motion06
A DURAVANT COMPANY

Operating manual
CBC
080/100/120

Original operating manual
Valid from: 03-2021

Contents

1 Legal information

Document no:	operating_manual-CBC-DE-Rev-
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This operating manual was created by motion06 gmbh.

In the event of inconsistencies, incorrect compilation of the operating manual or absence of the type plate, please notify us immediately. The wording of the operating manual assumes equality between all groups of persons. Masculine word forms refer equally to the corresponding female form.

The original German operating manual for the incomplete machine must be fully and accurately translated into the relevant national language. The translation must be identified with the text: 'Translation of the original operating manual' and the original operating manual must be enclosed.

motion06 gmbh
Gewerbestraße 28
5211 Lengau, Austria

Phone +43 (0) 7746 20 300 0
Fax +43 (0) 7746 20 300 20

office@motion06.at
www.motion06.at

2 Product data

Product: CBCxxx (xxx={080, 100, 120})

CBC ... Curve belt conveyor

Available types:

- 080
- 100
- 120

Available areas of use:

- AP ... Airport
- PP ... Post & Parcel

Available conveying directions:

- CW
- CCW
- Reverse

Variable belt widths, conveyor channel widths, frame widths

Variable centre line radii

Variable side guide interfaces/front covers

Variable belts, depending on the application

Drives:

- A/B/C/D (for all types) with slip on gear mechanism and toothed belt drive (lower drive unit)

Maximum conveyor speeds (measured on the centre line):

Type	Drive	V_{max} @ centre line [m/s]
CBC080	Slip on gear mechanism	1.8
CBC080	Toothed belt drive	1.8
CBC100	Slip on gear mechanism	1.8
CBC100	Toothed belt drive	3
CBC120	Slip on gear mechanism	2
CBC120	Toothed belt drive	3

Table 1: Max. conveyor speeds CBC

2.1 Specifications of conveyed items

Airport area:

All normal luggage (with or without rollers) with belts, straps, labels, as well as all bags (soft and hard), garment bags, backpacks, duffel bags, etc.

Dimensions:

	Min [mm]	Max [mm]
Length	500	1200
Width	200	800
Height	100	1000

The following are to be transported in luggage trays:

- all backpacks and bags with loose straps, loops or hooks, such as mountaineering or army equipment;
- all pieces of luggage with a cylindrical shape, such as sleeping bags and rolled-up foam underlays;
- internal air mail.

Logistics area:

Dimensions:

	Min [mm]	Max [mm]
Length	100	1200
Width	100	800
Height	5	1000

NOTICE

- The dimensions stated above are the standard dimensions. The maximum permitted load can be found in the conveyor list.
- The permitted dimensions may vary on a project-specific basis following consultation with motion06 gmbh.

3 About these instructions

3.1 How to use the instructions

The aim of this operating manual is to help you familiarise yourself with the machine/plant and make the most of its intended uses.

The instructions contain important information on how to operate the machine/plant safely and correctly. They:

- also describe the correct handling, operation and maintenance of the machine/plant.
- provide important information so that the machine/plant can be used safely and efficiently.

Reading these instructions will help you to:

- avoid dangers
- reduce repair costs and downtime
- increase the reliability and service life of the product.

This operating manual must be read and followed by anyone who has been tasked with working on the machine/plant.

In addition to this operating manual, the regulations for accident prevention and environmental protection that apply in the operator's country and at the place of use must also be observed.

INFORMATION

- Due to the various possible configurations, the illustrations in this manual may differ slightly from the machine/plant supplied to you. The exact configuration of the machine/plant can be found in the detailed drawing that is included in the documentation.
- Subject to technical changes due to product improvements.

3.2 Depiction of general notices, warnings and safety information

This section describes how the general notices, warnings and safety information used in this operating manual are structured and used. In addition, the warning signs that may be used in this operating manual are listed and briefly explained.

⚠ DANGER

Personal injury (immediate danger)

- Death or extremely severe permanent injuries!

⚠ WARNING

Personal injury (immediate danger)

- Severe to extremely severe temporary injuries!

⚠ CAUTION

Personal injury (potentially dangerous situation)

- Mild or minor injuries!

NOTICE

Personal injury unlikely, or easily preventable and avoidable low-risk situation.

Further advice and information

- Obligation to behave in a certain way or do something specific to ensure that the machine/plant is used safely.
- Possible mild or minor injuries/slight risk.
- Restrictions when handling/working with or operating the machine/plant.

INFORMATION

Further advice, information and tips. Personal injury unlikely, or easily preventable and avoidable low-risk situations

- No injuries/risk to possible mild or minor injuries/slight risk.
- Restrictions and/or further information, advice or tips on handling/working with or operating the machine/plant.

3.3 Structure of warnings/safety information

Warnings are structured as follows:

- Pictogram with signal word indicating the warning level
- Description of the danger (type of danger)

- Description of the consequences of the danger (danger consequences)
- Measures (activities) for preventing the danger

⚠ DANGER

Danger type (text)

- Danger consequence 1 (text)
- Danger consequence 2 (text)

a) Danger prevention 1 (text)

b) Danger prevention 2 (text)

c) ...

3.4 Technical terms and abbreviations used

Abbreviation	Meaning
PPE	Personal protective equipment
RA	Risk assessment
RAN	Risk analysis
MD	Machinery Directive 2006/42/EC as amended at the time of placing the machine/system on the market
n.s.	not specified
n/a	not applicable
tbd	to be defined
tba	to be announced
tbc	to be confirmed

Table 2: Abbreviations used

3.5 Depiction of specific warning signs

Special safety information is provided at the relevant points. It is marked with the following symbols.

⚠ WARNING

General danger (zone)

- This sign is used for activities where there is a risk of personal injury and extensive damage to property.

⚠ WARNING

Warning – risk of hand injury

- being pulled into/trapped in moving machine parts
- performing maintenance work

⚠ WARNING

Warning – risk of hand injury

- being pulled into belt transmission
- performing maintenance work

⚠ WARNING

Warning – risk of hand injury

- being pulled into opposing rollers
- performing maintenance work

⚠ WARNING

Warning – risk of crushing

- machine motion

⚠ WARNING

Warning – opposing rollers

- danger of being drawn into moving parts
- machine motions

⚠ WARNING

Warning – suspended loads

- transportation using crane systems and hoist equipment

⚠ WARNING

Warning – forklift trucks

- transportation

⚠ WARNING

Warning – electrical voltage

- with electrified machines/plants

⚠ WARNING

Warning – hot surface

- in overloaded or faulty drives

⚠ CAUTION

Environmental damage

3.6 Depiction of compulsory actions

The following compulsory actions are identified by a pictogram.

NOTICE

Use the crossing

- climbing over the conveyor is prohibited

NOTICE

Wear eye protection

- danger of items with sharp edges hitting eye area when conveyor units are pivoting

NOTICE

Wear protective headgear

- transportation using crane systems and hoist equipment

NOTICE

Wear hearing protection

- during operation
- during assembly/disassembly work

NOTICE

Wear protective footwear

- transportation

NOTICE

Wear protective gloves

- with electrified machines/plants

NOTICE

Disconnect before starting work

- the machine/plant should be switched off before performing any maintenance or servicing work

3.7 Depiction of prohibited actions

The following prohibited actions are identified by a pictogram.

⚠ DANGER

General prohibition

- This sign is only used in conjunction with an additional sign that provides specific information about the prohibited action.

⚠ DANGER

Unauthorised access prohibited

- Access to areas of the machine/plant bearing this sign is prohibited for unauthorised persons!
- Climbing over the conveyor is prohibited!

⚠ DANGER

Transportation of persons prohibited

- Transporting people is prohibited!
- Transport of persons on the continuous handling equipment is prohibited!

⚠ DANGER

Switching prohibited

- Switching of switching devices (e.g. main switches) bearing this pictogram is prohibited!
- Especially when maintenance and servicing work is being performed!

⚠ DANGER

Do not enter

- Entering areas bearing this sign is prohibited!

⚠ DANGER

Transportation of persons prohibited

- The transportation of people using lifting equipment bearing this sign is prohibited!

3.8 Associated documents

- Data sheets
- Conveyor list
- Third-party documentation
- Drawings
- Assembly manual
- Various supplementary sheets (depending on the design)

NOTICE

- All the documents listed above are enclosed with the complete documentation for the machine/plant and must be read and understood in full.

3.9 Safekeeping

An up-to-date copy of the operating manual must always be kept at the location where the machine/plant is in use. The operating manual must be easily accessible to operators and maintenance staff.

This manual must be kept in a safe place where it can be easily accessed by assembly, operating and maintenance staff, until the machine/plant is disassembled.

If the owner or operator of the machine/plant changes, this manual must be handed over to the new owner or operator.

If the manual is lost, destroyed or in poor condition, please request a copy from the manufacturer by stating the machine/plant's identifying features (document no and version).

4 General safety regulations

4.1 Basic principles

NOTICE

Limitations on the operating safety of the machine/plant

- Personal injury of undetermined severity
- Possible damage to property
- Reduced service life of the machine/plant or machine/plant parts

a) In order to ensure that the machine/plant can be operated safely, the instructions in this operating manual must be followed. In particular the basic principles set out below must be observed.

b) Please observe all the information and instructions in this manual.

c) General and local regulations for accident prevention and environmental protection must be complied with.

d) Persons under the influence of alcohol, drugs or medication that impairs reaction times are not permitted to be present in the area of the machine/plant.

e) The machine/plant must not be used in a manner other than the intended use as specified in the operating manual.

f) The machine/plant may only be operated in perfect working condition.

g) Inspection and maintenance work must be conducted and the intervals for this work that are specified in the operating manual must be observed.

h) The machine/plant may only be operated if the safety equipment is fully functional.

i) Any manipulation of the machine/plant or mode of operation which puts operational safety at risk should be refrained from or prevented by the operator using suitable measures.

j) Only OEM parts from the manufacturing company (motion06 gmbh) or parts and accessories approved by the manufacturer may be connected to and used with the machine/plant.

k) Only original spare/wearing parts and operating/auxiliary materials and those specified and approved by the manufacturer may be used for the maintenance and servicing of this machine/plant.

l) Any use that is contrary to the intended use is prohibited. The use of the machine/plant according to the section on intended use is the basic prerequisite for safe operation.

4.2 Training and instruction

Persons tasked with operating the machine/plant and with carrying out activities on it must be trained in how to handle it safely before using it for the first time.

Training must be repeated at regular intervals. The purpose of this training is to ensure that knowledge is kept up to date, and that personnel know how to use the machine/plant safely and are aware of their working environment, in particular with regard to the dangers associated with the machine/plant. A suitable repeat training schedule must be defined by the operator.

In general, written records must be kept of the training contents, date, participants and their responsibilities/activities involving the machine/plant. By signing the relevant documents, the training participants confirm that they have understood the training contents, accept them and will follow them without objection. Training records must be archived so that the skills of the relevant personnel can be verified as needed.

For the group(s) of people involved in each respective phase of the service life of the machine/plant, the training must cover at least the following:

- correct handling and operation of the machine/plant
- potential dangers
- potential faults and the procedures for remedying them
- the regular maintenance, repair and cleaning work that must be performed
- (reasonably foreseeable misuse)

4.2.1 Maintenance/repair

Maintenance personnel must attend advanced training that covers the aspects mentioned above from the perspective of the maintenance life cycle (including cleaning, malfunctions, troubleshooting, shutting down and recommissioning the machine/plant).

4.2.2 Assembly/commissioning

Assembly personnel must attend advanced training that covers the aspects mentioned above from the perspective of the set-up and installation life cycle (including commissioning, configuring settings, teaching in, programming, malfunctions, troubleshooting, and – if applicable – retrofitting, procedural modifications, shutting down and (re)commissioning the machine/plant).

4.3 Obligations of the operator

4.3.1 Qualifications/training

The operator shall only allow people to work on the machine/plant if they

- are familiar with the basic rules on occupational health and safety and accident prevention.
- have read and understood this operating manual, in particular the section General safety regulations.
- have received training on the safe operation of the machine/plant before using it for the first time.

4.3.2 Occupational safety

The operator must monitor the personnel continuously in order to verify that they are working in a safety-conscious manner. If the safety regulations are contravened, the operator must introduce suitable, effective measures to remedy the situation.

The operator is required to keep the machine/plant up to date with the latest versions of any applicable safety regulations.

The operator is required to have safety-relevant components checked by authorised personnel in accordance with the applicable regulations and testing intervals in the country in question.

Provisions concerning escape routes must be complied with. Existing escape routes must not be blocked, or must be rearranged by the operator of the machine/plant.

4.3.3 Airborne noise emissions

Depending on the national regulations, the operator may be required to conduct a workplace evaluation in order to determine the noise/sound level in the workplace in the areas affected by machines and plants. If the statutory limit values for airborne noise emissions are exceeded, suitable measures must be defined and implemented by the operator (for details of the noise emissions caused by the conveying technology, see the section on sound pressure levels).

4.4 Obligations of the staff

Before starting work, anyone who has been tasked with working on the machine/plant agrees to

- follow the basic rules on occupational health and safety and accident prevention.
- make sure that they are familiar with the operating manual, in particular the section on safety, and read and follow the safety information contained in this operating manual.
- take part in training on how to handle the machine/plant safely before using it for the first time, confirm that they have understood the training content, accept it and will follow it without objections, and provide their signature as confirmation of this.

4.5 Intended use

The curve belt conveyors of the series CBCxxx are designed exclusively for transporting items of cargo that comply with the specified limits and requirements (specifications and transport regulations are provided in this operating manual) and, where applicable, are suitably well packaged. This machine is intended for use in baggage or cargo conveyor systems.

These types of curve belt conveyors can be used in a network of systems for transporting baggage or items of cargo. They may be equipped with different sensors and actuators (e.g. conveyor drive motor including power electronics) for operation (particularly for automatic operation in a network of systems). The control technology and control cabinet necessary for operation are not part of the machines in this series.

For machines of this type, there is a CE Declaration of Conformity in accordance with Directive 2006/42/EC.

The creator of the overall system is responsible for completing the installation with the electrical operating materials required for operation or corresponding control and safety technology in a control cabinet, as well as for integrating it into a network of systems.

Only qualified electricians may connect machines of this type to the required electrical operating materials/control technology and electrical energy supply.

The integrator (creator of the overall system) must use suitable measures to safeguard against hazard zones and hazardous situations that occur during the integration. In particular, any hazards and hazard zones at the interfaces between the machine and upstream and downstream system components and the surrounding area must be secured at all times. The regulatory and national minimum distances from hazard zones and safety guidelines should be observed.

When combining and integrating the machines into a network of systems and/or a connected overall system, the creator of the overall system must carry out an EU conformity assessment complete with risk assessment and issue a declaration of conformity.

Only original accessories or approved accessories from the manufacturer (motion06 gmbh) may be assembled with the machine.

Only original spare/wearing parts and operating/auxiliary materials and those specified and approved by the manufacturer may be used for the maintenance and servicing of this machine/system.

Any use that is contrary to the intended use is prohibited. Safe operation can only be assured if the machine is operated properly and used as intended.

4.6 Foreseeable misuse

The machines of this type must not be used in a manner other than the intended use and as described in the operating manual.

Any manipulation or modification of the machine/system or mode of operation which puts operational safety at risk should be refrained from or prevented by the operator using suitable measures.

In general, the transportation of people with this machine/system is prohibited.

The use of CBCxxx series conveyor systems to transport loose bulk goods, vibration-sensitive goods, explosive substances and live animals is expressly prohibited!

Transportation of liquids in unsealed and/or non-stable containers with CBCxxx conveyors is prohibited.

Operation of this machine type in potentially explosive atmospheres is prohibited.

People who are not specialists and have not been trained are not permitted access to these machines during operation.

Operating a conveyor that is not firmly anchored to the ground is prohibited.

A firm and stable base is required for the set-up and operation of a machine of this kind. Detailed information on the static and dynamic forces applied to the ground can be found in the operating and assembly manual and any relevant data sheets. In special cases, the manufacturer, motion06 gmbh, should be consulted.

The machine/system must never be assembled or operated in a manner other than that intended. Integration into systems other than those for transporting baggage or items of cargo is not permitted.

Without consulting and obtaining a written declaration of consent from the manufacturer, the following actions are contrary to the intended use and therefore not permitted:

- combining the CBCxxx with components that have not been approved by the manufacturer
- combining the CBCxxx with components from other manufacturers
- making any structural modifications to the machine/system
- making any customer-specific adjustments to the machine/system
- operating the machine/system contrary to the intended use described
- operating the machine/system outside the specified guidelines and limits

No aggressive or oxidising cleaning agents, or cleaning agents that emit fumes, or intensive wet cleaning processes (such as pressure washers or steam cleaners) may be used to clean the machine/system.

PPE should be worn during assembly, servicing, disassembling and transport.

The original German operating manual for these machines must be fully and accurately translated into the relevant national language. The translation must be identified with the text: “Translation of original operating manual”, and the original operating manual must be enclosed.

National legislation may require the performance of an acceptance test before the system is commissioned for the first time and/or repeated checks of the machine/system.

4.7 Qualifications of the staff

NOTICE

- The fundamental requirements concerning qualifications for working with conveyors and conveyor systems are defined in the applicable standards. The use of suitably qualified personnel is a prerequisite. This means that, as a rule, only trained staff with technical qualifications who have been tasked with working on the machine/plant will be granted access to it and permitted to carry out activities on it.
- Personnel tasked with operating the machine/plant must be trained by the operator before using it for the first time and must receive refresher training at regular intervals.

- Control (incl. rectifying minor problems) and maintenance (with cleaning and general troubleshooting) of this machine/plant must be carried out exclusively by competent personnel, who must be authorised to carry out this work by the manufacturer and operator.
- Direct access to the machine/plant must be granted only to the maintenance personnel (electrical engineering and mechanics).
- In general, members of the public and particularly vulnerable people must be strictly denied access to the machine/plant.

Activity	Specially trained staff	Trained staff with specific technical qualifications (mechanics/electrical engineering)	Trained staff
Transportation	X		
Assembly	X	X	
Commissioning	X	X	
Operation/controls		X	X
Cleaning		X	X
Maintenance		X	
Troubleshooting		X	
Disassembly		X	
Removal/recycling	X	X	
Normal operation		X	X

Table 3: Staff qualifications

Assembly, commissioning:

Completion, installation, alignment and insertion of the machine into an overall system and commissioning must be carried out exclusively by competent personnel, who must be authorised to carry out this work by the manufacturer and/or integrator. If necessary, assembly may also be carried out by personnel from the machine manufacturer. The assembly manual is available to assembly personnel when setting up the machine/plant.

Only competent personnel may carry out the necessary electrical and control technology work for integration and commissioning of the machine/plant in the complete plant.

Competent personnel for assembly and commissioning:

- Specialists in the fields of mechanical engineering and metalworking, electrical engineering and mechatronics with sufficient professional experience, particularly in the area of machine and plant installation.
- Personnel who connect the plant's electrics and control technology and integrate it into the complete machine/plant must be familiar with the current state of the art and the respective valid guidelines and national laws.
- Semi-skilled personnel may be used only for auxiliary activities.

Operation, control, troubleshooting, cleaning and maintenance:

Control (incl. rectifying minor problems) and maintenance (with cleaning and general troubleshooting) of this machine must be carried out exclusively by competent personnel, who must be authorised to carry out this work by the manufacturer and/or integrator. Access to the luggage system must be granted only to the maintenance personnel (electrical engineering and mechanics). Depending on the operator, the operating personnel can/may also enter the danger zone of the machine/plant, e.g. to rectify simple problems. These groups of people must be given instruction, which must be documented, about the particular hazards in the area of impact of the machine/plant and the procedures for troubleshooting.

In general, members of the public and particularly vulnerable people must be strictly denied access to the machine/plant.

Competent personnel for operation and control:

- Semi-skilled workers for operation and control of the machine/plant in normal operating conditions, with preference given to people who can demonstrate prior work experience as machine operators.

Competent personnel for troubleshooting:

- Semi-skilled workers who can provide evidence of sufficient professional experience as machine operators and a suitable technical training background.
- Specialists in the fields of mechanical engineering and metalworking, electrical engineering and mechatronics with sufficient professional experience, particularly in the area of mechanical and plant engineering.

Competent personnel for maintenance and cleaning:

- Specialists in the fields of mechanical engineering and metalworking, electrical engineering and mechatronics with sufficient professional experience, particularly in the area of machine and plant installation/maintenance.
- Semi-skilled personnel in maintenance may only be used for cleaning and auxiliary activities.

Taking the machine out of operation, disassembly and disposal:

Disassembly of this machine/plant must be carried out exclusively by competent personnel, who must be authorised to carry out this work by the manufacturer and/or integrator. The machine/plant must be disposed of professionally, and, if necessary, in accordance with national laws. Only a company authorised to carry out disposal may be used for this purpose. The machine/plant does not contain problematic materials that require special treatment.

Competent personnel for taking the machine out of operation, disassembly and disposal:

- Specialists in the fields of mechanical engineering and metalworking, electrical engineering and mechatronics with sufficient professional experience, particularly in the area of assembly, disassembly and disposal of machines and plants.

4.8 Workstations for operating staff

No operator is required to operate the plant/machine, therefore no workstation is required for operation.

4.9 Safety devices

The machine/plant is available in a number of different variants depending on the delivery scope ordered. The following must be taken into consideration:

- Any circuit diagrams for the basic cabling.
- Any data sheets/documentation from the drive manufacturer.
- Any data sheets/documentation from the manufacturer of guard locking devices (e.g. safety fence).
  - The construction of protection equipment around the machine/plant that takes into consideration its area of impact and complies with the prescribed safety distances.
  - When using metal parts, it must be ensured that they are connected to the protective earthing/protective potential.
  - Protection equipment must not restrict the visibility of the machine/plant area.
- Any data sheets/documentation from the belt manufacturers (e.g. conveyor belts, lifting and/or conveying drive belts). The data sheets for the installed components are enclosed with the complete documentation for the machine/plant.

Position of the safety equipment

- See circuit diagrams for the basic cabling.
- See overview drawings of the machine/plant.

Function of the safety equipment

- See circuit diagrams for the basic cabling.
- See data sheets/documentation from the drive manufacturer.
- See data sheets/documentation from the manufacturer of guard locking devices (e.g. safety fence).

Fire protection

No particular fire protection measures are required for safe operation of the machine/plant.

4.10 Safety signs on the machine/plant

The safety and warning signs and notices affixed to the machine/plant remain valid the entire time the machine/plant area is occupied, regardless of the activity being performed. A general explanation of the warnings and safety information used on the machine/plant can be found in the sections Depiction of specific warning signs [▶ 13] / Depiction of compulsory actions [▶ 15] / Depiction of prohibited actions [▶ 16] and Structure of warnings/safety information [▶ 11].

4.11 Personal protective equipment

PPE	Transportation	Assembly/installation/commissioning	Normal use/operation	Maintenance/repair	Cleaning	Troubleshooting	Decommissioning/disassembly/disposal
	♦	♦	○	♦	♦	♦	♦
	○	♦	○	♦	♦	♦	♦
	○	♦	○	○	○	○	○
	♦	♦	○	♦	♦	♦	♦
	○	○	○	○	○	○	♦
	♦	♦	○	♦	♦	♦	♦

♦	PPE must be worn
○	PPE recommended for various activities, but may be deemed mandatory by the operator depending on the operating conditions
-	no PPE required, but may be deemed mandatory by the operator depending on the operating conditions

Table 4: Explanation of PPE symbols

4.12 Safety regulations

NOTICE

Follow manual

- Obligation to read and observe the manual before carrying out an activity, in order to ensure correct, efficient and safe use of the machine/plant.

NOTICE

- Transport of persons is prohibited.
- The machine/plant must not be used as a working platform or similar.
- The use of the conveying area as a walkway/maintenance access route is prohibited. (Such an application is to be evaluated by the general contractor/commissioner of the complete plant in which this machine/plant is integrated by way of a risk assessment, and any risk-reducing measures necessary must be implemented.)
- Transportation of loose bulk goods, vibration-sensitive goods, explosive substances and live animals is prohibited.
- Compliance with the maximum dimensions and weights of conveyed items
- Transportation of liquids in unsealed and/or non-stable containers is prohibited.

NOTICE

- The machine/plant may only be commissioned and operated with the protection equipment and/or protection covers in perfect working condition. In the event of damage to protection equipment or protection covers that makes it possible to access the danger zone of the machine/plant, the machine/plant must be shut down immediately.

- In general, accessing and remaining in the danger zone during operation is prohibited.
- Access to the danger zone of the machine/plant must be granted only to trained, qualified and authorised personnel.
- Persons under 14 years of age must not be granted access to the machine/plant environment (including the area outside protection equipment) under any circumstances.
- The machine/plant must be securely shut down before the danger zone is accessed.
- Personnel not familiar with the operation, control and handling of this machine/plant must be given suitable training.
- Only qualified and authorised personnel may access the machine/plant and its area of impact and danger zone in order to undertake the necessary measures and activities.

4.12.1 Assembly

See section Assembly and commissioning [▶ 71]

4.12.2 Commissioning

See section Assembly and commissioning [▶ 71]

4.12.3 Operation

See section Normal use and operation [▶ 88]

4.12.4 Maintenance work and inspections

See section Maintenance work and inspections for operators [▶ 92]
See section Maintenance work by specialist personnel [▶ 96]

4.12.5 Maintenance and servicing work

See section Maintenance work by specialist personnel [▶ 96]

4.12.6 Disassembly

See section Decommissioning and disassembly [▶ 174]

4.12.7 Disposal

See section Disposal [▶ 182]

4.12.8 Structural alterations

See section Modifications or alterations [▶ 37]

4.13 Residual risks

NOTICE

When you are using the machine/plant, it is possible that risks may arise and damage may be caused, both of which may endanger

- the health and life of operators or third parties,
- the machine/plant itself, or
- other property.

a) Knowledge of the safety and user information within this manual serves as the basis for the safe use and fault-free operation of this machine/plant.

b) Personnel tasked with operating the machine/plant must be trained by the operator before using it for the first time and must receive refresher training at regular intervals, which must be documented.

4.13.1 General

⚠ DANGER

Danger due to use of conveyors by persons

- Tripping
- Death and severe injuries

a) Walking on the conveyors and using them as a working platform is strictly prohibited.

b) The transportation of persons on conveyors is strictly prohibited.

c) The intended points for crossing conveyors must be signposted and used.

d) Safety information and warnings must be observed.

⚠ WARNING

Danger to persons due to machine and plant

- Death and severe injuries due to lack of knowledge or immaturity

a) Permission to access and work in the danger zone of the machine/plant must be granted only to trained, qualified and authorised personnel.

b) In general, accessing and remaining in the danger zone of the machine/plant during operation is prohibited.

c) Persons under 14 years of age must not be granted access to the plant environment (including the area outside protection equipment) under any circumstances.

d) Unauthorised persons must be kept away from the machine/plant.

⚠ WARNING

Danger of being pulled in and getting caught on rotating shafts, moving parts of the machine/plant, and parts moving in opposing directions

- Danger of scrapes and burns on limbs
- Danger of limb loss

a) Never touch rotating or moving parts.

b) Do not wear jewellery or similar items.

c) Do not wear loose clothing and do not allow items or parts of clothing to hang loose.

d) Wear tight-fitting protective clothing.

e) Do not wear gloves to handle rotating machine parts.

f) Tie back long hair and wear a hair net.

g) Never work on the machine/plant alone. Ensure a second person is present.

⚠ WARNING

Delayed stop when deactivating the power supply

- Depending on the design of the drive (with/without brake), there may be some degree of delay in the machine/plant stopping when the power to the drive is deactivated.
- This delay time depends on the conveying speed, the load being carried and the angle of inclination of the conveyor.
- A delayed stop may also occur if the power supply to the machine/plant fails.

⚠ CAUTION

The surfaces of the drives can reach high temperatures during operation.

- There is a risk of burns to skin and body parts due to contact with hot surfaces (e.g. radiators) and parts of the machine and drive.

a) Let gear motors and radiators cool down.

b) The machine/assembly may only be handled by qualified, authorised personnel with the machine/plant deactivated.

c) Please follow the instructions in the enclosed documentation from the drive manufacturer.

d) Wear appropriate protective clothing for protection against heat.

⚠ CAUTION

Danger of becoming caught and trapped by conveyed items moving along the conveyor passage

- Danger of shearing, crushing, trapping of body parts between conveyed items and machine and plant parts
- Danger of shearing, crushing, trapping of body parts between conveyed items, machine and plant parts and machine transition points
- Danger of body parts, loose hair etc. becoming caught and trapped
- Danger of conveyed items falling from the machine/plant

a) Entering the conveyor passage is prohibited.

b) The transportation of people and animals using the conveyor system is prohibited.

c) Do not reach or lean into the conveyor passage during operation.

d) Do not reach or lean into machine transition points during operation.

⚠ CAUTION

Optical radiation

- Looking directly into the beam of light barriers or other light-emitting components can cause a temporary dazzling effect.

a) Do not look directly into the beam of light barriers or other light-emitting components.

b) Please follow the instructions in the enclosed documentation from the manufacturer of the light barriers or light-emitting components used.

4.13.2 Assembly/commissioning

See section Assembly and commissioning [▶ 71]

4.13.3 Operation

See section Normal use and operation [▶ 88]

4.13.4 Maintenance and servicing work

See section Maintenance work by specialist personnel [▶ 96]

4.13.5 Faults

See section Faults [▶ 94]

4.13.6 Disassembly

See section Decommissioning and disassembly [▶ 174]

4.14 Modifications or alterations

If significant modifications or alterations are made to the machine/plant without authorisation, the machine/plant will cease to comply with the respective declaration of conformity. Moreover, any manufacturer's liability and warranty may no longer apply.

Without consulting and obtaining a written declaration of consent from the manufacturer, the following actions are contrary to the intended use and therefore not permitted:

- combining the machine/plant with components that have not been approved by the manufacturer
- combining the machine/plant with components from other manufacturers
- making any structural modifications to the machine/plant
- making any customer-specific adjustments to the machine/plant
- operating the machine/plant contrary to the intended use described
- operating the machine/plant outside the specified guidelines and limits

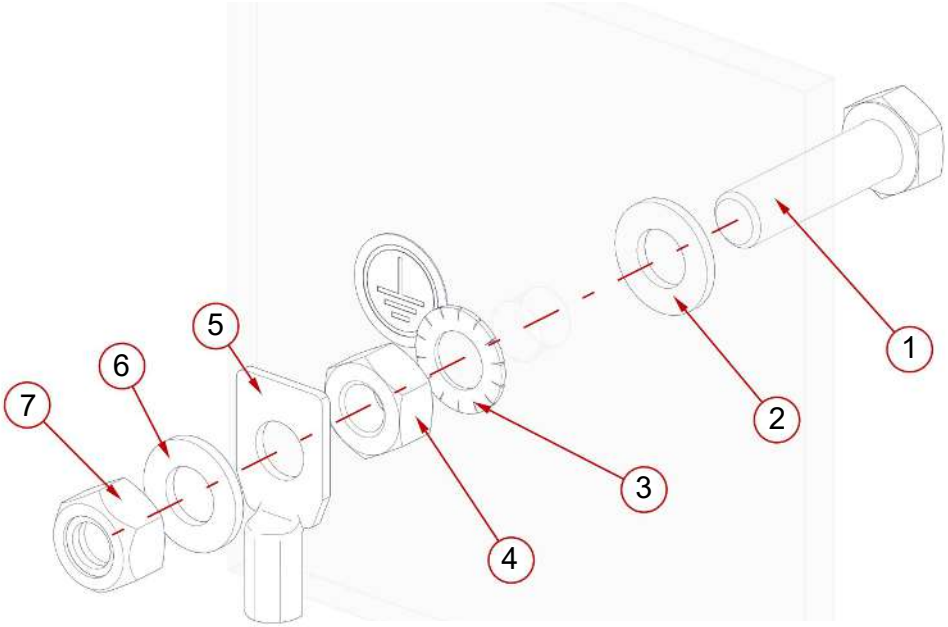
Please consult motion06 gmbh in order to find a safe solution to the problem if you plan to carry out modification work.

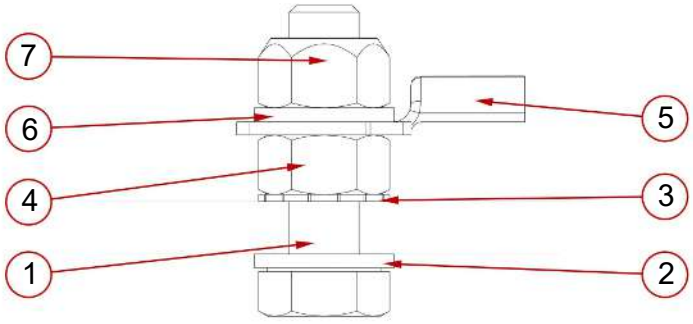
4.15 Earthing

Each (incomplete) machine/plant has at least one earth connector, which must be used to earth the machine/plant or create the potential equalisation. **NOTICE! The earth connector is normally located near the drive.**

	Pictogram for identifying earth connectors/earthing points.

Table 5: Earthing pictogram





76750987

1.	Hexagonal screw, DIN933, M8
2.	Washer, DIN125, M8
3.	Serrated washer, DIN6798A, M8
4.	Hexagon nut, DIN934, M8
5.	Cable lug

6.	Washer, DIN125, M8
7.	Hexagon nut, DIN985, M8

Table 6: Structure of earthing point

- Earth connectors/earthing points, such as earthing bolts and screws, must not be used to secure any mechanical parts.
- Earth connectors/earthing points may be used only to connect earthing or potential equalisation conductors.
- Earthing and potential equalisation conductors must be connected from the main earthing point/main potential distribution point of the machine/plant to the other earthing points in a radial circuit.

4.16 What to do in case of emergency

4.16.1 Fire-fighting

The machine/plant mainly consists of materials that do not or are not expected to represent a significant increase in the risk of fire or the fire load.

Fire loads nonetheless exist to a minor extent, primarily due to the use of a small number of parts containing plastics (e.g. rollers, toothed belts, conveyor belts; however, these are not highly flammable or have been certified as flame-resistant).

Flammable materials are only present in insignificant quantities (small quantities of grease for lubricating the bearings, oil in the sealed gearbox housing of the drive motors; however, these are not highly flammable).

In case of fire, the machine/plant must be disconnected from its power and media supplies.

Additional fire-fighting measures must be specified by the operator of the machine/plant.

NOTICE

- In the direct and indirect vicinity of the machine and plant, pay attention to cleanliness and tidiness.
- Do not store flammable materials, accelerants etc. in the direct and indirect vicinity of the machine and plant.
- The information and instructions in the (safety) data sheets for the operating materials and other materials used (conveyor belts) must be observed.

4.16.2 Anticipated emissions

Information on the expected noise emissions can be found in the section Sound pressure levels [▶ 70].

No other emissions are expected.

4.16.3 First-aid measures

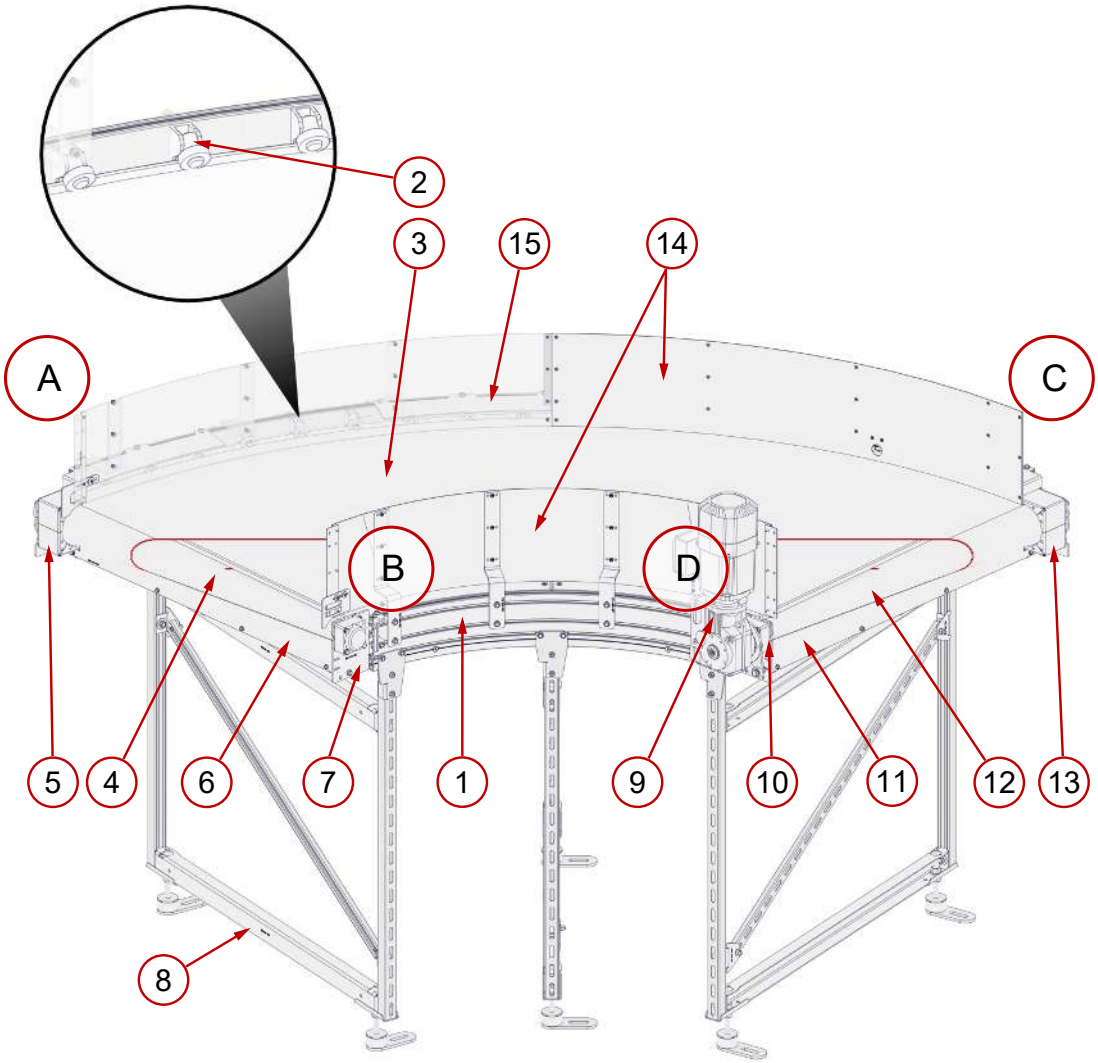
Lifting platforms or similar may be necessary for rescuing accident victims.

Aside from this, no special measures are required in relation to first aid.

5 Technical description

5.1 Description of the components

This section provides a comprehensive overview of the set-up of the machine/plant and how it works. You should ideally read it while you are near the machine/plant so that you can properly familiarise yourself with it.



77549579

1.	Frame
2.	Belt guiding unit
3.	Conveyor belt
4.	Bend roller
5.	Bearing unit A
6.	Front cover A-B
7.	Bearing unit B
8.	Support
9.	Drive (optional)

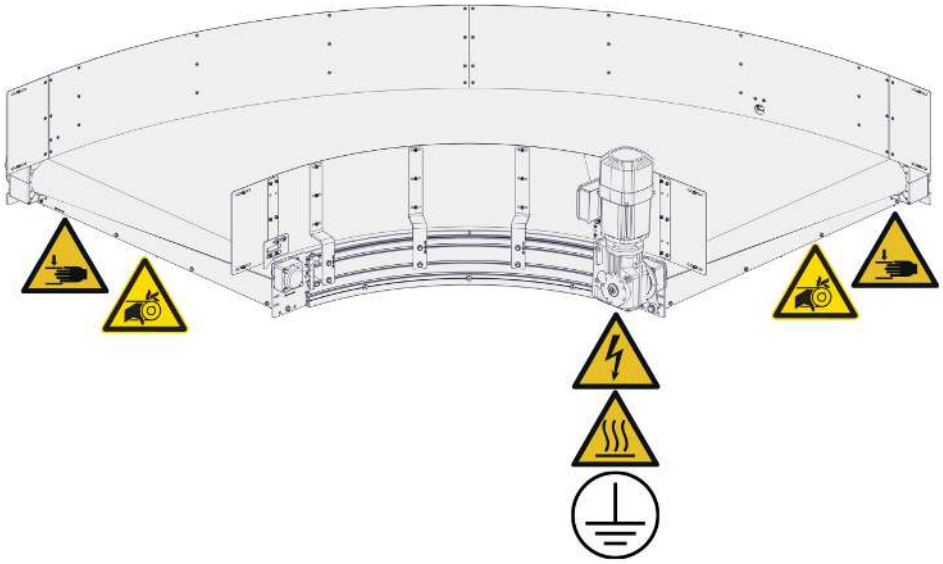
10.	Bearing unit D
11.	Front cover C-D
12.	Drive pulley
13.	Bearing unit C
14.	Side guide
15.	Protection covers

Table 7: Description of components

INFORMATION

- Due to the various possible configurations, the illustrations in this manual may differ slightly from the machine/plant supplied to you. The exact configuration of the machine/plant can be found in the detailed drawing that is included in the documentation.
- Subject to technical changes due to product improvements.

5.2 Overview of the interfaces and danger zones



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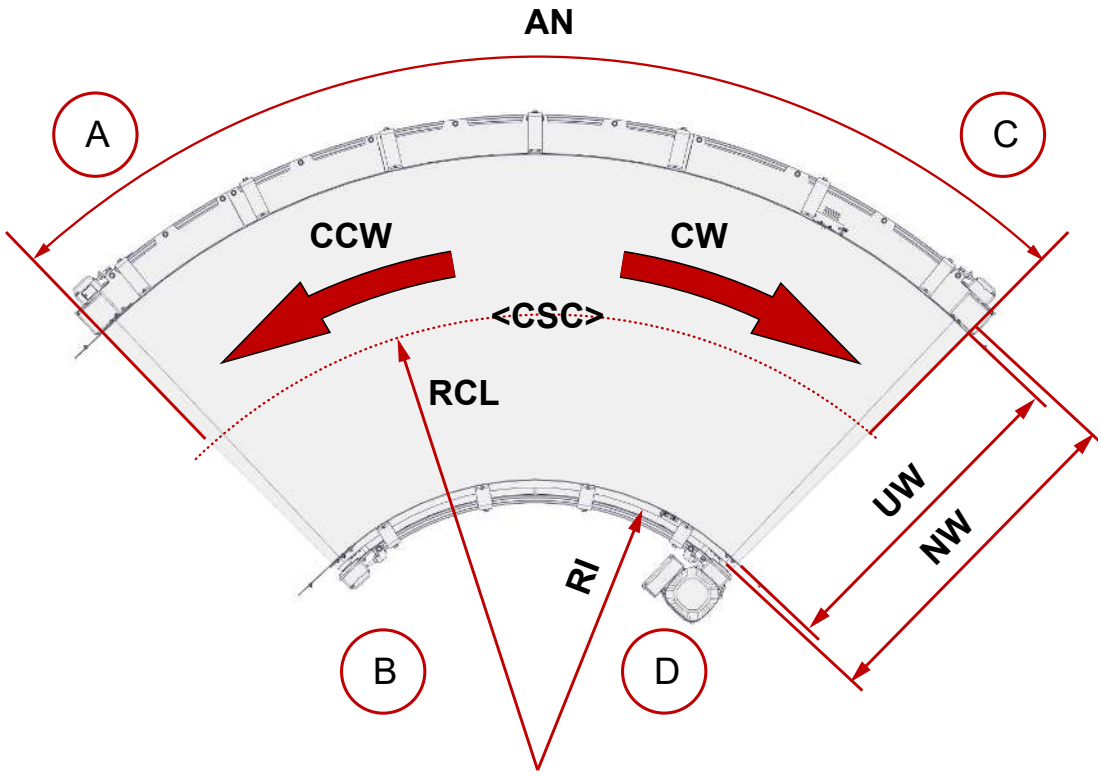
INFORMATION

- There must be a clearance of < 5 mm
  or > 50 mm at the interfaces between adjoining conveyors.
- The safety gap around the machine/plant should always be at least 500 mm.

5.3 Main dimensions



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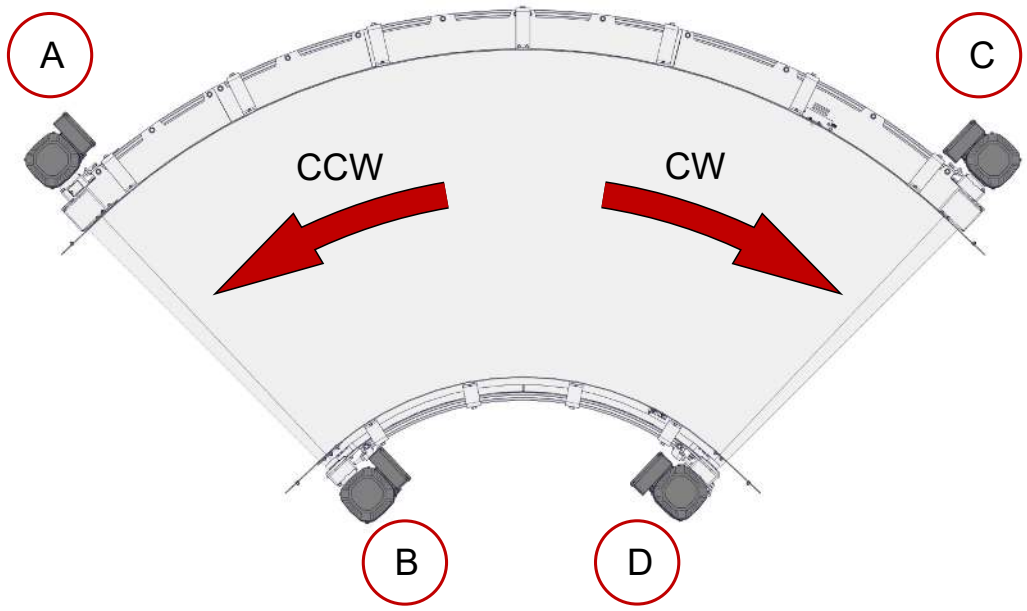
Variable	Description	Unit
RCL	Centre line radius	mm
RI	Internal radius on the conveyor belt	mm
AN	Curve conveyor angle	°
NW	Nominal width	mm
UW	Usable width	mm
CSC	Conveyor speed (measured on the centre line):	m/s
CW	Conveying direction “clockwise”	-
CCW	Conveying direction “counter clockwise”	-

Table 8: Main dimensions

5.4 Drive positions

The drive positions are always defined in the layout (view from above). Depending on the drive position (A, B, C, D) and conveying direction (CW, CCW) there is a “pulling” and “pushing” mode. **NOTICE! Motion06 recommends operation in the pulling direction.**



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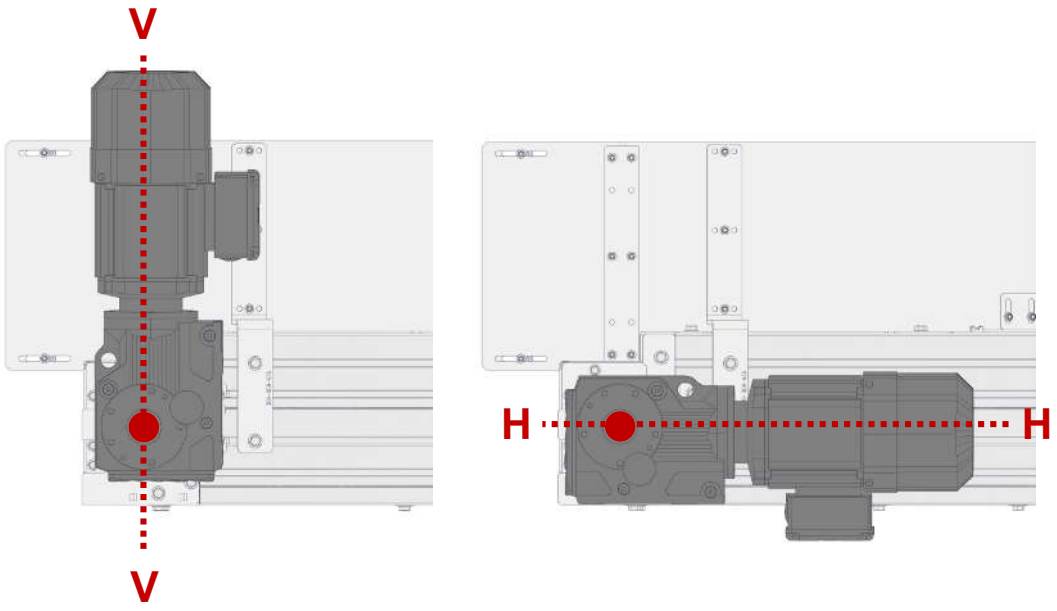
Drive position	Conveying direction	Pulling	Pushing	m06 recommendation
A	CW	○	♦	○
A	CCW	♦	○	♦
B	CW	○	♦	○
B	CCW	♦	○	♦
C	CW	♦	○	♦
C	CCW	○	♦	○
D	CW	♦	○	♦
D	CCW	○	♦	○

Table 9: Overview of drive positions – conveying direction

♦ ... YES

○ ... NO

5.5 Slip on gear mechanism installation positions



77307275

V-V ... Motor axis, vertical

H-H ... Motor axis, horizontal

Variable	Description	Possible variants
A-V	Drive position A/vertical	♦
B-V	Drive position B/vertical	♦
C-V	Drive position C/vertical	♦
D-V	Drive position D/vertical	♦
A-H	Drive position A/horizontal	♦
B-H	Drive position B/horizontal	○
C-H	Drive position C/horizontal	♦
D-H	Drive position D/horizontal	○

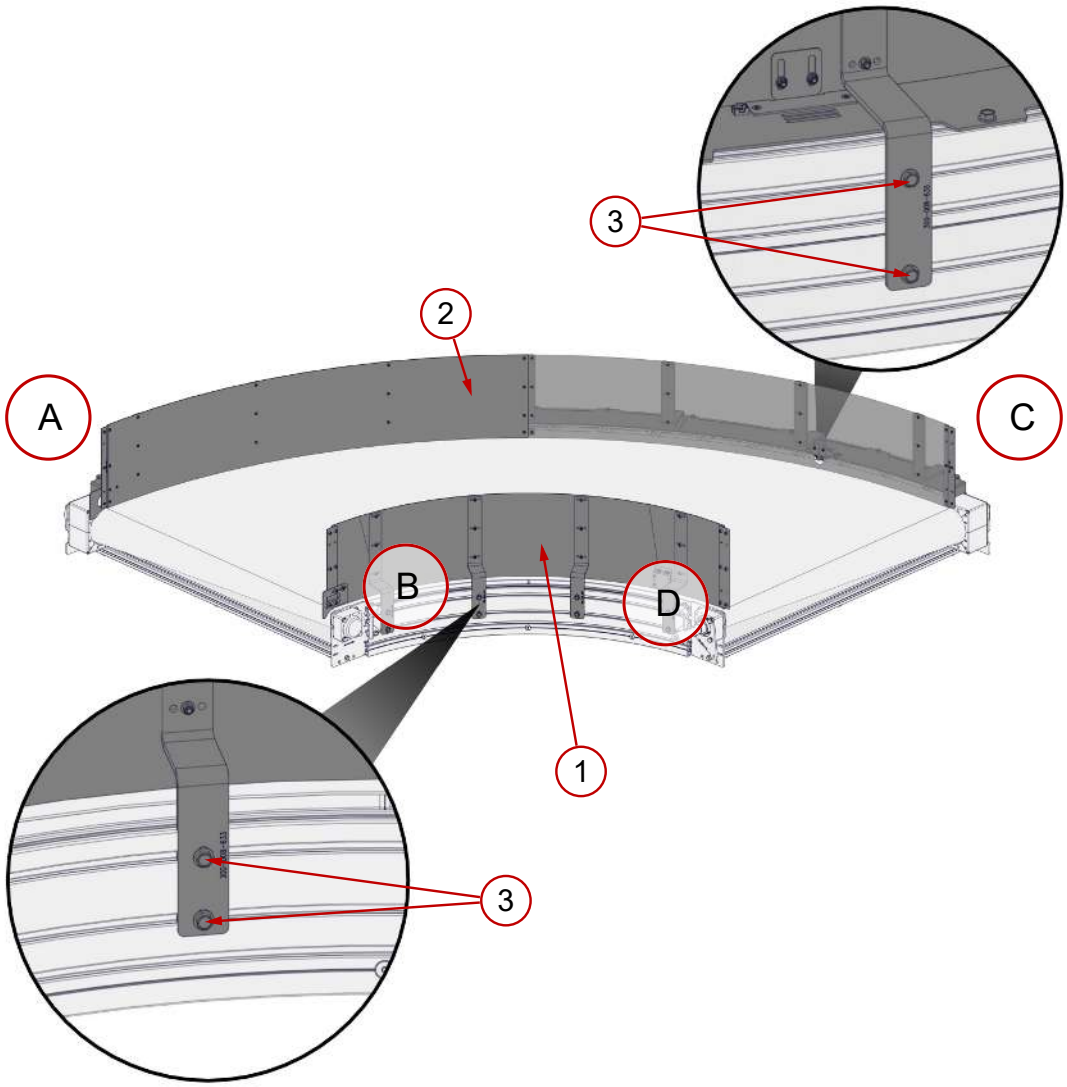
Table 10: Design variants

♦ ... YES

○ ... NO

5.6 Side guide

The side guide consists of an inner part (1) and an outer part (2), which are installed on the inner/outer profile using fasteners (3). Depending on the configuration of the CBC, the side guide may be various heights, have various surface treatments or be constructed as a complete special variant.



