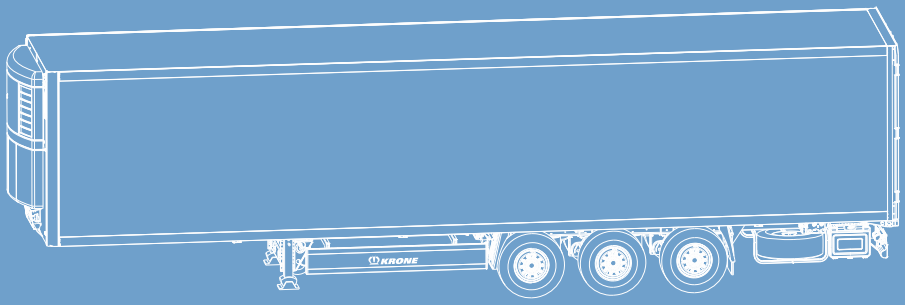
OPERATING INSTRUCTIONS
COOL LINER



515008991-02 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.

Fahrzeugwerk Bernard KRONE GmbH & Co. KG

Bernard-Krone-Straße 1

D-49757 Werlte

www.krone-trailer.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. 151)*.

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. 151)*.

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:

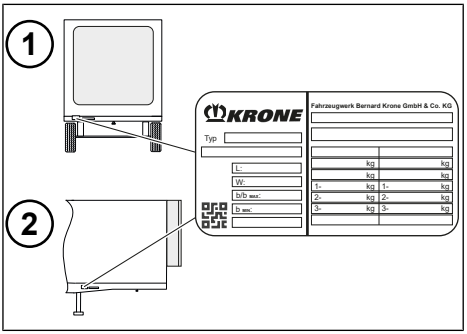


Fig. 1-1: Type plate/VIN attachment points

1 Standard
2 Alternative

The following information is shown on the type plate:

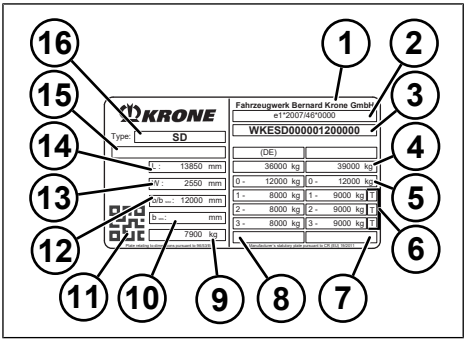


Fig. 1-2: Example type plate

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

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.

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 people or animals.
- Dangerous goods transports without official and manufacturer approval.
- Transport of unsecured loads.
- Transport of materials, for which, due to their properties, safe handling and transport is not ensured, or for which safe handling and conveyance is only ensured 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 the manufacturer, 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 trailers 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 trailer 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.
- Ensure that the trailer is regularly serviced by qualified staff.

When transporting and loading/unloading, 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. 8)*,
- 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.

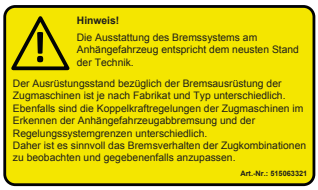
- ► Before loading, make sure that the vehicle is suitable for the goods to be carried.

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
	Note! The equipment of the braking system on the trailer vehicle corresponds to the latest state of the art. 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. Attachment point: front wall, coupling support
	Warning sign, risk of crushing, lift axle Attachment point: In the axle area on both sides of the vehicle, on the axle body.
	Warning sign for tilting stability (rear area of the superstructure) Attachment point: inside on the right rear door (for refrigerated trailers, above the scouring strip in the rear area of the right side wall)
	Warning sign for floor load (max. 5460/7000/8000/9000 kg) Attachment point: inside on the right rear door (for refrigerated trailers, above the scouring strip in the rear area of the right side wall)
	Warning sign for tilting stability (front area of the superstructure) Attachment point: inside on the right rear door (for refrigerated trailers, above the scouring strip in the rear area of the right side wall)

Sign	Attachment point/meaning
	Warning sign for risk of crushing with rear ladder Attachment point: on the folding rear access ladder
	Warning sign for electric voltage Attachment points: at the connection points (sockets), on both sides in the area of the batteries/side collision protection, in the cooling system, on the axle generators, on the front wall, on the rear door.
 	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.

2.7 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

2.8 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.
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.
Electrical high voltage system incl. axle generator, battery as well as lines (orange), connections and control electronics.	Danger to life due to electrical shock when the safety instructions for the product are not observed. Work on the vehicle and on the high voltage system must only a performed by qualified specialist personnel.
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.
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.

2.9 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
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

Component	Function
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
Emergency stop button (high voltage system)	Observe the enclosed supplier documentation.

2.10 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.
- ► 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

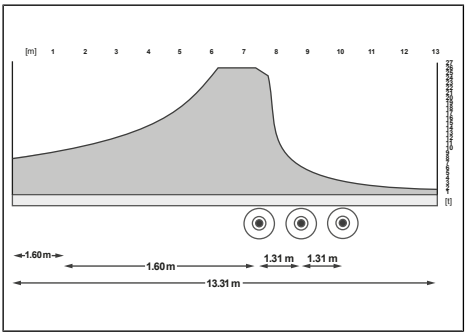


Fig. 2-1: Load distribution plan (example)

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 repairs carried out by authorised specialist workshops or by the manufacturer.

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 it with rubbish.
- ► Damaged cables, plugs or other components must only be replaced with original spare parts or spare parts authorised by the manufacturer.
- ► During operation, check all of the bolted and plug connections at regular intervals.

High voltage systems

The following instructions must be observed for safe operation of vehicles with high voltage systems:

- ► Never attempt to repair a defective device.
- ► Check the cable and socket for possible damage. Do not use damaged components.
- ► Check the battery for external damage.
- ► Persons with pacemakers, metal implants or hearing aids may not stand close to high voltage components without medical approval.
- ► Before departure, make sure that all of the power cables are disconnected.
- ► Have maintenance work performed only by qualified personnel.

2.11 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. 151)*.
- ► 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
Mud guard (spray suppression and mud guard)	folded down
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.

2.12 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. 11)*,
- 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,
- Unauthorized structural changes or modifications of the product,
- Subsequent installation of additional consumers on the electrical system without approval by the manufacturer,
- 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. 151)*.

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. 151)*).

2.13 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

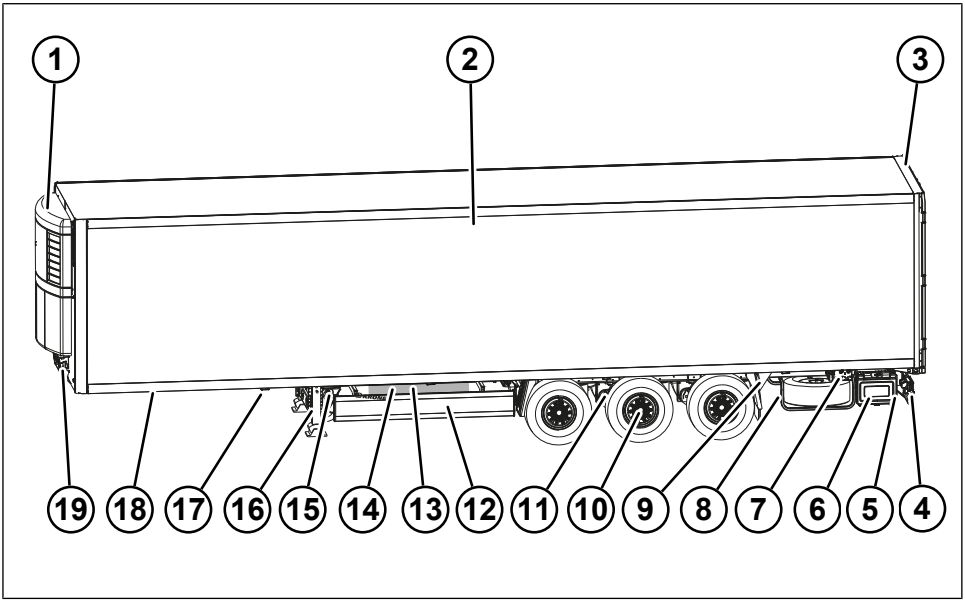


Fig. 3-1: Cool Liner overview (example)

1 Cooling system
2 Superstructure
3 Rear door
4 Rear underrun protection
5 Charging socket
6 Tool box
7 Control unit for brake system
8 Spare wheel bracket
9 Wheel chock
10 Axle assembly and brake system
11 Axle generator
12 Side collision protection
13 High-voltage battery
14 Safety switch (emergency stop)
15 Fuel tank
16 Support device
17 Kingpin
18 Running gear
19 Supply and control connections

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.
- ► Vehicles with high voltage components must only be collected by trained specialist personnel. (Level 1S: “Fachkundig unterwiesene Person” (FuP, expertly instructed person) for general work on vehicles with high voltage components)

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 information 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

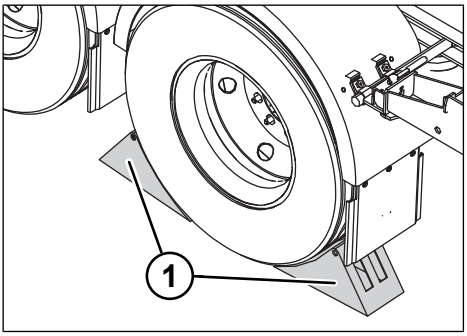


Fig. 5-1: Putting on the wheel chocks

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

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)

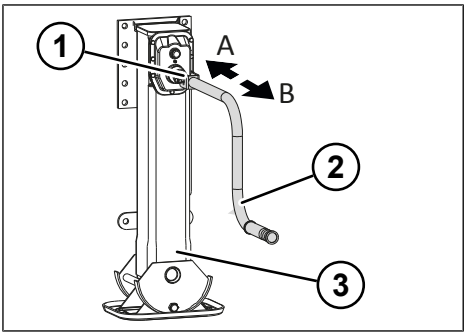


Fig. 5-2: Load speed and high speed of the support device

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 "5.8.2 Parking brake", pg. 41)*.
- ► 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. 23)*.
- ► 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. 5-2: Load speed and high speed of the support device", pg. 25)*.
- ► Wind down the landing leg winch until it touches the ground. Ensure a neutral foot position, landing leg foot in centre position.

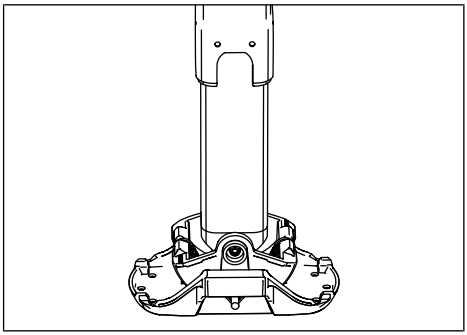


Fig. 5-3: Neutral landing leg foot position

- ► 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. 5-2: Load speed and high speed of the support device", pg. 25)*.

- ► 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 Rear braces.
- ► 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 "5.8.2 Parking brake", pg. 41)*.
- ► Couple the semitrailer *(see "7.2 Coupling and uncoupling the trailer", pg. 81)*.
- ► Hitch the trailer Hitching and unhitching the trailer.
- ► Retract the rear braces, if available Rear braces.
- ► 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. 5-2: Load speed and high speed of the support device", pg. 25)*.
- ► Crank up the landing leg winch until it is unloaded.
- ► Set to high speed by pulling out the hand crank *(see "Fig. 5-2: Load speed and high speed of the support device", pg. 25)*.
- ► 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.

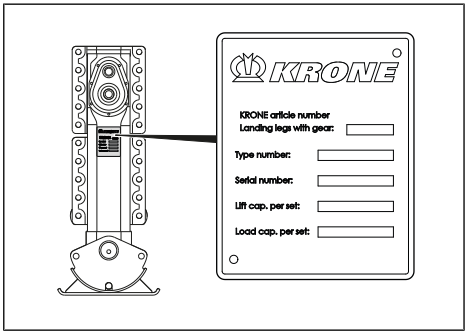


Fig. 5-4: Type plate for KRONE support device

5.2.2 Drop landing leg

Extending the drop landing leg

- ► Apply the parking brake *(see "5.8.2 Parking brake", pg. 41)*.
- ► 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. 23)*.
- ► Lift the semitrailer with the tractor unit's air suspension.

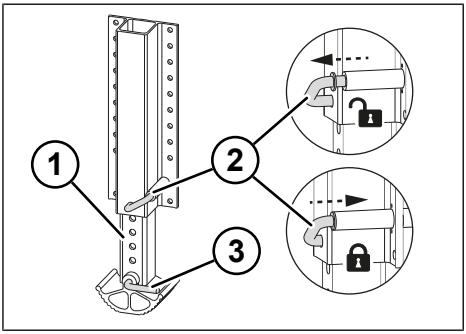


Fig. 5-5: Drop landing leg

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 "5.8.2 Parking brake", pg. 41)*.
- ► Couple the semitrailer .
- ► Lift the semitrailer with the tractor unit's air suspension.

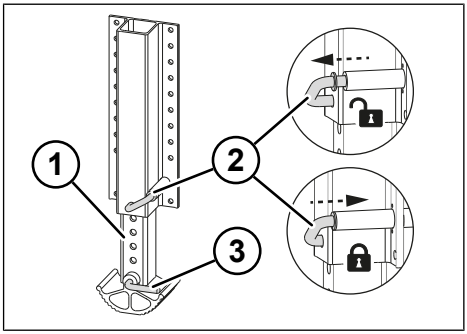


Fig. 5-6: Drop landing leg

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.
- ► 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 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.

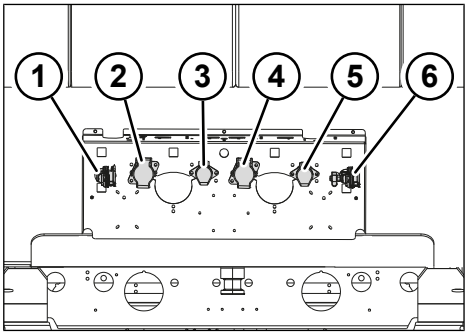


Fig. 5-7: Possible arrangement of the supply and control connections on a blind coupling (standard coupling support)

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

More information about the plug and socket assignment can be found in the technical data *(see "14.2 Plugs and socket pin assignments", pg. 152)*.

Sliding coupling support

Depending on the design, the KRONE trailer may be fitted with a sliding coupling support.

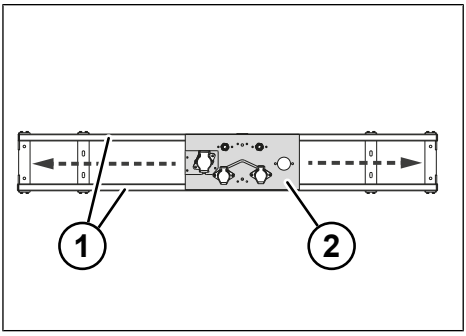


Fig. 5-8: Sliding coupling support

1 Guide rails
2 Coupling support

In contrast to the standard coupling support *(see "Fig. 5-7: Possible arrangement of the supply and control connections on a blind coupling (standard coupling support)", pg. 28)*, the sliding coupling support moves along the guide rails and minimises the load on the lines.

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

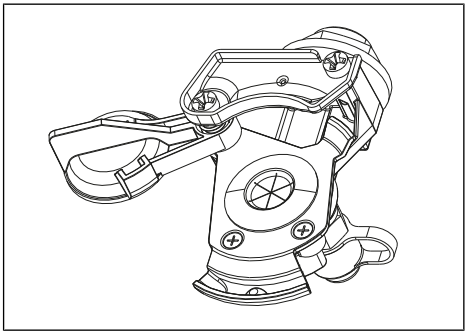


Fig. 5-9: Example of standard coupling head

- ☑ The parking brake on the tractor unit is applied.
- ☑ The parking brake on the trailer is applied *(see "5.8.2 Parking brake", pg. 41)*.
- ► 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 "5.8.2 Parking brake", pg. 41)*.
- ► 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

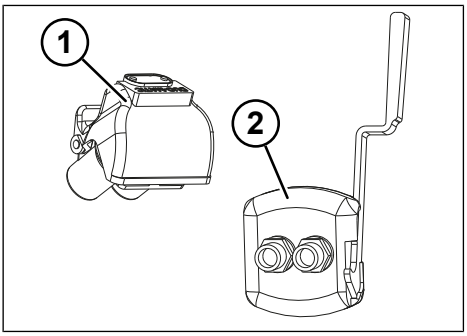


Fig. 5-10: Duo-Matic coupling

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 "5.8.2 Parking brake", pg. 41)*.

► 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 "5.8.2 Parking brake", pg. 41)*.

► 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

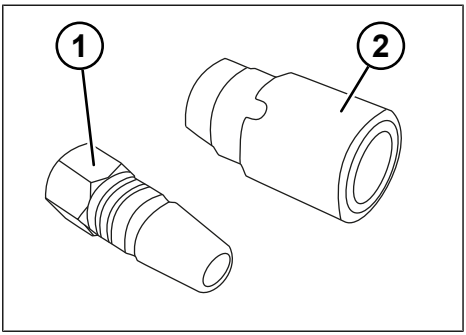


Fig. 5-11: C-coupling heads (trailer)

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 "5.8.2 Parking brake", pg. 41)*.

► 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 "5.8.2 Parking brake", pg. 41)*.

► 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.

5.4 High-voltage battery systems

⚠ WARNING

Fire hazard due to improper use!

Improper use of the system represents a potential fire hazard and can cause personal injuries and material damage.

► Do not disconnect the charging plug under load.

► First switch off the systems, then disconnect the charging plug.

► Do not work on the devices when they are under load (switch off the systems and disconnect the charging plug).

A low charge level can cause material damage to the system. For this reason, check the charge level of the high-voltage battery on a regular basis. When the charge level: is low, the battery pack must be charged via the power mains.

Also observe the enclosed supplier documentation.

Battery packs from different manufacturers can be installed ex-factory.

Information for use can be found in the operating instructions supplied by the respective manufacturer.

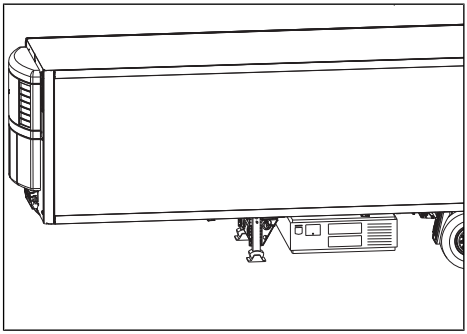


Fig. 5-12: Chassis with installed high-voltage battery system (example)

5.5 Loading lamp

Loading lamps are additional light sources to assist with vehicle operation while the vehicle is stationary. Loading lamps are switched on with an additional switch on the vehicle.

INFO

Use of the loading lamps is not permitted while the vehicle is driving (forwards and in reverse).

5.6 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.

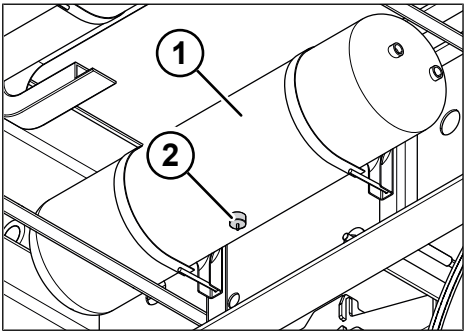


Fig. 5-13: Compressed air tank

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.

5.7 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.

