BRISBANE CITY COUNCIL
Brisbane Water
Viola Place P/S SP299 Australia Trade Coast Sewer Project

BCC Contract No. BW30137-02/03

BRISBANE CITY COUNCIL
BRISBANE WATER

Australia Trade Coast Sewer Project
SP299 - Viola Place Pump Station
Operation & Maintenance Manual
Contract No. BW30137-02/03

Volume No. 2.2 Contents

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Viola Place Pump Station SP299

Revision Control

Revision Number	Date	Amendment Details	Responsible Officer
Version 0.00	5 April 2006	Draft Manual Issued	Stuart Cowhig
Version 1.00	28 April 2006	Manual Issued	Stuart Cowhig

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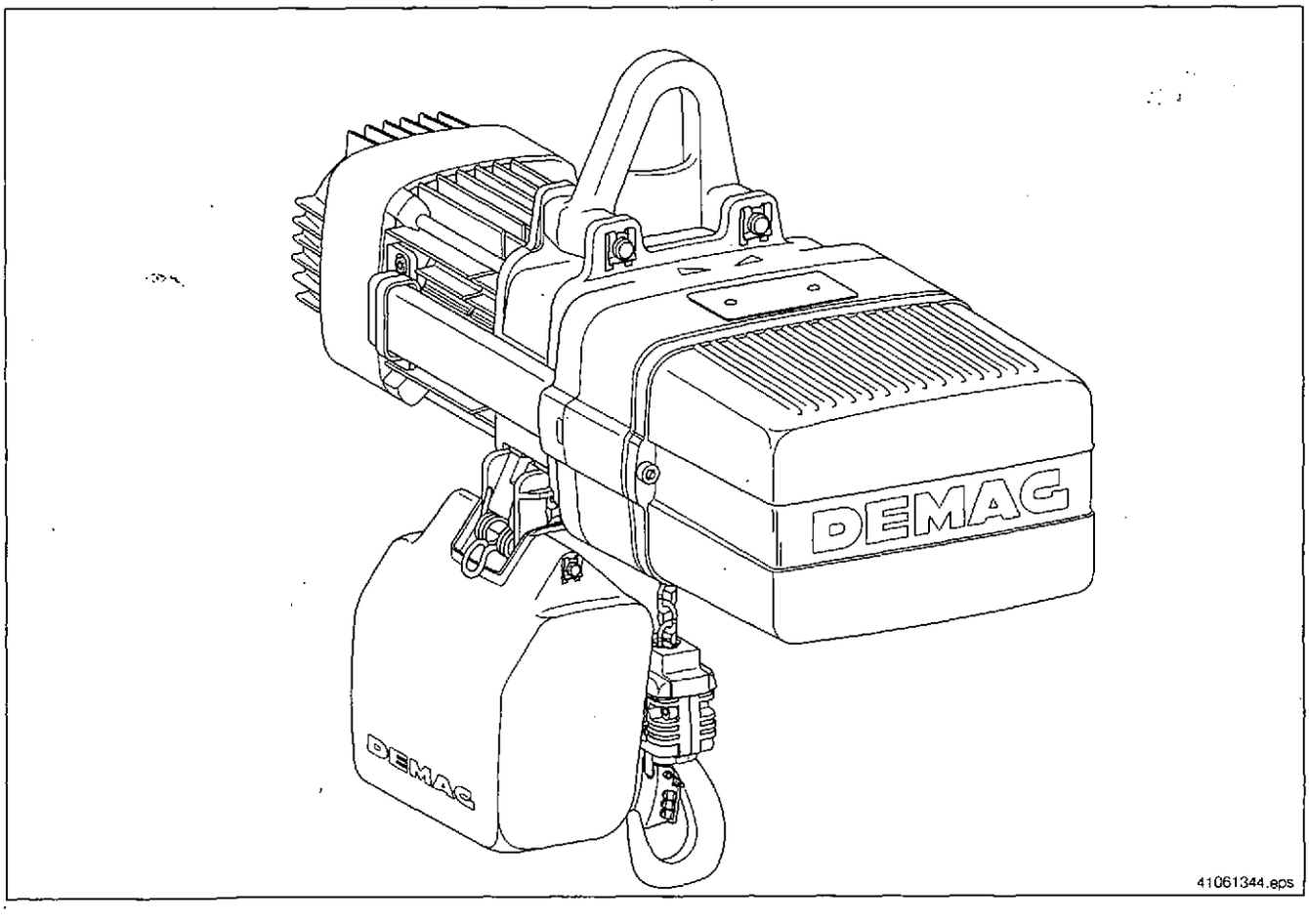
DEMAG
Cranes & Components

CE

Operating instructions

Demag chain hoist DKUN 2 - DKUN 5 - DKUN 10 - DKUN 16 - DKUN 20



020604 EN 206 501 44 720 IS 817

Manufacturer

Demag Cranes & Components GmbH
P.O. Box 67 · D-58286 Wetter
Telephone (+49/2335) 92-0 · Telefax (+49/2335) 927676
www.demagcranes.com

Please fill in the following table before first putting the chain hoist into service.
This provides you with a definitive documentation of your Demag chain hoist and important information if you ever have to contact the manufacturer or his representative.

Owner	
Where in use	
Model	
Serial number	
Main/creep hoist motor number	
Main hoist motor number	
Travel drive unit number	
Operating voltage	
Control voltage	
Frequency	
Wiring diagram number	
Direct control	
Contactor control	

Accompanying documents

Component parts list for Demag chain hoist

DKUN 2	222 501 44	721 **IS** 817
DKUN 5	222 506 44	721 **IS** 817
DKUN 10	222 511 44	721 **IS** 817
DKUN 16	222 546 44	721 **IS** 817
DKUN 20	222 516 44	721 **IS** 817
DSK Assembly instructions	206 485 44	720 **IS** 951
Component parts list for DSK control pendant	222 381 44	721 **IS** 951
Assembly instructions DST	206 165 44	720 **IS** 951
Component parts list for DST control pendant	222 142 44	721 **IS** 951
DSE assembly instructions	214 214 44	720 **IS** 951
Technical data for DSE control pendant	203 119 44	714 **IS** 951
Test and inspection booklet for Demag chain hoist	214 260 44	720 **IS** 817
Technical data		
Demag chain hoist DKUN 1 – 20	202 846 44	714 **IS** 817
RU/HU/EU DK assembly instructions	see page 54	
Assembly – Adjustment – Dimensions		
RKDK-EKDK low-headroom monorail hoist	202 876 44	714 **IS** 817
CF 5 Technical data – Assembly – Component parts	203 329 44	714 **IS** 845
CF 8 Technical data – Assembly – Component parts	203 209 44	714 **IS** 845

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Contents

0 Foreword

CE

You have purchased a Demag product.
This chain hoist was manufactured in accordance with German and European standards and regulations, e.g. EC Machinery Directive 98/37/EC, and state-of-the-art engineering principles.

Demag electric chain hoists are of modular design.

The main assemblies include:

- the gearbox
- the hoist motor
- the integrated electrics
- the chain drive mechanism
- the control pendant

These operating instructions are designed to provide the operator with appropriate instructions for safe and correct operation and to facilitate maintenance.

Every individual given the task of transporting, installing, commissioning, operating, maintaining and repairing our chain hoists and additional equipment must have read and understood

- the operating instructions
- the safety regulations and
- safety instructions in the individual chapters and sections.

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

0.1 Copyright

These operating instructions must be treated confidentially. They should only be used by authorized personnel. They may only be entrusted or made available to third parties with the prior written consent of Demag. All documents are protected within the sense of copyright law.

No part of this documentation may be reproduced, utilized or transmitted without specific prior consent. Infringements are an offence resulting in obligatory compensatory damages.

All industrial rights reserved.

0.2 After-sales service

Our after-sales service will provide you with all technical information on Demag products and their systematic application.

Should you have any questions regarding our products, please refer to one of our after-sales service stations, the relevant representative or to our main office.

Kindly quote the serial or order number (see test and inspection booklet, chain hoist data plate) in any correspondence or for spare part orders.

Specifying this data ensures that you receive the correct information or the required spare parts.

The relevant after-sales service station of Demag is specified for example on the back page of the test and inspection booklet.

0.3 Liability for defects

These operating instructions must be read carefully before installing and putting chain hoists into operation.

We assume no liability for damage and malfunctions resulting from failure to comply with the operating instructions.

Any liability claims for defects must be made by quoting the order number immediately on detecting the defect.

Liability claims for defects are void in the event of:

- inappropriate use,
- faulty devices or equipment connected or attached to the chain hoist which are not part of our scope of supplies and services,
- use of non-genuine spare parts and accessories,
- refurbishment or modification of the chain hoist unless approved in writing by Demag.

Wearing parts are not subject to liability for defects.

0.4 Limitations of liability

All technical information, data and instructions for operation contained in these operating instructions were up-to-date on going to print and are compiled on the basis of our experience and to the best of our knowledge.

We reserve the right to incorporate technical modifications within the scope of further development of the hoist units which are the subject of these operating instructions. The information, illustrations and descriptions contained in these operating instructions are therefore only intended for information purposes.

The descriptions and illustrations contained in this documentation do not necessarily correspond to the scope of delivery or any subsequent spare part delivery, either; the drawings and illustrations are not to scale.

Only documentation belonging to the actual order is valid.

We assume no liability for defects, damage and malfunctions caused as a result of operating errors, noncompliance with these operating instructions or omitted and/or inappropriate repairs and maintenance.

We expressly point out that only Demag spare parts and accessories approved by us may be used. Accordingly, this also applies to other manufacturers' parts supplied by us.

For safety reasons, the fitting and use of spare parts or accessories which have not been approved and unauthorized modification and conversion of the hoist unit are not permitted; we assume no liability for defects or damages resulting therefrom.

With the exclusion of any further claims, our liability for defects and other liability obligations for any defects pertaining to the products supplied or faults in the documentation delivered or any negligence on our part are exclusively based on the stipulations of the original contract. Any further claims, in particular any and all claims for damages, are excluded with the exception of legal claims in accordance with product liability legislation.

0.5 Definitions

Owner

Owners (employer, company) are defined as persons who own chain hoists and who use them appropriately or allow them to be operated by suitable and instructed persons.

Operating personnel

Operating personnel are defined as persons entrusted by the owner of the chain hoist with operation and/or transportation of the equipment.

Specialist personnel

Specialist personnel are defined as persons assigned by the owner to carry out special tasks such as installation, setting-up, maintenance and fault elimination.

Qualified electrician

Qualified electricians are defined as persons, who, owing to their technical training, knowledge and experience of electrical installations as well as knowledge of the relevant standards and regulations, are able to assess the tasks given to them and identify and eliminate potential hazards.

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 incorrect handling and who have been informed about the required protective devices, protective measures, relevant regulations, codes of practice, accident prevention regulations and operating conditions and who have proven their qualifications.

Experienced technician

Experienced technicians are defined as persons, who, owing to their technical training and experience, have sufficient knowledge of chain hoists and are 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 chain hoistts.

Qualified electricians are defined as persons who, owing to their technical training, knowledge and experience of electrical installations as well as knowledge of the relevant standards, codes of practice and regulations, are able to assess the tasks given to them and to identify and eliminate potential hazards.

Assigned expert engineer (in the Federal Republic of Germany according to BGV D8 § 23 (VBG 8), 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 serial hoists and for carrying out general overhauls of chain hoists (S.W.P. = safe working period).

Authorized expert engineer (according to BGV D6 § 28 (VBG 9))

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

Chain hoists

Chain hoists are systems used for lifting and moving loads, such as cranes, crabs and travelling hoist units, rail systems.

* VBG (BGV D8) = German Industrial Employers' Mutual Insurance Association responsible for the prevention of accidents

1 Safety instructions

1.1 Symbols

These symbols are used throughout the operating instructions in order to visually indicate hazard warnings.

Saftey at work symbol

This symbol appears in the operating instructions next to all instructions relating to safety at work wherever a potential danger to life and limb exists.

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

Pass on safety instructions to all persons entrusted with working on the chain hoist.

In addition to the safety instructions, observe all general safety regulations at all times.

Warning against electrical hazards

Contact with live parts can result in immediate death. Protective covers (e.g. covers and enclosures) marked with this sign may only be opened by qualified electricians. Before opening, all relevant operating, control, feed or other voltages must be disconnected.

Warning against suspended load

Any person remaining in this danger zone may suffer serious injury or death. This applies in particular to non-positive locked load handling attachments e.g. magnet and vacuum systems. In each case the special safety and operating instructions contained in the operating instructions for the load handling attachment in question must be complied with..

Operating hazard for the installation

This symbol in the operating instructions indicates all warnings which, if not complied with, may result in damage to the chain hoist or the load.

1.2 Appropriate use

Electric chain hoists are only intended for lifting and moving loads and may be used as stationary or travelling units.

Electric chain hoists may only be operated when in perfect working order by trained personnel in accordance with the relevant safety and accident prevention regulations. This also includes compliance with operating and maintenance conditions specified in the operating instructions.

Chain hoists are industrial equipment designed to be used with a rated voltage of up to 690 V for alternating current.

Power feed is via power supply lines (mobile cables, open or enclosed power conductor systems, cable drums). These systems are live up to the terminals of the isolating switch (mains connection switch, isolating switch). The relevant isolating switch must be switched off when performing maintenance/repair work.

During operation or when the main switch is not switched off, electrical components inside enclosures, motors, switchgear cabinets, terminal boxes, etc., carry dangerous voltages. This voltage may cause fatal injuries.

Serious personal injury or damage to property may occur in the event of:

- unauthorized removal of covers,
- inappropriate use of the chain hoist,
- incorrect operation,
- insufficient maintenance,
- exceeding the maximum permitted load
  (The rated load capacity/S.W.L. is the maximum permitted load. Pay attention to the sum of the load to be lifted and the load handling attachment.),
- working on live parts.

Advise operators to avoid inching as far as possible. It might cause excessive wear and premature failure of the chain hoist. Inching means giving short pulses to the motor to obtain small movements, e.g. when lifting loads or moving the travelling hoist unit or the crane.

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1.3 Prohibited practices

Certain work and practices are prohibited when using the chain hoist as they may involve danger to life and limb and result in lasting damage to the chain hoist, e.g.:

- Unsafe load handling (e.g. swinging the load).
- Do not handle suspended loads above persons.
- Do not pull or drag suspended loads at an angle.
- Do not pull free fixed or obstructed loads with the chain hoist.
- Do not exceed the maximum permitted load and permitted load dimensions.
- Do not leave suspended loads unsupervised.
- Do not allow the chain to run over edges.
- Do not use the chain as a load bearing sling.
- Always move the chain hoist with push travel trolley by pulling on the load, bottom block or load hook assembly – never pull on the control pendant.
- Do not allow loads to drop when the chain is in a slack condition.
- Do not subject the control pendant to inappropriate mechanical loads.
- Transporting persons, unless lifting devices are specifically approved for transporting persons, is not permitted.
- Do not tamper with or manipulate electrical equipment.
- Chain hoists must be suspended in such a way that they do not collide with stationary equipment and structures, e.g. when slewing jib cranes are slewed.

1.4 General safety information

Persons under the influence of drugs, alcohol or medicines which affect reactions must not install, operate, put into service, maintain, repair or disassemble chain hoists.

Any conversions and modifications to the installation require the written consent of Demag.

Work on electrical equipment of chain hoists may only be carried out by qualified electricians in accordance with electrical regulations. In the event of malfunctions, chain hoist operation must be stopped, the hoist switched off and the relevant main switches locked immediately. Defects must be rectified immediately.

National accident prevention regulations and codes of practice and general safety regulations must be observed when operating our products. Important information and instructions are marked by corresponding symbols. Follow these instructions and/or safety regulations in order to avoid accidents and damage. The operating instructions must be kept available at the place where the chain hoist is in use at all times. They include significant aspects and appropriate excerpts from the relevant guidelines, standards and regulations. The owner must instruct his personnel appropriately.

Any failure to comply with the safety instructions stated in these operating instructions can result in death or personal injury.

Observe general statutory and other obligatory regulations relating to accident prevention and environmental protection and basic health and safety requirements in addition to those included in these operating instructions. Such requirements may also relate, for example, to the handling of hazardous materials or the provision/wearing of personal protection equipment. Comply with these regulations and general accident prevention regulations relevant for the place at which the chain hoist is used and follow the instructions therein when working with the chain hoist. The chain hoist may still constitute a danger to life and limb if it is not installed, operated, maintained or used appropriately by personnel which have not been trained or specially instructed. The operating instructions must, if required, be supplemented by the owner with instructions and information (e.g. factory regulations) relating to organization of work, working procedures, operating personnel, etc. Supervising and reporting obligations as well as special operating conditions must also be taken into consideration.

Personnel assigned to working with the chain hoist must have read and understood the operating instructions and, in particular, the chapter on safety information.

All activities relating to chain hoists which are not described in these operating instructions may only be carried out by specialist personnel specifically trained for the particular chain hoist.

The owner must ensure that personnel work in a safety and hazard-conscious manner in compliance with the operating instructions.

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The owner must ensure that the chain hoist is only operated when in proper working order and that all relevant safety requirements and regulations are complied with. Chain hoists must be taken out of service immediately if functional defects or irregularities are detected. 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/experienced technician must carry out all prescribed safety measures (e.g. for cranes operating outdoors, ensure wind drift safety catch is fitted) or observe that they are automatically carried out. Personal protective clothing must be worn as necessary or as required by regulations. Personnel must not wear loose clothing, jewellery including rings or long hair loose. Injury may occur, for example, by being caught or drawn into the mechanism. All safety and hazard information and recommendations on the chain hoist, at access points and mains connection switches must be maintained in complete and legible condition. Inching (i.e. giving short pulses to the motor) must always be avoided. Emergency limit stop devices (e.g. slipping clutch or emergency limit switch) must not be approached in normal operation.
Modifications, additions to and conversions of the chain hoist which may impair safety in any way must not be carried out without the consent of Demag. This also applies to the installation and adjustment of safety devices as well as for performing welds on load bearing parts. Safety devices must not be rendered inoperative.
Only genuine Demag spare parts may be used.
Observe prescribed deadlines or those specified in the operating instructions for routine checks/inspections.

1.5 Selection and qualification of operating personnel

For independent operation or maintenance of the chain hoist, 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 or maintenance of the chain hoist and have proven their qualification to the owner in this respect (in addition to theoretical training, instruction also includes sufficient practical operating experience as well as acquiring the ability to identify defects which are a hazard to safe operation),
- who can be expected to carry out the work assigned to them reliably.

The owner must assign operating and maintenance personnel to their relevant tasks.

1.6 Safety instructions for installation and disassembly

- Installation and disassembly work may only be performed by experienced technicians.
- Installation and disassembly work must be coordinated by the person carrying out the work and the owner within the scope of their responsibility.
- The working and danger zone must be made safe.
- The installation must be isolated in accordance with the relevant electrical regulations.
- Customer-specific regulations must be observed.
- Only appropriate, tested and calibrated tools and equipment may be used.
- The electrode holder and earth must be connected to the same assembly when welding work is carried out. If the current flow is returned via protective conductors, screening elements or anti-friction bearings, serious damage may be caused to these or other components.

1.7 Safety instructions when first putting the hoist into service after completing installation

- The working and danger area must be made safe.
- First check that the voltage and frequency specified on the data plates match the owner's mains power supply.
- All clearance dimensions and safety distances (see approval drawing) must be checked before putting the hoist into service.
- When putting the hoist unit into service, it may be necessary to perform work in the danger zone.
- In the course of putting the hoist unit into service, it may be necessary to temporarily render safety devices or features inoperative.
- It must be ensured that only trained personnel are employed for putting the hoist unit into service.

1.8 Safety instructions for operation

The operator must check the function of the brakes and emergency limit stop devices before starting work.
All instructions and measures described in the operating instructions with regard to safe operation and items concerning general safety and accident prevention which have to be observed before, during and after putting into service must be strictly complied with. Any failure to comply can lead to accidents resulting in fatalities.
Chain hoists must be taken out of service immediately or not put into operation if any defects relating to operating safety and reliability are detected. Safety devices must not be rendered inoperative or modified in contradiction to their intended use.
Only operate chain hoists when all protective devices and safety-relevant equipment, e.g. movable protective devices and emergency-stop devices, are fitted and fully functioning.
Anybody who identifies an immediate danger of personal injury must actuate the emergency-stop button without delay. This also applies in the case of damage occurring to parts of the installation and equipment which makes immediate stoppage necessary. After an "emergency-stop", the operator must not switch on and restart the chain hoist until an experienced technician is satisfied that the cause which led to actuation of this function has been rectified and that continued operation of the installation constitutes no further hazard.
Chain hoists must be switched off immediately in the event of the following faults:

- In the event of damage to electrical devices and cables as well as parts of the insulation.
- In the event of brake and safety device failure.
- The chain hoist is provided with a slipping clutch as overload protection.

  In the event of overload, the following situations may occur:

  1. The load is not lifted, the slipping clutch responds.

  2. The load is lifted, however, after switching off the lifting motion, the load slowly moves downwards. In this case, the load must be immediately deposited by actuating the control switch.

  Malfunction: The slipping clutch must be readjusted or overload has occured.

Before switching on/putting into operation of the chain hoist it must be ensured that nobody is endangered by operation of the hoist.
If the operator notices persons who may be exposed to a risk to health or personal safety by operation of the chain hoist, he must suspend operation immediately and may not resume operation again until the persons are outside the danger zone.

Before putting the chain hoist into operation, the operator must be satisfied that the installation is in safe and correct operating condition.
Work on chain hoists may only be carried out when instructions to this effect have been issued, when operation and function of the chain hoist have been explained and when the working and danger zone has been made safe. Cooling devices, such as ventilation openings, may not be rendered permanently inoperative (e.g. covered or closed).
Special local conditions or special applications can lead to situations which were not known when this chapter was written. In such cases, special safety measures must be implemented by the owner.

1.9 Safety instructions for maintenance

Maintenance measures are defined as regular maintenance, inspection and repair work.

Mechanical and electrical repairs and maintenance work may only be carried out by appropriately trained personnel (experienced technicians).

Adjustment, maintenance and inspection activities and inspection deadlines including specifications concerning replacement of parts/assemblies prescribed in the operating instructions must be observed.

Ensure that all electrical components are de-energized before commencing work on electrical installations and devices. When all work on the chain hoist has been completed, operation of the chain hoist must not resume until the owner has given approval to this effect.

Unauthorized persons must be prohibited from carrying out work on machinery or parts of the chain hoist. Before starting all repair and maintenance work, the chain hoist must be switched off, taken out of operation and secured (switches must be locked) against accidental or unauthorized putting into operation (restarting).

It must be ensured that

- the chain hoist is switched off and checked that it is de-energized and, in special cases, isolated,
- moving parts are stationary and stopped,
- moving parts cannot start moving while maintenance work is being performed,
- the power supply cannot be accidentally restored as long as the hoist unit has been taken out of service for maintenance and repair purposes.
- Ensure that operating and auxiliary materials as well as spare parts are disposed of in a safe and environmentally sound way.

Instructions for repair work in the course of operation

The danger zone must be marked off with red/white safety chains or safety tape and indicated with warning signs.

In each individual case, the owner or the person specified by him must check whether the relevant work may be carried out in the course of operation without risk of personal injury owing to the particular local conditions.

To avoid injury, only use calibrated and appropriate tools and auxiliary materials for maintenance, inspection and repair purposes.

If there is a risk of objects falling, the danger zone must be made safe.

Maintain a sufficient safety distance to rotating parts to prevent clothing, parts of the body or hair becoming entangled.

Avoid naked flames, extreme heat and sparks in the vicinity of cleaning agents and flammable parts or parts liable to deformation (e.g. wood, plastic parts, oil, grease) as well as in electrical installations – noncompliance may result in fire hazard. Harmful gases may evolve or insulation may be damaged.

Additional instructions for repair work on electrical equipment

Only use genuine fuse links with specified amperage and tripping characteristics. Defective fuse links must not be repaired or bridged and must only be replaced by fuse links of the same type. Switch off the chain hoist immediately in the event of electrical power supply malfunctions. Work on the electronic and electrical components or equipment may only be carried out by qualified electricians. If inspection, maintenance and repair work is to be carried out on parts of chain hoists, these must – if prescribed by regulations – be isolated. First verify the safe isolation of the parts from the supply before commencing work. The electrical equipment of the chain hoist must be inspected and checked at regular intervals. Defects, such as loose connections, damaged cables and worn contactors must be rectified immediately.

Since it is possible that after a longer period of operation the switching points of relays (time, frequency, monitoring relays) change due to ageing of the components, the relay switching points in circuits relevant to safety must be checked at regular intervals.

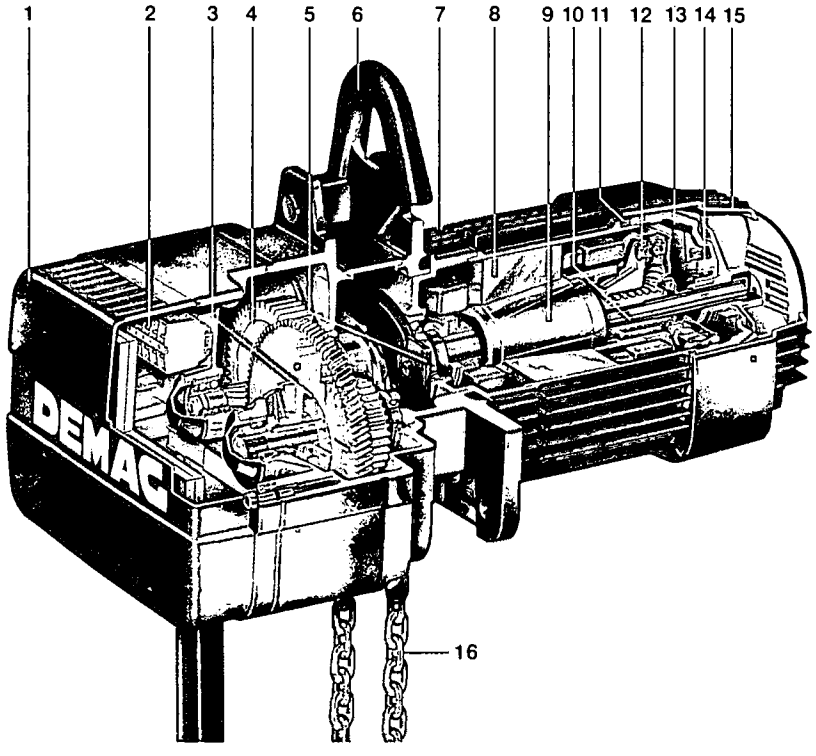
Electrical equipment must be replaced as a preventive measure on reaching the limit of its theoretical duration of service (service life).

If work has to be carried out on live parts, a second person must be available in order to actuate the emergency-stop button or mains connection switch/isolating switch for voltage disconnection in an emergency.

The second person must be familiar with resuscitation measures.
Only use insulated tools.
Before disconnecting and connecting electrical plug-and-socket connections, always disconnect them from the supply (this does not apply to mains connections, provided they do not represent a dangerous contact voltage in the sense of the safety regulations).

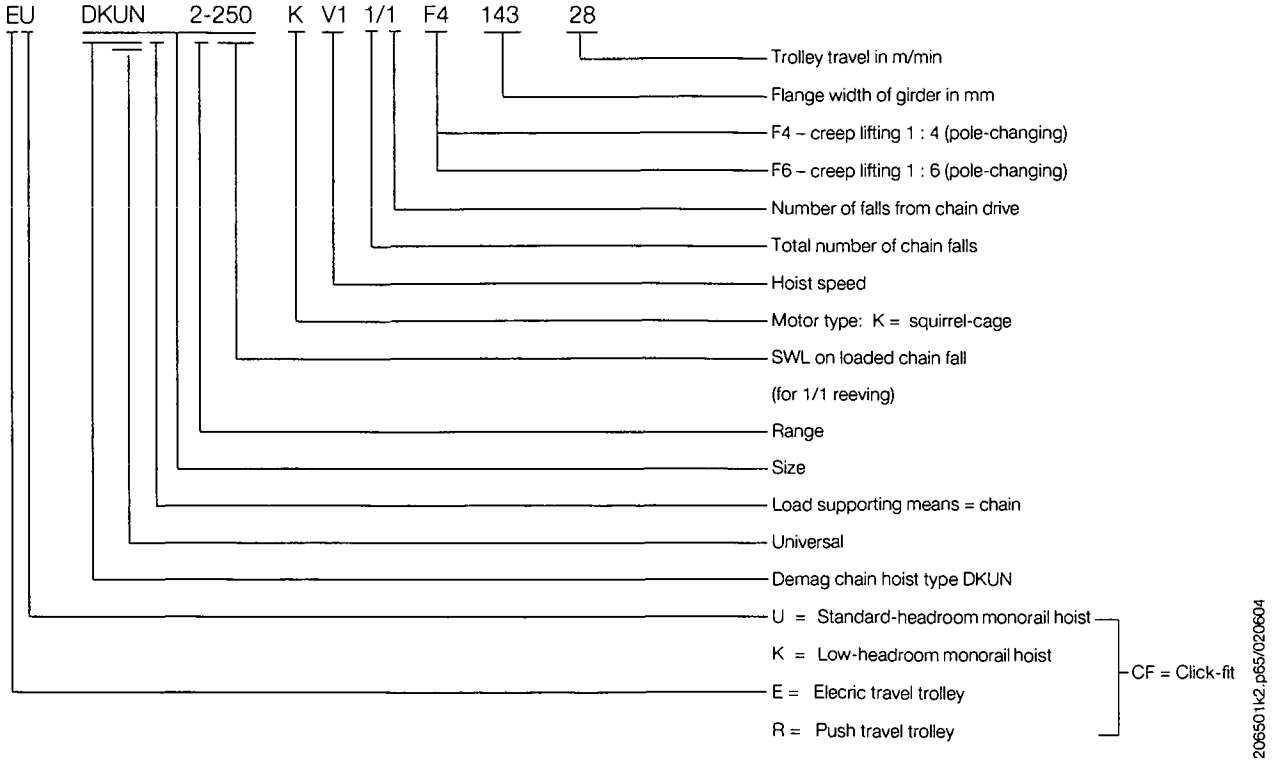
2 Technical data

2.1 Designation



1 Electrical equipment cover
2 Electrical components
3 Slipping clutch
4 Gearbox
5 Chain guide
6 Suspension eye
7 Intermediate flange
8 Stator
9 Rotor
10 Shaft
11 Brake shims
12 Coupling
13 Brake cup
14 End cap
15 Fan cover
16 Chain

2.2 Explanation of chain hoist designation



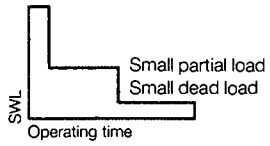
2.3 Selection criteria

The size of the hoist is determined by the load spectrum, average operating time per working day, SWL and reeving.

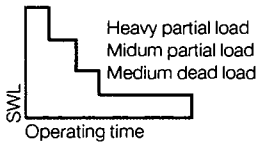
1. What are the operating conditions?
2. What is the specified SWL?
3. To what height must be load be lifted?
4. What is the required lifting speed?
5. Do the loads need to be lifted and lowered with high precision?
6. Is horizontal load travel required?
7. How is control to be effected?

The load spectrum
(in most cases estimated) can be evaluated in accordance with the following definitions:

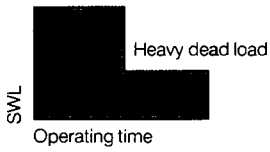
1 light
Hoist units which are usually subject to very small loads and in exceptional cases only to maximum loads.



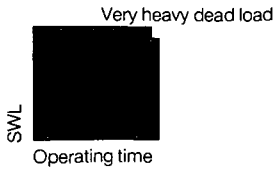
2 medium
Hoist units which are usually subject to small loads but rather often to maximum loads.



3 heavy
Hoist units which are usually subject to medium loads but frequently to maximum loads.



4 very heavy
Hoist units which are usually subject to maximum or almost maximum loads.



The group is determined from the operating time and load spectrum.

Load spectrum			Average operating time per day in working hours				
1	light		up to 1	up to 2	2-4	4-8	8-16
2	medium ⇒		up to 0,5	up to 1	1-2	2-4	4-8
3	heavy		up to 0,25	up to 0,5	0,5-1	1-2	2-4
4	very heavy		up to 0,12	up to 0,25	0,25-0,5	0,5-1	1-2
Group of mechanisms to FEM			1 Cm	1 Bm	1 Am	2m	3m
Reeving		Range	Size				
1/1	2/1						
SWL kg							
160	315	-	-	-	-	-	160
200	400	-	-	-	-	-	200
250	500	-	-	-	-	250	250
315 ⇒	630	-	-	-	315	-	315
400	800	DKUN 2	400	-	-	400	-
500	1000	-	-	-	500	-	500
630	1250	DKUN 5	630	-	-	-	630
800	1600	-	-	-	-	800	800
1000	2000	-	-	-	1000	1000	-
1250	2500	DKUN 10	1250	-	1250	-	1250
1600	3200	DKUN 16		1600	-	1600	-
2000	4000	-	-	-	2000	-	-
2500	5000	DKUN 20	-	2500	-	-	-

Example (see ⇒——)	
SWL	315 kg
Load spectrum	"medium" from table
Lifting speed	8 m/min
Reeving	1/1
Average hook path	2 m
Number of cycles/hour	20
Working time/day	8 hours

The average operating time per working day is estimated or calculated as follows:

$$\text{Op. time/day} = \frac{2 \times \text{average hook path} \times \text{no. of cycles/h} \times \text{working time/day}}{60 \times \text{lifting speed}} =$$

$$\frac{2 \times 2 \times 20 \times 8}{60 \times 8} = 1{,}34 \text{ hours}$$

For the medium load spectrum and an average daily operating time of 1,34 hours the table shows FEM group 1 A m. For an SWL of 315 kg and 1/1 reeving, the table indicates a hoist size DKUN 2–315.

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2.4 Selection table

SWL	Size	FEM	Hook path	Hoist speed m/min			Motor size	P	n	CDF %	Hook dimension C	max. weight
kg			m	V1	V2	V3		kW	rpm		mm [1] [2]	kg [3]
160	DKUN 2-160 KV3 1/1	3 m	3; 4; 6; 8	-	-	25	KMK 71 B 2	0,75	2680	60	355	25
	DKUN 2-160 KV3 1/1 F6			-	-	25/4	KMK 80 B 2/12	0,75/0,1	2720/380	40/20	355	31
200	DKUN 2-200 KV1 1/1	3 m	3; 4; 6; 8	8	-	-	KMP 71 B 2	0,4	2840	60	355	25
	DKUN 2-200 KV1 1/1 F4			8/2	-	-	KMK 80 Z 2/8	0,4/0,1	2770/675	40/20	355	29
	DKUN 2-200 KV2 1/1			-	14	-	KMK 71 B 2	0,75	2680	60	355	25
	DKUN 2-200 KV2 1/1 F4			-	14/3,5	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	355	31
250	DKUN 2-250 KV1 1/1	2 m	3; 4; 6; 8	8	-	-	KMP 71 B 2	0,4	2840	60	355	25
	DKUN 2-250 KV1 1/1 F4			8/2	-	-	KMK 80 Z 2/8	0,4/0,1	2770/675	40/20	355	29
	DKUN 2-250 KV2 1/1			-	14	-	KMK 71 B 2	0,75	2680	60	355	25
	DKUN 2-250 KV2 1/1 F4			-	14/3,5	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	355	31
	DKUN 5-250 KV3 1/1	3 m	3; 4; 6; 8	-	-	25	KMK 80 B 2	1,4	2720	60	395	38
	DKUN 5-250 KV3 1/1 F6			-	-	25/4	KMK 90 B 2/12	1,2/0,16	2840/430	40/20	395	45
315	DKUN 2-315 KV1 1/1	1 Am	3; 4; 6; 8	8	-	-	KMK 71 B 2	0,75	2680	60	355	25
	DKUN 2-315 KV1 1/1 F4			8/2	-	-	KMK 80 B2/8	0,75/0,17	2800/685	40/20	355	31
	DKUN 2-315 KV2 1/1			-	12,5	-	KMK 71 B 2	0,75	2680	60	355	25
	DKUN 2-315 KV2 1/1 F4			-	12,5/3,1	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	355	31
	DKUN 5-315 KV1 1/1	3 m	3; 4; 6; 8	8	-	-	KMK 71 B 2	0,75	2680	60	395	34
	DKUN 5-315 KV1 1/1 F4			8/2	-	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	395	38
	DKUN 5-315 KV2 1/1			-	15	-	KMK 80 B 2	1,4	2720	60	395	38
	DKUN 5-315 KV2 1/1 F4			-	12,5/3,1	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	395	38
	DKUN 2-160 KV3 2/1	3 m	3; 4	-	-	12,5	KMK 71 B 2	0,75	2680	60	415	26
	DKUN 2-160 KV3 2/1 F6			-	-	12,5/2	KMK 80 B 2/12	0,75/0,1	2720/380	40/20	415	32
400	DKUN 2-400 KV1 1/1	1 Cm	3; 4; 6; 8	8	-	-	KMK 71 B 2	0,75	2680	60	355	25
	DKUN 2-400 KV1 1/1 F4			8/2	-	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	355	31
	DKUN 5-400 KV1 1/1	2 m	3; 4; 6; 8	8	-	-	KMK 71 B 2	0,75	2680	60	395	34
	DKUN 5-400 KV1 1/1 F4			8/2	-	-	KMK 90 Z 2/8	0,85/0,2	2770/665	40/20	395	43
	DKUN 5-400 KV2 1/1			-	15	-	KMK 80 B 2	1,4	2720	60	395	38
	DKUN 5-400 KV2 1/1 F4			-	12,5/3,1	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	395	45
	DKUN 2-200 KV1 2/1	3 m	3; 4	4	-	-	KMP 71 B 2	0,4	2840	60	415	26
	DKUN 2-200 KV1 2/1 F4			4/1	-	-	KMK 80 Z 2/8	0,4/0,1	2770/675	40/20	415	30
	DKUN 2-200 KV2 2/1			-	7	-	KMK 71 B 2	0,75	2680	60	415	26
	DKUN 2-200 KV2 2/1 F4			-	7/1,7	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	415	32
500	DKUN 5-500 KV1 1/1	1 Am	3; 4; 6; 8	8	-	-	KMK 71 B 2	0,75	2680	60	395	34
	DKUN 5-500 KV1 1/1 F4			8/2	-	-	KMK 90 Z 2/8	0,85/0,2	2770/665	40/20	395	43
	DKUN 5-500 KV2 1/1			-	15	-	KMK 80 B 2	1,4	2720	60	395	38
	DKUN 5-500 KV2 1/1 F4			-	12,5/3,1	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	395	45
	DKUN 10-500 KV3 1/1	3 m	3; 4; 6; 8	-	-	20	KMK 90 B 2	2,1	2730	60	480	64
	DKUN 10-500 KV3 1/1 F6			-	-	20/3,3	KMK 100 B 2/12	2/0,31	2800/400	40/20	480	73
	DKUN 2-250 KV1 2/1	2 m	3; 4	4	-	-	KMP 71 B 2	0,4	2840	60	415	26
	DKUN 2-250 KV1 2/1 F4			4/1	-	-	KMK 80 Z 2/8	0,4/0,1	2770/675	40/20	415	30
	DKUN 2-250 KV2 2/1			-	7	-	KMK 71 B 2	0,75	2680	60	415	26
	DKUN 2-250 KV2 2/1 F4			-	7/1,7	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	415	32
	DKUN 5-250 KV3 2/1	3 m	3; 4	-	-	12,5	KMK 80 B 2	1,4	2720	60	465	40
	DKUN 5-250 KV3 2/1 F6			-	-	12,5/2	KMK 90 B 2/12	1,2/0,16	2840/430	40/20	465	47
630	DKUN 5-630 KV1 1/1	1 Cm	3; 4; 6; 8	8	-	-	KMK 80 B 2	1,4	2720	60	395	38
	DKUN 5-630 KV1 1/1 F4			8/2	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	395	45
	DKUN 10-630 KV1 1/1	3 m	3; 4; 6; 8	9	-	-	KMK 90 B 2	2,1	2730	60	480	64
	DKUN 10-630 KV1 1/1 F4			9/2,2	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	480	64

1) Hook dimension "C" with long suspension eye
2) For limit switch cut-off for the highest hook position, hook dimension C is increased by 80 mm
3) For 3 m hook path

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SWL	Size	FEM	Hook path	Hoist speed m/min			Motor size	P	n	CDF	Hook dimension C	max. weight
kg			m	V1	V2	V3		kW	rpm	%	mm 1) 2)	kg 3)
630	DKUN 10-630 KV2 1/1	3 m	3; 4; 6; 8	-	12,5	-	KMK 90 B 2	2,1	2730	60	480	64
	DKUN 10-630 KV2 1/1 F4			-	12,5/3,1	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	480	64
	DKUN 2-315 KV1 2/1	1 Am	3; 4	4	-	-	KMK 71 B 2	0,75	2680	60	415	26
	DKUN 2-315 KV1 2/1 F4			4/1	-	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	415	32
	DKUN 2-315 KV2 2/1			-	6,3	-	KMK 71 B 2	0,75	2680	60	415	26
	DKUN 2-315 KV2 2/1 F4			-	6,3/1,5	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	415	32
	DKUN 5-315 KV1 2/1	3 m	3; 4	4	-	-	KMK 71 B 2	0,75	2680	60	465	36
	DKUN 5-315 KV1 2/1 F4			4/1	-	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	465	40
	DKUN 5-315 KV2 2/1			-	7,5	-	KMK 80 B 2	1,4	2720	60	465	40
	DKUN 5-315 KV2 2/1 F4			-	6,3/1,5	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	465	40
800	DKUN 10-800 KV1 1/1	2 m	3; 4; 6; 8	9	-	-	KMK 90 B 2	2,1	2730	60	480	64
	DKUN 10-800 KV1 1/1 F4			9/2,2	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	480	64
	DKUN 10-800 KV2 1/1			-	12,5	-	KMK 90 B 2	2,1	2730	60	480	64
	DKUN 10-800 KV2 1/1 F4			-	12,5/3,1	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	480	73
	DKUN 16-800 KV1 1/1	3 m	3; 4; 6; 8	8	-	-	KMK 90 B 2	2,1	2730	60	540	68
	DKUN 16-800 KV1 1/1 F4			8/2	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	540	68
	DKUN 16-800 KV2 1/1			-	12,5	-	KMK 90 B 2	2,1	2730	60	540	68
	DKUN 16-800 KV2 1/1 F4			-	12,5/3,1	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	540	77
	DKUN 2-400 KV1 2/1	1 Cm	3; 4	4	-	-	KMK 71 B 2	0,75	2680	60	415	26
	DKUN 2-400 KV1 2/1 F4			4/1	-	-	KMK 80 B 2/8	0,75/0,17	2800/685	40/20	415	32
	DKUN 5-400 KV1 2/1	2 m	3; 4	4	-	-	KMK 71 B 2	0,75	2680	60	465	36
	DKUN 5-400 KV1 2/1 F4			4/1	-	-	KMK 90 Z 2/8	0,85/0,2	2770/665	40/20	465	45
	DKUN 5-400 KV2 2/1			-	7,5	-	KMK 80 B 2	1,4	2720	60	465	40
	DKUN 5-400 KV2 2/1 F4			-	6,3/1,5	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	465	47
1000	DKUN 10-1000 KV1 1/1	1 Am	3; 4; 6; 8	9	-	-	KMK 90 B 2	2,1	2730	60	480	64
	DKUN 10-1000 KV1 1/1 F4			9/2,2	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	480	64
	DKUN 10-1000 KV2 1/1			-	12,5	-	KMK 100 B 2	3	2780	60	480	73
	DKUN 10-1000 KV2 1/1 F4			-	12,5/3,1	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	480	73
	DKUN 16-1000 KV1 1/1	2 m	3; 4; 6; 8	8	-	-	KMK 90 B 2	2,1	2730	60	540	68
	DKUN 16-1000 KV1 1/1 F4			8/2	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	540	68
	DKUN 16-1000 KV2 1/1			-	12,5	-	KMK 100 B 2	3	2780	60	540	77
	DKUN 16-1000 KV2 1/1 F4			-	12,5/3,1	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	540	77
	DKUN 5-500 KV1 2/1	1 Am	3; 4	4	-	-	KMK 71 B 2	0,75	2680	60	465	36
	DKUN 5-500 KV1 2/1 F4			4/1	-	-	KMK 90 Z 2/8	0,85/0,2	2770/665	40/20	465	45
	DKUN 5-500 KV2 2/1			-	7,5	-	KMK 80 B 2	1,4	2720	60	465	40
	DKUN 5-500 KV2 2/1 F4			-	6,3/1,5	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	465	47
	DKUN 10-500 KV3 2/1	3 m	3; 4	-	-	10	KMK 90 B 2	2,1	2730	60	580	70
	DKUN 10-500 KV3 2/1 F6			-	-	10/1,6	KMK 100 B 2/12	2,0/0,31	2800/400	40/20	580	79
1250	DKUN 10-1250 KV1 1/1	1 Cm	3; 4; 6; 8	9	-	-	KMK 90 B 2	2,1	2730	60	480	64
	DKUN 10-1250 KV1 1/1 F4			9/2,2	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	480	73
	DKUN 16-1250 KV1 1/1	1 Am	3; 4; 6; 8	8	-	-	KMK 90 B 2	2,1	2730	60	540	73
	DKUN 16-1250 KV1 1/1 F4			8/2	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	540	82
	DKUN 20-1250 KV1 1/1 F4	3 m	3; 4; 6; 8	8/2	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	630	100
	DKUN 20-1250 KV2 1/1 F4			-	12,5/3,1	-	KMK 112 B 2/8	4/0,97	2770/670	40/20	630	115
	DKUN 20-1250 KV3 1/1 F4			-	-	16/4	KMK 112 B 2/8	4/0,97	2770/670	40/20	630	115
	DKUN 5-630 KV1 2/1	1 Cm	3; 4	4	-	-	KMK 80 B 2	1,4	2720	60	465	40
	DKUN 5-630 KV1 2/1 F4			4/1	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	465	47

1) Hook dimension "C" with long suspension eye
2) For limit switch cut-off for the highest hook position, hook dimension C is increased by 80 mm
3) For 3 m hook path

SWL	Size	FEM	Hook path	Hoist speed m/min			Motor size	P	n	CDF	Hook dimension C	max. weight
kg			m	V1	V2	V3		kW	rpm	%	mm [1] [2]	kg [3]
1600	DKUN 16-1600 KV1 1/1	1 Bm	3; 4; 6; 8	8	-	-	KMK 100 B 2	3,0	2780	60	540	82
	DKUN 16-1600 KV1 1/1 F4			8/2	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	540	82
	DKUN 20-1600 KV1 1/1 F4	2 m	3; 4; 6; 8	8/2	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	630	100
	DKUN 20-1600 KV2 1/1 F4			-	12,5/3,1	-	KMK 112 B 2/8	4/0,97	2770/670	40/20	630	115
	DKUN 10-800 KV1 2/1	2 m	3; 4	4,5	-	-	KMK 90 B 2	2,1	2730	60	580	70
	DKUN 10-800 KV1 2/1 F4			4,5/1,1	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	580	70
	DKUN 10-800 KV2 2/1			-	6,3	-	KMK 90 B 2	2,1	2730	60	580	70
	DKUN 10-800 KV2 2/1 F4			-	6,3/1,5	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	580	79
	DKUN 16-800 KV1 2/1	3 m	3; 4	4	-	-	KMK 90 B 2	2,1	2730	60	640	76
	DKUN 16-800 KV1 2/1 F4			4/1	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	640	76
	DKUN 16-800 KV2 2/1			-	6,3	-	KMK 90 B 2	2,1	2730	60	640	76
	DKUN 16-800 KV2 2/1 F4			-	6,3/1,5		KMK 100 B 2/8	2,5/0,62	2720/620	40/20	640	82
2000	DKUN 20-2000 KV1 1/1 F4	1 Am	3; 4; 6; 8	8/2	-	-	KMK 112 B 2/8	4/0,97	2770/670	40/20	630	115
	DKUN 10-1000 KV1 2/1	1 Am	3; 4	4,5	-	-	KMK 90 B 2	2,1	2730	60	580	70
	DKUN 10-1000 KV1 2/1 F4			4,5/1,1	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	580	70
	DKUN 10-1000 KV2 2/1			-	6,3	-	KMK 100 B 2	3,0	2780	60	580	79
	DKUN 10-1000 KV2 2/1 F4			-	6,3/1,5	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	580	79
	DKUN 16-1000 KV1 2/1	2 m	3; 4	4	-	-	KMK 90 B 2	2,1	2730	60	640	76
	DKUN 16-1000 KV1 2/1 F4			4/1	-	-	KMK 90 B 2/8	1,7/0,42	2800/640	40/20	640	76
	DKUN 16-1000 KV2 2/1			-	6,3	-	KMK 100 B 2	3,0	2780	60	640	85
	DKUN 16-1000 KV2 2/1 F4			-	6,3/1,5	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	640	85
2500	DKUN 20-2500 KV1 1/1 F4	1 Bm	3, 4, 6, 8	8/2	-	-	KMK 112 B 2/8	4/0,97	2770/670	40/20	630	115
	DKUN 10-1250 KV1 2/1	1 Cm	3; 4	4,5	-	-	KMK 90 B 2	2,1	2730	60	580	70
	DKUN 10-1250 KV1 2/1 F4			4,5/1,1	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	580	79
	DKUN 16-1250 KV1 2/1	1 Am	3; 4	4	-	-	KMK 90 B 2	2,1	2730	60	640	76
	DKUN 16-1250 KV1 2/1 F4			4/1	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	640	85
	DKUN 20-1250 KV1 2/1 F4	3 m	3; 4	4/1	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	755	106
	DKUN 20-1250 KV2 2/1 F4			-	6,3/1,5	-	KMK 112 B 2/8	4/0,97	2770/670	40/20	755	121
	DKUN 20-1250 KV3 2/1 F4			-	-	8/2	KMK 112 B 2/8	4/0,97	2770/670	40/20	755	121
3200	DKUN 16-1600 KV1 2/1	1 Bm	3; 4	4	-	-	KMK 100 B 2	3,0	2780	60	640	85
	DKUN 16-1600 KV1 2/1 F4			4/1	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	640	85
	DKUN 20-1600 KV1 2/1 F4	2 m	3; 4	4/1	-	-	KMK 100 B 2/8	2,5/0,62	2720/620	40/20	755	106
	DKUN 20-1600 KV2 2/1 F4			-	6,3/1,5	-	KMK 112 B 2/8	4/0,97	2770/670	40/20	755	121
4000	DKUN 20-2000 KV1 2/1 F4	1 Am	3; 4	4/1	-	-	KMK 112 B 2/8	4/0,97	2770/670	40/20	755	121
5000	DKUN 20-2500 KV1 2/1 F4	1 Bm	3; 4	4/1	-	-	KMK 112 B 2/8	4/0,97	2770/670	40/20	755	121

1) Hook dimension "C" with long suspension eye
2) For limit switch cut-off for the highest hook position, hook dimension C is increased by 80 mm
3) For 3 m hook path

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2.5 Hoist motor data

Main/creep lifting F4

Required supply cable conductor cross sections and fuse links

Size	Group of mech-anisms to FEM	P	CDF %	n	Starts/h	Rated current IN and starting current IA for 50 Hz						cos	cos
						230 V		400V		500 V		φ_N	φ_A
KMK		kW		rpm		I N (A)	I A (A)	I N (A)	I A (A)	I N (A)	I A (A)		
80 Z 2/8	1 Cm 1 Bm 1 Am 2 m 3 m	0,4/ 0,1	40/ 20	2770/ 675	120/ 240	2,6 2,6	9,1 3,8	1,5 1,5	5,3 2,2	1,1 1,1	3,8 1,6	0,80 0,62	0,84 0,84
80 B 2/8		0,75/ 0,17	40/ 20	2800/ 685	120/ 240	3,8 3,8	15,5 5,5	2,2 2,2	9,0 3,2	1,6 1,6	6,5 2,3	0,80 0,57	0,90 0,86
90 Z 2/8		0,85/ 0,2	40/ 20	2770/ 665	120/ 240	4,6 2,7	20 5,1	2,6 1,6	11,6 3,0	1,9 1,1	8,4 2,1	0,81 0,59	0,79 0,77
90 B 2/8		1,7/ 0,42	40/ 20	2800/ 640	120/ 240	7,7 4,4	35 8,6	4,4 2,5	20 5,0	3,2 1,8	14,4 3,6	0,90 0,60	0,82 0,75
100 B 2/8		2,5/ 0,62	40/ 20	2720/ 620	120/ 240	11,9 5,8	49 11,9	6,9 3,4	29 6,9	4,9 2,4	21 4,9	0,86 0,65	0,79 0,72
112 B 2/8		4/ 0,97	40/ 20	2770/ 670	120/ 240	19,2 11,9	91 24	11,1 6,9	53 13,7	8 4,9	38 9,9	0,82 0,50	0,68 0,68

Size	Group of mech-anisms to FEM	Mains connection delay fuse for 50 Hz 1)			Supply lines for 5% voltage drop Δ U and starting current IA for 50 Hz 2)					
		230 V	400 V	500 V	230 V (Δ U 11,5 V)		400 V (Δ U 20 V)		500 V (Δ U 25 V)	
KMK		A	A	A	mm²	m	mm²	m	mm²	m
80 Z 2/8	1 Cm 1 Bm 1 Am 2 m 3 m	6	6	6	1,5	73	1,5	100	1,5	100
80 B 2/8		6	6	6	1,5	42	1,5	100	1,5	100
90 Z 2/8		10	6	6	1,5	35	1,5	100	1,5	100
90 B 2/8		16	10	6	2,5	28	1,5	59	1,5	100
100 B 2/8		16	16	10	2,5	23	1,5	42	1,5	77
112 B 2/8		35	20	16	2,5	16	1,5	30	1,5	47

Main/creep lifting F6

Size	Group of mech-anisms to FEM	P	CDF %	n	Starts/h	Rated current IN and starting current IA bei 50 Hz						cos	cos
						230 V		400V		500 V		φ_N	φ_A
KMK		kW		rpm		I N (A)	I A (A)	I N (A)	I A (A)	I N (A)	I A (A)		
80 B 2/12	3 m	0,75/ 0,1	40/ 20	2720/ 380	120/ 240	3,7 3,7	15,0 4,8	2,1 2,1	9,0 2,7	1,5 1,5	6,5 2,0	0,84 0,73	0,87 0,77
90 B 2/12		1,2/ 0,16	40/ 20	2840/ 430	120/ 240	6,4 5,7	35 6,9	3,7 3,3	20 4,0	2,7 2,4	14,4 2,9	0,75 0,59	0,85 0,79
100 B 2/12		2,0/ 0,31	40/ 20	2800/ 400	120/ 240	9,9 6,0	49 10	5,7 3,5	29 5,8	4,1 2,5	20 4,2	0,81 0,53	0,79 0,64

Size	Group of mech-anisms to FEM	Mains connection delay fuse for 50 Hz 1)			Supply lines for 5% voltage drop Δ U and starting current I A for 50 Hz 2)					
		230 V	400 V	500 V	230 V (Δ U 11,5 V)		400 V (Δ U 20 V)		500 V (Δ U 25 V)	
KMK		A	A	A	mm²	m	mm²	m	mm²	m
80 B 2/12	3 m	6	6	6	1,5	41	1,5	100	1,5	100
90 B 2/12		16	10	6	2,5	31	1,5	57	1,5	99
100 B 2/12		16	16	10	2,5	24	1,5	42	1,5	77

1) Fuse links also apply in conjunction with a cross travel motor.

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

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Main hoist

Size	Group of mech-anisms to FEM	P	CDF %	n	Starts/h	Rated current I N and starting current I A for 50 Hz						cos φ N	cos φ A
						230 V		400V		500 V			
		kW		rpm		I N (A)	I A (A)	I N (A)	I A (A)	IN (A)	I A (A)		
KMP 71 B 2	1 Cm 1 Bm 1 Am 2 m 3 m	0,40	60	2840	360	3,7	16,4	2,1	9,5	1,5	6,8	0,52	0,74
KMK 71 B 2		0,75	60	2680	360	4,2	16,4	2,4	9,5	1,8	6,8	0,75	0,74
KMK 80 B 2		1,4	60	2720	360	7,3	33	4,2	19	3,0	13,7	0,80	0,82
KMK 90 B 2		2,1	60	2730	360	9,9	46	5,7	26	4,1	19	0,81	0,83
KMK 100 B 2		3,0	60	2780	360	14,6	77	8,4	44	6,1	32	0,78	0,78

Size	Group of mech-anisms to FEM	Mains connection delay fuse for 50 Hz 1)			Supply lines for 5% voltage drop Δ U and starting current IA for 50 Hz 2)					
		230 V	400 V	500 V	230 V (Δ U 11,5 V)		400 V (Δ U 20 V)		500 V (Δ U 25 V)	
		A	A	A	mm²	m	mm²	m	mm²	m
KMP 71 B 2	1 Cm 1 Bm 1 Am 2 m 3 m	6	6	6	1,5	46	1,5	100	1,5	100
KMK 71 B 2		6	6	6	1,5	46	1,5	100	1,5	100
KMK 80 B 2		16	10	6	2,5	34	1,5	62	1,5	100
KMK 90 B 2		16	10	10	2,5	24	1,5	45	1,5	77
KMK 100 B 2		20	16	10	2,5	15	1,5	28	1,5	48

2.6 Travel motor data

EU standard-headroom monorail hoist
EK low-headroom monorail hoist

Size	P	CDF %	n	Rated current IN and starting current IA at 50 Hz						cos φ N	cos φ A
				230 V		400V		500 V			
	kW		rpm	I N (A)	I A (A)	I N (A)	I A (A)	I N (A)	I A (A)		
13/3 PKF 2	0,2	40	2890	1,1	5,7	0,63	3,3	0,46	2,4	0,73	0,74
13/3 PKF 4	0,14	40	1390	0,77	2,6	0,44	1,5	0,32	1,1	0,76	0,74
13/3 PKF 8	0,05	40	710	0,95	2,2	0,55	1,3	0,4	0,91	0,48	0,7
13/6 PF 2	0,3	40	2840	1,5	8,8	0,85	5	0,68	4	0,78	0,8
13/6 PF 4	0,2	40	1320	1,1	3	0,62	1,7	0,49	1,4	0,86	0,88
13/6 PF 8	0,1	40	710	1,6	3,7	0,95	2,1	0,68	1,5	0,50	0,72
13/6 PKF 8/2 13/6 PF 8/2	0,07/ 0,27	40	680/ 2900	1,3/ 1,8	2,6/ 8,6	0,74/ 1,1	1,5/ 5,0	0,53/ 0,76	1,1/ 3,6	0,57/ 0,71	0,86 0,86
13/6 PKF 12/4 13/6 PF 12/4	0,05/ 0,17	20/ 40	450/ 1440	2,2/ 1,8	2,8/ 6,2	1,3/ 1,1	1,6/ 3,6	0,91/ 0,76	1,2/ 2,8	0,66/ 0,55	0,82/ 0,86
KMF 80 A 2	0,65	40	2570	3,0	9,6	1,7	5,5	1,4	4,4	0,93	0,84
KMF 80 A 4	0,32	40	1350	1,7	5,5	0,95	3,1	0,76	2,5	0,74	0,82
KMF 80 A 8/2	0,13/ 0,5	40	630/ 2710	2,0/ 2,5	3,3/ 9,9	1,1/ 1,4	1,9/ 5,7	0,91/ 1,1	1,5/ 4,6	0,71/ 0,88	0,84/ 0,84

1) Fuse links also apply in conjunction with a cross travel motor.
2) The lengths of the supply lines are calculated on the basis of an earth-loop impedance of 200 mΩ.

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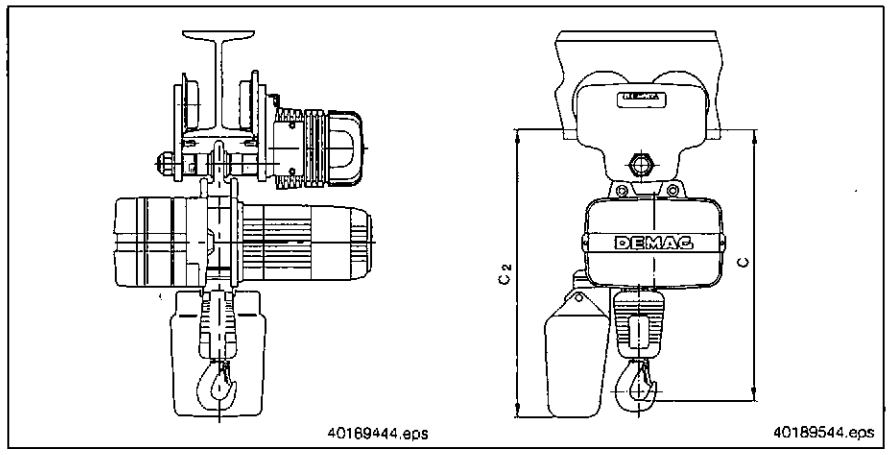
2.7 Hook dimensions C
Standard-headroom monorail hoist

1) Pay attention to flange thickness
2) Trolley crossbar with adjusting rings



2.7.1 RUDK/HUDK/EUDK trolley

Hook dimension C from girder running surface

For trolley assembly instructions see sections 5.18.

Trolley size	max. SWL	Flange width	Size	Hook dim. C		C2					
				Reeving		Chain collector box size					
	kg	mm		1/1	2/1	1	2	3	4	5	6
RU 3 DK	450	50-90	DKUN 2 -160-200	410	470	445	505	555	-	-	-
			DKUN 2 -250-315-400	410	-						
			DKUN5 -250-315	450		470	530	575			
RU 6 DK	700	58-300	DKUN 2 -250-315	-	460	460	520	565	-	-	-
			DKUN 5 -250-315		510	485	545	590			
			DKUN 5 -400-500-630	440	-						
		58-300 1)	DKUN 10 -500	535		-	-	-	680	800	
RU 11 DK	850	58-300	DKUN 2 -400	-	460	460	520	565	-	-	-
	1350	58-143	DKUN 5 -400-500-630		510	485	545	590			
		144-300			505	480	540	585			
		58-143 1)	DKUN 10 -500-630	535	635	-	-	-	680	800	-
		144-300 1)		530	-				675	795	
		58-143 1)	DKUN 10 -800-1000-1250	535					680	800	
		144-300 1)		530					675	795	
RU 22 DK	2600	82-300	DKUN 10 -500-630-800-1000-1250	545	645	-	-	-	690	810	-
			DKUN 16 -800-1000-1250	595	695						
			DKUN 16 -1600	595	-						
			DKUN 20 -1250-1600-2000	685					785	905	985
RU 36-N 2)	3600	90-300	DKUN 16 -800-1000-1250-1600	610	710	-	-	-	705	825	-
			DKUN 20 -2500	700	-				800	920	1000
			DKUN 20 -1250-1600	-	825						
RU 55 DK	5500	106-186	DKUN 20 -1250-1600-2000-2500	705	830	-	-	-	805	925	1005
		187-300		700	825				800	920	1000
EU 11/HU 11 DK	850	58-300	DKUN 2 -160-200-250-315-400	400	460	460	520	565	-	-	-
	1350	58-143	DKUN 5 -250-315-400-500-630	440	510	485	545	590			
		144-300		435	505	480	540	585			
		58-143 1)	DKUN 10 -500-630	535	635	-	-	-	680	800	-
		144-300 1)		530	630				675	795	
		58-143 1)	DKUN 10 -800-1000-1250	535	-				680	800	
		144-300 1)		530					675	795	
EU 22/HU 22 DK	2600	82-300	DKUN 10 -500-630-800-1000-1250	545	645	-	-	-	690	810	-
			DKUN 16 -800-1000-1250	595	695						
			DKUN 16 -1600	595	-						
			DKUN 20 -1250-1600-2000	685					785	905	985
EU 36-N 2)	3600	90-300	DKUN 16 -800-1000-1250-1600	610	710	-	-	-	705	825	-
			DKUN 20 -2500	700	-				800	920	1000
			DKUN 20 -1250-1600	-	825						
EU 55 DK	5500	106-186	DKUN 20 -1250-1600-2000-2500	705	830	-	-	-	805	925	1005
		187-300		700	825				800	920	1000

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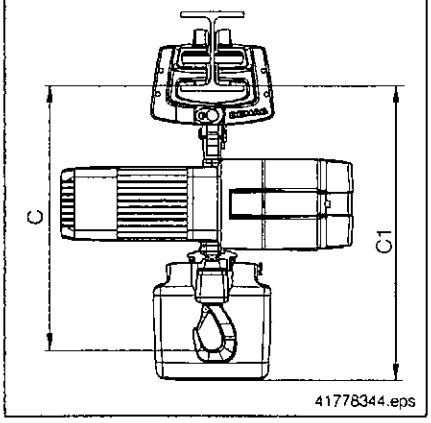
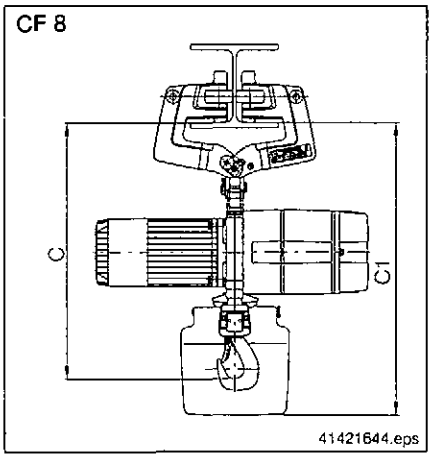
2.7.2 Hook dimension C Click-fit trolleys

CF 5



CF 8



CF 5 standard headroom monorail hoist (max. SWL 550 kg)

Hook dimension C from girder running surface

Mounting arrangement		Flange width 50 - 91 mm							
		At right angles to the track girder				Parallel to the track girder			
Range	Reeving		Chain collector box size				Chain collector box size		
			1	2	3		1	2	3
		C	C1			C	C1		
DKUN 2	1/1	370	435	495	540	390	455	515	560
	2/1	430				450			

For trolley assembly instructions see section 5.19.

CF 8 standard headroom monorail hoist (max. SWL 850 kg)

Hook dimension C from girder running surface

Mounting arrangement		Track girders with parallel flanges							
		Flange width 55 - 143 mm							
		At right angles to the track girder				Parallel to the track girder			
Range	Reeving		Chain collector box size				Chain collector box size		
			1	2	3		1	2	3
		C	C1			C	C1		
DKUN 2	1/1	400	460	520	565	420	480	540	585
	2/1	460				480			
DKUN 5	1/1	445	490	550	595	465	510	570	615
	2/1	515				535			
Mounting arrangement		Track girders with sloping flanges							
		Flange width 58 - 143 mm							
		At right angles to the track girder				Parallel to the track girder			
Range	Reeving		Chain collector box size				Chain collector box size		
			1	2	3		1	2	3
		C	C1			C	C1		
DKUN 2	1/1	390	450	510	555	410	470	530	575
	2/1	450				470			
DKUN 5	1/1	435	480	540	585	455	500	560	605
	2/1	505				525			

For trolley assembly instructions see section 5.20.

2.7.3 Curve radii for RU/HU/EUDK and CF 5/CF 8 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	Track girder			
	round-edged		square-edged	
	Flange width	Rmin	Flange width	Rmin
CF 5	50-91	800	50-91	800
CF 8	58-143	800	55-143	800
RU 3 DK	50 58-90	1200 900	50-90	900
RU 6 DK	58-300	1000	58-300	1200
RU 11 DK HU 11 DK EU 11 DK	58-300	1800	58-300	2000
RU 22 DK HU 22 DK EU 22 DK	82-143 144-200 201-300	2300 1900 1300	82-300 - -	2575 - -
RU 36-N EU 36-N	90-300	3000	90-300	3500
RU 55 DK EU 55 DK	106-186 187-300	3000	106-186 187-300	3500

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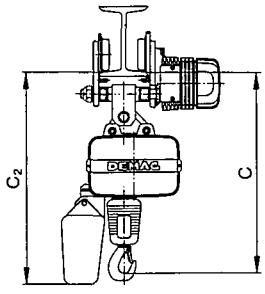
2.7.4 Trolley with special crossbar Flange width 144-300 mm



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Suitable for:

Chain hoist turned 90° and suspended with standard suspension eye.
As RU, HU or EU trolley.
For flange widths 144 - 300 mm.

For assembling trolleys see 202 846 44

Hook dimension C from girder running surface

Trolley size	Max. SWL	Flange width	Hoist size	Suspension eye							Suspension ring						
				Hook dim. C		C2					Hook dim. C		C2				
				Reeving		Chain collector box size					Reeving		Chain collector box size				
	kg	mm		1/1	2/1	1	2	3	4	5	1/1	2/1	1	2	3	4	5
RU 6 DK	700	144-300	DKUN1-100-125-160-200	435	495	485	545	-	-	-	-	-	-	-	-	-	-
			DKUN2-160-200-250-315	455	515	515	575	620			460	520	520	580	625		
			DKUN5-250-315	495	565	540	600	645			505	575	550	610	655		
			DKUN5-400-500-630	495	-						505	-					
RU 11 DK	1350	144-300	DKUN2-400	-	520	520	580	625	-	-	-	525	525	585	630	-	-
			DKUN5-400-500-630	-	570	545	605	650				580	555	615	660		
RU 22 DK	2600	144-300	DKUN10-500-630-800-1000-1250	625	725	-	-	-	770	890	650	750	-	-	-	805	925
			DKUN16 -800-1000-1250	675	775												
			DKUN16-1600	675	-												
EU 11/ HU 11 DK	1350	144-300	DKUN2-160-200-250-315-400	465	520	520	580	625	-	-	465	525	525	585	630	-	-
			DKUN5 -250-315-400-500-630	510	570	545	605	650			510	580	555	615	660		
EU 22/ HU 22 DK	2600	144-300	DKUN10 -500-530-800-1000-1250	625	725	-	-	-	770	890	650	750	-	-	-	805	925
			DKUN16 -800-1000-1250	675	775												
			DKUN16-1600	675	-												

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2.8 EU 11/EU 22 DK travel speeds with 13/3 PKF and 13/6 PKF motor

Travel drive			Possible travel speeds in approx. ... m/min				
			28	14	7	7/28	4,6/14
			13/3 PKF 2	13/3 PKF 4	13/3 PKF 8	13/6 PKF 8/2	13/6 PKF 12/4
Part no.	Voltage	230/400 V	563 062 44	563 064 44	563 067 44	-	-
		400 V	-	-	-	563 057 44	563 056 44

2.9 EU 36-N/EU 55 DK travel speeds with 13/6 PF motor up to 3600 kg

Travel drive			Possible travel speeds in approx. ... m/min				
			25	12,5	6,3	6,3/25	4,2/12,5
			13/6 PF 2	13/6 PF 4	13/6 PF 8	13/6 PF 8/2	13/6 PF 12/4
Part no.	Voltage	230/400 V	563 913 44	563 916 44	563 964 44	-	-
		400 V	-	-	-	563 968 44	563 982 44

2.10 EU 55 DK travel speeds with KMF 80 motor up to 5000 kg

Travel drive			Possible travel speeds in approx. ... m/min	
			12,5	6,3/25
			KMF 80 A 4	KMF 80 A 2/8
Part no.	Voltage	400 V	819 091 46	819 092 46

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3 General

3.1 Handling

Notes on inspections in accordance with

Relevant accident prevention regulations for winches, hoists and towing devices — BGV D8 (VBG 8)

Relevant accident prevention regulations for cranes — BGV D6 (VBG 9)

The EC machinery directive requirements are therefore also complied with.

