HUMBAUR

MAKES IT HAPPEN

Operating Instructions

Construction machine transporter
Flat bed HS (5 t - 10.9 t)

en

This operating manual is intended to be read carefully and understood and all its instructions followed by all persons with responsibility for the Humbaur GmbH vehicle and its modules.
Humbaur GmbH accepts no liability for any damage, injuries or malfunctions resulting from a failure to do this.

It is therefore imperative that you read and follow all the instructions, warnings and notes in this manual before driving for the first time.

Please note that the figures are to be considered sample figures and may deviate from the actual appearance / equipment.

Also read and observe the operating manuals for components such as axles, landing gear, etc.

The technical documentation is part of the product and should be kept in the driver's cab of the towing vehicle for reference.

This operating manual draws attention to particularly important details with regard to the operation and use of the trailer and to the required care and maintenance work. Only with this information is it possible to avoid errors and ensure fault-free operation.

The manufacturer reserves the right to correct errors and make technical changes to the design, equipment and accessories referred to in the information, illustrations and descriptions of the operating manual

Humbaur GmbH
Mercedesring 1
89368 Gersthofen (Germany)

No claims whatever may consequently be derived from the information, illustrations and descriptions contained herein.

Obligations of the operating company

Only operate the trailer when it is in perfect condition.

Ensure that the operating manual is included when the trailer is sold, for example.

Use only trained and instructed personnel.

Ensure compliance with the operating manual throughout the life of the trailer and that the correct protective clothing (See "Personal protective equipment/ rules and prohibited activities" on page 21) is worn.

Provide the required consumables and working and other materials.

Identification

Dimensions, weights and performance data can be found in the trailer's registration documents.

Vehicle type	Version	☒
HS - Flat bed (GG 5 t); upright ramp planks; with support wheel	HS 504020 BS	
HS - Flat bed (GG 5 t); upright ramp planks; with support wheel	HS 504520 BS	
HS - Flat bed (GG 6.5 t); upright ramp planks; with support wheel	HS 654020 BS	
HS - Flat bed (GG 6.5 t); upright ramp planks; with support wheel	HS 654520 BS	
HS - Flat bed (GG 8.9 t); upright ramp planks; with support foot	HS 895020 BS	
HS - Flat bed (GG 10.5 t); upright ramp planks; with support foot	HS 105020 BS	
HS - Flat bed (GG 10.9 t); upright ramp planks; with support foot	HS 115020 BS	
HS - Flat bed (GG 10.5 t); upright ramp planks; with support foot	HS 106020 BS	
HS - Flat bed (GG 10.9 t); upright ramp planks; with support foot	HS 116020 BS	
HS - Flat bed (GG 10.9 t); upright ramp planks; with support foot; for mill transport	HS 106020 BS	

The relevant trailer should be indicated on delivery by means of a cross.

Keyword index

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

1 Safety

The chapter entitled "Safety" starting on page **9** contains safety-related information on handling the trailer properly.
Read this chapter before driving for the first time.

2 General Information

The chapter entitled "General information" starting on page **23** provides information on vehicle identification.

3 Operation

The chapter "Operation" starting on page **33** provides information on using interchangeable containers, correct load distribution, and coupling and uncoupling the trailer.

4 Operation of the chassis

The chapter entitled "Operation of the chassis" starting on page **61** provides everything you need to know about the controls of the chassis such as the raising/lowering system, landing gear.

5 Body

In chapter "Operation:", from page **99**, you can see how to operate the vehicle body properly, for example folding the longitudinal stop up and down, securing twist-lock mechanisms, or climbing aids.

6 Electrical system

In the chapter "Electrical system", starting on page **139**, you will find information on the lamps, connectors and assignments.

7 Inspection, care and maintenance

In the chapter "Inspection, care and maintenance", starting on page **161**, you will be informed of the activities required for maintaining operational safety and the value of your vehicle.

8 Troubleshooting

The chapter entitled "Troubleshooting" starting on page **213** tells you what to do in the event of problems or malfunctions and provides contact details for Humbaur's service team.

Contents of this operating manual

Safety

Intended use

HUMBAUR vehicles and bodies are constructed in accordance with the technological regulations and the recognised safety regulations. Despite this, however, if used for other than their intended purpose, they can pose a hazard to life and limb for both users and third parties, or cause damage either to the HUMBAUR vehicle itself or to other property.

HUMBAUR vehicles and bodies are manufactured exclusively for transport operations in accordance with all relevant regulations and provisions.

Proper use entails adherence to regulations, descriptions and instructions provided in this manual and the suppliers' operating and maintenance manuals.

Should you be planning subsequent modifications to your HUMBAUR vehicle or vehicle body, enquire in good time at a Humbaur GmbH factory or at an approved HUMBAUR workshop.

Always check with HUMBAUR GmbH or an approved HUMBAUR workshop before having accessories fitted to your HUMBAUR vehicle or body.

The following is permitted:

- Transport of goods and construction vehicles
- Operation only in the range of the total permitted payload
- Operation only with suitable towing vehicle
- Operation only in when in technically perfect condition
- Operation with uniform weight distribution of the load
- Driving only with properly secured load (e.g. excavator)
- Driving only when in compliance with maximum legal speed and speed adjusted to poor road and weather conditions
- Loading and unloading only in secure areas or with additional safeguards in public streets
- Only stop/park the trailer with safeguards to prevent rolling away

Periodically subjecting the trailer to the general inspection and safety inspection by specialists as well as the certification of this is a prerequisite to participating in road transport.

The operator/user of the trailer is obligated to regularly care for/clean the trailer as well as perform maintenance.

HUMBAUR vehicles/bodies carry a vehicle identification number (VIN)- see page **31**. Always quote this number without fail when making enquiries or ordering parts.

Improper use that can reasonably be foreseen

Any use that goes beyond use for transport in accordance with the relevant regulations is considered to be improper. That includes, in particular:

- Transport of people/animals
- Transport of goods subject to special regulations and/or for which special vehicle versions are necessary (e.g. chemical substances)
- Loading with exceeded payload
- Exceeding the maximum permissible axle/bearing/trailing load
- Driving only with poorly or unsecured load
- Transport of hot/liquid materials (e.g. tar)
- Driving with poor load distribution (one-sided, selective loading)
- Unauthorised constructional changes to the trailer or those not approved by the manufacturer
- Use of non-authorised replacement parts or accessories
- Driving with defective lighting system or with faulty electrical system
- Driving with trailer dirty so that the license/number plate, lighting, markings are not visible or not clearly visible
- Driving with landing gear which is not folded in/up
  e.g. support foot of tube drawbar
- Driving with open structures (e.g. platform gates, curtains, doors, lids, toolbox, side guards, etc.)
- Unauthorised maintenance/repair of safety-relevant components which must only be maintained or repaired by specialists
- Driving with excessive/inappropriate speed in poor weather conditions and/or on bad roads
- Parking trailer without taking sufficient safety precautions to prevent the trailer from rolling away
- Operating the trailer in a damaged condition and visible part wear or with broken safety-relevant components
- Operating a trailer without a valid traction test with the towing vehicle
- Operating the ramps when a person is in the danger area
- Transport of vehicles/loaded goods which protrude over the total width of the trailer

Any liability for damage resulting from non-compliance is rejected by the manufacturer:

Humbaur GmbH
Mercedesring 1
86368 Gersthofen (Germany)

The user shall bear sole responsibility for any such risk.

Traction test

A traction test must be completed to ensure correct usage.

Unlike a drum brake, a disc brake does not produce any detectable reduction in the braking effect to the driver when overloaded.

This overload can mean that the brakes of the towing vehicle or trailer overheat. Reduced braking force, greater brake lining and/or brake disk wear as well as wheel bearing or axle damage can occur as a consequence of overloaded brakes.

For optimal distribution of the deceleration of the entire vehicle combination, a traction test must be conducted on the loaded vehicle's brake system by an independent brake service in compliance with 71/320 EC or ECE R13 after a short run-in time of 2,000 to 5,000 km or within 14 days following vehicle handover and each time the towing vehicle is changed.

Fig. 1 Warning panel on the trailer

In the event of non-compliance with any of the above or failure to provide the results of a traction test, any warranty claims made against Humbaur GmbH will be invalidated.

Disclaimer

Any liability of the manufacturer is invalidated if:

- Changes have been made to the trailers or its components independently.
- The original parts or the conversion parts/accessories approved by Humbaur GmbH being replaced by other components.
- Subsequent alterations have been made to the trailer (e.g. new holes made in the frame or existing bore holes enlarged). Any such intervention is classified by Humbaur GmbH as a structural change, and accordingly invalidates the operating permit.
- Non-approved accessories such as spares or components of other makes which are not original HUMBAUR parts being mounted or integrated. The operating approval for the vehicle is invalidated and possibly the insurance cover as well.
- the maintenance intervals prescribed by the manufacturer not being adhered to.

All resulting risks and liability waivers shall continue to apply in the event that:

- acceptances have been carried out by testers/experts from the technical testing authorities or officially recognised organisations,
- approvals have been granted by public authorities.

The warranty covers

Defects occurring in the course of correct and proper use of the trailer which are caused by the design or can be traced back to material defects. Repairs carried out during the warranty period do not extend this period.
The dealer as the contracting party is responsible for the warranty.

Prerequisites

Original replacement parts must be used during repairs.
Repairs must be carried out by an approved workshop.
The manufacturer's maintenance directions and instructions set out in this operating manual must have been followed.

Defects may not be traced back to

Non-compliance with the technical and legal regulations set out in this operating manual.
Improper use of the trailer or lack of user experience.
Unauthorised modifications to the trailer or built-on accessories not approved by Humbaur GmbH will invalidate the warranty. Non-observance of the relevant legal regulations.

The following are not defects

Every trailer is a product manufactured by craftsmen. Although every care has been taken, minor, superficial scratches can occur that have no effect on the intended use.
Production-related stress cracks in the surface (hairline cracks) cannot be avoided. These hairline cracks have no effect on the stability or use of the trailer.
Gaps between platform gate and loading ramp.
Furthermore, polyester components are not 100% colour-fast. UV and weather influences can give rise to bleaching here as well.
It must also be noted that rubber parts generally age due to UV influences, and the surface may be subject to cracking and bleaching.
Parts coated by electro dip painting (edp) are not colour-fast. They may bleach as a result of UV radiation.
Galvanised parts are normally not glossy, but lose their lustre after a short period of time. This is not a defect, but instead a desired quality since full protection against metal corrosion is only guaranteed by oxidation. Wood is a natural material. For this reason, in spite of the most varied types of machining and coating, it is subject to natural, weather-dependent stretching or shrinkage, which can lead to distortions. Natural wood blemishes and unevenness are normal for this natural material and can show on the surface. Bleaching caused by UV radiation and weather influences is possible. A manufacturing tolerance regarding thickness is defined for the wood components used. Claims cannot be made for deviations within the tolerance band.

Because trailers are generally not insulated, condensation may form under curtain and polyester covers in the event of temperature fluctuations. In this event, ensure adequate ventilation to prevent mould from forming. Trailers are also not 100% watertight. Water may get in through doors, flaps and windows even when rubber seals are used and applied with the utmost care.

The warranty is invalidated

If the operating, maintenance, cleaning and inspection regulations are not observed.
technical modifications are made to the trailer.

If structures and accessories that are not approved by Humbaur are built on.

If the trailer is overloaded and used incorrectly.

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

If the service intervals are not observed, including those for Humbaur-fitted parts such as axle, brake, overrunning equipment, hydraulic systems, etc.

If the materials used are subject to incorrect surface treatment.

If the trailer continues to be used despite defects already being known and communicated and use has been prohibited by the manufacturer until repair has been carried out.
If the trailer continues to be used despite defects being known and repair is impossible, complicated or only possible after enormous additional expenditure and use of the trailer is diminished.

The warranty does not cover

Expenses for routine maintenance.
Costs that can be traced back to normal wear and tear or also because the trailer has not been used for a long time.

Faults that can be traced back to improper handling of the trailer.

Defects that can be traced back to the use of non-original replacement parts.

Defects that can be traced back to the consequence of a repair carried out by a non-approved workshop.

Defects that can be traced back to structural modifications or installations on the vehicle.

Damage that can be traced back to snow and water loads on curtain, plywood or polyester structures.

The manufacturer reserves the right to make structural modifications.

Personnel qualifications

HUMBAUR vehicles and bodies and their operating components may only be used and maintained by personnel who have received instruction with regard to:

- This operating manual
- The trailer with the associated towing vehicle
- The suppliers' operating and maintenance manuals
- The road traffic regulations (StVO in Germany) and road traffic licensing regulations (StVZO in Germany)
- All the relevant working safety and accident prevention regulations as well as other laws relating to safety, industrial health and road traffic.
- Freight transport
- Transport of construction vehicles
- The dangers of handling construction vehicles, e.g. excavators

Sources of danger

It is essential that you are aware of the following source of danger:

- Coupling and uncoupling of a trailer: There must be nobody in the danger area.
- Travelling with unsecured landing gear.
- Travelling with unsecured ramps.
- Clearance heights on the way when loading and unloading.
- Exceeding the total permitted payload or uneven overloading due to incorrect distribution of weight.
- Badly secured or unsecured load and/or vehicle body components.
- Reversing manoeuvres - check area behind vehicle!
- Excessive steering during manoeuvring.
- Overloading of the trailer, axes and brakes.
- Overstressing as a result of fitting incorrect sizes of wheels or tyres.
- Use of wheels with incorrect wheel offset, unilateral runout or centrifugal imbalance.
- Overstressing due to unreasonable or improper driving or handling.
- Impacts and stress on the axles.
- Inappropriate speed for the quality of the road surface given the load of the vehicle – especially on bends.
- On ground that is not level or on soft ground, the parked trailer can topple over or sink.
- Driving on terrain with extreme slopes.
- Loading / unloading the trailer on terrain with steep gradients.
- Standing under unsecured trailer / ramps

In the chassis frame area

Important general information:

- Check that the central draw pipe and trailer coupling are in perfect condition.
- Lock the eye coupling properly.
- Connect the supply lines
- Establish the electrical connections
- Put the side guard (SG) in the position for driving and secure them, if present.
- Retract the landing gear and secure it
- Check the tyres and rims for damage
- Check the tyre pressure, including the spare wheel
- Check the tightening torque of the wheel nuts
- With a new trailer, tighten the wheel nuts after 50 km and after its first journey carrying a load
- Secure:
  Spare wheel/spare wheel holder, wheel chocks
- Check the trailer's lights, and repair any faulty lights
- Observe the permissible total weight
- Crank up the support wheel and secure it
- Release the screw parking brake / parking brakes and start to move off only when the operating brake pressure has been reached.
- Drain the compressed air tanks
- Check the licence plate and signs
- Interlock the trailer coupling properly
- Check that the license/number plate and signs are in place and visible.

Around the vehicle body

Close and secure all vehicle body components, such as:

- Supports / Ramp planks
- Slot-in gate
- Toolbox
- Any load securing equipment
- Ensure that the load distribution is balanced

Signal words

⚠ DANGER

Indicates an immediate danger

If this danger is not averted, it will result in death or very serious injury.

⚠ WARNING

Indicates a possibly dangerous situation

If this danger is not averted, it can result in death or serious injuries.

⚠ CAUTION

Indicates a possibly dangerous situation

If this danger is not averted, it can result in light or minor injuries.

NOTICE

Indicates a possibly dangerous situation

If this danger is not averted, it can result in damage to property.

General mandatory sign. Indicates information that has to be heeded and complied with for safe use.

All warnings and instructions must also be passed on to other users or ancillary staff.

Text emphasis

You will find the following symbols in front of some lines or paragraphs in the manual:

▶ (Arrow) Prompt to take action

- (Dash) List

1. (Digit) List of components

Warning signs used

The following warning signs can be used in this manual and on the product.

Heed these warning signs and proceed with particular caution.

Hazard area warning!
Be careful - there are several factors that could lead to risks to persons.

Risk of crushing injuries!
For limbs such as:
hands/fingers/feet

Risk of crushing injuries!
Body or parts of the body

Danger of falling!

Danger of electrical shock!
Dangerous voltage.

Risk of striking!
Falling objects.

Danger of burning!
Hot surfaces.

Risk of chemical burns!
Escaping battery acid.

Risk of poisoning!
Poisonous substances.

Risk of injury!
Obstacles in the area of the head.

Risk of slipping!

Risk of tripping!

Risk of explosion!
Explosive operating fluids/ consumables.

Personal protective equipment

Wear the prescribed personal protective equipment (PPE) for all the work described in this manual.

It includes the following:


Safety boots, sturdy shoes


Protective gloves


Safety helmet


Safety glasses


Fluorescent clothing


Protective mask, breathing protection


Hearing protection


Protective clothing

Instruction signs

Keep to and heed the following rules and prompts for all the work described in this manual.


Important information! To be observed and complied with to ensure safe use


Read the relevant information before performing an activity


Wash your hands thoroughly


Disconnect the power from live components by unplugging the connector before starting working on them


Ensure good ventilation and extraction


Work in pairs.


Instructions required from another person

Prohibition signs

Heed these prohibited activities.


Climbing up prohibited


Reaching in prohibited


Touching prohibited.


Entering this area prohibited.


Open flames are prohibited (e.g. cigar, lighter).


Jets of water are prohibited (e.g. high-pressure cleaner).


Entry prohibited (unauthorised persons have to keep out).


Going behind the swivel arm or near moving parts is prohibited.


Walking between the towing vehicle and trailer is prohibited.


Allowing trailer to run up on towing vehicle.

Other important pictograms

Observe the following pictograms for correct disposal as well as first aid in the case of emergency.


Problem waste!
Disposal with domestic waste not allowed.

Danger of polluting the environment.


Dispose of used oil properly without polluting the environment.


Dispose of used tyres properly, do not dispose of in the environment.


Immediately wash your eyes out with plenty of water.


See a doctor.

General information

HS 5 t / 6.5 t
HS 8.9 / 10.5 /10.9 t

Fig. 1 Side view

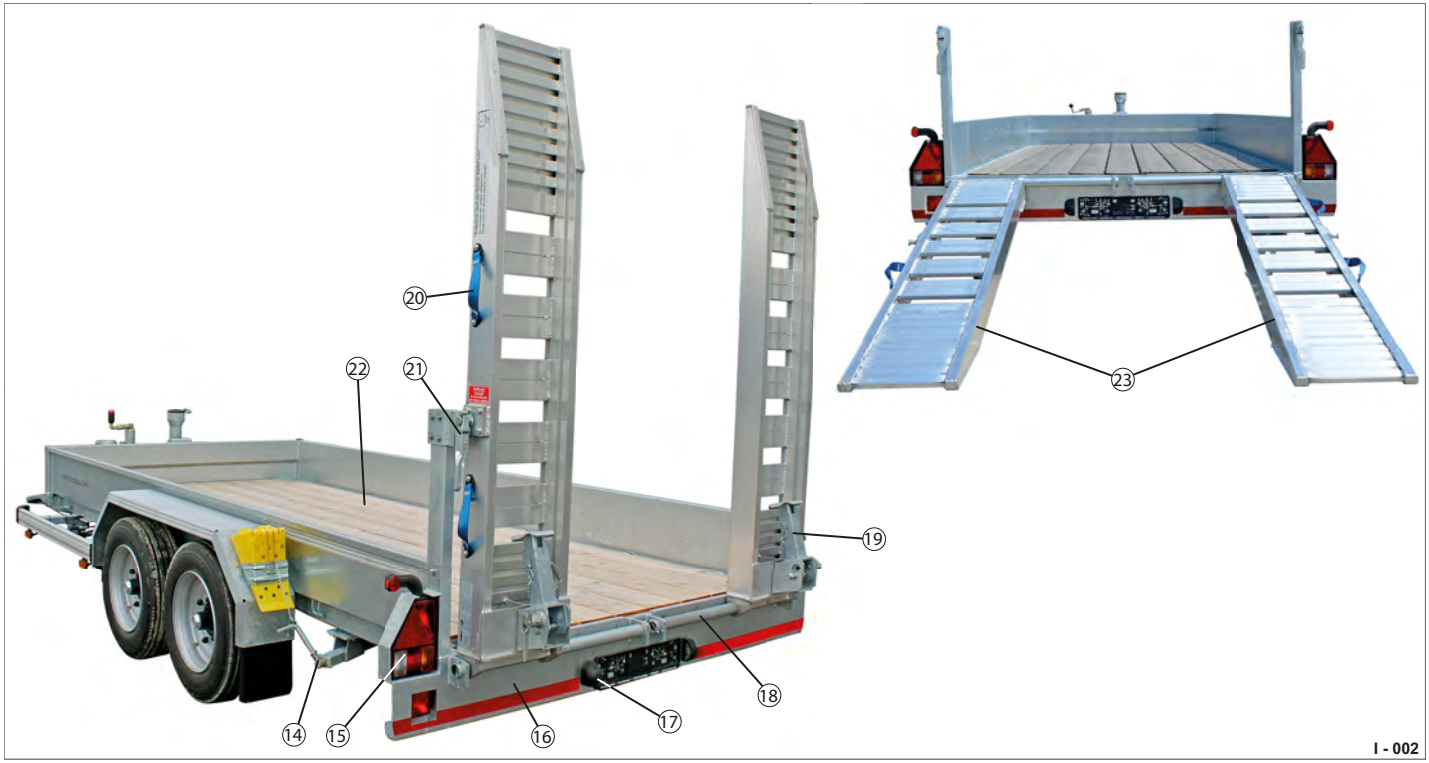


Fig. 2 Rear view

Fig. 3 HS for mill conveyor transport

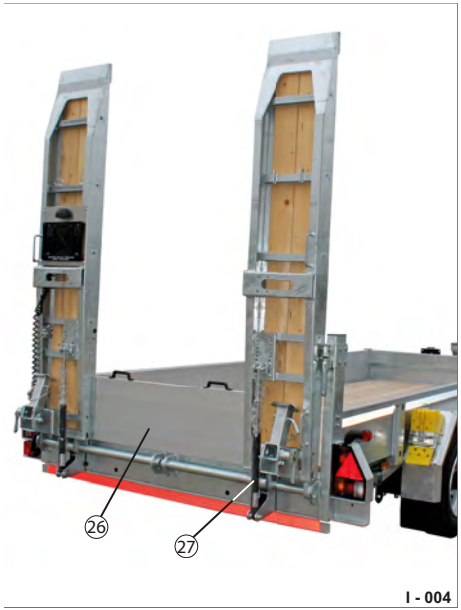


Fig. 4

1 Tube drawbar with towing eye
2 Park console for compressed air connections: Supply, brake
3 Park console for power supply: Electrical system, (EBS)
4 Support wheel
5 Side guard
6 Service brake release valve
7 Clearance lights, side (orange)
8 Axles / wheels, tyres
9 Mudguard with splash guards
10 Wheel chock
11 Ramp plank
12 Corner post
13 Tube drawbar height adjustment
14 Spindle parking brake
15 Rear lights (multi-functional)
16 Underrun guard
17 Licence plate holder lighting
18 Track width guide linkage
19 Supports for ramp planks
20 Handle
21 Latch for ramp planks
22 Loading platform
23 Ramp planks folded up
24 Geared support winch
25 Conveyor belt carrier
26 Slot-in gate
27 Gas pressure spring

HS specifications

The HS flat bed is a sturdy construction machine transporter with a height-adjustable tube drawbar.

HS as a 5 t / 6.5 t tandem trailer is equipped with a torsion spring assembly and support wheel.

HS from 8.9 t is equipped with a parabolic spring system and gear-supported jack.

The loading platform can be covered with soft wooden planks or screen printed mats or optionally with galvanised steel safety tread floor plates.

The welded and galvanized vehicle frame with fixed front and side walls guarantees a long lifetime.

Accessories such as:
Steel plate toolbox on the side, rotating light, support frame on the front wall, working lights , various ramps, slot-in gate at the rear improve convenience and safety in operation.

Spare wheel

Fig. 5 Spare wheel holder on the front wall

Steep plate toolbox

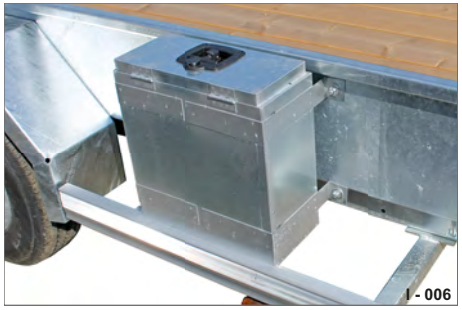


Fig. 7 On the side wall

Plastic toolbox

Fig. 9 On the front wall

Multi-function rear lights

Fig. 6 Separate fog light, left

Support frame

Fig. 8 Front side, removable

Service brake release valve

Fig. 10 Below the chassis in left direction of travel

park warning sign

Fig. 11 Front and at the rear

Rotating light

Fig. 13 Slot-in

Working light

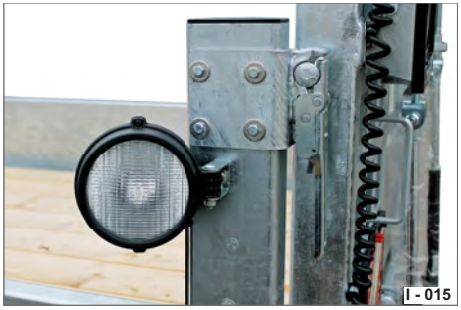


Fig. 15 Rear at the post

Roof bow/curtain structure

Fig. 12 Full curtain

Slot-in gate

Fig. 14 Between ramps

Duomatic coupling

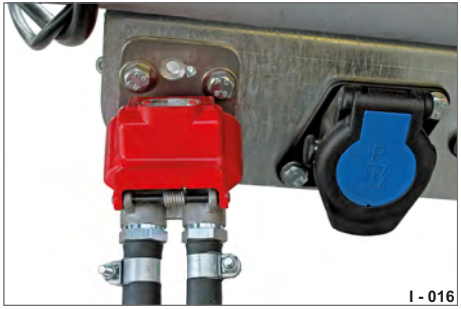


Fig. 16 For compressed air: Supply / brake

Voltage transformer

Fig. 17 ABS converter 24 V / 12 V

Conveyor belt carrier

Fig. 19 Mounted on the tube drawbar

Loading platform, sloping

Fig. 21 Wooden planks (spruce, 40 mm)

Compressed air brake console

Fig. 18 Compressed air brake with spring-loaded cylinder

Steel safety tread floor plate, galvanised

Fig. 20 Including screen printed mats

Swivel towing eye

Fig. 22 Swivel towing eye D 40 mm / 50 mm

There is a vehicle identification number (**VIN**) on the trailer to identify it.

If there are any queries about the trailer, this number has to be specified. The VIN number must be legible during the entire lifetime of the trailer.

VIN	WHD	000000	00000000
Item	1-3	4-9	10-17

Item	Explanation
1-3=	International code for Humbaur GmbH
4-9=	Filler character chosen by manufacturer
10-17=	Sequential numbering

Tab. 1 Example - VIN number

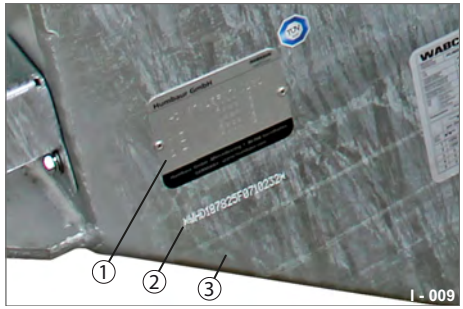


Fig. 23 Vehicle front

1 Nameplate
2 Vehicle identification numbers (VIN)
3 Front side, rack

Vehicle identification number

Operation

NOTICE

Exceeding the permissible tilt angle

When driving over slopes and descents, the maximum permissible inclination angle of the towing eye and pin coupling can be exceeded.

Trailer, towing eye, and pin coupling can be damaged.

Connections could be crushed or broken.

- ▶ Drive especially carefully over dips or bumps.
- ▶ Do not kink the trailer more than 90 degrees with respect to the towing vehicle.
- ▶ Do not exceed the maximum inclination angle of:
  Vertical ± 20 degrees,
  Axial ± 25 degrees.

Additional information can be found in the brochure from the employers' liability insurance association: BG-Information BGI 599 on the safe coupling of vehicles.

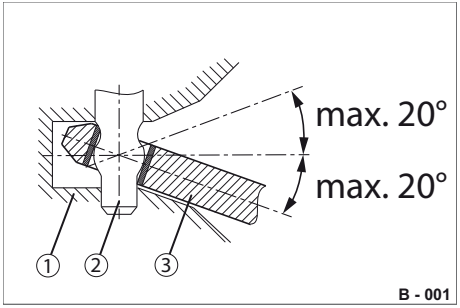


Fig. 1 Inclination angle of vertical transverse axis

1 Pin coupling (catcher)
2 Vertical pin
3 towing eye

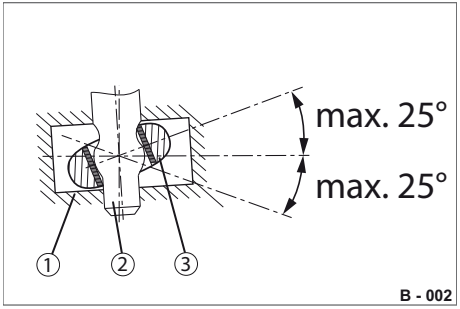


Fig. 2 Inclination angle of axial longitudinal axis

1 Pin coupling (catcher)
2 Vertical pin
3 Towing eye

Folding support

Fig. 3 Folding support folded down

WARNING

Driving the trailer

When driving on the loading platform/drive-up ramps or in the event of an uneven load distribution, the trailer can tilt forwards or backwards.

Persons can be trapped or crushed by the trailer.

- ▶ Secure the parked trailer at the front and rear with props to load or unload, or connect it to the towing vehicle.
- ▶ Do not load or unload the trailer across the slope (terrain with steep gradients) - risk of tipping!

NOTICE

Loss of stability during loading and unloading

The rear axle and the chassis can get damaged/overloaded.

- ▶ Before loading/unloading the trailer, check that the folding supports are lowered and locked - they stabilise the trailer and relieve the axle.

Fig. 4 Driving the trailer

⚠ WARNING

Overloading ramps

The ramps can become deformed.

The vehicle can fall/tip over - risk of striking/crushing!

- ▶ Observe the nameplate with maximum load specifications.
- ▶ Do not exceed the maximum values.

Fig. 5 Nameplate, ramp plank

Max. values/load bearing capacity	
Max. ramp angle	30% (16.5°)
Single-axle vehicles	1700 daN (Kp)
Dual-axle vehicles:	
Axle load distribution	40% to 60%
Wheelbase 1 m	2575 daN (Kp)
Distance between axles 1.5 m	2575 daN (Kp)

Preparation

WARNING

Limited visibility

When driving in reverse, persons could be overlooked and run over.

- Correctly estimate the danger area around the vehicle using the mirrors.

- Have a second person assist you.

WARNING

Ramps set to incorrect track width

The vehicle to be loaded can tip off the ramp - risk of striking/crushing!

- Set the ramp to the correct track width before loading/unloading.

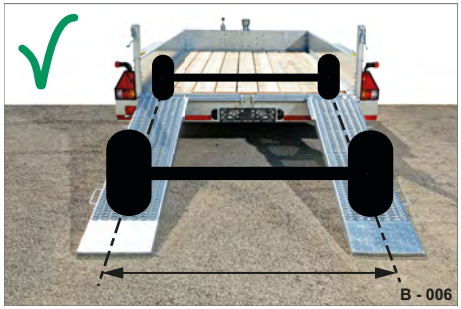


Fig. 6 Setting track width

Procedure:

- Place the trailer on firm ground to prevent it from sinking in or toppling over.
- Secure the trailer from rolling away.
- Apply the screw parking brake and use wheel chocks to secure the trailer in position.
- Fold down the folding supports and secure them.
- Set the drive-up ramps to the necessary track width and fold down the ramps.
- Slowly drive onto the ramps.
- Drive the trailer straight ahead - not at an angle from the side.

Loading and unloading

WARNING

Dirty/wet loading platform

The loading platform can get slippery due to dirt, water or ice - risk of falling!

- Carefully enter the loading platform and watch out for dirty, wet/icy patches.
- Open the curtain if the vehicle is not being used for an extended period. Clean the loading platform if necessary.
- If necessary, clean the dirty areas before entering the loading platform.

WARNING

Entering loading platform

Persons may fall when climbing onto/down from the loading platform/chassis, over mudguards, side guards, tube drawbar, chassis and toolboxes.

.

- Use  .
- Only enter the loading platform through the areas provided for this purpose.
- Do not jump onto or down from the loading platform.
- Use a secure ladder to climb on and off the platform.

WARNING

Loading/unloading with a crane

The mounting can rip and the load can fall - swinging loads can hit/crush persons!

- Use  .
- Do not walk under swinging loads.
-  Make sure no one is in the danger area.

WARNING

Loading/load-securing elements on the loading platform

The loading platform can be misaligned with loaded goods, squared timber, ratchet straps and pallets - risk of tripping!

- Make sure there is enough light on the loading platform.
- Stow away unnecessary ratchet straps and tools in the stowage spaces provided.
- Keep the loading platform clean.

⚠ WARNING

Shifted loading goods

There is an increased risk of injury during loading and unloading.

This can result in cutting and crushing injuries.

▶ Wear  .

After loading

The body must be completely closed during the drive.

DANGER

Driving with folded down ramps/open platform gates/doors/flaps

This can result in injury.

The load may fall out.

- ▶ Check that the ramps are up and secured before departing.
- ▶ Check before driving that all platform gates/doors/flaps are closed and secured.
- ▶ Check before driving that the side guards are folded down and secured.

WARNING

Driving with support equipment <u>not</u> folded up and not secured

The support equipment (geared support winch/swivel support/folding supports) may be ripped off during the drive and fly away - risk of accidents!

- ▶ Check that all support equipment is up and secured before departing.

WARNING

Driving with open or only partially closed curtain

The curtain can come loose and be pushed to the side.

If wind goes under the curtains, the trailer can rock to the side - risk of accidents!

- ▶ Check that the curtains are completely closed and secure before departure.

Prerequisites for safe driving with trailer:

- ▶ Comply with the total weight, axle loads, static drawbar load.
- ▶ Keep the centre of gravity of the load as low as possible.
- ▶ Distribute the load evenly.
- ▶ Avoid punctiform/one-sided loading.
- ▶ Adhere to loading securing instructions as set out in VDI 2700 (see page **180**).

Permissible weights and load distribution

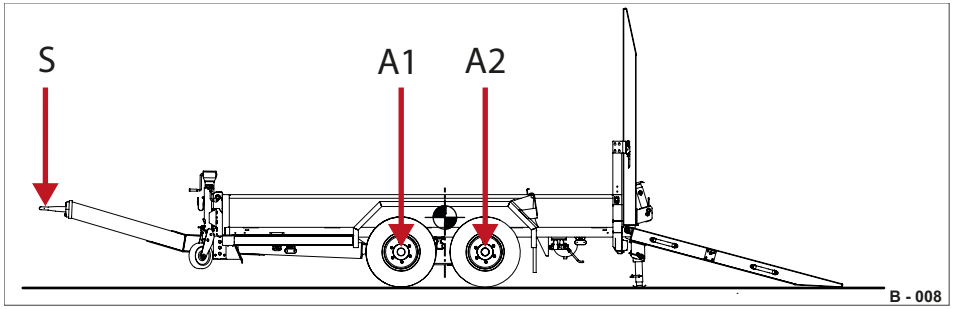


Fig. 7 Load definition HS 50xxxx, HS 65xxxx

S Drawbar load
A1 Axle load - 1st axle
A2 Axle load - 2nd axle

Stow away the load so that the load centre of the entire load lies over the longitudinal centre line of the trailer as far as possible.

Keep this load centre as low as possible.

Load your vehicle within the permissible total weight, the permissible axle loads and the permissible drawbar load.

Try for a uniform weight distribution even when there is only a part load, so that every axle is loaded proportionately and that there is sufficient drawbar load.

The maximum payload of the trailer can only be reached if the overall load centre of the load is within the permissible range.

Restrict the load at particular points of the loading surface by distributing the load appropriately to the permissible extent.

Fig. 8 Nameplate/weight specifications

- Total weight
0 Drawbar load(S)
1 Axle load - 1st axle
2 Axle load - 2nd axle
T Axle group weight

Note the actual weight specifications on the nameplate (Fig. 8) on the trailer chassis.

Permissible weights and load distribution

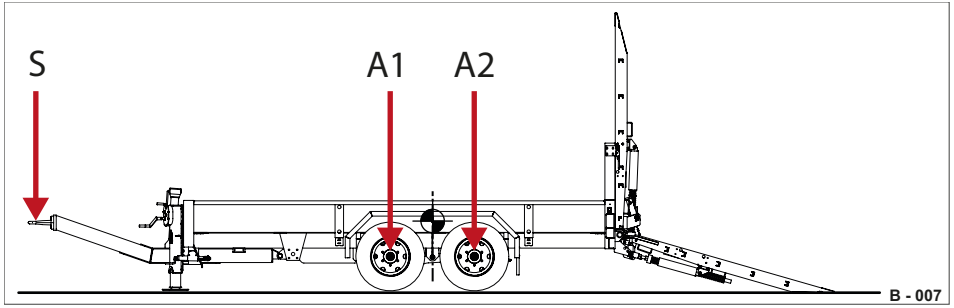


Fig. 9 Load definition HS 89xxxx, HS 10xxxx

S Drawbar load
A1 Axle load - 1st axle
A2 Axle load - 2nd axle

Fig. 10 Nameplate/weight specifications

- Total weight
0 Drawbar load(S)
1 Axle load - 1st axle
2 Axle load - 2nd axle
T Axle group weight

Loads	Max. weight
Permissible total weight	8,900 kg
Axle 1 (A1)	4,200 kg
Axle 2 (A2)	4,200 kg
Drawbar load(S)	500 kg
Unladen weight	2,400 kg
Payload	6,500 kg

Tab. 1 Example - HS 895020

Loads	Max. weight
Permissible total weight	10,500 kg
Axle 1 (A1)	5,000 kg
Axle 2 (A2)	5,000 kg
Drawbar load(S)	500 kg
Unladen weight	2,400 kg
Payload	8,100 kg

Tab. 2 Example - HS 105020

Loads	Max. weight
Permissible total weight	11,900 kg
Axle 1 (A1)	5,450 kg
Axle 2 (A2)	5,450 kg
Drawbar load(S)	1,000 kg
Unladen weight	3,340 kg
Payload	8,560 kg

Tab. 3 Example - HS 106020

General

In order to connect the trailer to a towing machine, a towing eye is attached to the tube drawbar.

A towing eye with
D40 mm is installed by default.

A towing eye with D50 mm can be attached as an option.

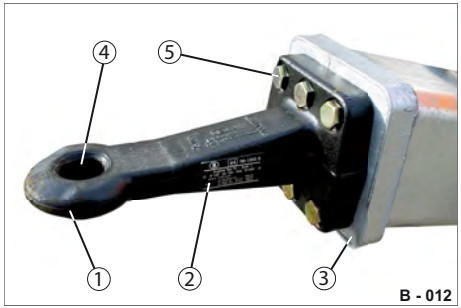


Fig. 11 Connection element

1 towing eye
2 Nameplate
3 Tube drawbar
4 Bushing
5 Screw fitting

DANGER

Damaged connection element

The trailer could detach from the towing machine during the drive - risk of accident!

- ▶ Check that the connection element is undamaged before departing.
- ▶ Have defective/damaged/deformed/ worn connection elements repaired or replaced immediately.
- ▶ Carry out regular maintenance of the connection elements (see Maintenance section on page **172**).

Possible versions of towing eye

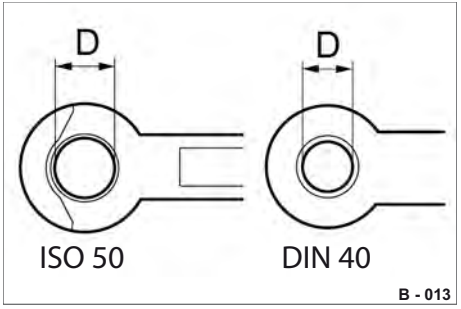


Fig. 12 Inner diameter of bushing

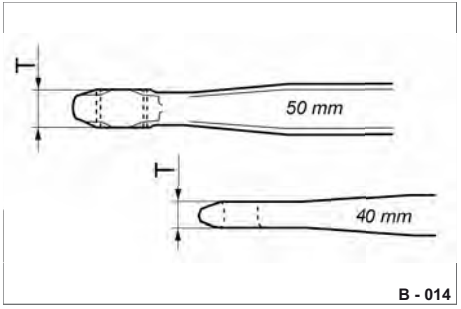


Fig. 13 Thickness of towing eye

Towing eye: Type	Diameter max. D (mm)	Thickness min. T (mm)
ISO 50	52	41.5
DIN 40	42	28

Tab. 4 Towing eye dimensions

Checking connection element

- ▶ Do regular visual inspections of the towing eye (see Maintenance section from page **172**).
- ▶ Only allow a qualified specialist to carry out repair work on the towing eye.
- ▶ Never do welding or adjustment work yourself on the towing eye.
- ▶ Only replace a worn/deformed towing eye with an original spare part - see label (Fig. 11/2) on the towing eye.

Rotatable towing eye (option)

The rotatable towing eye can be used for coupling varieties on the towing machine with diameter D40 mm or D50 mm.