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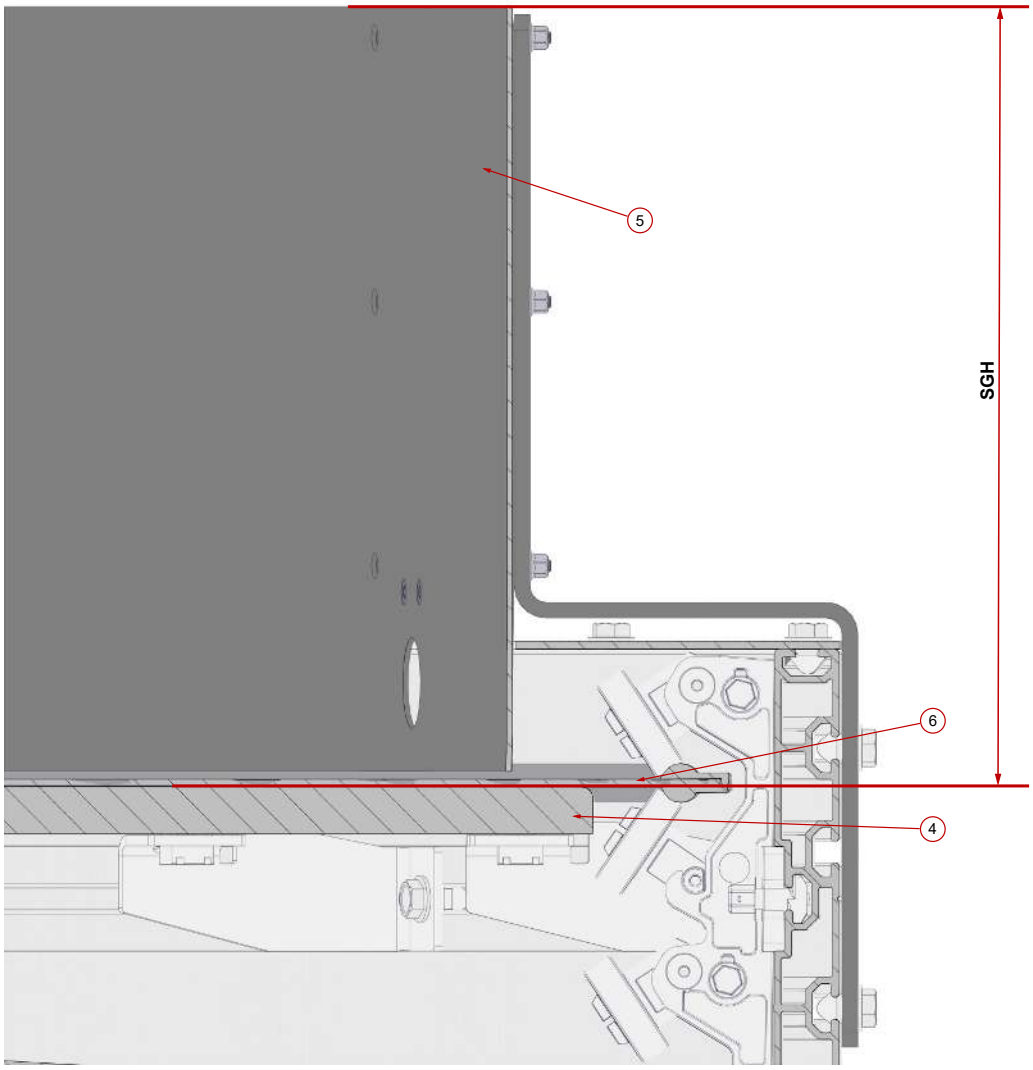
5.6.1 SGH height definition

The height of the side guide is always specified from the top edge of the belt support plate (4) and the top edge of the side guide (5). The thickness of the conveyor belt (6) is not considered.



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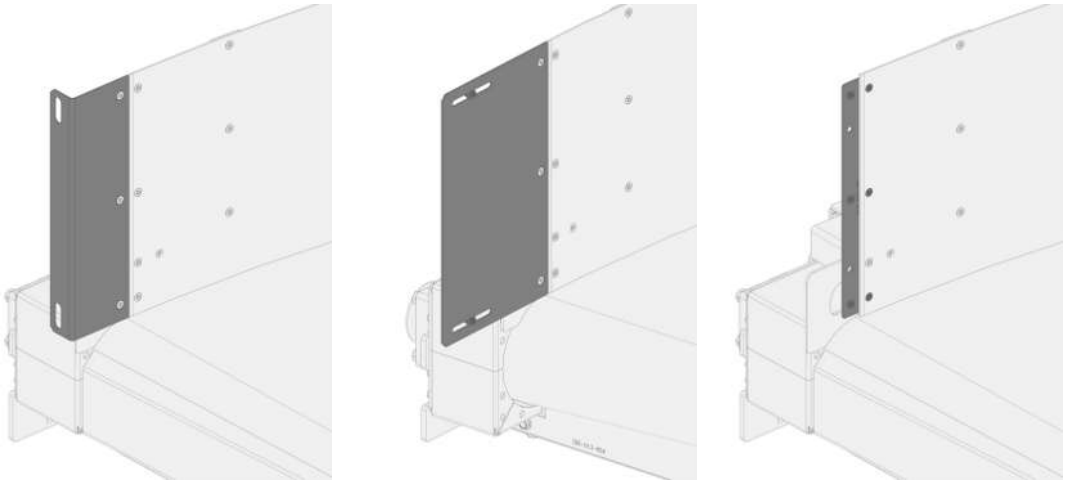
5.7 Side guide interfaces

The following side guide interface variants can be installed on the side guide.



78254475

1 ... folded side guide interface

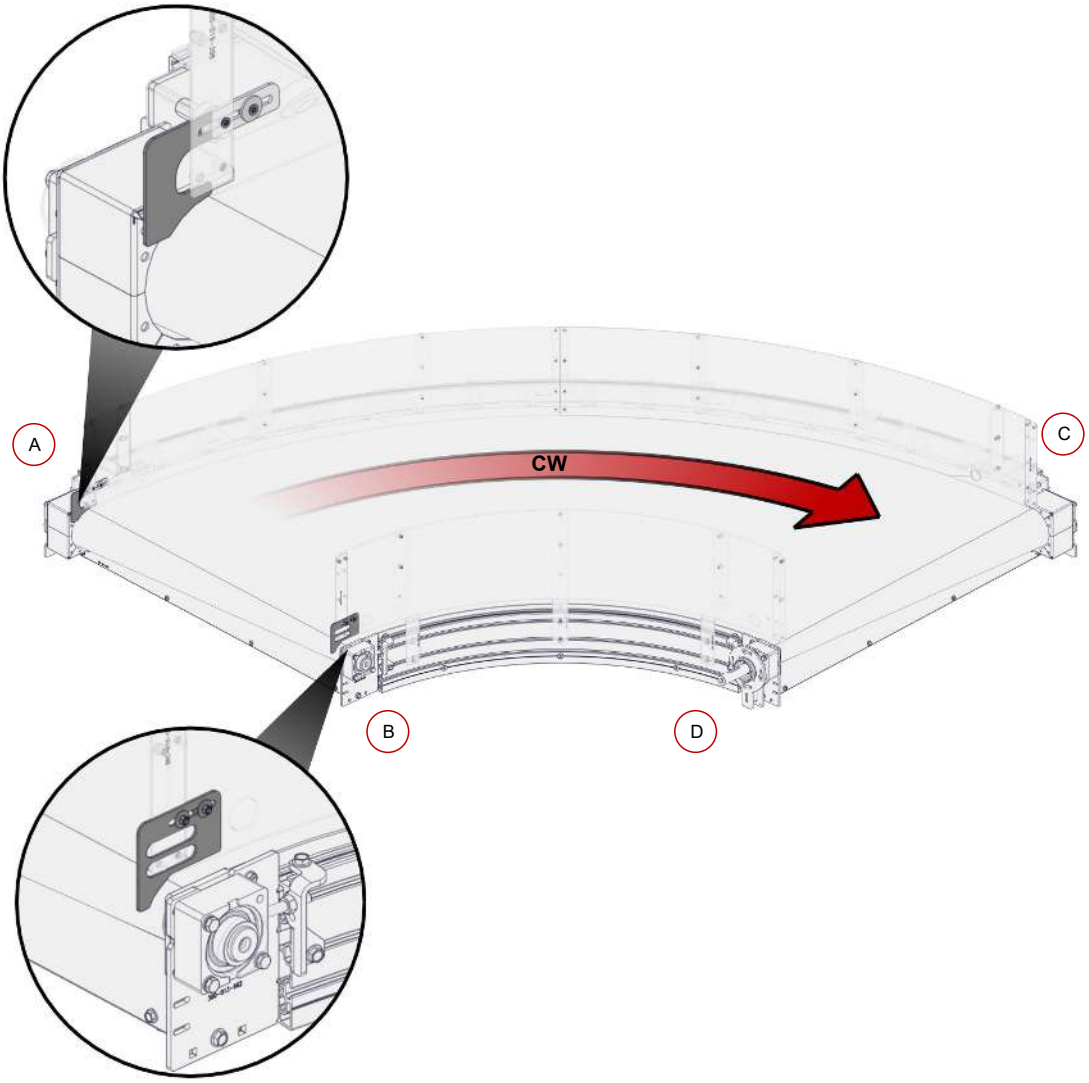
2 ... straight side guide interface (m06 standard)

3 ... no side guide interface (connector plate pre-installed)

5.8 Conveying direction/intake plates

Depending on the conveying direction, the intake plates are installed in the following positions.

5.8.1 CW intake plates

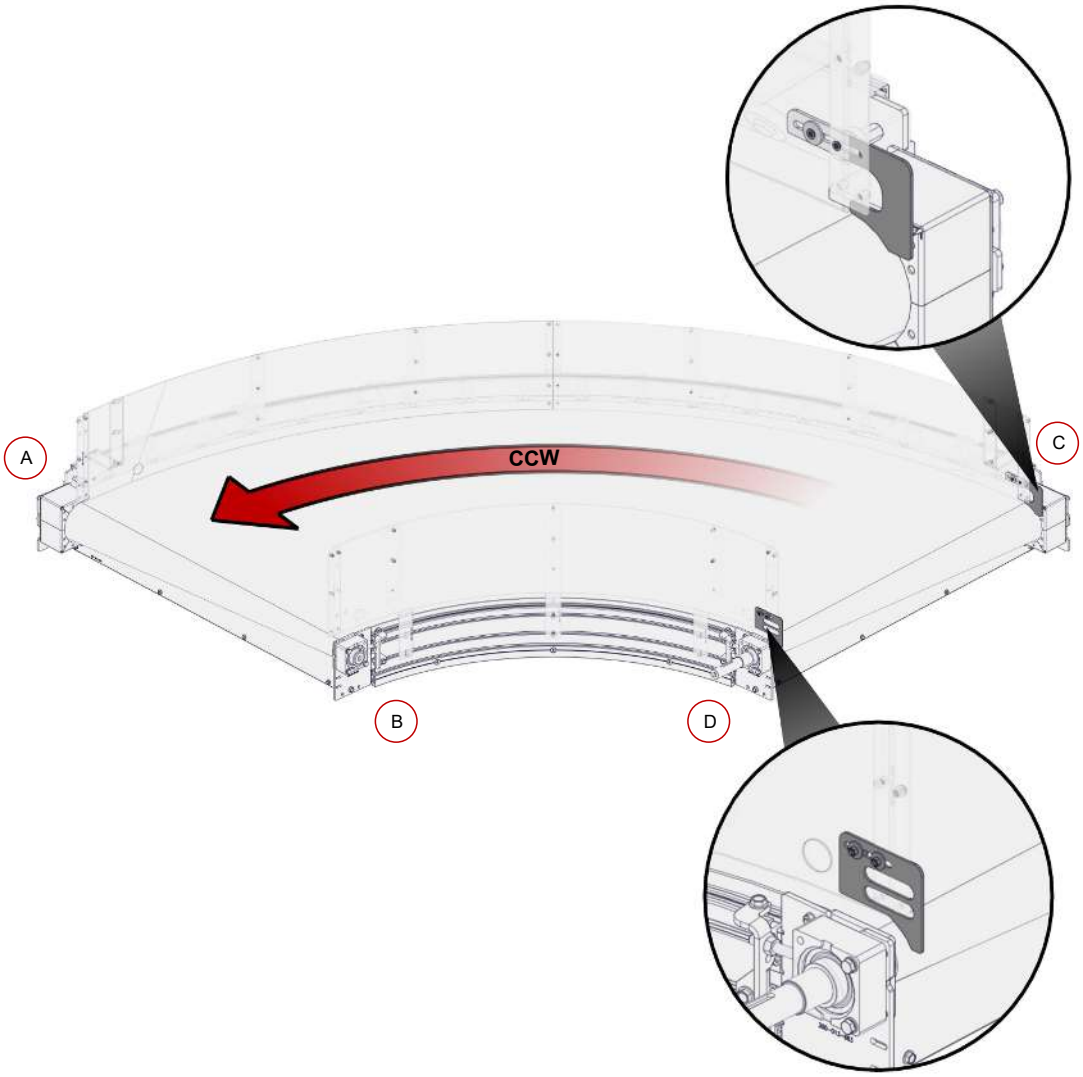


98607755

Drive side	Conveying direction	Intake plates position
C	CW	A/B
D	CW	A/B

Table 11: Intake plates

5.8.2 CCW intake plates

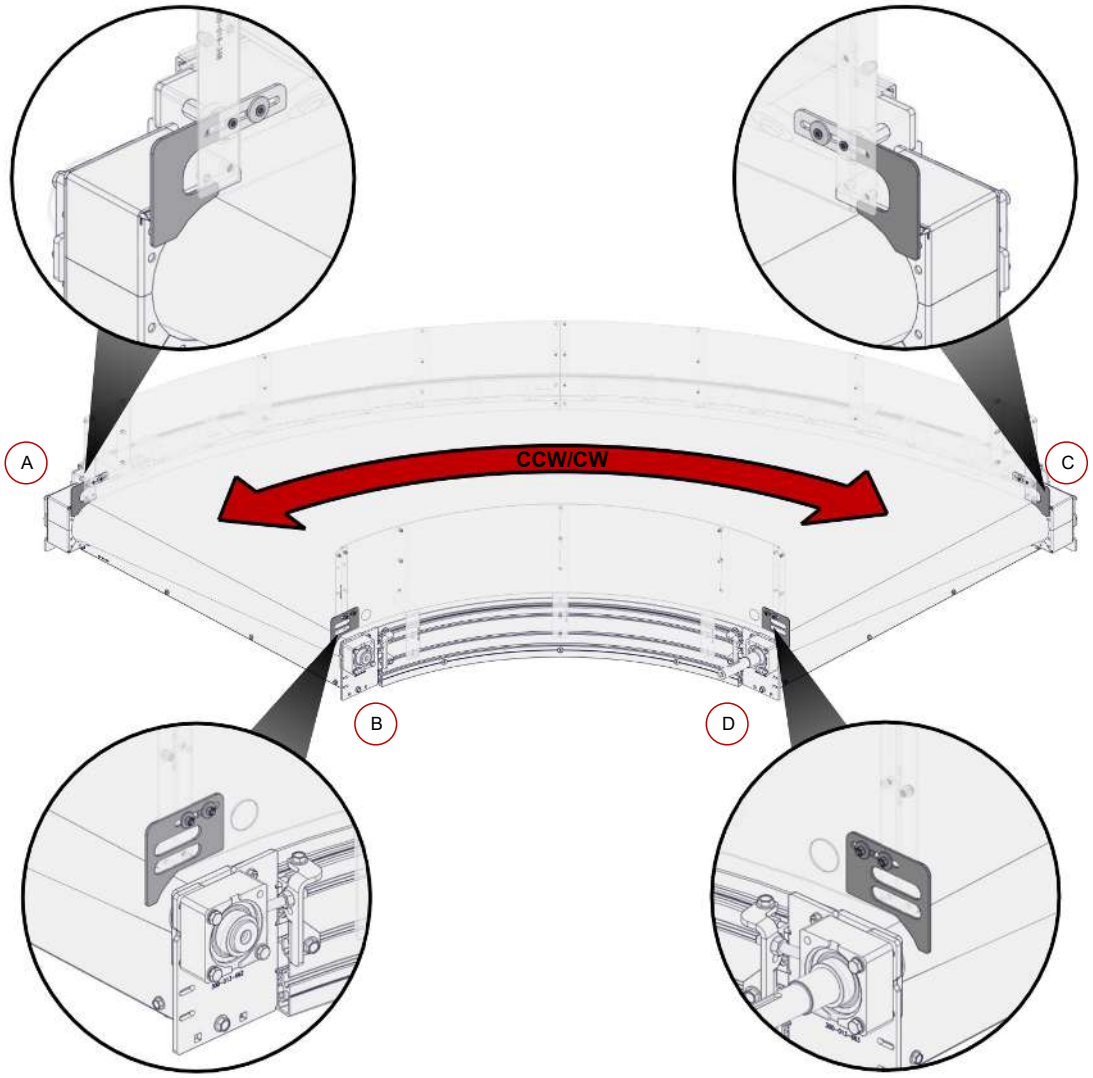


98603275

Drive side	Conveying direction	Intake plates position
A	CCW	C/D
B	CCW	C/D

Table 12: Intake plates

5.8.3 Intake plates reverse CW/CCW



98613003

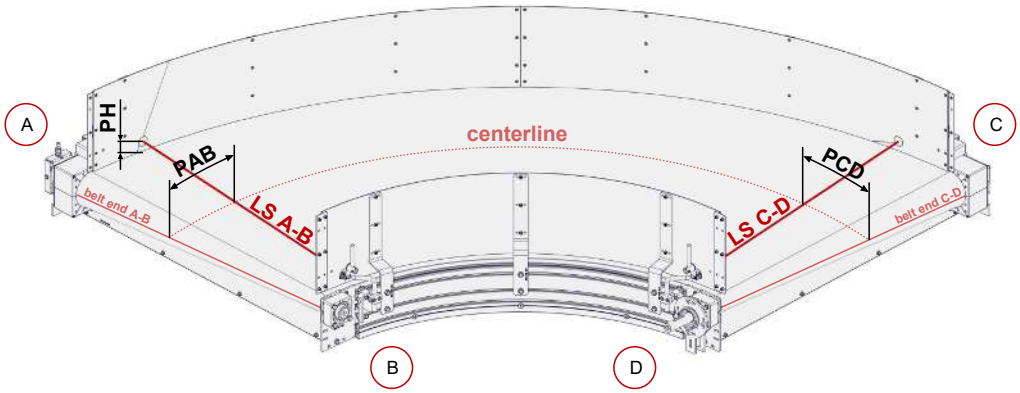
Drive side	Conveying direction	Intake plates position
A/B/C/D	Reverse	A/B/C/D

Table 13: Intake plates

5.9 Light barriers

Light barriers may be installed on the sides A-B and C-D. The distance PAB/PCD is specified/ measured in radians at the centre line from the respective belt end. In the standard design, perforations PAB and PCD are present symmetrically on both sides.

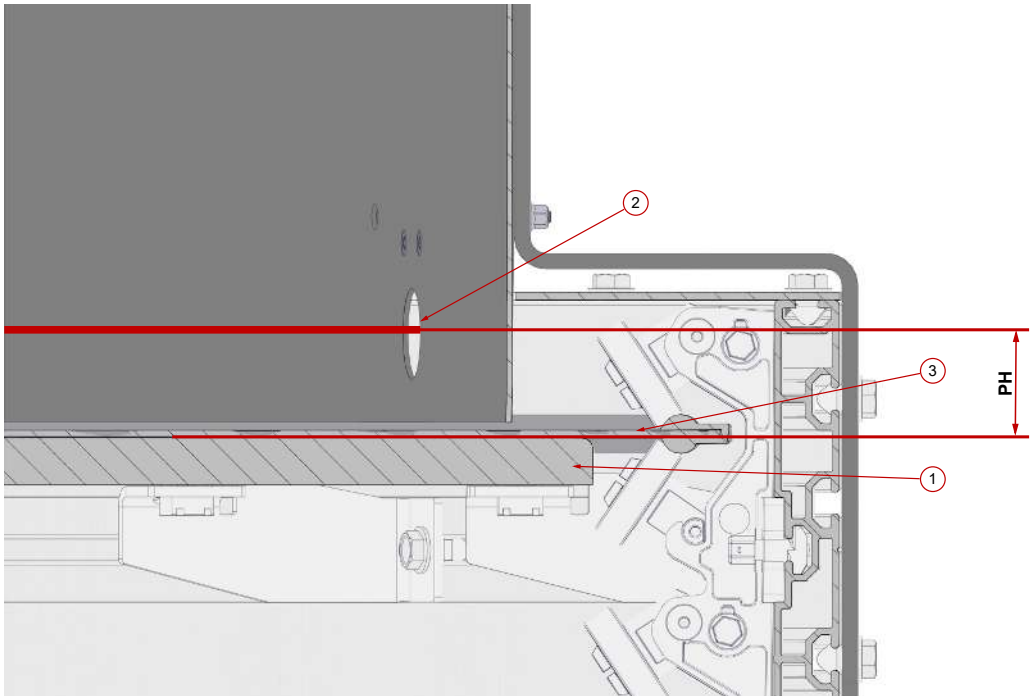
The light barrier height PH is specified from the belt support plate to the centre of the sensor recess.



98699659

5.9.1 PH height definition

The height of the light barriers is always specified from the top edge of the belt support plate (1) to the centre of the sensor/recess (2). The thickness of the conveyor belt (3) is not considered because the height of the sensor can be adjusted.



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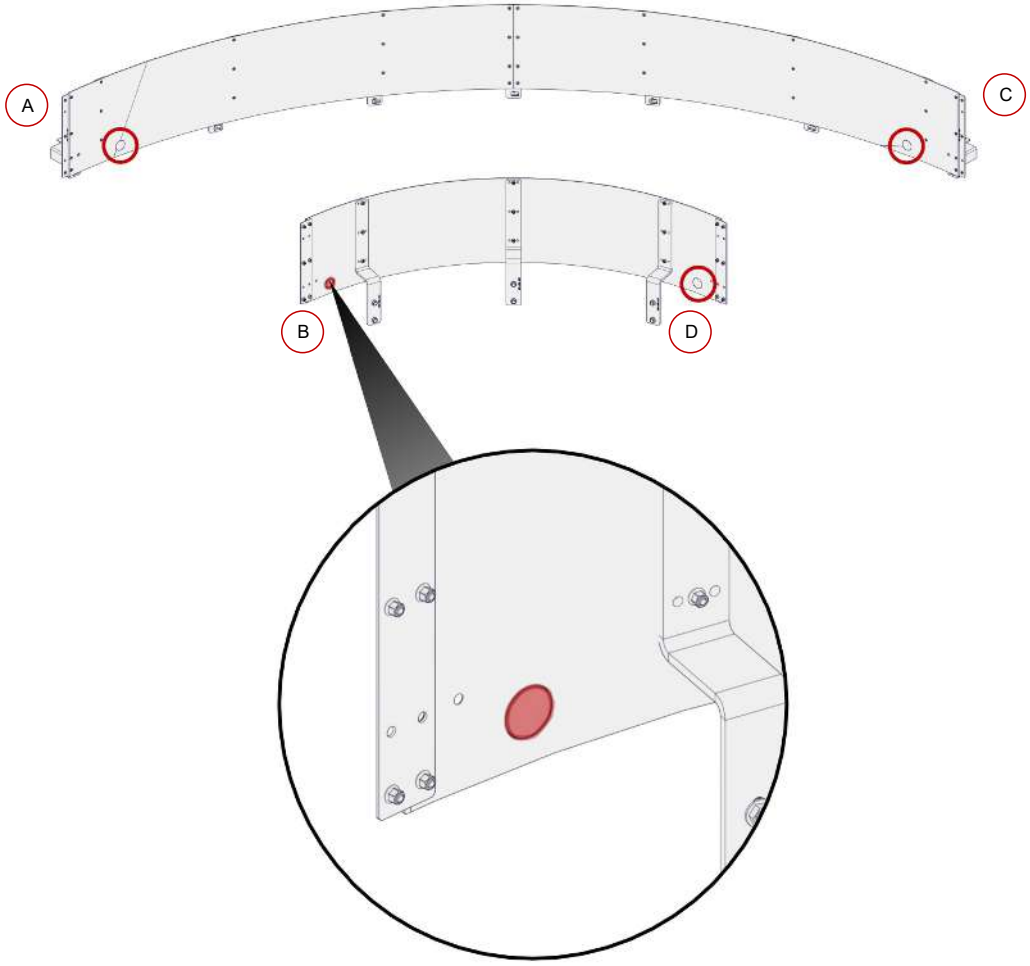
5.9.2 Knock-out holes on the side guide

Irrespective of the conveying direction, as standard perforations are prepared for knock-out holes on all sides and they can be knocked out if necessary. **NOTICE! Any bare knock-out surfaces that emerge must be treated with corrosion protection/the desired paint.**



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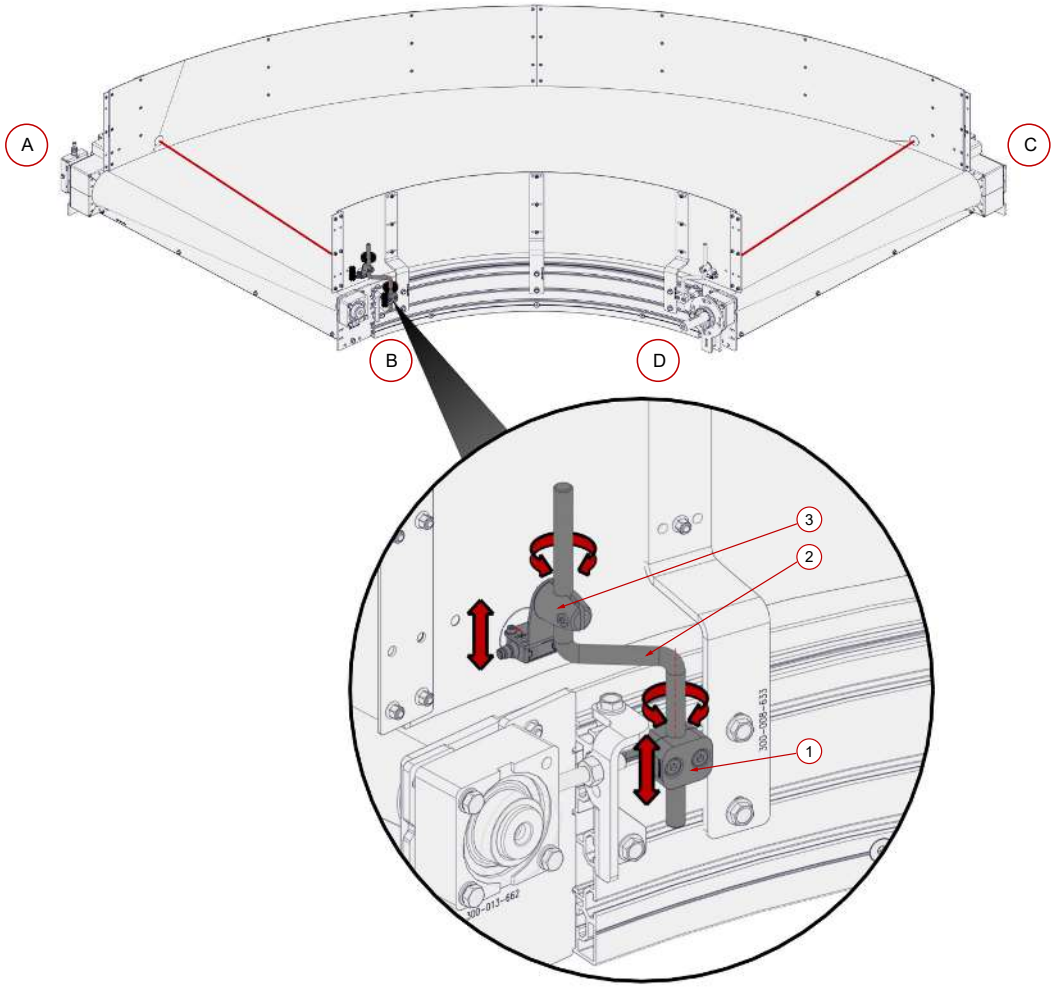
5.9.3 Light barrier bracket

In principle the light barrier bracket system consists of a clamping element (1), a supporting rod (2) and a sensor/reflector bracket (3). Depending on requirements, various sensors/reflectors and supporting rods (U shaped, Z shaped, straight) can be installed. The clamping element (1) can be shifted into the profile slot or the height can be adjusted.

5.9.3.1 Light barrier bracket B-D (inside)



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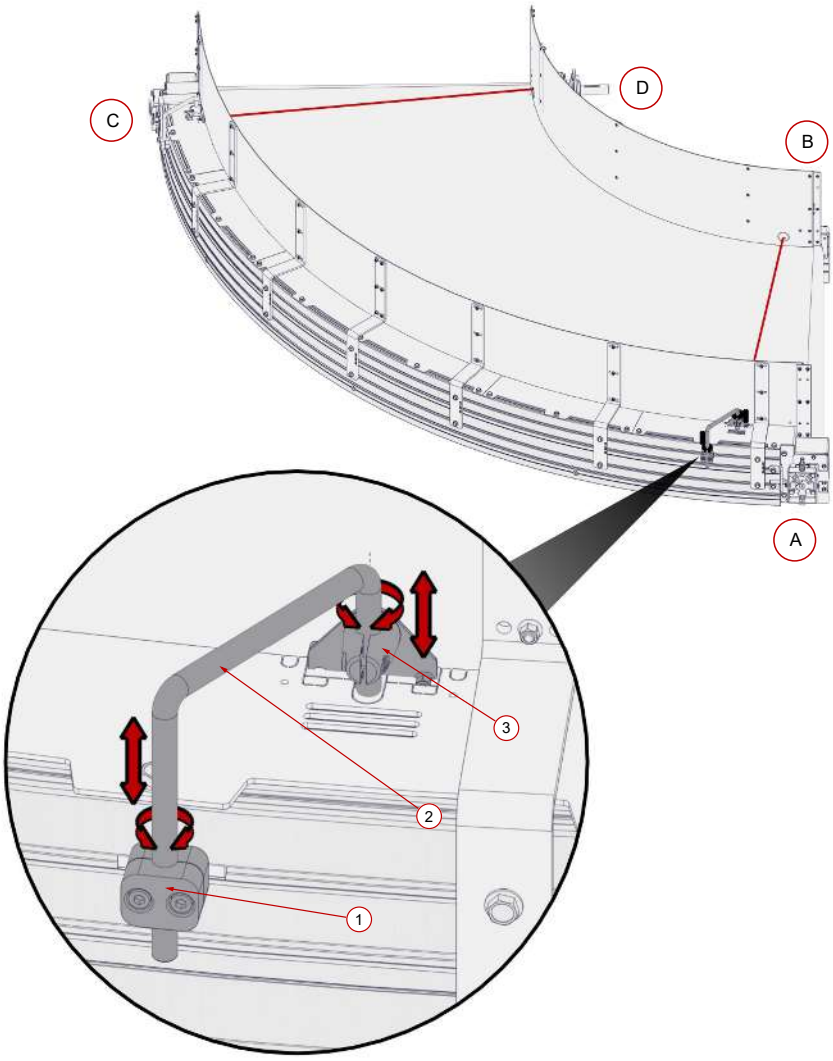
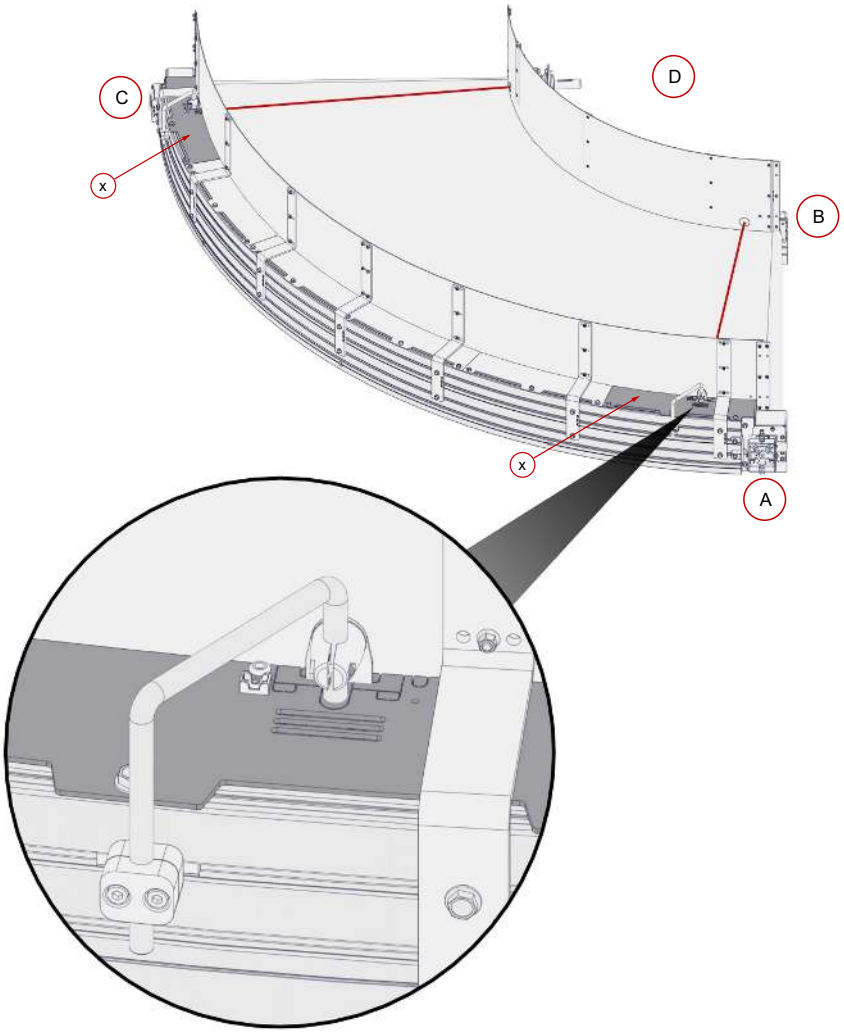
5.9.3.2 Light barrier bracket A-C (outside)



98924427

5.9.4 Knock-out holes on the protection cover

When installing the sensors/reflectors on sides A or C (exterior of the CBC), the perforated protection covers (x) must be knocked out as needed.



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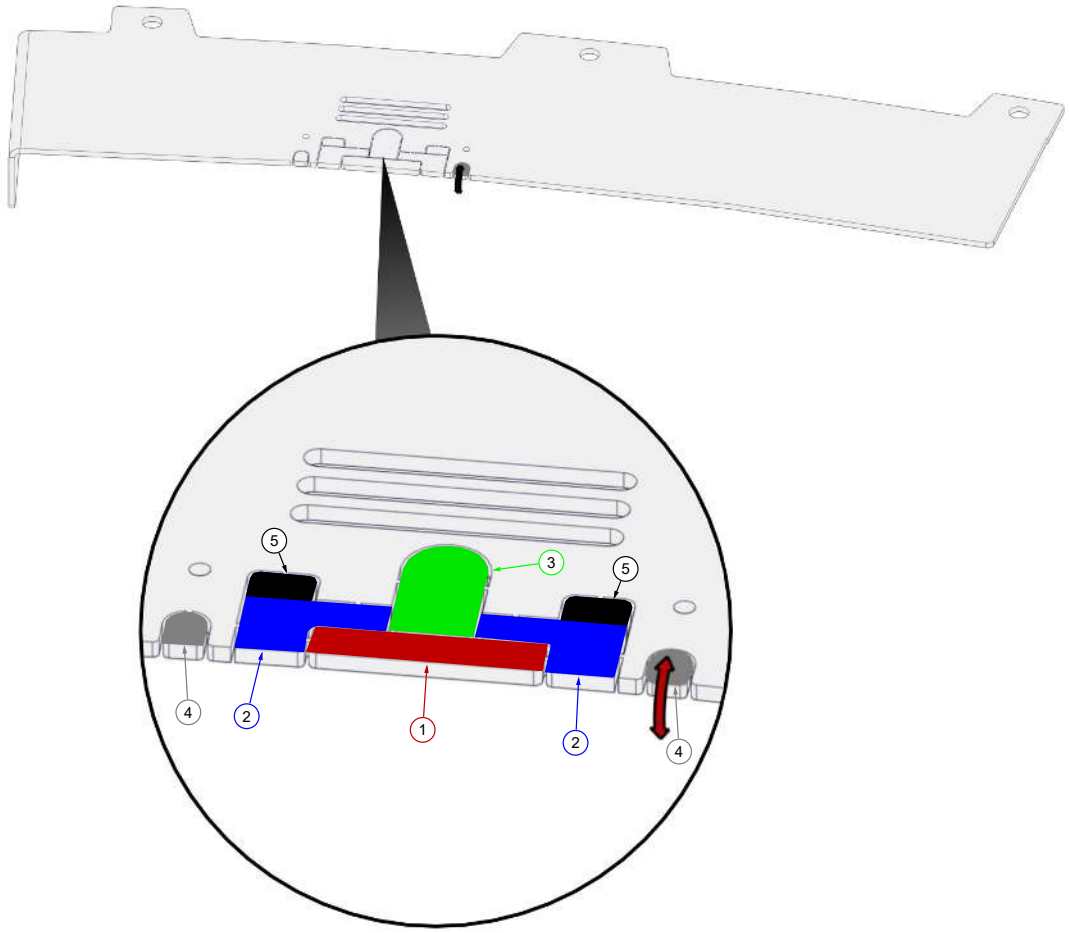
NOTICE! Any bare knock-out surfaces that emerge must be treated with corrosion protection/the desired paint.



99080459

1 ... knock-out hole for sensor bracket

2 ... knock-out hole for reflector bracket

3 ... knock-out hole for supporting rod

4 ... knock-out hole for sensor cable (only knock out one side depending on position)

5 ... knock-out hole for fasteners on reflector bracket (only knock out one side depending on alignment)

Variant	Position 1	Position 2	Position 3	Position 4	Position 5
Sensor bracket	♦	○	♦	♦	○
Reflector bracket	♦	♦	♦	○	♦

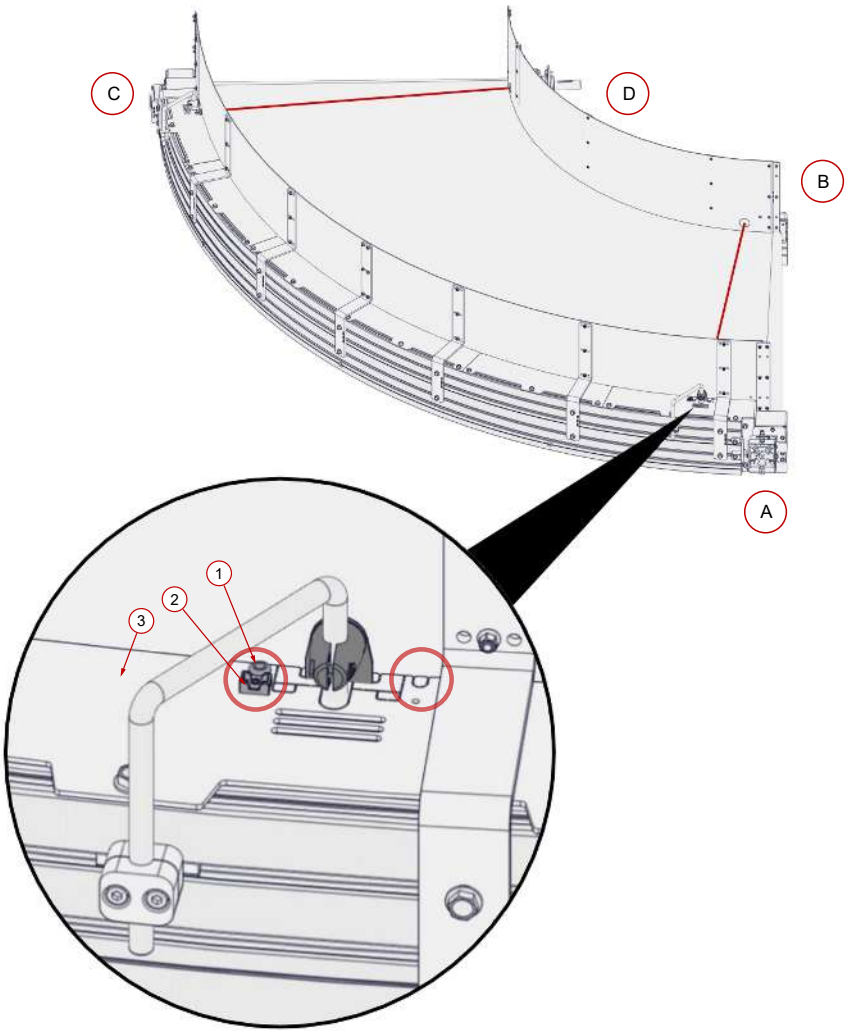
Table 14: Knock-out hole overview

♦ ... YES

○ ... NO

5.9.5 Sensor cable protection

If light barriers are installed on sides A or C (exterior of the CBC), the sensor cable is protected by a cable sleeve (1) and secured using a cable lug (2). Perforated knock-out holes are provided for this purpose on the protection cover (3), and these can be knocked out as required depending on the cable position. **NOTICE! Any bare knock-out surfaces that emerge must be treated with corrosion protection/the desired paint.**



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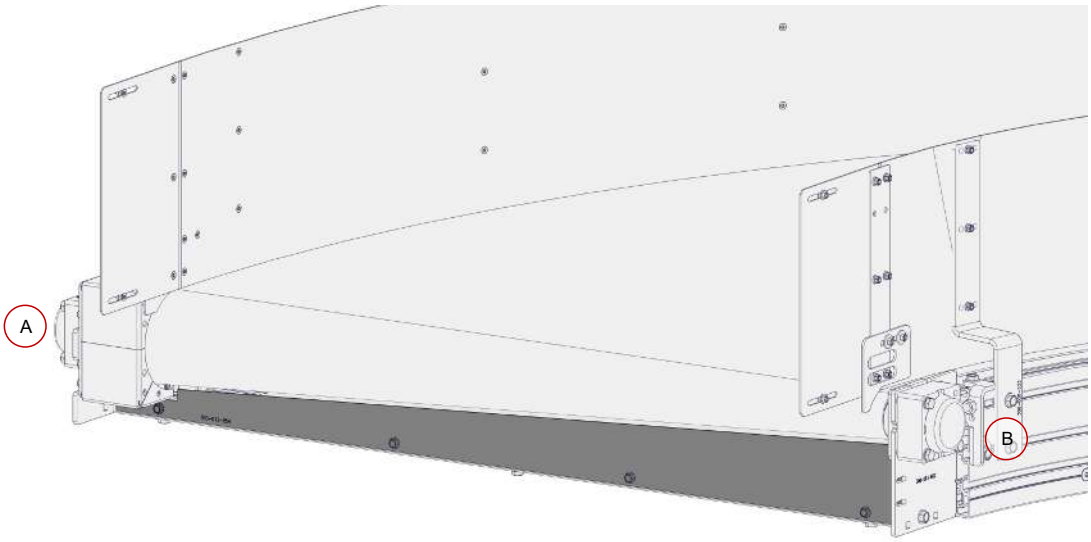
5.10 Front covers

The front covers are each installed on the end of the CBC on sides A-B or C-D. In principle a distinction is made between the airport and post & parcel variants.

5.10.1 Airport front covers



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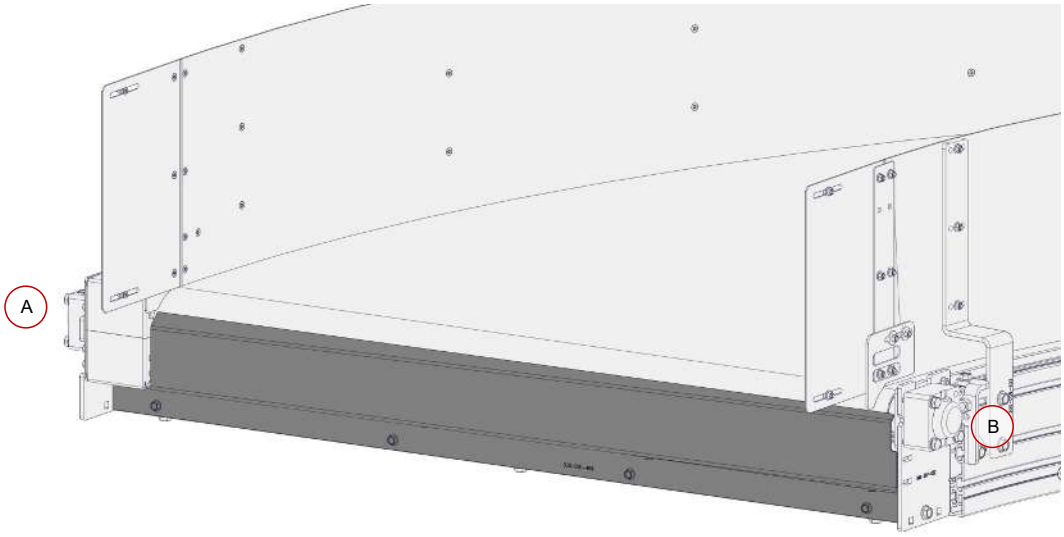
INFORMATION

- Airport front covers only available for CBC100/120!

5.10.2 Post & parcel front covers



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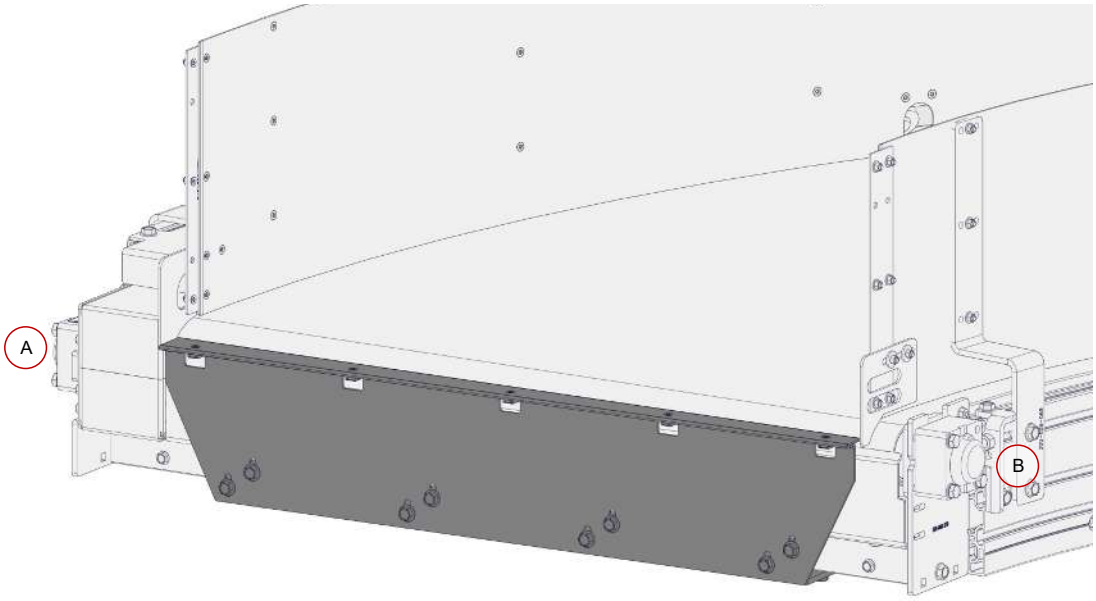
5.11 Transfer plates

The transfer plates are each installed on the end of the CBC on sides A-B or C-D and in principle are only available in combination with front covers in the post & parcel variant.