Inspection when putting the hoist into operation for the first time

If hoist units are used as cranes, an inspection must be carried out by an expert engineer in accordance with relevant accident prevention regulations BGV D6 § 25 for cranes.

Chain hoists used in accordance with relevant accident prevention regulations for winches, hoists and towing devices BGV D8 must be inspected by an experienced technician.

The inspection in accordance with relevant accident prevention regulations for winches, hoists and towing devices BGV D8 mainly consists of a visual inspection and a function check. It is designed to ensure that the equipment is in a safe condition and that any defects and damage, e.g. caused by inappropriate handling during transport, are identified and repaired.

In addition, regulations specific to cranes must also be taken into consideration during acceptance and other inspections in accordance with relevant accident prevention regulations for cranes BGV D6

Routine inspections

Hoists and cranes must be inspected by an experienced technician at least once a year. Routine 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 and brakes. It may be necessary to dismantle the hoist in order to inspect wearing parts.

Load carrying means must be inspected along their entire length, including those parts which cannot normally be seen.

The owner must arrange for all inspections to be carried out and documented in the test and inspection booklet of the chain hoist.

3.2 Noise emission measurement according to DIN 45635

The noise emission levels (L_{pAF}) are:

DKUN 2	up to	14 m/min	71^{+2}dB (A)
	above	14 m/min	73^{+2}dB (A)
DKUN 5	up to	14 m/min	72^{+2}dB (A)
	above	14 m/min	74^{+2}dB (A)
DKUN 10	up to	14 m/min	75^{+2}dB (A)
	above	14 m/min	77^{+2}dB (A)
DKUN 16	up to	14 m/min	75^{+2}dB (A)
	above	14 m/min	77^{+2}dB (A)
DKUN 20			78^{+2}dB (A)

at a distance of 1 m from the chain hoist.
These noise emission levels were measured under maximum load.
Structural influences such as

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

were not allowed for in the above measurements.

3.3 Chain hoists operating outdoors

Chain hoists operating outdoors should be provided with a cover for protection against the weather. Travelling hoists should be kept under shelter if they are not used for a considerable length of time.

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3.4 Packing and storage

The chain hoist and accessories such as chain, hook with fittings, bottom block and control pendant as well as the chain collector box and trolley are shipped in cardboard packaging.

Store the chain hoist and accessories in a dry place.

3.5 Paint finish

The chain hoist is supplied in the following standard colours:

Chain hoist	RAL 5009	Azure blue
Bottom block/hook with fittings	RAL 1007	Chrome yellow
Hook	RAL 9005	Jet black
Trolley	RAL 5009	Azure blue

Other colours and special colours can also be ordered.

3.6 Operating conditions

The chain hoist can be operated at:

- -10° to +40°C
- air humidity up to 80%
- Air pressure up to 1000 m above sea level

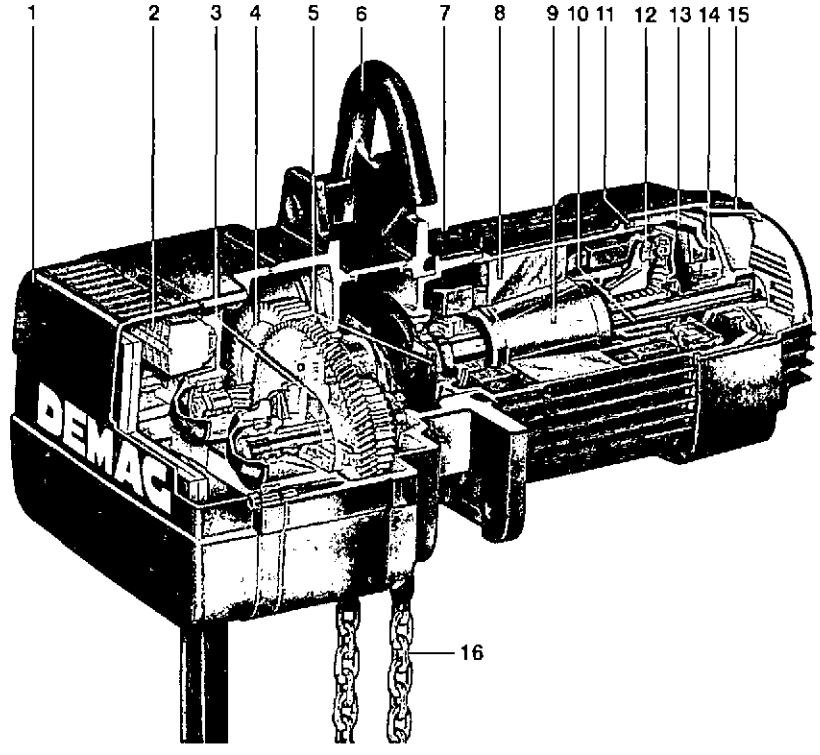
Other operating conditions are also possible.

Please refer to the manufacturer for information on any modifications that may be necessary.

See page 2 for the address.

4 Description

4.1 Design



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1 Electrical equipment cover
2 Electrical components
3 Slipping clutch
4 Gearbox
5 Chain guide
6 Suspension eye
7 Intermediate flange
8 Stator
9 Rotor
10 Shaft
11 Brake shims
12 Coupling
13 Brake cup
14 End cap
15 Fan cover
16 Chain

4.2 Hoist motor

The hoist motor is the proven sliding rotor brake motor with a newly developed rotor-shaft connection, torsionally resistant, axially free fail-safe coupling and conical brake with asbestos-free brake lining. Type of enclosure IP 55.

4.3 Gearbox

The gearbox is of two-stage coaxial design.

The gearbox is lubricated by a mineral oil to DIN 51502 CLP 220.

The first stage of the reduction gear has helical gearing. The wheel of the first gear stage has an integrated slipping clutch. It performs the function of an emergency limit stop device for the highest and lowest hook position and protects the Demag chain hoist against extreme overloads. The slipping clutch also fulfils the EC guideline requirements regarding a load control device starting with an SWL of 1000 kg.

If the emergency limit stop device – in this case the slipping clutch – is approached in normal operation, operation must be limited according to relevant national regulations and those of Demag.

In this case, an additional operating limit switch is required.

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4.4 Chain and sprocket drive

The special Demag chain is of highly wear-resistant material with a high degree of surface hardening, zinc-plated with additional surface treatment. Only chains marked with Demag may be used. The chain hoist has a six-pocket chain drive sprocket and a hardened chain guide.

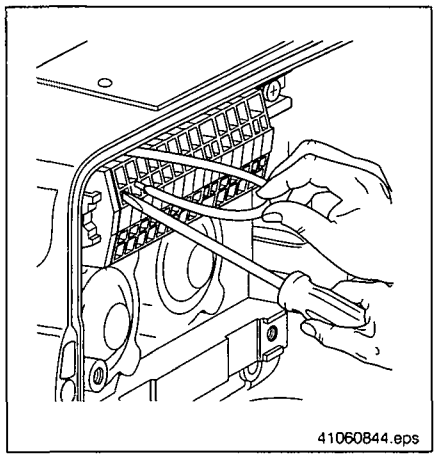
4.5 Chain hoist

The housing is of strong die-cast aluminium and thus light-weight and robust.

The pivoting chain collector box is of tough, flexible, impact-resistant plastic.

4.6 Electrical equipment

The standard chain hoist is designed for direct control:
The chain hoist can be supplied with contactor control as an option or if required by regulations.
Further electrical equipment includes:
Limit switches for lifting and lowering, geared limit switches with up to eight switching points, pulse generator, single-phase design, plug-and-socket connections for power supply line and control pendant, electric overload cut-off.



4.6.1 Direct control

Direct control is effected in the main circuit by means of the DSK 3 D... and DST control pendant.
The control pendant is supplied with the control cable connected to it. Connect the separately supplied control pendant in accordance with the wiring diagram.
Plastic-sheathed wire cords are used for strain relief of the DST control cable, the DSK 3 D... control cable is provided with strain relief by means of a flexible hose.
For control cable strain relief, see sections 5.6 and 5.7 for DSK 3 D... and DST control pendant assembly instructions.

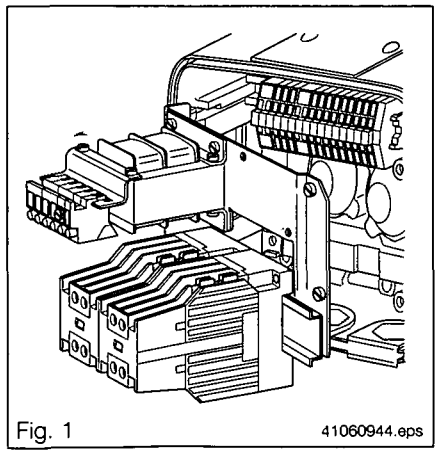


Fig. 1

4.6.2 Contactor control

Contactor control is effected in the auxiliary circuit by means of the Demag control pendant. The control pendant required depends on the application.
Control pendant DSK 3 S... for Demag chain hoists without electric travel trolley, control pendant DST or DSE for Demag chain hoists with electric travel trolley.
Connect the separately supplied control pendant in accordance with the wiring diagram.
Plastic-sheathed wire cords are used for strain relief of the DST and DSE control cable, the DSK 3 S... control cable is provided with strain relief by means of a flexible hose.
The hoist and travel drive contactors, as well as the main contactor and the control transformer are combined into one set of electrical equipment (see fig. 1).
The control circuit is fed from a transformer, the secondary of which is connected to earth.

4.7 Control pendant

The shock and impact-resistant housings are of high quality thermoplastic in the case of DSK and DSE units and of glass-fibre reinforced polyester in the case of DST units and are resistant to fuels, salt water, fats, oils and alkaline solutions.
Type of enclosure IP 55 (65) for DSK and IP 65 for DST/DSE.
Strong mineral (e.g. hydrochloric or sulphuric) acids may corrode pendant switch casings. Replace such pendant switches in good time.

4.8 Suspension fittings

Five types of suspension fitting provide a wide range of mounting possibilities.

Long suspension eye – standard design

For monorail and KBK trolleys

Short suspension eye

For optimum utilization of the available hook path (not suitable for KBK).

Suspension ring – turned 90°

For arrangement of the chain hoist parallel to the girder

Suspension hook

For quickly changing the position of the chain hoist and changing the mounting position by increments of 90° (not suitable for trolleys).

Special suspension eye

For fitting the carrier link with strain gauge or the electro-magnetic load link.

Additional bore holes in the housing of the chain hoist provide further mounting possibilities.

4.9 Trolley

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

4.9.1 Track

When selecting a track, we suggest you specify our KBK crane construction kit track section (fig. 2) of special design. The light-weight, cold-rolled track sections feature a smooth running surface and offer the advantage of simple power supply by means of trailing cables or integrated busbars. The use of I beams according to DIN 1025 as tracks is also possible.
The track radius on curved sections should always be as large as possible in order to ensure good travel characteristics.
I beam tracks should be bent with the utmost care in order to obtain a clean, regular curve. Ready-made curved sections are available for our special KBK track.
Hoist travel on I beam tracks must in no way be obstructed by protruding suspension bolts, screw heads, butt straps, clamping plates, etc. These types of obstruction can be avoided by using our special KBK track section.
Resilient buffers should be mounted at travel wheel axle level at the ends of tracks in order to prevent the hoist from derailing.

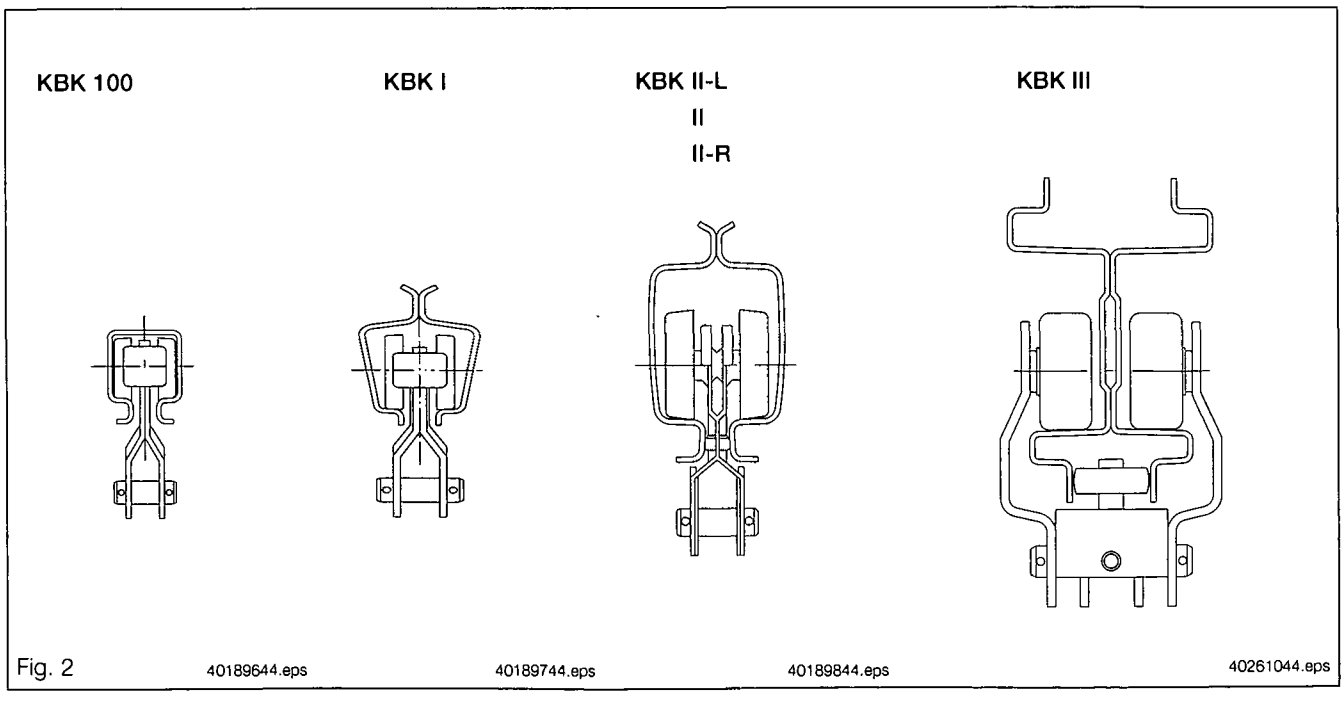


Fig. 2

5 Assembly instructions

5.1 Electrical equipment

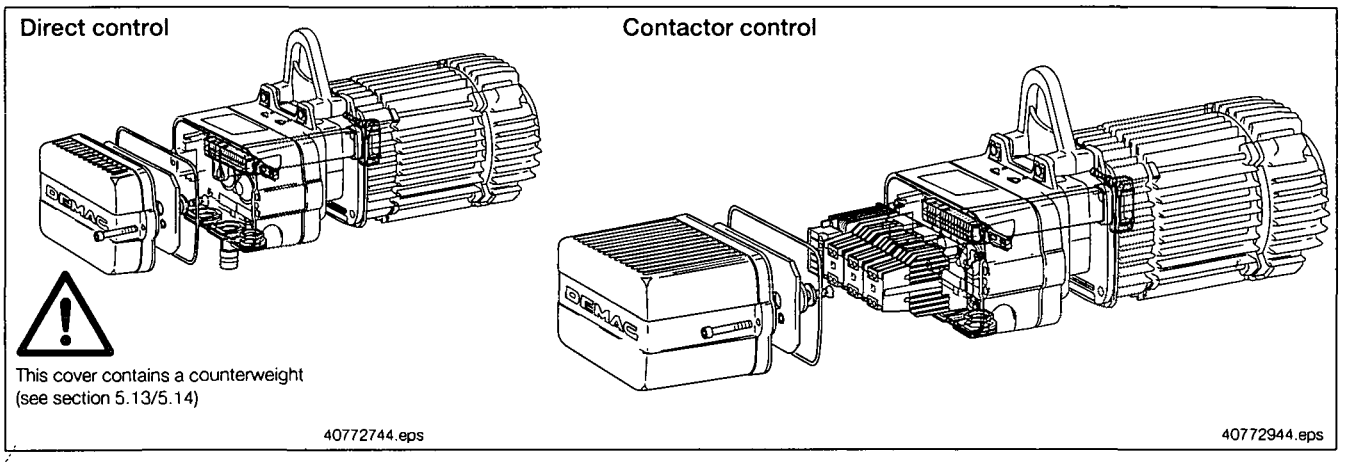
Work on electrical equipment may only be carried out by qualified electricians or trained personnel, see also section 1 "Safety instructions".

Each Demag chain hoist is provided with a wiring diagram showing details of the controls.

The wiring of the chain hoist complies in all respects with current DIN VDE- and accident prevention regulations. Unauthorized intervention and modifications may result in infringement of these regulations.
The switchgear is designed for extreme conditions. However, its life depends on usage.

Advise operators to avoid inching (i.e. giving short pulses to the motor to obtain small movements) as far as possible, e.g. when lifting loads, to prevent excessive contact burning and thus premature destruction of the switchgear.

Inching operations can largely be eliminated by using two-speed hoist and travel motors.



5.2 Connection to the electrical supply

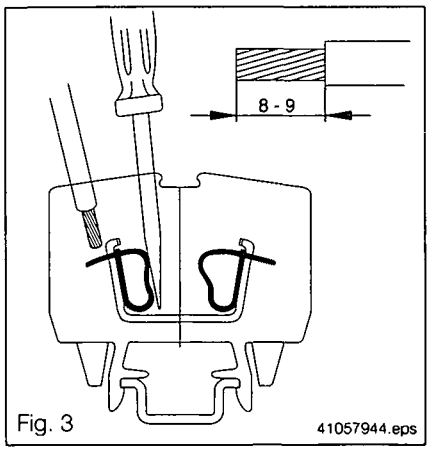


Fig. 3

First check whether the voltage and frequency stamped on the data plate match your mains supply.
The terminals for mains connection are located on the rear wall of the electrical enclosure.
To connect the power supply cable, the electrical equipment cover must be removed and, in the case of hoists with contactor control, the switchgear set must be swung to the side.

A 4-lead cable with an earth lead (PE) is required for current supply.

The required supply cable conductor cross sections, the maximum permissible supply cable length and fuse links can be seen in the tables in sections 2.5 and 2.6.
Please note that the length of the supply line specified for a given cross section must not be exceeded in order to avoid excessive voltage drop, which might prevent the conical rotor of the motor from sliding into running position when the motor is switched on.
The wiring carried out in our factory includes an earth lead which is connected to all parts of the equipment which relevant regulations require to be included in the protective measures.
The protective conductor marked green/yellow in the supply line must be connected to the green/yellow earth terminal.
Connect leads L1, L2 and L3 in accordance with the wiring diagram. Open the cage clamp terminals with a 3,5 mm wide screwdriver as in fig. 3.

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5.3 Connecting the control cable

Connect the control cable in accordance with the wiring diagram.

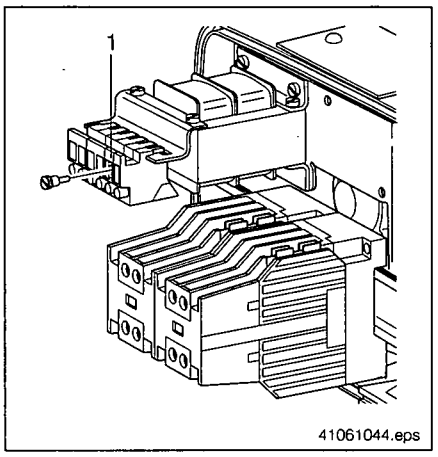
5.4 Checking the direction of movement

When the control pendant button for "lifting" is pressed, the load hook must move upwards.

If this is not the case, leads L2 and L3 of the supply cable should be changed over. (Switch off the mains supply before changing over the leads!)

5.5 Replacing the control fuse link

The control fuse link (1) is held in a fuse terminal on the control transformer. The required amperage of the fuse link can be seen on the transformer data plate.



5.6 Assembly instructions for DSK control pendant

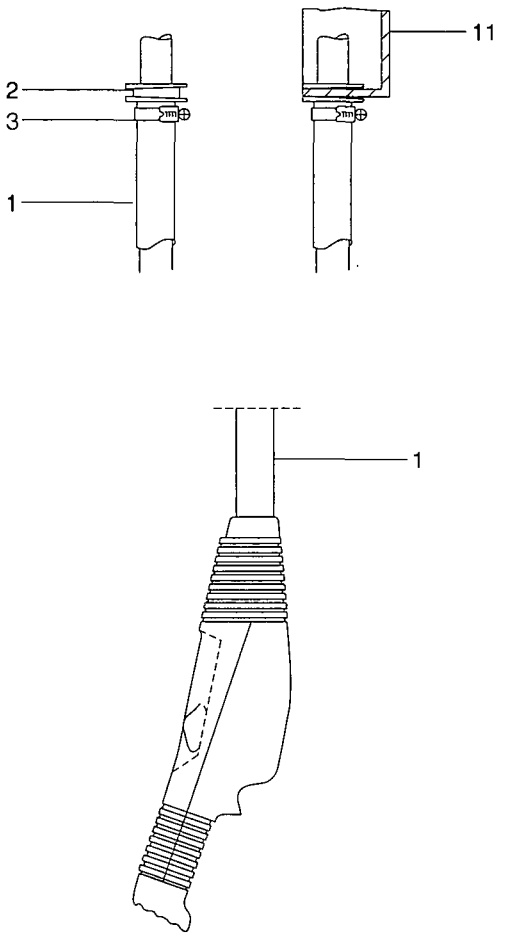
Electrical installation work must only be carried out by a qualified electrician, see also section 1 "Safety instructions".

Control pendant suspension height approx. 1000 mm above floor level.

For special strain relief solutions see operating instructions:
Ident no. 206 489 44 (720 **IS** 951)

Strain relief with special flexible hose

Push special flexible hose 1 over slide bush 2 and secure with hose clip 3. Insert slide bush 2 in DK housing 11.



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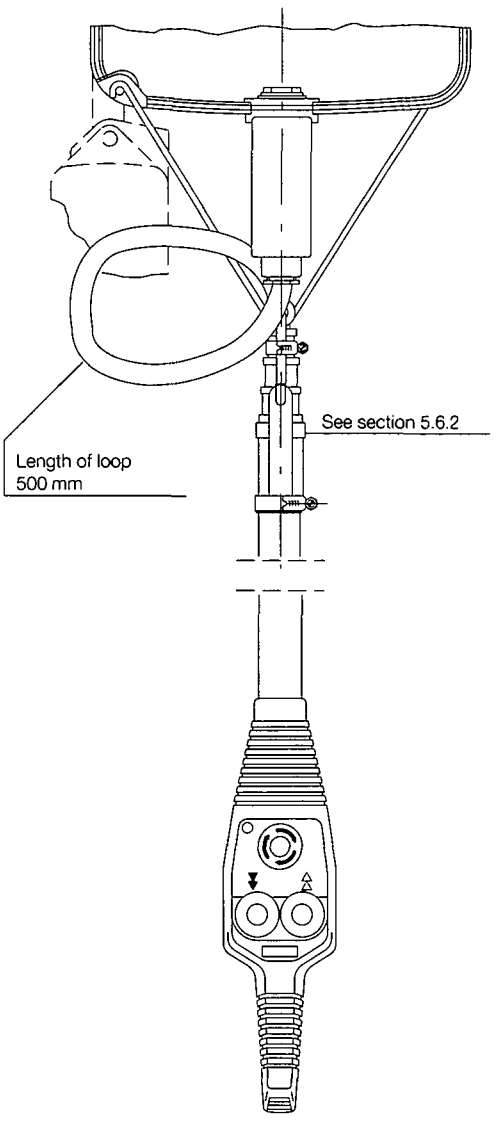
Strain relief with special flexible hose and plug-and-socket connection



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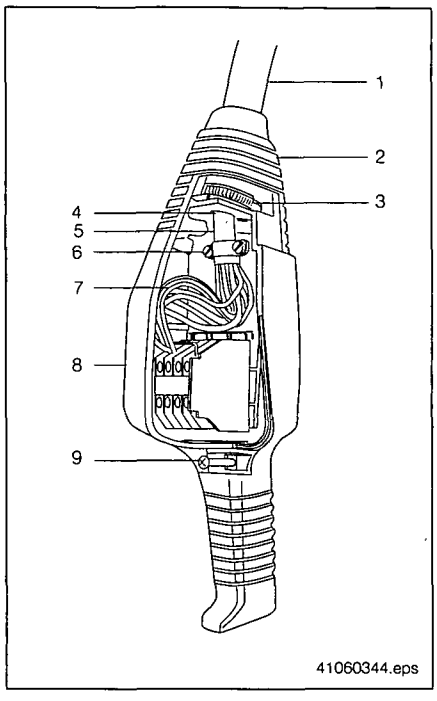


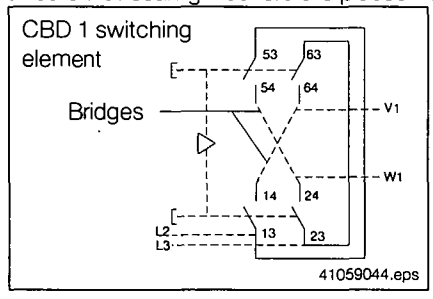
5.6.1 Connection and strain relief of the DSK control pendant

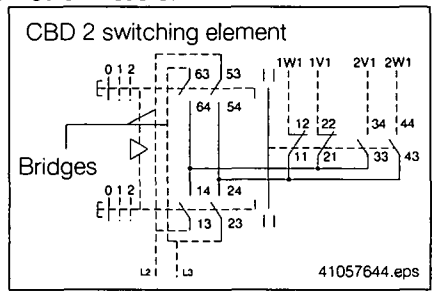
Loosen the three housing screws 9. Remove lower part 8 of the housing. Pass flexible boot 2 over flexible hose 1. Slide flexible hose onto connecting socket 4 until it stops and secure it to the latter by tightening clip 3. Pass cable 5 through clamp 6 and clamp tight. Carefully lay conductors 7 and connect them to terminals.

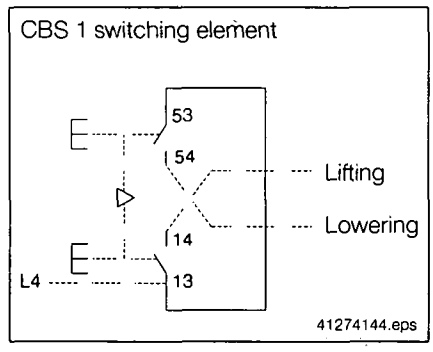
Connect only in compliance with the wiring diagram.

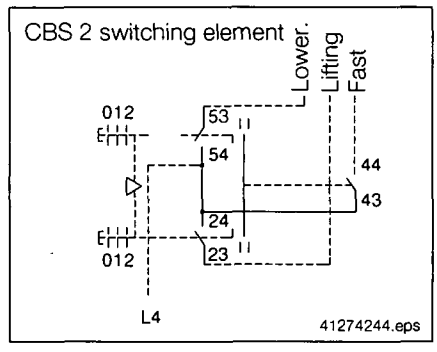
Switching elements CBD 1 / CBD 2:
Fit bridges 14-64, 24-54 for switching element CBD 1 and 13-53, 23-63 for CBD 2.

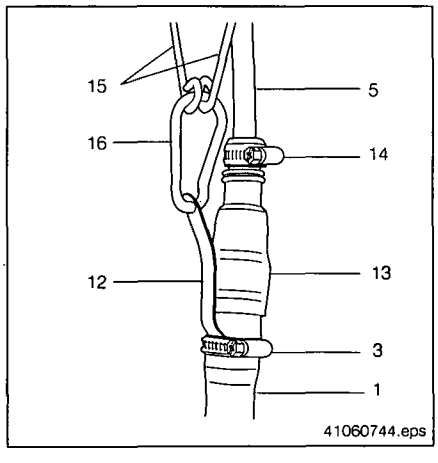
Switching elements CBD 1, CBS 1, CBD 2 and CBS 2 can only be fitted in one predetermined position defined by a rib.
Refit lower part 8 of the housing by tightening the screws provided for this purpose. Ensure that sealing washers are placed below screw head 9.











5.6.2 Strain relief with special flexible hose and plug-and-socket connection

Push special flexible hose 1 over threaded bush (not illustrated). Insert strain relief plate 12 under hose clip 3 and secure by tightening hose clip. Push sealing sleeve 13 over threaded bush until the latter is no longer visible (use grease or similar lubricant) and secure with hose clip 14.

Hook strain relief rods 15 to Demag chain hoist DK and connect to strain relief plate 12 by means of snap hook 16.

For further information see assembly instructions DSK control pendants Ident. no. 206 485 44

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5.7 Assembly instruction for DST control pendant

Electrical installation work must only be carried out by a qualified electrician, see also section 1 "Safety instructions".

Control pendant suspension height approx. 1000 mm above floor level.

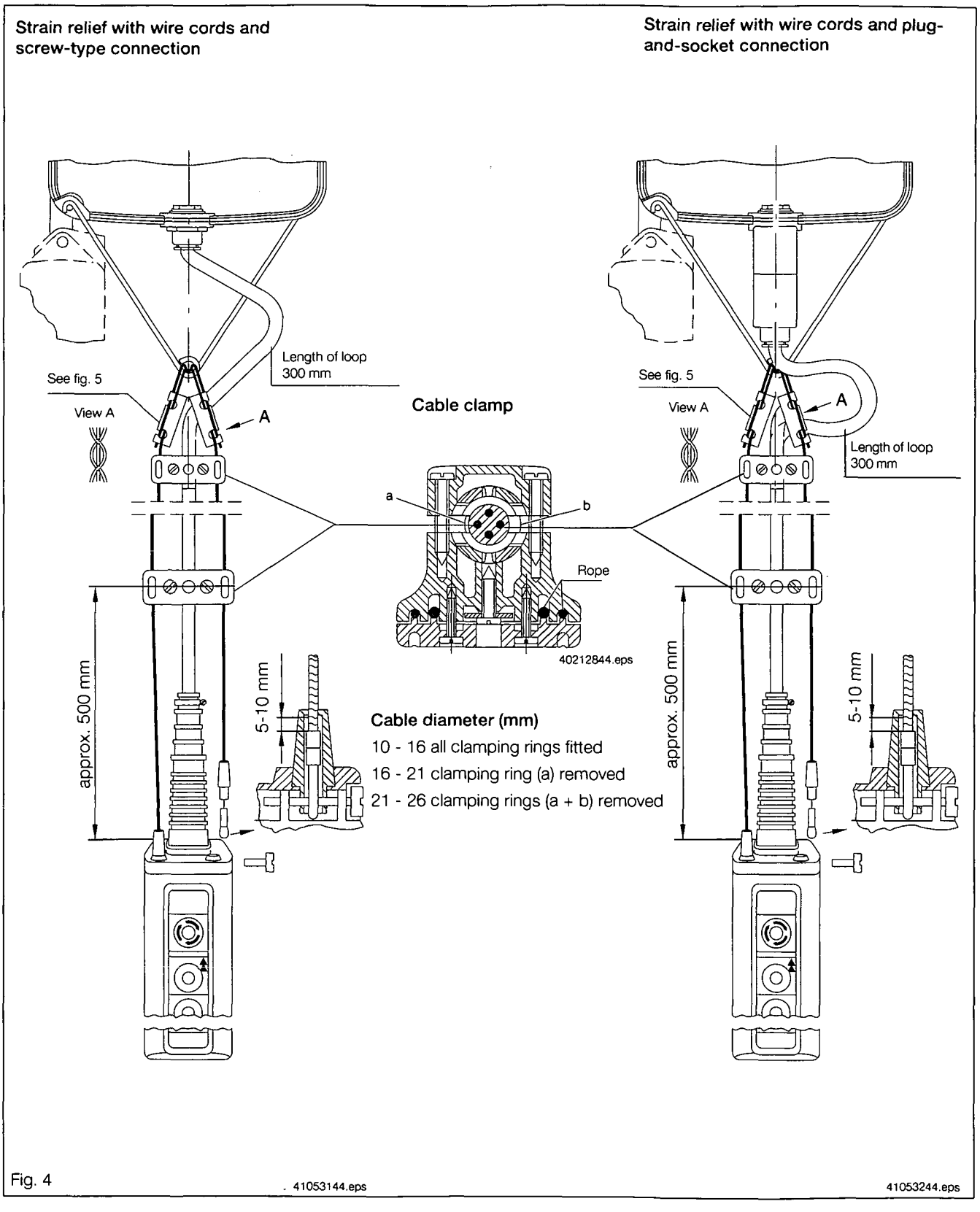

Fig. 4

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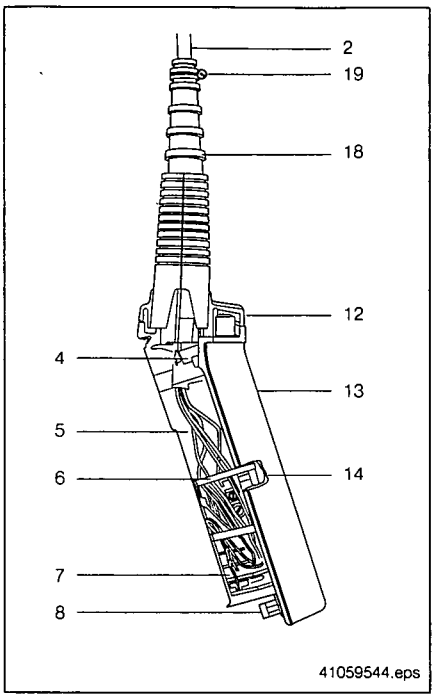


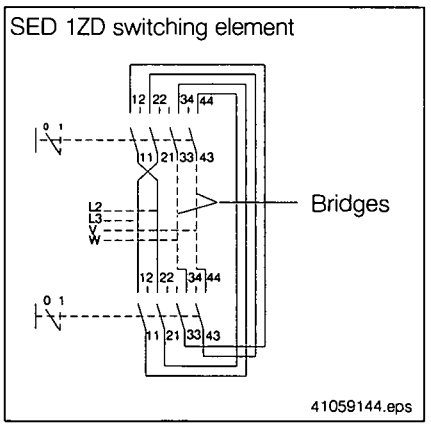
Control pendant with sleeve protecting against kinking 18.

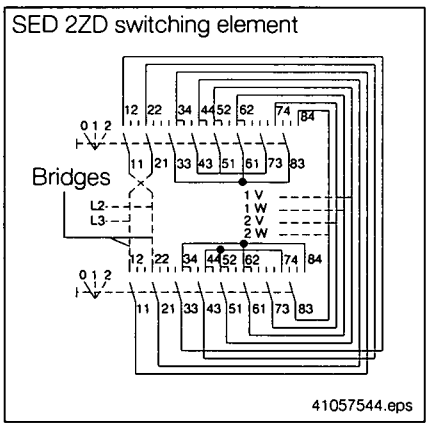
Strain relief by wire cords; see figs. 4 and 5.

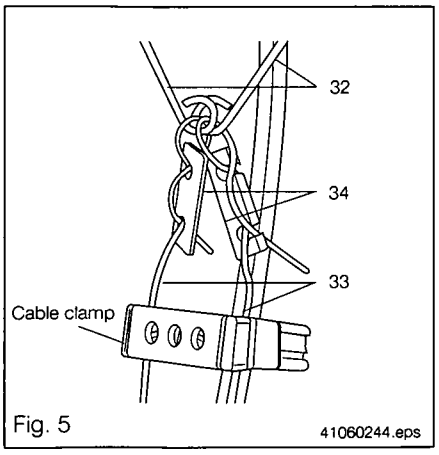
Loosen the 4 or 6 housing screws 8. Remove lower part 7 of the housing. By tightening the two screws securing cap 12 to upper part 13 of the housing, press sleeve protecting against kinking 18 against the housing. Cut off sleeve protecting against kinking 18 as required for the relevant cable diameter (see markings on sleeve). Pass cable 2 through sleeve 18 and clamp 4 (small opening for cables of 10-20 mm diameter and wide opening for cables of 20-26 mm diameter) and clamp the cable by tightening the screws. Tighten clip 19 on sleeve 18. This ensures that the cable inlet is water-tight. Carefully bunch conductors 5 behind clip 6 and connect them to terminals as required.

Connect only in compliance with the wiring diagram.

Only use bridges 33-34, 43-44 for switching element SED 1ZD and 11-22, 21-12 for switching element SED 2ZD. Remove bridges 34-62 and 44-52 on switching element SED 2ZD for lifting/lowering. Double switching elements SED 1D and SED 2D can only be fitted in one predetermined position defined by pin 14. Fit lower part 7 of the housing by tightening screws 8. Ensure that sealing washers are placed below screw heads 8.







Strain relief by means of wire cords

Hook strain relief rods 32 to Demag chain hoist DK. Thread strain relief cords 33 through loops of strain relief rods 32 and insert in slots of retaining plates 34 (part no. 864 662 44) in the shape of an "S" (see fig. 5).

For further information see assembly instructions DST control pendants Ident. no. 206 165 44

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5.8 Assembly instructions for DSE control pendant

Electrical installation work must only be carried out by a qualified electrician, see also section 1 "Safety instructions".

Control pendant suspension height approx. 1000 mm above floor level.

Assembly of strain relief see section 5.8.3

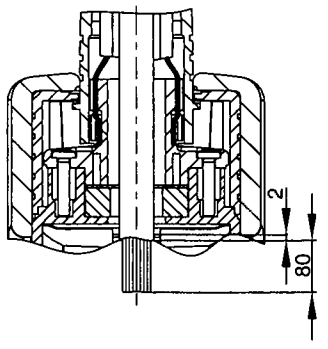


Fig. 7 41775244.eps

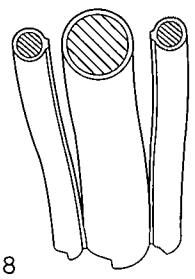
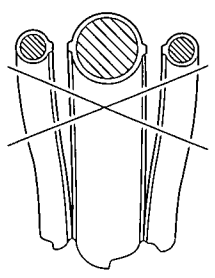
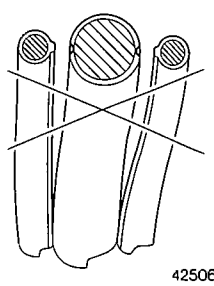
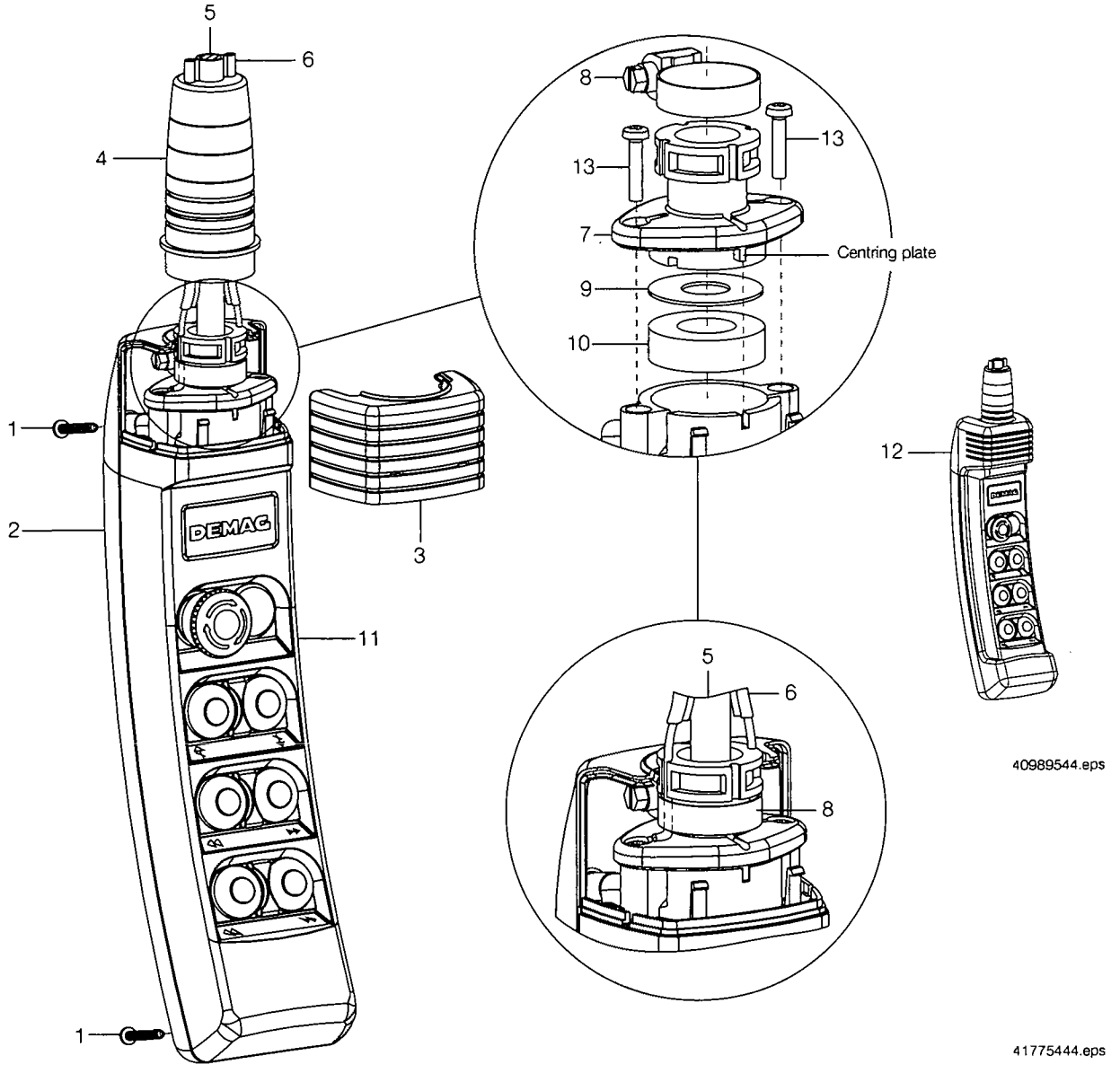
Separating the strain relief wire cords		
Correct	Incorrect	Incorrect
		

Fig. 8 42506344.eps



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For further information see assembly instructions DSE control pendants, ident. no. 214 214 44

Fig. 6

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5.8.1 Connecting the control cable with vulcanised strain relief wire cords to the DSE control pendant

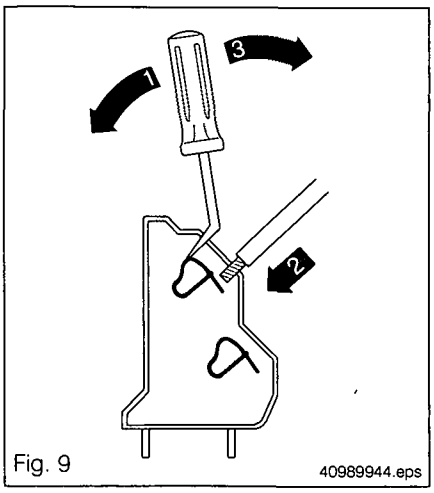


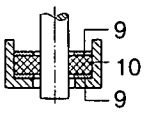
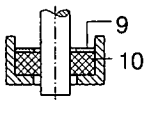
Fig. 9 40989944.eps

For connecting the control cable with vulcanised strain relief wire cords, proceed as follows:

- Undo the four recessed head screws (1) and remove rear part (2) of the housing.
- Remove housing cap (3).
- Cut off protective sleeve (4) as required for the relevant control cable diameter.
- Push protective sleeve (4) onto control cable (5). Use lubricant (e.g. washing-up liquid).
- Separate vulcanised strain relief wire cords (6) from control cable (5) (fig. 8).
- Push tube clip (8) up to strain relief wire cords (6) and control cable (5).
- Undo the two recessed head screws (13) of pressure sleeve (7).
- Push pressure sleeve (7) onto control cable (5) (fig. 6).
- Slide control cable (5) through washer (9) and sealing ring (10).

  The sealing washers and the sealing rings are assigned to the corresponding control cable diameter in accordance with table 1.
- Strip insulation from the end of the control cable (fig. 7). Pay attention to the mounting dimensions!
- Pull conductors into front part (11) of the housing.
- Slide washer (10), sealing ring (9) and pressure sleeve (7) down to the front part (11) of the housing.
- Tighten the two recessed head screws (13).
- Strip sheathing of strain relief wire cords (6) (fig. 6).
- Shorten strain relief wire cords (6) (fig. 6) and insert on the side in the groove of pressure sleeve (7)
- Fix strain relief wire cords with tube clip (8) (fig. 6).
- Connect conductors in accordance with wiring diagram and assignment diagram in rear part (2) of the housing.
- Open the cage clamp terminals with a 3,5 mm wide screwdriver or an offset screwdriver as shown in fig. 9 (part no. 772 798 44).
- Push protective sleeve (4) onto pressure sleeve (7). The protective sleeve is flush with the pressure sleeve flange.
- Fit housing cap (3).
- Screw rear part (2) of the housing back onto front part (11) of the housing.
- Finally fit bumper (12) (see section 5.8.2).

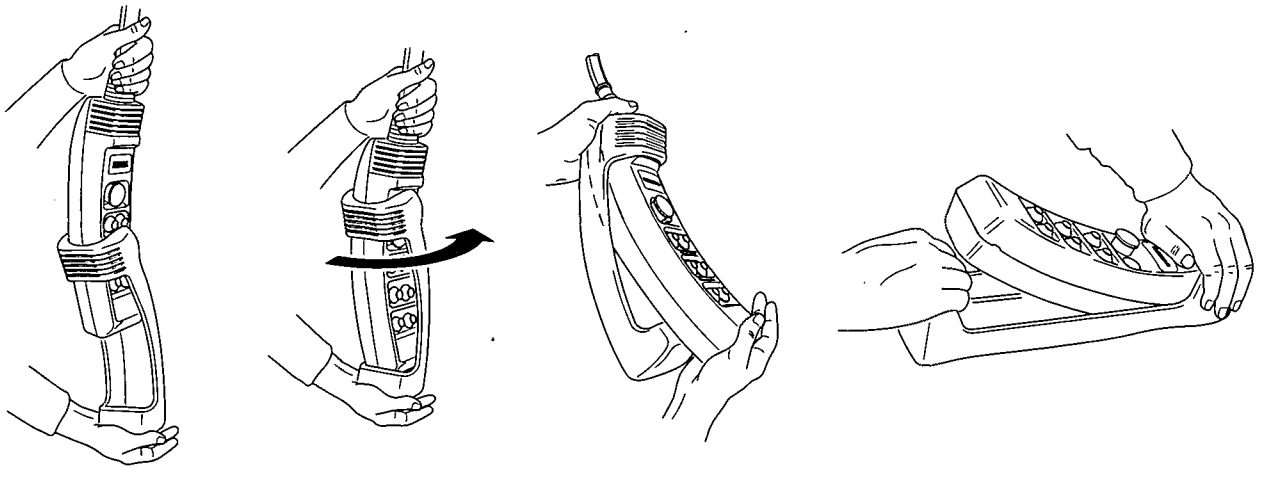
Table 1

Control cable outside diameter	Pressure sleeve with seal		Control cable outside diameter	Pressure sleeve with seal	
10,5 - 14,5	Item 9 2 x 772 576 44 Sealing washer 10-15	 42029544.eps	15 - 20	Item 9 1 x 772 574 44 Sealing washer 15-20	 41800144.eps
	Item 10 1 x 772 575 44 Sealing ring 10-15			Item 10 1 x 772 546 44 Sealing ring 15-20	

5.8.2 Fitting the rubber bumper

Fit the bumper at room temperature.

We recommend that a lubricant (e.g. washing-up liquid) be used for further assembly.


Pay attention to the protruding emergency-stop button.

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5.8.3 Connecting the strain relief wire cord

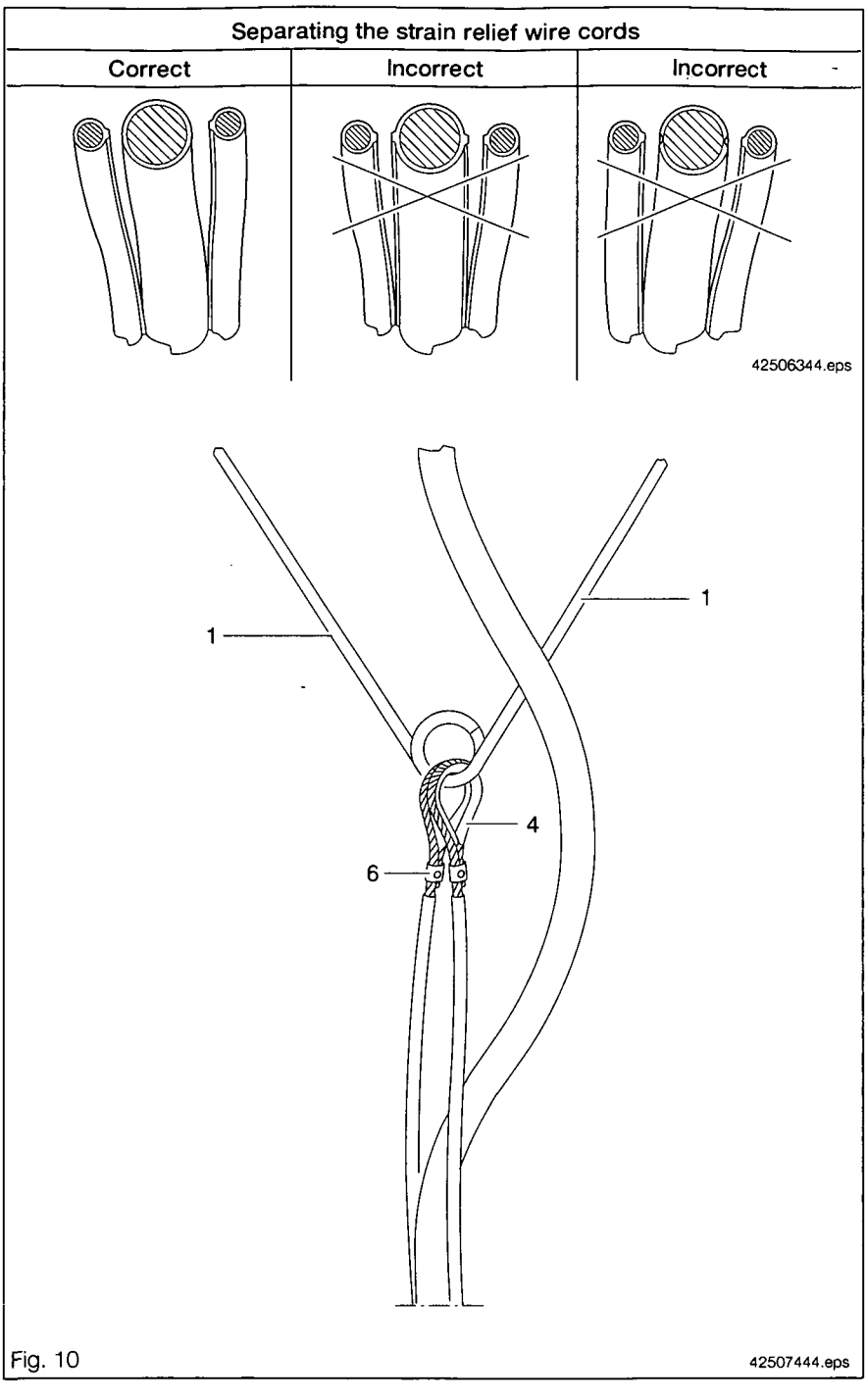

Fig. 10

Connecting the control cable with vulcanised strain relief wire cords to the DK housing.

- Separate vulcanised strain relief wire cords from the control cable as shown in the table above (for dimensions see fig. 11).
- Shorten strain relief wire cords by approx. 100 mm and strip sheathing in accordance with the thimble diameter + 30 mm for fitting Talurit clamp (6).
- Slide one Talurit clamp (6), each, onto the strain relief wire cords.
- Place strain relief wire cords around thimbles (4), insert into Talurit clamp (6) and secure using pliers while the rope is tensioned.
- Hook strain relief rods (1) to DK housing (see page 11).
- Hook strain relief rods (1) to thimbles (4) as shown in the fig. 10.

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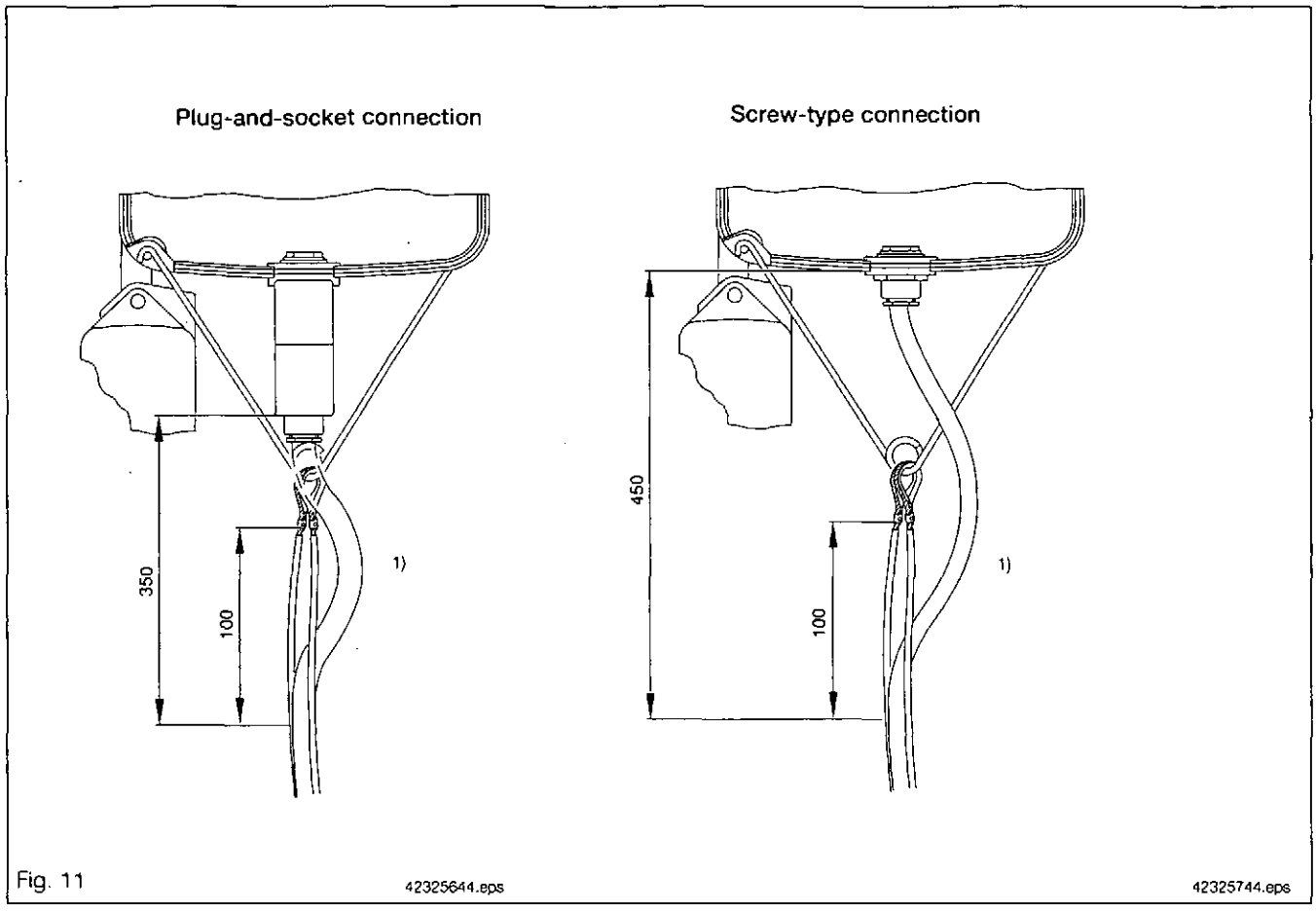
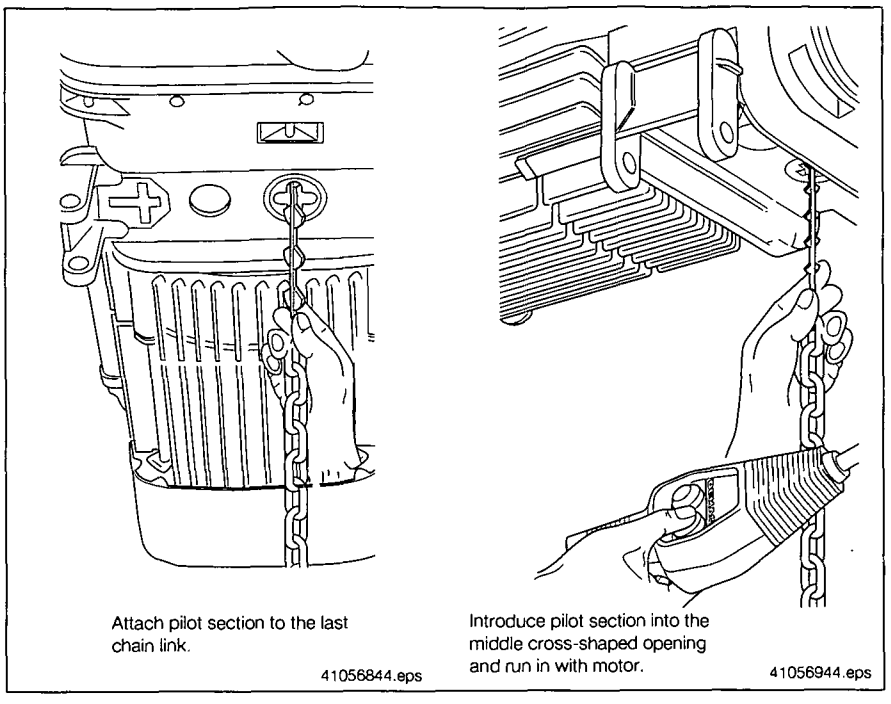
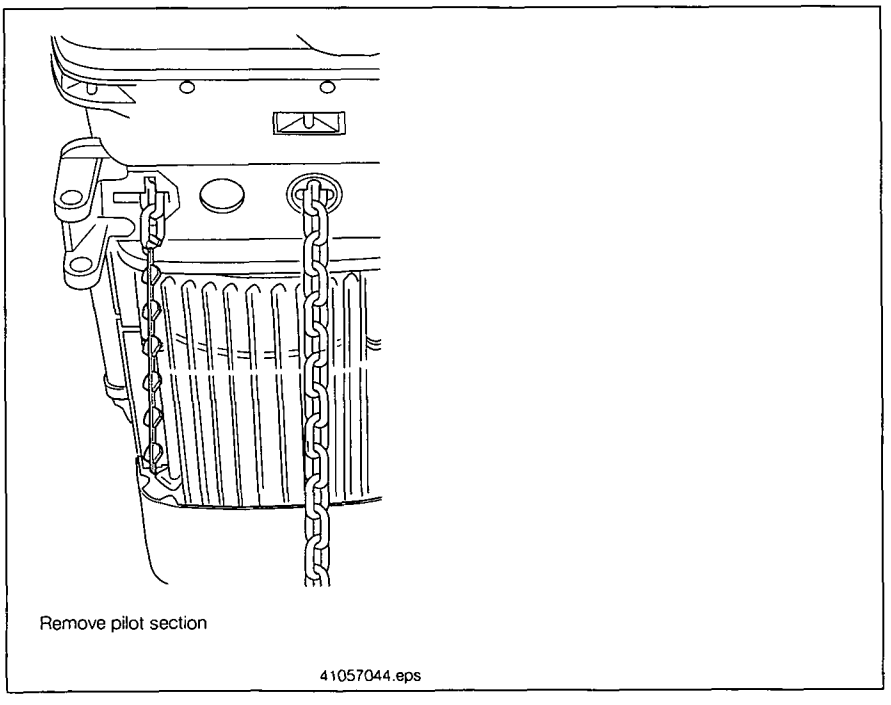


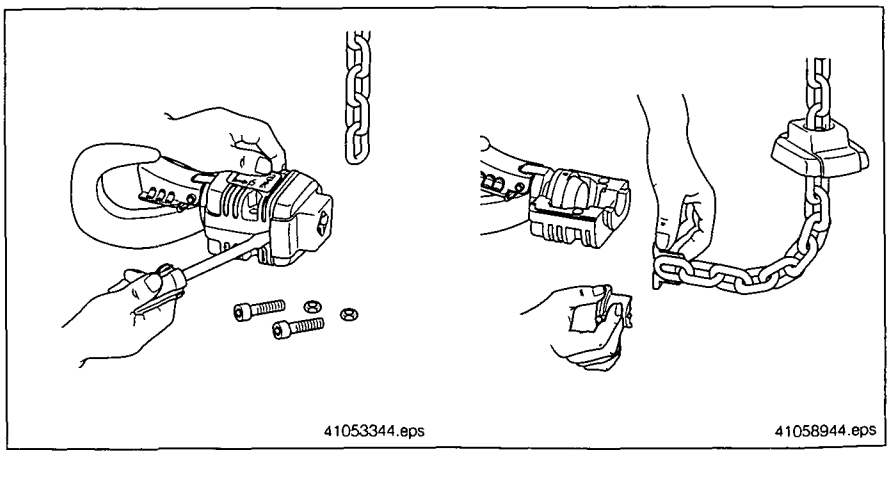
Fig. 11

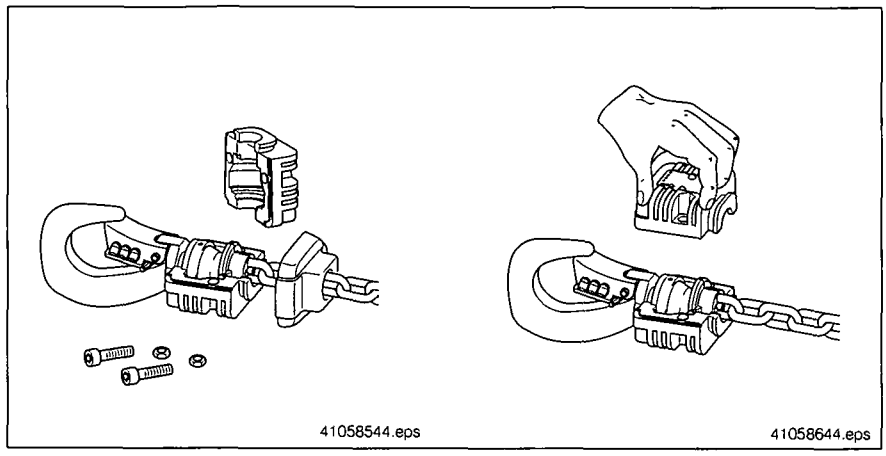
1) To ensure strain relief of the control cable, the control cable must be approx. 100 mm longer than the required strain relief cords.

5.9 Fitting the chain for 1/1 reeving Fitting the load hook assembly and limit stop









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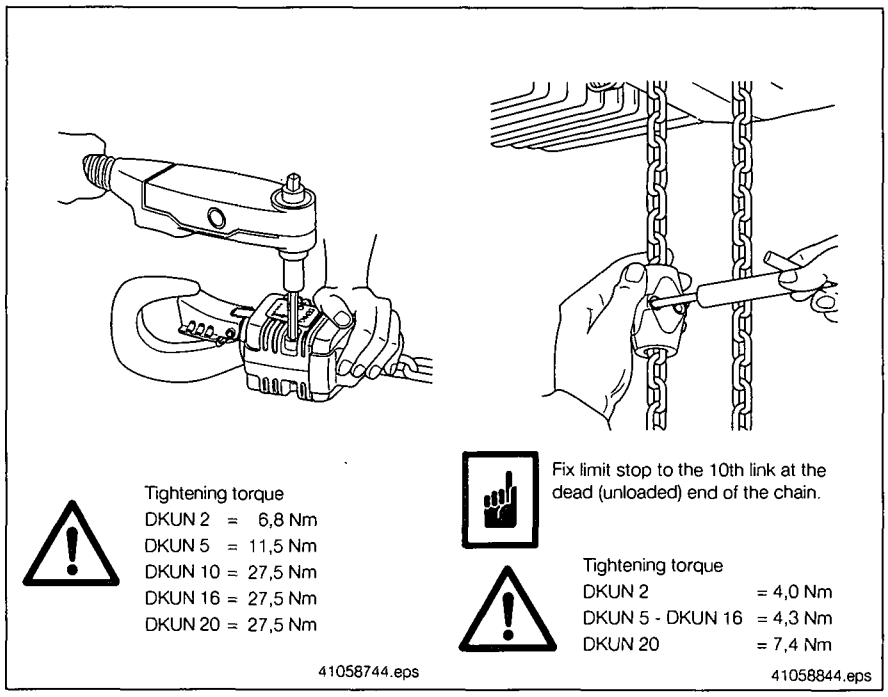

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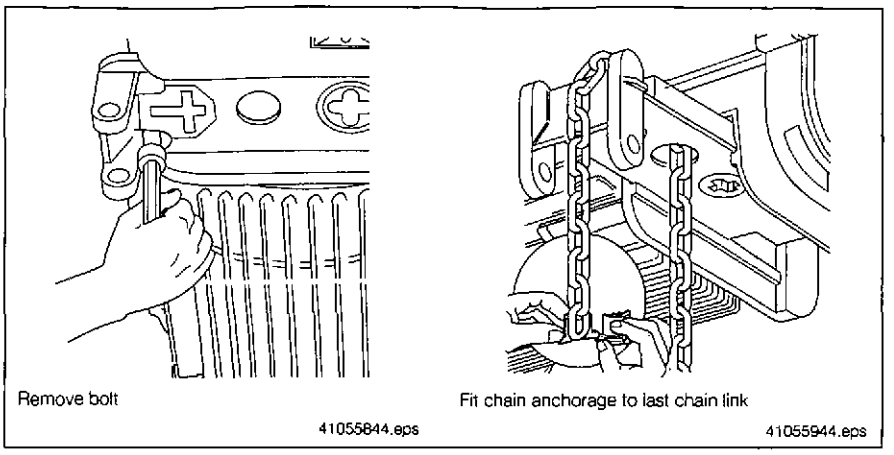
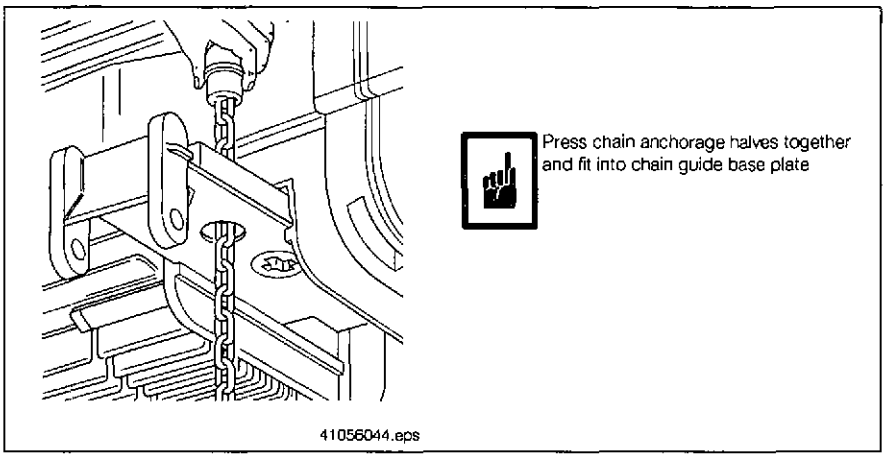
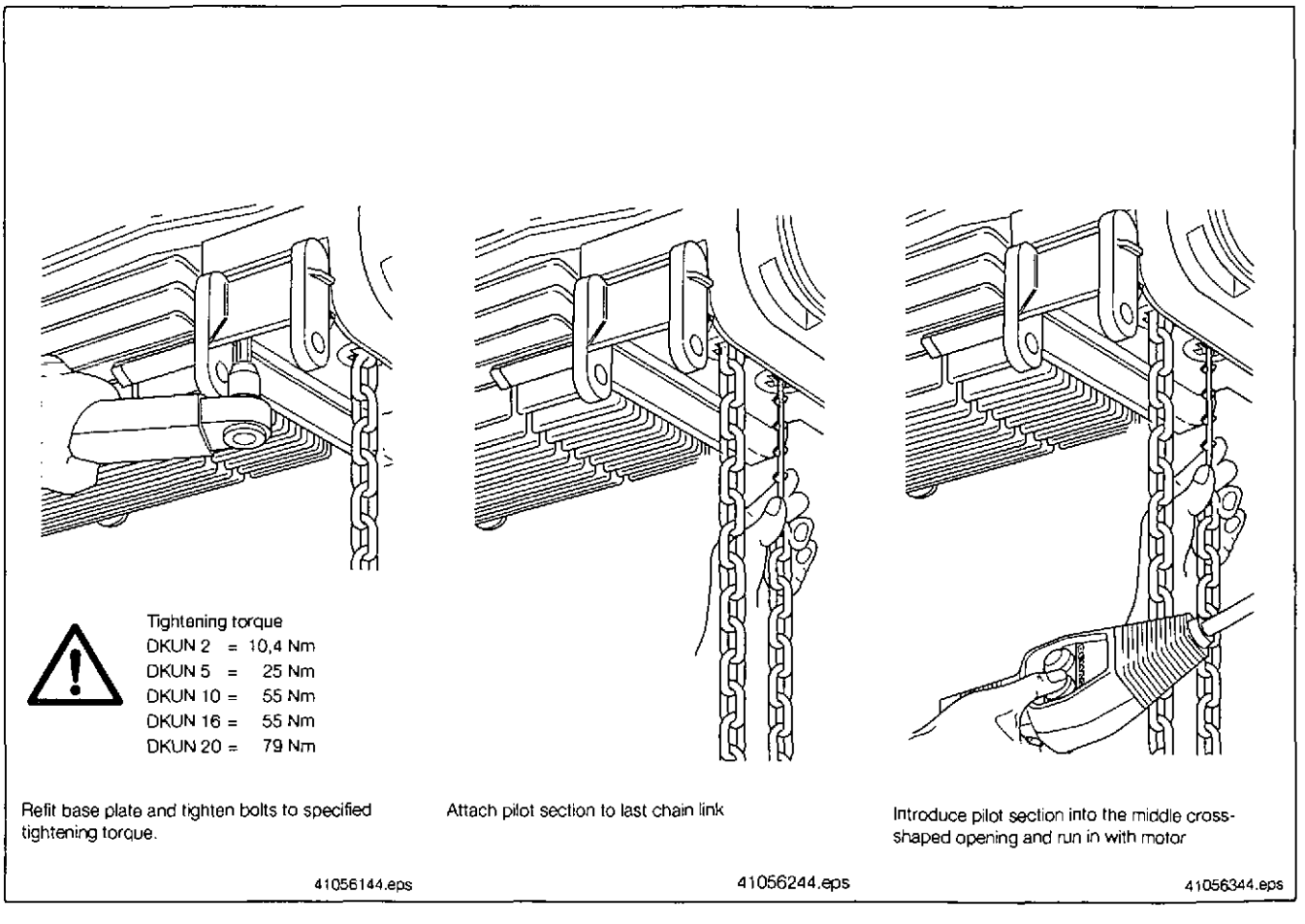
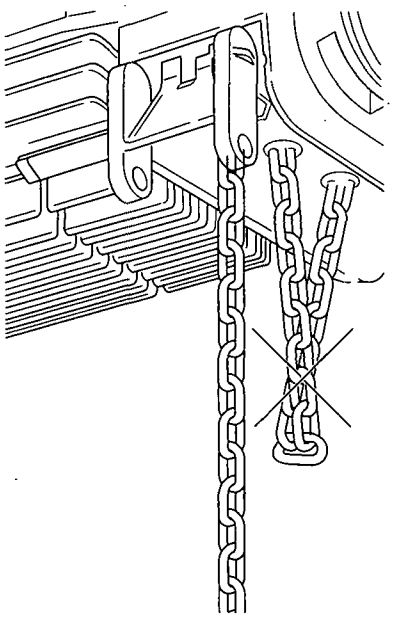
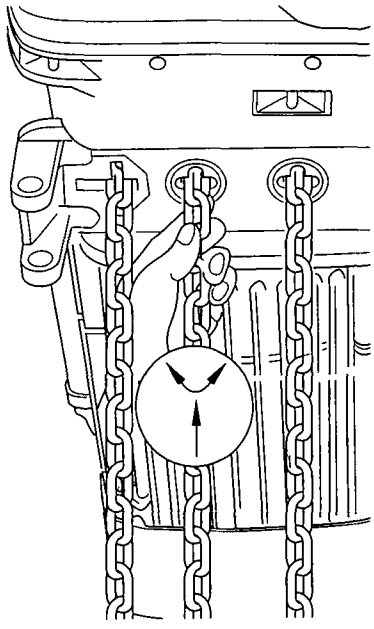
5.10 Fitting the chain for 2/1 reeving Fitting the bottom block and limit stop

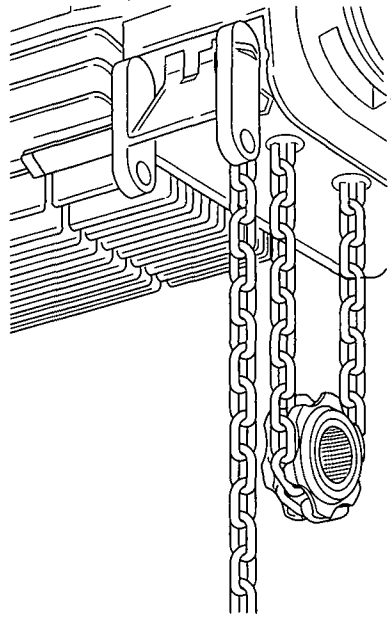












Align the chain by lifting and turning the chain anchorage.
The chain is correctly aligned when the chain links are not twisted.