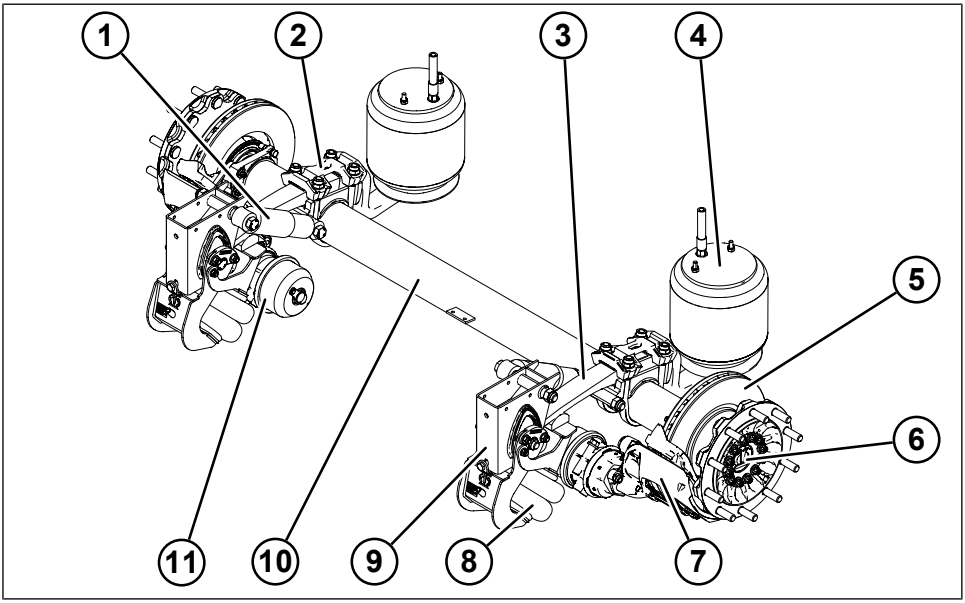


Fig. 5-14: Overview of the KRONE Trailer Axle disc brake (air spring link up)

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

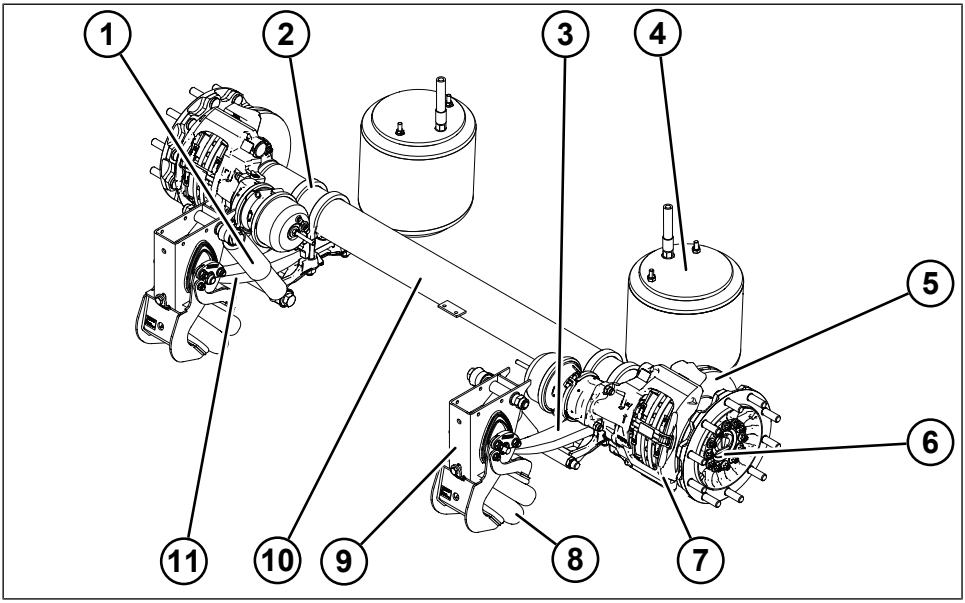


Fig. 5-15: Overview of the KRONE Trailer Axle disc brake (air spring link down)

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

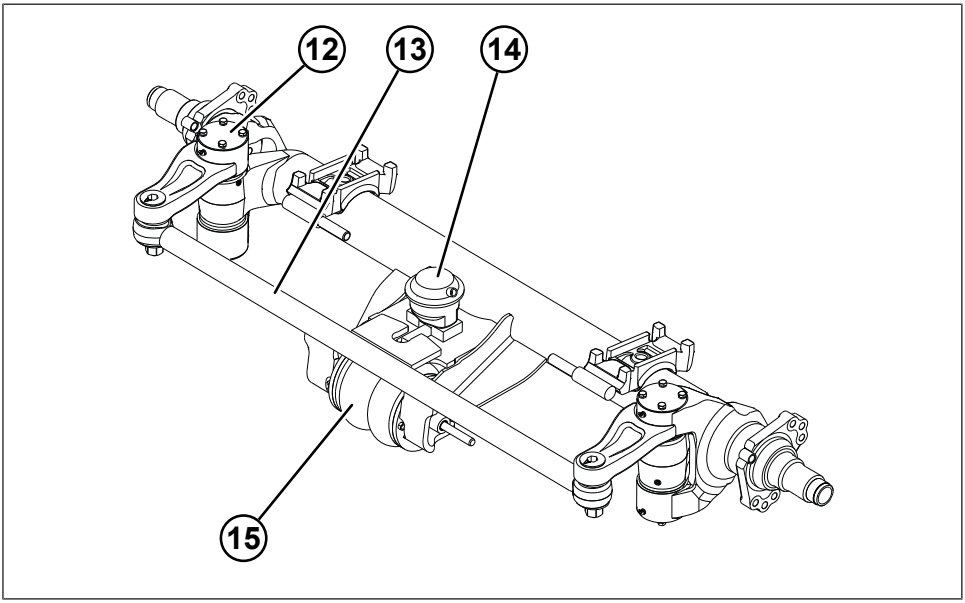


Fig. 5-16: Additional self-steering axle assemblies

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

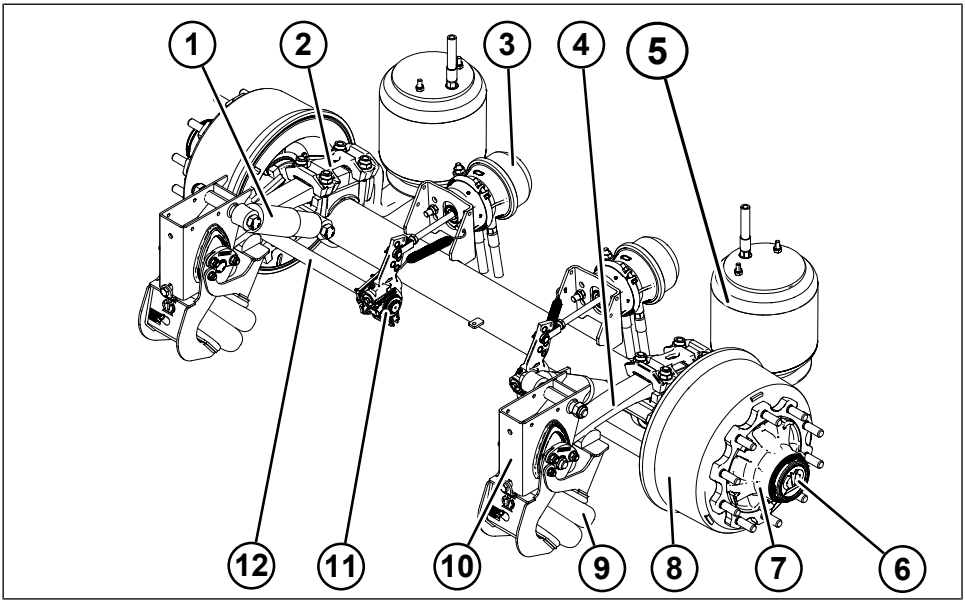


Fig. 5-17: Overview of the KRONE Trailer Axle drum brake (air spring link up)

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

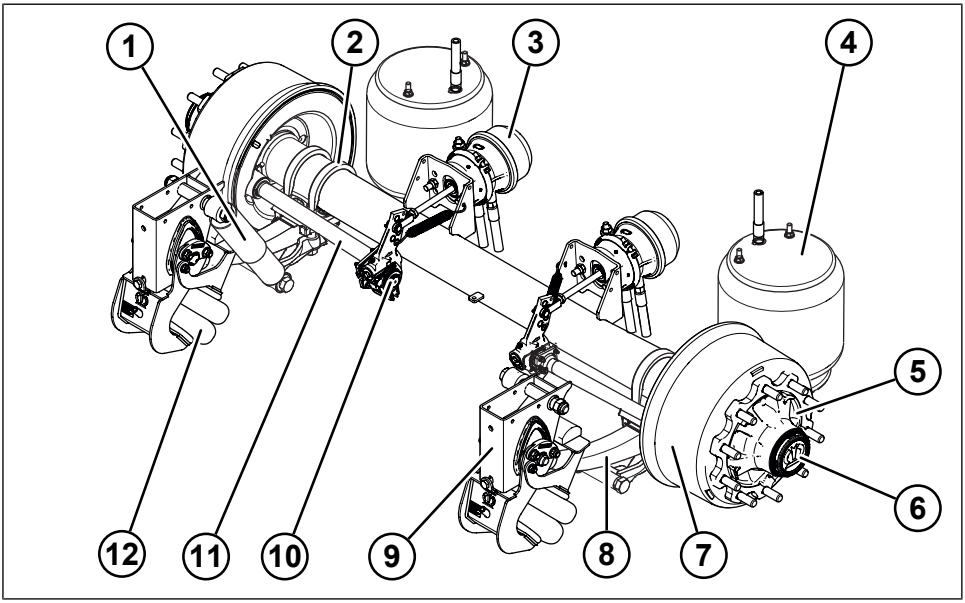


Fig. 5-18: Overview of KRONE Trailer Axle drum brake (air spring link down)

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

5.7.1 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:

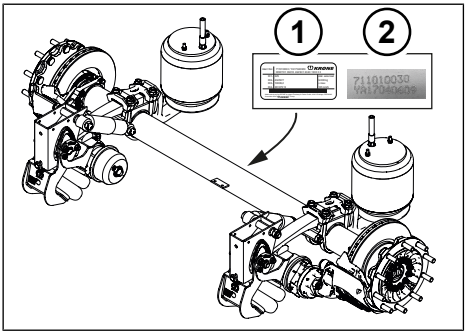


Fig. 5-19: Type plate position

1 Type plate
2 Engraving

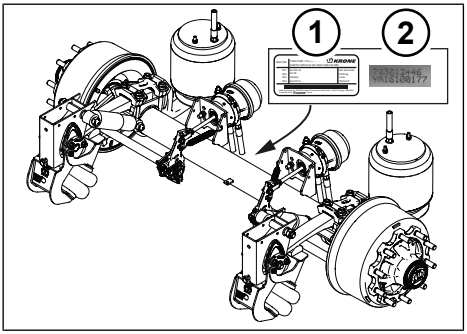


Fig. 5-20: Type plate position

1 Type plate
2 Engraving

The following information is presented on the type plate:

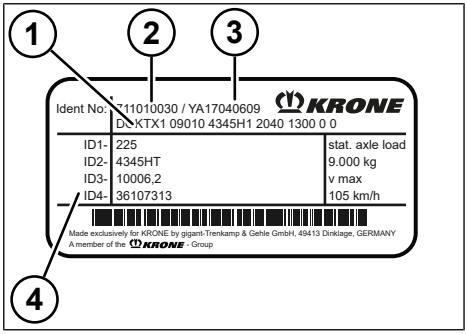


Fig. 5-21: Type plate example

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

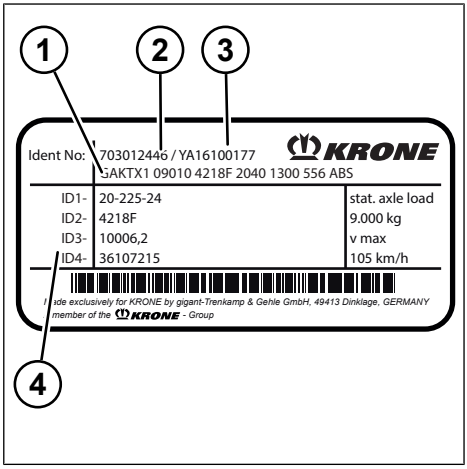


Fig. 5-22: Type plate example

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

5.8 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

5.8.1 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. 83)*.

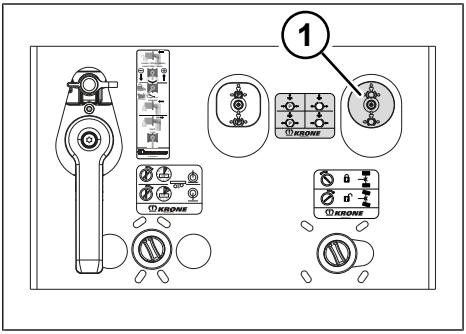


Fig. 5-23: Service brake

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.

5.8.2 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 "5.8.3 Emergency release devices for the parking brake", pg. 42)*.

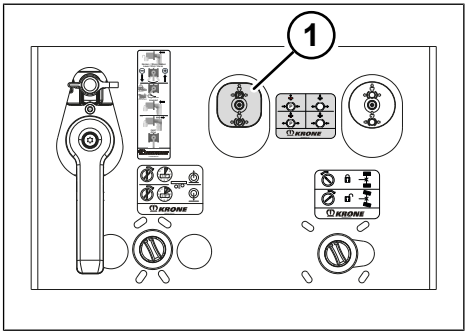


Fig. 5-24: Parking brake

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.

5.8.3 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

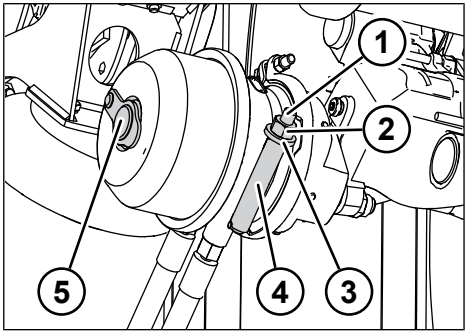


Fig. 5-25: Spring storage with emergency release device

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. 23)*.

► Loosen the retainer nut and flat washer.

► Remove the emergency release screw from the holder.

► Open the cap.

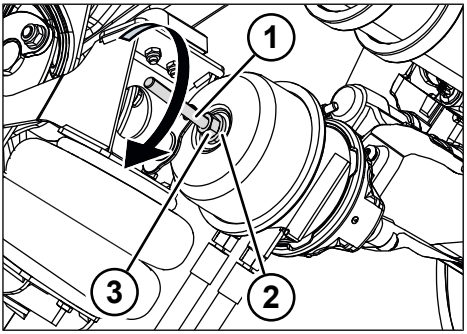


Fig. 5-26: Activating the emergency release screw

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

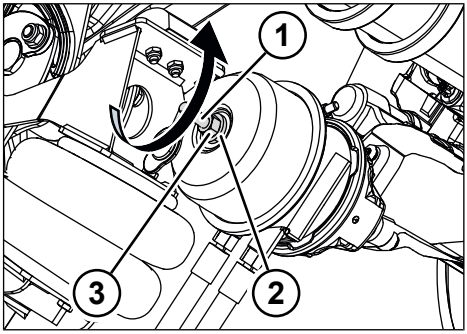


Fig. 5-27: Deactivating the emergency release screw

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.

5.9 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.

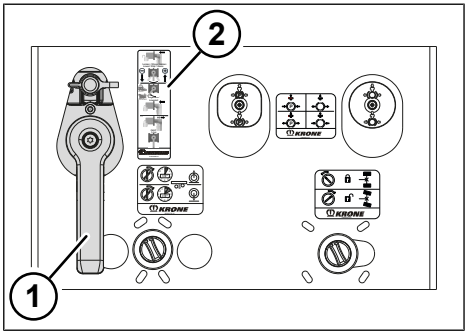


Fig. 5-28: Control lever of the air suspension

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.

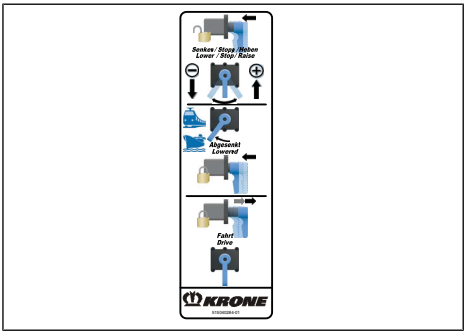


Fig. 5-29: Example pictogram of mechanically controlled air suspension

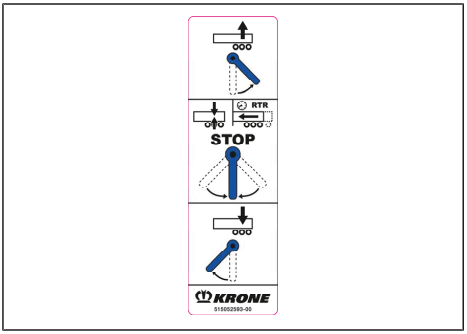


Fig. 5-30: Example pictogram of electronically controlled air suspension

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.).

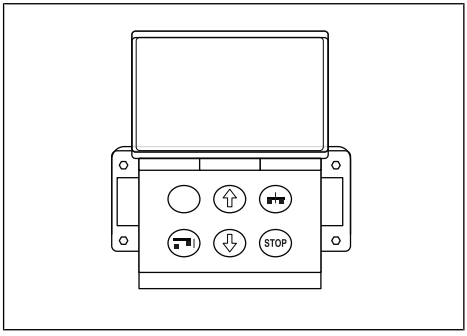


Fig. 5-31: Example of a control box (Wabco)

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.

5.10 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 reactivated by turning the ignition off and on in the tractor unit.

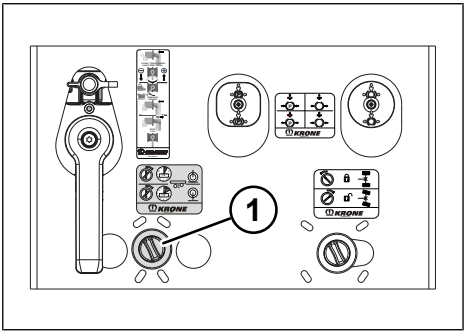


Fig. 5-32: Control unit

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.

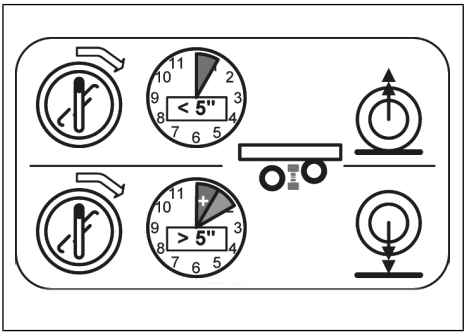


Fig. 5-33: Control switch functions of the lift axle control system

5.11 Rigid axle

KRONE trailers are equipped with rigid axles.

For vehicles without KRONE axle, the following applies:

Also observe the enclosed supplier documentation.

5.12 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.

5.12.1 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 "5.3 Supply and control connections", pg. 28)*.
- ► 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.

5.12.2 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.

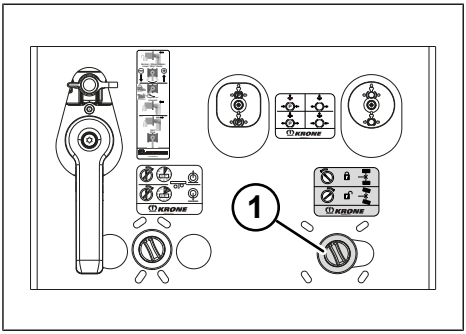


Fig. 5-34: Back-up interlock

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.

5.13 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

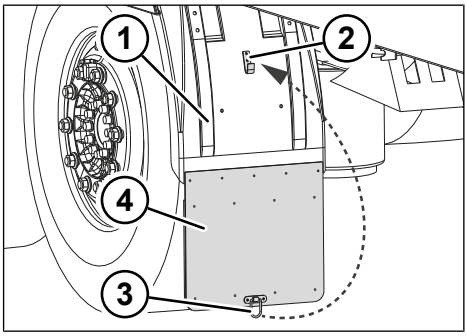


Fig. 5-35: Folded down mud flap

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.

5.14 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

Material damage when loading the trailer!

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

► Fold up and lock the side collision protection on both sides when loading the trailer.

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. 50)*
- Folding side collision protection with lock *(see "5.14.2 Folding side collision protection with lock", pg. 50)*

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

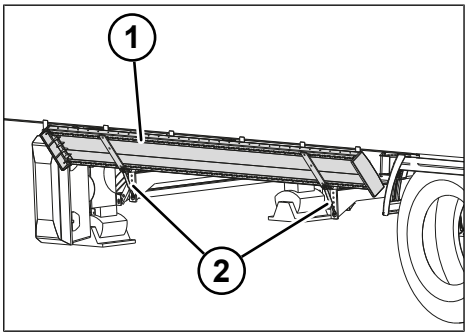


Fig. 5-36: Side collision protection folded up

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.

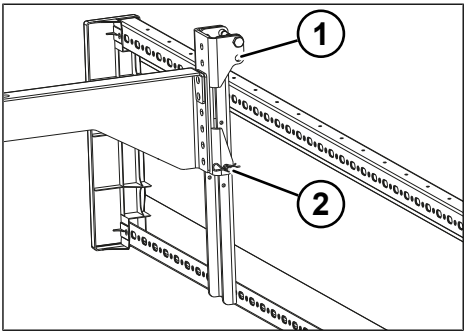


Fig. 5-37: Folded-down side collision protection ((rear view))

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.

5.15 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

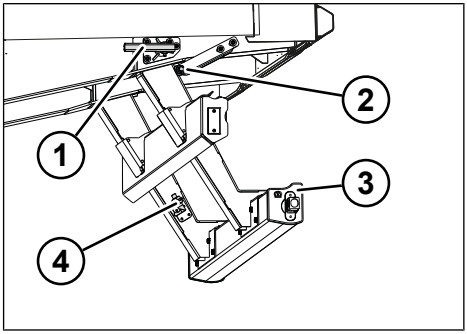


Fig. 5-38: Underrun protection lock

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.

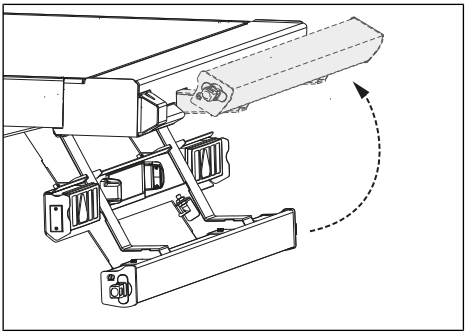


Fig. 5-39: Folding up the rear underrun protection

► 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

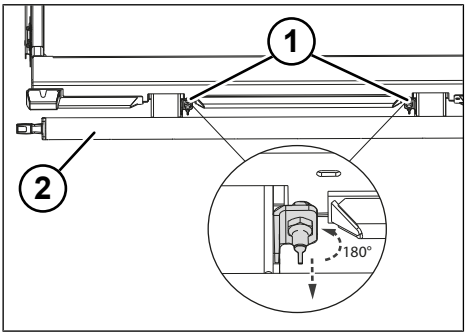


Fig. 5-40: Folding down the rear underrun protection

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.

5.16 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 Cool Liners are equipped with the following climbing aids:

○ Folding telescoping ladder *(see "5.16.1 Folding telescopic ladder", pg. 52)*

○ Hand rail *(see "5.16.2 Handle strap", pg. 53)*

5.16.1 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.

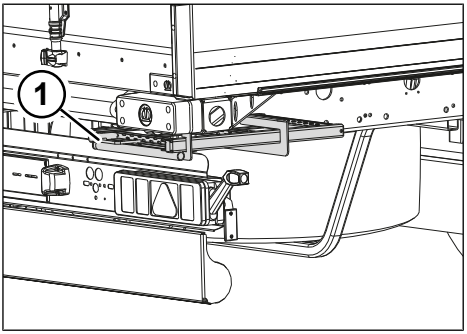


Fig. 5-41: Folding telescopic ladder

1 Handle

Using the telescopic ladder

► Lift the telescopic ladder past its lock.

► Pull out the telescopic ladder completely by its handle.

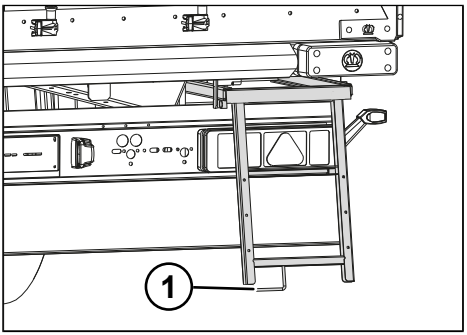


Fig. 5-42: Folding telescopic ladder in the function position

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.