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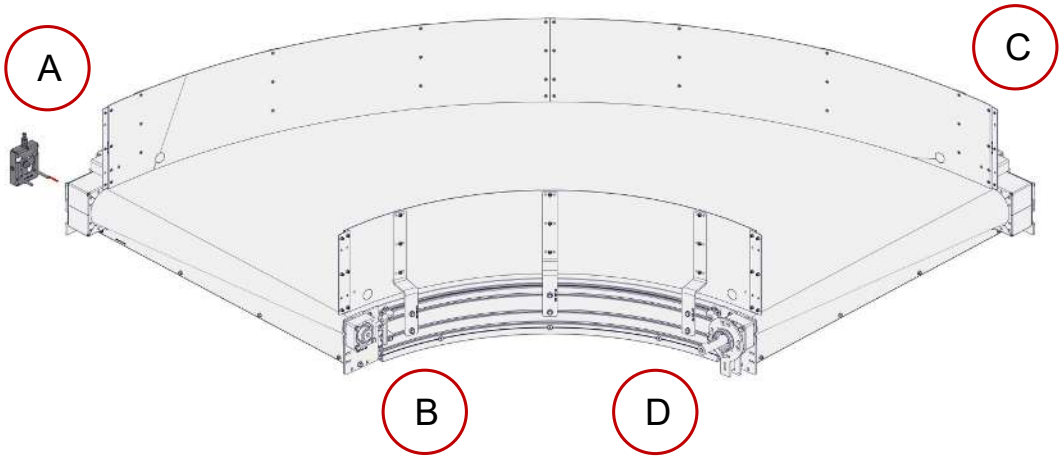
5.12 Tracking

5.12.1 Tracking – inductive

The tracking is installed axially on the bend roller of the CBC. Depending on the design, a 2, 3, 4, 5 or 6 radial signal can be used. **NOTICE! The tracking can only be installed on the pulley side on the interior/exterior of the CBC. For possible variants, see table below.**



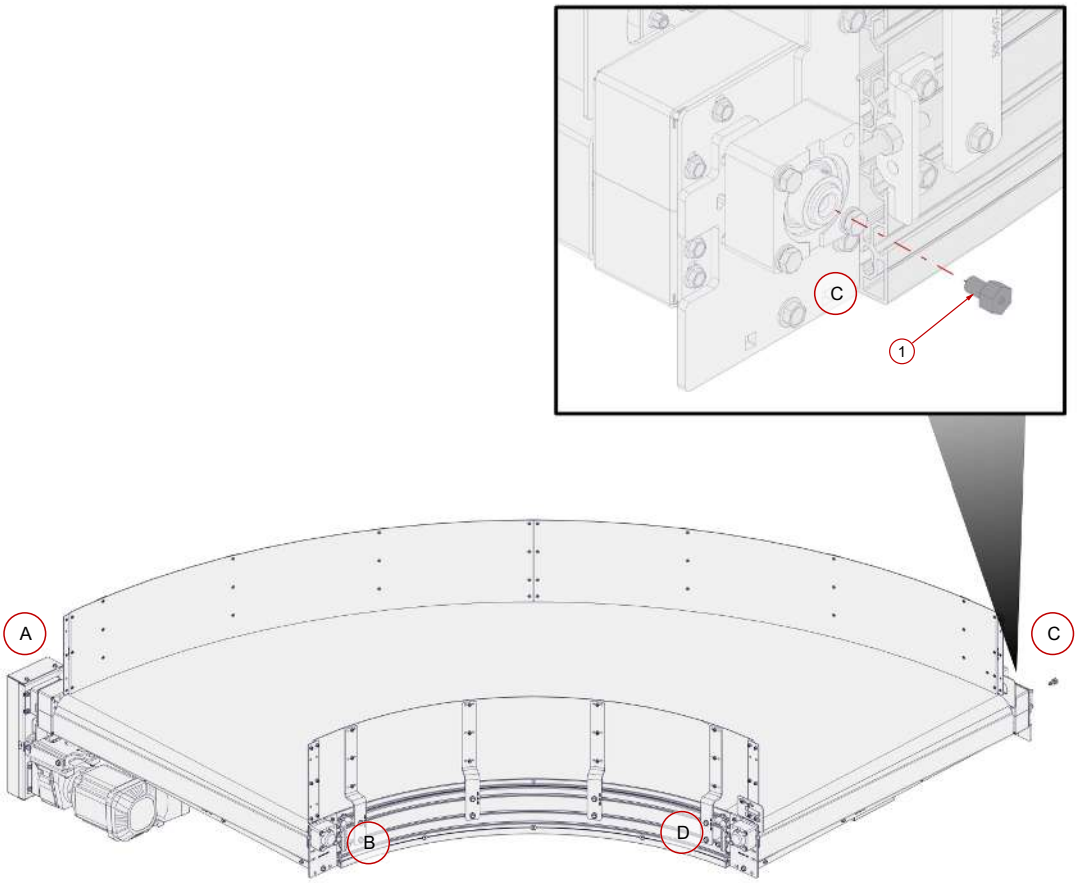
98534283

Drive side	Possible tracking position
A	C/D
B	C/D
C	A/B
D	A/B

Table 15: Design variants

5.12.2 Tracking – hall sensor

For the installation of a hall sensor, just one adapter (1) is screwed into the front of the bend roller. **NOTICE! The tracking can only be installed on the pulley side on the interior/exterior of the CBC. For possible variants, see table below.**



103853195

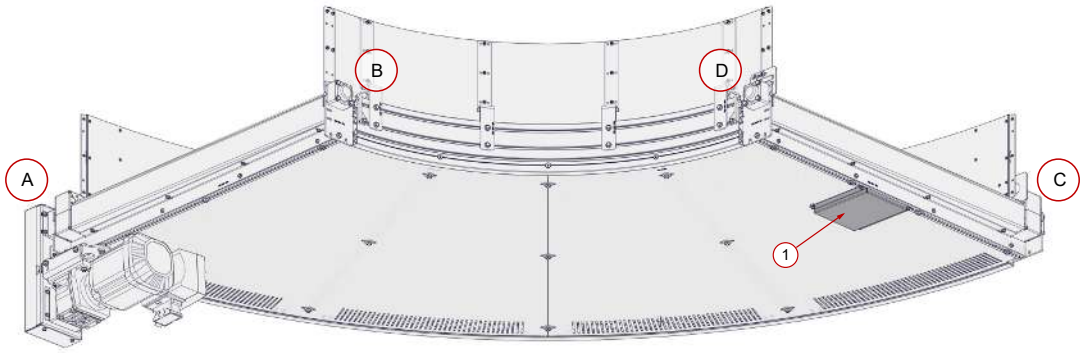
Drive side	Possible tracking position
A	C/D
B	C/D
C	A/B
D	A/B

Table 16: Design variants

5.12.3 Tracking – on the conveyor belt

In this tracking variant, unlike the other tracking variants, the signal is not taken on the bend roller but instead directly on the conveyor belt. For this purpose, there is a recess/a cover (1) in the lower covers of the CBC, under which the tracking sensor is located. Detailed information can be found in the section Tracking – on the conveyor belt [▶ 153].

NOTICE! The tracking is installed opposite the drive in the centre of the CBC. For variants, see table below.



103844747

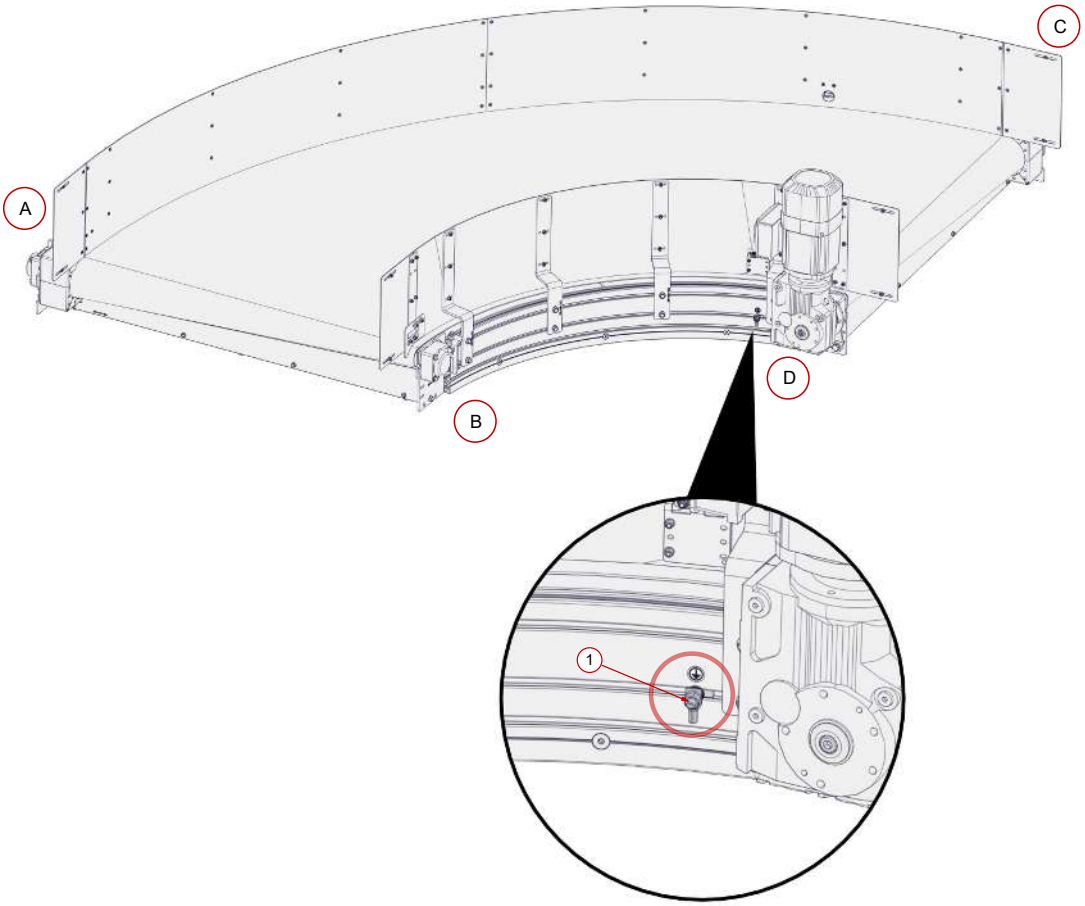
Drive side	Possible tracking position
A	C-D
B	C-D
C	A-B
D	A-B

Table 17: Design variants

5.13 Earthing point

The earthing point (1) is always installed in the immediate vicinity of the drive in a profile slot of the frame.

The structure of the earthing point is described in the section Earthing [▶ 38].



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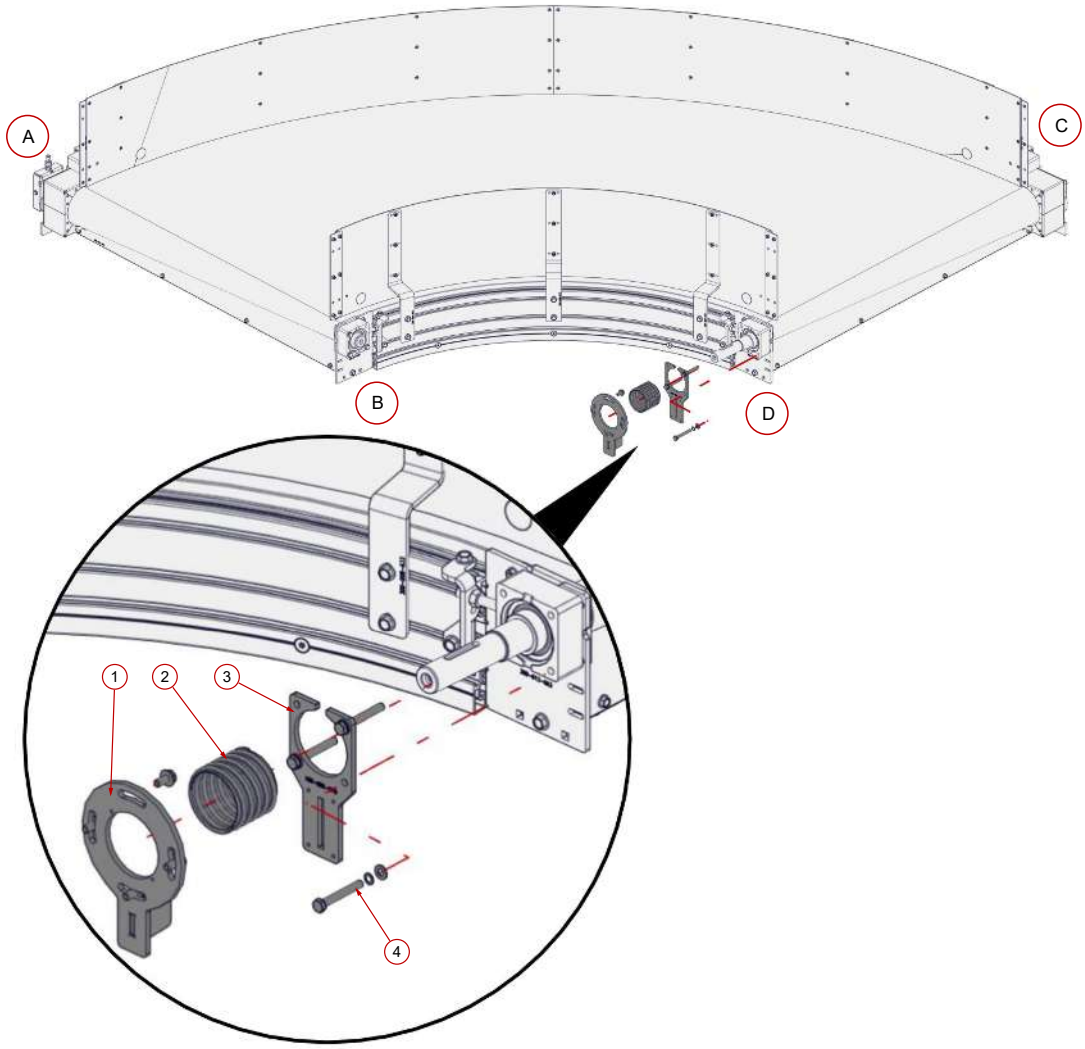
5.14 Torque support

The torque support is installed on the respective drive side between the drive and bearing unit and in principle consist of a motor flange (1), a shaft cover (2), a bearing unit flange (3) and the associated fasteners (4).



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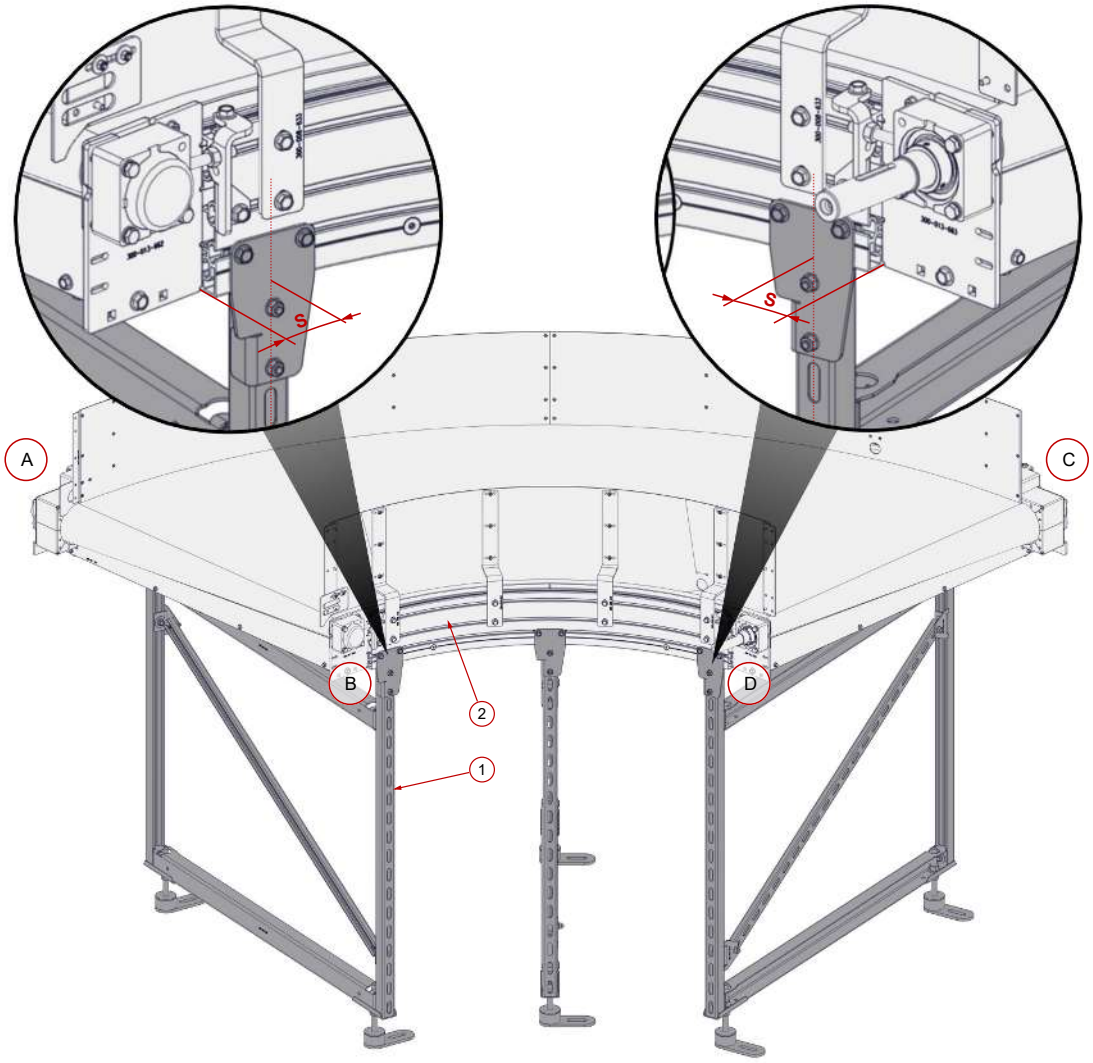
5.15 Supports

The supports (1) are screwed into the lower profile slot of the base frame (2). The number of supports may vary depending on the geometry of the CBC. The dimension “S” can be found in the overview drawing of the CBC and specifies the distance from the profile end to the centre of the outermost supports in radians. All other supports are then distributed evenly.



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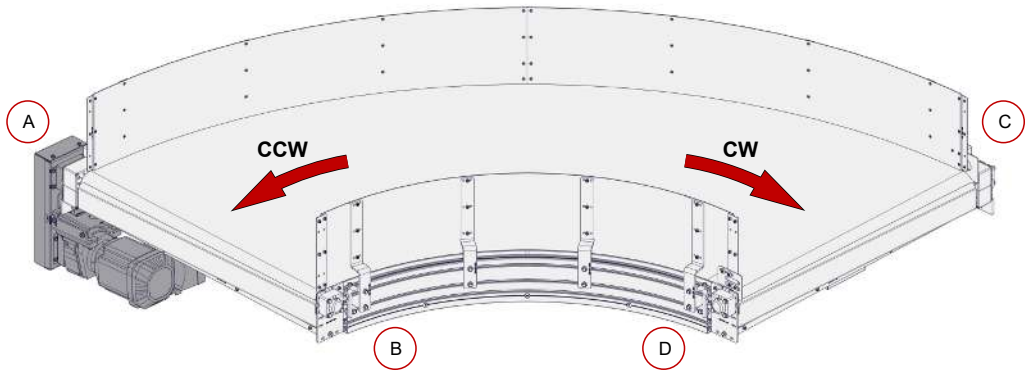
5.16 Toothed belt drive (lower drive unit)

Toothed belt drives may be installed as a complete unit on the drive sides A/B/C/D.



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Drive position	Conveying direction	Pulling	Pushing	m06 recommendation
A	CW	○	♦	○
A	CCW	♦	○	♦
B	CW	○	♦	○
B	CCW	♦	○	♦
C	CW	♦	○	♦
C	CCW	○	♦	○
D	CW	♦	○	♦
D	CCW	○	♦	○

Table 18: Overview of drive positions – conveying direction

♦ ... YES

○ ... NO

INFORMATION

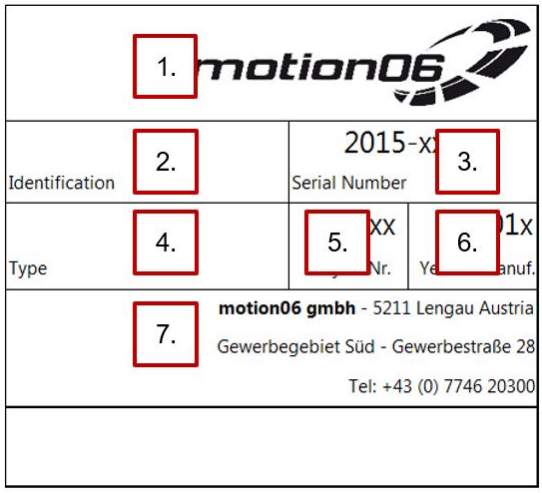
- If a toothed belt drive is used, the minimum installation height of the CBC changes. This must be considered in the layout planning/line planning.
- The documentation for the toothed belt drive is not part of this document and can be found in the complete documentation.

5.17 Machine labelling

Any of the following that are affixed to the machine/plant must be followed:

- warnings and safety information,
- other labels, which are optional depending on the design of the control cabinet, control panel and protection equipment.

The following labels will also be found on the machine/plant:

Type plate	Meaning
	1. Manufacturer logo 2. Identification 3. Serial number 4. Type 5. Project number 6. Year of manufacture 7. Manufacturer + address

5.18 Temperature range

The machine/plant may be operated only at temperatures between +5°C and +40°C (without condensation). This does not include components that are suitable for different temperature ranges according to the manufacturer's specifications.

Operating the machine/plant outside of this temperature range may cause malfunction(s) or damage.

INFORMATION

- Project-specific deviations in the temperature range are possible following clarification of the technical aspects with motion06 gmbh.

5.19 Sound pressure levels

The sound pressure level when operating the incomplete machine of type CBCxxx is below 70 dB(A).

6 Assembly and commissioning

The assembly and commissioning of this machine/plant must be carried out by the manufacturer or by a company authorised by the manufacturer.

6.1 General information

⚠ DANGER

General danger to life and limb due to the machine/plant during assembly and commissioning and associated activities

- Severe to fatal injuries

a) The machine and plant area must be secured against unauthorised access (e.g. by using barrier tape and information signs) over a suitably large area and on a temporary basis (i.e. during assembly and commissioning).

b) Only qualified and authorised personnel are permitted to carry out assembly and commissioning.

c) Before starting assembly and commissioning, it must be ensured that there are no dangers present as a result of neighbouring plants, machines and traffic areas. If necessary, a risk assessment should be conducted and effective measures implemented.

d) During assembly and commissioning, it must be ensured that the machine/plant is switched off/shut down and secured so that it cannot be switched back on, and the power and media supply lines must be deactivated and secured so that they cannot be reactivated (in accordance with EN 50110-1).

e) Ensure that the workplace is clean and tidy during assembly and commissioning.

f) Wear the required PPE.

g) Keep escape routes clear.

⚠ DANGER

Danger due to use of conveyors by persons

- Tripping
- Death and severe injuries

a) Walking on the conveyors and using them as a working platform is strictly prohibited.

b) The transportation of persons on conveyors is strictly prohibited.

c) The intended points for crossing conveyors must be signposted and used.

d) Safety information and warnings must be observed.

⚠ DANGER

Danger due to electric current

- Risk of electric shock

a) Electrical work may only be carried out by qualified electricians or personnel with electrical training.

b) Disconnect the machine/plant before carrying out work.

c) Work on the machine/plant while it is de-energised (EN 50110-1; 6.2 Dead working)

⇨ Disconnect

⇨ Secure against reactivation

⇨ Verify the absence of voltage

⇨ Earth and short-circuit

⇨ Cover or block off nearby energised parts

⚠ WARNING

Danger due to carrying out work in elevated positions

- Tripping
- Falling parts
- Suspended loads

a) Use working and lifting platforms with fall protection

b) Install and use fall protection

c) The use of ladders for long periods of work in elevated positions is prohibited.

d) Block off and mark the working area and secure against unauthorised access

e) Attach safety information/warnings

f) Support heavy parts (particularly gear motors and pulleys)

g) Never touch or stand under loosened parts

h) Use lifting aids

i) Wear PPE and protective headgear

j) If necessary, wear PPE for fall protection

⚠ WARNING

General danger due to assembly and commissioning of the machine/plant

- Danger of crushing, shearing, grazes and cuts due to machine parts, machine/plant parts moving relative to one another, and tools
- Danger of impacts on body parts
- Danger of loss of extremities
- Danger due to flying parts, e.g. when removing material (drilling etc.), loose parts
- Noise (e.g. angle grinders)

a) The machine/plant area must be secured against unauthorised access (e.g. by using barrier tape and information signs) over a suitably large area and on a temporary basis (i.e. during assembly and commissioning).

b) Only qualified and authorised personnel are permitted to carry out assembly and commissioning.

c) Before starting assembly and commissioning, it must be ensured that there are no dangers present as a result of neighbouring plants, machines and traffic areas. If necessary, a risk assessment should be conducted and effective measures implemented.

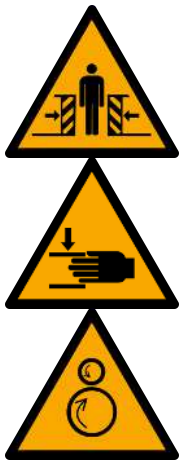
d) During assembly and commissioning, it must be ensured that the machine/plant is switched off/shut down and secured so that it cannot be switched back on, and the power and media supply lines must be deactivated and secured so that they cannot be reactivated (in accordance with EN 50110-1).

e) Ensure that the workplace is clean and tidy during assembly and commissioning.

f) Tools in perfect working order must be used for all work on the machine/plant.

g) Wear the required PPE.

h) Keep escape routes clear.



⚠ WARNING

Risk of crushing or being caught and pulled in at the transition points of the conveyors

- Danger of scrapes and burns on limbs
- Danger of limb loss

a) Never touch moving or rotating parts.

b) Do not wear jewellery or similar items.

c) Wear tight-fitting clothing.

d) Do not wear gloves to handle rotating machine parts.

e) If you have long hair, wear a hair net.

⚠ CAUTION

Danger of slipping, tripping and falling due to temporarily stored parts, cable guiding etc.

- Minor to severe temporary injuries (e.g. sprains, cuts, broken bones)

a) When working on the machine/plant, ensure that the direct and indirect vicinity of the assembly area is clean and tidy.

b) Make sure that the floor is dry, non-slippery, level, and free from coarse dirt and rolling objects.

⚠ CAUTION

Sharp-edged and pointed machine parts

- Danger of cuts, puncture wounds or limb loss

a) Wear appropriate protective clothing when working on the machine/plant

⚠ CAUTION

Hot surfaces and machine parts

- There is a risk of burns to skin and body parts due to contact with hot surfaces (e.g. radiators) and parts of the machine and drive.

a) Let gear motors and radiators cool down.

b) Wear appropriate protective clothing for protection against heat.

⚠ CAUTION

Unexpected operating behaviour due to failure to observe the specified operating parameters

- Injuries
- Potentially dangerous situation due to machine/plant malfunction

a) Strict compliance with the specified parameters for the operating environment

6.1.1 General

- In general, the machine/plant area must be secured against unauthorised access before and during assembly and commissioning (e.g. by using barrier tape and information signs) over a suitably large area and on a temporary basis (i.e. during assembly and commissioning). In particular, the danger zone and area of impact of the machine/plant must be secured against access by unauthorised persons while the protection equipment is not yet fully installed and able to fulfil its purpose.

- Only qualified and authorised personnel may access the machine/plant and its area of impact and danger zone in order to undertake the necessary measures and activities.

- Only qualified and authorised personnel are permitted to carry out assembly. Qualified personnel for assembly and installation also includes assembly personnel from the manufacturer.

- Before starting assembly, it must be ensured that there are no dangers present as a result of neighbouring plants, machines and traffic areas. If necessary, a risk/hazard assessment should be conducted and effective measures implemented.

- During assembly, it must be ensured that the entire machine/plant and all plant parts are switched off/shut down and secured so that they cannot be switched back on, and the power and media supply lines must be deactivated and secured so that they cannot be reactivated (in accordance with EN 50110-1).

- Ensure that the assembly area is clean and tidy during assembly and commissioning.
  - Make sure that the floor is dry, non-slippery, level, and free from coarse dirt and rolling objects (e.g. beads for bead blasting).
- Keep escape routes clear.
- Wear the required PPE.

6.1.2 PPE to be worn

The PPE described in the section Personal protective equipment [▶ 31] must be worn for assembly and commissioning.

6.1.3 Electrical installation

- Completion and connection of the electrical and control technology elements of the machine/plant must be carried out exclusively by qualified electricians or personnel with electrical training
- Assembly and connection according to the enclosed circuit diagrams and the corresponding assembly and operating instructions for the respective electrical and control technology components
- Any changes to electrical and control technology components must be documented and entered on the circuit diagrams and in the other technical documentation. Complete technical documentation (updated circuit diagrams etc.) for the machine/plant, with documentation of any alterations made, must be kept available at the machine/plant.
- The machine/plant may only be commissioned and operated with the protection covers fully installed and/or the protection equipment in perfect working condition. In the event of missing protection covers or damage to protection equipment that makes it possible to access the danger zone of the machine/plant, the machine/plant must be shut down immediately.

6.1.4 Integration of the machine/plant into a higher-level control system

The control system of the machine/plant must be designed such that it cannot start up independently or be accidentally put into operation. A lockable selector switch is required.

Measures for protection against (re)starting of the machine/plant:

- Remove tools, aids and loose parts
- Leave the danger zone
- Override the short-circuit and earthing at the point of operation first and then at the other points
- Lift the earthing cable from the machine/plant parts first and then from the earth
- Machine/plant parts and cables should not be touched once the earthing cable has been removed (if one had been in place to start with)
- Reattach any protection covers and safety signs that had been removed
- Remove the safety measures at the control centres only once the points of operation are cleared

6.2 Assembly

6.2.1 Requirements at the place of installation

NOTICE

- The specification of the quality of the on-site attachment points, the evaluation of their suitability, and the ultimate selection of fastening bolts and their dimensions must be conducted or checked by a structural engineer.

NOTICE

- The suitability of the load-bearing surface and the additional attachment points (if present) must be checked by a structural engineer.

- In order to ensure that the machine/plant works properly, it must be set up on a level concrete floor, or on a steel construction with a level surface.
- The site of installation must be stable, distortion-resistant and suitable for the static and dynamic loads of the machine/plant.
- Clean levelling of the machine/plant on the supporting surface is essential.
- Dry, non-slippery, level, and free from coarse dirt and rolling objects (e.g. beads for bead blasting).

NOTICE

- In order to ensure fault-free operation of the machine/plant, it must be:

a) perfectly levelled,

b) installed so that it is stable and distortion-resistant.

NOTICE

- The choice of fastening bolts and their dimensions should be designed and checked by a stress analyst. The key parameters are as follows:

a) the quality of the concrete (type of concrete, cracked/non-cracked concrete, strength of the load-bearing substrate)

b) reinforcement (reinforcement layout where applicable)

c) type and magnitude of the forces, torques and weights/masses to be applied

d) bearing surfaces and diagram of fastening points

NOTICE

- When drilling holes in concrete beams, the applicable reinforcement plans must be observed. Drilling into or through iron reinforcement bars should be avoided if possible.

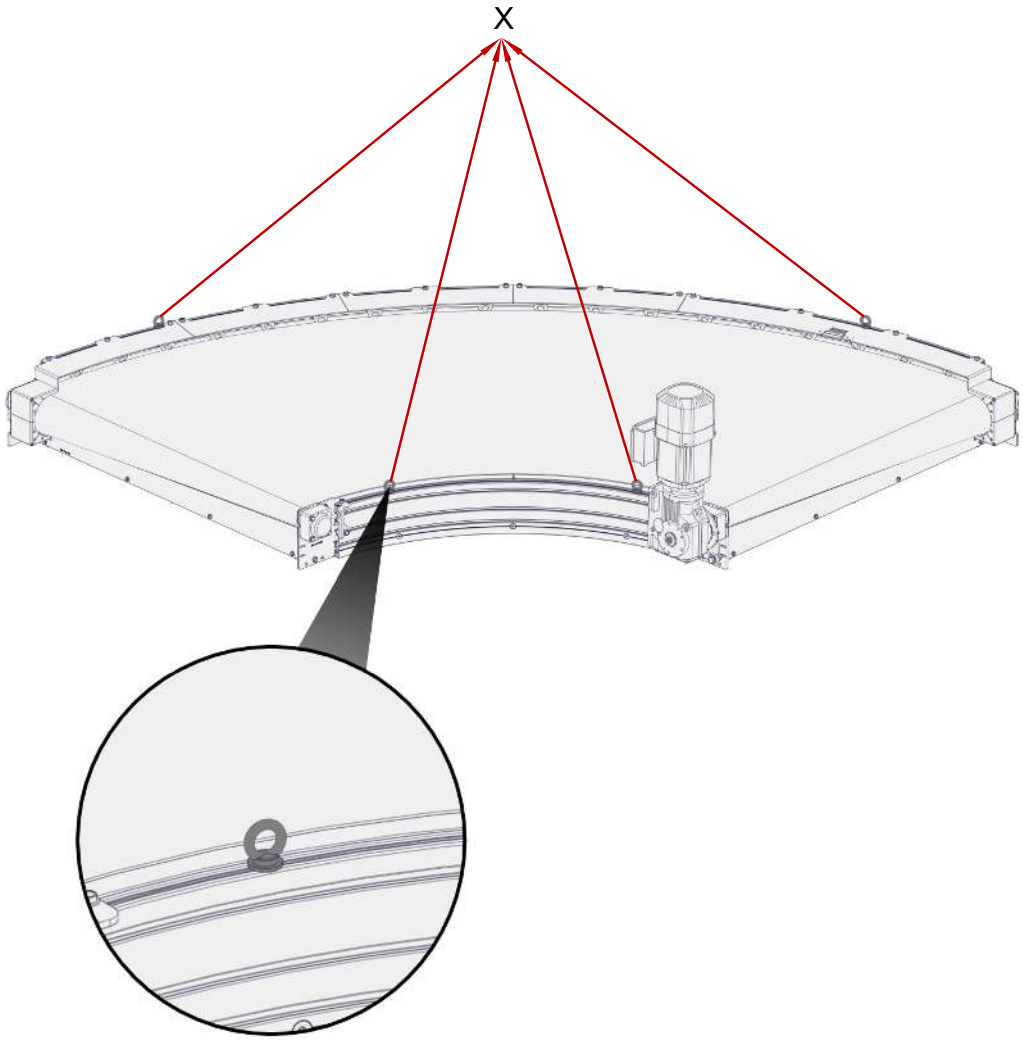
- The machine/plant must be installed and operated in a closed industrial environment that is protected from the elements.

6.2.2 Transportation to the installation location

Various means of transportation can be used for transportation to the place of installation on site. **NOTICE! Only use suitable and approved means of transportation.**

In order to lift the curve belt conveyor, there are ring bolts attached to the frame (see diagram below) in which the rigging equipment used can be suspended. **WARNING! In order to avoid twisting and to ensure fault-free operation, the curve belt conveyor should only be lifted at these points.**

X ... Attachment point for the means of transportation (e.g.: hook, lifting traverse, etc.)



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6.2.3 Required tools

For assembly and commissioning, the standard tools of mechanical and plant engineering, automation technology, mechatronics and electrical engineering may be used.

Hand tools	Size
Screw wrench	-
Socket wrench set	SW 7–SW 30
Torx screwdriver bit set	TX15–TX40
Allen key set	3–8 mm
Hammer	≈500 g
Plastic hammer	-
Pry bar	-
Mandrel	4 mm
Torque wrench	-
Puller for bearing housing	-

Table 19: Required hand-held tools

Measuring tools
Tape measure
Calliper gauge

Table 20: Required measuring tools

Aids
Equipment for lifting and lowering the components (forklift, lifting platform, winch etc.)
Transport trolley, ladders, mobile platforms etc.
Material for supporting the components (squared timber etc.)
Ladders, mobile platforms

Table 21: Required aids

Operating materials
Power supply
Cleaning agents (soapy water, ethyl alcohol, cold cleaner)
Lubricating grease
Rust remover spray
Fitting lubricant

Table 22: Required operating materials

6.2.4 Mechanical installation

- The components should be assembled and installed by suitably qualified staff in accordance with the corresponding assembly manual and parts list.
- Observe the information on the assembly drawings.
- Inspect the parts to ensure their corrosion protection is free from defects. If necessary, remove the corroded areas and touch up or replace the corrosion protection.
- Use flame-resistant electrical conductors and cables.

6.2.4.1 Mechanical connections

In the case of screw connections with nuts that are not self-locking or where locking agents have been used that are not suitable, a medium-strength screw-locking adhesive (blue) must be used to secure them against self-loosening.

The maximum and specified tightening torques for screw connections should be observed. (See section Tightening torques [▶ 189])

Follow the bolting instructions set out in EN 1090-2

NOTICE

- The substrate must be even, solid and load-bearing. This should be checked by a stress analyst.

NOTICE

- The gap that is created below the base plate as a result of the adjusting screws being adjusted must be filled completely (pour concrete underneath or underpin).

6.2.4.2 Cable routing

- Objects should not be installed or permanently set down on walkable and accessible surfaces.
  - Potential trip hazard areas must be visibly marked with a black/yellow hatched zone and an information sign containing a suitable warning and safety information must be affixed in a clearly visible position.
- In general, cables should not be routed over walkable and accessible surfaces.
  - Ideally, cables should be routed in the ceiling or running upwards in installation channels, ducts and shafts
  - Ideally, cables should be laid in underfloor installation channels and ducts
  - If it is not possible to avoid routing cables along flooring, installation ducts that are suitable for this purpose must be used. Installation ducts for routing cables along flooring must be stable and non-slip. Trip hazard areas must be made visible (yellow/black marking) and provided with a warning and safety information.
- In general, cables should not be routed in the direct area of impact of the machine/plant.
  - Pay attention to the risk of collision with moving parts of the machine/plant.
  - Anchoring/bolting points and attachment points must remain accessible for inspection and maintenance purposes.

6.2.5 Electronic installation

⚠ DANGER

Danger due to electric current

- Risk of electric shock

a) Electrical work may only be carried out by qualified electricians or personnel with electrical training.

b) Disconnect the machine/plant before carrying out work.

c) Work on the machine/plant while it is de-energised (EN 50110-1; 6.2 Dead working)

⇨ Disconnect

⇨ Secure against reactivation

⇨ Verify the absence of voltage

⇨ Earth and short-circuit

⇨ Cover or block off nearby energised parts

The electrical components (drives and sensors) can be pre-installed, and even wired up depending on the design.

- Completion of the electrical and control technology elements of the machine/plant must be carried out exclusively by qualified electricians or personnel with electrical training.
- The electrification of the machine/plant and any integration of control technology into higher-level machines/plants must be carried out properly and in compliance with the state of the art.
- Connection of the machine/plant according to the enclosed circuit diagrams and the corresponding assembly and operating instructions for the respective electrical and control technology components

NOTICE

- The electrical operating materials must be used, connected and installed correctly.

6.2.6 Connecting the power supply

⚠ DANGER

Danger due to electric current

- Risk of electric shock

a) Electrical work may only be carried out by qualified electricians or personnel with electrical training.

b) Disconnect the machine/plant before carrying out work.

c) Work on the machine/plant while it is de-energised (EN 50110-1; 6.2 Dead working)

⇨ Disconnect

⇨ Secure against reactivation

⇨ Verify the absence of voltage

⇨ Earth and short-circuit

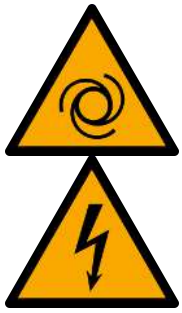
⇨ Cover or block off nearby energised parts

- Connection of the machine/plant must be carried out exclusively by qualified electricians or personnel with electrical training
- Connection according to the enclosed circuit diagrams and the corresponding assembly and operating instructions for the respective electrical and control technology components.

6.3 Commissioning

NOTICE

- The machine/plant may only be commissioned and operated with the protection equipment and/or protection covers in perfect working condition. In the event of damage to protection equipment or protection covers that makes it possible to access the danger zone of the machine/plant, the machine/plant must be shut down immediately.



⚠ DANGER

Unexpected/accidental reactivation of the machine/plant during assembly/ commissioning

- Handling a machine/plant that has not been secured and properly shut down can lead to severe, permanent to fatal injuries.
- Risk of electric shock

a) Take machine/plant out of operation (in accordance with EN 50110-1)

⇨ Disconnect

⇨ Secure against reactivation

⇨ Verify the absence of voltage

⇨ Earth and short-circuit

⇨ Cover or block off nearby energised parts

b) Attach safety information/warnings to the control centre

⚠ DANGER

Inadequate mechanical connections and structural stability

- Death and severe injuries
- Damage to property

a) Before commissioning and operating the machine/plant, it is important to ensure that it is stable.

b) The connections to the ground and connections to buildings/supporting structures must be durable, must be implemented correctly and must be checked.

⚠ CAUTION

The surfaces of the drives can reach high temperatures during operation.

- There is a risk of burns to skin and body parts due to contact with hot surfaces (e.g. radiators) and parts of the machine and drive.

a) Let gear motors and radiators cool down.

b) The machine/assembly may only be handled by qualified, authorised personnel with the machine/plant deactivated.

c) Please follow the instructions in the enclosed documentation from the drive manufacturer.

d) Wear appropriate protective clothing for protection against heat.

6.3.1 Safety precautions prior to commissioning

⚠ WARNING

Inadequate functioning of the protection equipment

- Death and severe injuries

a) Before commissioning the machine/plant, make sure that the safety components and safety measures are working properly.

b) The machine/plant may not be commissioned if the protection equipment is not fully effective.

NOTICE

- Commissioning should be performed by the manufacturer or the creator of the complete plant.

NOTICE

- National legislation may require the performance of an acceptance test before the system is commissioned for the first time and/or repeated checks of the machine/plant.

- Testing the electrical safety of the machine/plant prior to switching it on for the first time
- Measures prior to commissioning of electrical equipment/plants (activation procedure according to EN 50110-1, Section 6.2.7):
  - Remove tools, aids and loose parts
  - Inform personnel of the work that has been completed
  - Override the earthing and safety measures at the point of operation first and then at the other points
  - Reattach any protection covers and safety signs that had been removed
  - Leave the danger zone
  - Remove the safety measures at the control centres only once the points of operation are cleared

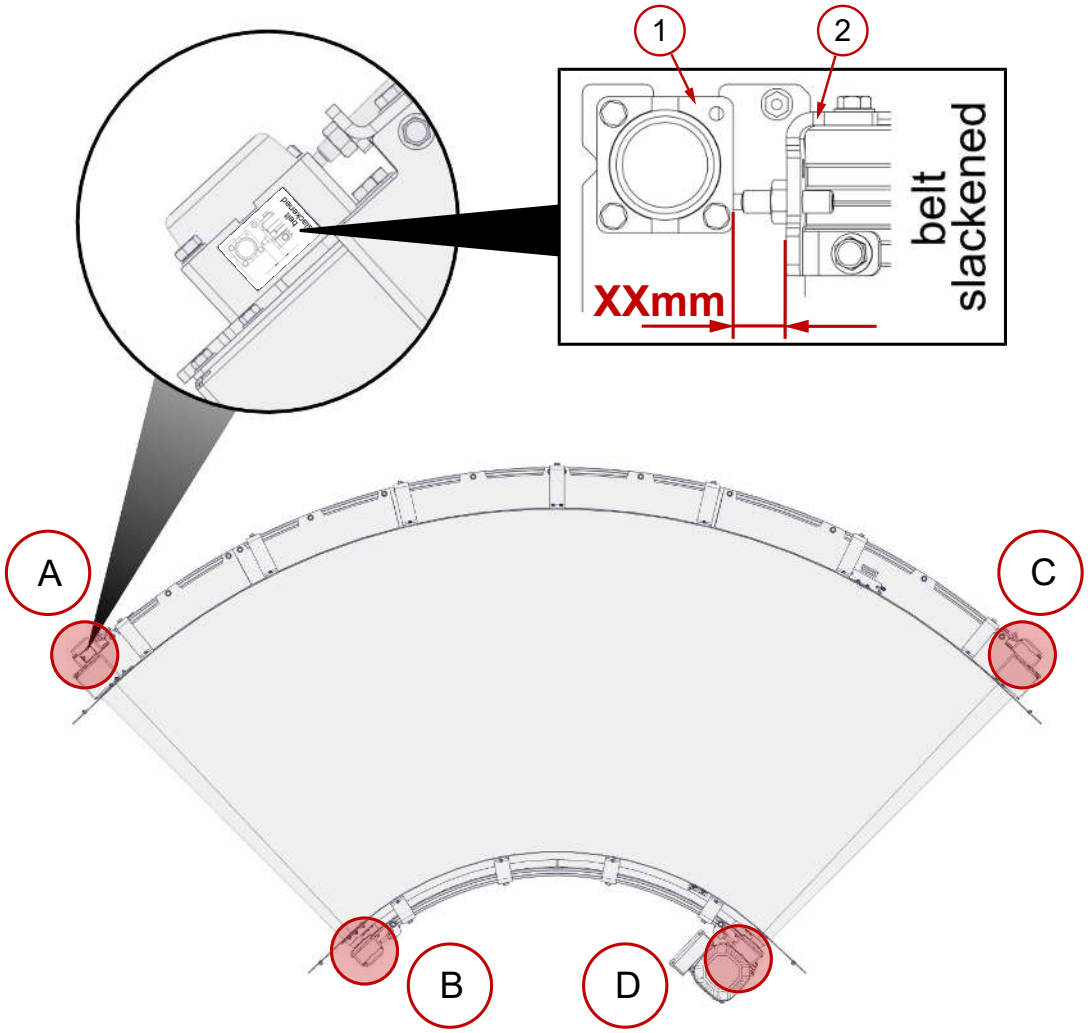
6.3.2 Belt tension during commissioning

NOTICE

In principle curve belt conveyors are supplied untensioned. This means that the conveyor belt needs to be tensioned before initial commissioning.

- An information document is included with every curve belt conveyor.

- Each curve belt is tensioned during factory assembly and put through a test run lasting several minutes.
- Following the successful test run, the individual clamping distances between the bearing unit (1) and tensioning bracket (2) are noted on the relevant bearing unit labels (A/B/C/D) and the tension on the conveyor belt is released before packaging.



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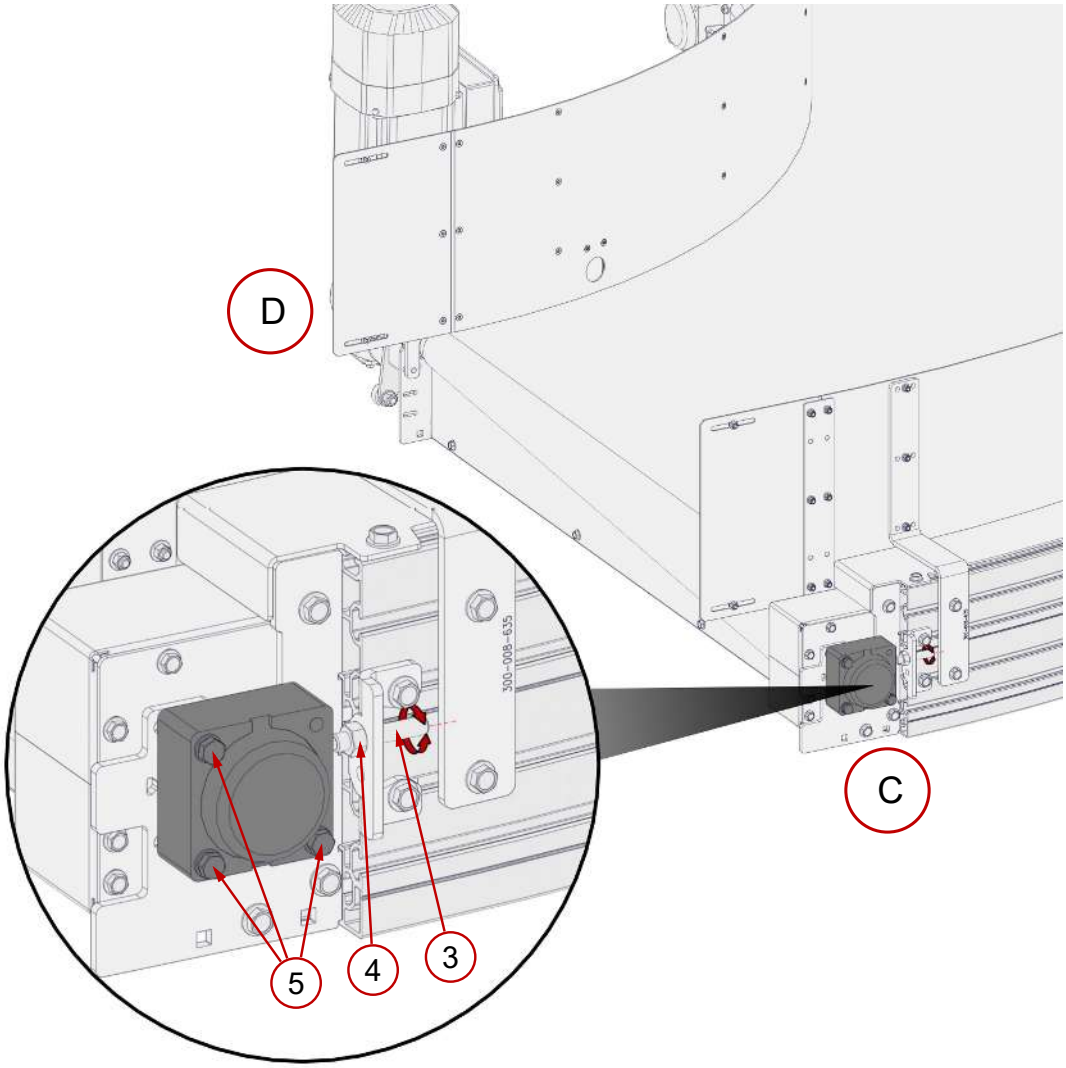
INFORMATION

- Due to production tolerances, the specified clamping distances between the bearing unit (1) and tensioning bracket (2) only apply for the original equipment conveyor belt. If this is replaced during the product life cycle, then the belt will need to be tensioned as in the section Tensioning/releasing tension on the belt [▶ 127].

- At all four bearing units (A/B/C/D), set the noted clamping distances by turning the clamping screw (3) or as described in the section Tensioning/releasing tension on the belt [▶ 127].
- Manually turn the conveyor belt and check that there are no collisions/streaking on frame parts.



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- If the conveyor belt runs smoothly and centred for about 10 minutes, it has been adjusted correctly.
- Tighten the locknuts (4) and fasteners (5).

NOTICE

- When doing this job, make sure the belt tension is not inadvertently set too high or too low, as this could cause problems when the belt path is being adjusted.
- Excessively high belt tension can cause extra wear on the pulley bearings and the conveyor belt.

7 Normal use and operation

7.1 General information

⚠ DANGER

Danger due to use of conveyors by persons

- Tripping
- Death and severe injuries

a) Walking on the conveyors and using them as a working platform is strictly prohibited.

b) The transportation of persons on conveyors is strictly prohibited.

c) The intended points for crossing conveyors must be signposted and used.

d) Safety information and warnings must be observed.

⚠ WARNING

Inadequate functioning of the protection equipment

- Death and severe injuries

a) Before commissioning the machine/plant, make sure that the safety components and safety measures are working properly.

b) The machine/plant may not be commissioned if the protection equipment is not fully effective.

c) The machine/plant may only be commissioned and operated with the protection equipment in perfect working condition.

d) The safety devices provided must never be switched off during operation.

e) In the event of damage to protection equipment (e.g. making it possible to access the danger zone of the machine/plant), the machine/plant must be shut down immediately.

f) Entering the danger zone of the machine/plant during operation is prohibited.

⚠ WARNING

Danger to persons due to machine and plant

- Death and severe injuries due to lack of knowledge or immaturity

a) Permission to access and work in the danger zone of the machine/plant must be granted only to trained, qualified and authorised personnel.

b) In general, accessing and remaining in the danger zone of the machine/plant during operation is prohibited.

c) Persons under the age of 14 years must not be granted access to the machine/plant environment under any circumstances.

d) Unauthorised persons must be kept away from the machine/plant.

⚠ WARNING

Danger of being pulled in and getting caught on rotating shafts, moving parts of the machine, and parts moving in opposing directions

- Danger of scrapes and burns on limbs
- Danger of limb loss

a) Never touch rotating or moving parts

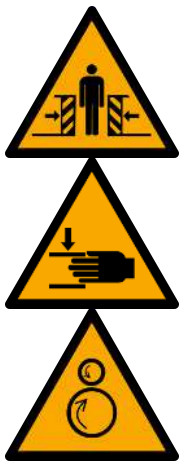
b) Do not wear jewellery or similar items

c) Do not wear loose clothing and do not allow items or parts of clothing to hang loose.

d) Wear tight-fitting protective clothing

e) Do not wear gloves to handle rotating machine parts

f) Tie back long hair and wear a hair net



⚠ WARNING

Risk of crushing or being caught and pulled in at the transition points of the conveyors

- Danger of scrapes and burns on limbs
- Danger of limb loss

a) Never touch moving or rotating parts.

b) Do not wear jewellery or similar items.

c) Wear tight-fitting clothing.

d) Do not wear gloves to handle rotating machine parts.

e) If you have long hair, wear a hair net.

⚠ CAUTION

Unexpected operating behaviour due to failure to observe the specified operating parameters

- Injuries
- Potentially dangerous situation due to machine/plant malfunction

a) Strict compliance with the specified parameters for the operating environment

⚠ CAUTION

Danger of lightweight conveyed items falling down

- Danger of scrapes on body parts
- Danger of reduced awareness

a) Carefully monitor the machine/plant

b) Regular visual inspection of the machine/plant during operation by personnel on site

c) If necessary, authorised personnel must activate the emergency stop device and remedy the dangerous situation

⚠ CAUTION

Breakdown, falling parts due to accumulation of conveyed items

- Danger of head and limb injuries

a) Carefully monitor the machine/plant

b) Regular visual inspection of the machine/plant during operation by personnel on site

c) If necessary, authorised personnel must activate the emergency stop device and remedy the dangerous situation

d) Do not place body parts in the flow of conveyed items

NOTICE

- Machine/plant operators and persons in the area surrounding the machine/plant are required to pay attention to the machine/plant during operation.
- Any irregularities, such as obvious increased wear, imminent faults, unusual movements/ noises etc., on the machine/plant during operation must be reported immediately to the relevant departments (e.g. maintenance).
- In the case of imminent critical faults or operating behaviour that is clearly unexpected, the emergency stop mechanism must be activated in order to prevent any further damage. The relevant departments (e.g. maintenance) must then be informed immediately.