The rotatable towing eye is secured with the following mounting elements:

– Fastening bolt
– Spacer sleeve
– Wing nut
– Shim rest
– If necessary, spring pin

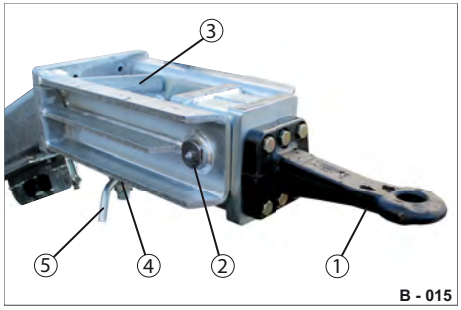


Fig. 14 Rotatable towing eye

1 towing eye
2 Pivot point/axle
3 Fastening bolt
4 Spacer sleeve
5 Wing nut

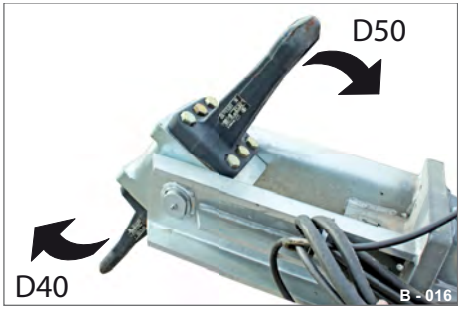


Fig. 15 Rotating the towing eye

⚠ CAUTION

Swivelling towing eye

If the towing eye swivels, fingers could be crushed between the towbar and towing eye.

▶ Use  .
▶ Turn the towing eye slowly and carefully.

⚠ WARNING

Towing eye secured incorrectly

The screw fitting can loosen during the journey. The trailer can detach from the towing machine - risk of accident!

▶ Check before driving that the rotatable towing eye is properly secured.

⚠ WARNING

Using incorrect towing eye

The towing eye can get overloaded and deformed during the journey. The trailer can detach from the towing machine - risk of accident!

▶ When coupling the trailer, check that the correct side of the rotatable towing eye D40 or D50 is used.
▶ Do not under any circumstances drive with the wrong towing eye.

Releasing

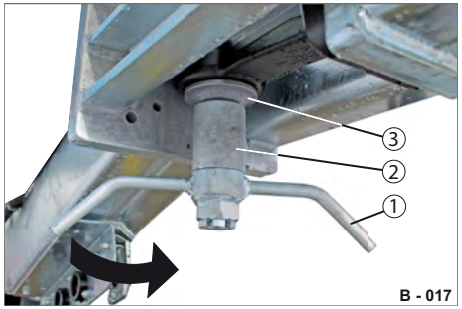


Fig. 16 Towing eye locked at bottom

1 Wing nut
2 Spacer sleeve
3 Shim rest

▶ Unscrew the wing nut (Fig. 16/1) completely.

▶ Remove the spacer sleeve (Fig. 16/2) and the shield rest (Fig. 16/3).

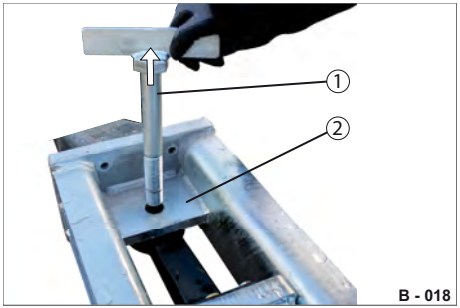


Fig. 17 Removing fastening bolt

1 Fastening bolt
2 Bracket

▶ Pull out the fastening bolt (Fig. 17/1).

▶ Remove the fastening elements.

Rotating

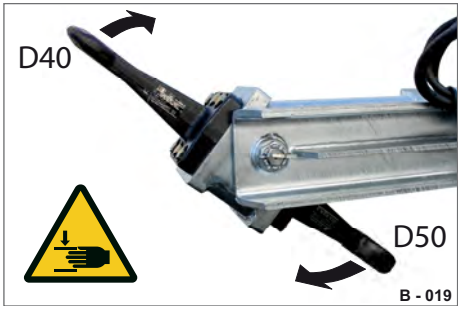


Fig. 18 Rotating the towing eye

▶ Turn the towing eye carefully.
The towing eye with D40 mm is placed on top of the holder.

Securing

Securing towing eye (D50)

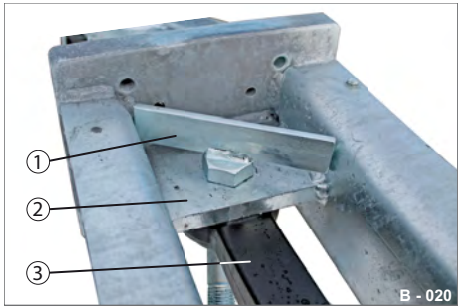


Fig. 19 Towing eye D50 locked at bottom

1 Fastening bolt
2 Bracket
3 Towing eye (D50)

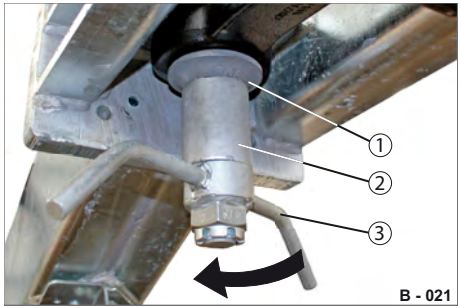


Fig. 20 Securing the towing eye D50 at bottom

1 Shim rest
2 Spacer sleeve
3 Wing nut

Fig. 21 Towing eye D50 secured

▶ Insert the fastening bolt (Fig. 19/1) from above through the bracket (Fig. 19/2) and the towing eye (Fig. 19/3).

▶ Engage the shim rest (Fig. 20/1) and the spacer (Fig. 20/2) from below on the fastening bolt of the towing eye (Fig. 19/3).

▶ Screw the wing nut (Fig. 20/3) onto the fastening bolt.

▶ Firmly tighten down the connection.

The towing eye is friction-locked.

Check before driving that the rotating towing eye is firmly tightened.

Securing towing eye (D40)

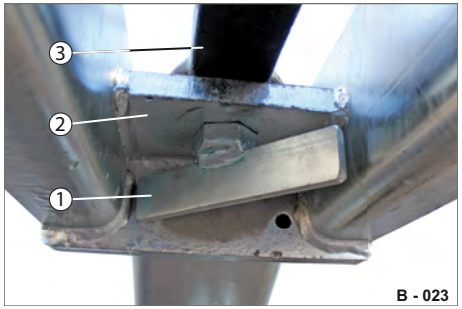


Fig. 22 Towing eye D40 locked at top

1 Fastening bolt
2 Bracket
3 Towing eye (D40)

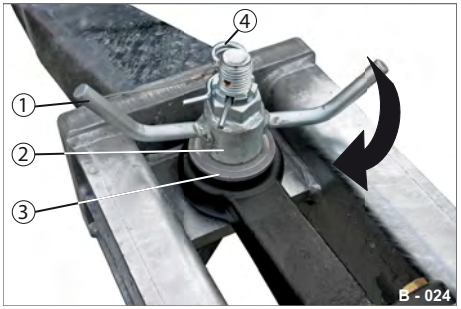


Fig. 23 Securing towing eye (D40)

1 Wing nut
2 Spacer sleeve
3 Shim rest
4 Spring pin (alternative)

Fig. 24 Towing eye D40 secured

▶ Insert the fastening bolt (Fig. 22/1) from below through the bracket (Fig. 22/2) and the towing eye (Fig. 22/3).

▶ Engage the shim rest (Fig. 23/3) and the spacer (Fig. 23/2) from above on the fastening bolt of the towing eye (Fig. 22/3).

▶ Screw the wing nut (Fig. 23/1) onto the fastening bolt.

▶ Firmly tighten down the connection.

The towing eye is friction-locked.

Check before driving that the rotating towing eye is firmly tightened.

▶ Stick the spring pin Fig. 23/4) (if present) through the bore hole and the crown nut of the wing bolt (Fig. 23).

Incorrectly secured towing eyes

NOTICE

Incorrectly securing the towing eye

The towing eye bushing may be damaged - premature wear.

- ▶ Secure the towing eye properly.
- ▶ Insert the fastening bolt only in the pockets of the bracket - not directly on the towing eye.

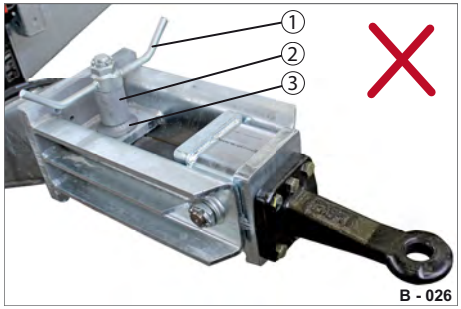


Fig. 25 Incorrectly secured - view, top

1 Wing nut
2 Spacer
3 Shim rest

The shim rest (Fig. 25/3) was not used as a rest for the towing eye, but only as a height compensator..

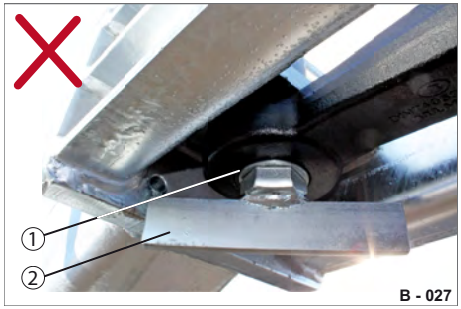


Fig. 26 Incorrectly secured - view, bottom

1 Towing eye bushing
2 Fastening bolt/wing

The towing eye bushing (Fig. 26/1) is pressed in by the tightening force.

The fastening bolt (Fig. 26/2) is not secured against independently coming loose in that the wing is freely mobile.

Connecting trailer to the towing vehicle/detaching from the towing vehicle

Connecting the towing vehicle to the trailer and detaching the trailer from the towing vehicle are two of the most dangerous procedures when operating the trailer.

These procedures require particular caution and attention of the operator.

Additional information can be found in the brochure provided: BG-Information BGI-599 on the safe coupling of vehicles.

CAUTION

Pin coupling is difficult to access

Hand/fingers can be crushed when operating the pin coupling.

You could hit your head.

- ▶ Use the remote control if inaccessible.
- ▶ Connect the pin coupling very carefully - no hasty movements.

WARNING

Rolling towing vehicle

There is risk of crushing between the trailer and towing vehicle when connection/ detaching the towing vehicle to/ from the trailer.

- ▶ Make sure danger area between the towing vehicle and trailer is empty.
- ▶ Agree on hand signals (in accordance with BGV-D29) when being guided by someone, and position this person within your field of vision and hearing distance.
- ▶ Keep the rear area of the towing vehicle clear.

WARNING

Allowing trailer to run up

Coupling/joining the trailers on a gradient by rolling up to the standing towing vehicle can endanger the lives of persons.

- ▶ Never allow a trailer to run up to a standing towing vehicle.
- ▶ Do a failed coupling attempt again.
- ▶ Drive the towing vehicle precisely - without lateral offset - to the towing eye of the trailer.
- ▶ If necessary, mark the driving distance on the ground.
- ▶ If necessary, ask an instructor for help.

Available versions of Pin couplings

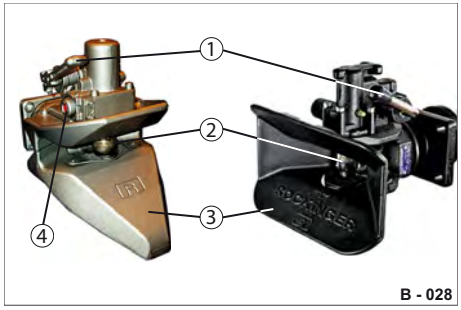


Fig. 27 Manual

1 Operating lever
2 Pin
3 Catcher
4 Control display

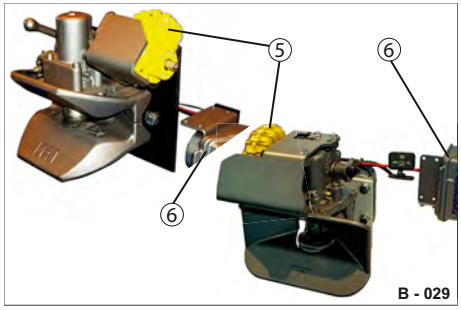


Fig. 28 Electrical

5 Electric motor
6 Control system

Fig. 29 Pneumatic

The pin is operated purely manually using the operating lever.

The safety monitoring of the condition can be seen on the position of the operating lever and the control display.

In addition, the state of the coupling (open/closed) is displayed in the driver's cab of the towing vehicle by a pneumatic or electrical remote indication.

You will find information on using the pin coupling in the manufacturer's operating instructions.

Preparation

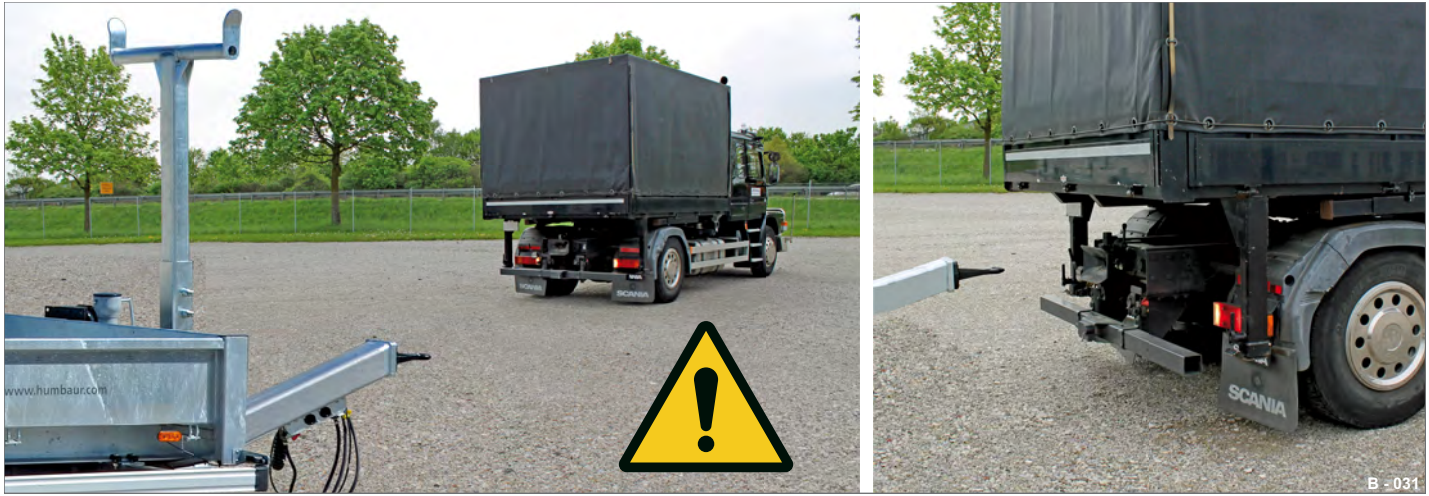


Fig. 30 Coupling trailer

▶ Before coupling for the first time, check that the towing vehicle - trailer connection is permissible.

- Do the trailer coupling size and the towing eye size match?
- Can the maximum permissible vertical load of the trailer be carried by the coupling of the towing vehicle?
- Does the position of the drawgear on the trailer and the height of the pin coupling match so that the towing eye is horizontal on flat surfaces in the coupled state?

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

Coupling

Fig. 31 Spindle parking brake

1 Securing cable with hook
2 Crank

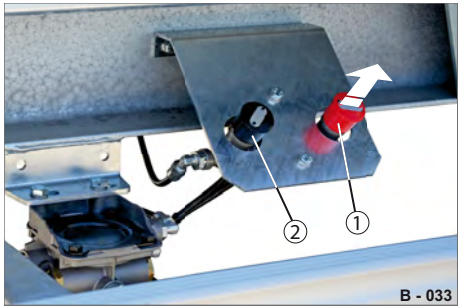


Fig. 32 Actuate the parking brake (for HS with compressed air brake)

1 Spring-loaded parking brake (red)
2 Service brake release valve (black)

Fig. 33 Wheel chocks positioned

1 Wheel chock

The spindle parking brake can be located on the front or side at the rear of the trailer (direction of travel left).

▶ Release the hook (Fig. 31/1) from the crank (Fig. 31/2).

▶ Turn the screw parking brake in the clockwise direction until it is applied.

This brakes the trailer.

▶ Engage the spring-loaded parking brake (Fig. 32/1).

This brakes the trailer.

▶ If necessary, place the wheel chocks (Fig. 33/1) under the wheels.

The trailer has an additional safeguard against rolling away.

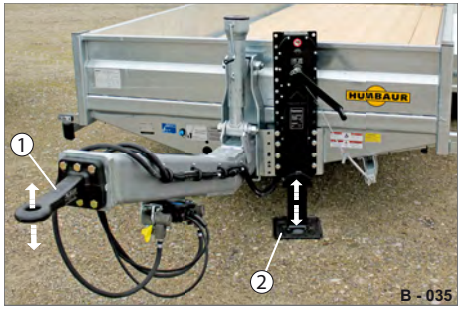


Fig. 34 Height equalisation/alignment

1 Tube drawbar - height
2 Geared support winch

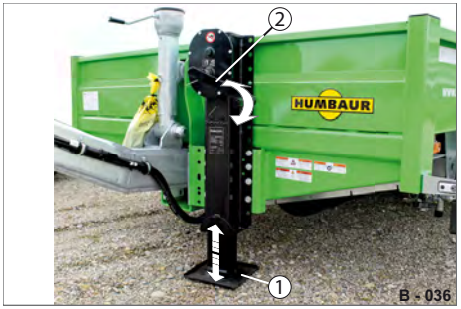


Fig. 35 Height equalisation (HS 89xx,10xx)

1 Geared support winch foot
2 Crank

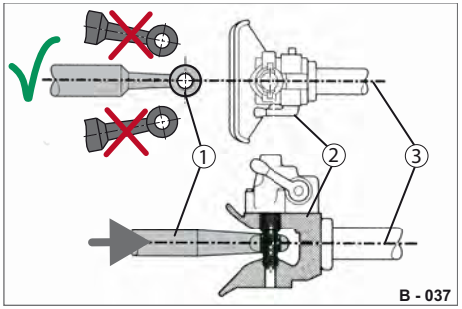


Fig. 36 Driving up

1 towing eye
2 Pin coupling (catcher)
3 Central axis

▶ If necessary, correct the tube drawbar setting (Fig. 34/1) by means of the geared support winch (Fig. 34/2).

▶ Crank the foot of the geared support winch (Fig. 35/1) up or down using the crank (Fig. 35/2).

▶ Do an optical check to ensure the trailer is as horizontal and level as possible.

▶ Reverse the towing vehicle until there is about 1 m distance between the coupling and the towing eye.

▶ Approach as straight and precisely as possible, not at an angle to the pin coupling.

▶ If necessary, correct the position of the trailer compared to the towing vehicle.

▶ If necessary, ask an instructor for help.

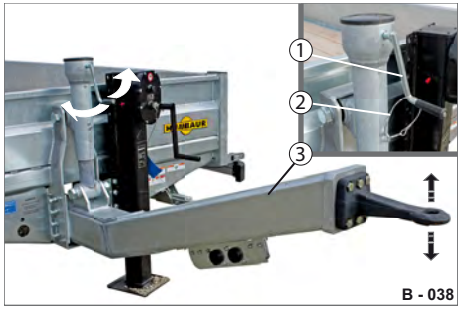


Fig. 37 Height adjustment of the draw pipe

1 Crank
2 Securing cable
3 Draw pipe

▶ Unclamp the securing cable (Fig. 37/2).

▶ Rotate the crank (Fig. 37/1) to the left or right and adjust the height of the draw pipe (Fig. 37/3) of the pin coupling (Fig. 40/2) to the towing vehicle.

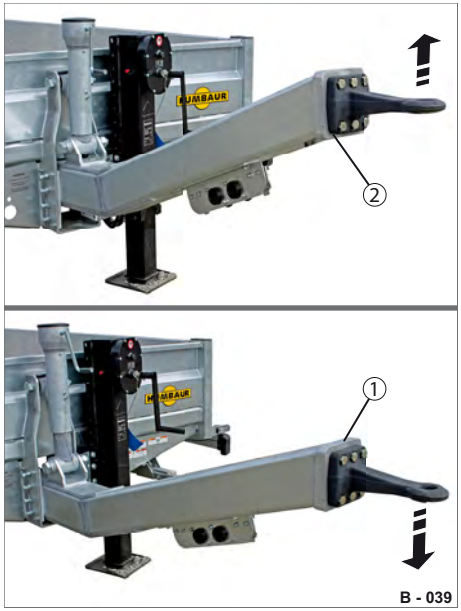


Fig. 38 Height adjustment of the draw pipe

1 Tube drawbar, fully down
2 Tube drawbar, full up

Towing eye too low:
- The tube drawbar would be pressed up during coupling.

Towing eye too high:
- The rear of the towing vehicle would be pressed up during coupling.

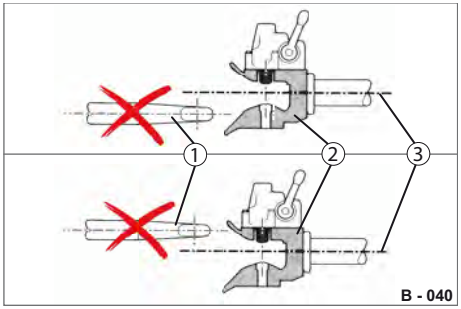


Fig. 39 Incorrect height adjustment

1 towing eye
2 Pin coupling (catcher)
3 Central axis

▶ Set the height so that the towing eye meets at the middle axis (Fig. 39/3) or slightly on the lower flaps of the catcher.

▶ Position the crank (Fig. 37/1) downward.

▶ Clamp the securing cable (Fig. 37/2).

The crank is secured against turning of its own accord.

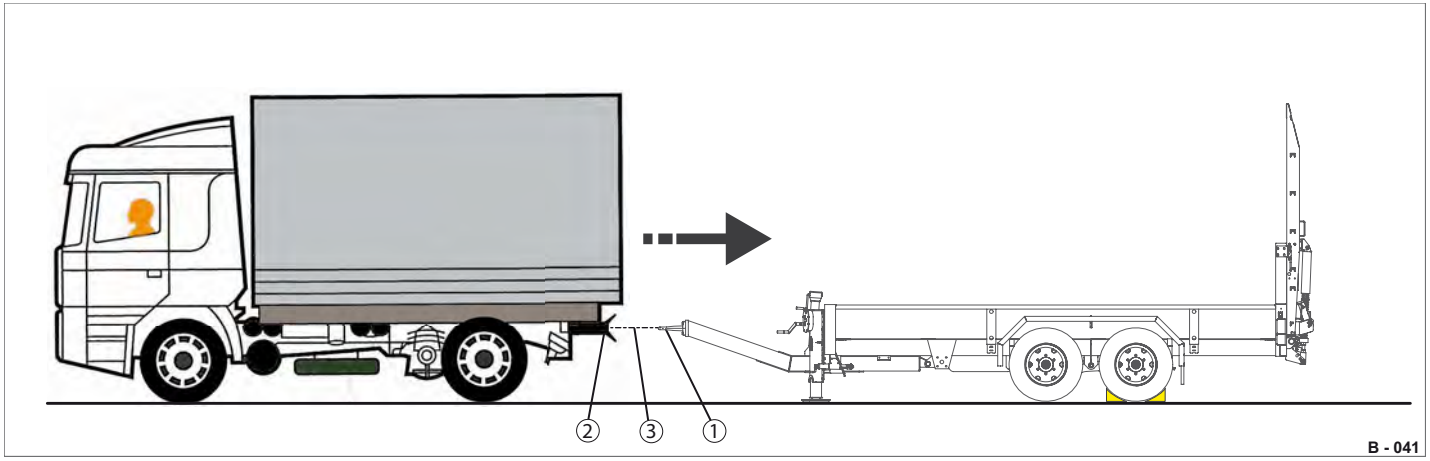


Fig. 40 Coupling

1 towing eye
2 Pin coupling (catcher)
3 Central axis

▶ Open the pin coupling (Fig. 40/2).

▶ Leave the danger area between the towing vehicle and trailer.

▶ Set the towing vehicle back so that the towing eye (Fig. 40/1) engages in the pin coupling.

If the pin coupling does not engage:

You can run the height position of the towing eye into the catcher so that the coupling pin engages by operating the pneumatic suspension (option) of the rear axle (by raising/lowering).

▶ Apply the towing vehicle parking brake.

▶ Check that the pin coupling is properly closed and secured.

After coupling

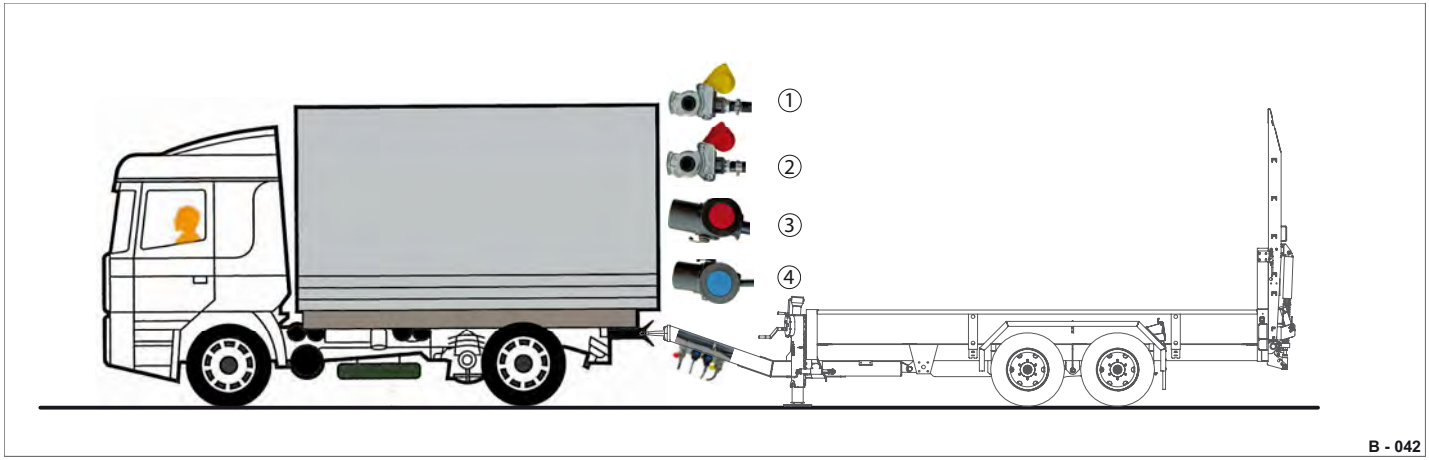


Fig. 41 Create connection

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

▶ Connect the lines in the following order to the towing vehicle:

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

(see "Coupling" on page **65**)

▶ Move the support equipment up (see from page **72**).

▶ Insert used wheel chocks in the holders and secure them in position (see from page **90**).

▶ If necessary:
Readjust the air spring (option), cover/ remove the park warning sign (option).

Uncoupling

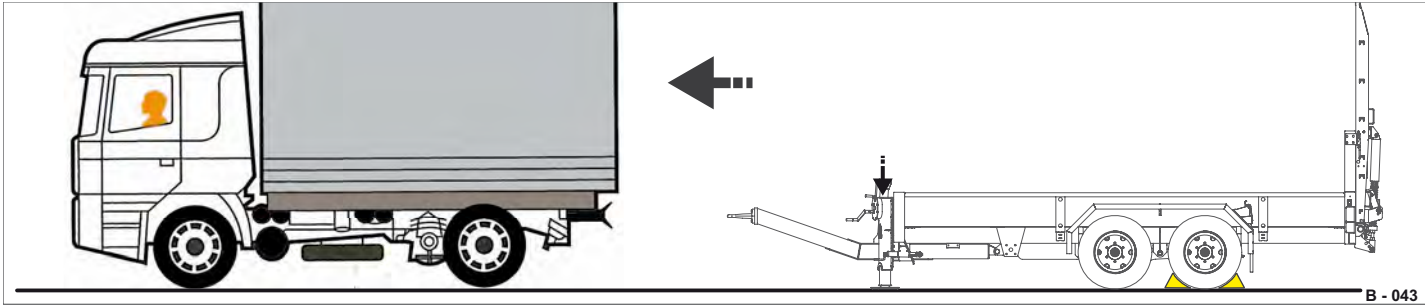


Fig. 42 Correctly coupling trailer

⚠ WARNING

Improperly coupled trailer

Trailer can start moving and tip over.

The trailer can hit and run over persons - risk of crushing!

- ▶ Only couple a trailer if it is empty.
- ▶ Use wheel chocks before coupling to prevent the trailer from rolling.

Procedure:

- ▶ Apply the trailer parking brake and the towing vehicle parking brake.
- ▶ Use wheel chocks to prevent the trailer from rolling.
- ▶ Let the support equipment (gear support foot or support wheel) down and secure them.
- ▶ Disconnect the lines from the towing vehicle, in this order:

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

- ▶ Plug the line heads into the respective parking socket or place the lines securely on the tongue.
- ▶ Unlock and open the pin coupling on the towing vehicle.
- ▶ Only drive the towing vehicle forward carefully once there is nobody in the danger area.
- ▶ Close the pin coupling.
- ▶ Do a check when parking.
- ▶ If necessary, attach park warning signs to the trailer.

Departure check

- The trailer is properly coupled.
- Brake and supply lines are connected.
- Electrical lines and & EBS cable are connected.
- Air suspension unit is located at driving level - with raising/lowering system.
- Working lights are switched off - if present.
- Parking brake is released.
- Support equipment is up and secured.
- The toolbox is closed and secured.
- Wheel chocks are secured in the holders.
- Night parking warning panels are closed.
- Drive-up ramps are up and secured.
- Unused load securing equipment is stowed away.

Check when parking

- The trailer is properly uncoupled.
- Screw parking brake/spring-loaded parking brake is actuated.
- Wheel chocks are under the wheels.
- Support equipment is extended and secured.
- Brake and supply lines are disconnected and parked.
- Electrical line & EBS cable are disconnected and parked.
- Raising/lowering system is in park position.
- Platform gates/curtain are closed.
- Side posts/lashing equipment are stowed away.
- Toolbox is closed.
- Ramp planks are slid in, ramp plank bay is closed and secured.
- Drive-up ramps are up and secured.
- Warning sign is extended.

When driving in a pair, note the following

Fig. 43 HTBDF while driving

Pay special attention to:

– Length of the vehicle team
– Speed
– Bending of the trailer to the towing vehicle when driving around tight curves (max. 90° possible)

Total height

▶ If applicable, measure the total height of the loaded trailer before starting the journey.
▶ Comply with the national regulations regarding the permissible maximum height.
▶ Before driving through underpasses and tunnels, pay attention to the maximum height specified on street signs.

Operation of the chassis

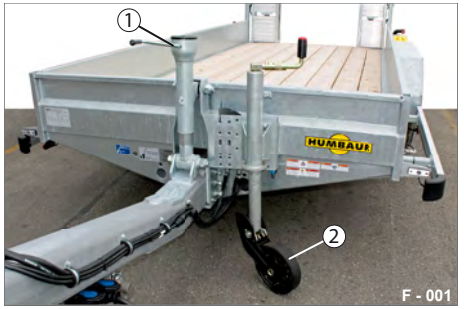


Fig. 1 Controls - front (HS 50xx, HS 65xx)

1 Height adjustment of the draw pipe
2 Support wheel

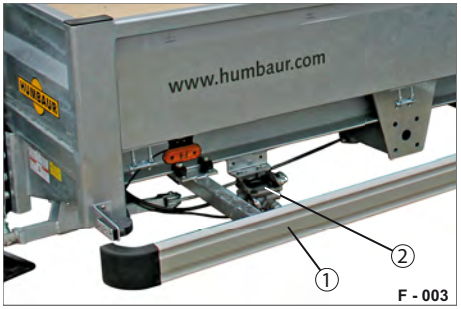


Fig. 3 Controls - left side in direction of travel

1 Side guard
2 Service brake release valve

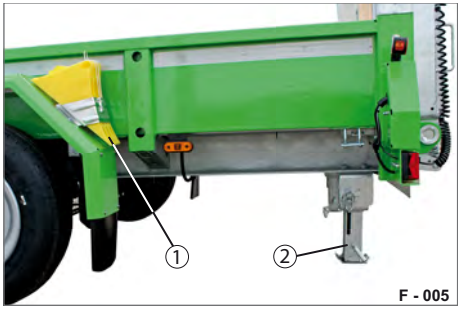


Fig. 5 Controls - rear

1 Wheel chock
2 Folding support (HS 10xx)

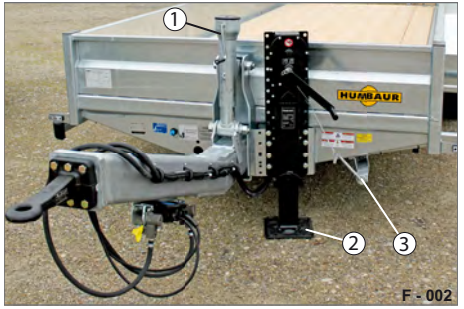


Fig. 2 Controls - front (HS 89xx, HS 10xx)

1 Height adjustment of the draw pipe
2 Geared support winch
3 Spindle parking brake

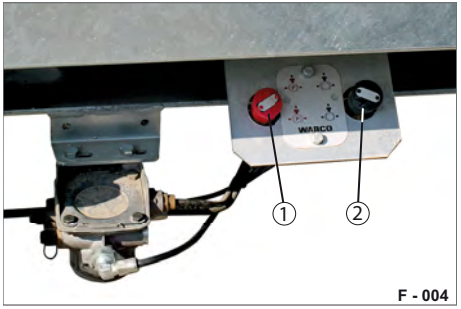


Fig. 4 Operating console - chassis (option)

1 Spring-loaded parking brake (red)
2 Service brake release valve (black)

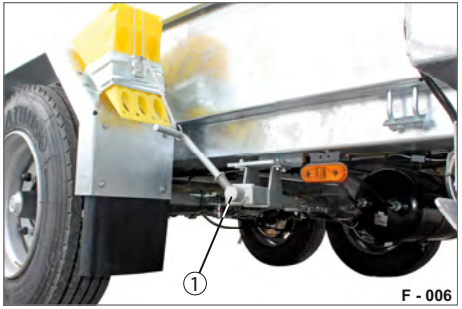


Fig. 6 Controls - rear side (HS 10xx)

1 Spindle parking brake

General

The Humbaur GmbH braking system is an electronic braking system (EBS) and complies with Directive ECE R13.

Driving without one of these connectors and/or driving without a plugged-in connection cable is illegal!

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

– ABS/EBS connector, 7-pin, 24 V, to ISO 7638-1996
– ABS/EBS connector, 5-pin, 24 V, to ISO 7638-1985

In addition, it is a requirement that the brake system be designed as a dual-line system with non-interchangeable compressed air connections.

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

Fig. 7 Connectors, standard 24 V

1 7-pin EBS/ABS plug (ISO 7638)
2 15-pin electrical plug (ISO 12098)

The electronic braking system is fitted with load-dependent braking pressure regulation (automatically adjusts to the current load condition) and an automatic anti-blocking system (ABS).

The EBS module detects faults and damage in the braking system, and these can be indicated by means of warning lights in the towing vehicle.

⚠ WARNING

EBS connection cable not connected

The automatic braking force regulation is out of operation, the wheel could block during braking.

The vehicle does not come to a stop on time - risk of accident!

▶ Connect the towing vehicle and the trailer using the EBS connection cable.
▶ Observe the label on trailer.

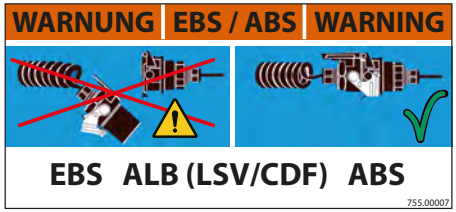


Fig. 8 Label on trailer - example

Observe the operating instructions of your towing vehicle.

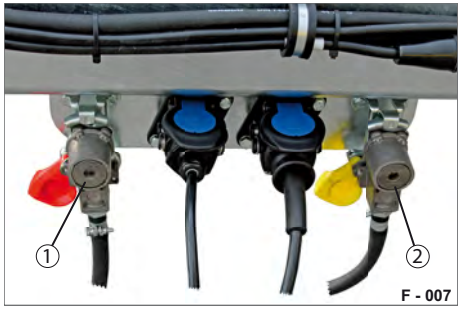


Fig. 9 Connections parked

1 Supply line (red)
2 Brake line (yellow)

DANGER

Incorrect order during coupling/uncoupling the lines

If the supply line is connected before the brake line, the service brake releases.

The trailer is unbraked.

This can result in persons being crushed or run over - risk of accident!

▶ Couple the brake line first.

▶ Uncouple the brake line last.

CAUTION

Coupling/uncoupling lines

You can crush your fingers in the connection points.

▶ Screw or unscrew the coupling heads carefully.

▶ Always pull at the coupling head, not at the hose.

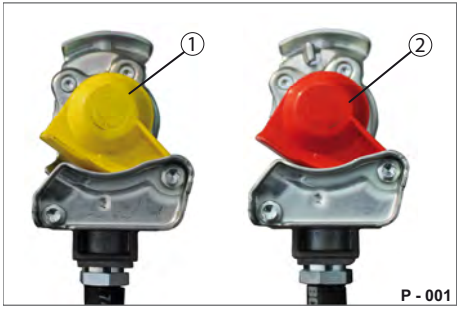


Fig. 10 Brake/supply line disconnected

1 Brake line (yellow)
2 Supply line (red)

Coupling

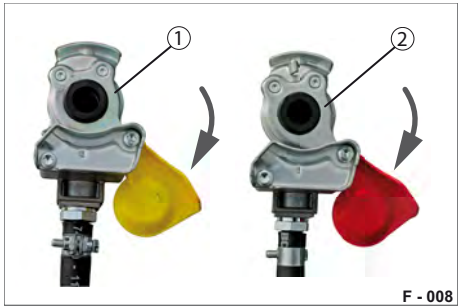


Fig. 11 Coupling

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

- ▶ Before coupling, check that the connections and coupling heads are clean and undamaged.
- ▶ Screw on the end cap.
- ▶ Connect the "Brake" coupling head (Fig. 11/1).
- ▶ Couple the "supply line" coupling head (Fig. 11/2).
- ▶ Release the spring-loaded parking brake.

Uncoupling

Fig. 12 Uncoupling

Fig. 13 Uncoupling

1 Parking sockets for coupling heads

- ▶ Disconnect "Supply" coupling head (Fig. 11/2).
- ▶ Disconnect the "Brake" coupling head (Fig. 11/1).

  The trailer is automatically braked with the service brake by venting the supply line during the uncoupling process.
- ▶ Close the end cap (see Fig. 12) or attach the coupling heads on the parking sockets (see Fig. 13/1).

Operating the service brake for manoeuvring

A coupled trailer, but without connected lines, can be manoeuvred by releasing the service brake.

The trailer is automatically braked with the service brake by venting the supply line during the uncoupling process.

The service brake can be manually released via the release valve.

The service brake does not replace the screw parking brake function!

At a lower tank pressure of approx. 2.5 bar, the service brake can no longer be released (residual pressure safeguarding).

When the supply line is recoupled to the towing vehicle, the released valve is automatically switched to the drive position (release valve is pressed out/ activated with excess pressure).

WARNING

Deactivating service brake with release valve

The trailer may start moving unchecked and roll over persons - risk of accident!

▶ Before releasing the service brake check that the trailer is properly coupled or secured with the screw parking brake.

WARNING

Closing release valve when compressed air tank empty

The trailer is not braked and may start moving unchecked and roll over persons - risk of accident!

▶ Couple the brake line to the towing vehicle if the compressed air tank is empty.

WARNING

Parking trailer only with activated service brake

The service brake function may diminish over time and the trailer may start moving unchecked and roll over persons - risk of accident!

▶ Secure a parked trailer with the screw parking brake and wheel chocks.

Service brake deactivation

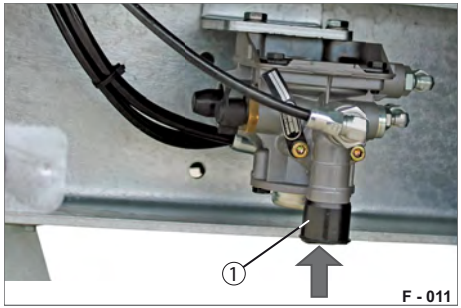


Fig. 14 Releasing service brake

1 Release valve, pressed in

▶ Press the release valve (Fig. 14/1).
The service brake releases.

Trailer is unbraked.
You can manoeuvre with the trailer.

Service brake activation

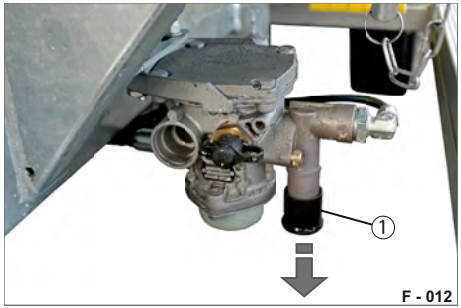


Fig. 15 Service brake in drive position

1 Release valve, pulled out

▶ Pull the release valve (Fig. 15/1).
The service brake engages.

Trailer is braked.

