HUMBAUR

MAKES IT HAPPEN

Operating manual

Multifunction construction transporter

HTK three-way tipper (5 t - 7.5 t)

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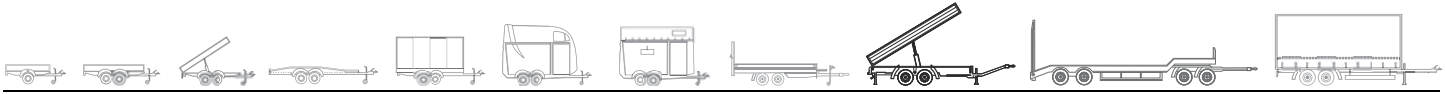

This operating manual must be read, understood and complied with in all points by all persons responsible for the vehicle manufactured by Humbaur GmbH and its subassemblies. Humbaur GmbH accepts no liability for damage and malfunctions resulting from failure to comply with these instructions!

For this reason, read this operating manual before using the vehicle for the first time and heed all instructions, warnings and notes contained therein!

Note that the illustrations are intended to serve as examples and that the design / equipment shown may vary from that of your specific vehicle.

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 at all times 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.

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Mercedesring 1
89368 Gersthofen (Germany)

No claims whatsoever 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 on, for example.

Use only trained and instructed personnel.

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

Provide the required operating and auxiliary materials.

Identification

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

Vehicle type	Version	☒
Three-way tipper, tandem (total mass 5 t)	HTK 504020	
Three-way tipper, tandem (total mass 6.5 t)	HTK 654020	
Three-way tipper, tandem (total mass 7.5 t)	HTK 754020	

Enter a cross next to the relevant trailer on delivery.

Index

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

1 Safety

The chapter "Safety," starting on page **9**, contains safety-relevant information on correct handling of the trailer.
Read this chapter before driving with the trailer 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 loading and unloading, correct distribution of loads and hitching / unhitching and coupling / uncoupling the trailer.

4 Operating the chassis

In the chapter "Operating the chassis," starting on page **55**, you will find all you need to know about the chassis operating elements, for example the raising/lowering system and landing gear, as well as information on safe loading and unloading.

5 Body

The chapter "Body," starting on page **97**, explains how to operate the body correctly, for example how to fold down the drive-up ramps and which equipment you can use to secure loads.

6 Electrical system

In the chapter "Electrical system," starting on page **135**, you will find information on the lights, connectors and connector assignments.

7 Inspection, care and maintenance

The chapter "Inspection, care and maintenance," starting on page **153**, describes the activities required for maintaining the operational safety and value of your vehicle.

8 Troubleshooting

The chapter entitled "Troubleshooting," starting on page **203**, tells you what to do in the event of problems or malfunctions and provides contact details for the service team.

Contents of this operating manual

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Safety

Intended use

HUMBAUR vehicles and bodies are manufactured to the accepted engineering and safety engineering standards. Nevertheless, misuse may give rise to danger to the life and limb of operating personnel or third parties, impairment of the HUMBAUR vehicle and other material damage.

HUMBAUR vehicles and bodies are manufactured exclusively for transport applications in accordance with the transportation provisions.

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

If you are planning to make later modifications to your HUMBAUR vehicle or body, contact Humbaur GmbH or an authorised HUMBAUR workshop in advance.

Always consult Humbaur GmbH or an authorised HUMBAUR workshop before having accessory parts attached to your HUMBAUR vehicle or body.

The following uses are permitted:

- Transport of goods
- Operation only within 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
- Driving only when in compliance with the maximum legal speed and at a speed adjusted to suit poor road and weather conditions
- Loading and unloading only in secure areas or with additional safeguards in public streets
- Trailer always secured appropriately to prevent rolling away when stopped / parked

The general inspection and safety inspection of the trailer by specialists at the prescribed intervals as well as the certification of these inspections are prerequisites for participating in road transport.

The operator / user of the trailer is under obligation to regularly perform care / cleaning work on the trailer as well as maintenance.

HUMBAUR vehicles/bodies bear a VIN (Vehicle Identification Number) - see page **29**. Always quote the VIN when making inquiries or ordering replacement parts!

Reasonably foreseeable misuse

Any use above and beyond the prescribed transport application is deemed to be improper use.
In particular, this includes:

- Transport of persons/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/draw bar/trailing load
- Transport of hot / liquid materials (e.g. tar)
- Driving with poorly secured or unsecured load
- Driving with the loading platform tipped
- Driving with poor load distribution (one-sided, selective loading)
- Unauthorised constructional changes to the trailer or modifications not approved by the manufacturer
- Use of non-authorised replacement parts or accessories
- Driving with defective light system or with faulty electrical system
- Driving with a dirty trailer on which the licence plate, lighting, markings are not visible or not clearly visible
- Driving with the body open (e.g. dropsides, support frame, steel grid extension, add-on drop sides, toolbox, side guards, ramps, landing gear, etc.)
- Unauthorised maintenance / repair of safety-relevant components which must be maintained or repaired by specialists only
- Driving at excessive / inappropriate speed in poor weather conditions and / or on bad roads
- Parking the trailer without taking adequate safety precautions to prevent it from rolling away
- Operating the trailer in damaged condition and with visible part wear or with broken safety-relevant components
- Operating a trailer without valid brake matching with the towing vehicle
- Operating the ramps when a person is in the danger area
- Transport of vehicles / loads which protrude over the total width of the trailer

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

Humbaur GmbH
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86368 Gersthofen (Germany)

The user shall bear sole responsibility for any such risk.

Brake matching

Brake matching must be performed to ensure correct usage.

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

Such overloading can cause the brakes of the towing vehicle or trailer to overheat. Brake overload can lead to a reduction in braking force, greater wear on the brake lining and / or brake discs and wheel bearings or axle damage.

For optimal distribution of the deceleration of the entire vehicle combination, brake matching must be carried out 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 distance 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

Failure to observe these instructions and failure to provide certification of brake matching renders all claims under warranty against Humbaur GmbH null and void.

Disclaimer

The manufacturer accepts no liability if:

- unauthorised modifications have been made to the trailer or its components.
- original parts or modification parts / accessory parts approved by Humbaur GmbH have been replaced with other parts.
- subsequent modification of the trailer has been performed (e.g. new bores have been drilled in the frame or existing bore holes on the frame re-drilled). This is deemed by Humbaur GmbH to constitute structural modification and thus invalidates the operating permit.
- non-approved accessories or replacement parts/components from other manufacturers which are not original HUMBAUR parts have been attached or installed. This invalidates the operating permit for the trailer and possibly even the insurance cover.
- the care and maintenance intervals prescribed by the manufacturer are not 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 includes

Defects occurring during correct use of the trailer as prescribed, which are design-related or can be attributed to material faults.
Repairs carried out during the warranty period do not extend it.
The dealer is responsible for the warranty as a contracting party.

Requirements

Original replacement parts must be used for repairs.

Repairs must be carried out by a specialist workshop.

The manufacturer's maintenance instructions and regulations as listed in this operating manual must have been complied with.

Defects must not be the result of

Failure to comply with the technical and legal regulations listed in this operating manual.
Incorrect use of the trailer of lack of experience on the part of the user.

Unauthorised modifications to the trailer or attachments not approved by Humbaur GmbH render the warranty invalid. Failure to comply with the respective statutory regulations.

The following do not constitute defects

Each trailer is a hand-made product. Despite utmost care during assembly, superficial scratches which have no effect on the intended use can occur.
Stress cracks in the surface (hairline cracks) caused during manufacture cannot be avoided. These hairline cracks have no effect on the stability or use of the trailer.
Gap between drop-side and loading bridge.
Furthermore, polyester components are not 100% colour-fast. Here, too, UV radiation and weathering can cause fading.
In addition, it should be noted that as rubber parts are generally subject to ageing as a result of UV radiation, cracks may appear and fading of the surface may occur.
Cathodic dip-paint coated (KTL) parts are not colour-fast. They can fade as a result of exposure to UV irradiation.
Galvanised parts are not normally shiny, but lose their bright finish after a short time. This is not a defect but a desired effect, as full protection against rusting of the metal is only guaranteed through oxidisation. Wood is a natural material. Despite a wide variety of processing methods and coatings, it therefore remains subject to natural, weather-dependent expansion and shrinkage, which can cause warping. The natural wood grain and irregularities are normal for this natural material and may become visible on the surface. Fading is also possible as a result of UV irradiation and weathering. A manufacturing tolerance is specified for the thickness of the wooden components used. Claims for deviations within the tolerance will not be accepted.
As the trailers are not generally insulated, fluctuations in temperature can cause condensation to form under curtains and polyester covers. In this case, adequate ventilation must be ensured to prevent the formation of mould. Furthermore, the trailers are not 100% waterproof. The ingress of water at doors, flaps and windows is still possible, even with the use of rubber seals and extremely careful workmanship.

The warranty will expire

If the regulations for operation, maintenance, cleaning and inspection are not observed.
If technical modifications to the trailer are carried out.

If unauthorised attachments or superstructures not approved by Humbaur are fitted.

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

If parts other than original Humbaur replacement parts are used.
If the safety instructions on the trailer are not observed.

If the prescribed service intervals are not adhered to, even in the case of parts fitted by Humbaur, such as axle, brake, draw bar, hydraulic systems etc.

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

In the event of continued use of the trailer although defects have already been detected and reported and although the manufacturer has prohibited use until repairs have been effected.
In the event of continued use of a trailer with known defects which renders repair impossible or more time-consuming or means that repair is only possible with significant additional expense and reduced function of the trailer.

The warranty does not cover

Expenditure for ongoing maintenance.
Costs incurred as a result of normal wear and tear or because the trailer has not been used for some time.

Faults resulting from failure to handle the trailer as prescribed.

Defects attributable to the use of parts other than original Humbaur replacement parts.

Defects as a consequence of repairs not carried out in a specialist workshop.

Defects resulting from structural modification or assembly work on the vehicle.

Damage caused by snow or water on curtains, plywood or polyester bodies.

The manufacturer reserves the right to make design changes without notice.

Personnel qualifications

HUMBAUR vehicles and vehicle bodies and their operating components may only be used and serviced by persons who are familiar with:

- this operating manual.
- the trailer with the associated towing vehicle.
- the subsuppliers' operating and maintenance manuals.
- the road traffic regulations and the road traffic licensing regulations.
- all relevant occupational safety/accident prevention regulations and other safety engineering, occupational health and road traffic laws.
- the correct procedures for freight transport.

Sources of danger

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

- Coupling and uncoupling the trailer: Keep the danger zone clear.
- Travelling with unsecured landing gear.
- Driving with unsecured drive-on aids (ramps).
- Clearance heights when on the road and during loading and unloading.
- Driving with the loading platform tipped - this is prohibited by law.
- Exceeding the total permitted payload or uneven overloading due to incorrect distribution of weight.
- Poorly secured or unsecured load and / or body components.
- Reversing manoeuvres - check the area behind the vehicle.
- Excessive steering during manoeuvring.
- Overloading of the trailer, axles and brakes.
- Overstressing as a result of fitting wheels or tyres of incorrect sizes.
- Use of wheels with incorrect wheel offset, unilateral runout or centrifugal imbalance.
- Excessive strain as a result of reckless and inappropriate driving or handling.
- Subjecting the axles to impact and shock loading.
- Failure to adapt your speed to the road conditions and the loading status 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 steep inclines.

In the chassis area

Important general information:

- Connect the supply lines
- Establish the electrical connections
- Put the side guard in the position for driving and secure it
- 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, chocks
- Check the trailer's lights, and repair any faulty lights
- Observe the permissible total weight
- Release the brakes and start to move off only when the operating brake pressure has been reached
- Drain the compressed air tank
- Check the licence plates and signs
- Check that the central draw bar and trailer coupling are in perfect condition
- Lock the trailer coupling correctly

Around the vehicle body

Close and secure all components of the vehicle body, such as:

- ramps
- drop-sides
- add-on drop sides
- steel grid extensions
- support frame
- toolbox
- load securing equipment
- immobilise and secure the load
- ensure that the load is distributed evenly

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 instruction.
Draws attention to information which must be observed and complied with to ensure 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 may be used in this operating manual and on the product. Heed these warning signs and proceed with particular caution in these cases.

Warning of a danger point!
Exercise caution - there may be several sources of danger to personnel.

Risk of crushing!
For parts of the body such as: hands / fingers / feet.

Risk of crushing!
To the body / parts of the body.

Danger of falling!

Risk of electric shock!
Dangerous voltage.

Risk of striking!
Falling objects.

Risk of burns!
Hot surfaces.

Risk of chemical burns!
Leaking battery acid.

Risk of poisoning!
Toxic substances.

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

Risk of slipping!

Risk of tripping!

Risk of explosion!
Explosive operating materials.

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

Heed the following rules and prompts for all the work described in this manual.


Important information! Must be observed and complied with for 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.


Guidance from another person required

Prohibitory signs

The following are prohibited.


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 (keep unauthorised persons away)


Stepping behind the swivel arm / moving parts is prohibited.


Stepping between the towing vehicle and trailer is prohibited.


Allowing the trailer to run up on the towing vehicle is prohibited.

Other important pictograms

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


Problem waste!
Must not be disposed of with household waste.

Danger of polluting the environment.


Dispose of used oil properly without polluting the environment


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


Rinse your eyes immediately with plenty of water


Consult a doctor

General Information

HTK three-way tipper

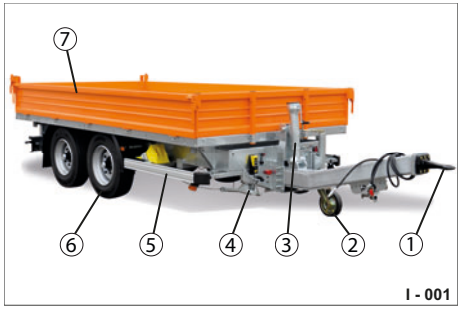


Fig. 1 Side view

1 Draw bar with towing eye
2 Support wheel
3 Height setting device
4 Spindle parking brake
5 Side guard
6 Axle / wheels
7 Lateral drop-sides, can be folded down

The HTK is a construction transporter with a draw bar which is height-adjustable from approx. 560 mm - 900 mm.

As a tandem trailer in the 5 t / 6.5 t version, the HTK is equipped with rubber sprung axles. The HTK in the 7.5 t version has leaf spring axles.

The welded and hot-dip galvanised chassis frame guarantees a long service life.

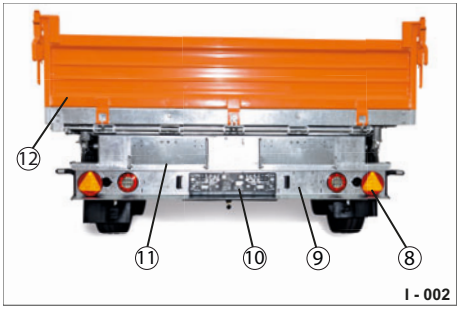


Fig. 2 Rear view

8 Rear lights
9 Underrun guard
10 Licence plate holder
11 Ramp stowage compartment
12 Rear platform gate, hinge-mounted, with central interlock

The ramp stowage compartments in the chassis frame allow you to carry ramps with you.

The 5-stage hard chrome-plated telescopic cylinder can tip the loading platform 45° to the rear and 48° to each side.

The optional folding supports in the rear area secure the vehicle during loading / unloading of construction machinery.

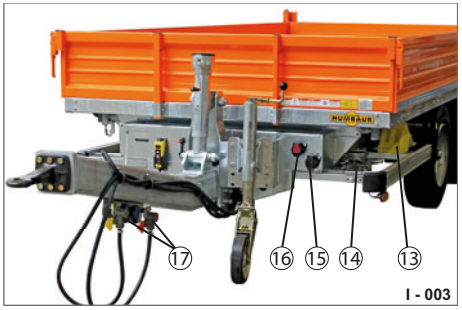


Fig. 3 Front view

13 Wheel chock
14 Release valve, service brake
15 EBS brake power supply (12-24 V)
16 Electrical system power supply (12-24 V)
17 Compressed-air connections: Supply, Brake

The HTK is available as an option as a multi-voltage vehicle with LED lighting in 12 V - 24 V.

The hydraulic system is supplied from the towing vehicle. Optionally, an electro-hydraulic unit can be integrated in the chassis.

A wide range of accessories, such as: spare wheel, support frame, toolbox, add-on drop sides, steel grid extension, ensure added comfort and safety in operation.

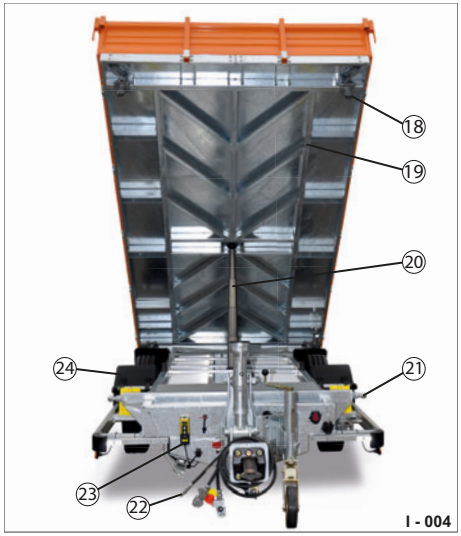


Fig. 4 Tipped position, towards the rear

18 Tipping bearing cup
19 Loading bridge
20 Telescopic hydraulic cylinder
21 Tipping bearing ball
22 Hydraulic connection
23 Manual operation: electro-hydraulics
24 Mud guard

Fig. 5 Tipped position, towards the side

25 Safety wire

Fig. 6 Tipped position, towards the side

26 Central interlock
27 Splash guard
28 Rubber support
29 Battery box, electro-hydraulics

Fig. 7 Tipped position, towards the side

30 Rear platform gate, hinge-mounted
31 Folding support
32 Drop-side locks

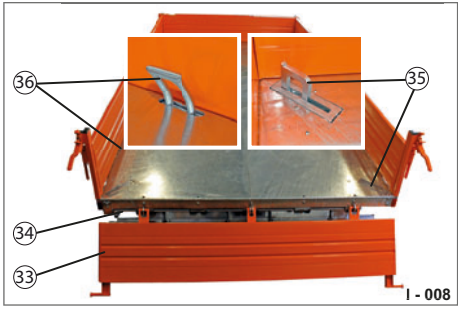


Fig. 8 Tipped position, towards the side

33 Rear platform gate, folded down
34 Central interlock
35 Pivoting tie-down ring, lowerable
36 Tie-down bracket, lowerable

Ramps, pushed in

Fig. 9 Ramp stowage compartments in the chassis

Ramps, in position for use

Fig. 10 Rear platform gate, folded down

Safety wire for loading bridge

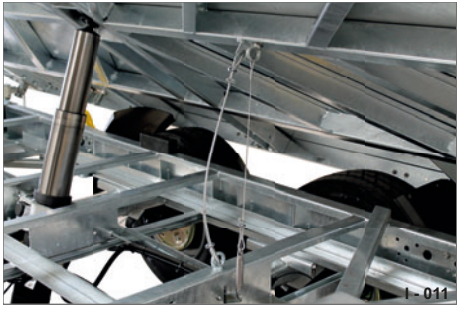


Fig. 11 Loading bridge tipped to the side

Central interlock

Fig. 12 Drop-side joint rod

Electro-hydraulic unit

Fig. 13 Mounted in the chassis

Remote control for electro-hydraulic system

Fig. 14 Pushbuttons and main switch for tipping operation

Hydraulic supply

Fig. 15 Switch lever, hydraulic supply

Steel grid extension

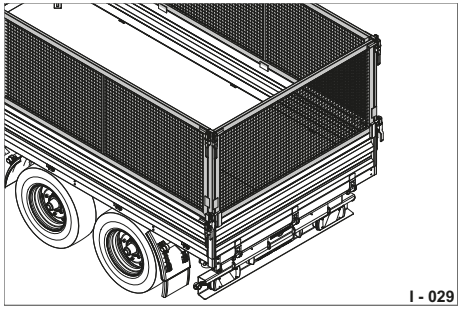


Fig. 17 fitted on the basic drop-sides

Add-on drop side

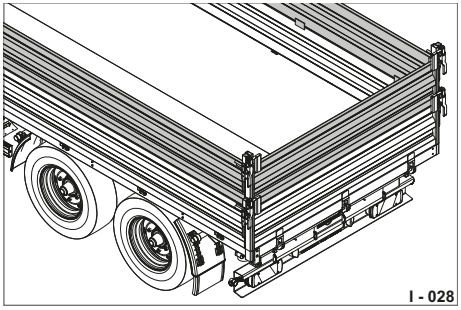


Fig. 19 fitted on the basic drop-sides

Multi-voltage 12 V to 24 V

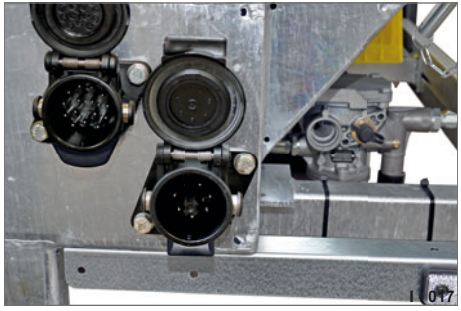


Fig. 16 Standard connection sockets:
15-pin for electrical system and 7-pin for EBS

Support frame

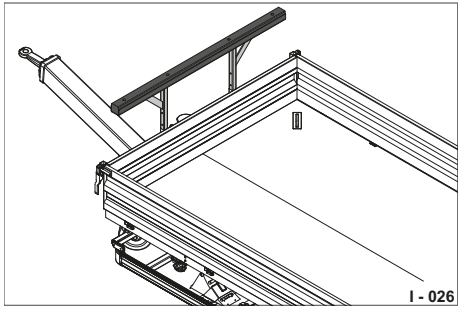


Fig. 18 Support frame on front wall,
e.g. for wheel loader / excavator bucket

Support wheel / spindle support

Fig. 20 Support equipment on the draw bar

Spare wheel

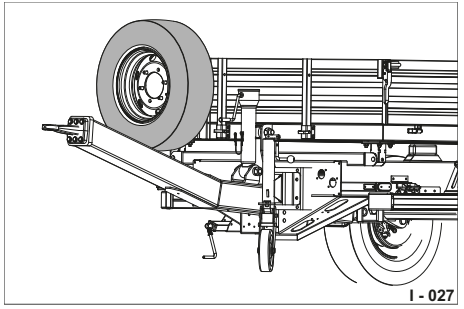


Fig. 21 Spare wheel holder on the front wall

LED lights

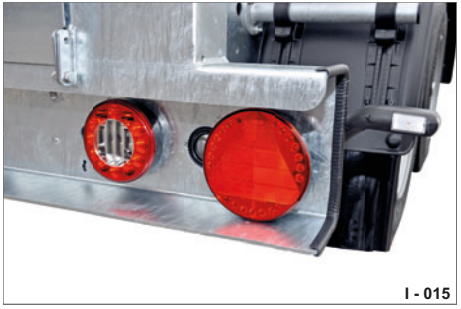


Fig. 23 Tail lights + peripheral light

Folding support

Fig. 25 Folding supports on the rear

Maintenance support

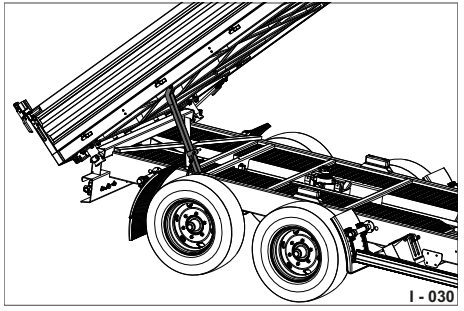


Fig. 22 Maintenance support for securing the loading bridge

Securing the load

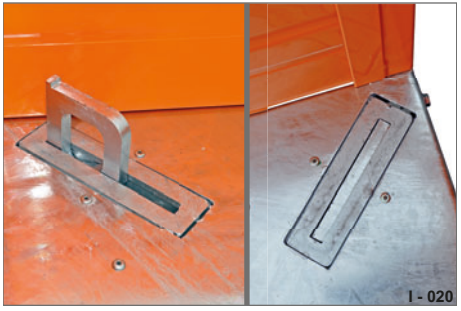


Fig. 24 Pivoting tie-down rings, lowerable in each corner of the loading platform

Securing the load

Fig. 26 Tie-down bracket, lowerable

There is a Vehicle Identification Number (**VIN**) on the trailer to identify it.

You will need to quote this VIN when making inquiries about the trailer. The VIN must remain legible throughout the service life of the trailer.

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

Item	Explanation
1-3=	World Manufacturer Identifier of Humbaur GmbH
4-9=	Filler characters chosen by manufacturer
10-17=	Sequential numbering

Tab. 1 Example - VIN number

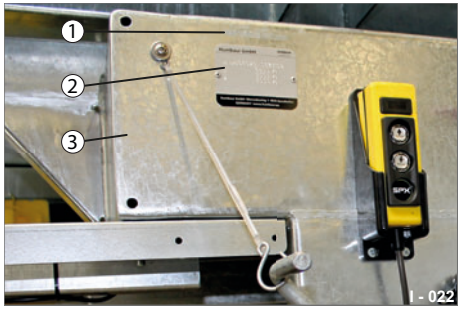


Fig. 27 Front end of vehicle

1 Vehicle Identification Number (VIN)
2 Name plate
3 Front end, frame

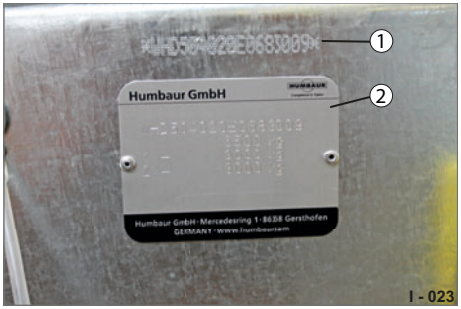


Fig. 28 VIN / name plate

1 VIN - engraved
2 Name plate / weight specifications

Spindle support (optional)

The spindle support can be attached as an option.

A name plate is attached to the spindle support to identify it.

If you have questions about the spindle support, you must specify the factory number / type and year of construction.

Read and comply with the operating and maintenance manual for the spindle support.

Manufacturer of the spindle support:

haacon hebetechnik gmbh

Josef- Haamann-Strasse 6

D-97896 Freudenberg

Tel. 09375-84-0

Fax: 09375-84-66

www.haacon.de

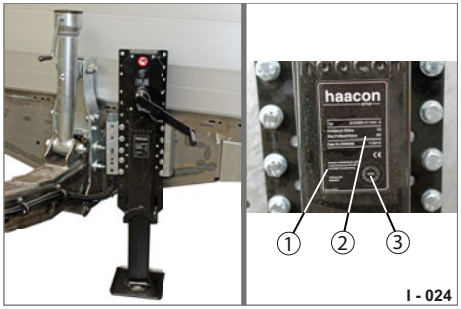


Fig. 29 Spindle support (example)

1 Manufacturer information
2 Technical data
3 Inspection sticker

CE

The company Humbaur GmbH hereby confirms compliance with all relevant EC guidelines for the licensing and safe operation of HTK trailers.
You can separately request an EC Declaration of Conformity from us.

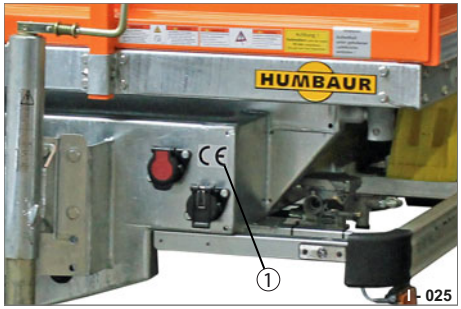


Fig. 30 EC Declaration of Conformity

1 CE label

EC Declaration of Conformity

Operation

NOTICE

Exceeding the permissible angle of inclination

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 exceed an articulation angle of 90 degrees between the trailer and the towing vehicle.
- ▶ Do not exceed the max. angle of inclination:
  vertical ± 20 degrees,
  axial ± 25 degrees.

You can find additional information in the employers' liability insurance association brochure: "BG Information BGI 599 - Safe coupling of vehicles."

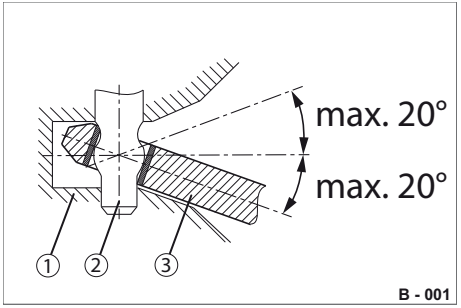


Fig. 1 Inclination angle of vertical transverse axis

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

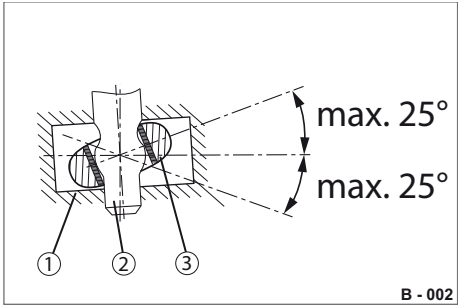


Fig. 2 Inclination angle of axial longitudinal axis

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

NOTICE

Loss of stability during loading and unloading

The rear axle and the chassis can be damaged / subjected to excessive loads.

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

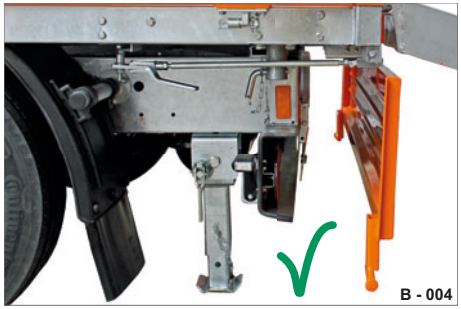


Fig. 3 Folding supports folded down

WARNING

Driving onto the trailer

When driving onto the trailer or if the load distribution is not uniform, the trailer can tip to the side - risk of crushing /striking!

▶ Secure the trailer before loading / unloading with support equipment or connect it to the towing vehicle.

▶ Do not load or unload the trailer across the slope (terrain with steep gradients) - risk of tipping!

Fig. 4 Driving onto the trailer

⚠ WARNING

Overloading the ramps

The ramps can be deformed.

The vehicle may fall / topple over - risk of crushing / striking!

- ▶ Observe the information on maximum loads on the name plate.
- ▶ Do not exceed the maximum values.

Fig. 5 Name plate, ramps

Max. values / load bearing capacity	
Max. ramp angle	30 % (16.5°)
Single-axle vehicles	1420 daN (Kp)
Double-axle vehicles:	
Axle load distribution	40 % to 60 %
Axle spacing 1 m	1875 daN (Kp)
Axle spacing 1.5 m	2195 daN (Kp)

Loading and unloading vehicles

⚠ WARNING

Limited visibility

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

- ▶ Correctly assess the danger area around the vehicle using the mirrors.
- ▶  Have a second person assist you.

⚠ WARNING

Unsecured ramps

The ramps can slip off the edge of the loading platform, causing the vehicle to topple off the ramps - risk of crushing / striking!

- ▶ Before loading / unloading, check that the ramps are securely seated on the edge of the loading platform.

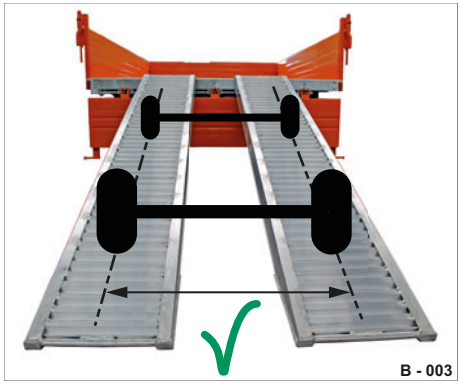


Fig. 6 Setting track width

⚠ WARNING

Ramps set to incorrect track width

The vehicle being loaded can topple and fall off the ramps - risk of crushing / striking!

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

Procedure:

- ▶ Position the trailer on firm ground to prevent it from sinking in or toppling over.
- ▶ Secure the trailer against rolling away.
- ▶ Apply the spindle parking brake and secure the trailer with wheel chocks.
- ▶ Fold the rear support feet down.
- ▶ Set the ramps to the required track width.
- ▶ Check that the ramps are secured.
- ▶ Drive the vehicle slowly onto the ramps.
- ▶ Drive straight onto the trailer - not at an angle from the side.

Loading and unloading

⚠ WARNING

Dirty/wet loading platform

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

- ▶ Step carefully onto the loading platform and watch out for dirty, wet / icy patches.
- ▶ If necessary, clean the dirty areas before entering the loading platform.

⚠ WARNING

Shifted loads

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

This can result in cutting and crushing injuries.

- ▶ Use  .

⚠ WARNING

Entering the loading platform

When climbing onto / down from the loading platform / the chassis, persons can fall over the mud guards, side guards, draw bar, chassis or toolbox.

. 

- ▶ Use .
- ▶ Only enter the loading platform via the access aids provided.
- ▶ Never step onto the loading platform when it is tipped.
- ▶ Never jump onto or down from the loading platform.
- ▶ If necessary, use a stable ladder to climb onto / down from the loading platform.

⚠ WARNING

Loading/unloading with a crane

The attachment can tear and the load can fall - swinging loads can hit / crush persons!

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

WARNING

Load / load-securing elements on the loading platform

The loading platform can be obstructed by the loaded goods, squared timbers, ratchet straps and pallets - risk of tripping!

- ▶ Make sure there is enough light on the loading platform.
- ▶ Stow pallets, ratchet straps and tools that are not required in the stowage spaces provided.
- ▶ Keep the loading platform clean.

WARNING

Loading bulk goods

Bulk goods can press against the drop-sides during loading. Unsecured drop-sides may spring open - risk of striking / crushing!

- ▶ Before loading bulk goods, check that all drop-sides / attachments are closed and secured.

Fig. 7 Unloading the trailer

Fig. 8 Loading the trailer

WARNING

Unloading bulk goods

The load can press against the drop-sides. This pressure can cause the drop-sides to burst open when the locks are released - risk of striking!

- ▶ When unlocking the drop-sides, stand to one side and not directly in front of the drop-sides.
- ▶ If necessary, remove the bulk goods pressing against the wall before opening the drop-sides.

WARNING

Tipping while the trailer is moving

The load will slide from the loading platform in an uncontrolled manner - risk of striking / crushing!

- ▶ Only tip the loading platform when the trailer is at a standstill.

Fig. 9 Tipped loading platform / danger areas

Procedure:

- ▶ Always make sure that traffic is not obstructed.
- ▶ If necessary, cordon off the surrounding area.
- ▶ Before tipping the platform, check that the trailer is coupled (fixed) and connected to the hydraulic system.
- ▶ When loading, distribute the load evenly over the loading platform.
- ▶ Never stand in the danger area while loading / unloading bulk goods.
- ▶ Keep persons away from the danger area.
- ▶ Before tipping the platform, check that the tipping bearings are correctly set and secured.
- ▶ Tip the load from the platform in a controlled manner.
- ▶ Keep off the loading platform and the chassis during the tipping process.
- ▶ 

Observe the warning labels on the trailer.

After loading and unloading

The body must be completely closed and secured during the drive.

The load must be properly lashed / secured.

⚠ DANGER

Driving with the loading platform tipped

The maximum permissible vehicle height may be exceeded - danger of colliding with underpasses / tunnels / power lines - risk of accidents!

Dynamic forces acting on the chassis may cause excessive loads on the trailer - danger of breakage / risk of accidents!