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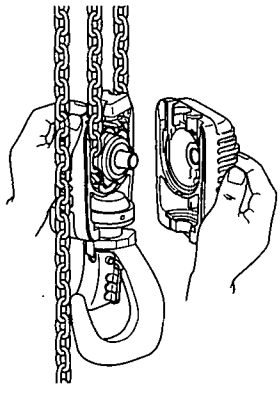

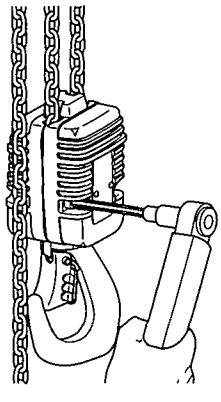

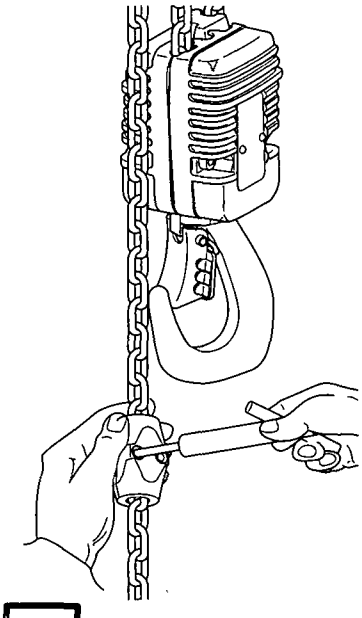

Tightening torque
DKUN 2 = 11,5 Nm
DKUN 5 = 27,5 Nm
DKUN 10 = 55 Nm
DKUN 16 = 55 Nm
DKUN 20 = 55 Nm

Fix limit stop to the 10th link at the dead (unloaded) end of the chain

Tightening torque
DKUN 2 = 4,0 Nm
DKUN 5 - DKUN 16 = 4,3 Nm
DKUN 20 = 7,4 Nm

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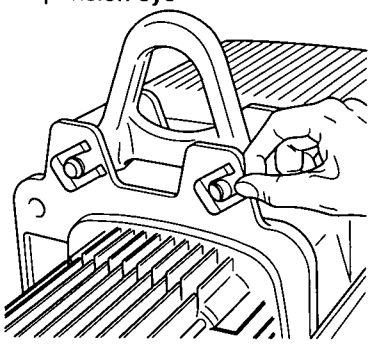
206501k4.p65/020604

5.11 Converting suspension eye, suspension hook and suspension ring from 1/1 to 2/1 reeving

Suspension eye



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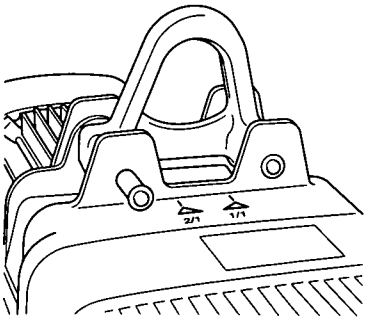
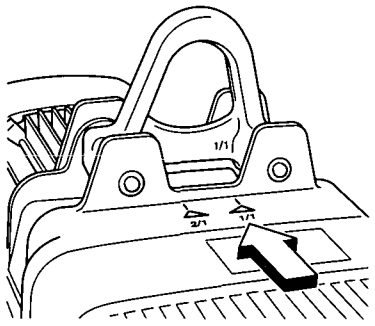


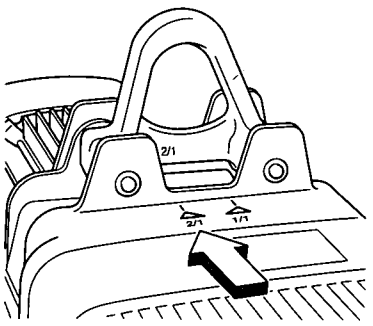
41047244.eps

1/1 reeving



41047344.eps

2/1 reeving



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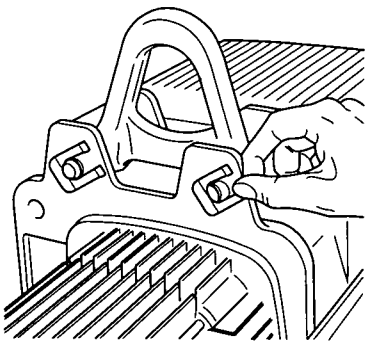

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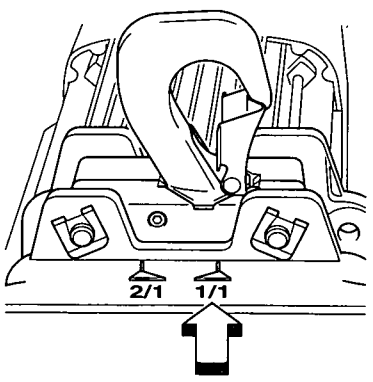
Suspension hook
DKUN 2 - DKUN 5 - DKUN 10

1/1 reeving



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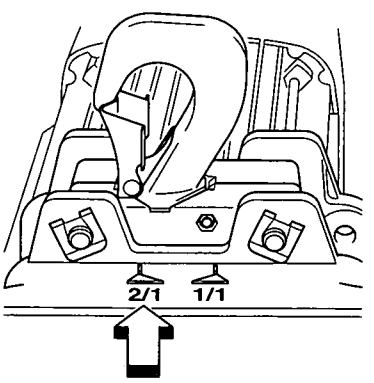
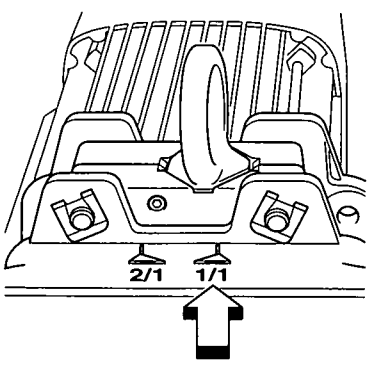
2/1 reeving



41043444.eps

Suspension ring turned 90°
DKUN 2 - DKUN 5 - DKUN 10

1/1 reeving



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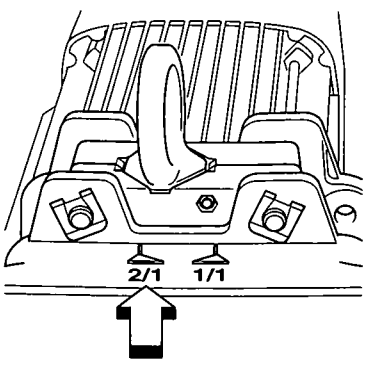
2/1 reeving



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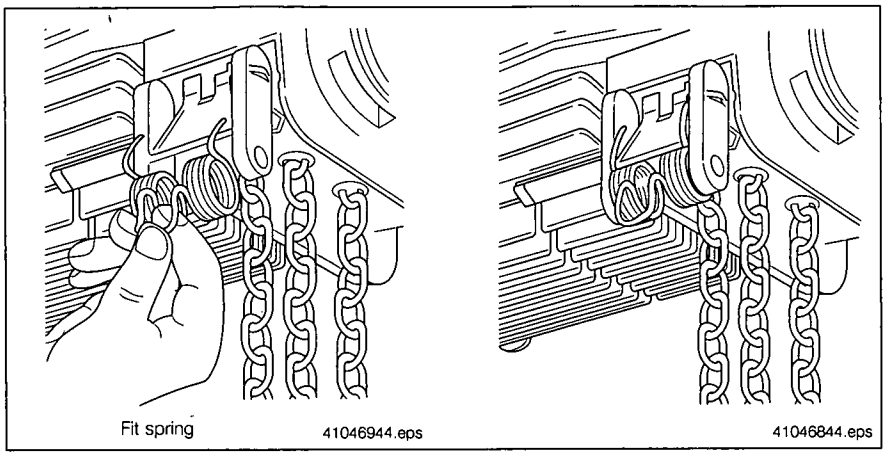
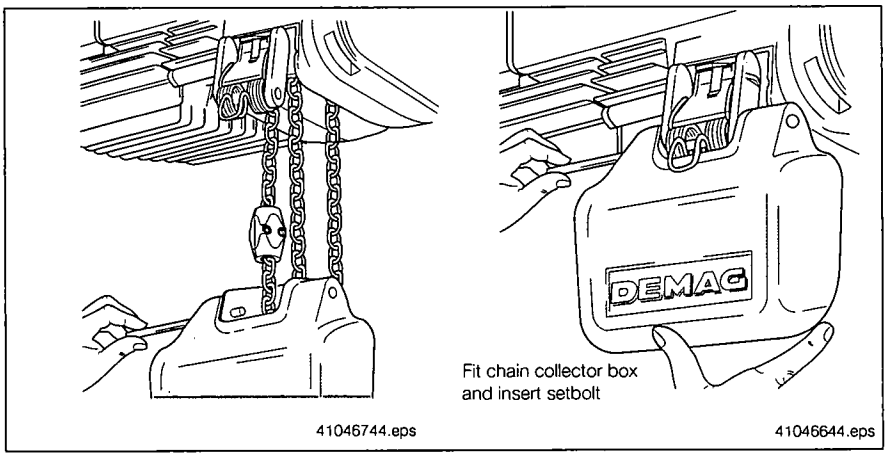
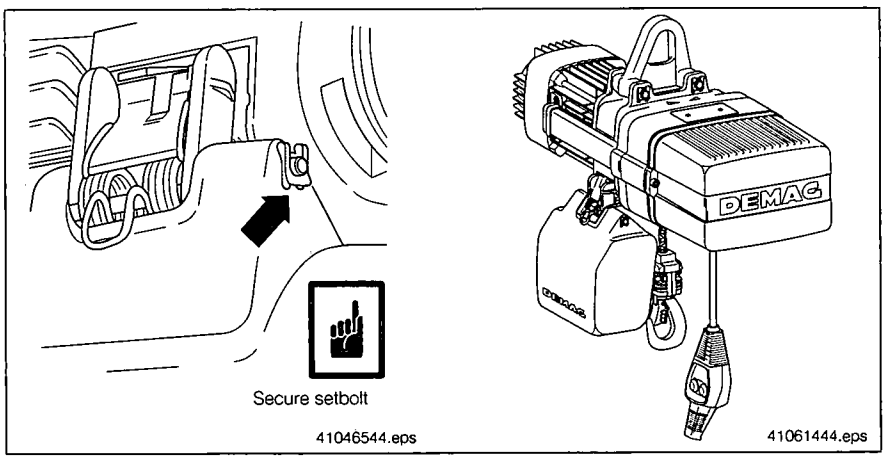
2065011k4.p65/020604

5.12 Fitting the chain collector box

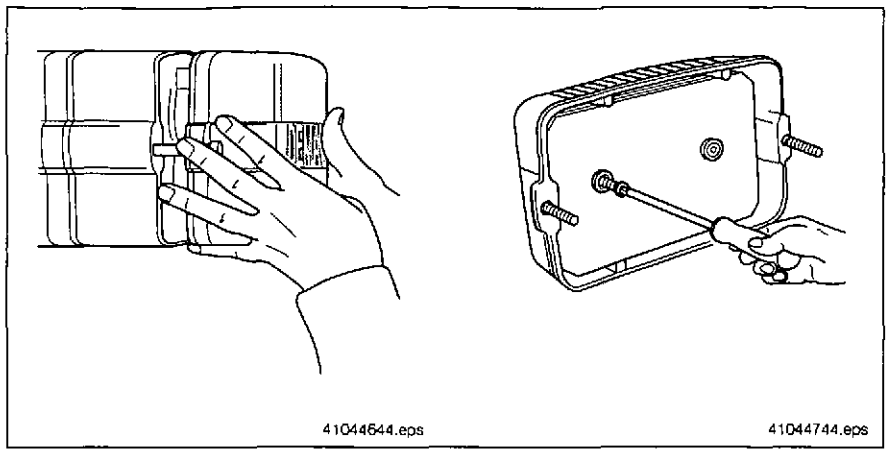


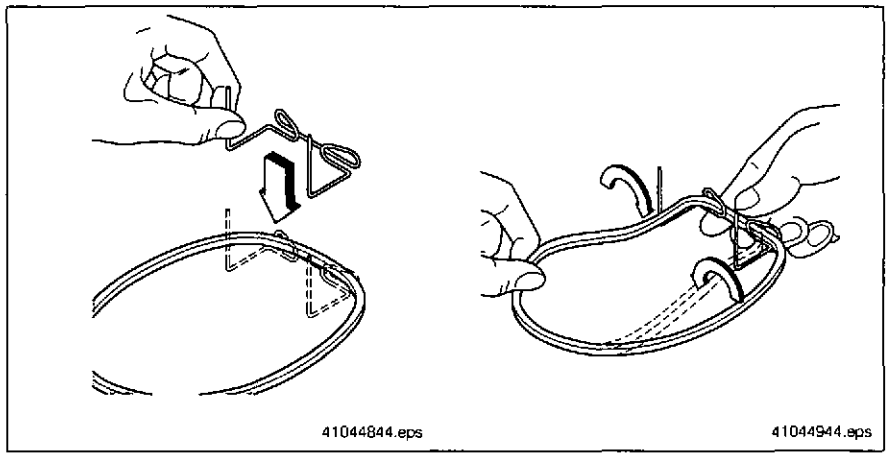


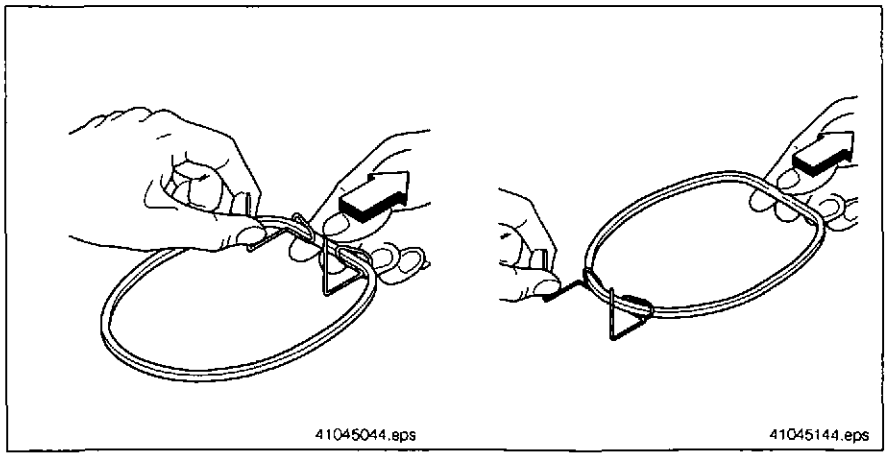


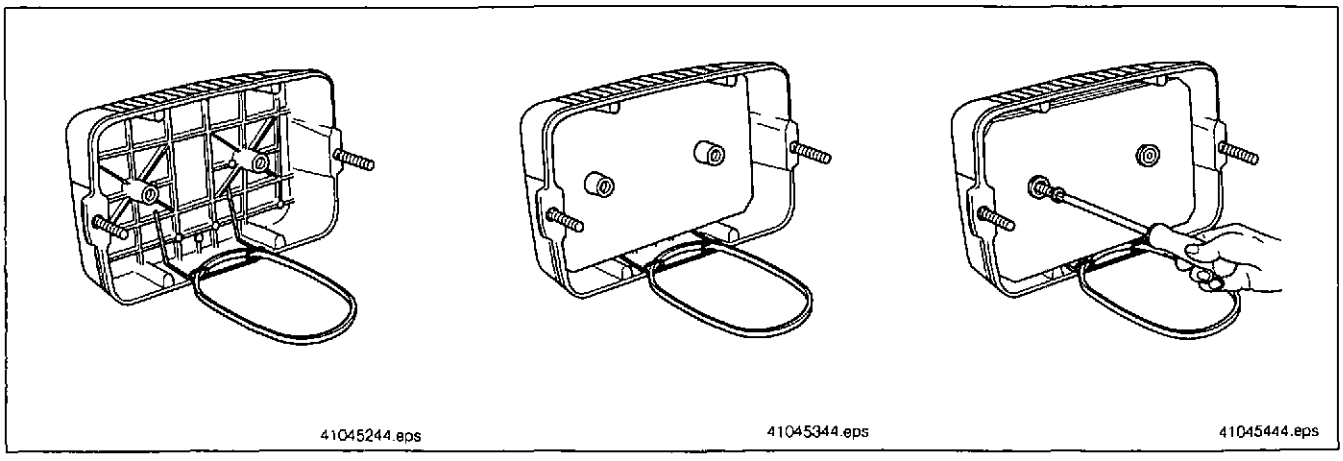
206501tk4.p65/020604

5.13 Fitting the counter-weights and cover retainer for DKUN 2/DKUN 5









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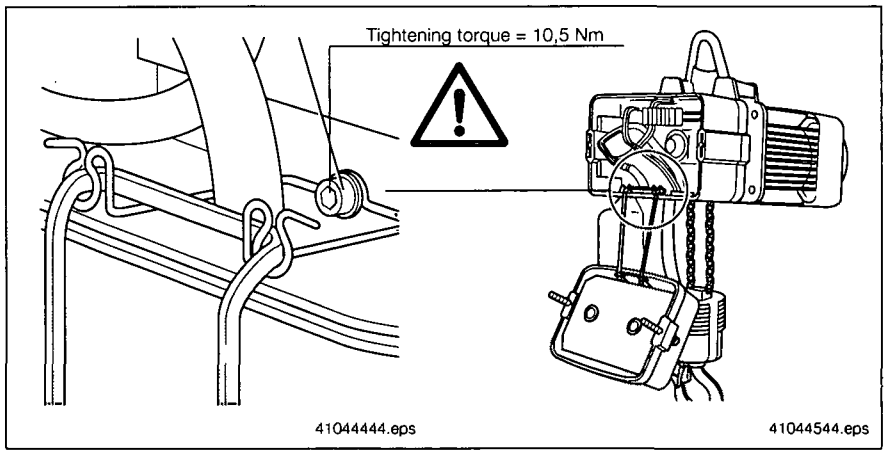
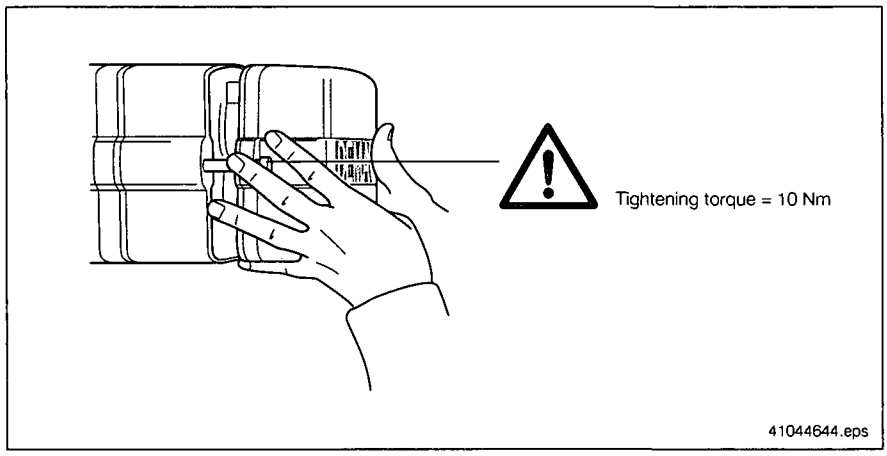




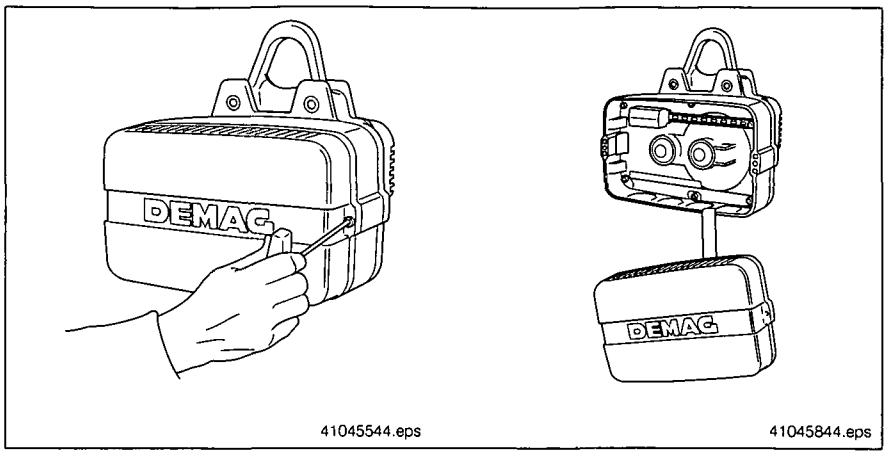
Allocation of counterweights

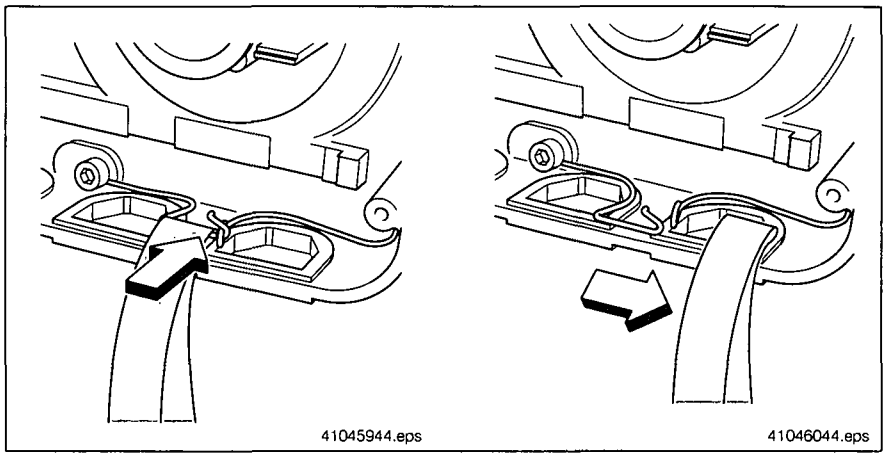
	DKUN 2				DKUN 5				DKUN 2				DKUN 5			
	Number of counterweights for contactor control with transformer								Number of counterweights for direct control							
	Part no.								Part no.							
	835 127 44				836 127 44				835 127 44				836 127 44			
	Motor				Motor				Motor				Motor			
	KMP	KMK			KMK				KMP	KMK			KMK			
	71 B	71 B	80 B	80 Z	71 B	80 B	90 B	90 Z	71 B	71 B	80 B	80 Z	71 B	80 B	90 B	90 Z
With short cover	-	-	-	-	-	-	-	-	4	4	8	7	3	6	-	8
With long cover	-	1	3	2	1	2	4	3	2	2	7	4	3	6	7	4

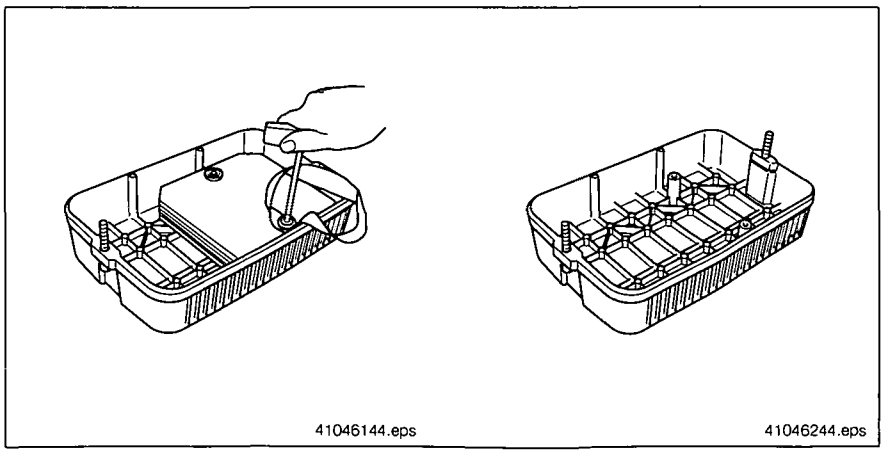
Cover retainer part no. 836 553 44

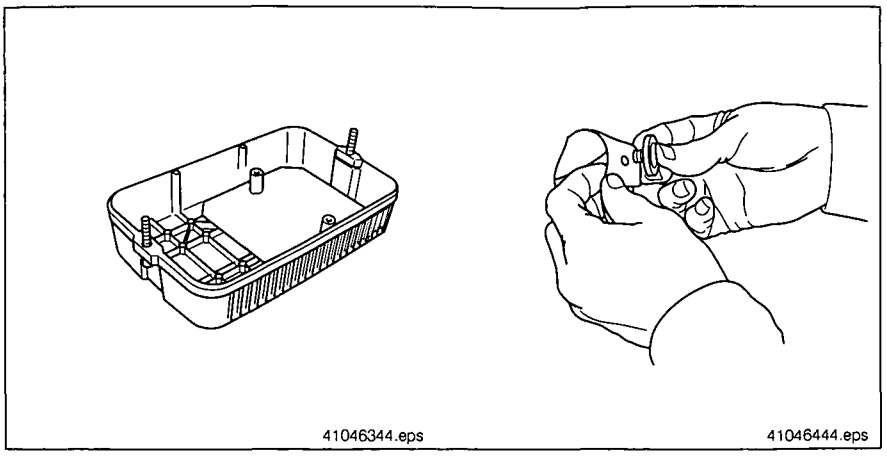
206501k4.p65/020604

5.14 Fitting the counter-weights and cover retainer for DKUN 10 - 16 - 20









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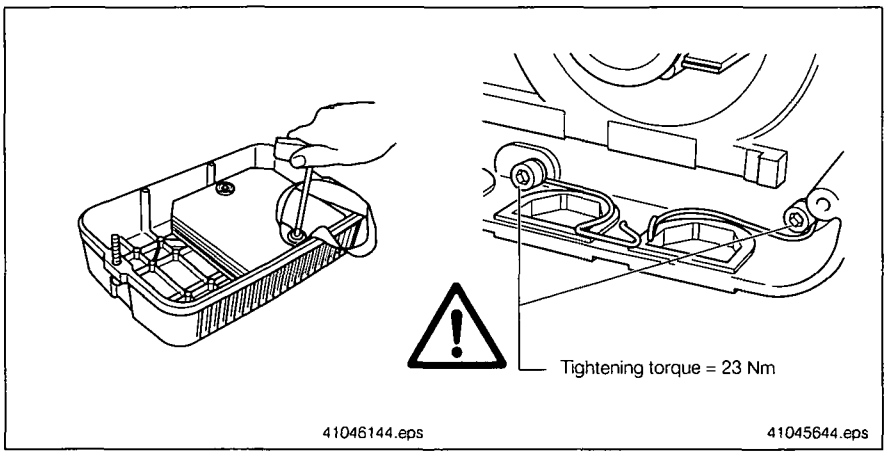
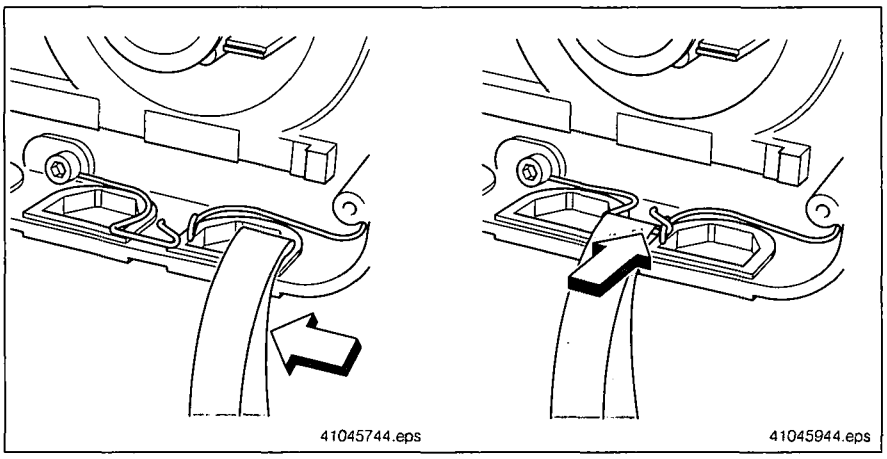
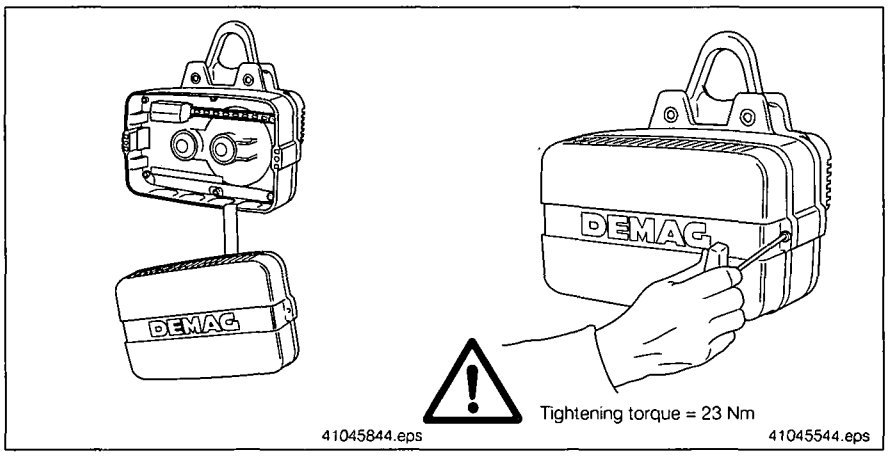






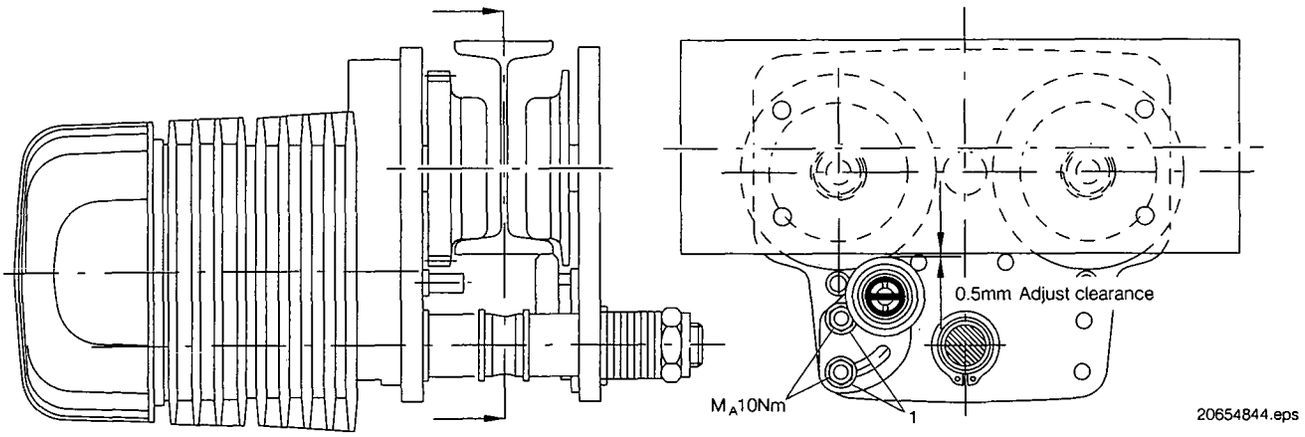
Allocation of counterweights

Part no.	DKUN 10/16		DKUN 20		DKUN 10/16				DKUN 20	
	Number of counterweights for contactor control with transformer				Number of counterweights for direct control					
	Motor				Motor					
	KMK 90 B	KMK 100 B	KMK 100 B 2/8	KMK 112 B 2/8	KMK 90 B with short cover	KMK 90 B with long cover	KMK 100 B with short cover	KMK 100 B with long cover	KMK 100 B with short/long cover	KMK 112 B with long cover
837 127 44	1	3	0	4	5	3	7	5	4/2	6

Cover retainer part no. 837 553 44

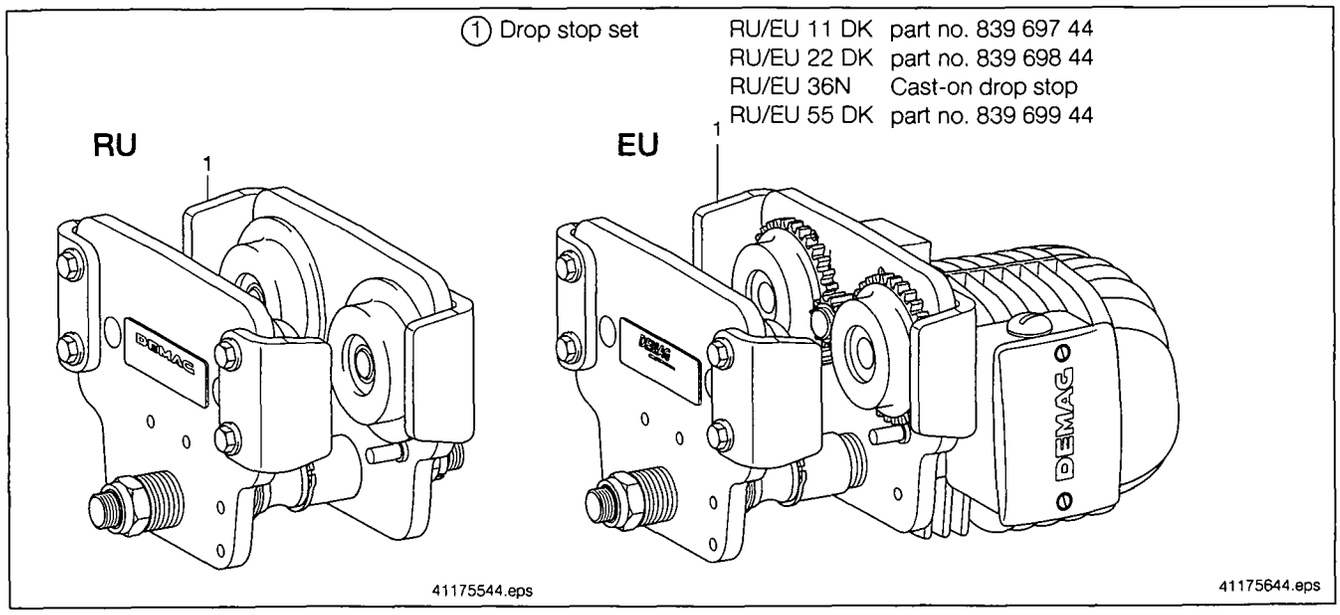
206501k4.p65/020604

5.15 Fitting the supporting roller on EU 11 DK trolleys for flange widths 58 – 143 mm



1. Position trolley on the track so that all 4 travel wheels are in contact with the running surface.
2. Press supporting roller against flange and secure with locking screw (1).
   Adjust to 0,5 mm clearance between supporting roller and flange.
3. Run trolley along entire track to make sure that the supporting roller does not jam.
4. If the supporting roller jams in a certain position, adjustment must be corrected in this position (required clearance: 0,5 mm)
5. Subsequently tighten locking screw (1) with 10 Nm tightening torque.

5.16 Fitting RU/EUDK drop stops



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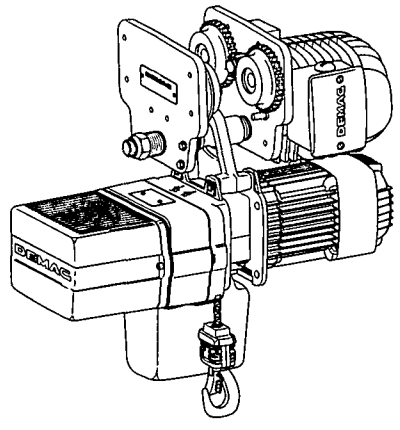
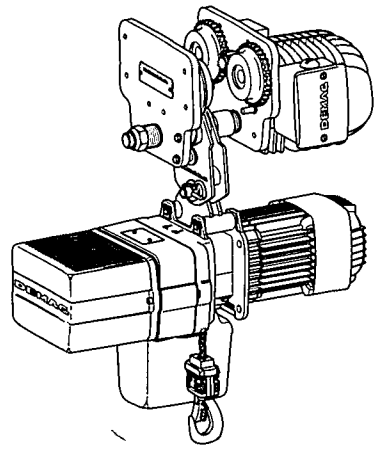
5.17 Example for mounting

EU 11 DK
Supporting roller up to flange width 143 mm only



40465544.eps

EU 11 DK
with ZMS strain gauge carrier link



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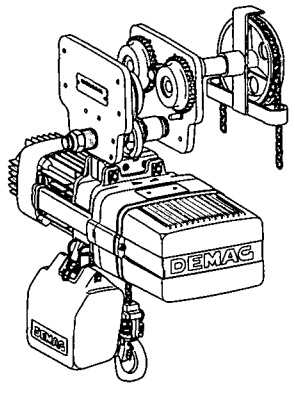
HU 11 DK
with suspension ring



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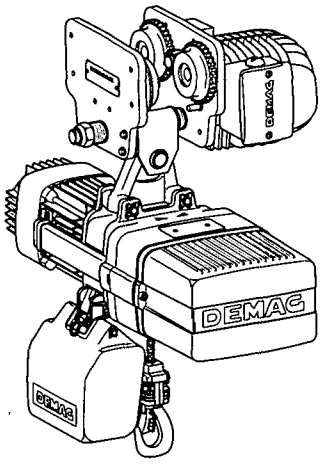
EU 11 DK
with suspension eye and crossbar yoke from flange width 144 mm



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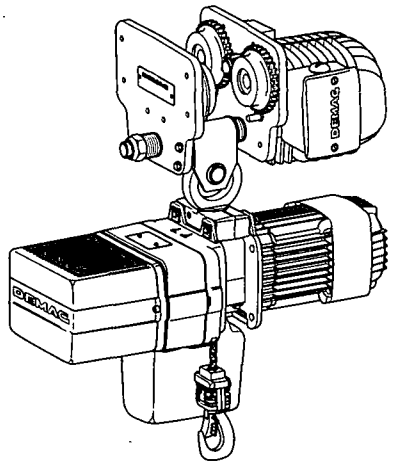
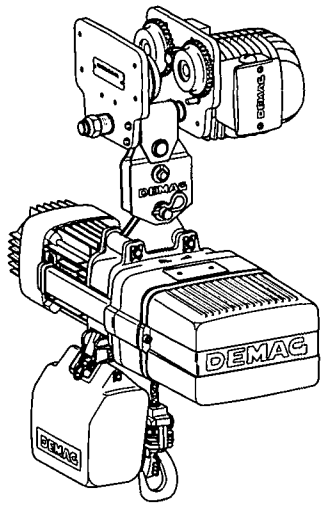
EU 11 DK
with suspension ring and trolley crossbar yoke from flange width 144 mm



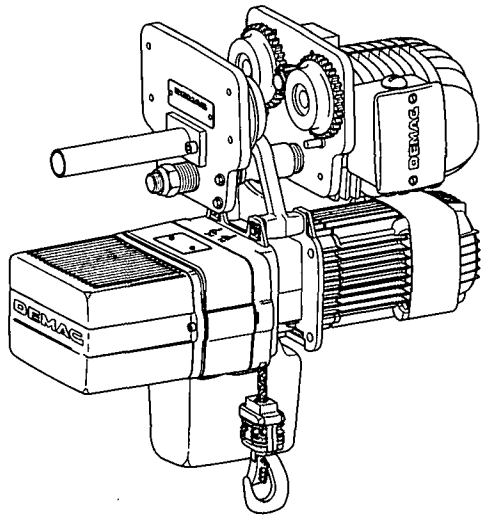
40465644.eps

EU 11 DK
with ZMS strain gauge carrier link and crossbar yoke from flange width 144 mm



40266244.eps

Current collector bracket
for RU/HU and EUDK trolleys
Part no. 839 737 44



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5.18 Assembling RU/HU/EUDK trolleys

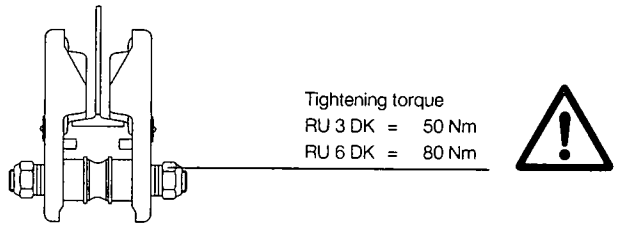
Assembling RU / EU 36-N (with adjusting rings for infinitely variable track gauge), see assembly instructions 214 800 44

For further assembly and adjustment, refer to:

RU 3 DK trolleys	206 600 44	720 IS 845
RU 6 DK trolleys	206 601 44	720 IS 845
RU 11 DK trolleys	206 602 44	720 IS 845
RU 22 DK trolleys	206 603 44	720 IS 845
EU 11 DK trolleys	206 604 44	720 IS 845
EU 11 DK trolleys	206 604 44	720 IS 845
EU 22 DK trolleys	206 605 44	720 IS 845
RU 36-N trolleys	214 800 44	720 IS 845
EU 36-N trolleys	214 800 44	720 IS 845
RU 55 DK trolleys	206 580 44	720 IS 845
EU 55 DK trolleys	206 581 44	720 IS 845

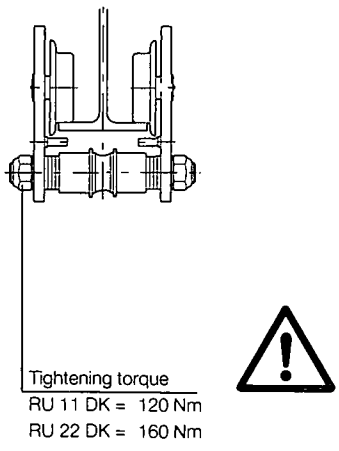
Trolley crossbars tightening torques

RU 3/RU 6 DK



41141044.eps

RU 11/RU 22 DK



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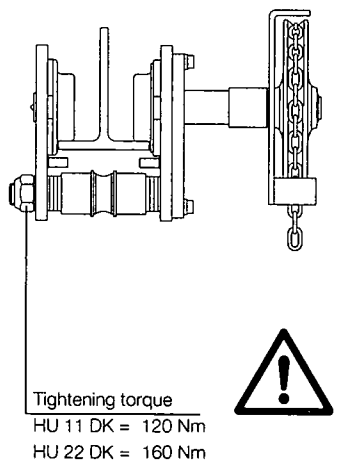
HU 11/HU 22 DK



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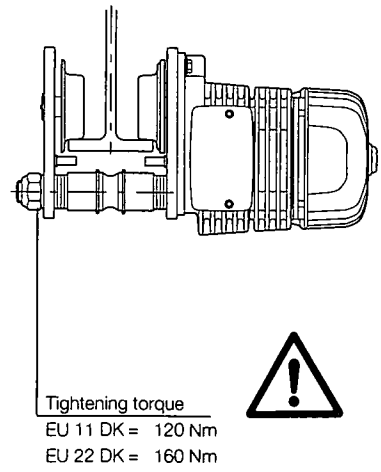
EU 11/EU 22 DK



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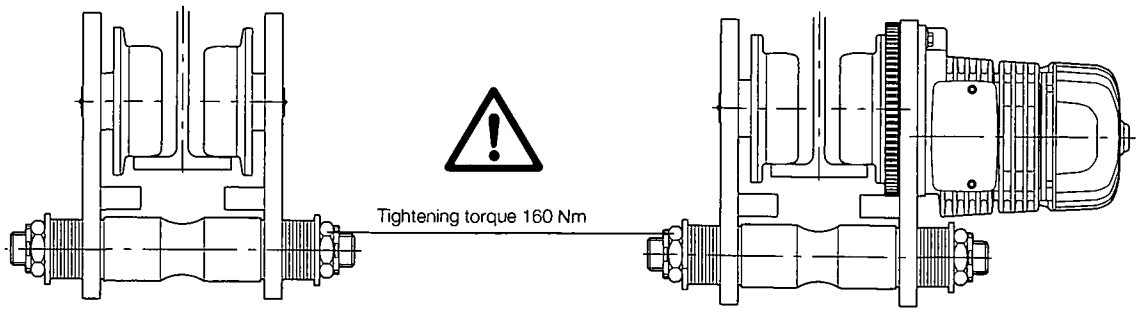
RU 55 DK

EU 55 DK



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206501k4.p65/020604

Fig. 12

Assembling RU / EU 36-N (with adjusting rings for infinitely variable track gauge), see assembly instructions 214 800 44

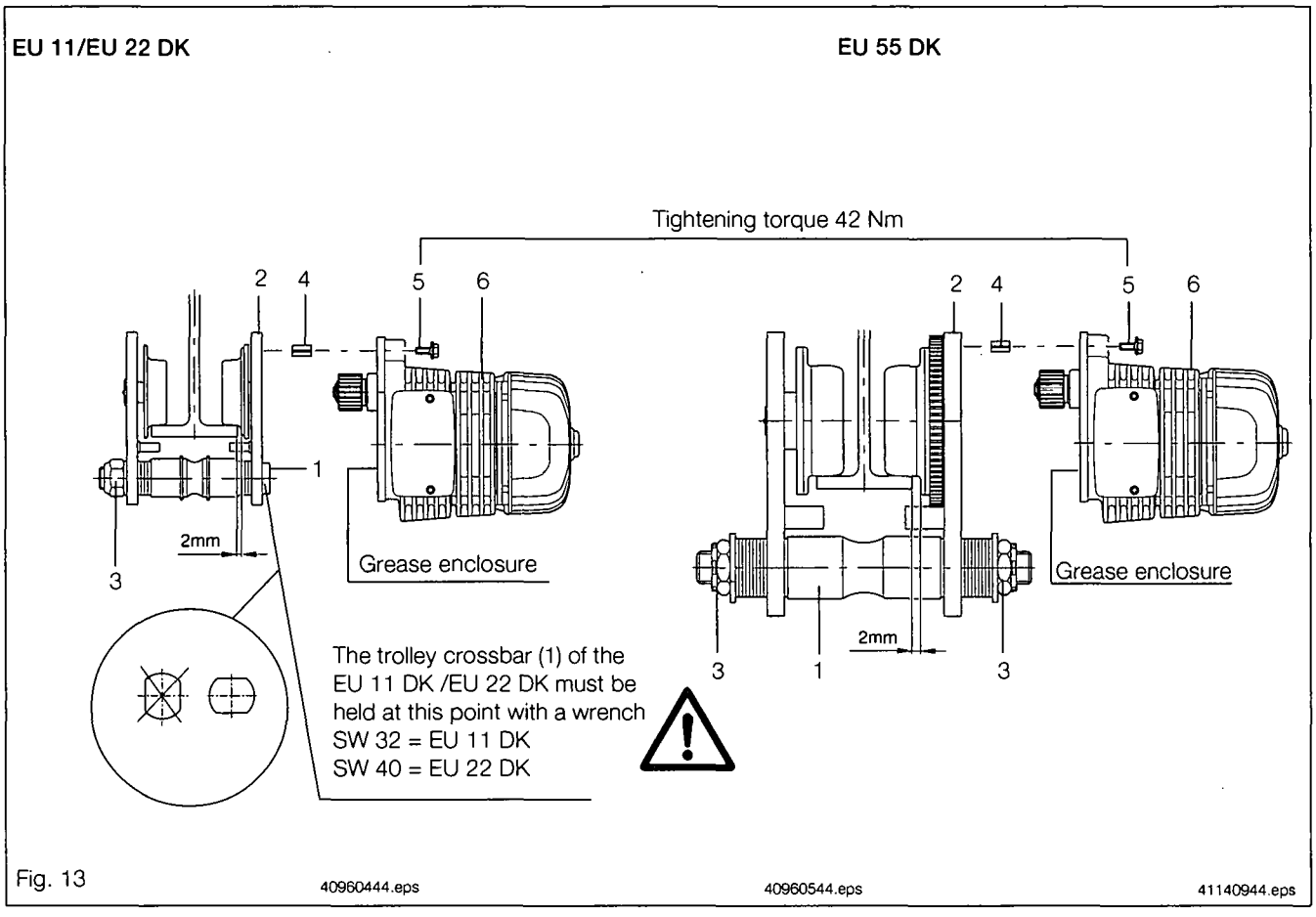

Fig. 13

Assembling the trolley

Insert trolley crossbar (1) into side cheek (2) (see fig. 13). Then adjust the trolley according to the girder flange width of the track by arranging the distance washers as specified on page 54. Assembling trolleys.

EU11/EU22 DK: The locknut (3) must be tightened to the specified tightening torque (see fig. 12).

EU 55 DK: The castle nut (3) must be tightened to the specific tightening torque (see fig. 12) and secured with a split pin.

Since girder flange width tolerances are relatively high, the gap between the travel wheel flange and the girder flange must be checked on both sides to ensure that the play does not exceed 2 mm.

Fitting the travel drive

Knock the split sleeve into the hole in the side cheek (2). Then fill the travel drive with grease – approx. 60 g, part no. 472 915 44 – see fig. 13. Screw travel drive (6) to side cheek (2) with screw (5). Fit the travel drive in such a way that the play between the teeth of the drive pinion and the two travel wheels is the same.

Removing/fitting the trolley crossbar locknut EU 11/EU 22 DK

If the locknut is completely removed from the crossbar, a new locknut acc. to DIN 985 must be used.

The locknut can be screwed onto the trolley crossbar for pre-assembly without being pre-tensioned.

For final assembly, only unscrew the locknut until the trolley can be placed on the girder.

Then tighten the locknut with the specified tightening torque (see fig. 12).

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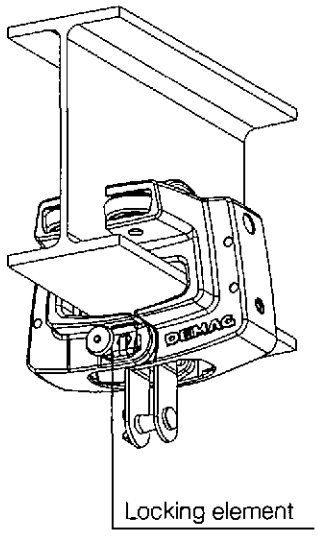
5.19 Fitting the CF 5 trolleys



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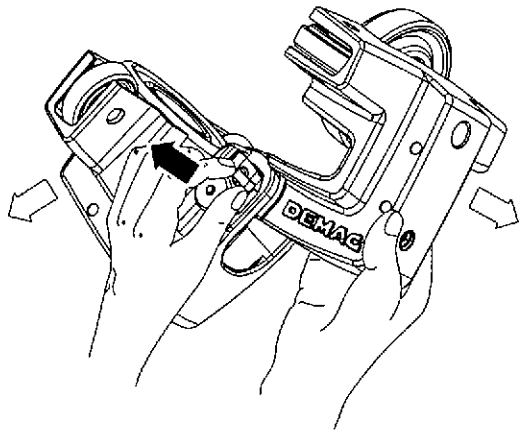

1. Unlock locking element (see figure).
2. Open trolley.

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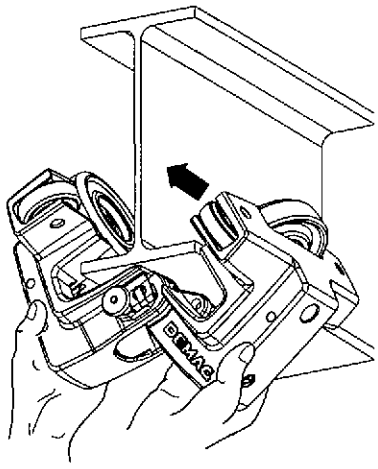

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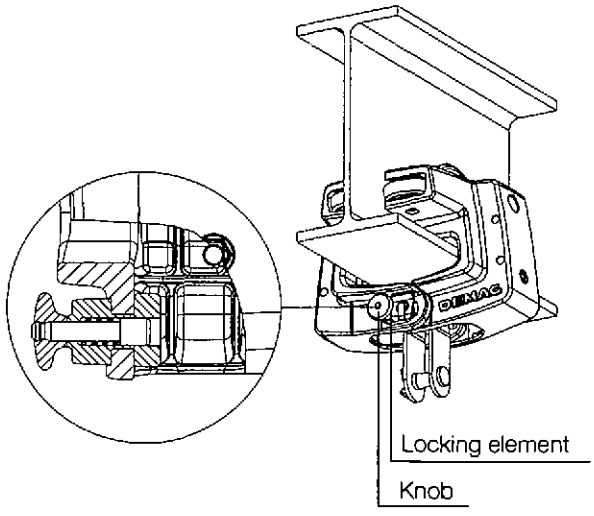
1. Place trolley travel roller on girder flange.
2. Close trolley.



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When the trolley is fitted, the locking element must be clearly heared to lock into place. The knob used to unlock the trolley must be fully pushed into the locking element.

The trolley guide rollers come into contact with the girder when a load is suspended.

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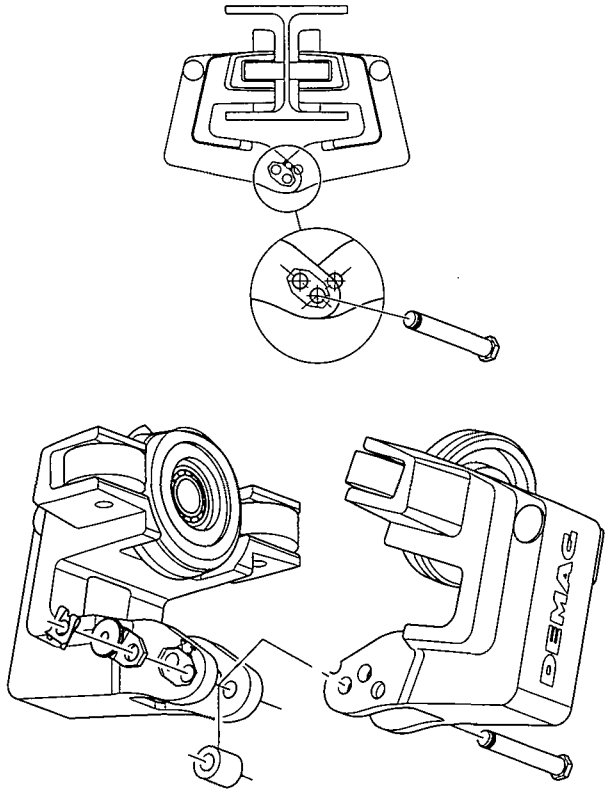
5.20 Fitting the CF 8 trolleys

Pay attention to girder type!

Girder to DIN 1025, parts 2, 3 and 5



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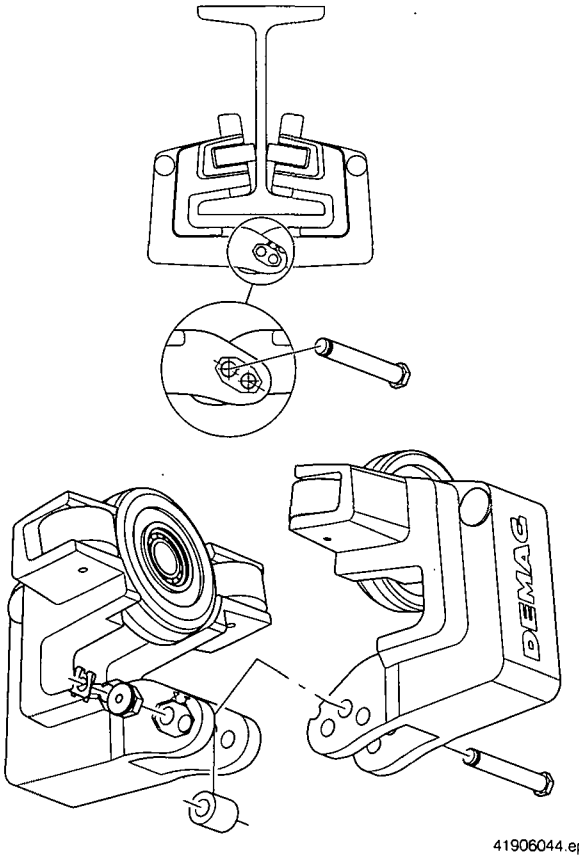
Girder to DIN 1025, part 1



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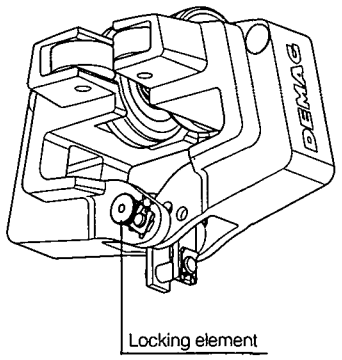
Fitting the trolleys



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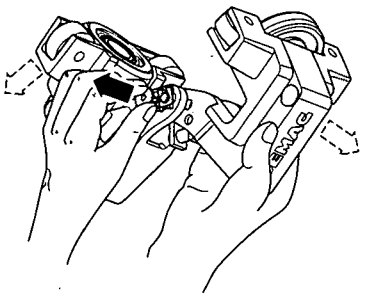

1. Unlock locking element (see figure).
2. Open trolley.

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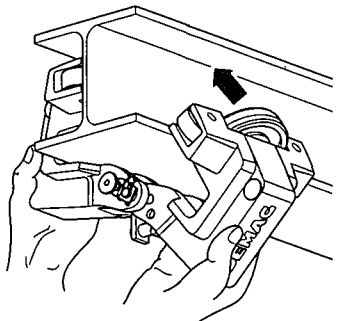

1. Place trolley travel roller on girder flange.
2. Close trolley.

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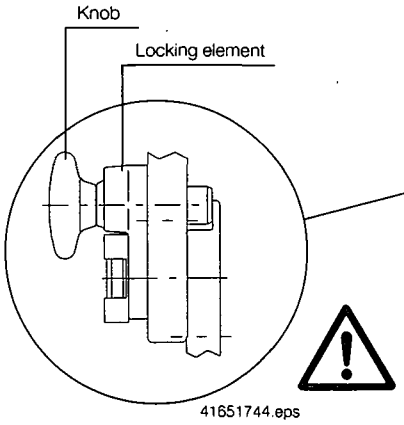

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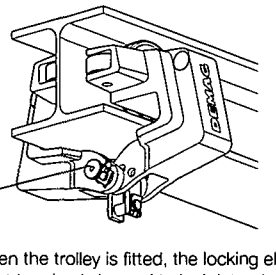

When the trolley is fitted, the locking element must be clearly heared to lock into place. The knob used to unlock the trolley must be fully pushed into the locking element.

The trolley guide rollers come into contact with the girder when a load is suspended.

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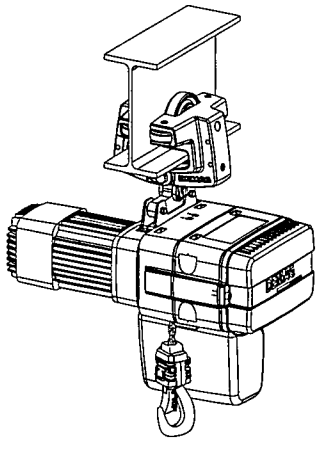
Examples for mounting CF 5 trolleys

DK – at right angles to track girder



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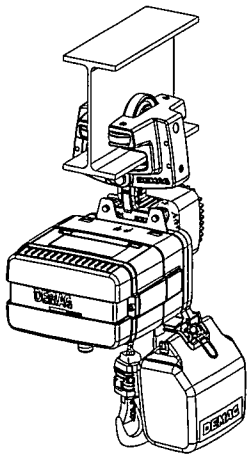
DK – parallel to track girder



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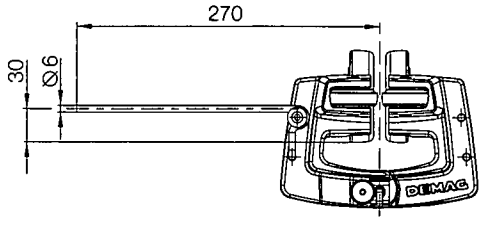
Current collector bracket
Part no. 840 085 44



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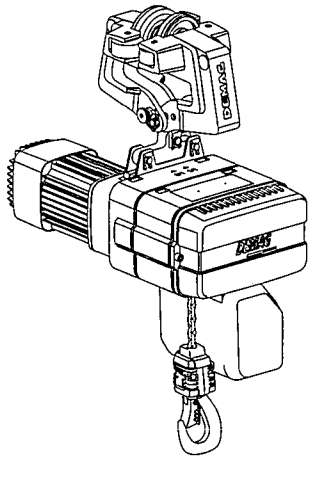
Examples for mounting CF 8 trolleys

DK – at right angles to track girder



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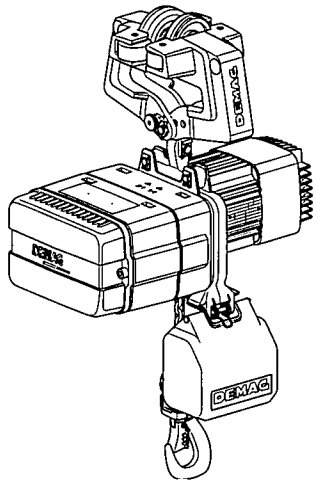
DK – parallel to track girder



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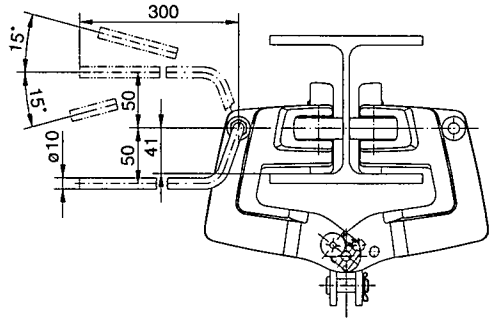
Current collector bracket
Part no. 840 055 44



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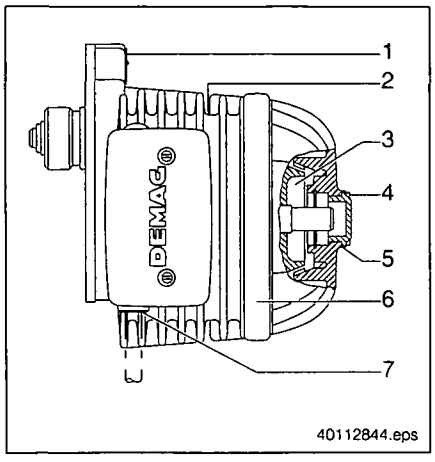
5.21 Converting the travel drive for arduous operating conditions



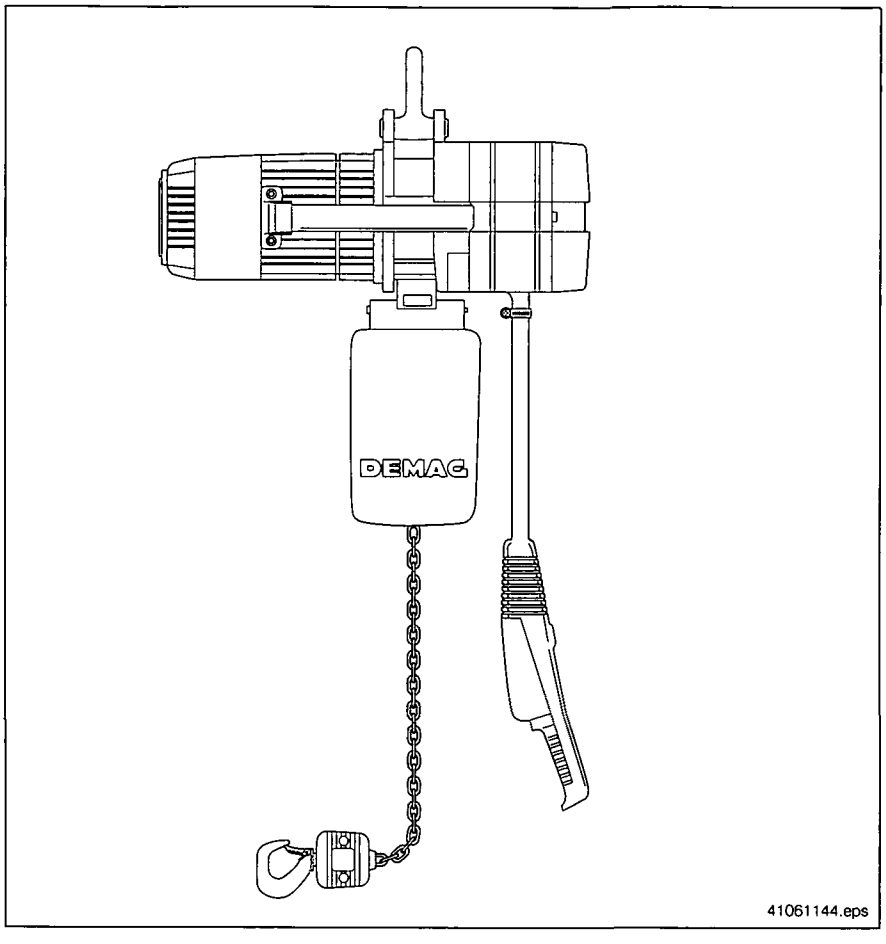
Conversion to IP 55

To convert, proceed as follows:

1. Seal centring collar (2) using Loctite 573.
2. Replace standard rotor assembly (3) with a new one with weather-proof braking surface.
3. Fit motor seal (6) between motor end cap and stator.
4. Place sealing ring (5) under cover (4).
5. Replace twist-type cable entry glands and plugs by cable entry bushes with gland nuts and screw plugs with sealing rings (7).
6. Stamp IP 55 and all other relevant data on blank rating plate (1) and fit this plate instead of the existing one. Replace all twist-type cable entry glands and plugs of the electrical equipment casing by cable entry bushes with gland nuts and screw plugs with sealing rings.

6 Putting the Demag chain hoist into service

When determining the hook path/lifting height, make sure that when in the lowest hook position, the load hook or bottom block is lying on the floor (limit stop at the dead end of the chain should not touch the chain guide base plate).



6.1 Inspection when putting the hoist into operation

When putting the hoist into operation for the first time, the inspections in accordance with section 8.3, table 2 must be carried out.

6.2 Safety instructions

All fitting 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 accident for persons and the chain hoist and is therefore prohibited.

Any change or modification which prejudices safety must be reported to the nearest person responsible immediately. Unauthorized repairs are not permitted.

6.3 Starting operation

See section 8.1

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6.4 Notes regarding the motor

The surfaces marked on the motor shaft shown in fig. 14 are preserved with Rustban 391. The involute spline is coated with lubricating varnish 321.

The preservative and the lubricating varnish must not be removed when dismantling the motor. When maintenance is carried out, the surfaces marked below must be checked and a new coat must be applied, if, required.

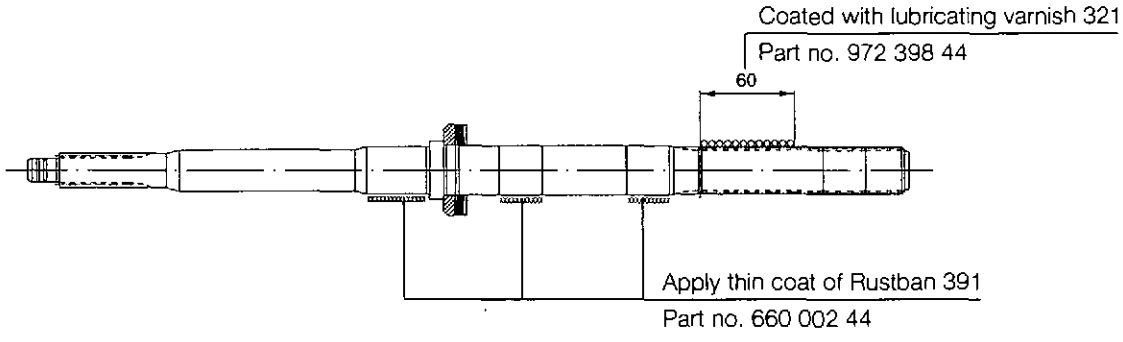
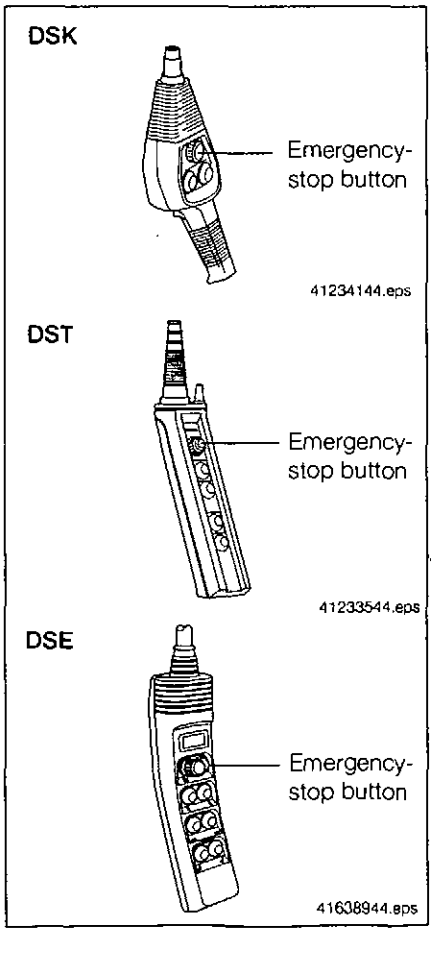


Fig. 14

The red paste which can be seen in the area of the braking surface is used for preservation until putting into operation and running in the braking surface of the motor.

This preservative must not be removed, however, it is not necessary to apply it again during maintenance.

7 Taking the Demag chain hoist out of service



7.1 Emergency-stop button

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

The emergency-stop button is arranged on the control pendant.

To actuate the emergency-stop button, press the button until it reaches the end stop and automatically latches.
To unlock the actuated emergency-stop button, turn the push button in the direction of the arrows and release.
The emergency-stop device must only be reset after the hazard and its cause have been eliminated.

7.2 Taking the hoist out of service at the end of the shift

When the work has been completed, raise the hook assembly or bottom block outside the travel area. Switch off the power supply at the mains connection or isolating switch.

7.3 Taking the hoist out of service for maintenance purposes

Maintenance work on the Demag chain hoist must not commence before the load has been removed and the mains switch/isolator switched off.
The relevant accident prevention regulations and statutory regulations must be observed for operation and maintenance.
Tests and inspections required in addition to those specified in the maintenance schedule (see table 2) must be carried out, see also section 1 "Safety instructions".