5.16.2 Handle strap

For safe mounting and dismounting, a handle strap is installed in the climbing area.

► Use the handle straps for safe mounting and dismounting.

► When mounting and dismounting, always face the ladder so that the handle straps can be used without problems.

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. 54)*
- Spare wheel with roller-guided double basket *(see "5.17.2 Spare wheel with roller-guided double basket", pg. 54)*
- Spare wheel with winch *(see "5.17.3 Spare wheel with winch", pg. 55)*
- Spare wheel in the pallet storage box *(see "5.17.4 Spare wheel in the pallet storage box", pg. 56)*

5.17.1 Spare wheel with basket storage

Spare wheel removal

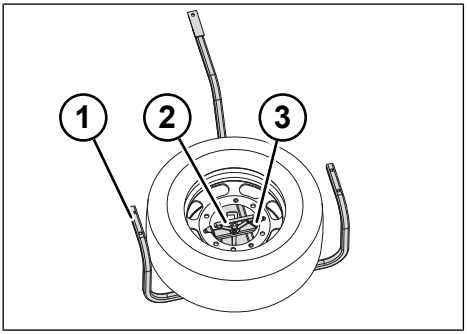


Fig. 5-43: Spare wheel with basket storage

1 Storage basket
2 Rim holder
3 Securing device

► Fold up the side collision protection, if necessary *(see "5.14 Side collision protection", pg. 49)*.
► 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. 49)*.
► The spare wheel is inserted.

5.17.2 Spare wheel with roller-guided double basket

Two spare wheels can be carried in the roller-guided double basket.

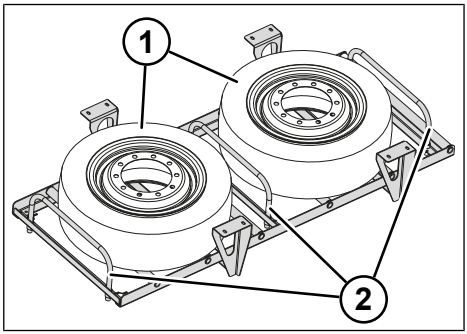


Fig. 5-44: Roller-guided double basket with two spare wheels

1 Spare wheels
2 Retainer

Taking out the spare wheels

► Pull the lever on the lighting bracket to the rear.
► Fold up the lighting bracket.
► Secure the lighting bracket with the rubber band

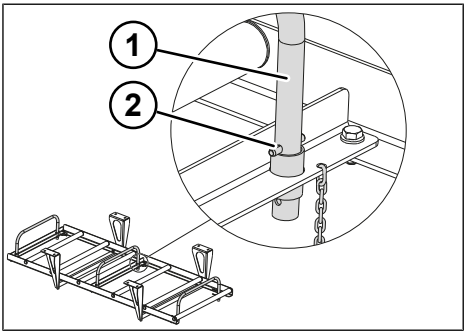


Fig. 5-45: Secure the retainer

1 Retainer
2 Lock pin

- ► Remove the lock pin from the first retainer.
- ► Remove the first retainer by pulling up.
- ► Guide the first spare wheel over the rollers and take it out.
- ► Remove the lock pin from the second retainer.
- ► Remove the second retainer by pulling up.
- ► Guide the second spare wheel over the rollers and take it out.
- ► Fold down the lighting bracket.
- ✓ The spare wheels have been taken out.

Putting in the spare wheel

- ► Pull the lever on the lighting bracket to the rear.
- ► Fold up the lighting bracket.
- ► Secure the lighting bracket with the rubber band
- ► Remove the lock pin from the first retainer.
- ► Remove the first retainer by pulling up.
- ► Guide the first spare wheel over the rollers and put it in.
- ► Put the first retainer back on and secure it with the lock pin.
- ► Remove the lock pin from the second retainer.
- ► Remove the second retainer by pulling up.
- ► Guide the second spare wheel over the rollers and put it in.
- ► Put the second retainer back on and secure it with the lock pin.
- ► Fold down the lighting bracket.
- ✓ The spare wheels have been put in.

5.17.3 Spare wheel with winch

⚠ 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.
- ► Before removing the securing devices, check the support cable and winch for function and damage.

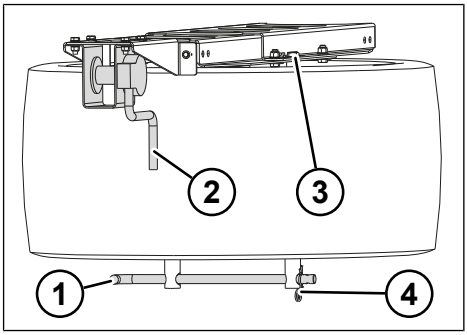


Fig. 5-46: Spare wheel with winch

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. 49)*.

- ► 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 counter-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. 49)*.
- ✓ The spare wheel is inserted.

5.17.4 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 "5.18.2 Pallet storage box", pg. 58)*.
- ► 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 "5.18.2 Pallet storage box", pg. 58)*.
- ✓ The spare wheel is inserted.

5.17.5 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. 23)*.

► Apply the parking brake on the trailer *(see "5.8.2 Parking brake", pg. 41)*.

► 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. 53)*.

► 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. 53)*.

✓ The spare wheel has been mounted.

► Check the tyre inflation pressure of the spare wheel used.

5.18 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.

5.18.1 Tool box

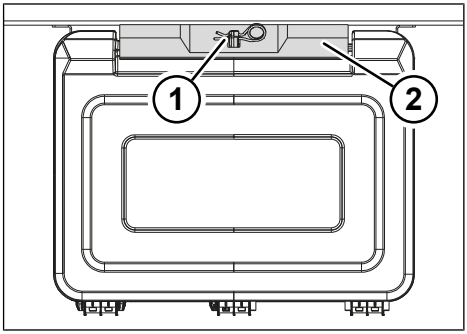


Fig. 5-47: Tool box

1 Spring cotter pin
2 Locking flap

Opening the tool box

- ► Fold up the side collision protection, if necessary *(see "5.14 Side collision protection", pg. 49)*.
- ► 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. 49)*.
- ✓ The tool box is closed and secured.

5.18.2 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.

Depending on the version, the pallet storage box is installed in front of or behind the axle assembly. Pallet storage boxes are available with different load capacities from 8 to 36 Euro pallets. The load capacity is indicated on the pallet box.

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.

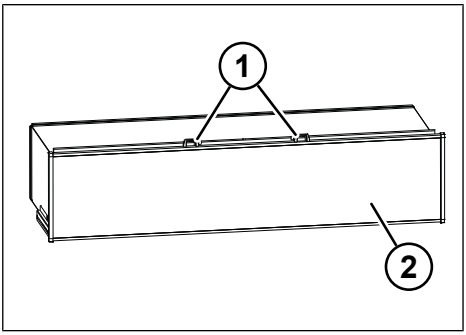


Fig. 5-48: Pallet storage box PK 4000

1 Handles with locks
2 Lid

Opening the pallet storage box

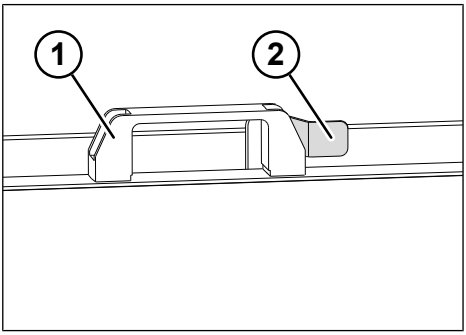


Fig. 5-49: Lock

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.

5.18.3 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.

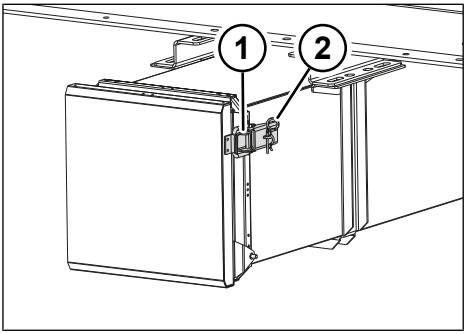


Fig. 5-50: Plug-in post storage box

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.

5.18.4 Food storage box

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.

5.18.5 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.

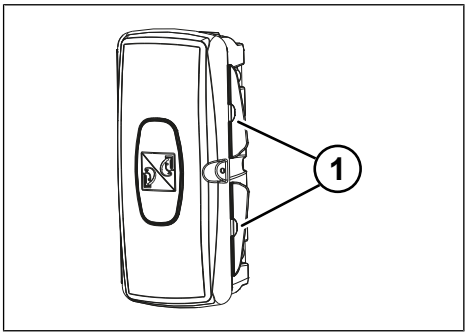


Fig. 5-51: Storage box

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.

5.19 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.

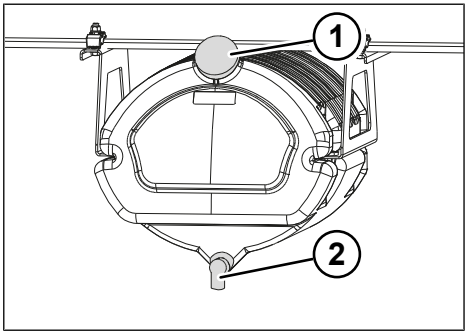


Fig. 5-52: Water tank

1 Filler neck with screw cap
2 Water tap

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 Fuel tank

⚠ WARNING

Fire and explosion hazard!

Fuels are highly flammable.

► Turn off the unit's motor during refuelling.
► Avoid open sources of ignition.

The cooling system’s fuel tank is mounted in a protected location behind the bracing beam.

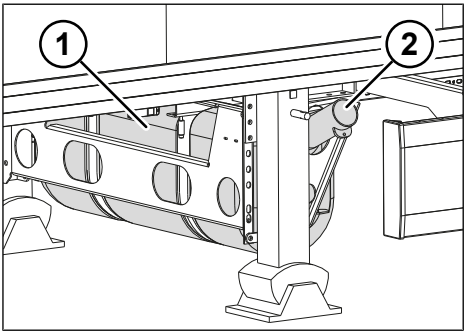


Fig. 5-53: Fuel tank

1 Fuel tank
2 Filler neck

The fuel tank is equipped with a filler neck and a filling level indicator. Depending on the equipment, the trailer can be equipped with an LED tank display on the front wall.

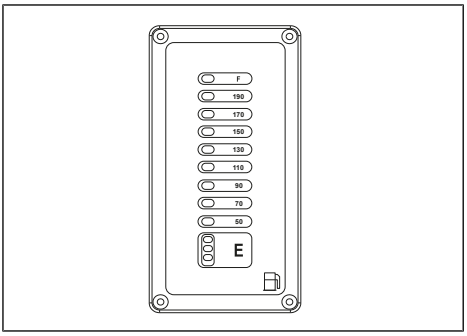


Fig. 5-54: LED tank display

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

► Check that the doors are locked before every trip.

► Do not drive with open or unlocked doors.

► To prevent the doors from bumping on the trailer superstructure, always swivel the lock lever back to its initial position (parallel to the door).

► Always secure open doors with door stops.

⚠ CAUTION

Risk of injury from falling loads!

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

► When opening the doors, 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.

Depending on the version, the doors on the rear gantry are locked with two or four turn rod locks.

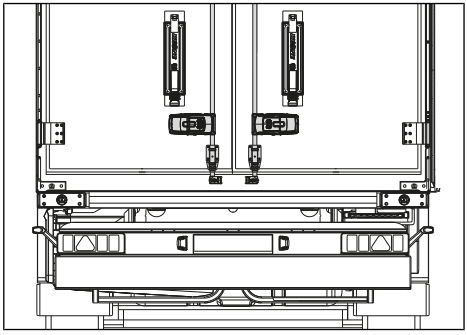


Fig. 6-1: Rear gantry with two door locks

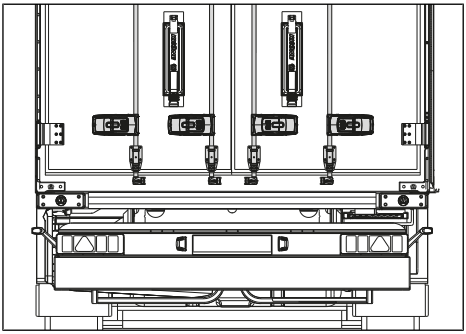


Fig. 6-2: Rear gantry with four door locks

6.1.1 Door lock

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

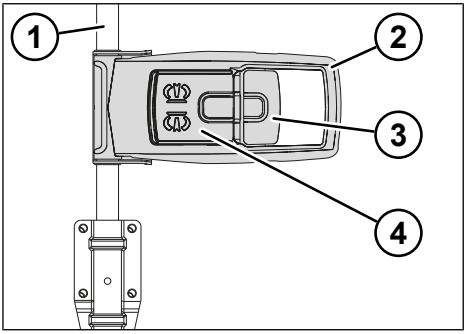


Fig. 6-3: Door lock

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

Opening doors with two door locks

- ► If applicable, fold down the protective cover for the right door and open the lock.
- ► Fold the opened protective cover back down again.
- ► Push in the lock of the right door lock.
- ► Swivel out the door lock lever so that the tension bolts push the door open.
- ► Open the right-hand door leaf.
- ► Swivel the door lock lever back to the original position and engage it.
- ► Secure the door with the door stop *(see "6.1.2 Door stop", pg. 64)*.
- ► Open the left door lock in the same way.
- ✓ Both doors are opened and secured.

Closing doors with two door locks

- ► Release the left door stop *(see "6.1.2 Door stop", pg. 64)*.
- ► Close the left door leaf.
- ► Swivel in the door lock lever so that the tension bolts pull the door closed.
- ► Firmly press the door lock lever so that the lock engages.
- ► Close the left-hand door.
  - ⇨ The left door is closed.
- ► Close the right door lock in the same way.
- ► If applicable, fold up the protective cover for the lock and close the lock.
- ► If applicable, close the protective cover for the lock again.
- ✓ Both doors are closed.

Opening doors with four door locks

- ► If applicable, fold down the protective cover for the right rear door and open the door lock.
- ► Fold the opened protective cover back down again.
- ► Push in both of the locking mechanisms of the door locks on the right door leaf at the same time.
- ► Swivel out both lock levers at the same time so that the tension bolts push the door open.
- ► Open the right-hand door leaf.
- ► Swivel both door lock levers back to the original position and engage them.
- ► Secure the doors with door stops *(see "6.1.2 Door stop", pg. 64)*.

- ► Open the left door locks in the same way.
- ✓ Both doors are opened and secured.

Closing doors with four door locks

- ► Release the left door stop *(see "6.1.2 Door stop", pg. 64)*.
- ► Close the left door leaf.
- ► Swivel in both door lock levers for the left door leaf at the same time, so that the tension bolts pull the door shut.
- ► Firmly press the door lock levers at the same time, so that the lock engages.
- ► Close the left-hand door.
  - ⇨ The left door is closed.
- ► Close the right door locks in the same way.
- ► If applicable, fold up the protective cover for the lock and close the lock.
- ► Close the opened protective cover for the lock again.
- ✓ Both doors 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.
- ► Door stops are not intended for driving with opened doors at more than walking speed.

Depending on the equipment, KRONE trailers can be equipped with the following door stops:

- ○ U-shaped door stop *(see "6.1.2.2 U-shaped door stop", pg. 65)*
- ○ Rope door stop *(see "6.1.2.1 Rope door stop", pg. 64)*

6.1.2.1 Rope door stop

The rope door stop is fastened under the superstructure.

⚠ CAUTION

Risk of crushing when operating the door stop!

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

- ► Wear work gloves.
- ► Move the door stop slowly.

Securing the door with the door stop

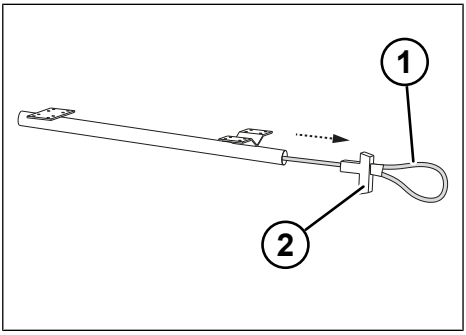


Fig. 6-4: Rope door stop

1 Rope loop
2 Plastic handle

- ☑ The door is opened.
- ► Pull the door stop from under the superstructure by the plastic handle.
- ► Lay the rope loop around the tension bolt of the turn rod lock of the opened door.
- ✓ The door is secured with the door stop.

Releasing the door from the door stop

- ► Remove the rope loop from the tension bolt of the turn rod lock.
- ✓ The door is released from the door stop.

6.1.2.2 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

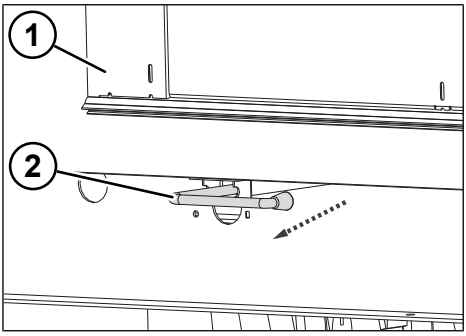


Fig. 6-5: Pulling the door stop outwards

1 Door leaf swung open
2 Door stop

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

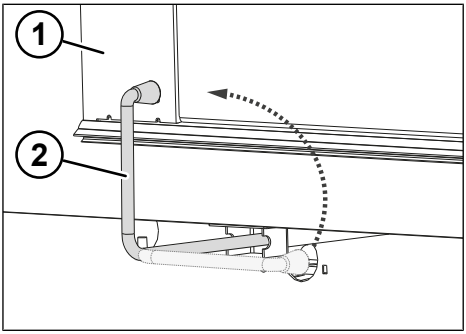


Fig. 6-6: Swivelling the door stop upwards

1 Door leaf swung open
2 Door stop

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

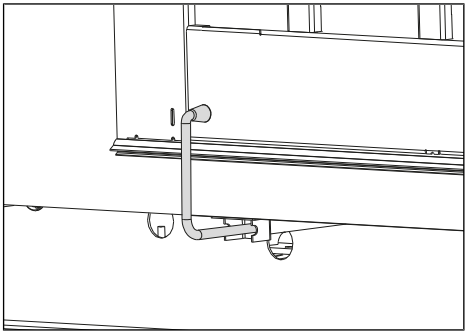


Fig. 6-7: Door leaf locked with the door stop

- ✓ The door is locked with the door stop.

Release the door from the door stop

- ► Move the door stop outwards from the swivelled open door.

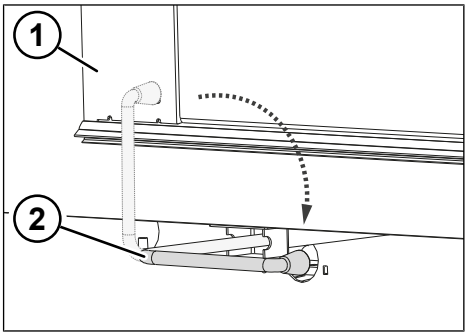


Fig. 6-8: Swivelling the door stop downwards

1 Door leaf swung open
2 Door stop

- ► Swivel the door stop downwards.
- ► Turn in the door stop with the spring force.
- ✓ The door is released from the door stop.

6.2 Rolling door

⚠ WARNING

Risk of accident due to loss of cargo!

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

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

⚠ CAUTION

Risk of injury from falling cargo!

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

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

For more information, see also

- Mechanically driven rolling door [▷ 66]
- Electrically driven roller shutter [▷ 67]

6.2.1 Mechanically driven rolling door

⚠ CAUTION

Risk of injury when operating the roller shutter!

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

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

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

► Ensure that the locking latch is working properly.

► Also observe the enclosed supplier documentation.

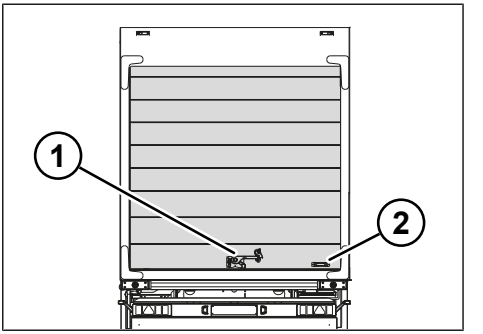


Fig. 6-9: Mechanically driven roller shutter with hook locking device

1 Locking mechanism
2 Handle

Opening the roller shutter

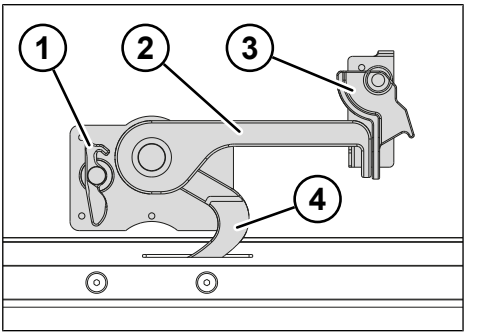


Fig. 6-10: Hook locking device

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

► Fold up the fall protection.

► Swing the locking lever around until the locking latch clicks into place.

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

► Push up the roller shutter completely with the handle.

► Climb into the refrigerated trailer and open the roller shutter to the end stop.

✓ The roller shutter is open.

Closing the roller shutter

⚠ CAUTION

Risk of injury by using the door strap incorrectly!

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

► Never use the door strap to climb up or down.

► Do not tie anything to the belt strap.

► Pull the roller shutter down as far as possible using the inside door strap.

► Pay attention to obstacles in the cargo that can damage the seals.

► Push the roller shutter all the way down using the handle.

► Release the locking latch.

► Push down the roller shutter with the handle.

► Swing the locking lever around again.

► Check that the locking latch is correctly positioned.

► Fold down fall protection.

✓ The roller shutter is closed and locked.

Depending on the version, the mechanically driven roller shutter can also be equipped with a turn locking device instead of a hook locking device.

