

# EUROBLOC<sup>®</sup>



---

## GENERAL OVERHAUL INSTRUCTIONS

---

### Hoist

English SUPDOC11F52A2-0.ORD 28.9.2016

-----  
169752 09.2016



SUPDOC11F52A20100-0 PS17080 28.9.2016

Original instructions

### Table of contents

1	UPDATE HISTORY.....	5
2	GENERAL INTRODUCTION.....	6
2.1	Foreword: About this manual.....	6
2.2	Symbols used in this manual.....	6
2.3	Safety Alert Symbols and Signal Words .....	6
2.4	Questions and Comments.....	7
2.5	Manual Use .....	7
2.6	Service personnel .....	7
2.7	Terminology.....	8
2.8	Standards and Directives .....	8
3	SAFETY FIRST!.....	9
3.1	Personal protective equipment (PPE).....	9
3.1.1	Fall Protection.....	9
3.2	Fire Safety.....	9
3.3	Main isolation switch .....	10
3.4	Safety during maintenance.....	10
3.4.1	Lockout - Tagout Procedure .....	11
4	IDENTIFICATION.....	13
4.1	Manufacturer.....	13
4.2	Hoist identification data .....	13
4.3	Motor identification data .....	14
4.4	Condition monitoring unit identification data.....	15
4.5	Frequency converter identification data .....	16
5	GENERAL OVERHAUL OVERVIEW.....	18
5.1	Collecting information.....	19
5.2	Evaluation of the need of General Overhaul (special assessment).....	19
5.3	Content and cost estimate.....	20
5.4	Performing General Overhaul.....	20
5.5	Commissioning inspection.....	20
6	GENERAL OVERHAUL SUMMARY.....	21
6.1	Parts that are always replaced in GO .....	21
6.2	Parts that are checked and replaced in GO if necessary.....	21
7	GENERAL OVERHAUL PREPARATIONS.....	23
7.1	Gathering information on current hoist components.....	23
7.2	Gathering parameter data from the condition monitoring unit.....	23
7.3	Tools needed for General Overhaul service.....	23
8	ROPE DRUM .....	26
8.1	Inspection of rope drum when hoist assembled on the crane .....	26
8.2	Inspection of rope drum when hoist and rope drum disassembled .....	27
8.2.1	Rope drum for hoist frame size: VT3 .....	28
8.2.2	Drum frame bolts (frame size VT3).....	29
8.2.3	Drum connector rods (frame size VT3) .....	29
8.2.4	Drum axial locking part (frame size VT3) .....	30
8.2.5	Needle-bearing strip (frame size VT3) .....	30
8.2.6	Rope drum for hoist frame size: VT4, VT5.....	30
8.2.7	Bearing sets (frame size VT4, VT5.....	30
8.3	Rope clamps.....	31
8.4	Wire rope.....	31
8.5	Rope guide .....	31
8.5.1	Construction of rope guide (newer model) for hoist frame size: VT3.....	32
8.5.2	Construction of rope guide for hoist frame size: VT4, VT5 (Models before 12.2006).....	32

	3/69
8.5.3 Construction of rope guide for hoist frame size: VT4, VT5 (Models after 12.2006).....	33
8.6 Rope pressure roller.....	34
8.6.1 Construction of rope pressure roller for hoist frame size: VT3.....	34
8.6.2 Construction of rope pressure roller for hoist frame size VT4, VT5 (On models before 2011) .....	35
8.6.3 Rope pressure roller for hoist frame size: VT4, VT5.....	35
9 HOISTING MACHINERY (MOTOR, GEARBOX).....	37
9.1 Hoisting machinery for hoist frame size VT3.....	37
9.1.1 Second brake (hoist frame size: VT3).....	37
9.2 Hoisting machinery for hoist frame size: VT4, VT5.....	38
10 UPPER PULLEY BLOCK.....	39
10.1 Housing.....	39
10.2 Rope sheave.....	39
10.3 Pulley block shaft, frame size VT3, reeving code 04.....	40
10.4 Pulley block shaft, other frame sizes.....	40
10.5 Sheave shaft.....	40
11 HOOK BLOCK.....	41
11.1 Rope sheave.....	42
11.2 Sheet metal cross bar, frame size VT3, reeving code 04.....	42
11.3 Shaft set (not in frame size VT3, reeving code 04).....	42
11.4 Hook.....	43
11.5 Thrust bearing.....	43
11.6 Locking rings / locking nut.....	43
12 ROPE SHEAVE.....	44
12.1 Measuring sheave groove wear.....	44
12.2 Measuring sheave groove depth wear.....	45
12.3 Measuring sheave groove wear by using slide caliper.....	45
13 OVERLOAD DEVICE OR ROPE ANCHORAGE SUPPORT.....	46
13.1 Rope anchorage.....	47
14 HOISTING LIMIT SWITCH.....	48
15 HOOK OPERATED CONTROL LIMIT SWITCH.....	49
16 TROLLEY.....	50
16.1 Trolley type H, M, W, F.....	50
16.1.1 Trolley inspections.....	50
16.1.2 End carriage.....	51
16.2 Trolley type N, swiveling and non-swiveling.....	52
16.2.1 Side plates.....	52
16.2.2 Screw rods.....	52
16.2.3 Cross bar.....	52
16.2.4 Trolley wheels.....	53
16.3 Trolley type L, frame size: VT3.....	54
16.3.1 Side plates.....	54
16.3.2 Screw rods.....	54
16.3.3 Trolley wheels.....	54
17 TROLLEY WHEELS.....	55
17.1 Under running trolley wheels.....	55
17.2 Top running trolley wheels.....	55
18 TRAVELING MACHINERY.....	57
19 ELECTRICS.....	58
19.1 Condition monitoring unit.....	58
19.2 Frequency converter.....	59
19.3 Push button controller.....	60
19.4 Radio receiver.....	60
19.5 Contactors.....	61
20 COMMISSIONING.....	62

---

21	AFTER GENERAL OVERHAUL .....	4/69 63
21.1	Parameter modification with the condition monitoring .....	63
21.1.1	GO settings menu (Menu 7) .....	63
21.1.2	Design values menu (Menu 6) .....	63
21.1.3	New runtime SWP (Menu 2) .....	64
22	APPENDIX, USAGE AND SAFETY ASSESSMENT .....	65
23	APPENDIX, INSPECTION AND SERVICE REPORT .....	67

## 1 UPDATE HISTORY

Section	Description	Date	Handled by
The whole document	The document structure renewed and the content updated according to the latest GO instructions.	11.2013	XJAASKPA
Chapters "General Overhaul preparations", "Rope drum", "Rope sheave (pulley)" and "Hook"	Corrected measurement tool information and drum groove wear acceptance criteria.	02.2014	XJAASKPA
The whole document	Corrections and improvements after a pilot.	06.2014	XJAASKPA
Chapters 7.3 and 8.2.1	Drum bearing groove gauge illustrations updated.	09.2016	XHUIKKHA

## 2 GENERAL INTRODUCTION

### 2.1 Foreword: About this manual

This manual offers guidance to enable safe and efficient service. See “Service Manual for Hoist” for more detailed disassembly and reassembly instructions.

Taking the time to read this manual helps you to prevent damage to the product, and, most importantly, personnel that are situated close to it. The product is safe when used correctly. However, there are many potential hazards associated with incorrect operation and these can be avoided when you know how to recognize and anticipate them.

This manual is not intended as a substitute for proper training but provides recommendations and methods for safe and efficient service.

### 2.2 Symbols used in this manual

Readers should familiarize themselves with the following symbols which are used in this manual.



Indicates items which require special attention by the reader. There is no obvious risk of injury associated with notes.

### 2.3 Safety Alert Symbols and Signal Words

The following symbols are used in this manual to indicate potential safety hazards.

	<b>Obey all safety messages that follow this symbol to avoid possible injury or death.</b>
<b>CAUTION</b>	<b>Indicates a potentially hazardous situation, which if not avoided, MAY result in minor or moderate injury. It may also be used to alert against unsafe practices.</b>
<b>WARNING</b>	<b>Indicates a potentially hazardous situation, which if not avoided, COULD result in death or serious injury.</b>
<b>DANGER</b>	<b>INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.</b>
<b>CAUTION</b>	<b>Addresses situations not related to personal injury, such as likely or possible damage to equipment.</b>
<b>Shall</b>	Indicates that a rule is mandatory and must be followed.
<b>Should</b>	Indicates that a rule is a recommendation, the advisability of which depends on the facts in each situation.

## 2.4 Questions and Comments

Any questions or comments relating to the content of this manual and/or the operation, maintenance and/or service of manufacturer products should be directed to: [www.verlinde.com](http://www.verlinde.com)

## 2.5 Manual Use

Every person exposed to the manufacturer's equipment must, prior to OPERATING, SERVICING AND/OR MAINTAINING SUCH PRODUCTS, read and understand the contents of this manual and strictly adhere AND CONFORM THEIR CONDUCT WITH AND TO THE INFORMATION, RECOMMENDATIONS AND warnings provided herein.



Keep these instructions in a safe, accessible location for future reference by personnel operating the equipment or exposed to the equipment's operation.



**Read and understand the contents of this manual prior to operating, servicing, and/or maintaining the equipment. Failure to do so can result in serious injury or death.**

Manufacturer shall not be liable for and owner and READER shall release, and hold manufacturer, harmless from any and all claims, demands, AND damages, regardless of their nature or type losses and expenses , whether known or unknown, present or future, any and all liability, of and from any and all manner of actions, cause[s] of actions, all suits in law, in equity, or under statute, State or Federal, of whatever kind or nature, third party actions, including suits for contribution and/or indemnity on account of or in any way arising out of acts or omissions of the Owner or READER and relating in any way to this MANUAL or THE PRODUCTS referenced herein, including, but not limited to the Owner's or READER'S use thereof or any other cause identified herein or that may be reasonably inferred HEREFROM.

## 2.6 Service personnel

Only authorized service personnel or an experienced service technician authorized by the manufacturer may perform the general overhaul. The original manufacturer has approved authorized service personnel to maintain its products.

The owner or operator of the product must perform the daily checks and, if required, daily lubrication. Service personnel authorized by the owner may also lubricate the product at the necessary intervals.



Mechanical and electrical maintenance work requires special skills and tools to ensure safe and reliable operation of the product. Maintenance work shall be carried out only by authorized service personnel or an experienced service technician authorized by the product manufacturer.

## 2.7 Terminology

The following terms and definitions may have been used in this manual:

<b>ANSI</b>	American National Standards Institute
<b>ISO</b>	International Organization for Standardization
<b>Authorized personnel</b>	Persons who are authorized by the owner and who have the necessary training to carry out an operation or service actions.
<b>Experienced service person authorized by the manufacturer</b>	A person with service experience who is properly trained to perform the service actions.
<b>CE marking</b>	The CE marking indicates that the product complies with the appropriate CE regulations.
<b>Check</b>	A visual and functional assessment (not a test) of the product without dismantling.
<b>Condition monitoring</b>	An analysis of collected data to provide information for the safe use of the crane.
<b>Condition monitoring unit (CID)</b>	A device that monitors, measures, calculates, and controls the performance, safety, and condition of the hoist.
<b>Emergency brake</b>	A brake that can be applied by the operator, or automatically upon loss of power.
<b>Electric panel</b>	Power is controlled to the motors and components through the electric panel.
<b>General overhaul (GO)</b>	All actions that are required after a special assessment, according to the assessment report recommendations, before any further use of the crane.
<b>Parking brake (storm lock)</b>	A brake which can be applied either automatically or manually and which prevents the horizontal movement of a trolley or a bridge. Used when movements must be prevented in windy conditions.
<b>Main brake</b>	A brake that stops motion and prevents movements.
<b>Second brake (Holding brake)</b>	A brake that supports the load if the main brake fails.
<b>Operator</b>	A person operating the product for the purpose of handling or moving loads.
<b>Inching</b>	Making very small movements by repeatedly and momentarily pressing the direction control.
<b>Bridge</b>	The bridge (main girder) moves along the runway.
<b>Main girder</b>	The main girder (bridge) is connected to the bridge end carriages.
<b>Main isolation switch</b>	The main isolation switch is the power switch which the operator should normally use to turn off the power.
<b>Hoist</b>	A drive mechanism for lifting and lowering the load.
<b>Inspection (Visual)</b>	Looking for defects and checking the operation of the controls, limiting and indicating devices without loading the product. This is much more than a check, but does not normally require any part of the product to be dismantled other than the removal or opening of covers or housings.
<b>Measurement</b>	The inspection that is done by measuring with a tool designed for the purpose.
<b>Operational test or testing</b>	The inspection that is done via checking the hoist operations.
<b>Power supply</b>	The power is supplied to the components via the power (mains) supply.
<b>Controller</b>	The pendant or other type of controller is used by the operator to give commands to the product.
<b>Qualified personnel</b>	A staff with necessary qualifications based on the theoretical and practical knowledge of hoists and cranes. The persons must be in a position to assess the safety of the installation in conjunction with the application. The persons with the authority to undertake certain maintenance work on the products of manufacturers including manufacturer service engineers and trained fitters with the corresponding certification.
<b>Maximum capacity</b>	The load that the product is designed to lift with a given operating condition (for example, a configuration or the position of the load).
<b>Runway</b>	The product rides on the runway or under the runway.
<b>Trolley (hoisting unit)</b>	The trolley (hoisting unit) moves along the main girder.
<b>Sling</b>	A sling is used to attach the hook to the load when the load cannot be lifted directly by the hook.
<b>Safe Working Period (SWP)</b>	The calculated hoisting machinery lifetime that is based either on the running hours or on the number of working cycles.

## 2.8 Standards and Directives

This state of the art product has been designed and manufactured to conform to European and international standards and directives. The product also fulfills the requirements of the following standards (if applicable): CSA, UL, RoHS, OSHA, CCC.



### 3 SAFETY FIRST!

Safety requirements must be understood and followed.

#### 3.1 Personal protective equipment (PPE)

For safety, the service personnel or others in close proximity to the product may be required to wear Personal Protective Equipment (PPE). Various types of PPE are available and must be selected according to the requirements of the working environment.



Follow the local regulations and requirements of the working environment.

##### 3.1.1 Fall Protection



While personnel are performing inspection or maintenance work at heights, they must follow fall protection procedures as required by local regulations. Fall prevention practices and fall protection equipment aim to protect personnel working on or around the equipment from exposure to falls.

If the equipment does not have a service platform or handrail, personnel must use a properly fitted safety harness that is attached to the dedicated fixing points on the building or equipment in order to prevent falls.

If the product does not have dedicated fixing points for fall protection, it is the owner's responsibility to make sure that there are suitable fixing points in the building structure.

If ladders must be used, personnel must practice setting and securing the ladders before using them for actual work.

A typical fall protection program may include:

- Documented and established site policies and procedures.
- Conducting site assessments for fall hazards.
- Selection of the proper fall protection system and equipment.
- Training on fall protection procedures and the proper use of fall protection systems.
- Inspection and proper maintenance of fall protection equipment.
- Measures to prevent falling objects.
- Rescue Plans.

If necessary, contact your supplier or service organization for assistance with designing your fall protection program.

#### 3.2 Fire Safety

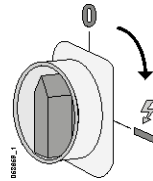
In the event of a fire, only attempt to fight it if you can do so without putting yourself in danger. Turn off the power if it is possible to do so. Evacuate the area. Notify other people about the potential danger, and call for help.




**WARNING**

**Never use a powder type fire extinguisher on high voltage.**

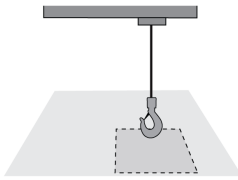
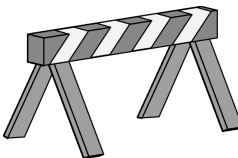

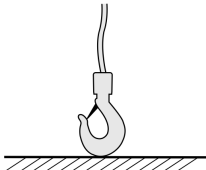
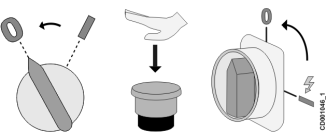
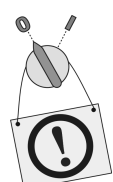
### 3.3 Main isolation switch

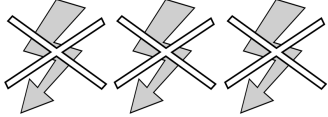
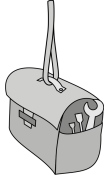
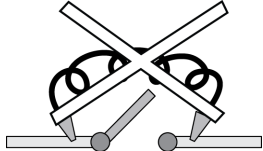
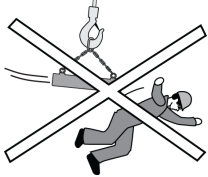
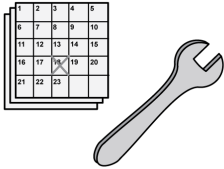
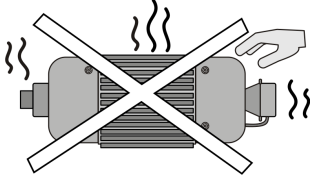


 <b>CAUTION</b>	<p><b>Service personnel shall be aware of main isolation switch functionality. Even though one switch is turned off, there may still be voltage in some parts of the product. This may result in exposure to electric shocks.</b></p>
--	---

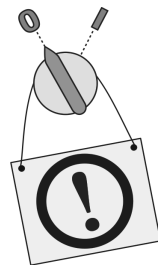
### 3.4 Safety during maintenance

Before and during product maintenance, the following precautions should be taken by maintenance personnel:

<b>1</b>	<p><b>Choose a safe working location</b></p> <p>The product should be moved to a location where it will cause the least disturbance and where it can be accessed easily.</p>	
<b>2</b>	<p><b>Prevent unauthorized access to the site</b></p> <p>Prevent unauthorized persons and bystanders from walking on or below the work site. For example, you can lock doors, install barriers and display notices. Ensure that the secured area is spacious enough to prevent injuries which could occur as a result of falling components or tools.</p>	
<b>3</b>	<p><b>Inform that equipment will be undergoing maintenance</b></p> <p>Before starting maintenance, people must be properly informed that the equipment is being removed from operation.</p>	
<b>4</b>	<p><b>Ensure that there is no load on the lifting device</b></p> <p>Before starting maintenance, there should be no load on the hook or lifting device. Park the hook on the ground if there is any chance that the hoisting brake will be opened during maintenance. A raised empty hook will fall to the ground if the hoisting brake is opened.</p>	
<b>5</b>	<p><b>Turn off all controllers and main switches</b></p> <p>All controllers and main isolation switches must be placed in the off position before starting maintenance.</p>	
<b>6</b>	<p><b>Lockout – Tagout</b></p> <p>The product power source must be locked out and tagged out when necessary, in accordance with local regulations. See chapter “Lockout – Tagout Procedure”</p>	

<b>7</b>	<b>Verify that power is completely disconnected</b> Measure between the phases and between each phase to ground to ensure that power is completely disconnected from the product.	
<b>8</b>	<b>Use hand lines for lifting and lowering tools</b> Hand lines, securely attached to the building structure, should be used for lifting or lowering materials and tools. Use proper safety equipment to prevent objects from falling when working in high places.	
<b>9</b>	<b>Safety devices must be restored to operational status</b> Ensure that any safety devices which have been bypassed for testing purposes have been restored to full operational status before allowing the product to be used for normal operation.	
<b>10</b>	<b>Minimize the risks of moving machinery</b> Secure the area so that personnel are not at risk from the movements of machines, automatic doors, or adjacent cranes at the installation site. Ensure that machinery and equipment cannot start up accidentally and cannot move during installation and servicing. Be prepared in case equipment moves in the wrong direction during testing.	
<b>11</b>	<b>Perform regular inspections and preventive maintenance</b> To ensure ongoing safe and efficient operation of the product, carry out regular inspections and preventive maintenance in compliance with the instructions. Keep a record of all inspections and servicing. If in doubt, contact the supplier of the product.	
<b>12</b>	<b>Beware of high temperature components</b> Some components of the product, such as the motors, can become very hot during use. Check that components are cool before working on them.	

### 3.4.1 Lockout - Tagout Procedure



During installation, inspection and maintenance, lockout-tagout procedures must be followed in accordance with local regulations and the documented site lockout-tagout policy. The owner must ensure that the operators are fully aware of the applicable lockout - tagout practices.

Lockout-tagout procedures are primarily intended to protect personnel by preventing accidental starting or exposure to electric shocks. Individual locks and tags are placed on controls to prevent their use until the person who installed the lock or tag removes it.

**CAUTION**

**Never attempt to operate a control, switch, valve, or other device when it is locked out or tagged out.**

Items which are normally included in the documented lockout-tagout policy:

- Communication requirements: who to inform before using lockout - tagout.
- When the use of lockout - tagout is permitted.
- Identification of each of the switches, controls, valves, and other energy isolating devices present at the site. The role of each device should also be explained.
- The lockout - tagout sequences to be followed before, during and after maintenance.
- Safety and operational considerations regarding other products on the same runway or on adjacent runways.

### 4 IDENTIFICATION

This manual contains information for several hoist types, components, and options. The information in this manual is identified by an individual feature of hoist or by the product code or by a part of the product code. Identification data is on the hoist data plate or component data plate.

#### 4.1 Manufacturer

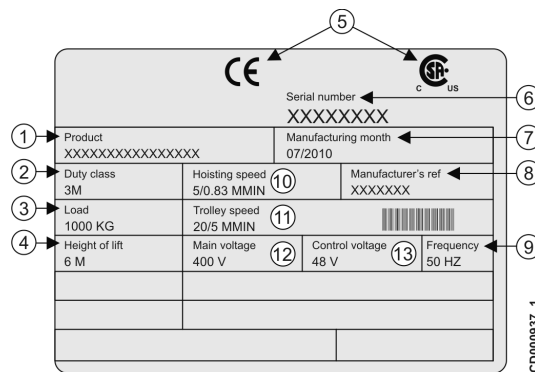
Manufacturer: **Verlinde S.A.**  
 Address: **2, Boulevard de l'Industrie  
 BP 20059  
 28509 VERNUILLET CEDEX  
 FRANCE**



For further information about the product, operational training or servicing, contact the manufacturer or the manufacturer's representative.

#### 4.2 Hoist identification data

The hoist serial number is stated on the hoist data plate which is located on the trolley.



1	Product	Exact model of the product, product code.
2	Duty class	Duty group defined based on the expected use of the product
3	Load	Maximum load which can be lifted with the product
4	Height of lift	Maximum lifting height of the hook
5	Approvals and standards	Directives and approvals which the product complies to. Refer to the chapter "Standards and directives".
6	Serial number	A unique number which identifies the product
7	Manufacturing month	Manufacturing month or year
8	Manufacturer's reference	Factory work number
9	Frequency	Supply frequency which the product is designed for
10	Hoisting speed	High or low hoisting speed
11	Trolley speed	High or low trolley traveling speed
12	Main voltage	Supply voltage which the product is designed for
13	Control voltage	Control circuit voltage

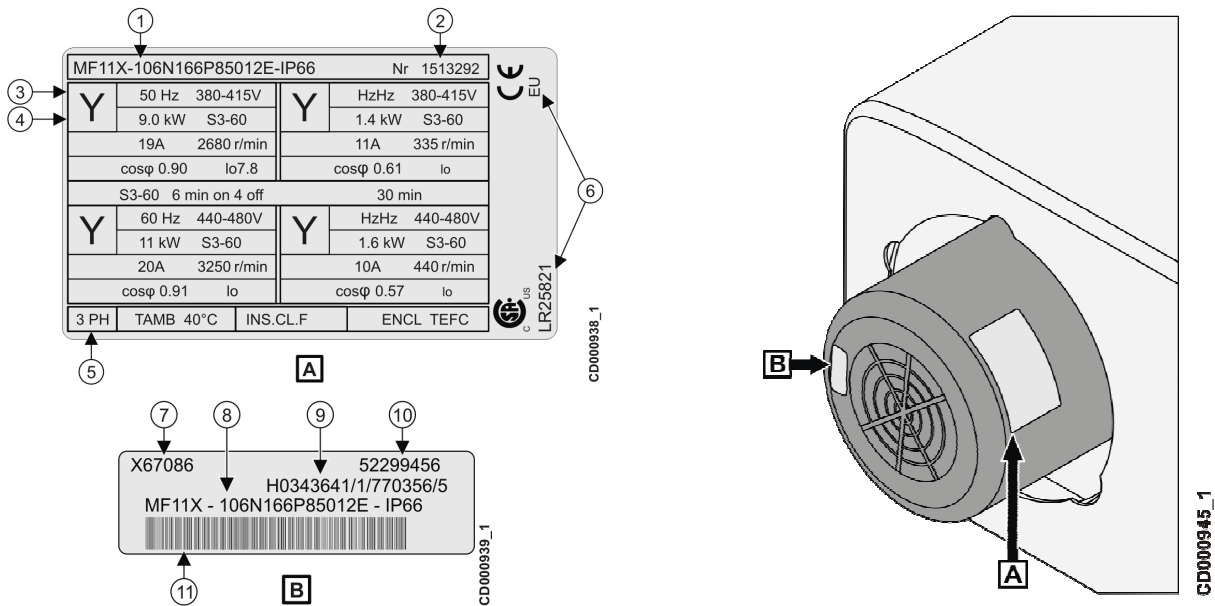


The example data in the figure is shown for illustration purposes only and does not match with the data on your product.

