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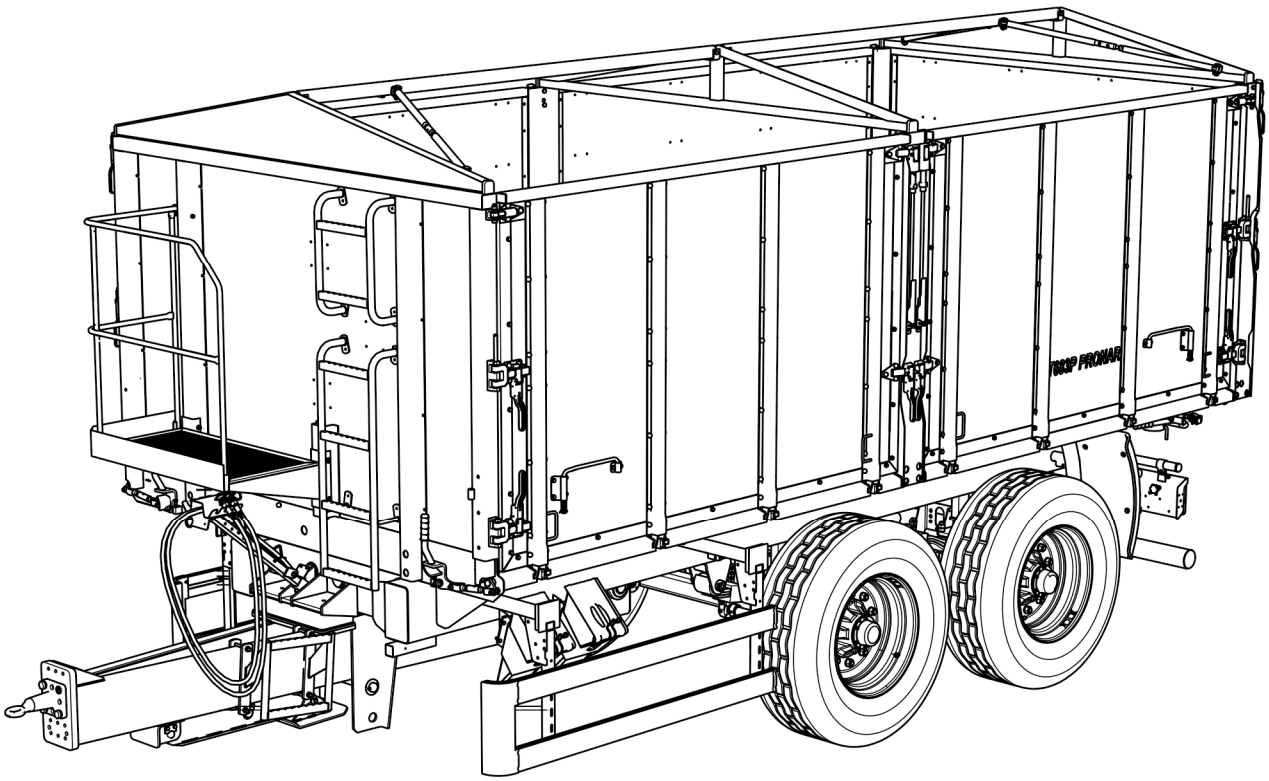
USER MANUAL

AGRICULTURAL TRAILER

PRONAR T683P

TRANSLATION OF ORIGINAL MANUAL



REVISION 1A-05-2014

PUBLICATION NUMBER 395N-00000000-UM

EN

Thank you for purchasing our trailer. In the interests of your safety and care for the reliability and durability of the machine, we ask that you familiarise yourself with the content of this manual.

Remember!!!

Before using the trailer for the first time, check if the wheels are properly tightened!!! Regularly check the technical condition of the machine in accordance with the attached schedule.

INTRODUCTION

The information contained in the publication is current as at the date of publication. As a result of improvement, some sizes and illustrations contained in this publication may not correspond to the actual state of the machine delivered to the user. The manufacturer reserves the right to introduce constructional changes in the manufactured machines to facilitate operation and improve the quality of their work, without making any current changes to this publication.

The operating instruction is the basic equipment of the machine. Before using the machine, the user must read the contents of this manual and observe all recommendations contained therein. This will guarantee safe and trouble-free operation of the machine. The machine was constructed in accordance with applicable standards, documents and current legal regulations.

The User Manual describes the basic principles of safe use and operation of Pronar T683P agricultural trailer.

If the information contained in the operating instructions does not turn out to be comprehensible, please contact the sales office where the machine was purchased or to the Manufacturer.

MANUFACTURER'S ADDRESS

PRONAR Sp. z o.o.
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17-210 Narew

CONTACT PHONE NUMBERS

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SYMBOLS USED IN THE MANUAL

Information, descriptions of hazards and precautions as well as instructions and orders related to safe use in the manual are marked with:

and preceded by the word **„DANGER”.** Failure to comply with these recommendations may endanger the health or life of persons operating the machine or unauthorized bystanders.

Particularly important information and recommendations, the observance of which is absolutely necessary, are highlighted in the text with a sign:

and preceded by the word **„CAUTION”.** Failure to comply with these recommendations creates the risk of damage to the machine due to improper handling, adjustment or use.

In order to draw the user's attention to the necessity to perform periodic maintenance, the content of the manual is marked with the following sign:

Additional instructions contained in the manual describe useful information on operating the machine and are marked with a sign:

and preceded by the word **„ADVICE”.**

DESIGNATION OF DIRECTIONS IN THE MANUAL

Left side – the left-hand side of the observer facing the machine in the forward direction.
Right side – the right-hand side of the observer facing the machine in the forward direction.

THE SCOPE OF SERVICE ACTIVITIES

The maintenance activities described in the manual are marked with the sign: ➡

The result of the maintenance / adjustment activity or remarks concerning the performed activities is marked with the sign: ⇨

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EC DECLARATION OF CONFORMITY OF THE MACHINERY

PRONAR Sp. z o.o. declares with full responsibility, that the machine:

Description and identification of the machinery	
Generic denomination and function:	**AGRICULTURAL TRAILER**
Type:	**T683**
Model:	- - - - -
Serial number:	
Commercial name:	**AGRICULTURAL TRAILER PRONAR T683** **AGRICULTURAL TRAILER PRONAR T683H** **AGRICULTURAL TRAILER PRONAR T683P** **AGRICULTURAL TRAILER PRONAR T683U**

to which this declaration relates, fulfills all the relevant provisions of the Directive **2006/42/EC** of The European Parliament and of The Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (Official Journal of the EU, L 157/24 of 09.06.2006).

The person authorized to compile the technical file is the Head of Research and Development Department at PRONAR Sp. z o.o., 17-210 Narew, ul. Mickiewicza 101A, Poland.

This declaration relates exclusively to the machinery in the state in which it was placed on the market, and excludes components which are added and/or operations carried out subsequently by the final user.

Z-CA DYREKTORA
d/s technicznych
członek zarządu
Ro[illegible]aniuk

Narew, the 2014 -08- 28

Place and date

Full name of the empowered person position, signature

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CHAPTER

1

GENERAL

1.1 IDENTIFICATION

1.1.1 IDENTIFICATION OF TRAILER

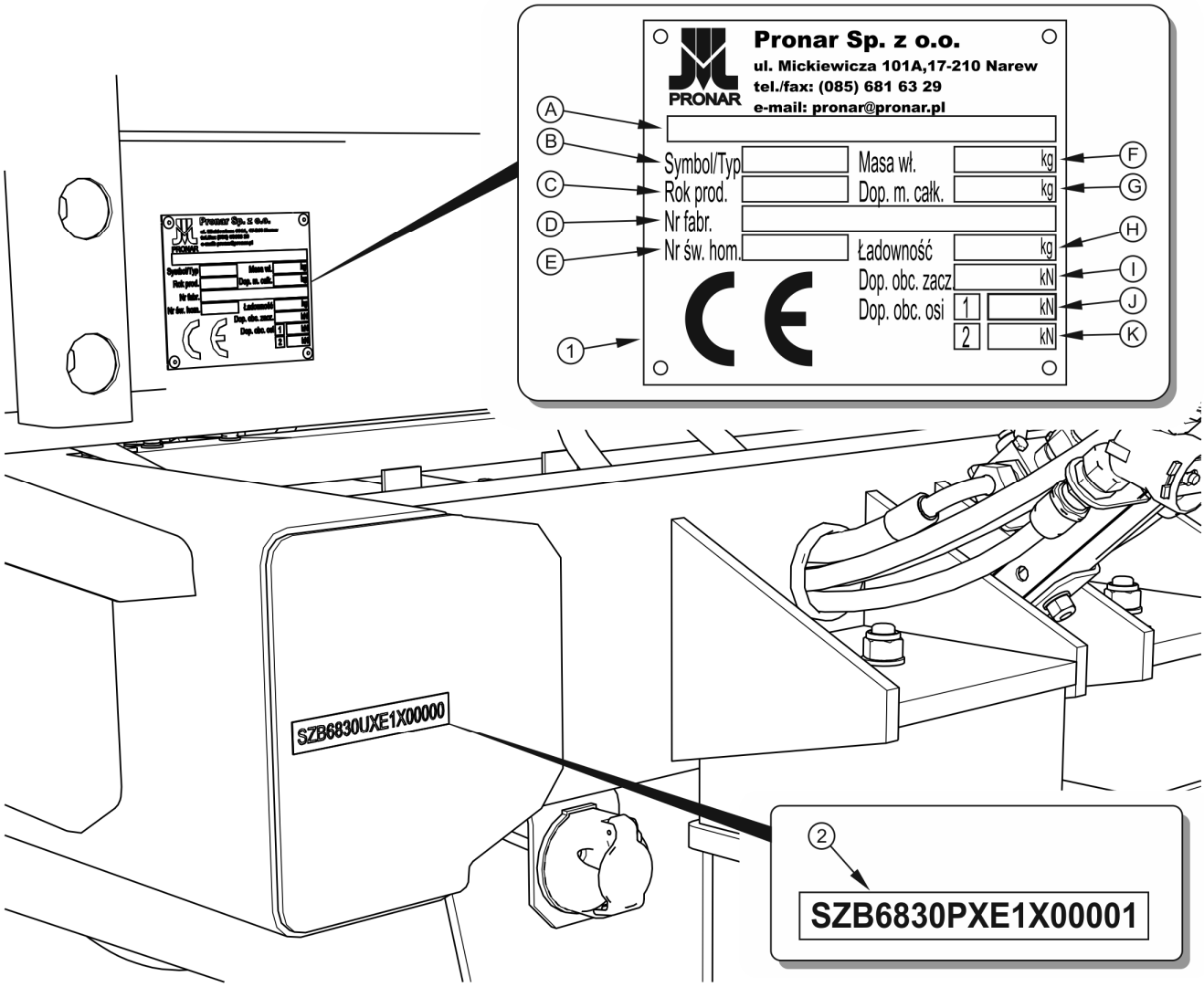


FIGURE 1.1. Location of nameplate and serial number

(1) nameplate, (2) serial number

The trailer was marked with a nameplate (1) and the serial number (2) placed on a rectangular field painted in gold. The data plate is located on the front beam of the upper frame and the serial number is on the lower frame longitudinal member - figure (*1.1*). When purchasing the trailer, check that the serial numbers on the machine match the number entered in the *WARRANTY CARD*, in the sales documents and in the *USER MANUAL*. The meaning of the individual fields on the nameplate is shown in the table below.

TABLE 1.1. Nameplate markings

ITEM	MARKING
A	General information and function
B	Trailer symbol / type
C	Year of trailer production
D	Seventeen-digit serial number (VIN)
E	Certificate approval number
F	The trailer's karb weight
G	Permissible gross weight
H	Capacity
I	Permissible load on the coupling device
J	Permissible axle 1 load
K	Permissible axle 2 load

1.1.2 IDENTIFICATION OF DRIVING AXLES

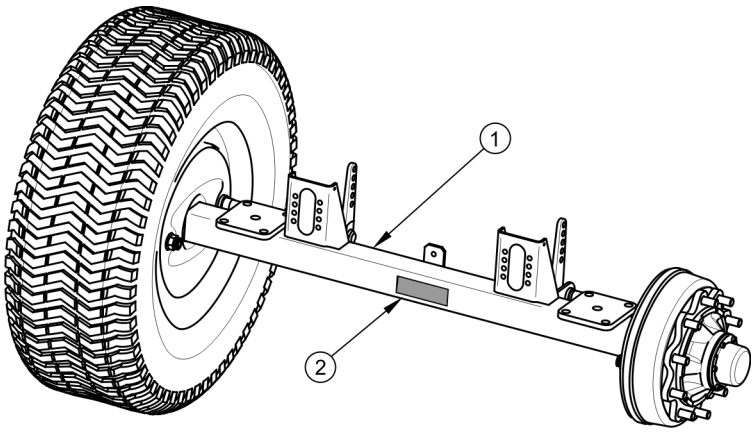


FIGURE 1.2. Location of the nameplate of driving axle

(1) driving axle, (2) nameplate

The serial number of the driving axle and its type are stamped on the nameplate (2) attached to the driving axle beam (1) - figure (*1.2*).

1.1.3 LIST OF FACTORY NUMBERS

VIN Number

S	**Z**	**B**	**6**	**8**	**3**	**0**	**P**	**0**			**X**					

FRONT AXIS SERIAL NUMBER

REAR AXIS SERIAL NUMBER

ADVICE

If you need to order spare parts or if you have problems with it, it is very often necessary to provide the serial numbers of the part or VIN of the trailer, so it is recommended to write these numbers in the fields below.

1.2 INTENDED USE

The trailer is designed for transporting crops and agricultural products (loose, volumetric, long-haul, etc.), and loads on euro-pallets and box-pallets within the farm and on public roads. Transportation of building materials, mineral fertilizers and other loads is allowed provided that the requirements of Chapter 4 are met. Non-compliance with the recommendations of carriage and loading specified by the Manufacturer and road transport regulations in force in the country in which the trailer is used will void the warranty services and is treated as using the machine for purposes other than those intended.

The trailer is not adapted and intended for the transport of people, animals and goods classified as hazardous materials.

The trailer was constructed in accordance with applicable safety requirements and machine standards. The braking system as well as the lighting and signalling system meet the requirements arising from traffic regulations. Permissible speed of a trailer on public roads in Poland is 30 km/h (in accordance with the Act of 20 June 1997, "Road Traffic Law", Art. 20). In the countries where the trailer is used, restrictions related to the road traffic laws in force in a given country must be observed. The trailer speed must not, however, be greater than the maximum design speed 40 km/h.

CAUTION

The trailer may not be used for purposes other than those for which it is intended. In particular, it is forbidden to:

- **Transport of people, animals, dangerous materials, aggressive loads as a result of chemical reactions to trailer structural elements (causing corrosion of steel, damaging paint coverings, dissolving plastic elements, destroying rubber elements, etc.),**
- **transport of improperly secured cargo that could cause road and environmental pollution while driving,**
- **transport of improperly secured load that could change its position in the box or fall out of the load box while driving,**
- **transport of cargo that location of the centre of gravity adversely affects the stability of the trailer,**
- **carry loads that affect uneven loading and/or overloading of the axles and suspension components.**

TABLE 1.2. Recommended pallet types

PALETTE NAME - TYPE	LENGTH [MM]	WIDTH [MM]	HEIGHT [MM]
EUR pallet - standard	1 200	800	144
EUR pallet - 1/2	800	600	144
EUR pallet - large	1 200	1 200	144

Intended use also includes all activities related to the correct and safe operation and maintenance of the machine. Therefore, the user is obliged to:

- Read the content of trailer's *USER MANUAL* and with *WARRANTY CARD* and to the guidelines contained in these documents,
- understand the principle of machine operation and the safe and proper operation of the trailer,
- work in compliance with established maintenance and adjustment plans,
- work in compliance with general safety regulations,

- accident prevention,
- comply with road traffic regulations and transport regulations in force in the country in which the trailer is used,
- get acquainted with the contents of the farm tractor instruction manual and comply with its recommendations,
- couple the vehicle only with such an agricultural tractor that meets all the requirements set by the trailer Manufacturer.

The trailer may only be used by persons who:

- Become familiar with the contents of publications and documents attached to the trailer and the contents of manual agricultural tractor,
- have been trained in trailer operation and work safety,
- have the required authorization to drive and are familiar with the traffic rules and transport regulations.

ADVICE

The tractor's requirements depend on the completion of the trailer.

TABLE 1.3. Agricultural tractor requirements

CONTENT	UNIT	REQUIREMENTS
Braking system - sockets		
Pneumatic 1 - wire	-	in accordance with ISO 1728
Pneumatic 2 - wire	-	in accordance with ISO 1728
Hydraulic	-	in accordance with ISO - 7421-1
Pressure of the system		
Pneumatic 1 - wire	bar / kPa	5.8 / 580
Pneumatic 2 - wire	bar / kPa	6.5 / 800
Hydraulic	bar / MPa	150 / 15

CONTENT	UNIT	REQUIREMENTS
Hydraulic tipping system		
Hydraulic oil	-	L HL 32 Lotos (1)
Maximum system pressure	bar / MPa	200 / 20
Oil demand	l	18
Electrical system		
Electrical system voltage	V	12
Connection socket	-	7 poles in accordance with ISO 1724
Tractor hitch required		
Type of hitch	-	Hitch for single axle trailers
	-	Upper transport hitch
Loading of the drawbar hitch	kg	2 000
Other requirements		
Min. tractor power	kW / KM	76.4 / 104

(1) – a different oil may be used, provided it can be mixed with oil in the trailer. Detailed information can be found in the product information card.

If a second trailer is connected to the trailer, it must meet the requirements specified in table (*1.4*).

TABLE 1.4. Second trailer requirements

CONTENT	UNIT	REQUIREMENTS
Permissible total weight of a two-axle trailer	kg	18,000
Braking system - connectors		
Pneumatic 1 - wire	-	connector in accordance with ISO 1728
Pneumatic 2 - wire	-	connector in accordance with ISO 1728
Hydraulic	-	connector in accordance with ISO - 7421-1
Maximum system pressure		
Pneumatic 1 - wire	bar / kPa	5.8 / 580
Pneumatic 2 - wire	bar / kPa	6.5 / 800
Hydraulic	bar / MPa	150 / 15
Hydraulic tipping system		
Hydraulic oil	-	L HL 32 Lotos (1)
Maximum system pressure	bar / MPa	200 / 20
Electrical system		
Electrical system voltage	V	12
Connection socket	-	7 poles in accordance with ISO 1724
Trailer drawbar		
The drawbar eye diameter	mm	40

(1) – a different oil may be used, provided it can be mixed with oil in the trailer. Detailed information can be found in the product information card.

1.3 EQUIPMENT

Some standard equipment items that are listed in table(*1.5*), may not be included in the trailer supplied. This is due to the possibility of ordering a new machine with a different set - optional equipment, replacing the standard equipment.

Tire information is provided at the end of the publication in *APPENDIX A.*

TABLE 1.5. Trailer equipment

EQUIPMENT	STANDARD	ADDITIONAL	OPTIONAL
User manual	•		
Warranty Card	•		
Wheel chocks	•		
Tarpaulin frame	•		
Hydraulic scissor support	•		
Side of the left portal	•		
Side of the right portal			•
Side of the left portal 3 chimney dampers			•
Side of the right portal 3 chimney dampers			•
Hand brake	•		
Electrical installation connection cable	•		
Wheel fenders	•		
Rear hitch		•	
Spare wheel		•	
Plate for slow-moving vehicles		•	
Warning reflective triangle		•	
Tarpaulin		•	
Balcony			
Chute		•	
Side overrun protection		•	

1.4 TERMS OF WARRANTY

PRONAR Sp. z o.o. in Narew guarantees smooth operation of the machine when it is used in accordance with the technical and operational conditions described in the *USER MANUAL*. Deadline for completion of repairs is specified in the *WARRANTY CARD.*

The warranty does not apply to parts and sub-assemblies of the machine, which are subject to wear in normal operating conditions, regardless of the warranty period. The group of these elements includes min. the following parts/components:

- drawbar hitch eye,
- filters on pneumatic system connectors,
- tires,
- brake shoes,
- bulbs and LED lamps,
- gaskets,
- bearings.

The warranty services only apply to such cases as: mechanical damage not caused by the fault of the user, factory defects of parts, etc.

In the event that damage occurs as a result of:

- mechanical damage caused by the user's fault, road accident,
- from improper operation, adjustment and maintenance, using the trailer contrary to its purpose,
- use of a damaged machine,
- repairs carried out by unauthorized persons, improper repairs,
- execution of user changes in machine design,

the user loses the warranty.

The user is obliged to immediately report all noticed defects in the paint coatings or traces of corrosion, and order removal of defects regardless of whether the damage is covered by the

warranty or not. Detailed warranty conditions are given in the *WARRANTY CARD* attached to the newly purchased machine.

ADVICE

You should require the seller to carefully fill out the Warranty Card and complaint coupons. The lack of e.g. date of sale or point of sale stamp exposes the user to not accept any complaints.

Modifications to the trailer without the written consent of the Manufacturer are prohibited. In particular, welding, reaming, cutting and heating of the main machine components that directly affect safety during use are not permitted.

1.5 TRANSPORT

The trailer is ready for sale completely assembled and does not require packing. Only the machine's technical documentation and any additional equipment elements are packed. Delivery to the user is carried out by road or independent transport (towing a trailer with an agricultural tractor).

1.5.1 TRUCKING

Loading and unloading of a trailer from a vehicle should be carried out using a loading ramp and a farm tractor. During work act in compliance with the general principles of workplace health and safety for reloading work. Persons operating reloading equipment must have the required permissions to use these devices. The trailer must be correctly connected to the tractor in accordance with the requirements contained in this operator's manual. The trailer braking system must be activated and checked before going down or onto the ramp.

The trailer should be attached firmly to the platform of the vehicle using straps, chains, lashings or other fastening devices equipped with a tensioning mechanism. The securing elements should be attached to the transport lugs designed for this purpose (1) - figure *(1.3)* or to the fixed construction elements of the trailer (longitudinal members, crossbars, etc.). The transport lugs are welded to the upper frame side members (2) in pairs on each side of the trailer. Use certified and technically reliable securing measures. Wiping belts, cracked fasteners, bent or corroded hooks or other damage may disqualify the product from being used. Please refer to the instructions in the operating instructions of the manufacturer of the

securing material used. Chocks, wooden beams or other elements without sharp edges should be placed under the trailer wheels, protecting the machine against rolling. Trailer wheel blocks must be nailed to the load platform planks of the car or secured in another way preventing their movement. The number of fastening elements (ropes, belts, chains, lashings, etc.) and the force needed for their tension depends, among others, on the weight of the trailer, the construction of the car carrying the trailer, the speed of travel and other conditions. Therefore, it is not possible to specify the fastening plan in detail. A properly attached trailer will not change its position relative to the transporting vehicle. The fastening means must be selected according to the manufacturer's instructions. In case of doubt, a larger number of attachment and securing points for the trailer should be used. If necessary, protect the sharp edges of the trailer, thus securing the securing means against damage during transport.

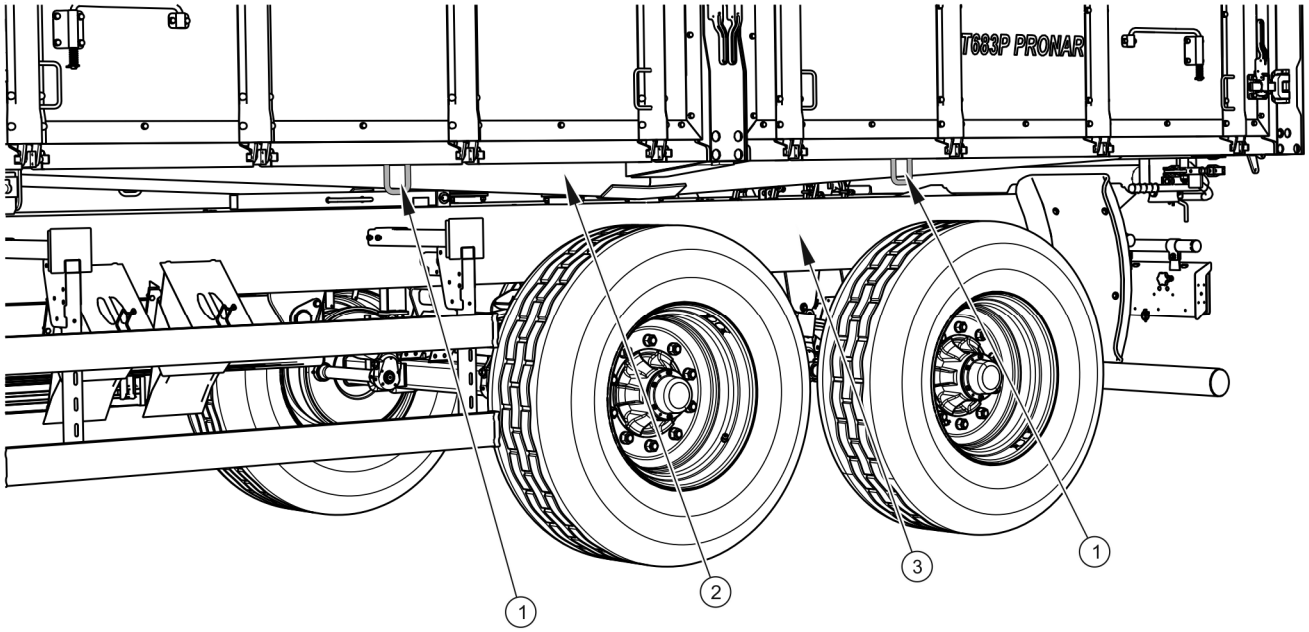


FIGURE 1.3. Arrangement of transport handles

(1) carrying handle, (2) upper frame member, (3) bottom frame member

CAUTION

During road transport, the trailer must be mounted on the platform of the vehicle in accordance with safety requirements and regulations.