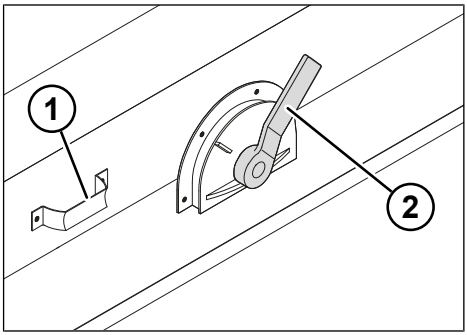


Fig. 6-11: Turn locking device

1 Handle
2 Locking mechanism

6.2.2 Electrically driven roller shutter

The electric roller shutter is opened and closed using buttons at the bottom right on the corner post. There is another button on the inside of the corner post for operation from a ramp. If there is no power supply or a malfunction, the electric roller shutter can be unlocked and opened mechanically from the outside with a key for the emergency release.

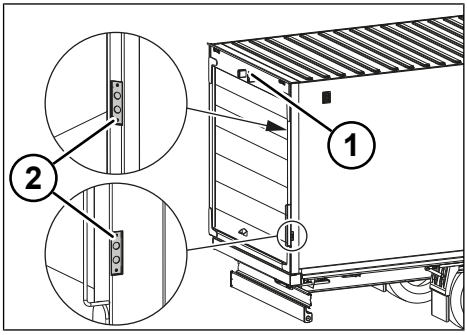


Fig. 6-12: Electrically driven roller shutter

1 Lock for emergency release
2 Button

Opening the roller shutter

► Press the button on the corner post.

✓ The roller shutter opens.

Closing the roller shutter

► Press the button on the corner post.

✓ The roller shutter closes.

Stopping the roller shutter

► Press the button on the corner post while opening/closing.

✓ The roller shutter stops. When the button is pressed again, the direction of movement of the roller shutter is changed.

Opening the roller shutter mechanically (emergency release)

⚠ CAUTION

Risk of injury by lifting the electrically driven rolling door!

Depending on the design, the weight of the electrically driven rolling door is between 70 kg and 100 kg. Lifting heavy loads can cause injuries.

► Never lift an electrically driven rolling door alone mechanically.

If a malfunction occurs or if there is a power failure, the electrically driven roller shutter can be opened mechanically by releasing the connection to the drive chain from the outside:

► Insert the supplied key into the lock on the roller shutter.

► Turn the key to the side to disconnect the connecting strap between the drive chain and roller shutter.

⇨ The connecting strap has released the connection between the roller shutter and drive chain.

► Lift the roller shutter.

► Secure the roller shutter against accidentally falling down.

✓ The roller shutter is mechanically opened.

► To start operating the roller shutter again after the emergency release, contact an authorised specialist workshop.

6.3 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.

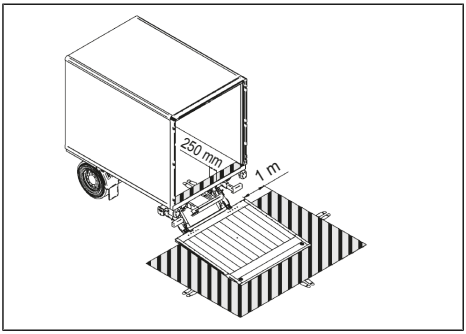


Fig. 6-13: Hazard area of the tail lift

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.

6.4 Side door

⚠ 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 from falling loads!

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

► When opening the doors, watch out for falling loads.

⚠ CAUTION

Personal injury or material damage due to swinging doors!

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

► Check that the doors are locked before every trip.

► Do not drive with open or unlocked doors.

► To prevent the doors from bumping on the trailer superstructure, always swivel the lock lever back to its initial position (parallel to the door).

► Always secure open doors with door stops.

Opening the side door

► If applicable, fold down the protective cover for the lock and open the lock.

► Close the opened protective cover for the lock again.

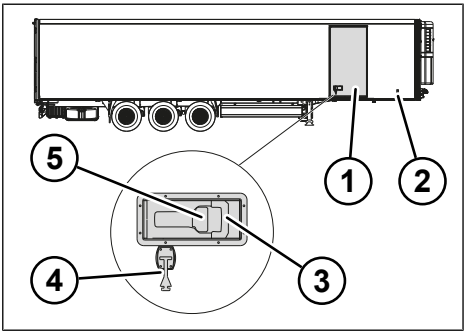


Fig. 6-14: Single-leaf side door

1 Side door
2 Counter block for the door stop
3 Lock
4 Door stop
5 Lock lever

► Push in the lock of the door lock.

► Swivel out the lock lever a bit.

► If there is no noticeable cargo pressure, completely open the door lock.

► Open the door leaf.

► Swivel the door lock lever back to the original position and engage it.

► Secure the door stop on the counterholder. As an option, the door stop can be secured with a rope and a carabiner on the front wall.

► Fasten the side door with the door stop.

✓ The side door is opened and fastened.

Closing the side door

► Release the door leaf from the door stop.

► Pay attention to obstacles in the cargo that can damage the seals.

► Close the door leaf.

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

► If applicable, fold down the protective cover for the lock and close the lock.

► Close the opened protective cover for the lock again.

✓ The side door is closed.

6.5 Load compartment lighting

The vehicle can be equipped with a different number of ceiling lights. In the standard version, 4 ceiling lights are installed that are switched on and off via the door contact switch.

On vehicles with rear door/roller shutter or tail lift, the lights are switched on and off with tilt switches and with light switches on the floor (optional).

INFO

The load compartment lighting only works when the tractor parking lights are switched on or with an external power supply (e.g. additional battery system).

6.6 Strip curtain

The strip curtain serves to prevent energy losses when loading and unloading. It does not serve to divide the load compartment into different temperature zones.

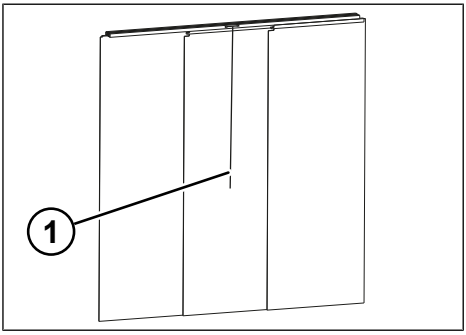


Fig. 6-15: Three-part sliding strip curtain

1 Pull strap

Depending on the version, the strip curtain

- slides transversely,
- slides transversely and longitudinally or
- is fixed at the rear.

NOTE

Material damage due to driving with forklift vehicles!

The clearance in the strip curtain area is reduced.

► Pay attention to the reduced clearance when driving with forklift vehicles.

Sliding the strip curtain longitudinally

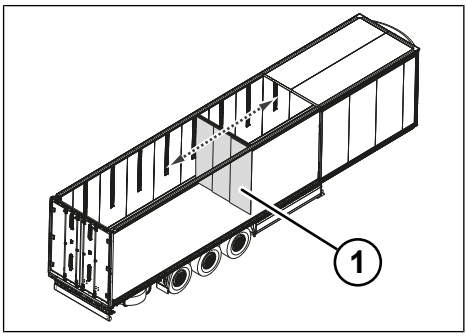


Fig. 6-16: Strip curtain

1 Three-part strip curtain

⚠ CAUTION

Risk of accident when sliding the strip curtain!

When sliding the strip curtain longitudinally, there is a risk of falling off the load compartment.

► Be particularly careful when moving in reverse near the rear gantry.

► Pull the pull strap down and slide the strip curtain longitudinally.

► Let go of the pull strap.

✓ The strip curtain has been moved longitudinally and is locked.

Sliding the strips transversely

► Pull the pull strap down and slide the individual strips transversely.

► Let go of the pull strap.

► The strip has been moved transversely and all of the strips are locked again.

6.7 Partition

⚠ CAUTION

Risk of accident due to slipping of the load!

Load pressure due to vehicle braking can not be compensated by the partition. The load can slip and cause personal injury as well as material damage.

- ► Do not use partitions to secure the load.
- ► Secure the load with the intended equipment for load securing.

NOTE

Material damage due to unlocked partitions!

Unlocked partitions do not insulate the temperature zones from each other; they can also change their position/orientation and cause damage to the superstructure and load.

- ► Always lock partitions after they are opened or moved.

NOTE

Material damage due to driving with forklift vehicles!

The clearance in the folded-up partition area is reduced.

- ► Pay attention to the reduced clearance when driving with forklift vehicles.
- ► Fold up the partition before driving with forklift vehicles.

INFO

To ensure proper function of the cooling systems, the chamber sizes must maintain specific dimensions. To position the transverse partition, observe the minimum chamber size according to the specifications of the cooling system manufacturer.

With the folding KRONE Isowall movable partition, different temperature zones can be created in the load compartment.

Depending on the equipment, KRONE trailers can be equipped with the following KRONE Isowall movable bulkhead:

- ○ Transverse partition *(see "6.7.1 Transverse partition", pg. 72)*
- ○ Transverse partition with fan *(see "6.7.2 Transverse partition with fan", pg. 73)*
- ○ Longitudinal partition wall *(see "6.7.3 Longitudinal partition wall", pg. 74)*

6.7.1 Transverse partition

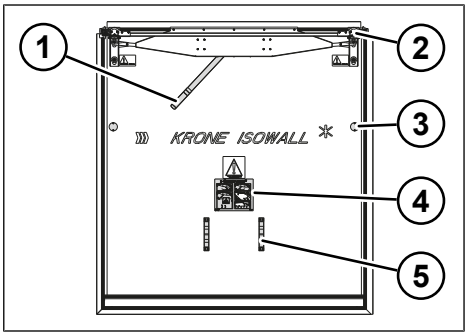


Fig. 6-17: Partition

1 Locking lever opened
2 Balancer
3 Stop plate (magnet)
4 Operating instructions sticker
5 Handle

Unlocking the partition

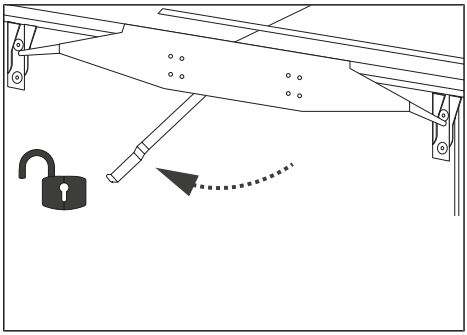


Fig. 6-18: Unlocking the partition

- ► Swivel the locking lever to the left.
- ✓ The partition is unlocked.

Locking the partition

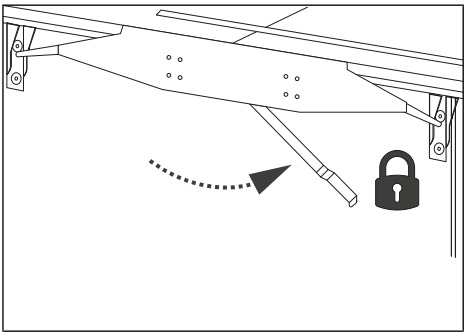


Fig. 6-19: Locking the partition

► Swivel the locking lever to the right.

✓ The partition is locked.

Shifting the partition

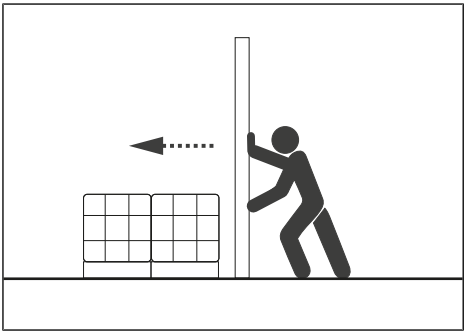


Fig. 6-20: Shifting the partition

► Unlock the partition.

► Pull the partition by the handle with one hand and at the same time, push on the middle of the panel with the other hand so that the partition swivels up. An angle of movement of 0-75 degrees is possible.

► Move the partition in the superstructure in a folded-up position.

► Fold down the partition.

► If necessary, push the partition in a vertical position towards the load standing in front of it.

► Lock the partition.

✓ The partition is moved and locked.

Moving the partition into parking position

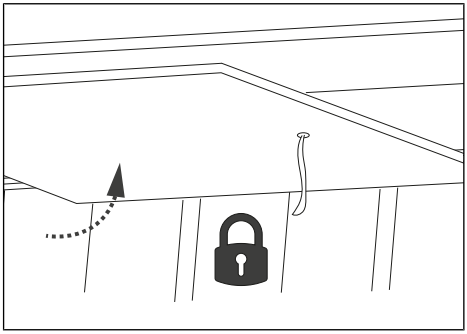


Fig. 6-21: Partition in parking position

► Swivel the locking lever to the left.

► Swivel the partition up by pulling and pushing until it engages.

✓ The partition is in the parking position and therefore automatically locked against longitudinal movement.

6.7.2 Transverse partition with fan

NOTE

Material damage on the partition fan due to unsecured load!

The partition fan is energised via live rails in the area of the partition running rails. Unsecured loads can damage the rails.

► Secure the load against sliding.

► When loading and unloading, make sure that the load does not collide on the rails.

INFO

The fan is not suited for ensuring an even air and temperature distribution in the separated load compartment. Observe the transport conditions for the load.

INFO

The fan is only operative when the cooling system is switched on.

To cool the untempered load compartment area, the partition can be equipped with a thermostat-controlled fan. Thus, tempered air from the temperature-controlled load compartment area is used.

The fan is supplied with power through the cooling system. The on/off switch as well as the temperature controller for the fan are located in a protective box on the front wall. As a result, operation is also possible when the vehicle is loaded.

The temperature probe is located in the rear area of the superstructure, beside the temperature sensor of the temperature recorder.

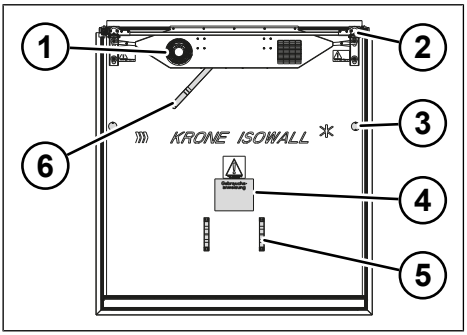


Fig. 6-22: Partition with fan

1 Fan
2 Balancer
3 Stop plate
4 Operating instructions sticker
5 Handle
6 Locking lever opened

To switch the fan on and off, observe the separate operating instructions from the manufacturer.

6.7.3 Longitudinal partition wall

Depending on the version, KRONE trailers can be equipped with a fixed longitudinal partition.

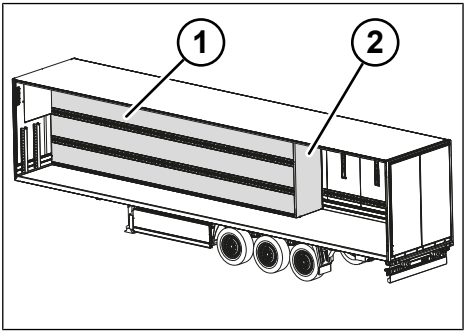


Fig. 6-23: Longitudinal partition wall

1 Longitudinal partition wall
2 Transverse partition

With the longitudinal partition, two or three independently controlled temperature zones (depending on the cooling system version) can be created to transport fresh and frozen goods.

The transverse partitions of the longitudinal partition can be positioned as desired along the length of the superstructure.

6.8 Air guide tarp

The air guide tarp installed on the ceiling with fastening links distributes the cold air evenly in the superstructure. The cooled air can emerge to the sides, in the middle of the section, and to the rear.

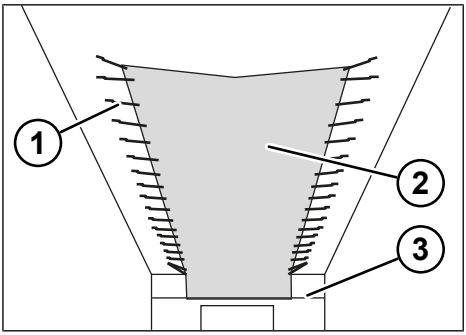


Fig. 6-24: Air guide tarp

1 Fastening links
2 Air guide tarp
3 Fastening rod

A combination of air guide tarp and transverse partition is possible. In this case, the air current towards the rear is closed off by the transverse partition. The cooled air can still emerge to the sides and in the middle of the section. With double-deck support beams in parking position *(see "8.9 Double-deck loading", pg. 99)*, the function of the air guide tarps is maintained. With double-deck support beams in the topmost parking position, the function of the air guide tarp can be limited.

► After each loading and unloading of the refrigerated trailer and prior to departure, check that the air guide tarp is correctly fastened.

To clean the cooling system or when driving with high loads that need to be cooled, the air guide tarp can be put out of operation and locked on the ceiling. The air guide tarp must be removed to be properly cleaned.

Installation of the air guide tarp

► Fasten the fastening rod, so that the air guide tarp encloses the cold air exhaust from the cooling system.
► Hook on all of the fastening links.
✓ The air guide tarp has been put back into operation.

Disconnection of the air guide tarp

► Fasten the fastening rod in the topmost position with the straps.
✓ The air guide tarp has been taken out of operation.

Removing the air guide tarp

The air guide tarp must be removed before it is cleaned.

► Release the fastening rod.
► Unhook the fastening links.
► Remove the air guide tarp.
✓ The air guide tarp is removed.
► Follow the cleaning instructions *(see "11.1 Care and cleaning", pg. 125)*.

6.9 Air duct

The air duct installed on the ceiling guides the cold air to the rear area of the superstructure. The cooled air can emerge to the sides and in the middle.

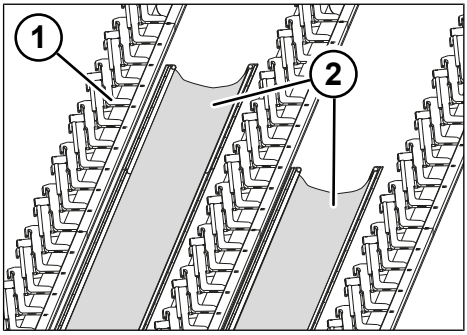


Fig. 6-25: Air duct

1 Euro meat suspension system
2 Air ducts

When combining air ducts with the double-deck system, make sure that the double-deck beams in the pushed-up parking position do not interfere with the cross-section of the air duct to ensure uniform air distribution in the superstructure *(see "8.9 Double-deck loading", pg. 99)*.

► After each loading and unloading of the refrigerated trailer and prior to departure, check that the air duct is correctly fastened.

6.10 Rebound plate

For an optimum exhaust air guiding as well as to protect the evaporation unit, a rebound plate is bolted onto the inside of the front wall or on the circulation profile in the refrigerated trailer.

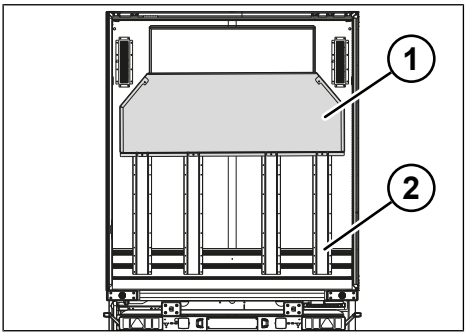


Fig. 6-26: Rebound plate

1 Rebound plate
2 Circulation profile

Depending on the equipment, the rebound plate can be folded down.

► Only fold the rebound plate up or down for maintenance and cleaning work. *(see "11.1 Care and cleaning", pg. 125)*

Folding the rebound plate down

► Loosen the toggle screws.

► Fold the lever down and secure the rebound plate manually against unintentional folding down.

► Repeat the steps on the other side of the rebound plate.

✓ The rebound plate is folded down.

Folding the rebound plate up

► Fold the rebound plate up.

► Fold the lever upwards.

► Repeat the steps on the other side of the rebound plate.

✓ The rebound plate is folded up and secured.

Unscrewing the rebound plate

⚠ CAUTION

Risk of injury due to improper removal of the rebound plate!

When it is being unscrewed, the rebound plate can fall down and injure people and cause material damage.

► Always remove the rebound plate with the help of a second person.

► Remove all of the screws on the rebound plate.

✓ The rebound plate is unscrewed.

Screwing on the rebound plate

► Hold the rebound plate in position.

► Insert and tighten all of the screws.

✓ The rebound plate is screwed on.

6.11 Circulation profiles

To ensure that the air can circulate freely on the front wall with form-fitting loads, air circulation profiles are installed on the inside of the front wall in the refrigerated trailer.

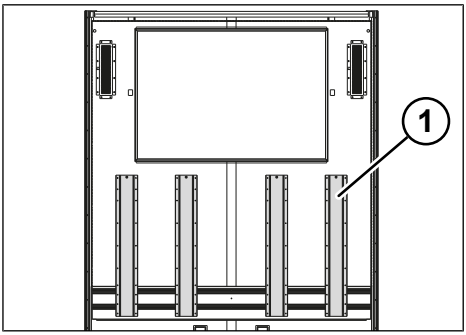


Fig. 6-27: Circulation profiles

1 Circulation profile

6.12 Water drain

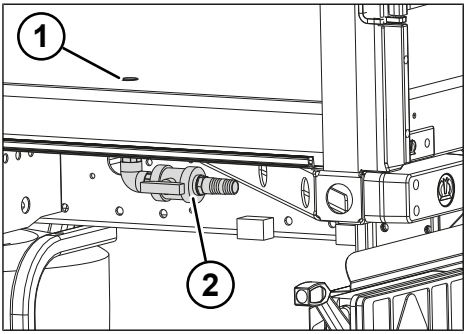


Fig. 6-28: Water drain

1 Water drain in the floor

2 Ball tap

6.13 Charging socket

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 cooling system manufacturer.
- ► Observe the connection conditions of the cooling system manufacturer.

Depending on the version, KRONE trailers can be equipped with a charging socket to operate the cooling system with an external power source.

6.14 Venting shutters

KRONE trailers can be equipped with venting shutters. The venting shutters are used for ventilation and exhaust of the inside of the refrigerated trailer superstructure. The venting shutters can be attached on the front wall or on the rear gantry.