### 4.3 Motor identification data

Motor serial number and other motor information such as motor type are stated on the motor rating plate which is located on the motor.

#### Hoisting motor



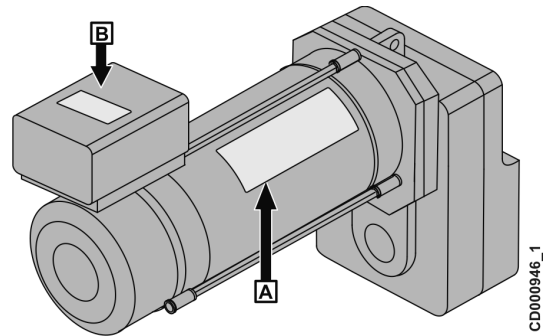
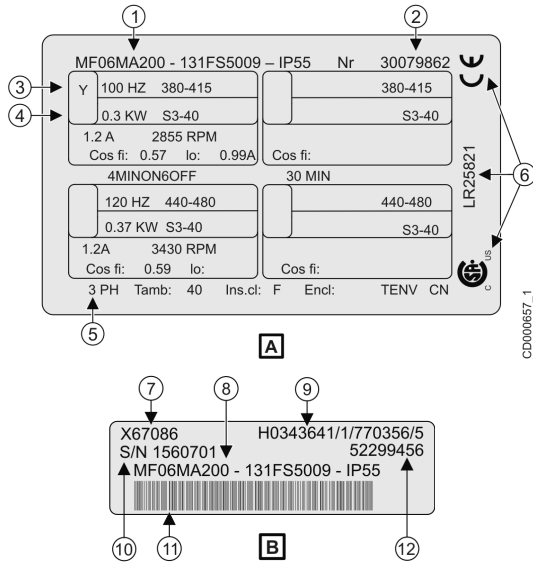
Hoisting motor data plate can also be located on the side plate of the hoist or trolley.

<b>A</b>	Motor rating plate	Product identification data
<b>B</b>	Bar code sticker	Product order references
<b>1</b>	Motor type code	Exact model of the product
<b>2</b>	Motor serial number	Unique number which identifies the unit
<b>3</b>	Input	Acceptable main voltage range and frequency that the product can be connected to
<b>4</b>	Output	Voltage range the product is able to provide at a specified output capacity
<b>5</b>	Phases	Phase quantity of the motor
<b>6</b>	Approvals and standards	Directives and approvals which the product complies to. Refer to the chapter "Standards and directives".
<b>7</b>	Factory work number	Motor factory work number
<b>8</b>	Motor type code	Exact model of the product
<b>9</b>	Reference numbers	Order related numbers
<b>10</b>	Identification number	Identification number of the motor. This number is used when ordering spare parts
<b>11</b>	Bar code	Bar code which includes, for example, the product serial number and ID in an optically readable form



The example data in the figure is shown for illustration purposes only and does not match with the data on your product.

### Traveling motor



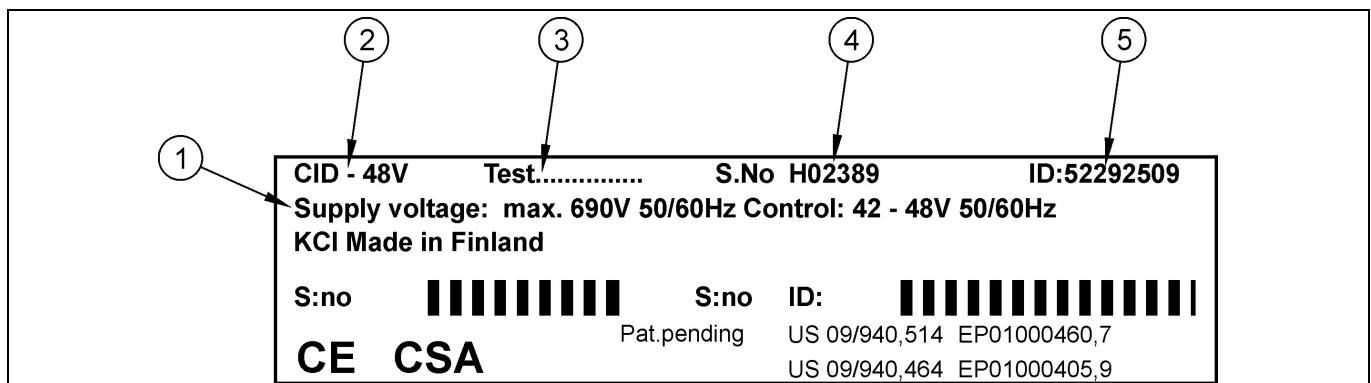
<b>A</b>	Motor rating plate	Product identification data
<b>B</b>	Bar code sticker	Product order references
<b>1</b>	Motor type code	Exact model of the product
<b>2</b>	Motor serial number	Unique number which identifies the unit
<b>3</b>	Input	Acceptable main voltage range and frequency that the product can be connected to
<b>4</b>	Output	Voltage range the product is able to provide at a specified output capacity
<b>5</b>	Phases	Phase quantity of the motor
<b>6</b>	Approvals and standards	Directives and approvals which the product complies to. Refer to the chapter "Standards and directives".
<b>7</b>	Factory work number	Motor factory work number
<b>8</b>	Motor type code	Exact model of the product
<b>9</b>	Reference numbers	Order related numbers
<b>10</b>	Motor number	Unique number which identifies the unit
<b>11</b>	Bar code	Bar code which includes, for example, the product serial number and ID in an optically readable form
<b>12</b>	Identification number	Identification number of the motor. This number is used when ordering spare parts



The example data in the figure is shown for illustration purposes only and does not match with the data on your product.

### 4.4 Condition monitoring unit identification data

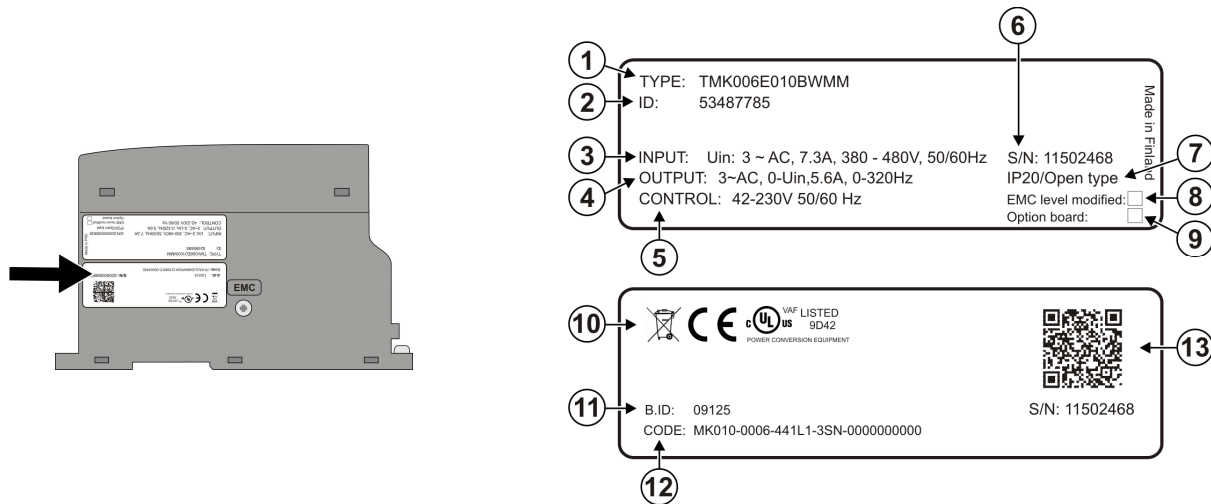
Condition monitoring serial number and other information are stated on the product description sticker which is attached to the unit.



1. Supply voltage / Control Voltage
2. Unit type
3. Tested (year, week, tester)
4. Serial number
5. Product specific code

### 4.5 Frequency converter identification data

The frequency converter serial number and other information is stated on the main sticker attached on the device. See an example sticker as follows:



1	<b>Product model number</b>	Indicates the exact model of the product.
2	<b>Identification number</b>	A unique string that identifies the unit.
3	<b>Input</b>	Indicates the acceptable mains voltage range, current and frequency that the product can be connected to.
4	<b>Output</b>	Indicates the voltage range, current and frequency range the product is able to provide at a specified output capacity.
5	<b>Control</b>	Indicates the acceptable voltage range and frequency of control signals that the product can be connected to.
6	<b>Serial number</b>	The serial number of the unit in an alphanumeric format.
7	<b>IP classification</b>	Indicates the ingress protection classification of the product.
8	<b>EMC level modified</b>	Indicates whether the EMC level has been changed from the default level. By default, the EMC level is set as N.
9	<b>Option board</b>	Indicates whether the product is fitted with an optional board providing additional features. Option boards can be used only with a frequency converter featuring a display.
10	<b>Approvals and standards</b>	Indicates the directives and approvals the product complies to.
11	<b>Batch identification number</b>	Indicates the batch from which the unit originates. The first four digits indicate the year and week of manufacture, respectively. The last digit (1 through 5) indicates the weekday, 1 being Monday, 2 Tuesday, number 5 indicating Friday.
12	<b>Code</b>	Identification and feature information provided by the manufacturer.



<b>13</b>	<b>QR Code™</b>	A two-dimensional bar code in an optically readable form. Note: The term "QR Code" is a registered trademark of Denso Wave Incorporated in Japan and other countries.
-----------	-----------------	--

### 5 GENERAL OVERHAUL OVERVIEW

In order to ensure safe operation of cranes, the proper working and operational condition shall be maintained according to standard ISO 9927.

This requirement covers also special assessments to be carried out by an expert engineer at regular intervals to check the remaining Safe Working Period (SWP) of the hoist as stated in standard ISO 12482-1.

The condition monitoring unit (CID) provides two different SWP values: the runtime-based SWP (CID parameter 2-12 SWPRT% ) and the working cycle-based SWP (CID parameter 2-15: SWPHC%).

The CID display of the data counter SWP always shows the lesser value of two parameters.

#### Runtime-based SWP versus working cycle-based SWP

The runtime-based SWP data found in parameter SWPRT% (2-12) is indicating the effects of runtime and loads on the rotating machinery of the hoist.

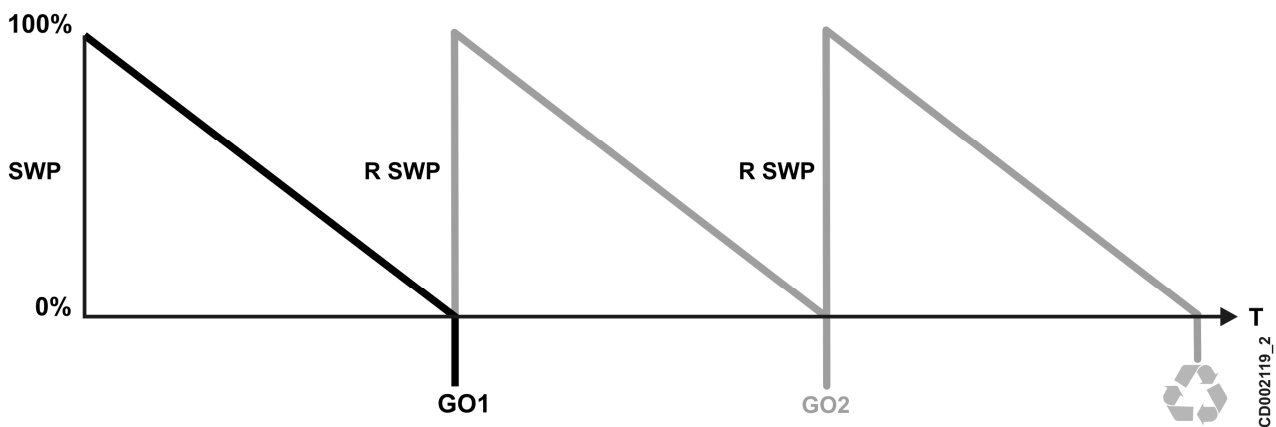
The working cycle-based SWP data found in parameter SWPHC% (2-15) is indicating the effects of cycles and loads on the steel structure of the hoist.

When the runtime-based SWP (SWPRT%) has reached zero and parameter SWPHC% is indicating greater than 50%, the General Overhaul service specified by the manufacturer can be carried out.

When the runtime-based SWP (SWPRT%) has reached zero and SWPHC% is less than 50%, the hoist shall be replaced and not considered for General Overhaul.

When the working cycle-based SWP (SWPHC%) is zero, the hoist shall be replaced and not considered for General Overhaul.

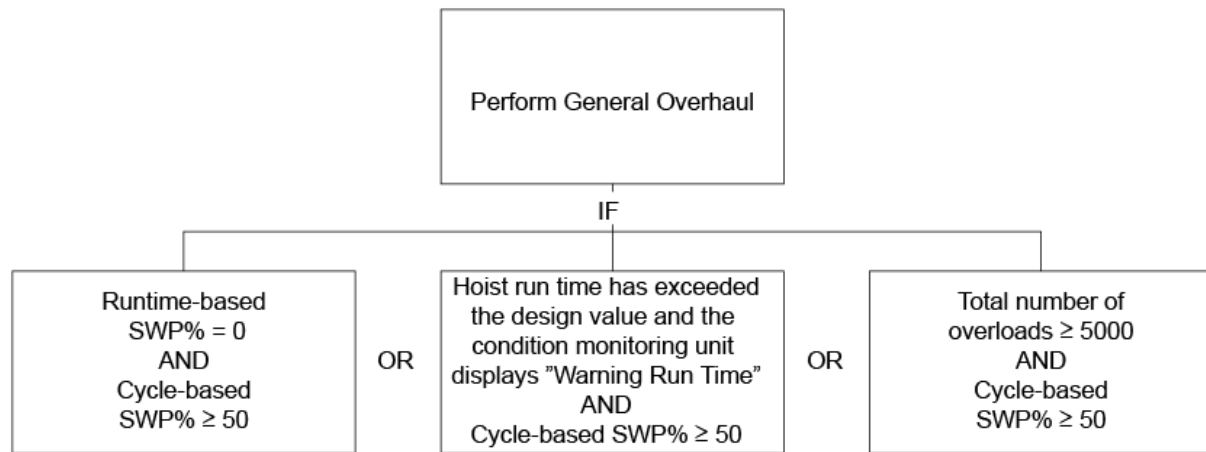
In the GO service, the product is assigned with a new, runtime-based SWP, provided that it is safe to continue the operation. The runtime-based SWP means the lifetime of the interchangeable rotating components of the hoist like gearbox, hoisting motor, and rope sheaves. The same hoisting machinery can undergo no more than two GOs before it must be replaced completely:



SWP = Safe Working Period  
 RSWP = Runtime-based Safe Working Period  
 GO1 = First General Overhaul  
 GO2 = Second General Overhaul  
 T = Time

#### Conditions for General Overhaul

The following figure summarizes the conditions based on which General Overhaul can be performed.



CD006886\_1

During the GO process, some of the components are always replaced, and some components are inspected and replaced if necessary.

The General Overhaul process of a hoist always includes the following phases:

1. Collecting the required information
2. Evaluating the need of General Overhaul
3. Estimating the content and cost
4. Performing General Overhaul
5. Commissioning.

The five phases are not always sequential, as for instance, not all the parts can be inspected before the hoist is disassembled during the actual GO service.

## 5.1 Collecting information

The following documents are required for General Overhaul:

- "General Overhaul Instructions"
- "Usage and Safety Assessment"
- "Inspection and Service Report"

Delivery/hoist documentation:

- Owner's manuals
- "Spare Part Catalogue for Hoist"
- "Service Manual for Hoist"

Design data:

- Type of the hoist
- Nominal load of the hoist
- Design class of the hoist

Maintenance history data:

- Previous service records
- Previous GOs, checked and replaced parts
- Previous modernization
- Additional replacements
- Extra service procedures


## 5.2 Evaluation of the need of General Overhaul (special assessment)

A special assessment is a thorough examination and evaluation of the product carried out by authorized service personnel or an experienced service man that is authorized by the manufacturer or by the manufacturer representative in accordance with the ISO 12482-1 standard. The assessment is done when the product is approaching the end of runtime SWP, typically when 20% of the runtime SWP is remaining. Any general overhaul requirements that are stated in the special assessment report must be carried out before further use of the product.

### 5.3 Content and cost estimate

Based on the information collected at earlier phases, it can be determined whether the General Overhaul service is a reasonable action, or in general, possible for the hoist, or if the hoist must be replaced with a new one. The GO package has a fixed price for spare parts. In addition, the labor costs, equipment rentals, and so on, are evaluated locally and included into the overall cost estimate.

### 5.4 Performing General Overhaul

 <b>WARNING</b>	<p><b>When the Safe Working Period (SWP) of the hoist has decreased to zero or is counting in the negative, the hoist may only be used after a GO service has been conducted. Any usage of a defective hoist can result in serious damage, injury, or death.</b></p>
--	--

<b>CAUTION</b>	<p><b>When performing General Overhaul, the construction of the hoist may not be changed or the supporting structures repaired without permission from the manufacturer. If there are any deformations, cracks or corrosion in the supporting structures of the hoist, the parts have to be replaced or repaired according to the instructions given by the manufacturer.</b></p>
----------------	---

Only authorized service personnel or an experienced service man that is authorized by the manufacturer or manufacturer representative may conduct a General Overhaul service. The components that have an impact on the product lifetime are inspected and the critical components are replaced.



Instructions on assembling and disassembling components that have to be checked and replaced are shown in "Service Manual for Hoist".



Document "Spare Part Catalogue For Hoist" includes the lists of the spare parts and item codes.

### 5.5 Commissioning inspection

Inspect the operation of the hoist in the end of the General Overhaul service. For more information, see chapter "Commissioning".

## 6 GENERAL OVERHAUL SUMMARY

### 6.1 Parts that are always replaced in GO

	ALWAYS REPLACE	SEE CHAPTER:
1	Rope drum: drum frame bolts (frame size VT3)	Rope drum
2	Rope drum: drum axial locking part (frame size VT3)	Rope drum
3	Rope drum: needle-bearing strip (frame size VT3)	Rope drum
4	Rope drum: bearing sets (frame size VT4, VT5)	Rope drum
5	Rope drum: rope guide models before 12.2006 (concerns only frame size VT4, VT5)	Rope drum
6	Rope drum: rope guide models after 12.2006: guide bearings (concerns only frame size VT4, VT5)	Rope drum
7	Hoisting machinery (motor, brake, gearbox, coupling)	Hoisting machinery (motor, gearbox)
8	Hoisting machinery: second brake (frame size VT3)	Hoisting machinery (motor, gearbox)
9	Upper pulley block: pulley block shaft, frame size VT3, reeving code 04	Upper pulley block
10	Hook block: sheet metal cross bar, frame size VT3, reeving code 04	Hook block
11	Hook block: shaft set, (not in frame size VT3, reeving code 04)	Hook block
12	Hook block: hook	Hook block
13	Hook block: thrust bearing	Hook block
14	Hook block: locking rings/locking nut	Hook block
15	Overload device / Rope anchorage support	Overload device or rope anchorage support
16	Rope anchorage	Overload device or rope anchorage support
17	Hoisting limit switch	Hoisting limit switch
18	Trolley type N, swiveling and non-swiveling: screw rods	Trolley
19	Trolley type L: screw rods	Trolley
20	Electrics: Contactors (including auxiliary contact blocks)	Electrics

### 6.2 Parts that are checked and replaced in GO if necessary

	CHECK AND REPLACE IF NECESSARY	SEE CHAPTER:
1	Rope drum (frame size VT4, VT5). Note that the rope drum of frame size VT3 is not replaced. Instead, order a new hoist if the drum itself does not pass the acceptance criteria.	Rope drum
2	Rope drum: rope clamps	Rope drum
3	Rope drum: wire rope	Rope drum
4	Rope drum: connector rods (frame size VT3)	Rope drum
5	Rope drum: rope guide	Rope drum
6	Rope drum: pressure roller or pressure roller parts	Rope drum
7	Upper pulley block: housing	Upper pulley block
8	Upper pulley block: rope sheave	Upper pulley block / Rope sheave
9	Upper pulley block: pulley block shaft	Upper pulley block
10	Upper pulley block: sheave shaft	Upper pulley block
11	Hook block: Rope sheave	Hook block / Rope sheave
12	Trolley	Trolley
13	End carriage: wheel set	Trolley
14	Trolley type N, swiveling and non-swiveling: side plates	Trolley
15	Trolley type N, swiveling: cross bar	Trolley
16	Trolley type N, swiveling and non-swiveling: trolley wheels	Trolley / Trolley wheels
17	Trolley type L: side plates	Trolley
18	Trolley type L: trolley wheels	Trolley / Trolley wheels
19	Electrics:Condition monitoring unit	Electrics
20	Electrics:Frequency converter	Electrics
21	Electrics: Push button controller	Electrics
22	Electrics: Radio receiver	Electrics



## 7 GENERAL OVERHAUL PREPARATIONS

When CID data indicates General Overhaul service, the hoist rope drum should be inspected when yet assembled on the crane for possible critical defects that justify the replacement of the drum.

The replacement, however, is not cost-efficient for drums of frame size: VT3. Refer to chapter "Rope drum" for more instructions.

General Overhaul requires the removal of the hoist and trolley unit from the crane to the floor level. While the hoist is still assembled on the crane:

- Refer to chapter "Rope guide" and inspect the operation of the rope guide to determine worn or defective parts. The guide must apply the wire rope properly into the grooves of the drum and the roller must apply pressure to the laid rope.
- Refer to chapter "Rope pressure roller" and inspect the operation of the pressure roller.

Use established safe rigging and handling procedures in lowering the hoist down to the floor level, onto a firm table or equivalent. If the hoist is dirty, clean it with a cleanser designed for the purpose. A clean, well-illuminated space is needed to perform the service work, as the whole hoist must be disassembled.

### 7.1 Gathering information on current hoist components

In the preparation phase, collect the required identification data (product codes/serial numbers) of the hoist components into the "Usage and Safety Assessment" form. For example, in case of the hoisting and traveling motors, you can collect the data from the stickers attached to the components. For more information, see chapter "Identification".

In case a sticker is damaged or missing, you can also find the information in the certificates provided by the manufacturer.

