HUMBAUR

MAKES IT HAPPEN

OPERATING INSTRUCTIONS

HTK ▶ Three way tipper (195024)

10000 SERIES EN

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Trailer data:

Date of first registration _____

Gross weight _____

Load capacity _____

Your trailer:

Model _____

Type (abbreviation) _____

Registration number _____

WHD

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

VIN number

Trailer components

Axle(s)
(Type / manufacturer) _____

Brake system
(Type / manufacturer) _____

Support device _____
(Type / manufacturer)

Electronic system _____
(installed components)

Keep this instruction manual readily available in the towing vehicle!

Pass on the complete documentation to the new owner if you sell the trailer.

This operating instruction manual must be carefully read, understood and complied with in full by anyone who is responsible for the Humbaur GmbH vehicle and its modules.
Humbaur GmbH accepts no liability for damage or failures which arise through disregard of this manual!

Read and observe the operating instruction manual with all the instructions, warnings and notes before driving for the first time!

Please note that all illustrations are representative and may differ from the actual appearance / equipment.

Also read and observe the instruction manuals for components such as axles, support devices, etc.!

The complete technical documentation is part of the product and should be kept in the driver's cab of the traction unit for reference at all times.

Key details for the handling, operation and the requisite care and maintenance work of the trailer are referred to in this operating instruction manual, and errors can only be avoided and trouble-free operation guaranteed if you are familiar with them.

Errors excepted. The manufacturer:

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reserves the right make technical changes to the design, equipment and accessories with respect to the information and illustrations in the operating instruction manual.

As a result, no claims whatsoever can be derived from the information, illustrations and descriptions.

Obligations of the operator

The trailer may only be operated in perfect condition.

Ensure that the operating instruction manual is included with the trailer e.g. if it is sold.

Only utilise trained or instructed personnel.

Ensure that the operating instruction manual is complied with in all life cycle phases of the trailer and that the prescribed personal protective equipment (see “Personal protective equipment / rules prohibitions” on page 24) is worn.

Provide the requisite operating and auxiliary materials.

Identification

Dimensions, weights and performance data can be found in the approval documents of the respective trailer.

Vehicle type:	Model	☒
Three-way tipper, tandem (gross weight 19 t)	HTK 195024	

The applicable trailer should be marked with a cross upon delivery.

Keyword index

Use the **keyword index** from page **5** to search for **specific** topics.

1 Safety

You will find safety information for the correct handling of the trailer in the "Safety" chapter from page **9**.
Read this chapter before driving for the first time.

2 General information

You will find details on vehicle identification in the "General information" chapter from page **27**.

3 Operation

You will find information on loading and unloading, correct load distribution and coupling and uncoupling the trailer in the chapter on "Operation" from page **37**.

4 Operating the chassis

You will find valuable information on the operating elements of the chassis, such as the lifting / lowering system, support devices and information on the safe loading and unloading, in the chapter on "Operating the chassis" from page **59**.

5 Body

You will find information on how to operate the body correctly, e.g. folding down the drop sides, securing loading ramps, and also on the equipment you can use to secure the load in the chapter on the "Body" from page **101**.

6 Electrical system

You will find information on the lights, plug connections and connector assignments in the chapter on the "Electrical system" from page **143**.

7 Testing, care and maintenance

You will find out more about the work required to maintain operational safety and the value of your vehicle in the chapter on "Testing, care and maintenance" from page **157**.

8 Troubleshooting

You will find information on troubleshooting and important service addresses in the "Troubleshooting guide" from page **217**.

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1 Safety

Intended use

HUMBAUR vehicles and bodies are built according to the acknowledged rules of technology and safety engineering. However, inappropriate use may result in risks for life and limb of the user or third parties and damage to the HUMBAUR vehicles and other goods.

HUMBAUR vehicles and bodies are exclusively made for appropriate transportation according to the transport regulations.

Appropriate use also includes adherence to the regulations, descriptions and recommendations in these instructions and the operating and maintenance instructions of the sub-suppliers.

Inquire at Humbaur GmbH or at a HUMBAUR contract workshop if you are planning additional changes to your HUMBAUR vehicle or body.

Only have accessories attached to your HUMBAUR vehicle or body after discussion with Humbaur GmbH or a HUMBAUR contract workshop.

The following are permitted:

- Transport of bulk goods
- Operation only within the framework of the permissible gross weight
- Only operate with appropriate towing vehicle
- Only operate in a technically flawless condition
- Ensure an even weight distribution for the goods
- Only drive with appropriately secured goods
- Adhere to the legally prescribed and permitted max. driving speed and adapt the speed when driving on bad roads or in bad weather conditions
- Loading and unloading is only permitted in secured areas or on public roads after additional securing measures
- Use additional safeguards against rolling off when switching off / parking the trailer

The regular presentation of the trailer for the main inspection and the safety tests by the specialist staff as well as its documentation is a requirement for participating in road traffic.

The operator / user of the trailer is responsible for regular servicing / cleaning and maintenance.

HUMBAUR vehicle bodies are provided with a VIN (Vehicle Identification Number) - see Page **34**.
It is essential to specify the VIN when making enquiries and ordering spare parts!

Reasonably foreseeable misuse

Any use extending beyond the prescribed transport applications is regarded as other than intended.
In particular, this includes:

- Person / animal transports
- Transports of goods for which special regulations apply and / or special vehicle versions are required (e.g. chemical substances, food stuff, dangerous goods)
- Exceeding the load capacity
- Exceeding the max. permitted axle / support / trailer load
- Transporting hot / liquid materials (e.g. tar)
- Driving with badly secured or unsecured goods
- Driving with a tipped cargo bed
- Driving with bad load distribution (load one-sided or in one point)
- Structural changes to the trailer that were not approved by the manufacturer or were arbitrary
- Use of unapproved spare parts or accessories
- Driving with a faulty light or electric system
- Driving with a dirty trailer on which the number plate, lights, markings are unrecognisable or hard to recognise
- Driving when the underride protection is not in driving position
- Driving with support devices not moved up
- Arbitrary performance of maintenance / repair of safety-related components that may only be maintained or repaired by specialist personnel
- Driving at an excessive / inappropriate speed in bad weather conditions or on a bad road
- Parking the trailer without sufficient safety precautions against rolling off
- Operating the trailer in a damaged state and when parts are visibly worn or safety-related components are broken
- Operating a trailer without appropriate brake adjustment involving the towing machine or with the wrong oil pressure
- Tilting / lowering the loading bridge while persons remain within the danger zone
- Remaining on the cargo bed when bulk goods are being tipped or when the loading bridge is lowered
- Tilting the loading bridge on steep slopes and soft ground
- Tilting the loading bridge with uneven tyre pressure

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rejects any damage which arises through disregard of this manual – the risks are borne solely by the user.

Vehicle combination brake balancing

Vehicle combination brake balancing is part of appropriate use.

Even when there is only 1 vehicle without EBS in a vehicle combination, the combination has to be balanced after approx. 5,000 km.

When different brake systems, i.e. disk brakes and drum brakes, are present in a vehicle combination, the brakes of the entire vehicle combination must be balanced.

Towing vehicles without EBS always require vehicle combination brake balancing.

Unlike drum brakes, disk brakes do not indicate overload to the driver by noticeable deterioration of the braking effect.

This overload may cause the brakes of the towing vehicle or the trailer to overheat. Overloaded brakes may result in decreasing brake force, higher brake lining and / or brake disk wear as well as damage to the wheel bearings or axles.

Optimal distribution of the brake force in the entire vehicle combination requires the brakes of the vehicle combination to be balanced with loaded vehicles according to 71/320/EC or ECE R13 by a neutral brake service after a short run-in time of 2000-5000 km or within 14 days after acceptance of the vehicle and after every exchange of the towing vehicle.

When the towing vehicle and the trailer are equipped with EBS, optimal brake force distribution requires a balancing examination and possible correction of the EBS parameters of the towing vehicle and possibly also the trailer.

Checks, settings and corrections of EBS parameters may only be performed by vehicle manufacturers!

Abb. 1 Warning sign on the trailer

Warranty claims against Humbaur GmbH become void when this instruction is not adhered to or documentation of the result of the vehicle combination brake balancing is missing.

Disclaimer

Any liability of the manufacturer becomes null and void if:

- the trailer and its components were altered without authorisation.
- The original parts or conversion parts / accessories approved by Humbaur GmbH are replaced by other components.
- subsequent changes were made to the trailer
  (e.g. new drill holes in the frame, tubular drawbar or widening of existing drill holes in the frame). This is considered by Humbaur GmbH to be a structural change, and the type approval therefore becomes null and void.
- Non-approved accessories or third-party spare / component parts which are not original HUMBAUR parts are attached or installed. The type approval of the trailer, possibly even the insurance cover, becomes null and void.
- care and maintenance intervals prescribed by the manufacturer are not complied with.

Any risks and liability exclusions resulting from this also exist if:

- Acceptance inspections have been carried out by inspectors / authorised experts of the technical inspection authorities or officially recognised organisations.
- Official approvals are available.

The warranty includes the following:

Defects that occur during proper use of the trailer as specified, or which are design-related or can be attributed to material faults.
Repairs carried out during the guarantee period do not extend it.
As the contracting party, the dealer is responsible for the warranty.

Requirements

Original replacement parts must be used for repairs.
Repairs must be carried out by a specialist workshop.
The maintenance instructions and regulations of the manufacturer as listed in this operating manual must be observed.

Defects must not be attributable to

Non-compliance with the technical and legal regulations listed in this operating manual.
Improper use of the trailer or lack of experience on the part of the user.
Unauthorised alterations to the trailer and the use of fittings not approved by Humbaur GmbH invalidate the warranty. Non-compliance with the relevant statutory regulations.

The following are not defects

Each trailer is a hand-made product. Despite the greatest of care, minor superficial scratches which have no effect on the intended use can occur during assembly.
Tension cracks in the surface (hair cracks) are inherent in the production method and cannot be avoided. These hair cracks have no impact on the stability or use of the trailer.
Gaps between the drop side and the loading bridge.
Furthermore, polyester components are not 100% colour-fast. Here, too, UV and weather effects can cause fading.
It should also be noted that rubber parts generally age as a result of UV exposure and the formation of cracks and fading of the surface is possible.
Parts coated with the cathodic dip-painting process (KTL) are not colour-fast. They can fade as a result of UV irradiation.
Galvanised parts are not normally shiny, as they lose their bright finish after a short time. This is not a defect but rather a desired effect, as full protection against rusting of the metal is only guaranteed after oxidation. Wood is a natural material. Despite the most diverse types of processing and coating, it is therefore subject to natural, weather-dependent expansion and shrinkage, which can result in warping. Natural wood grain and irregularities are normal for this natural material and can appear on the surface. Fading is also possible as a result of UV irradiation and weathering effects. A manufacturing tolerance is specified for the thickness of the wooden components used. Claims will not be accepted for deviations within the tolerance.
As the trailers are not generally insulated, temperature fluctuations can result in the formation of condensation under tarpaulins and polyester covers. In this case, adequate ventilation should be provided to prevent mould growth.
Furthermore, the trailers are not 100% watertight. Water ingress at the doors, flaps and windows is still possible, even with extremely careful workmanship and the use of rubber seals.

The warranty will expire

If the regulations for operation, maintenance, cleaning and inspection are not observed.
In the event of engineering alterations to the trailer.

In the event of independently added fittings and superstructures which have not been approved by Humbaur.

In the event of the overloading and improper use of the trailer.

If non-original Humbaur replacement parts are used.
If the safety instructions provided on the trailer are not observed.

If the service intervals are not adhered to, even when the parts concerned, e.g. axle, brake, drawbar, hydraulic systems etc. were fitted by Humbaur.

In the event of incorrect surface treatment of the materials used.

In the event of continued use of the trailer even though defects have already been detected and reported and the use has been prohibited by the manufacturer until repairs have been carried out.
In the event of continued use of the trailer with known defects where repair is not possible or is time-consuming or is only possible with significant additional expense and reduced function.

The warranty does not include

Expenditure for ongoing maintenance.
Costs that can be attributed to normal wear or even because the trailer has not been used for a long time.

Faults that can be attributed to not treating the trailer as specified.

Defects that can be attributed to the use of non-original Humbaur replacement parts.

Defects that can be attributed as a consequence of a repair not carried out by a specialist workshop.

Defects that can be attributed to structural alterations or assembly work on the vehicle.

Damage which can be traced back to snow and water loads on tarpaulin, plywood or polyester bodies.

The manufacturer reserves the right to make design changes.

HUMBAUR vehicles and bodies as well as their operating components may only be used and maintained by personnel who are aware of:

– this operating instruction manual.
– the trailer and the associated traction unit.
– the operating and maintenance instructions of the suppliers.
– the German Road Traffic Act (StVO) and German Road Traffic Licensing Regulations (StVZO).
– All the respective health and safety / accident prevention regulations as well as other safety, occupational health and road traffic regulations.
– the basic requirements of goods transport.
– the risks of handling dump trucks (see Brochure BGI -5064 "AVOID TIPPING OVER")

Sources of danger

Take note of the following points without fail:

- Coupling and uncoupling a trailer: Standing in the danger area is prohibited.
- Driving with unsecured support devices.
- Driving with an unlocked tailgate.
- Driving when the underride protection is not in the driving position.
- Inappropriate operation of the drop sides.
- Clearance heights on the route, while loading and unloading.
- Driving with a tipped loading bridge - not permitted by law.
- Exceeding the permissible gross weight or one-sided overloading through incorrect loading.
- Poorly secured or unsecured goods and / or body components.
- Reversing - keep an eye on the rear area.
- Excessive twisting while manoeuvring.
- Overloading of the trailer, axles and brakes.
- Overstressing caused by fitting incorrect wheel and tyre sizes.
- Use of wheels with incorrect offsets, one-sided run-out or centrifugal imbalance.
- Overstressing as a result of reckless and inappropriate driving or handling.
- Impact and shock stress of the axles.
- Speed inappropriate for the road conditions and the loading status of the trailer, especially in bends.
- The parked trailer can tilt or sink in on soft uneven ground.
- Tilting the loading bridge too close to a slope or excavation.
- Driving on severe inclines.
- Loading / unloading of the trailer in an area with a steep gradient.
- Standing on a tipped / moving loading bridge.
- Driving under a raised loading bridge.
- Tilting the loading bridge on uneven and soft ground.
- Jerky braking during tipping.
- Tipping with an engaged parking brake.
- Failure to clean the cargo bed after every use.
- Tipping viscous load materials e.g. asphalt, soil, loamy sand.
- Tipping large rocks.
- Tipping with an inclined combination.
- Tipping under high-voltage transmission lines (open power lines).

In the chassis area

Note the following in general:

- Connect the supply lines
- Establish the electrical connections
- Retract the support devices and lock them
- Check the tyres and rims for damage
- Check the tyre pressure, including the spare wheel
- Check the tightening torque of the wheel nuts
- In the case of a new trailer, retighten the wheel nuts after 50 km and after the first journey with a load
- Secure the:
  spare wheel / spare wheel holder, wheel chock
- Check the trailer lights, repair defective lights
- Adhere to the permissible gross weight
- Release the brakes and only start driving when the brake operating pressure has been reached
- Drain the compressed air tank
- Check the number plate and signs
- Check the attachment of the tubular drawbar
- Check that the coupling (eyelet) is in perfect condition
- Appropriately lock the trailer coupling
- Ensure that the loading bridge is secured in the tilting bearings
- Check the number plate and signs
- Ensure that the telescopic cylinder has been appropriately retracted

In the body area

Close and secure all body components, such as:

- Tailgate
- Drop sides, side
- Toolbox
- Climbing aids
- Ensure that the load distribution is balanced
- Use roll-up tarpaulin as required

Basic safety instructions regarding the tilting process

Tippers have a high risk of falling over.

They may fall over while tilting the load and cause major injuries and serious damage to goods.

Tipper accidents have varied causes and usually result when a combination of several issues was neglected during the tipping process.

We are listing the most important issues below, so that the risk of falling over can be minimised.

Clean cargo bed

The inside surfaces of the cargo bed must be kept clean to prevent bulk goods from sliding off!

▶ Thoroughly clean the cargo bed after each transport.

Total mass / weight

Higher loads increase the risk of falling over!
Exceeding the max. permitted total mass strongly increases the risk of falling over.

▶ Adhere to the permitted total mass and the max. load capacity as well as the max. axle loads.

▶ Do not overload the cargo bed - as this has a negative effect on this vehicle component and the tilting moment.

Uneven / soft ground

Tilting on a soft / uneven ground significantly reduces the stability of the vehicle during the tilting process!

▶ Check before tilting that the vehicle stands on firm and even ground - which can usually be seen with the naked eye.

Tyre pressure / load distribution

Uneven tyre pressure (different on the right and left side) as well as uneven load distribution increase the risk of falling over!

▶ Regularly check the tyre pressure - establish the same tyre pressure in all tyres.

▶ Evenly distribute the goods across the whole lengths / width of the cargo bed.

Unfavourable wind conditions

The risk of falling over increases with the height to which the loading bridge is raised at winds above a strength of 5 Bft (Beaufort scale = 35 km/h - small deciduous trees start to sway)!

- ▶ Check from which side the wind is blowing before the tilting process and tilt against the wind where possible.
- ▶ Avoid lifting the lowing bridge fully up when the side wind is strong.
- ▶ Perform the tilting at fair speed.

Tipping at building sites

Sufficient distance must be kept when tipping at fortified excavation pits!

- ▶ Maintain a distance of at least 1 m from the excavation pit when tipping.

Tipping on slopes

A sufficient distance must be maintained when tipping on slopes!

- ▶ Maintain a distance of at least 2 m from the slope when tipping.
- ▶ Ensure that the slope angle does not exceed the following values:
  - 45° on soft ground
  - 60° on firm ground
  - 80° on rock / rocky ground
- ▶ Maintain a larger distance if you are not sure.

Braking during tilting

The chassis must be able to compensate fo the forces during the tipping process.

The parking brake may not be activated during the tipping process!

The operating brake may not be continuously activated!

- ▶ Check that the parking brake has been released before the tipping process.
- ▶ Release the operating brake gently and repeatedly - not suddenly - during the tipping process.

Dragging bulk goods

Bulk goods that are difficult to move from the cargo bed can be dragged by a controlled movement of the vehicle.

This process must be carried out slowly and very carefully!

- ▶ Very slowly drive forwards and gently activate the operating brake - do not stop suddenly.

Jacking up the air-suspension

A lowered chassis - supported by a jack - provides more stability for the vehicle.

The air-suspension should always be lowered completely where possible!

- ▶ Use the lifting / lowering system to lower the air-suspension completely or switch on the automatic lowering facility.

Total vehicle combination extended

During the tilting process, the total vehicle combination must: be arranged with the towing vehicle and the trailer aligned / stretched out.

This ensures stability!

▶ Check that the total vehicle combination is arranged as straight as possible before tipping.

Height of the loading bridge

Tipping under power lines poses the risk of an electric shock!

Remain seated in the driver's cab in the event of an electric shock!

▶ Check before tipping that no exposed power lines are nearby or maintain a safety distance of at least 5 m.

Tipping pieces of rock

Tipping pieces of rock poses a high risk.

Pieces of rock may fall down during the tipping process and knock against the tailgate / drop sides, vehicle body or tailgate suspension, which may in turn cause the vehicle to fall over!

▶ Check before transporting pieces of rock that your version of the vehicle is suitable for that purpose.

Signal words

DANGER

Describes an immediate risk

Death or major injuries will result when this risk is not avoided.

WARNING

Describes a possibly dangerous situation

Death or major injuries may result when this risk is not avoided.

CAUTION

Describes a possibly dangerous situation

Light or minor injuries may result when this risk is not avoided.

NOTICE

Describes a possibly dangerous situation

Damage to goods may result when this risk is not avoided.

General mandatory signs. Refers to information that must be considered and adhered to in order to ensure safe use.

Also forward all warnings and instructions to other users or to auxiliary staff!

Text highlighting

The following symbols in front of text are used in these instructions:

▶ (Arrow) Request for action

\- (Dash) List

1. (Number) List of components

Warning signs used

The following warning signs may be used in these operating instructions and on the product.

Take note of these warning signs and behave very carefully in such cases.

Warning of hazard point!
Be careful - several factors could put persons at risk here.

Risk of crushing!
For limbs such as:
Hands / fingers / feet.

Risk of crushing!
For body / body parts.

Falling hazard!

Risk of electric shock!
Dangerous voltage.

Risk of impact!
Dropping objects.

Burn hazard!
Hot surfaces.

Risk of chemical burns!
Leaking battery acid.

Risk of poisoning!
Poisonous substances.

Risk of injury!
Obstacles in the head area.

Risk of slipping!

Risk of tripping!

Risk of explosion!
Explosive operating materials.

Risk of impact!
Keep distance.

Personal protective equipment

Wear the prescribed personal protective equipment (PPE) during all work described in these instructions.

This includes the following:


Safety shoes,
Sturdy footwear


Protective clothes


Protective helmet


Protective goggles


High-visibility clothing,
High-visibility vest


Protective mask,
Breathing protection


Hearing protection


Protective clothing

Mandatory signs

Adhere to the following directives / requests for action during all work described in these instructions.


Important note!
To be considered and adhered to


Read the operating instructions before performing a task


Thoroughly wash your hands


Pull out the mains connector before working on live components


Ensure good ventilation


Perform tasks as a 2-person team.


Instructions by support person required

Prohibitory signs

Adhere to these prohibitions.


Do not climb up.


Do not reach in.


Do not touch.


Do not step onto the surface.


Open fire prohibited,
e.g. cigar, lighter.


Do not splash with water,
e.g. high-pressure cleaner.


Access prohibited,
Keep unauthorised persons out.


Stepping behind swivel arm / moving parts prohibited.


Stepping between towing machine and the trailer is.


Letting the trailer run against the towing vehicle is prohibited.

Other important symbols

Take note of the following symbols for professional disposal as well as first aid in emergencies.


Problem waste!
Disposal in domestic waste not allowed.


Risk of
environmental pollution.


Professional waste oil disposal,
Do not dispose of oil into the environment.


Professional waste tyre disposal,
Do not dispose of old tyres into the environment.


Immediately rinse eyes with lots of water.


Visit a doctor.

Traffic signs regarding height

Please take note of the following, important traffic signs regarding height information in public transport.

Maximum vehicle height!
This height may not be exceeded.

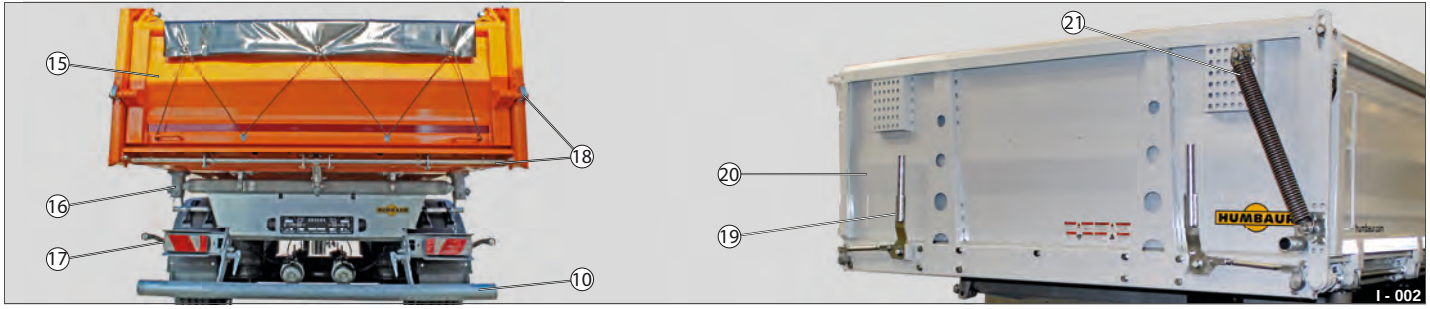

Caution - height limitation at bridges / underpasses!


Tunnel - limited height!
Take note of the maximum height information.

2 General information

HTK 19 t

Pic. 1 Side view



Pic. 2 Rear / front view

Pic. 3 Tilted positions

1 Towing ring (D40/D50)
2 Pneumatic connections: Supply, brake, hydraulic line
3 Tubular drawbar
4 Spindle support
5 Central lock of side drop side
6 Wheel chocks
7 Operating console: Spring-loaded parking brake, foot brake or lowering device
8 Mud guards with spray guards
9 Axle / wheels
10 Underride protection, foldable
11 Steps
12 Platform
13 Side drop side
14 Roll-up tarpaulin, manual
15 Rear drop side
16 Tilting bearings
17 Tail lights
18 Rear drop side lock
19 Operating lever for central locking system
20 Front drop side
21 Drop side lifting spring
22 Side drop side, folded down
23 Rear drop side, swinging
24 Arrester cables
25 Telescopic cylinder, hydraulic

Specifications for HTK 19 t - three-way tipper

The HTK is a bulk goods transporter with a rigid central pipe drawbar.

The pipe drawbar is supported at the front, using a reinforced spindle support with a load capacity of up to 12 t.

The HTK 19 t - three-way tipper has a load capacity of up to 15,000 kg (standard equipment).

The HTK 19 t as a tandem trailer comes equipped with low-maintenance air-suspension as well as optionally with an instant lowering device for tilt stabilisation.

The (Hardox) HB 450 steel drop sides can be provided with a height of 800 mm, 900 mm or 1000 mm.

The side drop sides can be optionally made from aluminium.

The standard platform floor is 4 mm thick. It is optionally available in 5 mm or 6 mm wear-resistant steel.

The 3-stage telescopic cylinder can be used to tilt the cargo bed backwards or to either side, up to an angle of approximately 50°.

The hydraulic pipe is connected to the towing vehicle via the SVK BG3 hydraulic quick connector.

The side and rear drop sides have a central locking system for swing operation.

The rear drop side is fully automatically unlocked during rear tipping.

The HTK 19 t is optionally available as a multi-voltage vehicle with LED lighting and a brake system.

The underride protection can be manually folded in.

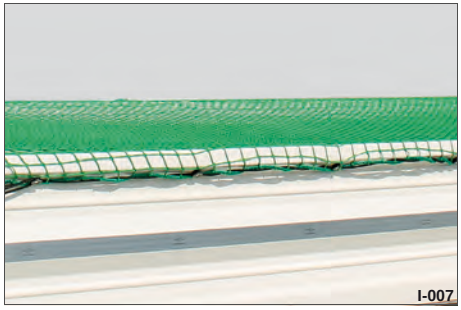
Optional additional equipment:

- A-label for waste transport
- Rear marker panel conforming to ECE R70
- Night-parking warning panels, front and rear
- Warning strips red/ white
- Plastic toolbox
- Maintenance support (optional)
- Roll-up tarpaulin, manual operation
- Cover net
- Podium with step
- Pivot tie-down rings (in pairs), recessed into the cargo bed
- Drop side lifting spring for fold-down operation (side drop sides)

Drop side lifting spring

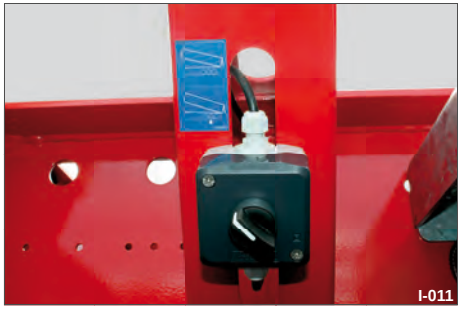
Pic. 4 Tension springs for side drop sides

Cover net



Pic. 6 Cover net with round buttons

Lowering function on/off switch

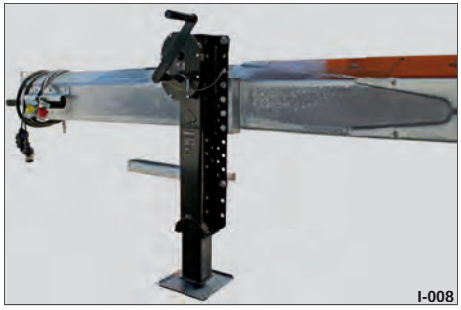


Pic. 8 Automatic lowering function, (optional)

Securing pins

Pic. 5 Loading bridge tipped down

Spindle support with step



Pic. 7 Supporting device on pipe drawbar

Road paver operation

Pic. 9 Controls for road paver (optional)

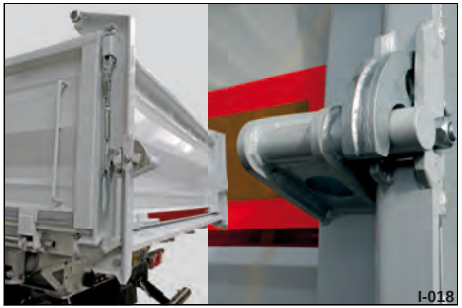
TIM (info display)

Pic. 10 Trailer information module (optional)

Toolbox

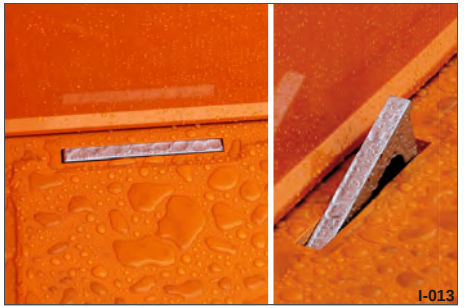
Pic. 12 On side of chassis (optional)

Automatic locking system



Pic. 14 Tailgate locked on right / left

Securing the load



Pic. 11 Pivot tie-down rings, recessed (optional)

Maintenance brace

Pic. 13 to prevent falling when trailer is in rear tipping position (optional)

Reversing lights

Pic. 15 Single, double at rear

Aluminium compressed air tank

Pic. 16 instead of steel tank

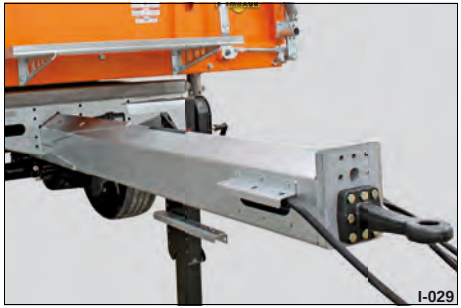
Axle lift

Pic. 18 1. Axle with axle lift (optional)

LED multi-voltage

Pic. 17 LED rear lights (12 V / 24 V)

Tilting drawbar



Pic. 19 Individually coordinated with drawbar (optional)

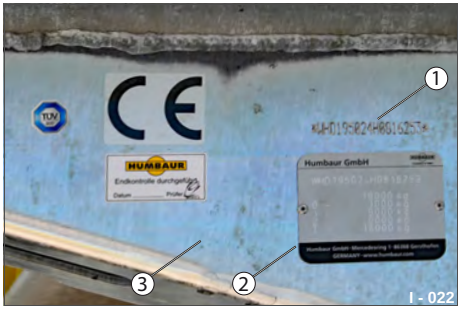
A vehicle identification number (**VIN**) has been attached to identify the trailer.

This number must be specified when asking any questions about the trailer. The VIN number must remain legible during the entire life cycle of the trailer.

VIN	WHD	000000	00000000
Pos.	1-3	4-9	10-17

Pos.	Explanation
1-3=	Worldwide manufacturer number of Humbaur GmbH
4-9=	Filler characters as selected by the manufacturer
10-17=	Sequential numbering

Tab. 1 Example - VIN number



Pic. 20 Front of vehicle

1 VIN engraved
2 Identification plate / weight information
3 Front side, frame

Spindle support

An identification plate has been attached to the spindle support for identification purposes.

If you have any questions about the spindle support, please state the factory number / type and the year of manufacture.

Read and adhere to the operating and maintenance instructions for the spindle support.

Manufacturer of spindle support:
haacon hebetechnik gmbh
Josef-Haamann-Strasse 6
D-97896 Freudenberg

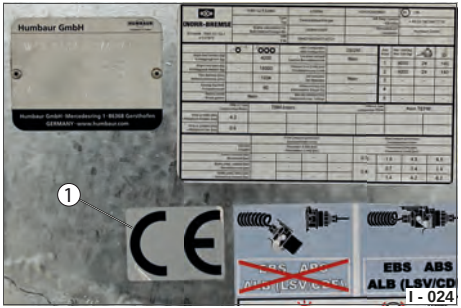
Phone 09375 -84-0
Fax: 09375-84-66

www.haacon.de

Pic. 21 Spindle support

1 Support leg
2 Manufacturer information / type
3 Technical data / weights
4 Inspection plate

Humbaur GmbH hereby confirms adherence to all relevant
CE directives for the approval and safe operation of HTK trailers.
You may request a detailed CE conformity statement from us separately.



Pic. 22 CE conformity

1 CE sticker

3 Operation

NOTICE

Exceeding the permitted tilt angles

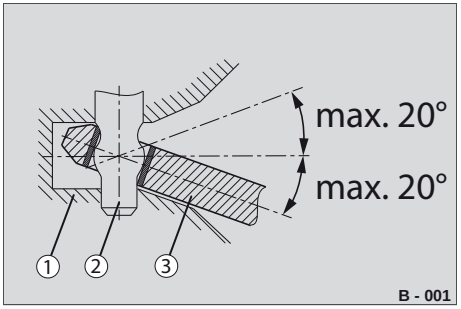
When driving up inclines and through dips, the maximum permitted tilt angles of the towing ring and bolt coupling may be exceeded.

The trailer, towing ring or bolt coupling may be damaged.

Connections may be compressed or torn off.

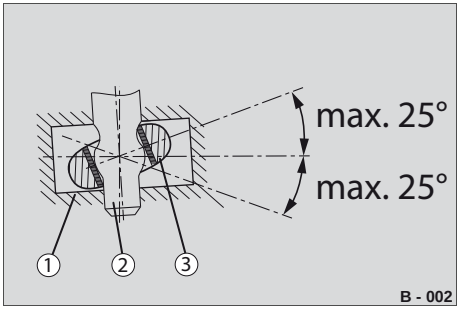
- ▶ Drive particularly carefully through dips or over rises.
- ▶ Do not bend the trailer at an angle of more than 90 degrees to the towing vehicle.
- ▶ Maintain the maximum tilt angles of:
  vertical ± 20 degrees,
  axial ± 25 degrees
  .

You will find additional information in the trade association brochure: "BG-Information BGI 599 - Safe coupling of vehicles".



Pic. 1 Tilt angle vertical to cross-axis

1 Bolt coupling (jaws)
2 Vertical bolt
3 Towing ring



Pic. 2 Axial tilt angle - longitudinal axis

1 Bolt coupling (jaws)
2 Vertical bolt
3 Towing ring

Safety during tipping

The use of tipping trailers requires a certain amount of experience and safety briefings for persons using the trailer to transport bulk loads, tip loads, etc.

The operator is obliged to instruct the driver / loader in the safe handling of tipping trailers.

DANGER

Wrong tilting of bulk loads / wrong operation of body

A wrongly executed tipping process or wrong operation of the loading bridge and bodies may cause the trailer to tilt / fall over
- Risk of crushing / impact / accident!

▶ Take note of the following points:
- Which type of bulk loads - viscous or dry - is being tipped, e.g. rock fragments?
- Is the interior of the cargo bed kept clean?
- Was the maximum gross weight / load capacity observed?
- How strong is the substrate during the tipping process?
- Is the tyre pressure the same for all tyres?
- How is the load positioned on the cargo bed?
- How are the weather conditions / wind strength on site?
- Where are you tipping: on a slope, into an excavation pit - minimum distance?
- Do you need to pull on the bulk load or slow it down during tipping?
- Can the chassis be placed on a jack (air-suspension)?
- Is a traction force exerted on the entire train during the tipping process?
- Are there any open power cables in the proximity?
- Must a roll-up or sliding tarpaulin be opened?
- Can the vehicle version be operated together with a road paver?
- How high must the loading bridge be tilted?

A high-visibility jacket must be worn while tipping in a traffic-bearing area!

Pic. 3 BG-Verkehr Brochure No. 5064

You will find additional information in the trade association brochure: "BG-Information BGI 5064 - Safe handling of tipper trailers".

Danger area

Pic. 4 Danger points in a tilted state

- ▶ Tip the load in a controlled manner.
- ▶ Never step on the cargo bed or the chassis during tipping.
- ▶ Before tilting, ensure that there is no person at the rear of the vehicle.

Safety distance

Pic. 5 Danger zone around the tipper

- While tipping, maintain a safety distance of at least 5 metres around the trailer / total train - keep all persons out of the danger zone.

  Extend the safety range if the environment cannot be ascertained as being safe.
- As the driver, you should remain in the driver's cabin, wearing your seat belt.
- Only carry out the tipping process if you can maintain constant visual contact with the assistant / instructor by viewing him in your rear-view mirror.

Loading / unloading

WARNING

Restricted view

People may not be seen and be run over when reversing.

- ▶ Use the mirrors to correctly assess the danger area around the vehicle.
- ▶  Have a second person direct you.

WARNING

Dirty / wet cargo bed

The cargo bed can become slippery through dirt, water or ice - slip / fall hazard!

- ▶ Carefully tilt the cargo bed to clean it.
- ▶ If required, clean the dirty areas before loading the cargo bed.

WARNING

Stepping on the cargo bed

People can fall when climbing up to / down from the cargo bed / the chassis via mudguards, lateral safety devices, the drawbar or chassis.

- ▶ Use  .
- ▶ Only access the cargo bed via the climbing aids intended for that purpose.
- ▶ Never step on to a tipped cargo bed.
- ▶ Do not jump up and down on the cargo bed.
- ▶ If required, use a stable ladder for climbing up and down.

WARNING

Moving load

There is increased risk of injury during loading / unloading.

People can be knocked over, buried or crushed.

- ▶ Use  .

WARNING

Loading / unloading with an excavator shovel

The load may fall down - suspended loads can crush / hit people!

- ▶ Use  .
- ▶ Never stand under suspended loads.
- ▶  Keep persons away from the danger zone.

Pic. 6 Loading the trailer

Pic. 7 Unloading the trailer

WARNING

Loading bulk goods

When bulk goods are loaded onto the trailer, they may get pressed against the drop sides. Unsecured drop sides may spring open, presenting a hitting/ crushing risk!

- ▶ Before loading bulk goods, make sure that all drop sides / bodies are closed and secured.

WARNING

Unloading bulk goods

The load can press against the drop sides. The load pressure could cause the drop sides to snap open when the locks are unlatched - impact risk!

- ▶ Stand to one side when unlocking the drop sides – not directly in front of them.
- ▶ If required, first remove the bulk goods from the drop side to be opened to relieve the pressure.

Procedure:

- ▶ Make sure that traffic is not obstructed.
- ▶ Secure the area if necessary.
- ▶ Before tipping, ensure that the trailer is coupled (fixed) and connected to the hydraulic system.
- ▶ Distribute the load evenly across the cargo bed.
- ▶ Never stand in the bulk load danger zone during loading / unloading.
- ▶ Keep people out of the danger area.
- ▶ Before starting to tip, make sure that the tilting bearings are correctly set and secured.
- ▶ Tip the load in a controlled manner.
- ▶ Never step on the cargo bed or the chassis during tipping.

- ▶ Note the warning sticker on the trailer.

Tipping the load over the drawbar

Pic. 8 Tipping over the drawbar

Light, pourable bulk loads may be tipped over the drawbar.

NOTICE

Tipping the load over the drawbar

The drawbar / connection cable may be damaged by tipping rocks / heavy lumps onto them.

- ▶ Ensure that only light, pourable bulk goods are tipped onto the drawbar.
- ▶ After tipping, ensure that the drawbar / connection cable has not been damaged.

Fold up the underride protection

Pic. 9 Load tipped over underride protection

NOTICE

Tipping the load over the underride protection

The underride protection may be damaged by tipping rocks / heavy lumps onto it.

- ▶ If necessary, fold up the underride protection before tilting.

Pic. 10 Underride protection dirty

1 Underride protection

- ▶ Inspect the underride protection (Pic. 10 /1) for damage.

After loading and unloading

The body must be fully closed and secured while driving.

The goods must be properly tied down / secured.

DANGER

Driving with a tipped loading bridge

The permitted total height of the vehicle may be exceeded - risk of collision at underpasses / tunnels / power lines - risk of accident!

The trailer could be overloaded at the chassis through the effects of dynamic force - risk of fracture / risk of accidents!

- ▶ Before setting off, make sure that the loading bridge has been tipped back and is resting completely on the chassis (tilting bearings).

WARNING

Driving with open drop sides, flaps

People may be caught and dragged along.

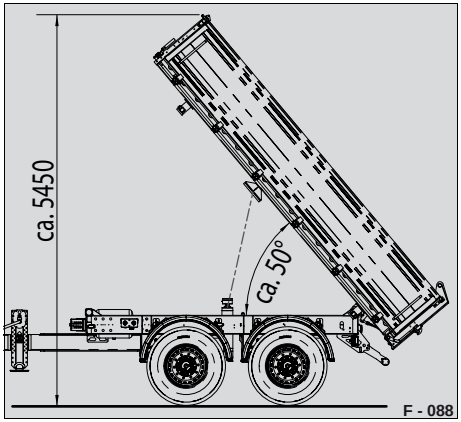
- ▶ Before setting off, make sure that all drop sides / flaps / toolboxes have been closed and secured.
- ▶ Check that the lateral protective devices (LPDs) are folded down and secured before driving off.

WARNING

Driving with support devices which have <u>not</u> been retracted and secured

The support devices could be torn off and hurled away while driving - risk of accidents!

- ▶ Before setting off, make sure that all support devices have been retracted and secured.

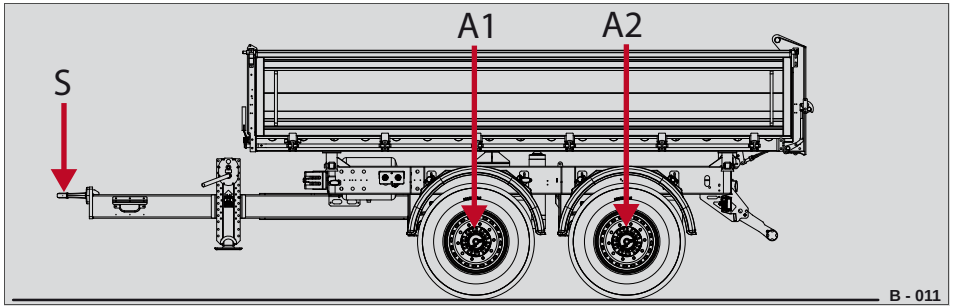


Pic. 11 Loading bridge tipped

Preconditions for safe driving with the trailer:

- ▶ Stay within the limitations for gross weight, axle loads and static drawbar load.
- ▶ Keep the centre of gravity of the load as low as possible.
- ▶ Distribute the goods evenly - avoid point / one-sided load distribution.
- ▶ Comply with the load securing guidelines pursuant to VDI 2700.

Permissible weights and load distribution



Pic. 12 Load definition

S Drawbar load
A1 Axle load - 1. Axle
A2 Axle load - 2. Axle

Stow away the load in such a way that the centre of gravity of the overall load is above the longitudinal centre line of the trailer as far as possible.

Keep this centre of gravity as low as possible.

Load your vehicle within the limits of the permissible gross weight, the permissible axle loads and the permissible drawbar load.

Also aim for an even weight distribution in the case of a partial load, so that each axle is proportionally loaded and a sufficient drawbar load is provided.

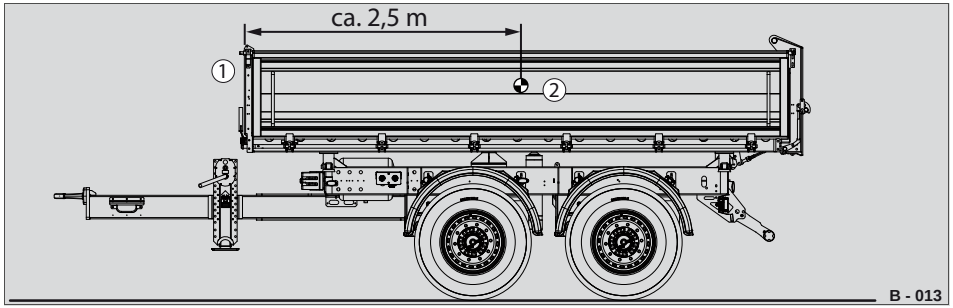
The maximum load capacity of the trailer can only be obtained if the overall centre of gravity of the load is within the permitted range.