Compressed air brake console (optional)

Service brake deactivation

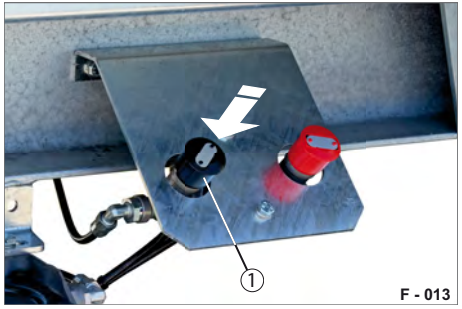


Fig. 16 Releasing service brake

1 Release valve (black) pressed in

▶ Press the release valve (Fig. 16/1).
The service brake releases.

Trailer is unbraked.
You can manoeuvre with the trailer.

Service brake activation

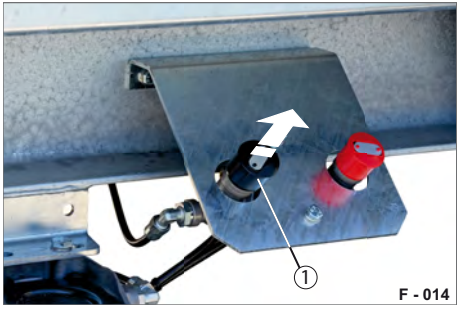


Fig. 17 Service brake in drive position

1 Release valve, pulled out

▶ Pull the release valve (Fig. 17/1).
The service brake engages.

Trailer is braked.

When the supply line is coupled up again, the release valve is automatically reset to the operating position.

Operating the quick-release coupling

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

With this type, the supply and brake lines are always connected or disconnected at the same time, due to their design and construction.

In the uncoupled condition, the coupling heads are automatically closed.

Removing

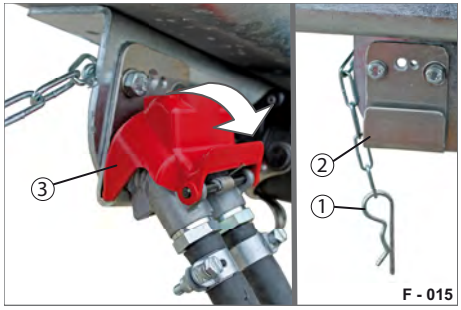


Fig. 18 Duo-Matic on park console

1 Securing cable with spring pin
2 Park console
3 End cap, Duo-Matic coupling

- ▶ Pull the spring pin (Fig. 18/1) out of the park console (Fig. 18/2).
- ▶ Press off the end cap (Fig. 18/3) and remove the Duo-Matic coupling from the park console.

Coupling

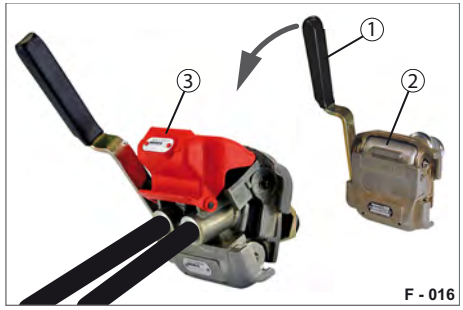


Fig. 19 Duo-Matic, coupled

1 Handle
2 Quick-release coupling on the towing vehicle
3 Duo-Matic coupling head

- ▶ Make sure that the coupling head and quick-release coupling socket sealing surfaces are clean.
- ▶ Clean the surfaces with a clean cloth, if necessary.
- ▶ Push the handle (Fig. 19/1) of the Duo-Matic quick-release coupling socket downwards and slide the Duo-Matic coupling head (Fig. 19/3) under the opened protective cover.
- ▶ Release the handle.

  The connection is made.

Uncoupling

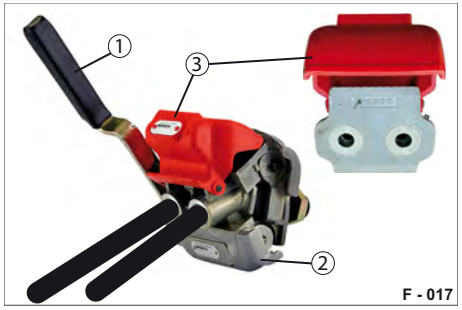


Fig. 20 Duo-Matic, uncoupled

1 Handle
2 Quick-release coupling on the towing vehicle
3 Duo-Matic coupling head

▶ Pull the handle (Fig. 20/1) of the Duo-Matic quick-release coupling socket upwards and pull out the Duo-Matic coupling head (Fig. 20/3) from under the protective cover.

The connection is disconnected. The cover plate automatically closes the coupling head and protects it from contamination and damage.

Parking

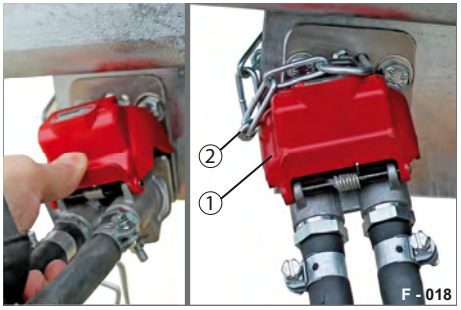


Fig. 21 Duo-Matic, parked

1 End cap, Duo-Matic coupling
2 Securing chain with spring pin

▶ Park the Duo-Matic quick-release coupling on the park console.

▶ Insert the spring pin (Fig. 21/2) into the bore holes.

The Duo-Matic coupling is secured against falling down.

Geared support winch (for HS 8.9 t / 10.5 t / 10.9 t)

Always remember:

- The geared support winch may only be operated with the crank handle.
- The support foot of the support equipment must be moved downwards until it touches the ground.
- When cleaning with a high-pressure cleaner, avoid a direct jet of water on the support equipment gearing.

Read the operating instructions provided by the manufacturer.

⚠ WARNING

Lowering the support equipment

Risk of crushing injuries below/ next to the support equipment .

▶ Keep the danger area around the support equipment free.

⚠ WARNING

Driving with lowered support feet

The support equipment can touch down on the road during the journey and rip off - risk of accident!

▶ Check that the support equipment is completely raised before departing.

▶ Check before driving that the hand crank has been secured with the securing cable.

⚠ WARNING

Sinking support feet

The support feet can sink into soft /sagging ground.

The trailer can tip over - risk of crushing!

▶ Check whether the ground is sufficiently stable (firm).

▶ Use a stable base if the ground is soft or sagging.

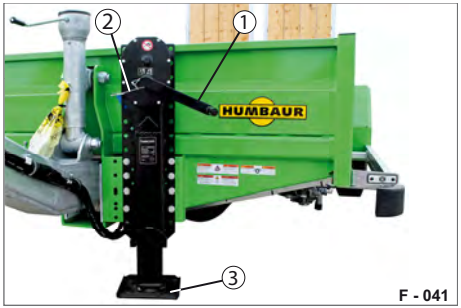


Fig. 22 Geared support winch

1 Crank handle
2 Securing cable
3 Support foot

The geared support winch is permanently mounted at the front on the chassis.

The support foot is cranked up in the drive position.

Operating the geared support winch

Unlocking/lowering

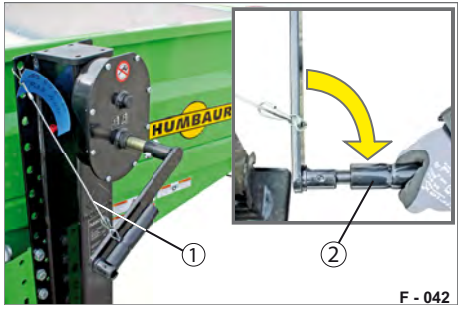


Fig. 23 Unlocking crank handle

1 Securing cable
2 Crank handle

- ▶ Fold out the crank handle (Fig. 23/2).
- ▶ Release the securing cable (Fig. 23/1) from the crank handle.
- ▶ Crank the support foot with the hand crank - in override - until it nearly makes contact with the ground.

Activating low gear

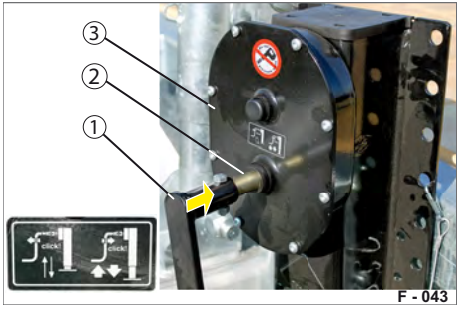


Fig. 24 Switching on low gear

1 Crank handle
2 Crankshaft
3 Transmission

- ▶ Push in the hand crank so that the gear detent engages in the transmission.
- ▶ Crank the support foot (Fig. 22/3) fully down to the ground.
- ▶ If necessary, even out uneven ground, e.g. by using a firm underlay.
- ▶ Leave the crankshaft (Fig. 24/2) in low gear (pressed in).
- ▶ Secure the crank handle with the securing cable (Fig. 25/3).

Retracting/securing

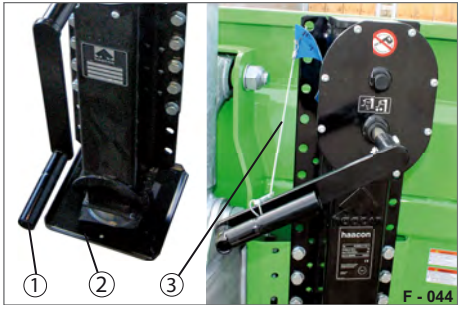


Fig. 25 Support foot retracted

1 Crank handle
2 Support foot
3 Securing cable

- ▶ Crank the support foot (Fig. 25/2) to the top in overdrive.
- ▶ Press the crankshaft (Fig. 24/2) into low gear.
- ▶ Wrap the securing cable (Fig. 25/3) around the crank handle and secure it with the hook.
- ▶ Fold out the crank handle if necessary.

  The hand crank is securing against turning of its own accord.

Support wheel (for HS 5 t / 6.5 t)

The support wheel supports the trailer when it is in the uncoupled state.
The fully-automatic support wheel is raised/lowered using the crank.

⚠ WARNING

Driving with lowered support wheel

The support wheel can touch down on the road during the journey and rip off - risk of accident!

▶ Check that the wheel support is completely raised and secured before departure.

⚠ WARNING

Sinking support wheel

The support wheel can sink into soft /sagging ground.

The trailer can tip over - risk of crushing!

▶ Check whether the ground is sufficiently stable (firm).

▶ Use a stable base if the ground is soft or sagging.

⚠ CAUTION

Manoeuvring with lowered support wheel

The support wheel cannot carry the load and becomes deformed. During uncoupling, the trailer falls forward and down - risk of crushing!

▶ Do not manoeuvre with support wheel lowered.

▶ Do not drive over the edge of the pavement with the support wheel.

⚠ CAUTION

Operating support wheel

They can crush fingers/hands/feet.

▶ Operate the support wheel carefully.

▶ Use  ,  .

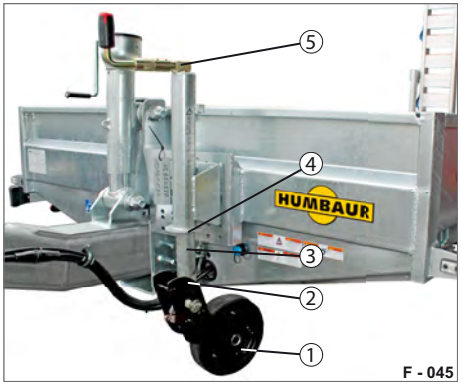


Fig. 26 Support wheel, automatic

1 Support wheel
2 Console
3 Adjustment tube
4 Collar
5 Crank, can be folded out

Raising support wheel

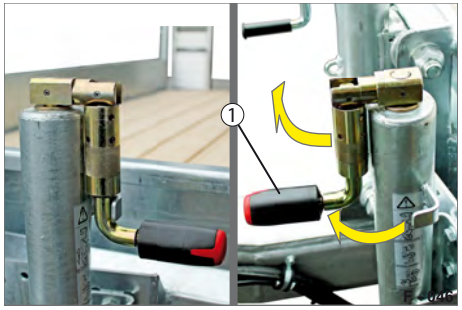


Fig. 27 Unlocking crank

1 Crank handle

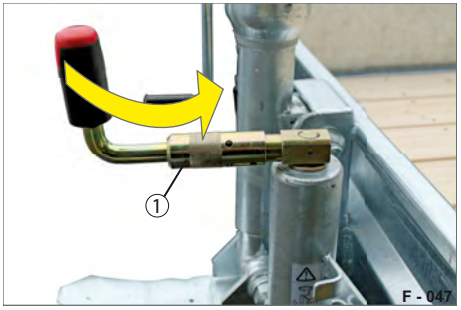


Fig. 28 Cranking up support wheel

1 Snap catch

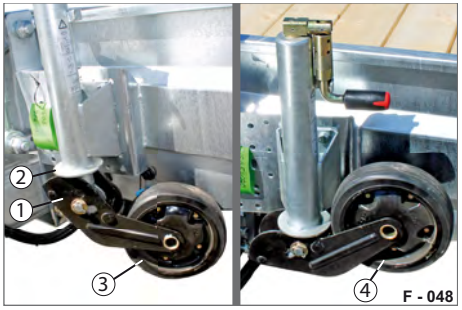


Fig. 29 Crank/support wheel in drive position

1 Console
2 Collar
3 Support wheel
4 Support wheel, parked

The support wheel cannot be raised until the trailer is coupled to the towing vehicle.

▶ Swing the crank (Fig. 26/5) out of the holder.

▶ Fold the crank handle (Fig. 27/1) upwards until the snap catch (Fig. 28/1) engages.

The crank is unlocked.

▶ Crank clockwise until the console (Fig. 29/1) moves over the collar (Fig. 29/2) and the support wheel (Fig. 29/3) moves upwards.

▶ If necessary, manually align the support wheel so that it does not jam on the chassis.

▶ Completely raise the support wheel (Fig. 29/4).

▶ Pull the snap catch and fold the crank handle downwards.

▶ Secure the crank in the holder.

The support wheel is raised and secured.

Lowering support wheel

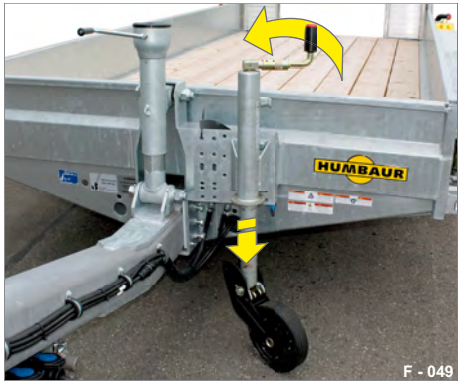


Fig. 30 Crank down support wheel

Fig. 31 Crank secured

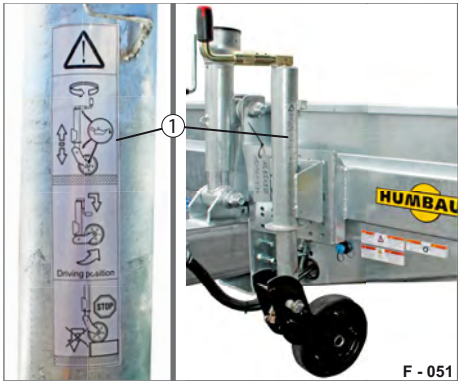


Fig. 32 Crank secured

The support wheel must be lowered before uncoupling the trailer from the towing vehicle.

- ▶ Fold out the crank.
- ▶ Crank anti-clockwise until the support wheel is sitting on the ground.
  Make sure the support wheel is properly folded down and does not jam.
- ▶ Fold in the crank and secure it.
  The support wheel is lowered and supports the tube drawbar/trailer.
- ▶ Note the safety sticker on the support wheel.

Support wheel (for HS 5 t / 6.5 t)

The semi-automatic support wheel can be installed as an alternative to the fully-automatic support wheel for HS trailers.

⚠ WARNING

Driving with lowered support wheel

The support wheel can touch down on the road during the journey and rip off - risk of accident!

▶ Check that the wheel support is completely raised and secured before departure.

⚠ WARNING

Sinking support wheel

The support wheel can sink into soft /sagging ground.

The trailer can tip over - risk of crushing!

▶Check whether the ground is sufficiently stable (firm).

▶ Use a stable base if the ground is soft or sagging.

⚠ CAUTION

Manoeuvring with lowered support wheel

The support wheel cannot carry the load and becomes deformed. During uncoupling, the trailer falls forward and down - risk of crushing!

▶ Do not manoeuvre with support wheel lowered.

▶ Do not drive over the edge of the pavement with the support wheel.

⚠ CAUTION

Operating support wheel

They can crush fingers/hands/ feet.

▶ Operate the support wheel carefully.

▶ Use  ,  .

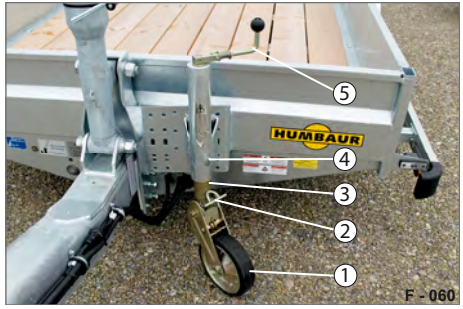


Fig. 33 Semi-automatic support wheel

1 Support wheel (bis 800 kg)
2 Eye
3 Adjustment tube
4 Hook
5 Crank, can be folded in

Raising support wheel

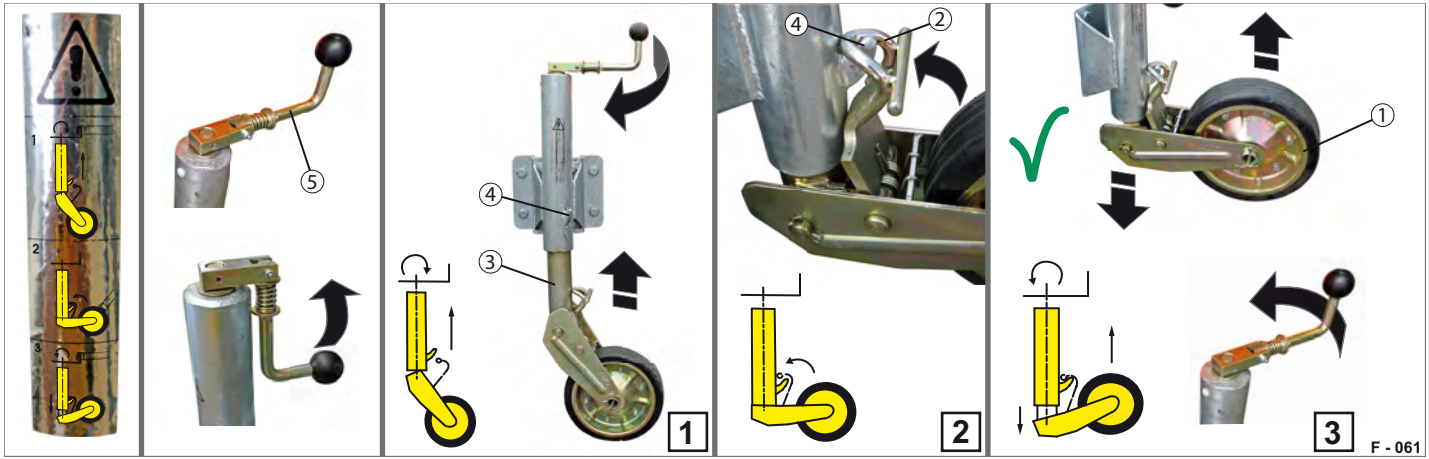


Fig. 34 Support wheel raised / secured

The support wheel cannot be raised until the trailer is coupled to the towing vehicle.

- ▶ Fold out the crank (Fig. 33/5). Press against the spring.
- ▶ Crank clockwise until the eye (Fig. 33/2) is above the hook (Fig. 33/4). Position the wheel by hand, if necessary.
- ▶ Crank anti-clockwise until the support wheel (Fig. 33/1) is completely raised. The support wheel will be tensioned.
- ▶ Fold in the crank (Fig. 33/5). The support wheel is raised and secured.

Lowering support wheel

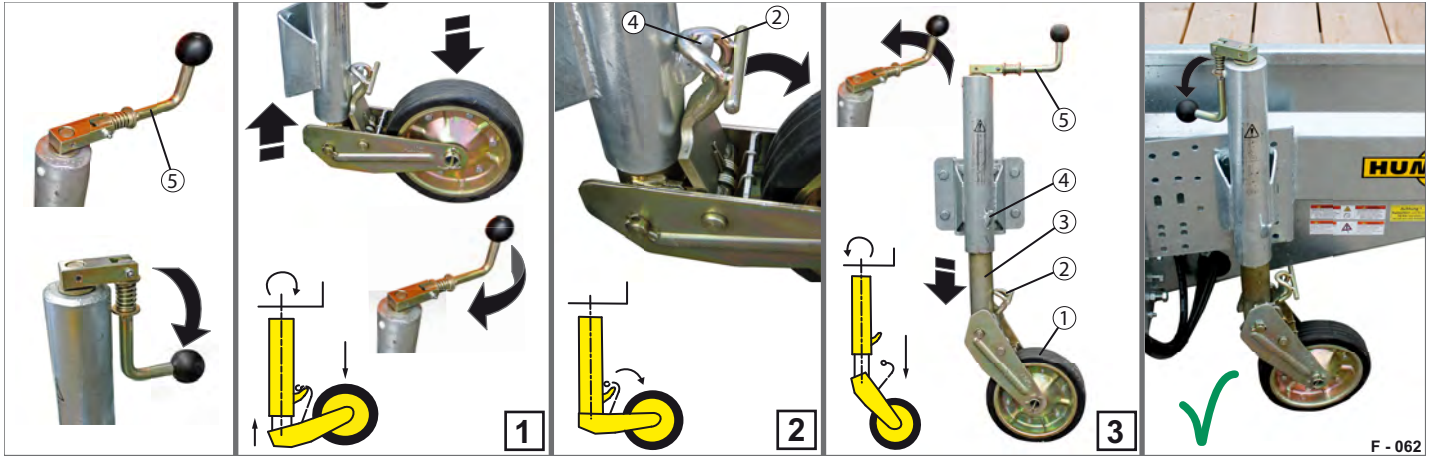


Fig. 35 Support wheel raised / secured

The support wheel must be lowered before uncoupling the trailer from the towing vehicle.

- ▶ Fold out the crank (Fig. 33/5). Press against the spring.
- ▶ Crank clockwise until the eye (Fig. 33/2) can be taken out of the hook (Fig. 33/4). Pull the wheel out by hand, if necessary.

  The support wheel is unlocked.
- ▶ Crank anti-clockwise until the support wheel (Fig. 33/1) is sitting on the ground.
- ▶ Fold in the crank (Fig. 33/5).

  The support wheel is lowered and supports the tube drawbar/trailer.

Operating folding supports

The right and left folding supports are attached to the rear of the trailer.

The folding supports stabilise the trailer during the loading/unloading of vehicles.

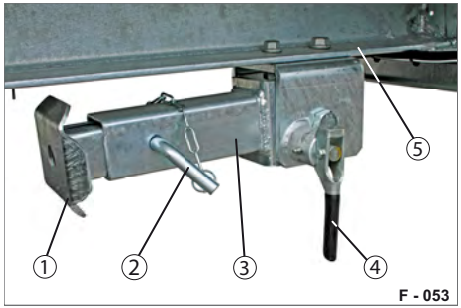


Fig. 36 Folding support in drive position

1 Levelling foot
2 Socket pin with guide
3 Folding support
4 Spring bar
5 Chassis

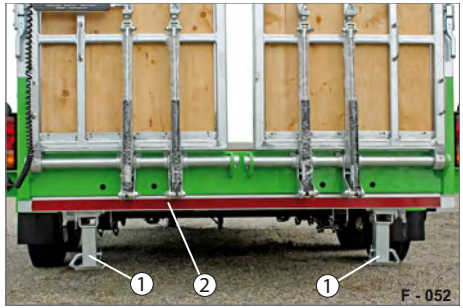


Fig. 37 Folding supports retracted

1 Folding support
2 Chassis

⚠ WARNING

Sinking support feet

The support feet can sink into soft /sagging ground.

The trailer can tip over - risk of crushing!

▶ Check whether the ground is sufficiently stable (firm).

▶ Use a stable base if the ground is soft or sagging.

⚠ WARNING

Driving with retracted folding supports

The folding supports can touch down on the road during the journey and rip off - risk of accident!

▶ Check that the folding supports are folded up and secured before departing.

⚠ WARNING

Unequally lowered support feet

The trailer may become unbalanced when driven on with the loading vehicle and cause the loading vehicle to tip over - danger of crushing!

▶ Adjust the support leg at equal distances.

⚠ WARNING

Loading/unloading without folding supports retracted

Loading/unloading of loading vehicles without folded down support feet can lead to loss of stability.

The trailer can tip over - risk of crushing!

- ▶ Fold down the folding supports before loading/unloading loading vehicles.
- ▶ Check that the folding supports are engaged.

⚠ CAUTION

Handling the folding supports

Danger of fingers/hands being crushed between the chassis and folding supports.

- ▶ Use the folding supports carefully and in a controller manner - do not let them fall.
- ▶ Use  .
- ▶  Keep your feet out of the crushing zone when folding down the folding supports.
- ▶ Only operate the folding supports when the trailer is at a standstill.

⚠ CAUTION

Working under the trailer

You could hit your head.

- ▶ Avoid jerky movements.
- ▶ Walk under the chassis slowly and carefully.

Folding out

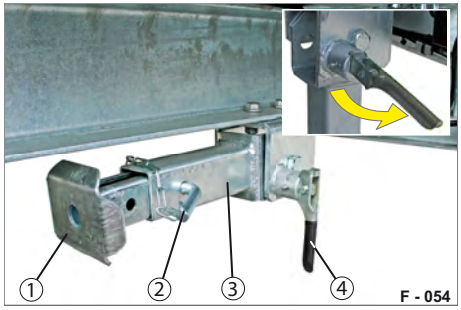


Fig. 38 Folding out the folding support

1 Levelling foot
2 Socket pin with guide
3 Folding support
4 Spring bar

▶ Pull on the spring bar (Fig. 38/4).
The folding support (Fig. 38/3) is unlocked.
This automatically folds downwards.

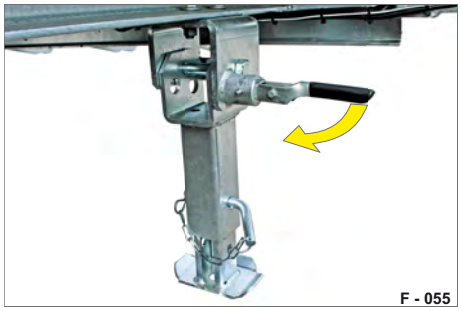


Fig. 39 Folding support folded out

▶ Release the spring bar (Fig. 38/4).
The spring bar locks automatically when the folding support is completely folded out.

▶ Check the locking, if necessary press down the spring bar.

Adjustment

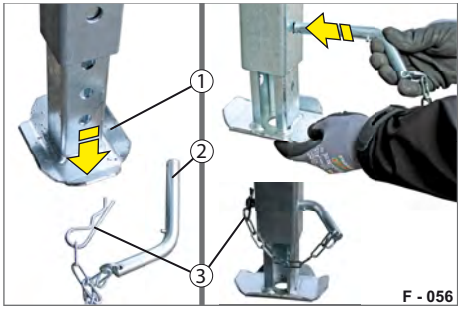


Fig. 40 Adjusting levelling foot

1 Levelling foot
2 Socket pin
3 Spring pin

▶ Remove the spring pin (Fig. 40/3) from the socket pin (Fig. 40/2).

▶ Pull out the socket pin.

▶ Place the levelling foot (Fig. 40/1) on firm ground and adjust the levelling foot downwards until it can still be located in the further hole.

▶ Insert the socket pin through the hole.

▶ Secure the socket pin with the spring pin.

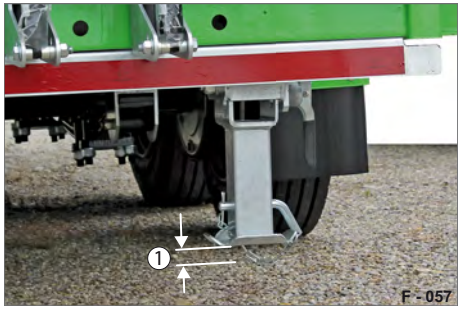


Fig. 41 Support feet adjusted

1 Distance to ground (approx. 3-5 cm)

▶ After folding down and, if necessary, adjusting the folding supports, check whether there is still an air gap (Fig. 41/1) between the ground and the levelling foot plate.

When a vehicle is loaded/unloaded, the chassis is compressed via the axle suspension and the foldings supports set down on the ground.

Folding in

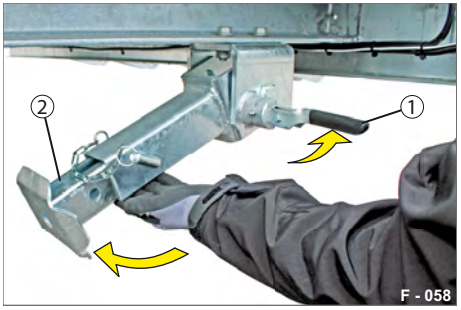


Fig. 42 Folding in folding support

1 Spring bar
2 Folding support

▶ Tilt the levelling foot (Fig. 40/1) up and secure it with the socket pin (Fig. 40/2) and spring pin (Fig. 40/3).

▶ Pull the spring bar (Fig. 42/1) into a horizontal position.

▶ Fold up the folding support (Fig. 42/2) (horizontally) and lock it with the spring bar (Fig. 42/1).

The spring bar snaps into place.

Checking the position

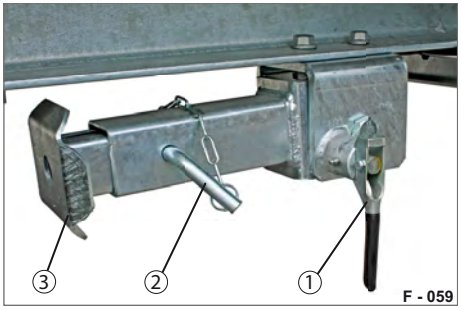


Fig. 43 Drive position

1 Spring bar, snapped in
2 Socket pin, inserted/secured
3 Folding support, folded up

▶ Check that both folding supports are in drive position before departing (see Fig. 43).

Operating the screw parking brake

Application

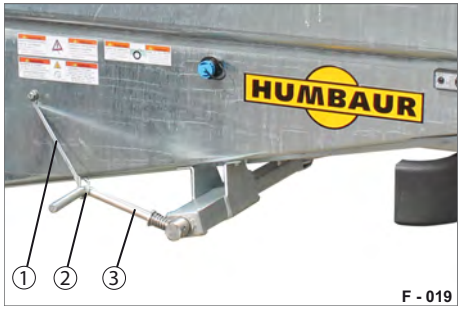


Fig. 44 Screw parking brake secured in drive position

1 Front wall / chassis
2 Securing cable with hook
3 Crank

The screw parking brake is operated 100% manually.

The screw parking brake secures the trailer against rolling away when parking in the uncoupled state.

The screw parking brake may only be released with the trailer in the coupled state!

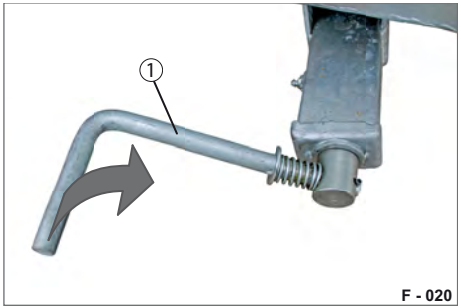


Fig. 45 Applying the screw parking brake

1 Crank

▶ Release the hook (Fig. 44/2) from the crank (Fig. 45/1).

▶ Turn the crank (Fig. 45/1) in the clockwise direction until the brake is applied.

This brakes the trailer.

Securing in park position

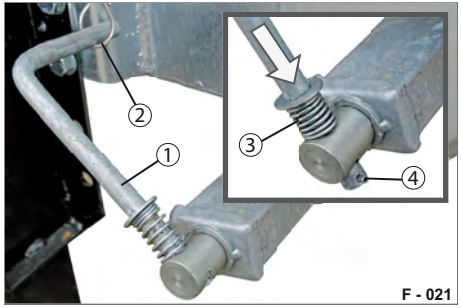


Fig. 46 Screw parking brake secured

1 Crank
2 Securing cable with hook
3 Compression spring
4 Pin

▶ Press the crank (Fig. 46/1) against the compression spring (Fig. 46/3).

▶ Turn the crank (Fig. 46/1) at the same time so the pin (Fig. 46/4) engages.

Crank handle points to the chassis.

▶ Fit the hook of the securing cable (Fig. 46/2) over the crank.

The screw parking brake is secured against unauthorised releasing.

Releasing

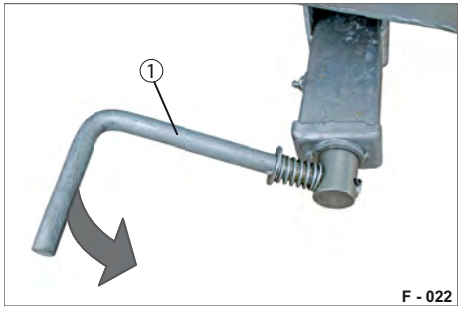


Fig. 47 Releasing the screw parking brake

1 Crank

▶ Release the hook (Fig. 46/2) from the crank (Fig. 47/1).

▶ Rotate the crank (Fig. 47/1).

▶ Rotate the crank (Fig. 47/1) anticlockwise as far as it will go.

The trailer is unbraked.

Securing in the drive position

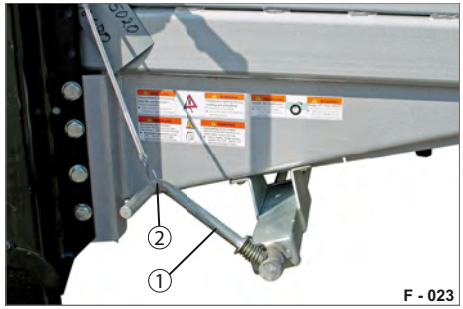


Fig. 48 Screw parking brake secured

1 Crank

2 Securing cable with hook

▶ Fit the hook of the securing cable (Fig. 48/2Fig. 481) over the crank.

The screw parking brake is se cured against turning of its own accord.

⚠ WARNING

Driving with unsecured crank

The crank may be ripped off during driving - risk of striking!

▶ Check before driving that the crank is secured with the securing cable.

Operating the spring-loaded parking brake

The spring-loaded parking brake is pneumatically controlled and is applied via the spring-loaded diaphragm brake cylinders.

If spring-loaded parking brake is engaged and released several times, the pressure in the system sinks. If the pressure falls under 5.2 bar, the spring-loaded parking brake can no longer be released using the operating element.

The spring-loaded parking brake can then only be released via the emergency release device.

For information on the emergency release device, refer to the chapter entitled “Emergency release device”, see page **282**.

Securing trailer

Fig. 49 Trailer secured

1 Wheel chocks in place

▶ Check before releasing the spring-loaded parking brake that:

- the wheel chocks are in place and/or
- the trailer is properly coupled to the towing vehicle.

Brakes

Fig. 50 Operating point

1 Spring-loaded parking brake (red)

▶ Pull out the spring-loaded parking brake (Fig. 50/1).

This brakes the trailer.

Releasing

▶ Press the spring-loaded parking brake (Fig. 50/1).

The trailer is unbraked.

Pressure level in the compressed air tank

The compressed air conveyed via the supply line from the towing vehicle to the trailer (up to 10 bar) has a maximum operating pressure of 8.5 bar (depending on the switch-off pressure of the compressor in the towing vehicle).
When the trailer is uncoupled, the supply pressure can drop as a result of:

– Leaks in the brake system or
– Multiple actuation of the release valves.

⚠ WARNING

Activated emergency release device

When the emergency release device is activated, the trailer brake system is put out of operation.

The trailer can hit and run over persons - risk of crushing!

▶ Use wheel chocks to prevent the trailer from rolling.
▶ Only actuate the emergency release system on even ground.

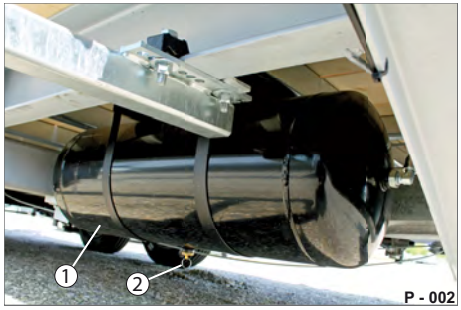


Fig. 51 Compressed air tank below frame

1 Compressed air tank, front side
2 Drain valve

When the pressure in the tank drops below approx. 3 bar, the trailer braking valve automatically switches to the braking position, the wheel brakes are applied and cannot be released by actuating the release valve.

In the event that you want to manoeuvre the trailer in this state, you must fill the brake system with supply pressure.

The compressed air tanks are attached at the centre rear below the chassis.

On trailers fitted with manual drainage valves, the tanks must be regularly drained and leaking drainage valves must be replaced.

With automatic water drain valves, manual water draining/bleeding is not required.

⚠ WARNING

Condensate in the compressed air system

The brake system can be destroyed or fall out.

▶ Regularly drain the compressed air system.

⚠ CAUTION

Escaping pressurised air

Actuating the drain valve causes a lot of noise.

This can cause tinnitus and hearing damage.

▶ Use  .

⚠ CAUTION

Working under the trailer

You could hit your head.

▶ Avoid jerky movements.

▶ Use an operating pole to drain the valves.

▶ Use  .

NOTICE

Compressed air system/valve freezing

The compressed air system/valves can freeze in the cold season and cause damage.

▶ Use antifreeze.

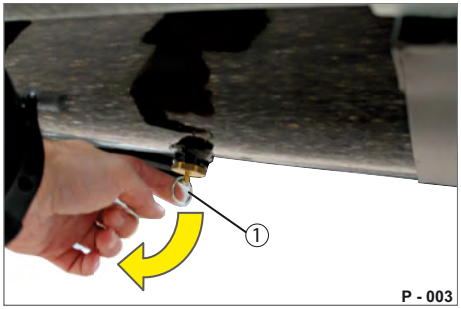


Fig. 52 Compressed air tank

1 Operating pin

▶ Push in the operating pin (Fig. 52/1) or push it to the side.

Accumulated condensate is forced out of the tank by the pressure.

▶ Release the operating pin (Fig. 52/1) when no more condensate comes out.

The drain valve closes automatically.

▶ Repeat the work steps for all drainage valves.

Underrun guard

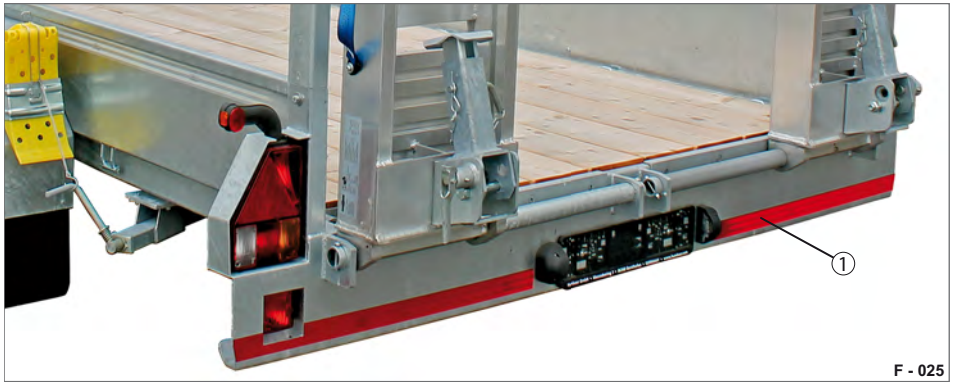


Fig. 53 Rear of the trailer

1 Underrun guard

The underrun guard (Fig. 53/1), a safety component, prevents vehicles from being pulled under the chassis in the event of an accident.

Driving with a deformed/ damaged underrun guard is not allowed.

General

The side guard is used as approach protection.

It is located on the sides of the trailer and is a legally required safety component.

Driving without a side guard is illegal.

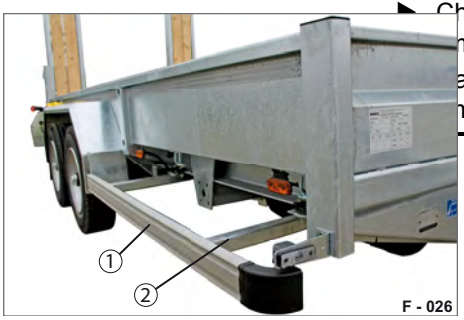


Fig. 54 Side guard, stationary

1 Side guard
2 Retaining bracket, bolted

DANGER

Driving with damaged side guard

This does not provided sufficient side approach protection.

Persons can be pulled under the chassis - risk of injury!

- Check that the side guard is not damaged before departing.
- Have a damaged side guard repaired immediately.

General

The wheel chocks serve to secure the trailer when it is parked.

Wheel chocks can be attached to different parts of the trailer, depending on the version and the optional equipment of the trailer.

In addition to the parking brake, the trailer must be secured with wheel chocks on up/down slopes, when loading and unloading and in the uncoupled state.

Observe the direction of inclination on a slope.

See that both wheel chocks are always present.

Replace lost or damaged wheel chocks immediately.

WARNING

Parking trailer on a slope

The service brake can give way and the trailer starts moving - risk of accident!