### 7.2 Gathering parameter data from the condition monitoring unit

Before starting the GO, write down the following parameter data from the condition monitoring unit into the "Usage and Safety Assessment" document:

#### Menu 1:

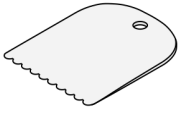
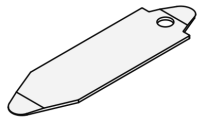
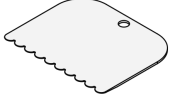
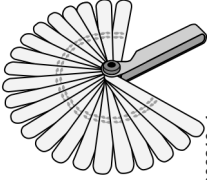
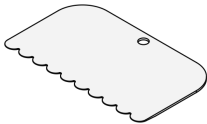
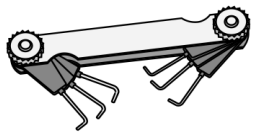
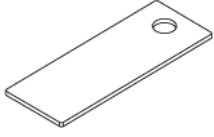
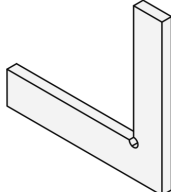
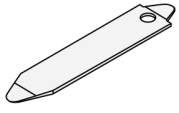
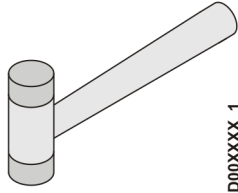
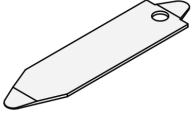
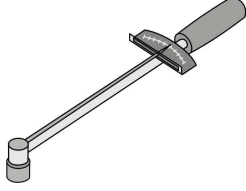
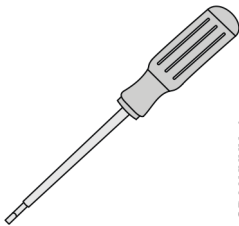
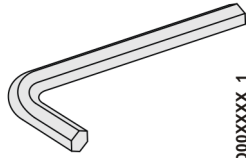
Parameter	Name	Value	Description
1-1-2	Starts	"n" %	Total number of starts of the hoist in either up or down direction.
1-1-3	Runtime	"n" h	Total running time of the hoist in hours.
1-1-6	Br SWP%	"n" %	Remaining Safe Working Period of the brake in percentage. The SWP for the brake is calculated according to the number of Starts and E-stops.

#### Menu 2

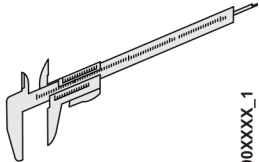
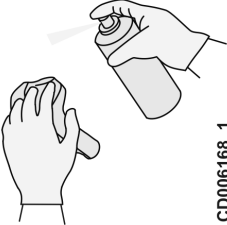
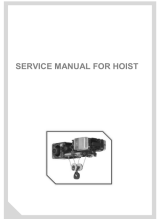

Parameter	Name	Value	Description
2-5	No.OL	"nnn"	Total number of overload incidents
2-7	ST up	"nnnn"	Number of control actions: compare these three parameters with each other and write down the highest value.
2-8	ST down	"nnnn"	
2-9	ST fast	"nnnn"	
2-12	SWPRT%	"nn" %	SWP% value calculated with hoist running time.
2-15	SPWHC%	"nn" %	SWP% value calculated with hoist cycles.

### 7.3 Tools needed for General Overhaul service

The GO service of a hoist takes 1 to 3 days and you need the following tools in the work:

	Drum groove gauge (rope diameter 8 mm)	 CD006223_1		Sheave groove gauge (rope diameter 15 mm)	 CD006177_1
	Drum groove gauge (rope diameter 11 mm)	 CD006174_1		Flat feeler gauge	 CD006219_1
	Drum groove gauge (rope diameter 15 mm)	 CD006175_1		Wire feeler gauge (wire sizes 1 mm and 1.5 mm)	 CD006662_1
	Drum bearing groove gauge (for a rope drum of frame size: VT3)			Ruler	 CD006171_1
	Sheave groove gauge (rope diameter 8 mm)	 CD006225_1		Plastic hammer or steel hammer	 CD00XXXX_1
	Sheave groove gauge (rope diameter 11 mm)	 CD006176_1		Wrench + sockets 8, 10, 13, 17 mm and 24 mm ½ inch drive torque wrench	
	Screwdrivers of different sizes (Phillips and normal)	 CD00XXXX_1		Socket screw drivers 3, 5, 6 mm and 8 mm	 CD00XXXX_1



	Caliper with the minimum accuracy of 0.05 mm	 CD00XXXX_1		 CD006168_1
	Service Manual for Hoist	 CD006168_1	Marking pen	 CD00XXXX_1

In addition, you need also various lifting devices instructed and recommended by the manufacturer, when disassembling and moving the heavy components.



Instructions on assembling and disassembling components that have to be checked and replaced are shown in "Service Manual for Hoist".

### 8 ROPE DRUM

Inspect visually and measure the rope drum grooves for wear while hoist is still on the crane before proceeding further with General Overhaul.

When the hoist yet assembled on the crane, lower the hook to the lowest point of travel to expose the entire surface of the rope drum.

If the acceptance criteria of drum measurements prove a drum to be worn out, the drum must be replaced. For further instructions on measurements, see chapter "Inspection of rope when hoist on the crane".



Replacing a hoist of frame size VT3 with a new hoist is a more economical solution than performing a GO service when the rope drum is found defective and requires replacement as well as the replacement of other parts plus labor costs.



The price of a rope drum of frame sizes VT4, VT5 and other replacements plus labor costs can still have an economical advantage over the price of a new hoist.

#### 8.1 Inspection of rope drum when hoist assembled on the crane

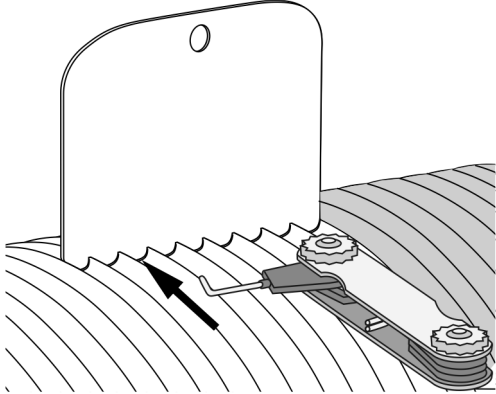
The rope drum must be replaced if:	Inspection method:
The groove wear is more than allowed.	Measurement. See the following instructions: "Measuring drum groove wear".
A crest of the drum is bent towards groove.	Visual. A sharpened crest is allowed if it is not bent towards the groove (the sharp area can be removed by filing if the crest wear dimension is still acceptable after filing).
The wear of the teeth of the drum rim gear is visible.	Visual. Teeth are broken or missing, or they have sharp endings or are otherwise clearly worn out.
➤ TO ORDER Frame size VT3: a new hoist. Frame size VT4, VT5: a rope drum	

#### Measuring drum groove wear



Clean the rope drum grooves before you start measuring groove wear.

**1**

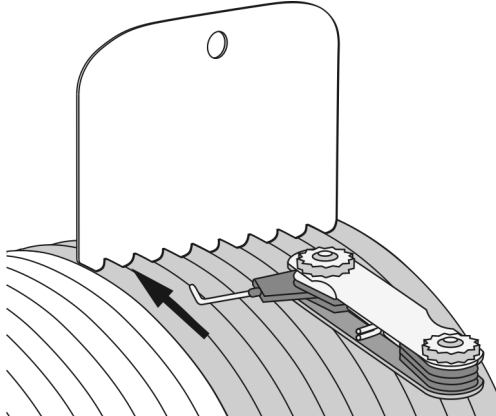


Place the drum groove gauge on top of the grooves on the non-worn area of the rope drum. Measure the clearance between the groove and the drum groove gauge with a wire feeler gauge.

Instead of a wire feeler gauge, you can also use a steel wire of same size.

CD006263\_2

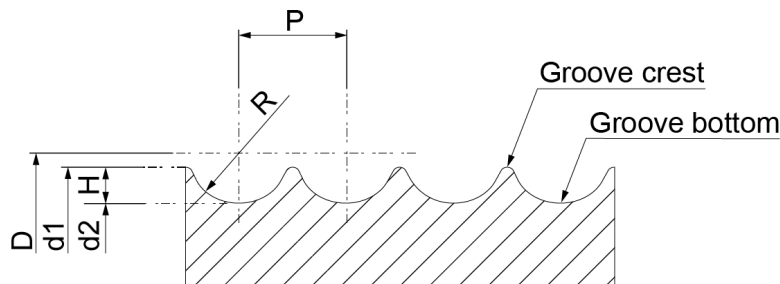
**2**



Place the drum groove gauge on top of the grooves on the worn area of the rope drum. Measure the clearance between the groove and the drum groove gauge with a wire feeler gauge.

Compare the measurement result with the result from the non-worn area, and see the acceptance criteria in the following diagram and table.

CD006263\_3



Hoist frame size	VT3	VT3	VT4	VT4	VT5
Rope diameter	11 mm (one rope)	8 mm (two ropes)	15 mm (one rope)	11 mm (two ropes)	15 mm (two ropes)
Nominal dimension	[mm]	[mm]	[mm]	[mm]	[mm]
Drum nominal diameter (D)	406	406	608	608	608
Drum diameter at groove crest (d1)	403.2	404	604.2	605.2	604.2
Drum diameter at groove bottom (d2)	395	398	593	597	593
Groove pitch (P)	12.5	9.1	17.1	12.5	17.1
Groove depth (H)	4.1	3.0	5.6	4.1	5.6
Groove radius (R)	5.8	4.2	8.0	5.8	8.0
Acceptance criteria	[mm]	[mm]	[mm]	[mm]	[mm]
The difference between the worn area and non-worn area in groove depth and radius:	<1.0	<1.0	<1.5	<1.0	<1.5

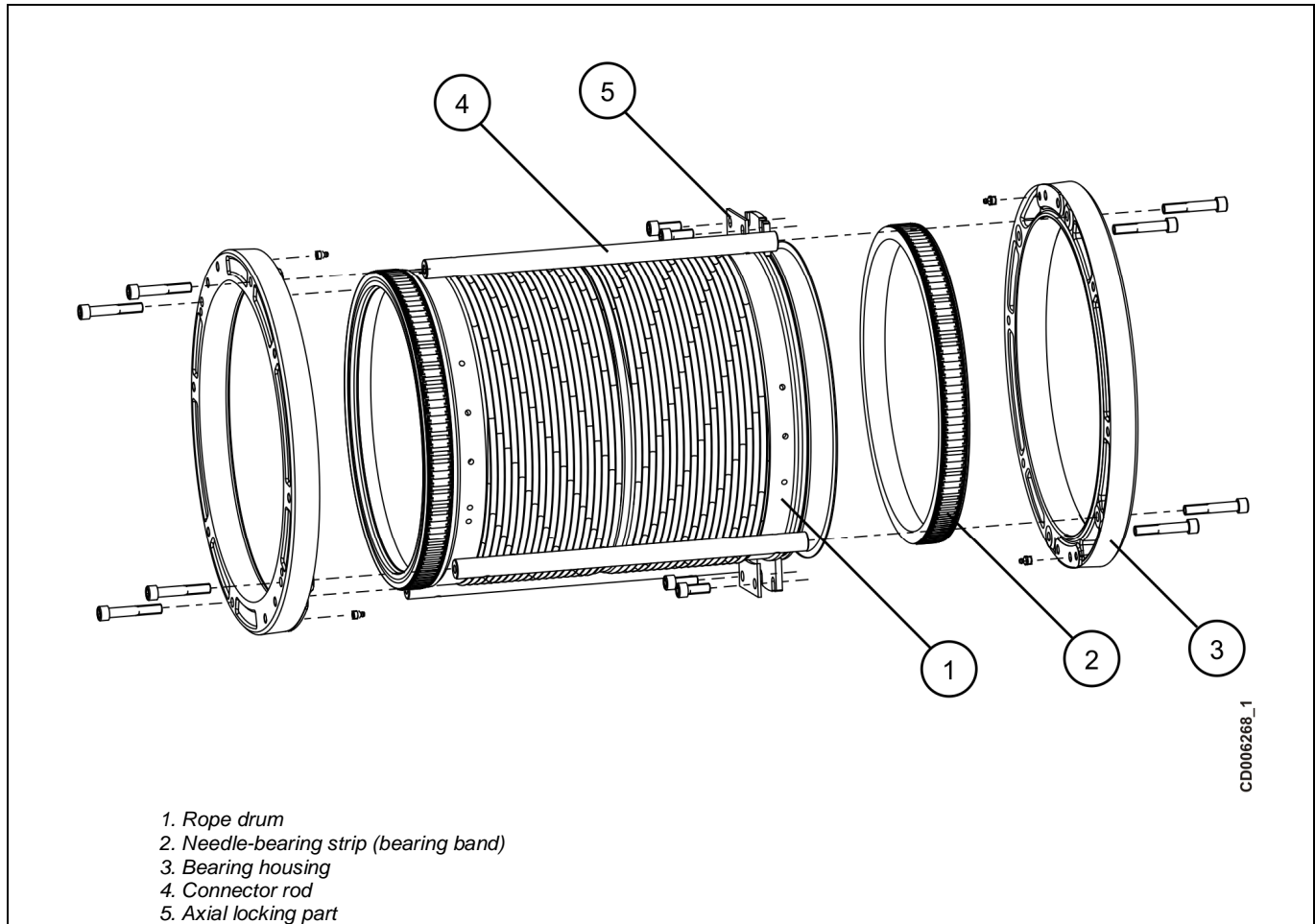
## 8.2 Inspection of rope drum when hoist and rope drum disassembled



### CAUTION

If the hoist assembly contains a drum brake, contact the manufacturer for further instructions before proceeding with GO.

### 8.2.1 Rope drum for hoist frame size: VT3

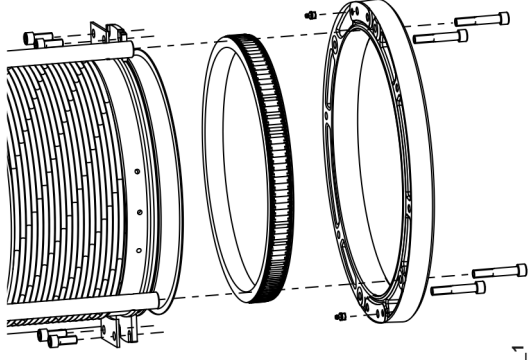
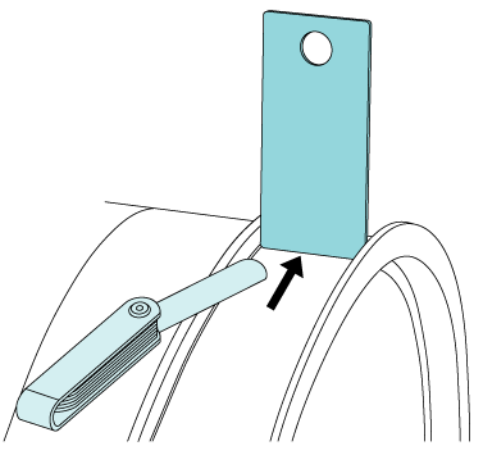


The rope drum must also be replaced if:	Inspection method:
The wear of the drum bearing running surface is more than allowed. This means that you should replace the hoist with a new hoist as it is not cost-efficient to continue GO service.	Measurement. See the following instructions: "Measuring drum bearing running surface wear".
Drum bearing housing (part 3 in the figure) has sharp edges that cannot be filed down, or is otherwise damaged. This means that you should replace the hoist with a new hoist as it is not cost-efficient to continue GO service.	Visual.
➤ TO ORDER: a new hoist.	

### Measuring drum bearing running surface wear

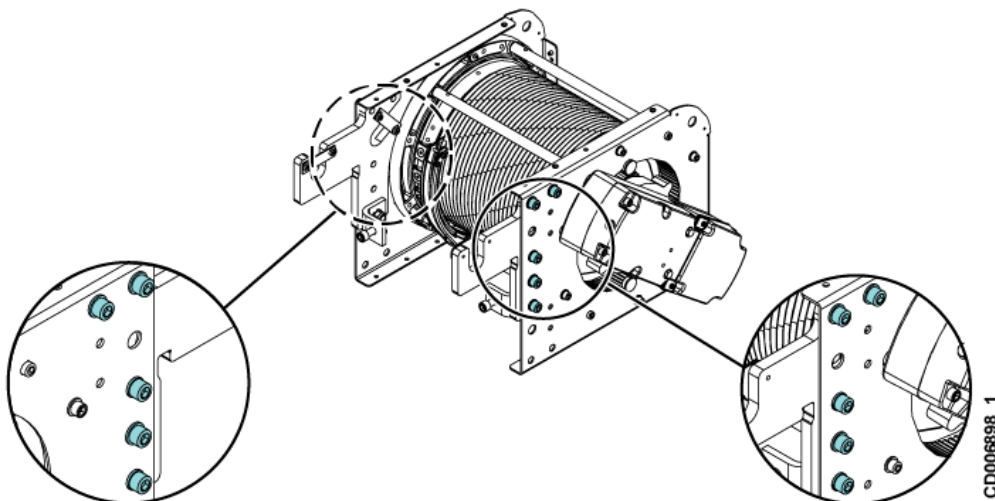


Clean the bearing running surface before you start measuring wear.

<p style="font-size: 24px; font-weight: bold; margin: 0;">1</p>  <p style="text-align: right; font-size: 10px; margin-top: 10px;">CD006259_1</p> <p style="margin-top: 10px;">Disassemble the bearing housing and the needle-bearing strip from both ends of the drum.</p>	<p style="font-size: 24px; font-weight: bold; margin: 0;">2</p>  <p style="margin-top: 10px;">Place the drum bearing groove gauge on the bearing running surface. Go around the whole bearing running surface and measure for wear with the help of a flat feeler gauge. See the acceptance criteria in the following table.</p>
---	--

Hoist frame size	VT3	VT3
Rope diameter	11 mm (one rope)	8 mm (two ropes)
<b>Acceptance criteria</b>	<b>[mm]</b>	<b>[mm]</b>
The clearance between the drum bearing groove gauge and the bearing running surface	<0.2	<0.2

### 8.2.2 Drum frame bolts (frame size VT3)



Always replace:	Parts list number
The bolts of the drum frame assembly.	See Spare Part Catalogue

### 8.2.3 Drum connector rods (frame size VT3)

Replace the drum connector rods if	Inspection method:
------------------------------------	--------------------

The drum connector rods are worn or otherwise damaged.	Visual.
--	---------

➤ TO ORDER: drum connector rods: See **Spare Part Catalogue**

### 8.2.4 Drum axial locking part (frame size VT3)

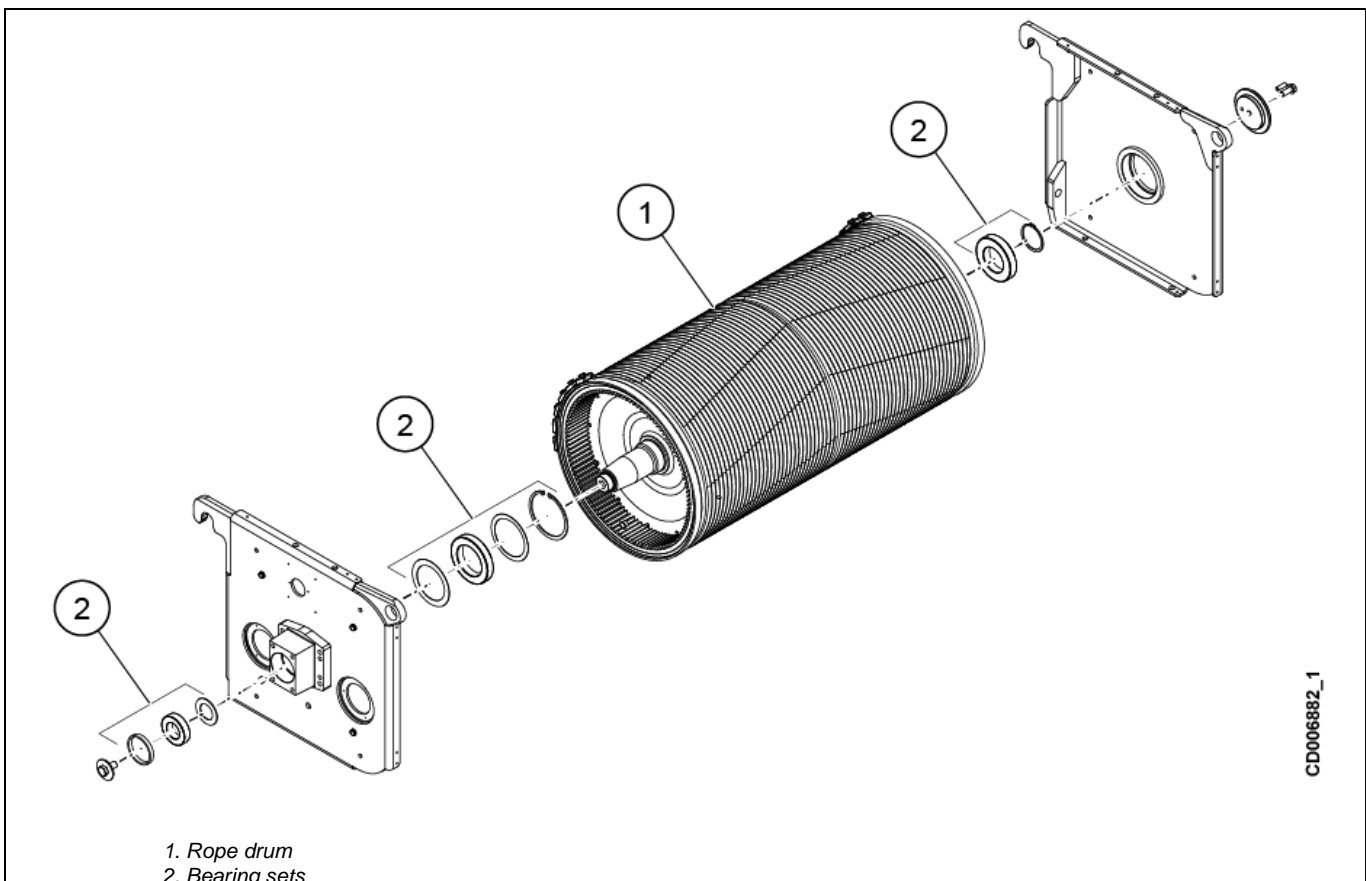
Always replace:	Parts list number
The drum axial locking part.	See Spare Part Catalogue

### 8.2.5 Needle-bearing strip (frame size VT3)

Always replace:	Parts list number
Needle-bearing strip (when reassembling the bearing set after the inspection).	See Spare Part Catalogue

### 8.2.6 Rope drum for hoist frame size: VT4, VT5

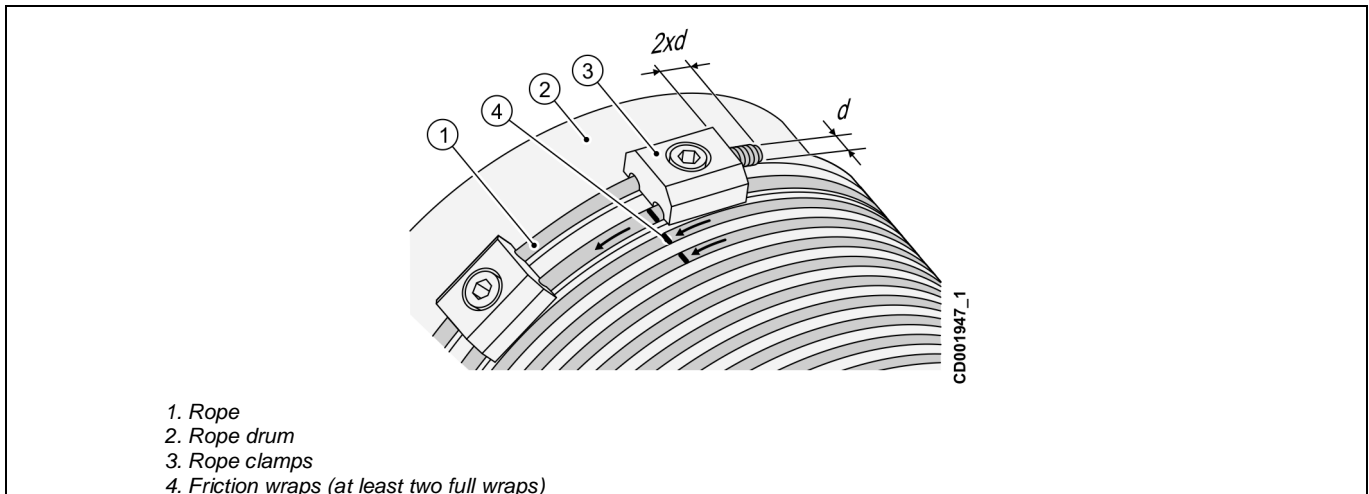
Example Rope drum for hoist frame size: VT5