While driving, the car driver should exercise extreme caution. This is due to the vehicle's centre of gravity shifting upwards with the machine loaded.

Use only approved and technically reliable securing measures. Read the operating instructions of the securing measures manufacturer.

During reloading work, particular attention should be paid so as not to damage the machine equipment components and the paint coating. The tare weight of the trailer, standard equipment, in running order, was given in table *(3.1)*.

DANGER

Incorrect use of securing measures can cause an accident.

1.5.2 USER'S TRANSPORT

In the case of independent transport by the user after purchasing the trailer, read the trailer User Manual and follow its recommendations. Independent transport involves towing a trailer with own agricultural tractor to its destination. While driving, adjust the speed to the prevailing road conditions, but it must not be greater than the maximum design speed.

CAUTION

When transporting independently, the tractor operator should read the instructions and follow the recommendations contained therein.

1.6 THREAT TO THE ENVIRONMENT

A hydraulic oil leak is a direct threat to the natural environment owing to its limited biodegradability. Due to the low solubility of oil in water, it does not cause high toxicity of living organisms. An oil leak into water reservoirs can, however, lead to a reduction in oxygen content.

When carrying out maintenance and repair work where there is a risk of leakage, this work should be carried out in rooms with an oil resistant surface. In the event of oil leaking into the environment, first of all contain the source of the leak, and then collect the leaked oil using available means. Collect oil residue with sorbents or mix the oil with sand, sawdust or other absorbent materials. Collected oil contaminants should be stored in an airtight and marked container, resistant to hydrocarbons. The container should be kept away from heat sources, flammable materials and food.

DANGER

Used hydraulic oil or collected residues mixed with absorbent material should be stored in a precisely marked container. Do not use food packaging for this purpose.

Oil which has been used up or is unsuitable for further use due to the loss of its properties is recommended to be stored in its original packaging in the same conditions as described previously. Oil waste should be taken to an oil disposal or regeneration point. Waste Code: 13 01 10. Detailed information on hydraulic oil can be found in the product safety data sheet.

ADVICE

The trailer's hydraulic system is filled with L-HL 32 Lotos oil.

CAUTION

Oil waste can only be delivered to a point dealing with the utilization or regeneration of oils. It is prohibited to throw or pour oil into the sewage system or water reservoirs.

1.7 WITHDRAWAL FROM USE

If the user decides to withdraw the trailer from use, comply with the provisions in force in the given country regarding withdrawal from use and recycling of machines withdrawn from use. Before disassembly, remove all oil from the hydraulic system and completely reduce air pressure in the pneumatic braking systems (e.g. by means of the air tank drain valve).

Worn or damaged elements that cannot be regenerated or repaired should be taken to a collection point for recyclable materials. Hydraulic oil should be taken to the appropriate facility dealing with the utilization of this type of waste.

During disassembly, use appropriate tools and use personal protective equipment, i.e. protective clothing, footwear, gloves, glasses, etc.

DANGER

Avoid oil contact with skin. Do not allow hydraulic oil to leak.

CHAPTER

2

SAFETY OF USE

2.1 GENERAL TERMS OF SAFETY

2.1.1 TRAILER USE

- Before using the trailer, the user should carefully read the content of this document and the *WARRANTY CARD*. During their operation, all recommendations contained therein must be observed.
- The trailer may only be used and operated by persons authorized to drive agricultural tractors with a trailer.
- If the information contained in the User's Manual is difficult to understand, contact a seller who runs an authorized technical service on behalf of the manufacturer, or contact the manufacturer directly.
- Careless and improper use and operation of the trailer, non-observance of the recommendations contained in these instructions creates a threat to health.
- Be aware of the existence of a minimal risk of danger, therefore the application of the principles of safe use and sound behaviour should be the basic principle of using a trailer.
- The machine must not be used by persons who are not authorized to drive agricultural tractors, including children, people under the influence of alcohol or other drugs.
- Non-compliance with the rules of safe use poses a threat to the health of the operating and bystanders.
- The trailer may not be used for purposes other than those for which it was intended. Everyone who uses the trailer in a manner contrary to its intended use, thus takes full responsibility for all consequences arising from its use. Use of the machine for purposes other than envisaged by the Manufacturer is inconsistent with the purpose of the machine and may void the warranty.
- Assembly and disassembly of extensions should be carried out using the appropriate height of platforms, ladders or ramps. The condition of these devices must protect working people against falling. This work should be performed by at least two people.

- The trailer user is obliged to become familiar with the construction, operation and principles of safe trailer operation.

2.1.2 CONNECTING AND DISCONNECTING THE TRAILER TO THE TRACTOR

- It is forbidden to connect the trailer to the tractor if it does not meet the requirements set by the Manufacturer (minimum power requirement of the tractor, inadequate connections, etc.) - compare table (1.2) *AGRICULTURAL TRACTOR REQUIREMENTS*. Before connecting the trailer, make sure that the oil in the tractor's external hydraulic system can be mixed with the trailer's hydraulic oil.
- Before coupling the trailer, make sure that both machines are technically sound.
- When connecting the trailer to the tractor, use the appropriate hitch of the tractor. After coupling the machines, check the hitch safety device. Read the tractor operating instructions. If the tractor is equipped with an automatic hitch, make sure that the coupling operation has been completed.
- Take special care when connecting the machine.
- When connecting, nobody may be between the trailer and the tractor.
- Disconnecting the trailer from the tractor is forbidden if the loading box is raised.
- Hitching and unhitching the trailer may only take place when the machine is immobilized by means of the parking brake.
- The trailer cannot be moved when the support is unfolded and rests on the ground. While the machine is in motion, there is a risk of damaging the support cylinder.

2.1.3 CONNECTING AND DISCONNECTING OF A SECOND TRAILER

- It is forbidden to connect a second trailer if it does not meet the requirements set by the Manufacturer (lack of the required drawbar eye, exceeding the permissible total weight, etc.) - compare table (*1.3*) *REQUIREMENTS OF THE SECOND TRAILER*. Before hitching the machine to the tractor, make sure that the oil in both trailers can be mixed.
- Only two-axle trailers with a permissible total weight specified in table (*1.3*) may be connected to the trailer.

- Before coupling the trailer, make sure that both machines are technically sound.
- Take special care when connecting the machine.
- When connecting nobody may be between the trailers. The person who helps aggregate the machine should stand in a place outside the hazardous area and be visible at all times by the tractor operator.
- Disconnecting of the second trailer is forbidden if its load box is raised.
- After completing the coupling of the trailer, check the safety of the hitch.

2.1.4 HYDRAULIC AND PNEUMATIC INSTALLATIONS

- The hydraulic and pneumatic systems are under high pressure during operation.
- Regularly check the technical condition of connections and hydraulic and pneumatic hoses. Oil leaks and air leaks are not permitted.
- The cut-off valve in the hydraulic tipping system limits the tipping angle of the load box when tilted to the sides and to the rear. The length of the control cable for this valve is set by the Manufacturer and it must not be adjusted when the trailer is used.
- In the event of a failure of the hydraulic or pneumatic system, the trailer should be decommissioned until the failure is removed.
- When connecting the hydraulic conduits to the tractor, make sure that the tractor hydraulic system and trailer are not under pressure. If necessary, reduce the residual pressure of the system.
- In the event of injuries being caused by pressurized hydraulic oil, contact a doctor immediately. Hydraulic oil can penetrate the skin and cause infection. If the oil gets into the eyes, rinse with plenty of water and if irritation occurs, contact a doctor. In the event of contact of oil with skin, wash the area of contact with water and soap. Do not use organic solvents (petrol, kerosene).
- Use hydraulic oil recommended by the manufacturer.
- After changing the hydraulic oil, the used oil must be disposed. Used oil or oil which has lost its properties should be stored in original containers or

replacement packaging resistant to hydrocarbons. Replacement containers must be accurately described and properly stored.

- It is forbidden to store hydraulic oil in packaging intended for food storage.
- Rubber hydraulic conduits must be replaced every 4 years regardless of their technical condition.

2.1.5 LOADING AND UNLOADING OF A TRAILER

- Loading and unloading work should be carried out by a person experienced in this type of work.
- Before loading, make sure that the wall reinforcements are properly installed and properly secured.
- Use only original tipping pins with handle. The use of non-original pins may damage the trailer.
- The trailer is not intended for transporting people, animals and hazardous materials.
- The load must be arranged in such a way that it does not threaten the stability of the trailer and does not hinder driving.
- The arrangement of the load must not cause an overload on the eye trailer's chassis.
- Incorrectly selected load distribution and overloading the machine may cause the trailer to overturn or damage its components.
- Do not stay on the load box during loading.
- Unloading and loading of the trailer can only be carried out when the machine is placed on level and hard surface and connected to the tractor. Tractor and trailer must be placed for straight-ahead driving.
- Make sure that there are no bystanders in the unloading / loading area or the raised load box. Before tipping the load box make sure that it is visible and make sure there are no bystanders nearby.
- When loading the trailer, the drawbar eye and the tractor hitch are subjected to high vertical loads.

- Before raising the load box, the tipping pins should be placed on the intended unloading side. Check the correct installation of the pins.
- Keep a safe distance from overhead power lines when lifting the box.
- When opening wall closures and locks be extremely cautious due to pressing the load on the walls.
- Tipping the load box is prohibited during strong wind gusts.
- If the load does not pour from the raised load box, unloading must be stopped immediately. Another tipping over is possible only after removing the cause of the non-sliding load.
- In winter, pay special attention to loads that may freeze during transport. At the time of tipping the load box, the frozen load may lead to the loss of stability of the trailer and cause its overturning.
- Do not raise the load box if there is any danger of the load box tipping over.
- It is forbidden to lift the load box with the sides closed.
- It is forbidden to jerk the trailer forward or backward if the load that is bulky or difficult to slide down has not been unloaded.
- After unloading make sure the load box is empty.
- Driving with the raised load box is prohibited.
- When closing or opening the slide window chute, walls and extensions, be very careful to avoid crushing your fingers.
- Do not get in or put your hands between open walls and the load box.
- Before proceeding with the elimination of breakdowns, lower the load box. If it is necessary to raise the box, secure it against lowering with the aid of a support. The load box cannot be loaded. The trailer must be connected to the tractor and secured with wedges and blocked with the parking brake.

2.1.6 TRANSPORT PASSAGE

- When driving on public roads, comply with traffic regulations and transport regulations in force in the country where the trailer is used.

- The admissible design speed should not be exceeded.
- Adjust speed to prevailing conditions.
- It is forbidden to leave the machine unsecured. The trailer disconnected from the tractor must be blocked with the parking brake and secured against rolling with wedges or other elements without sharp edges placed under the vehicle wheels.
- Wedges (1) , should only be placed under one wheel (one in front of the wheel, the other in the rear - Figure *(2.1)*).
- It is forbidden to drive with the load box raised.

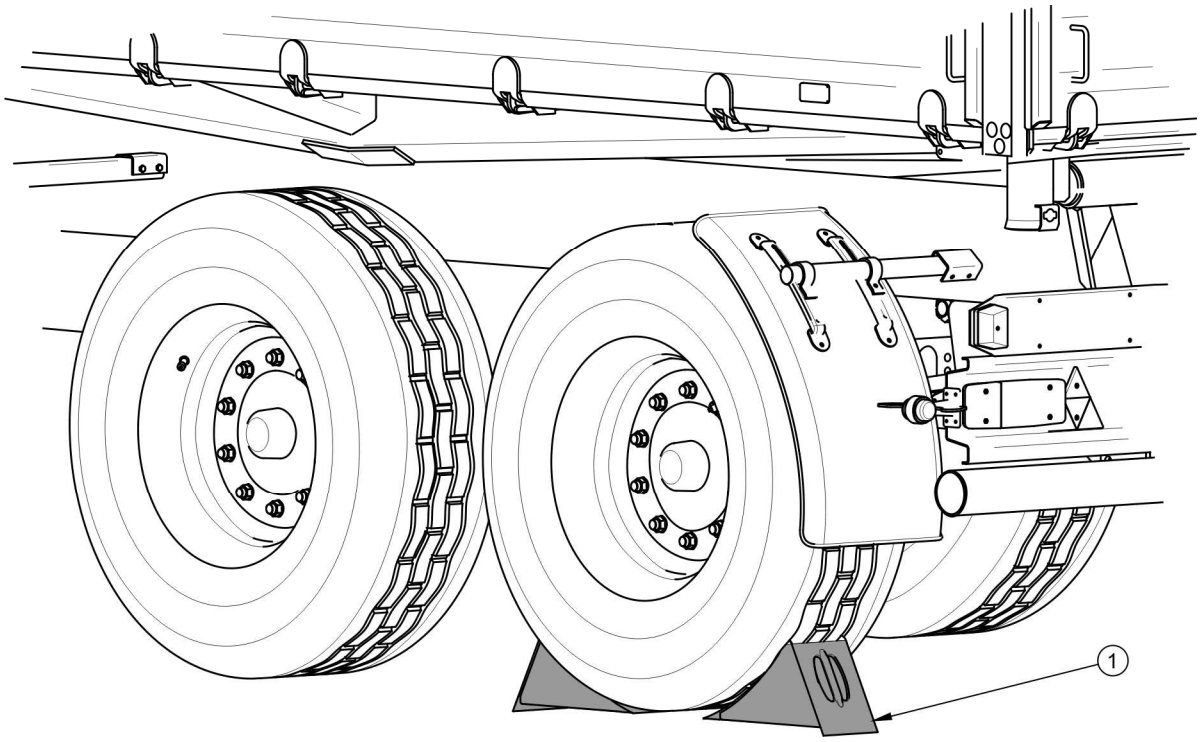


FIGURE 2.1. How to set the wedges

(1) locking pin

- Before driving, make sure that the trailer is correctly connected to the tractor, especially that the hitch pins are secured.
- Vertical load carried by the trailer drawbar eye affects the steering of the agricultural tractor.

- Before driving, check if the bolts connecting the load box to the lower frame and wall bolts are secured against falling out. Check rear wall slide protection. Make sure that all walls and extensions are properly closed.
- Before using the trailer always check its technical condition, especially in terms of safety. In particular, check the technical condition of the hitch system, the running gear, the braking system and traffic lights as well as the connecting elements of the hydraulic, pneumatic and electrical systems.
- Before driving, check that the parking brake is released and the braking force regulator is in the correct position (applies to pneumatic systems with a manual three-position regulator).
- The trailer is adapted for driving on slopes up to a maximum of 5^0. Moving on such slope requires adjusting your speed and your special care. Moving the trailer over slopes may cause the trailer to overturn as a result of loss of stability. Prolonged driving on sloping ground creates a risk of loss of braking efficiency.
- When driving on public roads, the tractor operator must ensure that the trailer and tractor are equipped with an approved or homologated warning reflective triangle.
- Periodically drain air tanks in the pneumatic system. During frosts, freezing water may cause damage to pneumatic system components.
- Reckless driving and excessive speed can cause an accident.
- Load protruding beyond the outline of the trailer should be marked in accordance with traffic regulations. It is forbidden to transport loads not allowed by the manufacturer.
- The trailer's maximum carrying capacity must not be exceeded. Exceeding the carrying capacity may lead to damage to the machine, loss of stability while driving, scattering of the load and a hazard while driving. The braking system of the machine has been adapted to the total weight of the trailer, exceeding of which will drastically reduce the operation of the service brake.
- Prolonged driving on sloping ground creates a risk of loss of braking efficiency.
- The load on the trailer must be evenly distributed and must not hinder driving.
- The load must be secured so that it cannot slide or tip over.

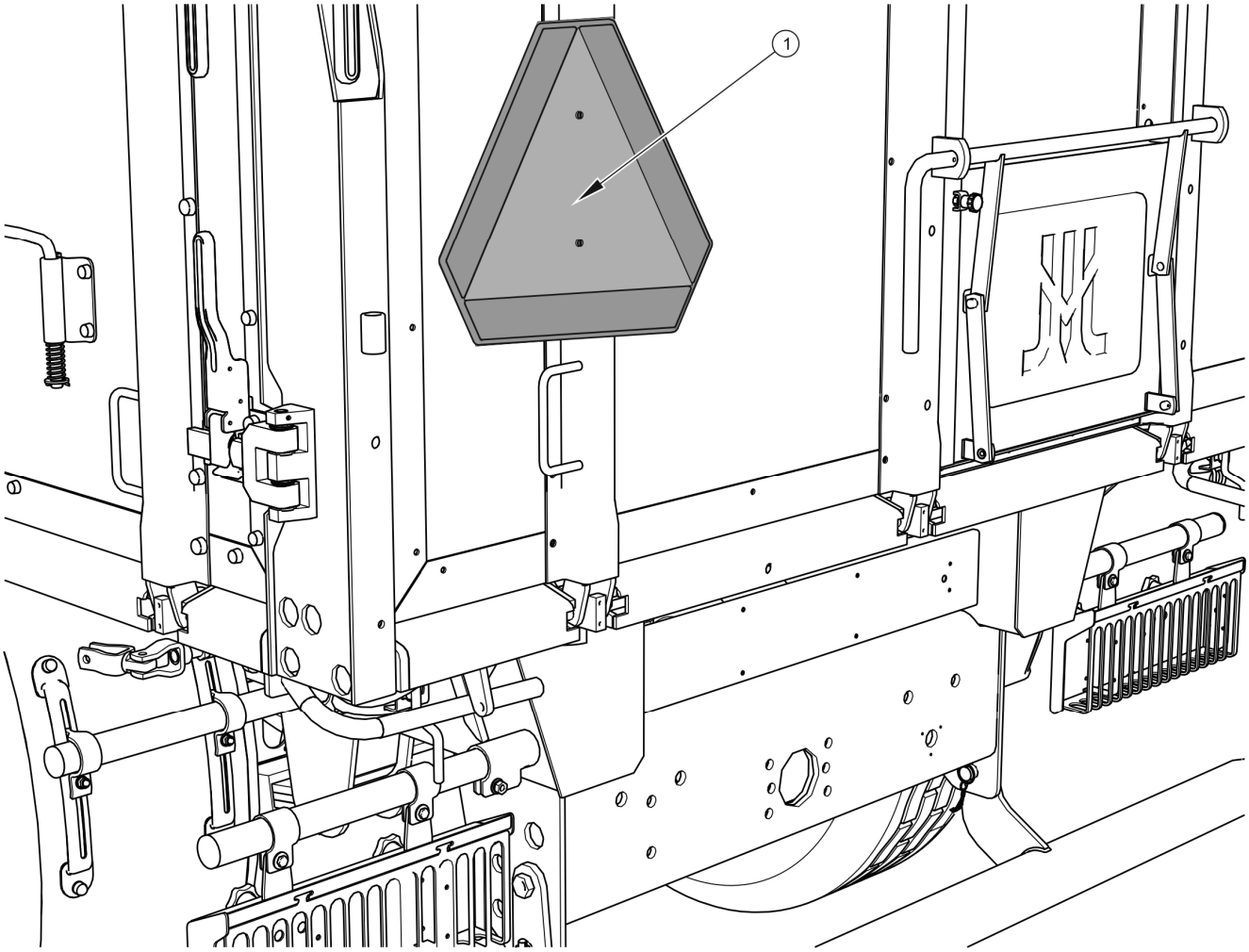


FIGURE 2.2. Mounting location for the slow-moving vehicle sign

(1) distinguishing sign

- A triangular plate for slow moving vehicles should be placed on the rear wall, if the trailer is the last vehicle in the set - Figure (*2.2*). The triangular plate should be placed in a specially prepared holder riveted to the rear wall of the load box.
- When reversing, it is recommended to use the help of another person. During manoeuvres, the helping person must keep a safe distance from danger zones and be visible to the tractor operator at all times.
- Parking the trailer on a decline is prohibited.

2.1.7 TIRES

- When working with tires, the trailer should be immobilized with the parking brake and secured against rolling by placing wedges under the wheels. The wheel can be dismantled only when the trailer is not loaded.
- Repair work on wheels or tires should be carried out by persons trained and authorized to do so. These works should be carried out using appropriately selected tools.
- Checking the tightening of the wheel nuts should be carried out after the first use of the trailer, every 2-3 hours during the first month of using the machine and then every 30 hours of driving. Each time, repeat all operations if the wheel was disassembled. Wheel nuts should be tightened in accordance with the recommendations contained in the 5 *MAINTENANCE* chapter.
- Avoid damaged road surfaces, sudden and variable manoeuvres, and high speeds when turning.
- Check tire pressure regularly. Tire pressure should also be checked during all-day intensive work. It should be taken into account that an increase in tire temperature can increase the pressure by up to 1 bar. With such a rise in temperature and pressure, reduce the load or speed. Never reduce pressure by venting if it increases due to temperature.
- Tire valves should be protected with suitable caps to avoid penetration of dirt.

2.1.8 TECHNICAL SUPPORT

- During the warranty period, any repairs may only be carried out by a Warranty Service authorized by the manufacturer. After the end of the warranty period, it is recommended that any repairs to the trailer be carried out by specialized workshops.
- In the event of any faults or damage, the trailer should be decommissioned until repaired.
- During maintenance work, use appropriate, close-fitting protective clothing, gloves, shoes, glasses and the right tools.

- Any modification of the trailer releases PRONAR Narew from any liability for damage or injury.
- Climbing the trailer is possible only when the trailer is absolutely stationary and the tractor engine is switched off. Tractor and trailer should be secured with parking brake and wedges should be placed under trailer wheels. Secure the tractor cab against unauthorized access.
- Regularly check the technical condition of safety devices and correct tightening of screw connections (in particular the drawbar and wheels).
- Inspect the trailer according to the frequency specified in this manual.
- Before starting work requiring the load box to be raised, it must be emptied of the load and secured with a support. The trailer must at this time be connected to the tractor and secured with wedges and blocked with the parking brake.
- Before starting repair work on hydraulic or pneumatic systems, the residual oil or air pressure must be completely reduced.
- Perform maintenance and repair activities applying general principles of health and safety at work. In the event of a cut, the wound should be immediately washed and disinfected. In case of serious injuries consult a physician.
- Repair, maintenance and cleaning work should only be carried out with the tractor engine switched off and the ignition key removed. Tractor and trailer should be secured with parking brake and wedges should be placed under trailer wheels. Secure the tractor cab against unauthorized access.
- During maintenance or repair work, the trailer may be disconnected from the tractor, but secured by means of wedges and parking brake. The load box cannot be raised during this time.
- If it is necessary to replace individual parts, use only parts recommended by the manufacturer. Failure to comply with these requirements may endanger the health or life of bystanders or persons operating the trailer, cause damage to the machine and constitute the basis for withdrawing the warranty.
- Before welding or electrical work, the trailer should be disconnected from the power supply. The paint coating should be cleaned. The fumes of burning paint

are poisonous to humans and animals. Welding work should be carried out in a well-lit and ventilated room.

- During welding work pay attention to flammable or fusible elements (elements of pneumatic, electric, hydraulic systems, elements made of plastic). If there is a risk of ignition or damage, they must be removed or covered with non-flammable material before welding. Before starting work, it is recommended to prepare a CO_2 or foam extinguisher.
- In the event of work requiring the trailer to be raised, use properly certified hydraulic or mechanical lifts for this purpose. After lifting the machine, stable and durable supports must also be used. It is forbidden to work under a trailer raised only with a lift.
- It is forbidden to support the trailer with fragile elements (bricks, hollow bricks, concrete blocks).
- After completing work associated with lubrication, remove excess grease or oil. The trailer should be kept clean.
- Be especially careful when entering the load box. Climbing is possible with the use of ladders located on the front wall, extension and drawbar, as well as folding steps inside the load box. Elements of the trailer that are not intended to be entered may not be used for this purpose. Before entering the load box, secure the trailer by immobilizing it with the parking brake and using wedges.
- It is forbidden to carry out independent repairs of the control valve, brake cylinders, tipping cylinder and braking force regulator. In case of damage to these elements, the repair should be entrusted to authorized repair centres or replace the elements with new ones.
- The drawbar must not be repaired (straightening, surfacing, welding). A damaged drawbar must be replaced with a new one.
- It is forbidden to install additional devices or accessories that do not comply with the specification specified by the Manufacturer.
- The trailer may only be towed when the running gear, lighting and braking systems are efficient.

