

Qimarox®



User Manual
Prorunner mk5

2.0 / 2019-12-12

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1 About this manual

1.1 Introduction

This manual gives information about the Prorunner mk5. From here on, the Prorunner mk5 is referred to as the 'machine'.

The function of the machine is vertical movement of products within a transport system.

This manual is intended for:

- Retailers/Original Equipment Manufacturers (OEM) project engineers and mechanics.
- Operators, installation and maintenance engineers and other users.

As soon as possible after purchase of the machine, carefully read this manual.

Before you operate the machine, you must read this manual. Make sure that you are familiar with the content of the manual and the machine.

System integrators/OEMs

This manual explains machine configurations that can be used to set up the machine. It also provides instructions on how to add or change the machine's technical components.

Users

The machine may be supplied fully assembled. If so, some chapters in this manual will not be applicable.

To integrate the machine within a transport system, refer to the documentation provided by the OEM of the transport system.

1.2 Product documentation

Document	Reference
Machine manual*	UM Prorunner mk5 v2.0 EN
Machine assembly instructions*	AI-Prorunner mk5 v2.0 EN
Electrical components	Refer to the manufacturer
Electrical drawings*	Refer to section 10
Specifications document**	Refer to section 2.2

* Generic information for each machine, apart from exceptions outlined in the Machine layout drawing. Download from <https://www.qimarox.com>.

** Machine specific information.

1.3 Source language

This manual was originally written in the English language.

1.4 Drawings

Drawings and illustrations used are examples and may differ from the actual situation in details.

1.5 Symbols used in the manual

The following symbols are used in this manual:



Warning

Risk of serious injury to the user if the instructions are not accurately followed.



Caution

Risk of damage to the machine if the instructions are not accurately followed.



Note

To provide additional information to the user about a task or issue.

1.6 Terminology list

For the machine, the following common terms are used.

Term	Definition
Machine	Machine name
Product	Products transported by the machine.
Fork	The component which carries the product.
Feeding conveyor	The conveyor that delivers products to the machine. The feeding conveyor is not part of the machine.
Discharge conveyor	The conveyor that discharges products from the machine. The discharge conveyor is not part of the machine.
Fenced area	Area around the machine that unauthorized personnel cannot enter for safety reasons.

Term	Definition
Infeed conveyor	The feeding conveyor puts products on the infeed conveyor. The infeed conveyor is not described in this manual. As a complete system, the infeed conveyor is part of the machine.
Outfeed conveyor	The outfeed conveyor puts products on the discharge conveyor. The outfeed conveyor is not described in this manual. As a complete system, the outfeed conveyor is part of the machine.

1.7 Further support and information

Qimarox can supply additional expertise and support services, for:

- Training.
- Global support.
- Service contracts.

For more information, please contact Qimarox.

2 General

2.1 Machine identification

The machine identification is given on the type plate. For the location, refer to section 9.10.

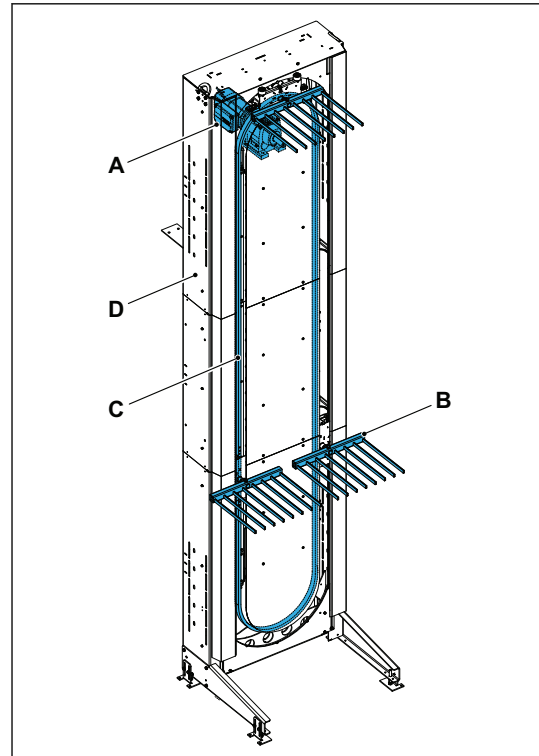
Refer to the Specifications document of the machine for an explanation of the serial number, for the specifications and for the applicable products.

Made in The Netherlands. Designed by		Qimarox [®]		CE	PRORUNNER mk5
Manufacturing year	:	_____			
Type	:	_____			
Serial number	:	_____			
Order number	:	_____			
Power supply	:	_____			
Nominal power	(kW) :	_____			
Weight	(kg) :	_____			
Power conveyor	(kW) :	_____			
Weight conveyors	(kg) :	_____			
Maximum load	(kg) :	Number of carriers	:	_____	
Nominal capacity	(p/h) :	Maximum carrier load	(kg) :	_____	
Total weight	(kg) :	_____			

2.1.1 Machine overview

The figure shows the main components.

- A. Drive
- B. Fork, on trolley and leveller
- C. Chain
- D. Frame

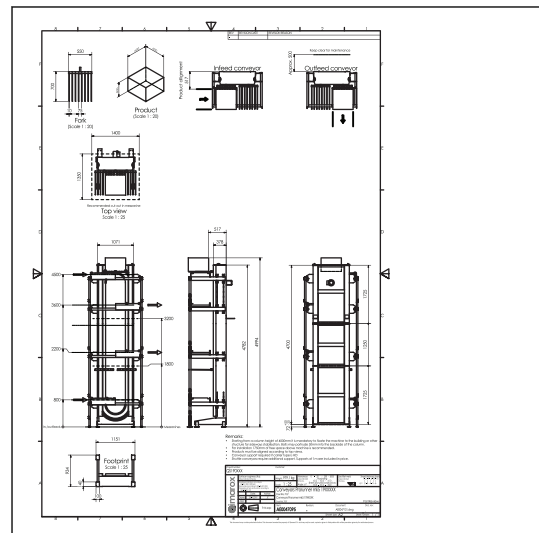


2.2 Machine layout drawing and specifications

After a machine order is placed, a Machine layout drawing and Specifications document is handed over for approval. After approval, the Specifications document is used as a reference for this manual.

The complete technical documentation of the machine consists of:

- Machine layout drawing (see sample).
- Specifications document (see sample).
- Electrical drawings.
- Functional software description of the software function block.



This Machine layout drawing and the Specifications document include:

- The machine serial number.
- Product dimensions and mass.
- Machine dimensions.
- Machine configuration.
- Motor specifications.
- The number of forks.
- Electrical components

The machine can only be used according to the specifications in this manual, the Machine layout drawing and the Specifications document.

If you want to use the machine outside the recommended specifications, you must contact Qimarox to check if this is possible. Inappropriate and/or modified use of the machine can result in dangerous safety issues and/or damage. You must obtain written confirmation from Qimarox before using the machine in a modified or unspecified manner.

Qimarox cannot be held liable for any accidents and/or damages that may occur through inappropriate unauthorised use of the machine.

Prorunner mk5		v4.0		Qimarox		S.p.A.	
<p>Quotation / order number: Q5180XXX Detail number: mk5 1803XXX Customer: [REDACTED] Line number / Customer PO: [REDACTED] / [REDACTED] Revision: [REDACTED] Date: [REDACTED] Discount / Currency: N/A / €</p>							
APPLICATION							
Recommended capacity	400	Products / hour					
MATERIAL & SURFACE TREATMENT							
Material	Steel	Default	Steel				
Material of leveling feet	Steel	Default	Steel				
Surface treatment	Powder coated	Default	Powder coated				
Columns	RAL 9007	Default	RAL 9007				
Conveyors	RAL 7037	Default	RAL 7037				
Side covers	RAL 3020	Default	RAL 3020				
Back covers	RAL 3020	Default	RAL 3020				
Front cover optional	Silver 9004	Glossy	Default	Steel 9002			
SAFETY FENCING							
Position	N/A	Default	Steel				
Material	N/A	Default	Steel				
Colour	N/A	Default	RAL 9002				
Safety switch	N/A	Default					
GENERAL CHARACTERISTICS							
Motor voltage	230/400V						
Brake voltage	230V AC (230-242V)						
Line frequency	50 Hz						
Certification	IEC						
Fixed grade oil in gearmotor	No						
WARRANTY & DOCUMENTATION							
Warranty	1 year	Default	1 year				
User manual language	English UK	Default	English UK				
SPECIAL CUSTOMER REQUESTS							
<p><small>Qimarox S.p.A. - Via C. Cesare, 10 - 40138 Bologna, Italy - Tel. +39 051 404 700 - Fax +39 051 404 701 - Email: info@qimarox.com - www.qimarox.com</small></p>							

2.3 Warranty

The scope and duration of the warranty is agreed upon when an order is placed for the machine. The warranty only applies if the machine is used according to the specifications and if the user and maintenance instructions are observed. The warranty does not cover wear of the parts.

The machine warranty is null and void in cases of:

- Unskilled usage.
- Inadequate maintenance.
- Unskilled maintenance.
- Modifications made to the machine without prior written permission from Qimarox.

2.4 Liability

Qimarox believes to the best of its knowledge that the information in this user manual is accurate. In the event that technical or typographical errors exist, Qimarox reserves the right to make changes to subsequent editions of this user manual without prior notice to holders of this edition. The reader should consult Qimarox if errors are suspected. In no event shall Qimarox be liable for any damages arising out of or related to this user manual or the information contained in it. Except as specified herein, Qimarox makes no

warranties, express or implied, and expressly disclaims any warranty of non-infringement, merchantability or fitness for a particular purpose. Customer's right to recover damages caused by fault or negligence on the part of Qimarox shall be limited to the amount paid to Qimarox by the customer. Qimarox shall not be liable for damages resulting from loss of data, profits, use of products, or incidental or consequential damages, even if advised of the possibility thereof. This limitation of liability of Qimarox will apply regardless of the form of action, whether in contract or tort, including negligence. Any action against Qimarox must be brought without one (1) year after that cause of action accrues.

Qimarox is not liable for damages, unsafe conditions, defects, malfunctions, or service failures caused by the following:

- Owner's or user's failure to follow Qimarox's installation, operation and maintenance instructions, including but not limited to neglecting warnings or regulations as shown on the machine or in this manual.
- Usage of the machine for other applications, or under other circumstances than indicated in this user manual. This includes abuse, misuse or negligent acts.
- Modifications of any kind to the machine. This includes the replacement of parts with parts that are not specified in this manual.
- Insufficient or improper maintenance.

2.5 CE Declaration of Conformity

For the CE Declaration of Conformity, refer to the Specifications document.

2.6 Patent

Patent protection applies to parts of the machine. Consequently, other parties are not permitted to build this machine in this form, unless Qimarox B.V. has explicitly given permission for this. For more information, refer to mk5patents.qimarox.com.

3 Safety

3.1 Intended use of the machine

The machine is exclusively intended for the vertical transportation of goods, as described in this manual. For a detailed description of the specifications of use, refer to section 4.

The machine is always set up within a larger transport system in which products are automatically loaded on and off the machine.



Warning

Any other use of the machine is strictly forbidden.

3.2 User types and qualifications

The following user types are referred to in this manual:

- The operator.
- The electrical installer.
- The maintenance engineer.
- The mechanical installer.

The maintenance engineer must be familiar with the full content of this manual.

Before any person sets up, electrically installs or maintains the machine, permission to carry out these tasks must be obtained from Qimarox. Qimarox determines if the person is qualified for carrying out the given task. The machine should only be operated by qualified personnel.

An electrical installer is only qualified if a person has attended appropriate training and/or attained appropriate industry standard recognized qualifications. Qimarox can provide training if required.

Qimarox can also give advice about actions and tasks to be carried out on the machine.

3.3 Safety instructions

3.3.1 General

- Comply with the safety regulations given in this manual. Deviation from these regulations can lead to unacceptable risks.
- Never close doors (if present) in the fenced area of the machine, when personnel are inside this area.

- Switch off the machine and secure the main power supply switch in the off position with a padlock to prevent the machine from being switched on while personnel work in the fenced area.
- Comply with all relevant local legislation and regulations.

3.3.2 Set up

- Connect the machine in accordance with the local laws and regulations concerning safety and health.
- Before putting the machine into use, check if the machine has been set up in accordance with the instructions in this manual and with the layout drawing.
- Make sure that the transport system complies with all relevant health and safety directives and regulations.

3.3.3 Start the machine

- Do not switch the main power supply on when persons are in contact with the machine.
- Do not start the machine when persons are in contact with the machine.
- Do not start the machine when persons are present in the fenced area of the machine.
- Before the machine is put into operation, all machine parts must comply with all relevant health and safety directives and regulations.

3.3.4 During machine operation

- Keep your hands and feet away from the fenced area.
- Make sure you do not wear loose clothing and secure long or loose hair.
- Make sure that no persons or objects are within the range of any moving parts of the machine.
- Make sure that users know and observe all safety rules with regard to the machine and the environment in which it operates.

3.3.5 Maintenance and repair

- Turn off the power of the machine using the main power supply switch before starting any maintenance or repair tasks. Secure the main power supply switch in the off position with a padlock.
- Replace damaged or defective parts before putting the machine back into operation.
- Changes and modifications that may affect the safety of the machine can only be carried out when these changes and modifications comply with the relevant regulations, legislation, directives and recognized industry standards.

- If changes and modifications are outside the scope of specifications given by Qimarox in this manual and Qimarox has not granted permission changes and modifications, then the changes and modifications will entirely be the responsibility of those persons responsible for carrying out the changes and modifications.
- Electrical installation tasks must only be carried out by qualified personnel.

3.4 Safety provisions

3.4.1 Safety equipment

- Do not disassemble, bypass or disable any safety equipment on the machine.
- Do not start the machine if even a single item of the machine safety equipment is defective.
- Immediately take the machine out of operation if a single item of the machine safety equipment is defective.
- Always replace all safety equipment that have been removed from the machine when all maintenance tasks are complete.

The machine should have the following safety equipment:

- Covers with labels.
- Interlock switches that trigger the safety system.
- Emergency stop buttons.



Note

Replace inreadable or damaged labels on the machine.

For safety reasons, Qimarox requires a fenced area around the machine. Any access doors must be secured with (interlock) door switches. The (interlock) door switches must be included in the emergency stop and safety circuit. For information about how to set up the fenced area, refer to section [3.4.2](#) .

In case of non-compliance with the required safety measures, the CE Declaration of Conformity will become null and void.

3.4.2 Safety fences

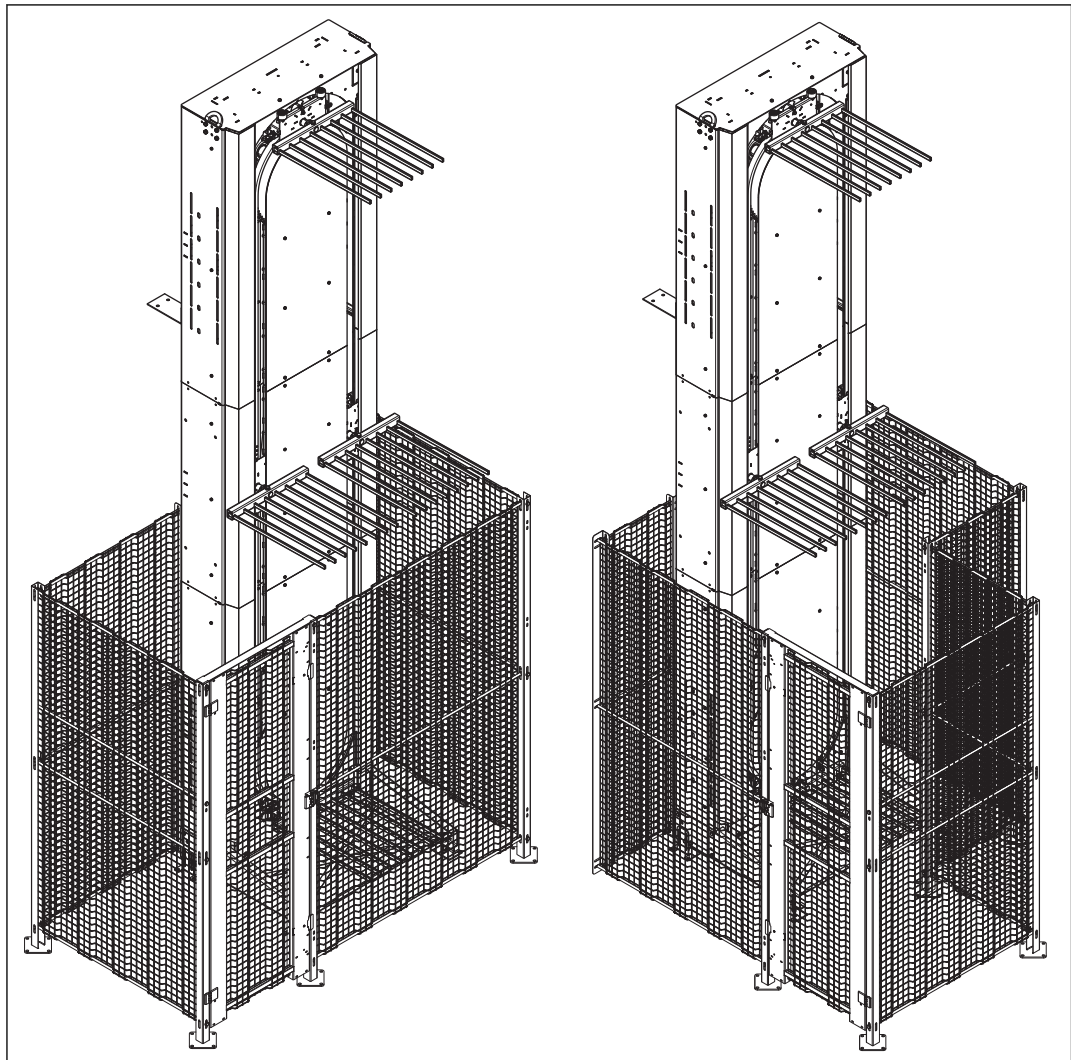
The fenced area must comply with EN ISO 13857 and EN 619 standards.

Make sure that the fence, the fenced area and safety control system comply with local safety laws and safety rules.

The infeed and outfeed openings of the machine must prevent persons from entering the danger zone when the machine may cause a danger to a person in that area. Every infeed and outfeed opening must be fitted with a safety device (door with a safety switch, light curtain, etc.) that is embedded in the safety control system, to control the access. All

machines in the fenced off area must stop if the safety control system is triggered due to unsafe access.

If Qimarox supplies the safety fencing, a layout drawing of the safety fencing will be provided. Refer to the figures as examples.



Warning

If the machine moves the products through a floor to another level, apply safety measures to all levels.

3.4.3

Safety controls

The provisions must be designed according to a so-called Performance Level (PL) corresponding with the current standard for safety functions of a machine or a machine control in compliance with EN ISO 13849-1:2016. To the machine a PL_d applies, in which 'd' indicates that the risk must be substantially reduced.

Emergency stop circuit

The machine must have an emergency stop circuit. When one of the emergency stop buttons is pressed, the main power and the control current of the machine are switched off immediately.

Set the motor protection relay

Motor protection devices must be set to the nominal motor current. A relay set too low prevents optimum use of the motor. A relay set too high does not guarantee full thermal protection.

Thermistor protection (TF contact)

For motors that are frequently started and stopped, intermittently operated, use a high switching frequency or power controller, it is essential to use a motor protection relay and thermistor protection. This is to avoid prematurely switching the motor protection relay or overheating of the motor winding in these operational conditions.

Check of the transport time slot

The software should monitor the position of the products in the machine during infeed, internal transport and outfeed. When the related time slots are exceeded, the machine must immediately stop to avoid damage.

3.5 Sound level

The sound level of the PRORUNNER Mk5 is 80.9 dB(A). To measure and calculate the sound level, refer to the standards ISO 3740 and ISO 3744.

If necessary, ask Qimarox for a full report.





3.6 Personal safety

For your own safety use personal protective equipment.

Always wear proper personal protective equipment when working with, on or near the machine.

The following table gives an overview of the required personal protective equipment.

Safety sign	Protective device (example)	Description	When required
		Safety helmet	During maintenance
		Protective goggles	During maintenance, cleaning
		Hearing protection	During production
		Protective gloves (no leather, but rubber or silicone!).	During cleaning
		Protective shoes	During cleaning and with slippery floors

Safety sign	Protective device (example)	Description	When required
		Protective clothing	During cleaning
		Safety harness/belt	

Take off your personal protective equipment during a work break to prevent possible residue from getting onto canteen tables and in your food.

3.7 Potential risks

The machine is intended to be integrated into a transport system. Qimarox has attempted to protect against as many hazards as possible.

The following potential risks should be addressed before machine and assembled parts are put into operation:

- Risk of injury caused by falling products.
- Risk of injury as a result of moving fork and conveyor.
- Hazards occurring at places where the machine connects to other parts of the production line, such as supply and discharge conveyors.

The interior of the machine can be accessed through the front of the machine. Protection is required at the supply, discharge, infeed and outfeed conveyors.

Protective measures must be applied on each floor level.

3.8 Machine end of life and environment disposal

Proper use and maintenance of the machine will not involve any environmental risks.

After the machine is no longer useable, the machine should be dismantled and disposed of in an environmentally responsible manner.



Warning

Obey all relevant legislation, regulations, instructions and precautions with regards to health and safety when dismantling the machine.

Warning

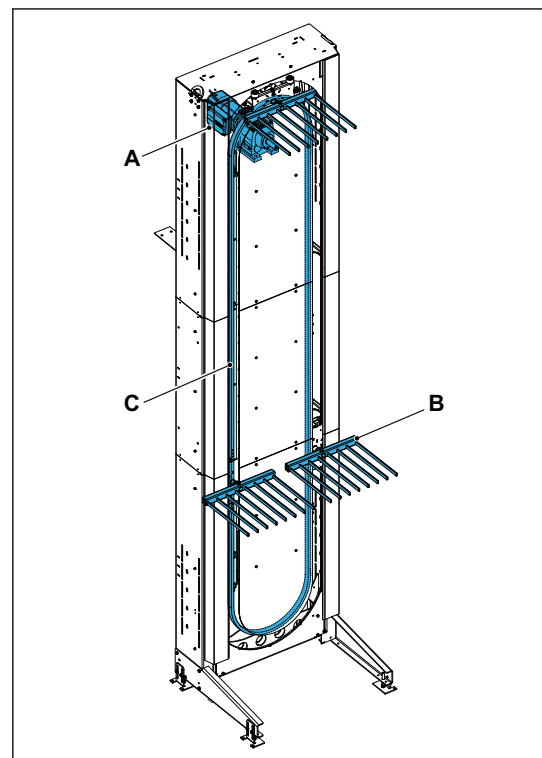
Obey all relevant legislation, regulations, instructions and precautions with regard to the disposal of products in the environment.

4 Description

4.1 General overview

The machine is designed to transport a product vertically from one level to another. Products can be transported upwards or downwards and, depending on the configuration, even a combination of the two. The machine must be installed as part of a larger transport system in which products are automatically transported to and from the machine.

The machine contains multiple forks (B), which are attached to a continuous chain (C). The forks follow the path of the chain in the column. The gearmotor (A), located at the top of the column, drives the chain (C).



The machine can operate in two modes:

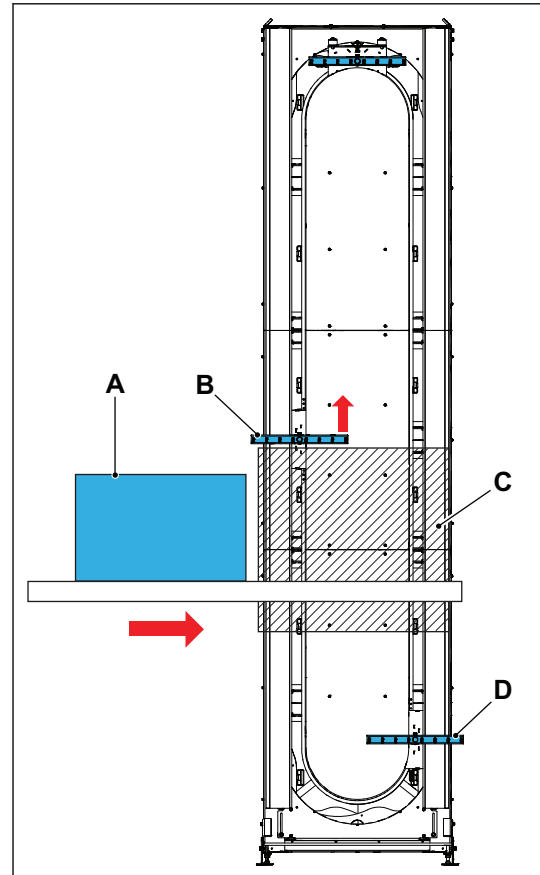
- Continuous: the forks can be loaded and unloaded without stopping. The shape of the forks allow them to cross in- and outfeed conveyors, so that the forks can be (un)loaded while moving.
- Discontinuous: the machine can be stopped for the loading and unloading of forks. This reduces the capacity of the machine. Consult Qimarox before using a machine discontinuously.

4.2 Working principles

4.2.1 Product infeed time frame

To prevent that a product causes a blockage of a fork, the infeed must occur in a certain timeframe.

When there are no forks in the hatched area (C), it is safe to insert product (A). The height of the hatched area (C) is the maximum product height plus a small margin. When fork (B) leaves the hatched area (C), the infeed can start. The product must be at the correct infeed position before fork (D) reaches the hatched area (C). The time it takes fork (D) to reach the hatched area (C) depends on the spacing and speed of the forks. This information is shown in the Specifications document.

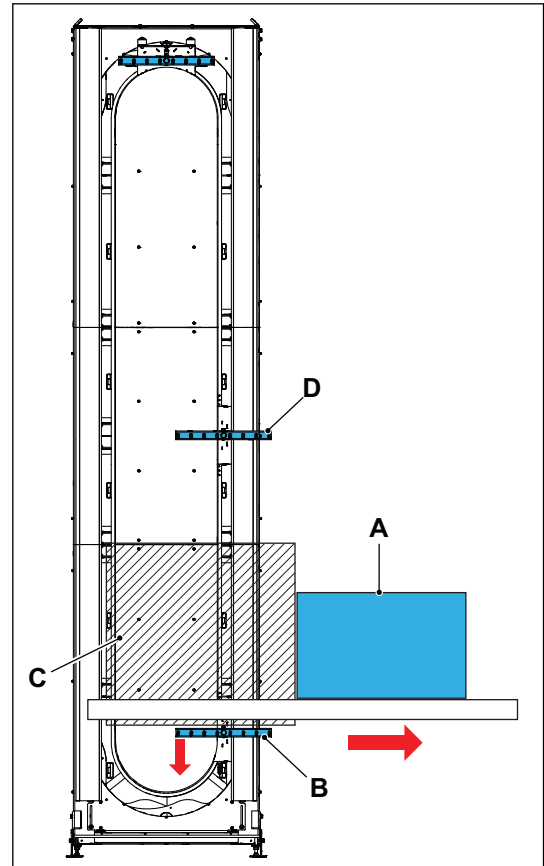
**Caution**

The infeed of a product outside the infeed time frame can cause serious damage to the machine.

4.2.2 Product outfeed time frame

To prevent that a fork causes a blockage of a product in the machine, the outfeed must occur within a certain timeframe.

The outfeed of product (A) should start immediately after fork (B) has left the hatched area (C). The product must have left the machine completely before fork (D) reaches the hatched area (C). The height of the hatched area (C) is the maximum product height plus a small margin. The time it takes fork (D) to reach the hatched area (C) depends on the spacing and speed of the forks.



Caution

If the product has not left the machine before the end of the outfeed timeframe, the machine must stop immediately.

4.3 Sensors

4.3.1 General

It is possible to install an encoder on the gearmotor. With an encoder, it is possible to track each fork, which is useful in sorter application. Consider to use an encoder and Qimarox software to find malfunctions easily. Refer to the documentation of the software for more detailed information.

The standard version of the machine does not include an encoder.

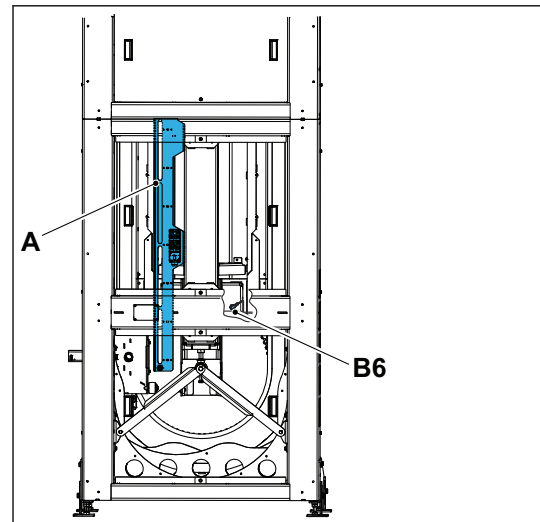
4.3.2 Sensors without encoder on gearmotor

General

If an encoder is not installed on the gearmotor, the machine contains the following sensors:

The sensors Infeed security sensor (B3) and Outfeed security sensor (B4) are installed on the strip (A). The exact position of the Infeed security sensor (B3) and Outfeed security sensor (B4) depends on the configuration.