- ▶ On slopes, secure the trailer additionally using wheel chocks.
- ▶ Only place the wheel chocks under rigid axles.

WARNING

Unsecured wheel chocks

Unsecured wheel chocks can fall during the journey - risk of accident!

- ▶ Check that the wheel chocks are secured before departing.
- ▶ Regularly check the condition of the holder for damage.

Using wheel chocks

Fig. 55 Example: Wheel chocks in place

- ▶ Place the wheel chocks under the wheel so that they touch the full surface.

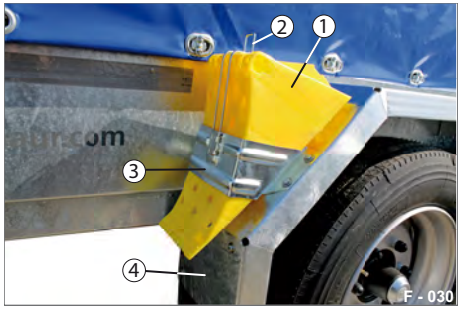


Fig. 56 Wheel chocks, unsecured

1 Wheel chock
2 Retaining spring
3 Bracket
4 Mudguard

Fig. 57 Handling the wheel chock

Removing

▶ Press down the retaining spring (Fig. 56/2) from the chock.

▶ Pull the chock (Fig. 56/1) out of the holder.

Attachment & securing

▶ Insert the chock fully into the holder (Fig. 56/3).

The retaining spring (Fig. 56/2) automatically secures the chock.

The chock is captively secured.

Using spare wheel

Optionally, a spare wheel can be carried in a basket under the chassis for vehicle versions with single tyring.

You must observe the local regulations, safety rules and fundamental principles when removing/returning the spare wheels, and when maintaining and testing the spare wheel brackets, for example:

- Motor vehicle traffic regulations (StVO in Germany)
- Motor vehicle construction and use regulations (StVZO in Germany)
- Accident prevention regulations - vehicles (BGV 12)
- Safety rules for the storage of spare wheels (ZH 1/13)
- Fundamental principles for vehicle testing by the driving personnel (BGG 915)
- When working in the road with moving traffic, a suitable warning vest must be worn.

⚠ WARNING

Unsecured spare wheel

The spare wheel can fall during the journey - risk of injury!

▶ Check that the spare wheels are properly secured before departing.

⚠ WARNING

Loading/removing spare wheel

Hands and feet could get crushed between the spare wheel, trailer parts and the ground.

▶ Use  ,  ,  .

▶  Wheels are heavy. Work in pairs.

⚠ WARNING

Working under the trailer

This can result in striking and crushing injuries.

▶ Make sure the vehicle is secured against rolling away.

▶ Use  ,  ,  .

▶ Avoid jerky movements.

⚠ WARNING

Spare wheel on the loading platform

You could fall off the loading platform when handling the spare wheel!

▶ Carefully attach/move/remove the spare wheel - do not let it roll.

▶  Wheels are heavy. Work in pairs

Spare wheel on the front wall

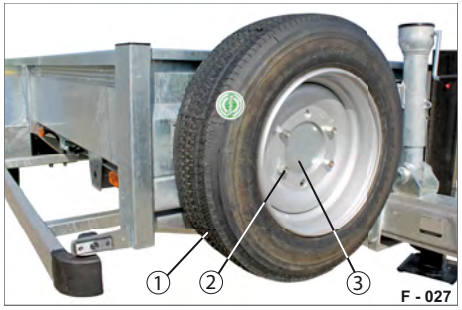


Fig. 58 Spare wheel on the front wall

1 Spare wheel
2 Nuts
3 Bracket

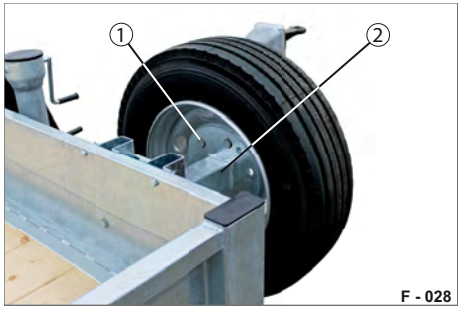


Fig. 59 Spare wheel on the front wall

1 Pin
2 Bracket

Spare wheel, spare wheel holder and safety elements must be properly secured to prevent loss.

Spare wheels being transported (on the loading platform) must be securely lashed down.

Spare wheels may only be transported in the provided spare wheel bracket.

NOTICE

Over-tightening spare wheel nuts

The wheel rim can get deformed.

▶ Tighten the spare wheel nuts with max. 80 Nm..

Removing

▶ Unscrew all 4 nuts (Fig. 58/2). Hold the spare wheel firmly in the process.

▶ With a second person helping, remove the spare wheel from the bracket (Fig. 58/3). If necessary, use an auxiliary aid for this purpose.

▶ Screw the 4 nuts onto the bracket.

Fitting

▶ With a second person helping, place the spare wheel (Fig. 58/1) onto the pins (Fig. 59/1) of the bracket (Fig. 59/2).

▶ Firmly screw on the spare wheel with min. 4 nuts (Fig. 58/2).

General

A closable toolbox is available as an option.
The location depends on the other equipment on the trailer.

The toolbox is used to stow tie-down straps, tools, cleaning utensils, etc.

The toolbox is not waterproof.

⚠ WARNING

Unlocked toolbox

Objects could fall out during the journey and hit persons.

The lid can be torn off - risk of accident!

▶ Check that the toolbox is closed and secure before departure.

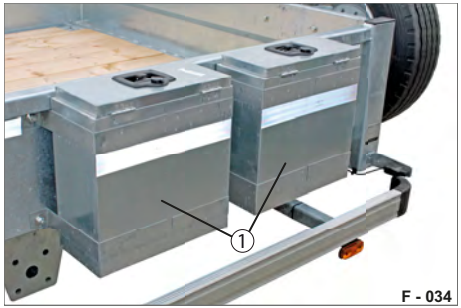


Fig. 60 On side of chassis

1 Aluminium plate toolboxes

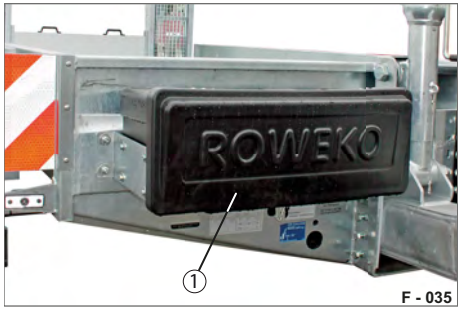


Fig. 61 On the front end (optional)

1 Plastic toolbox

Using sheet metal box

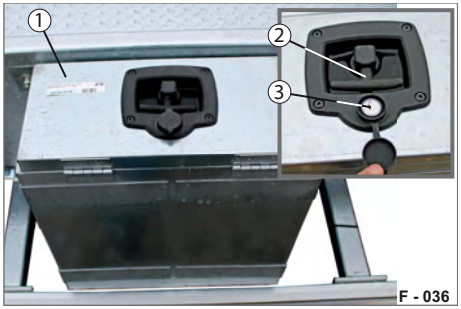


Fig. 62 Toolbox closed

1 Lid
2 Lock
3 Lock cylinder with cover

Observe the surface loading specified by the manufacturer.

▶ No not place any objects on the open lid of the toolbox.

Opening

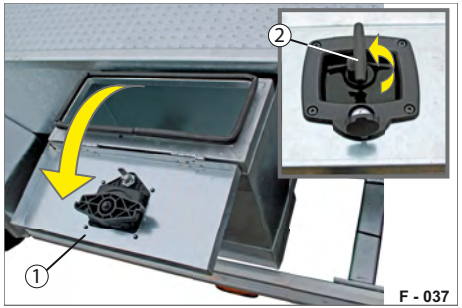


Fig. 63 Toolbox open

1 Lid, unfolded
2 Lock, unfastened

- ▶ Remove the cover (Fig. 62/3) from the lock cylinder and close the lid (Fig. 62/1) with a key.
- ▶ Pull off the lock (Fig. 63/2) and rotate it by 90°.
- ▶ Carefully fold the lid (Fig. 63/1) up.
- ▶ Remove or stow the tools/lashing equipment.

Closing

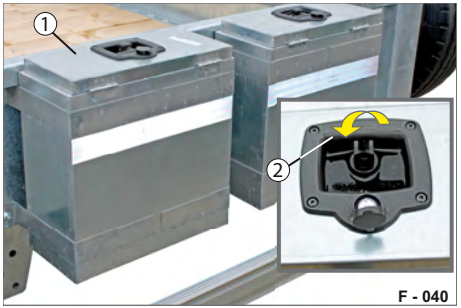


Fig. 64 Toolbox, secured

1 Lid, closed
2 Lock, fastened

- ▶ Close the lid.
- ▶ Rotate the lock (Fig. 64/2) by 90°.
- ▶ Lower the lock.
- ▶ Lock the lid (Fig. 64/1) with a key on the lock cylinder if necessary.

  The sheet metal box is closed and secured.

Using plastic box

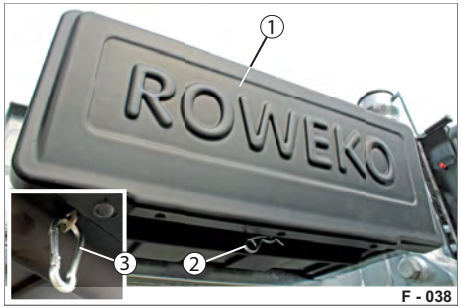


Fig. 65 Plastic box, closed

1 Lid
2 Spring pin
3 Karabiner/padlock

The plastic box can be secured with various locks, e.g. spring pin, karabiner, padlock.

▶ When opening the cover, watch out for falling objects.

Open / close

Fig. 66 Plastic box, open

1 Lid

▶ Unlock the lid (Fig. 66/1).
▶ Swing the lid up.
▶ Hold the lid firmly.
▶ Remove or stow the tools/lashing equipment.
▶ Swing the lid down.
▶ Secure the lid with a spring pin (Fig. 65/2) or karabiner or padlock (Fig. 65/. 3).

The plastic box is closed and secured.

General

The parking warning panels can be installed at the front and rear of trailer in the direction of travel.

These make it easier to see/identify the parked trailer.

⚠ WARNING

Driving with parking warning panels extended

An opened park warning sign may conceal the rear lights and the license/ number plate at the rear end - risk of accident!

▶ Check that the parking warning panels are retracted before departing.

⚠ WARNING

Dirty park warning signs

Parked trailers can only be seen poorly/ too late by other drivers - risk of accident!

▶ Clean the parking warning panels if they are very dirty.

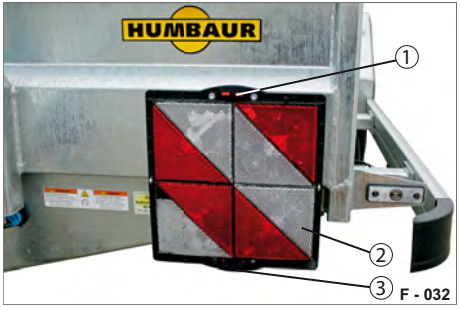


Fig. 67 Park warning sign, folded out

1 Locking mechanism
2 Warning sign (top half)
3 Pressure protection

NOTICE

Driving with opened park warning signs

The parking warning panels clap while driving and could break off.

▶ Check that the parking warning panels are retracted and the locks are not damaged before departing.

Handling the park warning sign

Fig. 68 Park warning sign, folded in

Folding down

▶ Press the press-catch (Fig. 67/3) and fold down the top half of the warning sign.

Folding up

▶ Fold up the lowered halves of the warning panels.

The press-catch (Fig. 67/3) automatically engages in the lock (Fig. 67/1).

Operation body

The construction mainly consists of:

- Floor / loading platform
- Platform gates
- Front platform gate
- Roof bow/high curtain
- Drive-up ramps
- Support frame
- Conveyor belt carrier

WARNING

Climbing on the body

The body is not sturdy enough to hold a person's weight.

The components could cave in or break - risk of falling!

- ▶ Do not use the components as a ladder.
- ▶ Use a stable ladder when working on the body.

WARNING

Unsecured/shifted load

Loads can fall out of the trailer when the body is opened - risk of crushing/striking!

- ▶ Make sure there are no bulges in the curtain.
- ▶ If there is bulging, open the curtain from the rear or from the opposite side and secure slipping and unsecured loads.
- ▶ Open the body locking points from a position outside of the movement range of the body components.

WARNING

Driving with open or only partially closed curtain

The curtain can come loose and be pushed to the side. If wind goes under the curtains, the trailer can rock to the side - risk of accidents!

- ▶ Check before driving that the curtain is completely closed and secured with tension ropes.

Fig. 1 Climb on body

WARNING

Objects on the body

Ice, snow, branches and other objects can fall from the loading platform/roof during the journey - risk of accidents!

- ▶ Check before driving that there are no accumulations of water, ice, snow, branches or other objects on the roof structure. Remove them if necessary.
- ▶ Use a secure ladder.

Operating folding supports

The folding supports are attached directly to the ramps of the trailer.

The folding supports stabilise the trailer during the loading/unloading of vehicles.

Fig. 2 Folding support in drive position

1 Levelling foot
2 Socket pin with guide
3 Folding support
4 Spring bar
5 Ramp

⚠ WARNING

Sinking support feet

The support feet can sink into soft /sagging ground.

The trailer can tip over - risk of crushing!

▶ Check whether the ground is sufficiently stable (firm).

▶ Use a stable base if the ground is soft or sagging.

⚠ WARNING

Unequally lowered support feet

The trailer may become unbalanced when driven on with the loading vehicle and cause the loading vehicle to tip over - danger of crushing!

▶ Adjust the support leg at equal distances.

⚠ WARNING

Loading/unloading without folding supports retracted

Loading/unloading of loading vehicles without folded down support feet can lead to loss of stability.

The trailer can tip over - risk of crushing!

▶ Fold down the folding supports before loading/unloading loading vehicles.

▶ Check that the folding supports are engaged.

⚠ CAUTION

Handling the folding supports

Danger of fingers/hands being crushed between the ramp and folding supports.

▶ Operate the folding supports carefully and in a controlled manner.

▶ Use  .

Folding out

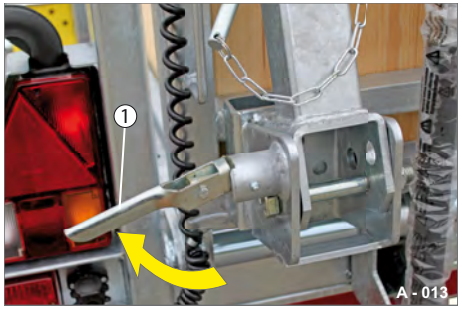


Fig. 3 Folding out the folding support

1 Spring bar

▶ Pull on the spring bar (Fig. 3/1).
The folding support (Fig. 2/3) is unlocked.

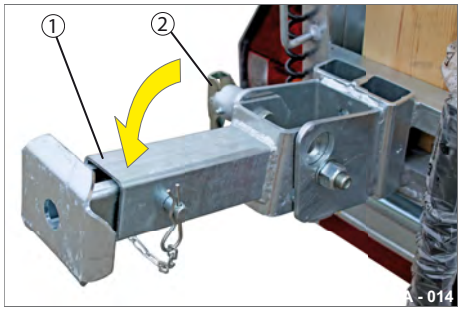


Fig. 4 Folding support folded out

▶ Fold down the folding support (Fig. 4/1).

▶ Release the spring bar (Fig. 4/2).
The spring bar locks automatically when the folding support is completely folded out.

▶ Check the locking, if necessary press down the spring bar.

Adjustment

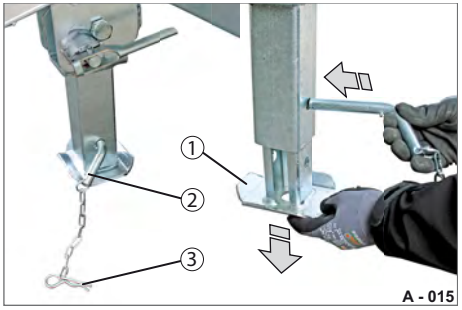


Fig. 5 Adjusting levelling foot

1 Levelling foot
2 Socket pin
3 Spring pin

▶ Remove the spring pin (Fig. 5/3) from the socket pin (Fig. 5/2).

▶ Pull out the socket pin.

▶ Place the levelling foot (Fig. 5/1) on firm ground and adjust the levelling foot downwards until it can still be located in the further hole.

▶ Insert the socket pin through the hole.

▶ Secure the socket pin with the spring pin.

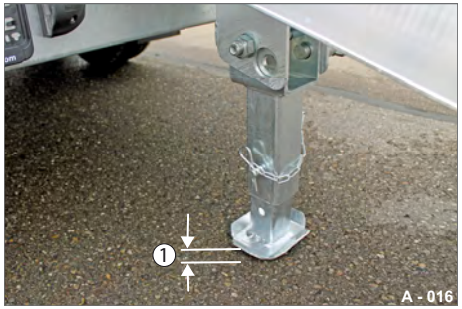


Fig. 6 Support feet adjusted

1 Distance to ground (approx. 3-5 cm)

▶ After folding down and, if necessary, adjusting the folding supports, check whether there is still an air gap (Fig. 6/1) between the ground and the levelling foot plate.

When a vehicle is loaded/unloaded, the chassis is compressed via the axle suspension and the foldings supports set down on the ground.

Folding in

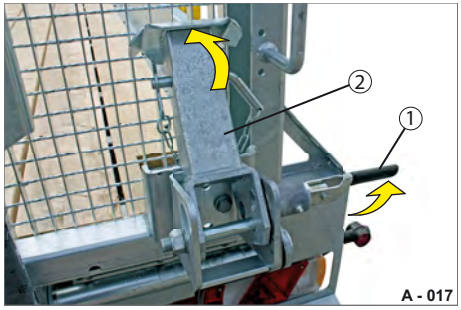


Fig. 7 Folding in folding support

1 Spring bar
2 Folding support

▶ Tilt the levelling foot (Fig. 5/1) up and secure it with the socket pin (Fig. 5/2) and spring pin (Fig. 5/3).

▶ Pull the spring bar (Fig. 7/1) into a horizontal position.

▶ Fold up the folding support (Fig. 7/2) (horizontally) and lock it with the spring bar (Fig. 7/1).

The spring bar snaps into place.

Checking the position

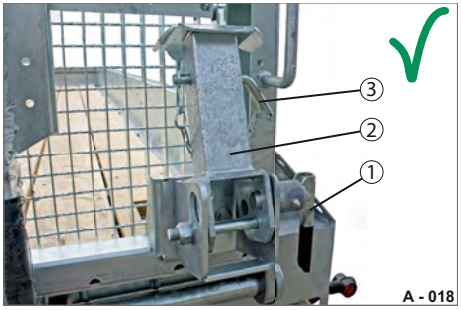


Fig. 8 Drive position

1 Spring bar, snapped in
2 Folding support, folded up
3 Socket pin, inserted/secured

▶ Check that both folding supports are in drive position before departing (see Fig. 8).

General

The ramps come in different versions:

– Steel ramps with different linings, e.g.: Grating, spruce wood floor
– Aluminium ramps
– Steel ramps, one-piece/two-piece
– with gas pressure springs
– with suspended lifting gear
– Wide ramps (for mill transport)

WARNING

Standing under the drive-up ramps

Persons may be crushed when the drive-up ramps are lowered.

▶  Do not stand under moving drive-up ramps.

▶  Keep all persons away from the danger area.

▶ Always be aware of the movement of the ramps while they are in operation.

Fig. 9 Warning label

WARNING

Opening drive-up ramp latches

Fingers and hands may be crushed between drive-up ramps and latches/corner posts when the latches are be unlocked and locked!

▶ Use  .

▶ Make sure when unlocking and locking the latches that your fingers are not in the crushing area.

Fig. 10 Operating drive-up ramps

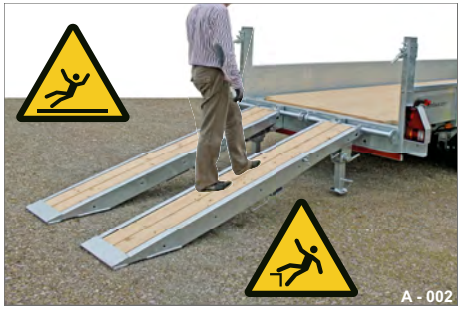


Fig. 11 Walking on drive-up ramps

Fig. 12 HS with aluminium ramps

WARNING

Positioning the drive-up ramps

Hands may be crushed between drive-up ramps and corner posts when the ramps are being moved!

▶ Use  .

▶ Use both hands and the handles/ grips when moving the ramps.

CAUTION

Walking on drive-up ramps

Drive-up ramps may be dirty and wet.

You could slip - risk of falling!

▶ Use  .

▶ Walk on the ramps slowly and with extreme caution.

1 Ramp (aluminium)
2 Handle grip
3 Folding support
4 Track width guide linkage
5 Underrun guard
6 Corner post
7 Lock

Fig. 13 HS with steel ramps,
with gas pressure spring support

1 Ramp (steel with wood covering)
2 Handle
3 Folding support
4 Gas pressure spring
5 Track width guide linkage
6 Slot-in gate
7 Underrun guard
8 Corner post
9 Lock

Fig. 14 HS with steel ramps,
with gas pressure spring support

1 Ramp (steel with grating)

Fig. 15 HS with wide steel ramps,
with gas pressure spring support

1 Ramp (steel with wood covering)
2 Handles
3 Folding support
4 Gas pressure spring
5 Track width guide linkage
6 Corner post
7 Lock

Fig. 16 HS with wide steel ramps,
with suspended lifting gear

1 Ramp (steel with grating)
2 Handles
3 Folding support
4 Lifting gear, dual
5 Track width guide linkage
6 Corner post
7 Lock

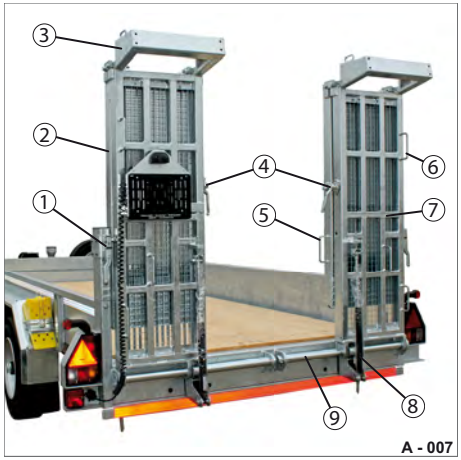


Fig. 17 HS with split ramps,
with gas pressure spring support

1 Lock
2 Ramp section
3 Support foot
4 Rotary lever latch for ramp section
5 Handle for ramp section
6 Handle
7 Ramp, split
8 Gas pressure spring
9 Track width guide linkage

Unlocking the drive-up ramps

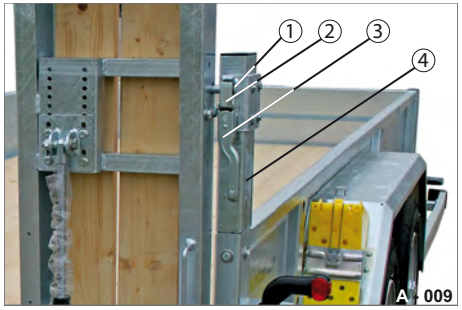


Fig. 18 Drive-up ramps with securing latch

1 Gudgeon
2 Catches
3 Latch handle
4 Corner post

All type ramps are fastened to the side on corner posts with the gudgeon and secured with a securing latch.

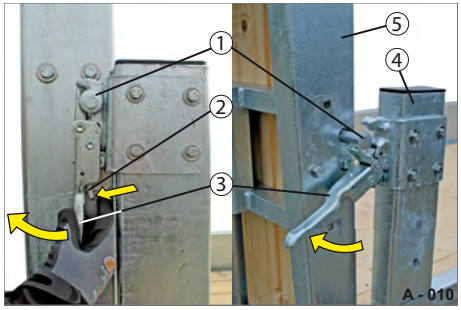


Fig. 19 Unlocking the securing latch

1 Gudgeon
2 Lock safeguard
3 Lock lever
4 Corner post
5 Ramp

▶ Press in the latch retainer (Fig. 19/2) and

▶ Pull on the latch bar (Fig. 19/3).

The gudgeon (Fig. 19/1) of the ramp (Fig. 19/5) is released.

▶ Swing the ramp down a little so that the securing latch can be closed.

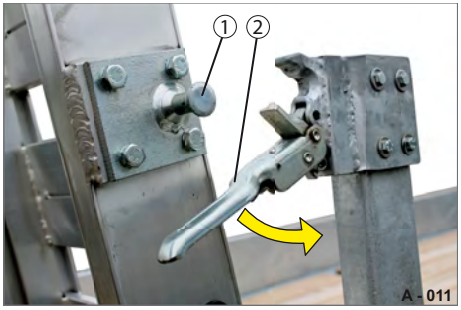


Fig. 20 Closing the securing latch

1 Gudgeon, released
2 Securing latch

▶ Press the latch lever (Fig. 19/3) towards the corner post (Fig. 19/4) with your hand held flat.

The latch retainer (Fig. 19/2) snaps in. The securing latch is locked.

The drive-up ramps can be moved to the required track width and lowered .

Moving drive-up ramps

The ramps can be adjusted infinitely by hand with the side handles.

The tyres of the vehicle to be transported must drive centrally onto the ramps.

The ramps must be adjusted in the vertical position.

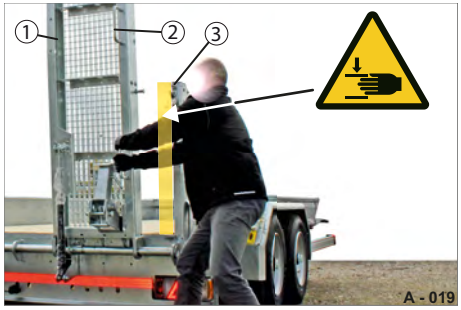


Fig. 21 Moving the drive-up ramp

1 Ramp
2 Handles
3 Corner post

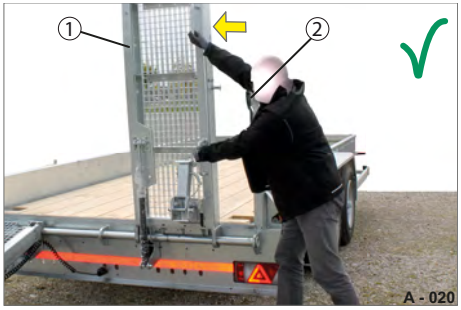


Fig. 22 Moving the drive-up ramp

1 Ramp
2 Securing latch, CLOSED

⚠ WARNING

Incorrect track width set

The vehicle to be loaded can tip off the ramp - risk of striking/crushing!

▶ Position the ramps to the correct track width before loading/unloading the vehicle to be loaded.

⚠ CAUTION

Moving drive-up ramps

Danger of hands being crushed between the ramps and corner posts.

▶ Use .

▶ Use both hands when moving the ramps.

▶ Hold on to the handles/grips.

⚠ CAUTION

Moving drive-up ramps

You could hit your head on opened securing latches.

▶ Close the securing latches before moving the ramps.

Setting track width

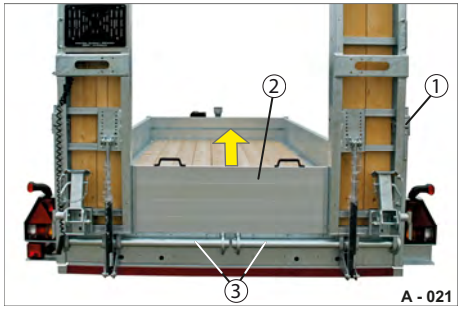


Fig. 23 Unlocking the drive-up ramps

1 Ramp retainer
2 Slot-in gate
3 Track width guide linkage

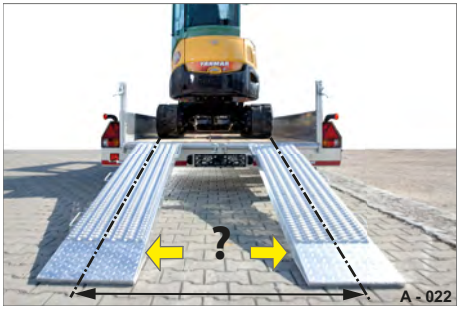


Fig. 24 Determining the track width

Fig. 25 Setting track width

Preparation

- ▶ Lower the two folding supports.
- ▶ If necessary, remove the slot-in gate (Fig. 23/2).
- ▶ Check that the track width guide linkages (Fig. 23/3) are free of dirt - if necessary, clean and apply a little grease beforehand.
- ▶ Unlock the ramp retainer (Fig. 23/1).
- ▶ If necessary, determine the track width of the vehicle to be loaded.

Moving drive-up ramps

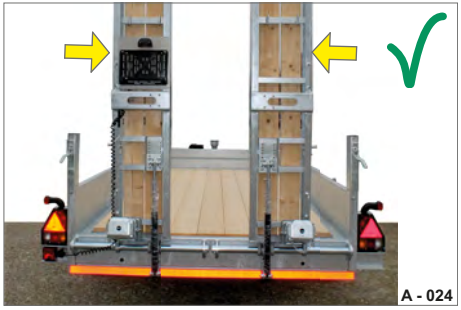


Fig. 26 Track width set correctly

- ▶ Slide the ramps (in the vertical position) one after the other to the required track width.

Lowering drive-up ramps

WARNING

Standing under the drive-up ramps

Persons may be crushed/struck when the drive-up ramps are lowered.

Feet/hands may be crushed.

- Do not stand under moving drive-up ramps.
- Keep all persons away from the danger area.
- Always be aware of the movement of the ramps while they are in operation.

Fig. 27 Danger areas

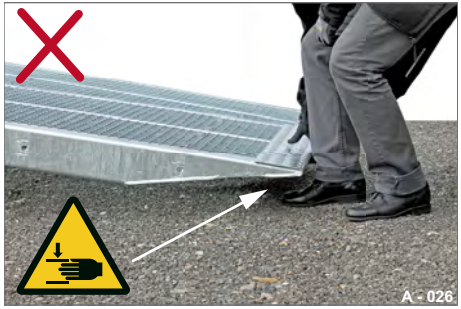


Fig. 28 Avoid crushing

The ramps must be operated from the outer side of the trailer!

Use the provided handles/grips.

Manual lowering

The weight of the ramps is held by the gas pressure springs or the suspended lifting gear.

The ramps are pulled down by the handles.

The gas pressure spring/suspended lifting gear provides operating assistance.

One-piece and two-piece ramps are operated in the same way.

On two-piece ramps the top section must be additionally secured.

The effect of the lifting gear springs or the gas pressure springs may be diminished after repeated operating cycles.

If the effect is diminished, readjust the suspended lifting gear or have the gas pressure springs replaced - see section entitled Maintenance starting on page **175**.

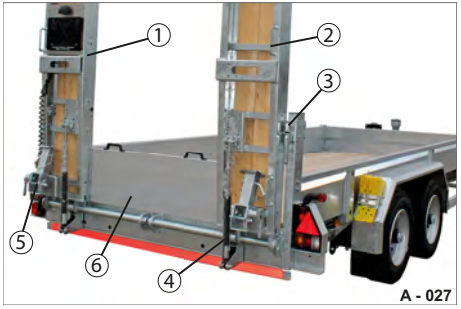


Fig. 29 Drive-up ramps, one-piece

1 Drive-up ramp, one-piece
2 Handle
3 Securing latch
4 Gas pressure spring
5 Folding support
6 Slot-in gate

Fig. 30 Lowering the ramp

1 Handle

One-piece ramps

▶ Fold down the folding supports (Fig. 29/5) - see from page **79** or **101**.

▶ If necessary, remove the slot-in gate (Fig. 29/6).

▶ Unlock the ramps (Fig. 29/1) - turn to page **108**.

▶ If necessary, set the track width - turn to page **110**.

▶ Grab the handle (Fig. 30/1) and pull the ramps down, one after another.

Fig. 31 Setting the ramp down

▶ Set the ramp down slowly on the ground - do not drop.

Fig. 32 Ramps lowered

▶ Check that the ramps rest fully on the ground.

▶ Check to ensure the stability of the trailer, e.g. when the trailer is on a slope or uneven ground when loading/ unloading.

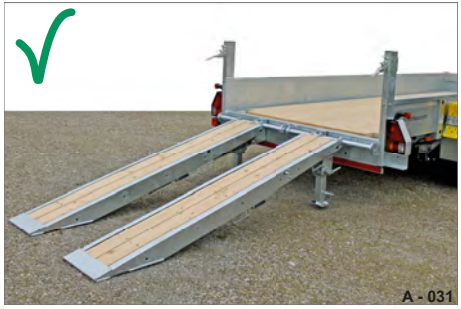


Fig. 33 Ramps lowered

▶ Check that the folding supports are properly folded down and secured.

▶ Make sure that the correct track width is set.

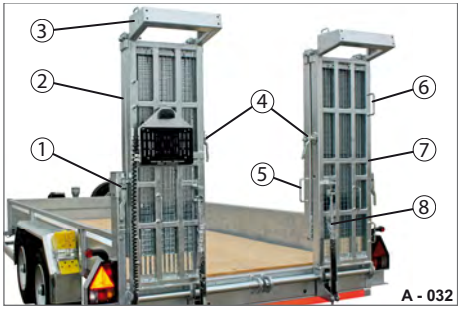


Fig. 34 Drive-up ramps, two-piece

1 Lock
2 Ramp section (upper section)
3 Support foot
4 Rotary lever latch for ramp section
5 Handle for ramp section
6 Handle
7 Ramp, split
8 Gas pressure spring

Two-piece ramps

▶ Unlock the ramps - turn to page **108**.

▶ If necessary, set the track width - turn to page **110**.

▶ If necessary, remove the slot-in gate.

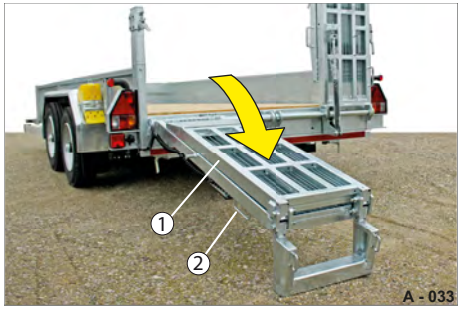


Fig. 35 Lowering the ramp

1 Drive-up ramp, complete with top section
2 Handle

▶ Securely hold the outside of the ramp with the handle (Fig. 35/2).

▶ Pull or push the ramp (Fig. 35/1) until the support foot is on the ground.

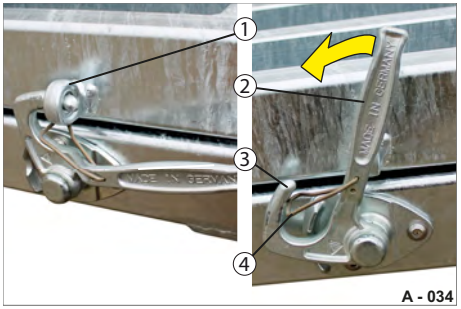


Fig. 36 Unlocking the rotary lever latch

1 Eye
2 Lever
3 Hook
4 Closing spring

Unlocking the top section

▶ Unlock the rotary lever latch (Fig. 34/4):
Press in the closing spring (Fig. 36/4) and simultaneously open the lever (Fig. 36/2) fully.

The hook (Fig. 36/3) is released.

The top section of the ramp is unlocked.

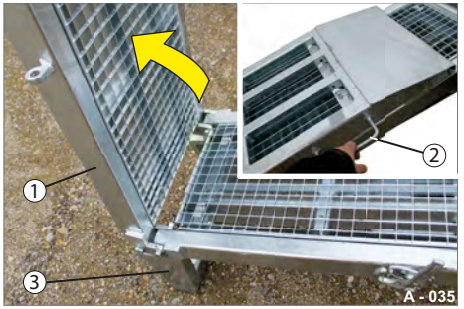


Fig. 37 Folding out the top section

1 Top section
2 Handle
3 Support foot

▶ Grab the handle (Fig. 37/2).

▶ Fold out the top section (Fig. 37/1).

▶ Carefully set down the top section on the ground - do not drop.

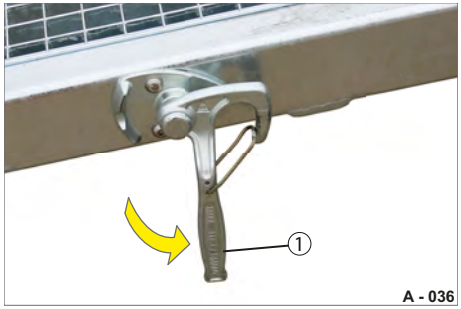


Fig. 38 Turning the rotary lever latch

1 Rotary lever latch

Fig. 39 Ramps lowered

▶ Turn the rotary lever latch (Fig. 38/1) downwards into the vertical position.

The rotary lever latch must be turned down before the vehicle is driven onto the ramps - so that the latch does not protrude.

▶ Check that the ramps rest fully on the ground.

▶ Check to ensure the stability of the trailer, e.g. when the trailer is on a slope or uneven ground when loading/ unloading.

Driving on drive-up ramps

Driving on the ramps is only permitted when there is a direct line of sight between the driver and the wheels.

If there is no line of sight, do so only with the supervision of a banksman.

Avoid sudden stopping and restarting when driving on the ramps!

Drive on the ramps slowly, at a speed of no more than 0.3 m/second.

⚠ WARNING

Ramps positioned to incorrect track width

The vehicle to be loaded can tip off the ramp - risk of striking/crushing!

▶ Position the ramps to the correct track width before loading/unloading.

⚠ WARNING

Limited visibility

When driving in reverse, persons could be overlooked and run over.

▶ Correctly estimate the danger area around the vehicle using the mirrors.

▶ Keep all persons away from the danger area all round the trailer.

▶ Have a second person assist you.

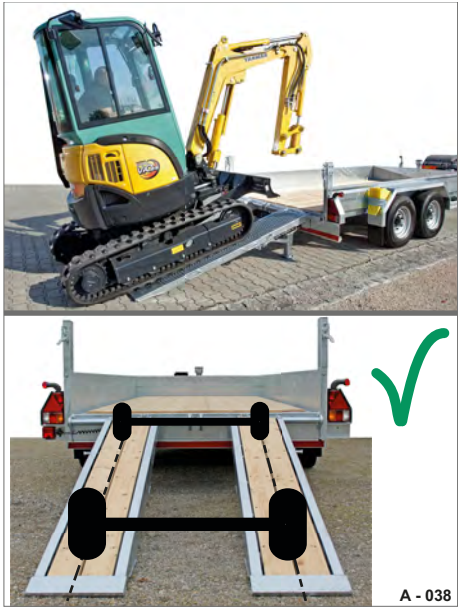


Fig. 40 Driving on drive-up ramps

▶ Slowly drive onto the ramps straight ahead - not at an angle from the side.

Raising & securing ramps

Driving with unsecured ramps is illegal!

If necessary, clean off dirt before raising the ramps.

The ramps are individually folded up one after another and secured.

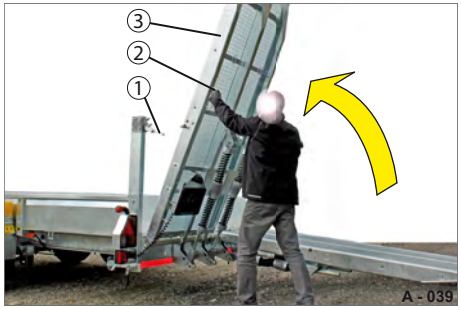


Fig. 41 Raising the drive-up ramp, one-piece

1 Securing latch, OPEN
2 Handle
3 Ramp

Raising the one-piece drive-up ramp

- ▶ Raise the ramp (Fig. 41/3) by the handles (Fig. 41/2).
- ▶ Press the ramp into the vertical position.

  The gas pressure springs or the suspended lifting gear provide assistance and hold the ramps in the vertical position.

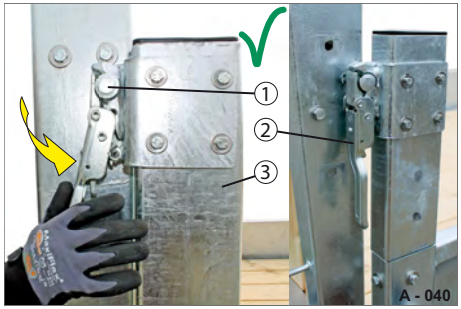


Fig. 42 Securing the drive-up ramp

1 Gudgeon
2 Securing latch, CLOSED
3 Corner post

Securing

- ▶ If necessary, slide the ramp outwards towards the corner post (Fig. 42/3).
- ▶ Insert the gudgeon (Fig. 42/1) on the ramp in the securing latch (Fig. 42/2).
- ▶ Press the latch lever closed with the palm of your hand.

  The latch engages.

  The drive-up ramp is secured.

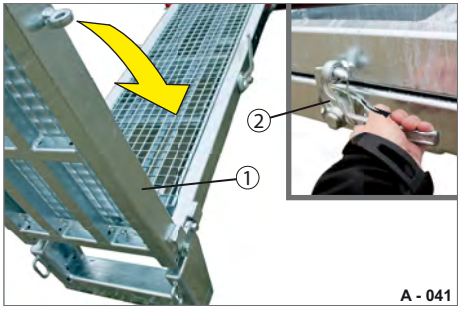


Fig. 43 Raising the drive-up ramp, two-piece

1 Ramp, top section
2 Rotary lever latch, CLOSED

Raising the two-piece drive-up ramp

- ▶ If necessary, open the rotary lever latch (Fig. 43/2).
- ▶ Grab the handle.
- ▶ Fold in the top section (Fig. 43/1) of the ramp.

