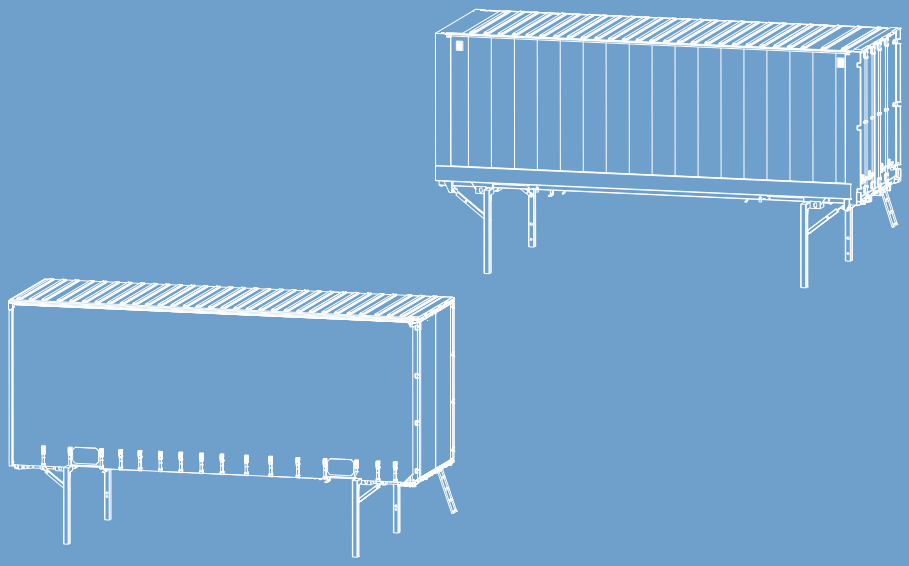
OPERATING INSTRUCTIONS
SWAP BODIES



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KRONE

Dear customer,

These are the instructions for the KRONE product you have purchased.

These instructions contain important information for the proper use and safe operation of the KRONE product.

If these instructions should become completely or partially unusable for any reason, you can order replacement instructions for your KRONE product by stating the item number.

KRONE Telematics Support

Telephone: +49 5951 209-220

email: telematics.nfz@krone.de

Spare Parts

Telephone: +49 (0) 5962 / 9363173

email: Swap.Service@brueggen-gmbh.de

Internet: www.brueggen-service.de

Mobile repairs

Telephone: +49 (0) 5962 / 9363200

email: Backoffice.Swap@brueggen-gmbh.de

Internet: www.brueggen-service.de

www.brueggen-gmbh.de

www.krone-trailer.com

www.krone-trailerparts.com

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1 Information about this document

1.1 Introduction

These operating instructions are intended for the operator of the swap body and their staff. The operating instructions are designed to help you to get to know the swap body and to use it within its intended possible uses.

It is mandatory that the operating instructions be read, understood, and applied by every person who is tasked with the following work on the swap body:

- stacking and unstacking,
- loading and unloading,
- remedying operation interferences,
- maintenance, and
- disposal of operating and auxiliary materials.

The operating instructions contain important advice on how to operate the swap body in a safe, competent, and economical manner. They serve to

- prevent risks and damages,
- reduce repair costs and downtimes, and
- increase the reliability and durability of the swap body.

KRONE cannot be held liable for damage and operational interference caused by failure to observe these operating instructions. The warranty conditions can be found in our general terms and conditions of business.

INFO
If you have any questions, please contact KRONE customer service *(see "11.2 Customer service and support", pg. 97)*.

1.2 Other applicable documents

For safe and failure-free operation of the swap body, detailed knowledge of the individual components is required.

Other documents also apply in conjunction with these operating instructions.

- ► Please observe the following additional documents, especially the safety instructions:
  - Operating instructions for the carrier vehicle,
  - All instructions for additional parts and components,
  - All instructions for additional equipment and special equipment.
- ► Re-order any instructions that have gone missing or become illegible *(see "11 Spare parts and customer service", pg. 97)*.
- ► When handling the vehicle and for all maintenance work, please also observe:
  - The maintenance regulations for the used installed components,
  - Load securing regulations.

1.3 Product identification and type plate

Every swap body can be clearly identified by the attached type plate. For product identification, the type plate is attached in the lower area of the front wall at the front right in the direction of travel:

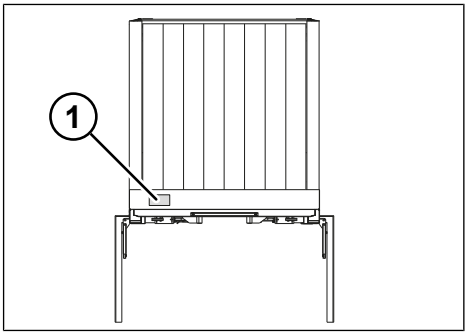


Fig. 1-1: Type plate attachment points

1 Type plate

The following information is listed on the type plate:

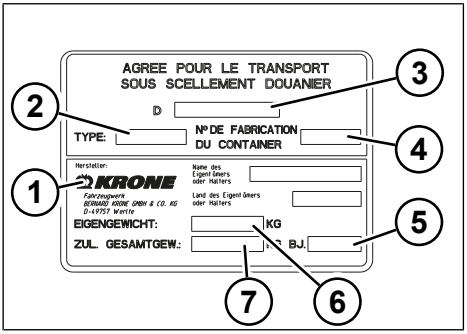


Fig. 1-2: Type plate

1 Manufacturer
2 Type designation
3 Customs number (optional)
4 Vehicle ID number
5 Year of construction
6 Curb weight
7 Permitted total weight

For vehicles without customs certificate, the top line can be empty or be completely omitted.

On stackable units, the vehicle ID number is also embossed on the front right of the corner fitting.

Moreover, identification plates with the stacking load and the CSC mark can be found beside the type plate.

The CSC regulation is a safety standard. The CSC plates provides information about the stackability, the permitted weights and the registration number.

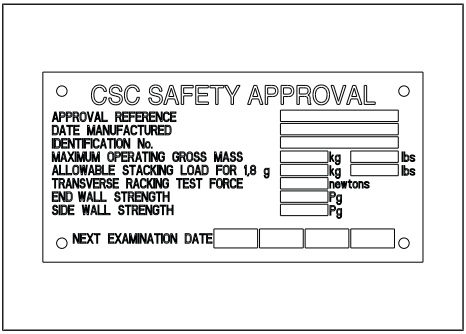


Fig. 1-3: CSC plate

The product type plates are located in the corresponding area of the components.

1.4 Retention of documents

► Store these instructions and all other applicable documents in a safe place.

► Pass the complete documentation on to the next driver or owner.

1.5 Part positions

The description of part positions is always viewed in forward driving direction.

1.6 Optional components

KRONE swap bodies are equipped with a number of optional components. The operating instructions describe all of the components in the following sections.

All components are not necessarily equipped on your swap body.

1.7 Symbols used in these instructions

Various markings and symbols are used in the text in these instructions. These are explained below.

○ Bullet list
  – Sub-list

1. Numbered list

☑ Prerequisite for action

► Action step
  ⇨ Intermediate action result

✓ Result of the action

Name of the software buttons

INFO
Additional information and tips.

: Also observe the enclosed supplier documentation.

1.8 Copyright

2 Safety

This manual contains instructions for your safety and for safe operation.

The basic safety instructions include instructions that apply fundamentally to the safe use or the maintenance of the safe condition of the swap body.

The action-related warnings warn you about residual hazards and are found before a dangerous action.

► Follow all the instructions to prevent personal injury, environmental or property damage.

2.1 Warnings

Design and structure

The action-related warnings are structured as follows:

⚠ WARNING
Type and source of the danger! Explanation of the type and source of the danger. ► Measures to avert the danger.

Hazard level

The warnings are classified according to the severity of the danger. The following explains the danger levels with their associated signal words and warning symbols.

⚠ DANGER
Direct danger to life or serious injuries

⚠ WARNING
Possible danger to life or serious injuries

⚠ CAUTION
Possible slight injuries, environmental damage or property damage

⚠ WARNING
Possible serious injury caused by crushing

⚠ CAUTION
Possible slight injury caused by crushing

NOTE
Possible environmental damage or property damage

2.2 Intended use

Intended use includes the observance of all operating and maintenance instructions supplied with the swap body as well as the observance of the maintenance intervals and conditions prescribed therein.

KRONE swap bodies are intended exclusively for transportation purposes in compliance with applicable laws, rules and regulations.

Operational reliability is only guaranteed if all instructions, settings, and limitations applicable to the swap body are fully complied with.

The swap body is produced with state-of-the-art manufacturing systems in compliance with all applicable safety-related laws, rules, and regulations. Nevertheless, operation of the swap body involves dangers for life and limb of the operator and other personnel or risks of damage to the swap body and other material damage.

► Swap bodies are only to be operated if in perfect condition and only as intended, with awareness of safety and hazards, and in compliance with the operation instructions.

► Have any faults that could impair safety immediately repaired by an authorised specialist workshop.

For swap bodies with **telematics unit**, the following also applies:

The KRONE Smart Collect Solar telematics unit sends the collected data to the KRONE server (KRONE Telematics Portal and device management). The status and position data for the swap body can be called up through the portal.

Foreseeable misuse

Any use going beyond proper transport usage is considered non-intended. Avoid the following:

- Transport of persons or animals
- Dangerous goods transports without official and manufacturer approval
- Transport of unsecured loads
- Transport of materials, which due to their properties, do not allow safe handling and transport or only with additional equipment
- Driving with the rear gantry open
- Exceeding the technically permitted weights, dimensions, axle loads and drawbar loads of the carrier vehicle
- Exceeding the max. permissible total weight
- Use of components that are not approved by KRONE

Fahrzeugwerk Bernard KRONE GmbH & Co. KG is not liable for damage resulting from non-intended use. Risks deriving from such infractions are exclusively borne by the operator.

2.3 Personnel qualification and requirements

KRONE swap bodies may only be used and maintained by persons who are appropriately qualified and who have read and understood the operating instructions.

In the operating instructions, a distinction is made between:

- Operator
- Driving staff
- Skilled craftsmen.

2.3.1 Operator

The operator is responsible for proper operation of the vehicle. The operator must:

- Instruct the driving and operating staff in the use of the swap body.
- Ensure that the swap body is regularly inspected and serviced at an authorised specialist workshop.

2.3.2 Driving staff

The driving staff consists fundamentally of the vehicle driver and a co-driver if applicable. The driving staff are responsible for proper operation of the vehicle and must

- have read and understood the operating instructions,
- Have reached the legal minimum age.

When transporting, only driving staff may be used who have received instruction prior to the first deployment and who have subsequently received verbal instruction at least once a year relating to this work.

This instruction should particularly cover the following points:

- The operating instructions,
- The measures to be taken in the event of malfunctions.

Driving is limited to persons who have the required driving license. In addition, the drivers must receive training with respect to:

- The respective transport trailer and associated tractor unit,
- The additional suppliers' information listed *(see "1.2 Other applicable documents", pg. 7)*,
- Motor Vehicle Traffic Regulations and Motor Vehicle Construction and Use Regulation, C.U.R., and
- All relevant regulations that apply to health and safety, accident prevention and environmental protection in the country of use, as well as
- Other safety-related, occupational health and road traffic regulations.

2.3.3 Skilled craftsmen

The skilled craftsmen of a specialist workshop are authorised to perform the maintenance work (maintenance and repair). Authorised skilled craftsmen must have a recognised qualification or have the relevant knowledge of their specialised area required to meet the relevant regulations, rules and guidelines.

2.4 Personal protective equipment

Personal protective equipment serves to avoid injuries and is prescribed by national regulations depending on the cargo.

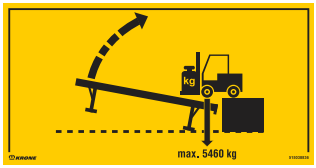
- ► Wear suitable personal protective equipment when loading and unloading.
  - ○ Depending on the transported goods, eyes, ears and respiratory tract must be protected with suitable protective equipment.
  - ○ Gloves and safety shoes are generally worn.
- ► Observe the national regulations regarding personal protective equipment.
- ► Always keep an eyewash bottle filled with clean water at hand in the working environment.

2.5 Information, warning, and mandatory signs

There are information, warning, and mandatory signs attached to the swap body.

- ► Observe and follow the signs.
- ► Keep the signs clean and legible.
- ► Do not remove, paint over or paste over the signs.
- ► Immediately replace signs that have become illegible or are missing.

Depending on the equipment and use, appropriate pictograms are used in the information, warning and mandatory signs.

Sign	Attachment point/meaning
	Warning sign for tilt stability Attachment point: Inside on the right rear door
	Roof collision warning sign Attachment point: Front wall, interior

Sign	Attachment point/meaning
	Warning sign for dead angle Attachment point: Outside on the right rear door
	Warning sign for loading flap Attachment point: Outside on the loading flap

2.6 Danger areas

On and around the swap body, there are areas with an increased risk to your safety or to the safety of other persons.

► Observe the following danger areas and instruct unauthorised persons to leave these areas:

Danger area	Danger
Loading and unloading area	There is a risk of injury on loose or uneven ground or on slopes.
Between the swap body and the load	There is a risk of crushing.
Connection between carrier vehicle and swap body	There is a risk of injury when stacking and unstacking the swap body from the carrier vehicle through incorrect operation when opening and closing the locking and securing devices.
Area approx. 3 m (10 ft) around the swap body	There is a risk of accidents.
Under the raised swap body	The raised swap body could start moving if defective or when being stacked by a carrier vehicle and could cause serious injury.
Roller shutter, doors, board wall, loading ramp	There is a risk of crushing

2.7 General safety instructions

The basic safety instructions include all safety measures sorted according to the theme, and must always be observed.

Superstructure stability

The stability of the superstructure is obtained by a variety of constructive measures and components.

► Do not make any changes to the delivery condition of the superstructure.

► Use the intended tensioning devices.

► Observe the instructions from the load security certificates concerning the components used.

Dangers while driving

There is a risk of impact on bridges, in tunnels or with other structures. Persons can be injured or the vehicle, the transported goods, and the structure can be severely damaged.

► Observe the vehicle dimensions incl. the transported goods.

► Observe the permissible passage dimensions (height, width).

► When driving in curves, be mindful of the vehicle swivelling out.

Dangers when setting down

When setting down the swap body in a public place, mark the swap body in compliance with the legal requirements.

► Place supporting plates under the landing legs if necessary.

Load securing

Unsecured or incorrectly secured loads can result in poor road handling or even accidents. Lost loads can cause injury to other road users.

► Secure the load according to the requirements of the relevant regulations for load securing.

► Observe the instructions on the load securing certificates.

Load distribution

Incorrect load distribution as well as improperly secured loads can lead to dangerous road handling and serious accidents or damage to the vehicle.

► Observe the specified axle loads and drawbar loads.

► Secure the load in accordance with the applicable regulations.

► Ensure that the load securing aids are not damaged and are functional.

Dangers caused by improper maintenance

Improperly performed maintenance work (care and cleaning, maintenance, repairs) impairs the safety.

► Perform regular inspections for defects.

► Perform care and cleaning work properly.

► Perform maintenance tasks according to the instructions.

► Park the vehicle before performing any work.

► Only have repair work carried out by authorised specialist workshops or by KRONE.

Operating materials

Operating materials (e.g. lubricants, coolants, fuels) are hazardous to health. Immediately seek medical attention upon ingesting operating materials. If possible, avoid breathing vapours. Do not allow operating materials to come into contact with the skin, eyes, or clothing. Clean affected skin areas with water and soap. If it enters the eyes, immediately and thoroughly clean them with abundant clear water. Change soiled clothing as soon as possible. Keep operating materials away from children.

Noxious fumes

Fumes can cause serious health damage or even death.

► Switch off generators, if possible.

► Ensure sufficient ventilation when the engine is running.

► In closed rooms, extract exhaust gases with a suitable extraction system.

Technical safety

Technical safety refers to all electronic devices, such as the telematics unit.

- ► In case of errors and malfunctions or if the device falls down, interrupt work immediately to prevent further damage. The device should be examined immediately by qualified specialist personnel for technical safety and proper functioning
- ► Do not open the housing. Otherwise, there is a risk of electric shock.
- ► Do not expose the device to naked flame or burn them with rubbish.
- ► Damaged cables, plugs and other components must only be replaced with original spare parts and spare parts authorised by Krone.
- ► During operation, check all of the bolted and plug connections at regular intervals.

2.8 Warranty and liability

The "General terms and conditions of sale and delivery" from Fahrzeugwerk Bernard KRONE GmbH & Co. KG fundamentally apply.

Warranty and liability claims for personal injury and material damage are excluded if they are due to one of more of the following causes:

- ○ Improper use *(see "2.2 Intended use", pg. 10)*,
- ○ Failure to observe the instructions, requirements and prohibitions of these operating instructions and the operating instructions for the accessories,
- ○ Failure to follow the instructions, requirements and prohibitions of the maintenance instructions,
- ○ Unauthorised structural changes to the KRONE product,
- ○ Inadequate monitoring of wear parts,
- ○ Improper maintenance or repairs not being carried out in good time,
- ○ Use of non-approved and unsuitable spare parts *(see "11.1 Spare parts", pg. 97)*.

You can find the warranty conditions at www.krone-trailer.com.

2.9 Environmental hazards

- ► Always observe environmental protection when operating.
- ► Avoid the release of operating materials into nature and the environment.
- ► Dispose of operating materials and other chemicals in accordance with the applicable national regulations.

3 Product overview

The following figures show examples of the swap body superstructures.

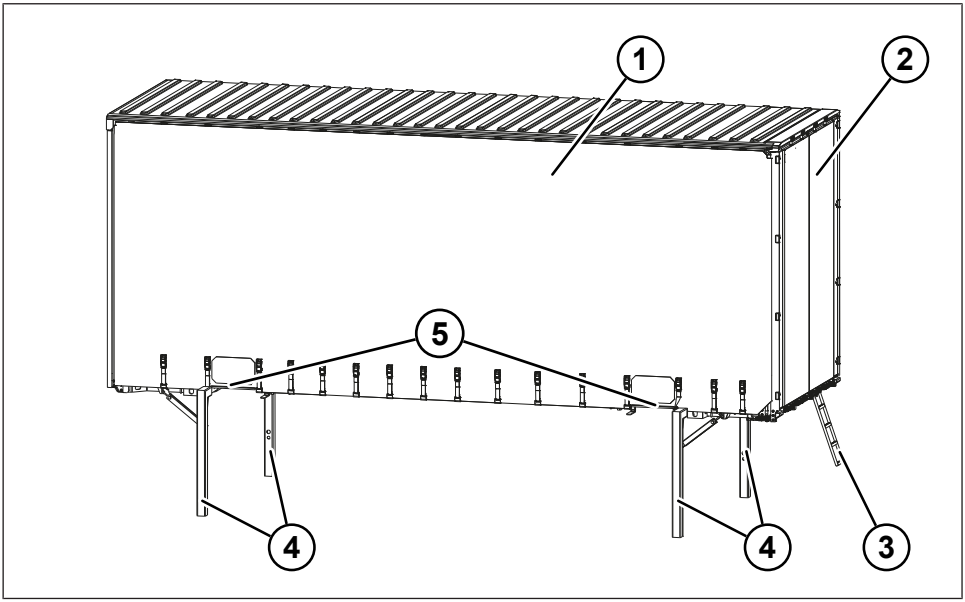


Fig. 3-1: Swap flatbed with sliding curtain superstructure

1 Sliding curtain superstructure
2 Rear gantry
3 Folding telescopic ladder
4 Landing legs with leg braces
5 Marked gripper surfaces

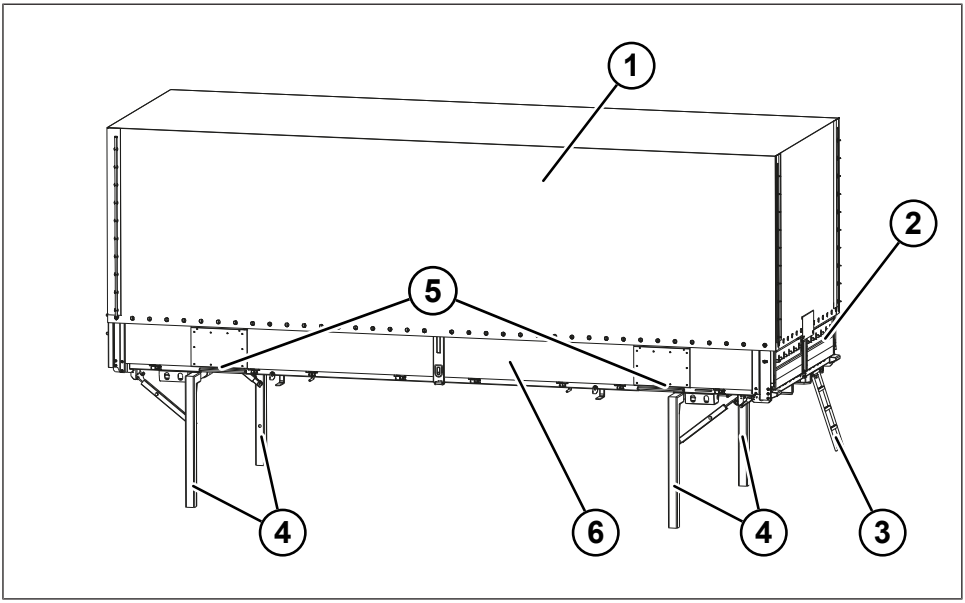


Fig. 3-2: Swap flatbed with full-tarp superstructure

1 Full-tarp superstructure
2 Rear wall doors
3 Folding telescopic ladder
4 Landing legs with leg braces
5 Marked gripper surfaces
6 Board wall

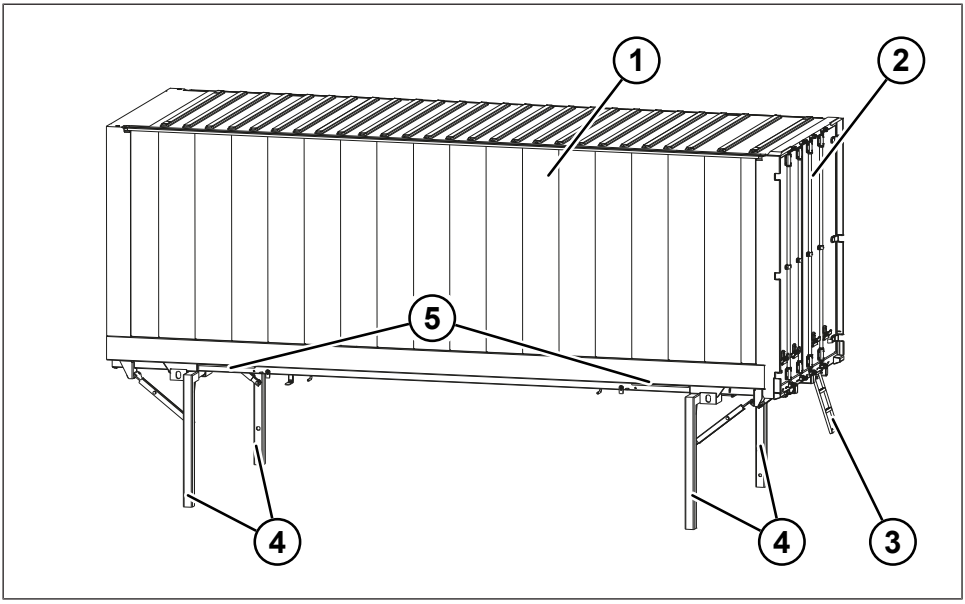


Fig. 3-3: Swap box

1 Box body superstructure
2 Rear gantry
3 Folding telescopic ladder
4 Landing legs with leg braces
5 Marked gripper surfaces

Usage designs

KRONE swap bodies are available as a flatbed or box version. Essential characteristics of the individual trailer types and their special features are described briefly below.

All swap bodies are also available as a Mega version with a bigger load capacity.

Swap flatbeds

Swap flatbeds are used for typical transport situations. They are designed as a swap body with a sliding curtain, full-tarp or as a plateau. To facilitate loading and unloading, swap flatbeds can be equipped with a lifting roof.

Swap box

KRONE swap boxes (Dry Box) are swap bodies for dry freight transport with variable interior equipment.

Ribbed-steel Dry Box

The ribbed-steel Dry Box, the skeleton of the superstructure is made of steel. The side wall is made of ribbed sheet steel. This type enables a great variety of interior equipment (keyhole rails, wood panelling, various lashing rails, double-deck, etc.)

Dry Box Plywood

With the Dry Box Plywood, the skeleton of the superstructure is made of steel. The side walls are made of plywood and can be optionally equipped with strapping strips.

Dry Box with clinched sheet steel cassettes (smooth steel wall)

With the Dry Box with clinched sheet steel cassettes, the superstructure is made of steel. The smooth side walls are made of galvanised sheet steel cassettes. This type enables a great variety of interior equipment (keyhole rails, wood panelling, various lashing rails, double-deck, etc.).

Dry Box with sliding curtain on one side

The superstructure of this Dry Box has a sliding curtain on one side, and the other side of the box is made of clinched sheet steel cassettes.

Dry Box Duoplex Steel, lightly insulated

With the Dry Box Duoplex Steel, based on the insulated box body technology, the light, insulated superstructure is made of galvanised steel sheet. It is fitted with 30 mm thick Duoplex steel side panels and optional integrated doubledeck guide rails and strapping strips.

The following figure shows an example of the swap body superstructure.

4 Commissioning

4.1 Initial commissioning

Initial commissioning is performed by Fahrzeugwerk Bernard KRONE GmbH & Co. KG. The delivery from the factory or production site is ready for operation.

► Check that the documentation provided is complete.

► Obtain instruction on operation and ask questions if necessary.

INFO
The transfer is not done by staff from Fahrzeugwerk Bernard KRONE GmbH & Co. KG.

4.2 Delivery and handover

Delivery and handover of the trailer takes place at a production site of Fahrzeugwerk Bernard KRONE GmbH & Co. KG.

► Check that the documentation provided is complete.

► Familiarise yourself with the product and the documents.

► Obtain instruction on operation and ask questions if necessary.

► Collect with a suitable carrier vehicle.

4.3 Commissioning before each trip

Commissioning before each trip ensures road safety and includes a check before driving off and after loading and unloading.