The Rotation detection sensor (B6) is used to sense the rotation.



Infeed security sensor (B3)

The Infeed security sensor (B3) gives a signal when the levellers are in a position where the infeed of a product is allowed. The signal marks the begin of the infeed time frame, refer to section 4.2.1.



Caution

Monitor the time between each signal of the Infeed security sensor (B3). Stop and check the machine if the interval is longer than expected.

Outfeed security sensor (B4)

The Outfeed security sensor (B4) gives a signal when a leveller is approaching the outfeed conveyor. The signal marks the start of the outfeed time frame, refer to section 4.2.2. If the outfeed conveyor can not accept a product ('occupied') when the Outfeed security sensor (B4) is triggered, the machine must stop immediately.



Caution

Monitor the time between each signal of the Outfeed security sensor (B4). Stop and check the machine if the interval is longer than expected.

Rotation detection sensor (B6)

The Rotation detection sensor (B6) monitors the rotation of the bottom sprocket of the machine. If the pulse frequency deviates unexpectedly, a malfunction may be present or may follow.



Caution

Stop the machine immediately if the pulse frequency of the Rotation detection sensor (B6) deviates unexpectedly.

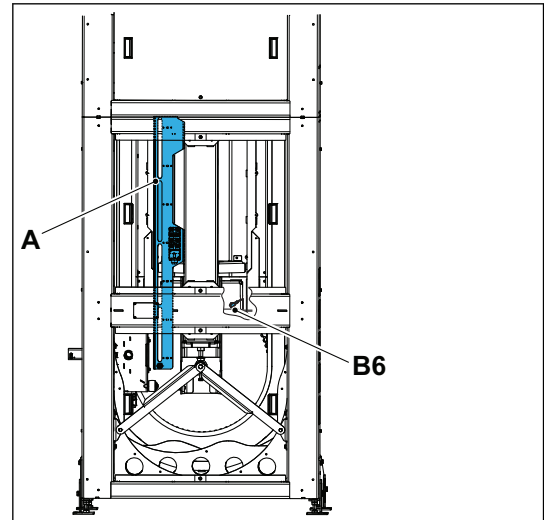
Sensors for bidirectional machine

If the carriers can turn clockwise and counter-clockwise (bidirectional use), additional sensors are installed.

The sensors Infeed security sensor (B3), Outfeed security sensor (B4), Reverse infeed security sensor (B5) and Reverse outfeed security sensor (B13) are installed on the strip (A).

The Infeed security sensor (B3) and Outfeed security sensor (B4) are used for rotation in the one direction.

The Reverse infeed security sensor (B5) and the Reverse outfeed security sensor (B13) are used for rotation in the other direction.

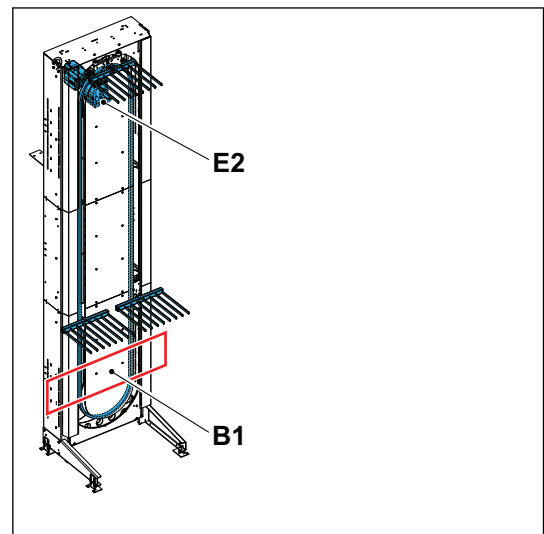


The Rotation detection sensor (B6) is used for both rotation directions.

4.3.3 Sensors with encoder on gearmotor

When the gearmotor is equipped with an encoder, the machine contains the following sensors:

The Reference position sensor (B1) gives a signal each time a leveller passes. The Reference position sensor (B1) signal, in combination with the encoder signals of the encoder (E2) on the gearmotor, lets the software calculate the position of each leveller continuously. The position of the leveller lets the software calculate the infeed timeframe (4.2.1) and outfeed timeframe (4.2.2).

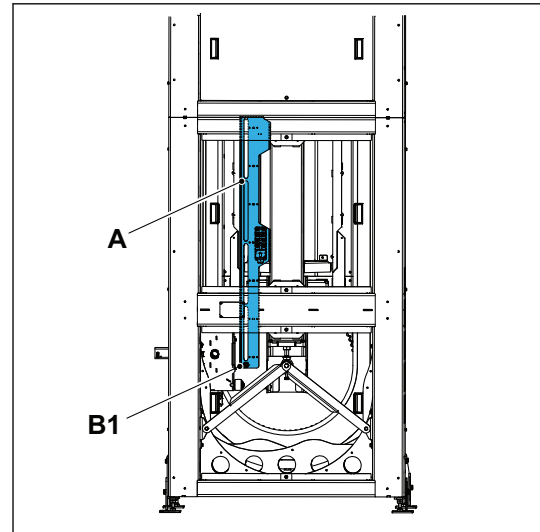


Caution

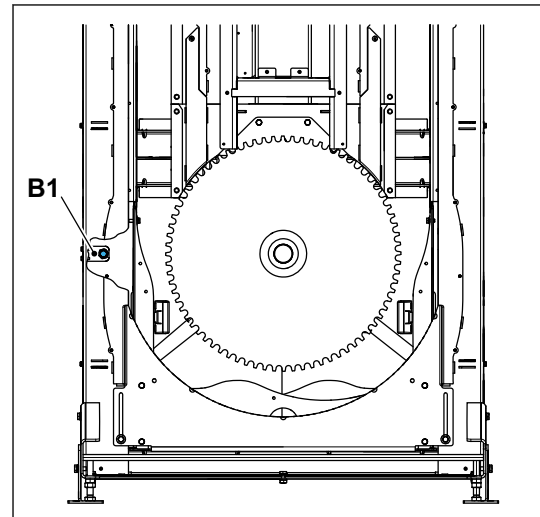
Monitor the time between each signal of the Reference position sensor (B1). Stop and check the machine if the interval is longer than expected.

The Reference position sensor (B1) is located on the side where the infeed conveyor is attached.

Infeed conveyor on the right hand side.
Reference position sensor (B1) is attached to the strip.



Infeed conveyor on the left hand side.
Reference position sensor (B1) is attached to a bracket.



Note

For more detailed information about the settings, features and safety provisions, refer to the functional description of the applicable software block (without or with encoder). The information can be downloaded from the Qimarox website.

4.4 Motor

It is recommended to use a frequency controller to power the motor of the machine. For some configurations it is mandatory. If a frequency controller is used, EMC directives must be observed and the device should be installed according to the manufacturer specifications. The motor safety relays must meet EN-IEC 60204-1 specifications. The setting range depends on the motor specifications.

Refer to the Qimarox Specifications document for drive parameters.

The following page (example) of the Specifications document shows the main drive specifications. The OEM gearmotor specifications are given in the 'gearmotor mk5(serial number)' document, which is part of the order documentation.

- Frequency controlled: indicates whether or not a frequency controller is mandatory.
- Nominal frequency: indicates at which frequency the drive has to be controlled by the frequency inverter to reach the speed and capacity stated in the Specifications document.
- Regenerative power: the maximum power a braking resistor needs to dissipate continuously.
- Minimal power frequency inverter: indicates the maximum power that the drive uses.

MAIN DRIVE			
Frequency controlled	Yes		
Motor type	Standard		
Gearmotor	R57DRS71M4BE1HR/TF	M1 - 0' - X	
Power	0,55 kW		
Torque	465 Nm		
Speed	11,0 RPM		
Gear ratio	120,63		
Motor protection	TF		
Insulation class	155 (F)		
Connection type	Y (Star)		
Encoder	N/A	Default:	N/A
Nominal frequency	50 Hz		At calibrated speed
Regenerative power	0,00 kW		
Minimal power frequency inverter	0,55 kW		

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4.5 Control system

4.5.1 General

This section includes the control system of the machine. When the conditions are not met, the emergency stop circuit of the machine must be activated.

4.5.2 Control software

The software of the machine is supplied by Qimarox. There are two software version:

- Drive without an encoder.
- Drive with an encoder.

For information about the signals, refer to the applicable software block and functional description (without or with encoder), that can be downloaded from the Qimarox website.

4.5.3 Control advice

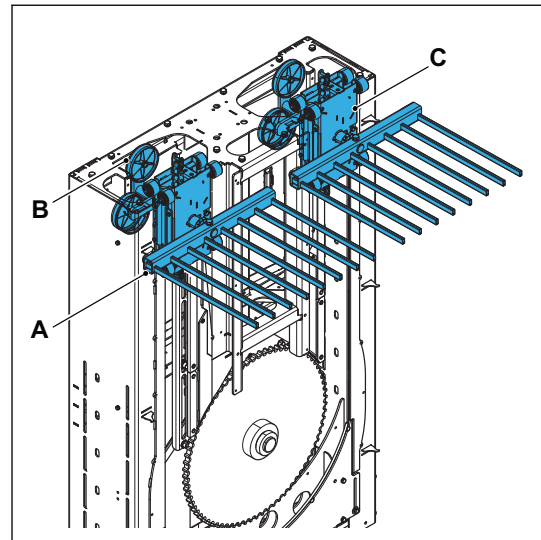
Remarks about the software control of the machine:

- Always feed the products into the machine one by one. Supply the products one by one to the feeding conveyor. If need be, create a greater distance between the products. To create a distance, use a higher transport speed on the infeed conveyor than on the feeding conveyor.
- Make sure that all the sensors (refer to section 4.3) are adjusted. Always refer to the product and the fork specifications. Inaccurate settings can result in machine malfunction.

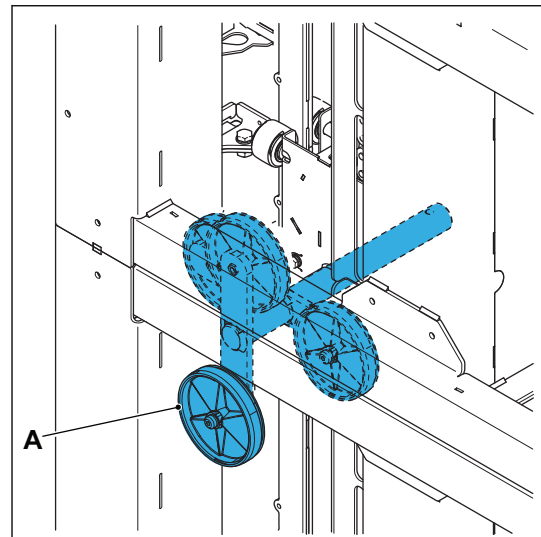
- Let the software monitor the product infeed time and the product outfeed time. Within the applicable time limit, a carrier must pass the Infeed security sensor (B3) and Outfeed security sensor (B4). If this time is more than the applicable time limit, the machine must stop immediately.
- Install special control requirements if a configuration with a cross transfer is to be installed.

4.6 Guiding of the carriers

Each fork (A) is attached to a leveller (B). The leveller (B) can turn and is installed in the trolley (C).



The leveller has 4 guide wheels (A) that follow the steel guides in the columns. Thus the fork is kept level at all times.



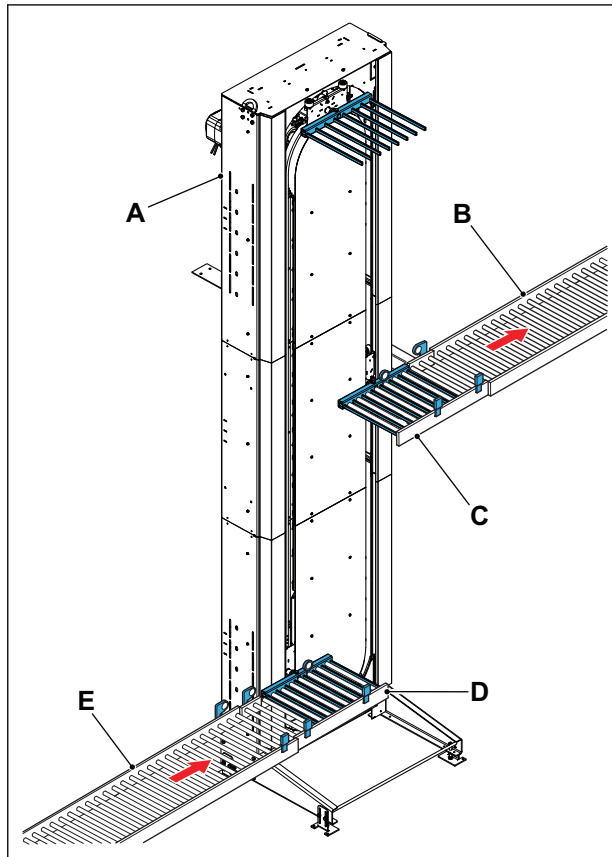
4.7 Machine in a system

The following example is a general overview of the intended use of the machine within a system. The product goes from a feeding conveyor at the bottom to a discharge conveyor at the top.



Note

Refer to the Specifications document for the correct settings for the machine and conveyors.



- A. Machine
- B. Discharge conveyor (not supplied by Qimarox)
- C. Outfeed conveyor (optionally supplied by Qimarox)
- D. Infeed conveyor (optionally supplied by Qimarox)
- E. Feeding conveyor (not supplied by Qimarox)

4.7.1 Product infeed



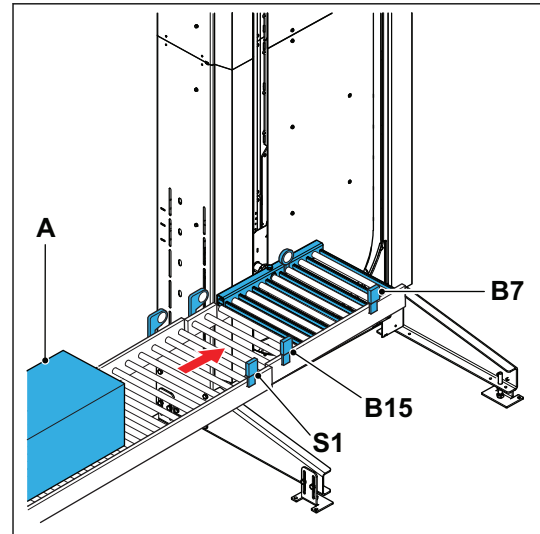
Caution

Always feed the products into the machine one by one. Supply the products one by one to the feeding conveyor. If need be, create a greater distance between the products. To create a distance, use a higher transport speed on the infeed conveyor than on the feeding conveyor.

The feeding conveyor (not supplied by Qimarox) must be equipped with sensor S1 and a brake to start and stop the conveyor. Thus the feeding conveyor operates as a dosing conveyor. Each product (A) that is supplied by the feeding conveyor must wait at sensor S1, until the machine is ready to accept the product.

The machine is ready to accept the product when the following conditions are met:

- The infeed time frame (4.2.1) is started or the remaining infeed time frame is long enough to perform the infeed.
- The infeed conveyor is empty.



When the machine is ready to accept the product, start the feeding and infeed conveyor. Stop the feeding conveyor after the product has fully left the feeding conveyor and before a second product is fed onto the infeed conveyor. This occurs when sensor (S1) is covered after it has been uncovered.

The infeed conveyor (optionally included) must be equipped with sensor (B15) to monitor the begin of the infeed conveyor and sensor (B7) near $\frac{3}{4}$ of the length of the infeed conveyor. Stop the infeed conveyor only when sensor (B7) (product on infeed) is covered and (B15) (product position monitoring) is free.



Caution

Monitor the actual infeed time. Stop the machine if the time is much more than the infeed time in the Specifications document. Validate that the correct settings are used.

Caution

Stop the machine if sensor B15 is still covered at the end of the timeframe. Validate that the correct settings and sensors positions are used.

Do not start the infeed of the next product until the infeed conveyor is empty and the next infeed timeframe is started.



Note

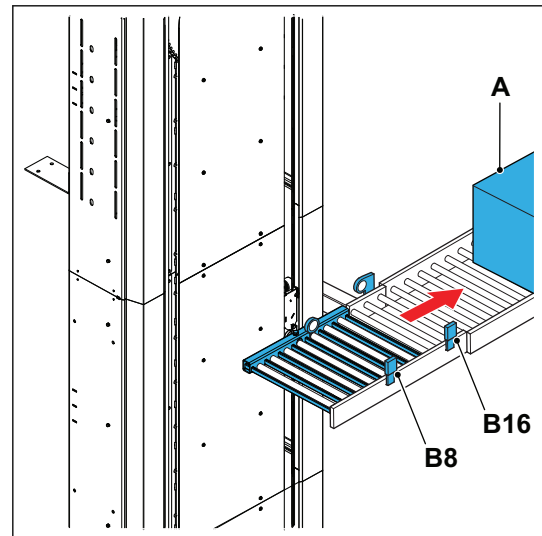
Because the infeed is discontinuous, it may be necessary to buffer the product at the feeding conveyor(s). If this is not possible and stops of the infeed are undesired, contact Qimarox.

4.7.2 Product outfeed

The outfeed conveyor (optionally included) must be equipped with sensor B8 monitoring the centre of the conveyor and sensor B16 monitoring the end of the conveyor.

When a fork puts a product (A) on the outfeed conveyor, sensor B8 is covered. Start the outfeed conveyor and discharge conveyor (not included) immediately. Stop the outfeed conveyor when the product (A) has left the conveyor completely. This is when sensor B16 is uncovered after it has been covered and sensor B8 is uncovered. Do not stop the discharge conveyor before the outfeed conveyor is stopped.

To prevent start/stop cycles, let the outfeed conveyor run continuously.



Caution

Stop the machine if the product has not left the outfeed conveyor at the end of the outfeed timeframe. Make sure that the correct settings and sensors positions are used.

Caution

Stop the machine if sensor B8 or B16 is covered unexpectedly. Check the discharge conveyor. Make sure that there are no products moving back into the machine.

Take the product (A) from the outfeed conveyor in time to make sure that the machine can run continuously. Make sure that the settings for the outfeed speed and the outfeed acceleration are correct. Refer to the layout drawing and Specifications document for the correct settings.

4.8 Specifications

4.8.1 General

The specifications in this section, together with the Machine layout drawing and the Specifications document, give guidelines for the transportation of products.

4.8.2 Product transport specifications

Refer to the Specifications document for the product specifications that apply to the relevant machine configuration.

Data concerning product type, dimensions, bottom sides and weights must always be verified with Qimarox. For example, deformable products in bags will usually not be transported along rollers, but along belts.

If you want to use the machine outside the recommended specifications, you must contact Qimarox to check if this is possible. Inappropriate and/or modified use of the

machine can result in dangerous safety issues and/or damage. You must obtain written confirmation from Qimarox before using the machine in a modified or unspecified manner.

4.8.3 Environmental specifications

The surrounding area of the machine must have the following properties:

Property	Description
General	Covered and normally clean for operation. There must be sufficient space around the machine to do maintenance activities and other activities on the machine.
Height (altitude)	The maximum allowed height of the machine position is 1000 m above sea level. At higher heights the power of the machine must be adapted according to the SEW manual.
Relative air humidity	Maximum 80 %
Temperature	Between +5 °C (41 °F) and 40 °C (104 °F)
Floor	Level. The floor load is provided in the Specifications document.
Required height	Refer to the Machine layout drawing.

If the machine must be adjusted to an environment outside the stated specifications, contact Qimarox. These type of adjustments may only be done by Qimarox or by you, after you get written permission of Qimarox.

5 Installation

5.1 General

This chapter includes the installation instructions. Refer to the assembly manual for machine assembly instructions.



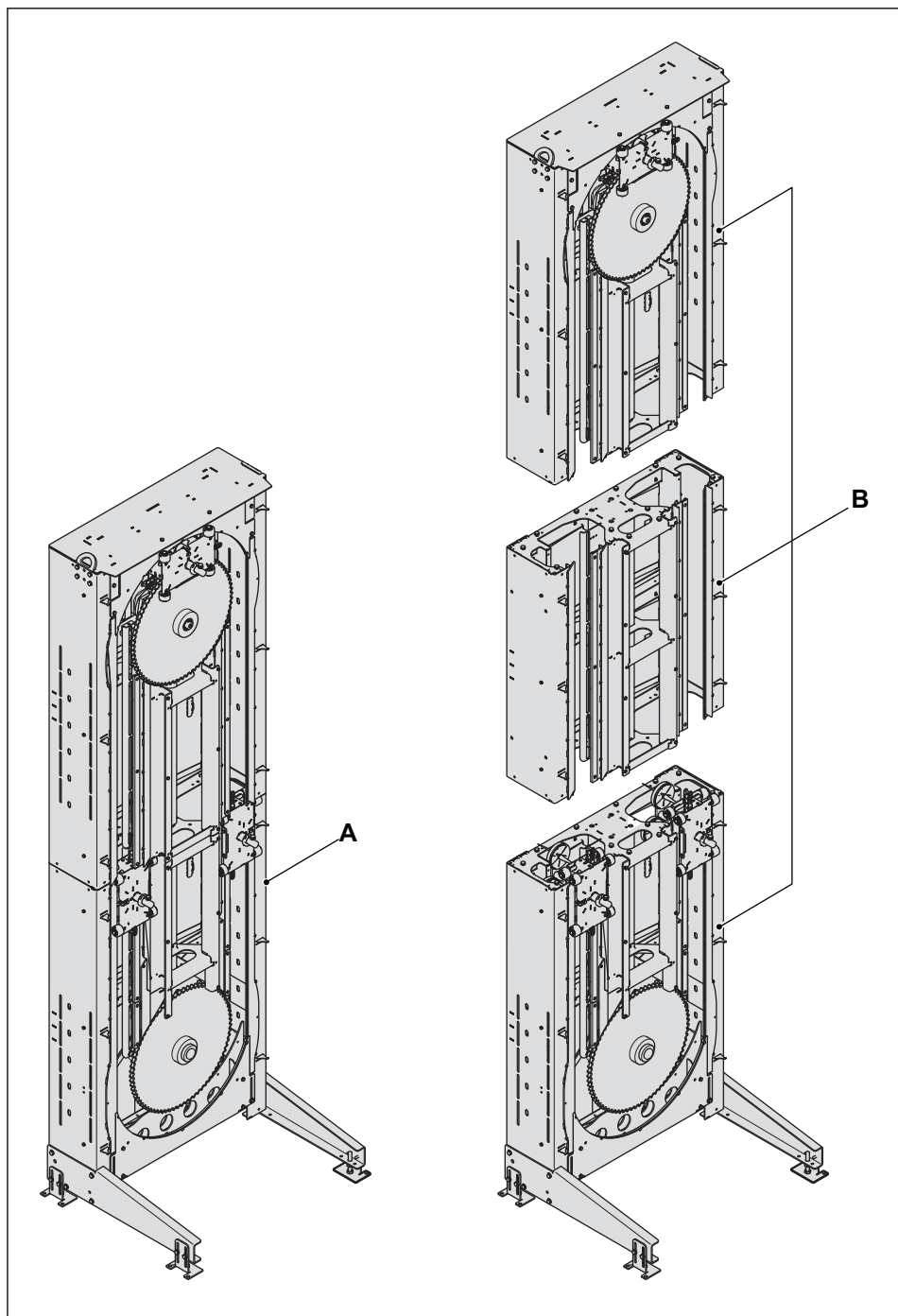
Warning

The machine should only be installed by qualified personnel.

5.2 Delivery

The machine can be delivered fully assembled or in segments.

- A fully assembled machine will be delivered in a horizontal position.
- For a machine delivered in segments, the column section is delivered in an upright position in a crate. Refer to the assembly manual for information on how to assemble the segments.



- A. Machine fully assembled
- B. Machine in two or more segments

5.3 Possible installations



Warning

Read all information on transport, lifting, preparation and such in this chapter before you install the machine.

The machine may be:

- An assembled machine.
- A machine in segments. To assemble:
 - It is possible to start with the top section.
 - It is possible to start with the bottom section.

5.4 Unpacking

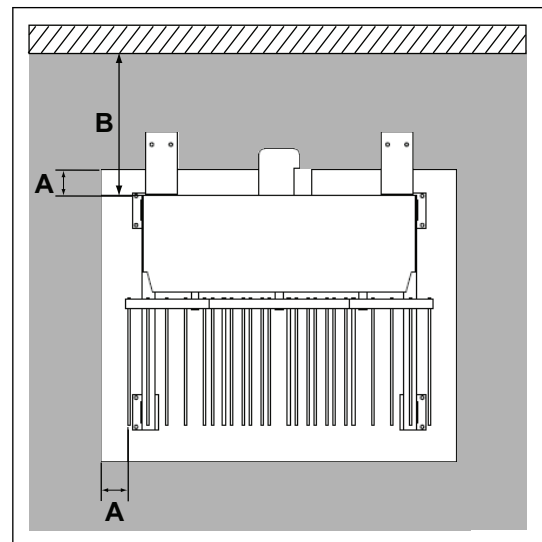
1. Check the packing list when unpacking the machine.
2. Immediately report damage or missing parts to Qimarox.

5.5 Location

Refer to the Machine layout drawing for detailed information about the location of the machine.

The minimum distance between the moving parts of the machine and other equipment or structures must be 100 mm (A).

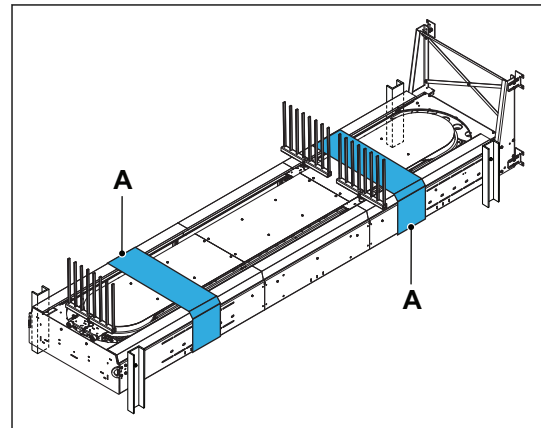
For maintenance, keep a free space of approximately 500 mm (B) on the rear side of the column.



5.6 On-site transport

5.6.1 General

If the machine is delivered fully assembled and in the horizontal position, it is packaged in cardboard. The forks of the fork-lift truck must be placed where cardboard is applied (A). The center of gravity of the machine is in the center of the two cardboard pieces. The packaging indicates the minimum length of the forks.



5.6.2 General preparation

Calculate the total weight before moving the machine.

1. The weight of the machine is given on the type plate. Refer to section 2.1.
 - Add to the weight of the machine the weights of any attachments to the machine, for example, product conveyors.

If the product conveyors are supplied with the machine by Qimarox, their weight is included on the type plate of the machine.
2. Check the floor load of the floor on which the machine will be placed.
3. Check the floor load of the floor on which the hoisting system is placed.
4. Make sure that the floor, on which the machine will be placed, is level and clean.
5. Block the working area to ensure a safe environment during hoisting.

5.6.3 Vertical transport < 1700 kg



Warning

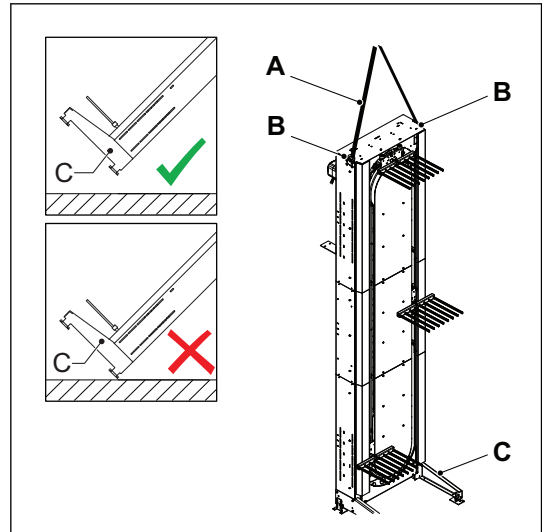
The lifting eyes (B) are suitable for a maximum weight of 1700 kg.

If the machine exceeds the weight of 1700 kg, but weighs less than 2400 kg, use the lifting yoke. Refer to sections 5.6.4, 5.8.4 and/or 5.8.5.

Up to a length of 7450 mm, a fully assembled machine can be tilted to the upright position when the weight does not exceed 2400 kg.

Above a length of 7450 mm, the machine must be assembled segment by segment. Refer to section 5.8.3.

1. Check the type plate for the exact weight of the machine.
2. Use a suitable hoisting system that complies with local regulations.
3. Attach a suitable hoisting belt or hoisting chain (A) to the lifting eye (B).
4. Ensure that the hoisting belt or hoisting chain is at an angle of 45 °.
5. Make sure that the bottom side of the machine (C) is not pulled along the ground during transport.
6. Make sure that the machine does not tip over after it has been put in the vertical position.
7. Attach the machine to the floor before removing the hoisting belt or the hoisting chain. Refer to section 5.8.2.