▶ Close the rotary lever latch (Fig. 43/2):.

The top section is joined to the ramp and secured.

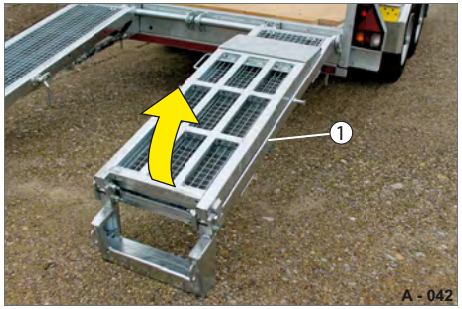


Fig. 44 Raising the drive-up ramp, two-piece

1 Ramp

▶ Press the ramp (Fig. 44/1) upwards into the vertical position.

The gas pressure springs or the suspended lifting gear provide assistance and hold the ramps in the vertical position.

▶ If necessary, move the ramp outwards towards the corner post - see page **110**.

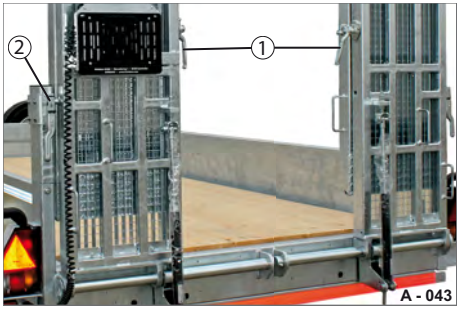


Fig. 45 Ramp, two-piece, secured

1 Rotary lever latch
2 Securing latch

Securing

▶ Secure the ramps on the side with securing latches (Fig. 45/2).

▶ Check that the upper part of the ramps are secured with the rotary lever latch (Fig. 45/1).

The ramp are secured.

Operating slot-in platform gate

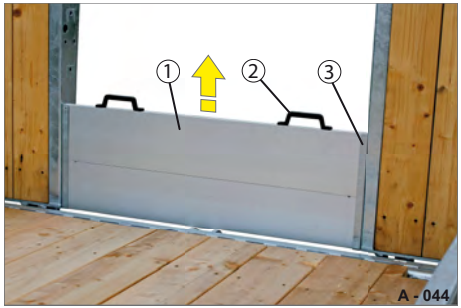


Fig. 46 Slot-in platform gate overview

1 Slot-in platform gate (aluminium)
2 Handle
3 Slot-in rail

The slot-in platform gate can be optionally installed between the upright ramps.

WARNING

Driving with a loose slot-in platform gate

A slot-in platform gate that is carried loose on the loading platform could be thrown onto the road surface - risk of accident!

▶ Check that the slot-in platform gate is secured before departing.

Removing

Fig. 47 Slot-in platform gate removed

The slot-in platform gate must be removed before the ramps are unlocked.

▶ Fully pull the slot-in platform gate (Fig. 46/1) by the two handles (Fig. 46/2) simultaneously out of the slot-in rails (Fig. 46/3).

▶ Set down the slot-in platform gate so it is safe from being damaged.

Slotting in

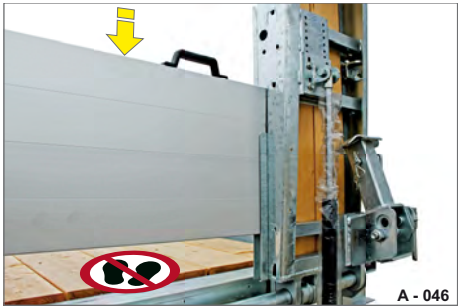


Fig. 48 Slotting in the slot-in platform gate

▶ Grip the slot-in rear platform gate by the two handles.

▶ Slot the slot-in platform gate simultaneously into the left and right slot-in rails (Fig. 46/3).

▶ Slide in the slot-in rear platform gate down to the lower stop.
Make sure that your feet are not under the slot-in platform gate.

General information

Many accidents are still attributable to deficiencies in loading safety.

Correctly secured loads prevent:

- Injury to persons,
- Damage to consignment,
- Damage to vehicles,
- Unnecessary wait times at traffic stops

Legal fundamentals/legal requirements

Loading safety is regulated in Germany by the legal authorities in the following laws and regulations:

- Road Traffic Type Approval Law (StVZO) Section 31,
- StVO Section 22/23,
- Accident prevention regulation - vehicles (in Germany VBG 12)
- German Commercial Code (HGB) Section 412

On this basis, the following group of people is responsible for loading safety:

- Vehicle driver,
- Vehicle owner,
- Loader,
- Dispatcher,
- Freight carrier.

You can find additional information/ practical tips from brochure BGI 649: ("Load Securing on Vehicles": A Manual for Entrepreneurs, Shift Planners, Driving and Loading Personnel).

Guidelines of series VDI 2700

These are the state of the art of the accepted engineering standards.

- VDI 2700 Load securing on road vehicles
- VDI 2700, Page 2, Lashing forces
- VDI 2700, Page 4, Load distribution plan
- VDI 2700, Page 6, Loading general cargo together
- VDI 2700, Page 7, Load securing in combined load traffic

Other standards for load securing:

- DIN EN 12195 -1, Calculation of lashing forces
- DIN EN 12195 -2, Tie-down straps made of synthetic fibres
- DIN EN 12195 -3, Load securing devices on road vehicles, tie-down chains
- DIN EN 12640 Load restraint points on goods transporting commercial vehicles
- DIN EN 12642 Minimum requirements for bodies of commercial vehicles

Physical fundamentals

The forces acting on the consignment during the journey are those due to starting and braking as well as change of direction.

These dynamic forces cause the loading goods to shift if they are not adequately secured and goods which are not firmly tied down.

An appropriate driving style minimises exerted forces and wear, and is always safer.

§ 3 of StVO (German Road Traffic Regulations) "Speed" contains a passage on "adapting the driving speed on the properties of the vehicle and load by the driver."

If you get into a dangerous situation, however, even the best driving style is not a replacement for a load securing system.

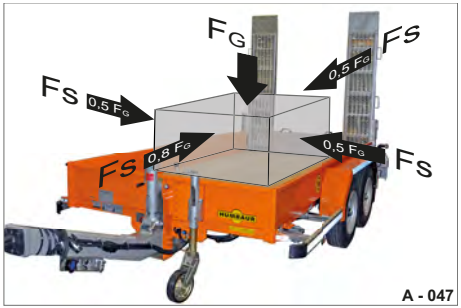


Fig. 49 Maximum inertial forces

Resulting from the driving dynamic in street traffic
FS Load securing force, **F_G** Load inertia

Example:

– Inertia F_G = 20,000 daN
– Maximum forward acceleration = 0.8 g (1 g = earth's acceleration 9.81 m/s^2)

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

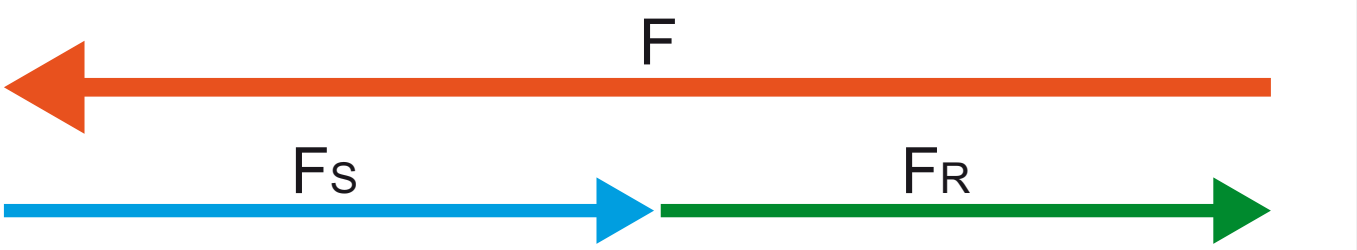
The actual necessary load securing force F_S is reduced for tip-stable loading goods by the amount of the frictional force F_R (between the load and vehicle floor).

Other details about coefficient of friction matching are given in the guideline VDI 2700.
All matches of coefficient of friction are valid for cleaned surfaces.

Tab. 1 Example calculation

Inertia F

Force which counters any change in the state of movement



Load securing force FS: Force which must be absorbed by the lashing method or by the vehicle body

Friction FR: Coefficient of friction x weight

Formula: FS = F – FR

Example:

– Forward inertia F_G: 16,000 daN
– Coefficient of friction μ_o = 0.3 (screen printed mat/pallet)
– Friction force, F_R = 0.3 x 20,000 daN = 6,000 daN

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

Tab. 2 Load securing force (F_S)

Types of load securing

Form-fit load securing

Supporting the load in stacks one on top of the other as well as body components such as the front wall and platform gates or on wedges, barrier beams or wooden fixing is called “form-fit load securing”.

Provided:
The measurements of the goods and bodies fit together.
Otherwise the gaps must be filled with pallets or airbags, for example.

In the case of multiple different goods types, it is not possible to use form-fitting loading for transporting.

These loads are to be secured, in addition to the specifications of DIN EN 12640, by several lashing points as specified in DIN EN 12195 and the VDI Guidelines, in line with practice.

Friction-lock load securing

Direct anchoring and tying down the load with lashing equipment is called "friction-lock load securing.“

Direct anchoring as "angular or diagonal lashing“, due to the considerably higher lashing forces achievable than with tying down, is counted as a form-fit safety process.

Pre-condition:
Lashing points are available on the required points on the load and on the vehicle.

Tying down is the most common type of load securing.

The necessary securing force is reached alone by the increase in friction.

The load is "pressed" onto the loading platform with the help of lashing equipment (e.g. tie-down straps).

NOTICE

Exceeding lashing forces/ exceeding the lashing angle

Lashing points can break.

▶ Observe the label on the lashing points.

▶ Comply with the following specifications:

- Maximum tension load on the lashing points on the loading platform:

6,000 daN (kg)
with lashing rings in lashing pockets

- Maximum tension load on the lashing shackles in the outer frame:
2,000 daN (kg)

▶ Only use suitable/tested lashing equipment.

Friction-lock load securing

Force specifications

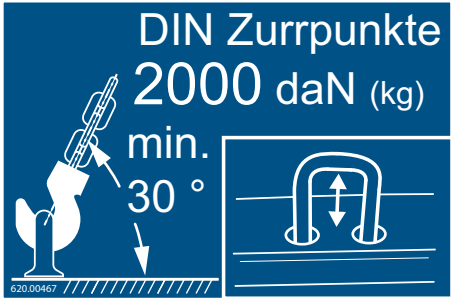


Fig. 50 Example: Sign - lashing shackle

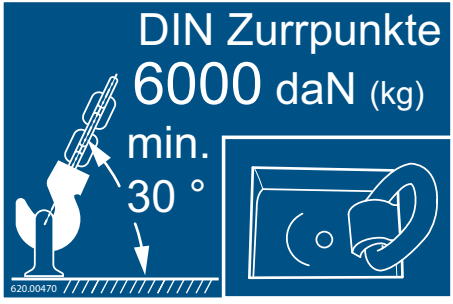


Fig. 51 Example: Sign - lashing ring

The lashing equipment can be used from inside as well as from outside.

Lashing points that are not required must be recessed in the outer frame or the loading platform.

WARNING

Impermissible tensile loads/ lashing angles

Lashing equipment may break/ tear.
The load is not sufficiently secured - risk of accident!

- ▶ Comply with the maximum values for force specifications.
- ▶ Use suitable lashing equipment. The max. possible tension values are specified on the lashing equipment.
- ▶ Lash the load with a lashing angle of min. 30° or greater.
  Situate the fixing point on the load as high as possible.
- ▶ Do not lash the load to corner posts/ middle posts.
- ▶ Do not lash/secure the load on the sloping loading platform, e.g. in the rear area.

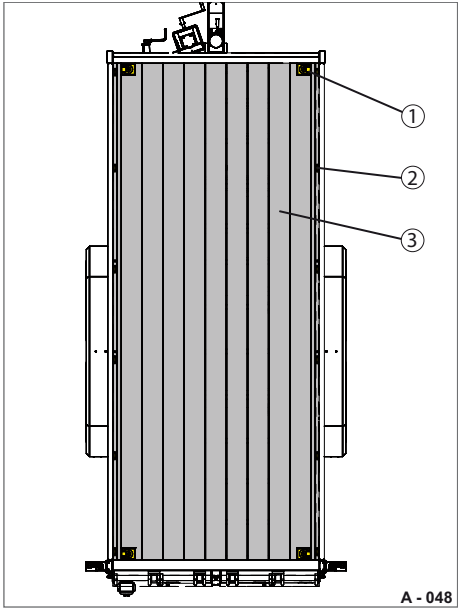


Fig. 52 Example: Lashing point arrangement

1 Lashing ring 6 t (right 2x, left 2x)
2 Lashing shackle 2 t (right 6x, left 6x)
3 Loading platform

Lashing points

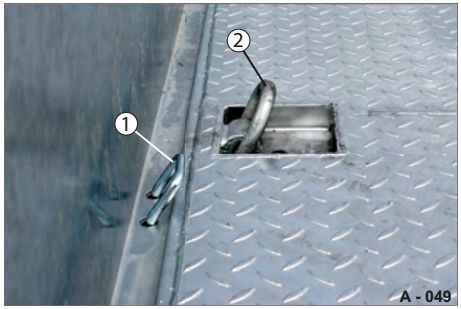


Fig. 53 Example: Lashing points

1 Lashing shackle (outer frame)
2 Lashing ring (loading platform)

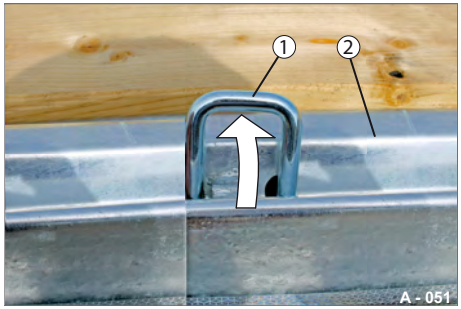


Fig. 55 Lashing shackle pressed out

1 Lashing shackle
2 Outer frame

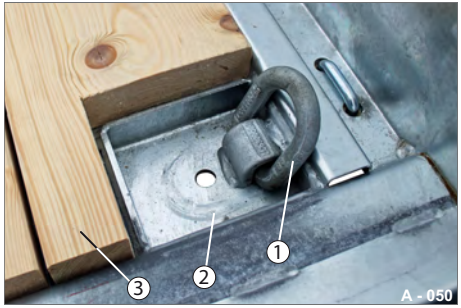


Fig. 54 Lashing ring folded in

1 Lashing ring
2 Pocket, sunk
3 Loading platform

- ▶ Press out the lashing shackle (Fig. 55/1) from below upwards.
- ▶ Raise the lashing ring (Fig. 54/1).
- ▶ Recess lashing points that are not required in the outer frame or the loading platform.

Form-fit load securing

The load can be form-fit secured with modular components along the platform gates and on the front wall.

A combination of form-fit and friction-lock securing is achieved with:

– platform gates,
– Steel grate attachment
– support frame,

and the correct lashing of the load units to DIN lashing points.

Observe the legal requirements for form-fit load securing, e.g. VDI 2700 Guideline.

Using support frame

Fig. 56 Support frame on front platform gate

1 Wood support
2 Support frame mount
3 Screw fitting in post pocket

The support frame is positioned at the front platform gate. It is used to accommodate for example a dredging shovel or a wheel loader.

It can be disassembled if it is not in use.

⚠ CAUTION

Standing on the support frame

Persons may slip and fall off.

▶ Do not climb on the support frame.

⚠ WARNING

Unsecured support frame

The support frame may fall out during driving and strike persons - risk of accident!

▶ Check that the support frame is secured before departing.

⚠ WARNING

Lashing load to the support frame

The support frame is not designed to accommodate lashing forces. It may become deformed. The load would be unsecured - risk of accident!

▶ Lash the load, e.g. dredging shovel, to the lashing points on the loading platform only.

▶ Do not incorporate any attachment options (lashing points) on the support frame.

⚠ WARNING

Assembling / disassembling the support frame

Hands and feet could get crushed between the support frame and trailer parts.

▶ Use  ,  ,  .

⚠ WARNING

Working on the loading platform

You may fall off the loading platform when handling the support frame!

▶ Walk on the loading platform with care!

▶ Clean the dirty loading platform before working on it.

▶ Use  ,  .

▶ Fit / move / remove the support frame with care.

Disassembly

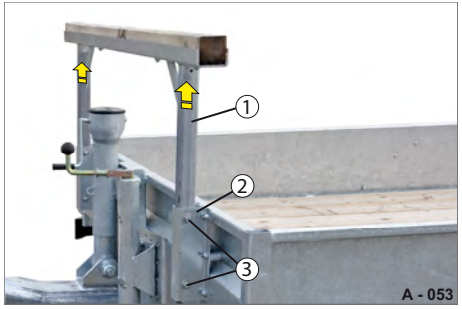


Fig. 57 Unlocking the support frame

1 Support frame mount
2 Side post pocket
3 Screw fitting

- ▶ Release the screw fitting (Fig. 57/3) on both post pockets (Fig. 57/2).
- ▶ Pull the support frame (Fig. 57/1) slowly and simultaneously out of the post pockets.
- ▶ Set the support frame down safely to avoid damage.
- ▶ Insert the screw fitting captively in the post pocket bore holes.

Installation

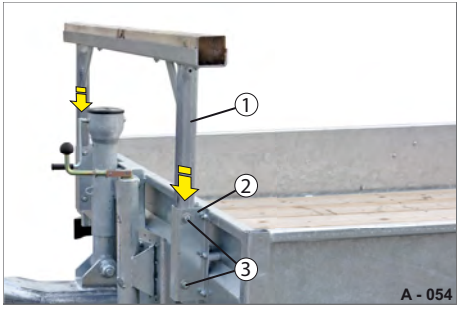


Fig. 58 Support frame secured on front wall

1 Post, front wall
2 Screw fitting
3 Post pocket, chassis
4 Support frame mount

- ▶ If necessary, remove the screw fitting from the front wall posts (Fig. 58/1).
- ▶ Insert the support frame (Fig. 58/4) simultaneously into the front wall post (Fig. 58/1).
- ▶ Secure the support frame with the screw fitting (Fig. 58/2).

General

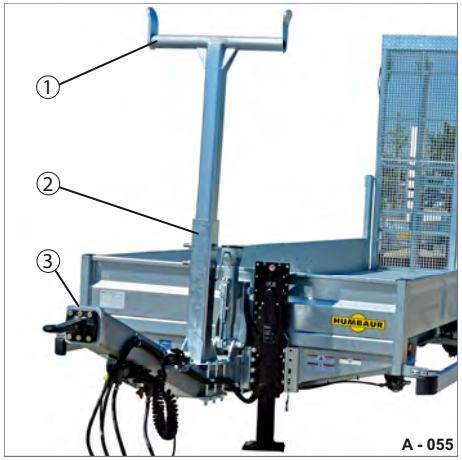


Fig. 59 Conveyor belt carrier overview

1 U-tube fork
2 Mount with shoe console
3 Drawbar

The conveyor belt carrier consists of a U-tube fork (Fig. 59/1) and mount with shoe console (Fig. 59/2), which is positioned and bolted at the front on the drawbar.

The conveyor belt carrier serves to accommodate conveyor belts.

The height of the U-tube fork is configured to meet your requirements.

⚠ WARNING

Fitting / removing the conveyor belt carrier

Hands and feet may get crushed between the conveyor belt carrier and trailer parts.

▶ Use , , .

▶ Conveyor belt carrier is heavy!
Work in pairs.
If necessary, use lifting gear.

⚠ WARNING

Unsecured conveyor belt carrier

The conveyor belt carrier may fall down during driving and strike persons - risk of striking/accident!

▶ Check before driving that the conveyor belt carrier is firmly bolted/ secured.

⚠ WARNING

Working on the loading platform

You may fall off the loading platform when handling the conveyor belt carrier!

▶ Walk on the loading platform with care!

▶ Clean the dirty loading platform before working on it.

▶ Use , .

▶ Fit / move / remove the conveyor belt carrier with care.

⚠ CAUTION

Accessing the conveyor belt carrier

Persons may slip and fall off.

▶ Do not climb on the conveyor belt carrier.

Disassembling the U-tube fork

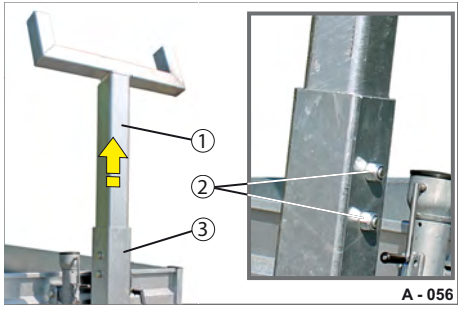


Fig. 60 U-tube fork

1 U-tube fork
2 Screw fitting
3 Mount

▶ Release the screw fitting (Fig. 60/2) on the mount.

▶ Pull out the U-tube fork (Fig. 60/1) in an upward direction.

▶ Secure the screw fitting on the mount.

If necessary, the U-tube fork can be assembled in reverse order.

The screw fitting must be tightened to 150 Nm.

Disassembling the mount

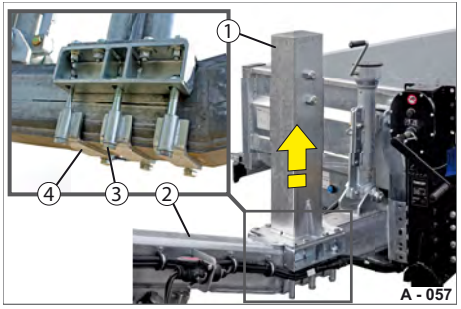


Fig. 61 Disassembling the mount

1 Mount with shoe console
2 Drawbar
3 Screw fitting
4 Clamp

▶ Release the screw fitting (Fig. 61/3) on the drawbar (Fig. 61/2) - grip the clamp (Fig. 61/4) firmly.

▶ Lift the mount (Fig. 61/1) off the drawbar.

▶ Secure the clamps, screws, nuts and washers on the mount for storage.

Installation

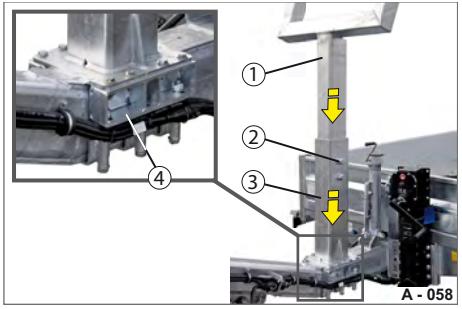


Fig. 62 Conveyor belt carrier assembled

1 U-tube fork
2 Screw fitting
3 Mount with shoe console
4 Shoe console with clamps

▶ Position the mount (Fig. 62/3) with shoe console (Fig. 62/4) on the drawbar.

▶ Tighten down the shoe console with clamps and screw fittings around the drawbar to 150 Nm.

▶ Insert the U-tube fork (Fig. 62/1) at the top into the mount.

▶ Tighten down the screw fitting (Fig. 62/2).

▶ Check before driving that the conveyor belt carrier is secured.

Working the roof bow / curtain structure

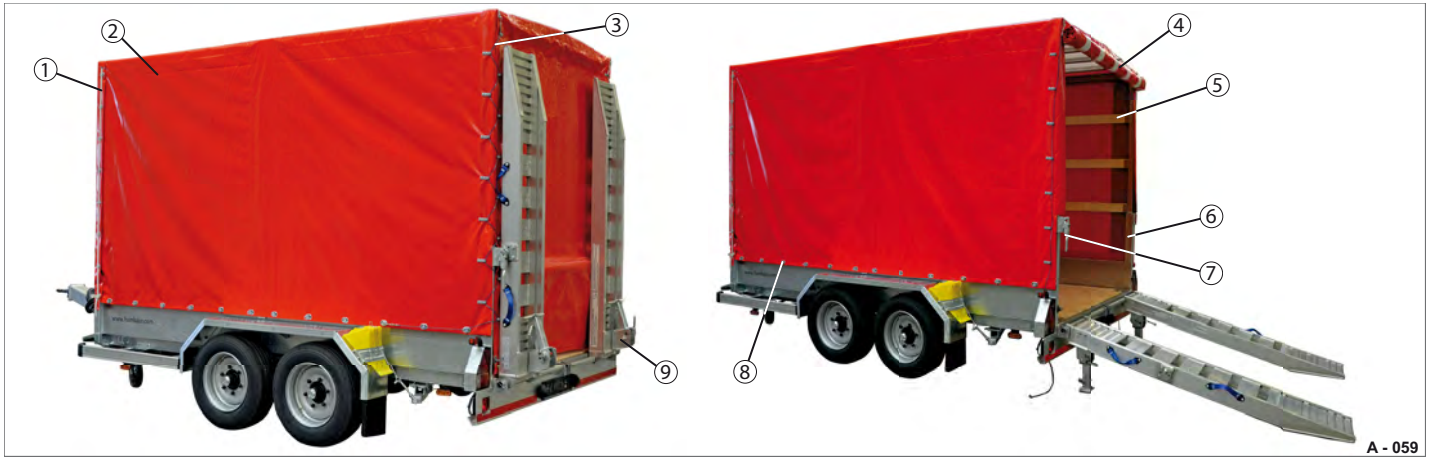


Fig. 63 Example: Trailer with roof bow/curtain structure

1 Belt band
2 Side curtain section
3 Tension rope
4 Curtain section, rear
5 Push-in slat
6 Corner post
7 Lock
8 Cramp
9 Ramp

HS trailers can optionally be manufactured with a roof bow/curtain structure.

The full curtain is provided to protect your loaded goods from theft and weather.

The bow frame is screwed into the trailer posts.

If needed, the bow and curtain can be disassembled.

The full curtain roof must be cleaned of foreign matter such as water, ice, snow and branches before use.

Operating curtain section, rear

Fig. 64 Rear side without ramps

1 Curtain section, rear
2 Tension rope
3 Operating belt
4 Handle grip

Fig. 65 Rear side with ramps

1 Drive-up ramps
2 Lock

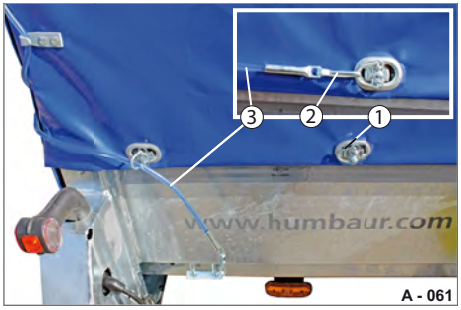


Fig. 66 Unlocking curtain section

1 Cramp/eye
2 Karabiner hook
3 Tension rope

The rear curtain section roof must be opened before loading/unloading the trailer.

The curtain must be completely closed and secured during driving.

The ramps must be unlocked and lowered before operating the curtain section.

Unlocking

▶ Release the karabiner hook (Fig. 66/2) from the cramp (Fig. 66/1).

▶ Pull the tensioning rope (Fig. 66/3) out of the eyes.

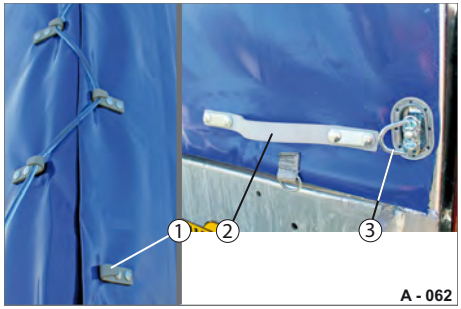


Fig. 67 Unlocking curtain section

1 Lug
2 Handle grip
3 Cramp

▶ Release the tensioning rope from the latches (Fig. 67/1).

▶ Screw on the cramp (Fig. 67/3).

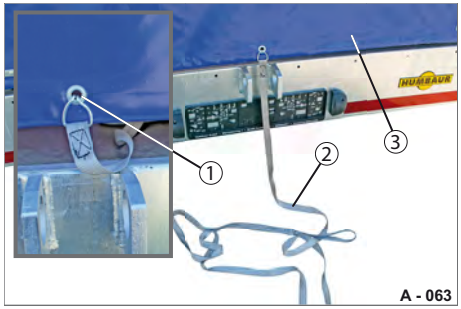


Fig. 68 Roll out curtain section

1 Round eye
2 Operating belt
3 Curtain section, rear

Rolling out

▶ Remove and hold the operating belt (Fig. 68/2).

▶ Slowly let the curtain section (Fig. 68/3) roll out.

Fig. 69 Curtain section, open

1 Curtain section, rolled out
2 Operating belt, position at top

▶ Position the operating belt (Fig. 69/2) on the roof of the curtain.

The rear curtain section is completely open.
The trailer can be loaded from the rear.

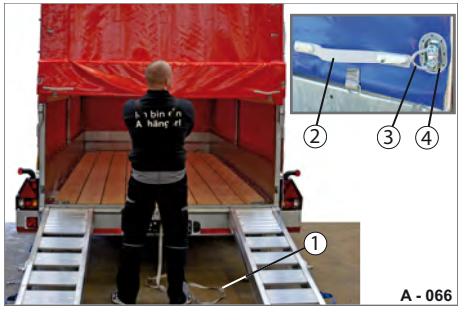


Fig. 70 Closing curtain section

1 Operating belt
2 Handle grip
3 Cramp, unfastened
4 Eye

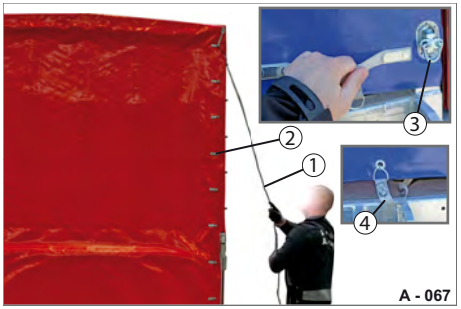


Fig. 71 Locking curtain section

1 Tension rope
2 Lug
3 Cramp, secured
4 Operating belt

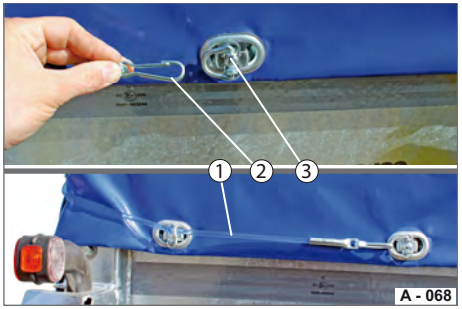


Fig. 72 Securing curtain section

1 Tension rope
2 Karabiner hook
3 Cramp, secured

Closing

- ▶ Slowly pull down the curtain section using the operating belt (Fig. 70/1).
- ▶ Grip the handle grip (Fig. 70/2) on both sides and pull the eye (Fig. 70/4) over the cramp (Fig. 70/3).
- ▶ Turn the cramp 90° to a horizontal position.
- ▶ Lay the tension rope (Fig. 71/1) in turns around the lugs (Fig. 71/2) from the top downwards.
- ▶ Stow the operating belt (Fig. 71/4) in the trailer interior.

Securing

- ▶ Pull the tensioning rope (Fig. 72/1) around the corner post and feed the tensioning rope around the cramp with the karabiner hook (Fig. 72/2).
- ▶ Attach the karabiner hook into the cramp (Fig. 72/3).

  The curtain section is closed and secured.

  The ramps can be raised and secured.

Operating side curtain section

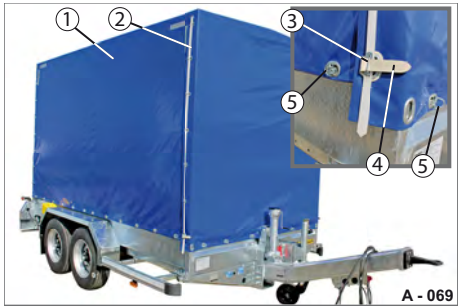


Fig. 73 Side curtain section

1 Side curtain section
2 Belt band
3 Eye
4 Clasp
5 Cramps, side and front

The curtain can be opened at the side, e.g. for loading/unloading from the side.

The curtain must be completely closed and secured during driving.

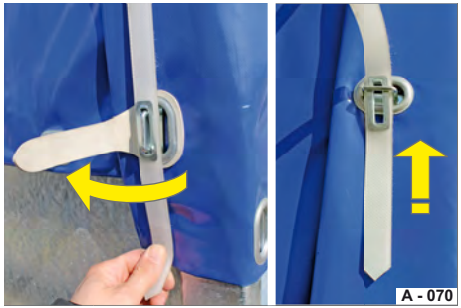


Fig. 74 Unlocking front curtain section

Fig. 75 Unlocking side curtain section

Unlocking

- ▶ Open the clasp (Fig. 73/4).
- ▶ Pull the belt band (Fig. 73/2) upwards out of the eyes (Fig. 73/3).
- ▶ Pull and rotate all side cramps (Fig. 73/5).

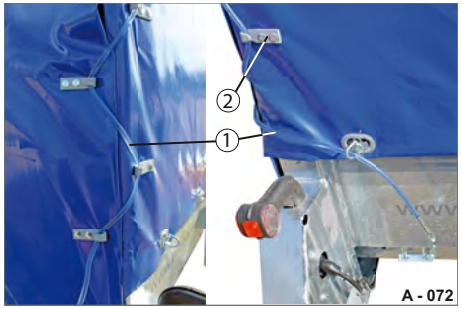


Fig. 76 Unlocking rear curtain section

1 Tension rope
2 Lug

▶ Release the tensioning rope (Fig. 76/1) from the latches at the rear.

Fig. 77 Opening curtain section

1 Side curtain section

Opening

▶ Lay the side curtain section (Fig. 77/1) on the bow frame.
If necessary, use a bar or fixed and free standing climbing equipment (ladder).

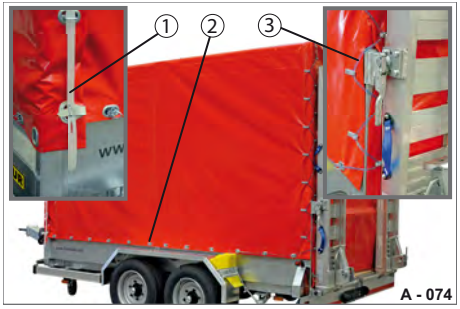


Fig. 78 Securing/closing curtain section

1 Catches, front
2 Catches, side
3 Catches, rear

Closing

▶ Fit the curtain section with the eyes over the opened cramps.

▶ Close all cramps.

▶ Secure the front curtain section with the belt band.

▶ Secure the rear curtain section with the tensioning rope.
The side curtain section is closed and secured.

Handling the push-in slats

Push-in slats serve to stabilise the structure during the journey.

Push-in slates prevent curtain rips and bulges which can be caused by crushing loads or side winds.

Push-in slats can be made of wood or aluminium.

Push-in slates are not designed for friction-lock load securing. These may not be used for friction-lock lashing.

⚠ WARNING

Inserting push-in slats incorrectly

The curtains can get pushed inward by wind during the journey.

The trailer can rock to the side - risk of accidents!

- ▶ Insert the push-in slats evenly over the entire trailer length.
- ▶ Check that the push-in slats are firmly inserted before departing.

⚠ CAUTION

Removing push-in slats

Push-in slats that are not correctly inserted or under tension may jump out and fall down in the course of removal - risk of striking!

- ▶ If necessary, remove the load pressure from the push-in slats prior to removal.
- ▶ Do not use damaged push-in slats.
- ▶ Use .

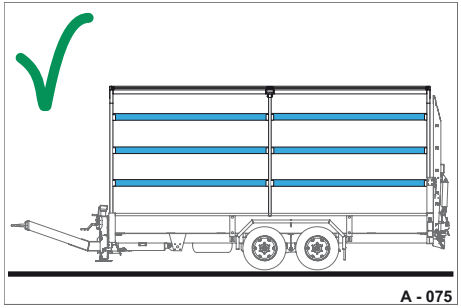


Fig. 79 Correct

Push-in slats are inserted consistently and uniformly.

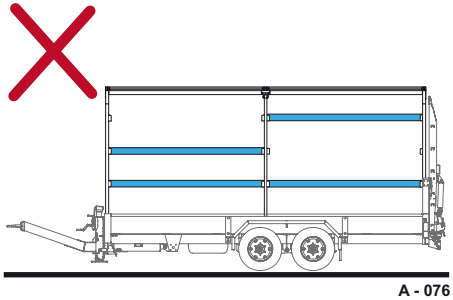


Fig. 80 Incorrect

Push-in slats are not inserted consistently and uniformly.

WARNING

Handling the push-in slats

Persons may fall when climbing/ alighting via the platform gates, mudguards, side guards, underrun guard and toolboxes.

- ▶ Only climb onto the loading platform via the areas provided for this purpose.
- ▶ Only use stable climbing aids, e.g. stable stepladders, to handle the push-in slats from the outside.
- ▶ Use a telescopic operating rod to handle the top push-in slats.

The push-in slats can be worked from the inside (from the loading platform) or from the outside.

When working from the outside, e.g. with the trailer fully laden, the side curtain section must be opened at the side beforehand.

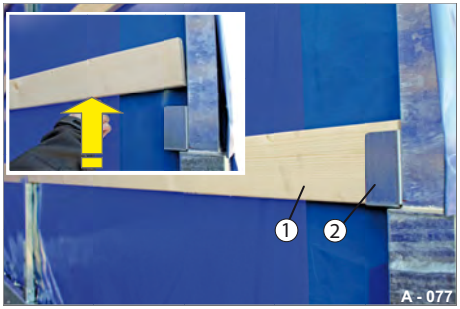


Fig. 81 Disengaging push-in slats

1 Push-in slat (wood)
2 Slot-in pocket

Fig. 82 Push-in slats inserted

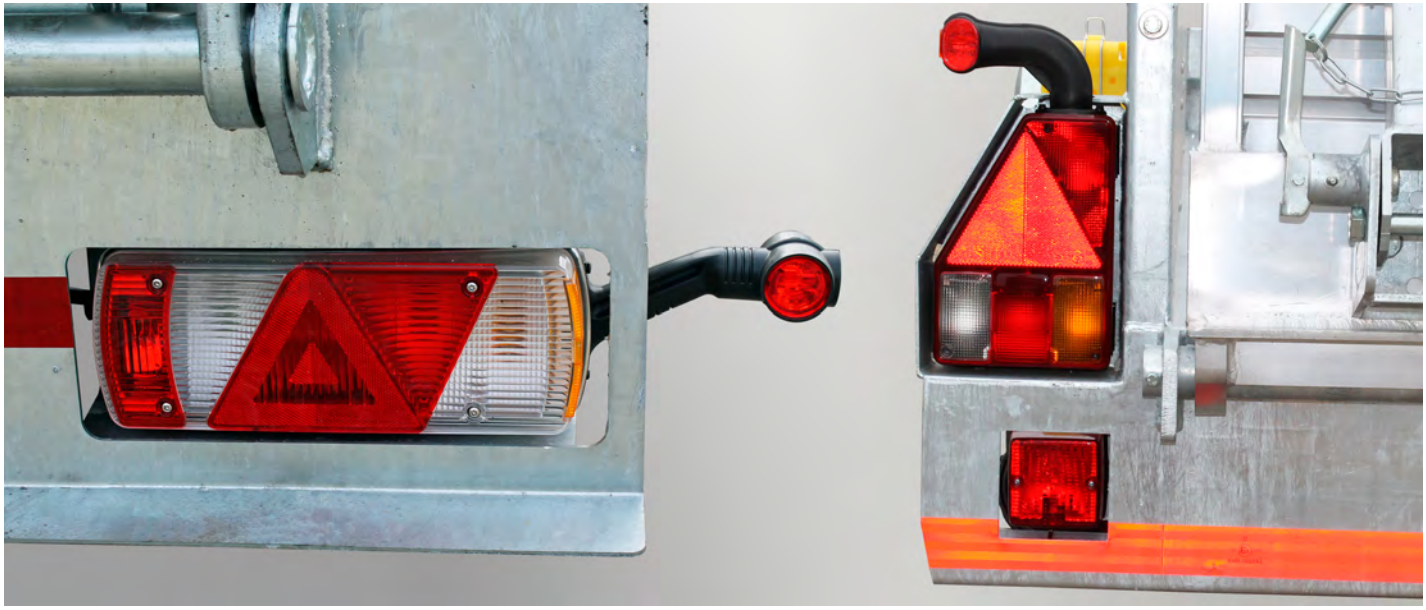
1 Push-in slat, front
2 Push-in slat, side
3 Slot-in pocket, middle post

Disengaging

- ▶ Disengage the top push-in slats (Fig. 81/1) from one side - if necessary, use the telescopic operating rod.
- ▶ Disengage the push-in slats from the other side.
- ▶ Remove these carefully and set them down safely to avoid damage.

Inserting

- ▶ Insert the push-in slats (Fig. 82/1 & 2) in succession, starting from below, into the slot-in pockets (Fig. 82/3) of the corner/middle posts.
- ▶ Check that the push-in slats are firmly seated - they must be fully seated in the slot-in pockets.
- ▶ Close the curtain.