Restrict point loading of the cargo bed to the permissible extent through suitable load distribution measures.

Adhere to the actual weight information on the identification plate (Pic. 13) on the trailer.

Pic. 13 Identification plate / weight

- Total mass
0 Drawbar load (S)
1 Axle load - 1. Axle
2 Axle load - 2. Axle
T Axle group weight



Pic. 14 Load distribution at 19 t

1 Distance of the centre of gravity of the load from the front wall of the cargo bed
2 Centre of gravity of the load

Loads	Max. weights
perm. gross weight	19,000 kg
Axle 1 (A1)	9,000 kg
Axle 2 (A2)	9,000 kg
Drawbar load (S)	1,000 kg
Unladen weight	3,990 kg
Load capacity	15,010 kg

Vehicle papers / Take note of the identification plate!

Tab. 1 Example - HTK 195024

General

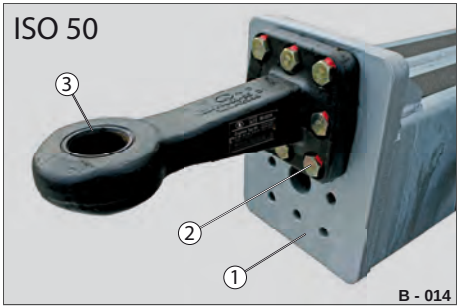
To connect the trailer to a towing vehicle, a towing ring has been mounted on the tubular drawbar.
These towing rings may be fastened at two different heights.

DANGER

Damaged connecting element

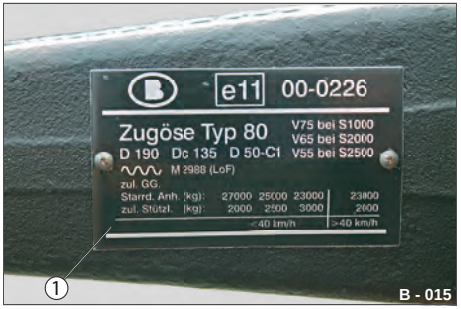
The trailer might come loose from the towing vehicle while driving - risk of accident!

- ▶ Ensure that the connecting element is undamaged before driving off.
- ▶ Have any faulty / damaged / deformed / worn connecting elements repaired or exchanged immediately and only use original spare parts (see identification plate).
- ▶ Do not carry out any welding / alignment work on the towing ring on your own under any circumstances.
- ▶ Service the connecting elements on a regular basis (see Maintenance section on page **165**).



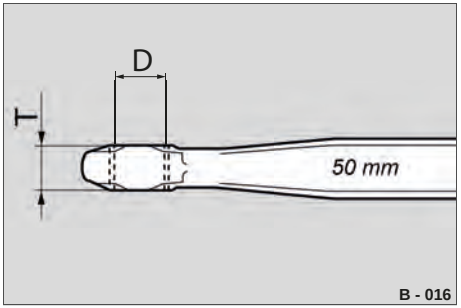
Pic. 15 Connecting element

1 Tubular drawbar
2 Screw connection
3 Towing ring (internal diameter D50 mm)



Pic. 16 Connecting element

1 Type plate



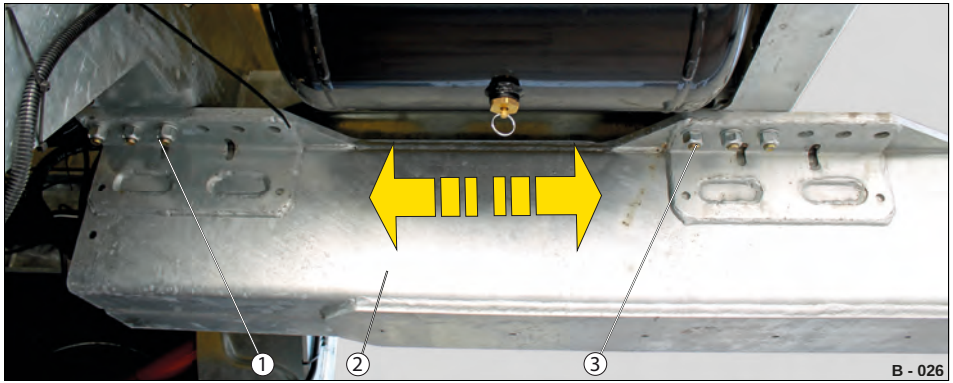
Pic. 17 Thickness of towing ring

Towing ring: Type	Diameter max. D (mm)	Thickness min. T (mm)
ISO 50	52	41.5

Tab. 2 Dimensions of towing rings

The technical values / information on the identification plate (Pic. 16 /1) for the towing ring must be adhered to!

Adjustable tubular drawbar



Pic. 18 Adjusting the tubular drawbar

1 Rear screw connection
2 Tubular drawbar
3 Front screw connection

The tubular drawbar (Pic. 18 /2) is connected to the chassis with screws (Pic. 18 /1 and Pic. 18 /3).

The tubular drawbar may only be adjusted by authorised persons in a specialised workshop!

The required projecting length of the tubular drawbar depends on the towing vehicle and its body / loading bridge.

WARNING

Adjusting the tubular drawbar

The tubular drawbar is heavy. It may fall down - risk of impact / crushing!

▶ Support the tubular drawbar at least at two points (front and rear) or secure these points with hoisting equipment, e.g. a crane.

The maximum adjustment range in 50 mm steps is 150 mm.

See the Maintenance Section Page 179 for more information about assembling the tubular drawbar.

Connecting the towing vehicle to the trailer or disconnecting the trailer from the towing machine are some of the most dangerous processes when operating the trailer.

These processes require particular care and attention on the part of the operator.

You will find additional information in the brochure provided: "BG-Information BGI - 599 - Safe coupling of vehicles".

CAUTION

Bolt coupling difficult to access

You may catch your hands / fingers while operating the bolt coupling.

You may hit your head.

- ▶ Before operating the bolt coupling, ensure that there is sufficient clearance for safe operation.

WARNING

Driving towing vehicle

A person could be crushed between the trailer and the towing vehicle while connecting / disconnecting the towing vehicle with / from the trailer.

- ▶ The danger zone between the towing vehicle and the trailer should be kept free.

- ▶ Make use of an assistant when manoeuvring the vehicle, agreeing on hand signs (according to BGV-D29) and positioning this person within call / visual range.
- ▶ Keep the rear section of the towing vehicle free.

WARNING

Allowing the trailer to roll

Coupling / joining the trailer on a slope by allowing it to roll against the stationary towing vehicle poses a mortal danger to the person involved.

- ▶ Never allow a trailer to roll against a stationary towing vehicle.
- ▶ Repeat any failed coupling attempt.
- ▶ Drive the towing machine up to the towing ring of the trailer and accurately align it - without a lateral offset.
- ▶ If necessary, mark the distance to be travelled on the ground.
- ▶ Get help from a signaller.

Operating the bolt coupling

Preparation

▶ Before using the coupling for the first time, ensure that the towing vehicle / trailer connection is permitted.

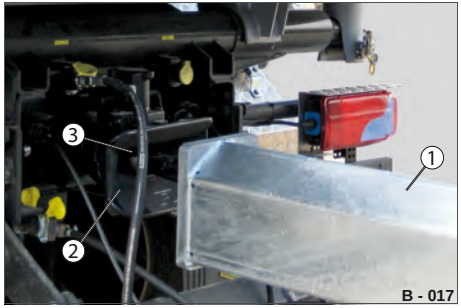
- Do the trailer coupling size and the size of the towing ring match?

- Can the maximum permissible drawbar load of the trailer be pulled by the coupling of the towing vehicle?

- Do the positions of the towing facility on the trailer and the mounting height of the bolt coupling match, so that the towing ring is horizontal when coupled on a smooth, horizontal surface?

(A maximum deviation of +/- 3 degrees is permitted.)

Information about the operation of the bolt coupling may be found in the manufacturer's operating instructions.



Pic. 19 Trailer coupled

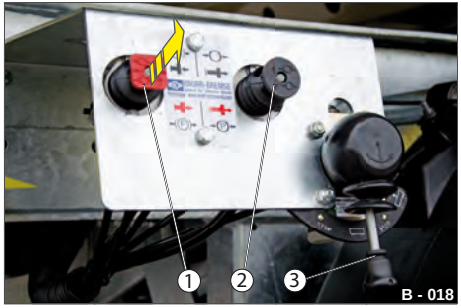
1 Drawbar with towing ring
2 Yoke bar
3 Bolt

The bolt is manually operated (Pic. 19 /3) or by means of a remote control - depending on the version of the bolt coupling.

The safety state may be identified from the position of the operating lever and the control display.

▶ You should also ensure that the bolt coupling has engaged correctly.

Coupling



Pic. 20 Parking brake / lifting or lowering system

1 Spring accumulator parking brake (red)
2 Operating brake release valve (black)
3 Air-suspension swivel lever

▶ Ensure that the air-suspension swivel lever (Pic. 20 /3) is in the neutral position.

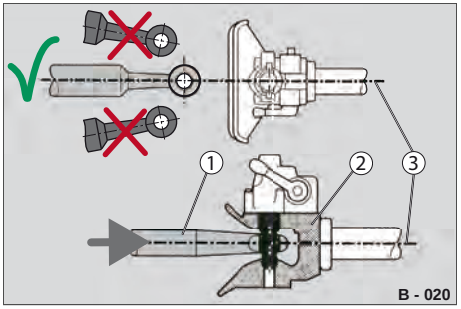
The trailer has not been lowered or raised.

▶ Pull the spring accumulator parking brake (Pic. 20 /1).

The trailer is braked.

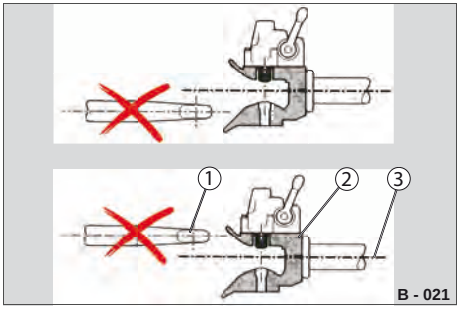
Pic. 21 Wheel chocks put in position

1 Wheel chock



Pic. 22 Driving up close

1 Towing ring
2 Bolt coupling (yoke bar)
3 Centre axle



Pic. 23 Wrong height adjustment

1 Towing ring
2 Bolt coupling (yoke bar)
3 Centre axle

▶ If necessary, place the wheel chocks (Pic. 21 /1) under the wheels of the rigid axle.

The trailer has also been secured to prevent it from rolling away.

▶ Inspect the trailer to ensure that it is in a horizontal position.

▶ Reverse the towing vehicle so that there is still approximately 1 m distance between the coupling and the towing ring.

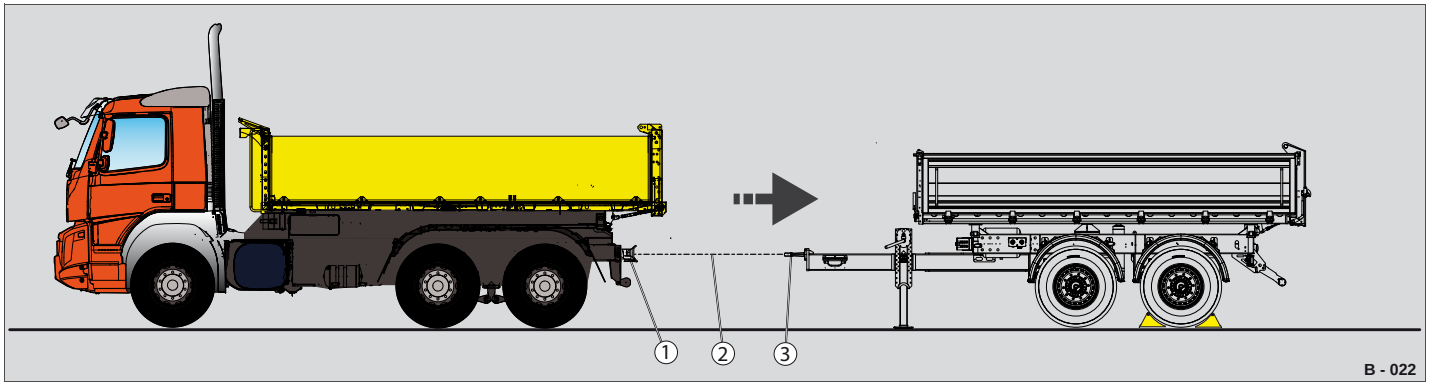
▶ Try to align the vehicle as much as possible with the bolt coupling.

▶ Correct the position of the trailer in relation to the towing vehicle if necessary.

▶ Get help from a signaller.

▶ Set the height of the bolt coupling in such a way that the towing ring meets the centre axle (Pic. 23 /3) or slightly overlaps with the lower part of the yoke bar.

Coupling process



Pic. 24 Coupling

1 Bolt coupling (yoke bar)
2 Centre axle
3 Towing ring

▶ Open the bolt coupling (Pic. 24 /1).
▶ Leave the danger zone between the towing vehicle and the trailer.
▶ Move the towing vehicle back, so that the towing ring (Pic. 24 /3) engages in the bolt coupling.

If the bolt coupling should fail to engage:

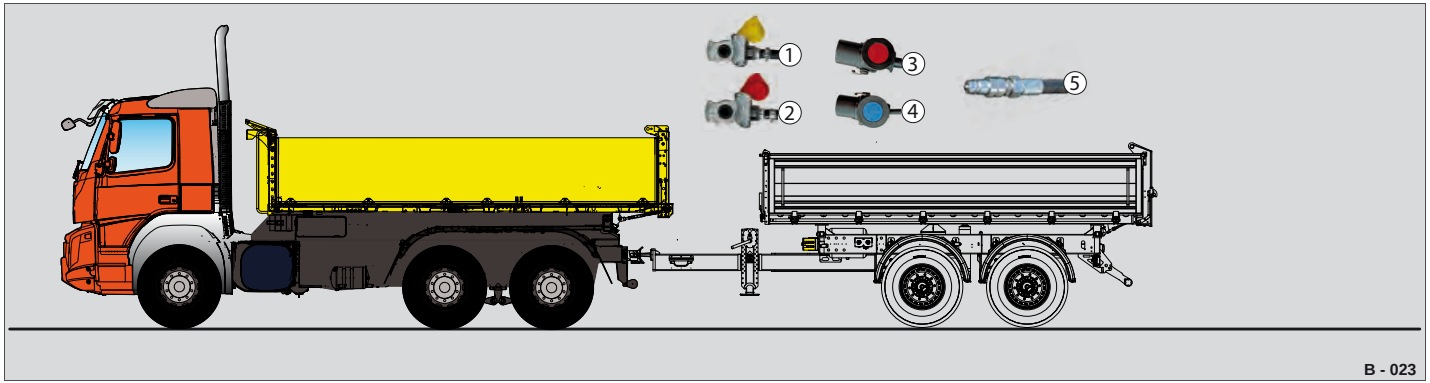
You can correct the height, using the lifting / lowering system.

▶ Activate the parking brake of the towing vehicle.
▶ Ensure that the bolt coupling has been properly connected and secured.

If the coupling has not been properly locked:

▶ Open the coupling.
▶ Drive the towing vehicle forwards.
▶ Repeat the coupling process.

After coupling



Pic. 25 Establish the connection

1 Brake line (yellow)
2 Supply line (red)
3 Lighting cable (electric system)
4 EBS / ABS cable (brakes)
5 Hydraulic line (1-circuit)

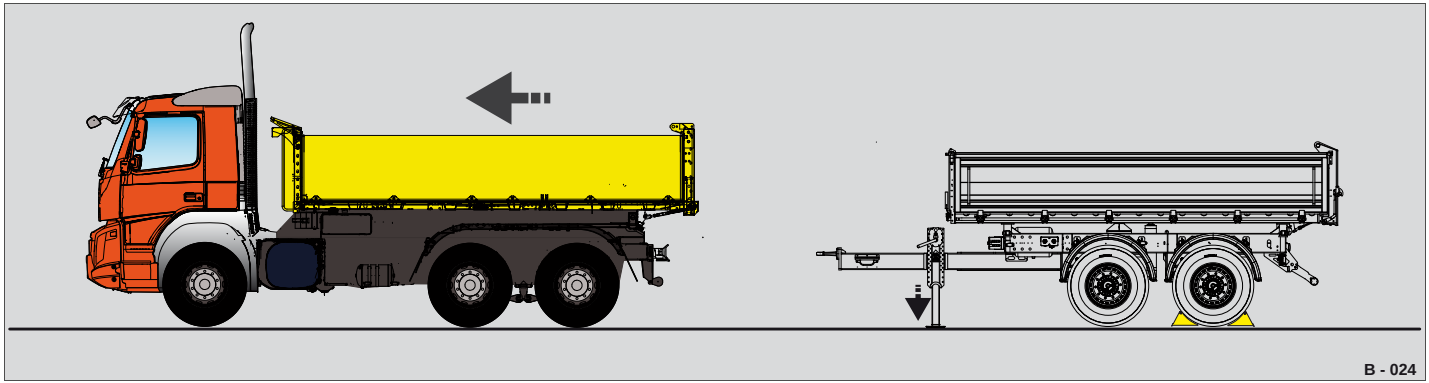
▶ Connect the cables to the towing vehicle in the following sequence:

1. Brake line (yellow)
2. Supply line (red)
3. Lighting cable
4. EBS / ABS cable

(see "Coupling" on page **51**)

▶ If necessary, connect the hydraulic line to the towing vehicle.
▶ Fold up the support devices.
▶ Place any wheel chocks used into their holders and secure them.
▶ Release the parking brake of the trailer.
▶ Carry out a check before driving off (see page **57**).

Uncoupling



Pic. 26 Uncouple the trailer correctly

WARNING

Incorrectly uncoupled trailer

The trailer could start moving and tip over.

People could be struck by the trailer and run over - risk of crushing!

- ▶ Only uncouple the trailer when it is empty.
- ▶ Use wheel chocks to secure the trailer from rolling away before uncoupling.

Preparation

- ▶ Before decoupling the trailer, ensure that a loaded trailer may be parked there.

Please take note of the specifications of the spindle support manufacturer.

- ▶ If possible, only uncouple an empty trailer.
- ▶ Ensure that the substrate is sufficiently stable to bear the weight of the spindle support contact surface.
- ▶ Ensure that the trailer can be positioned in a straight line with the vehicle and the recoupling will be possible without problems.
- ▶ Ensure that the substrate is even and horizontal - there should be no slope.

Procedure:

- ▶ Activate the parking brake of the trailer an the parking brake of the towing vehicle.
- ▶ Secure the trailer against rolling by using the wheel chocks.
- ▶ Extend the leg of the spindle support all the way to the substrate or until the trailer is more or less balanced and the towing ring is slightly lifted by the yoke bar.
- ▶ Disconnect the cables from the towing vehicle in the following sequence:

  1. Supply line (red)
  2. Brake line (yellow)
  3. Lighting cable
  4. EBS / ABS cable
  5. or hydraulic line

  (see Decoupling" on page **75**).
- ▶ Safely stow the cables on the tubular drawbar or the console.
- ▶ Release and open the bolt coupling on the towing vehicle.
- ▶ Only drive the towing vehicle forwards once there are no more persons in the danger area.
- ▶ Close the bolt coupling.
- ▶ Carry out a check when parking (see page **57**).

Departure check

- Trailer has been correctly coupled.
- The brake and supply line have been connected.
- The electrical cables and EBS cables have been connected.
- The air suspension system for the lifting / lowering system is at driving level.
- The operating lights (if any) have been switched off.
- The cargo bed has been tilted back and secured in the tilting bearings.
- The hydraulic line is connected to the towing vehicle.
- Parking brake has been released.
- The support devices have been extended upwards and secured.
- The underride protection is in the driving position and secured.
- The drop sides have been closed and secured.
- Toolbox has been locked and secured.
- The wheel chocks have been secured in the holders.
- The night parking warning signs have been closed.
- The steps (if any) have been folded up and secured.
- The roll-up tarpaulin, cover net or tarpaulin (if any) have been mounted and secured.
- The central locking systems have been closed.

Check when parking

- Trailer has been correctly uncoupled.
- Parking brake has been applied.
- Wheel chocks have been positioned.
- The support devices have been extended and secured.
- The brake and supply lines have been disconnected and parked.
- The electrical cables and EBS cables have been disconnected and parked.
- The cargo bed has been tilted back and secured in the tilting bearings.
- The hydraulic line has been disconnected and parked.
- The drop sides have been locked.
- Toolbox has been locked.
- Night parking warning signs have been folded out if necessary.

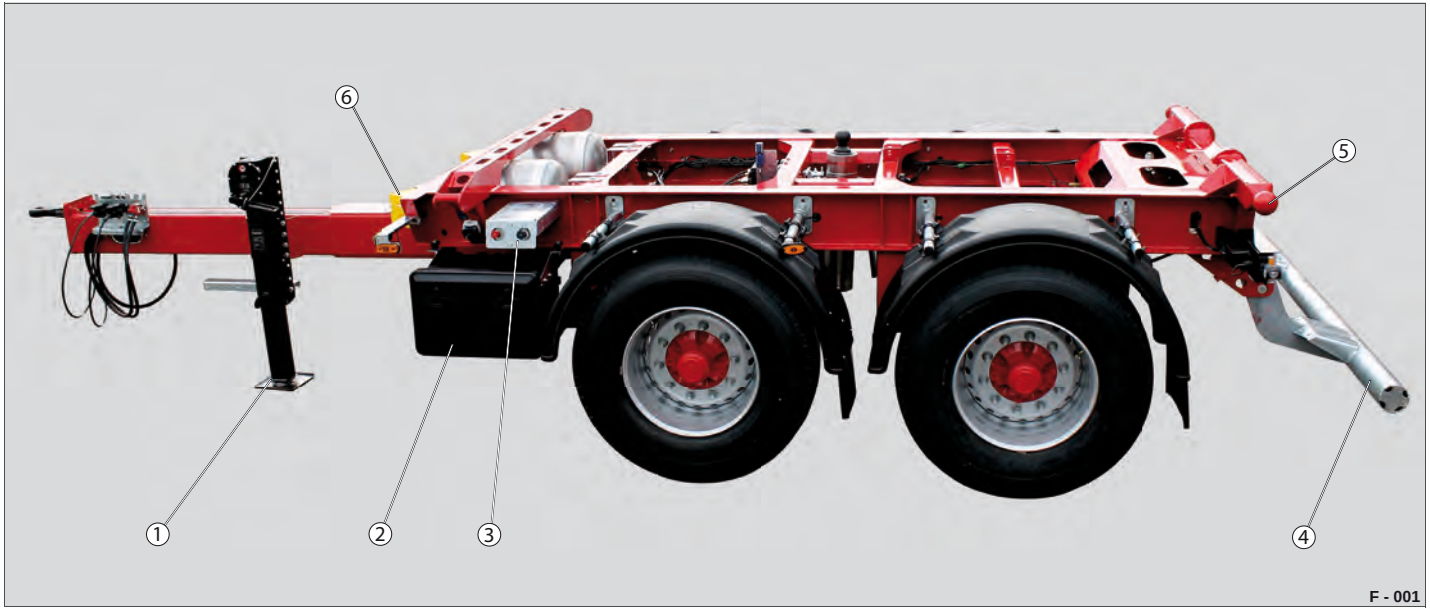
To be taken into account while driving

Pic. 27 HTK loading for driving purposes

The following should be particularly taken into account:

- Length of the vehicle/trailer combination
- Speed
- Weather conditions
- Kinking of the trailer in relation to the towing vehicle is possible when driving around sharp bends (max. 90° possible)
- Total height of loaded trailer (adhere to national regulations)
- Adhere to the maximum permitted height as stated on the road sign when driving through underpasses / tunnels.

4 Operating the chassis



Pic. 1 Operating the chassis

1 Support device
2 Toolbox
3 Operating console:
Accumulator parking brake,
Operating brake release valve,
Lifting / lowering device
4 Underride protection
5 Tilting bearings
6 Wheel chocks

General

The braking system of Humbaur GmbH is implemented as an electronic brake system (EBS) and corresponds to EC Directive ECE R13.

Driving without this plug connection and / or driving without the connection cable being plugged in is illegal!

Trailers with EBS may only be operated behind towing vehicles with the following plug connections:

– ABS / EBS plug connection, 7-pin, 24 V, according to ISO 7638-1996

– ABS / EBS plug connection, 5-pin, 24 V, according to ISO 7638-1985

It is furthermore required that the brake system should be implemented as a two-line system non-interchangeable compressed air connection.

The non-interchangeable coupling heads prevent incorrect connection of brake and supply line.

Pic. 2 Plug connections, standard 24 V

1 7-pin EBS/ABS connector (ISO 7638)
2 15-pin electric systems connector (ISO 12098)

The electronic brake system is equipped with load-dependent brake pressure controls (adapt to the current load state) and an anti-lock breaking system (ABS function).

The EBS module detects errors and damage in the brake system and can indicate them in the towing vehicle via warning lamps.

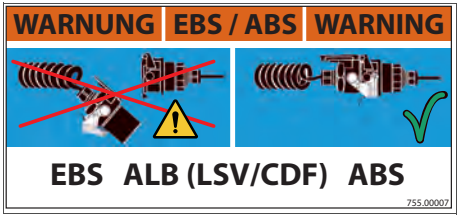
WARNING

EBS connection cable not connected

The anti-lock breaking system is out of order and the wheels may lock during braking.

The vehicle does not stop in time - accident risk!

▶ Connect the towing vehicle and the trailer with an EBS connection cable.



▶ Take note of the operating sticker on the trailer.

Please take note of the operating instructions for your towing vehicle.

DANGER

Wrong sequence during coupling / uncoupling of lines

The operating brake opens when the supply line is connected before the brake line.

The trailer is unbraked.

People could be crushed by the trailer or run over - accident risk!

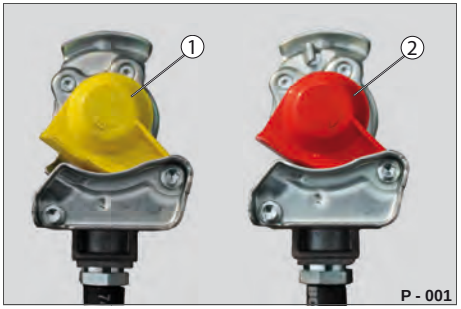
- ▶ Connect the brake line first.
- ▶ Disconnect the brake line last.

CAUTION

Coupling / uncoupling cables

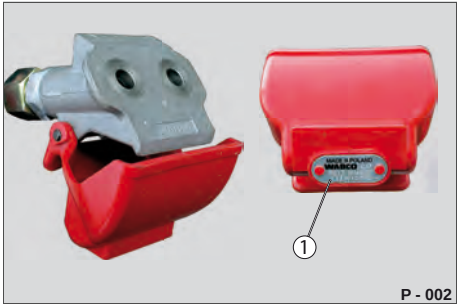
Fingers may be pinched at the connection points.

- ▶ Carefully turn the coupling heads in / out.
- ▶ Always pull at the coupling head and not on the hose.



Pic. 3 Brake / supply line separated

1 Brake (yellow)
2 Supply (red)



Pic. 4 Duo-Matic quick-coupling system

1 Coupling head for supply & brake

Optionally with Duo-Matic quick-coupling system.

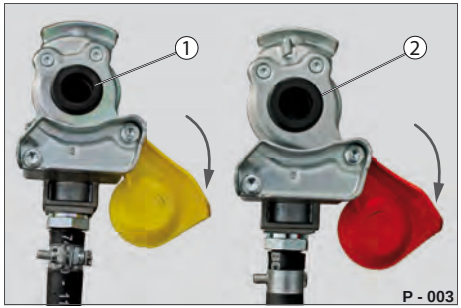
Pic. 5 Parking console for connections (optional)

1 Coupling head in parking position

After uncoupling from the tractor, the supply lines for compressed air and the electricity plugs must be safely stored in the parking console and secured against falling down.

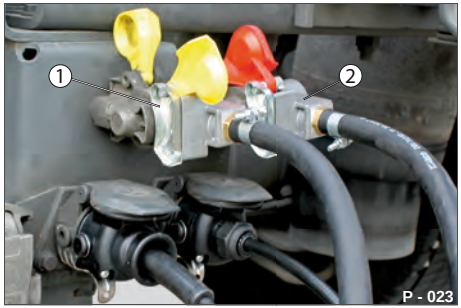
The supply line must be wrapped around the tubular drawbar when no parking console is present.

Coupling / uncoupling of the supply lines



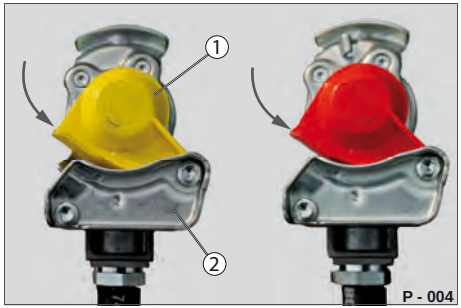
Pic. 6 Prepare coupling connections

1 "Brake" coupling head (yellow)
2 "Supply" coupling head (red)



Pic. 7 Connected

1 Pneumatic connection for brake
2 Pneumatic connection for supply



Pic. 8 Uncoupling / Parking

1 Protective lid
2 Coupling head

▶ Before establishing the connection, check that the connections and coupling heads are clean and undamaged.

▶ Turn the protective cap (Pic. 8 /1).

▶ Connect the "brake" coupling head (Pic. 7 /1).

▶ Connect the "supply" coupling head (Pic. 7 /2).

▶ Release the accumulator parking brake (see Page **66**).

▶ Disconnect the "supply" coupling head (Pic. 6 /2).

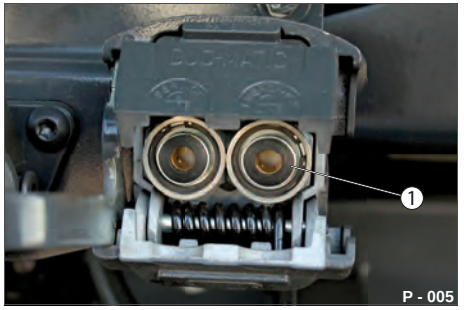
▶ Disconnect the "brake" coupling head (Pic. 6 /1).

The trailer is automatically braked by the operating brake, due to the ventilation of the supply line during decoupling.

▶ Turn the protective cap (Pic. 8 /1) of the coupling heads to the closed position.

This protects the connections / sealing surfaces against dirt and damage.

Operating the Duo-Matic coupling



Pic. 9 Duo-Matic, coupling socket on the tractor opened

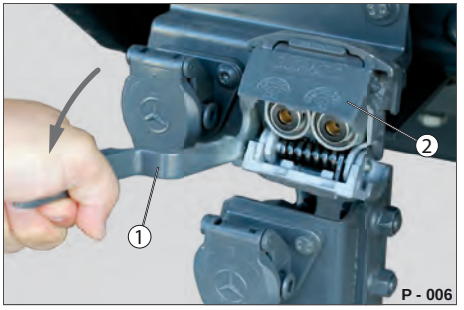
1 Sealing surfaces

Humbaur GmbH vehicles can be optionally equipped with the automatic Duo-Matic quick-coupling system.

Due to the design of this version, the supply and the brake line are always connected and disconnected at the same time.

The coupling heads are automatically closed in the uncoupled state.

Coupling



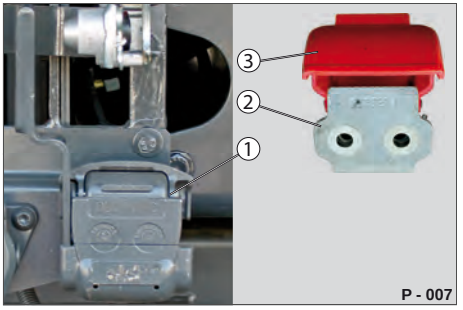
Pic. 10 Duo-Matic, establish coupling

1 Handle
2 Protective lid

- ▶ Ensure clean sealing surfaces (Pic. 9 /1) at the coupling head and the quick-coupling socket.
- ▶ Clean the line connection with a clean cloth as required.
- ▶ Press the handle (Pic. 10 /1) of the Duo-Matic quick coupling socket downwards and push the coupling head under the opened protective lid (Pic. 10 /2).
- ▶ Release the handle.

  The connection has been established.

Uncoupling



Pic. 11 Duo-Matic, disconnected

1 Quick coupling at the tractor
2 Coupling head
3 Sealing lid

- ▶ Pull the handle (Pic. 10 /1) of the Duo-Matic quick coupling socket upwards and pull the coupling head (Pic. 11 /2) out from under the opened protective lid (Pic. 10 /2).

  The connection has been separated. The sealing lid (Pic. 11 /3) automatically closes the sealing head and protects it against dirt and damage.

Use the operating brake for manoeuvring

A coupled trailer without connected lines can be manoeuvred by releasing the operating brake.

The trailer is automatically braked by the operating brake, due to the ventilation of the supply line during decoupling.

The operating brake does not replace the function of the parking brake!

Releasing the operating brake is no longer possible below a container pressure of approx. 2.5 bar (residual pressure safety).

WARNING

Deactivating the operating brake with the release valve

The trailer can start to move out of control and roll over people - accident risk!

▶ Check that the trailer has been appropriately coupled or has been secured with the parking brake before releasing the operating brake.

WARNING

Closing the release valve when the compressed air container is empty

The trailer is not braked and can start to move out of control and roll over people - accident risk!

▶ Connect the brake line to the traction unit when the compressed air container is empty.

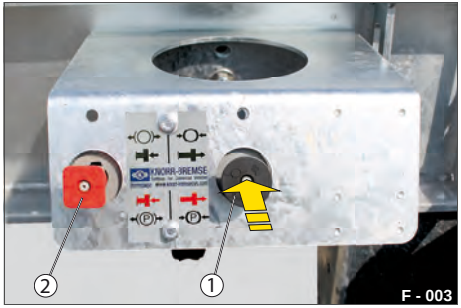
WARNING

Only park the trailer with activated operating brake

The operating brake may slacken after some time, so that the trailer may perform uncontrolled movements and roll over people - accident risk!

▶ Secure parked trailers with the parking brake and wheel chocks.

Opening / closing the operating brake



Pic. 12 Operating console

1 Operating brake release valve
2 Accumulator parking brake

▶ Press the release valve (Pic. 12 /1).

The operating brake opens.

The trailer is unbraked. You can now manoeuvre the trailer.

▶ Pull the release valve (Pic. 12 /1).

The operating brake closes.

The release valve is automatically put into operating position when the supply line is reconnected.

Operating the spring accumulator parking brake

The spring accumulator parking brake is pneumatically controlled and activated by the spring accumulator diaphragm cylinder.

Activating and releasing the spring accumulator parking brakes several times lowers the pressure in the system.

If the pressure falls below 5.2 bar, the spring accumulator parking brake can no longer be released via the control panel.

The spring accumulator parking brake can then only be released through the emergency release unit.

Information regarding the emergency braking facility is provided in the maintenance column from Page **197**.

Securing the trailer

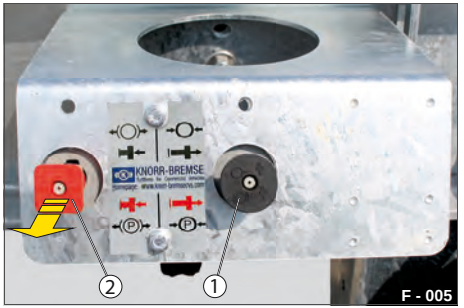
Pic. 13 Trailer secured

1 Wheel chocks positioned

▶ Check the following before releasing the spring accumulator parking brake:

- The wheel chocks (Pic. 13 /1) are in position or
- the trailer is properly coupled to the towing vehicle.

Releasing the parking brake



Pic. 14 Operating console without raising / lowering device

1 Operating brake release valve (black)

2 Spring accumulator parking brake (red)

▶ Pull the spring accumulator parking brake (Pic. 14 /2).

The trailer is braked.

Releasing

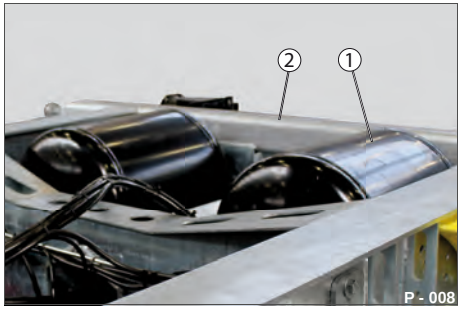
▶ Push the spring accumulator parking brake (Pic. 14 /2).

The trailer is unbraked.

Pressure level in the compressed air container

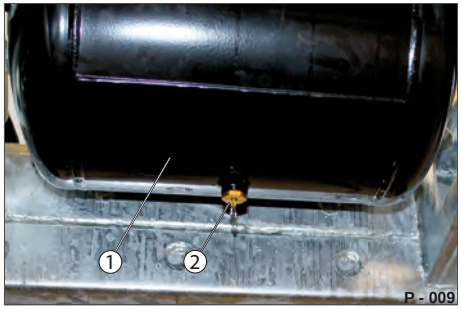
The compressed air provided by the towing vehicle (up to 10 bar) through the supply line to the trailer has an operating pressure of max. 8.5 bar (depending on the switch-off pressure of the compressor in the towing vehicle).
The supply pressure in a disconnected trailer can drop for the following reason:

– Leak in the brake system or
– multiple activation of the release valve.



Pic. 15 View below the loading bridge

1 Compressed air container
2 Chassis



Pic. 16 View below the chassis

1 Compressed air container
2 Drainage valve

WARNING

Activated emergency release device

The braking system of the trailer is out of action when the emergency release device has been activated.

People could be struck by the trailer and run over - risk of crushing!

▶ Carefully secure the trailer against rolling by using the wheel chocks.
▶ Activate the emergency release device only on even ground.

When the supply pressure has dropped below approx. 3 bar, the trailer brake valve automatically switches to brake position, the wheel brakes are clamped and can no longer be released by activating the release valve.

The brake system must be filled with supply pressure if you want to move the trailer in this state.

Two compressed air containers (Pic. 16 /1) are arranged in the front part of the chassis (Pic. 15 /2).

Draining the compressed air container

Trailers with manual drainage valves require the containers to be regularly drained and leaking drainage valves to be exchanged.

No manual drainage / bleeding is required for automatic drainage valves.

WARNING

Condensed water in the compressed air system

The brake system may become faulty or fail.

▶ Regularly drain the compressed air system.

CAUTION

Exuding compressed air

Considerable noise is generated when the drainage valve is activated.

This leads to tinnitus and hearing damage.

▶ Use  .

CAUTION

Working under the trailer

You can hit your head.

▶ Avoid jerky movements.

▶ Use an operating rod to drain the valves.

▶ Use  .

NOTICE

Freezing of the pressure system / valves

The compressed air system / valves may freeze and get damaged during the cold season.

▶ Use antifreeze.

Pic. 17 Compressed air container

1 Operating pin

▶ Pull on the operating pin (Pic. 17 /1) or push it sideways.

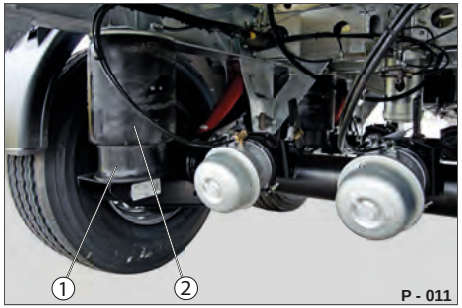
The condensed water is pressed out of the container by the pressure.

▶ Release the operating pin when no more condensed water exudes.

The drainage valve closes automatically.

▶ Repeat these work steps for all drainage valves.

General information



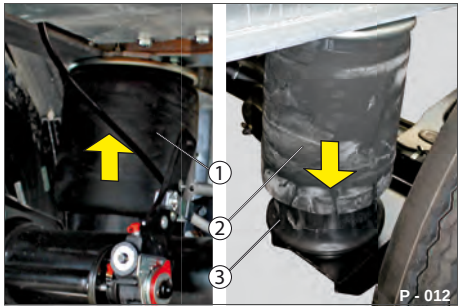
Pic. 18 Air-suspension

1 Air bellows
2 Bellows dome

The raising / lowering device consists of air bellows (Pic. 18 /1) that prepare the trailer for loading / unloading by taking in or releasing air.

Air-suspension is also used to keep the driving level of the trailer in "driving mode" at the same height, irrespective of its load. Filling and releasing is controlled by using a pivoted lever.

The axle assembly is controlled by the raising/lowering valve at the same time.



Pic. 19 Air bellows filled / emptied

1 Air bellows, emptied
2 Air bellows, filled
3 Bellows dome

Ensure that the air bellows properly roll over the bellows dome when lowering the trainer.

WARNING

Operating the raising / lowering device of a braked trailer

The trailer can make a sudden movement upwards or downwards when the brake is released - risk of crushing / impact!

- ▶ Check that no persons remain in the danger zone.
- ▶ Attach the trailer to the towing vehicle.
- ▶ Activate the parking brake of the towing vehicle.
- ▶ Only loosen the parking brake when the trailer has been coupled.
- ▶ Secure the trailer with additional wheel chocks on a slope.

Pic. 20 Example: Cargo bed raised / lowered

1 Air bellows filled
2 Air bellows emptied

The air bellows must be emptied for the tilting process. The chassis must be completely lowered!

Raising / lowering device

WARNING

Inappropriate vehicle height

The vehicle height of the trailer can be set too high for road traffic.

Road handling deteriorates.

The trailer may exceed the maximum height for bridges and passages and collide.

- ▶ Ensure that the max. driving height of the trailer is not exceeded before driving off.
  Adhere to the national regulations.
- ▶ Check that the raising / lowering valve is in driving position before driving off.

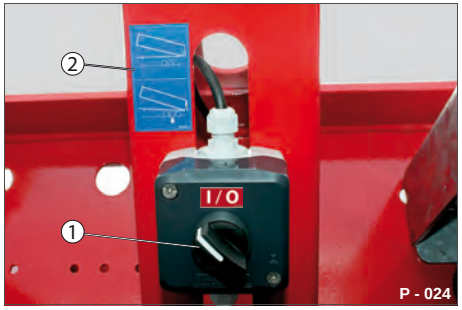
NOTICE

Inappropriate vehicle height

Inappropriately adjusted vehicle height may lead to increased wear of the tyres and the brake system.

- ▶ Check that the raising / lowering valve is in driving position before driving off.

Operating the lowering system



Pic. 21 Lowering system operating point

1 ON / OFF switch
2 Sticker

The automatic lowering function is activated when the loading bridge is tilted.

The chassis is stabilised.

The automatic lowering function can be optionally installed with a switch on the chassis for manually switching off, e.g. for use with a road paver.

The lowering device is switched on or of at an electrical switch (Pic. 21 /1):

– Switch position "0": The automatic lowering system is switched off, the air-suspension remains at driving height.
– Switch position "I": The automatic lowering system is switched on.

When the lowering system is switched on / activated, the lowering process is automatically initiated by raising the tipping platform.

The axle assembly / the air-suspension retains the driving level when the lowering device is switched off / deactivated.

NOTICE

Activated lowering device in road paver operation

The air-suspension would automatically lower the tipping platform and damage the road paver.

▶ Deactivate lowering (position: (0) OFF) when working with a road paver.

WARNING

Perform the tipping process with the lowering device deactivated

The trailer might fall over during the tipping process - risk of crushing / impact!

▶ Only perform the tipping process when the automatic lowering system is activated - Set the switch to (I) ON.

▶ Take note that the chassis is lowered when the tipping platform is raised.