► Prior to starting each trip, perform a departure check:

1. Are the documents for the carrier vehicle and swap body available?
2. Is the carrier vehicle suitable for the transport task?
3. Are the applicable regulations for driving on public roads observed with the transport tasks?
4. Have all accident prevention regulations been complied with?
5. Are all existing superstructure components of the swap body properly fastened and/or closed and secured?
6. Have all locking mechanisms of the carrier vehicle intended to secure the swap body been properly closed and secured?
7. Is the load properly distributed and correctly secured?
8. Has the permitted maximum total weight been adhered to?
9. Are all landing legs locked and **doubly secured**?

► Fix any observed defects.

► Only drive the vehicle when road safety is ensured.

5 Operating the swap body

5.1 Landing legs

⚠ WARNING

Risk of accident caused by damaged, defective or missing landing legs!

The swap body could tip over while being unstacked and could cause serious personal injury as well as material damage.

- ► Never set down a swap body that has defective, damaged, or missing landing legs and landing leg braces.
- ► Decommission any swap bodies with safety-relevant malfunctions or changes to the operating behaviour as soon as possible.
- ► Have defective or damaged components replaced immediately.

⚠ WARNING

Risk of accidents from locking and securing the landing legs incorrectly!

While driving, improperly locked and secured landing legs can slide out of their retainer guides, endangering other road users, possibly causing serious injuries, including death.

- ► Before every trip, ensure that all landing legs are properly locked in place and doubly secured.

⚠ CAUTION

Risk of crushing when operating the landing legs!

When operating the landing legs, there is the risk of injury from crushing or pinching fingers.

- ► When operating the landing legs, wear protective gloves.

The landing legs of the swap body have a double locking mechanism. Depending on the swap body equipment, the landing legs can be equipped with the following locking mechanisms:

- ○ Locking bolt
- ○ Com-Lock
- ○ Locking lever

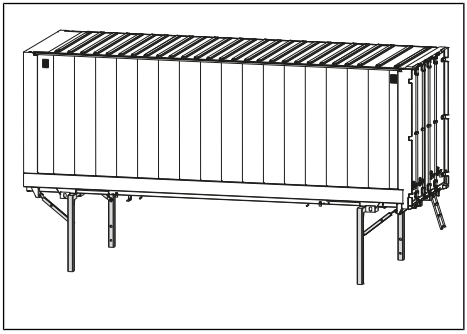


Fig. 5-1: Swap body with fold-out landing legs

Folding in the landing legs

► Pull out the locking bolt or

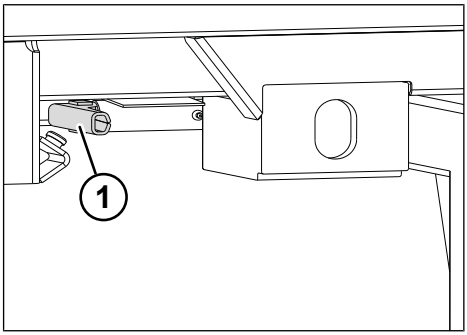


Fig. 5-2: Locking bolt

1 Locking bolt

► Pull out the Com-Lock or

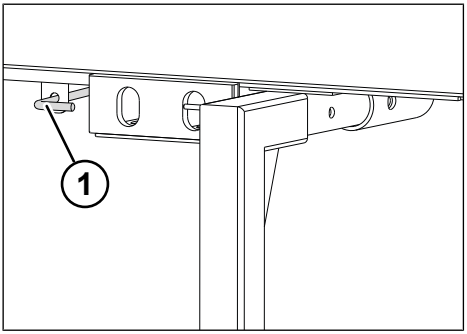


Fig. 5-3: Com-Lock

1 Com-Lock

► Swing the locking lever to the side and downwards.

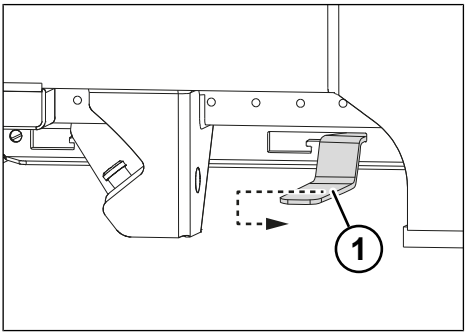


Fig. 5-4: Locking lever

1 Locking lever

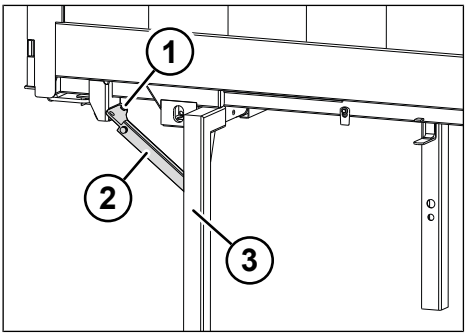


Fig. 5-5: Locked landing leg brace

1 Landing leg brace bracket
2 Landing leg brace
3 Landing leg

► Lift the landing leg brace out of the landing leg brace bracket.

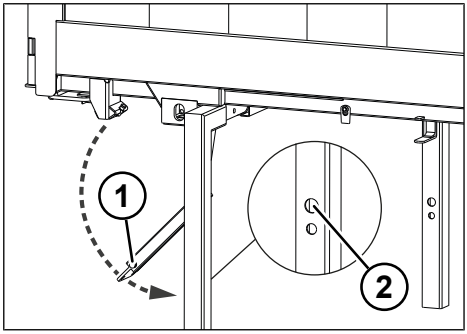


Fig. 5-6: Folding down the landing leg brace

1 Retaining pin on the landing leg brace
2 Opening the landing leg

► Fold down the landing leg brace.
► Hook the retaining pin for the landing leg brace into the opening on the landing leg.
► Pull out the landing leg a little.
► Swivel up the landing leg.
► Push the landing leg in all the way.
► Hook the landing leg into the landing leg support.
► Allow the locking mechanism to engage into place.
⇨ The landing leg is secured with the first lock.

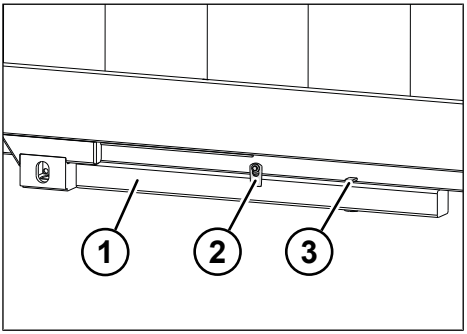


Fig. 5-7: Landing legs folded in and secured

1 Landing leg
2 Fall protection swivelled down
3 Landing leg support

► Swivel down the fall protection to secure the landing leg in the landing leg support.
  ⇨ The landing leg is secured with the second lock.
✓ The landing leg is folded in and secured.
► Repeat these steps on all landing legs.

Folding out landing legs

► Swivel up the fall protection.
► Pull out the locking bolt or
► Pull out the Com-Lock or
► Swing the locking lever to the side and downwards.
► Pull out landing leg.
► Fold down landing leg.
► Push the landing leg in a little.

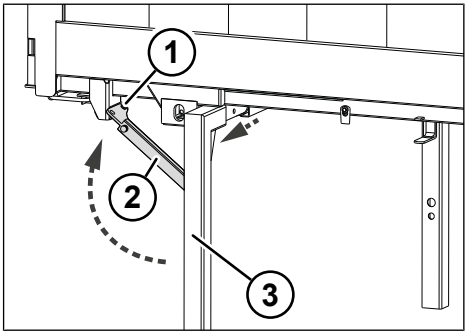


Fig. 5-8: Landing leg brace swivelled up

1 Landing leg brace bracket
2 Landing leg brace
3 Landing leg folded down

► Fold up the landing leg brace and hook it into the landing leg brace bracket.
► Allow the locking mechanism to engage into place.
✓ The landing leg is folded out and secured.
► Repeat these steps on all landing legs.

Operating the telescopic landing leg foot (version 1)

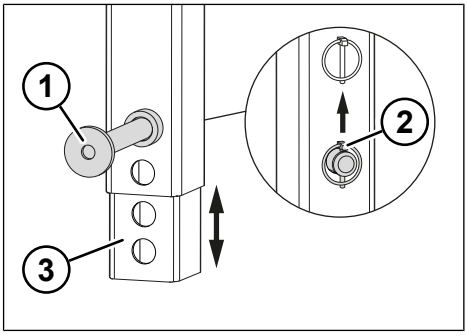


Fig. 5-9: Telescopic landing leg foot with lock bolt

1 Lock bolt
2 Safety split pin
3 Telescopic landing leg foot

- ► Remove the safety split pin from the bolt on the telescopic landing leg foot and pull out the bolt to adjust the length of the landing leg.
- ► Pull out the telescopic landing leg foot to the ground.
- ► Lock the telescopic landing leg foot with the bolt.
- ► Secure the lock bolt with the safety split pin.
- ✓ The landing leg is folded out and secured.
- ► Repeat these steps on all landing legs.

Operating the telescopic landing leg foot (version 2)

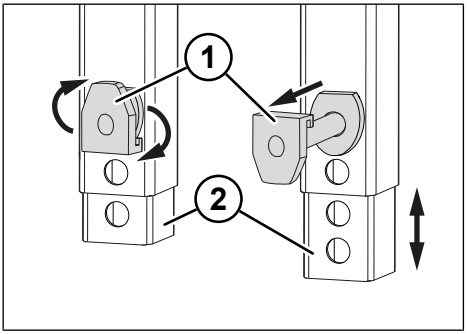


Fig. 5-10: Telescopic landing leg foot

1 Locking mechanism
2 Telescopic landing leg foot

- ► Turn the lock by 180°.
- ► Pull out the lock to adjust the length of the landing leg.
- ► Pull out the telescopic landing leg foot to the ground.
- ► Lock the telescopic landing leg foot with the lock.
- ► Turn the lock by 180°.
- ✓ The landing leg is folded out and secured.
- ► Repeat these steps on all landing legs.

Depending on the equipment, KRONE swap bodies can be fitted with a brake for the landing leg brace. The brake prevents uncontrolled falling down. The ideal setting is achieved when the landing leg brace slowly slides down due to its own weight.

Adjusting the brake for the landing leg brace

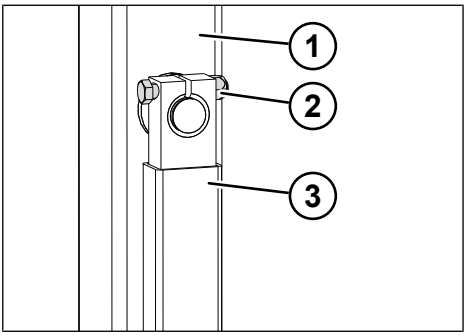


Fig. 5-11: Brake for the landing leg brace

1 Landing leg
2 Setting screw
3 Landing leg brace

- ► Lift the landing leg brace out of the landing leg brace bracket.
- ► Loosen or tighten the setting screw by a few turns.
- ► Fold up the landing leg brace and hook it into the landing leg brace bracket.
- ✓ The brake for the landing leg brace is adjusted.

5.2 Rear gantry

⚠ WARNING

Risk of accident due to loss of load!

If the doors are unlocked and unsecured, the load falling out while driving can result in personal injury and material damage.

- ► Check that the doors are locked before every trip.

⚠ CAUTION

Personal injury or material damage due to swinging doors!

Unlocked doors can suddenly swing open, injure people, and cause material damage to the trailer superstructure.

- ► Check that the doors are locked before every trip.
- ► Do not drive with open or unlocked doors.
- ► To prevent the doors from bumping on the trailer superstructure, always swivel the lock lever back to its initial position (parallel to the door).
- ► Always secure open doors with door stops.

⚠ CAUTION

Risk of injury from falling loads!

Loads falling out can injure people and cause material damage when the doors or rear walls are opened, particularly with double-deck loading.

- ► When opening the doors or rear walls, always watch out for falling loads.

⚠ CAUTION

Risk of injury from falls!

Using unsuitable items to climb onto or off the vehicle or jumping from the load compartment can result in falls with injuries.

- ► Only use the intended step-on devices.
- ► Do not jump down from the load compartment.

⚠ CAUTION

Risk of injury when operating the superstructure!

When working on the superstructure, limbs may be crushed or other injuries may result.

- ► Watch for swivelling components and hinge parts.
- ► Wear protective gloves.

To operate the doors, observe the following instructions:

- ○ Park the vehicle straight on level ground.
- ○ Make sure that all tension bolts of the turn rods are locked at the top and bottom.
- ○ When closing the doors, pay attention to obstacles that could damage the door seals.

5.2.1 Doors

NOTE

Material damage due to setting down with open doors

If the swap body is unstacked with the doors open, the superstructure can become warped and the doors cannot be closed properly. This can cause material damage to the swap body.

- ► Park the swap body on level ground.
- ► If necessary, pick up the swap body again and close the doors before setting it down.

Depending on the version, the doors on the rear gantry are locked with two or four turn rod locks. These door locks are designed for one-handed or two-handed operation, depending on the version.

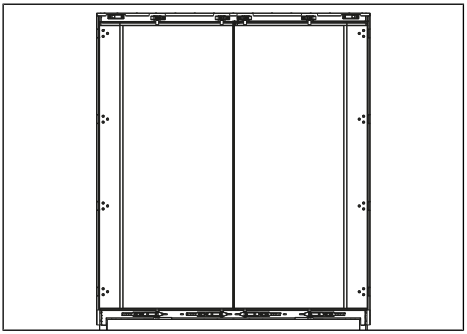


Fig. 5-12: Rear gantry with internal turn rods

Depending on the version, the turn rods are on the inside or outside of the rear gantry.

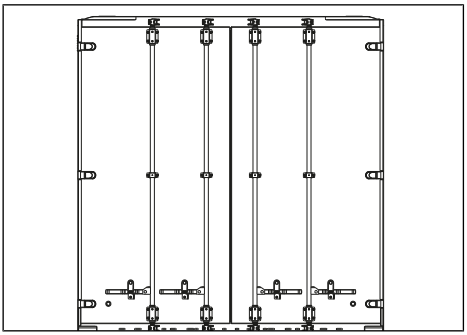


Fig. 5-13: Rear gantry with external turn rods

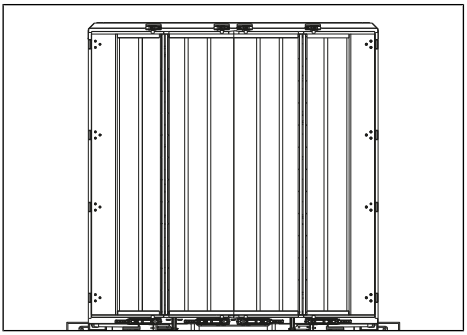


Fig. 5-14: Four-leaf door

Operation of the doors is shown on a sticker on the inside of the door.

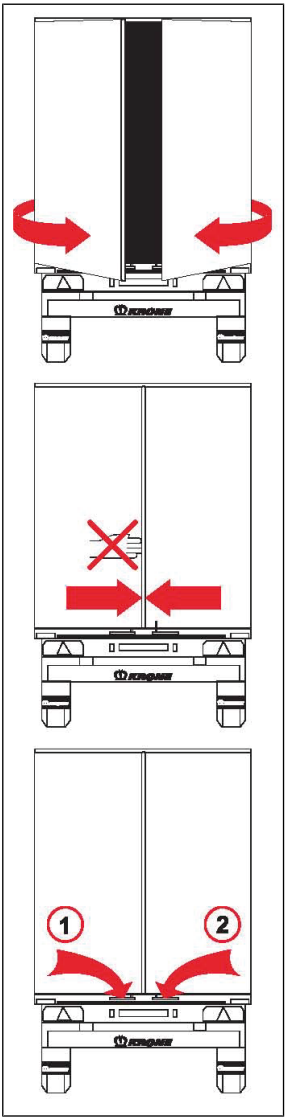


Fig. 5-15: Sticker for operating the rear gantry

5.2.1.1 Door lock with one-handed operation

Opening the door lock

► If necessary, remove the curtain rope.

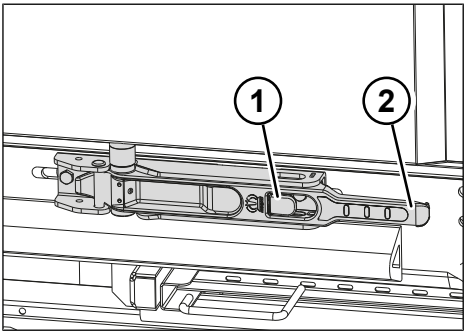


Fig. 5-16: Door lock with one-handed operation

1 Lock
2 Lock lever

► Push in the lock of the right door lock. If there are two door lock levers, press both locks at the same time.

⇨ The lock lever snaps out, the door is unlocked.

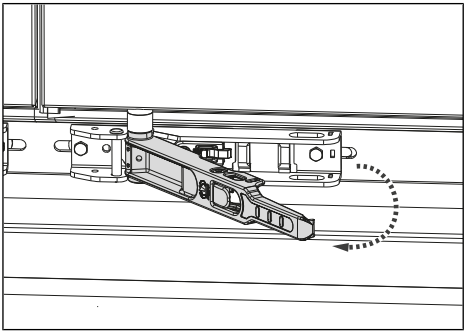


Fig. 5-17: Swivelling out the door lock lever

► Swivel out the door lock lever so that the tension bolts push the door open.

► Open the door leaf.

► Both door lock levers should then be moved back to their original position.

► Secure the swivelled open door leaves with door stops *(see "5.2.2 Door stop", pg. 30)*.

⇨ The right-hand door lock is opened.

► Open the left door lock in the same way.

✓ Both door locks are opened and fastened.

Closing the door lock

► Release the left door stop.

► Close the left door leaf.

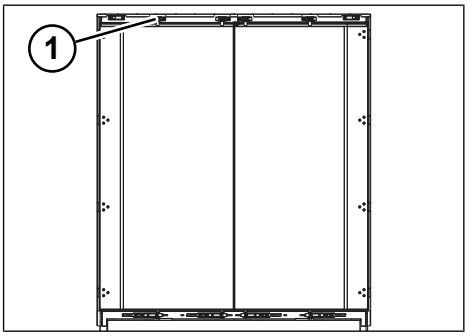


Fig. 5-18: Tension bolt

1 Tension bolt

► Swivel in the door lock lever so that the tension bolts pull the door closed. If there are two door lock levers, close both at the same time.

► Firmly press the door lock lever so that the lock engages.

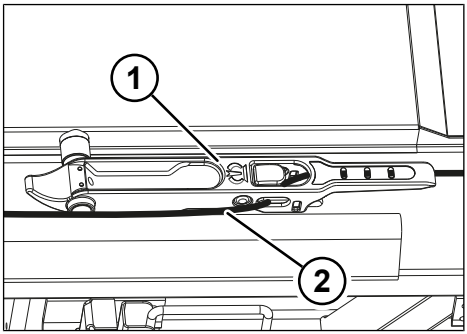


Fig. 5-19: Threading the curtain rope through the door lock

1 Door lock
2 Curtain rope

⇨ The left-hand door lock is closed.

► Close the right door lock in the same way.
► If necessary, install the curtain rope.
✓ Both door locks are closed.

5.2.1.2 Door latch of dual-action design

Opening the door locks

► If necessary, remove the curtain rope.

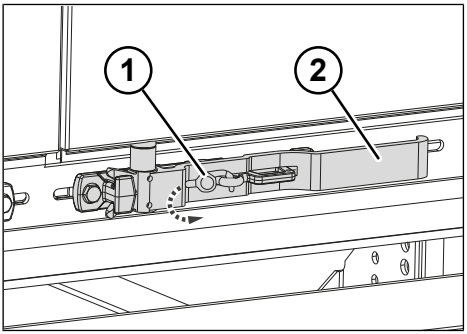


Fig. 5-20: Door lock with two-handed operation

1 Anti-tilt device
2 Door lock lever

► Press the right door lock lever in the vehicle direction. If there are two door locks on one door leaf, unlock the door locks successively.
► Open the anti-tilt device.
► Swivel out the door lock lever so that the tension bolts push the door open.
► Open the door leaf.
► Swivel the door lock lever back to the original position.
► Secure the swivelled open door leaves with door stops *(see "5.2.2 Door stop", pg. 30)*.
⇨ The right-hand door lock is opened.
► Open the left door lock in the same way.
✓ Both door locks are opened and fastened.

Closing the door locks

► Release the left door stop *(see "5.2.2 Door stop", pg. 30)*.
► Close the door leaf.

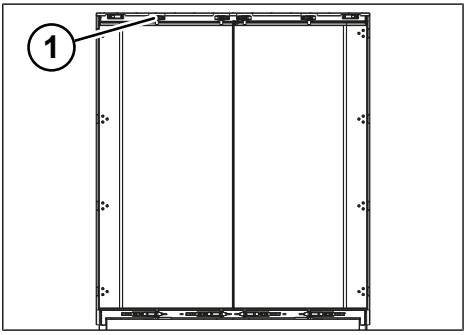


Fig. 5-21: Tension bolt

1 Tension bolt

► Swivel in the door lock lever so that the tension bolts pull the door closed.
⇨ The left-hand door lock is closed.
► Close the anti-tilt device.
► Close the right door lock in the same way.
► Attach the curtain rope.
✓ Both door locks are closed.

5.2.1.3 Door lock with external turn rods

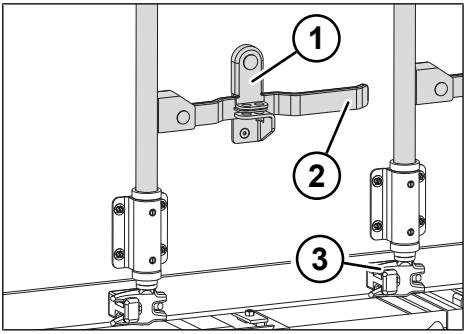


Fig. 5-22: External door lock

1 Lock
2 Lock lever

Opening the door lock

► If necessary, remove the padlock.

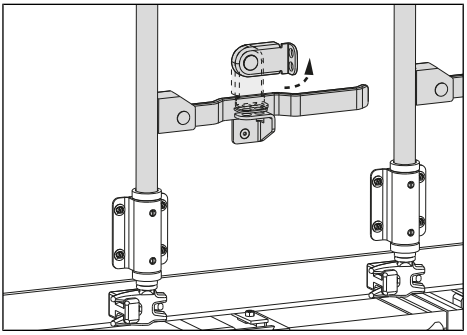


Fig. 5-23: Opening the lock

► Turn the lock on the right and left door lock up by 90°.

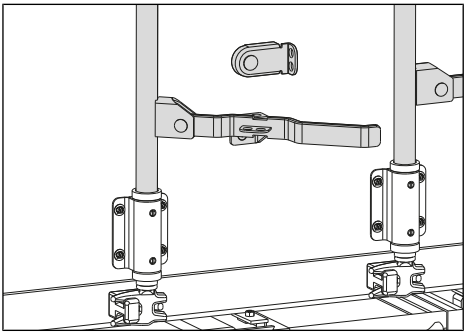


Fig. 5-24: Opening the external door lock

► Slightly lift the door lock lever and swivel it to the front over the hook.

► Swivel out the door lock so that the tension bolts push the door open.

► Secure the swivelled open door leaf with a door stop.

⇨ The right-hand door leaf is opened.

► Open the left door leaf in the same way.

✓ All door locks are opened.

Closing the door lock

► Release the left door stop *(see "5.2.2 Door stop", pg. 30)*.

► Close the left door leaf.

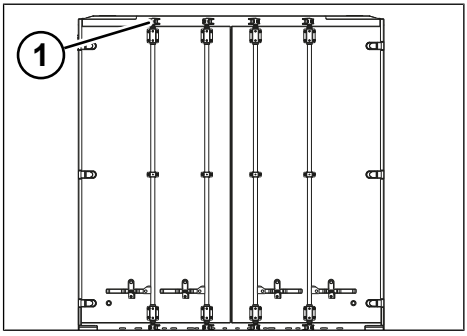


Fig. 5-25: Tension bolt

1 Tension bolt

► Swivel in both door lock levers at the same time so that the tension bolts pull the door closed.

► Turn the lock for the door lock down by 90°.

► Slightly lift the door lock lever, hook it on and fold down the lock.

⇨ The left-hand door leaf is closed.

► Close the right door leaf in the same way.

► Secure the right door lock against unintentional opening.

✓ All door locks are closed.

5.2.1.4 Loading ramp door lock

The door locks can be with or without locking mechanism. The keys for the door locks are attached to the door lock upon delivery of the trailer.

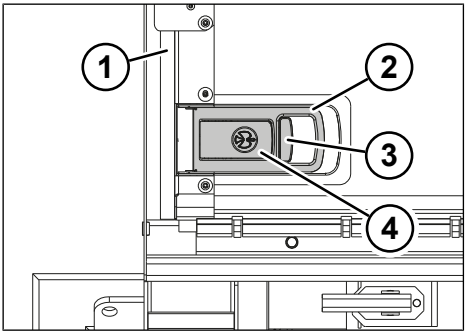


Fig. 5-26: Loading ramp door lock

1 Turn rod
2 Lock lever
3 Lock
4 Locking mechanism protective cover

Opening the door locks

- ► If applicable, fold down the protective cover and open the lock.
- ► Fold the opened protective cover back down again.
- ► Push in the lock of the right door lock.
- ► Swivel out the door lock lever so that the tension bolts push the door open.
- ► Open the left door lock in the same way while firmly holding the loading ramp.
- ✓ The door locks are opened.

Closing the door locks

- ► Close the loading flap.
- ► Swivel in the door lock lever so that the tension bolts pull the door closed.
- ► Firmly press the door lock lever so that the lock engages.
- ► Close the right door lock in the same way.
- ► If applicable, fold up the protective cover for the lock and close the lock.
- ► If applicable, close the protective cover for the lock again.
- ✓ The door locks are closed.

5.2.2 Door stop

⚠ CAUTION

Risk of accident due to the doors swinging uncontrollably!

Unlocked doors can swing out and injure people and cause material damage.

- ► Always secure open doors with door stops.
- ► Close and secure doors prior to departure.
- ► When operating the door stops, hold the doors with one hand.

5.2.2.1 U-shaped door stop

⚠ CAUTION

Risk of crushing when operating the door stop!

The spring-loaded door stop can spring back and crush fingers and hands.

- ► Wear work gloves.
- ► Grab the U-shaped door stop as far below the curve as possible during use.

Securing the door with the door stop

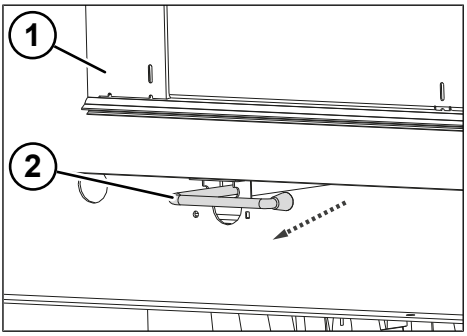


Fig. 5-27: Pulling the door stop outwards

1 Door leaf swung open
2 U-shaped door stop

► Pull out the door stop against the spring force.