- ▶ Before driving off, check that the loading platform has been lowered to its normal position and is lying flat against the chassis (tipping bearings).

⚠ WARNING

Driving with the ramps incorrectly stowed / open drop-sides / flaps

This can result in injury.

- ▶ Before driving off, check that the ramps are stowed correctly in the stowage compartments and are secured.
- ▶ Check that all drop-sides / flaps / tool-boxes are closed and secured before driving off.
- ▶ Check that the side guards are up and secured before driving off.

⚠ WARNING

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

The support equipment (support wheel / spindle support / rear folding supports) can be torn off and hurled away while the vehicle is moving - risk of accidents!

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

Prerequisites for safe driving with trailer:

- ▶ Comply with the maximum total weight, axle loads and static vertical draw bar load.
- ▶ Keep the centre of gravity of the load as low as possible.
- ▶ Distribute the load evenly - avoid selective / one-sided loads.
- ▶ Observe the load securing requirements in VDI 2700.

Permissible weights and load distribution

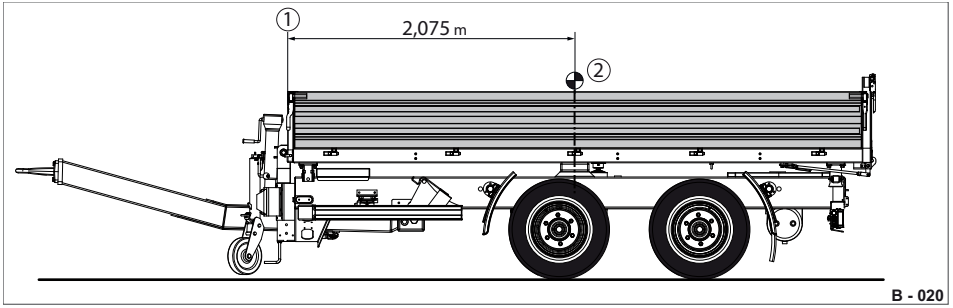


Fig. 10 Example - load distribution plan

1 Distance between the centre of gravity of the load and the front wall of the loading platform

2 Centre of gravity of the load

Stow the load in such a way that as far as possible, the centre of gravity of the entire load lies above the longitudinal centreline of the trailer.

Keep this load centre as low as possible.

Load your vehicle in accordance with the permissible total weight, the permissible axle loads and the permissible vertical draw bar load.

Aim for uniform weight distribution even when there is only a part load, so that every axle is loaded proportionately and that there is sufficient load on the draw bar.

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

Limit point loading of the loading platform to a permissible degree by taking appropriate measures to distribute the load.

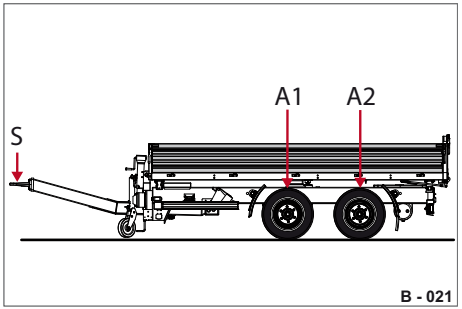


Fig. 11 Load definition HTK

Example for HTK 6.5 t:

Loads	Max. weights
Perm. total mass	6,500 kg
Axle 1 (A1)	3,000 kg
Axle 2 (A2)	3,000 kg
Draw bar load (S)	500 kg
Unladen weight	approx. 1,850 kg
Payload	approx. 4,750 kg

Observe vehicle documents / name plate!

Tab. 1 Loads (example)

General

A towing eye is fitted to the draw bar in order to connect the trailer with the towing vehicle.

⚠ DANGER

Damaged connection element

The trailer could become disconnected from the towing machine during the drive - risk of accidents!

- ▶ Check that the connection element is undamaged before driving off.
- ▶ Have defective / damaged / deformed / worn connection elements repaired or replaced immediately.
- ▶ Carry out maintenance on the connection elements regularly (see section Maintenance on page **163**).

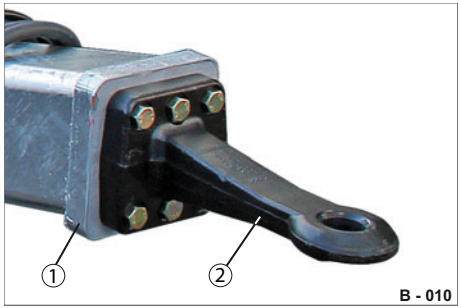


Fig. 12 Connection element

1 Draw bar
2 Towing eye

Possible Towing eye versions

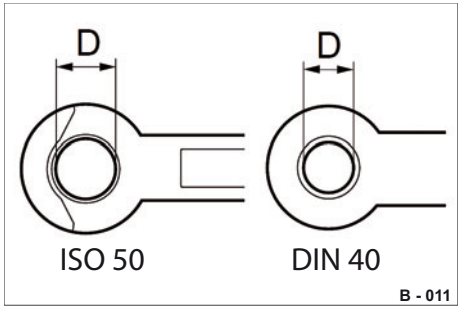


Fig. 13 Inner diameter of bushing

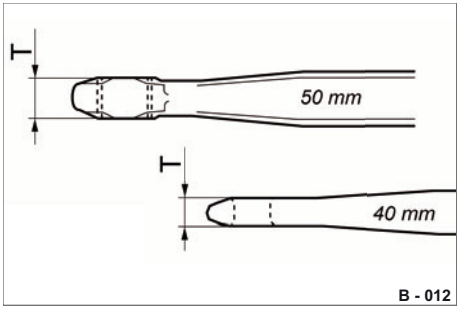


Fig. 14 Thickness of towing eye

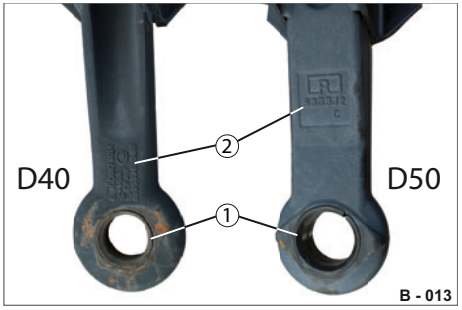


Fig. 15 Towing eyes with wear bushings

1 Bushing (internal diameter D40 / D50)
2 Towing eye identification

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

Tab. 2 Towing eye dimensions

- ▶ Carry out regular visual inspection of the towing eye (see page **163**).
- ▶ Always have the towing eye repaired by qualified specialist personnel.
- ▶ Never carry out welding or adjustment work yourself on the towing eye.
- ▶ Always replace a worn / deformed towing eye with an original replacement part - see label (Fig. 15/2) on the towing eye.

Connecting the towing machine 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.

For additional information, see the brochure enclosed: "BG Information BGI-599 - Safe coupling of vehicles."

WARNING

Rolling towing vehicle

There is a risk of crushing between the trailer and towing machine when connecting the towing machine to/ disconnecting it from the trailer.

- Make sure the 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 / attaching the trailer on a gradient by rolling it up to the stationary towing vehicle can endanger the lives of persons.

- Never allow a trailer to run up to a stationary towing vehicle.
- If a coupling attempt fails, try again.
- Drive the towing vehicle precisely - without lateral offset - up to the towing eye of the trailer.
- If necessary, mark the driving distance on the ground.
- If necessary, have another person guide you.

⚠ WARNING

Improperly uncoupled trailer

Trailer can start moving and tip over.

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

- ▶ Only uncouple a trailer if it is empty.
- ▶ To prevent it from rolling away, secure the trailer with wheel chocks before uncoupling it.

⚠ CAUTION

Pin coupling is difficult to access

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

You could hit your head.

- ▶ Before operating the pin coupling, check that there is enough free space for safe operation.
- ▶ The rear clearance from the centre of the coupling pin to the outside of the drop-side should be max. 420 mm.

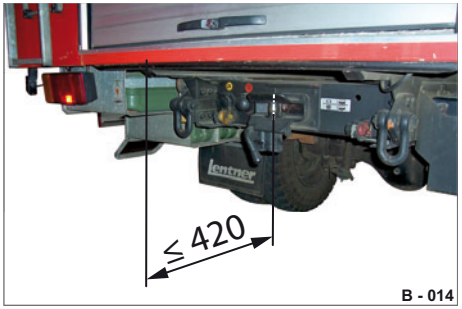


Fig. 16 Max. rear clearance

Available versions of pin couplings

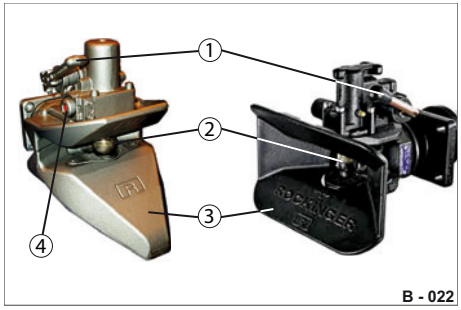


Fig. 17 Manual

1 Operating lever
2 Pin
3 Catcher
4 Control display

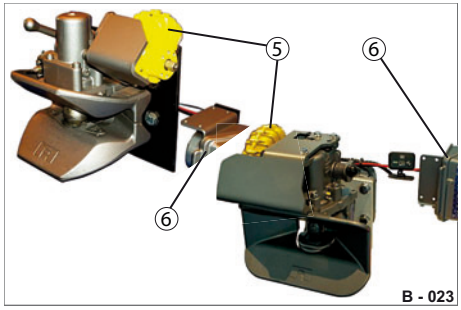


Fig. 18 Electrical

5 Electric motor
6 Control system

Fig. 19 Pneumatic

The pin is operated exclusively by hand using the operating lever.

A safety check of the status of the coupling can be performed by looking at 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 display.

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

Preparation

▶ 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 towing device on the trailer match the attachment height of the pin coupling, ensuring that when coupled and on a level, horizontal surface, the towing eye is horizontal?

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

Coupling

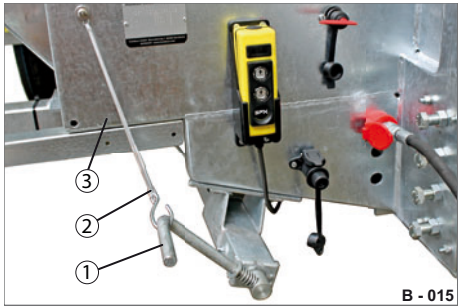


Fig. 20 Spindle parking brake

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

▶ Release the hook (Fig. 20/2) from the crank (Fig. 20/1).

▶ Turn the crank clockwise until the brake is applied.

This brakes the trailer.

Fig. 21 Wheel chocks positioned

1 Wheel chock

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

The trailer is additionally secured against rolling away.

▶ Carry out a visual inspection to ensure that the trailer is as horizontal and level as possible.

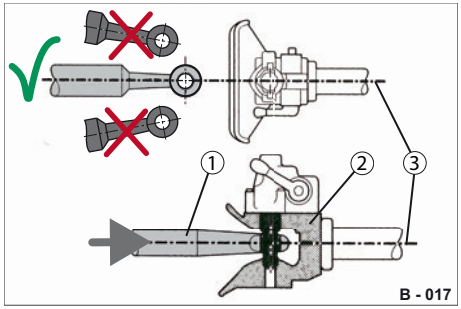


Fig. 22 Driving up

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

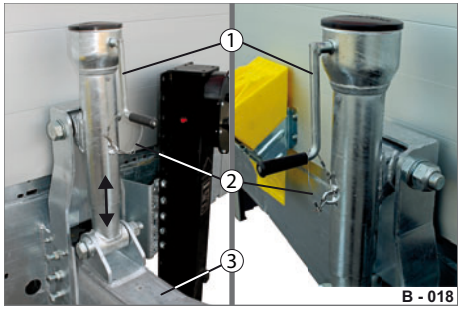


Fig. 23 Height adjustment of the draw bar

1 Crank
2 Safety cable
3 Draw bar

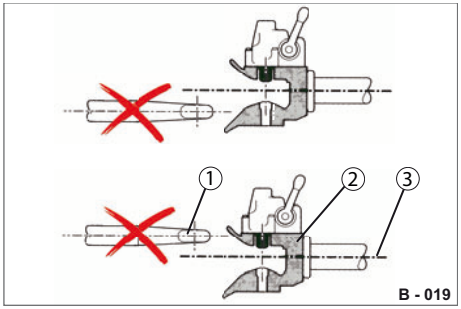


Fig. 24 Incorrect height adjustment

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

- ▶ Reverse the towing machine up to the trailer 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 relative to the towing vehicle.
- ▶ If necessary, have a second person guide you.

- ▶ Disconnect the safety cable (Fig. 23/2).
- ▶ Turn the crank (Fig. 23/1) to the right or left and adjust the height of the draw bar (Fig. 23/3) of the pin coupling (Fig. 25/2) on the towing vehicle.
- ▶ Position the crank downwards.
- ▶ Connect the safety cable.

- ▶ Set the height of the draw bar so that the towing eye meets at the central axis (Fig. 24/3) or slightly on the lower flaps of the catcher.

Coupling process

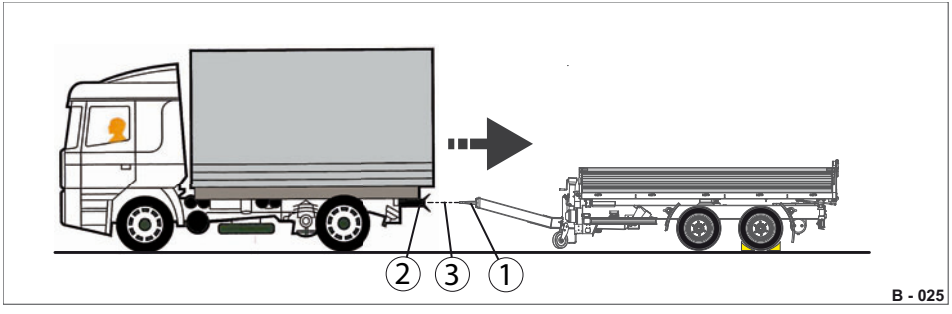


Fig. 25 Coupling

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

- ▶ Open the pin coupling (Fig. 25/2).
- ▶ Leave the danger area between the towing vehicle and trailer.
- ▶ Reverse the towing vehicle so that the towing eye (Fig. 25/1) engages in the pin coupling.

If the coupling is not properly locked:

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

After coupling

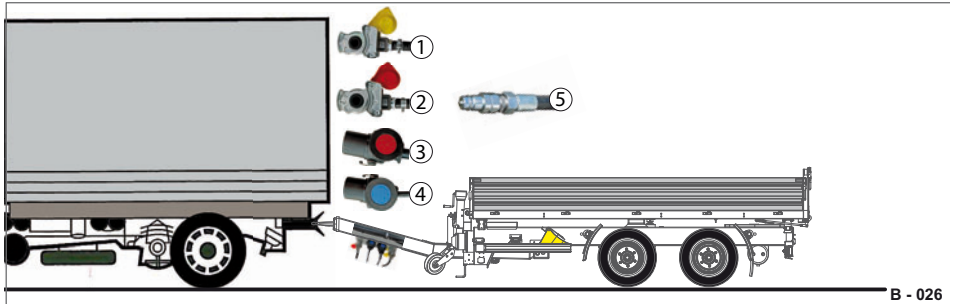


Fig. 26 Establishing connection

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

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

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

(see "Coupling" on page **48**)

▶ If necessary, connect the hydraulic line to the towing vehicle.

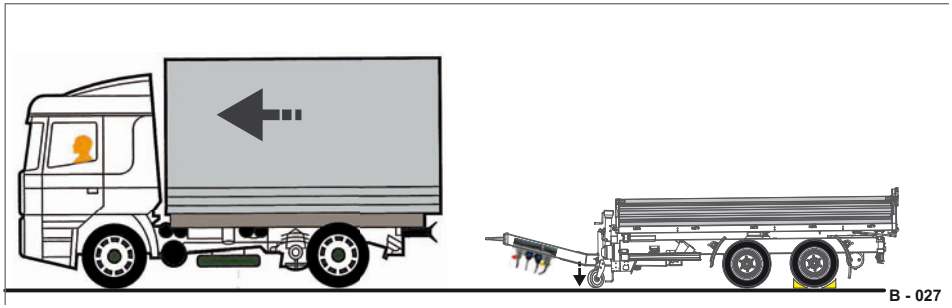
▶ Raise the support equipment.

▶ Put the wheel chocks in their holders and secure them in position.

▶ Release the spindle parking brake.

▶ Carry out a check before driving off (see page **53**).

Uncoupling



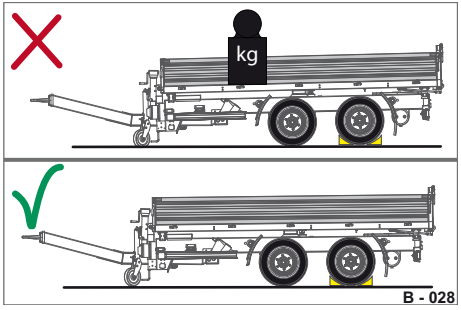


Fig. 27 Correctly uncoupling the trailer

Procedure:

- ▶ Apply the spindle parking brake of the trailer and the towing vehicle parking brake.
- ▶ Use wheel chocks to prevent the trailer from rolling.
- ▶ Extend the support foot of the spindle support or the support wheel until it touches the ground, or until the trailer is approximately horizontal and the towing eye is lifted slightly off the towing coupling.
- ▶ 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
  5. Where applicable, hydraulic line

  (see "Uncoupling" on page **59**)
- ▶ Place the coupling heads in the respective parking socket or put the lines down securely on the draw bar.
- ▶ Unlock and open the pin coupling on the towing vehicle (see page **47**).
- ▶ Wait until there is no-one in the danger area before driving the towing vehicle forward carefully.
- ▶ Close the pin coupling.
- ▶ If necessary, attach parking warning signs to the trailer (see page **95**).
- ▶ Check that the power supply is disconnected (see page **59**).

Check before driving off

- The trailer is properly coupled.
- Brake and supply line are connected.
- Hydraulic line is connected, where applicable.
- Loading platform has been lowered to normal position.
- Spindle parking brake is released.
- Electrical lines and & EBS cable are connected.
- Landing gear is up and secured.
- Side guards are down and secured.
- Drop-sides / extensions / flaps / ramp stowage compartments are closed and secured.
- Toolbox is closed and secured.
- Ramps are stowed away and secured.

Check when parking

- The trailer is properly uncoupled.
- Spindle parking brake is applied.
- Wheel chocks are in place under the wheels.
- Landing gear is extended and secured.
- Brake and supply lines are disconnected and parked.
- Loading platform has been lowered to normal position.
- Electrical lines and & EBS cable are disconnected and parked.
- Hydraulic line is disconnected and parked.
- Drop-sides / extensions / flaps are closed.
- Posts / lashing equipment are stowed away.
- Toolbox is closed.
- Ramps are stowed away and secured.
- Ramp stowage compartments are locked.

Operating the chassis

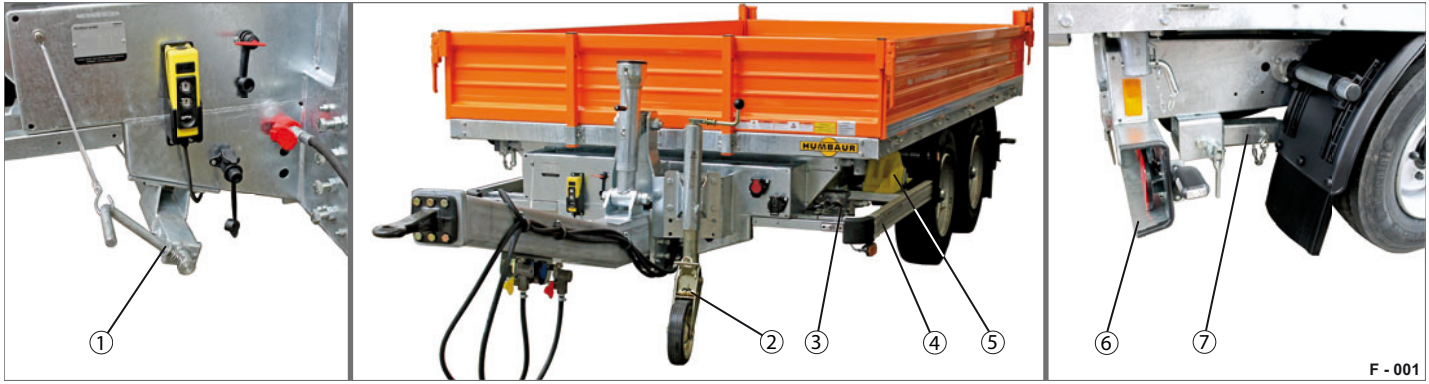


Fig. 1 Operating the chassis

1 Spindle parking brake
2 Support wheel / support equipment
3 Service brake with release valve
4 Side guard
5 Wheel chocks
6 Underrun guard
7 Folding supports (on the rear)

General

The Humbaur GmbH brake system is an Electronic Braking System (EBS) and meets the requirements of EC guideline ECE R13.

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

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

– 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.

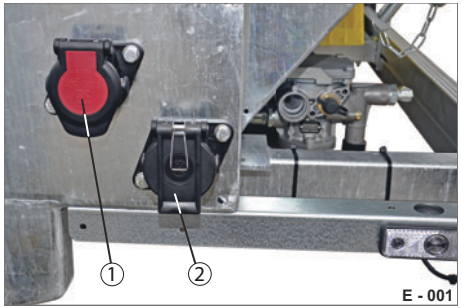


Fig. 2 Standard 24 V sockets

1 Electrical system 24 V, 15-pin socket
2 EBS 24 V, 7-pin socket

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.

Fig. 3 Standard 24 V connectors

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

The EBS module can be programmed at the factory for 24 V or 12 V. Optionally, the EBS module can be programmed to detect 12 to 24 V.

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

The correct cable set for 24 V or 24 V must be used to connect the connection cables to the towing vehicle.

⚠ WARNING

EBS connection cable not connected

The automatic braking force regulation is out of operation, the wheels could lock during braking.

The vehicle will not come to a stop in time - risk of accidents!

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

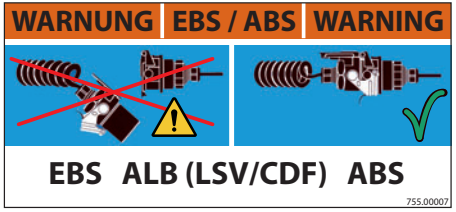


Fig. 4 Label on trailer - example

Observe the operating instructions for your towing vehicle.

⚠ DANGER

Coupling / uncoupling the lines in incorrect order

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

The trailer is unbraked.

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

- ▶ 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 on the coupling head, not on the hose.

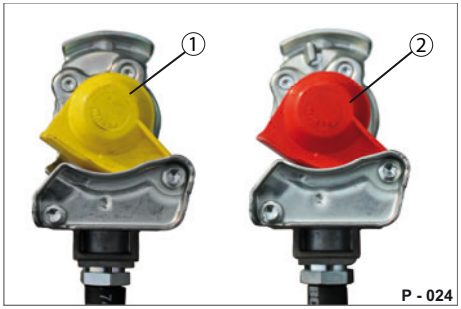


Fig. 5 Brake / supply line disconnected

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

Fig. 6 Duo-Matic quick-release coupling system

1 Coupling head with supply and brake

As an optional version with Duo-Matic quick-release coupling system.

Coupling / uncoupling the lines

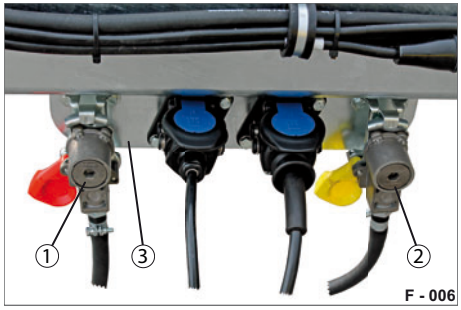


Fig. 7 Connections parked

1 Supply line (red)
2 Brake line (yellow)
3 Parking console for lines

▶ Unscrew the coupling heads from the parking holders on the parking console (Fig. 7/3).

Coupling

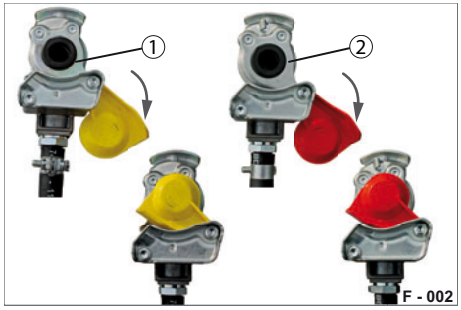


Fig. 8 Coupling

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

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

▶ Connect the "Brake" coupling head (Fig. 8/1).

▶ Connect the "Supply" coupling head (Fig. 8/2).

▶ Release the spindle parking brake (see Page62).

Uncoupling

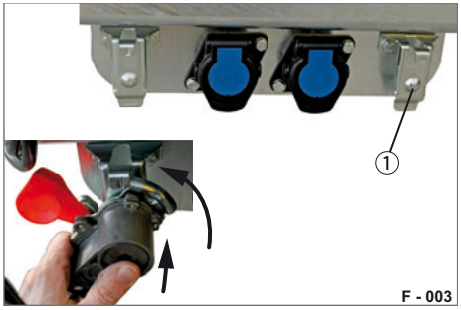


Fig. 9 Uncoupling

1 Parking sockets for coupling heads

▶ Disconnect the "Supply" coupling head (Fig. 8/2).

▶ Disconnect the "Brake" coupling head (Fig. 8/1).

When the supply line is uncoupled, the trailer is braked.

▶ Screw the coupling heads into the parking sockets (see Fig. 7).

This reliably protects the connections / sealing surfaces against contamination and damage.

Operating the service brake for manoeuvring

A trailer which is coupled up but on which the lines have not been connected can be manoeuvred by releasing the service brake.

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

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

The service brake is not a substitute for the function of the spindle parking brake!

At a lower tank pressure of approx. 2.5 bar, it is no longer possible to release the service brake (residual pressure maintenance).

When the supply line is connected to the towing vehicle again, the release valve is automatically switched to driving position (release valve is pressed out / activated with overpressure).

WARNING

Deactivating the service brake with the release valve

The trailer can start to move in an uncontrolled manner and run persons over - risk of accidents!

▶ Before releasing the service brake, check that the trailer is correctly coupled / secured with the spindle parking brake.

WARNING

Closing the release valve with empty compressed air tank

The trailer is not braked, may start to move in an uncontrolled manner and run persons over - risk of accidents!

▶ If the compressed air tank is empty, connect the brake line to the towing vehicle.

WARNING

Parking the trailer with only the service brake applied

The effectiveness of the service brake may be reduced over time. The trailer can start to move in an uncontrolled manner and run persons over - risk of accidents!

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

Deactivating the service brake

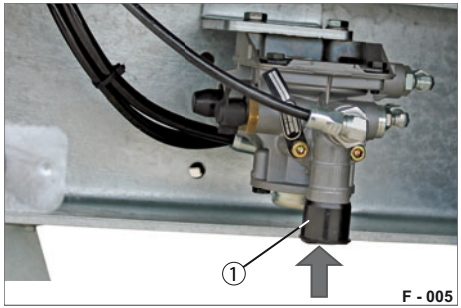


Fig. 10 Releasing the service brake

1 Release valve pressed in

▶ Press the release valve (Fig. 10/1).
The service brake is released.

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

Activating the service brake

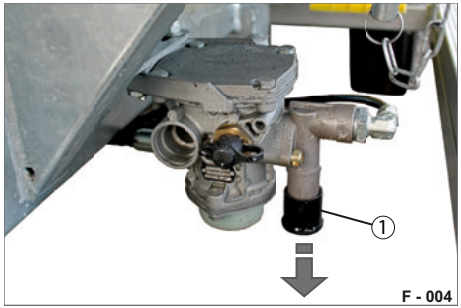


Fig. 11 Service brake in driving position

1 Release valve pulled out

▶ Pull the release valve (Fig. 11/1).
The service brake engages.

The trailer is braked.

Operating the spindle parking brake

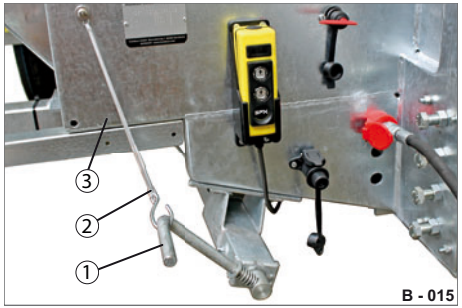


Fig. 12 Spindle parking brake locked in driving position

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

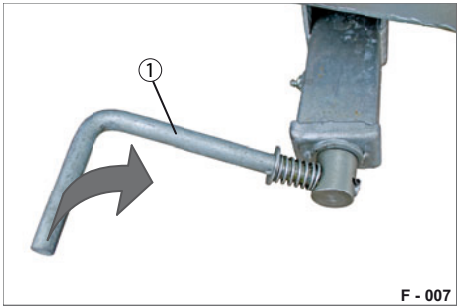


Fig. 13 Applying the spindle parking brake

1 Crank

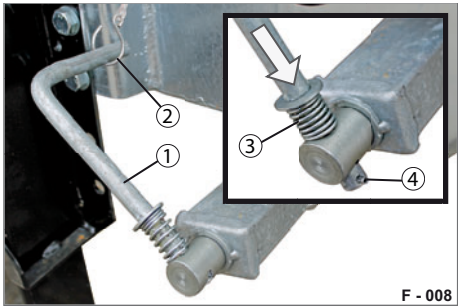


Fig. 14 Spindle parking brake, locked

1 Crank handle
2 Safety cable with hook
3 Pressure spring
4 Pin

The spindle parking brake is operated exclusively by hand.

The spindle parking brake secures the stationary / parked and uncoupled trailer against rolling away.

The spindle parking brake may only be released when the trailer is coupled to the towing vehicle!

Applying the brake

▶ Release the hook (Fig. 12/2) from the crank (Fig. 13/1).

▶ Turn the crank clockwise until the brake is applied.

This brakes the trailer.

Locking the brake in parking position

▶ Press the crank (Fig. 14/1) against the pressure spring (Fig. 14/3).

▶ At the same time, turn the crank handle (Fig. 14/1) so that the pin (Fig. 14/4) engages.

Crank handle points towards the chassis.

▶ Pull the hook of the safety cable (Fig. 14/2) over the crank.

The spindle parking brake is secured against unauthorised release.

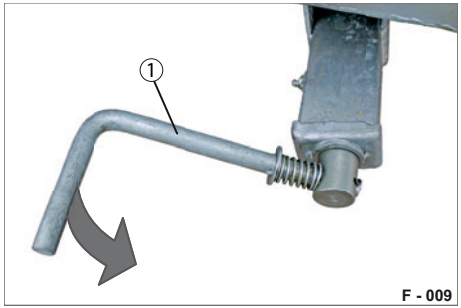


Fig. 15 Releasing the spindle parking brake

1 Crank

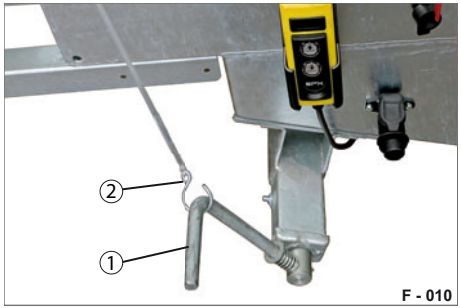


Fig. 16 Spindle parking brake, locked

1 Crank handle
2 Safety cable with hook

Releasing the brake

▶ Release the hook (Fig. 14/2) from the crank (Fig. 15/1).

▶ Turn the crank handle (Fig. 14/1) over.

▶ Turn the crank anti-clockwise as far as the stop.

This releases the brake.

Locking the brake in driving position

▶ Pull the hook of the safety cable (Fig. 16/2) over the crank.

The spindle parking brake is secured and cannot turn by itself.

⚠ WARNING

Driving with the crank unsecured

The crank may be torn off while you are driving - risk of striking!

▶ Before driving off, check that the crank is secured with the safety cable.

Operating the quick-release coupling

As an option, vehicles from Humbaur GmbH can be equipped with the Duo-Matic automatic quick-release coupling system.

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

In uncoupled condition, the coupling heads are automatically closed.

Removing

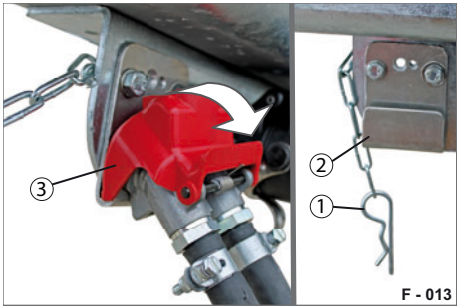


Fig. 17 Duo-Matic on the parking console

1 Safety cable with spring pin
2 Parking console
3 Cover, Duo-Matic coupling

▶ Pull the spring pin (Fig. 17/1) out of the parking console (Fig. 17/2).

▶ Press the cover (Fig. 17/3) off and remove the Duo-Matic coupling from the parking console.

Coupling

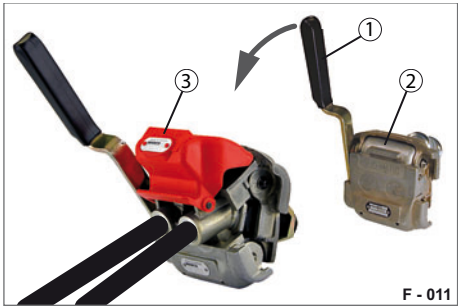


Fig. 18 Duo-Matic, coupled

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

▶ Make sure that the sealing surfaces on the coupling head and the quick-release coupling socket are clean.

▶ Clean the surfaces with a clean cloth, if necessary.

▶ Push the handle (Fig. 18/1) of the Duo-Matic quick-release coupling socket downwards and slide the Duo-Matic coupling head (Fig. 18/3) under the opened protective cover.

▶ Release the handle.

The connection is established.

Uncoupling

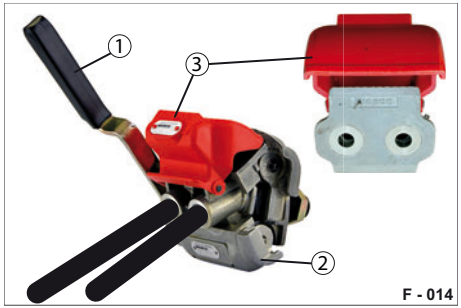


Fig. 19 Duo-Matic, uncoupled

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

▶ Pull the handle (Fig. 19/1) of the Duo-Matic quick-release coupling socket upwards and pull the Duo-Matic coupling head (Fig. 19/3) out from under the protective cover.

The connection is severed.
The cover automatically closes the coupling head and protects it against contamination and damage.

Parking

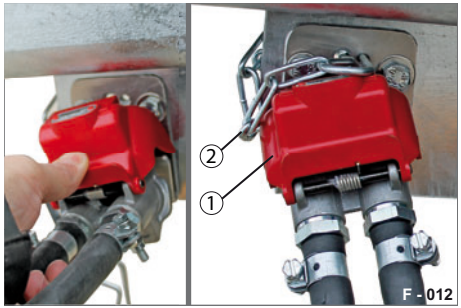


Fig. 20 Duo-Matic, parked

1 Cover, Duo-Matic coupling
2 Safety chain with spring pin

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

▶ Insert the spring pin (Fig. 20/2) into the bores.

The Duo-Matic coupling is secured against falling.