8 Inspections/maintenance/general overhaul GO

8.1 Inspection before starting work and during operation

The operator must carry out inspections in accordance with table 2 before starting work. Chain hoists must be taken out of service immediately or not put into operation if any defects relating to operating safety and reliability are detected.

Such defects are e.g.:

- brake and safety device failure,
- damage to the chain,
- unusual noise in the gearbox, etc.

8.2 Inspection and maintenance schedule

The specified inspection and maintenance intervals (table 2) apply to normal chain hoist service conditions.
If routine maintenance reveals that the intervals are too long or too short, they should be adapted to the specific operating conditions.
For repairs, only use genuine Demag parts (see component parts list).
The use of spare parts not approved by Demag renders any liability and guarantee claims void.

8.3 General overhaul GO

The theoretical duration of service D (hours at full load h) depends on the Group of Mechanisms classification of the chain hoist (see section 9, table 4).
Upon expiration of 90 % of the theoretical duration of service – if the chain hoists are correctly classified after 8 to 10 years – the owner must arrange for a general overhaul GO to be carried out. A general overhaul must be carried out on reaching the theoretical duration of service at the latest.

During the general overhaul the following parts must be replaced in addition to the checks and work specified in the inspection and maintenance schedule (see table 2).

- Gearing
- Gearbox bearings
- Motor shaft
- Motor bearings
- Connection elements
- Gear oil

The small parts (screws, washers ...) to be replaced during maintenance and assembly work are not listed separately.

The general overhaul carried out by the manufacturer or an authorized specialist company fulfills the condition for continued operation of the chain hoist. Thus the relevant accident prevention regulations and the UVV/BGV D8 (VBG 8) are complied with.

Further utilization is approved when an expert engineer has entered the conditions for further utilization into the test and inspection booklet. The completion of the general overhaul must be confirmed in the test and inspection booklet and a further period of utilization in accordance with FEM 9.755 must be entered.

The general overhaul may be carried out by expert engineers of Demag or an authorized specialist company.

Table 2
Inspection and maintenance schedule

Check when putting into operation, when starting operation and during operation	See section	Before putting into operation	When starting operation	Every 6 months	Once per year
Lubricate chain (under heavy-duty conditions the chain must be lubricated more frequently)	8.5	X	X		X
Check electrical switchgear and wiring	5.1	X		X	
Check operation of emergency limit switch, if fitted		X	X		X
Check strain relieving elements, control cables and control pendant housing for damage		X	X		X
Check operation of the slipping clutch	8.9	X			X
Check operation of the brake	8.6	X	X		X
Check hook and hook safety catch		X	X		X
Check during operation					
Check and apply further grease to bearing points of suspension eyes, suspension hook assembly and suspension eye turned 90°, as required	5.11-5.12-5.18-5.19-5.20				X
Check brake stroke, adjust brake or replace brake cup, as required	8.6				X
Check trolley crossbar connection	5.18				X
Check suspension eye, locking elements, bracket for suspension eye and securing elements (clips, etc.)	5.11				X
Check suspension eye/suspension hook assembly and ensure suspension eye turned 90° is properly secured	5.11				X
Check tight fit of securing bolts on load hook assembly	5.9				X
Check hooks for cracks, deformation and wear	8.4				X
Check hook safety catch for deformation					X
Check hook bearing for wear					X
Bottom block: lubricate chain sprocket bearing and check tight fit of securing bolts	5.10				X
Check chain sprocket, return sprocket and chain guide					X
Check chain and chain collector box are properly secured	5.12				X
Check chain for deformation, cracks, pitting, reduction in the thickness of the links or increase in pitch due to wear, elongation caused by deformation	8.5				X
Check securing elements (clips, bolts, etc.) for tight fit and corrosion	5.11-5.12-5.18-5.19-5.20				X
Check and apply or supplement corrosion protection, as required					X
Check electrical enclosure seals					X
Check trolley, crossbar and condition of buffers	5.18-5.19-5.20				X
Check lubrication of geared travel rollers of monorail hoist	8.8				X
Check oil level					X
Change oil	8.7	every 4 - 5 years			
Check bearing points of rotor for corrosion	6.4	every 5 years			
General overhaul					
The general overhaul should coincide with the annual inspection		**On reaching the theoretical duration of service**			
Fit chain-hoist specific Demag GO set	8.3	X			

The small parts (screws, washers ...) to be replaced during maintenance and assembly work are not listed separately. The tasks specified in the inspection and maintenance schedule must be carried out during a GO.

The specified maintenance intervals apply to normal chain hoist service conditions. If the annual calculation of the actual duration of service S indicates that the theoretical duration of service D will be reached before a period of 8 – 10 years, regular maintenance work must be adapted to the operating conditions and maintenance must be carried out at shorter intervals.
For repairs, only use genuine Demag parts (see component parts list).

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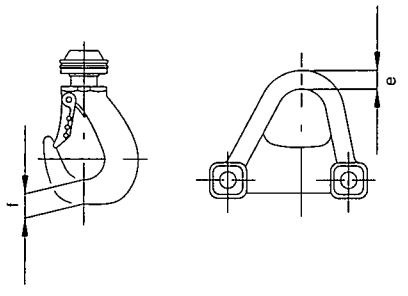
8.4 Suspension eye, hook, trolley crossbar

If a check or inspection reveals that these components are worn beyond the dimensions shown in fig. 15 and the tables, or if cracks can be seen in these parts, they must be replaced at once. See pages 42 – 45 for replacing the hook in the load hook assembly or in the bottom block.



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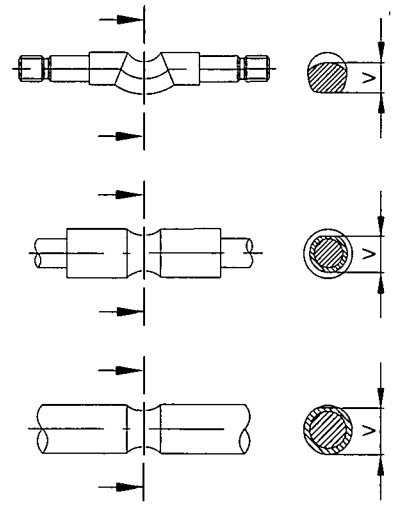

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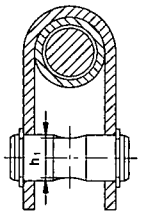

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Fig. 15

Chain hoist DK						
Range		DKUN 2	DKUN 5	DKUN 10	DKUN 16	DKUN 20
Suspension eye min. dimension e		13	17	24,5	24,5	30
Load hook min. dimension f for reeving	1/1	16,2	19,35	23,6	31	31
	2/1	19,35	23,6	30,95	35	44

Trolley for DKUN 2

Range	RU 3	RU 6		RU11/EU11	
Flange width mm	58-90	58-143	144-300	58-143	144-300
Trolley crossbar min. dimension v	16	24	30	30	
Trolley crossbar min. dimension h1	-	-	14,5	-	17,5

Trolley for DKUN 5

Range	RU 3	RU 6		RU11/EU11	
Flange width mm	58-90	58-143	144-300	58-143	144-300
Trolley crossbar min. dimension v	16	24	32	30	38,5
Trolley crossbar min. dimension h1	-	-	14,5	-	17,5

Trolley for DKUN 10

Range	RU 6		RU 11/EU 11		RU 22/EU 22	
Flange width mm	58-143		58-143	144-300	82-143	144-300
Trolley crossbar min. dimension v	24	32	30	38,5	45,5	
Trolley crossbar min. dimension h1	-	14,5	-	17,5	-	26,5

Trolley for DKUN 16

Range	RU 22/EU 22		RU 36-N/EU 36-N	
Flange width mm	82-143	144-300	90-180	181-300
Trolley crossbar min. dimension v	45,5		44	43
Trolley crossbar min. dimension h1	-	26,5	-	

Trolley for DKUN 20

Range	RU 22/EU 22		RU 36-N/EU 36-N		RU 55/EU 55	
Flange width mm	82-143	144-300	90-180	181-300	106-186	187-300
Trolley crossbar min. dimension v	45,5		44	43	57	67

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8.5 Hoist chain

The original Demag chain is a tested round section steel chain which is subject to the directives for round section steel chains in hoisting operation of the Main Association of Industrial Employers' Mutual Insurance Societies, Central Department for Accident Prevention and to the test criteria for round section steel chains in hoisting operation and to the inspection regulations according to DIN 685 part 5 Nov. 1981 as well as accident prevention regulations BGV D8 (VBG 8) and BGV D6 (VBG 9).

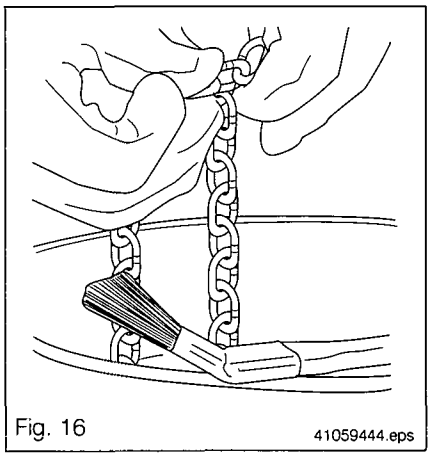

Fig. 16 41059444.eps

8.5.1 Lubricating the chain when putting the hoist into operation and during subsequent operation

Before fitting, before lifting a test load and commissioning and during normal operation, the contact surfaces of the chain must be lubricated with a gear grease, part no. 472 918 44, along the entire length of the chain, which must be free of load.

The contact surfaces of chains must be relubricated – after being cleaned – at intervals depending on service and load conditions. The lubricant should preferably be applied with a brush (see fig. 16).

A dry film lubricant should be used in environments where abrasives occur (emery, sand, etc.).

8.5.2 Checking wear or deformation of the original Demag chain

In addition to selecting the correct hoist unit, owners of electric chain hoists are obliged by relevant accident prevention regulations to constantly check the round section steel chain in order to ensure optimum operating safety and, therefore, to avoid serious accidents.

Where normal duty conditions prevail, the chain should be checked once a year (see section 8.2, table 2).

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

A partial load must be suspended from the load hook when measuring the chain for wear or deformation. This measurement can be taken in two different ways.

1. As in fig. 17 with a caliper gauge
2. As in fig. 18 with a chain gauge

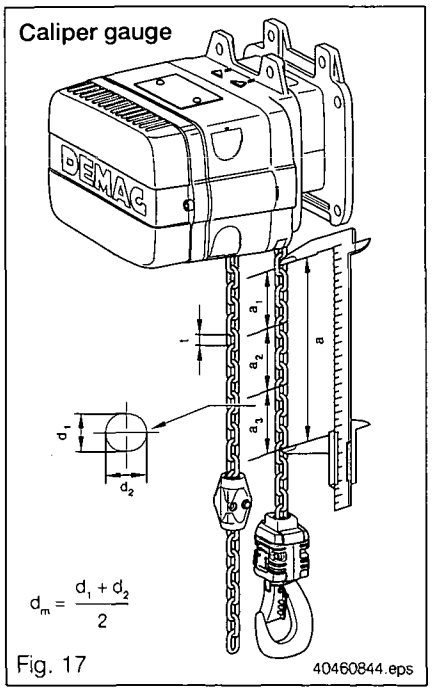

Fig. 17 40460844.eps

Measuring with the caliper gauge

Measurements on 11 chain links may be taken in steps of 2 x 3 and 1 x 5 chain links (see table 3 and fig. 17).

The sum total of the 3 readings taken, i.e. a1 + a2 + a3, must not exceed limit a in table 3. Otherwise, the chain must be replaced.

Since this is a chain of special manufacture with the name Demag stamped on every 12th link for chain size 4,2 x 12,2 and 5,3 as well as every 10th link for chain sizes 7,4 x 21,2 – 8,7 x 24,2 and 10,5 x 28,2 replacements must not be procured from any source other than Demag.

Do you find that, on fitting a new chain, it does not run smoothly over the sprocket? Please contact our after-sales service centre.

The use of chains other than those supplied by Demag is not permitted.

Chains and chain sprockets are designed to fit each other precisely. Your using a chain of a make other than Demag renders any liability and guarantee claims null and void.

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Table 3

Demag chain hoist	DKUN 2	DKUN 5	DKUN 10	DKUN 16	DKUN 20
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	10,5 x 28,2
Limit dimensions according to DIN 685 part 5					
Overall length of 11 links, maximum dimension a= a 1 + a 2 + a 3	144,7 mm	180,3 mm	253 mm	289,2 mm	337,4 mm
Inside length of 1 link, maximum dimension t	12,8 mm	15,9 mm	22,4 mm	25,5 mm	29,8 mm
Measuring the chain link diamenter, (see fig. 17) Minimum dimension d m = 0,9 x d	3,8 mm	4,8 mm	6,7 mm	7,8 mm	9,45 mm

Refer to sections 5.9 and 5.10 for replacing the chain when required.

When the chain hoist is operated with a dry-running chain, the chain guide, chain sprocket and return sprocket of the bottom block must also be replaced when the chain is replaced.

Chain gauge

Part no. 836 025 44

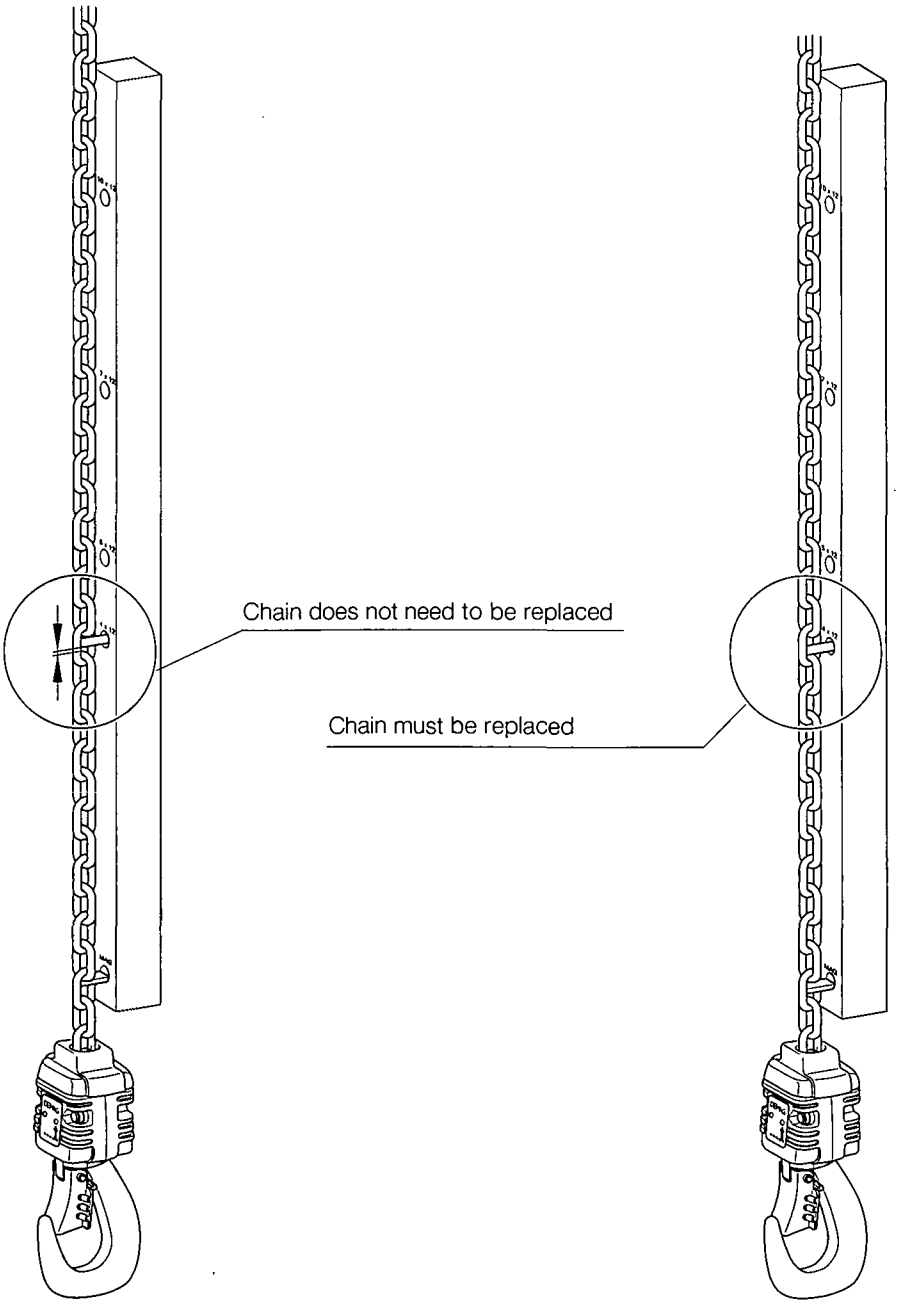

Fig. 18

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8.6 Brake

8.6.1 KMK main hoist motor brake and KMF travel motor brake 80

Demag chain hoists are supplied with the brake adjusted for the minimum rotor displacement path of approx.
1,5-2,0 mm for 71, 80, 90 motors and
1,8-2,3 mm for 100, 112 motors.

As the brake lining wears down, the path of rotor displacement increases.

The brake must be adjusted before the path of displacement has reached a maximum of 3,0 mm for 71, 80, 90 motors and 3,5 mm for 100, 112 motors.

It is therefore imperative to ensure, by regular maintenance, that the brake is adjusted before the maximum rotor displacement is reached.

For brake adjustment the load must be removed from the chain hoist.

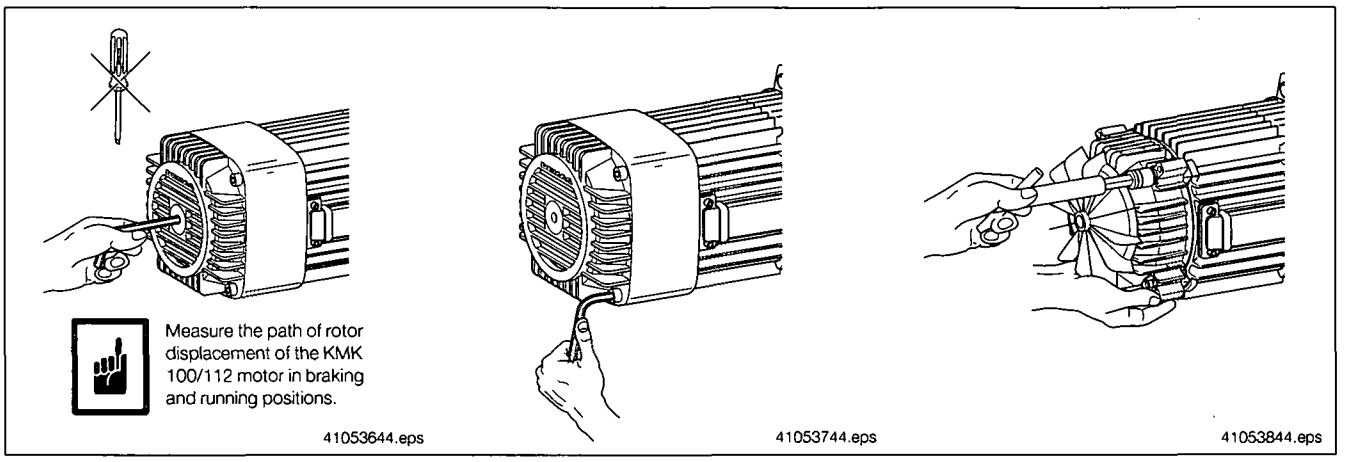
Adjustment can be repeated several times.

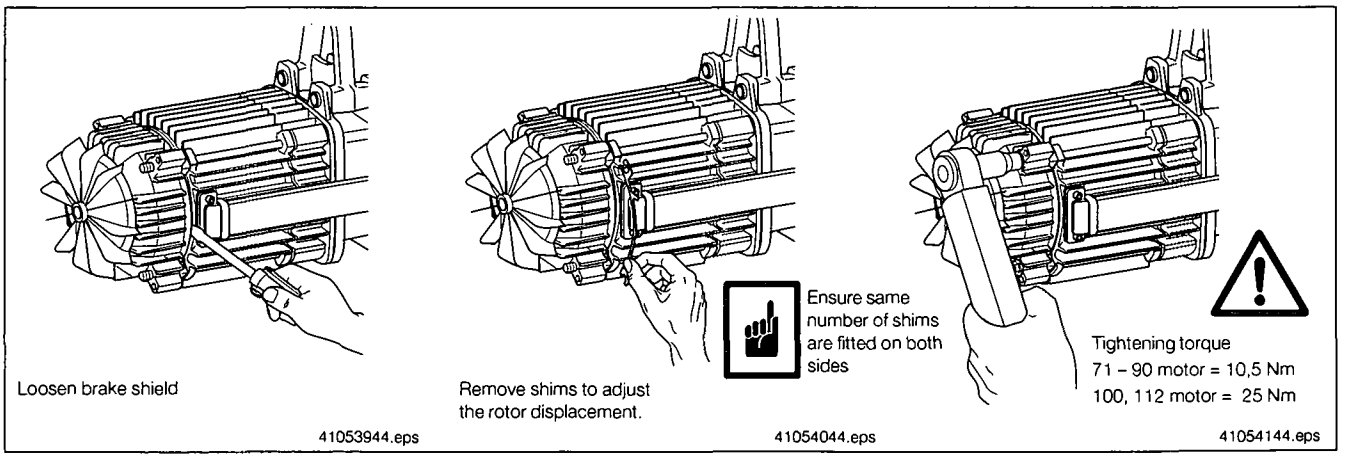
It is advisable to have a spare brake cup in stock.

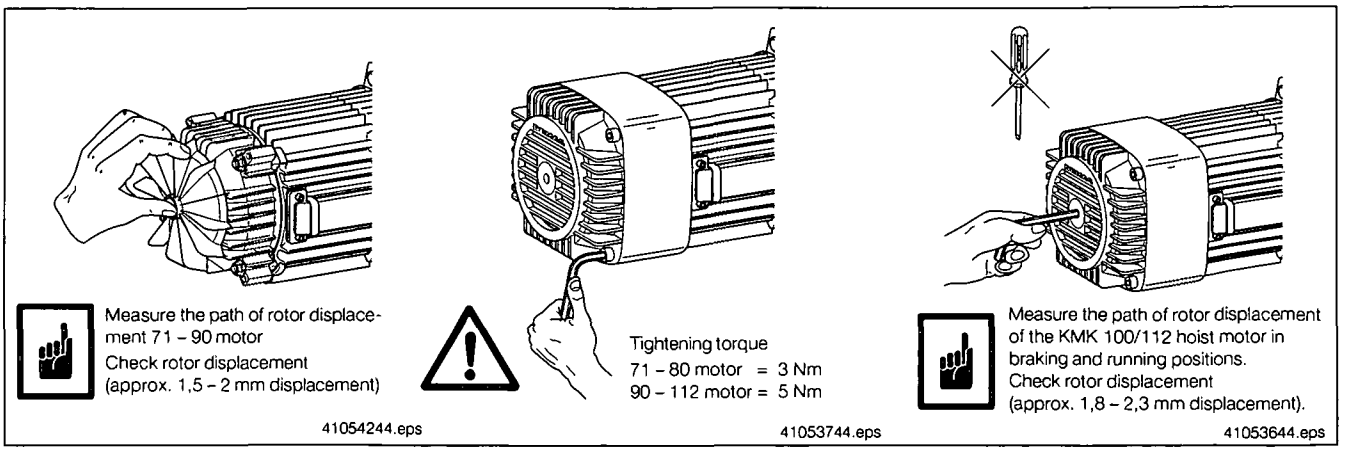
Number of shims

Motor	Quantity	Shim thickness
71/80	2 x 5	0,8 mm
90	2 x 6	0,8 mm
100	2 x 9	1 mm
112	2 x 10	1 mm

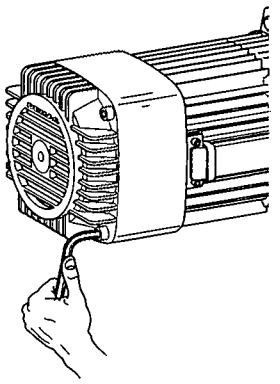
8.6.2 Adjusting the brake with shims







8.6.3 Changing the brake cup



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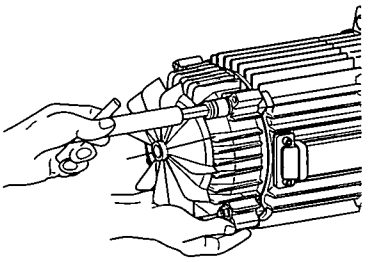

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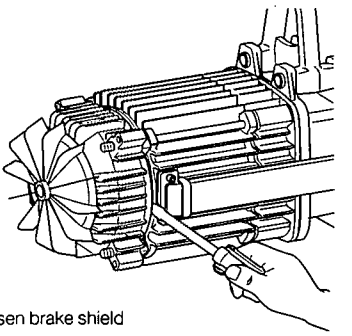
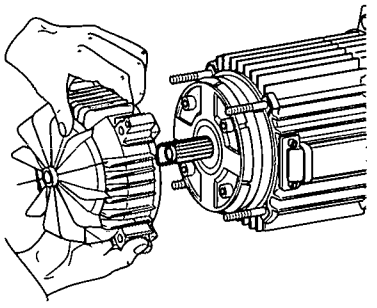


Loosen brake shield

41053944.eps



Remove fan with brake shield

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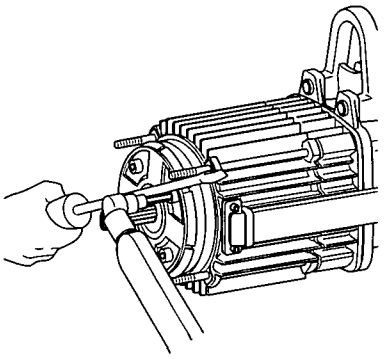

Lock brake cup using a screwdriver and remove bolts

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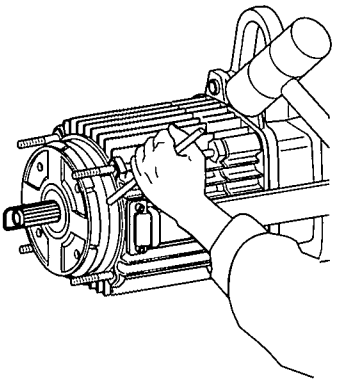

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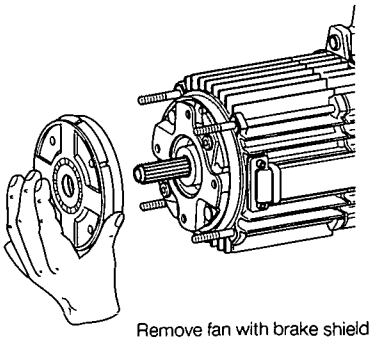
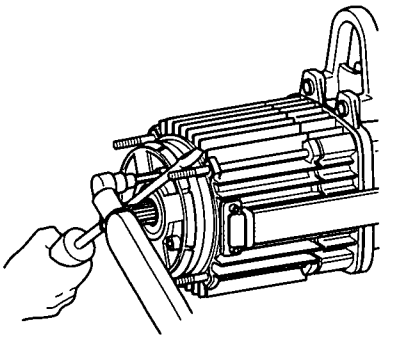


Remove fan with brake shield

41054644.eps



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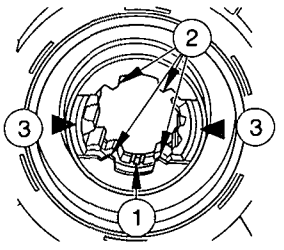
After fitting the brake cup, fit the new shims supplied with it.

Ensure same number of shims are fitted on both sides.

Lock the brake cup using a screwdriver and tighten bolts with a tightening torque of

71 – 90 motor = 10,5 Nm

100, 112 motor = 25 Nm



1 Guide for brake release stirrup
2 Splines to assist in assembly
3 Ensure that fan clips are correctly seated in bearing bush

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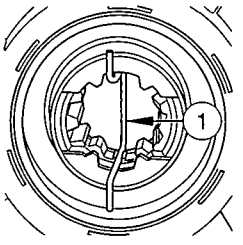

1 Brake release stirrup

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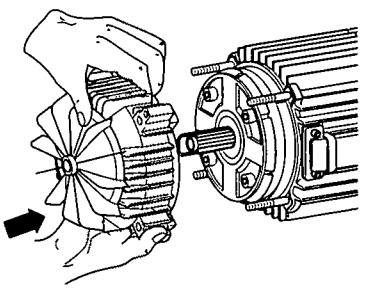

Fit brake shield

41055044.eps

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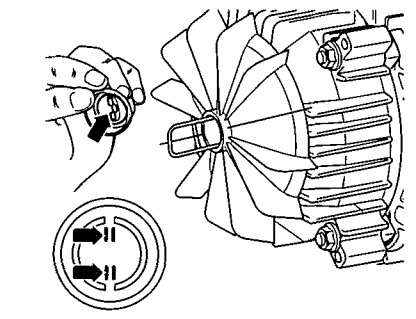

Press fan cap onto brake release stirrup

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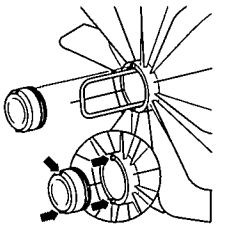
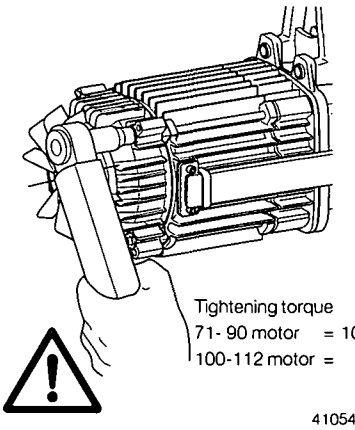


Match marks on fan and fan cap

41067344.eps



Tightening torque
71- 90 motor = 10,5 Nm
100-112 motor = 25 Nm

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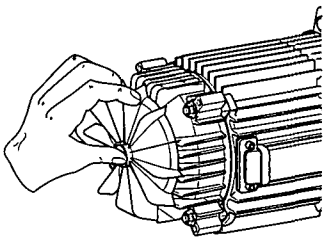

Measure the path of rotor displacement
71 – 90 motor
Check rotor displacement
(approx. 1,5 – 2 mm displacement).

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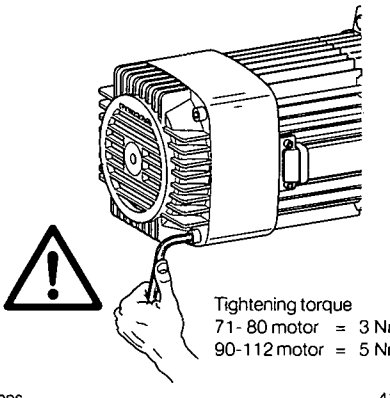

Tightening torque
71- 80 motor = 3 Nm
90-112 motor = 5 Nm

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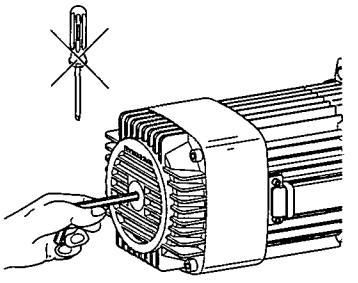

Measure the path of rotor displacement of the KMK 100/112 hoist motor in braking and running positions.
Check rotor displacement
(approx. 1,8 – 2,3 mm displacement).

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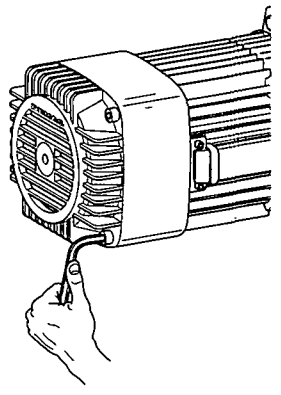
8.6.4 Changing the fan



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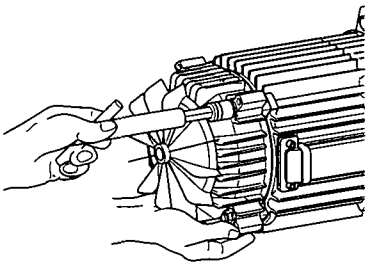

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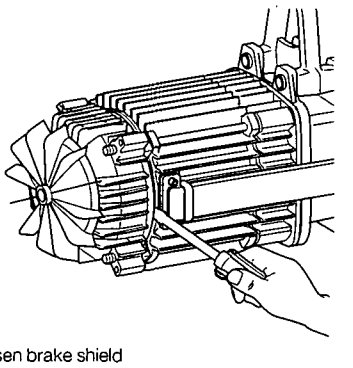

Loosen brake shield

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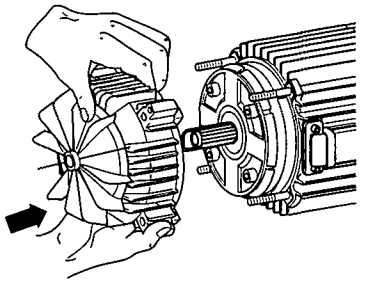

Remove fan with brake shield

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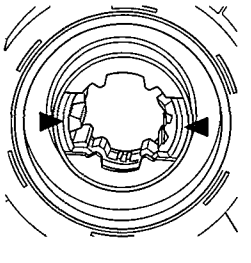

Press fan clips in direction of arrows and remove fan

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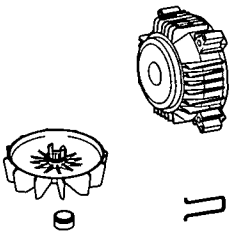

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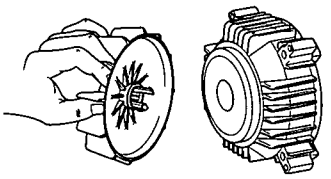
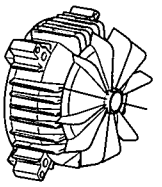


Fit fan to brake shield

41055344.eps



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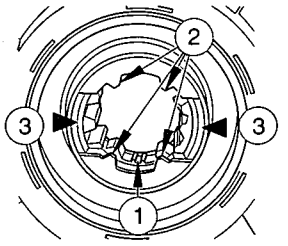
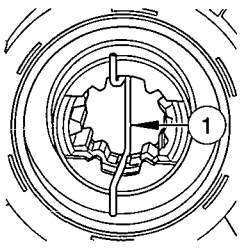


1 Guide for brake release stirrup
2 Splines to assist in assembly
3 Ensure that fan clips are correctly seated in bearing bush

41054844.eps



1 Brake release stirrup

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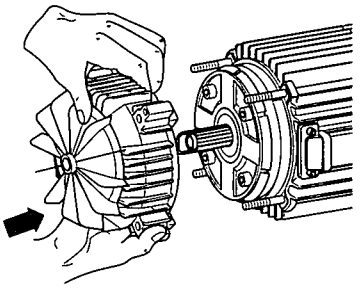
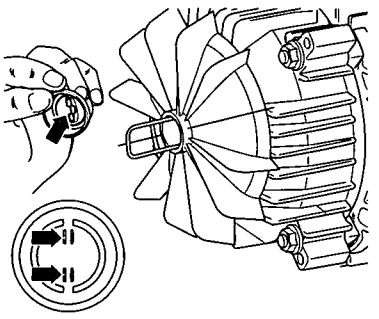


Fit brake shield

41055044.eps



Press fan cap onto brake release stirrup

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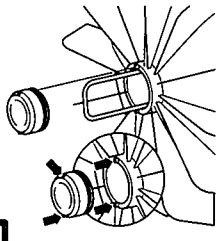
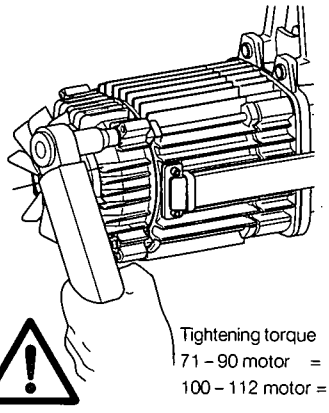


Match marks on fan and fan cap

41067344.eps



Tightening torque
71 – 90 motor = 10,5 Nm
100 – 112 motor = 25 Nm

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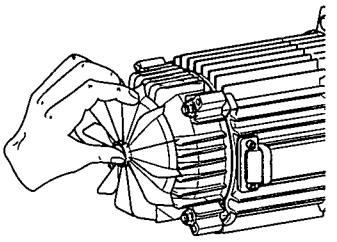

Measure the path of rotor displacement
71 – 90 motor
Check rotor displacement (approx. 1,5 – 2 mm displacement).

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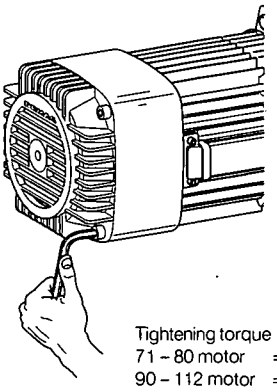

Tightening torque
71 – 80 motor = 3 Nm
90 – 112 motor = 5 Nm

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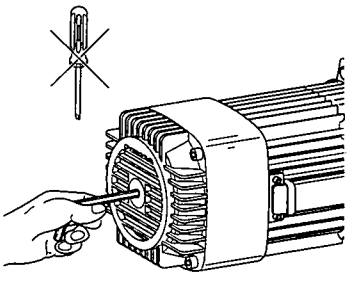

Measure the path of rotor displacement of the KMK 100/112 hoist motor in braking and running positions.
Check rotor displacement (approx. 1,8 – 2,3 mm displacement).

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8.6.5 KMP main hoist motor brake

Demag chain hoists are supplied with the brake adjusted for the minimum rotor displacement path of approx. 1,5 – 2 mm for the KMP 71 motor.

As the brake lining wears down, the path of rotor displacement increases.

The brake must be adjusted before the path of displacement has reached a maximum of 3,0 mm for the KMP 71 motor.

It is therefore imperative to ensure, by regular maintenance, that the brake is adjusted before the maximum rotor displacement is reached.

For brake adjustment the load must be removed from the Demag chain hoist.

Adjustment can be repeated several times.

It is advisable to have a spare brake cup in stock.

Number of shims

Motor	Quantity	Shim thickness
71	2 x 5	0,8 mm

8.6.6 Adjusting the brake with shims

1. Measure the path of rotor displacement:
   For KMP motors which are not fitted with a fan, remove the black plastic cap from the brake end cap, turn it and determine difference dimension lv by pressing on the brake release stirrup (see fig. 19).
2. Loosen the four nuts (2) and remove brake end cap (1).
3. Remove the necessary number of shims (3) in order to obtain a path of displacement of 1 – 1,5 mm (shim thickness 0,8 mm); it is absolutely essential that the number of shims at the top is the same as at the bottom.
4. Screw on brake end cap (1) evenly with the four hexagon socket nuts (2) with a tightening torque of 10,5 Nm. Any paint or dirt must be removed from the centering faces.
5. Check path of rotor displacement (should be 1 – 1,5 mm).

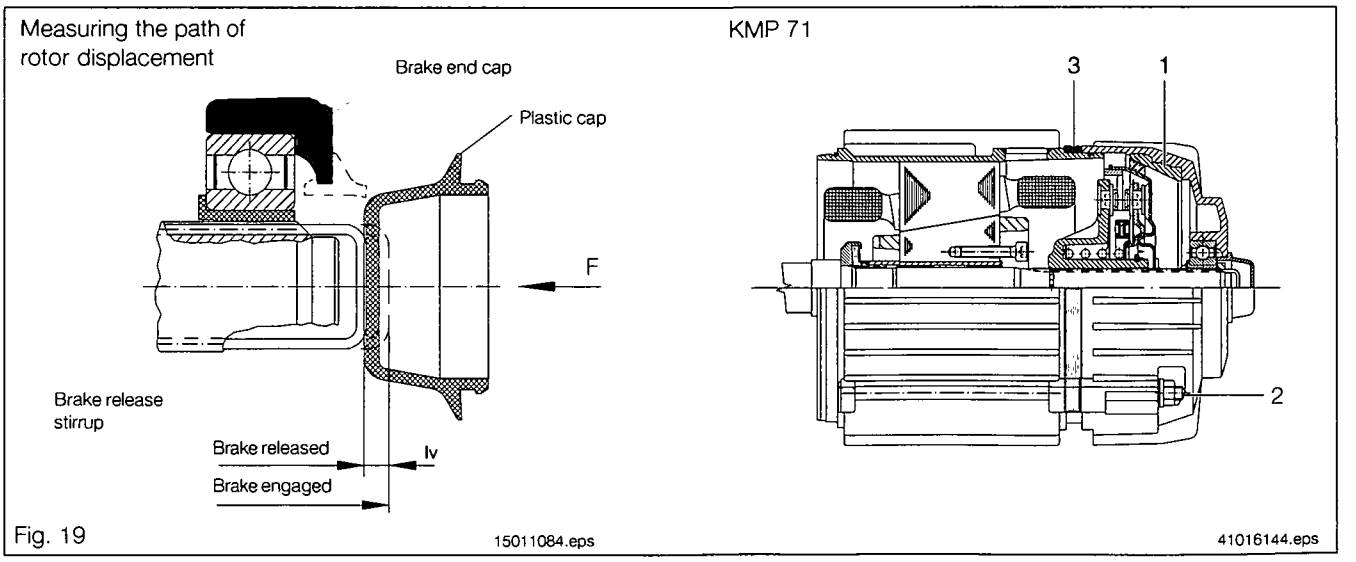


Fig. 19

8.6.7 Travel motor brake 13/3 PKF, 13/6 PKF and 13/6 PF

Demag travel drives are supplied with the brake adjusted for the minimum rotor displacement of approx. 1 – 1,5 mm.
As the brake lining wears down, the path of rotor displacement increases.
It is therefore imperative to ensure, by regular maintenance, that the brake is adjusted before the maximum rotor displacement is reached.

Adjustment can be repeated several times.
It is advisable to have a spare brake lining or a complete brake end cap available.

8.6.8 Adjusting the brake with shims

Measure the path of rotor displacement:
This is done by measuring the distance between the motor shaft end and the brake end cap, first with the brake engaged (fig. 20) and then with the brake released (fig. 21). If the path of displacement is approx. 3 mm, the brake must be adjusted.

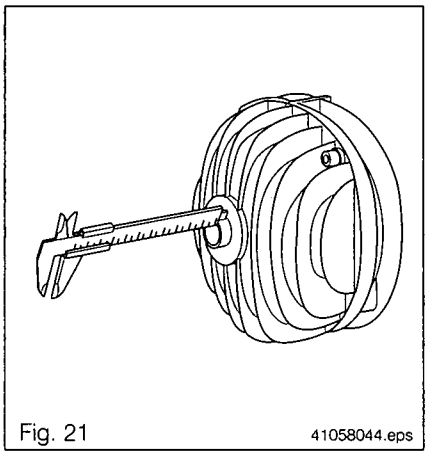


Fig. 21 41058044.eps

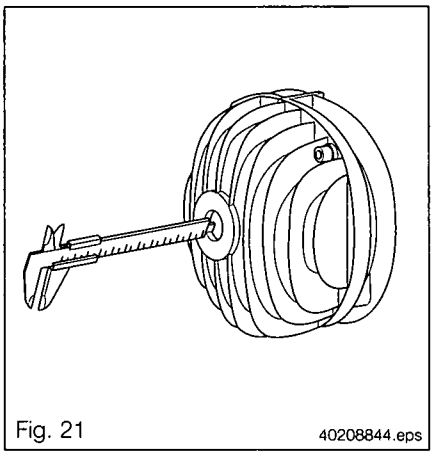


Fig. 21 40208844.eps

Loosen the four nuts (2) and remove brake end cap (1).

Remove the necessary number of shims (3) in order to obtain a path of displacement of 1 – 1,5 mm (shim thickness 0,8 mm); it is absolutely essential that the number of shims at the top is the same as at the bottom.

Screw on brake end cap (1) evenly with the four hexagon socket nuts (2) (for tightening torque see fig. 22). Any paint or dirt must be removed from the centering faces.

Check path of rotor displacement (should be 1 – 1,5 mm).

Loosen the four hexagon socket nuts (2) and remove brake end cap (1) with its worn lining.

8.6.9 Fitting new brake lining to travel motor

Remove old brake lining from brake end cap.

Glue new brake lining into brake end cap (see section 8.6.10).

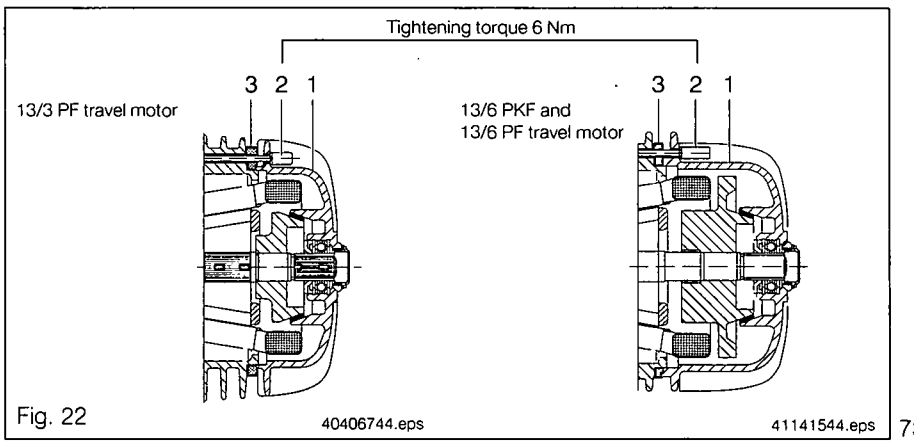


Fig. 22 40406744.eps 41141544.eps

8.6.10 Gluing on brake linings

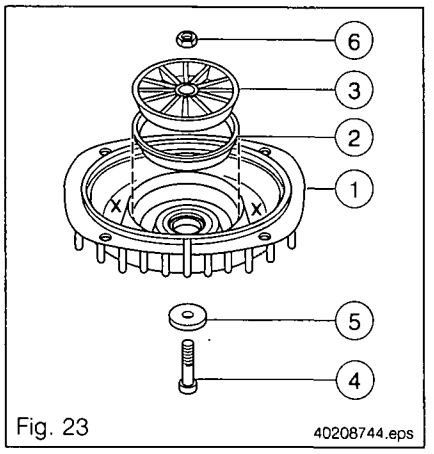


Fig. 23 40208744.eps

A two-component glue is supplied with every replacement brake lining. The lining must be held in position by a clamping device.

Remove end cap (brake end shield) (1), heat to 100 – 150° C and remove worn brake lining. (To do this, put the end cap on a heating plate and pour some water into recess "X" of the end cap. The required temperature has been reached when the water boils. Remove the remains of the old lining with a screwdriver or similar tool).

Surfaces to be glued together must be free from grease, oil, paint, rust, dirt and moisture. They should be emery-papered and wiped with acetone or any other good solvent.

Squeeze adhesive out of the two tubes supplied and mix the two components thoroughly in a ratio of 1:1. Apply a thin layer to both surfaces with a brush or paint scraper.

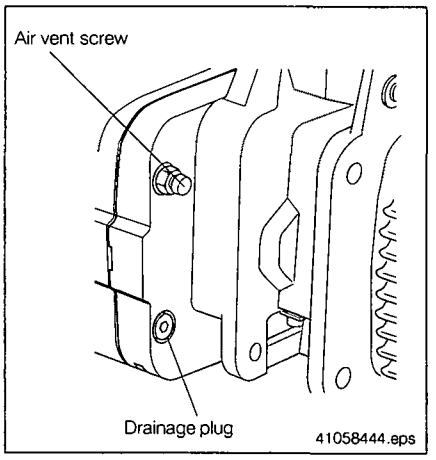
Locate annular brake lining (2) in its proper position and apply pressure by fitting pressure disc (3), bolt (4), washer (5) and nut (6) as illustrated in fig. 23.

Allow the glue to solidify under pressure for 20 hours at room temperature.

Remove the gluing jig (components 3 to 6).

Fit adjusting shims and end cap (see section 8.6.8).

8.7 Gearbox



Oil lubrication

Under normal operating conditions, the oil must be changed at least every 4 years.

Under exceptional conditions, e.g. increased ambient temperatures, we recommend that oil changes be adapted to suit these conditions.

Oil change

Drain the old oil at operating temperature. To do this, first remove the air vent screw at the top of the gearbox and then the plug at the bottom, and the oil will run out. The flushing oil should have a viscosity of 46 – 68 mm²/s at 40° C.

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 path. Then drain the flushing oil and refill the gearbox with oil as specified for lubrication. The required quantity and grade of oil can be seen from the table below.

Oil grades

For ambient temperatures of approx. –10° C to +50° C, a gear oil of 220 mm²/s at 40° C with mild high-pressure additives should be used, DIN 51502 CLP 220, e.g. BP ENERGOL GR-XP 220, Esso Spartan EP 220, SHELL Omala oil 220, Mobilgear 630 or Aral Degol BG 220.

At higher or lower ambient temperatures, the type of oil used should be adapted to the specific conditions.

Dispose of waste oil in accordance with environmental protection requirements.

Quantity of oil in litres

Range	DKUN 2	DKUN 5	DKUN 10	DKUN 16	DKUN 20
Litre	0,15	0,25	0,4	0,4	0,7

Part no. 472 902 44, 1litre

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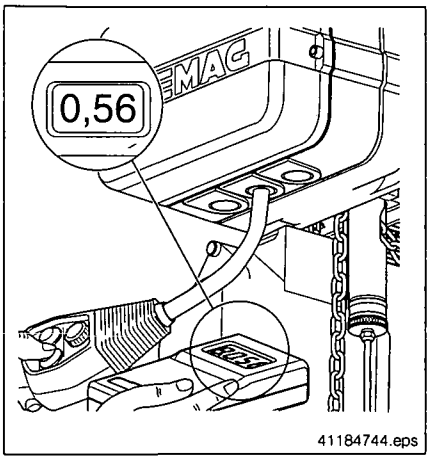
8.8 EU 11 DK/EU 22 DK/ EU 36-N/EU 55 DK electric trolley gearbox

The gearbox is lubricated with grease (approx. 60 g).
Under normal conditions this grease suffices for approx. 2 years after which the gears need relubricating. The geared travel wheels must be lubricated regularly with the same grease.

Part no. 011 058 44, 60 g.

8.9 Adjusting the slipping clutch



Under normal operating conditions, the slipping clutch does not need to be adjusted. The clutch runs in the oil bath and the linings are virtually wear-free. The slipping clutch is initially set in the factory. Adjustment of the slipping clutch may only be carried out by authorized specialists. An increase of the tripping torque which exceeds the factory setting is not permitted.

Adjust the slipping clutch with the friction force checking device.

Part no. 836 708 44

For further information see Adjusting the slipping clutch 206 974 44.

A new safety nut must be fitted each time the clutch lining is replaced.

206501K5.p65/020604

9 Measures necessary for achieving safe working periods

The safety and health provisions of EC directive 98/37/EC make it a legal requirement to eliminate special hazards which may be caused by, for example, fatigue and ageing. This requirement is also reflected in relevant accident prevention regulations and codes of practice, such as the 3rd supplement to UVV/BGV D8 (VBG 8) of 1.4.1996 in Germany. This requirement obliges the owner of serial hoist units to determine the actual duration of service of the hoist unit 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. The operating time T_i (number of operating hours) can be estimated or read on an elapsed time indicator.
3. The 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 on reaching the theoretical duration of service.
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):

Table 4:

	1Cm	1Bm	1Am	2m	3m
[h]	200	400	800	1600	3200

The actual duration of service is considerably increased if the hoist unit is only operated with partial load. For a chain hoist 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.

206501k6.p65/020604

9.1 Calculating the actual duration of service S

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

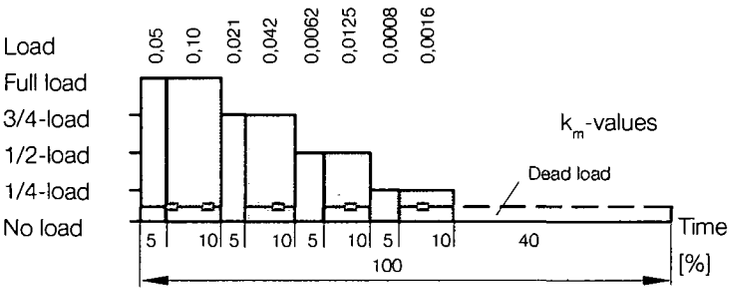
$$S = k_{mi} \times T_i \times f$$

k_{mi} : Actual load spectrum factor
T_i : Number of operating hours
f : Factor depending on the type of recording

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

To simplify estimation, each type of load can be grouped 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 taken into consideration.
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.



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

9.1.2 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:

$$T_i = \frac{\text{(Lifting+lowering) x cycles/h x working time/day x days/inspection interval}}{\text{60 x hoist speed}}$$

Only lifting and lowering movements are counted, long and cross travel times are not taken into consideration.

9.1.3 Factor depending on type of recording f

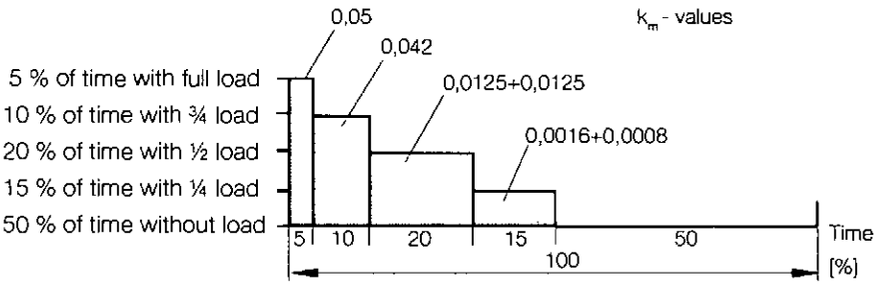
f = 1,1 for calculating the operating hours using an elapsed time indicator
f = 1,2 for estimating the operating hours and the load spectrum

9.2 Example: DKUN 10-1000 KV1 in 1Am

Hoist speed	:	9 m/min
No. of cycles per hour	:	10 cycles/h
Lifting and lowering	:	(2+2) m/cycle = 4 m/cyle
Operating time per day	:	8 h/day
Days per inspection interval	:	250 days/inspection interval

$$T_i = \frac{4 \times 10 \times 8 \times 250}{60 \times 9} = 148{,}1 \text{ h/inspection interval}$$

In the operating time as calculated above, the chain hoist has transported the following loads:



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:

$$S = k_{mi} \times T_i \times f = 0{,}119 \times 148{,}1 \times 1{,}2 = 21{,}2 \text{ hours}$$

For classification in FEM group of mechanisms 1Am (see DKUN data plate) with 800 hours of theoretical duration of service (see table 5) the hoist has a theoretical remaining duration of service of 778,8 hours.

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

Table 5

Date		Operating hours	Load (%) k_m factor					Load factor		Actual duration of service	Theoretical duration of service	Remaining duration of service
from	until	T_i value [h]	full	3/4	1/2	1/4	none	k_{mi}	f	S [h]	D [h] group of mechanisms	D-S [h]
3.1.--	30.12.--	148,1	5	10	20	15	50	0,119	1,2	21,2	800 / 1Am	778,8
			0,05	0,042	0,025	0,002	-					

DEMAG Cranes & Components	EC conformity declaration Demag chain hoist DKUN, DKES, DKST in accordance with EC Directives 89/336/EEC, Annex I, 98/37/EEC, Annex II A and 73/23/EEC, Annex III	1 page(s) | Page 1 Ident. no. 204 405 44 Issue 0799 | EN

Hereby we,

Demag Cranes & Components GmbH
Komponententechnik,

declare that the product

Demag chain hoist DKUN, DKES, DKST

of serial design ready for use[1)] with or without the relevant serial trolleys has been declared in conformity with the provisions of the following relevant regulations:

EC EMV Directive	89/336/EEC
amended by	92/31/EEC and 93/68/EEC
EC Machinery Directive	98/37/EEC
EC Low Voltage Directive	73/23/EEC
amended by	93/68/EEC

Applied harmonised standards:

EN 292-1, 292-2	Safety of Machinery	
EN 50081-2	Electromagnetic compatibility	
EN 50082-2	Electromagnetic compatibility	
EN 60034-1	Rating and performance for rotating electrical machines	
EN 60034-5	Types of enclosure for rotating electrical machines	
EN 60204-32	Electrical equipment, requirements for hoists	#
EN 60529	Types of enclosure (IP code)	
EN 60947-1	Low voltage switchgear	

Applied standards and technical specifications: #

DIN VDE 0160	Electronic equipment for use in electrical power installations and their assembly into electrical power installations
FEM 9.511	Classification of mechanisms
FEM 9.671	Chains for hoist units
FEM 9.683	Travel and hoist motor selection
FEM 9.755	Measures for achieving safe working periods
FEM 9.811	Specifications for rope and chain hoists

Wetter, den 19. 7. 1999

Place and date of issue

Neupert

ppa. Dr. Neupert
Technik
Hebezeuge und Komponenten

ppa. Weihmann
Vertrieb
Hebe- und Komponententechnik

1) Design ready for use requires a scope of parts as specified in Works Standard 012 313 99.

# = Modifications compared to previous issue	7550 Normung	Class. no. 715 **IS** 817

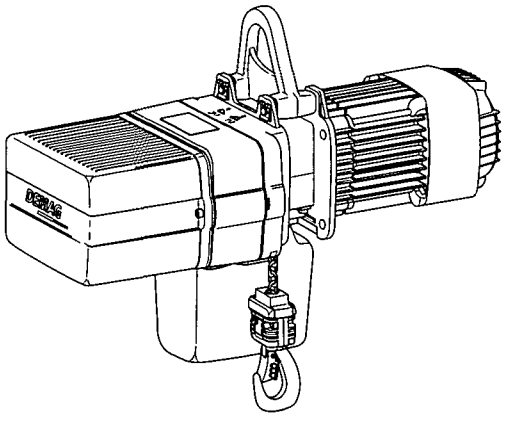
206501k6.p65/020604

DEMAG
Cranes & Components

Component parts

Demag chain hoist DKUN 10

Contents



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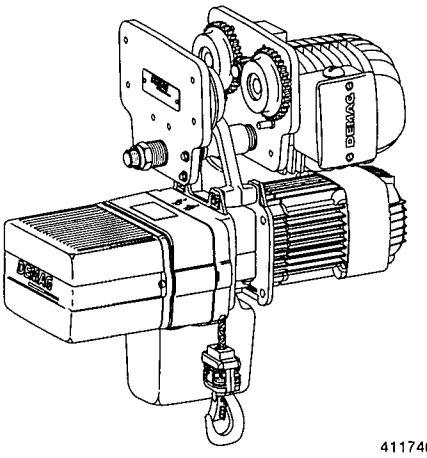

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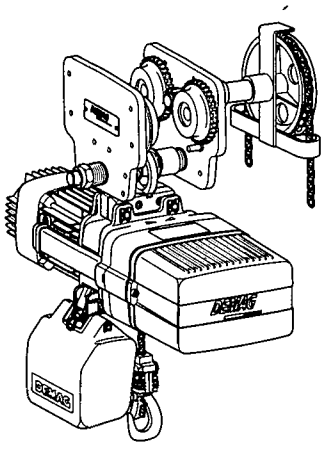

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222511k1.p65/110504

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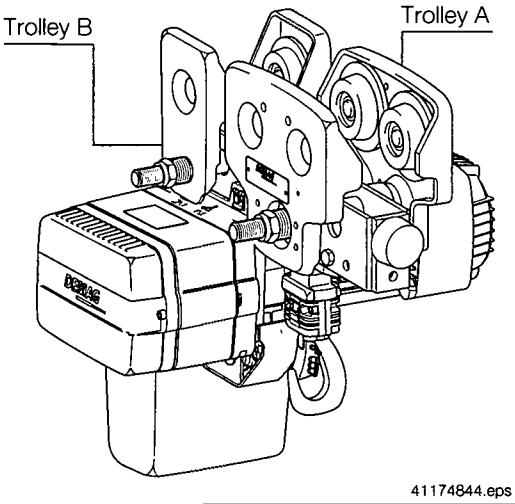

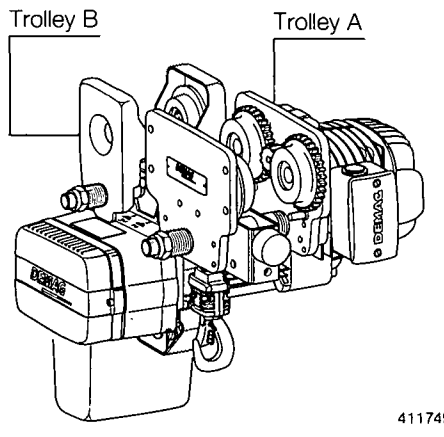

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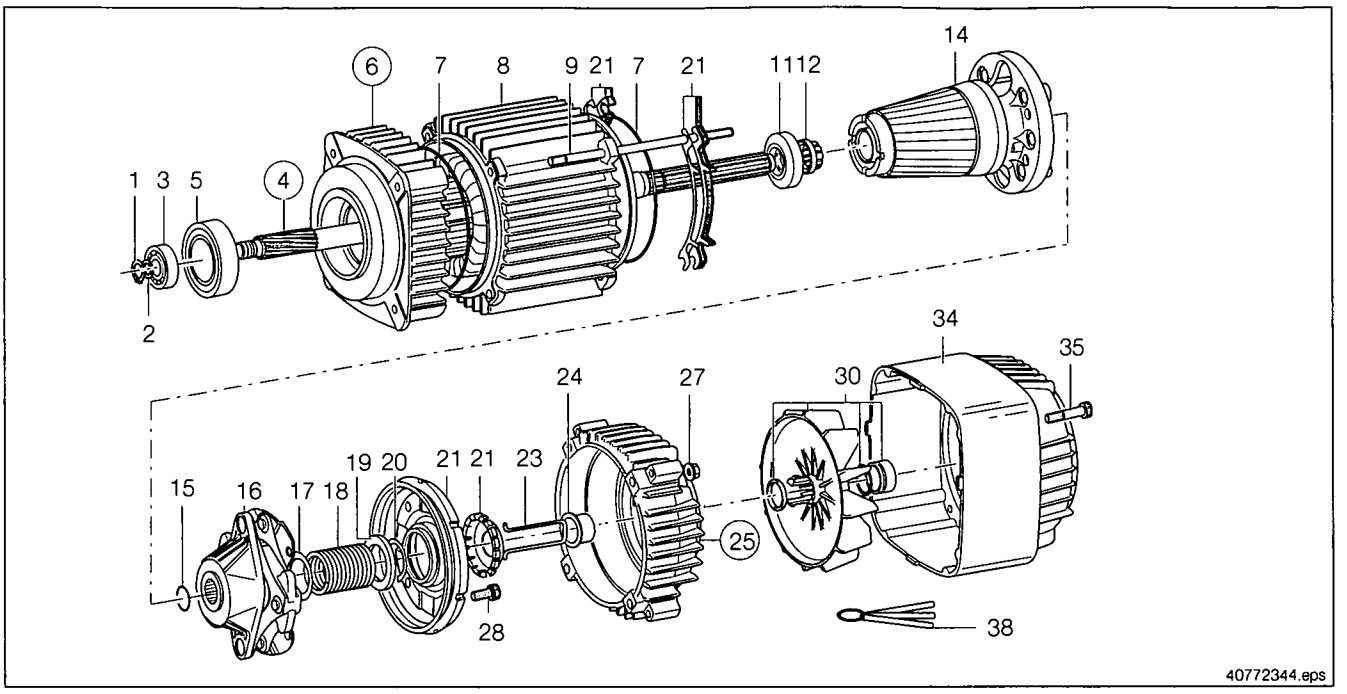
Alterations compared with previous issue
Example

# 35	321 516 99	4	Hex.socket cylind.screw M 6 X 60	10.9 A2F	DIN 912	

Main hoist motor KMK 90 B 2
Main/creep hoist motor KMK 90 B 2/8



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	34252199	1	Retaining ring 15X1,5		FedSt	DIN 471
2	36720099	1	O-ring 12 X 1,5 N		NBR 70	DIN- 3771
3	36060299	1	Grooved ball bearing 6302		Wlz-St !L	DIN 625
4	13847684	1	Shaft DK10 KMK 90B	c/w items 2, 11, 15		
5	36826899	1	Grooved ball bearing 6208 2RS		Wlz-St !L	DIN 625
6	83731244	1	Intermediate flange KM 90B-DK10	c/w item 5		
7	36719099	2	O-ring 133,07X 1,78 N		NBR 70	DIN- 3771
8	13600584	1	Stator KMK 90B 2 AB	1)		
8	13600884	1	Stator KMK 90B 2/8 AB	1)		
9	30242899	4	Stud M 6 X240		8.8 A2F	DIN- 835
11	13886584	1	Damper ring KM 90			
12	13885284	1	Thrust ring set KM 90	1)		
14	13847384	1	Rotor KMK 90B 2/12	B 2, B 2/8 1)		
15	34190799	1	Spring ring A 24		FedSt	DIN 7993
16	13876084	1	Engaging element KMK 90			
17	34143699	1	Shim 35X 45X0,5		St2K50	DIN 988
18	13874584	1	Spring 3,6 X35 X89 GN	228 N, 90 B 2		
18	13874784	1	Spring 3,2 X35 X101 GEWS	180 N, 90 B 2/8		
19	13876684	1	Quill gear KM 90			
20	34249599	1	Retaining ring 32X2		FedSt	DIN 471
21	13889584	1	Brake lining support KM 90			
23	13877084	1	Brake release bracket KM 90			
24	13881384	1	Bearing bush KM 90			
25	13861384	1	End shield BS KMK 90	c/w item 24		
27	15108499	4	Hexagonal nut M 6		8 A2F	DIN 6923
28	32011499	4	Hex.socket cylind.screw M 6 X 25		8.8 A2F	DIN 6912
30	13889684	1	Fan set KM 90			
34	13882084	1	Fan cover KM 90			
35	32151699	4	Hex.socket cylind.screw M 6 X 60		10.9 A2F!L	DIN 912
38	10041084	3	Feeler gauge set	1)		

22251001.tbl

1) When ordering a rotor or stator, a set of thrust rings (item no. 12) must also be ordered for adjusting the air gap (adjust with feeler gauge no. 2, item no. 38)

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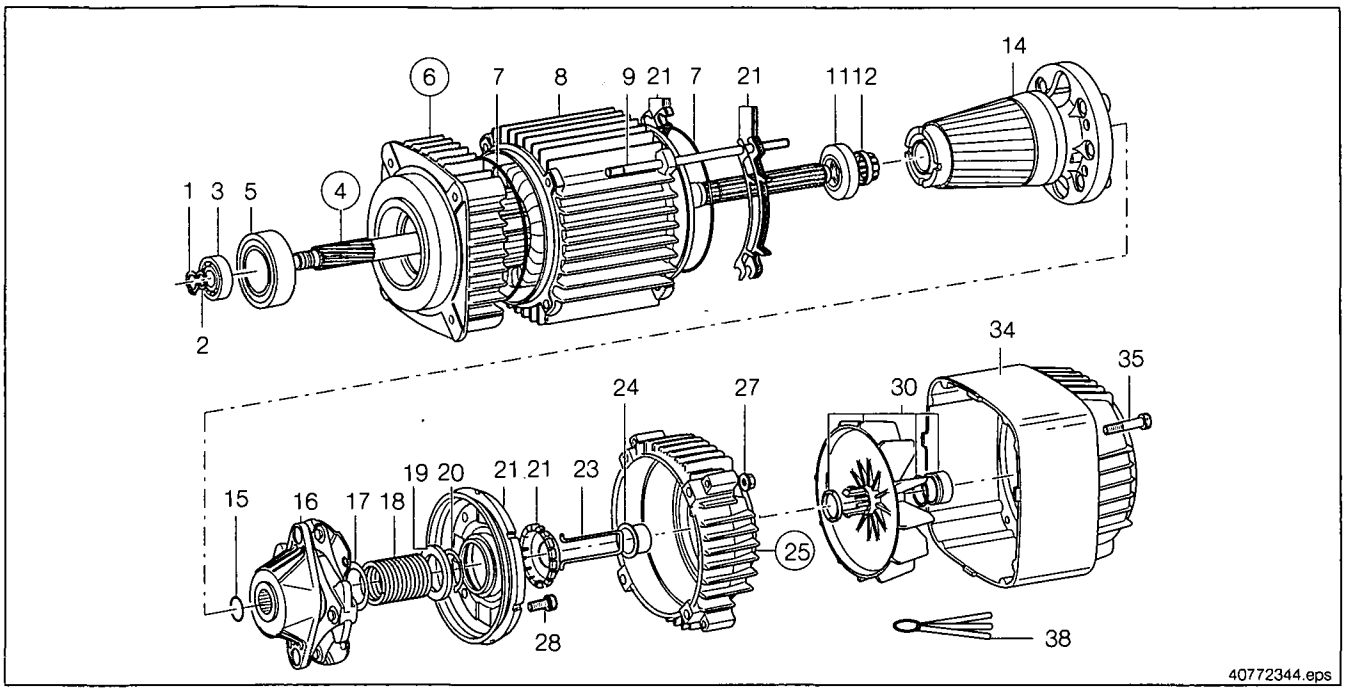
Main hoist motor KMK 100 B 2



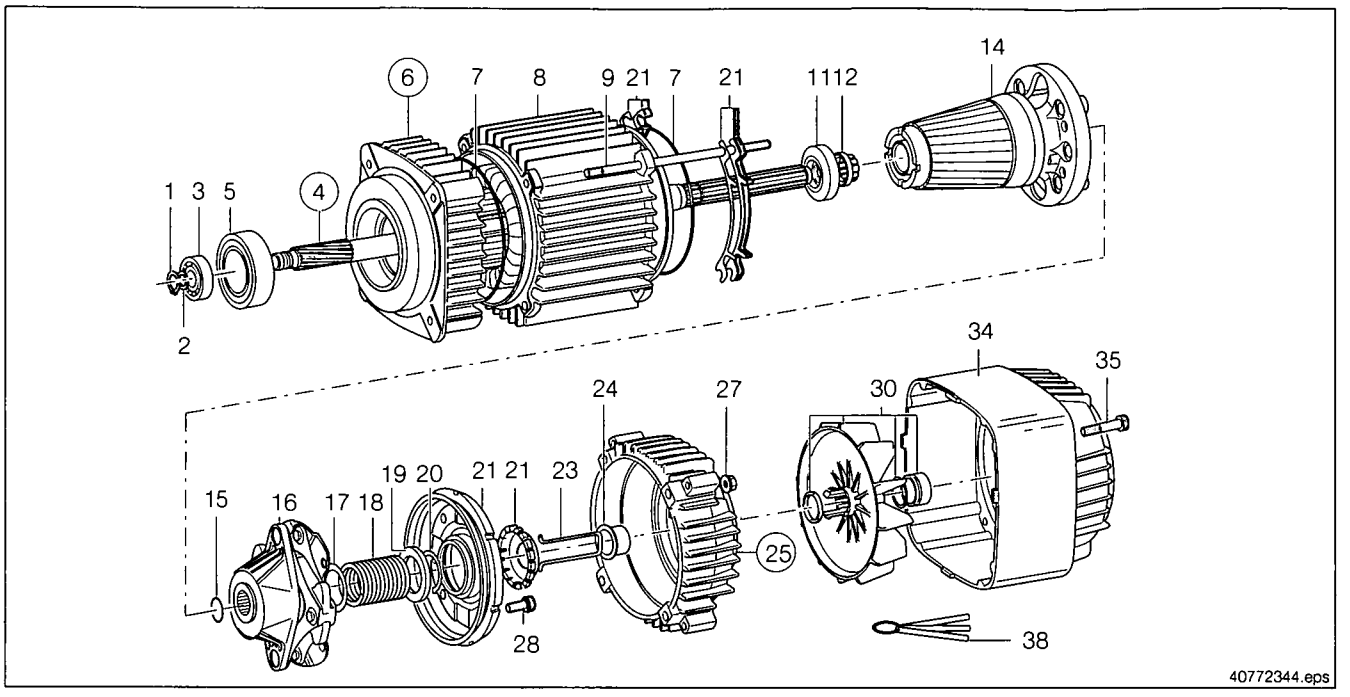
Item no.	Part no.	Quantity	Designation		Material	Standard
1	34252199	1	Retaining ring 15X1,5		FedSt	DIN 471
2	36720099	1	O-ring 12 X 1,5 N		NBR 70	DIN- 3771
3	36060299	1	Grooved ball bearing 6302		Wlz-St !L	DIN 625
4	14335684	1	Shaft coupling DK10/16	c/w items 2, 11, 15		
5	36826899	1	Grooved ball bearing 6208 2RS		Wlz-St !L	DIN 625
6	83731444	1	Intermediate flange KM100B-DK	c/w item 5		
7	36719199	2	O-ring 150 X 2 N		NBR 70	DIN- 3771
8	14101684	1	Stator KMK100B 2 AB	1)		
9	30242999	4	Stud M 8 X265		8.8 A2F	DIN- 835
11	14386284	1	Damper KM 100 GEDREHT			
12	14385284	1	Thrust ring set KM100	1)		
14	14345484	1	Rotor KMK100B 2/12	B 2 1)		
15	34191199	1	Spring ring A 28		FedSt	DIN 7993
16	14376084	1	Engaging element KMK100			
17	34144999	1	Shim 42X 52X0,5		St2K50	DIN 988
18	14374384	1	Spring 4,75X42 X81 BL	287 N		
19	14876684	1	Quill gear KM 100-112			
20	34246999	1	Retaining ring 40X2,5		FedSt !L	DIN 471
21	14389584	1	Brake lining support KM 100			
23	14377084	1	Brake release bracket KM100			
24	14381384	1	Bearing bush KM 100			
25	14361384	1	End shield BS KM 100	c/w item 24		
27	15108599	4	Hexagonal nut M 8		8 A2F	DIN 6923
28	32012599	4	Hex.socket cylind.screw M 8 X 30		8.8 A2F	DIN 6912
30	14389684	1	Fan set KM 100			
34	14382084	1	Fan cover KM100			
35	32151699	4	Hex.socket cylind.screw M 6 X 60		10.9 A2F!L	DIN 912
38	10041084	3	Feeler gauge set	1)		

