.5.5.6 Available hoist chains

Genuine Demag chain is a round-section steel chain tested to EN 818-7 which is subject to the regulations for round-section steel chains used in hoist applications issued by the Main Association of Industrial Employers' Mutual Insurance Societies, Central Department for Accident Prevention and the test criteria for round-section steel chains used in hoist applications and the inspection regulations to DIN 685 part 5 of Nov. 1981 as well as BGV D8 (VBG 8) and BGV D6 (VBG 9).

CAUTION



Pay attention to reduced load capacities.

The special chains listed below can be used for special environments and non-standard operating conditions in which RDC/TDK chains are employed.

	Chain hoist size	Dimension	Stamp, chain quality	Weight per metre	Production test force	Minimum breaking force	Minimum elongation at rupture	Max. load capacity for reeving	
		[mm]		[kg]	[kN]	[kN]	[%]	1/1	2/1
								[kg]	[kg]
Demag RDC/TDK standard chain									
	DC 1 / 2	4,2 x 12,2	DAT RDC/TDK	0,38	13,8	22	10	250	-
	DC 5	5,3 x 15,2		0,62	22	35		500	-
	DC 10	7,4 x 21,2		1,20	43	70		1250	2500
	DC 15	8,7 x 24,2		1,67	59	95		1600	3200
Properties	High-strength ageing-resistant material with a high degree of surface hardening, galvanised with additional surface treatment, blue-chromated, colour: silver								
Material	Ni-Mo special chain steel to EN 818-7, part 5.3.1								
Lubrication	GP00H-30REN.SO-GFB grease								
Demag Corrod special chain									
Application, e.g. galvanising, electroplating facilities	DC 1 / 2	4,2 x 12,2	DAT RDC/TDK	0,38	13,8	22	10	250	-
	DC 5	5,3 x 15,2		0,62	22	35		500	-
	DC 10	7,4 x 21,2		1,20	43	70		1250	2500
	DC 15	-		-	-	-		-	-
Properties	Ageing-resistant, corrosion-free, „Corrod DS“ micro-layer corrosion protection, black-coated, colour: black, Stabylan 2001								
Material	Ni-Mo special chain steel to EN 818-7, part 5.3.1								
Lubrication	Acid-resistant chain grease								
Demag HS7 special chain									
Application, e.g. foundry, dust, emery, blasting	DC 1 / 2	4,2 x 12,2	RSX / DS	0,38	12,5	19,3	5	160	-
	DC 5	5,3 x 15,2		0,62	19,8	30,8		400	-
	DC 10	7,4 x 21,2		1,20	38,7	60		800	1600
	DC 15	-		-	-	-		-	-
Properties	Ageing-resistant, blue-chromated, with deeper surface hardening								
Material	Ni-Mo special chain steel to EN 818-7, part 5.3.1								
Lubrication	Dry or with dry lubricant, e.g. Klüber UNIMOLY C220								
Demag RS6 special chain									
Application, e.g. foodstuffs sector	DC 1 / 2	4,2 x 12,2	RSA / S	0,38	10	16	15	125 - 160	-
	DC 5	5,3 x 15,2		0,62	16	25		200 - 250	-
	DC 10	7,4 x 21,2		1,20	32	50		400 - 500 ⁴²⁾	800 - 1000 ⁴³⁾
	DC 15	-		-	-	-		-	-
Properties	Non-rusting chain, not hardened, bright								
Material	Stainless steel AISI 316 (V4A) 1,4401								
Lubrication	Edible lubricant, e.g. Paraliq chain spray								

Tab. 64

⁴²⁾ for max. 10 cycles per day = 500 kg; for max. 25-50 cycles per day = 400 kg

⁴³⁾ for max. 5 cycles per day = 1000 kg; for max. 12-25 cycles per day = 800 kg

8.5.5.7 Replacing the chain set

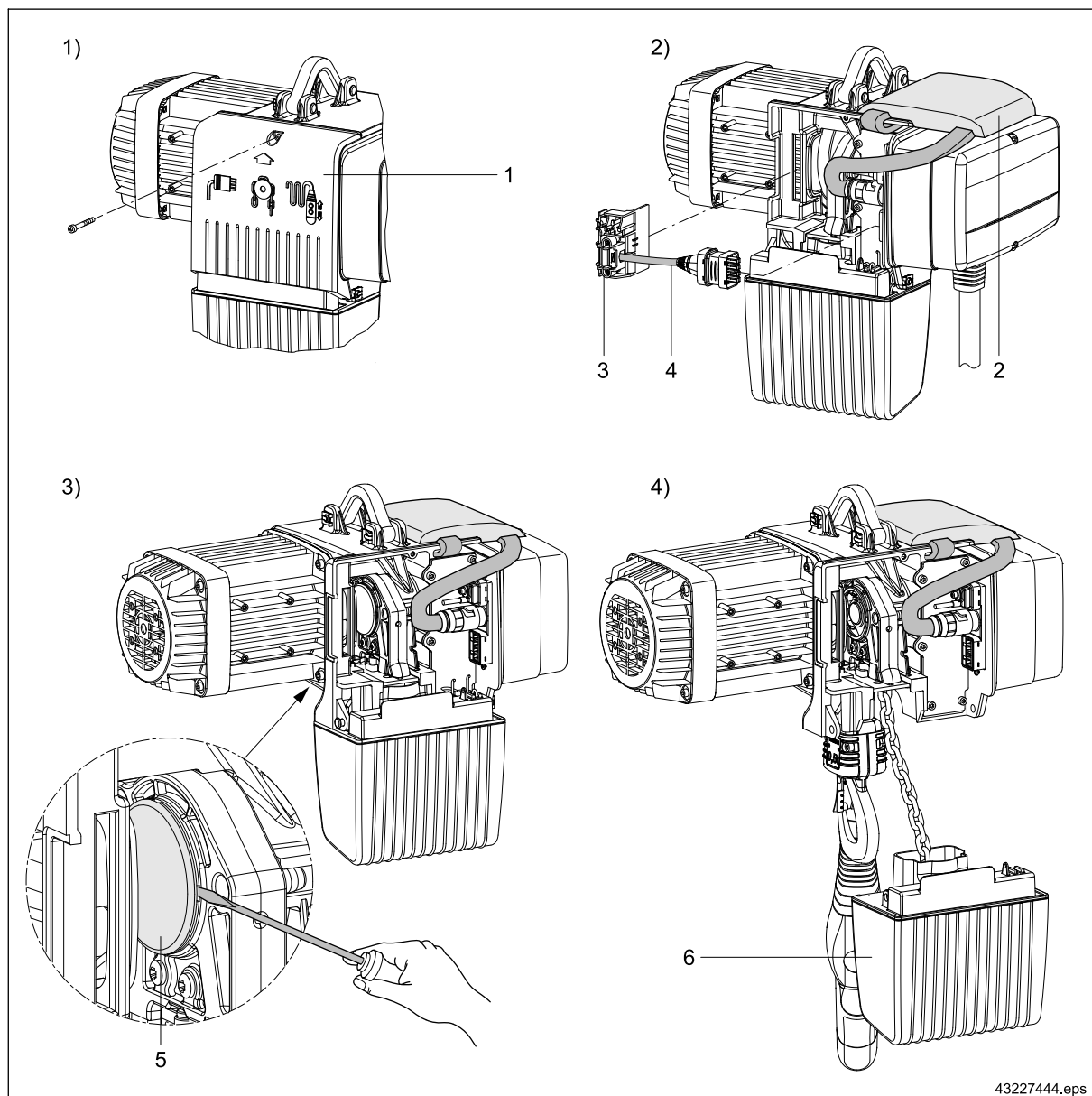
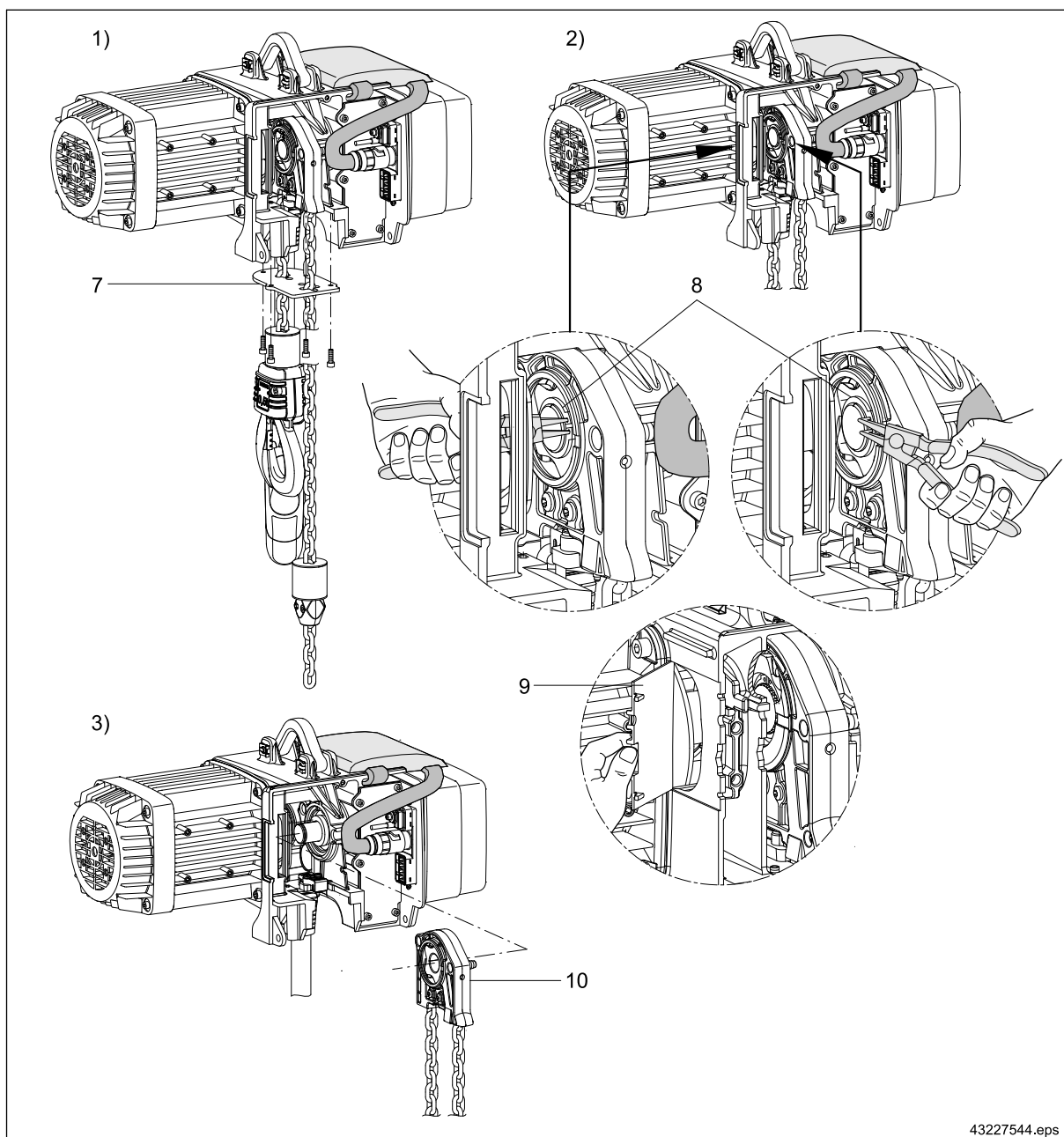


Fig. 62

Before starting any maintenance work, switch the hoist off and secure it against reconnection to the power supply. To replace the chain set, proceed as follows:

1. Open and remove service cover (1).
2. Place bag (2) with the control cable on the chain hoist; pull out mains cable union (3) with fitted mains cable (4) and place to one side; if a travel drive is fitted, remove the connecting cable from the strain relief arrangement;
3. Loosen cap (5) with a screwdriver (lever off);
4. Remove chain collector box (6) and set it down (⇒ "Removing the chain collector box", Page 83);



43227544.eps

Fig. 63

1. Remove guide plate (7);
2. Remove retaining ring (8) using ring pliers; either use straight or offset pliers (access through the opening in the gearbox housing on the side of the motor or from the service enclosure);
DC-Pro 1 to 5: In the area power supply insert;
DC-Pro 10: Fold cover (9) of the opening in the gearbox housing to the side.
3. Remove chain guide (10) with the sprocket from the output shaft; to do this, slide the complete assembly in the direction of the motor until the sprocket is free; the worn chain can then be removed from the service enclosure.

Proceed in reverse order to install the new chain set.

Pay attention to the following points:

Chain hoist with geared limit switch

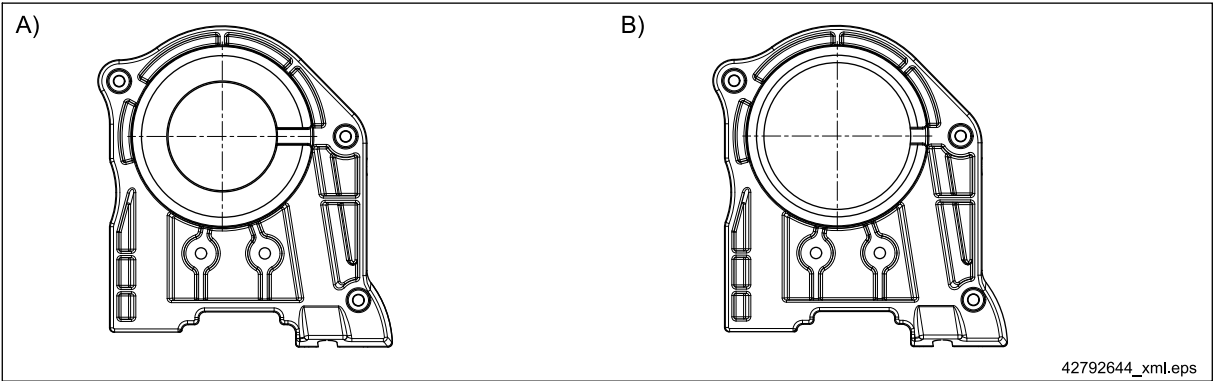


Fig. 64

A)	Chain guide for DC 10 without geared limit switch	B)	Chain guide for DC 10 with geared limit switch
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Tab. 65

The chain guide has a larger opening on chain hoists that are equipped with a geared limit switch.

See also ⇒ "Chain drive", Page 130.

Output shaft distance rings

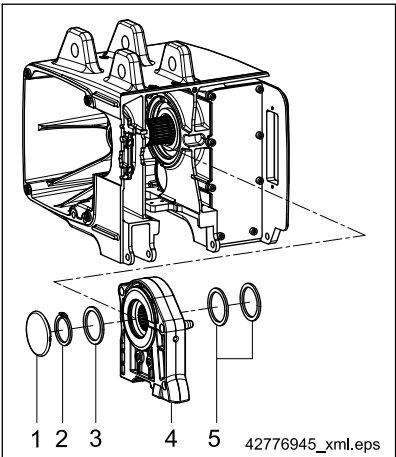


Fig. 65

- Ensure that the complete quantity of distance rings is fitted on the output shaft when the chain guide is installed.

Item	Designation		
1	Cap		
2	Retaining ring		
3	Distance ring	DC-Pro 15	1 off
4	Chain guide		
5	Distance ring	DC-Pro 1 / 2	3 off
		DC-Pro 5	1 off
		DC-Pro 10	2 off
		DC-Pro 15	2 off

Tab. 66



Apply Molykote or a similar lubricant to the splines of the output shaft before you install the chain sprocket.

Fitting the retaining ring

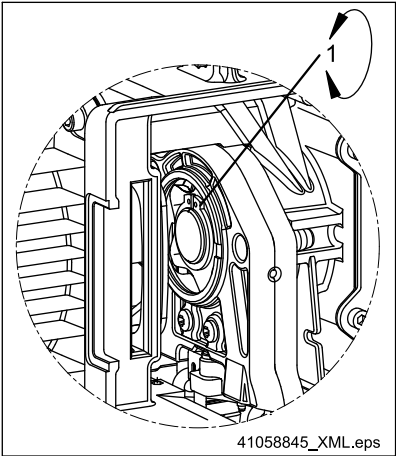


Fig. 66

- The stamped burr of retaining ring (1) must face the motor. The retaining ring is correctly installed if it can be easily turned on the output shaft after assembly.

DANGER



Danger of broken chain and falling load

The chain may break and loads may fall if the chain is incorrectly installed.

When the chain is fitted, it must be ensured that the chain is inserted in the same position and orientation.

The chain must operate without any twist.

Fitting the chain anchorage for 2/1 reeving on DC 10

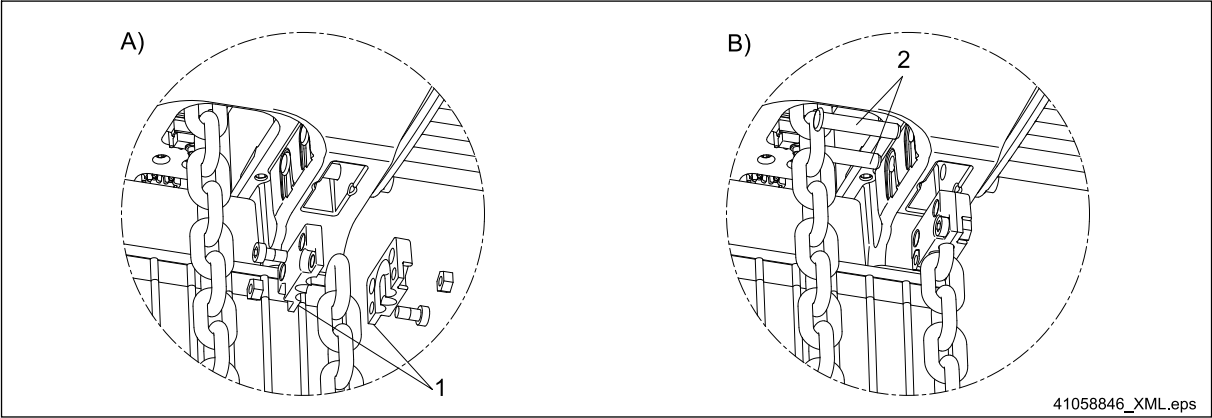


Fig. 67

- Fit the chain anchorage before bolting the guide plates into position for DC-Pro 10 with 2/1 reeving. Bolt chain anchorage halves (1) together (fig. A).
- Insert the bolted chain anchorage into the opening of the gearbox housing (fig. B).
- Fit pins (2) (the pins are retained by the fitted guide plates).

Fitting the chain anchorage for 2/1 reeving on DC 15

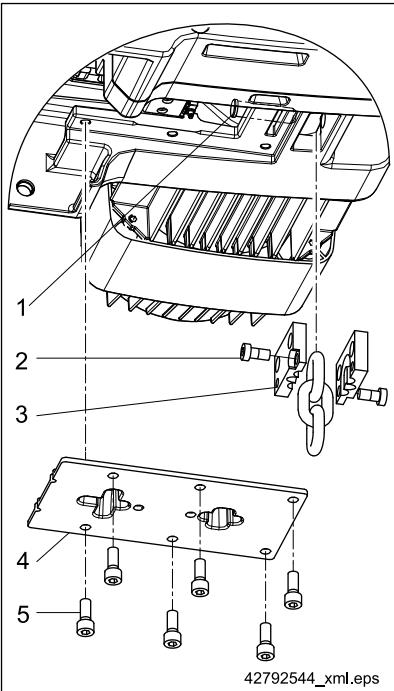


Fig. 68

Fit the chain anchorage before bolting guide plate (4) into position for DC-Pro 15 with 2/1 reeving.

- When you remove the chain anchorage, only push both pins (1) far enough out of the bore holes until the chain anchorage can be removed.
- Place the end of the chain between the two halves of chain anchorage (3) and bolt them together with a tightening torque of 25 Nm.
- Insert the bolted chain anchorage into the opening of the gearbox housing.
- Push both pins (1) completely back into the bore holes (the pins are secured by the fitted guide plate).

Item	Designation
1	Chain anchorage pin
2	Hexagon socket bolt for chain anchorage halves
3	Half of chain anchorage
4	Guide plate
5	Hexagon socket bolt for guide plate

Tab. 67

Fitting the limit stop

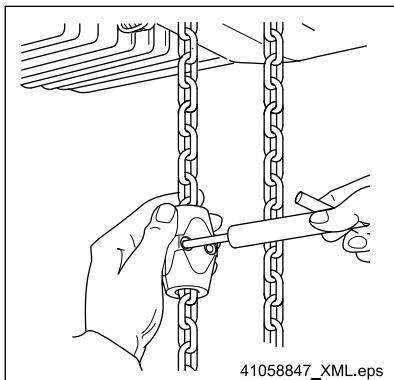


Fig. 69

- Attach the limit stop to the 5th link at the dead (unloaded) end of the chain; pay attention to the tightening torque.
- If the chain hoist is operated with a replacement chain that is longer than suitable for the standard capacity of the chain collector, an additional limit stop must be fitted to the chain between the hook assembly and the buffer plate. The limit stop must be fitted in such a way that the extra length of chain is positioned between the hook assembly and the limit stop. In this case, a geared limit switch is required for DC 10 and DC 15 units with 2/1 reeving.

Further procedure after replacing the chain set



If the chain has to be replaced because it has reached its wear limit, the return sprockets are usually also worn and have to be replaced. For this reason, the condition of the return sprockets must be checked when the chain is replaced. We recommend that the return sprocket should be replaced no later than every second time the chain is replaced.

- Fit the hook assembly/bottom block ⇒ "Load hook", Page 96
- Lubricate the chain ⇒ "Available hoist chains", Page 89, ⇒ "Lubricating the hoist chain", Page 94
- Set the lowest hook position, if necessary ⇒ "Adjusting the lower hook position", Page 63.
- Fit chain collector box ⇒ "Removing the chain collector box", Page 83.
- If the chain hoist is fitted with an optional geared limit switch, it must be re-adjusted each time the chain is replaced, see "DC geared limit switch" document ⇒ Tab. 3, Page 7.

Tightening torques [Nm]	DC-Pro 1 / 2	DC-Pro 5	DC-Pro 10		DC-Pro 15	
Reeving	1/1		1/1	2/1	1/1	2/1
Service cover	5,5		7,5		25	
Limit stop	4,0	4,3				
Chain anchorage halves	-		-	10,5	-	25
Guide plate	5,5				25	

Tab. 68

8.5.5.8 Lubricating the hoist chain



After fitting, before a test load is lifted and before the hoist is put into operation as well as during normal operation when no load is attached, the chain link contact areas must be lubricated with gear grease, part no. 665 009 44.

The chain link contact areas must be relubricated appropriately – after being cleaned – at intervals depending on the service and load conditions. A dry film lubricant should be used in environments where abrasives occur (emery, sand, etc.). For non-standard lubrication, see ⇒ "Available hoist chains", Page 89.

CAUTION



Premature wear of the chain

Danger of load being dropped due to broken chain.