Pressure level in the compressed air tank

The compressed air supplied from the towing vehicle (up to 10 bar) to the trailer via the supply line has a maximum operating pressure of 8.5 bar (depending on the switch-off pressure of the compressor in the towing vehicle). With an uncoupled trailer, the supply pressure may fall as a result of:

– Leakage in the brake system or
– Multiple actuation of the release 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.

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

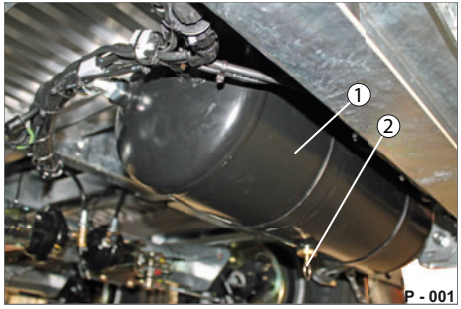


Fig. 21 Compressed air tank

1 Compressed air tank, on the rear
2 Drain valve

Draining the compressed air tank

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

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

⚠ WARNING

Condensate in the compressed air system

The brake system can be destroyed or fail.

▶ Drain the compressed air system regularly.

⚠ CAUTION

Escaping compressed air

Actuating the drain valve causes a lot of noise.

This can cause tinnitus and hearing damage.

▶ Wear  .

⚠ CAUTION

Working under the trailer

You could hit your head.

▶ Avoid jerky movements.

▶ Use an operating pole to drain the valves.

▶ Wear  .

NOTICE

Compressed air system / valve freezing

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

▶ Use antifreeze.

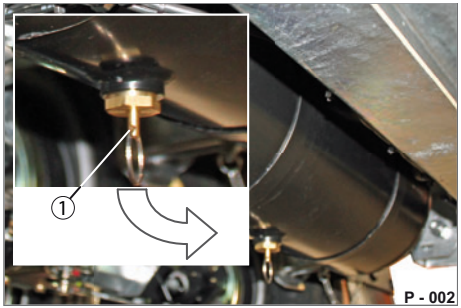


Fig. 22 Compressed air tank

1 Operating pin

▶ Pull the operating pin (Fig. 22/1) or push it to one side.

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

▶ Release the operating pin (Fig. 22/1) when no more condensate emerges.

The drain valve closes automatically.

▶ Repeat the work steps for all drain valves.

Hydraulic system

The trailer's telescopic cylinder, which tips the loading platform, is powered hydraulically.

The hydraulic unit is designed as a 1-circuit system.

The hydraulic unit is filled with hydraulic oil of type HLP ISO 46 at the factory and commissioned.

As standard, the trailer is supplied with the required pressure via the hydraulic line from the towing vehicle. Optionally, an electro-hydraulic unit can be fitted.

⚠ DANGER

Excessive operating pressure

The maximum permissible pressure is exceeded - the lines may burst / components may be damaged.

Escaping oil can cause injury - risk of accidents!

- ▶ Comply with the specified maximum oil pressure and oil quantity - see label on the trailer.
- ▶ Contact your specialist workshop if the hydraulic system is defective.

⚠ WARNING

Lines are under pressure

The hydraulic line is under pressure during decoupling.

The oil can escape under high pressure and cause cuts or lacerate skin.

- ▶ Before uncoupling, check that the lines are depressurised and that the towing vehicle is switched off.
- ▶ Wear  .

NOTICE

Use of incorrect / spent hydraulic oil

The hydraulic system (hoses, connections, cylinder) may corrode rapidly and fail.

- ▶ Use only hydraulic oils of groups HL, HLP and HPLD, e.g. HLP ISO 46.

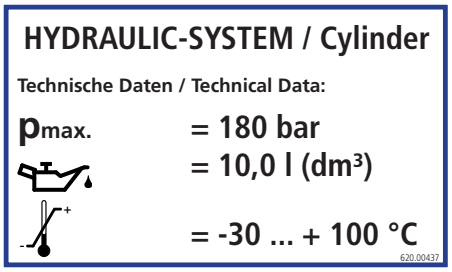


Fig. 23 Label on trailer

1 Max. oil pressure (Pmax.): 180 bar
2 Max. oil quantity: 10 l
3 Operating temperature: -30 °C / + 100 °C

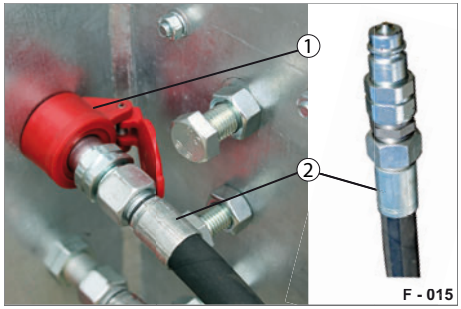


Fig. 24 Hydraulic line for towing vehicle

1 Parking socket
2 Line connection (SVK BG3)

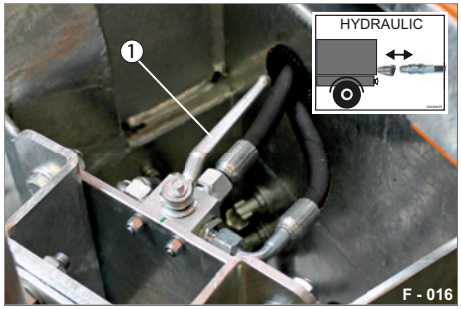


Fig. 25 Switchover of hydraulic supply

1 Lever position: for towing vehicle

Read the operating manual for the towing vehicle for information on the hydraulic supply of the trailer.

The hydraulic system of the towing vehicle must have the required oil quantity and must not exceed the maximum permissible operating pressure.

The lever (Fig. 25/1) is switched to the position for supply from the towing vehicle.

Coupling

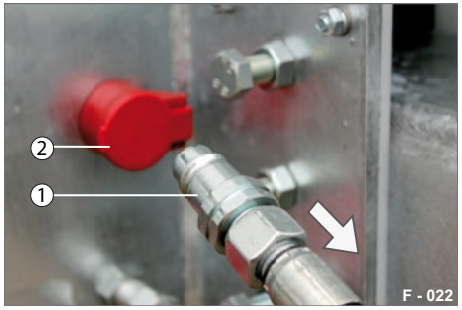


Fig. 26 Hydraulic line, connecting

1 Line connection
2 Parking socket

- ▶ Make sure that the line connection for the hydraulics (Fig. 26/1) is clean.
- ▶ If necessary, wipe it with a clean cloth.
- ▶ If necessary, check the hydraulic oil level of your towing vehicle.
- ▶ Plug the line connection into the socket of the towing vehicle.

  Starting the towing vehicle builds up the pressure.

Tipping the loading platform

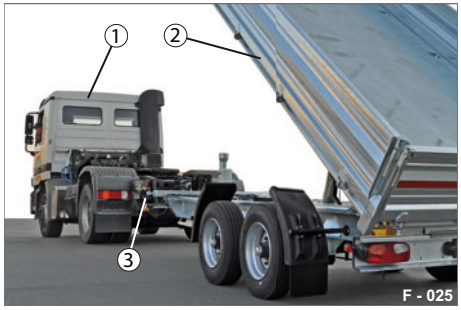


Fig. 27 Loading platform, tipped (example illustration)

1 Towing vehicle
2 Loading platform
3 Hydraulic connection

The loading platform is activated from the control point on the towing vehicle.

- ▶ Before tipping the loading platform, check that the trailer is coupled to the towing vehicle and secured against rolling away.
- ▶ Check that the tipping bearings have been set correctly / for the desired tipping operation and secured.

Uncoupling

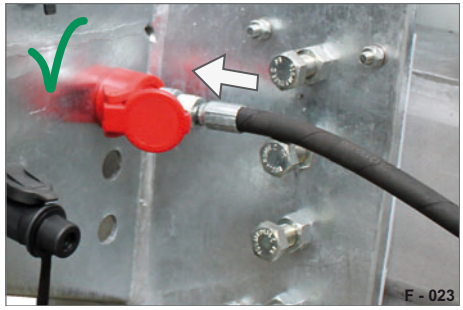


Fig. 28 Hydraulic line, parking

The line must not be under pressure during uncoupling.

- ▶ Pull the line connection out of the socket of the towing vehicle.
- ▶ Park the line connection in the parking socket on the front wall.

Electro-hydraulic unit (optional)

The electro-hydraulic unit comprises the electric pump, oil tank and batteries and is integrated in the chassis.

The electric pump is supplied with 12 V by means of a battery.

The oil tank is filled with hydraulic oil at the factory and commissioned.

The electro-hydraulic unit can be activated / deactivated via the plug-in switch on the front wall.

Switchover to electro-hydraulic supply is effected via a switch lever on the front wall.

WARNING

Danger when handling batteries

The batteries can explode as a result of sparking or short circuits.

- ▶ Avoid short circuits or sparking.
- ▶ Do not place any tools / objects on the batteries.
- ▶ Cover the battery poles before starting work on the batteries.
- ▶  Do not smoke or allow naked flames near the batteries.

WARNING

Escaping battery acid

Battery acid is corrosive and can cause chemical burns if it comes into contact with the skin.

- ▶  Consult a doctor immediately in the event of chemical burns.

WARNING

Hot batteries

Bridged batteries can become hot - risk of burns!

- ▶  Allow bridged batteries to cool down before commencing work on them.

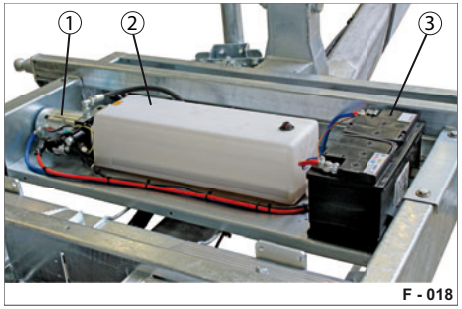


Fig. 29 Electro-hydraulic unit

1 Electric pump
2 Hydraulic oil tank
3 Batteries (12 V)

Maintenance / servicing work on the electro-hydraulic unit may only be performed by qualified specialists in a specialist workshop!

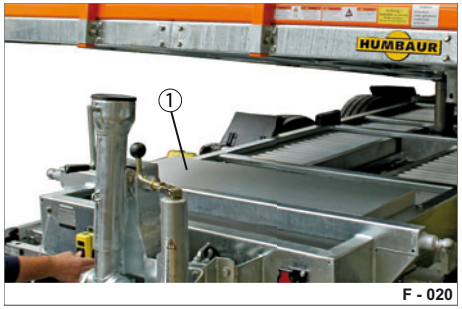


Fig. 30 Unit closed

1 Cover

The raised loading bridge must be secured with the maintenance support when working on the electro-hydraulic unit!

See the Maintenance section starting on page **171**.

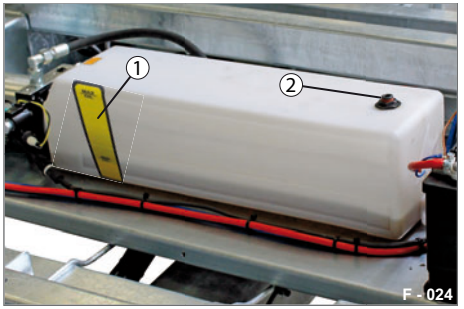


Fig. 31 Oil filling quantity

1 Control strip for oil level (min. / max.)
2 Filling port

You can read off the oil level in the oil tank on the control strip (Fig. 31/1).

The oil level must lie between the min. and max. limits.

Follow the safety instructions on handling hydraulic oil in the chapter Maintenance.

Tipping the loading platform electro-hydraulically

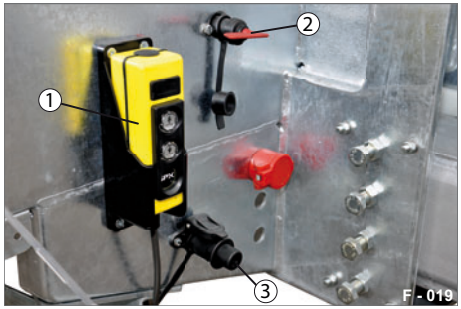


Fig. 32 Electro-hydraulics control point

1 Remote control
2 Plug-in switch (ON / OFF)
3 Battery charging point (12 V)

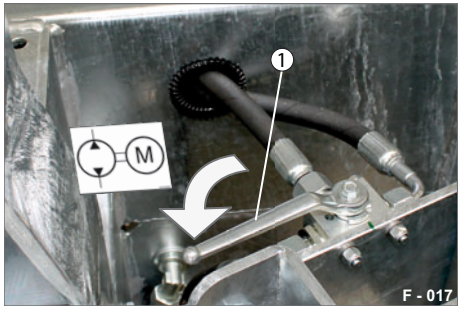


Fig. 33 Switchover Hydraulic supply

1 Lever position: for electro-hydraulic pump

Fig. 34 Tipping the loading platform

1 Operating button: Raise
2 Plug-in switch: switched to ON

The loading platform is operated via remote control.

▶ Before tipping the loading platform, check that the trailer is coupled to the towing vehicle and secured against rolling away.

▶ Insert the plug-in switch (Fig. 32/2).

▶ Check that the tipping bearings have been attached correctly / in the desired position and secured.

▶ Turn the lever (Fig. 33/1) anti-clockwise.

The hydraulic supply is switched over to the electro-hydraulic unit.

▶ Turn the plug-in switch (Fig. 34/2) to ON position.

▶ Press and hold the operating button (Fig. 34/1) until the loading platform has reached the desired position.

When the max. loading bridge position is reached, the electric pump switches off via the limit switch.

Lowering the loading platform to normal position electro-hydraulically

Fig. 35 Lowering the loading platform to normal position

1 Operating button: Lower

▶ Press and hold the operating button (Fig. 35/1) until the loading platform is lying fully on the chassis again.

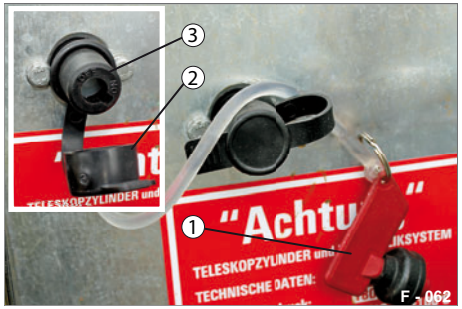


Fig. 36 Electro-hydraulics switched off

1 Plug-in switch
2 Cap
3 Socket ON / OFF

Switching off the power supply

▶ Turn the plug-in switch (Fig. 36/1) to OFF position.

▶ Remove the plug-in switch.

▶ Fit the cap (Fig. 36/2) onto the socket (Fig. 36/3).

▶ Keep the plug-in switch (Fig. 36/1) in a safe place.

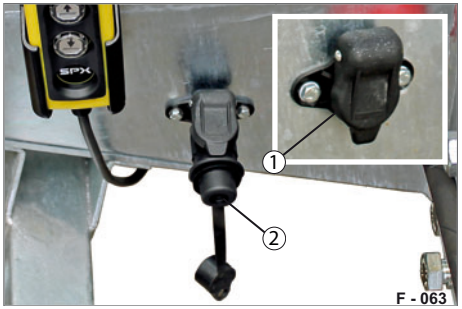


Fig. 37 Battery charging point

1 Socket, closed
2 Charging plug (12V)

Charging the battery

If the battery power runs low, the battery can be charged via the charging point.

Follow the instructions / safety instructions from the manufacturer of the charging device.

For details of the design of the charging plug, see the section Maintenance on page **171**.

▶ Charge the battery regularly and completely.

Securing the loading platform

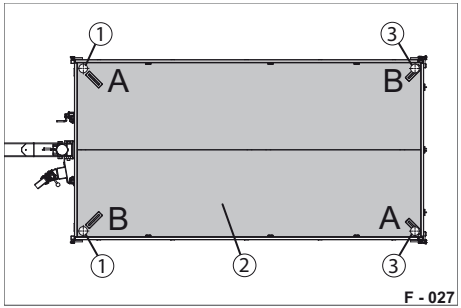


Fig. 38 Loading platform tipping bearings

1 Front tipping bearings (fork tipping bearings)
2 Loading platform
3 Rear tipping bearings (ball tipping bearings)

The loading platform is bearing-mounted at 4 corner points.

The corresponding tipping bearings must be operated in order to tip the loading platform.

The loading platform can be tipped to the rear or to either side (right or left).

Before changing the setting of the tipping bearings, the loading platform must be lowered completely onto the vehicle chassis!

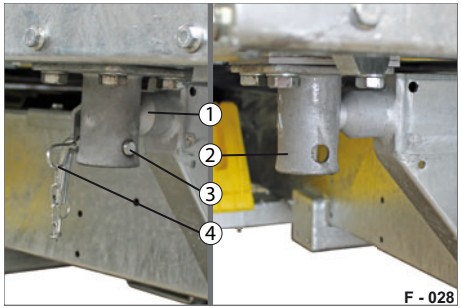


Fig. 39 Tipping bearings

1 Ball bearing, on the chassis
2 Tipping bearing, released
3 Tipping bearing, fastened with securing pin
4 Spring pin

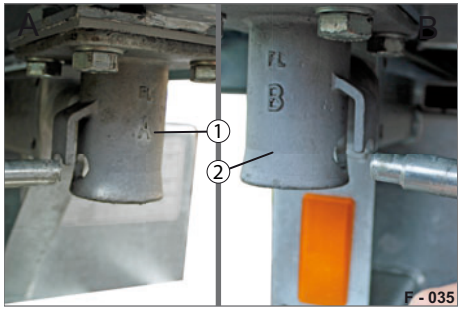


Fig. 40 Tipping bearing version A & B

1 Tipping bearing A
2 Tipping bearing B

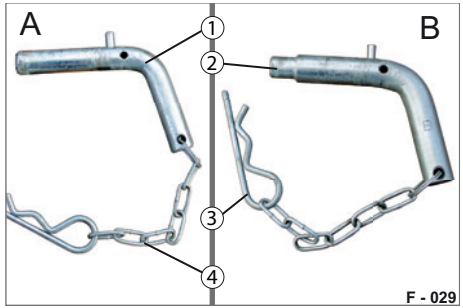


Fig. 41 Securing pin version

1 Securing pin version A
2 Securing pin version B, with extension
3 Spring pin
4 Chain

The loading platform must never be secured with diagonally fastened tipping bearings!

Use only the original securing pins to fasten the bearings!

The securing pins are present in two different versions. The tipping bearings have different bores (tipping bearings A & B). This prevents diagonal securing of the load platform.

Fastening the tipping bearings

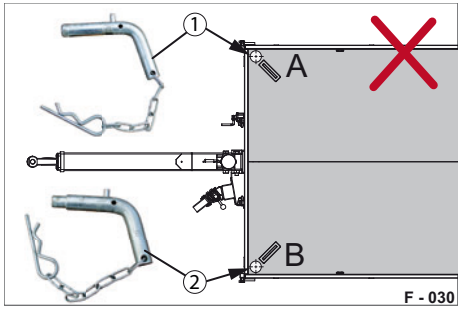


Fig. 42 Securing pins inserted only at the front

1 Securing pin version A
2 Securing pin version B, with extension

WARNING

Tipping the loading platform forward

The load slides forward and deforms the loading platform / drop-side / chassis - risk of crushing / striking!

▶ Never tip the loading platform forwards - the securing pins must not both be attached at the front.

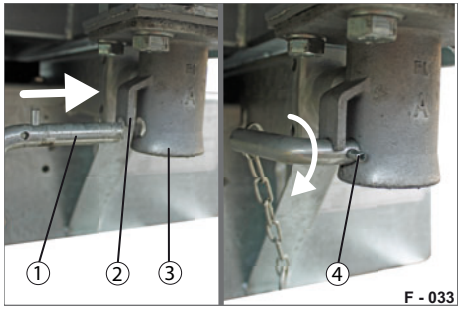


Fig. 43 Inserting the securing pins

1 Securing pin
2 Safety latch
3 Tipping bearing cup
4 Pin
5 Spring pin with chain

Inserting

▶ Insert the securing pin (Fig. 43/1) as far as the stop.

▶ Turn the securing pin and push it in further so that the pin (Fig. 43/4) engages behind the safety latch (Fig. 44/2).

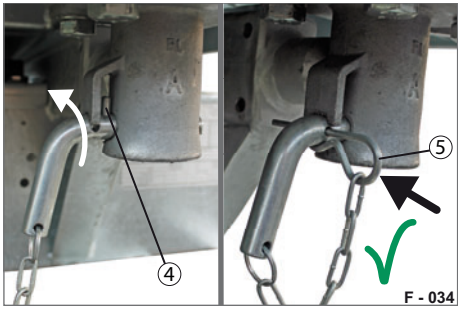


Fig. 44 Securing pin, fastened

Securing

▶ Insert the spring pin (Fig. 44/5) through the bore in the securing pin.

The securing pin is secured against falling out.

Releasing

▶ Remove the spring pin (Fig. 44/5).

▶ Turn the securing pin (Fig. 43/1) so that the pin (Fig. 43/4) is free of the safety latch (Fig. 44/2).

▶ Remove the securing pin completely.

Fastening the bearings for tipping towards the rear

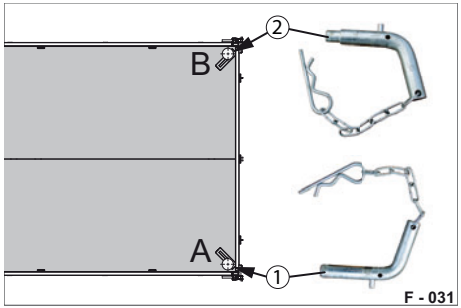


Fig. 45 Securing pins inserted at the rear

1 Securing pin A
2 Securing pin B, with extension

▶ Insert and fasten the securing pins (Fig. 45/1 & Fig. 45/2) in the rear tipping bearings.

The front tipping bearings are released.

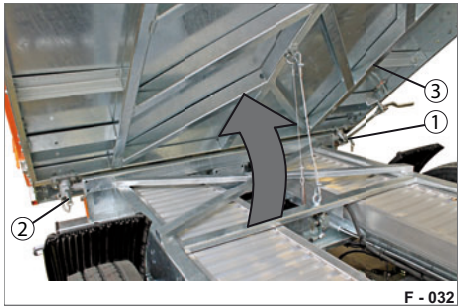


Fig. 46 Tipping the loading platform towards the rear

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

Observe and comply with all safety precautions for loading / unloading the trailer.

See the section Operation starting on page **38**.

▶ Unlock and open the rear platform gate (Fig. 47/2).

Fig. 47 Loading platform fully tipped

1 Loading platform, fully raised
2 Rear platform gate, hinge-mounted

▶ The loading platform (Fig. 47/1) can be tipped hydraulically towards the rear (see page **68**).

Fastening the bearings for tipping to the side

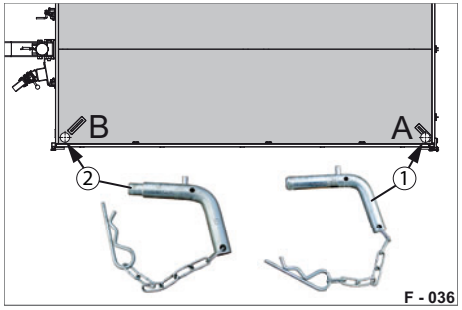


Fig. 48 Securing pins inserted on the left in the direction of travel

1 Securing pin A
2 Securing pin B, with extension

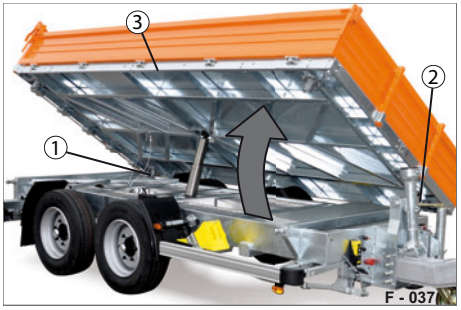


Fig. 49 Loading platform tipped to the side

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

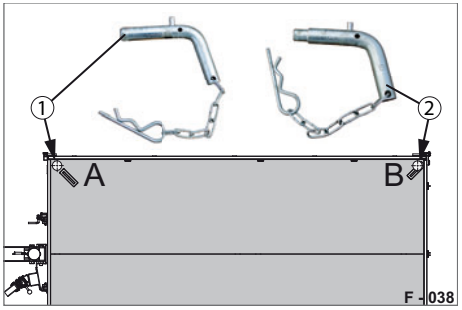


Fig. 50 Securing pins inserted on the right in the direction of travel

1 Securing pin A
2 Securing pin B, with extension

▶ Insert and fasten the securing pins (Fig. 48/1 & Fig. 48/2) on the left side of the trailer.

The tipping bearings on the right side of the trailer are released.

Observe and comply with all safety precautions for loading / unloading the trailer.

See the section Operation starting on page **38**.

▶ Fold down the drop-side on the respective side of the trailer.

▶ The loading platform can be tipped hydraulically to the side (see page **68**).

▶ Insert and fasten the securing pins (Fig. 48/1 & Fig. 48/2) on the right side of the trailer.

The tipping bearings on the left side of the trailer are released.

Operating the folding supports

⚠ 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 the folding supports extended

The folding supports can touch down on the road during the journey and be torn off - risk of accidents!

- ▶ Before driving off, check that the folding supports are raised and secured.

⚠ WARNING

Loading / unloading without extending the folding supports

Loading / unloading without folding down the support feet can make the trailer unstable.

The trailer can tip over - risk of crushing!

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

⚠ CAUTION

Working under the trailer

You could hit your head.

- ▶ Avoid jerky movements.
- ▶ Only operate the folding supports if the drop-sides are closed.

⚠ CAUTION

Operating the folding supports

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

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

Pulling the folding supports out

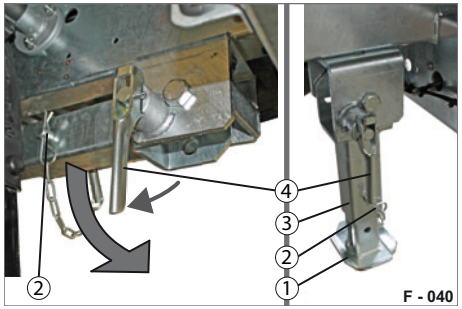


Fig. 51 Folding support lowered

1 Adjustable foot
2 Securing pin with spring pin
3 Folding support
4 Spring bar

▶ Pull the spring bar (Fig. 51/4) into horizontal position.
The folding support (Fig. 51/3) is unlocked and folds down.

▶ Release the spring bar (Fig. 51/4).
The spring bar locks into position automatically when the folding support is fully extended.

▶ Check that it has locked in place.

Adjusting

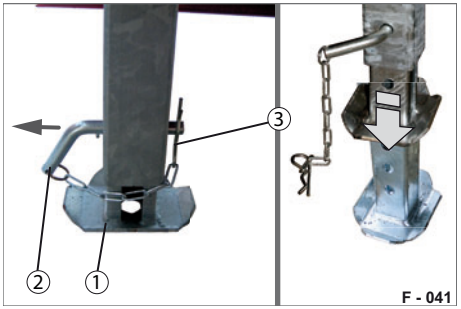


Fig. 52 Adjusting the foot

1 Adjustable foot
2 Socket pin
3 Spring pin

▶ Remove the spring pin (Fig. 52/3) from the securing pin (Fig. 52/2).

▶ Remove the securing pin (Fig. 52/2).

▶ Extend the adjustable foot (Fig. 52/1) downwards until it can be engaged in a lower bore.

▶ Push the securing pin through the holes.

▶ Fasten the securing pin in place with the spring pin.

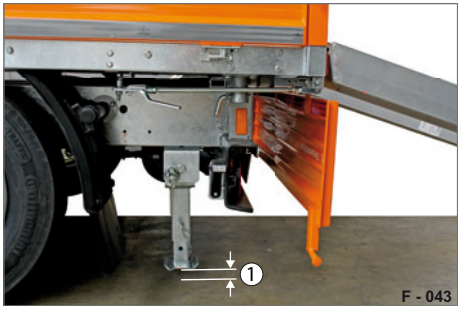


Fig. 53 Folding support extended

1 Distance from subsurface (approx. 3 - 5 cm)

▶ After folding down and if necessary adjusting the folding supports, check that a gap (Fig. 53/1) remains between subsurface and footplate.
During loading / unloading of the vehicle, the chassis will settle on the axle suspension and lower the folding supports onto the subsurface.

Pushing the folding supports in

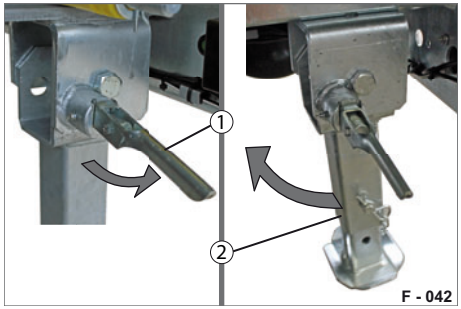


Fig. 54 Folding support in driving position

1 Spring bar
2 Folding support

▶ Fold the support foot (Fig. 52/1) up and secure it with the securing pin (Fig. 52/2) and spring pin (Fig. 52/3).

▶ Pull the spring bar (Fig. 54/1) into horizontal position.

▶ Fold the folding support (Fig. 54/2) up (into horizontal position) and lock it in place with the spring bar (Fig. 54/1).

The spring bar engages.

Checking the position

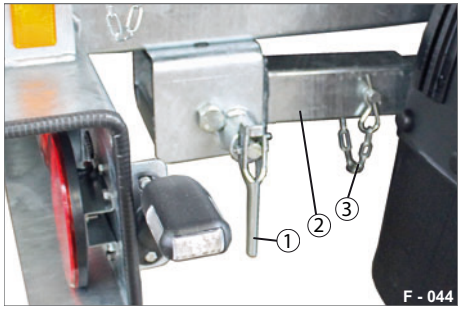


Fig. 55 Driving position

1 Spring bar, engaged
2 Folding support, folded up
3 Securing pin, inserted / secured

▶ Before driving off, check that both folding supports are in driving position (see Fig. 55).

Operating the support wheel

The support wheel supports the draw bar when the trailer is uncoupled.

⚠ WARNING

Driving with the support wheel lowered

The support wheel can touch down on the road during the journey and be torn off - risk of accidents!

▶ Before driving off, check that the support wheel is fully cranked up and secured.

⚠ WARNING

Support wheel sinks into soft ground

On soft / sagging ground, the support wheel can sink in.

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 the support wheel lowered

The load is too great for the support wheel and the wheel is deformed. When uncoupled, the front of the trailer will drop - risk of crushing!

▶ Never manoeuvre with the support wheel lowered.

⚠ CAUTION

Operating the support wheel

There is a risk of crushing your hands / fingers / feet.

▶ Operate the support wheel carefully.

▶ Wear  ,  .

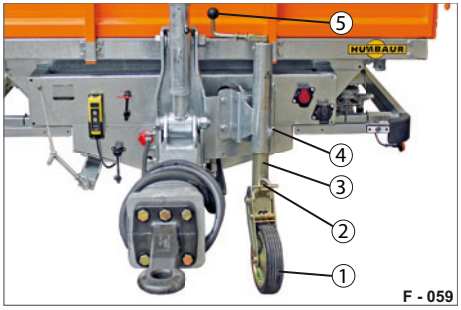


Fig. 56 Support wheel, semi-automatic

1 Support wheel (up to 800 kg)
2 Eyelet
3 Adjustment tube
4 Hook
5 Crank, retractable

Raising the support wheel

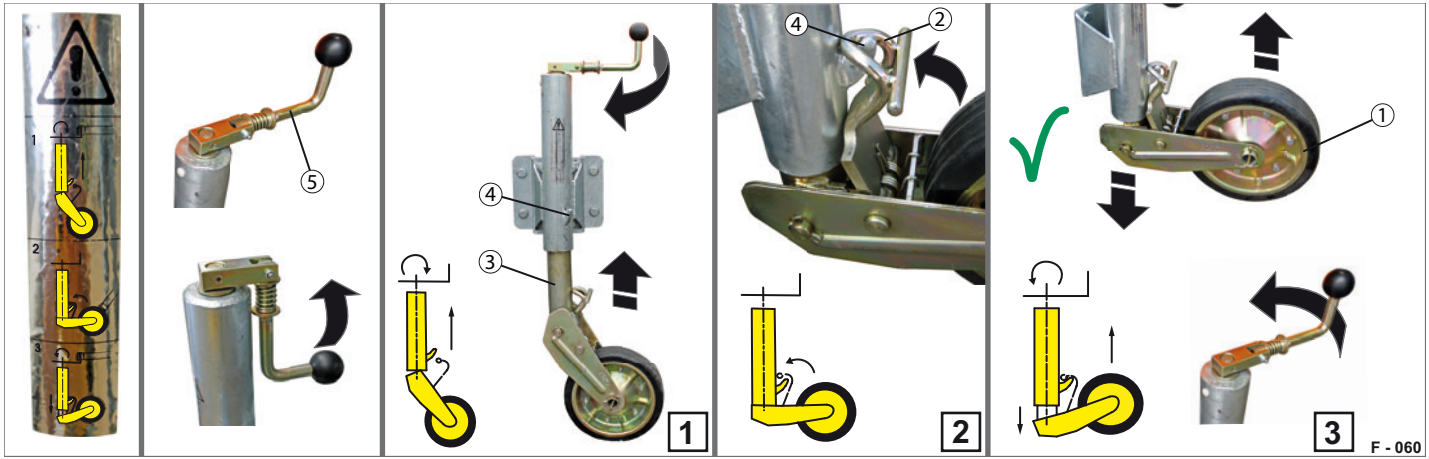


Fig. 57 Support wheel raised / secured

The support wheel must not be raised until the trailer has been coupled to the towing vehicle.

- ▶ Extend the crank (Fig. 57/5). Press against the spring.
- ▶ Turn the crank clockwise until the eyelet (Fig. 57/2) is located over the hook (Fig. 57/4). If necessary, position the wheel by hand.
- ▶ Turn the crank anti-clockwise until the support wheel (Fig. 57/1) is fully raised.

  The support wheel is tensioned.
- ▶ Fold the crank (Fig. 57/5) in.

  The support wheel is raised and secured.

Lowering the support wheel

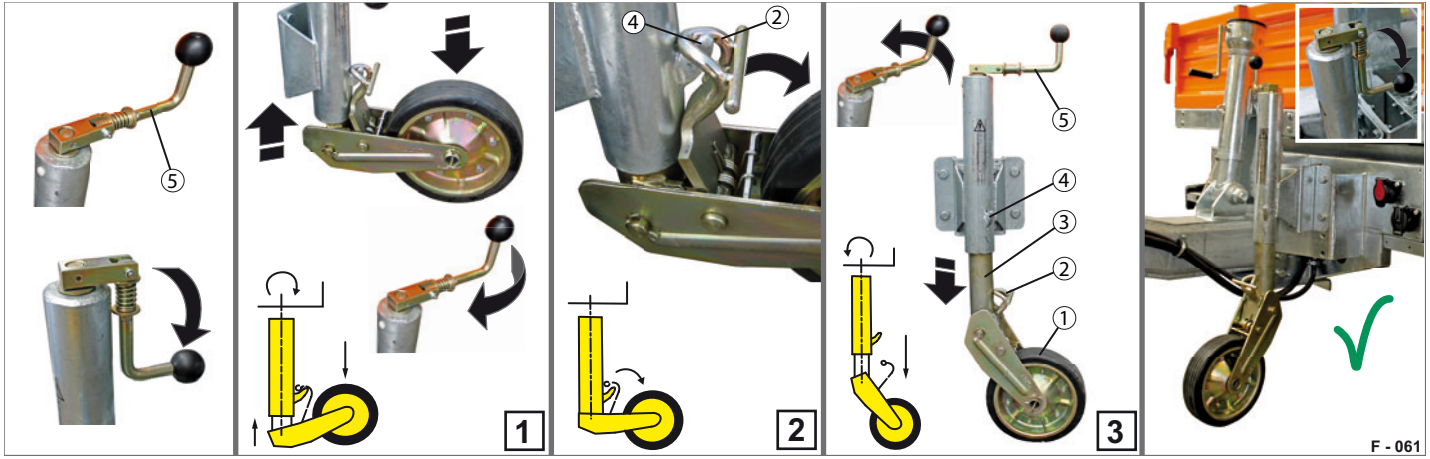


Fig. 58 Support wheel raised / secured

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

- ▶ Extend the crank (Fig. 58/5). Press against the spring.
- ▶ Turn the crank clockwise until the eyelet (Fig. 58/2) can be removed from the hook (Fig. 58/4). Lift the wheel out by hand.