22251002.tbl

222511k1.p65/110504

1) When ordering a rotor or stator, a set of thrust rings (item no. 12) must also be ordered for adjusting the air gap (adjust with feeler gauge no. 2, item no. 38)

Main/creep hoist motor KMK 100 B 2/8



Item no.	Part no.	Quantity	Designation		Material	Standard
1	34252199	1	Retaining ring 15X1,5		FedSt	DIN 471
2	36720099	1	O-ring 12 X 1,5 N		NBR 70	DIN- 3771
3	36060299	1	Grooved ball bearing 6302		Wlz-St !L	DIN 625
4	14335684	1	Shaft coupling DK10/16	c/w items 2, 11, 15		
5	36826899	1	Grooved ball bearing 6208 2RS		Wlz-St !L	DIN 625
6	83731444	1	Intermediate flange KM100B-DK	c/w item 5		
7	36719199	2	O-ring 150 X 2 N		NBR 70	DIN- 3771
8	14101484	1	Stator KMK100B 2/8 AB	1)		
9	30242999	4	Stud M 8 X265		8.8 A2F	DIN- 835
11	14386284	1	Damper KM 100 GEDREHT			
12	14385284	1	Thrust ring set KM100	1)		
14	14345484	1	Rotor KMK100B 2/12	B 2/8 1)		
15	34191199	1	Spring ring A 28		FedSt	DIN 7993
16	14376084	1	Engaging element KMK100			
17	34144999	1	Shim 42X 52X0,5		St2K50	DIN 988
18	14374784	1	Spring 4,75X42 X77 RTBL	250 N		
19	14876684	1	Quill gear KM 100-112			
20	34246999	1	Retaining ring 40X2,5		FedSt !L	DIN 471
21	14389584	1	Brake lining support KM 100			
23	14377084	1	Brake release bracket KM100			
24	14381384	1	Bearing bush KM 100			
25	14361384	1	End shield BS KM 100	c/w item 24		
27	15108599	4	Hexagonal nut M 8		8 A2F	DIN 6923
28	32012599	4	Hex.socket cylind.screw M 8 X 30		8.8 A2F	DIN 6912
30	14389684	1	Fan set KM 100			
34	14382084	1	Fan cover KM100			
35	32151699	4	Hex.socket cylind.screw M 6 X 60		10.9 A2F!L	DIN 912
38	10041084	3	Feeler gauge set	1)		

22251003.tbl

1) When ordering a rotor or stator, a set of thrust rings (item no. 12) must also be ordered for adjusting the air gap (adjust with feeler gauge no. 2, item no. 38)

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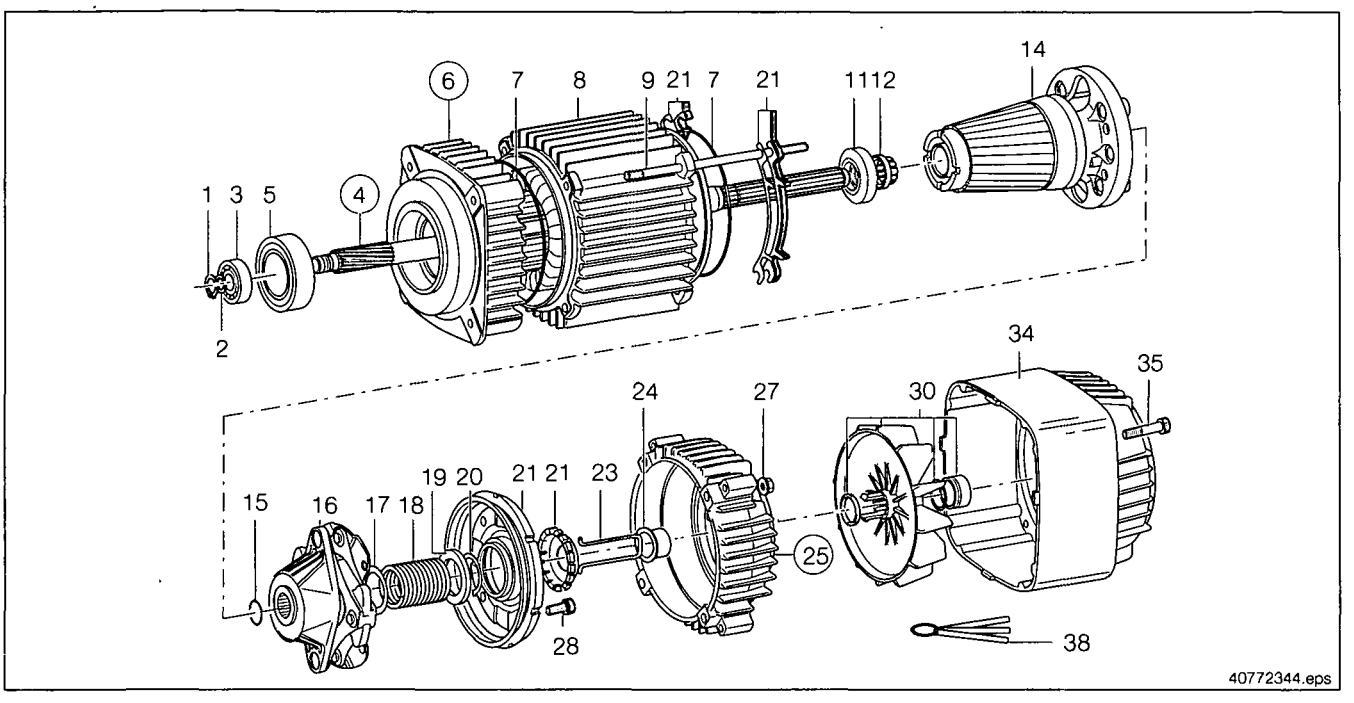
Main/creep hoist motor KMK 100 B 2/12



Item no.	Part no.	Quantity	Designation		Material	Standard
1	34252199	1	Retaining ring 15X1,5		FedSt	DIN 471
2	36720099	1	O-ring 12 X 1,5 N		NBR 70	DIN- 3771
3	36060299	1	Grooved ball bearing 6302		Wlz-St !L	DIN 625
4	14335684	1	Shaft coupling DK10/16	c/w items 2, 11, 15		
5	36826899	1	Grooved ball bearing 6208 2RS		Wlz-St !L	DIN 625
6	83731444	1	Intermediate flange KM100B-DK	c/w item 5		
7	36719199	2	O-ring 150 X 2 N		NBR 70	DIN- 3771
8	14101384	1	Stator KMK100B 2/12AB	1)		
9	30242999	4	Stud M 8 X265		8.8 A2F	DIN- 835
11	14386284	1	Damper KM 100 GEDREHT			
12	14385284	1	Thrust ring set KM100	1)		
14	14345484	1	Rotor KMK100B 2/12	1)		
15	34191199	1	Spring ring A 28		FedSt	DIN 7993
16	14376084	1	Engaging element KMK100			
17	34144999	1	Shim 42X 52X0,5		St2K50	DIN 988
18	14374184	1	Spring 4,5 X42 X77 RT	190 N		
19	14876684	1	Quill gear KM 100-112			
20	34246999	1	Retaining ring 40X2,5		FedSt !L	DIN 471
21	14389584	1	Brake lining support KM 100			
23	14377084	1	Brake release bracket KM100			
24	14381384	1	Bearing bush KM 100			
25	14361384	1	End shield BS KM 100	c/w item 24		
27	15108599	4	Hexagonal nut M 8		8 A2F	DIN 6923
28	32012599	4	Hex.socket cylind.screw M 8 X 30		8.8 A2F	DIN 6912
30	14389684	1	Fan set KM 100			
34	14382084	1	Fan cover KM100			
35	32151699	4	Hex.socket cylind.screw M 6 X 60		10.9 A2F!L	DIN 912
38	10041084	3	Feeler gauge set	1)		

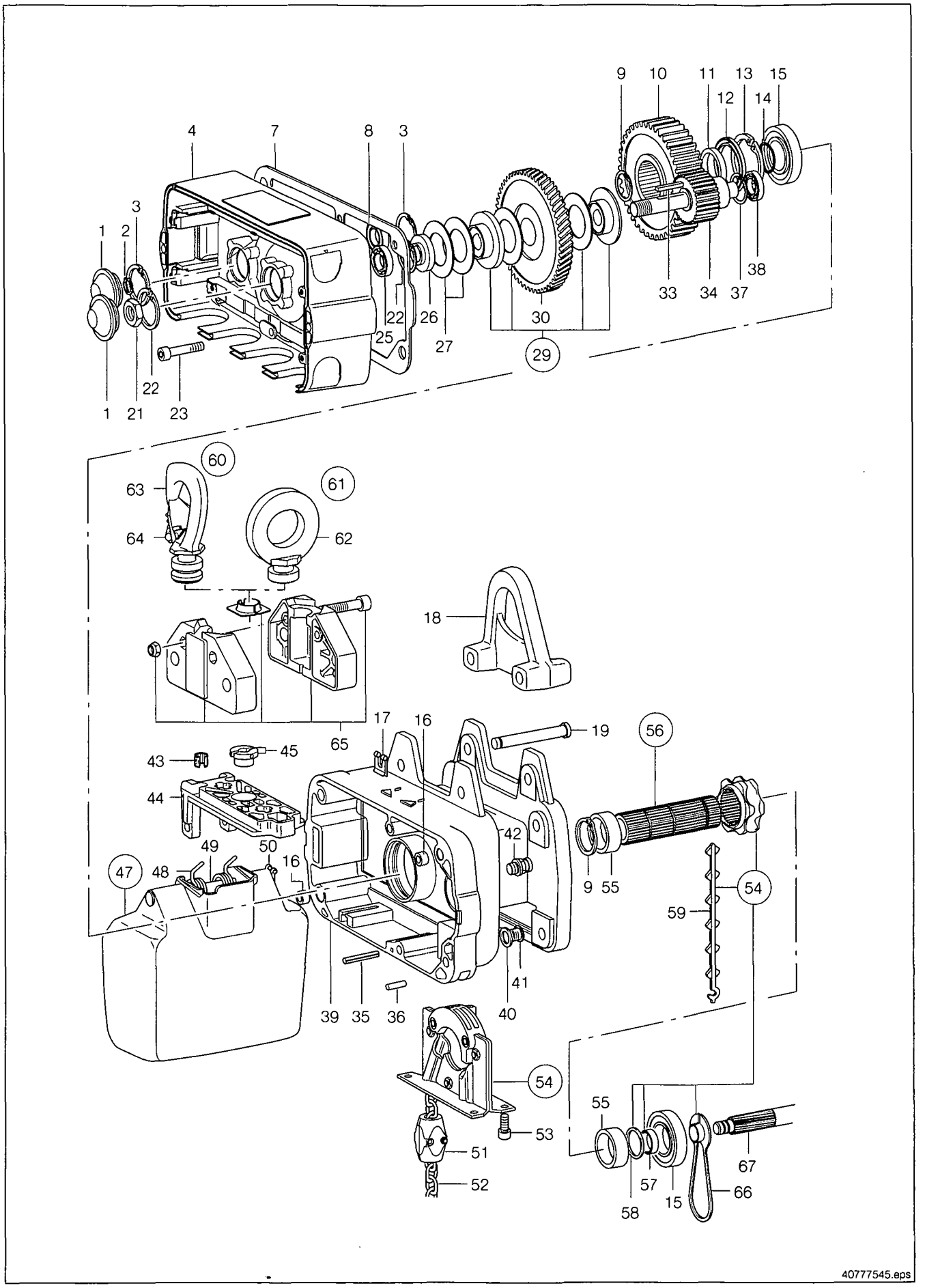
22251004.tbl

222511k1.p65/110504

1) When ordering a rotor or stator, a set of thrust rings (item no. 12) must also be ordered for adjusting the air gap (adjust with feeler gauge no. 2, item no. 38)

Helical gearbox, 2-stages

Helical gearbox, combination with corresponding motor for one/two hoist speeds



Helical gearbox, 2-stages

Helical gearbox, combination with corresponding motor for one/two hoist speeds

Item no.	Part no.	Quantity	Designation		Material	Standard
1	83725844	2	Plug with O-ring			
2	34252199	1	Retaining ring 15X1,5		FedSt	DIN 471
3	34276299	2	Retaining ring 42X2		FedSt	DIN 472
4	83710444	1	Gearbox housing DK10/16T.2	1)		
7	83713944	1	Gearbox seal DK10/16	1)		
8	36060299	1	Grooved ball bearing 6302		Wlz-St !L	DIN 625
9	34254099	2	Retaining ring 40X1,75		FedSt !L	DIN 471
10			**Stage 2 for two Hoist speeds**	**Mot. KMK 90 B 2/8**		
10	83714644	1	Gearwheel Z111 M 1,6 B 32	1000, 800, 630, V 1, i = 79,9		
10	83714444	1	Gearwheel Z105 M 1,6 B 32	630, V 2, i = 58,8		
			Stage 2 for two Hoist speeds	**Mot. KMK 100 B 2/8**		
10	83714644	1	Gearwheel Z111 M 1,6 B 32	1250, V 1, i = 79,9		
10	83714444	1	Gearwheel Z105 M 1,6 B 32	1000, 800, V 2, i = 58,8		
			Stage 2 for two Hoist speeds	**Mot. KMK 100 B 2/12**		
10	83714244	1	Gearwheel Z 97 M 1,6 B 32	500, V 3, i = 36,2		
			Stage 2 for one Hoist speed	**Mot. KMK 90 B 2**		
10	83714644	1	Gearwheel Z111 M 1,6 B 32	1250, 1000, 800, 630, V 1, i = 79,9		
10	83714444	1	Gearwheel Z105 M 1,6 B 32	800, 630, V 2, i = 58,8		
10	83714244	1	Gearwheel Z 97 M 1,6 B 32	500, V 3, i = 36,2		
			Stage 2 for one Hoist speed	**Mot. KMK 100 B 2**		
10	83714444	1	Gearwheel Z105 M 1,6 B 32	1000, V 2, i = 58,8		
11	83712844	1	Ring 40 X 55 X12			
12	36680799	1	Oil seal A 55X 80X 8		NBR !L	DIN 3760
13	34266599	1	Retaining ring 80X2,5		FedSt	DIN 472
14	92491644	1	O-ring 34 X 3 B		NB 70	DIN- 3770
15	36826899	2	Grooved ball bearing 6208 2RS		Wlz-St !L	DIN 625
16	71631144	2	Bush 8,5X 14 X12			
17	34287744	2	Securing clip SL 16 SXN08			
18	83770444	1	Supporting eye long DK10/16			
18	83770244	1	Supporting eye short DK10/16			
19	83761644	2	Setbolt 16H11X100 Nut			
21	83713744	1	Lock nut M20X1			
22	34276299	2	Retaining ring 42X2		FedSt	DIN 472
23	32158399	6	Hex.socket cylind.screw M 8 X 50		8.8 A2F	DIN 912
25	36050499	1	Grooved ball bearing 6004		Wlz-St !L	DIN 625
26	83713844	1	Pressure ring DK10/16			
27	33975199	2	Dished washer 90 X46 X3,5 B		50CRV4	DIN 2093
29	83726044	1	Coupling set DK10/16 XX	c/w item 21		
30			**Stage 1 for two Hoist speeds**	**Mot. KMK 90 B 2/8**		
30	83723044	1	Gearwheel Z141 M 1,25B 18	1000, 800, 630, V 1, i = 79,9		
30	83723044	1	Gearwheel Z141 M 1,25B 18	630, V 2, i = 58,8		
			Stage 1 for two Hoist speeds	**Mot. KMK 100 B 2/8**		
30	83723044	1	Gearwheel Z141 M 1,25B 18	1250, V 1, i = 79,9		
30	83723044	1	Gearwheel Z141 M 1,25B 18	1000, 800, V 2, i = 58,8		
			Stage 1 for two Hoist speeds	**Mot. KMK 100 B 2/12**		
30	83723044	1	Gearwheel Z141 M 1,25B 18	500, V 3, i = 36,2		
			Stage 1 for one Hoist speed	**Mot. KMK 90 B 2**		
30	83723044	1	Gearwheel Z141 M 1,25B 18	1250, 1000, 800, 630, V 1, i = 79,9		
30	83723044	1	Gearwheel Z141 M 1,25B 18	800, 630, V 2, i = 58,8		
30	83723044	1	Gearwheel Z141 M 1,25B 18	500, V 3, i = 36,2		
			Stage 1 for one Hoist speed	**Mot. KMK 100 B 2**		
30	83723044	1	Gearwheel Z141 M 1,25B 18	1000, V 2, i = 58,8		
33	35426499	1	Key A 6X 6X 45		C 45 K	DIN 6885
34			**Stage 2 for two Hoist speeds**	**Mot. KMK 90 B 2/8**		
34	83715544	1	Pinion shaft Z14M1,6 B 41	1000, 800, 630, V 1, i = 79,9		
34	83715344	1	Pinion shaft Z18M1,6 B 41	630, V 2, i = 58,8		
			Stage 2 for two Hoist speeds	**Mot. KMK 100 B 2/8**		
34	83715544	1	Pinion shaft Z14M1,6 B 41	1250, V 1, i = 79,9		
34	83715344	1	Pinion shaft Z18M1,6 B 41	1000, 800, V 2, i = 58,8		
			Stage 2 for two Hoist speeds	**Mot. KMK 100 B 2/12**		
34	83715244	1	Pinion shaft Z27M1,6 B 41	500, V 3, i = 36,2		
			Stage 2 for one Hoist speed	**Mot. KMK 90 B 2**		
34	83715544	1	Pinion shaft Z14M1,6 B 41	1250, 1000, 800, 630, V 1, i = 79,9		
34	83715344	1	Pinion shaft Z18M1,6 B 41	800, 630, V 2, i = 58,8		
34	83715244	1	Pinion shaft Z27M1,6 B 41	500, V 3, i = 36,2		
			Stage 2 for one Hoist speed	**Mot. KMK 100 B 2**		
34	83715344	1	Pinion shaft Z18M1,6 B 41	1000, V 2, i = 58,8		

22251005.tbl

222511K1.p65/110504

1) Quantity 0.40 litre, part no. 472 902 44 (1,0 kg).

Helical gearbox, 2-stages

Helical gearbox, combination with corresponding motor for one/two hoist speeds

Item no.	Part no.	Quantity	Designation		Material	Standard
35	34638899	1	Cylinder pin 5 h11X 45		St A2F	DIN 7
36	34638999	2	Cylinder pin 5 h11X 28		St A2F	DIN 7
37	34264799	1	Retaining ring 47X1,75		FedSt	DIN 472
38	36055499	1	Grooved ball bearing 6204		Wlz-St !L	DIN 625
39	83710244	1	Gearbox housing DK10 T.1	1)		
40	33987499	1	Sealing ring A10 X16 X1		CU	DIN 7603
41	31339499	1	Screw plug M10X1		5.8	DIN 908
42	34264844	1	Bleeding valve AM10X1			
43	34251744	1	Tolerance ring 16X 10			
44	83729444	1	Base plate chain guide DK10	c/w item 43		
45	83717844	2	Spring clip fastener 7,4X21,2			
47	83806344	1	Chain collector box DK10-20GR. 4	max. 8 m, c/w items 48 - 50		
47	83806544	1	Chain collector box DK10-20GR. 5	max. 20 m, c/w items 48 - 50		
48	83807044	1	Double spring washer DK10/20			
49	83806944	1	Setbolt 12H11X205 Nut			
50	34287644	1	Securing clip SL 12 SXN08			
51	83708344	1	Stop piece DK10	2)		
52	83769944	1	Chain 7,4X 21,2	3)		
53	32142399	4	Hex.socket cylind.screw M10 X 20		10.9 A2F!L	DIN 912
54	83737744	1	Chain guide set DK10	c/w items 57 - 59, 66		
55	83716344	2	Bush 40,5X 48,5X12,3			
56	83738044	1	Output shaft DK10/16	c/w item 57		
57	36640999	1	Oil seal A 25X 33X 6		NBR-CFW	DIN- 3760
58	92491644	1	O-ring 34 X 3 B		NB 70	DIN- 3770
59	83707844	1	Pilot section DK10 7 X21			
60	83761944	1	Load hook crossbeam DK10	c/w items 63 - 65		
61	83764544	1	Eye ring transverse DK10	c/w items 62, 65		
62	83764244	1	Eye ring DK10			
63	83865044	1	Load hook number 5 2,5 T			
64	83865944	1	Hook safety catch GR.5			
65	83762544	1	Crossbeam DK10			
66	83703544	1	Protective sleeve DK10/16			
67			**Stage 1 for two Hoist speeds**	**Mot. KMK 90 B 2/8**		
67	13847684	1	Shaft DK10 KMK 90B	1000, 800, 630, V 1, i = 79,9		
67	13847684	1	Shaft DK10 KMK 90B	630, V 2, i = 58,8		
			Stage 1 for two Hoist speeds	**Mot. KMK 100 B 2/8**		
67	14335684	1	Shaft coupling DK10/16	1250, V 1, i = 79,9		
67	14335684	1	Shaft coupling DK10/16	1000, 800, V 2, i = 58,8		
			Stage 1 for two Hoist speeds	**Mot. KMK 100 B 2/12**		
67	14335684	1	Shaft coupling DK10/16	500, V 3, i = 36,2		
			Stage 1 for one Hoist speed	**Mot. KMK 90 B 2**		
67	13847684	1	Shaft DK10 KMK 90B	1250, 1000, 800, 630, V 1, i = 79,9		
67	13847684	1	Shaft DK10 KMK 90B	800, 630, V 2, i = 58,8		
67	13847684	1	Shaft DK10 KMK 90B	500, V 3, i = 36,2		
			Stage 1 for one Hoist speed	**Mot. KMK 100 B 2**		
67	14335684	1	Shaft coupling DK10/16	1000, V 2, i = 58,8		

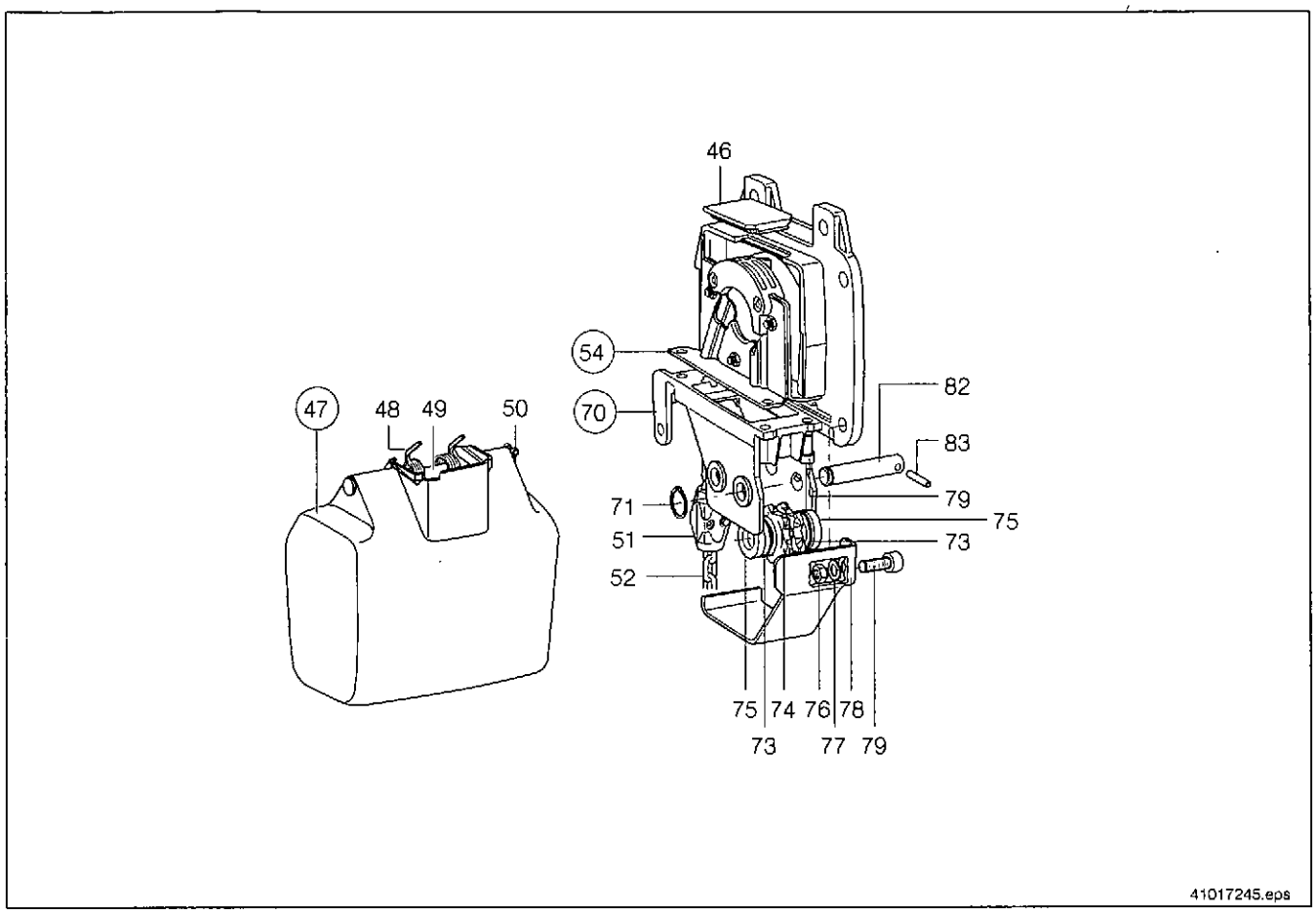
22251005.tbl

1) Quantity 0.40 litre, part no. 472 902 44 (1,0 kg).
2) Fix limit stop (item 51) to the 10th chain link.
3) Supplied per metre, state length required when ordering.

222511k1.p65/110504

Chain guide

Fittings for RKDK - EKDK low-headroom monorail hoist



Item no.	Part no.	Quantity	Designation		Material	Standard
1	83774044	1	Hook fittings DK10	c/w items 2, 5 - 7		
2	83775344	1	Buffer cover 1,0 T			
3	35091099	4	Round head dowel pin 3 X 5		St A2F	DIN 1476
4	83591044	2	Capacity plate 0,5 T AL	DKUN 10, 500		
4	83591744	2	Capacity plate 0,63T AL	DKUN 10, 630		
4	83591844	2	Capacity plate 0,8 T AL	DKUN 10, 800		
4	83590844	2	Capacity plate 1 T AL	DKUN 10, 1000		
4	83591944	2	Capacity plate 1,25T AL	DKUN 10, 1250		
5	83775244	1	Hook fittings DK10			
6	83717844	2	Spring clip fastener 7,4X21,2			
7	83765044	1	Load hook number 4 1,25T	c/w item 8		
8	83765944	1	Hook safety catch GR.4			

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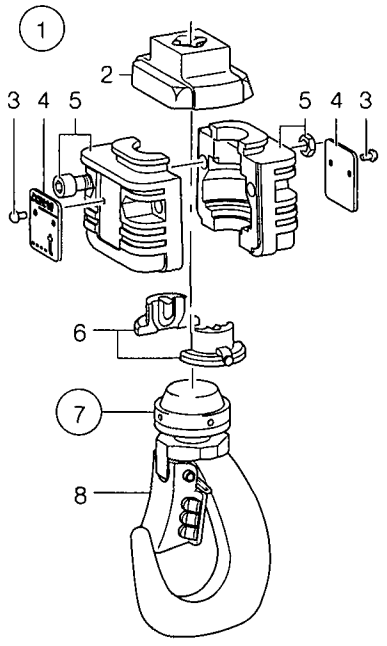
Hook with fittings, 1/1 reeving



40188744.eps

Item no.	Part no.	Quantity	Designation		Material	Standard
1	83774044	1	Hook fittings DK10	c/w items 2, 5 - 7		
2	83775344	1	Buffer cover 1,0 T			
3	35091099	4	Round head dowel pin 3 X 5		St A2F	DIN 1476
4	83591044	2	Capacity plate 0,5 T AL	DKUN 10, 500		
4	83591744	2	Capacity plate 0,63T AL	DKUN 10, 630		
4	83591844	2	Capacity plate 0,8 T AL	DKUN 10, 800		
4	83590844	2	Capacity plate 1 T AL	DKUN 10, 1000		
4	83591944	2	Capacity plate 1,25T AL	DKUN 10, 1250		
5	83775244	1	Hook fittings DK10			
6	83717844	2	Spring clip fastener 7,4X21,2			
7	83765044	1	Load hook number 4 1,25T	c/w item 8		
8	83765944	1	Hook safety catch GR.4			

22251007.tbl

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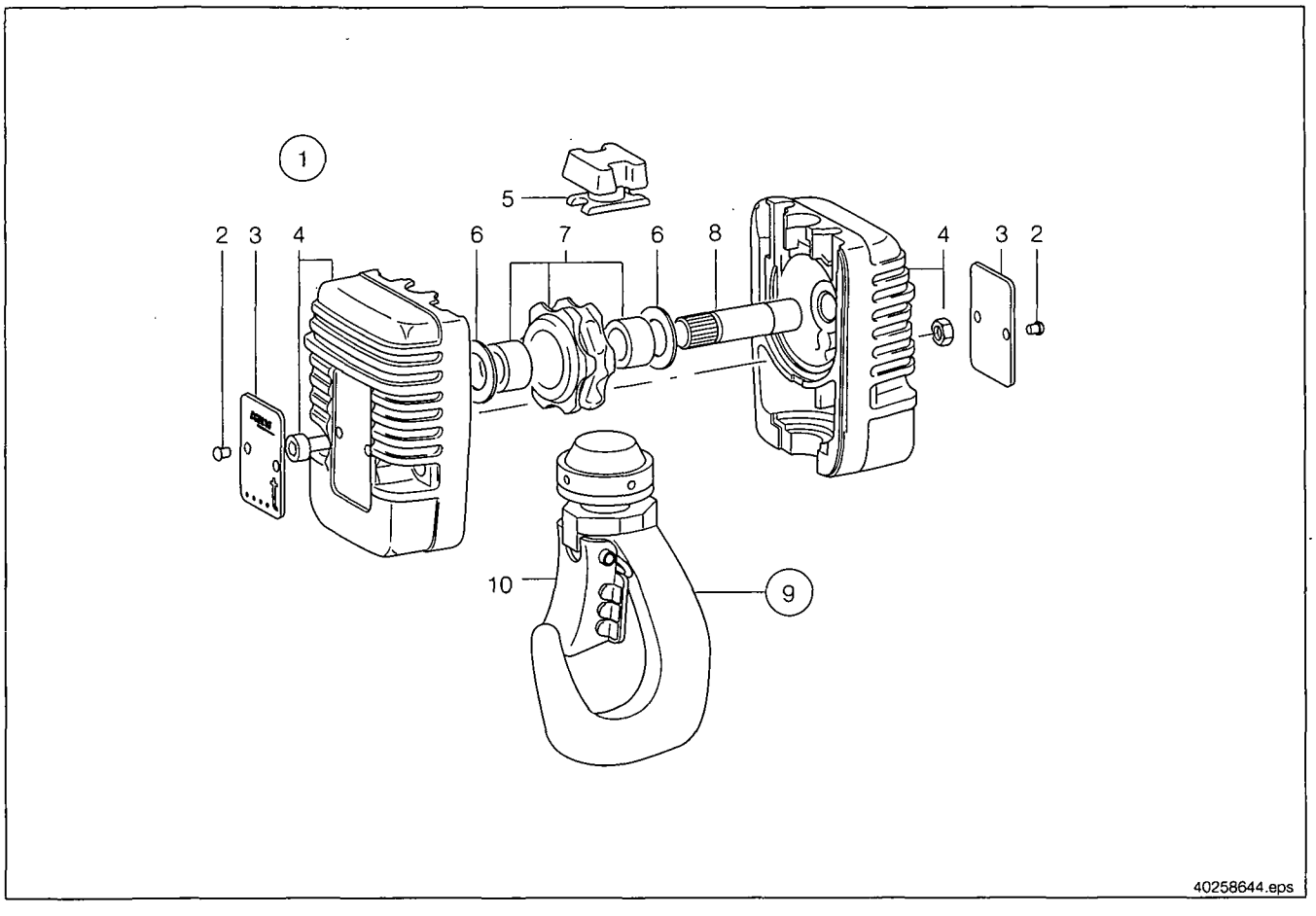
Bottom block, 2/1 reeving



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	83788144	1	Bottom block DK10 1CM RUD	c/w items 4 - 9		
2	35091099	4	Round head dowel pin 3 X 5		St A2F	DIN 1476
3	83593044	2	Capacity plate 1 T AL	DKUN 10, 500		
3	83597744	2	Capacity plate 1,25T AL	DKUN 10, 630		
3	83597644	2	Capacity plate 1,6 T AL	DKUN 10, 800		
3	83592844	2	Capacity plate 2 T AL	DKUN 10, 1000		
3	83597844	2	Capacity plate 2,5 T AL	DKUN 10, 1250		
4	83785244	1	Bottom block half DK10			
5	83786144	1	Buffer plug bottom block 2,0T			
6	34228944	2	Axial bearing disk 25X 42X1			
7	83788044	1	Return sheave 7,4X21,2 Z5	Needle-roller assembly, z = 5		
8	83785844	1	Bolt return sprocket 7,4X21,2			
9	83865044	1	Load hook number 5 2,5 T	c/w item 10		
10	83865944	1	Hook safety catch GR.5			

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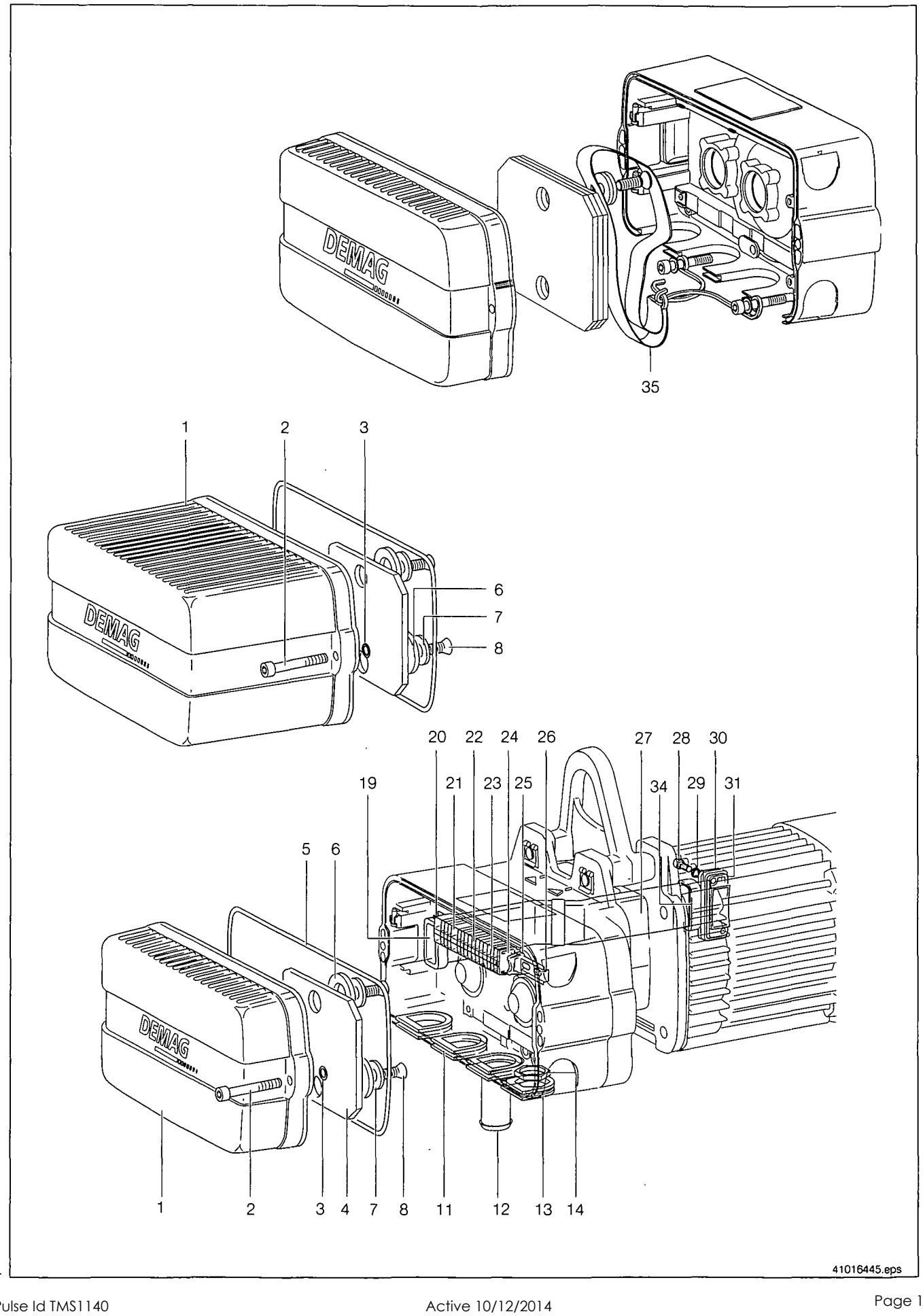
222511k1.p65/110504

Electrical components
Direct control



222511k1.p65/110504

Electrical components
Direct control

Item no.	Part no.	Quantity	Designation		Material	Standard
1	83712044	1	Hood short DK10-20			
1	83712344	1	Hood long DK10-20			
2	32158399	2	Hex.socket cylind.screw M 8 X 50		8.8 A2F	DIN 912
3	73917544	2	O-ring 7,3 X 2,4 B		NB 70/769	DIN- 3770
4	83712744	5	Counterweight DK10/16	Mot. 90 B, cover short		
4	83712744	3	Counterweight DK10/16	Mot. 90 B, cover long		
4	83712744	7	Counterweight DK10/16	Mot. 100 B 2, cover long		
4	83712744	5	Counterweight DK10/16	Mot. 100 B 2/8, B 2/12, cover long		
5	83722144	1	Seal DK10 3 X 980			
6	34054299	6	Washer A17 x 30 x3	Mot. 90 B, cover short	140HV A2F	DIN 125
6	34054299	8	Washer A17 x 30 x3	Mot. 90 B, cover long	140HV A2F	DIN 125
6	34054299	2	Washer A17 x 30 x3	Mot. 100 B 2, cover long	140HV A2F	DIN 125
7	34059199	2	Washer A13 x 24 x2,5		140HV A2F	DIN 125
8	15072099	2	Countersunk screw M 8 X 25		8.8A2FT40	DIN-7991
11	83620244	1	Plug-in unit M20			
11	83605644	1	Plug-in unit PG16			
12	83605144	1	Slide-in connection piece 20/3			
13	83620144	3	Plug-in unit, dummy M25			
13	83605244	3	Plug-in unit, dummy PG21			
14	53746184	2	Counter nut M25 EMV M			
19	83605044	1	Seal cable guide	Gearbox side		
20	89541744	1	Supporting rail 15 / 5,5X 160M			
21	89539544	1	Modular terminal 2,5X4X1DRDR	4 conductors		
22	89528444		Modular terminal 2,5X4X1DRDR	4 conductors 1)		
23	89528344		Modular terminal 2,5X2X1DRDR	2 conductors 1)		
24	89528544	1	End plate 264-368			
25	89541944	1	End angle TS15			
26	32475099	3	Thread rolling screw CE M 4X 12		St-TX A2F	DIN- 7500
27	83704644	1	Cable guide KM 90 B-DK10			
27	83704744	1	Cable guide KM100 B-DK10			
28	31892499	2	Hex.socket cylind.screw M 5 X 16	Mot. 90	10.9 A2F!L	DIN 912
28	32147999	2	Hex.socket cylind.screw M 6 X 16	Mot. 100	10.9 A2F!L	DIN 912
29	34387344	2	Screw locking device M 5	Mot. 90		
29	34387444	2	Screw locking device M 6	Mot. 100		
30	83604944	1	Elbow piece cable tray GR1	Mot. 90		
30	83704944	1	Elbow piece cable tray Gr.2	Mot. 100		
31	05480684	1	O-ring 46 X 2,5+-0,08	Mot. 90	KB71,80,90	DIN- 3771
31	06980684	1	O-ring 58 X 2,5+-0,08	Mot. 100	Perbunan	DIN- 3771
34	83615044	1	Seal cable guide	Motor side		
35	83755344	1	Cover securing set DK10,16,20			

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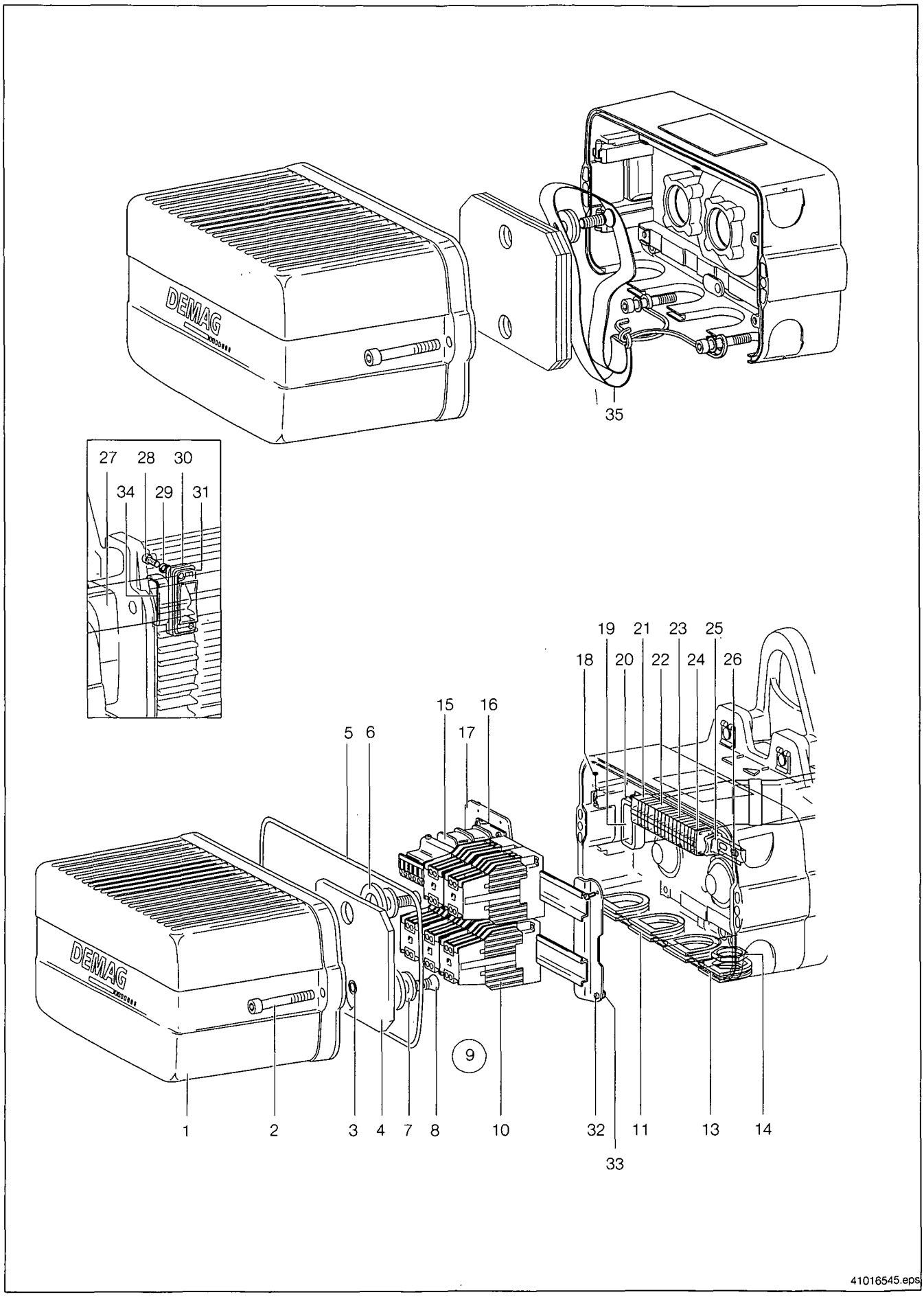
222511k1.p65/110504

1) Quantity depends on the version.

Electrical components
Contactor control



222511k1.p65/110504

Electrical components
Contactor control

Item no.	Part no.	Quantity	Designation		Material	Standard
1	83712344	1	Hood long DK10-20			
2	32158399	2	Hex.socket cylind.screw M 8 X 50		8.8 A2F	DIN 912
3	73917544	2	O-ring 7,3 X 2,4 B		NB 70/769	DIN- 3770
4	83712744	3	Counterweight DK10/16	Mot. 100		
4	83712744	1	Counterweight DK10/16	Mot. 90		
5	83722144	1	Seal DK10 3 X 980			
6	34054299	10	Washer A17 x 30 x3	Mot. 100	140HV A2F	DIN 125
6	34054299	16	Washer A17 x 30 x3	Mot. 90	140HV A2F	DIN 125
7	34059199	2	Washer A13 x 24 x2,5		140HV A2F	DIN 125
8	15072099	2	Countersunk screw M 8 X 25		8.8A2FT40	DIN- 7991
9			Switchgear set 3-Phase Design	c/w items 10, 15 - 18, 20 - 26		
9	19801846	1	Switchgear set 230V 50HZ VDE	Main hoist, 1), 2), 3)		
9	19800646	1	Switchgear set 400/230V50HZ VDE	Main hoist 1),3)		
9	19801246	1	Switchgear set 400/230V50HZ VDE	Main hoist 1),3),4)		
9	19801946	1	Switchgear set 230V 50HZ VDE	Main/creep hoisting 1),2),3)		
9	19800746	1	Switchgear set 400/230V50HZ VDE	Main/creep hoisting 1),3)		
9	19801346	1	Switchgear set 400/230V50HZ VDE	Main/creep hoisting 1),3),4)		
9	19802046	1	Switchgear set 230V 50HZ VDE	Main hoist+cross travel 1),2),3)		
9	19800846	1	Switchgear set 400/230V50HZ VDE	Main hoist+cross travel 1),3)		
9	19801446	1	Switchgear set 400/230V50HZ VDE	Main hoist+cross travel 1),3),4)		
9	19802146	1	Switchgear set 230V 50HZ VDE	Main/creep hoisting+cross travel 1),2),3)		
9	19800946	1	Switchgear set 400/230V50HZ VDE	Main/creep hoisting+cross travel 1),3)		
9	19801546	1	Switchgear set 400/230V50HZ VDE	Main/creep hoisting+cross travel 1),3),4)		
9	19802246	1	Switchgear set 230V 50HZ VDE	Main hoist+cross travel,2 speeds 1:4, 1),2),3)		
9	19801046	1	Switchgear set 400/230V50HZ VDE	Main hoist+cross travel,2 speeds 1:4, 1),3)		
9	19801646	1	Switchgear set 400/230V50HZ VDE	Main hoist+cross travel,2 speeds 1:4, 1),3),4)		
9	19802346	1	Switchgear set 230V 50HZ VDE	Main/creep hoisting+cross travel, 2 speeds, 1), 2), 3)		
9	19801146	1	Switchgear set 400/230V50HZ VDE	Main/creep hoisting+cross travel, 2 speeds, 1), 2), 3)		
9	19801746	1	Switchgear set 400/230V50HZ VDE	Main/creep hoisting+cross travel, 2 speeds, 1),2),3),4)		
10	87535244	2	Contactor DSW 3TF8133 42V50HZ	1 NC		
10	87535044	2	Contactor DSW 3TF8133 230/220V50HZ	1 NC		
10	87536244	1	Contactor DSUB 111 42V50HZ	1 NO + 1 NC		
10	87536044	1	Contactor DSUB 111 230/220V50HZ	1 NO + 1 NC		
10	87548744	1	Contactor DSKR 110 42V50HZ	1 NO		
10	87545544	1	Contactor DSKR 110 230/220V50HZ	1 NO		
10	89510544	1	Compact rev.contactor 42V50HZ	1 NO + 1 NC		
10	89563444	1	Compact rev.contactor 230V50HZ	1 NO + 1 NC		
10	57524444	1	AC power contactor 25C 42V56 11E			
10	57524844	1	AC power contactor 25C230V56 11E			
10	87559244	1	Contactor DSW 3TF8633 42V50HZ	1 NC		
10	87559044	1	Contactor DSW 3TF8633 230/220V50HZ	1 NC		
11	83620244	1	Plug-in unit M20			
11	83605644	1	Plug-in unit PG16			
13	83620144	3	Plug-in unit, dummy M25			
13	83605244	3	Plug-in unit, dummy PG21			
14	53746184	2	Counter nut M25 EMV M			
15	89553944	1	Control transformer 36VA400/ 42V			
15	89569944	1	Control transformer 36VA400/230V			
15	89595044	1	Control transformer 63VA400/ 42V			
15	89597144	1	Control transformer 63VA400/230V			
16	31892599	4	Cylinder screw M 4X 8Z DIN84		4.8 A2F	DIN 6900
17	83712244	1	Mounting plate DK10-20			
18	34280444	1	Clamping plate 4X1.5X11.2			
19	83605044	1	Seal cable guide	Gearbox side		
20	89541744	1	Supporting rail 15 / 5,5X 160M			
21	89539544	1	Modular terminal 2,5X4X1DRDR	4 conductors		
22	89528444		Modular terminal 2,5X4X1DRDR	4 conductors 5)		
23	89528344		Modular terminal 2,5X2X1DRDR	2 conductors 5)		
24	89528544	1	End plate 264-368			
25	89541944	1	End angle TS15			
26	32475099	3	Thread rolling screw CE M 4X 12		St-TX A2F	DIN- 7500
27	83704644	1	Cable guide KM 90 B-DK10			
27	83704744	1	Cable guide KM100 B-DK10			
28	31892499	2	Hex.socket cylind.screw M 5 X 16	Mot. 90	10.9 A2F!L	DIN 912
28	32147999	2	Hex.socket cylind.screw M 6 X 16	Mot. 100	10.9 A2F!L	DIN 912
29	34387344	2	Screw locking device M 5	Mot. 90		
29	34387444	2	Screw locking device M 6	Mot. 100		
30	83604944	1	Elbow piece cable tray GR1	Mot. 90		
30	83704944	1	Elbow piece cable tray Gr.2	Mot. 100		
31	05480684	1	O-ring 46 X 2,5+-0,08	Mot. 90	KB71,80,90	DIN- 3771
31	06980684	1	O-ring 58 X 2,5+-0,08	Mot. 100	Perbunan	DIN- 3771
32	31921499	2	Hex.socket cylind.screw M 5 X 12		10.9 A2F!L	DIN 912
33	34085499	2	Washer 4,3X 8 X 0,5		VULKANFIBE	DIN- 433
34	83615044	1	Seal cable guide	Motor side		
35	83755344	1	Cover securing set DK10,16,20			

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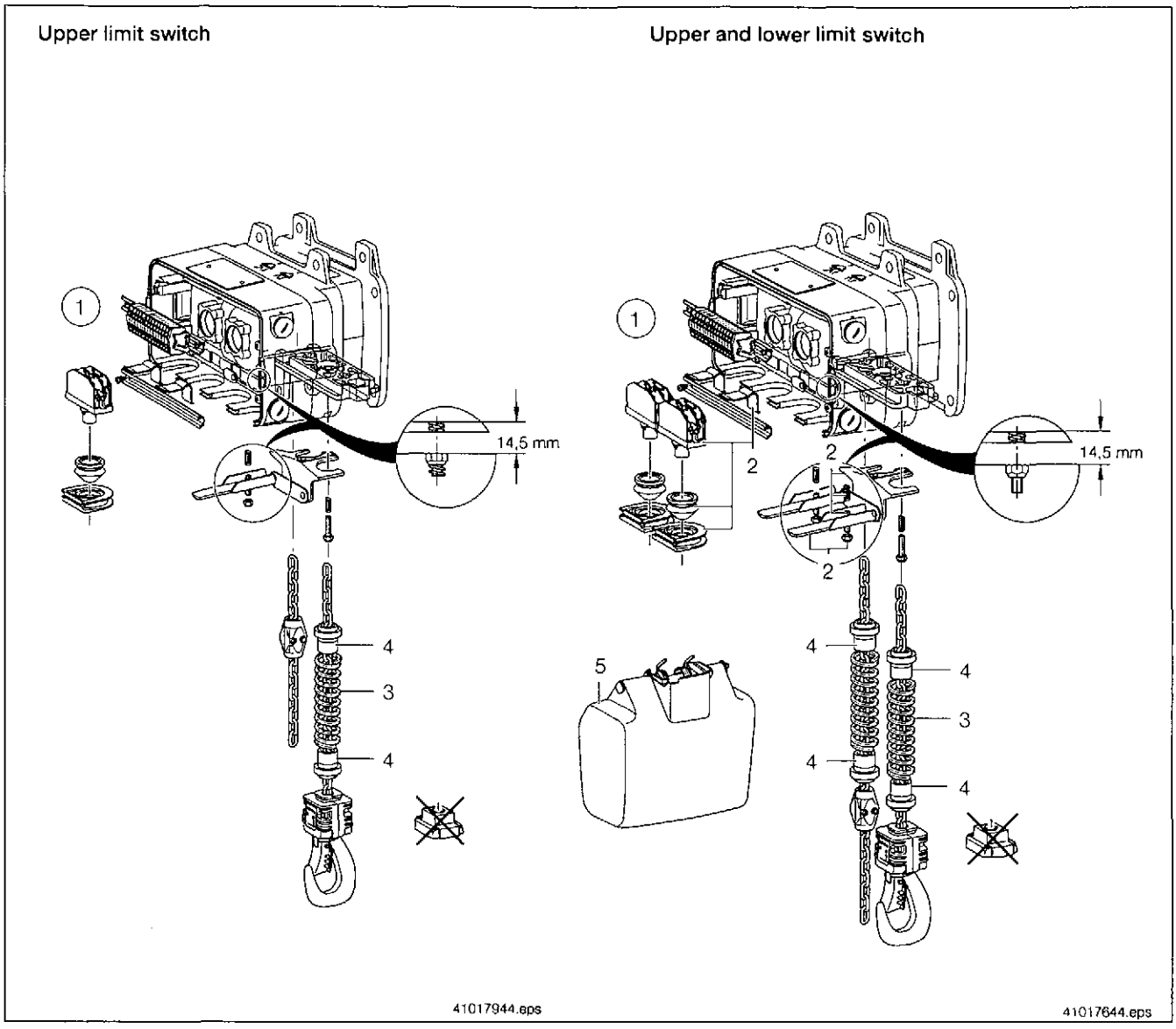
1) State operating and control voltage when ordering.
2) Without control transformer.
3) Wired according to order no.
4) With crane switch.
5) Quantity depends on the version.

222511k1.p65/110504

Limit switch for the upper and lower hook position
1/1 reeving



Limit switch for the upper hook position

Item no.	Part no.	Quantity	Designation	Material	Standard
1	83778344	1	Limit switching set DK10		
3	34087999	1	Pressure spring 3,6 X36,4X155		
4	83728644	2	Cut-out sleeve DK10		

22251011.tbl

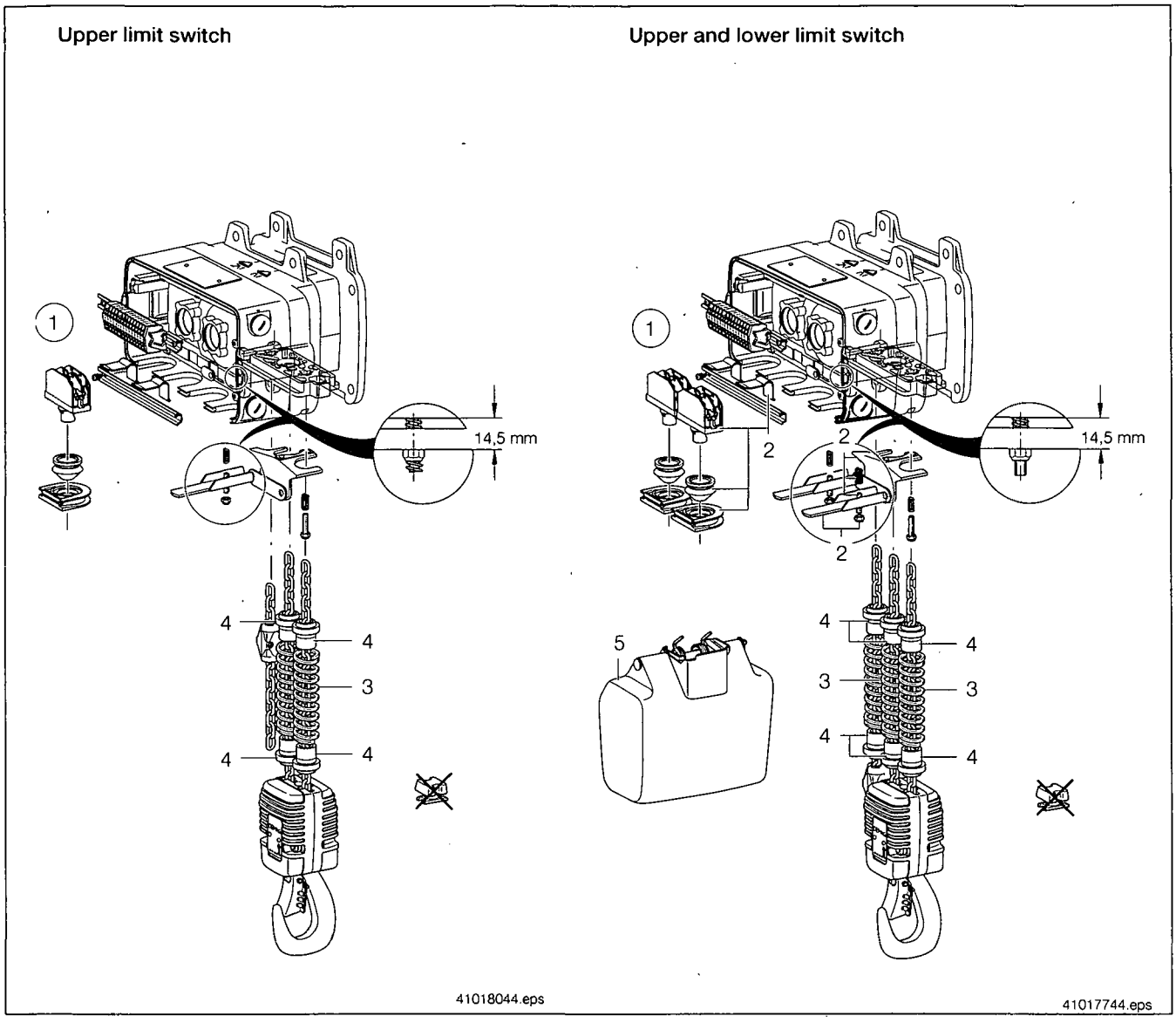
Limit switch for the upper and lower hook position

Item no.	Part no.	Quantity	Designation		Material	Standard
1	83778344	1	Limit switching set DK10	Basic set		
2	83778244	1	Limit switching set DK10/16	Supp. set		
3	34087999	2	Pressure spring 3,6 X36,4X155			
4	83728644	4	Cut-out sleeve DK10			
5	83806544	1	Chain collector box DK10-20GR. 5	max. chain length 17 m		

22251012.tbl

22251112.p65/110504

Limit switch for the upper and lower hook position 2/1 reeving



Limit switch for the upper hook position

Item no.	Part no.	Quantity	Designation	Material	Standard
1	83778344	1	Limit switching set DK10		
3	34087999	2	Pressure spring 3,6 X36,4X155		
4	83728644	4	Cut-out sleeve DK10		

22251013.tbl

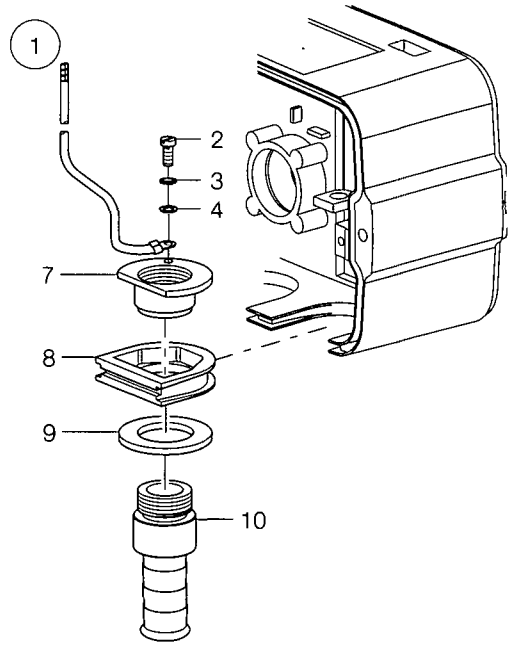
Limit switch for the upper and lower hook position

Item no.	Part no.	Quantity	Designation		Material	Standard
1	83778344	1	Limit switching set DK10	Basic set		
2	83778244	1	Limit switching set DK10/16	Supp. set		
3	34087999	3	Pressure spring 3,6 X36,4X155			
4	83728644	6	Cut-out sleeve DK10			
5	83806544	1	Chain collector box DK10-20GR. 5	max. chain length 17 m		

22251014.tbl

222511k2.p65/110504

Reinforced M24 x 1,5 cable sleeve insert



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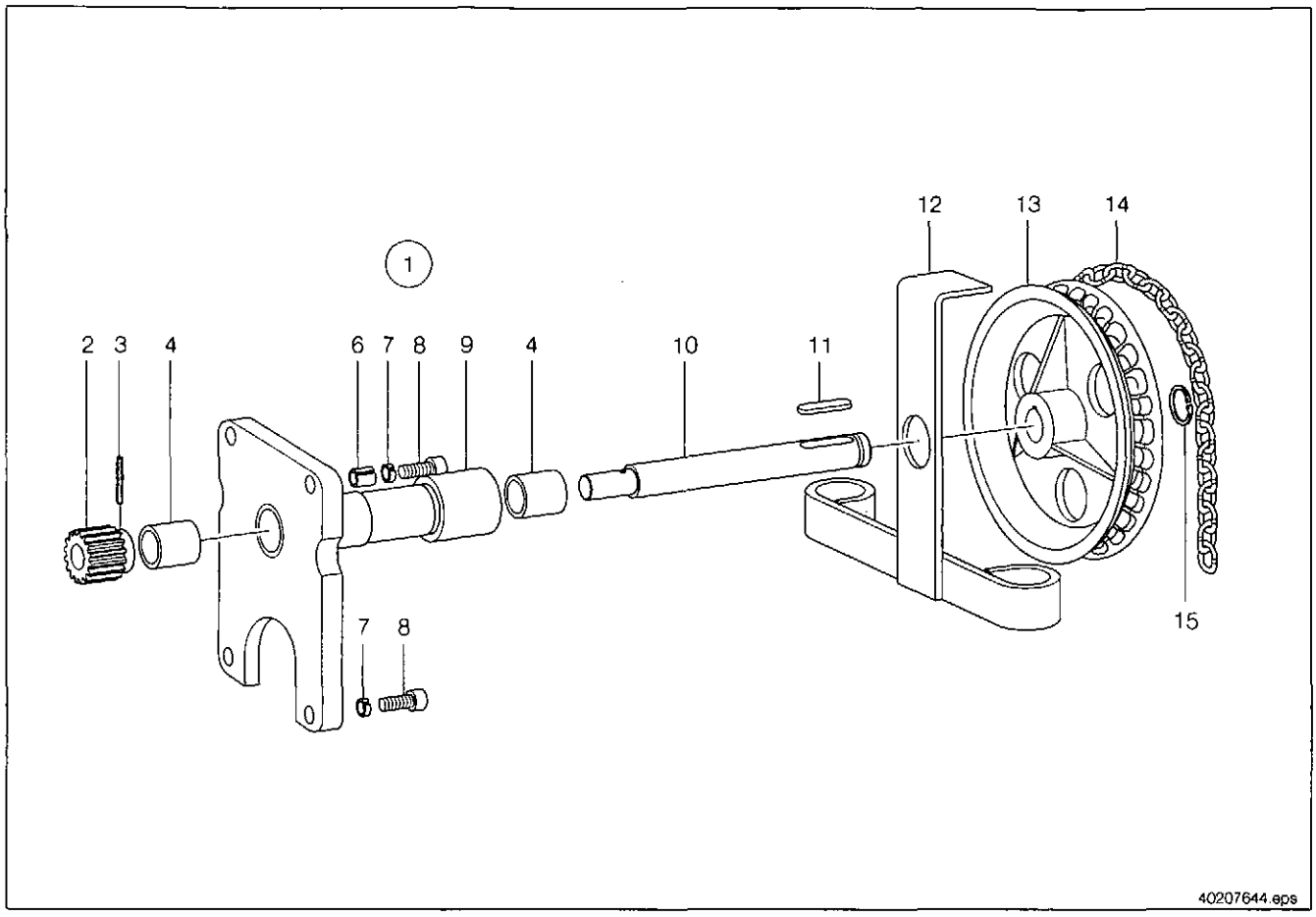
Item no.	Part no.	Quantity	Designation		Material	Standard
1	83654044	1	Plug-in unit M24X1,5DK 1-20	c/w items 2 - 4, 7 - 10		
2	31813699	1	Cylinder screw M 4 X 10		4.8 A2F	DIN 84
3	34398199	1	Serrated lock washer A 4,3		Fedst A2F	DIN 6798
4	34040399	1	Washer 4,3X 8 X 0,5		140HV A2F	DIN 433
7	83654144	1	Bush M24X1,5			
8	83620144	1	Plug-in unit, dummy M25			
9	34034199	1	Washer 26 X 44 X 4		100HV A2F	DIN 126
10	83654244	1	Screw socket M24X1,5			

22249506.tbl

2225111k2.p65/110504

Hand chain drive for HU 11 DK/HU 22 DK trolley



Item no.	Part no.	Quantity	Designation		Material	Standard
1	56189044	1	Hand chain drive HU5+10PK	c/w items 2 - 13, 15		
2	56189644	1	Pinion Z 18 M 2 B 34			
3	34469599	1	Full lgth.par.gr.dowel pin 6 X 30		St	DIN 1473
4	34219944	2	Bush 25X 28X30 B			
6	34575899	1	Split sleeve 11 X 12		ST	ISO-13337
7	34310899	4	Lock washer 8 A		FedSt	DIN 127
8	31924299	4	Hex.socket cylind.screw M 8 X 25	36 Nm	10.9	DIN 912
9	50221944	1	Bush 37 X 42,4X44			
10	56189444	1	Drive shaft HU 5+10PK			
11	35427799	1	Key A 8X 7X 40		C 45 K	DIN 6885
12	50226544	1	Chain guide bracket			
13	50226344	1	Reel wheel 200 FAHRWERK			
14	47260499	1	Round steel chain 3- 5X18,5	1)	ST35-2 Zn	DIN 766
15	34252599	1	Retaining ring 25X1,2		FedSt	DIN 471

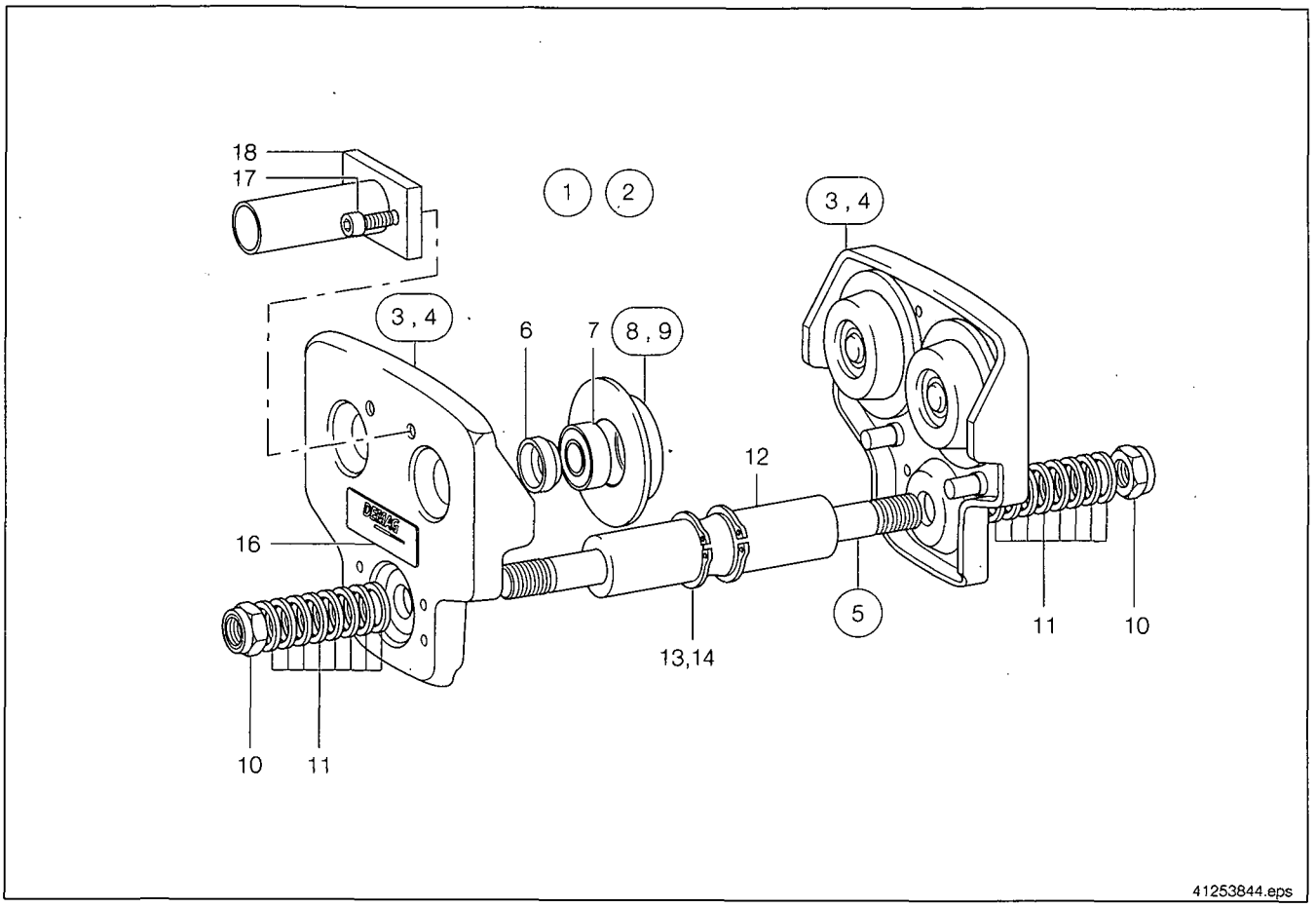
22250020.tbl

22251142.p65/110504

1) Supplied per metre, state length required when ordering.

