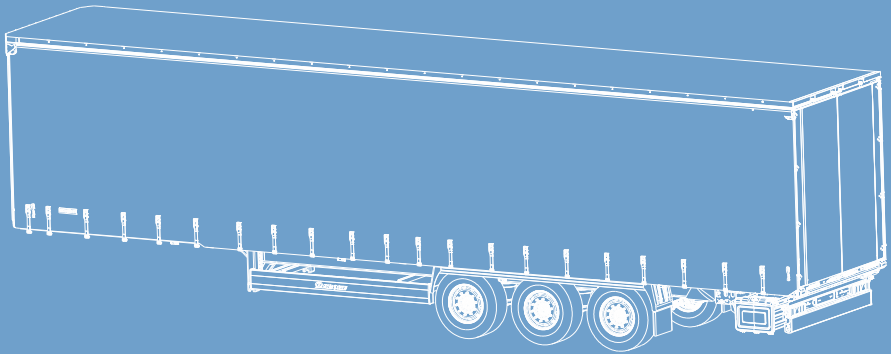




OPERATING INSTRUCTIONS SEMITRAILERS

Profi Liner | Mega Liner | Paper Liner | Coil Liner



505369471-06 EN



Dear customer,

These are the operating instructions for the KRONE vehicle you have purchased.

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

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

Customer Service

Telephone: +49 (0) 59 51 / 209-320

email: kd.nfz@krone.de

Internet: www.krone-trailer.com/service/kundendienst

Spare Parts

Telephone: +49 (0) 59 51 / 209-302

E-mail: Ersatzteile.nfz@krone.de

Internet: www.krone-trailer.com

KRONE Telematics Support

Telephone: +49 5951 209-220

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www.krone-trailer.com



www.krone-trailerparts.com

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1 Information about this document

1.1 Introduction

The operation instructions are provided for the user of the vehicle and his personnel. The operating instructions are designed to help you to get to know the vehicle and to use it within its intended usage capabilities.

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

- Driving, parking and manoeuvring the vehicle,
- Loading and unloading the vehicle,
- Resolving any disruptions to the workflow,
- Servicing the vehicle (maintenance and care),
- Disposing of working materials and auxiliary materials.

The operating instructions contain important advice on how to operate the vehicle 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 vehicle.

Immediately replace operating instructions that have become illegible or are missing.

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 customer service (see "13.2 Customer service and support", pg. 217).

1.2 Other applicable documents

For safe and failure-free operation, 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 tractor unit,
- 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 "13 Spare parts and customer service", pg. 217).

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 vehicle can be clearly identified by the attached type plate. The vehicle ID number (VIN) is also embossed on the front right of the chassis.

The type plate with the VIN is attached to the following location for product identification:

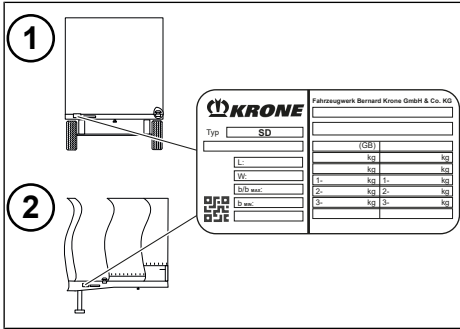


Fig. 1-1: Type plate/VIN attachment points

- 1 Standard
- 2 Alternative

The following information is shown on the type plate:

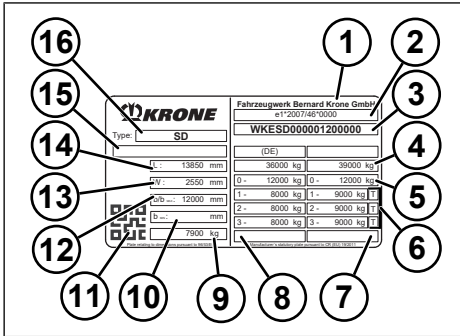


Fig. 1-2: Example type plate

- 1 Manufacturer
- 2 EC type approval number (if available)
- 3 Vehicle ID number (VIN)
- 4 Approved total mass
- 5 Total mass on the coupling point
- 6 Technically approved axle loads
- 7 Technically approved total mass
- 8 If applicable, the nationally approved total masses for registration/operation including the code
- 9 If applicable, dead weight

- 10 Min. distance
- 11 TPMS QR code
- 12 Distance/max. distance
- 13 Vehicle width
- 14 Vehicle length
- 15 If applicable, national type approval no.
- 16 Type designation

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 vehicles are provided 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 vehicle.

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

Names of buttons

INFO

Additional information and tips.

 : Also observe the enclosed supplier documentation.

1.8 Copyright

These instructions represent an official document within the meaning of laws against unfair competition. They incorporate texts and drawings which, in their entirety or partly, without written consent of the manufacturer, are not to be

- copied (except attached copy originals),
- published, or
- made public by other means.

The copyright to these instructions remains with

Fahrzeugwerk Bernard KRONE
GmbH & Co. KG, D-49757 Werlte

Violations oblige compensation for damages.

2 Safety

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

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


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 vehicle as well as the observance of the maintenance intervals and conditions prescribed therein.

KRONE vehicles and their superstructures are intended exclusively for transportation purposes in compliance with applicable laws, rules and regulations.

The support device supports the unhitched vehicle or helps to adjust the vehicle at the coupling height of the towing device. They can be used on loaded or unloaded vehicles. Loading a parked vehicle is only permitted in compliance with the relevant safety regulations.

Operational reliability of the vehicle is guaranteed only if all applicable instructions, settings, laws, rules, regulations, and limitations are fully complied with.

The vehicle has been manufactured according to the state of the art of manufacturing systems, and in accordance with all applicable safety-related laws, rules, and regulations. Nevertheless, operation of the trailer incorporates dangers for life and limb of the operator and other personnel, or danger of equipment damage, or operational problems.

- ▶ The vehicle and its components are only to be operated if in technically 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.

The following also applies for semitrailers with **hydraulic rear width expansion**:

The hydraulic rear width expansion is designed and built to increase the loading width of a KRONE trailer. The rear is expanded via a manual hydraulic pump. In the widened condition, approx. 500 mm of additional loading width per side is available. This means a maximum total loading width of 3480 mm. The hydraulic rear width expansion must be retracted again after loading and unloading. Do not drive with an extended rear width expansion (when expanded). Intended use also includes reading all the instructions that they contain - particularly the safety instructions. In addition, all inspection and maintenance work must be performed at the required time intervals. Only qualified specialist personnel may work on the hydraulic rear expansion.

The following also applies for semitrailers with **roof tarp lifting device**:

The roof tarp lifting device is used to prevent water accumulating on the roof tarp of a parked semitrailer and/or to remove any water accumulations already on the roof tarp. In addition, the raised roof tarp prevents the accumulation of condensation building up on the inside of the roof tarp. If the roof tarp is raised, the semitrailer may reach a height which is above the permitted limit values for road operations. The roof tarp lifting device must be lowered prior to departure. It needs to be operated by trained personnel. Other persons must not linger in the danger area of the roof tarp lifting device. Maintenance may only be carried out by specialist staff. Any other use is not intended and can result in damage to the vehicle and the device.

- The device is only to be operated if in technically 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.
- Do not use the roof tarp lifting device if ice sheets have already formed on the roof tarp.

For vehicles with **telematics unit**, the following also applies:

The KSC Box telematics and diagnosis unit establishes the connection between the semitrailer, tractor, other control units (such as the electronic braking system) and the KRONE server (KRONE Telematics Portal and Device Management). The status, position and operating data of the semitrailer can be accessed via the portal and actions can be triggered remotely. The device is mounted outside on the semitrailer.

For vehicles with a **camera system**, the following also applies:

The KRONE Smart Capacity Management is a camera system that is mounted in the cargo area. Depending on the equipment, images are taken or the available load capacities are evaluated.

For vehicles with a **tyre pressure monitoring system**, the following also applies:

The KRONE Smart Tyre Monitoring is intended exclusively for the purpose of measuring the inflation pressure and temperature of tyres and to transmit the values to the display in the tractor unit and, depending on the vehicle equipment, to the KRONE Telematics unit.


Operational reliability of the devices is guaranteed only if all applicable instructions, settings, laws, rules, regulations, and limitations are fully complied with.

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 ensure safe handling and transport or only with additional equipment
- Exceeding the technically permitted weights, axle loads and drawbar loads
- Exceeding the maximum vehicle speed
- Exceeding the permitted length, width and height dimensions
- Use of components that are not approved by KRONE, e.g. tyres, accessories, spare parts

The manufacturer is not liable for damage caused by improper use. Risks deriving from such infractions are exclusively borne by the operator.

 Also observe the enclosed supplier documentation.

2.3 Personnel qualification and requirements

KRONE vehicles and KRONE superstructures as well as their operating components may only be used and maintained by persons who have the respective qualification and who have read and understood the operating instructions.

In the operating instructions, a distinction is made between

- Operator,
- Driving staff, and
- Skilled craftsmen.

2.3.1 Operator

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

- Instruct the driving staff in the use of the vehicle,
- Ensure that the vehicle is regularly checked and serviced in an authorised technical 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. 9*),
- 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 Transported material characteristics

The vehicle is designed to transport many different goods.

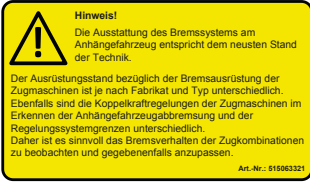




- ▶ Before loading, make sure that the vehicle is suitable for the goods to be carried.



2.6 Information, warning, and mandatory signs

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

- ▶ 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 |
|---|---|
|  | <p>Note!</p> <p>The equipment of the braking system on the trailer vehicle corresponds to the latest state of the art.</p> <p>The equipment level of the brake equipment on the tractor unit depends on the manufacturer and type. The coupling force controllers of the tractor vehicle in relation to the trailer vehicle braking and the control system limits differ. It is therefore sensible to observe the braking behaviour of the vehicle train and to adjust it if necessary.</p> <p>Attachment point: front wall, coupling support</p> |
|  | <p>Warning sign, risk of crushing, lift axle</p> <p>Attachment point: In the axle area on both sides of the vehicle, on the axle body.</p> |
|  | <p>Warning sign for tilting stability (rear area of the superstructure)</p> <p>Attachment point: inside on the right rear door (for refrigerated trailers, above the scouring strip in the rear area of the right side wall)</p> |
|  | <p>Warning sign for floor load (max. 5460/7000/8000/9000 kg)</p> <p>Attachment point: inside on the right rear door (for refrigerated trailers, above the scouring strip in the rear area of the right side wall)</p> |
|  | <p>Warning sign for tilting stability (front area of the superstructure)</p> <p>Attachment point: inside on the right rear door (for refrigerated trailers, above the scouring strip in the rear area of the right side wall)</p> |

| Sign | Attachment point/meaning |
|---|---|
|  | <p>Warning sign for risk of crushing with rear ladder Attachment point: on the folding rear access ladder</p> |
|  | <p>Warning sign for dead angle Attachment point: outside on the right rear door, outside and on both sides in the front area of the vehicle The signs shown here may differ in the design on the vehicle.</p> |

2.7 Danger areas

On and around the vehicle, there are areas with an increased risk to your safety or to the safety of other persons. Ensure adequate lighting when performing any work in hazard areas.

- 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 vehicle frame and the load | There is a risk of crushing. |

| Danger area | Danger |
|---|--|
| Area approx. 5 m around the vehicle (manoeuvring area) | There is a risk of accidents. |
| Under the vehicle | The vehicle can move due to a defect or when starting up and injure persons. |
| Between the tractor unit and semitrailer, especially when coupling and uncoupling | Persons can be crushed or run over. The semitrailer can tip over or tilt up. |

| Danger area | Danger |
|--|---|
| Connection between the tractor unit and the semitrailer | There is a risk of injury when coupling and uncoupling the semitrailer from the tractor by incorrect operation when opening and closing the connections of the compressed air hose connectors and cables. |
| Area around the lift axle | Risk of crushing due to remote-controlled movement. |
| Area in front of and behind the vehicle, as well as in front of and behind the axles | Vehicle movement due to unexpected release of the brake. |

2.8 Protective and safety devices

Depending on the equipment, the vehicles are equipped with the following protective and safety devices.

- ▶ Check the function of the protective and safety devices regularly.
- ▶ Have defective components repaired only by authorised specialist workshops or by the manufacturer.
- ▶ Damage to the side collision protection and to the underrun protection can result in non-compliance with the legal regulations. Have deformed or distorted components promptly replaced by an authorised specialist workshop.

| Component | Function |
|---|---|
| Automatic anti-blockage system (ABS) | Prevents blockage of the wheels when braking |
| Automatic load-dependent brake power regulation (ALB) | Regulates the braking effect depending on the load status |

| Component | Function |
|--|--|
| Electronic brake system (EBS) | Braking assistance system, which contains/comprises the brake components and connected driving dynamics systems of the vehicle |
| Roll stability support (RSS) | Prevents the vehicle from tipping over |
| Tyre pressure monitoring system (TPMS) | Prevents accidents caused by incorrect tyre pressure |
| Hazard lights | Serve to indicate a traffic hazard |
| Wheel chocks | Prevent accidental rolling away when parking/unhitching |
| Side collision protection | Prevents cyclists and pedestrians from passing under the trailer in case of accident |
| Underrun protection | Prevents under-running in case of rear-end collisions |
| Indicators and control displays | Serve to monitor and make settings for the vehicle; optional systems differ according to the manufacturer |

2.9 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 manoeuvring, coupling and uncoupling

When manoeuvring or coupling and uncoupling, there is a lethal risk of crushing for persons standing between the tractor unit and the semitrailer as well as in the coupling area.

- ▶ Only drive in reverse when nobody is endangered.
- ▶ Only manoeuvre with a guiding assistant.
- ▶ Before uncoupling, secure the trailer additionally with wheel chocks against accidental movement.
- ▶ Instruct all persons to leave the area between the tractor unit and the semitrailer during the coupling procedure.

Dangers when parking and unhitching

Accidental trailer movements, unstable ground and poor securing can cause serious accidents and injuries.

- ▶ Actuate the parking brake when unhitching.
- ▶ Also use wheel chocks on the wheels.
- ▶ Park the vehicle on a load-bearing, horizontal and level surface.
- ▶ When parking in a public traffic area during the hours of darkness, the vehicle should be particularly marked in accordance with the legal requirements.

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

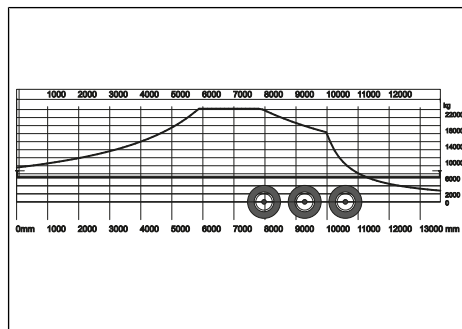


Fig. 2-1: Load distribution plan (example)

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

INFO

Observe the load distribution plan for optimum loading. The load distribution plan is individually calculated for every vehicle. Using the load distribution curve, you can read the distance that must be maintained between the front wall and the load.

- ▶ 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.

Pneumatic dangers

There is a risk of injury due to pressure in the pneumatic system.

- ▶ Do not open any components of the pneumatic system if there is pressure in the lines.
- ▶ Check the hose connections of the pneumatic system regularly.
- ▶ When aerating and venting the system, pay attention to unforeseeable movement of pneumatic actuators.
- ▶ Fully depressurise the pneumatic system before beginning maintenance work.

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.

2.10 Notes about legal regulations

The vehicle is built according to the regulations that were applicable at the time of delivery in the intended country of registration.

- ▶ Observe compliance with the nationally prescribed monitoring inspections and time intervals.
- ▶ Observe compliance with the nationally prescribed weights, axle loads, and drawbar loads. They can be lower than the technically possible values.

- ▶ Observe compliance with the nationally prescribed maximum vehicle height for the tractor-trailer combination.

Changes to the vehicle against the data provided in the registration documents result in the operating permit becoming invalid. This includes, in particular, driving on public roads without a power supply for the brake electronics via the ISO-7638 plug connection.

- ▶ Do not make any unauthorised changes or manipulations.
- ▶ Have permitted changes entered into the vehicle documentation by a certified test centre.
- ▶ Only use proper and approved tyres.
- ▶ With KRONE Trailer Axle, use only 19.5 inch or 22.5 inch mid-centred steel or aluminium rims with 120 mm offset.
- ▶ Only used approved and suitable spare parts (see "13.1 Spare parts", pg. 217).
- ▶ Observe the normal use position of a moving component for normal vehicle use and when the vehicle is parked.
- ▶ Only drive with the EBS plug connected.
- ▶ Moving parts are to be positioned in the normal use position while driving, when stopped and parked:

| Component | Use position |
|--|---|
| Side collision protection (collision protection, pallet storage boxes, etc.) | Storage box covers at the side perpendicular and parallel to the vehicle's longitudinal axis are closed |
| Rear underrun protection | Lowest distance to the road |
| Spray suppression (spray suppression and splash guard) | folded down |

| Component | Use position |
|---|---|
| Truck-mounted forklift (retractable or foldable) | When driving with a forklift: rails extended, rear underrun protection swivelled in and secured. When driving without a forklift: rails inserted, rear underrun protection swivelled out and secured. |
| Lighting equipment (spotlights, lights, lamps, signal devices and conspicuous markings) on curtains, board walls and rear doors | Corresponding to the delivery condition of the vehicle If curtains, board walls and/or rear doors with attached lighting equipment have been removed, the lighting equipment must be mounted to the vehicle again. |

2.11 Data protection

Vehicles equipped with a KRONE Smart Capacity Management System must comply with the requirements of the General Data Protection Regulation (GDPR).

In order to use video surveillance in compliance with data protection, the sticker with the instructions for video surveillance must be filled out. The sticker is located on the inside of the rear door.

The following information must be noted on the sticker:

- Name and contact data of the person responsible
- Storage period for the recorded images

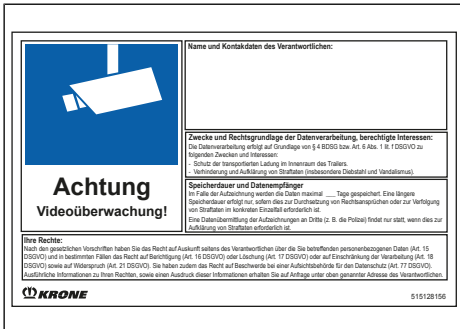


Fig. 2-2: Video surveillance sticker

The operator is legally responsible for the storage and evaluation of the images. The storage period can be set in the KRONE Telematics Portal. Please note that the storage period for the image data complies with legal requirements, in particular the regulations on data protection.

2.12 Warranty and liability

The manufacturer's "General Terms and Conditions of Sale and Delivery" always apply.

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

- Improper use (see "2.2 Intended use", pg. 12),
- Operating the vehicle with missing or non-functional safety devices,
- 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 "13.1 Spare parts", pg. 217).

For the assessment of warranty and liability claims, you must permit unimpeded access to the data stored in the brake electronics. Deleting this data needed for an assessment can result in an exclusion of liability.

You can find the warranty conditions online (see (see "13 Spare parts and customer service", pg. 217)).

2.13 Limits of use

- ▶ Observe the following requirements for the operational environment and conditions of use:
 - Permissible temperature range (depending on the specification, the additional equipment, and the tyres).
 - Permissible functional range and permissible age of the tyres
 - Permissible clearance and permissible swing radius
 - Load-bearing and level road conditions

2.14 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.
- ▶ Drive with the correct tyre inflation pressure.

3 Vehicle overview

The following illustrations provide an example of the design of the trailer in the sliding curtain and full-tarp with board wall versions.

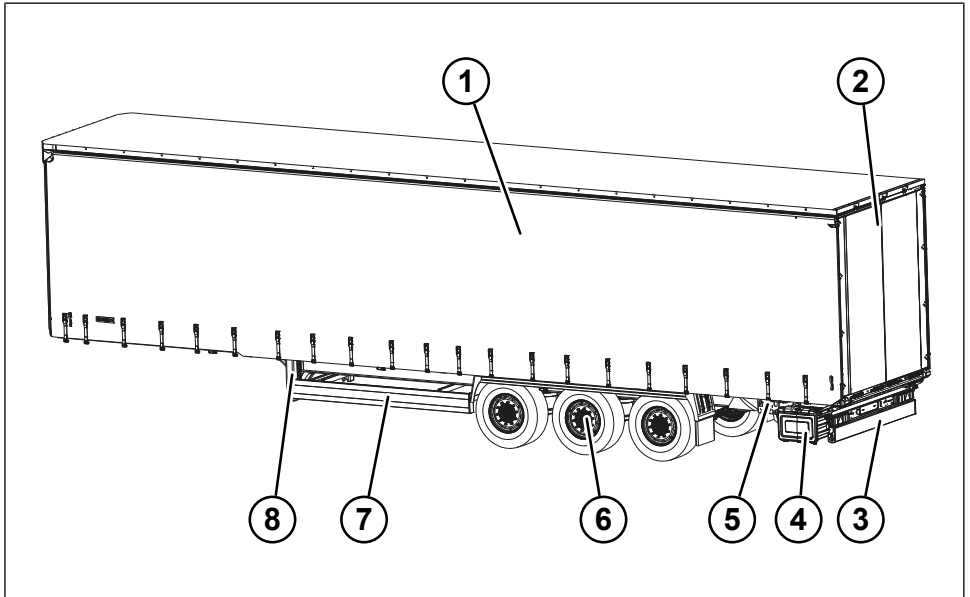


Fig. 3-1: Trailer with sliding curtain superstructure

- 1 Sliding curtain superstructure
- 2 Rear gantry
- 3 Rear underrun protection
- 4 Tool box (option)
- 5 Control unit for brake system/air suspension
- 6 Axle assembly
- 7 Side collision protection
- 8 Landing leg winches

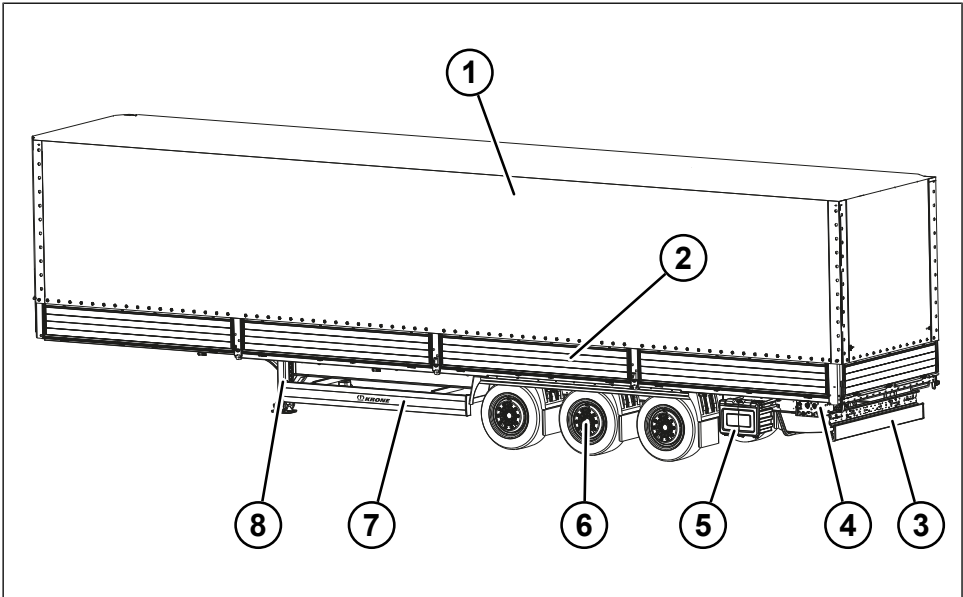


Fig. 3-2: Trailer with full-tarp superstructure

- 1 Full tarp
- 2 Board walls
- 3 Rear underrun protection
- 4 Control unit for brake system/air suspension
- 5 Tool box (option)
- 6 Axle assembly
- 7 Side collision protection
- 8 Landing leg winches

Usage designs

Essential characteristics of the individual trailer types and their special features are described briefly below.

Profi Liner

The Profi Liner is the KRONE standard trailer that covers normal transportation requirements. It is designed as a trailer with a sliding curtain superstructure, full-tarp superstructure, or as a plateau. The Multi Steel version of the Profi Liner can be used for special transportation requirements, such as transporting steel reinforcement mats or lattice girders (see "8.10.13 Steel mat system", pg. 160).

Optionally, trailers can be equipped with a hydraulic rear expansion for easier loading and unloading procedures (see "6.7 Hydraulic rear width expansion", pg. 131).

Mega Liner

The Mega Liner's superstructure is similar to the Profi Liner; however, it has a larger cargo space and has a lifting roof as a standard to facilitate loading and unloading.

Coil Liner

The Coil Liner's superstructure is similar to the Profi Liner; however, it has been specially equipped with a trough to transport coils as well as point loads (see "8.13 Coil transport", pg. 167).

Paper Liner

The Paper Liner's superstructure is similar to the Profi Liner; however, it has been specially equipped with pallet rollers and perforated rails to transport pallets and paper rolls (see "8.14 Transporting paper", pg. 171).

4 Commissioning

4.1 Initial commissioning

The manufacturer carries out the initial commissioning. 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 carried out by the manufacturer's personnel.

4.2 Delivery and handover

Delivery and acceptance is carried out at one of the manufacturer's manufacturing facilities.

- ▶ 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 tractor unit.

4.3 KRONE Smart Assistant

The KRONE Smart Assistant system uses product-specific QR codes, which are attached e.g. to the front walls of the semitrailers, to record the condition of the vehicles and to transmit information about them. With just a few steps, the condition can be documented, including damage, defects, missing accessories or other relevant information. The reports are provided in a customer portal.

The QR code is scanned with a commercially available smartphone. A messenger chat is then opened, where questions about the condition of the product must be answered. Questions are answered with "Yes/No" and text or photos are entered with the tap of a finger. Once the informa-

tion has been confirmed, the data is securely transmitted to the KRONE Smart Assistant customer portal.

The KRONE Smart Assistant ensures data protection-compliant handling of the collected data.



Fig. 4-1: Sticker for KRONE Smart Assistant

5 Running gear operation

5.1 Using wheel chocks

WARNING

Risk of accident due to improperly used wheel chocks!

Unintentional vehicle movements and improper use of wheel chocks can result in serious injury and property damage.

- ▶ Secure the tractor unit additionally with wheel chocks when unhitching.
- ▶ Secure the unhitched semitrailer with wheel chocks.
- ▶ Place wheel chocks only on wheels mounted on rigid axles, never on wheels mounted on lift axles or steering axles.
- ▶ Always secure wheel chocks on the vehicle with the appropriate securing devices before travel.

5.1.1 Wheel chocks without anti-theft device

Removing the wheel chocks

- ▶ Remove safety split pin.
 - ▶ Pull the wheel chocks off the retaining rod.
- ✓ The wheel chocks have been removed.

Stowing the wheel chocks

- ▶ Slide the wheel chocks onto the retaining bar.
 - ▶ Secure the wheel chocks with the safety split pins.
- ✓ The wheel chocks are stowed and secured.

5.1.2 Wheel chocks with anti-theft device

Removing the wheel chocks

- ▶ Remove safety split pin.

- ▶ Pull out the wheel chocks using the theft protection chains or theft protection ropes.
- ✓ The wheel chocks have been removed.

Stowing the wheel chocks

- ▶ Insert the wheel chocks into the bracket.
 - ▶ Secure the wheel chocks with the safety split pins.
 - ▶ Insert the theft protection chains or theft protection cables into the bracket.
- ✓ The wheel chocks are stowed and secured.

5.1.3 Wheel chocks with spring-clip mount

Removing the wheel chocks

- ▶ Depending on the design, push down or pull up the spring clip.
 - ▶ Remove the wheel chock.
- ✓ The wheel chocks have been removed.

Stowing the wheel chocks

- ▶ Depending on the design, push down or pull up the spring clip.
 - ▶ Insert the wheel chock in the bracket.
 - ▶ Secure the wheel chock with the spring clip.
- ✓ The wheel chocks are stowed and secured.

5.1.4 Putting on the wheel chocks

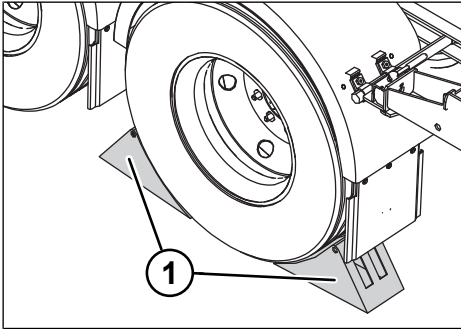


Fig. 5-1: Putting on the wheel chocks

- 1 Wheel chocks

- ▶ Place the wheel chocks in front of and behind a wheel of the rigid axle.
- ✓ The wheel chocks have been placed.

5.2 Support device

⚠ WARNING

Risk of accident due to tipping over!

A lack of supports when loading and unloading as well as when hitching and unhitching can result in serious injuries.

- ▶ Park the vehicle on solid and level ground to avoid sinking in or tipping.
- ▶ Secure the vehicle against rolling away by activating the parking brake.
- ▶ Use wheel chocks to prevent the vehicle from rolling away.

⚠ WARNING

Risk of accident when driving with the support device not retracted and protruding components!

An insufficiently retracted support device can hit the ground while driving and cause serious accidents.

- ▶ Move the support device into driving position before departure.
- ▶ Secure the crank in its holder before starting to drive.

⚠ CAUTION

Risk of injury due to crushing!

When extending the support device, limbs can be crushed between the landing leg foot and the ground.


- ▶ Avoid the danger areas.
- ▶ Wear personal protective equipment (safety shoes, gloves).

NOTE

Material damage due to longitudinal movement!

The support device can be damaged when loading and unloading as well as when the unhitched/uncoupled loaded vehicle is parked for extended periods of time.

- ▶ Prevent longitudinal movement when the trailer is uncoupled.
- ▶ Only uncouple the semitrailer in the neutral, centred landing leg foot position.
- ▶ Align the loading platform horizontally.
- ▶ When the uncoupled trailer is parked for extended periods of time, lower the air suspension.

 Also observe the enclosed supplier documentation.

Central axle trailers are equipped with a support device.

The support devices support the unhitched vehicle and move the vehicle to the coupling height of the towing device.

Depending on the version, the vehicle is equipped with the following support device:

- Landing leg winch with crank mechanism
- Drop landing leg without crank mechanism

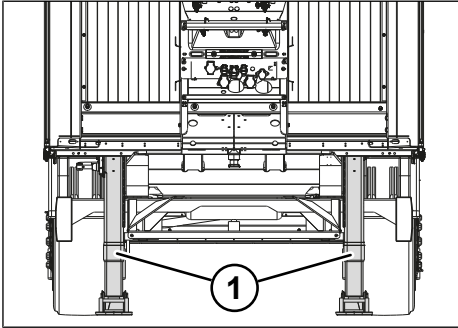


Fig. 5-2: Support device extended
1 Support device

For more information, see also

- ▣ Landing leg winch [▶ 29]
- ▣ Parking brake [▶ 49]
- ▣ Using wheel chocks [▶ 27]

5.2.1 Landing leg winch

NOTE

Material damage due to overloading!

When the vehicle is raised in high gear, the crank drive of the support device can be overloaded and damaged.

- ▶ Only use the high gear with fully unloaded and raised landing leg feet.
- ▶ Only use the load speed after the landing leg feet make ground contact.

The crank drive for the landing leg winch has two speeds:

- High speed (retract/extend support device)
- Load speed (raise/lower the vehicle)

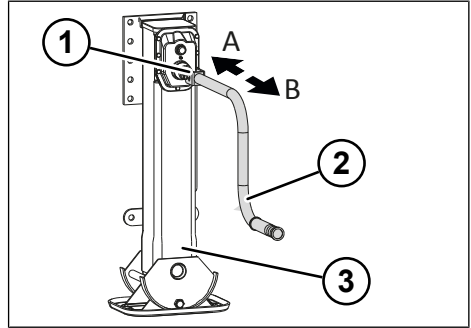


Fig. 5-3: Load speed and high speed of the support device

- 1 Crank drive shaft
- 2 Hand crank
- 3 Landing legs
- A Load speed
- B High speed

INFO

Cranking clockwise moves the landing leg downwards. Cranking counter-clockwise moves the landing leg upwards.

Extending the landing leg winch

⚠ CAUTION

Risk of injury due to crank recoil!

A hand crank recoil can cause injuries when releasing the hand crank.

- ▶ Slowly ease the load off the hand crank at the end of the rotation.
- ▶ Apply the parking brake (see "5.7.2 Parking brake", pg. 49).
- ▶ Ensure that the ground is load-bearing and level.
- ▶ Use wheel chocks to prevent the vehicle from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Lift the hand crank from the bracket.
- ▶ Engage the hand crank on the crank drive shaft until it locks into place.

- ▶ Switch on rapid speed by pulling out the hand crank (see "Fig. 5-3: Load speed and high speed of the support device", pg. 29).
- ▶ Wind down the landing leg winch until it touches the ground. Ensure a neutral foot position, landing leg foot in centre position.

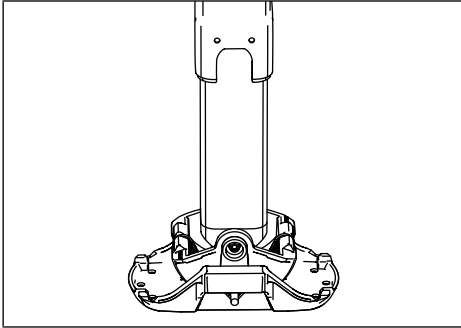


Fig. 5-4: Neutral landing leg foot position

- ▶ Wind down the landing leg winch until it touches the ground. Do not exceed the maximum lift height (mark).
- ▶ Switch on load speed by pushing in the hand crank (see "Fig. 5-3: Load speed and high speed of the support device", pg. 29).
- ▶ Use the hand crank to wind to the desired support height. Do not fully unload the wheels while doing so.
- ▶ Use the rear braces, if available (see "5.3 Rear braces", pg. 32).
- ▶ Secure the hand crank in the bracket.
- ✓ The landing leg winches are extended and the vehicle is supported.

Retracting the landing leg winch

CAUTION

Risk of injury due to crank recoil!

A hand crank recoil can cause injuries when releasing the hand crank.

- ▶ Slowly ease the load off the hand crank at the end of the rotation.

- ▶ Check the parking brake and apply if necessary (see "5.7.2 Parking brake", pg. 49).
- ▶ Couple the semitrailer (see "7.2 Coupling and uncoupling the trailer", pg. 133).
- ▶ Hitch the trailer Hitching and unhitching the trailer.
- ▶ Retract the rear braces, if available (see "5.3 Rear braces", pg. 32).
- ▶ Take the hand crank from the bracket.
- ▶ Engage the hand crank on the crank drive shaft until it locks into place.
- ▶ Set to load speed by pushing in the hand crank (see "Fig. 5-3: Load speed and high speed of the support device", pg. 29).
- ▶ Crank up the landing leg winch until it is unloaded.
- ▶ Set to high speed by pulling out the hand crank (see "Fig. 5-3: Load speed and high speed of the support device", pg. 29).
- ▶ Crank up the landing leg winch to the stop.
- ▶ Secure the hand crank in the bracket.
- ✓ The landing leg winches are retracted and are in the driving position.

Type plate

The type plate of the KRONE support device is located on the left side in the direction of travel, on the landing leg foot with the crank.

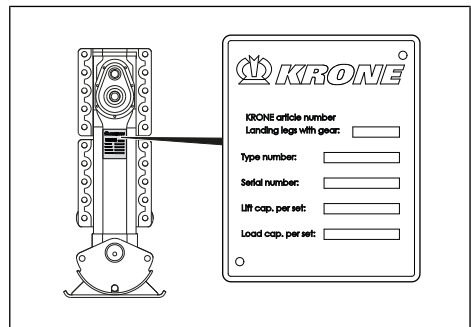


Fig. 5-5: Type plate for KRONE support device

5.2.2 Drop landing leg

Extending the drop landing leg

- ▶ Apply the parking brake (see "5.7.2 Parking brake", pg. 49).
- ▶ Ensure that the ground is load-bearing and level.
- ▶ Use wheel chocks to prevent the vehicle from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Lift the semitrailer with the tractor unit's air suspension.

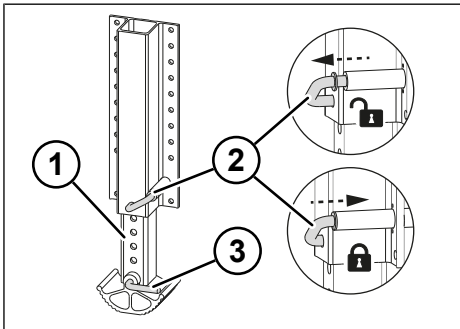


Fig. 5-6: Drop landing leg

- 1 Foot
- 2 Bolt for the height lock
- 3 Handle

- ▶ Hold the foot of the drop landing leg by the handle and remove the bolt for the height lock.
- ▶ Lower the foot of the drop landing leg according to the required loading height.
- ▶ Reinsert the bolt for the height lock and secure the foot of the drop landing leg in the required position.
- ▶ Extend the second drop landing leg in the same way.
- ✓ The drop landing legs are extended and the vehicle is supported.

Retracting the drop landing legs

- ▶ Check the parking brake and apply if necessary (see "5.7.2 Parking brake", pg. 49).
- ▶ Couple the semitrailer .
- ▶ Lift the semitrailer with the tractor unit's air suspension.

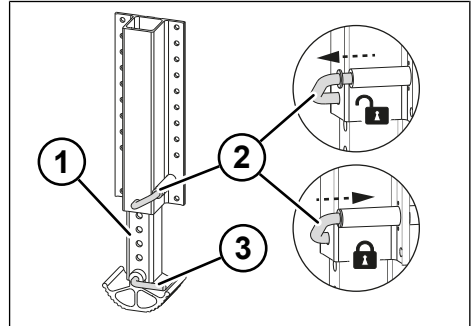


Fig. 5-7: Drop landing leg

- 1 Foot
- 2 Bolt for the height lock
- 3 Handle

- ▶ Hold the foot of the drop landing leg by the handle and remove the bolt for the height lock.
- ▶ Slide up the foot of the drop landing leg up to the stop.
- ▶ Reinsert the bolt for the height lock and secure the foot of the drop landing leg in the raised position.
- ▶ Slide in the second drop landing leg in the same way.
- ✓ The drop landing legs are pushed in and are in the driving position.

5.3 Rear braces

⚠ WARNING


Risk of accident when driving with rear brace folded down!

Partially folded up and/or unlocked rear braces can touch the ground while driving and cause accidents.

- ▶ Before departure, ensure that the rear braces are in the driving position and secured.

The rear braces prevent the trailer from overturning when loading and unloading and provide an optimal adjustment to the ramp. Depending on the version, KRONE trailers are equipped with the following rear braces:

- Rear braces with crank mechanism
- Rear braces without crank mechanism

 Also observe the enclosed supplier documentation.

5.3.1 Rear braces with crank mechanism (rigid)

⚠ WARNING

Risk of injury due to a swivelled-out hand crank!

An unsecured crank can swing out while driving and injure other persons.

- ▶ Before departure, ensure that the hand crank is in the driving position and secured.

⚠ CAUTION

Risk of injury due to crank recoil!

A hand crank recoil can cause injuries when releasing the hand crank.

- ▶ Slowly ease the load off the hand crank at the end of the rotation.

The crank drive for the rear braces has two speeds:

- High speed (extend/retract the rear brace)
- Load speed (raise or lower the vehicle)

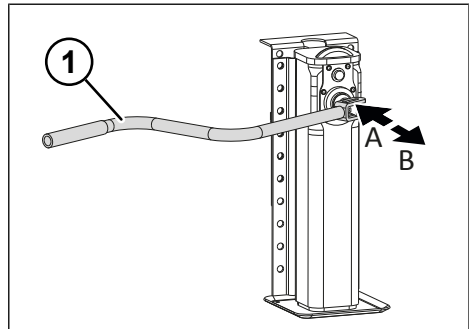



Fig. 5-8: Load speed and high speed of the rear brace

- 1 Hand crank
- A Load speed
- B High speed

INFO

Cranking clockwise moves the landing leg downwards. Cranking counter-clockwise moves the landing leg upwards.

 Also observe the enclosed supplier documentation.

Putting the rear braces in the support position

- ▶ Apply the parking brake (see "5.7.2 Parking brake", pg. 49).
- ▶ Ensure that the ground is load-bearing and level.
- ▶ Use wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Raise the trailer to the desired ramp height using the air suspension (see "5.8 Air suspension", pg. 52).
- ▶ Lift the hand crank from the bracket.
- ▶ Engage the hand crank on the crank drive shaft until it locks into place.
- ▶ Switch on high speed by pulling out the hand crank (see "Fig. 5-8: Load speed and high speed of the rear brace", pg. 32).
- ▶ Wind down the landing legs until they touch the ground.

- ▶ Switch on load speed by pushing in the hand crank (see "Fig. 5-8: Load speed and high speed of the rear brace", pg. 32).
- ▶ Use the hand crank to wind to the desired support height.
 - ⇒ The rear braces are extended.
- ▶ Adjust the front landing leg winch (see "5.2 Support device", pg. 28).
- ▶ Align the trailer level in the longitudinal and transverse directions. Do not fully unload the wheels while doing so.
- ▶ Lower the trailer with the air suspension (see "5.8 Air suspension", pg. 52).
- ✓ The rear braces have been placed in the support position
- ✓ The trailer is supported at the rear only by the rear braces.

Putting the rear braces in the driving position

- ▶ Check the parking brake and apply if necessary (see "5.7.2 Parking brake", pg. 49).
- ▶ Take the hand crank from the bracket.
- ▶ Engage the hand crank on the crank drive shaft until it locks into place.
- ▶ Set to load speed by pushing in the hand crank (see "Fig. 5-8: Load speed and high speed of the rear brace", pg. 32).
- ▶ Wind up the landing leg until it is unloaded.
- ▶ Set to high speed by pulling out the hand crank (see "Fig. 5-8: Load speed and high speed of the rear brace", pg. 32).
- ▶ Wind up the landing leg up to the stop.
- ▶ Secure the hand crank in the bracket.
- ✓ The rear braces have been put in driving position and the crank is secured.

5.3.2 Rear braces with crank mechanism (folding)

⚠ WARNING

Risk of injury due to a swivelled-out hand crank!

An unsecured crank can swing out while driving and injure other persons.

- ▶ Before departure, ensure that the hand crank is in the driving position and secured.

⚠ CAUTION

Risk of injury due to crank recoil!

A hand crank recoil can cause injuries when releasing the hand crank.

- ▶ Slowly ease the load off the hand crank at the end of the rotation.

The crank drive for the rear braces has two speeds:

- High speed (extend/retract the rear brace)
- Load speed (raise or lower the vehicle)

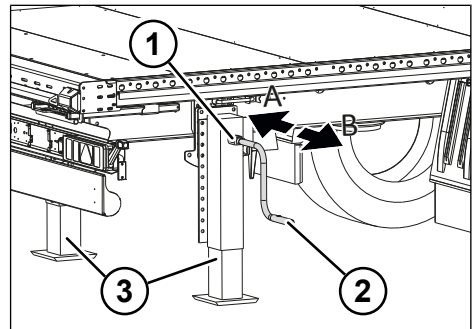



Fig. 5-9: Load speed and high speed of the rear brace

- 1 Crank drive shaft
- 2 Hand crank
- 3 Extended landing legs
- A Load speed
- B High speed

INFO

Cranking clockwise moves the landing leg downwards. Cranking counter-clockwise moves the landing leg upwards.

 Also observe the enclosed supplier documentation.

Putting the rear braces in the support position

- ▶ Apply the parking brake (see "5.7.2 Parking brake", pg. 49).
- ▶ Ensure that the ground is load-bearing and level.
- ▶ Use wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Raise the trailer to the desired ramp height using the air suspension (see "5.8 Air suspension", pg. 52).
- ▶ Lift the hand crank from the bracket.
- ▶ Support the rear brace with one hand to prevent it from falling suddenly after unlocking.

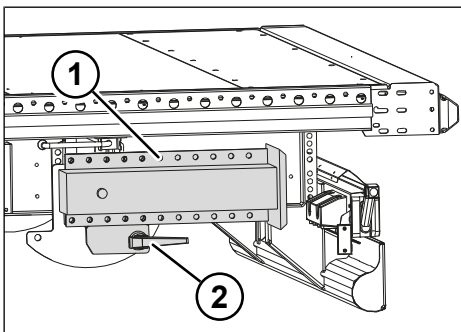


Fig. 5-10: Rear brace folded in

- 1 Folded in rear brace
- 2 Hand lever for the rear brace lock

- ▶ Pull the hand lever on the rear brace lock until the lock is released.
- ▶ Fold down the rear brace until the bolt of the lock is in front of the hole.

- ▶ Push in the hand lever until it locks into place.
 - ⇒ The rear brace is locked.
- ▶ Also fold down and lock the second rear brace.

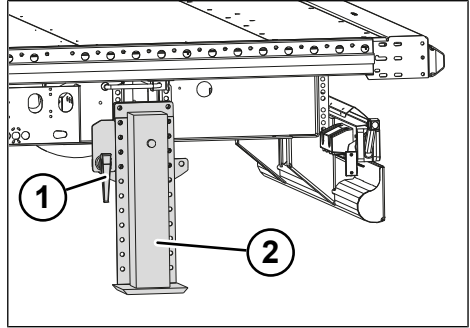


Fig. 5-11: Folded down rear brace

- 1 Hand lever for the rear brace lock
- 2 Rear brace folded down

- ▶ Engage the hand crank on the crank drive shaft until it locks into place.
- ▶ Switch on high speed by pulling out the hand crank (see "Fig. 5-9: Load speed and high speed of the rear brace", pg. 33).
- ▶ Wind down the landing legs until they touch the ground.
- ▶ Switch on load speed by pushing in the hand crank (see "Fig. 5-9: Load speed and high speed of the rear brace", pg. 33).
 - ⇒ The rear braces are folded down and extended.
- ▶ Adjust the front landing leg winch (see "5.2 Support device", pg. 28).
- ▶ Align the trailer level in the longitudinal and transverse directions. Do not fully unload the wheels while doing so.
- ▶ Lower the trailer with the air suspension (see "5.8 Air suspension", pg. 52).
- ✓ The rear braces have been placed in the support position.
- ✓ The trailer is supported at the rear only by the rear braces.

Putting the rear braces in the driving position

- ▶ Check the parking brake and apply if necessary (see "5.7.2 Parking brake", pg. 49).
- ▶ Take the hand crank from the bracket.
- ▶ Engage the hand crank on the crank drive shaft until it locks into place.
- ▶ Set to load speed by pushing in the hand crank (see "Fig. 5-9: Load speed and high speed of the rear brace", pg. 33).
- ▶ Wind up the landing legs until they are unloaded.
- ▶ Set to high speed by pulling out the hand crank (see "Fig. 5-9: Load speed and high speed of the rear brace", pg. 33).
- ▶ Wind up the landing legs up to the stop.
- ▶ Pull the hand lever on the rear brace lock until the lock is released.
- ▶ Fold up the rear brace until the bolt of the lock is in front of the hole.
- ▶ Push in the hand lever until it locks into place.
 - ⇒ The rear brace is locked.
- ▶ Secure the hand crank in the bracket.
- ▶ Also fold up and lock the two rear braces.
- ✓ The rear braces have been placed in the driving position and the cranks are secured.

5.3.3 Rear braces without crank mechanism

Putting the rear braces in the support position

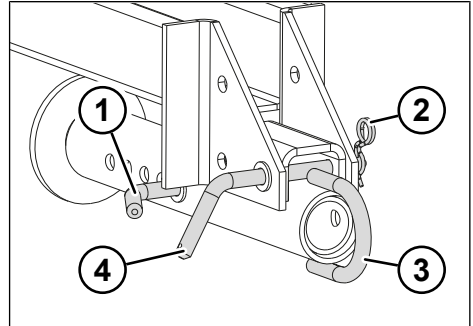


Fig. 5-12: Folding down the rear brace

- 1 Bolt for the height lock
 - 2 Spring cotter pin for the folding mechanism
 - 3 Handle
 - 4 Bolt for the folding mechanism
- ▶ Lift the vehicle to the desired ramp height using the air suspension (see "5.8 Air suspension", pg. 52).
 - ▶ Remove the spring cotter pin for the folding mechanism.
 - ▶ Support the rear brace by its handle and remove the bolt for the folding mechanism.
 - ▶ Fold down the rear brace.
 - ▶ Reinsert the bolt for the folding mechanism.

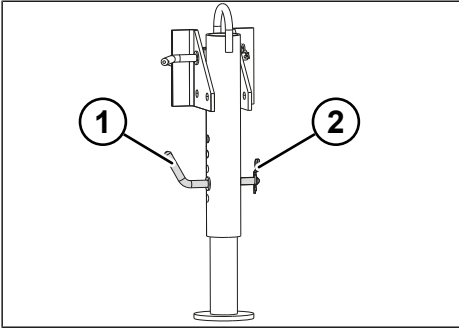


Fig. 5-13: Adjusting the height of the rear brace

- 1 Bolt for the height lock
- 2 Spring cotter pin for the height lock

- ▶ Secure the bolt for the folding mechanism with the spring cotter pin.
- ▶ Remove the spring cotter pin for the height lock.
- ▶ Hold the foot of the rear brace and remove the bolt for the height lock.
- ▶ Pull out the foot of the rear brace as necessary to the length required by the loading height.
- ▶ Reinsert the bolt for the height lock and secure the foot of the rear brace in the desired position.
- ▶ Secure the bolt for the height lock with the spring cotter pin.
- ▶ Fold down the second rear brace in the same way.
- ▶ Adjust the front support device (see "5.2 Support device", pg. 28).
- ▶ Align the vehicle level in the longitudinal and transverse directions. Do not fully unload the wheels while doing so.
- ▶ Lower the vehicle with the air suspension (see "5.8 Air suspension", pg. 52).
- ✓ The rear braces have been placed in the support position.
- ✓ The vehicle rear is supported only by the rear braces.

Putting the rear braces in the driving position

- ▶ Lift the vehicle with the air suspension until the rear braces no longer touch the ground (see "5.8 Air suspension", pg. 52).
- ▶ Remove the spring cotter pin for the height lock.
- ▶ Hold the foot of the rear brace and remove the bolt for the height lock.
- ▶ Push the foot for the rear brace upwards.
- ▶ Reinsert the bolt for the height lock and secure the foot of the rear brace in the top position.
- ▶ Secure the bolt for the height lock with the spring cotter pin for the height lock.
- ▶ Remove the spring cotter pin for the folding mechanism.
- ▶ Hold the rear brace by its handle and remove the bolt for the folding mechanism.
- ▶ Fold up the rear brace.
- ▶ Reinsert the bolt for the folding mechanism.
- ▶ Secure the bolt for the folding mechanism with the spring cotter pin.
- ▶ Fold up the second rear brace in the same way.
- ✓ The rear braces have been placed in the driving position and secured.

5.4 Supply and control connections

⚠ DANGER

Disconnected supply and control connections pose a risk of accident!

Driving without the supply and control connections being connected between the tractor unit and the trailer affects the driving and brake behaviour and is prohibited by law. There is a risk of accidents due to the malfunction.

Before each trip:

- ▶ Connect the compressed air supply.
- ▶ Connect the electrical power supplies for the vehicle lighting.
- ▶ Connect the electrical power supplies for the brake system.

⚠ WARNING

Damaged or inadequate supply and control connections pose a risk of accident!

Damaged or inadequate supply and control connections between the tractor unit and trailer affect driving and braking behaviour and can lead to accidents.

- ▶ Ensure that all compressed air connections are properly connected and not leaking.
- ▶ Ensure proper functioning of the couplings.
- ▶ Replace damaged rubber seals or damaged coupling heads on the tractor unit and trailer.
- ▶ Ensure that the EBS plug is properly locked.

⚠ WARNING

Improperly connecting and disconnecting the supply and control connections poses a risk of accident!

Improperly connected compressed air and electrical lines affect driving and braking behaviour and can lead to accidents.

- ▶ Observe the connection sequence of the lines when hitching and unhitching.
- ▶ Always close the coupling heads with the protective caps after unhitching the brake lines.

For axle and brake control as well as air and power supply, the trailer is equipped with various connections on its front side.

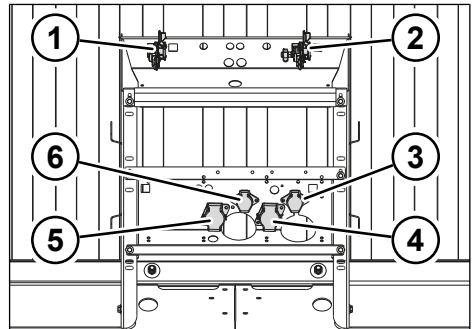


Fig. 5-14: Possible arrangement of the supply and control connections

- 1 Supply compressed air coupling (red)
- 2 Brake compressed air coupling (yellow)
- 3 Vehicle lighting socket N ISO 1185, 7-pin (black)
- 4 Vehicle lighting socket ISO 12098, 15-pin
- 5 Brake EBS socket power supply ISO 7638
- 6 Vehicle lighting socket S ISO 3731, 7-pin (white)

More information about the plug and socket assignment can be found in the technical data (see "14.1 Plugs and socket pin assignments", pg. 218).

Coupling

Depending on the design, the following couplings may be installed:

- Standard coupling heads (standard),
- Duo-Matic coupling and
- C-coupling heads.

Connecting the standard coupling

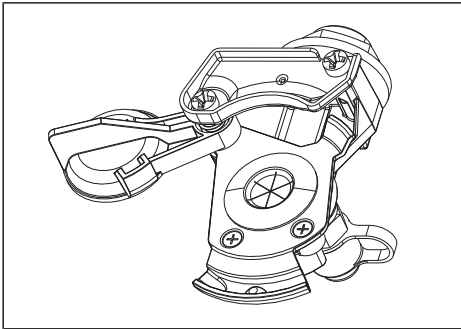


Fig. 5-15: Example of standard coupling head

- ☑ The parking brake on the tractor unit is applied.
- ☑ The parking brake on the trailer is applied (see "5.7.2 Parking brake", pg. 49).
- ▶ Check the cleanliness and integrity of the sealing surfaces on the coupling heads. Clean if necessary.
- ▶ Always connect the brake compressed air coupling (yellow) first.
- ▶ Connect the supply compressed air coupling (red).
- ▶ Connect the power supply (vehicle lighting) and the brake power supply (EBS).
- ✓ The supply and control connections are now connected.

Disconnecting the standard coupling

- ☑ The parking brake on the tractor unit is applied.

- ☑ The parking brake on the trailer is applied (see "5.7.2 Parking brake", pg. 49).
- ▶ Always disconnect the supply compressed air coupling (red) first.
- ▶ Disconnect the brake compressed air coupling (yellow).
- ▶ Disconnect the power supply (vehicle lighting) and the brake power supply (EBS).
- ▶ Close the disconnected coupling heads and plugs with the protective caps.
- ✓ The supply and control connections are disconnected.

Connecting the Duo-Matic coupling

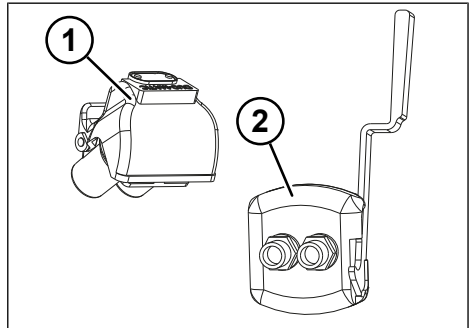


Fig. 5-16: Duo-Matic coupling

- 1 Compressed air coupling (tractor unit part)
 - 2 Compressed air coupling (trailer part)
- ☑ The parking brake on the tractor unit is applied.
 - ☑ The parking brake on the trailer is applied (see "5.7.2 Parking brake", pg. 49).
 - ▶ Check the cleanliness and integrity of the sealing surfaces on the coupling heads. Clean if necessary.
 - ▶ Pull down the compressed air coupling (trailer part) lever and insert the coupling head (tractor unit part).

- ▶ Connect the power supply (vehicle lighting) and the brake power supply (EBS).
- ✓ The supply and control connections are now connected.

Disconnecting the Duo-Matic coupling

- ☑ The parking brake on the tractor unit is applied.
- ☑ The parking brake on the trailer is applied (see "5.7.2 Parking brake", pg. 49).
- ▶ Pull down the coupling head (trailer part) lever and remove the coupling head (tractor unit part).
- ▶ Disconnect the power supply (vehicle lighting) and the brake power supply (EBS).
- ▶ Close the disconnected coupling heads and plugs with the protective caps.
- ✓ The supply and control connections are disconnected.