2.2 DESCRIPTION OF RESIDUAL RISK

Pronar Sp. z o. o. o. in Narew made every effort to eliminate the risk of an accident. However, there is some residual risk that can lead to an accident and is primarily associated with the following activities:

- using the trailer contrary to its purpose,
- being between the tractor and the trailer when the engine is running and when connecting the machine or connecting a second trailer,
- being on the machine during work,
- failure to maintain a safe distance when loading or unloading the trailer,
- trailer operation by unauthorized persons or persons under the influence of alcohol,
- introducing design changes without the consent of the Manufacturer,
- trailer cleaning, maintenance and technical inspection,
- presence of persons or animals in areas invisible from the operator's position.

Residual risk can be reduced to a minimum by following these recommendations:

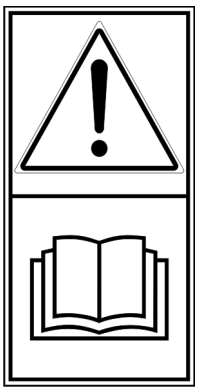
- prudent and leisurely machine operation,
- sensible application of the remarks and recommendations contained in the operating instructions,
- maintaining a safe distance from prohibited or dangerous places during unloading, loading and coupling the trailer,
- performing maintenance and repair work in accordance with the principles of operating safety,
- carrying out maintenance and repair work by trained persons,
- the use of close-fitting protective clothing and appropriate tools,
- securing the machine against access by unauthorized persons, especially children.
- keeping a safe distance from prohibited and dangerous places,

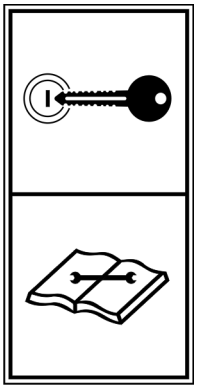
- a ban on being on the machine while driving, loading or unloading.

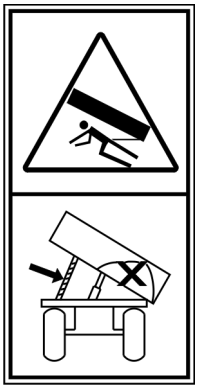
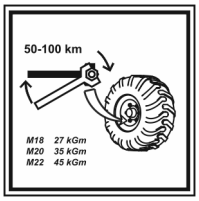
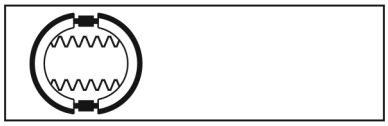
2.3 INFORMATION AND WARNING STICKERS

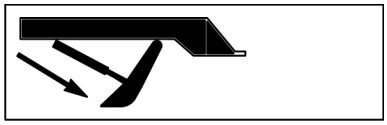
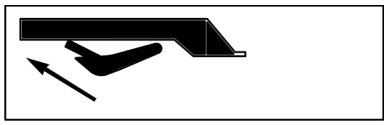
The trailer is marked with information and warning stickers mentioned in table (2.1). The arrangement of symbols is shown in figure (*2.3*). The machine user is obliged to ensure that the inscriptions, warning and information symbols placed on the trailer are legible throughout the entire period of use. In the event of their destruction, they must be replaced. Labels with inscriptions and symbols are available from the Manufacturer or in the place where the machine was purchased. New assemblies replaced during repair must be marked again with the appropriate safety signs. When cleaning the trailer, do not use solvents that may damage the label coating and do not direct a strong water jet.

TABLE 2.1. INFORMATION AND WARNING Stickers

ITEM	STICKER	MEANING
1		Trailer type.
2		Caution. Before starting work, read the User's Manual.

ITEM	STICKER	MEANING
3		Before starting any servicing or repair work, switch off the tractor engine and remove the ignition key. Secure the tractor cab against unauthorized access.
4		Before starting any servicing or repair work, switch off the tractor engine and remove the ignition key.
5		Caution. Danger of electric shock. When unloading the trailer keep a safe distance from overhead power lines.

ITEM	STICKER	MEANING
6		Danger of being crushed. It is forbidden to carry out repair or maintenance works under a loaded and/or unsupported load box.
7		Regularly check the tightness of wheel nuts and other bolted connections.
8		Lubricate the trailer according to the schedule outlined in the User's Manual.
9		Hydraulic supply hose for the braking system.
10		Hydraulic supply hose for the tip system.
11	**Ładowność z nadstawami 14300 kg** **Ładowność bez nadstaw 14700 kg** **Ładowność z nadstawami, stelażem, plandeką i podestem 14170 kg**	Trailer load capacity (depending on the trailer variant).

ITEM	STICKER	MEANING
12		Position of the valve controlling the operation of the hydraulic tipping system.
13		Information on hitching the trailer to the upper transport hitch only.
14		Tire pressure. (1)
15		Manufacturer's website address.
16		The hose supplying the hydraulic system of the scissor support.
17		Return hose (sink) of the hydraulic system of the scissor support.

(1) – *the pressure depends on the used tires*

The numbering of the ITEM column . is consistent with the designations in figure (2.3)

Stickers - item 9, 10, 16 17 - are placed on the hydraulic conduits. The sticker 12 is located near the hydraulic valve.

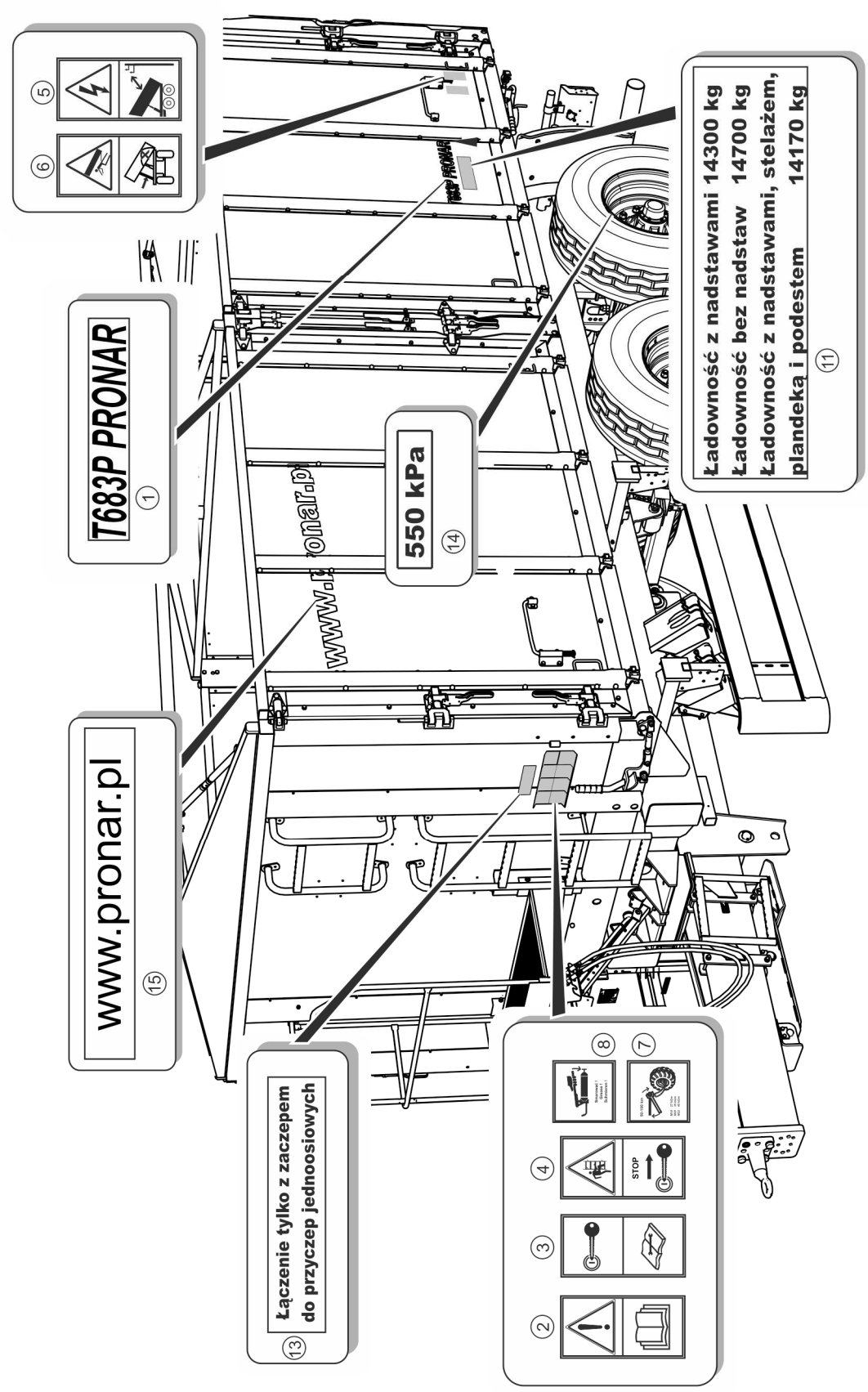


FIGURE 2.3. Arrangement of information and warning stickers

CHAPTER

3

CONSTRUCTION AND PRINCIPLE OF OPERATION

3.1 TECHNICAL CHARACTERISTICS

TABLE 3.1. Basic technical data

CONTENT	UNIT	
Overall dimensions of the trailer		
Total length	mm	6 800
Overall width	mm	2 550
Overall height	mm	2 790
Internal dimensions of box		
Length	mm	5 100
Width	mm	2 420
Height	mm	800+ 600
Weight and load capacity		
The trailer's karb weight	kg	4 640
Permissible gross weight	kg	20 000
Allowed package	kg	15 360
Other information		
Wheel track	mm	1 960
Load capacity	m^3	17.3
Loading area	m^2	12.3
Loading surface lift	mm	1 350
Load box swing angle		
- side	(°)	46
- back	(°)	50
Electrical system voltage	V	12
Speed limit	km/h	40
Noise level	dB	below 70
Min. tractor power	KM/ kW	104 / 76.4
Hydraulic oil demand	l	18
Permissible eye load	kg	2 000

3.2 CONSTRUCTION OF A TRAILER

3.2.1 CHASSIS

The trailer chassis consists of the units specified in figure (*3.1*). The lower frame (1) is a welded structure made of steel sections. The basic load-bearing element are two longitudinal members connected with crossbars. In the central part there are sockets (2) for mounting the hydraulic tipping cylinder. The load box support (10) is mounted in front of the tipping cylinder sockets. In the rear part of the lower frame, the rear beam (7) is welded, terminated with ball pins, on which the load box is mounted. The design of the foundation of the upper frame and the locking method enables tipping of the load box sideways and backwards. The front beam (8) of the lower frame, on the right and left side have the welded brackets for mounting the upper frame.

Lighting beams (3) are bolted to the rear part of the chassis, to which elements of electrical equipment are attached. The rear hitch (9) is turned to the crossbar of the lower frame, intended for aggregating the second machine (two-axle). The ∅33 mm diameter pin is adapted to be connected with a ∅40 mm tie rod. There are also hydraulic and pneumatic system sockets for connecting a second trailer in the crossbar.

The trailer's suspension is made of road axles (4), attached to parabolic springs with U bolts. The suspension is attached to the lower frame (1). The axles are made of a square bar terminated with a pin, on which the wheel hubs (5) are mounted on the tapered roller bearings. These are single wheels equipped with calliper brakes actuated by mechanical cam expanders. The rear wheels are covered with a pair of fenders (12) attached to the trailer's frame. On both sides of the trailer, in its front part there are underrun protection (15). The pockets of the support wedges (13) are located on the left stringer just behind the left shield.

The drawbar eye (6) is mounted on the front part of the drawbar. In the lower part of the drawbar there are holders for the hydraulic scissor support (11). Further on, on the left side, a ladder (14) is installed to facilitate access to the load box.

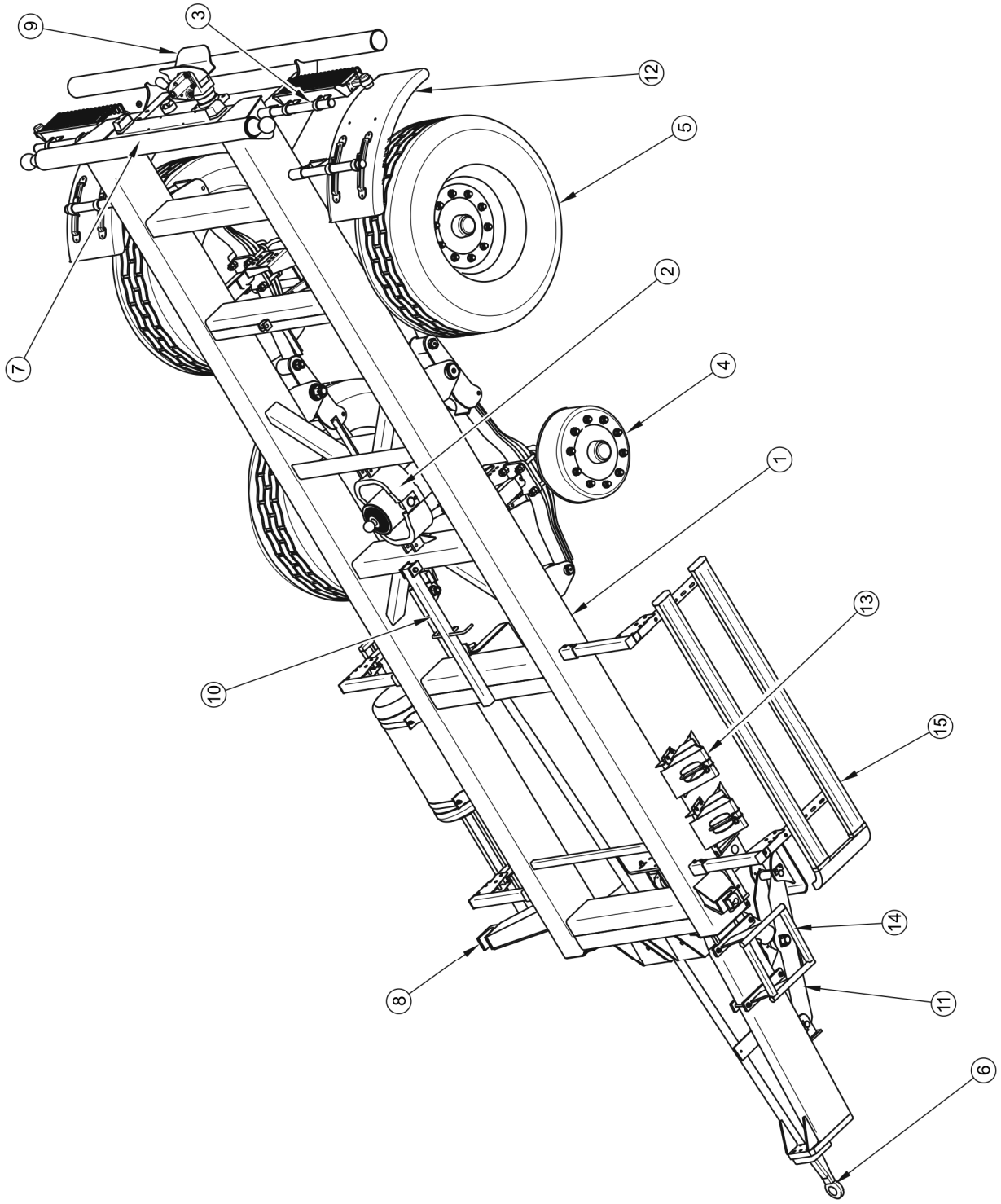


FIGURE 3.1. Trailer chassis

(1) lower frame, (2) tipping cylinder seat, (3) lighting beam, (4) road axle, (5) wheel, (6) string, (7) rear beam, (8) front crossbar, (9) hitch, (10) box support, (11) trailer support, (12) fender, (13) wedges, (14) drawbar ladder, (15) underrun protection

3.2.2 LOAD BOX

The load box of the trailer - figure (3.2) - consists of: upper frame (1) with a welded steel floor, front wall (2), rear wall (3), right side walls with extensions (5) forming a tilting system, and side walls (4) on the left side (tilt and fold system). In the central part of the trailer there are posts (6) which are connected with each other by means of connecting lines (15). The tarpaulin frame (13) is mounted in the upper part of the box. The lower ladder (9) and the upper ladder (10) are attached to the front wall of the load box, and the balcony (11) (option) is screwed on - figure (*3.2*). An additional folding step is screwed on the inside of the front wall, which makes it easier to get into the load box. All side walls and the rear wall are opened hinged by unlocking the appropriate locks of the trailer. In addition, the walls on the left side of the trailer can be opened horizontally, thus allowing access to the cargo transported on pallets.

The load box is seated in the sockets of the rear beam and the front crossbar of the lower frame, see figure (*3.1*). The selected direction of tipping is realized by placing the tipping pins in properly profiled socket holes, whose construction prevents their incorrect placement by the trailer operator.

All walls of the trailer are made of waterproof, laminated plywood with aluminium fittings with rubber seals. As additional equipment, the trailer can be equipped with a balcony (11), a tarpaulin (14), a chute system consisting of side plates (12) and a rear wall chute plate.

In the rear wall there is a chute slide (1), which can be additionally fitted with a chute (2) enabling more precise unloading of loose materials - figure (*3.3*).

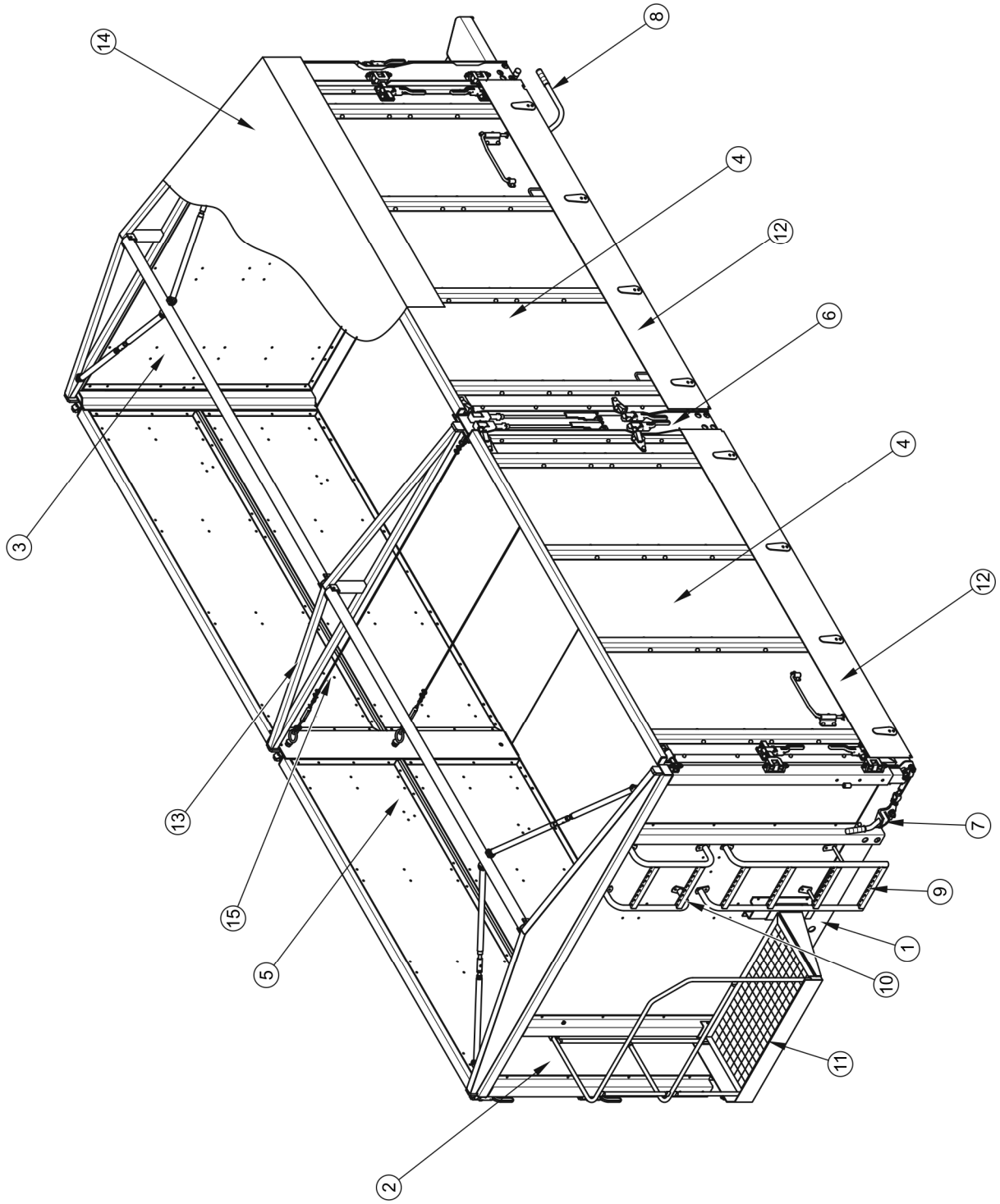


FIGURE 3.2. Load box

(1) upper frame, (2) front wall, (3) rear wall, (4) portal side wall, (5) right side wall with extension, (6) central post, (7) front lock, (8) rear lock, (9) lower ladder, (10) upper ladder, (11) balcony, (12) side plates of the chute system, (13) frame, (14) tarpaulin. (15) fastening conduit

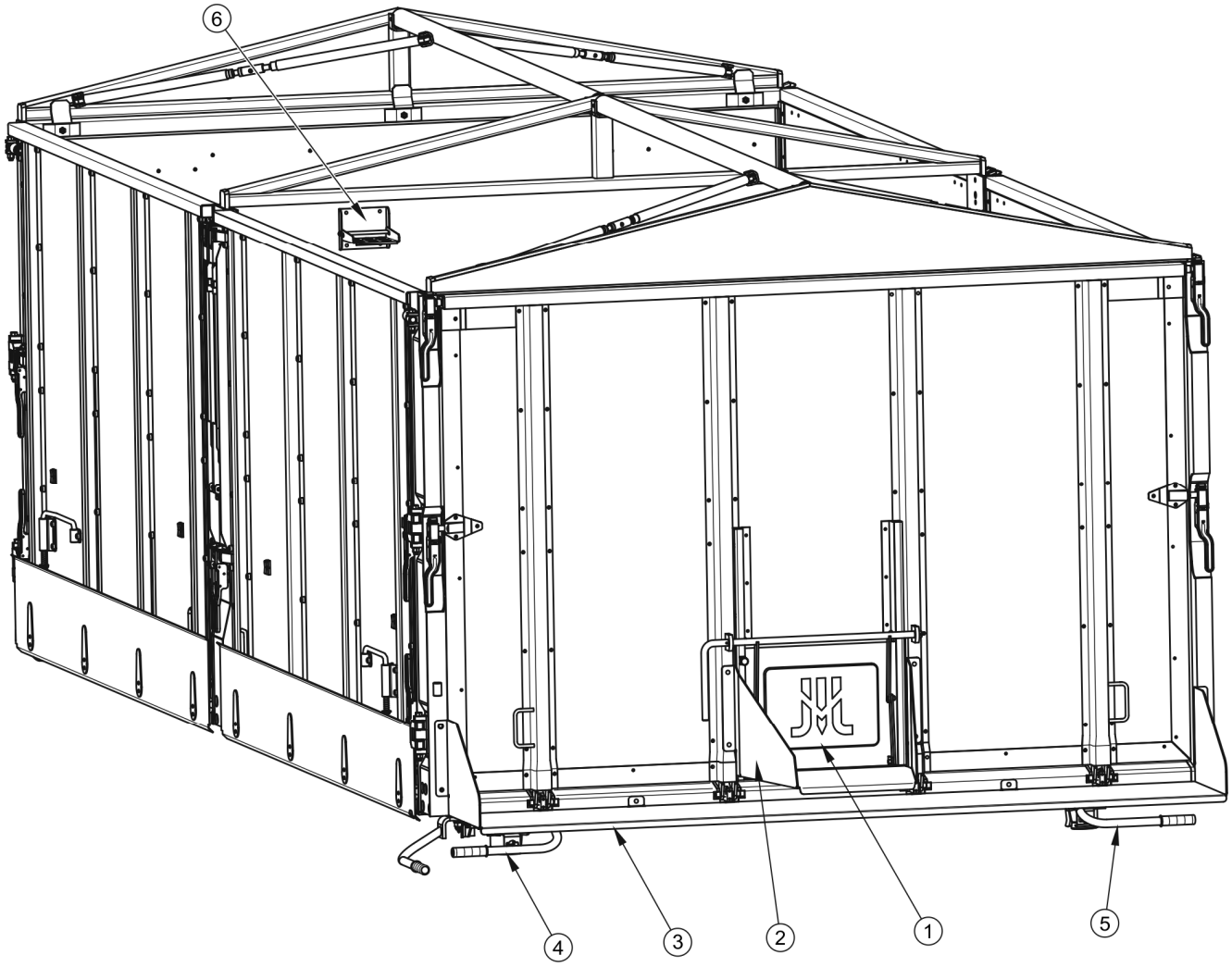


FIGURE 3.3. Load box rear wall

(1) gate valve, (2) chute of the discharge chute, (3) rear wall chute plate, (4) closing of the left rear wall, (5) closing the right rear wall, (6) side step

3.2.3 SERVICE BRAKE

The trailer is equipped with one of four types of service brake:

- double conduit pneumatic system with three-position manual regulator, figure (*3.4*),
- double conduit pneumatic system with three-position manual regulator, figure (*3.5*),
- double conduit pneumatic system with ALB automatic regulator, figure (*3.6*),
- hydraulic braking system, figure *(3.7)*.