Electrical system

Lighting system

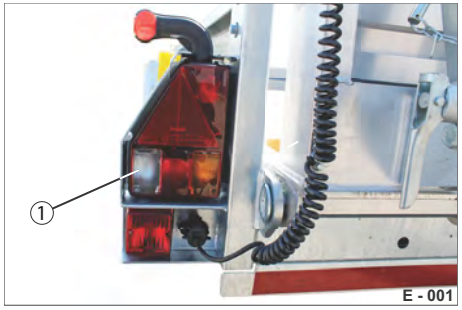


Fig. 1 Rear lighting

1 Multi-function lighting

The electrical lighting system operates at 24 V by default.

The lighting system can optionally be configured to operate at 12 V.

The lighting system can be ordered in an LED version.

The LED lighting system operates with a 12 to 24 V power supply.

The EBS module (Fig. 1/1) can be programmed at the factory to 24 V or 12 V.
Optionally, the EBS module can be programmed to detect 12 to 24 V.

⚠ WARNING

Failure of electrical function

Driving performance and the braking distance can worsen - risk of accident!

- ▶ Check that all electrical connections are established before departing.
- ▶ Check the state of plugs and cables before departing.
- ▶ Do not drive with broken, defective electrical connections.

Connecting EBS/ABS

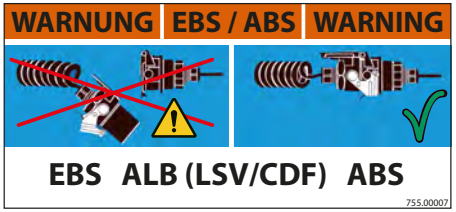


Fig. 2 Label on trailer - example

EBS/ABS plug must be inserted in the towing vehicle before departure.

- ▶ Check before driving that the EBS/ABS plug is inserted on the towing vehicle.
- ▶ Check that the plug is secure.

Plug connections (standard)

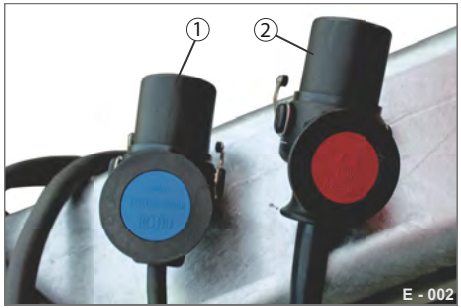


Fig. 3 Connection cable Standard

1 7-pin EBS/ABS plug (ISO 7638)
2 15-pin electrical plug (ISO 12098)

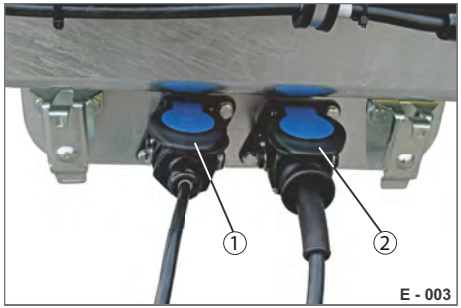


Fig. 4 Park position on drawbar

1 EBS/ABS plug parking socket (7P)
2 Electrical plug parking socket (15P)

Fig. 5 7-pin to 13-pin adapter

1 13-pin (plug)
2 7-pin (adapter plug)

Standard version of electrical connection in 24 V:

– with 7-pin
EBS/ABS plug acc. to ISO 7638
– with 15-pin
electrical plug acc. to ISO 12098

▶ With uncoupled trailer, connect the sockets into the respective parking sockets.
▶ Maintain the contacts of the connectors with contact spray, if necessary.
▶ Clean dirty connectors before departing.
▶ Have defective, torn, worn connectors replaced immediately in a workshop.

The electrical system (12 V) can optionally be configured with an intermediate cable in accordance with DIN ISO 1724 and 7-pin/13-pin adapter.

Plug connections : 2 x 7-pin (optional)

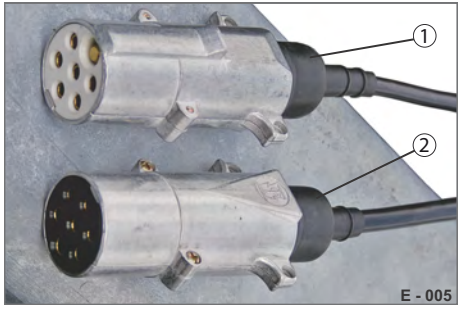


Fig. 6 Connection cable 24 V, optional

1 7-pin plug, 24 V-S (ISO 3731)
2 7-pin plug, 24 V-N (ISO 1185)

In addition, the trailer can be equipped with a 15-pin electrical plug with two 7-pin plug connections:
24 V-N acc. to ISO 1185
24 V-S acc. to ISO 3731.

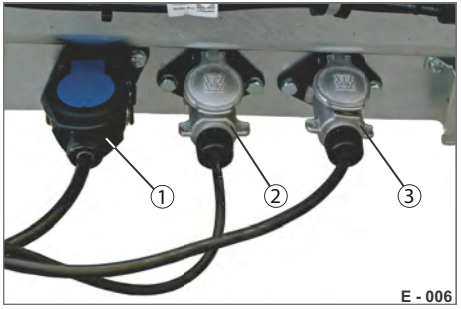


Fig. 7 Park position on drawbar

1 EBS/ABS plug parking socket
2 24 V-N plug parking socket
3 24 V-S plug parking socket

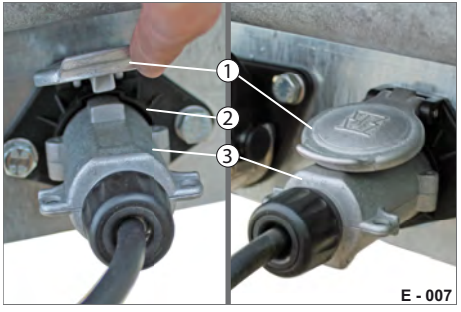


Fig. 8 Plug, parked

1 Lid
2 Parking socket
3 Plug, 7-pin

- ▶ Open the lid (Fig. 8/1).
- ▶ Pull the plug (Fig. 8/3) out of the parking socket (Fig. 8/2) - do not pull on the cable.
- ▶ Connect the plug to the towing vehicle.
- ▶ Check that the plug is secure.
- ▶ Connect the socket into the respective parking socket after uncoupling the trailer.

  The lid secures the plug.

Connecting electrical system/ Handling plugs

Driving with damaged/dirty plug connections is illegal.

⚠ CAUTION

Coupling/uncoupling cables

You can crush your fingers in the connection points.

- ▶ Carefully twist the cliplock onto/off the locking nubs.
- ▶ Pull on the plug – not on the cable.

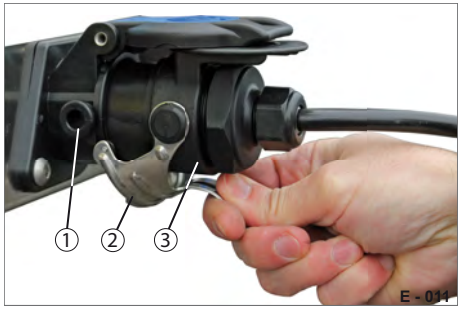


Fig. 9 Unlocking the plug

1 Locking nubs
2 Cliplock
3 Plug

- ▶ Pull on the cliplock (Fig. 9/2).
  The clip lock twists out of the locking nubs.
- ▶ Pull the plug (Fig. 9/3) out of the parking socket (Fig. 10/3) - do not pull on the cable.

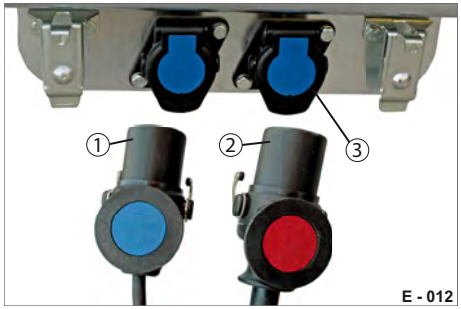


Fig. 10 Park position on tube drawbar

1 EBS/ABS plug (7-pin)
2 Electrical system plug (15-pin)
3 Parking socket, lid closed

- ▶ Connect the electrical system plug (Fig. 10/2) to the towing vehicle.
- ▶ Check that the plug is secure.

Parking the plug

Fig. 11 Securing the plug

1 Locking nubs
2 Cliplock
3 Plug

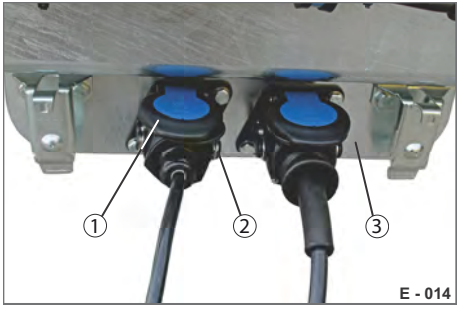


Fig. 12 Plug, parked

1 Parking socket/lid
2 Cliplock
3 Park console

▶ After uncoupling the trailer, insert the plugs into the respective parking sockets (Fig. 11/3).

▶ Twist the cliplock (Fig. 11/2) onto the locking nubs (Fig. 11/1) on the parking socket.

The plugs are firmly seated in the parking socket in the park console.

Parked plug connections are protected from damage/contamination.

▶ Maintain the contacts of the connectors with contact spray, if necessary.

▶ Clean dirty connectors before departing.

▶ Have defective, torn, worn connectors replaced immediately in a workshop.

ABS converter / voltage transformer

Fig. 13 ABS voltage transformer

1 Housing (stainless steel)
2 ABS plug for 12 V supply
3 Empty socket, closed

Fig. 14 Voltage transformer

1 Protective cover
2 Socket, 7-pin according to ISO 7638
3 Empty socket, open

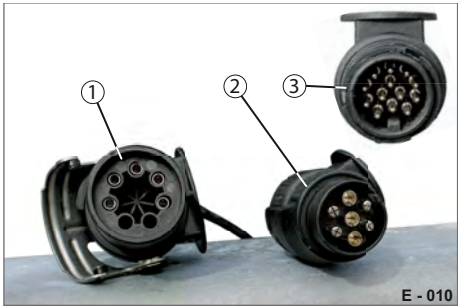


Fig. 15 Plug connection

1 7-pin EBS/ABS plug (ISO 7638) 12 V
2 Adapter plug, 7 pin for lighting
3 13-pin plug connector (DIN 72570), ISO 11446 - 12 V for lighting

The ABS converter is intended for an input voltage of 12 V and output voltage of 24 V.

The voltage transformer is pre-assembled and ready for use.

The trailer can be operated with a 12 V power supply for lighting and brakes.

Pins 6 and 7 ("CAN bus") are occupied.

The lighting connection is to be established in line with the connection options on the towing vehicle.

Multi-voltage version 12 V - 24 V

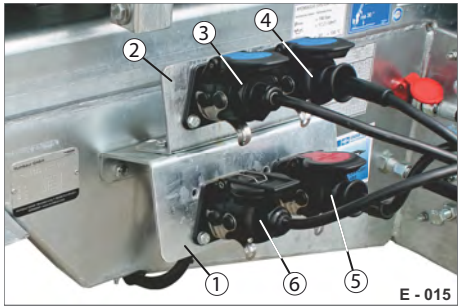


Fig. 16 Plug console 12 V - 24 V

1 Console, connected
2 Empty socket console
3 EBS/ABS plug, for 12 V
4 Electrical system plug, for 12 V
5 Electrical system plug, for 24 V
6 EBS/ABS plug, for 24 V

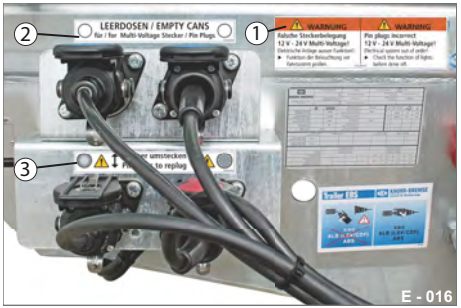


Fig. 17 Multi-voltage label

1 Warning label
2 Label: Empty sockets
3 Label: Electrically connected sockets

Fig. 18 Empty socket open

1 Empty socket console
2 Empty socket for plug 12 V or 24 V

⚠ WARNING

Incorrect plug assignment
12 V - 24 V multi-voltage

Electrical system not working.

- ▶ Check that the electrical system works before departing.
- ▶ Check that the plugs are correctly assigned in the console.

The required supply of the trailer with 12 V or 24 V for the brake or lighting system must be checked during every change of towing vehicle and be replugged as necessary.

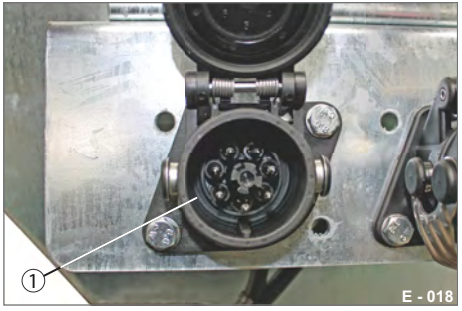


Fig. 19 EBS/ABS socket lower left

1 Multi-voltage socket for brakes, 7-pin

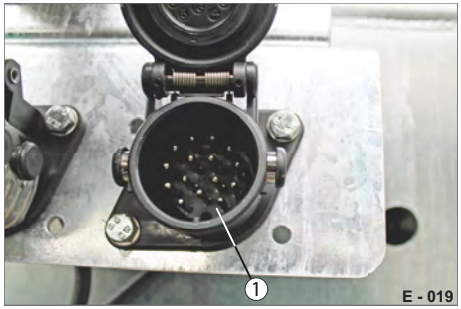


Fig. 20 Electrical system plug lower right

1 Multi-voltage socket for lighting system, 15-pin

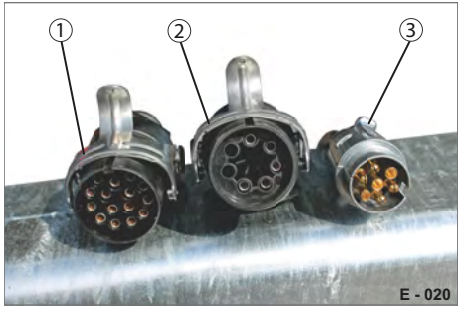


Fig. 21 12 V - 24 V plug

1 Electrical system (15P) - ISO 12098 (24 V)

2 Brakes (7P) - ISO 7638-1/2 (12 / 24 V)

3 Electrical system (7P) - DIN ISO 1724 (12 V)

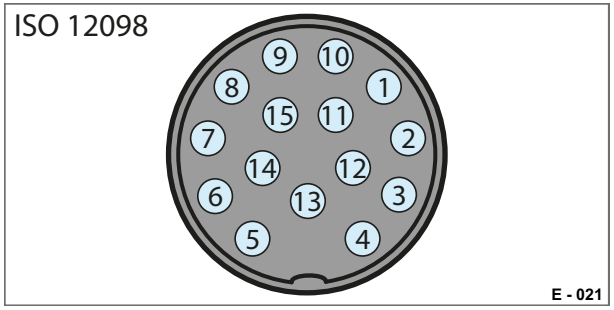
Create connection

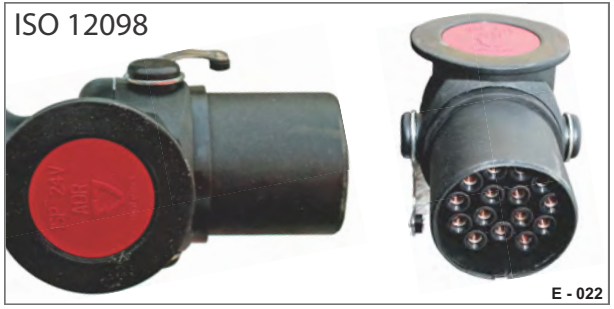
- ▶ Plug the required 12 V or 24 V plug in the lower multi-voltage socket (Fig. 19/1 & Fig. 20/1) on the console.
- ▶ Insert the unneeded plug in the empty socket (Fig. 18/2).
- ▶ Connect the electrical system plug (Fig. 21/1 or 3) and the corresponding EBS plug (Fig. 21/2) for 12 V or 24 V to the towing vehicle.

15-pin connector ISO 12098

Pin	Function	Cross-section	Colour
1	Turn indicator, left	1.5 mm²	Yellow
2	Turn indicator, right	1.5 mm²	Green
3	Rear fog light	1.5 mm²	Blue
4	Earth	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	Continuous positive power supply 24 V	2.5 mm²	Brown/blue
10	Steering axle, sensor brake lining wear	1.5 mm²	Brown/red
11	Approach aid, pressure sensor spring-loaded brake	1.5 mm²	Yellow/black
12	Lift axle	1.5 mm²	Pink
13	CAN bus earth	2.5 mm²	White/black
14	CAN bus high	1.5 mm²	Violet
15	CAN bus low	1.5 mm²	Orange

Image/arrangement

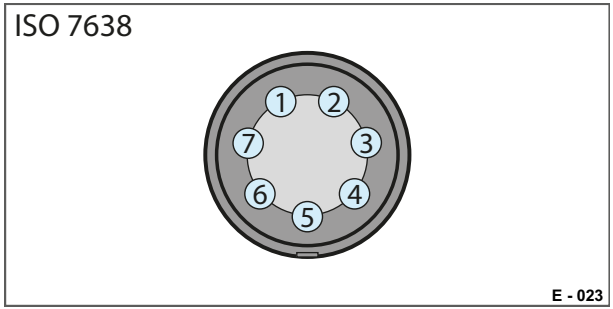




7-pin EBS connector ISO 7638-1/2 for 12 V / 24 V

Pin	Function	Cross-section	Colour
1	Positive solenoid valve (term. 30)	4 or 6 mm²	Red
2	Positive (term. 15)	1.5 mm²	Black
3	Minus electronics (term. 31b)	1.5 mm²	Yellow
4	Minus solenoid valve (term. 31)	4 or 6 mm²	Brown
5	Warning device (ABS)	1.5 mm²	White
6	Not assigned		
7	Not assigned		

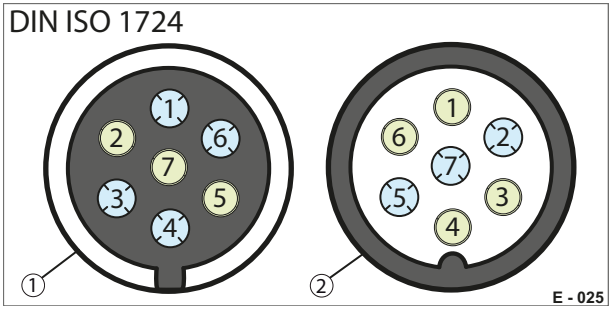
The 12 V system differs from the 24 V system in that it has different codings.



7-pin plug connector DIN ISO 1724 - 12 V

Pin	Function	Cross-section	Colour
1	Turn indicator, left (L)	1.5 mm²	Yellow
2	Fog light (54G)	1.5 mm²	Blue
3	Earth (31)	2.5 mm²	White
4	Turn indicator, right (R)	1.5 mm²	Green
5	Right tail light/clearance light (58R)	1.5 mm²	Brown
6	Brake lights (54)	1.5 mm²	Red
7	Left tail light/clearance light (58L)	1.5 mm²	Black

Image/arrangement

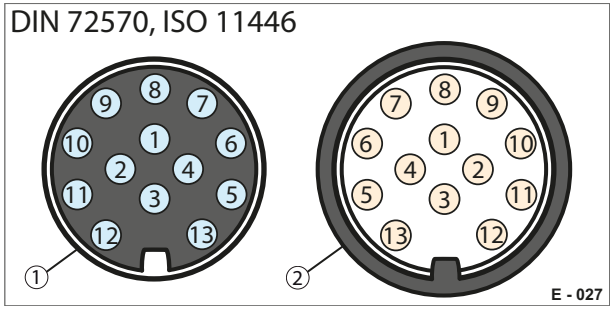


Tab. 1 pos. 1) plug / pos. 2) socket

13-pin connector DIN 72570, ISO 11446 - 12 V

Pin	Function	Cross-section	Colour
1	Turn indicator, left (L)	1.5 mm²	Yellow
2	Fog light (54G)	1.5 mm²	Blue
3	Earth (31) for contacts no. 1-8	2.5 mm²	White
4	Turn indicator, right (R)	1.5 mm²	Green
5	Right tail light/clearance light (58R)	1.5 mm²	Brown
6	Tail light, right	1.5 mm²	Brown
7	Brake lights (54)	1.5 mm²	Red
8	Reversing light (1)	1.5 mm²	Grey/pink
9	Continuous current/continuous positive power (4)	2.5 mm²	Brown/blue/ orange
10	Charging line (6)	2.5 mm²	Brown/red
11	Earth (3) for circuit no. 10 (charging line)	2.5 mm²	White/black/ blue
12	Trailer detection (empty)	- mm²	-
13	Earth for circuit no. 9 (empty)	2.5 mm²	White/red

Image/arrangement

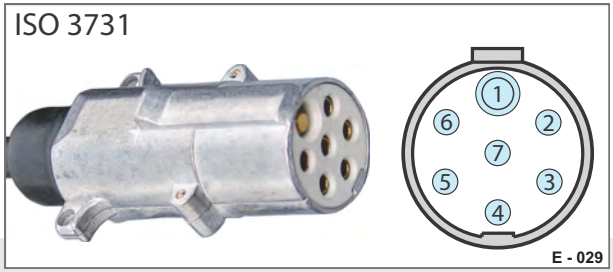


Tab. 2 pos. 1) socket / pos. 2) plug

Contact assignment

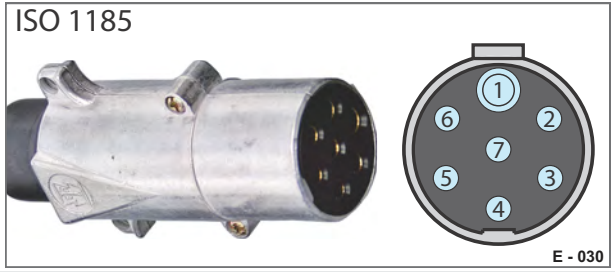
7-pin plug connector ISO 3731 (White)

Pin	Function	Cross-section	Colour	Image/arrangement
1	Earth (31)	2.5 mm²	White/black	
2	Not assigned (58L)	1.5 mm²	Violet	
3	Reversing light (L)	1.5 mm²	Blue	
4	Continuous positive power (54)	2.5 mm²	Brown/blue	
5	Control over earth (R)	1.5 mm²	Orange	
6	Power over ignition switch	2.5 mm²	Pink	
7	Fog light (54G)	1.5 mm²	Blue	



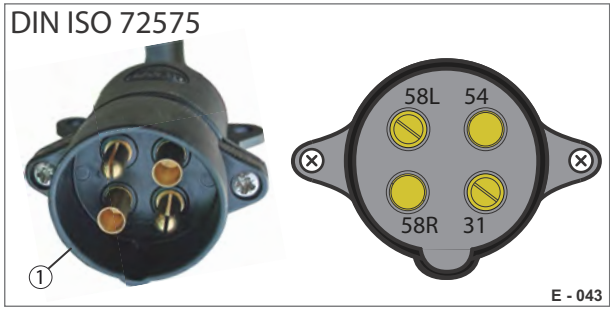
7-pin connector ISO 1185 (Black)

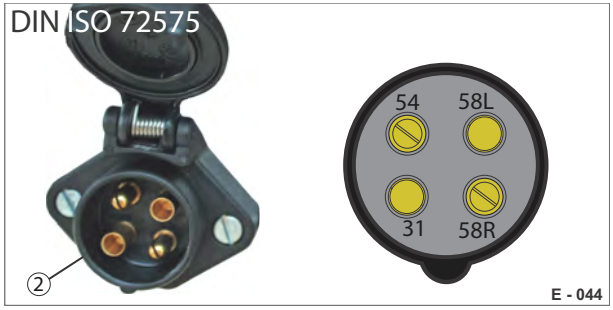
Pin	Function	Cross-section	Colour	Image/arrangement
1	Earth (31)	2.5 mm²	White	
2	Left tail light / clearance / license /	1.5 mm²	Black	
3	Turn indicator, left (L)	1.5 mm²	Yellow	
4	Brake lights (54)	1.5 mm²	Red	
5	Turn indicator, right (R)	1.5 mm²	Green	
6	Right tail light / clearance light / license/number plate light (58R)	2.5 mm²	Brown	
7	Trailer braking control (54G)	1.5 mm²	Blue	



4-pin plug connector DIN ISO 72575 (6 - 24 V)

Pin	Function	Cross-section	Colour	Image/arrangement
1	Earth (31)	2.5 mm²	White/black	
2	Fog light (58R)	1.5 mm²	Blue	
3	Reversing light (54)	1.5 mm²	Grey	
4	Not assigned (58L)			





Tab. 3 pos. 1) plug / pos. 2) socket

Rear lights with peripheral light 24 V

The multi-functional tail light is equipped with the following functions:

– Reversing light
– Tail light with reflector
– Brake light
– Indicator

The peripheral light identifies the vehicle with the following colours:

– Red, to the rear
– Orange, side
– White, forwards

⚠ WARNING

Non-functioning tail lights

The road users cannot correctly gauge/ identify the vehicle - risk of injury!

▶ Check that the tail and peripheral lights are secured before departing.

Standard left (lamps)

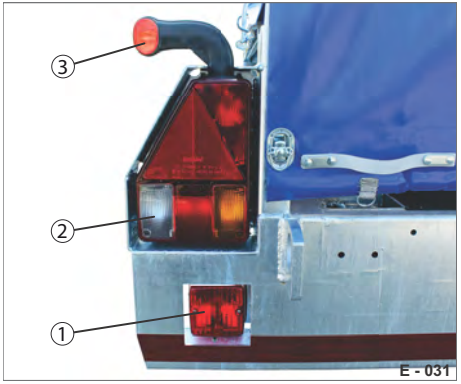


Fig. 22 Rear lighting 24 V - left

1 Rear fog light
2 Tail light complete with:
Reversing light,
Tail lights with reflectors,
Brake light,
Indicator
3 Peripheral light

Standard right (lamps)

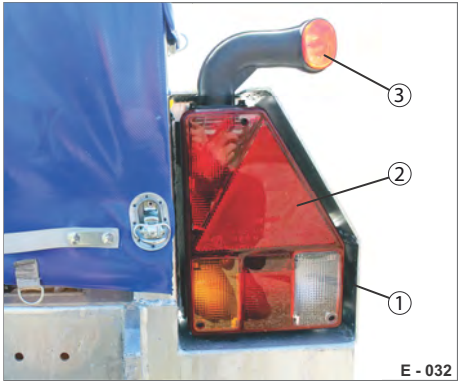


Fig. 23 Rear lighting 24 V - right

1 Steel border
2 Tail light complete with:
Reversing light,
Tail lights with reflectors,
Brake light,
Indicator
3 Peripheral light

Tail lights with peripheral light (optional)

The multi-functional rear light can optionally be integrated in the underrun guard.

Rear lighting 24 V

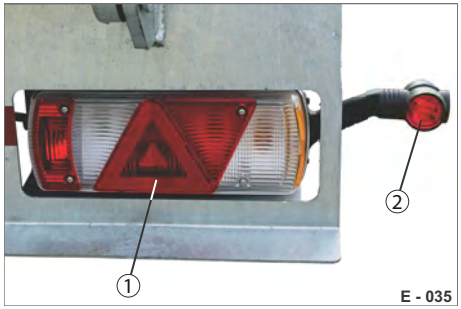


Fig. 24 Multi-functional light 24 V

1 Tail light complete with:
Fog light,
Reversing light,
Tail lights with reflectors,
Brake light,
Indicator

2 Peripheral light

Rear lighting 24 V (LED)

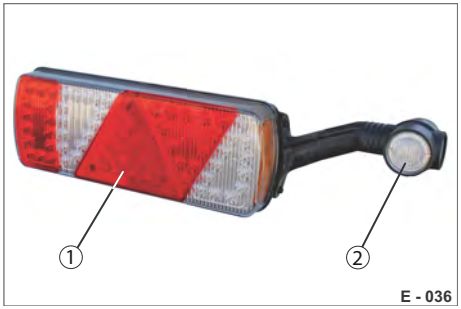


Fig. 25 Multi-functional light "LED" 24 V

1 Tail light complete with:
Fog light,
Reversing light,
Tail lights with reflectors,
Brake light,
Indicator

3 Peripheral light white

⚠ WARNING

Non-functioning tail lights

The road users cannot correctly gauge/ identify the vehicle - risk of injury!

▶ Check that the tail and peripheral lights are secured before departing.

Marking/ Clearance lights

The white clearance lights are installed on the front side of the chassis.

The orange clearance lights are installed on the side of the chassis.

The marking/clearance lights are LED lights supplied by the electrical system.

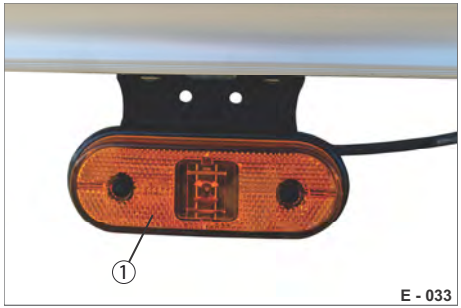


Fig. 26 Marking lights, side

1 Side marking light (LED)

⚠ WARNING

Non-functioning marker / clearance lights

The road users cannot correctly gauge/ identify the vehicle - risk of injury!

▶ Check that the marker and clearance lights are secured before departing.

Maintenance of marking/ clearance lights, see page **199**.

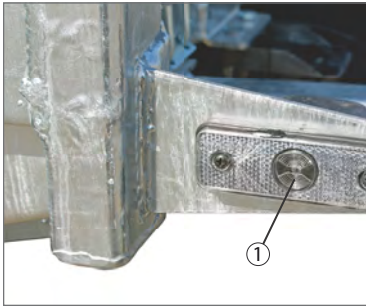


Fig. 27 Clearance lights , front

1 Clearance light (LED)

Licence plate light 24 V

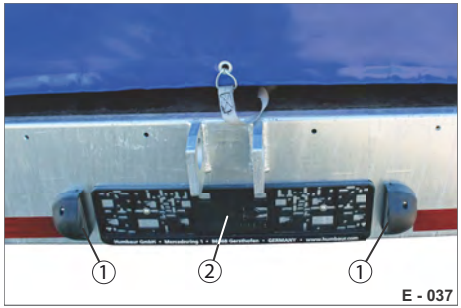


Fig. 28 Licence plate light

1 lamps, 24 V lights
2 Licence plate holder, one-line

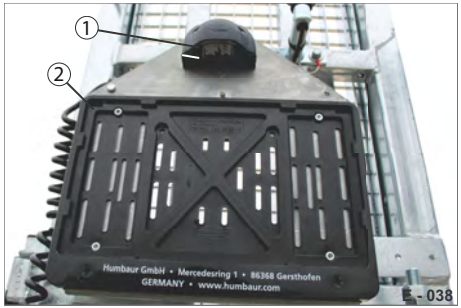


Fig. 29 Licence plate light

1 Lamp
2 Licence plate holder, two-line

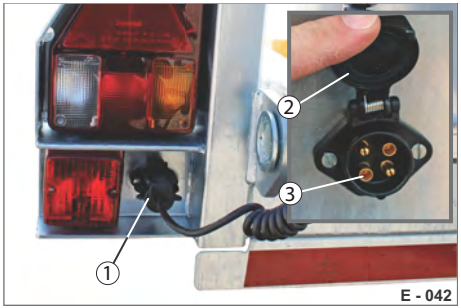


Fig. 30 Inserting licence plate light

1 Lid
2 Socket, 4-pin DIN ISO 72575
3 Plug, inserted

It is required by law that the licence plate be illuminated.

The licence plate lights are attached separately to the left and right of the licence plate holder.

The licence plate light is attached above the licence plate holder on the ramps.

Maintenance of the licence plates, see page **198**.

Inserting

▶ Open the cover of the socket (Fig. 30/1) and insert the plug (Fig. 30/3).

▶ Secure the plug with the cover of the socket.

Working light

The working lights illuminate the work environment at the rear of the trailer.

They increase work safety when loading/ unloading when it is dark.

The working lights are switched on and off through the towing vehicle or separately on the light itself.

The light direction can be adjusted separately.

The working lights are swivel-mounted.

Maintenance of the working lights, see page **200**.

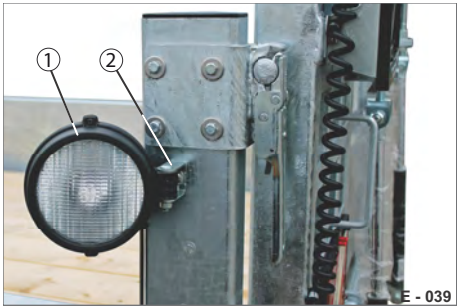


Fig. 31 Working light on the corner post

1 Working light
2 Console, rotatable mounting

Fig. 32 Working light on the underrun guard

1 Working light
2 Underrun guard

Rotating light

The rotating light can be installed at the side of the rear on the posts or on the ramps.

⚠ WARNING

Non-functioning rotating light

The road users cannot correctly gauge/ identify the wide-load vehicle - risk of accident!

▶ Check that the rotating light is securely fastened before departing if driving with a wide load.

Maintenance of the rotating light, see page **201**.

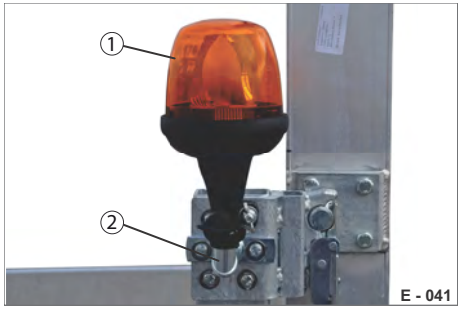


Fig. 33 Rotating light, installed

1 Lamp
2 Console
3 Wing nut

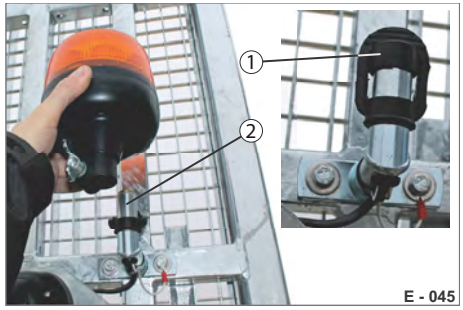


Fig. 34 Disassembling rotating light

1 Rubber cover
2 Console

If not used, the rotating light can be unplugged and disassembled.

The rotating light must be transported so it is protected from damage, e.g. in a toolbox.

▶ Release the wing nut (Fig. 33/3).
▶ Carefully pull the light body (Fig. 33/1) from the console (Fig. 33/2).
▶ Attach the rubber cover (Fig. 34/1) on the console to protect against dampness/dirt.

Rotating light (option)

Inspection, care and maintenance

Safety tests

Trailers must be inspected as frequently as required, but at least once a year, by an authorised/qualified specialist to ensure that they are in a roadworthy condition.

This applies also to all components associated with the securing of the load in accordance with VDI 2700 and/or EN 12642.

Instructions for maintenance work on the following assemblies can be found in the manufacturer's operating and maintenance manuals:

- Brakes
- Axles

For safety reasons, all important mechanical components must be tested and serviced at regular intervals.

These include:

- Axles
- Brakes
- Screws
- Tube connections
- Attachments
- Switch-off and safeguard mechanism
- Electrical system

You can find the regular intervals on page **164** "Maintenance intervals".

- Always observe the accident prevention regulations when performing maintenance work.
- Observe environmental conservation guidelines.
- Switch off the engine before starting all maintenance work.
- Damaged twist-lock mechanisms should never be repaired; instead, they should be replaced with new parts.
- Damaged and non-functioning trailer components must be replaced with original Humbaur GmbH replacement parts.

Certificate of general inspection/ safety assessment

Fig. 1 Inspection log book for trailer

HU = General inspection
SP = Safety assessment

- ▶ Enter the completed general inspection/safety assessment (§29 para. 12 of StVZO).
- ▶ Keep the last inspection report (general inspection) and the last test log (safety assessment) at least until the next inspection/assessment (§29 para. 10 of StVZO).
- ▶ Keep the inspection log book until the vehicle is taken off the road for good (§29 para. 13 of StVZO).

Axle/wheel maintenance

Fig. 2 Maintenance log book for axle unit

ZU Intermediate inspection
HU = General inspection
BSU = Special brake inspection

- ▶ Have the legally stipulated visual inspections and maintenance work done by qualified workshops.
- ▶ Document the test in the service log book.

Support equipment maintenance

Fig. 3 Operating and service manual for support equipment

- ▶ Have the legally stipulated visual inspections and maintenance work done by qualified specialists.
- ▶ Document the test in the trailer inspection log book (Fig. 1).

Maintenance regulations

Maintenance includes regular controls of individual components and corresponding action based on checks.

The rhythm must be adapted to user behaviour.

Defective trailer parks must be replaced by original spare parts.

The following specifications refer to normal use of the trailer at max. 20,000 km per year.

One-time maintenance work	After	50 km	2000 km	5000 km	6 months	6 years
Wheel nuts: Tightening (also after every wheel change)		X				
Brake system: Perform traction test/lubrication			X			
Bolted connections of spring leaks, shock absorber and axle connections: Visual inspection			X		X	
Draw pipe height adjustment system Lubricating				X		
Tighten towing eye-bolted connection			X			
Check and set brake adjustment				X		
Gas pressure springs/components: Check for leaks and replace if necessary						X
Tightening/adjusting/if necessary, replacing lifting springs						X

Tab. 1 Maintenance table, initial commissioning

Maintenance work	Every	500 km or 14 days	1500 km or 30 days	5000 km or 3 months	10000 km or 6 months	20000 km or 12 months
Axle and wheel brake *1: Check state and wear						
Wheel nuts: Check they are secure and adjust if necessary		X			X	
Towing eye: Lubricating		X				X
Lighting system: Check for damage		X				
Wheels: Check air pressure, tyre wear		X				
Compressed air system: Check for leaks/crack formations			X			
Curtain structure: Check for crack formations, replace tensioning rope or belt band if necessary						X
Shock absorbers: Check for escaping oil					X	
Towing eye / drawbar: Check for wear and if they are secure					X	
Gas pressure springs: Check for damage/gas emission					X	
Line filter of the pressure system: Cleaning					X	
Brake system: Draining the compressed air tank		X				
All attachments: Check they are secure						X
Bolted connections of spring leaks, shock absorber and axle connections: Visual inspection						X
Screws/riveted joints on body/chassis: Visual inspection						X

*1: **You will find information on the maintenance in the manufacturer's operating instructions**

Tab. 2 Maintenance table

Tightening torques for bolted connections

Thread	Strength 8.8	Strength 10.9
	Tightening 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

Thread	Strength 8.8	Strength 10.9
	Tightening 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 General tightening torques

Tightening torques for special attachments

Name	Thread	Strength class	Tightening torque
Valve clamp (pneumatic control stage)	M 12	10.9	73 Nm
Side guard	M 12	10.9	73 Nm
Spare wheel holder, front platform gate	M 12	10.9	73 Nm
Support foot of gear-supported jack	M 16	10.9	265 Nm
Toolbox	M 12	10.9	73 Nm
Fixing screws, tail light			1.5 Nm

Tightening torques for wheel nuts

Axle manufacturer	Thread	Wheel nuts	Tightening torque
BPW, SAF, AL-KO	Observe size	Observe version	 See manufacturer's specifications

Implementation instructions

Without a central lubrication system, all the following lubrication work has to be carried out.

Use only high-pressure grease guns that do not exceed a lubrication pressure of 250 bar.

Damage can occur at bearing points, seals, etc. if the grease gun used does not have a safety mechanism.

NOTICE

Dirty lubrication nipple

The bearing can get dirty and cause increased wear.

Lubrication nipple and bearing points can get damaged.

▶ Clean the lubrication nipples carefully before lubricating.

⚠ CAUTION

Contact with lubricants

Lubricants can cause skin reactions.

▶ Only use approved lubricants.

▶ Clean lubrication nipples carefully before lubricating.

▶ Use  ,  .

▶  after working with lubricants.

Lubricating grease

Lubrication point	Lubricant
– towing eye – Support equipment – Drawbar height adjustment – Spindle parking brake – Latches / fasteners / locks – Suspended lifting gear – Drive-up ramps	Multi-purpose grease in acc. with ISO-L-XCCHB3 or DIN 51825-Typ K with application range -30 °C to + 120°C

Drawbar height adjustment

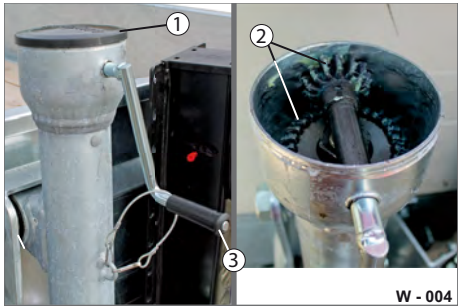


Fig. 4 Lubricating drawbar height adjustment

1 Lid
2 Gear wheels
3 Crank

- ▶ Remove the cover (Fig. 4/1).
- ▶ Clean the gear wheels with a clean, dry cloth, if necessary.
- ▶ Remove dirt and old, hardened grease.
- ▶ Lubricate the gear wheels (Fig. 4/2) with grease.
- ▶ Use the crank (Fig. 4/3) to crank the height adjustment up and down - this distributes the grease.
- ▶ Close the cover.
- ▶ Remove excess grease if necessary - environmental pollution!