  The support wheel is no longer secured.
- ▶ Turn the crank anti-clockwise until the support wheel (Fig. 58/1) rests on the ground.
- ▶ Fold the crank (Fig. 58/5) in.

  The support wheel is lowered and supports the draw bar.

Operating the support equipment

⚠ 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

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 the support feet lowered

The support equipment can touch down on the road during the journey and be torn off - risk of accidents!

▶ Check that the support equipment is completely raised before driving off.

▶ Before driving off, check that the hand crank is secured with the safety cable.

For details of operation, read the manufacturer's operating manual.

Always observe the following:

– Support equipment may only be operated with the hand crank.

– The support feet of the support equipment must be lowered until they touch the ground.

– When cleaning with a high-pressure cleaner, avoid directing jets of water at the gearing of the support equipment.

Lowering

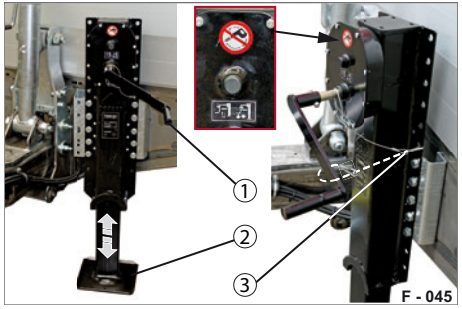


Fig. 59 Support foot extended

1 Hand crank
2 Support foot
3 Safety cable

- ▶ Release the safety cable (Fig. 59/3) from the hand crank (Fig. 59/1).
- ▶ Crank the support foot (Fig. 59/2) down with the hand crank - at high speed - until it almost touches the ground.

Activating the load gear

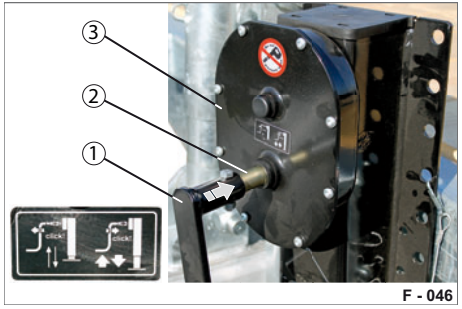


Fig. 60 Switching the load gear on

1 Hand crank
2 Crankshaft
3 Gearing

- ▶ Press the hand crank in until the selector interlock mechanism in the gearing engages.
- ▶ Crank the support foot (Fig. 59/2) down completely until it touches the ground.
- ▶ If necessary, compensate for uneven ground so that the trailer is in a horizontal position.
- ▶ Leave the crankshaft (Fig. 60/2) in load gear (pressed in).
- ▶ Secure the hand crank with the safety cable (Fig. 61/3).

Raising / securing

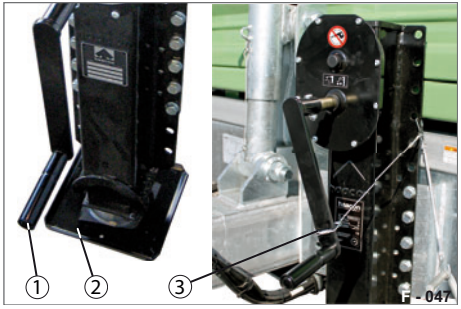


Fig. 61 Support foot raised

1 Hand crank
2 Support foot
3 Safety cable

- ▶ Crank the support foot (Fig. 61/2) up completely - only after coupling the trailer.
- ▶ Press the crankshaft (Fig. 60/2) into the load gear.
- ▶ Lay the safety cable (Fig. 61/3) around the hand crank and secure it with the hook.

  The hand crank is secured against turning while the vehicle is in motion.

Side guard

The side guard is used as approach protection.

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

It is illegal to drive without a side guard.

Fig. 62 Side guard, fixed

1 Side guard on right, direction of travel
2 Retaining bracket

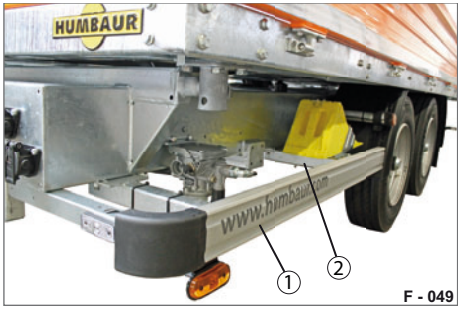


Fig. 63 Side guard, fixed

1 Side guard on left, direction of travel
2 Retaining bracket

DANGER

Driving without side guard / with damaged side guard

This does not provide sufficient lateral approach protection.

Persons can be pushed under the chassis - risk of accidents

- ▶ Before driving off, check that the side guard is fitted and undamaged.
- ▶ Have a damaged side guard repaired immediately.

CAUTION

Climbing on the side guard

The side guard is not designed to be climbed on - risk of falling!

- ▶ Do not climb onto the side guard.

The side guard is attached in fixed position on the right (Fig. 62) and left (Fig. 63) in the direction of travel.

Underrun guard

Fig. 64 Rear end of the trailer

1 Underrun guard

The underrun guard (Fig. 64/1) is a safety component which prevents vehicles being pushed under the chassis in the event of an accident.

Driving with a deformed / damaged underrun guard is illegal.

Operating the spare wheel

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:

- Road Traffic Regulations (StVO in Germany)
- Road traffic licensing 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)
- A suitable high-visibility vest must be worn when carrying out work in moving traffic

⚠ WARNING

Unsecured spare wheel

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

▶ Check that the spare wheels are properly secured before driving off.

⚠ WARNING

Loading / removing spare wheel

Hands and feet can be crushed between the spare wheel, trailer parts and the ground.

▶ Wear  ,  ,  .

▶  Wheels are heavy! Work in pairs.

⚠ WARNING

Working under the trailer

This can result in striking and crushing injuries.

▶ Make sure that the vehicle is secured against rolling away.

▶ Wear  ,  ,  .

▶ Avoid jerky movements.

⚠ WARNING

Spare wheel on the loading platform

Risk of falling from the loading platform when trying to ply the spare wheel out of its storage space!

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

▶  Wheels are heavy! Work in pairs

Spare wheel transport

The spare wheels can be transported as follows:

– on the loading platform, lashed down
– in the holder on the front wall

Spare wheel, spare wheel holder and securing elements must be attached correctly to prevent them being lost. If spare wheels are transported loose (on the loading platform), they must be securely lashed down.

Spare wheels may only be transported in the spare wheel storage compartment / holder provided.

NOTICE

Overtightening spare wheel nuts

The wheel rim can be deformed.

▶ Tighten the spare wheel nuts to a maximum of 80 Nm.

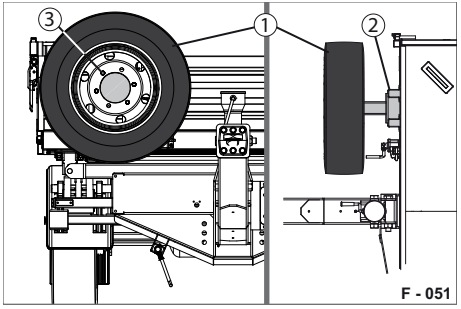


Fig. 65 Spare wheel on the front wall

1 Spare wheel
2 Spare wheel holder
3 Spare wheel nuts

▶ Check the tyre pressure of the spare wheel regularly.

▶ Check regularly that the spare wheel is firmly seated (max. 80 Nm).

Removing

▶ Unscrew and remove all 4 spare wheel nuts (Fig. 65/3). Hold the spare wheel in position as you do so.

▶ Working with another person, remove the spare wheel from the spare wheel holder (Fig. 65/2). If necessary, use tools to help you.

▶ Screw the 4 spare wheel nuts onto the spare wheel holder.

Attaching

▶ Working with another person, place the spare wheel (Fig. 65/1) on the bolts of the spare wheel holder (Fig. 65/2).

▶ Screw the spare wheel tight (max. 80 Nm) with 4 spare wheel nuts (Fig. 65/3).

General

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

On upward/downward slopes, during loading and unloading and when it is uncoupled, the trailer must be secured with wheel chocks in addition to the parking brake.

⚠ WARNING

Parking the trailer on a slope

The service brake can give way, causing the trailer to roll - risk of accidents!

- ▶ On slopes, secure the trailer additionally using wheel chocks.
- ▶ Only put the wheel chocks under rigid axles.
- ▶ Replace lost or damaged wheel chocks.

⚠ WARNING

Unsecured wheel chocks

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

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

⚠ CAUTION

Operating wheel chocks under the chassis

You could hit your head on the chassis.

- ▶ Operate the wheel chock slowly and carefully.
- ▶ Avoid jerky movements.

Operating wheel chocks

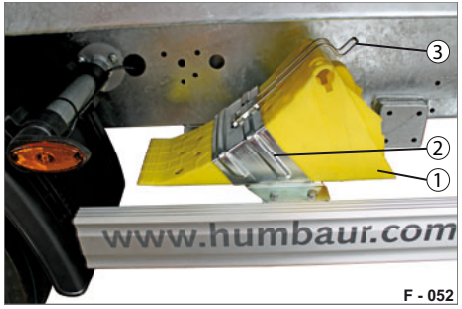


Fig. 66 Wheel chocks, parked

1 Wheel chock
2 Holder
3 Retaining spring

Removing the wheel chock

▶ Press the retaining spring (Fig. 66/3) away from the wheel chock.

▶ Remove the wheel chock (Fig. 66/1).

Fitting the wheel chock

▶ Place the wheel chock in the holder (Fig. 66/2).

▶ The retaining spring (Fig. 66/3) snaps into place.

The wheel chock is secured.

Using wheel chocks

Fig. 67 Wheel chocks in place

1 Wheel chock

▶ Place the wheel chocks (Fig. 67/1) under the wheel with their full surface against the wheel.

Observe the angle of inclination of the trailer, e.g. on slopes.

Make sure that both wheel chocks are always present.

Replace lost or damaged wheel chocks immediately.

General

A lockable toolbox is available as an option.

The location depends on the other equipment on the trailer.

The toolbox is used to stow lashing straps, tools, cleaning utensils, etc.

The toolbox serves as a substitute for the side guard.

The toolbox is not waterproof.

⚠ WARNING

Unlocked toolbox

Objects could fall out during the journey.

The lid can be torn off - risk of accidents!

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

Operating the toolbox

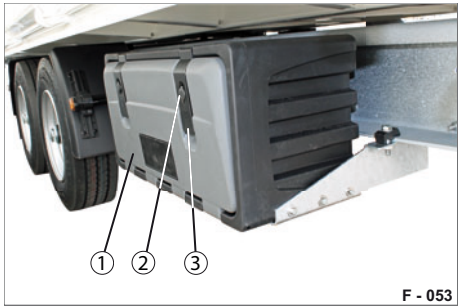


Fig. 68 Toolbox closed

1 Lid
2 Lock cylinder with cover
3 Locks

Observe the specified surface load
(see manufacturer's data on the inside of the lid, approx. 30 kg).

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

▶ Do not place objects on the open lid of the toolbox.

Setting up the toolbox

Fig. 69 Toolbox set up

1 Intermediate base plate
2 Lid

▶ If necessary, fit the intermediate plate at the required height.

Opening

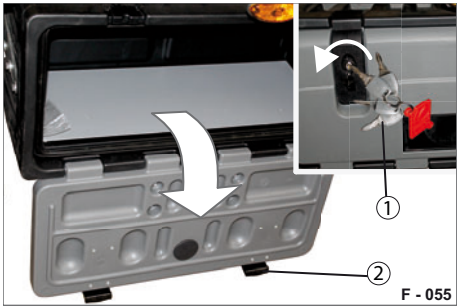


Fig. 70 Toolbox open

1 Key
2 Locks

- ▶ Remove the covers (Fig. 68/2) from the lock cylinders and close the lid (Fig. 68/1) with the key (Fig. 70/1).
- ▶ Pull out the locks (Fig. 70/2) from below and twist them downwards.
- ▶ Carefully swing the lid down.

Closing

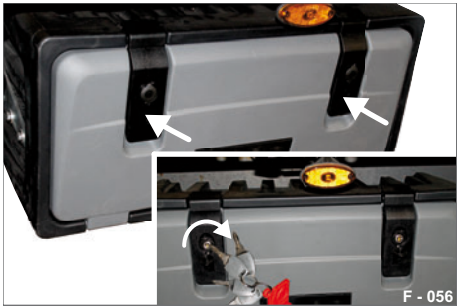


Fig. 71 Toolbox closed

- ▶ Swing the lid up.
- ▶ Clasp the locks (Fig. 70/2) from above and press them downwards.
  The lid is closed.
- ▶ Lock with the key (Fig. 70/1) and fasten the cover over the key cylinder (Fig. 68/2).
  The toolbox is closed and secured.

Parking warning signs

The parking warning signs can be attached to the front and rear of the trailer on the left in the direction of travel. They make the parked trailer easier to see / recognise.

⚠ WARNING

Driving with the parking warning sign unfolded

Unfolded parking warning signs can obscure the rear lights on the trailer - risk of accidents!

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

⚠ WARNING

Dirty parking warning signs

Other road users will not see the parked trailer or will not recognise it in time - risk of accidents!

▶ Clean the parking warning signs if they are extremely dirty.

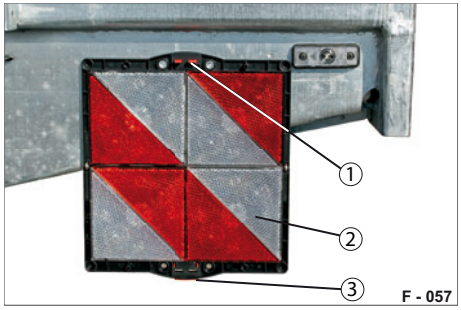


Fig. 72 Parking warning sign

1 Lock
2 Warning sign (top half)
3 Pressure catch

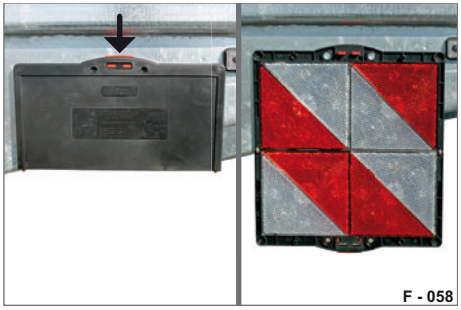


Fig. 73 folded / unfolded

NOTICE

Driving with the parking warning signs unfolded

The parking warning signs rattle while the vehicle is in motion and may break off.

▶ Before driving off, check that the parking warning signs are folded away and that the lock is undamaged.

Unfolding

▶ Press the pressure catch (Fig. 72/3) in and fold down the top section of the warning sign.

Folding away

▶ Fold up the unfolded section of the warning sign.

The pressure catch (Fig. 72/3) automatically engages in the lock (Fig. 72/1).

Warning signs (optional)

Operation: body

The construction mainly consists of:

- Lateral drop-sides
- Rear platform gate
- Front wall
- Ramps
- Lashing brackets / tie-down rings
- Add-on drop sides (optional)
- Steel grid extension (optional)
- Support frame (optional)

⚠ 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

Objects on the body

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

▶ Before driving off, check that there are no accumulations of water, ice, snow, branches or other objects on the body / loading platform.
If there are, remove them.

▶ If necessary, use a stable ladder.

⚠ WARNING

Unsecured / shifting load

Loads can fall out of the trailer when the clamping elements are opened - risk of crushing / striking!

▶ Ensure that the load is upright and has not shifted.

▶ If the load has moved, carefully open the clamping elements and secure the shifted and unsecured load.

▶ Open locking devices on the body from a position outside the swinging range of the body components (drop-sides).

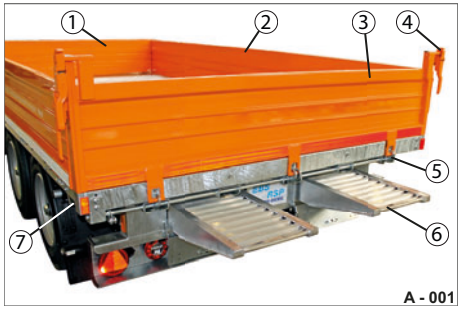


Fig. 1 Body - components

1 Front wall, fixed
2 Drop-side, lateral, right + left / folding
3 Rear platform gate, hinge-mounted / folding
4 Locks
5 Swing interlock fasteners
6 Ramps, in ramp stowage compartment
7 Central interlock

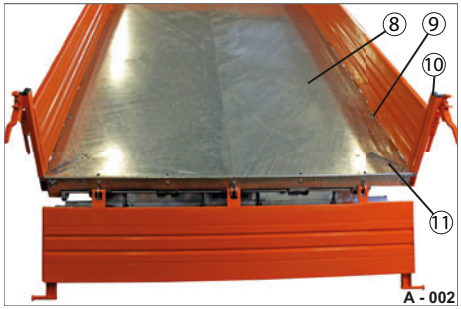


Fig. 2 Body - components

8 Loading platform / loading floor, steel
9 Lashing bracket, lowerable
10 Side post
11 Pivoting tie-down ring, lowerable

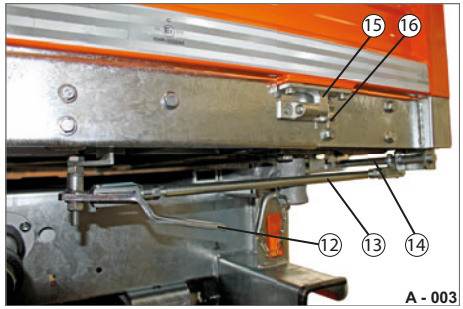


Fig. 3 Body - components

12 Swing interlock lever
13 Transmission rod
14 Swing interlock
15 Drop-side hinge
16 Safety splint pin

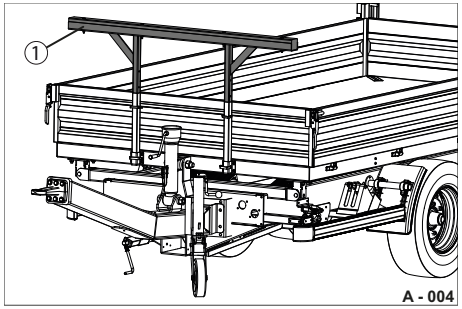


Fig. 4 Body - accessories

1 Support frame

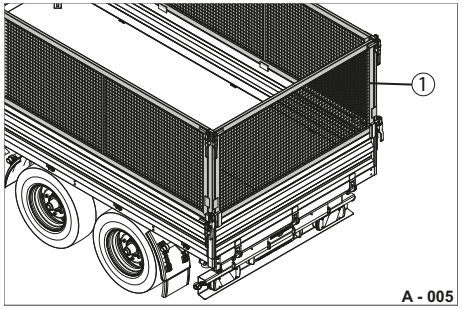


Fig. 5 Body - accessories

1 Steel grid extension

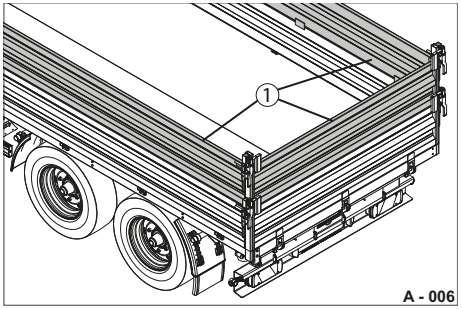


Fig. 6 Body - accessories

1 Add-on drop side

General operation of the drop-sides

The drop-sides make form-fit load securing possible.

Driving with open or partly disassembled drop-sides is illegal.

Drop-sides are heavy!

2 persons are required to fit / remove the drop-sides.

⚠ DANGER

Driving with drop-sides open

This can result in injury.

The load can fall out - risk of accidents!

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

⚠ WARNING

Driving with partly dismantled drop-sides

The drop-sides cannot be secured - risk of accidents!

▶ Drive only with all drop-sides attached or completely dismantled drop-sides.

⚠ CAUTION

Operating drop-sides and locks

Fingers / hands can be crushed when opening / closing the drop-sides and locks.

▶ Wear  .

▶ Fold down the drop-sides in a controlled manner - do not let them fall.

▶ When locking a drop-side, do not reach directly into the area of the posts / locks.

▶ Close the hand lever with the flat of your hand.

⚠ CAUTION

Drop-sides under pressure from the load

The drop-sides can spring open - risk of striking!

▶ Before releasing the drop-side locks, check that the load is not pressing against the drop-side.

▶ If necessary, reposition the load before opening.

▶ When opening the drop-side, stand to the side, outside the swinging range.

⚠ CAUTION

Dismantled drop-sides

Dismantled drop-sides can become obstacles - risk of tripping!

▶ Do not place dismantled drop-sides in the direct work area for loading and unloading.

▶ Lay the drop-sides down lengthwise - do not stand them upright.

Front wall

The front wall secures the load with form-fitting.

The drop-sides are secured to the front wall.

⚠ WARNING

Driving without the front wall

The drop-sides cannot be secured. The load can slide forwards and off the loading platform - risk of accidents!

▶ Do not drive without the front wall.

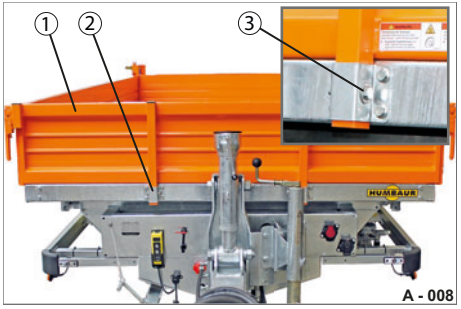


Fig. 7 Front wall, fixed

1 Front wall
2 Post on the chassis
3 Screw connection

The front wall (Fig. 7/1) is firmly attached to the chassis.

The front wall is inserted in two posts (Fig. 7/2) and secured with a screw connection (Fig. 7/3).

▶ Before driving off, check that the front wall is secured in the posts.

Dismantling

▶ Release the screw connections (Fig. 7/3) on the posts (Fig. 7/2).

▶ Release the locks of the drop-sides and fold the drop-sides down.

▶ Lift the front wall (Fig. 7/1) out of the posts.

Lateral drop-sides

Fig. 8 Drop-side right + left

1 Drop-side, made of steel
2 Hinge
3 Lock, front + rear

Fig. 9 Lock, secured

1 Bearing pin
2 Locking lever
3 Secondary lock

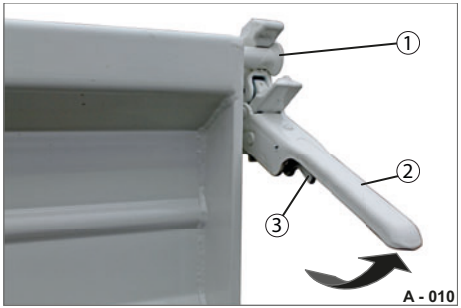


Fig. 10 Lock, released

1 Bearing pin
2 Locking lever
3 Secondary lock

The drop-sides (Fig. 8/1) are flexibly mounted in the hinges (Fig. 8/2).

The drop-sides are secured on the right and left with locks (Fig. 8/3).

- ▶ Only operate the drop-sides when the loading platform is horizontal.
- ▶ Release the locks one after the other.
- ▶ Hold the drop-sides in position as you do so.

Releasing the locks

- ▶ Press the secondary lock (Fig. 9/3) in.
- ▶ Pull on the locking lever (Fig. 9/2 & Fig. 11/2).

  The bearing pin is released (Fig. 11/1).

The side drop-side can be folded down.

Fig. 11 Drop-side folded down

1 Locks, open
2 Drop-side, folded down

Fig. 12 Loading platform tipped to the side

1 Loading platform
2 Danger area

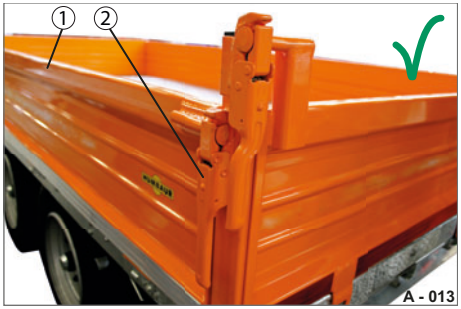


Fig. 13 Drop-side, secured

1 Drop-side, raised
2 Lock, secured

Folding down the drop-side

▶ Fold the drop-side down in a controlled manner.
The loading platform can be tipped.

▶ Step out of the danger area (Fig. 12/2).
▶ Keep other persons away from the danger area.

Closing / securing the drop-side

▶ Fold the drop-side (Fig. 13/1) up.
▶ Close the locks one after the other. Hold the drop-side in position.
▶ Press the locking lever (Fig. 13/2) shut with the flat of your hand.
The secondary lock (Fig. 9/3) engages.

The bearing pin (Fig. 9/1) is locked in position.

The drop-side is secured with both locks.

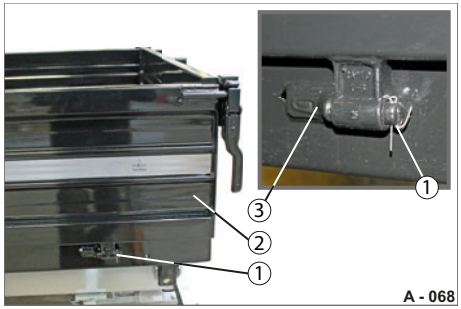


Fig. 14 Drop-side hinges

1 Safety splint pin
2 Drop-side, secured
3 Hinge (welded)

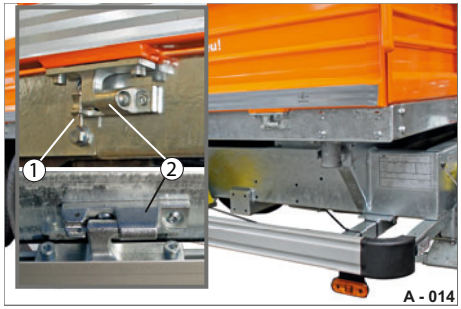


Fig. 15 Dismantling the drop-side

1 Safety splint pin
2 Hinge (bolted)

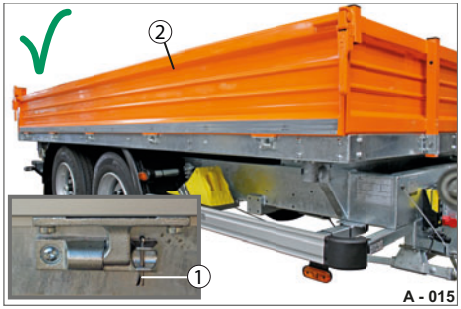


Fig. 16 Drop-side mounted (driving position)

1 Safety splint pin, inserted
2 Drop-side, secured

⚠ WARNING

Unsecured hinges / drop-sides

The drop-side can slide off the hinges / fall while being folded down - risk of striking / crushing!

- ▶ Before operating the drop-side, check that it is secured with a safety splint pin in one of the hinges.
- ▶ Replace deformed / worn safety splint pins.

- ▶ Check the condition and correct functioning of the hinges.

Dismantling

- ▶ Release the locks.
- ▶ Fold the drop-side down.
- ▶ Remove the safety splint pin (Fig. 15/1) from one of the hinges (Fig. 15/2) - keep the pin in a safe place.
- ▶ Slide the drop-side (in horizontal position) out laterally - in the direction of release.
- ▶ Put the drop-side down safely.

Fitting

- ▶ Slide the drop-side (in horizontal position) into the hinges (Fig. 15/2).
- ▶ Insert the safety splint pin (Fig. 16/1) into one of the hinges.
  Replace the safety splint pin if it is destroyed.
- ▶ Fold the drop-side (Fig. 16/2) up.
- ▶ Secure the drop-side with the locks.
- ▶ Splay the safety splint pin.

Rear platform gate

The rear platform gate can be folded down or swung open at the hinges via the central interlock.

Loose bulk goods can be tipped from the trailer when the rear platform gate is swung open at the hinges.

WARNING

Opening the rear platform gate with the loading platform tipped

The rear platform gate can spring open due to the pressure of the load - risk of striking / crushing!

▶ Unlock the rear platform gate before tipping the loading platform.

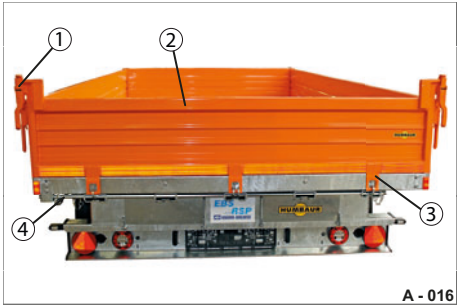


Fig. 17 Rear platform gate

1 Lock
2 Rear platform gate
3 Locking flap
4 Central interlock

The rear platform gate (Fig. 17/2) is secured on the top at both sides with locks (Fig. 17/1).

At the bottom, the rear platform gate is secured at the locking flaps (Fig. 17/3) with the central interlock (Fig. 17/4) for swing operation.

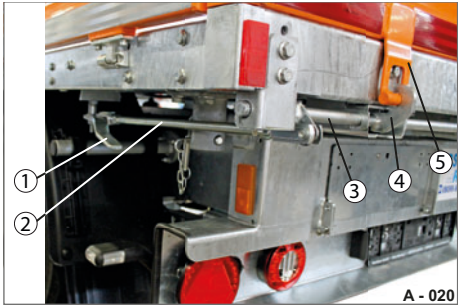


Fig. 18 Central interlock

1 Lever
2 Transmission rod
3 Turning rod
4 Locking hook
5 Locking flap

The central interlock for swing mode of the rear platform gate is located on the rear of the trailer (on the left looking in the direction of travel).

Fold-down operation

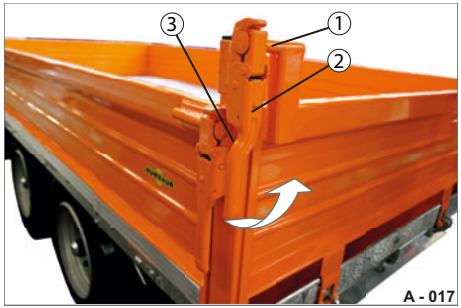


Fig. 19 Rear platform gate folded down

1 Bearing pin
2 Locking lever
3 Secondary lock

Releasing the locks

▶ Press the secondary lock (Fig. 19/3) in.

▶ Pull on the locking lever (Fig. 19/2).
The bearing pin is released (Fig. 19/1).

▶ Release the lock on the other side.
The platform gate can be folded down.

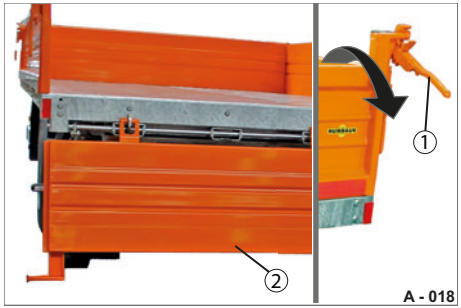


Fig. 20 Rear platform gate folded down

1 Locks, open
2 Rear platform gate, lowered

Folding down the platform gate

▶ Fold the platform gate down in a controlled manner - do not let it fall.

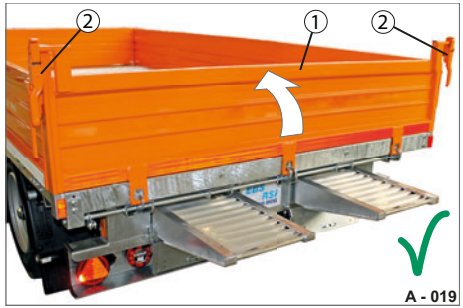


Fig. 21 Rear platform gate, secured

1 Rear platform gate, raised
2 Locks secured

Closing / securing the platform gate

▶ Fold the rear platform gate (Fig. 21/1) up.

▶ Close the locks (Fig. 21/2) one after the other.

▶ Press the locking lever (Fig. 19/2) shut with the flat of your hand.
The secondary lock (Fig. 19/3) engages.

The bearing pin (Fig. 19/1) is locked in position.

The platform gate is secured at the top with both locks.

Swing mode

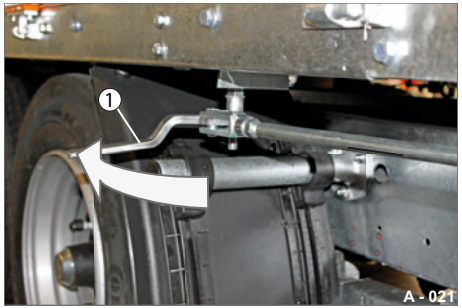


Fig. 22 Central interlock released

1 Lever, opened

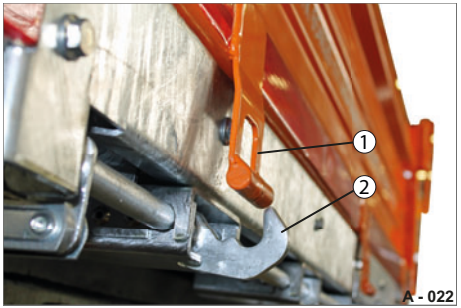


Fig. 23 Rear platform gate unlocked

1 Locking lug
2 Locking hook

Fig. 24 Swing mode

1 Rear platform gate, hinge-mounted at the top
2 Lever, in opened position

The rear platform gate must be closed with locks at the top and secured.

Unlocking the rear platform gate

▶ Turn the lever (Fig. 22/1) to 90 ° position.

The locking hooks (Fig. 23/2) move out of the locking lug (Fig. 23/1).

The rear platform gate is enabled for swing mode.

The rear platform gate swings at the hinges after the loading platform has been tipped.

The bulk goods can be tipped.

▶ Step out of the danger area.

▶ Keep other persons away from the danger area.

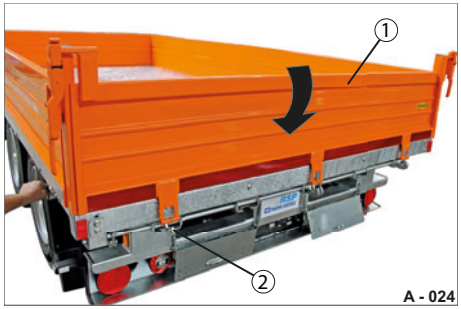


Fig. 25 Rear platform gate, closed

1 Rear platform gate, folded shut
2 Locking hook, open

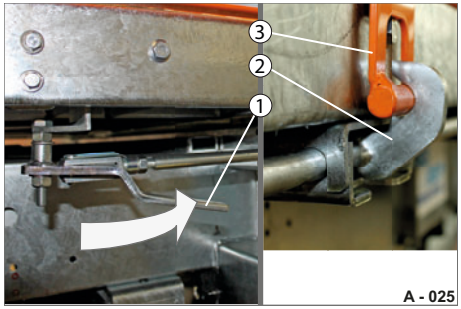


Fig. 26 Closing the central interlock

1 Lever, closed
2 Locking hook, inserted
3 Locking lug

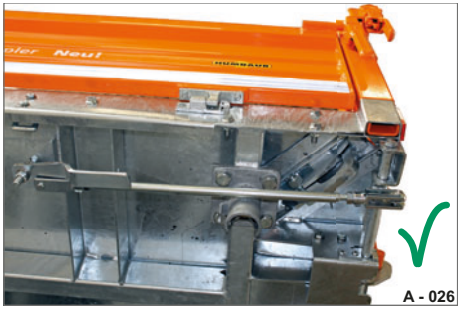


Fig. 27 Central interlock, closed

Closing the rear platform gate

▶ Lower the loading platform back onto the chassis.