Standard headroom monorail hoist
Trolley RU 6 DK
SWL 700 kg
Flange width 58 - 300 mm

Suitable for Demag chain hoist
DKUN 10-500, 1/1 reeving



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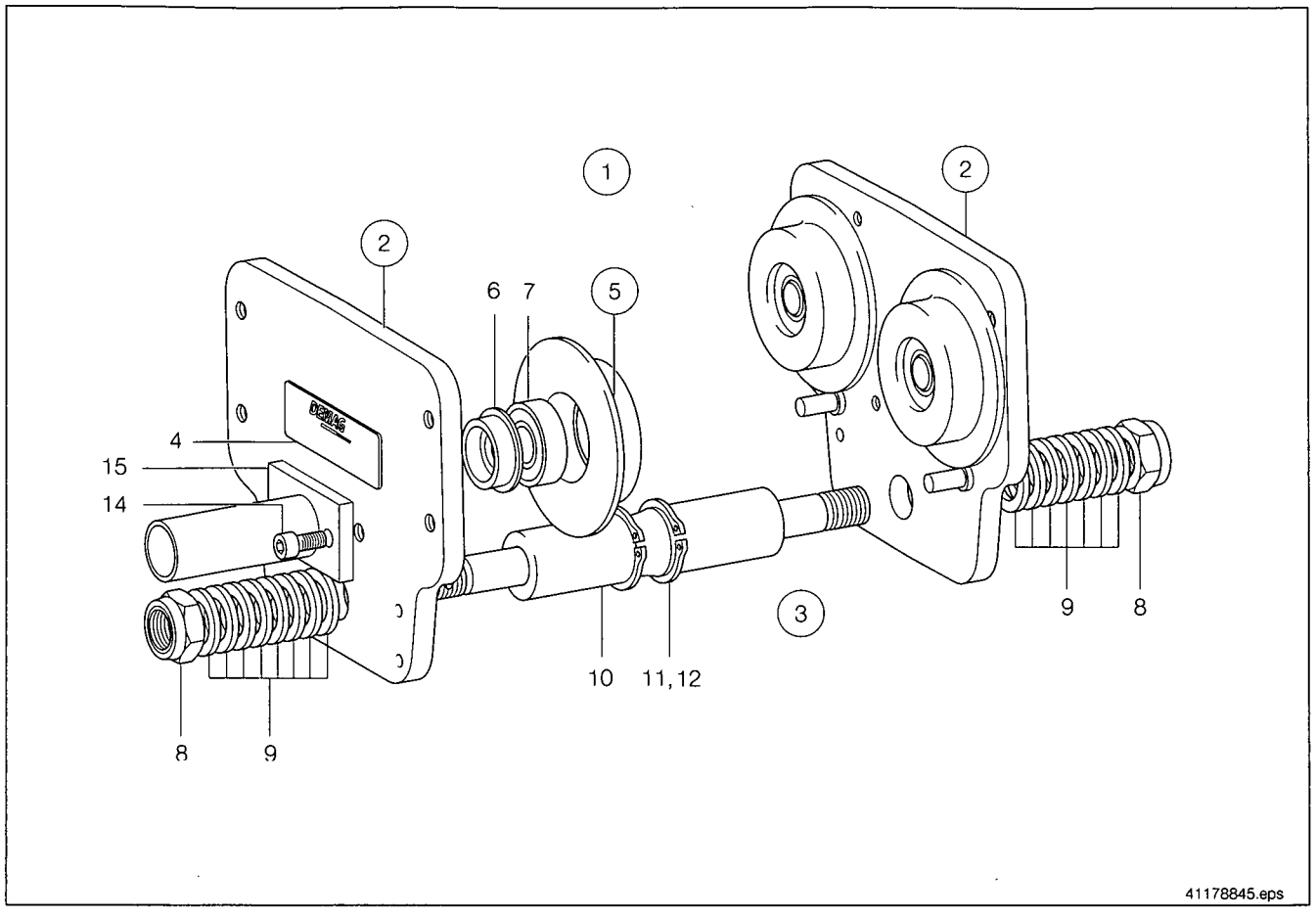
Item no.	Part no.	Quantity	Designation		Material	Standard
1	83963444	1	Tr.un.tr.whl.cyl.w/o crossb. RU 6	c/w item 3		
2	83963244	1	Tr.un.tr.whl.coni.w/o crossb. RU 6	c/w item 4		
3	83963144	2	Side plate RU6DK	c/w items 6, 8, 16		
4	83963044	2	Side plate trv.whl.con.w/o gear rim	c/w items 6, 9, 16		
5	83963944	1	Crossbeam RU 6 Flb. 58- 90	c/w items 10 - 13		
5	83964044	1	Crossbeam RU 6 Flb. 91-143	c/w items 10 - 13		
5	83952044	1	Crossbeam RU 6 Flb.144-200	c/w items 10 - 12, 14		
5	83952144	1	Crossbeam RU 6 Flb.201-300	c/w items 10 - 12, 14		
6	83970844	2	Bush 17,1X 32 X 9,6			
7	36822399	1	Grooved ball bearing 6203 2Z		Wlz-St	DIN 625
8	83983644	2	Cylindrical tr.wheel 65 1SPK OZ	c/w item 7		
9	83963544	2	Conical travel wheel 65 1SPK OZ	c/w item 7		
10	33468699	2	Hexagonal nut M20 X1,5		8 A2F	DIN 985
11	56312444	10	Washer 20,3X 30 X 4	Fl. W. 58 - 90		
11	56312444	16	Washer 20,3X 30 X 4	Fl. W. 91 - 143		
11	56312444	16	Washer 20,3X 30 X 4	Fl. W. 144 - 200		
11	56312444	28	Washer 20,3X 30 X 4	Fl. W. 201 - 300		
12	83963744	1	Tube 30 X 4,5 X 77	Fl. W. 58 - 90		
12	83963844	1	Tube 30 X 4,5 X 110	Fl. W. 91 - 143		
12	83951244	1	Tube 38 X 8 X 163	Fl. W. 144 - 200		
12	83951344	1	Tube 38 X 8 X 220	Fl. W. 201 - 300		
13	34248699	2	Retaining ring 30X2	Fl. W. 58 - 143	FedSt	DIN 471
14	34248499	2	Retaining ring 38X2,5	Fl. W. 144 - 300	FedSt	DIN 471
16	83961744	1	Capacity plate 700KG			
17	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2F!L	DIN 912
18	83973744	1	Current collector tube 400			

22251015.tbl

222511k2.p65/110504

Standard headroom monorail hoist
Trolley RU 11 DK
SWL 1350 kg
Flange width 58 – 300 mm

Suitable for Demag chain hoist
DKUN 10-800/1000/1250, 1/1 reeving
DKUN 10-500/630, 1/1 and 2/1 reeving



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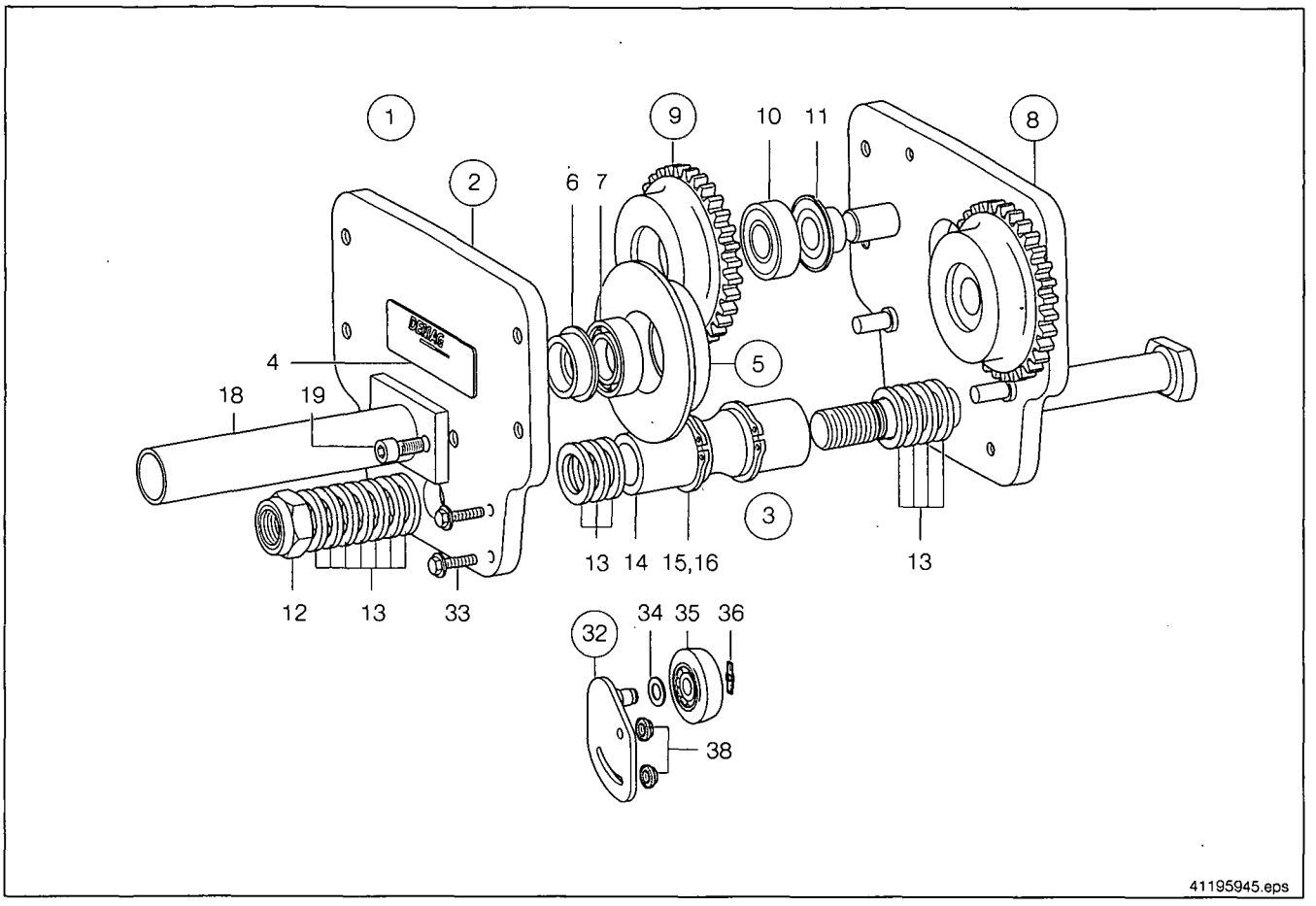
Item no.	Part no.	Quantity	Designation		Material	Standard
1	84010344	1	Tr.un.tr.whl.univ.w/o crossb. RU11	c/w item 2		
2	84010844	2	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 5		
3	83965944	1	Crossbeam RU11 Flb. 58- 90	c/w items 8 - 11		
3	83966044	1	Crossbeam RU11 Flb. 91-143	c/w items 8 - 11		
3	83953544	1	Crossbeam RU11 Flb.144-200	c/w items 8 - 10, 12		
3	83953644	1	Crossbeam RU11 Flb.201-300	c/w items 8 - 10, 12		
4	83962744	1	Capacity plate 1350KG			
5	84014044	2	Universal travel wheel 80 1SPK OZ	c/w items 6, 7		
6	83970944	1	Collar packing sleeve			
7	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
8	33460299	2	Hexagonal nut M24 X2		8 A2F	DIN 985
9	56322444	10	Washer 24,5X 36,5X 4	Fl. W. 58 - 90		
9	56322444	15	Washer 24,5X 36,5X 4	Fl. W. 91 - 143		
9	56322444	16	Washer 24,5X 36,5X 4	Fl. W. 144 - 200		
9	56322444	27	Washer 24,5X 36,5X 4	Fl. W. 201 - 300		
10	83965744	1	Tube 34 X 5 X88	Fl. W. 58 - 90		
10	83965844	1	Tube 34 X 5 X 120	Fl. W. 91 - 143		
10	83952744	1	Tube 45 X10 X 174	Fl. W. 144 - 200		
10	83952844	1	Tube 45 X10 X 230	Fl. W. 201 - 300		
11	34248799	2	Retaining ring 34X2,5	Fl. W. 58 - 143	FedSt	DIN 471
12	34247499	2	Retaining ring 45X2,5	Fl. W. 144 - 300	FedSt	DIN 471
14	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2F!L	DIN 912
15	83973744	1	Current collector tube 400			

22251016.tbl

2225111k2.p65/110504

Standard headroom monorail hoist
Trolley EU 11 DK
SWL 1350 kg
Flange width 58 – 300 mm

Suitable for Demag chain hoist
DKUN 10-800/1000/1250, 1/1 reeving
DKUN 10-500/630, 1/1 and 2/1 reeving



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	84010444	1	Tr.un.tr.whl.univ.w/o crossb. EU11	c/w items 2, 8		
2	84010844	1	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 5		
3	83952344	1	Crossbeam EU11 Flb. 58- 90	c/w items 12 - 15, 32		
3	83952444	1	Crossbeam EU11 Flb. 91-143	c/w items 12 - 15, 32		
3	83954444	1	Crossbeam EU11 Flb.144-200	c/w items 12 - 14, 16		
3	83954544	1	Crossbeam EU11 Flb.201-300	c/w items 12 - 14, 16		
4	83962744	1	Capacity plate 1350KG			
5	84014044	2	Universal travel wheel 80 1SPK OZ	c/w items 6, 7		
6	83970944	1	Collar packing sleeve			
7	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
8	84010744	1	Side plate trv.whl.univ.w.gear rim	c/w item 9		
9	84015044	2	Universal travel wheel 80 1SPK MZ	c/w items 10, 11		
10	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
11	83975944	1	Collar packing sleeve EU11			
12	33460299	1	Hexagonal nut M24 X2		8 A2F	DIN 985
13	56322444	10	Washer 24,5X 36,5X 4	Fl. W. 58 - 90		
13	56322444	15	Washer 24,5X 36,5X 4	Fl. W. 91 - 143		
13	56322444	16	Washer 24,5X 36,5X 4	Fl. W. 144 - 200		
13	56322444	27	Washer 24,5X 36,5X 4	Fl. W. 201 - 300		
14	83965744	1	Tube 34 X 5 X88	Fl. W. 58 - 90		
14	83965844	1	Tube 34 X 5 X 120	Fl. W. 91 - 143		
14	83952744	1	Tube 45 X10 X 174	Fl. W. 144 - 200		
14	83952844	1	Tube 45 X10 X 230	Fl. W. 201 - 300		
15	34248799	2	Retaining ring 34X2,5	Fl. W. 58 - 143	FedSt	DIN 471
16	34247499	2	Retaining ring 45X2,5	Fl. W. 144 - 300	FedSt	DIN 471
18	83973744	1	Current collector tube 400			
19	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2F!L	DIN 912
32	83913044	1	Supporting roller unit	c/w items 33 - 36, 38		
33	30021144	2	Lock screw M 6X25 VB.RIPP			
34	34142899	1	Shim 10X 16X0,5		St2K50	DIN 988
35	98453644	1	Travel wheel 44 KG-L			
36	98058944	1	Safety clamp 7			
38	30044044	2	Lock nut M 6 VB.RIPP			

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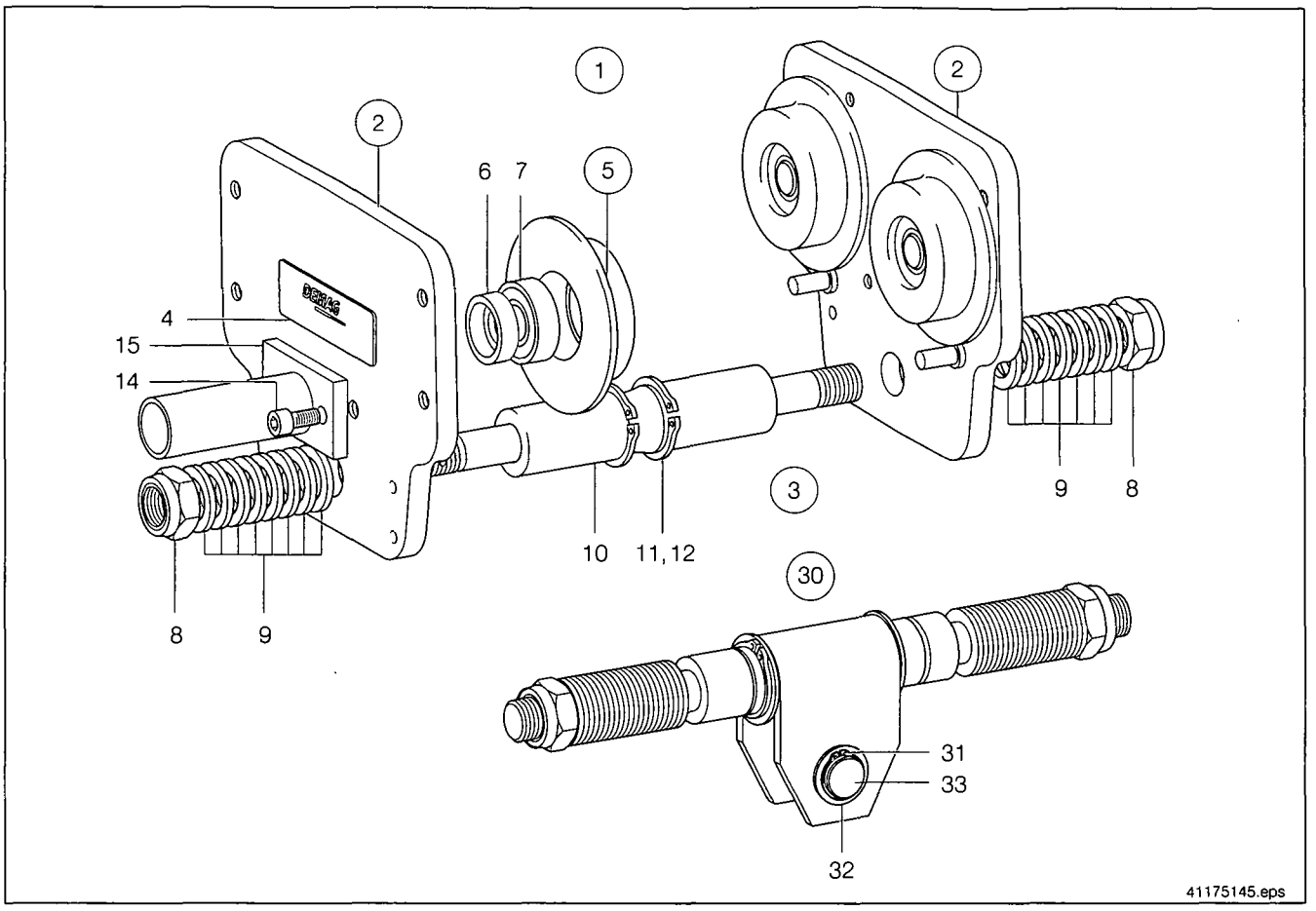
222511k2.p65/110504

Standard headroom monorail hoist
Trolley RU 22 DK
SWL 2600 kg
Flange width 82 – 300 mm

Suitable for Demag chain hoist DKUN 10-500/630/800/1000/1250, 1/1 and 2/1 reeving



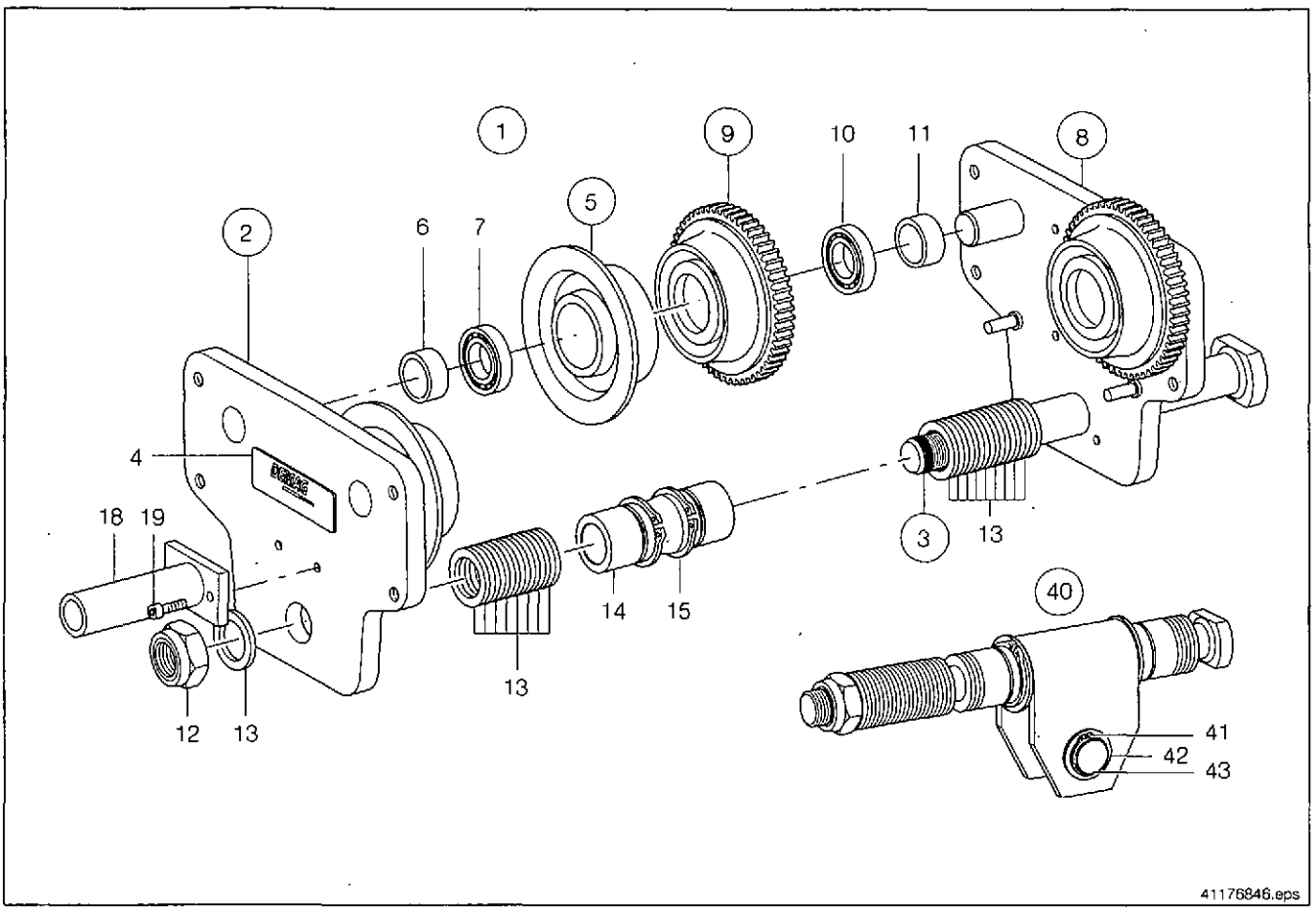
Item no.	Part no.	Quantity	Designation		Material	Standard
1	84011344	1	Tr.un.tr.whl.univ.w/o crossb. RU22	c/w item 2		
2	84011644	2	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 5		
3	83955644	1	Crossbeam RU22 Flb. 82-143	c/w items 8 - 11		
3	83955744	1	Crossbeam RU22 Flb.144-200	c/w items 8 - 11		
3	83955844	1	Crossbeam RU22 Flb.201-300	c/w items 8 - 11		
4	83964744	1	Capacity plate 2600KG			
5	84016044	2	Universal travel wheel 112 1SPK OZ	c/w items 6, 7		
6	84017244	1	Bush 30,2X 38 X17,4			
7	36822699	1	Grooved ball bearing 6206 2Z		Wlz-St	DIN 625
8	33468799	2	Hexagonal nut M30 X2		8 A2F	DIN 985
9	50222044	19	Washer 35,5X 50 X 4	Fl. W. 82 - 143		
9	50222044	16	Washer 35,5X 50 X 4	Fl. W. 144 - 200		
9	50222044	27	Washer 35,5X 50 X 4	Fl. W. 201 - 300		
10	83955044	1	Tube 51 X 7,1 X 109	Fl. W. 82 - 143		
10	83955144	1	Tube 51 X 7,1 X 174	Fl. W. 144 - 200		
10	83955244	1	Tube 51 X 7,1 X 230	Fl. W. 201 - 300		
11	34244299	2	Retaining ring 52X3		FedSt	DIN 471
14	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2FIL	DIN 912
15	83973744	1	Current collector tube 400			
30	56334044	1	Crossbeam RU10PK Flb.144-200	c/w items 31 - 33		
30	56334544	1	Crossbeam RU10PK Flb.201-300	c/w items 31 - 33		
31	34243599	2	Retaining ring 35X2,5		FedSt !L	DIN 471
32	34351499	2	Shim 35X 45X1		St2K50	DIN 988
33	56334644	1	Pin 35 X 84,5 Nut			

22251018.tbl

22251112.p65/110504

Standard headroom monorail hoist
Trolley EU 22 DK
SWL 2600 kg
Flange width 82 – 300 mm

Suitable for Demag chain hoist DKUN 10-500/630/800/1000/1250, 1/1 and 2/1 reeving



Item no.	Part no.	Quantity	Designation		Material	Standard
1	84011444	1	Tr.un.tr.whl.univ.w/o crossb. EU22	c/w items 2, 8		
2	84011644	1	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 5		
3	83956344	1	Crossbeam EU22 Flb. 82-143	c/w items 12 - 15		
3	83956444	1	Crossbeam EU22 Flb.144-200	c/w items 12 - 15		
3	83956544	1	Crossbeam EU22 Flb.201-300	c/w items 12 - 15		
4	83964744	1	Capacity plate 2600KG			
5	84016044	2	Universal travel wheel 112 1SPK OZ	c/w items 6, 7		
6	84017244	1	Bush 30,2X 38 X17,4			
7	36822699	1	Grooved ball bearing 6206 2Z		Wlz-St	DIN 625
8	84011744	1	Side plate trv.whl.univ.w.gear rim	c/w item 9		
9	84017044	2	Universal travel wheel 112 1SPK MZ	c/w items 10, 11		
10	36822699	1	Grooved ball bearing 6206 2Z		Wlz-St	DIN 625
11	84017344	1	Bush 30,2X 38 X23,2			
12	33468799	1	Hexagonal nut M30 X2		8 A2F	DIN 985
13	50222044	19	Washer 35,5X 50 X 4	Fl. W. 82 - 143		
13	50222044	17	Washer 35,5X 50 X 4	Fl. W. 144 - 200		
13	50222044	28	Washer 35,5X 50 X 4	Fl. W. 201 - 300		
14	83955044	1	Tube 51 X 7,1 X 109	Fl. W. 82 - 143		
14	83955144	1	Tube 51 X 7,1 X 174	Fl. W. 144 - 200		
14	83955244	1	Tube 51 X 7,1 X 230	Fl. W. 201 - 300		
15	34244299	2	Retaining ring 52X3		FedSt	DIN 471
18	83973744	1	Current collector tube 400			
19	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2F!L	DIN 912
40	83976844	1	Crossbeam EU10/22Flb.144-200	c/w items 41 - 43		
40	83976944	1	Crossbeam EU10/22Flb.201-300	c/w items 41 - 43		
41	34243599	2	Retaining ring 35X2,5		FedSt !L	DIN 471
42	34351499	2	Shim 35X 45X1		St2K50	DIN 988
43	56334644	1	Pin 35 X 84,5 Nut			

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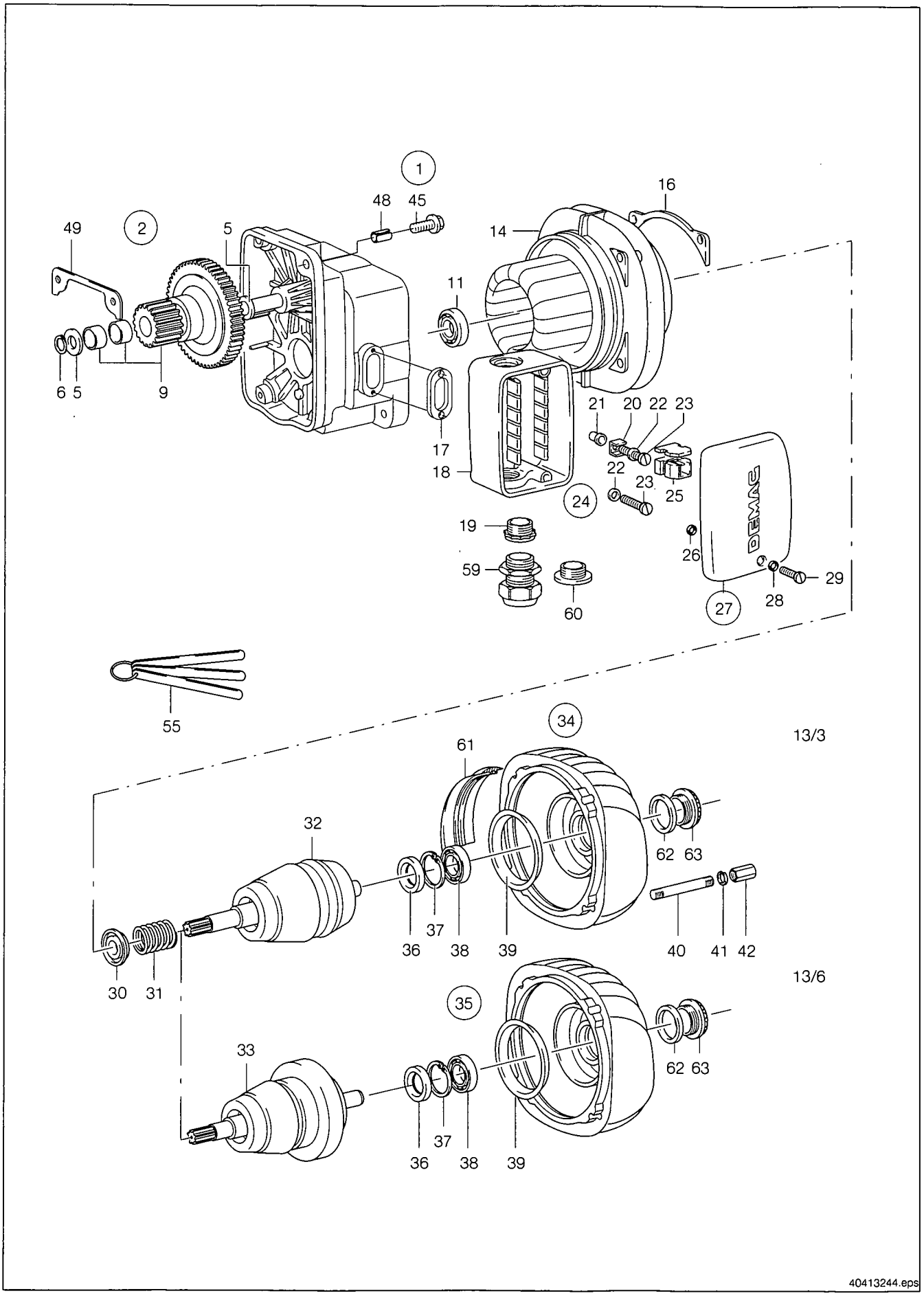
Travel drive PKF 13/3 and PKF 13/6



222511K2.p65/110504

Travel drive PKF 13/3 and PKF 13/6

Item no.	Part no.	Quantity	Designation		Material	Standard
1	56306744	1	Motor 7M 13/3PKF8 AB	c/w items 2,12-14,16,24,25,30-32,34,40-42, 220-400 V, 50 ID		
1	56306444	1	Motor 14M 13/3PKF4 AB	c/w items 2,12-14,16,24,25,30-32,34,40-42, 220-400 V, 50 ID		
1	56306244	1	Motor 28M 13/3PKF2 AB	c/w items 2,12-14,16,24,25,30-32,34,40-42, 220-400 V, 50 ID		
1	56305644	1	Motor 4,6/14M 13/6PKF AB	c/w items 2,12-14,16,24,25,30,31,33,35,40-42, 380-400 V, 50 ID		
1	56305744	1	Motor 7/28M 13/6PKF8-2AB	c/w items 2,12-14,16,24,25,30,31,33,35,40-42, 380-400 V, 50 ID		
5	56377844	2	Washer 15D12X 26 X 2			
6	34251599	1	Retaining ring 15X1		FedSt	DIN 471
9	56307344	1	Cluster gear Z103M1 Z18M2			
11	36050399	1	Grooved ball bearing 6003		Wlz-St !L	DIN- 625
14	56010644	1	Stator F 13/ 3P2K AB	220/380 V, 50 ID, 230/400 V, 50 ID, 1)		
14	56371444	1	Stator F 13/ 3PF4 AB	220/380 V, 50 ID, 230/400 V, 50 ID, 1)		
14	56371744	1	Stator F 13/ 3PF8 AB	220/380 V, 50 ID, 230/400 V, 50 ID, 1)		
14	56372544	1	Stator F 13/ 6PF8/2AB	380/400 V, 50 ID, 1)		
14	56370144	1	Stator F 13/6PF12/4AB	380/400 V, 50 ID, 1)		
16	56025444	14	Segment 13/3P	13/6 P		
17	56368944	1	Seal terminal box lower part			
18	56369044	1	Terminal box lower part M25X1,5			
19	79494644	1	Twist.cab.entr.gland M25 ZU/ 9-16 K			
20	44016499	1	Flat plug 6,3-0,8/2X			
21	37437999	1	Tubular rivet A6 X0,4 X10		1.4301	DIN- 7340
22	34360599	2	Serrated lock washer A 5,3		Fedst A2F	DIN 6798
23	31817999	2	Cylinder screw M 5 X 20		4.8 A2F	DIN 84
24	56368544	1	Terminal board 13 KF-PKF	c/w items 17 - 23, 27		
25	50577344	1	Terminal strip 4X 4,8 STST	1 speed		
25	50577444	1	Terminal strip 6X 4,8 STST	2 speeds		
26	34043599	2	Washer 3,7X 7 X 1		VULKANFIBE	DIN- 433
27	56368744	1	Terminal box cover EU	c/w items 26, 28, 29		
28	34387244	2	Screw locking device M 4			
29	31816699	2	Cylinder screw M 4 X 16		4.8 A2F	DIN 84
30	56022544	1	Pressure ring 7,3 13/3P	13/6 P 1)		
30	56022644	1	Pressure ring 7,6 13/3P	13/6 P 1)		
30	56022744	1	Pressure ring 7,9 13/3P	13/6 P 1)		
30	56022844	1	Pressure ring 8,2 13/3P	13/6 P 1)		
31	56379344	1	Pressure spring 1,8 X25,8X 84	30 N		
32	56379144	1	Rotor 13/ 3PKF	1), 3)		
32	56379244	1	Rotor 13/ 3PKF+B.Sch.	1)		
33	56304744	1	Rotor 13/ 6PF 8-2	1), 3)		
33	56304844	1	Rotor 13/ 6PF8-2B.Sch	1)		
34	56024044	1	End shield B 13/ 3P	c/w items 36 - 39, 63		
35	56305544	1	End shield B13/ 6PF8-2	c/w items 36 - 39, 63		
36	56024544	1	Oil seal 17 X 35X 5			
37	34263599	1	Retaining ring 35X1,5		FedSt	DIN 472
38	36050399	1	Grooved ball bearing 6003		Wlz-St !L	DIN- 625
39	56029044	1	Brake lining PK 1 ASBFR	2)		
40	60063544	4	Stud M 5 X 54X 62	MA= 6 Nm 13/3 P		
40	60063844	4	Stud M 5 X 79X 87	MA= 6 Nm 13/6 P		
41	34380599	4	Lock washer 5 A		FedSt A2F	DIN 127
42	60065444	4	Nut with hexagon socket M 5	MA= 6 Nm		
45	30021944	4	Lock screw M 8X25 VB.RIPP	MA= 42 Nm		
48	34575899	1	Split sleeve 11 X 12		ST	ISO-13337
49	58136944	1	Seal travel drive PK			
55	10092644	1	Feeler gauge 0,30X3X300	1)		
55	10092744	1	Feeler gauge 0,35X3X300	1)		
59	79495944	2	Screw conn. compl. M25 RD K	3)		
60	79499144	1	Screw plug M25X1,5	3)		
61	60077444	1	Profiled joint 13P	3)		
62	60087599	1	Sealing ring thr.con. PG21 K	3)	PE	DIN 46320
63	60070644	1	Screw plug PG21 K			
	01105844	1	Grease KPF2K-30PLANTO.2FS			

22249524.tbl

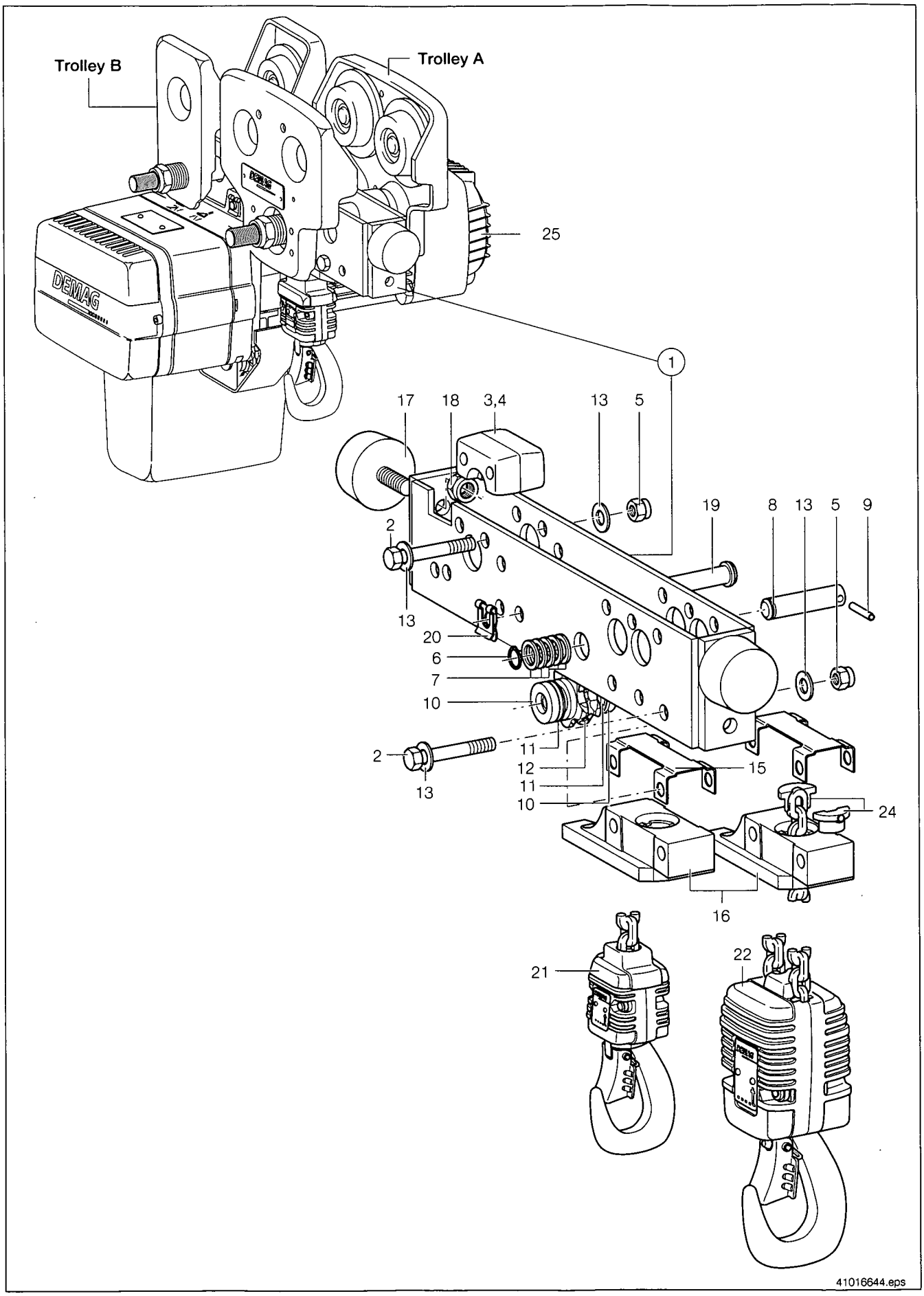
1) When ordering a rotor or stator, a set of thrust rings (item no. 30) must also be ordered for adjusting the air gap (adjust with feeler gauge no. 2, item no. 55)

2) With gluing device.

3) For service in arduous conditions.

2225111K2.p65/110504

Bridge
Low-headroom monorail hoist RK/EKDK



222511k2.p65/110504

Bridge
Low-headroom monorail hoist RK/EKDK

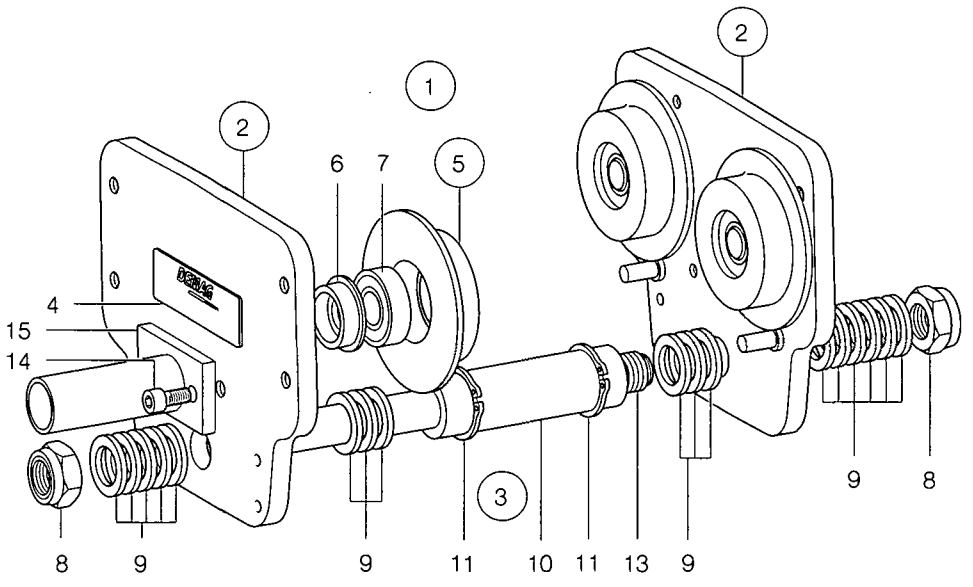
Item no.	Part no.	Quantity	Designation		Material	Standard
1	83945144	1	Longitudinal girder DK10	size 22, c/w items 2, 3, 5 - 16		
1	83942544	1	Longitudinal girder DK10	size 11, c/w items 2, 4 - 16		
2	15048999	4	Hexagonal screw M12 X 80		8.8 A2F	ISO 4014
3	83986644	1	Self-aligning bearing KDK GR.22			
4	83984544	1	Self-aligning bearing KDK GR.11			
5	33461244	4	Lock nut V M12		8 A2F	DIN 980
6	34250399	1	Retaining ring 25X2		FedSt !L	DIN 471
7	34142499	5	Shim 25X 35X1		St2K50	DIN 988
8	83717144	1	Pin 25 H 5X 78 Nut			
9	34503399	1	Split sleeve 5 X 36		ST	ISO- 8752
10	34034199	2	Washer 26 X 44 X 4		100HV A2F	DIN 126
11	34349899	2	Supporting plate 25X 35X2		Fedst	DIN 988
12	83788044	1	Return sheave 7,4X21,2 Z5	Needle-roller assembly, z = 5		
13	33966999	8	Strain washer 13 X29X3		Fedst	DIN 6796
15	83993644	1	Retaining plate 7 X21			
16	83993444	1	End bracket 7,4X21,2DK10			
17	97820644	2	Buffer 50X 20 M10 SHR			
18	33461044	2	Lock nut V M10		8 A2F	DIN 980
19	83761644	2	Setbolt 16H11X100 Nut			
20	34287744	2	Securing clip SL 16 SXN08			
21	83774044	1	Hook fittings DK10	1/1, see Page 12		
22	83788144	1	Bottom block DK10 1CM RUD	2/1, see Page 13		
24	83717844	2	Spring clip fastener 7,4X21,2	2/1		
25			Travel drive PKF 13/3 and 13/6	see page 28		

22251020.tbl

Low-headroom monorail hoist
Trolley size 11 RKDK
Flange width 91 – 300 mm

Suitable for Demag chain hoist
DKUN 10- 800/1000, 1/1 reeving
DKUN 10-630, 1/1 and 2/1 reeving

Trolley A



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	84010344	1	Tr.un.tr.whl.univ.w/o crossb. RU11	c/w item 2		
2	84010844	2	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 5		
3	83996844	1	Crossbeam RKDK10 Flb. 91-143	c/w items 8 - 11, 13		
3	83996944	1	Crossbeam RKDK10 Flb.144-200	c/w items 8 - 11, 13		
3	83997044	1	Crossbeam RKDK10 Flb.201-300	c/w items 8 - 11, 13		
4	83962744	1	Capacity plate 1350KG			
5	84014044	2	Universal travel wheel 80 1SPK OZ	c/w items 6, 7		
6	83970944	1	Collar packing sleeve			
7	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
8	33460299	2	Hexagonal nut M24 X2		8 A2F	DIN 985
9	56322444	18	Washer 24,5X 36,5X 4	Fl. W. 91 - 143		
9	56322444	14	Washer 24,5X 36,5X 4	Fl. W. 144 - 200		
9	56322444	30	Washer 24,5X 36,5X 4	Fl. W. 201 - 300		
10	83993044	1	Tube 32 X 3,5 X 113	Fl. W. 91 - 143		
10	83993144	1	Tube 32 X 3,5 X 166	Fl. W. 144 - 200		
10	83993244	1	Tube 32 X 3,5 X 223	Fl. W. 201 - 300		
11	34253299	2	Retaining ring 32X1,5		FedSt	DIN 471
13	83953044	1	Pin cross beam RU11	Fl. W. 91 - 143		
13	83958144	1	Pin cross beam RU11	Fl. W. 144 - 200		
13	83958244	1	Pin cross beam RU11	Fl. W. 201 - 300		
14	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2F!L	DIN 912
15	83973744	1	Current collector tube 400			

22251021.tbl

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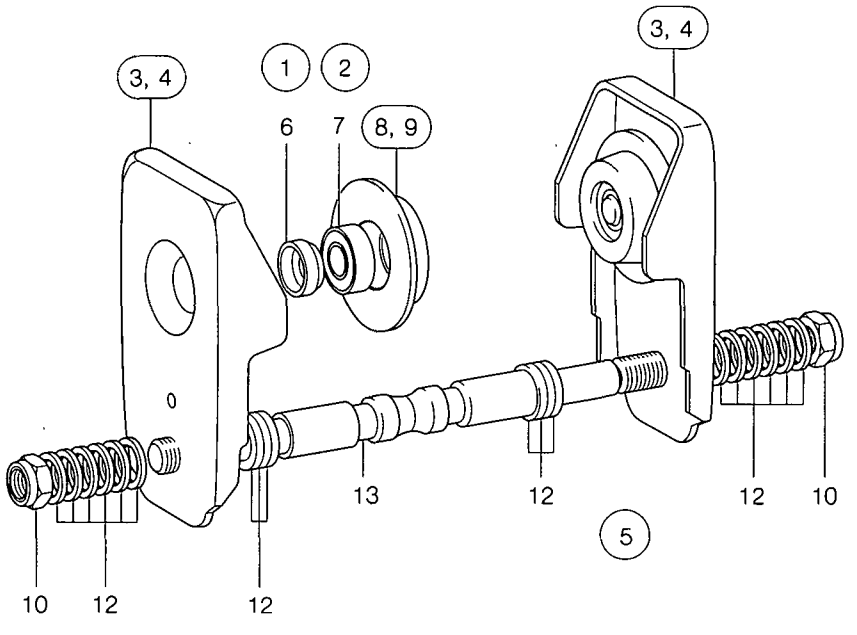
Low-headroom monorail hoist
Trolley size 6/2 RKDK
Flange width 91 – 300 mm

Only to be used with trolley A

Trolley B



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	83983944	1	Tr.un.tr.whl.cyl.w/o crossb. RU 6/2	c/w item 3		
2	83984044	1	Tr.un.tr.whl.coni.w/o crossb. RU 6/2	c/w item 4		
3	83982544	2	Side plate RU 6-2 ZYL	c/w items 6, 8		
4	83982444	2	Side plate trv.whl.con.w/o gear rim	c/w items 6, 9		
5	83983344	1	Crossbeam RKDK Flb. 91-143	c/w items 10, 12, 13		
5	83983444	1	Crossbeam RKDK Flb.144-200	c/w items 10, 12, 13		
5	83983544	1	Crossbeam RKDK Flb.201-300	c/w items 10, 12, 13		
6	83970844	1	Bush 17,1X 32 X 9,6			
7	36822399	1	Grooved ball bearing 6203 2Z		Wlz-St	DIN 625
8	83983644	1	Cylindrical tr.wheel 65 1SPK OZ	c/w item 7		
9	83963544	1	Conical travel wheel 65 1SPK OZ	c/w item 7		
10	33468699	2	Hexagonal nut M20 X1,5		8 A2F	DIN 985
12	56312444	18	Washer 20,3X 30 X 4	Fl. W. 91 - 143		
12	56312444	18	Washer 20,3X 30 X 4	Fl. W. 144 - 200		
12	56312444	30	Washer 20,3X 30 X 4	Fl. W. 201 - 300		
13	83982944	1	Pin cross beam RU 6/ 2	Fl. W. 91 - 143		
13	83983044	1	Pin cross beam RU 6/ 2	Fl. W. 144 - 200		
13	83983144	1	Pin cross beam RU 6/ 2	Fl. W. 201 - 300		

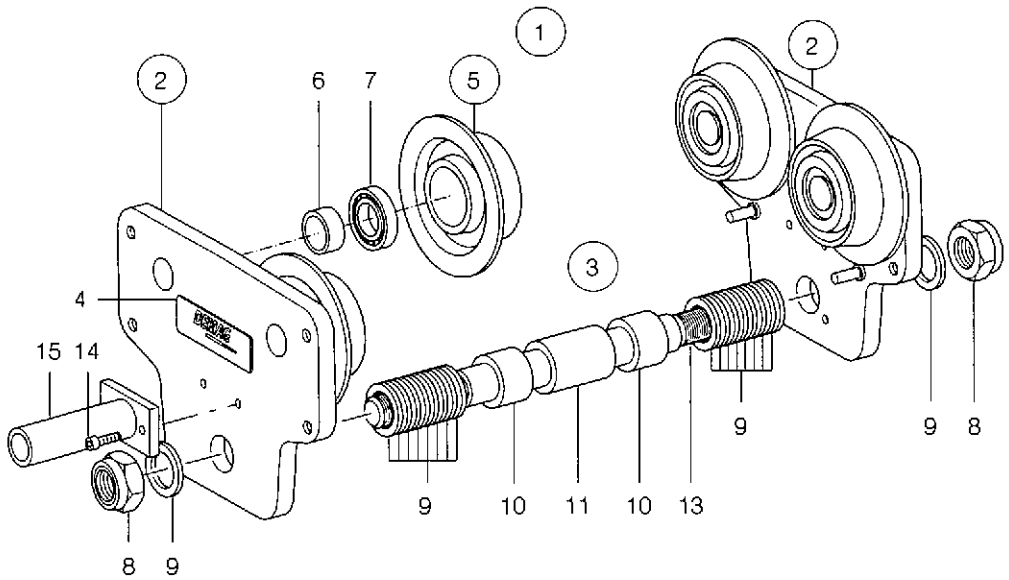
22251022.tbl

2225111K2.p65/110504

Low-headroom monorail hoist
Trolley size 22 RKDK
Flange width 82 – 300 mm

Suitable for Demag chain hoist
DKUN 10-800/1000, 2/1 reeving

Trolley A



41177045.eps

Item no.	Part no.	Quantity	Designation		Material	Standard
1	84011344	1	Tr.un.tr.whl.univ.w/o crossb. RU22	c/w item 2		
2	84011644	2	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 5		
3	83996044	1	Crossbeam RKDK Flb. 82-143	c/w items 8 - 11, 13		
3	83996144	1	Crossbeam RKDK Flb.144-200	c/w items 8 - 11, 13		
3	83996244	1	Crossbeam RKDK Flb.201-300	c/w items 8 - 11, 13		
4	83964744	1	Capacity plate 2600KG			
5	84016044	2	Universal travel wheel 112 1SPK OZ	c/w items 6, 7		
6	84017244	1	Bush 30,2X 38 X17,4			
7	36822699	1	Grooved ball bearing 6206 2Z		Wlz-St	DIN 625
8	33468799	1	Hexagonal nut M30 X2		8 A2F	DIN 985
9	50222044	20	Washer 35,5X 50 X 4	Fl. W. 82 - 143		
9	50222044	18	Washer 35,5X 50 X 4	Fl. W. 144 - 200		
9	50222044	29	Washer 35,5X 50 X 4	Fl. W. 201 - 300		
10	83995544	2	Tube 44,5X 4 X 21,5	Fl. W. 82 - 143		
10	83995644	2	Tube 44,5X 4 X 54	Fl. W. 144 - 200		
10	83995744	2	Tube 44,5X 4 X 82,5	Fl. W. 201 - 300		
11	83995444	1	Tube 44,5X 4 X 46			
13	83955344	1	Pin cross beam RU22	Fl. W. 82 - 143		
13	83955444	1	Pin cross beam RU22	Fl. W. 144 - 200		
13	83958344	1	Pin cross beam KDK22	Fl. W. 201 - 300		
14	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2F/L	DIN 912
15	83973744	1	Current collector tube 400			

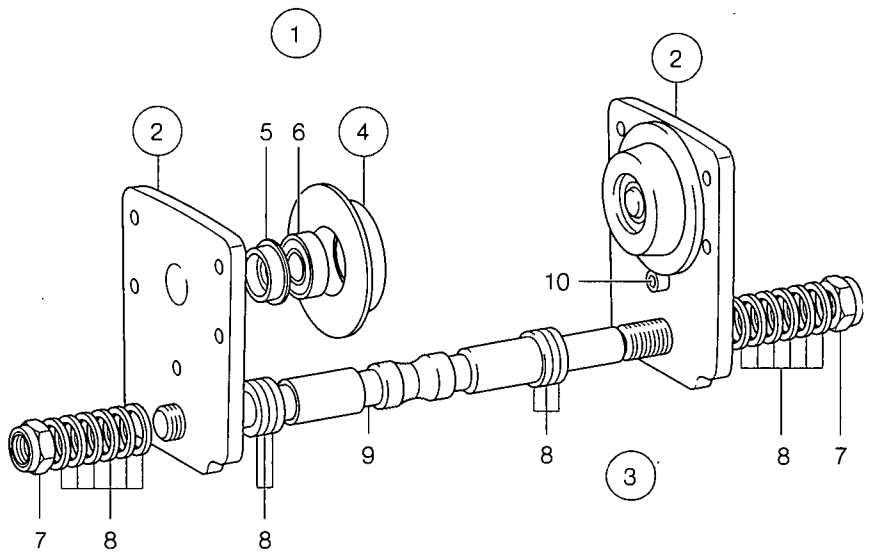
22251023.tbl

222511X2.p65/110504

Low-headroom monorail hoist
Trolley size 11/2 RKDK
Flange width 82 – 300 mm

Only to be used with trolley A

Trolley B



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	84011244	1	Tr.un.tr.whl.univ.w/o crossb.	c/w item 2		
2	84010944	1	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 10		
3	83985144	1	Crossbeam RKDK Flb. 82-143	c/w items 7 - 9		
3	83985244	1	Crossbeam RKDK Flb.144-200	c/w items 7 - 9		
3	83985344	1	Crossbeam RKDK Flb.201-300	c/w items 7 - 9		
4	84014044	1	Universal travel wheel 80 1SPK OZ	c/w items 5, 6		
5	83970944	1	Collar packing sleeve			
6	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
7	33460299	2	Hexagonal nut M24 X2		8 A2F	DIN 985
8	56322444	20	Washer 24,5X 36,5X 4	Fl. W. 82 - 143		
8	56322444	20	Washer 24,5X 36,5X 4	Fl. W. 144 - 200		
8	56322444	29	Washer 24,5X 36,5X 4	Fl. W. 201 - 300		
9	83984844	1	Pin cross beam RU11/2	Fl. W. 82 - 143		
9	83984944	1	Pin cross beam RU11/2	Fl. W. 144 - 200		
9	83985044	1	Pin cross beam RU11/2	Fl. W. 201 - 300		
10	31954199	1	Hex.socket cylind.screw M10 X 16		10.9	DIN 912

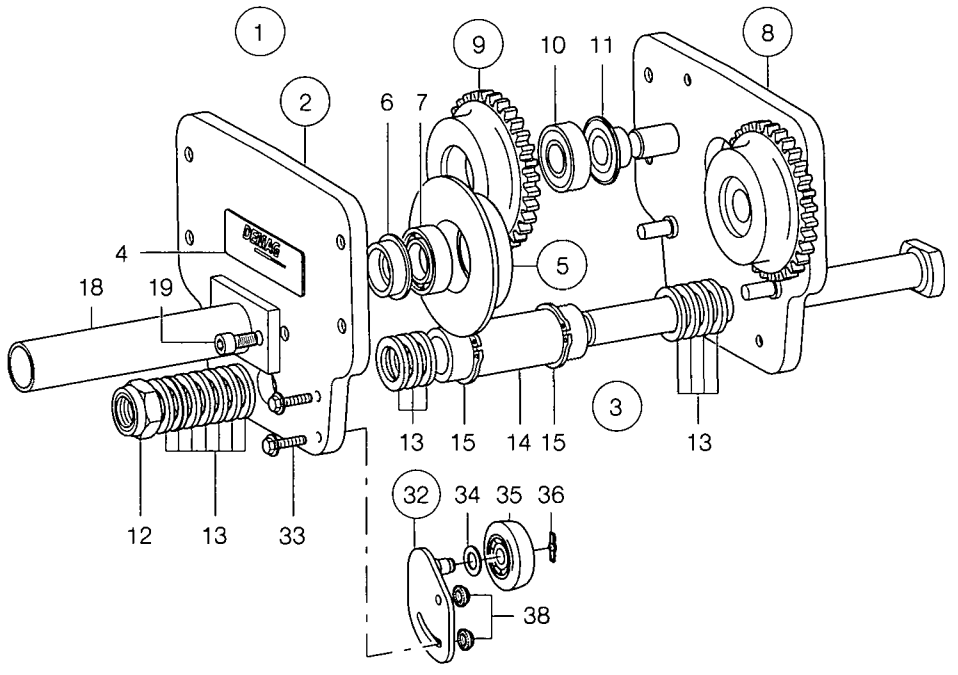
22251024.tbl

222511k2.p65/110504

Low-headroom monorail hoist
Trolley size 11 EKDK
Flange width 91 – 143 mm

Suitable for Demag chain hoist
DKUN 10-800/1000, 1/1 reeving
DKUN 10-630, 1/1 and 2/1 reeving

Trolley A



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	84010444	1	Tr.un.tr.whl.univ.w/o crossb. EU11	c/w items 2, 8		
2	84010844	1	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 5		
3	83995144	1	Crossbeam EKDK10 Flb. 91-143	c/w items 12 - 15, 32		
4	83962744	1	Capacity plate 1350KG			
5	84014044	2	Universal travel wheel 80 1SPK OZ	c/w items 6, 7		
6	83970944	1	Collar packing sleeve			
7	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
8	84010744	1	Side plate trv.whl.univ.w.gear rim	c/w item 9		
9	84015044	2	Universal travel wheel 80 1SPK MZ	c/w items 10, 11		
10	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
11	83975944	1	Collar packing sleeve EU11			
12	33460299	1	Hexagonal nut M24 X2		8 A2F	DIN 985
13	56322444	17	Washer 24,5X 36,5X 4			
14	83993044	1	Tube 32 X 3,5 X 113			
15	34253299	2	Retaining ring 32X1,5		FedSt	DIN 471
18	83973744	1	Current collector tube 400			
19	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2F!L	DIN 912
32	83913044	1	Supporting roller unit	c/w items 33 - 36, 38		
33	30021144	2	Lock screw M 6X25 VB.RIPP			
34	34142899	1	Shim 10X 16X0,5		St2K50	DIN 988
35	98453344	1	Travel wheel 44 KG-L			
36	98058944	1	Safety clamp 7			
38	30044044	2	Lock nut M 6 VB.RIPP			

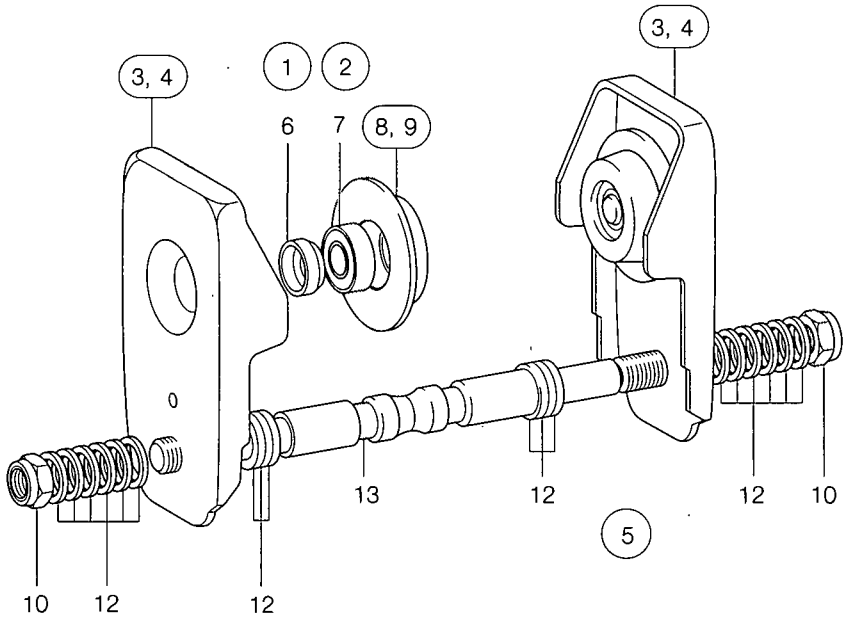
22251025.tbl

2225111k2.p65/110504

Low-headroom monorail hoist
Trolley size 6/2 EKDK
Flange width 91 – 143 mm

Only to be used with trolley A

Trolley B



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	83983944	1	Tr.un.tr.whl.cyl.w/o crossb. RU 6/2	c/w item 3		
2	83984044	1	Tr.un.tr.whl.coni.w/o crossb. RU 6/2	c/w item 4		
3	83982544	2	Side plate RU 6-2 ZYL	c/w items 6, 8		
4	83982444	2	Side plate trv.whl.con.w/o gear rim	c/w items 6, 9		
5	83983344	1	Crossbeam RKDK Flb. 91-143	c/w items 10, 12, 13		
6	83970844	1	Bush 17,1X 32 X 9,6			
7	36822399	1	Grooved ball bearing 6203 2Z		Wlz-St	DIN 625
8	83983644	1	Cylindrical tr.wheel 65 1SPK OZ	c/w item 7		
9	83963544	1	Conical travel wheel 65 1SPK OZ	c/w item 7		
10	33468699	2	Hexagonal nut M20 X1,5		8 A2F	DIN 985
12	56312444	18	Washer 20,3X 30 X 4			
13	83982944	1	Pin cross beam RU 6/ 2			

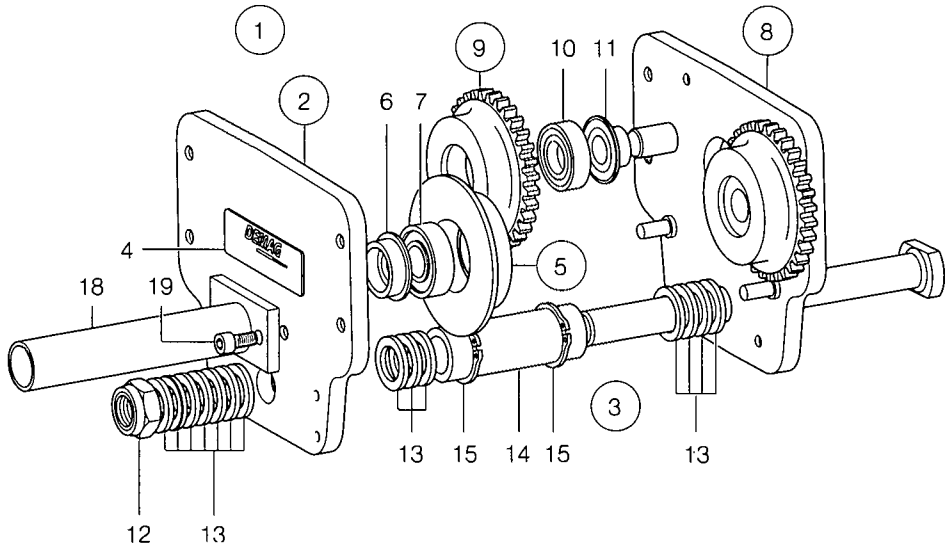
22251026.tbl

222511k2.p65/110504

Low-headroom monorail hoist
Trolley size 11 EKDK
Flange width 144 – 300 mm

Suitable for Demag chain hoist
DKUN 10-800/1000, 1/1 reeving
DKUN 10-630, 1/1 and 2/1 reeving

Trolley A



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	84010444	1	Tr.un.tr.whl.univ.w/o crossb. EU11	c/w items 2, 8		
2	84010844	1	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 5		
3	83995244	1	Crossbeam EKDK10 Flb.144-200	c/w items 12 - 15		
3	83995344	1	Crossbeam EKDK10 Flb.201-300	c/w items 12 - 15		
4	83962744	1	Capacity plate 1350KG			
5	84014044	2	Universal travel wheel 80 1SPK OZ	c/w items 6, 7		
6	83970944	1	Collar packing sleeve			
7	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
8	84010744	1	Side plate trv.whl.univ.w.gear rim	c/w item 9		
9	84015044	2	Universal travel wheel 80 1SPK MZ	c/w items 10, 11		
10	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
11	83975944	1	Collar packing sleeve EU11			
12	33460299	1	Hexagonal nut M24 X2		8 A2F	DIN 985
13	56322444	18	Washer 24,5X 36,5X 4	Fl. W. 144 - 200		
13	56322444	29	Washer 24,5X 36,5X 4	Fl. W. 201 - 300		
14	83993144	1	Tube 32 X 3,5 X 166	Fl. W. 144 - 200		
14	83993244	1	Tube 32 X 3,5 X 223	Fl. W. 201 - 300		
15	34253299	2	Retaining ring 32X1,5		FedSt	DIN 471
18	83973744	1	Current collector tube 400			
19	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2F!L	DIN 912

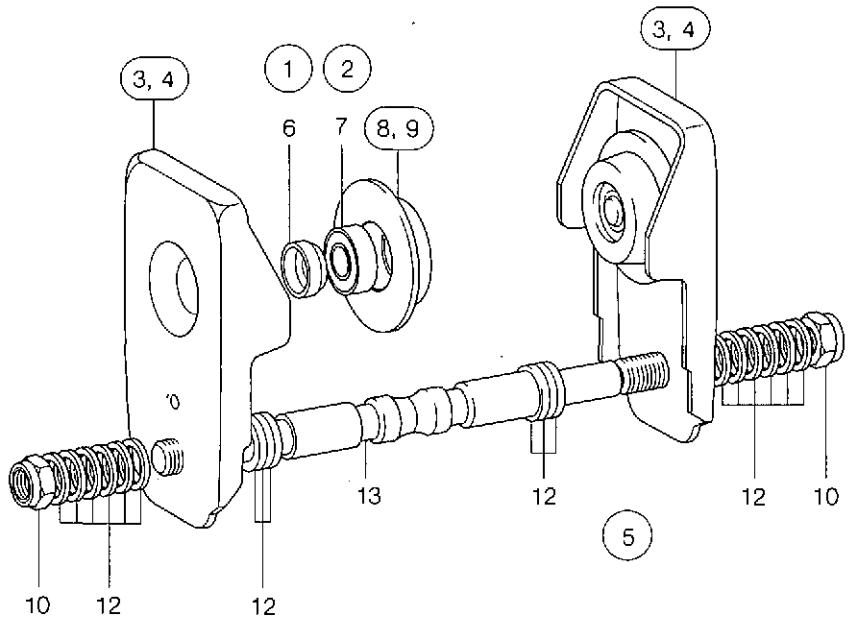
22251027.tbl

2225111K2.p65/110504

Low-headroom monorail hoist
Trolley size 6/2 EKDK
Flange width 144 – 300 mm

Only to be used with trolley A

Trolley B



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	83983944	1	Tr.un.tr.whl.cyl.w/o crossb. RU 6/2	c/w item 3		
2	83984044	1	Tr.un.tr.whl.coni.w/o crossb. RU 6/2	c/w item 4		
3	83982544	2	Side plate RU 6-2 ZYL	c/w items 6, 8		
4	83982444	2	Side plate trv.whl.con.w/o gear rim	c/w items 6, 9		
5	83983444	1	Crossbeam RKDK Flb.144-200	c/w items 10, 12, 13		
5	83983544	1	Crossbeam RKDK Flb.201-300	c/w items 10, 12, 13		
6	83970844	1	Bush 17,1X 32 X 9,6			
7	36822399	1	Grooved ball bearing 6203 2Z		Wlz-St	DIN 625
8	83983644	1	Cylindrical tr.wheel 65 1SPK OZ	c/w item 7		
9	83963544	1	Conical travel wheel 65 1SPK OZ	c/w item 7		
10	33468699	2	Hexagonal nut M20 X1,5	80 Nm	8 A2F	DIN 985
12	56312444	18	Washer 20,3X 30 X 4	Fl. W. 144 - 200		
12	56312444	30	Washer 20,3X 30 X 4	Fl. W. 201 - 300		
13	83983044	1	Pin cross beam RU 6/ 2	Fl. W. 144 - 200		
13	83983144	1	Pin cross beam RU 6/ 2	Fl. W. 201 - 300		