Folding support

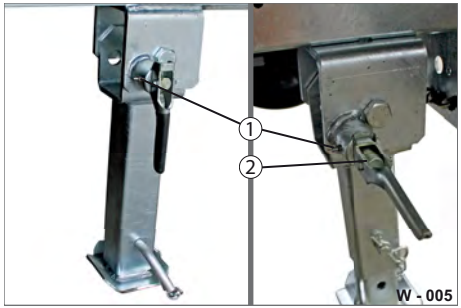


Fig. 5 Lubricating folding supports

1 Lubrication nipple
2 Locking handle bearing point

- ▶ Clean the lubrication nipples (Fig. 5/1) with a clean, dry cloth.
- ▶ If necessary, remove fouling such as grass and twigs from the bearing points (Fig. 5/2).
- ▶ Grease the folding supports with a grease gun on the lubrication nipple.
- ▶ Fold the folding supports up and down several times.

  The locking handle must engage on its own.
- ▶ Remove excess grease if necessary - environmental pollution!

Support winch

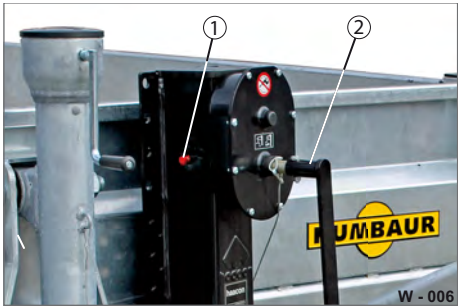


Fig. 6 Geared support winch / swivel support

1 Lubrication nipple
2 Crank

Observe/adhere to the manufacturer's maintenance instructions/intervals.

- ▶ Extend the foot of the support winch fully using the crank (Fig. 6/2).
- ▶ Removal the cap from the lubrication nipple (Fig. 6/1).
  Clean the grease nipple with a clean, dry cloth.
- ▶ Grease the support winch using a grease gun on the lubrication nipple.
- ▶ Slowly retract the foot of the geared support winch - this distributes the grease.

Support wheel

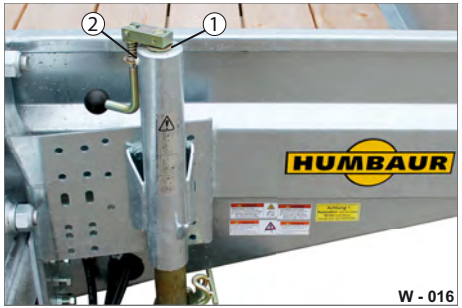


Fig. 7 Clean/oil support wheel

1 Oil gap
2 Lubrication hole, closed

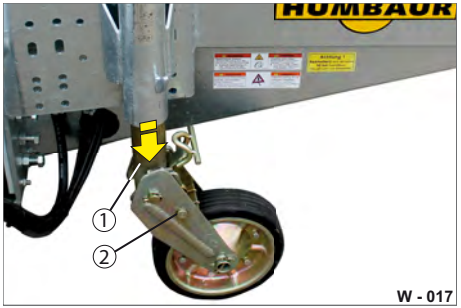


Fig. 8 Raising/lowering support wheel

1 Adjustment tube
2 Support wheel bearing points

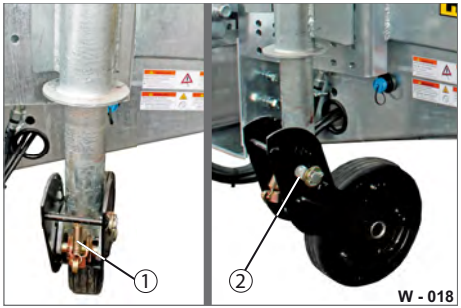


Fig. 9 Lubricate mechanism

1 Tension spring
2 Elongated hole / pin

The support wheel is provided with lifetime lubrication at the factory.
Regular lubrication is not necessary.

Heavy contamination can lead to support wheel sluggishness.

▶ Clean contamination off the support wheel and oil the support wheel via the oil gap (Fig. 7/1) if necessary.

Make sure the trailer is coupled or supported and secured against falling.

▶ Crank the support wheel up and down several times - this distributes the oil.

▶ Oil the bearing points if necessary.

▶ Check the function and ease of movement of the support wheel.

▶ Check that the mechanism of the automatic support wheel functions perfectly.
- Crank the support wheel up and down completely one time.
The wheel must retract completely automatically.

▶ If necessary, replace the tension spring/pin.

▶ Lubricate the function points, if necessary.

Spindle parking brake

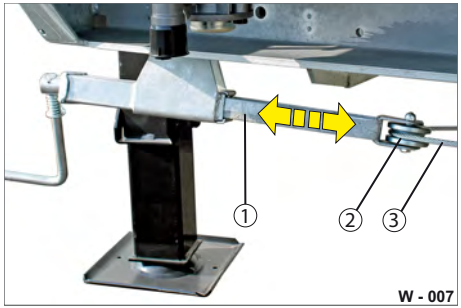


Fig. 10 Lubricating spindle parking brake

1 Stroke linkage
2 Guide pulley
3 Transfer cable

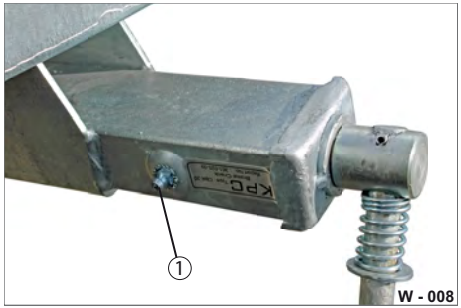


Fig. 11 Lubrication point

1 Lubrication nipple

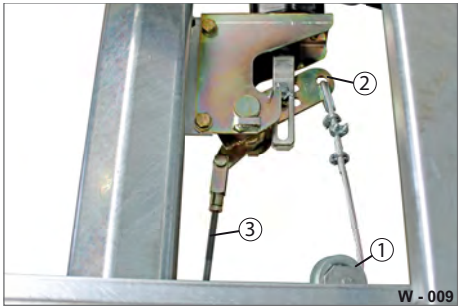


Fig. 12 Transfer mechanism

1 Guide pulley
2 Lever
3 Transfer rod

- ▶ Actuate the spindle parking brake several times and clean the lubrication points and the lubrication nipple carefully (Fig. 11/1) with a clean, dry cloth.
- ▶ Check the stroke linkage (Fig. 10/1), guide pulley (Fig. 10/2) and transfer cable (Fig. 10/3) for damage/ deformation/cracks.
- ▶ Lubricate the guide pulley (Fig. 10/2).
- ▶ Grease the spindle parking brake using a grease gun on the lubrication nipple.
- ▶ Actuate the spindle parking brake several times.

  This distributes the grease.
- ▶ Remove excess grease if necessary - environmental pollution!

Setting the mechanical components

Maintenance/repair work on the brake systems must be done only be qualified specialists.

- ▶ Check the transfer mechanism for perfect function.
- ▶ If necessary, readjust it.
- ▶ Lubricate the guide pulley (Fig. 12/1) as well as friction and bearing points with grease.

Towing eye

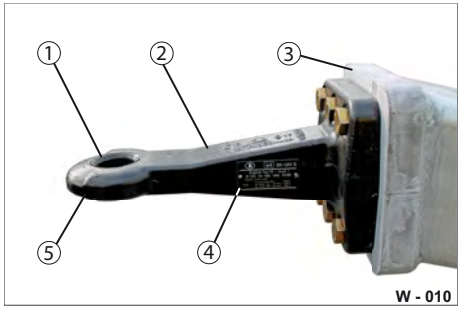


Fig. 13 Lubricate towing eye

1 Wear bushing
2 towing eye
3 Draw pipe
4 Manufacturer's nameplate/technical data
5 Rounded area of towing eye

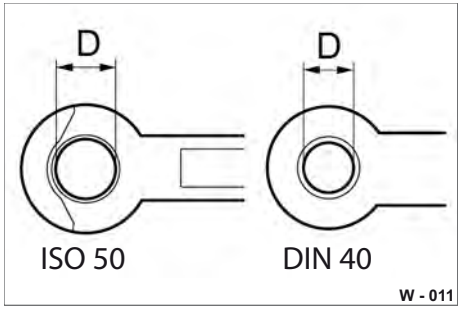


Fig. 14 Inner diameter of bushing

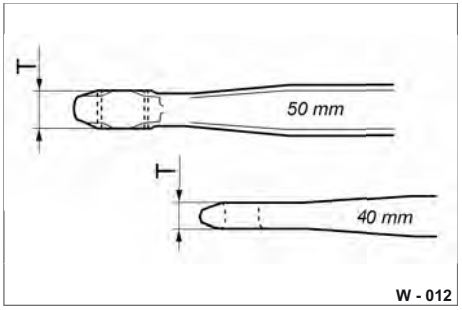


Fig. 15 Thickness of towing eye

Towing eye: Type	Diameter max. D (mm)	Thickness min. T (mm)
ISO 50	52	41.5
DIN 40	42	28

Tab. 4 Towing eye dimensions

- ▶ Clean the wear bushing (Fig. 13/1) and the towing eye (Fig. 13/2) with a clean, dry cloth.
- ▶ Check the diameter of the wear bushing:
  - with D=40 mm, max. + 1.5 mm
  - with D=50 mm, max. + 2.5 mm.
- ▶ When exceeding the maximum diameter values of:
  42 mm / 52 mm or 59.5 mm,
  the wear bushing must be replaced.

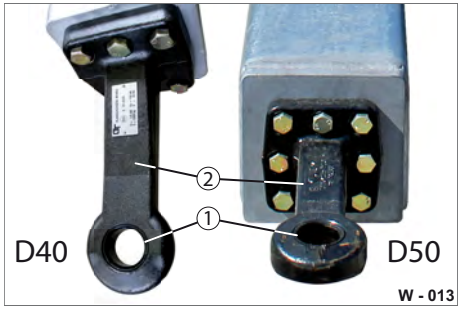


Fig. 16 Lubricating towing eyes/wear inspection

1 Wear bushing
2 towing eye

▶ Check the towing eye for damage.
▶ Lubricate the wear bushing (Fig. 16/1) and the rounded area of the towing eye (Fig. 16/2) with long-term high pressure lubricant.

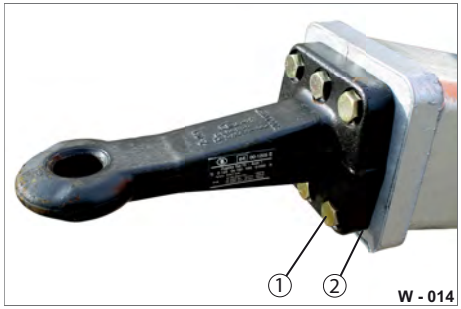


Fig. 17 Towing eye connection

1 Threaded bolt (M16)
2 Flange/contact surfaces

The towing eye-bolted connection must be re-tightened after approx. 2,000 km. The contact surface must not be treated!

Observe the information provided by the towing eye manufacturer.

▶ Re-tighten the threaded bolts (Fig. 17/1) in crosswise sequence.
▶ Observe the torque:
1. Acceleration with 50 Nm
2. Acceleration with 100 Nm
3. Acceleration with 390 Nm

Rotatable towing eye

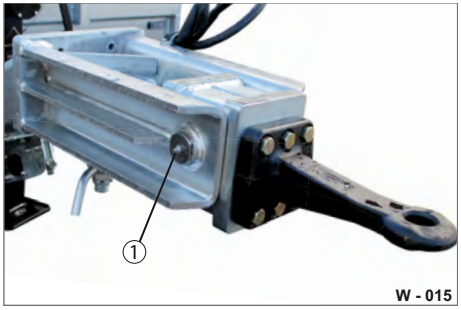


Fig. 18 Lubricating swivel axis

1 Lubrication nipple

▶ Lubricate the swivel axis on the lubrication nipple (Fig. 18/1) with a grease gun until lubricant escapes.
▶ Turn the towing eye around a few times.

This distributes the grease in the swivel axis.

▶ Clean the escaping/excess lubricant with a cloth.
▶ Close the lubrication nipple with the protective cap.

Ramps

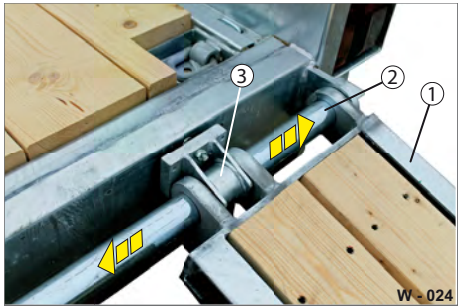


Fig. 19 Lubricating ramp bearing

1 Ramp
2 Cross frame
3 Bearing block

- ▶ Clean the cross frame/bearing points with a clean cloth. If necessary, remove impurities.
- ▶ Lubricate the cross frame/bearing points (Fig. 19/2) with machine grease.
- ▶ Move the ramps from side to side. Raise and lower the ramps.

  This distributes the grease.

Fasteners

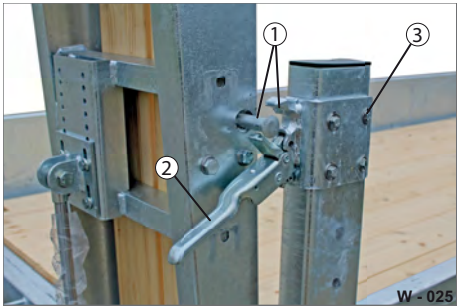


Fig. 20 Lubrication points

1 Lubrication/bearing points
2 Lock
3 Screw connection

Perfect functioning of the securing latches can only be guaranteed if the bearing points are regularly cleaned and regreased.

- ▶ After every use of the platform latches, check that the bearing and locking points are clean (without foreign objects such as blades of grass, sand, etc.).
- ▶ Clean them with a hand broom or cloth before locking the ramps.
- ▶ Unfasten the lock (Fig. 20/2) of the respective ramp.
- ▶ Carefully fold down the ramp.
- ▶ Clean the lubrication/bearing points (Fig. 20/1) with a clean, dry cloth.
- ▶ Lubricate lubrication/bearing points.
- ▶ Fold up the ramp and fasten it with the latch.
- ▶ Check that the screw connections are secure (Fig. 20/3).
  If applicable, re-tighten them.

Suspended lifting gear

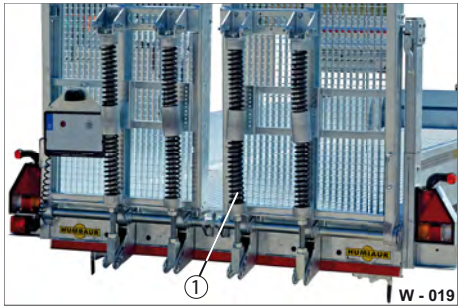


Fig. 21 Suspended lifting gear for ramps

1 Springs

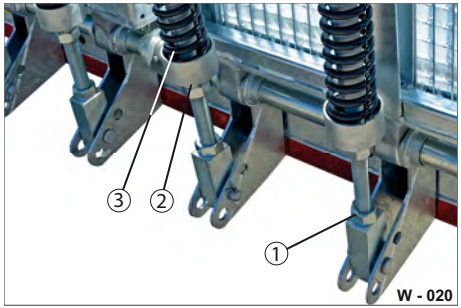


Fig. 22 Spring, factory setting

1 Adjusting screw
2 Lock nut
3 Spring

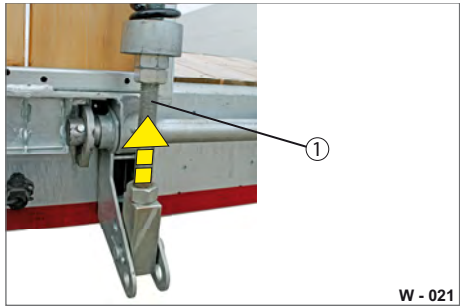


Fig. 23 Spring, tightened

1 Adjusting screw

The springs sit up to 50 mm in a new trailer.

The springs were set tighter at the factory.
The ramps should be folded down for about 24 hours in a new vehicle.

The spring tensioning force will decrease over time.

Tightening springs

- ▶ Tighten both springs if the tensioning force subsides.
- ▶ Release the lock nuts (SW 56) (Fig. 22/2).
- ▶ Screw the adjusting screw (Fig. 22/1) anti-clockwise.

  The spring is tightened.
- ▶ Tighten the lock nut.
- ▶ Let down the ramps and check that enough tensioning force is created for lifting or releasing.
- ▶ Adjust the springs if the tensioning force is insufficient or too high.
- ▶ Have the springs replaced after about 3 years or if the tensioning force is too weak.

Gas pressure springs

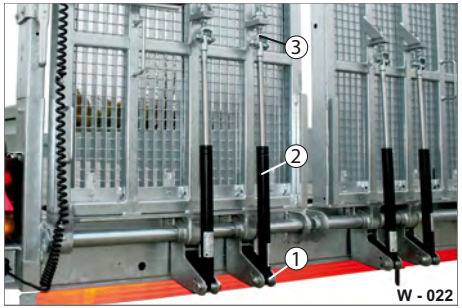


Fig. 24 Gas pressure springs for ramps

1 Lower bearing console
2 Gas pressure spring
3 Upper bearing console

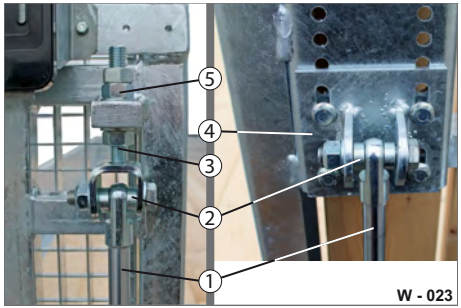


Fig. 25 Readjusting gas pressure spring

1 Pistons
2 Pin/bearing
3 Adjusting screw
4 Fixing console
5 Lock nut

The gas pressure springs are set with the correct preload force at the factory.

The preload force will decrease over time.

It can be readjusted using the upper adjustment console.

Tightening gas pressure springs

- ▶ Adjust the preload force of the gas pressure springs corresponding to the gas pressure spring mounting.
- ▶ Release the lock nuts (Fig. 25/5) / fixing console (Fig. 25/4).
- ▶ Screw the adjusting screw (Fig. 25/3) accordingly or adjust the fixing console.

  The gas pressure spring is pre-tensioned.
- ▶ Tighten the lock nut/fixing console.
- ▶ Check the gas pressure spring setting.
- ▶ Let down the ramps and check that enough tensioning force is created for lifting or releasing.
- ▶ Have the gas pressure springs replaced after about 3 years or if the tensioning force is too weak.

Tyre types

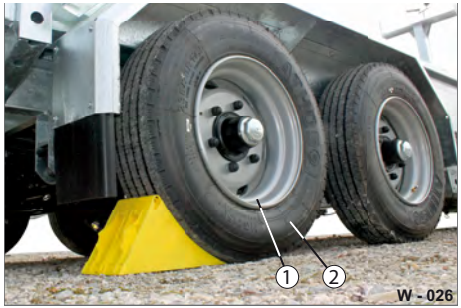


Fig. 26 Tyre - wheel combination

1 Steel rims
2 Tyres

				Tyre pressure in bar (psi) / maximum pressure (kg)										
Type	Load bearing capacity (index)	Tyre equipment		3.00 (44)	3.25 (47)	3.50 (51)	3.75 (54)	4.00 (58)	4.25 (62)	4.50 (65)				
215 R 14 C	112	Single		1620	1725	1830	1935	2040	2140	2240				
				Tyre pressure in bar (psi) / maximum pressure (kg)										
				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)
215/75 R17.5	135	Single		3520	3630	3730	3840	3940	4050	4150	4260	4360		
235/75 R17.5	143	Single			4430	4460	4580	4710	4840	4960	5080	5200	5330	5450

Tab. 5 Tyre pressure/max. load

Tyre pressure/tread

Tyre fitting should only be carried out by trained technical personnel.

⚠ WARNING

Driving with degraded tread /incorrect tyre pressure

The tyres can burst during the journey - risk of accident!

- ▶ Do regular tyre checks.
- ▶ Check the tyre pressure, profile and overall condition of the tyres.

NOTICE

Driving with incorrect tyre pressure

The tyres wear excessively.

- ▶ Check that the tyres have the correct pressure before departing or at least every 14 days.
- ▶ Regularly check the tyre pressure (see page **178**) on all the wheels. Tyre pressures should be checked when the tyres are cold (before starting journey or after lengthy break from driving).
- ▶ See the tyre type table (starting from page **177**) for the tyre equipment of the trailer to find the correct tyre pressure. If the tyre type used is not listed, please contact the tyre manufacturer directly.
- ▶ Inflate the spare wheel to highest tyre pressure used on the trailer.
- ▶ Check the tyre tread in the middle area of the tyre (a minimum of 1.6 mm is stipulated in Germany).
- ▶ Visually inspect the entire tyre. Note crack formations and foreign objects. Recommendation: The tyres should be changed after every 6 years of use.

Wheel nuts

⚠ WARNING

Wheel nuts loosen

Wheels can falls off during the journey - risk of accident!

Wheel nuts that are tightened to an excessive torque can break and result in loss of a wheel.

- ▶ Check that the wheel nuts are secure on a regular basis.
- ▶ Re-tighten the wheel nuts: after the first hour of service (50 km), after the first trip with a load (max. 500 km) and after the first 5,000 km, then after every 100 hours of service.
- ▶ When using new or freshly painted rims, always additionally re-tighten wheel nuts after 20 to 100 hours of service.
- ▶ Tighten the wheel nuts in opposite pairs.
- ▶ Note the required tightening torques of the axle manufacturer (see page **167**).

Wheel changing

DANGER

Carelessness on the road

You can hinder the flow of traffic when changing tyres - risk of accident!

Moving vehicles could hit you!

- ▶ Secure the location on the road.
- ▶ Erect a warning triangle.
- ▶ Use  .
- ▶ Use  ,  .

WARNING

Unsecured wheels

Unsecured wheels can roll away - risk of accident!

This can result in injury.

- ▶ Secure the removed wheels from rolling away.
- ▶ Also make sure that traffic is not blocked.

WARNING

Unsecured trailer

The trailer can start moving and tip over - danger of accidents!

Persons can be hit or run over. The trailer can slip off the lifting device and fall - risk of crushing!

- ▶ Use wheel chocks before coupling to prevent the trailer from rolling.
- ▶ Only use approved lifting device when working on the trailer.
- ▶ Check that the trailer is on flat and level ground before changing the wheel.

CAUTION

Hot brakes

You can burn yourself on hot brake disks/drum brakes when changing a wheel.

- ▶ Let the brakes cool off before changing the wheel.

Tyres/wheels:

When performing a wheel change always observe:

Fig. 27 Tyres/wheels:

1 Technical specifications

- Only use the prescribed rims and tyre sizes.
- Observe the prescribed tyre carrying capacity and speed index.
- Observe the direction of rotation of the wheels
- Dual tyre pairs should have the same tread.
- Check tyre pressure after changing the tyre.
- Replace damaged wheel bolts
- Tighten wheel nuts
  (see page **167** & **178**)

Securing trailer

Fig. 28 Secure the vehicle

1 Wheel chocks

▶ Apply the towing vehicle parking brake.

▶ Engage the trailer service brake.

▶ Also use wheel chocks to secure the trailer and prevent it from rolling off (Fig. 28/1).

Putting lifting device into position

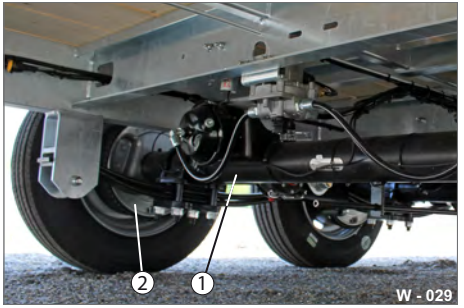


Fig. 29 Putting lifting device into position

1 Axle tube, area for lifting device
2 Tyre

▶ Set the lifting device on firm ground or use a firm support.

▶ Position the lifting device as far outside as possible, in the lifting device area (Fig. 29/2) under the axle tube (Fig. 29/1).

▶ You can find the exact lifting point in the operating/maintenance instructions of the respective axle unit manufacturer.

Replacing a defective wheel

- ▶ Obtain help from another person - wheels are heavy!
- ▶ Remove spare wheel- see from page **95**.
- ▶ Get the spare wheel.
- ▶ Unscrew the nuts of the defective wheel.
- ▶ Carefully pull the wheel off the axle.
- ▶ Carefully set the spare wheel on the axle - do not damage the wheel bolts - and screw them by hand with the same nuts.
- ▶ Screw the nuts on with a torque wrench, in a crosswise sequence if possible.
  - Observe the stipulated tightening torque.
- ▶ Carefully set down the trailer.
- ▶ Carefully stow the defective wheel in the spare wheel cage.
- ▶ Carefully stow away any tools/lifting equipment used.

Spare wheel storage

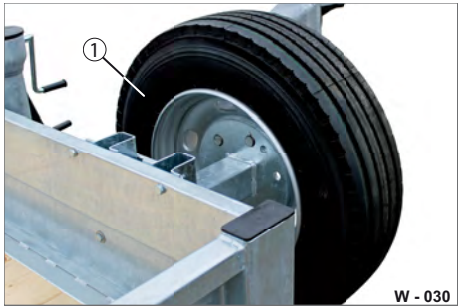


Fig. 30 Spare wheel in the basket

1 Spare wheel

Adhere to the following regulations, safety rules and principles when maintaining and checking spare wheel holders:

- Road traffic regulations (StVO in Germany)
- Accident prevention regulations - vehicles (BGV 12)
- Technical: Principles for the testing of vehicles by driving personnel (BGG 915) and (ZH 1/282.1).

Cleaning alloy wheels

Lubricants for the hubs

Aluminium disc wheels are only approved for hub centring.

Approved lubricant

- "Freylube“
- "Rocol MG“
- "Esso (Moly)“

These lubricants prevent the wheel and hub from sticking together. The surfaces of the hub and wheel must be smooth, flat and clean.

No conical or spherical nuts may be used.

Only fit the supplied valves or those with nickel or chrome plating.

- ▶ Only lubricate the hubs with the approved lubricants when changing a wheel.

Checking fixings, lines, cable clips

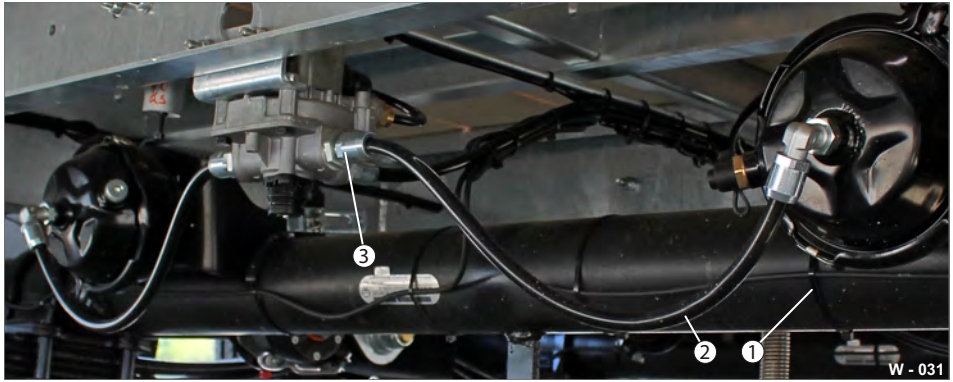


Fig. 31 Electrical and pneumatic connections/lines

1 Cable clip
2 Lines
3 Screw fittings

- ▶ Thoroughly clean the dirty trailer.
- ▶ Remove rust from all fixings.
- ▶ Check the plug connections of the electrical connections.
- ▶ Replace damaged/ripped lines (Fig. 31/2) and cable clips (Fig. 31/1).
- ▶ Replace defective screw fittings (Fig. 31/3).

Brakes are safety-critical components!

- Adhere to the road traffic licensing regulations (StVZO in Germany).
- Main inspections must only be conducted by accredited workshops.
- Have the brake system checked and serviced regularly.
- Work on the brake system may only be carried out by qualified specialists with the appropriate levels of knowledge and experience.
- Any faults found in the braking system must be repaired immediately by a brake service workshop.
- The settings made in the factory to the brake valves must not be modified.
- When replacing brake linings use only approved brake linings.

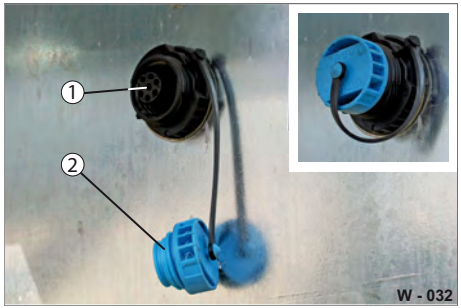


Fig. 32 Diagnose for EBS/ABS brakes

1 Plug connection
2 Cap, threaded

Fig. 33 “WABCO” brake nameplate

The brake system is set at the factory via the diagnosis connection.

Changes to the settings may only be carried out by qualified personnel.

The technical specs are set out on the brake nameplate (Fig. 33) of the brake manufacturer.

Wheel brake

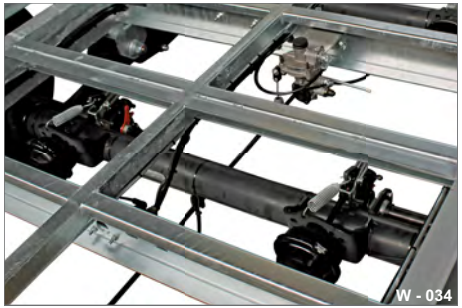


Fig. 34 Brake system

The maintenance and repair work to be done on wheel brakes is described in the manufacturer's documentation for the relevant axle.

When changing the brake linings use only the same brake linings as fitted originally or those approved "Brake Linings" listed in the constructional description.

Using any other brake linings will invalidate the operating permit.

Warranty claims against the brake or trailer manufacturer will also be void.

Compressed air system

⚠ WARNING

Condensate in the compressed air system

The brake system can be destroyed or fall out.

▶ Regularly drain the compressed air system.

⚠ CAUTION

Escaping pressurised air

Actuating the drain valve causes a lot of noise.

This can cause tinnitus and hearing damage.

▶ Use  .

With automatic water drain valves, manual water draining/bleeding is not required.

The maintenance work described below must be performed conscientiously by the driver before each journey.

Compressed air tank

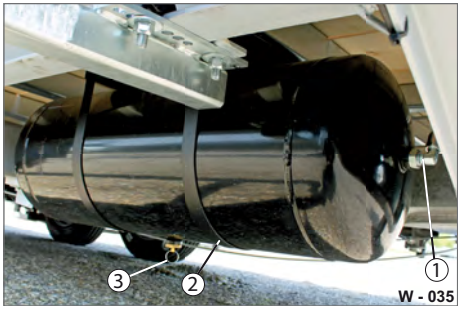


Fig. 35 Chassis underside

1 Screw fittings, hose/pipes
2 Holders
3 Operating pin

On trailers fitted with manual drainage valves, the tanks must be regularly drained and leaking drainage valves must be replaced (see **89**).

▶ Check that the screw fittings (Fig. 35/1) are secure.

▶ Tighten non-tight screw fittings or replace them.

▶ Replace damaged hoses and pipes (Fig. 35/1).

Cleaning coupling heads

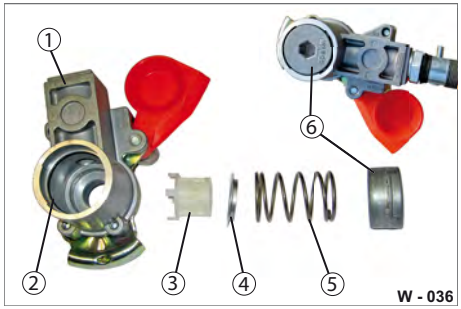


Fig. 36 Coupling head disassembled

1 Housing
2 Seal
3 Filter
4 Metal ring
5 Spring
6 Lid

The coupling heads for "supply, brake" with filter insert must be regularly cleaned (see **165**).

Disassembling

- ▶ Press in the cover (Fig. 36/6) with a hexagon socket up to the limit position in the housing (Fig. 36/1). Turn the hexagon socket key by 90°.
  The cover opens.
- ▶ Remove the spring (Fig. 36/5), the metal ring (Fig. 36/4) and the filter (Fig. 36/3) from the housing.
- ▶ Clean the housing with a clean, dry cloth.
- ▶ Clean the filter.
  Replace the filter in the event of major contamination or damage.
- ▶ Check if the seal (Fig. 36/2) is present or damaged.
  Replace damaged seals.
- ▶ Lubricate the seal with a bit of grease.

Assembly

- ▶ Insert the metal ring into the spring with the edge downwards.
- ▶ Place the filter into the spring with the filter body downwards.
- ▶ Plug the spring into the housing.
- ▶ Press the cover downwards with a hexagon socket until the limit position. Turn the hexagon socket key by 90°.
  The coupling head is ready for use.

Cleaning air filter

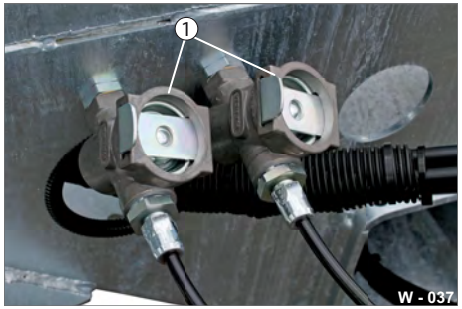


Fig. 37 Line filter for compressed air system

1 Line filter

The line for the compressed air system must be cleaned every 5,000 km or every 3 months.

⚠ CAUTION

Opening the cover

The cover is pre-tensioned with a spring and can fly upwards - risk of striking!

▶ Open the cover carefully.

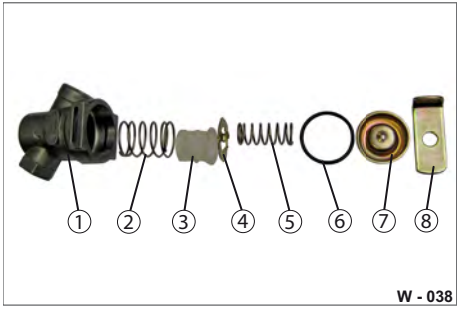


Fig. 38 Line filter disassembled

1 Filter housing
2 Large spring
3 Filter
4 Intermediate plate
5 Small spring
6 Seal
7 Lid
8 Angle

Disassembling

▶ Press the cover (Fig. 38/8) downwards with a screwdriver and pull out the bracket (Fig. 38/9).

▶ Remove both springs (Fig. 38/3 & Fig. 38/6), the seal (Fig. 38/7), the intermediate plate (Fig. 38/5) and the filter (Fig. 38/4).

▶ Clean the filter housing (Fig. 38/2) with a clean, dry cloth.

▶ Clean the filter (Fig. 38/4).
Replace the filter in the event of major contamination or damage.

▶ Check if the seal (Fig. 38/7) is present or damaged.
Replace damaged seals.

▶ Lubricate the seal with a bit of grease.

Assembly

- ▶ Insert the intermediate plate into the filter housing with the latches pointing upwards.
- ▶ Set the small springs (Fig. 38/6) on the latches of the intermediate plate.
- ▶ Set the cover (Fig. 38/8) on top.
- ▶ Press the cover into the filter housing and slide the bracket through the perforations in the filter housing.

Cleaning the Duo-Matic coupling

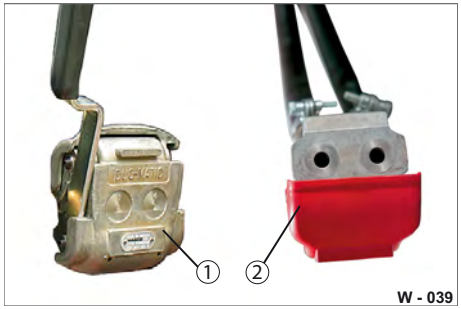


Fig. 39 Coupling head disassembled

1 Coupling (socket)
2 Coupling head (plug)

The Duo-Matic coupling for "supply, brake" must be regularly cleaned (see **165**).

- ▶ Clean the sealing surfaces of the coupling head (Fig. 39/2) and the coupling socket (Fig. 39/1) with a clean, dry cloth.
- ▶ Replace the coupling head if damaged.

Operating emergency trigger device

In the event of a pressure failure, the pre-tensioned spring is released and this initiates automatic braking.

For repair purposes, the spring-loaded diaphragm cylinders can be released manually (emergency release device).

⚠ CAUTION

Pre-tensioned spring under pressure

When opening the spring-loaded diaphragm cylinder, the pre-tensioned spring can be ejected - risk of striking!

- ▶ Only allow repairs to the spring-loaded diaphragm cylinder to be carried out by Humbaur GmbH or an approved workshop.

⚠ WARNING

Unbraked trailer

When the emergency release device is activated, the trailer brake system is put out of operation.

The towing vehicle brakes are insufficient for stopping the vehicle train.

- ▶ Drive the loaded trailer no faster than walking speed (4 km/h).

⚠ WARNING

Activated emergency release device

When the emergency release device is activated, the trailer brake system is put out of operation.

Persons can be hit or run over by the trailer.

- ▶ Use wheel chocks to prevent the trailer from rolling.
- ▶ Only actuate the emergency release system on even ground.

Emergency release device (variant 1)

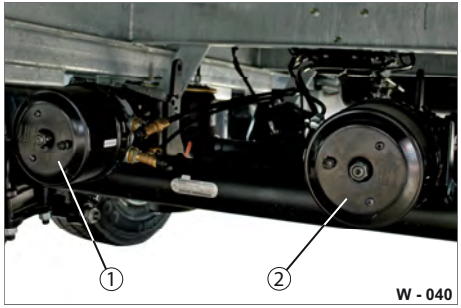


Fig. 40 Chassis underframe/rear axle

1 Spring-loaded diaphragm cylinder
2 Release screw

When the pressure in the system falls below 5.2 bar, you can manually release the parking brake individually for each wheel.

The release bolt (Fig. 40/2) is firmly integrated in the diaphragm cylinder.

A suitable tool for operating the emergency release device (Fig. 40/2) must be carried in the toolbox in the towing vehicle.

Releasing the parking brake

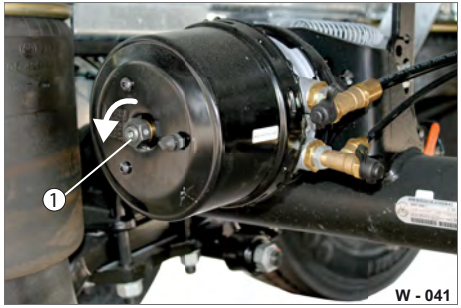


Fig. 41 Releasing parking brake

1 Release screw

▶ Unscrew the release bolt (Fig. 41/1).
The release bolt unscrews itself - the spring is tightened.

▶ Release the parking brake, see spring-loaded diaphragm cylinder.

Deactivating the emergency release function

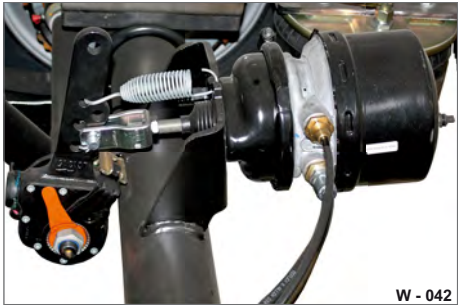


Fig. 42 Releasing spring tension

Before restoring pressure to the brake system (before departing), you must release the spring-loaded cylinders.

▶ Screw on the release bolt (Fig. 41/1).
The release bolt screws itself in - the spring is relaxed.

▶ Deactivate the emergency release function for all spring-loaded diaphragm cylinders.
The trailer can be braked with the spring-loaded parking brake.

Emergency release device (variant 2)

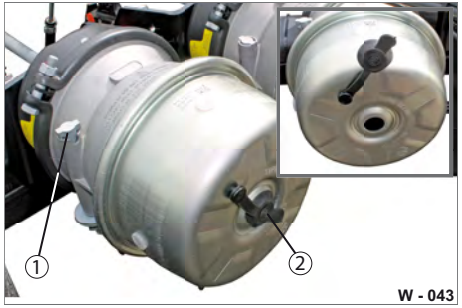


Fig. 43 Spring-loaded diaphragm cylinder

1 Release screw
2 End cap (bore hole)

When the trailer is ready to be driven, the release screw (Fig. 43/1) must be fixed in place in a location provided for the purpose.

The end cap (Fig. 43/2) covers the bore hole in the cover of the spring accumulator diaphragm cylinder.

Releasing the parking brake

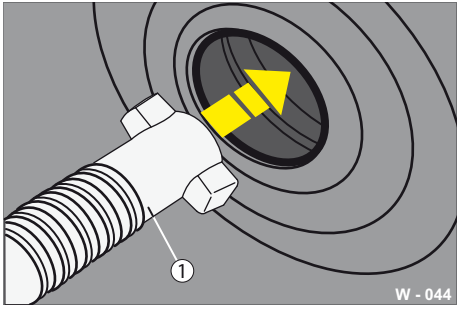


Fig. 44 "Keyhole“ bore hole

1 Release screw

▶ Insert the release screw (Fig. 44/1) through the bore hole in the cover at the back into the "keyhole" aperture.
▶ Turn the release screw 90°.
▶ Slide on the washer (Fig. 45/1).
▶ Screw the hexagon nut (Fig. 45/2) onto the release bolt (Fig. 45/3).
▶ Continue to turn this so that the release screw is drawn out.