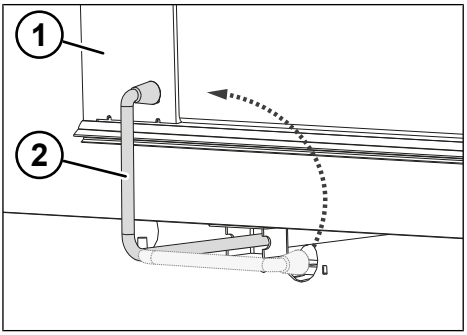


Fig. 5-28: Swivelling the door stop upwards

1 Door leaf swung open
2 Door stop

► Swivel the door stop upwards.
► Move the door stop against the swung-open door.

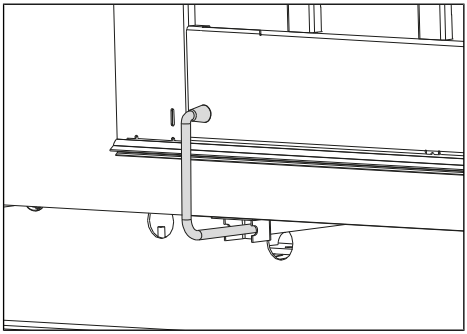


Fig. 5-29: Door leaf locked with the door stop

✓ The door is locked with the door stop.

Releasing the door from the door stop

► Pull the door stop against the spring force away from the swung-open door.

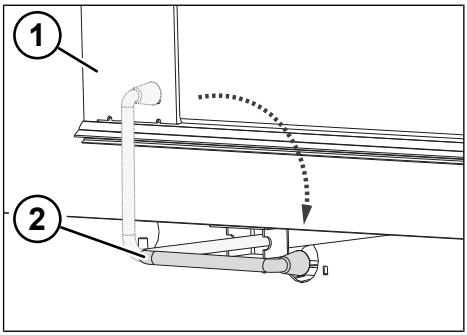


Fig. 5-30: Swivelling the door stop downwards

1 Door leaf swung open
2 Door stop

► Swivel the door stop downwards.
► Put the door stop in parking position with the spring force.
✓ The door is released from the door stop.

5.2.2.2 Chain door stop

NOTE

Material damage due to loose chain hanging down

A loose, hanging chain can cause damage to the frame, door or door seals.

- ► Always hook the chain in the holder (parking position).
- ► Close the door slowly.

Securing the door

☑ The door is opened.

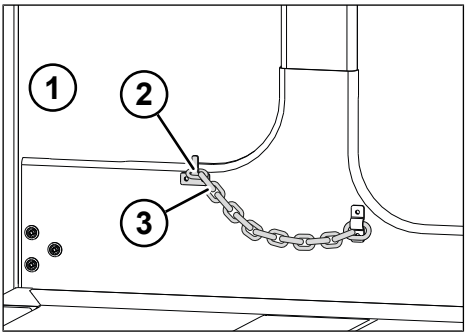


Fig. 5-31: Door stop with chain

1 Door
2 Bracket
3 Chain

► Take the chain from the holder on the door.

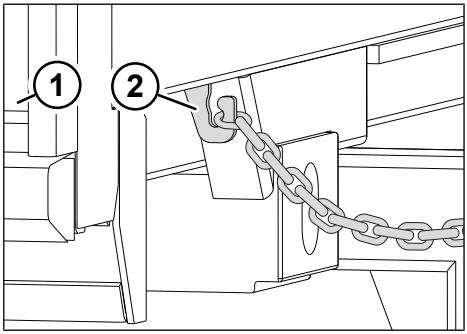


Fig. 5-32: Hook

1 Door
2 Hook

► Hook the chain on the hook on the vehicle frame.

✓ The door is secured with the door stop.

Releasing the door from the door stop

► Take the chain from the hook on the vehicle frame.

► Hook the chain on the holder on the door.

✓ The door is released from the door stop.

5.2.2.3 Door Fix

Swap bodies with a lifting roof can be equipped with a Door Fix. It secures the doors against swinging and enables the roof beam of the sliding roof to be unlocked *(see "5.6.2 Sliding roof", pg. 55)*. The door leaves are then held open in a latched position of approx. 15 degrees.

Engaging the Door Fix

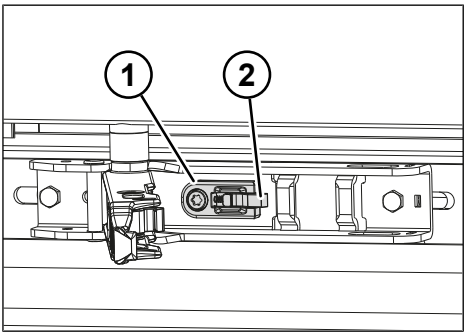


Fig. 5-33: Door Fix

1 Door Fix
2 Lever for Door Fix

☑ The door leaf is open.

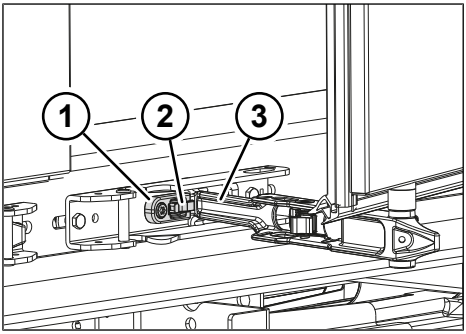


Fig. 5-34: Door lock lever engaged in the Door Fix

1 Door Fix
2 Lever for Door Fix
3 Door lock lever

► Turn the door lock lever forwards towards the direction of travel.
► Engage the door lock lever with the end of the handle in the Door Fix device.
✓ The Door Fix is engaged.

Releasing the Door Fix

► Pull out the door lock lever from the lock.
✓ The Door Fix is released.

5.2.3 Rear wall

⚠ WARNING

Risk of accident due to loss of load!

If the rear wall is unlocked and unsecured, load falling out while driving can result in personal injury and material damage.

► Check that the rear wall is locked before every trip.

⚠ CAUTION

Risk of injury due to the rear wall uncontrollably folding down!

An unlocked and unsecured rear wall can suddenly fold down and cause personal injury and material damage.

► When unlocking the last lock, hold onto the rear wall with one hand.

⚠ CAUTION

Risk of accident due to folded-down rear wall!

A folded-down rear wall can cover the lighting equipment. This can cause rear-end collisions while driving and with parked trailers, causing material damage and personal injuries.

► Drive and park only with a properly closed and secured rear wall.

⚠ CAUTION

Risk of injury from falling loads!

Loads falling out can injure people and cause material damage when the doors or rear walls are opened, particularly with double-deck loading.

► When opening the doors or rear walls, always watch out for falling loads.

Depending on the version, the rear wall of the KRONE swap body is equipped with between two and four locks.

Folding down the rear wall

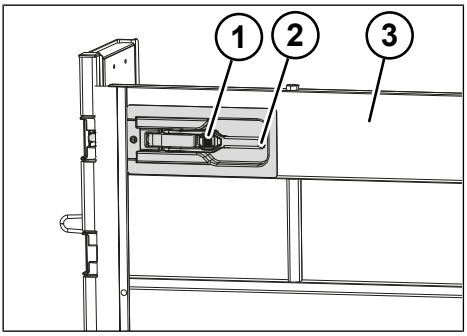


Fig. 5-35: Rear wall lock

1 Lock for the rear wall lock
2 Lock lever
3 Rear wall

- ► Push in the lock on the rear wall lock.
- ► Position the lock lever so that the locking pin is completely out of its guide groove.
- ► Hold onto the rear wall.
- ► Unlock the second lock on the other side of the vehicle in the same way.
- ► Partly fold down the rear wall.
- ► Close both locks again.
- ► Fully fold down the rear wall.
- ✓ The rear wall has been folded down.

Using the fold-down steps

There are fold-down steps on the inside of the rear wall to climb onto the superstructure *(see "5.3.3 Fold-down steps", pg. 40)*.

- ► Fold in the fold-down steps again after use.

Closing the rear wall

- ► Swivel up the rear wall.
- ► Engage the locks and retainers on both sides of the vehicle to lock the rear wall.
- ✓ The rear wall is closed.

Removing the rear wall

⚠ WARNING

Danger when transporting loads of excessive length!

Transporting protruding load parts can result in accidents with material damage and injure people.

- ► Restrict the size of the protrusion.
- ► Mark the load with excessive length using a red flag, for example.

⚠ CAUTION

Risk of injury due to improper removal of the rear wall!

When it is being removed, the rear wall can fall down and injure people and cause material damage.

- ► Always remove the rear wall with the help of a second person.

INFO

If lighting equipment is fitted to the rear wall when it is removed (e.g. edge markers), these must be reproduced on the vehicle.

For loads of excessive length, the rear wall can be removed.

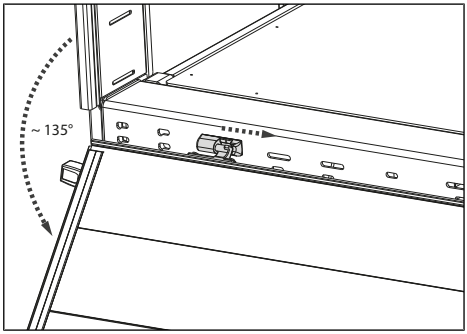


Fig. 5-36: Folding down the rear wall

- ► Fold the rear wall down by approximately 135°.
- ► With a second person, slide off the rear wall to the right.
- ✓ The rear wall has been removed.

Inserting the rear wall

INFO
The rear wall can only be inserted in the same position as it was removed.

- ► With a second person, slide the rear wall onto the hinges from the right-hand side.
- ► Fold up the rear wall.
- ✓ The rear wall has been inserted.

5.2.4 Rear wall doors

⚠ WARNING

Risk of accident due to loss of load!

If the rear wall is unlocked and unsecured, load falling out while driving can result in personal injury and material damage.

- ► Check that the rear wall is locked before every trip.

⚠ CAUTION

Personal injury or material damage due to swinging doors!

Unlocked doors can suddenly swing open, injure people, and cause material damage to the trailer superstructure.

- ► Check that the doors are locked before every trip.
- ► Do not drive with open or unlocked doors.
- ► To prevent the doors from bumping on the trailer superstructure, always swivel the lock lever back to its initial position (parallel to the door).
- ► Always secure open doors with door stops.

Depending on their design, KRONE swap bodies can be equipped with a two-leaf rear wall.

Opening the rear wall doors

- ► If necessary, remove the curtain rope and curtain on the rear end of the swap body.

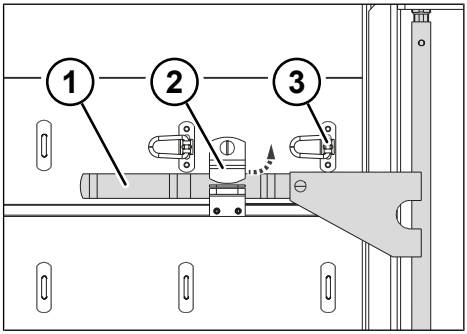


Fig. 5-37: Rear wall lock

1 Door lock lever
2 Lock
3 Eyelets

- ► If applicable, push the eyelets against the rear wall on the sides.
- ► Swivel up the retainer.
- ► Press the door lock lever up.
- ► Swivel out the door lock lever so that the tension bolts push the door open.
- ► Open the door leaf.
- ► Swivel the door lock lever back to the original position.
- ► Secure the swivelled open door leaves with door stops *(see "5.2.2 Door stop", pg. 30)*.
- ► Open the left door leaf and secure it.
  - ⇨ The rear wall is opened.

Close the rear wall doors.

- ► Release the both door stops *(see "5.2.2 Door stop", pg. 30)*.
- ► Close the doors.
- ► Swivel in the door lock lever so that the tension bolts pull the door closed.
- ► Swivel down the retainer.
- ► If necessary, put on the curtain rope and curtain.
- ✓ The rear wall is closed and secured.

5.2.5 Loading ramp

⚠ CAUTION

Risk of accident when operating the loading ramp!

Improper operation of the loading ramp can cause it to fold down uncontrollably and injure people. When folding up, there is the risk of injury from crushing or pinching fingers.

- ► Make sure that nobody is standing in the range of movement of the loading ramp when it is being opened and closed.
- ► Make sure that the loading ramp is resting firmly before walking or driving on it.
- ► Make sure that the cargo is not resting on the loading ramp.
- ► Wear protective gloves.

KRONE swap bodies can be equipped with a loading ramp. Depending on the version, the loading ramp is located behind the doors or is installed in combination with a top flap *(see "5.2.6 Top flap", pg. 36)*.

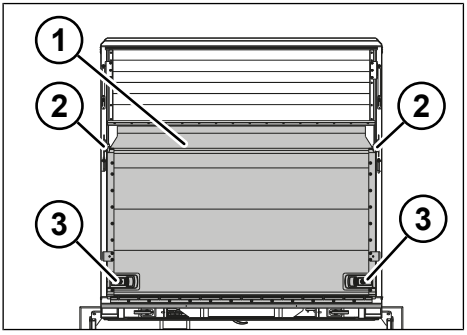


Fig. 5-38: Loading ramp with top flap

1 Loading ramp
2 Tension bolt
3 Door lock

Folding down the loading ramp

- ► The loading ramp should only be folded down onto a suitable support.
- ► Open the door lock on one side *(see "5.2.1.4 Loading ramp door lock", pg. 30)*.
- ► Open the door lock on the other side while holding the loading ramp firmly.
- ► Slowly fold down the loading ramp.
- ✓ The loading ramp has been folded down.

Folding up the loading ramp

- ☑ The top flap is closed and locked.
- ► Fold up the loading ramp and hold it firmly.
- ► Close both door locks consecutively *(see "5.2.1.4 Loading ramp door lock", pg. 30)(see "5.2.1.4 Loading ramp door lock", pg. 30)*.
  - ⇨ The tension bolts of the lock are hooked on.
- ✓ The loading ramp has been folded up.

5.2.6 Top flap

KRONE swap bodies with loading ramp can be equipped with a top flap.

Opening the top flap

INFO

To prevent damage, be mindful of the height when swinging out the top flap.

- ► Fold down the loading ramp.
- ► Use the door strap to open the top flap completely with the assistance of the gas pressure springs.

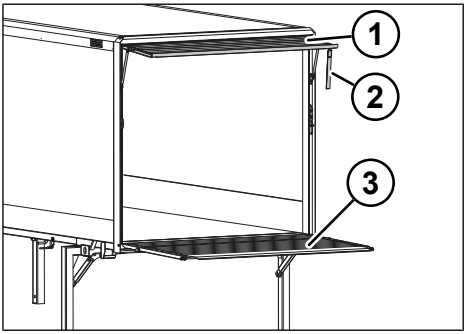


Fig. 5-39: Top flap opened

1 Top flap opened
2 Door strap
3 Loading ramp folded down

✓ The top flap is open.

Closing the top flap

► Use the door strap to pull down the top flap against the resistance of the gas pressure springs until it is resting against the superstructure.

► Fold up the loading ramp.

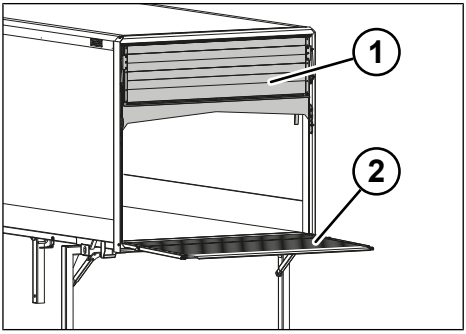


Fig. 5-40: Top flap closed

1 Top flap closed
2 Loading ramp folded down

✓ The top flap is closed.

5.2.7 Rolling door

⚠ WARNING

Risk of accident due to loss of cargo!

Unlocked rolling doors can open again while on the road. Cargo falling out can cause personal injury as well as material damage.

► Check that the rolling door is locked every time before setting off.

⚠ CAUTION

Risk of injury from falling cargo!

Cargo falling out can injure people when the rolling doors are opened and can cause material damage.

► When opening the rolling doors, always watch out for falling cargo.

5.2.7.1 Mechanically driven rolling door

⚠ CAUTION

Risk of injury when operating the roller shutter!

If the roller shutter is operated incorrectly, limbs may be crushed or other injuries may result.

► Only open and close the roller shutter using the handle.

► Before closing the roller door, make sure that there is no one inside the swap body.

► Before closing the roller door, make sure that there is no one in the danger zone of the swap body.

► Ensure that the locking latch is working properly.

► Also observe the enclosed supplier documentation.

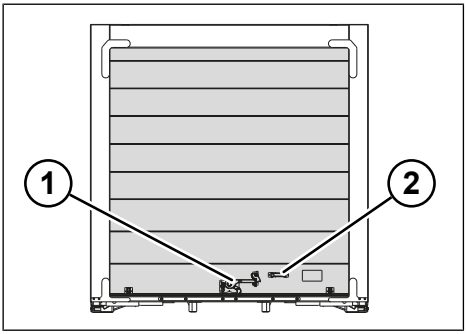


Fig. 5-41: Mechanically driven roller shutter

1 Locking mechanism
2 Handle

Opening the roller shutter

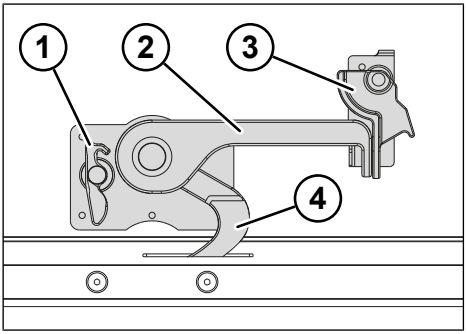


Fig. 5-42: Hook locking device

1 Locking latch
2 Lock lever
3 Fall protection
4 Locking hook

- ► Fold up the fall protection.
- ► Swing the locking lever around until the locking latch clicks into place.

CAUTION! Risk of being shut in by the roller shutter accidentally falling shut. Check that the locking latch is working correctly.

- ► Push up the roller shutter completely with the handle.
- ✓ The roller shutter is open.

Closing the roller shutter

⚠ CAUTION

Risk of injury by using the door strap incorrectly!

The door strap can snap if the load on it is too great.

- ► Never use the door strap to climb up or down.
- ► Do not tie anything to the belt strap.

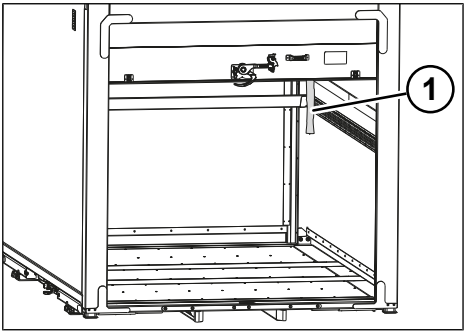


Fig. 5-43: Door strap on the roller shutter

1 Door strap

- ► Pull the roller shutter down as far as possible using the inside door strap.
- ► Pay attention to obstacles in the cargo that can damage the seals.
- ► Press the roller shutter all the way down using the handle, making sure that the door belt is on the inside.
- ► Release the locking latch.
- ► Push down the roller shutter with the handle.
- ► Swing the locking lever around again.
- ► Check that the locking latch is correctly positioned.
- ► Fold down fall protection.
- ✓ The roller shutter is closed and locked.

5.3 Step-on devices

⚠ CAUTION

Risk of injury from falls!

Using unsuitable items to climb onto or off the vehicle or jumping from the load compartment can result in falls with injuries.

- ► Only use the intended step-on devices.
- ► Do not jump down from the load compartment.

KRONE swap bodies can be equipped with the following step-on devices:

- ○ Hand strap *(see "5.3.1 Hand strap", pg. 39)*
- ○ Folding telescoping ladder *(see "5.3.2 Folding telescopic ladder", pg. 39)*
- ○ Fold-down steps (at rear wall, folding) *(see "5.3.3 Fold-down steps", pg. 40)*

5.3.1 Hand strap

For safe climbing up and down, a hand strap is installed on the inside of the corner post.

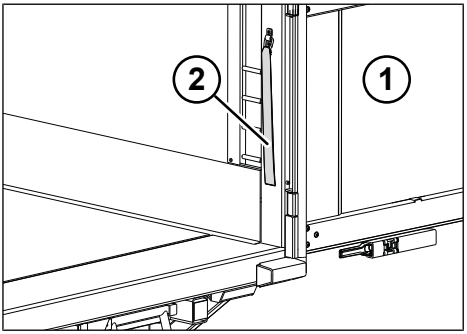


Fig. 5-44: Hand strap

1 Door
2 Hand strap

- ► Use hand straps to climb up and down safely.
- ► When climbing up and down, always face the ladder so that the hand straps can be used without problems.

5.3.2 Folding telescopic ladder

⚠ WARNING

Risk of accident caused by an unsecured telescopic ladder!

An unsecured telescopic ladder can swing onto the road while driving and cause an accident.

- ► Prior to departure, check that the telescopic ladder is properly secured.

KRONE swap bodies can be equipped with a folding telescopic ladder at the rear. Depending on the equipment, the telescopic ladder can be locked either with a spring lock or with a catch at the rear.

Using the telescopic ladder

- ► If necessary, pull out the lock against the spring force and swivel it to the side by 90°.
- ► Pull out the telescopic ladder completely by its handle.

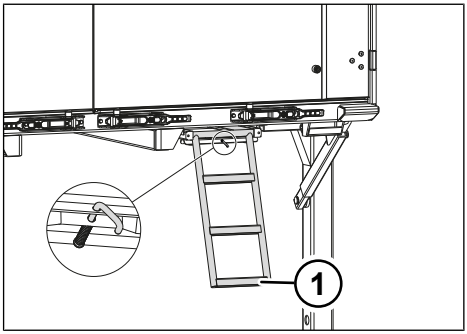


Fig. 5-45: Folding telescopic ladder in the function position

1 Handle

- ► Move the telescopic ladder to the function position.
- ✓ The telescopic ladder can be used to climb onto or off the vehicle.

Sliding in and securing the telescopic ladder

- ► Slide in the telescopic ladder completely using the handle.

- ► If applicable, check whether the telescopic ladder is locked in the catch.
- ► If necessary, pull out the lock against the spring force and swivel it to the side by 90°.
- ✓ The telescopic ladder is inserted and secured.

5.3.3 Fold-down steps

KRONE swap bodies with a folding rear wall and folding side walls can be equipped with fold-down steps.

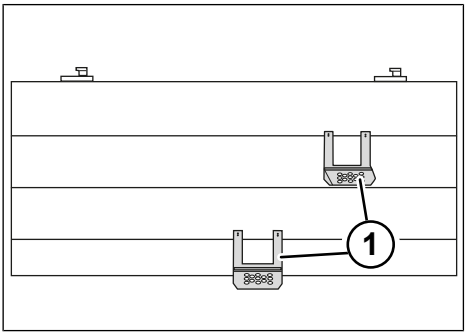


Fig. 5-46: Fold-down steps on the folding rear wall

1 Fold-down steps

- ► Fold out the fold-down steps before use.
- ► If necessary, use the hand straps for climbing up and down *(see "5.3.1 Hand strap", pg. 39)*.
- ► Fold in the fold-down steps again after use.

5.4 Sliding curtain superstructure

⚠ WARNING

Risk of accident due to unlocked curtain!

When driving with an unlocked curtain, the curtain can suddenly flap around and injure other road users. In addition, there is a risk of losing the load.

- ► Before every trip, check that the curtain is properly locked.

KRONE swap bodies with a sliding curtain superstructure have sliding curtains at the sides *(see "5.4.1 Side curtain", pg. 40)* and sliding posts (adjustable centre posts *(see "5.4.7 Centre posts", pg. 48)*) as well as a separate roof tarp. Furthermore, aluminium, steel or wooden plug-in laths can be used to reinforce the lateral load compartment limiter*(see "5.4.6 Lateral load compartment limiter", pg. 46)*.

5.4.1 Side curtain

⚠ CAUTION

Risk of injury due to unfastened curtain rope ends!

Unfastened curtain rope ends can flap around, injure people, and cause material damage.

- ► Secure the ends of the curtain ropes after closing the curtain.

The side curtain can be pushed together lengthwise from back to front as well as in the opposite direction. The curtain is suspended from rollers on the continuous external beam of the roof. The curtain can be fastened to the corner posts and tensioned lengthwise.

Curtain fastenings are tensioned on the chassis with curtain buckles at regular intervals *(see "5.4.2 Curtain buckle", pg. 41)*.

Along with the board walls, the side curtain is

- tensioned with rubber expanders and curtain cramps on the board wall *(see "5.4.3 Curtain cramps", pg. 43)*
- or tightened with curtain buckles that are hooked into the board wall instead of the chassis.

5.4.2 Curtain buckle

⚠ WARNING

Risk of accident due to unlocked curtain buckle!

When driving with the curtain buckles unlocked, the curtain and the curtain buckles can flap around and injure other road users. In addition, there is a risk of losing the load.

► Before every trip, check that the curtain and the curtain buckle are properly locked.

NOTE

Loose strap ends can cause material damage!

Loose belt strap ends can cause damage to the curtain and the lettering on the curtain while driving.

► Tighten loose belt strap ends before travel.

Using the curtain buckle, a curtain rope can be guided as an anti-theft device, depending on the equipment. It must be removed beforehand to release the curtain buckle.

Repeated operation of the tension straps could cause loss of their original adjustment. Re-tighten the tension straps as necessary to ensure that the side curtains are securely closed.

KRONE swap bodies can be equipped with the following curtain buckles:

- Curtain buckle with latch-type tension lock *(see "5.4.2.1 Curtain buckle with latch-type tension lock", pg. 41)*
- Curtain buckle with anti-tilt tension lock *(see "5.4.2.2 Curtain buckle with anti-tilt tension lock", pg. 42)*
- Curtain buckle with knee lever tension lock *(see "5.4.2.3 Curtain buckle with knee lever tension lock", pg. 42)*
- Direct tensioner *(see "5.4.2.4 Direct tensioner", pg. 43)*

5.4.2.1 Curtain buckle with latch-type tension lock

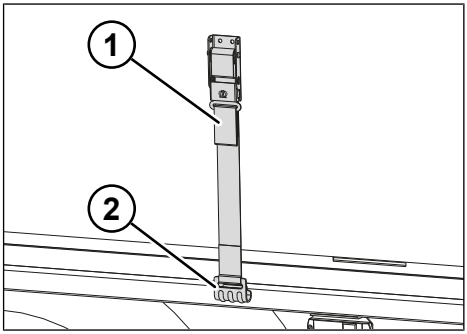


Fig. 5-47: Latch-type curtain buckle

1 Loop
2 Strap hook

Releasing the curtain buckle

► Pull down the locking mechanism on the loop.
► Release the strap hook on the frame.
✓ The curtain buckle is released.