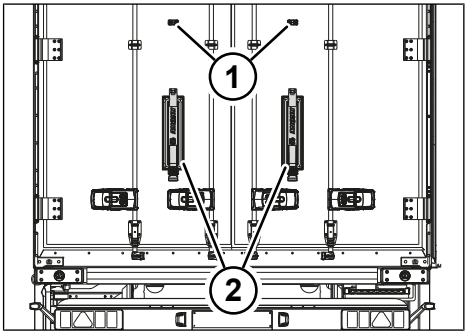


Fig. 6-29: Venting shutters on the rear gantry

1 bracket

2 Venting shutters

Opening the venting shutter

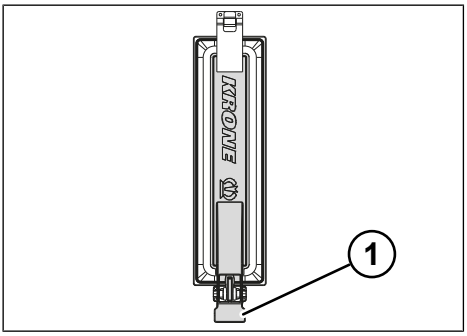


Fig. 6-30: Venting shutter

1 Handle

► Fold up the flap using the handle.
► Press the handle down in the mount.
✓ The venting shutter is opened and fastened.

Closing the venting shutter

► Release the handle from the mount.
► Fold the flap down and press it firmly.
✓ The venting shutter is closed.

6.15 Remote thermometer

The remote thermometer records the air temperature in the load compartment. Depending on the air circulation, the load compartment temperature can differ from the air temperature. The remote thermometer is installed on the front wall. The temperature sensor is located in the return current area of the cooling system.

6.16 Temperature recorder

The temperature recorder records the temperatures during transport and saves the data. The saved data can be printed directly at the trailer (if a printer is available) or transferred to the computer.

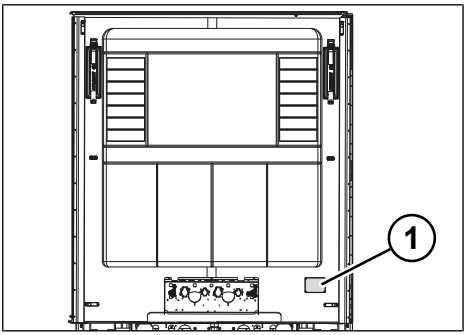


Fig. 6-31: Attachment point of the temperature recorder

1 Temperature recorder

The temperature recorder installed in a weatherproof housing on the outside of the trailer front wall. Temperature recorders from different manufacturers can be installed ex-factory.

Also observe the enclosed supplier documentation.

6.17 Cooling system

⚠ WARNING

Risk of fire due to overheating cooling system!

Unsuitable electrical supply and control connections can cause fires due to overheating.

► Only use cables that meet the specifications of the cooling system manufacturer.
► Comply with the connection conditions prescribed by the cooling system manufacturer.

Also observe the enclosed supplier documentation.

The cooling system is mounted on the front side of the refrigerated trailer superstructure. Cooling systems from different manufacturers can be installed ex-factory. Information for using the cooling system can be found in the operating instructions supplied by the respective manufacturer.

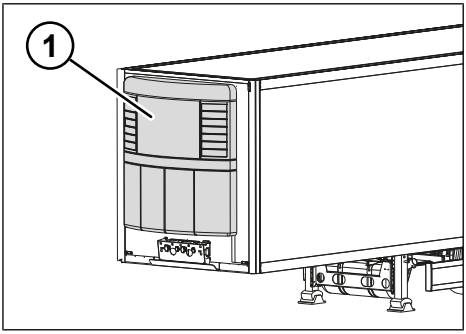


Fig. 6-32: Cooling system (example)

1 Cooling system

Power can be supplied to the cooling system in different ways (depending on the design):

- ○ During road operation, through direct supply from the tractor unit.
- ○ During road operation, through direct supply from a high-voltage battery in the trailer.
- ○ For mains operation, through an external power source.

► Before departure, disconnect the power cable from the external power source and/or the charging connection on the vehicle (depending on the design, e.g. on the cooling system or on the high-voltage battery system).

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?
- ○ Are all of the supply lines between the trailer and the external charging stations properly disconnected and stowed away?
- ○ Is the load properly distributed and correctly secured?
- ○ Is the load compartment clean enough and disinfected for transporting food?
- ○ 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?
- ○ Are the air spring bellows undamaged?
- ○ Is each support device retracted and secured?
- ○ Is the roof closed and free of ice, snow, or other objects?

► 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.

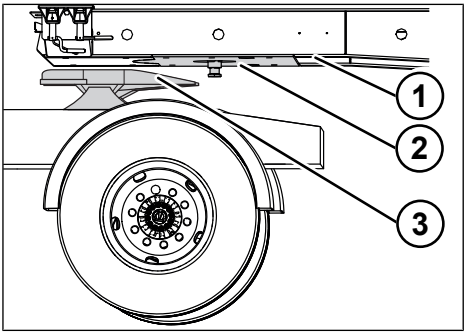


Fig. 7-1: Coupling

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 "5.8.2 Parking brake", pg. 41)*.
- ► Use the wheel chocks to prevent the trailer from rolling away *(see "5.1 Using wheel chocks", pg. 23)*.
- ► 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 "5.3 Supply and control connections", pg. 28)*.
► Retract the landing leg winches *(see "5.2 Support device", pg. 24)*.
► Put the trailer's air suspension in the driving position *(see "5.9 Air suspension", pg. 44)*.
► Remove the wheel chocks and properly secure them *(see "5.1 Using wheel chocks", pg. 23)*.
► Disengage the parking brake on the trailer *(see "5.8.2 Parking brake", pg. 41)*.
► 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. 80)*.
✓ The trailer is coupled and ready to drive.

Uncoupling

► Lower the trailer's air suspension down to the mechanical limit *(see "5.9 Air suspension", pg. 44)*.
► 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 "5.8.2 Parking brake", pg. 41)*.
► Use the wheel chocks to prevent the trailer from rolling away *(see "5.1 Using wheel chocks", pg. 23)*.
► Lift the trailer with the tractor unit's air suspension.
► Support the trailer with the landing leg winches *(see "5.2 Support device", pg. 24)*.
► 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 "5.3 Supply and control connections", pg. 28)*.
► 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 "5.8.1 Service brake", pg. 40)* must be released.

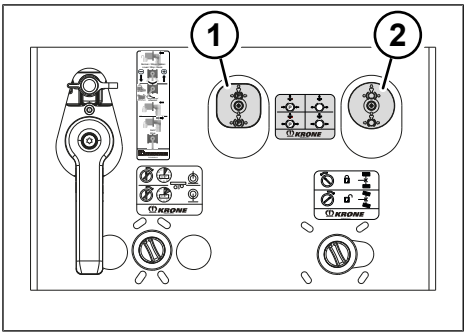


Fig. 7-2: Control unit for brake system

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 "5.8.2 Parking brake", pg. 41)*.

► 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 "5.8.2 Parking brake", pg. 41)*.

► Use wheel chocks to prevent the trailer from rolling away *(see "5.1 Using wheel chocks", pg. 23)*.

► Extend the landing leg winches *(see "5.2 Support device", pg. 24)*.

► Extend the rear braces, if present Rear braces.

► Disconnect the supply and control connections *(see "5.3 Supply and control connections", pg. 28)*.

- ► Protect the high-voltage device against unauthorised use (observe the specifications of the system manufacturers!).
- ► Uncouple the trailer from the tractor unit *(see "7.2 Coupling and uncoupling the trailer", pg. 81)*.
- ► For longer parking periods and when loading the ramp while parked, lower the air suspension *(see "5.9 Air suspension", pg. 44)*.
- ✓ 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 "5.9 Air suspension", pg. 44)*. Do not allow the trailer to have any residual pressure in the air spring bellows.

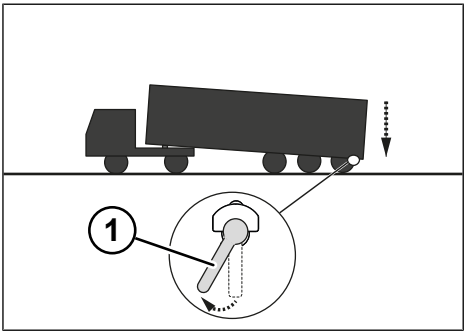


Fig. 7-3: Lowering the trailer

1 Control lever in “Lower the trailer” position

- ► Slowly manoeuvre to the parking spot.
- ► Apply the parking brake on the control knob *(see "5.8.2 Parking brake", pg. 41)*.
- ► Use the wheel chocks to prevent the trailer from rolling away *(see "5.1 Using wheel chocks", pg. 23)*.
- ► Fold up the rear underrun protection if the underrun protection can be folded up and locked Rear underrun protection.
- ► If necessary, unlock, fold up, and lock the side collision protection on both sides *(see "5.14 Side collision protection", pg. 49)*.
- ► Hang up all the mud flaps *(see "5.13 Mud flap", pg. 49)*.
- ► 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 Hydraulic lifting roof.
- ► 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. 24)*.
- ► Disconnect the supply and control lines and seal them properly.
- ► Unhitch the trailer*(see "7.2 Coupling and uncoupling the trailer", pg. 81)*.
- ► 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 "5.8.2 Parking brake", pg. 41)*.
- ✓ 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 "5.9 Air suspension", pg. 44)*. Do not allow the trailer to have any residual pressure in the air spring bellows.

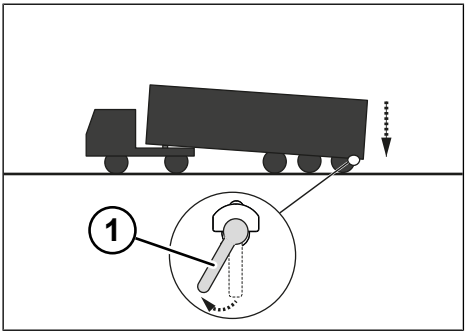


Fig. 7-4: Lowering the trailer

1 Control lever in “Lower the trailer” position

- ► Slowly manoeuvre to the parking spot.
- ► Apply the parking brake on the control knob *(see "5.8.2 Parking brake", pg. 41)*.
- ► Use the wheel chocks to prevent the trailer from rolling away *(see "5.1 Using wheel chocks", pg. 23)*.
- ► Fold up the rear underrun protection if the underrun protection can be folded up and locked Rear underrun protection.
- ► If necessary, unlock, fold up, and lock the side collision protection on both sides *(see "5.14 Side collision protection", pg. 49)*.
- ► Hang up all the mud flaps *(see "5.13 Mud flap", pg. 49)*.
- ► 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 Hydraulic lifting roof.
- ► 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. 24)*.
- ► Disconnect the supply and control lines and seal them properly *(see "5.3 Supply and control connections", pg. 28)*.
- ► Uncouple the trailer *(see "7.2 Coupling and uncoupling the trailer", pg. 81)*.
- ► 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. 23)*.
- ► Release the parking brake on the control knob *(see "5.8.2 Parking brake", pg. 41)*.
- ► Bring the trailer to the loading site using a terminal tractor unit.
- ► Uncouple the trailer *(see "7.2 Coupling and uncoupling the trailer", pg. 81)*.
- ► 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. 24)*.
- ► 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 "5.8.2 Parking brake", pg. 41)*.
- ► Use the wheel chocks to prevent the trailer from rolling away *(see "5.1 Using wheel chocks", pg. 23)*.
- ► Put the air suspension's control lever in the driving position *(see "5.9 Air suspension", pg. 44)*.

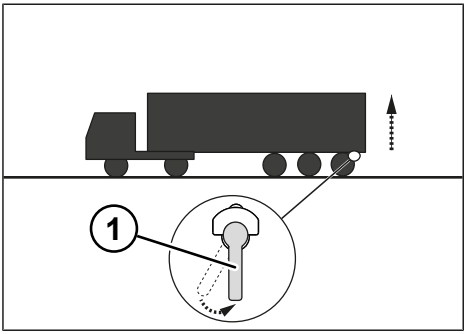


Fig. 7-5: Place the trailer in the driving position

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. 24)*.
- ► 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. 81)*.
- ► Connect the supply and control lines *(see "5.3 Supply and control connections", pg. 28)*.
- ► 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 underrun protection Rear underrun protection.
- ► If necessary, unlock, fold down and relock the side collision protection *(see "5.14 Side collision protection", pg. 49)*.
- ► 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 "5.9 Air suspension", pg. 44)*. 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 Rear underrun protection.
- ► If necessary, unlock, fold up, and lock the side collision protection on both sides *(see "5.14 Side collision protection", pg. 49)*.

- ► 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. 24)*.
- ► Disconnect the supply and control lines and seal them properly *(see "5.3 Supply and control connections", pg. 28)*.
- ► Uncouple the trailer *(see "7.2 Coupling and uncoupling the trailer", pg. 81)*.
- ► Apply the parking brake on the control knob *(see "5.8.2 Parking brake", pg. 41)*.
- ► Use the wheel chocks to prevent the trailer from rolling away *(see "5.1 Using wheel chocks", pg. 23)*.
- ✓ 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. 23)*.
- ► Couple the trailer with the port tractor unit *(see "7.2 Coupling and uncoupling the trailer", pg. 81)*.
- ► Release the parking brake on the control knob *(see "5.8.2 Parking brake", pg. 41)*.

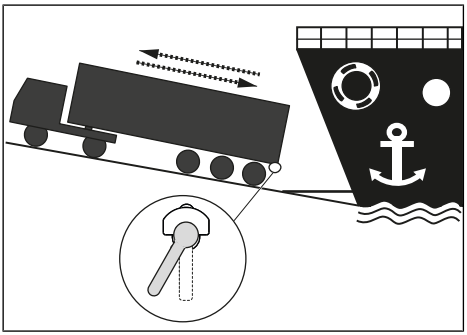


Fig. 7-6: Driving the trailer onto the ferry

- ► Connect the supply and control lines *(see "5.3 Supply and control connections", pg. 28)*.
- ► 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.

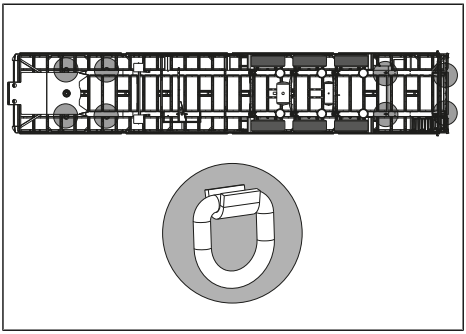


Fig. 7-7: Arrangement of the ferry rings

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. 81)*.
- ► Connect the supply and control lines *(see "5.3 Supply and control connections", pg. 28)*.
- ► 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 "5.8.2 Parking brake", pg. 41)*.
- ► Drive the trailer from the ferry to the parking space on the port.

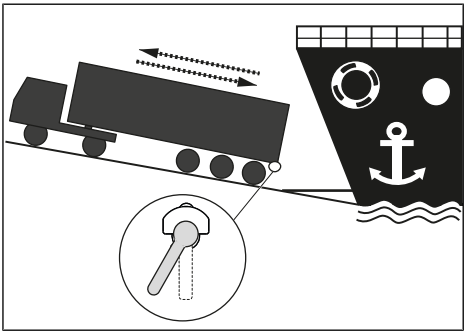


Fig. 7-8: Driving the trailer off the ferry

- ► 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. 23)*.
- ✓ 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. 23)*.
- ► Wind down the landing leg winch until the trailer can be coupled *(see "5.2 Support device", pg. 24)*.
- ► Put the air spring valve's control lever in the driving position *(see "5.9 Air suspension", pg. 44)*.

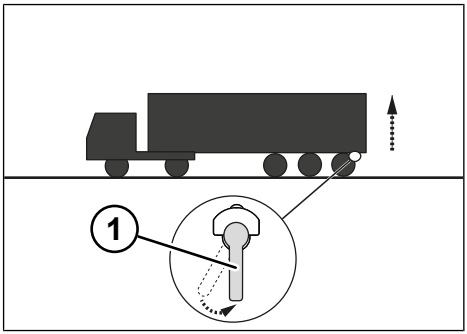


Fig. 7-9: Place the trailer in the driving position

1 Control lever in the “driving position”

- ► Couple the trailer *(see "7.2 Coupling and uncoupling the trailer", pg. 81)*.
- ► Connect the supply and control lines *(see "5.3 Supply and control connections", pg. 28)*.
- ► 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 underrun protection Rear underrun protection.
- ► If necessary, unlock, fold down and relock the side collision protection *(see "5.14 Side collision protection", pg. 49)*.
- ► Hang down the mud flaps, if necessary *(see "5.13 Mud flap", pg. 49)*.
- ► 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.

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.

NOTE

Material damage due to blocked air vents!

When the air vents are blocked, air cannot circulate in the load compartment. Under unfavourable conditions, this can cause damage to the cargo.

► Do not block the air vents with cargo or aids.

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.

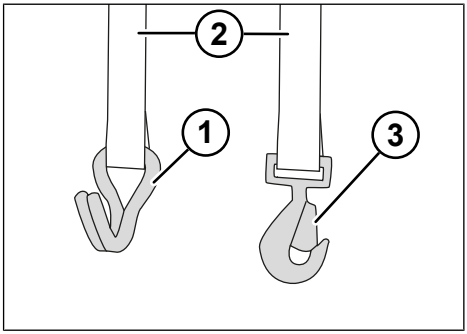


Fig. 8-1: Lashing material

1 Wire hook
2 Lashing belts
3 Load hook

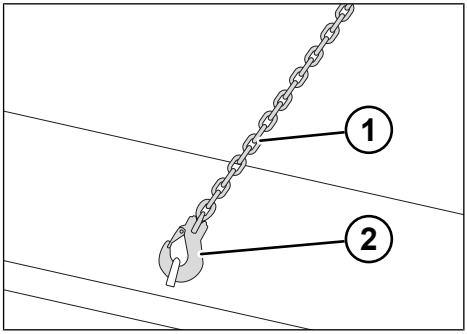


Fig. 8-2: Lashing chain with load hook

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.

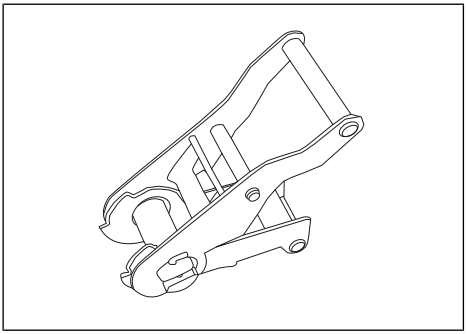


Fig. 8-3: Strap ratchet

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 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.

8.3 Load securing rail

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

8.4 Locking rods

⚠ CAUTION

Risk of accident due to overloading!

The maximum load is specified on the bearing elements.

- ► Never exceed the maximum load.

NOTE

Material damage due to unsuitable load securing elements!

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

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

The load is secured against sliding with locking rods. The locking rods are equipped with spring-loaded sliding blocks and are attached at the required position on the load securing rails *(see "8.3 Load securing rail", pg. 94)*.

Combination lashing rail

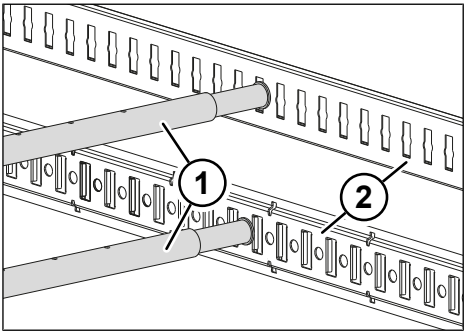


Fig. 8-4: Locking rods combination lashing rail

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.

8.5 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 "8.3 Load securing rail", pg. 94)*.

⚠ 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.

8.6 Vario Lock system

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

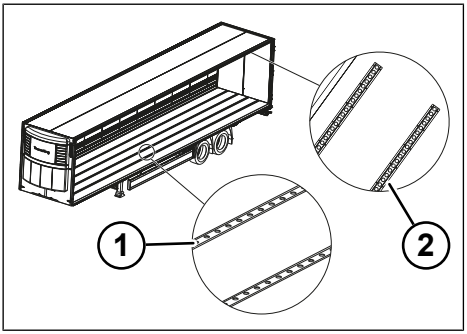


Fig. 8-5: Vario Lock system

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

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

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

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

8.7 Cooling air routing

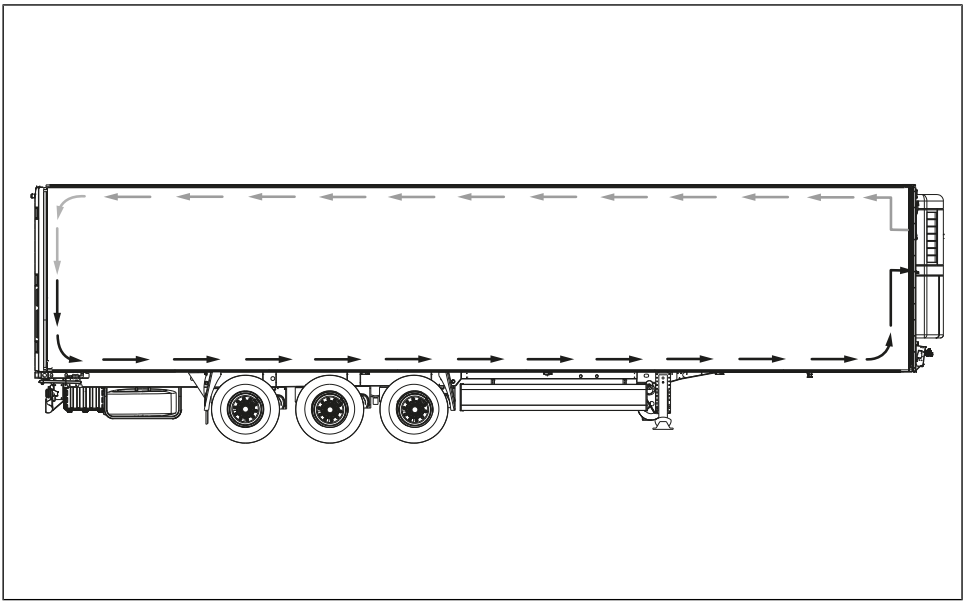


Fig. 8-6: Cooling air routing in the Cool Liner

For uniform cooling of the cargo, air must be able to circulate freely in the refrigerated trailer.