Connecting C-coupling heads

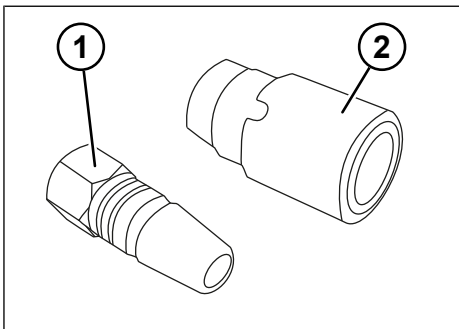


Fig. 5-17: C-coupling heads (trailer)

- 1 Supply compressed air coupling (red)
- 2 Brake compressed air coupling (yellow)

- ☑ The parking brake on the tractor unit is applied.
- ☑ The parking brake on the trailer is applied (see "5.7.2 Parking brake", pg. 49).

- ▶ Check the cleanliness and integrity of the sealing surfaces on the coupling heads. Clean if necessary.
- ▶ Always connect the brake compressed air coupling (yellow) first.
- ▶ Connect the supply compressed air coupling (red).
- ▶ Connect the power supply (vehicle lighting) and the brake power supply (EBS).
- ✓ The supply and control connections are now connected.

Disconnecting C-coupling heads

- ☑ The parking brake on the tractor unit is applied.
- ☑ The parking brake on the trailer is applied (see "5.7.2 Parking brake", pg. 49).
- ▶ Always disconnect the supply compressed air coupling (red) first.
- ▶ Disconnect the brake compressed air coupling (yellow).
- ▶ Disconnect the power supply (vehicle lighting) and the brake power supply (EBS).
- ▶ Close the disconnected coupling heads and plugs with the protective caps.
- ✓ The supply and control connections are disconnected.

High-voltage connections

- ▶ Use only undamaged cables and plugs.
- ▶ Before connecting and disconnecting the power cable, switch off the battery pack unit on the cooling system.

 Observe the instructions in the manufacturer's documentation.

5.5 Draining the compressed air tanks

⚠ WARNING

Risk of accident due to condensation water!

Condensation water in the compressed air tank can cause corrosion and affect the functionality of the brake system and the air suspension. Frozen condensation water can lead to total failure of the brake system and to serious accidents.

- ▶ Check the compressed air tank for the presence of condensation water.
- ▶ Drain any existing condensation water.
- ▶ Drain existing condensation water more frequently in case of low or strongly fluctuating outside temperatures.

The tractor vehicles are fitted with air dryers. This means that condensate in the compressed air is largely prevented. During cold periods of the year, or when air humidity is high, condensation water can still form and collect in the compressed air tank. The compressed air supply for the brake system and the air suspension is stored in the compressed air tanks. Existing condensation water can be drained using the water drain valve.

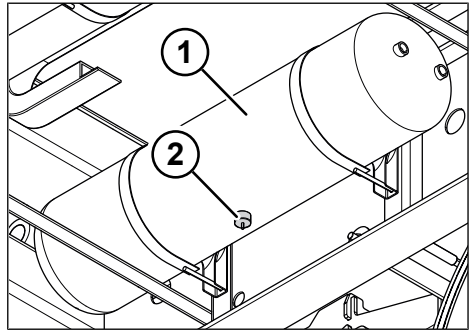


Fig. 5-18: Compressed air tank

- 1 Compressed air tank
- 2 Water drain valve

- ▶ Push the valve pins of the water drain valves on all compressed air tanks to the side until the condensation water is fully drained.
- ✓ The condensation water is drained.

5.6 KRONE Trailer Axles

The KRONE Trailer Axle can optionally be installed on the trailer. It is fitted with air suspension, brakes, brake cylinders, shock absorbers and, as an option, with a Twinlift.

Depending on the equipment, the last axle of the vehicle can be a self-steering axle.

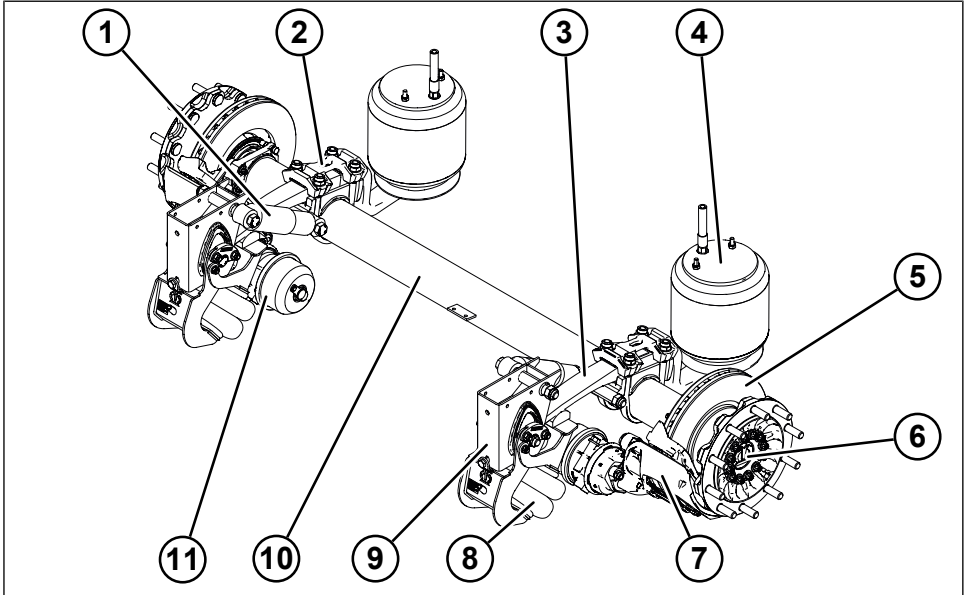


Fig. 5-19: Overview of the KRONE Trailer Axle disc brake (air spring link up)

- 1 Shock absorber
- 2 Integration
- 3 Air spring link
- 4 Air spring bellow
- 5 Brake discs
- 6 Wheel flange/wheel bearing unit
- 7 Brake calliper
- 8 Twinlift
- 9 Air spring bracket
- 10 Axle body
- 11 Brake cylinder

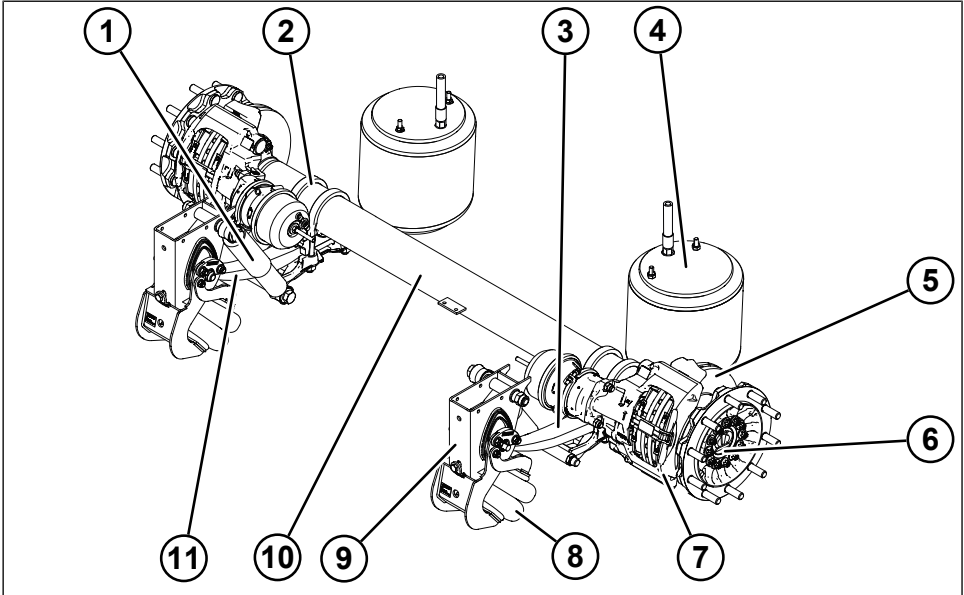


Fig. 5-20: Overview of the KRONE Trailer Axle disc brake (air spring link down)

- 1 Shock absorber
- 2 Integration
- 3 Air spring link
- 4 Air spring bellow
- 5 Brake discs
- 6 Wheel flange/wheel bearing unit
- 7 Brake calliper
- 8 Twinlift
- 9 Air spring bracket
- 10 Axle body
- 11 Brake cylinder

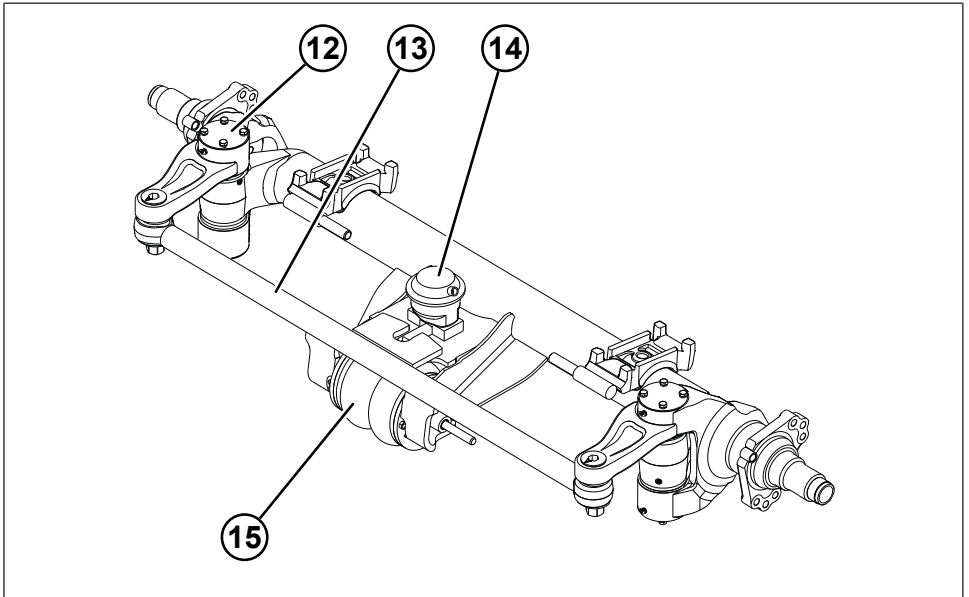


Fig. 5-21: Additional self-steering axle assemblies

- 12 Steering pin unit
- 13 Tie rod unit
- 14 Locking unit
- 15 Stabilisation unit

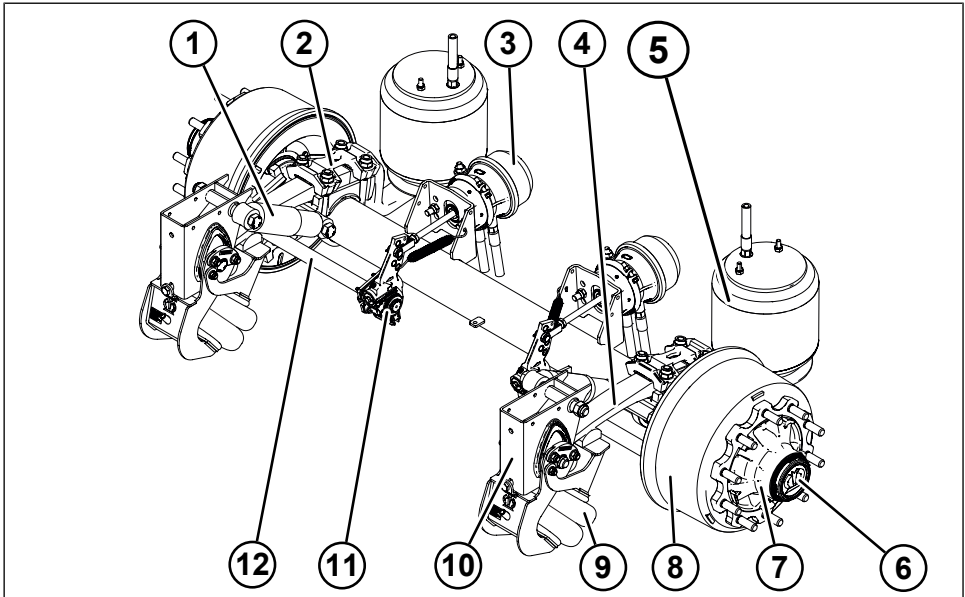


Fig. 5-22: Overview of the KRONE Trailer Axle drum brake (air spring link up)

- 1 Shock absorber
- 2 Integration
- 3 Brake cylinder
- 4 Air spring link
- 5 Air spring bellow
- 6 Hub cap
- 7 Hub unit
- 8 Brake drum
- 9 Twinlift
- 10 Air spring bracket
- 11 ASA
- 12 Brake camshaft

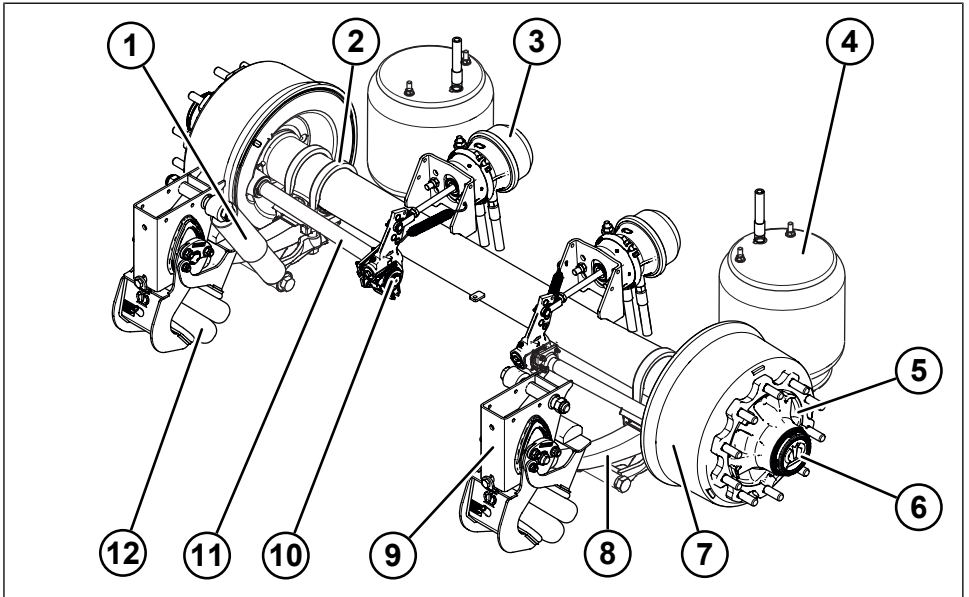


Fig. 5-23: Overview of KRONE Trailer Axle drum brake (air spring link down)

- 1 Shock absorber
- 2 Integration
- 3 Brake cylinder
- 4 Air spring bellow
- 5 Hub unit
- 6 Hub cap
- 7 Brake drum
- 8 Air spring link
- 9 Air spring bracket
- 10 ASA
- 11 Brake camshaft
- 12 Twinlift

5.6.1 Product identification and type plate

The item number and serial number are engraved on the axle body next to the type plate. This is to identify the axle if the type plate is lost or is not sufficiently legible.

The type plate and the engraving for product identification of the KRONE Trailer Axle are attached at the following location:

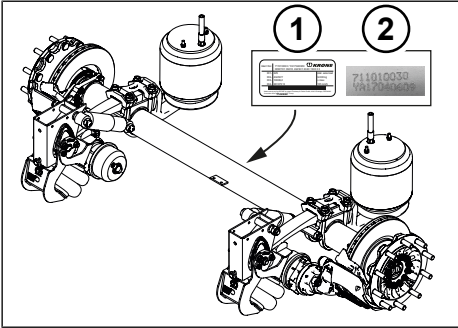


Fig. 5-24: Type plate position

- 1 Type plate
- 2 Engraving

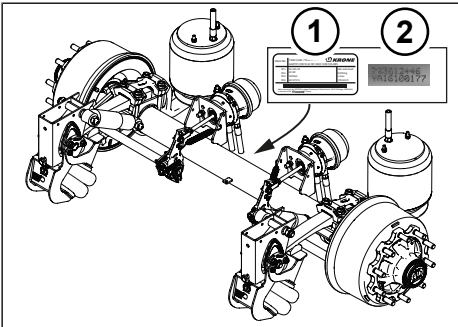


Fig. 5-25: Type plate position

- 1 Type plate
- 2 Engraving

The following information is presented on the type plate:

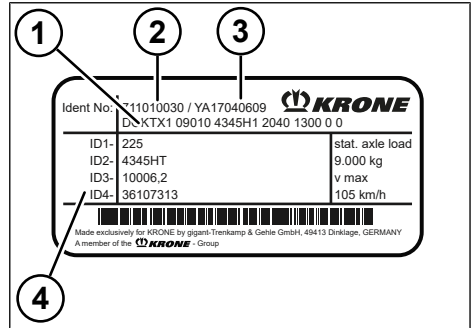


Fig. 5-26: Type plate example

- 1 Axle designation
- 2 Item number
- 3 Serial number
- 4 ID test log

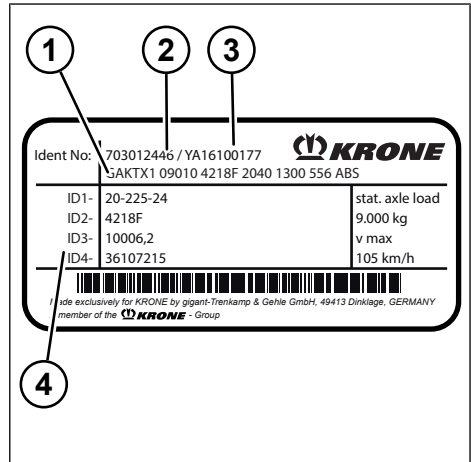


Fig. 5-27: Type plate example

- 1 Axle designation
- 2 Item number
- 3 Serial number
- 4 ID test log

5.7 Brake system

DANGER

Risk of accidents due to non-functional EBS!

If the EBS plug connection function is not established, the EBS of the vehicle and the automatic load-dependent brake power regulation cannot work. The vehicle is overbraked and the wheels may lock. Serious traffic accidents could occur. Driving without the EBS plug connection is prohibited by law.

- ▶ Only drive with an approved, connected and functioning EBS plug connection.
- ▶ Always connect the EBS plug connections between the tractor unit and the trailer.
- ▶ Verify the EBS plug connection via a system check (the magnetic valves in the EBS modulator are audibly and briefly activated and deactivated for 2 seconds after "ignition on")
- ▶ Only use plug connections that comply with the regulations.
- ▶ Have the fault immediately repaired by the nearest contract workshop.

WARNING

Risk of accident due to unharmonised brake power tuning!

Unharmonised brake power between the tractor unit and vehicle may lead to insufficient or excessive vehicle braking values. This can cause increased wear and accidents.

- ▶ Monitor the automatic coupling force control to harmonize the brake power.
- ▶ Observe the sticker on the vehicle.

WARNING

Risk of accident due to insufficient air supply pressure!

If the air supply pressure is < 4.5 bar, the vehicle can no longer be stopped using the service brake. If the pressure is < 2.5 bar on the red coupling head, the vehicle will automatically be stopped via the spring storage.

- ▶ As soon as the warning display/warning lamp lights up (red and yellow), stop the vehicle and park at a suitable location.
- ▶ Check the pressure supply and call a repair service if necessary.

WARNING

Risk of accident due to pressure loss inside the brake system!

Pressure loss in the brake system due to a leak causes a deterioration in the service brake's effectiveness until the parking brake is automatically activated. Unintended vehicle movement can cause an accident.


- ▶ For extended stops, additionally secure the vehicle from rolling away by using the parking brake and wheel chocks.
- ▶ Have an authorized specialist workshop eliminate the leaks.

INFO

The brake system equipment on the vehicle is state of the art. The equipment level of the brake equipment on the tractor unit depends on the manufacturer and type. Likewise, the coupling force controllers of the tractor units in relation to the vehicle braking and the control system limits also differ. It is therefore sensible to observe the braking behaviour of the tractor combination and to adjust it if necessary.

INFO

The vehicle may only be towed by tractor units that ensure the effectiveness of the EBS system. The EBS system includes the ABS function (automatic anti-lock system ABS), the ALB function (automatic load-dependent braking), and the RSS function (vehicle stabilization for air-suspended vehicles). Full EBS functionality is only ensured when used in conjunction with tractor units equipped with EBS equipment (ISO 7638 socket, 7-pin).

 Also observe the enclosed supplier documentation.

KRONE vehicles are equipped with a brake system according to the current version of UN-ECE Regulation 13.

A system check of the electronic brake system (EBS) is performed upon turning on the ignition in the tractor unit and during the trip. Errors in the EBS brake system are displayed via a warning lamp/warning display on the tractor unit's dashboard. The warning lamp/warning display lights up after turning on the ignition. If no error is detected, the warning lamp/warning display turns off after approx. two seconds.

If an error was detected during the last trip (e.g. sensor error), the warning lamp/warning display lights up and turns off if the speed is > 7 km/h.

- ▶ If the warning lamp/warning display does not turn off at the start of the trip either, have the fault repaired by a specialist workshop.

The brake system has two independent brake circuits:

- Service brake
- Parking brake

5.7.1 Service brake

⚠ WARNING

Possible risk of accidents when releasing the parking brake with the service brake released at the same time!

The trailer is not braked if the parking brake and the service brake are released at the same time. The trailer is not braked, it can roll away and cause an accident.

- ▶ Only release the service and parking brake at the same time when a towing or manoeuvring vehicle is connected to the trailer.
- ▶ Additionally secure the trailer with wheel chocks when parking or standing on slopes.

INFO

Repeated operation of the service brake when the supply lines are uncoupled uses up compressed air from the air reservoir. The trailer is then only partially braked (depending on the air supply).

When the supply conduit is unhitched, the trailer is automatically braked. The black control knob on the control unit can be used to release the service brake to manoeuvre the trailer without a connected compressed air supply (see "7.3 Manoeuvring the trailer without a connected compressed air supply", pg. 135).

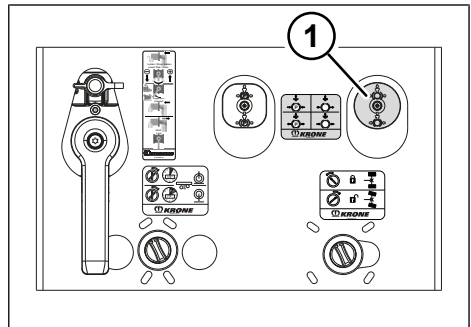


Fig. 5-28: Service brake

- 1 Black control knob (manoeuvring)

Disengaging the service brake

- ▶ Press the black control knob.
- ✓ The service brake is disengaged.
- ✓ If the parking brake is also released, the trailer is not braked.

Applying the service brake

- ▶ Pull out the black control knob.
- ✓ The service brake is applied.
- ✓ The trailer is partially braked (depending on the air supply).

Connecting the supply conduit will automatically push out the black control knob to the driving position again.

5.7.2 Parking brake

NOTE

Property damage by driving with the parking brake applied!

Driving with the parking brake applied will damage the trailer's brakes, tyres and axles after a short time.

- ▶ Disengage the parking brake before starting the trip.

The parking brake is its own brake circuit. It is applied via the brake cylinder's spring storage parts.

The parking brake must be actuated manually. Before unhitching and for parking, the trailer must be braked using the red control knob.

To tow or manoeuvre without compressed air, the parking brake can be disengaged with the emergency release system (see "5.7.3 Emergency release devices for the parking brake", pg. 50).

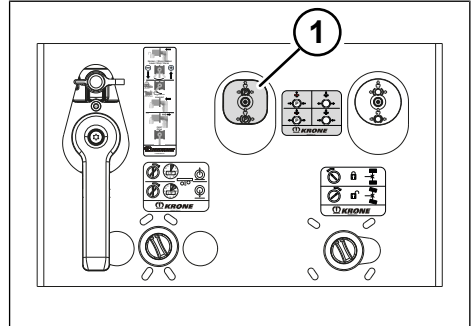


Fig. 5-29: Parking brake

- 1 Red control knob (park)

Applying the parking brake

- ▶ Pull out the red control knob.
- ✓ The parking brake is applied
- ✓ The trailer is braked and can be parked.

Disengaging the parking brake

⚠ WARNING

Possible risk of accidents when releasing the parking brake with the service brake released at the same time!

The trailer is not braked if the parking brake and the service brake are released at the same time. The trailer is not braked, it can roll away and cause an accident.

- ▶ Only release the service and parking brake at the same time when a towing or manoeuvring vehicle is connected to the trailer.
- ▶ Additionally secure the trailer with wheel chocks when parking or standing on slopes.

INFO

The parking brake does not disengage automatically. Prior to starting off it must be disengaged manually.

- ☑ The trailer is hitched.
- ☑ The supply and control lines are connected.

- ▶ Press the red control knob.
- ✓ The parking brake is released and the trailer is not braked.

5.7.3 Emergency release devices for the parking brake

⚠ WARNING

Risk of accident due to rolling away!

When the emergency release device is activated, the parking brake does not function. When it is not braked, the trailer can roll away and cause serious injuries and material damage.

- ▶ Only release the service and parking brake when a towing or manoeuvring vehicle is connected to the trailer.
- ▶ Use wheel chocks to prevent the trailer from rolling away.
- ▶ Insert the emergency release screw in its holder before starting to drive.

⚠ WARNING

Risk of accidents when driving with the emergency release screw!

Driving with the emergency release screw fitted can make the brake system inoperative and result in accidents.

- ▶ Ensure that the emergency release screw has been returned to the parking position before driving off again.

If the compressed air for the parking brake's spring storage fails due to a defect, the braking effect can be cancelled via an emergency release device on the brake cylinders.

The spring storage of the brake system can be operated without compressed air using the emergency release device. When the emergency release device is activated, the spring storage is clamped on each wheel and the parking brake is opened. By doing so, the trailer can be towed or manoeuvred.

INFO

The shape of the spring storage can vary according to the model and differ from the figure shown.

Activating the emergency release device for the parking brake

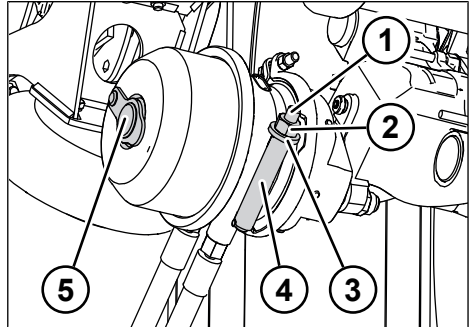


Fig. 5-30: Spring storage with emergency release device

- 1 Emergency release screw
- 2 Retainer nut
- 3 Flat washer
- 4 Bracket
- 5 Protective cap

- ▶ Use wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Loosen the retainer nut and flat washer.
- ▶ Remove the emergency release screw from the holder.
- ▶ Open the cap.

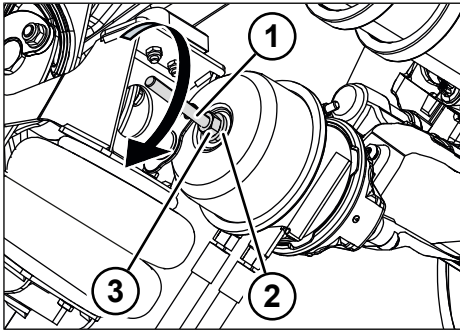


Fig. 5-31: Activating the emergency release screw

- 1 Emergency release screw
- 2 Flat washer
- 3 Retainer nut

- ▶ Insert the emergency release screw.
- ▶ Turn the emergency release screw clockwise (90°) until it engages.
- ▶ Screw the retainer nut and flat washer onto the emergency release screw.
- ▶ Tighten the retainer nut with the suitable spanner until the stop.
- ✓ The spring storage is mechanically tensioned and the brake cylinder has no more braking effect.
- ▶ Activate the emergency release device on all the spring storage devices.
- ✓ The emergency release device is activated and the service and parking brakes are without function.
- ✓ The trailer is not braked.

Deactivating the emergency release device for the parking brake

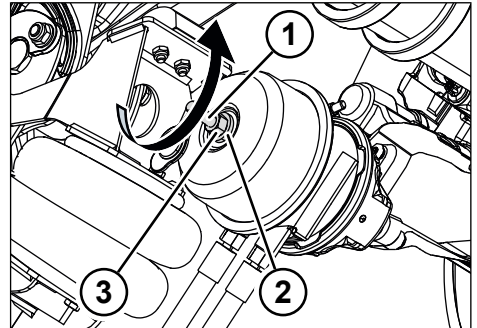


Fig. 5-32: Deactivating the emergency release screw

- 1 Emergency release screw
- 2 Flat washer
- 3 Retainer nut

- ▶ Unscrew the retainer nut and flat washer from the emergency release screw using a suitable spanner.
- ▶ Turn the emergency release screw key counter-clockwise (90°) and disengage it.
- ▶ Remove the emergency release screw.
- ▶ Insert the emergency release screw in its holder.
- ▶ Screw the retainer nut and flat washer onto the emergency release screw and tighten up to the stop with a suitable spanner.
- ▶ Close the cap.
- ✓ The spring storage is mechanically released and the brake is functional.
- ▶ Deactivate the emergency release device on all the spring storage devices.
- ✓ The emergency release device is deactivated and the service and parking brakes are functional.

5.8 Air suspension

⚠ WARNING

Risk of accident due to fully lowered or raised vehicle!

Failure to set the air suspension to the "Drive" position before starting off can result in a risk of accidents due to impaired driving characteristics or vehicle collisions in passageways.

- ▶ Always move the air suspension into driving position before driving off. The only exception is manoeuvring at walking speed.

⚠ CAUTION

Risk of injury due to crushing!

When lowering the trailer, the clearance under the trailer is reduced. Persons between the road and vehicle parts can be crushed and seriously injured.

- ▶ Avoid the danger areas.
- ▶ When operating the air suspension, avoid having persons underneath the trailer.

NOTE


Material damage due to grounding!

On vehicles with a large lifting height, the distance between the ground and suspension elements is reduced when reaching maximum lifting height. The spring elements on the axle could ground when manoeuvring and be damaged.

- ▶ For vehicles with large lifting heights, always put the air suspension in driving position.

KRONE trailers are equipped with an air suspension system. The vehicle height (e.g. to adjust it for a ramp) can be adjusted in two ways:

- Manually
- Electronically controlled

 Also observe the enclosed supplier documentation.

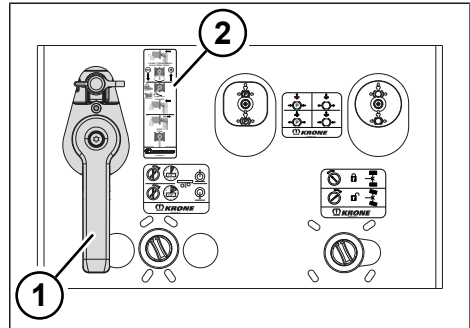


Fig. 5-33: Control lever of the air suspension

- 1 Control lever
- 2 Pictogram

Depending on the make and design of the lifting and lowering valves, the following functions can be carried out using the air suspension's control lever:

| Control lever position | Function |
|------------------------|--|
| Drive* | The trailer is always kept at the same height, regardless of the load. |
| Raised | The trailer is raised, e.g. to adjust it for a ramp. |
| Raised and engaged | The trailer is raised to the maximum possible lifting height. |
| Lowered | The trailer is lowered, e.g. to adjust it for a ramp. |
| Lowered and engaged | The trailer is lowered down to its mechanical limit (air suspension bellow without overpressure) |
| Stop | The trailer height achieved via lifting or lowering is maintained. |

* The driving position cannot be set manually on electronically controlled air suspension. Instead, the ride height is automatically set at a driving speed of > 15 km/h.

The operating instructions for the air suspension's control lever are shown as a pictogram on the control unit.

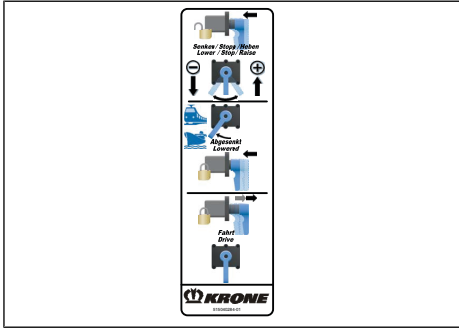


Fig. 5-34: Example pictogram of mechanically controlled air suspension

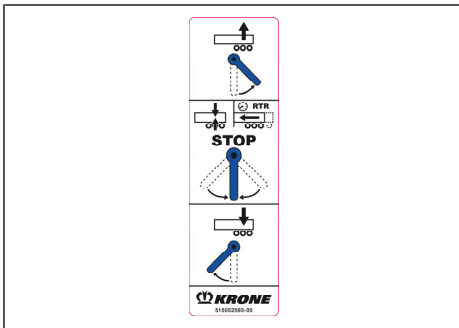


Fig. 5-35: Example pictogram of electronically controlled air suspension

To prevent chassis damage, the version with the lifting-lowering valve with automatic ride height resetting automatically sets the trailer back to the driving position when the vehicle speed exceeds 15 km/h.

NOTE

Driving with the wrong lifting height causes material damage!

Driving at the minimum or maximum lifting height on an electronically controlled air suspension can cause material damage to the trailer.

- ▶ Do not drive at the minimum or maximum lifting height.

⚠ CAUTION

Risk of accidents due to tipping movements!

If there is an improper power interruption, this may, among other things, result in the valve switching states being unclear on electronically controlled air suspension systems. Unclear valve switching positions can result in tipping movements in the longitudinal direction of the loading surface on lift axle controls. These are especially dangerous when using a forklift to load or unload from the rear.

- ▶ Properly shut down the entire electronic system before hitching and unhitching the trailer.
- ▶ Before disconnecting the supply lines (compressed air, vehicle electronics and ISO-7638 EBS power supply), switch the ignition in the tractor to "off" (terminal 15 = de-energised).

Optionally, KRONE trailers may also have a system for electronically controlled air suspension, e.g. via Wabco's ECAS system. It electronically controls the vehicle's ride height if there is a power supply and an adequate compressed air supply.

KRONE trailers with electronically controlled air suspension may be optionally equipped with various electronic control devices (control box, SmartBoard, electronic buttons, etc.).

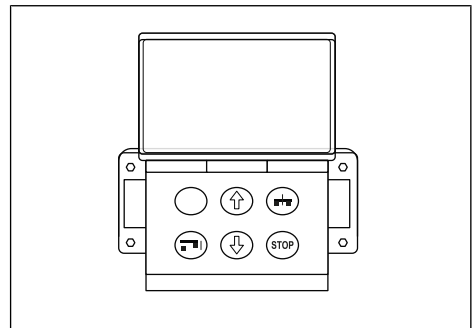



Fig. 5-36: Example of a control box (Wabco)

If there is sufficient air and power supply, the system can automatically regulate the ramp height. If there is no power supply, the ramp can also be adjusted via the electronically controlled air suspension with the control lever on the control unit.

 Also observe the enclosed supplier documentation.

Second ride height

The KRONE Mega Liner can be driven at two ride heights. The ride height is set automatically depending on the connection of the tractor unit. The ride height is adjusted manually with a control switch on the control unit.

- ▶ Turn control switch 1 to the right: 2. The ride height (high) will be activated.
- ▶ Turn control switch 1 to the left: 1. The ride height (low) will be activated.

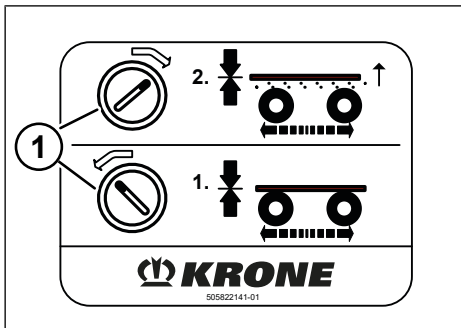


Fig. 5-37: Sticker for second ride height

- 1 Control switch for ride heights

5.9 Lift axles

WARNING

Risk of accidents due to the raising and lowering of the lift axle!

The lift axles are automatically raised depending on the load state. If the tractor unit's ignition is turned off, the raised lift axles are lowered. There is an increased risk of injury in the danger area of the wheels.

- ▶ Instruct persons to leave the hazard area of the wheels during loading and unloading.

KRONE trailers can be equipped with an electronic lift axle control with fully automatic operation.

Fully automatic lifting of lift axles depending on the vehicle's axle weight (air bellows pressure) only takes place if the EBS plug connection (ISO 7638) is active and the vehicle speed is greater than 15 km/h for the first time. When the ignition is interrupted while the vehicle is at standstill, the lift axle is lowered independent of the vehicle's axle weight.

Manually overriding the fully-automatic electronic lift axle control

Automatic control is cancelled if the lift axle control is manually operated on the control switch. The dependencies on the vehicle axle weight and the vehicle speed are not taken into account in this event. An EBS plug connection is a precondition for this. The control switch for manual lift axle control is on the control unit. Controlling a further lift axle is done on the same control switch on the fully-automatic and electronic lift axle control systems. The design and arrangement of the control switch depends on the vehicle equipment.

Using the lift axle's control switch, the driver can interrupt the automation of the lift axle control to activate the following functions:

- **Starting aid:** Manually raise the lift axle

A lift axle can be raised by force at a maximum vehicle speed of 30 km/h and up to 30% overload for the axle remaining on the ground.

- **Manoeuvring aid:** Manually raise the lift axle

A lift axle can be raised by force at a maximum vehicle speed of 30 km/h and up to 0 % overload for the axle remaining on the ground.

- **Deactivating the lift axle automatic system:** Manually lower the lift axles

The starting aid function refers to a lift axle in the first position of the axle group. The manoeuvring aid function refers to a lift axle in the last position of the axle group. Only the starting aid function is available if more than one lift axle is installed on the trailer. The automatic lift axle control is re-activated by turning the ignition off and on in the tractor unit.

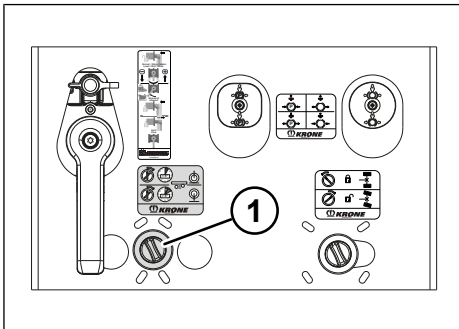


Fig. 5-38: Control unit

- 1 Lift axle control switch

- ▶ Operate the control switch time-dependently (rotary push-button switch with reset).
- ✓ The lift axle is raised in compliance with legal regulations when the button is actuated for less than 5 seconds.
- ✓ The lift axle is raised in compliance with legal regulations when the button is actuated for less than 5 seconds (starting aid).
- ✓ When operated for longer than 5 seconds, the lift axle automatic system is deactivated and the lift axle remains down regardless of the load state (force lowered). This position is kept as long as the ignition of the tractor is not interrupted.

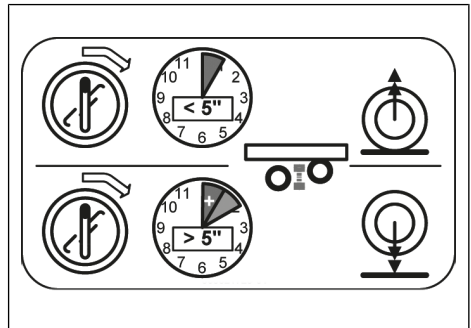


Fig. 5-39: Control switch functions of the lift axle control system

5.10 Rigid axle

KRONE trailers are equipped with rigid axles.

Also observe the enclosed supplier documentation.

5.11 Self-steering axle

WARNING

Risk of accident due to incorrectly set air pressure!

Incorrectly set air pressure in the stabilisation unit has a negative effect on the driving characteristics and can cause accidents.

- ▶ Adjust the air pressure to the loading conditions.
- ▶ Ensure a pressure of approx. 1 bar when in an empty state.

CAUTION

Risk of injury due to crushing!

Working on the self-steering axle can cause crushing injuries.

- ▶ Before working on the self-steering axle, disconnect the compressed air connection.
- ▶ Perform functional tests with sufficient distance from the hazard area.

INFO

Emergency safety device in case of pressure loss of the locking unit!

In case of pressure loss or a defective supply line, the locking unit goes into the locking function. As a result, the self-steering axle is permanently locked in the straight ahead position.

NOTE

Material damage when driving in reverse with the self-steering axle unlocked!


When reversing with an unlocked self-steering axle, the vehicle can run out of track. It is no longer possible to reset to a straight position, this can result in material damage.

- ▶ Activate the lock of the self-steering axle when driving in reverse.
- ▶ Make sure that the wheels are always set straight before locking.
- ▶ If the wheels are turned while reversing, cancel the operation and straighten and lock the wheels again.

KRONE trailers can be fitted with a self-steering axle with a back-up interlock. The trailing steering axle is the last axle of the vehicle.

When driving in reverse, the steering axle is locked:

- Automatically if the back-up spotlight is activated on the tractor unit or
- Manually (e.g. when manoeuvring without supply and control connections.)

 Also observe the enclosed supplier documentation.

5.11.1 Locking the self-steering axle automatically via the reverse gear lock

WARNING

Risk of accident when reversing with unlocked self-steering axle!

When reversing with the self-steering axle unlocked, the vehicle can run out of track. It is no longer possible to reset to a straight position, this can result in an accident.

- ▶ Always lock the self-steering axle with the back-up interlock when reversing.

Locking the self-steering axle

- ▶ Properly connect the supply and control connections between the tractor unit and the trailer vehicle (see "5.4 Supply and control connections", pg. 37).
- ▶ Straighten the combination.
- ▶ Engage reverse gear on the tractor.
- ✓ The self-steering axle is locked.

INFO

When the vehicle is unhitched, the back-up interlock can be controlled via the manual control unit. If the manual control unit is used, the back-up interlock must always be unlocked manually.

5.11.2 Manually locking the self-steering axle

⚠ WARNING

Risk of accident when reversing with unlocked self-steering axle!

When reversing with the self-steering axle unlocked, the vehicle can run out of track. It is no longer possible to reset to a straight position, this can result in an accident.

- ▶ Always lock the self-steering axle with the back-up interlock when reversing.

INFO

When manoeuvring without supply and control connections between the tractor unit and trailer, the self-steering axle must always be manually locked and unlocked. This does not take place automatically.

The control switch for the back-up interlock can be found on the control unit.

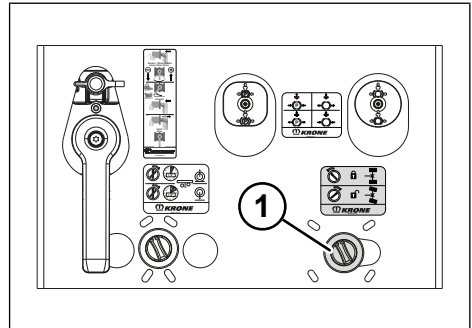


Fig. 5-40: Back-up interlock

- 1 Back-up interlock control switch

INFO

The operation is also indicated by pictograms. The shape and colour of the control units may vary depending on the type of device and differ from the type shown in the figure.

Locking the self-steering axle

- ▶ Straighten the combination.
- ▶ Turn the control switch to the left.
- ✓ The self-steering axle is locked.

Unlocking the self-steering axle

- ▶ Turn the control switch to the right.
- ✓ The self-steering axle is unlocked.

5.12 Mud flap

The mudguards of KRONE trailers that are designed for rail loading can be equipped with fold-up mud flaps on both sides.

Folding up the mud flap

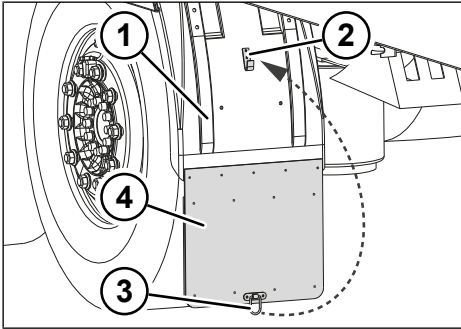


Fig. 5-41: Folded down mud flap

- 1 Mudguard
- 2 Hook
- 3 Hooking eyelet
- 4 Mud flap

- ▶ Fold up the mud flap.
- ▶ Attach the hooking eyelet to the hook on the mudguard.
- ✓ The mud flap is folded up.

Folding down the mud flap

- ▶ Unhook the hooking eyelet from the hook on the mudguard.
- ▶ Fold down the mud flap.
- ✓ The mud flap is folded down.

5.13 Rear underrun protection

KRONE trailers can be equipped with the following versions of the movable underrun protection:

- Fold-up rear underrun protection (see "5.13.1 Fold-up rear underrun protection", pg. 58)
- Rear underrun protection that swivels on both sides (see "5.13.2 Rear underrun protection that swivels on both sides", pg. 59)

5.13.1 Fold-up rear underrun protection

⚠ WARNING

Risk of accident when driving with the rear underrun protection folded up!

Driving with the rear underrun protection folded up is not permitted by law. In a collision, other motorists can drive under the vehicle and be fatally injured.

- ▶ Only drive with the rear underrun protection properly folded down and locked in place.

⚠ CAUTION

Risk of injury from the rear underrun protection folding down unintentionally!

If the rear underrun protection is folded up, but not properly secured (e.g. when loading at a rail terminal), it can suddenly fold down and injure people.

- ▶ Always lock the rear underrun protection.

Folding up the rear underrun protection

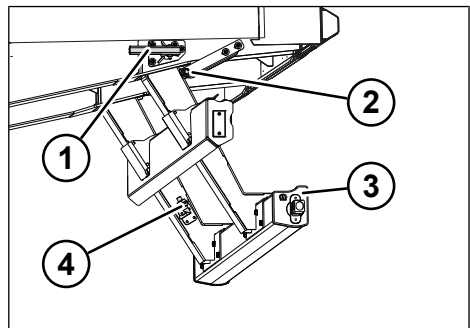


Fig. 5-42: Underrun protection lock

- 1 Underrun protection lock
- 2 Lock
- 3 Rear underrun protection
- 4 Spring latch

- ▶ Open the safety latch.
- ▶ Release the underrun protection lock.

- ▶ Lift the rear underrun protection until the underrun protection locks into place.

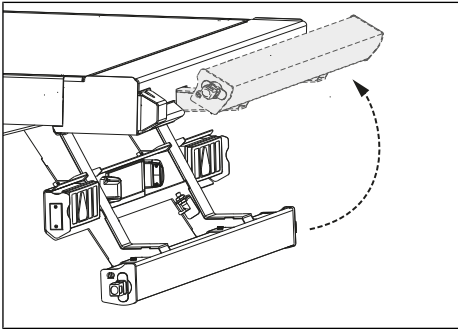


Fig. 5-43: Folding up the rear underrun protection

- ▶ Release the spring latches.
- ▶ Lift the rear underrun protection again until the spring latches engage.
- ✓ The rear underrun protection is folded up.

Folding down the rear underrun protection

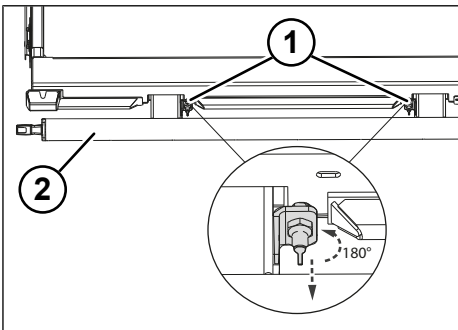


Fig. 5-44: Folding down the rear underrun protection

- 1 Spring latch
- 2 Underrun protection folded up

- ▶ Slightly lift the rear underrun protection and turn the spring latch by 180° degrees.
- ▶ Release the underrun protection lock.

- ▶ Fold down the rear underrun protection.
- ▶ Lock the rear underrun protection with the safety latch.
- ✓ The rear underrun protection is folded down and secured.

5.13.2 Rear underrun protection that swivels on both sides

⚠ WARNING

Risk of accident when driving with the rear underrun protection swivelled in!

Driving with the rear underrun protection swivelled in is not permitted by law. In a collision, other vehicles can drive under the trailer and fatally injure motorists.

- ▶ When driving without a rear stacker, always ensure that the underrun protection is swivelled out and locked.

Swivelling out the rear underrun protection that swivels on both sides

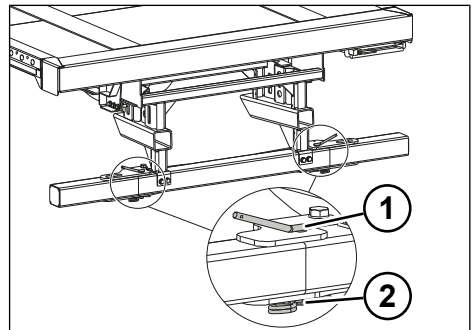


Fig. 5-45: Underrun protection that swivels out on both sides

- 1 Bolt
- 2 Securing device

- ▶ Remove the securing devices.
- ▶ Pull out the bolt.
- ▶ Swivel out the rear underrun protection (on both sides).

- ▶ Secure the bolt with the securing devices.
- ✓ The rear underrun protection is swivelled out.

Swivelling in the rear underrun protection that swivels on both sides

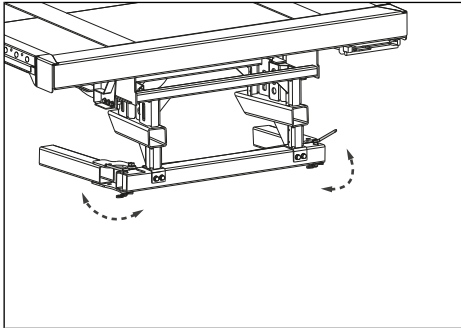


Fig. 5-46: Rear underrun protection swivelled in

- ▶ Remove the securing devices.
- ▶ Pull out the bolt.
- ▶ Swivel in the rear underrun protection (on both sides).
- ▶ Secure the bolt with the securing devices.
- ✓ The rear underrun protection is swivelled in.

5.14 Side collision protection

⚠ WARNING

Risk of accident when driving with the side collision protection folded up!

Driving with the side collision protection folded up is not permitted by law. In a collision, other motorists can get below the trailer and be fatally injured.

- ▶ Only drive with the side collision protection folded down and locked in place on both sides.

NOTE

Property damage during loading!

A folded-down side collision protection can cause damage to the vehicle when loading the vehicle (e.g. for rail transport).

- ▶ Fold up and lock the side collision protection on both sides when loading the vehicle.

KRONE trailers have a side collision protection. In addition to the fixed version, the folding version provides the possibility of folding up the side collision protection for maintenance work, to remove tools, to change the spare wheel or similar.

The following side collision protection versions are possible:

- Folding side collision protection with gas pressure springs (see "5.14.1 Folding side collision protection with gas pressure springs", pg. 60)
- Folding side collision protection with lock (see "5.14.2 Folding side collision protection with lock", pg. 61)
- Swivelling side collision protection with lock (see "5.14.3 Swivelling side collision protection with lock", pg. 62)

5.14.1 Folding side collision protection with gas pressure springs

⚠ CAUTION

Risk of injury from the side collision protection folding down unintentionally!

Malfunctioning gas pressure springs cannot secure the side collision protection. The side collision protection can suddenly fold down and injure people or swing outwards while driving, thereby causing accidents.

- ▶ Check the functionality of the gas pressure springs before beginning a trip.
- ▶ Immediately replace defective components.

Folding up the side collision protection

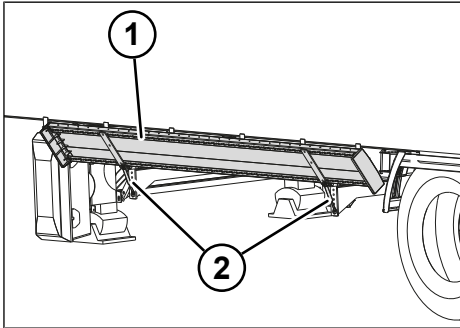


Fig. 5-47: Side collision protection folded up

- 1 Side collision protection
- 2 Gas pressure springs

- ▶ Carefully fold up the side collision protection until it is held in this position by the gas pressure springs.
- ✓ The side collision protection is folded up.

Folding down the side collision protection

- ▶ Carefully fold down the side collision protection until it is held in this position by the gas pressure springs.
- ✓ The side collision protection is folded down.

5.14.2 Folding side collision protection with lock

⚠ CAUTION

Risk of injury from the side collision protection folding down unintentionally!

An unlocked side collision protection can suddenly fold down and injure people or swing outwards while driving, thereby causing accidents.

- ▶ Lock the side collision protection in every position.

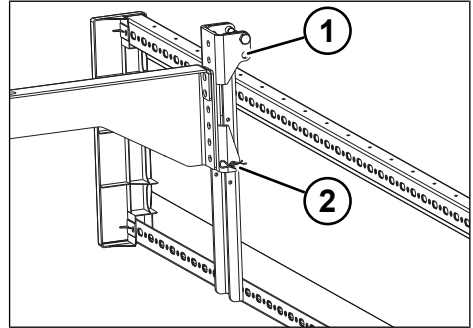


Fig. 5-48: Folded-down side collision protection ((rear view))

- 1 Drilled hole for the plug-in bolt while folded up
- 2 Plug-in bolts with spring pin

Folding up the side collision protection

- ▶ Pull out the spring pin on both plug-in bolts.
- ▶ Pull out the plug-in bolts.
- ▶ Fold up the side collision protection.
- ▶ Insert the plug-in bolts into the drilled holes.
- ▶ Secure the plug-in bolts with the spring pins.
- ✓ The side collision protection is folded up and secured.

Folding down the side collision protection

- ▶ Pull out the spring pin on both plug-in bolts.
- ▶ Pull out the plug-in bolts.
- ▶ Fold down the side collision protection.
- ▶ Insert the plug-in bolts into the drilled holes.
- ▶ Secure the plug-in bolts with the spring pins.
- ✓ The side collision protection is folded down and secured.

5.14.3 Swivelling side collision protection with lock

⚠ CAUTION

Risk of injury from the side collision protection folding down unintentionally!

An unlocked side collision protection can suddenly fold down and injure people or swing outwards while driving, thereby causing accidents.

▶ Lock the side collision protection in every position.

Folding up the side collision protection

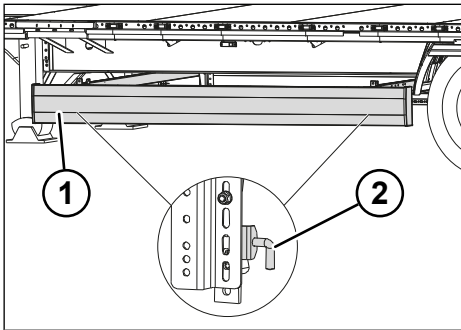


Fig. 5-49: Swivelling side collision protection

- 1 Side collision protection
- 2 Spring latch

- ▶ Pull out both spring latches and engage them in the unlocked position.
- ▶ Fold up the side collision protection until it is in a horizontal position and push in towards the centre of the vehicle.
- ▶ Lock the side collision protection by engaging the spring latch.

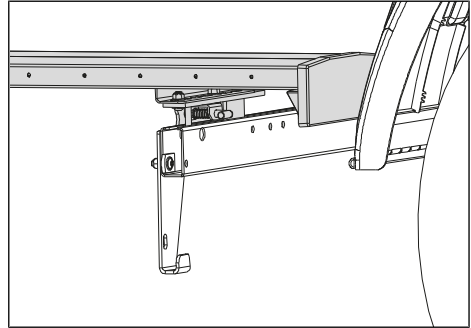


Fig. 5-50: Swivelling side collision protection folded up

- ✓ The side collision protection is folded up and locked.

Folding down the side collision protection

- ▶ Pull out both spring latches and engage them in the unlocked position.
- ▶ Pull out the side collision protection to the stop and fold down to the vertical position.
- ▶ Lock the side collision protection by engaging the spring latch.
- ✓ The side collision protection is folded down and locked.

5.15 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 vehicles can be equipped with the following step-on devices:

- Handle (see "5.15.1 Handle", pg. 63)
- Single ladder (see "5.15.2 Single ladder", pg. 63)

- Folding rear access ladder (see "5.15.3 Folding telescopic ladder", pg. 63)
- Fold-down steps (foldable for rear wall) (see "5.15.4 Fold-down steps", pg. 64)

5.15.1 Handle

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

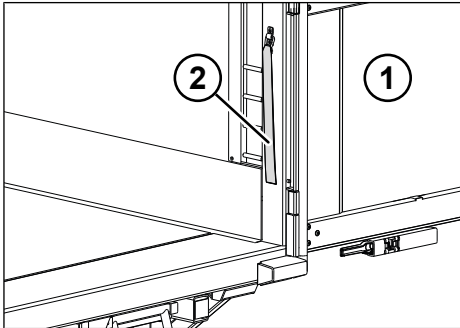


Fig. 5-51: Handle

- 1 Door
- 2 Handle

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

5.15.2 Single ladder

KRONE trailers can be equipped with single ladders for safe climbing.

⚠ WARNING

Risk of accident caused by an unsecured ladder!