Closing the curtain buckle

► Place the strap hook on the frame.
► Place the strap hook around the lower edge of the curtain.
► Press the lock back into the locked position until it locks into place.
✓ The curtain buckle is closed.

5.4.2.2 Curtain buckle with anti-tilt tension lock

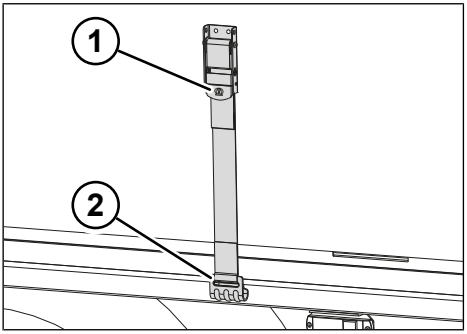


Fig. 5-48: Anti-tilt curtain buckle

1 Anti-tilt device
2 Strap hook

Releasing the curtain buckle

► Press in the anti-tilt device.
► Release the strap hook on the frame.
► Relieve the curtain strap.
✓ The curtain buckle is released.

Closing the curtain buckle

► Place the strap hook on the frame.
► Place the strap hook around the lower edge of the curtain.
► Tighten the belt, if necessary.
► Press the lock back into the locked position until it locks into place.
✓ The curtain buckle is closed.

5.4.2.3 Curtain buckle with knee lever tension lock

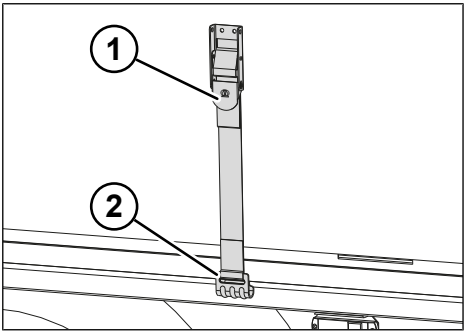


Fig. 5-49: Knee-lever curtain buckle

1 Lock
2 Strap hook

Releasing the curtain buckle

► Completely swing the lock upwards.
► Release the strap hook on the frame.
✓ The curtain buckle is released.

Closing the curtain buckle

► Place the strap hook on the frame.
► Place the strap hook around the lower edge of the curtain.
► Tighten the belt, if necessary.
► Completely swivel the lock over the knee lever point downwards.
✓ The curtain buckle is closed.

5.4.2.4 Direct tensioner

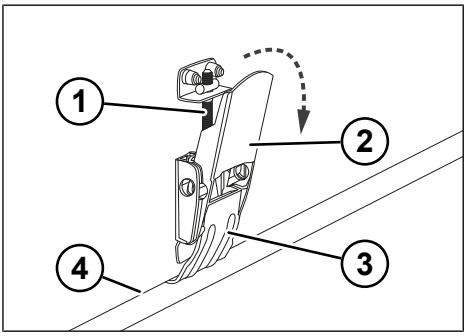


Fig. 5-50: Releasing the direct tensioner

1 Threaded rod
2 Lock
3 Hook
4 Curtain hooking profile

Releasing the direct tensioner

► Pull on the lock and fold it down.
✓ The direct tensioner is released.

Setting the tension on the threaded rod

► Turn the lock to the left.
⇨ The curtain tension decreases.
► Turn the lock to the right.
⇨ The curtain tension increases.

Closing the direct tensioner

► Attach the hook to the curtain hooking profile.
► Fold up the lock and press until it snaps into place.
✓ The direct tensioner is closed.

5.4.3 Curtain cramps

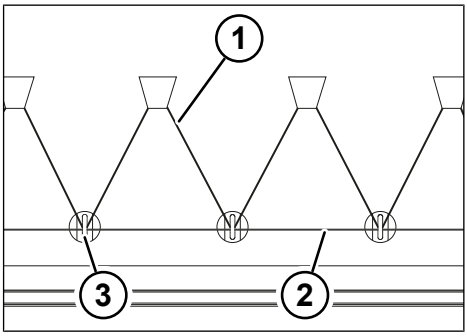


Fig. 5-51: Curtain cramps

1 Rubber expander (optional)
2 Curtain rope
3 Curtain cramp

Opening the side curtain

► Remove the curtain rope.
► Unhook the rubber expander's spring snap, if applicable.
► Remove the rubber expander from the curtain cramp, if applicable.
► Release the side curtain *(see "5.4.5 Rear curtain tensioning device", pg. 45)*.
► Slide open the side curtain.
✓ The side curtain is open.

Closing the side curtain

► Pull the side curtain closed.
► Tension the side curtain.
► Fasten the rubber expander into the curtain cramps, if applicable.
► Hook on the rubber expander's spring snap, if applicable.
► Thread the curtain rope through the curtain cramps.
✓ The side curtain is closed and secured.

5.4.4 Front curtain tensioning device

For quick loading and unloading of partial loads in the front area of the load compartment, it is also possible to open the side

curtain from the front. Before opening, the tension on the side curtain must be released at the rear with the rear curtain tensioning device.

Opening the slide curtain at the front

- ► If necessary, remove the existing curtain rope.
- ► Release the curtain buckle *(see "5.4.2 Curtain buckle", pg. 41)*.
- ► Release the curtain using the rear curtain tensioning device *(see "5.4.5 Rear curtain tensioning device", pg. 45)*.

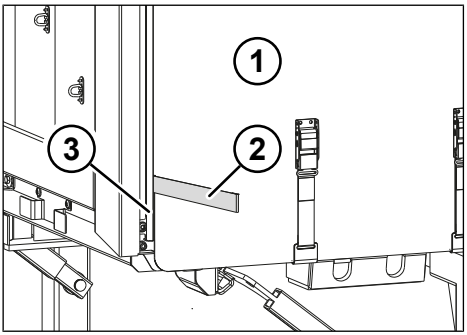


Fig. 5-52: Channel rail

1 Outside of the curtain
2 Curtain handle
3 Channel rail

- ► Lift the channel rail together with the curtain using the curtain handle installed on the channel rail.
- ► Slide the curtain forwards.
  - ⇨ The channel rail is unhooked.
- ► Slide the curtain to the rear.
- ✓ The side curtain is opened at the front.

Closing the side curtain at the front

- ► Slide the curtain forwards.
- ► Lift the channel rail together with the curtain using the curtain handle installed on the channel rail.

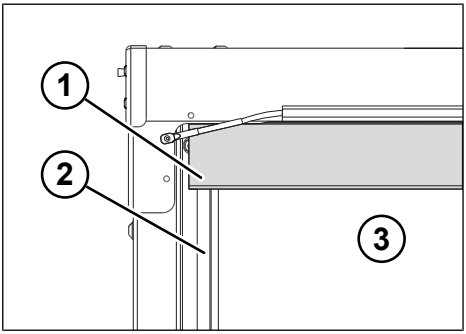


Fig. 5-53: Thread the channel rail

1 Sealing lip
2 Channel rail
3 Outside of the curtain

- ► Guide the curtain at the front below the sealing lip using the channel rail.

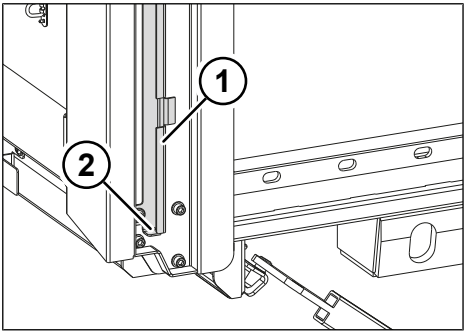


Fig. 5-54: Tension shaft support

1 Profile mount
2 Support

- ► Attach the channel rail to the profile mount.
- ► Lift the channel rail together with the curtain onto the support.
- ► Tighten the curtain using the rear curtain tensioning device *(see "5.4.5 Rear curtain tensioning device", pg. 45)*.
- ► Secure the closed and longitudinally tensioned curtain with the curtain buckles *(see "5.4.2 Curtain buckle", pg. 41)*.

► If necessary, install the curtain rope for the curtain rope bracket.

✓ The side curtain is closed at the front.

5.4.5 Rear curtain tensioning device

Loosening and releasing the rear curtain tensioning device

► If necessary, remove the existing curtain rope.

► Release the curtain buckle *(see "5.4.2 Curtain buckle", pg. 41)*.

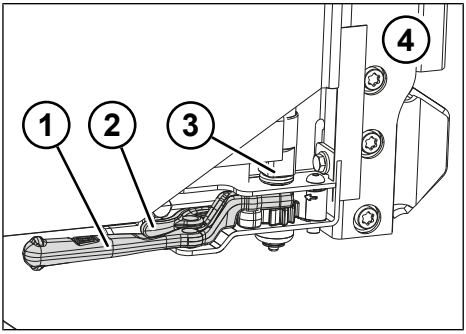


Fig. 5-55: Rear curtain tensioning device

1 Tension ratchet
2 Retainer lever
3 Curtain pole in the tension ratchet
4 Rear gantry

► Press the retainer lever outwards.

► Swivel the tension lever by 90° to the side until the side curtain is released.

► Lift up the curtain pole along with the curtain from the slot holding pins using the curtain loops fitted on the outside of the curtain or on the curtain pole.

NOTE

Incorrect operation may cause material damage!

Do not move the curtain by the loops (outside of the curtain) or by the tension bar. The loops are only used to lift up the curtain pole.

► Pull out the curtain with the curtain pole from the top bracket.

► Pull the curtain forwards.

✓ The side curtain is open at the rear.

Closing and tensioning the side curtain at the rear

► Pull the curtain fully to the rear.

► Insert the curtain pole at the top behind the tension shaft support under the seal.

► Lift up the curtain pole along with the curtain onto the slot holding pins at the bottom using the curtain loops fitted on the outside of the curtain or on the curtain pole.

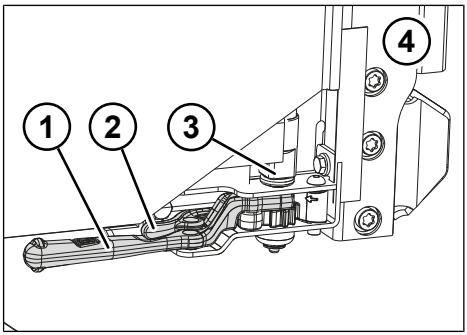


Fig. 5-56: Rear curtain tensioning device

1 Tension ratchet
2 Retainer lever
3 Curtain pole in the tension ratchet
4 Rear gantry

► Move the tension ratchet back and forth without pulling the tension lever outwards.

► As soon as the curtain has reached the required tension, push the tension ratchet back to the locking position.

► Secure the closed and longitudinally tensioned curtain with the curtain buckles *(see "5.4.2 Curtain buckle", pg. 41)*.

✓ The side curtain at the rear is closed and tensioned.

5.4.6 Lateral load compartment limiter

On the sliding curtain superstructure, corner posts and centre posts *(see "5.4.7 Centre posts", pg. 48)* laterally limit the load compartment.

KRONE swap bodies can also be equipped with board walls and/or plug-in laths.

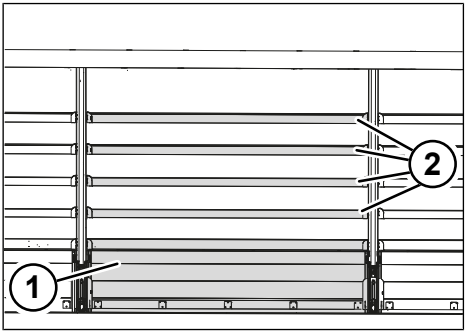


Fig. 5-57: Load compartment limiter with board walls and plug-in laths

1 Board wall
2 Plug-in laths

Plug-in laths

The plug-in laths for reinforcement of the lateral load compartment limiter are inserted into the lath sockets of centre and corner posts.

NOTE

Material damage due to tension in the plug-in laths!

Plug-in laths that are under tension due to the adjacent cargo can damage the superstructure when they are taken out.

► Remove any cargo beforehand if necessary.

Depending on their design, the posts have

- several sets of lath sockets, each for one plug-in lath and/or
- one set of lath sockets above the floor, each for four plug-in laths or three alloy plug-in laths.

Board walls

⚠ WARNING

Risk of accident due to loss of load!

If the board walls are unlocked and unsecured, load falling out while driving can result in personal injury and material damage.

► Check that the board walls are locked before every trip.

⚠ CAUTION

Risk of injury due to the board walls uncontrollably folding down!

Unlocked and unsecured board walls can suddenly fold down and cause personal injury and material damage.

► When unlocking the last lock, hold onto the board wall with one hand.

⚠ CAUTION

Risk of accident when driving with folded-down board walls

Folded-down board walls pose an accident hazard due to excess width and concealed contour markings.

► Do not drive with folded-down board walls.

► Fold down board walls only for loading and unloading.

NOTE

Material damage due to the board wall folding down!

Folding down of the board wall can cause material damage. The board wall can collide with the lever of the rear curtain tensioning device.

► Only fold down the board wall if the lever for the curtain tensioning device is swivelled out.

NOTE

Material damage due to the board wall folding down!

Folding down of the board wall can cause material damage. The board wall can collide with the landing legs.

► Only fold down the board wall if the landing legs are moved to the inner position.

KRONE swap bodies are equipped with several board walls on each side. The board walls each have two locks.

Folding down the board wall

► If necessary, remove the curtain rope and curtain.

► Swivel out the lever for the rear curtain tensioning device *(see "5.4.5 Rear curtain tensioning device", pg. 45)*.

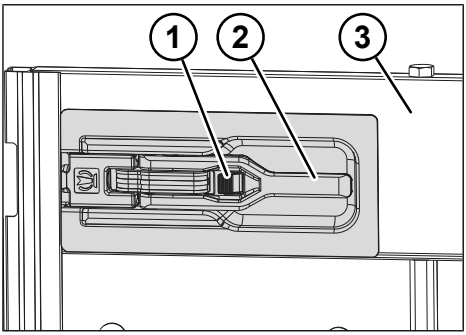


Fig. 5-58: Board wall lock

1 Lock for the board wall lock
2 Lock lever
3 Board wall

► Push in the lock on the board wall lock.

► Position the lock lever so that the locking pin is completely out of its guide groove.

► Hold the board wall.

► Unlock the second lock of the board wall in the same way.

► Partly fold down the board wall.

► Close both locks again.

► Fully fold down the board wall.

✓ The board wall has been folded down.

Closing the board wall

► Swivel up the board wall.

► Snap the locks into place to lock the board wall.

✓ The board wall is closed.

Removing the board wall

⚠ CAUTION

Risk of injury due to improper removal of the board walls!

When they are being removed, the board walls can fall down and injure people and cause material damage.

► Always remove the board wall with the help of a second person.

► Fold the board wall down by approximately 135°.

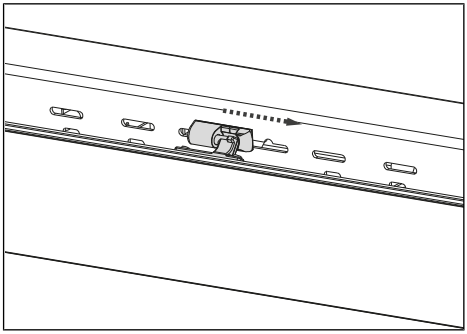


Fig. 5-59: Folding down the board wall

► With a second person, slide off the board wall to the right.

✓ The board wall has been removed.

Inserting the board wall

► With a second person, slide the board wall onto the hinges from the right-hand side.

► Fold up the board wall.

✓ The board wall has been inserted.

5.4.7 Centre posts

⚠ WARNING

Risk of accident from falling loads due to unsecured posts!

Inadequately secured posts can lead to a loss of load and can therefore cause injuries and material damage.

► Lock and secure the posts before travel.

⚠ WARNING

Risk of accident caused by loads pressing against the posts!

The load can fall out when the posts are unlocked. Load falling out can cause injuries and material damage.

► Ensure that no loads are pressing against the posts.

► Unlock the posts with caution.

► Hold the posts when unlocking outside of the swivelling area.

⚠ CAUTION

Risk of injury when closing and locking the centre posts!

There is a crushing hazard when closing and locking the centre posts.

► Wear protective gloves.

► Press the locking lever downwards with the palm of your hand.

► Do not grab the locking lever.

⚠ CAUTION

Risk of injury when opening the locking lever!

The locking levers on the posts are under tension. There is the risk of crushing when opening the locking lever.

► Hold the locking lever with one hand when opening.

NOTE

Improperly positioned posts can cause material damage!

On vehicles with a sliding curtain superstructure, incorrectly positioned or incorrectly plugged in posts can cause damage to the roof frame and curtain while driving.

► Evenly distribute and lock the posts throughout the entire length of the load after the loading procedure. Observe the designated positions for the posts.

KRONE swap bodies can be equipped with several pairs of one of the following sliding post types:

○ Fold-out posts *(see "5.4.7.1 Fold-out posts", pg. 49)*

Preparing to move the centre posts

► Open the curtain.

► Remove any tension chains between the centre posts and the board walls.

► If necessary, fold down the board walls *(see "5.4.6 Lateral load compartment limiter", pg. 46)*.

► If necessary, remove the plug-in laths *(see "5.4.6 Lateral load compartment limiter", pg. 46)*.

✓ The centre posts are prepared for shifting.

Top bearings of sliding posts

The sliding posts are mounted on rollers that run in the continuous external beams of the roof frame.

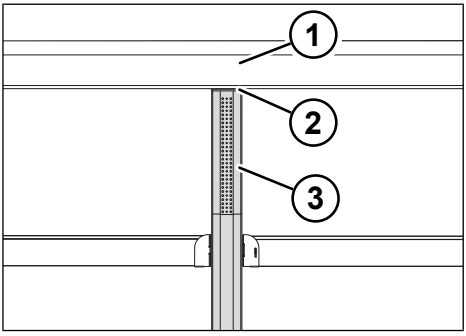


Fig. 5-60: Bearings of sliding posts

1 External beam
2 Bogie truck with rollers
3 Sliding post

5.4.7.1 Fold-out posts

KRONE swap bodies with sliding curtain superstructures are equipped with fold-out posts.

Depending on their design, fold-out posts have

- several sets of lath sockets for plug-in laths, and
- one set of lath sockets above the floor, each for four plug-in laths or three alloy plug-in laths.

Posts without lath sockets are also possible.

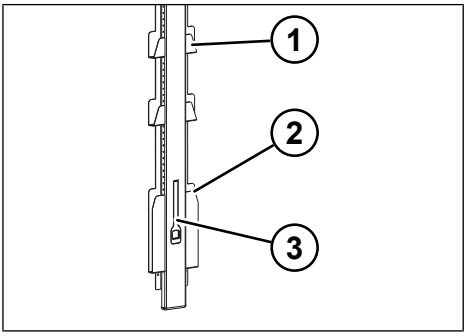


Fig. 5-61: Centre post

1 Flat lath sockets
2 Lath depot
3 Locking lever

Opening the fold-out posts

☑ The centre posts are prepared for sliding *(see "5.4.7 Centre posts", pg. 48)*.

► Pull out the locking lever and completely fold up.

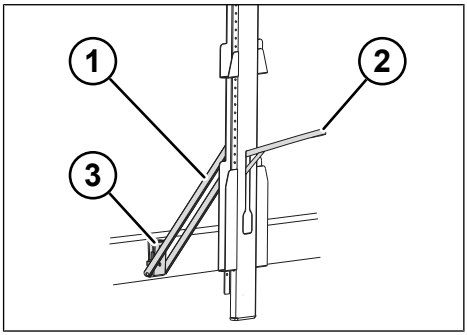


Fig. 5-62: Releasing the one-part fold-out post

1 Fastening bow
2 Locking lever completely folded up
3 Post retainer

► Pull the post away from the vehicle without pulling the fastening bow out of the post retainer on the chassis.

► Lift the fastening bow out of the post retainers.

► Let the post hang freely.

✓ The post is opened and can be moved.

Locking the fold-out posts

► If necessary, slide the post to the post retainer.

► Insert the fastening bow into the post retainers.

► Push back the locking lever to the stop.

✓ The post is locked.

Fold-out posts with pins

Depending on the floor frame version, the folding posts can be equipped with pins.

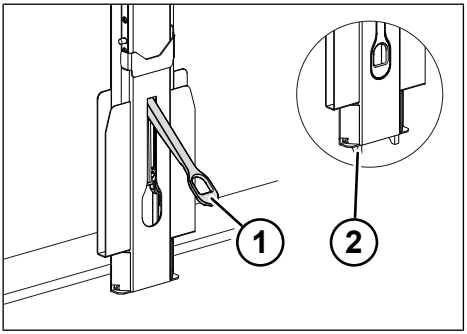


Fig. 5-63: Optional version with folding posts

1 Locking lever
2 Journal

Sliding the fold-out posts with pins

☑ The centre posts are prepared for sliding *(see "5.4.7 Centre posts", pg. 48)*.
► Pull out the locking lever and fold up.
► Pull the post away from the vehicle.
► Let the post hang freely.
✓ The post is opened and can be moved.

Locking the fold-out posts with pins

► If necessary, slide the post to the parking position.
► Push back the locking lever to the stop.
✓ The post is locked.

Fold-out posts with travel height adjustment

KRONE swap bodies with lifting roof and travel height adjustment are equipped with telescopic fold-out posts. A telescopic piece inside the posts adjusts to match the height difference.

NOTE

Material damage due to incorrect height of the fold-out posts!

After adjusting the superstructure height on the corner posts, the roof can bulge or sag and damage the superstructure.

► After adjusting the superstructure height on the corner posts, adjust the height of the telescopic fold-out posts.
► The roof height adjustment may only be plugged in if the front and rear interior height are identical. Canopies with different interior heights at the front and rear (wedge canopies) are special equipment.

INFO

For maximum loading height, open the side curtain and unlock the centre posts.

When temporarily raising the lifting roof at the height-adjustable corner posts, the fold-out posts are extended to adapt to the height differences. Using the plugging unit, the superstructure height can be adjusted in 50-mm increments.

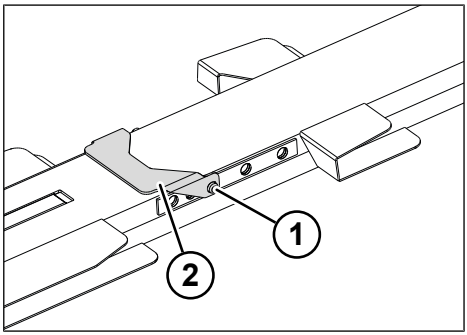


Fig. 5-64: Using the plugging unit

1 Plug-in bolt
2 Plugging unit

☑ The posts are opened.
► Pull out the plug-in bolts.
► Move the plugging unit to the desired position.
► Slide in the plug-in bolts.

► Close the post.
✓ The post heights have been adjusted.

5.5 Full-tarp superstructure

KRONE swap bodies with a full-tarp superstructure have a one-part curtain.

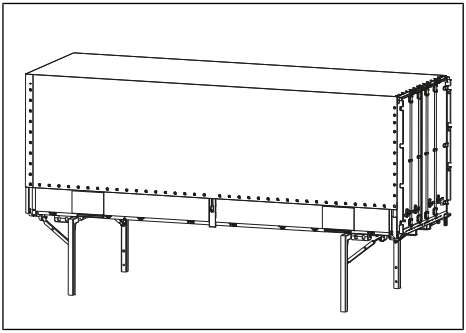


Fig. 5-65: Full-tarp superstructure

Posts limit the load compartment space at the sides on swap flatbeds with a full-tarp superstructure. For the full-tarp design, posts are normally of the fixed type (not movable). Furthermore, aluminium, steel, or wooden plug-in laths can be used to reinforce the lateral load compartment limiter. The swap flatbeds can be equipped with board walls. The roofs are designed to be either sliding or fixed roofs.

Depending on design, the full-tarp can be folded-up simultaneously with the sliding roof, or be rolled-up or folded-up separately on the fixed roof.

5.5.1 Opening and closing the side curtain/rear curtain

⚠ CAUTION

Risk of injury due to unfastened curtain rope ends!

Unfastened curtain rope ends can flap around, injure people, and cause material damage.

► Secure the ends of the curtain ropes after closing the curtain.

There are ring-reinforced curtain eyes for the curtain cramps on the board, rear and front walls. The curtain rope pulled through the curtain cramps fastens the curtain to the vehicle.

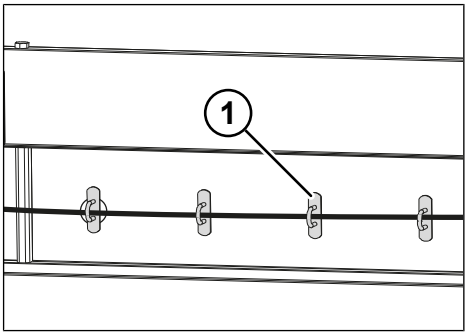


Fig. 5-66: Curtain cramps on the rear wall

1 Curtain cramp

Opening the curtain

► Remove the curtain rope.
► Throw the ends of the curtain rope over the roof.
► Tie the ends of the curtain rope to the curtain.
► Pull up the curtain from the other side of the vehicle with the curtain rope.
► If required, push up the corners of the curtain with a plug-in lath.
✓ The curtain is open.

Closing the curtain

► Let the curtain down.
► Secure the curtain with the curtain rope on all sides.
► Thread the curtain rope ends into the curtain eyes at the rear.
✓ The curtain is closed.

Fastening the curtain rope at the rear

► Thread the curtain rope through the curtain eyes.

► Do not allow the ends of the curtain rope to hang down; rather, thread them back into the curtain cramp.

✓ The rear curtain rope is fastened.

5.5.2 Lateral load compartment limiter

On the full-tarp superstructure, corner posts and centre posts *(see "5.5.3 Centre posts", pg. 54)* limit the load compartment to the sides.

KRONE swap bodies can also be equipped with board walls and/or plug-in laths.

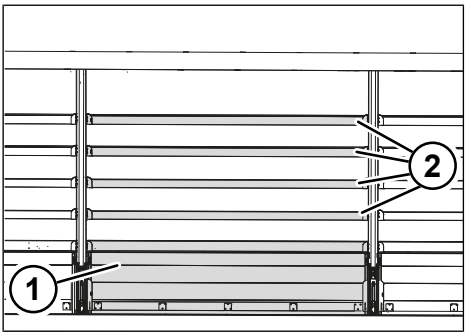


Fig. 5-67: Load compartment limiter with board walls and plug-in laths

1 Board wall
2 Plug-in laths

Plug-in laths

The plug-in laths for reinforcement of the lateral load compartment limiter are inserted into the lath sockets of centre and corner posts.