The cooling system is mounted at the front on the front wall. It blows cold air into the refrigerated trailer. The air is guided to the rear via the air ducts.

In doing so, the air is warmed and subsides. The subsided air is drawn in by the cooling system and cooled again.

To ensure that the air can circulate freely on the front wall with form-fitting loads, air circulation profiles are installed on the inside of the front wall in the refrigerated trailer *(see "6.11 Circulation profiles", pg. 77)*.

For an optimum exhaust air guiding as well as to protect the evaporation unit, a rebound plate is also mounted to the inside of the front wall *(see "6.10 Rebound plate", pg. 76)*.

► Observe the following instructions for economical and correct cooling:

Loading

► Make sure that the cargo does not crush the air ducts or the air guide tarp or blocks the opening of the air exhaust.

► Maintain a distance of at least 20 cm between the cargo and the refrigerated trailer ceiling.

► Maintain a small distance between the cargo and the wall to prevent heat transmission through the wall.

► Put piece cargo on pallets/roller carriages to prevent heat transmission through the floor.

Cold chain

The cold chain may not be interrupted during the loading procedure:

► Cool down the load compartment to the required temperature before loading.

► Pre-cool the cargo as much as possible.

► Set the control thermostat of the cooling system 3 to 5°C colder than required by the load.

Loss of cold air

► During cooling operation, only open the doors when necessary and as briefly as possible.

► If possible, only open one door leaf.

► Keep the load compartment dry.

► Defrost the cooling system regularly. Observe the manufacturer documentation *(see "6.17 Cooling system", pg. 78)*.

► Have damage in the insulation repaired promptly.

8.8 ATP labelling

INFO

The validity of the ATP approval for new vehicles is 6 years. If the vehicle passes re-inspection, the validity can be extended for another 3 years by issuing an ATP certificate.

► Take into account national circumstances.

The ATP transport agreement regulates the conditions under which temperature-controlled food must be transported with the international transport of goods.

ATP approval is mandatory when

- Goods are transported across borders,
- Easily perishable foods that are intended for human consumption are transported,
- Goods should be unloaded in a country that ratifies the ATP agreement,
- Goods are transported over a distance of less than 150 km or the trailer is intended to be forwarded by sea with its contents.

The ATP approval sign is attached on the outside of the front wall of the refrigerated trailer.

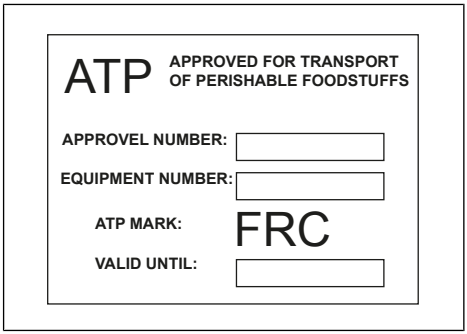


Fig. 8-7: ATP approval sign (example)

The ATP approval sign includes the TÜV registration number, the superstructure or ID number of the trailer, the ATP class, and the period of validity of the ATP approval.

In the ATP treaty, means of transport are divided into classes according to their function and equipment for transporting easily perishable food.

With ATP class FRC, easily perishable food can be transported without restrictions.

- F: internal refrigeration unit
- R: heavy insulation
- C: temperature class from +12 C to -20 C

Fig. 8-8: ATP labelling (example)

The ATP class, together with the date of validity of the ATP approval, must be clearly visible on the refrigerated trailer superstructure in dark brown letters on a white background.

Other ATP distinguishing signs:

- M: multi-chamber superstructure with more than two chambers.
- X: supplement for refrigeration units (e.g. high-voltage systems, depending on the utilised systems).

8.9 Double-deck loading

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

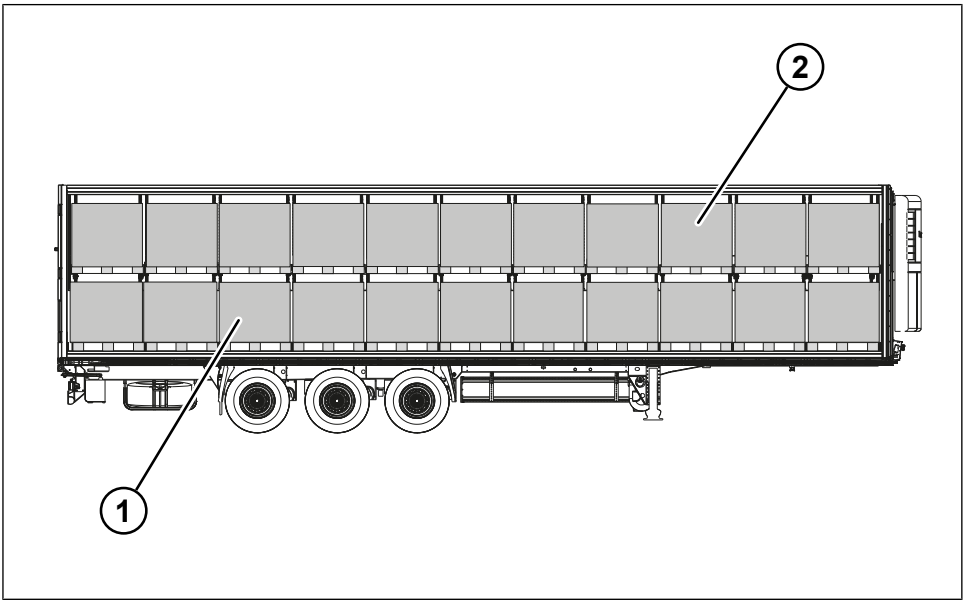


Fig. 8-9: Double-deck superstructure

1 First loading level
2 Second loading level

The double-deck superstructure consists of:

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

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

Loading instructions:

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

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

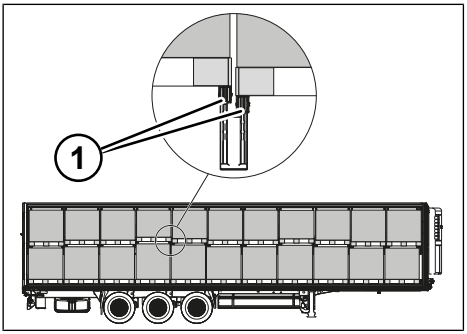


Fig. 8-10: Stepped arrangement of the support beams

1 Support beam

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

Bearing element	Max. load capacity
per pallet	660 kg
per support beam	1,000 kg
per double-deck rail pair on the left and right	1,000 kg
Total second loading level	11,000 kg

Inserting support beams

⚠ CAUTION

Risk of accident due to improper use of the support beams!

Improper handling of the support 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 support beams.
- ► Comply with the maximum load capacity of the support beams as well as of the double-deck rails. The load capacity of the support beams is indicated on the stickers.
- ► Secure the load against sliding. To do so, install the support beams at different levels. The maximum blocking force is indicated on the support beams.
- ► Do not unlock loaded support beams.

⚠ CAUTION

Risk of accident due to support beams falling down

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

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

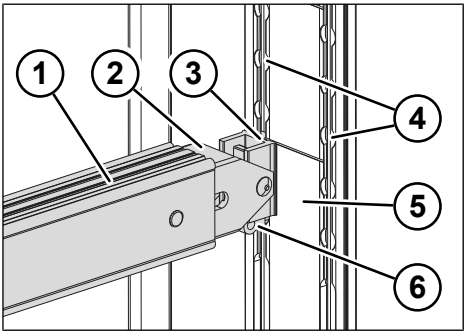


Fig. 8-11: Bearing elements

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

- ► Insert the support beam into the double-deck rail from below.
- ► Push the support beams gradually, alternating on each side, to the desired height.
- ► Repeat the steps for all other support beams.
- ✓ The support beams have been inserted.

Removing the support beams

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

Adjusting the height of the support beams

- ► Actuate the unlocking mechanism and push in the guide to the desired height.
- ► Adjust the other end of the support beam to the same height in the same way in the opposite double-deck rail.
- ► Repeat the steps for all other support beams as required.
- ✓ The heights of the support beams have been adjusted.

Support beam storage

During the loading procedure or when the support beams are not needed, they can be pushed under the ceiling (e.g. for loading tall pallet carts or similar). With double-deck support beams in the topmost parking position, the function of the air guide tarp can be limited. The minimum permissible distance between the support beam and the ceiling is indicated by measure **A** and depends on the type of tarp. Do not position the support beams higher, otherwise the air guide tarp is pressed in and cooling can no longer be ensured.

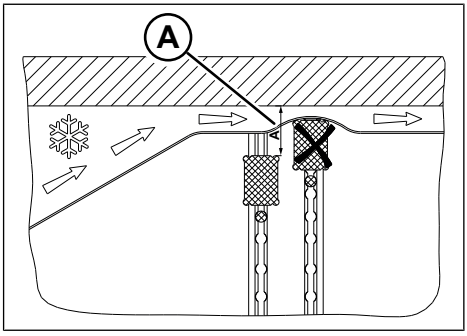


Fig. 8-12: Support beam in parking position

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

Operating the pallet retainer

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

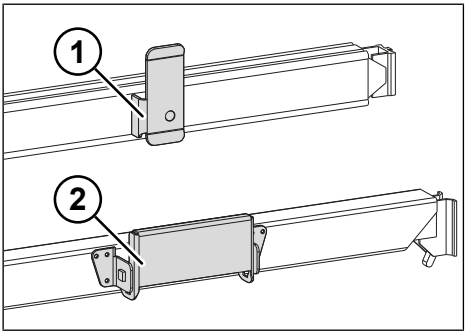


Fig. 8-13: Pallet retainer

1 Catch 1
2 Catch 2

Swivelling up the pallet retainer (Catch 1)

► Pull the retainer towards the rear (rear in the direction of travel).
► Swivel the retainer upwards.
✓ The retainer has been swivelled up.

Swivelling down the pallet retainer (Catch 1)

► Pull the retainer towards the rear (rear in the direction of travel).
► Swivel the retainer to the side.
► The retainer has been swivelled down.

Swivelling up the pallet retainer (Catch 2)

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

Swivelling down the pallet retainer (Catch 2)

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

Loading regulations for the second level

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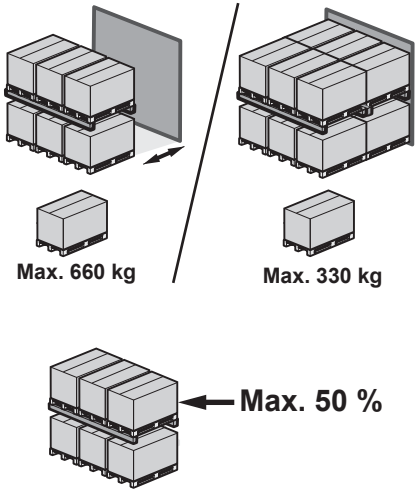
<td> 
</td>
<td>Full capacity: Maximum weight 330 kg per pallet
Partial capacity: Maximum weight 660 kg per pallet

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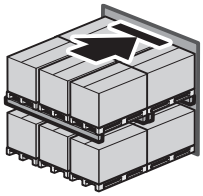
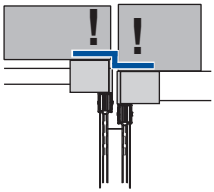
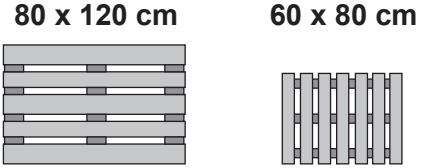
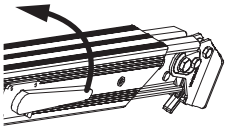
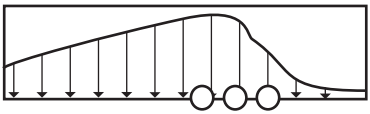
<tr>
<td>  </td>
<td>For full capacity, always start loading at the front wall with positive-locking. Use support beams, locking bars or lashing belts to secure the load towards the rear.
For partial capacity, position the load according to the load distribution plan. Load securing to the front and rear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

	Use pallet retainers if necessary.
	For combined load transport (CLT), ensure that the load is evenly distributed. Observe the load distribution plan for the transport vehicle.

8.10 Meat suspension system

The meat suspension version of the Cool Liner is equipped with the following features:

- Meat suspension/tubular rail system,
- Air ducts *(see "6.9 Air duct", pg. 75)*,
- Reinforced roof,
- Reinforced side walls.

The meat suspension system is installed under the roof and reduces the usable height of the refrigerated trailer. The following versions are possible:

- Euro meat suspension system with tubular rails (Ø 60 mm) for clockwise meat hooks *(see "8.10.1 Euro meat suspension system", pg. 104)*
- Danish meat suspension system with tubular rails (Ø 48 mm) for counterclockwise meat hooks *(see "8.10.2 Danish meat suspension system", pg. 105)*
- Italian meat suspension system with C-profile sliding rails *(see "8.10.3 Italian meat suspension system", pg. 106)*

8.10.1 Euro meat suspension system

NOTE

Material damage due to slipping loads!

Uncontrolled slipping of the load can cause material damage in the load compartment of the refrigerated trailer and to the load itself.

► Lock/close all of the stoppers for transporting suspended loads.

The Euro meat suspension system is an open meat suspension system. The meat hooks can be replaced via the connection couplings on the tubular rails.

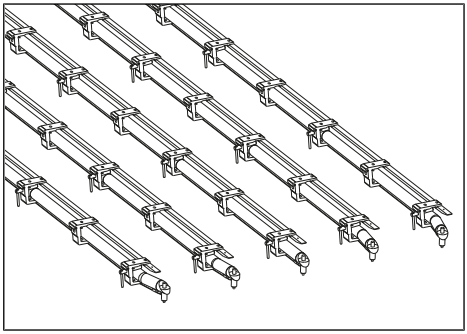


Fig. 8-14: Euro meat suspension system

The hook stoppers are arranged at a distance of 1.2 m on every 2nd retainer bow. The closed hook stoppers prevent the meat hooks in between them from slipping.

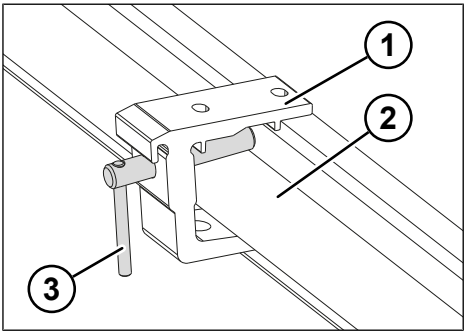


Fig. 8-15: Hook stopper

1 Retainer bow
2 Tubular rail
3 Locking bolt

Opening the hook stopper

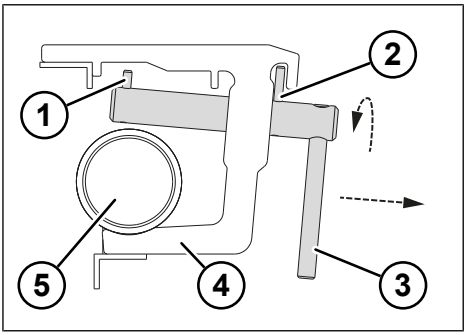


Fig. 8-16: Operating the hook stopper

1 Front lock pin
2 Rear lock pin
3 Locking bolt
4 Retainer bow
5 Tubular rail

► Turn the locking bolt until the rear lock pin releases the locking bolt in its position.
► Pull out the locking bolt.
► Turn back the locking bolt so that the front lock pin locks the locking bolt in its position on the retainer bow.
✓ The hook stopper is open.

Closing the hook stopper

► Turn the locking bolt until the front lock pin releases the locking bolt in its position.
► Push in the locking bolt.
► Turn the locking bolt so that the rear lock pin locks the locking bolt in its position on the retainer bow.
✓ The hook stopper is closed.

8.10.2 Danish meat suspension system

NOTE

Material damage due to slipping loads!

Uncontrolled slipping of the load can cause material damage in the load compartment of the refrigerated trailer and to the load itself.

► Lock/close all of the stoppers for transporting suspended loads.

The Danish meat suspension system is an open meat suspension system. The meat hooks can be replaced via the connection couplings on the tubular rails.

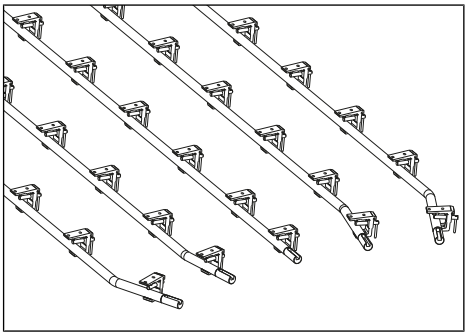


Fig. 8-17: Danish meat suspension system

The hook stoppers are arranged at a distance of 1.2 m on every 2nd retainer bow. The closed hook stoppers prevent the meat hooks in between them from slipping.

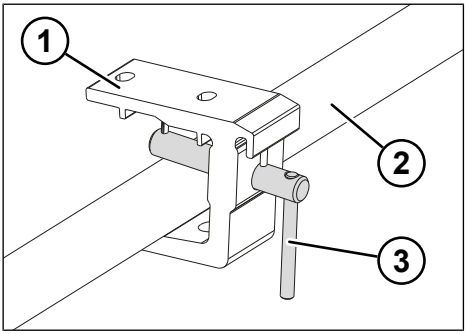


Fig. 8-18: Hook stopper

1 Retainer bow
2 Tubular rail
3 Locking bolt

Opening the hook stopper

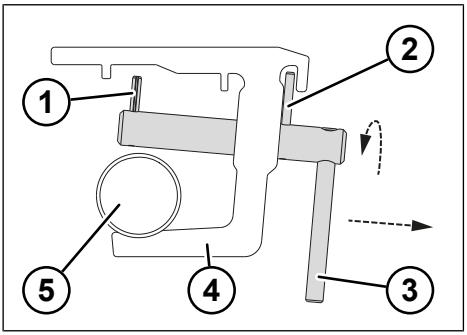


Fig. 8-19: Operating the hook stopper

1 Front lock pin
2 Rear lock pin
3 Locking bolt
4 Retainer bow
5 Tubular rail

► Turn the locking bolt until the rear lock pin releases the locking bolt in its position.
► Pull out the locking bolt.
► Turn back the locking bolt so that the front lock pin locks the locking bolt in its position on the retainer bow.
✓ The hook stopper is open.

Closing the hook stopper

► Turn the locking bolt until the front lock pin releases the locking bolt in its position.
► Push in the locking bolt.
► Turn the locking bolt so that the rear lock pin locks the locking bolt in its position on the retainer bow.
✓ The hook stopper is closed.

8.10.3 Italian meat suspension system

NOTE

Material damage due to slipping loads!

Uncontrolled slipping of the load can cause material damage in the load compartment of the refrigerated trailer and to the load itself.

► Lock/close all of the stoppers for transporting suspended loads.

With the Italian meat suspension system, special meat hooks with round heads are guided in C-shaped sliding rails. The meat hooks remain in the system.

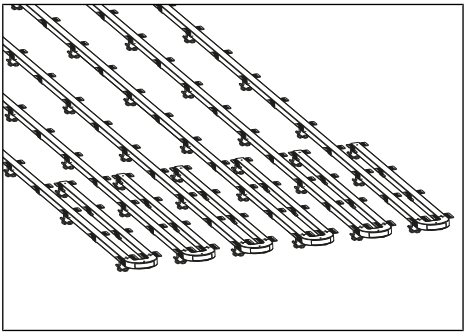


Fig. 8-20: Bi-Rail system

Meat hooks that are not required can be slid into the parking rails. The chain stoppers are arranged at a distance of 1.2 m on every 2nd retainer bow.

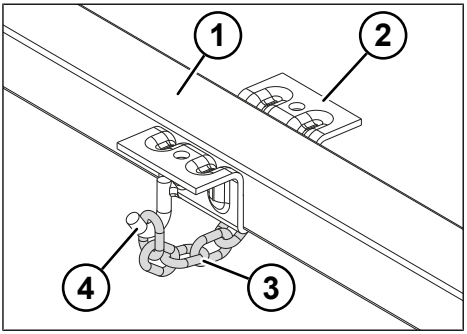


Fig. 8-21: Chain stopper closed

1 C-profile sliding rail
2 Retainer bow
3 Chain
4 Hook

Opening the chain stopper

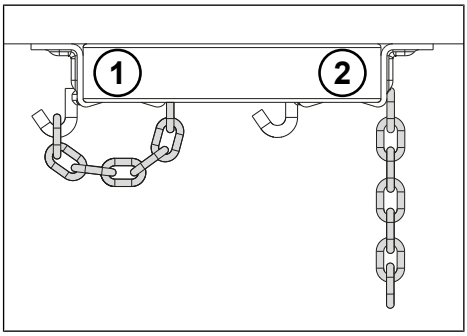


Fig. 8-22: Chain stopper

1 Chain stopper closed
2 Chain stopper opened

► Release the chain from the hook.
✓ The chain stopper is open.

Closing the chain stopper

► Hook the chain onto the hook.
✓ The chain stopper is closed.

8.11 Multitemp

With the KRONE Cool Liner Multitemp, loads can be transported in completely independent temperature zones. Test: With the KRONE Cool Liner Multitemp, loads can be transported in completely independent temperature zones.