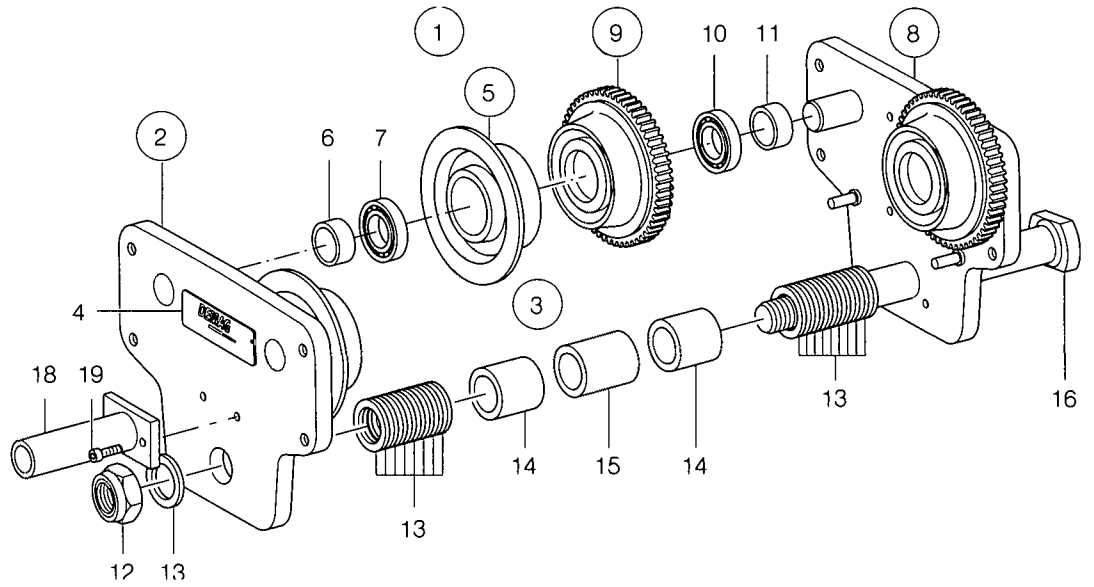
22250027.tbl

2225111k2.p65/110504

Low-headroom monorail hoist
Trolley size 22 EKDK
Flange width 82 – 300 mm

Suitable for Demag chain hoist
DKUN 10-800/1000, 2/1 reeving

Trolley A



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Item no.	Part no.	Quantity	Designation		Material	Standard
1	84011444	1	Tr.un.tr.whl.univ.w/o crossb. EU22	c/w items 2, 8		
2	84011644	1	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 5		
3	83996344	1	Crossbeam EKDK Flb. 82-143	c/w items 12 - 16		
3	83996444	1	Crossbeam EKDK Flb.144-200	c/w items 12 - 16		
3	83996544	1	Crossbeam EKDK Flb.201-300	c/w items 12 - 16		
4	83964744	1	Capacity plate 2600KG			
5	84016044	2	Universal travel wheel 112 1SPK OZ	c/w items 6, 7		
6	84017244	1	Bush 30,2X 38 X17,4			
7	36822699	1	Grooved ball bearing 6206 2Z		Wlz-St	DIN 625
8	84011744	1	Side plate trv.whl.univ.w.gear rim	c/w item 9		
9	84017044	2	Universal travel wheel 112 1SPK MZ	c/w items 10, 11		
10	36822699	1	Grooved ball bearing 6206 2Z		Wlz-St	DIN 625
11	84017344	1	Bush 30,2X 38 X23,2			
12	33468799	1	Hexagonal nut M30 X2		8 A2F	DIN 985
13	50222044	21	Washer 35,5X 50 X 4	Fl. W. 82 - 143		
13	50222044	19	Washer 35,5X 50 X 4	Fl. W. 144 - 200		
13	50222044	29	Washer 35,5X 50 X 4	Fl. W. 201 - 300		
14	83995544	2	Tube 44,5X 4 X 21,5	Fl. W. 82 - 143		
14	83995644	2	Tube 44,5X 4 X 54	Fl. W. 144 - 200		
14	83995744	2	Tube 44,5X 4 X 82,5	Fl. W. 201 - 300		
15	83995444	1	Tube 44,5X 4 X 46			
16	83907744	1	Pin cross beam FLB. 82-143			
16	83908144	1	Pin cross beam FLB.144-200			
16	83908544	1	Pin cross beam FLB.201-300			
18	83973744	1	Current collector tube 400			
19	32141099	2	Hex.socket cylind.screw M 8 X 20		10.9 A2F!L	DIN 912

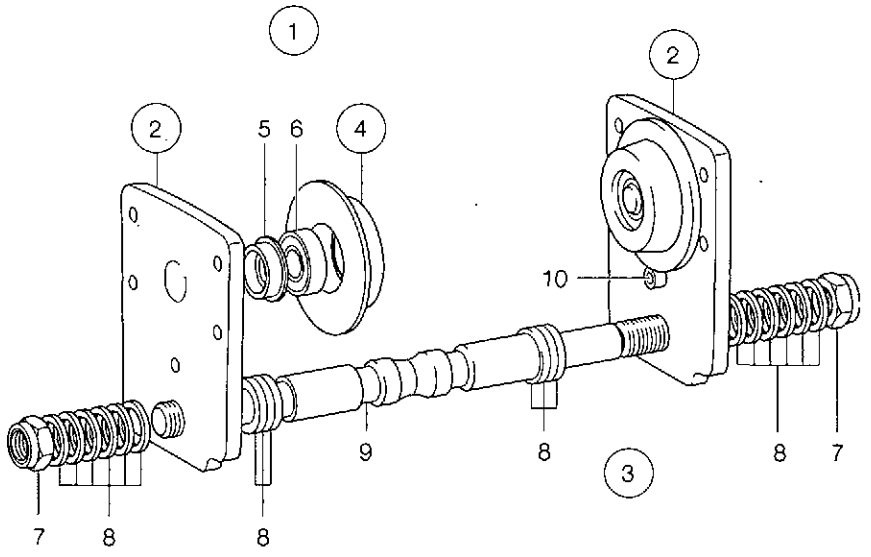
22251028.tbl

22251 1K2.p65/110504

Low-headroom monorail hoist
Trolley size 11/2 EKDK
Flange width 82 – 300 mm

Only to be used with trolley A

Trolley B



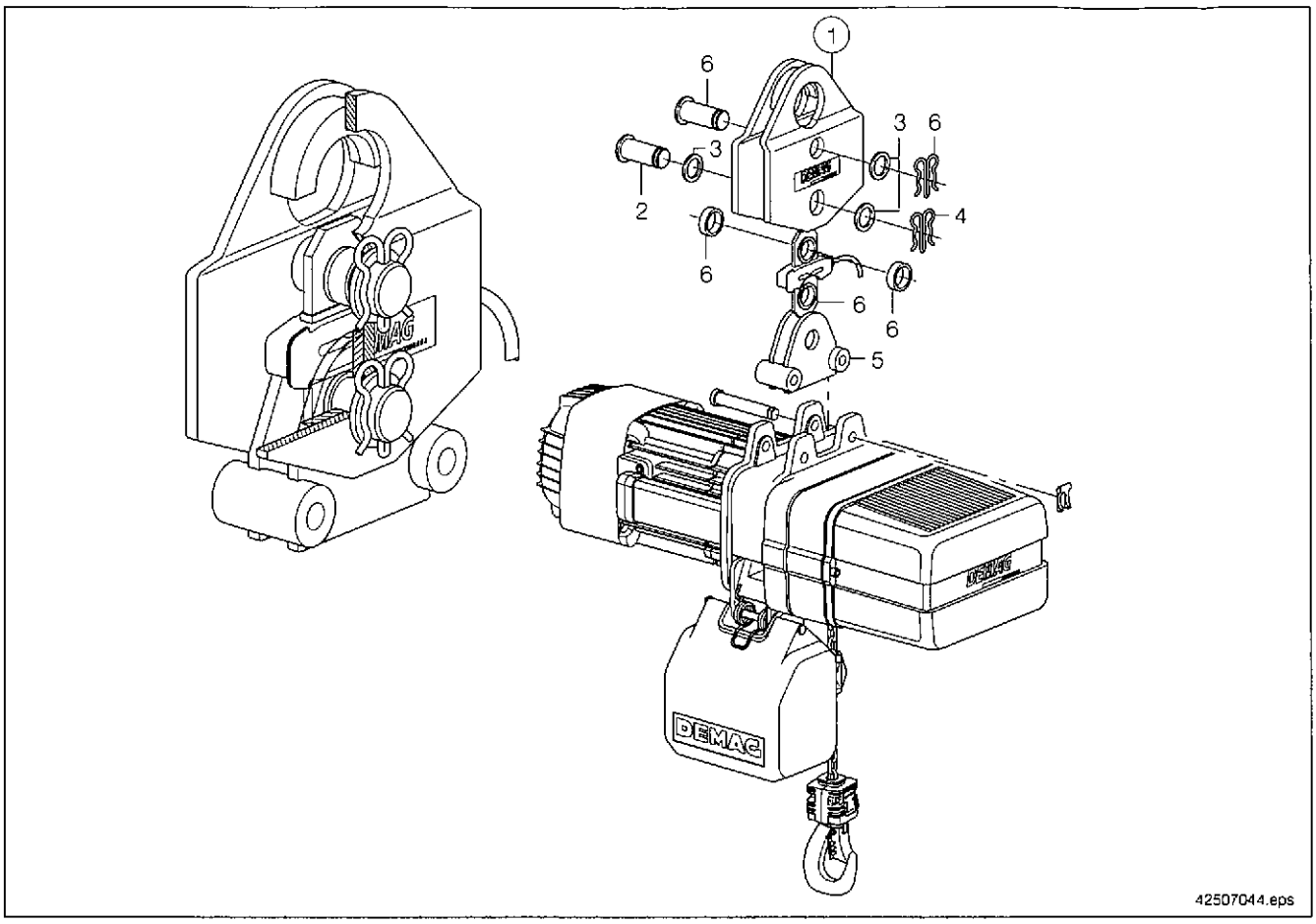
41179345.eps

Item no.	Part no.	Quantity	Designation		Material	Standard
1	84011244	1	Tr.un.tr.whl.univ.w/o crossb.	c/w item 2		
2	84010944	1	Side plate trv.whl.univ.w/o g.rim	c/w items 4, 10		
3	83985144	1	Crossbeam RKDK Flb. 82-143	c/w items 7 - 9		
3	83985244	1	Crossbeam RKDK Flb.144-200	c/w items 7 - 9		
3	83985344	1	Crossbeam RKDK Flb.201-300	c/w items 7 - 9		
4	84014044	1	Universal travel wheel 80 1SPK OZ	c/w items 5, 6		
5	83970944	1	Collar packing sleeve			
6	36820499	1	Grooved ball bearing 6204 Z		Wlz-St	DIN 625
7	33460299	2	Hexagonal nut M24 X2		8 A2F	DIN 985
8	56322444	20	Washer 24,5X 36,5X 4	Fl. W. 82 - 143		
8	56322444	20	Washer 24,5X 36,5X 4	Fl. W. 144 - 200		
8	56322444	29	Washer 24,5X 36,5X 4	Fl. W. 201 - 300		
9	83984844	1	Pin cross beam RU11/2	Fl. W. 82 - 143		
9	83984944	1	Pin cross beam RU11/2	Fl. W. 144 - 200		
9	83985044	1	Pin cross beam RU11/2	Fl. W. 201 - 300		
10	31954199	1	Hex.socket cylind.screw M10 X 16		10.9	DIN 912

22251024.tbl

22251142 p65/110504

Strain gauge carrier link ZMS 1250
1/1 reeving

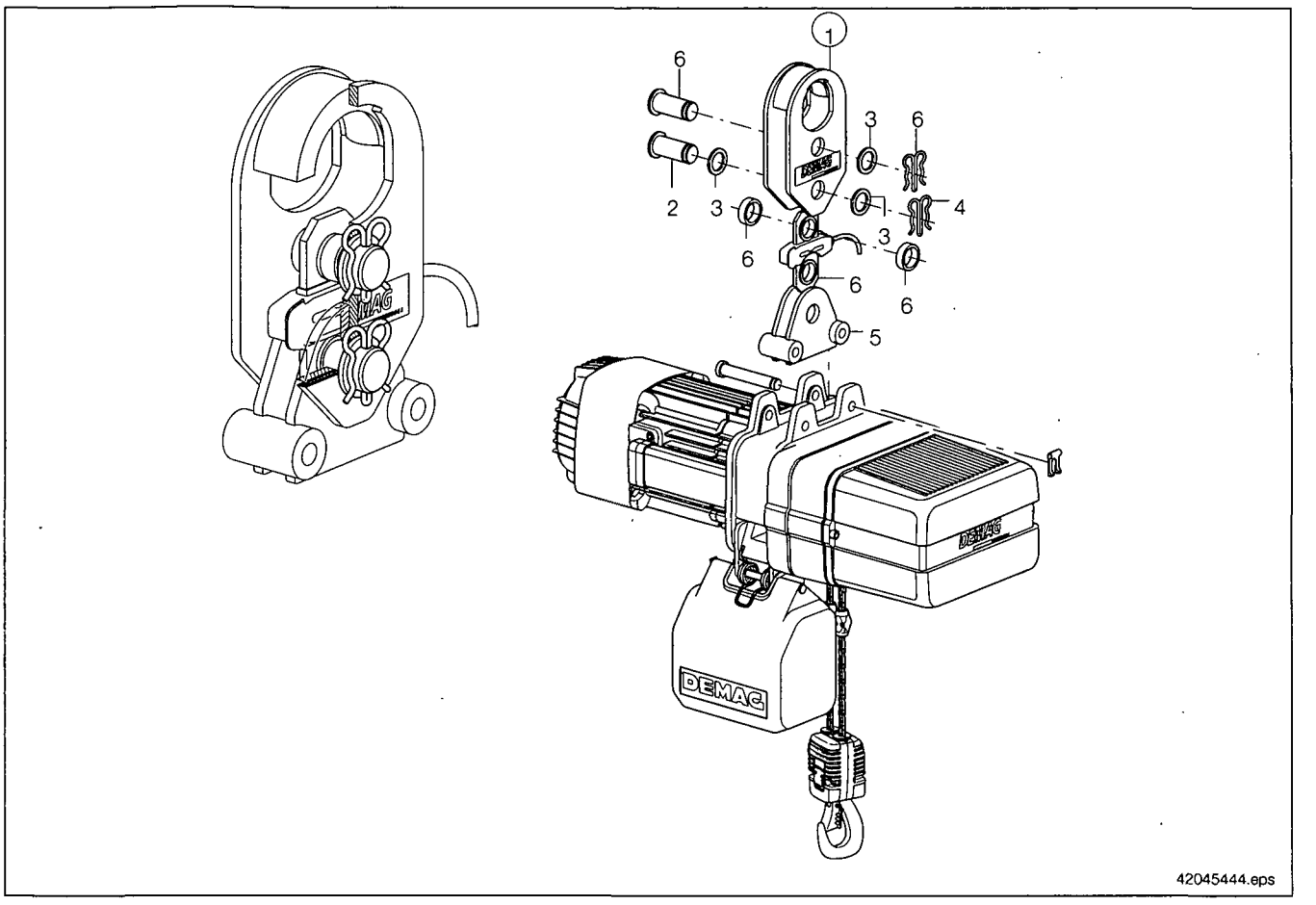


Item no.	Part no.	Quantity	Designation		Material	Standard
1	83761444	1	Strain gauge carr. link 1,25 T DK10	c/w items 2 - 6		
2	82863844	1	Setbolt 20H 9X 56 Boh			
3	34350199	3	Shim 20X 28X1		St2K50	DIN 988
4	34306844	1	Double spring plug 2,8 X 41			
5	83760544	1	Eye DK10-ZMS 1250			
6	49139144	1	Strain gauge carr. link 1,25 T			

22251030.tbl

2225112.p65/110504

Strain gauge carrier link ZMS 2500
2/1 reeving

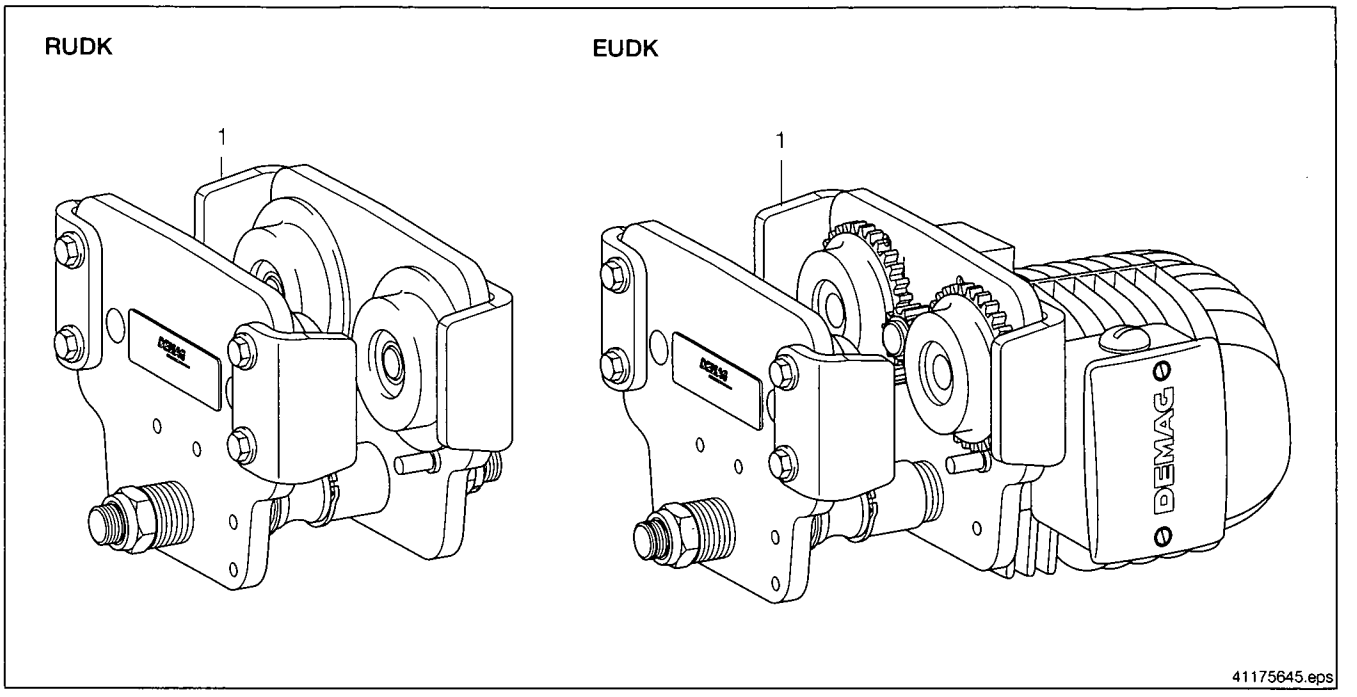


Item no.	Part no.	Quantity	Designation		Material	Standard
1	83761844	1	Strain gauge carr. link 2,50 T DK10-16	c/w items 2 - 6		
2	82873844	1	Setbolt 25H 9X 65 Boh			
3	34142499	3	Shim 25X 35X1		St2K50	DIN 988
4	34306944	1	Double spring plug 3 X 51			
5	83761044	1	Eye DK10-ZMS 2500			
6	49139244	1	Strain gauge carr. link 2,50 T P 400			

22251031.tbl

22251112.p65/110504

Drop stop fittings RU/EUDK



Item no.	Part no.	Quantity	Designation	Material	Standard
1	83969744	1	Drop stop set GR.11		
1	83969844	1	Drop stop set GR.22		

22251029.tbl

Demag Cranes & Components GmbH
P.O. Box 67 · D-58286 Wetter
Telephone (+49/2335) 92-0 · Telefax (+49/2335) 927676
www.demagcranes.com

DEMAG
Cranes & Components

QUALITY ASSURANCE
LOAD TEST REPORT FOR BRIDGE, GANTRY, PORTAL, MONORAIL & JIB CRANES

DOC. No. DCC-IT-410/29
ISSUE 3 – 1/7/2000

CUSTOMER: LEIGHTON

JOB No. 5400355

LOCATION (Address): VIOLA PLACE MEEANDAH

DESCRIPTION (Crane/Installation Type): MONO-RAIL CHAIN HOIST

CRANE S/N: N/A

MAKE & MODEL OF HOIST: EUROMAP 10-1000 V1 2/1 F4

CLASS: M4

HOIST S/N: 61586803.

STATUTORY BODY: (IF APPLICABLE)

APPROVAL No. (IF APPLICABLE)

NOTE: 1/ If load testing is required by contract or is a statuary requirement, testing is to be carried out in accordance with AS1418.3, Section 12 - Inspection & Commissioning.
2/ All hoists are pretested at 25% overload (Test certificates available).
3/ Commissioning checks are to be carried out in accordance with Doc. No. MOA-IT-6/5 "Installation & Commissioning Checklist"

LOAD TESTING

WITH MAXIMUM S.W.L. OF 1670 kg

CHECK AT POINT OF MAXIMUM DEFLECTION: Calculated: ____ mm Actual: 001 mm

DEFLECTION AFTER REMOVAL OF LOAD: 0 mm

	ACCEPTABLE (✓)	NOT ACCEPTABLE (✓)
CHECK CRANE TRAVEL AND TRAVERSE AT FULL SPEED WITH MAXIMUM RATED CAPACITY.	✓	

REMARKS:

TEST CARRIED OUT BY:	WITNESSED By (Crane Owner, Authorised Officer)
Name: Greg Windsor (print)	Name: (print)
Sign:	Sign:
Title: Service	Title:
Date: 03 / 06 / 2005	Date: / /

S:\QA and Safety\Inspection & Testing - IT.410.docs\Load Test Report - It410.29 - Issue 3.doc

BRISBANE CITY COUNCIL
Brisbane Water
SP299 - Viola Place

Q1112-WC-001

Leighton Contractors Pty Ltd.

Installation, Operation and Maintenance Manual

SP299
Viola Place Pump Station

Prepared By Style Industries

Contract No. Q1112-WC-001

Job Reference: 9835C

CONTENTS

Part 1 Introduction and Background Information

1 Introduction

These instructions contain information for the installation, operation and maintenance of your mechanical equipment supplied by Style Industries.

When properly installed and maintained, this equipment will provide trouble free operation for a long period of time. These instructions are issued as a guide to correct procedures to be followed, and must be carried out to maximise the effectiveness and life of the equipment.

For replacement equipment, spare parts or service, please contact our office and quote the equipment details and Style Industries Job No 9835C.

Telephone:	07 37105200
Fax:	07 32791828
Email:	pumps@styleindustries.com.au
Delivery Address:	7 Forge Close Sumner Park QLD 4074
Postal Address:	PO Box 3081 Darra QLD 4076

Works under this contract comprise of supply and installation and pressure testing of a submersible pump station and rising main.

Scope of Works includes:

- Installation of two (2) submersible pumps.
- Supply and installation of new discharge pipework and valves
- Supply and installation of two (2) submersible sump pumps

2 Description of Equipment and Process

Equipment supplied under this contract includes:

- Metal Seated Sluice Valves
- Check Valves
- Discharge pipework and fittings
- Sump pumps and associated pipework

Part 2 Installation and Commissioning

3 Installation and Pre-commissioning Procedure

3.1 Installation Process

The upper guide rail brackets, which bolt to the wall of the opening of the well, determine the positioning of the submersible pump stools. Once the stool position has been ascertained and the stool installed, the pipework can be bolted in succession, starting from the discharge flange of the pump stool.

Throughout the installation process, special care is to be taken to ensure that all pipework remains level and all flange faces are correctly aligned. Rubber insertion gaskets are to be inserted between all mating flanges and nuts and bolts tightened in the star pattern to the specified torque setting, according to the Water Services Specification (Table 2, Section 5 of WS-SPEC : 2000).

Once all the pipework is installed and correctly aligned, the guide rails and support chains can be installed, followed by the lowering of the pumps onto the stools.

3.2 Pre-Commissioning Test Procedures

All torque settings on the nuts and bolts are to be confirmed prior to the pressure testing of the pipework, as per Table 2, Section 5 of WS-SPEC : 2000.

4 Commissioning Procedure

The pipework is to be filled with water, allowing the venting of any trapped air. The water pressure will be allowed to steadily rise to between 600kPa and 700kPa and be held for 15 minutes. The pressure is to be monitored throughout the holding time and any pressure drop noted. If any leaks are discovered, the pressure test is to discontinue, and the cause of the leak determined and rectified, prior to any further re-tests.

Part 3 Appropriate Records

5 Inspection and Test Plans

BRISBANE CITY COUNCIL
Brisbane Water
SP299 - Viola Place

Q1112-WC-001

AUSTRALIAN TRADE COAST PROJECT
STYLE INDUSTRIES – ITP
LEIGHTON J/N Q1112

DOCUMENT NUMBER: 9835c - ITP	INSPECTION AND TEST PLAN	B.W C/N : 30137-02/03 LEIGHTON J/N : Q1112	BRISBANE WATER AUSTRALIA TRADE COAST SEWERAGE PROJECT

					ACTION BY			COMPLETED			
SEQ NO	ITEM / DESCRIPTION	INSPECTION ACTIVITY	ACCEPTANCE CRITERIA	LOCATION	STL	LCPL	BW	STL	LCPL	BW	REPORT DOC REF
	VIOLA PLACE										
1	CONCRETE WORKS	DIMENSION CHECK	CONTRACT DWGS	SITE	W/H CB	W/S JR	27/4	27/4 CB			CONTRACT DWGS
2	PIPE & VALVES	GOODS INSPECTION & DIMENSION CHECK	PIPE & VALVE SCHEDULE (FROM CONTRACT DWGS)	SITE	W/H CB	W/S JR	27/4	27/4 CB			CONTRACT DWGS
3	PUMPS	DIMENSION CHECK	WEIR IOM & 9835-PSCL	SITE	W/H CB	W/S JR	11/5	11/05 CB			WEIR IOM & 9835-PSCL
4	PIPE & VALVES	INSPECTION OF INSTALLATION	CONTRACT DWGS & 9835-PSCL	SITE	W/H CB	W/H JR	W/H 6/5	6/5 CB		12/05/05	CONTRACT DWGS
5	TEST PIPEWORK FOR LEAKS	PRESSURE TEST	SPECIFICATION & 9825-HSTC	SITE	W/H CB	W/H JR	W/H 6/5	6/5 CB		12/05/05	SPECIFICATION & 9825-HSTC
6	PRIOR TO EPOXY GROUT POUR	INSPECTION	SPECIFICATION	SITE	W/H CB	W/H JR	W/H 9/5	9/5 CB		12/05/05	
7	PUMPS	INSPECTION OF INSTALLATION	WIER IOM & 9835-PSCL	SITE	W/H CB	W/H JR	W/H 11/5	11/5 CB		12/05/05	WEIR IOM & 9835-PSCL
8	SUMP PUMP & PIPEWORK	INSPECTION OF INSTALLATION	CONTRACT DWGS	SITE	W/H CB	W/S JR		6/5 CB			CONTRACT DWGS

ACTION CODES :		REVISION STATUS	DATE	DRAWN	CHECKED	REASON FOR REVISION
W/H	WITNESS - MANDATORY HOLD POINT					
W/S	WITNESS - INSPECT AT RANDOM					
W/I	WITNESS INITIAL, THEN AT RANDOM					
R/A	REVIEW AND SIGN DOCUMENTATION					
R	REVIEW DOCUMENTATION ONLY					
STL	STYLE ROUTINE INSPECTION ONLY	2	25/02/05	CB	CB	LEIGHTONS REQUEST
G	GENERAL INSPECTION BY CUSTOMER DURING ACTIVITY	1	14/1/05	MC	MC	LEIGHTONS REQUEST
		0		MR	MR	FIRST ISSUE

STYLE INDUSTRIES	CUSTOMER / SITE :	BRISBANE WATER	PAGE	1	OF	1
DENK INVESTMENTS PTY. LTD. A.C.N. 010 418 014 T/A	VIOLA PLACE PS	AUSTRALIA TRADE COAST SEWER PROJECT				

9835c - ITP-Viola Place

BRISBANE CITY COUNCIL
Brisbane Water
SP299 – Viola Place

Q1112-WC-001

AUSTRALIAN TRADE COAST PROJECT
STYLE INDUSTRIES – ITP
LEIGHTON J/N Q1112

PUMP STATION CHECKLIST

REF NO. – 9835/PSCL

CONCRETE WORKS – CHECK	CHECKED BY	DATE	COMMENTS
Check Dimensions of pump well to Leighton Contractors Pty Ltd Drawings	CB	27/04	Complete
Ensure all core holes are correct in size and position	CB	27/04	"
Check to ensure all surfaces are smooth and level where required	CB	27/04	"
PIPE & VALVES – GOODS INSPECTION & DIMENSION CHECK			
Check dimensions of all items ordered against those received	CB	27/04	Complete
Check correct quantity has been supplied of each item	CB	"	"
Ensure goods are in as new condition (e.g. no cracks, scratches, or other damage)	CB	"	"
Check all sockets are correct	CB	"	"
PUMPS – DIMENSIONAL CHECK			
Ensure pump is correct model and type	CB	11/05	Complete
Check dimensions of pump to that of the Weir drawing	CB	"	"
Visually inspect pump for damage before installation	CB	"	"
Check electrical cable is undamaged and correct length	CB	"	"
PIPE & VALVES – INSPECTION OF INSTALLATION			
Ensure all gasket materials are clean and free from grit before install	CB	27/04	Complete
Install all pipework and valves as per the drawings	CB	"	"
Check that pipework is level and that faces are mating correctly aligned	CB	"	"
Ensure all valves are closed after installation	CB	"	"
Make sure bolts are of correct size, material, and tightness	CB	"	"
Tighten bolts in star pattern (tighten opposites)	CB	"	"
Install temporary support structures for pipework	CB	"	"

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Brisbane Water
SP299 - Viola Place

Q1112-WC-001

AUSTRALIAN TRADE COAST PROJECT
STYLE INDUSTRIES – ITP
LEIGHTON J/N Q1112

Tighten bolts after installation as per Table 2 Sect 5 of WS-Spec	CB	27/04	Complete
Ensure pipes are clean once installed	CB	27/04	"

BRISBANE CITY COUNCIL
Brisbane Water
SP299 – Viola Place

Q1112-WC-001

AUSTRALIAN TRADE COAST PROJECT
STYLE INDUSTRIES – ITP
LEIGHTON J/N Q1112

PUMP STATION CHECKLIST

REF NO. – 9835/PSCL **PAGE 2 OF 2**

PUMPS – INSPECTION OF INSTALLATION	CHECKED BY	DATE	COMMENTS
Ensure suction and discharge are free from any foreign matter	CB	11/05	Complete
Install pump pedestal and ensure discharge is aligned correctly	CB	27/04	"
Secure electrical cable, ensure no water ingress at open ends	CB	11/05	"
Grout under pump pedestal	CB	9/05	"
PRESSURE TESTING PIPEWORK – HYDROSTATIC TESTING			
Pipework will be isolated by lowering the pump stools to a point where a plate can be inserted between the stool flange and riser pipe flange. The stool will be jacked up and the bolts tightened which will isolate the pipework. The discharge pipework down the line from the valve pit will have a tee inserted and a pipe return line back to the well (by others). Water for test to be supplied by others.	CB	6/05	Complete
Pipework will be filled with water allowing to vent air	CB	6/05	"
Pressure will pumped up to 600kPa	CB	"	"
No drop in pressure allowed over 15min	CB	"	"
Check visually for leaks and or pipe deformations	CB	"	"

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Brisbane Water
SP299 – Viola Place

Q1112-WC-001

AUSTRALIAN TRADE COAST PROJECT
STYLE INDUSTRIES – ITP
LEIGHTON J/N Q1112

ON COMPLETION OF CHECKLIST SIGN OFF BELOW

NAME:	CLIVE BLORE
SIGNED:	
DATE:	12/05/05

9835c - ITP-Viola Place

6 Commissioning Report

BRISBANE CITY COUNCIL
Brisbane Water
SP299 - Viola Place

Q1112-WC-001

PIPEWORK HYDROSTATIC TEST CERTIFICATE

REF NO: 9835-Viola-HSTC

PAGE 1 OF 1

TEST PRESSURE:	660kPa
DESCRIPTION OF WORKS:	Pressure test pipework to 600kPa or more and hold at the achieved pressure for 15 minutes. Check for leaks, deformations and substantial pressure drop.
TIME PRESSURE HELD:	15 minutes
JOB NO:	9835C
CERTIFIED BY:	Clive Blore
WITNESSED BY:	Gary Mole
CERTIFICATE NO:	9835-Viola Place-HSTC
DATE:	6 May 2005
COMMENTS:	No leaks or deformations. 2kPa pressure drop over 15 minutes.

Part 4 Operation and Maintenance

7 Maintenance

7.1 Corrective Maintenance

Fastener Torque Settings, Loadings (Table 2, Section 3, WS-SPEC : 2000)

TABLE 2

PIPE DIA	BOLT SIZE	NO. OF BOLTS	FULL FACE, CLASS 14		RAISED FACE, CLASS 16	
			BOLT TENSION (kN)**	ESTIMATED TIGHTENING TORQUE* (N.m)	BOLT TENSION (kN)**	ESTIMATED TIGHTENING TORQUE* (N.m)
100	M16	4	32	102	18	58
150	M16	8	27	86	15	48
200	M16	8	37	118	22	70
225	M16	8	45	144	23	74
250	M20	8	53	212	34	136
300	M20	12	43	172	28	112
375	M24	12	62	298	42	202
450	M24	12	83	398	52	250
500	M24	16	75	360	52	250
600	M27	16	101	545	67	362
750	M30	20	116	696	80	480

* Torques shown are calculated to achieve sealing and to limit risk of stress corrosion. Flat, smooth, well-lubricated surfaces such as would be achieved with anti-seize compounds for a torque coeff. of 0.2, and fibre reinforced natural rubber gaskets, have been assumed. Bolt tensions may vary considerably with different applications. Check with manufacturer for application of torques inconsistent with the above.

** Using a torque wrench, the resultant bolt tension may vary as much as ± 25%.

Part 5 Appendices

Appendix 1 Pressure Gauge Certificate

BRISBANE CITY COUNCIL
Brisbane Water
SP299 – Viola Place

Q1112-WC-001

Page 1 of 1

NATA CERTIFICATE
NO. 4313N

Ross Brown Sales Pty Limited
A.B.N. 28 000 690 362
21 Brookhollow Avenue
Baulkham Hills NSW 2153
Tel: (02) 9899 2744
Fax: (02) 9899 4233

To : Style Industries
7 Forge Close
Sumner Park Qld. 4074

Date of Test : 12th October 2004

Instrument Tested : 160mm Wise Pressure Gauge **Serial No :** 4313

Range : 0/160 metres head **Graduation Interval :** 2 metres head

Instrument Orientation : Vertical **Temperature During Test:** 20°C

Reference Instrument : Mansfield & Green Pneumatic Dead Weight Tester
Model No. RK-2000N-SS **Serial No.** 82838 **Certificate No.** APL 036882

TEST RESULTS

Applied Pressure	Mean Instrument Reading (metres head)		Corrections (metres head)	
Metres head	Ascending	Descending	Ascending	Descending
0	0	0	0	0
20	20	20	0	0
40	40	40	0	0
60	60	60	0	0
80	80	80	0	0
100	100	100	0	0
120	120	120	0	0
140	140	140	0	0
160	160	-	0	-

Note : All corrections (+ or -) should be added to the instrument reading.
Conversion Factor : 1 metre head = 9.8064 kPa at 4°C

Uncertainty of Measurement : The reported corrections have an expanded uncertainty of +/- 0.6 metres head, with a coverage factor k = 1.96, and an estimated level of confidence of 95%

Test Method : Ross Brown Sales Laboratory Test Method A, based upon AS 1349-1986

Performance Criteria : The manufacturer's specification being +/- 1% of full scale

Conclusion : The Instrument described above complies with the performance criteria

NATA Signatory : *D.W. Brown* **Date :** *13th October 2004*
D.W. Brown

NATA Accredited Laboratory No. 1808

NATA Endorsed Document
The tests, calibrations or measurements covered by this document have been performed in accordance with NATA requirements which include requirements of ISO/IEC 17025 and are traceable to Australian national standards of measurement. This document shall not be reproduced, except in full

QSF021-1 Issue: 11 OCTOBER 2003

Appendix 2 Rilsan® Nylon 11 Polymeric Coatings

Rilsan® Nylon 11 Polymeric Coating

tyco
Flow Control

Tyco Water

Rilsan® Nylon 11 polymeric coatings provide corrosion protection for fittings, valves and hydrants. Coating system and application complies with AS/NZS 4158.

Features

- Excellent corrosion resistance to
  - water
  - wastewater
  - sea water and mist
- Chemical resistance to
  - hydrocarbons
  - solvents
  - acids
  - salts
  - alkalis and many others
- Outstanding
  - abrasion resistance
  - impact resistance
  - flexibility
  - thermal resistance
  - weathering and chalking resistance
- Low
  - water absorption
  - friction coefficient
- Wide range of working temperatures
- Long service life
- Produced from renewable raw materials of plant origin, environmentally friendly.

Typical Type Test Results

Test	AS/NZS 4158 Requirement	Rilsan® Nylon 11 Result
Hot Water Immersion	<= 1	<1
Water Absorption	<= 4.0%	2.2%
Flexibility	no crack @ 1.0%	no crack
Impact Resistance	>= 2.0 J	2.8 J
Penetration Resistance	<= 10%	1.4%
Abrasion Resistance	<= 40mg	16.6mg
Cathodic Disbondment	<= 15mm	4.2mm
Thermal Stability	<= 35% change to melt flow rate after 100 days @100°C	viscosity change <28%
Ultraviolet Radiation	<= 35% change to melt flow rate after 100 days @100°C	viscosity change <20%
Water Contact	No effect when used to convey drinking water	AS 4020 certified

Production Batch Release Requirements

Test	Requirement
Thickness	>250µm - <600µm
Continuity	no holidays
Adhesion	<= 1

Rilsan® is a registered trademark of ATOFINA S.A.
A.B.N. 75 087 415 745

General Application

Rilsan® Nylon 11 coating provides excellent corrosion resistance in both potable and wastewater applications.

Technical Data

Coating Thickness:
250µm(minimum)
Application Method:
Fluidised Bed
Maximum Temperature : 50°C
Colour: Blue
Standards:
AS/NZS 4158 - Thermal-bonded polymeric coatings on valves and fittings for water industry purposes
Approvals:
AS 4020 - suitable for contact with drinking water.

BRISBANE CITY COUNCIL
Brisbane Water
SP299 – Viola Place

Q1112-WC-001

tyco Water

MANUFACTURING SPECIFICATION NO. MS01

APPLICATION OF THERMAL-BONDED POLYMERIC COATINGS TO DUCTILE IRON FITTINGS AND VALVES

1. Material — The coating shall be Rilsan (Nylon 11) 7411 MAC, a thermoplastic polyamide powder or Jotun Corrocoat EP9188A50941R, a thermosetting epoxy powder (FBE).

2. Colour — Blue

3. Surface Preparation
   i) Remove grease or oil, if present, with a volatile solvent.
   ii) Abrasive grit blast to AS1627.4 Class 2 ½ to a white metal blast using clean, dry, angular grit to achieve a surface profile between 40 & 90 µm. NB: Wet blasting is not permitted.
   iii) Remove any remaining grit or metallic dust contamination.

4. Primer (for Nylon 11 only)
   i) PRIMOREEN LAT 12035 shall be applied as soon as practicable, but no later than 8 hrs after grit blasting.

5. Powder Application
   i) Components shall be preheated in accordance with the manufacturer's recommendations.
   ii) The powder coating shall be applied before the surface temperature falls below the figure recommended by the powder manufacturer.
   iii) The coating shall be applied by the fluidised bed process.

6. Coating Repairs
   i) Repair to coating defects shall be carried out using Jotacote 605 Epoxy colour Blue.

7. Certification.
   i) The powder coating material shall conform to the requirements of AS/NZS4158 and type test results shall be provided in accordance with Section 2.
   ii) Production tests shall be carried out in accordance with 8. below

300 Production Test Requirements.

Requirement	Test Method	Requirement			*Frequency
		Surface	Nylon 11	FBE	
Thickness	AS 3894.3 Method B	Wetted	250 – 600	350 – 650	One product per batch
		External	200 – 600	300 – 650	
Continuity	AS 3894.1/Visual	As shown in table below.			When detected visually
Adhesion.	AS 1580 Method 408.2.	≤ 1.			One product per 8 hours
Cure (for FBE only)	AS3894.4 Method C: MEK rub test	Pass			One product per 8 hours

* Frequencies are based on prior demonstration of process control.

CMF Manufacturing Manual Ref. 9.13.005 Page 1 of 2 Issue No. 11 Dated 11/07/03

tyco Water

9. Acceptance Limits for Continuity Testing.

Region	End Result	Repair Limitations	Test Requirements
Internal wetted surface	No holidays	Maximum holiday area 25mm² per holiday, with a maximum of 3 repairs per coated product or 3 repairs per 100,000 mm² of coated surface, whichever is the greater	High voltage spark test at 3V per µm of the specified minimum thickness.
External surface	No visual defects	Maximum holiday area 1000mm² per holiday, with a maximum of 6 repairs per coated product or 6 repairs per 100,000 mm² of coated surface whichever is the greater.	Visual

Discontinuities at bolt holes, other external edges, hook holes and scuff marks shall not considered as coating defects.

Appendix 3 Metal Seated Sluice Valves

Metal Seated Gate Valves - Figure 400
DN80 - DN900

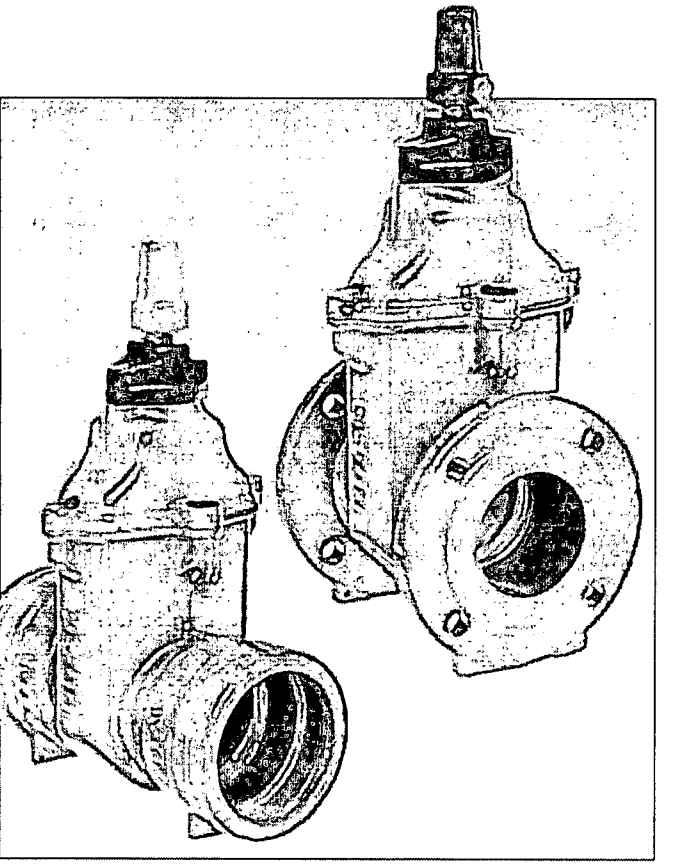
tyco
Flow Control

Tyco Water

Figure 400 metal seated gate valves are designed and manufactured to AS 2638.1.

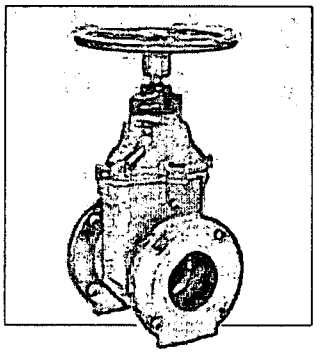
Features

- Ductile Iron body and bonnet for high strength and impact resistance.
- Solid gunmetal gate for DN80-DN200, ductile iron fusion coated gate with gunmetal rings for larger sizes.
- Grade 431 Stainless Steel spindle for high strength and corrosion resistance.
- Gunmetal dezincification resistant top casting incorporating dual O-ring seals and wiper ring for long life operation.
- Back seal facility to allow for replacement of seals under full operating pressure.
- Rilsan® Nylon 11 coating for long life corrosion protection.
- Isolated fasteners for corrosion protection.
- Anti-friction thrust washer for low operating torques.
- Integral cast in feet for safe and easy storage.
- Integral lifting lugs for installation convenience.
- Anticlockwise closing or clockwise closing available.
- Key, handwheel or gearbox operation available.



General Application

Figure 400 metal seated gate valves are suitable for use with drinking water and waste water, in below or above ground applications. Used for the isolation of sections and branches in pipelines.



Technical Data

Size Range: DN80-DN900
Allowable Operating Pressure:
1600 kPa or 3500 kPa
Maximum Temperature: 40°C
End Connections:
Flanged to AS 4087 Fig B5 or B6
TYTON® Socket
Approvals:
WSAA Appraisal No. 98/21
ISC AS 2638 Product Mark
Registration No. PRD/R61/0412/2
[DN80 - DN600]
Certified to AS 4020 -suitable for contact with drinking water.

A.B.N. 75 087 415 745

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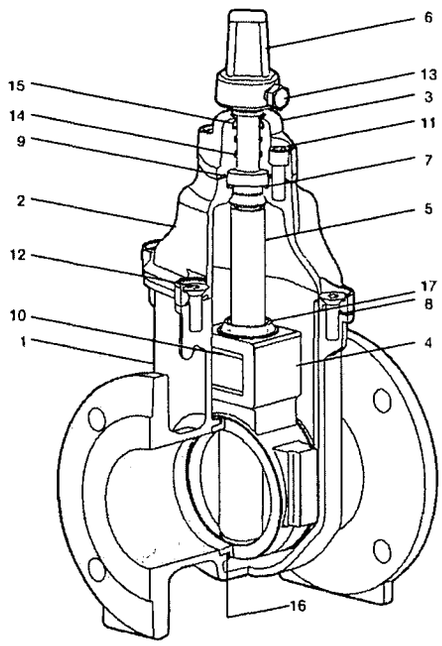
Metal Seated Gate Valves - Figure 400
DN80 - DN900

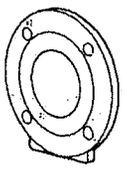


Parts List

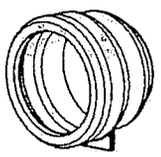
No	Description	Material	Standard
1	Body	Ductile Iron	AS 1831 400-12
2	Bonnet	Ductile Iron	AS 1831 400-12
3	Seal Retainer	Gunmetal	AS 1565 C83600
4	Gate	DN80-DN200 Gunmetal	AS 1565 C83600
		DN255-DN900 Ductile Iron	AS 1831 400-12
5	Spindle	Stainless Steel	ASTM A 276 431
6	Spindle Cap	Ductile Iron	AS 1831 400-12
7	Thrust Washer	Acetyl	-
8	Body Gasket	EPDM	AS 1646
9	Bonnet Gasket	EPDM	AS 1646
10	Gate Nut	Gunmetal	AS 1565 C83600
11	Socket Head Screws	High Tensile Alloy Steel	-
12	Countersunk Screws	High Tensile Alloy Steel	-
13	Hex Head Screw	Stainless Steel	ASTM A276 316
14	O-Rings	Nitrile Rubber	AS 1646
15	Wiper Ring	Nitrile Rubber	AS 1646
16	Seat Rings	Gunmetal	AS 1565 C83600
17	Backseal Grommet	Nitrile Rubber	AS 1646
18	Fusion Coating	Rilsan® Nylon II	AS/NZS 4158

Metal Seated Gate Valves - Figure 400
DN80 - DN900

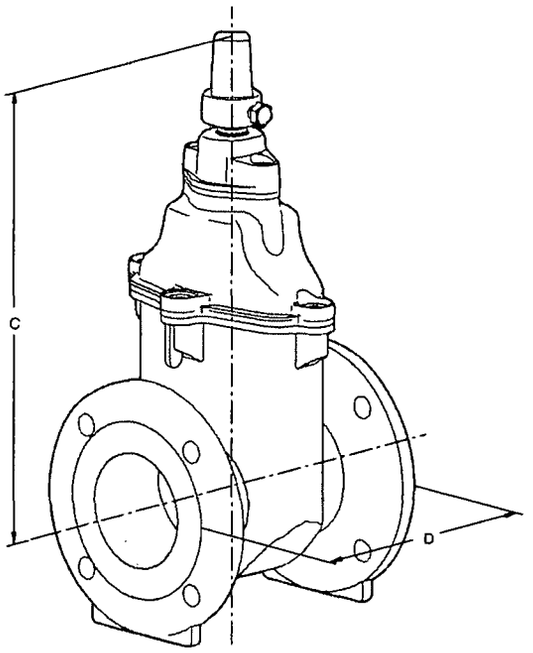
End Connections



Flange



Socket



Dimensions (mm)

Valve Size	C	D Class 16 TYTON Socket	D Class 16 Flange AS4087 Fig B5	D Class 35 Flange AS4087 Fig B6	Turns to Close	Approx. Mass kg
80	367	-	203	280	20	18
100	402	150	229	305	23	24
150	502	170	267	330	26	43
200	610	195	292	380	34	75
225	649	205	305	405	38	85
250	723	235	330	420	42	110
300	810	245	356	430	50	160
375	960	-	381	610	62	340
450	1145	-	432	660	76	560
500	1290	-	457	710	82	710
600	1467	-	508	785	98	940

Note: DN750 and DN900 Gate Valves are also available.

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Metal Seated Gate Valves - Figure 400
DN80 - DN900

Available Range

DN	Metal Seated Gate Valves, Inside Screw, Key Operated, Class 16, Fl-Fl	Metal Seated Gate Valves, Inside Screw, Key Operated, Class 16, Sc-Sc	Metal Seated Gate Valves, Inside Screw, Key Operated, Class 35, Fl-Fl	Metal Seated Gate Valves, Inside Screw, Handwheel Operated, Class 16, Fl-Fl
80	'		'	'
100	'	'	'	'
150	'	'	'	'
200	'	'	'	'
225	'	'	'	'
250	'	'	'	'
300	'		'	'
375	'		'	'
450	'		'	'
500	'		'	'
600	'		'	'
750	'		'	
900	'		'	
Fig No.	400	400	400	600
Coating				
Rilsan Nylon 11	'	'	'	'
Options				
Anticlockwise Closing	'	'	'	
Clockwise Closing	'	'	'	'
Gear Actuator	'		'	
Flange Drilling Fig B5 (TC)	'			'
Flange Drilling Fig B6 (HP)			'	

Recommended Specification

- Gate valves shall be metal seated conforming to AS2638.1.
- The allowable operating pressure shall be 1600 kPa/3500 kPa.
- Operation shall be by means of a key/hand wheel.
- The direction of closing shall be anticlockwise/clockwise.
- The valve body and bonnet shall be cast in Ductile Iron and coated with a thermally applied polymeric coating to AS/NZS 4158.
- The gate shall be cast in Ductile Iron and coated with a thermally bonded polymeric coating. Gate sealing rings shall be dezincification resistant copper alloy mechanically fixed to the body and gate. Solid gunmetal gates are also acceptable.
- The spindle shall be Grade 431 Stainless Steel incorporating a failsafe thrust collar.
- The spindle seal retainer shall be manufactured from a dezincification resistant copper alloy to AS1565.
- The spindle seal shall be affected by a minimum of two O-rings, which can be replaced under full operating pressure.
- Fasteners shall be completely isolated from the external environment.
- Valves shall be manufactured under a product certification scheme and each valve marked in accordance with the certification body's requirements.

1.00.00 DESCRIPTION

1.00.01 This manual covers Tyco Waters' range of Class 16, Flange / Flange, metal seated gate valves. Sizes covered are from DN80 – DN600. All flanges are drilled in accordance with AS4087 Figure B5.

1.01.00 OPERATING INSTRUCTIONS

1.01.01 The valves are available in clockwise and anti-clockwise closing configurations. The direction of closing for your valve will be indicated by the colour of the spindle cap or marked by an arrow on top of the handwheel. **Clockwise** closing valves are identified by a red spindle cap or a red mark in the centre of the handwheel.

1.01.02 The number of turns from open to close is shown in the table below:

Valve Size	Turns to close
80	20
100	23
150	28
200	34
225	38
250	42
300	50
375	62
450	76
500	82
600	98

1.01.03 Valves of this type are not designed for throttling purposes.

1.01.04 The allowable pressures for Class 16 Metal Seated Valves are:

- Allowable Operating Pressure (AOP) - 1600kPa.
- Maximum Allowable Operating Pressure (MAOP) - 1920kPa.
- Allowable Site Test Pressure (ASTP) - 2400kPa

Seat leakage may occur at the MAOP, however structural damage will not occur. ASTP should be applied only with the gate in the fully open position.

1.01.05 Care should be taken to remove any foreign material from the pipeline end particularly from the well of the valve body. Closing the wedge onto solid debris may damage the gunmetal sealing rings.

1.02.00 *MAINTENANCE INSTRUCTIONS*

1.02.01 This type of valve does **NOT** require any lubrication.

1.02.02 In the unlikely event of any of the long life Spindle Sealing Rings (items 14 & 15) requiring replacement, ensure valve is fully **OPEN** and remove spindle cap/handwheel and Seal Retainer (items 6 & 3) by removing concealed Socket Head Screws (item 12). This will permit the Seal Retainer (item 3) to be removed from the Spindle (item 5) for replacement of the appropriate rings.

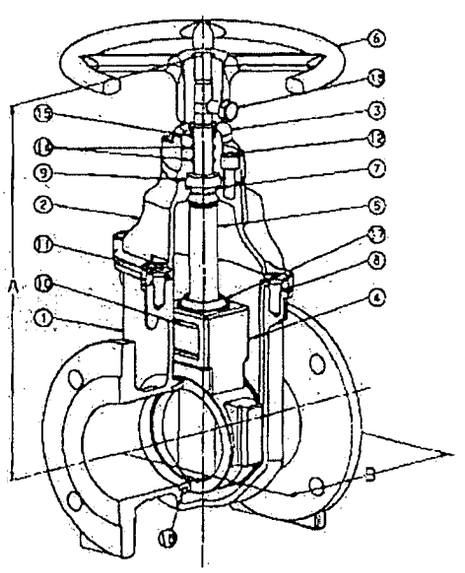
1.02.03 Re-assemble in the reverse sequence using any commercially available water pump grease applied to the upper end of the Spindle to aid assembly. Reseal Screws with silicon sealant.

2.00.00 SPARE PARTS LIST

2.00.01 Spare parts are **NOT** normally required for this type of valve.

2.00.02 In the unlikely event of a sealing ring failure the appropriate ring may be selected from items 14 & 15 in the attached general assembly drawing.

3.00.00 DETAIL DRAWING



No	Description	Material
1	Body	Ductile Iron
2	Bonnet	Ductile Iron
3	Seal Retainer	Gunmetal
4	Gate	DN80-DN200 Gunmetal DN225-DN600 Ductile Iron
5	Spindle	Stainless Steel
6	Spindle Cap/Handwheel	Ductile Iron
7	Thrust Washer	Acetyl
8	Body Gasket	EPDM
9	Bonnet Gasket	EPDM
10	Gate Nut	Gunmetal
11	Countersunk Screws	High Tensile Alloy Steel
12	Socket Head Screws	High Tensile Alloy Steel
13	Socket Head Cap Screw	Stainless Steel
14	O-Rings	Nitrile Rubber
15	Wiper Ring	Nitrile Rubber
16	Seal Rings	Gunmetal
17	Backseal Grommet	Nitrile Rubber
18	Key Head Screw	Stainless Steel

Operation & Maintenance Manual – Class 16 MSV

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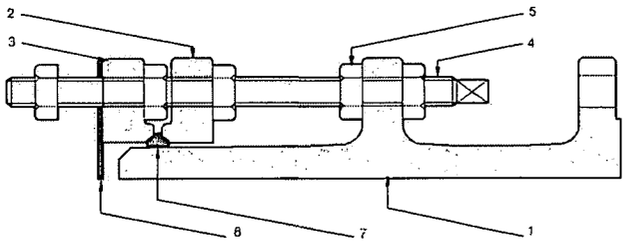
Appendix 4 Dismantling Joints

Dismantling Joints
DN100-DN750



Parts List

No.	Description	Material	Standard
1	Body (Thrust type only)	Ductile Iron	AS 1831-400/15
2	Thrust Ring Inner	Ductile Iron	AS 1831-400/15
3	Thrust Ring Outer	Ductile Iron	AS 1831-400/15
4	Stud	Stainless steel	ASTM A276 316
5	Nut	Stainless steel	ASTM A276 316
6	Gasket	EPDM Rubber (Class 16)	AS 1646
		Teadit NA1000 (Class 35)	-
7	Rubber Ring	EPDM Rubber	AS 1646

Specifying Sequence

Specifying a non-thrust type DN300 Class 16 dismantling joint.

Example	300	DIS JNT	N-THRUST	S/S	TC	FC
Nominal Size						
100 - 750						
Name						
Type						
Thrust						
Non thrust						
Fastener Type						
SS - Stainless Steel						
End Type						
TC – Flanged AS 4087 Figure B5						
HP – Flanged AS 4087 Figure B6						
Extra Information						
FC – Fusion Coated						
DI – Ductile Iron						
DICL – Ductile Iron Cement Lined						

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Dismantling Joints
DN100-DN750

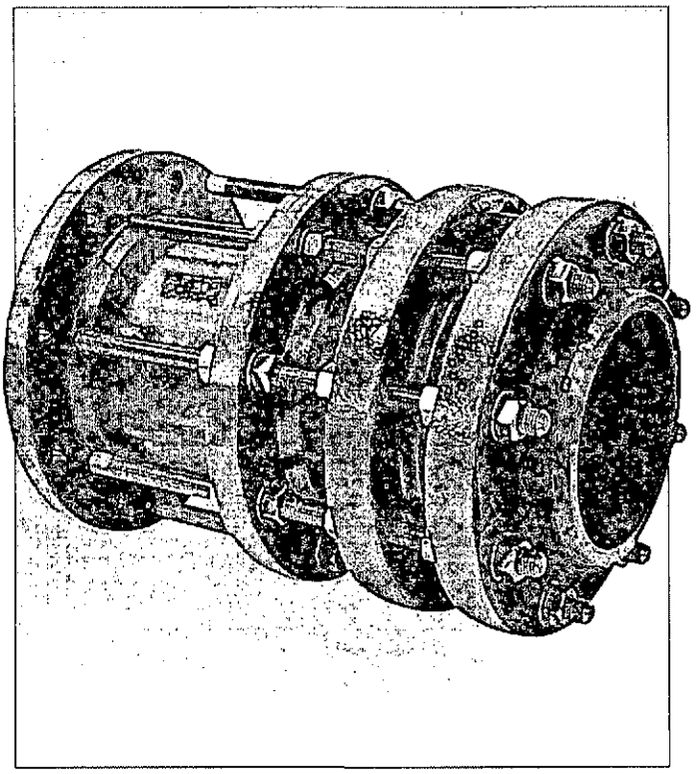
tyco
Flow Control

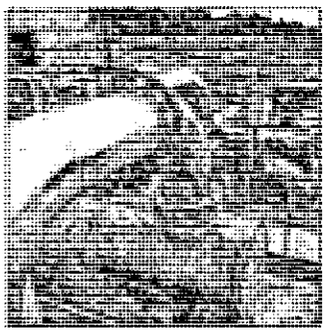
Tyco Water

Dismantling joints are designed to facilitate the removal of flanged valves from pipelines.

Features

- Ductile Iron components for high strength and impact resistance.
- Fasteners are grade 316 Stainless Steel for long life operation.
- Thrust type available to provide longitudinal restraint.
- Non-Thrust type available where restraint is separately provided.
- Cement lined and bituminen coated or fusion coated with Rilsan Nylon 11 for long life corrosion protection.
- Studs are fully threaded.





General Application

Dismantling Joints are used in pipelines where valves may need to be removed for future maintenance or replacement.

Technical Data

Size Range:
DN100-DN750
Allowable Operating Pressure:
1600 kPa or 3500 kPa
End Connections:
Flanged to AS 4087 Figure B5
Flanged to AS 4087 Figure B6

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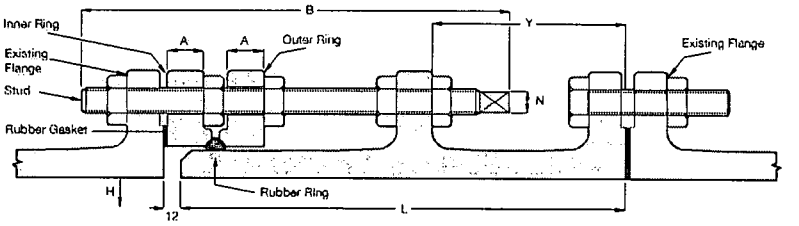
Dismantling Joints DN100-DN750

Thrust Type



Class 16 - Thrust Type Dismantling Joint Dimensions

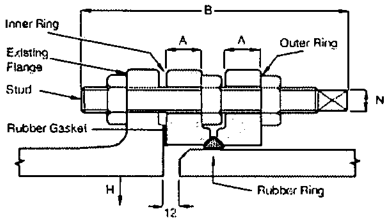
Nominal Size DN	Joint Dimensions A	H	L	Y	Rubber ID x d	No. of Studs	Stud Details Stud Size	B	Z	No. of Nuts
100	30	126	400	175	104 x 16	4	M16	340	10	5
150	30	181	400	175	155 x 16	8	M16	340	10	5
200	30	236	400	175	206 x 16	8	M16	340	10	5
225	30	263	400	175	232 x 19	8	M16	340	10	5
250	30	290	400	175	268 x 19	6	M20	340	13	5
300	30	349	400	175	298 x 13	12	M20	340	13	5
375	35	430	600	260	410 x 13	12	M24	495	16	5
450	35	511	600	260	500 x 20	12	M24	495	16	5
500	40	564	600	260	555 x 20	16	M24	495	18	5
600	45	671	600	260	660 x 20	16	M27	495	16	5
750	47	831	600	260	780 x 25	20	M30	495	18	5

Class 35 - Thrust Type Dismantling Joint Dimensions

Nominal Size DN	Joint Dimensions A	H	L	Y	Rubber ID x d	No. of Studs	Stud Details Stud Size	B	Z	No. of Nuts
100	30	126	400	175	104 x 16	8	M16	340	10	5
150	30	181	400	175	155 x 16	12	M20	340	13	5
200	31	236	400	175	206 x 16	12	M20	340	13	5
225	34	263	500	220	232 x 19	12	M24	425	16	5
250	34	290	500	220	268 x 19	12	M24	425	16	5
300	38	349	500	220	298 x 19	16	M24	425	16	5
375	42	430	600	260	410 x 24	16	M27	495	16	5
450	46	511	600	260	500 x 20	20	M30	495	18	5
500	49	564	600	260	555 x 20	24	M30	495	18	5
600	54	671	700	300	660 x 20	24	M33	595	20	5
750	59	831	700	300	780 x 25	28	M33	595	20	5

Dismantling Joints
DN100-DN750

Non-thrust Type



Class 16 - Non Thrust Type Dismantling Joint Dimensions

Nominal Size DN	Joint Dimensions A	Joint Dimensions H	Rubber ID x d	No. of Studs	Stud Details Stud Size	Stud Details C	Stud Details Z	No. of Nuts
100	30	126	104 x 16	4	M16	195	10	3
150	30	181	155 x 16	8	M16	195	10	3
200	30	236	206 x 16	8	M16	195	10	3
225	30	263	232 x 19	8	M16	195	10	3
250	30	290	268 x 19	8	M20	195	13	3
300	30	349	298 x 13	12	M20	195	13	3
375	35	430	410 x 13	12	M24	275	16	3
450	35	511	500 x 20	12	M24	275	16	3
500	40	564	555 x 20	16	M24	275	16	3
600	45	671	660 x 20	18	M27	275	16	3
750	47	831	780 x 25	20	M30	275	18	3

Class 35 - Non Thrust Type Dismantling Joint Dimensions

Nominal Size DN	Joint Dimensions A	Joint Dimensions H	Rubber ID x d	No. of Studs	Stud Details Stud Size	Stud Details C	Stud Details Z	No. of Nuts
100	30	126	104 x 16	8	M16	195	10	3
150	30	181	155 x 16	12	M20	195	13	3
200	31	236	206 x 16	12	M20	195	13	3
225	34	263	232 x 19	12	M24	275	16	3
250	34	290	268 x 19	12	M24	275	16	3
300	38	349	298 x 19	16	M24	275	16	3
375	42	430	410 x 24	16	M27	275	16	3
450	46	511	500 x 20	20	M30	275	18	3
500	49	564	555 x 20	24	M30	275	18	3
600	54	671	660 x 20	24	M33	330	20	3
750	59	831	780 x 25	28	M33	330	20	3

Note: When non-thrust dismantling joints are used on non machined DI pipe spigots, the allowable operating pressure is 2100kPa

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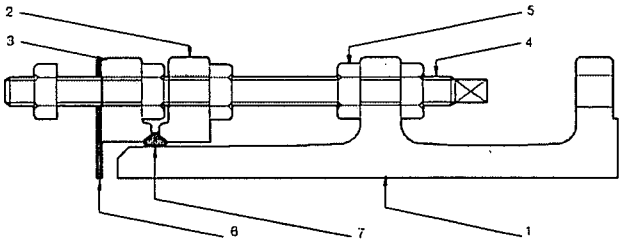
Dismantling Joints
DN100-DN750



Parts List

No.	Description	Material	Standard
1	Body (Thrust type only)	Ductile Iron	AS 1831-400/15
2	Thrust Ring Inner	Ductile Iron	AS 1831-400/15
3	Thrust Ring Outer	Ductile Iron	AS 1831-400/15
4	Stud	Stainless steel	ASTM A276 316
5	Nut	Stainless steel	ASTM A276 316
6	Gasket	EPDM Rubber (Class 16)	AS 1646
		Teadit NA1000 (Class 35)	-
7	Rubber Ring	EPDM Rubber	AS 1646

Specifying Sequence

Specifying a non-thrust type DN300 Class 16 dismantling joint.

Example	300	DIS JNT	N-THRUST	S/S	TC	FC
Nominal Size						
100 - 750						
Name						
Type						
Thrust						
Non thrust						
Fastener Type						
SS - Stainless Steel						
End Type						
TC – Flanged AS 4087 Figure B5						
HP – Flanged AS 4087 Figure B6						
Extra Information						
FC – Fusion Coated						
DI – Ductile Iron						
DICL – Ductile Iron Cement Lined						

tyco Water

Dismantling Joints for pressure pipe

Installation Instructions

1. Remove nut (1) and washer.
2. Place dismantling joint into position and attach fixed end of dismantling joint to pipeline.
3. Wind nut (5) back to 15mm from end of stud.
4. Slide whole assembly along by tightening nut (4) against thrust flange. Wind nut (3) back towards nut (4) about 20- 30mm. Keep tightening nut (4) against thrust flange until enough thread is protruding from existing flange for nut (1) to go on.
5. Screw nut (1) and washer on.
6. Tighten nuts (4) & (5) together so that the stud is locked in position.
7. Tighten nut (1).
8. Tighten nut (2) so that flange "Y" is tight against existing flange.
9. Tighten nut (3) so that rubber ring gives appropriate seal.
10. Check to make sure joint is secure.

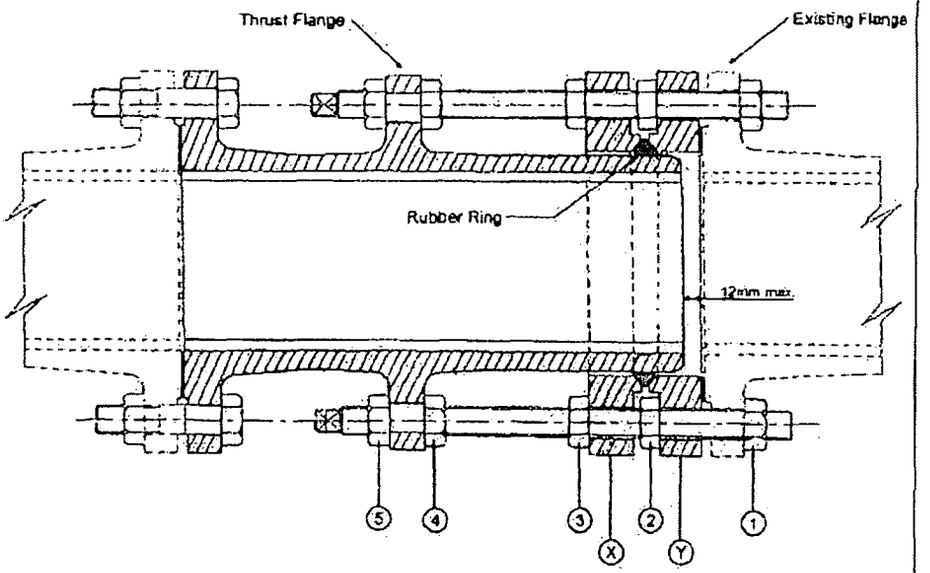
REMOVAL

1. Remove nut (1) and washer.
2. Loosen nut (4) until it meets up with nut (3).
3. Slide flange "X" back towards thrust flange, which in turn will pull studs back as well.
4. There is no need to move nuts (2), (3) and (5).