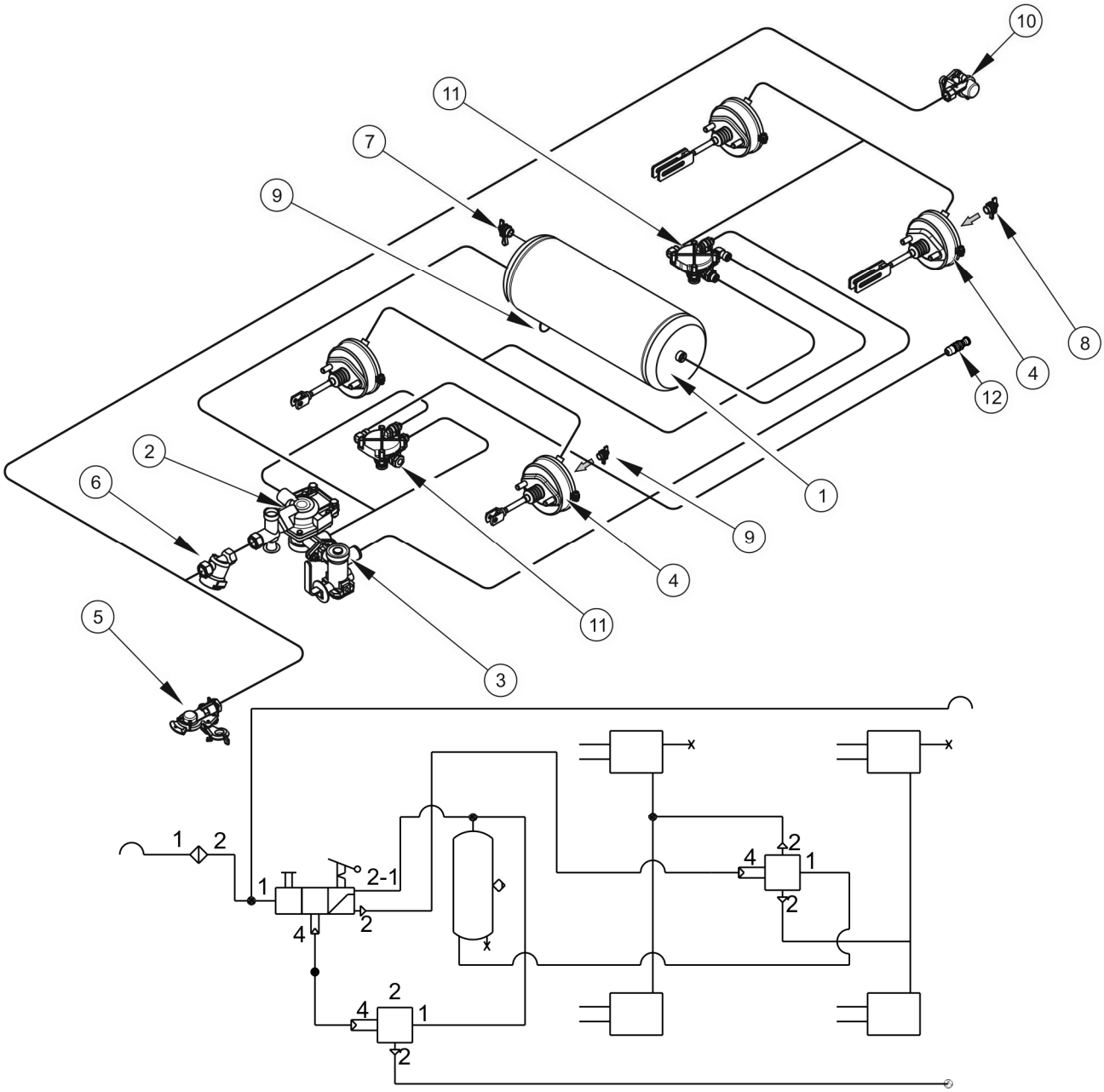


FIGURE 3.4. Construction and diagram of the dual-line pneumatic braking system

(1) air tank, (2) control valve, (3) brake force regulator, (4) pneumatic cylinder, (5) hose connector (black), (6) air filter, (7) air tank control connector, (8) pneumatic actuator control connection, (9) drain valve, (10) socket (black), (11) relay valve, (12) plug

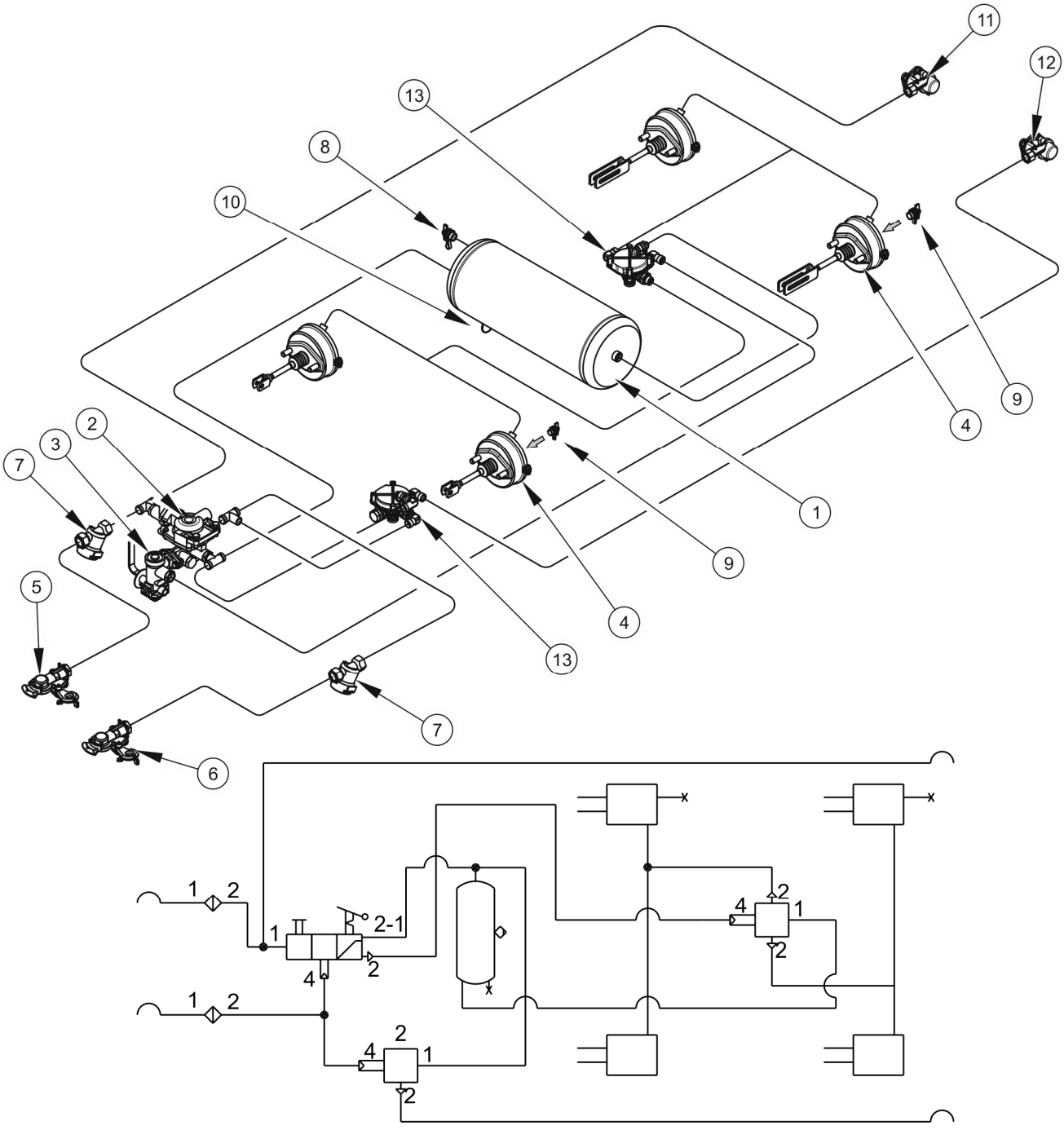


FIGURE 3.5. Construction and diagram of the dual-conduit pneumatic braking system with a manual braking force regulator

(1) air tank, (2) control valve, (3) brake force regulator, (4) pneumatic actuator, (5) hose connector (red), (6) hose connector (yellow), (7) air filter, (8) air tank control joint, (9) pneumatic actuator control joint, (10) relay valve, (11) drain valve, (12) socket (red), (13) socket (yellow)

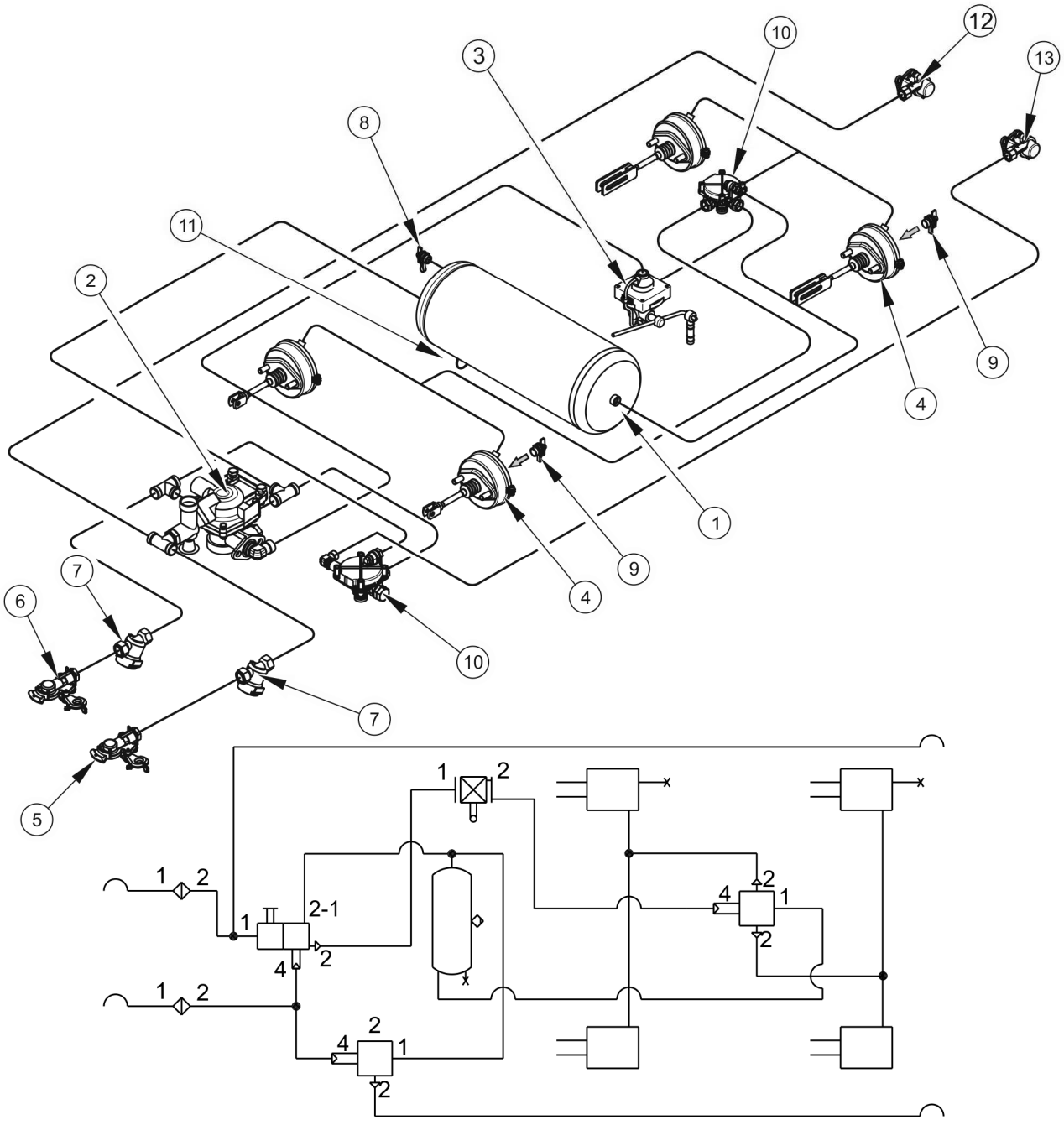


FIGURE 3.6. Construction and diagram of the dual-conduit pneumatic braking system with an automatic braking force regulator

(1) air tank, (2) control valve, (3) brake force regulator, (4) pneumatic actuator, (5) hose connector (red), (6) hose connector (yellow), (7) air filter, (8) air tank control joint, (9) pneumatic actuator control joint, (10) relay valve, (11) drain valve, (12) socket (red), (13) socket (yellow)

The service brake (pneumatic or hydraulic) is activated from the driver's cab by pressing the tractor brake pedal. The task of the control valve (2) - figure (*(3.4*), (*3.5*) and (*3.6*) , is to activate the trailer brakes simultaneously with the tractor brake applied. In addition, in the event of an unforeseen disconnection of the hose between the trailer and the tractor, the control valve automatically applies the machine's brake. The applied valve has a brake release system used when the trailer is disconnected from the tractor, see figure *(3.8)*. After connecting the air line to the tractor, the release device automatically adjusts to the position enabling normal operation of the brakes.

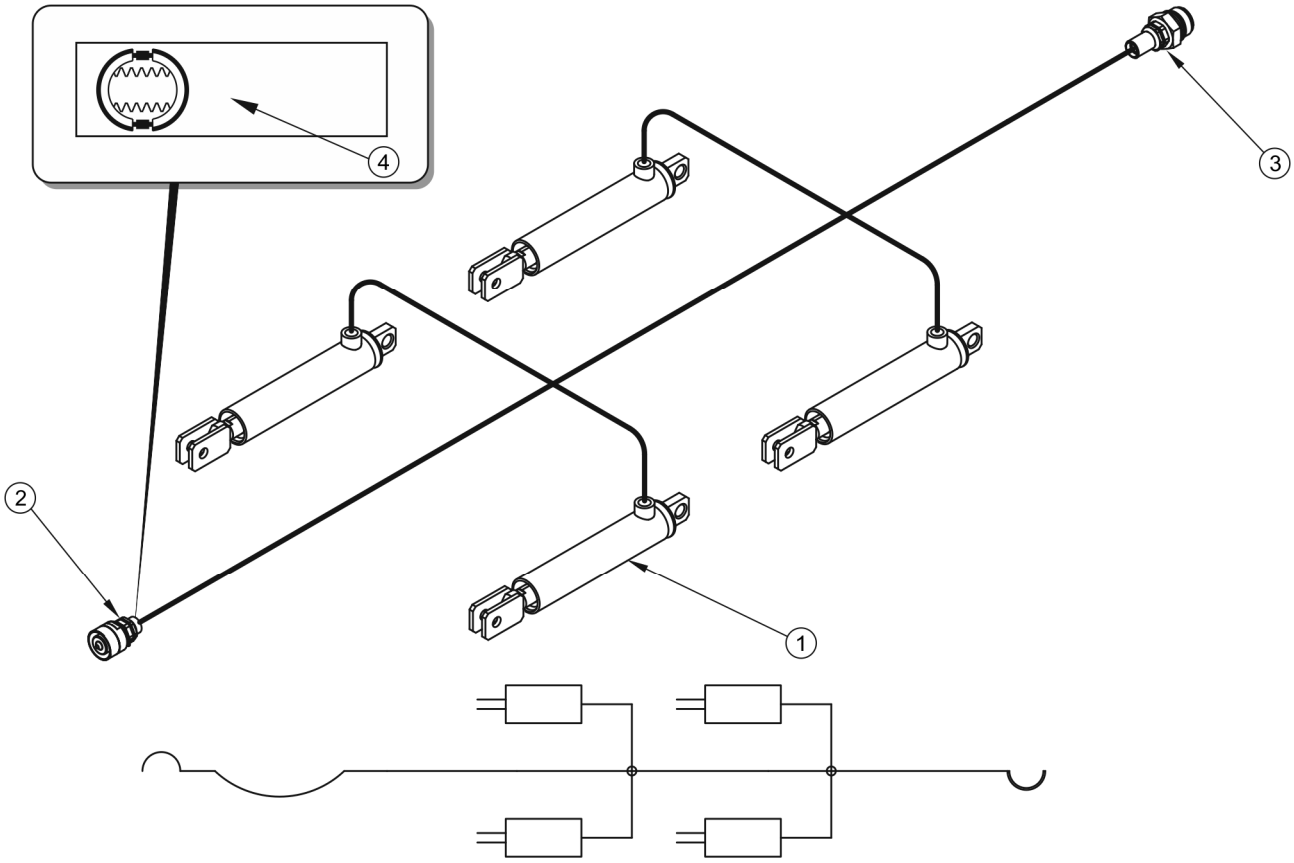


FIGURE 3.7. Construction and diagram hydraulic braking system

(1) hydraulic cylinder, (2) hydraulic quick coupler, (3) hydraulic socket, (4) information sticker

Three-band braking force regulator (2) - figure *(3.8)*, adjusts braking force depending on the setting. Switching to the appropriate operating mode is done manually by the machine operator before starting the journey using the lever (4). Three work positions are available: A - ‘No load’, B - ‘Half load’ and C - ‘Full load’.

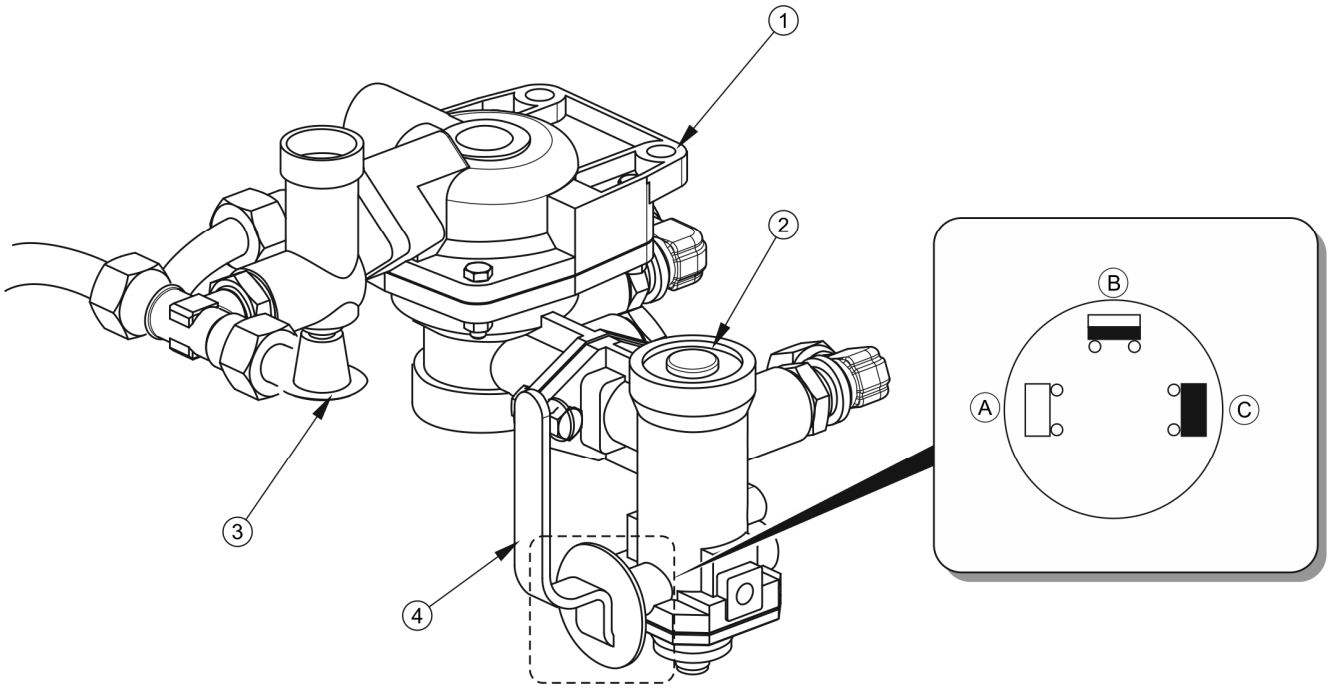


FIGURE 3.8. Control valve and braking force regulator

(1) control valve, (2) braking force regulator, (3) trailer brake release button when parking, (4) regulator selection lever, (A) 'UNLOADED' position, (B) 'HALF LOAD' position, (C) 'FULL LOAD' position

3.2.4 HYDRAULIC TIPPING SYSTEM

The hydraulic tipping system - figure *(3.9)* - is used for automatic unloading of the trailer by tilting the load box backwards or on sides. The hydraulic system of the unloading mechanism is supplied with oil from the tractor's hydraulic system. The tractor's external hydraulic oil distributor is used to control the lifting of the load box.

In the trailer, the installation consists of two independent circuits:

- circuit (A) - for supplying the hydraulic cylinder of the trailer,
- circuit (B) - to supply the second trailer hydraulic cylinder in case of connecting two trailers to the tractor).

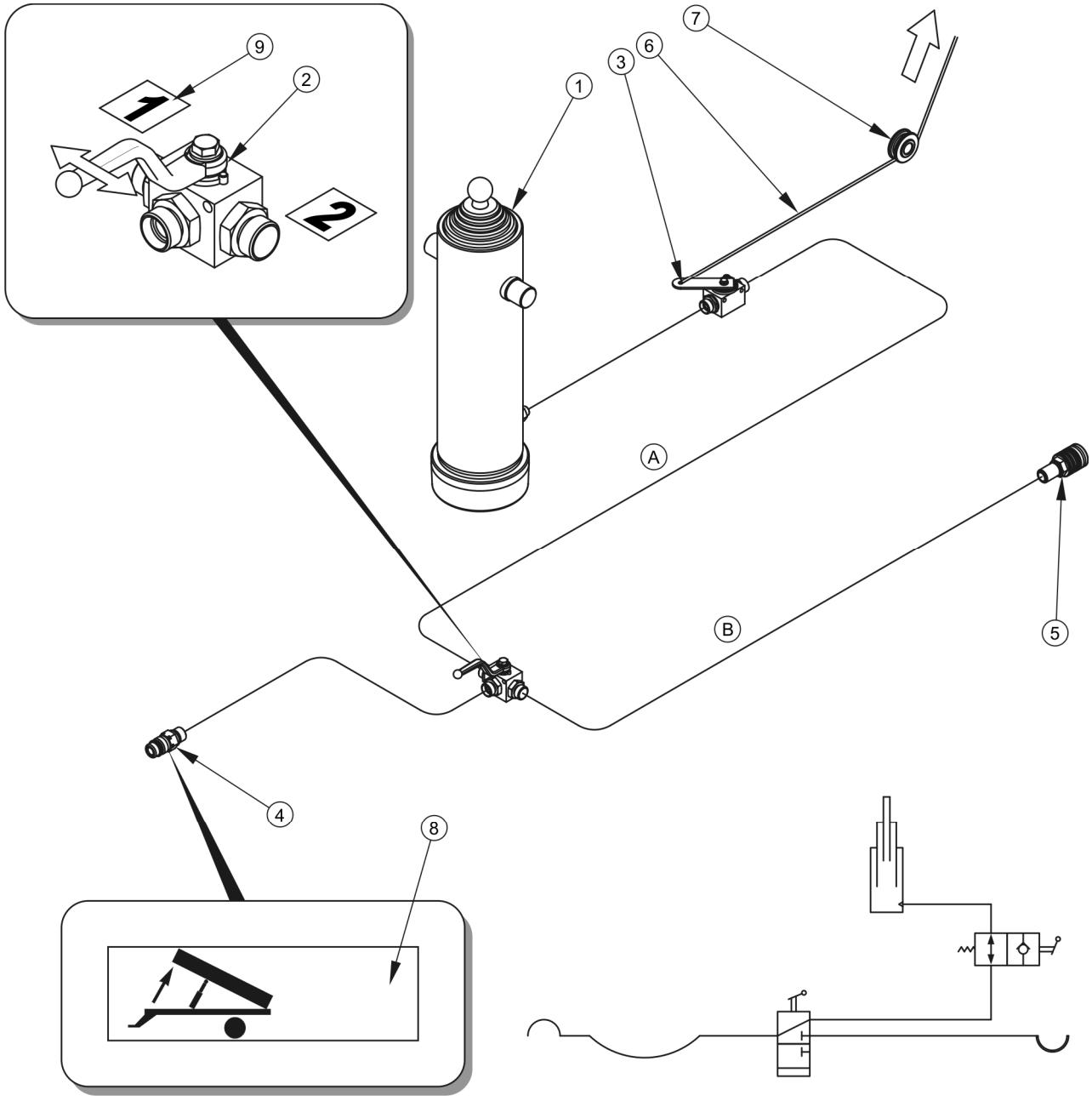


FIGURE 3.9. Construction and diagram of the hydraulic tipping system

(1) telescopic cylinder, (2) three-way valve, (3) shut-off valve, (4) quick coupler (5) socket, (6) control cable, (7) guide roller, (8), (9) information stickers

A three-way valve (2) is used to turn on these circuits - see figure (*3.9*). The lever on this valve can occupy 2 positions:

- **1** - trailer tipping open circuit - circuit (A),
- **2** - second trailer tipping open circuit - circuit (B).