NOTICE

Contamination due to leaking/escaping auxiliary and operating materials (problematic materials such as grease, mineral oil, cleaning agents, batteries etc.)

- Environmental damage
- Poisoning

a) Collect the operating materials and problematic materials in suitable airtight, sealable collection containers in coordination with the machine/plant operator's waste officer

b) Problematic materials, such as used oil, lubricating grease, solvent-based cleaning agents and similar, must be properly disposed of by an authorised company in accordance with the applicable legal provisions.

c) The information in the safety data sheets for the substances used must be observed.

- The machine/plant must not be operated under the following conditions:
  - if people or objects are present in the hazardous area.
  - if the machine is known to be damaged or if it is not working properly.
  - if protection equipment is missing or has been removed.
  - if the maintenance intervals have been exceeded or have not been observed.
  - if the operating parameters have been changed to values outside the permitted ranges.
  - if the physical environment does not permit it.

7.2 Modes of operation

See operating manual for integrator control technology.

7.3 Switching on the machine/plant

⚠ WARNING

Unexpected/accidental reactivation or restarting of the machine/plant

- Improper activation/commissioning of the machine/plant can lead to severe injuries.
- Danger of crushing, shearing, grazes, cuts, severing, getting caught in/pulled into parts of the machine, and machine parts moving relative to one another

a) Only qualified and authorised personnel may switch on and (re)commission the machine/plant.

b) The machine/plant should be switched on or off securely at the specified locations using the correct switching devices.

c) Before switching on and recommissioning the machine/plant, make sure that there are no persons or objects in the area of impact and the danger zone of the machine/plant.

The following conditions must be met for correct operation of the machine/plant:

- There must be no persons or objects that could endanger operating safety in the area of impact and danger zone of the machine/plant.
- The machine/plant must be free from damage and in perfect working condition. If damage or malfunctions are identified, they must be rectified before the machine/plant is commissioned.
- All protection equipment must be fully present and working correctly.
- Maintenance and servicing activities must be conducted at the prescribed intervals.
- Operating parameters must not be changed without permission.
- The structural surroundings must allow for hazard-free operation of the machine/plant.

7.4 Operating the machine/plant

See operating manual for integrator control technology.

7.5 Switching off the machine/plant

See operating manual for integrator control technology.

8 Maintenance work and inspections for operators

8.1 General information

NOTICE

- Machine/plant operators and persons in the area surrounding the machine/plant are required to pay attention to the machine/plant during operation.
- Any irregularities, such as obvious increased wear, imminent faults, unusual movements/ noises etc., on the machine/plant during operation must be reported immediately to the relevant departments (e.g. maintenance).
- In the case of imminent critical faults or operating behaviour that is clearly unexpected, the emergency stop mechanism must be activated in order to prevent any further damage. The relevant departments (e.g. maintenance) must then be informed immediately.

NOTICE

- It is not intended for machine/plant operators to carry out cleaning and maintenance of the machine
- In general, the machine/plant should be cleaned and maintained by the maintenance and servicing personnel.
- Separate cleaning personnel must always be instructed in the dangers associated with the machine/plant and the activities to be performed.

NOTICE

- Always stay alert for:

a) unusual noises in bearings and drive components,

b) grease leaks at bearing points,

c) oil leaks at the drive components,

d) uneven motion,

e) damage to any toothed belts. Paying attention to these aspects allows faults to be detected early and helps avoid the need for repairs.

Always report unusual observations to the person in charge (e.g. maintenance department) immediately.

- Do not use any cleaning agents that are flammable, corrosive/oxidising or contain solvents.
- In most cases, the use of a conventional soap solution and a damp cloth will suffice.

8.2 Maintenance and inspection plan

Interval	Maintenance and inspection activities	Comments
Continuous	Monitoring of the machine/ system during operation	Any irregularities, such as • obvious increased wear and corrosion on machine and system parts (e.g. conveyor base frame, steel construction) • damage or wear on the toothed belts, conveyor belts, etc. • grease leaks at bearing points • oil leaks at the drive components • uneven motion of the machine/system • unusual movements/noises (in particular in bearings and drive components) • imminent faults • or similar, on the machine/system during operation must be reported immediately to the relevant departments (e.g. maintenance).

Table 23: Maintenance and inspection plan

9 Faults

9.1 Procedure for faults

NOTICE

- Machine/plant operators and persons in the area surrounding the machine/plant are required to pay attention to the machine/plant during operation.
- Any irregularities, such as obvious increased wear, imminent faults, unusual movements/ noises etc., on the machine/plant during operation must be reported immediately to the relevant departments (e.g. maintenance).
- In the case of imminent critical faults or operating behaviour that is clearly unexpected, the emergency stop mechanism must be activated in order to prevent any further damage. The relevant departments (e.g. maintenance) must then be informed immediately.

NOTICE

- The maintenance and servicing intervals must be observed and documented in writing in order to maintain operational safety and protect warranty claims.
- Faults must be rectified immediately by specially trained staff or reported to motion06 gmbh.

9.2 Remedying faults

NOTICE

- Machine/plant operators and persons in the area surrounding the machine/plant are required to pay attention to the machine/plant during operation.
- Any irregularities, such as obvious increased wear, imminent faults, unusual movements/ noises etc., on the machine/plant during operation must be reported immediately to the relevant departments (e.g. maintenance).
- In the case of imminent critical faults or operating behaviour that is clearly unexpected, the emergency stop mechanism must be activated in order to prevent any further damage. The relevant departments (e.g. maintenance) must then be informed immediately.

NOTICE

- The maintenance and servicing intervals must be observed and documented in writing in order to maintain operational safety and protect warranty claims.
- Faults must be rectified immediately by specially trained staff or reported to motion06 gmbh.

INFORMATION

- Faults/malfunctions and warranty queries must be sent using the document ‘m06_claim report’, which is enclosed with the complete documentation (including all maintenance and servicing logs), to motion06 gmbh (mailto:customersupport@motion06.at).

10 Maintenance work by specialist personnel

10.1 General information

⚠ DANGER

Danger due to use of conveyors by persons

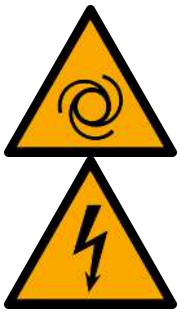
- Tripping
- Death and severe injuries

a) Walking on the conveyors and using them as a working platform is strictly prohibited.

b) The transportation of persons on conveyors is strictly prohibited.

c) The intended points for crossing conveyors must be signposted and used.

d) Safety information and warnings must be observed.



⚠ DANGER

Unexpected/accidental reactivation of the machine/plant while performing maintenance work

- Handling a machine/plant that has not been secured and properly shut down can lead to severe, permanent to fatal injuries.
- Risk of electric shock

a) Take machine/plant out of operation (in accordance with EN 50110-1)

- ⇨ Disconnect
- ⇨ Secure against reactivation
- ⇨ Verify the absence of voltage
- ⇨ Earth and short-circuit
- ⇨ Cover or block off nearby energised parts

b) Attach safety information/warnings to the control centre

⚠ WARNING

General danger due to maintenance and servicing work on the machine/plant

- Danger of crushing, shearing, grazes and cuts due to machine parts, machine/plant parts moving relative to one another, and tools
- Danger of impacts on body parts
- Danger of loss of extremities
- Danger due to flying parts, e.g. when removing material (drilling etc.), loose parts
- Noise (e.g. angle grinders)

a) The machine/plant area must be secured against unauthorised access (e.g. by using barrier tape and information signs) over a suitably large area and on a temporary basis (i.e. during maintenance and servicing work).

b) Only qualified and authorised personnel are permitted to carry out maintenance and servicing work.

c) Before starting maintenance and servicing work, it must be ensured that there are no dangers present as a result of neighbouring plants, machines and traffic areas. If necessary, a risk assessment should be conducted and effective measures implemented.

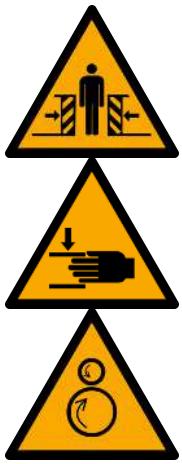
d) During maintenance and servicing work, it must be ensured that the machine/plant is switched off/shut down and secured so that it cannot be switched back on, and the power and media supply lines must be deactivated and secured so that they cannot be reactivated (in accordance with EN 50110-1).

e) Ensure that the workplace is clean and tidy during maintenance and servicing work.

f) Tools in perfect working order must be used for all work on the machine/plant.

g) Wear the required PPE.

h) Keep escape routes clear.



⚠ WARNING

Risk of crushing or being caught and pulled in at the transition points of the conveyors

- Danger of scrapes and burns on limbs
- Danger of limb loss

a) Never touch moving or rotating parts.

b) Do not wear jewellery or similar items.

c) Wear tight-fitting clothing.

d) Do not wear gloves to handle rotating machine parts.

e) If you have long hair, wear a hair net.

⚠ WARNING

Danger of being pulled in and getting caught on rotating shafts, moving parts of the machine/plant, and parts moving in opposing directions

- Danger of scrapes and burns on limbs
- Danger of limb loss

a) Never touch rotating or moving parts.

b) Do not wear jewellery or similar items.

c) Do not wear loose clothing and do not allow items or parts of clothing to hang loose.

d) Wear tight-fitting protective clothing.

e) Do not wear gloves to handle rotating machine parts.

f) Tie back long hair and wear a hair net.

g) Never work on the machine/plant alone. Ensure a second person is present.

⚠ WARNING

Danger due to carrying out work in elevated positions

- Tripping
- Falling parts

a) Use working and lifting platforms with fall protection

b) Install and use fall protection.

c) The use of ladders for long periods of work in elevated positions is prohibited.

d) Block off and mark the working area and secure against unauthorised access.

e) Attach safety information/warnings.

f) Support heavy parts (particularly gear motors and pulleys).

g) Never touch or stand under loosened parts.

h) Use lifting aids.

i) Wear PPE and protective headgear.

j) If necessary, wear PPE for fall protection.

⚠ WARNING

Unexpected/accidental reactivation or restarting of the machine/plant

- Handling a machine/plant that has not been secured and properly shut down can lead to severe, permanent to fatal injuries.
- Danger of crushing, shearing, grazes, cuts, severing, getting caught in/pulled into parts of the machine, and machine parts moving relative to one another.

a) Before maintenance and servicing work, the machine/plant must be safely shut down and secured against reactivation.

⇨ The machine/plant must be switched off at the main switch.

⇨ The main switch must be secured against reactivation.

⇨ The machine/plant must be secured against unexpected/accidental movements.

b) Block off/mark the working area and secure against unauthorised access.

c) Attach safety information/warnings to the control centre for the duration of the maintenance and servicing work.

⚠ CAUTION

Danger of slipping, tripping and falling due to temporarily stored parts, cable guiding etc.

- Minor to severe temporary injuries (e.g. sprains, cuts, broken bones)

a) Ensure that the area is clean and tidy during maintenance and servicing.

b) Make sure that the floor is dry, non-slippery, level, and free from coarse dirt and rolling objects.

⚠ CAUTION

Breakdown, falling parts due to accumulation of conveyed items

- Danger of head and limb injuries

a) Carefully monitor the machine/plant

b) Regular visual inspection of the machine/plant during operation by personnel on site

c) If necessary, authorised personnel must activate the emergency stop device and remedy the dangerous situation

d) Do not place body parts in the flow of conveyed items

⚠ CAUTION

Sharp-edged and pointed machine parts

- Danger of cuts, puncture wounds or limb loss

a) Wear appropriate protective clothing when working on the machine/plant

⚠ CAUTION

Hot surfaces and machine parts

- There is a risk of burns to skin and body parts due to contact with hot surfaces (e.g. radiators) and parts of the machine and drive.

a) Let gear motors and radiators cool down.

b) Wear appropriate protective clothing for protection against heat.

NOTICE

Contamination due to leaking/escaping auxiliary and operating materials (problematic materials such as grease, mineral oil, cleaning agents, batteries etc.)

- Environmental damage
- Poisoning

a) Collect the operating materials and problematic materials in suitable airtight, sealable collection containers in coordination with the machine/plant operator's waste officer

b) Problematic materials, such as used oil, lubricating grease, solvent-based cleaning agents and similar, must be properly disposed of by an authorised company in accordance with the applicable legal provisions.

c) The information in the safety data sheets for the substances used must be observed.

NOTICE

Follow manual

- The instructions in the operating manual must be followed when carrying out maintenance and servicing work.
- The safety regulations must be observed for all maintenance and servicing work.

NOTICE

Disconnect before starting maintenance or repairs

- Before conducting maintenance and/or repair work, the machine/plant must be taken out of operation and switched off at the main switch.

NOTICE

- The maintenance and servicing intervals must be observed and documented in writing in order to maintain operational safety and protect warranty claims.
- Faults must be rectified immediately by specially trained staff or reported to motion06 gmbh.

10.1.1 General

- In general, the machine/plant area must be secured against unauthorised access before and during maintenance and servicing activities (e.g. by using barrier tape and information signs) over a suitably large area and on a temporary basis. In particular, the danger zone and area of impact of the machine/plant must be secured against access by unauthorised persons while the protection equipment is not yet fully installed and able to fulfil its purpose.
- Only qualified and authorised personnel are permitted to carry out maintenance and servicing work. Only such personnel may access the machine/plant and its area of impact and danger zone in order to undertake the necessary measures and activities.

- Before starting maintenance and servicing work, it must be ensured that there are no dangers present between protection equipment and/or the machine/plant and neighbouring plants or machines, or as a result of traffic areas (due to powered vehicles, including autonomous vehicles). If necessary, a risk/hazard assessment should be conducted and effective measures implemented.
- Before maintenance and servicing activities are started, protection covers/protection devices or safety fences are opened, and the machine/plant danger zone is entered, it must be ensured that the entire machine/plant and all machine/plant parts are switched off or shut down and secured so that they cannot be switched back on, and disconnected from the power and media supply lines and secured so that the power supply cannot be re-established (in accordance with EN 50110-1).
- If manual operation of the machine/plant is necessary during maintenance and servicing work, the machine/plant must be:
  - put into manual operating mode and secured so that normal operating mode cannot be activated (e.g. remove key from operating mode selector switch/key switch).
  - The emergency stop/emergency off device must be kept within immediate reach of the person carrying out the activity or a helper
  - Movements of the machine/plant are only permitted in jog mode.
- Keep escape routes clear.
- Before and during maintenance and servicing work, ensure that the workplace is clean and tidy.
  - Make sure that the floor is dry, non-slippery, level, and free from coarse dirt and rolling objects.
- Wear the required PPE.

10.1.2 PPE to be worn

The PPE described in the section Personal protective equipment [▶ 31] must be worn for maintenance and servicing.

- Only original spare/wearing parts and operating/auxiliary materials and those specified and approved by the manufacturer may be used for the maintenance and servicing of this machine/plant.
- When carrying out maintenance and servicing work on elevated machine/plant parts that are not accessible via fixed working platforms, use conventional mobile platforms.

10.1.3 Maintenance work on the electrical system

⚠ DANGER

Danger due to electric current

- Risk of electric shock

a) Electrical work may only be carried out by qualified electricians or personnel with electrical training.

b) Disconnect the machine/plant before carrying out work.

c) Work on the machine/plant while it is de-energised (EN 50110-1; 6.2 Dead working)

⇨ Disconnect

⇨ Secure against reactivation

⇨ Verify the absence of voltage

⇨ Earth and short-circuit

⇨ Cover or block off nearby energised parts

10.1.3.1 (Re)commissioning

⚠ WARNING

Inadequate functioning of the protection equipment

- Death and severe injuries

a) Before recommissioning the machine/plant, make sure that the safety components and safety measures are working properly.

Measures prior to (re)commissioning of electrical equipment or a machine/plant:

- Remove tools, aids and loose parts
- Leave the danger zone
- Override the short-circuit and earthing at the point of operation first and then at the other points
- Lift the earthing cable from the machine/plant parts first and then from the earth
- Machine/plant parts and cables should not be touched once the earthing cable has been removed (if one had been in place to start with)
- Reattach any protection covers and safety signs that had been removed
- Remove the safety measures at the control centres only once the points of operation are cleared

10.2 Maintenance plan

Regular maintenance:

Maintenance activity	D	W	M	Q	H	Y	AR
Perform a general visual check for damage and obvious increased wear	X						
Perform a visual check of the entire machine/system and the drives		X					
Check for noises and unusually high temperatures in the bearings and gear motors		X					
Clean the sensors and/or light barriers		X					
Check the belt path		X					
Clean the various conveyor covers			X				
Check for loss of lubricant; check the lubricant and auxiliary material fill levels			X				
Check the conveyor belt tension			X				
Check for loose screws and bolts				X			
Unlock the emergency stop device after activation							X
Check the belt for damage and build-up of dirt		X					
Check that the drive(s) is/are not losing oil			X				
Clean the entire machine/system							X

D	Daily
W	Weekly
Q	Quarterly
H	Half-yearly
Y	Yearly
AR	As required

Table 24: Explanation of symbols in maintenance plan

10.3 Maintenance activities

10.3.1 Cleaning the machine/plant

NOTICE

- For safety reasons and to increase its service life, the whole machine/plant should be cleaned regularly.

No aggressive or oxidising cleaning agents or cleaning agents that emit fumes or intensive wet cleaning processes (such as pressure washer or steam cleaners) may be used to clean the plant.

This particularly applies to safety switches and sensors, which should be cleaned of dust and oily contamination.

Do not use any cleaning agents that are flammable or corrosive/oxidising, contain solvents or pose a health or environmental risk. The use of these types of cleaning agents is prohibited.

Safety switches and sensors can generally be cleaned with a dry cloth without cleaning agents. If large amounts of dirt have accumulated, a damp cloth soaked in a mild soap solution may be used for cleaning.

The air ducts of the electrical drives must be cleaned if there is an excessive build-up of dirt.

10.3.2 Preservation

The surfaces of the machine/plant parts are made of powder coated or galvanised stainless steel.

- The parts should be inspected at random intervals to ensure their corrosion protection is free from defects and detect (the first signs of) corrosion.
- If necessary, remove the corroded areas and touch up or replace the corrosion protection

10.3.3 Lubrication

NOTICE

Contamination due to leaking/escaping auxiliary and operating materials (problematic materials such as grease, mineral oil, cleaning agents, batteries etc.)

- Environmental damage
- Poisoning

a) Collect the operating materials and problematic materials in suitable airtight, sealable collection containers in coordination with the machine/plant operator's waste officer

b) Problematic materials, such as used oil, lubricating grease, solvent-based cleaning agents and similar, must be properly disposed of by an authorised company in accordance with the applicable legal provisions.

c) The information in the safety data sheets for the substances used must be observed.

The following should be avoided:

- Exceeding the limit values for substances that are hazardous to health or the environment.
- Formation of flammable mixtures.
- Spilling products that could damage the machine/plant (in particular cables, connections and seals).

These products can:

- be highly flammable,
- form hazardous vapours, and
- cause skin irritation and allergies.

Ensure that lubrication products and cleaning agents are disposed of in accordance with relevant environmental regulations.

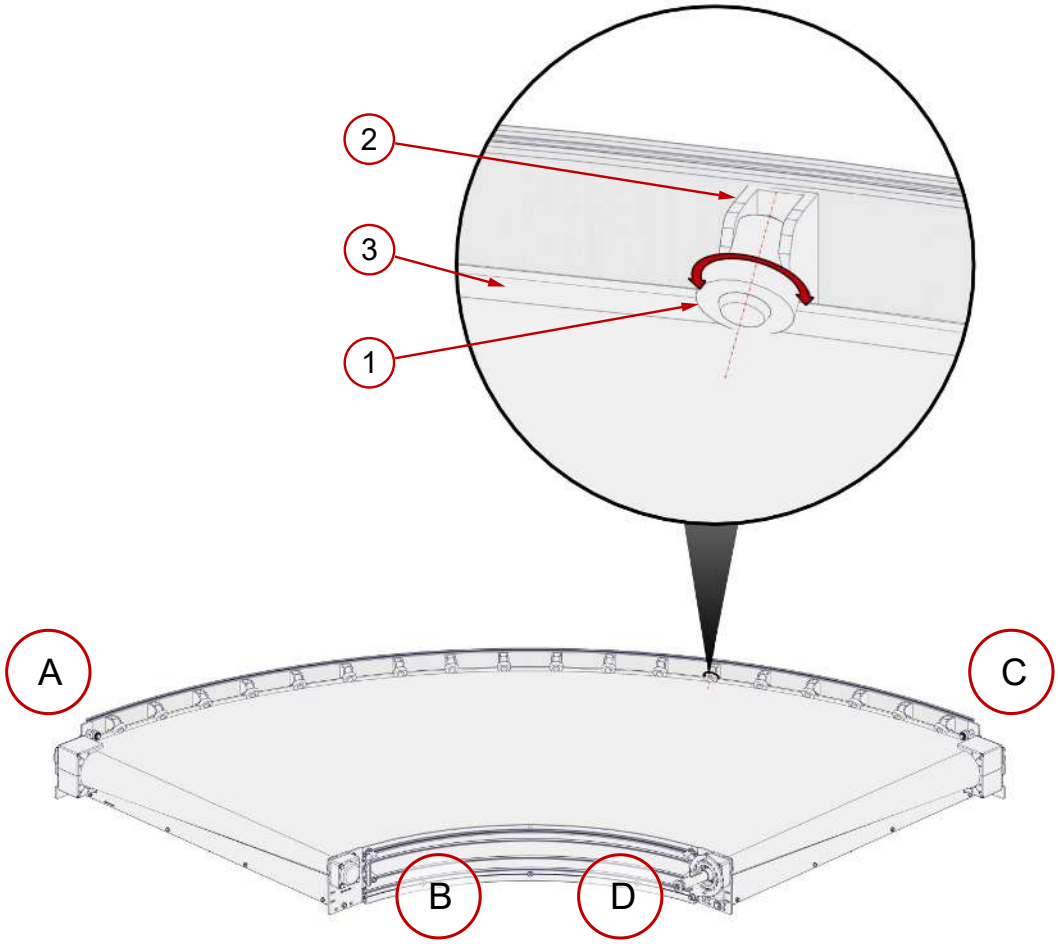
Only using the prescribed lubricants will guarantee:

- long service life.
- proper functioning.
- occupational health and safety.
- prevention of corrosion.

All bearings used have permanent lubrication and therefore do not need additional lubrication.

10.3.4 Belt tension: general

- The belt tension must be kept to a minimum on both the external and internal radius.
- It must be possible to manually move the belt without difficulty.
- It must still be possible to manually turn the bearing (1) of the belt guide unit (2).
- If the belt has been tensioned properly, it will lie flat against the belt support plate, without any waves/folds or bubbles forming.
- It is normal for the belt seam (3) to be slightly irregular.
- The belt tension must be adjusted to the requirements/load information so that there is slack between the drive pulley and the conveyor belt when fully-loaded.



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NOTICE

- When doing this job, make sure the belt tension is not inadvertently set too high or too low, as this could cause problems when the belt path is being adjusted.
- Excessively high belt tension can cause extra wear on the pulley bearings and the conveyor belt.

10.3.5 Removing/installing the drive

10.3.5.1 Removing/installing the drive - m06 standard

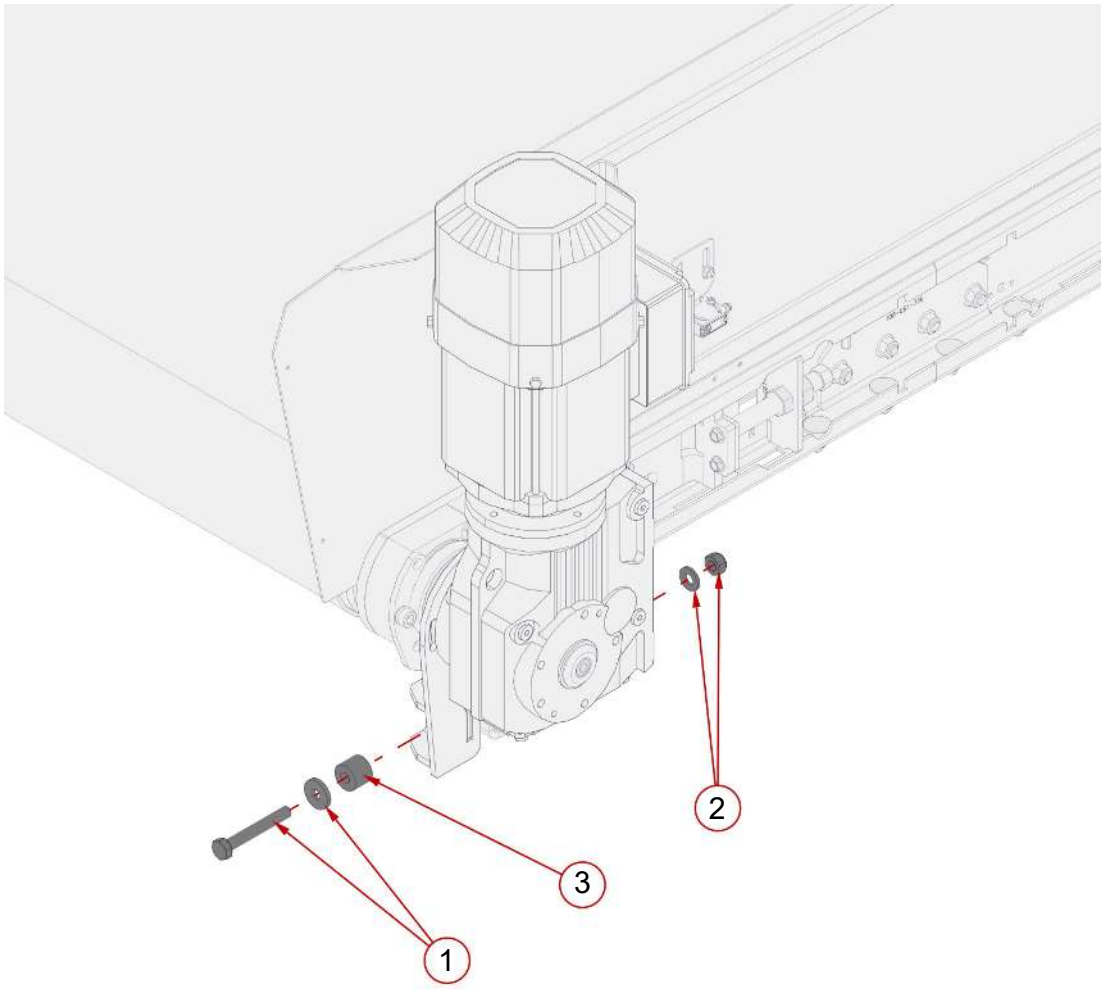
NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

INFORMATION

- Figures of the drives and their accessories are similar.
- Drives may vary depending on the machine type, drive manufacturer and drive type.
- Observe the information and documentation from the manufacturer.

- Disconnect the gear motor supply line from the terminal box. **WARNING! Danger due to electric current**
- Release the torque support by loosening the fasteners (1)/(2) and removing the damping elements (3).



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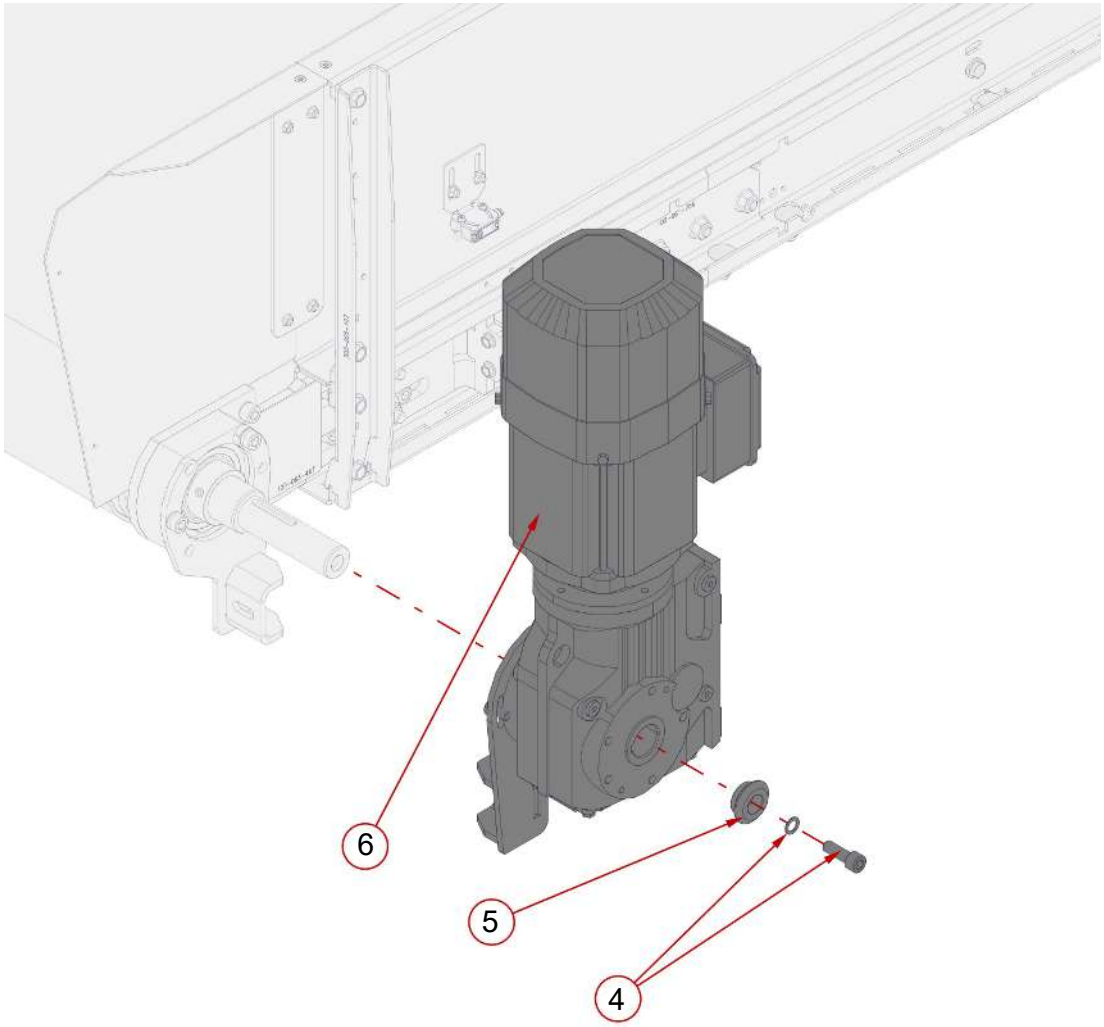
- Loosen the fasteners (4) and remove the clamping bush (5).
- Remove the drive (6). **WARNING! When lifting the drive motor down from the stub shaft, bear in mind that it weighs up to 30 kg.**



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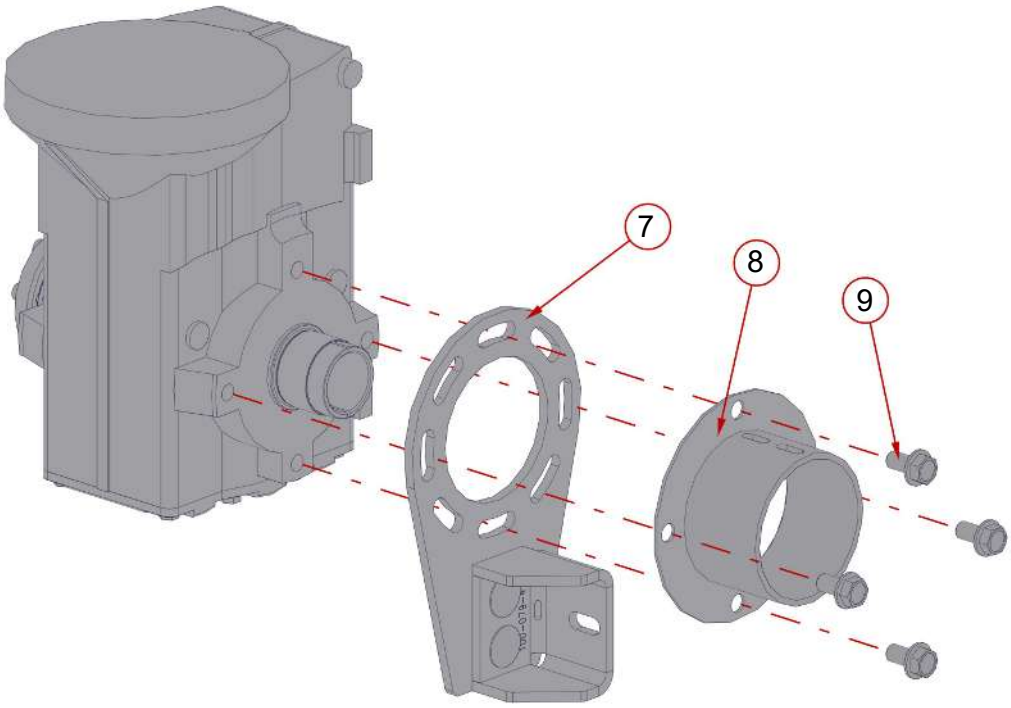
- If the drive is being replaced by a new one, remove the torque support (7) and shaft cover (8) (if present) by loosening the fasteners (9).



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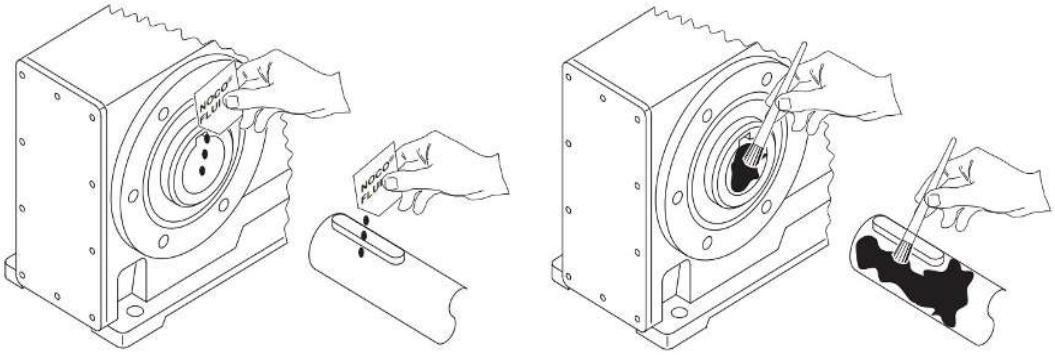
INFORMATION

- Figure of the torque support is similar.
- The torque support may vary depending on the machine type, drive manufacturer and drive type.

INFORMATION

- Figures of the shaft cover and its accessories are similar.
- The shaft cover may vary depending on the machine type, drive manufacturer and drive type, or may not be present at all.

- Once the maintenance or adjustment work is complete or the drive has been replaced, install the torque support (7) and the shaft protector (8) (if present) on the drive using the fasteners (9).
- Clean the drive shaft and the hollow shaft of the drive.
- Apply NOCO® fluid (or equivalent) to the hollow shaft and the stub shaft and distribute it carefully so as to prevent friction corrosion and make assembly easier.



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- Slide the new or existing drive onto the stub shaft.
- Secure the gear motor axially by fastening the clamping bush (5) with the fasteners (4).
- Insert the damping elements (3) and use the fasteners (1)/(2) to install the torque support.
- Connect the gear motor supply line. **WARNING! Danger due to electric current**
- If any protection covers were removed, reattach them on the machine.

10.3.5.2 Removing/installing the drive - Torqloc

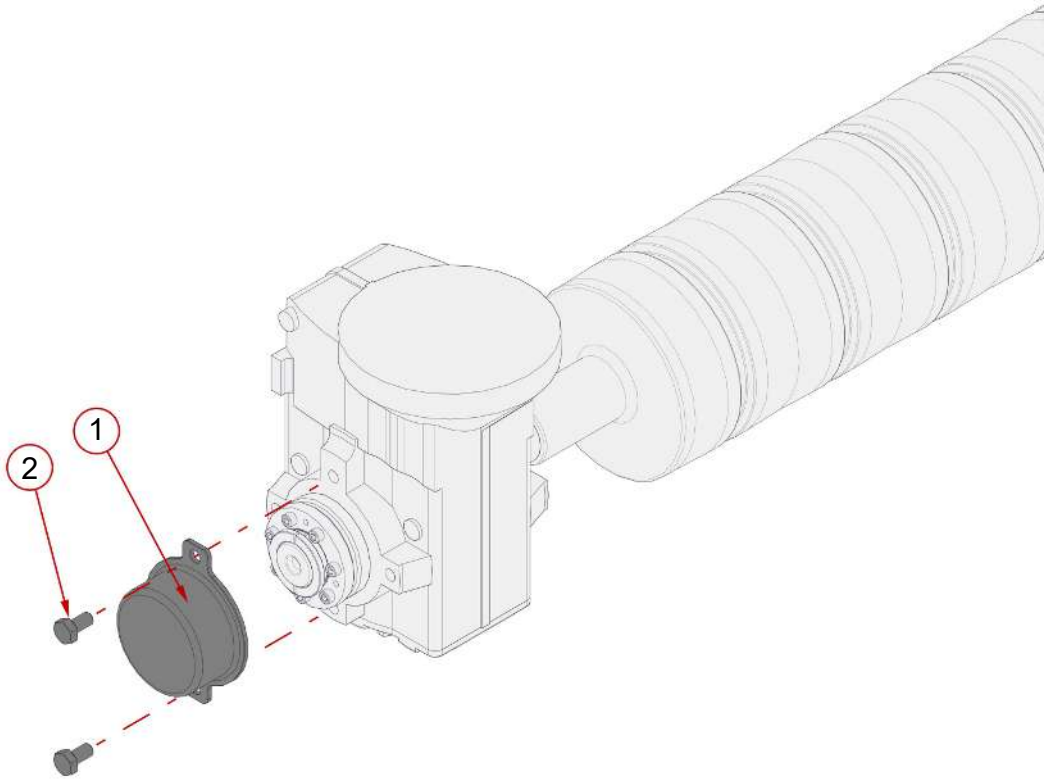
NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

INFORMATION

- Figures of the drives and their accessories are similar.
- Drives may vary depending on the machine type, drive manufacturer and drive type.
- Observe the information and documentation from the manufacturer.

- Disconnect the gear motor supply line from the terminal box. **WARNING! Danger due to electric current**
- Remove the protection cover (1) by loosening the fasteners (2)



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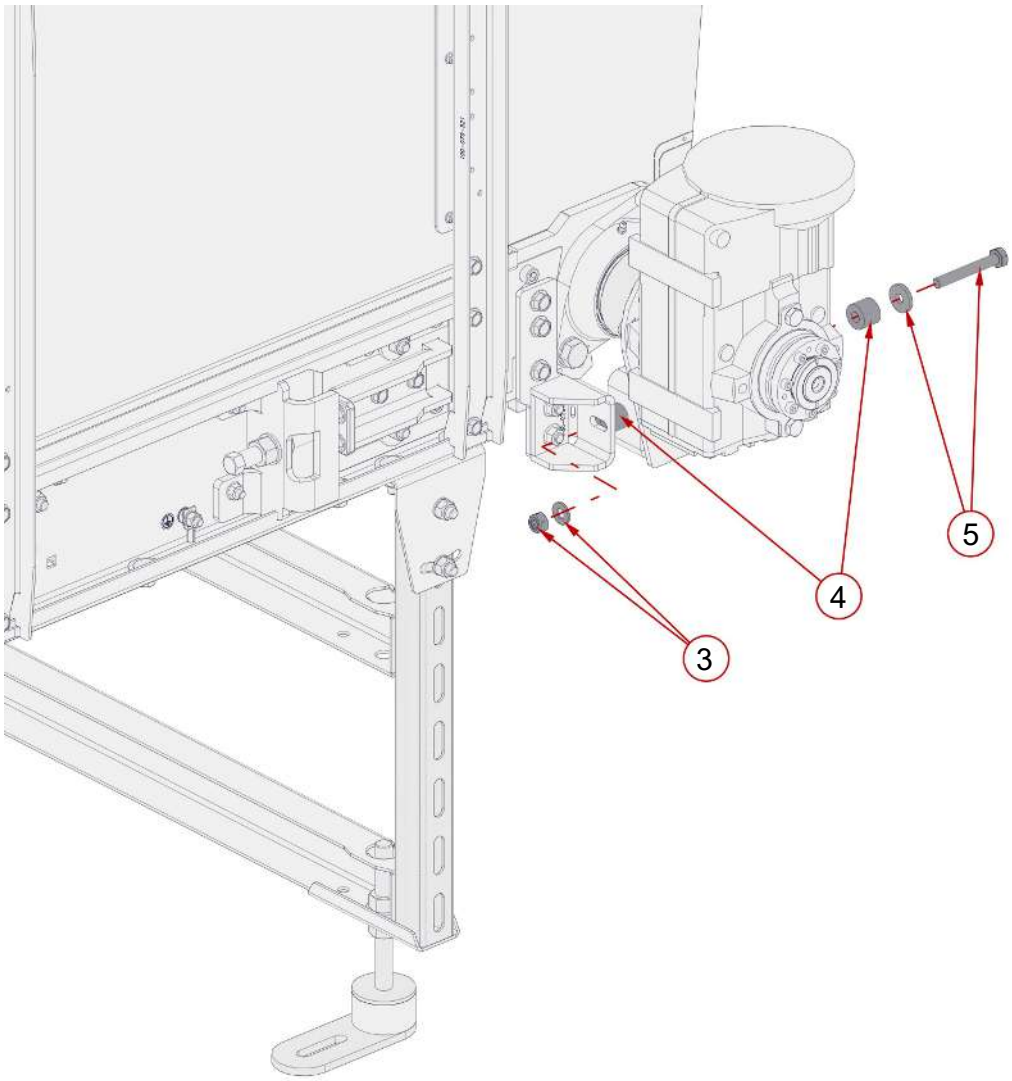
- Release the torque support by loosening the fasteners (3)/(5) and removing the damping elements (4).



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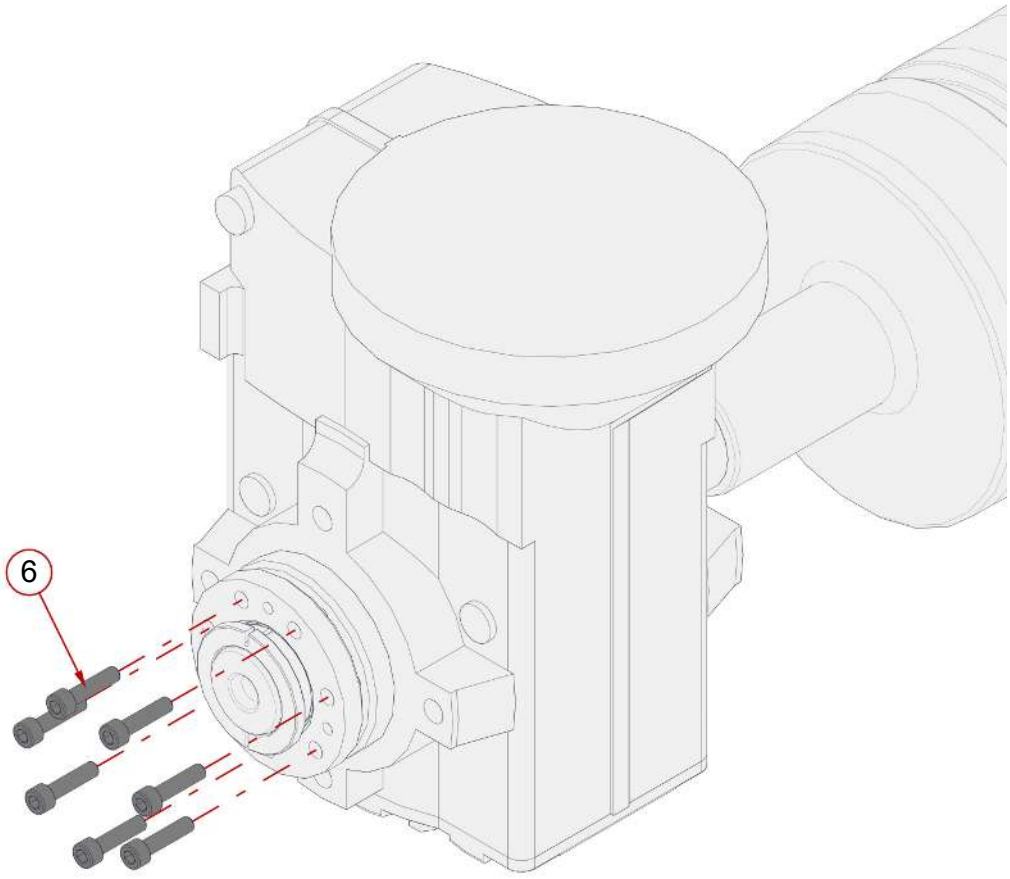
INFORMATION

- Figure of the torque support is similar.
- The torque support may vary depending on the machine type, drive manufacturer and drive type.

- Loosen and remove the fasteners (6) of the shrink disc.



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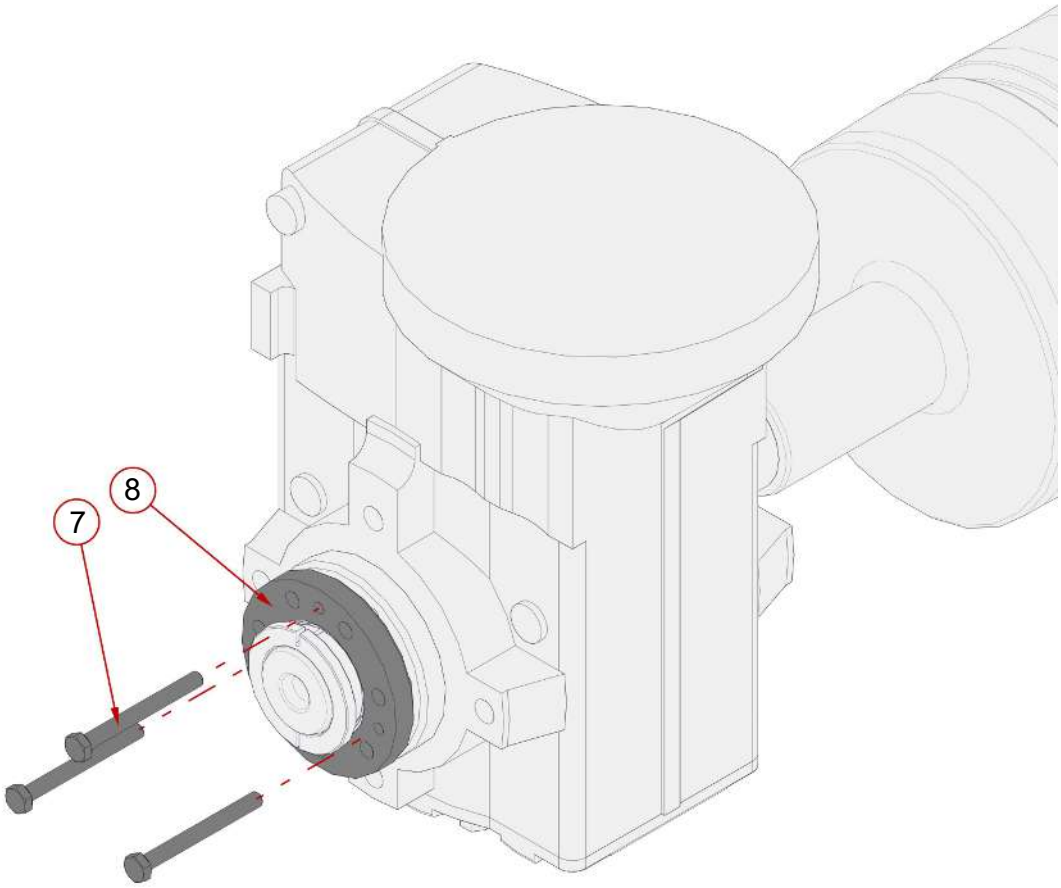
- Twist the screws (7) into the thread of the tensioning washer (8) to loosen the shrink disc.

NOTICE

- No defined screw type is necessary, but the screw diameter must match the thread of the tensioning washer.



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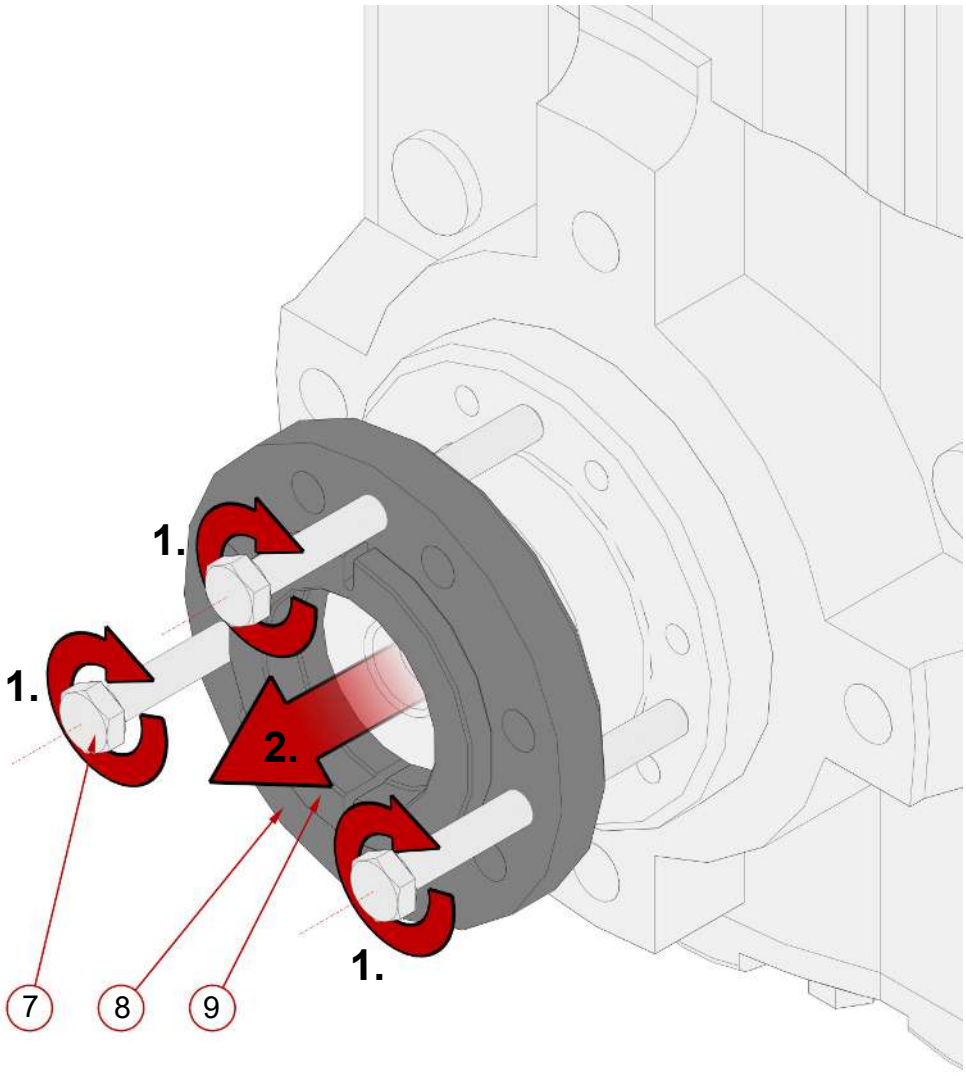
- Turn the screws (7) until the tensioning washer (8) pulls the conical steel bush (9) from the drive shaft and out of the gearbox hollow shaft.