5.6.4 Vertical transport > 1700 kg



Note

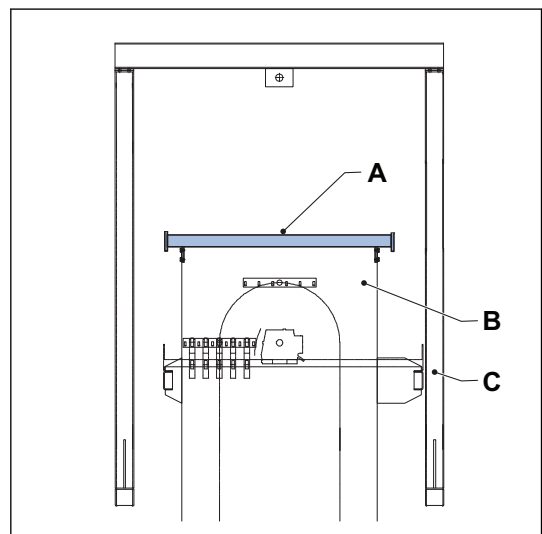
The lifting eyes on the machine (C) have a capacity of a maximum weight of 1700 kg. Refer to section 5.6.3 if the weight to be moved is less than 1700 kg.



Warning

To lift weights of over 1700 kg, always use the yoke that is supplied by Qimarox. The yoke is suitable till a maximum weight of 2400 kg. If the machine weighs more than 2400 kg, install the machine per segment. Each segment must weigh less than 2400 kg.

1. Check the type plate for the exact weight of the machine.
2. Use a suitable hoisting system (C) that complies with local regulations.
3. Attach a suitable hoisting belt or hoisting chain to the yoke (A). The yoke (A) is installed by Qimarox and is part of the machine (B).
4. Follow the rules for lifting using a yoke.
5. Make sure that the bottom side of the machine is not dragged along the ground during transport.
6. Attach the machine to the floor before removing the hoisting belt or the hoisting chain. Refer to section 5.8.2.



5.7 Preparations for installation by Qimarox (optional)

The preparations given below must be done before Qimarox can assemble the machine on site. All equipment listed below must be present before and during assembly.

1. Indicate the contact person to whom the mechanic of Qimarox must report when arriving or leaving before and after the assembly. This only applies when Qimarox supervises the assembly.
2. Make sure that the mechanic of Qimarox is assisted by two qualified mechanics of the customer. Refer to section 3.
3. Make sure that the place where the assembly takes place:
 - is accessible, has sufficient light and is at room temperature.
 - has been laid out such that the mechanics can work quietly and safely there.
 - is suitable for drilling and/or grinding, if necessary.
4. Provide hoisting equipment:
 - preferably a bridge crane, minimum carrying capacity 1.5 x the weight of the machine.
 - or hoist with hoisting equipment with a minimum capacity of 2x the weight of the machine.
5. Provide electric power (230 V AC) at a maximum of 5 metres from the place of assembly of the machine.
6. Provide the correct safety provisions:
 - Moveable scaffolding or an aerial work platform.
 - Personal protection equipment.

5.8 Installing the machine



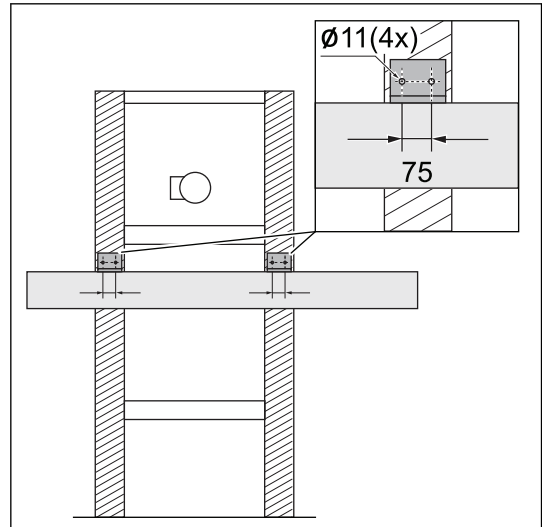
Warning

The machine must be set up by qualified personnel. Refer to section 3. Machines higher than 4 meters must be laterally supported every 4 meters, in order to get sufficient stability in the column. Refer to the Machine layout drawing.

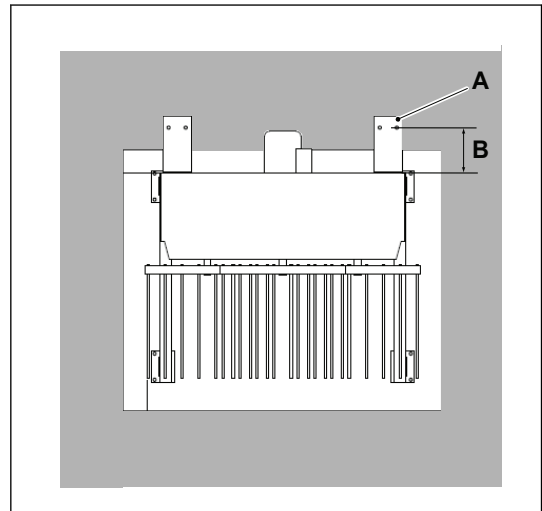
5.8.1 Preparation

- Make sure that a hoisting system above the machine is available. Refer to section 5.6.3 or 5.6.4.
- Make sure that the surface is level and meets the requirements for supporting the total weight of the transport system. Refer to the Machine layout drawing.
- Keep the rear side of the machine, especially the top of the drive, accessible for service. Maintain a free space of approximately 500 mm.

- Machines higher than 4 meters (13 ft) must be laterally supported. Only drill holes and attach bolts in the sections highlighted in the illustration.



- The lateral support brackets (A) are part of the delivery. The distance from the centers of the holes in the lateral support brackets to the rear of the machine is 200 mm (B).

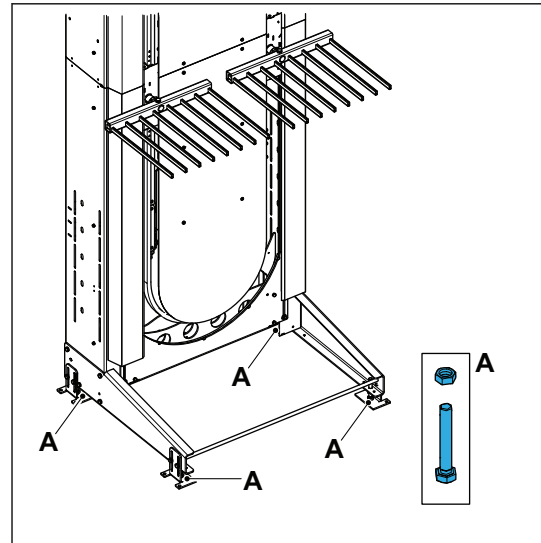


5.8.2 Installing a fully assembled machine

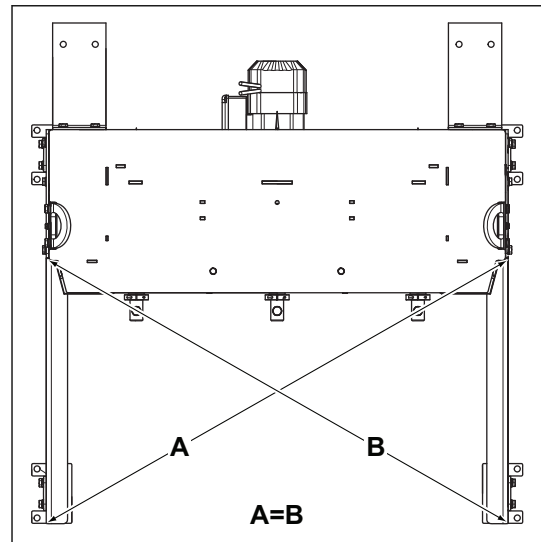
1. Position the machine using a hoisting system. Refer to section [5.6.3](#) or [5.6.4](#).
2. Make sure that products run smoothly over the gap:
 - from the feeding conveyor to the infeed conveyor,
 - from the outfeed conveyor to the discharge conveyor.

The maximum gap size is 25 mm.
3. Make sure that the products, when leaving the feeding conveyor, are properly aligned to the infeed conveyor. The dimensions of the product alignment are given on the Machine layout drawing.

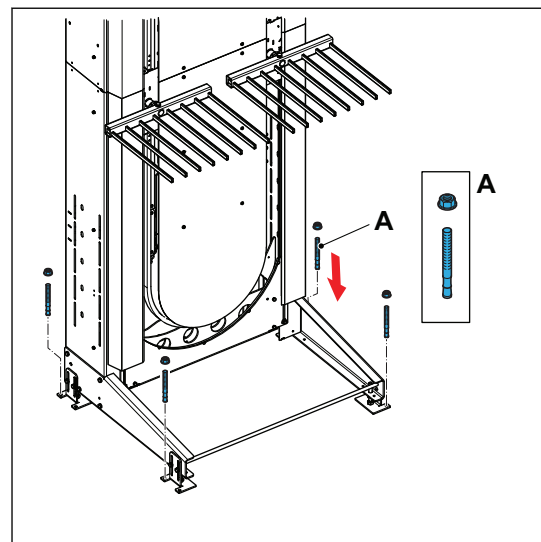
4. Make sure that the machine is completely level. Use the bolts (A) to level the machine.



5. Measure the diagonal distances (A, B) between the supports of the machine and make sure that they are equal.



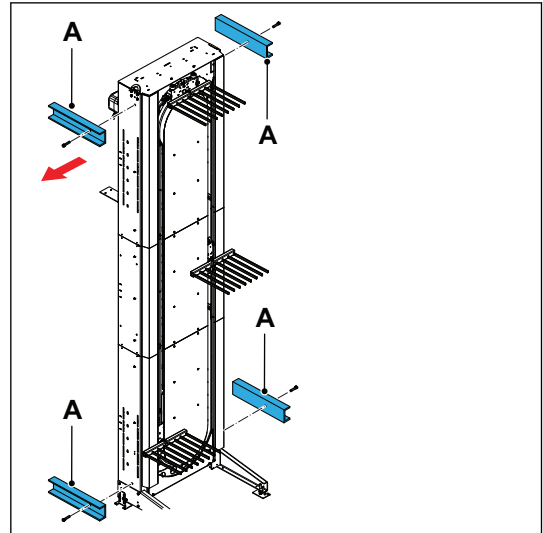
6. Use the bolts (A) to attach the machine to the floor.



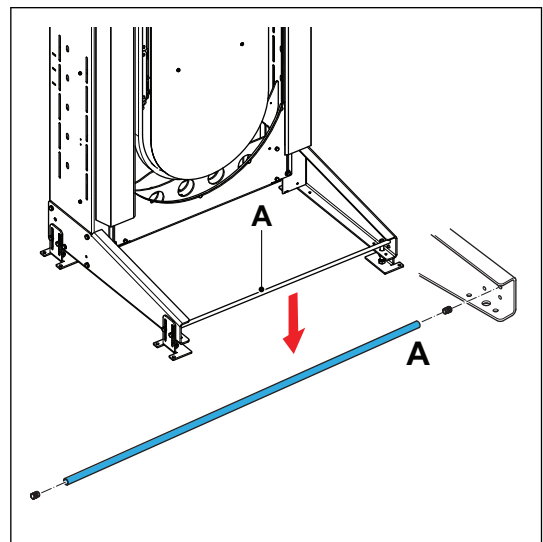
Note

Use Fischer FBN II 12/100 bolts or equivalent (not included). For the specifications of the bolts, refer to the information of the supplier.

7. Attach the support brackets for lateral support.
8. Remove the hoisting belt or the hoisting chain from the machine.
9. Remove the transport supports (A).



10. When the machine is aligned and anchored, remove the cross beam support (A).
11. Check the tension of the chain. Refer to section 6.6.

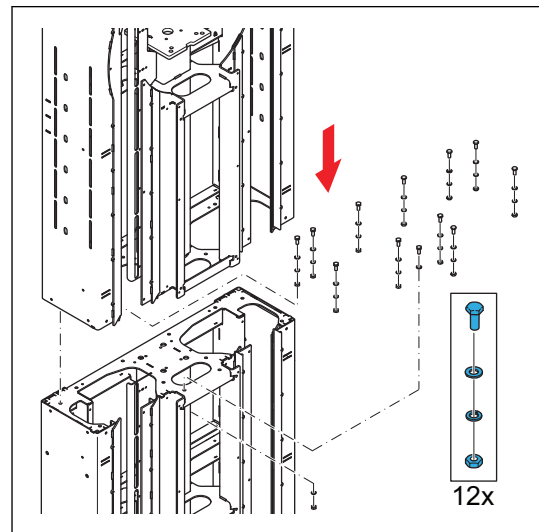


Note

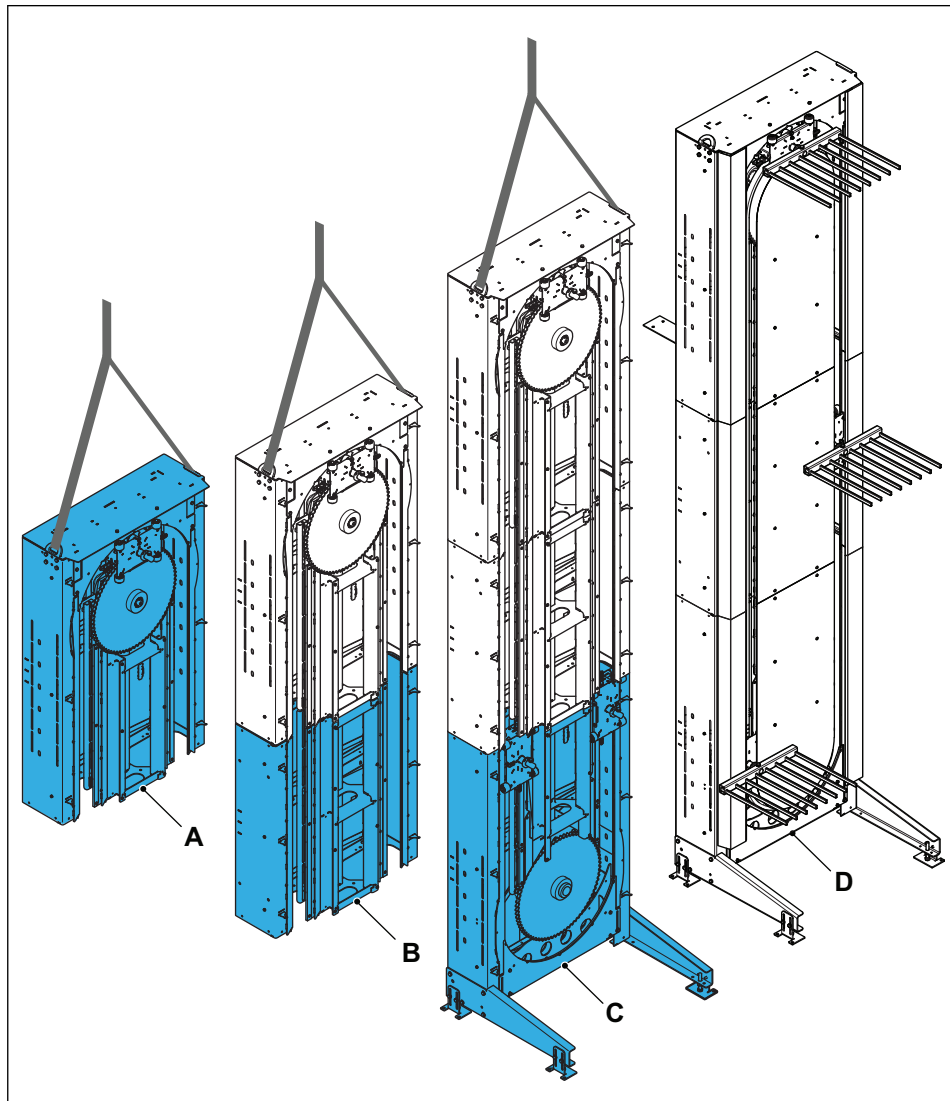
Keep the transport supports and shaft for any future transport.

5.8.3 Installing a machine delivered in segments

1. Install the segments. Refer to the assembly instructions.
2. Install the machine from top to bottom (refer to section 5.8.4) or from bottom to top (refer to section 5.8.5).
3. Put the machine in position. Refer to section 5.6.3, 5.6.4 or 5.8.2.
4. Attach the machine to the floor. Refer to section 5.8.2.
5. To install and connect the electrical components, refer to the electrical drawings.



5.8.4 Installing a machine from top to bottom

**Warning**

Do not work directly under the load.

**Caution**

The lifting eyes are suitable for a maximum weight of 1700 kg. Else use the yoke. The yoke is suitable for a maximum weight of 2400 kg.

**Warning**

Support the machine during installation to prevent falling over if the machine is not in the final position.

1. Calculate the total weight of the machine.
2. Select the correct hoisting method.
3. Lift the top section (A).

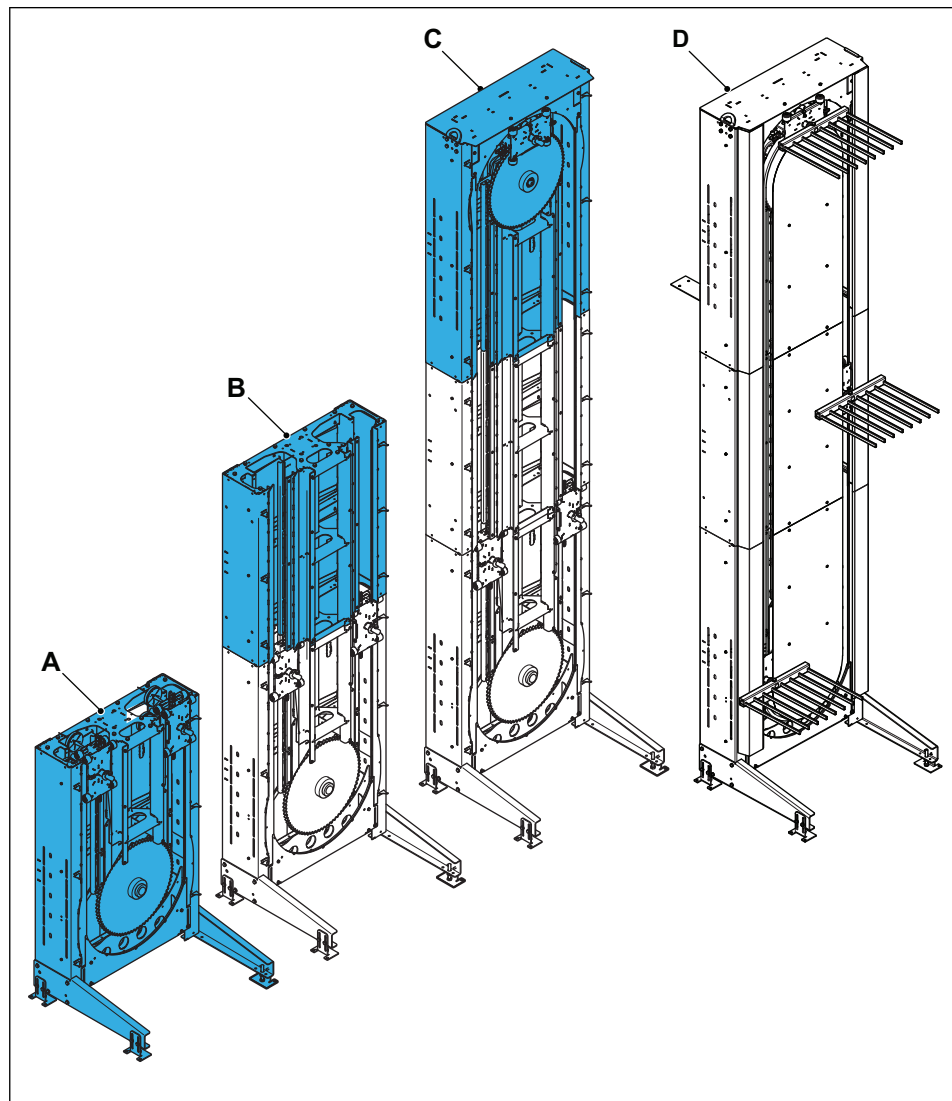
4. Attach a few trolleys in the top section.
5. Attach a middle section (B) below the top section.
6. Attach trolleys on the left side and right side of the column.
7. Lift the assembled sections.
8. Attach the next middle section(s) (B).
9. Attach the trolleys and chains in bottom section (C).
10. Make sure that the trolleys are installed in the bottom section (C).
11. Install the chains to the trolleys.
12. Lift the assembled sections.
13. Attach the bottom section (C).
14. Attach the bottom section (C) to the floor.

**Warning**

Fix the bottom section to the floor if the machine is installed in the final position.

15. Tension the chain. Refer to section [6.6](#).
16. Attach infeed and outfeed conveyors (D). Refer to section [5.9](#).

5.8.5 Installing a machine from bottom to top

**Warning**

Do not work directly under the load.

**Caution**

The lifting eyes are suitable for a maximum weight of 1700 kg. Else use the yoke.

**Warning**

Support the machine during installation to prevent falling over if the machine is not in the final position.

1. Calculate the total weight of the machine.
2. Select the correct hoisting method.
3. Attach the bottom section (A) to the floor.

**Warning**

Fix the bottom section to the floor if the machine is installed in the final position.

4. Make sure that the trolleys are installed in the bottom section (A).
5. Attach the chains to the trolleys.
6. Attach a middle section (B) on top of the bottom section.
7. Attach the trolleys on the left side and right side of the column.
8. Attach the next middle section(s) (B).
9. Make sure that the trolleys are installed in the top section (C).
10. Attach the top section (C) to the top of the last middle section (B).
11. Install the chains onto the trolleys.
12. Tension the chain. Refer to section 6.6.
13. Attach the infeed and outfeed conveyors (D). Refer to section 5.9.

5.9 Installing conveyors

Preparation

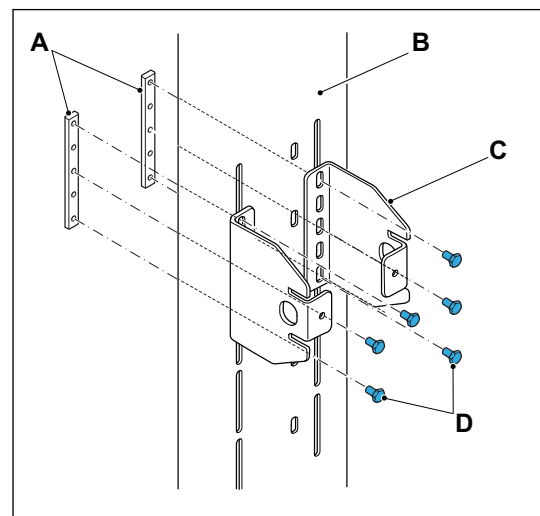
**Warning**

The conveyor may only be set up by qualified personnel. Refer to section 3.

- Make sure that a hoisting system is available above the conveyor. Refer to section 5.6.
- If Qimarox supplied the support to the floor: Make sure that the surface is level and meets the requirements for carrying the weight of the conveyor. Refer to the layout drawing.

To install the conveyor:

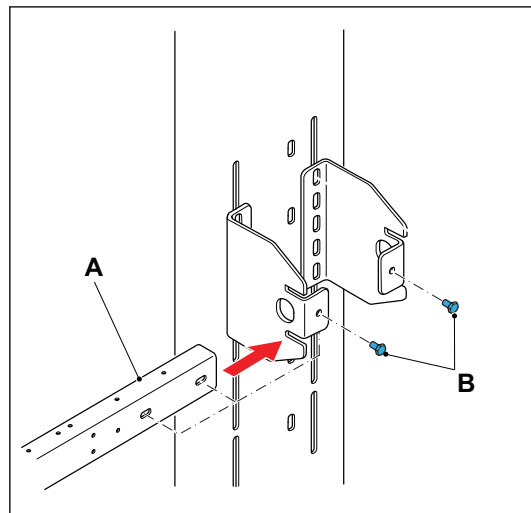
1. Use a hoisting system to position the conveyor. Refer to section 5.6.
2. Attach the consoles (C) to the column (B) of the machine with the M10x25 bolts (D) and treaded plates (A).
 - a) Use the slotted holes (130 x 10 mm) that are available in the column (B).
 - b) If you cannot use the slotted holes, drill holes that are aligned with the slotted holes and at the necessary height.



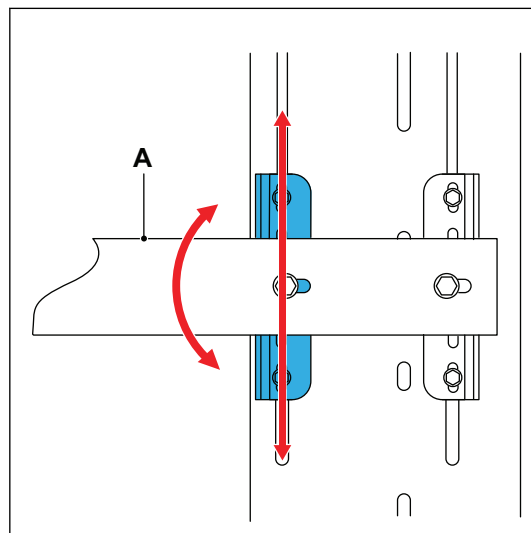
**Note**

If no slots are available at the desired position, drill 6 holes Ø10 on both sides of the column.

3. Attach both conveyor supports (A) to the consoles with the M10x20 bolts (B).



4. Make sure that the conveyor supports (A) are fully level. If necessary: move the consoles.
5. Disconnect the hoisting system.

**Note**

For information on the conveyors, refer to the related manuals.

6 Maintenance

6.1 General



Caution

The maintenance schedule is based on 2000 running hours per year. Adjust the maintenance frequency to the actual number of running hours per year. If required, Qimarox can carry out the maintenance activities.

6.2 Specific safety regulations

For optimum functioning of the machine the various machine parts must be regularly maintained. In this way defects and inaccuracies of the machine are prevented.



Warning

Only a qualified maintenance engineer is allowed to carry out maintenance activities on the machine. Refer to section 3.2.

Before you do a maintenance or repair procedure, use the main switch to stop the power supply to the machine. Safety the main power with a padlock.

Do not use any corrosive and inflammable solvents or cleaning agents on the machine that contain TRI, PER, TETRA or FCHC.

If you use chemical substances (cleaning agents), obey the instructions on the packaging and in the MSDS (material safety data sheet).

After having completed maintenance activities, always put all safety provisions that have been removed in place again.

Make sure that the machine has always run empty before carrying out any activities. No products must be present in the machine.

Take the appropriate measures for safely working at heights.

Warning

Avoid parts made of rubber or plastic, such as cables and gaskets, from making contact with oil, solvents or other chemicals.

6.3 Preventive maintenance

6.3.1 Daily maintenance

Daily Preventive maintenance - vertical conveyor

Item	Task	Action when required by the task
Guards and covers	Examine for visible damage.	Replace damaged guards and / or covers.
	Make sure that the mounting materials are there and are installed correctly.	Install the mounting materials correctly.
Entire machine	Examine for visible dirt.	Clean the machine. Refer to section 6.4.

6.3.2 Weekly maintenance (the first 8 weeks of operation)

Weekly – first 8 weeks Preventive maintenance - vertical conveyor

Item	Task	Action when required by the task
Chain	Examine the tension of the chain.	Adjust the tension of the chain.
	Refer to section 6.6.3.	Refer to section 6.6.3.

6.3.3 Weekly maintenance

Weekly Preventive maintenance - vertical conveyor

Item	Task	Action when required by the task
Trolley: wheels	Examine for visible damage of the running surface and bearings.	Replace the wheels. Refer to section 6.9.3.
	Clean. Refer to section 6.4.	
	Examine for running sounds.	Lubricate the wheels of the trolley. Refer to section 6.5.2.

Item	Task	Action when required by the task
Leveller: guide wheels	Examine for damage of the running surface.	Replace the wheels. Refer to section 6.9.6.
	Clean. Refer to section 6.4.	
	Examine for running sounds.	Lubricate the guide wheels. Refer to section 6.5.3.
Forks	Examine for damage.	Replace the fork. Refer to section 6.9.4.
	Make sure that the fastening bolt on the carrying shaft is there and is attached correctly.	Install the mounting materials correctly.
	Examine for dirt.	Clean. Refer to section 6.4.
Curve plates	Examine for dirt.	Clean. Refer to section 6.4.
	Examine for visible deformation of the running surface.	Replace the curve plate: <ul style="list-style-type: none"> - For the bottom side, refer to section 6.9.7. - For the upper side, refer to section 6.9.8.

6.3.4 Monthly maintenance

Monthly Preventive maintenance - vertical conveyor

Item	Task	Action when required by the task
Gearmotor Follow the instructions in the manual of the manufacturer of the gearmotor.	Examine the seals for leakage.	Replace the seals.
	Examine for visible damage.	Replace the damaged parts.
	Examine for running sounds.	Replace the gearmotor. Refer to section 6.9.13.
Chain	Adjust the tension of the chain. Refer to section 6.6.	Replace the chain if the tensioning block is at the end of the setting range. Refer to section 6.9.9.
	Lubricate the chain. Refer to section 6.5.1.	