A sticker (13) has been placed on the connecting pipe, in the vicinity of the plug (4), which identifies the hydraulic feed pipe of the tipping system.

CAUTION

The cut-off valve (3) - figure (3.9) limits the tipping angle of the load box when tilted to the sides and to the rear. The length of the cable (6) controlling this valve is regulated by the Manufacturer and cannot be adjusted when the trailer is used.

ADVICE

The trailer's hydraulic system was filled with L-HL32 Lotos hydraulic oil..

3.2.5 HYDRAULIC SYSTEM OF THE SCISSOR SUPPORT

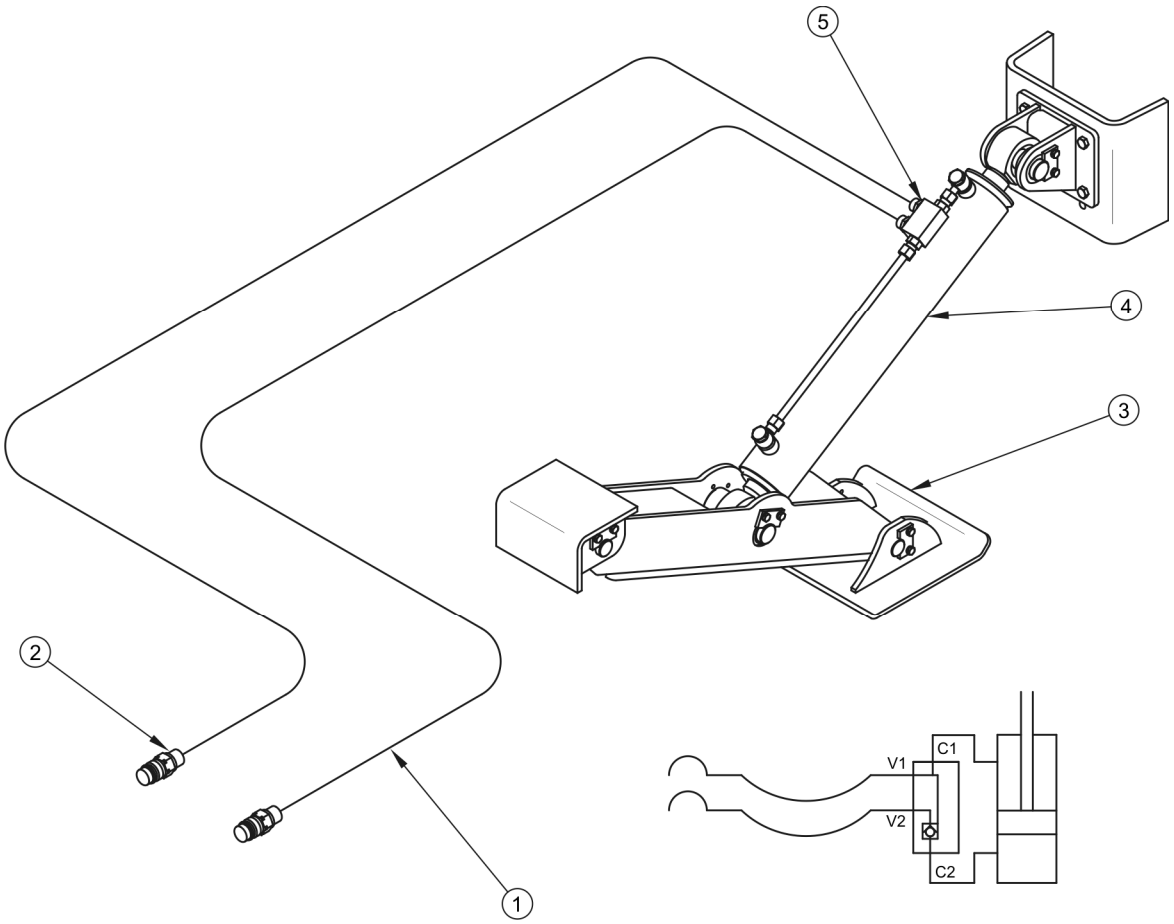


FIGURE 3.10. Construction and diagram of the hydraulic installation of the scissor support

(1) hydraulic hose, (2) quick coupler, (3) scissor support, (4) cylinder

Hydraulic system of support - figure *(3.10)* is used for automatic unfolding and folding of the support leg (3). This is done by extending or retracting the piston rod of the hydraulic cylinder (4). The support system is fed through the conduit (1) with oil from the tractor's hydraulic system. The tractor's external hydraulic oil distributor is used to control the support cylinder operation.

The system is equipped with a hydraulic lock (5) located on the actuator (4). The use of a hydraulic lock increases the safety of using the trailer. In the event of raising or lowering the support, the system conduits may be damaged (abrasion, unsealing), in which case the hydraulic lock will lock the cylinder (4) in a fixed, unchanged position.

ADVICE

The support's hydraulic system was filled with L-HL32 Lotos hydraulic oil.

3.2.6 PARKING BRAKE

The parking brake is used to immobilize and secure the trailer against rolling away when parked. The trailer is equipped with a parking brake with a crank mechanism - figure (*3.11*).

The trailer is immobilized by turning the crank of the mechanism (1) clockwise as far as it will go. When turning the lever, the steel cable (2) is tensioned, which, through the mechanism, tightens the next cable guided through the rollers (3). The cables are connected with the wheel axle expander levers (4). Tensioning of the cable tilts the expander levers, which spread the brake shoes of the wheel axle, immobilizing the trailer.

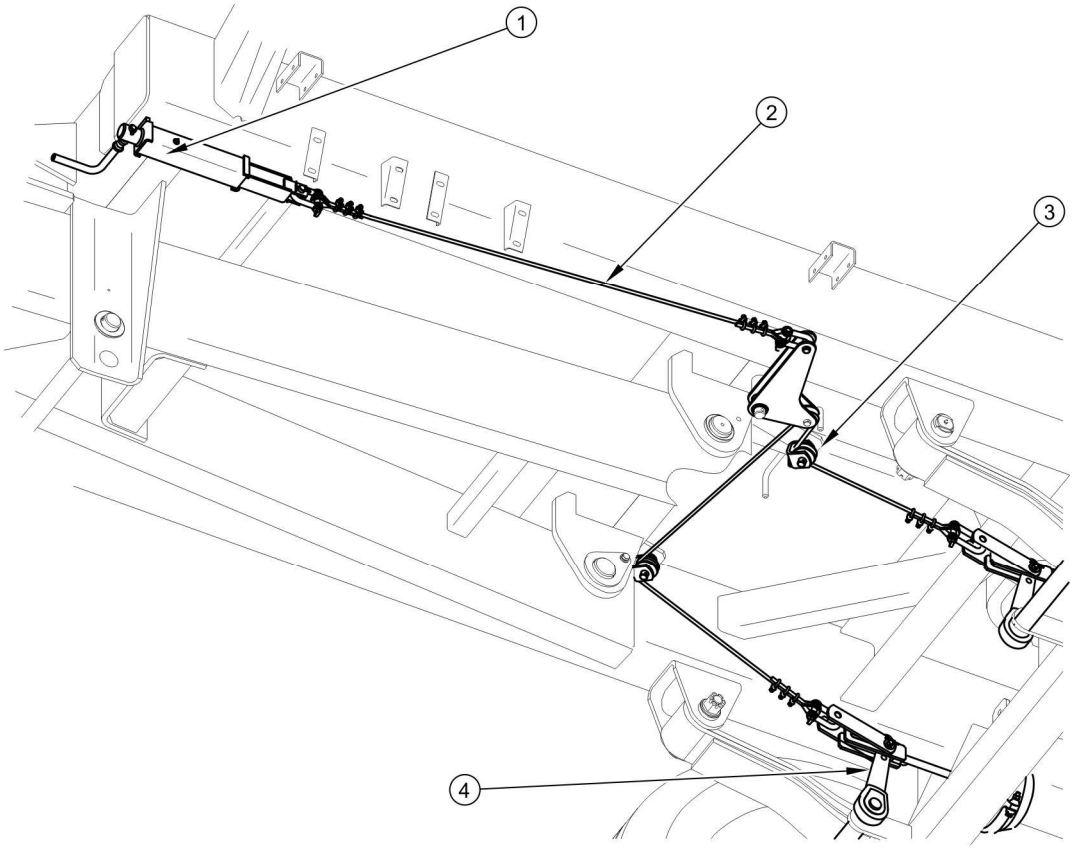


FIGURE 3.11. Parking brake construction

(1) crank mechanism, (2) cable, (3) guide roller, parking brake lever, (4) expander arm

3.2.7 LIGHTING INSTALLATION

TABLE 3.2. List of electrical components markings

SYMBOL	FUNCTION
ZP	Multifunctional rear right lamp
ZL	Multifunctional rear left lamp
X7P	Front seven-pin socket
GT	Rear seven-pin socket
OTP	License plate lighting lamp right
OTL	License plate lighting lamp left
PP	Front right plate lamp
PL	Front left plate lamp

SYMBOL	FUNCTION
OBP	Multifunctional right lamp
OBL	Multifunctional left lamp
TOL	Multifunctional left rear lamp
TOP	Multifunctional right rear lamp

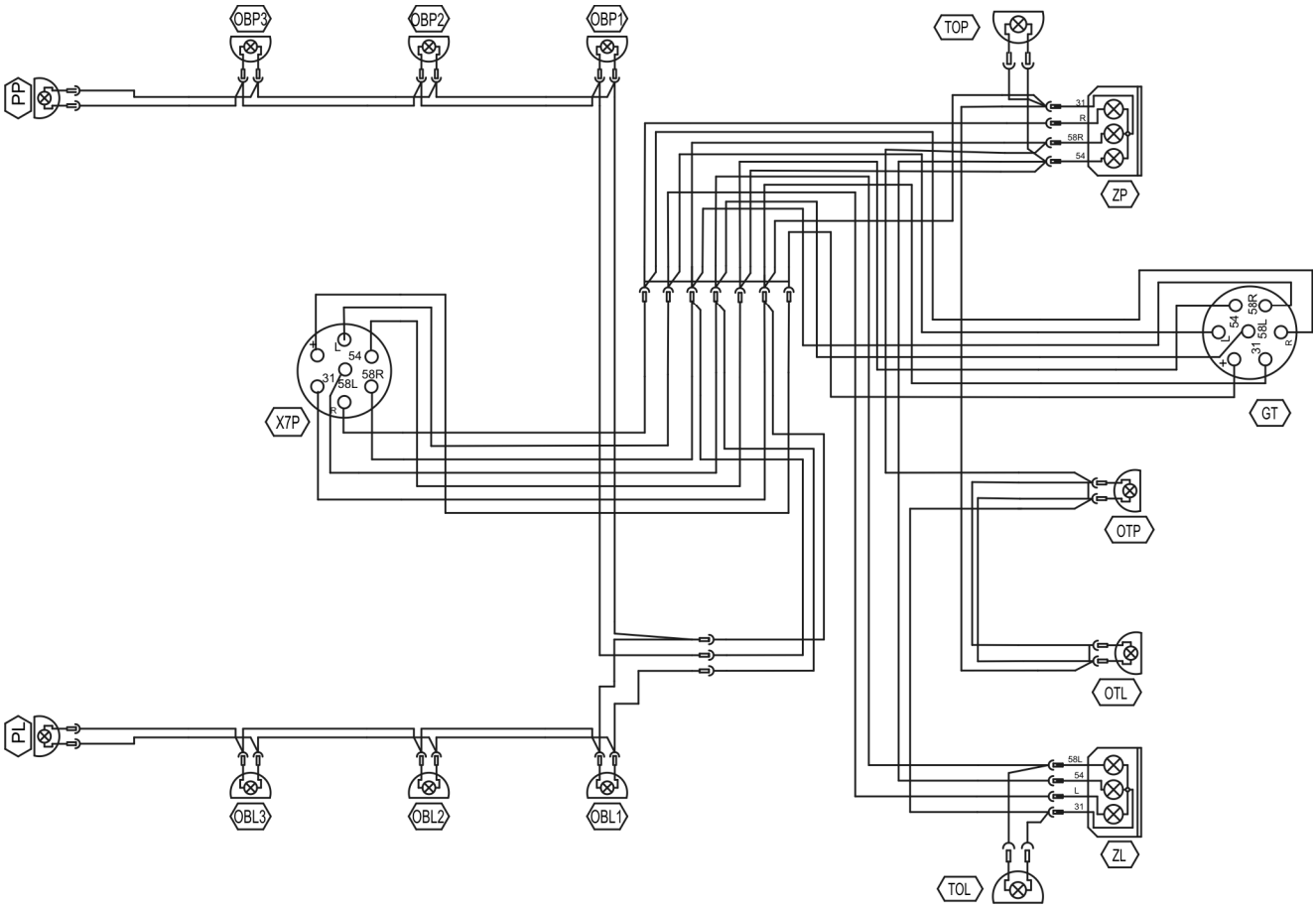


FIGURE 3.12. Electrical system schematic diagram

Designations according to the table (3.2)

The trailer's electrical installation is adapted to be supplied from a 12 V DC source. Connecting of the hook trailer's electrical system to the tractor should be made using a connection cable, which is included in the machine's equipment.

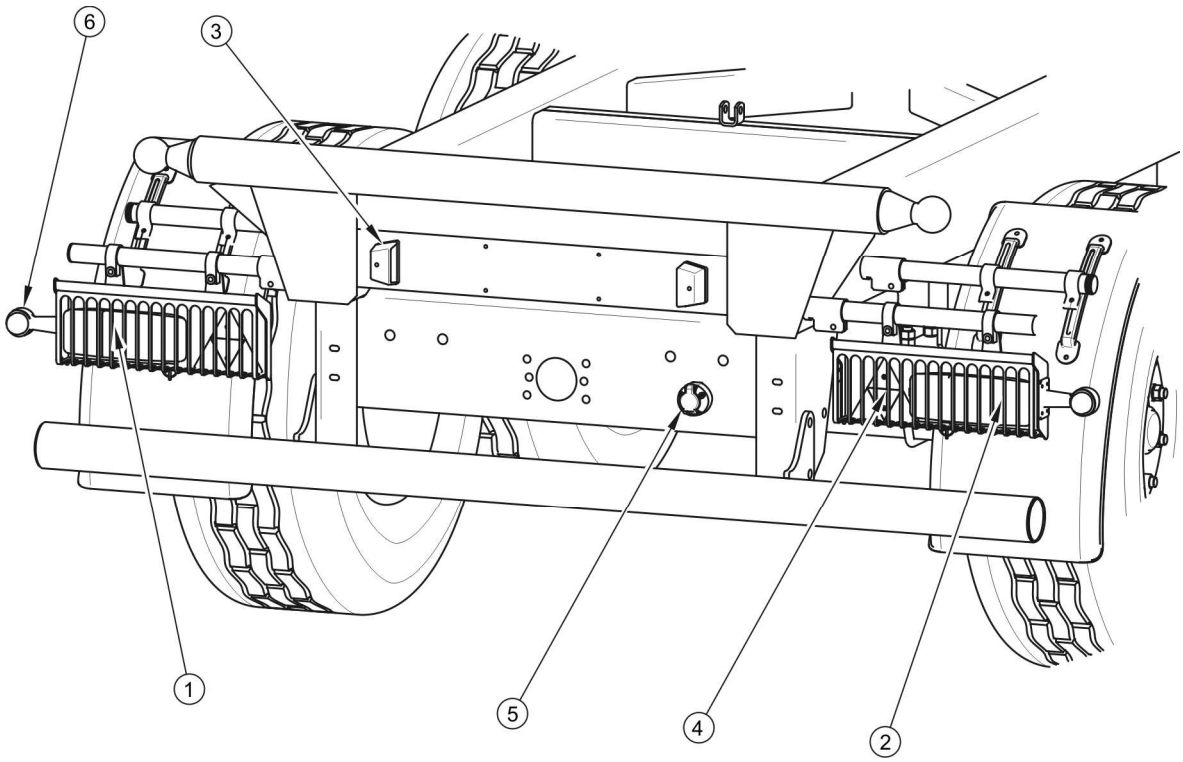


FIGURE 3.13. Arrangement of electrical system components and reflectors - rear view

(1) left rear multi-purpose lamp, (2) right rear multi-purpose lamp, (3) license plate lamp, (4) triangular reflector, (5) rear 7-pin socket, (6) rear clearance lamp

TABLE 3.3. Designation of the connections of the X7P and GT sockets

MARKING	FUNCTION
31	Weight
+	+ 12V power supply (not used)
L	Left direction indicator
54	STOP light
58L	Rear left position light
58R	Rear right position light
R	Right direction indicator

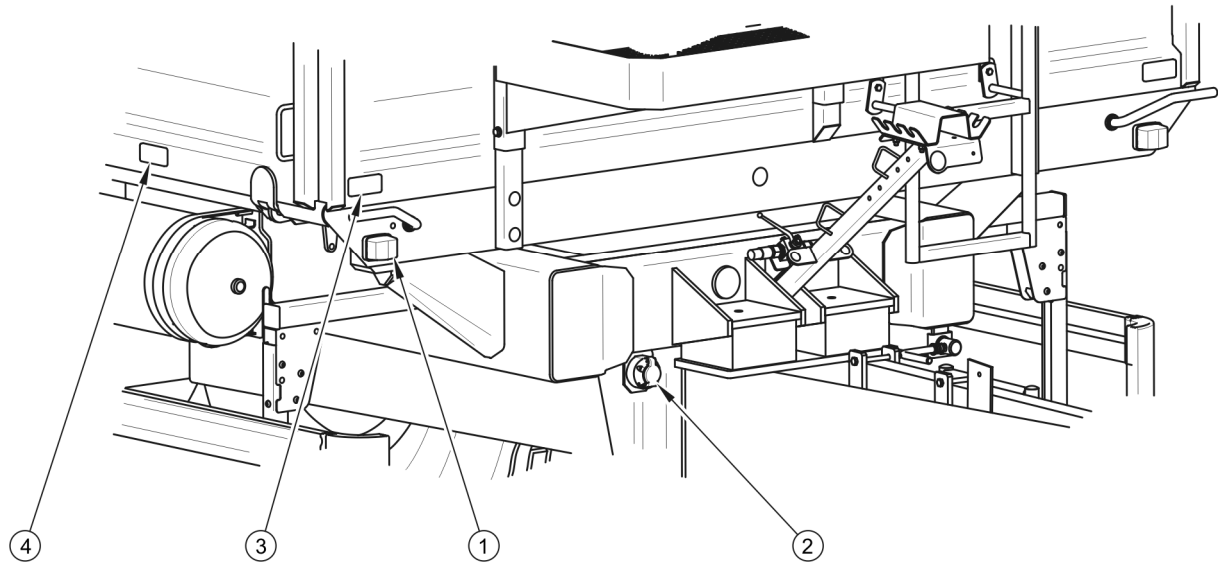


FIGURE 3.14. Arrangement of electrical system components and reflectors - forward view

(1) front position lamp, (2) front 7-pin socket, (3) white reflector, (4) orange reflector

CHAPTER

4

RULES OF USE

4.1 PREPARING FOR WORK BEFORE FIRST USE

4.1.1 CHECKING THE TRAILER AFTER DELIVERY

The manufacturer ensures that the trial is fully functional, has been checked in accordance with control procedures and is approved for use. However, this does not release the user from the obligation to check the vehicle after delivery and before first use. The machine is delivered to the user completely assembled.

Before starting work, the trailer operator must check the technical condition of the trailer and prepare it for the first start-up. It is necessary to read the content of this manual attached to the trailer and follow the recommendations contained in it, familiarize with the construction and understand the principle of operation of the machine.

CAUTION

Before connecting and starting up the trailer, read the contents of this manual and obey the recommendations contained in them.

External inspection

- Check the completeness of the machine (standard and optional equipment).
- Check the condition of the paint coating.
- Carry out visual inspection of individual trailer elements for mechanical damage resulting due to incorrect transport of the machine (dents, punctures, bends or broken parts).
- Check the condition of the tires on the road wheels and the air pressure in the tires.
- Check the technical condition of the flexible hydraulic hoses.
- Check technical condition of pneumatic conduits.
- Make sure there are no hydraulic oil leaks.
- Check lighting electric lamps.
- Check cylinders for hydraulic oil leaks.

4.1.2 PREPARATION OF THE TRAILER FOR THE FIRST CONNECTION

Preparation

- ➡ Check all trailer lubrication points, if necessary lubricate machine as recommended in chapter 5.
- ➡ Check the tightness of the nuts securing the road wheels.
- ➡ Drain the air reservoir in the braking system.
- ➡ Make sure that the pneumatic, hydraulic and electrical connections on the agricultural tractor comply with the requirements, otherwise do not connect the trailer.
- ➡ Adjust the height of the drawbar or the position of the upper transport hitch. Check the tightness of the bolts securing the drawbar hitch.
    - ⇨ A detailed description can be found in chapter 5.

Test drive

If all of the above activities have been carried out and the technical condition of the trailer does not raise any objections, connect the machine to the tractor. Start the tractor, check individual systems and carry out a test run of the trailer and perform a test drive without load (without a loading box). It is recommended that visual inspection be carried out by two people, one of them should be permanently in the tractor's cab. The test run must be carried out in the order shown below.

- ➡ Connect the trailer to the appropriate hitch on the agricultural tractor.
- ➡ Connect the brake, electrical and hydraulic system lines.
- ➡ Raise the support to the transport position.
- ➡ By activating individual lights, check the correct operation of the electrical system.
- ➡ Turn the valve of the hydraulic tipping system to position 1. Perform test tipping of the load box to the rear and sideways.
- ➡ When moving off check the operation of the service brake.
- ➡ Perform a test drive.

ADVICE

Service activities: connecting / disconnecting from the tractor, adjusting the drawbar position, tipping the load box, etc. are described in detail further in the manual, in chapters 4 and 5.

The trailer may only be hitched when all preparatory activities and technical inspection have been successful. If during the test trip, disturbing symptoms such as:

- noise and unnatural noises from rubbing moving parts against the trailer structure,
- hydraulic oil leakage,
- pressure drop in the braking system,
- improper operation of hydraulic and/or pneumatic cylinders,

or other faults, you need to diagnose the problem. If the fault cannot be rectified or remedied, you will void the warranty, contact the place of purchase for clarification or repair.

DANGER

Careless and improper use and operation of the trailer, non-observance of the recommendations contained in these instructions creates a threat to health.

The trailer must not be used by persons who are not authorized to drive agricultural tractors, including children and people under the influence of alcohol or other drugs.

Non-compliance with the rules of safe use poses a threat to the health of the operating and bystanders.

After completing the test drive, check the tightness of the wheel nuts.

4.2 CONNECTING AND DISCONNECTING THE TRAILER TO THE TRACTOR

The trailer may be connected to an agricultural tractor, if all connections (electrical, pneumatic, hydraulic) and the hitch on the agricultural tractor are in accordance with the trailer manufacturer's requirements.

In order to connect the trailer with the tractor, perform the following actions in order. The machine must be immobilized with the parking brake.

Connecting

- ➡ Block the trailer with parking brake.
  - ⇨ Turn the brake mechanism clockwise as far as it will go.
- ➡ Position the agricultural tractor directly in front of the drawbar eye.
- ➡ Connect the conduits of the hydraulic system of the support.
  - ⇨ The support hydraulic system conduit is marked with information stickers (16) and (17) - table *(2.1)* chapter 2.
- ➡ Using the support, set the drawbar eye at such a height that it is possible to hitch the machines.
- ➡ Reverse the tractor, connect the trailer to the hitch, check the coupling safety device protecting the machine against accidental unhitching.
  - ⇨ If an automatic coupler is used in the agricultural tractor, make sure that the hitching operation is completed and that the drawbar eye is secured against opening.
- ➡ Switch off the tractor engine. Close the tractor cabin and secure it against unauthorized access.
- ➡ Connect pneumatic system lines (applies to double line pneumatic system):
  - ⇨ Connect the pneumatic conduit marked yellow with the yellow socket on the tractor.
  - ⇨ Connect the pneumatic conduit marked red with the red socket on the tractor.