Deactivating the emergency release function

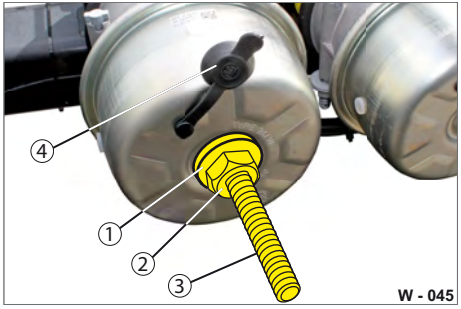


Fig. 45 Releasing spring tension

1 Washer
2 Hexagonal nut
3 Release screw
4 End cap

▶ Unscrew the hexagonal nut (Fig. 45/2).
▶ Remove the washer (Fig. 45/1).
▶ Turn the release screw (Fig. 45/3) 90° and remove it.
▶ Fix the release bolt to the diaphragm cylinder in the location provided (see Fig. 43).
▶ Close the bore hole with the end cap (Fig. 43/2).

⚠ CAUTION

Short circuit in the electrical system

People may suffer burns.

Short circuits could set the trailer on fire.

Before working on the electrical system always:

- ▶ Disconnect all connectors to the towing vehicle.
- ▶  Unplug all connectors to external power supplies.
- ▶ Switch all consumers off.
- ▶ Disconnect the negative terminal (-) on the battery.
  Use insulated tools.
- ▶ Only allow qualified specialists to do work on electrical systems.

NOTICE

Contamination during installation

Electrical elements, lights can become contaminated during installation when touched with bare fingers or a dirty work environment.

Contacts can malfunction.

- ▶ Only do electrical work in protected areas - protect equipment from water.
- ▶  Do not touch the new lamp with your bare fingers - this significantly reduces the lifetime of the lamp.
- ▶ Use clean gloves or a clean, dry cloth when handling lamps/lights, or use the lamp packaging.

Lighting terminal diagram

⚠ WARNING

Insufficient lighting

Increased risk of accident due to failure of vehicle lighting.

- ▶ Before setting off, check the:
  1. Tail lights
  2. License/number plate lights
  3. Side marker lights
  4. Clearance lights
- ▶ Replace faulty lights.
  Use lights of the type and power listed in the tables below.

Lights

Function	DIN / desc.	Cap type	Power output (W)
Side marker lights/rear reflector light (orange)		LED	12 V = 0.5 / 24 V = 1.1
Clearance light (white)		LED	12 V = 0.6 / 24 V = 1.3
Rear lights "24 V - standard"			
Indicator	P21W	Ba15s	21
Brake light	P21W	Ba15s	21
2 x tail lights	R10W	Ba15s	10
Reversing light	P21W	Ba15s	21
Rear fog light	P21W	Ba15s	21
Tail light	R10W	Ba15s	10
Peripheral light/outline marker (red/white/yellow)	R5W	Ba9s	5
Rear lights "LED"			
Fog and reversing light		LED	
Tail lights with reflectors, brake light and indicator		LED	
Peripheral/outline marker		LED	12 V = 0.6 / 24 V = 1.2
"LED" **licence plate light**	W 52	LED	12 V = 0.4 / 24 V = 0.7
"Standard" **licence plate light**	Festoon lighting		5

Tab. 6 Lamp type

Replacing lights

Tail light

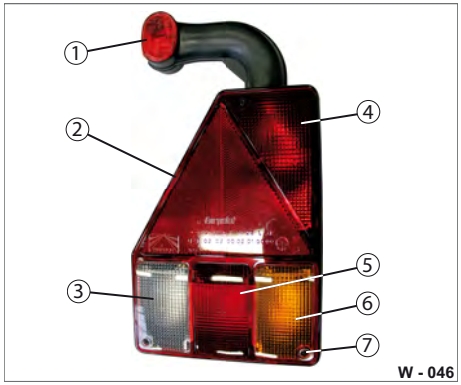


Fig. 46 Tail light components

1 Clearance / peripheral light
2 Outer lens
3 Fog light
4 Brake light
5 Tail lights
6 Indicator
7 3x fixing screws

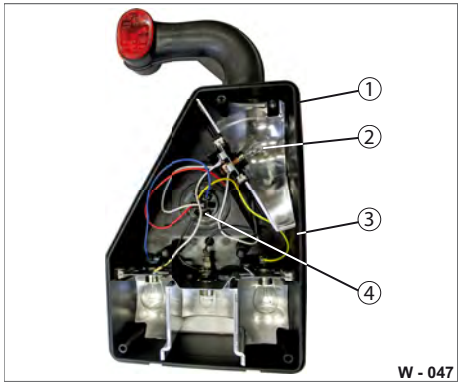


Fig. 47 Tail light open

1 Seal
2 Lamp
3 Housing
4 Cable connections / contacts

The electrical system must be switched off before beginning work.

- ▶ Unscrew the 3 fixing screws (Fig. 46/7).
- ▶ Remove the outer light lens (Fig. 46/2).
  Remove them carefully.
- ▶ If necessary, clean the housing interior of dirt.
- ▶ Clean the contacts.
- ▶ Unscrew the defective lamp.
- ▶ Screw in the new lamp.
- ▶ Check that the lamp is secure.
- ▶ Check the contacts/cable connections (Fig. 47/4).
- ▶ Set the outer light lens close to the housing (Fig. 47/3).
- ▶ Ensure that the seal is correctly seated (Fig. 47/1).
  Replace damaged/ripped seals.
- ▶ Screw on the fixing screws (Fig. 46/7). Tighten the screw connections with max. 1.5 Nm tightening torque. Cracked light lenses must be replaced.

Peripheral light

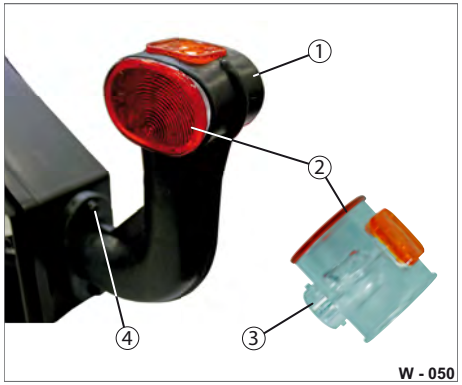


Fig. 48 Removing the rubber arm

1 Rubber arm covering
2 Lamp
3 Screw fitting
4 2x fixing screws

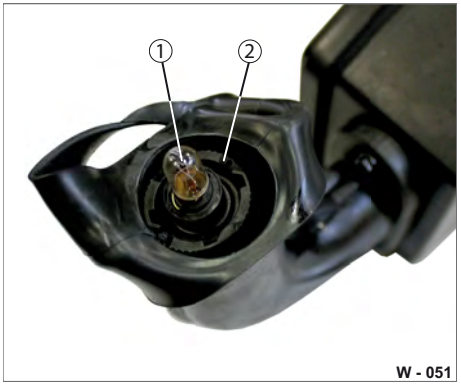


Fig. 49 Replacing the lamp

1 Lamp
2 Socket

Fig. 50 Turning up rubber arm

1 Rubber arm
2 Cable connection / contacts

- ▶ Spray plenty of silicon spray on the rubber arm covering (Fig. 48/1) - this makes turning up and down easier.
- ▶ Remove the rubber arm covering from the light body (Fig. 48/2) using a slotted screwdriver.
- ▶ Release the screw fittings (Fig. 48/3) and remove the light body.
- ▶ Unscrew the defective lamp (Fig. 49/1).
- ▶ Screw in the new lamp.
- ▶ Screw on the lamp (Fig. 48/1) with the screw fitting (Fig. 48/3). Ensure that the seal is fitted correctly.
- ▶ Put the rubber arm over the light body.
- ▶ Check the peripheral light for damage.
- ▶ If necessary, completely replace a damaged rubber arm.
- ▶ Unscrew the peripheral light and release the cable connection.
- ▶ Mount a new peripheral light and connect the cables properly.

Tail light (optional)

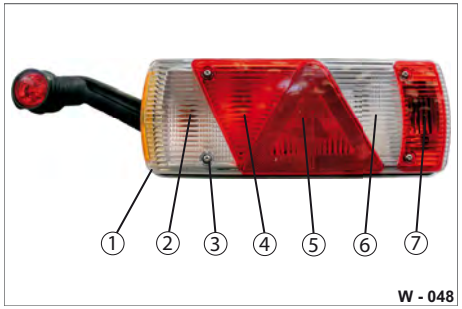


Fig. 51 Tail light components

1 Outer lens
2 Rear fog light
3 4x fixing screws
4 Reversing light
5 Tail light with reflector
6 Brake light
7 Indicator

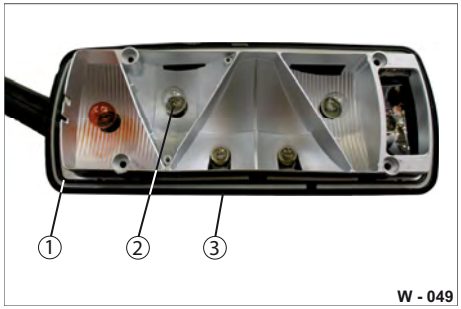


Fig. 52 Tail light open

1 Seal
2 Lamp
3 Housing

The electrical system must be switched off before beginning work.

- ▶ Unscrew the 4 fixing screws (Fig. 51/3).
- ▶ Remove the outer light lens (Fig. 51/1).
  Remove them carefully.
- ▶ If necessary, clean the housing interior of dirt.
- ▶ Clean the contacts.
- ▶ Unscrew the defective lamp.
- ▶ Screw in the new lamp.
- ▶ Check that the lamp is secure.
- ▶ Set the outer light lens close to the housing (Fig. 52/3).
- ▶ Ensure that the seal is correctly seated (Fig. 52/1).
  Replace damaged/ripped seals.
- ▶ Screw on the fixing screws (Fig. 51/3). Tighten the screw connections with max. 1.5 Nm tightening torque. Cracked light lenses must be replaced.
- ▶ Monitor the connections/cable connections.

Peripheral light

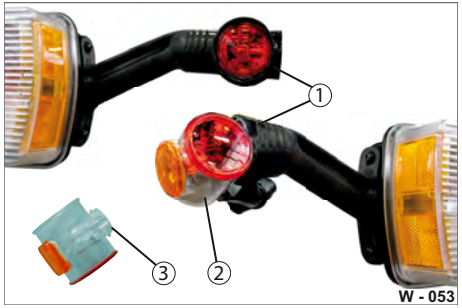


Fig. 53 Removing the rubber arm

1 Rubber arm covering
2 Lamp
3 Screw fitting

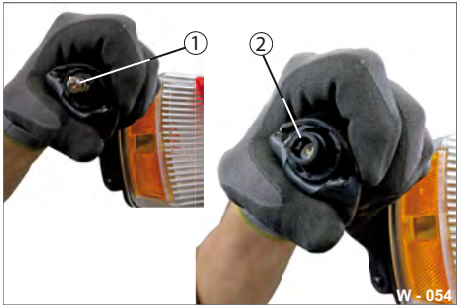


Fig. 54 Replacing the lamp

1 Lamp
2 Socket

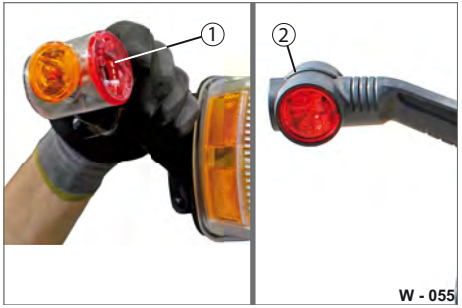


Fig. 55 Turning up rubber arm

1 Lamp
2 Rubber arm covering

▶ Spray plenty of silicon spray on the rubber arm covering (Fig. 53/1) - this makes turning up and down easier.

▶ Remove the rubber arm covering (Fig. 53/1) from the light body (Fig. 53/2) using a slotted screwdriver.

▶ Release the screw fitting (Fig. 53/3) and remove the light body (Fig. 53/2).

▶ Unscrew the defective lamp (Fig. 54/1).

▶ Screw in the new lamp.

▶ Screw on the lamp (Fig. 55/1) with the screw fitting (Fig. 53/3).
Ensure that the seal is fitted correctly.

▶ Put the rubber arm (Fig. 55/2) over the light body.

▶ Check the peripheral light for damage.
Damaged peripheral lights must be replaced completely.

"LED" rear light

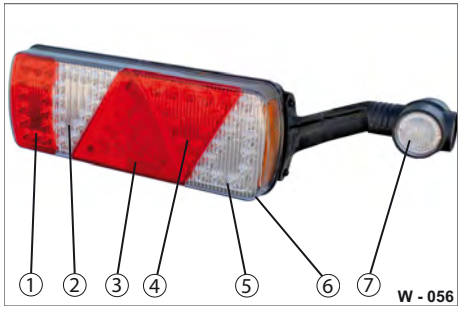


Fig. 56 "LED" 24 V rear lighting

1 Indicator
2 Brake light
3 Tail light with reflector
4 Reversing light
5 Rear fog light
6 Outer lens
7 Nozzle with peripheral light

The LED lamps must be completely replaced in the event of defects.

▶ Replace the rear lights only with original manufacturer parts. The type is marked on the lamps.

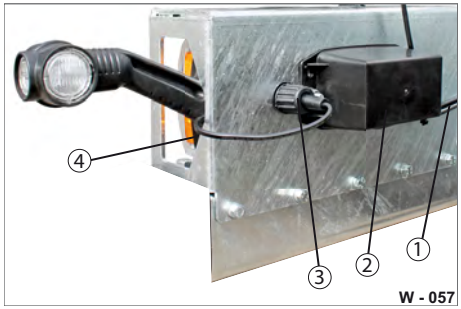


Fig. 57 Rear lighting, mounting

1 Connection cable
2 Junction box
3 Bolted connection, lamp
4 Bolted connection, nozzle

▶ Release the respective bolted connection (Fig. 57/ 3, 4).
▶ Disconnect the respective connection cable (Fig. 57/1).
▶ Insert the new LED lamps.
▶ Connect the connection cable.
▶ Screw in the bolted connection tightly.
▶ Check the LED lamp for function.

Licence plate light "Standard"

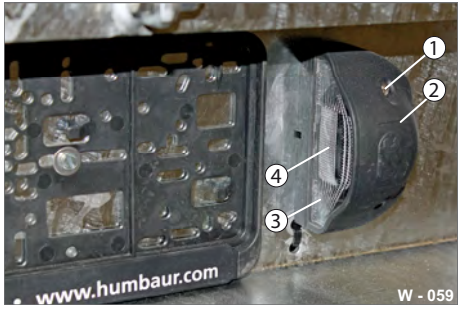


Fig. 58 Licence plate light 24 V

1 Fastening bolt
2 Lamps
3 Light lens
4 Light

- ▶ Release the fixing screws (Fig. 58/1).
- ▶ Open the lamp carefully (Fig. 58/2).
- ▶ Remove the light lens (Fig. 58/3).
- ▶ Replace the light (Fig. 58/4).
- ▶ Insert the light lens.
- ▶ Close the light body.
- ▶ Screw on the fixing screws.

Licence plate light-connection

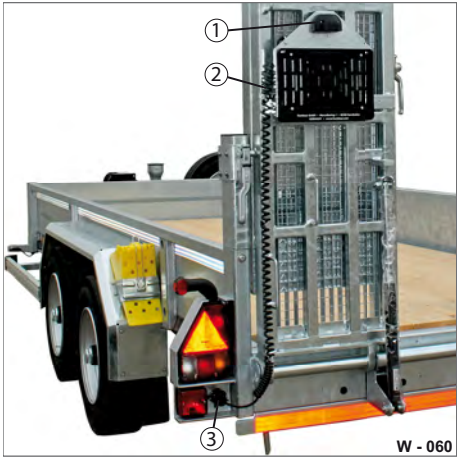


Fig. 59 Cable connection

1 Licence plate light
2 Spiral cable
3 Plug

- ▶ Release the plug (Fig. 59/3).
- ▶ Check the spiral cable (Fig. 59/2) for damage.

"LED" licence plate light“

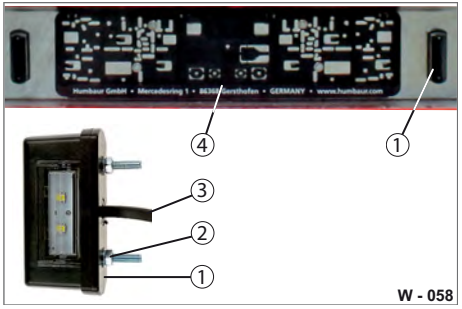


Fig. 60 Licence plate light

1 LED light
2 Fastening bolt / nut
3 Connection cable with connector
4 Licence plate holder

A defective LED light must be replaced completely.

- ▶ Loosen the bolted connections (Fig. 60/2).
- ▶ Loosen the connection cable with connector (Fig. 60/3).
- ▶ Replace the complete LED lamp (Fig. 60/1).
- ▶ Screw on the new LED lamp with fixing screws/nuts.
- ▶ Connect the connection cable.

Side marker lightn

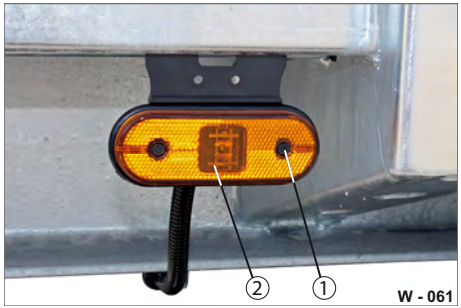


Fig. 61 Side marking light "LED"

1 Fastening bolt
2 LED lamp (orange)

A defective LED light must be replaced completely.

- ▶ Release the fixing screws (Fig. 61/1).
- ▶ Remove the LED light (Fig. 61/2) - remove connection.
- ▶ Insert the new LED light.
- ▶ Screw in the fastening bolts securely, but not too tightly.

Clearance lights

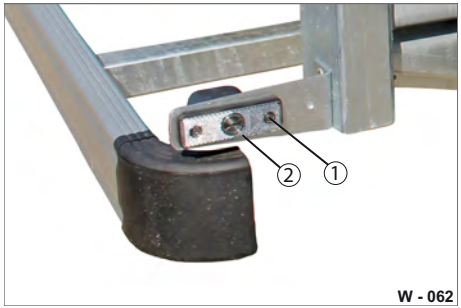


Fig. 62 Clearance lights, front side

1 Fastening bolt
2 LED light (white)

A defective LED light must be replaced completely.

- ▶ Release the fixing screws (Fig. 62/1).
- ▶ Remove the LED light (Fig. 62/2) - remove connection.
- ▶ Insert the new LED light.
- ▶ Screw in the fastening bolts securely, but not too tightly.

Working light

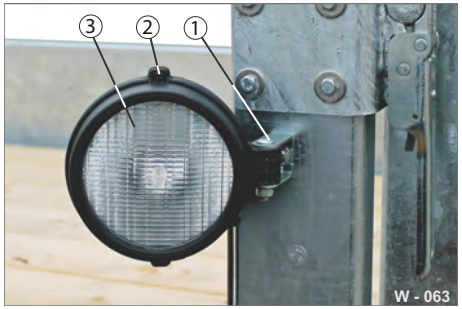


Fig. 63 Working light, from the front

1 Storage / screw fitting
2 Fastening bolt
3 Light lens

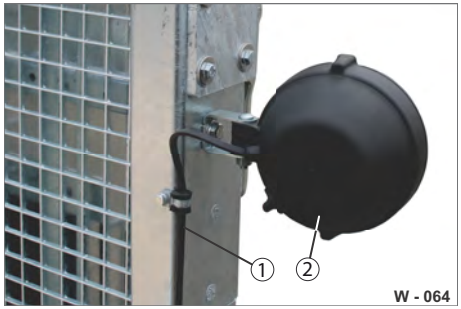


Fig. 64 Working light, from the rear

1 Connection cable
2 Housing

▶ Release the fixing screw (Fig. 63/2).
▶ Remove the light lens (Fig. 63/3).
▶ Replace a defective lamp.

▶ Insert the light lens - make sure the housing does not have any leaks (Fig. 64/2).
▶ Screw on the bolted connections .

Rotating light

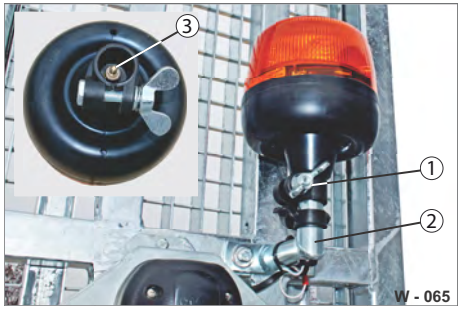


Fig. 65 Rotating light

1 Wing nut
2 Console
3 Contact

Fig. 66 Disassembling rotating light

1 Rubber cover
2 Contact

Fig. 67 Console sealed

1 Rubber cover

▶ Release the wing nut (Fig. 65/1).
▶ Carefully pull off the rotating light.
▶ Replace a rotating light.

▶ Insert a rotating light - make sure that the contact in the console is clean (Fig. 66/2).
▶ Screw the wing nut on tightly.

▶ Disassemble the rotating light if not in use.
▶ Attach the rubber cover (Fig. 67/1) on the console to protect against dampness/dirt.

Necessity

The lifetime and functionality of the trailer depends on how often and how intensively you clean your trailer and how the different materials, surfaces and components are cared for.

Cleaning, maintenance and care of your trailer are important elements of driving safety and conservation of warranty claims.

To prevent accidents and avoid personal injury and property damage, it is important to regularly clean and maintain the trailer.

The intervals of cleaning and care depend on the operational environment and degree of contamination.

⚠ WARNING

Cleaning/maintenance products can be toxic

There is a danger of injury and poisoning if the products are swallowed or come into contact with the skin.

- ▶ Read the instructions for use of the maintenance products.
- ▶ Reseal the containers securely after use.
- ▶ Use  ,  .
- ▶  after working with cleaning/ maintenance products.

⚠ CAUTION

Entering trailer/chassis when cleaning

There is a risk of slipping when cleaning the trailer with liquids (water, cleaning agents).

- ▶ Avoid entering the chassis if possible. If necessary, use stable climbing aids.
- ▶ Use  ,  .
- ▶ Never enter unsecured trailers.
- ▶ Do not walk under an unsecured chassis.

NOTICE

Use of aggressive cleaning agents

The surfaces/materials can attack with chemicals, salts, acids and bases.

- ▶ Use  .
- ▶  In the first 3 months, wash only using cold water and do not use high-pressure cleaners or steam cleaners.
- ▶ Wash using plenty of clean water (not over 60° C), in order to avoid scratching the paintwork.
- ▶ Do not use any aggressive cleaning agents, acids or alkalis.
- ▶ Use only weak acid to weak alkaline cleaning agents having a pH value of 6-10.
- ▶ Use only soft, clean cloths or brushes.
- ▶ Repair any paintwork damage immediately.
- ▶ Carefully remove any greasy areas using pure petroleum ether (not petrol).
- ▶ Do not expose brake and hydraulic hoses to petrol, benzene, petroleum or mineral oil.
  Use only water to remove any stubborn dirt.
- ▶ Do not apply sprays or grease to the brake and hydraulic hoses.
- ▶ Do not clean seals using mineral oils, petrol or solvents.
- ▶ In salty conditions (winter/marine climate), external cleaning must be carried out more frequently (approx. every 3-4 weeks).
  This also especially applies to the thorough cleaning of the brushed, bare stainless steel gantries.
- ▶ Do not let grease come into contact with seals.

Environmental protection regulations

DANGER for the environment

Cleaning agents, brake dust, hydraulic fluid and lubricants can get into the groundwater.

- ▶ Clean/care for your trailer only in suitable washing areas.
- ▶ Observe the local environmental safety regulations.

High-pressure cleaners

NOTICE

Cleaning with high-pressure cleaners

Components/surfaces which are sprayed directly with too much pressure at a short distance or with very hot water can be damaged.

▶ Do not point the jet directly at:

- Nameplate
- EBS/ABS system plate,
- Seals,
- Electrical components/distributor,
- Connectors,
- Cable bolted connections/cables,
- Braking or hydraulic hoses,
- Voltage transformer.

Proceed as follows when cleaning with high-pressure cleaner:

▶  Read the manufacturer's instructions.

▶ Lubricate all lubrication points until grease exudes before cleaning.

▶ Use  ,  ,  .

▶ During the cleaning process, always keep the water jet moving.

▶ Only use high-pressure cleaners with a maximum pressure of 50 bar and a maximum temperature of 80°C.

▶ Keep a minimum distance between the high-pressure nozzle and the item to be cleaned approx. 700 mm with round jets, and approx. 300 mm with 25° flat nozzles and dirt removers.

▶ Do not use round jet nozzles to clean tyres and curtains. A hard jet of water can damage the tyres or curtains.

Cleaning alloy wheels

▶ Wash the alloy wheels regularly, especially after uses such as:
- Transporting alkaline materials
- Driving in winter when roads have been treated with salt

Aluminium disc wheels do not require any particular maintenance apart from occasional polishing.

Trailer materials

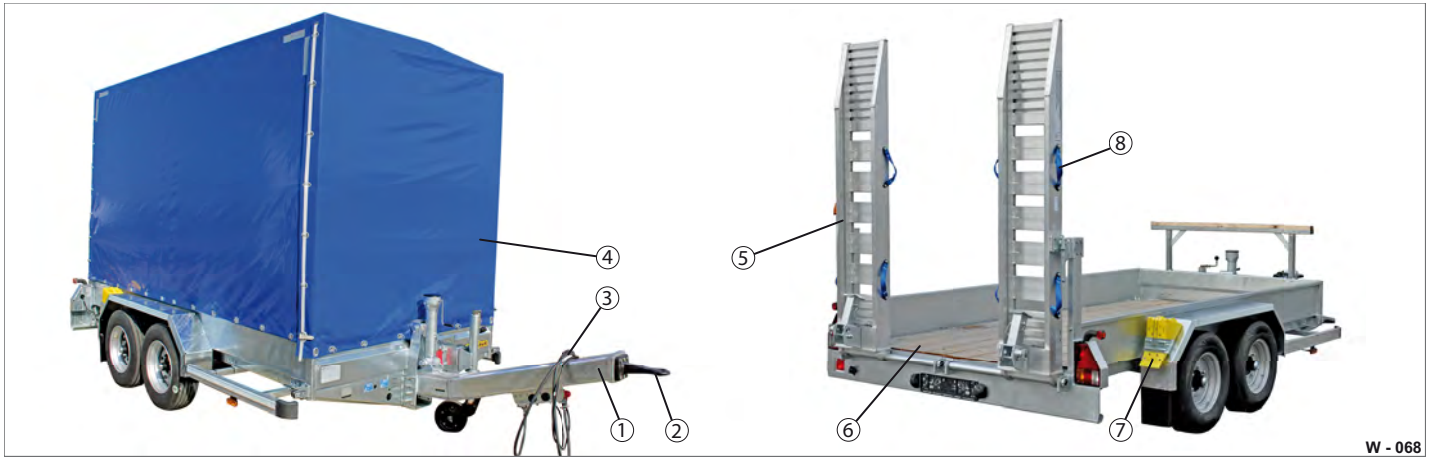


Fig. 68 Materials/surfaces

1 Steel, galvanised
2 Steel, painted/coated
3 Rubber (hoses)
4 PVC (curtain)
5 Aluminium, anodised
6 Wood planks
7 Plastic
8 Fabric

The trailers are made of different materials.

Observe the special instructions for caring for the materials/surfaces.

When cleaning the chassis with a high-pressure cleaner, sensitive components, e.g.: electrical/pneumatic lines, electronic components and brake components are to be protected from the direct spray!

Galvanised steel surfaces

Galvanised surfaces/components (e.g. chassis, drawbar, loading platform) must first oxidise in order to develop anti-rusting properties.
This can last a few months.
Anti-rusting properties are not achieved until the surface loses its glossy zinc surface.
White rust can develop on surfaces. Dampness/high humidity promotes/causes this, e.g. with road salt. White rust is not a shortcoming or damaged to the surface – the galvanising workshop cannot affect this and does not justify a warranty claim.

- ▶ Clean the galvanised components with clean water immediately after contact with aggressive substances.
- ▶ Let the surfaces dry well.

Treating white rust:

- ▶ Clean the affected places with lots of clean water and dry them thoroughly.
- ▶ Wipe away the white rust with a nylon brush.
- ▶ Apply zinc protection (zinc spray) on the affected areas.
- ▶ If necessary, seal the surface with wax.

Painted or powder-coated steel surfaces

Painted surfaces/components (e.g. towing eye) have a mild rust protection effect.
Painted surfaces/components which are directly exposed to braking dust, loose chipping, road salt, sand, etc. required special intensive care so that the painted surfaces maintain their appearance and are protected from rust in the long-term.

- ▶ Clean the painted surfaces after every exposure to the aggressive substances.
- ▶ Let the surfaces dry well.
- ▶ If necessary, seal the surfaces with wax.
- ▶ Paint damages (chips, scratches) on the surface should be repaired immediately by specialists.

Aluminium

Aluminium components/profiles with anodised coating are optimally protected from corrosion.
Anodised aluminium surfaces are hard and smooth and can be cleaned with mild cleaning agents.
In order to remove heavy contamination and maintain the aluminium shine, we recommend using aluminium and canvas cleaning agents.
Surface scratches are not a defect and do not lead to rust accumulation, since aluminium itself is resistant to corrosion.

- ▶ Clean the aluminium surfaces with water and neutral cleaning agents.
- ▶ Let the surfaces dry well.

PVC/synthetic fabric

Curtains made of synthetic fabric (PES) two PVC coating on both sides is a high-quality, easy-to-care-for material which is used universally for covering trailers.

- ▶ It is best to clean the curtains during damp weather (rain, fog) and mid-range temperatures (20 +/-5 °C). Do not clean the curtains when it is very hot (bright sunshine) or very cold (curtains can harden).
- ▶ Spray the curtains with plastic or canvas cleaning agents and let soak in.
- ▶ Use a soft brush on the curtains if they are very dirty.
- ▶ Hose the curtains down thoroughly, e.g. with high-pressure cleaner a water hose.
- ▶ Let the surfaces dry well.

Cleaning curtains with writing:

- ▶ Inscribed curtains (with writing, pictures) should be cleaned very carefully. Depending on the writing/ colours, the cleaning process should first be tried out on a small area.
- ▶ Do not use high-pressure cleaners/ steam-jet devices.
- ▶ Ensure that the writing does not come off.

Pay special attention to:

Curtains which are exposed to weather conditions, e.g. bright sunshine, for a long period of time can fade or get spots.
Condensate can form under tightly closed curtains due to temperature difference, causing mould to form.

- ▶ Ensure there is good circulation in the trailer body during long periods of non-use.

Wooden components

Wood floors/loading platforms consist of robust, waterproof-glued laminated wood panels and are sealed with an anti-slip phenolic resin coating.
Wood is an organic material and reacts strongly to water logging, UV light, major dehydration, overloading and selective loading.
Wood is subject to weather-related expansion and shrinkage, which can lead to tension and stress cracks (hairline cracks).
Natural wood blemishes and unevenness are normal for wood and can show on the surface. This is not a safety risk and is not a reason for complaint.
Prevent swelling and oxidation with galvanised materials:

- ▶ Remove water, snow, ice, branches, leaves, sand, grass, etc. from the wood surfaces immediately after/ before using the trailer as well as after parking it.
- ▶ Avoid waterlogging on the wood surfaces.
- ▶ Thoroughly dry the wood surfaces regularly after using the trailer.
- ▶ Ensure good ventilation, e.g. outdoors, until the surface is completely dry.
- ▶ Close and seal scratches and damage caused by loads on the wooden surface with wood treatment – this prevents dampness from entering the wood panel.

Rubber/seals

Rubber parts such as elastic seals, sealing joints made of PU adhesive sealant, e.g. on doors, ceilings, flaps, vent windows, loading platform, etc. are subject to certain ageing/wear processes during use.
The rubber/seals become hard over time due to mechanical loads and environmental influences (cold, heat, UV ray, dampness). They can shrink and crack.

- ▶ When cleaning, check the condition, fullness and adhesion of seals.
- ▶ Have damaged, missing, or porous seals replaced.
- ▶ Regularly clean seals (in winter) with talcum powder, vaseline or silicon spray.

Approved operating fluids / consumables

The perfect functioning, operational safety and working life of a trailer depend largely on the quality and correct selection of the consumables used.

Only use consumables for your trailer and its assemblies that are approved by HUMBAUR GmbH and the relevant assembly manufacturers.

Follow the rules and instructions of the individual manufacturers on approved and recommended consumables.

Consumables are:

- Fuels (petrol, diesel, gas)
- Coolants/antifreeze
- Refrigerant
- Lubricants, e.g.:
  engine oils, hydraulic fluids, greases
- Batteries, rechargeable batteries

⚠ WARNING

Flammable / toxic operating fluids / consumables

Fuel/refrigerants and their vapours are highly flammable and pose a health hazard - danger of poisoning!

- ▶ Do not smoke or allow naked flames near.
- ▶ Avoid sparking.
- ▶ Do not inhale the vapours.
- ▶ Immediately take care of escaping/ spilling consumables.
- ▶ Wear personal protective equipment.

⚠ WARNING

Explosive operating fluids / consumables

The battery can explode as a result of sparking or short circuits.

- ▶ Cover the battery poles before starting work.
- ▶ Do not smoke or allow naked flames near.
- ▶ Avoid short circuits or sparking.
- ▶ Do not place any tools on the battery.
- ▶ Observe the manufacturer's safety instructions.

Disposing of operating materials

Used oil, lubricating grease, cooling and refrigeration fluids, fuels and batteries and rechargeable batteries are waste that requires monitoring.

DANGER of polluting the environment.

▶  Never dispose of environmentally harmful materials with your domestic waste or into the environment.
Dispose of environmentally-harmful waste in accordance with national and local regulations.

Used oil/lubricants

▶  Used oil, lubricants, oil-soaked rags and hoses are to be emptied/disposed of in suitable containers.

Tyres

▶  Old tyres may never be disposed of into the environment. These must be properly stored and disposed of by municipalities.

▶ Get information from public disposal points in your country.

Electrical and electronic waste

▶ Dispose of electrical and electronic waste in your local recycling centre (electronic scrap recycling).

Batteries

Batteries are subject to EU guideline 2006/66/EC and can be returned to the manufacturer free of charge.

▶ Be very careful when removing batteries.

Taking trailer out of operation

- ▶ Secure the trailer against unauthorised use by third parties, e.g. secure power supply from being switched on.
- ▶ Do not park the trailer on public streets, only on private property.
- ▶ Park the trailer so that it does not pose a risk to third parties, e.g.: Tipping over, rolling away.
- ▶ Secure the trailer with wheel chocks.
- ▶ Remove environmentally harmful operating fluids/consumables/ substances (oil, batteries, etc.) properly.

Disposing of trailer

- ▶ Bring the entire trailer to a vehicle recycling centre.
  The vehicle recycling centre specialists will properly dispose of the individual components.

Troubleshooting

Action in the event of a fault

This section contains information relating to possible faults of the trailer. The information is intended to help with the search for the cause of a fault and to resolve it to the extent that it is possible to go to the nearest Humbaur GmbH Service Station.

Any faults that can occur as a result of ignoring the operating instructions or insufficient maintenance are not covered.

Unfortunately, it is not possible here to cover all eventualities or problems that may occur.

In the event of more serious faults, please inform our **Humbaur Service** (see contact addresses listed below).

⚠ WARNING

Improper troubleshooting

Improper troubleshooting can lead to the failure of components - risk of accidents

▶ Have the faults rectified by qualified personnel at an approved workshop.

What to do in the event of fire

⚠ WARNING

A great deal of heat can be generated and toxic gases released by burning paint and plastic parts

Danger of burning and suffocation.

▶ When trying to extinguish a fire, keep a safe distance from the flames.

▶ Do not inhale any toxic gases.

Humbaur Service

Any attempt to repair or dismantle trailer components or sub-assemblies will result in voiding of the warranty cover.

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/Repair

Manufacturer address

Humbaur GmbH

Mercedesring 1

86368 Gersthofen (Germany)

Tel.: +49 821 24929 0

fax.: +49 821 24929 100

www.humbaur.com

info@humbaur.com

Replacement parts

Use only genuine Humbaur replacement parts!

Replacement parts can be purchased as follows quoting the vehicle identification number (**VIN**) and part designation:

- Online, e-mail, phone

Parts logistics contact details

Tel.: +49 821 24929 0

fax.: +49 821 24929 200

Email: parts@humbaur.com

Fault	Possible causes	Rectification
The trailer pulls to the left/right when driving.	- The load is not evenly distributed.	Distribute the load evenly.
	- The tyre pressure is not uniform.	Adjust the tyre pressure properly for all tyres.
	- The load is not properly secured and is slowly shifting.	Align the load and secure it properly.
	- The brakes are incorrectly set/blocked.	The fault must be rectified by personnel at an approved workshop.
The trailer rocks during drive.	- The tyre pressure is incorrect.	Adjust the tyre pressure properly for all tyres.
	- The speed is too high for the load and road conditions.	Slowly reduce the speed. Adjust your driving behaviour to the road conditions.
	- The load centre is too far back.	Correct the load centre to the front.
The trailer rattles during the journey.	- The load is not sufficiently secured.	Secure the load properly.
	- Cables/hoses loosen.	The fault must be rectified by personnel at an approved workshop.
	- A toolbox/storage compartment is not correctly closed.	Close the toolbox/storage compartment properly.
	- The top parts of the drive-up ramps are not closed and secured.	Close and secure the two-piece drive-up ramps properly.
	- The curtain is not correctly closed.	Close the curtain properly.

Fault	Possible causes	Rectification
Brake does not correctly disengage.	- Brake is not correctly adjusted. - Brake shoe return spring slackened. - Brake shaft sticking (drum brake). - Pressure/brake line kinked. - Fault in the compressed air system.	The fault must be rectified by personnel at an approved workshop.
Brake locked	- Too little operating pressure.	Check the pneumatic connections. Check that the correct operating pressure is achieved.
	- Parking brake activated.	Release the parking brake.
	- The brake has seized on to the drum.	The fault must be rectified by personnel at an approved workshop.
Insufficient braking effort/ brakes pull to one side.	- Brake linings worn, contaminated with oil or glazed. - Brake not correctly adjusted. - Fault in the compressed air system.	The fault must be rectified by personnel at an approved workshop.
Operating pressure is not reached.	- Pneumatic connections incorrectly connected.	Check the pneumatic connections.
	- Pressure regulator or compressor faulty (towing vehicle).	The fault must be rectified by personnel at an approved workshop.

Fault	Possible causes	Rectification
Wiring/switches	- Terminals loose or contaminated.	Clean the connections.
	- Cable broken or terminal damaged.	The fault must be rectified by personnel at an approved workshop.
Lighting does not work.	- Lamp failure.	Replace the lamp.
	- Terminals loose or contaminated.	Clean the connections.
	- Short circuit or open circuit in the electrical circuit.	Replace faulty LED lights and lamps. The fault must be rectified by personnel at an approved workshop.

Fault	Possible causes	Rectification
The trailer creaks during the journey/ bearing wear.	- Bearing adjustment too slack or too tight. - Foreign bodies in the axle bearing.	The fault must be rectified by personnel at an approved workshop.
	- Insufficient axle lubrication.	Lubricate the axles in line with the axle manufacturer's instructions.
	- Axle overload.	Observe the axle loads applicable to the trailer.
Worn or damaged wheel bolts.	- Wheel nuts screwed on with incorrect torque. - Wheel nuts not properly tightened.	Replace the wheel bolts and nuts, as well as the rim if required. Tighten the wheel nuts with the torque specified by the axle manufacturer. The fault must be rectified by personnel at an approved workshop.

Fault	Possible causes	Rectification
The trailer is not horizontal after coupling.	- Coupling height is not correctly adjusted.	Set the coupling height correctly.
	- The support foot is not folded up.	Crank the support foot upwards.
	- The raising/lowering valve is not in drive position.	Pull the raising/lowering valve into drive position.
Rotatable towing eye does not rotate or only rotates with difficulty.	- The bearing of the rotatable towing eye has seized up.	Re-lubricate the towing eye bearing points.

Fault	Possible causes	Rectification
Drive-up ramps cannot be raised/ lowered.	- Spring of the suspended lifting gear broken.	Have the suspended lifting gear replaced in an approved workshop.
	- Spring of the suspended lifting gear not correctly set.	Re-tighten the spring at the adjusting screw.
	- Bearing of the suspended lifting gear insufficiently lubricated/not lubricated at all.	Lubricate the bearing of the suspended lifting gear.
	- Gas pressure spring faulty.	Have the gas pressure spring checked and if necessary replaced in an approved workshop.
Drive-up ramps cannot be moved laterally.	- Bearing insufficiently lubricated/not lubricated at all.	Lubricate the lateral movement bearing.
	- Dirt blocks the movement.	Clean the bearing and relubricate it.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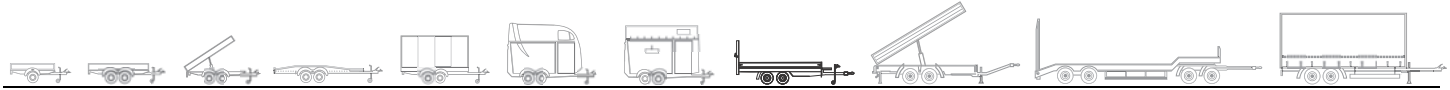

Humbaur GmbH ● Mercedesring 1 ● 86368 Gersthofen ● Germany ● Tel. +49 821 24929-0 ● info@humbaur.com ● www.humbaur.com