▶ Check that no persons remain in the danger zone.

Hydraulic system

The telescopic cylinder of the trailer for tipping the cargo bed is activated by a hydraulic system.

The standard version of the hydraulic system with SVK BG3 hydraulic plug-in coupling is implemented as a 1-circuit system.

The standard supply of the trailer with the pressure required is provided by the towing vehicle through the hydraulic line.

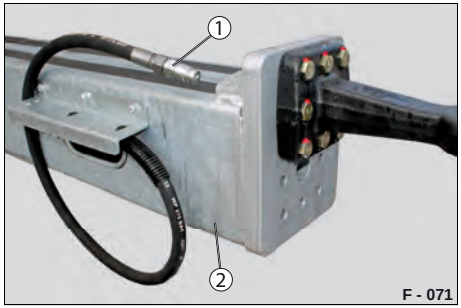
DANGER

Excessive operating pressure

The max. permissible pressure is exceeded - the lines could burst / components are damaged.

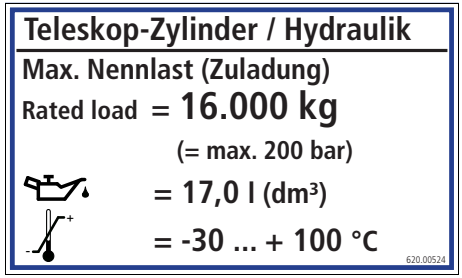
People will be injured by the escaping oil - risk of accidents!

- ▶ Comply with the maximum specifications for oil pressure / oil quantity / nominal load - see sticker on the trailer.
- ▶ Contact a specialist workshop in the event of a defective hydraulic system.



Pic. 22 Hydraulic line

1 SVK BG3 plug-in coupling
2 Drawbar



Pic. 23 Sticker on the trailer

1 Max. oil pressure (Pmax.): 200 bar
2 Max. nominal load: 16,000 kg
3 Max. oil quantity: 17 l
4 Operating temperature: -30 °C / + 100 °C

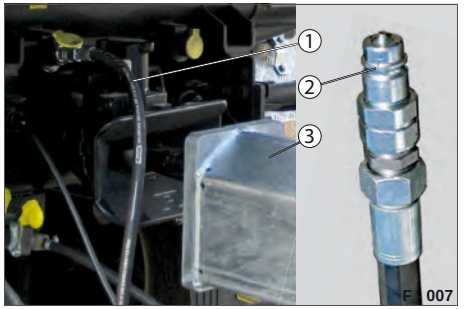
NOTICE

Do not use incorrect / old hydraulic oil

The hydraulic system (hoses, connections, cylinder) could corrode quickly and fail.

- ▶ Only use hydraulic oils from the groups HL, HLP and HPLD e.g. HLP ISO 46.

Hydraulic connection at the towing vehicle



Pic. 24 Hydraulic line, connected

1 Hydraulic line
2 Plug-in coupling (SVK BG3)
3 Tubular drawbar

Take note of the instruction manual of the towing vehicle with regard to the hydraulic supply of the trailer.

The hydraulic system of the towing vehicle must be filled with the required quantity of oil and may not exceed the max. permissible operating pressure.

⚠ WARNING

Lines are under pressure

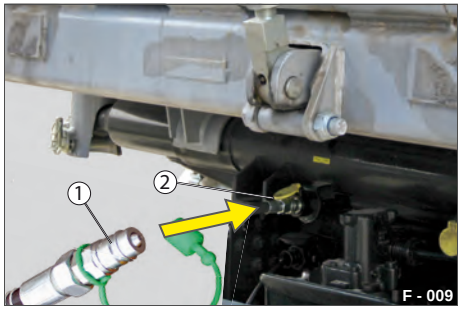
The hydraulic line is under pressure when it is uncoupled.

The oil can escape under high pressure and cut people / shred skin!

▶ Before uncoupling, check that the lines are not under pressure and the traction unit has been switched off.

▶ Use .

Coupling



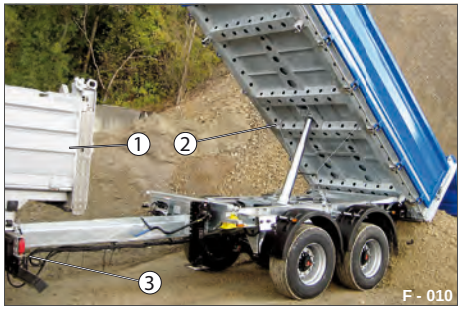
Pic. 25 Hydraulic line, connection

1 Plug-in coupling
2 Towing vehicle connection socket

- ▶ Ensure that the line connection is clean (Pic. 25 /1).
- ▶ Clean the line connection with a clean cloth as required.
- ▶ If required, check the hydraulic oil level of your towing vehicle.
- ▶ Insert the line connection in the connection socket (Pic. 25 /2) of the towing vehicle.

  The pressure is built up by starting the towing vehicle.

Tipping the cargo bed



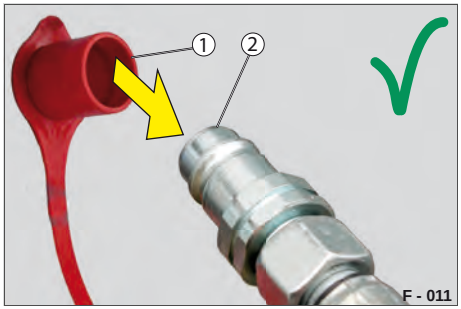
Pic. 26 Cargo bed tipped

1 Towing vehicle
2 Loading bridge
3 Hydraulic connection

The loading bridge is controlled from the operating unit on the towing vehicle.

- ▶ Before tilting the loading bridge, ensure that the trailer is coupled to the traction unit and secured, so that it cannot roll away.
- ▶ Ensure that the tilting bearings have been correctly attached in the required position and secured.

Uncoupling



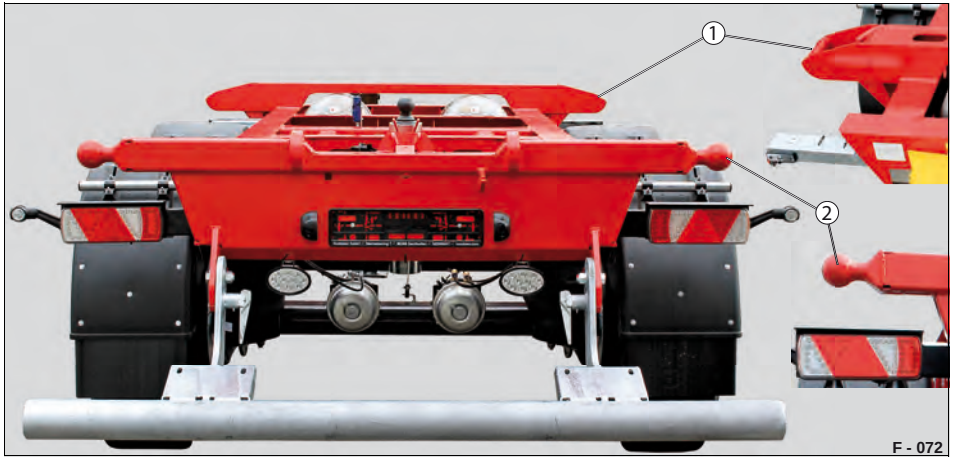
Pic. 27 Hydraulic line, parking

1 Protective cap
2 SVK BG3 plug-in coupling

The hydraulic line may not be under pressure when it is uncoupled.

- ▶ Remove the line connection from the connection socket of the towing vehicle.
- ▶ Close the plug-in coupling (Pic. 27 /2) with a protective cap (Pic. 27 /1) as required.
- ▶ Stick the hydraulic lines onto the parking console or carefully place them onto the tubular drawbar.

Version 1



Pic. 28 Bridge suspension, Version 1

1 Bolt opening, front
2 Ball receptacle, rear

The loading bridge is suspended on bolts at the front and on balls at the rear.

It is secured by 2 plug pins.

Read and adhere to the instructions for securing / operating the bridge suspension of the loading bridge superstructure manufacturer.

Version 2

Pic. 29 Bridge suspension, Version 2

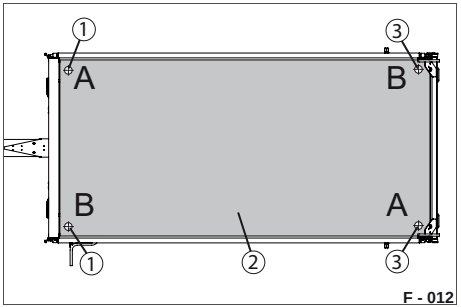
1 Ball receptacle, front
2 Ball receptacle, rear

The loading bridge is suspended on balls at the front and rear.

It is secured by 2 plug pins.

Read and adhere to the instructions for securing / operating the bridge suspension on the following pages of these operating instructions.

Securing the cargo bed



Pic. 30 Tilting bearings of the cargo bed

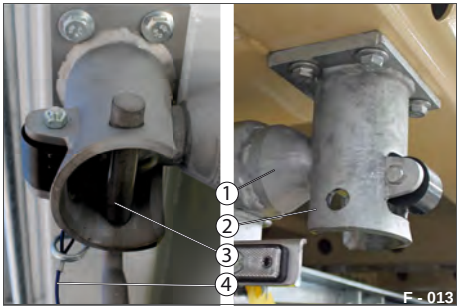
1 Tilting bearing, front (ball tipping bearing)
2 Cargo bed
3 Tilting bearing, rear (ball tilting bearing)

The cargo bed is mounted on bearings at 4 corners.

The appropriate tilting bearings must be operated to tip the cargo bed.

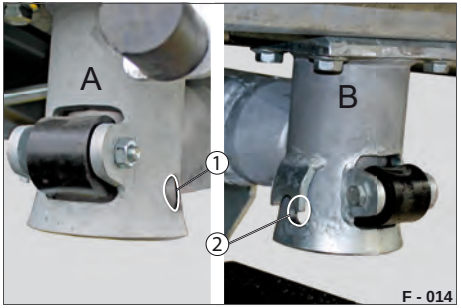
The cargo bed can be tipped to the rear or to each side (right or left).

The cargo bed must rest completely on the vehicle frame before repositioning the pins of the tilting bearings!



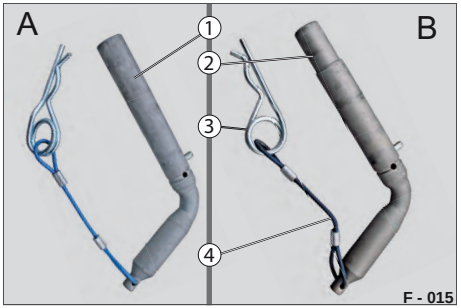
Pic. 31 Tilting bearings

1 Ball bearings, on the chassis
2 Tilting bearing, release
3 Tilting bearing, secured with plug pin
4 R-clip



Pic. 32 Tilting bearing variant A & B

1 Tilting bearing A (normal hole)
2 Tilting bearing B (smaller hole)



Pic. 33 Plug pin version

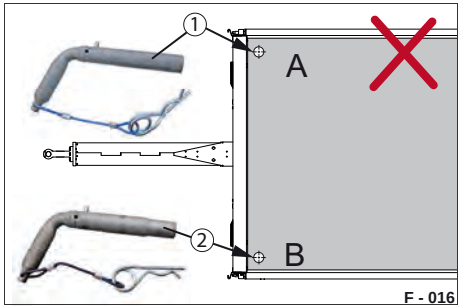
1 Plug pin variant A
2 Plug pin variant B, with shoulder
3 R-clip
4 Safety cable (blue / black)

The cargo bed may never be diagonally secured in tilting bearings!

Only the original plug pins may be used for securing!

The plug pins are available in two executions. The tilting bearings have various drill holes (tilting bearings A & B). Diagonal securing of the cargo bed is thereby excluded.

Securing tilting bearings



Pic. 34 Plug pin only inserted in front

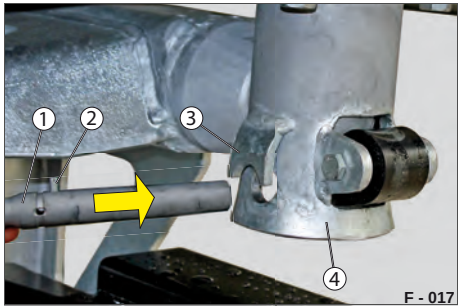
1 Plug pin variant A
2 Plug pin variant B, with shoulder

WARNING

Tipping the cargo bed towards the front

The goods slide to the front. The cargo bed / drop side / chassis is deformed - risk of crushing / impact!

▶ Do not tip the cargo bed towards the front - both plug pins may not be attached in front.



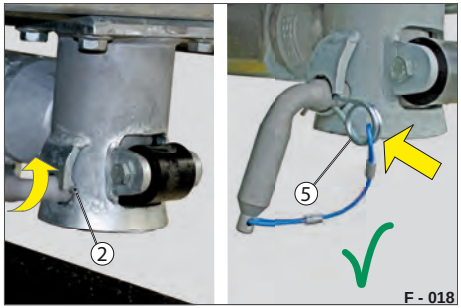
Pic. 35 Inserting the plug pin

1 Plug pin
2 Pin
3 Safety latch
4 Tilting bearing cup
5 R-clip

Insertion

▶ Push in the plug pin (Pic. 35 /1) up to the limit stop.

▶ Turn and push the plug pin in further, so that the pin (Pic. 35 /2) engages behind the locking strap (Pic. 36 /3).



Pic. 36 Plug pin secured

Securing

▶ Push the cotter pin (Pic. 36 /5) through the hole in the plug pin.

The plug pin is secured against falling out.

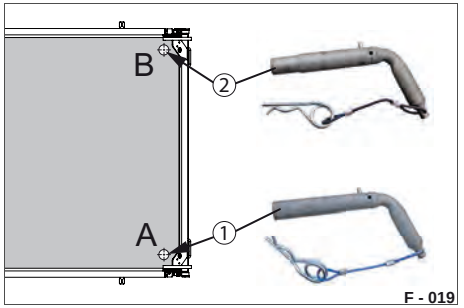
Releasing

▶ Pull out the cotter pin (Pic. 36 /5).

▶ Turn the plug pin (Pic. 35 /1) so that the pin (Pic. 35 /2) moves out of the securing bracket (Pic. 36 /3).

▶ Remove the plug pin completely.

Configuring for backwards titling

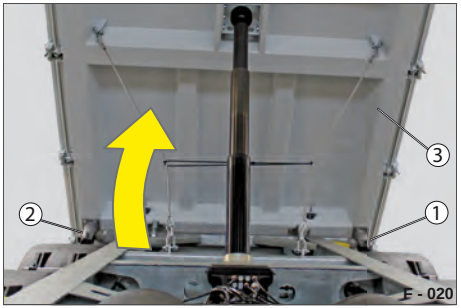


Pic. 37 Plug pins inserted at the rear

1 Plug pin A
2 Plug pin B, with shoulder

▶ Insert and secure the plug pins (Pic. 37 /1 & Pic. 37 /2) in the rear tilting bearings.

The front tilting bearings are free.



Pic. 38 Tip the cargo bed to the rear

1 Plug pin A, inserted
2 Plug pin B, inserted
3 Loading bridge raised

Adhere to all the safety procedures for loading / unloading the trailer.

See the Operation section from page **42**.

▶ Fold up the underride protection.

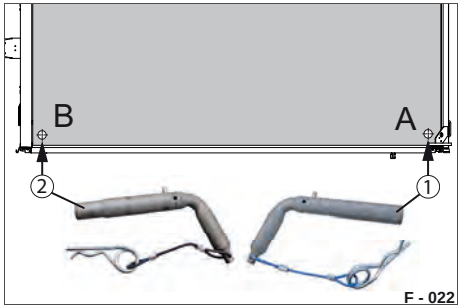
▶ Check that the rear drop side is not blocked (Pic. 39 /2).

Pic. 39 Cargo bed tipped

1 Cargo bed raised
2 Rear drop side, swivelling

▶ The cargo bed (Pic. 39 /1) can be tipped at the rear by means of the hydraulic system (see page **73**).

Pinning for tilting sideways

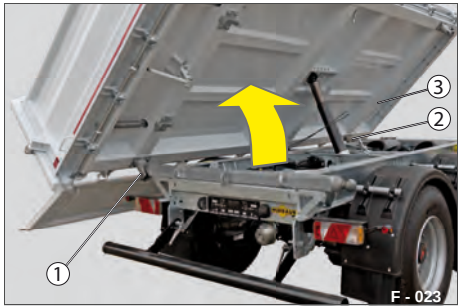


Pic. 40 Plug pin inserted on the left in driving direction

1 Plug pin A
2 Plug pin B, with shoulder

▶ Insert and secure the plug pins (Pic. 40 /1 & Pic. 40 /2) on the left-hand side of the trailer.

The tilting bearings on the right-hand side of the trailer are free.



Pic. 41 Cargo bed tipped to the side

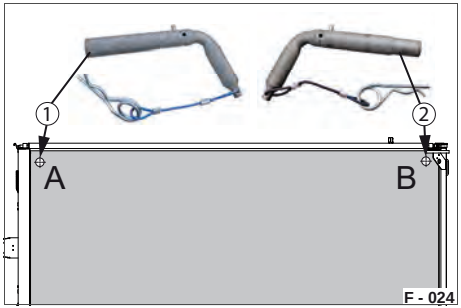
1 Plug pin A, inserted
2 Plug pin B, inserted
3 Loading bridge raised

Adhere to all the safety procedures for loading / unloading the trailer.

See the Operation section from page **42**.

▶ Unlock the central locking at the front wall.

▶ Check that the rear drop sides are not blocked (Pic. 41 /3).



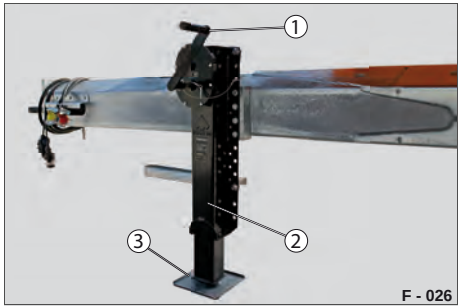
Pic. 42 Plug pin inserted on the right in the direction of travel

1 Plug pin A
2 Plug pin B, with shoulder

▶ Insert and secure the plug pins (Pic. 42 /1 & Pic. 42 /2) on the right-hand side of the trailer.

The tilting bearings on the left-hand side of the trailer are free.

Spindle support



Pic. 43 Spindle support, manual

1 Hand crank
2 Support device
3 Support leg

The support device (Pic. 43 /2) is positioned in front on the tubular drawbar and consists of a support winch with hand crank (Pic. 43 /1) and a support foot (Pic. 43 /3).

Adhere out of principle to the following:

The support foot must always be completely retracted before driving off.

Only operate protective devices with the hand crank.

Lower the support foot until it is in contact with the ground.

Read the operating instructions of the manufacturer before operating the support device.

WARNING

Sinking support device

The support foot may sink into soft / caving ground.

The trailer can tip or fall over - risk of crushing!

- ▶ Ensure that the surface provides sufficient support.
- ▶ Use a stable support if the surface is soft / yielding.

WARNING

Lowering the support device

Risk of crushing for persons below / next to the support winch.

- ▶ Keep the danger zone around the support device free.

Pic. 44 Driving with lowered support foot

1 Support foot down

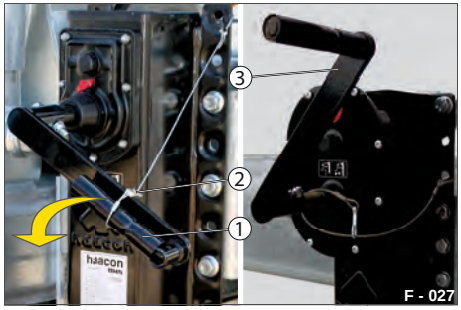
WARNING

Driving with lowered support foot

The support device could make contact with the road while driving and be torn off - accident risk!

- ▶ Ensure that the support device has completely moved up before driving off.
- ▶ Ensure that the hand crank has been secured with the safety cable before driving off.

Spindle support in support position



Pic. 45 Releasing the hand crank

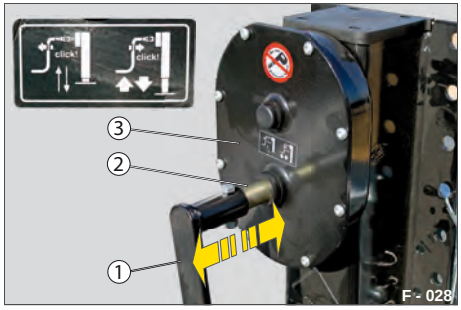
1 Crank handle
2 Safety cable with snap hook
3 Hand crank

Releasing the hand crank

▶ Release the snap hook (Pic. 45 /2) on the safety cable.

▶ Release the safety cable from the hand crank (Pic. 45 /3).

▶ Swivel out the crank handle (Pic. 45 /1).



Pic. 46 Activate quick / load gear

1 Hand crank
2 Crank shaft
3 Gearbox

Activating the quick gear

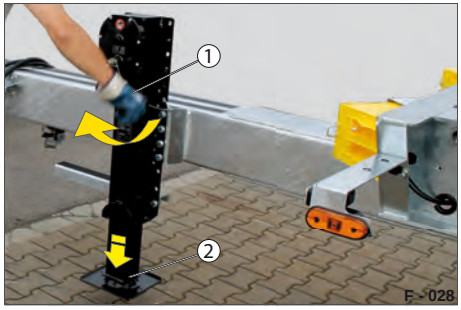
▶ Pull out the hand crank (Pic. 46 /1).

Quick gear is activated.

Activate the load gear

▶ Push in the hand crank so that the gear selection arrester in the bear box latches.

Load gear is activated.



Pic. 47 Turn the crank to lower the support foot

1 Hand crank
2 Support leg

Lowering the support foot

▶ Turn the crank to lower the support foot (Pic. 47 /2) - in quick gear - until it is almost in contact with the ground.

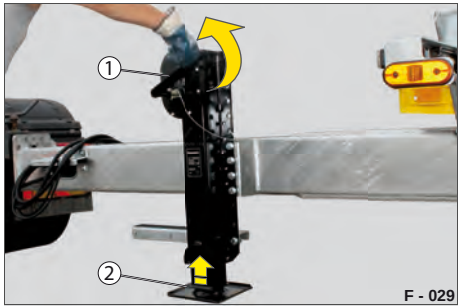
▶ Switch to the load gear.

▶ Wind down the support foot until it reaches the floor.

▶ Compensate for uneven ground as required, so that the trailer is horizontally aligned.

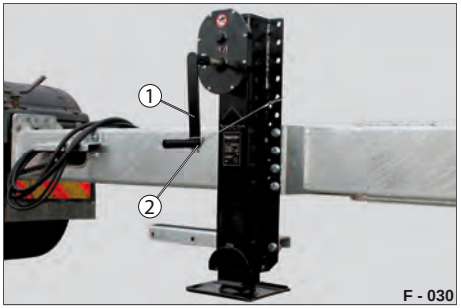
▶ Secure the hand crank as required - see (Pic. 45).

Spindle support in driving position



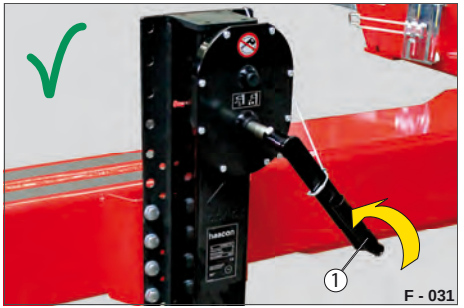
Pic. 48 Move in the support foot

1 Hand crank
2 Support leg



Pic. 49 Securing the hand crank

1 Hand crank
2 Safety cable with snap hook



Pic. 50 secured in driving position

1 Crank handle

Moving / securing the support foot

- ▶ Switch to fast gear.
- ▶ Wind up the support foot (Pic. 48 /2).
- ▶ Switch to the load gear.

  Leave the gear support in load gear (pressed in).

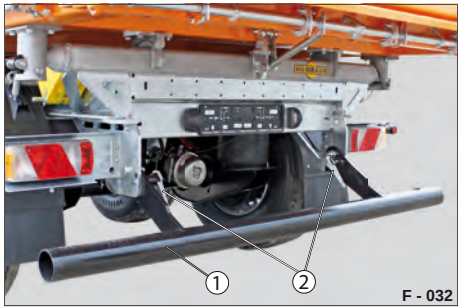
Securing the hand crank

- ▶ Turn the hand crank (Pic. 49 /1) downwards.
- ▶ Secure the hand crank with the safety cable(Pic. 49 /2).

  The hand crank is secured against autonomous turning.

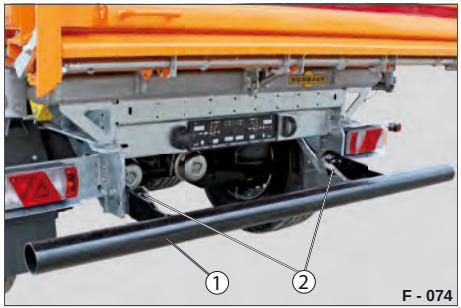
- ▶ Pull and swivel the crank handle (Pic. 50 /1) at the same time.
- ▶ Check that the support foot has been completely moved up and that the hand crank is secured before driving off.

Underride protection (standard)



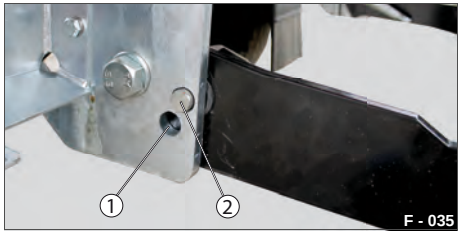
Pic. 51 Underride protection (driving position)

1 Underride protection, folded down
2 Spring bolt latch (ri / le)



Pic. 52 Underride protection (building site)

1 Underride protection, folded up
2 Spring bolt latch (ri / le)



Pic. 53 Positions / securing bolts

1 Driving position / driving on roads
2 Off-road position (building site)

The underride protection (Pic. 51 /1) is a safety component that prevents vehicles from being pushed under the chassis in the event of an accident.
The standard underride protection is not suitable for road paver operation.

The underride protection must be folded down and secured on both sides before driving off.

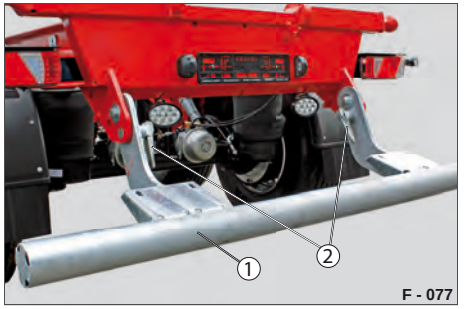
Driving with raised / folded up or deformed underride protection is not permitted on public roads.

WARNING

Driving with unsecured underride protection

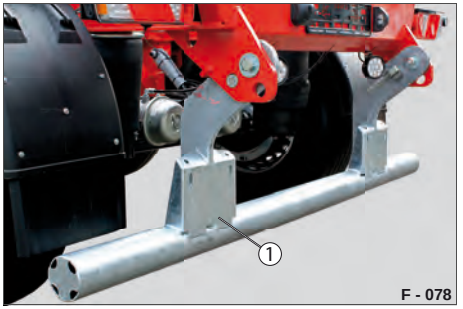
Persons may be pushed under the chassis in the event of an accident - crushing / accident risk!

- ▶ Check that the underride protection is in driving position and secured with spring latches before driving off.
- ▶ Driving with folded up and secured underride protection is only permitted outside public traffic areas (e.g. on building sites).



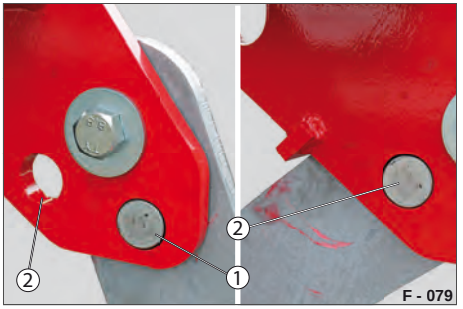
Pic. 54 Underride protection (driving position)

1 Underride protection, folded up
2 Spring bolt latch (ri / le)



Pic. 55 Underride protection (road paver operation)

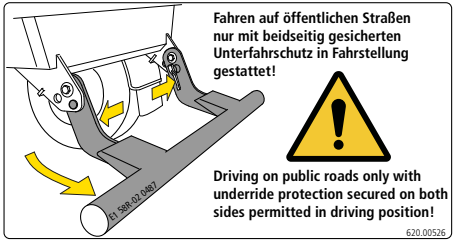
1 Underride protection, folded down



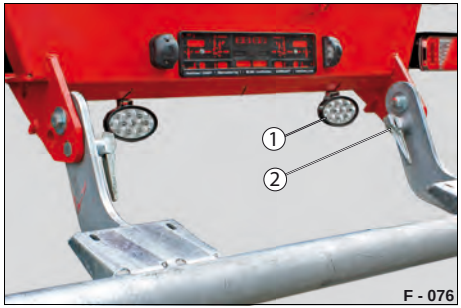
Pic. 56 Positions / securing bolts

1 Driving position / driving on roads
2 Position for road paver operation

Driving with folded down or deformed underride protection is not permitted on public roads.



Securing / unlocking the underride protection



Pic. 57 Underride protection

1 Working light
2 Spring latch, secured

The underride protection on the right and left are secured with spring latches (Pic. 57 /2).

CAUTION

Operating the underride protection / spring latch

The device can crush your hands / fingers.

▶ Use  .

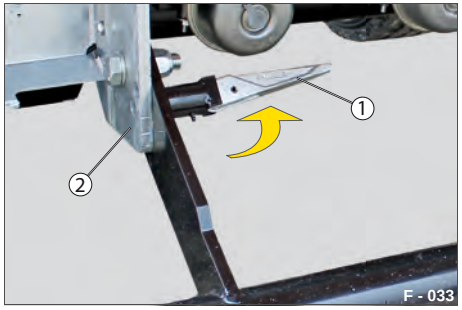
CAUTION

Operating the underride protection / spring latch

You could also hit your head on the chassis.

▶ Move particularly carefully under the chassis - avoid hasty movements.

Releasing



Pic. 58 Underride protection secured

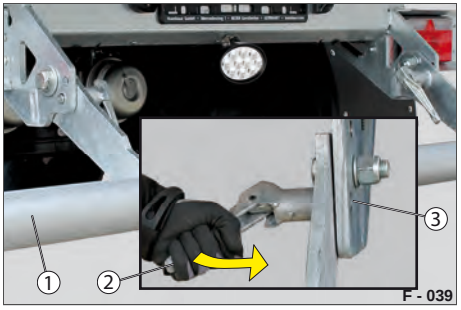
1 Spring latch
2 Bracket / console

▶ Swivel the spring latches (Pic. 58 /1) on both sides into a horizontal position.

The bolt of the spring latch moves out of the hole in the bracket / console (Pic. 58 /2).

The underride protection is unlocked.

Securing



Pic. 59 Underride protection locked

1 Tubing
2 Spring latch
3 Bolt

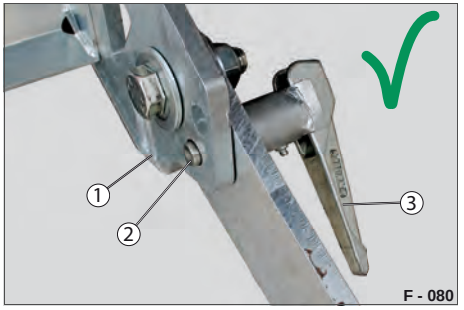
▶ Turn to close the spring latch (Pic. 59 /2).

▶ Move the tubing (Pic. 59 /1) slightly upwards and downwards as required.

The bolt (Pic. 59 /3) moves into the hole of the bracket / console.

The underride protection is secured.

Check the safeguard



Pic. 60 Spring latch, secured

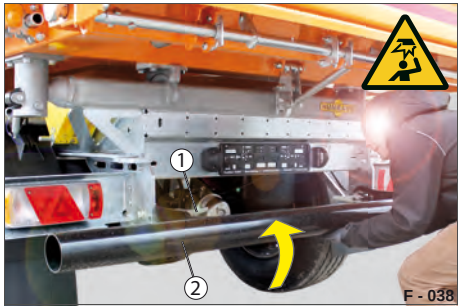
1 Bracket / console
2 Bolt
3 Spring latch

▶ Ensure that the underride protection is secured with bolts on the right and left side before tilting the cargo bed or driving off.

▶ Ensure that the bolt (Pic. 60 /2) is inserted into the hole of the bracket / console (Pic. 60 /1).

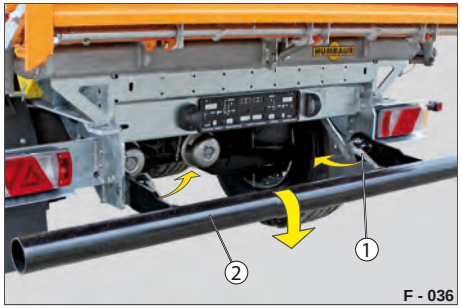
The spring latches (Pic. 60 /2) must be in a vertical position.

Operating the underride protection (standard)



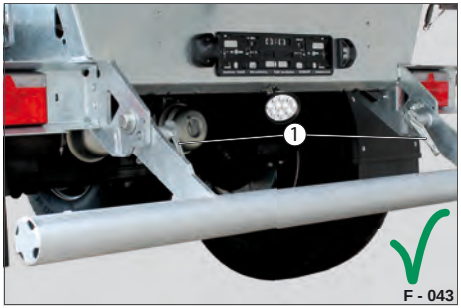
Pic. 61 Fold up the underride protection (off-road position / building site)

1 Spring latch, unlocked
2 Tubing



Pic. 62 Fold down the underride protection

1 Spring latch, locked
2 Underride protection, moved up



Pic. 63 Underride protection in driving position

1 Spring latch, locked

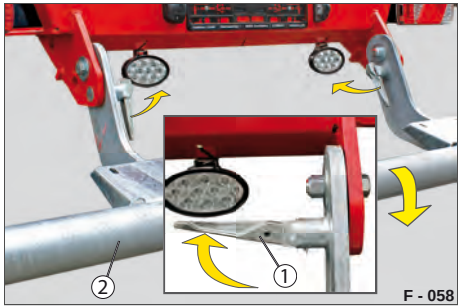
Folding up

- ▶ Unlock the spring latches on the right and left side (Pic. 61 /1) - see Pic. 60 on Page **89**.
- ▶ Hold the underride protection approx. in the middle of the tubing (Pic. 61 /2) with both hands.
- ▶ Lift the piping until the bolt can be locked in the upper hole of the bracket - see Pic. 53 on Page **85**.

Folding down

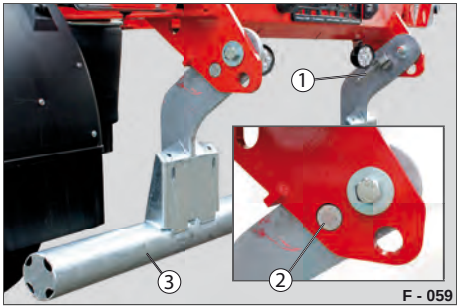
- ▶ Unlock the spring latches on the right and left side (Pic. 62 /1) - see Pic. 60 on Page **89**.
- ▶ Hold the underride protection (Pic. 62 /2).
- ▶ Swivel the tubing down until the bolt can be locked in the lower hole of the console - see Pic. 60 on Page **88**.
- ▶ Lock both spring latches (Pic. 63 /1) in the lower hole.
- ▶ Check that the underride protection is in driving position and secured on both sides before driving off.

Operating the underride protection (paver)



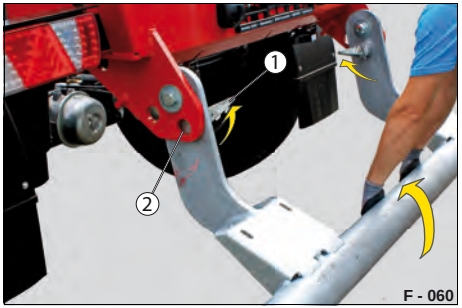
Pic. 64 Unlock the underride protection

1 Spring latch, locked
2 Tubing (driving position)



Pic. 65 Fold down the underride protection

1 Spring latch, locked
2 Bolt / rear hole
3 Underride protection (road paver position)



Pic. 66 Fold up the underride protection

1 Spring latch, unlocked
2 Bolt / front hole

Folding down

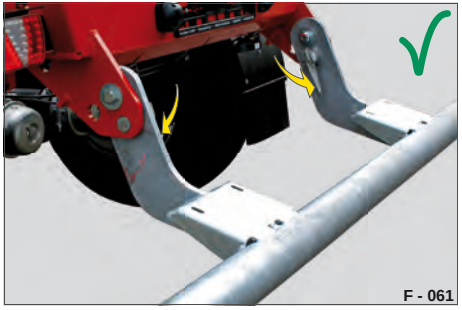
- ▶ Unlock the spring latches on the right and left side (Pic. 64 /1) - see Pic. 60 on Page **89**.
- ▶ Hold the underride protection approx. in the middle of the tubing (Pic. 64 /2) with both hands.
- ▶ Swivel down the tubing until the bolt can be locked in the rear hole (Pic. 65 /2) of the console - see (Pic. 56 /2) on Page **86**.

Securing

- ▶ Lock both spring latches (Pic. 65 /1) in the rear hole (Pic. 65 /2).

Folding up

- ▶ Unlock the spring latches on the right and left side (Pic. 66 /1).
- ▶ Lift the underride protection sufficiently to allow locking of the bolt in the front hole (Pic. 66 /2).



Pic. 67 Underride protect. in driving position

1 Spring latch, locked

- ▶ Lock both spring latches (Pic. 67 /1) in the front hole.

General

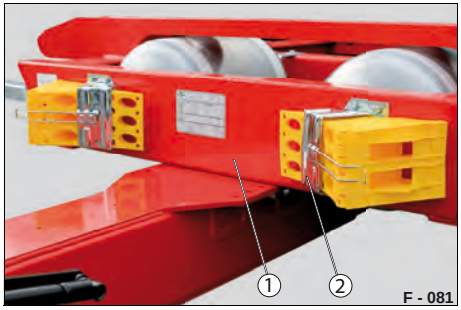
The wheel chocks are attached at the front side in the standard model of the 19t HTK three-way tipper.

The wheel chocks may be optionally mounted on the side of the chassis.

The trailer must - in addition to the parking brake - be secured by wheel chocks on inclines / declines, during loading and unloading and when it is decoupled.

Wheel chocks must always be available.

Replace any lost or damaged wheel chocks immediately.



Pic. 68 Position of the wheel chocks

1 Chassis front
2 Wheel chock holders

Pic. 69 Using wheel chocks

WARNING

Unsecured wheel chocks

Unsecured wheel chocks could fall off while driving - risk of accidents!

- ▶ Check that the wheel chocks are secured before driving off.
- ▶ Check the holders for damage at regular intervals.

WARNING

Parking a trailer on a slope

The operating brake may slacken so that the trailer starts moving - accident risk!

- ▶ Secure the trailer on a slope with additional wheel chocks.
- ▶ Only use the wheel chocks on rigid axles.
- ▶ Replace lost / damaged wheel chocks.

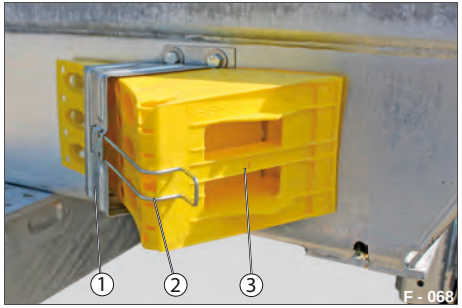
CAUTION

Handling wheel chocks under the chassis

You could also hit your head on the chassis.

- ▶ Manipulate the wheel chocks slowly and carefully.
- ▶ Avoid jerky movements.

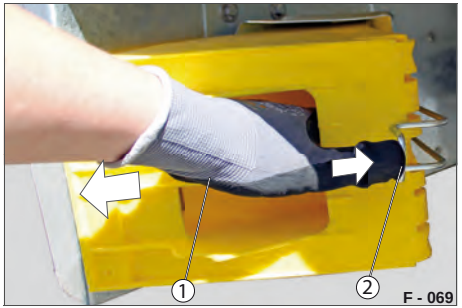
Wheel chock in front holder



Pic. 70 Wheel chocks

1 Holder
2 Spring latch
3 Wheel chock with handle

The wheel chocks (Pic. 70 /3) are positioned in front on the right and left in a holder (Pic. 70 /1) with spring latch (Pic. 70 /2).



Pic. 71 Pulling out a wheel chock

1 Wheel chock with handle
2 Spring latch

Removal

▶ Press the spring latch (Pic. 71 /2) off the wheel chock.

▶ Pull the wheel chock by the handle (Pic. 71 /1) out of the holder.

Pic. 72 Inserting the wheel chock

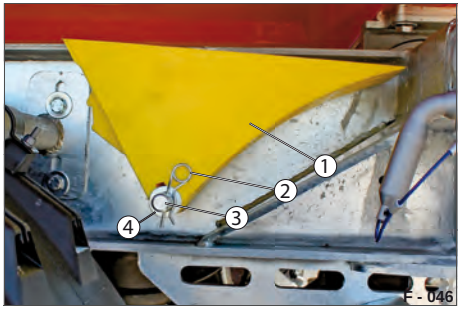
1 Holder
2 Spring latch

Inserting and securing

▶ Press the wheel chock into the holder (Pic. 72 /1) until the spring latch (Pic. 72 /2) firmly encloses the wheel chock (see Pic. 70).

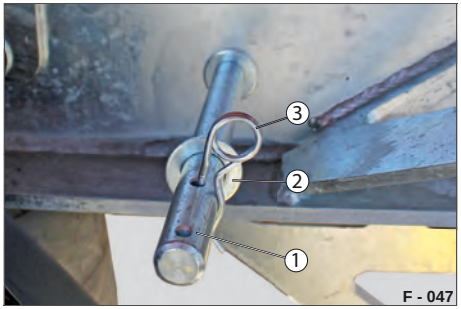
The wheel chock is secured in the holder.

Removing wheel chocks (on retaining pins)



Pic. 73 Wheel chock, parked

1 Wheel chock
2 R-clip
3 Retaining pin
4 Disk



Pic. 74 Wheel chock - retainer

1 Retaining pin
2 Disk
3 R-clip

Pic. 75 Wheel chocks positioned

1 Wheel chock

Removing the wheel chock

- ▶ Pull out the cotter pin (Pic. 73 /2).
- ▶ Remove the disk (Pic. 73 /4).
- ▶ Pull the wheel chock (Pic. 73 /1) from the retaining pin (Pic. 73 /3).

Securing the safety elements

- ▶ Place the washer (Pic. 74 /2) onto the retaining pin (Pic. 74 /1).
- ▶ Push the cotter pin (Pic. 74 /3) into the bole of the retaining pin.

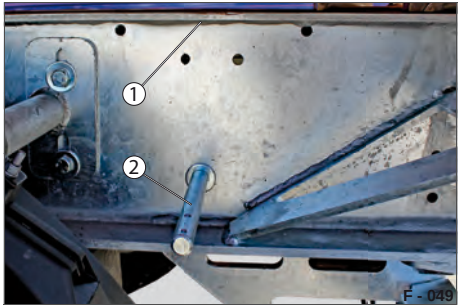
  The safety elements are protected against loss.

Placing the wheel chocks

- ▶ Place the wheel chocks (Pic. 75 /1) completely under the wheels.

  Consider the direction of inclination of the trailer e.g. on a slope.