Item	Task	Action when required by the task
Bottom sprocket	Examine for slack. Refer to section 6.7.	Replace the plain bearing of the tensioning sprocket when there is too much slack. Refer to section 6.9.10.
Bearings of the wheels of the trolleys	Examine for slack. Refer to section 6.8.	Replace the wheels. Refer to section 6.9.3.
Bearings of the guide wheels of the leveller	Examine for slack. Refer to section 6.8.	Replace the wheels. Refer to section 6.9.6.
Levellers	Examine for slack between the leveller and the trolley. Refer to section 6.8.	Replace the plain bearings. Refer to section 6.9.5.
Photocells	Examine for visible damage.	Replace the photocell if necessary.
	Examine for loose parts.	Attach loose parts.
	Clean. Refer to section 6.4.	
Inductive sensors	Examine for visible damage.	Replace the sensor if necessary.
	Examine for loose parts.	Attach loose parts.
	Clean. Refer to section 6.4.	
Clamping bush of upper sprocket	Examine if the clamping bush screws are tight.	Tighten the socket screws to the following torques: <ul style="list-style-type: none"> - shaft diameter ≤ 40 mm: 17 Nm - shaft diameter ≤ 65 mm: 41 Nm - shaft diameter ≤ 95 mm: 83 Nm
Cabling	Make sure that all cables are securely connected.	Connect the cables again if necessary.
Adjusting ring on carriers	Examine if the adjusting rings are tight.	Replace the adjusting ring. Refer to section 6.9.5.
	Examine for visible damage.	

Item	Task	Action when required by the task
Adjusting rings of the bottom sprocket	Examine if the adjusting rings are tight. Examine for visible damage.	Replace the adjusting ring. Refer to section 6.9.3.
Starlocks on the trolleys.	Examine if the starlocks are present. Examine if the starlocks are tight.	Replace the starlocks. Refer to section 6.9.3.

6.3.5 6-monthly maintenance

6 monthly Preventive maintenance - vertical conveyor

Item	Task	Action when required by the task
Gearmotor Follow the instructions in the manual of the manufacturer of the gearmotor.	Examine the oil level.	Fill the oil to the applicable level.
	Examine the oil for contamination.	Change the oil.
	Examine the air gap of the brake.	Adjust the air gap.
All bolt connections	Examine all bolt connections.	Tighten bolts using the correct tool and torque.

6.3.6 1-Yearly maintenance (or 2,000 running hours)



Note

1-Yearly maintenance, or after 2,000 running hours, whichever comes first.

1-Yearly preventive maintenance - vertical conveyor

Item	Task	Action when required by the task
Trolleys	Examine if the trolleys runs through the curves smoothly	Inspect individual parts of the trolley. Refer to sections 6.9.2 and 6.9.3.
Collar bearing on trolleys	Examine for slack. Refer to section 6.8.	Part information, refer to section 9.8.3. Replace the part. Refer to section 6.9.5.

Item	Task	Action when required by the task
Rubber profile carriage in the trolleys.	Examine for slack.	Part information, refer to section 9.8.3 . Replace the part.
Other parts of the trolleys	Examine for slack and wear.	Replace the part if required.
Plain bearing (diameter 50 mm) of bottom sprocket	Examine for slack.	Part information: art. 1005521. Replace the part. Refer to section 6.7 .
Shim washers of bottom sprocket	Examine if the sprocket is in line with the vertical running surface.	Part information: AE0013502. Refer to 6.9.10 .
Upper sprocket alignment	Examine if the sprocket is aligned with the vertical running surface.	Refer to section 6.9.11 .

6.3.7 2-yearly maintenance (or 10,000 running hours)



Note

2-yearly maintenance, or after 10,000 running hours, whichever comes first.

2 yearly Preventive maintenance - vertical conveyor

Item	Task	Action when required by the task
Gearmotor Follow the instructions in the manual of the manufacturer of the gearmotor.	Change the oil.	

6.4 Cleaning



Warning

**Avoid that electrical components touch water or other liquids.
Do not clean the machine with water under high pressure.**

**Caution**

Do not use any corrosive and inflammable solvents or cleaning agents on the machine that contain TRI, PER, TETRA or FCHC.

If you use chemical substances (cleaning agents), obey the instructions on the packaging and in the MSDS (material safety data sheet).

Avoid that parts made of rubber or plastic, such as cables and gaskets, touch oil, solvents or other chemicals.

1. Switch the main switch to "OFF".
2. Lock the main switch with a personal lock.
3. Remove deposit and dirt by hand.
4. Report any damage to the technically responsible person or to Qimarox.
5. Make sure that any damage is remedied before a start of the machine.

6.5 Lubrication

6.5.1 Lubricate the chain

Non foodgrade function:

Lubricate the chain with Nigrider SNY-1.

Foodgrade function:

Lubricate the chain with Kluber UH1-1500 (foodgrade lube) or equivalent.

6.5.2 Lubricate the wheels of the trolleys

Lubricate the running surfaces of the wheels with Bel-Ray No-Tox HD Grease (62270, 62280) or equivalent.

6.5.3 Lubricate the guide wheels of the levellers

Lubricate the running surfaces of the wheels with Bel-Ray No-Tox HD Grease (62270, 62280) or equivalent.

6.6 Chain maintenance

6.6.1 General

The chain wears and elongates. How fast elongation occurs depends on the conditions of use. Most of the elongation occurs in the first weeks of operation. The elongation has an effect on the chain tension.

- Too low chain tension causes noises at the bottom sprocket and a jerky fork movement.
- Too high chain tension causes extra wear and may damage the bearings of the gearmotor.

6.6.2 Measuring chain elongation

Required tool: chain wear gauge.



Warning

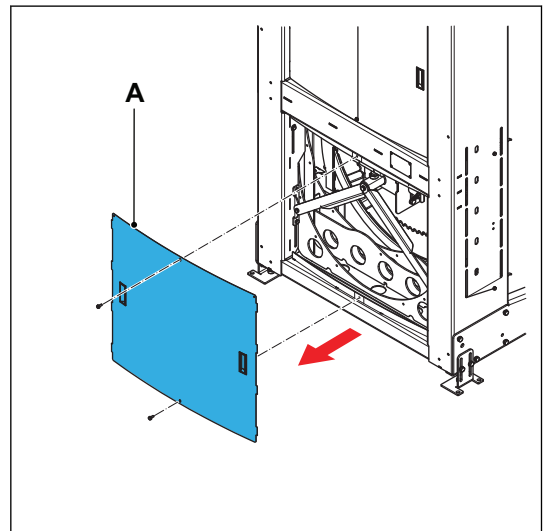
Replace the chain when required

To measure the chain elongation:

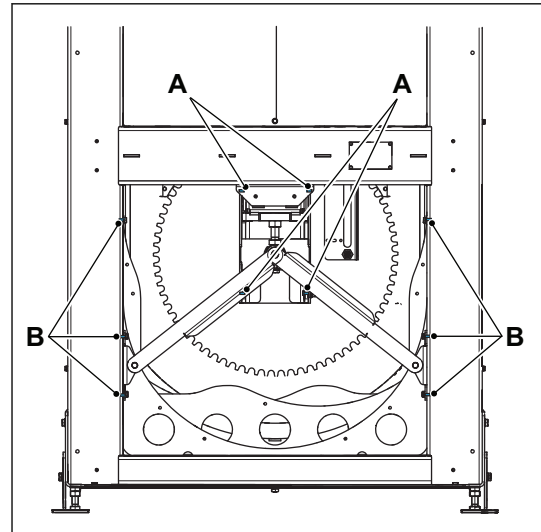
1. Use the chain wear gauge to measure the stretch amount [%].
2. Examine the elongation in [%].
 - If the chain elongation is lower than 2%, adjust the chain tension. Refer to section [6.6.3](#).
 - If the chain elongation is 2 - 3 %, the chain must be replaced soon. Replace the chain with 4 weeks.
 - If the chain elongation is 3% or more, replace the chain immediately. Refer to section [6.9.9](#).

6.6.3 Adjusting the chain tension

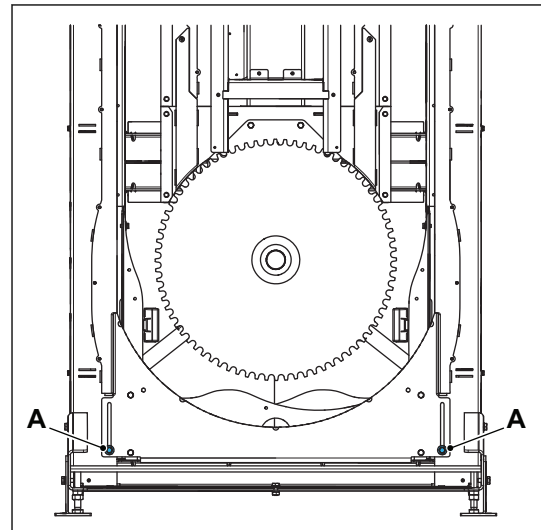
1. Remove the bottom cover of the bottom section (A).



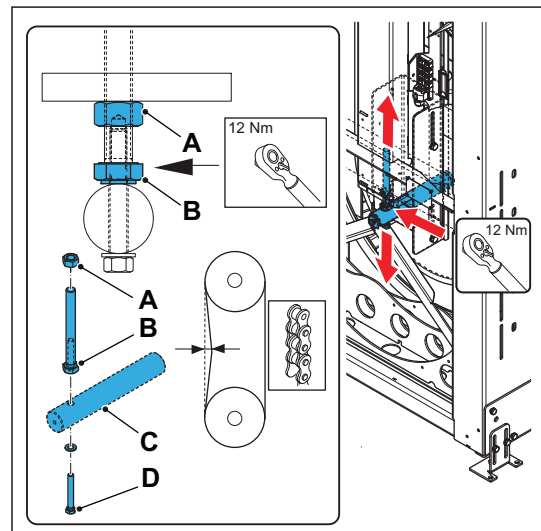
2. Loosen the four bolts M12 (A) at the side of the tension block.
3. Loosen the six bolts (B) at the back, three bolts on each side, that attach the curve frame to the main frame.



4. Loosen the two bolts (A) on the front that attach the turning plate to the main frame.



5. Unlock the locking nut (A).
6. Turn the tensioning bolt (B) to tighten or to slacken the chain:
 - Turn counterclockwise with a torque of 12 Nm to tighten.
 - Turn clockwise to slacken.
7. Reassemble the parts in reverse order.



6.7 Bottom sprocket plain bearing rejection dimension

Replace the plain bearing (diameter 50 mm) of the bottom sprocket every 2,000 running hours or when the diameter is 51 mm or more.

6.8 Plain bearing (between trolley and leveller) rejection dimension

Replace the bearings every 2,000 running hours or when the diameter is bigger than the rejection dimension.

Trolley type	Diameter [mm]	Rejection dimension (internal diameter) [mm]
Normal	30	30.5
HD	35	35.5

6.9 Replace parts

6.9.1 General

Some machine parts are subject to wear. See the Specifications document and the exploded view for the specifications of the machine parts.



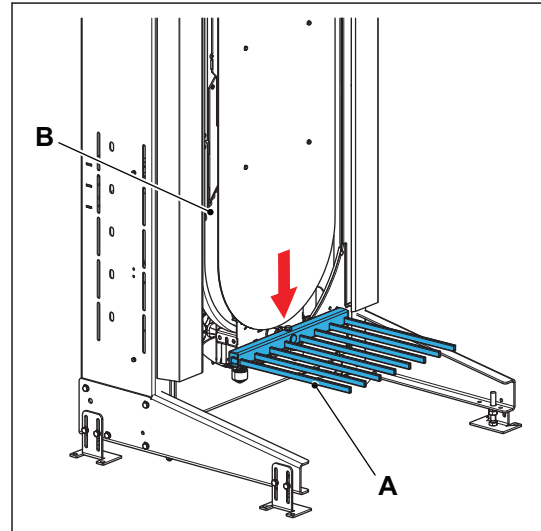
Warning

Always replace parts with parts supplied or recommended by Qimarox. If parts are not replaced with supplied or recommended Qimarox parts, the machine warranty becomes null and void. Refer to section 2.3.

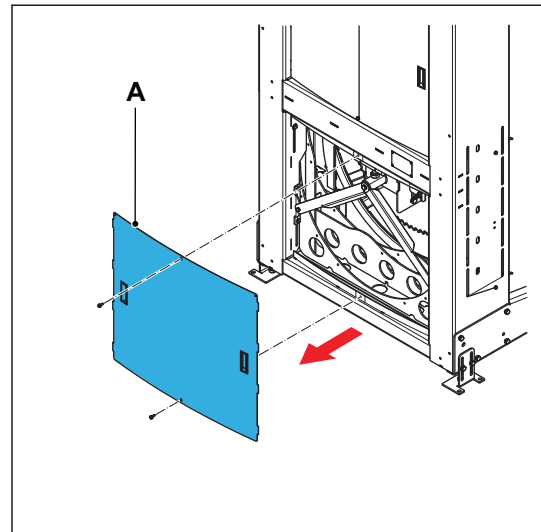
6.9.2 Trolley

Remove the trolley (preparation)

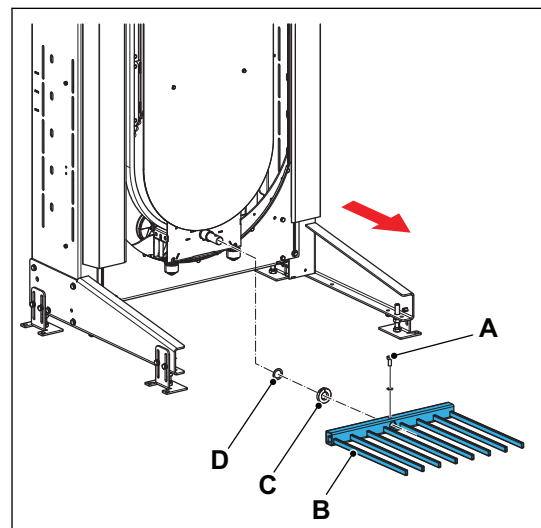
1. Move the fork (A) to the bottom sprocket (B).
2. Switch the main switch to "OFF".
3. Lock the main switch with a personal lock.
4. Loosen the tension of the chain.
Refer to section [6.6.3](#).

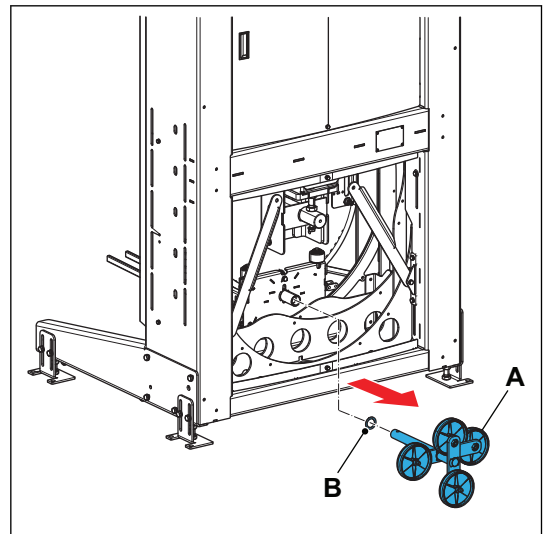


5. Remove the bottom cover at the rear of the bottom section (A).



6. Remove the bolt (A).
7. Remove the fork (B).
8. Remove the adjusting ring (C) and the shim ring (D).





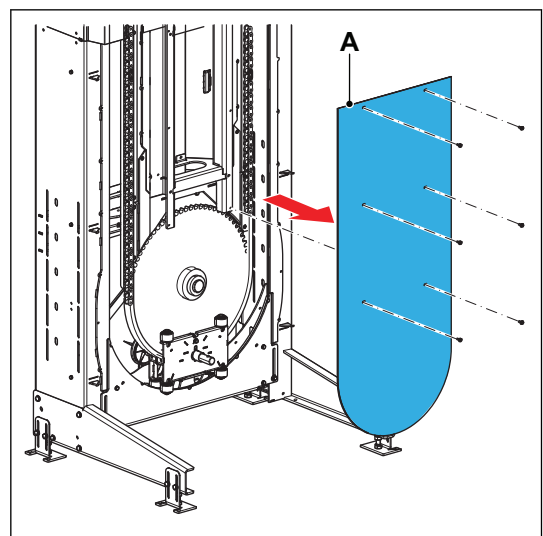
Note

Pay attention to shim ring (B).

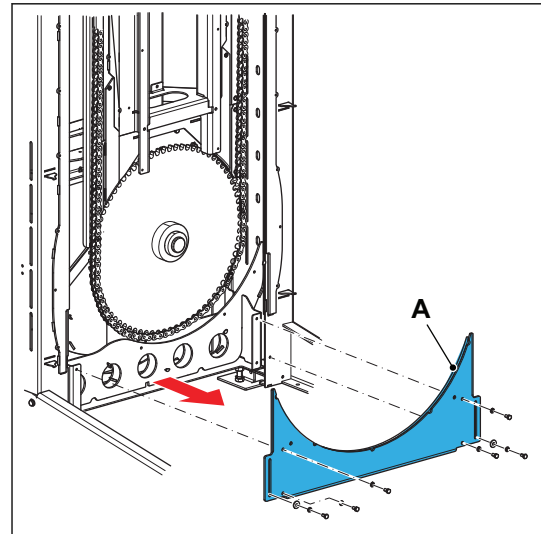
- Carefully remove the leveller (A) from the machine.

Remove the trolley

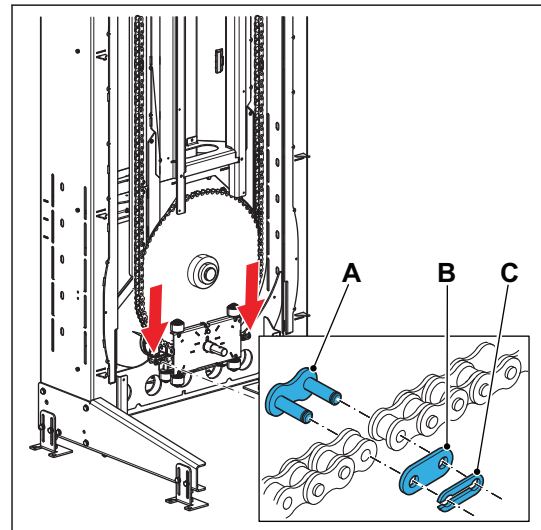
- Remove the front cover (A).



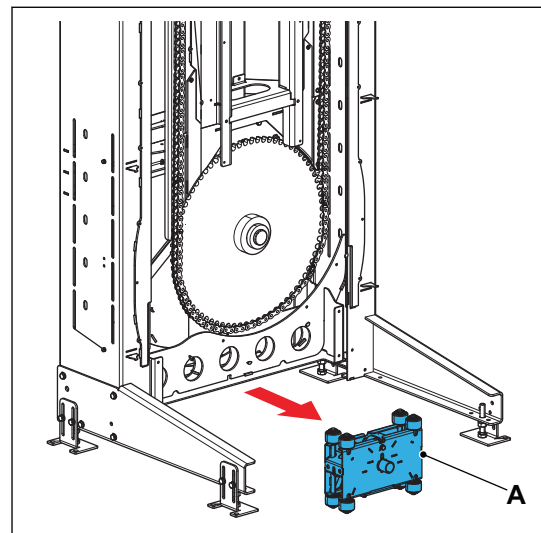
2. Remove the curve plate (A). Refer to section 6.9.7.



3. Remove the closing links (A, B, C) at both sides of the trolley.



4. Remove the trolley (A).



Replace the trolley

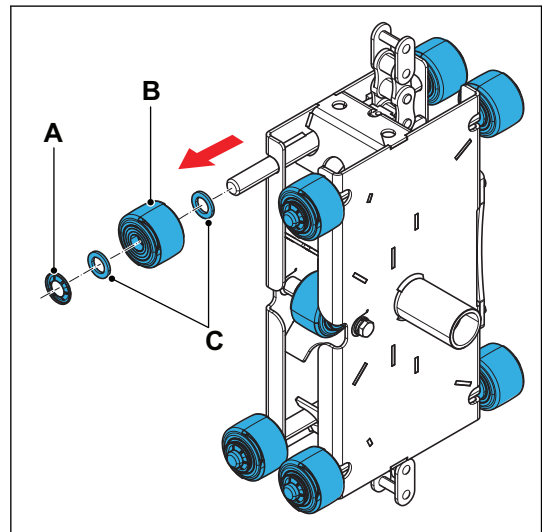
1. Check the parts for wear.

2. Replace worn parts by new ones. Refer to section [6.9.3](#).
3. Reassemble the parts in reverse order.

6.9.3 Wheel of the trolley

Remove the wheel

1. Remove the trolley. Refer to section [6.9.2](#).
2. Remove the Starlock (A).
3. Use a pulley puller to remove the wheel (B).



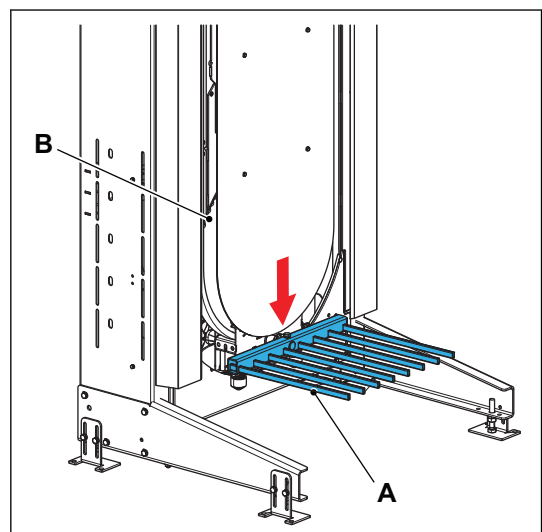
Replace the wheel

1. Check the parts for wear.
2. Replace worn parts by new ones.
Make sure that, when you attach the Starlock, the wheel has no play.
3. Reassemble the parts in reverse order.

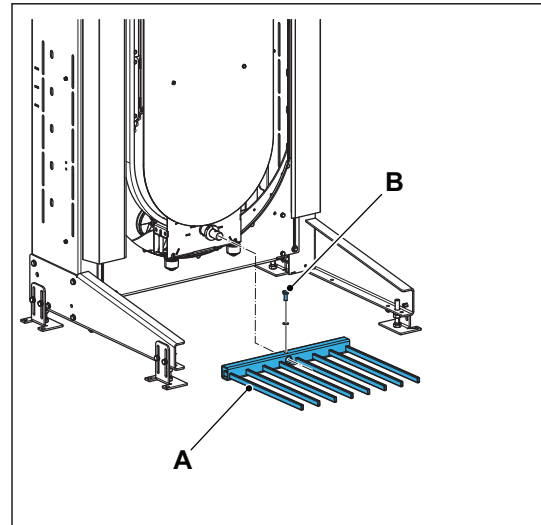
6.9.4 Fork

Remove the fork

1. Move the fork (A) to the bottom sprocket (B) or another position where you can level the fork (A).
2. Switch the main switch to "OFF".
3. Lock the main switch with a personal lock.



4. Remove the bolt (B).
5. Remove the fork (A).



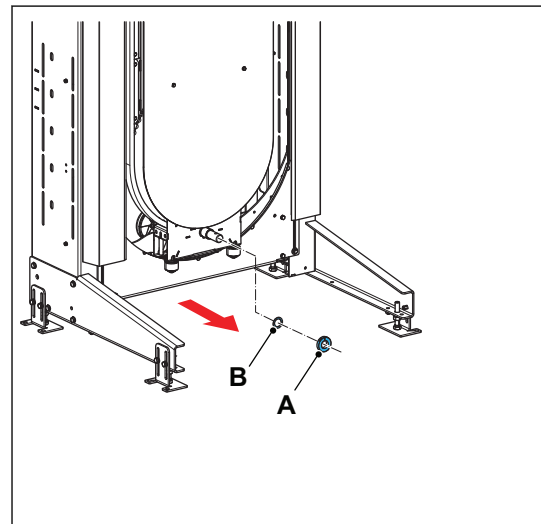
Replace the fork

1. Check the parts for wear.
2. Replace worn parts by new ones.
3. Reassemble the parts in reverse order.
4. Make sure that the fork is level.

6.9.5 Plain bearings of the trolley

Remove the plain bearing - front side

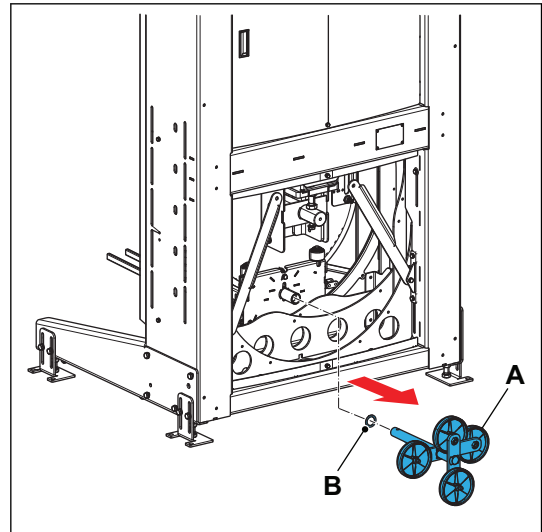
1. Remove the fork. Refer to section [6.9.2](#).
2. Remove the adjusting ring (A).
3. Remove the shim ring (B).



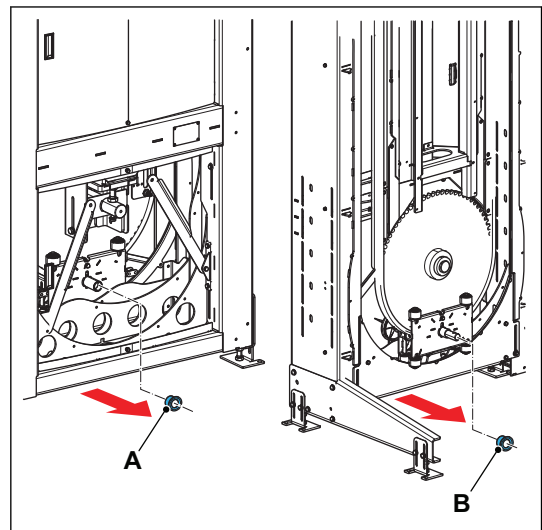
Note

Pay attention to shim ring (B).

4. Carefully remove the leveller (A) from the machine.
5. Remove the shim ring (B).



6. Remove the bearings at the front side (B) and rear side (A).

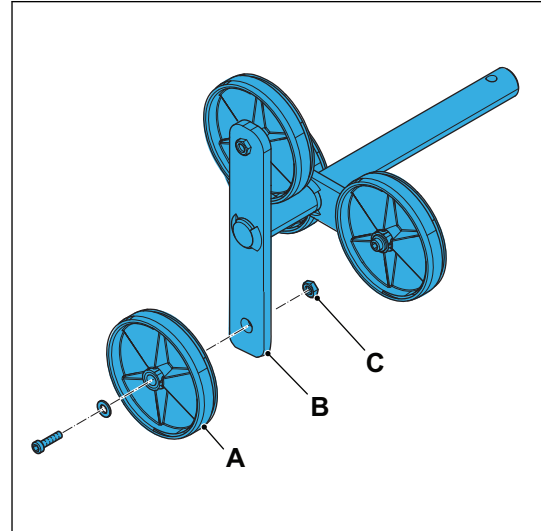


Replace the leveller

1. Check the parts for wear. Refer to section [6.8](#).
2. Replace worn parts by new ones.
3. Reassemble the parts in reverse order.

6.9.6 Wheel of the leveller

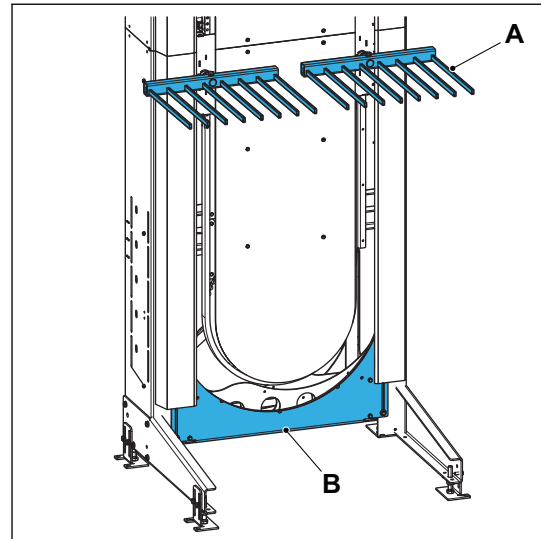
1. Remove the leveller. Refer to section [6.9.5](#).
2. Loosen the bolt.
3. Replace the wheel (A) of the leveller (B).
4. Replace the bolt.
5. Apply Loctite 243 to the bolt.
6. Tighten the bolt with a torque of 30 Nm.
7. Apply Loctite 603 to a lock nut (C).
8. Attach the lock nut (C) at the bolt.
9. Clean the running surfaces of the wheels.
10. Lubricate the running surfaces of the wheels with Bel-Ray No-Tox HD Grease (62270, 62280) or equal.
11. Install the leveller. Refer to section [6.9.5](#).