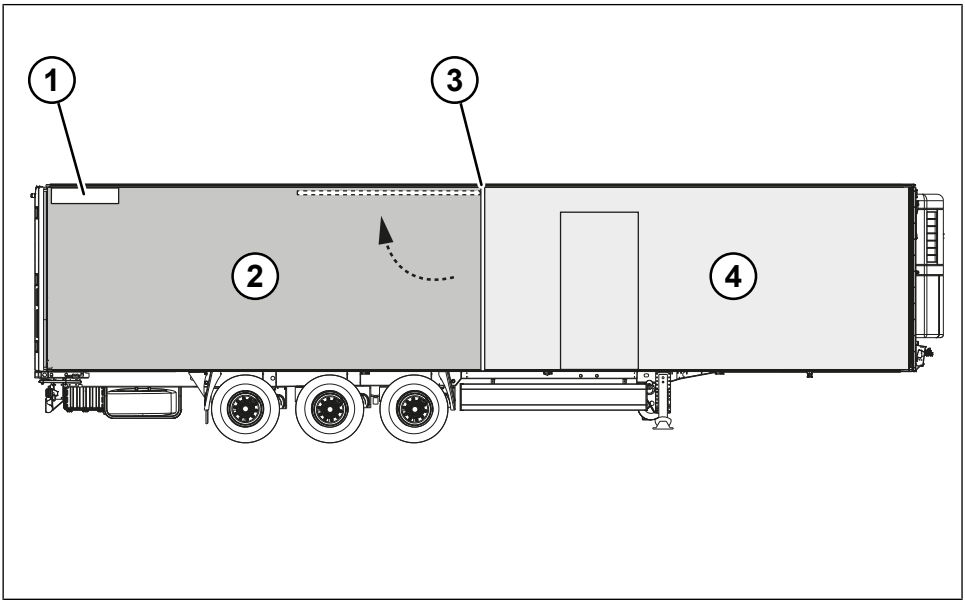


Fig. 8-23: Cool Liner Multitemp (sample division)

1 Additional evaporator (optional)
2 Fresh service area +°C
3 Sliding KRONE Isowall movable bulkhead
4 Freezer area down to -20°C

The Multitemp version of the Cool Liner is equipped with the following features:

- Cooling system that can supply the additional evaporator
- KRONE Isowall Standard movable bulkhead *(see "6.7.1 Transverse partition", pg. 72)*
- Additional evaporator (optional)
- Longitudinal partition (optional) *(see "6.7.3 Longitudinal partition wall", pg. 74)*

The size of each chamber depends on the required temperature, the volume of the load, and the capacity of the additional evaporator.

Additional evaporator

NOTE

Material damage due to reduced clearance!

The additional evaporator as well as the required inlet and outlet lines reduce the clearance within the refrigerated trailer.

► Observe the clearance when loading and unloading as well as when driving inside the trailer with forklift vehicles.

If the refrigerated trailer superstructure is equipped with one or more additional evaporators, different temperature areas can be created using partitions *(see "6.7 Partition", pg. 72)*.

If the refrigerated trailer is equipped with a temperature recorder *(see "6.16 Temperature recorder", pg. 78)*, the second temperature sensor is located in the return current area of the evaporator.

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 network is available, the KSC Box stores the data and sends it at the earliest possible time.

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

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

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.

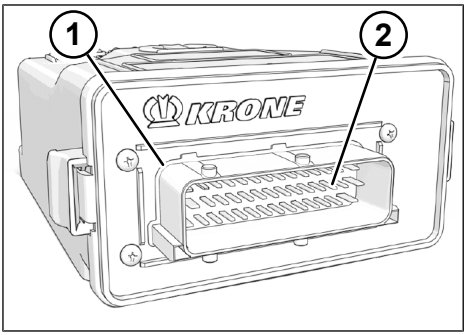


Fig. 9-1: Front side

1 Surrounding seal
2 Plug connector 42-pin

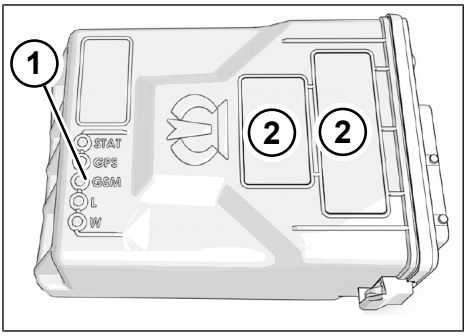


Fig. 9-2: Top side

1 LED displays
2 Type plates

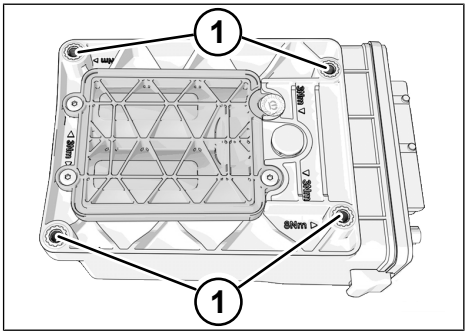


Fig. 9-3: Bottom side

1 Theaded 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.

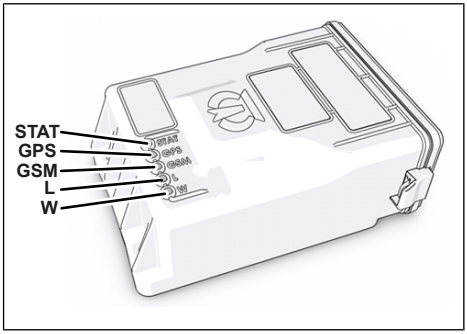


Fig. 9-4: LED displays

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 parametrisable 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 systemthat 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.

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 .

Type plate

The type plate is located on the top or bottom of the camera.

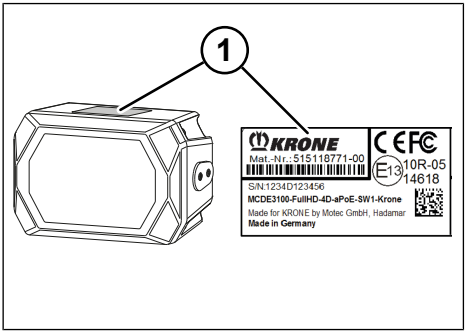


Fig. 9-5: Type plate (example on top)

1 Type plate

9.3 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. 151)*.

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. 9-6: Homepage

1 Map

2 Vehicles

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

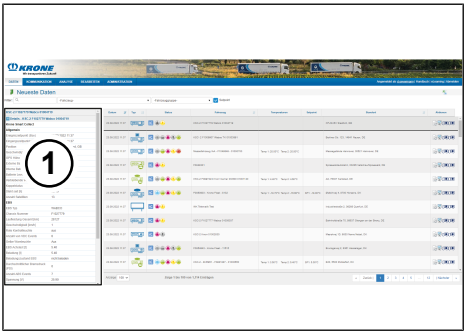


Fig. 9-7: Technical data

1 Data

9.4 Door Protect

9.4.1 Product description

KRONE Telematics Door Protect is a telematically controlled door locking system in the KRONE trailer to increase transport security of high-value goods.

The rear gantry is locked by built-in electric motors. As soon as the doors are closed and locked, the system is activated by the driver. Thanks to this activation, it is no longer possible for the driver or any other person to open the doors of the trailer on their own. They can only be opened in coordination between the dispatcher and the driver (dual control principle).

The system is monitored in detail by the KRONE Telematics System, so that all statuses of the locking system itself and also of the entire vehicle (GPS position, EBS data, door status, temperature data, etc.) are shown to the dispatcher or the supervising person in the KRONE Telematics Portal or in the KRONE app.

If the transported goods now need to be unloaded at the unloading point, the driver first has to inform his or her dispatcher or the corresponding transport supervisor. First, the supervisor checks the position of the unloading point. If it corresponds to the correct unloading point, or the KRONE the Door Protect System is deactivated by the supervisor through the KRONE Telematics Portal or the KRONE app, so that the driver can enter an authorisation code and open the doors.

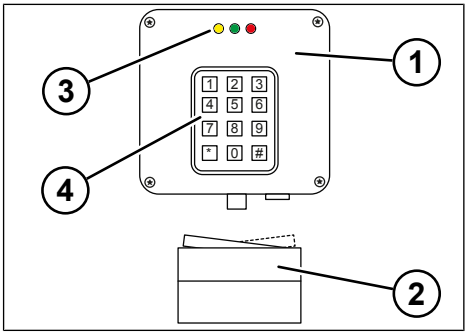


Fig. 9-8: Control unit and switch

1 Control unit
2 Rocker switch
3 Status LED
4 Keypad

9.4.2 Switching on the locking system

► Open the doors of the trailer.
► Flip the rocker switch in the control housing on the front wall of the trailer.

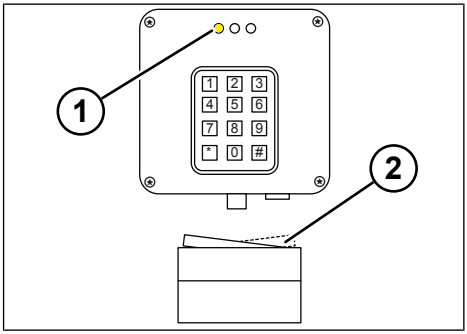


Fig. 9-9: Control unit and rocker switch

1 LED
2 Rocker switch

✓ The orange LED on the control unit is lit.
✓ The locking system is switched on.

9.4.3 Activating the system

☑ The trailer is completely loaded.

► Close the rear gantry and lock the turn rod locks.

⇨ As soon as the rear gantry is closed, the Door Protect System detects that the doors were closed thanks to the built-in door contacts. Now the system locks the doors automatically after approx. 10 seconds.

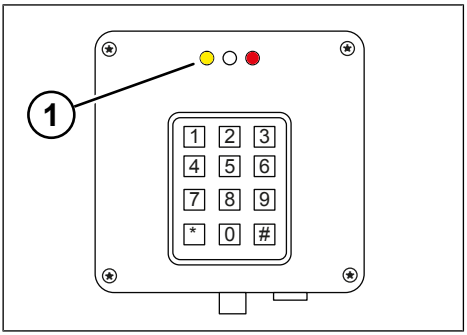


Fig. 9-10: Control unit

1 LED

⇨ When the system is properly locked, the third LED on the control unit lights up red.

► Enter the driver code on the control unit to activate the system. The code is "*0#".

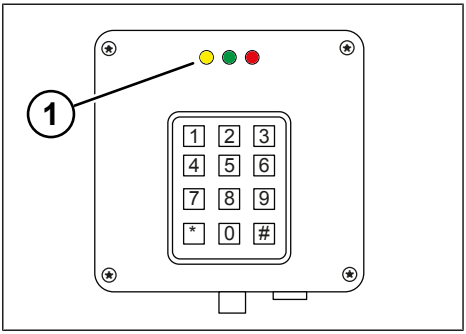
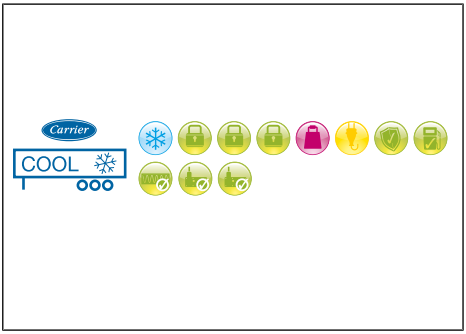


Fig. 9-11: Control unit

1 LED

⇨ All three LEDs on the control unit are lit.

⇨ The vehicle with the locking system is shown to the dispatcher or transport supervisor in the KRONE Telematics Portal.



✓ The system is activated and secure transport can begin.

9.4.4 Deactivating the system

Before unloading, the system must be deactivated to open the rear gantry.

► Inform the dispatcher or transport supervisor that you have arrived at the unloading point.

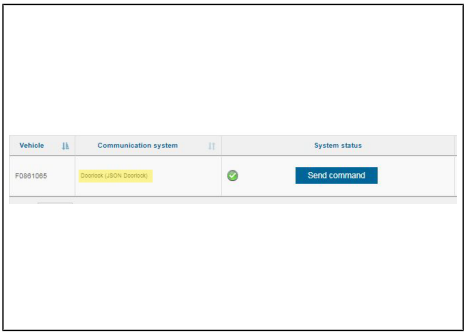
► The dispatcher or transport supervisor checks in the app the position of the vehicle on the KRONE Telematics Portal or in the KRONE app.

► The dispatcher or transport supervisor sends the command to deactivate the system through the KRONE Telematics Portal or the KRONE app.

KRONE Telematics Portal

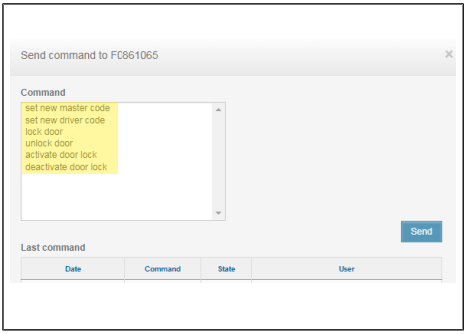
► On the main tab of the KRONE Telematics Portal, select the "Communication" tab.

⇨ The following screen will be shown:

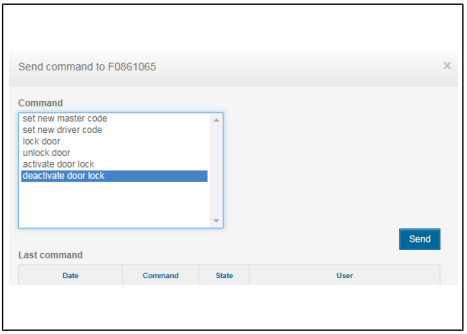


► When the green check mark is shown, a command can be sent to the Door Protect System. Click on the *Send command* button.

⇨ The possible commands will be shown.



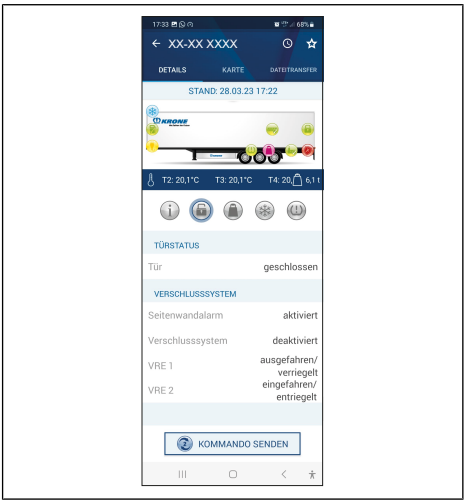
► To deactivate the Door Protect System, select the *Deactivate locking system* command and click on the *Send* button.



KRONE app

► Select the vehicle on the main tab in the KRONE app.

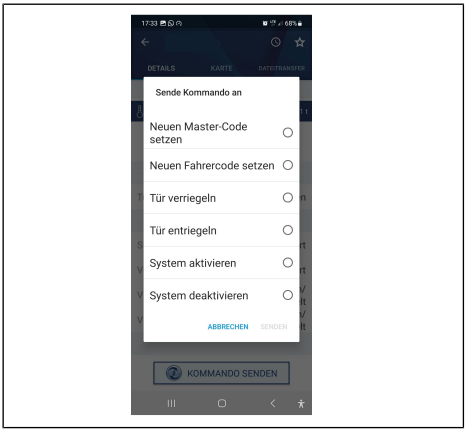
⇨ The following screen will be shown:



► Click of the padlock icon.

► Click on the *Send command* button.

⇨ The possible commands will be shown.



► To deactivate the Door Protect System, select the *Deactivate system* command and click on the *Send* button.

Control unit on the vehicle

☑ The command to deactivate the system has been sent by the dispatcher or transport supervisor to the KRONE Telematics unit on the trailer and the system has been deactivated.

☑ The green LED on the control unit is turned off, and the red and orange LEDs are still lit. Now the driver has 30 seconds to enter his or her driver code to unlock the Door Protect System.

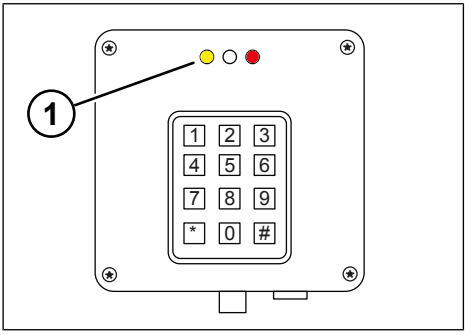


Fig. 9-12: Control unit

1 LED

► Enter the driver code *67890# on the control unit within 30 seconds.

⇨ The red LED on the control unit is turned off.

INFO

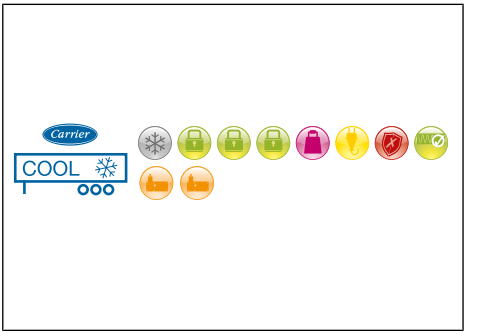
Change the driver code after the first use and document it. The code can be changed in the KRONE Telematics Portal or in the KRONE app.

► Open the doors within 30 seconds.

INFO

If the driver does not open the door within these 30 seconds, the system automatically locks again and it has to be activated and deactivated again.

If the system was not deactivated by the driver within 30 seconds, the following screen will be shown in the KRONE Telematics Portal:



9.4.5 Troubleshooting

If the vehicle cannot be properly opened or closed, proceed as follows:

► Start the cooling system and ensure the voltage supply.

► Park the vehicle on level ground.

► Restart the system by switching the rocker switch off and back on.

If a restart does not help, please contact Telematics Support .

9.4.6 Master code

In the event that the KRONE Telematics unit does not respond to the "Deactivate locking system" command (no GSM/GPRS network coverage in steel buildings or telematics hardware defect), the doors can be opened independently of the telematics, regardless of the Door Protect System status. To do so, the master code for the trailer must be used. Each trailer has an individual master code, which can be used any number of times. For this reason, it is important to only use this master code in absolute emergencies and to keep it in a safe place. The master code for the trailer with Door Protect System is transmitted separately.

Before entering the master code, try to unlock the locking system using the rocker switch, the KRONE Telematics Portal or the Krone app.

☑ The locking system is activated.

☑ The dispatcher or transport supervisor cannot , Rocker switch deactivate the system using the KRONE Telematics Portal, KRONE app or rocker switch.

► The drivers informs the dispatcher or transport supervisor about the error.

► The dispatcher or transport supervisor communicates the master code to the driver.

► The driver enters the master code `*Mastercode#`:

✓ The door can be opened.

INFO

Change and document the master code after using it for the first time and after each time it is used. The code can be changed in the KRONE Telematics Portal or in the KRONE app. To do so, select the “Change master code” command. The * and # characters are automatically set.

9.4.7 Switching off the locking system

In the event of standard transports that do not require the Door Protect System, there is the option of using the trailer without the system. To do so, the system must be switched off.

► Deactivate the system *(see "9.4.4 Deactivating the system", pg. 116)*.

► Open the rear gantry and leave it open.

⇨ The orange LED on the control unit is lit.

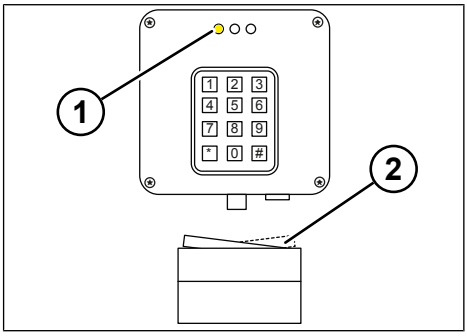


Fig. 9-13: Control unit and rocker switch

1 LED

2 Rocker switch

► Flip the rocker switch in the control housing on the front wall of the trailer.

✓ The power supply is interrupted and the system is switched off.

To switch the system back on again, see *(see "9.4.2 Switching on the locking system", pg. 115)*.

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. 151)*.

Troubleshooting overview

Fault	Cause	Solution
Electrical components are not working	Supply and control connections are interrupted	► Check that the supply and control connections between the tractor unit and trailers are properly connected.
Pneumatic components are not working	Leaks on components	► 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	► 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.

Fault	Cause	Solution
Braking abnormalities (trailer and tractor brake abnormally in the vehicle combination)	Failure to perform the brake power/train tuning	► Perform a brake power/train tuning with the allocated tractor unit *(see "10.2 Fixing braking abnormalities", pg. 122)*. ► 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	► 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	► 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	► 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	► Contact an authorised specialist workshop or customer service.
The wheels wobble when driving straight ahead	Fault in the compressed air control	► Contact an authorised specialist workshop or customer service.
KRONE support device		
Landing leg cannot be retracted or extended	Landing leg bent	► 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	► Lubricate the support device *(see "11.2.8 Lubricating the vehicle", pg. 145)*.
	Support device is soiled	► Clean the support device.
	Landing leg bent	► Have repairs performed by a specialist workshop.
	Drive shaft is stuck	► Shorten the drive shaft.
It is not possible to change gears	Gearbox defective	► 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. 151)*.
- ► Observe the operating and maintenance instructions of the installed supplied components.

Questionnaire: Basic information about braking abnormalities

- ► Copy the questionnaire below.
- ► Fill in the questionnaire completely.
- ► Include the following attachments:
  - ○ Logs from the rolling brake test stand
  - ○ Data from the memory of the brake electronics
  - ○ Error memory
  - ○ Operating data
  - ○ If necessary, the data from the internal CPU memory (e.g. EEPROM memory)

Customer	
Name/company	
Telephone	
Fax	
Email	
Trailer	
Item number	
Vehicle ID number *(see "1.3 Product identification and type plate", pg. 8)*	
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.
- ► During maintenance, cleaning and repairs, make sure that the trailer cannot be towed by the tractor unit. If necessary, pull out the key from the tractor unit.
- ► 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.

INFO

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

Cleaning the trailer

- ► Park the trailer on a level and firm surface.
- ► Apply the parking brake *(see "5.8.2 Parking brake", pg. 41)*.
- ► Secure the trailer with wheel chocks *(see "5.1 Using wheel chocks", pg. 23)*.
- ► 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. 80)*.

Cleaning the sealing seams

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

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

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.

Internal cleaning and disinfection

To ensure the hygienic safety of foods during transport, the load compartment of the refrigerated trailer must be cleaned and disinfected according to the general standards of good practice.

The driver, the transport company, the authorised representative of the transport company and/or the forwarder are re-

sponsible for cleaning and checking for damage or wear in the load compartment of the refrigerated trailer before each trip.