Securing the wheel chocks (on retaining pins)



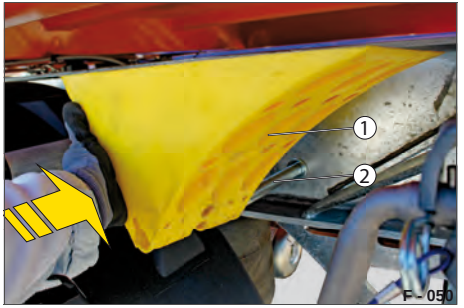
Pic. 76 Positioning the retaining pins

1 Chassis frame edge
2 Retaining pin

The retaining pins may be arranged below or above the chassis, depending on the chassis version. The upper or lower chassis frame edge (Pic. 76 /1) is used as a limit stop.

Positioning the wheel chock

▶ Remove the securing elements (cotter pin, disk) from the retaining pin (Pic. 76 /2).

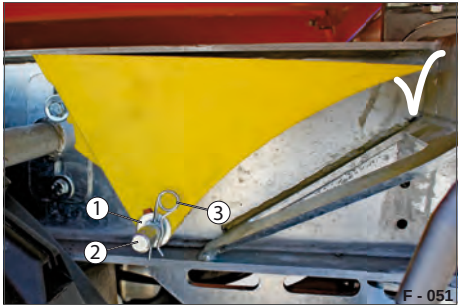


Pic. 77 Insert the wheel chock

1 Wheel chock
2 Retaining pin

Insert the wheel chock

▶ Push the wheel chock (Pic. 77 /1) with the flat edge upwards onto the retaining pin (Pic. 77 /2).



Pic. 78 Wheel chock secured

1 Disk
2 Retaining pin
3 R-clip

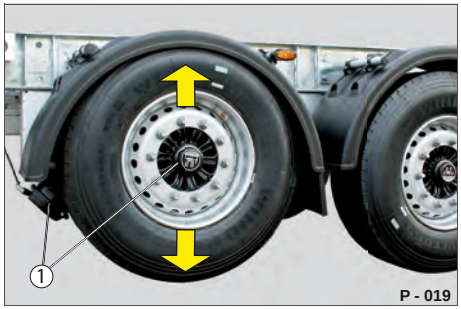
Securing the wheel chock

▶ Place the washer (Pic. 78 /1) onto the retaining pin (Pic. 78 /2).

▶ Push the cotter pin (Pic. 78 /3) into the hole of the retaining pin, so that the wheel chock is locked.

The wheel chock is secured against twisting and falling out.

Operating the axle lift system



Pic. 79 Axle 1 as lifting axle

1 Lifting axle, automatic

The first axle of the HTK 19t is designed as a lifting axle.

The lifting axle reduces tyre wear during empty drives.

During normal use, the lifting axle control automatically lifts the axle when the trailer is unloaded.

When the trailer is loaded and the permitted axle load of the other axles is exceeded, the lifting axle is automatically lowered.

WARNING

Sudden movements of the lifting axle

Persons may be crushed when the lifting axle is lifted or lowered.

▶ Check that no persons remain in the danger zone.

▶ Check that there are no persons in the danger zone of the lifting axle before switching off the ignition of the towing vehicle.

Automatic lifting axle system

Pic. 80 Axle lifted

The control of the lifting axle in empty and partially loaded trailers is fully automated and load-dependent.

– The lifting axle is lifted when a driving speed of approx. 25 km/h is exceeded.

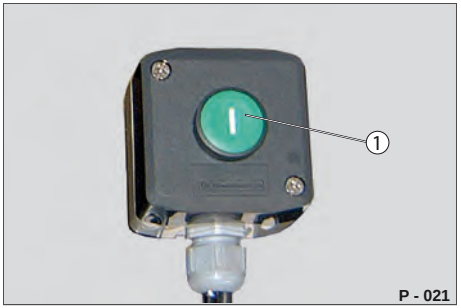
– The lifting axle is lowered when the ignition is switched "OFF".

Manual operation of the axle lifting system

Lifting or lowering of the lifting axle only when the trailer is empty or partially loaded.

Prerequisite:

– the EBS cable is connected
– the ignition is on
– the permitted axle loads are adhered to



Pic. 81 Operating panel for the lifting axle

1 ON/OFF button

Forcible lifting

▶ Press the button (Pic. 81 /1) for 2 to 4 seconds.
The lifting axle moves up.

Forcible lowering

▶ Press the button (Pic. 81 /1) for more than 5 seconds.
The lifting axle moves down.

Activation of the starting aid

There are two ways of activating the starting aid or the forcible lifting/lowering function:

▶ Starting aid: Briefly press the button (Pic. 81 /1) (< 5 sec.)
▶ Forcible lowering with active starting aid: Press the button (Pic. 81 /1) 2 times (> 5 sec.).

Activation from the towing vehicle

Control through the towing-vehicle-trailer interface according to the standard ISO 11992 is possible.

Press the brake pedal 3x.

Waste plate (A-plate)

The HTK 19 t can be optionally equipped with a plate for waste transport (A-plate).

This marking is legally required in Germany for commercial waste transport on public roads (according to the German Recycling Economy Act (KrWG))

.

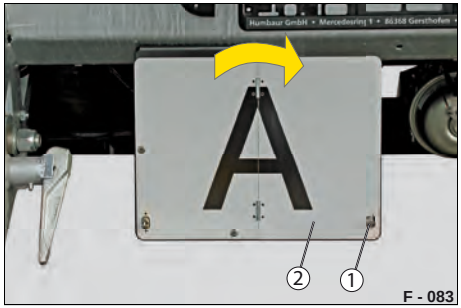
The waste plate (A-plate) must be opened in front and the rear of the vehicle before driving off.

CAUTION

Operating the waste plate

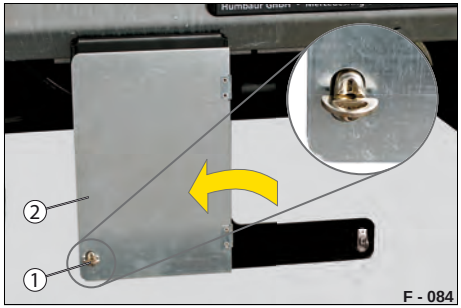
You could hit your head on the chassis!

- ▶ Only operate the waste plate when the loading bridge is resting on the chassis and has been secured.
- ▶ Move particularly carefully and slowly under the chassis - avoid hasty movements.



Pic. 82 Waste plate, opened

1 Rotary lock
2 Half-part of the warning plate, folded open



Pic. 83 Waste plate, closed

1 Rotary lock, CLOSED
2 Half-part of the warning plate, closed

Folding open

- ▶ Open the rotary lock (Pic. 82 /1) - turn to vertical position.
- ▶ Fold open the half-part (Pic. 82 /2) of the warning plate.
- ▶ Secure the half-part with the rotary lock - turn to horizontal position.

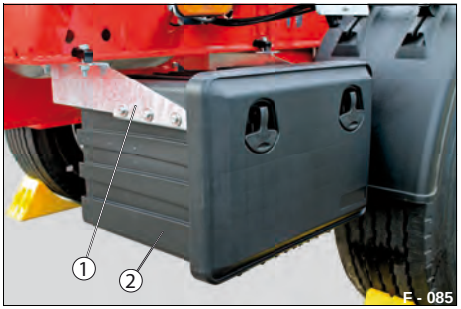
  The waste plate is opened and secured.

Closing

- ▶ Open the rotary lock - turn to a vertical position.
- ▶ Close the half-part (Pic. 83 /2) of the warning plate.
- ▶ Close the rotary lock (Pic. 83 /1) - turn to a vertical position.

  The waste plate is closed and secured.

General



Pic. 84 Toolbox, on the chassis

1 Holder on the chassis
2 Toolbox
3 Rotary locks, lockable

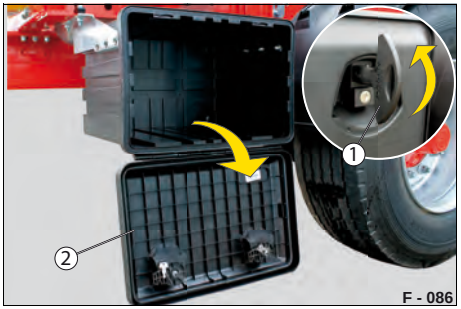
A lockable toolbox is available as an option.

The tool box can be attached to the chassis on the left or the right side of the chassis.

The toolbox is not waterproof.

The toolbox is used for stowing away lashing straps, tools, cleaning equipment, etc.

Opening the toolbox



Pic. 85 Toolbox open

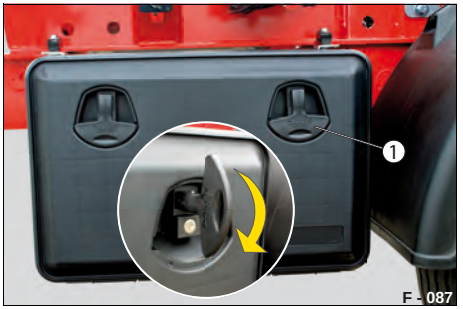
1 Rotary lock, unlocked
2 Cover, folded away

Take note of the max. area load of the tool box - see manufacturer information.

▶ Fold and turn the rotary locks (Pic. 85 /1) open.

▶ Watch out for falling objects when opening the lid (Pic. 85 /2).

Closing the toolbox



Pic. 86 Toolbox locked

1 Rotary locks, closed

WARNING

Unlocked toolbox

Objects could fall out while driving.
The lid could be torn off - risk of accidents!

▶ Check that the toolbox is closed and secured before driving off.

▶ Fold the lid upwards.

▶ Close the locks (Pic. 86 /1).

Parking warning signs

The parking warning signs may be attached on the front or the rear at the left side of the trailer in the driving direction. They are intended for better visibility / recognition of a parked trailer.

WARNING

Driving with an opened parking warning sign

An opened parking warning sign in the rear area can cover the rear lights - accident risk!

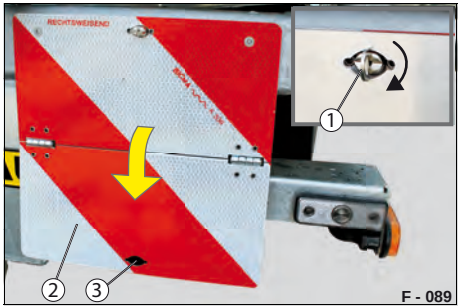
▶ Check that the parking warning signs are closed before driving off.

WARNING

Dirty parking warning signs

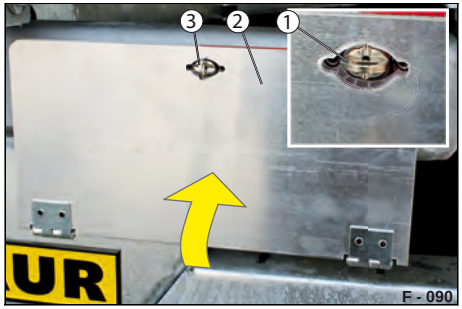
Other traffic participants may see parked trailers not at all / badly / too late - accident risk!

▶ Clean the parking warning signs when they are severely contaminated with dirt.



Pic. 87 Parking warning sign open

1 Rotary lock
2 Warning sign (bottom part)
3 Lock opening



Pic. 88 Parking warning sign, closed

1 Rotary lock, open
2 Warning plate, half-part folded in and closed
3 Lock opening

Folding open

▶ Turn the rotary lock (Pic. 87 /1) to vertical position.

▶ Fold down the bottom half-part (Pic. 87 /2) of the warning sign.

Closing

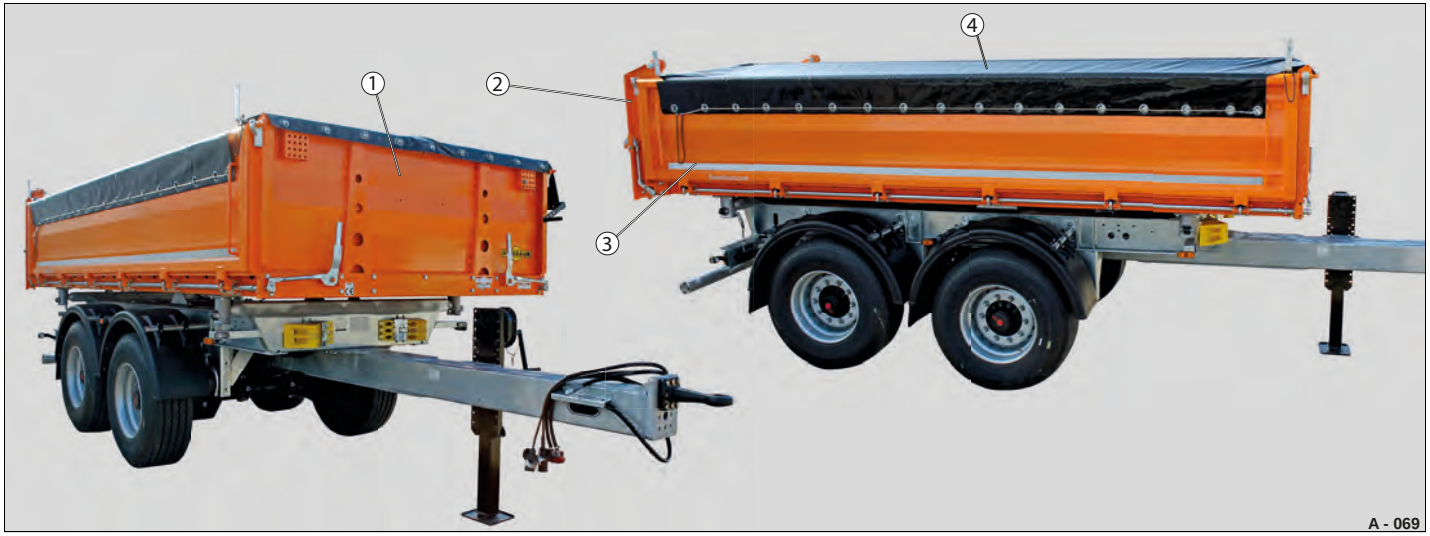
▶ Fold up the open half-part (Pic. 88 /2) of the warning sign.

▶ Turn the rotary lock (Pic. 88 /1) to vertical position.

The parking sign is secured (in driving position).

5 Operating the body

Basic safety instructions concerning the body area



Pic. 1 Body components

1 Front drop side
2 Rear drop side
3 Side drop side
4 Roll-up tarpaulin

The body of the HTK tipper mainly consists of a cargo bed with drop sides, a firm front wall and a tailgate as back wall.

The telescopic tilting cylinder can tilt the cargo bed in three directions.

The cargo bed can be covered with a manually operated roll-up tarpaulin.

Take note of the safety instructions for safe handling during tilting in the "Safety" section after Page **20** as well as the warning instructions regarding positional stability / risk of tilting in the "Operation" section after Page **40**.

WARNING

Climbing onto / into the body

The elements of the body, e.g. roll-up tarpaulin, fender, underride protection may yield or break. You may slip – risk of falling!

- ▶ Do not use the components of the chassis or the body as a ladder.
- ▶ Use a stable ladder or the permanently installed climbing aids, e.g. pedestal, climbing ladder.
- ▶ Only climb onto the cargo bed when necessary - and use the climbing aids attached.
- ▶ Never climb into a tilted / moving cargo bed.

WARNING

Objects on /in the body

Ice, snow, branches and other objects could fall from the body while driving - risk of accidents!

- ▶ Before setting off, make sure that there are no pools of water, ice, snow, branches or other objects on the body. Remove these if required.
- ▶ Use a stable ladder or the climbing aids on the body as required.

Pic. 2 Total height of the vehicle when tilted

WARNING

Total height while tilting the cargo bed

Tilting the cargo bed under bridges, power lines, in buildings / halls, tunnels, etc. may lead to collisions and falling over - accident risk!

- ▶ Check for each tilting process that a minimum distance of 5 m to components such as bridges, tunnel ceilings, power lines, hall ceilings, etc. is maintained.
- ▶ Take note of the total height of the cargo bed when it is tilted (approx. 5.5 m).

Pic. 3 Accident: Driving with a tilted body

DANGER

Driving with a tilted body

The body can get stuck / be torn off at bridges, underpasses, tunnels or power lines - accident risk!

- ▶ Make sure that the body / cargo bed is lowered and secured before driving off.
- ▶ Ensure during the drive that the body rests on the chassis.

Manual operation of the drop sides

Driving with unlocked or partly removed drop sides is not permitted by law.

Drop sides are heavy!

The installation / removal of drop sides must be performed by 2 persons or by using a crane / fork lift.

Pic. 4 Crushing points / closing edges

Pic. 5 Risk during unlocking

DANGER

Driving with open drop sides

People may be caught and dragged along.

The load could fall off - accident risk!

▶ Before driving off, check that all drop sides are closed and secured.

CAUTION

Operating the drop sides

Fingers / hands may be crushed between the chassis / stanchions and the drop sides in the closing edge area when opening / closing drop sides.

▶ Use .

▶ Do not hold a drop side in the stanchion / lock area when closing it.

CAUTION

Laterally folding down the drop sides

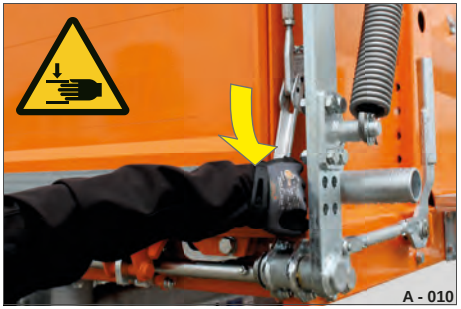
The drop sides may unexpectedly fold down after unlocking - risk of impact!

▶ The lateral drop side should be operated by 2 persons.

▶ Press on the drop side on the right and left side while unlocking it and hold it.

▶ Slowly and carefully fold down the drop side.

Pic. 6 Risk during closing



Pic. 7 Risk when opening

WARNING

Drop sides must be completely unlocked

If the upper locks and the central lock were to unlock at the same time, the drop side would fall down - crushing / impact risk!

- ▶ Only unlock the upper locks or the lower central locking - never both locking systems together!

CAUTION

Operating the locks

Fingers / hands could be crushed when opening / closing the locks.

- ▶ Use  .
- ▶ Grip around the locks, touching the whole area.
- ▶ Press the locks with flat hands.
- ▶ Keep your fingers away from the crushing areas.

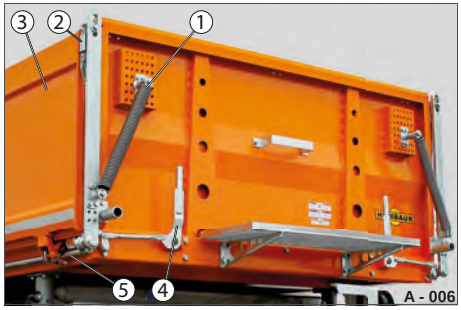
CAUTION

Drop sides under pressure from a load

The drop sides could fly open when they are being opened - impact risk!

- ▶ Check to make sure that the goods are not pressing against the drop side before unlatching the drop side locks.
- ▶ Only open or close the drop sides when the cargo bed is horizontally positioned.
- ▶ Stand to the side when opening the drop side - outside the swivel range.

Front drop side / lateral drop sides

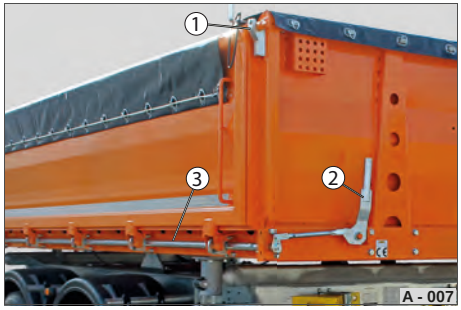


Pic. 8 Drop side with folding-down function

1 Drop side lifting spring
2 Self-aligning bearing lock
3 Lateral drop side, can be swivelled / folded down
4 Central locking lever
5 Transmission linkage

The lateral drop sides (Pic. 8 /3) can only be opened in swivel mode or optionally with the folding-down function.

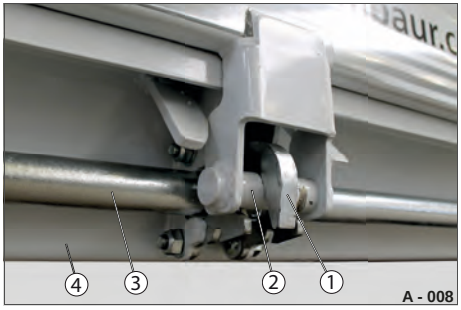
The drop sides can be folded down for other operating processes such as cleaning of the cargo bed or loading with loading devices.



Pic. 9 Drop side only available with swivel mode

1 Bearing point
2 Central locking lever
3 Transmission linkage

The lateral drop sides are pulled by drop side lifting springs (Pic. 8 /1) towards the chassis to implement the folding-down function.



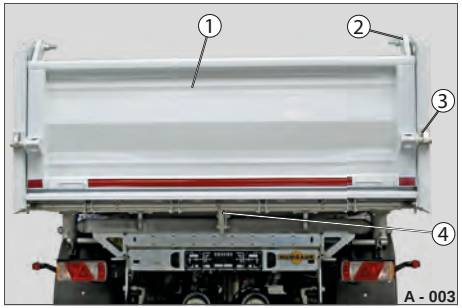
Pic. 10 Locking components

1 Locking hooks, CLOSED
2 Locking bolts
3 Locking linkage
4 Chassis

The lateral drop sides are manually unlocked / locked by using the central locking lever (Pic. 9 /2).

The transmission and locking linkage (Pic. 9 /3) is used to lock the drop sides with locking hooks (Pic. 10 /1).

Rear drop side



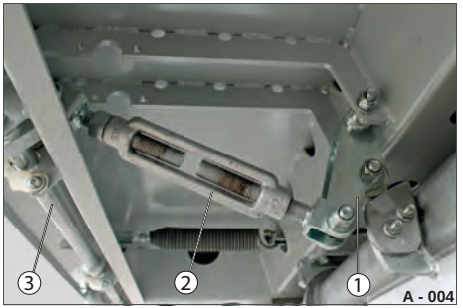
Pic. 11 Body, rear drop side

1 Rear drop side, swivel function
2 Bearing corner stanchion
3 Locking hooks, ri +le
4 Automatic locking / unlocking

The rear drop side has a swivel mounting in the corner stanchions (Pic. 11 /2).

The rear drop side can only be opened in swivel mode - folding down is not possible.

Loose bulk goods can be tipped when the rear drop side is in swivel mode.



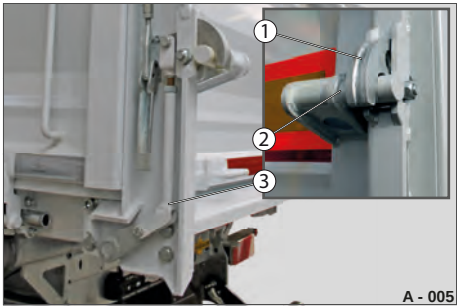
Pic. 12 Mechanical automation

1 Angled ramp / roll-up
2 Adjustment
3 Transmission linkage

Unlocking of the rear drop side (Pic. 11 /1) while tilting backwards is completely automated.

When the cargo bed is tilted backwards, the mechanical automatic locking system locks the (Pic. 11 /4) rear drop side with the lateral bolts (Pic. 13 /2).

The driver does not have to get out to operate the rear drop side for tilting backwards.



Pic. 13 Locking components

1 Locking hooks
2 Locking bolts
3 Transmission linkage, vertical

The horizontal transmission linkage (Pic. 12 /3) turns and activates the vertical transmission linkage (Pic. 13 /3).

The lateral locking hooks (Pic. 13 /1) release the locking bolts (Pic. 13 /2) and the rear drop side is unlocked.

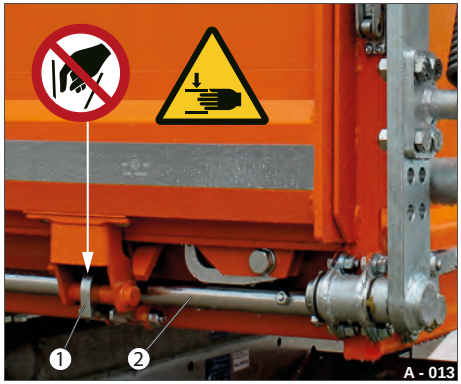
Swivel mode for the lateral drop sides

Pic. 14 Swivel operation

1 Drop side unlocked

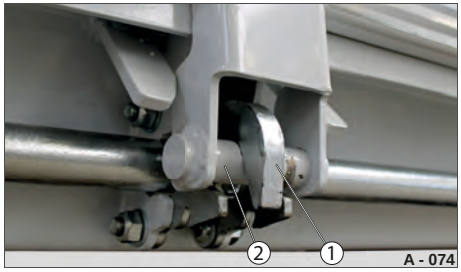
The front central locking for the swivel mode makes unloading of bulk goods easier and ensures safety - as the operator does not have to enter the danger zone.

The closing edge of the lateral drop side and the swivel locking points must be cleared of foreign objects after every tipping process!



Pic. 15 Central locking

1 Sealing point
2 Transmission linkage



Pic. 16 Sealing point locked

1 Hook
2 Bolt

WARNING

Unlocking the drop side with the cargo bed tilted

The load can press against the drop sides. The goods pressure could cause the drop sides to snap open when the locks are unlatched - impact risk!

▶ Only unlock the central locking when the cargo bed is horizontally orientated - i.e. not tilted.

CAUTION

Operating the central lock

Fingers / hands may be crushed.

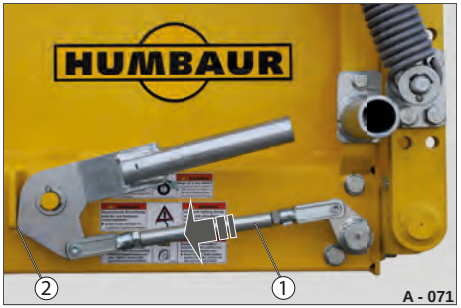
▶ Operate the lever of the central locking system cautiously and slowly.

▶ Check before locking that there are no persons with their hands / fingers in the locking points.

Unlocking the central locking system

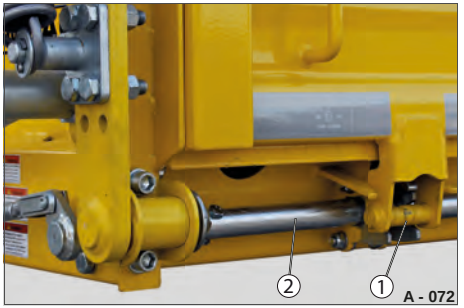
Pic. 17 Unlocking the central locking system

1 Lever



Pic. 18 Drop side unlocked

1 Transmission linkage
2 Limit stop



Pic. 19 Drop side unlocked at the lower end

1 Locking point, open
2 Rotary linkage

The lateral drop side must be closed and secured with the upper locks.

▶ Grab the lever (Pic. 17 /1) and pull it to the limit stop (Pic. 18 /2).

The transmission linkage (Pic. 18 /1) is pulled and acts on the rotary linkage (Pic. 19 /2) that unlocks the locking points (Pic. 19 /1).

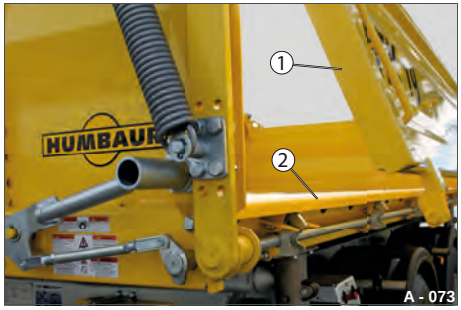
▶ Visually check that all locking points are unlocked.

The locking points release the lateral drop side for swivelling.

▶ Tip the loading bridge.

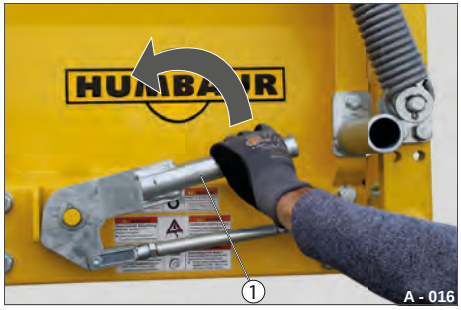
The lateral drop side swivels.

Locking with the central locking system



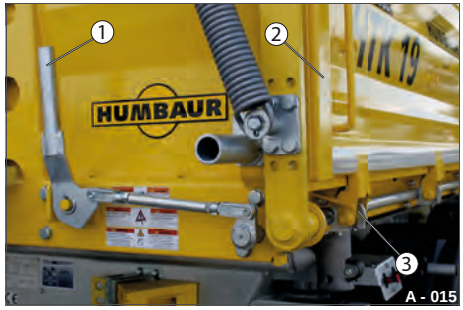
Pic. 20 Drop side, hinge-mounted

1 Drop side
2 Cargo bed closing edge



Pic. 21 Locking with the central locking system

1 Lever



Pic. 22 Lower part of the drop side locked

1 Lever, standing vertically
2 Drop side, pulled close
3 Locking points, locked

▶ Before closing the lateral drop side (Pic. 20 /1), clean the closing edge (Pic. 20 /2) along the cargo bed to remove any dirt / foreign objects.

▶ Grab the lever (Pic. 21 /1) and push it up to the limit stop.

The lever must then be vertically orientated (Pic. 22 /1).

▶ After locking, check that all locking points (Pic. 22 /3) are locked.

▶ Check that the drop side (Pic. 22 /2) is appropriately pulled close - and seals tightly.

Fold-down mode for the lateral drop sides

Pic. 23 Drop side lock for fold-down mode

1 Drop side lock, rear side
2 Drop side lock, front side

The lateral drop sides are secured with locks in the upper area as well as at the front and rear.

The lower area of the lateral drop sides is held by the central locking mechanism.

Folding down the lateral drop sides is an optional function.

The lateral drop side must be locked in the lower area by the central locking system to facilitate the fold-down mode!

Recommendation: Folding own of the lateral drop side must be performed by 2 people!

⚠ WARNING

Driving without lateral drop sides

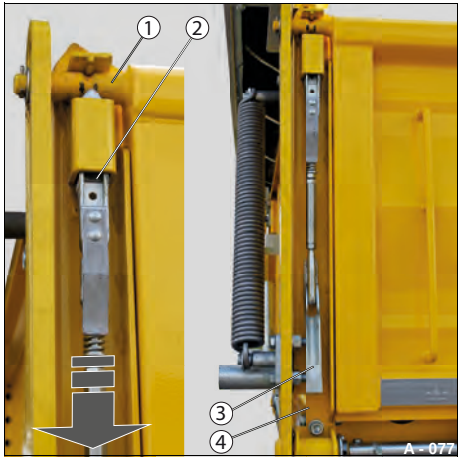
The goods may slide sidewards and off the cargo bed - accident risk!

- ▶ Safely tie down solid goods / loading units using the lashing points.
- ▶ Do not transport loose bulk goods or unsecured load.

Unlocking the drop side locks

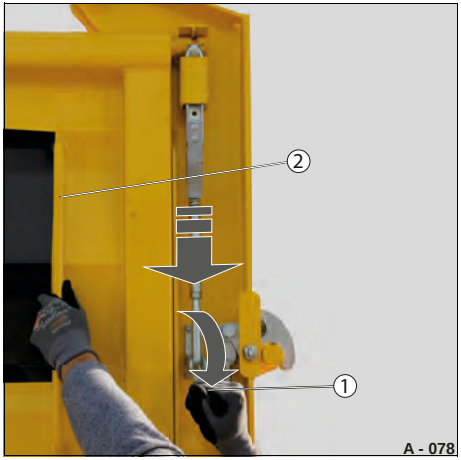
Pic. 24 Drop side lock, front side

1 Hand lever
2 Locking points, locked at the lower side



Pic. 25 Drop side lock unlocked

1 Bearing pin
2 Sealing tongue
3 Hand lever, down
4 Stanchion



Pic. 26 Drop side lock, rear side

1 Hand lever
2 Handle

▶ Ensure that the drop side is secured by the central locking system.

▶ Grab the hand lever (Pic. 24 /1) and turn it slowly downwards.

▶ Push the hand lever (Pic. 25 /3) into the stanchion (Pic. 25 /4).

The locking tongue (Pic. 25 /2) releases the bearing bolt (Pic. 25 /1).

▶ Push the hand lever (Pic. 26 /1) into the stanchion.

▶ Grab the drop side by the handle (Pic. 26 /2).

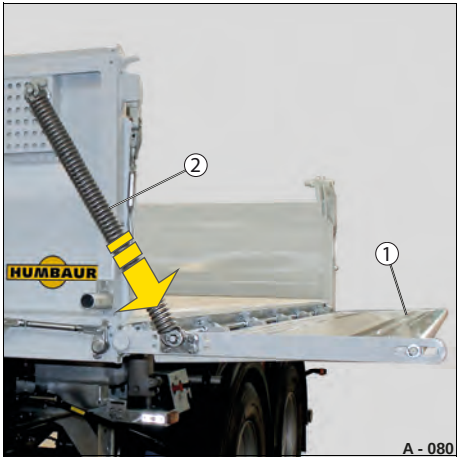
Folding down the drop side

Pic. 27 Open the drop side

1 Drop side
2 Handle

▶ Firmly hold the drop side (Pic. 27 /1) at the handle (Pic. 27 /2).

▶ Slowly fold the drop side downwards - taking care that none of the goods pushes against the drop side.

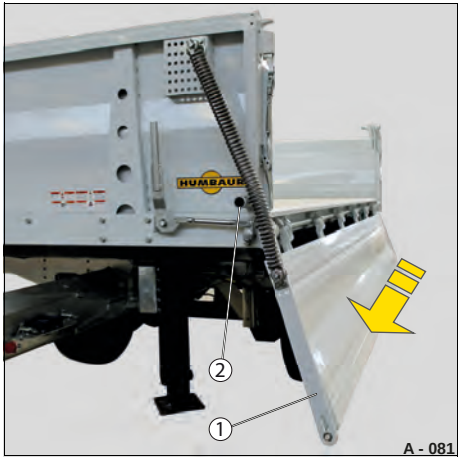


Pic. 28 Drop side open

1 Drop side, in horizontal position
2 Drop side lifting spring

The drop side is held in horizontal position by the drop side lifting spring (Pic. 28 /2) and the drop side rail (Pic. 29 /1).

▶ The loading bridge can be tilted to the side.



Pic. 29 Drop side completely folded down

1 Drop side rail
2 Stopper for lifting spring

▶ Push the drop side fully down.

The drop side lifting spring (Pic. 28 /2) bumps against the stopper (Pic. 29 /2).

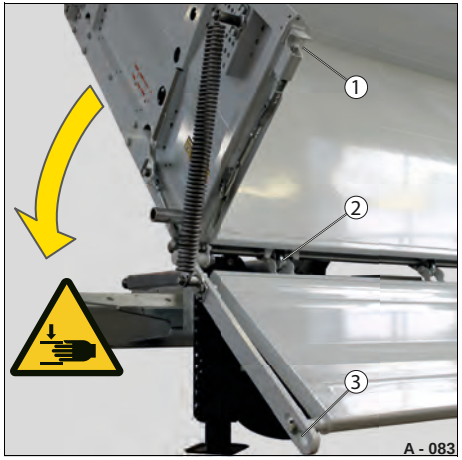
The swivel movement of the drop side is limited by the drop side rail (Pic. 29 /1).

Tilting the loading bridge while the drop side is folded down

Pic. 30 Loading bridge tilted to the side / drop side in folding-down mode

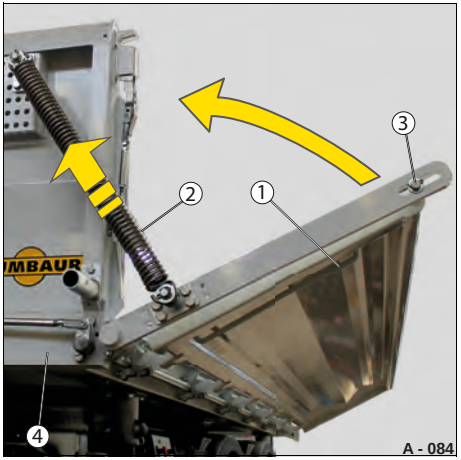
The safety measures and preconditions for safe tilting must be adhered to - see the "Safety" and "Operation" chapters from Page **40**.

Folding up the drop side



Pic. 31 Tilting back the loading bridge

1 Drop side lock, opened
2 Locking points
3 Sliding point



Pic. 32 Close the drop side

1 Handle
2 Drop side lifting spring
3 Lug
4 Loading bridge, horizontal

Pic. 33 Locking the drop side

1 Locking lever
2 Lug

▶ Clean the locking points (Pic. 31 /2) and the sliding points (Pic. 31 /3) to remove any dirt.

▶ Ensure that the drop side locks (Pic. 31 /1) are open.

▶ The loading bridge can be tipped back sideways.

The drop side lifting spring (Pic. 32 /2) partially pulls the drop side up.

▶ Grab the handle (Pic. 32 /1) and push the drop side up into a vertical position (see Pic. 33).

The lugs (Pic. 32 /3) move into the bearing points

▶ Close the locking lever (Pic. 33 /1) with your flat hand.

The lug (Pic. 33 /2) is locked.

The drop side is secure on the right and left side.

Rear drop side automatically unlocked

Pic. 34 Tipping process at the back

1 Rear drop side, swivelling

The rear drop side is automatically unlocked during the rear tilting process.

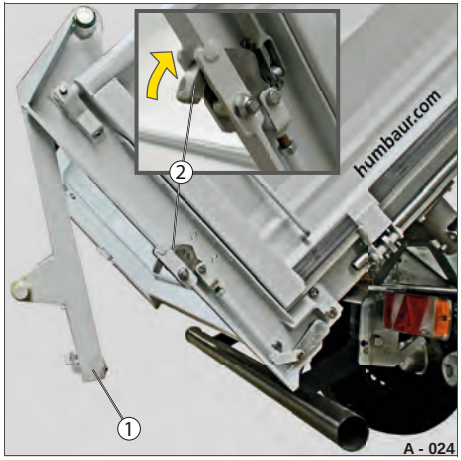
- ▶ Stop the tilting process if the rear drop side (Pic. 34 /1) is not automatically unlocked.
- ▶ Do not manually interfere.

Pic. 35 Rear drop side, unlocked

1 Locking bolt, released

The locking bolts (Pic. 35 /1) are released during the tilting process.

- ▶ The mechanics of the automation system can be re-adjusted if required / after wear - see Maintenance section Page **171**.



Pic. 36 Rear drop side, swivelling

1 Rear drop side, open
2 Locking hook, open

- ▶ Clean the closing edge and the sliding points of dirt after the tilting process.

Tipping the cargo bed

Pic. 37 Tipping the cargo bed

1 Cargo bed / loading bridge
2 Hydraulic, telescopic cylinder

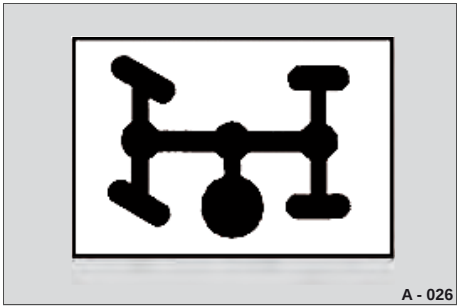
The cargo bed is controlled from the operating panel on the traction unit.

Read and adhere to the operating instructions of the towing vehicle and the hydraulic system.

The subsequent function and description may deviate from the description of the towing vehicle!

▶ Ensure before the first tilting process that the conditions for orderly tilting are fulfilled.

Switching on the hydraulic pump

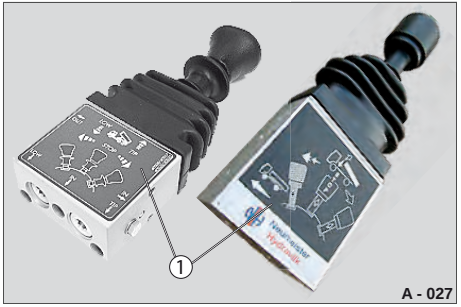


Pic. 38 Auxiliary drive - symbols

▶ Uncouple the main drive of the towing vehicle while the engine is running.
▶ Switch on the auxiliary drive of the towing vehicle after a few seconds.
▶ Slowly couple in the main drive of the towing vehicle.

The hydraulic pump is activated.

The cargo bed of the three-way tipper can be tilted.



Pic. 39 Example: Operating elements of the towing vehicle / driver's cab

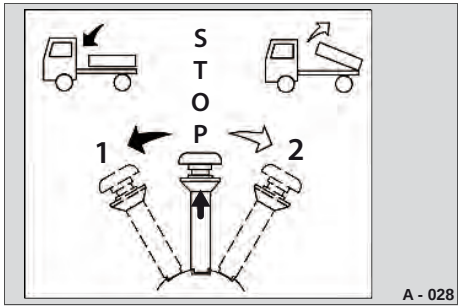
1 Air transducer (pneumatic)

The operation of the hydraulic pump must be performed according to the manufacturer documentation.

The instructions must be adhered to!

The subsequent functional description is provided as an example!

Starting to tilt



Pic. 40 Valve lever in the driver's cab

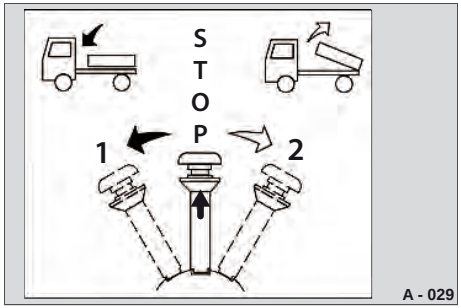
1 LOWERING (driving position)
2 RAISING (tilting the tipper box)

- ▶ Unlatch the valve lever from its Stop position.
- ▶ Gently move the valve lever into Position 2.

  The further the valve lever is pressed, the higher the speed.
- ▶ Release the valve lever once the tipping position has been reached.

  The valve lever automatically returns to the STOP position.

Initiating the lowering



Pic. 41 Valve lever in the driver's cab

- ▶ Unlatch the valve lever from its Stop position.
- ▶ Gently move the valve lever into Position 1.

  The further the valve lever is pressed, the higher the speed.
- ▶ Wait until the cargo bed has fully been lowered onto the chassis.

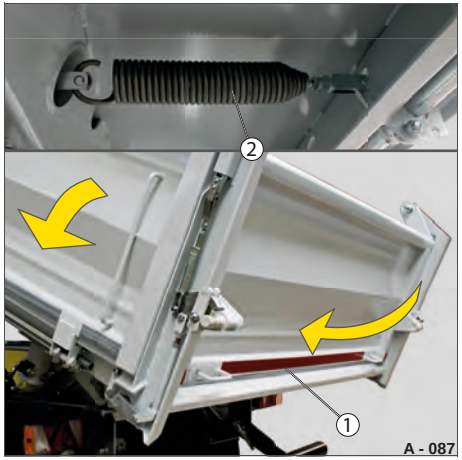
Switching off the hydraulic pump

Pic. 42 Switching off the auxiliary drive

- ▶ Uncouple the main drive of the towing vehicle while the engine is running.
- ▶ Switch off the auxiliary drive.
- ▶ Slowly couple in the main drive of the towing vehicle.

  The towing vehicle is ready to drive.
- ▶ Use the rear view mirror to check again that the body is lowered.

Rear drop side locks automatically



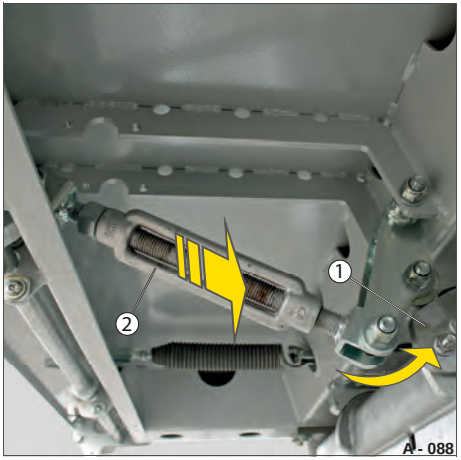
Pic. 43 Tilting back the loading bridge

1 Rear drop side, pulled close
2 Tension spring

The rear drop side (Pic. 43 /1) is pulled close by a tension spring (Pic. 43 /2) while the loading bridge is tilted back.