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

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

In order to make it easier to get into the vehicle a single ladder is provided, stored and secured beneath the chassis.

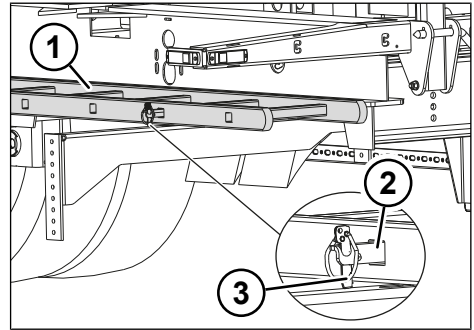


Fig. 5-52: Single ladder

- 1 Single ladder
- 2 Bracket
- 3 Lynch pin

Using the single ladder

- ▶ Remove the lynch pin.
- ▶ Pull out the ladder.
- ▶ Position the ladder.
- ✓ The ladder can be used to climb onto or off the vehicle.

Inserting and securing the single ladder

- ▶ Slide in the ladder over the brackets.
- ▶ Secure the ladder with the lynch pins.
- ✓ The ladder is inserted and secured.

5.15.3 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 trailers can be equipped with a folding telescopic ladder at the rear.

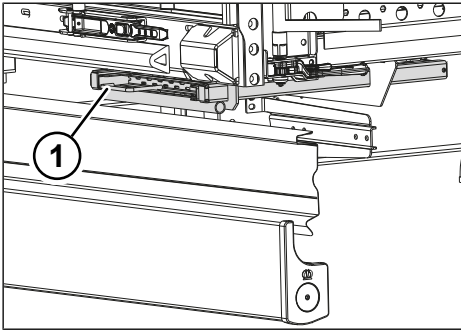


Fig. 5-53: Folding telescopic ladder

1 Handle

Using the telescopic ladder

- ▶ Lift the telescopic ladder past its lock.
- ▶ 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.

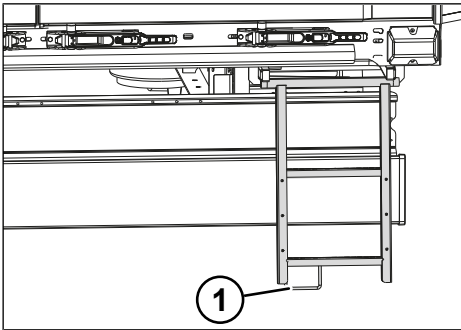


Fig. 5-54: Folding telescopic ladder in the function position

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.

- ▶ Lift the telescopic ladder and place it on the lock.
- ✓ The telescopic ladder is inserted and secured.

5.15.4 Fold-down steps

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

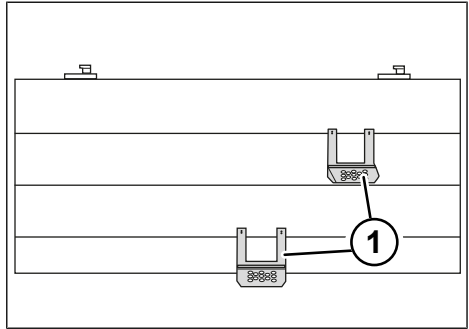


Fig. 5-55: Fold-down steps on the folding rear wall

1 Fold-down steps

- ▶ Fold out the fold-down steps before use.
- ▶ If necessary, use the hand straps for climbing up and down (see "5.15.1 Handle", pg. 63).
- ▶ Fold in the fold-down steps again after use.

5.16 Rear forklift bracket

⚠ WARNING

Risk of accident due to improper transport of the rear stacker!

Improperly transported and secured rear stackers can cause serious accidents.

- ▶ Always properly fasten and secure rear stackers.
- ▶ Observe the operating instructions for the rear stacker.
- ▶ Observe the load distribution plan for the trailer. Unladen trips with a stacker can cause poor driving characteristics. Use counterweights if necessary.
- ▶ Check and observe the national regulations for the maximum permissible overhangs.

⚠ WARNING

Risk of accident due to improper operation of the rear stacker!

People can be injured in the hazard area or if the rear stacker is incorrectly operated.

- ▶ Observe the operating instructions for the rear stacker.
- ▶ Direct people out of the rear stacker's hazard area.
- ▶ Do not tolerate people standing underneath the lifted stacker.
- ▶ Use a rod to pull out the telescopic rails.

⚠ WARNING

Risk of accident when driving with the rear underrun protection swivelled in!

Driving with the rear underrun protection swivelled in is not permitted by law. In a collision, other vehicles can drive under the semitrailer and fatally injure motorists.

- ▶ When driving without a rear-mounted forklift, always ensure that the underrun protection is swivelled out and locked.

INFO

Pay attention to the dead weight of the stacker. If necessary, we recommend, particularly for unladen trips, a counterweight on the front wall or a counter-load to achieve the required fifth-wheel load.

KRONE trailers can be equipped with a rear stacker bracket. The following rear stacker brackets are possible:

- Rail bracket secured with a chain
- Statics mast chain bracket

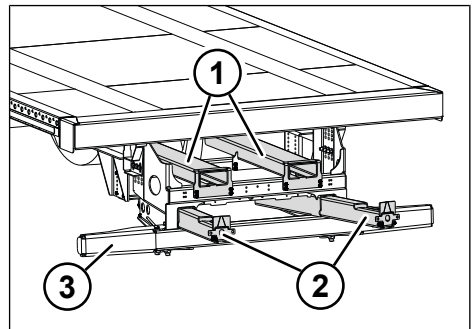


Fig. 5-56: Rail bracket

- 1 Fork slot
- 2 Rails
- 3 Underrun protection that swivels on both sides

The rear stacker brackets, depending on the equipment, can be designed in the following versions:

- With swivelling rear underrun protection
- With rigid rear underrun protection for a transportable forklift with front wheels that can fold in
- With telescopic rails
- ▶ Observe the supplier documentation for operating the rear stacker and the bracket.
- ▶ Secure the rear stacker with chains during transport.
- ▶ On the rail bracket, secure the additional locks with chains to the outside chain brackets.
- ▶ Swing out the rear underrun protection when driving without the rear stacker (see "5.13.2 Rear underrun protection that swivels on both sides", pg. 59).

5.17 Spare wheel bracket

⚠ WARNING

Risk of accident from an unsecured spare wheel!

An unsecured spare wheel can fall off when driving and cause serious accidents.

- ▶ Properly secure the spare wheel.
- ▶ Only transport wheels that are designed for the spare wheel bracket.
- ▶ Check the spare wheel bracket for damage.
- ▶ Immediately repair the spare wheel bracket if defective.

⚠ CAUTION

Risk of injury due to a falling spare wheel!

The weight of a falling spare wheel can cause injuries.

- ▶ Work carefully when changing a spare wheel.

KRONE trailers can be equipped with a spare wheel bracket. Depending on the equipment, the following versions are possible:

- Spare wheel with basket storage (see "5.17.1 Spare wheel with basket storage", pg. 66)
- Spare wheel with winch (see "5.17.2 Spare wheel with winch", pg. 67)
- Spare wheel in the pallet storage box (see "5.17.3 Spare wheel in the pallet storage box", pg. 67)

5.17.1 Spare wheel with basket storage

Spare wheel removal

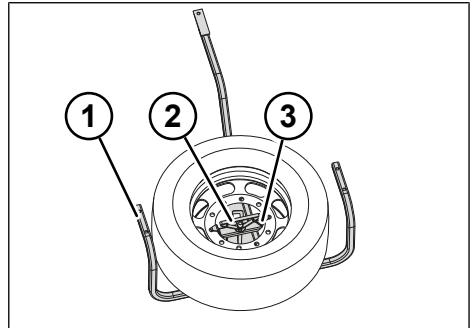


Fig. 5-57: Spare wheel with basket storage

- 1 Storage basket
- 2 Rim holder
- 3 Securing device

- ▶ Fold up the side collision protection, if necessary (see "5.14 Side collision protection", pg. 60).
- ▶ Remove the securing device.
- ▶ Unscrew the rim holder.
- ▶ Remove the spare wheel from the storage basket.
- ✓ The spare wheel has been removed.

Spare wheel insertion

- ▶ Insert the spare wheel in the storage basket.
- ▶ Firmly screw the rim holder.

- ▶ Install the securing device.
- ▶ Fold down the side collision protection, if necessary (see "5.14 Side collision protection", pg. 60).
- ▶ The spare wheel is inserted.

5.17.2 Spare wheel with winch

⚠ CAUTION

Risk of injury due to a falling spare wheel!

The weight of a falling spare wheel can cause injuries.

- ▶ Proceed carefully when removing the spare wheel.
- ▶ Before removing the securing devices, check the support cable and winch for function and damage.

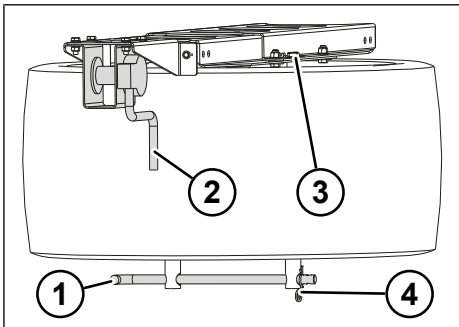


Fig. 5-58: Spare wheel with winch

- 1 Retainer rod
- 2 Hand crank
- 3 Tubular nut
- 4 Spring cotter pin

Spare wheel removal

- ▶ Fold up the side collision protection, if necessary (see "5.14 Side collision protection", pg. 60).
- ▶ Remove the spring cotter pin.
- ▶ Remove the retainer rod from the tubular nuts.
- ▶ Unscrew the tubular nuts counter-clockwise using the retainer rod.

- ▶ Turn the hand crank counter-clockwise and slowly lower the spare wheel to the ground using the winch.
- ▶ Let out the support cable until the spare wheel can be removed from the spare wheel bracket.
- ✓ The spare wheel has been removed.

Spare wheel insertion

- ▶ Place the spare wheel under the support cable.
- ▶ Let out the support cable until the spare wheel bracket can be fastened to the rim.
- ▶ Turn the crank clockwise and slowly lift the spare wheel using the winch until the support cable is slightly tensioned.
- ▶ Screw in the tubular nuts clockwise using the retainer rod.
- ▶ Insert the retainer rod into the tubular nuts.
- ▶ Secure the retainer rod with the spring cotter pin.
- ▶ Fold down the side collision protection, if necessary (see "5.14 Side collision protection", pg. 60).
- ✓ The spare wheel is inserted.

5.17.3 Spare wheel in the pallet storage box

KRONE trailers can be equipped with a spare wheel in the pallet storage box. In this version, the spare wheel is fastened to a pull-out bracket in the pallet storage box.

Spare wheel removal

- ▶ Open the pallet storage box (see "5.19.2 Pallet storage box", pg. 71).
- ▶ Lift the pull-out bracket out of the locks.
- ▶ Remove the spare wheel.
- ✓ The spare wheel has been removed.

Spare wheel insertion

- ▶ Place the spare wheel on the pull-out bracket.

- ▶ Lift the pull-out bracket with the spare wheel into the lock and slide it into the pallet storage box.
- ▶ Secure the spare wheel to prevent it sliding away.
- ▶ Close the pallet storage box (see "5.19.2 Pallet storage box", pg. 71).
- ✓ The spare wheel is inserted.

5.17.4 Changing the spare wheel

⚠ WARNING

Risk of accident caused by loose wheel nuts!

Wheel nuts that are not tightened correctly will come loose during travel, possibly leading to serious accidents.

- ▶ Tighten the wheel nuts with the appropriate tightening torque.
- ▶ Check the tightness of the wheel nuts after each wheel change, and again shortly after the first laden journey.

⚠ WARNING

Risk of accident due to instability and rolling away!

Unintentional trailer movements can cause serious injury and property damage.

- ▶ Secure the trailer against rolling away by applying the parking brake.
- ▶ Use the wheel chocks to prevent the trailer from rolling away.
- ▶ Park the trailer on a solid surface to avoid sinking in or tipping.
- ▶ When the trailer is hitched/unhitched, ensure stability. If necessary, use additional supports.

⚠ CAUTION

Risk of injury due to a falling spare wheel!

The weight of a falling spare wheel can cause injuries.

- ▶ Work carefully when changing a spare wheel.

INFO

The tightening torques for the wheel nuts are noted in the axle manufacturer's supplier documentation.

Removing the wheel

- ▶ Lock the tractor unit to prevent unintended movement while changing the wheel.
- ▶ Secure the tractor unit and trailer according to the regulations for moving traffic (warning sign, etc.).
- ▶ Use wheel chocks to prevent the tractor unit and trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Apply the parking brake on the trailer (see "5.7.2 Parking brake", pg. 49).
- ▶ Loosen the wheel nuts by one turn.
- ▶ Place the jack under the axle as close as possible to the defective wheel.
- ▶ Lift the axle with the jack until the defective wheel no longer touches the ground.
- ▶ Unscrew the wheel nuts and remove them.
- ▶ Remove the defective wheel from the axle.
- ✓ The wheel is removed.

Mounting the spare wheel

- ▶ Remove the spare wheel from the spare wheel bracket (see "5.17 Spare wheel bracket", pg. 66).
- ▶ Slide the spare wheel onto the wheel hub.
- ▶ Screw on the wheel nuts and slightly tighten.

- ▶ Lower the axle with the jack.
- ▶ Properly tighten the wheel nuts in a criss-cross pattern. Please consult the axle manufacturer's supplier documentation for the specified tightening torque.
- ▶ Insert the defective wheel in the spare wheel bracket and secure it (see "5.17 Spare wheel bracket", pg. 66).
- ✓ The spare wheel has been mounted.
- ▶ Check the tyre inflation pressure of the spare wheel used.

5.18 Depots

KRONE trailers can have the following depots under the vehicle:

- Post depot (see "5.18.1 Plug-in post depot", pg. 69)
- Lath depot (see "5.18.2 Plug-in lath depot", pg. 70)
- Brackets for Multi Block beams (see "5.18.3 Multi-Block holder", pg. 70)

5.18.1 Plug-in post depot

⚠ WARNING

Risk of accident due to falling plug-in posts!

If the retainer plate is open, or if there are fewer than three plug-in posts in the depot, the posts can fall out while driving and cause accidents.

- ▶ Ensure that there are at least three plug-in posts in the depot.
- ▶ Only drive with the lock bolts secured when up to three plug-in posts are inserted.
- ▶ Only drive with the retainer plate closed, locked, and secured.

In the plug-in post depot oriented lengthwise to the vehicle, the plug-in posts are stored next to each other in the direction of travel and secured with a retainer plate.

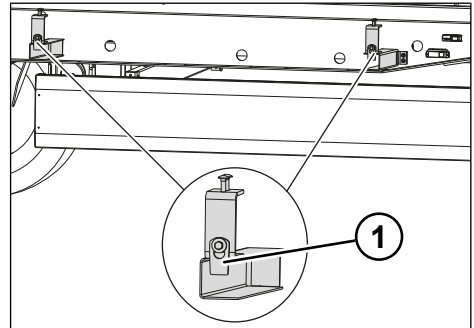


Fig. 5-59: Post depot

1 Retainer plate

Removing the posts from the depot

- ▶ Slide the retainer plate upwards and then to the side.
- ▶ Take out the plug-in posts.
- ✓ The plug-in posts have been removed from the depot.

Before each trip:

- ▶ Slide the retainer plate to the side and then downwards.
- ✓ The plug-in post depot is closed, locked, and secured.

Stowing the plug-in posts in the depot

- ▶ Slide the plug-in posts into the depot side by side.
- ▶ Slide the retainer plate to the side and then downwards.
- ✓ The plug-in posts are stowed in the depot.
- ✓ The plug-in post depot is closed, locked, and secured.

5.18.2 Plug-in lath depot

⚠ WARNING

Risk of accident due to falling plug-in laths!

Plug-in laths that are not properly secured can fall out while driving and cause accidents.

- ▶ Drive only with properly stored and secured plug-in laths.

Depending on the design, the plug-in lath depots are arranged on the left or right side of the chassis. They provide space for wood, steel, and aluminium plug-in laths.

Removing the plug-in laths from the depot

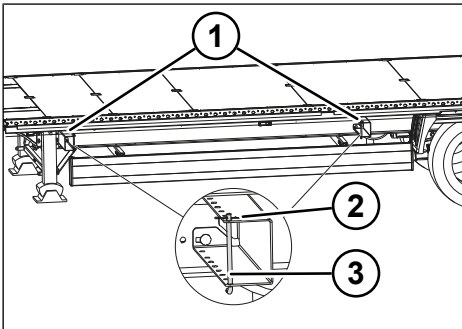


Fig. 5-60: Plug-in lath depot

- 1 Plug-in lath depot
- 2 Spring cotter pin
- 3 Retainer bolt

- ▶ Remove the spring cotter pin.
- ▶ Remove the retainer bolt.
- ▶ Take out the plug-in lath.
- ✓ The plug-in laths have been removed from the depot.

Before each trip:

- ▶ Install the retainer bolt.
- ▶ Insert the spring cotter pin.
- ✓ The plug-in laths are locked and secured.

Stowing the plug-in laths in the depot

- ▶ Insert the plug-in laths into the plug-in lath depot toward the centre of the vehicle.
- ▶ Secure one or several plug-in laths by repositioning the retainer bolts.
- ✓ The plug-in laths are stowed in the depot.
- ✓ The plug-in laths are locked and secured.

5.18.3 Multi-Block holder

⚠ WARNING

Risk of accident due to Multi Block beams falling out!

Unsecured Multi Block beams can fall out and cause accidents.

- ▶ Drive only with properly mounted and secured Multi Block beams.

The Multi Block beams (see "8.10.8 Beam system", pg. 153) are stored in brackets along the direction of travel. Depending on the equipment, the brackets can hold up to four Multi Block beams.

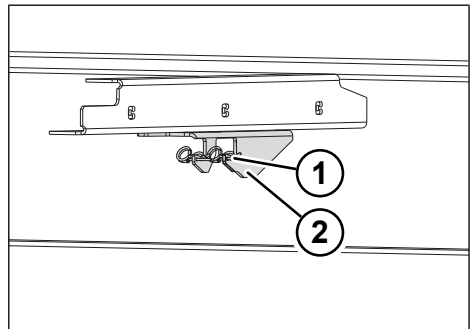


Fig. 5-61: Bracket for Multi Block beams

- 1 Spring cotter pin
- 2 Bracket

Unhooking the Multi Block beams

- ▶ Remove the spring cotter pin.
- ▶ Unhook the Multi Block beams and remove.

- ▶ The Multi Block beams have been unhooked .

Before each trip:

- ▶ Insert the spring cotter pin.

Hooking on the Multi Block beams

- ▶ Hang the Multi Block beams on the bracket.
- ▶ Insert the spring cotter pin.
- ✓ The Multi Block beam is hooked on and secured.

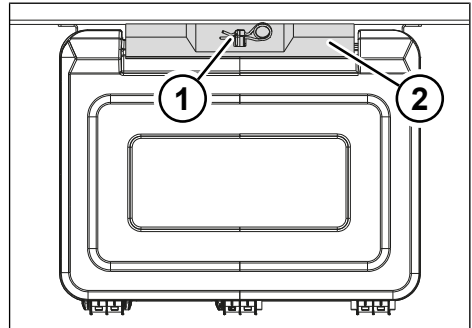


Fig. 5-62: Tool box

- 1 Spring cotter pin
- 2 Locking flap

5.19 Storage boxes

⚠ CAUTION

Risk of injury due to falling objects!

When the storage box is opened, objects may fall out and injure people.

- ▶ Be careful when opening the storage box and watch for falling objects.

⚠ WARNING

Risk of accident when driving with an open storage box!

If the storage box lid is open, objects may fall out and cause accidents.

- ▶ Only drive with the storage box closed and secured.

5.19.1 Tool box

The tool box is used to transport tools and also to store plug-in brackets for Multi Block beams (see "8.10.8 Beam system", pg. 153).

Opening the tool box

- ▶ Fold up the side collision protection, if necessary (see "5.14 Side collision protection", pg. 60).
- ▶ Remove the spring cotter pin.
- ▶ Fold up the locking flap.
- ▶ Open the lid.
- ✓ The tool box is open.

Closing the tool box

- ▶ Fold up the lid.
- ▶ Fold down the locking flap.
- ▶ Secure the locking flap with a spring cotter pin.
- ▶ Fold down the side collision protection, if necessary (see "5.14 Side collision protection", pg. 60).
- ✓ The tool box is closed and secured.

5.19.2 Pallet storage box

⚠ WARNING

Risk of accident when driving with an open pallet storage box!

If the pallet storage box lid is open, pallets may fall out and cause accidents.

- ▶ Only drive with the pallet storage box closed and secured.

NOTE

Material damage when driving on uneven ground!

When driving on uneven ground with low ground clearance, the pallet storage box can be damaged.

- ▶ When driving on uneven ground, ensure that there is sufficient ground clearance.

For trailers with pallet storage boxes, the lids of the storage boxes replace the side collision protection.

Pallet storage box PK 4000

The covers of pallet storage boxes PK 4000 are operated by a one-hand locking system. The locks are fitted to the handles.

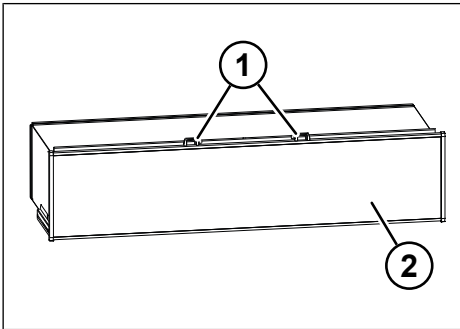


Fig. 5-63: Pallet storage box PK 4000

- 1 Handles with locks
- 2 Lid

Opening the pallet storage box

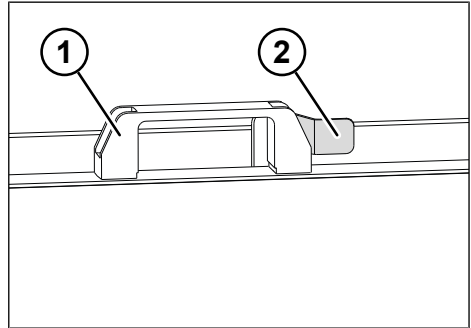


Fig. 5-64: Lock

- 1 Handle
- 2 Lock

- ▶ Push in the lock.
- ▶ Fold down the lid by the handles while simultaneously sliding it into the guide rails at the bottom of the pallet storage box.
- ✓ The pallet storage box is open.

Closing the pallet storage box

- ▶ Pull out the lid from the guide rails by the handles and simultaneously fold it up.
- ▶ Close the cover and press until the lock engages.
- ✓ The pallet storage box is closed and secured.

5.19.3 Plug-in post storage box

The plug-in post storage box is mounted underneath the trailer. The plug-in post storage box is part of the side collision protection or replaces the side collision protection.

The plug-in post storage box also offers space for paper wedges, pallet rollers and components of the load securing systems.

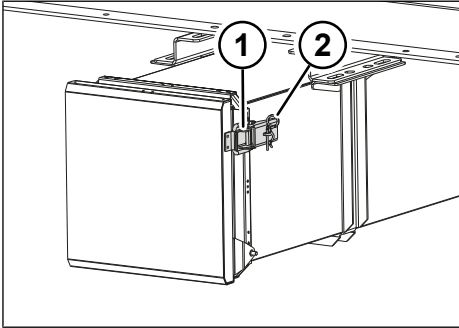


Fig. 5-65: Plug-in post storage box

- 1 Tension lock
- 2 Spring cotter pin

Opening the plug-in post storage box

- ▶ Remove the spring cotter pin.
- ▶ Open the tension locks.
- ▶ Fold the lid down.
- ✓ The plug-in post storage box is open.

Closing the plug-in post storage box

- ▶ Fold the lid up.
- ▶ Close the tension locks.
- ▶ Secure the tension locks with spring cotter pins.
- ✓ The plug-in post storage box is closed and secured.

5.19.4 Food storage box

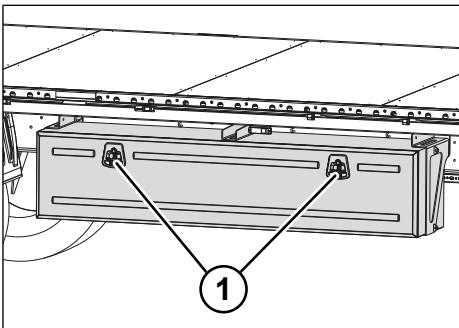


Fig. 5-66: Food storage box

- 1 Locks

Opening the food storage box

- ▶ Release the locks on the lid.
- ▶ Fold down the lid.
- ✓ The food storage box is open.

Closing the food storage box

- ▶ Fold up the lid.
- ▶ Close the locks on the lid and secure them.
- ✓ The food storage box is closed and secured.

5.19.5 Fire extinguisher storage box

Unmaintained and unchecked fire extinguishers may not work in an emergency and will not be able to fight any potential fires. Used fire extinguishers must be replaced after a single use. Additional instructions can be found on the housing of the fire extinguisher.

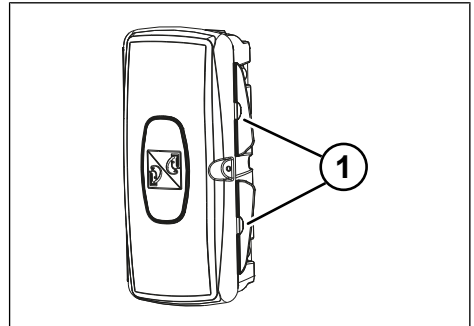


Fig. 5-67: Storage box

- 1 Quick-release fasteners

Removing the fire extinguisher from its storage box

- ▶ Release the quick-release fastener on the lid.
- ▶ Swivel the cover to the side.
- ▶ Remove the fire extinguisher.
- ✓ The fire extinguisher is removed and can be used.

Placing the fire extinguisher in the storage box

- ▶ Insert the fire extinguisher.
 - ▶ Close the lid.
 - ▶ Close the quick-release fasteners on the lid.
- ✓ The fire extinguisher is inserted in the storage box.

Using the water tank

- ▶ Fill water through the filler neck.
- ▶ Close the filler neck with the screw cap.
- ▶ Draw water using the water tap on the water tank.
- ▶ Close the water tap.

5.20 Water tank

⚠ CAUTION

Health hazard due to neglected hygiene!

If the hygiene regulations are not observed, the water may be contaminated. This can result in a risk to health.

- ▶ Do not fill any fluids other than water in the water tank.
- ▶ Ensure cleanliness and hygiene.

NOTE

Material damage due to frost!

Frost can damage a filled water tank.

- ▶ Do not completely fill the water tank if there is a risk of frost.

KRONE trailers can be equipped with a water tank. The water tank is installed on the frame under the chassis and is used to transport water.

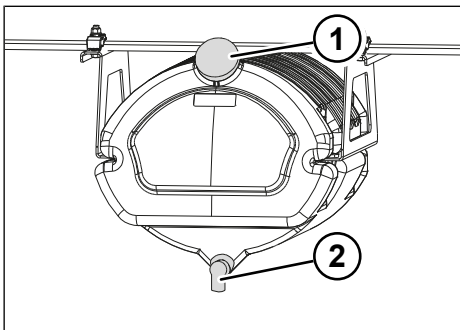


Fig. 5-68: Water tank

- 1 Filler neck with screw cap
- 2 Water tap

6 Superstructure operation

6.1 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 or rear walls can suddenly swing open, injure people, and cause material damage to the trailer superstructure.

- ▶ Check that the doors/rear walls are locked before every trip.
- ▶ Do not drive with open or unlocked doors or rear walls.
- ▶ Always swivel the lock lever back to the initial position (parallel to the door).
- ▶ Always secure the doors with door stops.
- ▶ Do not allow the doors to hit the trailer superstructure.
- ▶ Observe the pictogram for closing the doors on the vehicle.

CAUTION

Risk of injury from falling loads!

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

- ▶ When opening the doors or board 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.

6.1.1 Doors

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.

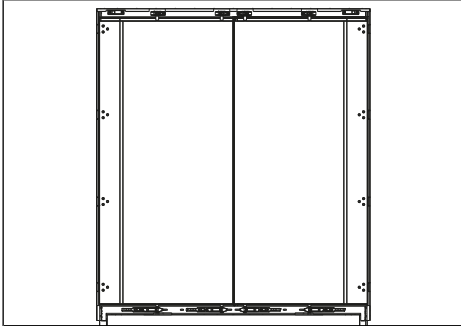


Fig. 6-1: Rear door with internal turn rods

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

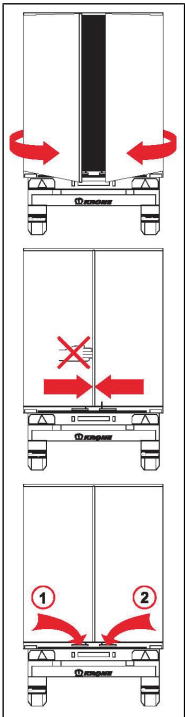


Fig. 6-2: Sticker for operating the rear gantry

6.1.1.1 Door lock with one-handed operation

Opening the door lock

- ▶ If necessary, remove the curtain rope.

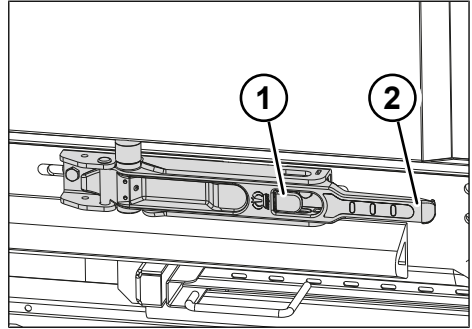


Fig. 6-3: Door lock with one-handed operation

- 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.

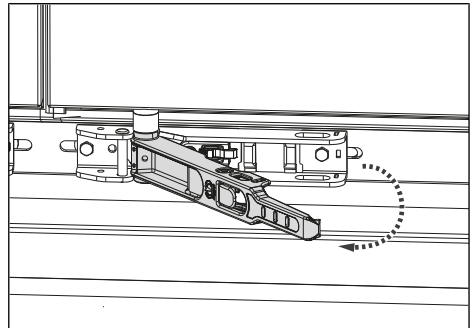


Fig. 6-4: Swivelling out the door lock lever

- ▶ 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 "6.1.2 Door stop", pg. 78).
 - ⇒ 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.

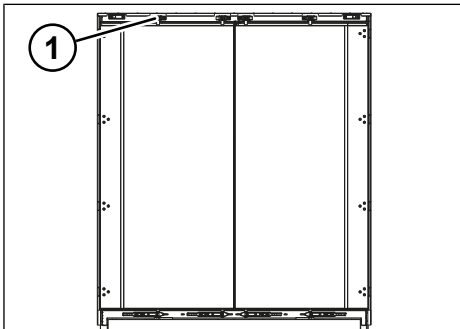


Fig. 6-5: Tension bolt

- 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.

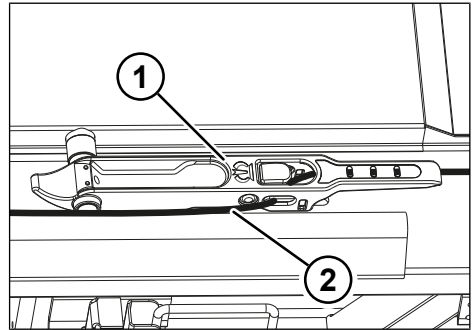


Fig. 6-6: Threading the curtain rope through the door lock

- 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.

6.1.1.2 Door latch of dual-action design

Opening the door locks

- ▶ If necessary, remove the curtain rope.

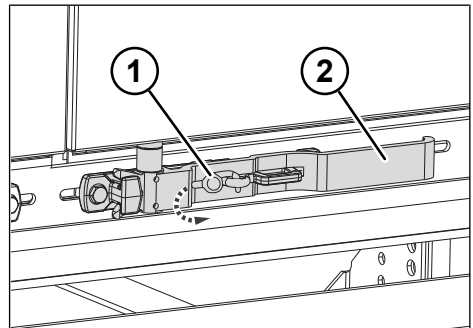


Fig. 6-7: Door lock with two-handed operation

- 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 "6.1.2 Door stop", pg. 78).
 - ⇒ 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 "6.1.2 Door stop", pg. 78).
- ▶ Close the door leaf.

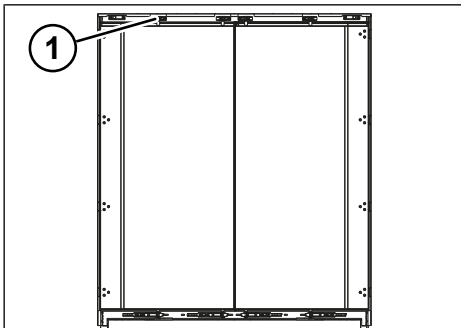


Fig. 6-8: Tension bolt

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.

6.1.2 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.
- ▶ Door stops are not intended for driving with opened doors. Follow the additional instructions (see "7.6 Driving with open doors", pg. 143) when driving with open doors.

6.1.2.1 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.

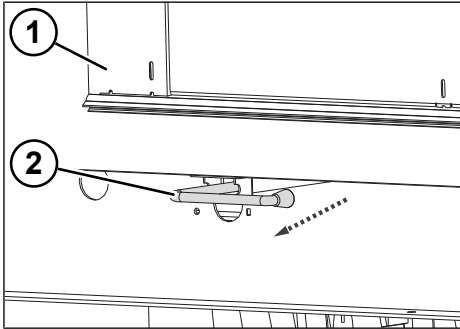
Securing the door with the door stop

Fig. 6-9: Pulling the door stop outwards

- 1 Door leaf swung open
- 2 U-shaped door stop

- ▶ Pull out the door stop against the spring force.

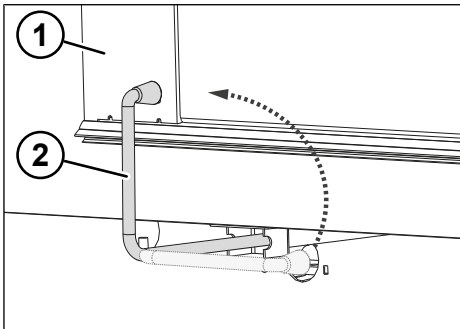


Fig. 6-10: Swivelling the door stop upwards

- 1 Door leaf swung open
- 2 Door stop

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

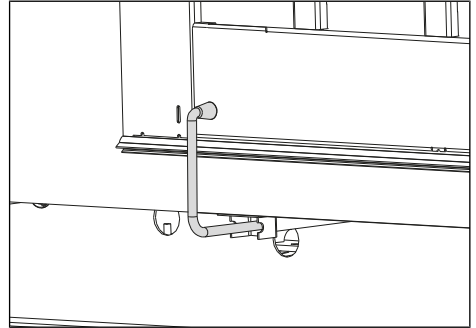


Fig. 6-11: Door leaf locked with the door stop

- ✓ 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.

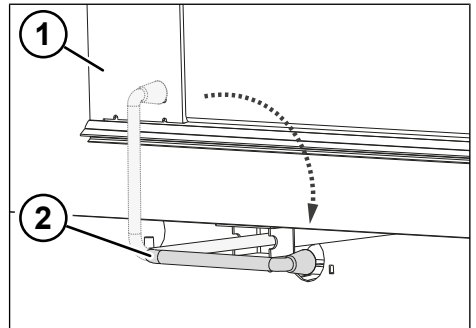


Fig. 6-12: Swivelling the door stop downwards

- 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.

6.1.2.2 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 "6.5.2 Sliding roof", pg. 121). The door leaves are then held open in a latched position of approx. 15 degrees.

Engaging the Door Fix

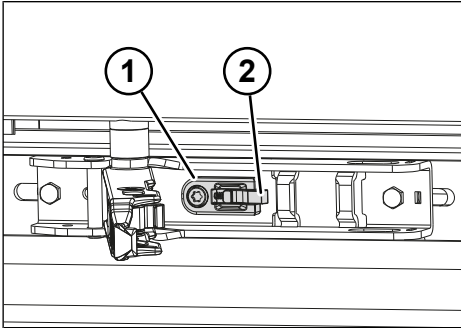


Fig. 6-13: Door Fix

- 1 Door Fix
- 2 Lever for Door Fix

The door leaf is open.

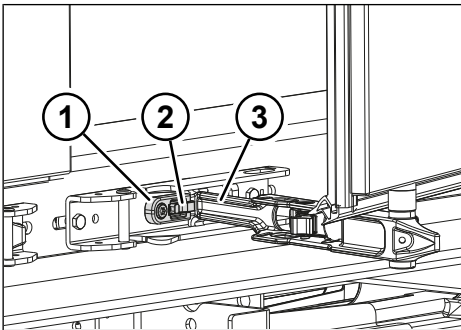


Fig. 6-14: Door lock lever engaged in the Door Fix

- 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.

6.1.3 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 board wall folding down uncontrollably!

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

- ▶ When unlocking the last lock, hold onto the rear board wall with one hand.

⚠ CAUTION

Risk of accident due to folded down rear board wall!

A folded-down rear board 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 board wall.

⚠ CAUTION

Risk of injury from falling loads!

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

- ▶ When opening the doors or board walls, always watch out for falling loads.

Depending on the version, the rear board wall of the KRONE trailer is equipped with between two and four fasteners.

Folding down the rear board wall

- ▶ If necessary, remove the curtain rope and curtain on the rear end of the vehicle.

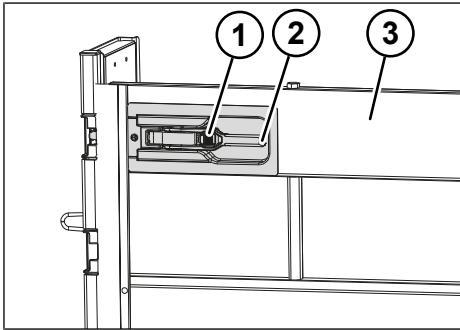


Fig. 6-15: Rear board wall fastener

- 1 Lock for rear board wall fastener
- 2 Lock lever
- 3 Rear board wall

- ▶ Push in the lock on the rear board wall fastener.
- ▶ Position the lock lever so that the locking pin is completely out of its guide groove.
- ▶ Hold the rear board wall.
- ▶ Unlock the second lock on the other side of the vehicle in the same way.
- ▶ Fold down the rear board wall slightly.
- ▶ Close both locks again.
- ▶ Fold down the rear board wall completely.
- ✓ The rear board wall is folded down.

Using the fold-down steps

There are fold-down steps on the inside of the rear board walls to climb onto the superstructure (see "5.15.4 Fold-down steps", pg. 64).

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

Closing the rear board wall

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

Removing the rear board 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 board wall!

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

- ▶ Always remove the rear board wall with two persons.

INFO

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

For loads with an excessive length, the rear board wall can be removed.

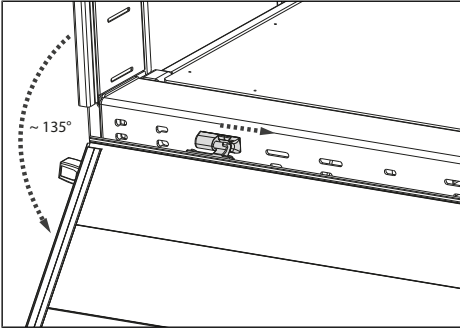


Fig. 6-16: Folding down the rear board wall

- ▶ Fold down the rear board wall to approx. 135°.
- ▶ With a second person, slide off the rear board wall to the right.
- ✓ The rear board wall is removed.

Inserting the rear board wall

INFO

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

- ▶ With a second person, slide the rear board wall onto the hinges from the right-hand side.
- ▶ Fold up the rear board wall.
- ✓ The rear board wall is inserted.

6.1.4 Door retainer chain

⚠ 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 accidents due to unsecured chains!

Unsecured chains can swing about while driving and injure people and cause material damage.

- ▶ When not in use, always place the chains over the rear wall into the load compartment.

For loads of excessive length, it is possible to partly open the rear wall and hold it in position with retainer chains.

Hooking on the door retainer chain

- ▶ Fold down the rear wall to the horizontal position.
- ▶ Hook the door retainer chain onto the bracket.
- ✓ The door retainer chain is hooked on.

Securing the door retainer chain

- ▶ When driving, place the door retainer chain over the rear wall into the load compartment.
- ✓ The door retainer chain is secured.

6.1.5 Tail lift

⚠ WARNING

Risk of tipping due to unfavourable load distribution!

An unfavourable load distribution can cause an uncoupled trailer to tip during loading and unloading and injure people.

- ▶ Never load or unload the tail lift when the trailer is uncoupled.


⚠ CAUTION**Risk of accident due to improper use of the tail lift!**

People in the tail lift's hazard area can be injured when operating the tail lift.

- ▶ Only have trained specialist personnel operate the tail lift.
- ▶ Secure the hazard area with pylons.
- ▶ Direct people out of the tail lift's hazard area during operation.
- ▶ Always completely lower the tail lift.
- ▶ Secure the tail lift to prevent unauthorised use.
- ▶ Do not exceed the tail lift's load capacity (observe the type plate).
- ▶ Also observe the enclosed supplier documentation.

INFO

Tail lifts influence the load distribution. Particularly for unladen trips, a counterload is sensible to increase the fifth-wheel loads.

 Also observe the enclosed supplier documentation.

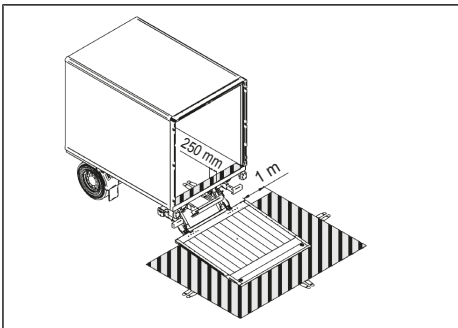


Fig. 6-17: Hazard area of the tail lift

The tail lift can be retracted or is standing depending on its design.

Retractable tail lift

The retractable tail lift is folded under the superstructure.

The control unit of the tail lift is located under the superstructure.

- ▶ Also observe the enclosed supplier documentation.

Standing tail lift

The standing tail lift is standing at the rear. The control unit of the tail lift is located under the superstructure.

- ▶ Also observe the enclosed supplier documentation.

Power supply**⚠ CAUTION****An excessive charging current poses a cable fire hazard!**

If the tail lift is operated while the vehicle motor is running, the charging current may be too high and cause the cable to catch fire.

- ▶ Turn off the tractor unit's motor while operating the tail lift.

NOTE**Unsuitable charging cables pose a fire hazard and may cause material damage!**

Unsuitable charging cables may tear or break and cause fires.

- ▶ Only use cables that meet the specifications of the unit manufacturer.
- ▶ Observe the connection conditions of the unit manufacturer.
- ▶ Also observe the enclosed supplier documentation.

The tail lift is supplied with power either

- via an auxiliary battery or
- via direct supply from the tractor unit.

Auxiliary battery

Two 12V batteries in the trailer supply the tail lift with power. The electric charging cable is connected to the tractor unit's plug and must remain connected while driving. The battery is charged when the motor of

the tractor unit is running and the voltage is greater than 26.4 V. The battery is not charged when the motor of the tractor unit is not running and the voltage falls below 25.6 V. The battery is not charged when the tail lift is actuated.

Direct supply

The tractor unit's batteries directly supply the tail lift with current. The electric supply line is connected to the tractor unit's plug and must remain connected while driving.

6.1.6 Top flap

KRONE trailers with a tail lift can be equipped with different top flaps. Depending on the version, the sliding roof with a top flap can either only be opened from front to back (version 1) or both from front to back and from back to front (version 2).

Opening the top flap (version 1)


- ▶ Open the tail lift.
- ▶ Open the top flap completely with the assistance of the gas pressure springs.
- ✓ The top flap is open.
- ✓ The sliding roof can be opened from front to back (see "6.5.2 Sliding roof", pg. 121).

Closing the top flap (version 1)

- ▶ Pull down the top flap against the resistance of the gas pressure springs.
- ▶ Close the tail lift.
- ✓ The top flap is closed.

Opening the top flap (version 2)

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

 Also observe the enclosed supplier documentation.

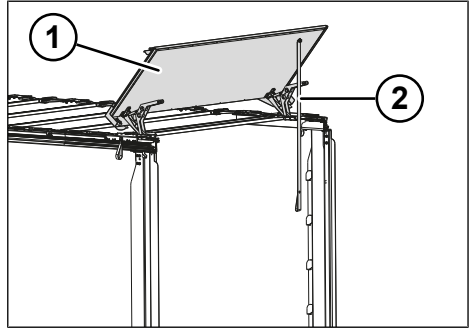


Fig. 6-18: Top flap open (version 2)

- 1 Top flap
- 2 Pull strap

- ▶ Open the tail lift.
- ▶ Open the top flap completely with the assistance of the gas pressure springs.
- ✓ The top flap is open.
- ✓ The sliding roof can be opened from front to back or from back to front (see "6.5.2 Sliding roof", pg. 121).

Closing the top flap (version 2)

- ☑ The sliding roof is fully pushed from front to back (see "6.5.2 Sliding roof", pg. 121).
- ▶ Pull down the top flap against the resistance of the gas pressure springs using the pull strap.
- ▶ Close the tail lift.
- ✓ The top flap is closed.

6.2 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 trailers with a sliding curtain superstructure have sliding curtains at the sides (see "6.2.1 Side curtain", pg. 85) and sliding posts (adjustable centre posts (see "6.2.9 Centre posts", pg. 103)) as well as a separate roof tarp. Furthermore, aluminium or wooden plug-in laths can be used to reinforce the lateral load compartment limiter (see "6.2.8 Lateral load compartment limiter", pg. 100).

6.2.1 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 "6.2.2 Curtain buckle", pg. 85).

Along with the board walls, the side curtain is

- tensioned with rubber expanders and curtain cramps on the board wall (see "6.2.3 Curtain cramps", pg. 88)
- or tightened with curtain buckles that are hooked into the board wall instead of the chassis.

6.2.2 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 trailers can be equipped with the following curtain buckles:

- Curtain buckle with latch-type tension lock (see "6.2.2.1 Curtain buckle with latch-type tension lock", pg. 86)
- Curtain buckle with anti-tilt tension lock (see "6.2.2.2 Curtain buckle with anti-tilt tension lock", pg. 86)

- Curtain buckle with knee lever tension lock (see "6.2.2.3 Curtain buckle with knee lever tension lock", pg. 87)
- Direct tensioner (see "6.2.2.4 Direct tensioner", pg. 87)

6.2.2.1 Curtain buckle with latch-type tension lock

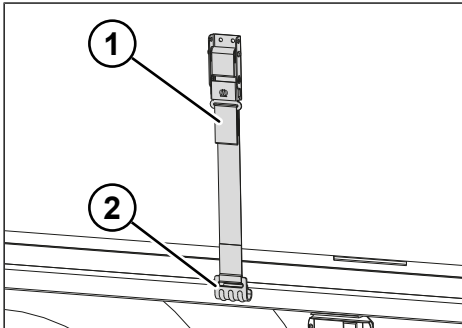


Fig. 6-19: Latch-type curtain buckle

- 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.

6.2.2.2 Curtain buckle with anti-tilt tension lock

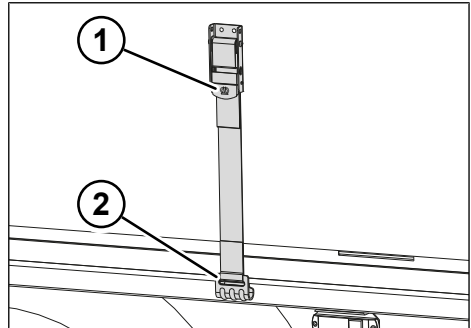


Fig. 6-20: Anti-tilt curtain buckle

- 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.

6.2.2.3 Curtain buckle with knee lever tension lock

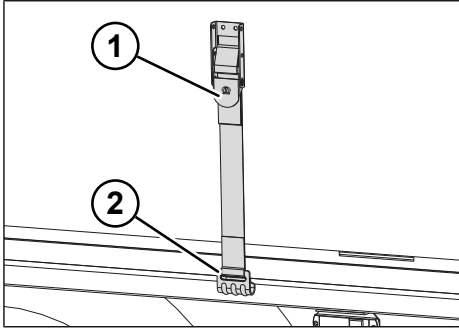


Fig. 6-21: Knee-lever curtain buckle

- 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.

6.2.2.4 Direct tensioner

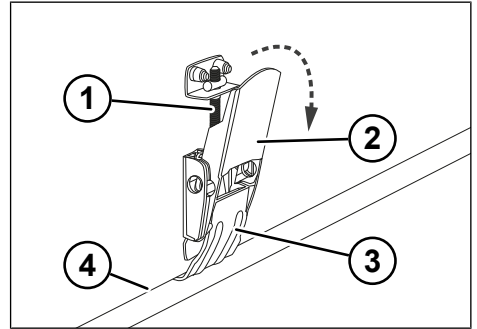


Fig. 6-22: Releasing the direct tensioner

- 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.

6.2.3 Curtain cramps

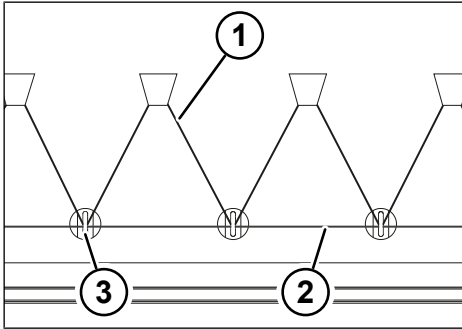


Fig. 6-23: Curtain cramps

- 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 "6.2.5 Rear curtain tensioning device", pg. 93).
- ▶ 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.

6.2.4 Front curtain tensioning device

⚠ WARNING

Risk of injury due to tension lever flapping about!

The tension lever may spring back suddenly when tensioning the curtain. This can result in personal injury and material damage.

- ▶ Ensure that no persons are in the swivelling area of the tension lever.

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. Depending on the version, a curtain pole or a channel rail is required to do so.

TIR Liner

INFO

The curtain tensioning device can be fitted with a folding cover plate to prevent unauthorised opening (e.g. with a bonded seal on the TIR Liner).

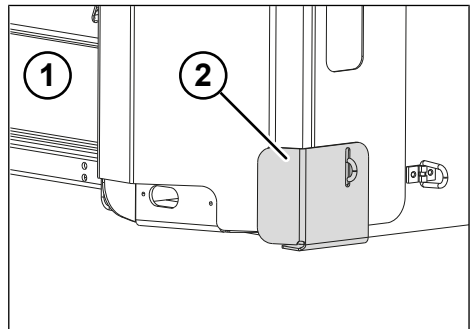


Fig. 6-24: Front curtain tensioning device protection

- 1 Cover plate for the tension lever lock

6.2.4.1 Curtain pole

Before opening, the tension on the side curtain must be released at the front with the curtain pole. Depending on the equipment, two different versions are possible.

Opening the side curtain at the front (version 1)

- ▶ If necessary, remove the existing curtain rope.
- ▶ If necessary, remove the retainer hook.
- ▶ Release the curtain buckle (see "6.2.2 Curtain buckle", pg. 85).

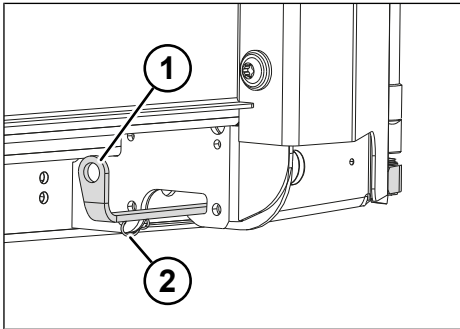


Fig. 6-25: Version 1 tension lever

- 1 Tension lever
- 2 Retainer hook (only on trailers with a lifting roof)

- ▶ Guide the tension lever upwards and in a circular motion out of its bracket.
- ▶ Swivel the tension lever by 90° to the side until the side curtain is released at the front.

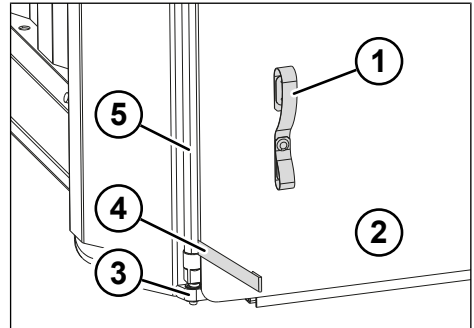


Fig. 6-26: Version 1 curtain pole

- 1 Curtain loop (option)
- 2 Outside of the curtain
- 3 Slot holding pins
- 4 Curtain handle
- 5 Curtain pole

- ▶ Lift up the curtain pole along with the curtain from the slot holding pins using the curtain handle installed 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.

- ▶ Slide the curtain to the rear.
- ✓ The side curtain is opened at the front.

Closing the side curtain at the front (version 1)

- ▶ Slide the curtain forwards.

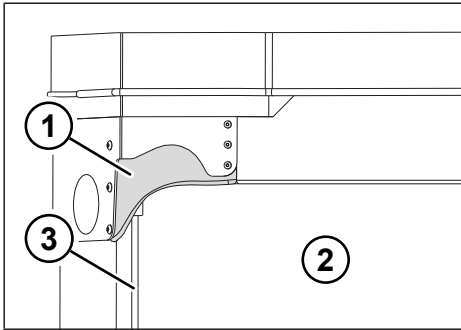


Fig. 6-27: Threading the curtain pole

- 1 Sealing lip
- 2 Outside of the curtain
- 3 Curtain pole

- ▶ Guide the curtain at the front below the sealing lip with the curtain pole.
- ▶ Place the curtain pole on the slot holding pins with the curtain handle so that the curtain pole is covered by the curtain after tensioning.
- ▶ Swivel the tension lever to the side until the side curtain is tensioned.
- ▶ Using a circular motion, guide the tension lever into the bracket and secure it.
- ▶ Hook on the retainer hook (see "Fig. 6-25: Tension lever", pg. 89).
- ▶ Secure the closed and longitudinally tensioned curtain with the curtain buckles (see "6.2.2 Curtain buckles", pg. 85).
- ▶ If necessary, install the curtain rope (see "6.2.6 Curtain rope bracket", pg. 95).
- ✓ The side curtain is closed at the front.

Opening the side curtain at the front (version 2)

- ▶ If necessary, remove the existing curtain rope.
- ▶ Release the curtain buckle (see "6.2.2 Curtain buckle", pg. 85).

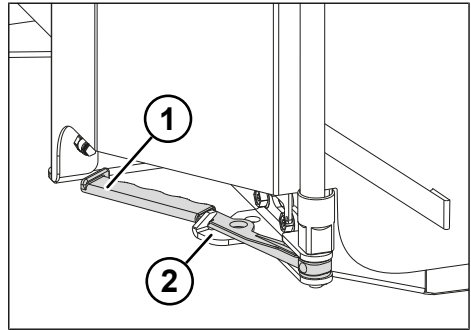


Fig. 6-28: Version 2 tension lever

- 1 Tension lever
- 2 Bracket

- ▶ Press the tension lever towards the rear and guide it out of the bracket.
- ▶ Swivel the tension lever by 90° to the side until the side curtain is released at the front.

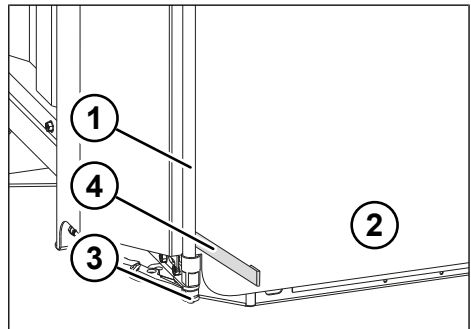


Fig. 6-29: Version 2 curtain pole

- 1 Curtain pole
- 2 Outside of the curtain
- 3 Slot holding pins
- 4 Curtain handle

- ▶ Lift up the curtain pole along with the curtain from the slot holding pins using the curtain handle installed 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.

- ▶ Slide the curtain to the rear.
- ✓ The side curtain is opened at the front.

Closing the side curtain at the front (version 2)

- ▶ Slide the curtain forwards.
- ▶ Place the curtain pole on the slot holding pins with the curtain handle so that the curtain pole is covered by the curtain after tensioning.
- ▶ Swivel the tension lever to the side until the side curtain is tensioned.
- ▶ Guide the tension lever into the bracket until it locks into place.
- ▶ Secure the closed and longitudinally tensioned curtain with the curtain buckles (see "6.2.2 Curtain buckles", pg. 85).
- ▶ If necessary, install the curtain rope (see "6.2.6 Curtain rope bracket", pg. 95).
- ✓ The side curtain is closed at the front.

6.2.4.2 Channel rail

Before opening, the tension on the side curtain must be released with the rear curtain tensioning device. The channel rail is unhooked to open the curtain at the front. Depending on the equipment, two different versions are possible.