The method for cleaning and disinfection must be selected based on the refrigerated trailer and the previously transported goods. The cleaning frequency also differs depending of the type of transported goods. Cleaning and disinfection of the refrigerated trailer are considered as preparatory measures for transport.

For the internal cleaning and disinfection of KRONE refrigerated trailers, the basic principle of the four cleaning components must be observed:

- Mechanics
- Temperature
- Treatment time
- Cleaning agent

For internal cleaning and disinfection, use commercial detergents with a pH >4 and <11. Observe the basic principles of good hygiene practice (HACCP concept).

- ► Clean the trailer in a suitable washing area.
- ► Wear protective clothing.
- ► Observe the safety data sheets and product information from the cleaning agent manufacturer.
- ► Do not mix different cleaning agents.
- ► Use water with drinking water quality for cleaning and rinsing.
- ► Remove coarse soiling.
- ► Do not wash the cold refrigerated trailer with warm water.
- ► Clean and coat all areas of the refrigerated trailer (also loading and venting equipment, cooling system, air ducts).
- ► Work from the front to the back and from top to bottom.
- ► Clean and disinfect the rear gantry doors last.
- ► Avoid standing moisture after cleaning.
- ► When air-drying, make sure that the cleaned and disinfected surfaces are not soiled again by environmental influences (leaves, birds).
- ► Document the cleaning process.

Maintenance cleaning

For refrigerated trailers and freezer trailers that transport packaged goods, maintenance cleaning in usually sufficient. Maintenance cleaning means removing all substances (wastes, residues, soiling, grease) that represent a physical or chemical danger. It is performed with a broom or vacuum cleaner (dry cleaning) and with a high-pressure cleaner if necessary.

Deep cleaning

Deep cleaning is performed at regular intervals (depending on the type of transported goods) by qualified staff. This includes intensive cleaning of the entire interior along with all interior fittings, the evaporator, the air ducts, etc. Pay attention to use suitable cleaning agents and change the cleaning agent regularly.

Disinfection

Disinfection is performed as required after cleaning. It reduces the number of microorganisms. Disinfection is usually performed in transport vehicles that carry unpackaged goods, particularly meat and fish. Disinfectants must be suitable for the food operations and transport containers. Be sure to comply with the dose and treatment time for the disinfectant. After the treatment time, rinse out the disinfectant residues with drinking water.

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. 80)*.
- ► 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 trip/use

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 "5.6 Draining the compressed air tanks", pg. 32)*.
Lighting equipment	► Visually inspect to make sure it is working properly.

Component	Inspection
Landing leg winch	► Visually inspect for wear, damage and proper attachment.
Electrical charging cables	► Visual check of the mains power / charging cable for wear and damage
Kingpin/coupling plate	► Visual check for wear, damage and proper attachment.
Seals and gaskets	► Visual inspection for wear, damage, leaks

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
Keyhole rails	► Remove bulk material residues behind the keyhole plates and clean without water.

► 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. 132)*	► 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 KRONE Trailer Axle.		X	
Axle and suspension *(see "11.2.5 Axle and suspension", pg. 132)*	► Check the tightening torque of the fixing bolts. ► Observe the maintenance instructions from the axle manufacturer. ► View the KRONE Trailer Axle separately KRONE Trailer Axle.	X		
Brake system *(see "11.2.6 Brake system", pg. 132)*	► 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

Assembly group	Maintenance work	Monthly	Every six months	Yearly
Compressed air system *(see "5.6 Draining the compressed air tanks", pg. 32)*	► Check the compressed air tank. ► Check the compressed air connections. ► Check the compressed air lines.			X
Landing leg winch	► Conduct a visual inspection for wear on the spindle and spindle nut.			X
Lubrication points *(see "11.2.8 Lubricating the vehicle", pg. 145)*	► 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. 146)*	► Check all electrical components for proper function.			X
Contour marking *(see "11.2.10 Contour marking", pg. 146)*	► Check the contour markings for completeness and legibility.	X		
Bolted connections *(see "11.2.11 Bolted connections", pg. 146)*	► Perform a visual inspection for wear and damage.			X
Superstructure *(see "11.2.14 Superstructure", pg. 147)*	► Check the bolted connections. ► Check all the superstructure components and locks			X
Roller shutter	► Check the bolted connections. ► Check the function of the lock. ► Lubricate the rollers, bearings, hinges, rails, lock and spring shaft with light penetrating oil. ► Replace warning stickers that have become illegible. ► Observe the maintenance instructions from the manufacturer.			X
Kingpin *(see "11.2.13 Kingpin and coupling plate", pg. 147)*	► 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

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. 132)*	► 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. 132)*	► Observe the maintenance instructions from the axle manufacturer. ► View the KRONE Trailer Axle separately KRONE Trailer Axle.	X		
Compressed air system *(see "5.6 Draining the compressed air tanks", pg. 32)*	► Check the compressed air tank. ► Check the compressed air connections.			X
Landing leg winch	► Conduct a visual inspection for wear on the spindle and spindle nut.			X
Contour marking *(see "11.2.10 Contour marking", pg. 146)*	► Check the contour markings for completeness and legibility.	X		
Jack-up loading ramp	► 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	
Roller shutter	► Lubricate the rollers, bearings, hinges, rails, lock and spring shaft with light penetrating oil. ► Check all parts for firm seating. ► Check the function of the lock.		X	
Kingpin *(see "11.2.13 Kingpin and coupling plate", pg. 147)*	► Perform a visual inspection for wear and damage.			X
Lubrication points *(see "11.2.8 Lubricating the vehicle", pg. 145)*	► Top up the grease on all the lubrication points. ► Pay attention to the lubrication points shown in the applicable operating instructions.			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 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. 122)*.

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 vehicle 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 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 can be obtained from KRONE for any current vehicle *(see "13.2 Customer service and support", pg. 151)*.

11.2.7 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, replace 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
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			

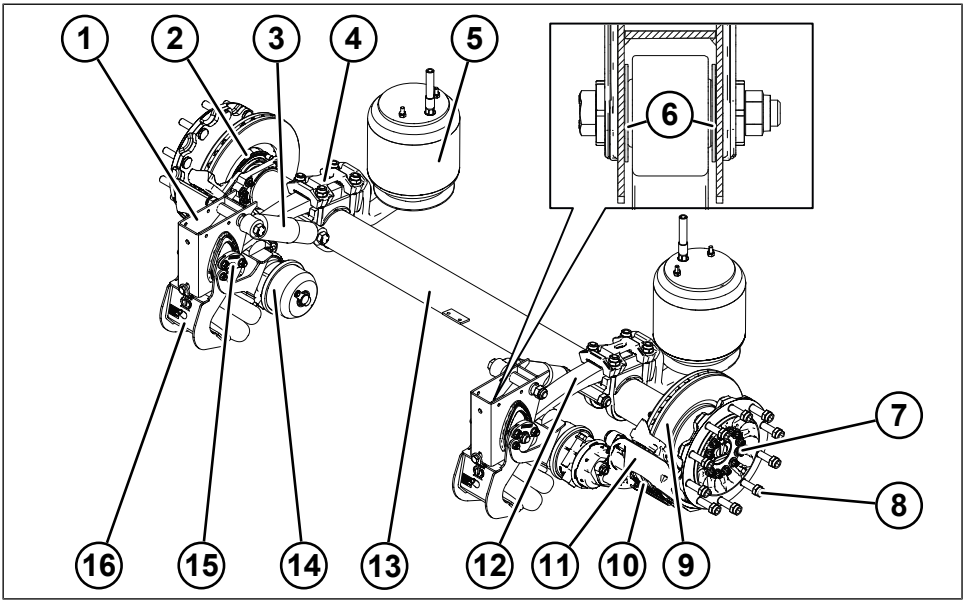


Fig. 11-1: Overview of disc brake maintenance (air spring link up)

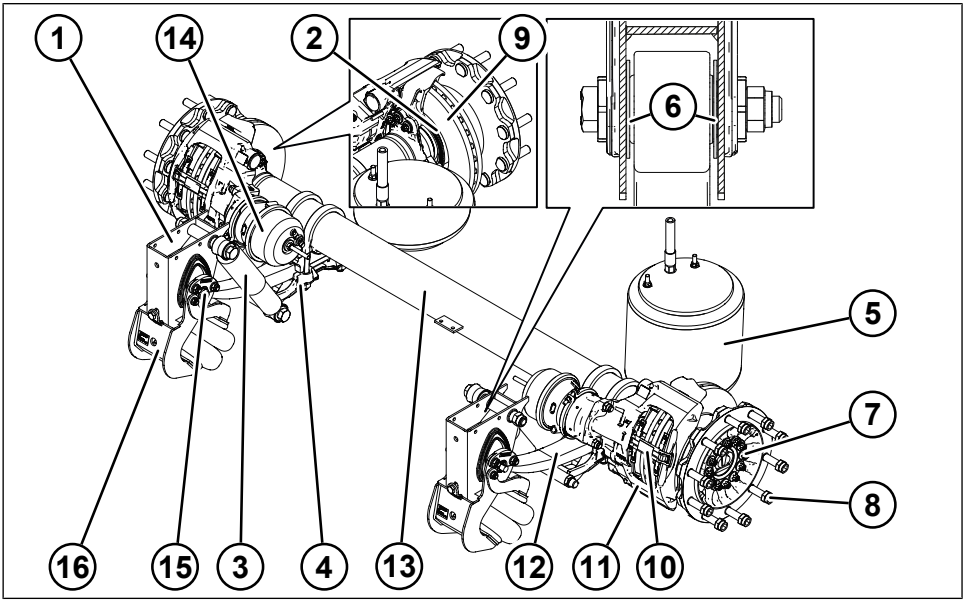


Fig. 11-2: Overview of disc brake maintenance (air suspension down)

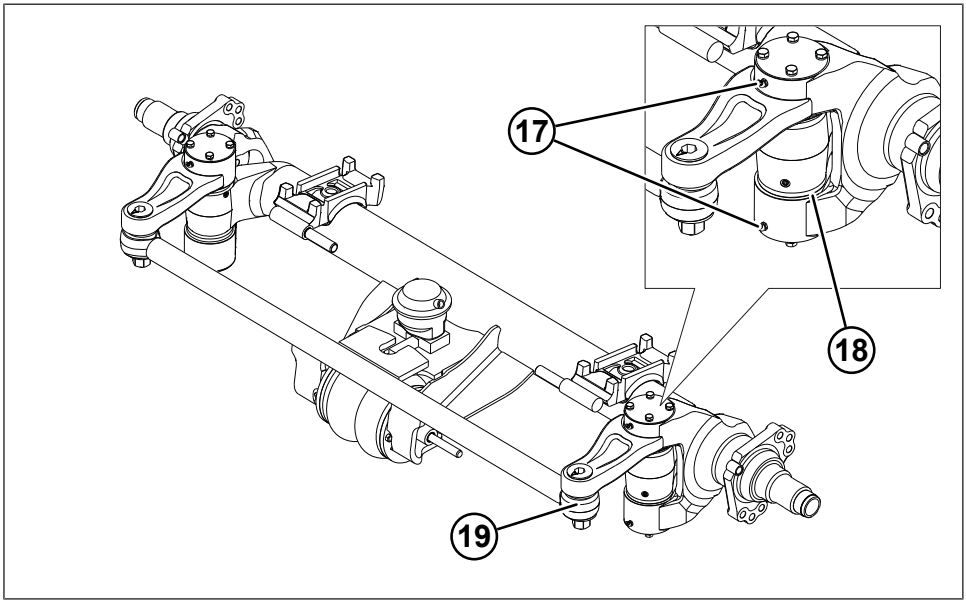


Fig. 11-3: Additional maintenance overview for self-steering axles

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.					

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			

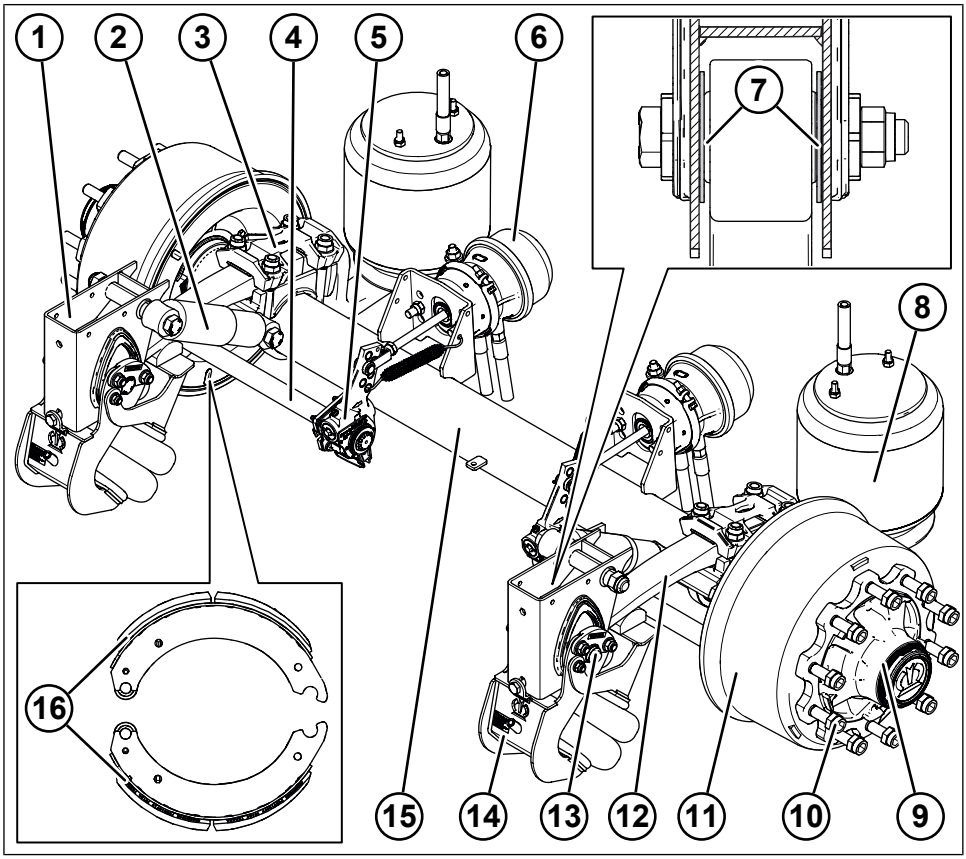


Fig. 11-4: Drum brake maintenance overview

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.	☐
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	
Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐

1st maintenance	
Brake pads checked.	☐
Maintenance work performed according to the detailed maintenance instructions.	☐
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:	

2nd maintenance	
Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

2nd maintenance	
Maintenance work performed according to the detailed maintenance instructions.	☐
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.	☐
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.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

4th maintenance	
Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

4th maintenance	
Maintenance work performed according to the detailed maintenance instructions.	☐
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.	☐
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.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

6th maintenance	
Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

6th maintenance	
Maintenance work performed according to the detailed maintenance instructions.	☐
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.	☐
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.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

8th maintenance	
Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

8th maintenance	
Maintenance work performed according to the detailed maintenance instructions.	☐
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.	☐
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.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

10th maintenance	
Bolted connections checked and tightened, if necessary, with the prescribed tightening torque according to the detailed testing and maintenance regulations.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

10th maintenance	
Maintenance work performed according to the detailed maintenance instructions.	☐
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.	☐
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.	☐
Chassis checked for wear, leaks and damage.	☐
Air spring bellows checked.	☐
Brake system checked for leaks.	☐
Braking effect for the service and parking brake checked.	☐
Brake pads checked.	☐

11.2.8 Lubricating the vehicle

NOTE

Material damage caused by dry lubrication points!

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

► Lubricate the vehicle 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.

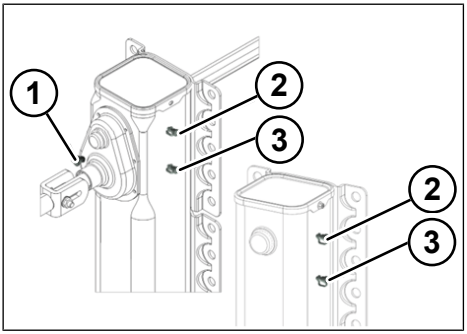


Fig. 11-5: Lubrication points for landing leg winches

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.

11.3 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:

- ○ For vehicles with high voltage systems, observe the operating instructions and the safety instructions from the system manufacturer.
- ○ 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. 151)*.
- ○ 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 vehicle once a month to prevent the tyres from developing flat spots.

The following measures must be taken to temporarily decommission the vehicle:

► When decommissioning vehicles with high voltage system, observe the specifications from the system manufacturer to avoid damage to the battery.

► Clean the vehicle.

► Drive the vehicle onto firm and level ground.

► If necessary, protect the vehicle from excess water and snow loads.

► Apply the parking brake *(see "5.8.2 Parking brake", pg. 41)*.

► Secure the vehicle to prevent it rolling away *(see "5.1 Using wheel chocks", pg. 23)*.

► Drain the brake system *(see "5.6 Draining the compressed air tanks", pg. 32)*.

► Before the start of the frosty period, fill up the brake lines with antifreeze *(see "5.6 Draining the compressed air tanks", pg. 32)*.

► 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 vehicle 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 vehicle'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 vehicle 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. 80)*.

► 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 vehicle must be disposed of properly. In doing so, the electrical, pneumatic and hydraulic components must be disposed of separately.

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

- ► Ensure that the disposal is done properly and in an environmentally sound way.
- ► Have the vehicle 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 vehicle 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.

Spare parts

Telephone: +49 (0) 5962 / 9363173

email: Swap.Service@brueggen-gmbh.de

Internet: www.brueggen-service.de

Spare parts catalogue

13.2 Customer service and support

The Customer Service Department can be reached using the following contact data:

14 Technical data

14.1 Dimensions and weights

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.

Cool Liner (SDR 27 eL4-S)

Dimensions and weights	
Permitted total weight	39,000 kg
Fifth-wheel load	12,000 kg
Axle load	27,000 kg
Dead weight (without cooling system)	approx. 7,600 kg
Dead weight (with cooling system)	approx. 8,360 kg
Unloaded fifth coupling height	1,150 mm
Axle distances	1,310 mm
Internal clearance length	13,310 mm
Internal clearance width	2,470 mm
Internal clearance height	2,650 mm
Outer width	2,600 mm
Front wall panel thickness	50 mm
Side wall panel thickness	60 mm
Roof panel thickness	85 mm
Rear door panel thickness	90 mm
Floor panel thickness	125 mm

Further information can be found on our website www.krone-trailer.com.

14.2 Plugs and socket pin assignments

14.2.1 Socket S (white) ISO 3731, 7-pin

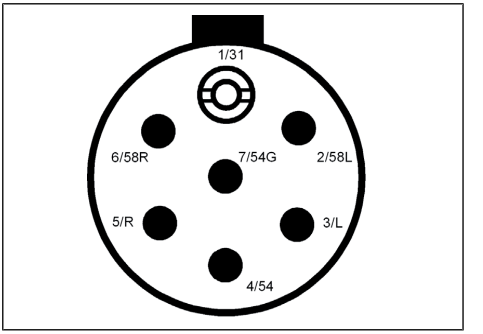


Fig. 14-1: Socket ISO S 3731, 7-pin

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

14.2.2 Socket N (black) ISO 1185, 7-pin

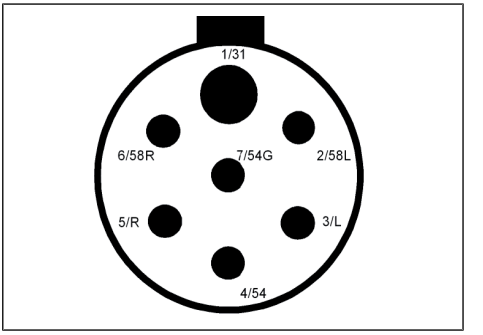


Fig. 14-2: Socket ISO N 1185, 7-pin

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

14.2.3 Socket ISO 12098, 15-pin

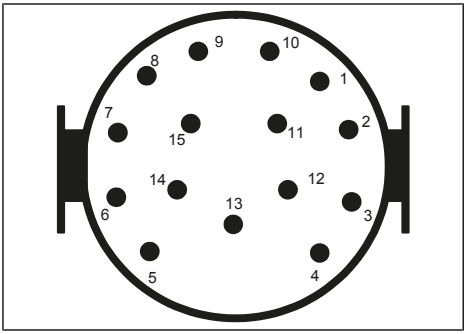


Fig. 14-3: Socket ISO12098, 15-pin

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

15 Legal requirements

Temperature registration device

Telematics unit Krone Smart Collect KSC is certified with TB1 characteristics according to DIN EN 12830:

- Suitability: T (suitable for transport)
- Ambient condition: B (food transport medium)
- Accuracy class: 1 (tolerance ±1 °C; resolution 0.5 °C)
- Measuring range: -30 °C to +70 °C

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 ISOBUS 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 R10 (EMC)

The LUIS Smart LOAD Ethernet camera TX has been tested under UN guidelines ECE R10 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

LUIS TECHNOLOGY

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

LUIS
LUIS Technology GmbH
Hammer Deich 70
20537 Hamburg
T +49.40.897 27 84-0
F +49.40.897 27 84-15
service@luis.de
luis.de

(Unterschrift)

Dr. Matthias Feistel

Konformitätserklärung Seite 1 von 1

LUIS TECHNOLOGY

UKCA-Konformitätserklärung

UK CA

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

LUIS
LUIS Technology GmbH
Hammer Deich 70
20537 Hamburg
T +49.40.897 27 84-0
F +49.40.897 27 84-15
service@luis.de
luis.de

EU-Konformitätserklärung
EC Declaration of Conformity
Déclaration de conformité de la CE
EU- vyhlásenie konformity
Deklaracja zgodności UE

DSA

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 zodpovednost', 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

Index

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FAHRZEUGWERK BERNARD KRONE GMBH & CO. KG
Bernard-Krone-Straße 1, 49757 Werlte, GERMANY
Phone: +49 (0) 5951 / 209-0, Fax: +49 (0) 5951 / 209-98268
info.nfz@krone.de, www.krone-trailer.com

04/2025