NOTES:

Always tighten nuts progressively in a star pattern as per normal for flanged joints.
For reinstallation after removal, reverse the removal procedure.
Maximum Operating Pressure is 3500 kPa

THRUST TYPE DISMANTLING JOINT



Revision 1-27/11/03

Appendix 5 Reflux Valves

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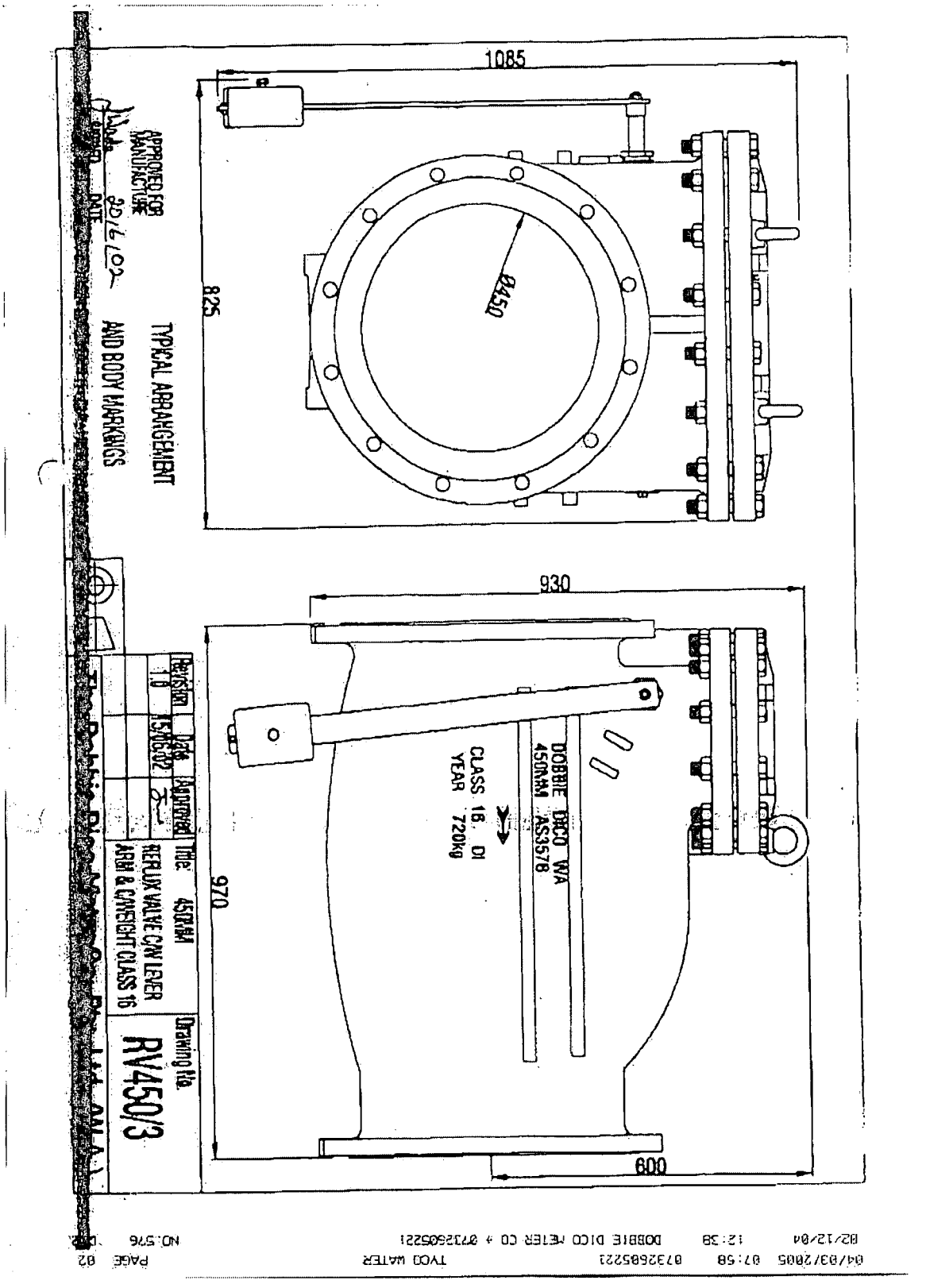
Q1112-WC-001



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02/12/04 12:38 DOBBIE DICO METER CO + 0732605221 NO.576

Q1112-WC-001

450mm REFLUX VALVE SPECIFICATIONS

No	PART	MATERIAL	STANDARD	GRADE
1	BODY	DUCTILE IRON	AS1831	AS 500-7
2	COVER	DUCTILE IRON	AS1831	AS 500-7
3	BOLTS	GALV. CARBON STEEL	AS1252	HIGH STRENGTH STRUCTURAL
3	BOLT ALTERNATIVE	STAINLESS STEEL	AS2837	304 OR 316
4	BLANKING PLUG	OR BRASS	BS1256	
5	FLAP SPINDLE	STAINLESS STEEL	AS2837	316 OR 416
6	SEATING RING	GUNMETAL	AS1565	C83600
7	FLAP	GUNMETAL	AS1565	C83600
8	HINGE	GUNMETAL	AS1565	C83600
9	HINGE SPINDLE	STAINLESS STEEL	AS2837	316 OR 416
10	GASKET	NON ASBESTOS JOINTING	BS5292	
11	SPINDLE BUSH	GUNMETAL OR OR BRASS	AS1565	C83600
12	WASHER	STAINLESS STEEL	AS2837	316 OR 304
13	SPLIT PIN	STAINLESS STEEL	AS2837	316 OR 304
14	GLAND NUT	GUNMETAL	AS1565	C83600
15	BLEED PLUG	GALV. MALLEABLE IRON	BS1256	
16	LEVER ARM (IF REQ'D)	STRUCTURAL STEEL	AS3679	250
17	COUNTERWEIGHT (IF REQ'D)	GREY CAST IRON	AS1830	T220
18	LIMIT SWITCH (IF REQ'D)	AS SPECIFIED		
19	CAM (IF REQ'D)	STAINLESS STEEL	AS2837	316 OR 304

METRIC TOLERANCE

mm	
25	± 0.5
25.0	± 0.2
25.00	± 0.1

APPROVED FOR MANUFACTURE

SIGNED DATE 10/12/02

A.S. FLANGE SPECIFICATIONS

VALVE CLASS	FLANGE DIAM.	FLANGE THICKNESS	FACE/FACE LENGTH	LENGTH TOL. +/-	MIN WALL THICKNESS	No. BOLT HOLES	BOLT HOLE DIAM.	BOLT HOLE P.C.D.
450C	640	35	970	3	X	12	26	584
450E	640	35	970	3	X	16	26	584
450F	675	38	970	3	X	20	33	610
450H	675	51	970	3	X	20	33	610

REV	DATE	APPD	TITLE: 450MM REFLUX VALVE SPECIFICATIONS	DRAWING No.
0.0	26/10/00			RV450/1
0.1	14/05/02			

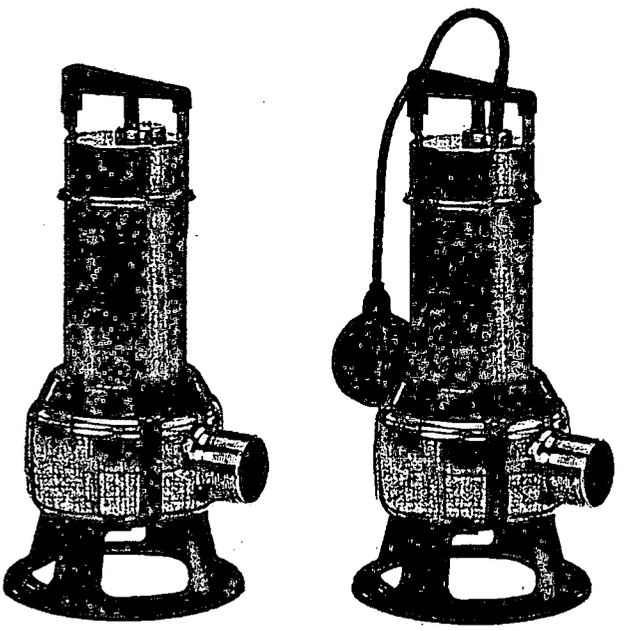
THE DOBBIE DICO METER CO

Appendix 6 Sump Pumps

GRUNDFOS **INSTRUCTIONS**

AP35B, AP50B

(GB) Installation and operating instructions
(D) Montage- und Betriebsanleitung
(F) Notice d'installation et d'entretien
(I) Istruzioni di installazione e funzionamento
(E) Instrucciones de instalación y funcionamiento
(P) Instruções de instalação e funcionamento
(GR) Οδηγίες εγκατάστασης και λειτουργίας
(NL) Installatie- en bedieningsinstructies
(S) Monterings- och driftsinstruktion
(SF) Asennus- ja käyttöohjeet
(DK) Monterings- og driftsinstruktion



BE›THINK›INNOVATE›

GRUNDFOS

Declaration of Conformity

We GRUNDFOS declare under our sole responsibility that the products AP35B and AP50B to which this declaration relates, are in conformity with the Council Directives on the approximation of the laws of the EEC Member States relating to

- Machinery (98/37/EEC).
  Standard used: EN 292.
- Electrical equipment designed for use within certain voltage limits (73/23/EEC).
  Standards used: EN 60 335-1 and EN 60 335-2-41.

Konformitätserklärung

Wir GRUNDFOS erklären in alleiniger Verantwortung, daß die Produkte AP35B und AP50B, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EG-Mitgliedstaaten übereinstimmen:

- Maschinen (98/37/EWG).
  Norm, die verwendet wurde: EN 292.
- Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen (73/23/EWG).
  Normen, die verwendet wurden: EN 60 335-1 und EN 60 335-2-41.

Déclaration de Conformité

Nous GRUNDFOS déclarons sous notre seule responsabilité que les produits AP35B et AP50B auxquels se réfère cette déclaration sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CEE relatives à

- Machines (98/37/CEE).
  Standard utilisé: EN 292.
- Matériel électrique destiné à employer dans certaines limites de tension (73/23/CEE).
  Standards utilisés: EN 60 335-1 et EN 60 335-2-41.

Dichiarazione di Conformità

Noi GRUNDFOS dichiariamo sotto la nostra esclusiva responsabilità che i prodotti AP35B e AP50B ai quali questa dichiarazione si riferisce sono conformi alle Direttive del Consiglio concernente il ravvicinamento delle legislazioni degli Stati membri CEE relative a

- Macchine (98/37/CEE).
  Standard usato: EN 292.
- Materiale elettrico destinato ad essere utilizzato entro certi limiti di tensione (73/23/CEE).
  Standard usati: EN 60 335-1 e EN 60 335-2-41.

Declaración de Conformidad

Nosotros GRUNDFOS declaramos bajo nuestra única responsabilidad que los productos AP35B y AP50B a los cuales se refiere esta declaración son conformes con las Directivas del Consejo relativas a la aproximación de las legislaciones de los Estados Miembros de la CEE sobre

- Máquinas (98/37/CEE).
  Norma aplicada: EN 292.
- Material eléctrico destinado a utilizarse con determinadas límites de tensión (73/23/CEE).
  Normas aplicadas: EN 60 335-1 y EN 60 335-2-41.

Declaração de Conformidade

Nós GRUNDFOS declaramos sob nossa única responsabilidade que os produtos AP35B e AP50B aos quais se refere esta declaração estão em conformidade com as Directivas do Conselho das Comunidades Europeias relativas à aproximação das legislações dos Estados Membros respeitantes à

- Máquinas (98/37/CEE).
  Norma utilizada: EN 292.
- Material eléctrico destinado a ser utilizado dentro de certos limites de tensão (73/23/CEE).
  Normas utilizadas: EN 60 335-1 e EN 60 335-2-41.

Δήλωση Συμμόρφωσης

Εμείς η GRUNDFOS δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι το προϊόντα AP35B και AP50B συμμορφώνονται με την Οδηγία του Συμβουλίου επί της σύγκλισης των νόμων των Κρατών Μελών της Ευρωπαϊκής Ενωσης σε σχέση με το

- Μηχανήματα (98/37/ΕΕC).
  Πρότυπο που χρησιμοποιήθηκε: EN 292.
- Ηλεκτρικές συσκευές σχεδιασμένες γιά χρήση εντός ορισμένων ορίων ηλεκτρικής τάσης (73/23/ΕΕC).
  Πρότυπα που χρησιμοποιήθηκαν: EN 60 335-1 και EN 60 335-2-41.

Overeenkomstigheidsverklaring

Wij GRUNDFOS verklaren geheel onder eigen verantwoordelijkheid dat de produkten AP35B en AP50B waarop deze verklaring betrekking heeft in overeenstemming zijn met de Richtlijnen van de Raad inzake de onderlinge aanpassing van de wetgevingen van de Lid-Staten betreffende

- Machines (98/37/EEG).
  Norm: EN 292.
- Elektrisch materiaal bestemd voor gebruik binnen bepaalde spanningsgrenzen (73/23/EEG).
  Normen: EN 60 335-1 en EN 60 335-2-41.

Försäkran om överensstämmelse

Vi GRUNDFOS försäkrar under ansvar, att produkterna AP35B och AP50B, som omfattas av denna försäkran, är i överensstämmelse med Rådets Direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende

- Maskinell utrustning (98/37/EC).
  Använd standard: EN 292.
- Elektrisk material avsedd för användning inom vissa spänningsgränser (73/23/EC).
  Använda standarder: EN 60 335-1 och EN 60 335-2-41.

Vastaavuusvakuutus

Me GRUNDFOS vakuutamme yksin vastuullisesti, että tuotteet AP35B ja AP50B, joita tämä vakuutus koskee, noudattavat direktiivejä jotka käsittelevät EY:n jäsenvaltioiden koneellisia laitteita koskevien lakien yhdenmukaisuutta seur.:

- Koneet (98/37/EY).
  Käytetty standardi: EN 292.
- Määrättyjen jänniterajoitusten puitteissa käytettävät sähköiset laitteet (73/23/EY).
  Käytetyt standardit: EN 60 335-1 ja EN 60 335-2-41.

Overensstemmelseserklæring

Vi GRUNDFOS erklærer under ansvar, at produkterne AP35B og AP50B, som denne erklæring omhandler, er i overensstemmelse med Rådets direktiver om indbyrdes tilnærmelse til EF medlemsstaternes lovgivning om

- Maskiner (98/37/EØF).
  Anvendt standard: EN 292.
- Elektrisk materiel bestemt til anvendelse inden for visse spændingsgrænser (73/23/EØF).
  Anvendte standarder: EN 60 335-1 og EN 60 335-2-41.

Bjerringbro, 1st April 2000

Kenth Hvid Nielsen
Technical Manager

AP35B, AP50B

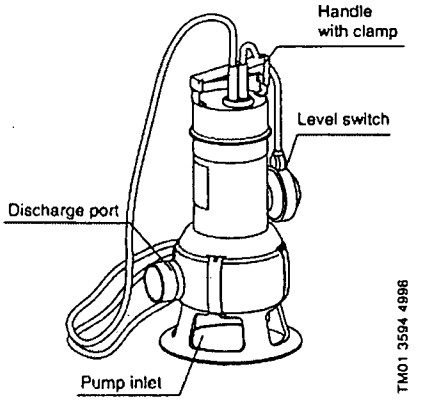
GB

CONTENTS

Before beginning installation procedures, these installation and operating instructions should be studied carefully. The installation and operation should also be in accordance with local regulations and accepted codes of good practice.

1. General description

Fig. 1



1.1 Applications

The GRUNDFOS AP35B and AP50B pumps are single-stage submersible pumps designed for the pumping of waste water.

The pump is capable of pumping water which contains a limited quantity of solids, however not stones and similar materials, without being blocked or damaged.

The pump is available for automatic as well as manual operation and can be installed in a permanent installation (on auto-coupling or as a free-standing pump) or used as a portable pump.

The pump is suitable for:

Applications	AP35B	AP50B
Groundwater lowering	●	●
Pumping in drainage pits	●	●
Pumping in surface water pits with inflow from roof gutters, shafts, tunnels, etc.	●	●
Emptying of ponds, tanks, etc.	●	●
Pumping of fibre-containing waste water from laundries and industries	●	●
Pumping of domestic waste water from septic tanks and sludge treating systems	●	●
Pumping of domestic waste water without discharge from water closets	●	●
Pumping of domestic waste water with discharge from water closets		●
Maximum particle size [mm]	35	50

The pump must not be used in or at swimming pools, garden ponds, etc. when there are persons in the water.

Incorrect application of the pump (e.g. resulting in blocking of the pump) and wear are not covered by the warranty.

1.2 Storage and operating conditions

Storage temperature: Down to –30°C.

Minimum liquid temperature: 0°C.

Maximum liquid temperature: +40°C.

Installation depth: Maximum 7 metres below liquid level.

pH value: Between 4 and 10.

Density: Maximum 1100 kg/m³.

Viscosity: Maximum 10 mm²/s.

Technical data: See pump nameplate.

1.3 Sound pressure level

The sound pressure level of the pump is lower than the limiting values stated in the EC Council Directive 98/37/EEC relating to machinery.

2. Safety

Pump installation in wells must be carried out by specially trained persons.

3. Electrical connection

Note: Depending on local regulations, a pump with 10 metres of mains cable must be used if the pump is used as a portable pump for different applications.

The electrical connection should be carried out in accordance with local regulations.

The operating voltage and frequency are marked on the pump nameplate. Please make sure that the motor is suitable for the electricity supply on which it will be used.

As a precaution, the pump must be connected to a socket with earth connection. The installation must be fitted with an earth leakage circuit breaker (ELCB) with a tripping current < 30 mA.

The pump must be connected to an external mains switch with a minimum contact gap of 3 mm in all poles. If the pump is not installed close to the switch, this must be of a lockable type.

Three-phase pumps must be connected to an external motor starter with differential release. The nominal current of the motor starter must correspond to the electrical data marked on the pump nameplate.

If a level switch is connected to a three-phase pump, the motor starter must be magnetically operated.

Single-phase pumps incorporate thermal overload protection and require no additional motor protection.

Note: If the motor is overloaded, it will stop automatically. When it has cooled to normal temperature, it will restart automatically.

3.1 Checking of direction of rotation

(Three-phase pumps only)

The direction of rotation should be checked every time the pump is connected to a new installation.

Check the direction of rotation as follows:

1. Position the pump so that the impeller can be observed.
2. Start the pump for a short period.
3. Observe the rotation of the impeller. The correct direction of rotation is indicated by an arrow on the top of the motor (clockwise when seen from the bottom). If the impeller rotates in the wrong direction, reverse the direction of rotation by interchanging two of the phases to the motor.

If the pump is connected to a piping system, the direction of rotation can be checked as follows:

1. Start the pump and check the quantity of water or the discharge pressure.
2. Stop the pump and interchange two of the phases to the motor.
3. Start the pump and check the quantity of water or the discharge pressure.
4. Stop the pump.
5. Compare the results taken under points 1 and 3. The connection which gives the larger quantity of water or the higher pressure is the correct direction of rotation.

GB

4. Installation

The installation of the pump must be carried out by specially trained persons. Care must be taken to ensure that persons cannot come into contact with the pump impeller.

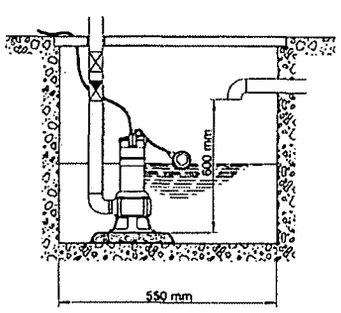
4.1 Connection

For permanent installation, it is recommended to fit a union, a non-return valve and an isolating valve in the discharge pipe.

If the pump is installed in a pit with a minimum free cable length of 100 mm, see fig. 5, the minimum pit dimensions must be as shown in fig. 2.

Furthermore, the pit should be dimensioned according to the relation between the water flow to the pit and the pump performance.

Fig. 2

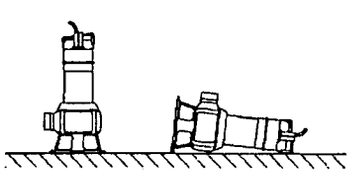


4.2 Pump location

The pump can be used in vertical or horizontal position, see fig. 3.

During continuous operation, the motor and the pump inlet must always be completely covered by the pumped liquid.

Fig. 3



5

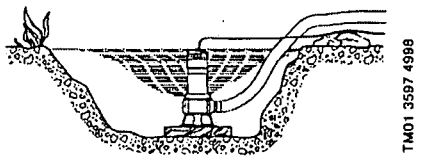
When the pipe/hose has been connected, place the pump in its operating position.

Note: Do not lift or lower the pump by means of the electric cable.

Position the pump so that the pump inlet will not be blocked or partly blocked by sludge, mud or similar materials.

It is recommended to place the pump on a solid base, see fig. 4.

Fig. 4



In the case of permanent installation, the pit must be cleared of sludge, pebbles, etc. before the pump is installed.

4.3 Installation on auto-coupling

See figs. A and B, pages 62 and 63.

Pumps for parmanent installation can be installed on a stationary auto-coupling and operated completely or partially submerged in the pumped liquid.

1. Drill mounting holes for guide rail bracket on the inside of the pit and fasten the guide rail bracket provisionally with two screws.
2. Place the auto-coupling base unit on the bottom of the pit. Use a plumb line to establish the correct positioning. Fasten with heavy-duty expansion bolts. If the bottom of the pit is uneven, the auto-coupling base unit must be supported so that it is level when being fastened.
3. Assemble the discharge line in accordance with the generally accepted procedures and without exposing the line to distortion or tension.
4. Insert the guide rails in the rings of the auto-coupling base unit and adjust the length of the rails accurately to the guide rail bracket.
5. Unscrew the provisionally fastened guide rail bracket, fit it on top of the guide rails and finally fasten it firmly to the pit wall.

Note: The guide rails must not have any axial play as this would cause noise during pump operation.

6. Clean out debris from the pit before lowering the pump into the pit.
7. Fit the auto-coupling half on to the discharge port of the pump. Then slide the guide bar of this coupling half between the guide rails and lower the pump into the pit by means of a chain. When the pump reaches the auto-coupling base unit, the pump will automatically connect tightly.
8. Hang up the end of the chain on a suitable hook at the top of the pit.
9. Adjust the length of the motor cable by coiling it up on a relief fitting, so the cable is not damaged during operation. Fasten the relief fitting to a suitable bracket at the top of the pit. Make sure that the cables are not sharply bent or pinched.

Note: The end of the cable must not be submerged, as water may penetrate through the cable into the motor.

4.4 Free-standing installation

See fig. C, page 64.

For free-standing installation of the pumps, fit a 90° elbow to the discharge port. The pump can be installed with a hose or rigid pipe and valves.

In order to facilitate service of the pump, fit a flexible union or coupling to the discharge line for easy separation.

If a hose is used, make sure that the hose does not buckle and that the inside diameter of the hose matches that of the discharge port.

If a rigid pipe is used, the union or coupling, non-return valve and isolating valve should be fitted in the sequence mentioned, as seen from the pump side.

Lower the pump into the liquid.

If the pump is installed in muddy conditions or on uneven ground, it is recommended to support the pump on bricks.

4.5 Setting of level switch

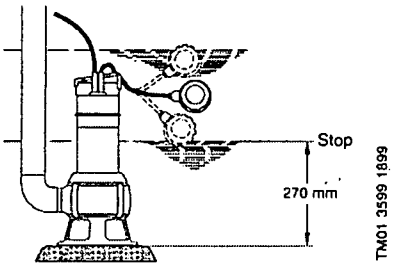
Intermittent operation:

For pumps supplied with a level switch, the difference in level between start and stop can be set by adjusting the free cable between the level switch and the pump handle.

The longer the length of free cable, the larger the difference in level between start and stop.

The pump is allowed to run for maximum 5 minutes per 30 minutes without the motor being submerged in the liquid.

Fig. 5



Continuous operation:

During continuous operation, the pump must always be completely covered by the pumped liquid.

5. Start-up

Before start-up, the pump inlet must be submerged in the pumped liquid.

Open the isolating valve, if fitted, and check the level switch setting.

Note: The pump may be run briefly to check the direction of rotation without being submerged in the pumped liquid.

6. Maintenance and service

Before starting work on the pump, make sure that the electricity supply to the pump has been switched off and that it cannot be accidentally switched on.

Before carrying out maintenance and service, it must be ensured that the pump has been thoroughly flushed with clean water. Rinse the pump parts in water after dismantling.

Check the pump and replace the oil once a year. If the pump is used for pumping liquids containing abrasive particles or it is operating continuously, the pump must be checked at shorter intervals.

Out of consideration for the personal safety and health, this work must be carried out by specially trained persons. Furthermore, all rules and regulations covering safety, health and environment must be observed.
During dismantling, caution should be exercised as there will be access to sharp edges, etc. which may cut.

A possible replacement of the cable or the level switch must be carried out by an authorised GRUNDFOS service workshop.

6.1 Oil

The pump contains approx. 60 ml non-poisonous oil.

Used oil must be disposed of in accordance with local regulations.

If the drained oil contains water or other impurities, the shaft seal should be replaced.

6.2 Pump construction

The construction of the pump will appear from the table below and fig. D, page 65.

GB

Pos.	Description
50	Pump housing
37a	O-ring
49	Impeller
150	Motor with flange
66	Washer
84	Base
67	Lock nut
6	Inlet part
105a	Shaft seal
182	Level switch

6.3 Service kits

Service kit	Part number
Shaft seal, standard	96 42 93 07
Shaft seal, FKM	96 42 93 08
Oil	96 01 06 46

6.4 Contaminated pumps

Note: If a pump has been used for a liquid which is injurious to health or toxic, the pump will be classified as contaminated.

If GRUNDFOS is requested to service the pump, GRUNDFOS must be contacted with details about the pumped liquid, etc. *before* the pump is returned for service. Otherwise GRUNDFOS can refuse to accept the pump for service.

Possible costs of returning the pump are paid by the customer.

However, any application for service (no matter to whom it may be made) must include details about the pumped liquid if the pump has been used for liquids which are injurious to health or toxic.

7

GB

7. Fault finding chart

Fault	Cause	Remedy
1. Motor does not start.	a) No electricity supply.	Connect the electricity supply.
	b) Motor switched off by level switch.	Adjust/replace the level switch.
	c) Fuses are blown.	Replace fuses.
	d) Motor protection/thermal relay has tripped out.	Wait until the motor protection trips in again/reset the relay.
	e) Impeller blocked by impurities.	Clean the impeller.
	f) Short-circuit in cable or motor.	Replace the defective part.
2. Motor protection/ thermal relay trips out after short time of operation.	a) Temperature of pumped liquid too high.	Use another pump type.
	b) Impeller blocked or partly blocked by impurities.	Clean the pump.
	c) Phase failure.	Call an electrician.
	d) Voltage too low.	Call an electrician.
	e) Overload setting of the motor starter too low.	Adjust the setting.
	f) Incorrect direction of rotation. See section *3.1 Checking of direction of rotation.*	Reverse the direction of rotation.
3. Pump runs constantly or gives insufficient water.	a) Pump partly blocked by impurities.	Clean the pump.
	b) Discharge pipe or valve partly blocked by impurities.	Clean the discharge pipe.
	c) Impeller not properly fixed to the shaft.	Tighten the impeller.
	d) Incorrect direction of rotation. See section *3.1 Checking of direction of rotation.*	Reverse the direction of rotation.
	e) Incorrect setting of level switch.	Adjust the level switch.
	f) Pump too small for the application.	Replace the pump.
	g) Impeller worn.	Replace the impeller.
4. Pump runs but gives no water.	a) Pump blocked by impurities.	Clean the pump.
	b) Discharge pipe or non-return valve blocked by impurities.	Clean the discharge pipe.
	c) Impeller not properly fixed to the shaft.	Tighten the impeller.
	d) Air in pump.	Vent the pump and the discharge pipe.
	e) Liquid level too low. The pump inlet is not completely submerged in the pumped liquid.	Submerge the pump in the liquid or adjust the level switch.
	f) Level switch does not move freely.	Make the level switch move freely.

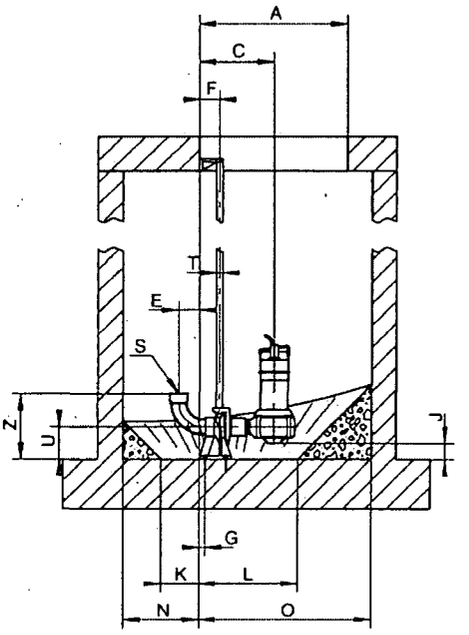
8. Disposal

Disposal of this product or parts of it must be carried out according to the following guidelines:

1. Use the local public or private waste collection service.
2. In case such waste collection service does not exist or cannot handle the materials used in the product, please deliver the product or any hazardous materials from it to your nearest GRUNDFOS company or service workshop.

GB: 1-pump installation on auto-coupling
D: Eine Pumpe mit Autokupplung
F: Une pompe avec système d'accouplement automatique
I: Una pompa con accoppiamento rapido
E: Una bomba con autoacoplamiento
P: Uma bomba com acoplamento automático
GR: Εγκατάσταση μιάς αντλίας με αυτόματη ζεύξη
NL: Eén pomp met voetbochtsnelkoppeling
S: En pump installerad med kopplingsfot
SF: Yhden pumpun asennus jalustaliittimellä
DK: En pumpe med autokobling

Fig. A



TM01 3593 0399

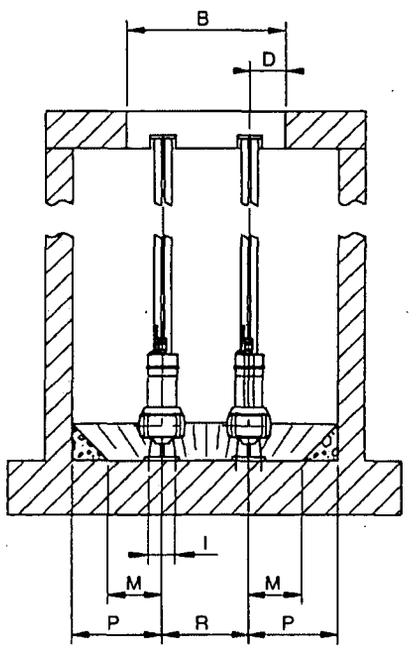
A	B	C	D	E	F	G	I	J	K
ø600	ø600	304	135	82	85	65	100	63	150

L	M	N	O	P	R	S	T	U	Z
400	200	300	700	500	–	R 2	¾"	130	261

62

GB: 2-pump installation on auto-coupling
D: Zwei Pumpen mit Autokupplung
F: Deux pompes avec système d'accouplement automatique
I: Due pompe con accoppiamento rapido
E: Dos bombas con autoacoplamiento
P: Duas bombas com acoplamento automático
GR: Εγκατάσταση δύο αντλιών με αυτόματη ζεύξη
NL: Twee pompen met voetbochtsnelkoppeling
S: Två pumpar installerade med kopplingsfot
SF: Kahden pumpun asennus jalustaliittimellä
DK: To pumper med autokobling

Fig. B



TM01 3592 0399

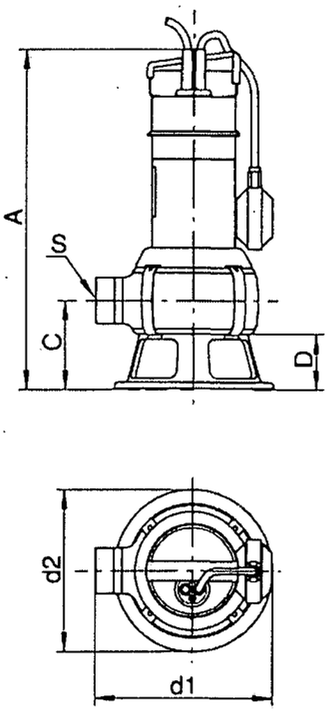
A	B	C	D	E	F	G	I	J	K
600	600	304	135	82	85	26	100	63	150

L	M	N	O	P	R	S	T	U	Z
400	200	300	700	335	330	R 2	¾"	130	261

63

GB: Free-standing installation
D: Freistehender Einbau
F: Installation fixe sur socle
I: Installazione su piede d'appoggio
E: Instalación portátil
P: Instalação autónoma
GR: Ανεξάρτητη εγκατάσταση
NL: Vrijstaande opstelling
S: Fristående installation
SF: Vapaasti seisova asennus
DK: Fritstående installation

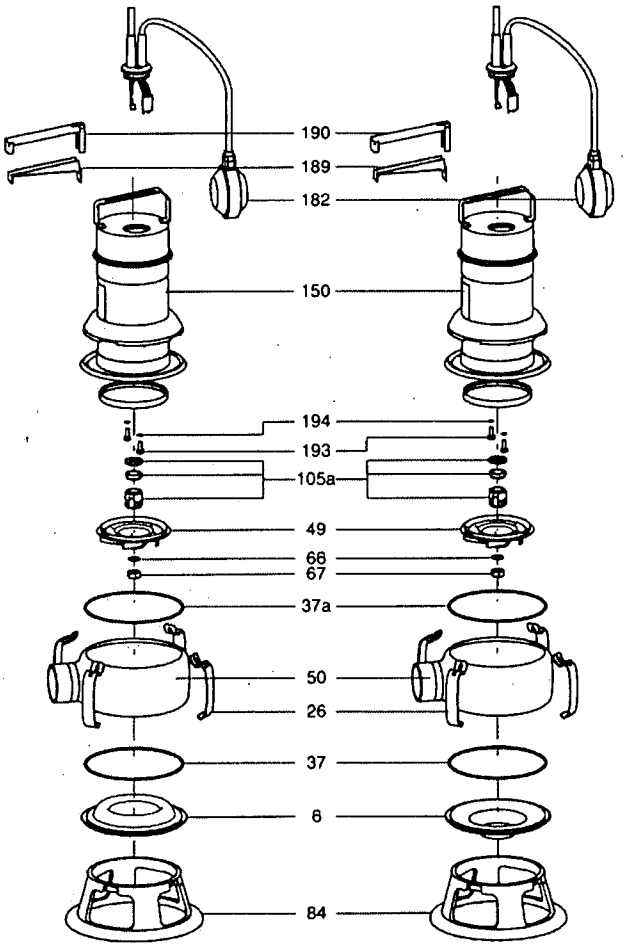
Fig. C



A	C	D	S	d1	d2
443	116	73	R 2	234	210

64

Fig. D


190
189
182
150
194
193
105a
49
68
67
37a
50
26
37
6
84
TM01 3709 4998

65

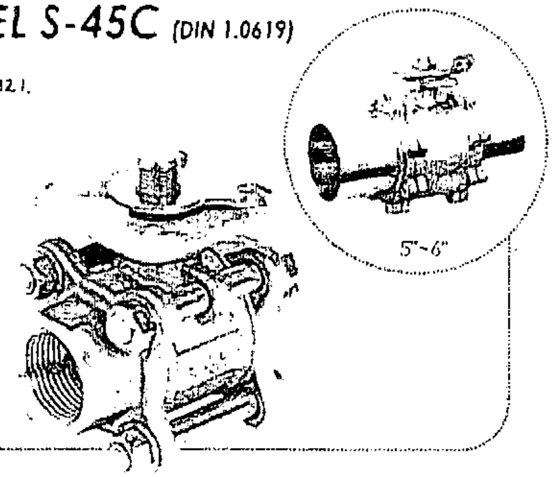
Appendix 7 Stainless Steel Ball Valves

V-3MH TYPE

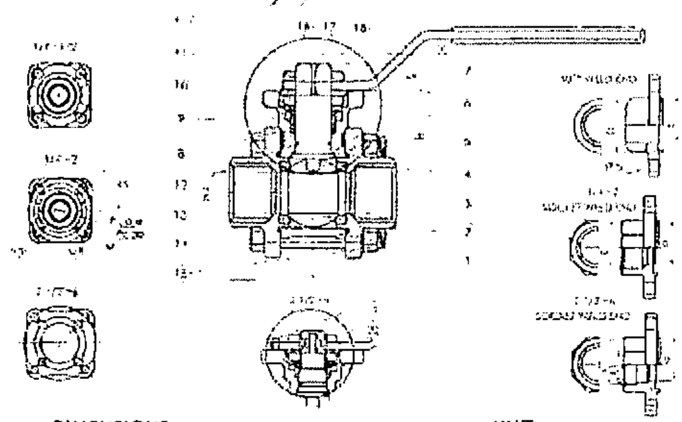
STAINLESS STEEL AISI 316 (Din 1.4408)
CARBON STEEL S-45C (DIN 1.0619)

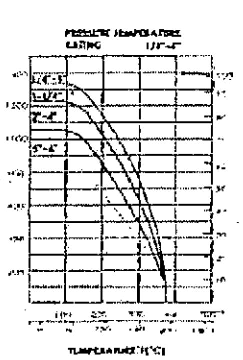
FEATURES:
- Pipe thread in accordance with ANSI B2.1, BS21 1973, DIN259/2999, ISO 228
- Lug body
- Blow-out proof stem/Full port
- Investment casting body and cap
- 1000PSI (69BAR) W.O.G.
- Direct Mounting Pad for ISO Standard 5211
- Screwed end, butt weld end, socket weld end.
- Material: ASTM-A351-CF8M, ASTM-A351-CF8 & ASTM-A216-WCB

*OPTION: Similar Design but with C Style clip DIN Standard, M3 Length



ITEM	PARTS	Q'TY	MATERIALS V3MH	MATERIALS V3MH-C
1	BODY	1	ASTM A351 CF8M	ASTM A216 WCB
2	CAP	2	ASTM A351 CF8M	ASTM A216 WCB
3	BALL	1	ASTM A351 CF8M	ASTM A351 CF8M
4	BALL SEAT	2	15% G-PTFE	15% G-PTFE
5	JOINT GASKET	2	PTFE	PTFE
6	STEM	1	AISI 316	AISI 316
7	THRUST WASHER	1	PTFE	PTFE
8	STEM PACKING	2	PTFE	PTFE
9	GLAND WASHER	1	AISI 304	AISI 304
10	BELLEVILLE WASHER	2	AISI 301	AISI 301
11	STEM NUT	2	AISI 304	AISI 304
12	O-RING	1	VITON	VITON
13	BOLT	4~6	AISI 304	AISI 304
14	SPRING WASHER	4~6	AISI 304	AISI 304
15	HEX NUT	4~8	AISI 304	AISI 304
16	[illegible]	1	AISI 304	AISI 304
17	HANDLE	1	AISI 304	AISI 304
18	PLASTIC COVER	1	PLASTIC	PLASTIC
19	STOP PIN	1	AISI 304	AISI 304
20	LOCK DEVICE	1	AISI 304	AISI 304





DIMENSIONS. UNIT: mm

NOMINAL SIZE	ød	L	H	S	X	ISO 5211 PCD	ISO 5211 W	ISO 5211 M	ISO 5211 M1	Cv FACTOR	TORQUE kgf-cm	D	d	K	K1
1/4"	[illegible]	[illegible]	[illegible]	[illegible]	112	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
3/8"	[illegible]	[illegible]	[illegible]	[illegible]	112	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1/2"	[illegible]	[illegible]	[illegible]	[illegible]	112	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
3/4"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1-1/4"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1-1/2"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
2"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
2-1/2"	[illegible]	[illegible]	[illegible]	[illegible]	330	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3"	[illegible]	[illegible]	[illegible]	[illegible]	330	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4"	[illegible]	[illegible]	[illegible]	[illegible]	330	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Appendix 8 Non-Shrink Epoxy Grout

Conbextra EP

Epoxy resin free flow grout

Uses

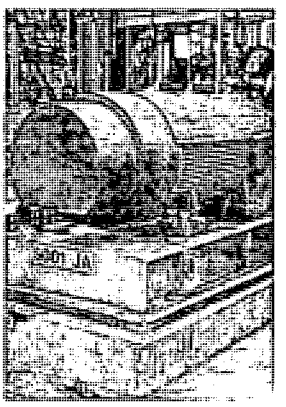
A range of free flow grouts for use in situations where heavy dynamic or mobile loads are encountered. The gap between a base plate and substrate will need to be filled and the structural load be uniformly distributed in such applications as reciprocating machinery, testing equipment, heavy crane and transporter rails, high speed turbines and centrifuges and drop forges.

Also for use in conditions where chemical spillage may be encountered. Typical situations could be met in steelworks, refineries, electroplating works and chemical plants.

Conbextra EP120 is especially suitable where long working time and/or low exotherm properties are required e.g. for large pours, large gaps or high ambient temperatures.

Advantages

- High compressive, tensile and flexural strengths
- Resistant to repetitive dynamic loads
- Fast, convenient installation with early strength gain
- Withstands a wide range of chemicals
- Non-shrink and hence ensures complete surface contact and bond
- Low creep characteristics under sustained loading



Grouting of motor baseplate with Conbextra EP products

Description

Conbextra EP is a range of epoxy resin based products designed for free-flow grouting of gaps from approximately 0.25 mm to 120 mm. Four grades of product are available.

Conbextra EP10 for grouting gaps ranging from 0.25 mm to 10 mm. It is an all liquid system consisting of a base and hardener.

Conbextra EP40 for grouting gaps ranging from 10 mm to 40 mm.

Conbextra EP65 for grouting gaps ranging from 35 mm to 65 mm.

Conbextra EP120 is a low exotherm material which is particularly suitable where long working time is needed; for large gaps (up to 120 mm) or for grouting at high ambient temperatures (up to 55°C).

Technical support

Parchem offers a comprehensive range of high performance, high quality construction products. In addition, Parchem offers a technical support package to specifiers and contractors as well as technical advice from staff experienced in the construction industry.

Properties

The following results are typical for the hardened grout at 20°C.

Test method for	Typical result			
	EP10	EP40	EP65	EP120
Density (kg/m³):	1060	1950	2050	1950
Compressive strength (MPa)				
BS 6319 part 2 1983				
1 day:	57	79	77	5
3 days:	66	86	89	90
7 days:	83	91	90	100
Typical site results @ 23°C				
Compressive Strength (MPa)				
	EP40	EP65		
3 Hours	30	20		
4 Hours	45	35		
5 Hours	55	50		
Tensile strength (MPa)				
BS 6319 part 7 1985				
7 days:	29	19	15	18
Flexural strength (MPa)				
BS 6319 part 3 1990				
7 days:	91	40	29	34
Secant modulus (GPa)				
BS 6319 part 6 1984:		13.3	13.3	12.7

Conbextra EP : 5/2003

FOSROC

Chemical resistance

All Conbextra EP products are resistant to oil, grease, fats, most chemicals, mild acids and alkalis, fresh and sea water. Consult Parchem Technical Services when exposure to solvents or concentrated chemicals is anticipated.

Pot life

Ambient temperature affects the time for which bulk material will remain fluid.

Typical values in minutes are:

	10°C	20°C	30°C	40°C
EP10	40	20	10	-
EP40	60	30	15	-
EP65	60	30	15	-
EP120	-	120	90	50

Exotherm

All epoxy systems will develop a temperature rise on mixing. Its extent will be a function of the volume to surface ratio, the ambient temperature, as well as the mass and thermal conductivity of the surrounding materials. Contact Parchem for specific data on each product.

Specification clauses

Supplier specification

All epoxy resin grouting where shown on the drawings, must be carried out using the suitable grade of Conbextra EP product manufactured by Parchem and used in accordance with the manufacturer's data sheet.

Performance specification

All epoxy resin grouting where shown on the drawings must be carried out with a factory packed product. The hardened grout must have a compressive strength which exceeds 80 MPa at 7 days, a tensile strength which exceeds 15 MPa at 7 days and a flexural strength which exceeds 28 MPa at 7 days.

The storage handling and placement of the grout must be in strict accordance with the manufacturer's instructions.

Instructions for use

Preparation

Foundation surface

All contact surfaces must be free from oil, grease, free standing water or any loosely adherent material. Concrete surfaces should be cut back to a sound base. All dust must be removed and bolt holes or fixing pockets blown clean of any dirt or debris.

Steel surfaces

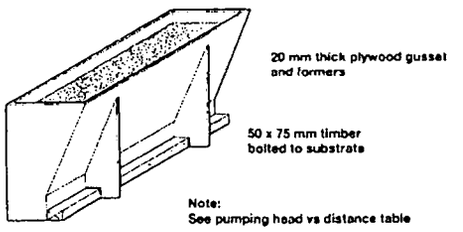
All steel surfaces should be shot blasted free of rust, paint and flaky mill scale.

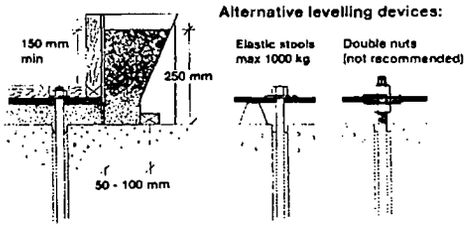
Formwork

The formwork should be constructed to be leakproof as Conbextra EP products are free flowing grouts. Loss of grout once the material is placed, but not hardened, will result in incomplete filling of the gap.

For free flow grout conditions it is essential to provide a hydrostatic head of grout. To achieve this a feeding hopper system should be used.

Typical on-plate shutter system





FOSROC

Mixing

Pour all the contents of the hardener pack into the base container. Mix using a slow speed power mixer until homogeneous.

In the case of EP120, pour all the resultant liquid into a container with e capecity of 20 - 25 litres then add all the filler.

For all products, mix using a slow speed power mixer for two minutes or until a uniform colour is achieved in the grout.

Placing

The mixed grout should be poured steadily from one side only to eliminate the entrapment of air.

Continuous grout flow is essential.

Sufficient grout must be available prior to starting.

The time taken to pour a batch should be regulated to the time taken to prepare the next batch.

Flow characteristics

The maximum distance of flow is governed by the gap thickness, the head of grout applied and the ambient temperature. The following table gives typical data for flow design.

	°C	Gap thickness (mm)	Hydrostatic head (mm)	Maximum flow (mm)
EP10:	Flow determined by gap thickness and pressure applied.			
EP40:	5	12	100	450
	20	12	100	900
EP65:	5	35	100	900
	20	35	100	2000
EP120:	Similar to Conbextra EP65			

Cleaning

All tools and equipment should be cleaned immediately after use with Solvent 10. Spillages should be absorbed with sand or sawdust and disposed in accordance with local regulations.

Limitations

Temperature

During application

For all products except EP120, grouting may be carried out without special precautions at ambient temperatures from 5° to 25°C.

For EP120, grouting should not be carried out at temperatures below 20°C.

In service

The cured grouts, which are completely resistant to frost and sub-zero temperatures, are suitable for use up to 45°C. EP120 is most suited for temperatures in the range 20° to 55°C.

Estimating

Supply

EP10:	300 ml and 1.5 litre	2 component packs
EP40:	3 and 15 litre	2 component packs
EP65:	3.5 and 14 litre	2 component packs
EP120:	14 litre	3 component packs

(3 component packs contain base resin, hardener and fillers.)

Storage

All Conbextra EP products have a shelf life of 12 months if kept in dry conditions at 20°C.

Precautions

Health and safety

Conbextra EP10,EP40, EP65, EP120 and Solvent 10 are classed hazardous under WorkSafe Australia guidelines.

Conbextra EP: Contains resins which may cause sensitisation by skin contact. Avoid contact with skin and eyes and inhalation of vapour. Wear suitable protective clothing, gloves and eye/face protection. Barrier creams provide additional skin protection. Should accidental skin contact occur, remove immediately with a resin removing cream, followed by soap and water. Do not use solvent. In case of contact with eyes, rinse immediately with plenty of clean water and seek medical advice. If swallowed seek medical attention immediately - **do not** induce vomiting.

If poisoning occurs, contact a Doctor or Poisons Information Centre - phone 13 11 26

Fire

Solvent 10 is flammable. In the event of fire extinguish with CO_2 or foam.Solvent 10 is flammable. Keep away from sources of ignition - no smoking. Wear suitable protective clothing, gloves and eye/face protection. Use only in well ventilated areas.

Flash point - Solvent 10: 27°C.

A product Material Safety Data Sheet is available from your local Parchem sales office. Read MSDS and product data sheet carefully before first use. In emergency, contact any Poisons Information Centre.

Parchem Construction Products Pty Ltd
A.B.N. 80 069 961 968
7 Lucca Road
WYONG. N.S.W. 2259
Tel (02) 4350 5000
Fax (02) 4351 2024

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Canberra	(02) 6239 3772
Archerfield, Brisbane	(07) 3255 5866
Townsville	(07) 4725 4394
Adelaide	(08) 8293 2222
Perth	(08) 9358 2533
Melbourne	(03) 9328 3100

Email: technical@parchem.com.au
Internet: www.parchem.com.au

7 days a week
Technical Support Hotline : 1800 812 884

Important note

Parchem Construction Products Pty Ltd products are guaranteed against defective materials and manufacture and are sold subject to its standard terms and conditions of sale, copies of which may be obtained on request. Whilst the company endeavours to ensure that any advice, recommendation, specification or information it may give is accurate and correct, it cannot, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation or information given by it.

AUS/13004/03/A

Material Safety Data Sheet

Infosafe No.	LPT9B	Issue Date : August 2004	ISSUED by PARCHEMC

Product Name : **FOSROC CONBEXTRA EP65 BASE**

Classified as hazardous according to criteria of NOHSC

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

Product Name FOSROC CONBEXTRA EP65 BASE

Product Use Base component of epoxy grout.

Company Name Parchem Construction Products Pty Ltd (ABN 80 069 961 968)

Address 7 Lucca Road Wyong
NSW 2259 Australia

Emergency Tel 1800 638 556

Telephone Number/Fax Tel: 02 4350 5000 Fax: 02 4351 2024

Other Information This MSDS summaries at the date of issue our best knowledge of the health and safety hazard information of the product, and in particular how to safely handle and use the product in the workplace. Since Parchem Construction Products Pty Ltd cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, review this MSDS in the context of how the user intends to handle and use the product in the workplace.
If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact this company.
Our responsibility for product as sold is subject to our standard term and conditions, a copy of which is sent to our customers and is also available upon request.

www.parchem.com.au

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Name	CAS	Proportion
Silica (crystalline-quartz)	14808-60-7	60-100 %
Bisphenol-A Epoxy Resin	25068-38-6	10-30 %
Bisphenol F epoxy resin	55492-52-9	1-10 %
C12-C14 Glycidyl ether	68609-97-2	1-10 %
Other ingredients determined not to be hazardous		Balance

3. HAZARDS IDENTIFICATION

Classified as Hazardous according to the criteria of NOHSC.
Classified as Dangerous Goods according to the ADG Code.
RISK PHRASES:
Irritating to eyes, respiratory system and skin.
May cause sensitization by skin contact.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
SAFETY PHRASES:
Do not breathe vapour.
Avoid contact with skin and eyes.
Wear suitable protective clothing, gloves and eye/face protection.
Avoid release to the environment. Refer to special instructions/safety data sheet.

Other Information

4. FIRST AID MEASURES

Inhalation Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. In event of cardiac arrest, apply external cardiac massage. Seek immediate medical advice.

parchem **Material Safety Data Sheet**

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Ingestion	Do NOT induce vomiting. Wash out mouth with water. Do not give anything by mouth to an unconscious person. Seek immediate medical attention.
Skin	If skin or hair contact occurs remove contaminated clothing and wash contaminated skin and hair with plenty of soap and running water. Wash contaminated clothing before re-use. If irritation occurs seek medical advice.
Eye	If in eyes, hold eyelids apart and flush the eye continuously with running water. Take care not to rinse contaminated water into the non-affected eye. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. In all cases of eye contamination it is a sensible precaution to seek medical advice.
First Aid Facilities	Eyewash and normal washroom facilites.
Advice to Doctor	Treat symptomatically. For advice, contact a Poisons Information Centre (Phone eg Australia 131 126)or a doctor (at once).

5. FIRE FIGHTING MEASURES

Extinguishing Media	Water fog (or if unavailable fine water spray), foam, dry agent (carbon dioxide or dry chemical powder).
Specific Methods	Keep uninvolved containers cool with water spray. Contain run-off water for later collection and controlled disposal.
Specific Hazards	Combustible material. This product will burn if exposed to fire. This product contain crystalline silica and when the wet product dries out, a proportion of this may become airborne as respirable dust.
Hazardous Combustion Products	Combustion products include oxides of carbon and nitrogen. Under fire conditions this product may produce hazardous dusts (crystalline silica).
Protective Equipment	Fire-fighters should wear full protective clothing and self contained breathing apparatus (SCBA).

6. ACCIDENTAL RELEASE MEASURES

Remove all sources of ignition. Increase ventilation. Evacuate all unnecessary personnel. Slippery when spilt. Wear Self-Contained Breathing Apparatus (S.C.B.A) and full protective clothing to minimise skin and eye exposure, and inhalation of vapours. If possible contain the spill. Place inert absorbent such as vermiculite, sand or dirt onto material. Prevent run off into drains and waterways. Use clean non-sparking tools to collect the material and place into a suitable labelled container. Do not dilute material but contain. Mop up the remaining material and place into the same container. If large quantities of this material enter the waterways contact the Environmental Protection Authority, or your local Waste Management Authority.

7. HANDLING AND STORAGE

Handling	Use approved combustible liquid storage containers in the work area. Keep material away from sparks, flames and other ignition sources. Prevent release of vapours into workplace air. Use smallest possible amounts in designated areas with adequate ventilation. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Label containers. Keep containers closed when not in Use. Empty containers may contain residues which are hazardous. Ensure a high level of personal hygiene is maintained when using this product. That is; always wash hands before eating, drinking, smoking or using the toilet.
Storage	Store in a cool, dry, well ventilated area away from sources of heat or ignition. This product should be stored away from foodstuffs and strong oxidising agents. Keep containers closed at all times - check regularly for leaks. For information on the design of the storeroom reference should be made to Australian Standard AS1940, The storage and handling of flammable and combustible liquids. Reference should also be made to any relevant Commonwealth, State or Territory regulations.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

parchem **Material Safety Data Sheet**

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Classified as hazardous according to criteria of NOHSC

Exposure Limits

No exposure standards have been established for this material by the National Occupational Health & Safety Commission (NOHSC). However , air concentrations of components should be controlled as low as possible.
The following are applicable when the wet product dries out, and a proportion of it may become airborne as respirable dust:

Substance	TWA		STEL		NOTICE
	ppm	mg/m³	ppm	mg/m³	
Crystalline Silica	-	0.2	-	-	Cat 1 Carcinogen

Other Exposure Information

TWA - the Time-Weighted Average airborne concentration over an eight-hour working day, for a five-day working week over an entire working life.
STEL (Short Term Exposure Limit) - the average airborne concentration over a 15 minute period which should not be exceeded at any time during a normal eight-hour workday.
According to current knowledge these concentrations should neither impair the health of, nor cause undue discomfort to, nearly all workers.
These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. Exposure Standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.
This product contain crystalline silica and when using the dry product, or when the wet product dries out, a proportion of this may become airborne as respirable dust.
Silica may be released by grinding or machining of coated materials. Use approved dust respirator when grinding or machining coating or coated items.
Crystalline silica is classified as a Class 1 Human Carcinogen according to IARC (International Agency for Research on Cancer), however the NATIONAL OCCUPATIONAL HEALTH & SAFETY COMMISSION NOHSC) has yet to classify crystalline silica as a human carcinogen.
Repeated exposure to respirable crystalline silica dust may lead to silicosis, or other serious delayed lung injury. The onset of silicosis is usually slow and lung damage may occur even when no symptoms or signs of ill-health have occurred.
Silicosis can develop to a more serious degree even after exposure has ceased, and may also lead to other diseases including heart disease and scleroderma.

Respiratory Protection

If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable organic vapour filter should be used. Reference should be made to Australian Standards AS/NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

Eye Protection

Safety glasses with side shields or goggles should be worn as described in Australian Standard AS/NZS 1337 - Eye Protectors for Industrial Applications. Final choice of appropriate eye/face protection will vary according to individual circumstances. This can include methods of handling, and engineering controls as determined by appropriate risk assessments.

Hand Protection

Wear gloves of impervious material conforming to AS/NZS 2161: Occupational protective gloves - Selection, use and maintenance. Final choice of appropriate glove type will vary according to individual circumstances. This can include methods of handling, and engineering controls as determined by appropriate risk assessments. Advice should be sought from appropriate glove manufacturers in order to ensure gloves are correct for application.

Body Protection

Suitable workwear should be worn to protect personal clothing, eg cotton overalls buttoned at neck and wrist. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust of dried product when removing or laundering clothes.

Eng. Controls

Use in well ventilated areas. In confined spaces the use of local exhaust ventilation system is recommended. Air concentrations of components should be controlled as low as possible. Keep containers closed when not in use.

Hygiene Measures

Ensure a high level of personal hygiene is maintained when using this product. Always wash hands before eating, drinking, smoking or using the toilet.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

High viscosity grey paste.

parchem **Material Safety Data Sheet**

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Classified as hazardous according to criteria of NOHSC

Odour	Slight epoxy-like odour.
Melting Point	Not applicable
Solubility in Water	Insoluble.
Vapour Pressure	Not applicable
Volatile Component	Not determined.
Flammability	Combustible substance.

10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions.
Hazardous Polymerization	Will not occur.
Materials to Avoid	Strong acids, alkalis, oxidisers and amines.
Hazardous Decomposition Products	Under fire conditions this product may produce hazardous dusts (crystalline silica) and could produce oxides of carbon and nitrogen.
Hazardous Reaction	

11. TOXICOLOGICAL INFORMATION

Toxicology Information	No toxicity data is available for this specific product.
Inhalation	Inhalation of product vapours may cause irritation of the nose, throat and respiratory system.
Ingestion	Ingestion of this product may irritate the gastric tract, causing nausea and vomiting. Ingestion of large quantities may depress the central nervous system.
Skin	May cause irritation resulting in redness, itching and dermatitis. Prolonged or repeated skin contact may lead to allergic contact dermatitis and sensitisation in some individuals.
Eye	Irritating to eyes. On eye contact this product will cause tearing, stinging, blurred vision, and redness.

12. ECOLOGICAL INFORMATION

	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Environ. Protection	Prevent this material entering waterways, drains, sewers.
Mobility	Not available.
Persistence / Degradability	Not available.
Bioaccumulation	Not available.
Ecotoxicity	Not available.

13. DISPOSAL CONSIDERATIONS

Disposal should be in accordance with the relevant local, state and federal government regulations.

14. TRANSPORT INFORMATION

	This material is a Class 9 - Miscellaneous Dangerous Good according to the Australian Code for the Transport of Dangerous Goods by Road and Rail. Class 9 - Miscellaneous Dangerous Goods are incompatible in a placard load with dangerous goods of Class 1, Explosives.
ADG U.N. Number	3082
ADG Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S.*
ADG DG Class	9
ADG Hazchem Code	2X
ADG Packaging Method	5.9.9
ADG Packing Group	III

parchem **Material Safety Data Sheet**

Infosafe No.	LPT9B	Issue Date : August 2004	ISSUED by PARCHEMC

Product Name : **FOSROC CONBEXTRA EP65 BASE**

Classified as hazardous according to criteria of NOHSC

Storage and Transport	Keep in dry, cool and well ventilated area.
ADG EPG Number	9C1
ADG IERG Number	47

15. REGULATORY INFORMATION

Risk Phrase	R36/37/38 Irritating to eyes, respiratory system and skin. R43 May cause sensitization by skin contact. R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety Phrase	S23(2) Do not breathe vapour. S24/25 Avoid contact with skin and eyes. S36/37/39 Wear suitable protective clothing, gloves and eye/face protection. S61 Avoid release to the environment. Refer to special instructions/safety data sheet.
Poisons Schedule	S5
Hazard Category	Irritant, Dangerous for the environment
AICS (Australia)	All components in this product are listed on AICS (Australian Inventory of Chemical Substances).

16. OTHER INFORMATION

Contact Person/Point	Technical Support: 1800 812 864
SDS History	MSDS Creation: August 2004

...End Of MSDS...

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Material Safety Data Sheet

Infosafe No.	LPT8R	Issue Date : August 2004	ISSUED by PARCHEMC

Product Name : **FOSROC CONBEXTRA EP65 HARDENER**

Classified as hazardous according to criteria of NOHSC

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

Product Name	FOSROC CONBEXTRA EP65 HARDENER
Product Use	Hardener component of epoxy grout.
Company Name	Parchem Construction Products Pty Ltd (ABN 80 069 961 968)
Address	7 Lucca Road Wyong NSW 2259 Australia
Emergency Tel.	1800 638 556
Telephone Number/Fax	Tel: 02 4350 5000 Fax: 02 4351 2024
Other Information	This MSDS summaries at the date of issue our best knowledge of the health and safety hazard information of the product, and in particular how to safely handle and use the product in the workplace. Since Parchem Construction Products Pty Ltd cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, review this MSDS in the context of how the user intends to handle and use the product in the workplace. If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact this company. Our responsibility for product as sold is subject to our standard term and conditions, a copy of which is sent to our customers and is also available upon request. www.parchem.com.au

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Name	CAS	Proportion
	Benzyl alcohol	100-51-6	30-60 %
	Isophoronediamine	2855-13-2	30-60 %
	2,4,6-Tri(dimethylamino methyl) Phenol	90-72-2	10-30 %
	Salicylic acid	69-72-7	1-10 %
	Other ingredients determined not to be hazardous		Balance

3. HAZARDS IDENTIFICATION

Classified as Hazardous according to the criteria of NOHSC.
Classified as Dangerous Goods according to the ADG Code.
RISK PHRASES:
Harmful by inhalation, in contact with skin and if swallowed.
Causes burns.
May cause sensitization by skin contact.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
SAFETY PHRASES:
Do not breathe gas/fumes/vapour/spray.
Avoid contact with skin and eyes.
Wear suitable protective clothing, gloves and eye/face protection.
In case of accident or if you feel unwell seek medical advice immediately.

Medical Conditions Generally Aggravated by Exposure	Those suffering pre-existing pulmonary disorders should avoid inhaling vapours in confined spaces.

4. FIRST AID MEASURES

Inhalation	Remove the source of contamination or move the victim to fresh air. Ensure airways are clear and have qualified person give oxygen through a face mask if breathing is difficult. If symptoms develop seek medical attention.
Ingestion	Do NOT induce vomiting. Wash out mouth with water. Do not give anything by mouth to an unconscious person. Seek immediate medical attention.

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Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Ensure contaminated clothing is washed before re-use or discard. If irritation develops, seek medical attention.
Eye	If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Remove clothing if contaminated and wash skin. Seek immediate medical assistance.
First Aid Facilities	Eye wash and normal washroom facilities.
Advice to Doctor	Treat symptomatically.
Other Information	For advice, contact a Poisons Information Centre (Phone eg Australia 131 126 or a doctor (at once).

5. FIRE FIGHTING MEASURES

Extinguishing Media	Dry chemical, CO2 or foam. Do not use water jets.
Specific Methods	Keep uninvolved containers cool with water spray. Contain run-off for later collection and controlled disposal.
Specific Hazards	Combustible liquid. This product will burn if exposed to fire.
Hazardous Combustion Products	Combustion products include oxides of carbon, oxides of nitrogen and ammonia gas.
Protective Equipment	Fire fighters to wear Self-Contained Breathing Apparatus (S.C.B.A) and full protective clothing if risk of exposure to vapour or products of combustion to minimise skin exposure.

6. ACCIDENTAL RELEASE MEASURES

Remove all sources of ignition. Increase ventilation. Evacuate all unnecessary personnel. Slippery when spilt. Wear Self-Contained Breathing Apparatus (S.C.B.A) and full protective clothing to minimise skin and eye exposure, and inhalation of vapours. If possible contain the spill. Place inert absorbent such as vermiculite, sand or dirt onto material. Prevent run off into drains and waterways. Do not dilute material but contain. Mop up the remaining material and place into the same container. If large quantities of this material enter the waterways contact the Environmental Protection Authority, or your local Waste Management Authority.

7. HANDLING AND STORAGE

Handling	Use approved combustible liquid storage containers in the work area. Keep material away from sparks, flames and other ignition sources. Prevent release of vapours and mists into workplace air. Use smallest possible amounts in designated areas with adequate ventilation. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Label containers. Keep containers closed when not in Use. Empty containers may contain residues which are hazardous. Ensure a high level of personal hygiene is maintained when using this product i.e. always wash hands before eating, drinking, smoking or using the toilet.
Storage	Store in a cool, dry, well ventilated area away from sources of heat or ignition. This product should be stored away from foodstuffs and strong oxidising agents. Keep containers closed at all times - check regularly for leaks. For information on the design of the storeroom reference should be made to Australian Standard AS1940, The storage and handling of flammable and combustible liquids. Reference should also be made to any relevant Commonwealth, State or Territory regulations.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Exposure Limits	No exposure standards have been established for this material by the National Occupational Health & Safety Commission (NOHSC). However , air concentrations of components should be controlled as low as possible.
Respiratory Protection	If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable organic vapour filter should be used. Reference should be made to Australian Standards AS/NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

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Infosafe No.	LPT8R	Issue Date : August 2004	ISSUED by PARCHEMC

Product Name : **FOSROC CONBEXTRA EP65 HARDENER**

Classified as hazardous according to criteria of NOHSC

Eye Protection	Safety glasses with side shields or goggles should be worn as described in Australian Standard AS/NZS 1337 - Eye Protectors for Industrial Applications. Final choice of appropriate eye/face protection will vary according to individual circumstances. This can include methods of handling, and engineering controls as determined by appropriate risk assessments.
Hand Protection	Wear gloves of impervious material conforming to AS/NZS 2161: Occupational protective gloves - Selection, use and maintenance. Final choice of appropriate glove type will vary according to individual circumstances. This can include methods of handling, and engineering controls as determined by appropriate risk assessments. Advice should be sought from appropriate glove manufacturers in order to ensure gloves are correct for application.
Body Protection	Suitable workwear should be worn to protect personal clothing, eg cotton overalls buttoned at neck and wrist. When large quantities are handled the use of plastic aprons and rubber boots is recommended.
Eng. Controls	Use in well ventilated areas. In confined spaces the use of local exhaust ventilation system is recommended. Air concentrations of components should be controlled as low as possible. Keep containers closed when not in use.
Hygiene Measures	Ensure a high level of personal hygiene is maintained when using this product. Always wash hands before eating, drinking, smoking or using the toilet.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Low viscosity, light brown liquid.
Odour	Characteristic amine odour.
Solubility in Water	Insoluble.
Vapour Pressure	0.15 mmHg (benzyl alcohol)
Vapour Density (Air=1)	Not available
Flash Point	>100°C
Flammability	C1 Combustible liquid for the purpose of storage and handling- according to AS1940 - Storage and Handling of Flammable and Combustible Liquids.

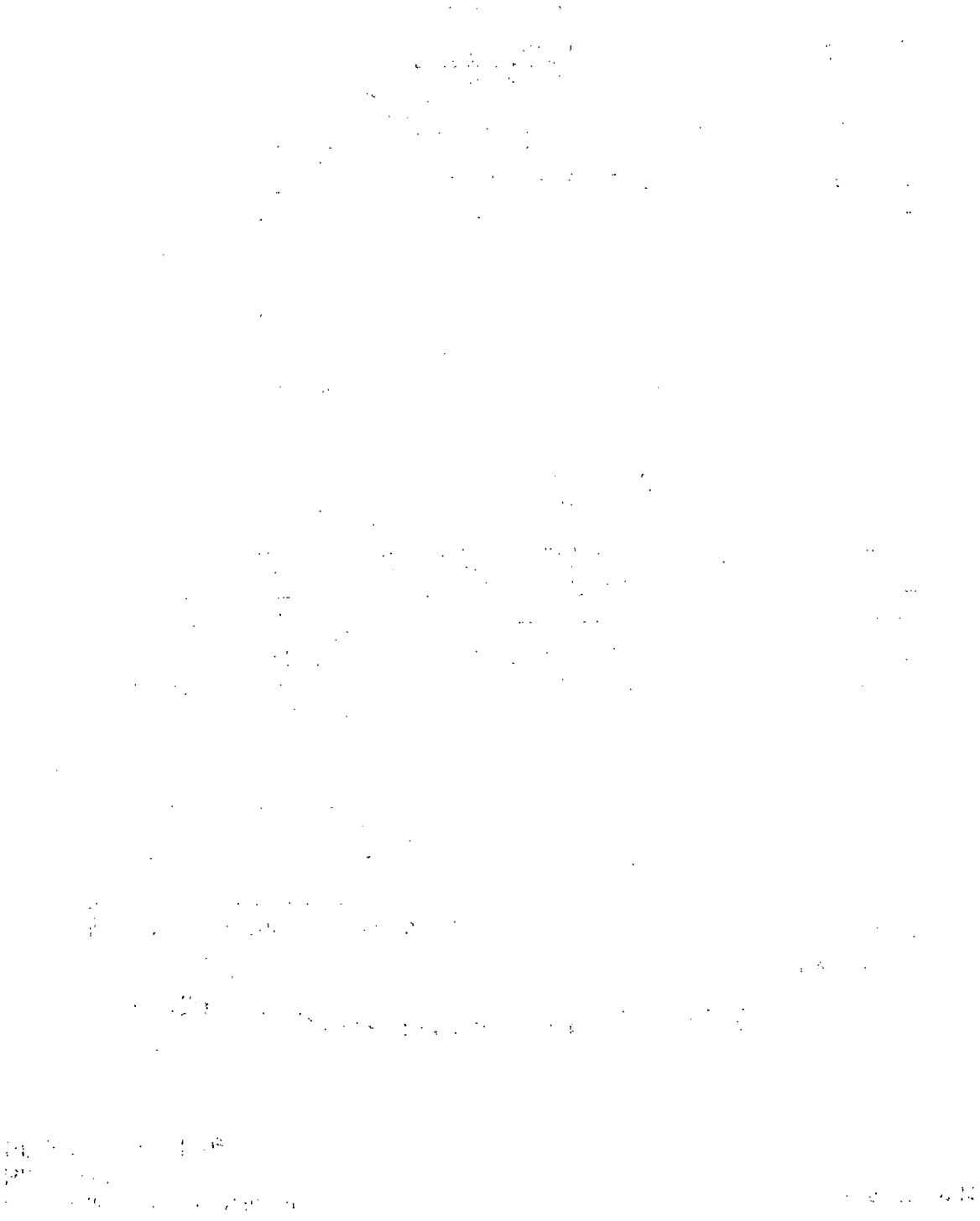
10. STABILITY AND REACTIVITY

Stability	Stable under normal conditions.
Hazardous Polymerization	Will not occur.
Materials to Avoid	Incompatible with acids, bases and strong oxidising substances.

11. TOXICOLOGICAL INFORMATION

Toxicology Information	No toxicity data is available for this specific product, however toxicity data found for constituents are stated below: Benzyl alcohol: LD50 (oral, rat) 1,230 mg/kg LD50 (dermal, rabbit) 2000mg/kg (Standard Draize Test:100mg/24H moderate reaction) Salicylic acid: LD50 (oral, rat) 891mg/kg LD50 (dermal, rabbit) >10g/kg 2,4,6-tris(dimethylaminomethyl)phenol: LD50 (oral, rat) 1200mg/kg
Inhalation	Harmful by inhalation. Inhalation of mists or vapours will result in respiratory irritation and possible harmful corrosive effects including lesions of the nasal septum, pulmonary edema, pneumonitis and emphysema.
Ingestion	Harmful if swallowed. Ingestion of this product may cause nausea, vomiting, abdominal pain and chemical burns to the mouth, throat and stomach.
Skin	Harmful in contact with skin. This product may cause sensitisation in some individuals. Skin contact will cause redness, itching, irritation, severe pain and chemical burns with resultant tissue destruction.
Eye	Causes burns. Eye contact will cause stinging, blurring, tearing, severe pain and possible permanent corneal damage.

12. ECOLOGICAL INFORMATION



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Product Name : **FOSROC CONBEXTRA EP65 HARDENER**

Classified as hazardous according to criteria of NOHSC

	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Environ. Protection	Prevent this material entering waterways, drains and sewers.
Mobility	Not available.
Persistence / Degradability	Not available.
Bioaccumulation	Not available.
Ecotoxicity	Not available.

13. DISPOSAL CONSIDERATIONS

Disposal should be in accordance with the relevant local, state and federal government regulations.

14. TRANSPORT INFORMATION

This material is a Class 8 Corrosive Substance according to the Australian Code for the Transport of Dangerous Goods by Road and Rail.
Class 8 - Corrosive Substances are incompatible in a placard load with any of the following:
- Class 1, Explosives
- Class 4.3, Dangerous When Wet Substances
- Class 5.1, Oxidising Agents & Class 5.2 - Organic Peroxides
- Class 6, Toxic Substances (where the Toxic substances are cyanides and the corrosives are acids),
- Class 7, Radioactive Substances

and are incompatible with food and food packaging in any quantity.

ADG U.N. Number	2735
ADG Proper Shipping Name	AMINES, LIQUID, CORROSIVE, N.O.S. - (Contains: isophoronediamine)
ADG DG Class	8
ADG Hazchem Code	3X
ADG Packaging Method	5.9.8
ADG Packing Group	III
ADG EPG Number	8A1
ADG IERG Number	36

15. REGULATORY INFORMATION

Risk Phrase	R20/21/22 Harmful by inhalation, in contact with skin and if swallowed. R34 Causes burns. R43 May cause sensitization by skin contact. R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety Phrase	S23 Do not breathe gas/fumes/vapour/spray. S24/25 Avoid contact with skin and eyes. S36/37/39 Wear suitable protective clothing, gloves and eye/face protection. S45 In case of accident or if you feel unwell seek medical advice immediately.
Poisons Schedule	S5
Hazard Category	Harmful,Corrosive,Dangerous for the environment
AICS (Australia)	All components in this product are listed on AICS (Australian Inventory of Chemical Substances).

16. OTHER INFORMATION

Contact Person/Point	Technical Support: 1800 812 864
SDS History	MSDS Creation: August 2004.

...End Of MSDS...