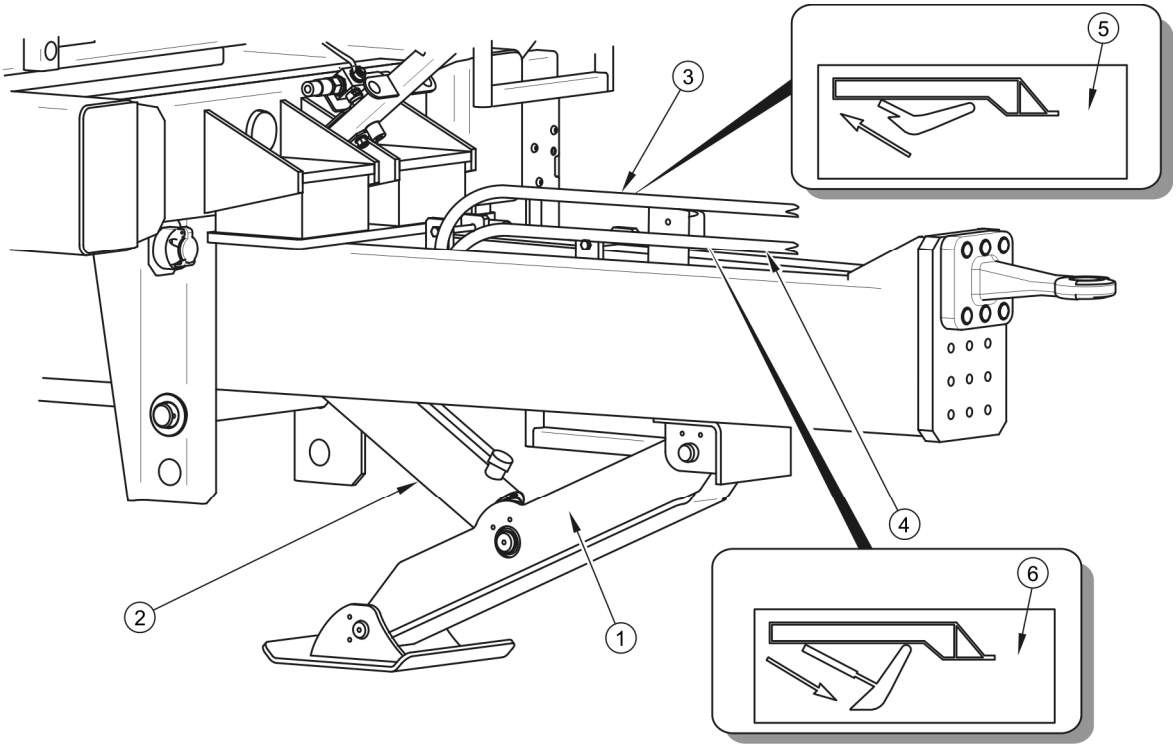


FIGURE 4.1. Trailer support

(1) scissor support, (2) actuator, (3), (4) cables, (5), (6) information decals

- Connect the pneumatic system conduits (applies to single conduit systems):
  - Connect the pneumatic conduit marked black with the black socket in the tractor.
- Connect the hydraulic brake system conduits (applies to the trailer variant with hydraulic brake system).
  - The hydraulic brake system conduit is marked with information decal (9) - table (*2.1*) chapter 2.
- Connect the hydraulic tipping system conduits.
  - The hydraulic tipping system conduit is marked with an information decal (10) - table (*2.1*) chapter 2.
- Connect the main power supply cable for the lighting installation.
- Raise support in driving position.

DANGER

During coupling it is forbidden to stand bystanders between the trailer and the tractor. The agricultural tractor operator when connecting the machine should take particular care during work and make sure that unauthorized persons are not in the danger zone during coupling.

When connecting the hydraulic conduits to the tractor, make sure that the tractor hydraulic system and trailer are not under pressure.

Ensure good visibility during coupling.

Be especially careful when folding the support - danger of severing of the limbs.

After coupling the machines, check the hitch safety device.

When connecting the braking system (pneumatic double conduit) wiring, the correct order of wiring is important. The first is to connect the yellow plug to the yellow socket on the tractor, and then to the red plug to the red socket on the tractor. After connecting the second conduit, the brake release system will switch to normal operation mode (disconnection or interruption of the air conduits causes the trailer control valve to automatically move to the machine braking position).

The cables are marked with coloured protective covers, which identify the appropriate installation cable.

CAUTION

Make sure that the oils are compatible in the tractor hydraulic system, the trailer's tipping hydraulic system and the scissor support hydraulic system.

The trailer may only be coupled with such an agricultural tractor that has a suitable hitch, required connection sockets for braking, hydraulic and electrical systems, and hydraulic oil in both machines can be mixed with each other.

After completing the coupling, secure the hydraulic, braking and electrical wiring in such a way that they do not become entangled in the moving parts of the agricultural tractor during travel and are not exposed to kinking or cutting during turning.

Disconnecting the trailer

In order to disconnect the trailer from the tractor, perform the following actions in order.

- ➡ Block the tractor and trailer with parking brake.
- ➡ Lower the support.

- ⇨ By controlling the tractor hydraulic manifold levers, set the drawbar eye at such a height that it is possible to unlock and disconnect the trailer.

➡ Switch off the tractor engine. Close the tractor cabin and secure it against unauthorized access.

➡ Disconnect the hydraulic tipping system conduit from the tractor.

➡ Disconnect the electric wire.

➡ Disconnect pneumatic system wires (applies to double conduit systems).

- ⇨ Disconnect the red pneumatic wire.
- ⇨ Disconnect the yellow pneumatic wire.

➡ Disconnect the pneumatic system conduits (applies to single conduit systems).

- ⇨ Disconnect the pneumatic conduit marked black.

➡ Disconnect the hydraulic brake system hose (applies to trailer version with hydraulic brake system).

➡ Disconnect the hydraulic tipping system conduits.

➡ Secure the cable ends with covers. Insert the plugs into their respective sockets.

➡ Place safety wedges under the trailer wheel.

- ⇨ The wheel chocks must be positioned so that one of them is at the front of the wheel and the other at the rear of the wheel - see chapter 2.

➡ Release tractor hitch, disconnect trailer drawbar from tractor hitch, drive tractor away.

DANGER

When disconnecting the trailer from the tractor, take particular care. Ensure good visibility. Unless it is necessary, do not stay between the trailer and the tractor.

Before disconnecting wires and drawbar eye, close tractor cab and secure it against unauthorized access. The tractor engine must be turned off.

4.3 CONNECTING AND DISCONNECTING OF A SECOND TRAILER

A second trailer may only be connected if it is a machine built on a two-axle chassis and if it meets all the requirements of chapter 1. Hitching a second trailer with a set requires experience in steering an agricultural tractor with a trailer. It is recommended that when coupling the second trailer the operator uses the help of another person who will inform the tractor operator about the course of the operation.

Second trailer requirements

- Position the tractor with the first trailer attached straight ahead of the second trailer's drawbar.
- Immobilize the second trailer with the parking brake.
- Unlock the coupling bolt on the first trailer.
  - If the automatic rear hitch is used in the trailer, the bolt should be lifted up using the handle (4) - figure (4.2).
- Adjust the height of the drawbar of the second trailer so that the machines can be coupled.
- When reversing the tractor, drive the rear hitch of the first trailer onto the drawbar of the second trailer.
  - If the trailer is fitted with an automatic rear hitch, make sure that the hitching operation is completed and that the drawbar eye of the second trailer is secured.
- Install the pin and the cotter securing the pin.
- Connect conduits of pneumatic, hydraulic and electric systems in accordance with the recommendations contained in chapter (4.2).

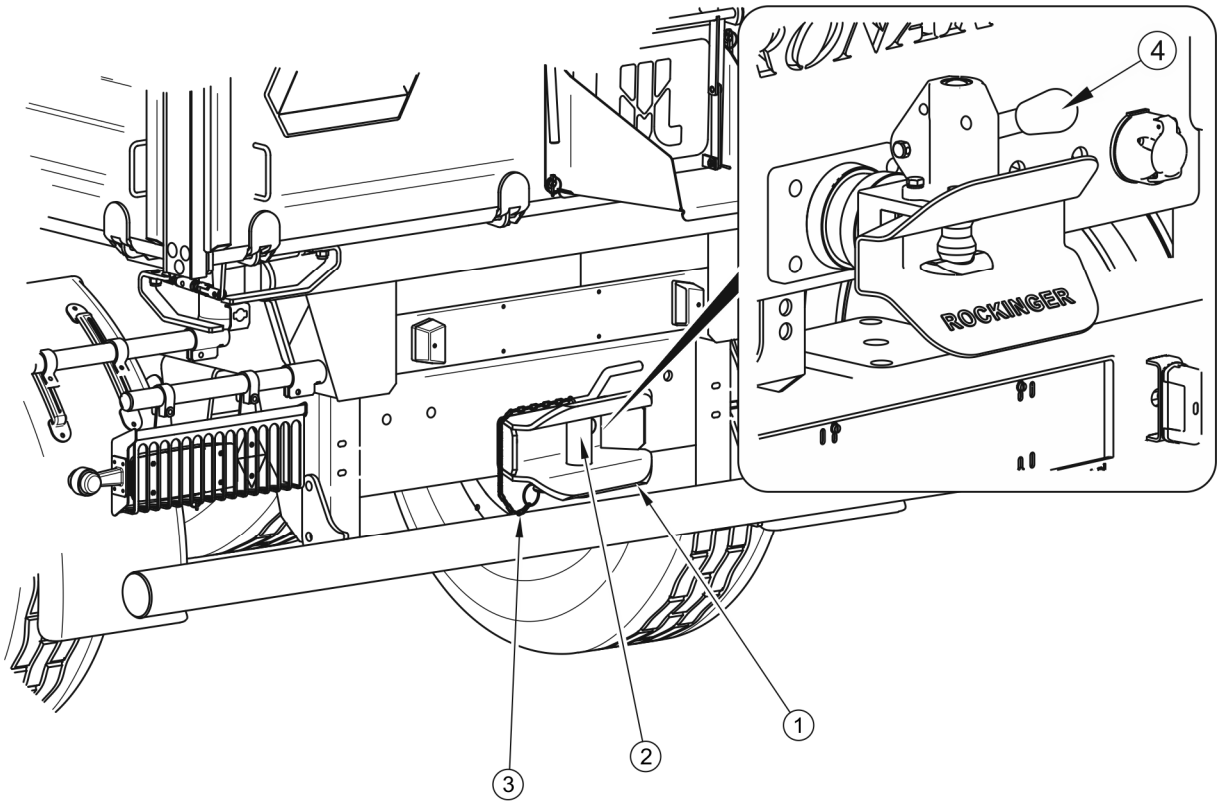


FIGURE 4.2. Rear hitch

(1) hitch body, (2) hitch pin, (3) chain with a securing pin, (4) handle for lifting the automatic hitch

Disconnecting of the second trailer

- Block the tractor and trailer with parking brake.
- Switch off the tractor engine. Close the tractor cabin and secure it against unauthorized access.
- Disconnect conduits of pneumatic, hydraulic and electric systems in accordance with the recommendations contained in chapter (4.2).
- Unlock the coupling bolt on the first trailer. Remove the bolt and drive the tractor away.

DANGER

The person assisting in the operation of coupling the second trailer must stand in such a place that he is visible at all times by the tractor operator. When doing so, be especially careful and do not stay in danger areas.

CAUTION

It is forbidden to connect a second trailer built on a chassis other than in a two-axle system.

The manual rear hitch is designed only for towing the second trailer, the maximum permissible weight of which does not exceed 13,500 kg.

4.4 LOADING AND LOAD SECURING

4.4.1 GENERAL LOADING INFORMATION

Before starting loading, make sure that the walls, extensions and the slide of the chute window are properly closed and secured. The trailer must be placed for straight ahead and connected to the tractor. Loading should take place only when the trailer is placed on level and stable ground. If the trailer is equipped with a tarpaulin, it should be rolled up. If the load will not exert pressure on the walls or side extensions, the strapping cable can be detached, otherwise it must be installed between the middle posts of the load box. Lack of a fastening rope may damage the load box.

Regardless of the type of transported load, the user is obliged to secure it in such a way that the load cannot move freely and cause contamination of the road. If this is not possible, it is prohibited to transport this type of load.

Materials that come into contact with painted or steel surfaces may cause damage, should be transported in sealed packaging (bags, boxes, barrels, etc.), and after transporting the load box should be thoroughly washed with a strong water jet.

If materials that exert point pressure on the floor of the load box are transported, they should be protected against damage by placing thick boards, plywood or other materials with similar properties under the load.

When loading goods in pallets or on pallets, pay attention to their distribution on the platform. The pallets must be secured so that they cannot move freely on the platform. Laying pallets in layers is prohibited.

During pallets loading, open the side walls on the left side of the trailer.

CAUTION

The load should be evenly distributed in the load box.

The trailer's maximum carrying capacity must not be exceeded.

Due different density of materials, the use of the total capacity of the load box may exceed the allowable capacity of the trailer. Approximate specific weight of selected materials is presented in table (*4.1*). Therefore, pay special attention not to overload the trailer. Loading should be performed by a person with appropriate authorization to operate the equipment (if required).

TABLE 4.1. Approximate volumetric weights of selected loads

TYPE OF MATERIAL	VOLUMETRIC WEIGHT kg/m^3
Root Crops:	
raw potatoes	700 - 820
steamed mashed potatoes	850 - 950
dried potatoes	130 - 150
sugar beets - roots	560 - 720
fodder beets - roots	500 - 700
Organic fertilizers:	
Old manure	700 - 800
Settled down manure	800 - 900
Fresh manure	700 - 750
Compost	950 – 1,100
Dry peat	500 - 600
Mineral fertilizers:	
ammonium sulphate	800 - 850
potassium salt	1,100 – 1,200
super phosphate	850 – 1,440
basic slag	2,000 – 2,300
potassium sulphate	1,200 – 1,300
kainite	1,050 – 1,440
ground lime fertilizer	1,250 - 1,300

TYPE OF MATERIAL	VOLUMETRIC WEIGHT kg/m^3
Building Materials:	
cement	1,200 – 1,300
dry sand	1,350 – 1,650
wet sand	1,700 – 2,050
solid bricks	1,500 – 2,100
brick blocks	1,000 – 1,200
stone	1,500 – 2,200
soft wood	300 - 450
hardwood timber	500 - 600
impregnated timber	600 - 800
steel structures	700 – 7,000
ground quicklime	700 - 800
slag	650 - 750
gravel	1,600 – 1,800
Plant litter and roughage:	
dry meadow hay on the swath	10 - 18
hay wilted on the swath	15 - 25
hay in a collecting trailer (dry, wilted)	50 - 80
hay wilted, cut	60 - 70
dry pressed hay	120 - 150
wilted pressed hay	200 - 290
dry stored hay	50 - 90
cut stored hay	90 - 150
clover (alfalfa) wilted on the swath	20 - 25
clover (alfalfa) withered cut on a trailer	110 - 160
clover (alfalfa) wilted on a collecting trailer	60 - 100
dry stored clover	40 - 60
dry chopped stored clover	80 - 140
dry straw in rollers	8 - 15
wet straw in rollers	15 - 20
wet straw cut on a volume trailer	50 - 80
Dry straw cut on a volume trailer	20 - 40

TYPE OF MATERIAL	VOLUMETRIC WEIGHT kg/m^3
dry straw cut on a collecting trailer	50 - 90
dry straw cut in a haystack	40 - 100
pressed straw (low compaction)	80 - 90
pressed straw (high compaction)	110 - 150
cereal mass cut on a volume trailer	35 - 75
cereal mass cut on a collecting trailer	60 - 100
forage	28 - 35
forage cut on a volume trailer	150 - 400
forage on a collecting trailer	120 - 270
fresh beet leaves	140 - 160
fresh cut beet leaves	350 - 400
beet leaves on a harvesting trailer	180 - 250
Concentrated feed and compound feed:	
stored chaff	200 - 225
oil cake	880 – 1,000
dried mince	170 - 185
compound feed	450 - 650
mineral mixtures	1,100 – 1,300
oat middlings	380 - 410
wet beet pulp	830-1000
expeller pressed beet	750 - 800
dry beet pulp	350 - 400
bran	320 - 600
bone meal	700 – 1,000
fodder salt(1)	1,100 – 1,200
molasses	1,350 – 1,450
silage (underground silo)	650 – 1,050
silage (tower silo)	550 - 750
Seeds:	
broad bean	750 - 850
mustard	600 - 700

TYPE OF MATERIAL	VOLUMETRIC WEIGHT kg/m^3
pea	650 - 750
lentil	750 - 860
bean	780 - 870
barley	600 - 750
Shamrock	700 - 800
grass	360 - 500
maize	700 - 850
wheat	720 - 830
rape	600 - 750
flax	640 - 750
lupine	700 - 800
oat	400 - 530
Lucerne	760 - 800
rye	640 - 760
Other:	
dry soil	1,300 – 1,400
wet soil	1,900 – 2,100
fresh peat	700 - 850
compost soil	250 - 350

Source: „Technologia prac maszynowych w rolnictwie", PWN, Warsaw 1985

CAUTION

The trailer is intended for the transport of crops and agricultural products (bulky or loose). It is allowed to transport other loads (wood, building materials, packed loads), provided that the load box is protected against damage (abrasion of the paint coating, corrosion, etc.).

DANGER

The trailer load must be secured to prevent it from shifting and polluting the road when travelling. If it is not possible to properly secure the load, it is forbidden to transport such materials.

When loading the trailer, the drawbar eye and the tractor hitch are subjected to high vertical loads.

Loose materials

Loading of loose materials is usually carried out with the help of loaders or conveyors, possibly by manual loading. Loose materials must not protrude beyond the outline of walls or extensions. After loading, the load layer should be evenly distributed over the entire surface of the load box. When loading loose materials, connect the central posts with a fastening rope.

Rapeseed, seeds of other plants with very small grains or powdered materials can be transported provided that the load box is thoroughly sealed, in places where the connection gap is smaller than the grain diameter. For sealing, it is recommended to use profiled rubber gaskets, silicone sealants, foil, cord or textile materials used for tarpaulins.

In addition, it is necessary to secure the load with a tarpaulin. It will protect the load against scattering while travelling, blowing away by the wind and will additionally protect the load against moisture. This is especially dangerous in the case of loose materials. They can significantly absorb water, which can increase the weight of the load while driving. In extreme cases, the total weight of the trailer may exceed the permissible total weight of the vehicle.

Some loose loads (e.g. building materials such as gravel, slag) can cause faster damage to the paint coating.

Piece or lump loads

Piece or lump loads are usually hard materials of much larger sizes than loose loads (stones, coal, bricks, aggregate). These materials without prior preparation of the load box may cause dents on the floor or walls and abrasion of the paint coating. For this reason, it is necessary to cover the floor and possibly the walls and add a thick plywood, hard vortex plate, thick boards or other materials with similar properties. The user acting contrary to the above recommendations may void the warranty. Loading piece or lump materials must be from a low height. The load cannot fall with great force on the floor of the load box despite its protection.

Dangerous goods

Pursuant to the European ADR agreement regarding the international carriage of dangerous goods by road, this type of cargo (specified in detail in this agreement) is prohibited using agricultural trailers. The only exceptions are plant protection products and artificial fertilizers

that can be transported with an agricultural trailer, provided that they are transported in appropriate packaging and in the quantities provided for in the ADR agreement.

DANGER

If it is necessary to transport permitted hazardous materials, please read the regulations for the transport of hazardous materials in force in your country and the ADR agreement in detail.

Familiarize yourself with the contents of the manufacturer's information leaflets, adhere to the transport and handling instructions. Make sure that additional personal protective equipment (masks, rubber gloves, etc.) is necessary during loading work.

Bulk loads

Bulk loads (light, high-volume), such as hay, pressed cubes or bales, straw, fodder, etc., it is recommended to load with the help of appropriate accessories: bale grippers, forks, etc. The load can be loaded even above the load box extensions with special attention due to the stability of the trailer and proper fastening and securing of the load. It should be remembered that a highly placed load adversely affects the stability of the trailer.

Loads in packaging

Loads transported in packages (boxes, sacks) should be placed tightly next to each other starting from the front wall. If it is necessary to lay several layers, individual batches should be applied alternately (in a block system). The load must be laid tightly and over the entire surface of the trailer floor. Otherwise, the load will shift during the journey. Due to the construction of the trailer (adapting the load box to transport crops and agricultural products, no load fastening points), packed materials can be placed only below the contour of the walls or extensions of the load box. When stacking the load, it must not exceed the upper edge of the walls. A higher layer of load may shift while driving and cause significant damage to the mesh extensions and the scattering of the load.

DANGER

Trailer overloading, inefficient loading and securing of loads are the most common causes of accidents during transport.

The load must be arranged in such a way that it does not threaten the stability of the trailer and does not hinder driving.

Make sure that there are no bystanders in the unloading / loading area or the raised load box. Before tipping the load box make sure that it is visible and make sure there are no bystanders nearby. The placement of load must not cause overloading of the running gear or the trailer hitch system.

Materials that can cause steel corrosion chemical damage or react in a different way by adversely affecting the construction materials of the trailer may be transported only if the load is properly prepared. Materials must be tightly packed (in plastic bags, plastic containers, etc.). During transport, the contents of the packages must not get into the load box, so ensure that the containers are properly sealed.

DANGER

If there is a danger of the load moving in packaging, it is forbidden to transport this type of material. The shifting load is a serious danger when driving the tractor operator and other road users.

Final remarks

Due to the variety of materials, tools, methods of securing and securing loads, it is not possible to describe all methods of loading. When working, be guided by reason and your own experience. The trailer user is obliged to read the regulations regarding road transport and comply with their recommendations.

DANGER

Trailer overloading, inefficient loading and securing of loads are the most common causes of accidents during transport.

The load must be arranged in such a way that it does not threaten the stability of the trailer and does not hinder driving.

Make sure that there are no bystanders in the unloading / loading area or the raised load box. Before tipping the load box make sure that it is visible and make sure there are no bystanders nearby.

DANGER

The trailer is not designed for transporting people, animals or hazardous materials (except for loads specified in chapter 4.4).

The placement of load must not cause overloading of the running gear or the trailer hitch system.

4.5 LOAD TRANSPORTATION

When driving on roads (public and non-public), comply with traffic regulations, be prudent and considerate. The most important guidelines for steering a tractor with a trailer attached are presented below.

- Before moving off make sure that there are no bystanders, especially children, near the trailer and tractor. Ensure proper visibility.
- Make sure that the trailer is correctly connected to the tractor and tractor's hitch is properly secured.
- Vertical load carried by the trailer drawbar eye affects the steering of the agricultural tractor.
- The trailer must not be overloaded, the load must be evenly distributed so that the maximum permissible axle and hitch loads are not exceeded. Exceeding the permissible load capacity of the vehicle is forbidden and may cause damage to the machine, and may also pose a threat during road travel for the tractor and trailer operator or other road users.
- The permissible design speed and speed resulting from restrictions on road traffic regulations must not be exceeded. The travel speed should be adjusted to the prevailing road conditions, trailer load condition, type of load carried and other conditions.
- The trailer may be towed on slopes of up to 5°, unloading should only be carried out on level ground.
- The trailer disconnected from the tractor must be secured by immobilizing it with the parking brake and placing chocks or other elements without sharp edges under the wheel. Leaving an unsecured trailer is prohibited. In the event of a

machine breakdown, stop at the side of the road without endangering other road users and mark the stopping place in accordance with traffic regulations.

- When travelling on public roads, the trailer must be marked with a slow-moving vehicle warning sign located on the rear wall of the load box, if the trailer is the last vehicle in the set.
- The tractor operator is required to equip the trailer with an approved or approved warning reflective triangle.
- While driving, obey the rules of the road, signal the change of direction by means of direction indicators, keep clean and take care of the technical condition of the lighting and signalling installation. Damaged or lost lighting and signalling components must be repaired or replaced immediately.
- Avoid ruts, depressions, ditches, or driving along roadside slopes. Driving across such obstacles can cause the trailer and tractor to tilt suddenly. This is particularly important because the centre of gravity of the trailer with load (and especially with volumetric load) adversely affects driving safety. Driving near the edges of ditches or canals is dangerous due to the risk of landslides under the wheels of a trailer or tractor.

CAUTION

Before driving the trailer, check that the pins connecting the load box with the lower frame are secured against accidental falling out.

Travelling with a volumetric load through ruts, ditches, slopes etc. poses a great risk of tipping over. Take special care.

- The travel speed should be reduced sufficiently in advance of driving to curves, when driving on uneven or sloping terrain.
- When driving, avoid sharp turns, especially on slopes.
- It should be remembered that the braking distance of the set increases significantly with the increase in the weight of the transported load and the increase in speed.
- Control the behaviour of the trailer when driving on uneven terrain and adjust the speed to terrain and road conditions.

- The trailer is adapted for driving on slopes up to a maximum of 5^0. Moving the trailer over slopes may cause the trailer to overturn as a result of loss of stability. Prolonged driving on sloping ground creates a risk of loss of braking efficiency.

4.6 UNLOADING

The trailer is equipped with a hydraulic tipping system and a suitable frame and load box construction enabling tipping to the sides and to the rear. Tipping the load box is controlled by means of the distributor of the tractor's external hydraulic system.