NOTE

Material damage due to tension in the plug-in laths!

Plug-in laths that are under tension due to the adjacent cargo can damage the superstructure when they are taken out.

► Remove any cargo beforehand if necessary.

Depending on their design, the posts have

- several sets of lath sockets, each for one plug-in lath and/or
- one set of lath sockets above the floor, each for four plug-in laths or three alloy plug-in laths.

Board walls

⚠ WARNING

Risk of accident due to loss of load!

If the board walls are unlocked and unsecured, load falling out while driving can result in personal injury and material damage.

► Check that the board walls are locked before every trip.

⚠ CAUTION

Risk of injury due to the board walls uncontrollably folding down!

Unlocked and unsecured board walls can suddenly fold down and cause personal injury and material damage.

► When unlocking the last lock, hold onto the board wall with one hand.

⚠ CAUTION

Risk of accident when driving with folded-down board walls

Folded-down board walls pose an accident hazard due to excess width and concealed contour markings.

► Do not drive with folded-down board walls.

► Fold down board walls only for loading and unloading.

NOTE

Material damage due to the board wall folding down!

Folding down of the board wall can cause material damage. The board wall can collide with the lever of the rear curtain tensioning device.

► Only fold down the board wall if the lever for the curtain tensioning device is swivelled out.

NOTE

Material damage due to the board wall folding down!

Folding down of the board wall can cause material damage. The board wall can collide with the landing legs.

► Only fold down the board wall if the landing legs are moved to the inner position.

KRONE swap bodies are equipped with several board walls on each side. The board walls each have two locks.

Folding down the board wall

► If necessary, remove the curtain rope and curtain.

► Swivel out the lever for the rear curtain tensioning device *(see "5.4.5 Rear curtain tensioning device", pg. 45)*.

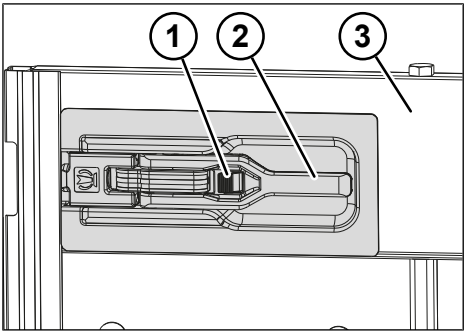


Fig. 5-68: Board wall lock

1 Lock for the board wall lock
2 Lock lever
3 Board wall

► Push in the lock on the board wall lock.

► Position the lock lever so that the locking pin is completely out of its guide groove.

► Hold the board wall.

► Unlock the second lock of the board wall in the same way.

► Partly fold down the board wall.

► Close both locks again.

► Fully fold down the board wall.

✓ The board wall has been folded down.

Closing the board wall

► Swivel up the board wall.

► Snap the locks into place to lock the board wall.

✓ The board wall is closed.

Removing the board wall

⚠ CAUTION

Risk of injury due to improper removal of the board walls!

When they are being removed, the board walls can fall down and injure people and cause material damage.

► Always remove the board wall with the help of a second person.

► Fold the board wall down by approximately 135°.

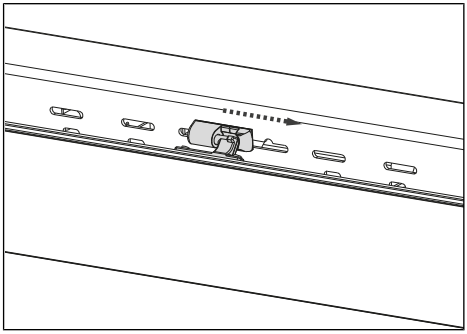


Fig. 5-69: Folding down the board wall

► With a second person, slide off the board wall to the right.

✓ The board wall has been removed.

Inserting the board wall

► With a second person, slide the board wall onto the hinges from the right-hand side.

► Fold up the board wall.

✓ The board wall has been inserted.

5.5.3 Centre posts

⚠ WARNING

Risk of accident from falling loads due to unsecured posts!

Inadequately secured posts can lead to a loss of load and can therefore cause injuries and material damage.

► Lock and secure the posts before travel.

Removing the centre posts can greatly facilitate loading and unloading. The board walls are locked on the centre posts as well as on the corner posts. The plug-in laths are seated in the lath sockets of the posts.

○ KRONE swap bodies can be equipped with several pairs of fold-down posts *(see "5.5.3.1 Fold-down posts", pg. 54)*.

Preparing to remove the centre posts

⚠ CAUTION

Risk of injury due to falling posts!

Posts are held by plug-in laths and/or board walls. If the plug-in laths or board walls are removed, the posts can tip over and cause personal injuries and material damage.

► Ensure that the posts are on firm ground when removing the plug-in laths and folding down the board walls.

► Open the curtain.

► Remove any tension chains between the centre posts and the board walls.

► Fold down the board walls *(see "5.5.2 Lateral load compartment limiter", pg. 52)*.

► Remove the plug-in laths *(see "5.5.2 Lateral load compartment limiter", pg. 52)*.

✓ The centre posts are ready for removal.

5.5.3.1 Fold-down posts

Fold-down posts have several sets of lath sockets for plug-in laths.

Removing fold-down posts

⚠ CAUTION

Risk of injury due to falling posts!

The top part of the post can fall down and injure people and cause material damage when removing the fold-down posts.

► Proceed with the utmost caution when lifting out the posts.

☑ The centre posts are prepared for removal *(see "5.5.3 Centre posts", pg. 54)*.

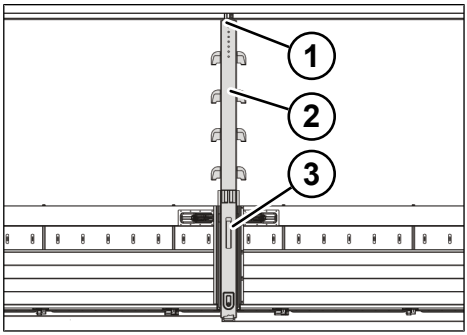


Fig. 5-70: Fold-down post

1 External beam guide
2 Top part of the post
3 Locking lever on the bottom part of the post

► Press down the locks on the locking lever.

► Pull out the locking lever.

- ► Completely fold down the locking lever.
- ► Fold the post away from the vehicle such that the bottom part of the post remains in the post retainer on the chassis.
- ► Release the bottom part of the post from the top part of the post at the joints and continue holding.
  - ⇨ The top part of the post now only hangs on the external beam of the roof frame.
- ► Fold in the locking lever again.

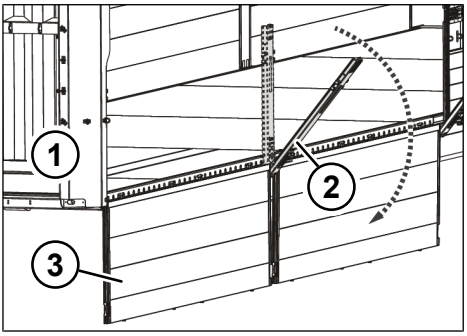


Fig. 5-71: Folded down bottom part of the post

1 Front wall
2 Bottom part of the post
3 Folded down board wall

- ► Fold down the bottom part of the post.
- ► Lift the bottom part of the post out of the post retainer.
- ► Slide the upper part of the post out to the side of the bracket on the external beam of the roof frame.
- ✓ The post has been removed.

Inserting fold-down posts

- ► Slide the top part of the post into the bracket from the side.
- ► Lift the bottom part of the post into the post retainer.
- ► Fold up the locking lever on the bottom part of the post.
- ► Connect the bottom part of the post to the joint with the top part of the post.
- ► Fold in the complete post to the vehicle.
- ► Completely fold the locking lever into the post until the lock on the locking lever engages.
- ✓ The post has been inserted.
- ► Fold up the board walls and lock them.

5.6 Roofs

⚠ WARNING

Risk of accident from objects falling from the roof!

Objects falling from the roof (e.g. tools, snow, ice) can result in accidents with personal injury and material damage.

- ► Do not leave any objects on the roof.
- ► Prior to departure, remove any snow or ice from the roof, if necessary.
- ► When cleaning the roof surface, maintain an adequate safe distance from surrounding people and objects.

NOTE

Material damage from driving with the roof open!

Driving with the roof opened can result in material damage and is prohibited by law.

- ► Close the roof before every trip.

5.6.1 Roof tarp

Depending on the version, the roof tarp can be

- ○ a fixed roof *(see "5.6.3 Fixed roof (full-tarp superstructure)", pg. 56)* or
- ○ be pushed together with the sliding roof, *(see "5.6.2 Sliding roof", pg. 55)*.

5.6.2 Sliding roof

Sliding roofs can be slid together within the superstructure length for crane loading from the rear to almost the front wall. Depending on the design, it is also possible to

slide together from the front wall to the rear. Opening and locking the sliding roofs depends on the specific roof design.

► Please consult the enclosed supplier documentation for information about the superstructure and the operation of the sliding roofs.

Also observe the enclosed supplier documentation.

Moving the sliding roof from the rear to the front wall

► Please consult the enclosed supplier documentation for information about moving the sliding roof from the rear to the front wall.

Also observe the enclosed supplier documentation.

Moving (opening) the sliding roof from the front wall to the rear

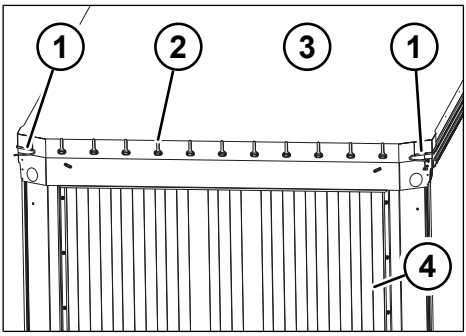


Fig. 5-72: Sliding roof on the front wall side

1 Roof tarp rope
2 Plug lock
3 Roof tarp
4 Front wall

► Unhook the roof tarp rope.
► Open all the plug locks on the roof tarp.
► Fold back the roof tarp at the front.
► Remove the securing rope and, if necessary, the diagonal rope of the sliding roof on the front wall side.
► Using the pull rod, pull back the sliding roof over the canopy lock on the front transverse hoop.
► Fasten the sliding roof to the pull rod so that it does not close again by itself when the trailer is in a slanted position.
✓ The sliding roof is open.

Moving (closing) the sliding roof from the front wall to the rear

► Release the pull rod.
► Pull the sliding roof forward using the pull rod on the front transverse hoop.
► Hook the securing rope and, if necessary, the diagonal rope of the sliding roof on the front wall side.
► Fold down the roof tarp at the front.
► Close all the plug locks on the roof tarp.
► Hook on the roof tarp rope.
► The sliding roof is closed.

5.6.3 Fixed roof (full-tarp superstructure)

⚠ WARNING

Risk of accident from unstable ladders or scaffolding!

Unstable ladders or scaffolding can fall down and cause personal injury and material damage.

► Ensure that the ladders and scaffolding are on stable ground.

Fixed roofs are composed of roof sections attached to each other. The curtain tubes rest on the transverse hoops. The transverse hoops rest on the external beams. Fixed roofs must be dismantled for crane loading/unloading.

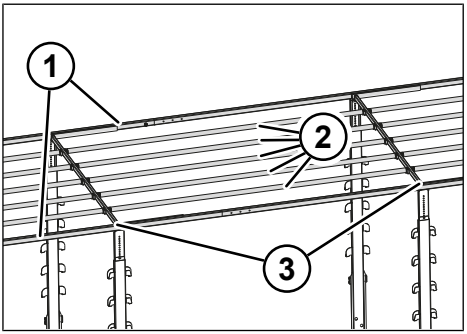


Fig. 5-73: Fixed roof

1 External beams
2 Curtain tubes
3 Transverse hoop

Dismantling of fixed roofs

- ► Release the curtain from the board walls and the rear wall.
- ► Fold up the curtain on the sides and at the rear.
- ► Roll up the curtain.
- ► Remove the curtain tubes.
- ► Remove the transverse hoop.
- ► Remove the external beams.
- ✓ The fixed roof is dismantled.

5.6.4 Lifting roof

⚠ WARNING

Risk of accident when driving with a raised roof!

Driving with a raised roof causes the vehicle to become unstable and exceeds the maximum permitted vehicle height, which can lead to accidents involving personal injury and material damage.

- ► Lower the roof before every trip.

⚠ CAUTION

Risk of accident due to loads on the lifting roof!

Loads (e.g. objects, ice, snow), on the lifting roof can fall down when lifting and lowering, injuring people and causing material damage.

- ► Ensure that there are no loads on the lifting roof before every lifting and lowering operation.

NOTE

Material damage due to insufficient free space above the lifting roof!

Opening the lifting roof without sufficient free space above it can result in material damage to the vehicle superstructure.

- ► Ensure that there is sufficient free space above the lifting roof before every lifting and lowering operation.

NOTE

Material damage due to unopened doors and curtain tensioning devices!

Operating the roof lift or adjusting the superstructure **without** first opening the doors and all curtain tensioning devices can result in material damage to the superstructure, external beam, and curtain.

- ► Open all curtain tensioning devices (curtain buckles, front/rear curtain tensioning devices) before every lifting and lowering operation.
- ► Fully open the doors before every lifting and lowering operation.

Also observe the enclosed supplier documentation.

Lifting roofs facilitate the loading and unloading. The roof can be lifted separately at the front and the rear.

Depending on the equipment, the swap body can have double tension bolts. The tension bolts mark the two possible ride heights at which the swap body can be set.

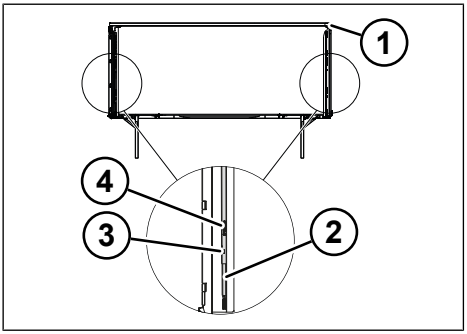


Fig. 5-74: Lifting roof

1 Gantry beam with double tension bolts
2 Hand lever
3 Trigger lever
4 Superstructure height adjustment

Raising the lifting roof

► Open the curtain tensioning device at the front and rear *(see "5.4.4 Front curtain tensioning device", pg. 43) (see "5.4.5 Rear curtain tensioning device", pg. 45)*.
► Open the doors.
► If applicable, fasten the doors with the Door Fix *(see "5.2.2 Door stop", pg. 30)*.
► Fully slide the side curtain to the side.
► Take out the plug-in laths.
► Hold the hand lever by the handle and pull it out of the lock against the spring pressure.
► Pull the hand lever towards your body.
⇨ The lifting roof will be raised.
► By pumping with the hand levers, raise the roof to the desired position.
► Swivel the hand lever back and lay it loosely in the U-profile.
✓ The lifting roof is raised.

Lowering the lifting roof

► Fold up the gantry beam.
► Swivel back the hand lever and close it until it engages.
⇨ The lifting roof is automatically lowered.
✓ The lifting roof is lowered.

Suspending the lowering procedure

If the hand lever has to be completely closed during the loading process while the roof is lifted, the trigger lever can suspend the lowering procedure until the next time it is opened.

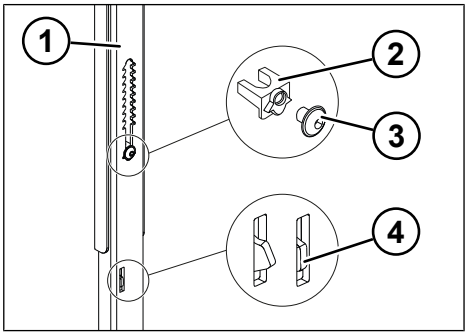


Fig. 5-75: Hand lever

1 Hand lever
2 Locking block
3 Screw
4 Trigger lever

☑ The lifting roof is raised.
► Actuate the trigger lever.
► Swivel back the hand lever and close it until it engages.
✓ The lowering procedure is suspended.

Resuming the lowering procedure

► Open the hand lever.
► Raise the lifting roof by at least one stroke. **NOTE! Be sure to perform the stroke before the hand lever is closed again. Otherwise, the mechanics can get jammed.**
✓ The lowering procedure will be performed.

Operating the superstructure height adjustment

INFO
Observe the legally permitted total height for the superstructure height adjustment.

Depending on the version, the superstructure height at the front can be adjusted in increments from 50 mm to 100 mm. Depending on the version, the superstructure height at the rear can be adjusted in increments of 50 mm.

☑ The doors are open.

☑ The side curtain is open.

► Open the hand lever.

► Raise the lifting roof by at least 150 mm.

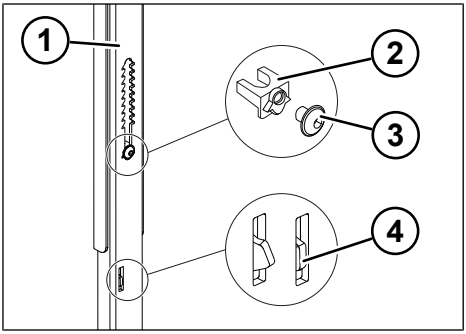


Fig. 5-76: Hand lever

1 Hand lever
2 Locking block
3 Screw
4 Trigger lever

► Loosen the screw.

► Press the locking block in and slide it to the desired position in the rail.

► Tighten the screw hand-tight.

► Swivel back the hand lever and close it until it engages.

► Tighten the screw.

► Adjust the height of the centre posts *(see "5.4.7.1 Fold-out posts", pg. 49)*.

⇨ The centre posts have been adjusted to the superstructure height.

► Lower the lifting roof.

✓ The superstructure height has been adjusted.

5.7 Power supply

⚠ WARNING
Risk of injury from electric shock!
Damaged cables and plug connections can cause electric shocks.
► Do not use any bandages or adhesive tape to repair defective cables or plugs.
► Work on electric cables may only be carried out by specialists.
► In the event of any damage, immediately consult a specialist workshop.

The swap body does not have its own power source. For the internal lighting, the swap body must be supplied with power through a cable. The socket is located at the bottom rear.

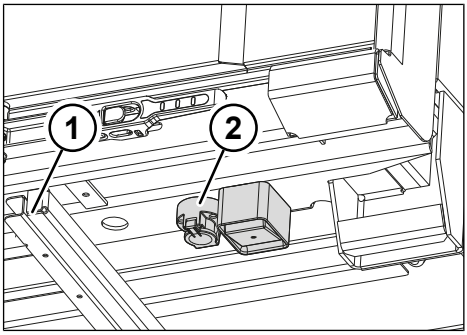


Fig. 5-77: Socket

1 Folding telescopic ladder
2 Socket

5.8 Internal lighting

KRONE box body superstructures be equipped with ceiling lights, loading lamps or both for the internal lighting. The light

switch is located on the transverse beam beside the folding telescopic ladder. The socket for the power supply is beside the switch.

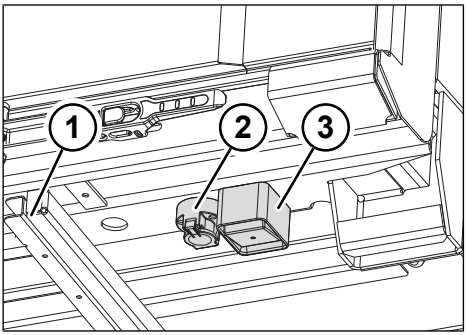


Fig. 5-78: Internal lighting switch

1 Folding telescopic ladder
2 Socket
3 Internal lighting switch

Switching on the internal lighting

► Press the switch.

✓ The internal lighting is switched on.

Switching off the internal lighting

► Press the switch.

✓ The internal lighting is switched off.

5.9 Stacking and unstacking swap bodies

⚠ WARNING

Risk of accidents caused by not complying with operation instructions of the carrier vehicle!

Lack of knowledge of how to handle the carrier vehicle when stacking and unstacking the swap body can cause serious accidents.

► Familiarise yourself with the operating instructions of the carrier vehicle, and in particular with the safety information in them.

⚠ WARNING

Risk of accidents caused by driving an overloaded carrier vehicle!

An overloaded carrier vehicle can tip over and cause serious accidents as well as material damage to the carrier vehicle.

► Ensure that the cargo is evenly distributed.

► Comply with the permissible values for the total weight and the axle and drawbar loads of the carrier vehicle as stated on the vehicle documents.

► Comply with the valid national and international regulations applicable in the country of use and adhere to them.

⚠ WARNING

Risk of accidents caused by exceeding the maximum payload of the swap body! An overloaded swap body can fall over when parked and can cause serious accidents. Overloading can cause material damage to the swap body.

► You will find information on the maximum payload of the swap body on the type plate. The maximum load is the product of permitted total weight minus the tare weight.

5.9.1 Stacking the swap body

⚠ WARNING

Risk of accident caused by incorrectly stacking the swap body!

If stacked incorrectly, the swap body could fall over and cause serious personal injury or material damage.

► While stacking the swap body, secure the carrier vehicle against rolling away.

► Ensure that no persons are in the danger zone when stacking the swap body.

⚠ WARNING

Risk of accident caused by incorrectly locking and securing the swap bodies!

While driving, swap bodies that have been inadequately locked and secured can tip off their carrier vehicles, causing fatal injuries to other road users.

- ► Do not exceed the legally permitted heights.
- ► Before each trip, after stacking the swap body, check that all locks and retainers are properly secured. Information concerning operating the locking mechanisms can be found in the operating instructions for the carrier vehicle.

⚠ WARNING

Risk of accidents from locking and securing the landing legs incorrectly!

While driving, improperly locked and secured landing legs can slide out of their retainer guides, endangering other road users, possibly causing serious injuries, including death.

- ► Before every trip, ensure that all landing legs are properly locked in place and doubly secured.

NOTE

Material damage by manoeuvring with folded out landing legs!

When manoeuvring with folded out landing legs, the landing legs could hit the ground or obstacles and thereby damage the swap body and the carrier vehicle.

- ► Fold in the landing legs on the swap body before manoeuvring.

- ► Observe the operating instructions for the carrier vehicle.
- ☑ The carrier vehicle is prepared for loading.
- ☑ The longitudinal stop is prepared for loading.
- ☑ The trunnion for the (container) locks on the carrier vehicle are lowered.
- ☑ The swap body is standing on the landing legs *(see "5.1 Landing legs", pg. 21)*. If applicable, lift the swap body from the ground and fold out the landing legs *(see "" pg. 23)*.
- ► Drive the carrier vehicle under the swap body. Use the guiding aids on the carrier vehicle.
- ► Put the swap body down on the carrier vehicle and secure it.
- ► Fold in landing legs *(see "" pg. 21)*.
- ✓ The swap body is stacked.

5.9.2 Unstacking the swap body

⚠ WARNING

Risk of accident caused by incorrectly unstacking the swap body!

If unstacked incorrectly, the swap body could fall over and cause serious personal injury or material damage.

- ► While unstacking the swap body, secure the carrier vehicle against rolling away.
- ► Ensure that no persons are in the danger zone when unstacking the swap body.
- ► Only unstack the swap body on suitable and designated surfaces.
- ► Only unstack the swap body on a flat, load-bearing surface.
- ► Never unstack a swap body with defective or missing landing legs.

⚠ WARNING

Risk of accidents from locking and securing the landing legs incorrectly!

Landing legs that are not or insufficiently secured can collapse during unstacking. As a result, the swap body could fall over and cause serious personal injury or material damage.

► Before unstacking, unfold all landing legs and adjust the telescopic landing leg feet to the same parking height.

NOTE

Material damage caused by an unsuitable parking location!

Parking the swap body in an unsuitable parking location can lead to material damage to the swap body and operational malfunctions due to lack of space and bad lighting.

► Park swap bodies in a space that is at least 10,000 mm (26 ft) long, 3,000 mm (8 ft) wide, and 4,500 mm (15 ft) high.

► The area of the parking space should be lit with an illumination strength of 300 lx - 500 lx at a height of one metre (3 ft) over the ground of the parking space.

► Observe the operating instructions for the carrier vehicle.

☑ The carrier vehicle is prepared for unstacking.

► Fold out landing legs *(see "" pg. 23)*.

► Release the locking mechanisms and retainers on the carrier vehicle.

► Slowly pull the carrier vehicle with the tractor unit from under the swap body.

✓ The swap body is unstacked.

5.9.3 Supporting plates

KRONE swap bodies can be equipped with supporting plates. Supporting plates are used as an underlay for the landing legs.

⚠ WARNING

Risk of accident caused by incorrectly unstacking the swap body!

If unstacked incorrectly, the swap body could fall over and cause serious personal injury or material damage.

► While unstacking the swap body, secure the carrier vehicle against rolling away.

► Ensure that no persons are in the danger zone when unstacking the swap body.

► Only unstack the swap body on suitable and designated surfaces.

► Only unstack the swap body on a flat, load-bearing surface.

► Never unstack a swap body with defective or missing landing legs.

⚠ WARNING

Risk of accident from falling supporting plates!

Supporting plates that are not properly secured can fall out while driving and cause accidents.

► Drive only with properly locked and secured supporting plates.

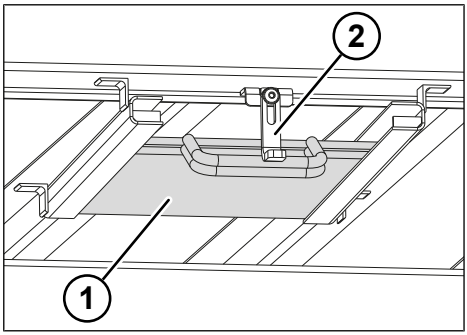


Fig. 5-79: Supporting plates

1 Supporting plate
2 Retainer plate

Taking out the supporting plates

- ► Slide the retainer plate upwards and then to the side.
- ► Take out the supporting plate.
- ✓ The supporting plate has been taken out.

Stowing the supporting plate

- ► Slide in the supporting plate.
- ► Slide the retainer plate to the side and then downwards.
- ✓ The supporting plates are closed, locked and secured.

Using the supporting plates as an underlay

- ► Take out the supporting plate.
- ► Place the supporting plate centred under the landing leg.
- ► Repeat for all of the landing legs.
- ✓ The supporting plates are placed under the landing legs.

5.10 Crane transport

Inspection before transport

- ► Ensure that the swap body is in proper and operationally safe condition.
- ► Check the corner protections and connection for damage.
- ► If applicable, check the gripper edges for damage.
- ► Ensure that the swap body is evenly loaded.
- ► Ensure that the load is properly secured.
- ► Observe the CSC plate on the swap body. The swap body must be suitable for loading with a crane. The maximum stack load specified on the CSC plate may not be exceeded *(see "1.3 Product identification and type plate", pg. 7)*.