Opening the side curtain at the front (version 1)

- ▶ If necessary, remove the existing curtain rope.
- ▶ Release the curtain buckle (see "6.2.2 Curtain buckle", pg. 85).
- ▶ Release the curtain using the rear curtain tensioning device Rear curtain tensioning device.

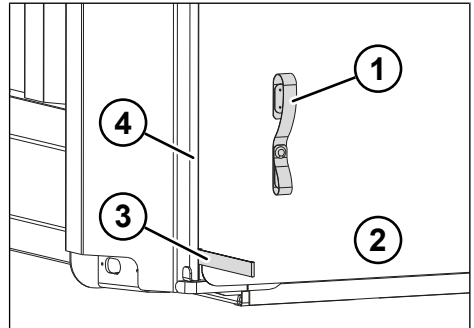


Fig. 6-30: Version 1 channel rail

- 1 Curtain loop (option)
- 2 Outside of the curtain
- 3 Curtain handle
- 4 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 (version 1)

- ▶ Slide the curtain forwards.

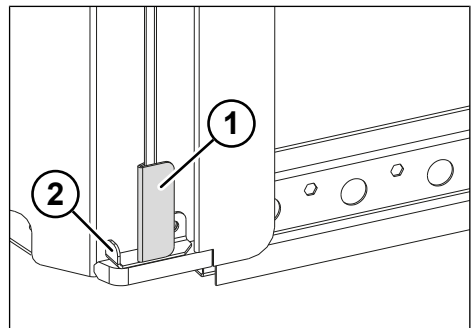


Fig. 6-31: Version 1 tension shaft support

- 1 Tension shaft support
- 2 Bracket

- ▶ Lift the channel rail together with the curtain using the curtain handle installed on the channel rail.
- ▶ Slide the curtain forwards.
- ▶ Guide the curtain at the front below the sealing lip using the channel rail.
- ▶ Attach the channel rail to the tension shaft support.
- ▶ Lift the channel rail together with the curtain onto the bracket.
- ▶ Tighten the curtain using the rear curtain tensioning device Rear curtain tensioning device.
- ▶ Secure the closed and longitudinally tensioned curtain with the curtain buckles (see "6.2.2 Curtain buckles", pg. 85).
- ▶ If necessary, install the curtain rope (see "6.2.6 Curtain rope bracket", pg. 95).
- ✓ The side curtain is closed at the front.

Opening the side curtain at the front (version 2)

- ▶ If necessary, remove the existing curtain rope.
- ▶ Release the curtain buckle (see "6.2.2 Curtain buckle", pg. 85).
- ▶ Release the curtain using the rear curtain tensioning device Rear curtain tensioning device.

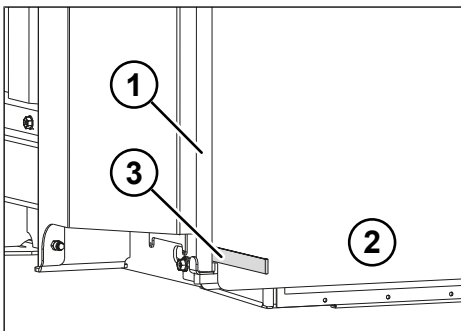


Fig. 6-32: Version 2 channel rail

- 1 Channel rail
- 2 Outside of the curtain
- 3 Curtain handle

- ▶ 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 (version 2)

- ▶ Slide the curtain forwards.

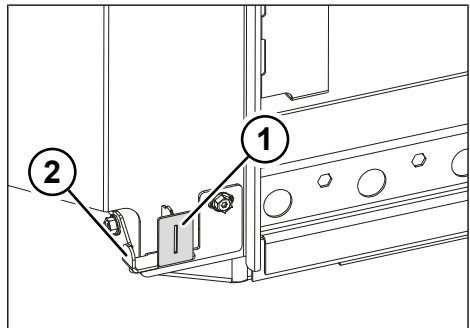


Fig. 6-33: Version 2 tension shaft support

- 1 Tension shaft support
- 2 Bracket

- ▶ Lift the channel rail together with the curtain using the curtain handle installed on the channel rail.
- ▶ Slide the curtain forwards.
- ▶ Guide the curtain at the front below the sealing lip using the channel rail.
- ▶ Attach the channel rail to the tension shaft support.
- ▶ Lift the channel rail together with the curtain onto the bracket.
- ▶ Tighten the curtain using the rear curtain tensioning device Rear curtain tensioning device.
- ▶ Secure the closed and longitudinally tensioned curtain with the curtain buckles (see "6.2.2 Curtain buckles", pg. 85).

- ▶ If necessary, install the curtain rope (see "6.2.6 Curtain rope bracket", pg. 95).
- ✓ The side curtain is closed at the front.

6.2.5 Rear curtain tensioning device

TIR Liner

INFO

The curtain tensioning device can be fitted with a folding cover plate to prevent unauthorised opening (e.g. with a bonded seal on the TIR Liner).

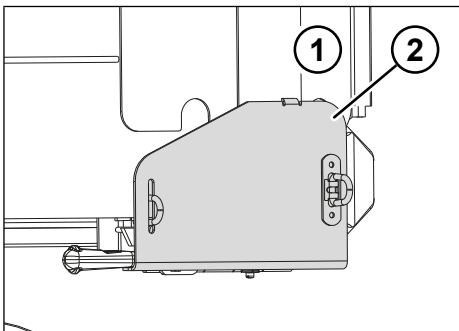


Fig. 6-34: Rear curtain tensioning device protection

- 1 Rear gantry
- 2 Cover plate for the tension lever lock

Releasing and loosening the curtain tensioning device at the rear (version 1)

- ▶ If necessary, remove the existing curtain rope.
- ▶ Release the curtain buckle (see "6.2.2 Curtain buckle", pg. 85).

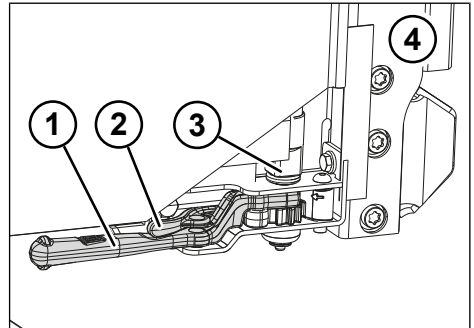


Fig. 6-35: Rear curtain tensioning device

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

- ▶ 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 (version 1)

- ▶ 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.

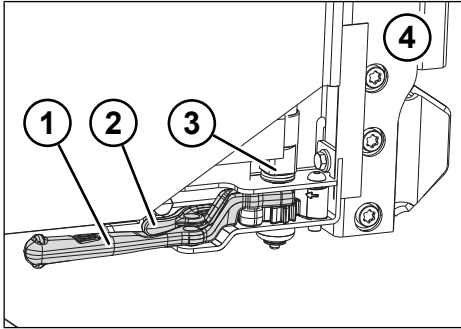
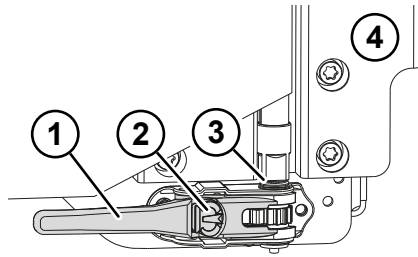


Fig. 6-36: Rear curtain tensing device

- 1 Tension ratchet
 - 2 Retainer lever
 - 3 Curtain pole in the tension ratchet
 - 4 Rear door
- ▶ 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 "6.2.2 Curtain buckle", pg. 85).
 - ✓ The side curtain at the rear is closed and tensioned.

Releasing and loosening the curtain tensing device at the rear (version 2)

- ▶ If necessary, remove the existing curtain rope.
- ▶ Release the curtain buckle (see "6.2.2 Curtain buckle", pg. 85).



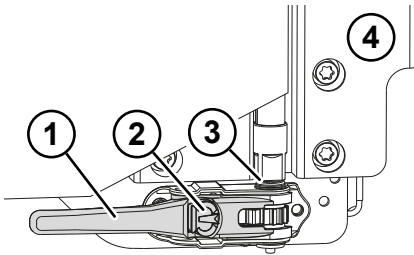
Rear curtain tensing device

- 1 Tension lever
- 2 Lock
- 3 Curtain pole in the tension ratchet
- 4 Rear door

- ▶ Push in the lock on the tension ratchet.
- ▶ Pull 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.
- ▶ 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 (version 2)

- ▶ 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.



Rear curtain tensioning device

- 1 Tension lever
- 2 Lock
- 3 Curtain pole in the tension ratchet
- 4 Rear door

- ▶ 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 "6.2.2 Curtain buckle", pg. 85).
- ✓ The side curtain at the rear is closed and tensioned.

6.2.6 Curtain rope bracket

⚠ WARNING

Risk of accident due to curtain rope flapping around!

Unsecured excess curtain rope can flap around and injure other road users or cause damage to the vehicle.

- ▶ Prevent excess curtain rope from flapping around.
- ▶ Use the curtain rope bracket (if available).

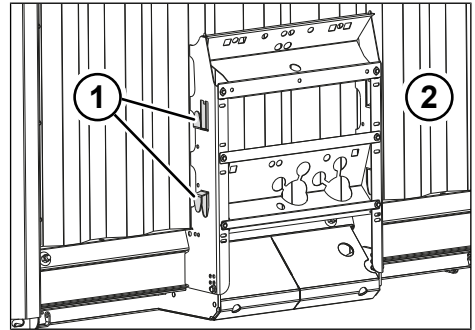


Fig. 6-37: Curtain rope bracket

- 1 Curtain rope bracket
- 2 Front wall

Securing the curtain rope on the curtain rope bracket

- ▶ Wind the curtain rope on the curtain rope bracket.
- ▶ Slide the end of the rope into the wound-up curtain rope.
- ✓ The excess curtain rope is secured on the curtain rope bracket.

Releasing the curtain rope from the curtain rope bracket

- ▶ Pull the end of the rope out of the wound-up curtain rope.
- ▶ Unwind the curtain rope.
- ✓ The curtain rope is released from the curtain rope bracket.

6.2.7 Comfort equipment

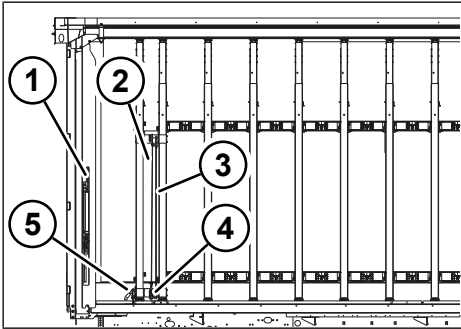


Fig. 6-38: Comfort curtain (interior view)

- 1 Corner post
- 2 Cable
- 3 Bungee cord
- 4 Lock for closed curtain
- 5 Curtain package arrester

Opening the side curtain

- ▶ Open all the curtain buckles (see "6.2.2 Curtain buckle", pg. 85).

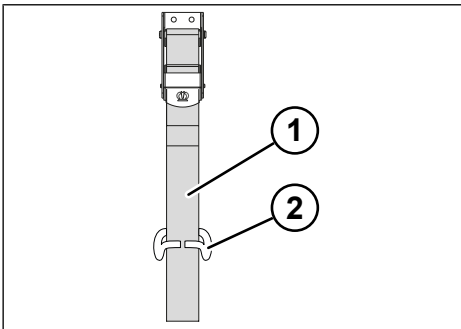


Fig. 6-39: Curtain buckle

- 1 Belt
- 2 Wire hook

- ▶ Bring the end of the belt behind the wire hook of the curtain buckle. This prevents the wire hook from getting caught onto the side curtain during the lifting procedure.

- ▶ If necessary, open the side curtain at the front (see "6.2.4 Front curtain tensioning device", pg. 88) and at Rear curtain tensioning device the rear.
- ▶ Fold down the open side curtain and fasten with a bungee cord in the hook for the rubber expanders on the curtain.

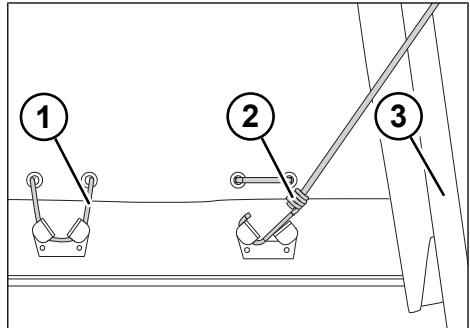


Fig. 6-40: Hooking on the bungee cord

- 1 Rubber expanders
- 2 Bungee cord
- 3 Curtain pole

- ▶ Release the lock with the cable (between the curtain and post).

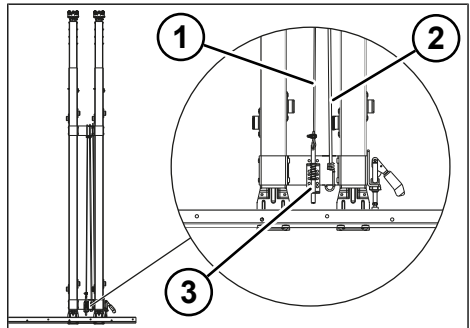


Fig. 6-41: Release the lock with the cable

- 1 Cable
- 2 Bungee cord
- 3 Lock for closed curtain

- ▶ Pull open the side curtain.

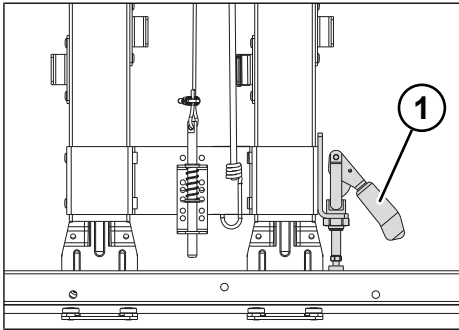


Fig. 6-42: Curtain package arrester

1 Locking lever

- ▶ Fold down the locking lever of the curtain package arrester to keep the curtain in the open position.
- ✓ The side curtain is open.

Closing the side curtain

NOTE

Property damage due to incorrectly tensioned side curtain!

If the side curtain is not correctly tensioned, the curtain buckles are not in the proper position and cannot be tensioned. This can cause property damage to the trailer and the load.

- ▶ Tension the side curtain to the front and rear such that the curtain buckles are located directly over the notches in the side rail.
- ▶ Hook the curtain buckles into the notches in the side rails and tighten them.
- ▶ Do not hook the curtain buckles into the curtain edge.
- ▶ Fold up the locking lever of the curtain package arrester to release the side curtains held in position.
- ▶ Pull the side curtain closed until the lock engages.

- ▶ Close the side curtains at the front (see "6.2.4 Front curtain tensioning device", pg. 88) and rear Rear curtain tensioning device.
- ▶ Close all curtain buckles (see "6.2.2 Curtain buckle", pg. 85).
- ✓ The side curtain is closed.

Lifting the roof

⚠ WARNING

Risk of accident due to failure to remove rearward load securing!

If the rearward load securing is not removed before lifting the roof, the load securing system can fall over, injure people, and damage the trailer.

- ▶ Always remove the rearward load securing before lifting the roof.

- ☑ The rearward load securing is removed (see "" pg. 100).
- ▶ Open the doors and secure them with the Door Fix (see "6.1.2 Door stop", pg. 78).
- ▶ Open all the curtain buckles (see "6.2.2 Curtain buckle", pg. 85).

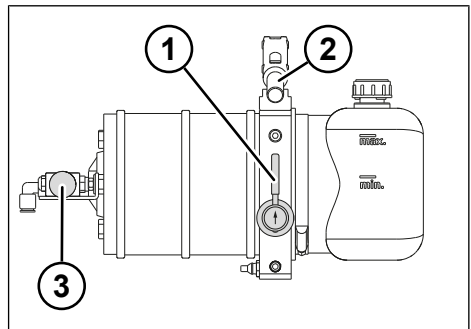


Fig. 6-43: Central pump

- 1 "Raise/lower" lever
- 2 Emergency operating lever
- 3 Control knob

- ▶ Swivel the "raise/lower" lever straight up.

- ▶ Press and hold the control knob until the desired roof height is reached.
 - ⇒ The entire roof is lifted.

or

- ▶ Swivel the “raise/lower” lever to the left or right.
 - ⇒ The roof is lifted on the right or left side.
- ▶ Press and hold the control knob until the desired roof height is reached.
 - ✓ The roof is raised.

Lowering the roof

- ▶ Swivel the “raise/lower” lever downwards.
- ✓ The roof is lowered.

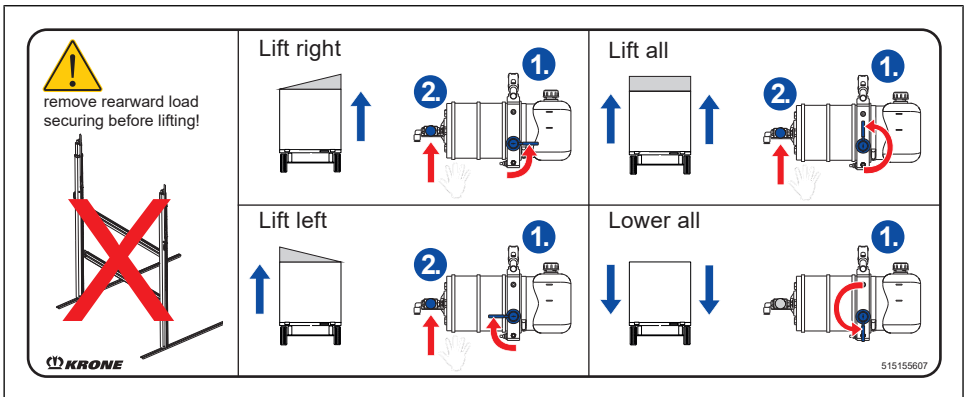


Fig. 6-44: Operating sticker on the central pump

Adjusting the superstructure height

- ▶ Lift the roof until the load on the adjustment bolts on all four corners is relieved (see "" pg. 97).

- ▶ Pull the adjustment bolt out of the latched position and swivel outwards.
- ▶ Allow the adjustment bolt to engage again at the desired height.

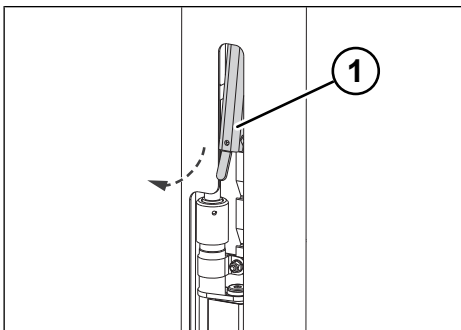


Fig. 6-45: Adjustment bolt in corner post

- 1 Adjustment bolt

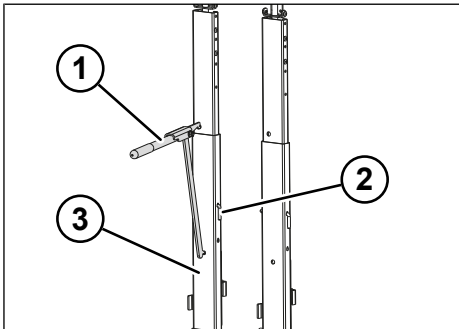


Fig. 6-46: Lifting aid

- 1 Lifting aid
- 2 Bolt
- 3 Post

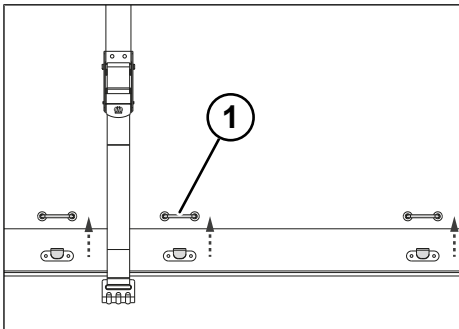


Fig. 6-47: Releasing the rubber expanders

- 1 Rubber expanders

- ▶ Release all the rubber expanders on the side curtain's edge flap.
- ▶ Insert the lifting aid into the "holes" of the centre post and lift slightly.
- ▶ Pull out the bolt.
- ▶ Set the desired height using the lifting aid.
- ▶ Insert the bolt.
- ▶ Lower the roof until it rests on the adjustment bolts.
- ▶ Hook all the rubber expanders into the edge flap.
- ✓ The superstructure height has been adjusted.

Rearward load securing

Depending on the version, KRONE trailers with a Comfort curtain can be equipped with rearward load securing.

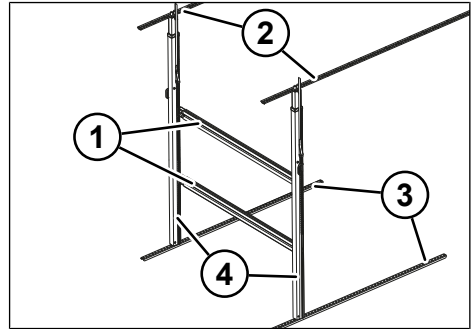


Fig. 6-48: Rearward load securing

- 1 Transverse beams
- 2 Top perforated rails
- 3 Bottom perforated rails
- 4 Vertical load securing beam

Installing the rearward load securing

⚠ WARNING

Risk of accident due to improperly installed rearward load securing!

Improperly installed rearward load securing does not fully secure the load. Load falling out can cause personal injury as well as material damage.

- ▶ Always allow the bolt of the load securing beams to fully engage across the entire length of the bolt.
- ▶ Do not use the vertical load securing beam in the transverse hoop area.
- ▶ Do not exceed the 10 t payload when using the rearward load securing.
- ▶ Allow the top and bottom bolts of the load securing beams to engage into the perforated rail.

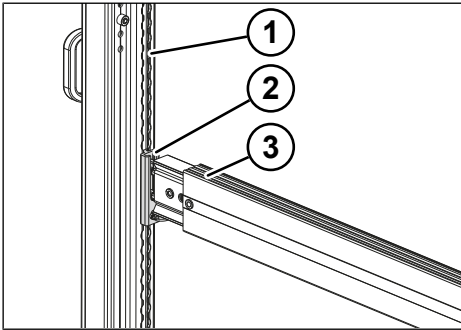


Fig. 6-49: Transverse beam in the mounting slot

- 1 Hole pattern
- 2 Mounting slot
- 3 Transverse beams

- ▶ Install the mounting slots for the transverse beam onto the hole pattern of the load securing beams.
- ▶ Insert the transverse beam into the mounting slot.
- ✓ The rearward load securing is installed.

Removing the rearward load securing

- ▶ Remove the transverse beam.

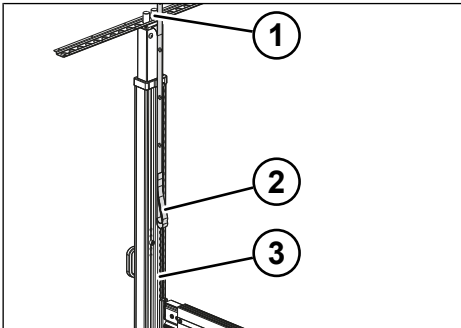


Fig. 6-50: Unlocking the load securing beam

- 1 Bolt
- 2 Belt
- 3 Vertical load securing beam

- ▶ Pull the belt down to unlock the bolt of the vertical load securing beams.

- ▶ Remove the load securing beams from the hole pattern.
- ✓ The rearward load securing is removed.

6.2.8 Lateral load compartment limiter

On the sliding curtain superstructure, corner posts and centre posts (see "6.2.9 Centre posts", pg. 103) laterally limit the load compartment.

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

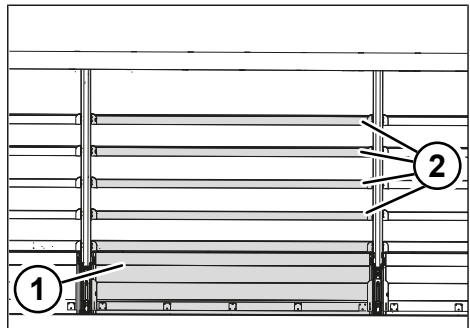


Fig. 6-51: Load compartment limiter with board walls and plug-in laths

- 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 all-plug-in laths.

Board walls

WARNING

Risk of accident from falling loads!

Particularly with double-deck loading, load that suddenly falls out can cause serious personal injury and material damage.

- ▶ When opening the board walls, watch out for falling loads.
- ▶ If possible, open superstructure locks from an area outside of the fold-down range of the board walls.

WARNING

Risk of accident from falling loads!

Loads that suddenly fall out can cause serious personal and material damage.

- ▶ When opening the board walls, watch out for falling loads.
- ▶ If possible, open superstructure locks from an area outside of the fold-down range of the 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.

KRONE trailers are equipped with several board walls on each side. The board walls each have two to four 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 "6.2.5 Rear curtain tensioning device", pg. 93).

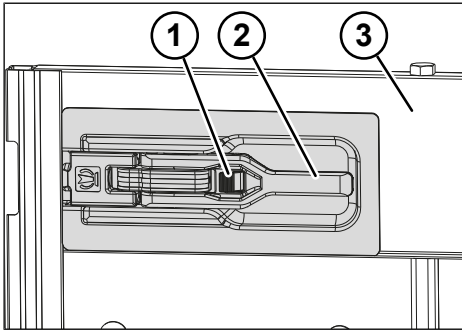


Fig. 6-52: Board wall lock

- 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.

Using the fold-down steps

Depending on the version, there are fold-down steps on the inside of the rear wall to climb onto the superstructure (see "5.15.4 Fold-down steps", pg. 64).

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

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.

⚠ CAUTION

Risk of accident when driving with removed board walls

Removed board walls pose an accident hazard due to missing contour markings.

- ▶ Drive with removed board walls only if the trailer is authorised for driving without board walls.
- ▶ Fold the board wall down by approximately 135°.

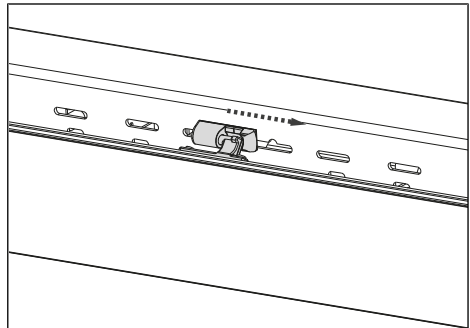


Fig. 6-53: Folding down the board wall

- ▶ 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.

6.2.9 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 trailers can be equipped with several pairs of one of the following sliding post types:

- One-part fold-out posts (see "6.2.9.1 One-part fold-out posts", pg. 104)
- Telescopic fold-out posts (see "6.2.9.2 Telescopic fold-out posts", pg. 104)
- Fold-down posts
- Double-deck posts (see "6.2.10.1 Moving and locking double-deck posts", pg. 108)

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 "6.2.8 Lateral load compartment limiter", pg. 100).
- ▶ If necessary, remove the plug-in laths (see "6.2.8 Lateral load compartment limiter", pg. 100).
- ✓ 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.

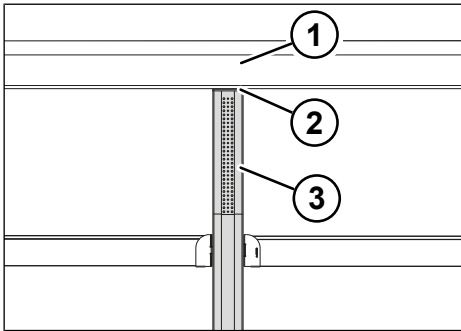


Fig. 6-54: Bearings of sliding posts

- 1 External beam
- 2 Bogie truck with rollers
- 3 Sliding post

6.2.9.1 One-part fold-out posts

KRONE trailers with sliding curtain superstructures are equipped with one-part fold-out posts.

Depending on their design, one-part 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.

Posts without lath sockets are also possible.

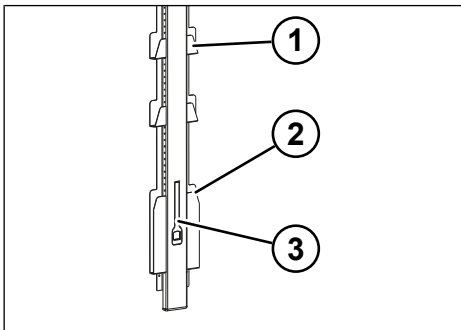


Fig. 6-55: One-part centre post

- 1 Flat lath sockets
- 2 Lath depot
- 3 Locking lever

Moving and locking one-part fold-out posts

- ☑ The centre posts are prepared for sliding (see "6.2.9 Centre posts", pg. 103).
- ▶ Pull out the locking lever and completely fold up.

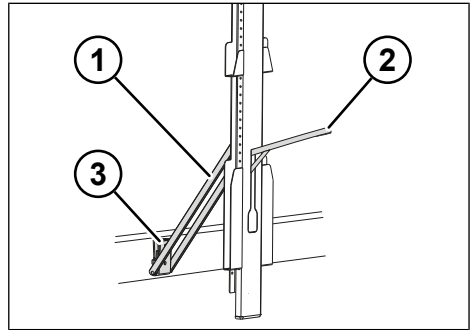


Fig. 6-56: Releasing the one-part fold-out post

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

- ▶ Pull the posts 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.
- ▶ Slide the posts in the desired direction.
- ▶ Insert the fastening bow into the post retainers.
- ▶ Push back the locking lever to the stop.
- ✓ The posts have been moved and are locked.

6.2.9.2 Telescopic fold-out posts

KRONE trailers with a lifting roof are equipped with telescopic fold-out posts that can be lifted for loading/unloading. A telescopic piece inside the posts adjusts to match the height difference. Depending on their design, telescopic 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.

Posts without lath sockets are also possible.

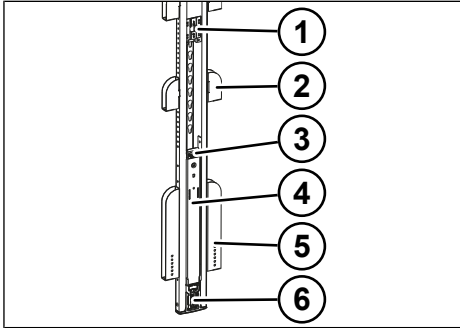


Fig. 6-57: Telescopic fold-out post

- 1 Plugging unit
- 2 Flat lath sockets
- 3 Lock
- 4 Locking lever
- 5 Lath depot
- 6 Post pockets

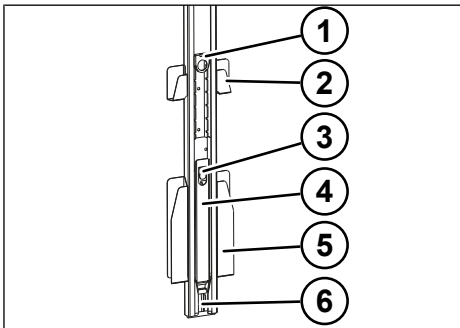


Fig. 6-58: Optional design of the centre post

- 1 Plugging unit
- 2 Flat lath sockets
- 3 Lock
- 4 Locking lever
- 5 Lath depot
- 6 Post pockets

Opening the telescopic fold-out posts

- ☑ The posts are ready to be moved (see "6.2.9 Centre posts", pg. 103).
- ▶ Press in the locks on the locking lever.
- ▶ Pull out the locking lever from the post profile.

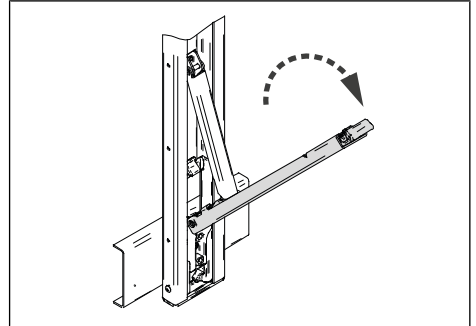


Fig. 6-59: Folding down the locking lever

- ▶ Completely fold down the locking lever until the post retainer is released from the chassis and the post slides down from the post pocket.

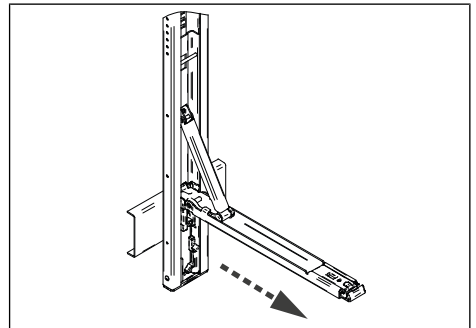


Fig. 6-60: Swivelling the post away from the vehicle

- ▶ Swivel the posts away from the vehicle.

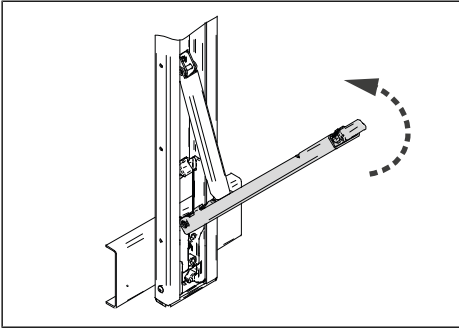


Fig. 6-61: Closing the locking lever

- ▶ Close the locking lever.
- ✓ The posts are opened.

Sliding the telescopic fold-out posts

- ☑ The posts are opened.
- ▶ Swivel the posts away from the vehicle and move them in the desired direction.
- ✓ The posts have been moved
- ▶ Close the posts prior to departure.

Closing the telescopic fold-out posts

- ▶ Position the posts in front of the post pockets.
- ▶ Press in the locks on the locking lever.
- ▶ Pull out the locking lever from the post profile.

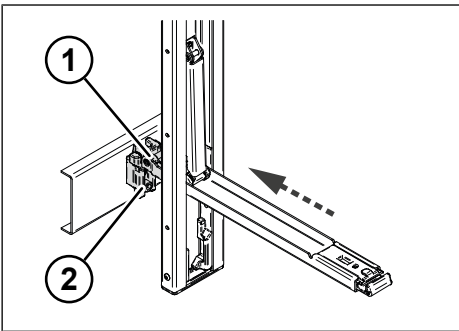


Fig. 6-62: Locking lever folded down

- 1 Fastening mechanism on the locking lever
- 2 Post pockets

- ▶ Place the locking lever's fastening mechanism on the post pocket.
- ▶ Fold up the locking lever to the stop, until the locks engage.
- ✓ The posts are closed and secured.

Adjusting the height of the telescopic fold-out post

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 adjustable corner posts, the telescopic fold-out posts adapt themselves to the height differences by extending their telescoping parts. Using the plugging unit, the superstructure height can be adjusted in 50-mm increments.

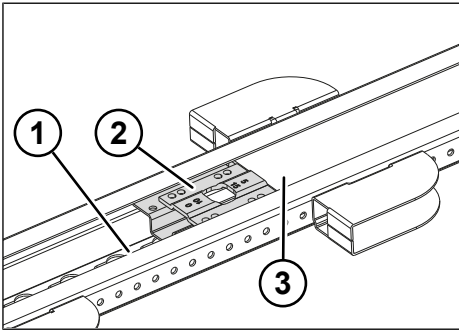


Fig. 6-63: Using the plugging unit

- 1 Keyhole row
- 2 Plugging unit
- 3 Telescopic piece

- ☑ The posts are opened.
- ▶ Slide up the plugging unit and lift it out of the keyhole row.
- ▶ Adjust the height of the plugging unit.
- ▶ Engage the plugging unit at the desired height in the post profile.
- ▶ Close the post.
- ✓ The post heights have been adjusted.

6.2.10 Double-deck superstructure

Using double-deck loading on the double-deck superstructure, you can make better use of the available load compartment volume. Information on load securing can be found in the section “Loading and securing” (see “8.11 Double-deck loading”, pg. 164).

Longitudinal beams and transverse beams are used as bearing elements.

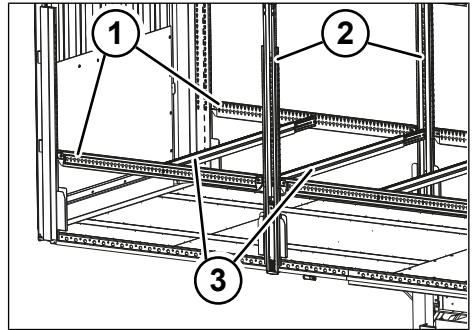


Fig. 6-64: Bearing elements for double-deck superstructure

- 1 Longitudinal beams
- 2 Double-deck posts
- 3 Transverse beams

Design of the double-deck posts:

- A lateral hole pattern to fasten the longitudinal beams and adjust their height.
- An inside hole pattern to directly mount and adjust the height of the transverse beams.

To accommodate Euro pallets, the transverse beams can be fastened to the hole pattern of the longitudinal beams.

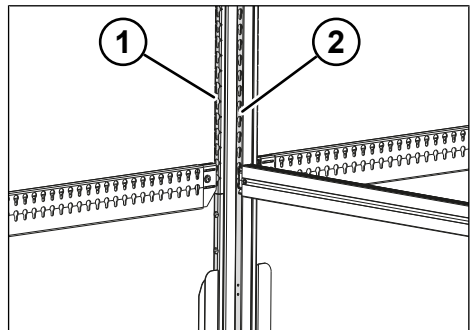


Fig. 6-65: Double-deck post

- 1 Lateral hole pattern for longitudinal beams
- 2 Inside hole pattern for transverse beams

6.2.10.1 Moving and locking double-deck posts

KRONE trailers with double-deck superstructure are equipped with double-deck posts. Double-deck posts have a set of lath sockets above the floor for four plug-in laths.

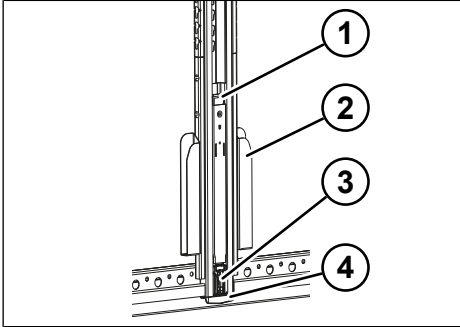


Fig. 6-66: Double-deck post

- 1 Lock
- 2 Lath depot
- 3 Post pockets
- 4 Post retainer

- ▶ Prepare to move the posts (see "6.2.9 Centre posts", pg. 103).
- ▶ Remove the longitudinal and transverse beams of the double-deck superstructure.
- ▶ Press in the locks on the locking lever.
- ▶ Pull out the locking lever from the post profile.

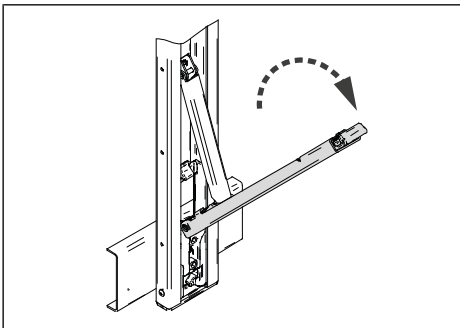


Fig. 6-67: Folding down the locking lever

- ▶ Completely fold down the locking lever until the post retainer is released from the chassis and the post slides down from the post pocket.

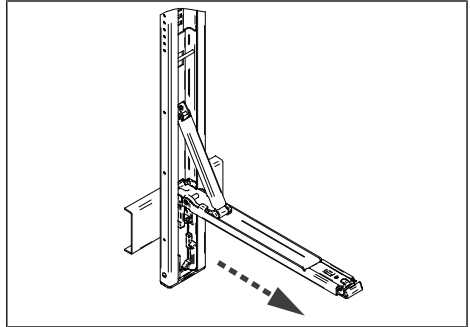


Fig. 6-68: Swivelling the post away from the vehicle

- ▶ Swivel the posts away from the vehicle.

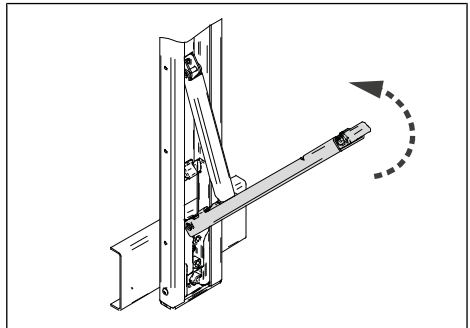


Fig. 6-69: Closing the locking lever

- ▶ Close the locking lever.
- ▶ Slide the posts in the desired direction.
- ▶ Position the posts in front of the post pockets.
- ▶ Press in the locks on the locking lever.
- ▶ Pull out the locking lever from the post profile.

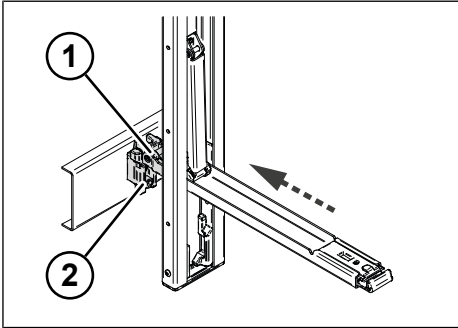


Fig. 6-70: Locking lever folded down

- 1 Fastening mechanism on the locking lever
- 2 Post pockets

- ▶ Place the locking lever's fastening mechanism on the post pocket.
- ▶ Press the post against the chassis.
- ▶ Fold up the locking lever to the stop, until the locks engage.
- ✓ The posts have been moved and are locked.

6.2.10.2 Inserting and removing the longitudinal beams

⚠ CAUTION

Risk of accident due to improper use of the transverse beams and longitudinal beams!

Improper handling of the longitudinal and transverse beams can injure people and cause material damage.

- ▶ Follow the loading instructions.
- ▶ Keep the centre of gravity of the load as low as possible. Place the heaviest load on the load compartment floor, and the lighter freight on the transverse beams.
- ▶ Observe the maximum working load limit of the longitudinal beams, transverse beams, and posts. The working load limit for the transverse beams is listed on the stickers.
- ▶ Secure the load against sliding. To do so, install the transverse beams at different levels.

Longitudinal beams can be fastened between the double-deck posts.

Inserting the longitudinal beams

- ▶ If necessary, lock the posts in the fastening points on the vehicle frame provided.
- ▶ Insert the fixed ends of the longitudinal beams.

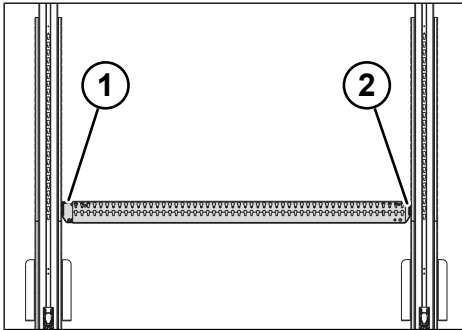


Fig. 6-71: Longitudinal beams

- 1 Telescopic piece
- 2 Fixed longitudinal beam end

- ▶ Insert the longitudinal beam ends into the lateral hole pattern of the posts.
- ▶ Slide and attach the telescopic pieces with the hinge devices into the lateral hole pattern of the posts.
- ✓ The longitudinal beams are fastened.

Removing the longitudinal beams

- ▶ Lift up the retainer lever.
- ▶ Move the hook.
- ▶ Remove the fixed ends of the longitudinal beams.
- ✓ The longitudinal beams are removed.

6.2.10.3 Inserting and removing the transverse beams

⚠ CAUTION

Risk of accident due to improper use of the transverse beams and longitudinal beams!

Improper handling of the longitudinal and transverse beams can injure people and cause material damage.

- ▶ Follow the loading instructions.
- ▶ Keep the centre of gravity of the load as low as possible. Place the heaviest load on the load compartment floor, and the lighter freight on the transverse beams.
- ▶ Observe the maximum working load limit of the longitudinal beams, transverse beams, and posts. The working load limit for the transverse beams is listed on the stickers.
- ▶ Secure the load against sliding. To do so, install the transverse beams at different levels.

You can attach transverse beams between the longitudinal beams or between posts.

Inserting the transverse beams between the longitudinal beams

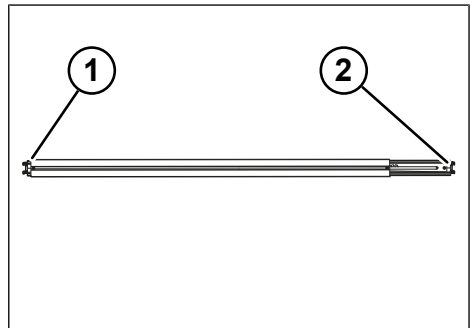


Fig. 6-72: Transverse beams

- 1 Fixed end
- 2 Telescopic end

- ▶ Insert the fixed end of the transverse beam on one side of the vehicle into the longitudinal beams.
- ▶ Lift the transverse beams to the height of the opposite longitudinal beam.
- ▶ Lift up the locking lever on the telescopic end of the transverse beam.
- ▶ Pull out the insert on the telescopic end of the transverse beam.
- ▶ Using slight pressure, attach the telescopic end of the transverse beam into the hole pattern of the longitudinal beam.

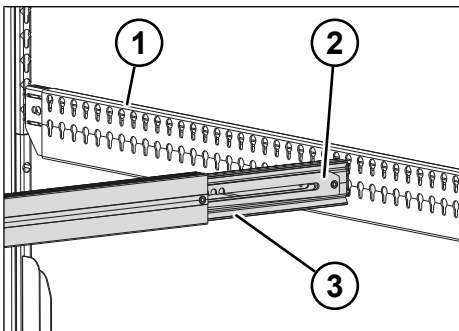


Fig. 6-73: Attached telescopic end

- 1 Longitudinal beams
- 2 Locking lever
- 3 Telescopic end of the transverse beam

- ▶ Allow the locking lever to automatically engage.
- ✓ The transverse beams are fastened.

INFO

The locking lever locks independently due to its own weight. The transverse beams must be perpendicular to the longitudinal beams. The transverse beam must be attached to the keyholes. The telescopic extension has a latch system to withstand the transverse forces experienced when cornering. If they are not used, the transverse beams can be parked between the posts.

Removing the transverse beam

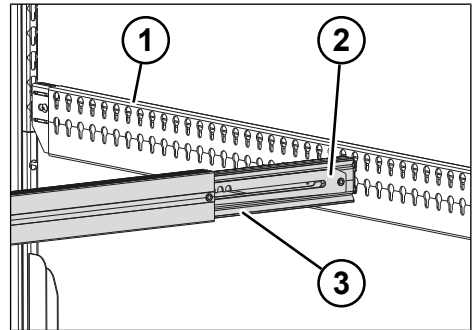


Fig. 6-74: Attached telescopic end

- 1 Longitudinal beams
- 2 Locking lever
- 3 Telescopic end of the transverse beam

- ▶ Lift up the locking lever.
- ▶ Lift up the telescopic end of the transverse beam.
- ▶ Slide the insert on the telescopic end of the transverse beam into the transverse beam.
- ▶ Lift up the fixed end of the transverse beam.
- ▶ Remove the transverse beam.
- ✓ The transverse beam has been removed.

Fastening the transverse beams between posts

Fastening the transverse beams between the posts is identical to fastening the transverse beams between the longitudinal beams.

6.2.10.4 Moving the lath sockets for plug-in laths

Depending on the version, KRONE trailers with a double-deck superstructure can be equipped with adjustable lath sockets.

Removing the lath socket

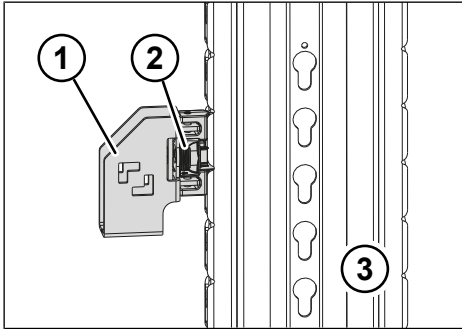


Fig. 6-75: Adjustable lath socket

- 1 Lath socket
- 2 Locking mechanism
- 3 Double-deck post

- ▶ Removing the plug-in lath
- ▶ Press back the lock on the lath socket.
- ▶ Lift out the lath socket.
- ✓ The lath socket has been removed

Inserting the lath socket

- ▶ Attach the lath socket at the desired position from above into the grid on the post.
- ▶ Allow the lock on the lath socket to engage.
- ✓ The lath socket has been inserted. When all the lath sockets have been moved, the plug-in laths can be attached.

INFO

The plug-in laths must be aligned horizontally.

6.2.11 Front wall depot

Depending on the version, KRONE trailers with a steel front wall can be equipped with a front wall depot.

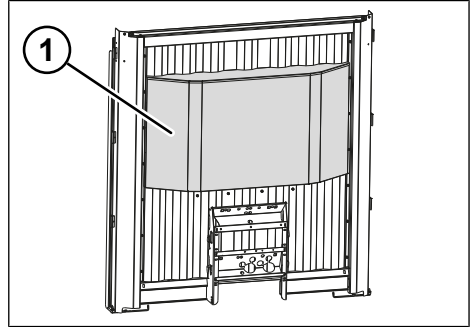


Fig. 6-76: Front wall depot

- 1 Front wall depot

The front wall depot contains fixed storage shelves to store 24 paper wedges (see "8.14.1 Using the paper wedge", pg. 172), two pallet rollers, (see "8.14.2 Using the pallet roller", pg. 172) and various other load securing materials.

Opening the front wall depot

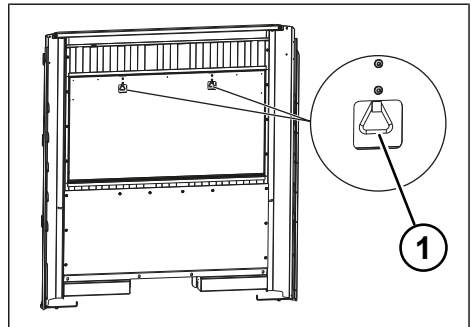


Fig. 6-77: Locks on the front wall depot

- 1 Locks

- ▶ Actuate the locks.
- ▶ Fold down the flap.
- ✓ The front wall depot is open.

Closing the front wall depot

- ▶ Fold up the flap.
- ▶ Allow the locks to engage into place.
- ✓ The front wall depot is closed.

6.3 Full-tarp superstructure

NOTE

Material damage due to improper removal of posts!

Incorrect removal of the posts can cause the roof to sag and cause material damage to the superstructure.

- ▶ Take only one pair of posts out on each side of the vehicle.

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

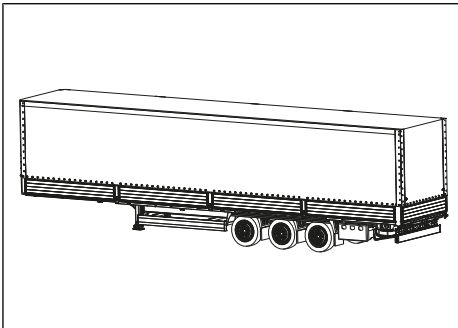


Fig. 6-78: Full-tarp superstructure

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

6.3.1 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.

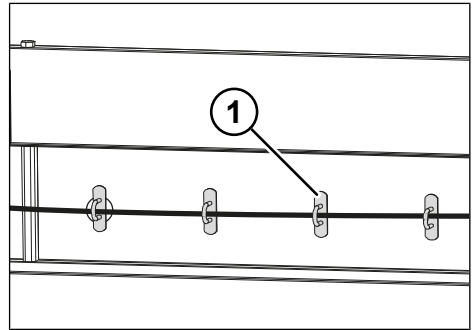


Fig. 6-79: Curtain cramps on the rear wall

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.

6.3.2 Lateral load compartment limiter

On the full-tarp superstructure, corner posts and centre posts (see "6.3.3 Centre posts", pg. 116) limit the load compartment to the sides.

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

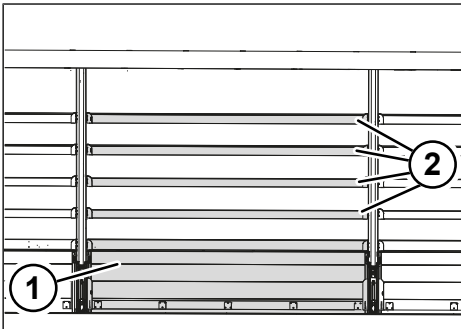


Fig. 6-80: Lateral load compartment limiter with board walls and plug-in laths

- 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 from falling loads!

Particularly with double-deck loading, load that suddenly falls out can cause serious personal injury and material damage.

- ▶ When opening the board walls, watch out for falling loads.
- ▶ If possible, open superstructure locks from an area outside of the fold-down range of the board walls.

⚠ WARNING

Risk of accident from falling loads!

Loads that suddenly fall out can cause serious personal and material damage.

- ▶ When opening the board walls, watch out for falling loads.
- ▶ If possible, open superstructure locks from an area outside of the fold-down range of the 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.

KRONE trailers are equipped with several board walls on each side. The board walls each have two to four 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 "6.2.5 Rear curtain tensioning device", pg. 93).

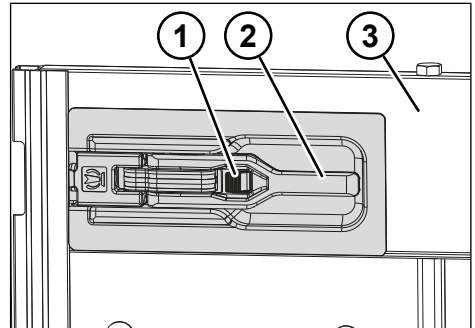


Fig. 6-81: Board wall lock

- 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.

Using the fold-down steps

Depending on the version, there are fold-down steps on the inside of the rear wall to climb onto the superstructure (see "5.15.4 Fold-down steps", pg. 64).

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

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.

⚠ CAUTION

Risk of accident when driving with removed board walls

Removed board walls pose an accident hazard due to missing contour markings.

- ▶ Drive with removed board walls only if the trailer is authorised for driving without board walls.

- ▶ Fold the board wall down by approximately 135°.

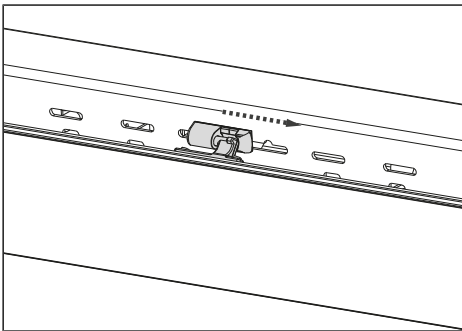


Fig. 6-82: Folding down the board wall

- ▶ 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.

6.3.3 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 trailers can be equipped with several pairs of one of the following post types:

- Tilting/plug-in posts (see "6.3.3.1 Tilting/plug-in posts", pg. 117)
- Fold-down posts (see "6.3.3.2 Fold-down posts", pg. 117)

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 "6.3.2 Lateral load compartment limiter", pg. 114).

- ▶ Remove the plug-in laths (see "6.3.2 Lateral load compartment limiter", pg. 114).
- ✓ The centre posts are ready for removal.

6.3.3.1 Tilting/plug-in posts

Tilting/plug-in posts can be removed for the loading/unloading process and have several sets of lath sockets for plug-in laths.

The posts are stored on a post socket on the chassis and are guided into the external beam guide on the roof frame at the top.

Removing tilting/plug-in posts

⚠ CAUTION

Risk of accident when removing the tilting/plug-in posts!

There is a risk of injury due to the high weight of the tilting/plug-in posts. The posts can tip over or fall down and injure people and cause material damage.

- ▶ Always remove the posts with two people.

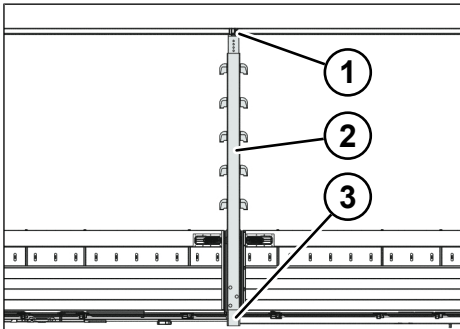


Fig. 6-83: Tilting/plug-in post

- 1 External beam guide
- 2 Tilting/plug-in post
- 3 Post retainer

- ☑ The centre posts are prepared for removal (see "6.3.3 Centre posts", pg. 116).
- ▶ Tilt the posts from the external beam guides on the roof frame.

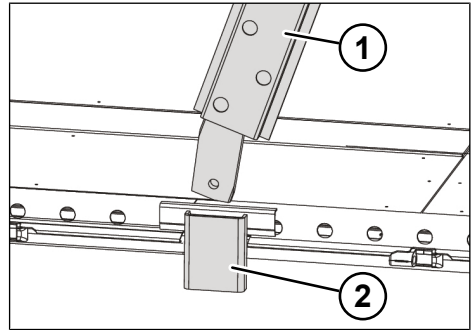


Fig. 6-84: Lifting out the tilting/plug-in post

- 1 Tilting/plug-in post
- 2 Post retainer

- ▶ Lift out the posts from the post retainer on the chassis.
- ✓ The posts have been removed.

Inserting the tilting/plug-in posts

- ▶ Insert the posts in the post retainer on the chassis.
- ▶ Tilt the posts into the external beam guides on the roof frame in the vertical position.
- ✓ The posts have been inserted.
- ▶ Fold up the board walls and lock them.

6.3.3.2 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 "6.3.3 Centre posts", pg. 116).