The chain must be lubricated along its entire length.

Even chain links which are covered, e.g. in the chain anchorage, hook assembly, limit stop or crab frame, must be fully lubricated.

DC-Pro 1-10 chain hoist

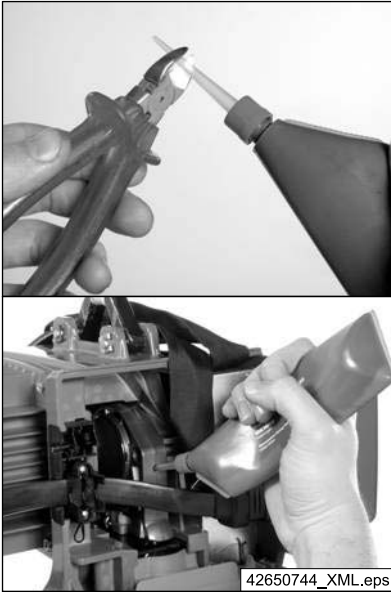


Fig. 70

Cut off the tip of the grease tube and insert the grease tube at the lubrication point. Insert grease into the chain guide by pressing the tube while you run the chain to its end positions to ensure complete and even lubrication of the chain.

DC-Pro 15 chain hoist

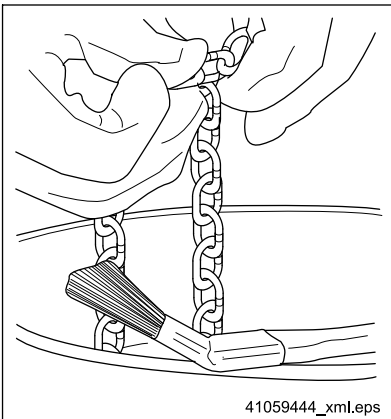


Fig. 71

Apply the lubricant with a brush.

8.5.6 Load hook

8.5.6.1 Checking the load hook

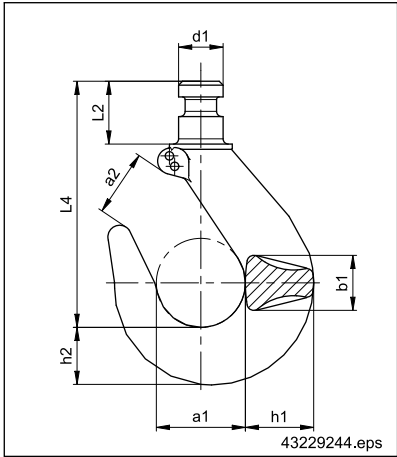


Fig. 72

Load capacity	[kg]	125	250	500	1250	2500	1600	3200
Chain hoist	DC	1	2	5	10		15	
Reeving		1/1			2/1	1/1	2/1	
Load hook	Type	V 2	V 3	V 4	V 5	V 5	V 6	
Dimensions	a1	30	36	43	50	50	56	
	a2 _{nom} ⁴⁴⁾	25,3	30,5	36	43	43	49	
	a2 _{max}	27,8	33,5	39,6	47,3	47,3	53,9	
	b1	13	19	22	29	29	30	
	h1	22	27,5	33,5	44	44	55	
	h2 _{nom} ⁴⁵⁾	18	21,5	27	36	36	38	
	h2 _{min}	17,1	20,4	25,7	34,2	34,2	36,1	
	L2	22	30	36	45	45	56	
	L4	86	109	110	159	159	187	
	d1	19,8	23,8	31,8	41,8	41,8	49,8	
Max. test force		[kN]	8	16	25	50	50	65
Max. hook force		[kN]	16	32	50	100	100	130

Tab. 69

8.5.6.2 Hook safety catch

If the hook safety catch has to be replaced, turn the nut on the bolt until at least two turns of the thread can be seen on the other side of the nut
The bolted connection must only be tightened enough to allow the hook safety catch to move freely.

8.5.6.3 Checking the return sprocket

The return sprocket must be checked every month to ensure that it turns easily. To do this, any load bars attached to the bottom block have to be removed.
Check to ensure the bottom blocks moves easily during lifting and lowering operations. Abrupt movements of the bottom block indicate wear.
We recommend that the return sprocket should be replaced every second time the chain is replaced.

⁴⁴⁾ Permissible deviation +10%
⁴⁵⁾ Permissible deviation -5%

8.5.6.4 Replacing the hook with fittings for 1/1 reeving

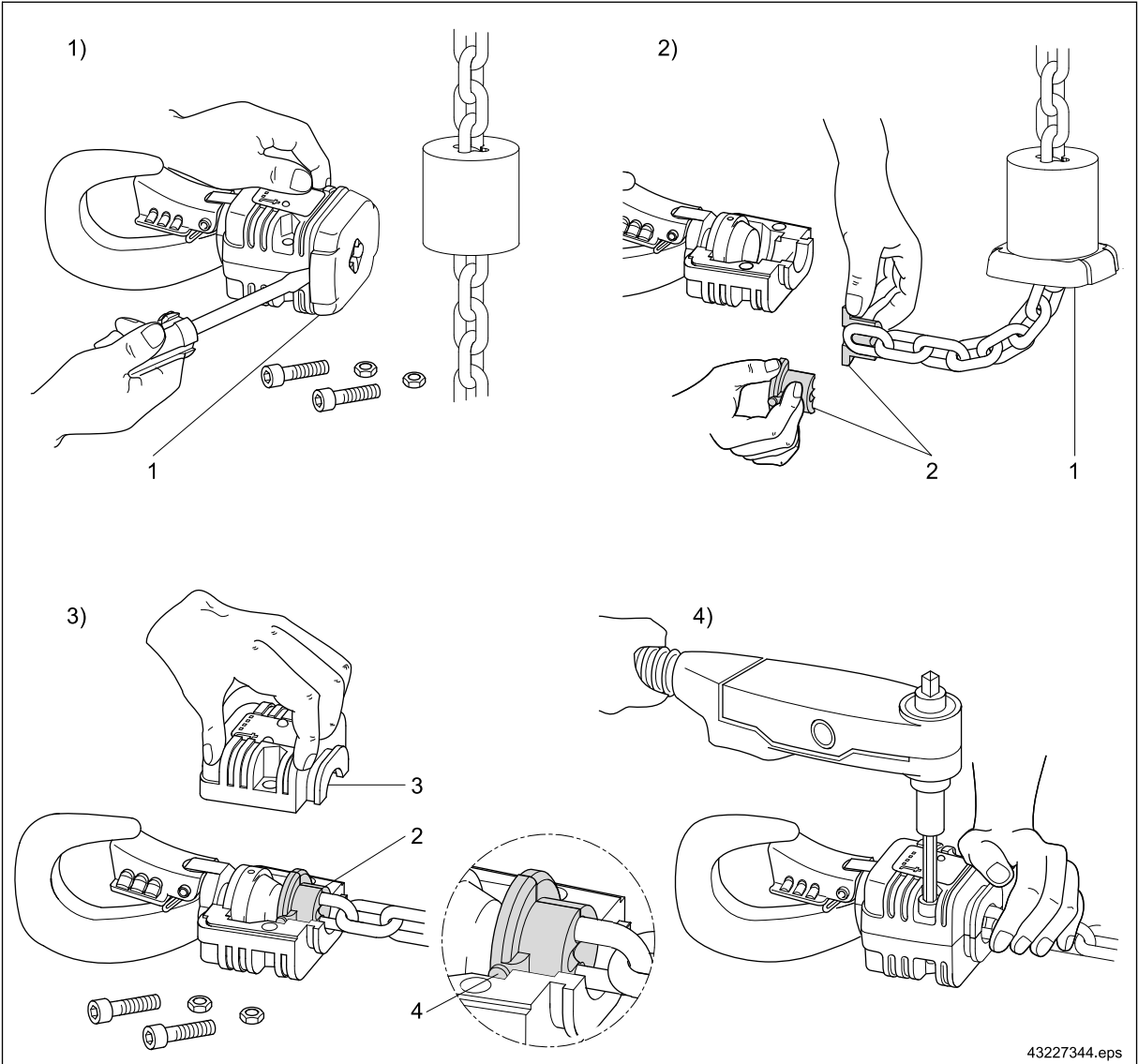


Fig. 73

1. Remove both bolts from the new hook.
Lever cap (1) off with a screwdriver.
2. Remove the upper half of the hook assembly.
Slide buffer cap (1) onto the chain.
Remove chain link anchorage sections (2) from the load hook and place them around the last chain link.
Grease the last chain link in the chain link anchorage section.
3. Insert the chain and chain link anchorage sections (2) in the new hook and fit upper half of hook assembly (3).
Ensure that locating pins (4) are correctly positioned.
4. Tighten the housing bolts according to the tightening torque table.

Tightening torques [Nm]	DC-Pro 1	DC-Pro 2	DC-Pro 5	DC-Pro 10	DC-Pro 15
Hook assembly	6,8		11,5	25,0	27,5

Tab. 70

8.5.6.5 Replacing the bottom block (standard for DC 10) with internal cut-off springs for 2/1 reeving

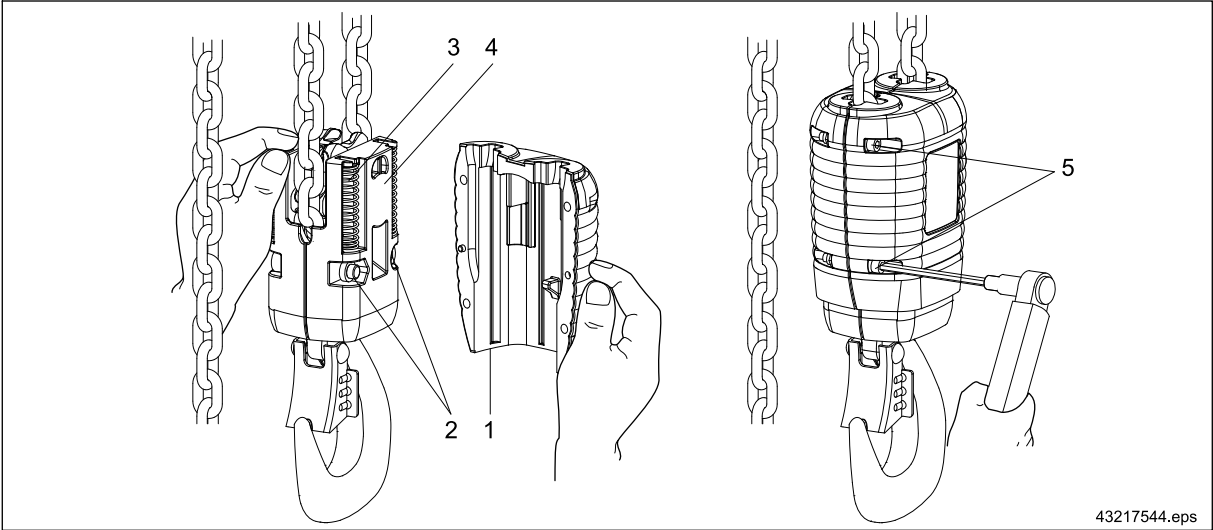


Fig. 74

1. Remove guide half sections (1) (four M 6 bolts);
2. Remove bottom block retaining bolts (2) and remove the bottom block.
3. Insert the new chain into the bottom block in the same position and orientation (chain must operate without any twist);
4. Re-assemble the bottom block and tighten bolts (2) to a torque of 52 Nm;
5. Check correct fit of the four cut-off springs (3) in new halves (4) of the bottom block;
6. Install new guide half sections (1) and tighten bolts (5) to a torque of 5,5 Nm;
7. Apply the load capacity plate;
8. Perform a function check (run against the operating limit switches and check against the 7-segment display).

Tightening torques [Nm]		DC-Pro 10
Bottom block with internal cut-off springs	Bottom block halves	52,0
	Guide section halves	5,5

Tab. 71

Bottom block as of approx. 09/2009

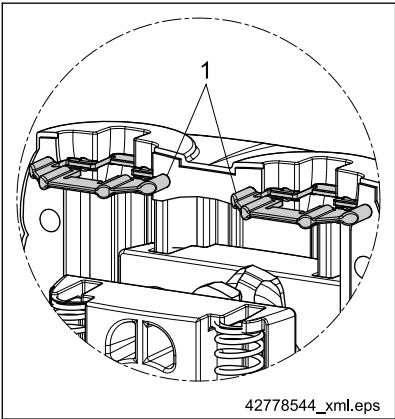


Fig. 75

As of approx. 09/2009, the bottom block is provided with rubber lips (1) at the chain entry points. The rubber lips should be checked for wear and correct fit during the annual inspection.

8.5.6.6 Replacing the bottom block (standard for DC 15, option for DC 10) with external cut-off springs for 2/1 reeving

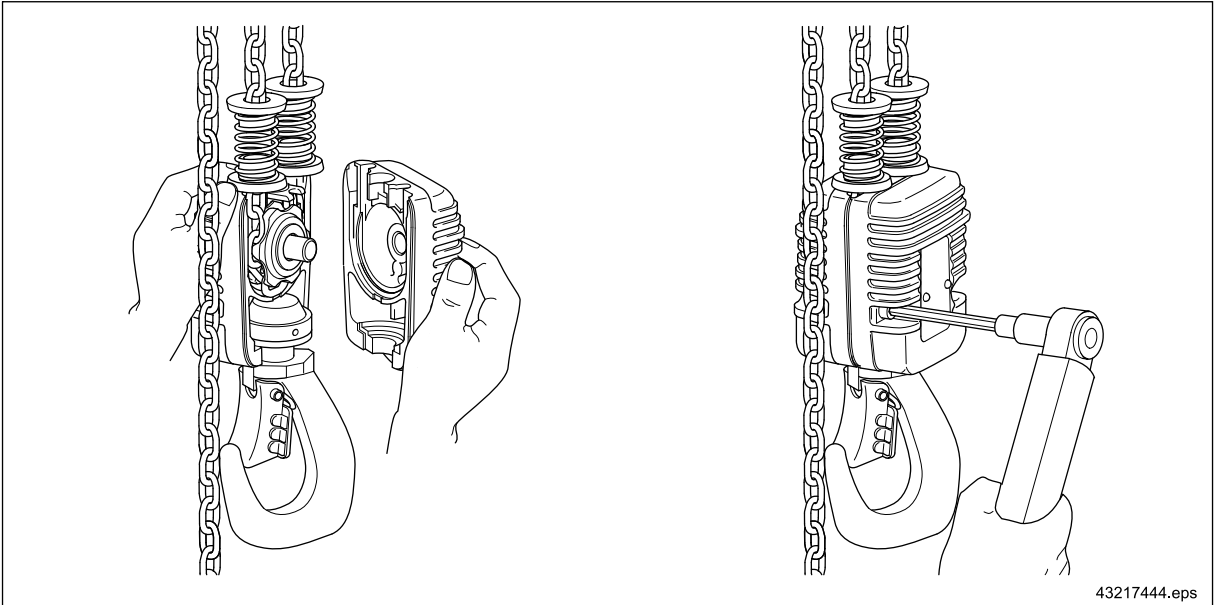


Fig. 76

Tightening torques [Nm]	DC-Pro 10 / DC-Pro 15
Bottom block with external cut-off springs	55,0

Tab. 72

8.5.7 Manulift

8.5.7.1 Checking the quick-change coupling

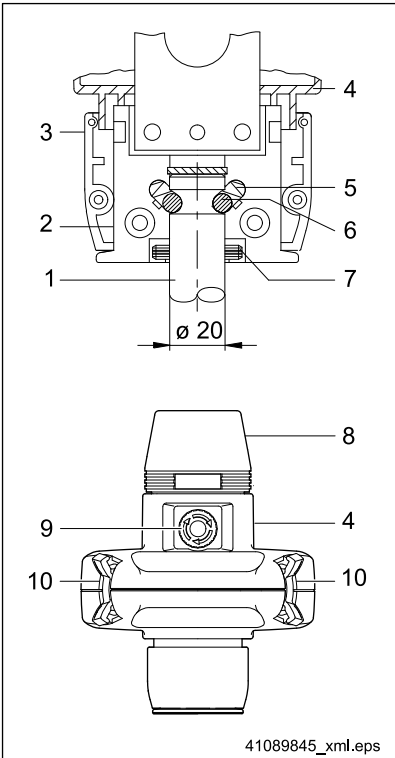


Fig. 77

Item	Designation	Item	Designation
1	Coupling pin	6	Cylindrical pin
2	Load attachment retaining block	7	Swivel lock
3	Unlocking sleeve	8	Cap
4	Control unit	9	Emergency stop
5	Pressure spring	10	Actuating rockers

Tab. 73

The quick-release coupling must be checked daily for correct functioning and smooth operation.

Cylindrical pins (6) fitted in the quick-release coupling must be checked for wear every three months. To check the cylindrical pins, undo both connecting bolts on unlocking sleeve (3). The diameter of the cylindrical pins must not be less than 5,4 mm at any point.

Swivel lock (7) installed in the load handling attachment must be checked for tight fit and wear every three months.

The quick-release coupling used to insert load handling attachments measures 20 mm in diameter. It will increase in size with wear. It must not be larger than 26 mm at any point.

8.5.7.2 Replacing the chain

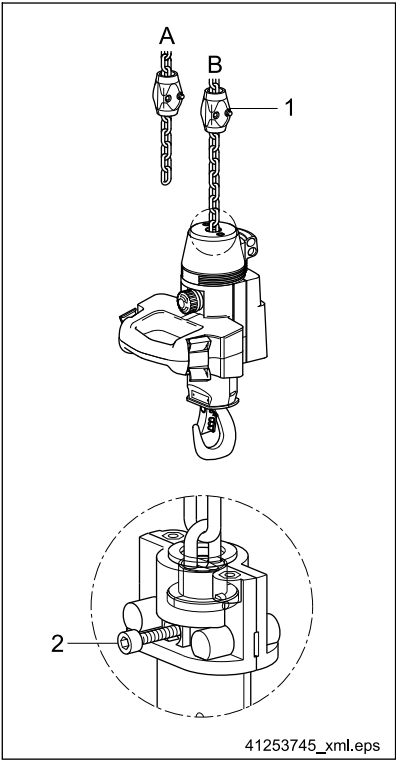


Fig. 78

Item	Designation		
A	Chain collector box side		
B	Load side		
Tightening torques [Nm]		DCM-Pro 1 / 2	DCM-Pro 5
1	Limit stop	4,0	4,3
2	Bolt for chain retainer halves	5 - 6	

Tab. 74

- Remove the chain collector box ⇒ "Removing the chain collector box", Page 83.
- Remove the helical cable from the control unit ⇒ "Replacing the helical cable", Page 116.
- Remove both limit stops (1).
- Remove the chain retainer from the control unit ⇒ "Attaching the chain to the control unit", Page 101.
- Lubricate the new chain before it is put into service ⇒ "Lubricating the hoist chain", Page 94.
- Replace chain set ⇒ "Replacing the chain set", Page 90.
- Attach both limit stops:
 - Limit stop on the 5th chain link on the chain collector box side,
 - Limit stop on the 17th chain link on the load side.
- Attach the free end of the chain to the control unit ⇒ "Attaching the chain to the control unit", Page 101.

8.5.7.3 Attaching the chain to the control unit

The chain swivel unit is fitted as standard as of year of manufacture 04/2009

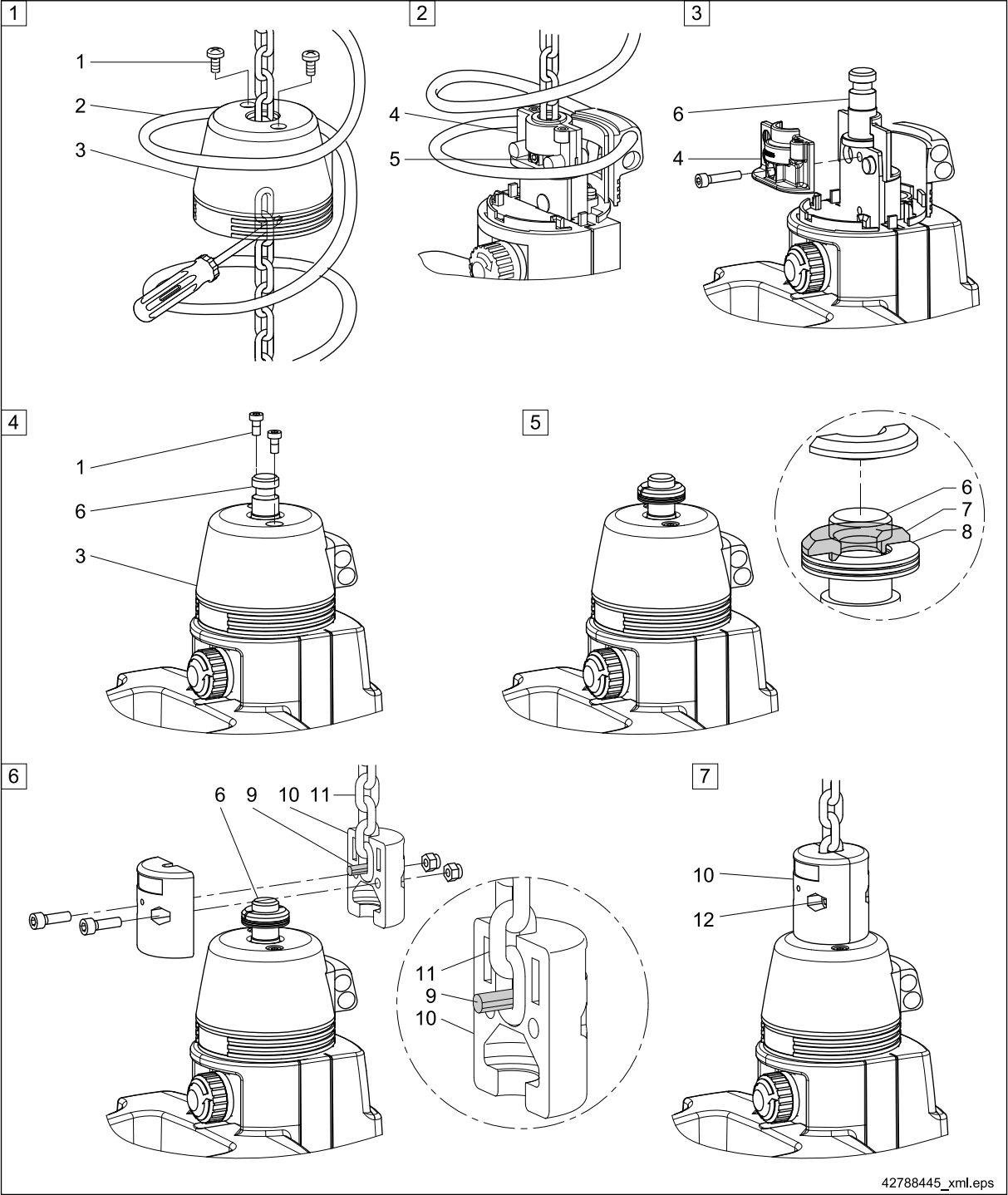


Fig. 79

Item	Designation	Item	Designation	Item	Designation
1	Cap screw	5	Chain retainer bolt	9	Retaining pin
2	Helical cable	6	Pin	10	Chain swivel unit
3	Cap	7	Link section	11	Chain
4	Chain retainer	8	Bearing	12	Adapter screws

Tab. 75

Deposit the Manulift unit in such a way that the chain and helical cable are relieved of strain.