### 8.2.7 Bearing sets (frame size VT4, VT5)

Always replace:	Parts list number
The bearing sets (part 2 in the previous figure)	See Spare Part Catalogue

### 8.3 Rope clamps



Replace the rope clamps if:	Inspection method:
The inspection of rope clamps reveals any corrosion, excessive wear, dents, cracks, or other damage. Examine the threaded holes in the drum for wear.	Visual
➤ TO ORDER: rope clamps: See <b>Spare Part Catalogue</b>	

### 8.4 Wire rope

Replace the wire rope if:	Inspection method:
The inspection reveals broken wire(s), excessive wear, localized reduction of the rope diameter, deformation, local increase of the rope diameter, basket deformation, protrusion of wire rope components (wire, strand, or core), kinks, or bends.	Visual, measurements
➤ TO ORDER: a wire rope: See <b>Spare Part Catalogue</b>	



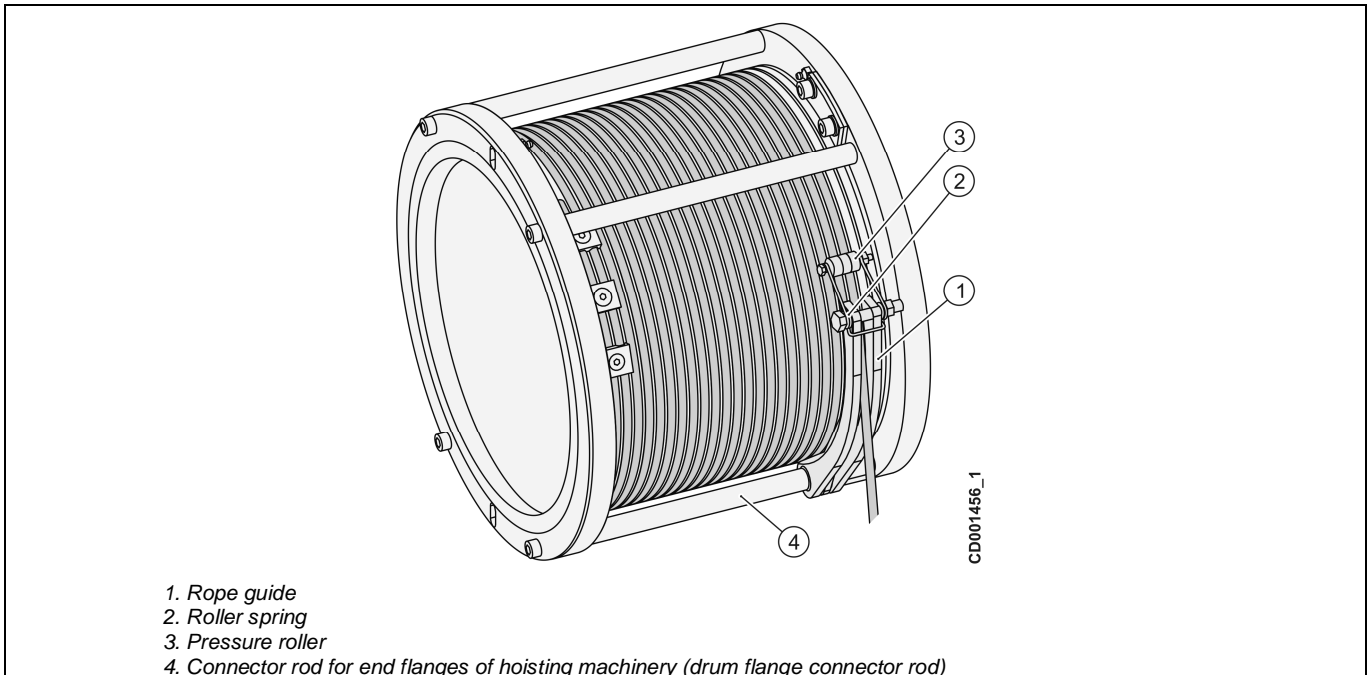
See more information on wire rope inspection, disassembly, and reassembly in "Service Manual for Hoist".

### 8.5 Rope guide



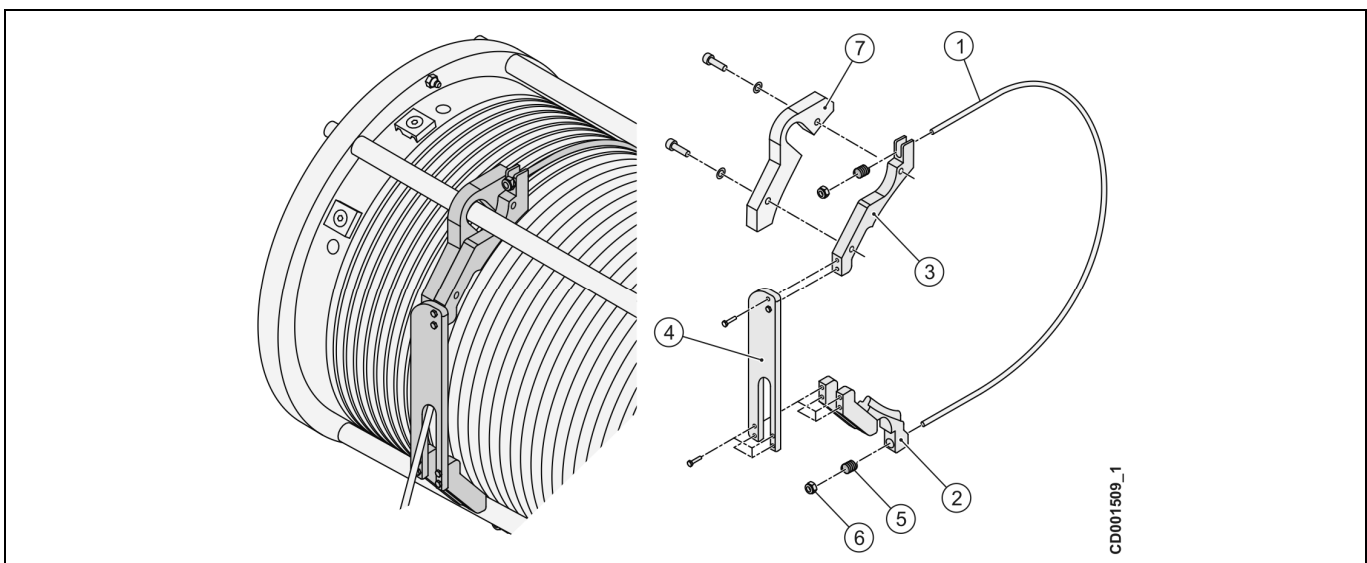
The operational testing of the rope guide must be done before the hoist is lowered to the floor level.

### 8.5.1 Construction of rope guide (newer model) for hoist frame size: VT3



Replace the rope guide if:	Inspection method:
The rope guide does not work properly.	Visual/Operational testing. See the rope guide in operation. Look for smooth moving without any binding. Verify that the roller is applying enough pressure to guide the rope into the grooves of the drum smoothly and tightly.  Check that the connector rod is not bent or damaged in some other way.
➤ TO ORDER: a rope guide: See <b>Spare Part Catalogue</b>	

### 8.5.2 Construction of rope guide for hoist frame size: VT4, VT5 (Models before 12.2006)



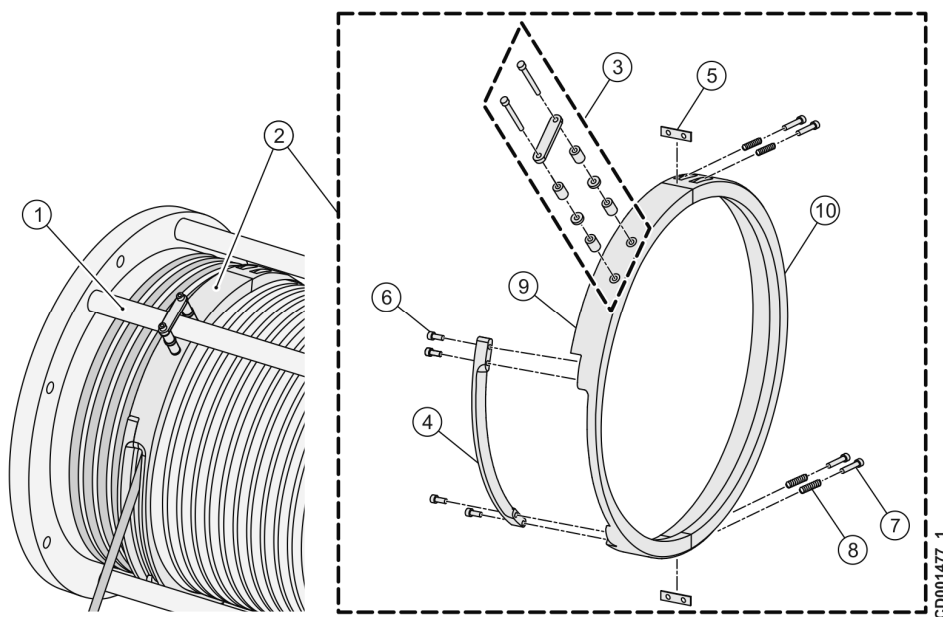


1. "U" shaped rod
2. Guide frame, lower half
3. Guide frame, upper half
4. Joint plate
5. Sleeves
6. Self-locking nuts
7. Guide element

Always replace the old rope guide to the newer model. Instructions for disassembling the old model and assembling the new one can be found in "Service Manual for Hoist".

➤ TO ORDER: a rope guide: See **Spare Part Catalogue**

### 8.5.3 Construction of rope guide for hoist frame size: VT4, VT5 (Models after 12.2006)



1. Connector rod for end flanges of hoisting machinery
2. Rope guide assembly
3. Guide bearings
4. Rope exit gate
5. Spacer
6. Locking bar fixing screws
7. Tension screws
8. Springs
9. Rope guide, front half
10. Rope guide, rear half

Replace the rope guide if:	Inspection method:
The rope guide does not work properly.	Visual/Operational testing. See the rope guide in operation. Look for smooth moving without any binding.
There are sharp worn edges towards rope exit.	Visual.
➤ TO ORDER: a rope guide: See <b>Spare Part Catalogue</b>	

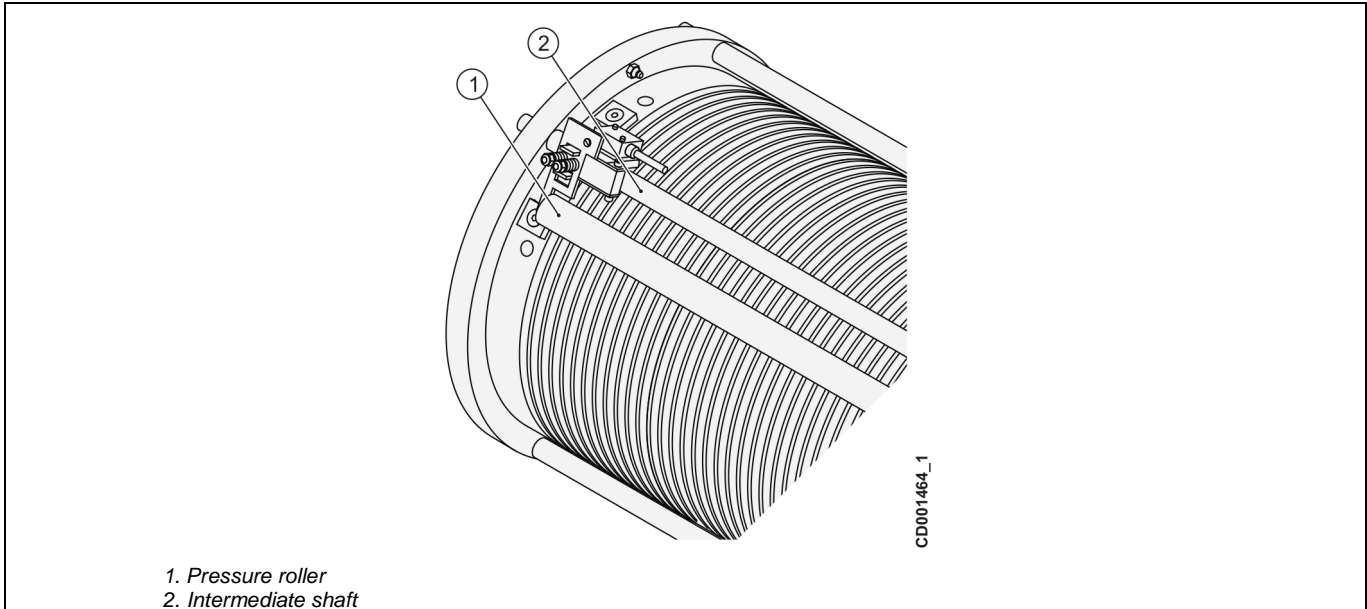
Always replace:	Parts list number
The guide bearings (part 3 in the figure).	See Spare Part Catalogue

### 8.6 Rope pressure roller



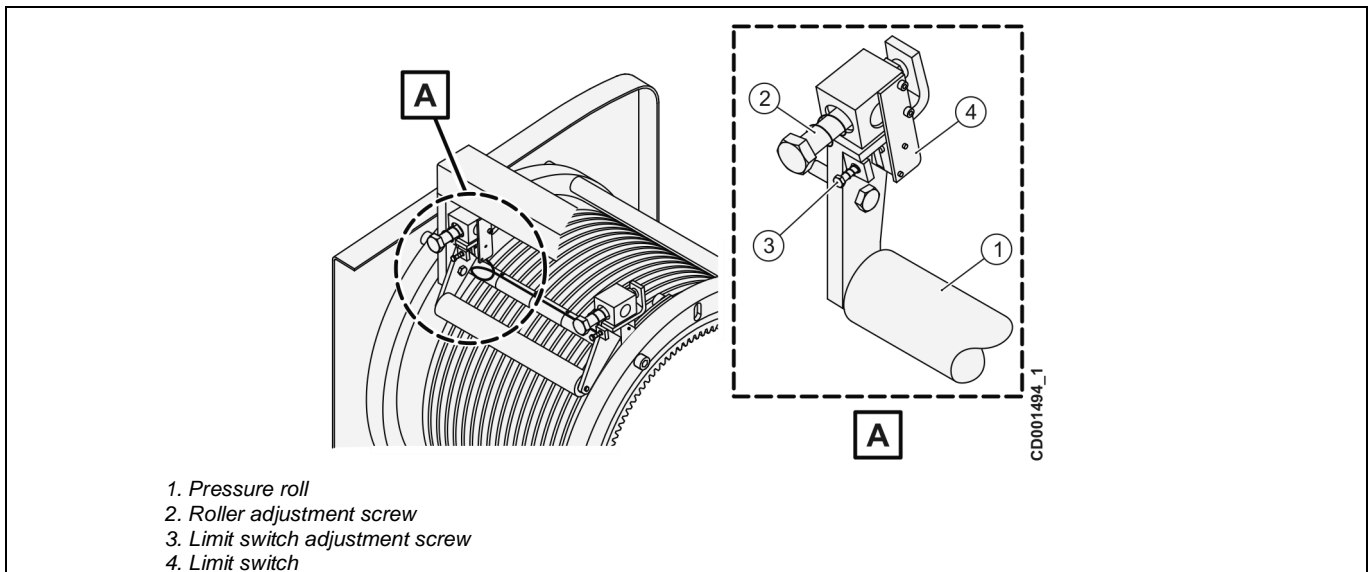
The operational testing of the rope pressure roller must be done before the hoist is lowered to the floor level.

#### 8.6.1 Construction of rope pressure roller for hoist frame size: VT3



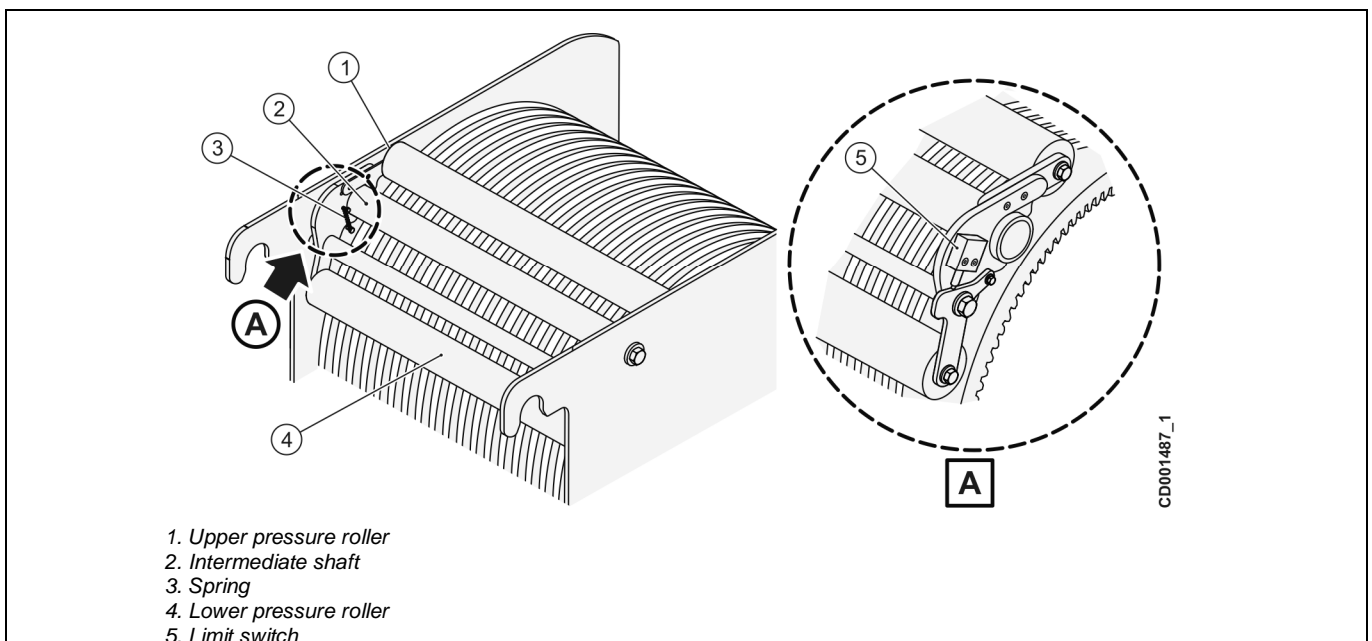
Replace the pressure roller if:	Inspection method:
the pressure roller does not work properly.	Check that the roller turns freely. Verify that lifting the roller by 1/3 of the diameter actually trips the limit switch.
there are worn out or damaged parts in the pressure roller.	Inspect for worn or broken roller or shaft.
➤ TO ORDER: a complete pressure roller or pressure roller parts: See <b>Spare Part Catalogue</b>	

### 8.6.2 Construction of rope pressure roller for hoist frame size VT4, VT5 (On models before 2011)



Replace the pressure roller if:	Inspection method:
the pressure roller does not work properly.	Check that the roller turns freely. Verify that lifting the roller by 1/3 of the diameter actually trips the limit switch.
there are worn out or damaged parts in the pressure roller.	Inspect for worn or broken roller or shaft.
➤ TO ORDER: a complete pressure roller or pressure roller parts: See <b>Spare Part Catalogue</b>	

### 8.6.3 Rope pressure roller for hoist frame size: VT4, VT5

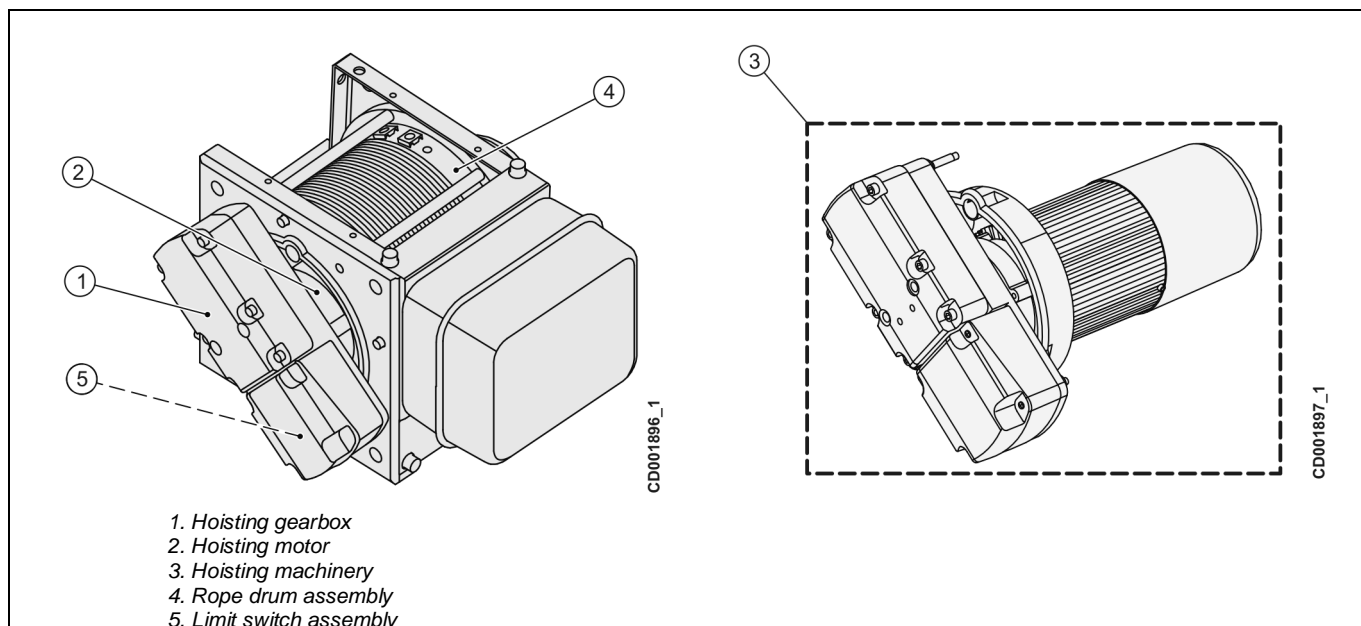


Replace the pressure roller if:	Inspection method:
---------------------------------	--------------------

the pressure roller does not work properly.	Check that the roller turns freely. Verify that lifting the roller by 1/3 of the diameter actually trips the limit switch.
there are worn out or damaged parts in the pressure roller.	Inspect for worn or broken roller or shaft.
➤ TO ORDER: a complete pressure roller or pressure roller parts: See <b>Spare Part Catalogue</b>	