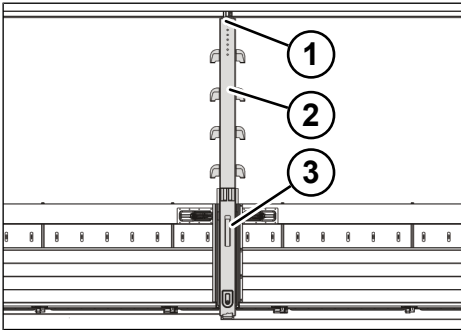


Fig. 6-85: Fold-down post

- 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.

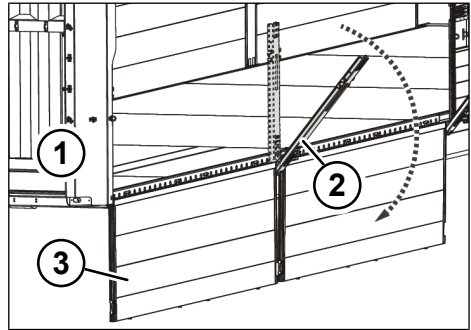


Fig. 6-86: Folded down bottom part of the post

- 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.

6.4 Building material superstructure

On KRONE trailers with building material superstructures, posts and board walls limit the load compartment.

⚠ WARNING

Risk of accident from falling loads!

Loads that suddenly fall out can cause serious personal and material damage.

- ▶ When opening the board walls, watch out for falling loads.
- ▶ If possible, open superstructure locks from an area outside of the fold-down range of the board walls.

⚠ 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 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

Self-closing posts pose a risk of injury!

When the self-closing posts are inserted, they can cause personal injury.

- ▶ Wear protective gloves.
- ▶ Ensure that your hands and fingers are not in the closing area of the posts.

⚠ 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.

KRONE trailers with a building material superstructure have removable posts, removable board walls and, depending on the version, a Multi Rail lashing rail integrated on the floor (see "8.10.7 Lashing rail", pg. 153). The board walls are secured on the posts with integrated board wall locks. As an option, the board walls can also be equipped with board wall locks.

Fold down the board wall with the post (integrated board wall locks)

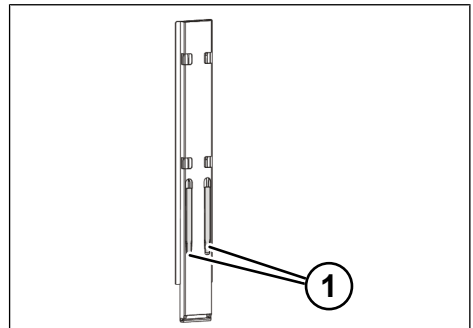


Fig. 6-87: Post with integrated board wall locks

- ▶ Swivel down the lever on the post halfway.
- ▶ Hold the board wall.
- ▶ Unlock the second lock of the board wall in the same way.
- ▶ Fully fold down the board wall.
- ✓ The board wall has been folded down.
- ▶ Swivel the lever completely down and fold down the post.
- ✓ The board wall and the post are folded down.

Using the fold-down steps

There are fold-down steps on the inside of the board walls to climb onto the superstructure (see "5.15.4 Fold-down steps", pg. 64).

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

Close the board wall with the post (integrated board wall locks)

- ▶ Swivel up the post.
- ▶ Swivel up the lever on the post halfway.
- ▶ Swivel up the board wall.
- ▶ Swivel the lever completely up.
- ✓ The board wall and the post are closed and locked.

Fold down the board wall with the board wall locks

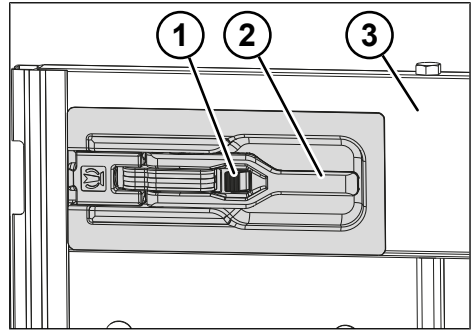


Fig. 6-88: Board wall lock

- 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 on the other side of the vehicle 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.

Using the fold-down steps

There are fold-down steps on the inside of the board walls to climb onto the superstructure (see "5.15.4 Fold-down steps", pg. 64).

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

Closing the board wall

- ▶ Swivel up the board wall.
- ▶ Engage the locks on both sides of the vehicle 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.

⚠ CAUTION

Risk of accident when driving with removed board walls

Removed board walls pose an accident hazard due to missing contour markings.

- ▶ Drive with removed board walls only if the trailer is authorised for driving without board walls.

INFO

If lighting equipment is fitted to the board walls when they are removed (e.g. edge markers), these must be reproduced on the vehicle.

- ▶ For loads with an excessive length, the board wall can be removed.
- ▶ Fold the board wall down by approximately 135°.

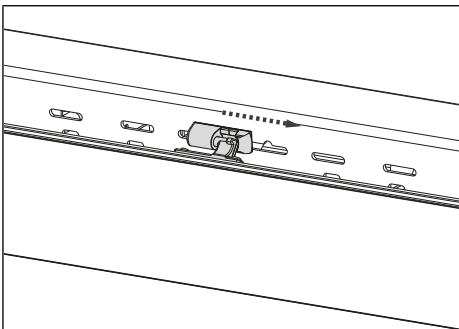


Fig. 6-89: Folding down the board wall

- ▶ 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.

6.5 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.

6.5.1 Roof tarp


Depending on the version, the roof tarp can be

- a fixed roof (see "6.5.3 Fixed roof (full-tarp superstructure)", pg. 123) or
- be pushed together with the sliding roof, (see "6.5.2 Sliding roof", pg. 121).

6.5.2 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

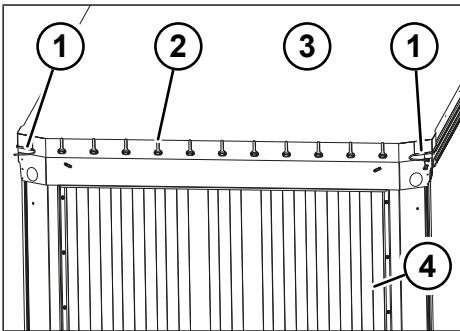


Fig. 6-90: Sliding roof on the front wall side

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

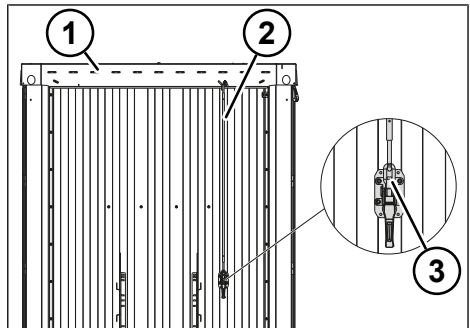
- ▶ Unhook the roof tarp rope.
- ▶ Open all the plug locks on the roof tarp.
- ▶ Fold back the roof tarp at the front.
- ▶ Remove the securing rope and, if necessary, the diagonal rope of the sliding roof on the front wall side.
- ▶ Using the pull rod, pull back the sliding roof over the canopy lock 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.

Opening the roof hood (Comfort solution)



- 1 Roof hood
- 2 Rod
- 3 Lock on the tension lock

The roof cover can be folded and locked so that the roof can be slid on both sides.

- ▶ Press in the lock on the tension lock and swivel upwards to release the tension lock.
- ▶ Remove the rod.
- ▶ Push up the roof hood above the dead centre using the rod.

- ▶ Pull back the sliding roof using the pull rod on the foremost transverse hoop.
- ▶ Attach the rod to the front wall and secure it at the bottom with the tension lock.
- ✓ The roof hood is open.

Closing the roof hood (Comfort solution)

- ▶ Pull forward the sliding roof using the pull rod on the foremost transverse hoop.
- ▶ Allow the cover to engage into place.
- ▶ Remove the rod.
- ▶ Pull down the roof hood with the rod until it is fully folded in.
- ▶ Attach the rod to the roof cover and secure it at the bottom with the tension lock.
- ✓ The roof hood is closed.

6.5.3 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.

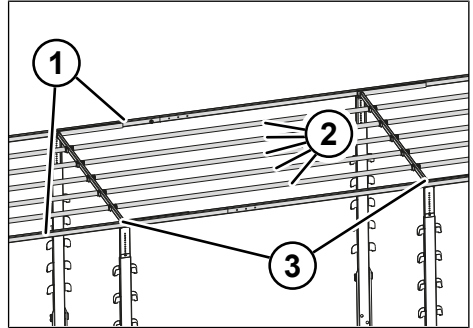


Fig. 6-91: Fixed roof

- 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.

6.5.4 Open Box sliding superstructure

⚠ WARNING

Risk of accident due to unsecured sliding superstructure!

If the sliding superstructure is slid forwards and unsecured, it can lead to accidents with personal injury and material damage.

- ▶ Secure the sliding superstructure with belts and plug-in posts when driving in a pushed-in state.

NOTE

Material damage due to driving with the sliding superstructure pushed to the rear!

Driving with the sliding superstructure pushed to the rear can result in material damage, e.g. to the sliding superstructure.


- ▶ After every loading/unloading process, push the sliding superstructure to the front.
- ▶ Close the sliding superstructure or slide it entirely to the front and lock before travel.

NOTE

Material damage when driving with the container!

With a roof height of 2,900 mm, the driving wind can push the sliding superstructure which has been slid to the front to the rear in the upper area. This can cause the roof and curtain to rub against the container and be damaged.

- ▶ At a roof height of 2,900 mm and greater, additionally secure the slid forward superstructure with a belt.

 Also observe the enclosed supplier documentation.

The Open Box sliding superstructure can be slid completely forwards or backwards to permit obstacle-free loading and unloading or transportation of containers.

You can transport the following container types with the superstructure slid forward and secured:

- Two 20-foot containers, or
- One 40-foot container, or
- One 30-foot container.

Opening the sliding superstructure

- ▶ Release the curtain tension on the tension ratchet at the front on both sides.

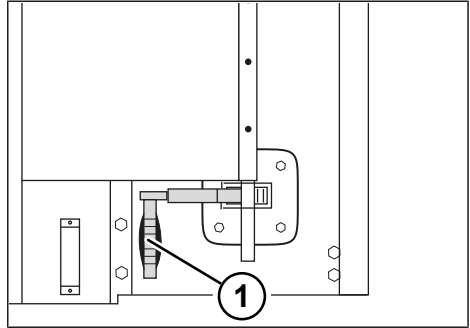


Fig. 6-92: Tension ratchet

- ▶ Release the side curtain.
- ▶ Fold up the side curtain and position the straps on the inside.
- ▶ Place all four retainer levers in the “Plateau” position. In the “Superstructure” position, the retainer levers prevent the side curtain from creasing.

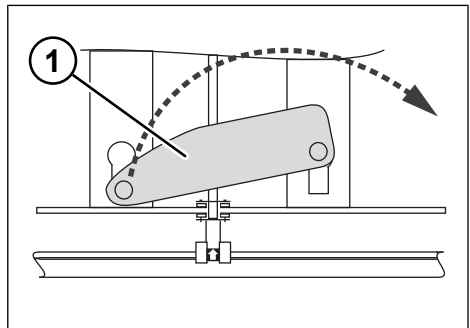


Fig. 6-93: Retainer lever closed

- ▶ Lift all the locks of the roof bow.

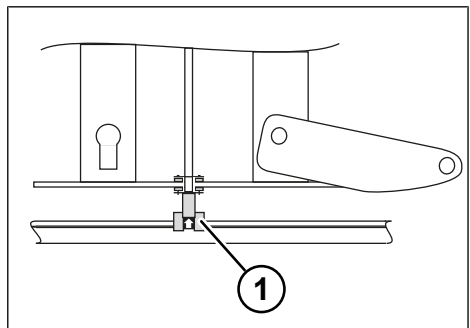


Fig. 6-94: Lock for roof bow

- ▶ Open the rear doors.

- ▶ Fold down the rear beam.

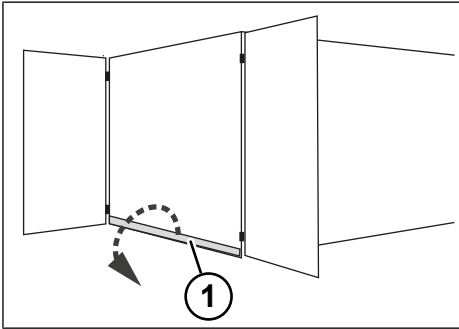


Fig. 6-95: Rear beam

- ▶ Close the rear doors.
- ▶ Move the locking handle on the rear gantry down, thereby unlocking the rear gantry.

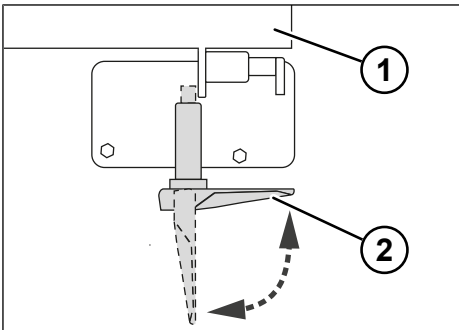


Fig. 6-96: Unlocking the rear gantry

- 1 Rear gantry
- 2 Locking handle

- ▶ Push the superstructure to the front. At the same time, push the roof bow inwards.
- ▶ Slide the rear gantry with the folded curtain toward the front wall.
- ▶ Insert three plug-in posts as door protection posts.
- ▶ Tension the side curtain with the tension ratchet at the front.

- ▶ Strap down the superstructure using the tension straps on the front wall.
- ✓ The superstructure is opened.

Closing the sliding superstructure

- ▶ Remove the three plug-in posts and securely store them in the post depot.
- ▶ Release and remove the tension straps at the front.
- ▶ Release the side curtain with the tension ratchet at the front.
- ▶ Move the superstructure a little until the locks loosen.
- ▶ Push the superstructure to the rear.
- ▶ Put all four retainer levers in the “Superstructure” position. In the “Superstructure” position, the retainer levers prevent the side curtain from creasing.

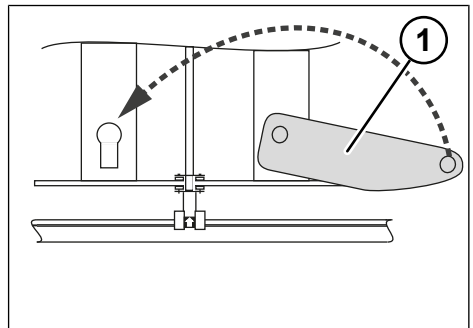


Fig. 6-97: Opening the retainer lever

- ▶ Lock the rear gantry.
- ▶ Move the roof hoops to a straight position and allow them to engage in the sliding rail.
- ▶ Fold in all the locks of the roof bow.

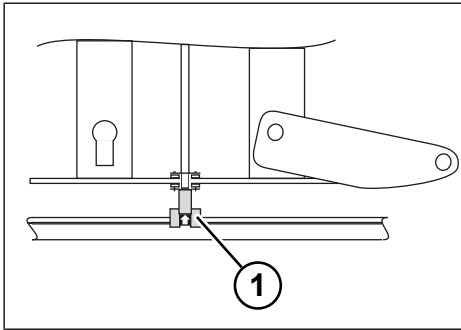


Fig. 6-98: Lock for roof bow

- ▶ Fold down the side curtain.
- ▶ Open the rear doors.
- ▶ Fold up the rear beam.

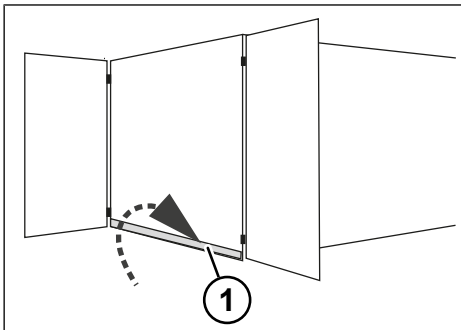


Fig. 6-99: Rear beam

- ▶ Close the rear doors again and lock them.
- ▶ Tension the side curtain.
- ✓ The superstructure is closed.

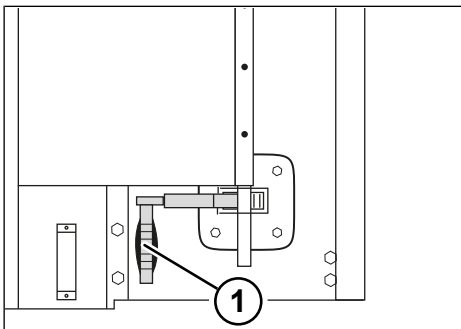


Fig. 6-100: Curtain buckle

6.5.5 Hydraulic 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**Unopened doors and non-adjusted centre posts and curtain tensioning devices can cause material damage!**

Operating the roof lift or adjusting the superstructure **without** first opening the container doors, opening the centre posts, 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 and the centre posts before every lifting and lowering operation.

Hydraulic lifting roofs facilitate the loading and unloading of the trailer. The roof can be lifted separately at the front and the rear.

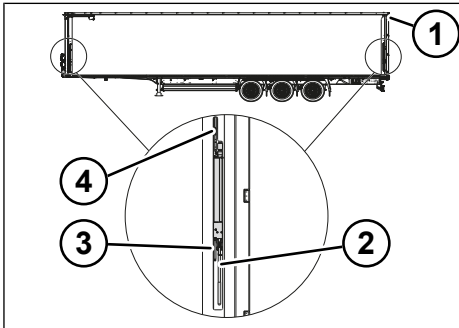


Fig. 6-101: Lifting roof

- 1 Gantry beam with integrated locking chambers for the rear doors
- 2 Hand lever
- 3 Drain valve
- 4 Adjustment bolt

The integrated locking chambers in the portal beams allow the doors to be closed at the set height.

Lifting the hydraulic lifting roof

- ▶ Open the front (see "6.2.4 Front curtain tensioning device", pg. 88) and rear Rear curtain tensioning device curtain tensioning device.
- ▶ Open the doors.
- ▶ Fasten the doors with the Door Fix (see "6.1.2 Door stop", pg. 78).

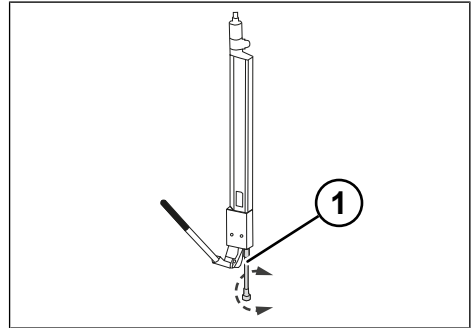


Fig. 6-102: Closing the drain valve

- 1 Drain valve

- ▶ Fully slide the side curtain to the side.
 - ▶ Turn the drain valves on the hand pumps in the corner posts clockwise to the stop.
- ⇒ The drain valves are closed.

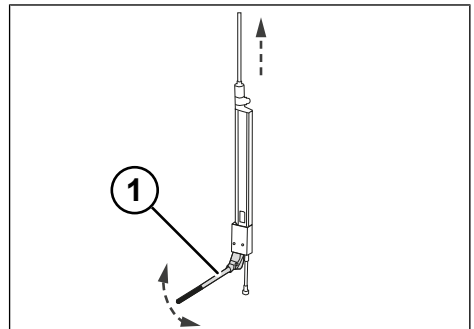


Fig. 6-103: Raising the lifting roof

- 1 Hand lever

- ▶ By pumping with the hand levers, raise the roof to the desired position.
- ✓ The lifting roof is raised.

Lowering the hydraulic lifting roof

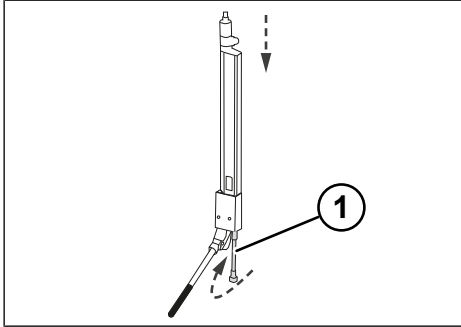


Fig. 6-104: Lowering the lifting roof

1 Drain valve

- ▶ Open the drain valves on the hand pumps in the corner posts by one turn counter-clockwise.
- ✓ The drain valves are opened.
- ✓ The lifting roof is lowered.

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 250 mm. Depending on the version, the superstructure height at the rear can be adjusted in increments from 50 mm to 200 mm.

- ☑ The doors are open.
- ☑ The side curtain is open.
- ▶ Raise the lifting roof until the load on the adjustment bolts on all four corners is relieved.

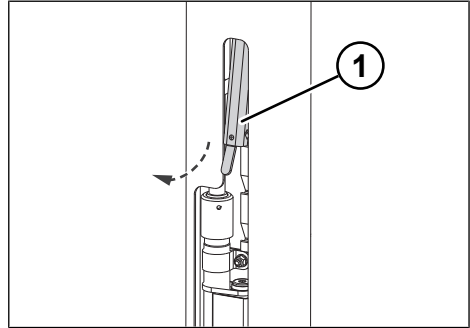


Fig. 6-105: Swivelling the adjustment bolt outwards

1 Adjustment bolt

- ▶ Pull the adjustment bolt out of the latched position and swivel outwards.
- ▶ Allow the adjustment bolt to engage again at the desired height.
- ▶ Adjust the height of the centre posts (see "" pg. 106).
 - ⇒ The centre posts have been adjusted to the superstructure height.
- ▶ Lower the lifting roof until it rests on the adjustment bolts.
- ✓ The lifting roof rests on the adjustment bolts.
- ✓ The superstructure height has been adjusted.

6.5.6 Roof Safety Airbag

As an option, the roof can be equipped with the Roof Safety Airbag (RSAB) roof tarp lifting device. The RSAB hose is installed in the middle under the roof tarp and is filled with compressed air. It lifts the roof tarp and eliminates any water accumulations. Snow and ice can be removed from the roof if there is a risk of frost and when the vehicle is parked for a long period of time. This prevents or minimises the formation of ice.

⚠ WARNING**Risk of injury from falling ice sheets!**

Even if the roof tarp is raised, small amounts of water or ice may build up on the roof tarp. Falling ice sheets can seriously injure persons and cause damage to objects.

- ▶ Ensure that no persons or objects are in the danger area around the trailer (approx. 3 m) while the roof tarp is being lifted up.
- ▶ As the operator, keep at least 3 m away from the trailer after the system has been switched on.

⚠ WARNING**Risk of accident when driving with a raised roof tarp!**

Driving with a raised roof tarp can cause accidents involving personal injury and material damage due to exceeding of the maximum permitted vehicle height.

- ▶ Vent the RSAB before every trip.

INFO

The RSAB system is connected to the power supply for the vehicle lighting system. The vehicle lighting system must be switched on to operate it. The system is also connected to the compressed air and requires a pressure of more than 6.5 bar. Do not switch off the tractor unit when filling and venting the hose.

 Observe the instructions in the manufacturer's documentation.

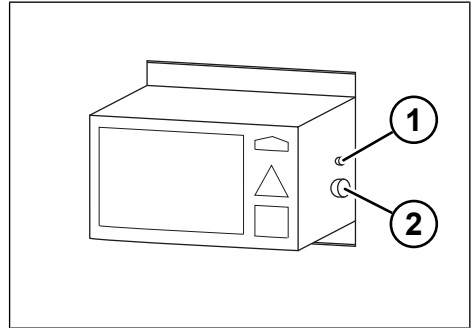
Filling the RSAB with air

Fig. 6-106: Control unit

- 1 LED display
- 2 Button

- ▶ Press the button on the control unit.
 - ⇒ The RSAB is filled with compressed air.
 - ⇒ The LED display flashes red.
- ▶ Wait until the system is turned off automatically.
 - ⇒ The LED display is continuously lit red.
- ✓ The RSAB is filled.

Venting the RSAB

- ▶ Press the button on the control unit or
- ▶ actuate the brake on the tractor unit.
 - ⇒ The LED display flashes green.
- ✓ The RSAB is vented.

LED display

This LED provides information about the status of the RSAB systems.

| LED signal | Definition |
|--------------|------------------------------------|
| Lit green | Functional and ready for operation |
| Lit red | Completely filled |
| Flashing red | Filling in progress |

| LED signal | Definition |
|------------------------|---------------------|
| Flashing green | Venting in progress |
| Flashing red and green | Fault indication |

6.6 Rear expansion

⚠ WARNING

Risk of accident due to driving with the rear gantry expanded!

Driving with the rear gantry expanded can cause accidents resulting in personal injury and material damage. Expanding the rear gantry is only permitted while loading/unloading.

- ▶ After every loading and unloading operation, reduce the rear gantry back to its normal dimensions (up to the stop).
- ▶ Observe the maximum vehicle width of 2,550 mm.

NOTE

Possible material damage due to expanding the rear gantry!

Expanding the rear gantry without first opening the sliding curtain and the doors can result in material damage.

- ▶ Open the sliding roof and doors before expanding the rear gantry.

To load and unload without obstacles, the rear gantry can be completely opened together with the corner posts.

Before the rear gantry can be expanded, the procedure must be prepared.

Preparing the rear gantry for expansion

- ▶ Open the side curtains on both sides.
- ▶ Fully slide the side curtain to the side.
- ▶ Open the doors.
- ▶ If applicable, fasten the doors with the Door Fix (see "6.1.2.2 Door Fix", pg. 79).

- ▶ Raise the lifting roof (see "6.5.5 Hydraulic lifting roof", pg. 126).
- ✓ The rear gantry is prepared for expansion.

Expanding the rear gantry

- ▶ Prepare the rear gantry for expansion.

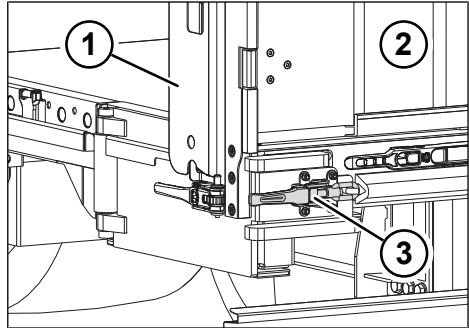


Fig. 6-107: Locking mechanism

- 1 Corner post
- 2 Door leaf
- 3 Lock for the rear expansion

- ▶ Open the lock for the rear expansion.
 - ⇒ The corner post is unlocked at the bottom.

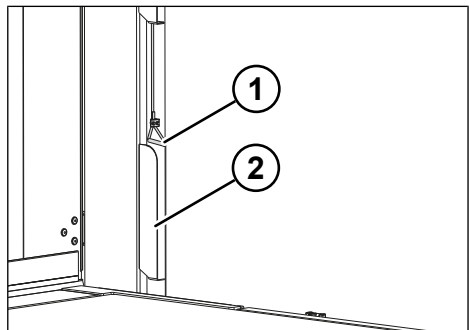


Fig. 6-108: Cable

- 1 Cable
- 2 Post socket

- ▶ Pull on the cable.
 - ⇒ The corner post is unlocked at the top.

- ▶ Release the Door Fix, if applicable.

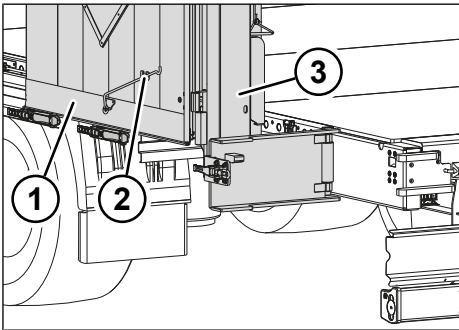


Fig. 6-109: Folding the corner post

- 1 Door leaf
- 2 Safety catch
- 3 Corner post

- ▶ Fold the corner post back by 90°.
- ▶ Swivel the door leaf to the rear.
- ▶ Fasten the door leaf with the safety catch.

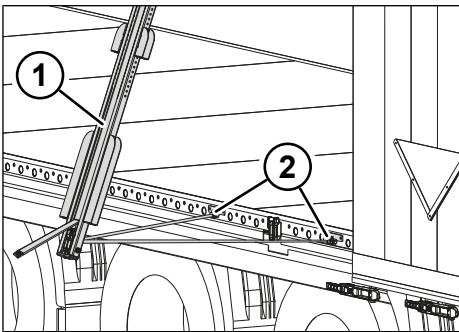


Fig. 6-110: Locking the centre posts

- 1 Centre post
- 2 Hinged rod

- ▶ Open the centre post.
- ▶ Fasten the centre post on the side rail with the hinged rod (see "6.2.9 Centre posts", pg. 103)
- ▶ Open the other side in the same way.
- ✓ The rear gantry has been expanded.

Reducing the rear gantry to its normal width

- ▶ Release the centre post.
- ▶ Fasten the hinged rod on the side rail.
- ▶ Fold down the corner post.
- ▶ Swivel the door leaf back.
- ▶ Close the lock for the rear expansion.
- ▶ Close the other side in the same way.
- ✓ The rear gantry has been reduced to its normal width.

6.7 Hydraulic rear width expansion

⚠ WARNING

Risk of accident due to driving with the rear gantry expanded!

Driving with the rear gantry expanded can cause accidents resulting in personal injury and material damage. Expanding the rear gantry is only permitted while loading/unloading.

- ▶ After every loading and unloading operation, reduce the rear gantry back to its normal dimensions (up to the stop).
- ▶ Observe the maximum vehicle width of 2,550 mm.

NOTE

Possible material damage due to expanding the rear gantry!

Expanding the rear gantry without first opening the sliding roof, the curtains, doors and, if necessary, the board walls can result in material damage.

- ▶ Open the sliding roof, curtain and, if necessary, the board walls before expanding the rear gantry.
- ▶ Open the doors and secure against movement with a chain. Do not secure the doors with door stops or using the Door Fix.

The hydraulic pumps can be used to slide the rear gantry out on the right and left sides to increase the loading width.

In the expanded state, there is a total of approx. 1,000 mm (approx. 500 mm per side) more loading width available. The maximum total loading width is approx. 3,480 mm.

Before the rear gantry can be expanded, the procedure must be prepared.

Preparing the rear gantry for expansion

- ▶ Open the sliding roof.
 - ▶ Open the curtain.
 - ▶ If necessary, open the board walls.
 - ▶ Open the doors.
 - ▶ Secure the doors against movement with a chain. **NOTE! Do not secure the doors with the door stops.**
- ✓ The rear gantry is prepared for expansion.

Expanding the rear gantry

- ▶ Prepare the rear gantry for expansion.

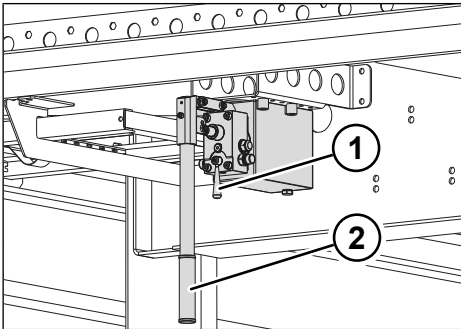


Fig. 6-111: Hydraulic pump

- 1 Valve
- 2 Pump lever

- ▶ Set the valve on the pump to "Expand".
 - ▶ Using the pump lever, expand the rear gantry to the required width (max. approx. 500 mm per side).
- ✓ The rear gantry has been expanded.

Reducing the rear gantry to its normal width

- ▶ Set the valve on the pump to "Retract".
 - ▶ Using the pump lever, reduce the width of the rear gantry up to the stop.
- ✓ The rear gantry has been reduced to its normal width.

7 Road operations

7.1 Commissioning before each trip

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

Perform a departure check prior to starting each trip:

- Are the documents for the tractor unit and vehicle at hand?
- Are the tractor unit and vehicle in the combination suitable for the transport task?
- Is there sufficient clearance between the vehicles so that the connection lines are not functionally impaired and can move freely?
- Are the applicable regulations for driving on public roads observed with the transport tasks?
- Have all accident prevention regulations been complied with?
- Are all the supply and control connections properly made between the tractor and the vehicle?
- Is the semitrailer coupling locked and secured correctly?
- Are all the vehicle components (such as wheel chocks, storage boxes, support devices) present, properly fastened, or respectively closed and secured?
- Are all movable collision protections locked and secured?
- Is the load properly distributed and correctly secured?
- Has the permitted maximum total weight been adhered to?
- Is there sufficient clearance between the vehicle floor and the tyres?
- Is the air suspension in the driving position?

- Is the permitted vehicle height complied with?
- Are lighting and signalling systems fully operational?
- Are the tyres inflated to the correct pressure?
- Has the trailer's parking brake been disengaged?
- Is the compressed air supply for the vehicle's brakes sufficient?
- Has the functional test of the EBS brake system been audibly heard?
- Has a functional test been performed on the brake system?
- Does the warning lamp/warning display in the tractor unit indicate that the vehicle's braking system is error free?
- Are the air tanks drained?
- Is the support device retracted and secured?
- ▶ Fix any observed defects.
- ▶ Only drive the tractor unit and vehicle when road safety is ensured.

7.2 Coupling and uncoupling the trailer

DANGER

Danger to life due to crushing!

People can be crushed between the tractor and trailer when coupling and uncoupling.

- ▶ Instruct persons to leave the danger area between tractor unit and trailer.
- ▶ Ensure that any guide person present stays far enough away to the side from the vehicles.

NOTE**Material damage due to improper coupling and uncoupling**

Improper coupling and uncoupling can cause damage to the vehicle.

- ▶ Prior to coupling and uncoupling, use the landing leg winches to adjust the trailer to the required coupling or uncoupling height of the tractor unit.
- ▶ When coupling or uncoupling, also observe the instructions from the tractor's operating instructions.
- ▶ Ensure sufficient clearance of all components.

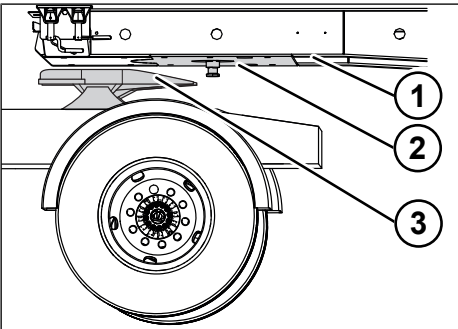


Fig. 7-1: Coupling

- 1 Semitrailer plate
- 2 Kingpin
- 3 Semitrailer coupling

Coupling

- ▶ Before coupling, check:
 - Is the tractor unit's coupling load suitable for the trailer?
 - Do the semitrailer coupling and the kingpin match?
 - Does the coupling height of the tractor and trailer correspond?
 - Is the trailer correctly loaded?
 - Is the coupling plate sufficiently lubricated?
- ▶ Apply the parking brake on the trailer (see "5.7.2 Parking brake", pg. 49).
- ▶ Use the wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Check the attachment and wear of the kingpin.
- ▶ Set the height of the semitrailer coupling using the tractor unit's air suspension. The coupling plate must be approx. 50 mm higher than the coupling plate.
- ▶ Prepare and unlock the semitrailer coupling on the tractor unit.
- ▶ Drive the tractor unit toward the centre until it is approx. 30 cm away from the kingpin.
- ▶ Raise the tractor unit's air suspension until the coupling plate and the semitrailer plate touch. Do **not** raise the semitrailer in doing so!
- ▶ Continue to drive the tractor centrally until the lock engages with the semitrailer coupling.
- ▶ Put the tractor unit's air suspension in the driving position.
- ▶ Perform the start-up test in low gear.
- ▶ Apply the parking brake on the tractor unit.
- ▶ Perform a visual inspection:
 - The semitrailer plate must lie against the semitrailer coupling without an air gap.
 - The semitrailer coupling must have locked properly.
- ▶ Secure the semitrailer coupling with its securing device.
- ▶ Connect the supply and control lines (see "5.4 Supply and control connections", pg. 37).
- ▶ Retract the landing leg winches (see "5.2 Support device", pg. 28).
- ▶ Put the trailer's air suspension in the driving position (see "5.8 Air suspension", pg. 52).

- ▶ Remove the wheel chocks and properly secure them (see "5.1 Using wheel chocks", pg. 27).
- ▶ Disengage the parking brake on the trailer (see "5.7.2 Parking brake", pg. 49).
- ▶ Check for clearance:

| Clearance | Requirement |
|---|--|
| Bending angle to the left and the right | Max. 90° |
| Tilt angle | Max. 6° to the front, max. 7° to the rear |
| Swing radius | There must be sufficient distance between the rear wall of the driver's cab on the tractor and the trailer. The two vehicles should not come into contact when turning a corner. |
| Supply lines | The supply lines must hang freely. They may not hang too low and rub, nor be pulled too tight when cornering. |

- ▶ Carry out a departure check (see "7.1 Commissioning before each trip", pg. 133).
- ✓ The trailer is coupled and ready to drive.

Uncoupling

- ▶ Lower the trailer's air suspension down to the mechanical limit (see "5.8 Air suspension", pg. 52).
- ▶ Park the trailer on a load-bearing and level surface.
- ▶ Position the semitrailer as stretched as possible.
- ▶ Apply the parking brake on the trailer (see "5.7.2 Parking brake", pg. 49).
- ▶ Use the wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Lift the trailer with the tractor unit's air suspension.

- ▶ Support the trailer with the landing leg winches (see "5.2 Support device", pg. 28).
- ▶ Set the tractor ignition to "Off". As a result, the electronic systems of the trailer are properly shut down.
- ▶ Disconnect the supply and control lines (see "5.4 Supply and control connections", pg. 37).
- ▶ To compensate for the length of the overall combination, briefly release the parking brake on the trailer.
- ▶ Prepare and unlock the semitrailer coupling on the tractor unit.
- ▶ Observe the operating instructions for the tractor unit and the semitrailer coupling.
- ▶ Slowly drive the tractor unit out by approx. 30 cm.
- ▶ Lower the tractor unit's air suspension by 5 - 10 cm.
- ▶ Fully drive the tractor unit out.
- ▶ If necessary, lower the lift axle.
- ✓ The trailer is uncoupled.
- ▶ After uncoupling, set the air suspension of the tractor unit to the driving position.

7.3 Manoeuvring the trailer without a connected compressed air supply

INFO

Manoeuvring without a connected compressed air supply is only permissible in exceptional cases.

To manoeuvre the trailer without a connected compressed air supply, the service brake (see "5.7.1 Service brake", pg. 48) must be released.

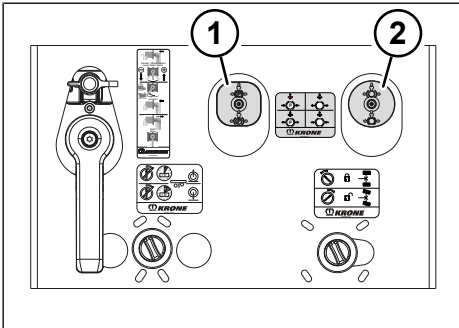


Fig. 7-2: Control unit for brake system

- 1 Red control knob for the parking brake
- 2 Black control knob for the service brake

- ☑ The trailer's compressed air supply is not connected.
- ▶ Press in the black control knob for the service brake.
- ▶ Press in the red control knob for the parking brake (see "5.7.2 Parking brake", pg. 49).
- ▶ The trailer brake is released.
- ✓ The trailer can be manoeuvred.
- ▶ Pull out the black control knob for the service brake again after manoeuvring.
- ▶ Pull out the red control knob for the parking brake.
- ✓ The trailer brake is engaged.

7.4 Parking the trailer safely

⚠ WARNING

Risk of accident due to instability and rolling away!

Unintentional trailer movements can cause serious injury and property damage.

- ▶ Park the trailer on a solid surface to avoid sinking in or tipping.
- ▶ Align the tractor unit and trailer behind each other in a straight line.
- ▶ Secure the trailer against rolling away by applying the parking brake.
- ▶ Use the wheel chocks to prevent the trailer from rolling away.
- ▶ Load and unload the trailer such that traffic hazards are ruled out.
- ▶ Be mindful of the trailer's stability when loading and unloading while uncoupled. If necessary, use additional supports.

INFO

Desired ramp adaptation can be obtained only in coupled (saddled) state, with added compressed air. If rear braces have been factory-fitted to the rear of the trailer, adjust these according to the height of the ramp.

- ▶ Drive the trailer onto firm and level ground.
- ▶ Apply the parking brake (see "5.7.2 Parking brake", pg. 49).
- ▶ Use wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Extend the landing leg winches (see "5.2 Support device", pg. 28).
- ▶ Extend the rear braces, if present (see "5.3 Rear braces", pg. 32).
- ▶ Disconnect the supply and control connections (see "5.4 Supply and control connections", pg. 37).

- ▶ Uncouple the trailer from the tractor unit (see "7.2 Coupling and uncoupling the trailer", pg. 133).
- ▶ For longer parking periods and when loading the ramp while parked, lower the air suspension (see "5.8 Air suspension", pg. 52).
- ✓ The trailer is safety parked.

7.5 Loading the trailer

7.5.1 Loading onto railway wagons

This section will describe the process for **unaccompanied** combined transport (UCT) via handling by crane (grip edges on the trailer).

WARNING

Risk of accident when driving with the rear underrun protection folded up!

Driving with the rear underrun protection folded up is not permitted by law. In a collision, other motorists can drive under the vehicle and be fatally injured.

- ▶ Only drive with the rear underrun protection properly folded down and locked in place.

WARNING

Risk of accident when driving with the side collision protection folded up!

Driving with the side collision protection folded up is not permitted by law. In a collision, other motorists can get below the trailer and be fatally injured.

- ▶ Only drive with the side collision protection folded down and locked in place on both sides.

INFO

After uncoupling the brake lines, close off the coupling heads and the connection sockets for the electrical cables/power to prevent contamination.

Secure the high-voltage device against unauthorised use. Observe the specifications of the system manufacturers.

Connection to external power supply via railway wagon. Observe the specifications of the system manufacturers.

Inspection before loading

- ▶ Ensure that the trailer is in proper and operationally safe condition.
- ▶ Check the crane pockets and their connection.
- ▶ Ensure that the vehicle load is evenly distributed.
- ▶ Observe the braced load limitation on the type plate of the landing leg winches.
- ▶ Ensure that the load is properly secured.
- ▶ Ensure that the coding signs, warning signs, and ILU codes are on the vehicle.

7.5.1.1 Direct loading

Preparing for loading

- ▶ Drive the semitrailer into the area indicated by the terminal operator.
- ▶ Shortly before reaching the parking position, fully vent the trailer using the control device (see "5.8 Air suspension", pg. 52). Do not allow the trailer to have any residual pressure in the air spring bellows.

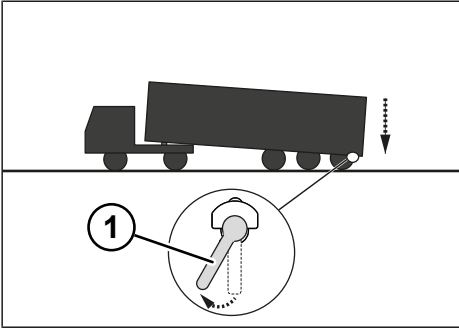


Fig. 7-3: Lowering the trailer

1 Control lever in “Lower the trailer” position

- ▶ Slowly manoeuvre to the parking spot.
- ▶ Apply the parking brake on the control knob (see “5.7.2 Parking brake”, pg. 49).
- ▶ Use the wheel chocks to prevent the trailer from rolling away (see “5.1 Using wheel chocks”, pg. 27).
- ▶ Fold up the rear underrun protection if the underrun protection can be folded up and locked (see “5.13 Rear underrun protection”, pg. 58).
- ▶ If necessary, unlock, fold up, and lock the side collision protection on both sides (see “5.14 Side collision protection”, pg. 60).
- ▶ Hang up all the mud flaps (see “5.12 Mud flap”, pg. 57).
- ▶ On superstructures with travel height adjustment, ensure that the height of the front and rear corner posts and the centre posts are adjusted for railway transport (see “6.5.5 Hydraulic lifting roof”, pg. 126).
- ▶ If necessary, fold up and lock the foldable bracing devices on both sides for rail operation.
- ▶ Wind down the landing leg winch until the trailer is supported (see “5.2 Support device”, pg. 28).
- ▶ Disconnect the supply and control lines and seal them properly.

- ▶ Unhitch the trailer (see “7.2 Coupling and uncoupling the trailer”, pg. 133).
 - ▶ Set the landing leg winch so that the trailer is as horizontal as possible.
 - ▶ Remove the wheel chocks and secure them in their designated parking positions.
 - ▶ Release the parking brake on the control knob shortly before loading at the rail terminal (see “5.7.2 Parking brake”, pg. 49).
- ✓ The handover is prepared.

Loading the trailer onto the pocket wagon

The following activities involve the terminal personnel:

- ▶ Pay attention to the coding sign on the trailer. The pocket wagon must be suitable for the trailer.
 - ▶ If the trailer is slightly raised, fully retract the landing leg winches as needed.
 - ▶ Load the trailer onto the pocket wagon.
 - ▶ Lock the kingpin in the trestle of the pocket wagon.
- ✓ The trailer is loaded onto the pocket wagon.

7.5.1.2 Parking on the terminal parking space

- ▶ Drive the semitrailer into the area indicated by the terminal operator.
- ▶ Shortly before reaching the parking position, fully vent the trailer using the control device (see “5.8 Air suspension”, pg. 52). Do not allow the trailer to have any residual pressure in the air spring bellows.

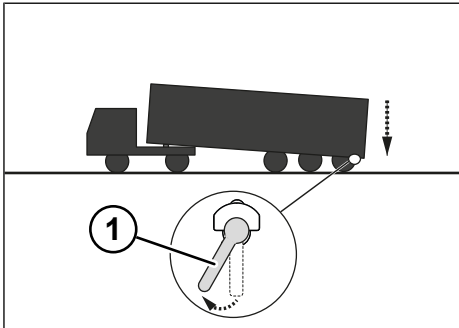


Fig. 7-4: Lowering the trailer

- 1 Control lever in "Lower the trailer" position

- ▶ Slowly manoeuvre to the parking spot.
- ▶ Apply the parking brake on the control knob (see "5.7.2 Parking brake", pg. 49).
- ▶ Use the wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Fold up the rear underrun protection if the underrun protection can be folded up and locked (see "5.13 Rear underrun protection", pg. 58).
- ▶ If necessary, unlock, fold up, and lock the side collision protection on both sides (see "5.14 Side collision protection", pg. 60).
- ▶ Hang up all the mud flaps (see "5.12 Mud flap", pg. 57).
- ▶ On superstructures with travel height adjustment, ensure that the height of the front and rear corner posts and the centre posts are adjusted for railway transport (see "6.5.5 Hydraulic lifting roof", pg. 126).
- ▶ If necessary, fold up and lock the foldable bracing devices on both sides for rail operation.
- ▶ Wind down the landing leg winch until the trailer is supported (see "5.2 Support device", pg. 28).
- ▶ Disconnect the supply and control lines and seal them properly (see "5.4 Supply and control connections", pg. 37).

- ▶ Uncouple the trailer (see "7.2 Coupling and uncoupling the trailer", pg. 133).
- ▶ Set the landing leg winch so that the trailer is as horizontal as possible.
- ✓ The trailer is in the parking position and is prepared for subsequent loading onto a pocket wagon.

Loading the trailer onto the pocket wagon

The following activities involve the terminal personnel:

- ▶ Remove the wheel chocks and secure them in their designated parking positions (see "5.1 Using wheel chocks", pg. 27).
- ▶ Release the parking brake on the control knob (see "5.7.2 Parking brake", pg. 49).
- ▶ Bring the trailer to the loading site using a terminal tractor unit.
- ▶ Uncouple the trailer (see "7.2 Coupling and uncoupling the trailer", pg. 133).
- ▶ Pay attention to the coding sign on the trailer. The pocket wagon must be suitable for the trailer.
- ▶ If the trailer is slightly raised, fully retract the landing leg winches as needed (see "5.2 Support device", pg. 28).
- ▶ Load the trailer onto the pocket wagon.
- ▶ Lock the kingpin in the trestle of the pocket wagon.
- ✓ The trailer is loaded onto the pocket wagon.

7.5.1.3 Handover after unloading the pocket wagon

- ▶ Apply the parking brake on the control knob (see "5.7.2 Parking brake", pg. 49).
- ▶ Use the wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Put the air suspension's control lever in the driving position (see "5.8 Air suspension", pg. 52).

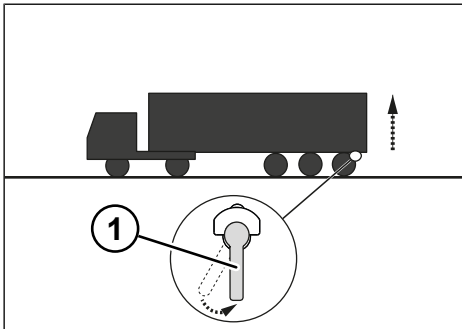


Fig. 7-5: Place the trailer in the driving position

1 Control lever in the "driving position"

- ▶ Wind down the landing leg winch until the trailer can be coupled (see "5.2 Support device", pg. 28).
 - ▶ Drive the semitrailer tractor up close to the trailer.
 - ▶ Ensure that the front edge of the trailer (deflection horn) is adjusted approx. to the height of the semitrailer coupling of the semitrailer tractor (approx. 5 cm below the centre of the slide-on plate).
 - ▶ Adjust the distance as needed using the landing leg winch.
 - ▶ Couple the semitrailer (see "7.2 Coupling and uncoupling the trailer", pg. 133).
 - ▶ Connect the supply and control lines (see "5.4 Supply and control connections", pg. 37).
 - ▶ Fully retract the landing leg winch again for road use.
 - ▶ Release the parking brake on the control knob.
 - ▶ Remove the wheel chocks and secure them in their designated parking positions.
 - ▶ Unlock, fold down, and lock the under-run protection (see "5.13 Rear underrun protection", pg. 58).
 - ▶ If necessary, unlock, fold down and re-lock the side collision protection (see "5.14 Side collision protection", pg. 60).
- ▶ Hang down all the mud flaps.
 - ▶ Remove any wrinkles in the bellows by repeatedly lifting and lowering the trailer.
 - ▶ Check if the trailer is in operationally safe condition and has not suffered any damage due to railway transport.
 - ✓ The trailer is ready for road use.

7.5.2 Loading onto ships

This section will describe the process for **unaccompanied** transport in ferry operations.

Inspection before loading

- ▶ Ensure that the trailer is in proper and operationally safe condition.
- ▶ Check the ferry rings and their connection.
- ▶ Ensure that the vehicle load is evenly distributed.
- ▶ Observe the braced load limitation on the type plate of the parking braces.
- ▶ Ensure that the load is properly secured.
- ▶ Ensure that the warning signs for ferry operations are on the vehicle.

Before loading

- ▶ Drive the trailer into the area indicated by the terminal operator.
- ▶ Shortly before reaching the parking position, fully vent the trailer using the control device (see "5.8 Air suspension", pg. 52). Do not allow the trailer to have any residual pressure in the air spring bellows.
- ▶ Slowly manoeuvre to the parking spot.
- ▶ Fold up the rear underrun protection if the underrun protection can be folded up and locked or hung up with a chain (see "5.13 Rear underrun protection", pg. 58).

- ▶ If necessary, unlock, fold up, and lock the side collision protection on both sides (see "5.14 Side collision protection", pg. 60).
- ▶ If necessary, fold up and lock the foldable bracing devices on both sides.
- ▶ Wind down the landing leg winch until the trailer is supported (see "5.2 Support device", pg. 28).
- ▶ Disconnect the supply and control lines and seal them properly (see "5.4 Supply and control connections", pg. 37).
- ▶ Uncouple the trailer (see "7.2 Coupling and uncoupling the trailer", pg. 133).
- ▶ Apply the parking brake on the control knob (see "5.7.2 Parking brake", pg. 49).
- ▶ Use the wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ✓ The trailer is ready to be loaded onto the ferry.

Driving the trailer onto the ferry

The following activities involve the port personnel:

- ▶ Remove the wheel chocks and secure them in their designated parking positions (see "5.1 Using wheel chocks", pg. 27).
- ▶ Couple the trailer with the port tractor unit (see "7.2 Coupling and uncoupling the trailer", pg. 133).
- ▶ Release the parking brake on the control knob (see "5.7.2 Parking brake", pg. 49).

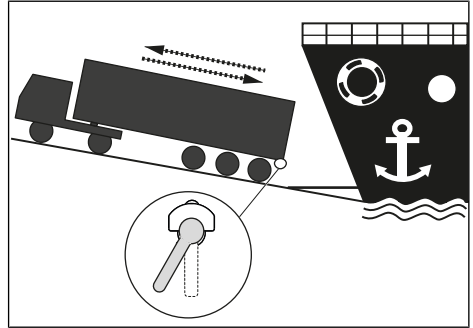


Fig. 7-6: Driving the trailer onto the ferry

- ▶ Connect the supply and control lines (see "5.4 Supply and control connections", pg. 37).
- ▶ If necessary, secure the high-voltage device against unauthorised use. Observe the specifications of the system manufacturers.
- ▶ If necessary, connection to external power supply. Observe the specifications of the system manufacturers.
- ▶ Drive the trailer to its designated parking space on the ferry.
- ▶ Slide a trestle behind the king pin (observe the marking on the trailer).
- ▶ Lower the trailer onto the trestle and unhitch.
- ▶ Disconnect the supply and control lines and seal them properly.
- ▶ Ensure that the trailer is completely vented. Vent, if necessary.
- ▶ Wedge the trailer on the rear axle.
- ▶ Apply the parking brake on the control knob.

⚠ WARNING

Risk of accident due to improperly lashing the trailer!

Improper lashing can cause the trailer to break free from the ship, cause accidents, and injure people.

- ▶ Fully lower the trailer using the air suspension's control device before lashing.

- ▶ Lash the trailer onto the ship's deck via the four pairs of ferry rings with lashing chains and tensioning elements.
- ✓ The trailer is loaded onto the ferry.

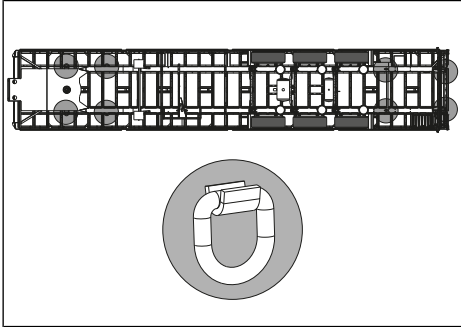


Fig. 7-7: Arrangement of the ferry rings

Driving the trailer off the ferry

The following activities involve the port personnel:

- ▶ Release and remove the lashing on the four pairs of ferry rings.
- ▶ Couple the trailer with the port tractor unit (see "7.2 Coupling and uncoupling the trailer", pg. 133).
- ▶ Connect the supply and control lines (see "5.4 Supply and control connections", pg. 37).
- ▶ Lift the trailer by the kingpin and remove the trestle.
- ▶ Remove the wedging on the rear axle.
- ▶ Release the parking brake on the control knob (see "5.7.2 Parking brake", pg. 49).
- ▶ Drive the trailer from the ferry to the parking space on the port.

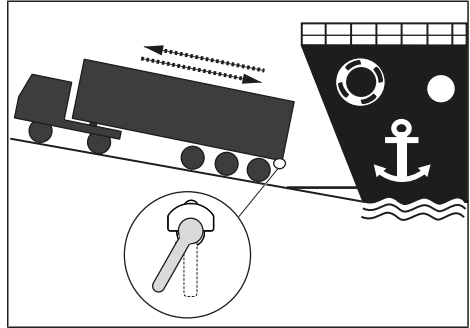


Fig. 7-8: Driving the trailer off the ferry

- ▶ Disconnect the supply and control lines and seal them properly.
- ▶ Uncouple the trailer.
- ▶ Apply the parking brake on the control knob.
- ▶ Use the wheel chocks to prevent the semitrailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ✓ The trailer is parked in the parking space.

Picking up the trailer from the parking space

- ▶ Remove the wheel chocks and secure them in their designated parking positions (see "5.1 Using wheel chocks", pg. 27).
- ▶ Wind down the landing leg winch until the trailer can be coupled (see "5.2 Support device", pg. 28).
- ▶ Put the air spring valve's control lever in the driving position (see "5.8 Air suspension", pg. 52).

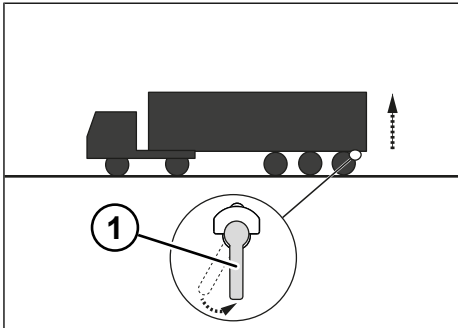


Fig. 7-9: Place the trailer in the driving position

1 Control lever in the “driving position”

- ▶ Couple the trailer (see “7.2 Coupling and uncoupling the trailer”, pg. 133).
 - ▶ Connect the supply and control lines (see “5.4 Supply and control connections”, pg. 37).
 - ▶ Fully retract the landing leg winch again for road use.
 - ▶ Remove any wrinkles in the bellows by repeatedly lifting and lowering the trailer.
 - ▶ Unlock, fold down, and lock the under-run protection (see “5.13 Rear underrun protection”, pg. 58).
 - ▶ If necessary, unlock, fold down and relock the side collision protection (see “5.14 Side collision protection”, pg. 60).
 - ▶ Hang down the mud flaps, if necessary (see “5.12 Mud flap”, pg. 57).
 - ▶ Check if the semitrailer is in operationally safe condition and has not suffered any damage due to ferry transport.
- ✓ The trailer is ready for road use.