Lifting

Swap bodies may only be lifted by the top corner protections, the marked gripper surfaces or using crane gear *(see "5.10.1 Marked gripper surfaces", pg. 64)*. The hoisting vehicles and cranes must be equipped with the corresponding standardised crane gear. Picking up by one side or by the front wall is not permitted.

- ► Fasten the crane on the upper corner protections of the swap body.
  - ⇨ or
- ► Fasten the crane on the marked gripper surfaces of the swap body.
  - ⇨ or
- ► Fasten the crane on the lower corner protections.
- ► Lift the swap body.
- ✓ The swap body has been lifted with the crane.

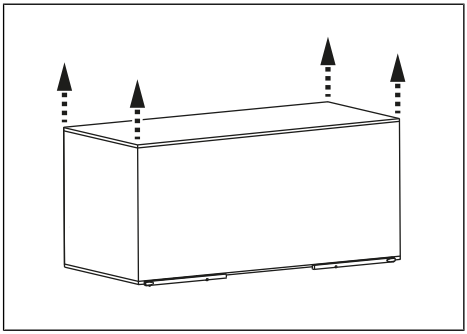


Fig. 5-80: Lifting the swap body

Lowering

- ► Slowly lower the swap body onto level and load-bearing ground or onto a carrier vehicle. **NOTE! Do not slide the swap body over the ground.**
- ► Remove the crane gear or crane.
- ✓ The swap body is set down.

5.10.1 Marked gripper surfaces

⚠ WARNING

Risk of accident due to damaged or defective gripper surfaces!

The swap body could tip over while being loaded with the crane and could cause serious personal injury as well as material damage.

- ► Before loading with a crane, always make sure that the gripper surfaces are in good working condition.
- ► Decommission any swap bodies with safety-relevant malfunctions and damage as soon as possible.
- ► Have defective or damaged components replaced immediately.

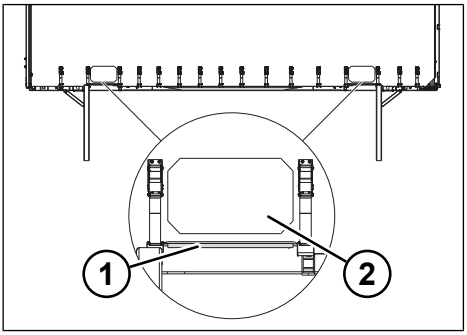


Fig. 5-81: Marked gripper surfaces

1 Marked gripper surface
2 Protective plate

KRONE swap bodies are equipped with marked gripper surfaces for loading with a crane. Swap bodies with a sliding curtain also have protective plates to prevent damage to the tarpaulin.

5.10.2 Stacking swap bodies

Stackable swap bodies can be stacked for storage.

- ○ Only stack swap bodies that have the same stacking device.
- ○ Ensure that the swap body is in proper and operationally safe condition.
- ○ Do not open the rear gantry on stacked swap bodies.
- ○ Fold in all of the landing legs on the swap body.
- ○ Observe the CSC plate on the swap body. The swap body must be suitable for stacking. The maximum stack load specified on the CSC plate may not be exceeded *(see "1.3 Product identification and type plate", pg. 7)*.
- ○ Comply with the standard regulations for stacking swap bodies, e.g. block stacking.

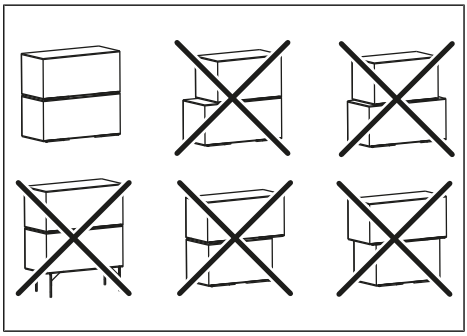


Fig. 5-82: Stacking swap bodies

5.11 Forklift transport

Inspection before transport

- ► Ensure that the swap body is in proper and operationally safe condition.
- ► Check the forklift pockets for damage.
- ► Ensure that the swap body is evenly loaded.
- ► Ensure that the load is properly secured.
- ► Use forks with a minimum length of 1825 mm.
- ► Use swap bodies with a length of more than 7820 mm only for empty handling (unloaded swap bodies).
- ► Use forklift pockets that are spaced by less than 2000 mm only for empty handling (unloaded swap bodies).

Lifting

- ► Pick up the swap bodies with a forklift by the forklift pockets and drive under it completely.
- ► Lift the swap body.
- ✓ The swap body is lifted.

Lowering

- ► Only set down the swap body on a level, load-bearing ground. **NOTE! Do not slide the swap body over the ground.**
- ► Drive the forklift away from the swap body.
- ✓ The swap body is unstacked.

5.11.1 Forklift pockets

⚠ WARNING

Risk of accidents caused by improper forklift loading.

Improper loading of the forklift can cause the HUB to tip over, causing personal injury as well as material damage.

- ► Before loading any forklift, make sure that the forklift pockets are in good working condition.
- ► For forklift loading, only use forklift types that are suitable for the specific loading process. The maximum weight of the swap body is given on the type plate.
- ► Only load with a forklift with a second person as a guide.

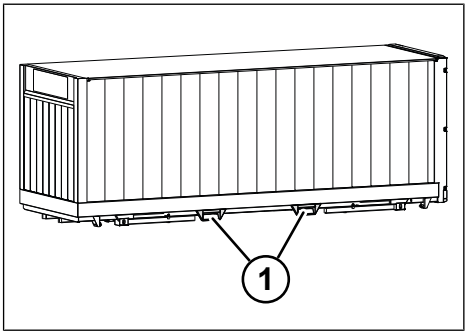


Fig. 5-83: Forklift pockets

1 Forklift pockets

For loading with a forklift, there are forklift pockets under the frame of the swap body. The forks can be inserted and lifted below the swap body from either side.

6 Loading and securing

⚠ WARNING

Risk of accident caused by incorrect loading and unloading!

Incorrect loading and unloading of the load can result in accidents with personal injury and material damage.

- ► Park the carrier vehicle or the unloaded swap body on firm ground.
- ► Secure the carrier vehicle against rolling away.
- ► Load and unload the swap body such that traffic hazards are ruled out.
- ► When unloading, pay attention to the height in thoroughfares, halls, or similar as the carrier vehicle could rebound.
- ► Secure the cargo through correct load distribution, form-fitting and lashing down.

⚠ WARNING

Risk of accident caused by incorrect load securing and weight distribution!

When loading and unloading, incorrect load securing and uneven weight distribution can result in personal injury and material damage.

- ► Keep the centre of gravity of the load as low as possible. The centre of gravity must lie on the swap body's longitudinal centre line.
- ► Ensure that the load is evenly distributed.
- ► Do not exceed the legally permissible values for total weight as well as axle loads and drawbar loads.
- ► Comply with current national and international regulations on load securing.

⚠ WARNING

Risk of accident caused by sliding and tipping loads!

When driving, the slipping or tipping of the load can result in personal injury and material damage.

- ► Secure the load with suitable means to prevent it from sliding and tipping.

⚠ WARNING

Risk of tipping due to overturning swap body

There is a risk of tipping when driving with a forklift onto the swap body on central axle trailers.

- ► Drive the swap body towards the ramp.
- ► Fold down the landing legs of the swap body and secure them.
- ► Completely vent the air spring bellows of the central axle trailer.

  ⇨ or:
- ► Drive the swap body towards the ramp.
- ► Support the central axle trailer with two landing leg winches at the front and rear respectively. Supporting with the folding, height-adjustable rear braces is not sufficient.

NOTE

Material damage due to unsuitable load securing elements!

Use of unsuitable load securing elements can cause material damage to the swap body and the cargo.

- ► Check the load securing elements for suitability and compatibility with the load securing rails / keyhole rails.
- ► Also observe the manufacturer documentation.

INFO

All KRONE swap bodies are prepared for certification according to EN 12642 Code XL.

The required securing is partially achieved through friction between the load and the load compartment. A rough load on a rough load compartment reduces the need for additional securing equipment.

However, even with high friction values, securing the load is essential. When driving, trailers and the load can start vibrating, which reduces or eliminates the friction.

General information concerning load securing is provided in the following.

► Comply with additional current national and international regulations on load securing.

6.1 Lashing material

⚠ CAUTION

Risk of accident caused by incorrect use of straps!

When the cargo shifts while driving, e.g. due to vibrations, strapping can lose its tension and become loose. Incorrect securing of the load can result in accidents with personal injury and material damage.

► Use down-lashing for the suitable transported goods.

NOTE

Material damage caused by incorrect use of straps!

Incorrect use of lashing belts, chains or wire ropes can result in material damage to the cargo and the vehicle.

► Only load lashing equipment and lashing points at the maximum permitted values.

► Immediately replace defective or damaged straps.

► Have repairs on straps carried out by qualified staff.

► Never tension straps and ratchets over sharp edges.

► Do not use straps to lift cargo.

► Do not place any cargo on the straps.

► Do not twist or knot the straps.

► Do not use ratchet extensions, except on heavy-duty ratchets designed for this purpose.

NOTE

Material damage caused by uneven tension force!

If the load is strapped down unevenly and/or the lashing down is done with large clamping forces, this can result in material damage.

► Ensure that the pre-tension force is evenly distributed on both sides of the load.

► Apply the ratchets on alternate sides when using tie-down lashing.

► For pressure-sensitive cargo (e.g. beverage crates) that cannot be subjected to high securing forces, use large-sized angular rails. This allows higher pre-tension forces to be applied without damaging the cargo.

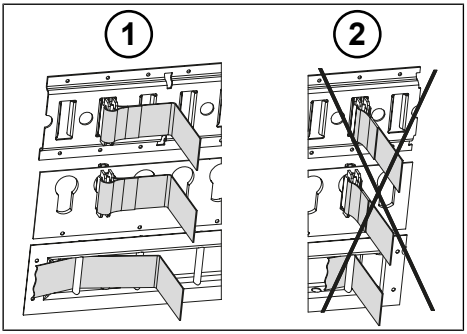


Fig. 6-1: Using tension straps

1 Correctly attached tension straps
2 Incorrectly attached tension straps

Tie-down lashing, angular lashing, and diagonal lashing can be achieved with lashing material such as lashing belts, lashing chains, and lashing cables.

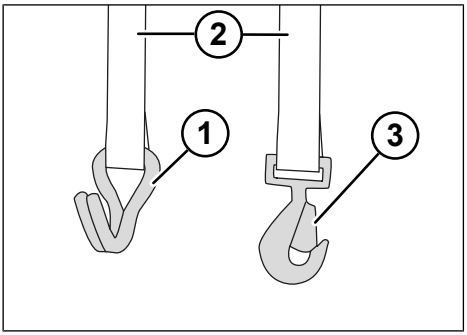


Fig. 6-2: Lashing material

1 Wire hook
2 Lashing belts
3 Load hook

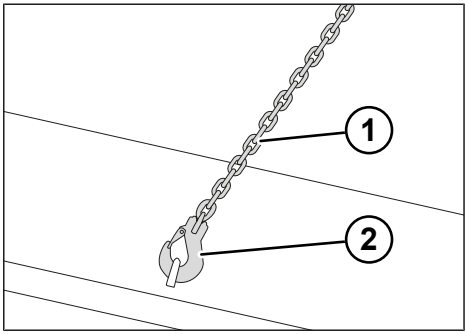


Fig. 6-3: Lashing chain with load hook

1 Lashing chain
2 Load hook

Wire hooks, load hooks, and flat hooks can be used to fasten the straps.

With tie-down lashing, the securing effect is achieved by increasing the pressure against the load compartment. Angled and diagonal lashing prevents non-stable loads from tipping over.

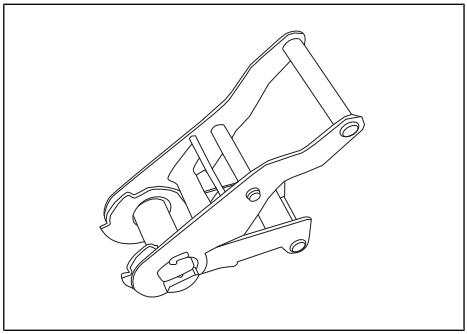


Fig. 6-4: Strap ratchet

The straps are tensioned using suitable clamping devices, such as strap ratchets or lashing strap winches.

Lashing down the load

► Attach the hooks on the lashing belts or lashing chains to the opening on the lashing rail or lashing points.

► Move the lashing belts to the desired position and stretch them.

► Tighten the lashing belts.

✓ The load is lashed down.

6.2 Ensuring form-fitting

NOTE

Material damage caused by empty spaces in the cargo area!

Empty spaces between parts of the cargo can result in material damage to the load while driving.

► Eliminate any empty space towards the cargo space limiters.

► Eliminate any empty space between individual pieces of cargo.

► Comply with the permissible axle load when eliminating empty spaces.

► Fill empty spaces for example with wooden pallets, storage pads or air cushions.

► Fill stowage gaps in the middle with packs of wood chip for example.

► Secure the load, e.g. by lashing it down.

Flush loading and form-fitting makes load securing easier. Form-fitting load securing means that the load fills the space between the load compartment limiters at the front, side, and rear wall.

The cargo can also be supported using telescopic lock rods or telescopic lock bars that are hooked into the load securing rail *(see "6.6 Load securing rail", pg. 71)*. Plug-in laths can also be hooked into the post sockets for load securing.

6.3 Securing pallets with hoop casings and shrink-wrap

Fastening hoops and plastic foil shrink-wrap of load items placed on pallets are not intended for load securing. They only fasten the load onto or with the pallet.

► Secure the load with hoop casings and shrink-wrap on pallets against sliding, e.g. by lashing it down *(see "6.1 Lashing material", pg. 67)*.

6.4 Additional aids

Other aids for load securing are, e.g.:

- Anti-slip mats, to create the highest possible friction between the load and the load compartment (the contact between the load and the load compartment must be raised),
- Rectangular pieces of wood can be used for support (wider side as a contact surface),
- Clamping planks and
- Partition wall locks.

6.5 Lashing possibilities

KRONE swap bodies can be equipped with lashing rings, lashing rods and lashing brackets. They are used to fasten the lashing equipment.

The lashing points on the front wall can each be loaded with 1,000 daN (~kg). The lashing points on the floor can each be loaded with 2,000 daN (~kg).

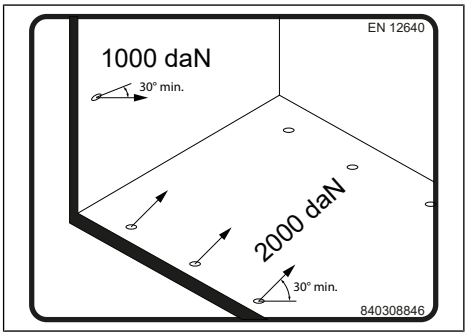


Fig. 6-5: Lashing points EN 12640

Lashing rings, lashing rods

Depending on the equipment, the lashing rings can be recessed in the wall (scouring strip) or embedded in the floor.

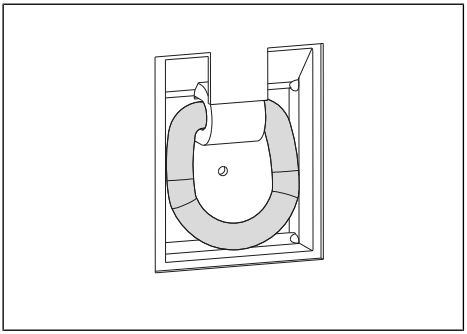


Fig. 6-6: Lashing ring

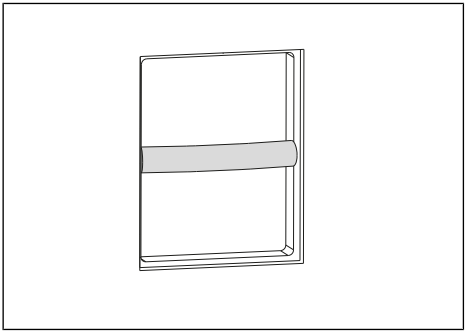


Fig. 6-7: Lashing rod

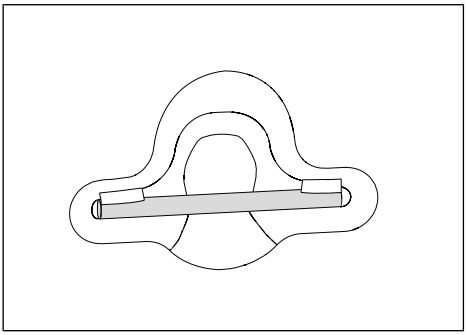


Fig. 6-8: Lashing rod

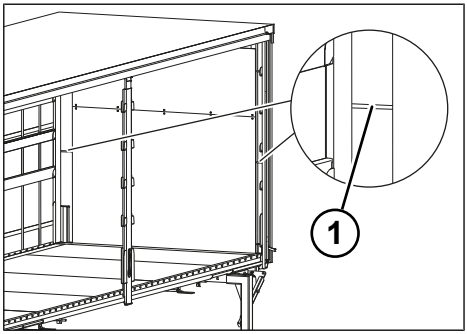


Fig. 6-9: Lashing rods on the front wall

1 Rod

Lashing bracket

The lashing brackets can be attached to the inside of the side wall.

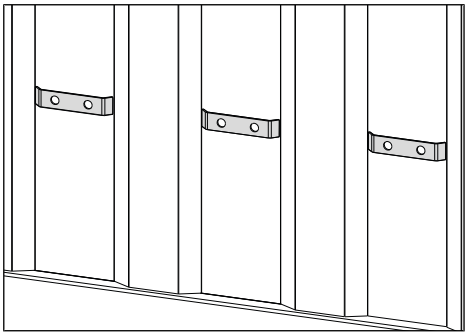


Fig. 6-10: Lashing bracket

6.6 Load securing rail

Load securing rails are used to attach tension straps, locking rods, and locking bars.

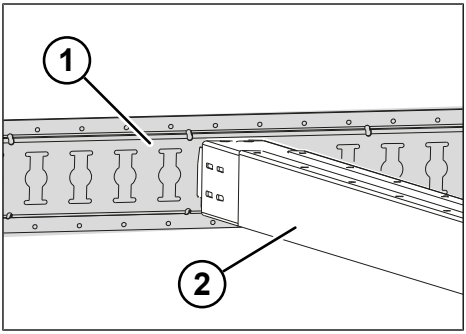


Fig. 6-11: Load securing rails with locking bars

1 Load securing rail
2 Locking bars

6.7 Pallet stop

KRONE swap flatbeds can be equipped with a pallet stop. The protruding edge makes loading pallets easier. The lashing holes are distributed along the whole length of the vehicle at 150-mm intervals.

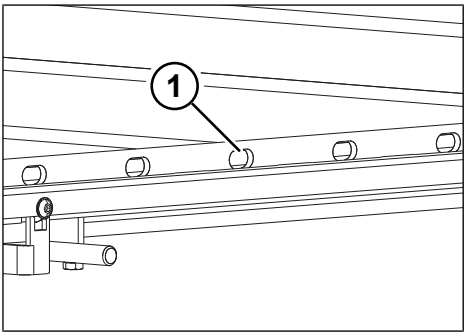


Fig. 6-12: Pallet stop

1 Lashing hole

6.8 Keyhole plates

Keyhole rails can be equipped for load securing. Keyhole rails are used to attach locking rods, locking bars, clothes rails, strap nets, and tension straps *(see "6.12 Clothes rails", pg. 74)*.

The lashing holes on the keyhole rails can each be loaded with 200 daN (~kg). With three or four lashing points, the lashing holes can be loaded with 500 daN, whereby a minimum distance of 480 mm must be maintained.

INFO

Clean the space behind the keyhole rails without water on a regular basis.

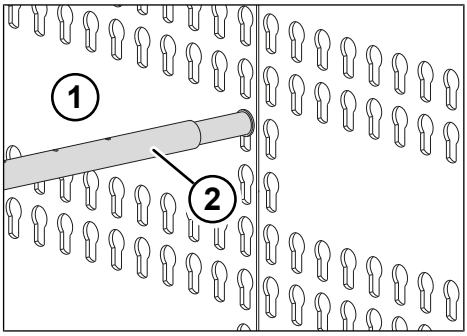


Fig. 6-13: Locking rod keyhole rail

1 Keyhole rail
2 Locking rod

6.9 Locking rods

⚠ CAUTION

Risk of accident due to overloading!

The maximum load is specified on the bearing elements.

► Never exceed the maximum load.

NOTE

Material damage due to unsuitable load securing elements!

Use of unsuitable load securing elements can cause material damage to the swap body and the cargo.

► Check the load securing elements for suitability and compatibility with the load securing rails / keyhole rails.

► Also observe the manufacturer documentation.

The load is secured against sliding with locking rods. The locking rods are equipped with spring-loaded sliding blocks and are attached at the required position on the load securing rails *(see "6.6 Load securing rail", pg. 71)*.

Combination lashing rail

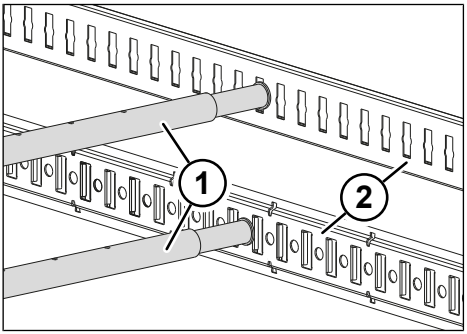


Fig. 6-14: Locking rods combination lashing rail

1 Locking rods
2 Load securing rail

Inserting the locking rod

► Insert the locking rod in the desired position of the load securing rail.
► Push the locking rod together and insert in the opposite side of the load securing rail.
✓ The locking rod has been inserted.

Removing the locking rod

► Push the locking rod together and pull it out of the load securing rail on the opposite side.
► Remove the locking rod.
► Store the locking rod safely.
✓ The locking rod has been removed and safely stored.

Rod lashing rail

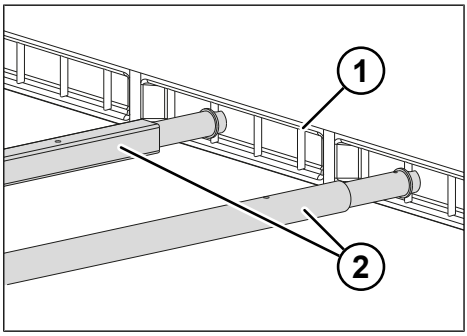


Fig. 6-15: Locking rods rod lashing rail

1 Rod lashing rail (load securing rail)
2 Locking rods

Inserting the locking rod

► Insert the locking rod in the desired position on the rods of the load securing rail.
► Push the locking rod together and insert it in the rods of the load securing rail in the opposite position.
✓ The locking rod has been inserted.

Removing the locking rod

► Push the locking rod together and pull it out of the load securing rail on the opposite side.
► Remove the locking rod.
► Safely store the locking rod
✓ The locking rod has been removed and safely stored.

Depending on the end piece, the locking rods can also be inserted in the keyhole rails *(see "6.8 Keyhole plates", pg. 71)*.

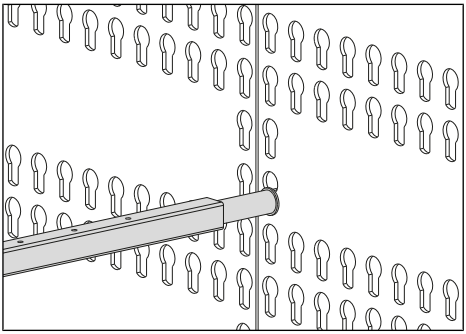


Fig. 6-16: Locking rod in the keyhole rail

Inserting the locking rod

- ► Insert the locking rod in the desired position of the keyhole rail.
- ► Push the locking rod down on one side.
- ► Insert the locking rod in the opposite position of the keyhole rail.
- ► Push the locking rod down on one side.
- ✓ The locking rod has been inserted and secured against twisting.

Removing the locking rod

- ► Push the locking rod upwards.
- ► Pull the locking rod out of the keyhole rail on the opposite side.
- ► Remove the locking rod.
- ► Store the locking rod safely.
- ✓ The locking rod has been removed.

6.10 Locking bars

The load is secured against sliding with locking bars. The locking bars are inserted in the required position in the load securing rail *(see "6.6 Load securing rail", pg. 71)*.

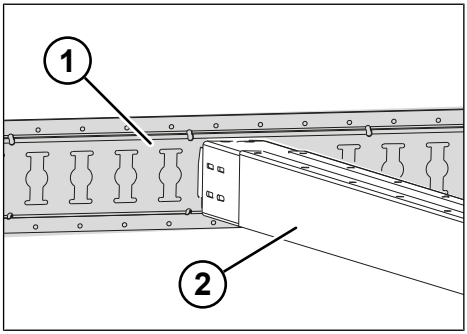


Fig. 6-17: Locking bars

1 Load securing rail
2 Locking bars

⚠ CAUTION

Risk of accident due to overloading!

The maximum load is specified on the bearing elements.

- ► Never exceed the maximum load.

Inserting the locking bar

- ► Insert one side of the locking bar in the desired position in the load securing rail.
- ► Insert the locking bar in the opposite position in the load securing rail.
- ✓ The locking bar has been inserted.

Removing the locking bar

- ► Lift up the retainer lever.
- ► Remove the locking bar.
- ► Store the locking bar safely.
- ✓ The locking bar has been removed.

6.11 Clamping rails

As an option, KRONE swap bodies can be equipped with clamping rails.

Clamping rails enable division of the load compartment and positive-locking load securing. Depending on the version, they can be equipped with two rubber feet, two pins or with one rubber foot and a pin. The pins can be inserted in a load securing rail *(see "6.6 Load securing rail", pg. 71)* in the roof and/or in the floor.

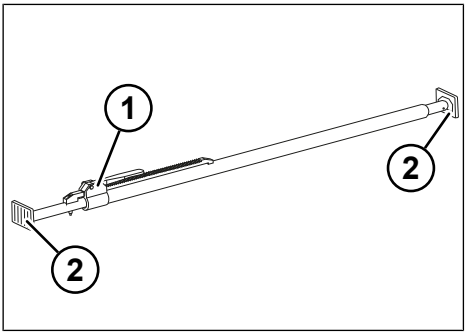


Fig. 6-18: Clamping rail

1 Ratchet
2 Rubber foot

Inserting the clamping rail

► Place the clamping rail in the desired position in the load compartment.
► If applicable, insert the pins for the clamping rail in the desired position of the load securing rail.
► Extend the clamping rail and tension it with the ratchet.
✓ The clamping rail has been inserted.