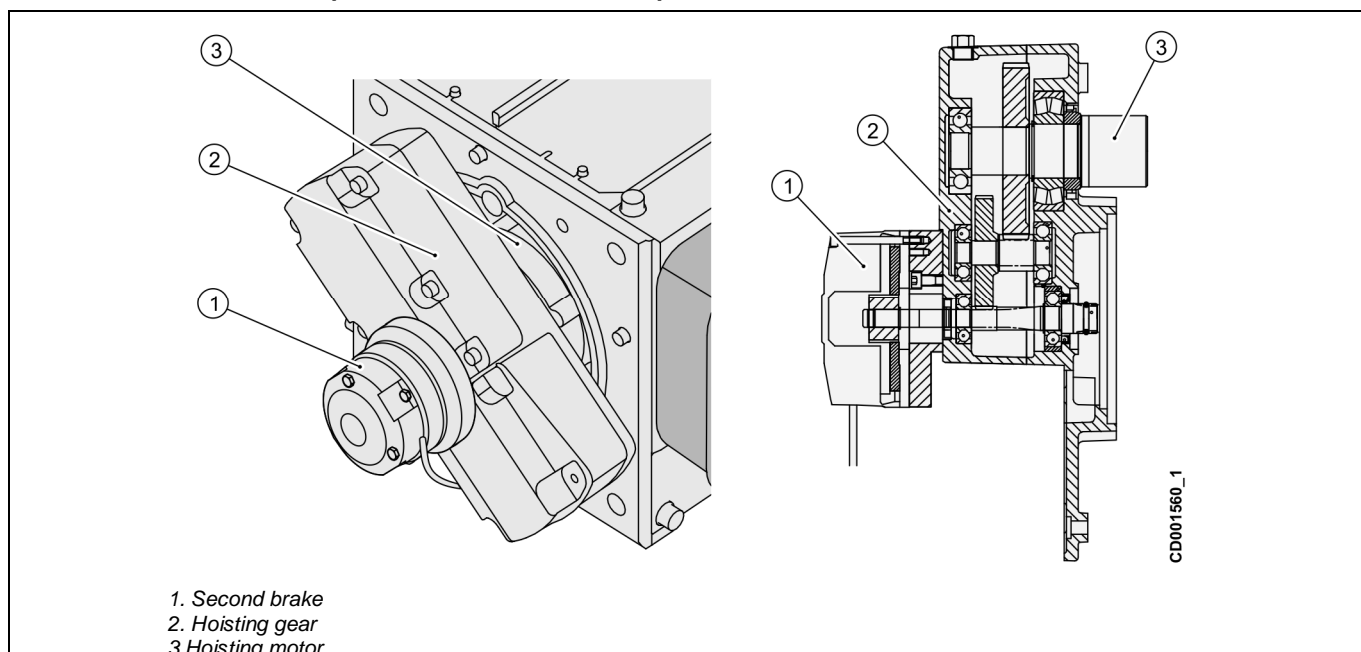
### 9 HOISTING MACHINERY (MOTOR, GEARBOX)

#### 9.1 Hoisting machinery for hoist frame size VT3



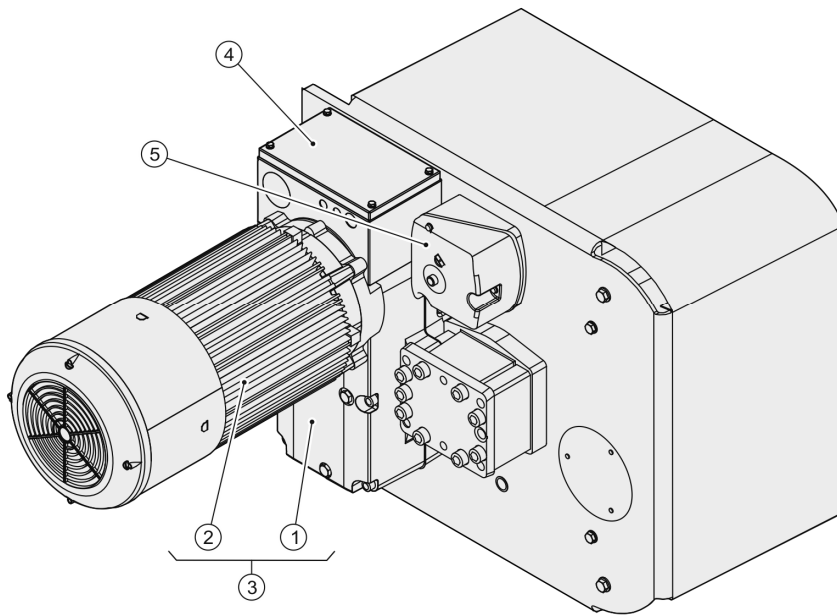
Always replace:	Parts list number
The hoisting motor, the hoisting gearbox, and the coupling.	See Spare Part Catalogue

#### 9.1.1 Second brake (hoist frame size: VT3)



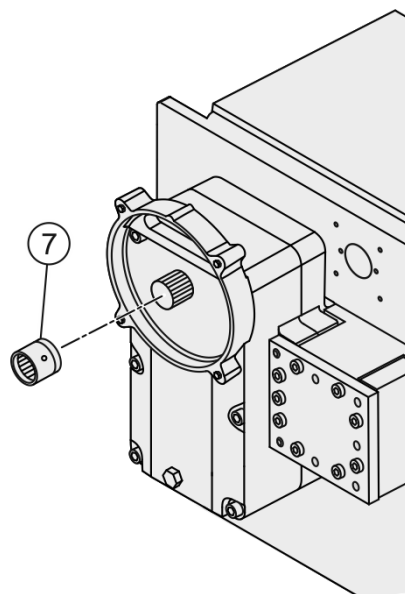
Always replace:	Parts list number
The second brake.	See Spare Part Catalogue

### 9.2 Hoisting machinery for hoist frame size: VT4, VT5



CD001909\_2

- 1. Hoisting gearbox
- 2. Hoisting motor
- 3. Hoisting machinery
- 4. Junction box
- 5. Hoisting limit switch assembly



CD001917\_2

7. Coupling

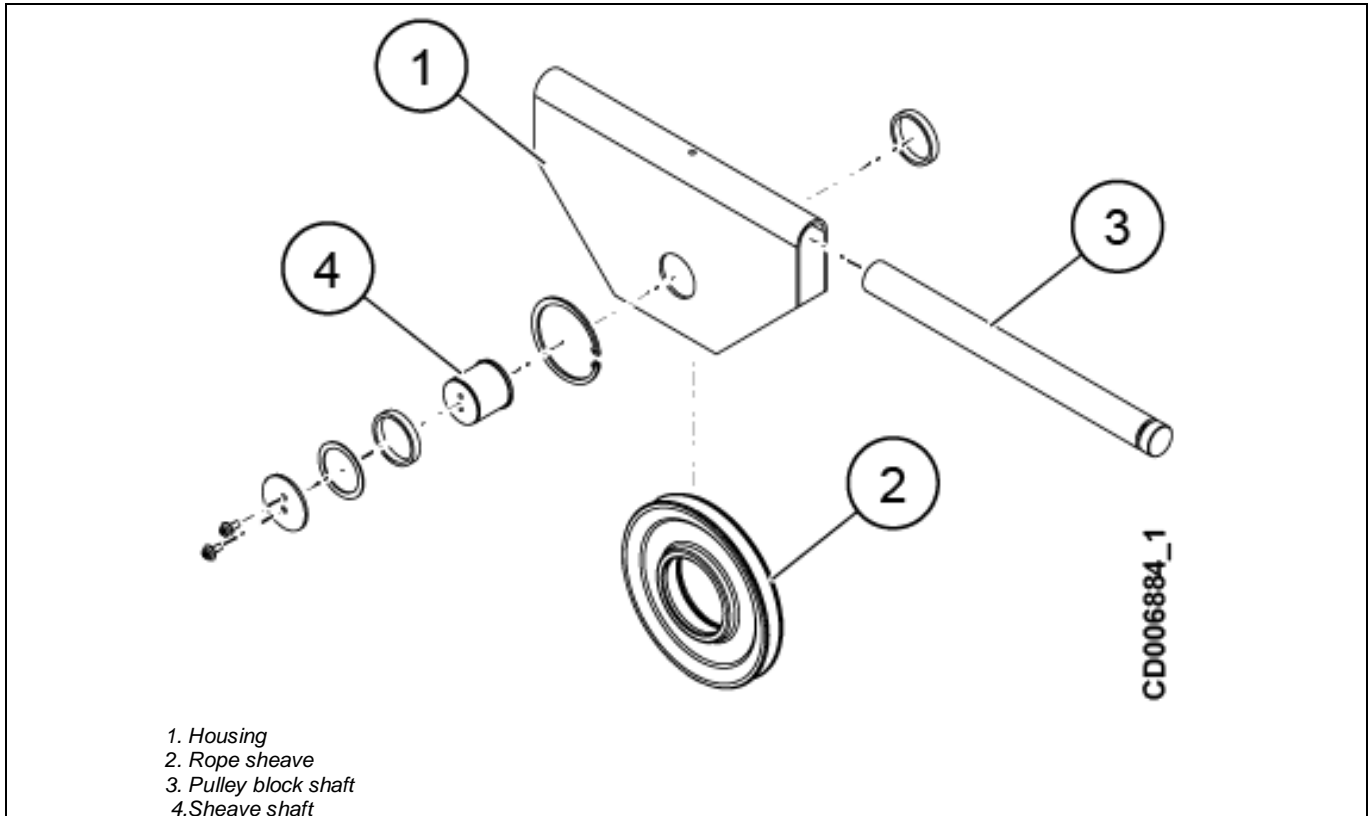
Always replace:	Parts list number
The hoisting motor and the brake, the hoisting gearbox, and the coupling.	See Spare Part Catalogue

### 10 UPPER PULLEY BLOCK



When you dismantle the pulley, remember to mark the assembly order of the shaft set / bearing set spacers for easier reassembly.

#### Example:



The pulley block composition may vary, depending on the reeving and drum frame size.

#### 10.1 Housing

Replace the housing if:	Inspection method:
There are cracks or wear in the housing parts.	Visual.
➤ TO ORDER: a housing: See <b>Spare Part Catalogue</b>	

#### 10.2 Rope sheave

Replace the rope sheave if:	Inspection method:
There are cracks in the flanges.	Visual.
The flanges have worn to a sharp edge or if the bottom of the groove shows signs of rope imprints or incorrect width.	Visual.

There is asymmetric wear of the flanges (this indicates heavy wear).	Visual.
Wear in the sheave groove is found.	Measurement. See chapters "Measuring sheave groove wear" and "Measuring sheave groove wear by using a slide caliper".
The depth of the sheave groove exceeds the specification.	Measurement. See chapter "Measuring sheave groove depth wear".
➤ TO ORDER: a rope sheave: See <b>Spare Part Catalogue</b>	

### 10.3 Pulley block shaft, frame size VT3, reeving code 04

Always replace:	Parts list number
The pulley block shaft.	See Spare Part Catalogue

### 10.4 Pulley block shaft, other frame sizes

Replace the pulley block shaft if:	Inspection method:
There are cracks in the pulley shaft.	Visual.
➤ TO ORDER: a pulley block shaft: See <b>Spare Part Catalogue</b>	

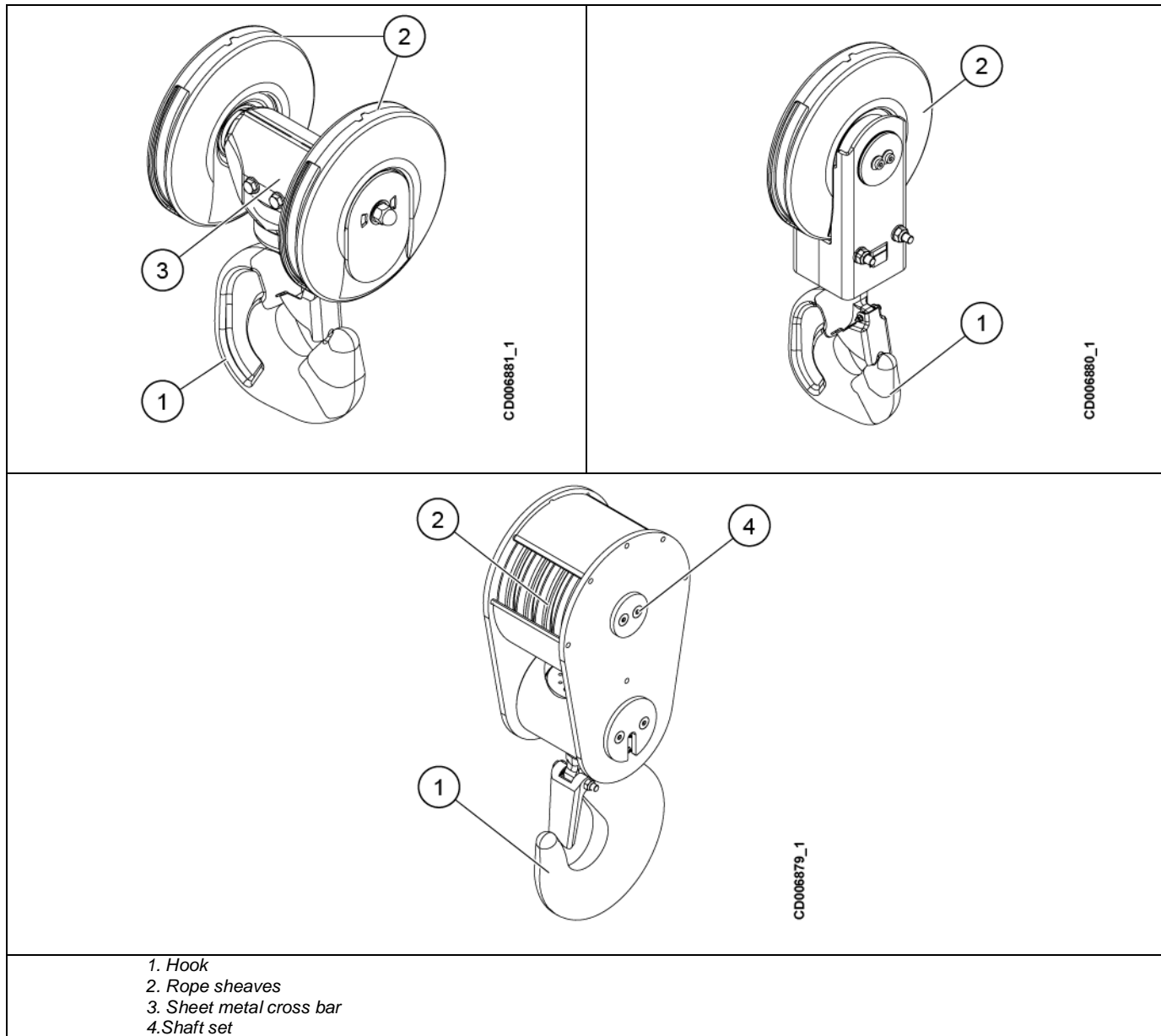
### 10.5 Sheave shaft

Replace the sheave shaft if:	Inspection method:
There are cracks in the sheave shaft.	Visual.
➤ TO ORDER: a sheave shaft: See <b>Spare Part Catalogue</b>	



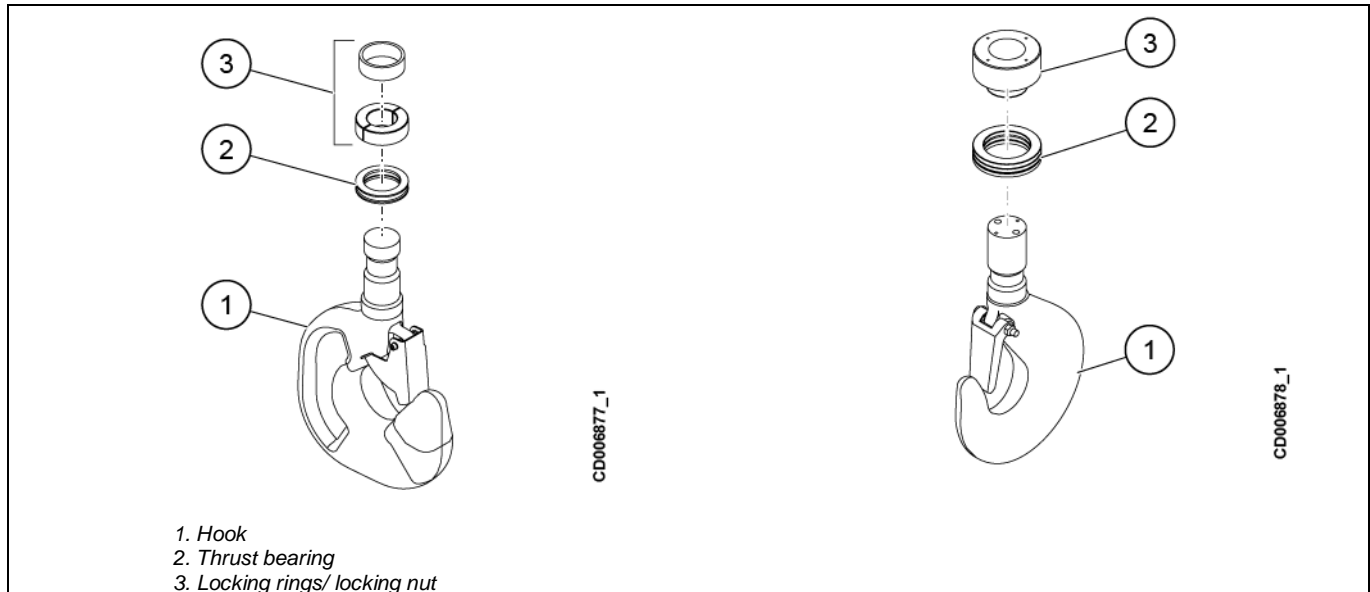
### 11 HOOK BLOCK

#### Hook block models



The actual hook block appearance may vary, depending on the size and type of the hook ordered. Depending on the number of rope falls, there are extra sheaves, side plates, and sheave covers.

### Hook types



### 11.1 Rope sheave

Replace the rope sheave if:	Inspection method:
There are cracks in the flanges.	Visual.
The flanges have worn to a sharp edge, or if the bottom of the groove shows signs of rope imprints or incorrect width.	Visual.
There is asymmetric wear of the flanges (this indicates heavy wear).	Visual.
Wear in the sheave groove is found.	Measurement. See chapter "Measuring sheave groove wear" and "Measuring sheave groove wear by using a slide caliper".
The depth of the sheave groove exceeds the specification.	Measurement. See chapter "Measuring sheave groove depth wear".
➤ TO ORDER: a rope sheave: See <b>Spare Part Catalogue</b>	

### 11.2 Sheet metal cross bar, frame size VT3, reeving code 04

Always replace:	Parts list number
The sheet metal cross bar.	See Spare Part Catalogue

### 11.3 Shaft set (not in frame size VT3, reeving code 04)

Always replace:	Parts list number
The shaft set.	See Spare Part Catalogue

## 11.4 Hook

Always replace:	Parts list number
The hook.	See Spare Part Catalogue

## 11.5 Thrust bearing

Always replace:	Parts list number
The thrust bearing.	See Spare Part Catalogue

## 11.6 Locking rings / locking nut

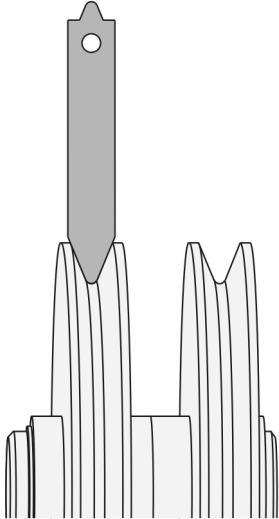
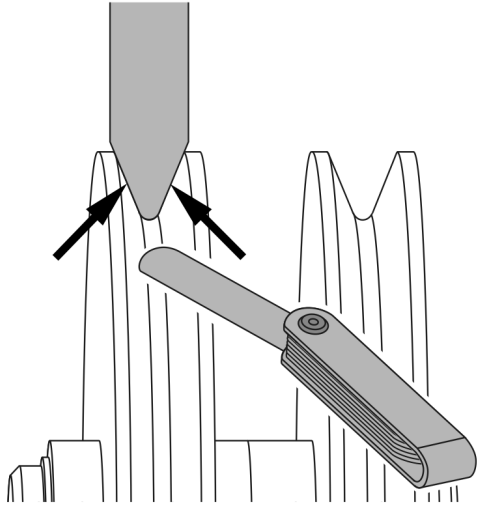
Always replace:	Parts list number
The locking rings/ locking nut	See Spare Part Catalogue

### 12 ROPE SHEAVE

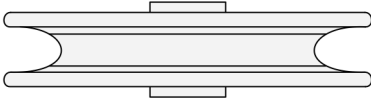

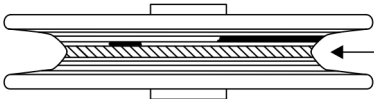


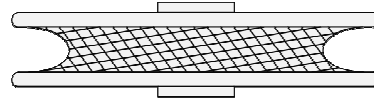


This chapter applies to rope sheaves both in the upper pulley block and in the hook block.

#### 12.1 Measuring sheave groove wear

<p><b>1</b></p>  <p style="text-align: right; font-size: small;">CD006266_1</p> <p>Once the rope is removed from the rope sheave, you can first check the sheave groove wear with the sheave groove gauge by placing the sharper end of the tool on the sheave groove.</p>	<p><b>2</b></p>  <p style="text-align: right; font-size: small;">CD006267_2</p> <p>Measure groove wear with the help of flat feeler gauges. See some example wear types in the following figure, and the acceptance criteria in the following table.</p>
---	--

#### Example wear types

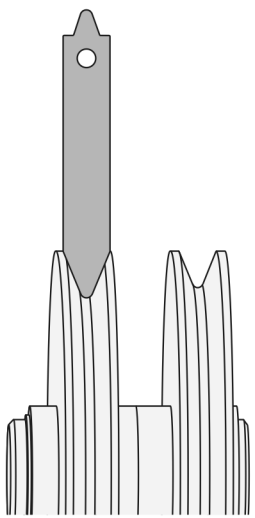
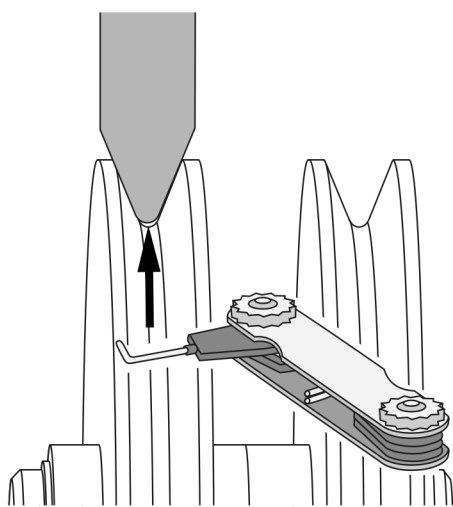
 <p style="font-size: small;">CD001721_1</p> <p><b>Normal condition</b></p>	 <p style="font-size: small;">CD001717_1</p> <p><b>Pulley misalignment</b></p>	 <p style="font-size: small;">CD001718_1</p> <p><b>Pulley too large for rope</b></p>
 <p style="font-size: small;">CD001719_1</p> <p><b>Rope misalignment</b></p>	 <p style="font-size: small;">CD001720_1</p> <p><b>Seized bearing</b></p>	 <p style="font-size: small;">CD001718_1</p> <p><b>Overloading</b></p>

Rope imprints can also be an indication that the hoist has been utilized beyond its design duty class.