Disassembly:

1. Push helical cable (2) to the side and loosen screws (1) of cap (3). Slide cap (3) off chain retainer (4) and secure it against slipping.
2. Loosen bolt (5) of chain retainer (4). Open chain retainer (4) and remove the chain link anchorage sections and the chain.

Assembly:

3. Insert pin (6) into chain retainer (4) and bolt the two halves of chain retainer (4) together with a tightening torque of 5 - 6 Nm.
4. Slide cap (3) over pin (6) and tighten cap screws (1) with a tightening torque of 3 Nm.
5. Fit bearing (8) and chain link sections (7) on pin (6) in the correct order.

DANGER



Load may be dropped

Incorrect assembly may cause loads to be dropped.

During assembly, ensure:

1. that chain link sections (7) are positioned with their collar in bearing (8). Grease the bearing and bearing seat.
6. Insert retaining pin (9) in chain (11) and fit swivel unit half (10) on pin (6).

DANGER



Load may be dropped

Incorrect assembly may cause loads to be dropped.

During assembly, ensure:

1. that retaining pin (9) is correctly fitted when the swivel unit is assembled.
7. Join swivel unit halves (10) and tighten screws (12) with the correct tightening torque:
Chain 4,2 x 12,2 \Rightarrow 6,8 Nm,
Chain 5,3 x 15,2 \Rightarrow 9,5 Nm.

Until year of manufacture 03/2009

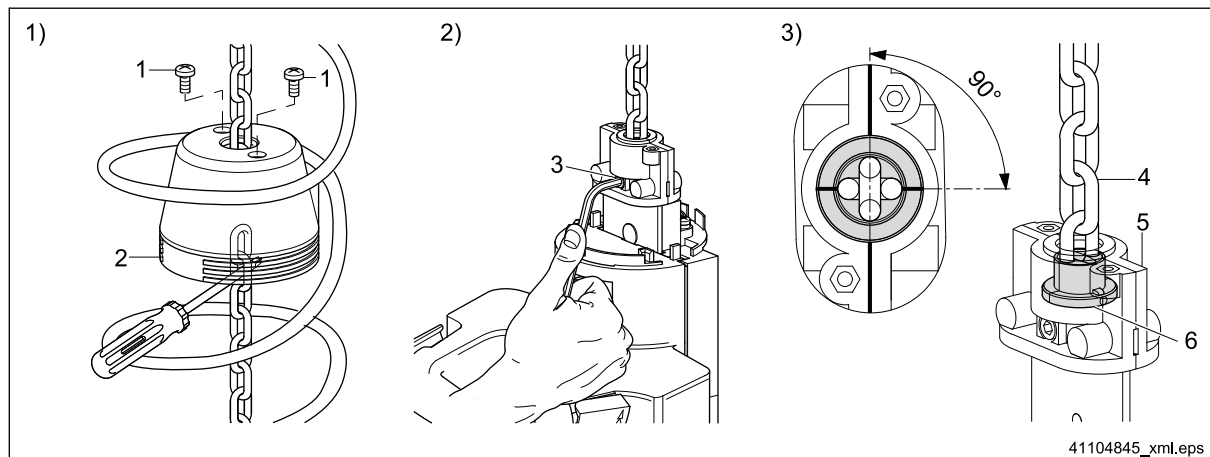


Fig. 80

1. Undo cap screws (1), slide cap (2) upwards and secure against dropping (e.g. with a screwdriver). Pull the new chain through cap (2) before fitting.

2. Set the control unit down before undoing hexagon socket screw (3).
3. Open chain retainer halves (5) until the last link of chain (4) can be removed.
Place the last link of the chain between chain link anchorage sections (6) before fitting.

DANGER



Incorrect assembly causes loads to be dropped

Chain link anchorage sections (6) must be inserted turned by 90° relative to the chain retainer halves.

Tightening torques [Nm]	DC-Pro 1 / 2 / 5
Bolt for chain retainer halves (Manulift)	5 - 6

Tab. 76

8.5.7.4 Replacing the switching elements

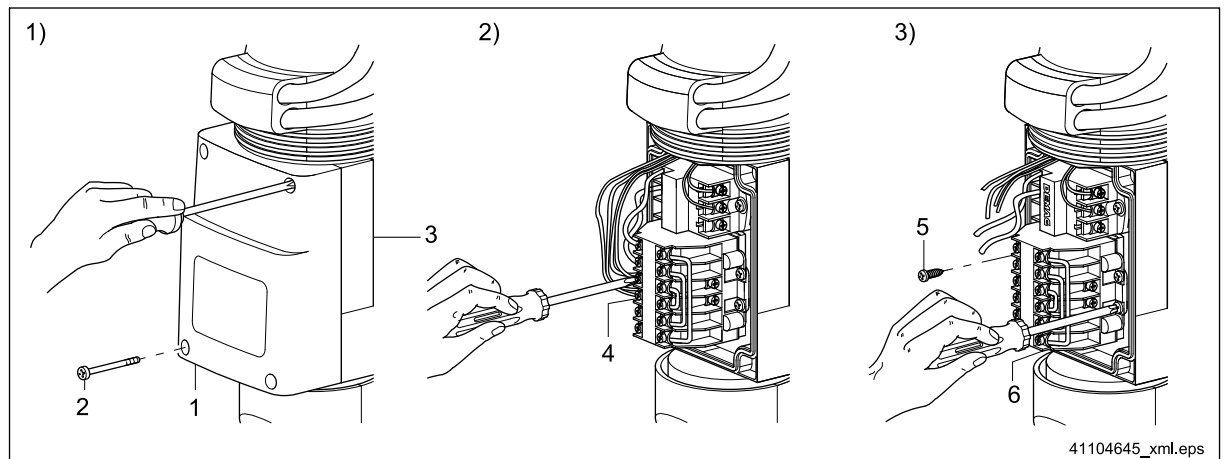


Fig. 81

1. Unscrew four cover screws (2) and remove lower part (1) of the housing cover.
Tighten diagonal pairs of screws when re-fitting the cover.
No gap must remain between the cover and housing (3) when the cover screws are tightened.
2. Disconnect electrical connections (4).
3. After removing four switching element screws (5), disconnect the cables and remove switching element (6).
The switching element can only be fitted in one position, which is determined by a rib on the housing.

DANGER



Live components

Only connect the helical cable in accordance with the circuit diagram.
Pay attention to cable lead coding.

8.5.7.5 Replacing the gear mechanism

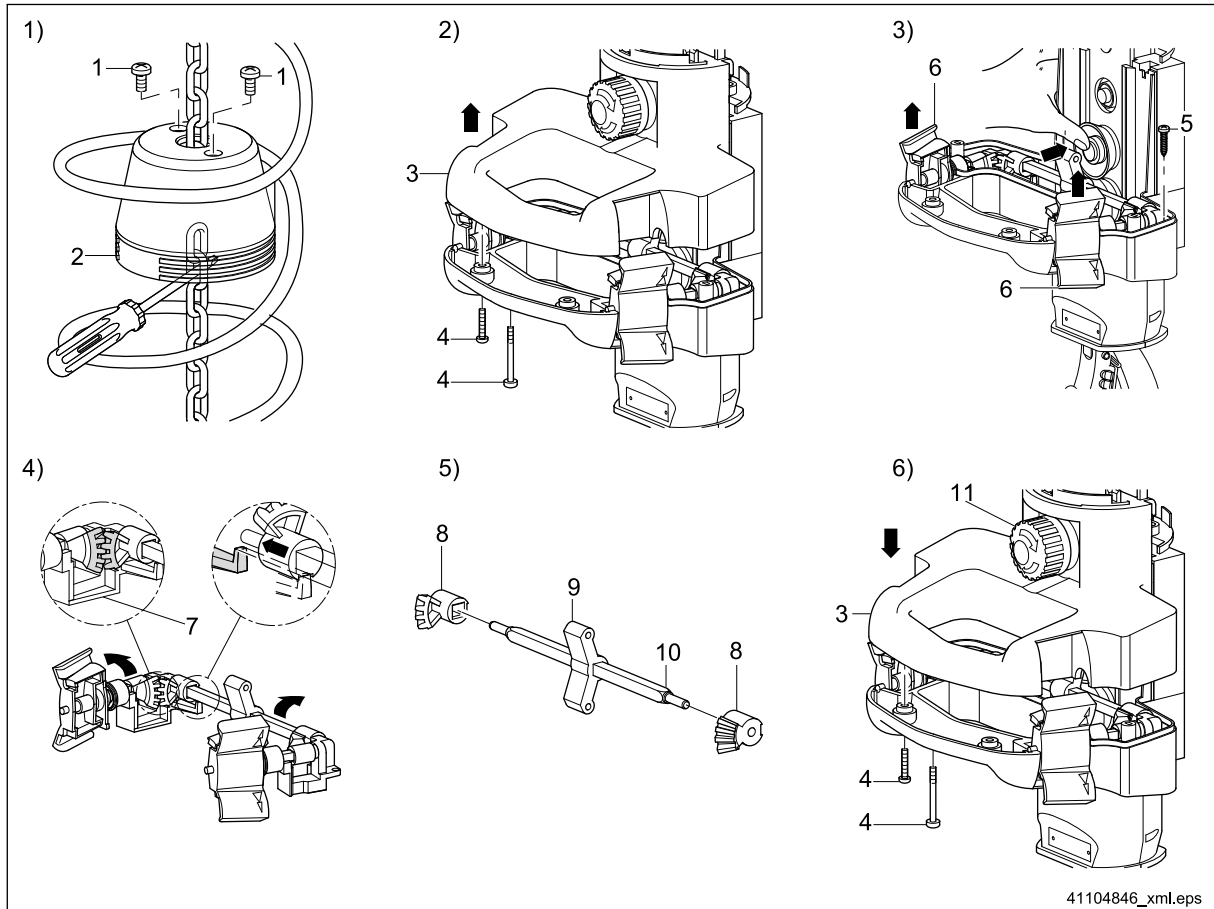


Fig. 82

1. Undo cap screws (1), slide cap (2) upwards and secure against dropping (e.g. with a screwdriver).
2. Unscrew four screws (4) and lift off upper part (3) of the housing.
3. Remove support screws (5) and then lift out complete gear mechanism with rocker switches (6).
4. Turn lever shaft (10) by 90° in relation to support (7) and remove it.
Fit lever shaft (10) with bevel wheel (8) into support (7) as shown.
Ensure that the bevel gears mesh properly with their counterpart gears.
5. Pull bevel gear (8) off lever shaft (10).
To assemble, push bevel gear (8) onto the shaft until it comes to a stop.
Ensure it is correctly position in relation to lever (9).
6. Emergency-stop button (11) must not be pressed when the two halves of the housing are joined together.

8.5.7.6 Load handling attachments

Load handling attachments must be checked depending on how often they are used:

- **Automatic locking and unlocking of the tongs** must be checked for smooth operation every day. Keep the automatic locking mechanism clean (but do not oil).
- Regularly check smooth operation of the **pantograph hinges**. Clean and oil the hinges, as required. Affected parts must be replaced immediately if cracks, deformation, wear of hinge pins (hinge play approx. 1,5 mm) and jaws are detected.
- **Belt slings** must be checked once a week if they are regularly used, or before being used again if they have not been used for a long period. During these checks, the fabric should be examined for brittleness, damage by chemicals or stretching, and for deformation caused by heat; the general condition of the end fittings should also be checked.

8.5.8 Buffers

8.5.8.1 Checking the cut-off buffers/cut-off springs

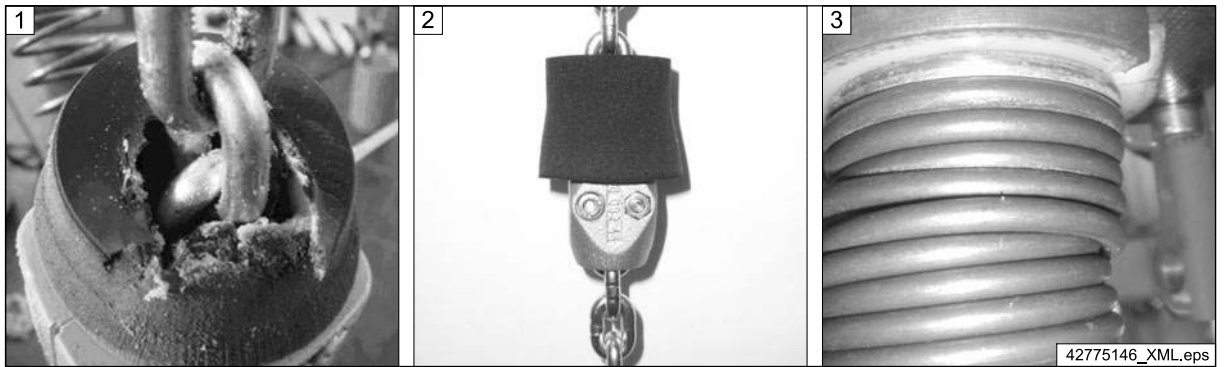


Fig. 83

1. **Buffer wear:**
Visually check the buffers in the course of the annual inspection. Check for damage, cracks and tears.
2. **Missing buffer plate:**
Ensure that the component parts are installed in the right order when new buffers are installed (see also ⇒ "Buffer arrangement", Page 106). A missing buffer plate, for example, will result in premature wear of the buffer.
3. **Wear of external cut-off springs:**
Visually check the external cut-off springs in the course of the annual inspection. Check the sleeves of the springs for cracks and damage. The individual windings of the springs must not cross over each other.

8.5.8.2 Buffer arrangement

Buffer variants

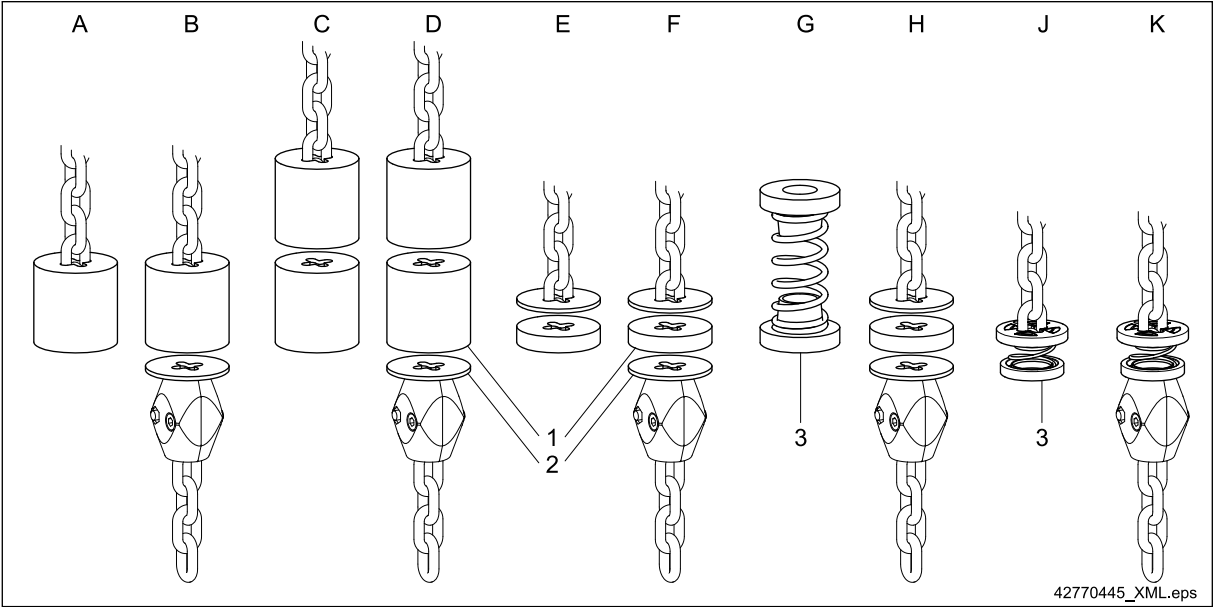


Fig. 84

- 1 Buffer
- 2 Buffer plate
- 3 Cut-off spring

Chain hoist range	Load side	Chain collector box side
DC-Pro 1 - 10	A	B
DC-Com 1 - 10 with operating limit switch		
DC-Pro 1 - 10	C	D
DC-Com 1 - 10 without operating limit switch	E	F
DC-Pro 1 - 10	G	H
DC-Pro 15	J	K

Tab. 77

DC-Pro buffer arrangement

Load capacity [kg]	Chain hoist DC-Pro	Reeving	Lifting speed		Hook path H [m]	Motor size	Buffer/cut-off springs see diagram ⇒ Fig. 84, Page 106		Chain collector box size for hook path		
			at 50 Hz [m/min]	at 60 Hz [m/min]			Load hook side	Chain collector box side	4 m	5 m	8 m
80	1	1/1	8,0/2,0	9,6/2,4	5 and 8	ZNK 71 B 8/2	A	B	-	H5	H8
	2		16,0/4,0	19,2/4,8			C	D		H8	
	5		24,0/6,0	28,8/7,2		ZNK 80 B 8/2	G	H		H5	
100	1		8,0/2,0	9,6/2,4		ZNK 71 B 8/2	A	B		H5	
	2		16,0/4,0	19,2/4,8			C	D		H8	
	5		24,0/6,0	28,8/7,2		ZNK 80 B 8/2	G	H		H5	
125	1		8,0/2,0	9,6/2,4		ZNK 71 B 8/2	A	B		H5	
	2		16,0/4,0	19,2/4,8			C	D		H8	
	5		24,0/6,0	28,8/7,2		ZNK 80 B 8/2	G	H		H5	
160	2		8,0/2,0	9,6/2,4		ZNK 71 B 8/2	A	B		H5	
	5		16,0/4,0	19,2/4,8			C	D		H8	
			24,0/6,0	28,8/7,2		ZNK 80 B 8/2	G	H		H5	
200	2		8,0/2,0	9,6/2,4		ZNK 71 B 8/2	A	B		H5	
	5		16,0/4,0	19,2/4,8			C	D		H8	
	10		24,0/6,0	28,8/7,2		ZNK 100 A 8/2	G	H		H5	
250	2		8,0/2,0	9,6/2,4		ZNK 71 B 8/2	A	B		H5	
	5		16,0/4,0	19,2/4,8			C	D		H8	
	10		24,0/6,0	28,8/7,2		ZNK 100 A 8/2	G	H		H5	
315	5		8,0/2,0	9,6/2,4		ZNK 80 B 8/2	A	B		H5	
	10		12,0/3,0	14,4/3,6			C	D		H8	
			24,0/6,0	28,8/7,2		ZNK 100 B 8/2	G	H		H5	
400	5		8,0/2,0	9,6/2,4		ZNK 80 B 8/2	A	B		H5	
	10		12,0/3,0	14,4/3,6			C	D		H8	
			24,0/6,0	28,8/7,2		ZNK 100 B 8/2	G	H		H5	
500	5		8,0/2,0	9,6/2,4		ZNK 80 B 8/2	A	B		H5	
	10		12,0/3,0	14,4/3,6			C	D		H8	
			24,0/6,0	28,8/7,2		ZNK 100 B 8/2	G	H		H5	
6,0/1,5			7,2/1,8	ZNK 100 A 8/2		A	B	H5			
12,0/3,0			14,4/3,6	ZNK 100 B 8/2		C	D	H8			
6,0/1,5			7,2/1,8	ZNK 100 A 8/2		A	B	H5			
12,0/3,0			14,4/3,6	ZNK 100 B 8/2		C	D	H8			
6,0/1,5			7,2/1,8	ZNK 100 A 8/2		A	B	H5			
12,0/3,0			14,4/3,6	ZNK 100 B 8/2		C	D	H8			
6,0/1,5			7,2/1,8	ZNK 100 A 8/2		A	B	H5			
12,0/3,0			14,4/3,6	ZNK 100 B 8/2		C	D	H8			
1000	15		8,0/2,0	9,6/2,4	4	ZNK 100 B 8/2	2 x J	K	S	-	-
	1250	10	2/1	6,0/1,5	7,2/1,8		5 and 8	- 46)	D	-	H8
15		1/1	8,0/2,0	9,6/2,4	4			A	B	-	H5
	8,0/2,0		9,6/2,4	4	2 x J		K	S	-	-	
1600	10	2/1	6,0/1,5	7,2/1,8	5 and 8		- 46)	D	-	H8	Flex
	15	1/1	8,0/2,0	9,6/2,4	4		2 x J	K	S	-	-
2000	10	2/1	6,0/1,5	7,2/1,8	5 and 8		- 46)	D	-	H8	Flex
	15		4	J	K		S	-	-		
2500	10		4,0/1,0	4,8/1,2	5 and 8		- 46)	B	-	H8	Flex
	15				4		J	K	S	-	-
3200	15						J	K	S	-	-

Tab. 78

⁴⁶⁾ Integrated in the bottom block. DK bottom block with external cut-off springs for certain ambient conditions.