▶ Re-adjust the tension spring as required - see Maintenance chapter Page **182**.

▶ Do not manually interfere.

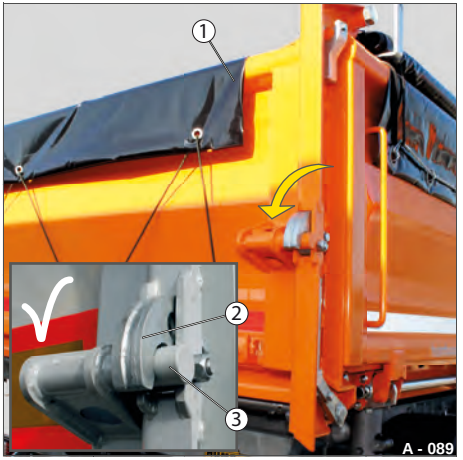


Pic. 44 Rear drop side, locked

1 End stop
2 Transmission linkage

The transmission linkage (Pic. 44 /2) connects the locking mechanism via the end stop (Pic. 44 /1).

▶ Re-adjust the transmission linkage as required - see Maintenance chapter Page **183**.



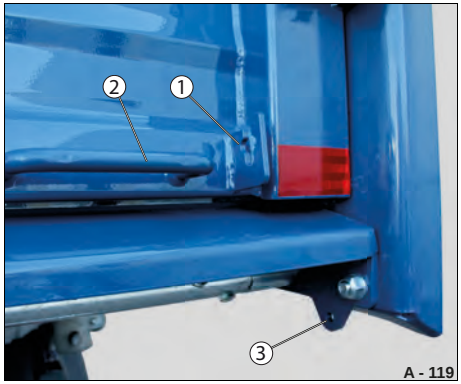
Pic. 45 Rear drop side secured

1 Rear drop side, closed
2 Locking hook, closed
3 Lug, locked

▶ Check that the locking hooks (Pic. 45 /2) properly enclose the lugs (Pic. 45 /3).

The rear drop side (Pic. 45 /1) is closed and secured.

Rear drop side limitation



Pic. 46 Rear drop side

1 Bracket at the rear drop side
2 Handle
3 Eyelet on the chassis

Pic. 47 Example: tilted position

1 Rear drop side not limited

Brackets are attached on the right and left side of the rear drop side (Pic. 46 /1).

The swivel movement of the rear drop side can be limited by a chain.

The limitation allows for controlled tilting of bulk goods.

The rear drop side (Pic. 47 /1) is out of control and swivels open, depending on the tilting angle and the bulk load.

▶ Check before the tilting process whether limitation of the swivelling movement is necessary.

▶ When required:
Hook the chain into the bracket (Pic. 46 /1) at the rear drop side.

General information

Many accidents are attributable to deficient load securing.

Correctly secured loads prevent:

– Personal injury
– Material damage to the load
– Damage to the vehicle
– Unnecessary waiting times in traffic checks

Appropriate securing (interlocking) of solid goods such as an excavator shovel is only possible to a limited extent on HTK tippers!

Two optional lashing points for tying solid goods are attached on the front wall. Swivel-type lashing eyelets can be optionally integrated on the cargo bed.

The HTK tipper was mainly designed for transporting loose and dry bulk goods such as sand, gravel, etc.

The bulk load must be protected against blowing off during the drive, e.g. by a roll-up tarpaulin.

Form-fitting load securing

Supporting the goods against each other and at parts of the body such as the front wall, drop sides or stanchions, blocking bars and chocks is called "positive-fit load securing".

Providing:
The dimensions of the load materials and bodies match.
The gaps arising must otherwise be filled in, e.g. with pallets or padding.

Form-fitting load securing is not possible when transporting a large number of different goods.

These load materials must be secured in a way which is suitable for practical application according to DIN EN 12195 and the VDI guidelines via a large number of tie-down points according to DIN EN 12640.

Force-fitting load securing

The term "force-fitting load securing" refers to direct lashing and tying down of the goods with tie-down equipment.

Direct lashing as "oblique and diagonal lashing" is included in the form-fitting securing processes as a result of the substantially higher tie-down forces which can be obtained compared with tie-down lashing.

Prerequisite:
Tie-down points are provided at the required points on the goods and on the vehicle.

Tie-down lashing is the most common type of load securing.

In this case, the required securing force is obtained solely by increasing the friction force.

The goods are "pressed" onto the cargo bed by means of tie-down equipment (e.g. lashing straps).

Physical foundations

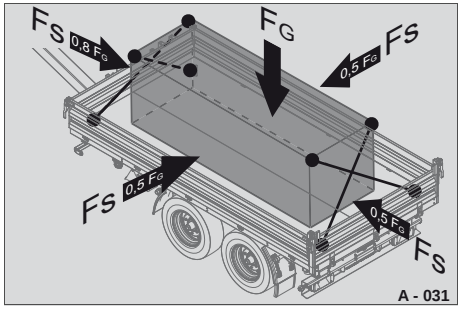
Forces caused by pulling away, braking and changing direction act on the load during driving.

These dynamic driving forces cause the load to slide if it is inadequately secured and unstable goods to tilt.

An appropriately adapted driving style minimises the arising forces and wear and always provides an increase in safety.

Section 3, "Speed", of the German Road Traffic Act (StVO) mentions "Adaptation of the driving speed to the characteristics of the vehicle and the goods by the vehicle driver."

However, in danger situations, even the best driving style cannot replace load securing!



Pic. 48 Maximum inertia forces

Resulting from the dynamics of vehicle movement in road traffic
F_S Load securing force,
F_G Inertial force of the load

Example:

– Inertia force F_G = 20,000 daN
– Maximum acceleration forwards = 0.8 g (1 g = force of gravity 9.81 m/s^2)

Result: F_G forwards = 20,000 daN x 0.8 g = 16,000 daN (kg)

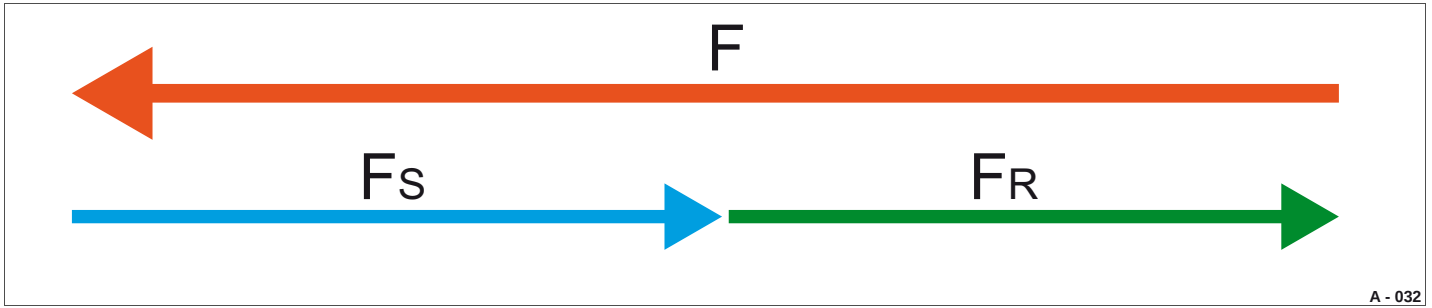
The actually required load securing force F_S is reduced by the amount of frictional force F_R (between the load and the vehicle floor) in the case of stable load materials.

Further information on friction-coefficient matchings can be found in the VDI 2700 guideline.
All friction-coefficient matchings apply to clean surfaces.

Tab. 1 Sample calculation

Tab. 2 Required load securing force (F_S)

Inertia force F
Force which counteracts a change in the state of movement



Load-securing force F_S: Force which has to be absorbed by the tie-down equipment or the vehicle body

Friction force F_R: Sliding friction coefficient x weight force

Calculation formula: $F_S = F - F_R$

Example:

– Inertia force F_G forwards: 16,000 daN
– Friction coefficient μ_0 = 0.3 (screen floor / pallet)
– **Frictional force** F_R = 0.3 x 20,000 daN = 6,000 daN

Actually required load securing force
F_S = 16,000 daN – 6,000 daN = 10,000 daN (kg).

Lashing points (optional)

Pic. 49 Sticker for lashing points

1 Swivel-tie-down ring
2 Folding ring

HTK tippers do not have standard lashing points.

NOTICE

Exceeding the lashing forces / too small lashing angles

Tie-down points could break.

- ▶ Take note of the stickers on the front wall regarding lashing points.
- ▶ Comply with the following specifications.
- ▶ Only use suitable / tested tie-down equipment.

WARNING

Impermissible tensile loads / lashing angles

Tie-down equipment could break / tear.

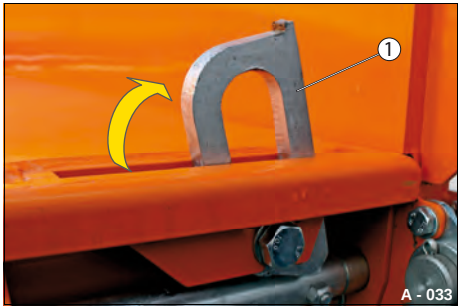
The load is inadequately secured - accident risk!

- ▶ Comply with the maximum stated values for the force specifications.
- ▶ Use suitable tie-down equipment. The max. possible tension values are stated on the tie-down equipment.
- ▶ Do not tie down with the tensioning equipment at an angle of less than 30 °. Attach the fixing point to the top of the load materials as far as possible.

Swivel lashing eyelets (Pic. 50 /1) can be optionally attached to the cargo bed.

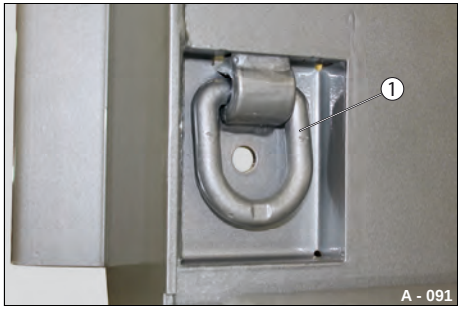
The front wall can be equipped with 2 folding rings for lashing rigid goods.

The front wall with installed folding rings was not force-tested!



Pic. 50 Swivel-tie-down ring, cargo bed

1 Tie-down ring, folded up



Pic. 51 Folding ring, front wall

1 Folding ring in bag

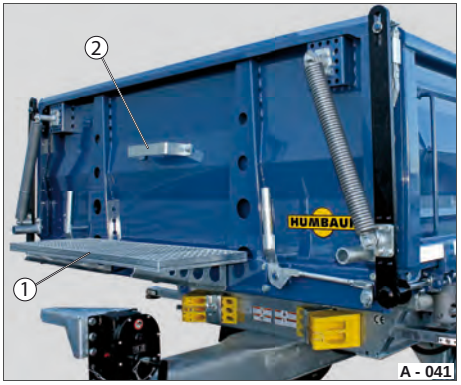
Climbing aids

A pedestal (Pic. 52 /1) at the front drop side is part of the standard installation.

The cargo bed / tipper box can be entered and exited via the steps (Pic. 52 /2) and the pedestal.

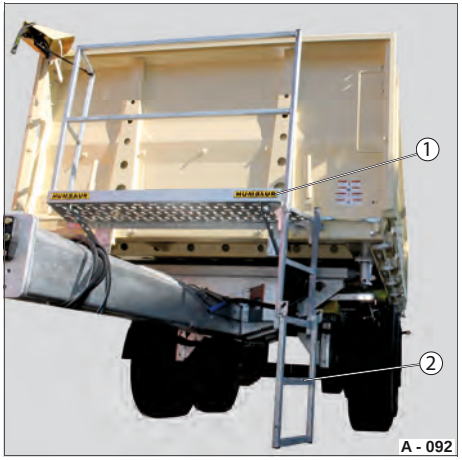
Alternatively, a pedestal with banister (Pic. 53 /1) and fold-down ladder (Pic. 53 /2) can be installed.

The pedestal can be used for tasks such as operating the roll-up tarpaulin and cleaning the tipper box.



Pic. 52 Climbing facility Version 1

1 Platform
2 Climbing steps at the front wall



Pic. 53 Climbing facility Version 2

1 Pedestal with banister
2 Ladder, can be folded down

WARNING

Entering / leaving the cargo bed via the climbing steps

You may lose your balance - risk of falling!

- ▶ Only use the climbing steps to enter / leave the cargo bed.
- ▶ Fully step on the climbing steps.
- ▶ Hold onto the pedestal or the climbing steps.

People are not allowed to remain on the pedestal during the tilting process!

Entering the pedestal via the climbing steps

Pic. 54 Climbing to the pedestal

1 Climbing steps, front wall
2 Climbing steps,
at the tubular drawbar, spindle support

Pic. 55 Remaining on the pedestal

1 Platform
2 Front wall edge

Pic. 56 Climbing down from the pedestal

Climbing facility

- ▶ Hold on to the pedestal or the climbing steps at the front wall (Pic. 54 /1).
- ▶ Climb up using the climbing steps (Pic. 54 /2) attached to the spindle support and the tubular drawbar.

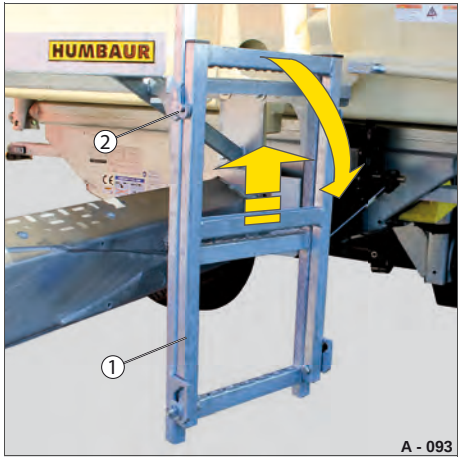
Remaining on the pedestal

- ▶ Be aware that you are not secured when remaining on the pedestal (Pic. 55 /1) - risk of falling.
- ▶ Hold on to the edge of the front wall (Pic. 55 /2).

Climbing down

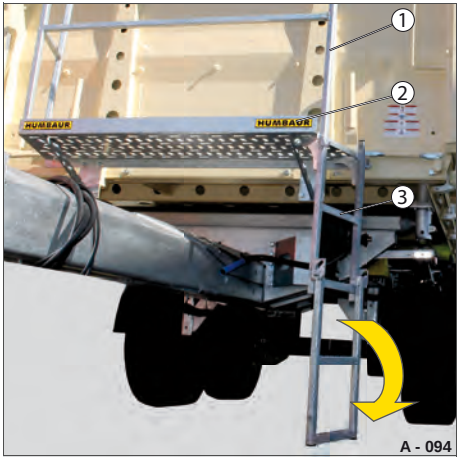
- ▶ Climb backwards and down the climbing steps.
- ▶ Hold on to the pedestal or the climbing steps on the front wall and the pedestal.

Reaching the pedestal with a banister using a folding ladder



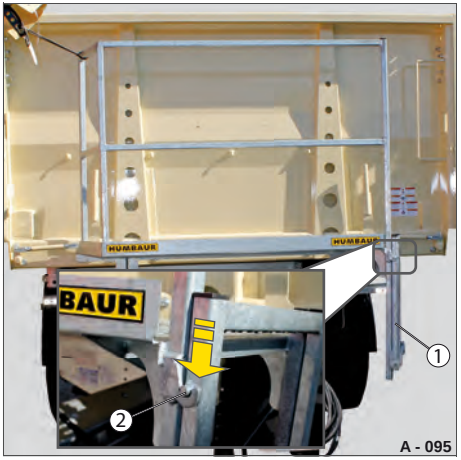
Pic. 57 Folding ladder, folded in

1 Folding ladder
2 Holder



Pic. 58 Remaining on the pedestal

1 Guard rails
2 Platform
3 Ladder



Pic. 59 Folding ladder, secured

1 Folding ladder, folded up
2 Bolt, hooked in

Folding down the folding ladder

▶ Lift the folding ladder (Pic. 57 /1) out of its supports (Pic. 57 /2) and swivel it downwards.

Remaining on the pedestal

▶ Climb up the ladder (Pic. 58 /3).

▶ Hold on to the banister (Pic. 58 /2).

Descent / securing

▶ Climb backwards and down the ladder.

▶ Hold on to the banister.

▶ Fold up the folding ladder (Pic. 59 /1).

▶ Secure it using the bolt (Pic. 59 /2) in the holder.

Climbing the tipping box

The tipping box is accessible for cleaning / maintenance purposes.

Climbing in and out of the tipper box may only be performed by using existing climbing facilities, steps and the pedestal!

Stable ladders can be used as an alternative!

The operator must ensure that the tipping box can be safely stepped into!

Remaining in the tipping box in an unsecured environment should be indicated - e.g. by a flag.

Operating elements that can move the tipping box, tailgate or sliding cover must be secured against re-operation by auxiliary personnel or unauthorised persons - e.g. lock the operating elements and pull out the key!

WARNING

Climbing in / out of the tipping box

You may slip / lose your balance - risk of falling!

You may be crushed / struck dead by parts of the load!

- ▶ Use  ,  .
- ▶ Use  as required.
- ▶ Only climb into the tipping box under bright / good light conditions - never in the dark.
- ▶ Before climbing into the tipping box, ensure that the tipping box will not be suddenly loaded, e.g. at a building site where excavators are working.
- ▶ Communicate in advance with the auxiliary staff / building workers as required.

CAUTION

Wetness / load remains in the tipping box

You may slip while walking / working in the tipping box - risk of falling!

- ▶ Use  ,  .
- ▶ Be particularly careful when any moisture / ice / snow / water or load remains in the tipping box.
- ▶ Move slowly.

Climbing in and out

WARNING

Climbing into / remaining in a closed tipping box

You may suffocate when remaining in a tipping box closed by a canopy / tarpaulin!

- ▶ Check before climbing into the tipping box that the canopy / tarpaulin is completely opened and secured.
- ▶ Only remain in the tipping box when the cover is completely opened.

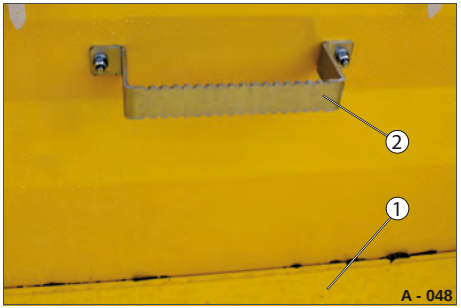
CAUTION

Jumping down from the tipper box / body

The tipping box is high.

You might get injured!

- ▶ Never jump from the body - it is prohibited by law (take care of the accident prevention regulations)!
- ▶ Only leave the body by using the climbing facilities installed.



Pic. 60 Tipping box, inside

1 Cargo bed
2 Climbing step, inside

- ▶ Carefully step onto the integrated climbing step (Pic. 60 /2) in front. Hold on to the edge of the front wall.

For safety reasons

- ▶ Hold firmly onto the front wall - particularly when you are carrying work tools such as a shovel or broom.
- ▶ Get help from a second person.
- ▶ Do not throw tools e.g. shovel, broom out of the tipping box.
- ▶ Do not forget your tools in the tipping box.

Roll-up tarpaulin

According to Guideline VDI 2700, bulk goods only need to be covered if they might fall down or be blown off during the drive.

The driver / operator is responsible for safety during the transport of bulk goods!

The material cone may not extend past the drop sides. The driver must ensure that the material cone is flattened - which is necessary for safe operation of the roll-up tarpaulin.

WARNING

Objects on the tarpaulin

Objects such as snow, ice, branches may fall down and hit persons when the tarpaulin is opened. Objects could be thrown off during the drive - accident risk!

- ▶ Check that there are no objects on the tarpaulin before driving off.
- ▶ Only open the tarpaulin once there are no more objects on top of it.

WARNING

Driving with an unsecured or faulty tarpaulin

The tarpaulin may move due to driving forces and be flung off - risk of impact / accident risk!

- ▶ Ensure that the tarpaulin is secured with rubber cables on all sides before driving off.
- ▶ Check that the tarpaulin is undamaged while closing it.

CAUTION

Operating the roll-up tarpaulin

You might slip, stumble, fall down - risk of falling!

- ▶ Use  ,  .
- ▶ Operate the roll-up tarpaulin from the pedestal or use a stable ladder.
- ▶ Do not climb up onto a vehicle component, e.g. fender, wheel, underride protection, etc.

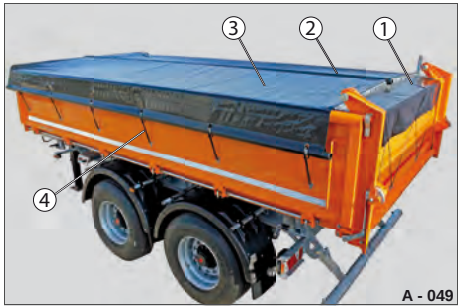
NOTICE

Roll the tarpaulin over the goods

Rolling the tarpaulin over the goods may damage the tarpaulin. The tarpaulin may tear.

- ▶ Check that the goods do not protrude past the drop sides before closing the tarpaulin.

Roll-up tarpaulin, manual (horizontal version)



Pic. 61 Roll-up tarpaulin closed

1 Overlap at the rear
2 Linkage in middle
3 Tarpaulin
4 Rubber cables

The roll-up tarpaulin is optionally available.

The roll-up tarpaulin is manually operated by using a hand crank (Pic. 62 /1).

Pic. 62 Roll-up tarpaulin, opened

1 Hand crank
2 Limit stop
3 Eyelets / cable

The roll-up tarpaulin is rolled on / off from one side to the other and is secured at the drop sides with rubber cables (Pic. 61 /4).

On one side, the roll-up tarpaulin is attached to the eyelets (Pic. 62 /3) by a cable.

Pic. 63 Roll-up tarpaulin, rear side, closed

1 Tarpaulin
2 Rubber cables / hooks

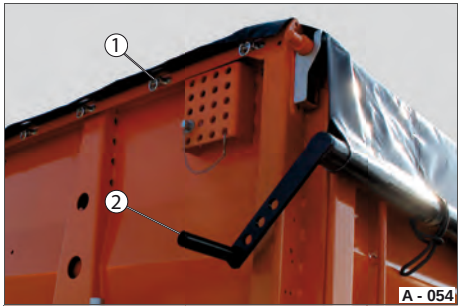
The rear is covered with a separate tarpaulin (Pic. 63 /1).

The tarpaulin is secured on the hooks (Pic. 63 /2) with a rubber cable.

Tarpaulin, rolled up

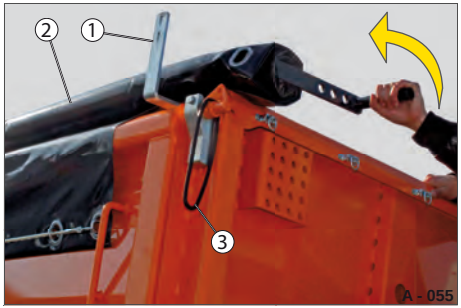
Pic. 64 Roll-up tarpaulin released at the sides

1 Rubber cable, released
2 Hook



Pic. 65 Roll-up tarpaulin released in front

1 Staples
2 Hand crank



Pic. 66 Tarpaulin, rolled up

1 Limit stop
2 Roll-up tarpaulin
3 Rubber loop

The roll-up tarpaulin may only be released when the tipping platform is in the driving position!

▶ Unhook the rubber cables (Pic. 64 /1) from the hooks.

▶ Climb onto the pedestal or use a stable ladder.

▶ Release the staples (Pic. 65 /1) at the front wall.

The roll-up tarpaulin is released.

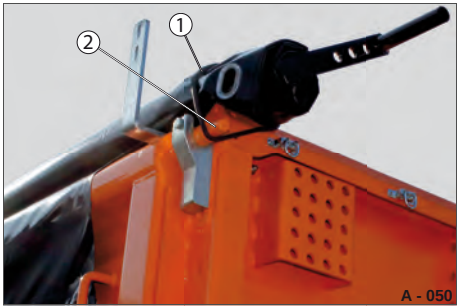
▶ Turn the hand crank (Pic. 65 /2) anticlockwise.

The tarpaulin is rolled up.

▶ Roll up the roll-up tarpaulin (Pic. 66 /2) to the limit stop (Pic. 66 /1).

▶ Check that the roll-up tarpaulin is properly rolled up - unroll and roll up again if required.

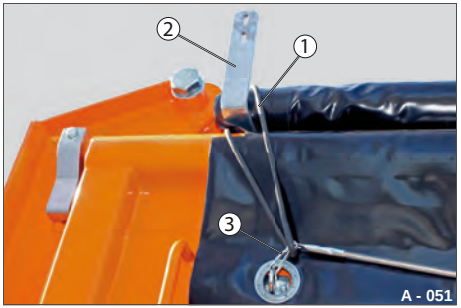
Securing the roll-up tarpaulin



Pic. 67 Roll-up tarpaulin secured at the front

1 Rubber loop
2 Bolt

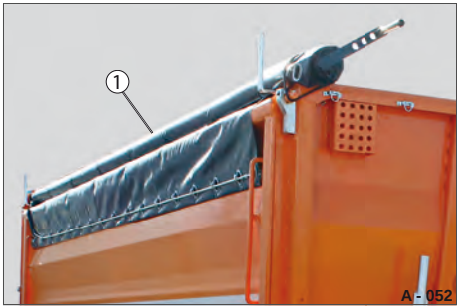
▶ Unhook the rubber loop (Pic. 67 /1) around the rolled-up tarpaulin and onto the bolt (Pic. 67 /2).



Pic. 68 Roll-up tarpaulin secured at the rear

1 Rubber loop
2 Limit stop
3 Securing cord

▶ Unhook the rubber loop (Pic. 68 /1) around the limit stop (Pic. 68 /2) and the roll-up tarpaulin.



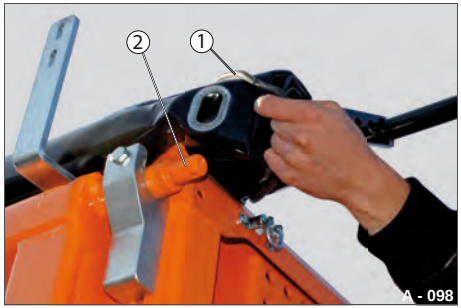
Pic. 69 Roll-up tarpaulin secured

1 Roll-up tarpaulin

▶ Before driving off, check that the roll-up tarpaulin (Pic. 69 /1) is secured in front and at the rear.

The tipping platform may only be tilted when the roll-up tarpaulin is secured!

Releasing the roll-up tarpaulin

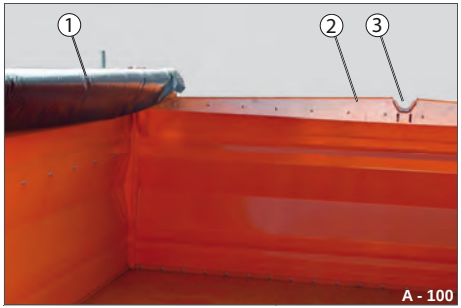


Pic. 70 Release the roll-up tarpaulin in front

1 Rubber cable, released
2 Bolt

Pic. 71 Release the roll-up tarpaulin at the rear

1 Rubber cable, released
2 Limit stop



Pic. 72 Roll-up tarpaulin, released

1 Roll-up tarpaulin
2 Cross-bracket
3 Linkage lock, in the middle

The roll-up tarpaulin may only be released when the tipping platform is in the driving position!

▶ Unhook the rubber loop (Pic. 70 /1) from the bolt (Pic. 70 /2) and the roll-up tarpaulin.

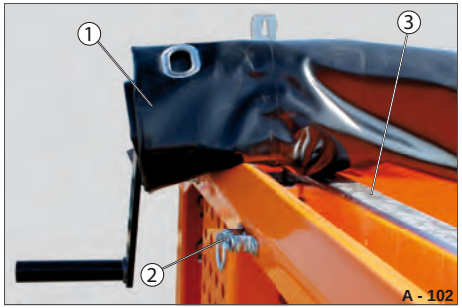
▶ Unhook the rubber loop (Pic. 71 /1) from the limit stop (Pic. 71 /2) and the roll-up tarpaulin.

The rear of the roll-up tarpaulin (Pic. 72 /1) rests on the cross-bracket (Pic. 72 /2).

The roll-up tarpaulin is stabilised in the middle by the linkage lock while it is being unrolled (Pic. 72 /3).

▶ Check that the roll-up tarpaulin is not obstructed by goods (material cone) before unrolling it.

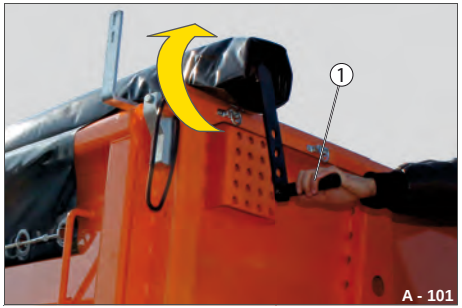
Unrolling the roll-up tarpaulin



Pic. 73 Roll-up tarpaulin released in front

1 Roll-up tarpaulin
2 Staple
3 Cross-beam, front

▶ Ensure that the front of the roll-up tarpaulin rests on the cross-beam (Pic. 73 /3) and that the rear rests on the cross bracket (Pic. 72 /2).

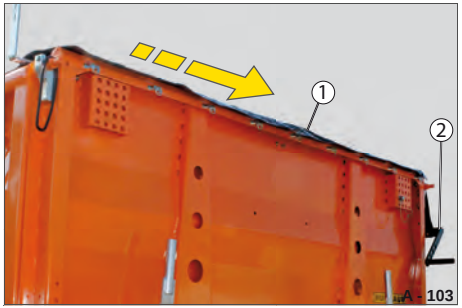


Pic. 74 Unrolling the roll-up tarpaulin

1 Hand crank

▶ Turn the hand crank (Pic. 74 /1) slowly in clockwise direction.

The roll-up tarpaulin is unrolled.



Pic. 75 Unrolled roll-up tarpaulin

1 Roll-up tarpaulin
2 Hand crank

▶ Completely unroll the roll-up tarpaulin (Pic. 75 /1).

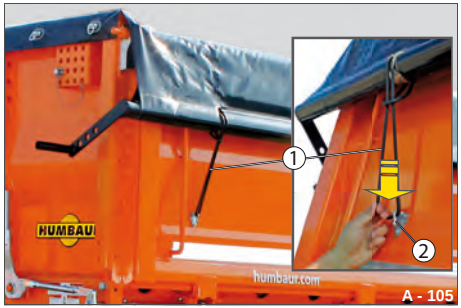
The hand crank (Pic. 75 /2) protrudes over the drop side.

Securing the roll-up tarpaulin

Pic. 76 Roll-up tarpaulin secured at the front

1 Staple, closed

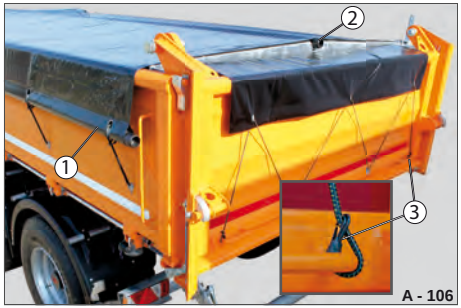
- ▶ Fold the eyelets of the roll-up tarpaulin over the staples.
- ▶ Close the staples (Pic. 76 /1) by turning them.



Pic. 77 Roll-up tarpaulin secured at the sides

1 Rubber
2 Hook

- ▶ Lubricate the rubbers (Pic. 77 /1) around the hooks (Pic. 77 /2).

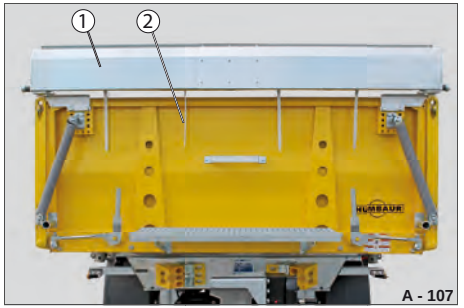


Pic. 78 Roll-up tarpaulin secured at the rear

1 Roll-up tarpaulin / tube
2 Tube, centre
3 Expansion cable / hook

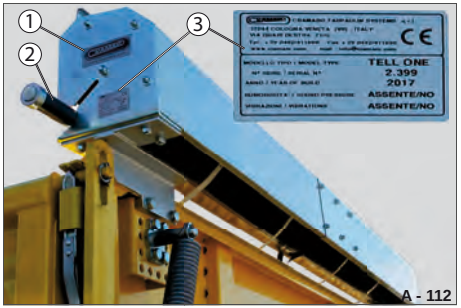
- ▶ Check that the rear of the tarpaulin is tightened by an expander cable / hook (Pic. 78 /3).
- ▶ Check that the tube is centred (Pic. 78 /2) in the linkage lock.

Roll-up tarpaulin (CRAMARO)



Pic. 79 Roll-up tarpaulin, manual

1 Storage box
2 Belt



Pic. 80 Roll-up tarpaulin, manual

1 Storage box
2 Tarpaulin, rolled up
3 Manufacturer name plate

Pic. 81 Manufacturer documentation

The CRAMARO roll-up tarpaulin is optionally available.

The roll-up tarpaulin is stored against the front wall in a storage box (Pic. 79 /1).

The roll-up tarpaulin in the storage box is secured with a belt against rolling out (Pic. 79 /2).

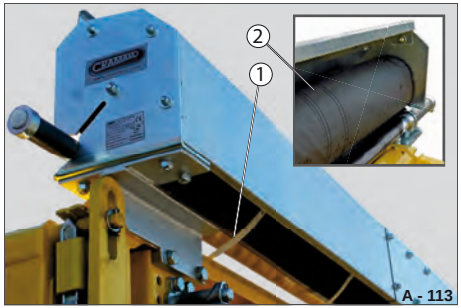
Safety, operating and maintenance instructions are provided in the CRAMARO manufacturer documentation!

A CE-declaration of conformity must be carried.

The maintenance interval prescribed must be adhered to and proof of maintenance must be documented - see manufacturer information.

The operator must ensure that the climbing aids required, e.g. ladder, are available for safe operation of the roll-up tarpaulin.

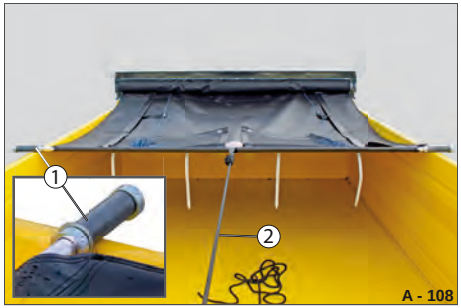
Manual opening of the roll-up tarpaulin (CRAMARO)



Pic. 82 Releasing the roll-up tarpaulin

1 Belt
2 Roll-up tarpaulin, released

▶ Climb onto the front pedestal.
▶ Release the belts (Pic. 82 /1).

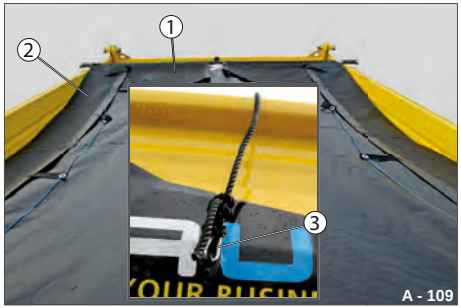


Pic. 83 Opening the roll-up tarpaulin

1 Tube guide
2 Pulling rope

The roll-up tarpaulin is guided by tube guides (Pic. 83 /1) at the drop sides.

▶ Release the pulling rope (Pic. 83 /2).
▶ Pull on the roll-up tarpaulin (Pic. 82 /2) by using the pulling rope.



Pic. 84 Unfolding / securing the roll-up tarpaulin

1 Tarpaulin parts, rear side
2 Tarpaulin parts, lateral
3 Snap-hook / hook

The roll-up tarpaulin is equipped with folded tarpaulin sections.

▶ Tie the pulling rope with a snap-hook (Pic. 84 /3) onto a hook on the rear drop side.

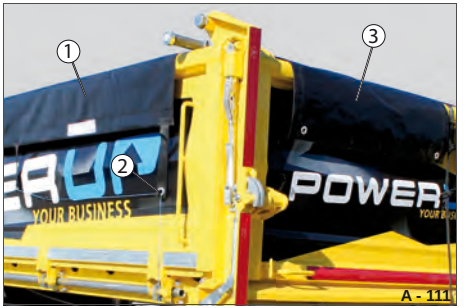
Securing the roll-up tarpaulin (CRAMARO) at the sides / rear

Pic. 85 Unfold the tarpaulin sections

1 Velcro connection
2 Rope, on the side

▶ Pull down the lateral tarpaulin parts with the rope (Pic. 85 /2).

The Velcro connections (Pic. 85 /1) of the tarpaulin parts are separated.



Pic. 86 Secure the tarpaulin parts

1 Tarpaulin parts, lateral
2 Hook
3 Tarpaulin parts, rear

▶ Secure the lateral tarpaulin sections (Pic. 86 /1) at the hooks (Pic. 86 /2).

▶ Fold down the rear tarpaulin sections (Pic. 86 /3).

▶ Secure the rear tarpaulin parts at the hooks.

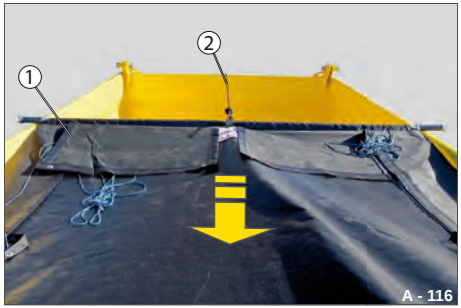
Pic. 87 Roll-up tarpaulin secured at the rear

1 Hook
2 Pulling rope

▶ Reliably secure the pulling rope (Pic. 87 /2) against detaching from the hook (Pic. 87 /1) of the tailgate.

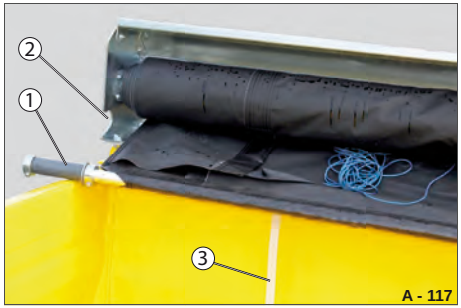
▶ Safely store the remainder of the pulling rope on the cargo bed.

Closing / securing the roll-up tarpaulin (CRAMARO)



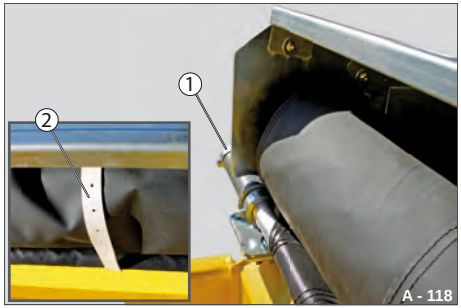
Pic. 88 Roll-up tarpaulin, released

1 Tarpaulin sections, lateral / rear
2 Pulling rope



Pic. 89 Tarpaulin, rolled up

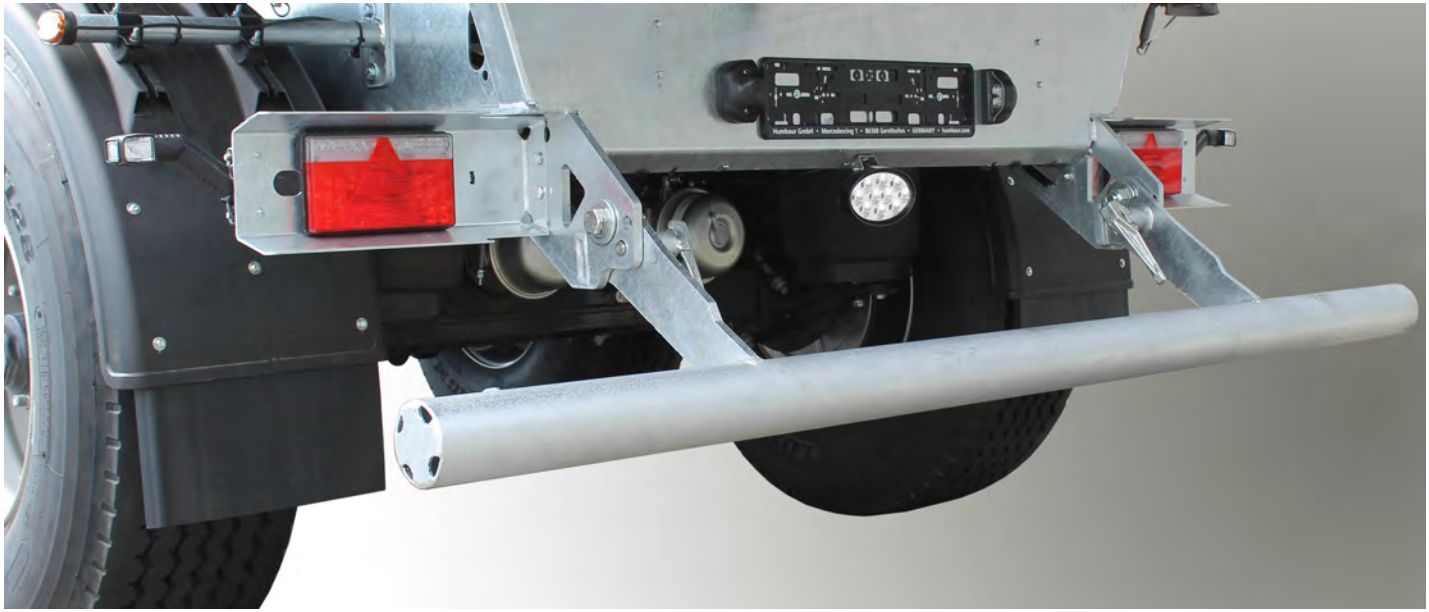
1 Tube guide
2 Tube holder
3 Belt



Pic. 90 Roll-up tarpaulin stored / secured

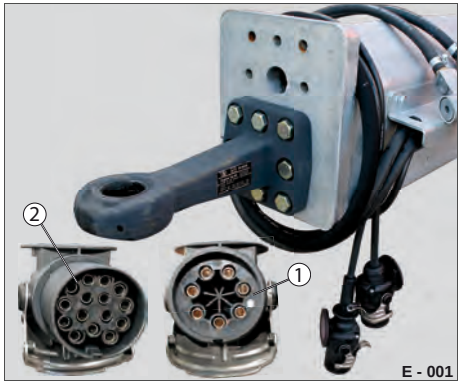
1 Tube, stored
2 Belt, secured

- ▶ Detach the lateral tarpaulin sections.
- ▶ Fold the tarpaulin sections (Pic. 88 /1) onto the roll-up tarpaulin, so that they are secured by the Velcro connections.
- ▶ Orderly place the lateral ropes onto the roll-up tarpaulin.
- ▶ Detach and secure the rear tarpaulin sections.
- ▶ Release the pulling rope (Pic. 88 /2).
- ▶ Hold the pulling rope firmly during the roll-up process.
- ▶ Ensure that the roll-up tarpaulin is properly rolled up and that the ropes are rolled in as well.
- ▶ Check that the tube (Pic. 90 /1) is stored in the tube holder on both sides - pull in the tube by hand as required.
- ▶ Strap down the roll-up tarpaulin using the belt (Pic. 90 /2).
- ▶ Check that the roll-up tarpaulin is safely attached in the storage box and cannot roll out by chance before starting the tilting process.



6 Electrical system

Lighting system



Pic. 1 Rear lighting (standard)

1 EBS/ABS plug (7P)
2 Electric system connection plug (15P)

The electrical lighting system operates with 24 V as standard.

The lighting system can be ordered in an LED version (24 V).

The lighting system can be optionally designed as a multi-voltage system with 12 V and 24 V.

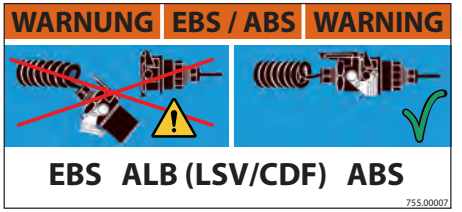
WARNING

Failure of electrical functions

The road handling and the braking distance deteriorate - accident risk!