#### Acceptance criteria for sheave groove wear

<b>Rope diameter [mm]</b>	<b>All</b>
<b>Acceptance criteria</b>	<b>MAX wear [mm]</b>
The clearance between the sheave groove gauge and the sheave groove	1.5

### 12.2 Measuring sheave groove depth wear

<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px; font-weight: bold;">1</div>  <div style="border: 1px solid black; padding: 5px; margin-left: 10px; font-size: small;">CD006264_1</div> </div> <p style="margin-top: 10px;">Once the rope is removed from the rope sheave, you can also check the sheave groove depth with the sheave groove gauge by placing the sharper end of the tool on the sheave groove.</p>	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px; font-weight: bold;">2</div>  <div style="border: 1px solid black; padding: 5px; margin-left: 10px; font-size: small;">CD006265_2</div> </div> <p style="margin-top: 10px;">Measure the groove depth with the help of wire feeler gauges. See the acceptance criteria in the following table.</p>
---	--

#### Acceptance criteria for sheave groove depth wear

<b>Rope diameter [mm]</b>	<b>All</b>
<b>Acceptance criteria</b>	<b>MAX wear [mm]</b>
The clearance between the sheave groove gauge and the sheave groove bottom in the worn areas	2.0

### 12.3 Measuring sheave groove wear by using slide caliper

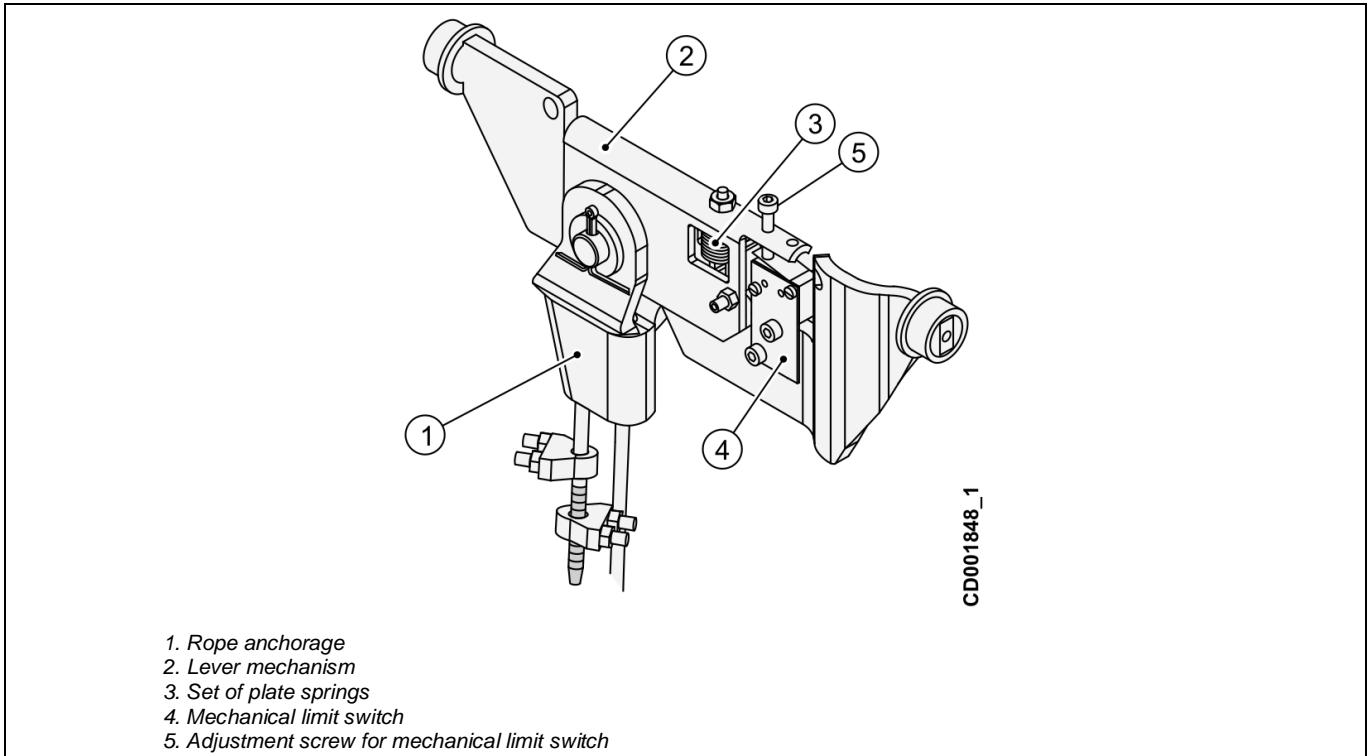
You can also measure sheave groove wear by measuring the sheave diameter with a slide caliper. The following table lists the acceptance criteria for wear.

#### Limits for the rope sheave groove wear

Rope diameter [mm]	Sheave nominal diameter [mm]	Radius [mm]	Sheave d [mm]	Replacement limit in GO [mm]
8	180	4.2	171	168
11	248	5.8	236	232
11	288	5.8	276	274
15	338	8	322	317
15	398	8	382	377

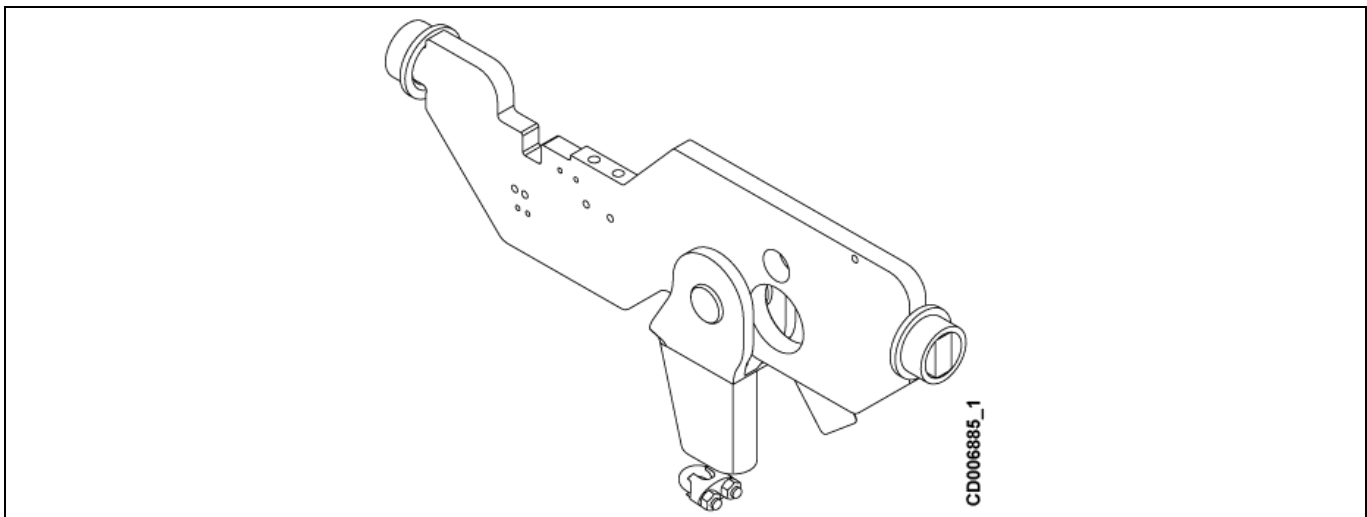
### 13 OVERLOAD DEVICE OR ROPE ANCHORAGE SUPPORT

Example: Mechanical overload device



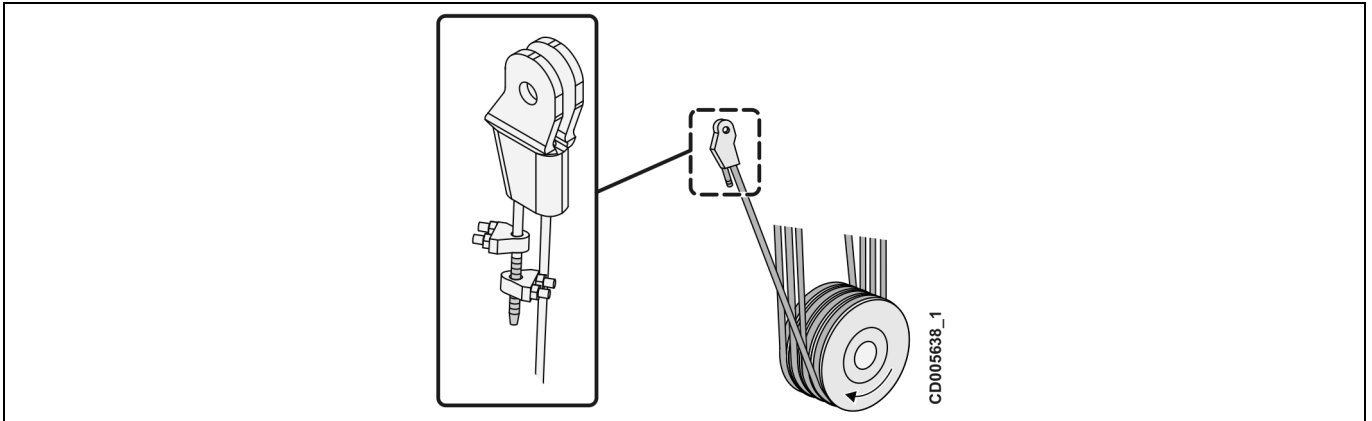
Always replace:	Parts list number
The entire overload device.	See Spare Part Catalogue

Example: Rope anchorage support



Always replace:	Parts list number
The rope anchorage support.	See Spare Part Catalogue

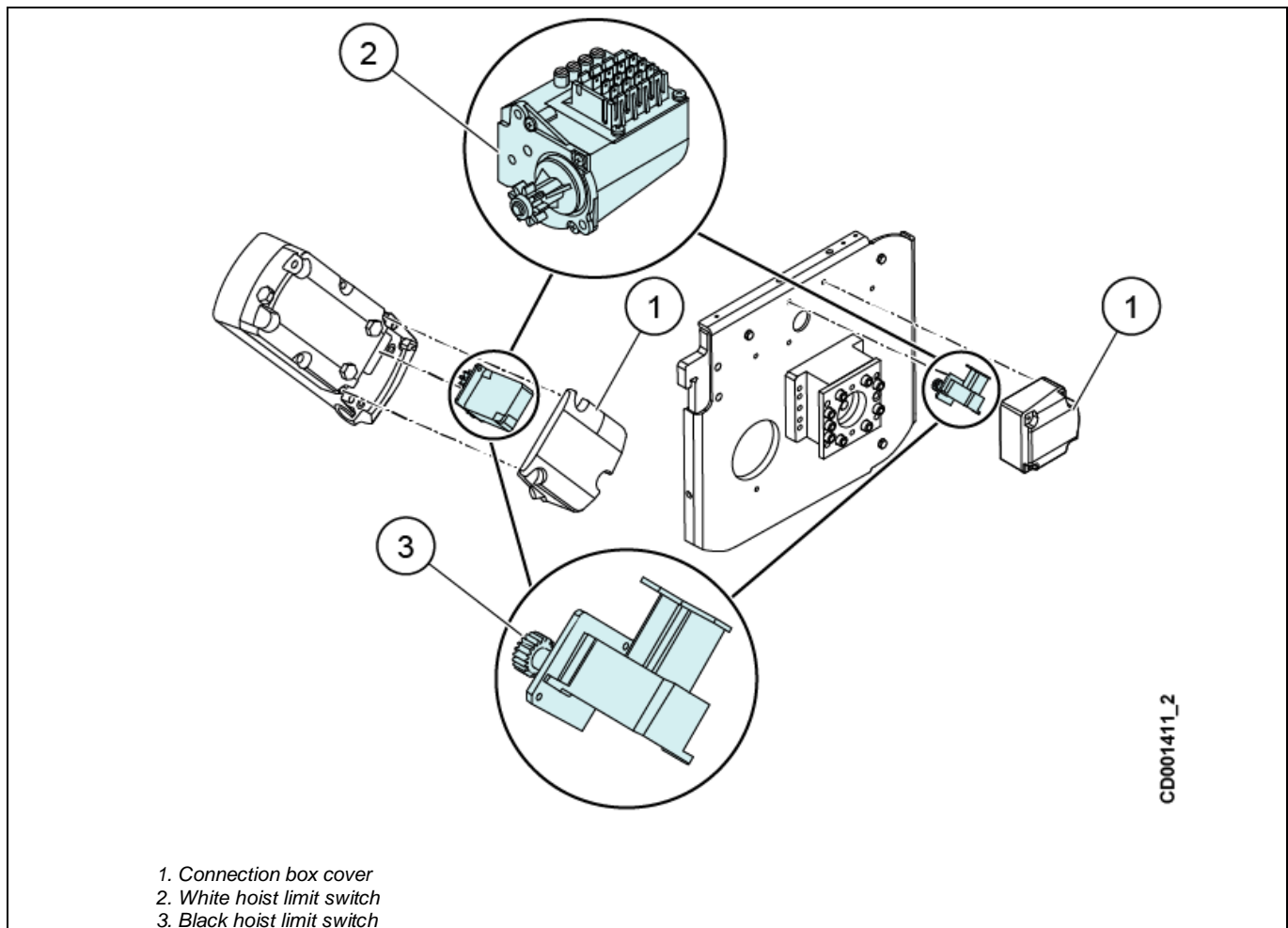
### 13.1 Rope anchorage



Always replace:	Parts list number
The rope anchorage.	See Spare Part Catalogue

### 14 HOISTING LIMIT SWITCH

The connection box can contain a black hoist limit switch or a white limit switch in all frame sizes.

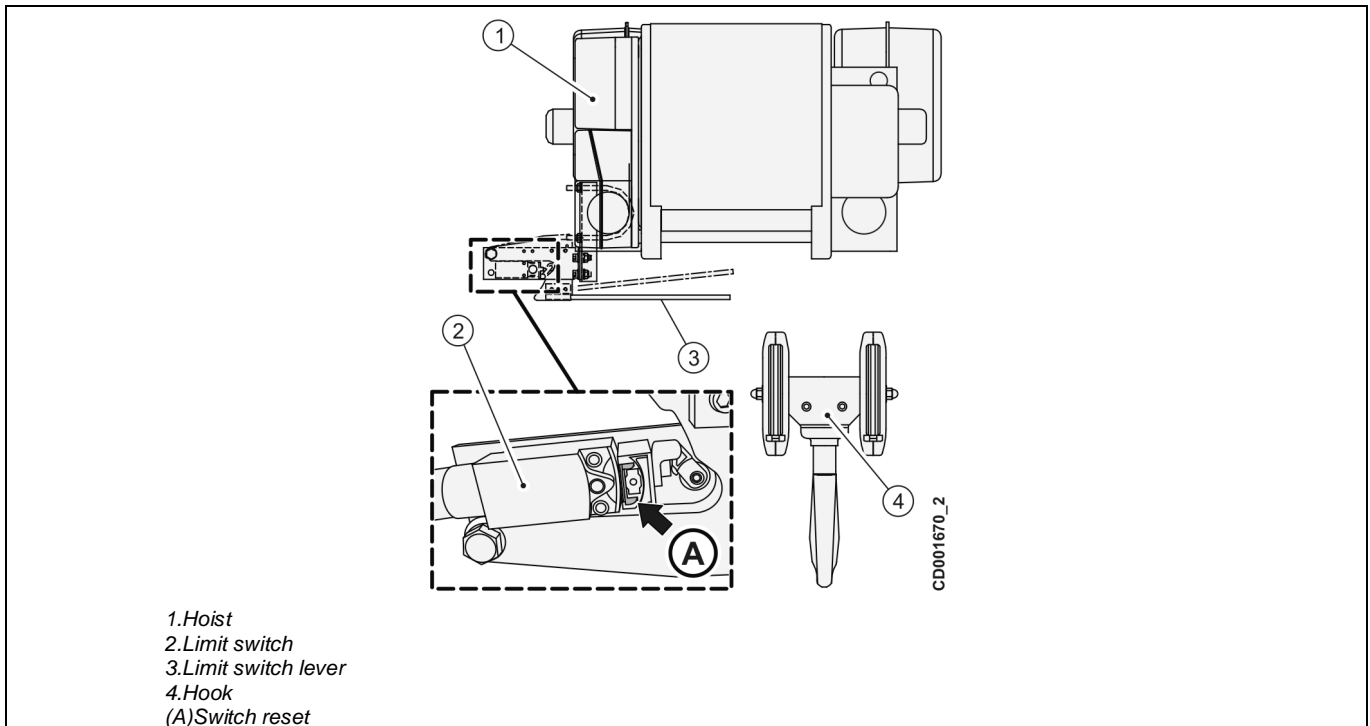


Always replace:	Parts list number
The hoisting limit switch. The new limit switch is always a white hoist limit switch.	See Spare Part Catalogue

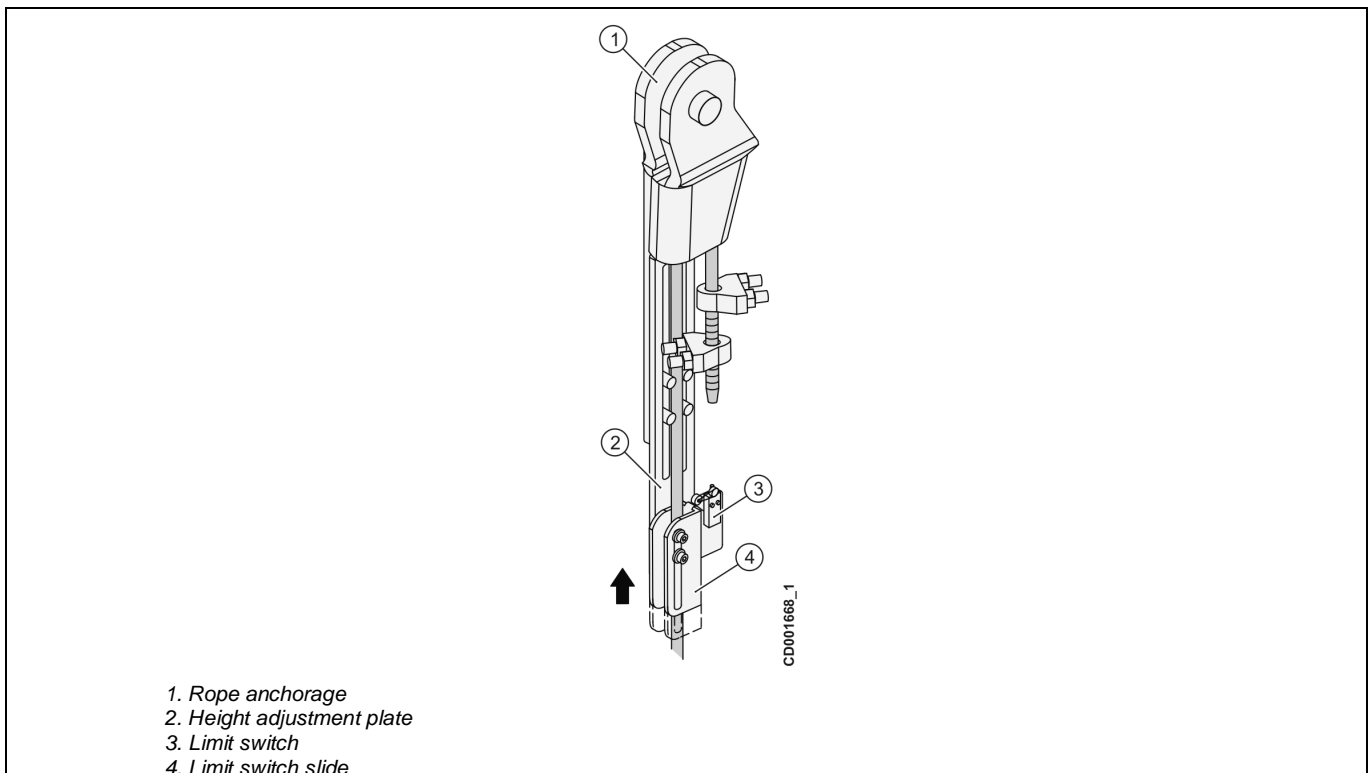


### 15 HOOK OPERATED CONTROL LIMIT SWITCH

Hook operated control limit switch for frame size: VT3, VT4



Hook operated control limit switch for frame size: VT4, VT5 (older model)

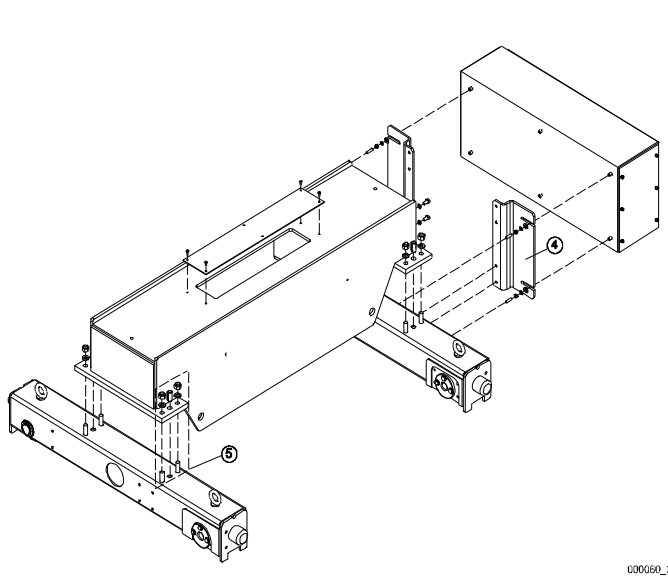


**GO:** The hook operated control limit switch needs no checking at this stage providing that it works properly and it has been maintained at regular intervals as instructed by the manufacturer. See also "Service Manual for Hoist".