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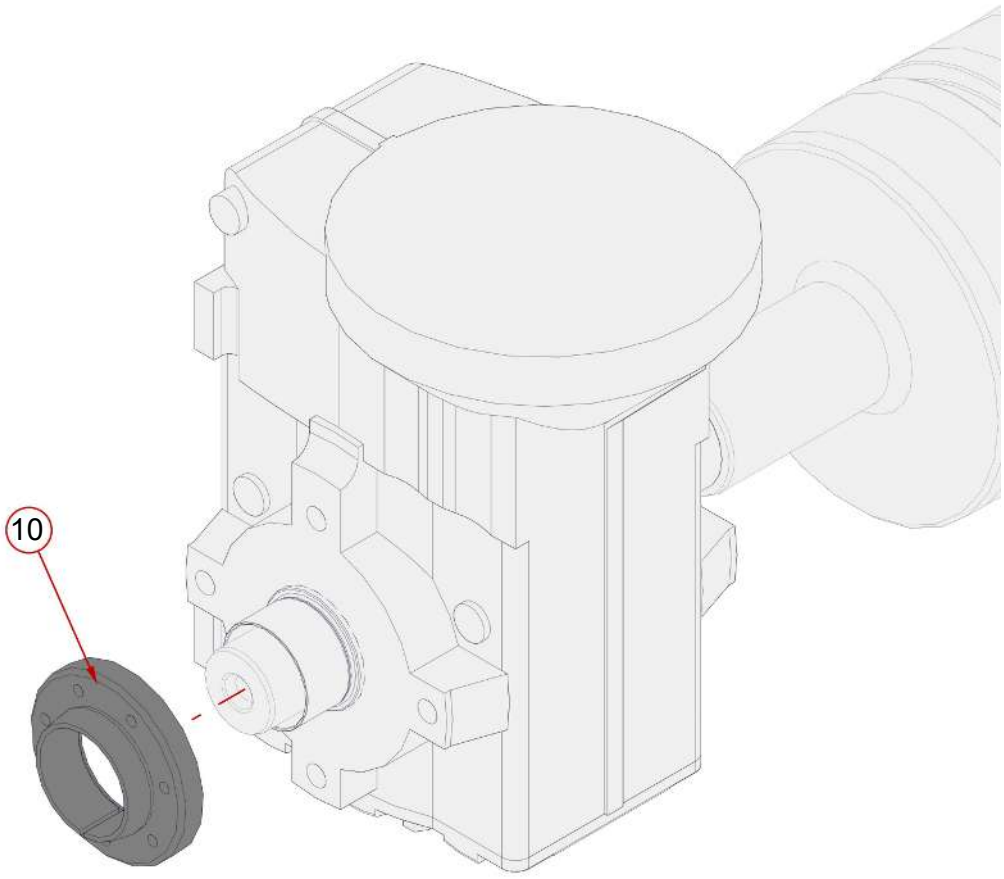
- Remove the shrink disc (10).



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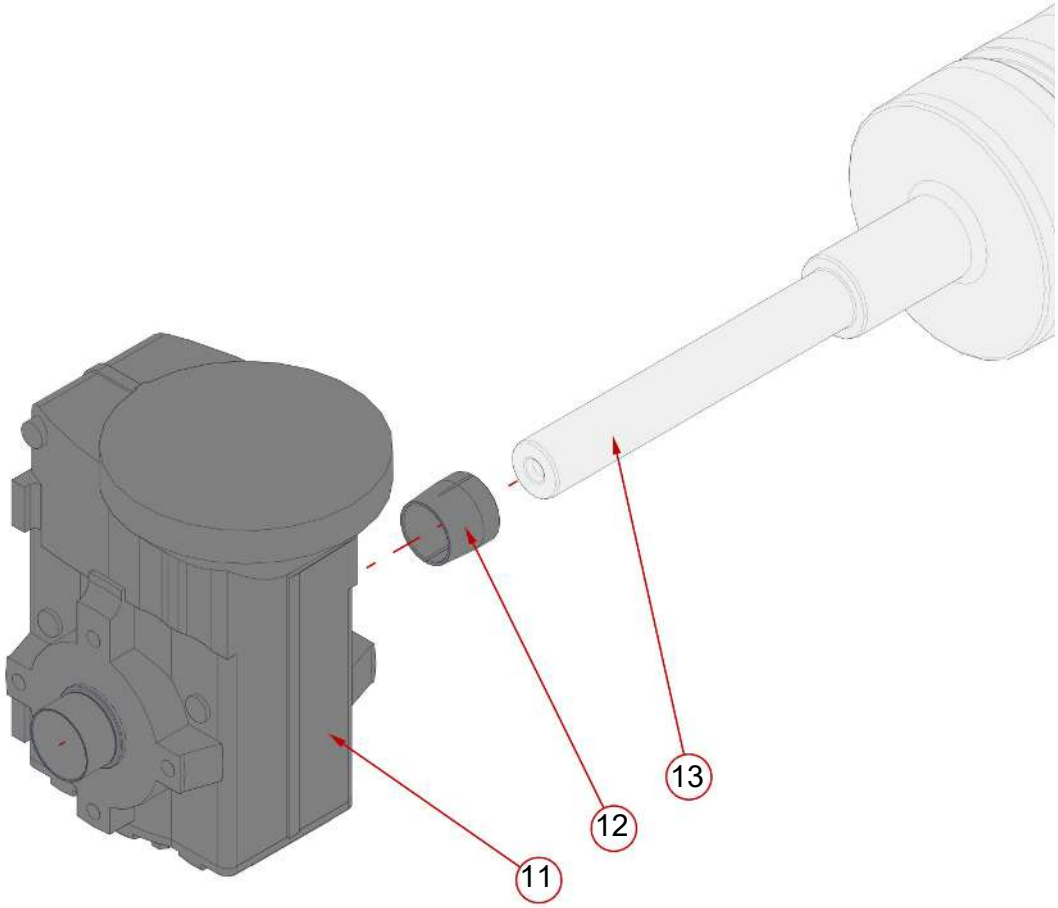
- Remove the drive (11) and the conical bronze bush (12) from the drive shaft stub (13). **WARNING! When lifting the drive motor down from the stub shaft, bear in mind that it weighs up to 30 kg.**



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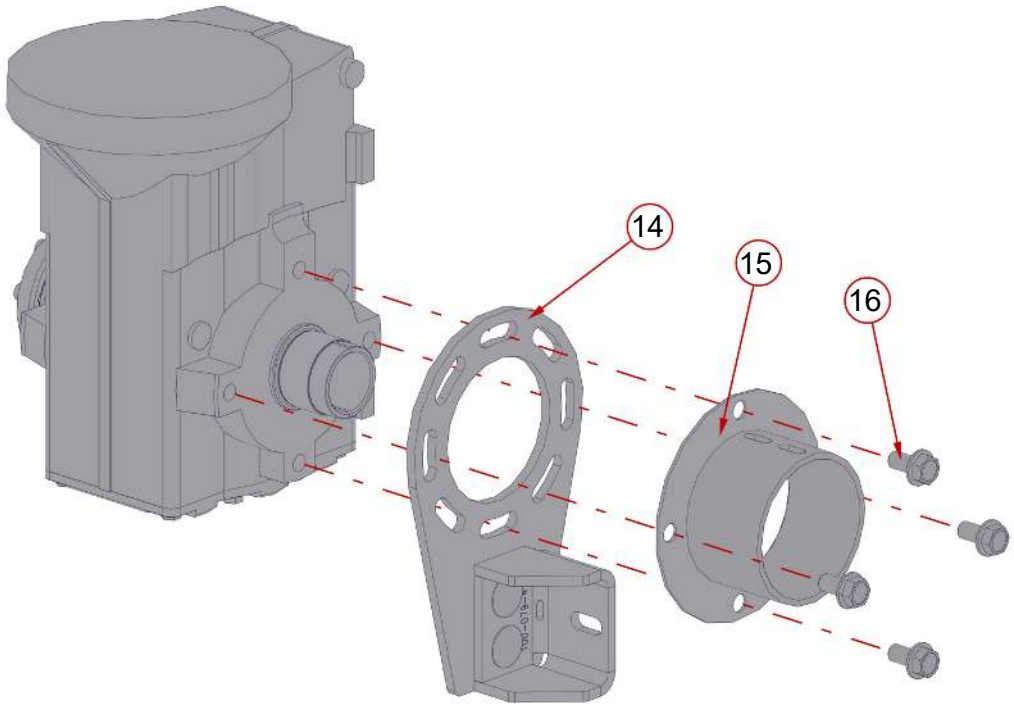
- If the drive is being replaced by a new one, remove the torque support (14) and shaft cover (15) (if present) by loosening the fasteners (16).



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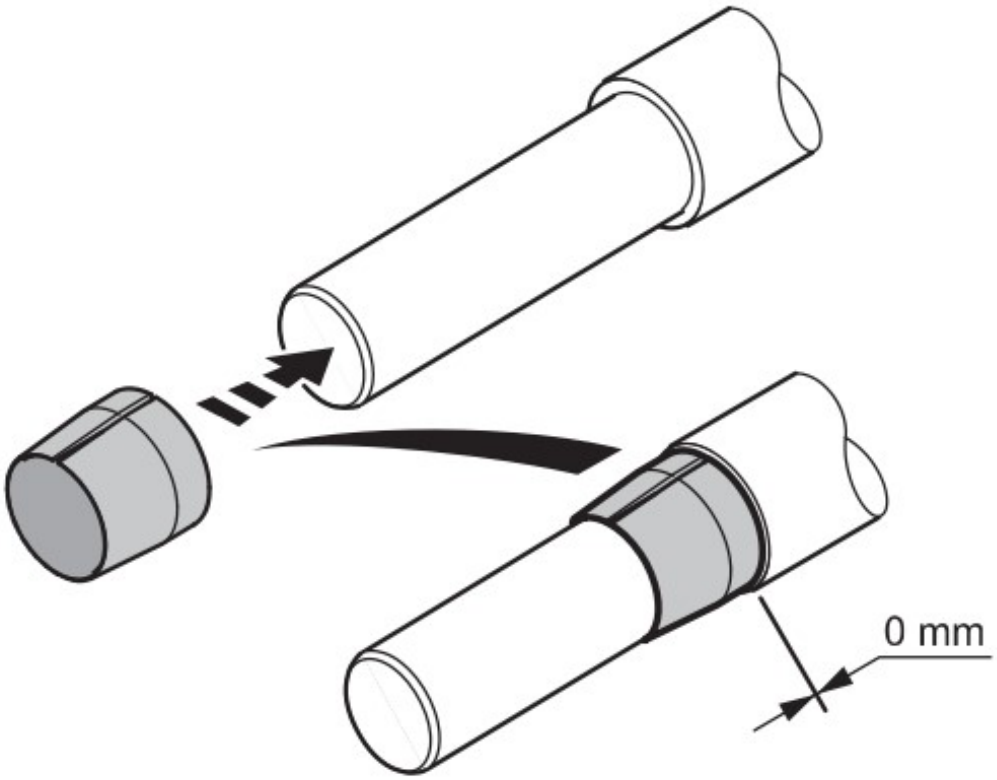
INFORMATION

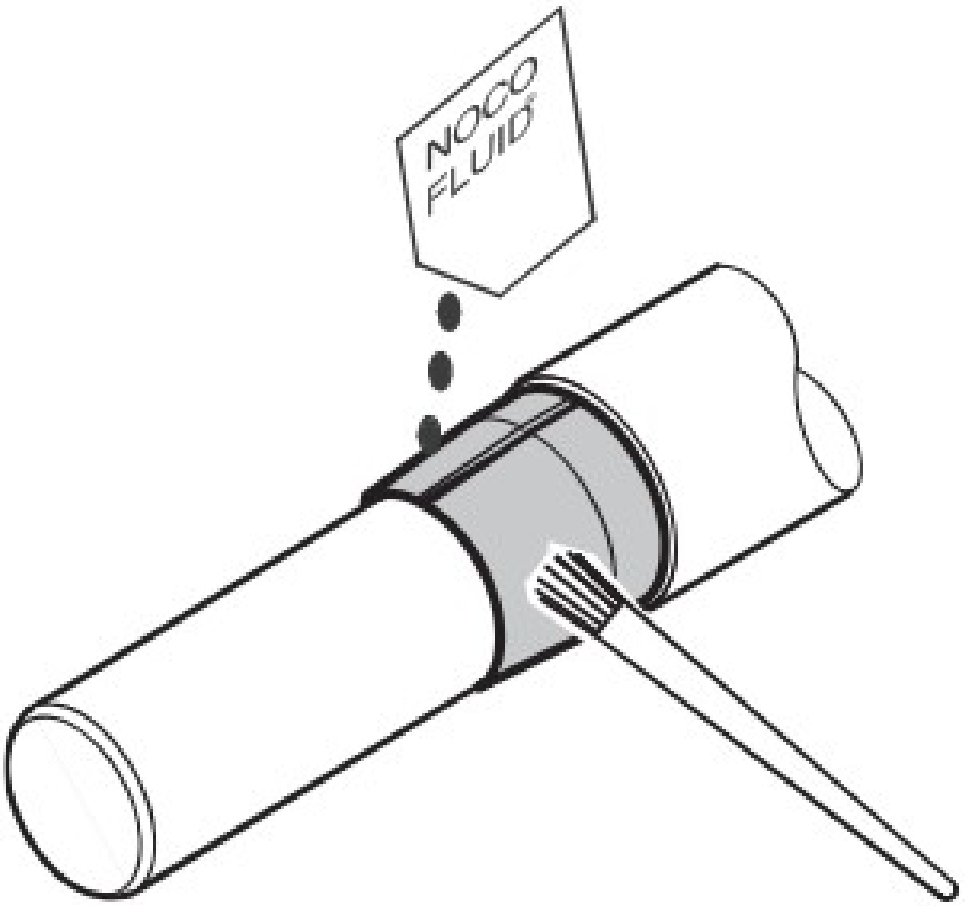
- Figures of the shaft cover and its accessories are similar.
- The shaft cover may vary depending on the machine type, drive manufacturer and drive type, or may not be present at all.

- Once the maintenance or adjustment work is complete or the drive has been replaced, install the torque support (14) and the shaft protector (15) (if present) on the drive using the fasteners (16).
- Clean the drive shaft and the hollow shaft of the drive. Make sure that all grease and oil residue is removed.
- Install the conical bronze bush on the drive shaft



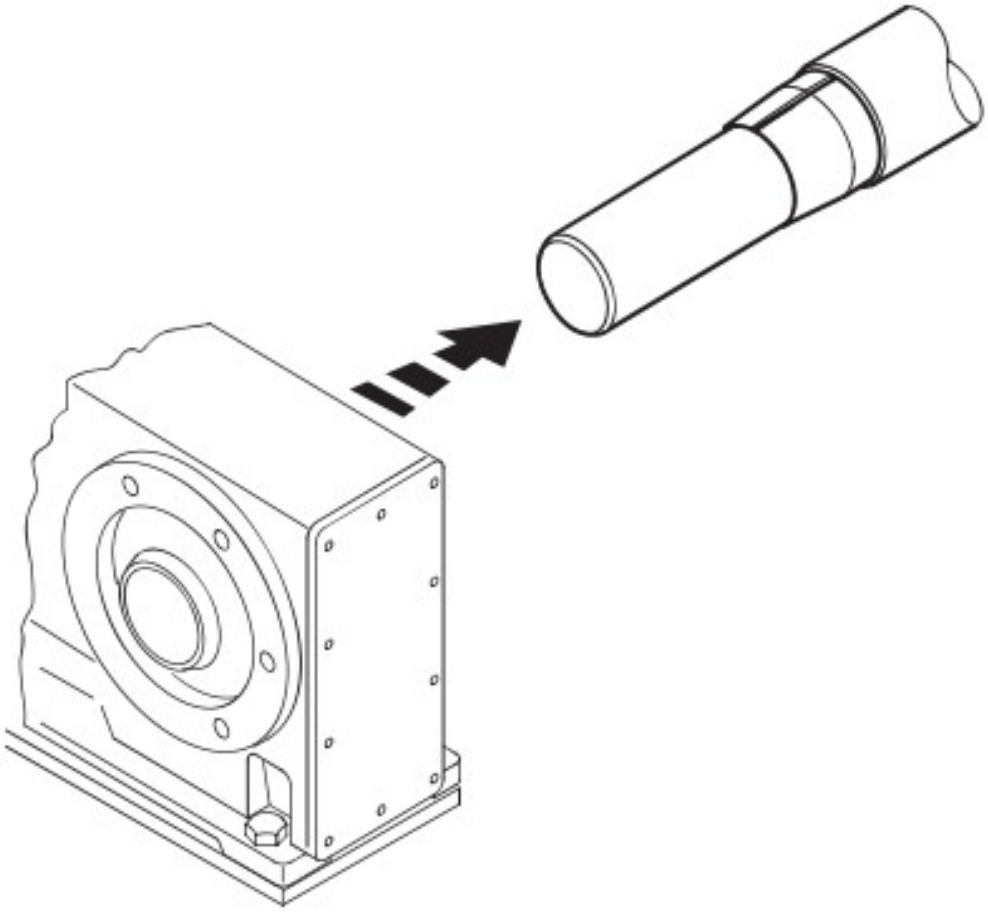
72941835

- Apply NOCO® fluid to the bush and distribute it carefully.



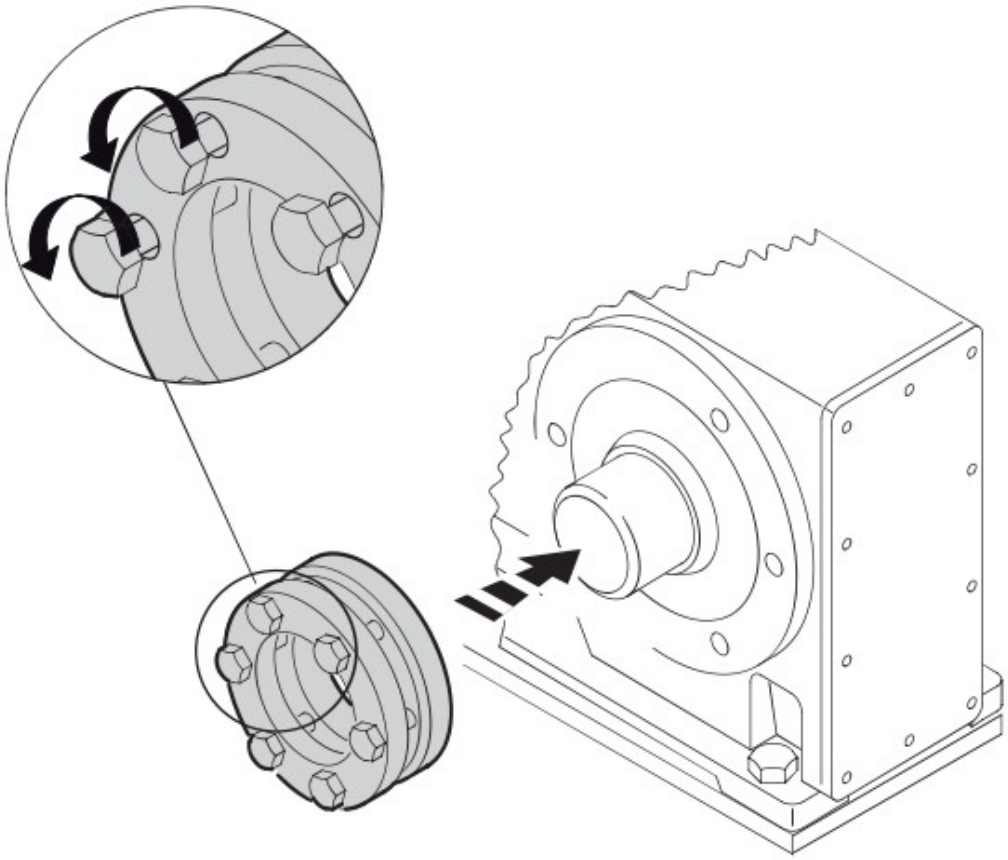
72949131

- Slide the drive onto the drive shaft.



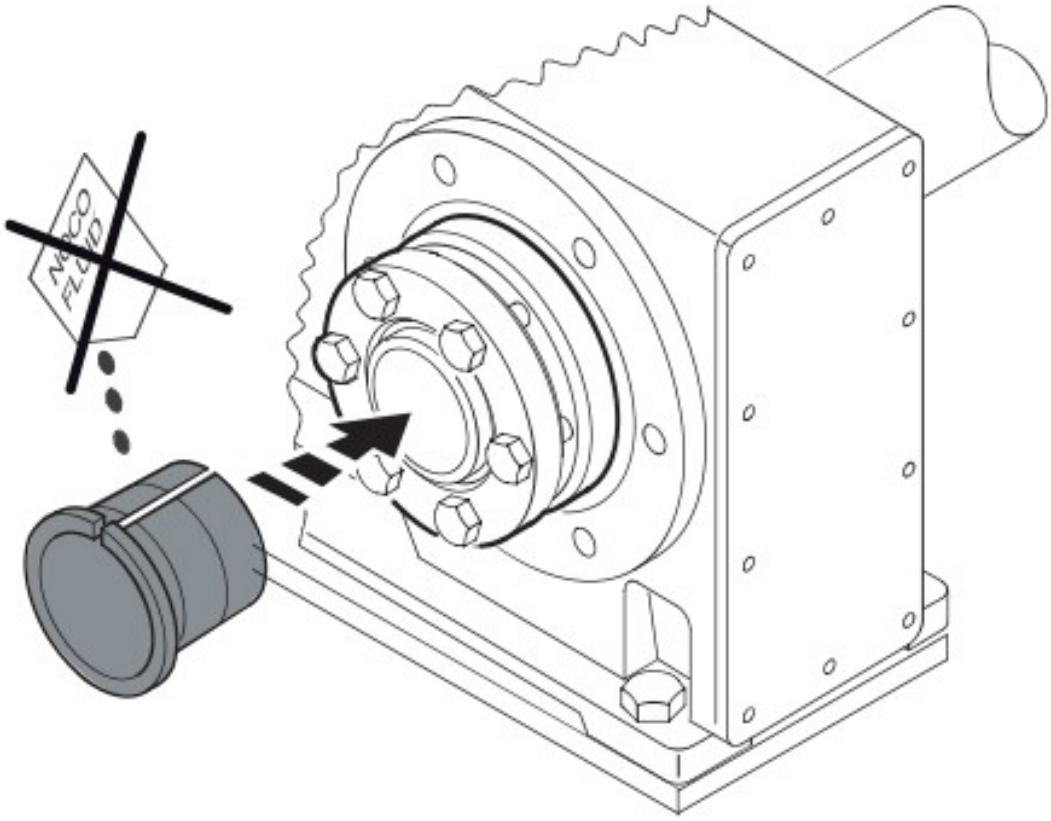
72951563

- Slide the shrink disc onto the hollow shaft of the drive. Make sure that all screws are loosened.



72953995

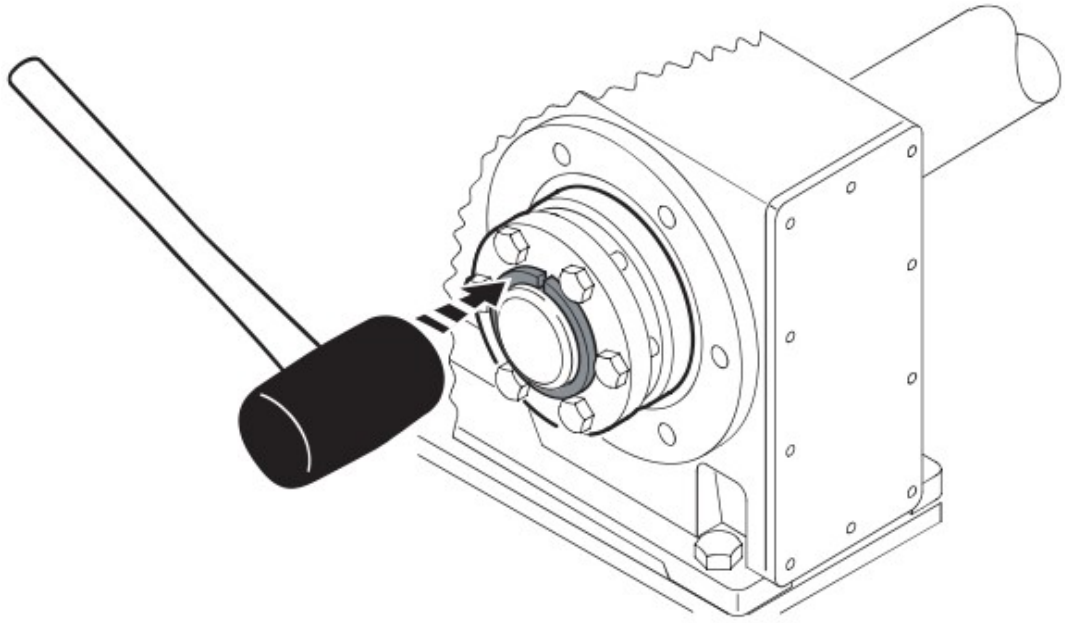
- Slide the conical steel bush onto the drive shaft and into the hollow shaft of the drive.



72956427

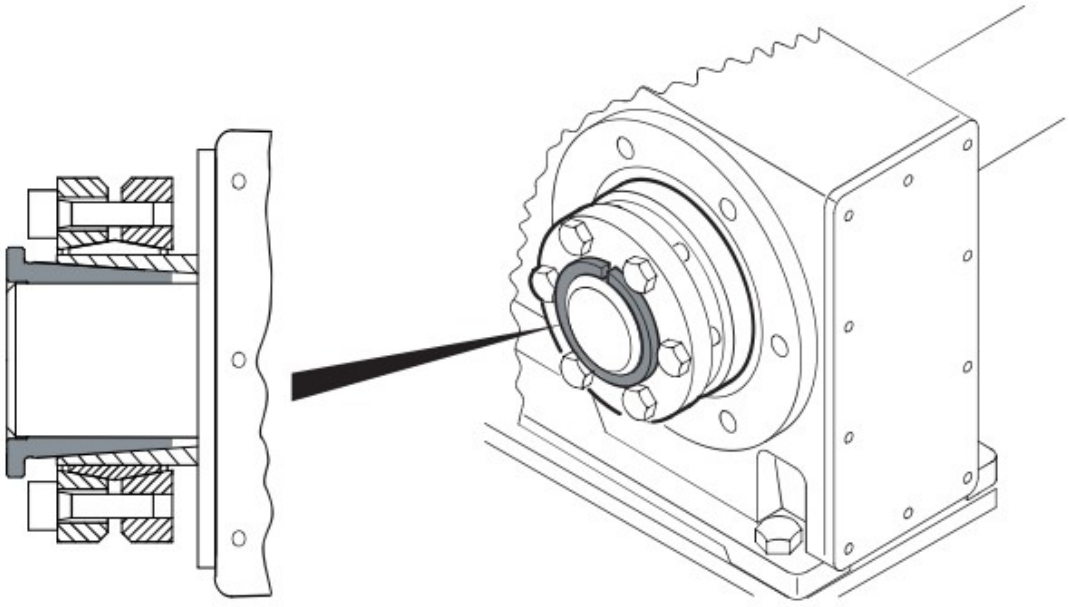
- Bring the shrink disc fully into position.

Gently tap on the flange of the conical steel bush to make sure that the bush sits securely in the hollow shaft.



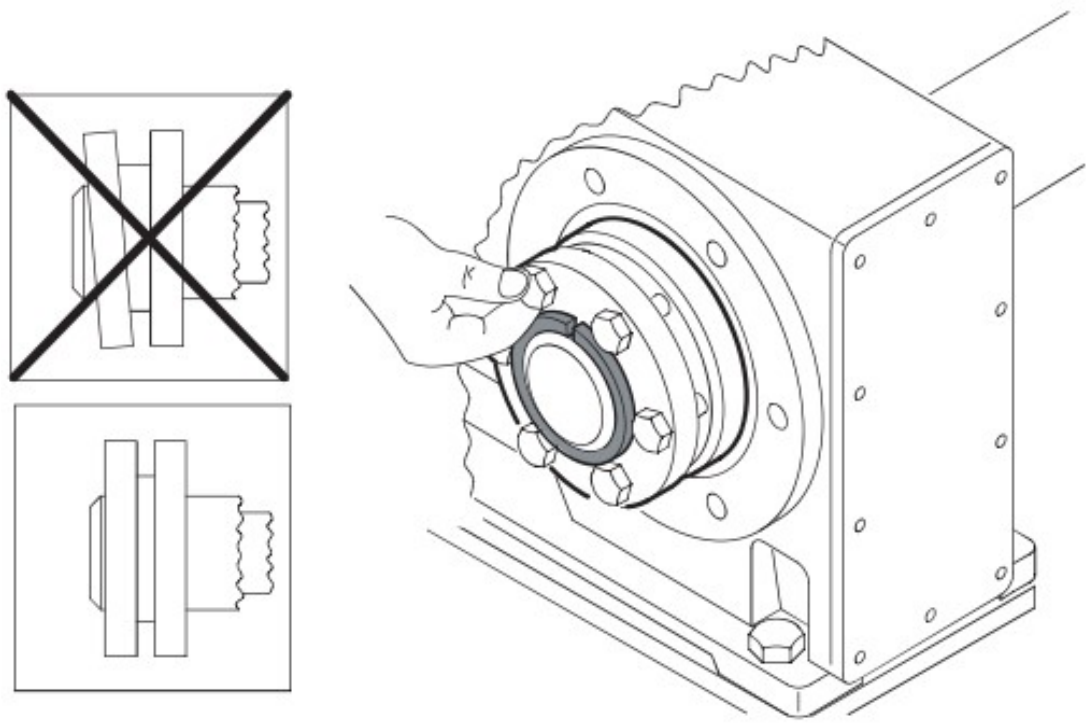
72958859

- Check whether the drive shaft is positioned in the conical steel bush.



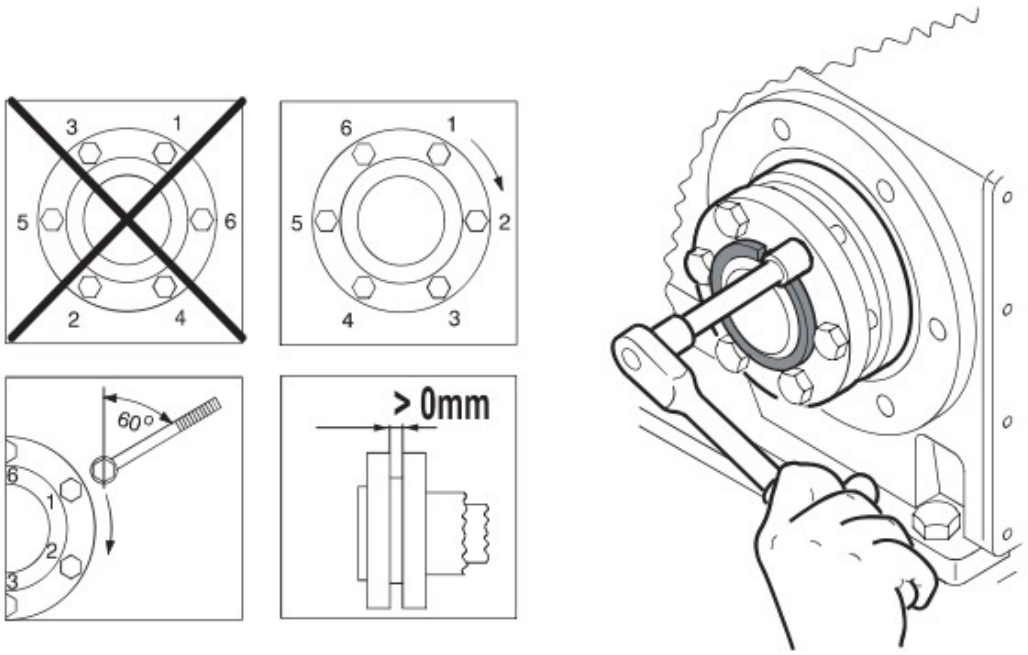
72961291

- Tighten the screws on the shrink disc by hand and make sure that the outer rings of the shrink disc are parallel to one another.



72963723

- Tighten the clamping screws with the correct tightening torque according to the manufacturer's instructions. Tighten the screws sequentially (not crosswise) in several passes.

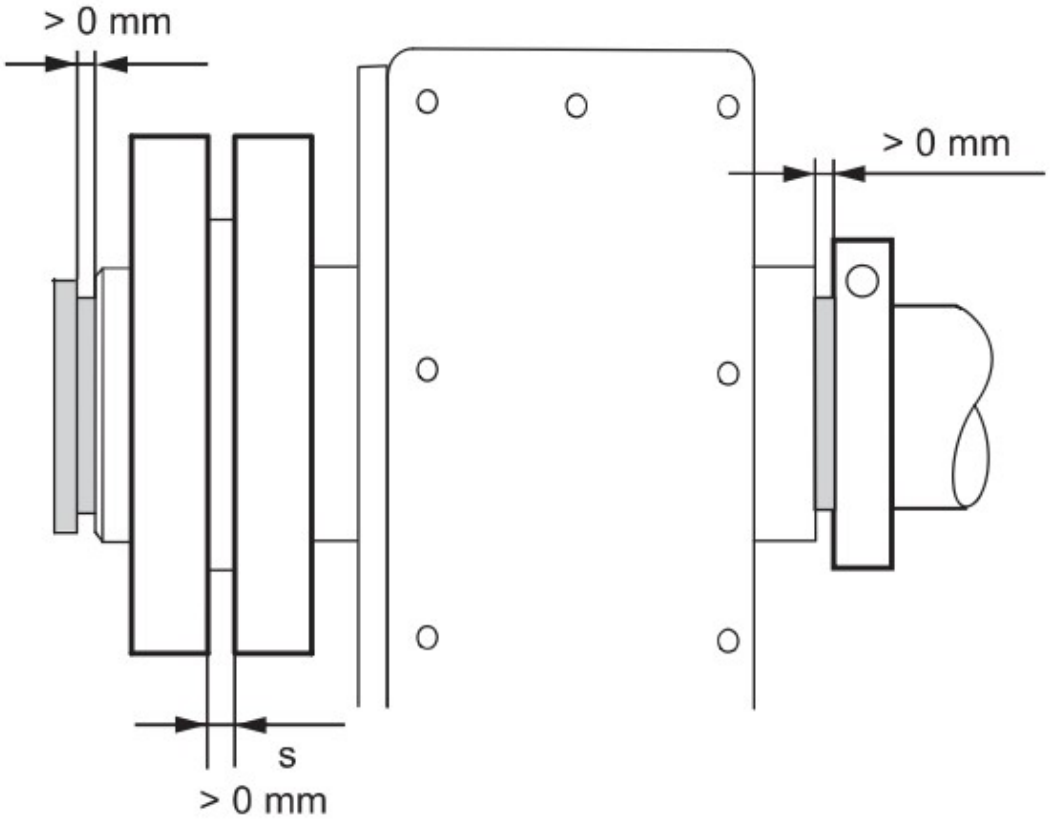


72966155

NOTICE

- Depending on the manufacturer, the tightening torques and/or type may be found on the shrink disc.
- Observe the information and documentation from the manufacturer.

- After assembly, check that the gap s between the outer rings of the shrink disc is > 0 mm.
- Check that the gap between the conical steel bush and the end of the hollow shaft, and between the conical bronze bush and the shaft shoulder (or end stop ring, depending on the design) is > 0 mm.



72944267

- Insert the damping elements (4) and use the fasteners (5)/(3) to install the torque support.
- Attach the protection cover (1) using the fasteners (2).
- Connect the gear motor supply line. **WARNING! Danger due to electric current**
- If any protection covers were removed, reattach them on the machine.

10.3.6 Tensioning/releasing tension on the belt

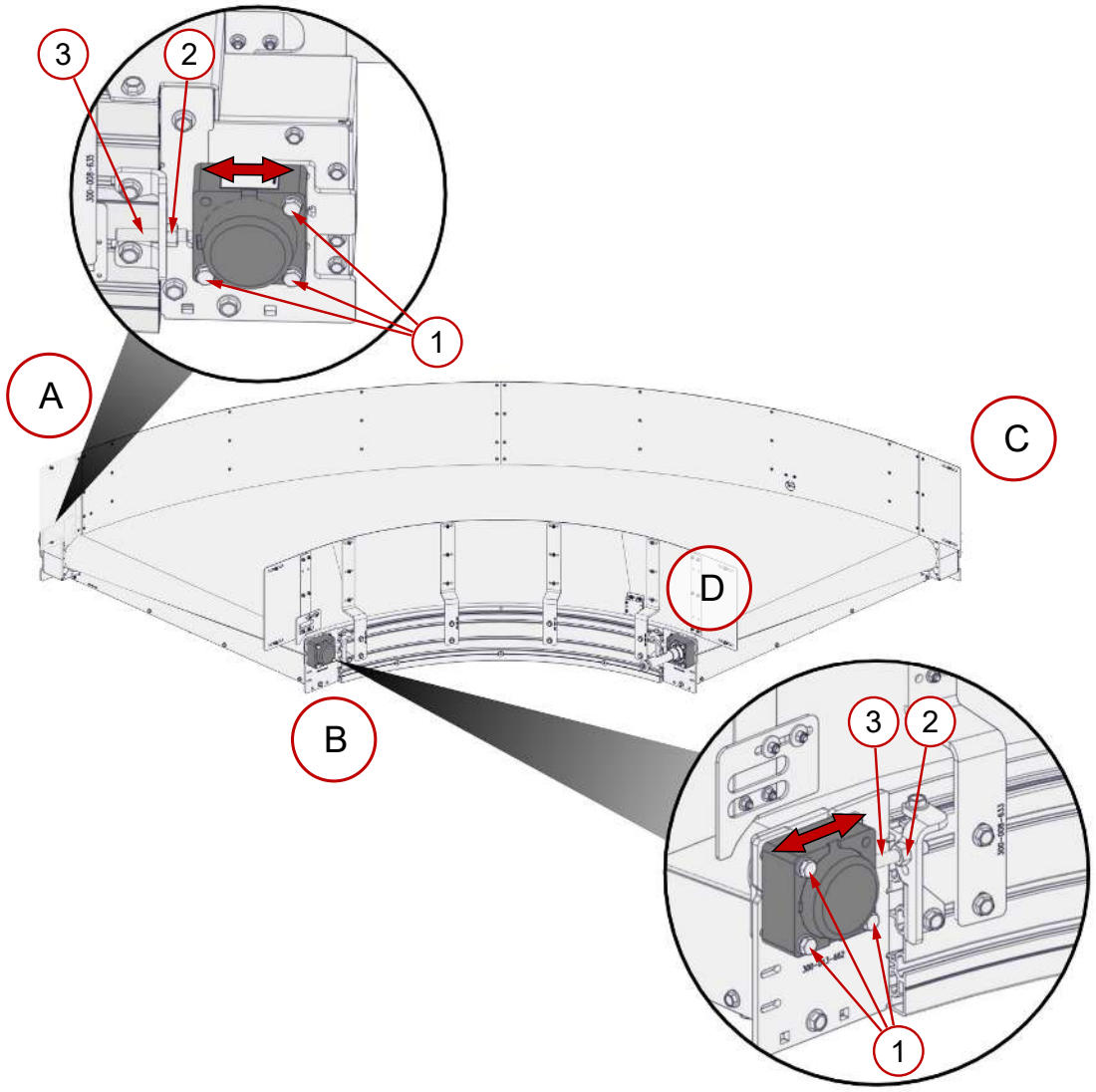
NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- The belt tension can be set for each bearing unit (A, B, C, D).
- Loosen/remove the front cover (A-B, C-D) as described in the section Installing/removing the front cover [▶ 129].
- Loosen the cover brackets on the bearing units B-D as in the section Installing/removing the cover brackets on the bearing units B-D [▶ 141].
- Loosen the fasteners (1) on the relevant bearing unit.
- Loosen the locknut (2).
- Use the clamping screw (3) to tension the conveyor belt as symmetrically as possible until there are no longer any folds and the conveyor belt is pulled evenly.
- Manually turn the conveyor belt and check that there are no collisions/streaking on frame parts.
- Adjust the belt tension with a “test weight” (the maximum weight the curve conveyor was designed for, e.g. 40 kg), so that the equipment can operate without any slipping between the conveyor belt and the pulleys.

NOTICE

- When doing this job, make sure the belt tension is not inadvertently set too high or too low, as this could cause problems when the belt path is being adjusted.
- Excessively high belt tension can cause extra wear on the pulley bearings and the conveyor belt.



77939211

- If the conveyor belt runs smoothly and centred for about 10 minutes, it has been adjusted correctly.
- Re-tighten the locknuts (2) and fasteners (1).
- Adjust the cover brackets on the bearing units B-D as in the section Installing/removing the cover brackets on the bearing units B-D [▶ 141].
- Install/adjust the front covers as described in the section Installing/removing the front cover [▶ 129].
- Manually turn the conveyor belt to check there are no collisions with the front cover.

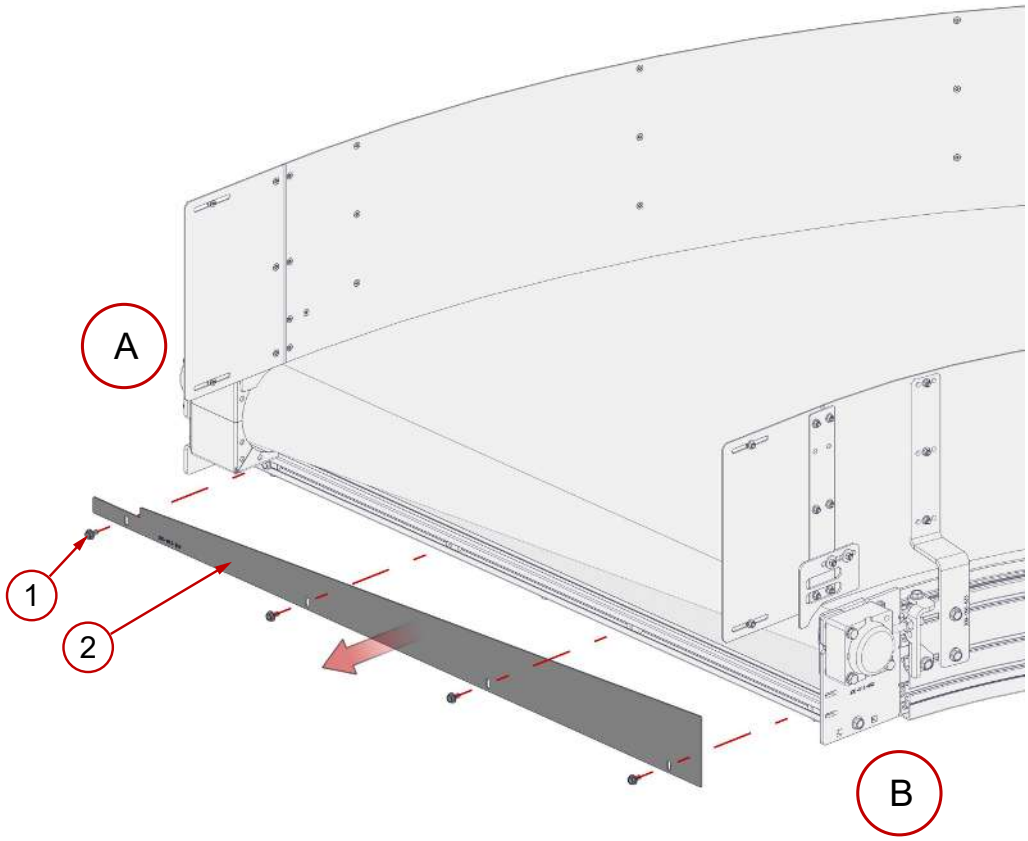
10.3.7 Installing/removing the front cover

10.3.7.1 Airport variant

NOTICE

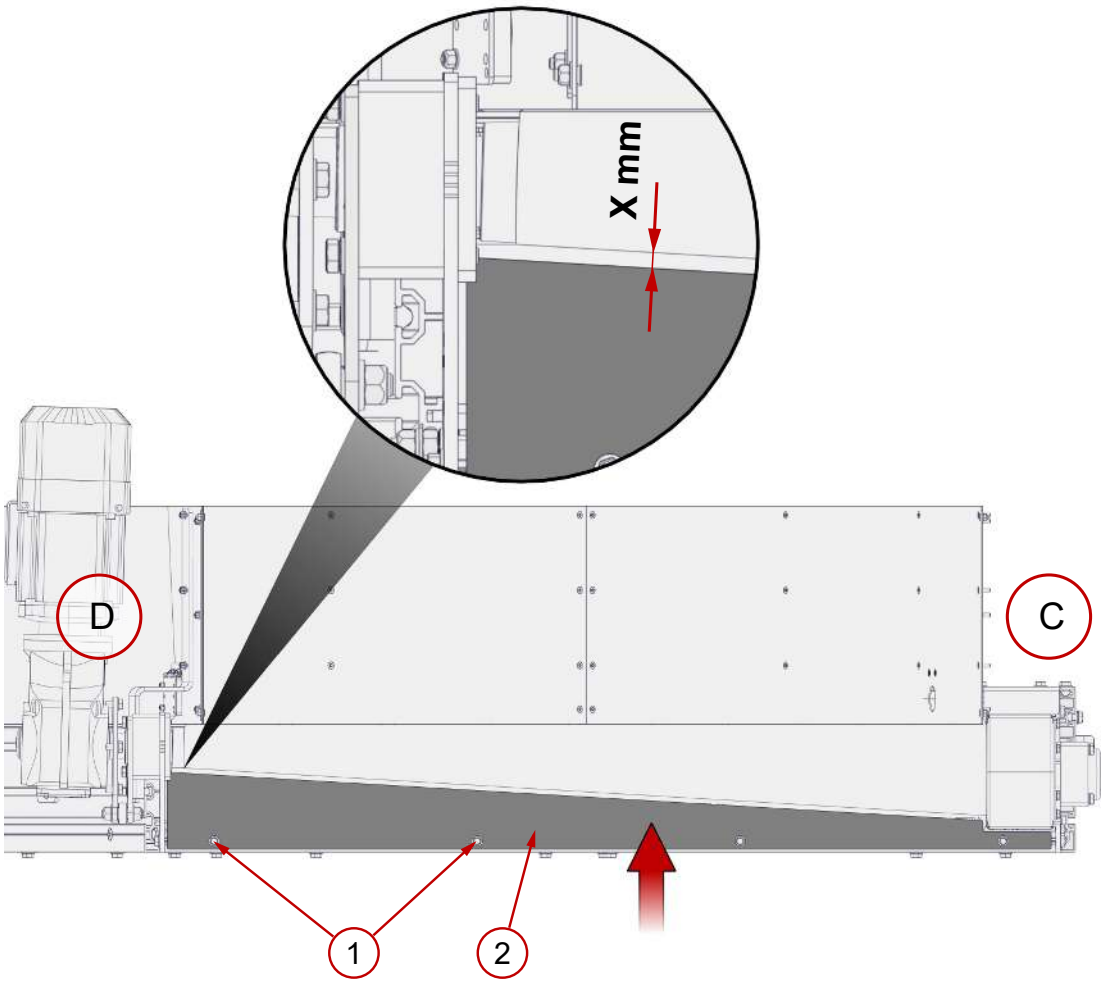
- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Front covers are applied to both sides (A-B, C-D) of the CBC.
- The front cover (2) can be removed by loosening the fasteners (1).



77887243

- Once the work is complete, install the front covers (2) back onto the CBC using fasteners (1).



77921163

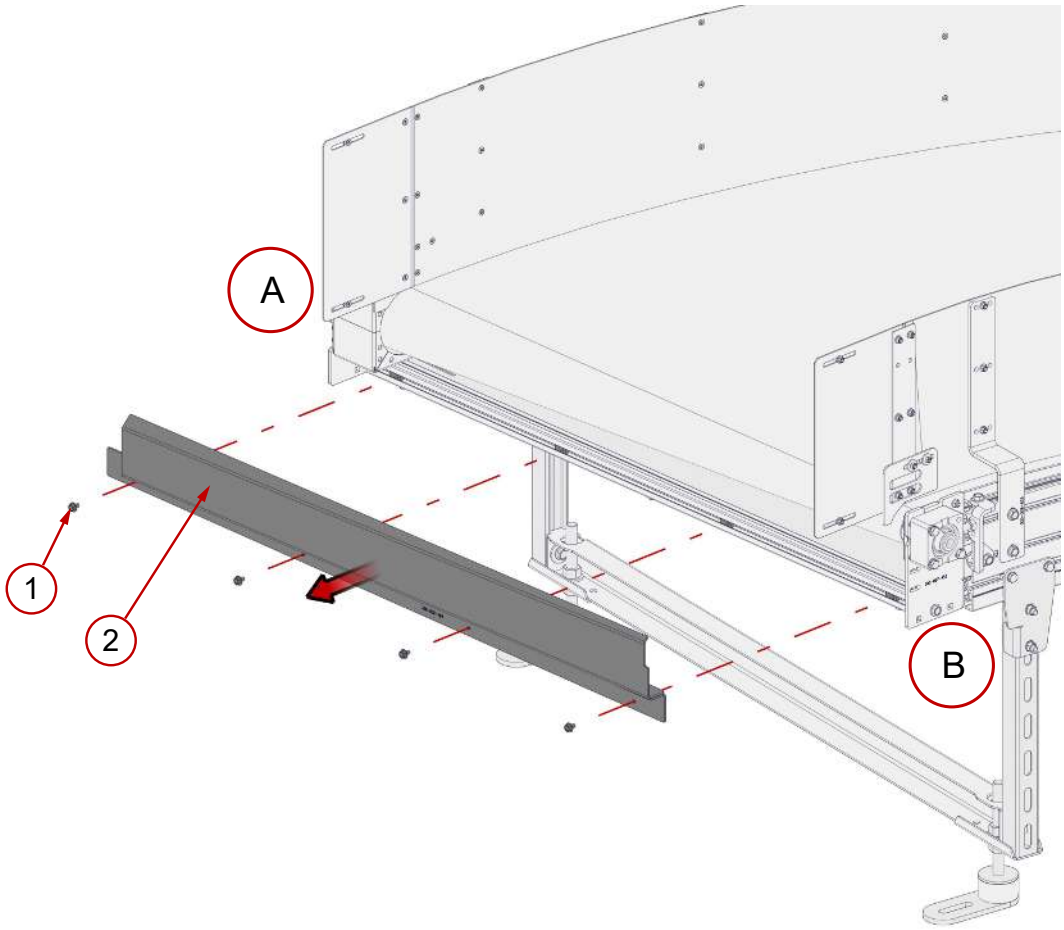
- Set the height of the front cover plate (2) so that the distance X is < 5 mm to the conveyor belt.