DCM-Pro buffer arrangement

Load capacity [kg]	Chain hoist DCM-Pro	Reeving	Lifting speed		Hook path H [m]	Motor size	Buffer/cut-off springs see diagram		Chain collector box size for hook path	
			at 50 Hz [m/min]	at 60 Hz [m/min]			Load hook side	Chain collector box side	2,8 m	4,3 m
80	1	1/1	8,0/2,0	9,6/2,4	2,8 and 4,3	ZNK 71 B 8/2	A	B	H5	
	2		16,0/4,0	19,2/4,8			C	D	H8	
	5		24,0/6,0	28,8/7,2		ZNK 80 B 8/2	G	F	H5	
125	1		8,0/2,0	9,6/2,4		ZNK 71 B 8/2	A	B	H5	
	2		16,0/4,0	19,2/4,8			C	D	H8	
	5		24,0/6,0	28,8/7,2		ZNK 80 B 8/2	G	F	H5	
200	2		8,0/2,0	9,6/2,4		ZNK 71 B 8/2	A	B	H5	
	5		16,0/4,0	19,2/4,8		ZNK 80 B 8/2	C	D	H8	
250	2		8,0/2,0	9,6/2,4		ZNK 71 B 8/2	A	B	H5	
	5		16,0/4,0	19,2/4,8		ZNK 80 B 8/2	C	D	H8	

Tab. 79

DC-Pro buffer arrangement, lifting speeds until 03/2007 (no longer available)

Load capacity	Chain hoist	Reeving	Lifting speed		Hook path H [m]	Motor size	Buffer/cut-off springs see diagram		Chain collector box size for hook path			
			at 50 Hz [m/min]	at 60 Hz [m/min]			Load hook side	Chain collector box side	5 m	8 m		
[kg]	DC-Pro											
160	5	1/1	12,0/3,0	14,4/3,6	5 and 8	ZNK 71 B 8/2	C	D	H5	H8		
200						ZNK 80 A 8/2	A	B				
250												
315												
400												
500												
			6,0/1,5	7,2/1,8								

Tab. 80

DCM-Pro buffer arrangement, lifting speeds until 03/2007 (no longer available)

Load capacity [kg]	Chain hoist DCM-Pro	Reeving	Lifting speed		Hook path H [m]	Motor size	Buffer/cut-off springs see diagram		Chain collector box size for hook path	
			at 50 Hz [m/min]	at 60 Hz [m/min]			Load hook side	Chain collector box side	2,8 m	4,3 m
200	5	1/1	12,0/3,0	14,4/3,6	2,8 and 4,3	ZNK 80 A 8/2	C	D	H8	H8
250										

Tab. 81

8.5.9 Brake

8.5.9.1 Brake assignment

Load capacity [kg]	Chain hoist DC-Pro	Reeving	Motor size	Brake	Max. brake displacement [mm]
80 - 125	1	1/1	ZNK 71 B 8/2	BK03	0,6
80 - 250	2				
80 - 500	5		ZNK 80 B 8/2		
200 - 1000	10		ZNK 100 A 8/2	BK07	
315 - 1250		2/1	ZNK 100 B 8/2		
1250 - 2500					
1000 - 3200	15				

Tab. 82

8.5.9.2 Check brake wear

Check brake wear depending on the year of manufacture of your chain hoist:

- When the max. brake displacement is reached (see ⇒ Tab. 82, Page 109), the brake must be replaced immediately.
- For brake displacement up to 0,5 mm, the brake can still be used until the next maintenance is due.

As of year of manufacture 04/2009

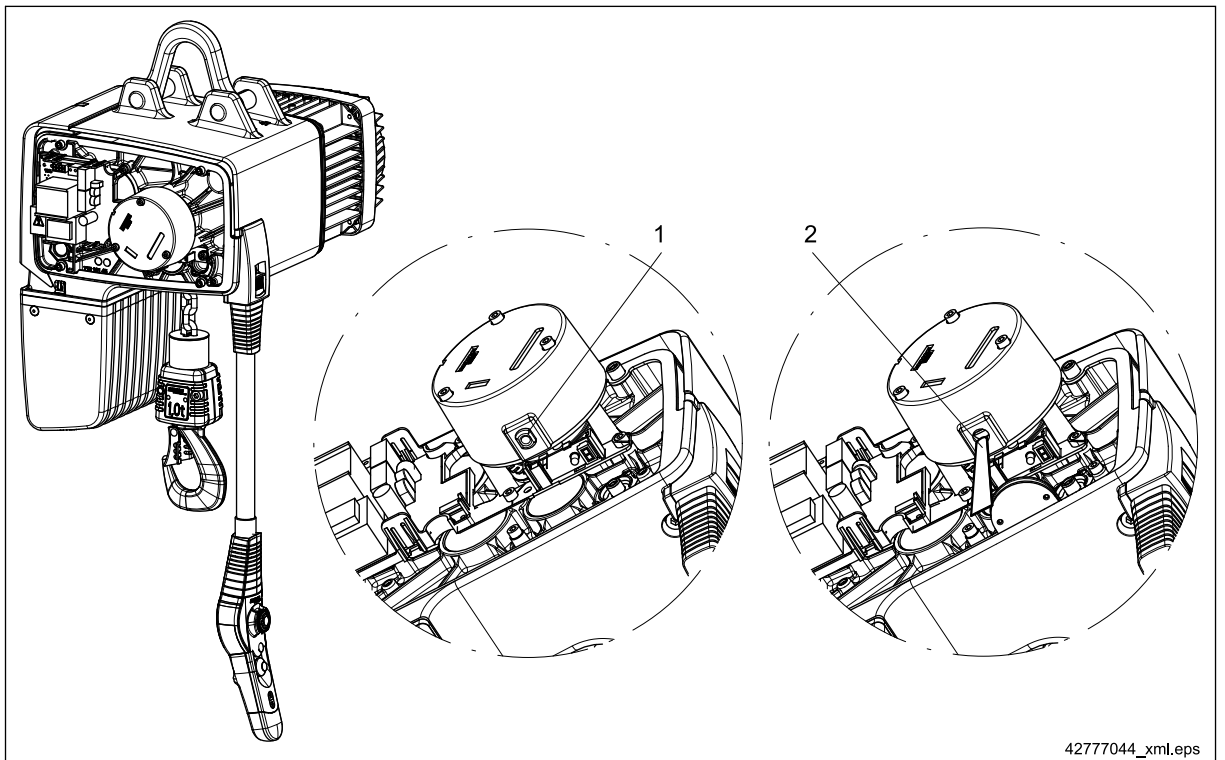


Fig. 85

Since 04/2009 – depending on the size of model – brakes have been gradually equipped with a plug inside the brake housing to enable brake wear to be measured without the need to remove the brake. Brake wear is measured by the air gap.

Disconnect the chain hoist from the power supply (mains connection switch) and secure it against switching on again.

- Open the electric equipment cover.
- Unscrew brake plug screw (1) from the brake.
- Check brake wear with feeler gauge (2) (see ⇒ Tab. 82, Page 109).

Until year of manufacture 03/2009

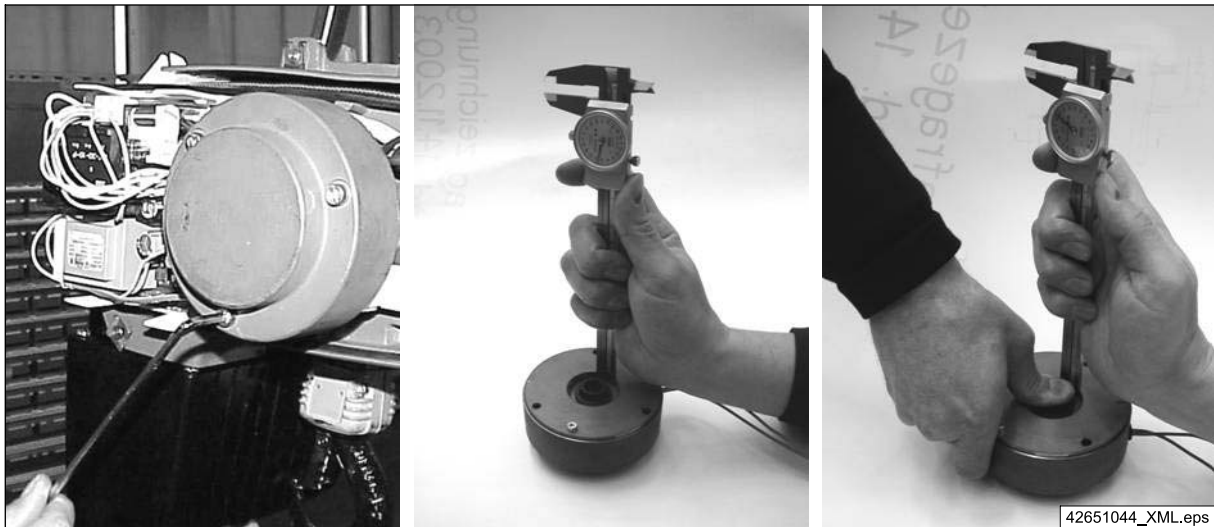


Fig. 86

Disconnect the chain hoist from the power supply (mains connection switch) and secure it against switching on again.

- Open the electric equipment cover.
- Disconnect brake connector.
- Dismantle brake.

Measure brake wear with calliper gauge as follows:

- Measure the distance from the back of the brake to the brake disc with a depth gauge or calliper gauge when the brake is not actuated.
- Measure the distance from the back of the brake to the brake disc with a depth gauge or calliper gauge when the brake is actuated; to do this, press the brake disc against the springs until it stops.
- Use both measured values to calculate the difference; this difference is the brake displacement.

Assembly and maintenance

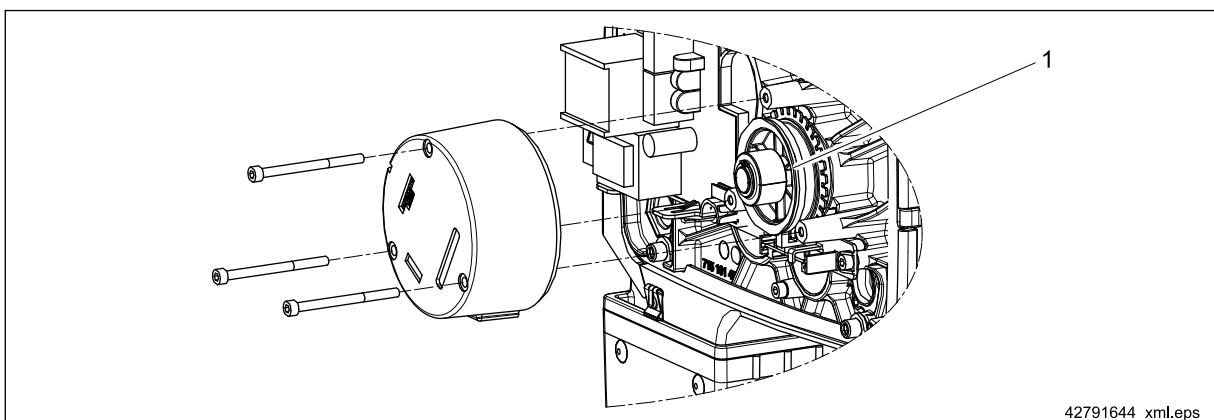


Fig. 87



When the brake is installed, make sure that the area of the V sealing ring (1) on the brake base is lightly greased. Ensure that no grease penetrates the inside of the brake. The continuous sealing lip must be in full contact with the back of the brake.

In the course of the annual inspection, V sealing ring (1) of the brake must be re-greased with anti-friction bearing grease without any solid lubricant.

Tightening torques [Nm]	DC-Pro 1 / 2 / 5 / 10 / 15
Brake	5,5
Electric equipment cover	9,5

Tab. 83

8.5.10 Slipping clutch

8.5.10.1 Checking the slipping clutch

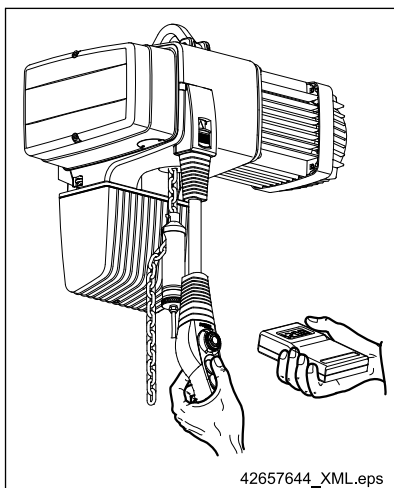


Fig. 88

If the slipping clutch is working correctly, the following will be observed:

- the hoist motor fan is still turning while there is no lifting motion;
- The 7-segment display shows the SLIP LIFTING V1 warning, ⇒ "Warning messages", Page 119.

When the slipping clutch function has been checked, the limit stop must be fitted again to the section of chain which is not under load.

8.5.10.2 Adjusting the slipping clutch

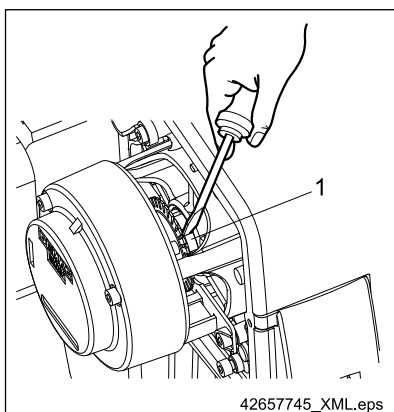


Fig. 89

The slipping clutch is protected against overload by slip monitoring, which means that it does not have to be re-adjusted until a general overhaul is carried out. If, owing to the operating conditions or due to malfunctions, the adjustment needs to be checked, a friction force checking device, ⇒ part no. 836 708 44, must be used. Inspection and adjustment may only be carried out by an experienced technician in compliance with the "Friction force checking device" document ⇒ Tab. 3, Page 7.

The slipping clutch provides the function of an emergency limit stop device and overload protection for the chain hoist.

The slipping clutch is initially adjusted in the factory. Under normal operating conditions, the slipping clutch does not need to be re-adjusted. The slipping clutch is maintenance-free for up to 10 years. The slipping clutch must be checked as part of the annual inspection.

The slipping clutch may only be adjusted by authorised specialists. An increase of the tripping torque which exceeds the factory setting is not permitted.

Check operation of the slipping clutch as follows:

- The chain collector must be disconnected in order to remove the limit stop, ⇒ "Removing the chain collector box", Page 83. Remove the limit stop ⇒ Fig. 69, Page 94 from the section of chain which is not under load and fit it above the hook assembly. Run the limit stop against the guide plate at creep speed. The operating limit switches must not be actuated while this is being done.

The slipping clutch is adjusted to the load capacity of the chain hoist during the final inspection in the factory. An increase of the tripping torque which exceeds the factory setting is not permitted, see also ⇒ "Suspending the chain hoist", Page 48.

For DC-Pro chain hoists that have a load capacity ≥ 1000 kg, the setting meets the requirements of EN 14492 2 for slipping clutches used as overload protection. Overload protection must be provided for load capacities ≥ 1000 kg.

If an acceptance check of the hoist or crane installation is carried out, a load of 110% of the rated load capacity must be lifted (without adjustment of the slipping clutch) as part of the dynamic overload test. A load $> 160\%$ must not be lifted, (EN 14492-2 "Direct acting rated capacity limiters").

8.5.11 Gearbox/oil change

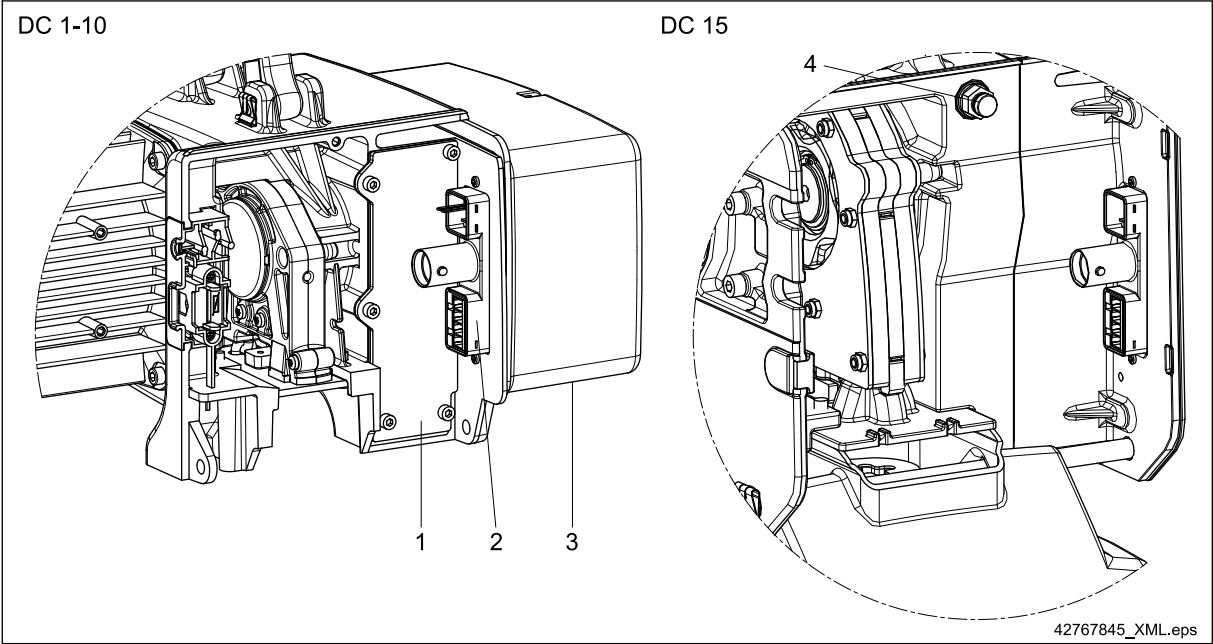


Fig. 90



Dispose of waste oil in accordance with environmental protection requirements.

Oil lubrication

Under normal operating conditions, the lubricant must be changed at least every 10 years. Under exceptional conditions, e.g. increased ambient temperatures, we recommend that oil changes be adapted to suit these conditions.

Oil quality

Shell Donax TD 10W-30 universal gear oil with wear-minimising additives, range of viscosity 10W-30. Malfunctions of the slipping clutch may occur if oils are used that are not approved. Contact the manufacturer for ambient temperatures lower or higher than -20 °C to + 45 °C.

General remarks on oil change

Drain the old oil at operating temperature. Turn the gearbox in such a way that the oil is drained. The flushing oil should have a viscosity of 46-68 mm²/s at rated temperature. The quantity of flushing oil used should be approximately twice that specified for lubrication. Then flush the gears by switching the hoist on and allowing the hook to run several times over the entire length of its lifting path. Then drain the flushing oil and refill the gearbox with new oil. Please refer to the table below for the required oil quantities. See spare parts for the order no.

DC 1-10

Remove control unit with plug-and-socket connections (2) under electrical equipment cover set (3). Now remove the screws of gearbox cover (1).

DC 15

The oil can be changed by unscrewing vent valve (4).

Chain hoist		DC-Pro 1/2	DC-Pro 5	DC-Pro 10	DC-Pro 15
Oil quantities	[l]	0,35	0,50	0,90	1,3

Tightening torques		DC-Pro 1/2	DC-Pro 5	DC-Pro 10	DC-Pro 15
Gearbox cover	[Nm]	5,5			-
2-piece gearbox housing	[Nm]	-			25
Oil fill opening and breather M16	[Nm]	-			15
Service cover	[Nm]	5,5		7,5	25

Tab. 84

8.5.12 Replacing the contactor on the control board

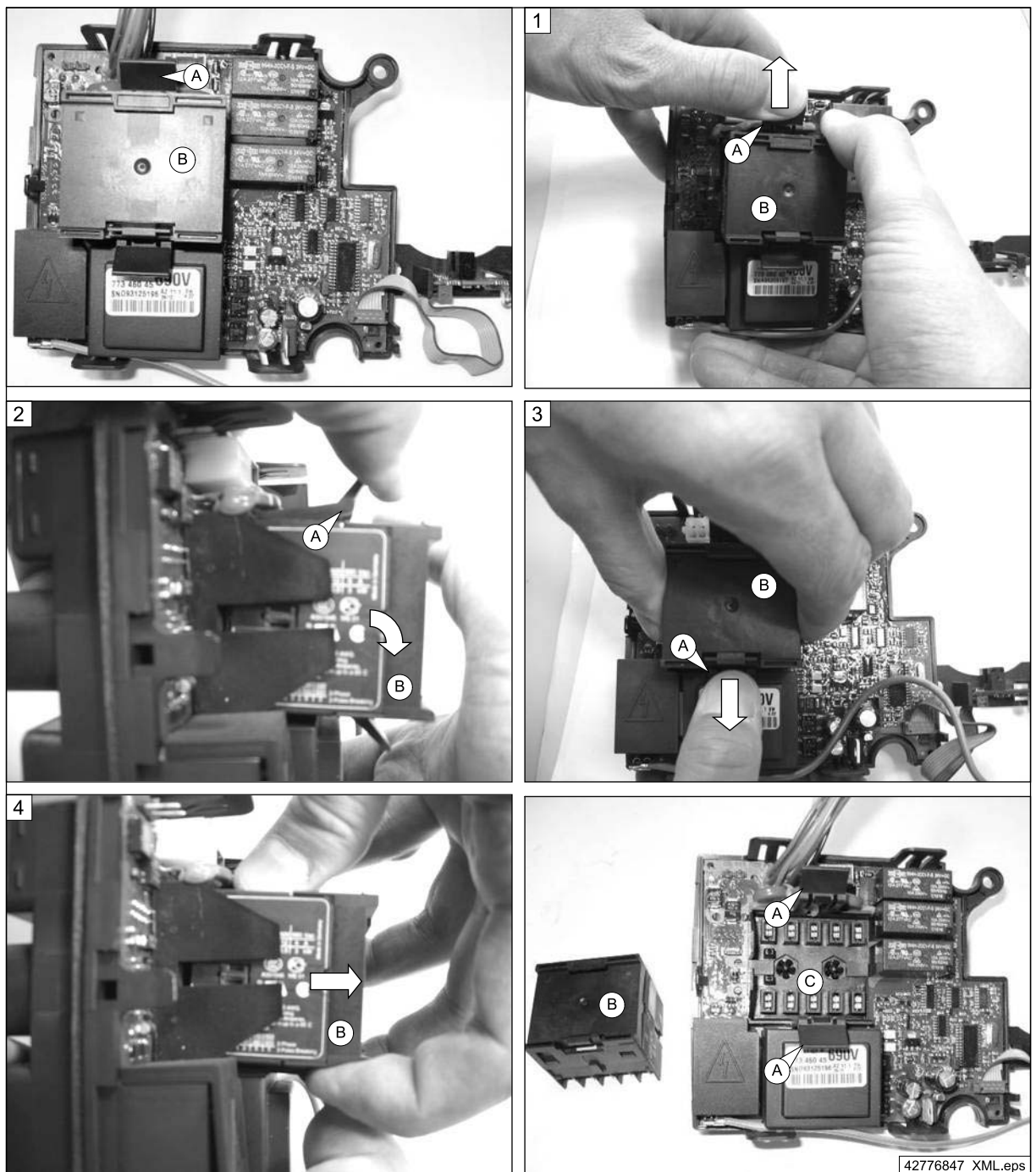


Fig. 91

1. Unclip the contactor retaining mechanism by pressing locking tab (A) with your thumb. This carefully bends locking tab (A) away from the contactor.
2. Then turn contactor (B) using your other hand until the mechanism no longer holds it.
3. Then unclip second locking tab (A) on the opposite side (as described in step 1 above).
4. Using your other hand, remove contactor (B) by pulling it away from the board.

The replacement contactor can only be inserted into the socket in one position. Push the contactor into contactor socket (C) until both locking tabs (A) click into position.



The contactors are also socket-mounted for sizes DC 1 to 5 manufactured as of 02/2011 and can be individually replaced.