▶ If necessary, remove any dirt from the closing edge / swing interlock / locking lugs in the rear area.

Locking the rear platform gate

▶ Press the lever (Fig. 26/1) fully closed.

All locking hooks (Fig. 26/2) engage in the locking lugs (Fig. 26/3) and press the rear platform gate closed.

The rear platform gate is locked.

▶ Before driving off, check that the rear platform gate is secured via the central interlock.

Operating the add-on drop sides

Add-on drop sides (height 400 mm) expand the loading volume of the trailer.

The add-on drop side comprises 4 side walls and 2 corner post extensions in the rear area.

The add-on drop sides are fitted on the basic drop-sides and secured in corner posts with locks.

The front wall add-on drop side is secured in posts with spring locking bolts.

The functions of the basic drop-sides (folding down and swing mode) remain unaffected.

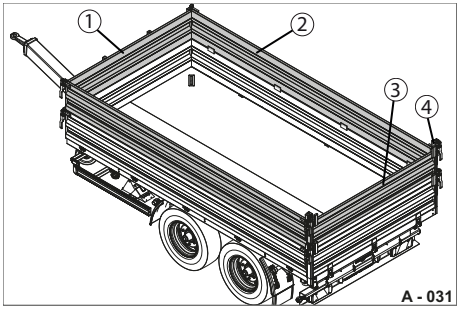


Fig. 28 Add-on drop sides, 4-sided

1 Front wall add-on drop side
2 Lateral add-on drop sides
3 Rear platform gate add-on drop side
4 Corner post extension, rear

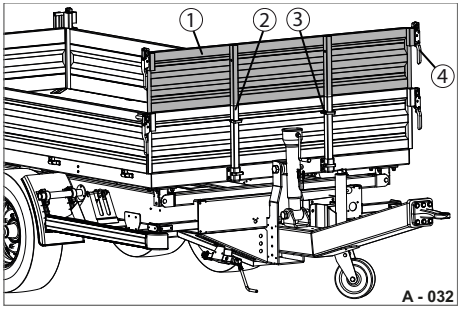


Fig. 29 Front wall add-on drop side

1 Front wall add-on drop side
2 Side post
3 Spring locking bolt
4 Lock

⚠ WARNING

Fitting / dismantling add-on drop sides

Add-on drop sides can fall down - risk of crushing!

▶ Work in pairs.

▶ Wear , .

⚠ CAUTION

Unlocking add-on drop sides

The add-on drop sides rest on the basic drop-sides. When the basic drop-sides are folded down, the add-on drop sides are freely suspended.

▶ Only unlock the add-on drop sides when the basic drop-sides are closed.

⚠ WARNING

Driving with corner post extensions inserted but without add-on drop sides

The corner post extensions are not secured and can be hurled off - risk of striking / crushing!

▶ Remove the corner post extensions when you dismantle the add-on drop sides.

Fitting / securing the front wall add-on drop side

Fig. 30 Preparing to fit the front wall add-on drop side

1 Cap
2 Post, basic drop-side

▶ Remove the caps (Fig. 30/1) from the posts (Fig. 30/2).

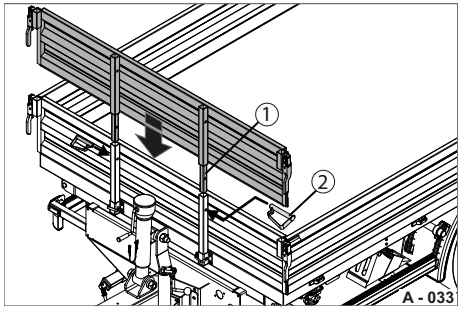


Fig. 31 Fitting the front wall add-on drop side

1 Add-on drop side posts
2 Spring locking bolt

▶ Insert the front wall add-on drop side (Fig. 29/1 & Fig. 31/1) into the posts of the basic drop-side (Fig. 30/2).
▶ Insert the spring locking bolts (Fig. 31/2) through the bores in the posts.

The front wall add-on drop side is secured.

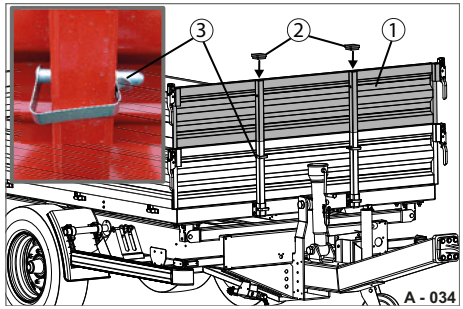


Fig. 32 Front wall add-on drop side, secured

1 Front wall add-on drop side, inserted
2 Caps
3 Spring locking pins, inserted

▶ Before driving off, check that the front wall add-on drop side is secured.
▶ Fit the caps (Fig. 30/1) into the posts of the add-on drop side.

Fitting the add-on drop sides on the sides / at the rear

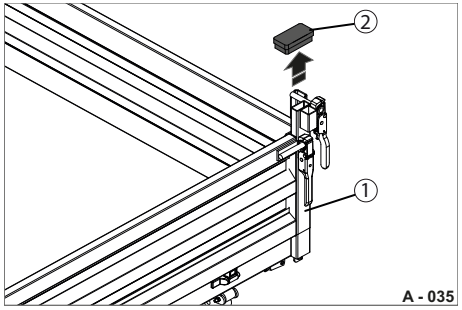


Fig. 33 Preparing to fit the add-on drop side

1 Corner post, basic drop-side
2 Cap

▶ Remove the caps (Fig. 33/2) from the corner posts (Fig. 33/1) of the basic drop-sides.

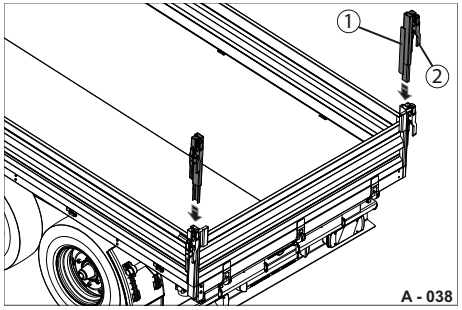


Fig. 34 Inserting the corner post extensions

1 Corner post extension
2 Lock

▶ Insert the corner post extensions (Fig. 34/1) into the corner posts of the basic drop-sides (Fig. 33/1). The locks (Fig. 34/2) must face outwards.

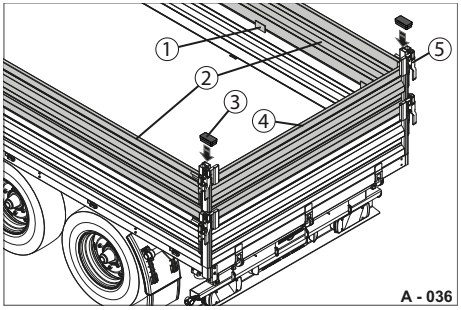


Fig. 35 Securing add-on drop sides

1 Stops, inside
2 Lateral add-on drop sides
3 Cap
4 Rear platform gate add-on drop side
5 Locks, closed

▶ Place one add-on drop side (Fig. 35/1 & Fig. 35/4) on each basic drop-side. The stops (Fig. 35/1) must face inwards, towards the loading platform.

▶ Close the locks (Fig. 35/5) one after the other.

▶ Fit the caps (Fig. 35/3) into the corner post extensions.

The add-on drop sides are secured.

Operating the support frame

The support frame is mounted at the front, on the front wall.

It is used to support, for example, an excavator bucket or wheel loader.

The support frame can be removed if it is not required.

⚠ WARNING

Lashing loads to the support frame

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

- ▶ Lash the load, e.g. excavator bucket, only to the lashing points on the loading platform.
- ▶ Do not fit any attachment equipment (lashing points) on the support frame.

⚠ CAUTION

Climbing on the support frame

Persons may slip and fall.

- ▶ Do not climb onto the support frame.

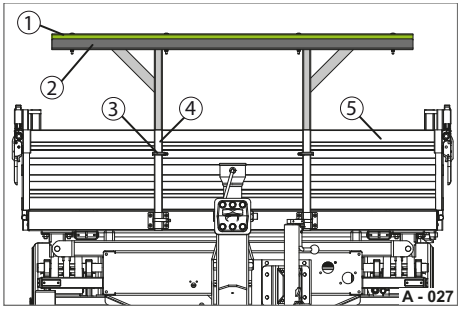


Fig. 36 Support frame, secured

1 Wooden trestle
2 Trestle support frame
3 Spring locking bolt
4 Side post
5 Front wall

Fitting / securing

Fig. 37 Preparing to fit the support frame

1 Cap
2 Side post

▶ Remove the caps (Fig. 37/1) from the posts (Fig. 37/2).

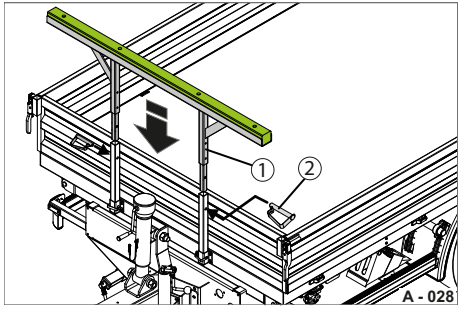


Fig. 38 Fitting the support frame

1 Trestle support frame
2 Spring locking bolt

▶ Fit the trestle support frame (Fig. 38/1) into the posts (Fig. 37/2).
▶ Insert the spring locking bolts (Fig. 38/2) through the bores in the posts.

The support frame is secured.

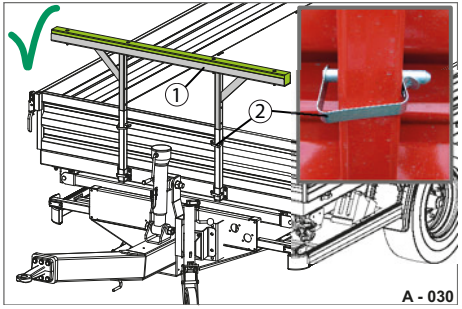


Fig. 39 Support frame, secured

1 Trestle support frame, inserted
2 Spring locking pin, inserted

▶ Before driving off, check that the support frame is secured.

Operating the steel grid extensions

Steel grid extensions (height 1000 mm) expand the loading volume of the trailer.

The steel grid extension comprises 4 steel grid walls and 2 corner post extensions in the rear area.

The steel grid extensions are fitted on the basic drop-sides and secured with locks.

The front wall steel grid extension is secured in posts with spring locking bolts.

The functions of the basic drop-sides (folding down and swing mode) remain unaffected.

⚠ WARNING

Fitting / dismantling steel grid extensions

Steel grid extensions can fall down - risk of crushing!

▶ Work in pairs.

▶ Wear , .

⚠ CAUTION

Unlocking steel grid extensions

The steel grid extensions rest on the basic drop-sides. When the basic drop-sides are folded down, the steel grid extensions are freely suspended.

▶ Only unlock the steel grid extensions when the basic drop-sides are closed.

⚠ WARNING

Driving with corner post extensions inserted but without steel grid extensions

The corner post extensions are not secured and can be hurled off - risk of striking / crushing!

▶ Remove the corner post extensions when you dismantle the steel grid extensions.

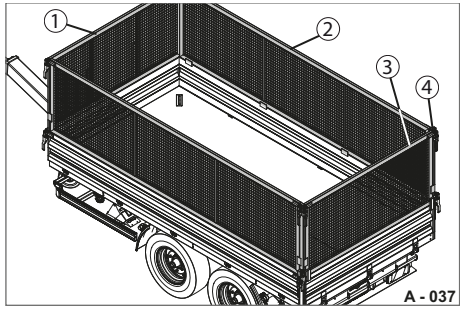


Fig. 40 Steel grid extensions, 4-sided

1 Front wall steel grid extension
2 Steel grid extensions, lateral
3 Rear steel grid extension
4 Corner post extension, rear
5 Locks
6 Steel grid extension posts

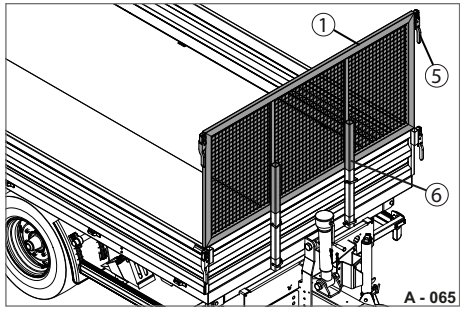


Fig. 41 Front wall steel grid extension

Fitting / securing front wall steel grid extensions

Fig. 42 Preparing to fit the front wall steel grid extension

1 Cap
2 Post, basic drop-side

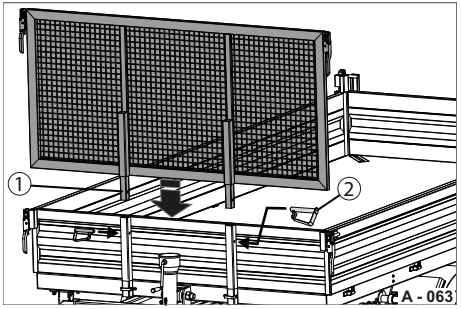


Fig. 43 Fitting the front wall steel grid extension

1 Steel grid extension posts
2 Spring locking bolt

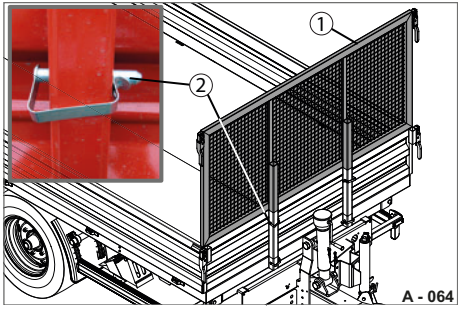


Fig. 44 Front wall steel grid extension, secured

1 Front wall steel grid extension, inserted
2 Spring locking bolts, inserted

▶ Remove the caps (Fig. 42/1) from the posts (Fig. 42/2).

▶ Keep the caps (Fig. 42/1) in a safe place.

▶ Insert the front wall steel grid extension (Fig. 40/1) into the posts of the basic drop-side (Fig. 42/2).

▶ Insert the spring locking bolts (Fig. 43/2) through the bores in the posts.

The front wall steel grid extension is secured.

▶ Before driving off, check that the front wall steel grid extension is secured.

Fitting the add-on drop sides on the sides / at the rear

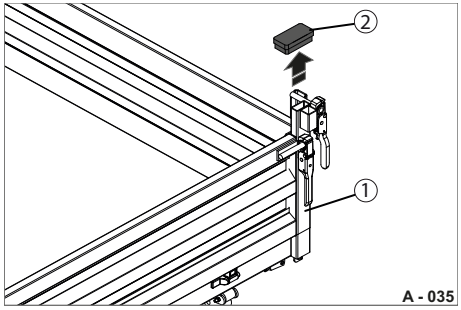


Fig. 45 Preparing to fit the steel grid extension at the rear

1 Corner post, basic drop-side
2 Cap

▶ Remove the caps (Fig. 45/2) from the corner posts (Fig. 45/1) of the basic drop-sides.

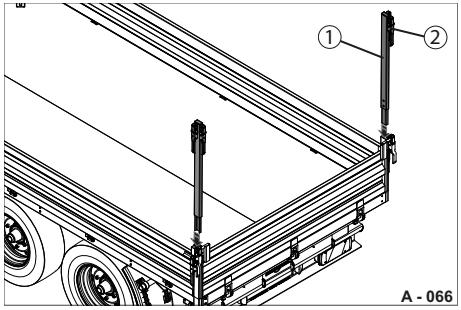


Fig. 46 Inserting the corner post extensions

1 Corner post extension
2 Lock

▶ Insert the corner post extensions (Fig. 46/1) into the corner posts of the basic drop-sides (Fig. 45/1). The locks (Fig. 46/2) must face outwards.

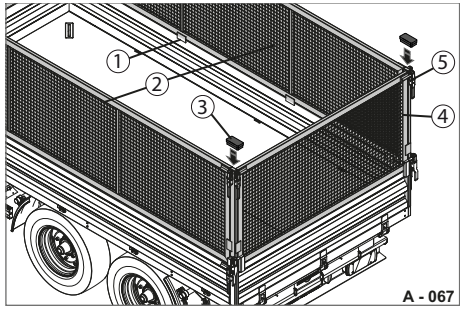


Fig. 47 Securing the steel grid walls

1 Stops, inside
2 Steel grid extensions, lateral
3 Cap
4 Rear steel grid extension
5 Locks, closed

▶ Place one steel grid extension (Fig. 47/2 & Fig. 47/4) on each basic drop-side.
The stops (Fig. 47/1) must face inwards, towards the loading platform.

▶ Close the locks (Fig. 47/5) one after the other.

▶ Fit the caps (Fig. 47/3) into the corner post extensions.

The steel grid extensions are secured.

Operating the ramps

The ramps are made of aluminium and designed for the specific trailer model. They have a serrated surface for increased safety.

The maximum load bearing capacity of the ramps must not be exceeded!

WARNING

Overloading the ramps

The ramps can be deformed.

The vehicle may fall / topple over - risk of crushing / striking!

- ▶ Observe the information on maximum loads on the name plate.
- ▶ Comply with the maximum values.

Fig. 48 Name plate, ramps

Max. values / load bearing capacity	
Max. ramp angle	30% (approx. 16°)
Single-axle vehicles	1420 daN (Kp)
Double-axle vehicles:	
Axle load distribution	40% to 60%
Axle spacing 1 m	1875 daN (Kp)
Axle spacing 1.5 m	2195 daN (Kp)

Dimensions	
Length	3050 mm
Width	400 mm

WARNING

Positioning the ramps

There is a risk of crushing your fingers / hands / feet!

- ▶ Wear , .
- ▶ Grip the ramps with both hands.
- ▶ Ramps are heavy!
  We recommend that you work in pairs.

CAUTION

Walking on the ramps

The ramps can be dirty and/or wet.

This can make them slippery - risk of falling!

- ▶ Wear .
- ▶ Walk with particular caution and slowly on the ramps.

Taking out the ramps

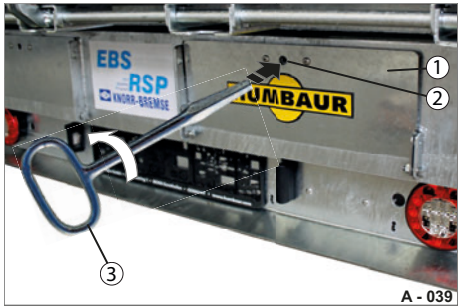


Fig. 49 Ramp stowage compartment, CLOSED

1 Flap
2 Square socket
3 Square key

▶ Unlock the flaps (Fig. 49/1) of the ramp stowage compartment with the square key (Fig. 49/3).

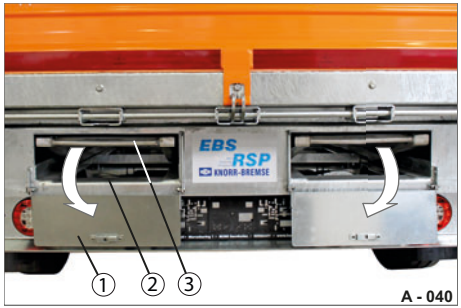


Fig. 50 Ramp stowage compartments, OPEN

1 Flap
2 Ramp stowage compartment
3 Ramp

▶ Swing the flaps (Fig. 50/1) of the ramp stowage compartments (Fig. 50/2) down.

Fig. 51 Pulling out the ramps

1 Handle

▶ Grip the handle (Fig. 51/1) and pull both ramps (Fig. 50/2) out a short distance.

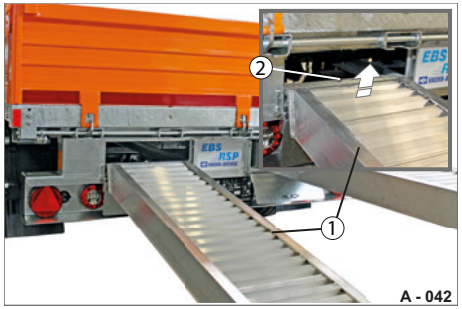


Fig. 52 Lifting out the ramps

1 Ramp
2 Securing pin

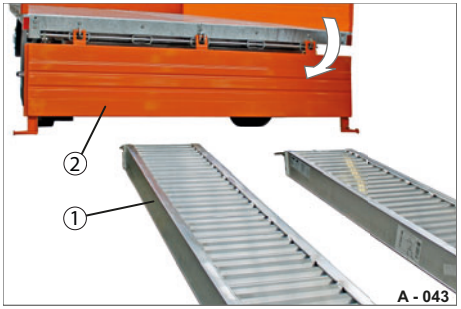


Fig. 53 Ramps, removed

1 Ramps, laid on the ground
2 Rear platform gate, folded down

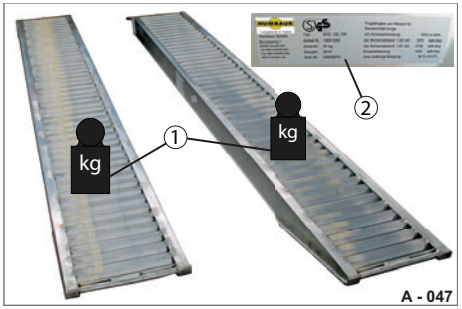


Fig. 54 Checking the ramps

1 Load bearing capacity / loading limits
2 Name plate

- ▶ Using both hands, pull first one ramp (Fig. 52/1), then the other, out of the ramp stowage compartments.
- ▶ Raise the end of the ramp slightly to lift it out of the stowage compartment.
- ▶ Lower the ramps slowly and safely to the ground - do not drop them.
- ▶ Close the flaps (Fig. 49/1) of the ramp stowage compartments.
- ▶ Unlock and fold down the rear platform gate (Fig. 53/2).
- ▶ Check the ramps for deformation / cracks / warping - defective ramps must not be used.
- ▶ Ensure that the vehicle driving onto the trailer does not exceed the maximum load bearing capacity (Fig. 54/1) of the ramps.
- ▶ Compare the maximum values on the ramp name plate (Fig. 54/2). Observe the axle load distribution.

Positioning the ramps

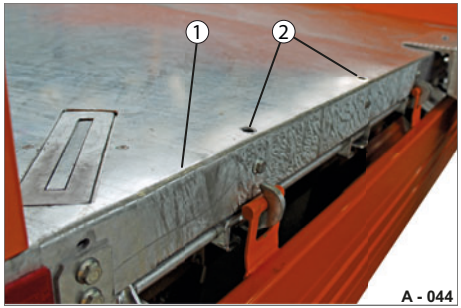


Fig. 55 Chassis - loading platform edge

1 Loading platform edge
2 Holes

Fig. 56 Putting the ramps in position

1 Securing pin

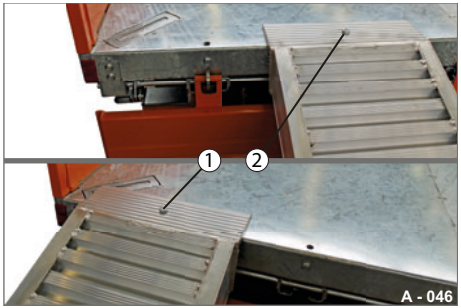


Fig. 57 Putting the ramps in position

1 Outer hole
2 Inner hole

Along the edge of the loading platform (Fig. 55/1), there are four holes (Fig. 55/2) for securing the ramps against slipping off.

The ramps can be positioned for 2 track widths.

- ▶ Check the track width of the vehicle to be loaded onto the trailer.
- ▶ It must be possible to drive the vehicle onto the trailer with the wheels in the middle of the ramps.

The ramps have a dead weight of approx. 31 kg.

If necessary, have another person help you lift the ramps.

- ▶ Clean any dirt off the holes and the edge of the loading platform.
- ▶ Position the ramps so that the securing pin (Fig. 56/1) slips into the respective hole (Fig. 55/2).

The ramps must lie on the edge of the loading platform across their full surface and must be secured in the holes provided.

- ▶ Before driving over the ramps, check that they are reliably secured against slipping.

Driving over the ramps

The driver must have the wheels in direct line of sight when driving over the ramps. If the driver cannot see the wheels, the ramps may only be driven over with the assistance of a second person for guidance.

Avoid abrupt stops and starts when driving over the ramps!

Drive slowly over the ramps, at a maximum speed of 0.3 m / second.

⚠ WARNING

Limited visibility

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

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

▶ Have a second person assist you.

⚠ WARNING

Unsecured ramps

The ramps can slip off the edge of the loading platform, causing the vehicle to topple off the ramps - risk of crushing / striking!

▶ Before loading / unloading, check that the ramps are securely seated on the edge of the loading platform.

⚠ WARNING

Ramps set to incorrect track width

The vehicle being loaded can topple and fall off the ramps - risk of crushing / striking!

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

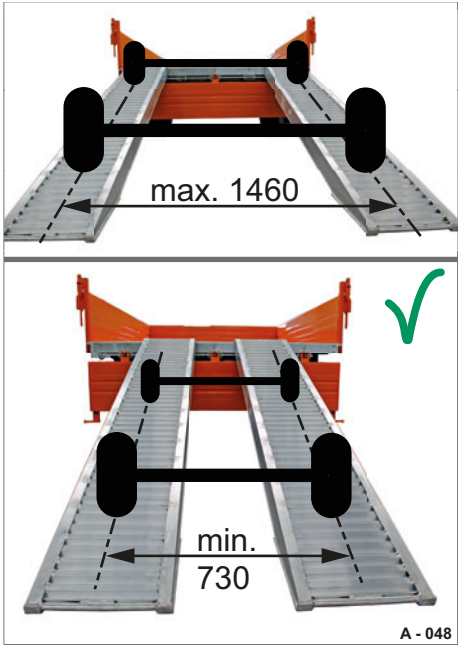


Fig. 58 Driving over the ramps

▶ Drive slowly and in a straight line onto the ramps - not at an angle from the side.

Stowing the ramps

The ramp stowage compartments may only be used to transport the ramps.

Transporting other objects in the ramp stowage compartments is not permissible!

⚠ WARNING

Driving with unsecured ramps

The ramps can be hurled out of the stowage compartments - risk of accidents!

▶ Before driving off, check that the ramps are pushed in and that the flaps of the ramp stowage compartments are closed.

Fig. 59 Removing the ramps from the loading platform

1 Ramp

▶ Remove the ramps (Fig. 59/1) individually.

▶ Lower the ramps slowly and safely to the ground - do not drop them.

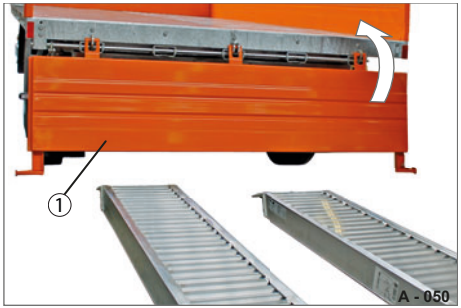


Fig. 60 Closing the rear platform gate

1 Rear platform gate

▶ Close the rear platform gate (Fig. 60/2).

Fig. 61 Sliding the ramps in

1 Ramp
2 Securing pin
3 Flap

▶ Open the flaps (Fig. 61/3) of the ramp stowage compartments.
See Fig. 49 on Page 119.

Position the ramps one by one in the ramp stowage compartments.

▶ Place one end of the ramp with the securing pin (Fig. 61/2) in the ramp stowage compartment.

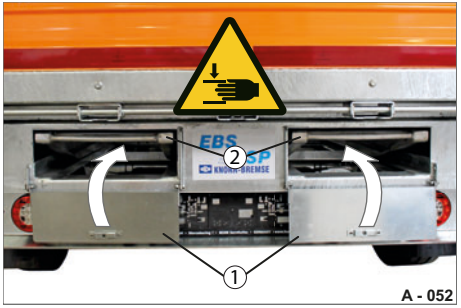


Fig. 62 Securing the ramps

1 Flaps
2 Ramps, fully inserted

▶ Working from the rear, slide the ramps (Fig. 62/2) all the way into the stowage compartments.

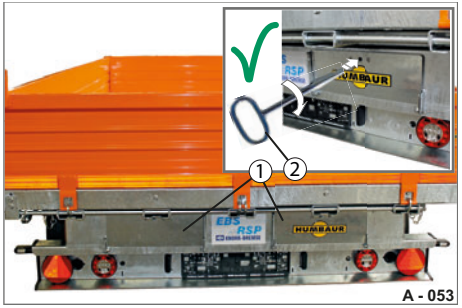


Fig. 63 Ramp stowage compartments, secured

1 Flaps, closed
2 Square key

▶ Close the flaps (Fig. 63/1) of the ramp stowage compartments.

▶ Lock the flaps using the square key (Fig. 63/2).

The ramps are secured.

General information

Many accidents are still attributable to failure to secure loads correctly.

Correctly secured loads prevent:

- injury to persons
- damage to the consignment
- damage to vehicles
- unnecessary waiting times at traffic stops

Legal basics / legal requirements

Load securing is regulated in Germany by the following laws and regulations:

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

On this basis, the following group of people is responsible for the securing of loads:

- vehicle driver
- vehicle owner
- loader
- dispatcher
- freight carrier

For further information / practical tips, see the brochure BGI 649 "Securing loads on vehicles":
A guide for companies, schedulers, drivers 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, Lashing straps made of synthetic fibres
- DIN EN 12195 -3, Load securing devices on road vehicles, lashing chains
- DIN EN 12640 Lashing points on commercial vehicles for goods transportation
- DIN EN 12642 Minimum requirements for bodies of commercial vehicles

Physical fundamentals

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

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

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

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

However, if you do get into a dangerous situation, not even the best driving style is a substitute for effective securing of the load!

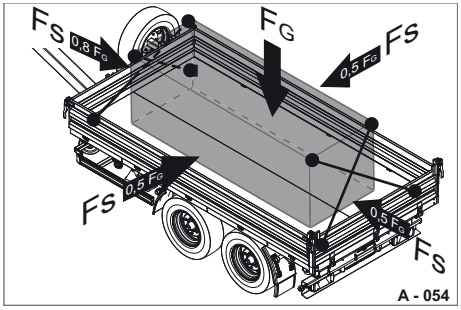


Fig. 64 Maximum inertia forces

Resulting from the driving dynamics in road traffic
F_S load securing force,
F_G inertia of the load

Example:

– Inertia F_G = 5,000 daN
– Maximum forward acceleration = 0.8 g (1 g = earth's acceleration 9.81 m/s^2)

Result: F_G forward = 5,000 daN x 0.8 g = 4,000 daN (kg)

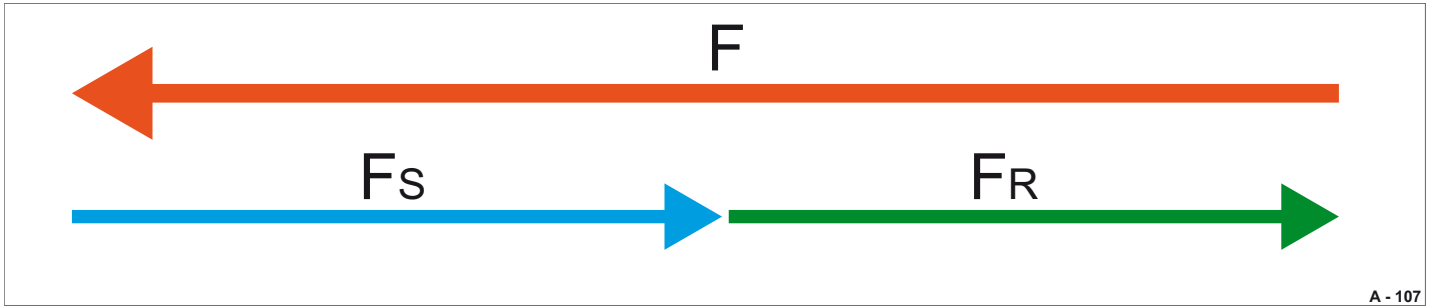
The actual required load securing force F_S is reduced for tip-stable loaded goods by the amount of the friction force F_R (between load and vehicle floor).

For further information on coefficients of friction matching, see guideline VDI 2700.
All coefficients of friction matching apply to clean surfaces.

Tab. 1 Example calculation

Tab. 2 Load securing force (F_S)

Inertia F
Force which counters any change in the state of movement



Load securing force F_S: Force which must be absorbed by the lashing equipment or the vehicle body

Friction force F_R: coefficient of sliding friction x weight force

Calculation formula: $F_S = F - F_R$

Example:

– Forward inertia F_G: 4,000 daN
– Coefficient of friction μ_o = 0.3 (silkscreen floor / pallet)
– Friction force, F_R = 0.3 x 5,000 daN = 1,500 daN

Actually required load securing force $F_{S:}$ = 4,000 daN – 1,500 daN = 2,500 daN (kg).

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 drop-sides or on posts, barrier beams or wooden fixings is called "form-fit load securing."

Precondition:
The dimensions of the loaded goods and body are matched.
Otherwise, the gaps must be filled, e.g. using pallets or airbags.

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

These goods must be secured correctly in compliance with DIN EN 12195 and the VDI guidelines via a large number of lashing points in accordance with DIN EN 12640.

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.

Precondition:
Lashing points are fitted on the load and the vehicle in the necessary places.

Lashing down is the most common type of load securing.

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

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

NOTICE

Exceeding lashing forces/ insufficient lashing angle

Lashing points can break.

- ▶ Observe the label on the lashing points.
- ▶ Comply with the following:

  - Maximum tensile load on the lashing points on the loading platform: 2,000 daN (kg) per tie-down ring.

- ▶ Use only suitable/tested lashing equipment.

Friction-lock load securing

Force specifications

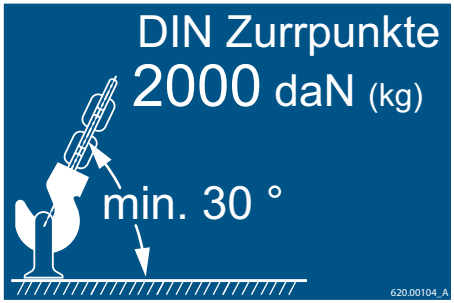


Fig. 65 Example of a lashing point label

The lashing points on the trailer are suitable for all conventional and standardised lashing equipment.

The lashing equipment can be fastened from inside or outside.

WARNING

Impermissible tensile loads / lashing angles

Lashing equipment may break / be torn off.
The load is not adequately secured - risk of accidents!

- ▶ Comply with the specified maximum values for the forces.
- ▶ Use suitable lashing equipment. The lashing equipment is labelled with the max. possible tensioning values.
- ▶ Do not lash the load with a lashing equipment angle of less than 30 °. The attachment point should be as high as possible on the load.