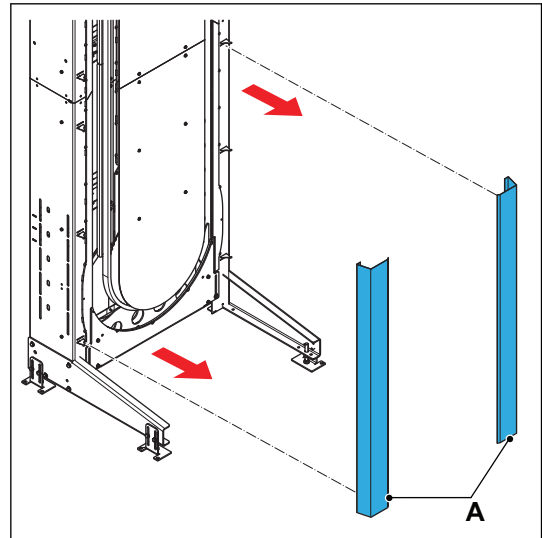
6.9.7 Curve plate - bottom side

Removal the curve plate

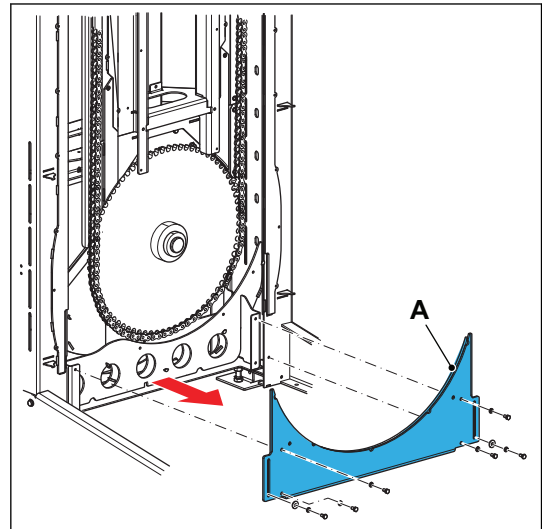
1. Move the fork (A) away from the bottom curve plate (B).
2. Switch the main switch to "OFF".
3. Lock the main switch with a personal lock.



4. Remove the side covers (A).



5. Remove the curve plate (A).



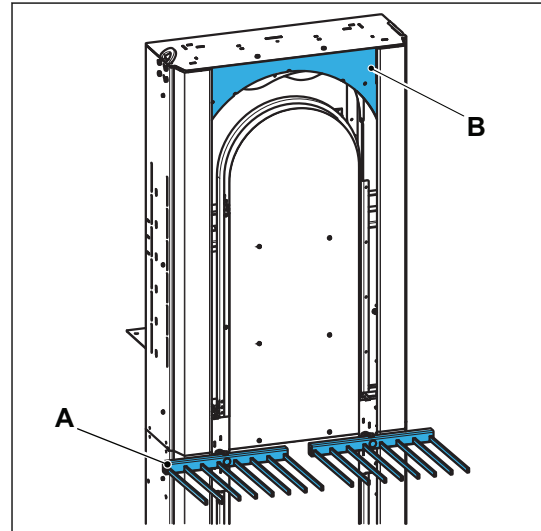
Replace the curve plate - bottom side

1. Check the parts for wear.
2. Replace worn parts by new ones.
3. Reassemble the parts in reverse order.

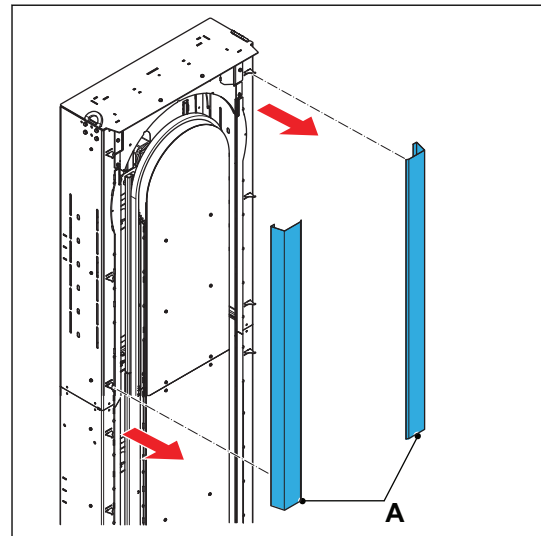
6.9.8 Curve plate - upper side

Uninstall the curve plate

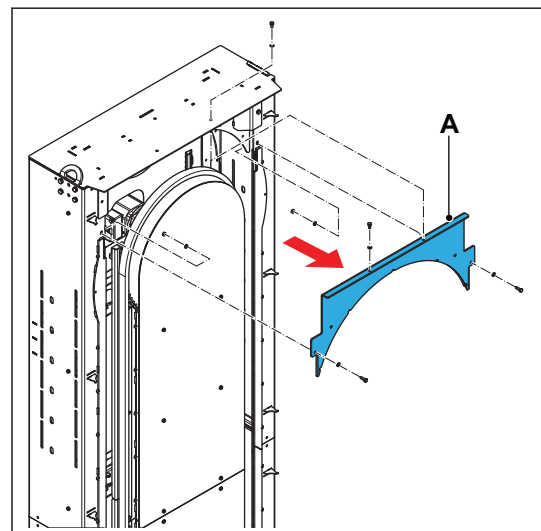
1. Move the fork (A) away from the upper curve plate (B).
2. Switch the main switch to "OFF".
3. Lock the main switch with a personal lock.



4. Remove the side covers (A).



5. Remove the curve plate (A).



Install the curve plate

1. Check the parts for wear.
2. Replace worn parts by new ones.
3. Reassemble the parts in reverse order.

6.9.9 Chain

General



Warning

Make sure that there are no products on the fork.

Make sure that the whole chain is replaced when done.

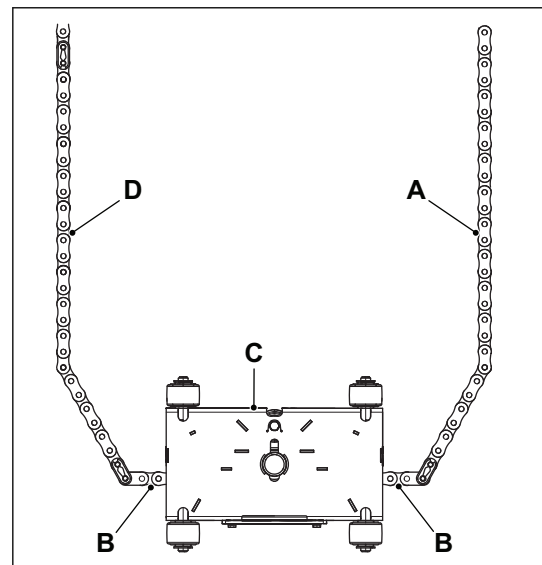
Replace the chain one section at a time. This provides for safe replacement of the complete chain without having to remove it from the top of the machine.



Caution

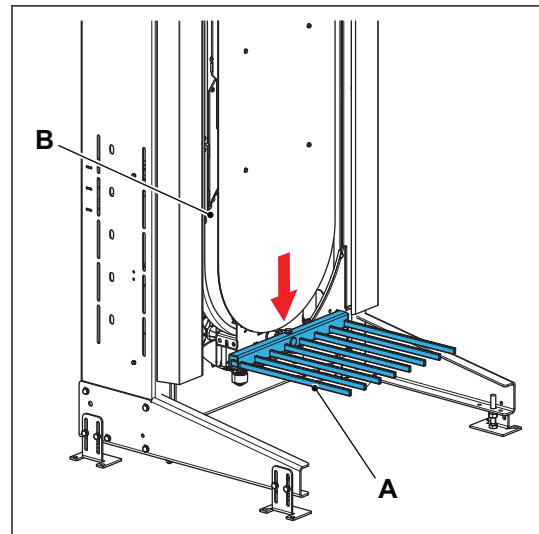
When you replace the chain, do also replace the chain in the trolley (7 links).

- A. Chain section 1
- B. Chain section of the trolley
- C. Trolley
- D. Chain section 2

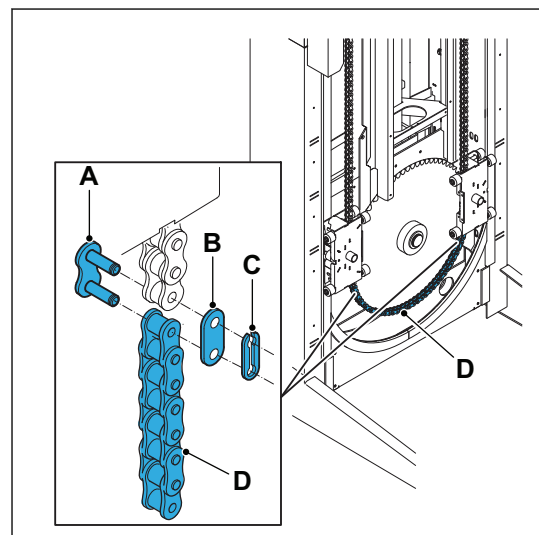


Remove a chain section

1. Move the fork (A) to the bottom sprocket (B).
2. Switch the main switch to "OFF".
3. Lock the main switch with a personal lock.
4. Remove the fork (A).

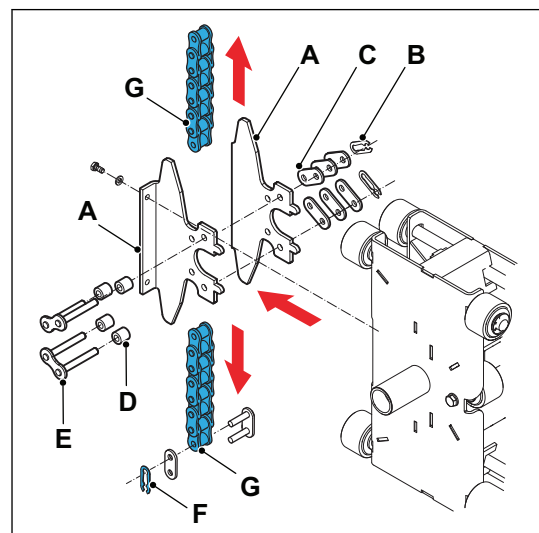


5. Remove the covers.
6. Release the tension of the chain by loosening the tensioning bolt. Refer to section 6.6.3.
7. Remove the locking plates (C) on both sides of the chain. The locking plates (C) attach the end link (A) to the catch (B).
8. Remove the carrier. Refer to section 6.9.4.



Remove the chain from the trolley

1. Remove the supports (A) with the chain section by loosening the bolts.
2. Remove the locking plates (B). The locking plates (B) attach the end links (E) and the bushes (D) to the catch (C).
3. Remove the locking plates (F) that attach the chain (G) to the supports (A).
4. Remove the two parts of chain (G).



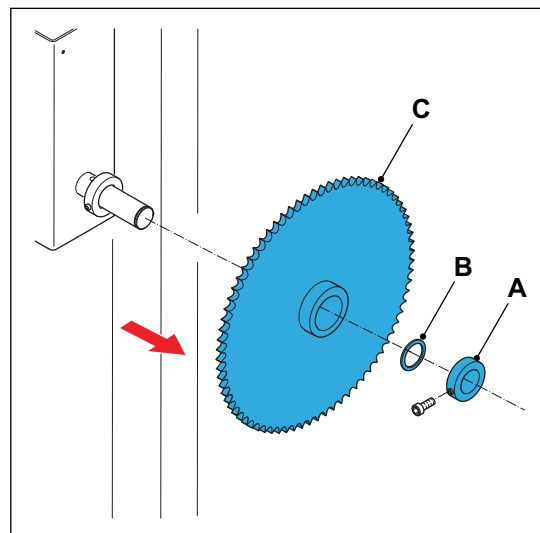
Install a chain section

1. Check the parts for wear.
2. Replace worn parts by new ones.
Make sure that the new chain section has the same number of links as the removed chain section.
3. If the chain is fully replaced: adjust the chain tension. Refer to section [6.6.3](#).
4. Reassemble the parts in reverse order.

6.9.10 Bottom sprocket and bearing

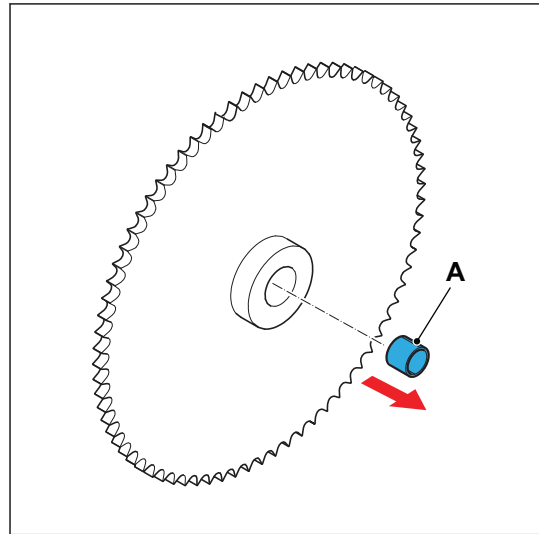
Remove the bottom sprocket

1. If necessary, remove the trolley. Refer to section [6.9.2](#).
2. Move the trolley away from the tensioning sprocket.
3. If the trolley can not be moved away from the tensioning sprocket, remove or split the chain section. Refer to section [6.9.9](#).
4. Remove the adjusting ring (A).
5. Remove the shim ring (B).
6. Remove the tensioning sprocket (C).



Replace the bottom sprocket bearing

1. Check the plain bearing (A) for wear.
Refer to section 6.7.
2. Replace worn parts by new ones.
3. Reassemble the parts in reverse order.



Caution

Align the sprocket correctly to prevent damage to the chain.

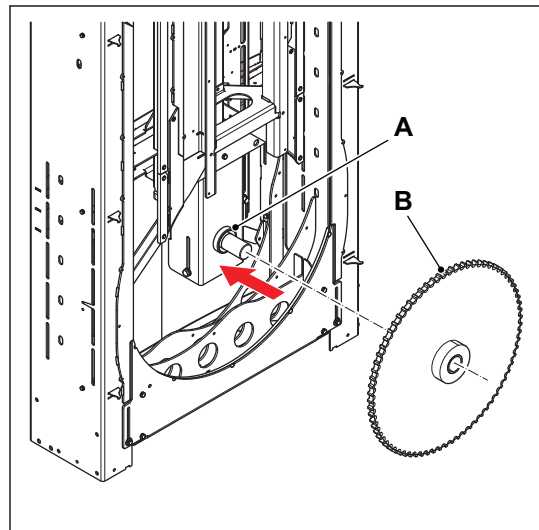
Chain - Install the bottom sprocket - prorunner mk5



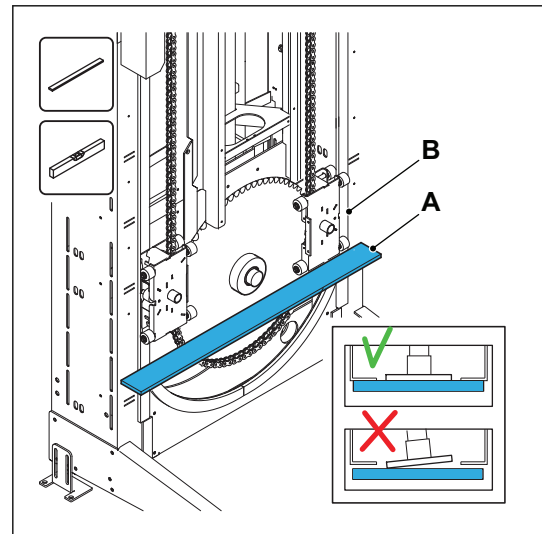
Note

Illustrations for the replacement procedure: see the illustrations for the removal procedure in reverse order.

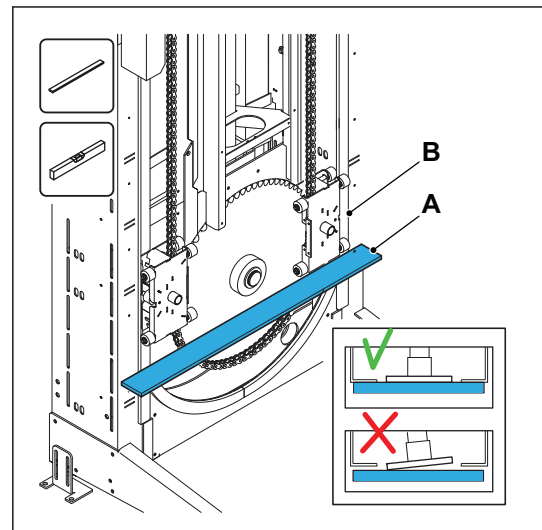
1. Install the sprocket (B) onto the shaft.
2. The adjusting ring (A) behind the sprocket (B) was aligned with the removed bearing. The new sprocket bearing requires a re-alignment.



3. Align the sprocket for the first time.
4. To align the sprocket with the side guides (B) of the chain, use a ruler (A).



5. Install the shim ring and the adjusting ring onto the shaft. Align the sprocket for the last time.
6. To align the sprocket with the side guides (B) of the chain, use a ruler (A).
7. Install the chain. Refer to [6.9.9](#).
8. Install the cover. Refer to [6.9.2](#).



Caution

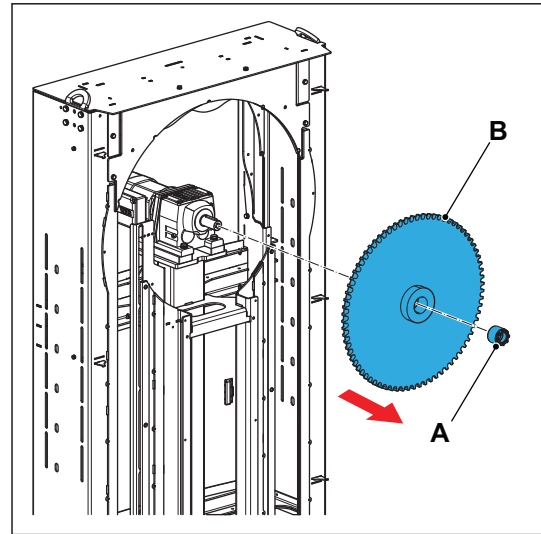
Align the sprocket correctly to prevent damage to the chain.

6.9.11 Replace the upper sprocket

Remove the upper sprocket

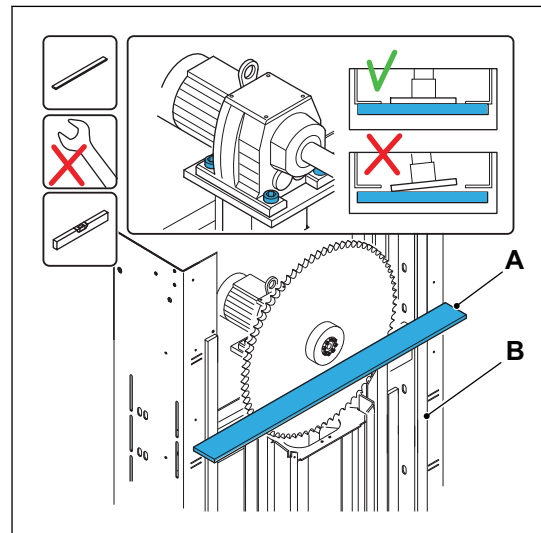
1. Make sure that the closing link of the chain is at the bottom of the machine.
2. Switch the main switch to "OFF".
3. Lock the main switch with a personal lock.
4. Remove the chain as a whole. Refer to section [6.9.9](#).

5. Remove the clamping bush (A).
6. Remove the sprocket wheel (B).



Replace the upper sprocket

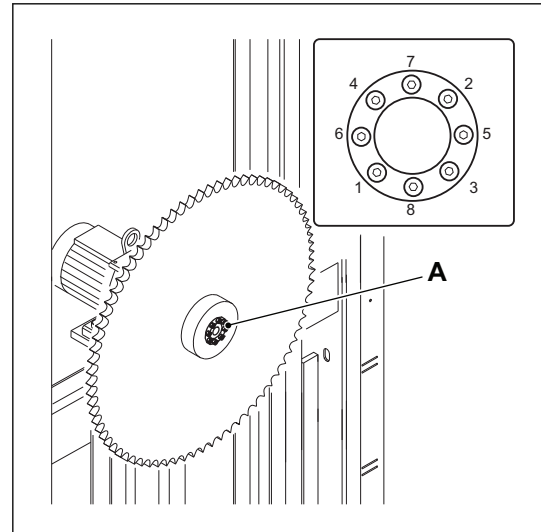
1. Check the parts for wear.
2. Replace worn parts by new ones.
3. Attach the upper sprocket with the clamping bush onto the upper sprocket shaft.
4. To align the upper sprocket with the guide strips (B) of the trolley, use a ruler (A).



Caution

Align the sprocket correctly to prevent damage to the chain.

5. Tighten the clamping bush (A) in the indicated sequence.
Use the following torques:
 - shaft diameter \leq 40 mm: 17 Nm
 - shaft diameter \leq 65 mm: 41 Nm
 - shaft diameter \leq 95 mm: 83 Nm
6. Install the chain. Refer to section [6.9.9](#).
7. Reassemble the parts in reverse order.



6.9.12 Replace the drive - R-series

General

If the machine is fitted with a FA-series gearmotor, refer to [6.9.13](#).

Lock the upper sprocket

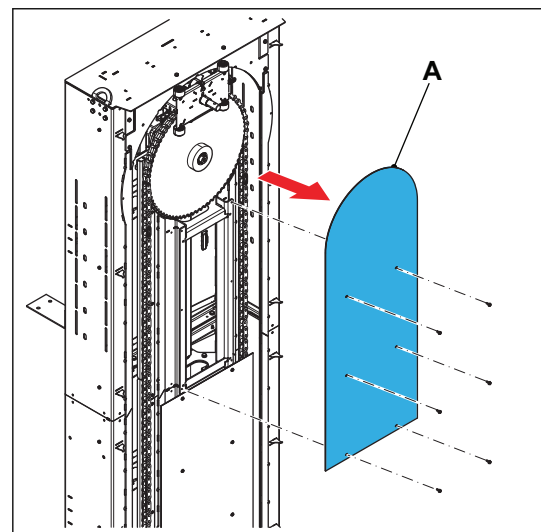


Warning

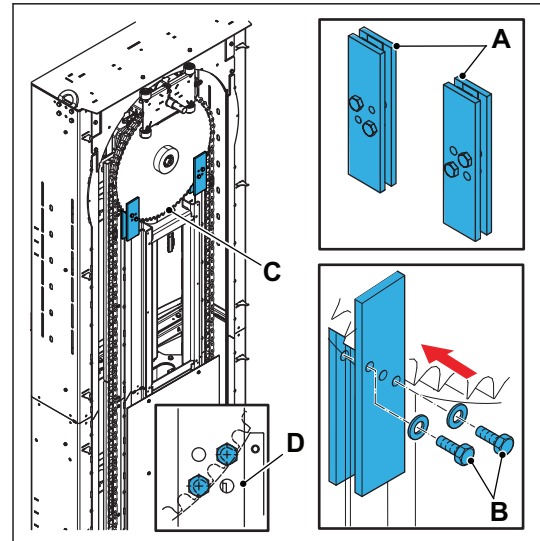
To prevent the upper sprocket to tilt, fall or turn, use the auxiliary tool (item 1001052). The auxiliary tool attaches the sprocket to the frame.

Attach the sprocket correctly to prevent injury and to easily remove and replace the drive or shaft.

1. Make sure that the closing link of the chain is at the bottom of the machine.
2. Switch the main switch to "OFF".
3. Lock the main switch with a personal lock.
4. Remove the front cover (A) at the upper sprocket.



5. Put the auxiliary tools (A) into position.
6. Install the two M16 x 40 bolts (B) (2x).
7. Tighten the bolts to attach the upper sprocket (C) to the frame (D).



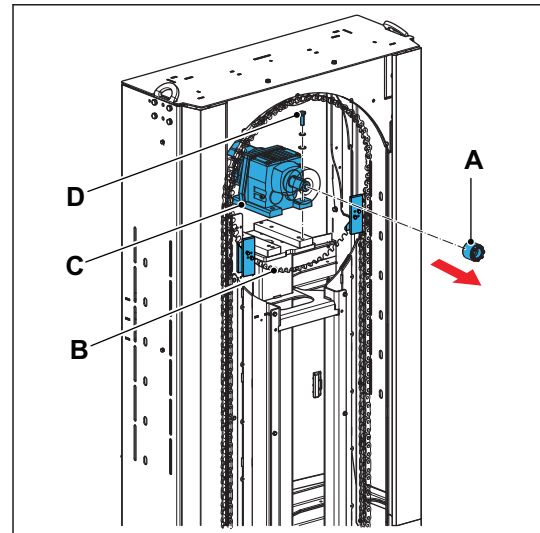
Remove the drive



Warning

Before you loosen the bolts, safety the drive to prevent it from tipping or falling down.

1. Lock the upper sprocket (B). Refer to section [6.9.12.2](#).
2. Disconnect the electrical wires.
3. Remove the clamping bush (A).
4. Remove the bolts (C).
5. Remove the drive (D) carefully.



Install the drive

1. Check the parts for wear.
2. Replace worn parts by new ones.
3. Reassemble the parts in reverse order.

6.9.13 Replace the drive - FA-series

General

If the machine is fitted with a R-series gearmotor, refer to [6.9.12](#).

Lock the upper sprocket

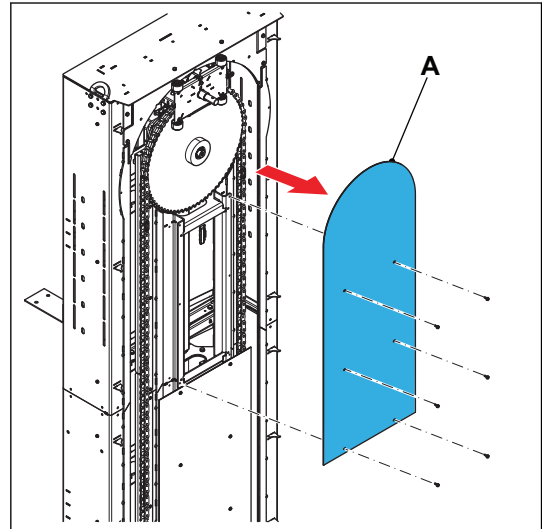


Warning

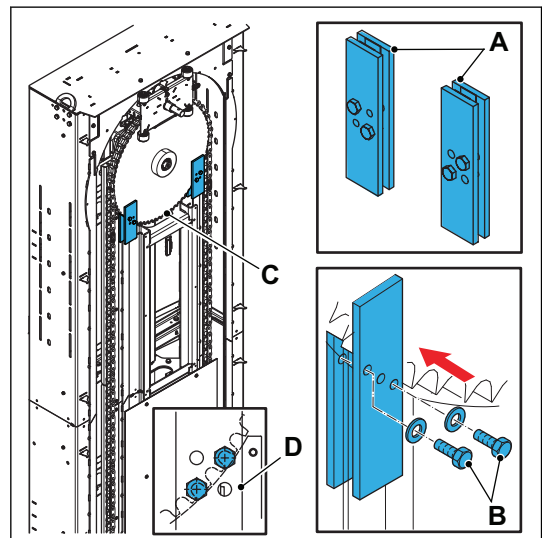
To prevent the upper sprocket to tilt, fall or turn, use the auxiliary tool (item 1001052). The auxiliary tool attaches the sprocket to the frame.

Attach the sprocket correctly to prevent injury and to easily remove and replace the drive or shaft.

1. Make sure that the closing link of the chain is at the bottom of the machine.
2. Switch the main switch to "OFF".
3. Lock the main switch with a personal lock.
4. Remove the front cover (A) at the upper sprocket.



5. Put the auxiliary tools (A) into position.
6. Install the two M16 x 40 bolts (B) (2x).
7. Tighten the bolts to attach the upper sprocket (C) to the frame (D).



Uninstall the gearmotor

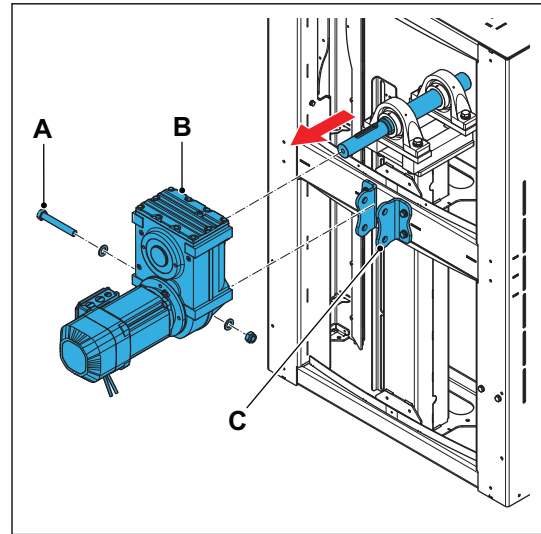


Warning

Before you loosen the bolts, safety the drive to prevent it from tipping or falling down.