7.6 Driving with open doors

Driving with open doors can be necessary in exceptional cases.

- ▶ Additionally secure open doors to prevent them from moving uncontrollably (tension strap).

- ▶ Mark excessive lengths at the rear of the vehicle.
- ▶ Stabilise the superstructure with cross-bracing (max. 20 dN).

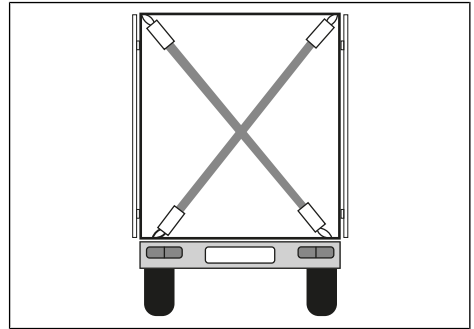


Fig. 7-10: Cross-bracing of the rear gantry
The opened doors give the trailer an excess width. Load-securing certificates become invalid.

8 Loading and securing

⚠ WARNING

Risk of accident due to instability and rolling away!

Unintentional trailer movements can cause serious injury and property damage.

- ▶ Park the trailer on a solid surface to avoid sinking in or tipping.
- ▶ Align the tractor unit and trailer behind each other in a straight line.
- ▶ Secure the trailer against rolling away by applying the parking brake.
- ▶ Use the wheel chocks to prevent the trailer from rolling away.
- ▶ Load and unload the trailer such that traffic hazards are ruled out.
- ▶ Be mindful of the trailer's stability when loading and unloading while uncoupled. If necessary, use additional supports.

⚠ WARNING

Risk of accident due to overloaded trailer!

Driving with an overloaded trailer can result in serious accidents with personal injury and material damage to the tractor and the trailer.

- ▶ Evenly distribute the load.
- ▶ Observe the legally permitted values for the total weight as well as axle and fifth-wheel loads.
- ▶ Observe the trailer's maximum permitted axle loads. In case of doubt, have the axle loads checked at a suitable weighing station.
- ▶ Comply with current national and international regulations on load 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.

- ▶ Evenly load and unload the trailer. The centre of gravity must lie on the trailer's longitudinal centre line.
- ▶ Distribute the load as low as possible on the load compartment floor.
- ▶ Observe the permissible total weight, permissible axle and fifth-wheel loads along with the maximum height.
- ▶ Ensure that the cargo can withstand the loads from stacking, transport, and the load securing system.

⚠ WARNING

Risk of accident caused by sliding and tipping loads!

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

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

⚠ CAUTION

Risk of accident due to improper securing of the load!

Improper securing of the load can result in accidents with personal injury and material damage.

- ▶ Secure the load with lashing material.
- ▶ Do not nail the cargo to the load compartment.

NOTE**Material damage due to trailer rebound during unloading!**

When the trailer is unloaded, the suspension decompresses. As a result, headroom heights may then be insufficient.

- ▶ When unloading trailers in underpasses or in factory halls, observe the headroom.

NOTE**Material damage when loading and unloading with forklifts!**

Loading and unloading with a forklift can exceed the bearing capacity of the load compartment floor and result in material damage.

- ▶ Observe the permissible working load limit of the load compartment floor.
- ▶ Observe the permissible inner dimensions of the load compartment with a loaded forklift.

NOTE**Material damage to floor due to improper loading!**

On trailers with an anti-slip coating (Trailer Safety Floor), loads sliding across the floor can cause material damage due to excess wear.

- ▶ Do not slide the load across the floor.
- ▶ Lift the load to move it.

INFO

The axle loads can vary due to the various loading conditions of the trailer. Information on the permitted axle loads can be obtained either from the type plate or the vehicle documents.

INFO

Keep the inspection booklet in the vehicle as proof of the validity of the load securing certificate. The inspection booklet serves as proof of the trailer's maintenance condition and can be downloaded from the download section at www.krone-trailer.com.

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.

For loading and unloading, the trailer must be

- coupled and secured, or
- uncoupled and supported.

8.1 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.

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

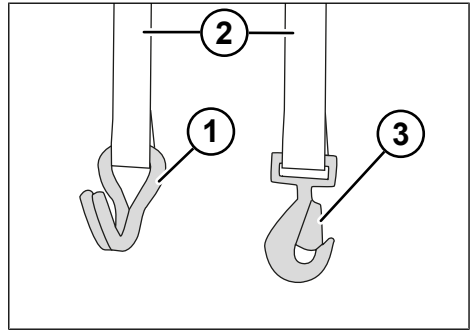


Fig. 8-1: Lashing material

- 1 Wire hook
- 2 Lashing belts
- 3 Load hook

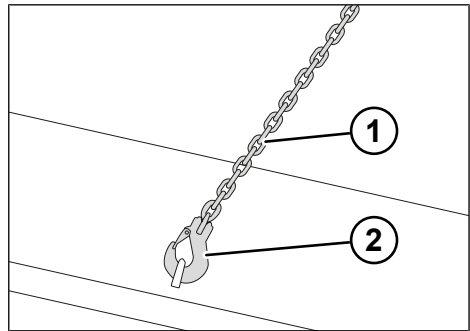


Fig. 8-2: Lashing chain with load hook

- 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.

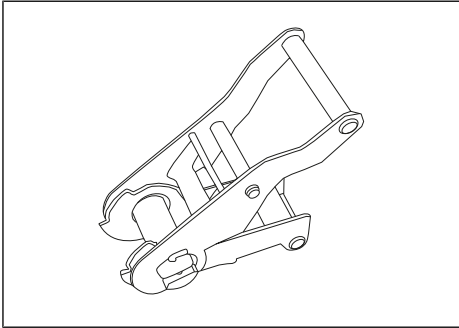


Fig. 8-3: Strap ratchet

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.

8.2 Lashing strap winch

There can be optional fixed lashing belts below the superstructure, which are tensioned with the ratchet winch.

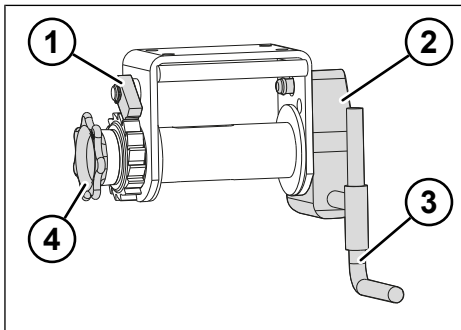


Fig. 8-4: Lashing strap winch with shaft-mounted gear unit

- 1 Locking lever
- 2 Shaft-mounted gear unit
- 3 Crank

Tensioning the lashing belt

- ▶ Remove the shaft-mounted gear unit from the storage box (see "5.19.3 Plug-in post storage box", pg. 72).
- ▶ Insert the shaft-mounted gear unit into the lashing strap winch.
- ▶ Fold the locking lever on the lashing strap winch towards the rear.
- ▶ Roll out the lashing belt.
- ▶ Place the lashing belt over the load to be secured.
- ▶ Thread and insert the lashing belt into the lashing belt bracket on the other side of the vehicle.
- ▶ Fold the locking lever on the lashing strap winch towards the front.
- ▶ Tension the lashing belts with the crank.
- ✓ The lashing belts are tensioned.
- ✓ Remove the shaft-mounted gear unit from the lashing strap winch prior to departure and store it in the (see "5.19.3 Plug-in post storage box", pg. 72) storage box.

Releasing the lashing belt

- ▶ Fold the locking lever on the lashing strap winch towards the rear.
- ▶ Unthread and remove the lashing belt from the lashing belt bracket on the other side of the vehicle.
- ▶ Remove the lashing belt from the load.
- ▶ Roll up the lashing belt.
- ▶ Fold the locking lever on the lashing strap winch towards the front.
- ✓ The lashing belt is released.

8.3 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.
- ▶ Secure the roller carriage against movement with its own brakes or other suitable measures.

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.

Furthermore, the load can be supported by pallet stop edges, locking beams (see "8.10.8 Beam system", pg. 153) or partition walls (see "8.10.10 Load compartment partition", pg. 157). Partition wall locks can help create a positive-locking fit with the outside of the vehicle.

8.4 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 "8.1 Lashing material", pg. 145).

8.5 Load securing rail

KRONE trailers can be equipped with load securing rails.

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

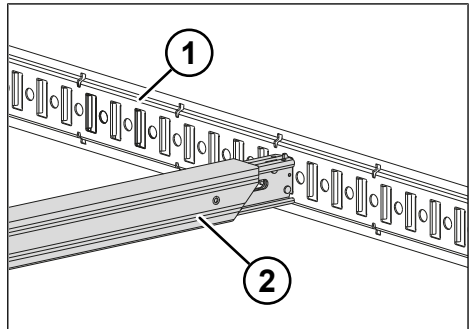


Fig. 8-5: Load securing rails with locking bars

- 1 Load securing rail
- 2 Locking bars

8.6 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 "8.5 Load securing rail", pg. 148).

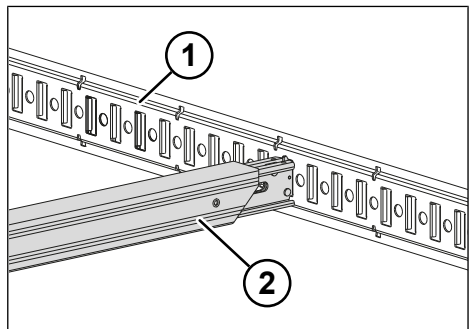


Fig. 8-6: Locking bars

- 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.

8.7 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.

KRONE trailers with board walls are equipped with anchor rails for load securing as an option.

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 "8.5 Load securing rail", pg. 148).

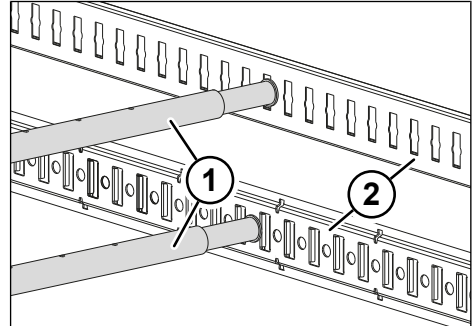
Combination lashing rail

Fig. 8-7: 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.

8.8 Retainer chains on centre posts/board walls

KRONE trailers have tension chains as an option, which are used to ease the pressure on the centre posts and board walls and to counter increased load pressure.

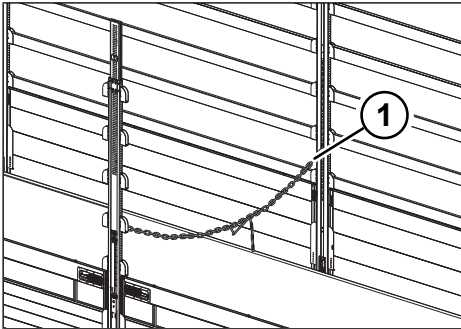


Fig. 8-8: Tension chain on the centre post

1 Tension chains with tension lever

Tension is achieved via two chain halves fastened on two posts facing each other, and being connected and tensioned in the centre of the vehicle.

The tension chains are handled in the same way for centre posts and board walls.

Connecting the tension chains

- ▶ Insert the ends of the tension chains with the fastening link in the brackets on the posts.
- ▶ Insert the tension lever of one chain through a chain link of the other chain.
- ▶ Hook the tension lever onto the fastening chain link.
- ▶ Fold and secure the tension lever.
- ✓ The tension chains have been tied and tensioned.

Releasing the tension chains

- ▶ Unhook the tension lever from the fastening link.

- ▶ Separate both tension chains from each other.
- ✓ The tension chains have been released.

8.9 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.

8.10 KRONE load securing systems

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

8.10.1 Outer frame

KRONE semitrailers are equipped with a Multi Lock outer frame with universal load securing possibilities. The lashing holes are distributed along the whole length of the vehicle at 100-mm intervals. The Multi Lock outer frame contains over 130 lashing holes on each side of the vehicle and can support loads of 2,000 daN (~kg) per lashing hole, with a maximum total load of 8,000 daN (~kg) over a length of 1,000 mm.

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

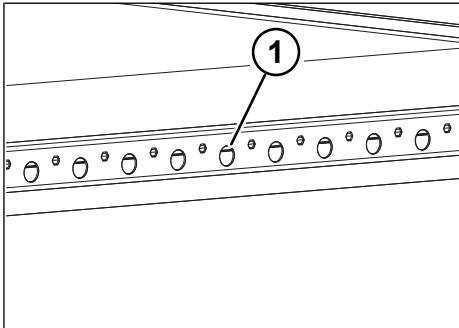


Fig. 8-9: Multi Lock outer frame

- 1 Lashing hole

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

8.10.2 Lashing rings

KRONE vehicles can be equipped with Multi Lash lashing rings. The pivoting lashing rings allow a tension strap to be attached above the exterior frame and thus, even extremely flat loads can be secured.

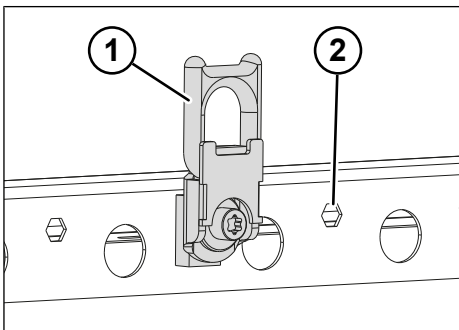


Fig. 8-10: Multi Lash with Multi Lock outer frame

- 1 Multi Lash lashing ring
- 2 Hole

The Multi Lash lashing rings can be flexibly screwed into the existing holes in the Multi Lock outer frame (see "8.10.1 Outer frame", pg. 150). Multi Lash can support loads up to 2,000 daN.

8.10.3 Chain adapter

KRONE vehicles can be equipped with Multi Flex chain adapters. The chain adapter enables the use of many different hook shapes on the lashing belts and lashing chains.

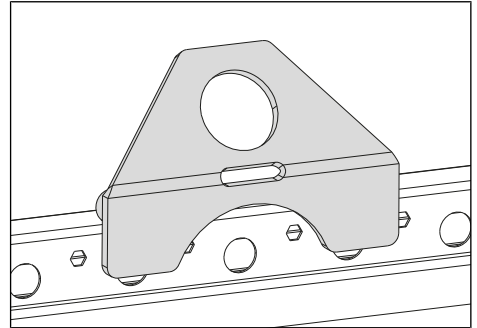


Fig. 8-11: Multi Flex chain adapter on the Multi Lock outer frame

The Multi Flex chain adapter is locked with two hooks on the Multi Lock outer frame (see "8.10.1 Outer frame", pg. 150). It can sustain loads up to 4,000 daN.

Inserting the Multi Flex chain adapter

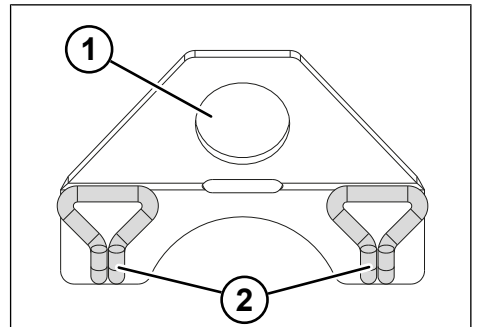


Fig. 8-12: Multi Flex chain adapter

- 1 Hook mount
- 2 Hook for Multi Flex chain adapter

- ▶ Attach the hook for the Multi Flex chain adapter to the lashing holes on the Multi Lock outer frame.

- ▶ Attach the lashing belt hook to the hook mount of the Multi Flex chain adapter.
- ✓ The Multi Flex chain adapter has been inserted.

8.10.4 Flat chain adapter

KRONE vehicles can be equipped with Multi Flex Flat chain adapters. The chain adapter for flat lashing allows the tension straps to be attached above the Multi Lock outer frame (see "8.10.1 Outer frame", pg. 150) and therefore allows you to secure extremely flat loads, e.g. heavy packages of sheet metal.

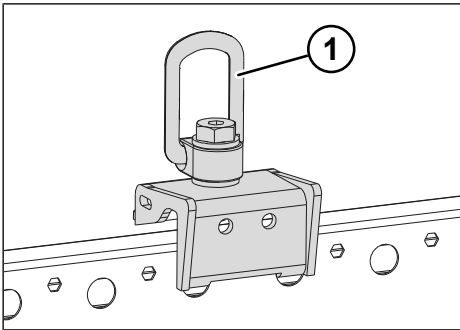


Fig. 8-13: Multi Flex Flat chain adapter

- 1 Lashing eyelet

The Multi Flex Flat chain adapter is locked onto the Multi Lock outer frame. It can sustain loads up to 4,000 daN.

Inserting the Multi Flex Flat chain adapter

- ▶ Lock the Multi Flex Flat chain adapter onto the Multi Lock outer frame.
- ▶ Hook the lashing belt onto the lashing eyelet of the Multi Flex Flat chain adapter.
- ✓ The Multi Flex Flat chain adapter has been inserted.

8.10.5 Fixed stop

KRONE vehicles can be equipped with the Multi Belt fixed stop load securing system. The Multi Belt system consists of a tension

strap that is fixed to the Multi Lock outer frame (see "8.10.1 Outer frame", pg. 150) and equipped with an additional wire hook.

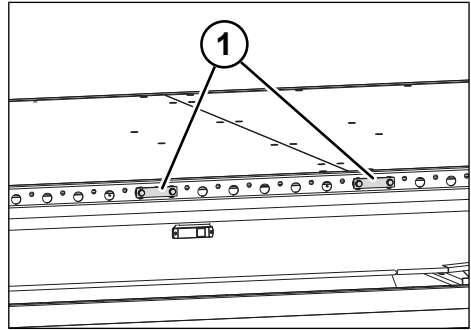


Fig. 8-14: Multi Belt fixed stop on the Multi Lock outer frame

- 1 Fixed stops for tension straps

8.10.6 Pallet stop

KRONE vehicles can be equipped with the Multi Screw load securing system. The Multi Screw pallet stop elements are screwed to the Multi Lock outer frame.

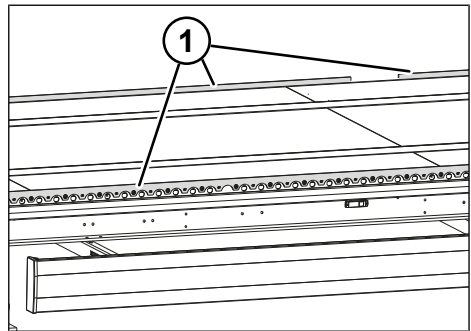


Fig. 8-15: Multi Screw on Multi Lock outer frame

- 1 Pallet stop elements

8.10.7 Lashing rail

The Multi Rail lashing rail is integrated into the centre of the floor of building material trailers and runs continuously over the entire length of the trailer.

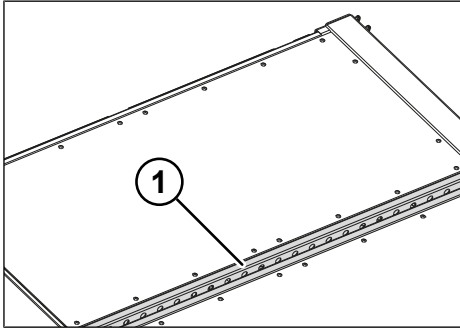


Fig. 8-16: Multi Rail lashing rail

- 1 Multi Rail lashing rail

The lashing rail has two lashing points every 100 mm, each with 2,000 daN lashing load. The load may not exceed 8,000 daN in total across a length of 1,000 mm.

8.10.8 Beam system

KRONE vehicles 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.

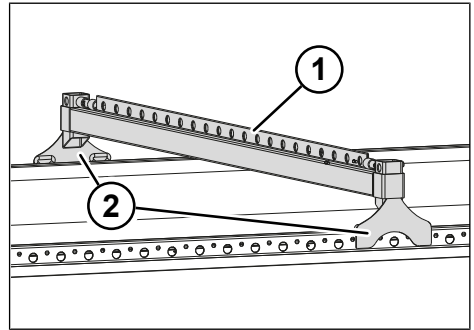


Fig. 8-17: Multi Block beam

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

The Multi Block beams are stored under the superstructure in the brackets provided for this purpose (see "5.18.3 Multi-Block holder", pg. 70). The plug-in brackets are stored in the tool box (see "5.19.1 Tool box", pg. 71).

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 "8.10.1 Outer frame", pg. 150).

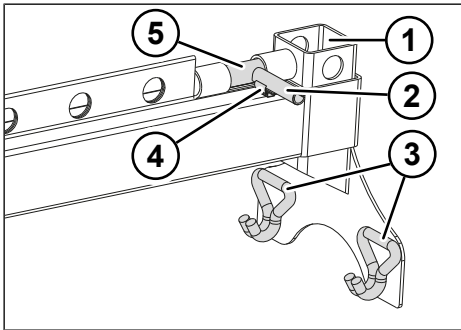
Locking position

Fig. 8-18: 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 "8.10.1 Outer frame", pg. 150).
- ▶ Insert the second plug-in bracket in the same hole position on the other side of the vehicle.

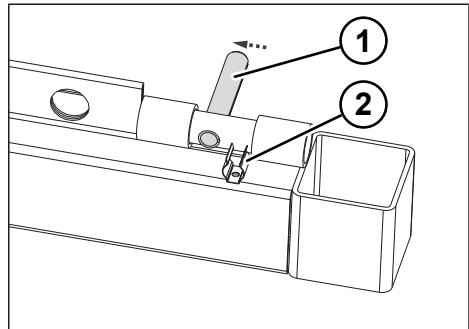


Fig. 8-19: Pulling out the locking lever

- 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.

Multi Block Paper

Loaded paper rolls can be fastened horizontally with Multi Block Paper (see "8.14 Transporting paper", pg. 171).

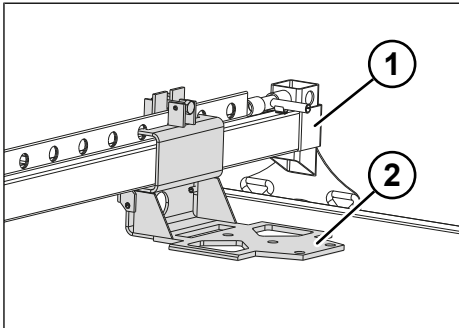


Fig. 8-20: Multi Block Paper system

- 1 Multi Block beams
- 2 Paper wedge receptacle

- ▶ Lock the paper wedge in the paper wedge holder.
- ▶ Fasten the paper wedge holder to the Multi Block beam.
- ▶ Fasten the Multi Block system to the Multilock external frame.
- ▶ Tighten the bolts on the paper wedge.
- ✓ The Multi Block Paper system is installed.

8.10.9 Footing beam system

KRONE vehicles can be equipped with the Multi Fix load securing system. The Multi Fix system secures pipes, round steels, or sheets with a load weight up to 25 t. The Multi Fix system consists of footing beams, sliding shoes, support beams, and one or two safety nets. The footing beam is split into two parts and is attached during installation. The footing beams can be variably fastened to the Multi Lock outer frame (see "8.10.1 Outer frame", pg. 150). The foot-

ing beams either have a lock lever or a screw for securing the system to the vehicle floor.

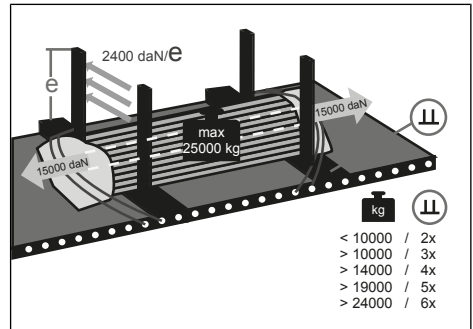


Fig. 8-21: Multi Fix system

Installing the Multi Fix system

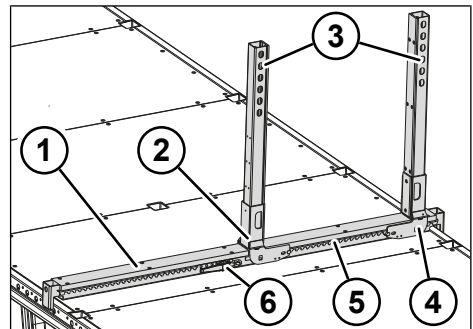


Fig. 8-22: Installing the Multi Fix system

- 1 Footing beam with lock lever
- 2 Sliding shoe
- 3 Support beam
- 4 Sliding shoe
- 5 Footing beam without lock lever
- 6 Lock lever on footing beam

- ▶ Hook the footing beam without lock lever onto the lashing holes on the Multi Lock outer frame (see "8.10.1 Outer frame", pg. 150).

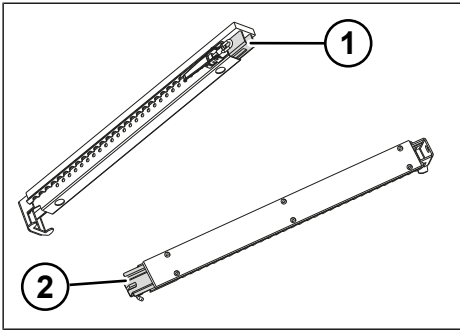


Fig. 8-23: Multi Fix footing beam

- 1 Connection profile on footing beam with lock lever
- 2 Connection profile on footing beam

- ▶ Attach the footing beam with the lock lever to the lashing holes on the opposite side on the Multi Lock outer frame (see "8.10.1 Outer frame", pg. 150).

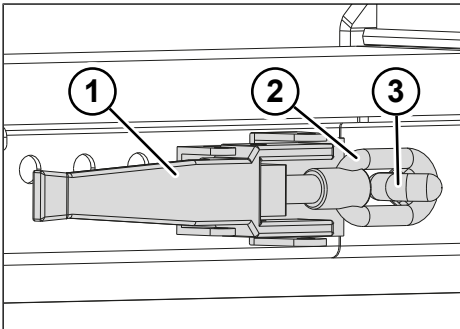


Fig. 8-24: Lock lever secured on the footing beam

- 1 Lock lever
- 2 Eyelet on lock lever
- 3 Hook on footing beam without lock lever

- ▶ Open the lock lever.
- ▶ Assemble the connection profiles.
- ▶ Attach the hook on the lock lever to the hook on the footing beam without lock lever.
- ▶ Close the lock lever.

- ▶ Place the sliding shoes on the footing beam in the required position and allow them to engage.

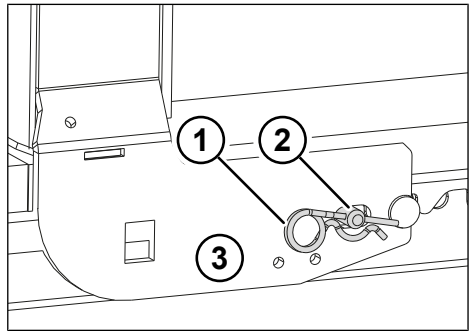


Fig. 8-25: Sliding shoe secured with plug-in bolt and spring cotter pin

- 1 Spring cotter pin
- 2 Plug-in bolt
- 3 Sliding shoe

- ▶ Insert the plug-in bolt into the hole.
- ▶ Secure the plug-in bolt with a spring cotter pin.
- ▶ Insert the support beam vertically into the sliding shoes.
- ✓ The Multi Fix system has been inserted.

Securing steel pipes with the Multi Fix system

- ▶ Position the steel pipes on the footing beam between the vertical support beams (see "Fig. 8-21: Multi Fix system", pg. 155).
- ▶ Install the safety net at the ends of the steel pipe (see "Fig. 8-21: Multi Fix system", pg. 155).
- ▶ Pull the tension straps through the eyelets of the safety nets.
- ▶ Hook the tension straps onto the Multi Lock outer frame.
- ▶ Lash the tension straps.
- ✓ The steel pipes are secured.

8.10.10 Load compartment partition

KRONE vehicles 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. The Multi Wall system can support a surface load of up to 8,000 daN.

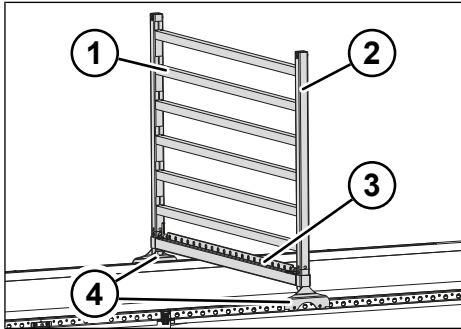


Fig. 8-26: Multi Wall

- 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 "8.10.1 Outer frame", pg. 150).

Inserting the Multi Wall system

- ▶ Insert the Multi Block system (see "8.10.8 Beam system", pg. 153).
- ▶ Remove the Multi Wall supports and the Multi Wall transverse beam from the storage box (see "5.19.3 Plug-in post storage box", pg. 72).

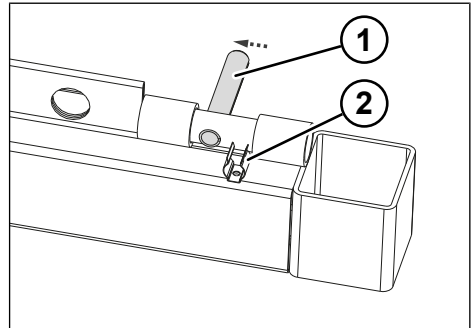


Fig. 8-27: Pulling out the locking lever

- 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.

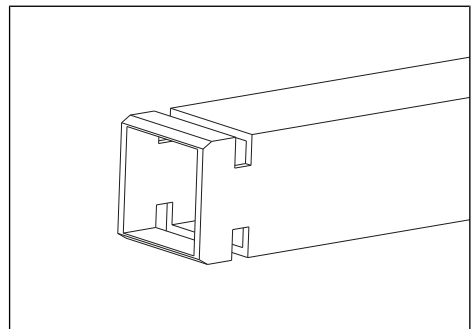


Fig. 8-28: Recesses on the Multi Wall transverse beam

- ▶ 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 "8.10.8 Beam system", pg. 153).
- ✓ The Multi Wall system is removed.

8.10.11 Tension belt system

INFO

Before loading the vehicle from above, unhook the tension straps from the respective lashing eyelets and slide forward all belt lifting units before opening the roof. Before the tension straps can be slid into the desired position again, the roof must be closed.

KRONE vehicles can be equipped with the Multi Strap load securing system. Multi Strap is a tension strap system that can be slid across the entire load length of the vehicle.

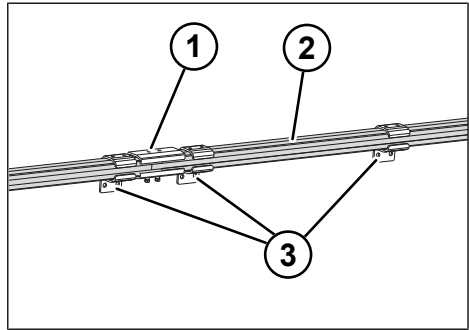


Fig. 8-29: Multi Strap sliding rail

- 1 Connecting sleeve
- 2 Multi Strap sliding rail
- 3 Bracket with fastening link

The bogie trucks are used on sliding rails that are attached in the vehicle's roof girder profile area.

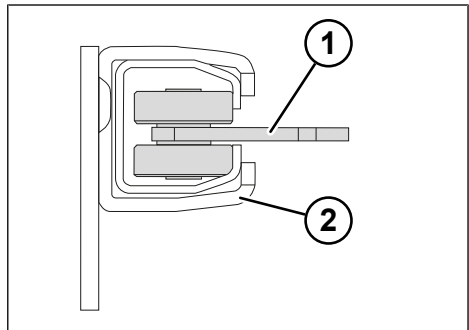


Fig. 8-30: Multi Strap sliding rail with bogie truck

- 1 Multi Strap bogie truck
- 2 Multi Strap sliding rail

The tension straps held by the bogie truck are pulled to the required position by a traction device. The position and number of belt lifting units depends on the position and number of lashing eyelets on the vehicle floor. Unneeded tension straps are attached to the front wall in the parking position.

Performing a functional check

- ▶ Attach the load securing tension straps to the corresponding lashing eyelets on the vehicle.
- ▶ Tighten the tension straps with the ratchet until the Multi Strap system has stretched.
- ▶ Fully release the Multi Strap system again.
- ✓ The Multi Strap system pulls the inserted tension straps back into the standby position below the roof of the vehicle.
- ✓ The functional check has been performed.

Tensioning the Multi Strap system

- ☑ The tension straps are located above the load to be secured.
- ▶ Pull down the tension straps and thread them into the ratchet elements.
 - ⇒ The Multi Strap system is stretched.
- ▶ Attach the ratchet elements to the lashing eyelets on the vehicle.
- ▶ Lash the tension straps according to the load.
- ▶ Tighten the tension straps with the ratchet.
- ✓ The Multi Strap system is tensioned.

Releasing the Multi Strap system

- ▶ Release the tension straps with the ratchet.
 - ⇒ The Multi Strap system pulls the inserted tension straps back into the standby position below the roof of the vehicle.
- ▶ Slowly guide the tension straps back upwards.
- ✓ The Multi Strap system is released.

8.10.12 Cable drum system

⚠ WARNING

Risk of accident due to improper transport of cable drums!

Improper loading and securing can cause cable drums to tip over during loading and transport. This can result in material damage and personal injury.

- ▶ Use a suitable load securing system to transport the cable drums.
- ▶ Follow the general information on transporting cable drums.

KRONE Paper Liners can be equipped with the Multi Reel load securing system. The Multi Reel system is used to secure cable drums (weighing up to 17 t).

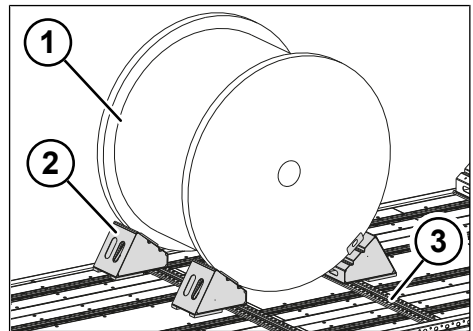


Fig. 8-31: Multi Reel system with cable drum

- 1 Cable drum
- 2 Multi Reel wedge
- 3 Multi Reel perforated rail

General information on transporting cable drums:

- Cable drums can be loaded vertically and horizontally. When loaded vertically, the cable drums can be loaded both with the rolling direction in the direction of travel and across the direction of travel.
- Secure the cable drums using the appropriate securing equipment. Additionally lash the cable drums.

- If several cable drums are loaded in series in a form-fitting manner alongside or behind one another, then only the outer cable drums need to be secured. Be mindful of the total weight for each cable drum.
- Secure vertical cable drums using wedges and/or wooden bases. Secure cable drums up to 5 t in weight with wooden fixings and wedges. Use additional wooden bases for greater weights (over 5 t).

Inserting the Multi Reel system

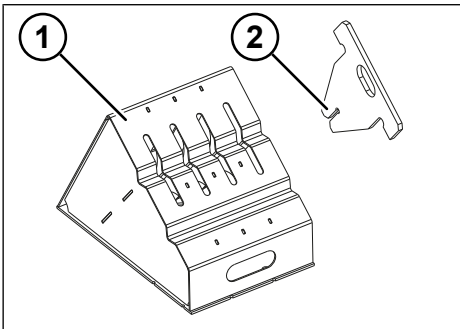


Fig. 8-32: Multi Reel wedge and stop

- 1 Multi Reel wedge
- 2 Multi Reel stop for laterally guiding the cable drum

- ▶ Connect the Multi Reel perforated rail to the existing perforated rail.
- ▶ Insert the Multi Reel stops in the required position in the wedges.
- ▶ Hook four wedges lengthways or crossways (as needed) into the perforated rails.
- ▶ Place the cable drum on the wedges.
- ▶ Lash the cable drum using the appropriate lashing material (see "8.1 Lashing material", pg. 145).
- ✓ The cable drum is loaded and secured.
- ✓ The Multi Reel system has been inserted.

8.10.13 Steel mat system

The Multi Steel versions of KRONE vehicles secure reinforcement mats, lattice girders, and 2D/3D elements in a form-fitting fashion. The Profi Liner Multi Steel is available as a plateau or board wall version.

Steel mat packages that are 5 or 6 m in length and have a maximum weight of 25 t can be transported with the Profi Liner Multi Steel.

The Multi Steel system consists of variably positionable plug-in posts with an integrated lashing belt guide and six tensioning devices for wire ropes and tension straps.

Two plug-in posts supported toward the front are used as a stop for the load. Removable post sockets with plug-in posts are used as a side limitation. Post sockets for plug-in posts are available in the middle of the chassis and at the vehicle end for rearward securing.

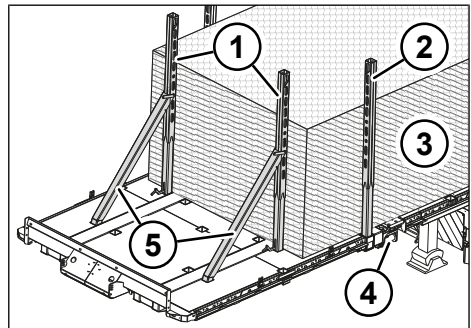


Fig. 8-33: Multi Steel system with steel mat loading

- 1 Plug-in posts with foot lever
- 2 Lateral plug-in post in extendible post socket
- 3 Steel mats
- 4 Tensioning device with lashing ring
- 5 Support struts

Reinforced lashing holes and Multi Lash lashing rings for lashing the load are available in the side rails of the vehicle.

For loads with excess width, 3000 daN lashing hooks below the outer frame and 5000 daN 180° lashing rings integrated in the tensioning device can be used.

Securing the steel mat packages with the Multi Steel system

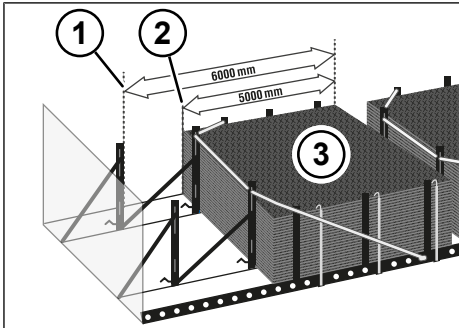


Fig. 8-34: Positioning the plug-in posts

- 1 Front plug-in position (steel mats 6 m in length)
 - 2 Rear plug-in position (steel mats 5 m in length)
 - 3 Steel mats
- ▶ Depending on the loading situation, insert the plug-in posts with foot lever in the post sockets in the front area of the vehicle in the front position (steel mats 6 m in length) or in the rear position (steel mats 5 m in length).
 - ▶ Insert the support strut into the post socket.

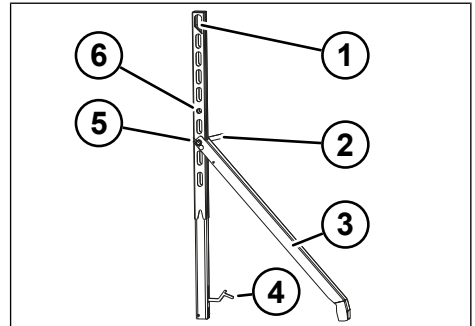


Fig. 8-35: Plug-in post with support strut

- 1 Integrated lashing belt guide
 - 2 Bolt (secured with spring cotter pin)
 - 3 Support strut
 - 4 Foot lever
 - 5 Lower hole (steel mats 5 m in length)
 - 6 Upper hole (steel mats 6 m in length)
- ▶ Depending on the load situation, insert the support brace into the lower hole (steel mats 5 m in length) or into the upper hole (steel mats 6 m in length) of the plug-in post and secure with the bolt.
 - ▶ Press down the foot lever to secure the plug-in post.
 - ▶ Unlock the extendible post sockets on the lever and slide them in the required position (depending on the package size).
 - ▶ Load the front steel mat package. Use the front plug-in posts as a stop.

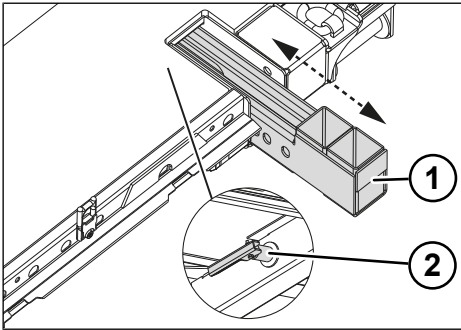


Fig. 8-36: Extending the post sockets

- 1 Extendible post socket
- 2 Lever

- ▶ Insert the lateral plug-in posts into the extendible post sockets.
- ▶ If necessary, unlock the extendible post sockets and slide them up to the steel mat package using the plug-in posts.
- ▶ Lock the extendible post sockets with the lever.
- ▶ Insert the plug-in posts into the post sockets behind the steel mats.

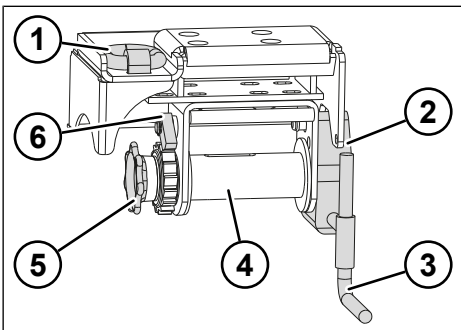


Fig. 8-37: Tensioning device

- 1 Lashing ring
- 2 Shaft-mounted gear unit
- 3 Crank
- 4 Lashing winch
- 5 Hand wheel
- 6 Locking lever

- ▶ Fold the locking lever on the lashing winch towards the rear.
- ▶ Roll up the lashing belt/wire rope as needed.
- ▶ Place the lashing belt/wire rope on or over the load to be secured.
- ▶ Attach the lashing belt/wire rope to the lashing ring or lashing belt brackets on the other side of the vehicle. For steel mat packages, lashing belts/wire ropes only need to be attached to the top-most mats.
- ▶ Fold the locking lever on the lashing winch towards the front.
- ▶ Turn the hand wheel to the right to pre-tension the lashing belt or the wire rope.
- ▶ Insert the shaft-mounted gear unit into the lashing winch.
- ▶ Turn the crank to the right to tension the lashing belt or the wire rope and to firmly lash the steel mats.
- ▶ Turn the crank to the left until the shaft-mounted gear unit is relieved of load by the locking lever.
- ▶ Remove the shaft-mounted gear unit and insert it into the next tensioning devices. Remove and store the shaft-mounted gear unit after the tensioning process.

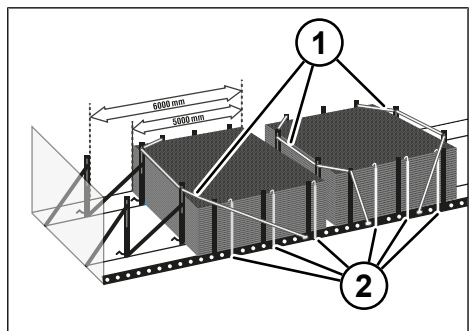


Fig. 8-38: Tie-down lashing of the steel mats

- 1 Lashing belts
- 2 Tensioning device

- ▶ Additionally strap the steel mats with lashing belts. To do so, primarily use the reinforced lashing holes.
- ▶ If one steel mat package will only be loaded on the front position, brace the rear plug-in posts as well. Ensure that the lashing belts are above the corners of the load. Use edge protection (see "Fig. 8-38: Tie-down lashing of the steel mats", pg. 162).

INFO

The lashing belts can be pulled into the front plug-in post before loading. Lashing belts in the lateral plug-in posts can also be pulled into the post sockets before insertion. This allows for load securing from the floor.

- ▶ Repeat the work steps for the rear steel mat package. The plug-in posts behind the front steel mat package are used as a front stop.
- ✓ The steel mat packages are secured with the Multi Steel system.

Parking position for plug-in posts

When not in use, the front clamping-type plug-in posts and the support struts can be inserted in the foremost position on the front wall. The other plug-in posts are stowed in the post depot. (see "5.18.1 Plug-in post depot", pg. 69)

- ▶ Take both support struts off of the plug-in posts.
- ▶ Insert the plug-in posts in the foremost position on the front wall and secure with the foot lever.
- ▶ Position both support struts on one of the plug-in posts.

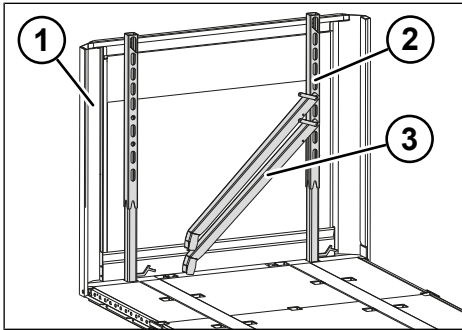


Fig. 8-39: Parking position for plug-in posts

- 1 Front wall
- 2 Plug-in post
- 3 Support struts

8.11 Double-deck loading

⚠ WARNING

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

When it comes to double-deck 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.
- ▶ Position the longitudinal and transverse beams straight so that they are not at a slope.
- ▶ Place the heaviest load on the load compartment floor, and the lighter freight on the transverse beams.
- ▶ Observe the maximum working load limit of the longitudinal beams, the transverse beams, and the posts. Consult the manufacturer's specifications for the working load limit of the transverse beams.
- ▶ For double-deck loading, secure the load items against sliding by installing the transverse beams at different levels.

For double-deck loading, the weight of the load may not exceed 400 kg per pallet.

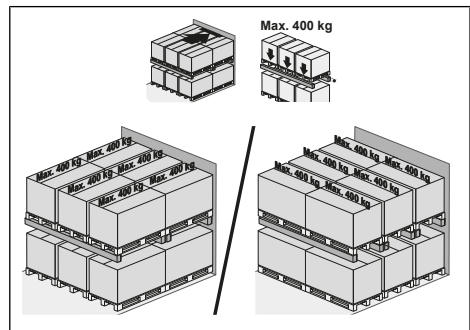


Fig. 8-40: Load systematics

Securing the load

- ▶ Insert the longitudinal beams (see "6.2.10.2 Inserting and removing the longitudinal beams", pg. 109).

- ▶ Insert the transverse beams (see "6.2.10.3 Inserting and removing the transverse beams", pg. 110).
- ▶ Load the trailer with positive locking (see "8.3 Ensuring form-fitting", pg. 148) from the front wall to the rear and the side. Only load the second level when the lower level is fully loaded.
- ▶ Laterally secure the load with plug-in laths (see "6.2.10.4 Moving the lath sockets for plug-in laths", pg. 111).
- ▶ Hook the end beams onto the rearward load securing.

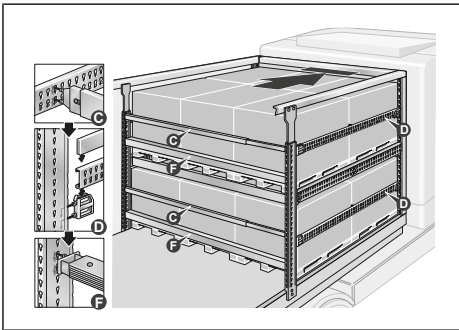


Fig. 8-41: Load securing with beams

- ▶ Only lash each load at one level.

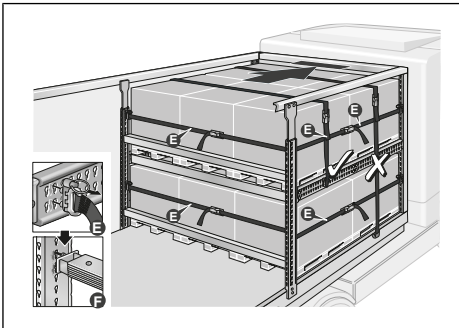


Fig. 8-42: Load securing with beams and belts

- ✓ The load is secured.

8.12 Variofloor segment floor

⚠ WARNING

Risk of accident from unsecured load!

Improper securing of the load on the Variofloor segment floor can result in personal injury and material damage.

- ▶ Secure the load between the segment floors with locking beams.
- ▶ Additionally secure non positive locking cargo towards the rear and sides using tension straps.
- ▶ Lash the load on the segment floor on the external frame of the trailer.
- ▶ Do not lash down the load to the chassis rails.

⚠ WARNING

Risk of accident caused by the movement of a segment floor!

When lifting or lowering a segment floor using a forklift, objects on or underneath the segment floor can cause severe personal injury and material damage.

- ▶ Secure the load between the segment floors with locking beams.
- ▶ Do not lift or lower the segment floor if there are people or objects on or below the segment floor.

⚠ WARNING

Risk of accident from a front wall that is not braced!

A front wall that is not braced or braced too steeply can result in personal injury and material damage.

- ▶ Before departure, lash the fixed tension straps of the front wall from the corner posts of the top front wall to the centre posts below.
- ▶ Release the fixed tension straps on the front wall only for loading and unloading.

⚠ WARNING**Risk of accident from actuating the lock with an unsecured segment floor!**

Folding out the internal lock of the segment floor without securing it, e.g. with a forklift truck, can cause the segment floor to fall down and result in personal injury and material damage.

- ▶ Before unlocking the internal lock, secure the segment floor with a forklift.

NOTE**Material damage due to improper folding out of the internal lock of the segment floor!**

Forced folding out of the internal lock of the segment floor can result in material damage.

- ▶ Avoid folding out the internal lock of the segment floor by force or with the help of tools (e.g. lever, hammer).
- ▶ Only fold out the internal lock of the segment floor when pressure on the rocker bolt is relieved.
- ▶ Only fold out the internal lock of the segment floor if a forklift lifts the segment floor horizontally so that the rocker bolt is relieved of pressure and does not lie on the post.

NOTE**Material damage caused by lowering a segment floor with the internal lock folded out!**

Lowering a segment floor to a new position with the internal lock folded out can result in material damage. The rocker bolts will not engage in the posts.

- ▶ Do not lower the segment floor to the new position if the internal lock of the segment floor is still folded out.
- ▶ Before lowering a segment floor to a new position, ensure that the signal flag is retracted and the rocker bolt engages in the post.

- ▶ Using a forklift, drive the forks into the fork receiver pockets on the segment floor.
- ▶ Lift up the segment floor horizontally until the rocker bolts are relieved of pressure and the signal flags appear.

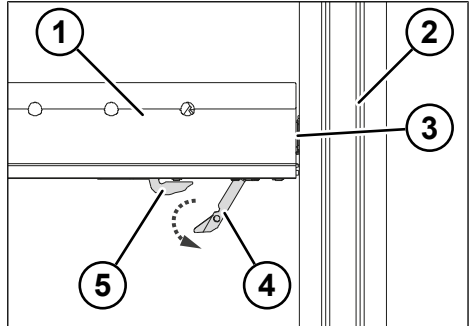


Fig. 8-43: Folding out the internal locks

- 1 Variofloor segment floors
- 2 Centre post
- 3 Rocker bolt
- 4 Internal lock
- 5 Signal flag

- ▶ Fold down the interior lock and ensure that the automatic engaging of the rocker bolts in the posts is blocked.
- ▶ Completely lower the segment floor downwards with the forklift.
- ▶ Allow the interior lock to fold down when stacking.
- ▶ Check that all signal flags have retracted and that all tilting pads have reached their original position.
- ▶ Lift the segment floor up horizontally to 20 cm above the new position and ensure that the rocker bolts latch into the post.
- ▶ Lower the segment floor to the new position.
- ✓ The Variofloor segment floor has been lowered to a lower position.

8.13 Coil transport

⚠ WARNING

Risk of accident due to improper loading and securing of coils!

Coils can slide or tip out of the coil well if improperly loaded and secured. This can result in material damage and personal injury.

- ▶ Only transport coils with the Coil Liner.
- ▶ Secure the coils with the appropriate securing devices and equipment.

8.13.1 Loading coils

Preparing the coil well for loading and unloading

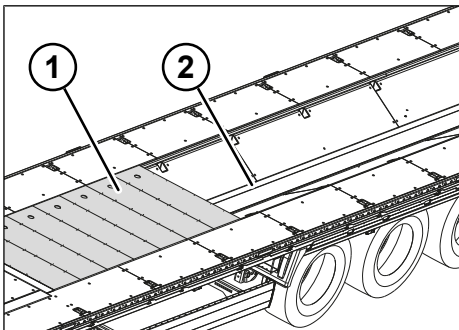


Fig. 8-44: Coil well with coil well cover

- 1 Coil well cover
- 2 Coil well

- ▶ Open the coil trough covers according to the number and size of the coils. Observe the yellow markings for the load's centre of gravity.
- ▶ If necessary, remove any load securing materials located in the coil well.

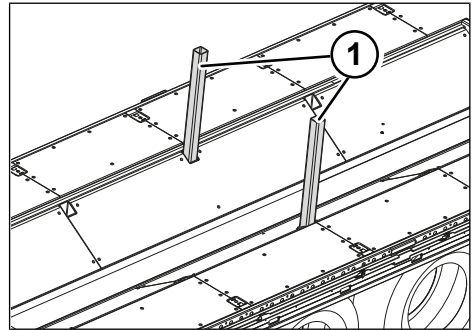


Fig. 8-45: Inserting plug-in posts

- 1 Plug-in posts

- ▶ Insert plug-in posts from the floor of the coil well into the post sockets to prevent the load from slipping towards the front wall.
- ✓ The coil well is prepared.

Coil loading

- ▶ Release the coil directly behind the plug-in posts.
- ▶ Allow the coil to rest up flush.
- ✓ The coil is loaded.

8.13.2 Coil lashing

Coils can be lashed with chains or with tension straps. To achieve the best possible lashing angle, special load securing must be used when securing coils with an external diameter of 2.1 m or greater and when securing coils that are at risk of tipping.

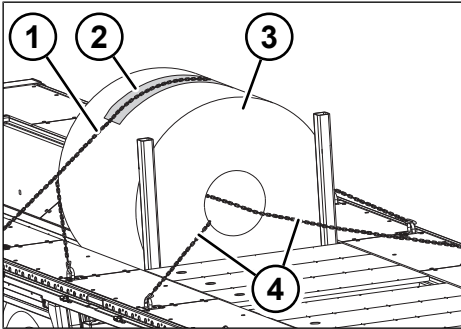
Lashing the coil with chains

Fig. 8-46: Lashing the coil with chains

- 1 Lashing down the coil transversely
- 2 Spacer
- 3 Coil with small diameter
- 4 Chains lashed diagonally

- ▶ To protect the load, position a suitable underlay material under the chain.
 - ▶ Lash down the coil across the direction of travel.
 - ▶ Feed two more chains through the opening of the coil.
 - ▶ Lash down the coil diagonally.
 - ▶ Lash down the chains to the lashing eyelets.
- ✓ The coil has been lashed down.

Use chains to lash coils that are at risk of tipping and coils with an external diameter 2.1 m or greater

NOTE**Material damage due to overloaded chains!**

When lashing down coils with a large diameter, there is a higher load on the lashing chain that is wrapped twice around the upper half of the coil. If overloaded, the chain may break resulting in accidents with material damage.

- ▶ Use lashing chains with a sufficient load capacity.
- ▶ Avoid using chains that are too weak and break.

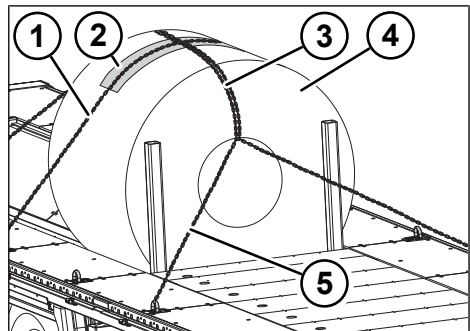


Fig. 8-47: Using chains to lash coils that are at risk of tipping

- 1 Lashing down the coil transversely
- 2 Spacer
- 3 Chain wrapped twice around the coil
- 4 Coil
- 5 Chain lashed diagonally

- ▶ To protect the load, position a suitable underlay material under the chain.
- ▶ Lash down the coil across the direction of travel.
- ▶ Guide a chain through the opening of the coil. Select a highly resilient chain.
- ▶ Pass the chain around the upper coil half twice.
- ▶ Hook the chains to each other.

- ▶ Guide the chains through the doubled chains on the rear of the coil and then tension the chains accordingly.
- ▶ Lash down the chain to the lashing eyelets diagonally.
- ✓ The coil is lashed down with chains.

Lashing down coils with tension straps

Lashing down the coils with tension straps is done in the same way as lashing down with chains.

8.13.3 Vario Coil system

⚠ WARNING

Serious injuries caused by slipping of the load!

The load is not fully secured with the Vario Coil system.

- ▶ Other suitable measures for load securing are absolutely essential.