8.5.13 Replacing cables

8.5.13.1 Replacing the control cable

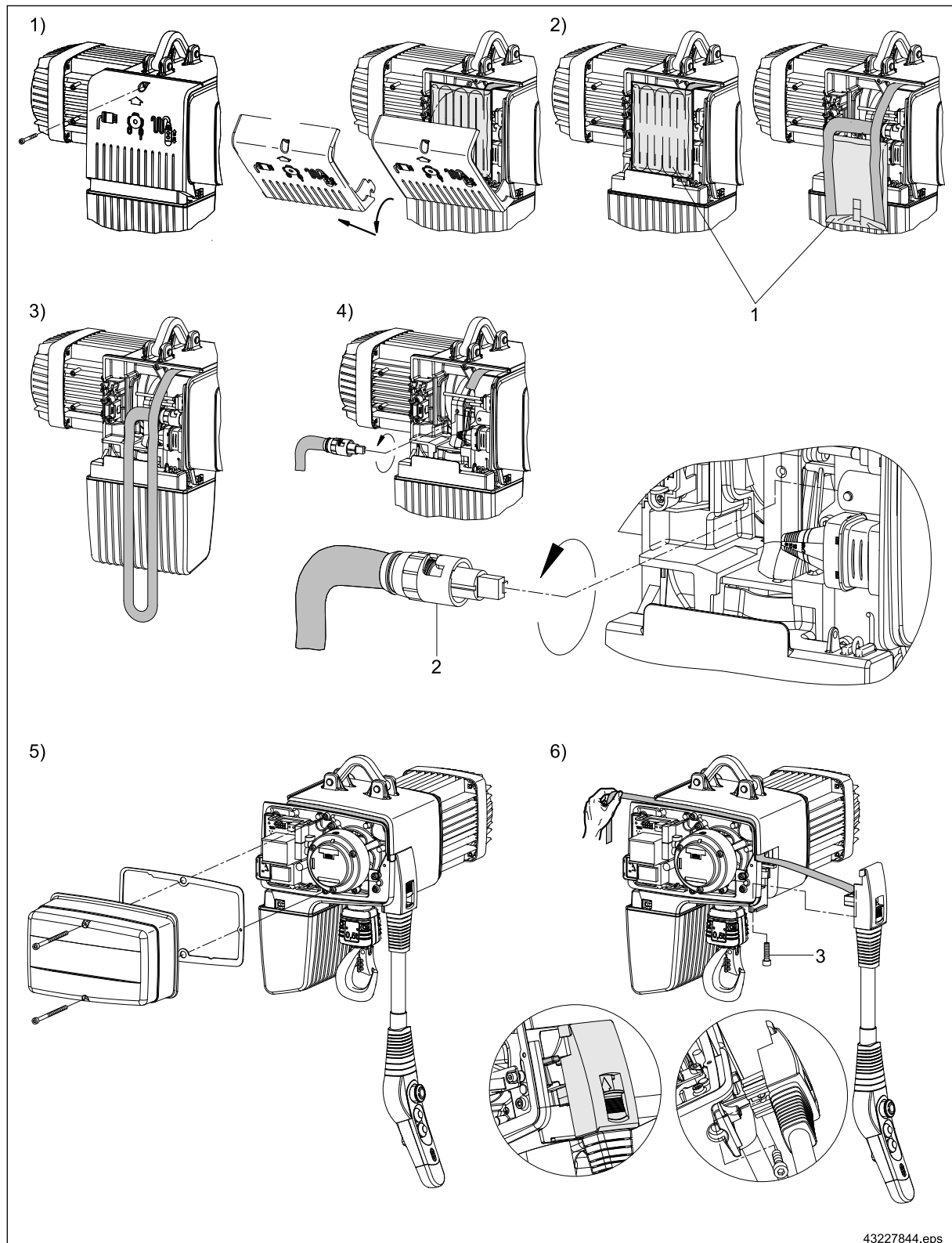


Fig. 92

1. Disconnect the chain hoist from the power supply (mains connection switch) and secure it against switching on again.
Open and disconnect the service cover.
2. Remove and open bag (1) with the control cable.
3. Take the control cable out of the bag.
4. Turn and disconnect bayonet lock (2) and remove the control cable plug connector.
5. Unscrew electrical equipment cover.
6. Loosen screw (3) on the control cable locking mechanism and remove the locking mechanism. Remove the control cable.

Install the new control cable in reverse order.

It must be ensured that

- the groove on the connector holder lines up with the swivel lock in the electrical enclosure and
- that the two pins on the enclosure line up with the bayonet lock.

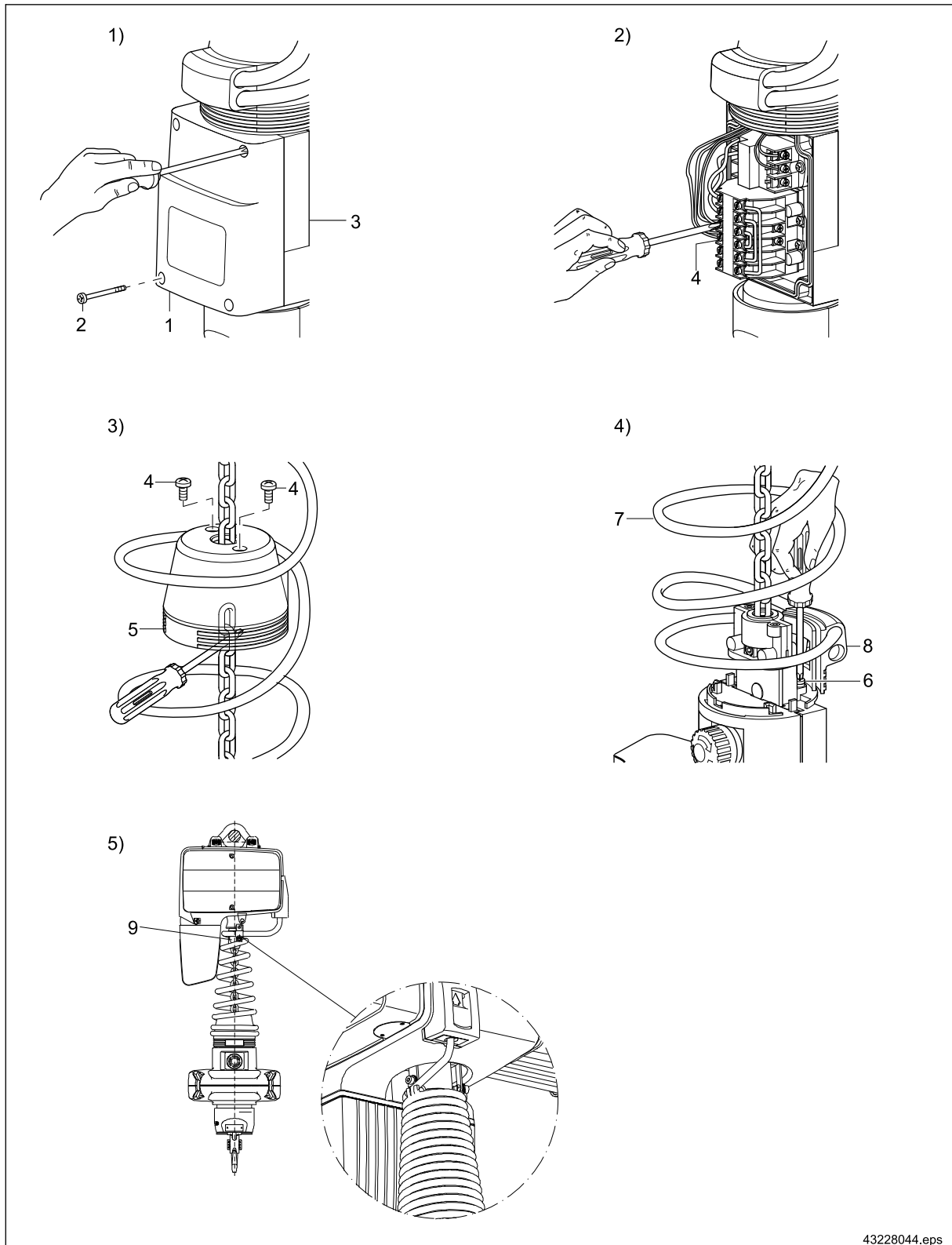
Assemble the control pendant ⇒ "Connecting the control pendant", Page 44.

Adjust the height of the control pendant ⇒ "Control pendant height adjustment", Page 46.

Tightening torques [Nm]	DC-Pro 1	DC-Pro 2	DC-Pro 5	DC-Pro 10	DC-Pro 15
Electric equipment cover	9,5				
Service cover	5,5			7,5	25
Control cable locking mechanism	11,0				

Tab. 85

8.5.13.2 Replacing the helical cable



43228044.eps

Fig. 93

1. Disconnect the chain hoist from the power supply (mains connection switch) and secure it against switching on again.
Undo the four screws (2) to remove cover (1). Tighten diagonal pairs of screws when re-fitting the cover.

2. Disconnect electrical leads (4).
3. Undo cap screws (4), slide cap (5) upwards and secure against dropping (e.g. with a screwdriver).
4. Fit helical cable entry section (8) to the centring rib of the housing and ensure helical cable is correctly arranged. Undo flanged cable entry sleeve (6), remove helical cable (7). When fitting the new cable, seal by tightening the flanged cable entry sleeve with rubber seal.
5. Disconnect helical cable, screws and pipe clamps from the adapter ring.

All further steps as described in ⇒ "Replacing the control cable", Page 114

- Open and disconnect the service cover.
- Turn and disconnect the bayonet lock and remove the control cable plug connector.
- Unscrew electrical equipment cover.
- Loosen the screw on the control cable locking mechanism and remove the locking mechanism. Remove the control cable.

Install the new helical cable in reverse order.

It must be ensured that

- the groove on the connector holder lines up with the swivel lock in the electrical enclosure and
- that the two pins on the enclosure line up with the bayonet lock.
- Limit stop (9) must be installed to match the hook path:
 - on the 17th chain link for a hook path of 2,8 m,
 - on the 21st chain link for a hook path of 4,3 m.

Tightening torques [Nm]	DC-Pro 1	DC-Pro 2	DC-Pro 5
Electric equipment cover	9,5		
Service cover	5,5		
Limit stop	4,0		4,3
Control cable locking mechanism	11,0		

Tab. 86

9 Malfunctions/warnings

9.1 Safety instructions for malfunctions/warnings

WARNING



Inappropriate fault elimination

Danger to life and limb. Risk of damage to the machine.

Faults may only be eliminated by qualified instructed personnel (⇒ "Definition of personnel", Page 9) in compliance with the safety regulations.

DANGER



Live components

Danger to life and limb.

Work on electric equipment may only be carried out by qualified specialist personnel (⇒ "Definition of personnel", Page 9) in compliance with the safety regulations.

Switch off the electric power supply before starting work. The mains connection or isolating switch must be protected against unauthorised or accidental restoration of the power supply by means of a padlock.

WARNING



Risk of burns

Risk of burns from contact after the chain hoist has been in operation.

Do not touch hot motor housings. Allow the motor to cool down before eliminating the fault.

Conduct when malfunctions occur

1. Bring the machine to an immediate standstill by actuating the emergency stop without delay if malfunctions occur that result in an immediate danger of personal injury, damage and/or an operating hazard.
2. Switch the chain hoist off at the mains connection switch or isolating switch and secure it against switching on again.
3. Inform the person responsible at the location about the malfunction.
4. Have the malfunction and the cause of the malfunction identified and eliminated by authorised specialist personnel.

Conduct after a malfunction is eliminated

WARNING



Check for correct assembly

Before reconnecting the power supply, ensure that

- Malfunction and cause of malfunction have been eliminated.
- All safety devices have been fitted properly and are in perfect condition and working order.
- Nobody is present in the danger zone of the equipment.

9.2 7-segment display

The 7-segment display is located on the underside of the chain hoist behind a window.



Fig. 94

Warning messages start with a lightning symbol.

Movement in the opposite direction is possible, the error message does not need to be acknowledged using the emergency stop.

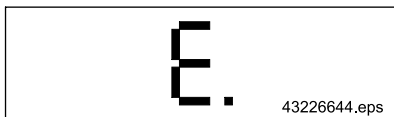


Fig. 95

Error messages start with an Error.

Before any further movement is possible, the error message must be acknowledged using the emergency stop.

Failed safety functions

If a safety function has failed, operation may only be continued after repair.

Malfunctions

The chain hoist can only function when it is correctly connected to the power supply. In the event of a failure, therefore, first check cables, strain relief and power supply connections. Malfunctions may also be caused by incorrect transmission of commands from the control pendant. Therefore, check the control pendant and the control cable for damage and the plug-in connector on the pendant and in the service enclosure for correct fit.



The symbols are shown one after the other.

- Please contact our after-sales service if the cause of the fault cannot be eliminated with the given measures.

9.3 General messages

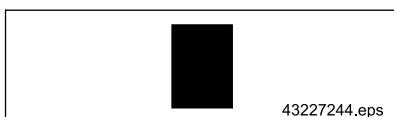


Fig. 96 No lifting, no lowering

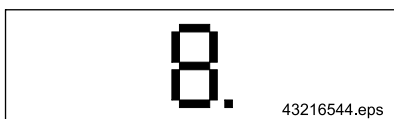


Fig. 97 No lifting, no lowering

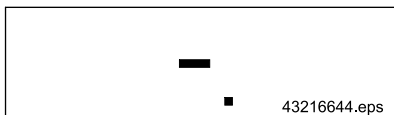


Fig. 98 Upper or lower limit position has been reached. No lifting, no lowering.

Possible cause	Remark
No power supply(display is dark)	Check mains connection and fuse link; check connection cable for interruption; check mains connector in the service enclosure. Check PE phase for correct connection.

Tab. 87

Possible cause	Remark
Emergency stop actuated Emergency-stop cable interrupted.	Unlock emergency stop by turning it. Check dummy plug for trolley connection. Check connections of the control cable on the pendant and in the service enclosure.

Tab. 88

Possible cause	Remark
Incorrect motor direction of rotation.	Two phases of the mains connection cable must be changed. First disconnect unit from the power supply.
Thermal contact open.	Check motor plug connector X8 for continuity between terminals 4 and 8.
When the voltage is switched on or the emergency-stop is unlocked, a button is already actuated.	Release button and actuate it again.
Control cable interrupted.	Check connections of the control cable on the pendant and in the service enclosure. Check control cable for continuity.

Tab. 89

9.4 Warning messages

In general, all warning messages are generated by comparison of the actual and theoretical speed. There may be various causes for a difference in speed:

- incorrectly adjusted slipping clutch;
- a binding brake or
- a dirty or defective speed sensor.

These causes may result in frequent warning messages. Various measures must be taken to eliminate the warning messages:

- clean the speed sensor with compressed air (e.g. dirt accumulation on the photo cell);
- check and, if necessary, adjust the slipping clutch;
- check and, if necessary, adjust the brake air gap.

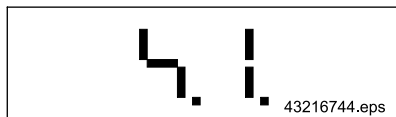


Fig. 99 SLIP LIFTING start-up: No lifting. No lifting with load.



Fig. 100 SLIP LIFTING V1: Cut-out in the upper limit position.



Fig. 101 SLIP LIFTING V2: Cut-out in the upper limit position. Fast lifting with load is switched off.

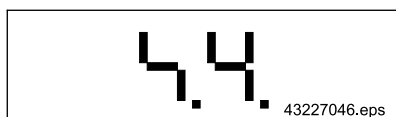


Fig. 102 Defective internal data memory.

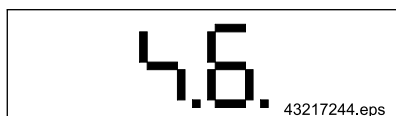


Fig. 103 No speed information.

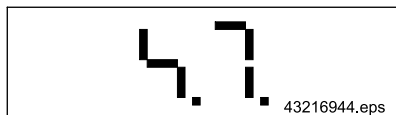


Fig. 104 SLIP LOWERING start-up: No lowering.

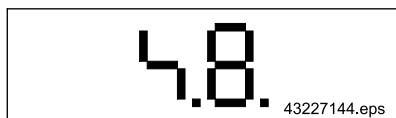


Fig. 105 SLIP LOWERING V1: Lowering is switched off, lower limit position is not reached. Cut-out in the lower limit position

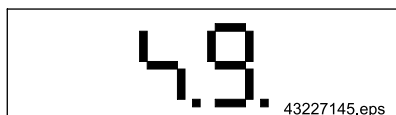


Fig. 106 SLIP LOWERING V2: Lowering is switched off, lower limit position is not reached. Cut-out in the lower limit position

Possible cause	Remark
A mains phase is missing or the motor is blocked.	Check mains connection and fuse link; check connection cable for interruption; check mains connector in the service enclosure.
Chain hoist overloaded or undervoltage.	Reduce load to the permissible load capacity. Ensure appropriate mains voltage.

Tab. 90

Possible cause	Remark
Operating limit switch contact is no longer actuated.	(-) is displayed when the limit switches function correctly. The slipping clutch acts as an emergency-stop device if there is a malfunction: Operating limit switch contact connection and operation must be inspected by an experienced technician.

Tab. 91

Possible cause	Remark
Operating limit switch contact is no longer actuated.	(-) is displayed when the limit switches function correctly. The slipping clutch acts as an emergency-stop device if there is a malfunction: Operating limit switch contact connection and operation must be inspected by an experienced technician.
Chain hoist overloaded.	Reduce load to the permissible load capacity.

Tab. 92

Possible cause	Remark
Defective control system.	Replace control system.

Tab. 93

Possible cause	Remark
Hardware monitoring malfunction.	Repeat lifting process; if the load does not move, have the brake and control system checked by an experienced technician.

Tab. 94

Possible cause	Remark
A mains phase is missing or the motor is blocked.	Check mains connection and fuse link; check connection cable for interruption; check mains connector in the service enclosure.

Tab. 95

Possible cause	Remark
Chain blocked.	Check chain entry point, replace chain, if required.
Operating limit switch contact is no longer actuated.	(-) is displayed when the limit switches function correctly. The slipping clutch acts as an emergency-stop device if there is a malfunction: Operating limit switch contact connection and operation must be inspected by an experienced technician.

Tab. 96

Possible cause	Remark
Chain blocked.	Check chain entry point, replace chain, if required.
Operating limit switch contact is no longer actuated.	(-) is displayed when the limit switches function correctly. The slipping clutch acts as an emergency-stop device if there is a malfunction: Operating limit switch contact connection and operation must be inspected by an experienced technician.

Tab. 97

9.5 Error messages

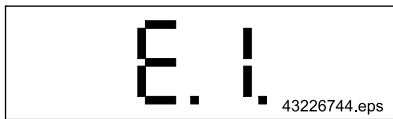


Fig. 107 Chain hoist is blocked.

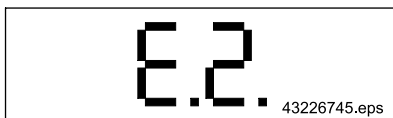


Fig. 108 Chain hoist is blocked.

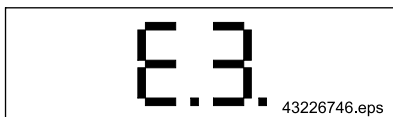


Fig. 109 Hoist unit: overspeed or load cannot be held. Lowering with load is switched off.

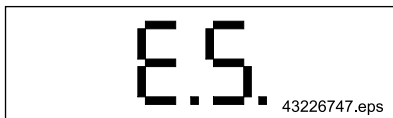


Fig. 110 Chain hoist is blocked.

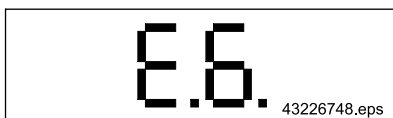


Fig. 111 Chain hoist is blocked.

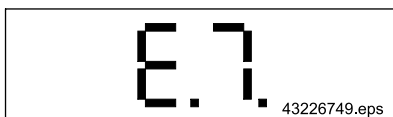


Fig. 112 Hoist unit: Motor runs in wrong direction. Chain hoist is blocked.

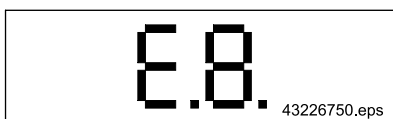


Fig. 113 Lowering is switched off.

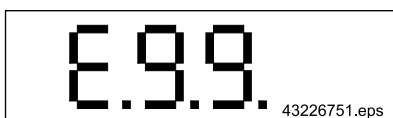


Fig. 114 Chain hoist is blocked.

Possible cause	Remark
Hardware error of control system.	Check error message by actuating and unlocking the emergency stop. Then actuate Lowering. If necessary, remove suspended load.
Defective electronic monitoring.	Replace hoist control system.
Defective „On/off“ contactor	Replace contactor, ⇒ „Replacing the contactor on the control board“, Page 113
Contact wear	

Tab. 98

Possible cause	Remark
Drive blocked.	Check error message by actuating and unlocking the emergency stop. Then actuate Lowering. If necessary, remove suspended load.
Speed measurement failure.	Replace hoist control system.

Tab. 99

Possible cause	Remark
Lowering speed too high.	Reduce load to the permissible load capacity. Check mains connection and fuse link; check connection cable for interruption; check mains connector in the service enclosure.

Tab. 100

Possible cause	Remark
Hardware error of control system.	Check error message by actuating and unlocking the emergency stop. Then actuate Lowering. If necessary, remove suspended load.
Defective electronic monitoring.	Replace hoist control system.

Tab. 101

Possible cause	Remark
Hardware error of control system.	Check error message by actuating and unlocking the emergency stop. Then actuate Lowering. If necessary, remove suspended load.
Defective electronic monitoring.	Replace hoist control system.

Tab. 102

Possible cause	Remark
Direction cannot be switched.	Check error message by actuating and unlocking the emergency stop. Then actuate Lowering. If necessary, remove suspended load. Replace hoist control system.

Tab. 103

Possible cause	Remark
Brake defective or slipping clutch incorrectly adjusted.	Check brake and slipping clutch. If there is no fault, replace electronics.

Tab. 104

Possible cause	Remark
Emergency-stop circuit of control system defective.	Check error message by actuating and unlocking the emergency stop. Then actuate Lowering. If necessary, remove suspended load. Replace hoist control system.

Tab. 105

10 Disassembly/disposal

10.1 General

WARNING



Before disassembly, follow the safety instructions in ⇒ "Maintenance/repair", Page 74 of these operating instructions.

Refer to ⇒ "Assembly", Page 41 of these operating instructions for information on removing track sections, trolleys and current collector trolleys. Other parts are removed in reverse order to assembly.

Unless a return or disposal agreement has been concluded, separated components must be recycled after proper removal:

- Scrap any remaining metallic material,
- Dispose of plastic elements for recycling,
- Separate and dispose of any other components by material type.



Electric scrap, electronic components, lubricants and other auxiliary materials are subject to special disposal regulations and may only be disposed of by certified companies.

National disposal regulations must be considered regarding environmentally friendly disposal. Further information can be obtained from corresponding local authorities.