The trailer is unloaded in the following order:

- The tractor and trailer should be positioned to drive straight ahead on flat and hard ground,
- immobilize the tractor and trailer with parking brake, for additional securing, wheel chocks can be used,
- if the tipping direction of the load box has not been planned and set beforehand, then the tipping pins (1), (2) (connecting the load box with the lower frame) should be placed on the side on which the unloading will be performed and properly secured with a cotter pin - figure *(4.3)*;
  - tipping pins and individual seats are designed in such a way that they cannot be moved diagonally across the load box, which would cause damage to the trailer,
  - handles (3) of correctly locked bolts are directed to the side - figure (*4.3*),
- If the tipping direction has been planned and set beforehand, it is necessary to check the correct securing of the tipping pins as well as the proper unlocking of the closing locks.
- depending on the way of opening the walls and extensions, release the appropriate wall closures or open the chute slide in the rear wall (depending on the intended direction and method of unloading);

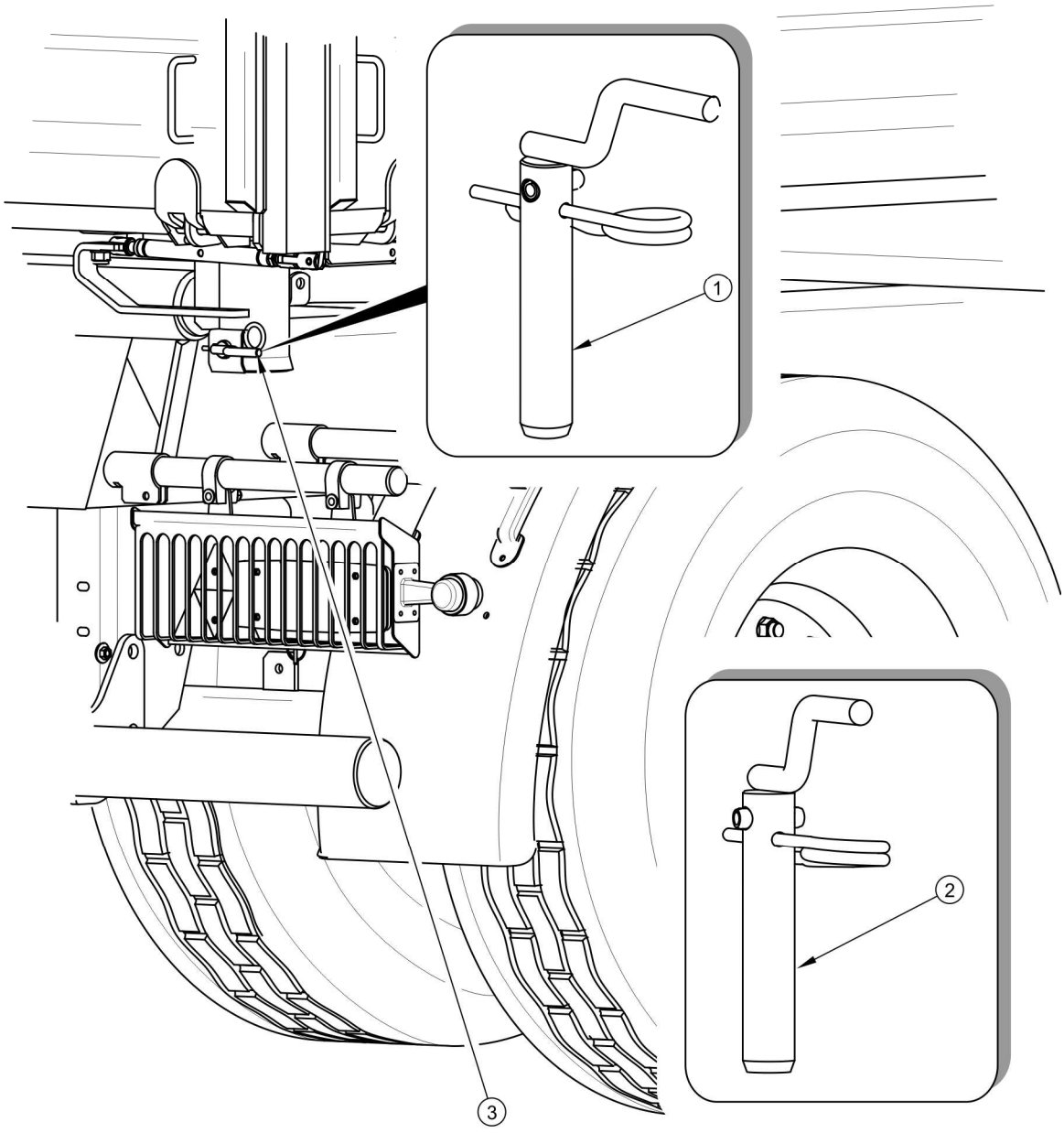


FIGURE 4.3. Locking of the tipping pins

(1) tipping pin I, (2) tipping pin II, (3) tipping pin holder

⇨ When opening the side walls together with the extensions (applies to the trailer with portal walls on the right side), first open the middle wall locks (13) - see figure *(4.5)*, and then unlock the lower locking hooks. Lever (2) - figure *(4.5)* is used to unlock the lower locking hooks of the right front side wall, while the lever (2) - figure *(4.5)* located on the opposite side of the load box is used to unlock the lower locking hooks of the right rear side wall.

⇨ Lever (1) - figure *(4.4)* is used to unlock the bolts of the right and left front side walls.

- ➡ set the control lever for the hydraulic tipping system circuits to position 1 - tipping the first trailer,
- ➡ using the divider lever in the driver's cab cause the load box to tilt,
- ➡ Unload the load by tilting the load box using a hydraulic cylinder. It is forbidden to start and jerking forward or backward with the load box raised,
- ➡ after unloading, lower the load box to the very end, clean the edges of the floor and walls,
- ➡ close and secure walls, extensions and a chute window,
- ➡ before moving off make sure that the tipping pins are secured with cotter pins.

CAUTION

It is not recommended to unload the load box with the use of opening the walls downwards (with the bottom locks of the box locked). The load pressing against the walls may injure the user or damage the trailer.

Incorrectly locked and secured pins may cause damage to the trailer.

ADVICE

In order to additionally secure the trailer during unloading, it is recommended to use wheel chocks. In the event of unloading bulky materials, e.g. branches, it is allowed to open the rear wall of the trailer downwards. During the unloading, the help of another person is recommended.

If the second trailer is hitched, it should be unloaded only when the load box of the first trailer has been lowered and the hydraulic tipping system control valve is set to position 2 - tipping of the second trailer.

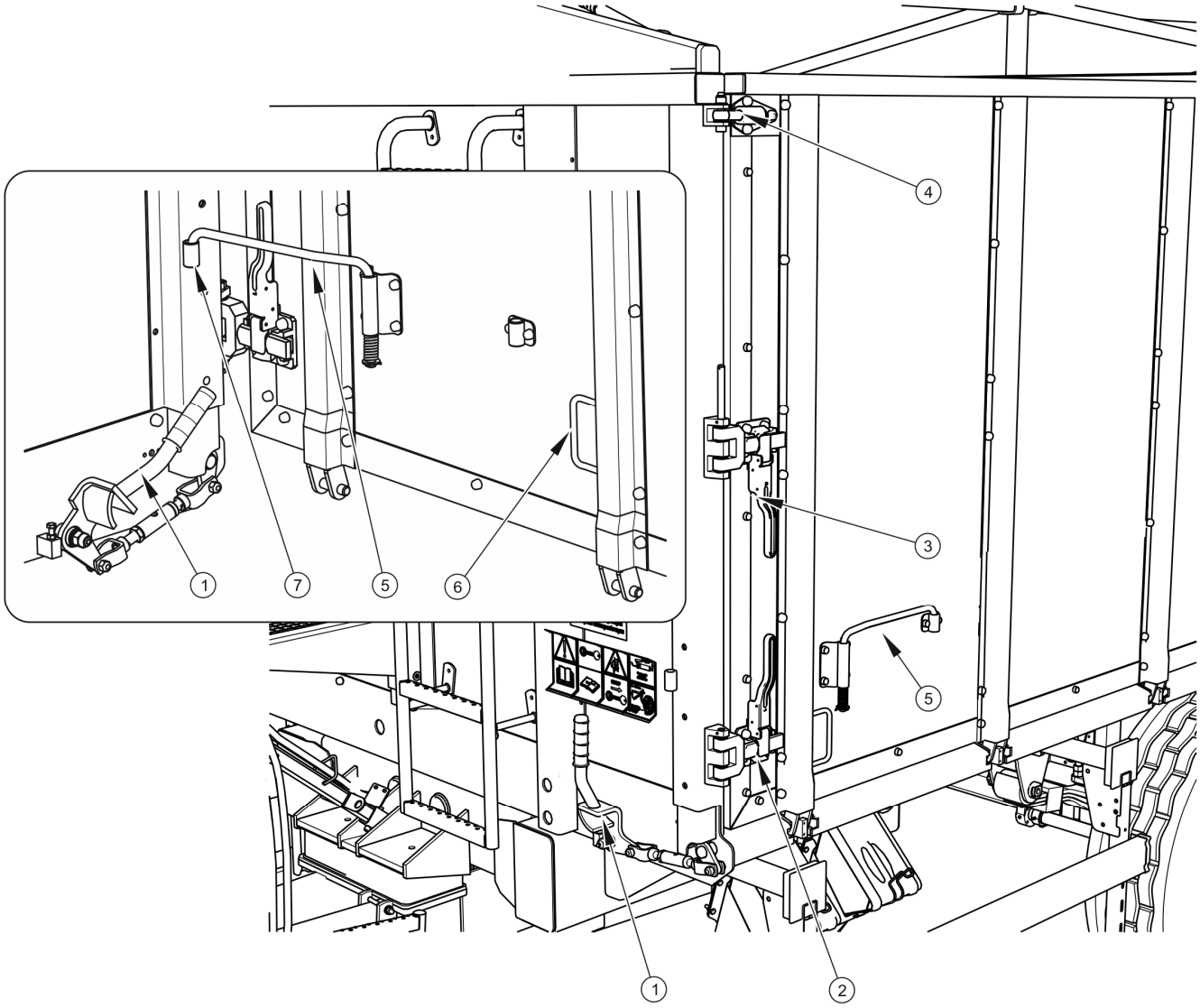


FIGURE 4.4. Opening the left portal wall of the cargo box

(1) front side wall closing lever, (2) lower side wall lock, (3) upper side wall lock, (4) hinge, (5) lock, (6) handle, (7) lock slot

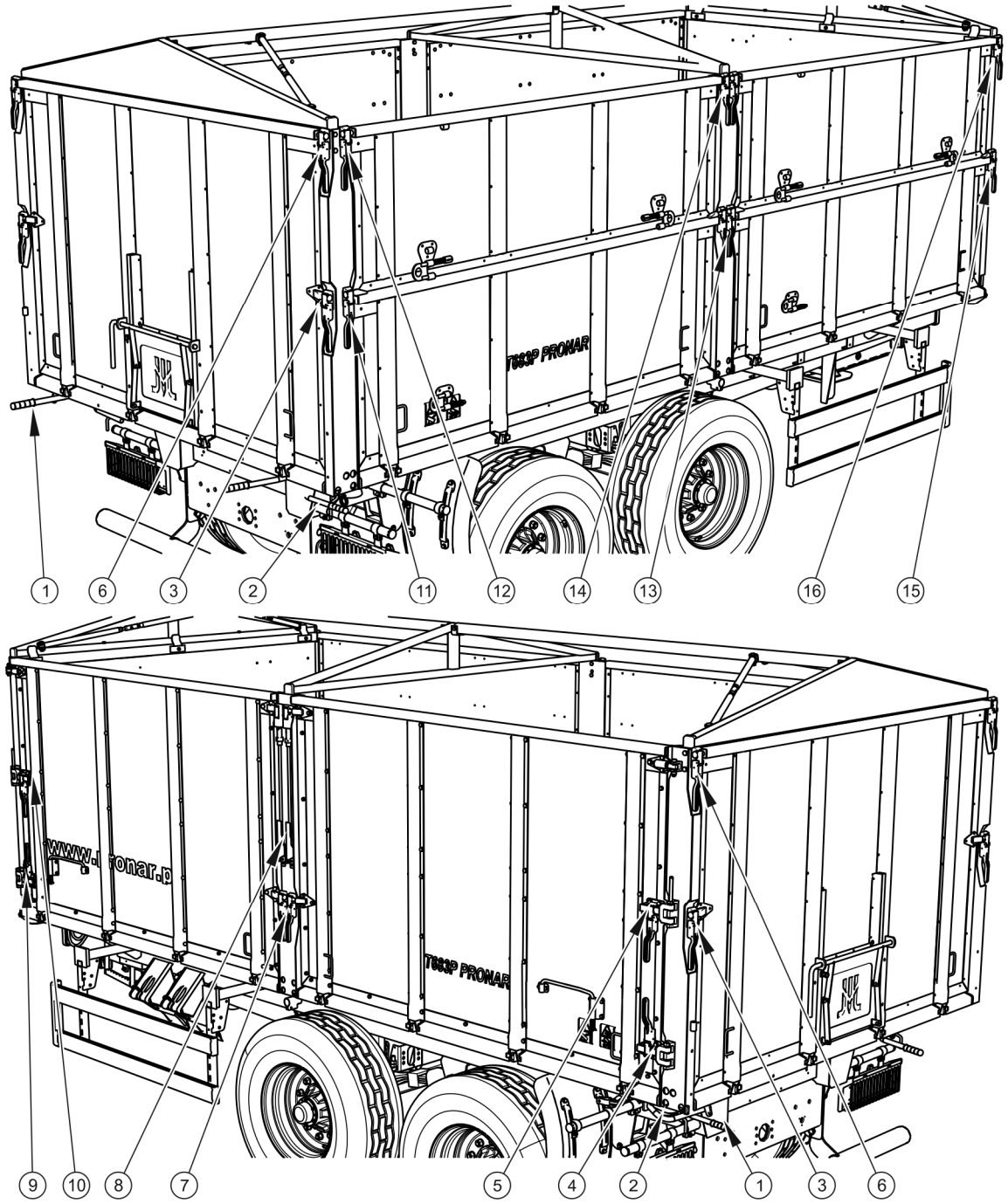


FIGURE 4.5. Arrangement of locks and bolts of the trailer walls

(1) rear wall lever, (2) left (right) rear wall lever, (3) rear wall bottom lock, (4) left rear wall bottom lock, (5) left rear wall top lock, (6) upper wall lock rear, (7) middle lower left lock, (8) middle upper left lock, (9) bottom lock of the left front wall, (10) upper lock of the left front wall. (11) bottom lock of the right rear wall, (12) upper lock of the right rear wall, (13) middle lock, bottom right, (14) middle lock, top right, (15) (16) locks of the front right walls

DANGER

Tilting of the load box may only be performed on firm and level ground.

Only original pins with a handle should be used. The use of non-original pins may damage the trailer. Tipping pins must be properly locked.

When opening wall closures and locks, be extremely cautious due to pressing the load on the walls.

4.6.1 UNLOADING OF CARGO TRANSPORTED ON PALLETS

The trailer is unloaded in the following order:

- The tractor and trailer should be positioned to drive straight ahead on flat and hard ground,
- Block the tractor and trailer with parking brake,

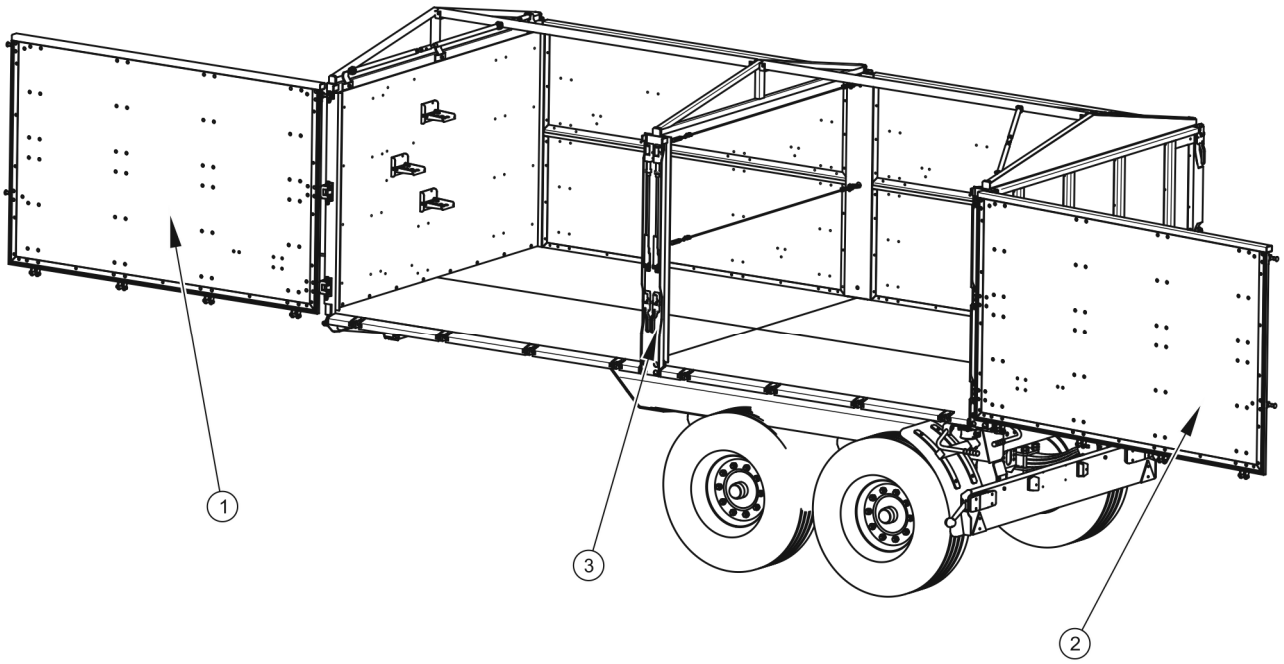


FIGURE 4.6. Opening portal walls (left side)

(1) the front portal wall, (2) the rear portal wall, (3) central pillar

- Roll up the tarpaulin and place it in the holders provided for this purpose,
- Make sure that the load does not tip over and rests against the walls of the load box,
- open the portal walls (1) and (2) - figure *(4.6)*,

- ⇨ as standard equipment, the portal walls are on the left side of the trailer,
- ⇨ in order to open portal walls, unlock the lever (2) - figure *(4.5)* and the lever (1) figure *(4.4)*.
- ⇨ open the upper middle (8) and lower (7) locks located in the central column (3) on the left side of the trailer. Then open the portal walls (1) and (2) (figure *(4.6)*) using the handles (6) - figure *(4.4)*. Secure the walls against accidental closing with locks (5),

➡ Unload the trailer with a forklift, close the walls of the load box,

➡ Before moving off, check the position and correct locking of the walls with the help of levers and locks. Check the safety of the tipping pins.

4.6.2 UNLOADING OF LOOSE MATERIALS BY HYDRAULIC TIPPING OF THE LOAD BOX

The trailer is unloaded in the following order:

➡ The tractor and trailer should be positioned to drive straight ahead on flat and hard ground,

➡ Block the tractor and trailer with parking brake,

➡ the tipping pins (1) and (2) - figure (*4.3*), (connecting the load box with the lower frame), place on the side on which the unloading will be performed and properly lock it;

- ⇨ the pins and individual sockets are designed in such a way that it is impossible to translate them on the diagonal of the load box, which would damage the trailer,
- ⇨ handles (3) of correctly locked bolts are directed to the side - figure (*4.4*),

➡ lift the hydraulic wall on the left side of the trailers - figure (4.6),

➡ set the control lever for the hydraulic tipping system circuits to position 1 - tipping the first trailer,

➡ use the manifold lever in the operator's cabin to tilt the load box,

- ➡ unload the load by tilting the load box using a telescopic cylinder. It is forbidden to start and jerking with the lifted load box in order to empty it.
- ➡ lower and close the hydraulic wall, paying particular attention to its proper locking,
- ➡ lower the cargo box all the way down.
- ➡ Before moving off, make sure that the tipping pins are in the correct position and are secured with cotter pins.

DANGER

When closing walls and the chute window slide, be extremely careful to avoid crushing your fingers.

Make sure that during unloading nobody is near the tilted load box and the falling load.

Tilting of the load box may be performed only when the trailer is connected to the tractor.

Unloading of volumetric materials that have been loaded above 1 meter can only be done by tilting the load box backwards.

It is forbidden to pull the trailer forward if the bulk or scattering load has not been unloaded.

It is forbidden to tilt the load box during strong gusts of wind.

It is forbidden to start or drive with the load box raised.

The rear wall of the load box is equipped with a bolt (1) - figure *(4.6)* oraz zsyp (2) jako wyposażenie dodatkowe który służy do rozładunku materiałów sypkich. The chute design enables accurate dosing of the load into the packaging (bags, boxes, etc.). The size of the gap opening should be determined by the lever (3). To do this, loosen the bolt locking the slide (4), open the slide at the selected height and secure it again with the screw. During unloading, using the chute, the wall locks and extensions must not be opened, and the load box must be lifted slowly and smoothly. Rapid lifting of the load box will cause very high pressure on the rear part of the load box as a result of the load shifting and may threaten the stability of the machine.

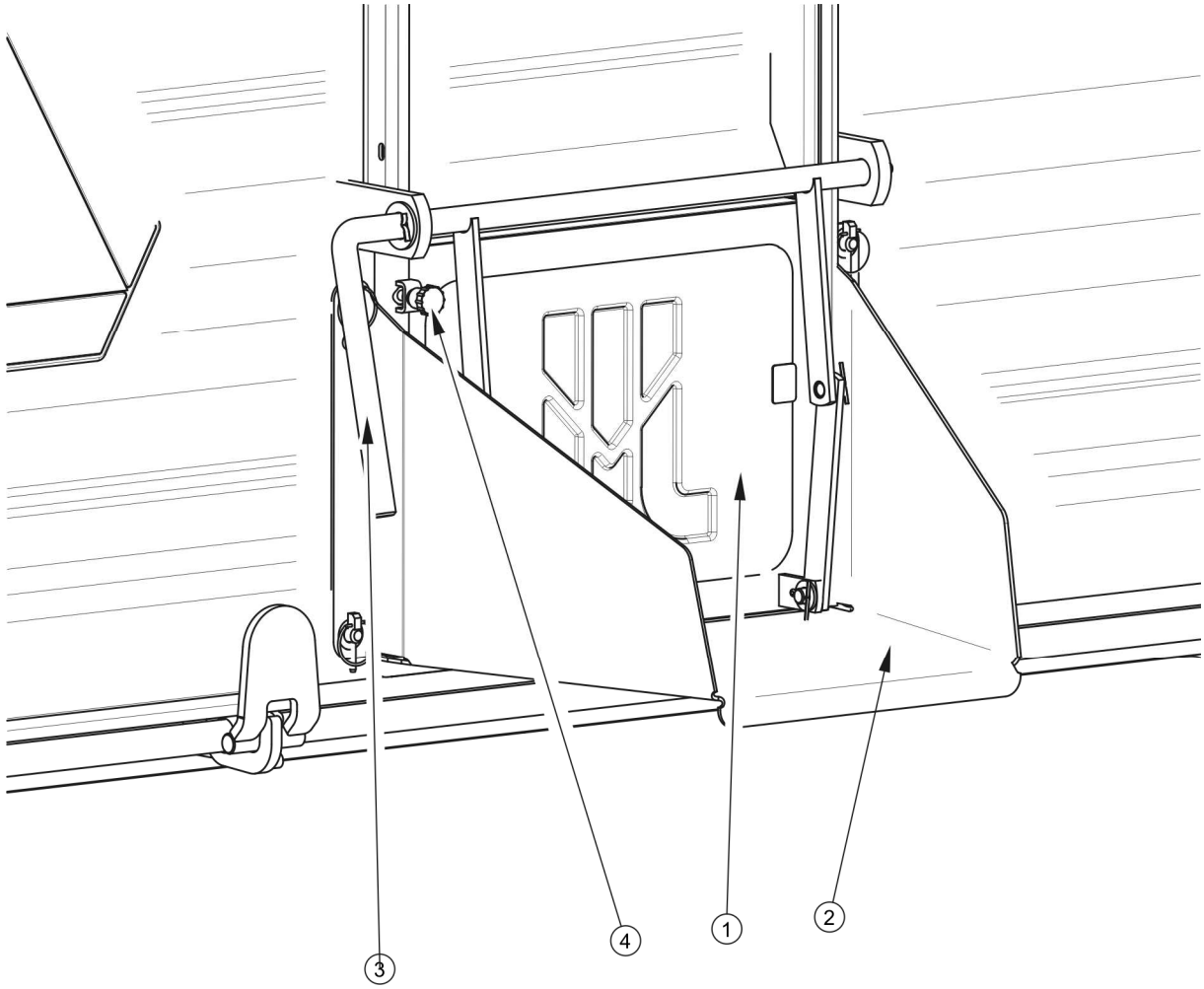


FIGURE 4.7. Chute

(1) chute slide gate, (2) chute, (3) lever, (4) locking screw

Be especially careful when unloading bulky materials. It is forbidden to tip the load box on uneven and wet terrain, as well as start and jerk the trailer during unloading. Bulky materials are usually loads that are difficult to discharge, so be careful and calm when working. Careless handling of the trailer may pose a threat to operators and bystanders, and may also damage the machine.

4.7 USE OF TIRES

- When working with tires, the trailer should be secured against rolling by placing wedges or other elements without sharp edges under the wheels. The wheel can be dismantled only when the trailer is not loaded.
- Repair work on wheels or tires should be carried out by persons trained and authorized to do so. These works should be carried out using appropriately selected tools.
- Checking the tightening of the wheel nuts should be carried out after the first use of the trailer, every 2-3 hours during the first month of using the machine and then every 30 hours of driving. Each time, repeat all operations if the wheel was disassembled. Wheel nuts should be tightened in accordance with the recommendations contained in the 5 *MAINTENANCE* chapter.
- Regularly check and maintain proper tire pressure as recommended in the instructions (especially after a long break of not using the trailer).
- Tire pressure should also be checked during all-day intensive work. It should be taken into account that an increase in tire temperature can increase the pressure by up to 1 bar. With such a rise in temperature and pressure, reduce the load or speed.
- Never reduce pressure by venting if it increases due to temperature.
- Valves must be secured with appropriate caps to avoid soiling.
- Do not exceed the maximum trailer speed.
- During the whole day cycle, take a minimum of one hour break at noon.
- Observe 30 minutes breaks for cooling the tires after driving 75 km or after 150 minutes of continuous driving, whichever comes first.
- Avoid damaged road surfaces, sudden and variable manoeuvres, and high speeds when turning.