10.3.7.2 Intralogistics variant

NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

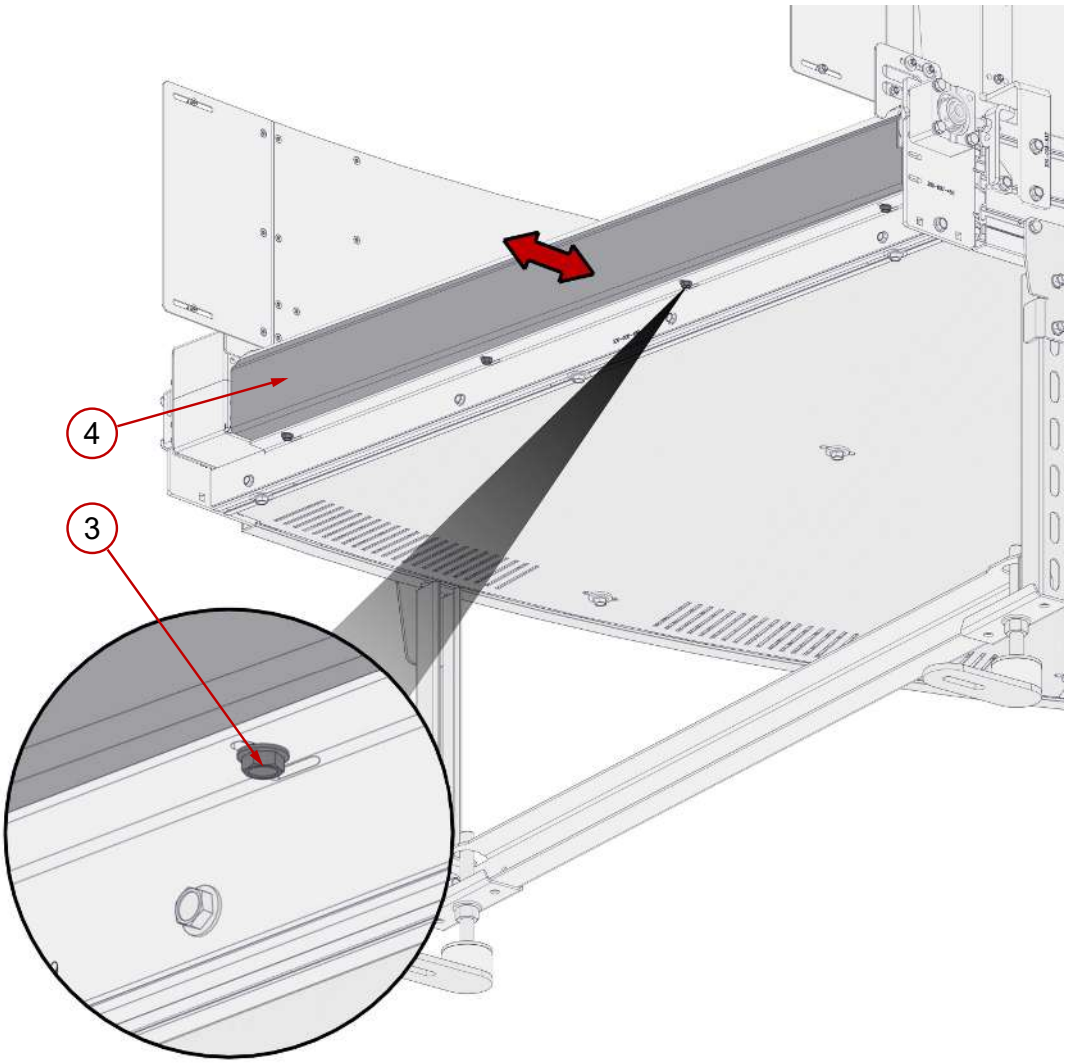
- Front covers are applied to both sides (A-B, C-D) of the CBC.
- The front cover (2) can be removed by loosening the fasteners (1).



78073867

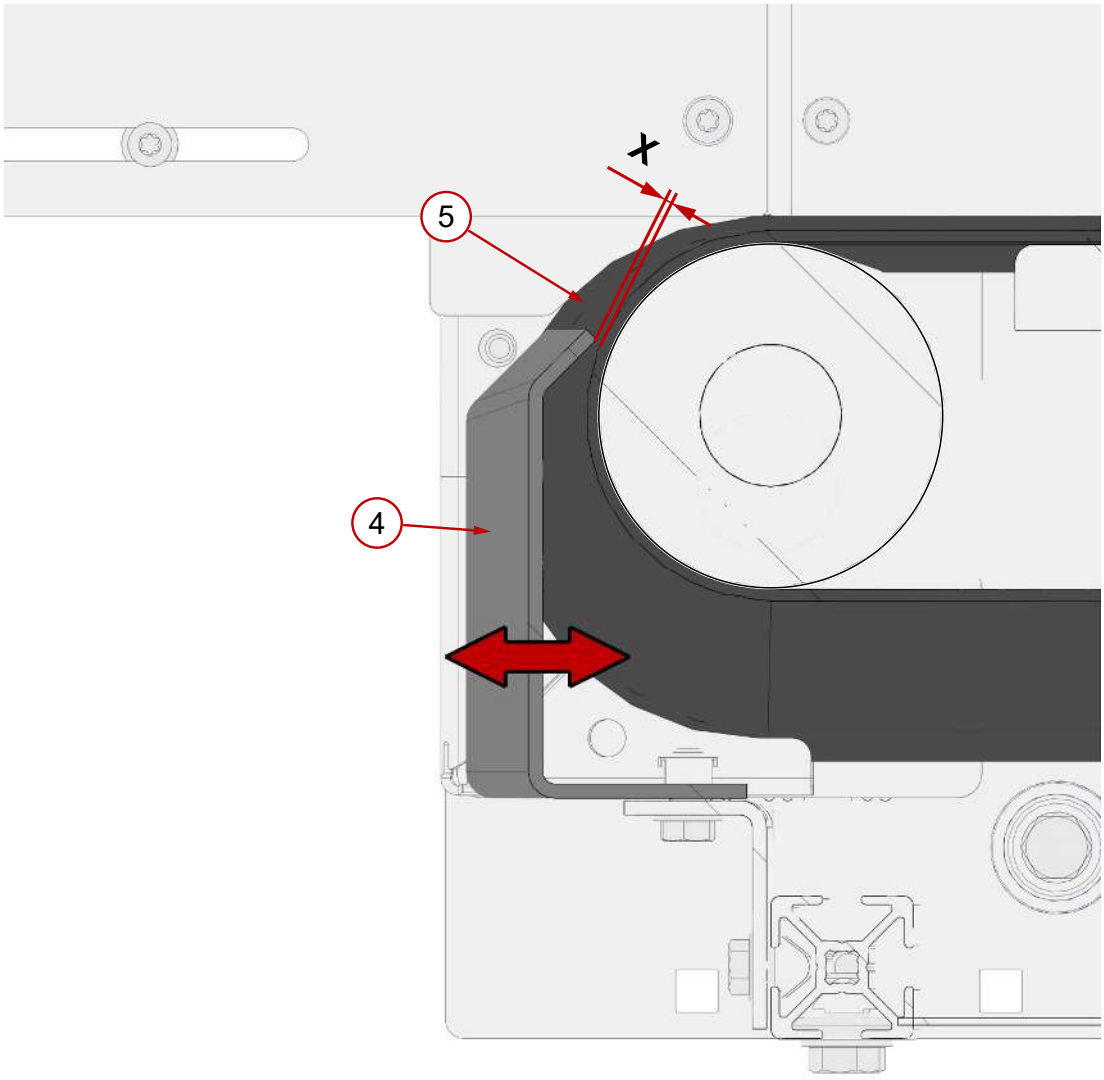
- Once the work is complete, install the front covers (2) back onto the CBC using fasteners (1).

The cover plate (4) can be adjusted by loosening the fasteners (3).



78076555

- Adjust the cover plate (4) so that the distance X is < 5 mm to the conveyor belt (5).



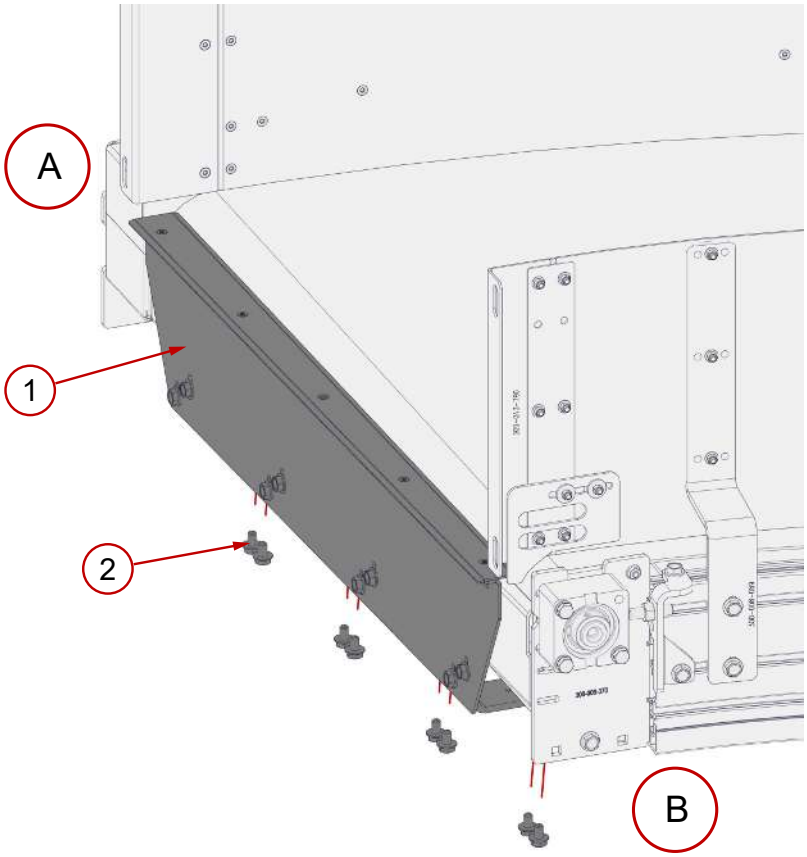
78092043

10.3.8 Installing/removing the transfer plate

NOTICE

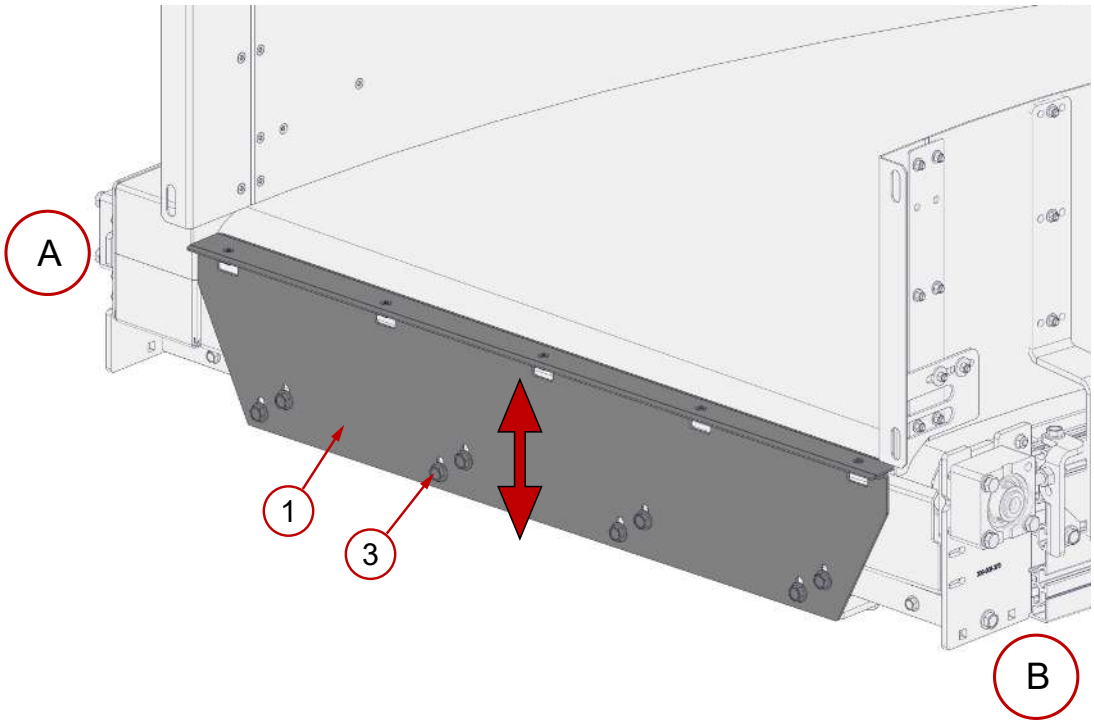
- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Transfer plates may be installed on side A-B/C-D of the CBC as required.
- If necessary, remove the side guide interfaces as described in the section Installing/removing the side guide interface [▶ 137].
- In order to dismantle the transfer plate (1), remove the fasteners (2) on the bottom of the CBC.



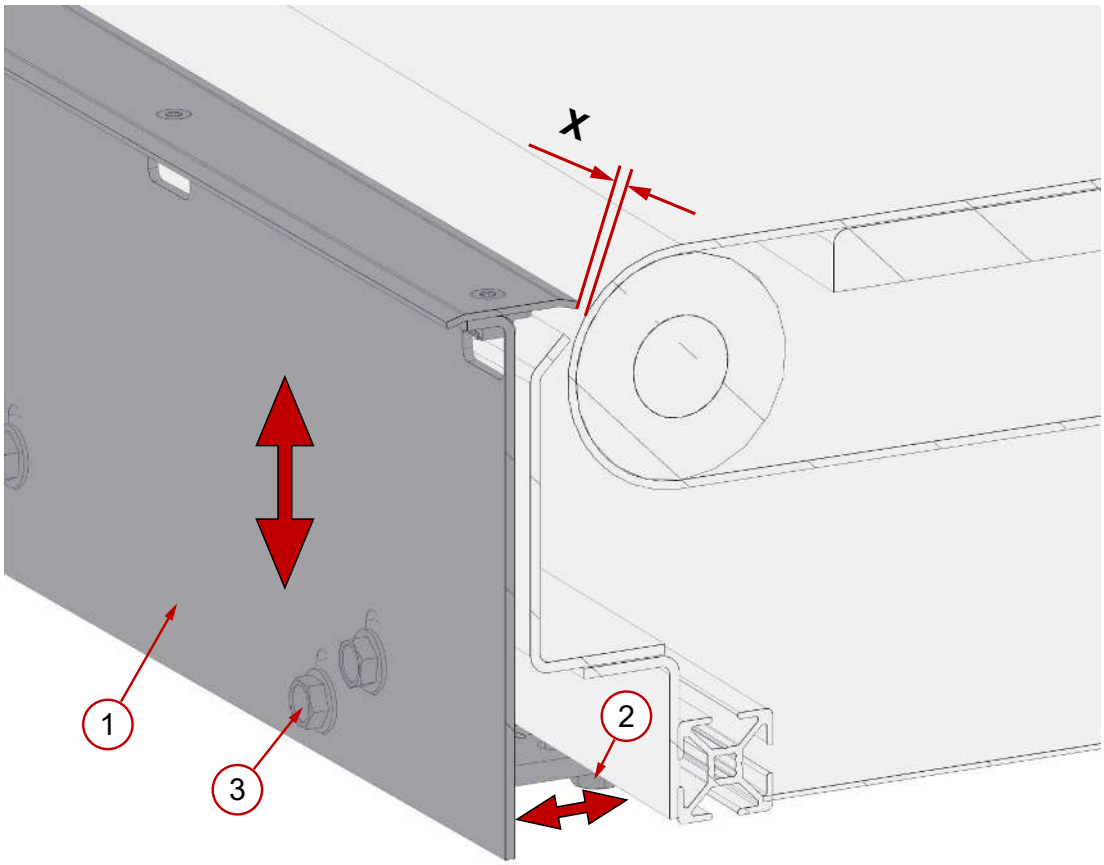
78188939

- Once the work is complete, install the transfer plate (1) using the fasteners (2).
- The height of the transfer plate (1) can be adjusted by loosening the fasteners (3).



78192267

- Adjust the transfer plate so that the distance X is < 4 mm. In order to do this, loosen the fasteners (2, 3), adjust and then tighten again.



78208779

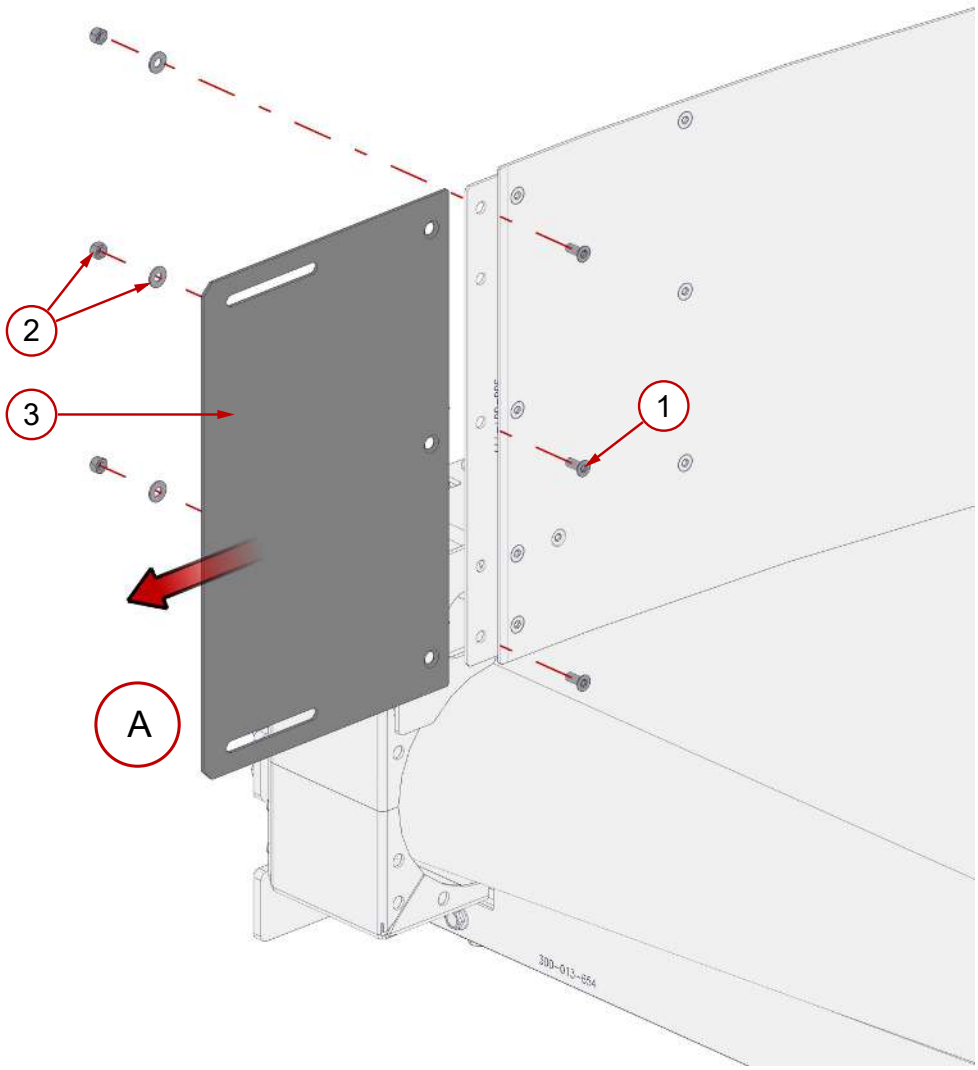
- Install the side guide interfaces as described in the section Installing/removing the side guide interface [▶ 137].

10.3.9 Installing/removing the side guide interface

NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Remove the side guide interfaces (3) on the relevant drive side by removing the fasteners (1) and (2).



77954571

- Once the work is complete, re-attach the side guide interfaces using fasteners.

INFORMATION

- Diagrams of the side guide interfaces similar.

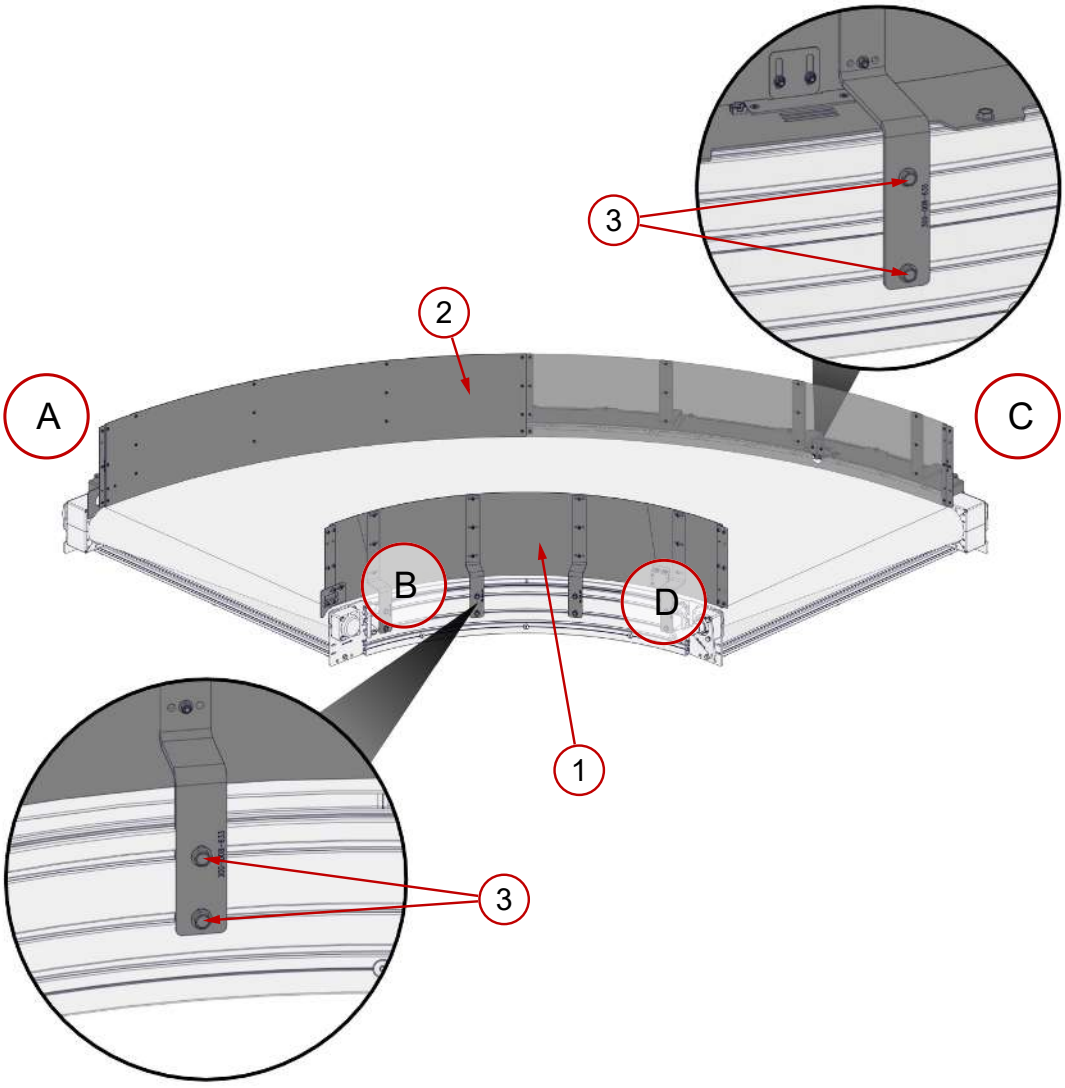
10.3.10 Installing/removing the side guide and protection covers

NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

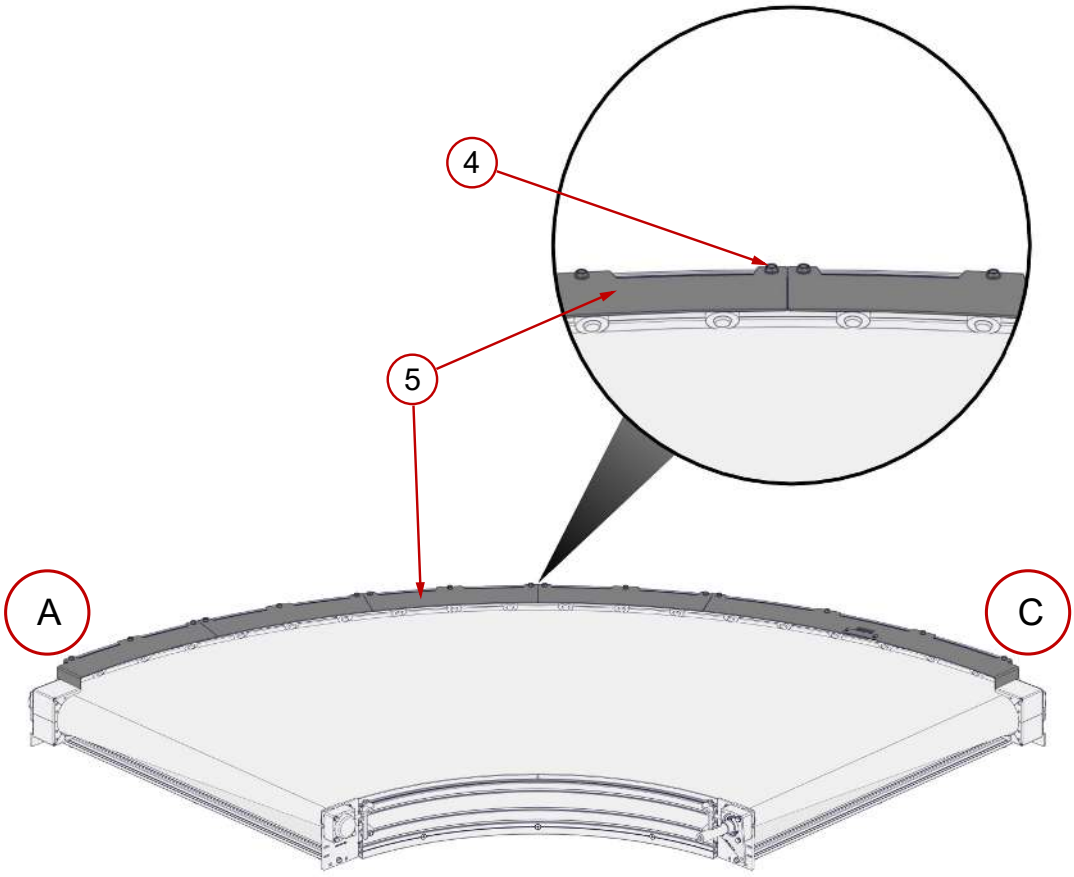
The side guides of the CBC consist of an inner (1) and an outer (2) side guide. They can be removed from the CBC as entire elements.

- Remove the side guide interfaces to the conveyors in front/behind as described in the section Installing/removing the side guide interface [▶ 137].
- Loosen the relevant side guide by removing the fasteners (3). **NOTICE! Dismantle any light barriers that have been installed on the inner/outer side as described in the section** Installing/removing light barriers [▶ 147].



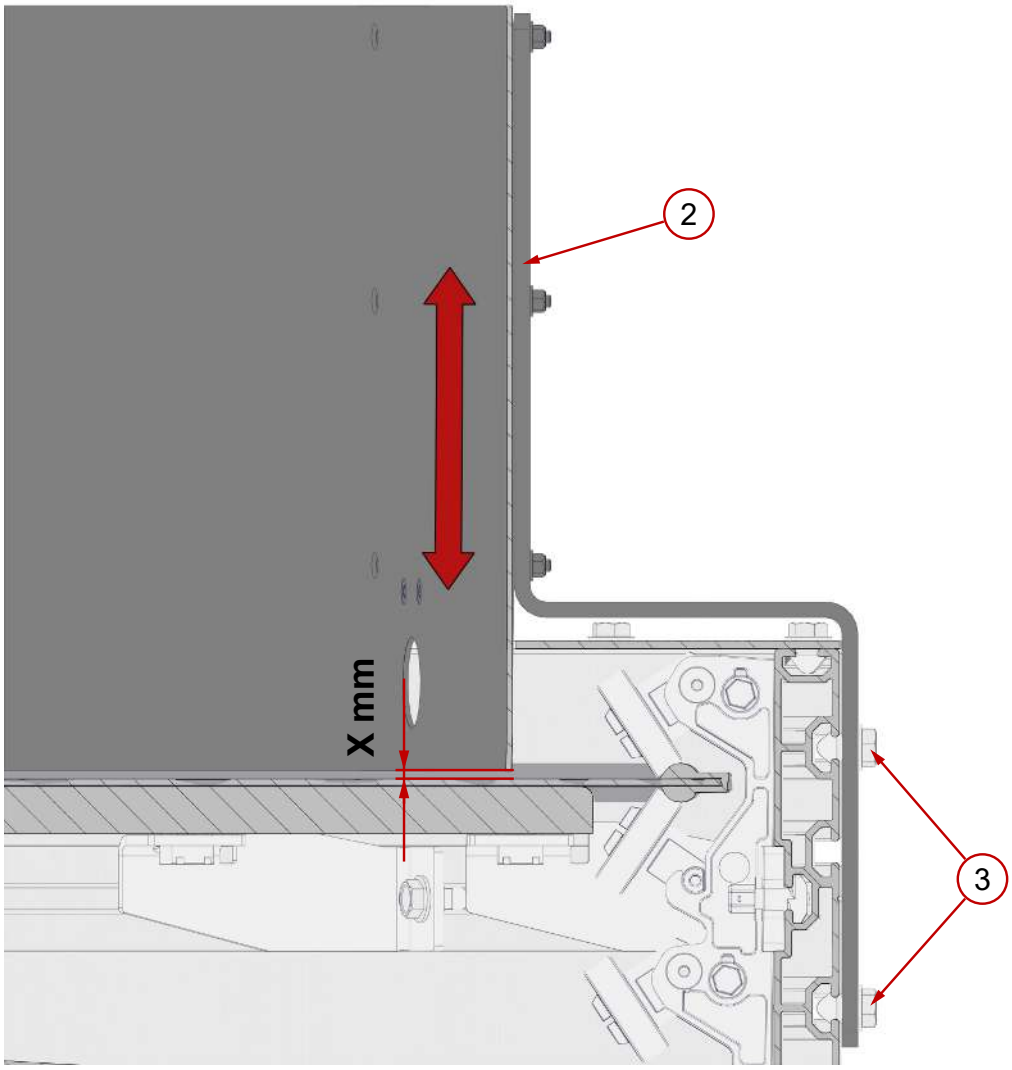
77974667

- Remove the protection segments (5) by loosening the fasteners (4).



77980683

- Once the work is complete, attach the protection segments.
- Apply the inner and outer side guide element.
- Position the height of the side guide elements (1, 2) so that dimension X is approx. 4 mm and tighten the fasteners (3). **NOTICE! For the height positioning, several 4 mm distances can be inserted between the conveyor belt and the lower edge of the side guide plate. The distance should be the constant over the entire CBC. Remove the distances again after the adjustment process.**



77986315

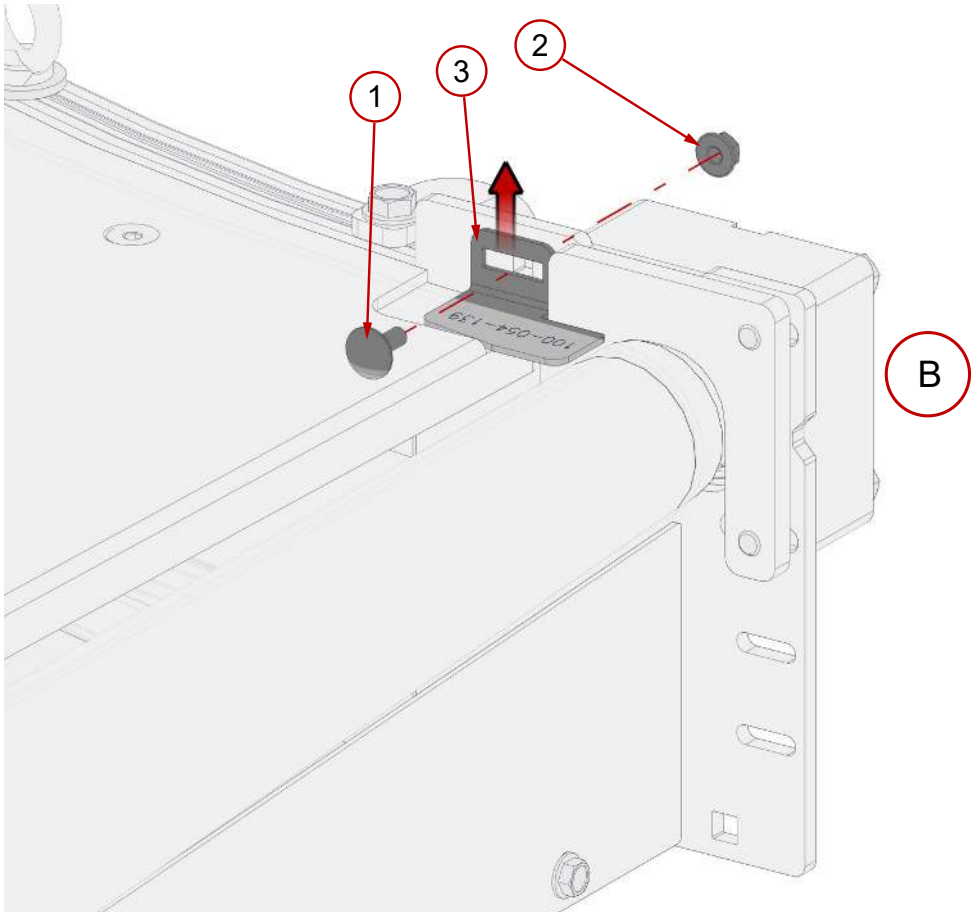
- Manually turn the conveyor belt and check that there are no collisions/streaking with frame parts or the side guide.
- **NOTICE! Install any light barriers that were removed on the inner/outer side.**
- If the belt runs smoothly and centred for about 10 minutes, then removed side guide interfaces to neighbouring conveyors can be applied as described in the section Installing/removing the side guide interface [▶ 137].

10.3.11 Installing/removing the cover brackets on the bearing units B-D

NOTICE

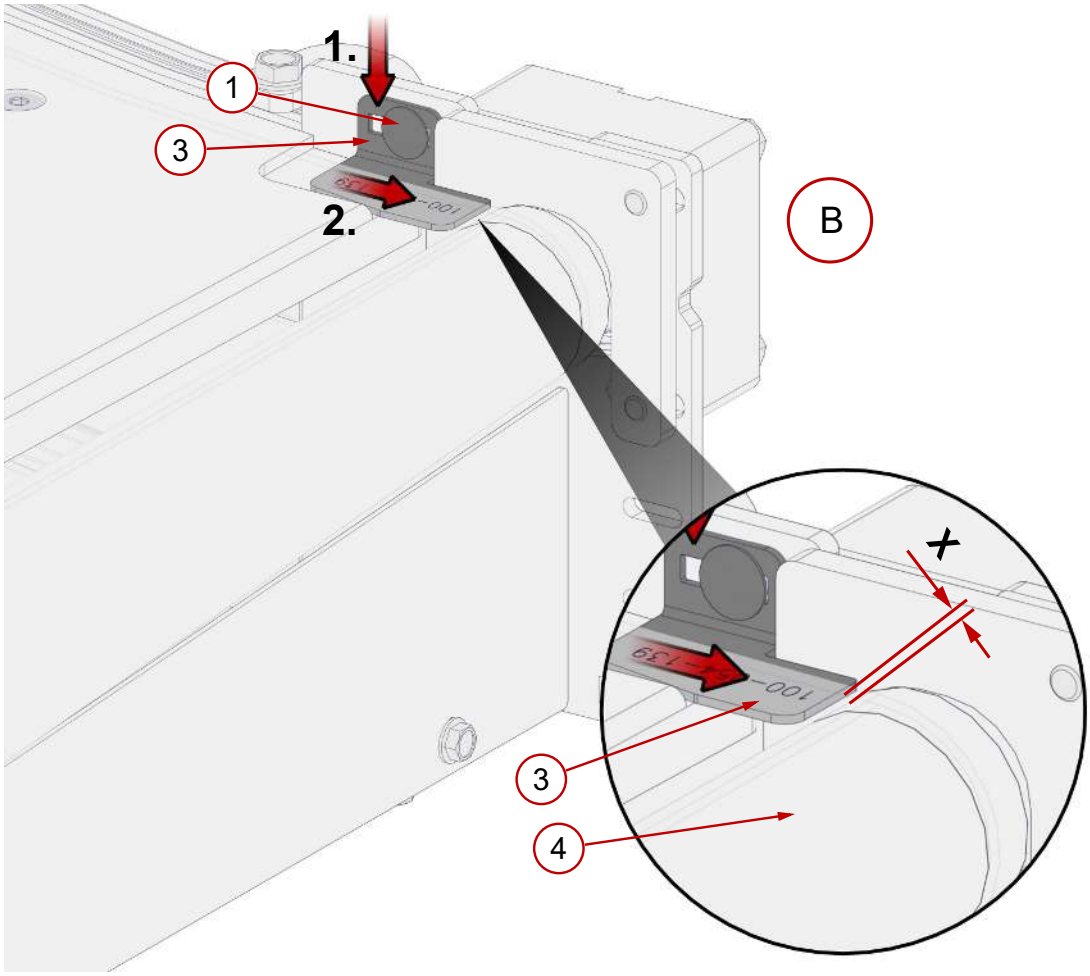
- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- One cover bracket (3) each is used on the bearing units (B, D) of the CBC.
- Loosen or dismantle the cover brackets (3) by loosening the fasteners (1, 2).



78143371

- Once the work is complete, re-install the cover brackets (3) using fasteners (1, 2) and when doing so adjust so that the distance X is < 5 mm between cover brackets and pulley (4).



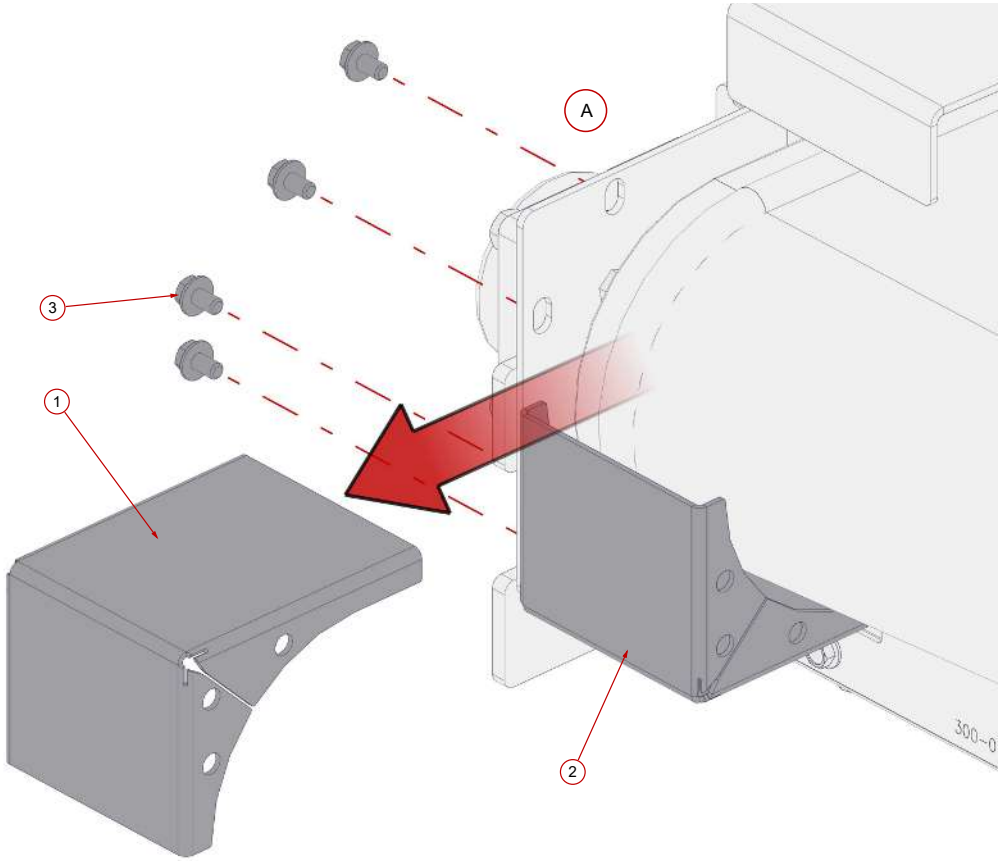
78146827

10.3.12 Installing/removing bearing cover A-C

NOTICE

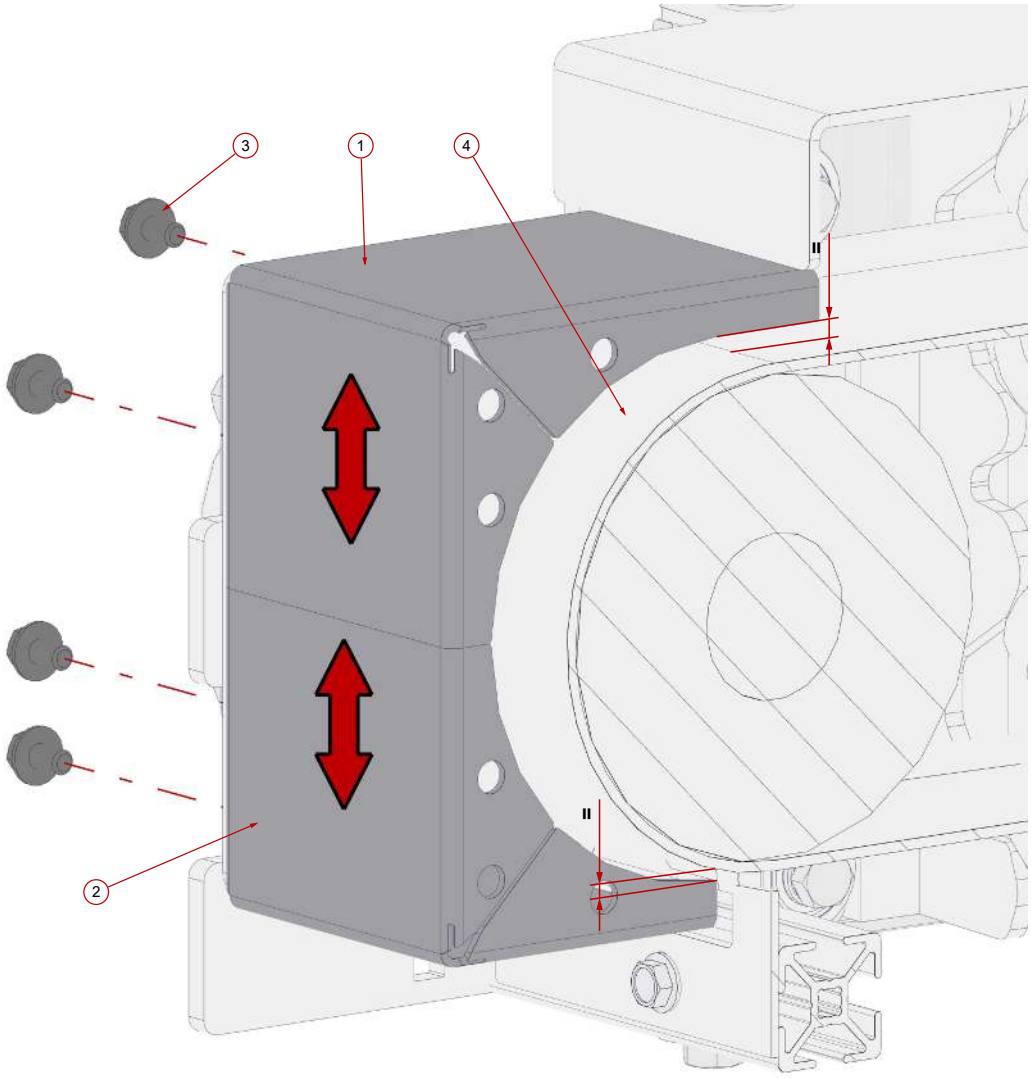
- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Remove the upper (1) and lower (2) bearing cover on bearing units A and C by loosening the fasteners (3).



100726539

- Once the work is complete, install the upper and lower bearing cover (1.2) using the fasteners (3).
- The height of the covers (1, 2) can be adjusted. The distance between the relevant cover around the conveyor belt (4) must be equal, or must be set so that the conveyor belt does not cause streaking on the covers.



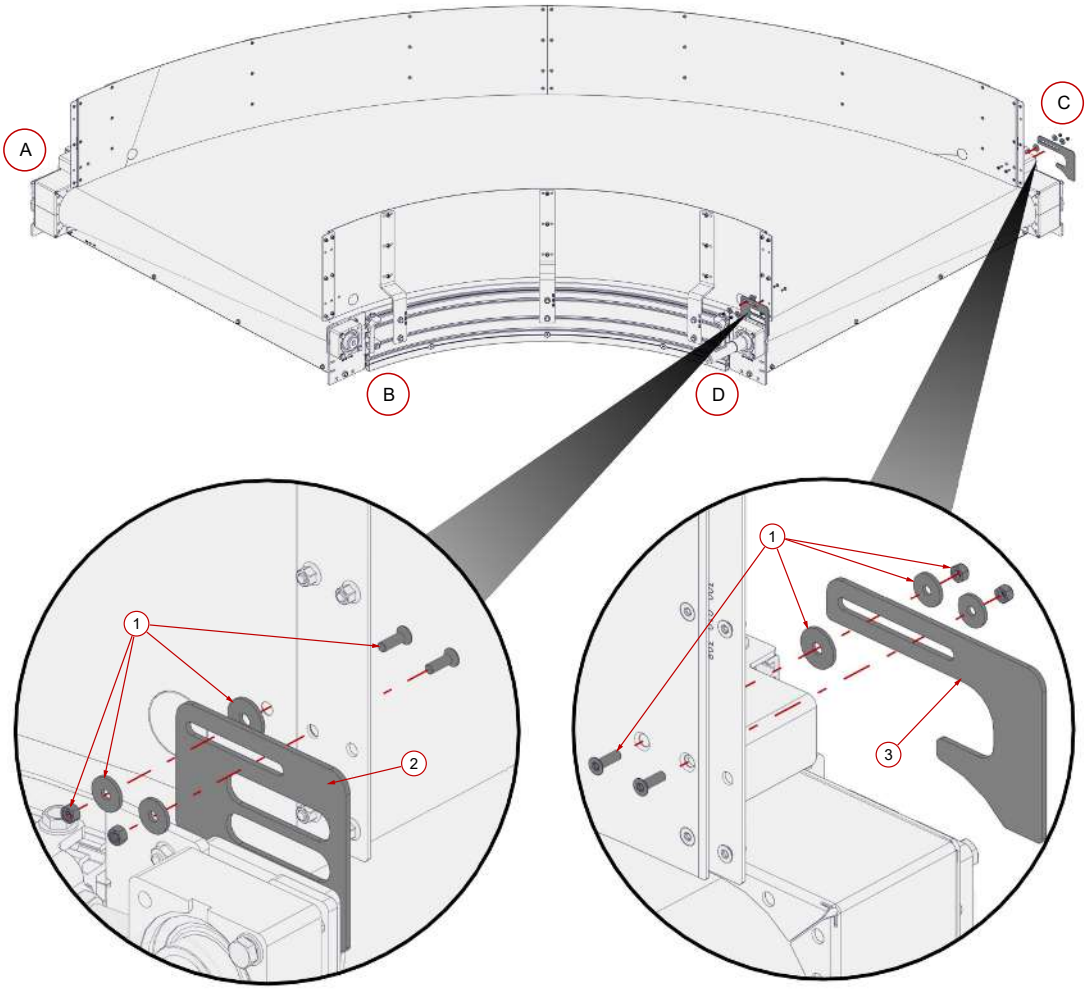
100729611

10.3.13 Installing/removing intake plates

NOTICE

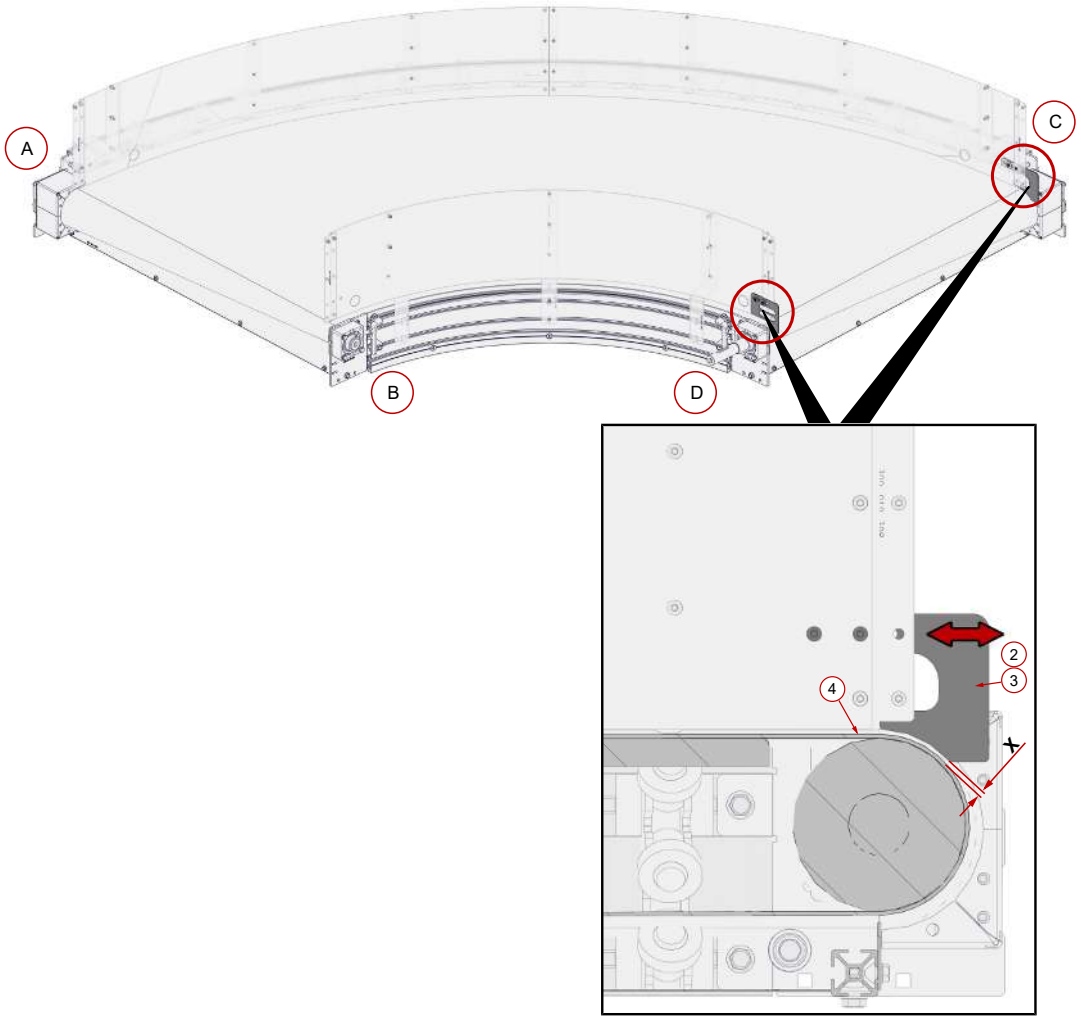
- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- The intake plates consist of plastic plates of varying shapes. There is one variant for sides A & C (3) and one variant for sides B & D (2). Depending on the curve belt conveyor geometry, the plate (2) may have varying shapes.
- The intake plates are screwed to the side guide using fasteners (1).



100561931

- Adjust the intake plates so that the dimension X between the plate (2, 3) and the conveyor belt (4) is < 4 mm.