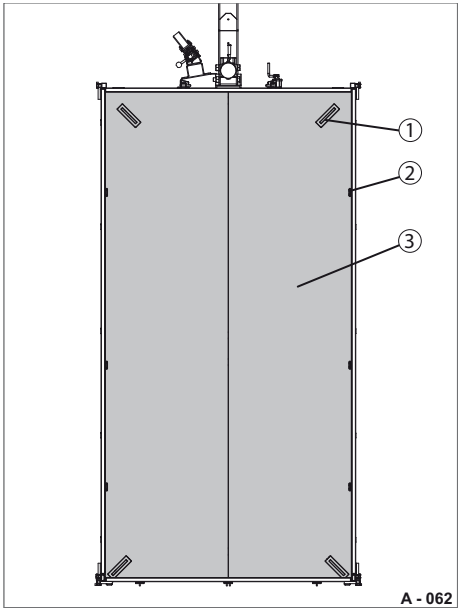


Fig. 66 Layout of lashing points

1 Pivoting tie-down ring (4x)
2 Lashing bracket (right 3x, left 3x)
3 Loading platform

Lashing points

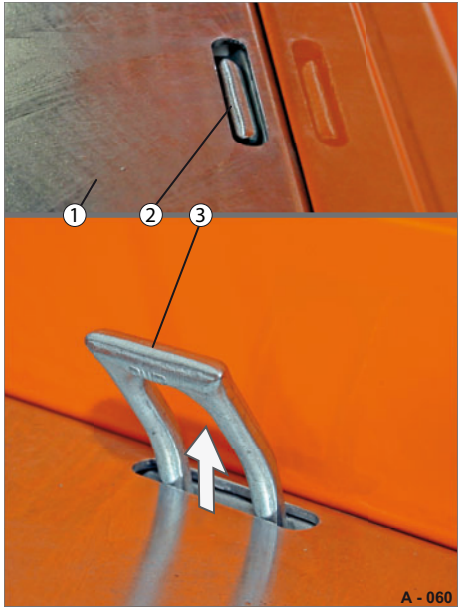


Fig. 67 Lashing points along the loading platform

1 Loading platform
2 Lashing bracket, lowered
3 Lashing bracket, raised

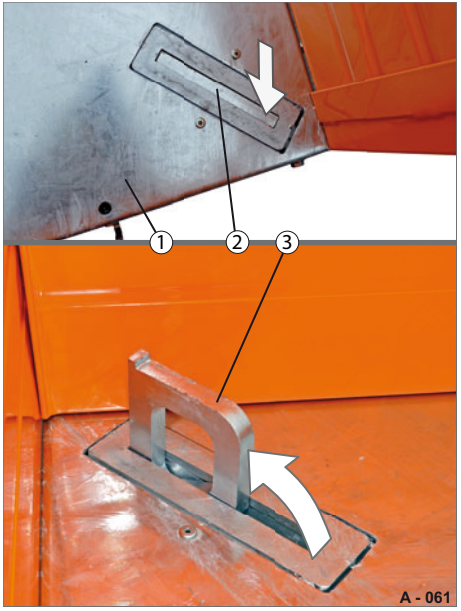


Fig. 68 Lashing points in the corners of the loading platform

1 Loading platform
2 Pivoting tie-down bracket, lowered
3 Pivoting tie-down bracket, raised

Operating the lashing points

- ▶ Press the tie-down bracket (Fig. 67/2) out from below.
- ▶ Press the pivoting tie-down bracket (Fig. 68/2) down from the corner and pull it out from the other side.

  The pivoting tie-down bracket remains in vertical position.
- ▶ Lower lashing points that are not required into the loading platform or fold them away.

Form-fit load securing

The HTK trailer in box form with side walls can be used for form-fit load securing by means of specific arrangement of the load.

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

– platform gates
– add-on drop sides
– steel grid extensions
– support frame on the front end

as well as by lashing the load units correctly to DIN lashing points.

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

Access aids

As an option, the rear platform gate can be equipped with a folding step.

The folding step can be used to climb onto and down from the loading platform.

The folding step is fitted on the inside of the rear platform gate near the corner posts.

Optionally, a fixed access ladder can be positioned on the front end.

⚠ WARNING

Using the folding step to climb onto / down from the loading platform

You might lose your balance - risk of falling!

- ▶ Use the folding step only to climb onto / down from the loading platform.
- ▶ Place your whole foot on the step.
- ▶ Hold onto the corner posts while climbing up or down.

Fig. 69 Example: access aid

1 Folding step
2 Rear platform gate, folded down

Fig. 70 Example: access aid

1 Access ladder, front end

Operating the folding step

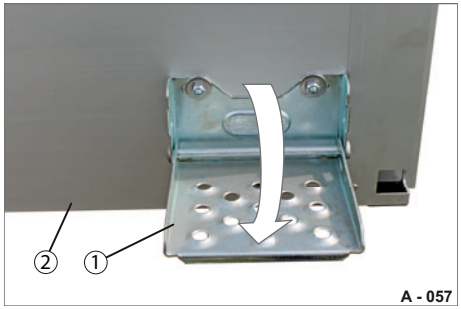


Fig. 71 Folding step, raised

1 Step
2 Rear platform gate

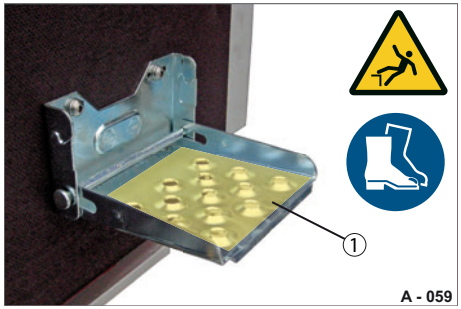


Fig. 72 Folding step, folded up

1 Step

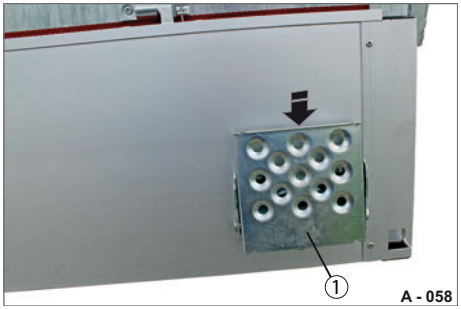


Fig. 73 Folding step, folded up

1 Step, secured

Folding the step down

▶ Unlock and fold down the rear platform gate (Fig. 71/2).

▶ Pull the step (Fig. 71/1) upwards and fold it down.

The step locks in place in horizontal position.

Using the step

▶ Place as much of your foot as possible on the step.

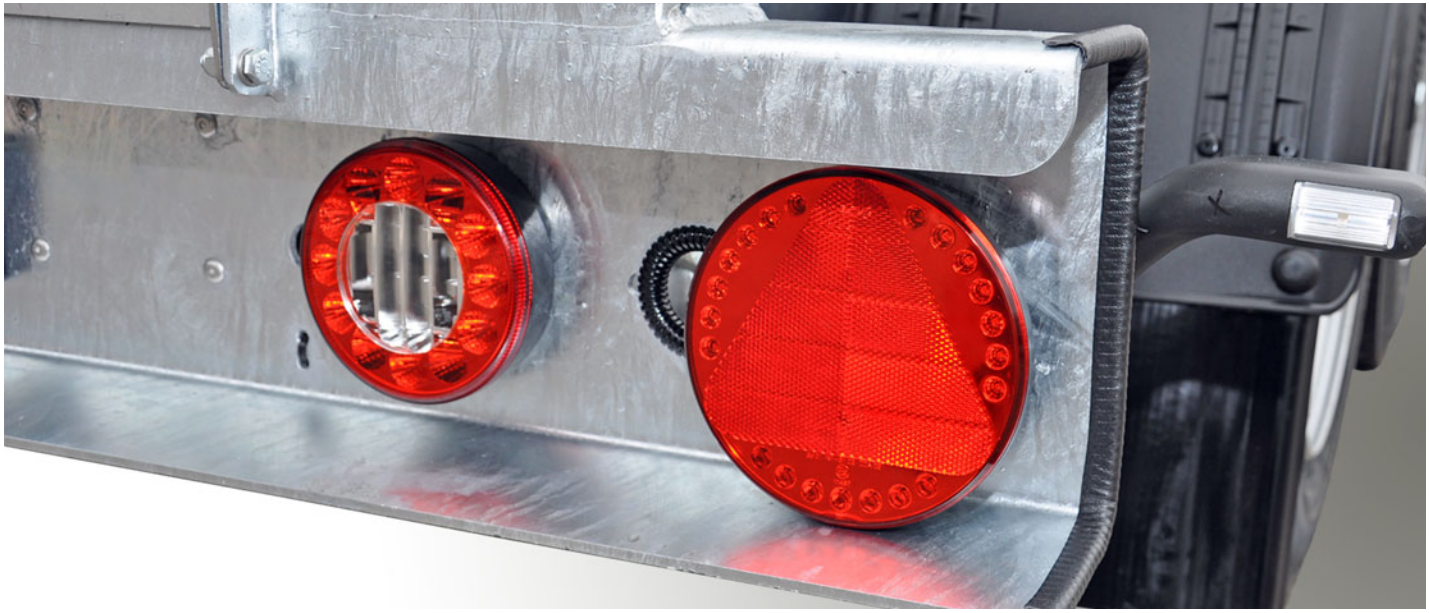
▶ Hold onto the secured corner post.

Folding the step up

▶ Fold the step (Fig. 73/1) up and push it downwards.

The step locks in place in vertical position.

▶ Fold the rear platform gate closed.



Electrical system

Light system / EBS modulator

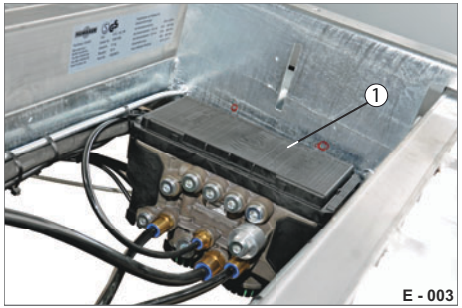


Fig. 1 Brake module, programmable

1 Brake module (EBS modulator)

The electrical light system operates at 24 V by default.

The light system is available in a 12 V version as an option.

The light system can be ordered in an LED version.

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

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

⚠ WARNING

Failure of electrical functions

The driving characteristics and the braking distance are impaired - risk of accidents!

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

⚠ CAUTION

Coupling / uncoupling lines

You can crush your fingers in the connection points.

- ▶ Turn the bar lock carefully onto and off of the locking knobs.
- ▶ Pull on the plug – not on the cable.

Connecting EBS/ABS

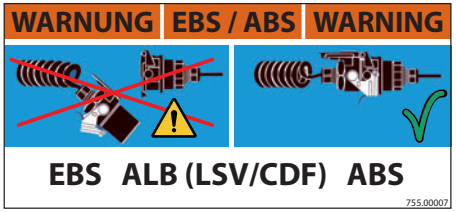


Fig. 2 Label on trailer - example

EBS/ABS plug must be inserted in the towing machine before driving off.

- ▶ Before driving off, check that the EBS/ABS plug is inserted on the towing vehicle.
- ▶ Check that the plug is securely seated.

Plug connections (standard)

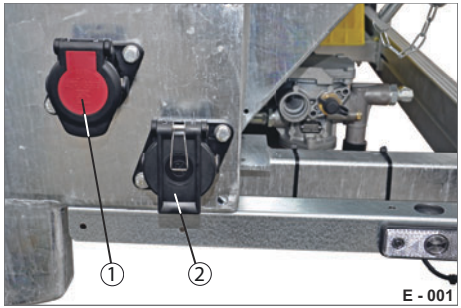


Fig. 3 Plug connections on the chassis "LED“

1 Electrics, 12 V / 24 V
2 EBS 12 V / 24 V

Fig. 5 Standard 24 V connectors

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

Standard model electrical connection in 24 V:

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

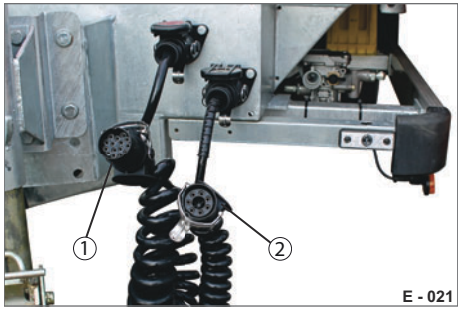


Fig. 4 Connection cables 12 V / 24 V

1 Electrics, "LED“, 15-pin
2 EBS, 7-pin

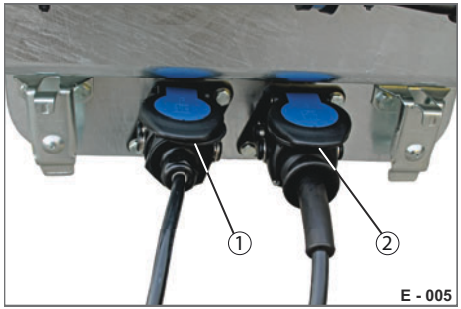


Fig. 6 Park position on draw bar

1 Parking socket, EBS/ABS plug (7-pin)
2 Parking socket, electrical plug (15-pin)

Optionally, the electrics can be in 12 V with intermediate cable in accordance with DIN ISO 1724 and 7-pin/13-pin adapter:

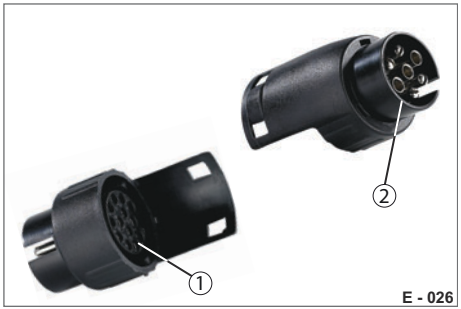


Fig. 7 7-pin to 13-pin adapter

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

Plug connections: 2 x 7-pin (optional)

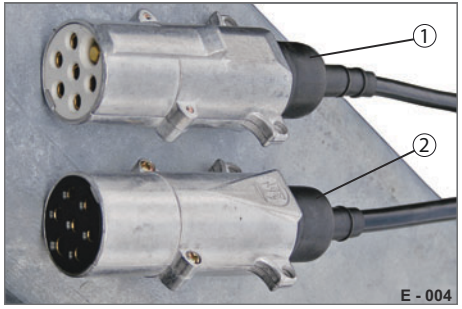


Fig. 8 24 V connection cable, optional

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

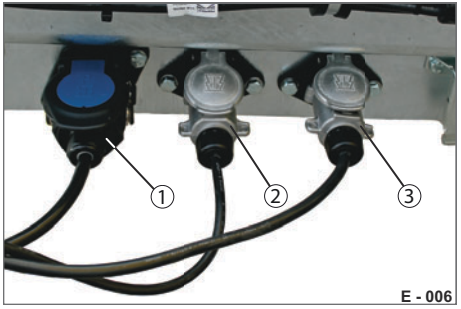


Fig. 9 Parking position on draw bar

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

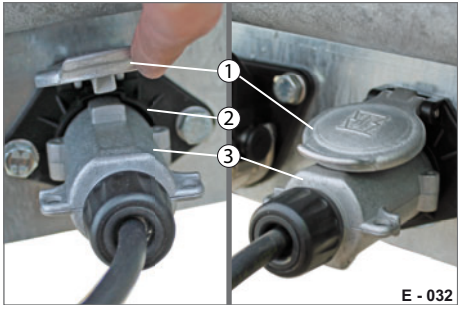


Fig. 10 Plug, parked

1 Lid
2 Parking socket
3 Plug, 7-pin

In addition, instead of a 15-pin electric plug, the trailer can be equipped with two 7-pin plug connections:
24 V-N in accordance with ISO 1185
24 V-S in accordance with ISO 3731.

- ▶ Open the lid (Fig. 10/1).
- ▶ Grip the plug (Fig. 10/3) and pull it out of the parking socket (Fig. 10/2) - do not pull on the cable.
- ▶ Connect the plug with the towing vehicle.
- ▶ Check that the plug is secure.
- ▶ After uncoupling the trailer, place the plug in the parking socket.

  The lid secures the plug.

Plug connections: MAN version (optional)

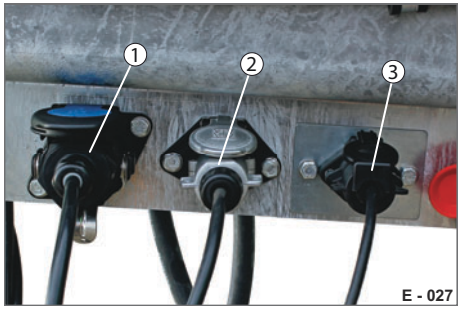


Fig. 11 MAN connection cable, parked

1 7-pin EBS/ABS plug (ISO 7638)
2 7-pin plug, 24 V-N (ISO 1185)
3 4-pin plug (DIN ISO 72575)

The trailer can be equipped with 1x 7-pin plug and 1x 4-pin plug for specific towing vehicle connections, e.g. MAN.

- ▶ Connect both electrical plugs with the towing vehicle.
- ▶ Connect the ABS/EBS plug with the towing vehicle.

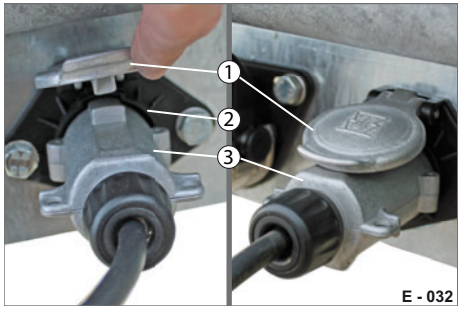


Fig. 12 Plug, parked

1 Lid
2 Parking socket
3 Plug, 7-pin (ISO 1185)

- ▶ Open the lid (Fig. 12/1).
- ▶ Grip the plug (Fig. 12/3) and pull it out of the parking socket (Fig. 12/2) - do not pull on the cable.
- ▶ Connect the plug with the towing vehicle.
- ▶ Check that the plug is secure.
- ▶ After uncoupling the trailer, place the plug in the parking socket.

  The lid secures the plug.

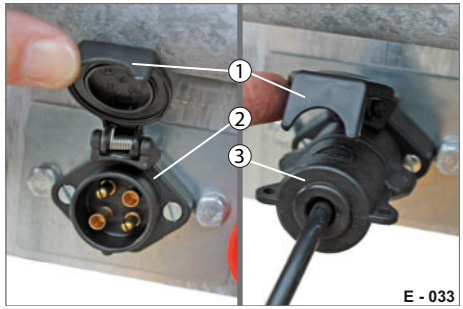


Fig. 13 Plug, parked

1 Lid
2 Parking socket
3 Plug, 4-pin (DIN ISO 72575)

- ▶ Open the lid (Fig. 13/1).
- ▶ Grip the plug (Fig. 13/3) and pull it out of the parking socket (Fig. 13/2) - do not pull on the cable.
- ▶ Connect the plug with the towing vehicle.
- ▶ Check that the plug is secure.
- ▶ After uncoupling the trailer, place the plug in the parking socket.

  The lid secures the plug.

Connecting the electrical system / operating the plugs

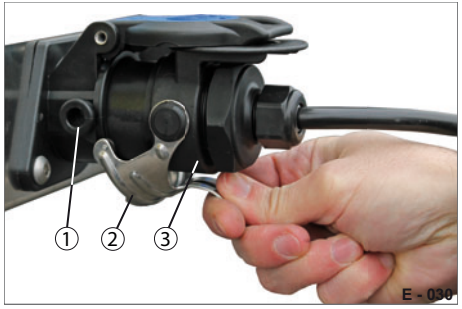


Fig. 14 Releasing the plugs

1 Locking knob
2 Bar lock
3 Plug

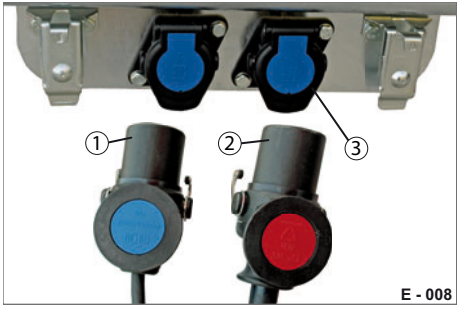


Fig. 15 Parking position on the draw bar

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

Driving with damaged / dirty plug connections is not permissible.

▶ Pull on the bar lock (Fig. 14/2).
The bar lock rotates out of the locking knobs.

▶ Grip the plug (Fig. 14/3) and pull it out of the parking socket (Fig. 15/3) - do not pull on the cable.

▶ Connect the electric plug (Fig. 15/2) with the towing vehicle.

▶ Check that the plug is secure.

Parking plugs

Fig. 16 Securing plugs

1 Locking knob
2 Bar lock
3 Plug

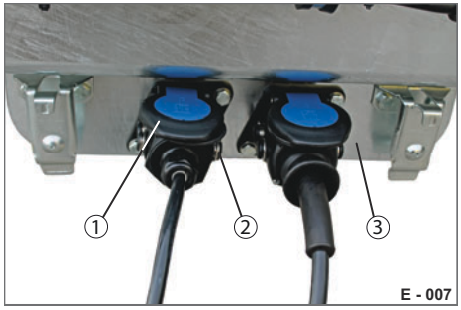


Fig. 17 Plug, parked

1 Parking socket / lid
2 Bar lock
3 Parking console

▶ After uncoupling the trailer, place the plugs in the respective parking sockets (Fig. 16/3).

▶ Rotate the bar lock (Fig. 16/2) onto the locking knobs (Fig. 16/1) on the parking socket.

The plugs are plugged securely into the parking sockets on the parking console.

Parked plug connections are protected from damage / contamination.

▶ Maintain the contacts of the plug connections with contact spray if necessary.

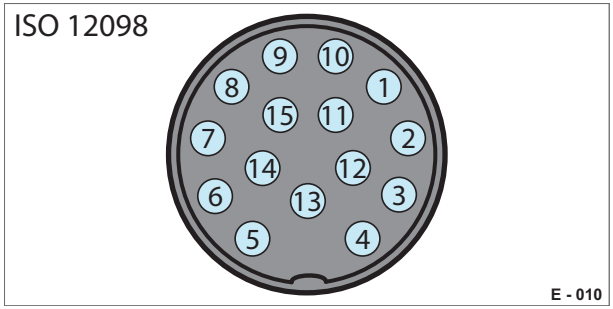
▶ Clean dirty plug connections before driving off.

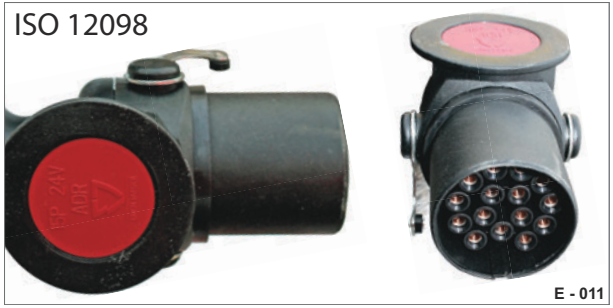
▶ Have defective, torn, worn plug connections replaced immediately in a workshop.

15-pin connector ISO 12098 - 24 V

Pin	Function	Cross-section	Colour
1	Turn indicator, left	1.5 mm²	Yellow
2	Turn indicator, right	1.5 mm²	Green
3	Rear fog lights	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

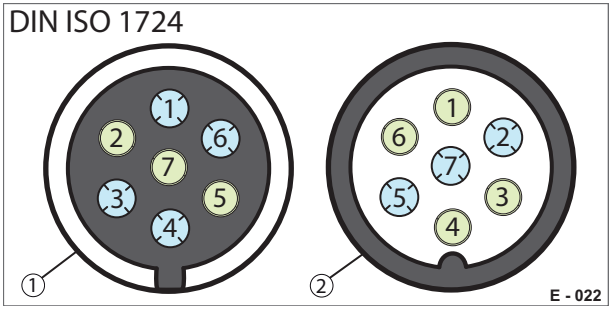




7-pin connector DIN ISO 1724 - 12 V

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 / limit light (58R)	1.5 mm²	Brown
6	Brake lights (54)	1.5 mm²	Red
7	left tail light / limit light (58L)	1.5 mm²	Black

Image/arrangement

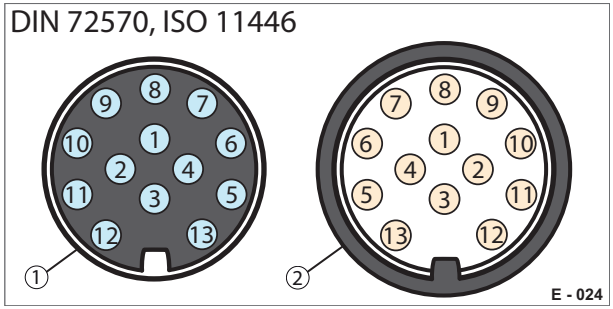


Tab. 1 Pos. 1) plug / Pos. 2) socket

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 contact no. 1-8	2.5 mm²	White
4	Turn indicator, right (R)	1.5 mm²	Green
5	right tail light / limit 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 power / continuous positive (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 (unassigned)	- mm²	-
13	Earth for circuit no. 9 (unassigned)	2.5 mm²	White/red

Image/arrangement

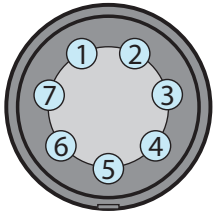


Tab. 2 Pos. 1) socket / Pos. 2) plug

7-pin EBS connector ISO 7638 (brakes)

Pin	Function	Cross-section	Colour
1	Positive solenoid valve (KL30)	4 or 6 mm²	Red
2	Positive (KL15)	1.5 mm²	White/red
3	Minus electronics (KL31b)	1.5 mm²	Brown/blue
4	Minus solenoid valve (KL31)	4 or 6 mm²	Brown
5	Warning device	1.5 mm²	Yellow/blue
6	Not assigned		
7	Not assigned		

ISO 7638



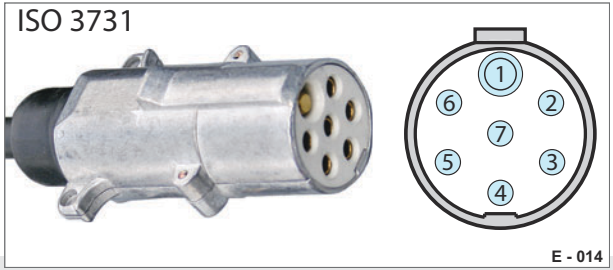
E - 012

ISO 7638

E - 013

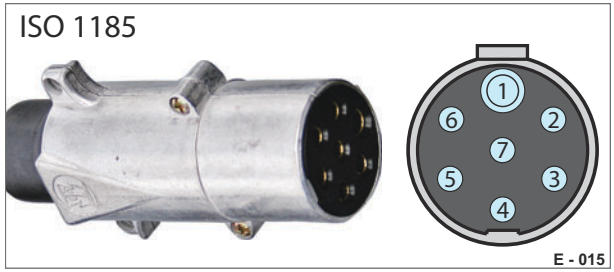
7-pin connector ISO 3731 (white) - 24 V

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	Grey	
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	



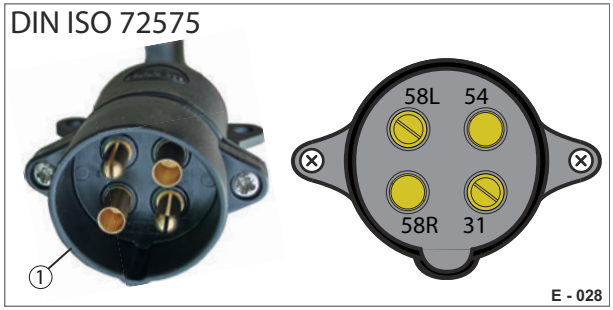
7-pin connector ISO 1185 (black) - 24 V

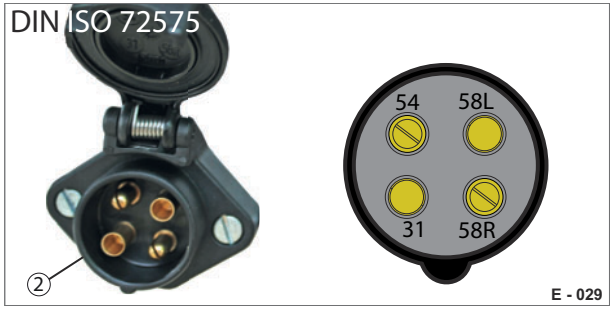
Pin	Function	Cross-section	Colour	Image/arrangement
1	Earth (31)	2.5 mm²	White	
2	Left tail light / limit light / licence plate light (58L)	1.5 mm²	Black	
3	Turn indicator, left (L)	1.5 mm²	Yellow	
4	Brake lights (54)	1.5 mm²	Red	
5	Turn indicator, right (R)	1.5 mm²	Green	
6	Right tail light / limit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



4-pin 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

Standard rear light with peripheral light

The standard rear lights are designed for 24 V and equipped with the following functions:

- Fog light
- Reversing light
- Tail lights with reflectors
- Brake light
- Indicator
- Peripheral light

The light system can be converted to 12 V at the factory as an option.

⚠ WARNING

Non-functioning rear lights

Other road users cannot correctly gauge / identify the vehicle - risk of accidents!

▶ Check that the rear and peripheral lights are working correctly before driving off.

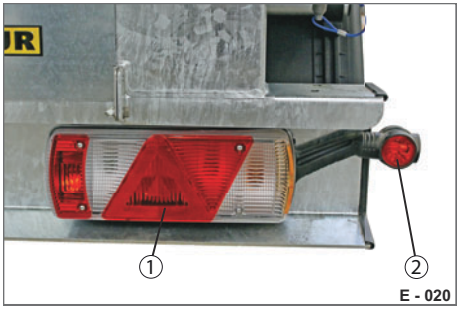


Fig. 18 Rear lights 24 V

1 Rear light complete with:
fog light,
reversing light,
tail light with reflector,
brake light,
indicator

2 Peripheral light

For information on servicing the rear lights, see page **187**.

LED rear light with peripheral light

The LED rear lights are equipped with the following functions:

– Fog light and reversing light
– Tail light with reflector, brake light and indicator
– Peripheral light

⚠ WARNING

Non-functioning rear lights

Other road users cannot correctly gauge / identify the vehicle - risk of accidents!

▶ Check that the rear and peripheral lights are working correctly before driving off.

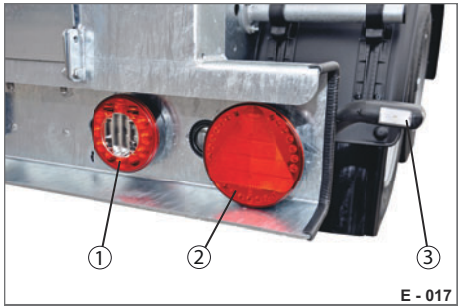


Fig. 19 Rear lights "LED"

1 Lamp with:
fog light / reversing light
2 Lamp with:
tail light with reflector, brake light and indicator
3 Peripheral light

For information on servicing the rear lights, see page **185**.

Marking / limit lights

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

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

The marking / limit lights are LED lights and are supplied by the electrical unit.

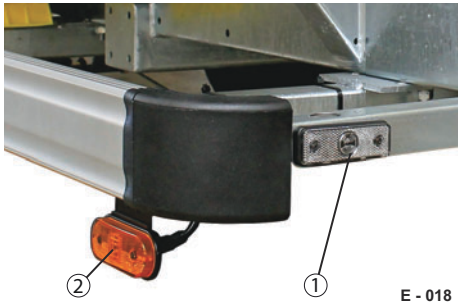


Fig. 20 Marking lights

1 Limit light, front end
2 Side marking lights

⚠ WARNING

Non-functioning marking / limit lights

Other road users cannot correctly gauge / identify the vehicle - risk of accidents!

▶ Check that the marking and limit lights are working correctly before driving off.

For information on servicing the marking / limit lights, see page **191**.

Licence plate light

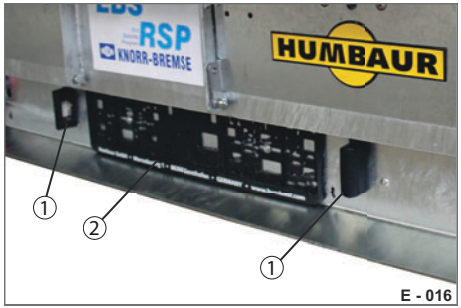


Fig. 21 Licence plate light, "LED"

1 LED lamp
2 Licence plate holder

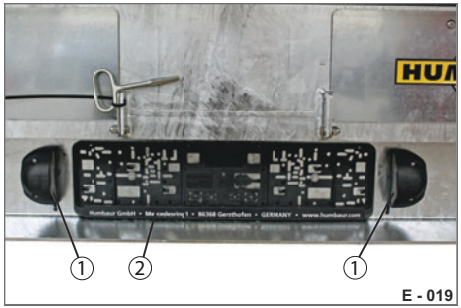


Fig. 22 Licence plate light, 24 V standard

1 Lights, 24 V lamps
2 Licence plate holder

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

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

For information on servicing the licence plate lights, see page **190**.

Licence plate light

Inspection, care and maintenance

Safety tests

Trailers must be inspected by an authorised/qualified specialist as frequently as required, but at least once a year, to ensure that they are in roadworthy condition.

This also applies to all components associated with the securing of the load in accordance with VDI 2700 and/or EN 12642.

For safety reasons, all important mechanical components must be tested and serviced at regular intervals.

These include:

- Axles
- Brakes
- Screws
- Pipe connections
- Attachments
- Mechanical switch-off and securing systems
- Electrical system

For details of the prescribed intervals, see the page **156** "Maintenance intervals."

- Always observe the accident prevention regulations when performing maintenance work.
- Observe environmental protection guidelines.
- Switch off the engine before starting all maintenance work.
- Damaged towing eyes must never be repaired, but must be replaced with new parts.
- Damaged and non-functioning trailer components must be replaced with original parts from Humbaur GmbH.

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 inspections 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 inspections in the trailer inspection log book (Fig. 1).

Maintenance regulations

Maintenance includes regular inspection of individual components and corresponding action based on the checks.

The intervals must be adapted to user behaviour.

Defective trailer parts must be replaced by original replacement parts.

The information below is based on normal trailer use with a max. of 20,000 km per year.

One-time maintenance work	After	50 km	2000 km	5000 km	6 months	6 years
Wheel nuts: tighten (also after every wheel change)		X				
Brake system: perform brake matching / lubrication work			X			
Screw connections of spring-loaded control arms, shock absorbers and axle connections: visual inspection			X		X	
Draw bar height adjustment: lubricate				X		
Tighten towing eye screw connections			X			
Check and if necessary, adjust brake setting				X		
Hydraulic lines / components: check for leakage and if necessary, replace						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 condition and wear						
Wheel nuts: check for firm seating and tighten if necessary		X			X	
Towing eye: lubricate		X				X
Light system: check for damage		X				
Wheels: check tyre pressure, wear on tyres		X				
Compressed air system: check for leakage / cracks			X			
Hydraulic system / hoses: check for leakage / cracks						X
Shock absorbers / telescopic hydraulic cylinders: check for leaked oil					X	
Towing eye / draw bar / tipping bearings: check for wear and firm seating					X	
Electro-hydraulic unit: check for oil loss / battery status					X	
Line filter of the pressure system / tipping bearings: clean					X	
Brake system: drain compressed air tank		X				
All attachments: check for firm seating						X
Screw connections of spring-loaded control arms, shock absorbers and axle connections: visual inspection						X
Screwed / riveted connections on the body / chassis: visual inspection						X

*1: **See the manufacturer's operating manual for information on maintenance**

Tab. 2 Maintenance table

Tightening torques for screw 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 specific screw connections

Name	Thread	Strength class	Tightening torque
Valve clamp (pneumatic control stage)	M 12	10.9	73 Nm
Mud guard clamp	M 8	8.8	10 Nm
Mud guard pipe	M 16	8.8	85 Nm
Side guard	M 12	10.9	73 Nm
Spare wheel holder, cage mounting with strap	M 12	10.9	73 Nm
Spare wheel holder, lifting nut	M 20	4.6	Approx. 50 Nm
Spare wheel holder, tube nut	M 12	4.6	80 Nm
Spindle support draw bar	M 16	10.9	265 Nm
Toolbox	M 12	10.9	73 Nm
Plastic lamp holder	M 10	10.9	30 Nm

Tab. 4 Tightening torques for special attachments

Tightening torques for wheel nuts

Axle manufacturer	Thread	Wheel nuts	Tightening torque
BPW, SAF, GFA, WAP, Al-KO	Observe size	Observe version	 See manufacturer's specifications

Instructions for lubrication

Instructions for maintenance work on the following assemblies can be found in the manufacturer's operating and maintenance manuals:

- Support equipment
- Axles

Without a central lubrication system, all the following lubrication work must be carried out.