1. Switch the main switch to "OFF".
2. Lock the main switch with a personal lock.
3. Disconnect the electrical wires.

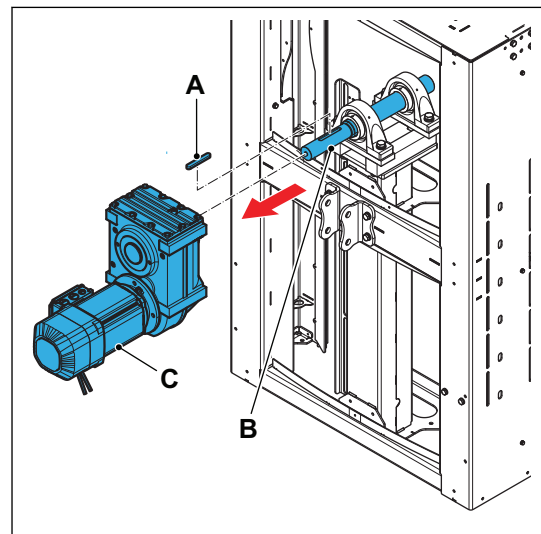
4. Remove the bolt (A).
5. Disconnect the gearmotor (B) from the reactor bar brackets (C).



Note

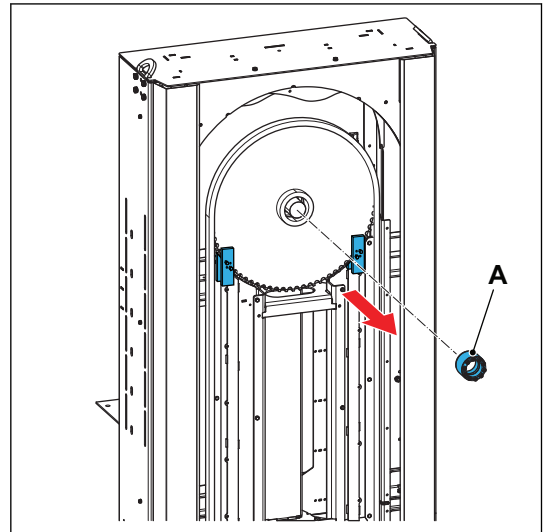
Make sure that the key (A) does not fall.

6. Remove the gearmotor (B) carefully from the shaft (C).

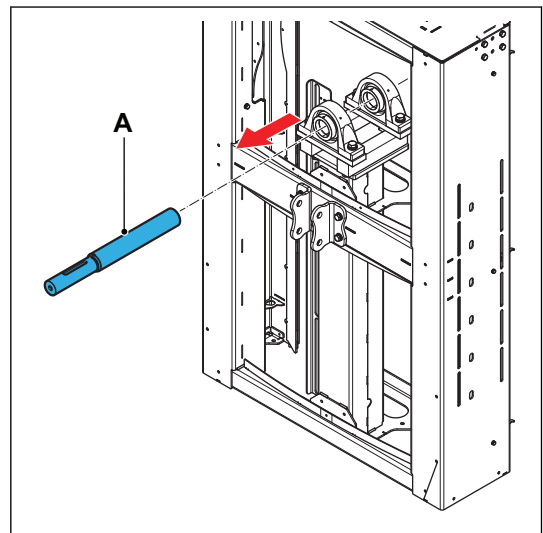


Remove the main shaft

1. Remove the clamping bush (A) from the shaft.

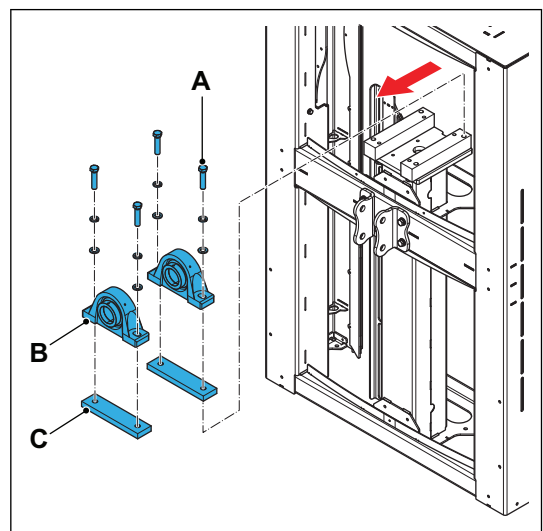


2. Remove the main shaft (A) from the bearing.



Uninstall the bearings

1. Remove the bolts (A) to remove bearings (B) and bearing block spacers (C).



Install the gearmotor

1. Check the parts for wear.
2. Replace worn parts by new ones.
3. Reassemble the parts in reverse order.

7 Troubleshooting

This section includes the troubleshooting information of the vertical conveyor.

Problem	Possible cause	Solution
Product blockage at conveyor	Sensor defect.	3. Go to manual control. 3. Move the fork in the opposite direction to release the clamped product. 3. Remove the clamped product.
The motor does not run.	Electrical failure.	Find and repair the cause.
	The operation or main power supply switch is set to "OFF".	Set the operation/main power supply switch to "ON".
	The door switch or emergency stop is active.	3. Make sure that the work area and machine are safe. 3. Unlock the emergency stop switch..
Shavings under the machine.	Trolley too tight at the side guides.	Adjust the 9th wheel.
	Sprocket not in line with the side guides and the curve plates.	Align the sprocket. Refer to section 6.9.10 and 6.9.11
Fingers of the fork touch parts of the conveyors.	Conveyors not aligned correctly.	Adjust the conveyors. Refer to section 5.9 .
	Sprocket not in line with the side guides and the curve plates.	Align the sprocket. Refer to section 6.9.10 and 6.9.11
	Fingers bent.	Align or replace the fingers of the fork.

Problem	Possible cause	Solution
The motor does not run and makes a humming noise.	Mechanical or electrical failure.	Only let an authorised qualified person disconnect the motor.
	No full power.	Examine the power cable for a break or short circuit.
	Poor contact.	Examine the terminal clamps.
	Defect in the motor.	Examine the connection and the motor winding.
	Blown fuse.	Replace the fuse.
	Thermal safeguard triggered.	Overheating or wiring fault. Find and repair the cause.
	Motor protection triggered by short circuit or overload.	3. Find and repair the cause. 3. Reset the motor protection.
	Defective power controller.	3. Find and repair the cause. 3. Replace the power controller.
The motor starts with difficulty.	Electrical faults such as "The motor does not run and makes a humming noise". The motor uses more energy than normal.	3. Check the starting current and the nominal current. 3. Find and repair the cause.



Problem	Possible cause	Solution
The motor is overheated.	The motor was designed for a star connection but has been connected in a triangle.	Connect the motor according to the Specifications document.
	Voltage and/or frequency deviates from the nominal value when switching on.	Connect the motor according to the data on the type plate.
	The supply voltage deviates more than 5% from the nominal motor voltage.	Find and repair the cause.
	Not sufficient motor cooling.	3. Examine the ventilation openings in the motor housing for blockage. 3. Examine the fan for damage.
The motor overheats and runs only at a low speed.	Loose contact or broken cable in the power circuit of the motor.	Find and repair the cause.
	Too high use of energy.	3. Examine the weight of the product. Refer to the Specifications document or the type plate. 3. Examine the motor for ease of movement.
The motor makes a noise and does not run properly.	The motor runs with 2 phases, e.g. because of a faulty connection, broken cable or a defective winding.	3. Examine the connections and the cable. 3. Remove the motor for repair. Refer to sections 6.9.13 or 6.9.12 .

Problem	Possible cause	Solution
The fuses blow and/or the motor protection is triggered.	The power terminals are incorrectly connected.	Connect the power terminals in the correct way.
	Short circuit in the power.	Repair the short circuit.
	Wrong fuse (too low value).	Adjust the fuse to the nominal motor current.
	Motor protection poorly set.	Adjust the motor protection to the nominal motor current.
	Short circuit in the winding. Short circuit to earth.	Remove the motor for repair. Refer to sections 6.9.13 or 6.9.12 .
The motor does not run. The motor protection is triggered immediately.	Incorrect setting of the motor protection.	Check and/or adjust the motor protection to the correct value.
	The mechanical drive, sprockets, chain, trolleys, levellers and forks are blocked.	3. Remove the blockage. 3. Clean the machine. 3. Examine the sprockets, wheels, bearings and such components for damage or incorrect adjustment. - If possible, shorten the inspection / maintenance / cleaning intervals.
The motor does not run.	The operation or main power supply switch is set to "OFF".	Set the operation/main power supply switch to "ON".
	The door switch or emergency stop is active.	Make sure that the work area and machine are safe. Unlock the emergency stop switch.
Use of energy (motor current) too high and higher motor temperature.	The products weigh too much.	Obey the specifications for use of the machine.

Problem	Possible cause	Solution
Use of energy (motor current) too high and wear of chains.	The chain tension is too high.	Lower the tension of the chain. Refer to section 6.6.3 .
	The chain is not in line with the sprockets or guide strips.	Align the chain. Refer to section 6.9.10 or 6.9.11 .
Use of energy (motor current) too high and high temperature of the bearing housing (sometimes accompanied by a noise).	Wheel, (ball) bearing, sprocket or such components are blocked.	3. Examine the wheel, (ball) bearing, sprocket or such components. 3. Replace if necessary.
Abnormal noises, unusual vibrations and swinging movements.	Drive system clogged by dirt.	3. Remove dirt or deposit. 3. Examine the movement of the chain. - Shorten the cleaning interval.
	Chains or drive belts are not running parallel.	Examine if the drive shafts are parallel to the frame. Repair if necessary.
	Wheels, sprockets or bearings are damaged or dirty.	3. Examine wheels, sprockets and bearings for damage or dirt. 3. Replace or clean them if necessary.
Irregular movement of the chain.	The tension of the chain is too low.	Tension the chain. Refer to section 6.6.3 .
	Damaged chain.	Replace the chain. Refer to section 6.9.9 .
	Damaged sprocket(s).	Replace the damaged sprocket. Refer to section 6.9.11 .
Increased temperature of the bearings. The sprockets do not turn easily.	Damaged bearings.	Replace the bearings.
	Transport speed too high.	Decrease the transport speed according to the Specifications document.
	Loose bolt connections.	Tighten the loose bolts.
	Other machine parts run loose.	Attach the loose parts.

8 CE declaration of conformity

The CE declaration of conformity depicted below is an example. Refer to the Specifications document for the official declaration.

Prorunner mk5	v5.6		10/10
mk5 19XXXXX rev -			
CE DECLARATION OF CONFORMITY OF THE MACHINERY			
in accordance with Directive 2006/42/EC, Annex II, point 1.A			
Original Declaration			
Qimarox B.V. Nobelstraat 43 3846 CE Harderwijk The Netherlands			
Telephone	+31 (0)341 436 700		
Fax	+31 (0)341 436 701		
E-mail	info@qimarox.com		
hereby declares that the undersigned is authorised to act on its behalf to compile this Technical Dossier for this machine, and also declares that the machine:			
Name	Prorunner mk5		
Function	Vertical transport of products		
Model/Type	mk5		
Method of construction	according to layout drawing		
Date of construction	2019		
Serial number	mk5 19XXXXX		
complies with all applicable provisions of the following Directive(s):			
Directive 2006/42/EC (Machinery Directive)			
Directive 2014/30/EU (EMC Directive)			
Where applicable, the following harmonised standards are used:			
NEN-EN-ISO 12100:2010 (Safety of machinery)			
NEN-EN-IEC 60204-1:2018 (Electrical safety of machinery)			
NEN-EN 619:2002+A1:2010 (Continuous handling equipment and systems - Safety and EMC requirements for equipment for mechanical handling of unit loads)			
City	Harderwijk		
Date	24-10-2019		
Name	P.G. Hannessen	Signature	
Function	Director		

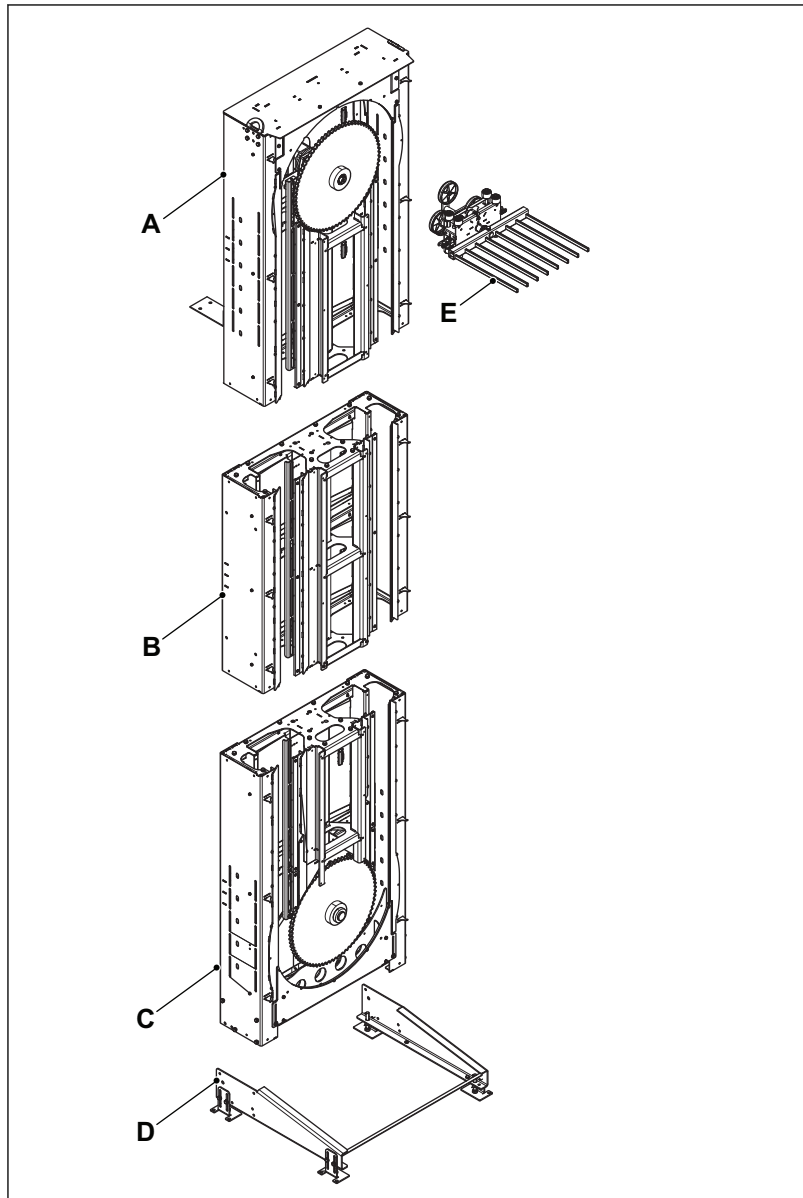
9 Exploded views

9.1 General

All item numbers listed are standard Qimarox item numbers. All items are powder coated (RAL 7037 or RAL 3020) or have a zinc plated surface treatment. If the machine is customized, a separate part list will be included.

9.2 Machine overview

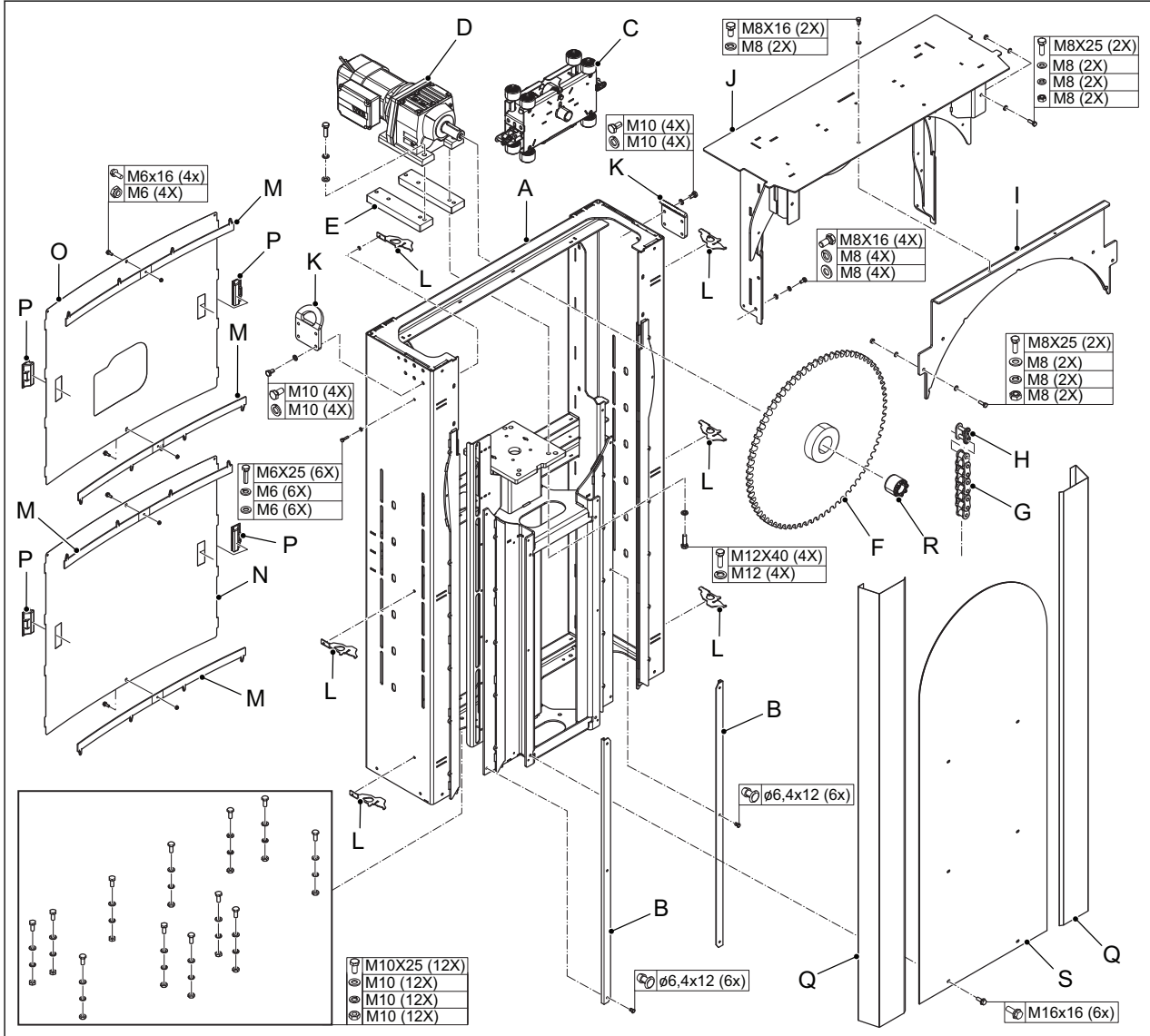
9.2.1 Machine overview



Machine overview parts list

A. Top section	D. Support
B. Middle section	E. Carrier
C. Bottom section	

9.3 Top section

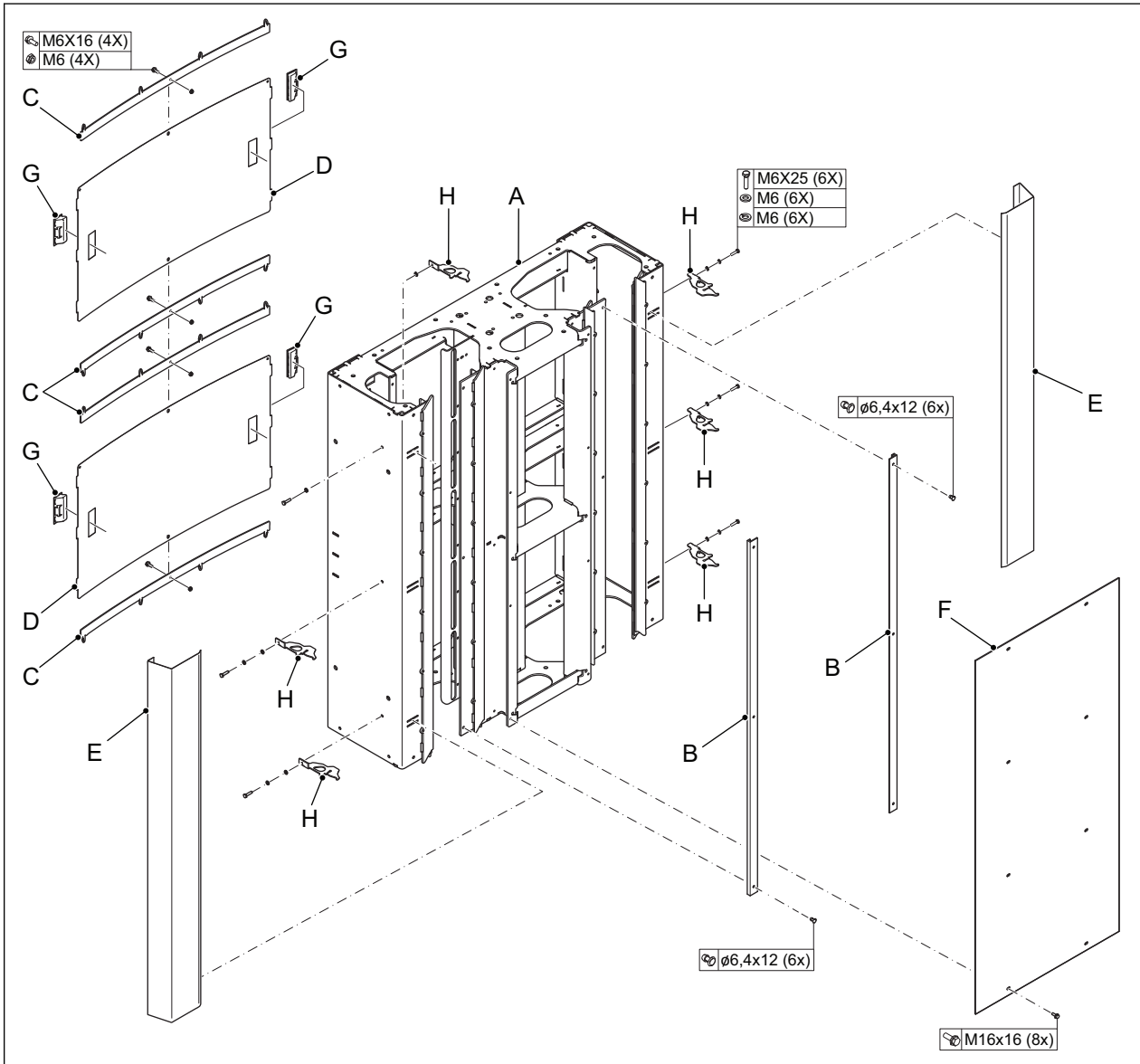


Top section parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	AE0055893	Frame top	L= 1475 mm
	1	AE0049435	Frame top	L= 1725 mm
	1	AE0055921	Frame top	L= 1975 mm
B	2	1000099	Rollerchain guide	L= 800 mm
	2	1000107	Rollerchain guide	L= 1050 mm
	2	1000100	Rollerchain guide	L= 1300 mm
C	See Specifications document	1000214	Trolley	
	See Specifications document	1000820	Trolley HD	
D	1	See Specifications document	Gearmotor	See Specifications document
E	2	1000188	Spacer R57	
	2	1000189	Spacer R67	
F	1	1000111	Sprocket 16B-1 (1") z=76	Clamping bush hole D = 60 mm
	1	1000112	Sprocket 16B-1 (1") z=76	Clamping bush hole D = 65 mm
	1	1001012	Sprocket 16B-1 (1") z=76	Clamping bush hole D = 90 mm
G	See Specifications document	See Specifications document	Chain 16B1	
H	See Specifications document	See Specifications document	Closing link 16B1	
I	1	AE0056651	Turning plate top	
J	1	AE0056231	Curve frame top	
K	2	1000081	Hoisting eye	
L	6	1000692	Clamp side cover	
M	4	AE0039201	Support back cover	
N	1	AE0039316	Back cover	H= 472 mm

Pos	Quantity	Item no.	Item name	Specification
	1	AE0039256	Back cover	H= 722 mm
	1	AE0056836	Back cover	H= 972 mm
O	1	AE0039331	Back cover R-series drive	H= 697 mm
	1	AE0040114	Back cover FA-series drive	H= 697 mm
P	4	1000742	Pull handle TS=0,8-1,2mm	
Q	2	1000737	Side cover	L= 1475 mm
	2	1000753	Side cover	L= 1725 mm
	2	1000789	Side cover	L= 1975 mm
R	1	1000111	Clamping bush DX 35/60 L=51	
	1	1000115	Clamping bush DX 40/65 L=51	
	1	1000803	Clamping bush DX 60/90 L=72	
S	1	AE0056830	Front cover top 1475	
	1	AE0039325	Front cover top 1725	
	1	AE0056834	Front cover top 1975	

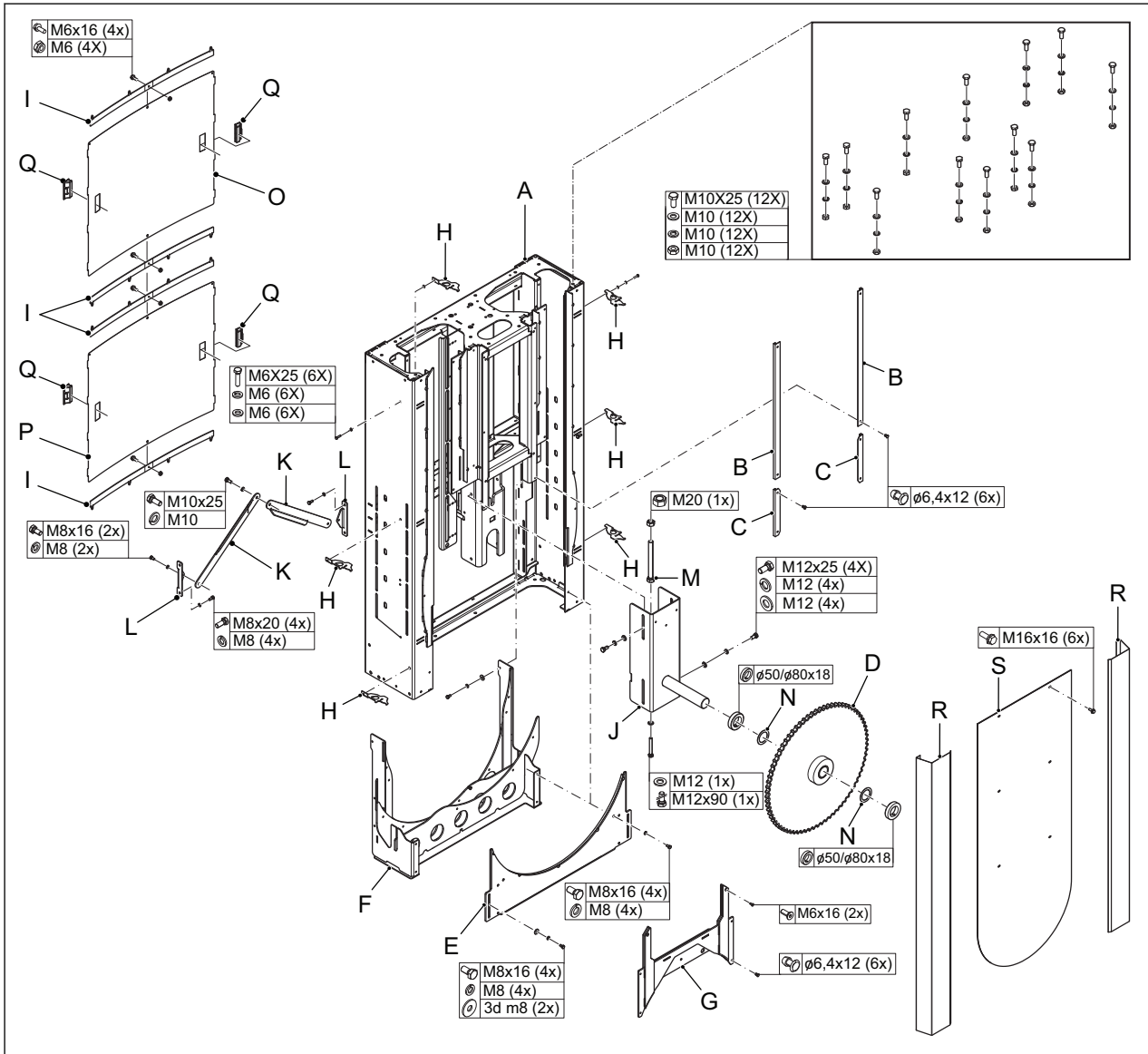
9.4 Middle section



Middle section parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	AE0056133	Frame middle	L= 1250 mm
	1	AE0056168	Frame middle	L= 1750 mm
B	2	1000101	Rollerchain guide	L= 1250 mm
	2	AE0019202	Rollerchain guide	L= 1750 mm
C	4	AE0039201	Support back cover	
D	2	AE0039316	Back cover	H= 472 mm
	2	AE0039256	Back cover	H= 797 mm
E	2	1000802	Side cover	L= 1250 mm
	2	AE0018329	Side cover	L= 1750 mm
F	1	AE0056778	Front cover middle	L= 1250 mm
	1	AE0056791	Front cover middle	L= 1750 mm
G	4	1000742	Pull handle TS=0,8-1,2mm	
H	6	1000692	Clamp side cover	