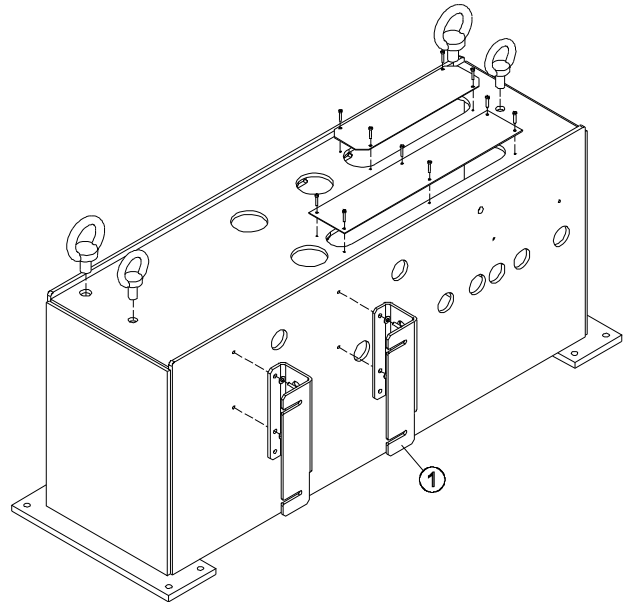
### 16 TROLLEY

#### 16.1 Trolley type H, M, W, F

Example trolleys



000060\_3



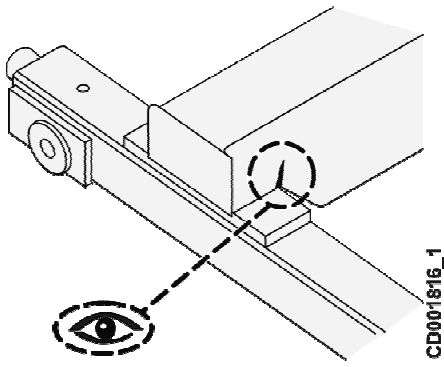
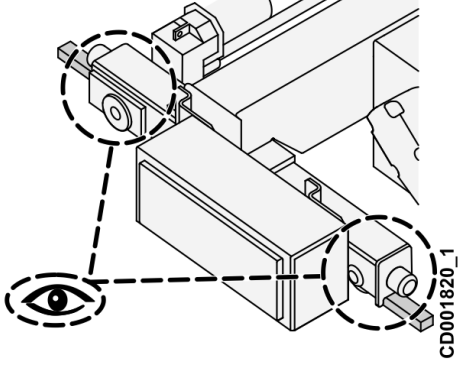
004936\_1

#### 16.1.1 Trolley inspections

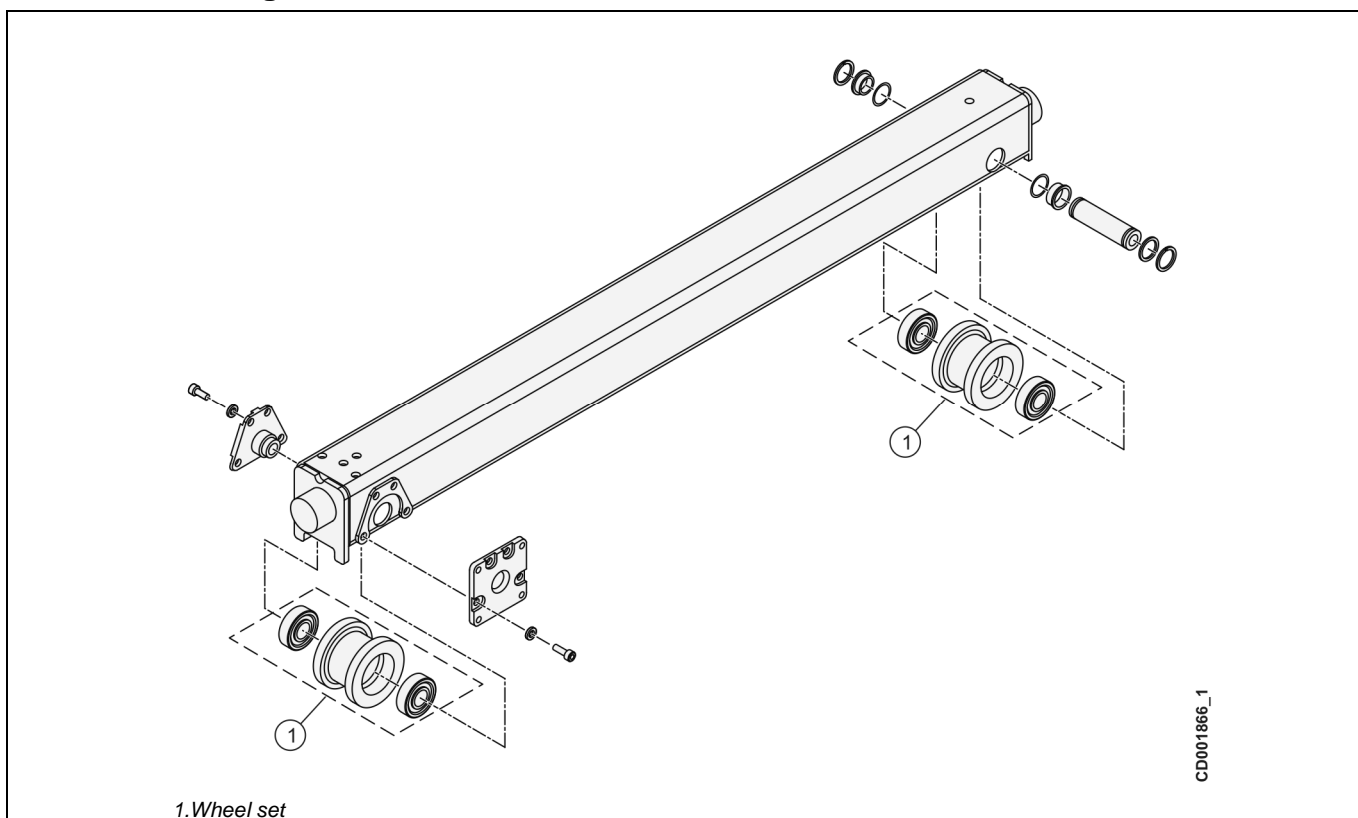
Replace the trolley if:	Inspection method:
There are cracks in the structure. Check also the welding seams.	Visual. See the following diagrams.
➤ TO ORDER: a trolley: See Spare Part Catalogue	

#### Inspection of double girder trolley structure

<p><b>1</b></p> <p><b>Bolted joints</b></p> <ul style="list-style-type: none"> <li>• Check the tightness of the bolted joints.</li> <li>• Replace loose bolts</li> <li>• Replace worn out fasteners.</li> </ul>	<p><b>2</b></p> <p><b>Welded joints</b></p> <ul style="list-style-type: none"> <li>• Check the welds for cracks. Replace the trolley if cracks are found.</li> </ul>
---	--

<b>3</b>	 <p><b>Load bearing structure</b> Check the load bearing structure (such as a load beam, an end carriage housing). Replace the structure if deformations, cracks, or broken welding seams are found.</p>	<b>4</b>	 <p><b>Trolley wheels</b></p> <ul style="list-style-type: none"> <li>• Check that the wheels are correctly aligned.</li> </ul>
----------	---	----------	--

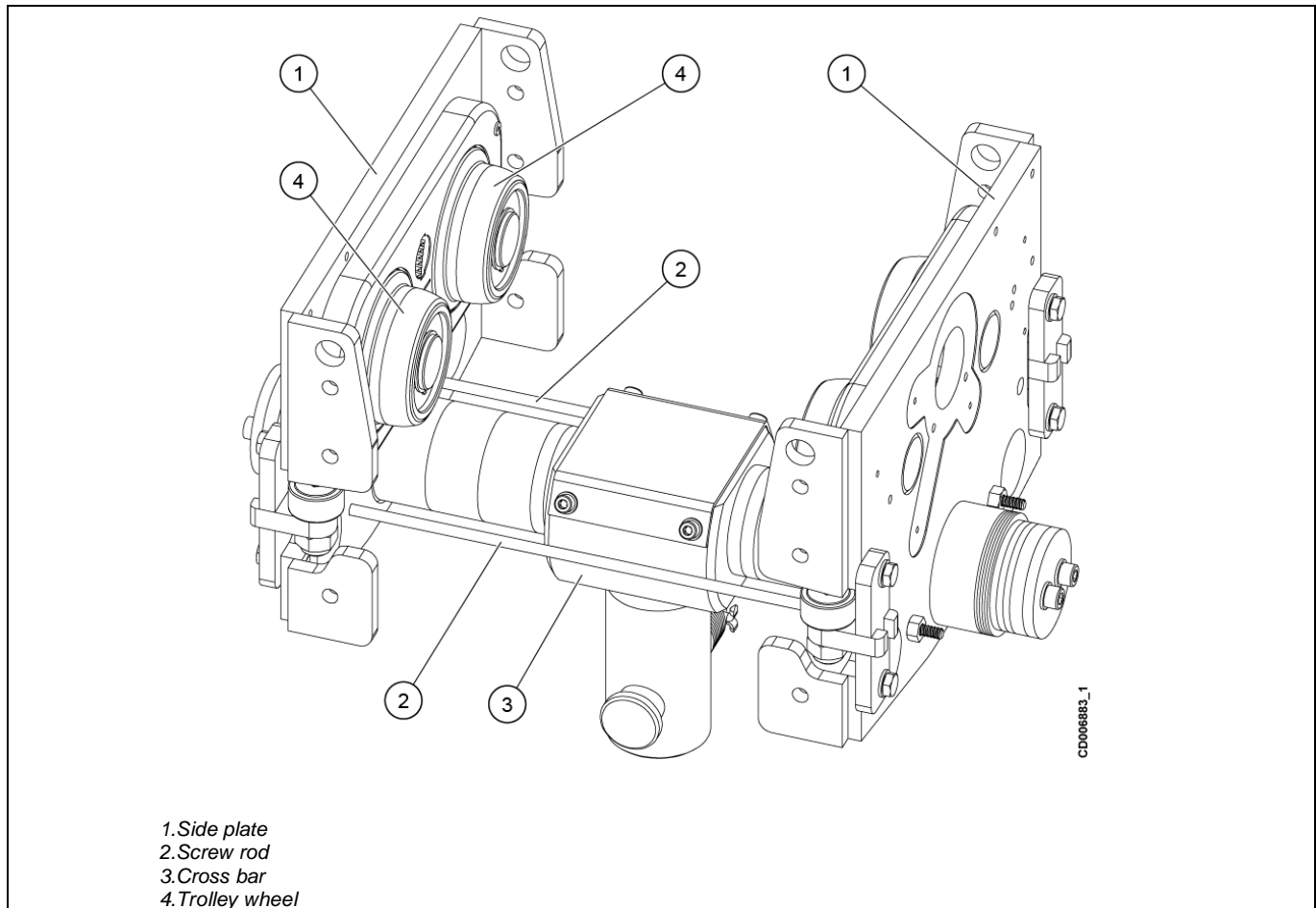
### 16.1.2 End carriage



Replace the wheel set if:	Inspection method:
The wheels are worn more than allowed. Measure the wheel running diameter.	Measurement. See chapter "Trolley wheels"
➤ TO ORDER: a wheel set: See <i>Spare Part Catalogue</i>	

### 16.2 Trolley type N, swiveling and non-swiveling

Example: trolley type N, swiveling



#### 16.2.1 Side plates

Replace the side plate if:	Inspection method:
There are cracks in the side plate.	Visual.
➤ TO ORDER: a side plate: See <b>Spare Part Catalogue</b>	

#### 16.2.2 Screw rods

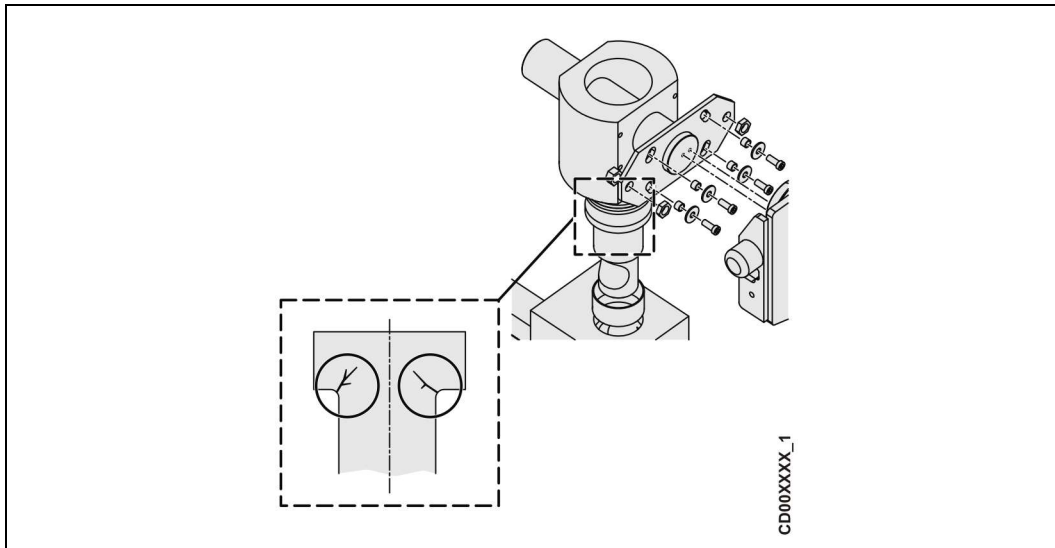
Always replace:	Parts list number
The screw rods (the entire fixing set of screw rods).	See Spare Part Catalogue

#### 16.2.3 Cross bar

A cross bar is a component used in swiveling trolley type.

Replace the cross bar if:	Inspection method:
There are cracks in the cross bar	Visual. See the following figure.
➤ TO ORDER: a cross bar: See <b>Spare Part Catalogue</b>	

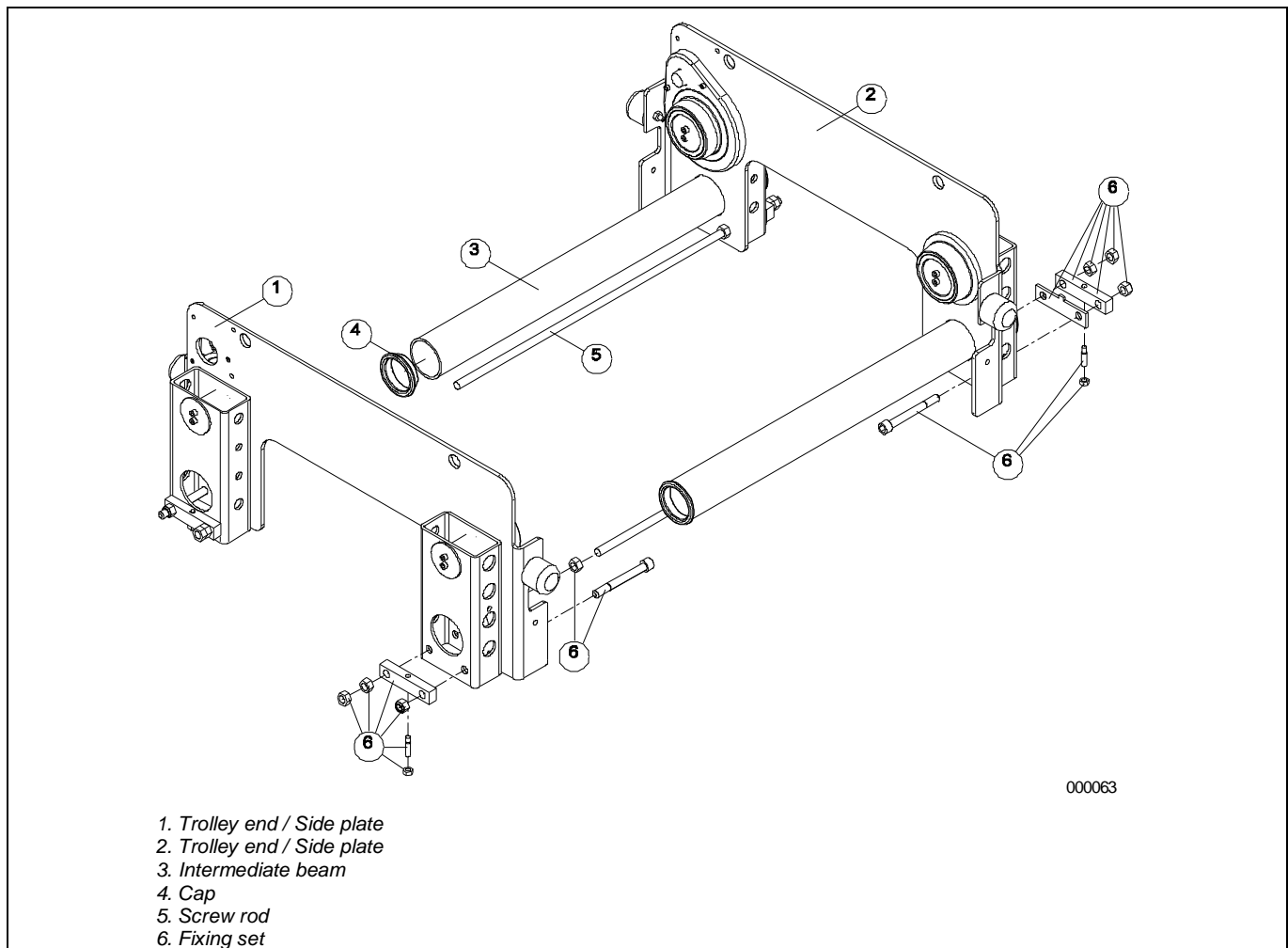
The most probable place for cracks in a cross bar:



### 16.2.4 Trolley wheels

Replace the trolley wheels if:	Inspection method:
The trolley wheels are worn more than allowed. Measure the wheel running diameter.	Measurement. See chapter "Trolley wheels".
➤ TO ORDER: trolley wheels: See <b>Spare Part Catalogue</b>	

### 16.3 Trolley type L, frame size: VT3



#### 16.3.1 Side plates

Replace the side plate if:	Inspection method:
There are cracks in the side plate.	Visual.
➤ TO ORDER: a side plate: See <b>Spare Part Catalogue</b>	

#### 16.3.2 Screw rods

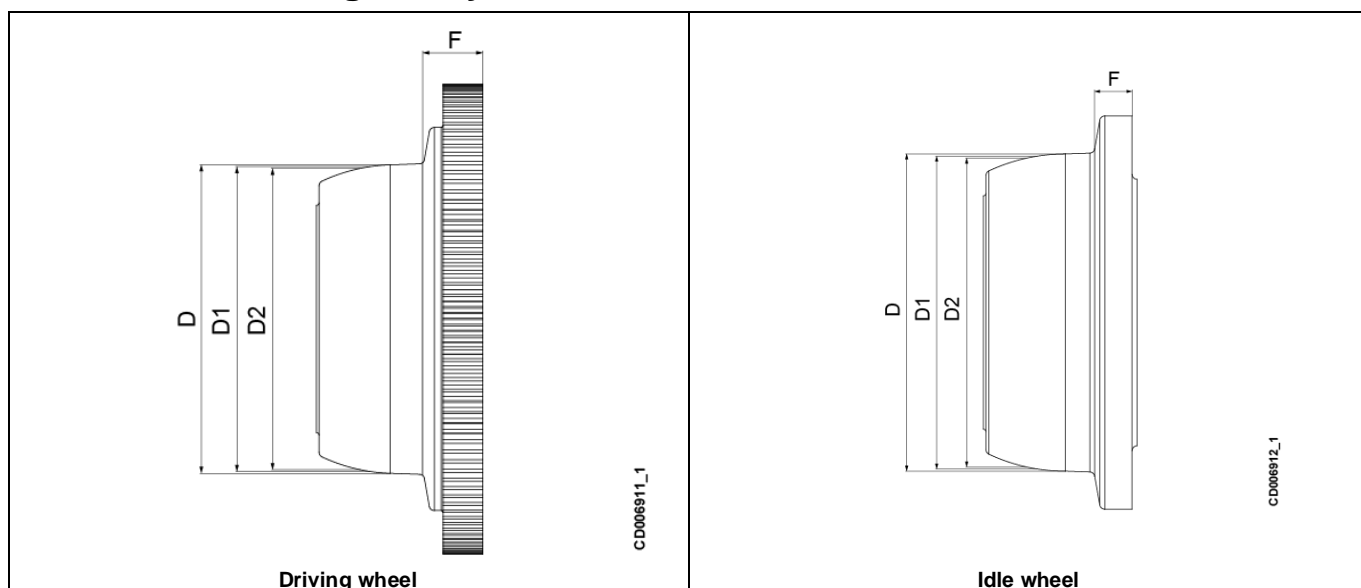
Always replace:	Parts list number
The screw rods (the entire fixing set of screw rods).	See Spare Part Catalogue

#### 16.3.3 Trolley wheels

Replace the trolley wheels if:	Inspection method:
The trolley wheels are worn more than allowed. Measure the wheel running diameter.	Measurement. See chapter "Trolley wheels".
➤ TO ORDER: trolley wheels: See <b>Spare Part Catalogue</b>	

### 17 TROLLEY WHEELS

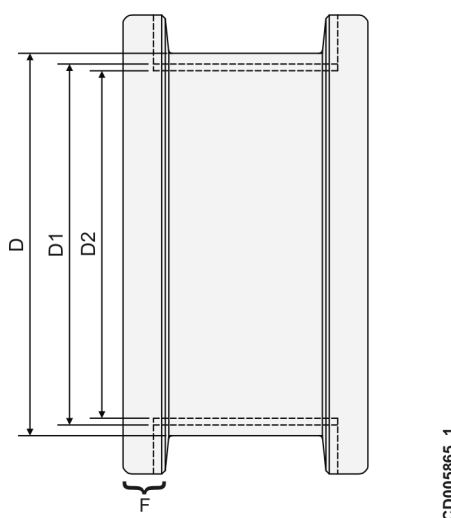
#### 17.1 Under running trolley wheels



Limits for the wear of under running trolley wheels:

Wheel nominal diameter D [mm]	Replace limit D1 [mm]	Worn out limit D2 [mm]	Min F [mm] idle	Min. F [mm] driving
100	97	94	13	19
125	120	115	13	22
150	145	140	23	22
180	175	170	25	25

#### 17.2 Top running trolley wheels



Limits for the wear of top running trolley wheels:

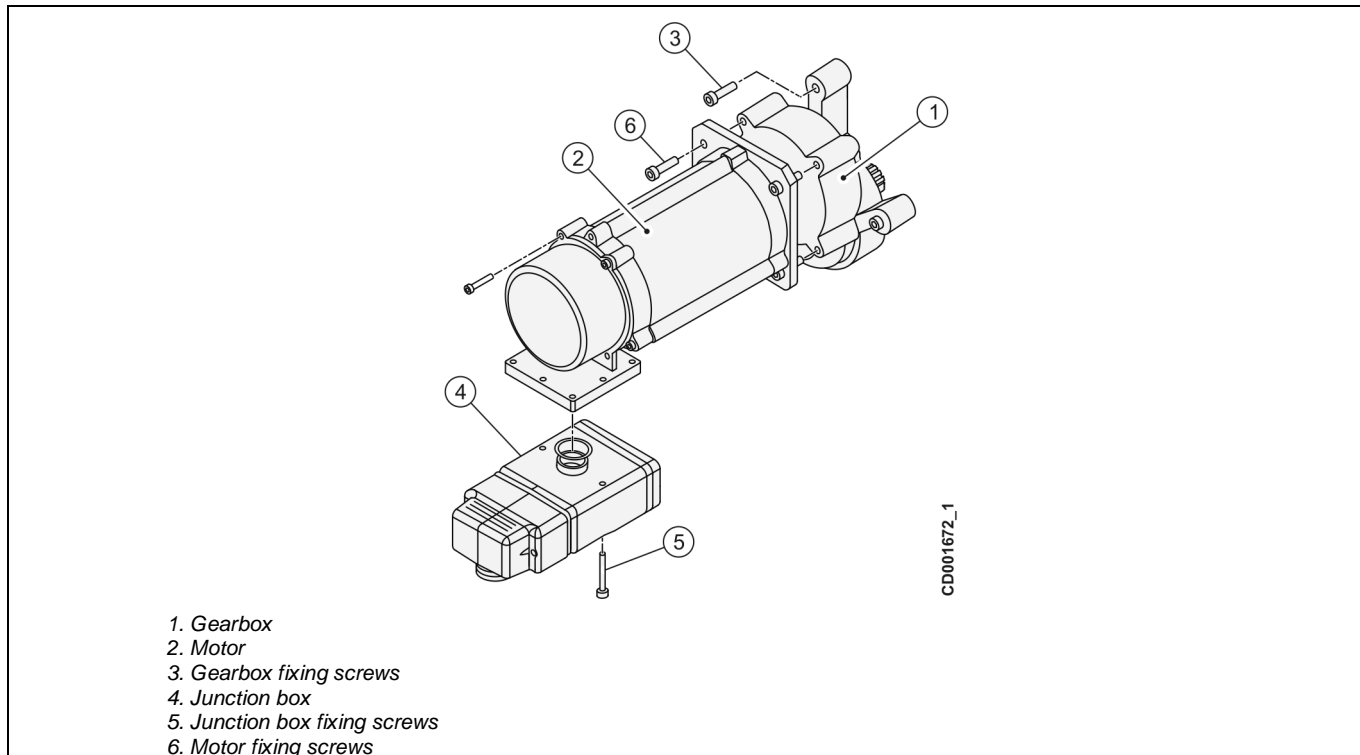
Wheel nominal diameter D [mm]	Replace limit D1 [mm]	Worn out limit D2 [mm]	Min. thickness of the flange F [mm]
110	107	104	8
140	135	130	8
200	195	190	11

56/69			
250	245	240	11



### 18 TRAVELING MACHINERY

Example: traveling machinery in Low Headroom and Normal Headroom trolleys



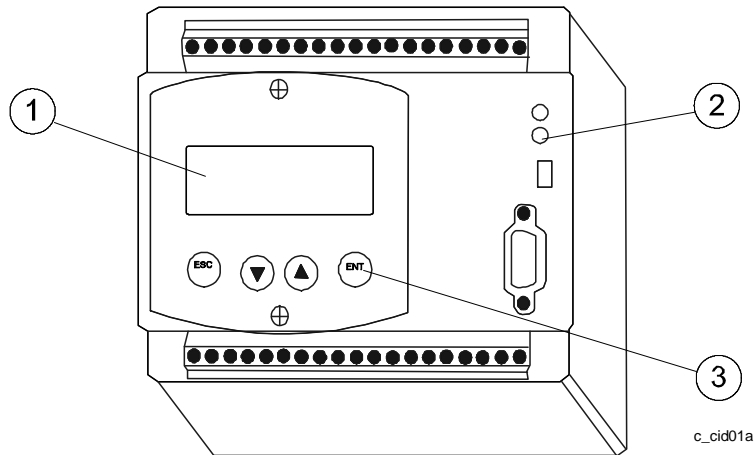
**GO:** The traveling machinery needs no checking at this stage providing that it works properly and it has been maintained at regular intervals as instructed by the manufacturer. See also "Service Manual for Hoist".