For lubrication, use only high-pressure grease guns which do not exceed a lubricating pressure of 250 bar. Bearing points, seals etc., can be damaged if a grease gun without a safety device is used.

⚠ CAUTION

Contact with lubricants

Lubricants can cause skin reactions.

▶ Only use approved lubricants.

▶ Clean lubrication nipples carefully before lubricating.

▶ Wear  ,  .

▶  after working with lubricants.

NOTICE

Dirty lubrication nipple

Dirt can penetrate into the bearing.

Lubrication nipple and bearing points can be damaged.

▶ Clean the lubrication nipple before using it.

Lubricating grease

Lubrication point	Lubricant
– Towing eye – Folding support – Spindle support – Support wheel – Draw bar height adjustment – Spindle parking brake – Locks	Multi-purpose grease in acc. with ISO-L-XCCHB3 or in acc. with DIN 51825-Typ K with application range -30 °C to + 120°C

Draw bar height adjustment

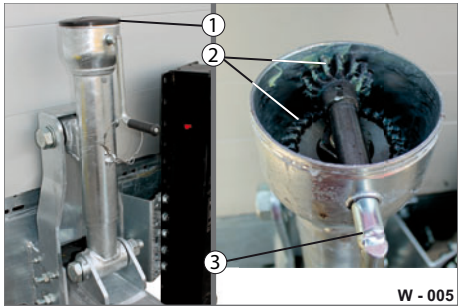


Fig. 4 Lubricating the draw bar height adjustment

1 Lid
2 Gear wheels
3 Crank

- ▶ Remove the lid (Fig. 4/1).
- ▶ If necessary, clean the gear wheels with a clean, dry cloth.
- ▶ Remove any 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 lid.
- ▶ Remove any superfluous grease - risk of environmental pollution!

Folding legs

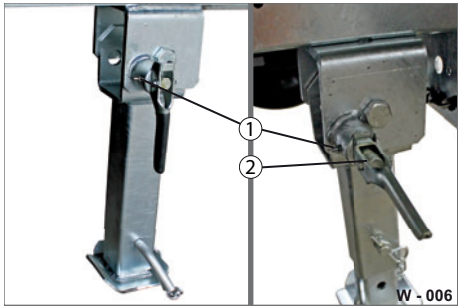


Fig. 5 Lubricating the folding legs

1 Lubrication nipple
2 Locking handle bearing point

- ▶ Clean the lubrication nipple (Fig. 5/1) with a clean, dry cloth.
- ▶ Remove any contamination such as blades of grass, twigs from the bearing points (Fig. 5/2).
- ▶ Use a grease gun to grease the folding legs at the lubrication nipple.
- ▶ Fold the legs up and down several times.

  The locking handle must engage.
- ▶ Remove any superfluous grease - risk of environmental pollution!

Spindle support

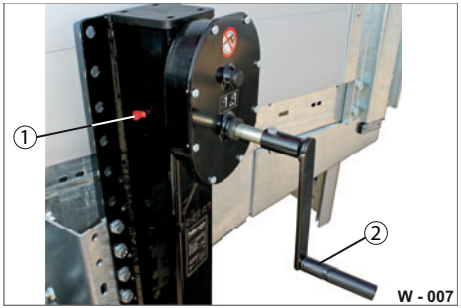


Fig. 6 Lubricating the spindle support

1 Lubrication nipple
2 Crank

Note / observe manufacturer's maintenance manual / intervals.

- ▶ Using the crank (Fig. 6/2), fully extend the leg of the spindle support.
- ▶ Remove the cap from the lubrication nipple (Fig. 6/1).
  Clean the lubrication nipple with a clean, dry cloth.
- ▶ Use a grease gun to grease the spindle support at the lubrication nipple.
- ▶ Slowly retract the leg of the spindle support - this distributes the grease.

Spindle parking brake

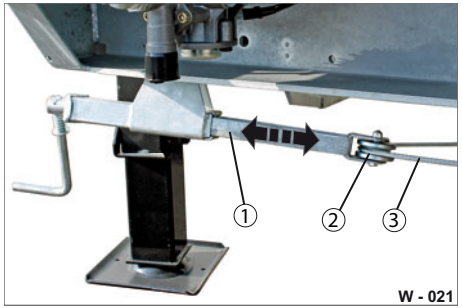


Fig. 7 Lubricating the spindle parking brake

1 Lifting rod
2 Deflection pulley
3 Transmission cable

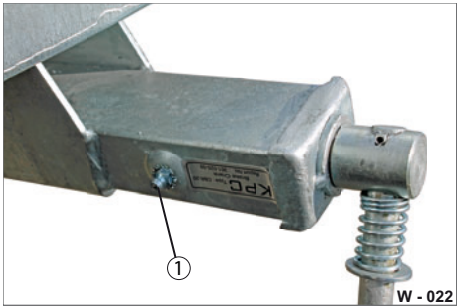


Fig. 8 Lubrication point

1 Lubrication nipple

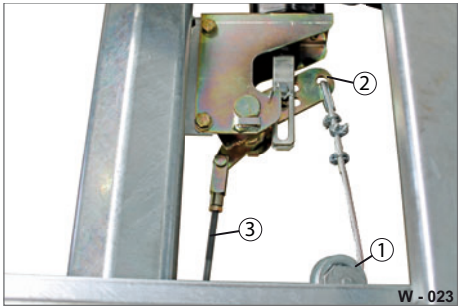


Fig. 9 Mechanical transmission system

1 Deflection pulley
2 Lever
3 Transmission linkage

- ▶ Operate the spindle parking brake several times and carefully clean the lubrication points and the lubrication nipple (Fig. 8/1) with a clean, dry cloth.
- ▶ Inspect the lifting rod (Fig. 7/1), deflection pulley (Fig. 7/2) and transmission cable (Fig. 7/3) for damage / deformation / cracks.
- ▶ Grease the deflection pulley (Fig. 7/2).
- ▶ Use a grease gun to grease the parking brake at the lubrication nipple.
- ▶ Operate the spindle parking brake several times.

  The grease is distributed.
- ▶ Remove any superfluous grease - risk of environmental pollution!

Adjusting the mechanical system

Maintenance / repair work on the brake system must be performed by qualified specialist personnel.

- ▶ Check that the mechanical transmission system is functioning smoothly.
- ▶ If necessary, readjust it.
- ▶ Grease the deflection pulley (Fig. 9/1), friction and bearing points.

Towing eye

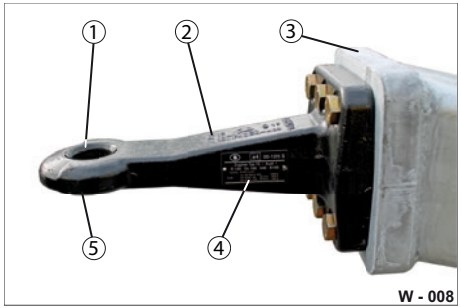


Fig. 10 Lubricating the towing eye

1 Wear bushing
2 Towing eye
3 Draw bar
4 Manufacturer's label / technical values
5 rounded area of the towing eye

- ▶ Clean the wear bushing (Fig. 10/1) and the towing eye with a clean, dry cloth.
- ▶ Check the diameter of the wear bushing:
  - at D=40 mm, max. + 1.5 mm
  - at D=50 mm, max. + 2.5 mm
- ▶ If the maximum diameter values of 41.5 mm / 52.5 mm are exceeded, the wear bushing must be replaced.
- ▶ Inspect the towing eye (Fig. 10/2) for damage.
- ▶ Grease the wear bushing (Fig. 10/1) and the rounded area of the towing eye (Fig. 10/5).

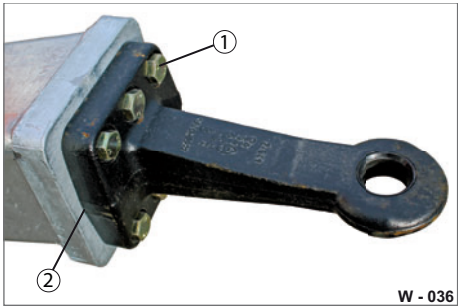


Fig. 11 Towing eye connection

1 Threaded bolt (M16)
2 Flange / contact surfaces

The towing eye screw connection must be tightened after approx. 2,000 km. The contact surfaces must not be treated!

Follow the towing eye manufacturer's instructions.

- ▶ Tighten the threaded bolts (Fig. 11/1), working diagonally.
- ▶ Adhere to the following torques:
  1. Tighten to 50 Nm
  2. Tighten to 100 Nm
  3. Tighten to 390 Nm

Support wheel

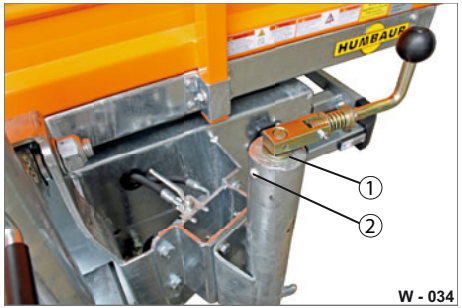


Fig. 12 Cleaning / oiling the support wheel

1 Oil gap
2 Lubrication bore, closed

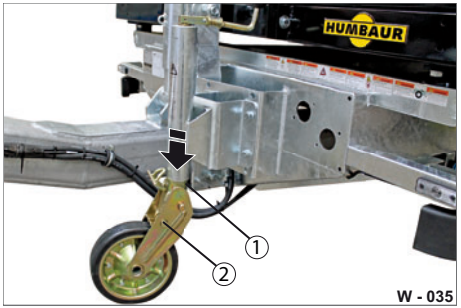


Fig. 13 Extending / retracting the support wheel

1 Adjustment tube
2 Support wheel bearing points

The support wheel is filled with permanent grease at the factory. Regular lubrication is not necessary.

Heavy soiling can cause sluggish movement of the support wheel.

▶ Clean dirt from the support wheel and if necessary, oil the support wheel via the oil gap (Fig. 12/1).

Make sure that the trailer is coupled or supported and secured against falling.

▶ Crank the support wheel up and down several times - this distributes the oil.

▶ If necessary, oil the bearing points.

▶ Check the support wheel for correct functioning and ease of movement.

Drop-side locks

Fig. 14 Lubrication points

1 Bearing point locks
2 Bearing points central interlock

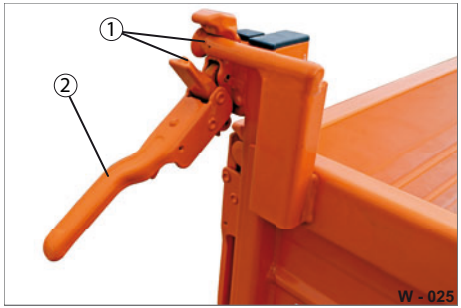


Fig. 15 Locks

1 Lubrication / bearing points
2 Lock

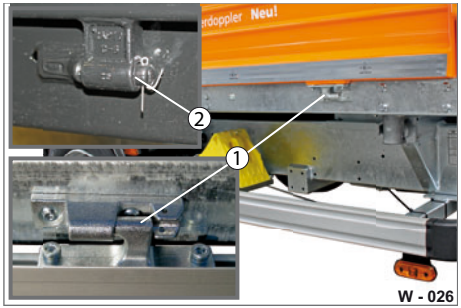


Fig. 16 Lateral drop-sides

1 Hinges, bolted
2 Hinges, welded

Smooth and problem-free folding / locking / swinging of the drop-sides can only be guaranteed through regular cleaning and regreasing of the bearing points.

- ▶ After using the drop-sides, check each time that the bearing and fastening points are clean (free of foreign bodies such as blades of grass, sand, etc.).
- ▶ If necessary, clean them with a hand-brush or cloth before locking the drop-sides.

- ▶ Release the locks (Fig. 15/2) for the respective drop-side.
- ▶ Fold the drop-side down carefully.
- ▶ Clean the lubrication / bearing points (Fig. 15/1) with a clean, dry cloth.
- ▶ Grease the lubrication / bearing points.
- ▶ Fold the drop-sides up and fix them in place with the locks.

- ▶ Dismantle the lateral drop-sides.
- ▶ Clean the hinges (Fig. 16/1 and 2) with a clean, dry cloth.
- ▶ Grease the sliding surfaces of the hinges.
- ▶ Fit the lateral drop-sides.
- ▶ If necessary, replace the safety splint pins.

Central interlock

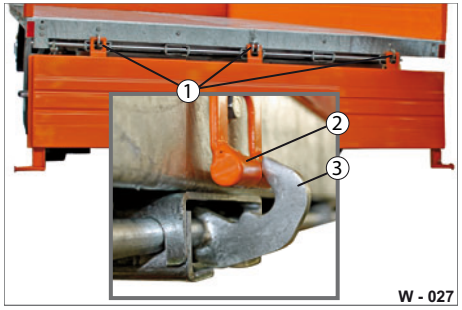


Fig. 17 Rear platform gates

1 Hinges / lubrication points
2 Locking lug
3 Locking hook

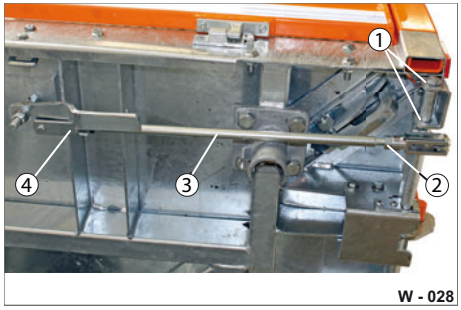


Fig. 18 Central interlock

1 Lubrication / bearing points, turning rod
2 Clevis on the turning rod
3 Transmission rod
4 Clevis on the lever

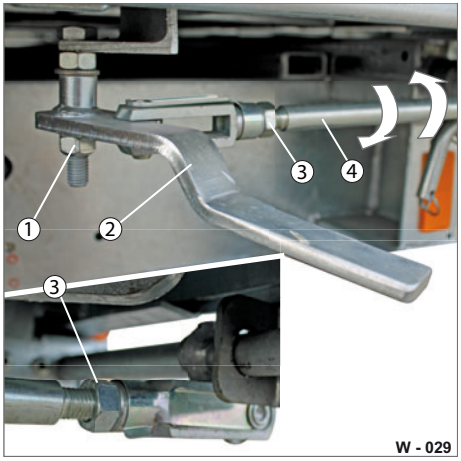


Fig. 19 Readjusting the central interlock

1 Bearing point, lever
2 Lever
3 Clevis, lock nut
4 Transmission rod

▶ Release the rear platform gate via the central interlock.

The rear platform gate is in swing mode.

▶ Clean the lubrication / bearing points (Fig. 17/1) with a clean, dry cloth.

▶ Grease the locking lug (Fig. 17/2) and locking hook (Fig. 17/3).

Readjusting the central interlock

▶ Release both lock nuts (Fig. 19/3) on the transmission rod (Fig. 18/3).

▶ Turn the transmission rod clockwise or anti-clockwise.

The transmission rod tensions or releases the central interlock mechanism.

▶ Check the adjustment by operating the lever (Fig. 19/2).

▶ Tighten the lock nuts (Fig. 19/3) firmly.

Tipping bearings

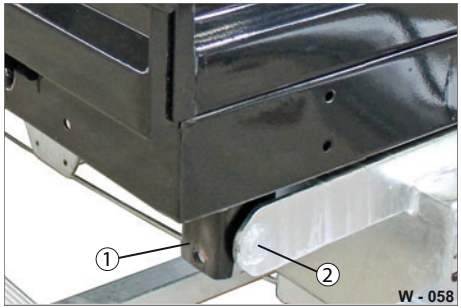


Fig. 20 Clevis tipping bearing (front end)

1 Clevis cup
2 Bolt, welded in

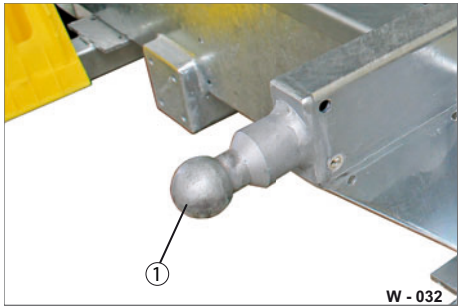


Fig. 21 Tipping bearing ball (rear side)

1 Tipping bearing ball

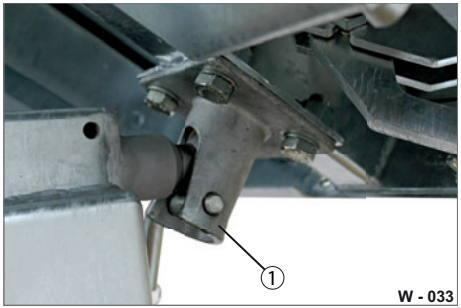


Fig. 22 Tipping bearing, secured

1 Tipping bearing cup

Depending on the intensity of use and the application environment of the trailer, the tipping bearings must be inspected regularly for soiling and wear and lubricated.

The tipping bearings must be visually inspected at least every 6 months, and if necessary cleaned and lubricated.

For operation of the loading platform / tipping bearings, see page **75**.

- ▶ Tip the loading platform to the left and right.
- ▶ Carry out a visual inspection.
- ▶ Remove any dirt particles such as sand, twigs, etc.
- ▶ Clean the tipping bearing ball (Fig. 21/1) or the bolt (Fig. 20/2) and the tipping bearing cup (Fig. 20/1 Fig. 22/1) with a clean cloth.
- ▶ Grease the tipping bearing ball or the bolt (Fig. 20/2).

- ▶ Tip the loading platform to the left and right.
- ▶ Check that the platform tipping function is working smoothly.

Servicing the hydraulic system

Trailers with hydraulic systems require special maintenance.

Maintenance / repair work on hydraulic systems must be performed by qualified specialist personnel.

Observe the national regulations, e.g. BGR 237 on handling / servicing / repairing hydraulic components.

⚠ WARNING

Lines are under pressure

The hydraulic lines.are under pressure when they are decoupled.

The oil can escape under high pressure, cause cut injuries and lacerate skin!

▶ Before doing repair work on the hydraulics, check that the lines are depressurised and that the towing vehicle is switched off.

▶ Wear .

⚠ WARNING

Working under the unsecured loading bridge

The loading bridge can drop and crush persons.

▶ Before performing work under the loading bridge, check that the maintenance support has been folded down correctly.

Hydraulic connections

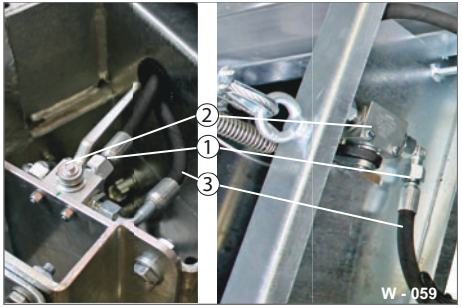


Fig. 23 Checking / servicing the connections

1 Connection points / screw fittings
2 Hydraulic oil distributor / valves
3 Hoses

▶ Check all hydraulic connection points (Fig. 23/1) for leakage (oil loss) and tight fit.

▶ If necessary, clean escaping oil from the hydraulic components.

▶ Replace defective hydraulic components, e.g. distributor / valves (Fig. 23/2) without delay.

▶ Check the hoses (Fig. 23/3) for crack formation / deformation.

▶ Replace the hoses after about 6 years.

Telescopic cylinder

⚠ CAUTION

Entering the area under the loading bridge

There is a danger of hitting your head.

▶ Move carefully when you are under a raised loading bridge - no hasty / rapid movements.

The loading bridge must be secured with the maintenance support before performing maintenance work.

The maintenance support is swing-mounted under the loading bridge and secured.

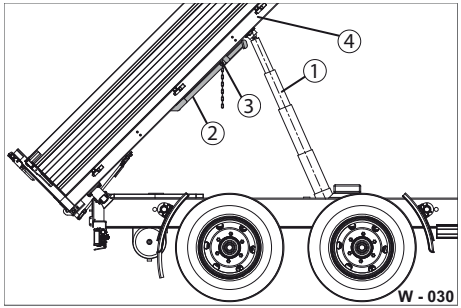


Fig. 24 Maintenance support in driving position

1 Telescopic cylinder
2 Maintenance support
3 Locking pin
4 Loading bridge

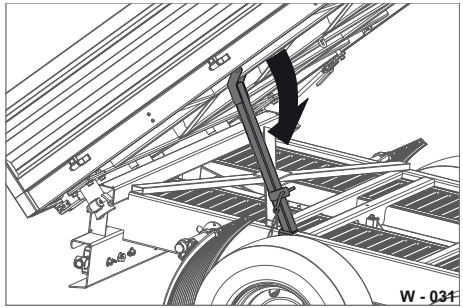


Fig. 25 Maintenance support, lowered

▶ Use the hydraulics to tip the loading bridge (Fig. 24/4) towards the rear.

▶ Pull the locking pin (Fig. 25/3) out.

▶ Fold the maintenance support (Fig. 25/2) down.
The maintenance support must rest securely on the edge of the chassis.

▶ Slowly lower the loading bridge onto the maintenance support.
The loading bridge is secured mechanically against falling.

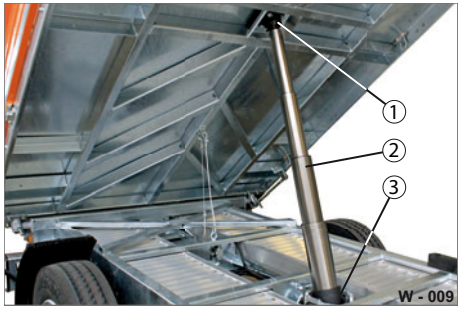


Fig. 26 Checking / servicing the cylinder

1 Cylinder bearing, top, lubrication nipple
2 Cylinder, extended
3 Cylinder bearing, bottom, bearing points

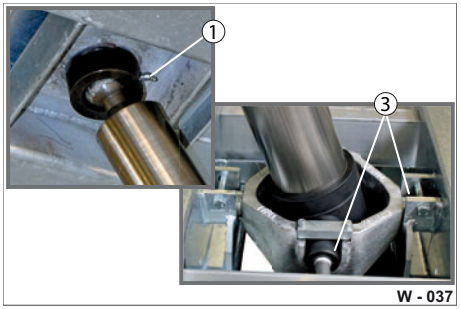


Fig. 27 Bearing points

1 Lubrication nipple, ball
3 Bearing cup

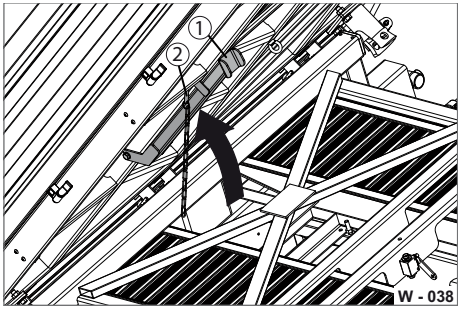


Fig. 28 Securing the maintenance support

1 Maintenance support
2 Locking pin

▶ Inspect the cylinder (Fig. 26/3) for leakage (oil loss) and firm seating.

▶ If necessary, clean escaping oil from the hydraulic components.

▶ Check the hoses for crack formation / deformation.

▶ Replace the hoses after about 6 years.

▶ Clean the bearing points at the top and bottom (Fig. 27/1,3) with a clean cloth.

▶ Grease the ball at the lubrication nipple (Fig. 27/1).

▶ Grease the bearing cups (Fig. 27/2).

▶ Fully raise the loading bridge.
The maintenance support is released.

▶ Fold the maintenance support (Fig. 28/1) up.

▶ Secure the maintenance support with the locking pin (Fig. 28/2).
The loading bridge can be tipped back.

Electro-hydraulic unit

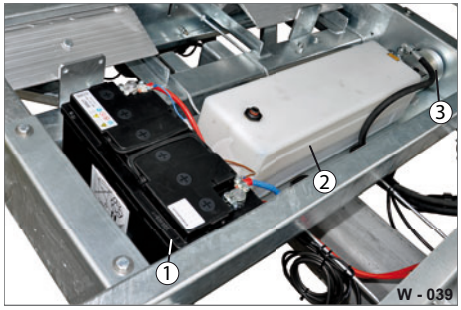


Fig. 29 Electro-hydraulic unit, open

1 Battery (12 V)
2 Hydraulic oil tank
3 Electric pump

Maintenance / servicing work on the electro-hydraulic unit may only be performed by qualified specialists in a specialist workshop!

The raised loading bridge must be secured with the maintenance support when working on the electro-hydraulic unit!

▶ Switch the hydraulic supply over to the electric pump.
See section Chassis on page **73**.

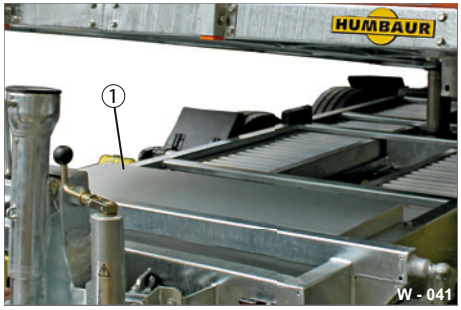


Fig. 30 Electro-hydraulic unit, closed

1 Cover

▶ Raise the loading bridge.
▶ Secure the loading bridge with the maintenance support.
▶ Release and remove the cover (Fig. 30/1) of the electro-hydraulic unit.

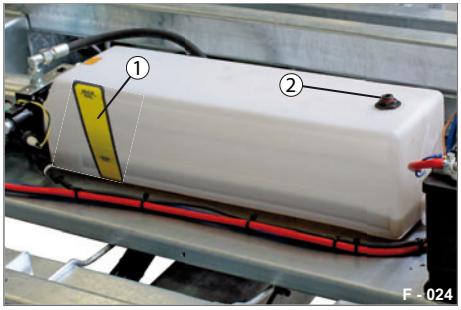


Fig. 31 Checking the oil filling level

1 Control strip for oil level (min. / max.)
2 Filling port

▶ Check the oil level in the hydraulic oil tank (Fig. 31/1).
▶ Replace spent / dirty hydraulic oil.
▶ After completing maintenance work, close and secure the electro-hydraulic unit with the cover.

Charging the battery

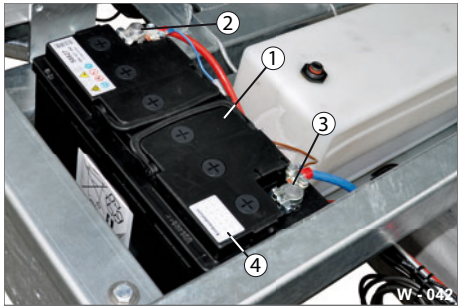


Fig. 32 Power supply

1 Battery (12 V) for electric pump
2 + pole
3 - pole
4 Installation date

The battery can be charged directly by connecting a suitable vehicle charger to the poles or more conveniently using a charging plug.

See the installation date for the age of the battery.

- ▶ Replace the battery if it is defective or old.
- ▶ Prevent possible battery damage, e.g. insufficient charge, deep discharge.

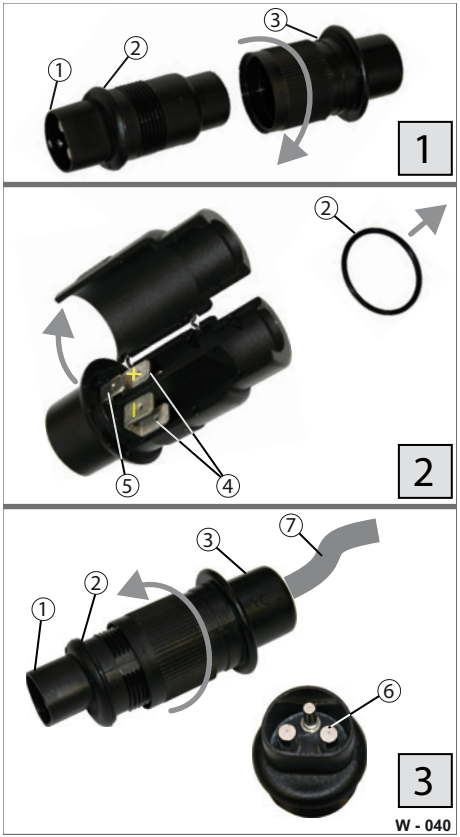


Fig. 33 Charging plug for charging device

1 Front section of plug (with contacts)
2 Rubber sealing ring
3 Rear section of plug
4 + line no. 15/30; - line no. 31
5 Pin terminal no. 82 (unassigned)
6 Contacts
7 Charging line, connected

Pre-assembling the charging plug

- ▶ Unscrew the charging plug (see step 1).
- ▶ Remove the rubber sealing ring (Fig. 33/2).
- ▶ Pull the rear section of the plug (Fig. 33/3) onto the charging line.
- ▶ Open the front section of the plug (Fig. 33/1).
- ▶ Clamp + line to terminal no. 15/30 and the - line to terminal no. 31.
- ▶ Close the front section of the plug and slide the rubber sealing ring on.
- ▶ Screw the front section of the plug to the rear section (see step 3).

  The charging device can be connected via the power socket using the charging plug.

Switch-off / securing mechanisms

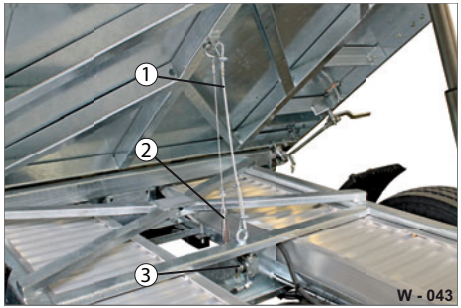


Fig. 34 Loading bridge tipped towards the rear

1 Safety wire / safety cable
2 Stroke limiting cable
3 Switch-off lever / valve

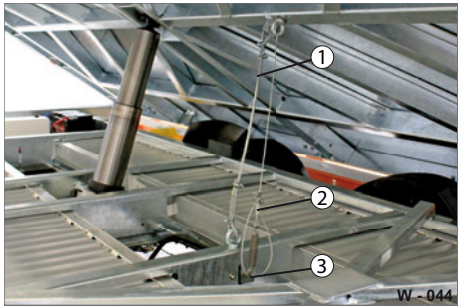


Fig. 35 Loading bridge tipped to the side

1 Safety wire / safety cable
2 Stroke limiting cable
3 Switch-off lever / valve

The stroke limiter for the loading bridge is maintenance-free.

The stroke of the loading bridge is preset at the factory. Unauthorised adjustment of the stroke limiter is impermissible!

Maintenance and repair work on the switch-off and safety mechanisms must be performed by qualified specialist personnel.

The loading bridge must be secured with the maintenance support before performing maintenance / repair work.

▶ Tip the loading bridge once towards the right / left and rear.

▶ Check that the lifting action of the loading bridge is switched off via the stroke limiting cable (Fig. 35/2) and switch-off lever (Fig. 35/3).
The stroke of the loading bridge must not be limited via the safety wire.

Tyre types

			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

Tyres should only be fitted by qualified technical personnel.

WARNING

Driving with degraded tread / incorrect tyre pressure

The tyres can burst during the journey - risk of accidents!

- ▶ Inspect the tyres regularly.
- ▶ Check the tyre pressure, tread depth and overall condition of the tyres.

NOTICE

Driving with incorrect tyre pressure

There is excessive wear on the tyres.

- ▶ Check that the tyres have the correct pressure before driving off or at least every 14 days.
- ▶ Check the tyre pressure (see page175) on all wheels regularly.
  Check the tyre pressure when the tyres are cold (before driving off or when the vehicle has not been driven for some time).
- ▶ See the tyre type table (on page **174**) for the correct tyre pressure for your trailer.
  If the type of tyre you are using is not listed, please contact the tyre manufacturer directly.
- ▶ Inflate the spare wheel to the 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).
- ▶ Inspect the tyres from all sides. Look out for cracks and foreign bodies.
  Recommendation:
  The tyres should be changed after six years of use.

Wheel nuts

WARNING

Wheel nuts work loose

Wheels can fall off during the journey - risk of accidents!

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.
- ▶ Always tighten the wheel nuts: after the first hour of operation (50 km), after the first journey with a load (max. 500 km), after the first 5000 km and then every 100 hours of operation.
- ▶ In addition, tighten the wheel nuts on new or freshly painted rims after 20 to 100 hours of operation.
- ▶ Tighten the wheel nuts in diagonal pairs.
- ▶ Observe the tightening torques prescribed by the axle manufacturers (see page **159**).

Wheel changing

DANGER

Carelessness on the road

You can hinder the flow of traffic when changing tyres - risk of accidents!

Moving vehicles could hit you!

- ▶ Secure the location on the road.
- ▶ Set up a warning triangle.
- ▶ Wear  .
- ▶ Wear  .

WARNING

Unsecured wheels

Unsecured wheels can roll away - risk of accidents!

This can result in injury.

- ▶ Secure dismantled wheels to prevent them 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 and run over. The trailer can slip off the lifting device and fall - risk of crushing!

- ▶ Fit wheel chocks before coupling to prevent the trailer from rolling.
- ▶ Use only approved lifting devices when working on the trailer.
- ▶ Check that the trailer is on flat and level ground before changing a 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.

Always observe the following when changing wheels:

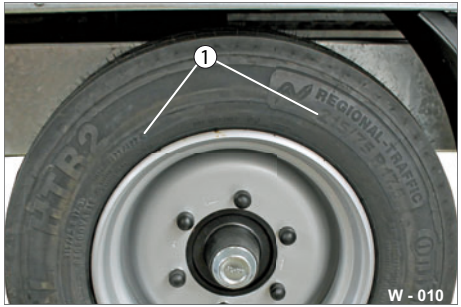


Fig. 36 Wheels / tyres:

1 Technical specifications

- Use only the prescribed rim and tyre sizes.
- Observe the prescribed tyre load bearing 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 **159** & **175**)

Securing the trailer

Fig. 37 Securing the vehicle

1 Wheel chocks

▶ Apply the towing vehicle parking brake.

▶ Engage the trailer service brake.

▶ Also use wheel chocks (Fig. 37/1) to secure the trailer and prevent it from rolling off.

Putting a lifting device into position

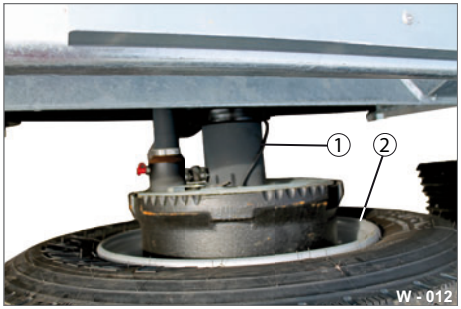


Fig. 38 Putting a lifting device into position

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. 38/2) under the axle tube (Fig. 38/1).

▶  You can find the exact lifting points in the operating/maintenance instructions from the respective axle unit manufacturer.