9.5 Bottom section

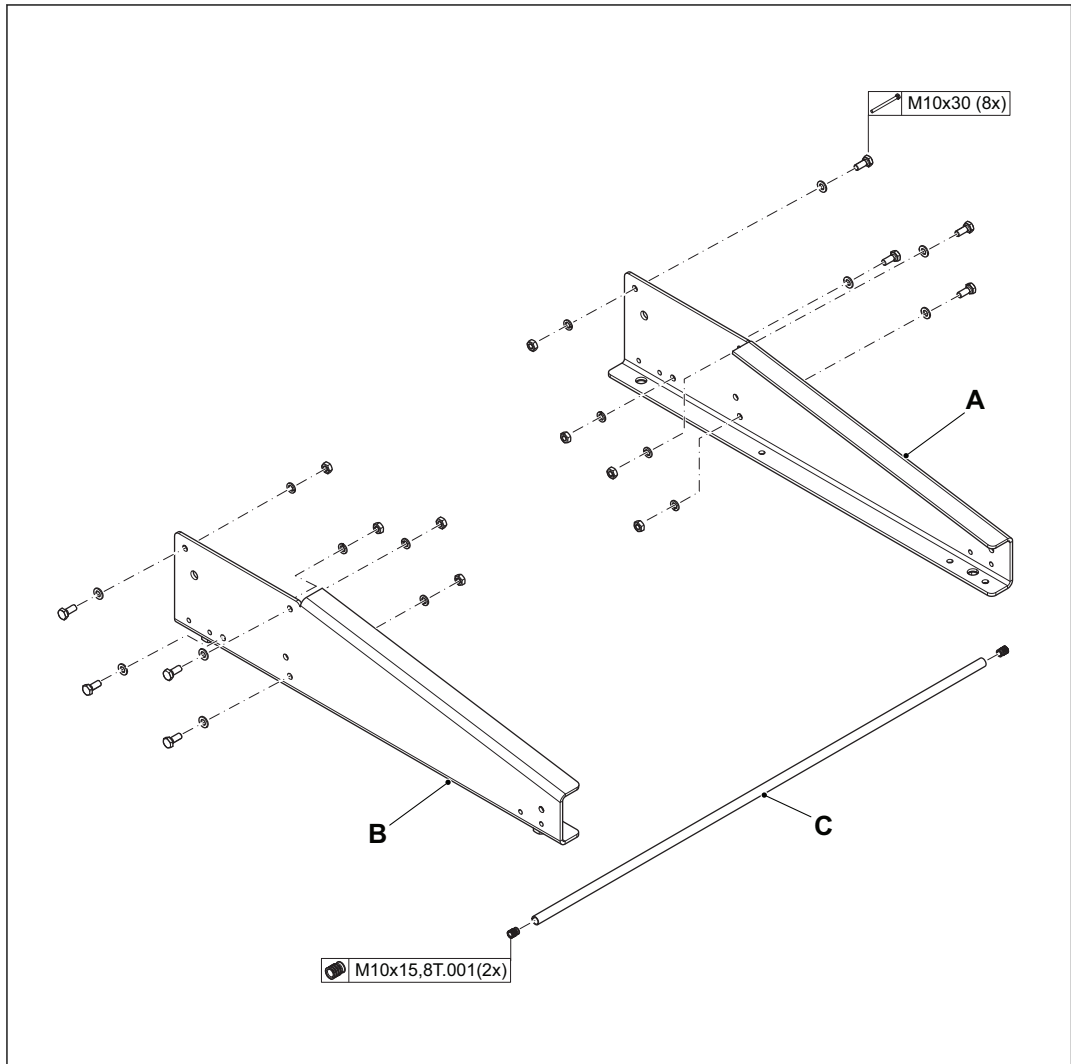


Bottom section parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	AE0055770	Frame bottom	L= 1475 mm
	1	AE0052012	Frame bottom	L= 1725 mm
	1	AE0055818	Frame bottom	L= 1975 mm
B	2	1000103	Rollerchain guide	L= 480 mm
	2	1000104	Rollerchain guide	L= 730 mm
	2	1000105	Rollerchain guide	L= 980 mm
C	2	1000106	Rollerchain guide	L= 250 mm
D	1	1000863	Sprocket 16B-1 (1") z=76	with plain bearing
E	1	AE0057033	Turning plate bottom	
F	1	AE0056205	Curve frame bottom	
G	1	AE0039216	Guide plate center	
H	6	1000692	Clamp side cover	
I	4	AE0039201	Support back cover	
J	1	1001070	Tension frame	
K	2	AE0039340	Rod curve frame	
L	2	AE0020895	Rod mounting	
M	1	1000156	Tension bolt M20x200	
N	2	AE0013502	Shim ring sprocket	
O	1	AE0039316	Back cover	H= 472 mm
	1	AE0039256	Back cover	H= 722 mm
	1	AE0056836	Back cover	H= 972 mm
P	1	AE0039300	Back cover	H= 697 mm
Q	4	1000742	Pull handle TS=0,8-1,2mm	
R	2	1000802	Side cover	L= 1250 mm
	2	1000737	Side cover	L= 1475 mm
	2	1000753	Side cover	L= 1725 mm
S	1	AE0056813	Front cover bottom 1475	
	1	AE0039235	Front cover bottom 1725	
	1	AE0056825	Front cover bottom 1975	

9.6 Supports

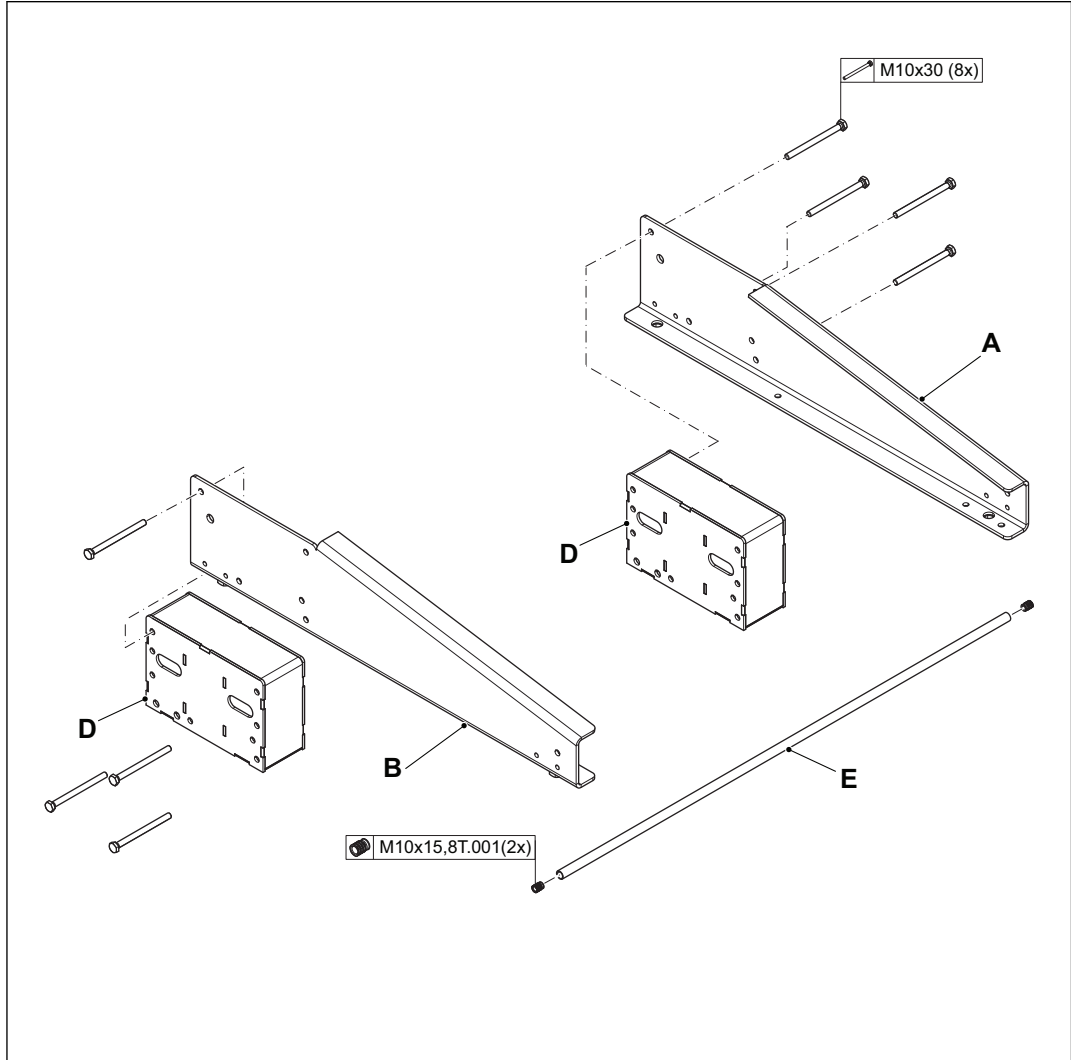
9.6.1 Support



Support parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1000181	Support right Prmk5	
B	1	1000824	Support left Prmk5	
C	1	1000060	Cross beam support Prmk5 XL	

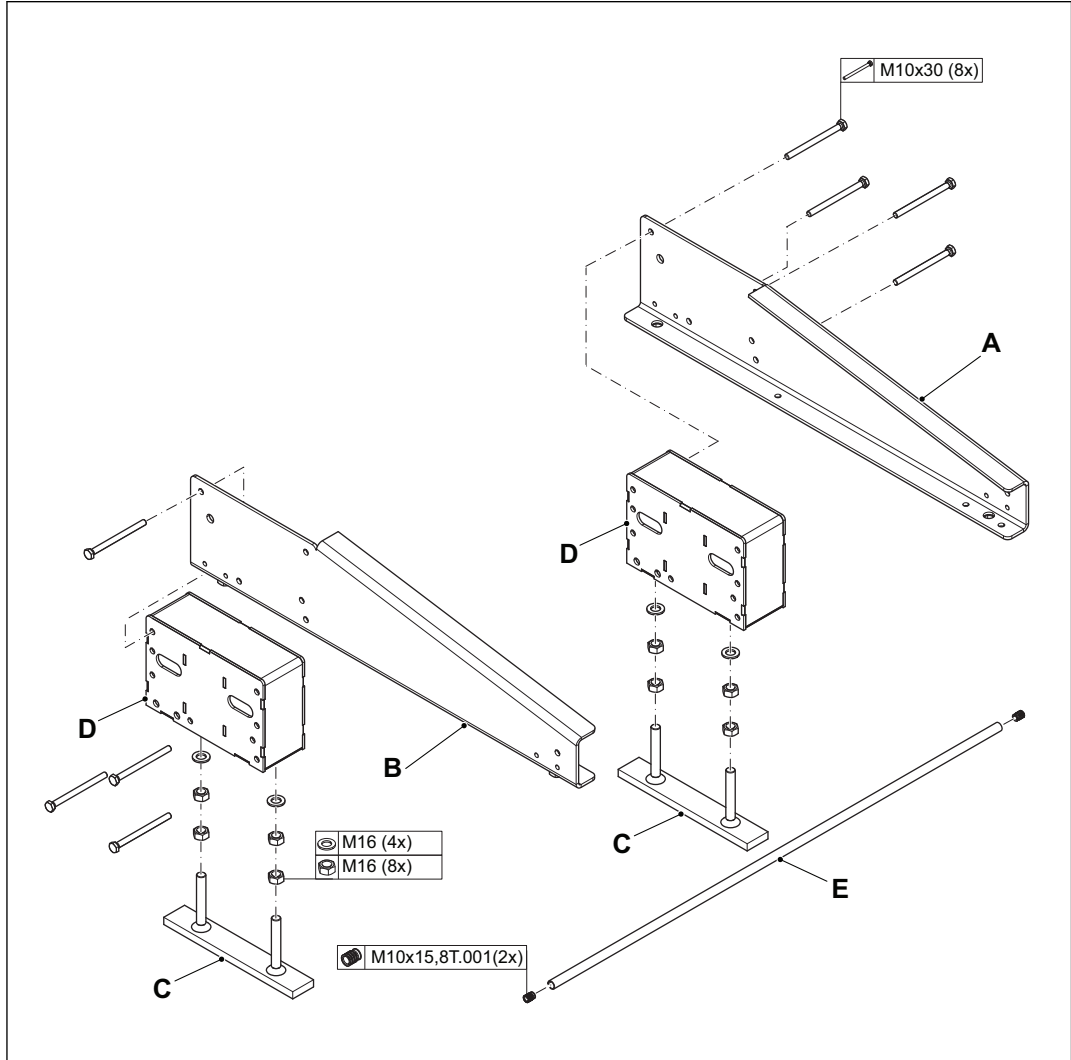
9.6.2 Support widened



Support widened parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1000181	Support right Prmk5	
B	1	1000824	Support left Prmk5	
D	2	1001956	Distance piece foot +200 Prmk5	
E	1	1002139	Cross beam support +200 Prmk5	

9.6.3 Support widened reinforced

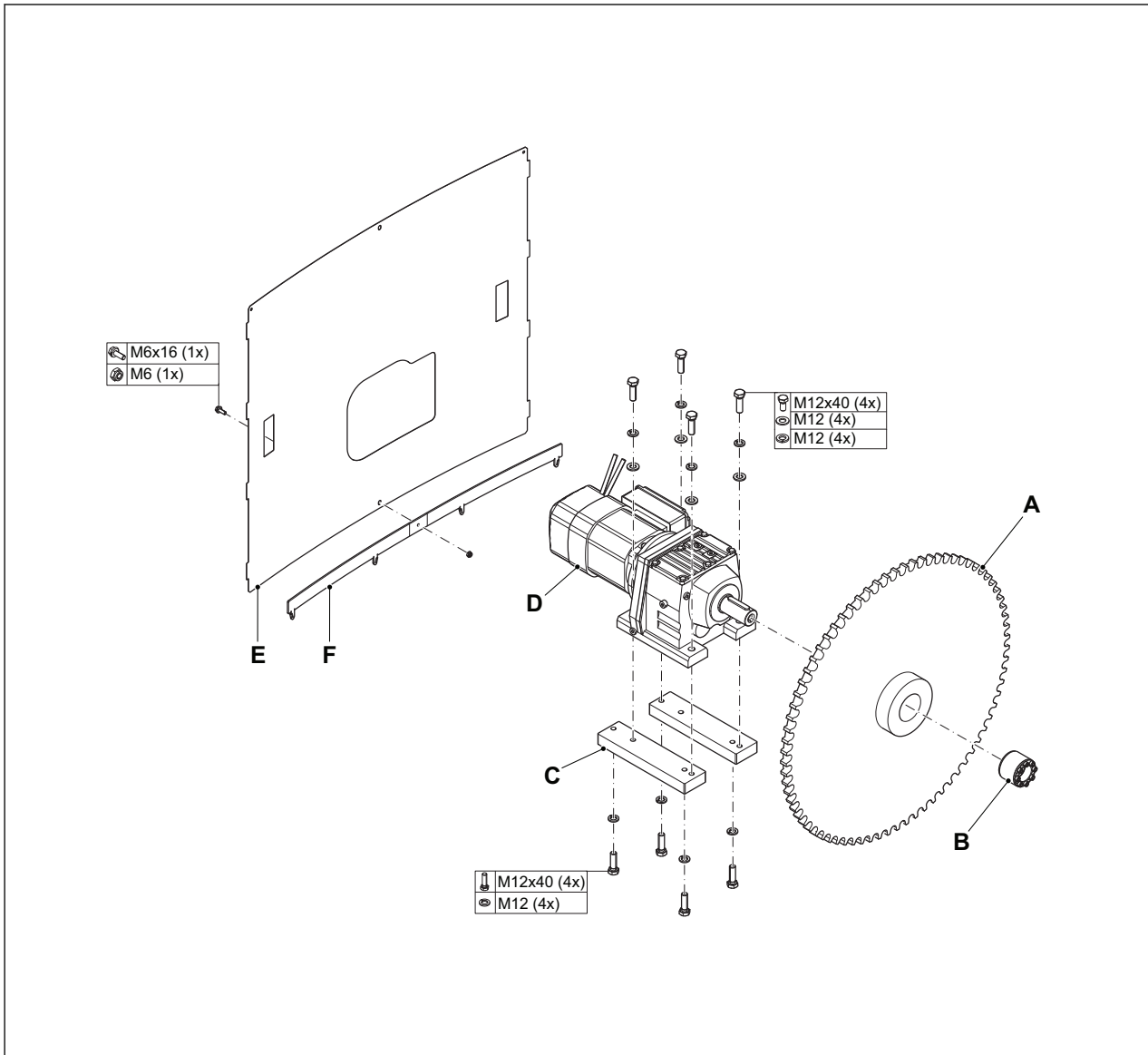


Support widened reinforced parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1000181	Support right Prmk5	
B	1	1000824	Support left Prmk5	
C	2	1001955	Adjustment-/footplate Prmk5	
D	2	1001956	Distance piece foot +200 Prmk5	
E	1	1002139	Cross beam support +200 Prmk5	

9.7 Drive (option)

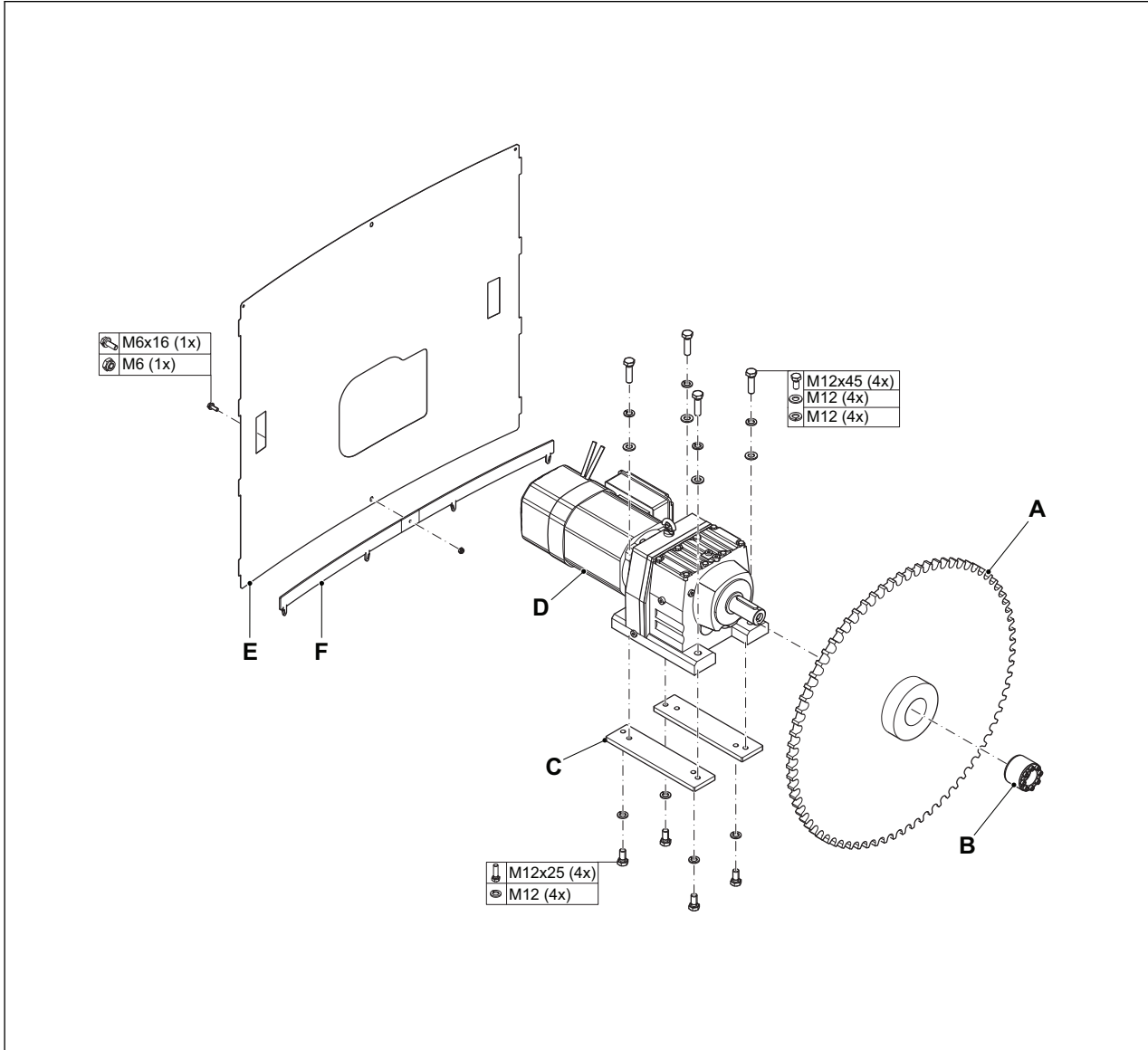
9.7.1 R57 drive



R57 drive section parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1000111	Sprocket 16B-1 (1") z=76	
B	1	1000114	Clamping bush DX $\varnothing 35/\varnothing 60$ L=51	
C	2	1000188	Spacer R57 Prmk5	
D	1	See Specifications document	Gearmotor R57	
E	1	AE0039331	Back cover Prmk5	
F	1	AE0039201	Support back cover Prmk5	

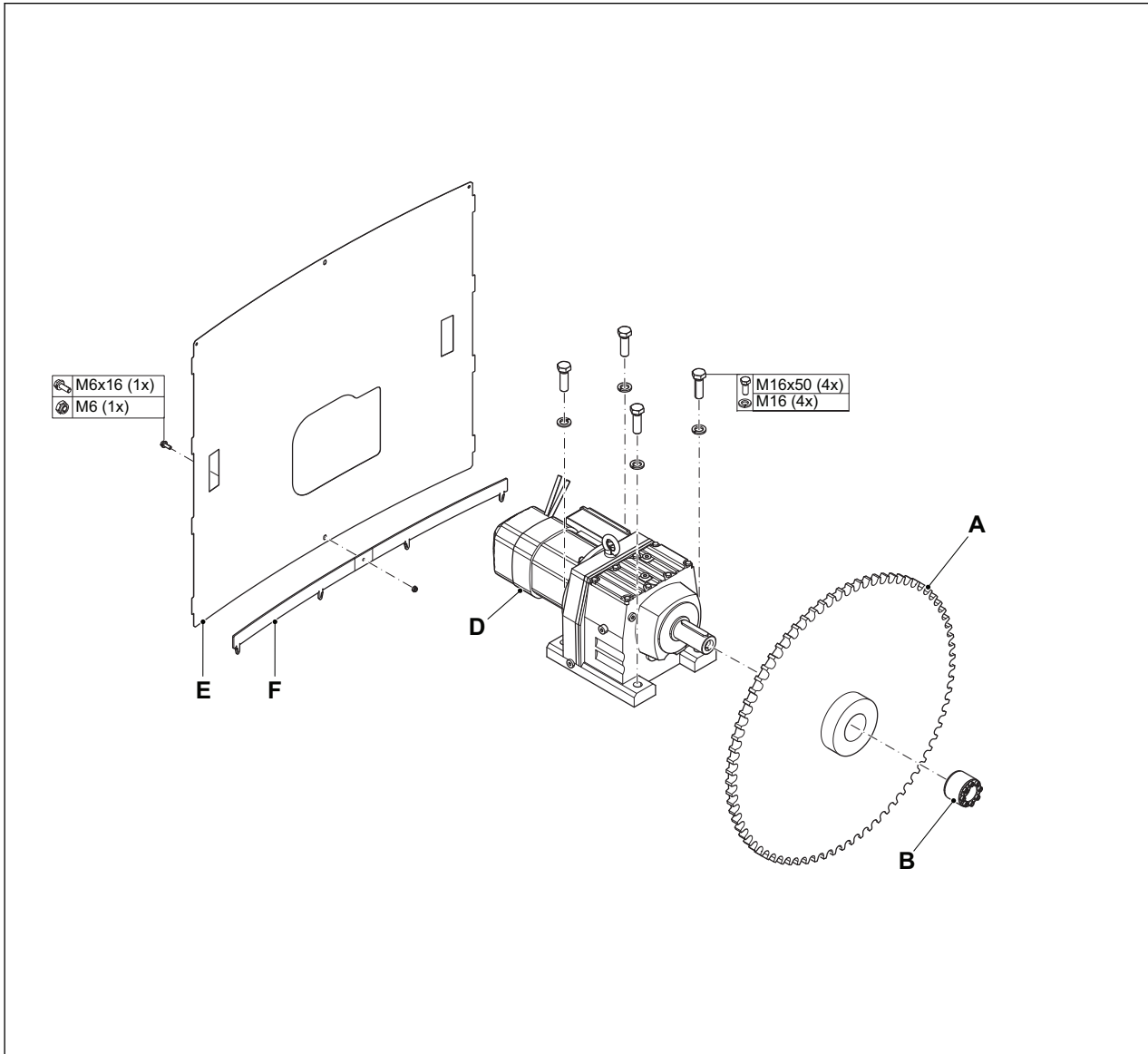
9.7.2 R67 drive



R67 drive section parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1000111	Sprocket 16B-1 (1") z=76	
B	1	1000114	Clamping bush DX $\varnothing 35/\varnothing 60$ L=51	
C	2	1000189	Spacer R67 Prmk5	
D	1	See Specifications document	Gearmotor R67	
E	1	AE0039331	Back cover Prmk5	
F	1	AE0039201	Support back cover Prmk5	

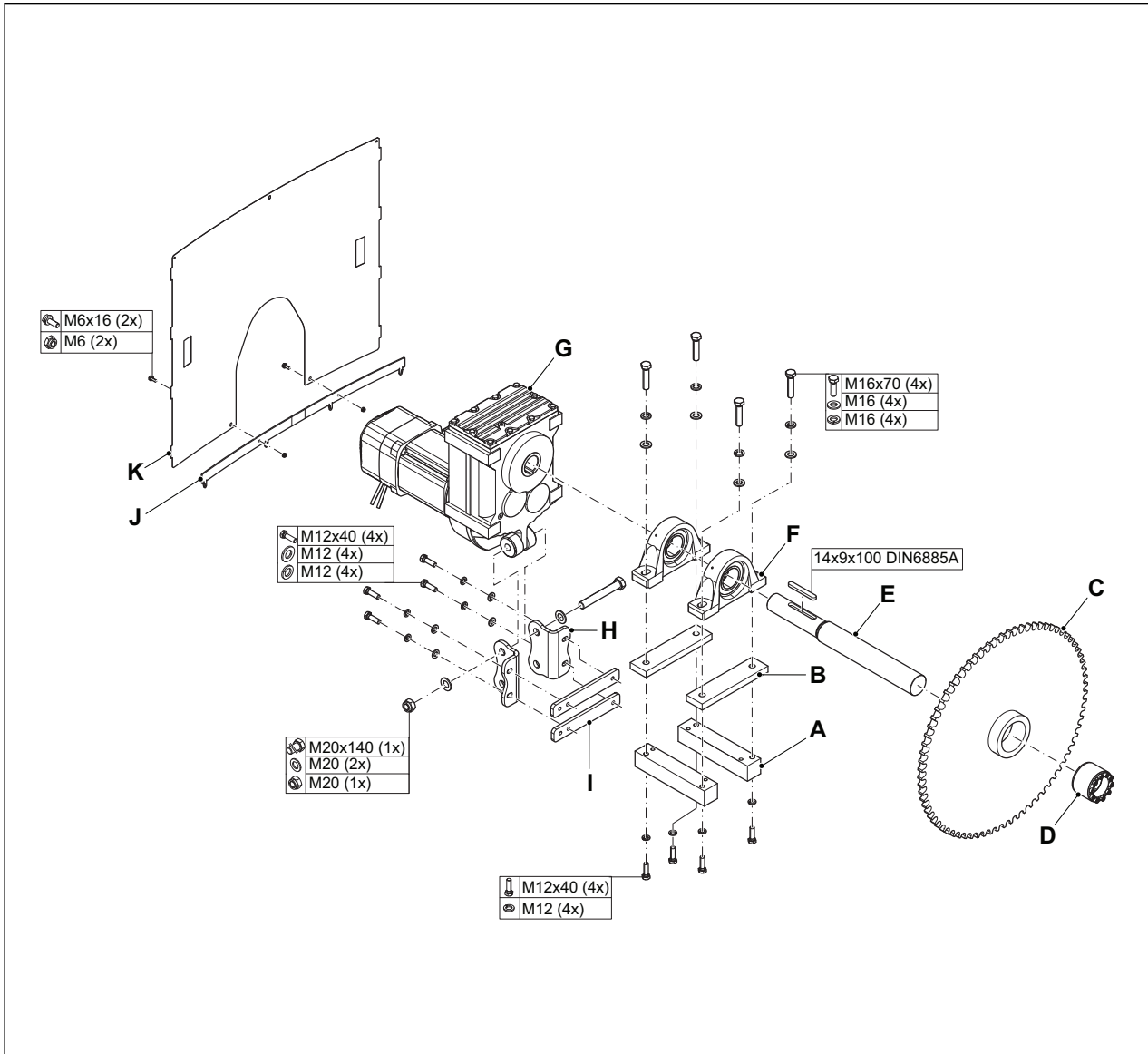
9.7.3 R77 drive



R77 drive section parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1000112	Sprocket 16B-1 (1") z=76	
B	1	1000115	Clamping bush DX $\varnothing 40/\varnothing 65$ L=51	
D	1	See Specifications document	Gearmotor R77	
E	1	AE0039331	Back cover Prmk5	
F	1	AE0039201	Support back cover Prmk5	