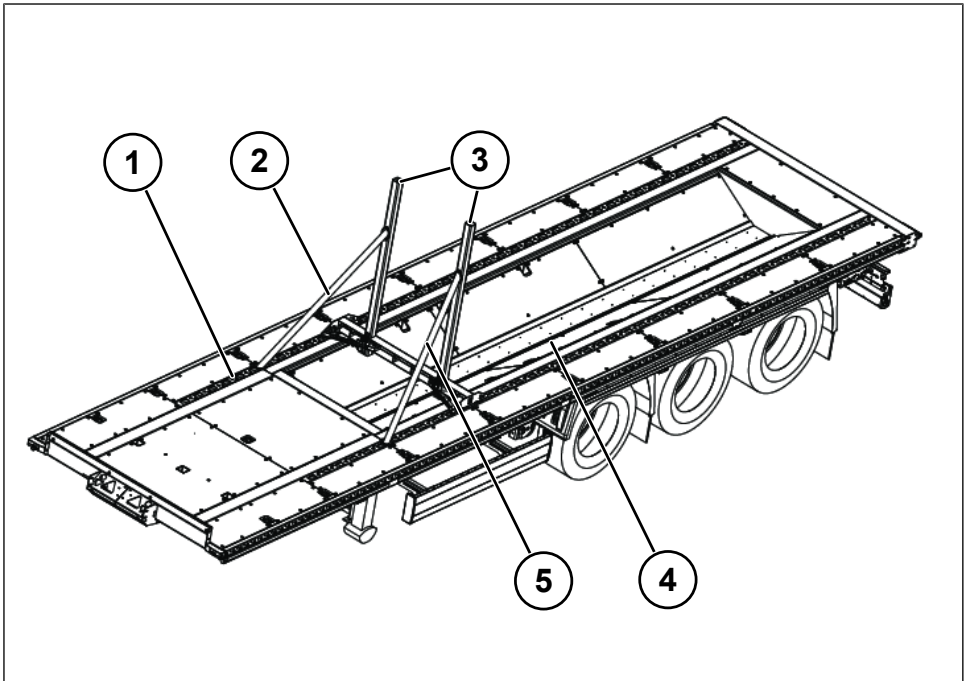


Fig. 8-48: Vario Coil system

- 1 Grid rail
- 2 Right strut
- 3 Posts
- 4 Coil well
- 5 Left strut

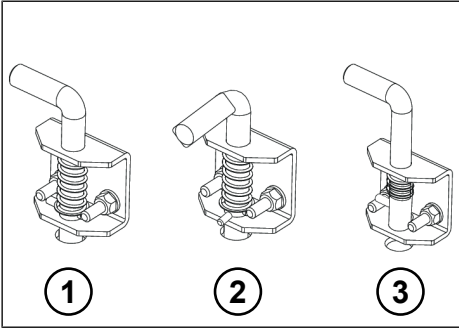


Fig. 8-49: Locking positions for retainer bolts

- 1 Position 1: Retainer bolt locked in closed position
- 2 Position 2: Retainer bolt is pressed down by the spring force, but can move upwards freely
- 3 Position 3: Retainer bolt locked in open position

Installing the Vario Coil system

- ▶ Insert the transverse beam between the grid rails.
 - ⇒ The square bolts on the bottom side of the transverse beam are immersed in the intended recesses in the grid rails.
- ▶ Move the retainer bolt on the transverse beam to Position 2 (see "Fig. 8-49: Locking positions for retainer bolts", pg. 170).

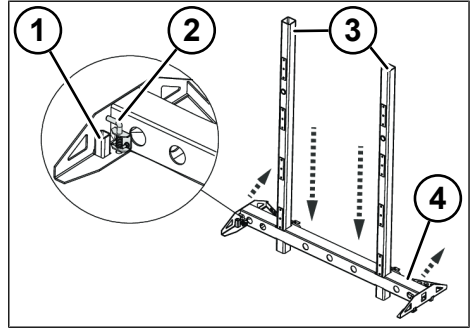


Fig. 8-50: Transverse beams with posts

- 1 Square bolt
 - 2 Retainer bolt for the transverse beam
 - 3 Posts
 - 4 Transverse beam
- ▶ Slide the transverse beam towards the front of the vehicle until the retainer bolts for the transverse beam latch into place.
 - ▶ Move the retainer bolts to Position 1 (see "Fig. 8-49: Locking positions for retainer bolts", pg. 170).
 - ▶ Move the retainer bolts for the posts on the transverse beam to Position 2 (see "Fig. 8-49: Locking positions for retainer bolts", pg. 170).
 - ▶ Insert the posts into the transverse beams.
 - ⇒ The posts are resting on the inserted retainer bolts.

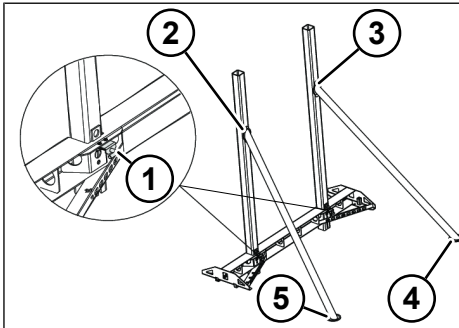


Fig. 8-51: Posts and struts

- 1 Retainer bolt for the posts
- 2 Connection post/left strut
- 3 Connection post/right strut
- 4 Right strut/grid rail
- 5 Left strut/grid rail

- ▶ Insert the left strut in the holes of the post.
 - ⇒ The bottom end of the strut is positioned above the corresponding hole in the grid rail.
- ▶ Insert the right strut in the holes of the right post.
 - ⇒ The bottom end of the strut is positioned above the corresponding hole in the grid rail.
- ▶ Move the retainer bolts for the posts to Position 3 (see "Fig. 8-49: Locking positions for retainer bolts", pg. 170) so that the posts are seated in the transverse beam up to the stop.
- ▶ By lowering the posts, the struts are immersed in the intended holes in the grid rail. If necessary, move the struts slightly until they are immersed.
- ▶ Move the retainer bolts for the posts to Position 1 (see "Fig. 8-49: Locking positions for retainer bolts", pg. 170).
- ✓ The posts are secured and installed.

Removing the Vario Coil system

- ▶ Lift both struts out of the grid rail and remove them from the post.

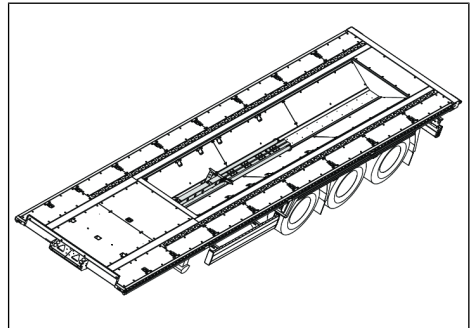


Fig. 8-52: Deposit in the coil well

- ▶ Deposit the struts in the coil well.
- ▶ Move the retainer bolts for the posts to Position 3 (see "Fig. 8-49: Locking positions for retainer bolts", pg. 170).
- ▶ Lift the posts upwards out of the transverse beam.
- ▶ Deposit the posts in the coil well.
- ▶ Move both retainer bolts on the transverse beam to Position 3 (see "Fig. 8-49: Locking positions for retainer bolts", pg. 170).
- ▶ Slide the transverse beam towards the rear of the vehicle.
- ▶ Lift the transverse beams upwards out of the grid rails.
- ▶ Deposit the transverse beam with the square bolts upwards in the coil well.

8.14 Transporting paper

⚠ WARNING

Risk of accident due to improper loading and securing of paper rolls!

Paper rolls can slip if improperly loaded and secured. This can result in material damage and personal injury.

- ▶ Only transport paper rolls with the Paper Liner.
- ▶ Secure the paper rolls with the appropriate securing devices and equipment.

8.14.1 Using the paper wedge

Using the paper wedges in the perforated rail

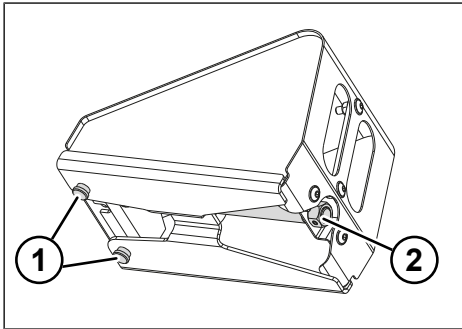


Fig. 8-53: Paper wedge

- 1 Stay bolts
- 2 Spindle

- ▶ Insert the paper wedges with the stay bolts in the corresponding holes of the perforated rail.
 - ⇒ The paper wedges are inserted.

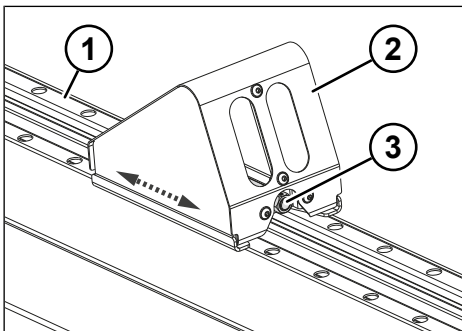


Fig. 8-54: Adjusting the paper wedge

- 1 Perforated rail
- 2 Paper wedge
- 3 Spindle

- ▶ Lock the paper wedges in accordance with the diameter of the paper roll by tightening the spindle with a ratchet.
- ✓ The paper wedges are adjusted.

8.14.2 Using the pallet roller

⚠ CAUTION

Risk of accident due to improper use of the pallet roller!

Improper use of the pallet roller can cause the load to topple resulting in personal injury and material damage.

- ▶ Observe the maximum weight specifications for loading the pallet roller. The weight specifications are indicated on the pallet rollers.
- ▶ Only use the pallet roller with the corresponding perforated rails for transporting pallets.
- ▶ Position the trailer straight when loading and unloading. Otherwise, additionally secure the load, e.g. with ropes, to prevent it from suddenly rolling away.
- ▶ Move the pallet roller completely under the load.
- ▶ Work with particular caution with greater loads, since they can tip due to sudden lowering and braking of the pallet.
- ▶ Only lower the pallet while stationary.
- ▶ Immediately replace defective or damaged parts.
- ▶ Keep pallet rollers and perforated rails clean.
- ▶ Observe the enclosed supplier documentation.

Two pallet rollers can be used to lift, move, and position paper rolls or other loads.

Inserting the pallet roller into the perforated rail

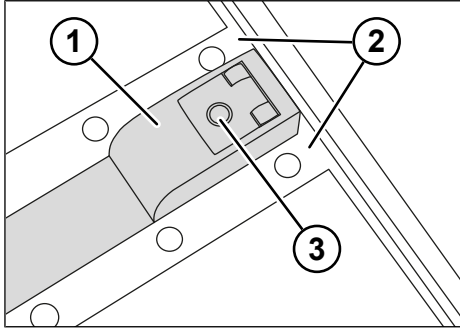


Fig. 8-55: Inserting the pallet roller

- 1 Pallet rollers
- 2 Sliding rail
- 3 Mounting hole

- ▶ Remove the perforated rail cover.
- ▶ If necessary, remove the dirt from the perforated rails.
- ▶ Insert the pallet roller into the perforated rails.
- ✓ The pallet roller is inserted in the perforated rails.

Lifting up the pallet

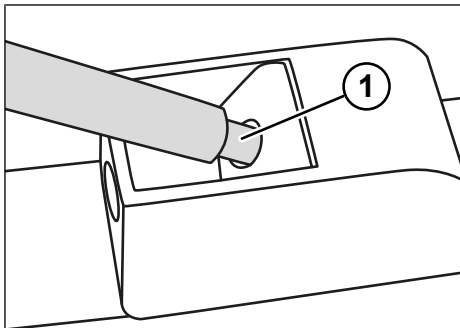


Fig. 8-56: Inserting a control lever into the pallet roller

- 1 Control lever

- ▶ Insert the control lever with the lock positioned downwards into the mounting hole.

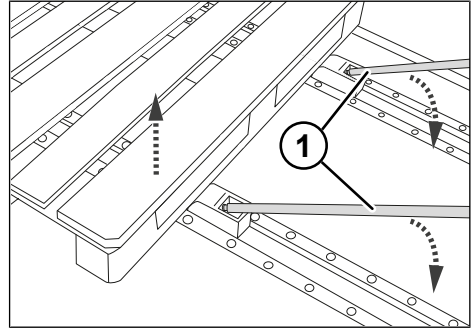


Fig. 8-57: Lifting up the pallet

- 1 Control lever

- ▶ Swivel the control lever downwards.
- ▶ The pallet is lifted.

Lowering the pallet

- ▶ Insert the control lever with the lock positioned downwards into the mounting hole.
- ▶ Swivel the control lever upwards.
- ✓ The pallet is lowered.

Shifting the load

- ▶ Shift the load.
- ✓ The load is shifted.

Pulling the load

- ▶ Swivel the auxiliary handle on the control lever downwards.
- ▶ Pulling the load.
- ✓ The load has been pulled.

8.14.3 Securing the paper rolls

Securing the paper rolls across the direction of travel

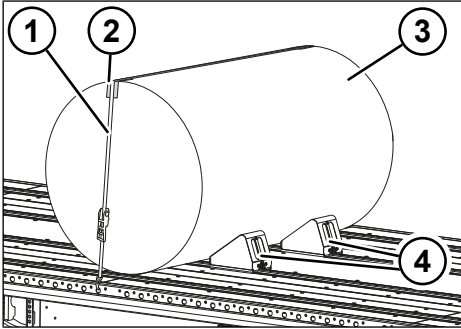


Fig. 8-58: Securing the paper rolls across the direction of travel

- 1 Tension strap
- 2 Edge protection
- 3 Paper roll
- 4 Paper wedges

- ▶ Insert the paper wedges into the perforated rails according to the diameter of the paper rolls (see "8.14.1 Using the paper wedge", pg. 172).
- ▶ Lock the paper rolls by adjusting the paper wedges (see "8.14.1 Using the paper wedge", pg. 172).
- ▶ Apply edge protection.
- ▶ Secure the paper rolls with the tension straps.
- ✓ The paper rolls are secured.

Securing the paper rolls along the direction of travel

The following can be transported along to the direction of travel

- One large paper roll, or

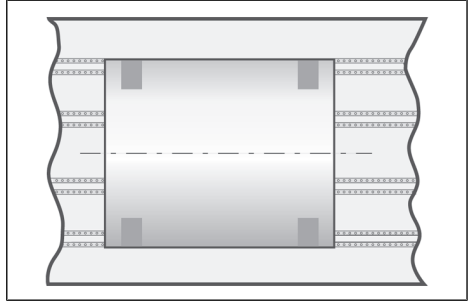


Fig. 8-59: One large paper roll lengthwise

- Two small paper rolls next to each other.

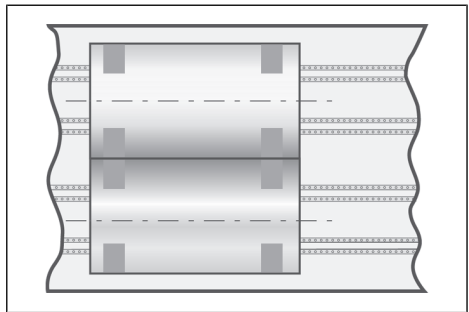


Fig. 8-60: Transporting two small paper rolls lengthwise

- ▶ Insert the paper wedges into the perforated rails according to the diameter of the paper rolls (see "8.14.1 Using the paper wedge", pg. 172).
- ▶ Lock the paper rolls by adjusting the paper wedges (see "8.14.1 Using the paper wedge", pg. 172).

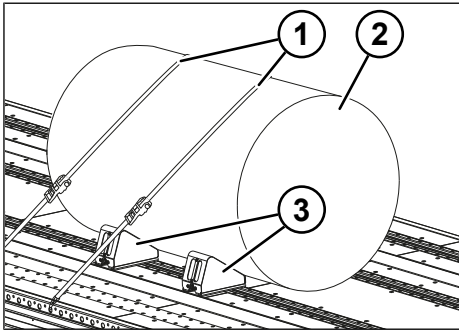


Fig. 8-61: Securing the paper roll lengthwise

- 1 Tension straps
- 2 Paper roll
- 3 Paper wedges

- ▶ Secure the paper rolls with the tension straps.
- ✓ The paper rolls are secured.

Securing the paper roll standing up

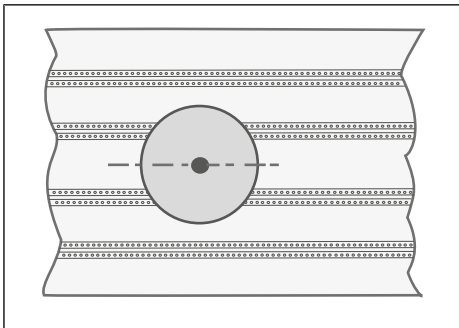


Fig. 8-62: Securing the paper roll standing up

- ▶ Position anti-slip mats under the paper roll.
- ▶ Secure the paper roll with the tension straps.

The paper rolls are secured.

8.15 Container transport

KRONE trailers can be equipped with lowerable container locks. The following containers can be loaded onto the trailer:

- 1 x 20-foot container in the centre (up to 25 t Profi Liner, up to 30 t Profi Liner HD) or flush with the rear
- 2 x 20-foot container
- 1 x 40-foot container

8.15.1 Operating the lock

⚠ WARNING

Risk of accident by improper placing, lifting and locking of the container!

Improperly placing, lifting or locking can cause the container to uncontrollably come loose from the trailer chassis and cause severe personal injuries and material damage.

- ▶ Ensure that no persons are in the hazard area when placing down or lifting the container.
- ▶ Before every trip, check that the container is properly locked and secured.

NOTE

Noise pollution and wear due to vibrations!

Locks that are not engaged when driving empty cause unnecessary wear and noise pollution.

- ▶ Always tighten the locks.

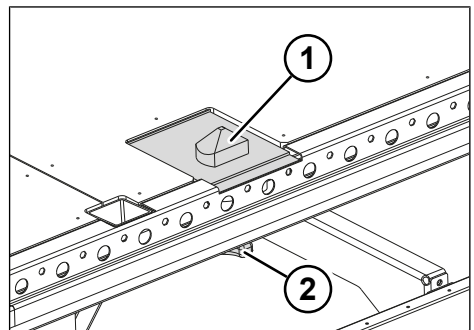


Fig. 8-63: Lowerable container lock

- 1 Trunnion
- 2 Tension nut

In the loading position, the trunnion lies along the direction of travel and flush with the guide bushing. From this position, the trunnion with the tension nut can be lowered.

For some load conditions, the loading preparation must include lowering certain locks.

Lowering and locking the trunnion

- ▶ Slightly raise the tension nut.

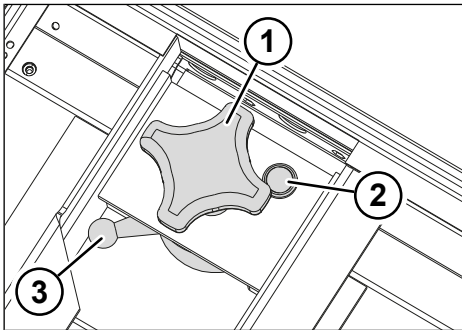


Fig. 8-64: Lowering the trunnion

- 1 Tension nut
- 2 Ball locking device
- 3 Groove bushing with handle

- ▶ Move the handle of the groove bushing from the right to the left.
- ▶ Allow the trunnion with the tension nut to drop into the lowered position.
- ✓ The trunnion is lowered and locked.

Open the lock

- ▶ Push the trunnion with the tension nut up and turn it by 90°.
- ▶ Lower the trunnion with the tension nut.
- ✓ The lock is opened.

Closing the lock

- The lock is opened.
- ▶ Load the container.
- ▶ Push the trunnion with the tension nut up and turn it by 90°.

- ▶ Lower the trunnion with the tension nut.
- ▶ Tighten the tension nut.
- ✓ The lock is closed.

8.15.2 Loading instructions

⚠ WARNING

Risk of accident due to instability and rolling away!

Unintentional trailer movements can cause serious injury and property damage.

- ▶ Secure the trailer against rolling away by applying the parking brake.
- ▶ Use the wheel chocks to prevent the trailer from rolling away.
- ▶ Park the trailer on a solid surface to avoid sinking in or tipping.
- ▶ Align the tractor unit and trailer behind each other in a straight line.
- ▶ Load and unload the trailer such that traffic hazards are ruled out.
- ▶ Be mindful of the trailer's stability when loading and unloading while uncoupled. If necessary, use additional supports.

When loading the trailer, specific regulations apply for the transport, loading and unloading and for the load distribution, depending on the container model.

Transporting 20-foot containers

Transport individual 20-foot containers in the centre (maximum 25 t). If one container has been lifted and the trip should continue with the second container, the remaining container must be placed in the centre (max. 25 t).

20-foot container, loading and unloading in uncoupled state

In an uncoupled state, load as follows:

1. First load the front container.
2. Then load the rear container.

In an uncoupled state, unload as follows:

1. First unload the rear container.
 2. Then unload the front container.
- ▶ Disengage the parking brake on the trailer (see "5.7.2 Parking brake", pg. 49).
 - ✓ The trailer is unloaded.

20-foot container, loading and unloading in coupled state

Loading/unloading of two 20-foot containers on/from a coupled (on the tractor) trailer requires no loading/unloading sequence.

8.15.3 Loading the container

- ▶ Park the trailer on level ground.
- ▶ Apply the parking brake on the trailer (see "5.7.2 Parking brake", pg. 49).
- ▶ Use wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Depending on the load state, lower the container locks .
- ▶ Open the container lock .
- ▶ Load the container.
- ▶ Close the container lock .
- ▶ Remove the wheel chocks that prevent rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Disengage the parking brake on the trailer (see "5.7.2 Parking brake", pg. 49).
- ✓ The trailer is loaded and the container is secured.

8.15.4 Unloading the container

- ▶ Park the trailer on level ground.
- ▶ Apply the parking brake on the trailer (see "5.7.2 Parking brake", pg. 49).
- ▶ Use wheel chocks to prevent the trailer from rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Open the container lock .
- ▶ Unload the container.
- ▶ Close the container lock .
- ▶ Remove the wheel chocks that prevent rolling away (see "5.1 Using wheel chocks", pg. 27).

9 Telematic systems

9.1 Telematics unit

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
- Control unit communication
- WLAN for diagnosis
- 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 net-

work 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.

WLAN

The WLAN Access Point forms an interface through which KRONE can connect special tool functions to the KSC Box. This is how the KSC Box and the connected control units are diagnosed in the workshop. Parameterisation can also be carried out via the WLAN Access Point.

Control unit communication

The CAN bus interface establishes communication with the braking system to collect the operating data. Additional control units can be connected with a second CAN bus interface.

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.

Overview

The antennas for positioning and mobile communications are internally located just below the top of the housing to ensure optimal reception.

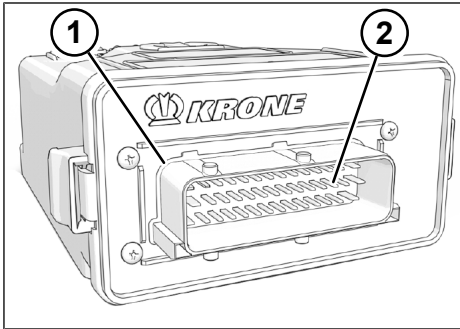


Fig. 9-1: Front side

- 1 Surrounding seal
- 2 Plug connector 42-pin

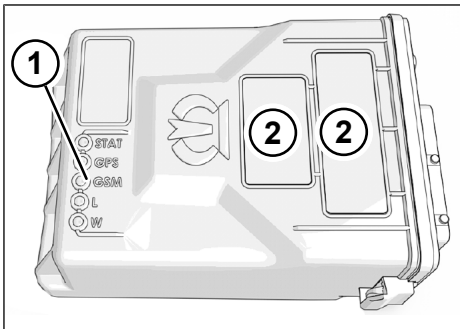


Fig. 9-2: Top side

- 1 LED displays
- 2 Type plates

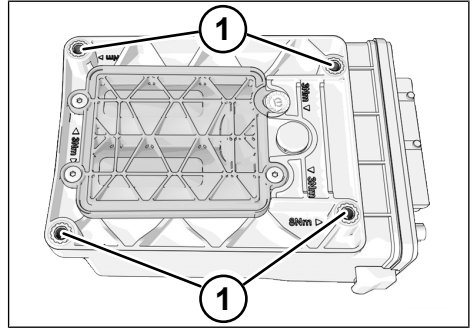


Fig. 9-3: Bottom side

- 1 Threaded inserts

The position of the threaded inserts corresponds to the hole positions of the coupling support specified by KRONE.

LED display

The device has 5 LEDs to display its operating status.

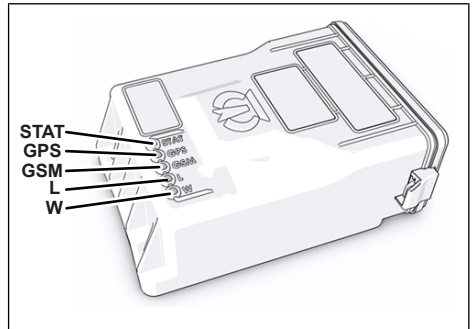


Fig. 9-4: LED displays

| Number | LED | Description |
|--------|------|---|
| 1 | STAT | Status of the box |
| 2 | GPS | Status of the positioning (Global Positioning System) |
| 3 | GSM | Status of the mobile communications connection |

| Number | LED | Description |
|--------|-----|-----------------------------------|
| 4 | L | Status of the Ethernet connection |
| 5 | W | Status of the WLAN connection |

INFO

KRONE Smart Collect is manufactured in a number of versions, which have different features. If your device does not support a particular function, the associated LEDs will have no function.

When the vehicle's ignition is switched on, the device starts up. During the start-up process, the STAT status LED is illuminated. After completion of the start-up process, all LEDs are briefly illuminated (< 0.5 seconds).

1 Status

Label: STAT

Colour: green

This LED provides information about the general status of the box.

When the vehicle's ignition is switched on, the device starts up. During the start-up process, the STAT status LED is illuminated. After completion of the start-up process, all LEDs are briefly illuminated (< 0.5 seconds).

| LED signal | Definition |
|-------------------------------------|--|
| Continuous illumination | Voltage connected incorrectly. Swap terminals. |
| Flashing regularly, every 4 seconds | The box draws power from the battery and not from the vehicle voltage. |
| Flashing regularly, every 2 seconds | The box is powered up and is working properly. |

2 Positioning

Label: GPS

Colour: blue

This LED provides information about the status of the positioning.

| LED signal | Definition |
|-------------------------------------|---------------------------------|
| Continuous illumination | Acquiring a fix. |
| Flashing regularly, every 4 seconds | GPS active, position determined |
| Off | GPS deactivated |

The device is fitted with a GPS module which supports GLONASS (Global Navigation Satellite System, the Russian equivalent of GPS) along with GPS.

3 Mobile communications

Label: GSM

Colour: white

This LED provides information about the status of the mobile communications connection.

| LED signal | Definition |
|-------------------------|--|
| Continuous illumination | No mobile communications connection |
| Regular flashing | GNS active, mobile communications connection established |
| Off | GSM deactivated |

4 Ethernet

Label: L

Colour: yellow

This LED supplies information about the status of the Ethernet connection.

| LED signal | Definition |
|-------------------------|--|
| Continuous illumination | No device connected. |
| Regular flashing | Active Ethernet connection |
| Off | Ethernet is deactivated or not installed |

5 WLAN

Label: W

Colour: red

This LED supplies information about the WLAN status.

| LED signal | Definition |
|-------------------------|---|
| Continuous illumination | WLAN is being initialised/deactivated |
| Regular flashing | WLAN is active |
| Off | WLAN module is deactivated or not installed |

The radio signal quality of the WLAN connection is monitored and recorded in an internal log file in the RAM disk.

However it cannot be guaranteed that the WLAN network is 100% available, since this is not dependent solely on the telematics unit.

The operator must ensure that applications critical to safety are backed up by suitable mechanisms.

The following services can be initiated over WLAN:

- Update or reconstruction of the basic system. Alternatively, this can also occur over Ethernet, UMTS or CAN.
- Infrastructure mode. In Infrastructure mode, the module can log on to (up to four) different independently parametrised logical WLAN networks. The priority corresponds to the sequence of the parametrisation. All common authentication and encrypting methods are offered here. In each of the logical networks the unit can behave like a DHCP server or DHCP client or work with a fixed IP address.
- Access point mode. In this mode, the unit makes up to two independently configurable WLAN networks available (private and public WLAN network). All networks share the same physical WLAN channel here. Connections to another or several additional machines (machine2machine connection) is possible. If required, this network can be configured in such a way that it can also provide internet access.

Battery

The internal battery ensures operation with the vehicle voltage switched off for a period of at least one to four weeks when data is transmitted to the KRONE server. The battery is charged when there is a power supply from the tractor unit. The battery is maintenance-free and its service life is generally 6 years when handled properly.

Purpose of the battery:

- Supply the processor (CPU) to allow proper shutting down of the operating system.
- Power supply to the unit for positioning via GPS even if there is no vehicle voltage.

Automatic charging during operation

The battery is charged via the external vehicle voltage using a charge controller. In the event of an interruption of the vehicle voltage, the integrated battery takes over the power supply to the box for a defined time. The essential electronics components are supplied with power by the battery with the help of a back-end regulator.

9.2 Camera system

KRONE Smart Capacity Management is a camera system that is mounted in the cargo area. The camera is equipped with infrared technology, which allows the capture of images in complete darkness. The image is transferred when there is a change relative to the previous image and is event-based. The data and images are displayed in the KRONE Telematics Portal and can be viewed after logging in.

Depending on the equipment, the camera system can perform other functions, such as activating an alarm function or evaluating the empty capacity of the freight compartment. The range of functions can be changed by updating the system and can be viewed and adapted in the KRONE Telematics Portal.

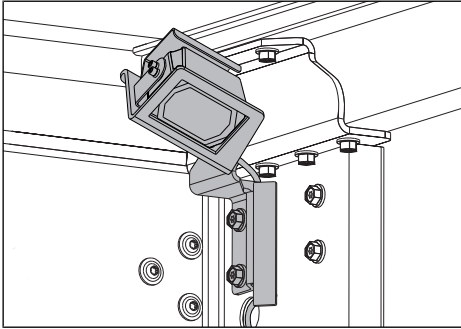


Fig. 9-5: Camera system

NOTE

Malfunction due to incorrectly positioned load

The evaluation of the load capacity can be impaired by incorrectly positioned loads.

- ▶ Start loading at the front wall.
- ▶ Ensure a positive-locking fit.

INFO

The camera only records when the vehicle is coupled to a tractor unit and the ignition is switched on, or the cooling system is in operation or its battery is fully charged.

KRONE Smart Capacity Management can only properly detect free loading capacities in the cargo area if the unladen floor and the viewing area in front of the camera are free of dirt.

- ▶ After loading and unloading, clean the dirt from the unladen floor of the cargo area.
- ▶ Clean the camera with a microfibre cloth in case of unclear vision.
- ▶ If the camera or holder is damaged during the loading or unloading process, contact KRONE Telematics Support to have the camera re-commissioned (see "" pg. 217).

Type plate

The type plate is located on the top or bottom of the camera.

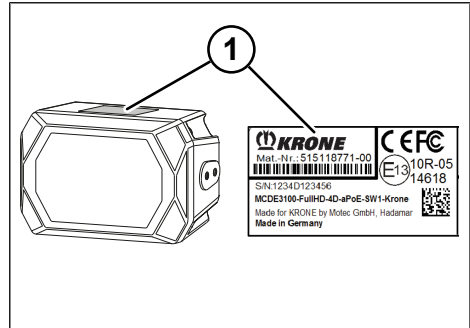


Fig. 9-6: Type plate (example on top)

1 Type plate

9.3 Tyre pressure control system

The KRONE Smart Tyre Monitoring System is a tyre pressure control system that measures the inflation pressure and temperature of the tyres. The system sends the values to the display in the tractor unit.

The system consists of the electronic control unit and the tyre sensors. Each wheel has a tyre sensor mounted on the rim.

The sensors measure tyre pressure and temperature on each wheel and transmit these values to an electronic control unit, which transmits the signals at short intervals.

The tyre status is displayed on the display in the tractor unit and, if equipped on the vehicle, on the KRONE Telematics Portal or the KRONE app. If there are deviations from the pre-set values, the system alerts the dispatcher and the driving staff.

The system only displays values when the vehicle is connected and the ignition is switched on.

NOTE**Risk of accident due to different or too low tyre pressures!**

Different or too low tyre pressures can cause tyre damage, tyre failure, loss of vehicle control, accidents, serious injury and death.

- ▶ Check the tyre pressure on all cold wheels regularly and correct if necessary.
- ▶ Check the tyres regularly for signs of wear and damage.
- ▶ If the warning light comes on, stop immediately and allow the tyres to cool.
- ▶ Check the cooled tyre.

Malfunctions

If the system detects that the tyre pressure is too low, the sensor sends the information to the control unit and the yellow warning light (⚠) in the cab lights up. The display in the cab varies depending on the tractor unit equipment.

Low tyre pressure will result in poor vehicle control, reduced braking effect, increased tyre wear and fuel consumption.

- ☑ The warning light in the cab lights up.
 - ▶ Allow the tyres to cool down if necessary.
 - ▶ Check the tyre pressure and correct if necessary.
 - ▶ Restart the system with the ignition switch.
 - ⇒ The warning light goes out automatically.
- ✓ The malfunction has been rectified.

If the warning light does not go out, see a qualified workshop immediately.

Type plate

For product identification, the type plates are lasered into the surfaces.

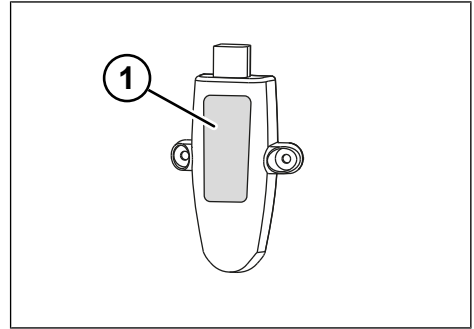


Fig. 9-7: Control unit/repeater type plate

- 1 Lasered type plate

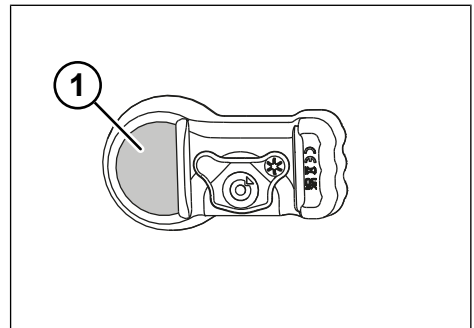


Fig. 9-8: Tyre sensor type plate

- 1 Lasered type plate

9.4 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 "13.2 Customer service and support", pg. 217).

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. 9-9: Homepage

- 1 Map
- 2 Vehicles

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

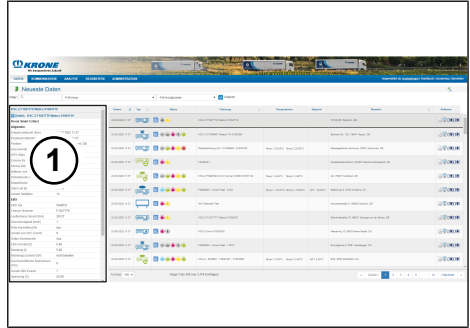


Fig. 9-10: Technical data

- 1 Data

10 Troubleshooting in the event of faults

⚠ WARNING

Risk of accident due to instability and rolling away!

Unintentional trailer movements can cause serious injury and material damage.

- ▶ Secure the vehicle against rolling away by applying the parking brake.
- ▶ Use the wheel chocks to prevent the vehicle from rolling away.
- ▶ Park the vehicle on a solid surface to avoid sinking in or tipping.
- ▶ When the semitrailer is unhitched, ensure stability. If necessary, use additional supports.

⚠ 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 that have been approved by the manufacturer.
- ▶ Observe the instructions concerning troubleshooting issued by the suppliers of the installed components.
- ▶ Verify functionality after installing/repairing components.

The following overview will help 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.
- ▶ Contacting Customer Service (see "13.2 Customer service and support", pg. 217).

Troubleshooting overview

| Fault | Cause | Solution |
|---------------------------------------|--|---|
| Electrical components are not working | Supply and control connections are interrupted | <ul style="list-style-type: none"> ▶ Check that the supply and control connections between the tractor unit and trailers are properly connected. |
| Pneumatic components are not working | Leaks on components | <ul style="list-style-type: none"> ▶ Check the components for damage and leaks. ▶ Have repairs/replacements performed by a specialist workshop. |
| Brake system fault | Leaks on the brake cylinder, leaks on the brake calliper | <ul style="list-style-type: none"> ▶ Check the brake cylinders for function and leaks. ▶ Check the brake callipers for function and leaks. ▶ Have repairs/replacements performed by a specialist workshop. ▶ In addition to the operating instructions for the axles, also observe the operating instructions for the tractor unit. |

TROUBLESHOOTING IN THE EVENT OF FAULTS

| Fault | Cause | Solution |
|---|---|---|
| Braking abnormalities (trailer and tractor brake abnormally in the vehicle combination) | Failure to perform the brake power/train tuning | <ul style="list-style-type: none"> ▶ Perform a brake power/train tuning with the allocated tractor unit (see "10.2 Fixing braking abnormalities", pg. 187). ▶ In addition to the operating instructions for the KRONE Trailer Axle, also observe the operating instructions for the tractor unit and the vehicle. |
| ABS/EBS error display | Fault in the controller | <ul style="list-style-type: none"> ▶ Contact an authorised specialist workshop or customer service. |
| The lift axle no longer functions | Faults on the lift axle control due to defective lift axle valves | <ul style="list-style-type: none"> ▶ Check that the supply and control connections between the tractor unit and vehicle are properly connected. ▶ Contact an authorised specialist workshop or customer service. |
| | Fault due to incorrect controls from the tractor unit | |
| Rear lights, direction indicators, position lamps or similar do not work | Defective bulbs | <ul style="list-style-type: none"> ▶ Replace the defective bulbs. ▶ Check that the supply and control connections between the tractor unit and vehicle are properly connected. |
| Self-steering axle | | |
| The wheels are not turned or the locking unit is not released | Fault in the controller or in the compressed air supply | <ul style="list-style-type: none"> ▶ Contact an authorised specialist workshop or customer service. |
| The wheels wobble when driving straight ahead | Fault in the compressed air control | <ul style="list-style-type: none"> ▶ Contact an authorised specialist workshop or customer service. |
| KRONE support device | | |
| Landing leg cannot be retracted or extended | Landing leg bent | <ul style="list-style-type: none"> ▶ Have repairs performed by a specialist workshop. |
| | Spindle or gearbox defective | |
| Landing leg moves stiffly | Friction between the spindle and the spindle nut is too high | <ul style="list-style-type: none"> ▶ Lubricate the support device (see "11.2.8 Lubricating the trailer", pg. 210). |
| | Support device is soiled | <ul style="list-style-type: none"> ▶ Clean the support device. |
| | Landing leg bent | <ul style="list-style-type: none"> ▶ Have repairs performed by a specialist workshop. |
| | Drive shaft is stuck | <ul style="list-style-type: none"> ▶ Shorten the drive shaft. |
| It is not possible to change gears | Gearbox defective | <ul style="list-style-type: none"> ▶ Have repairs performed by a specialist workshop. |

For vehicles with **telematics unit**, the following also applies:

| Error | Solution |
|--|---|
| No power to unit – red LED not illuminated | Check connections and ignition status. |
| Only power LED illuminated/Box fails to start up | The battery requires a certain charge level before the box will start. |
| EBS data is not transmitted or not completely transmitted. | Check whether the EBS system is installed and configured correctly. EBS data can be read by the KSC and transmitted to the portal only when the EBS is powered (ignition on). |
| 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 RS232 cabling RX/TX has been carried out correctly. |

10.1 Checking the lift axle control

WARNING

Risk of accident caused by faulty lift axle control!

A faulty lift axle control can have negative effects on the handling characteristics of the trailer. It can also change the vehicle height or the distance from the road and cause the trailer to get stuck in underpasses.

- ▶ Only drive with properly functioning lift axle control.
- ▶ In case of malfunction, contact an authorised specialist workshop and have the lift axle control repaired.
- ▶ In case of faults, have the lift axle control inspected by an authorised specialist workshop.

10.2 Fixing braking abnormalities

WARNING

Risk of accident due to unharmonised brake power tuning!

Unharmonised brake power between the tractor unit and trailer may lead to insufficient or excessive trailer braking values. This can cause increased wear and accidents.

- ▶ Monitor the automatic coupling force control to harmonize the brake power.
- ▶ Pay attention to the sticker on the trailer.

Technically optimised function of the brake system is only possible when trailer is combined with the corresponding allocated tractor unit. All components and the controls must function without faults and be properly set. If braking abnormalities occur, the following apply:

- ▶ Fill in the following questionnaire for basic information regarding braking abnormalities and send it to KRONE.

- ▶ More information and instructions can be found on the KRONE website or requested from customer service (see "13.2 Customer service and support", pg. 217).
- ▶ Observe the operating and maintenance instructions of the installed supplied components.

Questionnaire: Basic information about braking abnormalities

- ▶ Copy the questionnaire below.
 - Error memory
- ▶ Fill in the questionnaire completely.
 - Operating data
- ▶ Include the following attachments:
 - If necessary, the data from the internal CPU memory (e.g. EEPROM memory)
- Logs from the rolling brake test stand
- Data from the memory of the brake electronics

| Customer | |
|--|----|
| Name/company | |
| Telephone | |
| Fax | |
| Email | |
| Trailer | |
| Item number | |
| Vehicle ID number (see "1.3 Product identification and type plate", pg. 9) | |
| New registration | |
| Trailer mileage | km |
| Brake pads mileage | km |
| Tractor unit | |
| Manufacturer | |
| Type | |
| New registration | km |
| Tractor unit mileage | km |
| Brake pads mileage | km |

- ▶ Send the filled form and annexes to:

Fahrzeugwerk Bernard KRONE
 GmbH & Co. KG
 Customer Service
 D-49757 Werlte
 email: kd.nfz@krone.de

11 Maintenance and repair

⚠ DANGER

Risk of accident due to unintended vehicle movements!

Unintended vehicle movements can cause serious injury.

- ▶ Use wheel chocks to prevent the trailer from rolling away.
- ▶ Park the trailer on solid and level ground to avoid sinking in or tipping.
- ▶ During maintenance and repair work, observe the stability of the trailer.
- ▶ Observe the applicable national accident prevention regulations.

⚠ 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 that have been approved by the manufacturer.
- ▶ Observe the instructions concerning troubleshooting issued by the suppliers of the installed components.
- ▶ Verify functionality after installing/repairing components.

⚠ WARNING

Risk of injury due to hot hydraulic fluid!

The hydraulic fluid can get very hot during operation.

- ▶ Before maintenance and repair work on the hydraulic system, check the temperature and allow the hydraulic fluid to cool down if necessary.

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

- Care and cleaning
- Maintenance
- Repair

11.1 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.
- ▶ Do not clean brake hoses, gaskets and air lines with petrol, benzene, petroleum, or mineral oils.

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 direct the water jet directly onto electrical components, especially high-voltage components, plug connectors, seals, hoses, or gears.

NOTE

Material damage caused by road salt!

The use of road salt on public roads can damage the trailer if it is not cared for properly.

- ▶ After driving on roads treated with road salt, clean the trailer immediately with lots of cold water.
- ▶ Avoid warm water because it heightens the effect of the salt.

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 trailer

- ▶ Park the trailer on a level and firm surface.
- ▶ Apply the parking brake (see "5.7.2 Parking brake", pg. 49).
- ▶ Secure the trailer with wheel chocks (see "5.1 Using wheel chocks", pg. 27).
- ▶ Clean the trailer with lots of water and an acid-free and pH-neutral cleaning agent.
- ▶ Maintain a spraying distance of approx. 30 cm when using high-pressure cleaners.
- ▶ Allow the trailer to dry.
- ✓ The trailer is cleaned.
- ▶ Carry out a departure check (see "7.1 Commissioning before each trip", pg. 133).

Cleaning the curtain

Observe the following instructions when cleaning the side curtains:

- Vehicle cleaning should be confined to 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.

11.2 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).

⚠ WARNING

Risk of accident due to instability and rolling away!

Unintentional trailer movements can cause serious injury and property damage.

- ▶ Secure the trailer against rolling away by applying the parking brake.
- ▶ Use the wheel chocks to prevent the trailer from rolling away.
- ▶ Park the trailer on a solid surface to avoid sinking in or tipping.
- ▶ When the trailer is unhitched, ensure stability. If necessary, use additional supports.

The aim of maintenance is:

- that the commissioned trailer is kept operating safely and performing properly during use,
- to prevent downtimes,
- to keep the costs of operational readiness reasonable and financially justifiable,
- and to limit unavoidable repair expenditures.

11.2.1 Regular checks and functional testing

To ensure that the trailer is in proper operating condition, the safety-related equipment must be checked regularly for proper function, its effectiveness must be ensured and the recurring inspections must be performed.

- ▶ Prior to starting each trip, perform a departure check (see "7.1 Commissioning before each trip", pg. 133).
- ▶ Perform legally prescribed general inspections punctually.
- ▶ Observe the intervals and instructions for testing and maintenance of the supplied components (e.g. axles) contained within the respective supplied operating instructions.
- ▶ Report any detected safety defects:
 - Take the trailer out of operation if operational safety is not ensured.
 - When there is a change of shift, inform the colleague starting the next shift about observed defects and implemented measures.
- ▶ Perform the following checks and functional testing at the intervals prescribed:

Daily, or before every journey

| Component | Inspection |
|--|--|
| Rear underrun protection/side collision protection | ▶ Visually inspect for wear, damage and proper attachment. |
| Compressed air tank | ▶ Actuate the water drain valve (see "5.5 Draining the compressed air tanks", pg. 40). |
| Lighting equipment | ▶ Visually inspect to make sure it is working properly. |

| Component | Inspection |
|---|--|
| Landing leg winch | ▶ Visually inspect for wear, damage and proper attachment. |
| Hydraulic rear width expansion (optional) | ▶ Visually inspect for wear, damage, leakage and proper attachment, perform a functional test on the pump. |
| Kingpin/coupling plate | ▶ Visual check for wear, damage and proper attachment. |
| Kingpin/coupling plate | ▶ Visual check for wear, damage and proper attachment. |

Weekly

| Component | Inspection |
|------------------------|---|
| Compressed air tank | ▶ Perform a visual inspection for wear and damage. |
| Tyres | ▶ Check the tread depth, tyre pressure and uneven wear. |
| Kingpin/coupling plate | ▶ Lubricate with high-pressure grease |

- ▶ Go to an authorised specialist workshop if defects have been found.

11.2.2 Maintenance intervals for the authorised specialist workshop

| Assembly group | Maintenance work | Monthly | Every six months | Yearly |
|---|--|---------|------------------|--------|
| Wheels and tyres (see "11.2.4 Wheels and tyres", pg. 196) | <ul style="list-style-type: none"> ▶ Check the tightening torques of the wheel nuts. Additionally: For the first time after 50 and 100 km or after every wheel change ▶ Check the tyres and the tyre inflation pressure. ▶ Check the tyres for uneven wear. ▶ View the KRONE Trailer Axle separately (see "11.2.6 KRONE Trailer Axle", pg. 197). | | X | |
| Axle and suspension (see "11.2.5 Axle and suspension", pg. 196) | <ul style="list-style-type: none"> ▶ Check the tightening torque of the fixing bolts. ▶ Observe the maintenance instructions from the axle manufacturer. ▶ View the KRONE Trailer Axle separately (see "11.2.6 KRONE Trailer Axle", pg. 197). | X | | |
| Brake system (see "11.2.7 Brake system", pg. 209) | <ul style="list-style-type: none"> ▶ Check the screw connections (additionally: after the first trip). ▶ Check for brake pad wear. ▶ Check the brake discs/brake drums for damage and cracks. | | | X |

MAINTENANCE AND REPAIR

| Assembly group | Maintenance work | Monthly | Every six months | Yearly |
|---|---|---------|------------------|--------|
| Compressed air system (see "5.5 Draining the compressed air tanks", pg. 40) | <ul style="list-style-type: none"> ▶ Check the compressed air tank. ▶ Check the compressed air connections. ▶ Check the compressed air lines. | | | X |
| Landing leg winch | <ul style="list-style-type: none"> ▶ Visual check for wear on the spindle and spindle nut. | | | X |
| Lubrication points (see "11.2.8 Lubricating the trailer", pg. 210) | <ul style="list-style-type: none"> ▶ 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 "11.2.9 Electrical equipment", pg. 211) | <ul style="list-style-type: none"> ▶ Check all electrical components for proper function. | | | X |
| Contour marking (see "11.2.10 Contour marking", pg. 211) | <ul style="list-style-type: none"> ▶ Check the contour markings for completeness and legibility. | X | | |
| Bolted connections (see "11.2.11 Bolted connections", pg. 211) | <ul style="list-style-type: none"> ▶ Perform a visual inspection for wear and damage. | | | X |
| Superstructure (see "11.2.14 Superstructure", pg. 212) | <ul style="list-style-type: none"> ▶ Check the bolted connections. ▶ Check all the superstructure components and locks | | | X |

| | | | | |
|--|---|--|--|---|
| Container lock (see "11.2.15 Container lock", pg. 212) | <ul style="list-style-type: none"> ▶ Perform a visual inspection for wear and damage. | | | X |
| Kingpin (see "11.2.13 Kingpin and coupling plate", pg. 212) | <ul style="list-style-type: none"> ▶ Perform a visual inspection for wear and damage. ▶ Measure the wear and replace the kingpin if necessary. ▶ Check the mounting and tighten if required. ▶ Lubricate with high-pressure grease. | | | X |
| Load securing (see "11.2.12 Load securing", pg. 211) | <ul style="list-style-type: none"> ▶ Perform a visual inspection for wear and damage. | | | X |

11.2.3 Maintenance intervals for the driver

| Assembly group | Maintenance work | Monthly | Every six months | Yearly |
|---|--|---------|------------------|--------|
| Wheels and tyres (see "11.2.4 Wheels and tyres", pg. 196) | <ul style="list-style-type: none"> ▶ Check the tightening torques of the wheel nuts. ▶ Check the tyres for (uneven) wear and tyre inflation pressure. | X | | |
| Axle and suspension (see "11.2.5 Axle and suspension", pg. 196) | <ul style="list-style-type: none"> ▶ Observe the maintenance instructions from the axle manufacturer. ▶ View the KRONE Trailer Axle separately (see "11.2.6 KRONE Trailer Axle", pg. 197). | X | | |
| Compressed air system (see "5.5 Draining the compressed air tanks", pg. 40) | <ul style="list-style-type: none"> ▶ Check the compressed air tank. ▶ Check the compressed air connections. | | | X |

| Assembly group | Maintenance work | Monthly | Every six months | Yearly |
|--|--|---------|------------------|--------|
| Landing leg winch | <ul style="list-style-type: none"> ▶ Visual check for wear on the spindle and spindle nut. | | | X |
| Contour marking (see "11.2.10 Contour marking", pg. 211) | <ul style="list-style-type: none"> ▶ Check the contour markings for completeness and legibility. | X | | |
| Jack-up loading ramp | <ul style="list-style-type: none"> ▶ Lubricate the lubrication points according to the lubrication schedule. ▶ Check all of the parts for firm seating. ▶ Observe the maintenance instructions from the manufacturer. | | X | |
| Kingpin (see "11.2.13 Kingpin and coupling plate", pg. 212) | <ul style="list-style-type: none"> ▶ Perform a visual inspection for wear and damage. | | | X |
| Container lock (see "11.2.15 Container lock", pg. 212) | <ul style="list-style-type: none"> ▶ Perform a visual inspection for wear and damage. | | | X |
| Lubrication points (see "11.2.8 Lubricating the trailer", pg. 210) | <ul style="list-style-type: none"> ▶ 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 "11.2.12 Load securing", pg. 211) | <ul style="list-style-type: none"> ▶ Perform a visual inspection for wear and damage. | | | X |

11.2.4 Wheels and tyres

- ▶ Check the tightening torques of the wheel nuts. The tightening torque depends on the rim design.
- ▶ Observe the supplier documentation.
- ▶ Check the remaining tread depth on the tyres (at least 1.6 mm).
- ▶ Check the tyres for abrasion shape and damage. Tyre that are worn on one side or both sides affect the fuel consumption and handling of the vehicle.
- ▶ Check the tyre inflation pressure regularly according to the manufacturer specifications on the tyres when they

are cold, and correct if necessary. The tyre inflation pressure depends on the technical characteristics of the tyre.

- ▶ Drive only with approved rim and tyre combinations.
- ▶ Observe the seasonal tyres (summer or winter tyres) for the trailer.

11.2.5 Axle and suspension

⚠ DANGER

Danger to life from electrical voltage

Damaged high-voltage components in the axle area pose a risk to life due to electrical voltage.

- ▶ Work on high-voltage electrical components in the area of a generator axle may only be performed by qualified electricians or instructed persons under the supervision and oversight of an electrician in accordance with the electrical regulations.
- ▶ Perform a visual inspection for wear and damage.
- ▶ Have defective or damaged components replaced.
- ▶ Check the tightening torque of the fixing bolts.
- ▶ Observe the maintenance instructions from the axle manufacturer.

11.2.6 KRONE Trailer Axle

In addition to the general safety inspections in accordance with statutory regulations, for KRONE axle assemblies there is the visual inspection of the components and threaded unions. This maintenance work may only be performed by an authorised specialist workshop. For the check, the threaded unions should be checked visually as specified and if necessary, checked for firm seat with the torque spanner. With regards to the maintenance, re-




place the screw fittings, if necessary, and tighten them to the prescribed torque (among other things, rust and settling signs can be an indication of loose fittings). Also observe the maintenance instructions of the installed supplied components.

In the maintenance intervals, you will find the maximum maintenance work for the vehicle when used on the road. The maintenance intervals are shortened accordingly when using the vehicle off-road or depending on the driving style, and must be adjusted individually. To ensure proper operating condition of the KRONE Trailer Axle, the following maintenance work must be carried out:





- ▶ Perform regular visual inspections.
- ▶ Observe the maintenance intervals.
- ▶ Observe the applicable current national and international regulations.
- ▶ Report any safety faults determined to the operator.
- ▶ Take the KRONE Trailer Axle out of service in the event of poor operational safety.
- ▶ If there is a fault, have the KRONE Trailer Axle repaired by an authorised specialist workshop.
- ▶ Properly performed maintenance work must be documented in the maintenance master data sheet.



All maintenance intervals and work are listed on the following page and shown in an overview.