- ▶ Check that all electrical connections have been assembled before driving off.
- ▶ Check the condition of the plugs and cables before driving off.
- ▶ Do not drive with cracked or defective electric systems connections.

Connecting the EBS / ABS

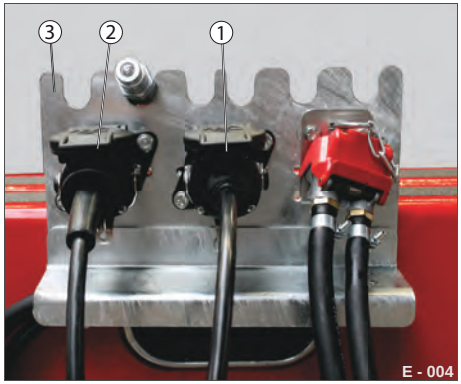


Pic. 2 Sticker on the trailer - example

The EBS / ABS plug must be plugged into the towing vehicle before driving off!

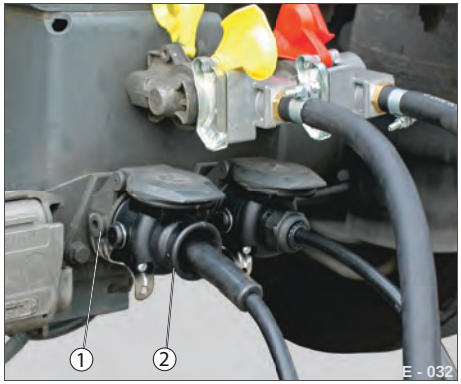
- ▶ Before driving off, ensure that the EBS / ABS plug is plugged into the towing vehicle.
- ▶ Check that the plug fits firmly.

Plug connections (standard)



Pic. 3 Console (optional)

1 7-pin EBS/ABS plug (ISO 7638)
2 15-pin electric system plug (ISO 12098)
3 Console, front



Pic. 4 Connecting to towing vehicle

1 Socket
2 Plug connections

Standard version of electrical connection in 24 V:

– with 7-pin
EBS/ABS plug according to ISO 7638

– with 15-pin
electric system plug according to ISO 12098

▶ Maintain the contacts of the plug connections, using contact spray if necessary.

▶ Clean any dirty plug connections before driving off (Pic. 4 /2).

▶ Have any faulty, torn or worn plug connections replaced immediately by a specialised workshop.

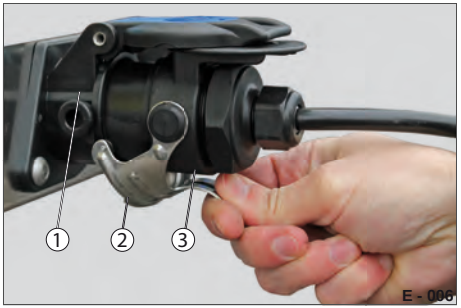
▶ Check that the sockets (Pic. 4 /1) are not damaged.

Connecting the electric system (standard)

Driving with damaged / dirty plug connections is not permitted!

Pic. 5 Securing plugs

1 Latch knobs
2 Latch bracket
3 Plug



Pic. 6 Release the plug

1 Latch knobs
2 Latch bracket
3 Plug

CAUTION

Coupling / uncoupling cables

Fingers may be pinched at the connection points.

- ▶ Carefully turn the latch bracket to fit it over the latch knobs or to remove it.
- ▶ Pull on the plug and not on the cable.

- ▶ Connect the electric system plug (Pic. 5 /3) with the towing vehicle.
- ▶ Close the latch bracket (Pic. 5 /2) by fitting it over the latch knobs (Pic. 5 /1) on the socket of the towing vehicle.
- ▶ Check that the plug fits firmly.

- ▶ Pull on the latch bracket (Pic. 6 /2).

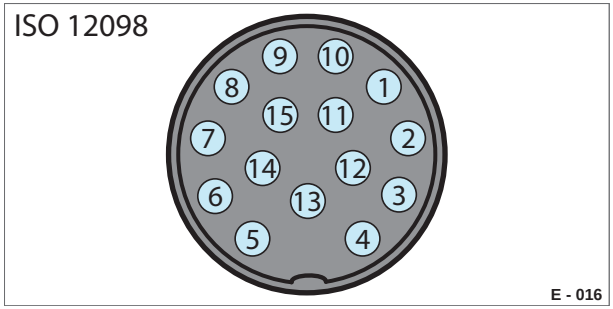
  The latch bracket can be turned to remove it from the latch knobs (Pic. 6 /1).

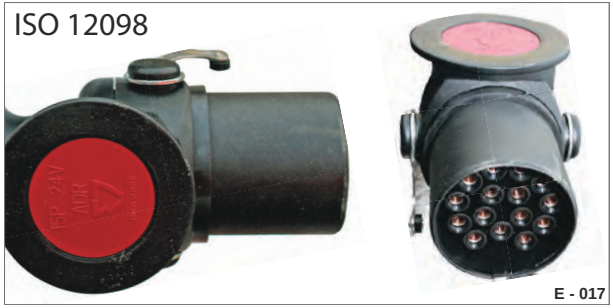
  The plug is now released and can be parked on the pipe drawbar.

15-pin plug connection ISO 12098 - 24 V

Pin	Function	Cross-section	Colour
1	Driving direction indicator, left	1.5 mm²	Yellow
2	Driving direction indicator, right	1.5 mm²	Green
3	Rear fog light	1.5 mm²	Blue
4	Ground	2.5 mm²	White
5	Tail light, left	1.5 mm²	Black
6	Tail light, right	1.5 mm²	Brown
7	Brake lights	1.5 mm²	Red
8	Reversing light	1.5 mm²	Grey
9	Permanent positive 24 V power supply	2.5 mm²	Brown/blue
10	Steering axle, sensor Brake lining wear	1.5 mm²	Brown/red
11	Starting aid, pressure sensor Spring-accumulator brake	1.5 mm²	Yellow/black
12	Lifting axle	1.5 mm²	Pink
13	CAN-bus dimensions	2.5 mm²	White/black
14	CAN-bus high	1.5 mm²	Violet
15	CAN-bus low	1.5 mm²	Orange

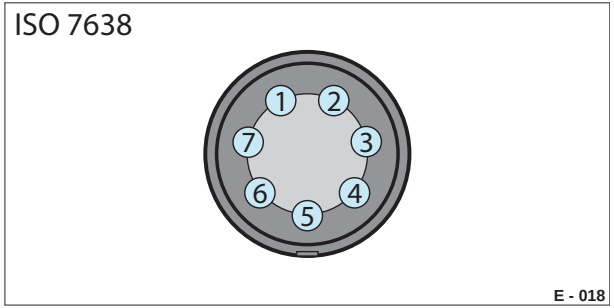
Figure / arrangement





7-pin EBS plug connection ISO 7638 (brakes)

Pin	Function	Cross-section	Colour
1	Positive electromagnetic valve (KL30)	4 or 6 mm²	Red
2	Positive electronic system (KL15)	1.5 mm²	White/red
3	Negative electronic system (KL31b)	1.5 mm²	Brown/blue
4	Negative magnetic valve (KL31)	4 or 6 mm²	Brown
5	Warning device	1.5 mm²	Yellow/blue
6	Spare		
7	Spare		



Tail light with side light 24 V

The rear, multifunctional tail lights come equipped with a side light.

The multifunctional tail light comes equipped with the following functions:

– Rear fog light
– Reversing light
– Tail light with reflector
– brake light
– Indicator light

The side light marks the vehicle in the following colours:

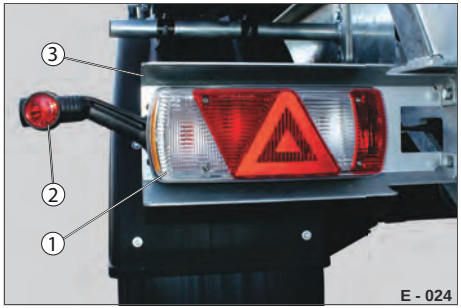
– red, to the rear
– orange, to the side
– white, to the front

WARNING

Non-functioning tail lights

Road users are unable to assess / identify the vehicle correctly - risk of accidents!

▶ Make sure that the tail lights and side lights work before driving off.



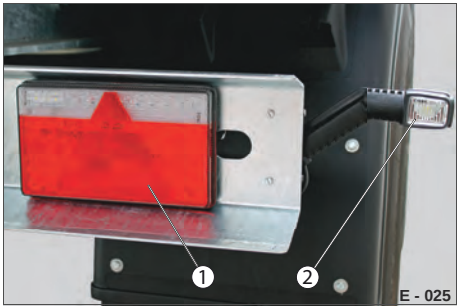
Pic. 7 Rear lighting 24 V

1 Tail light complete with:
Rear fog light,
Reversing light,
Tail light with reflector,
Brake light,
Indicator light
2 Side light
3 Support bracket

LED tail light with side light

The rear LED tail lights come equipped with the following functions:

– Rear fog and reversing lights
– Tail light with reflector, brake and indicator light
– Side light



Pic. 8 Tail light "LED"
(multi-voltage 12 V / 24 V)

1 Tail light complete with:
Rear fog light,
Reversing light,
Tail light with reflector,
Brake light,
Indicator light
2 Side light in white

WARNING

Non-functioning tail lights

Road users are unable to assess / identify the vehicle correctly - risk of accidents!

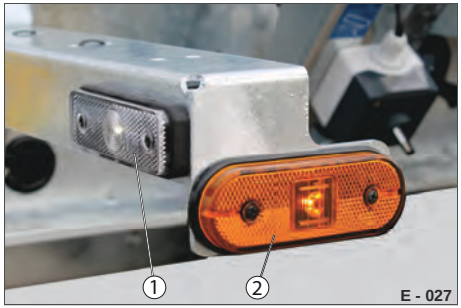
▶ Make sure that the tail lights and side lights work before driving off.

Marker lights / position lamps

The white position lamps are mounted on the front of the chassis.

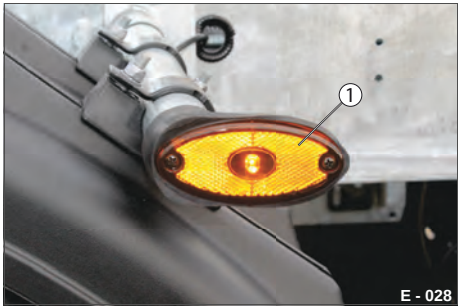
The orange marker lights are mounted on the side of the chassis.

The marker lights / position lamps are LED lights supplied by the electrical system.



Pic. 9 Marker lights

1 Position lamp, front
2 Side marker lights



Pic. 10 Side marker lights

1 Side marker lights

WARNING

Non-functional marker lights / position lamps

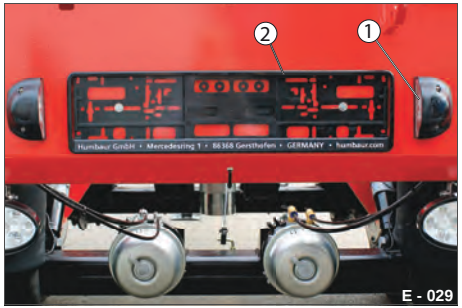
Road users are unable to assess / identify the vehicle correctly - risk of accidents!

▶ Make sure that the marker lights and position lamps work before driving off.

For maintenance of the marker lights / position lamps, see page **205**.

The side marker lights must be visible while driving!
Dirty side marker lights must be cleaned before driving off.

Licence plate lights

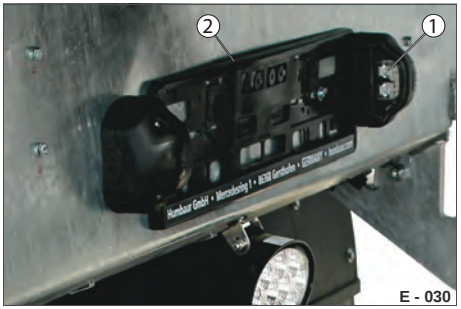


Pic. 11 Licence plate light, 24 V standard

1 Light fixture (24 V)
2 Number plate holder

It is a legal requirement to illuminate the licence plate.

For maintenance of the licence plate lights, see maintenance on page **204**.

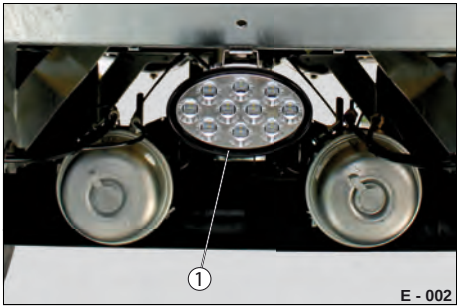


Pic. 12 Licence plate lights "LED"

1 LED light fixture (12 V / 24 V)
2 Number plate holder

The licence plate lights are separately mounted to the right and left of the licence plate bracket.

Reversing lights



Pic. 13 LED light, central

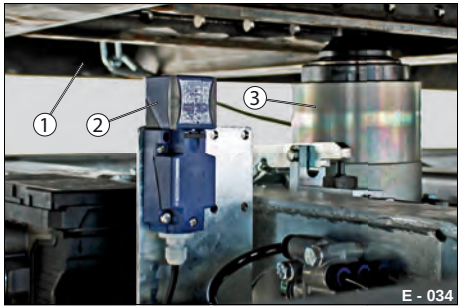
1 LED light

The reversing lights illuminate the work environment at the rear of the trailer.

An LED light can be optionally mounted at the centre or 2 LED lights on the right / left.

For maintenance of the LED lights, see page **205**.

Automatic lowering system (optional)



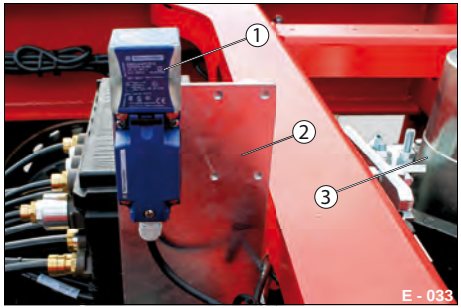
Pic. 14 Sensor function

1 Loading bridge
2 Inductive sensor
3 Telescopic cylinder

The automatic lowering system is addressed by an inductive sensor (Pic. 14 /2).

The sensor detects whether the loading bridge (Pic. 14 /1) is being lifted or lowered and supplies the signal to the automatic lowering system.

If the automatic lowering system has been activated, the chassis will be automatically lowered once the loading bridge has been lifted.



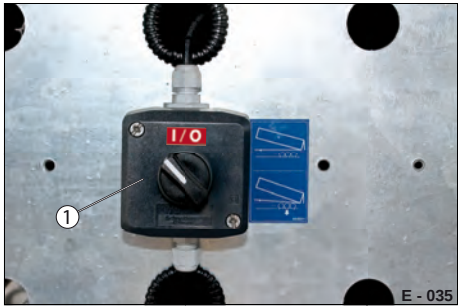
Pic. 15 Sensor position

1 Inductive sensor with LED display
2 Bracket
3 Telescopic cylinder

The inductive sensor (Pic. 15 /1) is approximately at the centre of a console (Pic. 15 /2) on the chassis.

LED display:
orange / green = ready for operation
green = activated (lowering)

For technical data / description, see sensor manufacturer documentation.

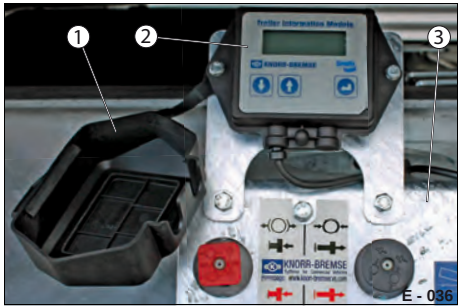


Pic. 16 Disconnection switch (optional)

1 ON / OFF switch

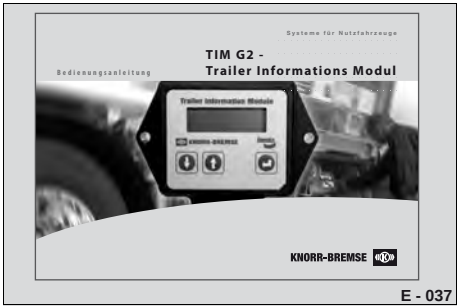
An optional disconnection switch (Pic. 16 /1) can be fitted to the automatic lowering system, e.g. for manufacturer operation.

Trailer information module (TIM)



Pic. 17 TIM position

1 Cover, open
2 TIM module control panel (made by Knorr)
3 Brake operating console



Pic. 18 Manufacturer documentation

Pic. 19 TIM module sealed

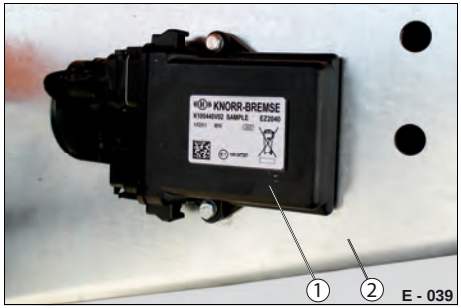
1 Cover, closed

The TIM module can be used to adjust or read various settings, such as service intervals (according to the km counter), load information and the lifting axle.

For technical data / description, see KNORR manufacturer documentation.

During operation of the trailer, the TIM module should be sealed with the cover (Pic. 19 /1).

Intelligent trailer access point (iTAP)



Pic. 20 iTAP position

1 iTAP hardware
2 Chassis, front

Pic. 21 Control via smartphone

Pic. 22 Functions

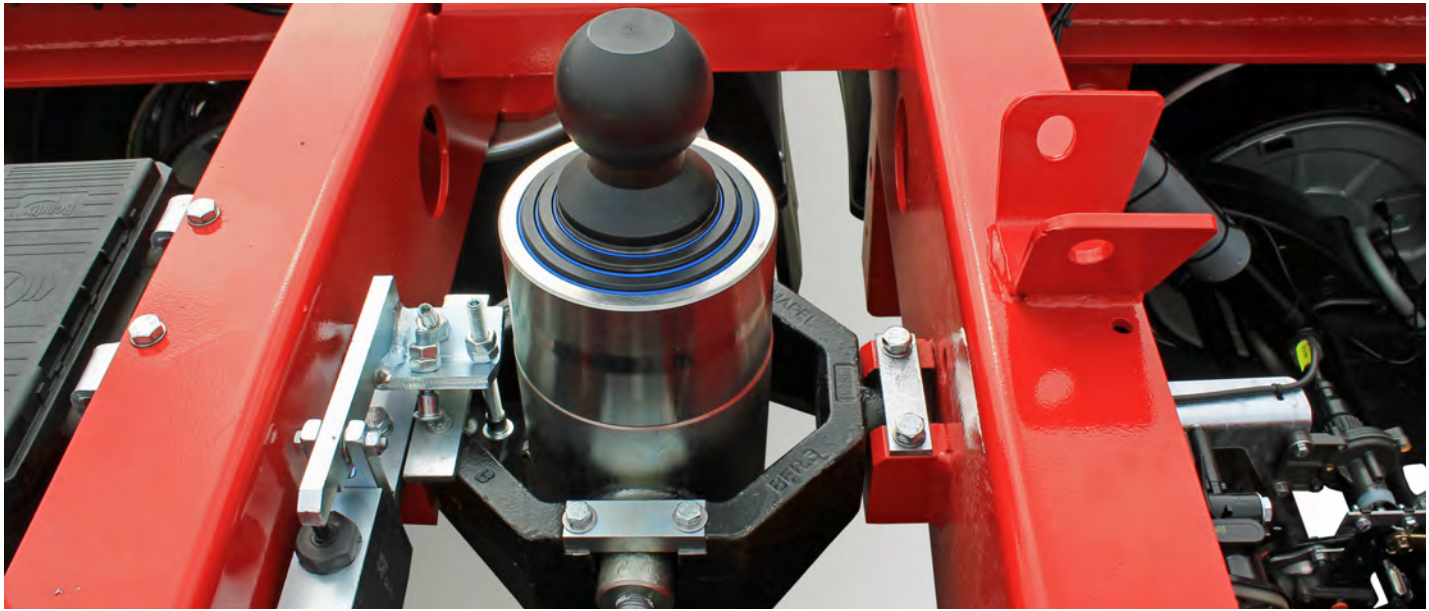
An app communicates via the WLAN interface of a smartphone / tablet with the iTAP on the trailer, which transmits the commands to the brake and chassis controls via a CAN bus (J1939).

For technical data / description, see KNORR manufacturer documentation.

Various processes can be adjusted / controlled during operation of the trailer.

RLF – manufacturer brake

You can use your smartphone to adjust the brake pressure without getting out of your vehicle. You can also accurately track how the loading state decreases.



7 Inspection, care and maintenance

Trailers must be inspected by a competent / qualified specialist for their condition for safe operation as and when required, but at least once a year.

This also applies to all components which are used for the load securing according to VDI 2700 or / and EN 12642.

Instructions for maintenance work on the following assemblies can be found in the operating and maintenance instructions of the manufacturer:

- Support devices,
- Axles,
- Brake system.

All important mechanical components must be inspected and maintained at regular intervals for safety reasons.

These include:

- Axles,
- Brakes
- Bolts
- Pipe connections
- Attachments
- Telescopic cylinder,
- Switch-off and securing mechanisms
- Electrical systems.

These regular intervals are specified on page **160** "Maintenance intervals".

- Comply with the accident prevention regulations for all maintenance work.
- Comply with the environmental protection guidelines.
- Switch off the engine prior to starting maintenance work.
- Damaged tie-down towing rings may never be repaired, but must be exchanged for new parts.
- Damaged and non-functioning trailer parts must be exchanged for original spare parts made by Humbaur GmbH.

Proof of the HU/SP

Pic. 1 Inspection book for trailer

HU = General inspection
SP = Safety inspection

- ▶ Log the HU/SP completed (Section 29, sub-section 12 of the StVZO (German Road Licensing Regulations)).
- ▶ Keep the latest inspection report (HU) and the latest test record (SP) at least until the next inspection / test (Section 29, sub-section 10 of the StVZO).
- ▶ Keep the inspection log book as proof until the vehicle is finally taken out of service (Section 29, sub-section 13 of the StVZO).

Maintenance of axles / wheels

Pic. 2 Maintenance booklet for axle assembly

ZU = Intermediate inspection
HU = General inspection
BSU = Special brake inspection

- ▶ Carry out the prescribed visual inspections and maintenance work or have them carried out by qualified specialist workshops.
- ▶ Have the inspections documented in the service booklet.

Maintenance of support device

Pic. 3 Operating and service instructions for support device

- ▶ Carry out the prescribed visual inspections and maintenance work or have them carried out by qualified specialist personnel.
- ▶ Have the inspections documented in the service booklet for the trailer (Pic. 1).

Maintenance regime

Maintenance includes regular checks of individual components, followed by taking appropriate action.

The schedule should be adapted to suit the conditions of use.

Faulty trailer parts must be replaced by genuine spare parts.

The following information refers to normal use of the trailer up to a maximum of 20,000 km per year.

Once-off maintenance work	after	50 km	2,000 km	5,000 km	6 months	6 years
Wheel nuts: Retightening (also after each wheel change)		X				
Braking system: Adjust the tension brake / lubrication			X			
Screw connections of spring links, shock absorbers and axle connections: Visual inspection			X		X	
Automatic locking / unlocking of the rear drop side: Lubrication				X		
Retighten the towing ring screw connection			X			
Check the brake setting and adjust if necessary				X		
Replace hydraulic lines						X

Tab. 1 Maintenance table, commissioning

Maintenance work	every	500 km or 14 days	1500 km or 30 days	5,000 km or 3 months	10,000 km or 6 months	20,000 km or 12 months
Axle and wheel brake [*1]: Check for state and wear						
Wheel nuts: Check for tightness and tighten if necessary		X			X	
Towing ring: Lubrication		X				X
Lighting system: Check for damage		X				
Wheels: Check air pressure, tyre wear		X				
Compressed air system: Check for tightness / crack formation			X			
Hydraulic system / hoses: Check for tightness / crack formation						X
Telescopic cylinder: Check scrapers / extension units for tightness, oil leaks					X	
Towing ring / drawbar / tilting bearing: Check for wear and tightness					X	
Central locking / automatic rear drop side lock: Check function					X	
Locking points on the rear drop side: Clean, readjust as required					X	
Tilting bearing: Clean / lubricate					X	
Locking points / central lock at the drop sides: Clean, lubricate					X	
Line filter of the pressure system: Cleaning					X	
Braking system: Drain the compressed air container		X				
All add-on parts: Check for tightness						X
Screw connections of spring links, shock absorbers and axle connections: Visual inspection						X

Maintenance work	every	500 km or 14 days	1500 km or 30 days	5,000 km or 3 months	10,000 km or 6 months	20,000 km or 12 months
Screws / riveted connections on the superstructure / chassis: Visual inspection						X
Roll-up tarpaulin: Function, check for damage						X
Telescopic cylinder: Lubricate the bottom / top mounting points Check / adjust the tilting angle of the switch-off function						X
Check the tubular drawbar: for damage, deformation Check the screw connection on the chassis by applying torque					X	
*1: **Information regarding maintenance is available in the manufacturer's operating instructions**						

Tab. 2 Maintenance table

Fastening torque for screw connections

Threads	Strength 8.8	Strength 10.9
	Fastening torque	
M5	5.5 Nm	8.1 Nm
M6	9.6 Nm	14 Nm
M8	23 Nm	34 Nm
M8x1	25 Nm	37 Nm
M10	46 Nm	67 Nm
M10x1.25	49 Nm	71 Nm
M12	79 Nm	115 Nm
M12x1.5	83 Nm	120 Nm
M14	125 Nm	185 Nm
M14x1.5	135 Nm	200 Nm
M16	195 Nm	290 Nm
M16x1.5	210 Nm	310 Nm
M18	300 Nm	430 Nm
M18x1.5	340 Nm	485 Nm

Threads	Strength 8.8	Strength 10.9
	Fastening torque	
M20	425 Nm	610 Nm
M20x1.5	475 Nm	980 Nm
M22	580 Nm	820 Nm
M22x1.5	630 Nm	900 Nm
M24	730 Nm	1050 Nm
M24x2	800 Nm	1150 Nm
M27	1100 Nm	1550 Nm
M27x2	1150 Nm	1650 Nm
M30	1400 Nm	2000 Nm
M30x2	1500 Nm	2150 Nm
M36	2450 Nm	3500 Nm
M36x2	2650 Nm	3780 Nm
M42	3930 Nm	5600 Nm
M42x2	4280 Nm	6050 Nm

Tab. 3 Fastening torques in general

Fastening torques for wheel nuts

Axle manufacturer	Threads	Wheel nuts	Fastening torque
BPW, SAF	Take note of size	Take note of the version	see manufact. information

Implementation instructions

All of the following lubrication steps must to be performed when no central lubrication system is available.

Only use high-pressure grease guns that do not exceed a lubrication pressure of 250 bar for this work.

Damage at the mounting points, seals, etc. may occur when the grease gun used does not have a safety device.

NOTICE

Dirty grease nipples

Dirt may enter the bearing and result in higher wear.

Grease nipples and grease gun may get damaged.

▶ Carefully clean the grease nipple before lubrication.

CAUTION

Contact with lubricants

Lubricants may cause reaction of the skin.

▶ Only use approved lubricants.

▶ Carefully clean the grease nipple before lubrication.

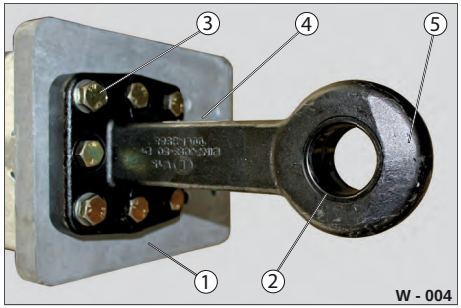
▶ Use  ,  .

▶  after working with lubricants.

Greases

Lubrication point	Lubricants
– Towing ring – Spindle support – Catches	Multi-purpose grease according to ISO-L-XCCHB3 or according to DIN 51825-Type K with application range -30°C to + 120°C

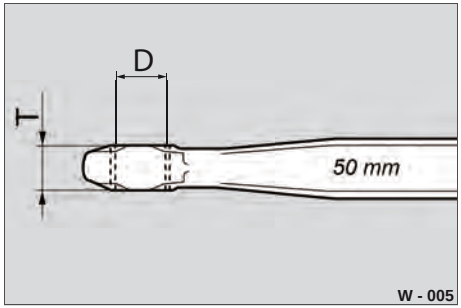
Towing ring



Pic. 4 Lubricate the towing ring

1 Drawbar
2 Wearing bushing
3 Screw connection
4 Manufacturer nameplate / technical data
5 Rounded area of the towing ring

- ▶ Check the towing ring for damage.
- ▶ Grease the wearing bushing (Pic. 4 /2) and the rounded part of the towing ring (Pic. 4 /5) with long-term high-pressure grease.

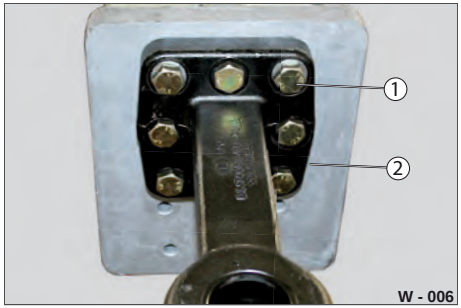


Pic. 5 Dimensions of the towing ring

Towing ring: Type	Diameter max. D (mm)	Thickness min. T (mm)
ISO 50	52	41.5

Tab. 4 Min. / max. dimensions

- ▶ Clean the wearing bushing (Pic. 4 /2) and the towing ring with a clean, dry cloth.
- ▶ Check the diameter of the wearing bushing:
  - for D=50 mm, max. + 2.5 mm.
- ▶ The wearing bush must be replaced when the maximum diameter of: 52 mm has been exceeded.



Pic. 6 Towing ring connection

1 Threaded bolt (M16)
2 Flange / contact surfaces

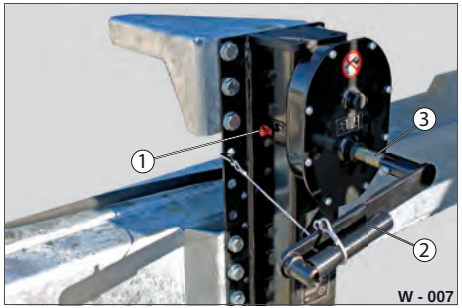
The towing ring screw connection must be re-tightened after approx. 2,000 km.

The contact surfaces may not be treated!

Please take into account the information provided by the towing ring manufacturer.

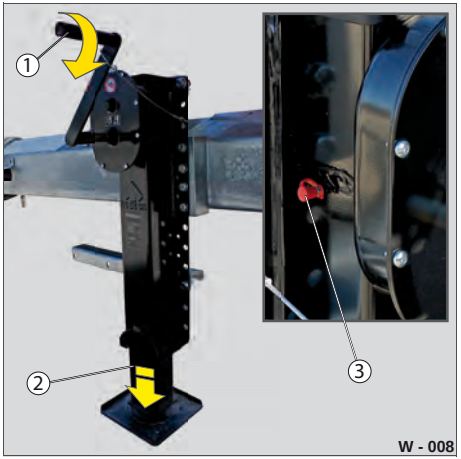
- ▶ Retighten the threaded bolts (Pic. 6 /1) in a crosswise pattern.
- ▶ Adhere to the torque specified:
  1. Tightening with 50 Nm
  2. Tightening with 100 Nm
  3. Tightening with 390 Nm

Spindle support



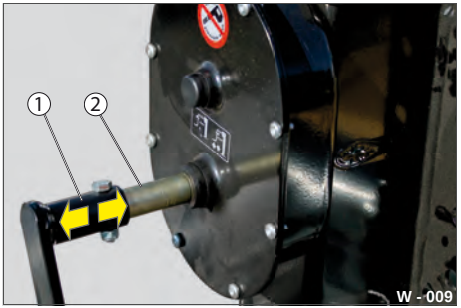
Pic. 7 Gear-supported jack on the chassis

1 Grease nipple
2 Crank handle
3 Gear connection



Pic. 8 Extend the support foot

1 Crank handle
2 Support leg
3 Grease nipple cap



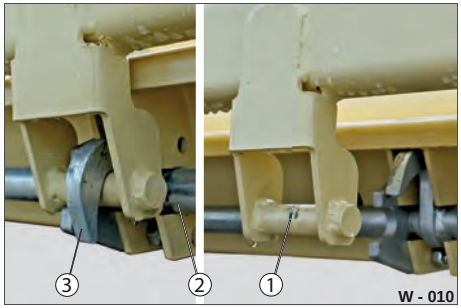
Pic. 9 Switching between load / fast gear

1 Crank handle
2 Gear connection, grease exit

Adhere to the operating instructions / intervals specified by the manufacturer.

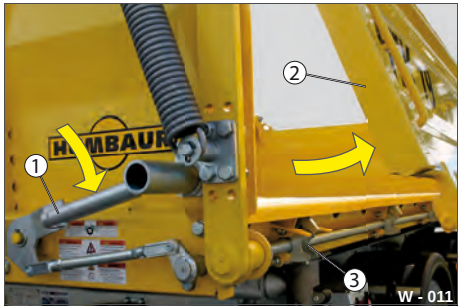
- ▶ Extend the support foot (Pic. 8 /2) by using the crank handle (Pic. 7 /2).
- ▶ Remove old grease from the support foot and the gear connection (Pic. 7 /3).
- ▶ Remove the cap from the grease nipple (Pic. 8 /3).
- ▶ Grease the grease nipple of the gear-supported jack with a grease gun.
- ▶ Slowly retract the support foot - so that the grease is equally distributed.
- ▶ Use the gear-supported jack in load and fast gear.
- ▶ Remove excess grease from the gear connection (Pic. 9 /2).

Drop side mounting



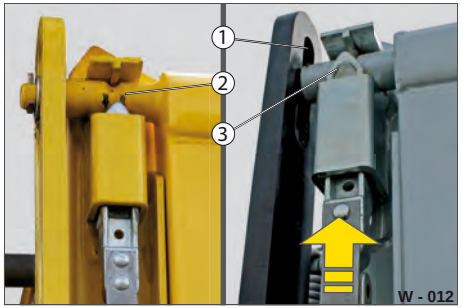
Pic. 10 Lower mounting points

1 Locking bolts / mounting points
2 Transmission linkage mounting points
3 Locking hooks



Pic. 11 Central locking

1 Central locking
2 Side drop side
3 Locking points



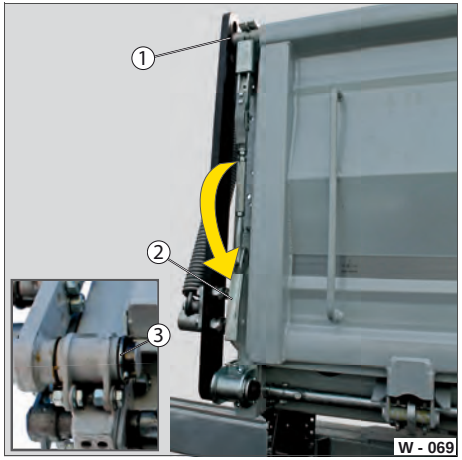
Pic. 12 Upper mounting points

1 Guide
2 Bolt
3 Tongue

Flawless operation of the drop sides: Locking / swivelling can only be assured by regular cleaning and regreasing of the mounting / locking points.

- ▶ Check after every use of the drop sides that the mounting and locking points are clean.
- ▶ Clean them as required with a hand brush or a cloth before locking the drop sides.
- ▶ Unlock the central locking (Pic. 11 /1) and allow the drop side to swing down.
- ▶ Clean the lower mounting points (Pic. 10 /1) with a clean, dry cloth.
- ▶ Grease the mounting points.
- ▶ Close the drop side and lock it.
- ▶ Clean the upper mounting points with a clean dry cloth.
- ▶ Lubricate the guides (Pic. 12 /1), the bolt (Pic. 12 /2), and the tongue (Pic. 12 /3) with lubricating oil.
- ▶ Remove excess / overflowing lubrication oil.
- ▶ Check the function of the upper locking / mounting point.

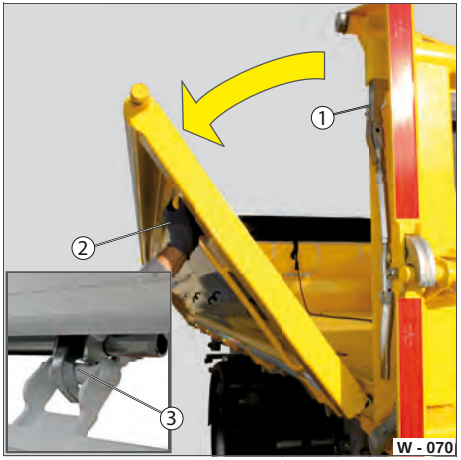
Drop side in fold-down mode



Pic. 13 Upper mounting points

1 Upper mounting point
2 Lever lock
3 Lower mounting point

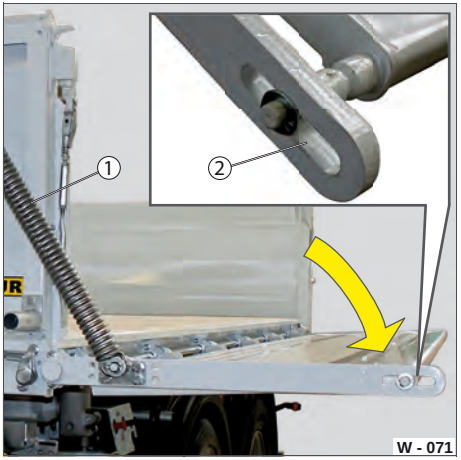
- ▶ Unlock the front (Pic. 13 /1) and real lock (Pic. 14 /1) with the lever.
- ▶ Check the function of the lever (Pic. 13 /2) for ease of movement.
- ▶ Lubricate the bottom mounting point (Pic. 13 /3).



Pic. 14 Upper mounting points

1 Lock, released
2 Drop side handle
3 Lower locking points

- ▶ Carefully fold down the drop side.
- ▶ Check the fold-down mechanism for ease of movement.
- ▶ Lubricate the sliding slot (Pic. 15 /2).
- ▶ Check the lower locking points (Pic. 14 /3).

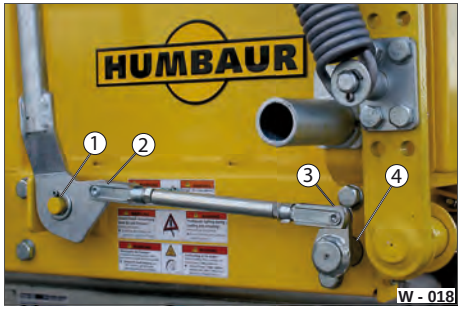


Pic. 15 Upper mounting points

1 Lifting spring
2 Sliding slot

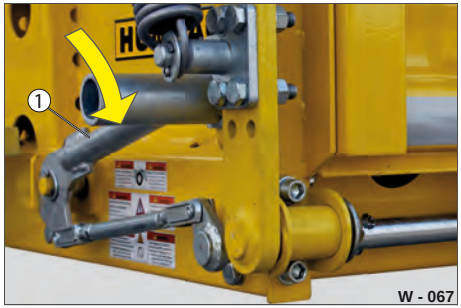
- ▶ Check the lifting spring (Pic. 15 /1) for damage / slackening.
- ▶ Close the drop side and lock it with the locks (Pic. 14 /1).

Central locking for the drop side



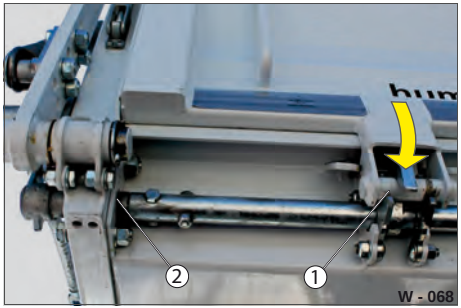
Pic. 16 Central locking mounting points

1 Lever mounting
2 Clevis mounting on the lever
3 Clevis mounting on the linkage
4 Linkage mounting



Pic. 17 Central locking unlocked

1 Lever



Pic. 18 Check the mounting points

1 Locking points
2 Linkage mounting

▶ Clean the mounting points with a clean dry cloth.

▶ Unlock the respective drop side with the central locking.

The drop side is in swivel mode.

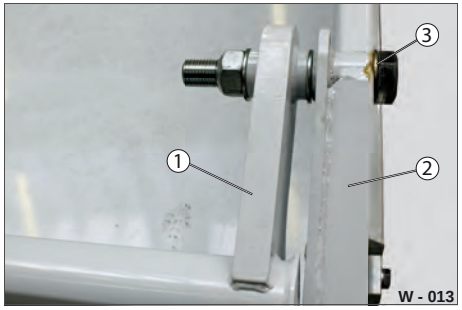
▶ Check the function of the central locking - it may not be too tight or too easy to move.

▶ Check that the locking points (Pic. 18 /1) do not show increased abrasion.

▶ Lubricate the mounting points (Pic. 18 /2) of the linkage.

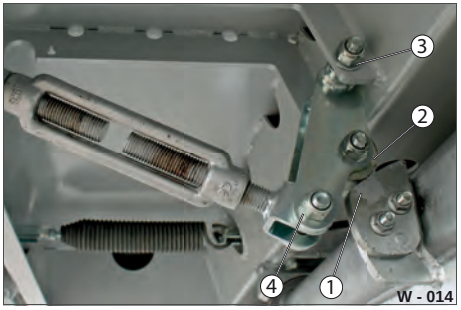
▶ Lubricate the mounting points: Lever (Pic. 16 /1), clevis on the lever (Pic. 16 /2), clevis on the linkage (Pic. 16 /3).

Rear drop side mounting



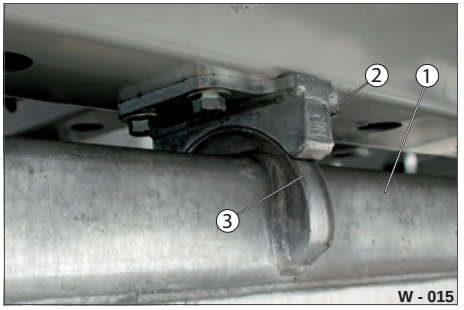
Pic. 19 Upper mounting

1 Tailgate mounting lugs
2 Stanchion
3 Hinge screw connection



Pic. 20 Locking / unlocking mechanism

1 End stop
2 Roller
3 Hinge screw connection, loading bridge
4 Hinge screw connection, transmission linkage



Pic. 21 Loading bridge sliding points

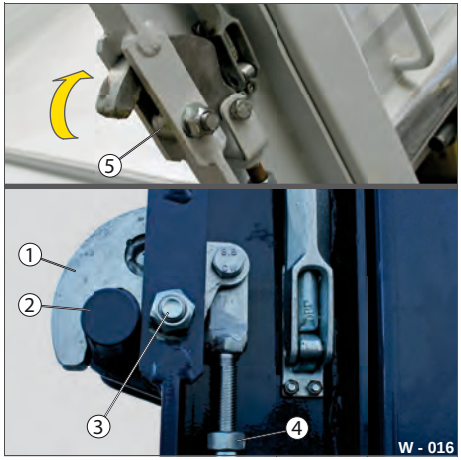
1 Chassis
2 Loading bridge bearing block
3 Sliding point

- ▶ Clean the lubrication / mounting points of the rear drop side.
- ▶ Check the top mounting for function / deformation / warping.
- ▶ Grease the hinge screw connection (Pic. 19 /3).

- ▶ Clean the lubrication / mounting points of the locking / unlocking mechanism.
- ▶ Grease the end stop (Pic. 20 /1) and the roller (Pic. 20 /2).
- ▶ Oil the hinge screw connections (Pic. 20 /3 and Pic. 20 /4).

- ▶ Clean the sliding points (Pic. 21 /3) of the loading bridge.
- ▶ Check the sliding points for abrasion.
- ▶ Grease the sliding points.