9.7.4 FA77 drive

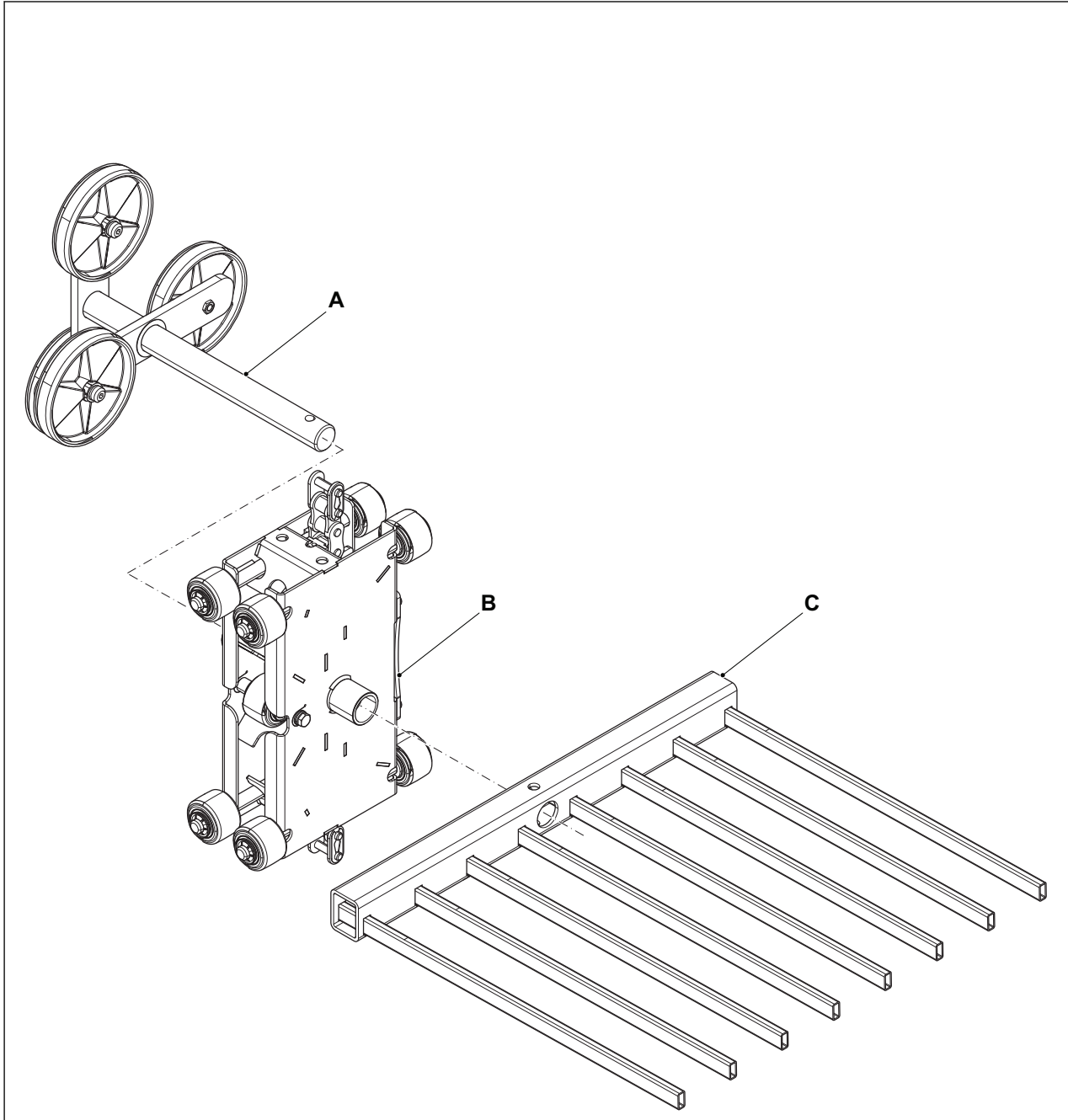


FA77 drive section parts list

Pos	Quantity	Item no.	Item name	Specification
A	2	1001007	Mounting bearing block	
B	2	1001008	Spacer bearing block	
C	1	1001012	Sprocket 16B-1 (1") z=76	Clamping bus hole D = 90 mm
D	1	1000803	Clamping bush DX60/90 L=72	
E	1	1003001	Drive shaft	
F	2	1000976	Bearing unit PASE60-N	
G	1	See Specifications document	Gearmotor FA77	
H	2	AE0040086	Angle torque arm	
I	2	AE0032830	Threaded plate 3x M12	
J	1	AE0040142	Support back cover	
K	1	AE0040114	Back cover	

9.8 Carrier

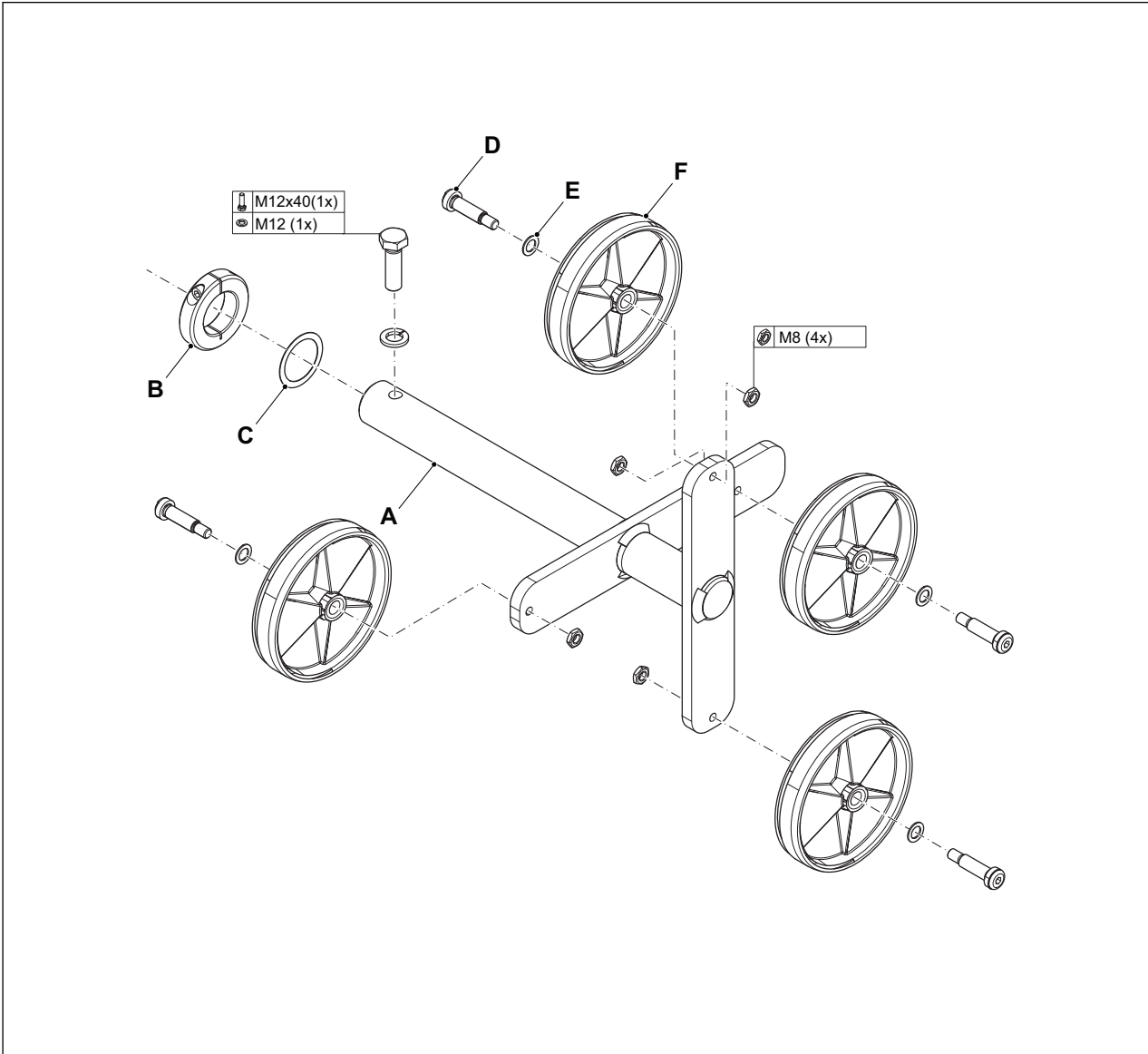
9.8.1 Carrier



Carrier parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1000215	Leveller Prmk5	
	1	1000821	Leveller Prmk5 HD	
B	1	1000214	Trolley Prmk5	
	1	1000820	Trolley Prmk5 HD	
C	1	Refer to section 9.8.4.	Fork	

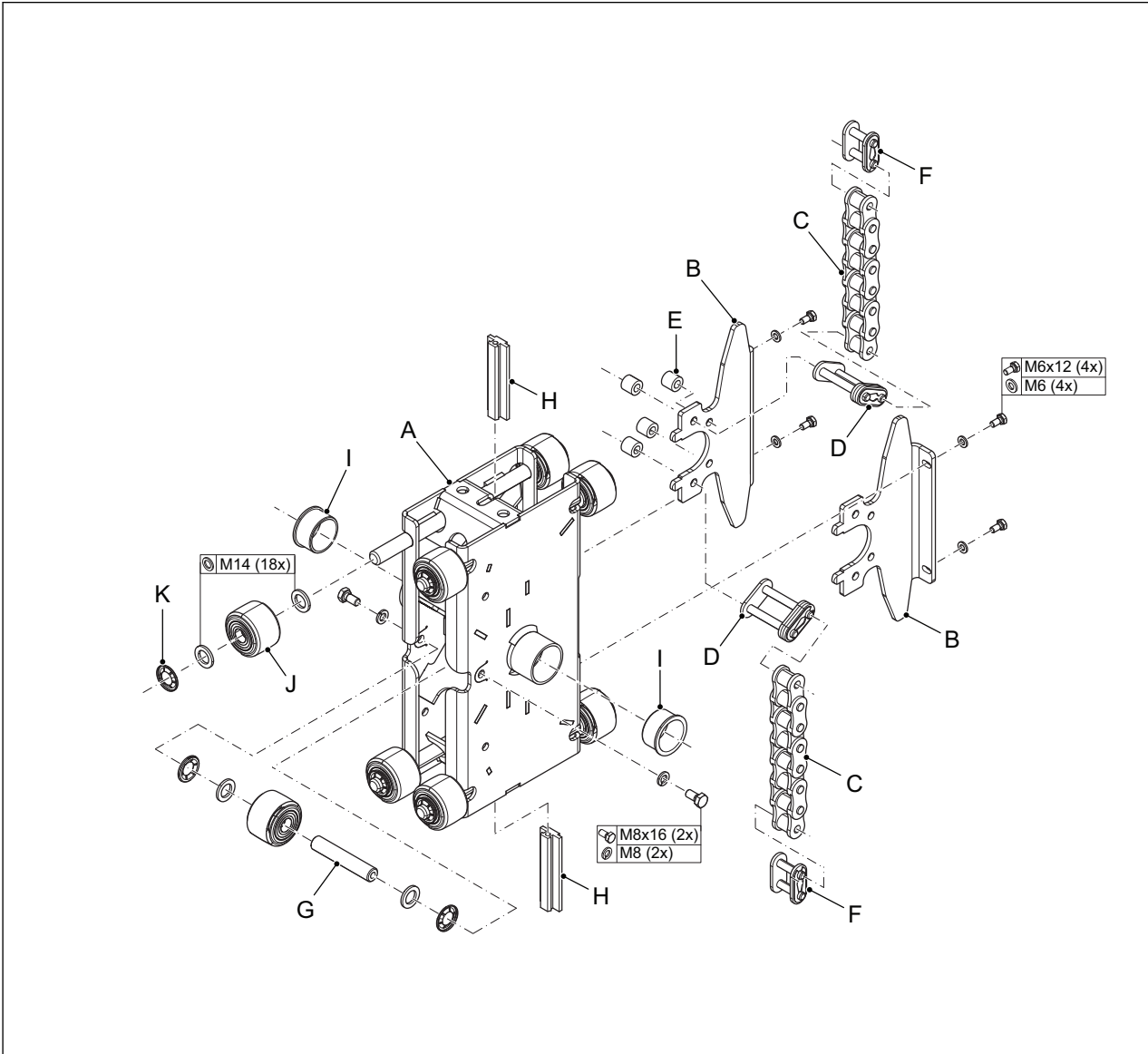
9.8.2 Leveller



Leveller parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1000135	Leveller Prmk5	
	1	1000218	Leveller Prmk5 HD	
B	1	1000732	Clamp adjusting ring \varnothing 30/ \varnothing 56x12	
	1	1000223	Clamp adjusting ring \varnothing 35/ \varnothing 57x15	
C	2	1000130	Shim ring 0,5 \varnothing 30x42	
	2	1000224	Shim ring 0,5 \varnothing 35x45	
D	4	1000219	Shoulder screw M8 \varnothing 10x30 f9	
E	4	1000221	Shim ring 1 \varnothing 10x16	
F	4	1000190	Wheel \varnothing 125x24 hole \varnothing 10.1x28	

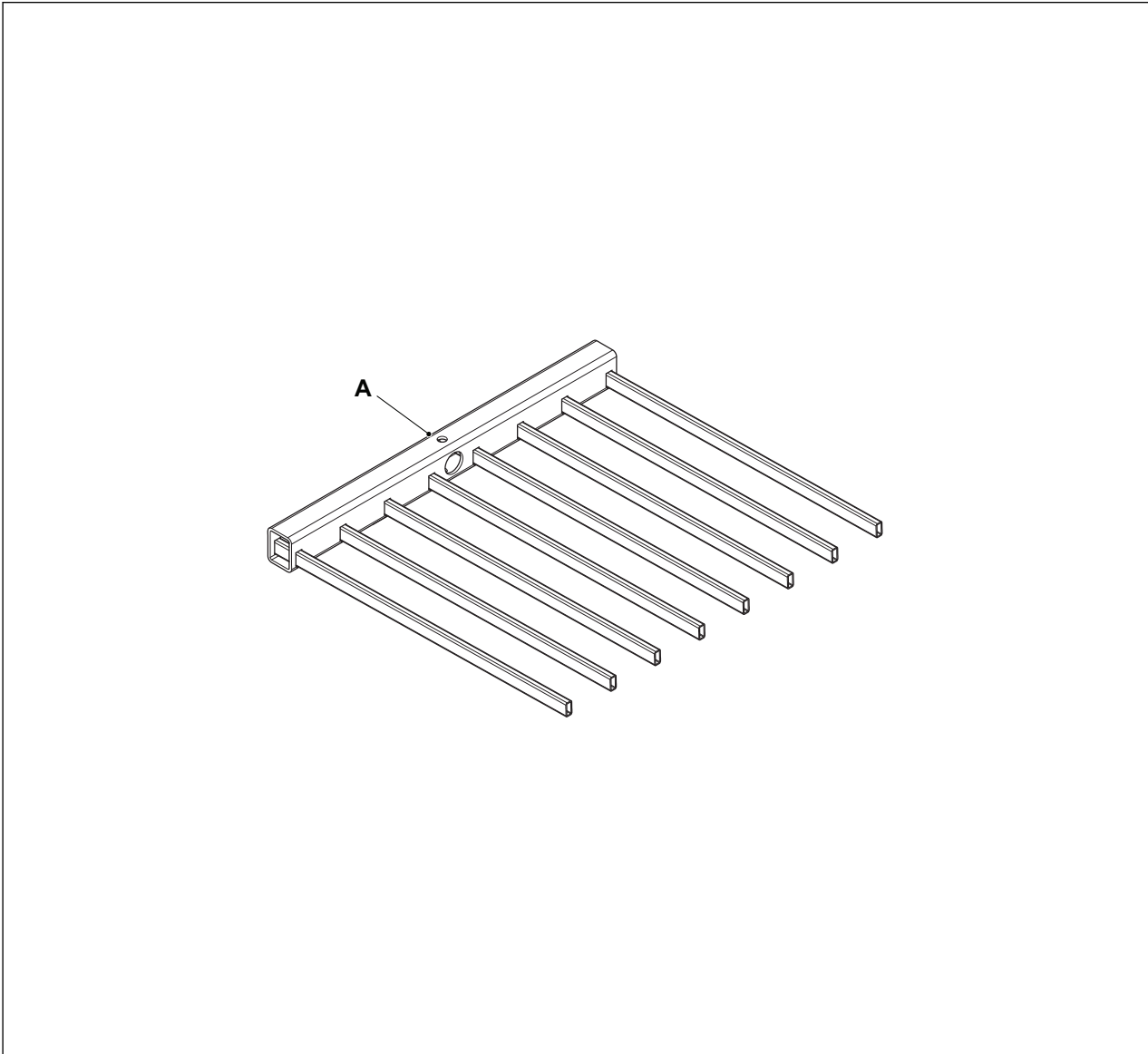
9.8.3 Trolley



Trolley parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1000076	Frame trolley Prmk5	
	1	1000077	Frame trolley Prmk5 HD	HD version
B	2	1000098	Roller chain mounting Prmk5	
C	2	1001894	Chain 16B-1 SY-PR 7 links	
D	2	1001447	Connection link 16B-2 SY-PR	
E	4	1000186	Spacer bush link PRmk5	
F	2	1001446	Connection link 16B-1 SY-PR	
G	1	1000043	Shaft carrier side wheel Prmk5	
H	2	1000139	Rubber profile carriage	
I	2	1000120	Bearing Igligur G 30/31x20	
	2	1001343	Collar bearing $\varnothing 35/40 \times 22$	HD version
J	9	1000672	Wheel $\varnothing 50 \times 32$ bearing $\varnothing 15 \times 35$	
K	10	1000162	Starlock uncapped $\varnothing 15$	

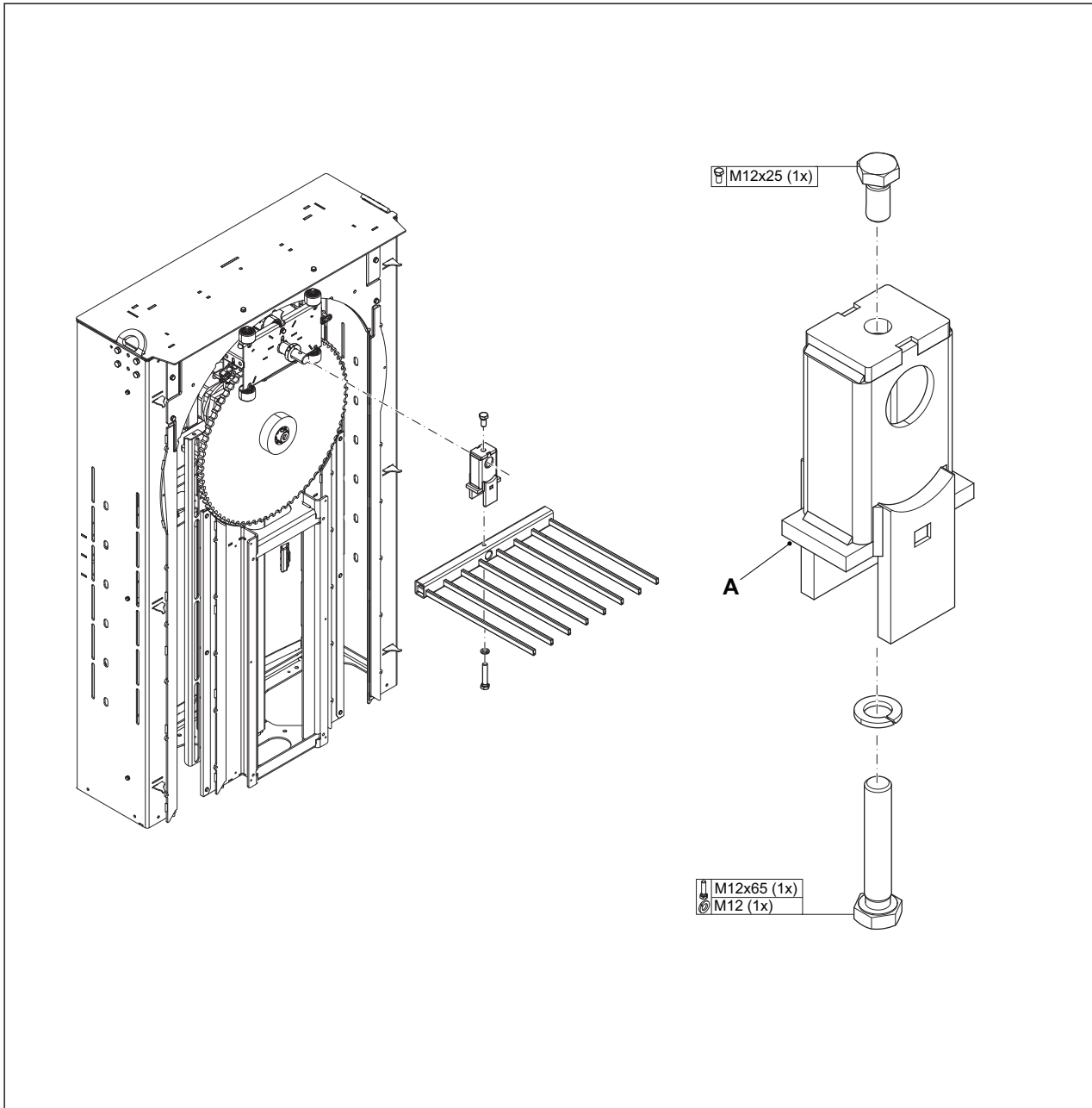
9.8.4 Forks



Fork parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1003948	Fork p=75 8xL=500	
	1	1004957	Fork p=75 8xL=700	
	1	1006954	Fork HD p=75 8xL=500	
	1	AE0016770	Fork HD p=75 8xL=700	
	1	AE0039754	Fork p=75 8xL=500	With slip resistant tape
	1	AE0038973	Fork p=75 8xL=700	With slip resistant tape
	1	AE0038603	Fork HD p=75 8xL=500	With slip resistant tape
	1	AE0041542	Fork HD p=75 8xL=700	With slip resistant tape

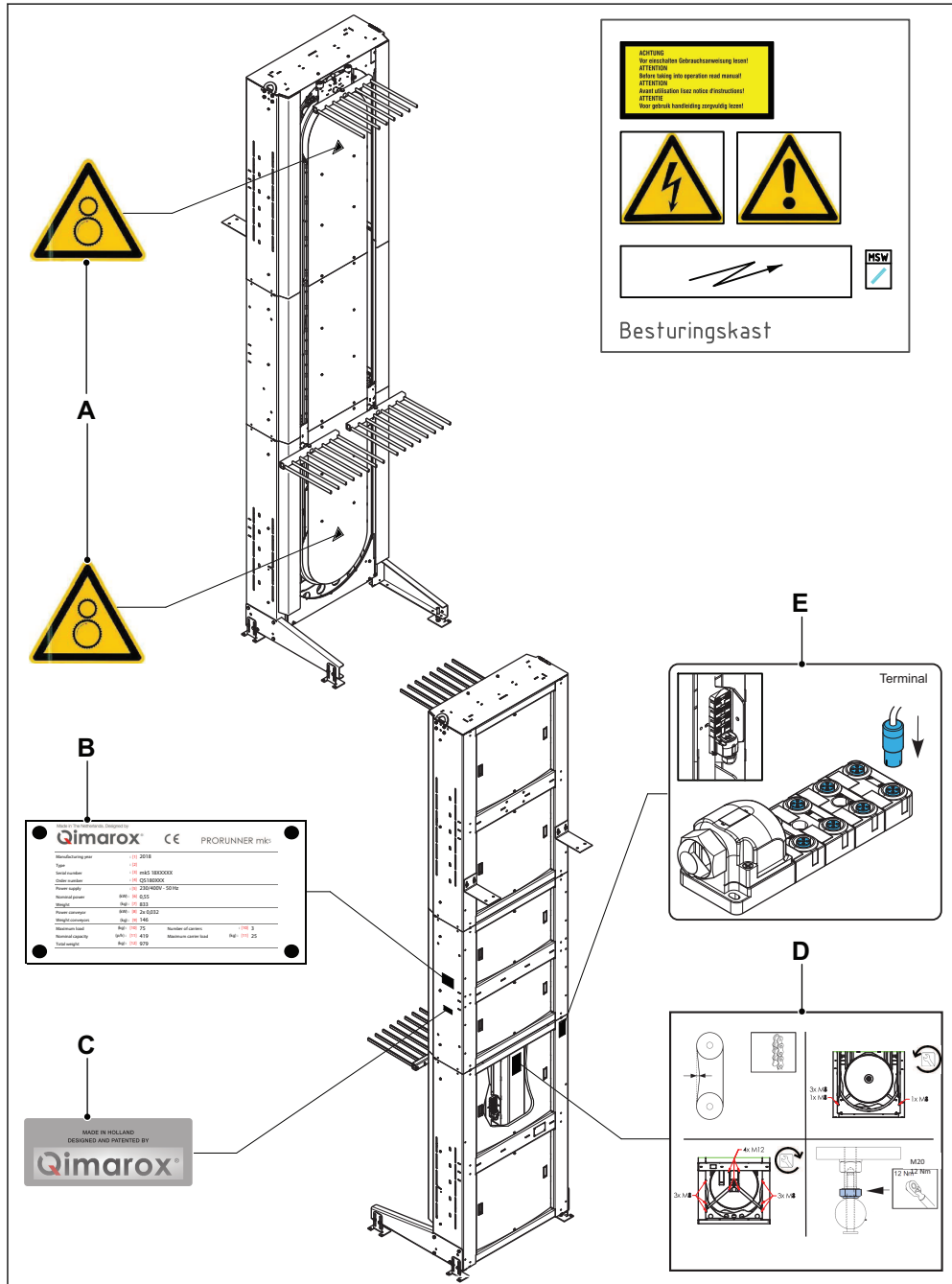
9.9 Lowering adapter



Lowering adapter parts list

Pos	Quantity	Item no.	Item name	Specification
A	1	1001229	Lowering adapter 100 Prmk5	
	1	1001228	Lowering adapter 150 Prmk5	
	1	1004658	Lowering adapter HD 100 Prmk5	
	1	1004441	Lowering adapter HD 150 Prmk5	

9.10 Labels



Machine overview parts list

Pos	Quantity	Item no.	Item name	Specification
A	2		Risk of rotating parts	
B	1		Type plate	
C	1		Manufacturer label	
D	1		Chain tension label	
E	1		Terminal label	



Warning
Risk of rotating parts.



Warning
Risk of electrical shocks from high electrical voltage.



Note
The label 'Risk of electrical shocks' must be attached to the electrical cabinet.
The electrical cabinet is not supplied by Qimarox.

10 Electrical circuit diagrams

10.1 Standard electric drawings

Download the electrical drawings of the machine from: <https://www.qimarox.com>.

If the standard electrical drawings apply, the overview of all electrical components is listed on the Specifications document.



Note

The Specifications document shown is an example.

Prorunner mk5		Qimarox	
Quotation / order number	GS180000		
Serial number	mk5 180000		
Customer			
Line number / Customer PO			
Revision			
Date			
Discount / Currency	N/A	/	€
APPLICATION			
Required capacity	400	Products / hour	
MATERIAL & SURFACE TREATMENT			
Material	Steel	Default:	Steel
Material of levelling feet	Steel	Default:	Steel
Surface treatment	Powder coated	Default:	Primer + paint
Column	RAL 9007	Default:	RAL 9007
Connectors	RAL 7037	Default:	RAL 7037
Side covers	RAL 3020	Default:	RAL 3020
Back covers	RAL 3020	Default:	RAL 3020
Front cover (optional)	Steel 1006	Glossy	Default: Steel 1006
SAFETY FENCING			
Position	N/A		
Material	N/A	Default:	Steel
Colour	N/A	Default:	RAL 9005
Safety switch	N/A		
GENERAL GEARMOTOR PROPERTIES			
Motor voltage	230/400V		
Brake voltage	230V AC (220-242V)		
Line frequency	50 Hz		
Certification	IEC		
Food grade oil in gearmotors	No		
WARRANTY & DOCUMENTATION			
Warranty	1 year	Default:	1 year
User manual language	English UK	Default:	English UK
SPECIAL CUSTOMER REQUESTS			

If the standard electrical drawings do NOT apply, the electrical drawings are included with the machine. The overview of all electrical components is NOT listed in the Specifications document.

10.2 Drives

10.2.1 Drive type: SEW 3PH

Connection main power:

<http://www.productliften.nl/media/text/240/247/680010306.pdf>

Connection Aseptic drive:

<https://www.qimarox.com/media/upload/original/65/seg-ac-motor-connector-is-mk1-mk5-1444730165.pdf>

Connection TF:

<http://www.productliften.nl/media/text/240/247/681510306.pdf>

Connection BR:

<http://www.productliften.nl/media/text/240/247/69001006.pdf>

Other connection diagrams DR:

<http://www.productliften.nl/media/text/240/247/9pd0058us.pdf>

10.2.2 **Drive type: Movimot**

Connections Movimot:

<http://www.productliften.nl/media/text/240/247/17000017.pdf>

<http://www.productliften.nl/media/text/240/247/16742419en.pdf>



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