11 Accessories

11.1 Assemblies

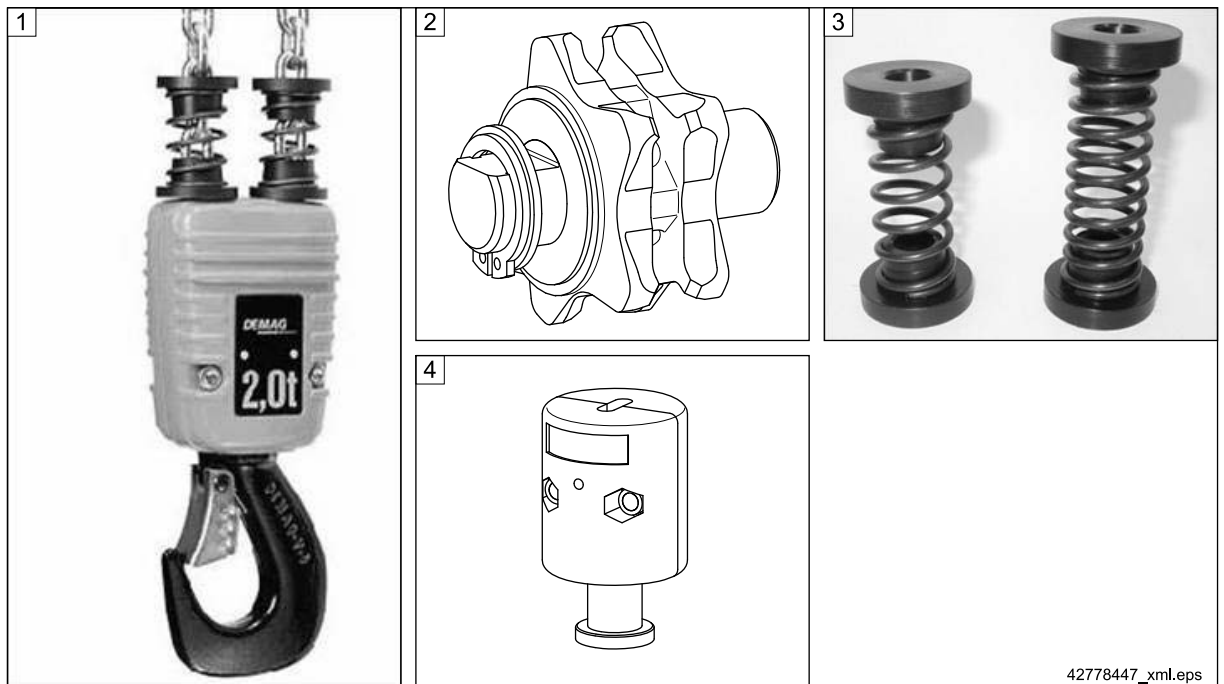


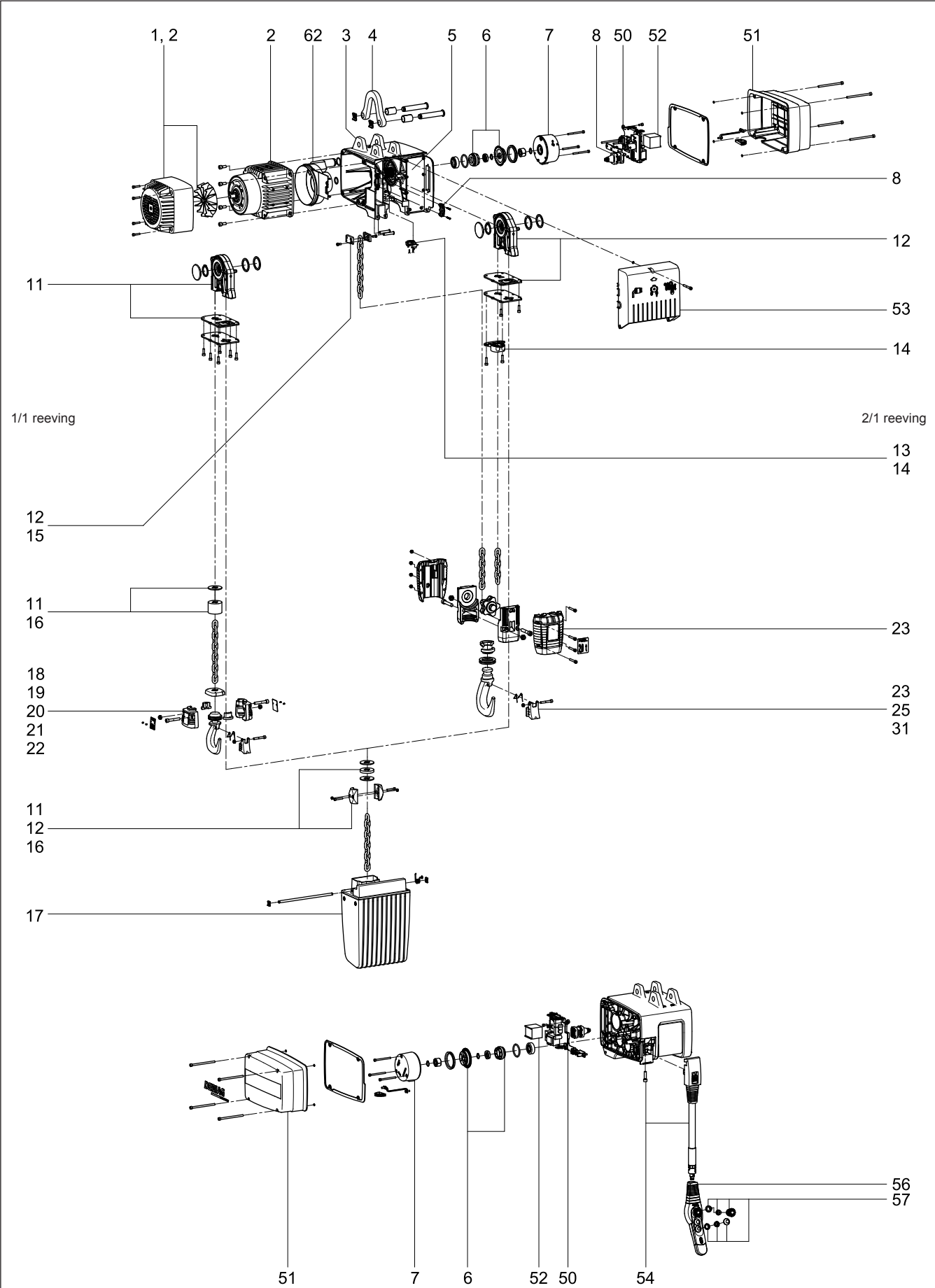
Fig. 115

Item	Description		Size	Order no.
1	Bottom block with cut-off springs (e.g. for hot applications) consisting of: Bottom block, cut-off springs, grooved pins with round head, load capacity plates		DC-Pro 10 2/1	715 431 45
2	Return sprocket assembly, consisting of: 1 return sprocket, 1 pin, 1 retaining ring, 1 supporting washer, 2 thrust washers, 2 needle-roller assemblies		DC-Pro 1 / 2	717 808 45
			DC-Pro 5	718 808 45
			DC-Pro 10	715 808 45
			DC-Pro 15	721 845 45
3	Cut-off spring (e.g. for hot applications), consisting of: 2 cut-off sleeves, 1 pressure spring each (for DC 10, 2/1 reeving: 2x part no.)	V6,0/1,5 V12,0/3,0	DC-Pro 1 / 2	717 250 45
			DC-Pro 5	718 250 45
			DC-Pro 10	715 250 45
	Cut-off spring (e.g. for hot applications) consisting of: 2 cut-off sleeves, 1 pressure spring	V24,0/6,0	DC-Pro 5	718 249 45
			DC-Pro 10	715 249 45
4	Swivel unit - swivel joint for Manulift (fitted in Manulift units as standard since 04/2009), consisting of: 1 swivel unit, 1 pin		DCM-Pro 1 / 2	717 306 45
			DCM-Pro 5	718 306 45
Not shown	Assembly for converting DC-Pro to DCM-Pro Manulift, consisting of: Manulift handle, helical cable, helical cable clamp, swivel unit, load hook, 2 x link sections, buffer plate, 2 x buffer		DCM-Pro 1 / 2 H2,8	773 509 44
			DCM-Pro 5 H2,8	773 511 44
			DCM-Pro 1 / 2 H4,3	773 513 44
			DCM-Pro 5 H4,3	773 514 44

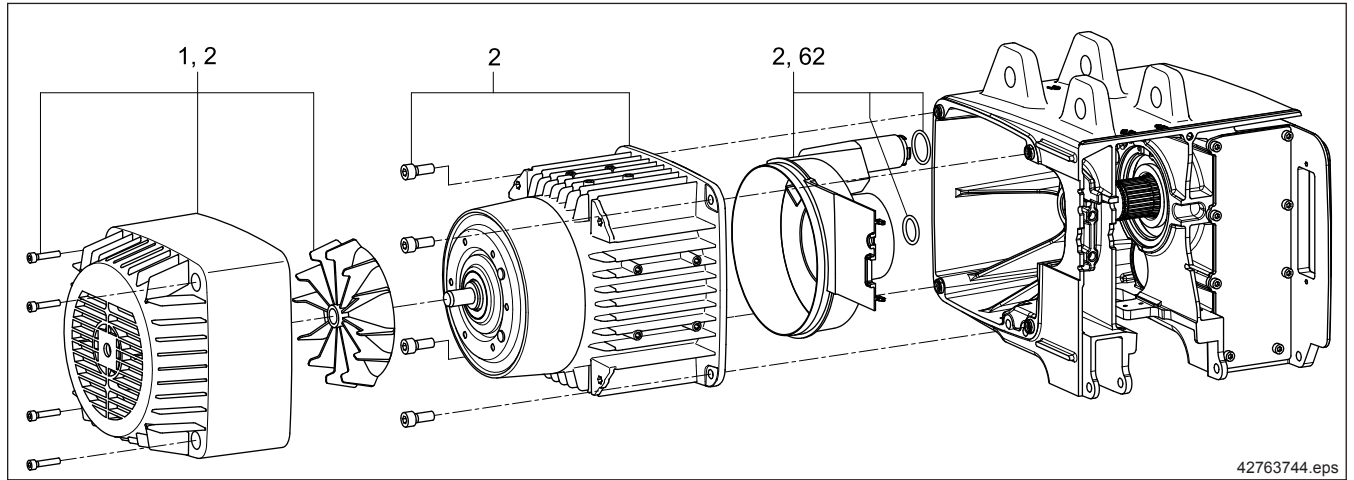
Tab. 106

12 Spare parts

12.1 Overview



12.2 Motor

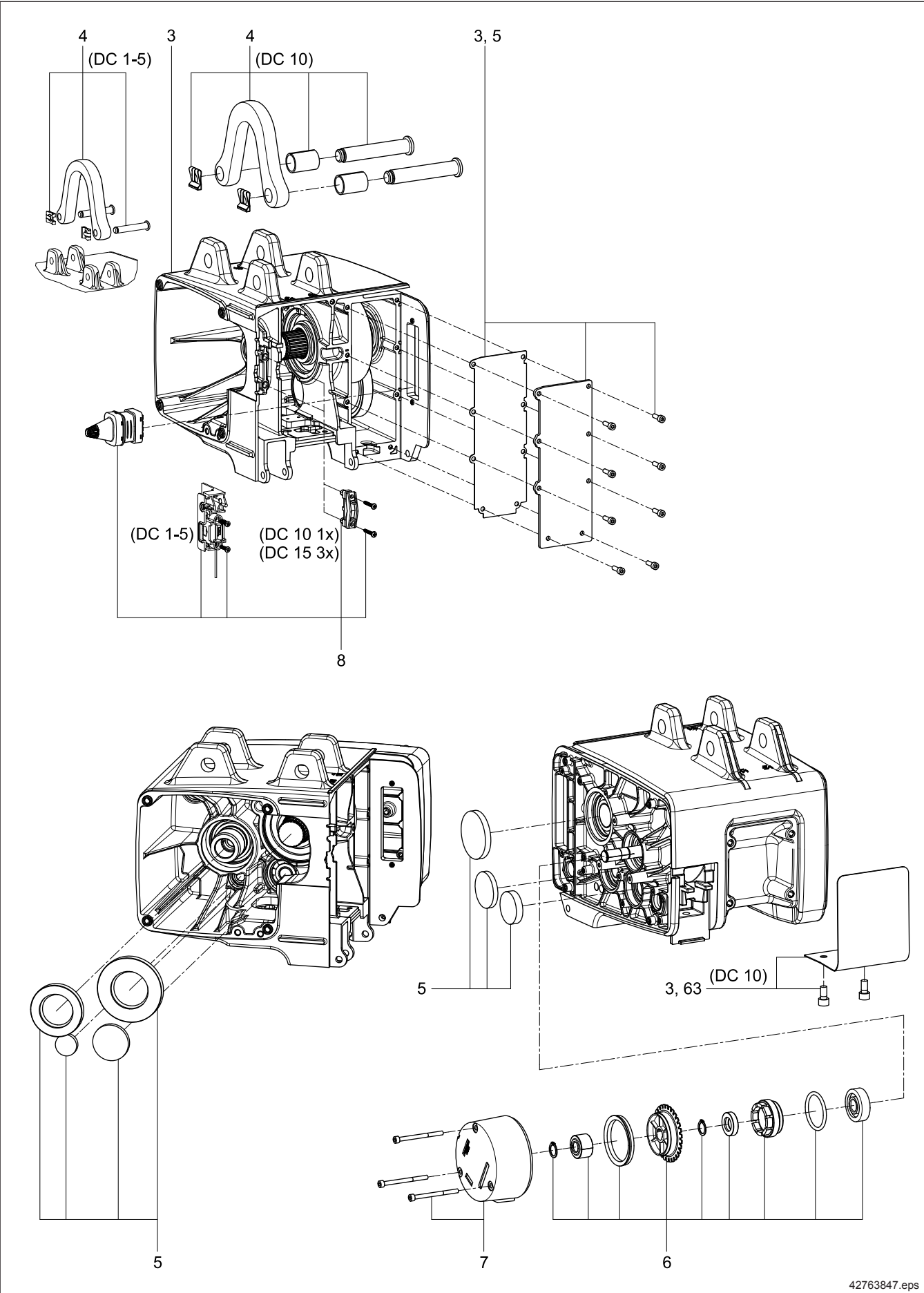


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Item	Part no.	Qty.	Designation	Material	Standard
1	71785033	1	DC-Pro 1 / 2 Fan set DC 2	4 Nm, ZNK 71	
1	71885033	1	DC-Pro 5 Fan set DC 5	4 Nm, ZNK 80	
1	71585033	1	DC-Pro 10 Fan set ZNK 100A	4 Nm	
1	71585133	1	DC-Pro 10 / 15 Fan set ZNK 100B	4 Nm	
2	71784133	1	DC-Pro 1 / 2 Motor set 240V50Hz	220 V - 240 V, 50 Hz, 9,5 Nm	
2	71784233	1	Motor set 415V50Hz	380 V - 415 V, 50 Hz, 9,5 Nm	
2	71784433	1	Motor set 525V50Hz	500 V - 525 V, 50 Hz/ 575 V, 60 Hz, 9,5 Nm	
2	71784533	1	Motor set 460V60Hz	440 V - 480 V, 60 Hz, 9,5 Nm	
2	71784633	1	Motor set 240V60Hz	220 V - 240 V, 60 Hz, 9,5 Nm	
2	71784733	1	Motor set 380V60Hz	380 V - 400 V, 60 Hz, 9,5 Nm	
2	71884133	1	DC-Pro 5 Motor set 240V50Hz	220 V - 240 V, 50 Hz, 9,5 Nm	
2	71884233	1	Motor set 415V50Hz	380 V - 415 V, 50 Hz, 9,5 Nm	
2	71884433	1	Motor set 525V50Hz	500 V - 525 V, 50 Hz/ 575 V, 60 Hz, 9,5 Nm	
2	71884533	1	Motor set 460V60Hz	440 V - 480 V, 60 Hz, 9,5 Nm	
2	71884633	1	Motor set 240V60Hz	220 V - 240 V, 60 Hz, 9,5 Nm	
2	71884733	1	Motor set 380V60Hz	380 V - 400 V, 60 Hz, 9,5 Nm	
2	71584133	1	DC-Pro 10 Motor set 240V50Hz A	220 V - 240 V, 50 Hz, 25 Nm	
2	71584233	1	Motor set 415V50Hz A	380 V - 415 V, 50 Hz, 25 Nm	
2	71584433	1	Motor set 575V60Hz A	500 V - 525 V, 50 Hz/ 575 V, 60 Hz, 25 Nm	
2	71584533	1	Motor set 460V60Hz A	440 V - 480 V, 60 Hz, 25 Nm	
2	71584633	1	Motor set 240V60Hz A	220 V - 240 V, 60 Hz, 25 Nm	
2	71584733	1	Motor set 380V60Hz A	380 V - 400 V, 60 Hz, 25 Nm	
2	71583233	1	DC-Pro 10 / 15 Motor set DC10/16 B 50Hz	380 V - 415 V, 50 Hz, 25 Nm	
2	71583433	1	Motor set DC10/16 B 60Hz	500 V - 525 V, 50 Hz/ 575 V, 60 Hz, 25 Nm	
2	71583533	1	Motor set DC10/16 B 60Hz	440 V - 480 V, 60 Hz, 25 Nm	
2	71583733	1	Motor set DC10/16 B 60Hz	380 V - 400 V, 60 Hz, 25 Nm	
62	26564933	1	Winding head can DC1/2		
62	71821033	1	Winding head can DC 5		
62	71521033	1	Winding head can DC10		

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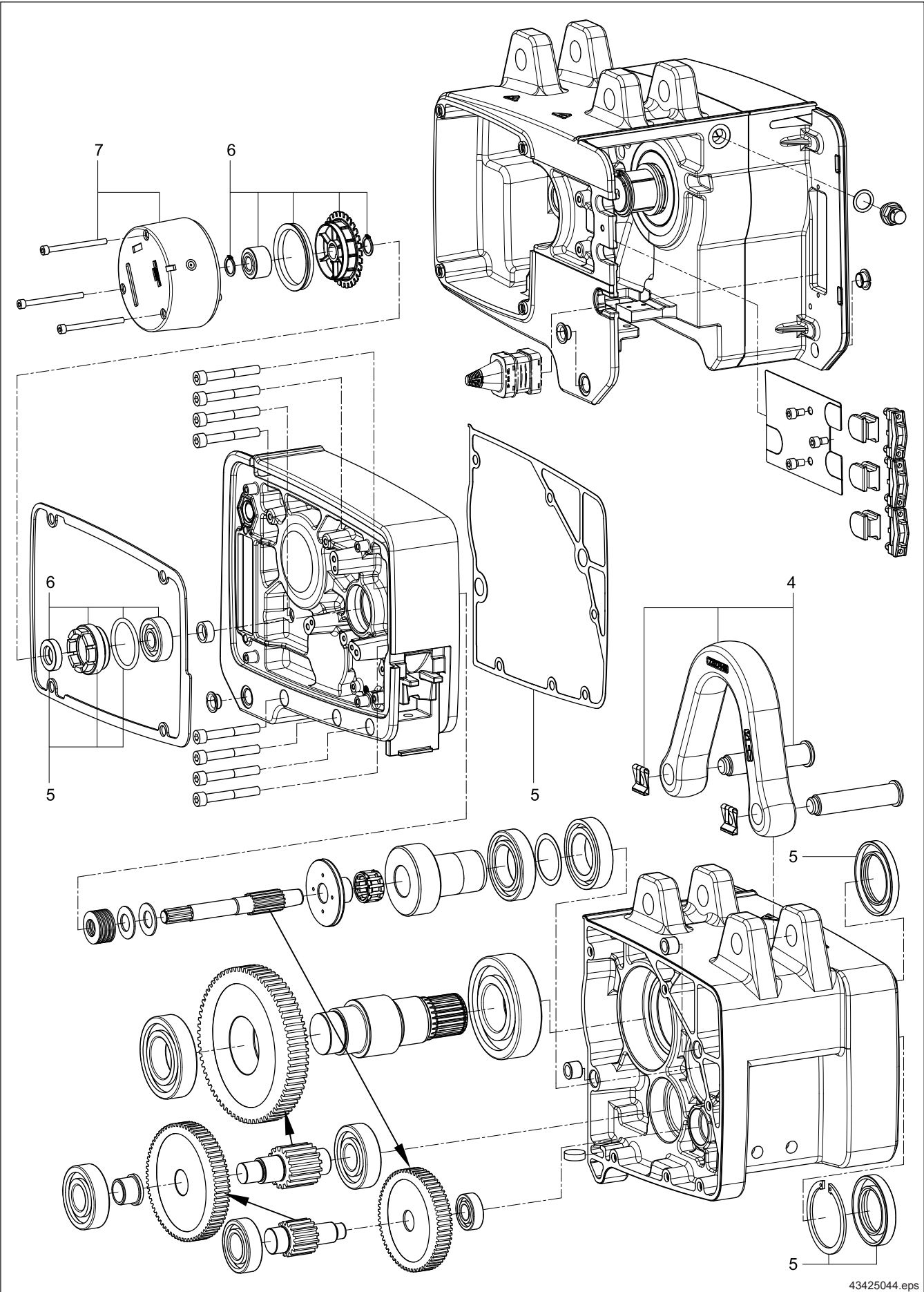
12.3 Parts on the DC-Pro 1-10 gearbox