Removing the clamping rail

► Release the ratchet and push the clamping rail together.
► If applicable, pull the pins of the clamping rail out of the load securing rail.
► Store the clamping rail safely.
✓ The clamping rail has been removed.

6.12 Clothes rails

For the transport of clothing, clothes rails are inserted in the side walls with keyhole rails.

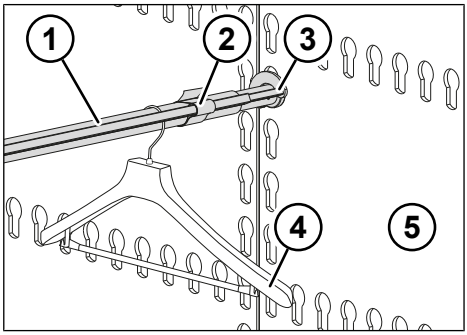


Fig. 6-19: Clothes rails

1 Clothes rail
2 Velcro strap
3 Retainer bow
4 Clothes hanger
5 Keyhole rails

Inserting the clothes rails

► Insert the clothes rails with the spring-loaded side in the desired position of the keyhole rail.
► Pull on the clothes rail and push it down to lock it.
► Insert the clothes rail at the same height in the opening of the keyhole rail on the opposite side.
► Pull on the clothes rail and push it down to lock it.
► Remove the Velcro straps and fold down the retainer bow.
► Hang up the clothes hangers.
► Fold down the retainer bow and secure with the Velcro straps.
✓ The clothes rail has been inserted and the clothes hangers have been secured.

Removing the clothes rails

► Remove the Velcro straps and fold down the retainer bow.

► Remove the clothes hangers.
► Fold down the retainer bow and secure with the Velcro straps.
► Pull on the clothes rail and push it up to remove it from the opening in the keyhole rail on both sides.
✓ The clothes rail has been removed.

Clothes rails that are not required can be stored in the clothes rail depot. The depot can positioned on the side horizontally or vertically as well as under the roof.

Storing the clothes rails in the depot

► Push the clothes rails into the depot on top of each other.
✓ The clothes rails are stored in the depot.

Removing the clothes rails from the depot

► Remove the clothes rails.
✓ The clothes rails have been removed.

6.13 Strap net

⚠ CAUTION

Risk of accident due to overloading!

The maximum load is specified on the bearing elements.

► Never exceed the maximum load.

Strap nets ensure positive-locking load securing for small load units *(see "6.2 Ensuring form-fitting", pg. 69)*. They also enable division of the load compartment. A strap net is hooked into the keyhole rails or in the load securing rail on the right and left. They can be equipped with hooks or a rod for this purpose. Depending on the manufacturer, the strap nets can bear different loads or have different sizes.

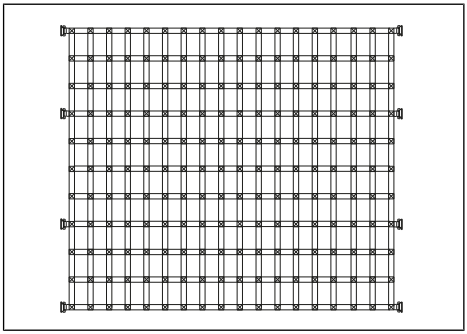


Fig. 6-20: Strap net with hooks

6.14 Using the Multi Safe system

The Multi Safe system includes various load securing systems with which KRONE swap bodies can be equipped. Information on the Multi Safe systems will be provided below.

6.14.1 Using the Multi-Lock external frame

KRONE swap bodies are equipped with a Multi Lock external frame with universal load security possibilities. The lashing holes are distributed along the whole length of the vehicle at 100-mm intervals.

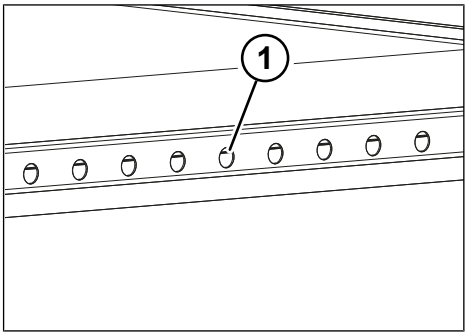


Fig. 6-21: Multilock external frame

1 Lashing hole

Other load securing systems can be fastened in the Multi Lock external frame, e.g. Multi Block or Multi Wall.

6.14.2 Using the Multi Block system

KRONE swap bodies can be equipped with the Multi Block load securing system as an option.

The Multi Block system can be used to lash down the load to prevent the load from slipping in the longitudinal direction. The Multi Block load securing system consists of a Multi Block beam with lashing holes and two plug-in brackets with square profiles.

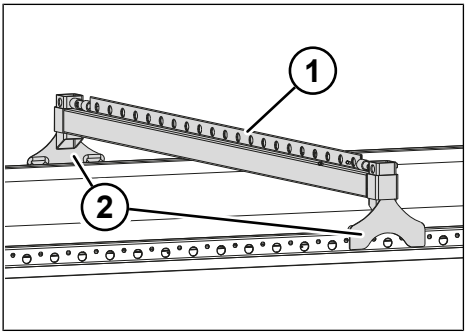


Fig. 6-22: Multi Block beam

1 Multi Block beam with lashing holes
2 Plug-in brackets with square tubes

The Multi Block beams are positioned across the direction of travel, they are placed into the square profiles of the plug-in brackets and secured in place using retainer bolts.

The plug-in brackets can be variably fastened to the Multi Lock external frame using two fastening hooks each *(see "6.14.1 Using the Multi-Lock external frame", pg. 75)*.

Locking position

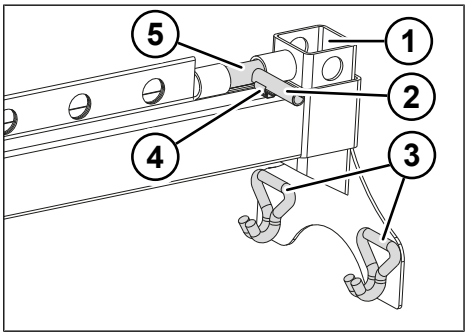


Fig. 6-23: Multi Block beam lock

1 Plug-in bracket
2 Locking lever
3 Fastening hooks
4 Clamping bracket
5 Retainer bolt

In the locking position, the retainer bolt is located in the hole in the square profile. The locking lever is found on the clamping bracket. It locks the Multi Block beam.

Inserting the Multi Block system

- ► Tilt the plug-in bracket towards the vehicle floor.
- ► Guide the fastening hooks into the lashing holes of the Multi Lock external frame *(see "6.14.1 Using the Multi-Lock external frame", pg. 75)*.
- ► Insert the second plug-in bracket in the same hole position on the other side of the vehicle.

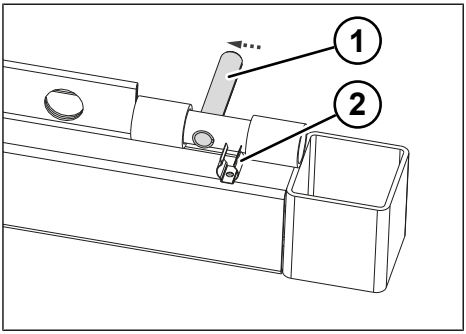


Fig. 6-24: Pulling out the locking lever

1 Locking lever
2 Clamping bracket

► Pull the locking lever from the clamping bracket.
► Push the retainer bolt completely in towards the centre of the Multi Block beam.
► Insert the Multi Block beam into the square profiles of the plug-in brackets.
► Move the retainer bolt to the lock position.
► Press the locking lever into the clamping bracket.
✓ The Multi Block system has been inserted.

Removing the Multi Block system

► Release the locking lever.
► Remove the Multi Block beam.
► Remove the plug-in brackets from the Multi Lock external frame.
✓ The Multi Block system has been removed.

6.14.3 Using the Multi Wall system

KRONE swap bodies can be equipped with the Multi Wall load securing system. The Multi Wall system can be used as a load compartment partition transverse to the direction of travel.

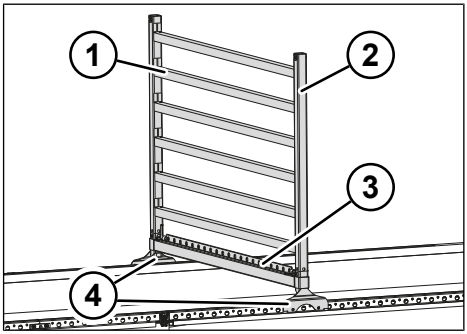


Fig. 6-25: Multi Wall

1 Multi Wall transverse beam
2 Multi Wall support
3 Multi Block beams
4 Plug-in brackets with square tubes

The Multi Wall system prevents the load from sliding in the direction of travel. It can be fastened to the Multilock external frame *(see "6.14.1 Using the Multi-Lock external frame", pg. 75)*.

Inserting the Multi Wall system

► Insert the Multi Block system *(see "6.14.2 Using the Multi Block system", pg. 76)*.

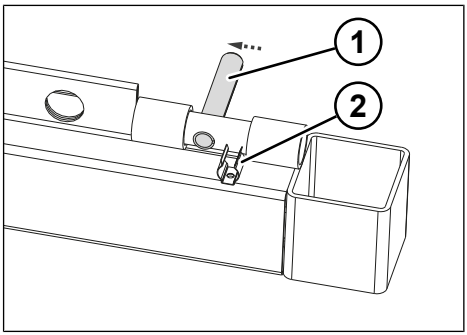


Fig. 6-26: Pulling out the locking lever

1 Locking lever
2 Clamping bracket

► Pull the locking lever out of the clamping bracket of the Multi Block beam.

- ► Push the retainer bolt completely in towards the centre of the Multi Block beam.
- ► Insert the Multi Wall support into the square profiles of the plug-in brackets.
- ► Move the retainer bolt to the lock position.
- ► Press the locking lever into the clamping bracket.
- ► Install the second Multi Wall support in the same way.

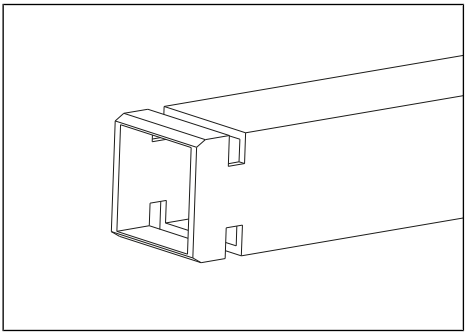


Fig. 6-27: Recesses on the Multi Wall transverse beam

- ► Insert the Multi Wall transverse beam with the recesses into the square openings of the Multi Wall support and fasten.
- ► Press down the transverse beam until the retainer plates of the supports grip into the recesses of the transverse beams.
- ► Additionally secure the Multi Wall system with diagonal lashing.
- ✓ The Multi Wall system has been inserted.

Removing the Multi Wall system

- ► Remove the diagonal lashing.
- ► Remove the Multi Wall transverse beam.
- ► Move the locking lever to the release position.
- ► Remove the Multi Wall supports from the plug-in bracket.
- ► Slide the retainer bolt out of the middle of the Multi Block beam and release it.
- ► Press the locking lever on the clamping bracket of the Multi Block beam.
- ► Stow the Multi Wall supports and the Multi Wall transverse beam.
- ► Remove the Multi Block system *(see "6.14.2 Using the Multi Block system", pg. 76)*.
- ✓ The Multi Wall system is removed.

6.15 Vario Lock system

KRONE swap bodies can be equipped with the Vario Lock load securing system.

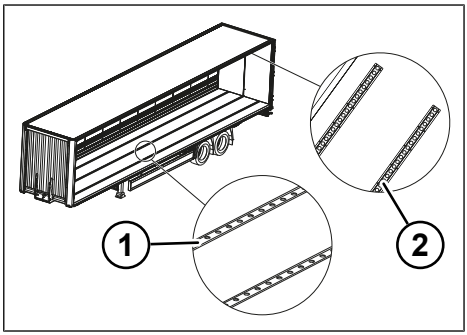


Fig. 6-28: Vario Lock system

1 Perforated rails in the floor
2 Perforated rails in the roof (view from the inside)

The Vario Lock system consists of several perforated rails. They are embedded in the floor and attached to the inside of the roof panel.

Locking bars can be inserted vertically between the perforated rails, which prevent sliding of the load.

This ensures that flower wheeled containers can be transported securely and safely, amongst other things.

6.16 Folding second loading level

⚠ CAUTION

Risk of accident when operating the second loading level!

Improper operation of the second loading level can cause the tables to fold down uncontrollably and injure people as well as damage the cargo. When operating the tables, there is the risk of injury from crushing or pinching fingers.

- ► Before loading with a forklift, fold up the tables.
- ► After folding up the tables, engage the locking mechanism.
- ► Insert the landing leg feet properly in the lock in the floor.
- ► Observe the permitted load of max. 400 kg/m².
- ► Wear protective gloves.

Depending on the equipment, KRONE box body superstructures can be equipped with a second folding loading level. This loading level consists of folding tables, which can be folded down on both sides if necessary to create a second loading level in the load compartment.

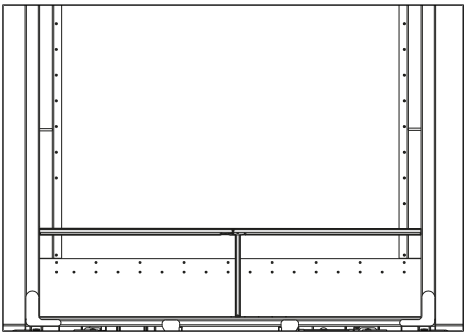


Fig. 6-29: Second loading level

Depending on the equipment, the tables are secured with a spring catch or fall protection.

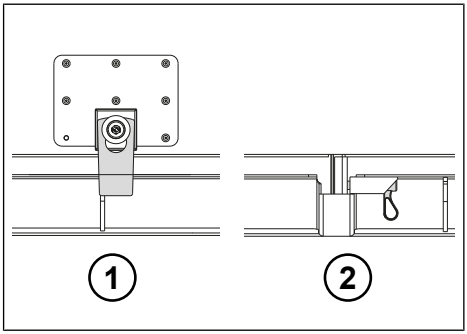


Fig. 6-30: Lock

1 Fall protection
2 Spring catch

The landing leg feet are locked in the floor of the load compartment. In doing so, pay attention to the correct position of the landing leg feet:

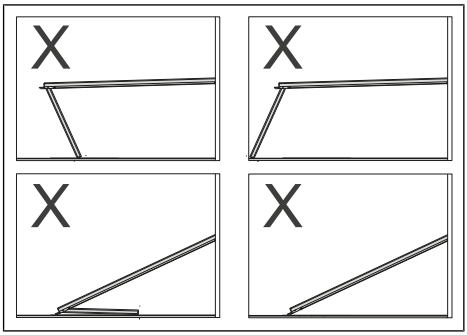


Fig. 6-31: Incorrectly positioned landing leg foot

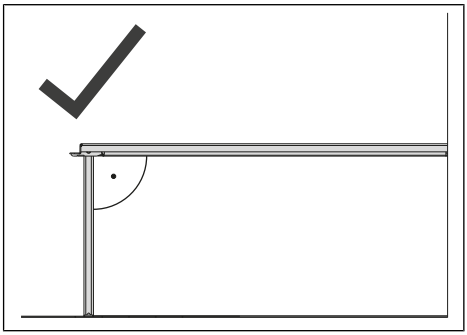


Fig. 6-32: Correctly positioned landing leg foot

The permitted load on the second loading level is 400 kg/m².

Folding down the second loading level

☑ Fold down the tables individually from the front wall towards the rear gantry.

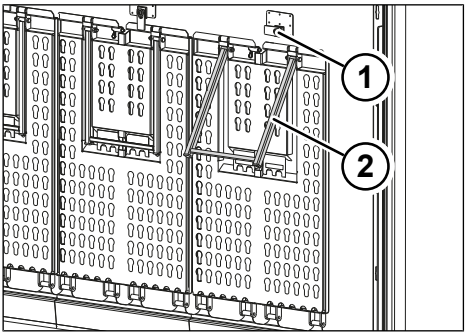


Fig. 6-33: Releasing the landing leg foot

1 Fall protection
2 Landing leg foot

► Release the landing leg foot.
► Release the fall protection / spring catch *(see "Fig. 6-30: Lock", pg. 79)*.
► Fold down the table with the landing leg foot.

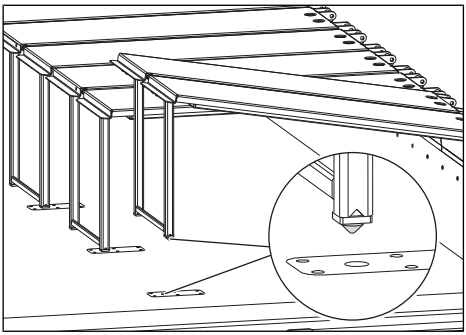


Fig. 6-34: Landing leg foot positioning aid

► Properly lock the landing leg foot in the floor. Pay attention to the correct position of the landing leg foot *(see "Fig. 6-32: Correctly positioned landing leg foot", pg. 79)*.
► Release the fall protection / spring catch of the opposite table.

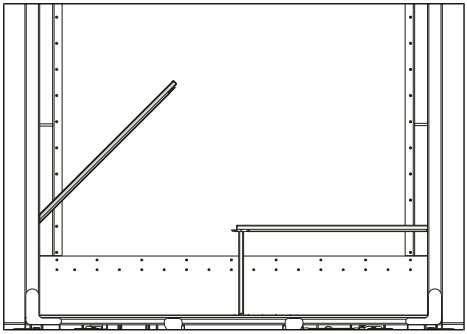


Fig. 6-35: Folding down the table without the landing leg foot

► Fold down the table.
⇨ The table is resting on the table that is already folded down.
► Repeat the steps for all tables.
✓ The second loading level in folded down.

Folding up the tables

► Fold up the table without the landing leg foot. In doing so, pay attention to small parts on the table that could damage the outer wall when folding up.
► Lock the table with the fall protection / spring catch.**CAUTION! Risk of crushing! Wear protective gloves.**
► Repeat the steps for all tables without landing leg foot.
► Fold up the table with the landing leg foot.
► Lock the table with the fall protection / spring catch.**CAUTION! Risk of crushing! Wear protective gloves.**
► Fasten the landing leg foot on the table.
► Repeat the steps for all tables with landing leg foot.
✓ The second loading level in folded up.

6.17 Double-deck loading

KRONE double-deck swap boxes are equipped with vertical double-deck rails, which enable better use of the existing load compartment volume thanks to multi-deck loading and the loading of twice as many pallets (full capacity).

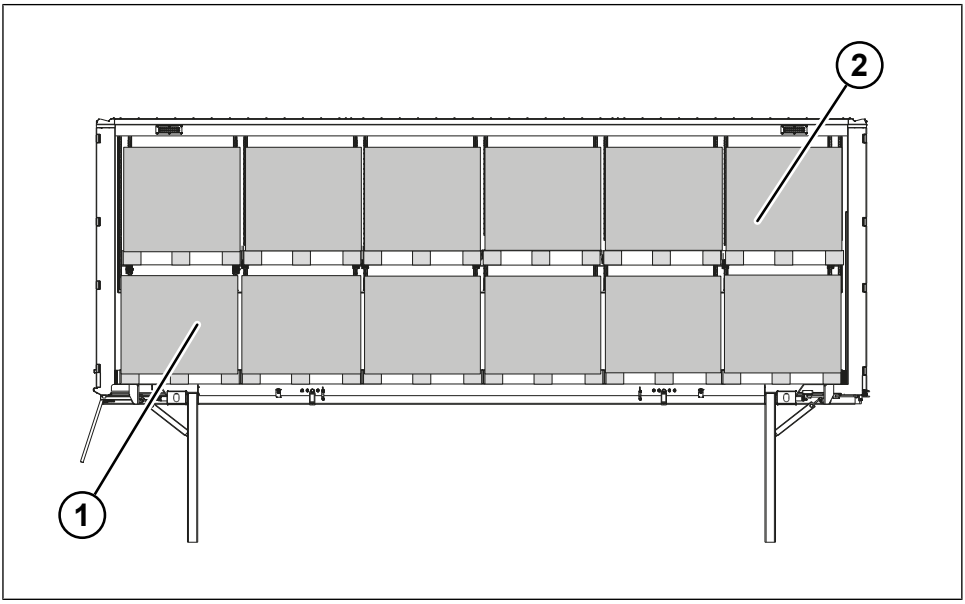


Fig. 6-36: Double-deck superstructure

1 First loading level
2 Second loading level

The double-deck superstructure consists of:

- vertical double-deck rails
- support beams (see sticker on the support beam for the working load capacity)
- and a control bar

Depending on the version, the control bar can be embedded in the rear double-deck rail or hooked on. The number of double-deck rails and support beams depends on the vehicle length and the size of the pallets.

Loading instructions:

- ► Do not lash cargo that is on the second loading level to the floor.
- ► A maximum of 50 % of the total payload may be transported on the second loading level. When loading higher, proportionally less load is allowed on the second loading level.
- ► Load heavy pallets on the first loading level and light pallets on the second loading level.
- ► Always start loading at the front wall with positive-locking.
- ► Use support beams, locking bars or lashing belts to secure the load towards the rear.
- ► Put every row of pallets on two support beams. It is not permitted for two rows of pallets to share one support beam.

- ► A stepped arrangement of the support beams in pairs prevents the pallets from sliding on the second loading level and supports load securing.
- ► Only load the support beams when they are aligned horizontally. There are orientation marks in the double-deck rails to help position the support beams horizontally.
- ► Follow the load distribution instructions.

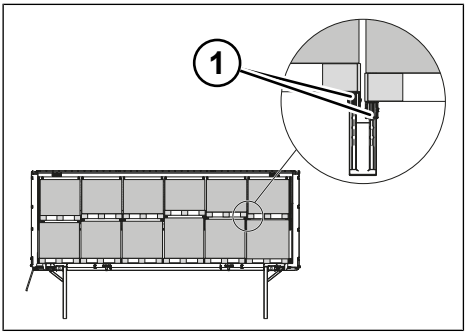


Fig. 6-37: Stepped arrangement of the support beams

1 Support beam

The following load capacities may not be exceeded on the second level:

Bearing element	Max. load capacity
per pallet	660 kg
per support beam	1,000 kg
per double-deck rail pair on the left and right	See sticker on the loading beam
Total second loading level	7,000 kg

Inserting support beams

⚠ CAUTION

Risk of accident due to support beams falling down

Support beams falling down can cause personal injury as well as material damage.

- ► Insert the support beams carefully.
- ► Do not allow the support beams to fall.
- ► Do not stand under the support beam when making adjustments.
- ► Wear safety shoes.

NOTE

Incorrect operation may cause material damage!

Operate the support beam only by hand or with the unlocking rod.

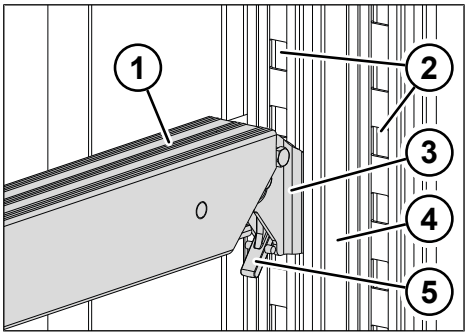


Fig. 6-38: Bearing element

1 Support beam
2 Hole pattern
3 Guide block
4 Vertical double-deck rail
5 Unlocking

There is a notch in the double-deck rail to insert the support beam in the double-deck rail.

- ► Position the support beam at the desired height.

- ► Actuate the unlocking mechanism and allow the guide piece to engage in the hole. If it is too high up, use the operating rod if necessary.
- ► Insert the other end of the support beam at the same height in the same way in the opposite double-deck rail.
- ► Repeat the steps for all other support beams.
- ✓ The support beams have been inserted.

Removing the support beams

- ► Actuate the unlocking mechanism and unhook the guide.
- ► Take the support beam out of the double-deck rail.
- ► Take out the other end of the support beam in the same way.
- ► Repeat the steps for all other support beams.
- ✓ The support beams have been removed.

Adjusting the height of the support beams

- ► Actuate the unlocking mechanism and unhook the guide.
- ► Slide the support beam to the desired hole height.
- ► Actuate the unlocking mechanism and allow the guide piece to engage in the hole.
- ► Insert the other end of the support beam at the same height in the same way in the opposite double-deck rail.
- ► Repeat the steps for all other support beams as required.
- ✓ The heights of the support beams have been adjusted.

Support beam storage

During the loading procedure or when the support beams are not needed, they can be pushed under the ceiling (e.g. for loading tall pallet carts or similar). First ensure that all pallet retainers are swivelled down.

With double-deck support beams in the topmost parking position, the function of the air guide tarp can be limited. The minimum permissible distance between the support beam and the ceiling is indicated by measure A and depends on the type of tarp. Do not position the support beams higher, otherwise the air guide tarp is pressed in and cooling can no longer be ensured.

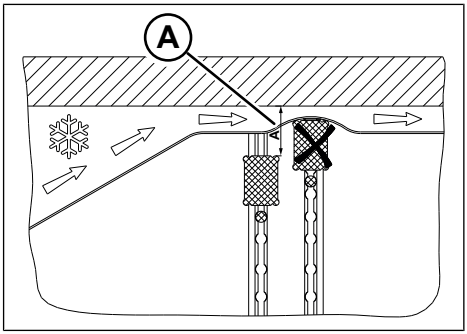


Fig. 6-39: Support beam in parking position

A Round tarp: 250 mm distance
Flat tarp: 100 mm distance

Unlocking rod

The unlocking rod can be used to adjust the height. After use, it is hooked into one of the double-deck rails.

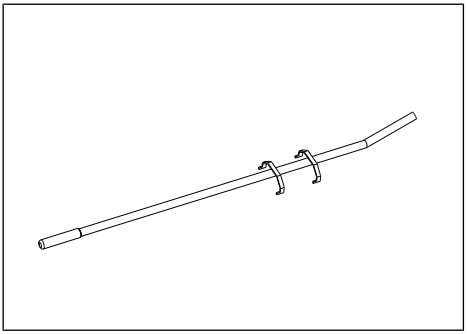


Fig. 6-40: Unlocking rod

Operating the pallet retainer

The pallet retainer on the support beam prevents the pallets from slipping. Depending on the equipment, different types of retainers can be installed.