Replacing a defective wheel

- ▶ Have the spare wheel ready.
- ▶ Unscrew the nuts on 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 on by hand with the same nuts.
- ▶ Tighten the nuts - if possible in diagonal pairs - with a torque wrench.
  - Observe the prescribed tightening torque!
- ▶ Carefully lower the trailer.
- ▶ Stow away the defective wheel safely on the loading platform.

  or
- ▶ Put the defective wheel in the spare wheel holder.
- ▶ Carefully stow away any tools / lifting equipment used.

Spare wheel storage

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: Fundamental principles for vehicle testing by the driving personnel (BGG 915) and (ZH 1/282.1).

Getting the spare wheel ready

- ▶  Obtain help from another person - wheels are heavy!
- ▶ Take out the spare wheel (see page **89**).

Alloy disc wheels

Lubricants for the hubs

Alloy disc wheels are only approved for hub centring.

Approved lubricant

– "Freylube“
– "Rocol MG“
– "Esso (Moly)“ or
– similar lubricants

These greases prevent the wheel and hub from sticking. The surfaces of the hub and wheel must be smooth, even and clean.

No conical or spherical nuts may be used.

Only fit the valves supplied or valves with nickel or chrome plating.

▶ Only lubricate the hubs with the approved lubricants when changing a wheel.

Fixings, lines, Cable clips

▶ Thoroughly clean the dirty trailer.
▶ Remove rust from fixings.
▶ Check the plug contacts of the electrical connections.
▶ Replace damaged lines and cable clips.
▶ Replace the hydraulic hoses every 6 years.

Brakes are safety components!

- Adhere to the road traffic licensing regulations (StVZO in Germany).
- General inspections must 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 brake system must be remedied 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.

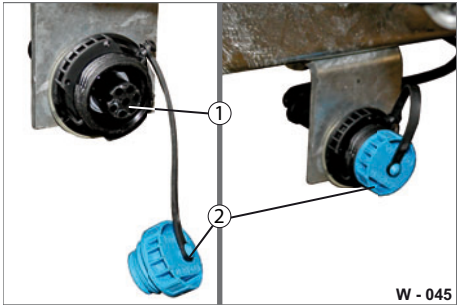


Fig. 39 Diagnostics for EBS / ABS brakes

1 Plug connection
2 Screw-on cap

The brake system is set at the factory via the diagnostics connection.

The settings may only be changed by qualified specialist personnel!

The technical values are listed on the brake name plate (Fig. 40 & Fig. 41) from the brake manufacturer.

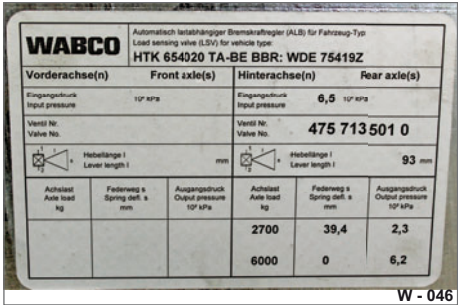


Fig. 40 "WABCO" brake name plate

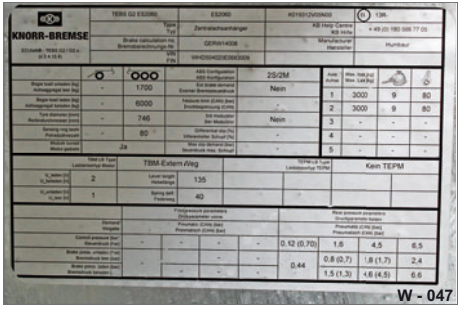


Fig. 41 "KNORR" brake name plate

Wheel brake

Fig. 42 Brake system

For details of maintenance and repair work on wheel brakes, please refer to the manufacturer documentation for the respective axle.

Brake linings must always be replaced with the same linings as were originally fitted or with the approved brake linings listed in the technical documentation of the brake system.

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 fail.

▶ 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.

▶ Wear .

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

The maintenance work described below must be performed conscientiously by the driver before each journey.

Compressed air tank

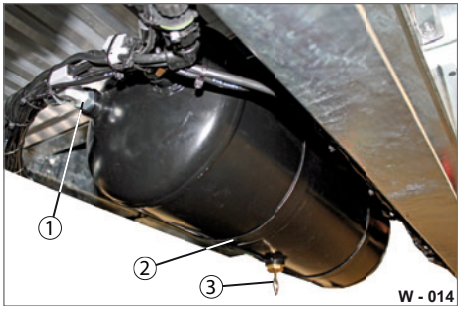


Fig. 43 Chassis underside

1 Screw fittings, hose / pipes
2 Holders
3 Operating pin

On trailers fitted with manual drain valves, the tanks must be regularly drained and leaking drain valves must be replaced (see page **66**).

▶ Check that the screw fittings (Fig. 43/1) are secure.

▶ Tighten leaking screw fittings or replace them.

▶ Have damaged hoses and pipes (Fig. 43/2) replaced.

Cleaning the line filter

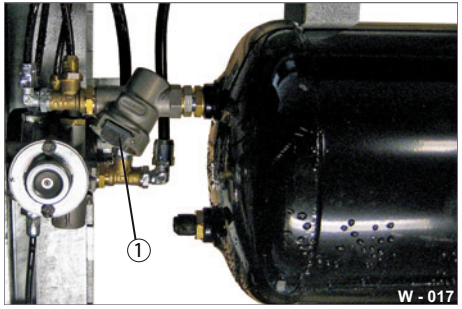


Fig. 44 Line filter for compressed air system

1 Line filter

The line filter 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.

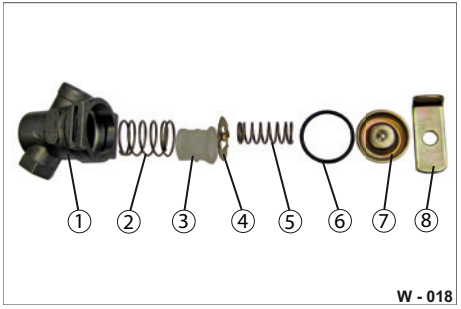


Fig. 45 Line filter, dismantled

1 Filter housing
2 Large spring
3 Filter
4 Intermediate plate
5 Small spring
6 Seal
7 Cover
8 Bracket

Dismantling

▶ Press the cover (Fig. 45/8) downwards with a screwdriver and pull out the bracket (Fig. 45/9).

▶ Remove both springs (Fig. 45/3 & Fig. 45/6), the seal (Fig. 45/7), the intermediate plate (Fig. 45/5) and the filter (Fig. 45/4).

▶ Clean the filter housing (Fig. 45/2) with a clean, dry cloth.

▶ Clean the filter (Fig. 45/4). Replace the filter if it is heavily soiled or damaged.

▶ Check that the seal (Fig. 45/7) is present and undamaged. Replace damaged seals.

▶ Lubricate the seal with a little grease.

Assembly

- ▶ Insert the intermediate plate into the filter housing with the latches pointing upwards.
- ▶ Set the small springs (Fig. 45/6) on the latches of the intermediate plate.
- ▶ Set the cover (Fig. 45/8) on top.
- ▶ Press the cover into the filter housing and push the bracket through the oblong holes in the filter housing.

Cleaning the Duo-Matic coupling

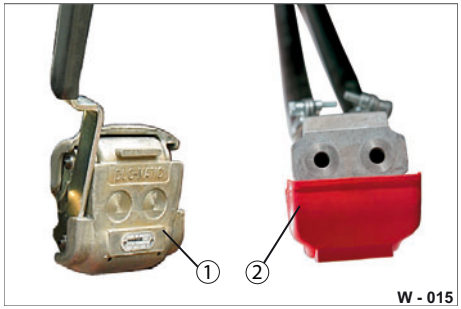


Fig. 46 Coupling head, dismantled

1 Coupling (socket)
2 Coupling head (plug)

The Duo-Matic coupling for "Supply, Brake" must be cleaned regularly (see page **157**).

- ▶ Clean the sealing surfaces of the coupling head (Fig. 46/2) and the coupling socket (Fig. 46/1) with a clean, dry cloth.
- ▶ Replace the coupling head if it is damaged.

Cleaning the coupling heads

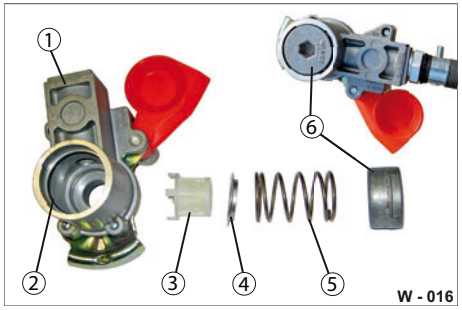


Fig. 47 Coupling head, dismantled

1 Housing
2 Seal
3 Filter
4 Metal ring
5 Spring
6 Cover

The coupling heads "Supply, Brake" with filter insert must be cleaned regularly (see page **157**).

Dismantling

- ▶ Using a hexagon socket, press the cover (Fig. 47/6) into the housing (Fig. 47/1) as far as the stop. Turn the hexagon socket through 90°.
  The cover opens.
- ▶ Remove the spring (Fig. 47/5), the metal ring (Fig. 47/4) and the filter (Fig. 47/3) from the housing.
- ▶ Clean the housing with a clean, dry cloth.
- ▶ Clean the filter.
  Replace the filter if it is heavily soiled or damaged.
- ▶ Check that the seal (Fig. 47/2) is present and undamaged.
  Replace damaged seals.
- ▶ Lubricate the seal with a little 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.
- ▶ Using a hexagon socket, press the cover downwards as far as the stop. Turn the hexagon socket through 90°.
  The coupling head is ready for use.

⚠ 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 plug-in connections to the towing vehicle.
- ▶  Unplug all connections to external power supplies.
- ▶ Switch all consumers off.
- ▶ Disconnect the negative pole (-) on the battery.
  Use an insulated tool.
- ▶ Only allow qualified specialists to carry out work on electrical systems.

NOTICE

Contamination during installation

Electrical elements, lamps can become contaminated during installation when touched with bare fingers or in a dirty work environment.

Contacts can malfunction..

- ▶ Only perform electrical work in protected areas - protect equipment from water.
- ▶  Do not touch the new lamp with your bare fingers - this significantly reduces the service life 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 the vehicle lighting.

- ▶ Before driving off, check the:
  1. rear lights,
  2. licence plate lights,
  3. side marking lights,
  4. limit lights.
- ▶ Replace defective lamps.
  Use lamps of the same type and output as listed in the tables below.

Lights

Function	DIN / form	Cap type	Output (W)
Side marking lights/rear reflector light (orange)		LED	12 V = 0.5 / 24 V = 1.1
Limit 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 lights	P21W	Ba15s	21
Peripheral light / outline marker (red/white/yellow)	R5W	Ba9s	5
Rear lights "LED"			
Fog light and reversing light		LED	
Tail light with reflector, brake light and indicator		LED	
Peripheral light / outline marker		LED	12 V = 0.6 / 24 V = 1.2
Licence plate light "LED"	W 52	LED	12 V = 0.4 / 24 V = 0.7
Licence plate light "standard"	Soffitte		5

Tab. 6 Lamp type

Replacing lights

Rear light "24 V - standard"

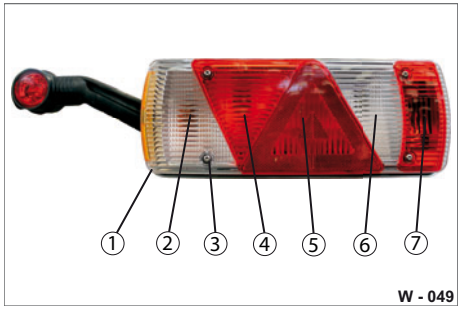


Fig. 48 Rear light components

1 Outer light lens
2 Rear fog lights
3 4x fixing screws
4 Reversing light
5 Tail lights with reflectors
6 Brake light
7 Indicator

The electrical system must be switched off before beginning work.

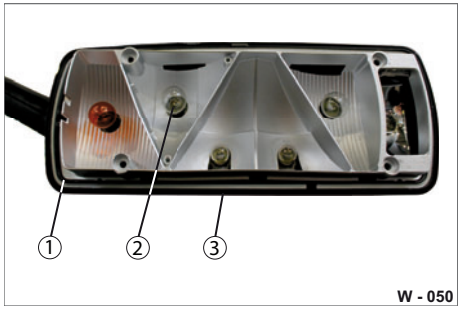


Fig. 49 Tail light open

1 Seal
2 Lamp
3 Housing

- ▶ Unscrew the 4 fixing screws (Fig. 48/3).
- ▶ Remove the outer light lens (Fig. 48/1).
  Put it down in a safe place.
- ▶ 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 tightly on the housing (Fig. 49/3).
- ▶ Make sure that the seal (Fig. 49/1) is seated correctly.
  Replace damaged / torn seals.
- ▶ Screw on the fixing screws (Fig. 48/3). Tighten the screws to max. 1.5 Nm torque.
  The light lens must be replaced if it is cracked!
- ▶ Check the connections / cable connections.

Peripheral light

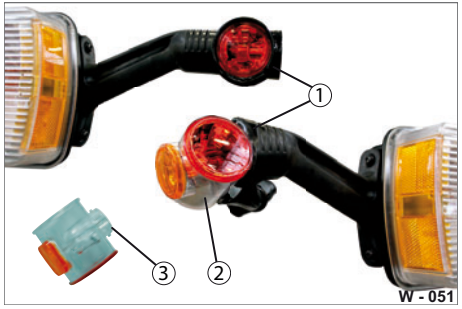


Fig. 50 Removing the rubber arm

1 Rubber arm cover
2 Lamp
3 Screw fitting

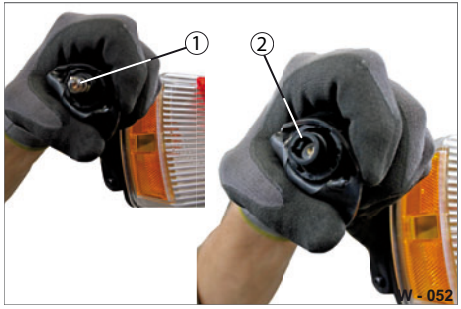


Fig. 51 Replacing the lamp

1 Lamp
2 Socket

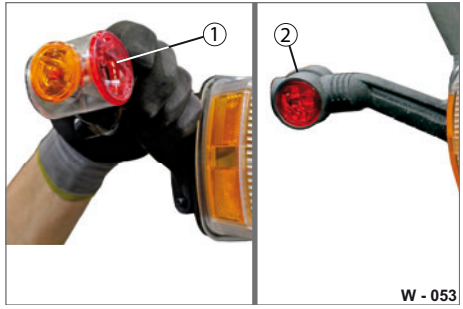


Fig. 52 Pulling on the rubber arm

1 Lamp
2 Rubber arm cover

▶ Spray an ample amount of silicone spray on the rubber arm coating (Fig. 50/1) - this makes pulling it up and down easier.

▶ Remove the rubber arm coating (Fig. 50/1) from the lamp (Fig. 50/2) using a slotted screwdriver.

▶ Loosen the screw connection (Fig. 50/3) and remove the lamp (Fig. 50/2).

▶ Unscrew the defective lamp (Fig. 51/1).

▶ Screw in the new lamp.

▶ Screw on the lamp (Fig. 52/1) with the screw fitting (Fig. 50/3).
Make sure that the seal is correctly seated.

▶ Pull the rubber arm (Fig. 52/2) over the lamp.

▶ Check the peripheral light for damage.
Damaged peripheral lights must be completely replaced.

Rear light "LED"

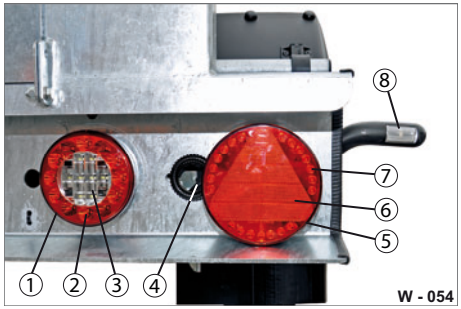


Fig. 53 Rear lights "LED"

1 Inside lamp
2 Reversing lights
3 Rear fog lights
4 Connection cable
5 Outside lamp
6 Tail lights with reflectors
7 Brake light and indicator
8 Arm with peripheral light

In the event of defects, the LED lamps must be replaced completely.

▶ The rear lights must be replaced with original replacement parts from the manufacturer.
The lamp type is shown on the lamps.

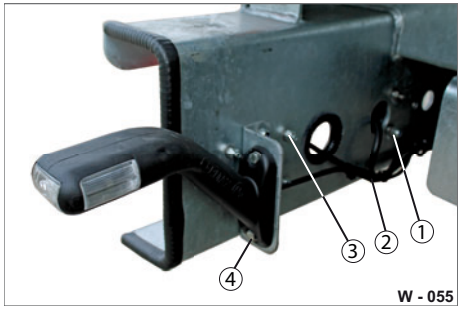


Fig. 54 Rear lights, attachment

1 Screw fitting, inside lamp
2 Connection cable
3 Screw fitting, outside lamp
4 Screw fitting, arm

▶ Release the corresponding screw fitting (Fig. 54/1, 3, 4).
▶ Disconnect the corresponding connection cable (Fig. 54/2).
▶ Fit the new LED lamp.
▶ Connect the connection cable.
▶ Tighten the screw connection.
▶ Check that the LED lighting is functioning correctly.

Licence plate light "LED"

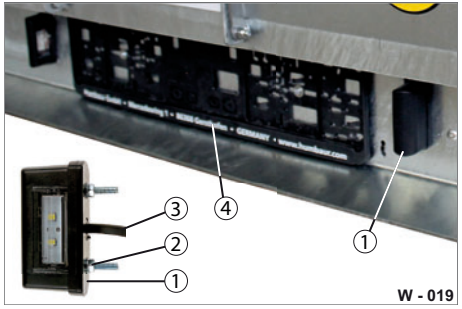


Fig. 55 Licence plate lighting

1 LED light
2 Fixing screw / nut
3 Connection cable with connector
4 Licence plate holder

A defective LED light must be completely replaced.

- ▶ Release the screw fittings (Fig. 55/2).
- ▶ Release the connection cable with connector (Fig. 55/3).
- ▶ Replace the complete LED light (Fig. 55/1).
- ▶ Screw on the new LED light with fixing screws / nuts.
- ▶ Connect the connection cable.

Licence plate light "Standard"

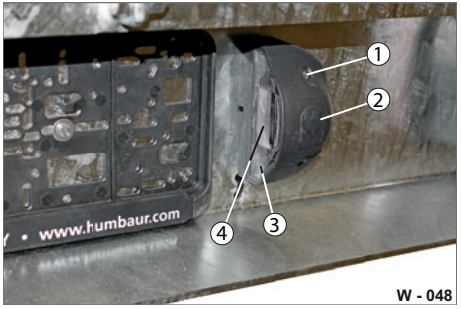


Fig. 56 Licence plate lighting 24 V

1 Fixing screw
2 Lamp body
3 Light lens
4 Light

- ▶ Release the fixing screws (Fig. 56/1).
- ▶ Carefully open the lamp body (Fig. 56/2).
- ▶ Remove the light lens (Fig. 56/3).
- ▶ Replace the lamp (Fig. 56/4).
- ▶ Insert the light lens.
- ▶ Close the lamp body.
- ▶ Screw on the fixing screws.

Side marking lightn

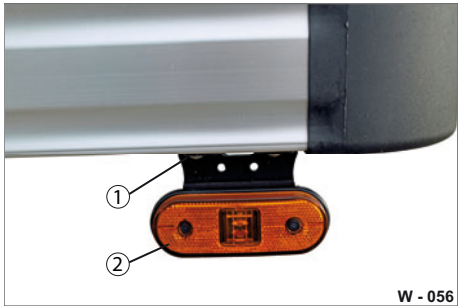


Fig. 57 Side marking light "LED“

1 Fixing screw
2 LED lamp body (orange)

A defective LED light must be completely replaced.

- ▶ Loosen the fixing screws (Fig. 57/1).
- ▶ Remove the LED light (Fig. 57/2) - remove connection.
- ▶ Insert the new LED light.
- ▶ Screw in the fixing screws securely, but not too tightly.

Limit lights

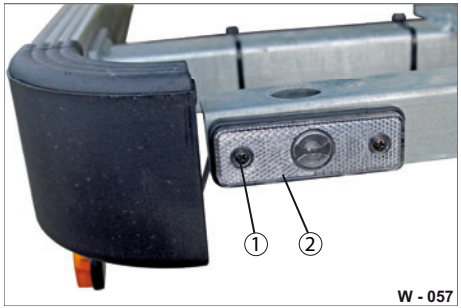


Fig. 58 Front wall limit light

1 Fixing screw
2 LED light (white)

A defective LED light must be completely replaced.

- ▶ Release the fixing screws (Fig. 58/1).
- ▶ Remove the LED light (Fig. 58/2) - remove connection.
- ▶ Insert the new LED light.
- ▶ Screw in the fixing screws securely, but not too tightly.

HUMBAUR trailers and bodies are partly coated with air-drying 2K acrylic paints.

The drying time depends on the ambient temperature, and particularly at low temperatures, these paints can take several months to dry.
During the drying time, the paints are not fully resilient.

During this time, we recommend avoiding the use of high-pressure cleaning equipment or steam jets to clean the trailer.

Lettering work

To avoid damage to the paint during lettering work, please observe the following:

– Fresh paint must be allowed to dry for at least 48 hours at +20°C and must be hardened to such an extent that the foils and strips, which will be removed subsequently, do not leave any marks on the painted surface (do not use aggressive adhesive foils which form a long-term adhesion to the painted surface).
– Trailers already exposed to moisture (snow, rain, fog) must be allowed to dry off in a temperate hall (20 °C) for at least 24 h before applying any type of lettering.
  In frosty weather, the drying time must be extended until the trailer has reached the same temperature as the hall.

These process guidelines and remarks are not intended for specific materials; they are generally applicable.

Necessity

The service life 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 for driving safety and the 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 cleaning and care intervals depend on the operational environment and the degree of soiling.

⚠ WARNING

Cleaning / care 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 care products.
- ▶ Reseal the containers securely after use.
- ▶ Use  ,  ,
- ▶  after working with cleaning / care products.

⚠ CAUTION

Entering the trailer / loading platform when cleaning

There is a risk of slipping when cleaning the trailer with liquids (water, cleaning agents)!

- ▶ Only enter the loading platform very carefully using the means of access provided for this purpose.
- ▶ Wear  ,  .
- ▶ Never enter unsecured trailers.
- ▶ Do not step under an unsecured loading platform.

NOTICE

Use of aggressive cleaning agents

Chemicals, salts, acids and alkalis can attack the surfaces / materials.

- ▶ Wear  ,  .
- ▶  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 aggressive cleaning agents, acids or alkalis.
- ▶ Use only weakly acidic to weakly alkaline cleaning agents with a pH value of 6-10.
- ▶ Use only soft, clean cloths or brushes.
- ▶ Repair any paintwork damage immediately.
- ▶ Carefully remove any grease 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 dirt residue.
- ▶ Do not apply sprays or grease to the brake and hydraulic hoses.
- ▶ Do not clean seals using mineral oils, petrol or solvents.
- ▶ In saline environments (winter/maritime climate) the outside of the trailer must be cleaned at shorter intervals (approx. every 3-4 weeks).
  In particular, it is necessary to thoroughly clean the brushed, polished stainless steel doors.
- ▶ Only use appropriate cleaning agents when cleaning the curtains and walls.
- ▶ Do not let grease come into contact with sealing rings.

Environmental protection regulations

DANGER for the environment!

Cleaning agents / care products, brake dust, hydraulic oil and lubricants can get into the groundwater.

- ▶ Clean / care for your trailer only in suitable washing areas.
- ▶ Observe the locally applicable environmental protection 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 direct the jet of water at:

- name plate
- EBS/ABS system plate,
- cracks of doors, seals,
- electrical components,
- connectors,
- gaskets or cables,
- piston surfaces of the hydraulic cylinders,
- lid of the oil / fuel tanks,
- brake hoses / hydraulic hoses,
- batteries,
- voltage transformers.

Proceed as follows when cleaning with high-pressure cleaners:

▶  Read the manufacturer's instructions.

▶ Lubricate all lubrication points until grease emerges before cleaning.

▶ Wear  ,  ,  .

▶ While cleaning, always keep the water jet moving.

▶ Use only high-pressure cleaners allowing a max. pressure of 50 bar and a max. temperature of 80 °C.

▶ Keep a minimum distance between the high-pressure nozzle and the item to be cleaned; approx. 700 mm with circular jet nozzles, and approx. 300 mm with 25° flat nozzles and dirt removers.

▶ Do not use circular jet nozzles to clean tyres and curtain. The powerful jet of water can damage the tyres or curtain.

Cleaning alloy disc wheels

▶ Wash the alloy disc wheels regularly, especially after:
- transporting alkaline materials,
- in winter, where roads are treated with de-icing salt.

Alloy disc wheels do not require any particular maintenance apart from occasional polishing.

Trailer materials

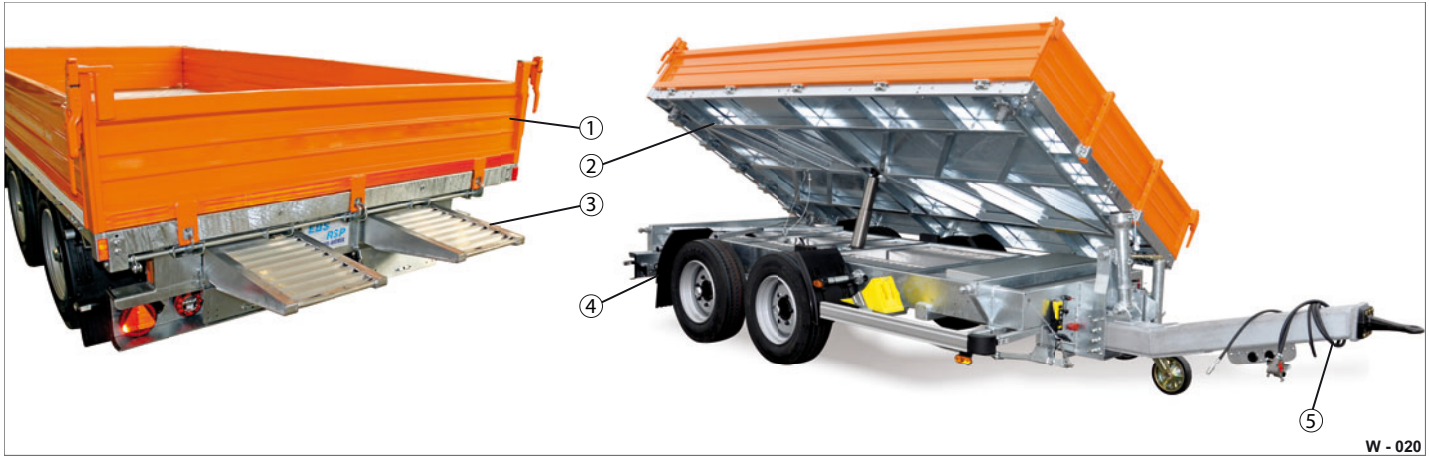


Fig. 59 Materials / surfaces

1 Steel, painted/coated
2 Steel, galvanised
3 Aluminium, anodised
4 Plastic
5 Rubber (hoses)

The trailers are made of various materials.

Observe the special instructions for caring for the various materials/surfaces.

Galvanised steel surfaces

Galvanised surfaces / components (e.g. chassis, draw bar, ramps) need to oxidise in order to be protected against corrosion.
This can take several months.
Only when the surface loses the sheen of zinc has the corrosion-protection layer been formed.
White rust may develop on galvanised surfaces.
This is encouraged / caused by moisture / high air humidity e.g. in de-icing salts.
White rust does not constitute a defect or damage the surface – it is an inevitable consequence of the galvanising process and does not therefore represent cause for claims under warranty.

- ▶ Clean the galvanised components with clean water immediately after contact with aggressive substances.
- ▶ Let the surfaces dry well.

Treating white rust:

- ▶ Clean the affected areas with plenty of clean water and dry them thoroughly.
- ▶ Remove the patches of white rust with a white rust brush.
- ▶ Apply zinc protection (zinc spray) to the affected areas.
- ▶ If necessary, seal the surface with wax.

Painted or powder-coated steel surfaces

Painted surfaces / components (e.g. stowage box, turnbuckle) offer some protection against corrosion.
Painted surfaces / components directly exposed to the influence of brake dust, loose chippings, de-icing salt, sand etc. require particular attention - both in order to maintain the appearance of the painted surfaces and to protect them permanently against the formation of rust.

- ▶ Clean the painted surfaces after every exposure to the aggressive substances.
- ▶ Let the surfaces dry well.
- ▶ If necessary, seal the surfaces with wax.
- ▶ Paint damage (chips, scratches) on the surface should be repaired immediately by qualified specialists.

Aluminium

Aluminium components / profiles coated with anodising aluminium offer optimum protection against corrosion.
Surfaces coated with anodising aluminium are hard / smooth and can be cleaned with mild cleaning agents.
To remove heavy soiling and maintain the sheen of the aluminium, we recommend that you use an aluminium and curtain cleaning agent.
Scratches on surfaces do not constitute a fault and will not lead to the formation of rust, as aluminium is resistant to corrosion.

- ▶ Clean the aluminium surfaces with water and neutral cleaning agents.
- ▶ Let the surfaces dry well.

Rubber/seals

Rubber parts such as elastic seals, sealing joints with PU adhesive / sealant e.g. on doors, covers, flaps, hinged windows, loading platforms etc. are subject to a certain degree of ageing / wear in use.
As a result of mechanical loads and environmental influences (cold, heat, UV radiation, moisture), the rubber / seal hardens in time. This can cause the rubber / seal to 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 silicone spray.

Approved operating materials

The perfect functioning, operational safety and service life of a trailer depend largely on the quality and correct selection of the operating materials used.

For your trailer and its attachments, use only operating materials approved by HUMBAUR GmbH or the manufacturer of the respective attachments.

Follow the rules and instructions of the individual manufacturers on approved and recommended operating materials.

Operating materials are:

- Fuels (petrol, diesel, gas)
- Coolants / anti-freeze,
- Refrigerants
- Lubricants, e.g.:
  engine oils, hydraulic oils, lubricating greases,
- Batteries, rechargeable batteries.

WARNING

Flammable/toxic operating materials

Fuels / refrigerants and their vapours are highly flammable and pose a health hazard - danger of poisoning!

▶ Do not smoke or allow naked flames near these materials.

▶ Avoid sparking.

▶ Do not inhale the vapours.

▶ Remove leaked / spilt operating materials immediately.

▶ Wear personal protective equipment.

WARNING

Explosive operating materials

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 the battery.

▶ 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, coolants and refrigerants, fuels, batteries and rechargeable batteries are waste requiring special monitoring.

DANGER of polluting the environment.

▶  Never dispose of environmentally harmful waste with household waste or in the environment. Substances that are harmful to the environment must be disposed of in accordance with the national and local regulations.

Used oil/lubricants

▶  Used oil, lubricants, oil-soaked rags and hoses must be drained into / disposed of in suitable containers.

Tyres

▶  Used tyres must never be disposed of in the environment. They must be stored professionally and disposed of by the municipal authorities.

▶ Contact public disposal points in your country for further information.

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 the power supply against being switched on.
- ▶ Do not park the trailer on public streets, only on private property.
- ▶ Park the trailer in such a way that it cannot pose any further hazard to third parties, e.g: by toppling over, rolling away.
- ▶ Secure the trailer with wheel chocks.
- ▶ Remove environmentally harmful operating materials/substances (oil, batteries, etc.) properly.

Disposing of the trailer

- ▶ Take the complete trailer to a car / vehicle recycling company.
  The specialist personnel of the car / vehicle recycling company will dispose of the individual components appropriately.

Troubleshooting

What to do in the event of malfunctions

This section contains information on possible faults and malfunctions on the trailer. The information is intended to facilitate troubleshooting and enable you to remedy the problems temporarily so that you can take the trailer to the nearest Humbaur GmbH service station.

Any faults that may occur as a result of ignoring the operating instructions or insufficient maintenance are not covered.

Unfortunately, it is not possible to cover all eventualities or problems that may occur here.

In the event of more serious problems, please contact **Humbaur Service** (see the contact addresses listed on the next page).

⚠ WARNING

Improper remedying of faults

Improper remedying of faults can lead to the failure of components - risk of accidents

▶ Have faults remedied 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 may be 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 toxic gases.

Humbaur Service

Any attempt to repair or dismantle trailer components or sub-assemblies without our prior written approval will render the warranty null and void.

Technical Customer Service

Tel.: +49 821 24929 0

Fax.:+49 821 24929 540

E-mail: service@humbaur.com

Humbaur Service Partners

can be found at www.humbaur.com under Dealers/Service/Repairs

Manufacturer's address

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86368 Gersthofen (Germany)

Tel.: +49 821 24929 0

Fax.:+49 821 24929 100

www.humbaur.com

info@humbaur.com

Replacement parts

Use only original Humbaur replacement parts!

Replacement parts can be purchased as follows, quoting the Vehicle Identification Number (**VIN**) and the part designation:

- Online, via e-mail, by phone

Contact information, Parts Logistics

Tel.: +49 821 24929 0

Fax.:+49 821 24929 200

E-mail: parts@humbaur.com

Fault	Possible causes	Remedy
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.	This fault must be rectified by personnel at an approved workshop.
The trailer rocks while driving.	- 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 your speed. Adapt your driving to suit the road conditions.
	- The load centre is too far back.	Move the load centre towards the front.
The trailer rattles during the journey.	- The load is not sufficiently secured.	Secure the load properly.
	- Cables/hoses work loose	This fault must be rectified by personnel at an approved workshop.

Fault	Possible causes	Remedy
Brake does not disengage correctly.	- Brake is not correctly set. - Brake shoe return spring has slackened. - Brake shaft jamming (drum brake). - Pressure line / brake line kinked. - Fault in the compressed air system.	This 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 reached.
	- Parking brake activated.	Release the parking brake.
	- The brake has seized on to the drum.	This fault must be rectified by personnel at an approved workshop.
Insufficient braking effect/ brakes pull to one side.	- Brake linings worn, oily or glazed. - Brake not correctly set. - Fault in the compressed air system.	This 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).	This fault must be rectified by personnel at an approved workshop.

Fault	Possible causes	Remedy
Wiring / switches	- Terminals loose or contaminated.	Clean the connections.
	- Cable broken or terminals damaged.	This 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 defective LED lights and lamps. Have the fault remedied by an approved workshop.

Fault	Possible causes	Remedy
The trailer creaks during the journey / bearing wear.	- Bearings set too loosely or too tight. - Foreign body in the axle bearing.	This 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 tightened to incorrect torque. - Wheel nuts not tightened properly.	Replace the wheel bolts, wheel nuts and, if necessary, the rim. Tighten the wheel nuts to the torques prescribed by the axle manufacturer. Have the fault remedied by an approved workshop.

Fault	Possible causes	Remedy
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.	Fold the support foot up.

Fault	Possible causes	Remedy
Trailer is losing oil.	- A hydraulic line or screw connection is defective.	Have the line / screw connection replaced in an approved workshop.
	- A hydraulic screw connection has worked loose.	Screw the connection tight.
The loading bridge cannot be raised.	- Switch lever for switchover from electric pump to hydraulic supply from the towing vehicle has not been flipped.	Position the lever as required for hydraulic supply via electric pump or from the towing vehicle.
	- The battery is flat or defective.	Charge the battery first or replace the defective / old battery.
	- The main switch for the electric pump is not turned on.	Set the main switch to ON.


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