Item	Part no.	Qty.	Designation	Material	Standard
3	71771533	1	Gearbox set DC-PRO 1 V8/2	DC-Pro 1; V8/2	
3	71790533	1	Gearbox set DC-PRO 2 V8/2	DC-Pro 2; V8/2	
3	71790633	1	Gearbox set DC-PRO 2 V16/4	DC-Pro 2; V16/4	
3	71890833	1	Gearbox set DC-PRO 5 V8/2	DC-Pro 5; V8/2	
3	71890933	1	Gearbox set DC-PRO 5 V16/4	DC-Pro 5; V16/4	
3	71800933	1	Gearbox set DC5 V3	DC-Pro 5; V24/6	
3	71590533	1	Gearbox set DC-PRO10V6/1,5	DC-Pro 10 1/1 reeving; V6/1,5	
3	71590833	1	Gearbox set DC-PRO 10 V8/2	DC-Pro 10 1/1 reeving; V8/2	
3	71590633	1	Gearbox set DC-PRO10 V12/3	DC-Pro 10 1/1 reeving; V12/3	
3	71500933	1	Gearbox DC-Pro10 V24	DC-Pro 10 1/1 reeving; V24/6	
3	71590933	1	Gearbox set DC-PRO 10 V4/1	DC-Pro 10 2/1 reeving; V4/1	
3	71590733	1	Gearbox set DC-PRO10V6/1,5	DC-Pro 10 2/1 reeving; V6/1,5	
			Year of manufacture 2004 to 03/2007		
3	71890533	1	Gearbox set DC-PRO5 V6/1,5	DC-Pro 5; V6/1,5	
3	71890633	1	Gearbox set DC-PRO 5 V12/3	DC-Pro 5; V12/3	
4	71897433	1	Suspension set DC 1- 5		
4	71597433	1	Suspension set DC10		
5	71791933	1	Gear oil/seal Pro 2	5,5 Nm, 0,35 litre, DC-Pro 1 / 2	
5	71891933	1	Gear oil/seal Pro 5	5,5 Nm, 0,5 litres	
5	71591933	1	Gear oil/seal DC10	5,5 Nm, 0,9 litres	
6	71894733	1	Adjusting nut/pulse wheel	DC1/2/5	
6	71594733	1	Adjusting nut/pulse wheel	DC10	
			DC-Pro 1 / 2 / 5		
7	71887133	1	Brake set 180V	380 V - 415 V, 50 Hz, 5,5 Nm	
7	71887233	1	Brake set 216V	440 V - 480 V, 60 Hz, 5,5 Nm	
7	71887333	1	Brake set DCS 1-5 104V	220 V - 240 V, 50/60 Hz, 5,5 Nm	
7	71887433	1	Brake set 258V	500 V - 525 V, 50 Hz/ 575 V, 60 Hz, 5,5 Nm	
			DC-Pro 10		
7	71587133	1	Brake set DC10/15 180V	380 V - 415 V, 50 Hz, 5,5 Nm	
7	71587233	1	Brake set DC10/15 216V	440 V - 480 V, 60 Hz, 5,5 Nm	
7	71587333	1	Brake set DC/DCS10/15	220 V - 240 V, 50/60 Hz, 5,5 Nm	
7	71587433	1	Brake set DC10/15 258V	500 V - 525 V, 50 Hz/ 575 V, 60 Hz, 5,5 Nm	
8	71885633	1	Insert/plug		
63	71511345	1	Cover plate DC10 Kit		

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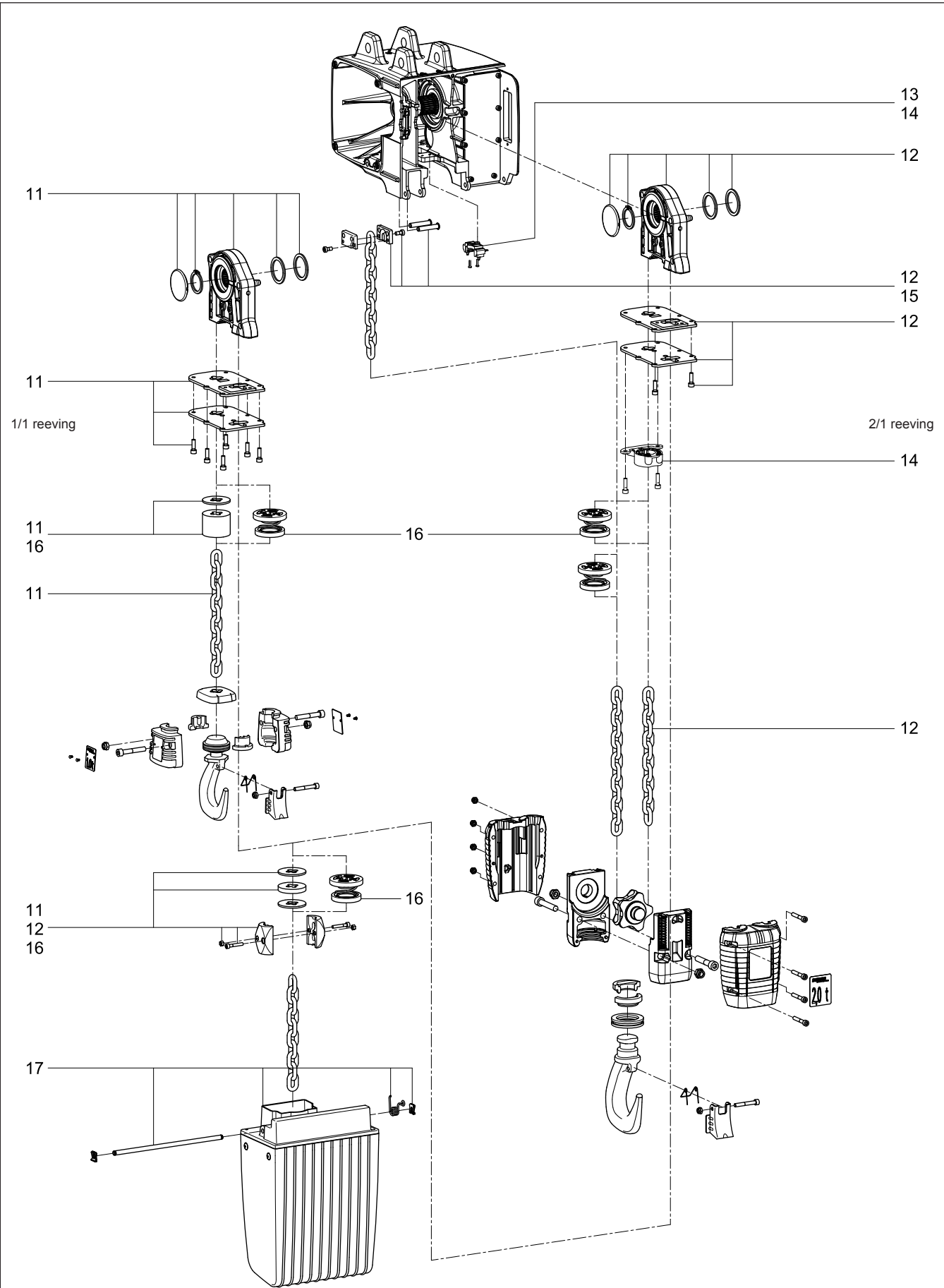
12.4 Parts on the DC-Pro 15 gearbox



Item	Part no.	Qty.	Designation	Material	Standard
4	72127433	1	Suspension bracket DC16/25		
5	72191933	1	Gear oil/seal DC15	1,3 litres	
6	71594733	1	Adjusting nut/pulse wheel	DC15	
7	71587133	1	Brake set DC10/15 180V	380 V - 415 V, 50 Hz, 5,5 Nm	
7	71587233	1	Brake set DC10/15 216V	440 V - 480 V, 60 Hz, 5,5 Nm	
7	71587333	1	Brake set DC/DCS10/15	220 V - 240 V, 50/60 Hz, 5,5 Nm	
7	71587433	1	Brake set DC10/15 258V	500 V - 525 V, 50 Hz/ 575 V, 60 Hz, 5,5 Nm	

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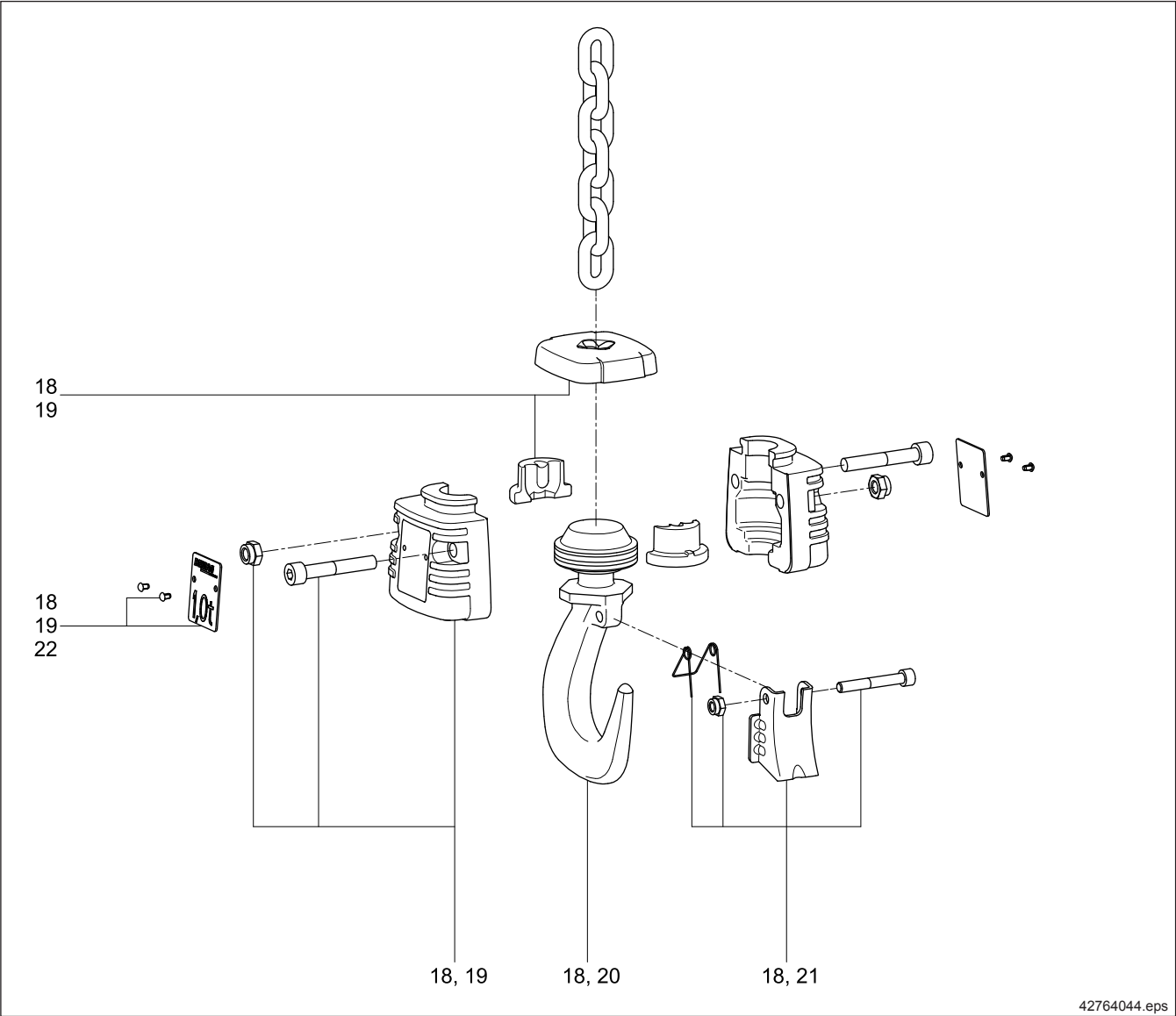
12.5 Chain drive



Item	Part no.	Qty.	Designation	Material	Standard
11	71795033	1	Chain set DC/DCM 1/2 H 5		
11	71795133	1	Chain set DC 1/2 H 8		
11	75266533	1	Chain set DC1/2 H9-H12		
11	75266633	1	Chain set DC1/2 H13-H15		
11	75266733	1	Chain set DC1/2 H16-H18		
11	75266833	1	Chain set DC1/2 H19-H25		
11	75266933	1	Chain set DC1/2 H26-H35		
11	71895033	1	Chain set DC/DCM 5 H 5		
11	71895133	1	Chain set DC 5 H 8		
11	75267033	1	Chain set DC5 H9-H12		
11	75267133	1	Chain set DC5 H13-H16		
11	75267233	1	Chain set DC5 H17-H20		
11	75267333	1	Chain set DC5 H21-H27		
11	75267433	1	Chain set DC5 H28-H35		
#	11	75395033	Chain set DC10 1/1 H 5		
#	11	75395133	Chain set DC10 1/1 H 8		
	11	75263733	Chain set DC 10 5m 1/1	for GGS 1)	
	11	75263833	Chain set DC 10 8m 1/1	for GGS 1)	
	11	75267533	Chain set DC10 1/1 H9-H10		
	11	75267733	Chain set DC10 1/1 H11-15		
	11	75267833	Chain set DC10 1/1 H21-25		
	11	75267933	Chain set DC10 1/1 H26-30		
	11	75264933	Chain set DC15 1/1 H 4		
	11	75265633	Chain set DC15 1/1 H 5		
	11	75265733	Chain set DC15 1/1 H 8		
	12	71596033	Chain set DC10 2/1 H 5		
	12	71596133	Chain set DC10 2/1 H 8		
	12	75263933	Chain set DC 10 5m 2/1	for GGS 1)	
	12	75264033	Chain set DC 10 8m 2/1	for GGS 1)	
	12	75268033	Chain set DC10 2/1 H9-10		
	12	75268333	Chain set DC10 2/1 H11-15		
	12	75268433	Chain set DC10 2/1 H16-20		
	12	75268533	Chain set DC10 2/1 H21-25		
	12	75265033	Chain set DC15 2/1 H 4		
	12	75265833	Chain set DC15 2/1 H 5		
	12	75265933	Chain set DC15 2/1 H 8		
	13	71888033	Limit switch set	DC 1/2/5; 3 Nm	
	14	71588033	Limit switch set	DC 10 - 15, 3 Nm	
#	15	71538845	Anchorage/limit stop DC10 Kit	DC 10 2/1	
	15	72238845	Anchorage/limit stop DC15 Kit	DC 15 2/1	
	16	71795333	Buffer set DC 1/2	2)	
	16	71895333	Buffer set DC5	2)	
	16	71595333	Buffer set DC10	2)	
	16	72175345	Cut-off switch accessories V8	DC15, 2)	
	17	71798633	Chain collector set DC1/2 5m		
	17	71798733	Chain collector set DC1/2 8m		
	17	71898633	Chain collector set DC5 5m		
	17	71898733	Chain collector set DC5 8m		
	17	71598633	Chain collector DC10 1/1 5m		
	17	71598733	Chain collector DC10 1/1 8m	DC 10 2/1 H5	
	17	71535045	Chain collector flexible 20 m	DC 10 2/1 H8	
	17	72238745	Chain collector DC15 Kit Gr.S	DC 15, Gr. S	
	17	72183045	Chain collector Kit	DC 15, Gr. 1	
	17	72183545	Chain collector Kit	DC 15, Gr. 2	

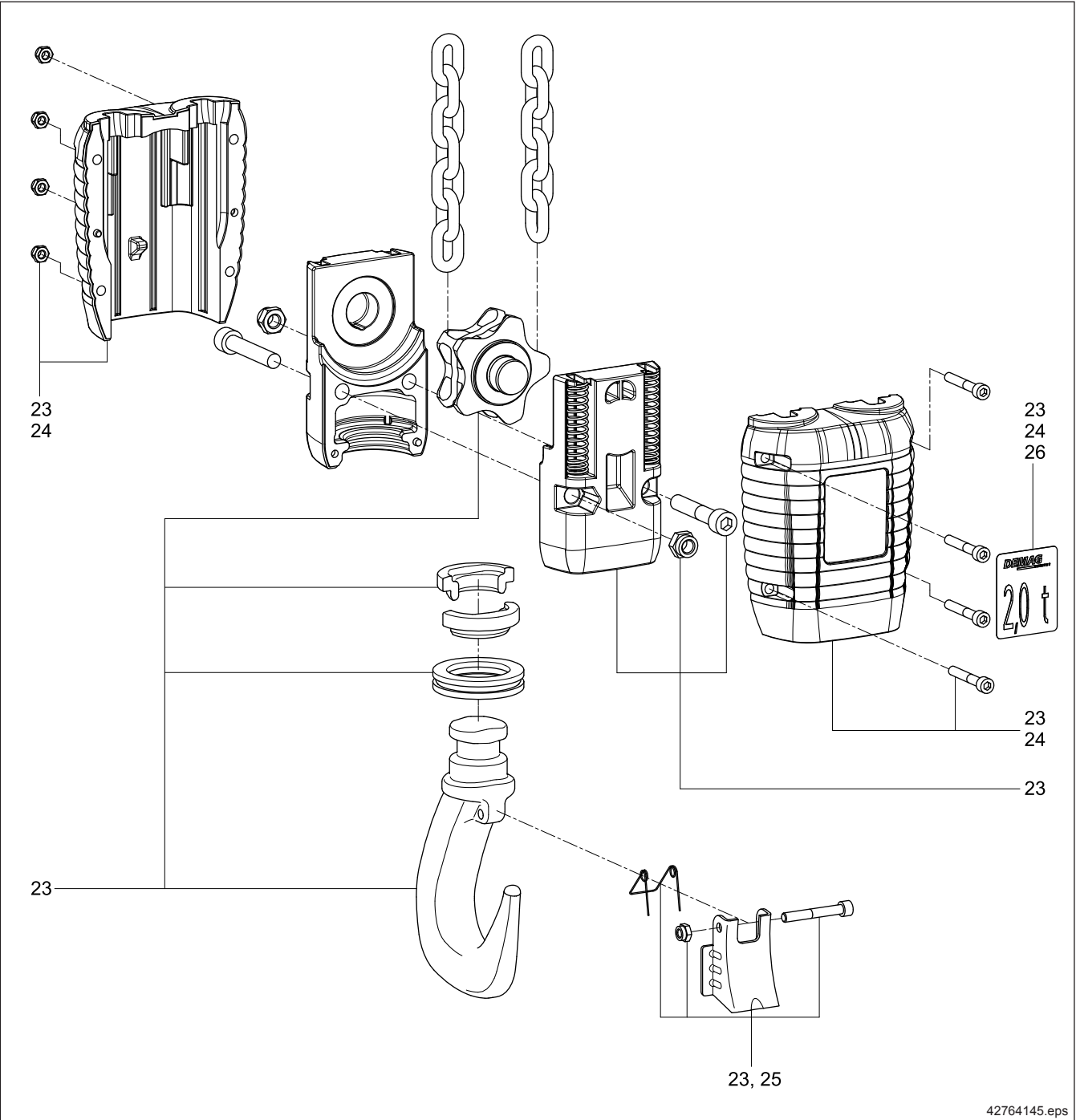
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12.6 Hook assembly



Item	Part no.	Qty.	Designation	Material	Standard
18	71798033	1	Load hook assembly set DC1/2	6,8 Nm	
18	71898033	1	Load hook assembly set DC 5	11,5 Nm	
18	71598033	1	Hook assembly set DC10	25 Nm	
18	72144133	1	Hook assembly DC16/DK16	DC-Pro 15, 27,5 Nm	
19	71728133	1	Hook assembly half set DC1/2	6,8 Nm, w/o hook	
19	71828133	1	Hook assembly half set DC5	11,5 Nm, w/o hook	
19	71528133	1	Hook assembly half set DC10	25 Nm, w/o hook	
19	72144533	1	Hook assembly DC16/DK16 1/1	DC-Pro 15, 27,5 Nm, without hook	
20	83565033	1	Load hook set no. 2 400kg	DC-Pro 1 / 2	
20	83665033	1	Load hook set no. 3 800kg	DC-Pro 5	
20	83765033	1	Load hook set no. 4	DC-Pro 10	
20	83865033	1	Load hook DC16/25 DK10/20	DC-Pro 15, Gr. 5	
21	83565933	1	Hook safety catch set S. 2	DC-Pro 1 / 2	
21	83665933	1	Hook safety catch set Gr. 3 x4	DC-Pro 5	
21	83765933	1	Hook safety catch set Gr. 4 x5	DC-Pro 10	
21	83865633	1	Hook safety catch set GR. 5 x5	DC-Pro 15	
22	71724033	1	Load capacity plate set DC1/2 Pro	DC-Pro 1 / 2	
22	71393433	1	Load capacity plate set DK5 1/1	DC-Pro 5	
# 22	83590833	1	Load capacity plate set DK10/DC10	DC-Pro 10	
22	72144933	1	Capacity plate DC16/DK16 1/1	DC-Pro 15	

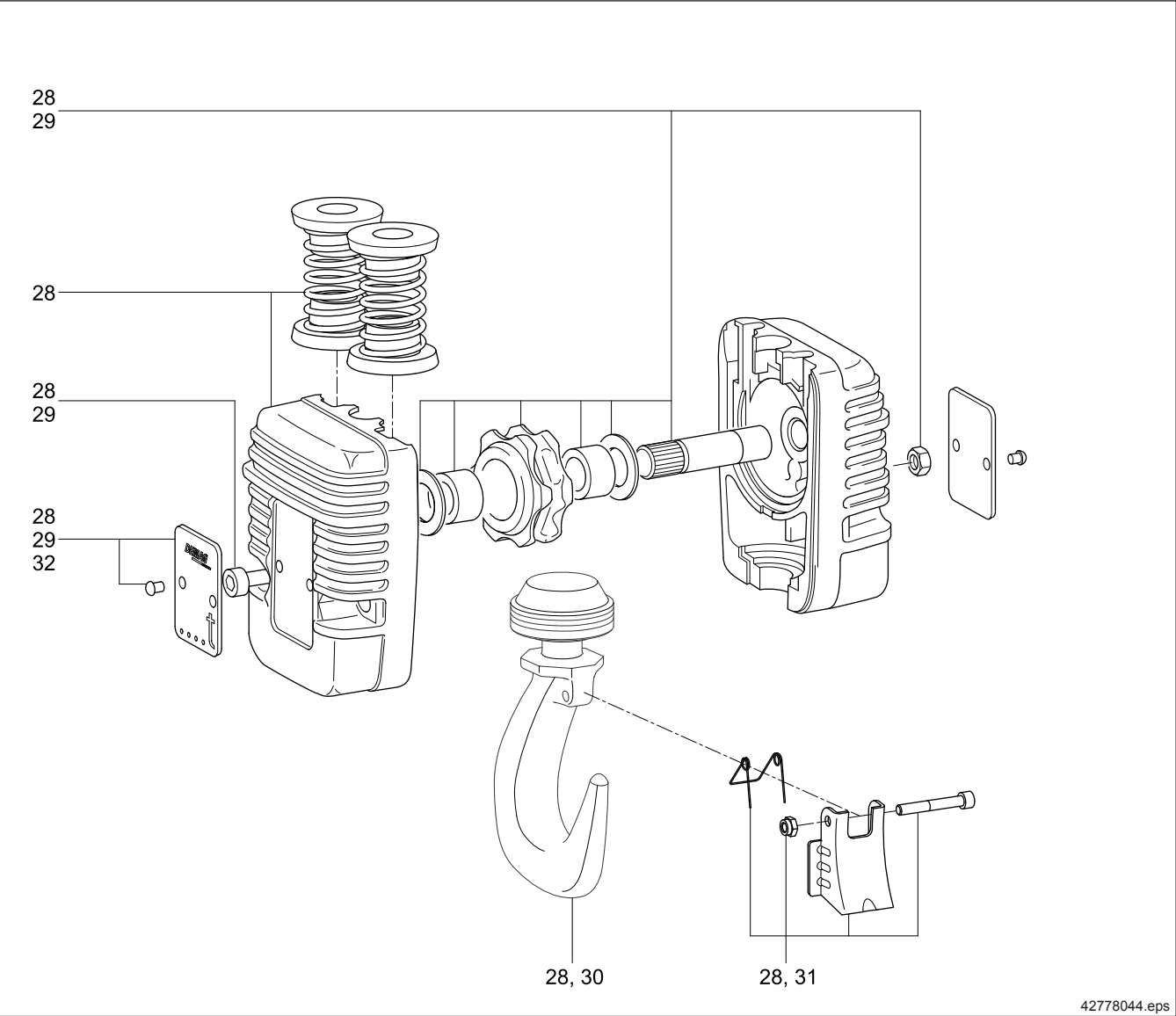
12.7 DC-Pro 10 bottom block with internal cut-off springs (standard)