100533515

10.3.14 Installing/removing light barriers

NOTICE

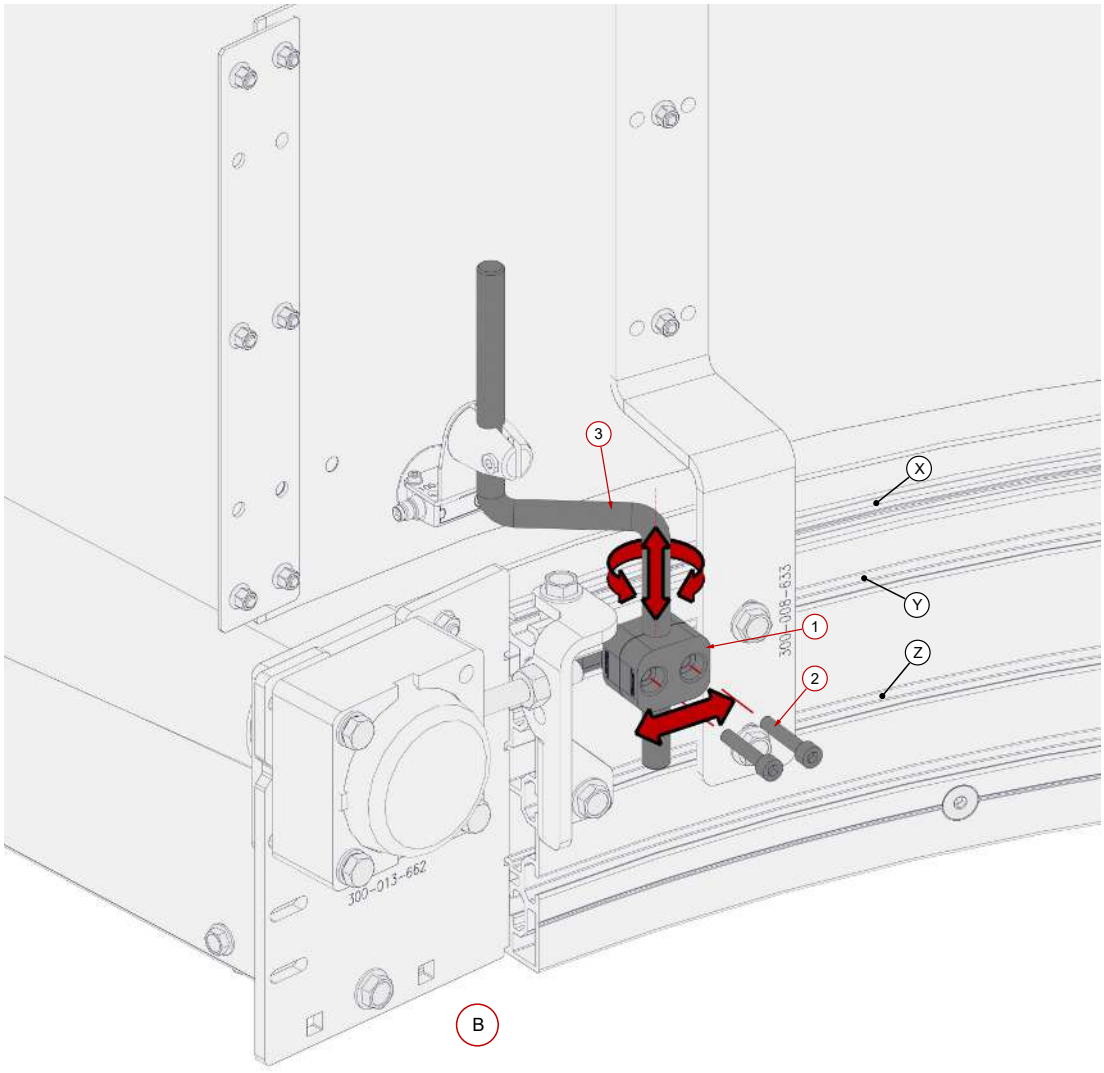
- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

INFORMATION

- Figures of the light barriers and their accessories are similar.
- Light barriers may vary depending on the light barrier type, retaining bracket and area of use.
- Observe the information and documentation from the manufacturer.

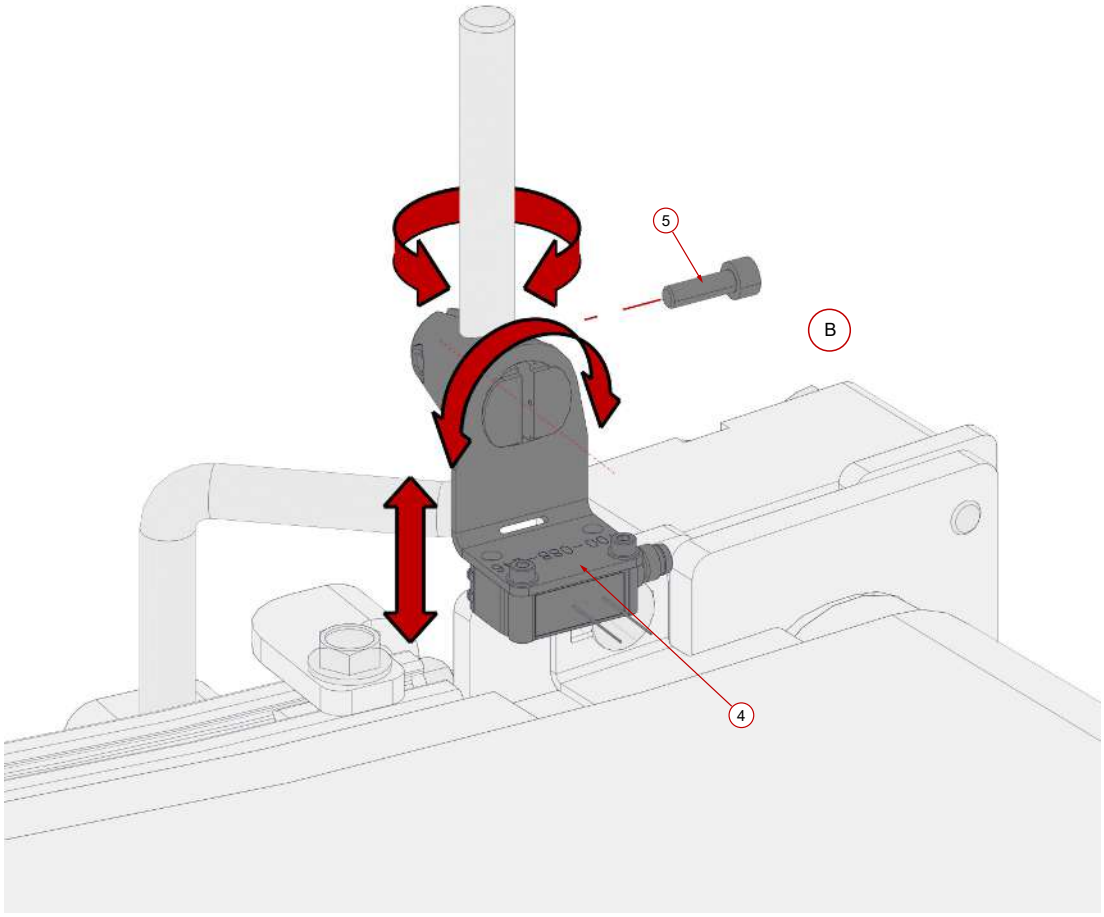
10.3.14.1 Light barriers inside B-D

- Install the clamp (1) in the desired profile slot (X, Y, Z) by loosening the fasteners (2) and sliding to the desired position. If the clamp (1) has been loosened, the retaining bracket (3) can be twisted and its height can be adjusted.



101935883

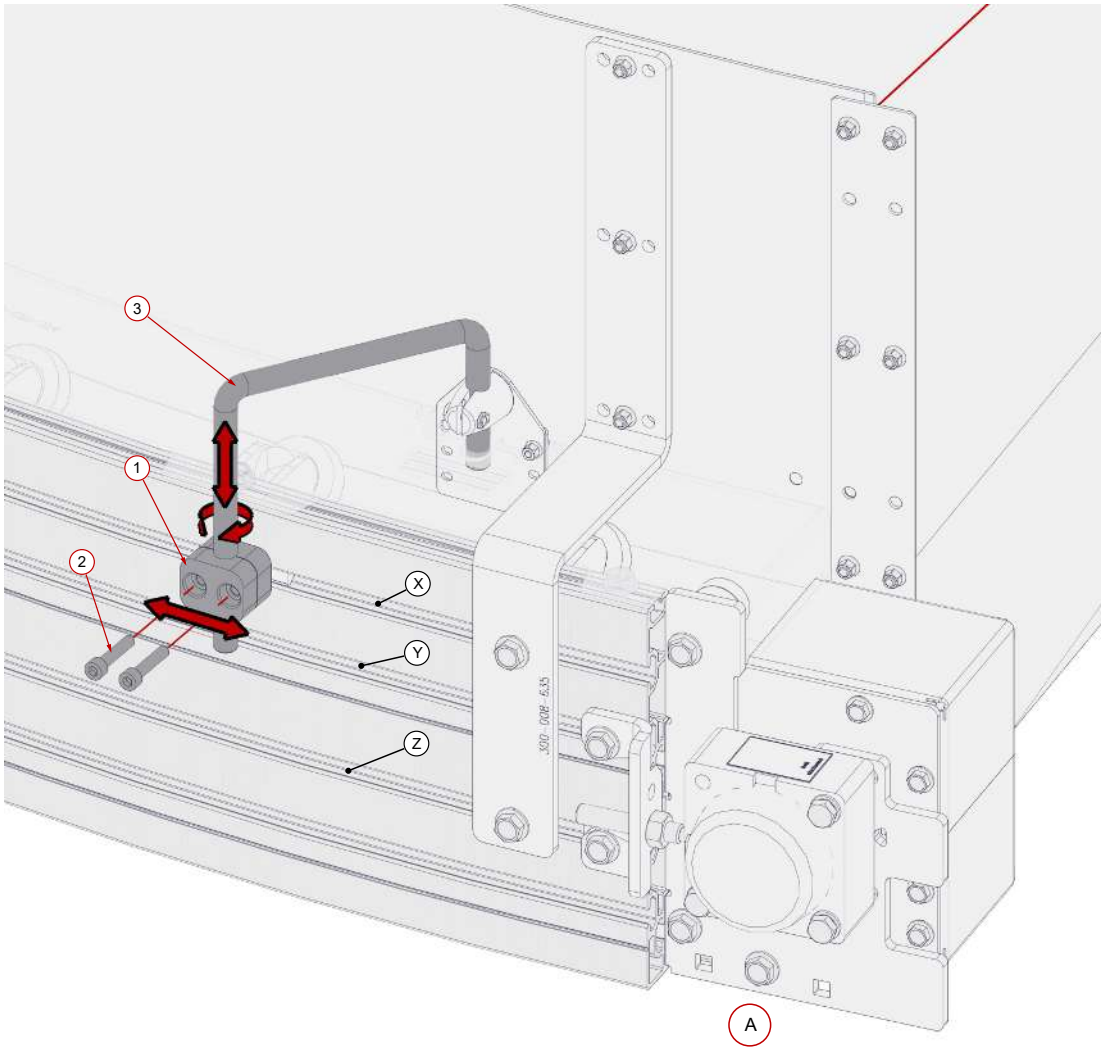
- The reflector or sensor bracket (4) can be twisted in the vertical and horizontal axis and its height can be adjusted by loosening the fastener (5).



101952395

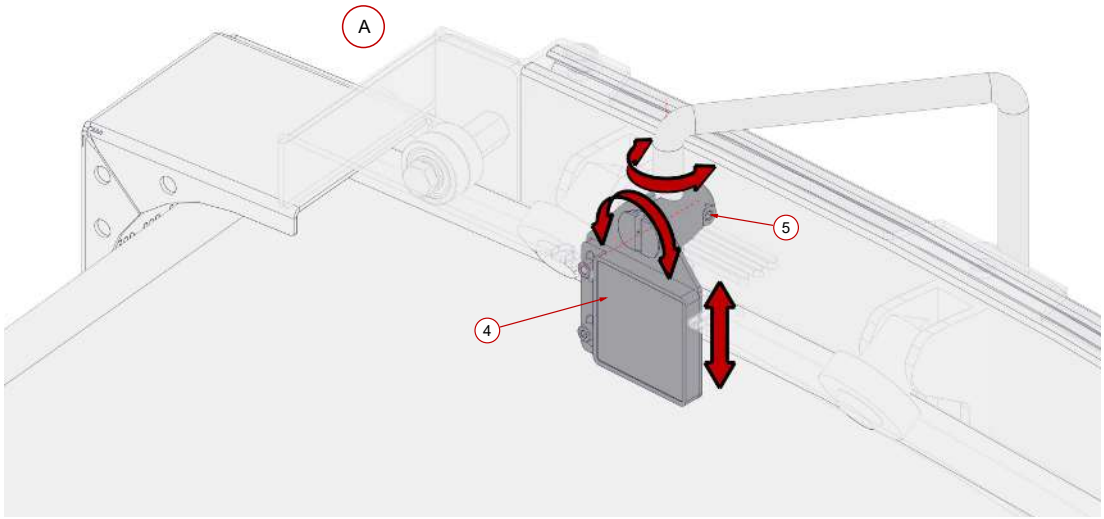
10.3.14.2 Light barriers outside A-C

- Install the clamp (1) in the desired profile slot (X, Y, Z) by loosening the fasteners (2) and sliding to the desired position. If the clamp (1) has been loosened, the retaining bracket (3) can be twisted and its height can be adjusted.



101918091

- The reflector or sensor bracket (4) can be twisted in the vertical and horizontal axis and its height can be adjusted by loosening the fastener (5).



101947787

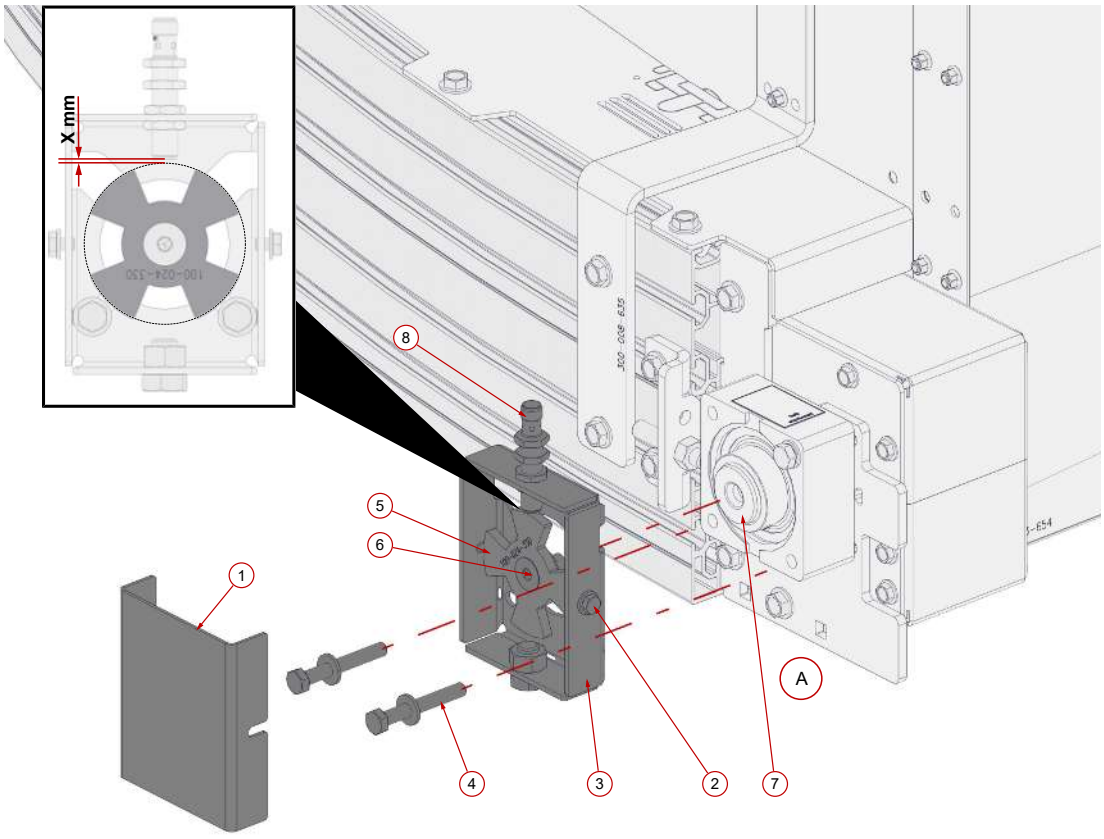
10.3.15 Installing/removing tracking

10.3.15.1 Tracking – inductive

NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Remove the cover (1) by loosening the fasteners (2). **NOTICE! Only loosen the fasteners; do not remove them.**
- The tracking disk (5) is installed on the curve conveyor pulley (7) using a fastener (6).
- The entire tracking housing (3) can be removed from the bearing unit by loosening the fasteners (4).



102055179

- Once the work is complete, check the distance X between the tracking disk (5) and tracking sensor (8).
- Apply the cover (1) using the fasteners (2).

INFORMATION

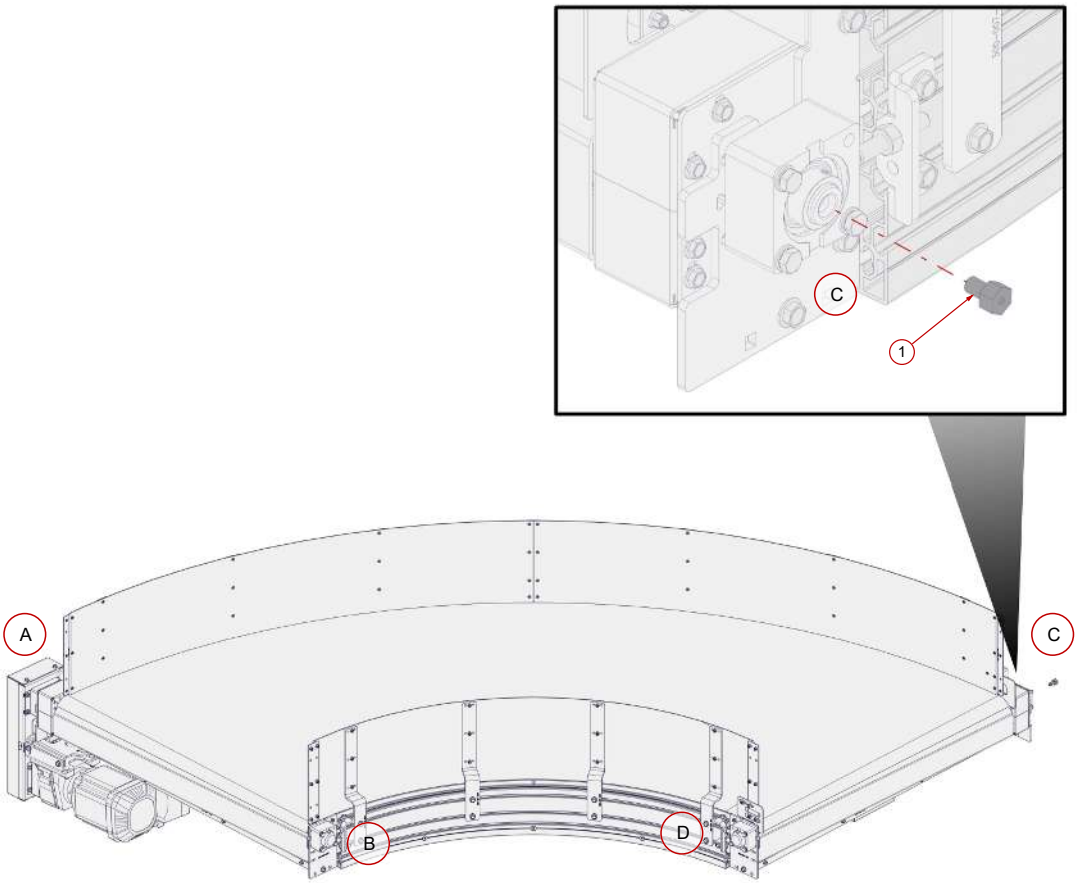
- The precise switching distance of the tracking sensor (8) can be found in the sensor data sheet in the complete documentation.

10.3.15.2 Tracking – hall sensor

NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- For the installation of a hall sensor, an adapter piece (1) is screwed into the front (inside or outside) of the bend roller.



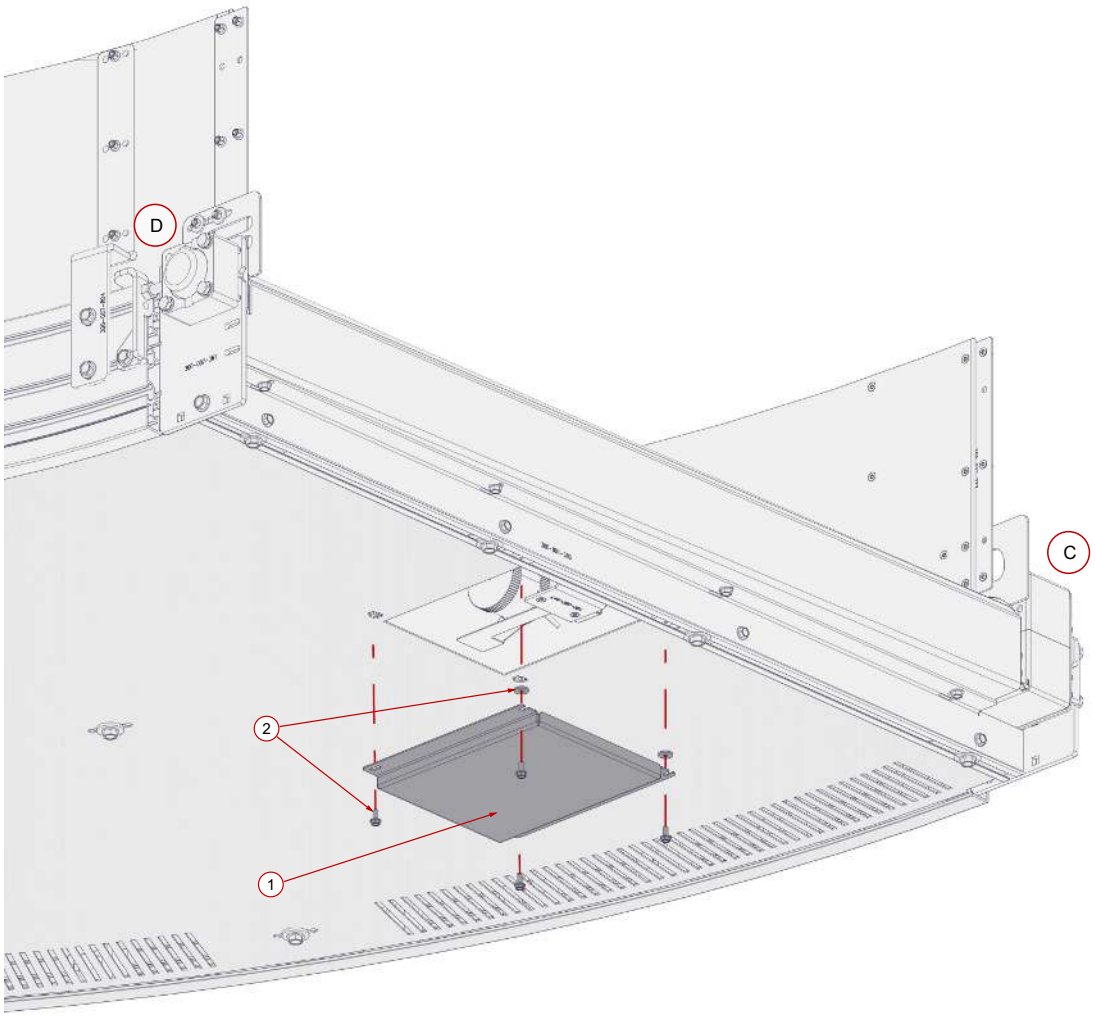
103853195

10.3.15.3 Tracking – on the conveyor belt

NOTICE

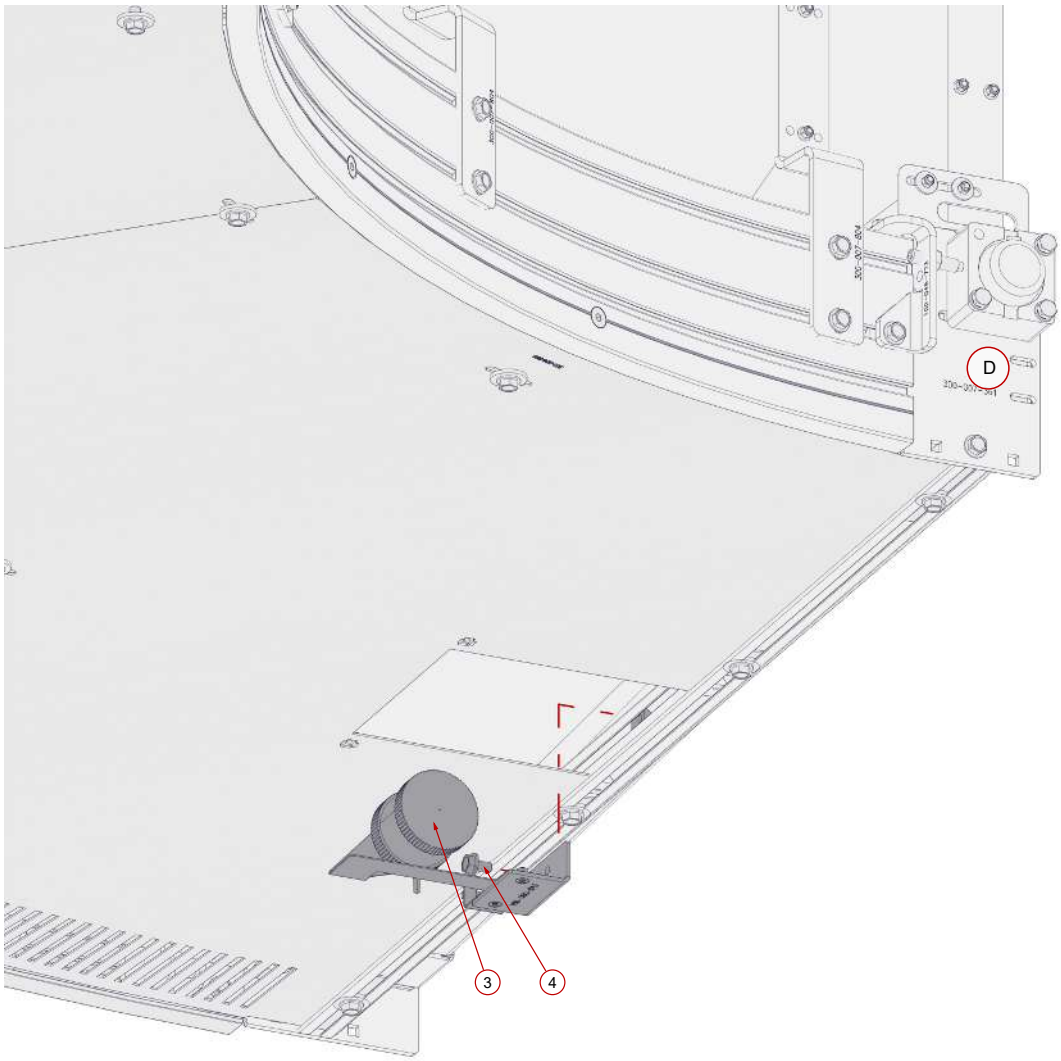
- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Remove the cover (1) by loosening the fasteners (2).



103847819

- The entire sensor bracket (3) can be removed from the frame by loosening the fastener (4).



103850507

- Once the work is complete, re-install the sensor bracket (3) using the fastener (4).
- Mount the protection cover (1) onto the lower cover using the fasteners (2).

INFORMATION

- Ensure that the roller of the rotary encoder has a clean contact with the CBC conveyor belt so that an analysable tracking signal is produced.

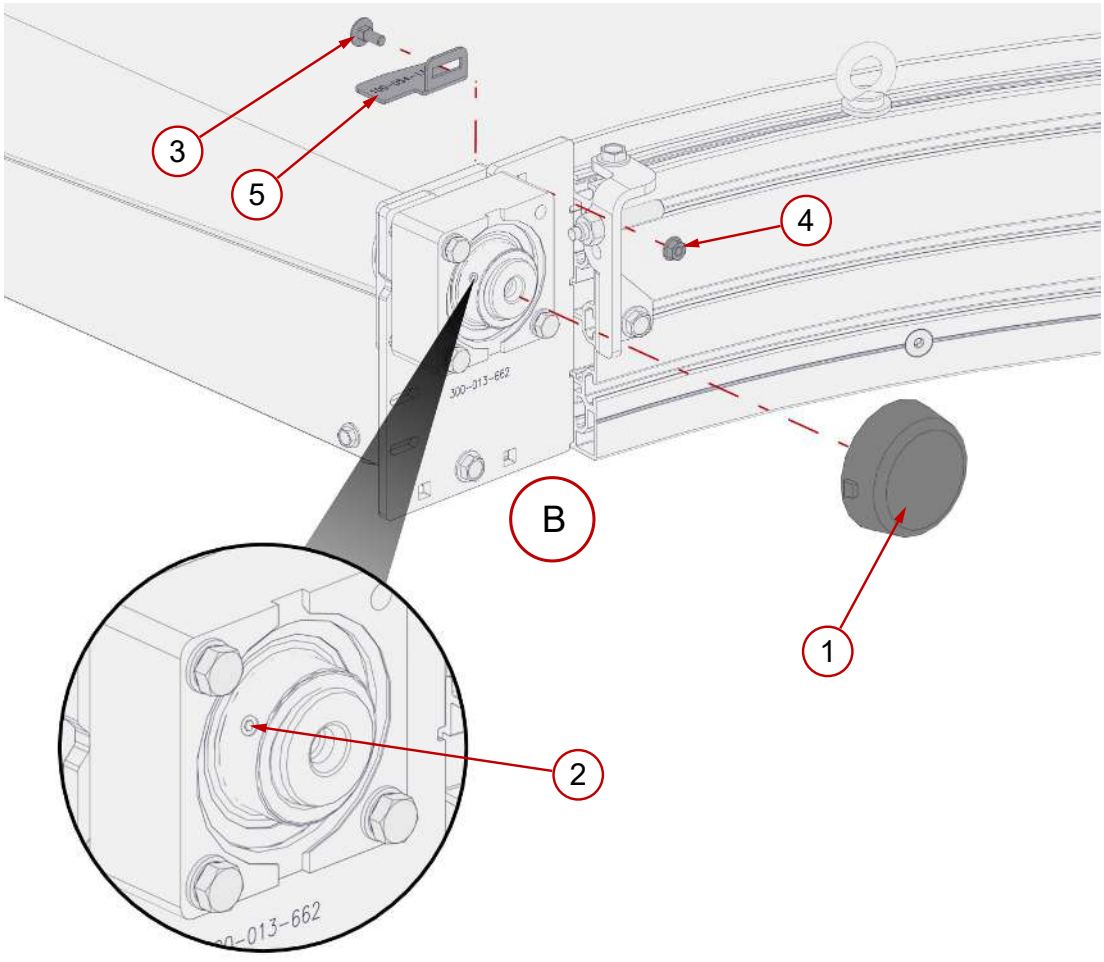
- The entire sensor bracket (3) can be removed from the frame by loosening the fastener (4).

10.3.16 Replacing bearing B-D

NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Bearing units are used on four sides (A, B, C, D) of the CBC. If you are replacing the bearing on the drive side, remove the drive as described in the section Removing/installing the drive [▶ 107].
- If necessary, remove the side guide as described in the section Installing/removing the side guide and protection covers [▶ 138].
- Loosen the fasteners (3, 4) and remove the cover brackets (5) as described in the section Installing/removing the cover brackets on the bearing units B-D [▶ 141] in order to make it easier to pull out the sliding nut (8) in the next step.
- Release the tension on the conveyor belt as described in the section Tensioning/releasing tension on the belt [▶ 127].
- Loosen the bearing cap (1) and the clamping screws (2).



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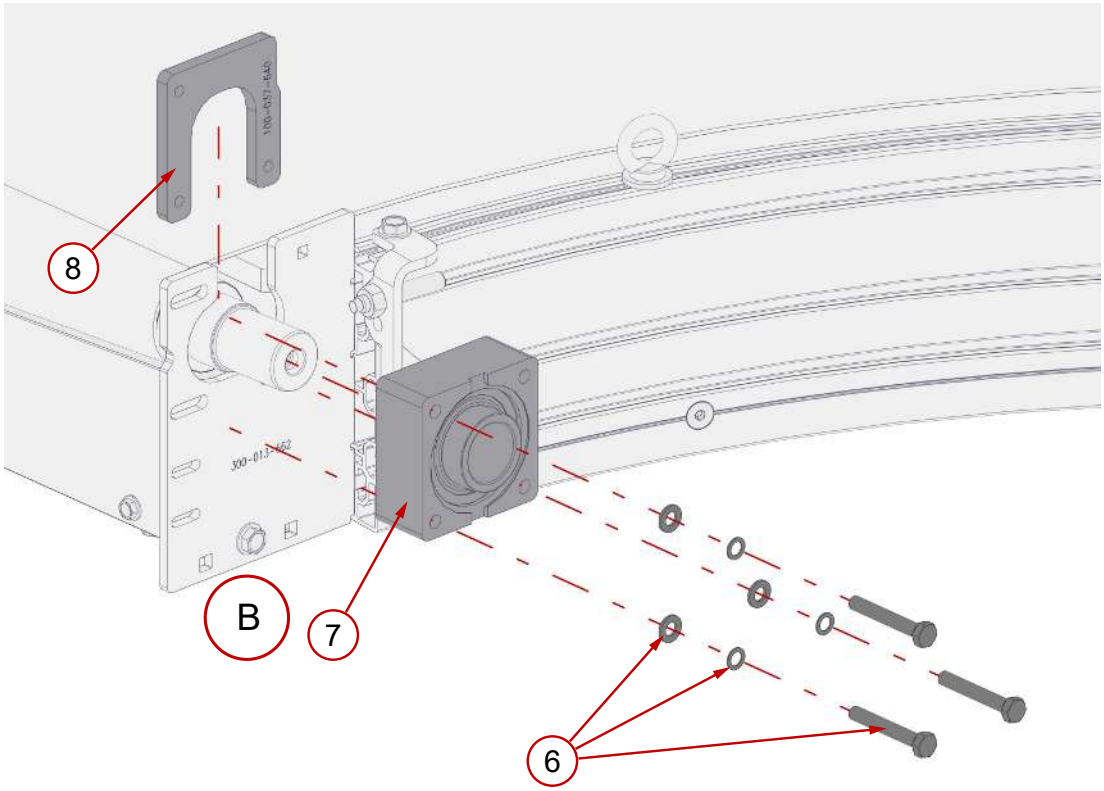
- Loosen the fasteners (6) and remove the sliding nut (8).
- Remove the bearing unit (7) from the drive pulley/bend roller using a removal tool.



78112267

NOTICE

- If the bearing stub of the drive pulley/bend pulley is worn out, or is showing signs of wear, the pulley must be replaced.

- Clean the bearing stub and grease it with a fitting lubricant (such as SKF LGAF 3E) to prevent frictional corrosion and make installation easier.
- Slide the new bearing unit onto the bearing stub and install with the fasteners (6) and the sliding nut (8).

⚠ WARNING

- Never apply pressure to the bearing rollers.
- Never hammer directly on the bearing rings or seals.
- Be sure not to warp the bearing and pulley.

- Tighten the clamping screws (2).
- Mount the cover brackets (5) using the fasteners (3, 4). **NOTICE! Do not tighten the fasteners yet.**
- Tension the conveyor belt as described in the section Tensioning/releasing tension on the belt [▶ 127].
- Adjust the cover brackets (5) as described in the section Installing/removing the cover brackets on the bearing units B-D [▶ 141].
- Install the inner side guide as described in the section Installing/removing the side guide and protection covers [▶ 138].

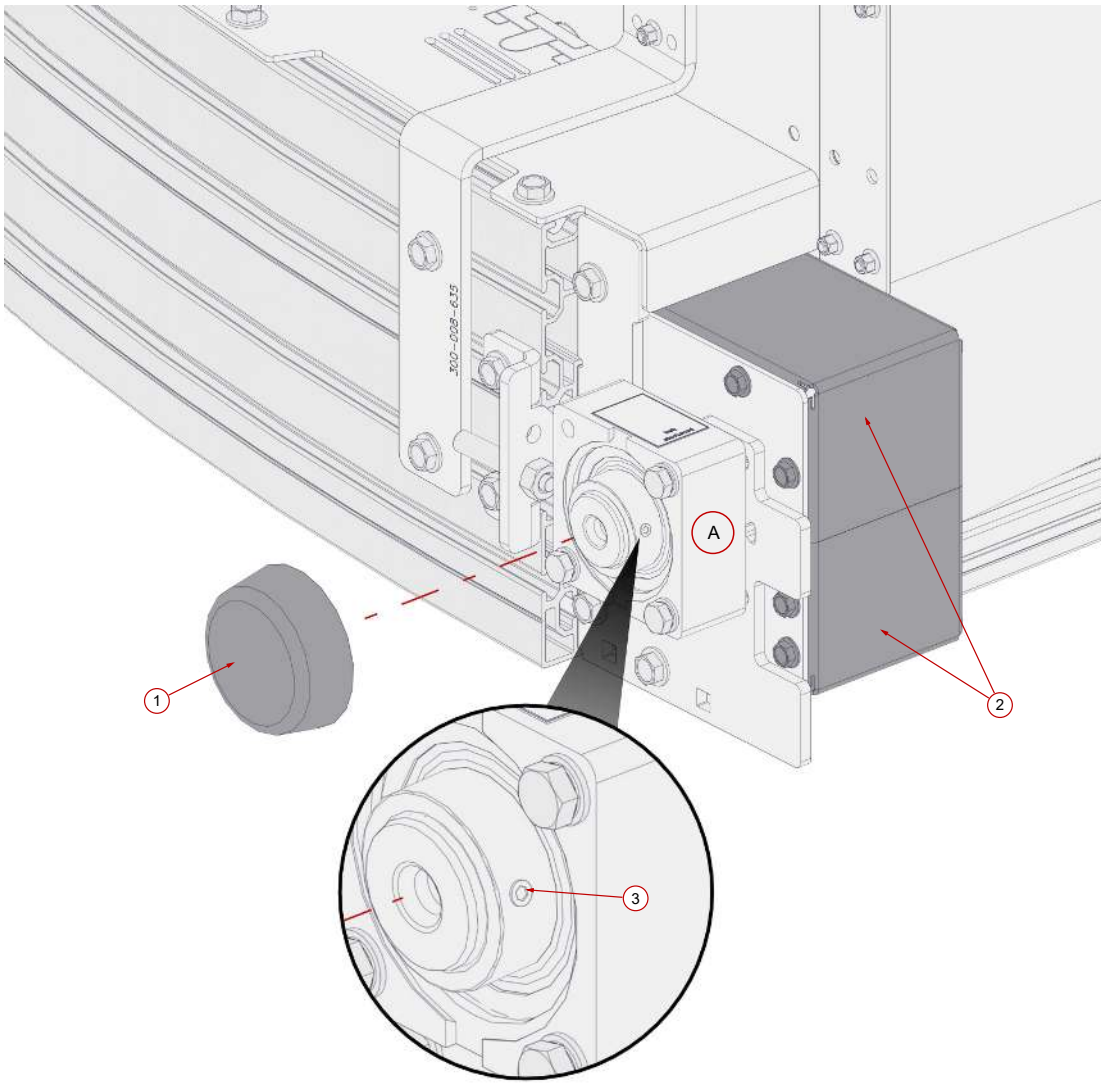
- Install any drive that had been removed as described in the section Removing/installing the drive [▶ 107].
- Attach the bearing cap (1).

10.3.17 Replacing bearing A-C

NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Bearing units are used on four sides (A, B, C, D) of the CBC. If you are replacing the bearing on the drive side, remove the drive as described in the section Removing/installing the drive [▶ 107].
- If necessary, remove the side guide as described in the section Installing/removing the side guide and protection covers [▶ 138], Installing/removing the side guide and protection covers [▶ 138].
- Remove any transfer plates as described in the section Installing/removing the transfer plate [▶ 134].
- Remove the front covers as described in the section Installing/removing the front cover [▶ 129].
- Release the tension on the conveyor belt as described in the section Tensioning/releasing tension on the belt [▶ 127].
- Remove the bearing cap (1) and bearing covers (2) as described in the section Installing/removing bearing cover A-C [▶ 143] and loosen the clamping screws (3).



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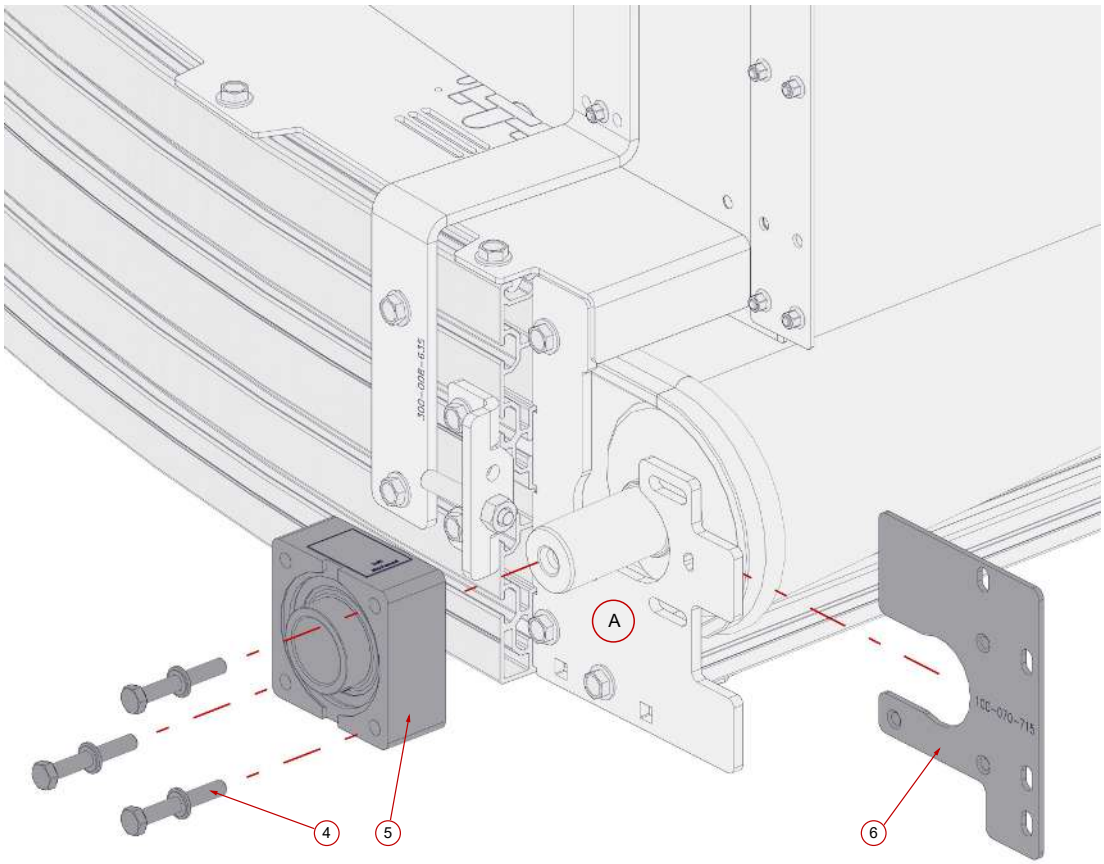
- Loosen the fasteners (4), remove the sliding nut (6) and remove the bearing unit (5) using the removal tool.



101892619

NOTICE

- If the bearing stub of the drive pulley/bend pulley is worn out, or is showing signs of wear, the pulley must be replaced.

- Clean the bearing stub and grease it with a fitting lubricant (such as SKF LGAF 3E) to prevent frictional corrosion and make installation easier.
- Slide the new bearing unit onto the bearing stub and install with the fasteners (4) and the sliding nut (6). **NOTICE! Do not tighten the fasteners yet.**

⚠ WARNING

- Never apply pressure to the bearing rollers.
- Never hammer directly on the bearing rings or seals.
- Be sure not to warp the bearing and pulley.

- Tighten the clamping screws (3).
- Tension the conveyor belt as described in the section Tensioning/releasing tension on the belt [▶ 127].
- Install the bearing covers (2) as described in the section Installing/removing bearing cover A-C [▶ 143] and apply the bearing cap (1).
- Install the front covers as described in the section Installing/removing the front cover [▶ 129].

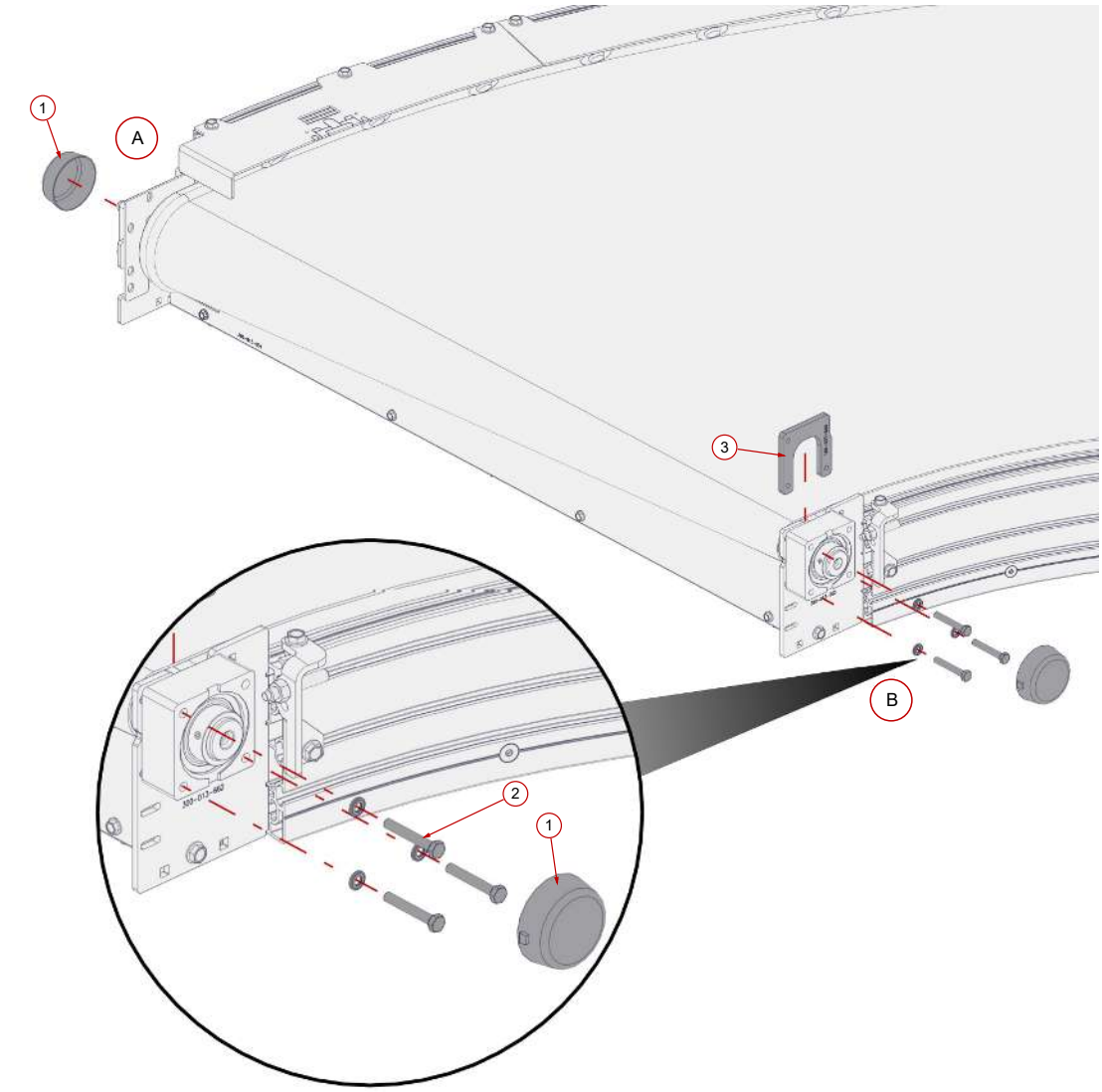
- Install any removed transfer plates as described in the section Installing/removing the transfer plate [▶ 134].
- Install any removed side guide as described in the section Installing/removing the side guide and protection covers [▶ 138], Installing/removing the side guide and protection covers [▶ 138].
- Install any removed drive as described in the section Removing/installing the drive [▶ 107].

10.3.18 Replacing pulleys

NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Remove the side guide interfaces as described in the section Installing/removing the side guide interface [▶ 137].
- Remove any transfer plates as described in the section Installing/removing the transfer plate [▶ 134].
- Remove the front covers as described in the section Installing/removing the front cover [▶ 129].
- Remove the side guide and protection covers as described in the section Installing/removing the side guide and protection covers [▶ 138].
- If the drive pulley has to be changed, remove the drive as described in the section Removing/installing the drive [▶ 107].
- Loosen/remove the cover brackets on the bearing units B-D as in the section Installing/removing the cover brackets on the bearing units B-D [▶ 141].
- Release the tension on the conveyor belt at all bearing units as described in the section Tensioning/releasing tension on the belt [▶ 127].
- Remove the outer bearing cap on bearing unit A/C as described in the section Installing/removing bearing cover A-C [▶ 143].
- Remove the bearing cap (1) on the bearing units, remove fasteners (2) and sliding nut (3).

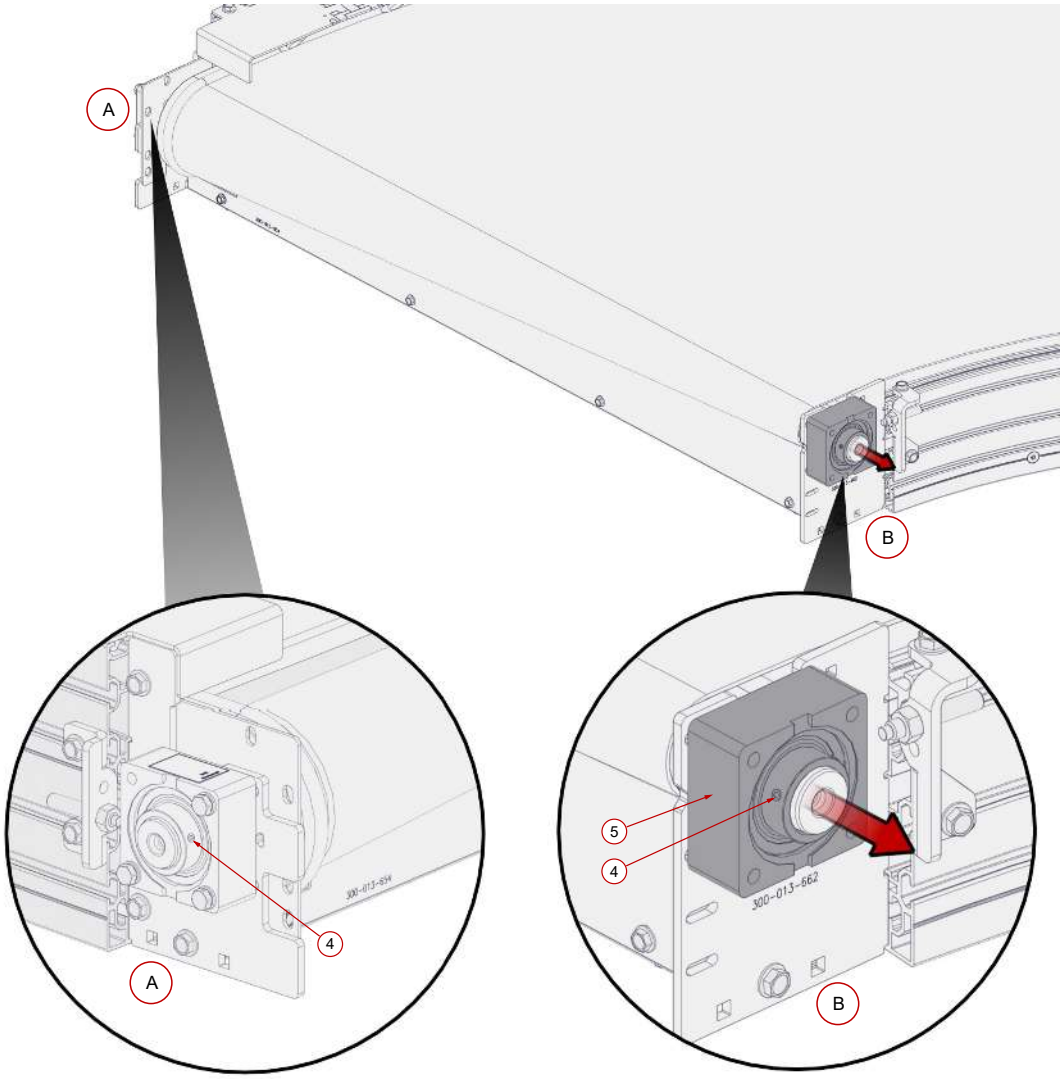


100756747

- Loosen clamping screws (4) on the bearing inserts and remove the bearing unit (5) of the drive pulley/bend roller using the removal tool.