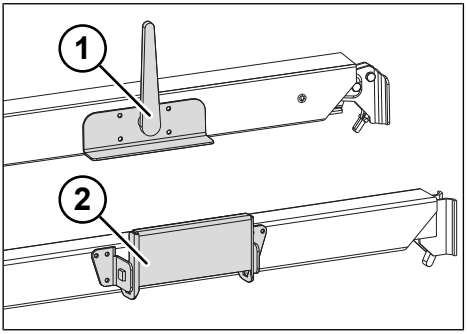


Fig. 6-41: Pallet retainer

1 Catch 1
2 Catch 2

Swivelling up the pallet retainer (Catch 1)

► Pull the retainer forwards.
► Swivel the retainer upwards.
✓ The retainer has been swivelled up.

Swivelling down the pallet retainer (Catch 1)

► Pull the retainer forwards.
► Swivel the retainer down.
► The retainer has been swivelled down.

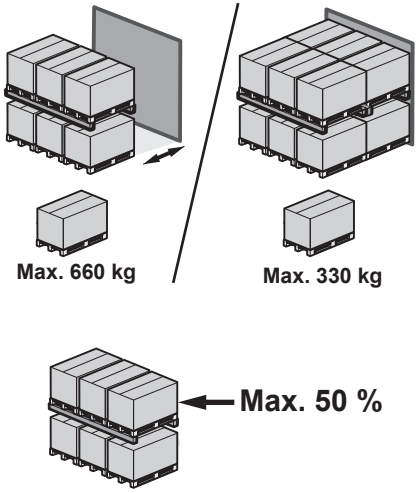
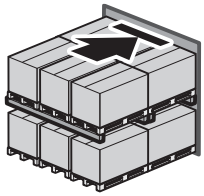
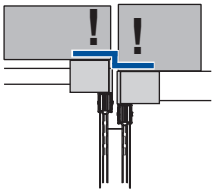
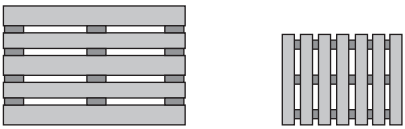
Swivelling up the pallet retainer (Catch 2)

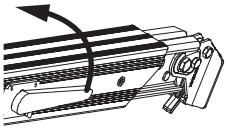
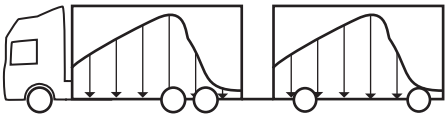
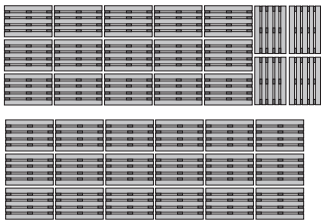
► Swivel up the retainer.
► Allow the retainer to engage into place.
✓ The retainer has been swivelled up.

Swivelling down the pallet retainer (Catch 2)

► Push up the retainer and swivel it down.
✓ The retainer has been swivelled down.

Loading regulations for the second level

	Full capacity: Maximum weight 330 kg per pallet Partial capacity: Maximum weight 660 kg per pallet Load max. 50 % of the payload on the 2nd loading level at half the superstructure height. When loading higher, proportionally less load is allowed.
	For **full capacity**, always start loading at the front wall with positive-locking. Use support beams, locking bars or lashing belts to secure the load towards the rear. For **partial capacity**, position the load according to the load distribution plan. Load securing to the front and rear is required.
	Support beams arranged stepped in pairs increase the load security.
	Depending on the rail spacing, use Euro pallets (80 x 120 cm) or Düsseldorf pallets (60 x 80 cm).

	Use pallet retainers if necessary.
	For combined load transport (CLT), ensure that the load is evenly distributed. Observe the load distribution plan for the transport vehicle.
	Swap box 7820 mm: depending on the version, 18 or 19 pallets (5 x 3 and 2 x 2 across) are possible (not with refrigerated swap boxes). Swap box 7450 mm: max. 18 pallets are possible.

7 Telematics unit

The KRONE Smart Collect Solar telematics unit is located on the roof of the swap body.

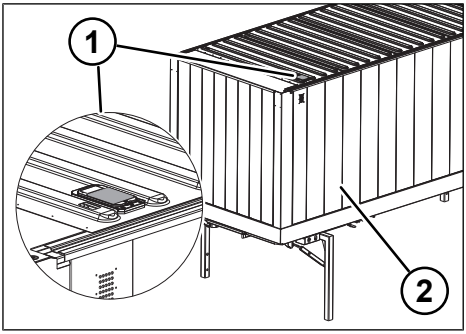


Fig. 7-1: Position of the KSC Box

1 KSC Box
2 Swap box

INFO

If you have any questions, please contact KRONE Telematics Support *(see "11.2 Customer service and support", pg. 97)*

7.1 Function description

The KRONE Smart Collect (KSC Box) is a telematics unit for use in commercial vehicles. It has the following functions:

- Positioning
- Mobile communications to transmit data to the KRONE server
- Motion detection

Positioning

The components work with the most recent global navigation satellite system (GNSS) and can independently determine the position via the following satellite systems:

- GPS (USA)
- GLONASS (Russia)
- Galileo (EU)
- BeiDou (China)

The reception of precise position data depends on the local conditions. In general, the antenna requires a clear line of sight to the satellites, i.e. the built-in antenna must not be covered with metallic surfaces or objects. Various local conditions, e.g. reflection from high walls of buildings, can cause inaccuracies to occur.

Mobile communications

The KSC Box works with mobile communications technology (GSM) to send the collected data to the KRONE server. The following technologies are used to transmit the data:

- LTE Cat. M1
- NB-IoT
- 2G fallback

The proper transfer of data is dependent on the regional features of the respective mobile communications network. If no network is available, the KSC Box stores the data and sends it at the earliest possible time.

Via the mobile communications interface, KRONE Telematics Support can access the KSC Box to update the software version.

For all remote access, it ensures that all participants are informed of status and the current measures.

Motion detection

A 3-axis acceleration sensor is used, which can detect acceleration in all three spatial axes. A value is defined for each axis, above which the sensor transmits a signal to the software. The sensor detects motion and activates the KSC Box above a defined speed.

7.2 Type plate

The type plate is located on the top side of the KSC Box.

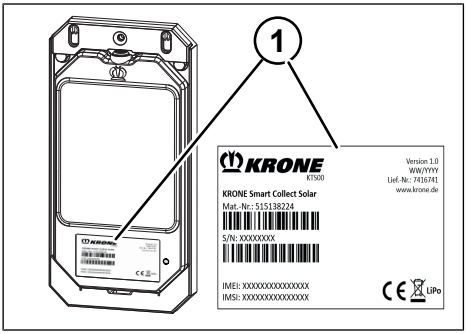


Fig. 7-2: KSC box type plate

1 Type plate

7.3 View

The housing is sealed and cannot be opened.

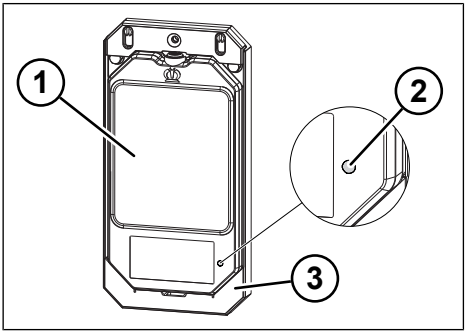


Fig. 7-3: Krone Smart Connect Solar

1 Solar panel
2 LED display
3 Holder (optional)

7.4 LED display

The LED display on the device indicates the various device statuses:

LED colour	Status
Red	Device software is starting up
Yellow	No driving movement
Blue	Driving movement
Purple	Sending
White	Over the air (OTA) update
Off	Sleep mode / status change

7.5 Battery

NOTE

Reduced battery life!

The battery life can be reduced by incorrect handling.

- ► Avoid temperatures below -20 °C and above 50 °C.
- ► Avoid complete recharging and discharging.
- ► Ensure a charge level of 40 – 50 % for longer periods of storage.

The internal 6,000 mAh battery (lithium polymer) ensures operation over a period of at least one week and up to four weeks, whereby the position of the trailer as well as the status being are transmitted to the portal. The battery is charged via the installed solar module and a charge controller. The battery is maintenance-free, its service life is generally 6 years when handled properly.

In addition, a super capacitor (lithium ions) is installed that is charged when the temperatures are too high or too low. The super capacitor has a capacity of 80F-120F.

Charging control is accomplished with a charge controller.

7.6 Solar panel

The integrated 2 W Solar panel charges the internal battery (lithium polymer) or, if necessary, an internal super capacitor (lithium ions).

7.7 Data

The telematics unit sends the collected data to the KRONE server for storage. The data can be integrated and displayed in a defined user interface such as the KRONE Telematics Portal, the KRONE app, external portals or in an ERP system.

KRONE Telematics Portal

INFO

The login data for the KRONE Telematics Portal is handed over during initial operation. For integration in other systems, KRONE Telematics Support is happy to provide support upon request *(see "11.2 Customer service and support", pg. 97)*.

Data from the KSC Box is displayed in the KRONE Telematics Portal (web portal). All vehicles with a telematics unit can be registered and viewed by the driver and dispatcher after logging in. E-learning videos for the different functions are stored in the portal.

The homepage shows all registered vehicles in the fleet and their position on the map.

Fig. 7-4: Homepage

1 Map
2 Vehicles

In the area on the right, all data for a selected vehicle are listed in real time.

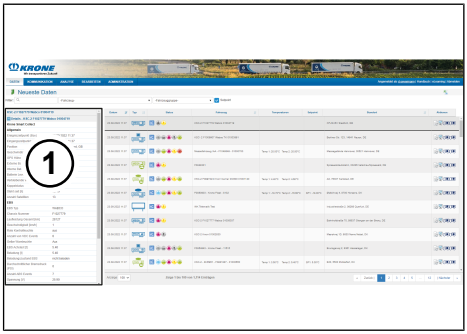


Fig. 7-5: Technical data

1 Data

8 Troubleshooting in the event of faults

⚠ WARNING

Risk of accident and material damage caused by improperly performed troubleshooting and repair work!

Improperly performed troubleshooting and repair work affect safety and may lead to serious injuries and property damage.

- ► Only have necessary repair work performed by an authorised specialist workshop.
- ► Only use original spare parts and spare parts authorised by KRONE.
- ► Observe the instructions concerning troubleshooting issued by the suppliers of the installed components.
- ► Verify functionality after installing/repairing components.

The following overview will help you to determine possible faults and their causes and to perform measures to eliminate them.

In case of faults that cannot be fixed:

- ► Visit an authorised specialist workshop.
- ► Contact the customer service department of Fahrzeugwerk Bernard Krone GmbH & Co. KG *(see "11.2 Customer service and support", pg. 97)*.

Fault	Cause	Solution
Electronic components are not working	Supply and control connections are interrupted	Check that the supply connections between the tractor unit and swap body are properly connected.

For swap bodies with **telematics unit**, the following also applies:

Error	Solution
LED is not illuminated	Check the solar panel for soiling and clean if necessary. Place the KSC Box in sunlight for a period of 48 hours.
GPS data is not always transmitted	Make sure that the vehicle is located in an area covered by mobile communications and that the GPS is in a position to receive signals.
No GSM/GPS reception	Check whether the KSC solar is shielded by metal objects.
KSC Box is not working properly	Restart by briefly holding a magnet in front of the type plate.

9 Maintenance and repair

⚠ WARNING

Risk of accident and material damage caused by improperly performed troubleshooting and repair work!

Improperly performed troubleshooting and repair work affect safety and may lead to serious injuries and property damage.

- ► Only have necessary repair work performed by an authorised specialist workshop.
- ► Only use original spare parts and spare parts authorised by KRONE.
- ► Observe the instructions concerning troubleshooting issued by the suppliers of the installed components.
- ► Verify functionality after installing/repairing components.

Maintenance and repair serve to maintain the operational readiness and to prevent premature wear. Maintenance is divided into:

- ○ Care and cleaning
- ○ Maintenance
- ○ Repair

9.1 Care and cleaning

NOTE

Material damage caused by incompatible cleaning agent

Incompatible cleaning agents can damage the paintwork, metal surfaces or plastic surfaces as well as destroy lines, hoses and seals.

- ► Do not use aggressive cleaning agents.
- ► Use acid-free and pH-neutral cleaning agents.

NOTE

Material damage caused by high-pressure cleaners!

When using a high-pressure cleaner, surfaces and components can be damaged.

- ► Keep a minimum distance of approx. 30 cm between the nozzle of the high-pressure cleaner and the surface being cleaned.
- ► Do not aim the water jet directly at electrical components, plug connections, seals, hoses or gearbox.

NOTE

Environmental damage caused by chemicals!

Along with dirt, lubricants and cleaning agents can also end up in the waste water and endanger the environment when you wash your vehicle.

- ► Do not allow lubricants or other cleaning chemicals to escape into drains, sewers or to seep into the ground.
- ► Only clean in suitable washing areas with an oil separator.
- ► Observe the applicable national environmental protection measures.

Cleaning the swap body

- ► Park the swap body and/or carrier vehicle on a level and firm surface.
- ► If applicable, apply the parking brake on the carrier vehicle.
- ► If applicable, secure the carrier vehicle with wheel chocks.
- ► Clean the swap body with lots of water and an acid-free and pH-neutral cleaning agent.
- ► Maintain a spraying distance of at least 30 cm when using high-pressure cleaners.

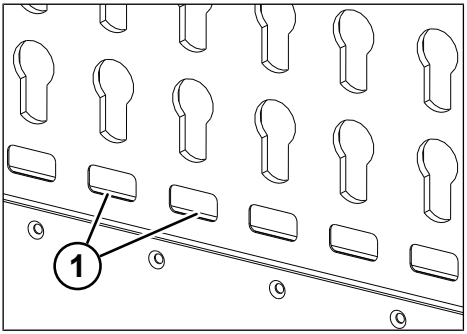


Fig. 9-1: Cleaning the keyhole rails

1 Spaces

- ► Clean the spaces in the keyhole rails without water on a regular basis.
- ► Allow the swap body to dry.
- ✓ The swap body is cleaned.
- ► Carry out a departure check *(see "4.3 Commissioning before each trip", pg. 20)*.

Cleaning the sealing seams

Sealing seams are subject to ageing. Check the seals for proper function, wear and damage and keep them clean.

- ► Clean and check all of the sealing seams (also on the roof).
- ► Have worn sealing seams replaced.

Cleaning the curtain

Observe the following instructions when cleaning the side curtains:

- ○ Swap bodies should only be cleaned at locations provided for this purpose.
- ○ Only use the appropriate, surfactant-containing, ph-neutral cleaners and, if necessary, a hose-washing brush.
- ○ Do not use any cleaners containing solvent, alkaline, or acidic agents.
- ○ Maintain a spraying distance of at least 30 cm when using high-pressure cleaners.
- ○ Do not clean Safe Coat curtains with high pressure.

Failure to observe these instructions may lead to a loss of warranty claims.

NOTE

Material damage due to improper care and cleaning!

Improper care and cleaning can damage the alloy wheels.

- ► Only use the methods and products recommended by the rim manufacturer for care and cleaning.

9.2 Maintenance

⚠ WARNING

Risk of accident and property damage caused by improperly performed or lack of maintenance!

Improperly performed or lack of maintenance work and incorrect replacement parts affect safety.

- ► Observe the national accident prevention regulations.
- ► Only have necessary maintenance work performed by an authorised specialist workshop.
- ► Only use original spare parts.
- ► Observe the maintenance instructions for the installed supplied components (e.g. brake cylinder).

The aim of maintenance is:

- ○ to prevent downtimes,
- ○ to keep the costs of operational readiness reasonable and financially justifiable,
- ○ and to limit unavoidable repair expenditures.

9.2.1 Regular checks and functional testing

To ensure that the swap body is in proper operating condition, the safety-related equipment must be checked regularly to

make sure it is working properly, its effectiveness must be ensured, and the recurring inspections must be performed.

- ► Prior to starting each trip, perform a departure check *(see "4.3 Commissioning before each trip", pg. 20)*.
- ► Perform legally prescribed general inspections punctually.
- ► Observe the intervals and instructions for testing and maintaining third-party supplier components as specified in the respective operating instructions supplied.
- ► Report any detected safety defects:
  - ○ Decommission the swap body if operational safety is inadequate.
  - ○ When there is a change of shift, inform the colleague starting the next shift about observed defects and implemented measures.
- ► Go to an authorised workshop if defects have been found.

9.2.2 Maintenance intervals for the operator

Assembly group	Maintenance work	Monthly	Every six months	Yearly
Lubrication points *(see "9.2.4 Lubricating the swap body", pg. 94)*	► Top up the grease on all the lubrication points. ► Pay attention to the lubrication points shown in the applicable operating instructions			X
Load securing *(see "9.2.7 Load securing", pg. 94)*	► Perform a visual inspection for wear and damage.			X
Sealing seams	► Perform a visual inspection for proper function, wear and damage.			X
	► Cleaning the sealing seams			X

9.2.3 Maintenance intervals for the authorised specialist workshop

Assembly group	Maintenance work	Monthly	Every six months	Yearly
Lubrication points *(see "9.2.4 Lubricating the swap body", pg. 94)*	► Top up the grease on all the lubrication points. ► Pay attention to the lubrication points shown in the applicable operating instructions.			X
Electrical equipment *(see "9.2.5 Electrical equipment", pg. 94)*	► Check all electrical components for proper function.			X

Assembly group	Maintenance work	Monthly	Every six months	Yearly
Bolted connections *(see "9.2.6 Bolted connections", pg. 94)*	► Perform a visual inspection for wear and damage.			X
Load securing *(see "9.2.7 Load securing", pg. 94)*	► Perform a visual inspection for wear and damage.			X
Locking mechanism *(see "9.2.8 Locking mechanism", pg. 95)*	► Perform a visual inspection for wear and damage.			X

9.2.4 Lubricating the swap body

NOTE

Material damage caused by dry lubrication points!

Too little or a lack of grease can result in damage to moving parts.

► Lubricate the swap body regularly.

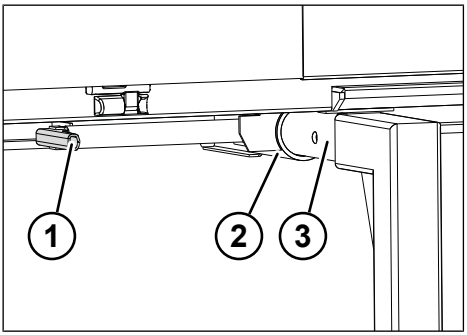


Fig. 9-2: Lubrication points on the swap body

1 Locking bolt
2 Supporting bearings
3 Landing leg tube

► Lubricate the locking bolts.
► Apply grease inside the supporting bearings using a paintbrush.
► Use grease to lubricate the landing leg tube.
► Also observe the enclosed supplier documentation.

9.2.5 Electrical equipment

► Perform a visual check of the lighting and signalling systems.
► Perform a visual inspection of the electrical connections.
► Have defective electrical components replaced by an authorised specialist workshop.
► Only have work on the electrical equipment performed by trained electricians, or by personnel trained especially for the purpose, in accordance with all applicable safety rules and regulations.

9.2.6 Bolted connections

► Check bolted connections regularly for settling signs.
► Replace defective bolted connections and those with visible damage.
► Observe the instructions about bolted connections in the supplier documentation.

9.2.7 Load securing

► Perform a visual inspection for wear and damage.
► Have defective or damaged components replaced.

Tension and lashing belts

Check the tension and lashing belts according to the following criteria:

- Cuts or ruptured twines
- Cuts in the edges and indentations
- Damaged seams or damage to other connecting elements
- Deformation of the belt straps
- Identification label has been lost or is not legible

Tensioning elements and hooks

Check the tensioning elements and hooks according to the following criteria:

- Breaks or cracks
- Deformation of the slit shaft (for lashing belt ratchets)
- Corrosion
- Enlargement of the hook opening

If defects are observed for one of the points on the lists, the tensioning element is considered worn and may no longer be used.

9.2.8 Locking mechanism

- ► Perform a visual inspection for wear and damage.
- ► Have defective or damaged components replaced.

9.3 Repair

⚠ CAUTION

Risk of injury due to unexpected component movements!

Pneumatically or electrically driven components may move unexpectedly and injure people.

- ► Fully depressurise the pneumatic system and disconnect the electrical connections before beginning maintenance work. Ensure that the system cannot be switched on again.

⚠ WARNING

Risk of accident and material damage caused by improperly performed troubleshooting and repair work!

Improperly performed troubleshooting and repair work affect safety and may lead to serious injuries and property damage.

- ► Only have necessary repair work performed by an authorised specialist workshop.
- ► Only use original spare parts and spare parts authorised by KRONE.
- ► Observe the instructions concerning troubleshooting issued by the suppliers of the installed components.
- ► Verify functionality after installing/repairing components.

Repair work includes the replacement and the repair of components and is only required when components are damaged by wear or other external circumstances.

The following applies to the specialist workshop:

- The necessary repair work must be performed professionally, according to the rules of engineering and in accordance with the applicable regulations.
- Do not repair worn or damaged components using a makeshift repair.
- Only use original or approved spare parts for repairs *(see "11.1 Spare parts", pg. 97)*.
- Always replace any removed seals with new seals.

10 Decommissioning

10.1 Temporary decommissioning

The following measures need to be taken to temporarily decommission the swap body:

- ► Clean the swap body.
- ► Observe the regulations on temporary decommissioning in the operating instructions for the associated carrier vehicle.
- ► Observe the instructions for decommissioning the installed supplied components.
- ► Make sure that the solar panels of the Krone Smart Collect are getting enough light for at least 24 hours every three months to maintain the battery capacity and battery life.
- ✓ The swap body is temporarily decommissioned.

10.2 Recommissioning

To recommission the swap body after temporary decommissioning, the following measures must be taken:

- ► Perform a general visual inspection.
- ► Carry out a departure check *(see "4.3 Commissioning before each trip", pg. 20)*.
- ► Observe the other applicable operating instructions for recommissioning the installed supplied components.
- ✓ The swap body has been commissioned again.

10.3 Final decommissioning and disposal

NOTE

Environmental damage due to improper disposal!

Improperly disconnecting and disposing of operating materials along with electric, pneumatic and hydraulic parts may harm the environment.

- ► Ensure that they are disposed of properly by a specialist company
- ► Observe the national and local regulations for the disposal.

After the end of its useful life, the swap body must be completely decommissioned and properly disposed of.

To fully decommission the swap body and to dispose of it properly, the following measures must be taken:

- ► Ensure that the disposal is done properly and in an environmentally sound way.
- ► Have the swap body disposed of properly by a specialist company.
- ► Observe the national and local regulations for the disposal.
- ► Observe the instructions for decommissioning issued by the suppliers of the installed components.
- ✓ The swap body is finally decommissioned and disposed of.

11 Spare parts and customer service

11.1 Spare parts

NOTE

Property damage caused by incorrect spare parts!

The use of non-approved or incorrect spare parts affects safety and can result in voiding of the operating permit.

► Only use original spare parts.

The original spare parts are regularly checked for safety and functionality. The use of original spare parts guarantees road and operating safety and the operating permit is retained.

► When ordering spare parts, indicate the vehicle ID number.

You can order spare parts by phone under +49 (0) 59 51 / 209-302 or from the KRONE website. An electronic spare parts catalogue is available on the website: www.krone-trailer.com

11.2 Customer service and support

The customer service department at Fahrzeugwerk Bernard KRONE GmbH & Co. KG can be reached using the following contact data:

KRONE Telematics Support

Telephone: +49 5951 209-220

email: telematics.nfz@krone.de

Spare Parts

Telephone: +49 (0) 5962 / 9363 173

Email: Swap.Service@brueggen-gmbh.de

Internet: www.brueggen-service.de

Mobile repairs

Telephone: +49 (0) 5962 / 9363 200

Email: Backoffice.Swap@brueggen-gmbh.de

Internet: www.brueggen-service.de

www.brueggen-gmbh.de

www.krone-trailer.com

www.krone-trailerparts.com

12 Technical data

12.1 products

Swap bodies

The maximum weight of the swap body is given on the type plate.

Type	Load compartment length [mm]	Load compartment width [mm]	Total length [mm]
WK 7.3 STG	7300	2470	7450
WK 7.7 STG	7670	2470	7820
WK 7.3 STP	7300	2470	7450
WK 7.7 STP	7670	2470	7820
WK 7.3 LI	7280	2470	7450
WK 7.7 LI	7630	2470	7820
WK 7.3 N2STG	7300	2470	7450
WK 7.7 N2STG	7670	2470	7820
WK 7.3 ST	7300	2470	7450
WK 7.7 ST	7670	2470	7820
WK 7.3 M1STG	7300	2470	7450
WK 7.7 M1STG	7670	2470	7820
WK 7.3 N2STGS	7300	2470	7450
WP 7.3 LS5	7280	2480	7450
WP 7.7 LS5	7650	2480	7820
WP 7.3 LF5	7300	2480	7450
WP 7.7 LF5	7670	2480	7820
WP 7.3 NS3-CS	7300	2480	7450
WP 7.7 NS3-CS	7710	2480	7820

KRONE Smart Collect Solar telematics unit

Height	130 mm
Width	230 mm
Depth	21 mm
Weight	approx. 510 g incl. battery
Protection category	IP6K9K
Operating temperature	-20°C to +60°C
Storage temperature	40°C to +85°C
Operating humidity	10 % to 90 % (non-condensing)
Storage humidity	10 % to 90 % (non-condensing)
Radio systems	GSM: LTE Cat. M1, NB-IoT, 2G fallback
	GNSS: GPS, GLONASS, Galileo, BeiDou
Internal antenna	GSM
	GPS
SIM card	Operation with chip SIM (form factor M2FF)
Display	1 LED
Sensors	3-axles acceleration sensor

Voltage supply / battery	2 W solar panel 6000 mAh LiPo battery for operation over several weeks (depending on the frequency and extent of the regular activities) Super capacitor (80F-120F)
Self-diagnosis	○ Internal temperature measurement ○ Measurement and monitoring of the supply voltages ○ Measurement and monitoring of the battery capacity and the battery status

13 Legal requirements

Protection category

The KSC telematics unit fulfils the following requirements of the protection category.

Standard: ISO 20653

IP Code: P6K9K (**K**: Protection of the electronics within the enclosure against ingress of dust, complete protection against contact. **9K**: Protection of the electronics within the enclosure from damage that can be caused by the use of high pressure water when cleaning vehicles.

E1 Type approval

The KSC telematics unit has been tested under UN guidelines ECE R10 as an ESA (Electrical sub-assembly) and has an E1 type approval for use in traffic on public roads.

Legal radio certifications

The radio approval is valid for EU countries.

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