Item	Part no.	Qty.	Designation	Material	Standard
23	71598533	1	Bottom block set DC 2/1		
24	71544233	1	Bottom block half set DC10 2/1		
25	83865633	1	Hook safety catch set GR. 5 x5		
# 26	83590833	1	Load capacity plate set DK10/DC10		

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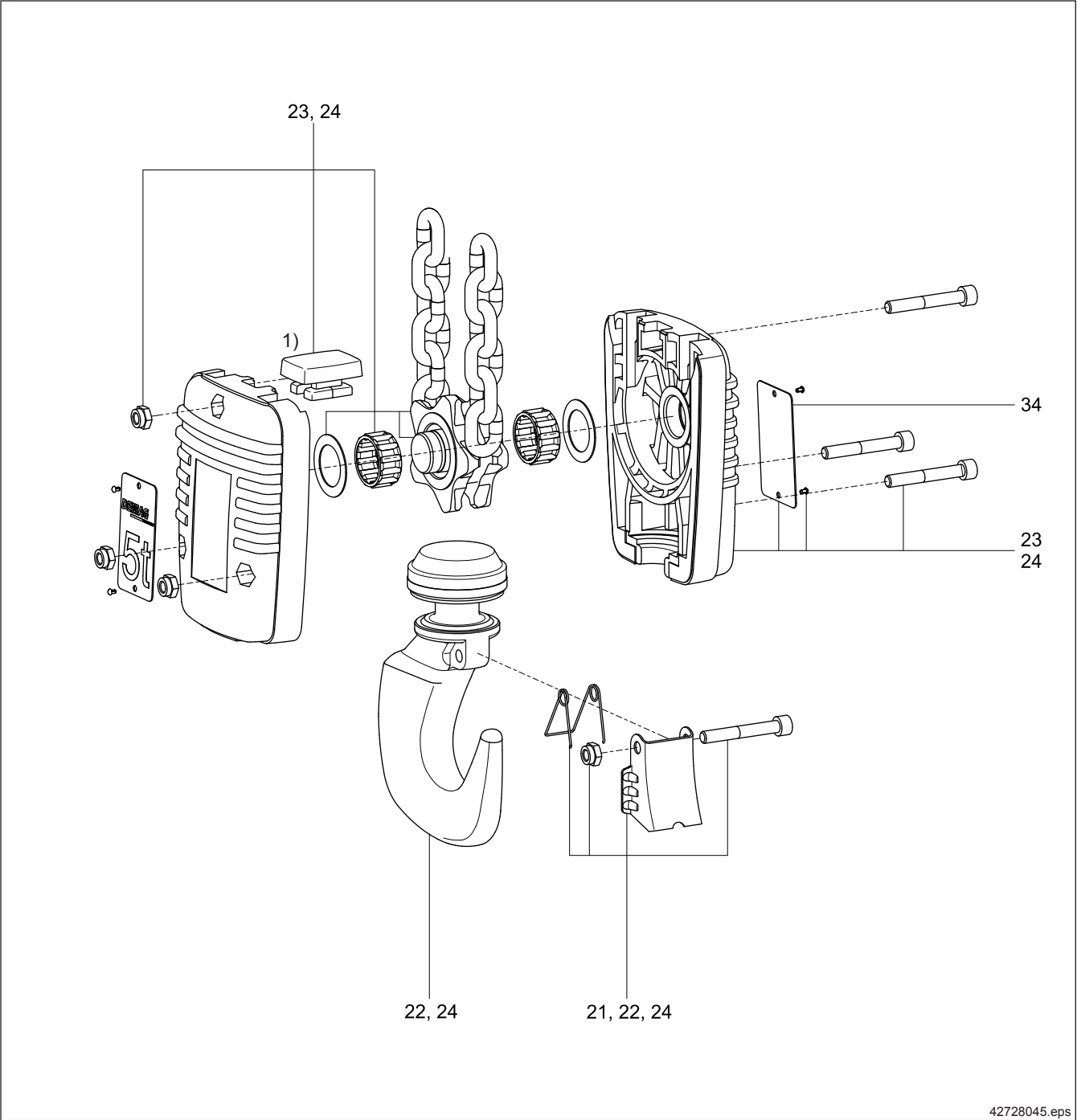
12.8 DC-Pro 10 bottom block with external cut-off springs (option)



Item	Part no.	Qty.	Designation	Material	Standard
28			Bottom block with cut-off springs	1)	
29	83785233	1	Bottom block half set DK10	6,8 Nm	
30	83865033	1	Load hook DC16/25 DK10/20		
31	83865633	1	Hook safety catch set GR. 5 x5		
32	83592833	1	Load capacity plate set DK10		

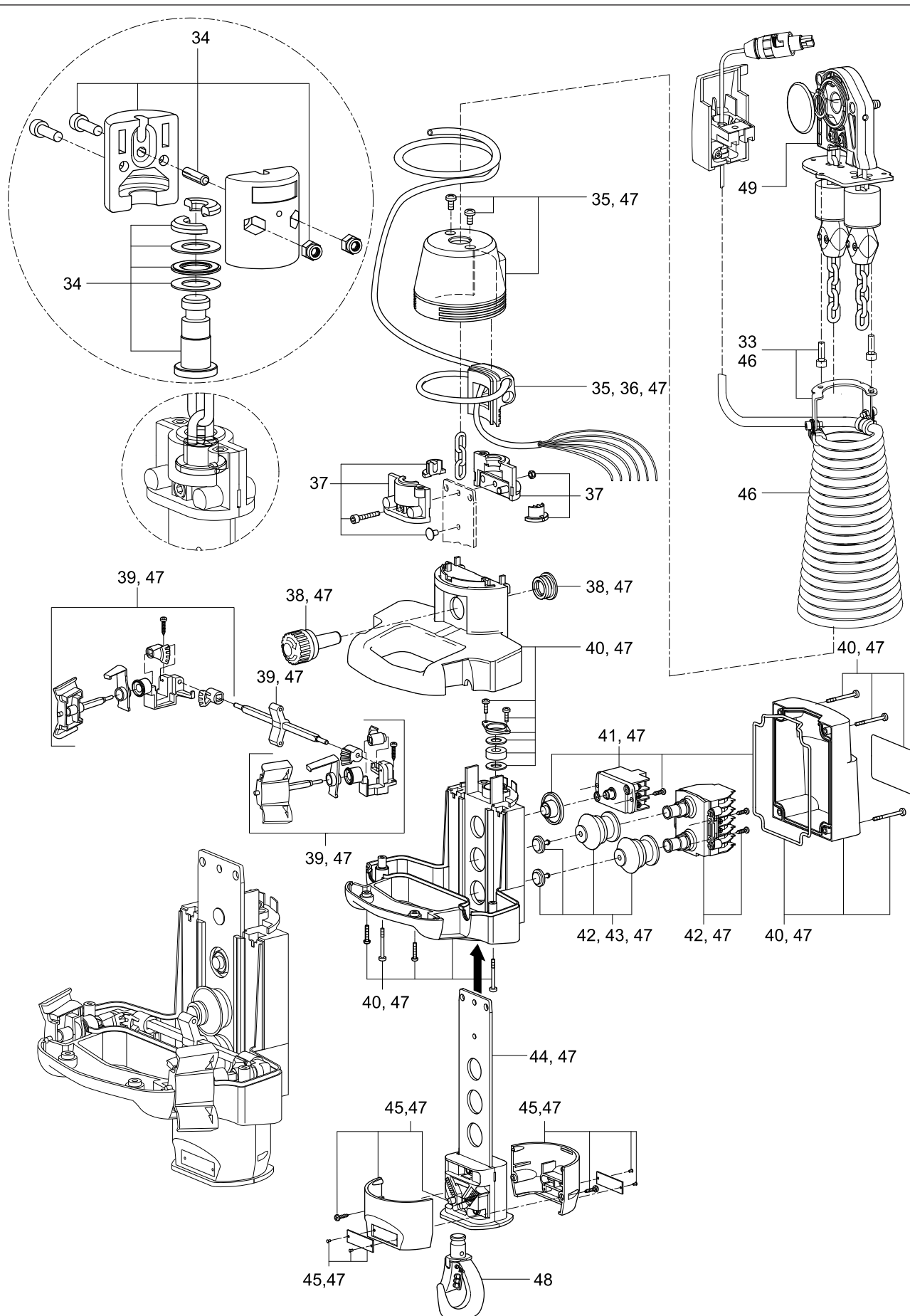
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12.9 DC-Pro 15 bottom block with external cut-off springs (standard)



Item	Part no.	Qty.	Designation	Material	Standard
21	82907733	1	Hook safety catch set S.6		
22	82903433	1	Load hook DC16/DK16 2/1	Size 6	
23	72144633	1	Bottom block set DC16/DK16 2/1	55 Nm, w/o hook	
24	72144233	1	Bottom block set DC16/DK16 2/1.	55 Nm	
34	72145033	1	Capacity plate DC16/DK16 2/1		

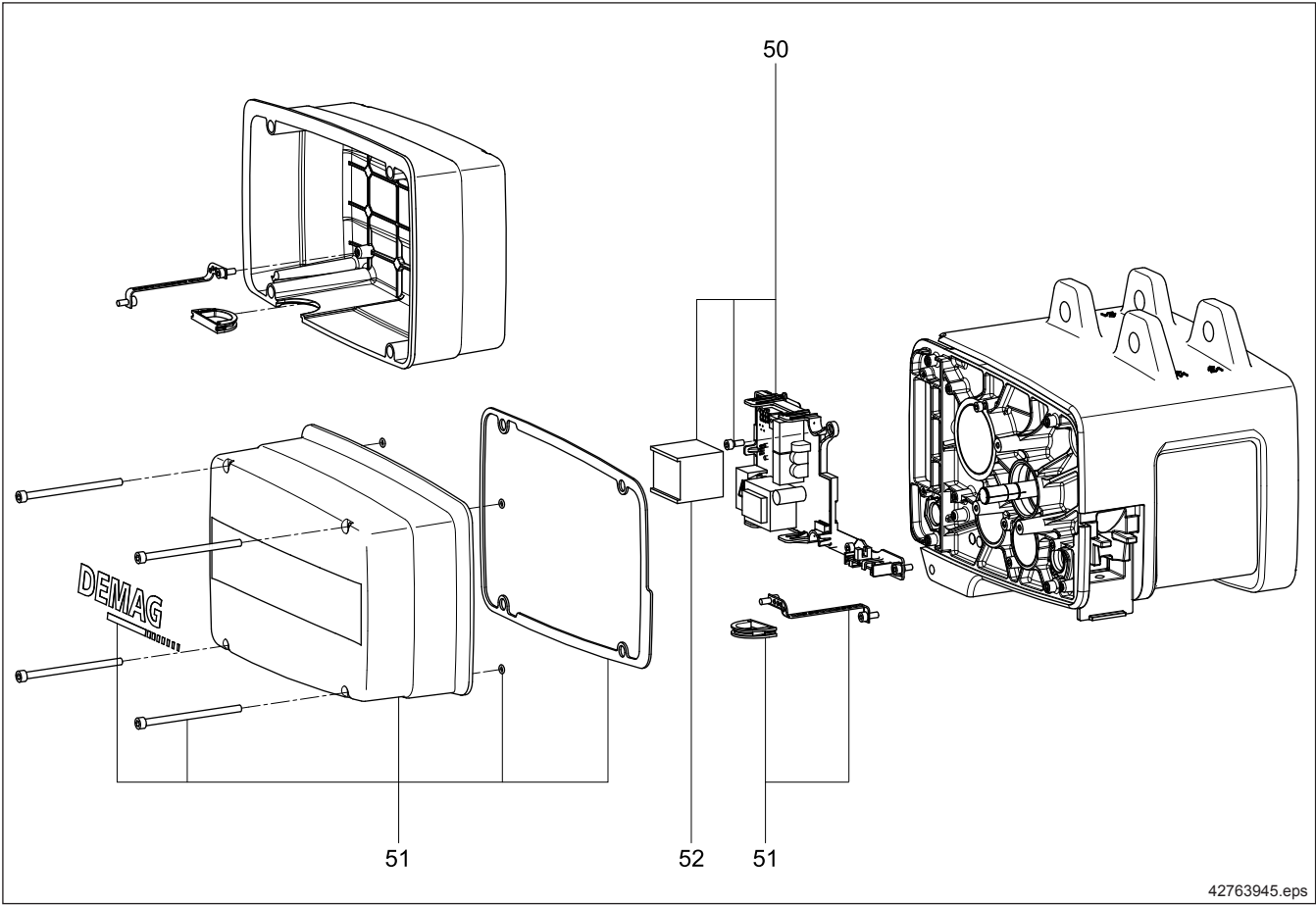
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Item	Part no.	Qty.	Designation	Material	Standard
33	71831533	1	Control cable attachment set DCM		
34			Twist adapter	1)	
35	77206833	1	Cap DSM 5 set		
36	77203933	1	Helical cable union		
# 37	77201233	1	Chain retainer 4,2x12,2		
# 37	77201533	1	Chain retainer 5,3x15,2		
38	77204733	1	Emergency pushbutton set x4		
39	77207533	1	Bearing DSM 5		
40	77200133	1	Housing set DSM 5		
41	77207933	1	Switching element CBDN 3OE		
42	77345233	1	Switching element Set		
43	77202333	1	Cap set		
44	75203133	1	Load capacity element 80/125		
44	77207633	1	Load capacity element 125/250		
45	77201833	1	Unlocking half		
46	77345733	1	Helical cable KPL 2800	4,3 Nm, H 2,8	
46	77345933	1	Helical cable KPL 4300	4,3 Nm, H 4,3	
47	77345033	1	DSM-C 1/2 control unit	cpl. (items 33, 35 - 36, 38 - 45)	
47	77345533	1	DSM-C 5 control unit	cpl. (items 33, 35 - 36, 38 - 45)	
48	83566544	1	Load hook DKDSM5 250KG		
49	71794833	1	Chain set DCM 1/2 H 2,8	DCM 1 / 2, H 2,8	
49	71795033	1	Chain set DC/DCM 1/2 H 5	DCM 1 / 2, H 4,3	
49	71894833	1	Chain set DCM 5 H 2,8	DCM 5, H 2,8	
49	71895033	1	Chain set DC/DCM 5 H 5	DCM 5, H 4,3	

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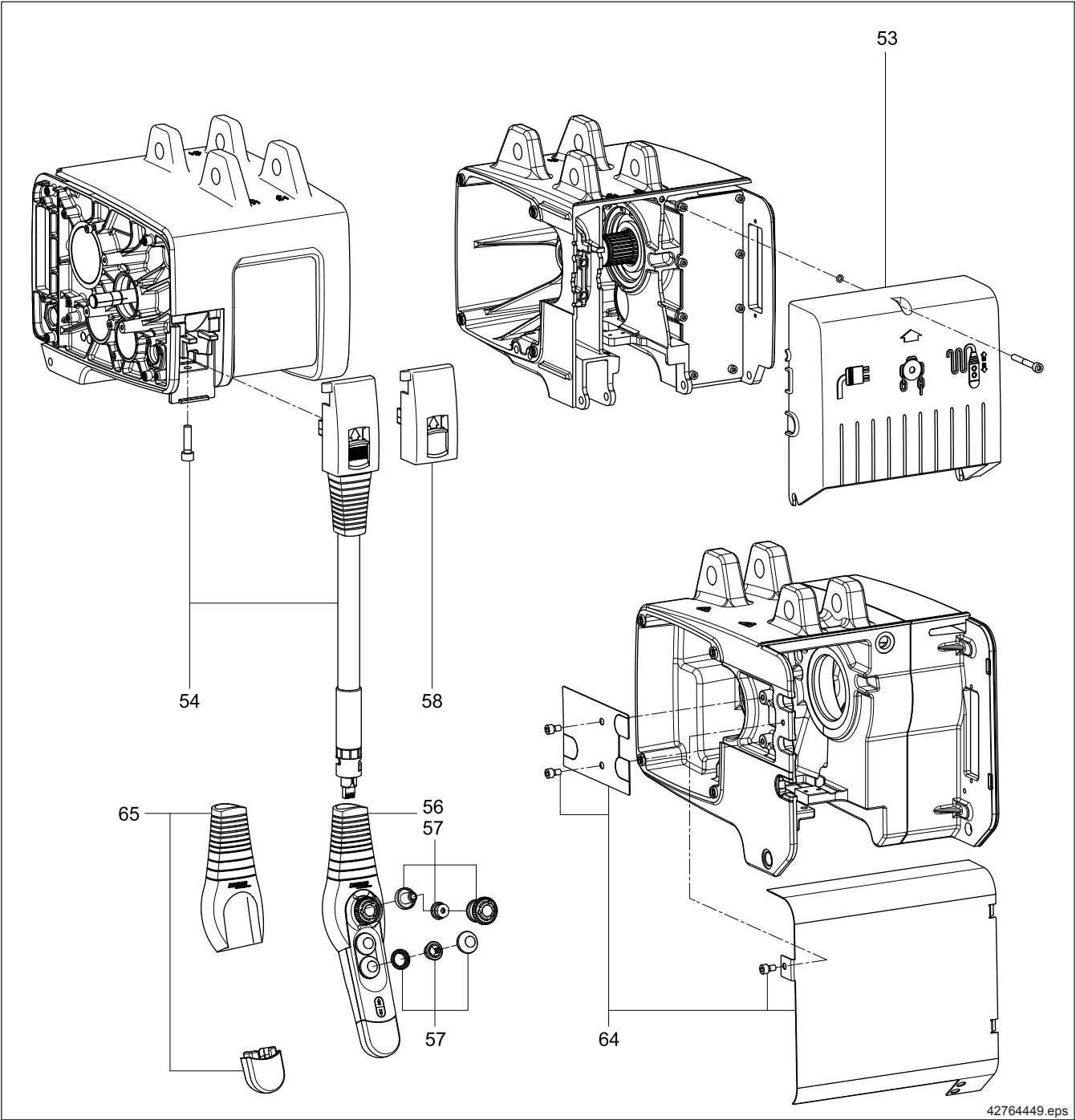
12.11 Electric equipment cover



Item	Part no.	Qty.	Designation	Material	Standard
# 50	77326033	1	Control set DC1-15 230V	220 V - 240 V, 50/60 Hz; 3 Nm	
# 50	77306033	1	Control set DC1-15 400V	380 V - 415 V, 50 Hz / 380 V - 400 V, 60 Hz; 3 Nm	
# 50	77336033	1	Control set DC1-15 575V	500 V - 525 V, 50 Hz / 575 V, 60 Hz; 3 Nm	
# 50	77316033	1	Control set DC1-15 460V	440 V - 480 V, 60 Hz; 3 Nm	
51	71792133	1	Electrical cover set DC 2	9,5 Nm	
51	71892133	1	Electrical cover set DC 5	9,5 Nm	
51	71592133	1	Electrical cover set DC10	DC-Pro 10 - 15, 9,5 Nm	
52	71582533	1	Contactor set	DC-Pro 1 - 15	

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12.12 Control pendant, control cable, service cover



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Item	Part no.	Qty.	Designation	Material	Standard
	53	1	Service cover set DC 2	5,5 Nm	
	53	1	Service cover set DC 5	5,5 Nm	
	53	1	Service cover set DC10	7,5 Nm	
	54	1	Control cable set 5m	11 Nm	
	54	1	Control cable set 8m	11 Nm	
	54	1	Control cable set 11m	11 Nm	
	56	1	DC control cable 11m		
	56	1	DSC control pendant		
	57	1	Emergency stop set / rubber cap DSC-S		
#	58	1	Bag Hose cpl.		
	64	1	Service cover DC15 Kit		
	65	1	DSC protection Bending+impact		

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Hereby we,

Demag Cranes & Components GmbH
Ruhrstraße 28, 58300 Wetter

declare that the electrically driven hoist for lifting loads

Demag DC chain hoist

Serial no.: nnnnnnnn

ready for service - as a series product or manufactured to order - with a cable-connected control pendant/wireless control unit complies with all relevant requirements of

EC Machinery Directive 2006/42/EC.

The safety objectives of **Low Voltage Directive 2006/95/EC** are achieved.
The product additionally complies with the following relevant directives/provisions:

EC EMC Directive 2004/108/EC

Applied harmonised standards and/or C standard drafts, in particular:


EN 14492-2	Cranes - Power driven winches and hoists - Part 2: Power driven hoists
EN 60204-32	Safety of machinery - Electrical equipment of machines - Part 32: Requirements for hoisting machines

The relevant technical documentation according to Annex VII Part A of Directive 2006/42/EC has been compiled and will be made available to authorised national authorities by the designated authorised representative in response to a justified request.

Authorised representative for technical documentation:

Hans-Jörg Böttcher, Demag Cranes & Components GmbH, 58286 Wetter

Wetter, 21.05.2012


ppa. Dr. Rainer Harkort
Wetter Factory Manager


ppa. Dirk Schulte
Handling Technology & Drives
Engineering & Development

Hereby we,

Demag Cranes & Components GmbH

Ruhrstraße 28, 58300 Wetter

declare that the electrically driven hoist / hoist with trolley for
lifting loads / lifting and moving loads

Demag DC chain hoist/Demag DC chain hoist with trolley

Serial no.: nnnnnnnn

supplied as **partly completed machinery** is intended to be incorporated into machinery and that it
must not be put into service until the machinery* into which this partly completed machinery is to be
incorporated has been declared in conformity with all relevant provisions of

EC Machinery Directive 2006/42/EC.

(* insofar as this machinery is subject to the scope of application)

Basic requirements of the EC Machinery Directive, insofar as they are relevant for the scope of
delivery, are met by application of the following harmonised standards or C standard drafts:

EN 14492-2

Cranes - Power driven winches and hoists -

Part 2: Power driven hoists

EN 60204-32

Safety of machinery - Electrical

equipment of machines - Part 32:

Requirements for hoisting machines

The safety objectives of **Low Voltage Directive 2006/95/EC** are achieved

The product additionally complies with the following relevant directives/provisions:

EC EMC Directive

2004/108/EC

The special technical documentation according to Annex VII Part B of Directive 2006/42/EC has
been compiled and will be made available to authorised national authorities by the designated
authorised representative in response to a justified request.

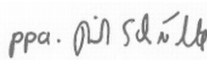
Authorised representative for technical documentation

Hans-Jörg Böttcher, Demag Cranes & Components GmbH, 58286 Wetter

Wetter, 21.05.2012



ppa. Dr. Rainer Harkort
Wetter Factory Manager



ppa. Dirk Schulte
Handling Technology & Drives
Engineering & Development

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