Rear drop side locking / unlocking mechanism



Pic. 22 Locking point

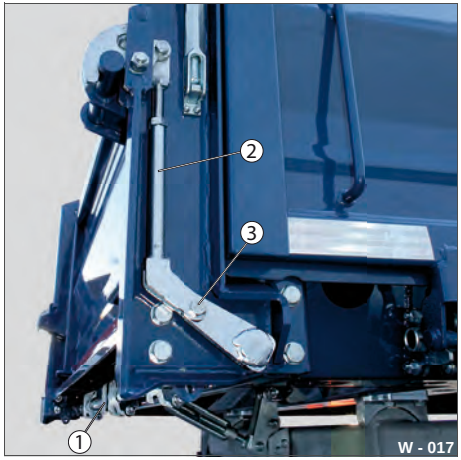
1 Hook
2 Bolt
3 Mounting screw connection
4 Counter-nut
5 Bush

▶ Tilt the loading bridge at the rear.
The hooks (Pic. 22 /1) release the bolts (Pic. 22 /2).

▶ Open the rear drop side.

▶ Clean the locking points.

▶ Lubricate the sliding points.

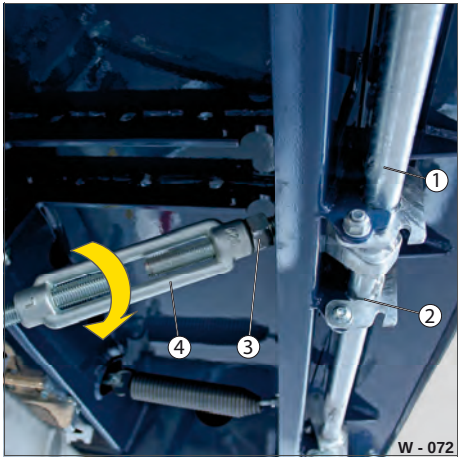


Pic. 23 Vertical transmission linkage

1 Horizontal linkage
2 Vertical linkage
3 Mounting screw connection

▶ Grease the bearing screw connection (Pic. 23 /3).

▶ Check the function / transmission linkage of the locking / unlocking mechanism.



Pic. 24 Horizontal transmission linkage

1 Horizontal linkage
2 Bearing point
3 Counter-nut
4 Adjustment nut

▶ Lubricate the mounting points (Pic. 24 /2).

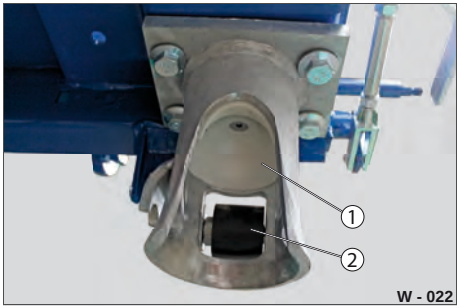
▶ Adjust the transmission linkage with the adjustment nut (Pic. 24 /4).

▶ Tighten the counter nut after adjustment (Pic. 24 /3).

Tilting bearings

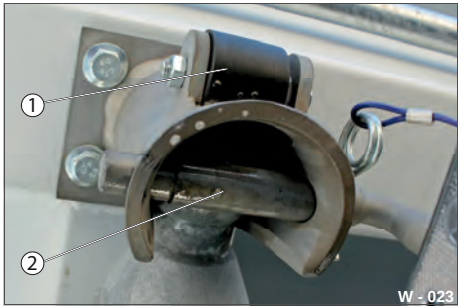
Pic. 25 Tilting bearing ball

1 Tilting bearing ball, welded on



Pic. 26 Tilting bearing open

1 Tilting bearing cup
2 Roller



Pic. 27 Tilting bearing secured

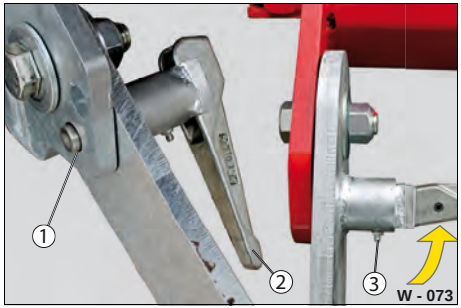
1 Roller
2 Plug pin inserted and secured

The tilting bearings must be regularly inspected for dirt accumulation and wear and lubricated, depending on the level of use and operating environment of the trailer.

A visual inspection and, where required, cleaning and lubrication of the tilting bearings must be carried out at least every 6 months.

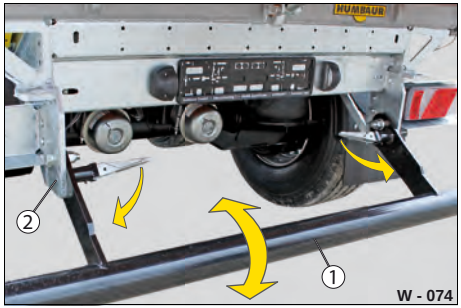
- ▶ Tip the cargo bed to the right and left.
- ▶ Carry out a visual inspection.
- ▶ Remove any dirt particles such as sand, twigs, etc.
- ▶ Clean the tilting bearing ball (Pic. 25 /1), the tilting bearing cup (Pic. 26 /1) and the roller (Pic. 26 /2) with a clean cloth.
- ▶ Check the roller for cracks. Exchange the roller as required.
- ▶ Grease the tilting bearing ball (Pic. 25 /1).
- ▶ Grease the plug pin (Pic. 27 /1).
- ▶ Tip the cargo bed to the right and left.
- ▶ Check that the tipping process is functioning correctly.

Underride protection lock



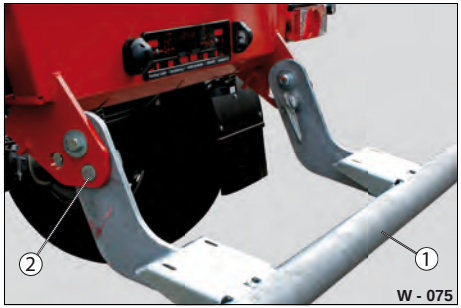
Pic. 28 Underride protection lubrication point

1 Drill-hole for bolt
2 Lever
3 Grease nipple



Pic. 29 Check the underride protection

1 Underride protection
2 Locking bolt



Pic. 30 Underride protection locked

1 Underride protection
2 Locking bolt

- ▶ Clean the lubrication points.
- ▶ Unlock the underride protection and clean the drill-hole (Pic. 28 /1) as required.
- ▶ Grease the underride protection mounting at the grease nipple (Pic. 28 /3) until grease exudes.
- ▶ Move the underride protection up and down several times.
- ▶ Lock the underride protection.
- ▶ Remove any excess grease.

When in the driving position, appropriate locking of the underride protection (Pic. 29 /1) must be possible.

A deformed / bent underride protection that cannot be properly locked must immediately be replaced!

It must be possible to move the locking bolts (Pic. 30 /2) completely into the drill holes (Pic. 28 /1).

Maintaining the hydraulic system

Maintenance / repair work on the hydraulic system may only be carried out by qualified specialist personnel.

Take note of the national regulations, e.g. BGR 237 handling / maintenance / repair of hydraulic components.

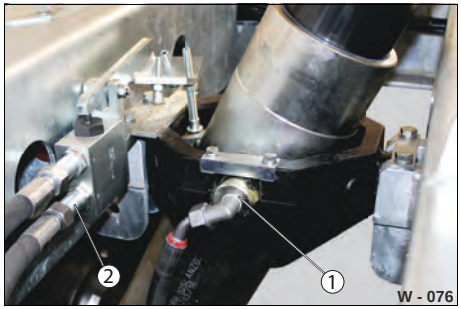
WARNING

Lines are under pressure

The hydraulic lines are under pressure when they are uncoupled.

The oil can escape under high pressure and cut people / shred skin!

- ▶ Check that the lines are not under pressure and that the traction unit has been switched off before any maintenance work is carried out on the hydraulic system.
- ▶ Use  .



Pic. 31 Hydraulic connection points

1 Connection points
2 Screw connections

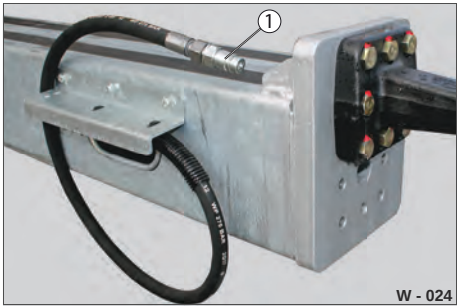
WARNING

Working under an unsecured loading bridge

The loading bridge may fall down and crush people.

- ▶ Before working under the loading bridge, make sure that it has been properly secured with the maintenance brace.
- ▶ Secure the loading bridge with lifting equipment, e.g. a crane, when there is no maintenance brace.

Hydraulic connection



Pic. 32 Supply connection

1 Connection SVK BG3

- ▶ Check all connection points (Pic. 31 /1) of the hydraulic system for tightness (oil loss) and firm connection.
- ▶ Clean off any oil that may have leaked from the hydraulic components.
- ▶ Immediately replace faulty hydraulic components, e.g. screw connections (Pic. 31 /2).
- ▶ Check the hoses (Pic. 32 /1) and their connections for incipient cracks / deformation.
- ▶ Replace the hoses after approx. 6 years.

Telescopic cylinder

CAUTION

Moving / remaining under a loading bridge

You can hit your head.

▶ Move carefully when you are under a raised loading bridge - no hurried / quick movements.

The loading bridge must be secured with a maintenance brace before carrying out maintenance work.

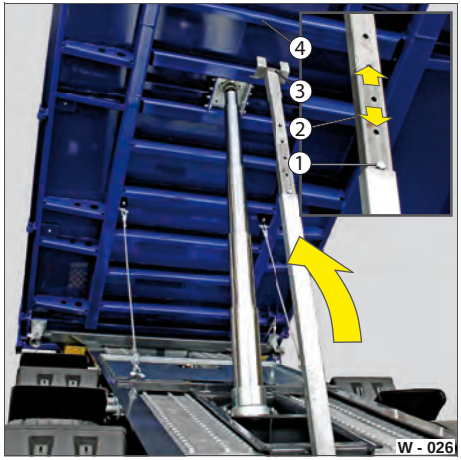
The maintenance brace can be swivelled, fastened and secured below the loading bridge.

The type of maintenance brace depends on the vehicle type and may vary in shape and size.

The operation follows the same principles.

▶ Hydraulically tilt the loading bridge to the rear.

▶ Adjust the support (Pic. 33 /2) to the length required and insert the screw (Pic. 33 /1) into one of the holes.



Pic. 33 Example: Maintenance brace

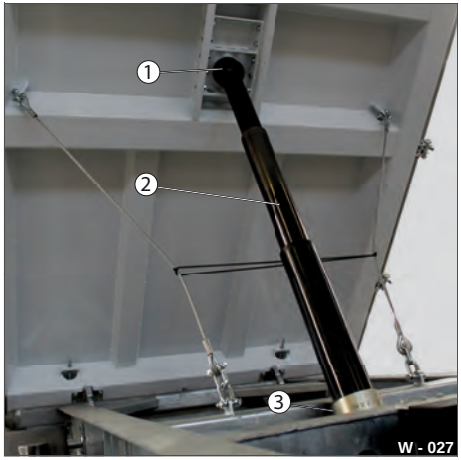
1 Bolt
2 Adjustable support
3 U-support arm
4 Lateral bracing, loading bridge

▶ Fold up the maintenance brace.

▶ Slowly tilt the loading bridge onto the U-type support arm (Pic. 33 /3).

The U-type support arm must safely rest on the lateral bracing (Pic. 33 /4).

The loading bridge has been mechanically secured against falling down.



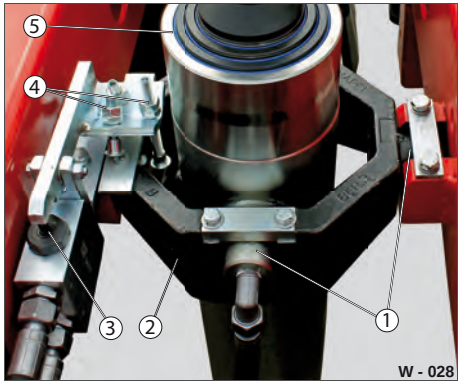
Pic. 34 Telescopic cylinder

1 Upper ball mounting
2 Cylinder, extended
3 Lower pivot mounting

▶ Check all the cylinder (Pic. 34 /2) for tightness (oil loss) and firm connection.

▶ Clean off any oil that may have leaked from the hydraulic components.

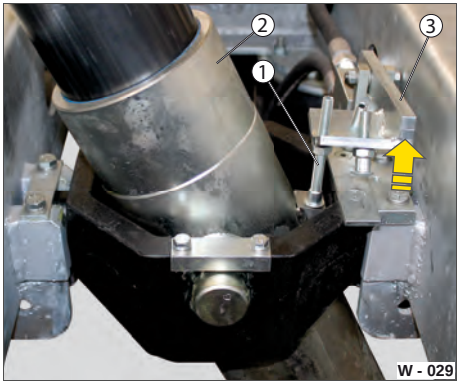
▶ Check the upper mounting (Pic. 34 /1) and the lower mounting (Pic. 34 /3).



Pic. 35 Lower mounting

1 Pivot
2 Slew ring
3 Lift limitation valve
4 Lifting adjustment screws
5 Cylinder stage scrapers

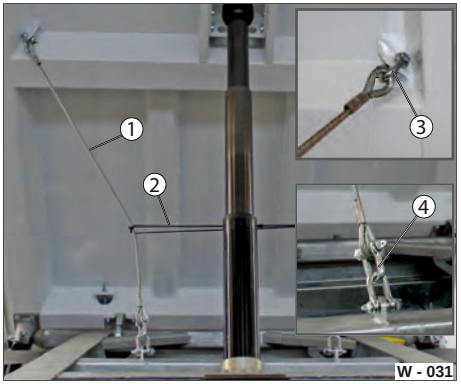
- ▶ Clean the mounting points at the slewing ring (Pic. 35 /2).
- ▶ Visually inspect the mounting for deformation, crack formation.
- ▶ Lubricate the bearing pins (Pic. 35 /1).
- ▶ Wipe off excess grease.
- ▶ Check the cylinder stage scrapers (Pic. 35 /5) for tightness.



Pic. 36 Loading bridge tipped to the rear

1 Adjustment screw
2 Cylinder, extended
3 Lifting off-switch

- ▶ Tilt the loading bridge until the lift limitation valve (Pic. 35 /3) switches off.
- ▶ Check the function of the adjustment screw (Pic. 36 /1) and the lift off-switch (Pic. 36 /3).

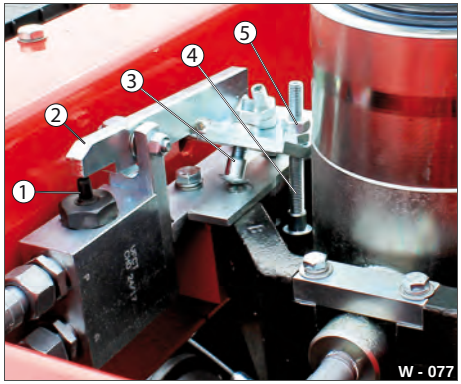


Pic. 37 Loading bridge secured

1 Securing cord
2 Elastic cable
3 Top fastener
4 Bottom fastener

- ▶ Check that the securing cables (Pic. 37 /1) are not pulled tight.

  The expander cable (Pic. 37 /2) holds both securing cables.
- ▶ Check the fasteners at the top (Pic. 37 /3) and bottom (Pic. 37 /4).
- ▶ Exchange damaged / ragged securing cables.

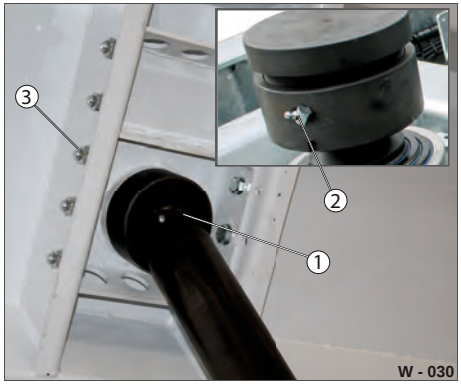


Pic. 38 Loading bridge secured

1 Lift limitation valve
2 Lifting off-switch
3 Adjustment screw, tilting sideways
4 Adjustment screw, tilting towards the rear
5 Counter-nuts

The lift limitation valve is factory-set to a tilting angle of approx. 50°. Unauthorised adjustment of the stroke limitation is not permitted!

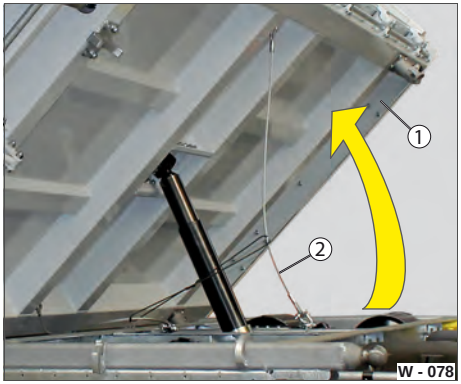
- ▶ Check that the adjustment screws (Pic. 38 /3 and Pic. 38 /4) are tight.
- ▶ Fasten the nuts as required and counter them with counter-nuts (Pic. 38 /5).



Pic. 39 Upper mounting

1 Ball
2 Grease nipple
3 Screw connection

- ▶ Visually inspect the upper mounting for deformation, crack formation.
- ▶ Tighten the screw connections (Pic. 39 /3) as required.
- ▶ Lubricate the ball (Pic. 39 /1) at the grease nipple (Pic. 39 /2).
- ▶ Wipe off excess grease.

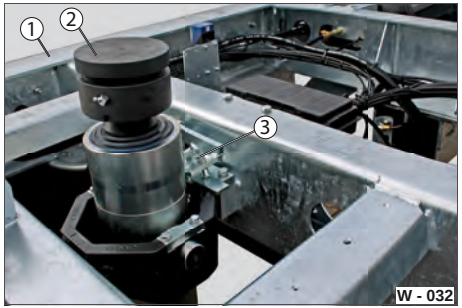


Pic. 40 Loading bridge tipped to the side

1 Loading bridge
2 Securing cord

- ▶ Tilt the loading bridge down (Pic. 40 /1) towards the right and then towards the left.
- ▶ Check the appropriate function of the telescopic cylinder and the switch-off function.
- ▶ Check that the securing cable (Pic. 40 /2) is not pulled tight.

Switch-off / securing mechanisms

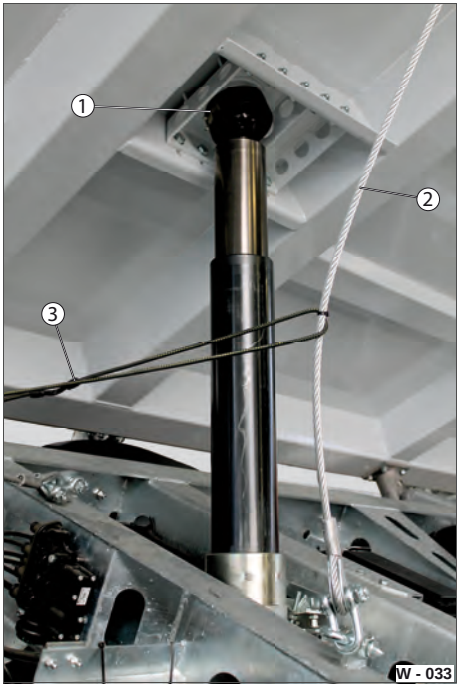


Pic. 41 Chassis without loading bridge

1 Chassis
2 Loading bridge ball mounting
3 Switch-off function

The switch-off function (Pic. 41 /3) must be checked and readjusted as required if the loading bridge was independently installed by the superstructure manufacturer.

Maintenance and repair work on the switch-off and securing mechanisms may only be carried out by trained and qualified personnel!



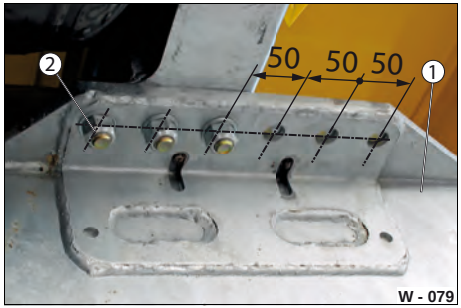
Pic. 42 Lateral tilting position

1 Loading bridge ball mounting
2 Securing cord
3 Elastic cable

The loading bridge must be secured with a maintenance brace before carrying out maintenance / repair work.

- ▶ Tip the loading bridge to the right / left and to the rear.
- ▶ Check that the lifting of the loading bridge is stopped by the lift limitation valve.
  The securing cord (Pic. 42 /2) may not be used to limit the stroke of the loading bridge.
- ▶ Check that the cylinder does not push against the top ball mounting (Pic. 42 /1) of the loading bridge.
- ▶ Ensure that the securing cables are guided and cannot get tangled, e.g. by using an expander cable (Pic. 42 /3).

Adjusting the tubular drawbar



Pic. 43 Front connection

1 Tubular drawbar ZR8
2 Screw connection M16

Permitted screw connections are ratchet screws sized:

12 x M16 ratchet screws,
with M16 nuts (strength 10.9)

▶ Check that the screw connections (Pic. 43 /2) are approved and not damaged.

Pic. 44 Rear connection

1 Screw connection M16 (10,9)

▶ Fasten the screw connections (Pic. 44 /1) after adjusting the tubular drawbar (Pic. 43 /1) with the following fastening torques:
M16: 320±10 Nm

▶ Check that the supply lines have not been damaged.

▶ Check the stability and functionality of the tubular drawbar.

DANGER

Inappropriate screw connections used

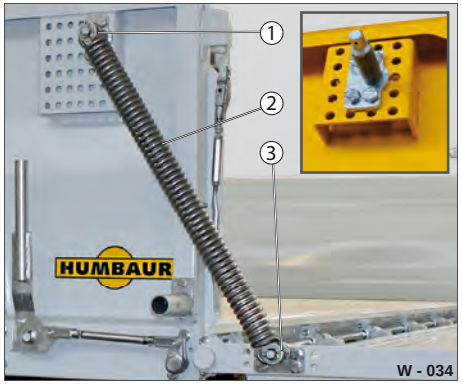
The tubular drawbar may come loose / break - accident risk!

▶ Only use the prescribed screws / nuts and the required number of screws.

▶ Replace corroded / defective connecting elements.

After adjusting the tubular drawbar, the operator is responsible for ensuring stability and appropriate use!
The structure of the tubular drawbar may not be changed (e.g. by drilling, welding)!

Adjusting the drop side lifting spring

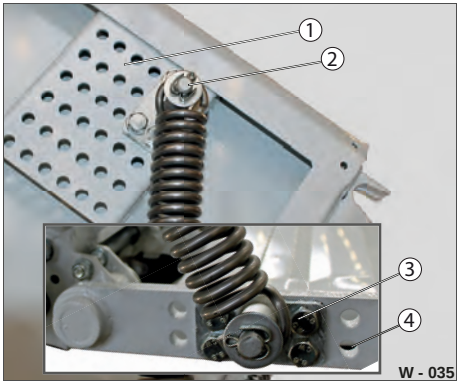


Pic. 45 Lifting spring tightened

1 Front wall, top connection
2 Tension spring
3 Drop side, bottom connection

The tractive force and the pretensioning of the lifting spring must be set as a function of the intensity of use of the drop sides.

▶ Check that the drop sides can be easily lifted / closed.



Pic. 46 Upper / lower connection

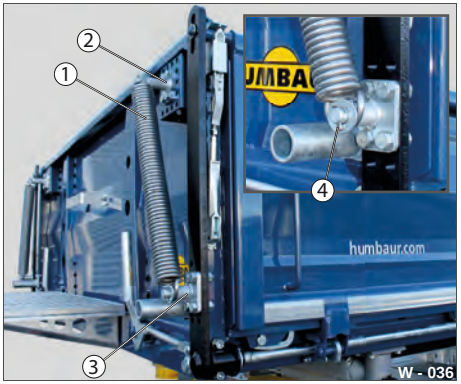
1 Plate with holes
2 Bolt with split pin / disk
3 Screw connection
4 Holes

The drop side must be secured against falling down before adjusting the lifting spring!

▶ Loosen the split pin / disk at the bolt (Pic. 46 /2).

▶ Loosen the upper connection (Pic. 45 /1) and the lower connection (Pic. 45 /3).

▶ Unhook the lifting spring.



Pic. 47 Drop side closed

1 Tension spring
2 Upper holder
3 Lower holder
4 Split pin / disk

▶ Move the holders in the holes of the plate (Pic. 46 /1).

▶ Tighten the holder using the screw connection (Pic. 46 /3).

▶ Insert the tension spring (Pic. 47 /1).

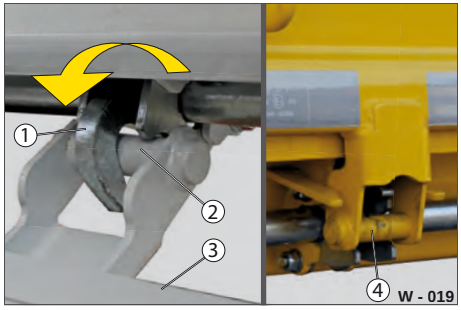
▶ Secure the tension spring with disk and split pin (Pic. 47 /4).

▶ Check the function of the tension spring.

Adjusting the central locking mechanism

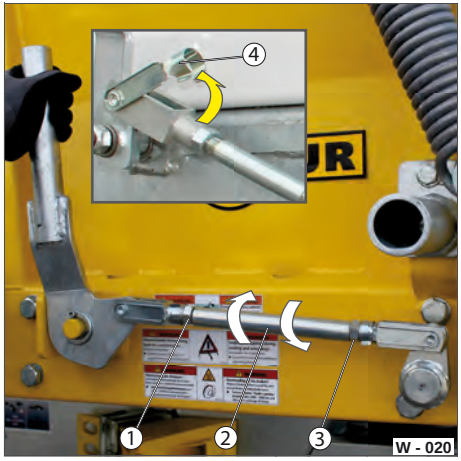
Pic. 48 Check the central locking mechanism

1 Clevis mounting on the lever
2 Rods
3 Counter-nut
4 Clevis mounting on the rotary linkage



Pic. 49 Locking points

1 Hook, locked
2 Bolt, secured
3 Drop side
4 Bolt, unlocked



Pic. 50 Adjust the central locking system

1 Counter-nut
2 Transmission linkage
3 Counter-nut
4 Clevis mounting bracket latch

▶ Unlock the respective drop side by using the central locking function - push the lever fully down.

The drop side is in swivel mode.

▶ Check that all locking points (Pic. 49) lock and unlock completely.

▶ Release the two counter nuts (Pic. 50 /1 & Pic. 50 /3) at the transmission linkage (Pic. 50 /2).

▶ Unhook the clevis (Pic. 48 /1 and Pic. 48 /4) as required.

▶ Turn the transmission linkage clockwise or counter-clockwise.

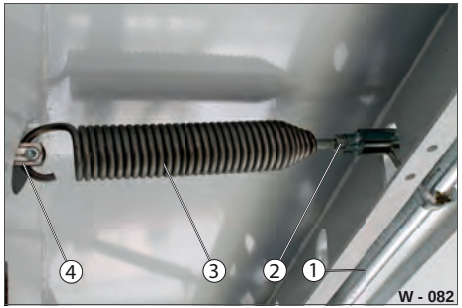
The transmission linkage tightens or releases the central locking mechanism.

▶ Fasten the clevis mountings with the bracket latch (Pic. 50 /4).

▶ Check the adjustment by operating the lever.

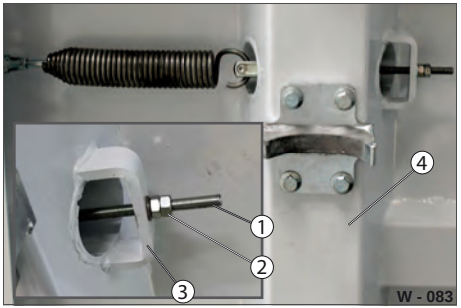
▶ Firmly tighten the counter nuts (Pic. 50 /1 & Pic. 50 /3).

Adjusting the tailgate tension springs



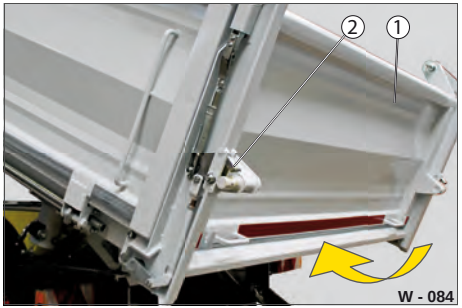
Pic. 51 Checking the tailgate

1 Rods
2 Clevis mounting on the linkage
3 Tension spring
4 Clevis mounting on the loading bridge



Pic. 52 Readjust the tension spring

1 Threaded rod
2 Nut with counter nut
3 Plate
4 Loading bridge



Pic. 53 Checking the tailgate

1 Tailgate, pulled close
2 Looking hooks, unlocked

While tilting back, the tailgate is pulled towards the loading bridge by two tension springs (Pic. 51 /3). The locking hooks (Pic. 53 /2) are held in the unlocked position.

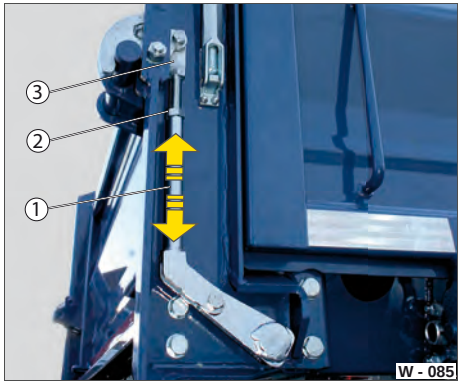
▶ Tilt the loading bridge down (Pic. 52 /4) at the rear.
The tailgate is automatically unlocked.

The tension springs can be retightened when the tension has decreased.
Evenly retighten the two tension springs.

▶ Release the counter-nut (Pic. 52 /2).
▶ Tighten the nut, so that the tension spring is tightened.
▶ Counter the nut.

▶ Tilt the loading bridge backwards.
The rear drop side (Pic. 53 /1) is pulled up to the loading bridge.
▶ Check that the automated locking of the looking hooks (Pic. 53 /2) works appropriately.

Setting the tailgate locking / unlocking mechanics

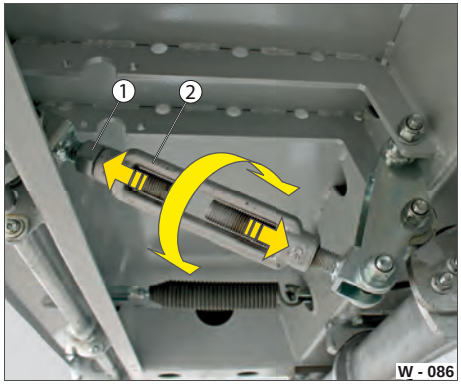


Pic. 54 Mechanics, vertical

1 Linkage, vertical
2 Counter-nut
3 Clevis mounting with thread

The locking / unlocking mechanics of the tailgate can be readjusted.

- ▶ Release the counter-nut (Pic. 54 /2).
- ▶ Re-adjust the clevis mounting with thread (Pic. 54 /3).
- ▶ Secure the linkage (Pic. 54 /1) with the counter nut.



Pic. 55 Mechanics, horizontal

1 Counter-nut
2 Turnbuckle

The locking / unlocking mechanics of the tailgate can be readjusted.

- ▶ Release the counter-nut (Pic. 55 /1).
- ▶ Adjust the turnbuckle (Pic. 55 /2).
- ▶ Counter the turnbuckle with the counter nut.

Pic. 56 Check the locking / unlocking mechanism

1 Hook
2 Bolt

- ▶ Check the function of the rear drop side locking / unlocking mechanism.
- ▶ Tilt the loading bridge several times down and back and observe the movement of the hooks (Pic. 56 /1).
- ▶ Ensure that the hooks on the right and left side fully enclose the bolts (Pic. 56 /2).

Tyre types

Pic. 57 Wheel/tyre combination

1 Rim (22.5 x 11,75 / 10-hole)
2 Wheels (after selecting the manufacturer: e.g. Continental HTC 160 K / Michelin 160J XYZ)
3 Axle: BPW
4 Axle: SAF

			Tyre pressure in bar (psi) / maximum load (kg)										
Type	Carrying capacity (index)	Tyres	6.50 (94)	6.75 (98)	7.00 (102)	7.25 (105)	7.50 (109)	7.75 (112)	8.00 (116)	8.25 (120)	8.50 (123)	8.75 (127)	9.00 (131)
385/65 R22.5	160	Single	6940	7150	7370	7580	7780	7990	8200	8400	8600	8800	9000
425/65 R22.5	160	Single	8310	8562	8815	9065	9315	9560	9810	10055	10300		

Tab. 5 Tyre pressure / max. load

Tyre pressure / wheel profile

Only have the tyre installation performed by qualified, specialist personnel!

WARNING

Driving with worn tyre profile / wrong tyre pressure

The tyres might burst during the ride - accident risk!

- ▶ Perform regular controls of the tyres.
- ▶ Check the tyre pressure, the profile depth and the state of the tyres.

NOTICE

Driving with incorrect tyre pressure

The tyres wear unusually fast.

- ▶ Check before starting to drive or at least every 14 days that the tyres have the correct tyre pressure.
- ▶ Regularly check the tyre pressure (see Page 185) of all wheels. Perform the air pressure check when the tyres are cold (before driving or after a prolonged driving break).
- ▶ The correct tyre pressure can be found in the tyre type table (see from page **185**) for the tyres of your trailer. Please contact the tyre manufacturer if your tyre type is not listed.
- ▶ Fill the spare wheel with the highest tyre pressure that is used for the trailer.
- ▶ Check the tyre profile depth in the central circumference area of the tyre (in Germany, at least 1.6 mm is prescribed).
- ▶ Check the entire circumference of the tyre. Take note of incipient cracks and alien objects. Recommendation: All tyres should be replaced after 6 years of use.

Wheel nuts

WARNING

Wheel nuts may come loose

Wheels may fall off while driving, posing an accident risk!

Wheel nuts that were fastened with too high fastening torque may break and result in a loss of the wheel.

- ▶ Regularly check the wheel nuts for tightness.
- ▶ Generally retighten the wheel nuts: after the first hour of operation (50 km), after the first drive under load (max. 500 km) as well as after the first 5,000 km and thereafter every 100 operating hours.
- ▶ Always retighten the wheel nuts of new or freshly painted rims every 20 to 100 operating hours.
- ▶ Fasten the wheel nuts in a crosswise pattern.
- ▶ Take note of the fastening torques prescribed b the axle manufacturers (see page **163**).

Changing the wheels

DANGER

Lack of attention on the road

You may obstruct the flow of traffic when exchanging a wheel - accident risk!

Driving vehicles might hit you!

- ▶ Secure your place in road traffic.
- ▶ Position a warning triangle.
- ▶ Use  .
- ▶ Use  ,  .

WARNING

Unsecured wheels

Unsecured wheels may roll off - accident risk!

People may be caught and dragged along.

- ▶ Secure the detached wheels against rolling off.
- ▶ Ensure that traffic flow is not obstructed.

WARNING

Unsecured trailer

The trailer could start moving and tip over - accident risk!

People could be struck by the trailer and run over.

The trailer might slide off the lifting device and fall down - risk of crushing!

- ▶ Use wheel chocks to secure the trailer from rolling off before uncoupling it.
- ▶ Only use approved lifting devices when working on the trailer.
- ▶ Check that the trailer is standing on level and firm ground before changing a wheel.

CAUTION

Hot brakes

During the wheel change, you may get burned on hot brake disks / brake drums.

- ▶ Always leave the brakes to cool down before exchanging a wheel.

Consider this when exchanging wheels:

Pic. 58 Wheels / tyres

1 Technical data

- Only use the approved rim and tyre sizes
- Take note of the prescribed tyre load capacity and speed index
- Take note of the direction of rotation of the wheels
- The tyre pairs of tandem wheels should have the same profile depth
- Check the tyre pressure after a wheel change
- Replace damaged wheel bolts
- Tighten the wheel nuts
(see page **163** & **186**)

Securing the trailer

Pic. 59 Securing the vehicle

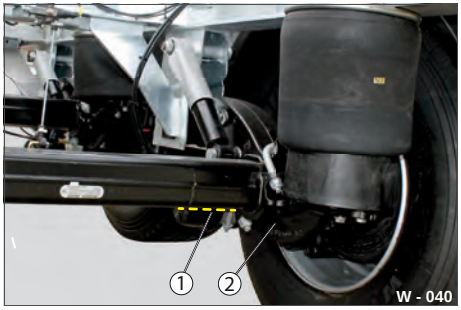
1 Wheel chocks

▶ Activate the parking brake of the towing vehicle.

▶ Apply the operating brake of the trailer.

▶ In addition, secure the trailer against rolling by using the wheel chocks (Pic. 59 /1).

Positioning the lifting device



Pic. 60 Positioning the lifting device

1 Axle tube, area for the lifting device
2 Axle suspension

▶ Place the lifting device onto firm ground or use a firm support surface for that purpose.

▶ Position the lifting device as far outside as possible, in the area below the axle tube intended for the lifting device (Pic. 60 /1).

▶  Details of the lifting points can be found in the operating / maintenance instructions of the respective axle assemble manufacturer when required.

Exchanging a faulty wheel

- ▶ Prepare the spare wheel.
- ▶ Remove the nuts of the faulty wheel.
- ▶ Carefully pull the wheel off the axle.
- ▶ Carefully place the spare wheel onto the axle - without damaging the wheel bolts - and screw it hand-tight, using the same nuts.
- ▶ Tighten the nuts - preferably crosswise - using a torque spanner. - Adhere to the fastening torque prescribed!
- ▶ Carefully lower the trailer.
- ▶ Safely store the faulty wheel on the cargo bed.

  or
- ▶ Attach the faulty wheel to the spare wheel holder.
- ▶ Safely store the tools / auxiliary materials / lifting device.

Spare wheel storage

Take note of the following regulations, safety rules and principles during the maintenance and inspection of spare wheel mountings:

- – "Road Traffic Ordinance" (StVO).
- – Accident Prevention Regulations "Vehicles" (BGV 12).
- – Technology: Principles for the inspection of vehicles by the driving personnel (BGG 915) and (AH 1/282.1).

Preparing a spare wheel

▶  Get help from another person - wheels are heavy!

Aluminium disc wheels

Lubricants for hubs

Aluminium disc wheels are only permitted for the centring mechanism.

Released lubricants:

– "Freylube"
– "Rocol MG"
– "Esso (Moly)" or
– similar lubricants

These greases prevent the wheel and hub from sticking together. The surfaces of hub and wheel must be smooth, even and clean.

No conical or ball nuts may be used.

Only install the nickel- or chromium-plated valves that have been supplied.

▶ Only coat the hubs with approved lubricants during wheel changes.

Fasteners, cables, cable clamps

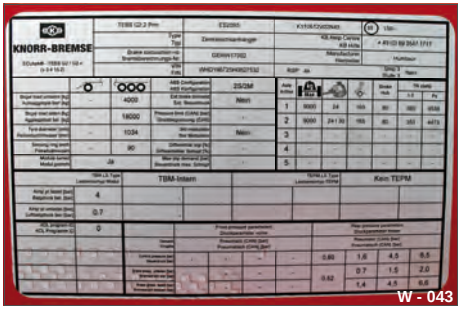
▶ Thoroughly clean dirty trailers.
▶ Remove corrosion areas on the fasteners.
▶ Check the plug-in contacts of the electrical connections.
▶ Replace damaged cables and cable ties.
▶ Exchange hydraulic hoses every 6 years.

Brakes are safety components!

- Take note of the German Road Traffic Licensing Regulations (StVZO).
- Ensure that main inspections are only performed in approved workshops.
- Ensure that the brake system is regularly inspected and maintained.
- Ensure that work on the brake systems is only performed by qualified specialist personnel with special knowledge and experience.
- Ensure that faults in the brake system are immediately repaired by a brake service workshop.
- Do not change the settings of the brake valves made at the manufacturing plant.
- Only use approved brake linings as replacements.

Pic. 61 Manufacturer documentation

Technical and setting / maintenance information for the brake system components is provided in the manufacturer documentation.



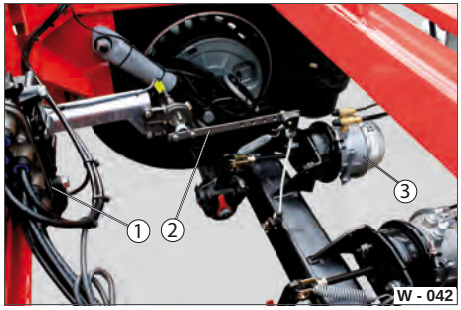
Pic. 62 Brake name plate "KNORR"

The technical data are provided on the brake name plate (Pic. 62) of the brake manufacturer.

The adjustment of the brake system is performed at the factory.

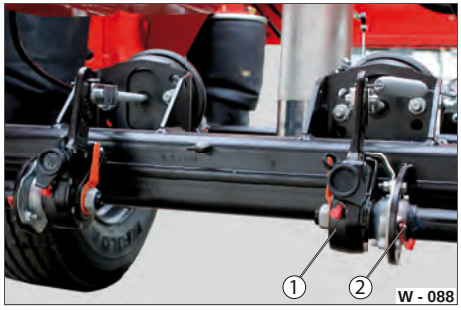
Changes of the settings may only be performed by qualified specialist staff!

Adjusting / maintaining the brake linings



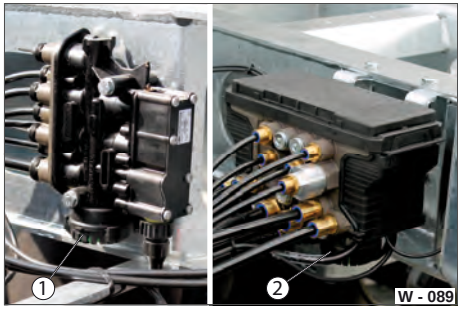
Pic. 63 Adjusting the air suspension valve

1 Electronic air suspension valve
2 Transmission linkage
3 Brake cylinder



Pic. 64 Lubricate the braking system

1 Transmission unit
2 Grease nipple



Pic. 65 Clean the shock absorbers / filters

1 Air suspension valve silencer
2 TEBS modulator silencer

▶ Check the function of the air suspension valve (Pic. 63 /1).

▶ Check the transmission linkage (Pic. 63 /2) for deformation.

▶ Check the brake cylinder (Pic. 63 /3) for function and deformation.

▶ Lubricate transmission linkage (Pic. 64 /1) at the grease nipples Pic. 64 /2).

▶ Clean the silencers (Pic. 65 /1) of the air suspension valve.

▶ Clean the silencers (Pic. 65 /2) of the modulator.

Exchanging the brake linings

Pic. 66 Exchanging the brake linings

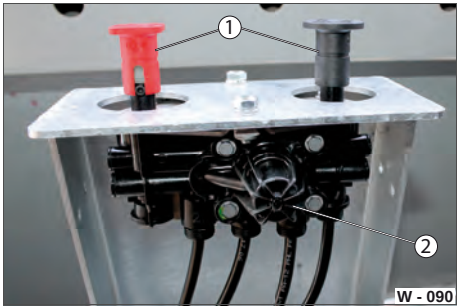
Maintenance and repair work for wheel brakes are described in the manufacturer documentation for the respective axle.

Brake linings used for a brake lining exchange may only be either identical to brake linings used for the initial equipment or brake linings that are permitted according to the design documentation of the brake system.

The operating permit expires when different brake linings are used.

Warranty claims against the brake and trailer manufacturer are invalidated as well.

Cleaning the compressed air filter



Pic. 67 Compressed air filter

1 Manoeuvring / parking brake valves
2 Filter

▶ Clean the filter (Pic. 67 /2) for the manoeuvring and parking brake valves (Pic. 67 /1).