### 19 ELECTRICS



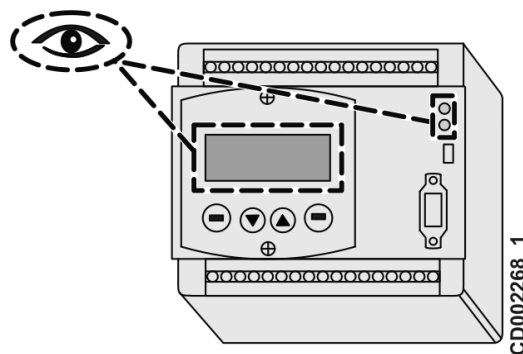
Check always the physical condition of wiring, cables, shield clamps and other grounding of the electrical components.

#### 19.1 Condition monitoring unit



c\_cid01a

- 1. Digital display
- 2. Indicator LEDs
- 3. Programming buttons

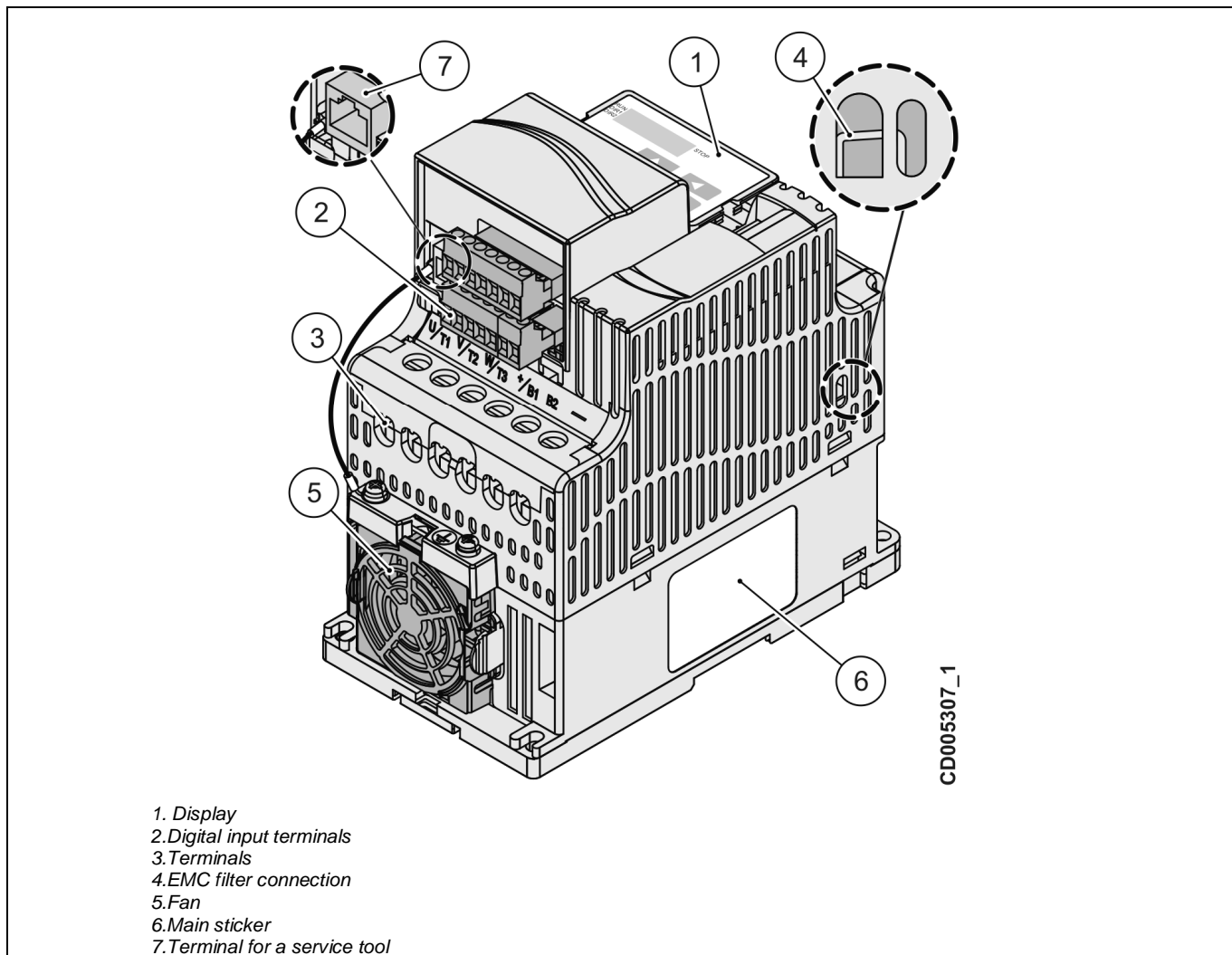


CD002268\_1

Checklist for condition monitoring unit:	Inspection method:
<p>If any of the red alarm lights are on or blinking, check if this is caused by a normal supervisory function.</p> <p>If "No Signal" text appears on the display, it may indicate a faulty unit.</p> <p>For more information, see troubleshooting instructions in "Service Manual for Hoist Control Device".</p>	<p>Visual. Operational testing.</p> <p>Check always the external wiring and sensors before confirming that the condition monitoring unit is broken.</p>
<p>➤ TO ORDER: a condition monitoring unit: See <b>Spare Part Catalogue</b></p>	

### 19.2 Frequency converter

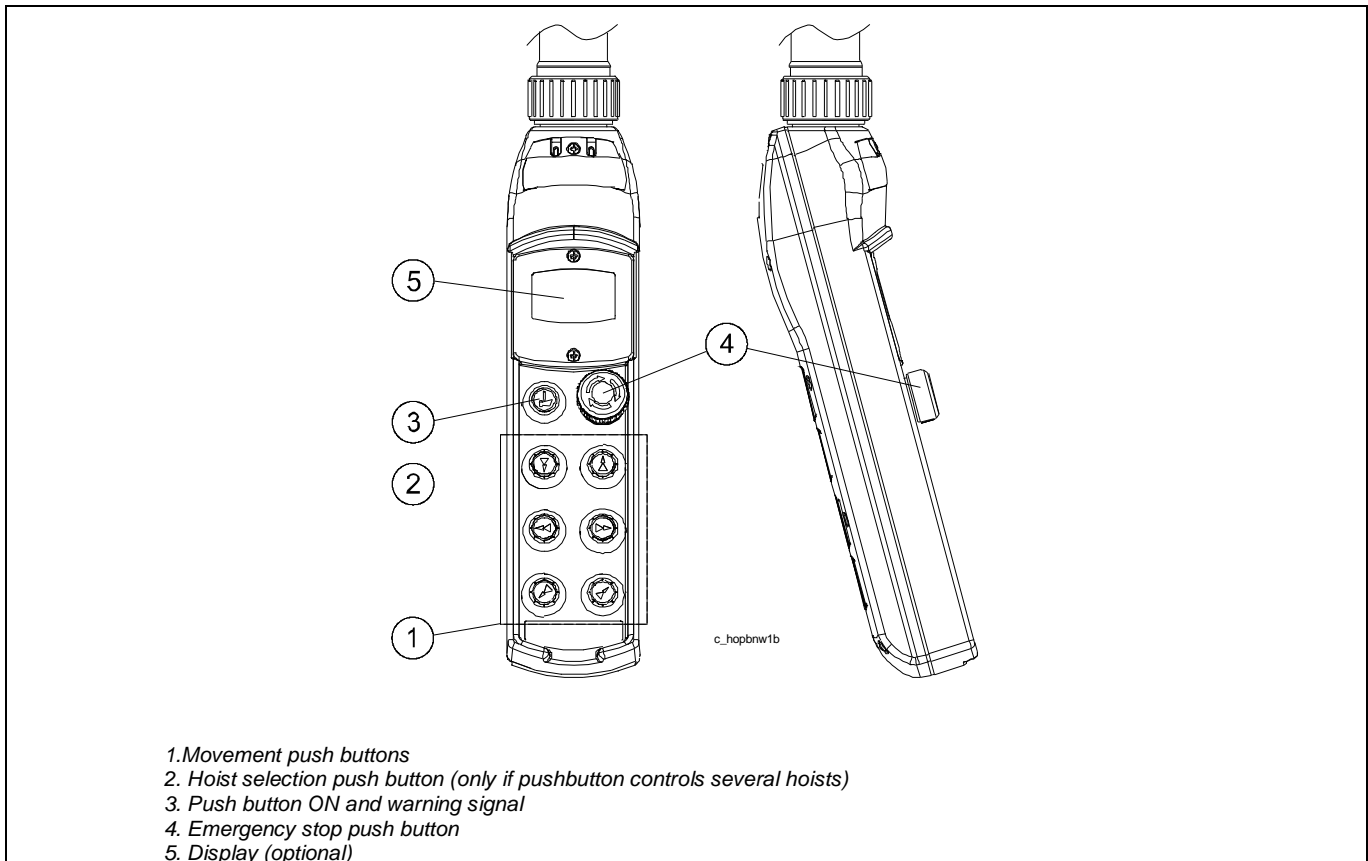
Example: Model 007



- 1. Display
- 2. Digital input terminals
- 3. Terminals
- 4. EMC filter connection
- 5. Fan
- 6. Main sticker
- 7. Terminal for a service tool

Checklist for the frequency converter	Inspection method:
See the maintenance instructions in the relevant service manual.	Visual. Operational testing.
> TO ORDER: a frequency converter: See <b>Spare Part Catalogue</b>	

### 19.3 Push button controller



Checklist for push button controller:	Inspection method:
<p>Check that the operating buttons are in good condition, and replace them if any damage is found.</p> <p>Check that the buttons work smoothly, feel that the steps or detents work without any sticking or binding.</p> <p>Ensure that the push button box frame has no cracks or other damage, and that the control cable and strain wire are properly and securely fixed.</p>	Visual. Operational testing.
<p>➤ TO ORDER: a push button controller: See <b>Spare Part Catalogue</b></p>	

### 19.4 Radio receiver

It is recommended to replace the radio receiver in context with a General Overhaul service, especially if the radio receiver has not been replaced earlier.

Replace the radio receiver if:	Inspection method:
The radio receiver is not working normally, or dates back to the original hoist rollout.	Operational testing. Check the hoist maintenance history.
<p>➤ TO ORDER: a radio receiver: See <b>Spare Part Catalogue</b></p>	

## 19.5 Contactors

Always replace:	Parts list number
The direction (up and down), speed change, and brake contactors. If a brake contactor contains an auxiliary contact block or a time delay auxiliary contact block, replace that part as well.	See Spare Part Catalogue

## 20 COMMISSIONING

Before taking the hoist back into operation, the inspections and adjustments listed in “Installation and Commissioning Manual for Hoist” must first be carried out.

A list of necessary inspections are described as follows. See “Installation and Commissioning for Hoist” for more detailed information.

### Inspections without load

- Verify that the connections of all electrical equipment to the panels are secure and wiring connections are tight
- Inspect the push button controller and verify the correction directions of the hoist
- Check the operation and condition of the emergency stop button
- Listen for normal operating sounds
- Check the operation of the hoisting limit switch, and adjust accordingly
- Inspect the wire rope for any defects
- Check the operation of the traveling limit switches of both the trolley and the bridge, and adjust accordingly
- Check that the trolley buffer hits the center of the end stop. Check also that the trolley buffers are able to make contact with the runway end stops or the buffers of another trolley
- Inspect the hook and sheaves for proper rotation / operation
- Check the operation of the overload protection (CID in use): lift a known load and verify that the load is measured with +/- 5% accuracy
- Inspect that the trolley is operating properly on the bridge
- Verify the hoisting brake operation
- If more than one hoist on the crane, check that the hoist selection is operating properly.

### Setting in a new wire rope

A new wire rope shall be taken into use with a load that is approx. 10% of the nominal load. This load is lifted to the total lifting height for 5 to 10 times. Make sure that the hook is not rotating while lifting.

### Inspections with test load, 100% of the rated load of the hoist

- Measure the power supply
- Inspect the brake operation
- Inspect the traveling machinery.

### Inspections with overload, 110...125% of the rated load of the hoist


- Inspect the overload protection mechanism
- Inspect the brake operation
- Inspect the wire rope fastenings.

### Tasks after the inspection phases:

- Cleaning (check that all tools and materials used during the installation and commissioning are removed from the hoist and track)
- Inform the customer on the requirements of having operators trained in safe and efficient crane operation
- Handover documents.

## 21 AFTER GENERAL OVERHAUL

### 21.1 Parameter modification with the condition monitoring unit

 <b>WARNING</b>	<b>Do NOT make any parameter changes with the condition monitoring unit before the General Overhaul process is fully completed.</b>
--	---

<b>CAUTION</b>	<b>Recheck the condition monitoring unit display for possible new warnings after you have done all parameter resettings that are listed in this chapter.</b>
----------------	--

#### 21.1.1 GO settings menu (Menu 7)


After General Overhaul, the parameters that are listed in the following table must be reset to the original value (zero) unless otherwise indicated.



Menu 7 is accessible for users with password level 7.

*Parameters to be reset to zero (0) after General Overhaul*

Parameter	Name	Value	Description
7-6	RT slow	"nnnn" h	Run-time in slow speed
7-7	RT fast	"nnnn" h	Run-time in fast speed
7-8	No. OT	"nnnnn"	Number of hoist motor overtemperature incidents. Reset when the hoisting motor has been replaced
7-9	No. OL	"nnnnn"	Number of hoist overload incidents
7-10	E-stops	"nnnnn"	Number of emergency stops
7-11	ST up	"nnnnn"	Number of starts in up direction
7-12	ST down	"nnnnn"	Number of starts in down direction
7-13	ST fast	"nnnnn"	Number of starts to fast speed (two-step control only)
7-14	Max ED	"nn" %	Maximum ED value
7-15	Over ED	"nnnnn"	Number of cases where ED value has exceeded the rated ED value
7-16	SRT3	"nnnnn"	Load sum with hoist running time, third power
7-17	SRT8	"nnnnn"	Load sum with hoist running time, eighth power
7-23	Max load	"nnnn" %	The maximum value of the measured load
7-24	Br Count	"nnnnn"	The brake wear counter. Counts the number of stop actions for the calculation of Br SWP%. Reset when the hoisting brake has been replaced

 <b>WARNING</b>	<b>Do NOT reset or otherwise adjust parameters 7-18 (SL1), 7-19 (SL3) or 7-20 (SL8).</b>
--	--

#### 21.1.2 Design values menu (Menu 6)

Check that the parameters of Menu 6 have their original design values as listed in the following table. Reset the parameter values to the original design values if necessary.



Menu 6 is accessible for users with password level 6.

Parameter	Name	Hoist duty class		
		ISO/FEM		
		M4/1Am	M5/2m	M6/3m
6-1	Hoist name	A	A	A
6-2	Unit No	00000	00000	00000
6-3	Class	4	5	6
6-4	Nom. Load	10.0 t	10.0 t	10.0 t
6-5	Nominal ED	60%	60%	60%
6-6	Sp ratio	6	6	6
6-7	Max ST	1M134	3M000	7M500
6-8	Max E-stop	5000	5000	5000
6-9	Max RT	6300 h	12500 h	25000 h
6-10	D SRT3	800 h	1600 h	3200 h
6-11	D SRT8	800 h	1600 h	3200 h
6-12	D SL3	24000	64000	160k0
6-13	D SL8	24000	64000	160k0
6-14	MaxST MF11	1M134	3M000	7M500
6-15	MaxRT MF11	6300 h	12500 h	25000 h
6-16	MaxST MF12	1M134	3M000	7M500
6-17	MaxRT MF12	6300 h	12500 h	25000 h
6-18	Max Br	1M000	1M000	1M000
6-19	Max Control	640k0	640k0	640k0

### 21.1.3 New runtime SWP (Menu 2)

After General Overhaul, ensure that the new runtime-based SWP (parameter 2-12 SWPRT%) is set as 100%. The cycle-based SWP (parameter 2-15) should be the same as before GO.



### 22 APPENDIX, USAGE AND SAFETY ASSESSMENT

General Data		
Date		
Owner	Contact Person	
	Company	
Inspector	Person	
	Company	

Product data	
Check product stickers or plates for serial numbers. For more information, see also chapter "Identification" in General Overhaul Service Instructions.	
Product code	
Crane serial number	
Hoist serial number	
Hoisting motor serial number	
Traveling motor serial numbers	
Condition monitoring unit serial number	
Frequency converter serial number	

Condition monitoring values collected from the condition monitoring unit		
Parameter	Value:	
<b>Menu 1</b>		
1-1-2 Starts		
1-1-3 Runtime		
1-1-6 Br SWP		
<b>Menu 2</b>		
2-5 No.OL		
2-7 ST up	Number of control actions: compare the three parameter values and write down the highest value	
2-8 ST down		
2-9 ST fast		
2-12 SWPRT[%]		
2-15 SWPHC[%]		

<b>History of usage</b>	
Usage is the same or lighter as the one defined by the manufacturer	<input type="checkbox"/>
<b>Modernization</b>	

Modernization has been done	<input type="checkbox"/>
If any modernization has been done, attach the report of the modernization to this form.	
<b>Servicing</b>	
Servicing process has been carried out according to the manufacturer's instructions	<input type="checkbox"/>
Attach the reports of the servicing processes.	

Additional service operations	
Replaced component	Reason/notes

Safety assessment		Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>
If the answer to any of the statements listed below is "No", attach a report to this form specifying how to manage possible safety risks caused by that issue.			
1	Usage conforms to the design class of the hoist	<input type="checkbox"/>	<input type="checkbox"/>
2	Users have up-to-date instructions	<input type="checkbox"/>	<input type="checkbox"/>
3	Users are familiar with the instructions	<input type="checkbox"/>	<input type="checkbox"/>
4	Usage conforms to the instructions	<input type="checkbox"/>	<input type="checkbox"/>
5	Owner/user is familiar with one's responsibilities	<input type="checkbox"/>	<input type="checkbox"/>
6	Owner/user acts according to the responsibilities	<input type="checkbox"/>	<input type="checkbox"/>
7	Servicing has been carried out according to the instructions	<input type="checkbox"/>	<input type="checkbox"/>
If the answer to any of the statements below is "Yes", attach a report to this form specifying how to manage possible safety risks caused by that issue.			
8	Safety requirements at the operating site are now higher than at the time when the hoist was delivered	<input type="checkbox"/>	<input type="checkbox"/>
9	The operating environment has higher requirements (due to humidity, temperature, dust, zone functions) than a normal hoist operating environment.	<input type="checkbox"/>	<input type="checkbox"/>

<b>New usage</b>	
Usage remains the same as defined by the manufacturer, or lighter usage.	<input type="checkbox"/>

Place and date

Signature

### 23 APPENDIX, INSPECTION AND SERVICE REPORT

General Data		
Date		
Owner	Contact Person	
	Company	
Inspector	Person	
	Company	

Parts	Checked	Replaced	Additional info/ measurement result
<b>Rope drum</b>			
Rope drum for hoist frame size: VT3 Note that the rope drum of frame size VT3 found unacceptable is not replaced. A new hoist is ordered.	<input type="checkbox"/>	<input type="checkbox"/>	
Rope drum for hoist frame size: VT4, VT5	<input type="checkbox"/>	<input type="checkbox"/>	
Rope clamps	<input type="checkbox"/>	<input type="checkbox"/>	
Wire rope	<input type="checkbox"/>	<input type="checkbox"/>	
Drum frame bolts (frame size VT3)	<input type="checkbox"/>	<input type="checkbox"/>	
Drum connector rods (frame size VT3)	<input type="checkbox"/>	<input type="checkbox"/>	
Drum axial locking part (frame size VT3)	<input type="checkbox"/>	<input type="checkbox"/>	
Needle-bearing strip (frame size VT3)	<input type="checkbox"/>	<input type="checkbox"/>	
Bearing sets (frame size VT4, VT5)	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Rope guide</b>			
Rope guide (newer model) for hoist frame size: VT3	<input type="checkbox"/>	<input type="checkbox"/>	
Rope guide for hoist frame size: VT4, VT5 (Models before 12.2006)	<input type="checkbox"/>	<input type="checkbox"/>	
Rope guide for hoist frame size: VT4, VT5 (Models after 12.2006)	<input type="checkbox"/>	<input type="checkbox"/>	
Guide bearings (in rope guide for hoist frame size VT4, VT5 (Models after 12.2006)	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Rope pressure roller</b>			
Rope pressure roller for hoist frame size: VT3	<input type="checkbox"/>	<input type="checkbox"/>	
Rope pressure roller for hoist frame size VT4, VT5 (On models before 2011)	<input type="checkbox"/>	<input type="checkbox"/>	
Rope pressure roller for hoist frame size: VT4, VT5	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Hoisting machinery (motor, gearbox)</b>			
Hoisting machinery for hoist frame size VT3	<input type="checkbox"/>	<input type="checkbox"/>	
Second brake (hoist frame size: VT3)	<input type="checkbox"/>	<input type="checkbox"/>	
Hoisting machinery for hoist frame size: VT4, VT5	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Upper pulley block</b>			
Housing	<input type="checkbox"/>	<input type="checkbox"/>	

Rope sheave	<input type="checkbox"/>	<input type="checkbox"/>	
Pulley block shaft, frame size VT3VT3, reeving code 04	<input type="checkbox"/>	<input type="checkbox"/>	
Pulley block shaft, other frame sizes	<input type="checkbox"/>	<input type="checkbox"/>	
Sheave shaft	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Hook block</b>			
Rope sheave	<input type="checkbox"/>	<input type="checkbox"/>	
Sheet metal cross bar, frame size VT3, reeving code 04	<input type="checkbox"/>	<input type="checkbox"/>	
Shaft set (not in frame size VT3, reeving code 04)	<input type="checkbox"/>	<input type="checkbox"/>	
Hook	<input type="checkbox"/>	<input type="checkbox"/>	
Thrust bearing	<input type="checkbox"/>	<input type="checkbox"/>	
Locking rings / locking nut	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Overload device or rope anchorage support</b>			
Mechanical overload device	<input type="checkbox"/>	<input type="checkbox"/>	
Rope anchorage support	<input type="checkbox"/>	<input type="checkbox"/>	
Rope anchorage	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Hoisting limit switch</b>			
Hoisting limit switch	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Hook operated control limit switch</b>			
Hook operated control limit switch for frame size: VT3, VT4	<input type="checkbox"/>	<input type="checkbox"/>	
Hook operated control limit switch for frame size: VT4, VT5 (older model)	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Trolley</b>			
Trolley type H, M, W, F	<input type="checkbox"/>	<input type="checkbox"/>	
End carriage	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Trolley type N, swiveling and non-swiveling</b>			
Trolley type N	<input type="checkbox"/>	<input type="checkbox"/>	
Side plates	<input type="checkbox"/>	<input type="checkbox"/>	
Screw rods	<input type="checkbox"/>	<input type="checkbox"/>	
Cross bar	<input type="checkbox"/>	<input type="checkbox"/>	
Trolley wheels	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Trolley type L</b>			
Trolley type L	<input type="checkbox"/>	<input type="checkbox"/>	
Side plates	<input type="checkbox"/>	<input type="checkbox"/>	
Screw rods	<input type="checkbox"/>	<input type="checkbox"/>	
Trolley wheels	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Electrics</b>			
Condition monitoring unit	<input type="checkbox"/>	<input type="checkbox"/>	
Frequency converter	<input type="checkbox"/>	<input type="checkbox"/>	
Push button controller	<input type="checkbox"/>	<input type="checkbox"/>	

Radio receiver	<input type="checkbox"/>	<input type="checkbox"/>	
Contactors	<input type="checkbox"/>	<input type="checkbox"/>	

Additional service operations during the General Overhaul process:	
Replaced component	Reason / notes

Check the following condition monitoring values after GO process is complete:	
Parameter	Value:
<b>Menu 2</b>	
2-12 SWPRT[%]	Set to 100 %
2-15 SWPHC[%]	Same as before GO