Maintenance intervals for the authorised specialist workshop (disc brake)


| Air suspension | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|------------------------------|---|---------|----------------|----------------|--------|
| Air spring bracket Pos. 1 |  | | | | X |
| Shock absorber Pos. 3 |  | | | | X |
| Integration Pos. 4 |  | | | | X |


MAINTENANCE AND REPAIR

| Air suspension | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|-----------------------------|---|---------|----------------|----------------|--------|
| Air spring bellow Pos. 5 |  | | | | X |
| Thrust washers Pos. 6 |  | | | | X |
| Silent block Pos. 12 |  | | | | X |
| Link fitting Pos. 15 |  | | | | X |

| Wheel bearing unit | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|------------------------------|---|---|----------------|----------------|--------|
| Wheel bearing unit Pos. 2 |  | When changing a brake disc | | | |
| Torx screws Pos. 7 |  | When fitting the wheel flange and after every brake disc change, tighten up after 100 km. | | | |


| Brake | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|---|---|---|----------------|----------------|--------|
| Wheel nuts Pos. 8 |   | During initial commissioning and after every wheel change, tighten up after 100 km. | | | |
| Brake disc Pos. 9 |  | | | X | |
| Brake pad Pos. 10 |  | | X | | |
| Brake calliper* Pos. 11 |  | | | | X |
| Brake cylinder Pos. 14 |  | | | X | |
| * Observe the maintenance instructions from the manufacturer. | | | | | |

| Twinlift | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|---------------------------|---|---------|----------------|----------------|--------|
| All components Pos. 16 |  | | | X | |

| Axle body | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|---------------------------|---|---------|----------------|----------------|--------|
| All components Pos. 13 |  | | | X | |

| Self-steering axle | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|-------------------------|---|---------|----------------|----------------|--------|
| Steering pin Pos. 17 |  | | | | X |
| Steering pin Pos. 18 |  | | X | | |
| Tie rod end Pos. 19 |  | | | | X |

Maintenance intervals for the driver (disc brake)

| Brake | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|----------------------|---|--|----------------|----------------|--------|
| Wheel nuts Pos. 8 |  | Visual inspection for wear and damage before each trip. After each wheel change, tighten up after 100 km. Tightening torque: 630 Nm +/- 30 Nm Test torque: 600 Nm | | | |

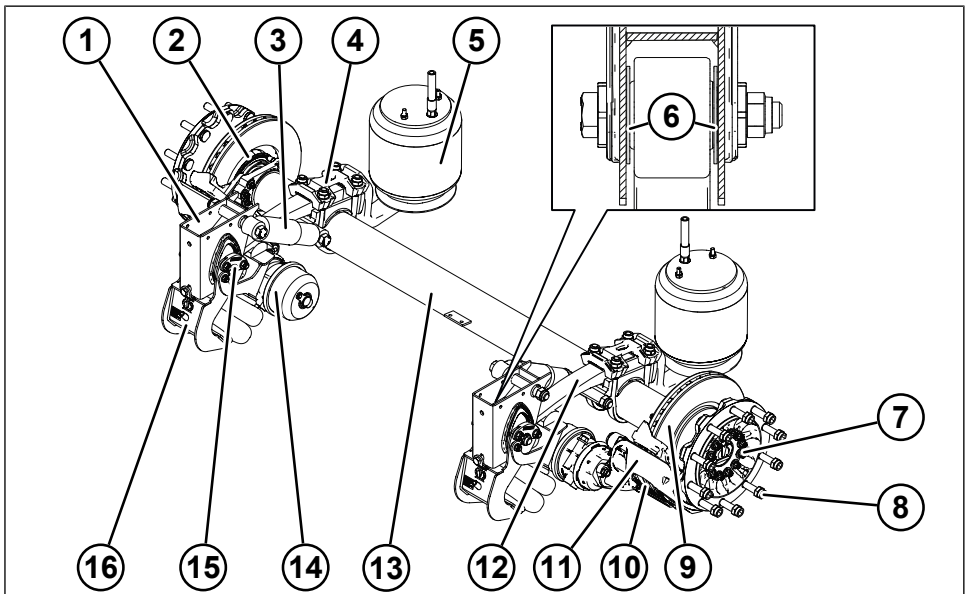


Fig. 11-1: Overview of disc brake maintenance (air spring link up)

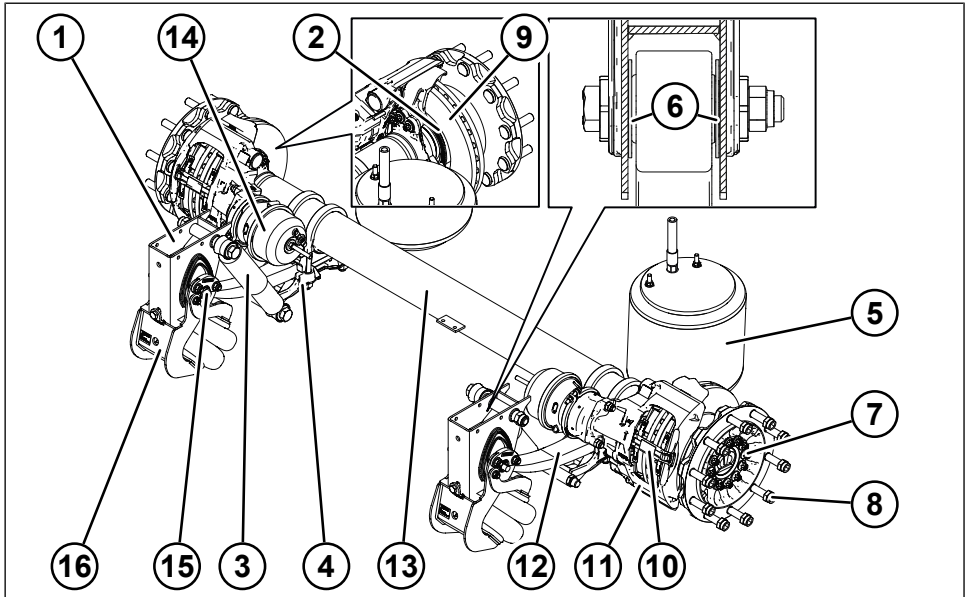


Fig. 11-2: Overview of disc brake maintenance (air suspension down)

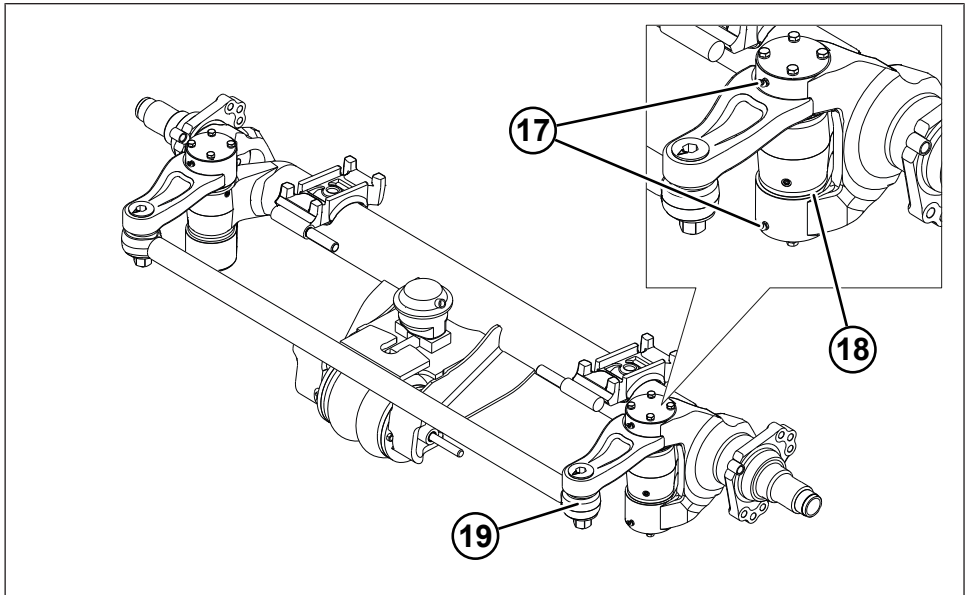















Fig. 11-3: Additional maintenance overview for self-steering axles






Maintenance intervals for the authorised specialist workshop (drum brake)

| Air suspension | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|------------------------------|---|---------|----------------|----------------|--------|
| Air spring bracket Pos. 1 |  | | | | X |
| Shock absorber Pos. 2 |  | | | | X |
| Integration Pos. 3 |  | | | | X |
| Air spring bellow Pos. 8 |  | | | | X |
| Thrust washers Pos. 7 |  | | | | X |
| Silent block Pos. 12 |  | | | | X |
| Link fitting Pos. 13 |  | | | | X |

| Brake | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|---------------------------|---|---|----------------|----------------|--------|
| Brake camshaft Pos. 4 |  | | | X | |
| ASA Pos. 5 |  | | | X | |
| Brake cylinder* Pos. 6 |  | | | X | |
| Wheel nuts Pos. 10 |  | During initial commissioning and after every wheel change, tighten up after 100 km. | | | |
| Brake drum Pos. 11 |  | | | X | |
| Brake pad Pos. 16 |  | | X | | |



* Observe the maintenance instructions from the manufacturer.

MAINTENANCE AND REPAIR

| Wheel hub unit | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|-------------------------------|---|--|----------------|----------------|--------|
| Wheel hub unit Pos. 9 |  | | | X | |
| Outer/inner bearing Pos. 9 |  | | | | X |
| Bearing grease Pos. 9 |   | The bearing grease must be replaced every 5 years (check the bearing). | | | |
| Seal Pos. 9 |  | The seal must be replaced every 5 years. | | | |

| Twinlift | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|---------------------------|---|---------|----------------|----------------|--------|
| All components Pos. 14 |  | | | X | |
| Axle body | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
| All components Pos. 15 |  | | | X | |

Maintenance intervals for the driver (drum brake)

| Brake | Maintenance work | Monthly | Every 3 months | Every 6 months | Yearly |
|-----------------------|---|--|----------------|----------------|--------|
| Wheel nuts Pos. 10 |   | Visual inspection for wear and damage before each trip. After each wheel change, tighten up after 100 km. Tightening torque: 630 Nm +/- 30 Nm Test torque: 600 Nm | | | |

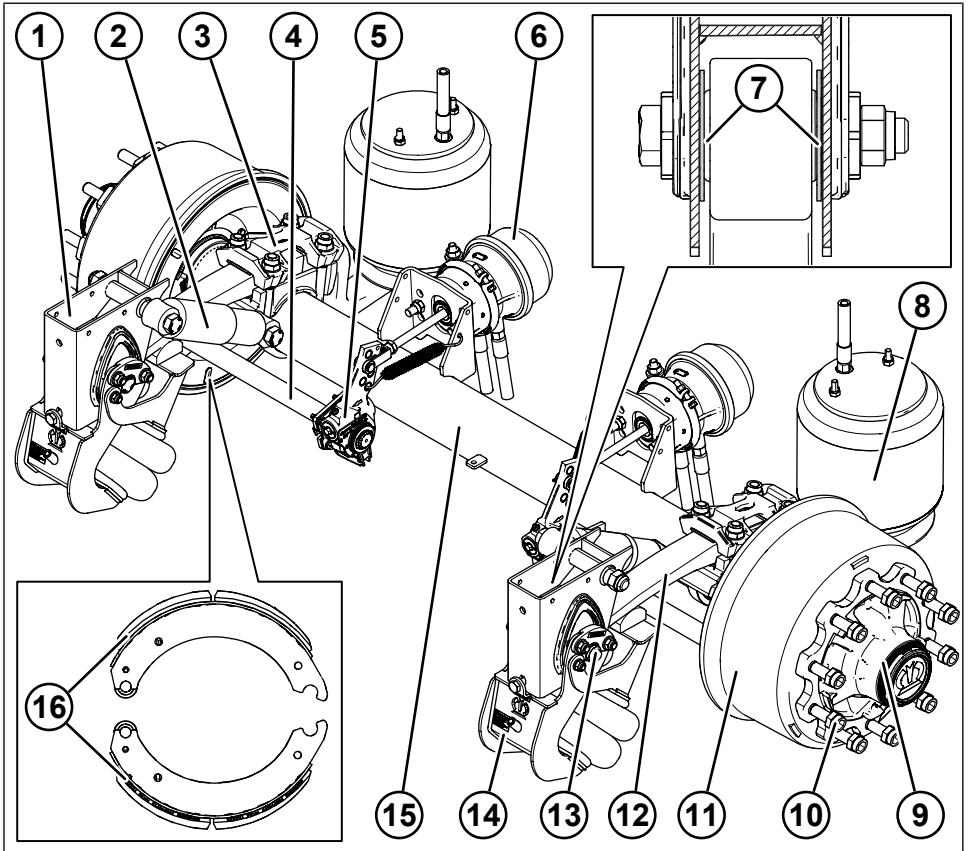


Fig. 11-4: Drum brake maintenance overview

Maintenance master data sheet

- ▶ All properly performed maintenance work must be documented in the maintenance master data sheet.

| Inspection after max. 1,000-1,500 km | |
|---|--------------------------|
| Bolted connections checked and tightened with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| After the first laden journey: | |
| Always check screw connections in accordance with the detailed maintenance guidelines in the maintenance booklet and re-tighten if necessary. | |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 1st maintenance | |
|--|--------------------------|
| Brake pads checked. | <input type="checkbox"/> |
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 1st maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |

| 2nd maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

| 2nd maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 3rd maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 3rd maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

| 4th maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

| 4th maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 5th maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 5th maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

| 6th maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

| 6th maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 7th maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 7th maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

| 8th maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

| 8th maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 9th maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 9th maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

| 10th maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

| 10th maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 11th maintenance | |
|--|--------------------------|
| Maintenance work performed according to the detailed maintenance instructions. | <input type="checkbox"/> |
| Brake pad thickness | |
| 1st axle, left: | mm |
| 1st axle, right: | mm |
| 2nd axle, left: | mm |
| 2nd axle, right: | mm |
| 3rd axle, left: | mm |
| 3rd axle, right: | mm |
| Mileage/km reading: | |
| Repair order no.: | |
| Date, signature: | |
| Company stamp of specialist workshop: | |

| 11th maintenance | |
|--|--------------------------|
| Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations. | <input type="checkbox"/> |
| Chassis checked for wear, leaks and damage. | <input type="checkbox"/> |
| Air spring bellows checked. | <input type="checkbox"/> |
| Brake system checked for leaks. | <input type="checkbox"/> |
| Braking effect for the service and parking brake checked. | <input type="checkbox"/> |
| Brake pads checked. | <input type="checkbox"/> |

11.2.7 Brake system

WARNING

Risk of accident caused by defective brakes!

A failure or defect of the brake system can lead to serious accidents.

- ▶ Drive only with properly functioning brake system.
- ▶ In case of defect or wear, park the trailer immediately.
- ▶ Abnormalities or malfunctions of the brake system must be immediately repaired by an authorised specialist workshop.
- ▶ Have the trailer towed if necessary.

Checking the axles/brake system

- ▶ Check all bolted connections on new trailers after repairs, after the first trip or at the latest after 1,000 km.
- ▶ Retighten bolted connections with the tightening torques specified by the manufacturer.
- ▶ Observe the maintenance instructions of the installed supplied components.
- ▶ Immediately consult an authorised specialist workshop if there are defects with the brake or ABS/EBS system (see "10.2 Fixing braking abnormalities", pg. 187).

Servicing the diagnostics connection for the EBS brake system

The EBS diagnostics connection is established using the EBS plug connector (ISO 7638, 7-pin) at the front of the vehicle. The diagnosis may only be performed by an authorised specialist workshop.

- ▶ Keep the protective caps closed to prevent soiling.

Brake pad conditioning

⚠ WARNING

Risk of accident due to rear-end collision!

When performing braking for conditioning, other road users can collide with the rear of your trailer and seriously injure themselves.

- ▶ When performing the braking for conditioning, make sure that other road users are not endangered by this action.

In order to obtain maximum performance and a long service life for the brake pads, the brake pads must be in an optimum condition. It may be necessary to condition the brake pad for this optimum condition due to underloading, weather conditions and when the trailer has been stood idle for a long period of time.

- ▶ As a preventative measure, perform the conditioning by braking accordingly.
- ▶ Procedure:
 - Strong braking and/or dragging brakes
 - Then allow the brake pads to cool down
 - Repeat in a cyclical loading mode
- ▶ Observe other technical information from the axle manufacturer regarding the topic of "Conditioning".

Obtaining the reference braking values

The reference braking values are used as the default for the legal brake tests. The reference braking values for every current trailer can be obtained on the KRONE website (see "13.2 Customer service and support", pg. 217).

11.2.8 Lubricating the trailer

NOTE

Material damage caused by dry lubrication points!

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

- ▶ Lubricate the trailer regularly.
- ▶ Top up the grease on all the lubrication points.
- ▶ Lubricate moving parts on the superstructure (e.g. door locks, hinges) as needed.
- ▶ Lubricate the ratchet for the rear curtain tensioning device after cleaning.

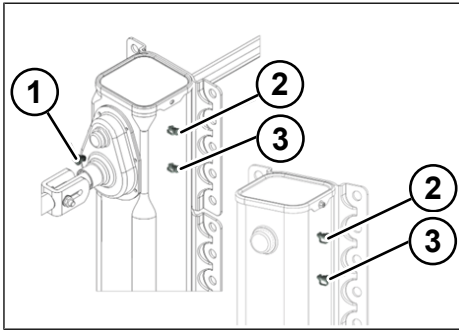


Fig. 11-5: Lubrication points for landing leg winches

- 1 Grease nipple for gearbox
- 2 Grease nipple for spindle
- 3 Grease nipple for spindle nut

Lubricate KRONE landing leg winches for the first time after three years and then annually.

- ▶ Remove the grease nipple cover and fill it with 100 g of grease
- ▶ Put the cover back on.
- ▶ Lubricate the spindle and spindle nut of the KRONE landing leg winches for the first time after three years and then annually.
- ▶ Crank the landing leg out to the red mark if possible.
- ▶ Remove the grease nipple covers.
- ▶ Fill the spindle grease nipple with 200 g of grease.
- ▶ Fill the spindle nut grease nipple with 100 g of grease.
- ▶ Unscrew the spindle as far as it will go and screw it back in again.
- ▶ Put both covers back on.
- ▶ Also observe the enclosed supplier documentation.

11.2.9 Electrical equipment

- ▶ Perform a visual check of the electrical connections for the lighting and ABS/EBS for wear and damage.

- ▶ 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, particularly on high-voltage components, performed by trained electricians, or by personnel trained especially for the purpose, in accordance with all applicable safety rules and regulations.

11.2.10 Contour marking

- ▶ Perform a regular visual check of the contour markings.
- ▶ Pay attention to damage, soiling and visibility.
- ▶ Have defective or damaged contour markings replaced.

11.2.11 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.

11.2.12 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.

11.2.13 Kingpin and coupling plate

WARNING

Risk of accident caused by wear!

A worn kingpin can cause the trailer to be ripped off while driving and result in serious injuries and material damage.

- ▶ Check the wear on the kingpin regularly.
- ▶ Worn kingpins must be replaced by an authorised specialist workshop.
- ▶ Check the kingpin and coupling plate for wear and damage.

INFO

Observe the maintenance instructions, dimensions and values of the kingpin manufacturer. Worn kingpins must be checked and replaced by an authorised specialist workshop.

- ▶ Check the mounting and tighten the fastening bolts if required.
- ▶ Lubricate the kingpin and coupling plate with high pressure grease.

11.2.14 Superstructure

- ▶ Inspect all superstructure components for proper function, wear, and damages.

- ▶ Have defective or damaged components replaced immediately.
- ▶ Keep the components in clean condition.

11.2.15 Container lock

- ▶ Perform a visual inspection for wear and damage.
- ▶ Have defective or damaged components replaced.
- ▶ Ensure that the fall protection is functional.

11.2.16 Tail lift batteries

WARNING

Risk of explosion due to released gases!

Gases released from the battery can explode, thereby injuring people and causing material damage.

- ▶ Turn off the tractor unit's motor while servicing the battery.
- ▶ Avoid fire, naked lights, sparks, and smoking near the batteries.

CAUTION

Risk of injury due to battery acid!

- ▶ Wear protective gloves and glasses when servicing batteries.
- ▶ Immediately rinse off acid splashes with clear water.

INFO

Be mindful of the capacity when replacing batteries. The capacity must match the generator output of the tractor unit. The battery capacity is indicated on the housing.

- ▶ Regularly check the charge state.
- ▶ Avoid damage due to deep discharging when the batteries are under high burden. If necessary, use an external charger.
- ▶ Regularly check the acid condition.

11.2.17 Pallet storage boxes

- ▶ Open the pallet storage box (see "5.19.2 Pallet storage box", pg. 71).
- ▶ Clean and grease the area of the guide rails on both sides across the entire length.

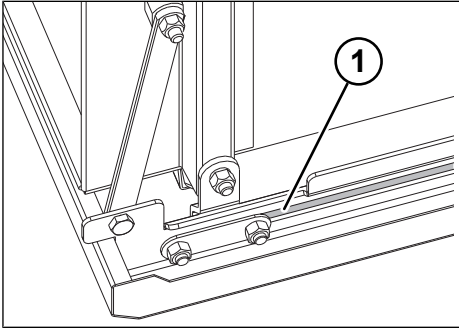


Fig. 11-6: Pallet storage box

1 Guide rails

11.3 Repair

⚠ DANGER

Risk of accident due to unintended vehicle movements!

Unintended vehicle movements can cause serious injury.

- ▶ Use wheel chocks to prevent the trailer from rolling away.
- ▶ Park the trailer on solid and level ground to avoid sinking in or tipping.
- ▶ During maintenance and repair work, observe the stability of the trailer.
- ▶ Observe the applicable national accident prevention regulations.

⚠ 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 that have been approved by the manufacturer.
- ▶ 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 "13.1 Spare parts", pg. 217).

- Always replace any removed seals with new seals.
- Welding work on the frame, chassis or on bearing parts may only be performed after consultation with KRONE customer service and KRONE construction.

Replacing defective bulbs

WARNING

Risk of accident due to defective bulbs!

Defective bulbs cause poor visibility and insufficient perception by third parties. There is a risk of traffic accidents.

- ▶ Replace defective bulbs immediately.

Defective bulbs can be replaced by the driver.

- Use similarly rated bulbs as replacements.
- Switch off the lighting system when changing bulbs to prevent a short circuit.
- Check the fuses of the lighting system if necessary.
- Observe the supplier documentation when replacing bulbs.
- If there are frequently occurring defects, have the electrical system checked out by an authorised specialist workshop.

12 Decommissioning

12.1 Temporary decommissioning

NOTE

Material damage caused by long downtimes!

If the decommissioning lasts for several months, the tyres can be damaged by storage deterioration.

- ▶ Move the trailer once a month to prevent the tyres from deteriorating during storage.

The following measures need to be taken to temporarily decommission the trailer:

- ▶ Clean the trailer.
- ▶ Drive the trailer onto firm and level ground.
- ▶ If necessary, protect the trailer from excess water and snow loads.
- ▶ Apply the parking brake (see "5.7.2 Parking brake", pg. 49).
- ▶ Secure the trailer against rolling away (see "5.1 Using wheel chocks", pg. 27).
- ▶ Drain the brake system (see "5.5 Draining the compressed air tanks", pg. 40).
- ▶ Before the start of the frosty period, fill up the brake lines with antifreeze (see "5.5 Draining the compressed air tanks", pg. 40).
- ▶ Close off the coupling heads for the supply and control connections separately with protective caps.
- ▶ Observe the instructions for decommissioning the installed supplied components.
- ✓ The trailer is temporarily decommissioned.

12.2 Recommissioning

⚠ WARNING

Risk of accident and material damage due to lack of checks!

After longer downtimes, the wear condition of the KRONE trailer's axle can change. Operating the axle when not in perfect technical condition can lead to serious accidents or material damage.

- ▶ Perform a component check before driving for the first time.
- ▶ Fix any detected faults before driving off.
- ▶ Serious faults must be repaired by an authorised specialist workshop.

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

- ▶ Perform a general visual inspection.
- ▶ Check the entire lighting system.
- ▶ Check the tyre inflation pressure, age and condition of the tyres.
- ▶ Check the function of the brake system.
- ▶ Check the function of the air suspension.
- ▶ Grease the lubrication points.
- ▶ Carry out a departure check (see "7.1 Commissioning before each trip", pg. 133).
- ▶ Check the coupling heads for the supply and control connections for cleanliness and functioning seals.
- ▶ Observe the other applicable operating instructions for recommissioning the installed supplied components.
- ✓ The trailer has been put back into operation again.

12.3 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 final decommissioning, the trailer must be disposed of properly. In doing so, the electrical, pneumatic and hydraulic components must be disposed of separately.

To fully decommission the trailer and to dispose of it properly, the following actions must be performed:

- ▶ Ensure that the disposal is done properly and in an environmentally sound way.
- ▶ Have the trailer 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 trailer is permanently taken out of operation and disposed of.

13 Spare parts and customer service

13.1 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 or on the KRONE website. An electronic spare parts catalogue is available on the website.

Spare parts

Phone: +49 (0) 59 51 / 209-302

email: Ersatzteile.nfz@krone.de

Internet: www.krone-trailer.com



Spare parts catalogue

13.2 Customer service and support

The Customer Service Department can be reached using the following contact data:

Customer Service

Phone: +49 (0) 59 51 / 209-320

email: kd.nfz@krone.de

Internet: www.krone-trailer.com/service/kundendienst

KRONE Telematics Support

Telephone: +49 5951 209-220

email: telematics.nfz@krone.de

13.3 Test certificate for load securing

The document to certify testing of the superstructure can be downloaded from the KRONE website in the download area.

14 Technical data

14.1 Plugs and socket pin assignments

14.1.1 Socket S (white) ISO 3731, 7-pin

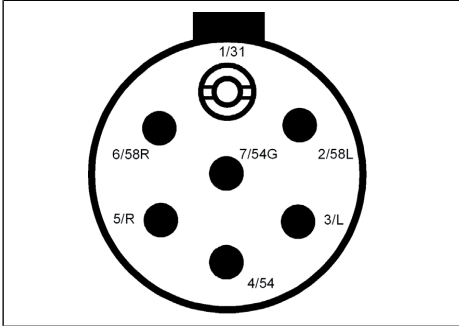


Fig. 14-1: Socket ISO S 3731, 7-pin

| Contact no. | Colour | Function |
|-------------|--------|-------------------------------|
| 1/31 | White | Ground |
| 2/58L | Black | Unassigned |
| 3/L | Yellow | Reversing light |
| 4/54 | Red | Permanent power (+24 V) |
| 5/R | Green | Steering axle lock (optional) |
| 6/58R | Brown | Lift axles (optional) |
| 7/54G | Blue | Rear fog light |

14.1.2 Socket N (black) ISO 1185, 7-pin

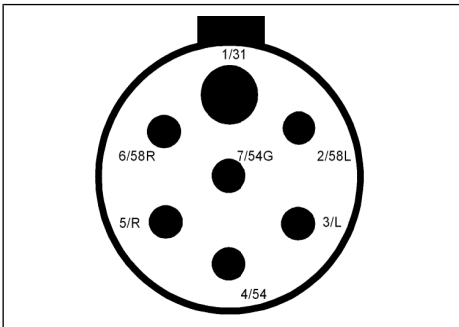


Fig. 14-2: Socket ISO N 1185, 7-pin

| Contact no. | Colour | Function |
|-------------|--------|--|
| 1/31 | White | Ground |
| 2/58L | Black | Rear, boundary and licence plate lights, left-hand side |
| 3/L | Yellow | Direction indicator, left |
| 4/54 | Red | Brake light |
| 5/R | Green | Direction indicator right |
| 6/58R | Brown | Rear, boundary and licence plate lights, right-hand side |
| 7/54G | Blue | Unassigned |

14.1.3 Socket ISO 12098, 15-pin

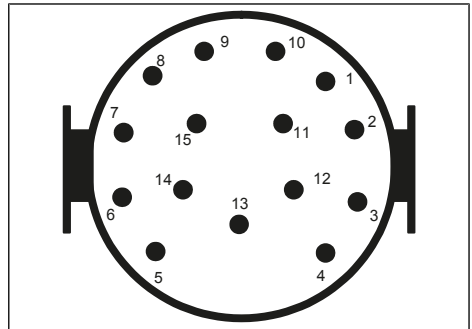


Fig. 14-3: Socket ISO12098, 15-pin

| Contact no. | Colour | Function |
|-------------|--------|--|
| 1 | Yellow | Direction indicator, left |
| 2 | Green | Direction indicator right |
| 3 | Blue | Rear fog light |
| 4 | White | Ground |
| 5 | Black | Rear, boundary and licence plate lights, left-hand side |
| 6 | Brown | Rear, boundary and licence plate lights, right-hand side |
| 7 | Red | Brake light |
| 8 | Pink | Reversing light |
| 9 | Orange | Permanent power (+24 V) |

| Contact no. | Colour | Function |
|-------------|--------|-------------------------------|
| 10 | | Steering axle lock (optional) |
| 11 | | Unassigned |
| 12 | Grey | Lift axles (optional) |
| 13 | | Unassigned |
| 14 | | Unassigned |
| 15 | | Unassigned |

14.2 Vehicle

The technical data can vary depending on the vehicle equipment. A list of the technical data for all variants is not possible here. The vehicle-specific technical data is noted in the vehicle documents. The measurements and weights in the following table refer to the basic vehicle model.

Profi Liner with sliding curtain superstructure (SDP 27 eLB50-CS)

| Dimensions and weights | |
|--------------------------------|-------------------|
| Permitted total weight | 39,000 kg |
| Fifth-wheel load | 12,000 kg |
| Axle load | 27,000 kg |
| Dead weight | approx. 5,940 kg |
| Payload | approx. 33,060 kg |
| Unloaded fifth coupling height | 1,050 – 1,200 mm |
| Axle distances | 1,310 mm |
| Construction height, front | 125 mm |
| Internal clearance length | 13,620 mm |
| Internal clearance width | 2,480 mm |
| Clear lateral loading height | 2,600 – 2,700 mm |
| Outer width | 2,550 mm |

Mega Liner with sliding curtain superstructure (SDP 27 eLG50-CS)

| Dimensions and weights | |
|--------------------------------|-------------------|
| Permitted total weight | 39,000 kg |
| Fifth-wheel load | 12,000 kg |
| Axle load | 27,000 kg |
| Dead weight | approx. 6,350 kg |
| Payload | approx. 32,650 kg |
| Unloaded fifth coupling height | 950 – 1,160 mm |
| Axle distances | 1,310 mm |
| Construction height, front | 80 mm |
| Internal clearance length | 13,620 mm |
| Internal clearance width | 2,480 mm |
| Clear lateral loading height | 2,595 - 2,845 mm |
| Outer width | 2,550 mm |
| | |

Paper Liner with sliding curtain superstructure (SDP 27 eLBP4-CS)

| Dimensions and weights | |
|--------------------------------|-------------------|
| Permitted total weight | 39,000 kg |
| Fifth-wheel load | 12,000 kg |
| Axle load | 27,000 kg |
| Dead weight | approx. 6,770 kg |
| Payload | approx. 32,230 kg |
| Unloaded fifth coupling height | 1,070 – 1,250 mm |
| Axle distances | 1,310 mm |
| Construction height, front | 125 mm |
| Internal clearance length | 13,620 mm |
| Internal clearance width | 2,480 mm |
| Clear lateral loading height | 2,000 - 2,800 mm |
| Outer width | 2,550 mm |

Coil Liner with sliding curtain super-structure (SDP 27 eLCQ41-CS)

| Dimensions and weights | |
|--------------------------------|-------------------|
| Permitted total weight | 39,000 kg |
| Fifth-wheel load | 12,000 kg |
| Axle load | 27,000 kg |
| Dead weight | approx. 6,830 kg |
| Payload | approx. 32,170 kg |
| Unloaded fifth coupling height | 1,070 – 1,250 mm |
| Axle distances | 1,410 / 1,310 mm |
| Construction height, front | 152 mm |
| Internal clearance length | 13,620 mm |
| Internal clearance width | 2,480 mm |
| Clear lateral loading height | 2,000 - 2,800 mm |
| Outer width | 2,550 mm |

Further information can be found on our website www.krone-trailer.com.

14.3 products

KRONE support device

| Type number | Lift |
|------------------------|--------|
| K350FG with gearbox | 350 mm |
| K350FW without gearbox | 350 mm |
| K400FG with gearbox | 400 mm |
| K400FW without gearbox | 400 mm |
| K450FG with gearbox | 450 mm |
| K450FW without gearbox | 450 mm |

| Dimensions and weights | |
|------------------------|----------------|
| Weight | Approx. 120 kg |
| Lifting capacity | 25,000 kg |
| Static test load | 60,000 kg |
| Weight | 89 kg |

| Dimensions and weights | |
|---------------------------------------|----------|
| Lift per crank rotation in high speed | 11.64 mm |
| Lift per crank rotation in load speed | 0.87 mm |

Hydraulic rear width expansion

| Technical data | |
|---------------------|----------------------------|
| Pump weight | 7.35 kg |
| Flow rate | 25 cm ³ /stroke |
| Tank capacity | 3 litres |
| max. perm. pressure | 250 bar |
| Temperature range | -40 °C/+70 °C |

Lifting roof central hydraulic system

| Technical data | |
|---------------------|---------------------------|
| Pump weight | 6.1 kg |
| Flow rate | 5 cm ³ /stroke |
| Tank capacity | 1 litres |
| max. perm. pressure | 6.5 - 8 bar |
| Temperature range | -20 °C/+50 °C |

KRONE Smart Collect telematics unit

| Technical data | |
|-----------------------|---|
| Width | 138 mm |
| Height | 66 mm |
| Depth | 186 mm |
| Weight | approx. 950 g incl. battery |
| Power supply | 12 V or 24 V nominal, minimum/maximum 7 – 36 V DC |
| Protection category | IP6K9K |
| Operating temperature | -30°C to +70°C |
| Storage temperature | 40°C to +85°C |
| Operating humidity | 10 % to 90 % (non-condensing) |
| Storage humidity | 10 % to 90 % (non-condensing) |

| Technical data | |
|---------------------------|--|
| Radio systems | GSM: LTE Cat, M1, NB-IoT, 2G fallback |
| | GNSS: GPS, GLONASS, Galileo or BeiDou |
| | WLAN (2.4 GHz, 802.11 a/b/g/n) |
| Internal antenna | GNSS |
| | GSM |
| | WLAN |
| SIM card | Operation with mini-SIM card (form factor M2FF) |
| | Alternative: operation without SIM card for CDMA-2000 |
| Display | 5 LEDs: Status / GPS / GSM-UMTS / WLAN / LAN |
| Power supply unit/battery | Internal power supply for nominal supply voltages of 12 V or 24 V |
| | 10 Wh battery for operation over several weeks (depending on the frequency and extent of the regular activities) |

Protection category

Telematics unit Krone Smart Collect KSC fulfils the following requirements of the protection category.

Standard: ISO 20653

IP code: P6K9K (**K**: Protects the electronics inside the housing against ingress of dust particles. **9K**: Protection of the electronics within the enclosure from damage that can be caused by the use of high pressure water when cleaning vehicles.

KRONE Capacity Management System camera system

| Technical data | |
|-----------------------|-------------------|
| Power consumption | < 3.5 Watts |
| Storage temperature | -30 °C to +80 °C. |
| Operating temperature | -20 °C to +70 °C. |
| Weight | Approx. 0.4 kg |

| Technical data | |
|--------------------|---|
| Housing | Aluminium housing, powder coated |
| Type of protection | Resistant to immersion and high-pressure cleaners (IP68 and IP69K) according to ISO 20653 and IEC 60529 |
| Angle of view | 56° horizontal, 110° diagonal |
| Night vision | IR up to 10 m |
| Dimensions | 80 x 55 x 67 mm |

KRONE Smart Tyre Monitoring tyre pressure monitoring system

| | |
|---|--|
| Dimensions of the electronic control unit | 145 x 82 x 28 mm |
| Weight of the electronic control unit | 200 g |
| Power supply | Compatible with vehicle power supply, 12 V / 24 V DC |
| Housing degree of protection | Resistant to immersion and high-pressure cleaners (IP69K) according to ISO 20653 and IEC 60529 |
| Operating temperature | -40 °C +- 85 °C |
| Transmission frequency | 433.92 MHz |
| Conformity | UN ECE R141 |
| Inflation pressure | Value range: 0 ... 12 bar Accuracy: +- 200 mBar |
| Temperature | Value range: -40°C ... 115 °C Accuracy: +- 3 °C. |

15 Legal requirements

LED class 1

The device is a LED class 1 Risk Group 0 product (no or minimal risk, no risk to eyesight) and satisfies the requirements of EN60825-1:2003.

AEF certification

The four effective components on the ISO-BUS according to ISO 11783 have the following AEF certifications:

- "combicfd" (combined Control Function):
 - Minimum CF
 - UT Client
- "tclogd" (Task Controller Logger Daemon):
 - Minimum CF
- "gpscand" (GPS positional data via NMEA200 on CAN):
 - Minimum CF
- "isobusfs" (ISOBUS File Server):
 - Minimum CF

Explanation of FCC regulations

The KRONE Smart Collect telematics unit has been tested and meets the requirements for levels for a Class A digital device, in accordance with Part 15 of the FCC rules.

E1 Type approval

Telematics unit Krone Smart Collect KSC 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

Along with registration in EU countries, the radio approval of the KCS variants with UMTS module (with and without WLAN) is valid for the following countries:

- Egypt
- Albania

- Algeria
- Libya
- Macedonia
- Morocco
- Montenegro
- Norway (EFTA)
- Russia
- Switzerland (EFTA)
- Serbia
- Tunisia
- Turkey
- Ukraine
- Belarus

Type approval according to ECE R13 (EMC)

The LUIS Smart LOAD Ethernet camera TX has been tested under UN guidelines ECE R13 as an ESA (Electrical sub-assembly) and has type approval for use in traffic on public roads.

EU Declaration of Conformity according to 2014/30/EU (EMC)

LUIS Technology GmbH hereby declares that the LUIS Smart LOAD Ethernet camera TX complies with Directive 2014/30/EU.

UKCA Declaration of Conformity according to BS EN 61000-6-3:2007

LUIS Technology GmbH hereby declares that the LUIS Smart LOAD Ethernet camera TX complies with the guideline BS EN 61000-6-3:2007.

16 CE documents

**Original - EG-Einbauerklärung nach
Maschinenrichtlinie 2006/42/EG Anhang II 1.B**



Der Hersteller/Inverkehrbringer

Fahrzeugwerk Bernard KRONE GmbH & Co. KG
Bernard-Krone-Straße 1
49757 Werlte

erklärt hiermit, dass folgendes Produkt

Produktbezeichnung: Hydraulische Heckverbreiterung 2019

Fabrikat:

Seriennummer:

Serien-/Typenbezeichnung:

Beschreibung: Mit der Hydraulischen Heckverbreiterung kann das Heck des Fahrzeuges je Seite bis zu 500 mm ausgefahren werden, um den Be- und Entladevorgang zu erleichtern.

den folgenden grundlegenden Anforderungen der Richtlinie 2006/42/EG entspricht: Nr. 1.1.2; 1.1.3; 1.1.5; 1.3.1; 1.3.2; 1.3.4; 1.3.7; 1.5.4; 1.7.3; 1.7.4

Die Inbetriebnahme dieses Produkts ist so lange untersagt, bis die Maschine oder die Anlage, in welche dieses Produkt eingebaut werden soll oder von welcher es eine Komponente darstellt, den Bestimmungen aller relevanten Richtlinien entspricht.

Folgende harmonisierte Normen wurden angewandt:

| | |
|-------------------|---|
| EN ISO 12100:2010 | Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikomindepfung (ISO 12100:2010) |
| EN ISO 4413:2010 | Fluidtechnik – Allgemeine Regeln und sicherheitstechnische Anforderungen an Hydraulikanlagen und deren Bauteile (ISO 4413:2010) |

Für das Produkt wurden die speziellen technischen Unterlagen gemäß Anhang VII Teil B erstellt, auf begründetes Verlangen können diese Unterlagen einer einzelstaatlichen Stelle per Post übermittelt werden.

Name und Anschrift der Person, die bevollmächtigt ist, die technischen Unterlagen zusammenzustellen:

Gerhard Papenbrock

Fahrzeugwerk Bernard KRONE GmbH & Co. KG
Bernard-Krone-Straße 1
49757 Werlte

Werlte, den
(Ort, Datum)

04.06.19

(Unterschrift)  Bereichsleiter Konstruktion/ Entwicklung



**EG-Einbauerklärung nach
Maschinenrichtlinie 2006/42/EG Anhang II 1.B**

Der Hersteller / Inverkehrbringer

Fahrzeugwerk Bernard KRONE GmbH
Bernard-Krone-Straße 1
49757 Werlte

erklärt hiermit, dass folgendes Produkt

Produktbezeichnung: Hydraulisches Hubdach

Fabrikat:

Seriennummer:

Serien-/Typenbezeichnung:

Beschreibung: Mit dem Hubdach kann das Dach der Fahrzeuge angehoben werden, um den Be- und Entladevorgang zu erleichtern. Eine zusätzliche Aufbauhöhenverstellung erlaubt es die Höhe auch während der Fahrt beizubehalten.

den folgenden grundlegenden Anforderungen der Richtlinie 2006/42/EG entspricht: Nr. 1.1.2; 1.1.3; 1.1.5; 1.2.2; 1.3.1; 1.3.2; 1.3.4; 1.3.7; 1.5.4; 1.7.3; 1.7.4

Die Inbetriebnahme dieses Produkts ist so lange untersagt, bis die Maschine oder die Anlage, in welche dieses Produkt eingebaut werden soll oder von welcher es eine Komponente darstellt, den Bestimmungen aller relevanten Richtlinien entspricht.

Folgende harmonisierte Normen wurden angewandt:

- | | |
|-------------------|---|
| EN ISO 12100:2010 | Sicherheit von Maschinen - Allgemeine Gestaltungsgrundsätze - Risikobeurteilung und Risikominderung (ISO 12100:2010) |
| EN ISO 4413:2010 | Fluidtechnik – Allgemeine Regeln und sicherheitstechnische Anforderungen an Hydraulikanlagen und deren Bauteile (ISO 4413:2010) |

Für das Produkt wurden die speziellen technischen Unterlagen gemäß Anhang VII Teil B erstellt, auf begründetes Verlangen können diese Unterlagen einer einzelstaatlichen Stelle per Post übermittelt werden.

Name und Anschrift der Person, die bevollmächtigt ist, die technischen Unterlagen zusammenzustellen:

Gerhard Papenbrock

Fahrzeugwerk Bernard KRONE GmbH
Bernard-Krone-Straße 1
49757 Werlte

Werlte, den 03.12.2013.

(Ort, Datum)

G. Papenbrock
(Unterschrift) Gerhard Papenbrock, Bereichsleiter Konstruktion/ Entwicklung

**EC Declaration of Incorporation in accordance with the
Machinery Directive 2006/42/EC Annex II 1.B**



The manufacturer / distributor

Fahrzeugwerk Bernard KRONE GmbH
Bernard-Krone-Straße 1
D-49757 Werlte

hereby declares that the following product

Product designation: Hydraulic lifting roof

Manufactured by:

Serial number:

Model / type description:

Description: Using the lifting roof, the roof of the vehicles can be raised to make the loading and unloading process easier. An additional superstructure height adjustment allows the height to be maintained even while driving.

meets the following essential requirements of the Directive 2006/42/EC: No. 1.1.2; 1.1.3; 1.1.5; 1.2.2; 1.3.1; 1.3.2; 1.3.4; 1.3.7; 1.5.4; 1.7.3; 1.7.4

The commissioning of this product is prohibited until the machine or system into which this product is to be incorporated or of which it represents a component complies with the provisions of all relevant guidelines.

The following harmonised standards were used:

| | |
|-------------------|--|
| EN ISO 12100:2010 | Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010) |
| EN ISO 4413:2010 | Hydraulic fluid power – General rules and safety requirements for systems and their components (ISO 4413:2010) |

Special technical documents were prepared for the product in accordance with Annex VII, Part B. Upon a reasonable request, these documents may be forwarded to a national authority by mail or e-mail.

Name and address of the person authorised to compile the technical documents:

Gerhard Papenbrock

Fahrzeugwerk Bernard KRONE GmbH
Bernard-Krone-Straße 1
D-49757 Werlte

Werlte, 03 December 2013
(Place, date)


(Signature) Gerhard Papenbrock, Head of Design and Development



Konformitätserklärung

Der Hersteller / Inverkehrbringer

LUIS Technology GmbH
Hammer Deich 70
20537 Hamburg

erklärt hiermit, dass folgendes Produkt

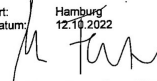
Artikelbezeichnung: LUIS SMART LOAD Ethernetkamera TX
Artikelnummer: 001211.KRONE.V1


technisch identisch ist mit dem Produkt „001211.LM.V1 LUIS SMART LOAD Ethernetkamera TX“ aus dem LUIS Produktportfolio.
Die Zertifikate und Prüfergebnisse externer Labore sind dementsprechend gültig.

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Name und Anschrift der Person, die bevollmächtigt ist, die technischen Unterlagen zusammenzustellen:
Dr. Matthias Feistel, Hammer Deich 70, 20537 Hamburg

Ort: Hamburg
Datum: 12.10.2022


(Unterschrift)
Dr. Matthias Feistel


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20537 Hamburg
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F +49 40 897 27 84 1
service@luis.de
luis.de



UKCA-Konformitätserklärung

Der Hersteller / Inverkehrbringer
 LUIS Technology GmbH
 Hammer Deich 70
 20537 Hamburg



erklärt hiermit, dass folgendes Produkt

Artikelbezeichnung: LUIS Ethernet Camera
 Artikelnummer: 001210.V1, 001210.V2, 001210.V3
 001211.V1, 001211.V2, 001211.V3
 001211.LM.V1, 001211.LM.V2, 001211.LM.V3

allen einschlägigen Bestimmungen der angewandten Rechtsvorschriften (nachfolgend) - einschließlich deren zum Zeitpunkt der Erklärung geltenden Änderungen - entspricht. Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Folgende Rechtsvorschriften wurden angewandt:

- Elektromagnetische Verträglichkeit (EMV)

Folgende harmonisierte Normen wurden angewandt:

BS EN 61000-6-3:2007+A1:2011+AC:2012 Elektromagnetische Verträglichkeit (EMV) - Teil 6-3:
 Fachgrundnormen - Fachgrundnorm Störaussendung für
 Wohngebiete, Geschäfts- und Gewerbegebiete sowie
 Kleinbetriebe 25/09/2007

Dieses Produkt „LUIS SMART LOAD Ethernetkamera TX“ mit der Artikelnummer „001211.KRONE.V1“ ist technisch identisch mit dem Produkt „001211.LM.V1“.

Name und Anschrift der Person, die bevollmächtigt ist, die technischen Unterlagen zusammenzustellen:
 Dr. Matthias Feistel, Hammer Deich 70, 20537 Hamburg

Ort: Hamburg
 Datum: 03.11.2022

(Unterschrift)

Dr. Matthias Feistel

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 service@luis.de
 luis.de

EU-Konformitätserklärung
EC Declaration of Conformity
Déclaration de conformité de la CE
EU- vyhlásenie konformity
Deklaracja zgodności UE



Hersteller: Daten- und Systemtechnik GmbH
 Manufacturer: Pascalstr. 28
 Fabricant: D - 52076 Aachen
 Výrobca: Tel.: +49 (0) 2408 / 94 92 0
 Producent:

Wir erklären in alleiniger Verantwortung, dass das Produkt:
 We declare under our sole responsibility that the product:
 Nous déclarons sous notre seule responsabilité que le produit:
 Vyhlasujeme na vlastnú zodpovednosť, že výrobok :
 Oświadczamy na własną odpowiedzialność, że produkt:

KRONE SmartCollect 2 / KRONE SmartConnect 500
KSC 500

den Anforderungen der EU-Richtlinien und Normen entspricht:
 complies with the requirements of the EU directives and standards:
 est conforme aux exigences des directives de la CE et des normes:
 spĺňa požiadavky smerníc EU a noriem:
 jest zgodny z wymaganiami dyrektyw i norm UE:

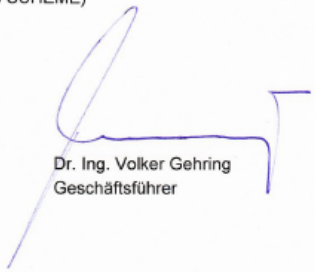
2014/53/EU

| | | |
|--------------------------------------|------------------------|----------------------|
| EN 300 328 V2.2.2 | EN 300 220-1 V3.1.1 | EN 301 511 V12.5.1 |
| EN 303 413 V2.1.1 | EN 300 220-2 V3.1.1 | EN 301 908-1 V13.1.1 |
| EN 301 489-1 V2.2.3 | EN 301 489-17 V3.2.4 | EN 301 489-52 V1.2.1 |
| EN 301 489-3 V2.2.0 | EN 301 489-19 V2.2.0 | EN 55032:2015 |
| EN 61000-4-2:2009 | EN 61000-4-3:2006/2010 | |
| EN 62368-1:2014/A11:2017 (CB SCHEME) | | |
| EN 62311:2008 | | |

2011/65/EU

(EC) 1907/2006

Aachen, den 28.04.2022
 Ort und Datum der Ausstellung
 Place and date of issue
 Lieu et date d'établissement
 Miesto a dátum vystavenia
 Miejsce i data wydania


 Dr. Ing. Volker Gehring
 Geschäftsführer



TireCheck GmbH - Schmelzofenvorstadt 33 - 89520 Heidenheim

To whom it concerns

Ihr Ansprechpartner

Christian Markert
Geschäftsführer
Telefon: +49 (0) 1602880906
Email: christian.markert@tirecheck.com
Internet: http://www.tirecheck.com

08.12.2023

**EG-Konformitätserklärung
gemäß Richtlinie
2014/53/EG (RED) und
RoHS 2011/65/EU**

**EC-Declaration of
Conformity in
accordance with the
directive
2014/53/EC (RED) and
RoHS 2011/65/EU**

**CE-Déclaration de
conformité selon la
directive
2014/53/CE (RED) et
RoHS 2011/65/CE**

| <i>Hiermit erklärt die</i> | <i>We</i> | <i>Nous</i> |
|---|---------------------------------|---|
| TireCheck GmbH Schmelzofenvorstadt 33 89520 Heidenheim Germany | | |
| <i>daß das Produkt</i> | <i>declare that the product</i> | <i>déclare par la présente que le produit</i> |

| <i>Produktbezeichnung</i> | <i>Product Name</i> | <i>Nom de produit</i> |
|---------------------------|---------------------|-----------------------|
| RF to CAN-Bridge | | |

| <i>Artikel Nummer</i> | <i>Part Number</i> | <i>Número d'article</i> |
|-----------------------|--------------------|-------------------------|
| 030303; 030321 | | |

TireCheck GmbH
Schmelzofenvorstadt 33
89520 Heidenheim an der Brenz
Deutschland

Firmensitz: Heidenheim
Registargericht: Amtsgericht Ulm, HRB738790
Geschäftsführer: Michael O'Dwyer, Christian Markert
USt-Identifikationsnummer: DE815823782

Kreisparkasse Heidenheim
Kontoinhaber: TireCheck GmbH
IBAN: DE54 6325 0030 0046 0479 93
BIC: SOLADE3333

Seite 1



| <i>Verwendungszweck</i> | <i>Intended purpose</i> | <i>Affectation</i> |
|---|--|---|
| Sende- und Empfangseinheit für Reifendruckkontrollsystem | Transmission and Reception Unit for Tire Pressure Monitoring System | Unité de transmission et de réception pour système capteur de pression des pneus |

bei bestimmungsgemäßer Verwendung den grundlegenden Anforderungen des Artikels 3 und den übrigen einschlägigen Bestimmungen der Richtlinie 2014/53/EG und RoHS 2011/65/EU entspricht.

complies with the essential requirements of article 3 and the other relevant provisions of the Directive 2014/53/EC and RoHS 2011/65/EU, when used for its intended purpose.

correspond aux exigences fondamentales de l'article 3 et aux autres prescriptions correspondantes de la directive 2014/53/CE et RoHS 2011/65/CE, dans la mesure où est utilisé conformément à la destination.

| <i>Gesundheit und Sicherheit gemäß Artikel 3.1.a, angewendete Normen</i> | <i>Health and safety requirements pursuant to Article 3.1.a, standards applied</i> | <i>Exigences relatives à la santé et la sécurité conformément à l'article 3.1.a, normes appliquées</i> |
|--|--|--|
| EN 62368-1:2014/AC:2015 DIN EN IEC 62311:2020-12 | | |

| <i>Schutzanforderungen in Bezug auf die elektromagnetische Verträglichkeit gemäß Artikel 3.1.b, angewendete Normen</i> | <i>Protection requirements concerning electromagnetic compatibility pursuant to Article 3.1.b, standards applied</i> | <i>Exigences en matière de protection en rapport à la compatibilité électromagnétique conformément à l'article 3.1.b, normes appliquées</i> |
|--|--|---|
| EN 301 489-1 V2.2.3 EN 301 489-3 V2.1.1 EN 301 489-17 V3.2.4 | | |

TireCheck GmbH
Schmelzofenvorstadt 33
89520 Heidenheim an der Brenz
Deutschland

Firmensitz: Heidenheim
Registriergericht: Amtsgericht Ulm, HRB/38790
Geschäftsführer: Michael O'Dwyer, Christian Markert
USt-Identifikationsnummer: DE3119625762

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Kontoinhaber: TireCheck GmbH
IBAN: DE54 6326 0030 0146 0479 93
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| | | |
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| <i>Maßnahmen zur effizienten Nutzung des Funkspektrums gemäß Artikel 3.2, angewendete Normen</i> | <i>Measures for the efficient use of the radio frequency spectrum pursuant to Article 3.2, standards applied</i> | <i>Mesures pour une exploitation efficace du spectre radio conformément à l'article 3.2, normes appliquées</i> |
| EN 300 220-1 V3.1.1 EN 300 220-2 V3.1.1 | | |

| | | |
|--|--|---|
| <i>Einheitliche Bedingungen für die Genehmigung der Fahrzeuge hinsichtlich der elektromagnetischen Verträglichkeit</i> | <i>Uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility</i> | <i>Prescriptions uniformes relatives à l'homologation des véhicules en ce qui concerne la compatibilité électromagnétique</i> |
| UN - R 10 including amendment No 06 supplement 02 | | |

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| <i>Das Produkt ist mit dem CE Zeichen markiert</i> | <i>The product is marked with the CE sign</i> | <i>Le produit est marqué avec la signe CE</i> |
| CE | | |

Heidenheim an der Brenz
12.12.2023

| | |
|-------------------------------------|--|
| Ort, Datum Place & date of issue | Name und Unterschrift/Geschäftsführung |
| Lieu & date de délivrance | Name and signature/CEO Nom et signature/President |

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29.08.2023

**EG-Konformitätserklärung
gemäß Richtlinie
2014/53/EG (RED) und
RoHS 2011/65/EU**

**EC-Declaration of
Conformity in
accordance with the
directive
2014/53/EC (RED) and
RoHS 2011/65/EU**

**CE-Déclaration de
conformité selon la
directive
2014/53/CE (RED) et
RoHS 2011/65/CE**

| <i>Hiertmit erklärt die</i> | <i>We</i> | <i>Nous</i> |
|---|---------------------------------|---|
| TireCheck GmbH Schmelzofenvorstadt 33 89520 Heidenheim Germany | | |
| <i>daß das Produkt</i> | <i>declare that the product</i> | <i>déclare par la présente que le produit</i> |

| <i>Produktbezeichnung</i> | <i>Product Name</i> | <i>Nom de produit</i> |
|--------------------------------------|---------------------|-----------------------|
| Internal Tire Pressure Sensor | | |

| <i>Artikel Nummer</i> | <i>Part Number</i> | <i>Numéro d'article</i> |
|---|--------------------|-------------------------|
| 030860, 030878, 030846, 030864, 030936, 030923, 030998, 030800 | | |

| <i>Verwendungszweck</i> | <i>Intended purpose</i> | <i>Affectation</i> |
|--------------------------|-----------------------------|----------------------------|
| Reifendrucksensor | Tire Pressure Sensor | Capteur de Pression |

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Seite 1



bei bestimmungsgemäßer Verwendung den grundlegenden Anforderungen des Artikels 3 und den übrigen einschlägigen Bestimmungen der Richtlinie 2014/53/EG und RoHS 2011/65/EU entspricht.

complies with the essential requirements of article 3 and the other relevant provisions of the Directive 2014/53/EC and RoHS 2011/65/EU, when used for its intended purpose.

correspond aux exigences fondamentales de l'article 3 et aux autres prescriptions correspondantes de la directive 2014/53/CE et RoHS 2011/65/CE, dans la mesure où il est utilisé conformément à la destination.

| <i>Gesundheit und Sicherheit gemäß Artikel 3.1.a, angewendete Normen</i> | <i>Health and safety requirements pursuant to Article 3.1.a, standards applied</i> | <i>Exigences relatives à la santé et la sécurité conformément à l'article 3.1.a, normes appliquées</i> |
|---|--|---|
| EN 62368-1:2014/AC:2015 DIN EN IEC 62311:2020-12 EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 + AC:2011 | | |
| <i>Schutzanforderungen in Bezug auf die elektromagnetische Verträglichkeit gemäß Artikel 3.1.b, angewendete Normen</i> | <i>Protection requirements concerning electromagnetic compatibility pursuant to Article 3.1.b, standards applied</i> | <i>Exigences en matière de protection en rapport à la compatibilité électromagnétique conformément à l'article 3.1.b, normes appliquées</i> |
| EN 301 489-1 V2.1.1 EN 301 489-3 V2.1.1 | | |
| <i>Maßnahmen zur effizienten Nutzung des Funkspektrums gemäß Artikel 3.2, angewendete Normen</i> | <i>Measures for the efficient use of the radio frequency spectrum pursuant to Article 3.2, standards applied</i> | <i>Mesures pour une exploitation efficace du spectre radio conformément à l'article 3.2, normes appliquées</i> |
| EN 300 220-1 V3.1.1 EN 300 220-2 V3.1.1 EN 300 330 V2.1.1 | | |

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| | | |
|--|--|---|
| <i>Einheitliche Bedingungen für die Genehmigung der Fahrzeuge hinsichtlich der elektromagnetischen Verträglichkeit</i> | <i>Uniform provisions concerning the approval of vehicles with regard to electromagnetic compatibility</i> | <i>Prescriptions uniformes relatives à l'homologation des véhicules en ce qui concerne la compatibilité électromagnétique</i> |
| ECE R 10 Revision 4 (2012-03-06) + Amendment 1 (2012-08-15) + Amendment 2 (2013-08-06) | | |

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| CE | | |

29.08.2023 *C. Kalaf*

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| Place & date of issue | Unterschrift/Geschäftsführung |
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09/2024