Compressed air system

WARNING

Condensed water in the compressed air system

The brake system may become faulty or fail.

▶ Regularly drain the compressed air system.

CAUTION

Exuding compressed air

Considerable noise is generated when the drainage valve is activated.

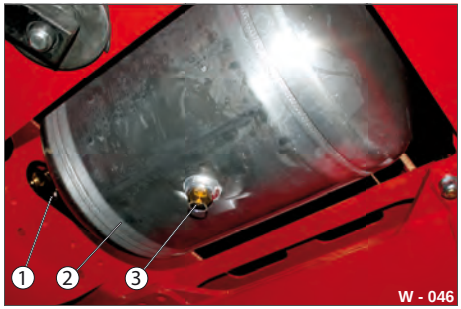
This leads to tinnitus and hearing damage.

▶ Use  .

No manual drainage / bleeding is required for automatic drainage valves.

The maintenance work listed below is to be performed before starting a drive.

Compressed air container



Pic. 68 Chassis bottom

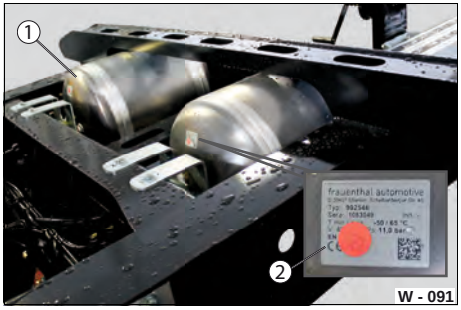
1 Screw connections, Hoses / pipes
2 Compressed air vessel, aluminium
3 Drainage valve (manual)

Trailers with manual drainage valves require the containers to be regularly drained and leaking drainage valves to be exchanged.

▶ Check the screw connections (Pic. 68 /1) for tightness.

▶ Tighten leaking screw connections or replace them.

▶ Have damaged hoses or pipes renewed.



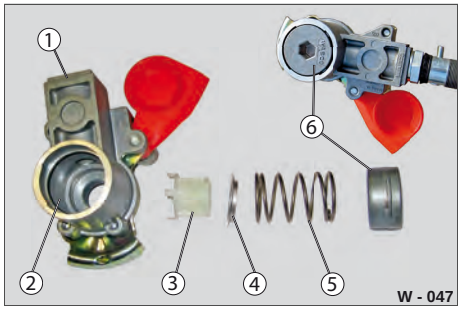
Pic. 69 Pressure vessel arrangement

1 Pressure vessel, placed in front
2 Manufacturer name plate

▶ Inspect the compressed air vessel (Pic. 69 /1) for tightness/ deformation.

▶ Have leaking compressed air vessels exchanged - see manufacturer name plate (Pic. 69 /2).

Cleaning the coupling heads



Pic. 70 Coupling head, dismantled

1 Housing
2 Seal
3 Filter
4 Metal ring
5 Spring
6 Lid

The "brake reserve" coupling heats with filter insert must be regularly cleaned (see page **162**).

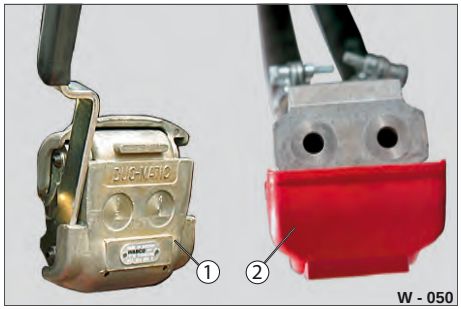
Disassembly

- ▶ Use an Allen key to press the lid (Pic. 70 /6) into the housing (Pic. 70 /1) up to the limit stop. Turn the Allen key by 90°.
  The lid opens.
- ▶ Take the spring (Pic. 70 /5), the metal ring (Pic. 70 /4) and the filter (Pic. 70 /3) out of the housing.
- ▶ Clean the housing with a clean, dry cloth.
- ▶ Clean the filter.
  Replace the filter if it is very dirty or damaged.
- ▶ Check the seal (Pic. 70 /2) for damage, presence.
  Replace damaged seals.
- ▶ Grease the seal with a little grease.

Assembly

- ▶ Insert the metal ring with the edge facing downwards into the spring.
- ▶ Insert the filter with the filter body facing downwards into the spring.
- ▶ Place the spring into the housing.
- ▶ Use an Allen key to press the lid downwards up to the limit stop. Turn the Allen key by 90°.
  The coupling head is ready to use.

Cleaning the Duo-Matic coupling



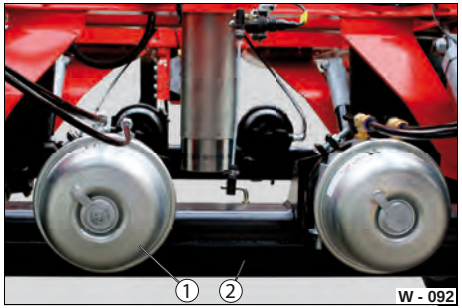
Pic. 71 Coupling head, dismantled

1 Coupling (socket)
2 Coupling (head)

The "brake reserve" Duo-Matic coupling must be regularly cleaned (see page **162**).

- ▶ Clean the sealing surfaces of the coupling head (Pic. 71 /2) and the coupling socket (Pic. 71 /1) with a clean, dry cloth.
- ▶ Replace the coupling head if it is damaged.

Activating the emergency release device



Pic. 72 Membrane brake cylinder

1 Accumulator parking brake
2 Rear axle

The membrane brake cylinders with accumulator parking brake (Pic. 72 /1) are installed on the rear axle (Pic. 72 /2).

In the event of a pressure failure, the pre-tensioned spring is released, which initiates automatic braking.

The accumulator brake membrane cylinders can be manually released (emergency release device) for repair purposes.

WARNING

Activated emergency release device

The braking system of the trailer is out of action when the emergency release device has been activated.

People could be struck by the trailer and run over.

- ▶ Carefully secure the trailer against rolling by using the wheel chocks.
- ▶ Activate the emergency release device only on even ground.

WARNING

Unbraked trailer

The braking system of the trailer is out of action when the emergency release device has been activated.

The brakes of the traction unit are not sufficient to stop the vehicle combination.

- ▶ Move a loaded trailer at most at walking speed (4 km/h).

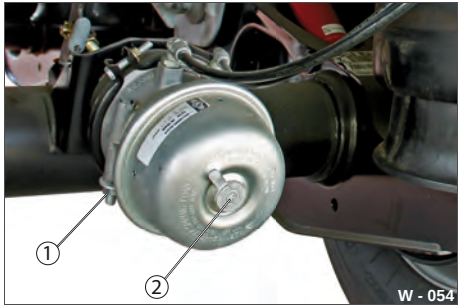
CAUTION

The pre-tensioned spring is under pressure

The pre-tensioned spring may be flung out when the accumulator brake membrane cylinder is opened - risk of being hit!

- ▶ Only have repairs to the spring-loaded membrane cylinder performed by Humbaur GmbH or an authorised workshop.

Emergency release device



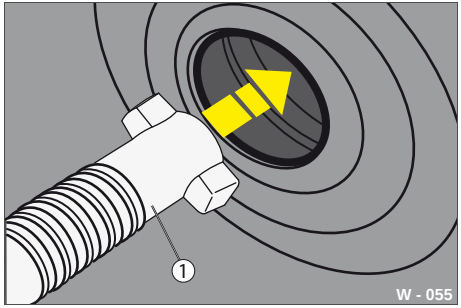
Pic. 73 Accumulator brake membrane cylinder

1 Release screw, parked
2 Sealing cap (hole)

In driving mode, the release screw (Pic. 73 /1) is attached to a mounting intended for that purpose.

The sealing cap (Pic. 73 /2) closes the hole in the lid of the accumulator brake membrane cylinder.

Releasing the parking brake

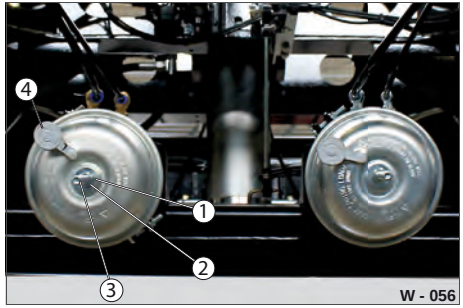


Pic. 74 "Keyhole"

1 Release screw

- ▶ Insert the release screw (Pic. 74 /1) through the hole in the lid into the "keyhole".
- ▶ Turn the release screw by 90°.
- ▶ Slide on the washer (Pic. 75 /1).
- ▶ Turn the hexagonal nut (Pic. 75 /2) onto the release screw (Pic. 75 /3).
- ▶ Turn it further, so that the release screw is pulled outwards.

Deactivate the emergency release function



Pic. 75 Release the spring

1 Washer
2 Hexagonal nut
3 Release screw
4 Sealing cap

- ▶ Remove the hexagonal nut (Pic. 75 /2) by turning it.
- ▶ Remove the washer (Pic. 75 /1).
- ▶ Turn the release screw (Pic. 75 /3) by 90° and remove it.
- ▶ Attach the loosening screw to the membrane cylinder in the mounting intended for that purpose (see Pic. 73).
- ▶ Close the hole with the sealing cap (Pic. 73 /2).

CAUTION

Short-circuits in the electrical system

Persons may suffer burns.

Short-circuits may set the trailer alight.

Observe the following points before working on the electrical system:

- ▶ Loosen all plug-type connections to the towing vehicle.
- ▶  Loosen all plug-type connections to external power supplies.
- ▶ Switch off all power consumers.
- ▶ Detach the minus pole (-) of the battery.
  Use insulated tools.
- ▶ Have all work on electrical installations carried out by qualified specialist staff.

NOTICE

Pollution during the installation

Electrical elements, lights may be polluted during the installation by touching them with bare hands or in a dirty environment.

Contacts may be destroyed.

- ▶ Perform work on the electrical system only in areas protected against the environment - protection against wetness.
- ▶  Do not touch new bulbs with bare hands - as this would significantly shorten their life spans.
- ▶ Use clean gloves or a clean, soft cloth to touch the lights / bulbs or use the light packaging for that purpose.

Lighting allocation plan

WARNING

Insufficient lighting

Increased accident risk due to failure of vehicle lighting.

- ▶ Check before starting to drive:
  1. Tail lights,
  2. Licence plate lights,
  3. Side marker lights,
  4. Position lamps.
- ▶ Exchange faulty bulbs.
  Use bulbs of the same type and same power as shown in the following tables.

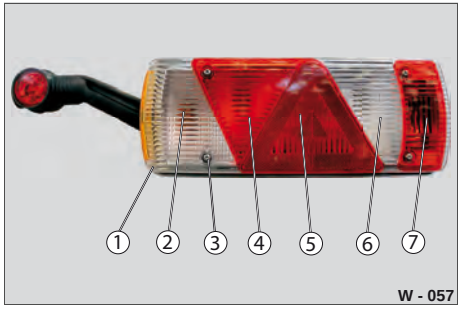
Lights

Function	DIN / type	Socket	Power (W)
Side marker lights / reflector light (orange)		LED	12 V = 0.5 / 24 V = 1.1
Position lamp (white)		LED	12 V = 0.6 / 24 V = 1.3
Tail lights "24 V - standard"			
Indicator light	P21W	Ba15s	21
brake light	P21W	Ba15s	21
2 x tail light	R10W	Ba15s	10
Reversing light	P21W	Ba15s	21
Rear fog light	P21W	Ba15s	21
Side / tracking light (red/white/yellow)	R5W	Ba9s	5
Tail lights "LED"			
Rear fog and reversing light		LED	
Tail light with reflector, brake and indicator light		LED	
Side / tracking light		LED	12 V = 0.6 / 24 V = 1.2
Licence plate light "LED	W 52	LED	12 V = 0.4 / 24 V = 0.7
Licence plate light "Standard	Soffitte		5

Tab. 6 Light type

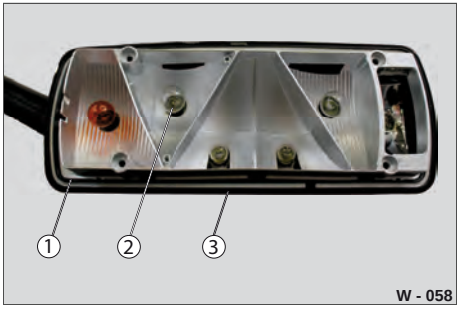
Exchanging light bulbs

Tail light "24 V - standard"



Pic. 76 Tail light components

1 Outer lens
2 Rear fog light
3 4x fastening bolts
4 Reversing light
5 Tail light with reflector
6 brake light
7 Indicator light



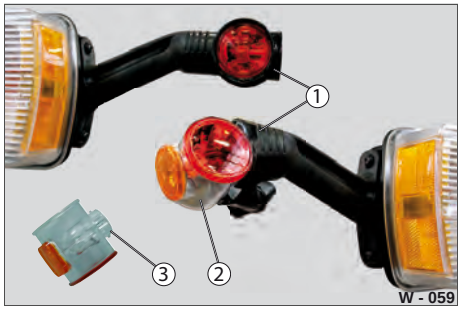
Pic. 77 Tail light, opened

1 Seal
2 Bulb
3 Housing

The electrical system must be switched off before performing any work.

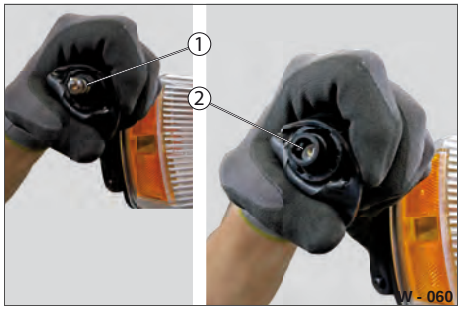
- ▶ Remove the 4 fastening screws (Pic. 76 /3).
- ▶ Remove the outer lens (Pic. 76 /1). Deposit it in a safe place.
- ▶ Clean the inside of the housing as required.
- ▶ Clean the contacts.
- ▶ Remove the faulty bulb.
- ▶ Insert the new bulb.
- ▶ Check that the bulb is firmly connected.
- ▶ Place the outer lens tightly onto the housing (Pic. 77 /3).
- ▶ Ensure that the seal (Pic. 77 /1) fits correctly.
  Replace damaged / torn seals.
- ▶ Tighten the fastening screws (Pic. 76 /3).
  Tighten the screws with max. 1.5 Nm fastening torque.
  Cracked discs must be replaced!
- ▶ Check the connections / cable connections.

Side light



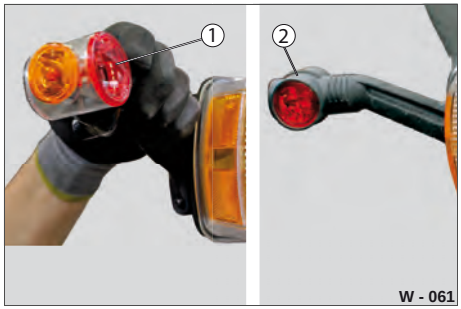
Pic. 78 Remove the rubber sleeve

1 Rubber sleeve coating
2 Light fixture
3 Screw connection



Pic. 79 Replacing the bulb

1 Bulb
2 Socket



Pic. 80 Pull on the rubber sleeve

1 Light fixture
2 Rubber sleeve coating

▶ Generously spray the rubber sleeve cover (Pic. 78 /1) with silicone spray - to make it easier to remove or fit it.

▶ Pull the rubber sleeve coating (Pic. 78 /1) off the light fixture (Pic. 78 /2) using a flat screw driver.

▶ Release the screw connection (Pic. 78 /3) and pull off the light fixture (Pic. 78 /2).

▶ Remove the faulty bulb (Pic. 79 /1).

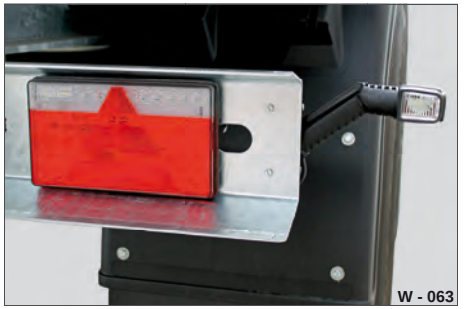
▶ Insert the new bulb.

▶ Fasten the light fixture (Pic. 80 /1) using the screw connection (Pic. 78 /3).
Ensure that the seal fits correctly.

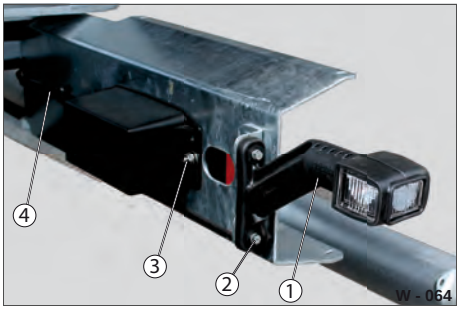
▶ Pull the rubber sleeve (Pic. 80 /2) over the light fixture.

▶ Check the side light for damage.
Damaged side lights must be completely exchanged.

Tail light "LED"



Pic. 81 Tail light "LED" 12 V



Pic. 82 Rear lights, fastening

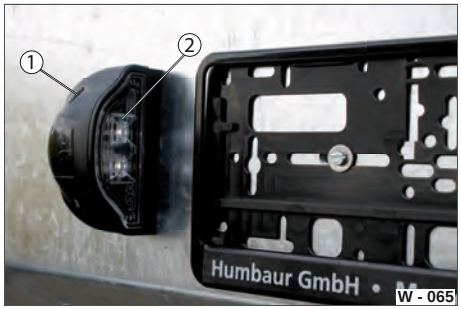
1 Trunk
2 Screw connection, trunk
3 Screw connection, tail light
4 Connection cable

The LED light fixtures must be completely replaced if they are faulty.

▶ Only replace the tail lights with genuine manufacturer spare parts. The type is marked on the lights.

▶ Loose the relevant screw connection (Pic. 82).
▶ Separate the connection cable (Pic. 82 /4).
▶ Insert the new LED light.
▶ Connect the connection cable.
▶ Tighten up the screw connection.
▶ Check the function of the LED light.

Licence plate light "LED"



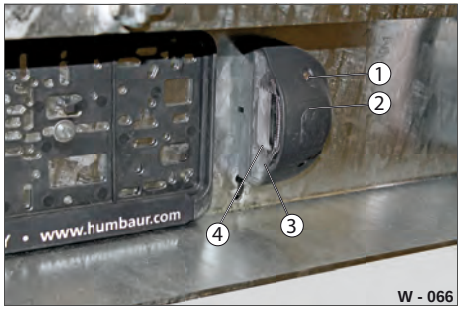
Pic. 83 Number plate light

1 Fastening screw
2 LED light

A faulty LED light must be completely replaced.

- ▶ Release the fastening screws (Pic. 83 /1).
- ▶ Detach the connection cable with plug-in connector.
- ▶ Replace the complete LED light (Pic. 83 /2).
- ▶ Attach the new LED lights with fastening screws / nuts.
- ▶ Connect the connection cable.

Licence plate light "Standard



Pic. 84 Number plate light 24 V

1 Fastening screw
2 Housing
3 Lens
4 Light (Soffite)

- ▶ Release the fastening screws (Pic. 84 /1).
- ▶ Open the housing (Pic. 84 /2).
- ▶ Remove the lens (Pic. 84 /3).
- ▶ Replace the light (Pic. 84 /4).
- ▶ Insert the lens.
- ▶ Replace the housing.
- ▶ Tighten the fastening screws.

Side marker lights

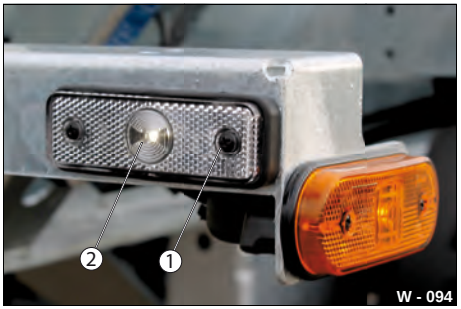
Pic. 85 Marker light, side

1 Fastening screw
2 LED light (orange)

A faulty LED light must be completely replaced.

- ▶ Unplug the plug connection.
- ▶ Release the fastening screws (Pic. 85 /1).
- ▶ Remove the LED light (Pic. 85 /2) - unplug the connection.
- ▶ Insert the new LED light.
- ▶ Connect the electrical connector.
- ▶ Tighten the fastening screws - but not too tightly.

Position lamps



Pic. 86 Position lamp, front

1 Fastening screw
2 LED light (white)

A faulty LED light must be completely replaced.

- ▶ Unplug the plug connection.
- ▶ Release the fastening screws (Pic. 86 /1).
- ▶ Remove the LED light (Pic. 86 /2) - unplug the connection.
- ▶ Insert the new LED light.
- ▶ Connect the electrical connector.
- ▶ Tighten the fastening screws - but not too tightly.

Reversing lights

Pic. 87 Light, rear

1 Fastening screw
2 LED light (white)

A faulty LED light must be completely replaced.

- ▶ Unplug the plug connection.
- ▶ Release the fastening screw (Pic. 87 /1).
- ▶ Remove the LED light (Pic. 87 /2) - unplug the connection.
- ▶ Insert the new LED light.
- ▶ Connect the electrical connector.
- ▶ Tighten the fastening screw.

Lettering work

Pic. 88 Lettering

HUMBAUR trailers and superstructures are painted with air-drying 2K acrylic lacquers.

The hardening of these lacquers depends on the environmental temperature and may take several months at low temperatures.
The lacquers are not fully wear resistant during this hardening time.

We therefore recommend to avoid the use of high-pressure cleaning devices or steam nozzles for cleaning the trailer.

The following has to be considered during lettering work to prevent damage to the lacquer:

– Fresh paint coats must dry for at least 48 hours at +20 °C to be sufficiently hardened, so that the auxiliary films and tapes can subsequently be pulled off without leaving markings on the lacquer surface (do not use corrosive adhesive films that form a permanent connection with the lacquer surface).
– Trailers that were already exposed to humidity (snow, rain, fog) must be dried in a temperature-controlled hall (20 °C) for at least 24 hours before any type of lettering is performed.
In icy weather, the drying period must be extended until the trailer has reached the temperature of the hall.

These processing guidelines and instructions are not material-specific, but apply in general.

Requirement

Life span and functionality of the trainer depend on how often and how intensively you clean your trailer and how the different materials, surfaces and components are maintained.

Cleaning, maintenance and care for your trailer are important for driving safety, value retention and warranty claims.

It is important that the trailer should be regularly cleaned and maintained in order to avoid accidents and prevent damage to persons and goods.

The cleaning and maintenance intervals depend on the application environment and the pollution intensity.

WARNING

Cleaning / care products may be poisonous

Persons may be injured or poisoned after skin contact or ingestion.

- ▶ Read the operating instructions of the care products.
- ▶ Safely close the care products after use.
- ▶ Use  ,
- ▶  after working with Cleaning / care products.

CAUTION

Stepping on the trailer / cargo bed

There is a risk of slipping when cleaning the trailer with liquids (water, cleaning agents)!

- ▶ Be particularly careful when stepping onto the cargo bed and only use the climbing aids intended for that purpose.
- ▶ Use  .
- ▶ Never step onto an unsecured trailer.
- ▶ Do not move under an unsecured cargo bed.

NOTICE

Use of corrosive cleaning agents

The surfaces / materials may be corroded by chemicals, salts, acids or bases.

- ▶ Use  .
- ▶  During the first 3 months, only wash with cold water and do not use high-pressure or steam jet cleaning devices.
- ▶ Wash with lots of cold water (not above 60°C) to avoid scratches to the paintwork.
- ▶ Do not use corrosive cleaning agents, acids or bases.
- ▶ Only use mildly acidic or weakly alkaline cleaning agents with a pH value of 6-10.
- ▶ Only use soft, clean cloths or brushes.
- ▶ Immediately remove any kind of paint damage.
- ▶ Carefully remove any grease spots with pure petroleum ether (not petrol).
- ▶ Do not handle hydraulic hoses with petroleum ether, benzene, petrol and mineral oils.
  Only use water to remove adhering dirt.
- ▶ Do not touch the brake or hydraulic hoses with spraying agents or grease.
- ▶ Do not clean seals with mineral oils, petrol or solvents.
- ▶ Outside cleaning must be performed at shorter intervals (approx. 3-4 weeks) in salt-rich environments (winter / sea climate).
  This particularly applies to careful cleaning of the brushed, bright stainless steel portals.
- ▶ Only use suitable cleaning agents to clean tarpaulins and walls.
- ▶ Do not allow sealing rings to come into contact with grease.

Environmental protection measures

RISK to the environment!

Cleaning / care products, brake dust, hydraulic oil and grease may penetrate into the groundwater.

- ▶ Clean / maintain your trailer only at washing places intended for that purpose.
- ▶ Adhere to the local environmental protection regulations.

High-pressure cleaner

NOTICE

Cleaning with a high-pressure cleaner!

Components / surfaces that are directly blasted with too high pressure, too short distance or too high water temperatures may get damaged.

- ▶ Do not direct the water jet directly onto the:

  - Name plate
  - EBS/ABS system plate,
  - Seals,
  - Electronic components / distribution boxes,
  - Plug connectors,
  - Screw-type cable connections / cables,
  - Piston surfaces / extensions and scrapers of the telescopic cylinder,
  - Oil / fuel container cap,
  - Brake and hydraulic hoses,
  - Batteries,
  - Voltage converters.

Please consider the following points when cleaning with a high-pressure cleaner:

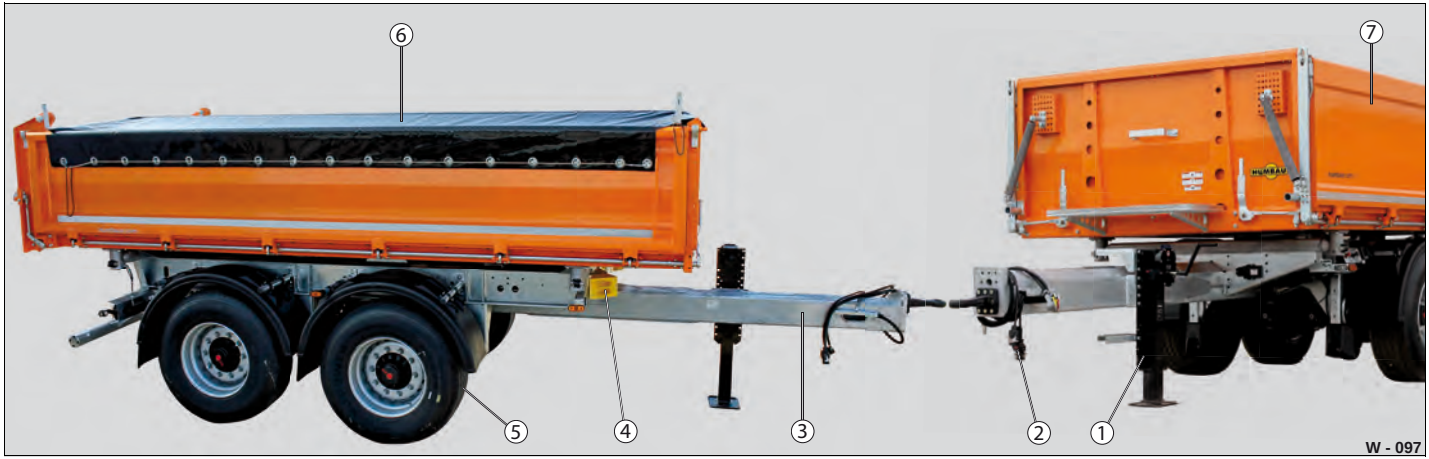
- ▶  Read the operating instructions of the manufacturer.
- ▶ Lubricate all lubrication points until they exude grease before cleaning.
- ▶ Use  ,  ,  .
- ▶ Always move the water jet while cleaning.
- ▶ Only use high-pressure cleaners that are limited to a maximum pressure of 50 bar and a maximum temperature of 80 °C.
- ▶ Keep a minimum distance between the high-pressure nozzle and the cleaning object - for round jet nozzles approx. 700mm, for 25° flat jet nozzles and dirt blasters approx. 300 mm.
- ▶ Do not user round jet nozzles to clean tyres and the tarpaulin. Hard water jets may damage the tyres or the tarpaulin.

Cleaning the aluminium disc wheels

- ▶ Regularly wash the aluminium disc wheels, particularly after activities such as:
  - Transports of alkaline materials,
  - in winter, when the roads are treated with grit.

  Aluminium disc wheels do not need special maintenance apart from occasional polishing.

Trailer materials



Pic. 89 Materials / surfaces

1 Steel, painted / coated
2 Rubber (hoses)
3 Steel, galvanised
4 Plastic
5 Soft rubber
6 PVC (tarpaulin)
7 Aluminium, anodised / painted

The trailers are assembled from various materials.

Always take note of the specific features for care of the materials / surfaces.

Galvanised steel surfaces

Galvanised surfaces / components (e.g. chassis, tow bar) must first oxidise in order to develop corrosion protection. This may take several months.
A corrosion protection layer has only been formed when the surface has lost its zinc gloss.
White rust may form on zinc-coated surfaces.
This is promoted by wetness / high air humidity and substances such as grit.
White rust is not a fault or damage to the surface - it cannot be prevented by the zinc-coating workshop and is therefore no basis for warranty claims.

- ▶ Immediately clean the zinc-coated components with clear water after they have come into contact with aggressive substances.
- ▶ Let the surfaces dry out well.

For white rust treatment:

- ▶ Clean the affected areas with lots of clear water and thoroughly dry them.
- ▶ Remove the white rust stains with a nylon brush.
- ▶ Apply zinc protection (zinc spray) to the affected areas.
- ▶ Seal the surfaces with wax as required.

Painted and powder-coated steel surfaces

Painted surfaces / components (e.g. cargo bed, drop sides) provide moderate corrosion protection.
Painted surfaces / components that are directly exposed to the effects of brake dust, loose chippings, de-icing salt, sand, etc. require particularly intense care - to make the painted surfaces look visually appealing and to protect them permanently against corrosion.

- ▶ Clean the painted surfaces after every exposure to surface-corroding substances.
- ▶ Let the surfaces dry out well.
- ▶ Seal the surfaces with wax as required.
- ▶ Paint damage (chipped off, scratched) on the surface should immediately be mended by qualified specialist personnel.

Aluminium

Aluminium components / profiles with an anodised coating offer optimal protection against corrosion.
Anodised aluminium surfaces are hard / smooth and can easily be cleaned with cleaning agents.
In order to remove severe dirt contamination and to retain the gloss of the aluminium, use an aluminium and tarpaulin cleaner.
Surface scratches are not a fault and do not lead to rust formation, as aluminium is resistant against corrosion.

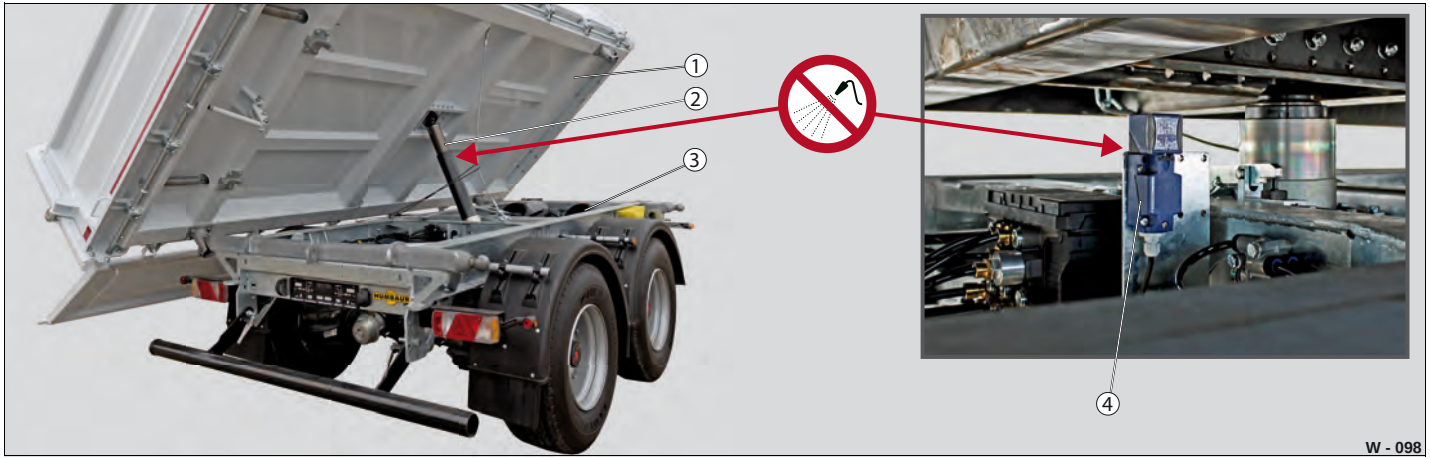
- ▶ Clean the aluminium surfaces with water and neutral cleaning agents.
- ▶ Let the surfaces dry out well.

Rubber parts / seals

Rubber parts such as elastic rubber hoses, seals, sealing joints made of PU adhesive / sealing material, e.g. doors, lids, flaps, vent windows, cargo bed, etc. are subject to a certain ageing / wearing process during use.
Mechanical strain and environmental effects (cold, warmth, UV radiation, wetness) make the rubber / seal hard over time. It may shrink and develop cracks.

- ▶ Check the state, completeness and adherence of the seals during cleaning work.
- ▶ Have damaged, missing or porous rubber components replaced.
- ▶ Regularly maintain the rubber components (in winter) by using talcum, petroleum jelly or silicone spray.

Cleaning of the chassis / loading bridge



Pic. 90 Cleaning the chassis / loading bridge

1 Loading bridge
2 Telescopic cylinder
3 Chassis
4 Electronic components

When cleaning the chassis with high-pressure cleaners, sensitive components such as: electrical / hydraulic lines, sealing areas of the telescopic cylinder, electronic components and brake components must be protected against direct blasting!

- ▶ Tilt the loading bridge down (Pic. 90 /1) towards the side and the rear during cleaning work.
- ▶ Protect sensitive electronics components (Pic. 90 /4) against direct blasting.
- ▶ Do not spray directly at the telescopic cylinder.
  Protect the extensions and scrapes of the telescopic cylinder (Pic. 90 /2) against spray water.
- ▶ Allow the loading bridge / chassis to dry completely after cleaning work.
- ▶

Cleaning the superstructure / cargo bed

Pic. 91 Cleaning the superstructure / cargo bed

1 Cargo bed
2 Underride protection
3 Fender / wheels
4 Lighting points

The cleaning intervals for the superstructure / cargo bed depend on the intensity of use and particularly on the goods to be transported!

- ▶ Clean the cargo bed (Pic. 91 /1) and the underride protection (Pic. 91 /2) after each transport of bulk goods. Clean the cargo bed of coarse dirt such as gravel, sand, branches, etc. by using a broom.
- ▶ Clean the lashing points as required, e.g. with a hand brush. Rinse them with water as required.
- ▶ Clean the fenders / wheels (Pic. 91 /3).
- ▶ Free the locking points of the drop sides from dirt. The drop sides must close and lock.
- ▶ Clean the lighting points (Pic. 91 /4).
- ▶ Rinse off the cargo bed with the pressure washer.
- ▶ Allow the trailer to dry completely after cleaning.

Disposing of operating materials

Waste oil, lubricants, cooling agents and refrigerants, fuel and batteries are waste types that require monitoring.

RISK of polluting the environment!

▶ Never dispose of environmentally hazardous substances in domestic waste or release them into the environment. Environmentally hazardous substances must be disposed of according to the national and local regulations.

Waste oil / lubricants

▶ Waste oil, grease, oily rags, and hoses must be drained into appropriate vessels and disposed of.

Tyres

▶ Waste tyres may never be released into the environment. These may only be stored in an appropriate manner and disposed of by municipalities.

▶ Enquire in advance at the public disposal centres of your state.

Electrical and electronic scrap

▶ Dispose of electrical and electronic components at the local recycling centre
(electronic scrap recycling).

Batteries

Batteries are subject to the EU Directive 2006/66/EC and can be returned to the manufacturer free of charge.

▶ Take particular care when removing batteries.

Decommissioning the trailer

- ▶ Secure your trailer against unauthorised use by third parties, e.g. by securing the power supply against switching on.
- ▶ Do not park your trailer on a public road - only use private property or locked building site areas.
- ▶ Park your trailer so that it cannot pose any additional hazards to third parties, e.g., by tipping over, rolling off.
- ▶ Secure the trailer with wheel chocks.
- ▶ Appropriately separate the environmentally hazardous operating materials / substances (oil, battery, etc.).

Disposing of the trailer

- ▶ Bring the complete trailer to a car/ vehicle recycling facility.
  The specialists at the car/vehicle recycling facility will
  dispose of the individual components in the proper manner.

8 Troubleshooting

Action in the event of faults

This section contains information on possible faults in the trailer. The information should facilitate the search for the fault source and enable it to be rectified to the extent that the next service station of Humbaur GmbH can be reached.

Faults which may occur as a consequence of failing to comply with the operating instruction manual or as a result of a lack of maintenance are not considered.

Unfortunately we cannot cover all the problems which may occur here.

In the case of major faults, please notify the **Humbaur Service** (see contact addresses stated below).

WARNING

Improper troubleshooting

Improper troubleshooting can cause components to fail - accident risk!

▶ Have faults rectified only by a qualified specialist workshop.

Action in the event of fire

WARNING

Intense heat development and toxic gases caused by burning paint and plastic parts

Risk of burns and asphyxiation.

▶ Maintain a sufficient safety distance to the flames when attempting to extinguish a fire.

▶ Do not directly inhale toxic fire gases.

Humbaur Service

Any warranty claims become invalid if the trailer or its modules are altered or disassembled without our previous written agreement.

Technical customer service

tel.: +49 821 24929 0

fax.:+49 821 24929 540

email: service@humbaur.com

Humbaur Service Partners

can be found at www.humbaur.com under Dealers/Service/Repairs

Address of the manufacturer

Humbaur GmbH

Mercedesring 1

86368 Gersthofen (Germany)

tel.: +49 821 24929 0

fax.:+49 821 24929 100

www.humbaur.com

info@humbaur.com

Spare parts

Only use original Humbaur spare parts!

Spare parts can be obtained stating the **VIN** and the part designation as follows:

- Online, email, phone

Contact parts logistics

tel.: +49 821 24929 0

fax.:+49 821 24929 200

email: parts@humbaur.com

Fault	Possible causes	Remedy
The trailer tends to pull to the right or to left when driving.	The load is not evenly distributed.	Distribute the load evenly.
	The tyre pressure is uneven.	Adjust the tyre pressure for all wheels.
	- The load is inadequately secured and shifts gradually while driving.	Evenly distribute the load and appropriately secure it.
	- The brakes have been wrongly adjusted / blocked.	Faults must be repaired by a specialist workshop.
The trailer starts to snake while driving.	- The tyre pressure has been wrongly adjusted.	Adjust the tyre pressure for all wheels.
	- The speed being driven is too fast for the load and the road conditions.	Gradually reduce your driving speed. Adjust your road handling to the road conditions.
	- The centre of gravity of the load too far to the rear.	Correct the centre of gravity of the load further forwards.

The trailer rattles as you drive.		
	- The cables / hoses are coming loose.	Faults must be repaired by a specialist workshop.
	- The roll-up tarpaulin has not been secured and is moving.	Close and secure the roll-up tarpaulin.
	- The sliding roof is not properly closed / locked.	Completely close the sliding roof and ensure that the locks engage properly.
	- The tailgate / side drop sides is / are unlocked and swinging.	Completely close the tailgate / side drop sides and ensure that they are locked.

Fault	Possible causes	Remedy
Brake does not release properly.	- The brake is incorrectly adjusted. - The brake shoe retaining spring is worn. - The brake shaft has jammed (drum brake). - The pressure/brake line has a kink. - Malfunction in the compres. air system.	Faults must be repaired by a specialist workshop.
The brake has jammed.	- Too little operating pressure.	Inspect the pneumatic lines. Ensure that the correct operating pressure is achieved.
	- Parking brake operated.	Release the parking brake.
	- The brake is jammed against the drum.	Faults must be repaired by a specialist workshop.
Braking effect too low / The brakes operate on one side only.	- Brake linings worn, covered in oil or glassy. - Brake incorrectly adjusted. - Malfunction in the compressed air system.	Have the fault repaired by a specialist workshop.
Operating pressure not achieved.	- Pneumatic lines incorrectly connected.	Inspect the pneumatic lines.
	- Faulty pressure regulator or compressor (towing vehicle).	Faults must be repaired by a specialist workshop.

Fault	Possible causes	Remedy
Cabling / switches.	- Connections loose or dirty.	Clean the connections.
	- Cable broken or terminals damaged.	Faults must be repaired by a specialist workshop.
Lighting does not work.	- Light is faulty.	Replace the bulb.
	- Connections loose or dirty.	Clean the connections.
	- Short-circuit in power circuit or interruption.	Replace the faulty LED lights and bulbs. Faults must be repaired by a specialist workshop.

Fault	Possible causes	Remedy
The automatic lowering system does not work.	- The inductive sensor is badly adjusted.	Readjust the position of the sensor.
	- The inductive sensor is faulty.	Have the sensor replaced in a specialist workshop.
	- The ON / OFF switch is faulty.	Have the switch replaced in a specialist workshop.

Fault	Possible causes	Remedy
The trailer squeaks while driving / worn bearings.	- Bearing setting too lose or too firm. - Foreign body in axle bearing.	Faults must be repaired by a specialist workshop.
	- Inadequate lubrication of the axles.	Lubricate the axles in accordance with the axle manufacturer's instructions.
	- Overloading the axles.	Adhere to the axle loads specified for your trailer.
Missing wheel bolts.	- Wheel nuts fastened with wrong torque. - Wheel nuts not properly tightened.	Replace the wheel bolts, wheel nuts and the rim, if required. Tighten the wheel nuts, using the torque specified by the axle manufacturer. Faults must be repaired by a specialist workshop.

Fault	Possible causes	Remedy
The trailer does not lie horizontally after coupling.	- Air-suspension (lifting / lowering system) has been lifted / lowered.	Ensure that the air-suspension system is in the normal position.
	- The spindle support has not been raised.	Raise the spindle support.

Fault	Possible causes	Remedy
The telescopic cylinder is losing oil.	- A line or screw connection in the hydraulic system is faulty.	Have the line / screw connection replaced in a specialist workshop.
	- A screw connection in the hydraulic system is loose.	Tighten the screw connection.

Fault	Possible causes	Remedy
The telescopic cylinder cannot be (completely) extended.	- The quantity of oil supplied is too low.	Check the oil level of your towing vehicle. Top up oil if required.
	- The oil is too viscous and too cold.	- Ensure that the oil has the requisite operating temperature and viscosity.
	- The oil pressure in the system is too low.	Check that sufficient oil pressure is generated by the towing vehicle. Check that there are no oil leaks, e.g. cracked hoses, leaky connection points.

Fault	Possible causes	Remedy
The rear drop side does not close properly.	- The locking mechanism is maladjusted.	Adjust the locking mechanism.
	- There are foreign bodies in the sealing edge of the rear drop side, e.g. stones.	Remove the foreign bodies.

Fault	Possible causes	Remedy
The central locking system for the side drop sides does not close off all locking points.	- The transmission of the central locking system is maladjusted.	Readjust the transmission rods of the central locking system.
	- The tailgate cylinders are faulty.	Faults must be repaired by a specialist workshop.

Fault	Possible causes	Remedy
The folded-down side drop side is difficult to lift up.	- The drop side lifting spring is worn out.	Check the tension of the spring and adjust its position. Replace any faulty tension springs.

We wish you a pleasant & safe journey!

NOTES:

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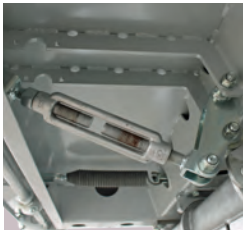

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