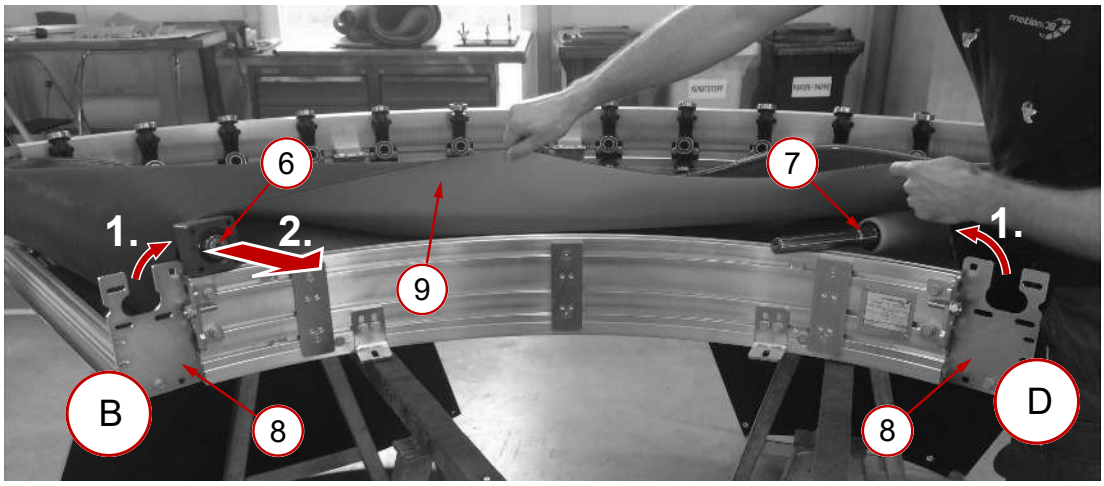
NOTICE

- If the noise during operation or the temperature of the bearing was unusual or higher than normal before the maintenance/servicing work then the bearing unit must be inspected in detail and replaced with a new one if necessary.



100761355

- Lift the affected pulley A-B (6) or C-D (7) out of the bearing consoles B or D (8) and pivot inwards (step 1).
- Lift the conveyor belt (9) and pull the pulley to be replaced out of the curve frame/conveyor belt (step 2).



100766347

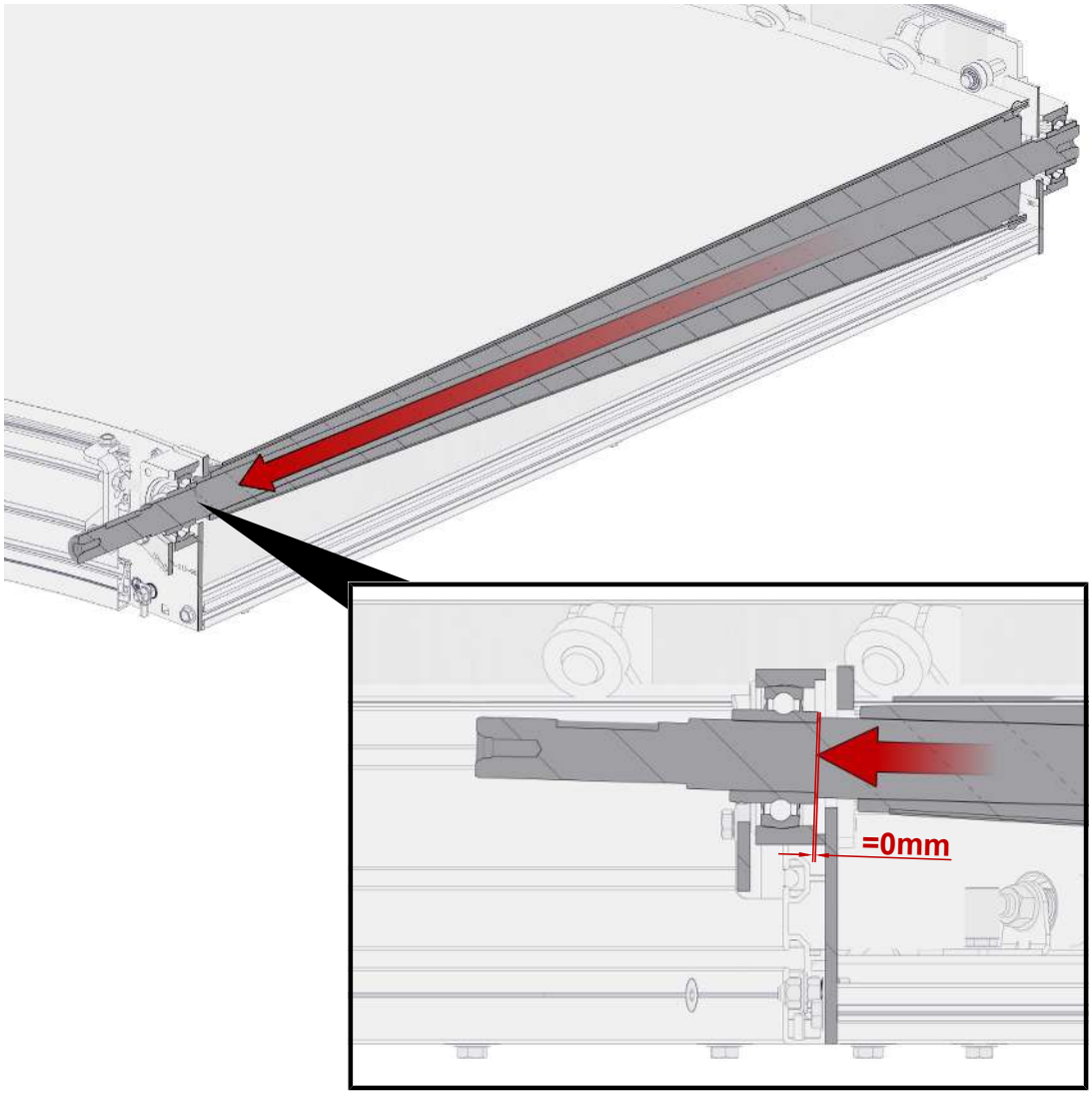
- Clean the stub shaft of the new pulley and grease it with a fitting lubricant (such as SKF LGAF 3E) to prevent frictional corrosion and facilitate installation.

- Thread the new pulley into the curve frame/conveyor belt and insert into the relevant inner bearing console B or D.
- Slide the bearing unit (5) onto the stub shaft of the new pulley and fasten the bearing housing using the fasteners (2) and the sliding nut (3). **NOTICE! Only tighten the fasteners (2) so that the bearing unit can still be moved in the bearing console. Final tightening is carried out later when tensioning the belt.**

⚠ WARNING

- Never apply pressure to the bearing rollers.
- Never hammer directly on the bearing rings or seals.
- Be sure not to warp the bearing and pulley.

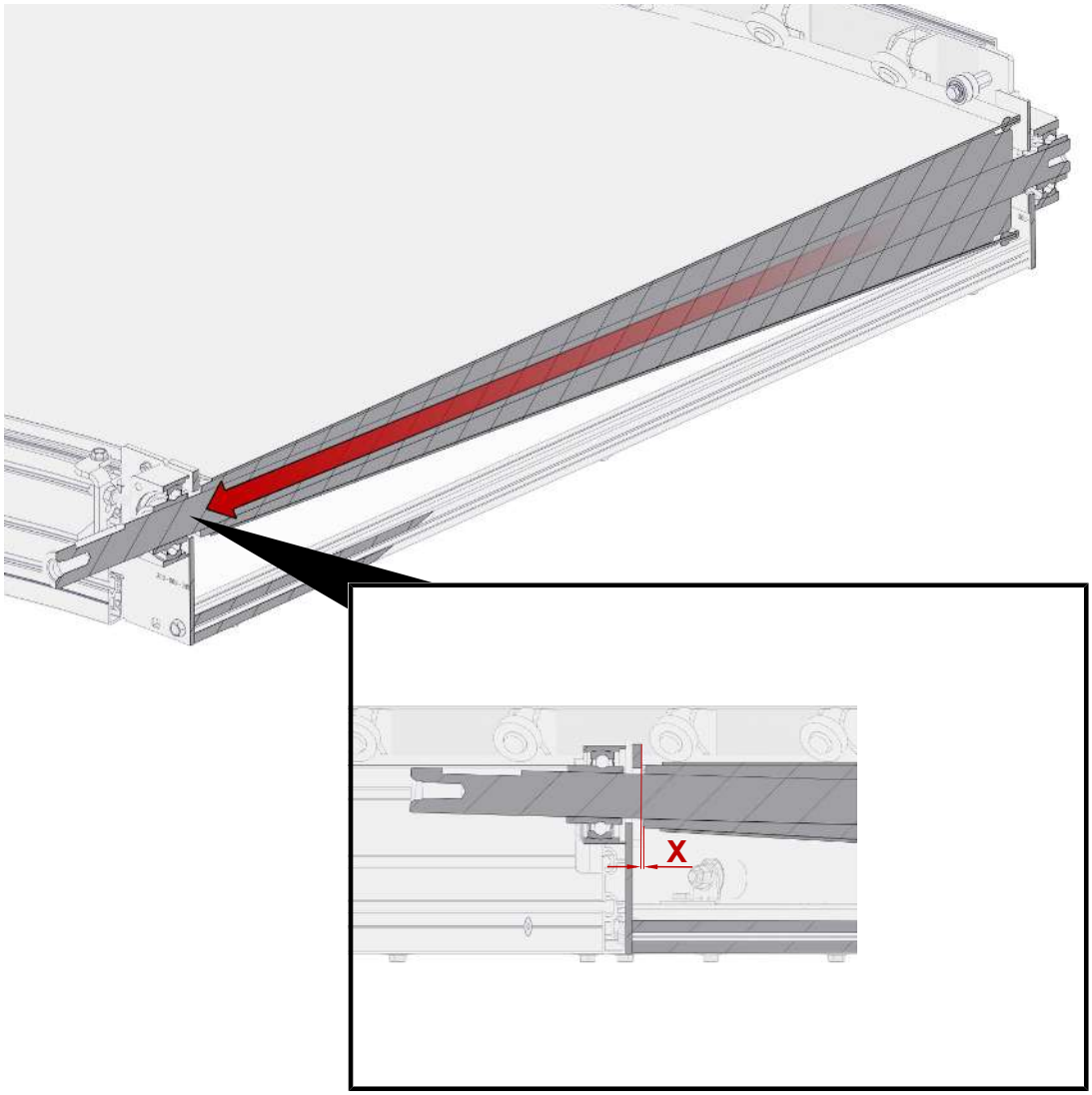
- Position the pulley so that the shaft shoulder is resting against the inner bearing ring.



100437387

INFORMATION

- There is one pulley variant for which there is no shaft shoulder available due to the required drive diameter (diameter 40 mm). In this case, the drive pulley must be aligned axially so that dimension X = 4 mm.



104254603

- Tighten the clamping screws (4) on all of the bearings.
- Tension the conveyor belt at all bearing units as described in the section Tensioning/releasing tension on the belt [▶ 127].
- Install/adjust the cover brackets on the bearing units B-D as in the section Installing/removing the cover brackets on the bearing units B-D [▶ 141].
- Attach the outer bearing cap on bearing unit A/C as in the section Installing/removing bearing cover A-C [▶ 143].
- Install any drive that had been removed as described in the section Removing/installing the drive [▶ 107].
- Perform a functional inspection of the CBC, including a test run, in order to inspect the work carried out.

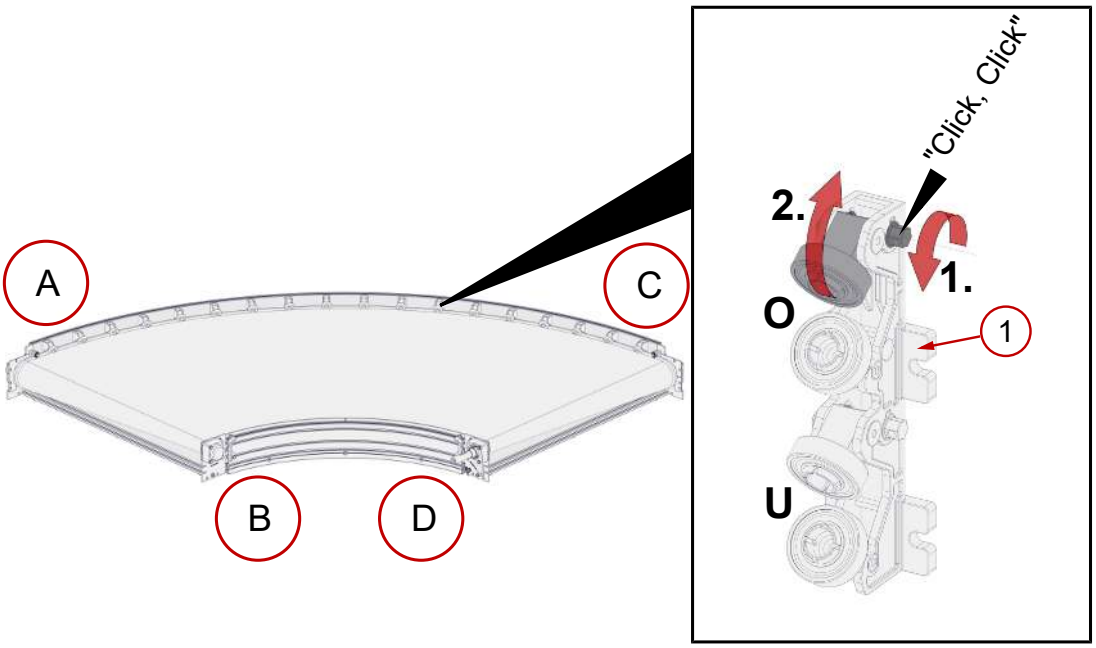
- Install the side guide and protection covers as described in the section Installing/removing the side guide and protection covers [▶ 138].
- Install the front covers as described in the section Installing/removing the front cover [▶ 129].
- Attach any removed transfer plates as described in the section Installing/removing the transfer plate [▶ 134].
- Remove the side guide interfaces as described in the section Installing/removing the side guide interface [▶ 137].

10.3.19 Replacing the conveyor belt

NOTICE

- Before you start work on the machine/system, read the section General information [▶ 96] carefully and follow the instructions for securing the machine/system.

- Remove the side guide interfaces as described in the section Installing/removing the side guide interface [▶ 137].
- Remove any transfer plates as described in the section Installing/removing the transfer plate [▶ 134].
- Remove the front covers as described in the section Installing/removing the front cover [▶ 129].
- Remove the side guide and protection covers as described in the section Installing/removing the side guide and protection covers [▶ 138].
- If the drive is installed on drive side B or D of the CBC, remove it as described in the section Removing/installing the drive [▶ 107].
- Release the tension on the conveyor belt at all bearing units as described in the section Tensioning/releasing tension on the belt [▶ 127].
- Remove the outer bearing cap on bearing unit A/C as described in the section Installing/removing bearing cover A-C [▶ 143].
- Open all belt guide units (1) at position “O” (step 1) and pivot the bearing upwards (step 2).



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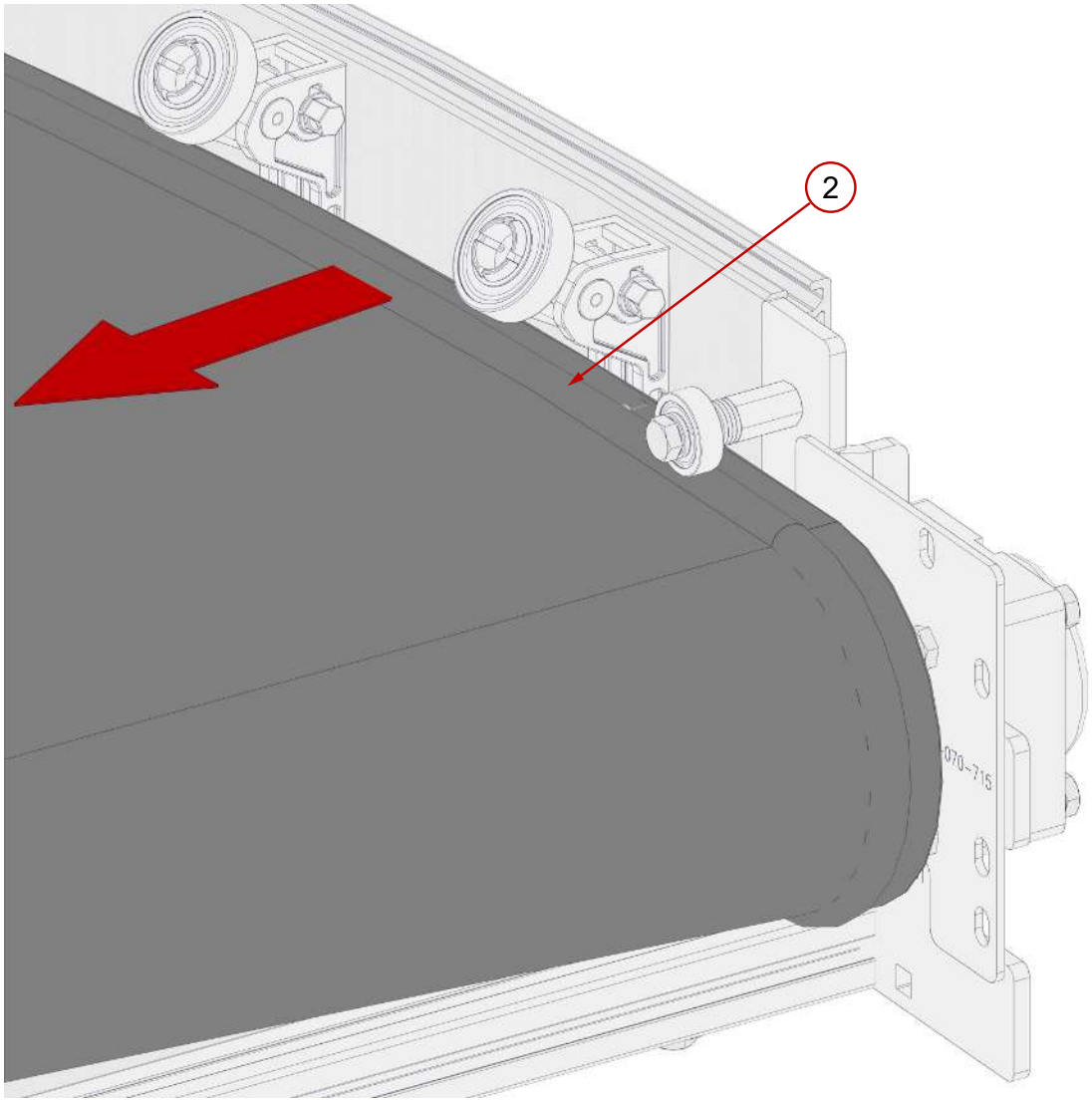
- Pull the conveyor belt (2) out of the opened belt guide units and knock in so that there is access to the belt support plates (3) and their fasteners (4).



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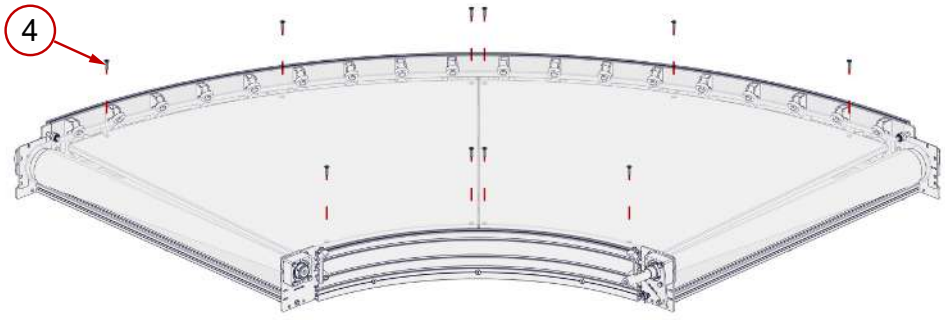
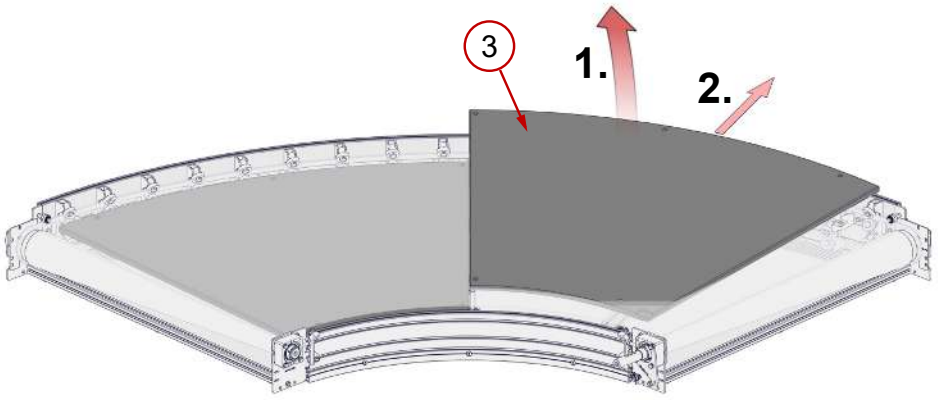
- Loosen and remove the fasteners (4).



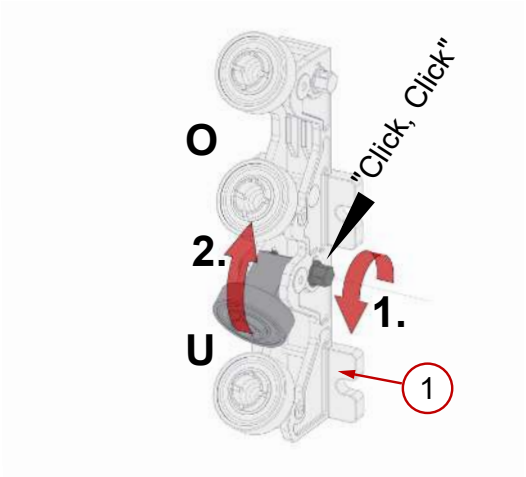
78326795

- Lift support plates (3) on the outside (step 1) and pull backwards out of the curve frame (step 2).



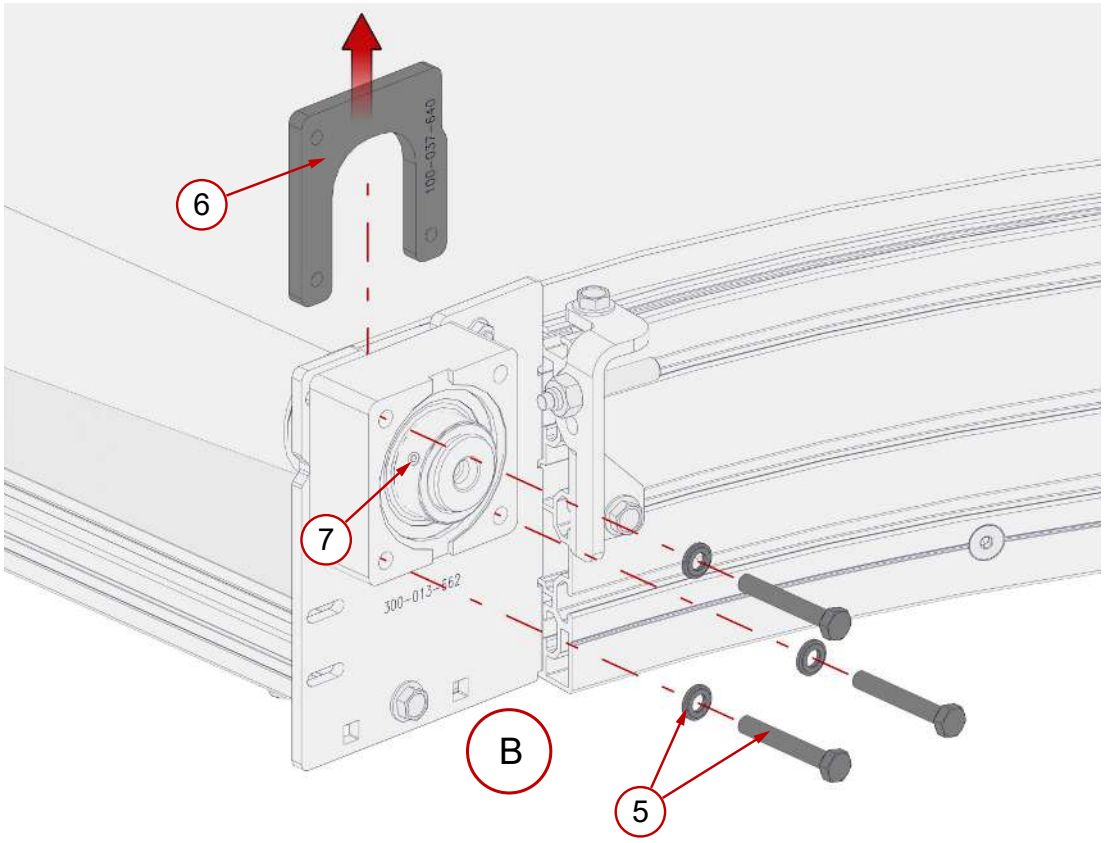
78356875

- Open all belt guide units (1) at position “U” (step 1), pivot the bearing upwards (step 2) and pull the conveyor belt out of the belt guide unit.



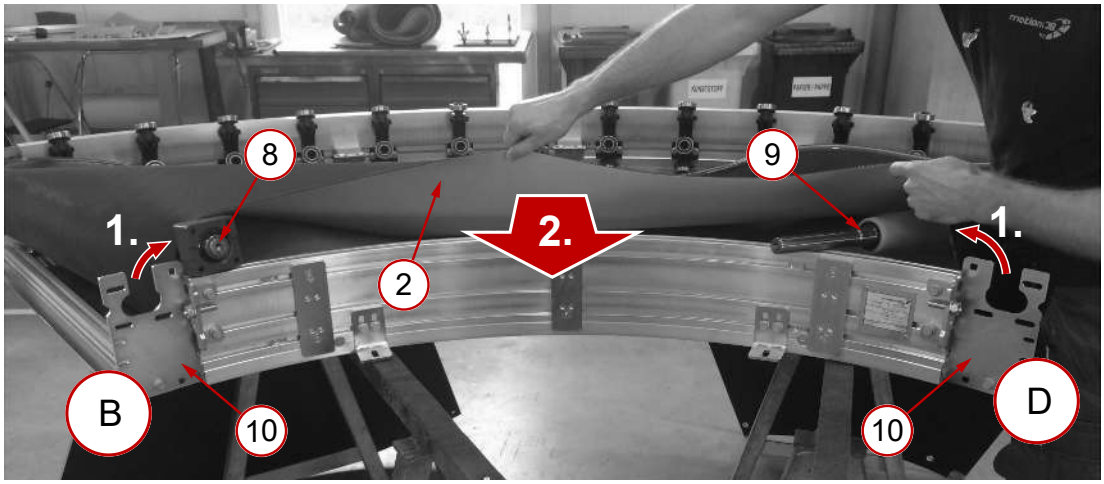
78359947

- Remove the fasteners (5) on bearing units B & D and remove the sliding nut (6). **NOTICE! If necessary, loosen the clamping screws (7) in order to make it easier to retract the pulleys.**



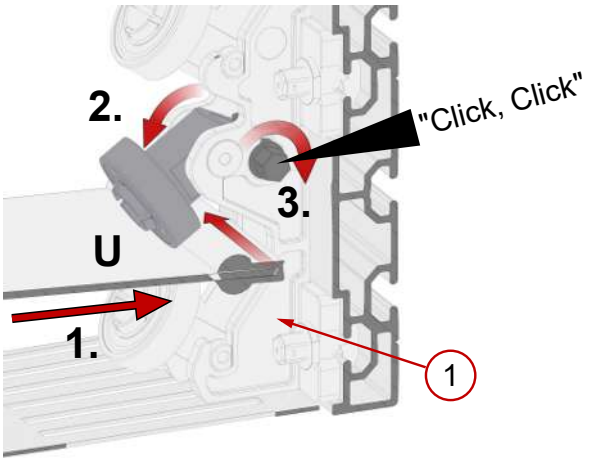
78410763

- Lift pulleys A-B (8) and C-D (9) out of bearing consoles B & D (10) and pivot inwards (step 1).



78389643

- Pull the curve belt (2) out of the curve frame in the direction of the inside of the frame (step 2) and pull out of the pulleys.
- Replace a defective conveyor belt with a new one and pull onto the curve frame in the direction of the outside of the frame.
- After mounting the curve belt, re-suspend pulleys A-B/C-D in the bearing consoles and secure the sliding nut (6) using the fasteners (5). **NOTICE! Only tighten the fasteners (5) so that the bearing unit can still be moved in the bearing console. Final tightening is carried out later when tensioning the belt.**



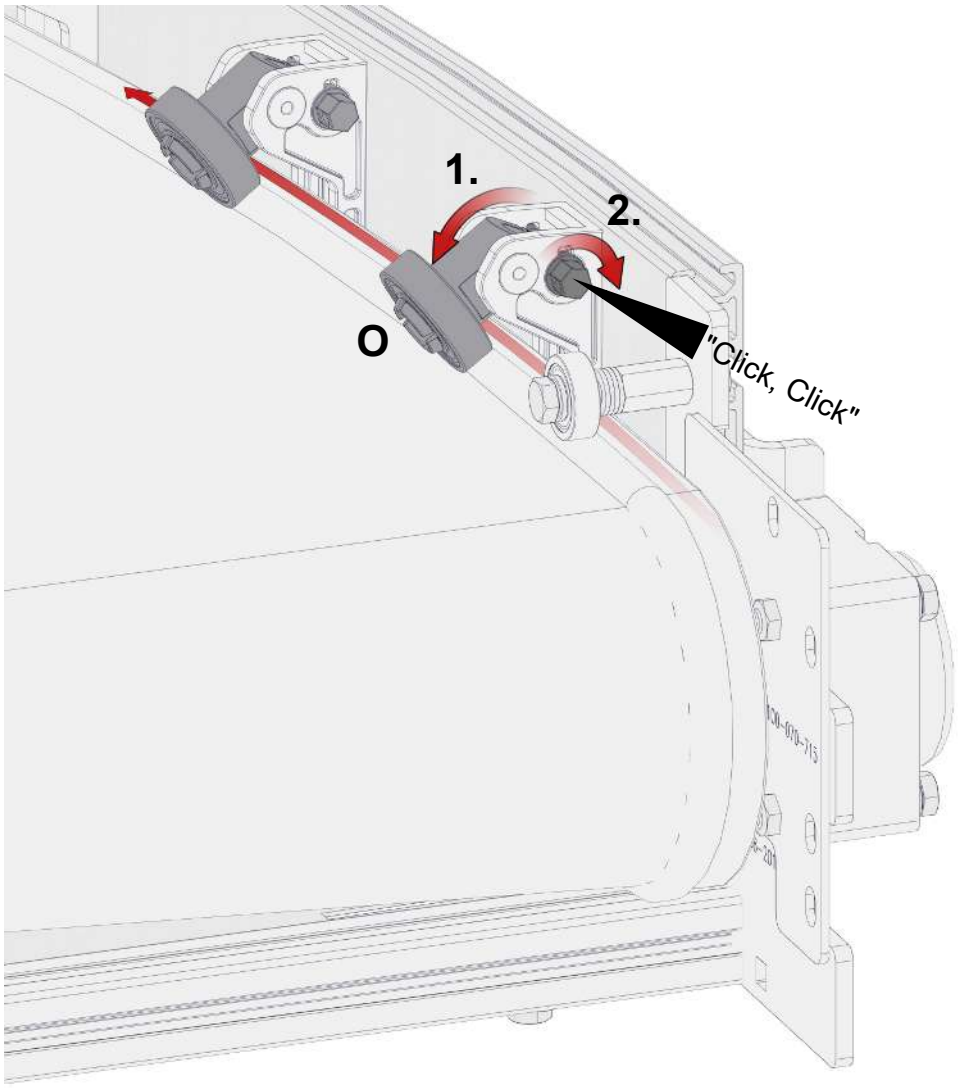
78417803

- Thread in the new belt at all belt guide units on side “U” (step 1), pivot the bearing downwards (step 2) and lock in place (step 3). **NOTICE! The locking bolt clicks twice if the locking is correct.**

INFORMATION

- Information on the correct belt type and length can be found in the conveyor list (included in the main documentation).

- Re-insert the support plates back into the frame and secure them in position with fasteners.
- Thread in the conveyor belt at all belt guide units on side “O”, pivot the bearing downwards (step 1) and lock in place (step 2). **NOTICE! The locking bolt clicks twice if the locking is correct.**



100137483

- Tension the conveyor belt as described in the section Tensioning/releasing tension on the belt [▶ 127].
- Install any drive that had been removed as described in the section Removing/installing the drive [▶ 107].
- Perform a functional inspection of the CBC, including a test run, in order to inspect the work carried out.
- Install the side guide and protection covers as described in the section Installing/removing the side guide and protection covers [▶ 138].
- Install the front covers as described in the section Installing/removing the front cover [▶ 129].
- Install any removed transfer plates as described in the section Installing/removing the transfer plate [▶ 134].
- Install the side guide interfaces as described in the section Installing/removing the side guide interface [▶ 137].

11 Decommissioning and disassembly

Decommissioning and disassembly of the machine/plant and subsequent disposal of it must only be carried out by authorised and qualified specialist companies that have been given this task by the operator and possess suitably trained specialist staff.

11.1 General information

⚠ DANGER

General danger to life and limb due to the machine/plant during decommissioning/disassembly and associated activities

- Severe to fatal injuries

a) The machine and plant area must be secured against unauthorised access (e.g. by using barrier tape and information signs) over a suitably large area and on a temporary basis.

b) Only qualified and authorised personnel are permitted to carry out decommissioning/disassembly.

c) Before starting decommissioning/disassembly, it must be ensured that there are no dangers present as a result of neighbouring plants, machines and traffic areas. If necessary, a risk assessment should be conducted and effective measures implemented.

d) During decommissioning and disassembly, it must be ensured that the machine/plant is switched off/shut down and secured so that it cannot be switched back on, and the power and media supply lines must be deactivated and secured so that they cannot be reactivated (in accordance with EN 50110-1).

e) Ensure that the workplace is clean and tidy during decommissioning/disassembly.

f) Wear the required PPE.

g) Keep escape routes clear.

⚠ DANGER

Danger due to use of conveyors by persons

- Tripping
- Death and severe injuries

a) Walking on the conveyors and using them as a working platform is strictly prohibited.

b) The transportation of persons on conveyors is strictly prohibited.

c) The intended points for crossing conveyors must be signposted and used.

d) Safety information and warnings must be observed.

⚠ WARNING

Danger due to carrying out work in elevated positions

- Tripping
- Falling parts

a) Use working and lifting platforms with fall protection

b) Install and use fall protection.

c) The use of ladders for long periods of work in elevated positions is prohibited.

d) Block off and mark the working area and secure against unauthorised access.

e) Attach safety information/warnings.

f) Support heavy parts (particularly gear motors and pulleys).

g) Never touch or stand under loosened parts.

h) Use lifting aids.

i) Wear PPE and protective headgear.

j) If necessary, wear PPE for fall protection.

⚠ WARNING

General danger due to decommissioning and disassembly of the machine/plant

- Danger of crushing, shearing, grazes and cuts due to machine parts and machine/plant parts moving relative to one another
- Danger of impacts on body parts
- Danger of loss of extremities
- Danger due to flying parts, e.g. when removing material (drilling etc.), loose parts etc.
- Noise (e.g. angle grinders)

a) The machine/plant area must be secured against unauthorised access (e.g. by using barrier tape and information signs) over a suitably large area and on a temporary basis (i.e. during decommissioning and disassembly).

b) Only qualified and authorised personnel are permitted to carry out decommissioning and disassembly.

c) Before starting decommissioning and disassembly, it must be ensured that there are no dangers present as a result of neighbouring plants, machines and traffic areas. If necessary, a risk assessment should be conducted and effective measures implemented.

d) During decommissioning and disassembly, it must be ensured that the machine/plant is switched off/shut down and secured so that it cannot be switched back on, and the power and media supply lines must be deactivated and secured so that they cannot be reactivated (in accordance with EN 50110-1).

e) Ensure that the workplace is clean and tidy during decommissioning and disassembly.

f) Wear the required PPE.

g) Keep escape routes clear.

⚠ CAUTION

Danger of slipping, tripping and falling due to temporarily stored parts, cable guiding etc.

- Minor to severe temporary injuries (e.g. sprains, cuts, broken bones)

a) When working on the machine/plant, ensure that the direct and indirect vicinity of the assembly area is clean and tidy.

b) Make sure that the floor is dry, non-slippery, level, and free from coarse dirt and rolling objects.

⚠ CAUTION

Hot surfaces and machine parts

- There is a risk of burns to skin and body parts due to contact with hot surfaces (e.g. radiators) and parts of the machine and drive.

a) Let gear motors and radiators cool down.

b) Wear appropriate protective clothing for protection against heat.

NOTICE

Contamination due to leaking/escaping auxiliary and operating materials (problematic materials such as grease, mineral oil, cleaning agents, batteries etc.)

- Environmental damage
- Poisoning

a) Collect the operating materials and problematic materials in suitable airtight, sealable collection containers in coordination with the machine/plant operator's waste officer

b) Problematic materials, such as used oil, lubricating grease, solvent-based cleaning agents and similar, must be properly disposed of by an authorised company in accordance with the applicable legal provisions.

c) The information in the safety data sheets for the substances used must be observed.

11.1.1 Securing the workplace

- In general, the machine/plant area must be secured against unauthorised access before decommissioning and during disassembly (e.g. by using barrier tape and information signs) over a suitably large area and on a temporary basis (i.e. during decommissioning and disassembly).
- Decommissioning and disassembly of this machine/plant must be carried out exclusively by competent personnel, who must be authorised to carry out this work by the manufacturer, integrator or operator. Only such personnel may access the machine/plant and its area of impact and danger zone in order to undertake the necessary measures and activities.

- Before starting decommissioning and disassembly, it must be ensured that there are no dangers present between protection equipment and/or the machine/plant and neighbouring plants or machines, or as a result of traffic areas (due to power-operated vehicles, including autonomous vehicles). If necessary, a risk/hazard assessment should be conducted and effective measures implemented.
- Keep escape routes clear.
- Before and during decommissioning and disassembly, ensure that the workplace is clean and tidy.
  - Make sure that the floor is dry, non-slippery, level, and free from coarse dirt and rolling objects.
- Wear the required PPE.

11.1.2 PPE to be worn

The PPE described in the section Personal protective equipment [▶ 31] must be worn for decommissioning and disassembly.

11.2 Decommissioning

⚠ DANGER

Danger due to electric current

- Risk of electric shock

a) Electrical work may only be carried out by qualified electricians or personnel with electrical training.

b) Disconnect the machine/plant before carrying out work.

c) Work on the machine/plant while it is de-energised (EN 50110-1; 6.2 Dead working)

⇨ Disconnect

⇨ Secure against reactivation

⇨ Verify the absence of voltage

⇨ Earth and short-circuit

⇨ Cover or block off nearby energised parts

⚠ DANGER

Unexpected/accidental reactivation of the machine/plant

- Handling a machine/plant that has not been secured and properly shut down can lead to severe, permanent to fatal injuries.
- Risk of electric shock

a) Take machine/plant out of operation (in accordance with EN 50110-1)

⇨ Disconnect

⇨ Secure against reactivation

⇨ Verify the absence of voltage

⇨ Earth and short-circuit

⇨ Cover or block off nearby energised parts

b) When decommissioning the machine/system, attach safety information/warnings to the control centre for the duration of the disassembly work.

c) Safely turn off power and media supply lines to the machine/plant at the infeed point and disconnect them.

- Electrical work may only be carried out by qualified electricians or personnel with electrical training.
- During decommissioning, the entire machine/plant must be shut down or deactivated and secured so that it cannot be switched back on (in accordance with EN 50110-1).
- Power and media supply lines must be safely turned off at the infeed points, disconnected from the machine/plant, and secured so that the supply cannot be turned back on (in accordance with EN 50110-1).
- Open or uncovered power and media supply guides/cables must be secured in accordance with the specifications.

11.3 Disassembly

⚠ DANGER

Danger due to use of conveyors by persons

- Tripping
- Death and severe injuries

a) Walking on the conveyors and using them as a working platform is strictly prohibited.

b) The transportation of persons on conveyors is strictly prohibited.

c) The intended points for crossing conveyors must be signposted and used.

d) Safety information and warnings must be observed.

⚠ WARNING

Danger due to carrying out work in elevated positions

- Tripping
- Falling parts
- Suspended loads

a) Use working and lifting platforms with fall protection

b) Install and use fall protection

c) The use of ladders for long periods of work in elevated positions is prohibited.

d) Block off and mark the working area and secure against unauthorised access

e) Attach safety information/warnings

f) Support heavy parts (particularly gear motors and pulleys)

g) Never touch or stand under loosened parts

h) Use lifting aids

i) Wear PPE and protective headgear

j) If necessary, wear PPE for fall protection

⚠ WARNING

General danger due to decommissioning and disassembly of the machine/plant

- Danger of crushing, shearing, grazes and cuts due to machine parts and machine/plant parts moving relative to one another
- Danger of impacts on body parts
- Danger of loss of extremities
- Danger due to flying parts, e.g. when removing material (drilling etc.), loose parts etc.
- Noise (e.g. angle grinders)

a) The machine/plant area must be secured against unauthorised access (e.g. by using barrier tape and information signs) over a suitably large area and on a temporary basis (i.e. during decommissioning and disassembly).

b) Only qualified and authorised personnel are permitted to carry out decommissioning and disassembly.

c) Before starting decommissioning and disassembly, it must be ensured that there are no dangers present as a result of neighbouring plants, machines and traffic areas. If necessary, a risk assessment should be conducted and effective measures implemented.

d) During decommissioning and disassembly, it must be ensured that the machine/plant is switched off/shut down and secured so that it cannot be switched back on, and the power and media supply lines must be deactivated and secured so that they cannot be reactivated (in accordance with EN 50110-1).

e) Ensure that the workplace is clean and tidy during decommissioning and disassembly.

f) Wear the required PPE.

g) Keep escape routes clear.

⚠ CAUTION

Danger of slipping, tripping and falling due to temporarily stored parts, cable guiding etc.

- Minor to severe temporary injuries (e.g. sprains, cuts, broken bones)

a) When working on the machine/plant, ensure that the direct and indirect vicinity of the assembly area is clean and tidy.

b) Make sure that the floor is dry, non-slippery, level, and free from coarse dirt and rolling objects.

⚠ CAUTION

Hot surfaces and machine parts

- There is a risk of burns to skin and body parts due to contact with hot surfaces (e.g. radiators) and parts of the machine and drive.

a) Let gear motors and radiators cool down.

b) Wear appropriate protective clothing for protection against heat.

NOTICE

Contamination due to leaking/escaping auxiliary and operating materials (problematic materials such as grease, mineral oil, cleaning agents, batteries etc.)

- Environmental damage
- Poisoning

a) Collect the operating materials and problematic materials in suitable airtight, sealable collection containers in coordination with the machine/plant operator's waste officer

b) Problematic materials, such as used oil, lubricating grease, solvent-based cleaning agents and similar, must be properly disposed of by an authorised company in accordance with the applicable legal provisions.

c) The information in the safety data sheets for the substances used must be observed.

- Decommissioning and disassembly of this machine/plant must be carried out exclusively by competent personnel, who must be authorised to carry out this work by the manufacturer, integrator or operator. Only such personnel may access the machine/plant and its area of impact and danger zone in order to undertake the necessary measures and activities.
- Electrical work may only be carried out by qualified electricians or personnel with electrical training.

12 Disposal and recycling

12.1 Packaging

The packaging supplied with the system must be separated by type and disposed of using local waste facilities (according to local waste disposal regulations).

The individual components are labelled and primarily consist of wood, paper, cardboard, PP and PE films.

12.2 Operating materials/problematic materials

NOTICE

Contamination due to leaking/escaping auxiliary and operating materials (problematic materials such as grease, mineral oil, cleaning agents, batteries etc.)

- Environmental damage
- Poisoning

a) Collect the operating materials and problematic materials in suitable airtight, sealable collection containers in coordination with the machine/plant operator's waste officer

b) Problematic materials, such as used oil, lubricating grease, solvent-based cleaning agents and similar, must be properly disposed of by an authorised company in accordance with the applicable legal provisions.

c) The information in the safety data sheets for the substances used must be observed.

Groundwater pollutants:

⚠ CAUTION

- Danger of contamination of the environment due to escaping operating materials, e.g. oils, etc.
- Danger to groundwater and soil due to contamination with operating materials
- Danger of skin irritation upon contact with substances harmful to health

a) The instructions in this operating manual must be followed when using, handling and disposing of problematic materials

b) Observe the information in the safety data sheets for the operating and auxiliary materials used

c) Avoid contact with problematic materials

d) Wear the required PPE

e) Wash hands after handling problematic materials or working on the machine/plant

- When conducting any work on or with the machine/plant, the provisions for preventing waste and for proper recycling or disposal of waste must be complied with.
- In particular during installation and maintenance work, as well as during decommissioning, it must be ensured that groundwater pollutants – such as grease, oil and solvent-based cleaning fluids – do not enter the soil or the sewer system. These materials must be collected and disposed of in suitable containers.

Environmental protection and sustainability:

- All operating materials, lubricants and auxiliary materials that are not reused must be disposed of in an environmentally friendly manner.

If you have any questions about disposal, contact the manufacturer.

List of tables

13 Glossary

Specialist:

A specialist is someone who, on the basis of their technical education, skills, experience and knowledge of the pertinent provisions, is capable of evaluating and carrying out the work assigned to them and identifying potential dangers.

Trained person:

A trained person is someone who has been instructed and trained as necessary by a specialist concerning the tasks assigned to them and the possible dangers of improper conduct and has been instructed regarding the required protection equipment and safety measures.

Layman:

A layman is a person who is neither a specialist nor a trained person. A person with direct responsibility is the person in charge of and responsible for the work in question and the person who must be familiar with the associated safety precautions.

User:

The user is the entity that operates the machine/plant as intended and has it maintained, repaired and operated by specialists or trained persons.

Integrator:

The integrator is the entity that installs the machine/plant into a complete plant on behalf of the user. The integrator is also responsible for the conformity of the complete plant unless contractually agreed otherwise.

Original operating manual:

written in German. Contains descriptions and instructions for the safe and correct operation of the machine/plant and for the rectification of straightforward faults in accordance with the requirements of the currently applicable Machinery Directive.

Operating manual:

General term that refers either to the original operating manual or its translation.

Assembly manual:

Contains all the information, drawings and plans needed for safe and correct set-up, connection and commissioning of the machine/plant. The assembly manual must be made available to the assembly personnel and satisfy the requirements of the currently applicable Machinery Directive.

14 Appendix

14.1 Product monitoring – contact form

Dear Customer,

We would like to stay informed about our products even after delivery. We are very interested in hearing about any corrections and/or changes that may have to be made.

In particular:

- recurring malfunctions
- bypassing or deactivating safety devices
- improper or unsafe operation
- accidents
- other unusual observations

Please inform us of any such incidents. This is the only way that we can improve our products where necessary, so that we can make them as safe and reliable as possible.

Date	Incident

INFORMATION

- Faults/malfunctions and warranty queries must be sent using the document ‘m06_claim report’, which is enclosed with the complete documentation (including all maintenance and servicing logs), to motion06 gmbh (mailto:customersupport@motion06.at).

14.2 Spare parts and wearing parts

The spare parts and wearing parts required for the machine/plant can be found in the list of spare parts and wearing parts included with the documentation and can be ordered using the following contact information:

motion06 gmbh

Gewerbestraße 28

5211 Lengau, Austria

Phone +43 (0) 7746 20 300 0

Fax +43 (0) 7746 20 300 20

office@motion06.at

www.motion06.at

14.3 Test criteria for wearing parts and spare parts

	Wearing part/spare part	Replacement criterion	Replacement interval
1	Bearing at bearing unit A/B/ C/D	Noises and unusually high temperatures, when they have reached the end of their service life	As per manufacturer's instructions
2	Drives	Noises and unusually high temperatures	As per manufacturer's instructions
3	Belt guide unit (Bearing)	Noises and unusually high temperatures	
4	Drive belt	Belt cracked or worn	-
5	Drive / deflection pulley	Visible damage or cracks, damaged screws, broken ribs	-
6	Conveyor belt	Conveyor belt cracked or worn, visible damage on the belt connection, wear on the outer edges or belt seam.	-
7	Sensors	Unusual switching behaviour, flickering	-
8	Belt support roller	Noises and unusually high temperatures	-
9	drive / return pulley	worn bearing stub, visible wearing or cracks of the lagging	

14.4 Notes

Date	Incident

14.5 Tightening torques

Dimension	Strength 8.8 [Nm]	Strength 10.9 [Nm]
M5	6	8
M6	10	13
M8	25	35
M10	50	65
M12	80	110
M16	210	310
M20	425	310
M30	1450	2100

Table 25: Tightening torques for fasteners (DIN 912, 931, 933, 934 etc.)

Type	Tightening torque [Nm]
1008-20	5.5
1008-22	
1008-25	
1108-20	
1108-25	
1210-20	20
1210-30	
1610-20	
1610-30	
1610-35	
1610-40	
1615-30	
2012-25	30
2012-30	
2012-35	
2012-40	
2517-40	50
2517-50	
2517-60	
3020-35	90

Table 26: Taper lock clamping bush (self-centring)

Type	Tightening torque [Nm]
TLK110 – 11x18	5
TLK110 – 19x27	17
TLK110 – 20x28	
TLK110 – 30x41	

Type	Tightening torque [Nm]
TLK110 – 35x47	
TLK110 – 40x53	
TLK110 – 45x59	41
TLK110 – 60x77	
TLK130 – 60x90	
TLK131 – 45x75	
TLK131 – 65x95	
TLK132 – 50x80	35
TLK133 – 60x90	41
TLK134 – 45x80	
TLK134 – 50x80	
TLK250L – 20x30	160
TLK350 – 50x80	41
TLK400 – 50x80	
TLK450 – 35x60	17

Table 27: Tollok clamping element (self-centring)

Type	Tightening torque [Nm]
TLK200 – 30x55	15
TLK200 – 40x65	
TLK200 – 50x80	37
TLK200 – 60x90	

Table 28: Tollok clamping element (not self-centring)

NOTICE

- When loosening screw connections with nuts that are not self-locking or where an unsuitable locking agent has been used, a medium-strength screw-locking adhesive (blue) must be used afterwards to re-secure them against self-loosening.

Boring	Bearing with excentric ring		Bearing with set screws in inner ring	
	Set screw		Set screw	
	Wrench size	Tightening torque	Wrench size	Tightening torque
mm	mm	Nm	mm	Nm
12	3	4	3	4
15				
17				
20				
25				

Boring	Bearing with excentric ring		Bearing with set screws in inner ring	
30	4	6.5		
35	5	16.5		
40			4	6.5
45				
50			5	16.5
55				
60				
65	-	-		
70			6	28.5
75				
80				
90				
100				

Table 29: Tightening torques for bearing elements (set screws)

Boring	Bearing with incorporated clamping sleeve			
	Hook wrench		Tightening torque	
	To tighten	To hold	Min.	Max.
mm			Nm	Nm
20	HN 4	HN 2	13	17
25	HN 5	HN 3	22	28
30	HN 6	HN 4	33	40
35	HN 7	HN 5	47	56
40	HN 8	HN 6	70	80

Table 30: Tightening torques for bearing elements (hook wrench)

14.6 Drawings/layout/parts lists

See complete documentation for the machine/plant and corresponding product documentation.

motion06 gmbh
Gewerbestraße 28
5211 Lengau
AUSTRIA
T: +43 7746 20300
F: +43 7746 20300 20
www.motion06.at