4.8 OPERATION OF THE OVERRUN PROTECTION

In the additional equipment of the trailer, it is possible to install two pairs of underrun protection, both covers are tiltable. They fulfil a very important role in road safety and therefore should take care of their condition and completeness.

DANGER

It is forbidden to drive with raised overrun protection. Before driving, make sure that the covers are lowered and locked in the down position.

If it is not necessary, do not leave the covers in raised position.

Lifting

- Pull the cover towards you while holding the bottom bar of the cover.
- Raise the cover to the height shown in figure (*4.8*)
- Move the cover away from you. A suitable cut out and oblong holes in the bracket enable the guard to be locked in a raised position.

Lowering

- Pull the cover towards you.
- Lower the guard and press until the bracket pin engages in the lock.
- Secure the covers with bolts (5).

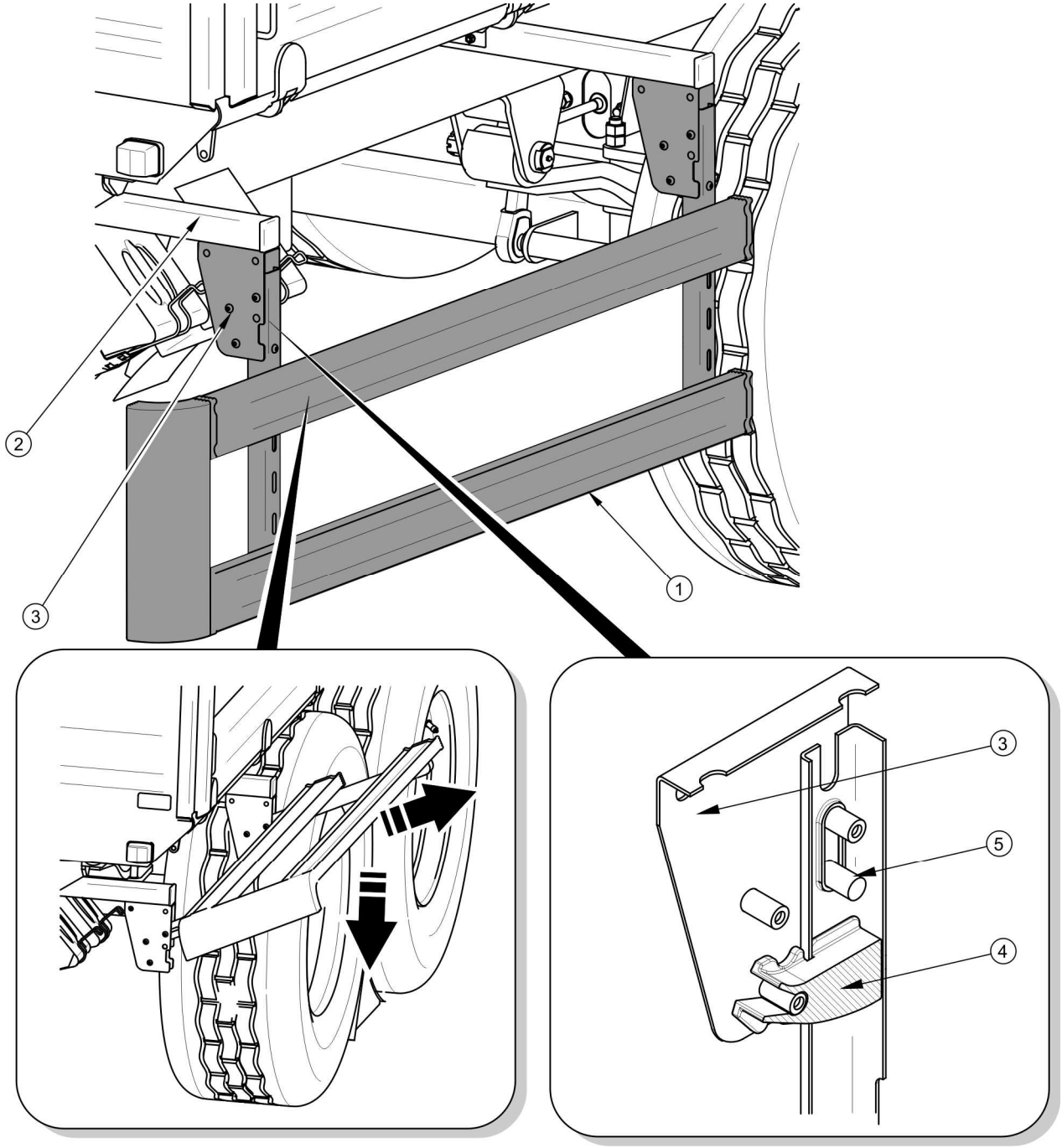


FIGURE 4.8. Left underrun protection

(1) left underrun protection, (2) barrier holder bracket, (3) clamp, (4) latch, (5) securing pin

CHAPTER

5

TECHNICAL SUPPORT

5.1 PRELIMINARY INFORMATION

When using the trailer, it is necessary to constantly check the technical condition and perform maintenance procedures that will allow the vehicle to be kept in good technical condition. Therefore, the trailer user is obliged to perform all maintenance and adjustment activities specified by the Manufacturer.

Repairs during the warranty period may only be carried out by authorized service centres.

This chapter describes in detail the procedures and scope of activities that the user can perform on his own. In the event of unauthorized repairs, changes to factory settings or activities that were not taken into account as possible for the trailer operator to perform this user loses the warranty.

5.2 DRIVING AXLE SERVICE

5.2.1 PRELIMINARY INFORMATION

Work related to the repair, replacement or regeneration of driving axle elements should be entrusted to specialized workshops that have the appropriate technologies and qualifications to perform this type of work.

User responsibilities include only:

- checking and adjusting the play of the axle bearings,
- wheel assembly and disassembly, checking wheel tightness,
- air pressure control and maintenance, assessment of the technical condition of wheels and tires,
- brake lining thickness control,
- adjustment of mechanical brakes,

Activities related to:

- grease replacement in axle bearings,
- replacement of bearings, hub seals,
- replacement of brake shoes,

- other road axle repairs,

can be performed by specialized workshops.

DANGER

It is forbidden to use a trailer with a damaged driving axle.

5.2.2 CHECKING THE CLEARANCE OF THE AXLE BEARINGS

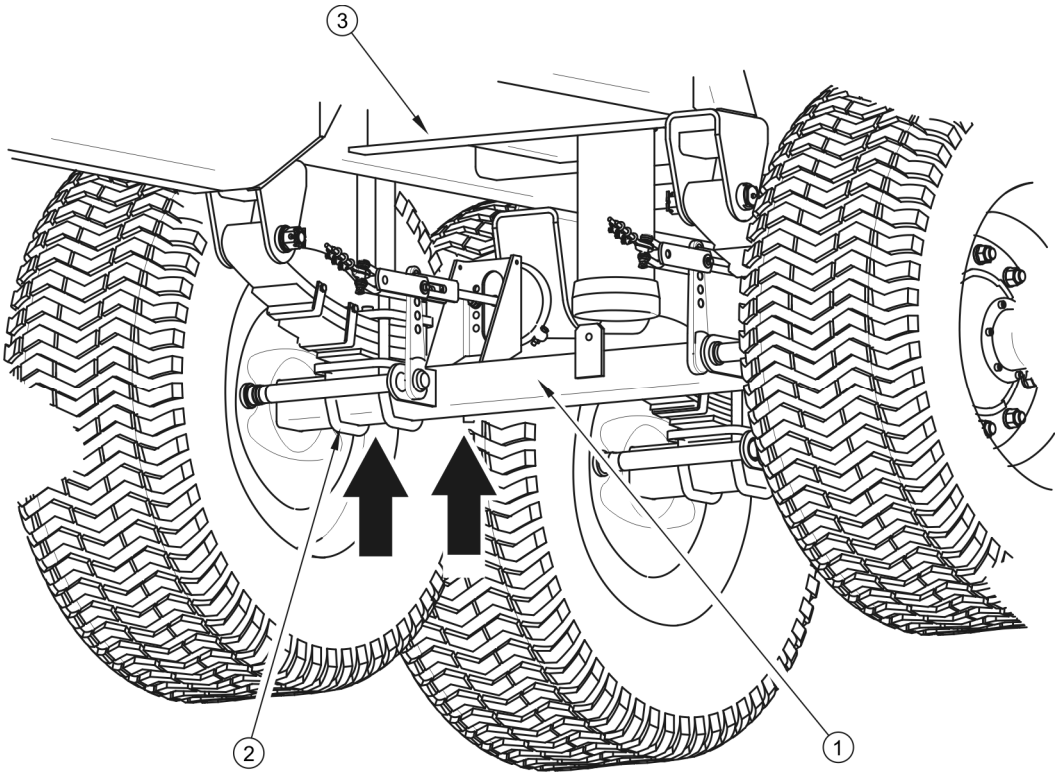


FIGURE 5.1. Hoist support point

(1) driving axle, (2) U-bolt, (3) lower frame

Preparatory activities

➡ Hitch trailer to tractor, immobilize tractor with parking brake.

➡ Place the tractor and trailer on firm and level ground.

⇨ Position the tractor for straight-ahead travel

- ➡ Place blocking chocks under the trailer wheel that will not be lifted. Ensure that the trailer will not roll during inspection.
- ➡ Raise the wheel (located on the opposite side of the placed wedges).
  - ⇨ The jack should be placed between the U bolts (2) - - figure *(5.1)* securing the axle (1) to the leaf springs. The recommended support point is marked with an arrow. The jack must be suited to the trailer weight.

Checking the clearance of the axle bearings

- ➡ Turn the wheel slowly in two directions to check if the movement is smooth and the wheel rotates without excessive resistance and jams.
- ➡ Turn the wheel so that it rotates very quickly, check that the bearing does not make any unusual sounds.
- ➡ Try to feel looseness by moving the wheel.
  - ⇨ You can use the lever under the wheel, resting the other end on the ground.
- ➡ Repeat checks for each wheel separately, remembering that the jack must be on the opposite side of the wedges,

If looseness is felt, adjust the bearings. Unnatural sounds coming from the bearing may be symptoms of excessive wear, dirt or damage. In this case, the bearing together with the sealing rings should be replaced or cleaned and regreased. When checking bearings, make sure that any noticeable looseness comes from the bearings, not the suspension system (e.g. looseness on the spring pins, etc.).

ADVICE

Damaged hub cover or lack thereof will cause the penetration of dirt and moisture into the hub, which will result in much faster wear of bearings and hub seals.

Bearing life depends on trailer operating conditions, load, vehicle speed and lubrication conditions.

Checking the clearance of the axle bearings:

- **after covering the first 1,000 km,**
- **before intensive use of the trailer,**
- **every 6 months of use or 25,000 km.**

Check the technical condition of the hub cover, replace if necessary. Check of the bearing looseness can only be carried out when the trailer is connected to the tractor and the loading box is empty.

DANGER

Before starting work, read the instructions for the lift and follow the manufacturer's instructions.

The lift must stand firmly against the ground and the axle.

Ensure that the trailer will not roll when checking the looseness of the axle bearings.

5.2.3 ADJUSTING THE CLEARANCE OF THE AXLE BEARINGS

The wheel should rotate smoothly, without any jams or noticeable resistance. Adjustment of bearing looseness may be performed only when the trailer is not loaded and is connected to the tractor.

Ensure that the trailer is properly secured and will not move during dismantling:

Adjusting the clearance of the axle bearings

- ➡ Remove the hub cover (1) – figure *(5.2*).
- ➡ Remove the cotter pin (3) securing the castellated nut (2).
- ➡ Tighten the castellated nut to remove slack.
  - ⇨ The wheel should rotate with slight resistance.
- ➡ Unscrew the nut (not less than 1/3 turn) to cover the nearest nut groove with a hole in the axle pin. The wheel should rotate without excessive resistance
  - ⇨ The nut must not be too tight. It is not recommended to apply too much pressure due to deterioration of bearing operating conditions.
- ➡ Secure the castellated nut with a cotter pin and mount the hub cover.

➡ Gently tap the hub with a rubber or wooden hammer.

The wheel should rotate smoothly, without jams and no noticeable resistance, not from rubbing the shoes against the brake drum. Adjusting of the bearing looseness can only be carried out when the trailer is connected to the tractor and the loading box is empty.

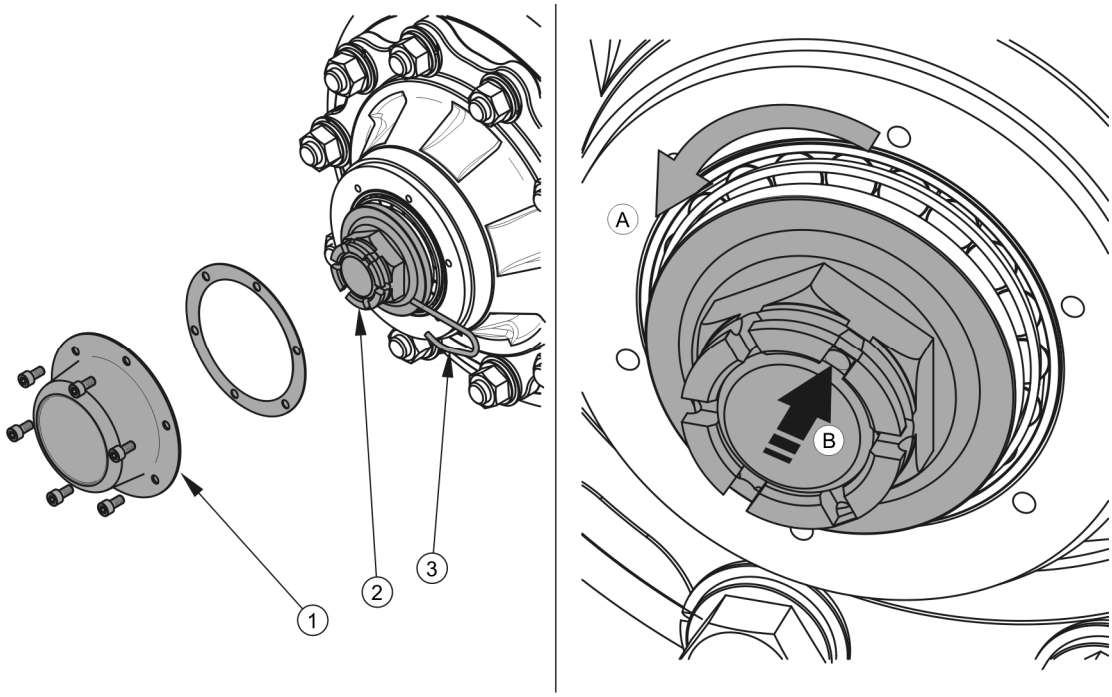


FIGURE 5.2. Adjustment of axle bearings

(1) hub cover, (2) crown nut, (3) cotter pin

ADVICE

If the wheel is removed, the bearing clearance is easier to check and adjust.

5.2.4 WHEEL ASSEMBLY AND DISASSEMBLY, CHECKING NUT TIGHTNESS

Wheel disassembly

➡ Block the trailer with parking brake.

➡ Place blocking chocks under the wheel that will not be removed.

➡ Ensure that the trailer is properly secured and will not move during wheel dismantling.

- ➡ Loosen the wheel nuts according to the order given in figure (*5.3*).
- ➡ Place the jack and raise the trailer.
- ➡ Remove the wheel.

Wheel mounting

- ➡ Clean the axle pins and nuts from contamination.
  - ⇨ Do not lubricate the threads of the nut and stud.
- ➡ Check the condition of the pins and nuts, replace if necessary.
- ➡ Mount the wheel on the hub, tighten the nuts so that the rim fits snugly to the hub.
- ➡ Lower the trailer, tighten the nuts according to the recommended torque and the given order.

Tightening the nuts

The nuts should be tightened gradually diagonally (in several stages until the required tightening torque is achieved), using a torque wrench. In the absence of a torque wrench, you can use a regular wrench. The wrench arm (L), figure *(5.3)*, should be selected according to the weight of the person (F) tightening the nut. It should be remembered that this method of tightening is not as accurate as when using a torque wrench.

ADVICE

Wheel nuts should be tightened to 450 Nm - M22x1.5 nuts.

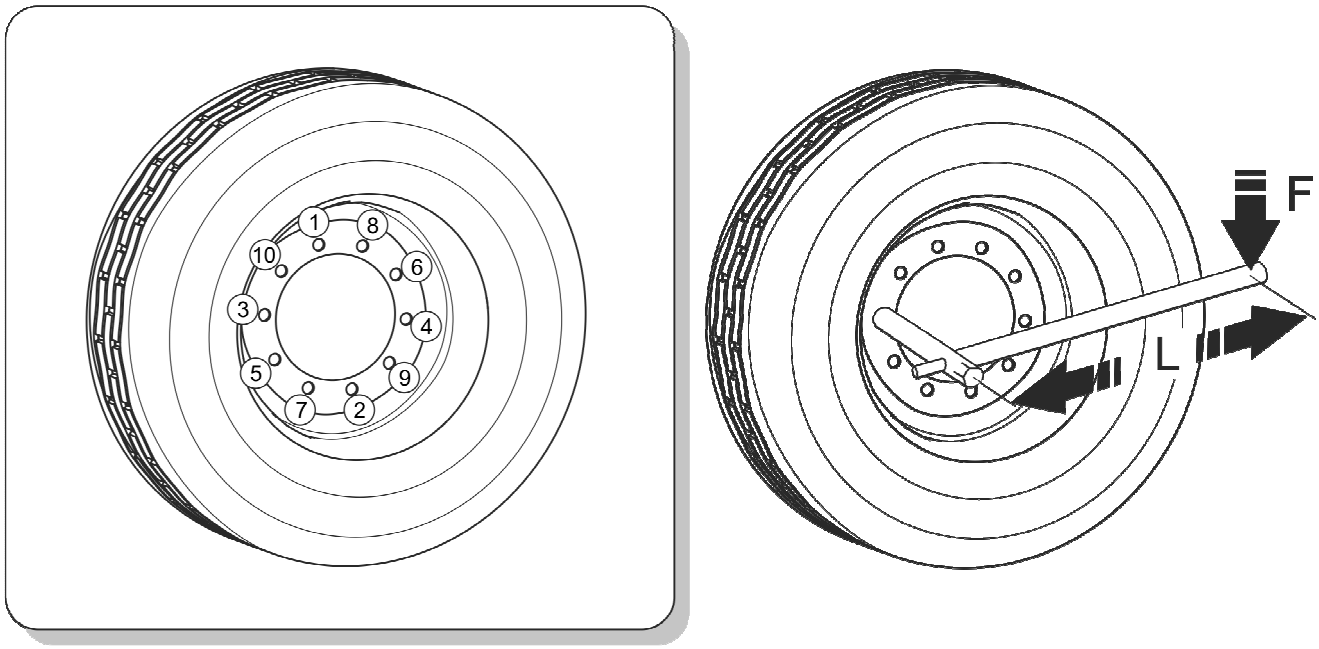


FIGURE 5.3. The order of the nuts tightening

(1) - (10) order of tightening the nuts, (L) wrench length, (F) user weight

- **After first use of the trailer (one-time inspection).**
- **Every 2– 3 hours of driving (during the first month of use of the trailer)**
- **Every 30 hours of trailer driving.**

All operations should be repeated if the wheel was disassembled.

TABLE 5.1. Key arm selection

TIGHTENING TORQUE	BODY WEIGHT (F)	ARM LENGTH (L)
[Nm]	[kg]	[m]
450	60	0.75
	70	0.65
	80	0.55
	90	0.50

CAUTION

Wheel nuts must not be tightened with impact wrenches, due to the danger of exceeding the permissible tightening torque, which may result in breaking the connection thread or breaking the hub pin.

The highest tightening accuracy is obtained with a torque wrench. Before starting work, make sure that the correct torque value is set.

5.2.5 AIR PRESSURE CONTROL, ASSESSMENT OF TECHNICAL CONDITION OF TIRES AND STEEL WHEELS

The tire pressure should be checked after each wheel change, and at least once a month. In the event of intensive use, it is recommended to check the air pressure more often. The trailer must be unloaded at this time. Checking should be carried out before driving, when the tires are not warm, or after a long standstill of the machine.

ADVICE

The value of the tire pressure is specified on the information sticker, placed on the rim or upper frame, above the trailer wheel.

DANGER

Damaged tires or wheels can be the cause of a serious accident.

When checking pressure, pay attention to the technical condition of rims and tires. Look carefully at the side surfaces of the tires and check the tread condition.

In the event of mechanical damage, consult your nearest tire service centre and ensure that your tire defect is eligible for replacement.

Rims should be checked for deformation, material cracks, weld cracks, corrosion, especially around welds and contact with the tire.

Technical condition and appropriate maintenance of wheels significantly extends the life of these elements and ensures an appropriate level of safety for trailer users.

Pressure control and visual inspection of steel wheels:

- **every 1 month of use,**
- **in case of emergency.**

5.2.6 BRAKE LINING THICKNESS CONTROL

While using the trailer, the drum brake friction linings will wear out. While using the trailer, the drum brake friction linings will wear out. Excessive wear of the brake shoes is a condition , in which the thickness of the brake linings glued or riveted to the steel structure of the shoes exceeds the minimum value and is manifested by the extension of the cylinder piston stroke. Assessment of the technical condition of the brake linings should be carried out through the inspection holes (3) - figure *(5.4).*

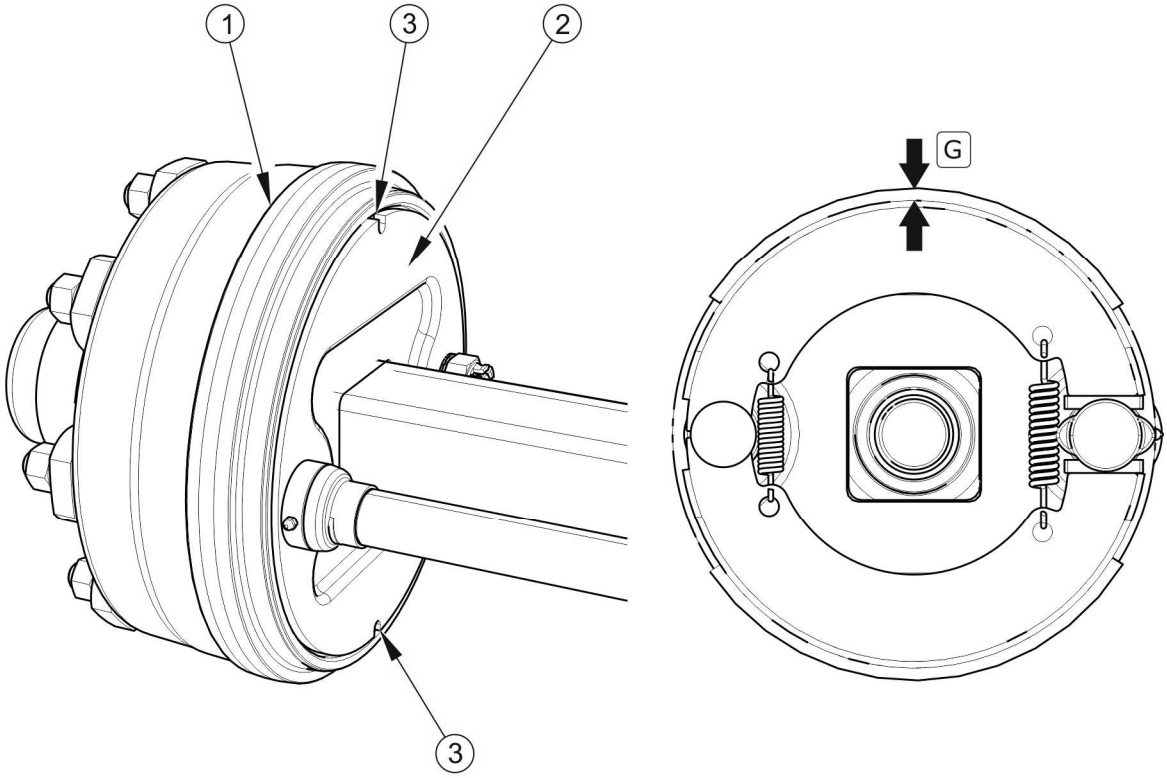


FIGURE 5.4. Brake lining control

(1) brake drum, (2) disc, (3) inspection holes, (G) lining thickness

The brake lining thickness should be checked every 6 months.

ADVICE

The minimum thickness of the linings is 5mm.

5.2.7 ADJUSTMENT OF MECHANICAL BRAKES

Significant lining wear increases the stroke of the brake cylinder piston and reduces braking performance.

When braking, the piston rod stroke should be within the specified working range, and the angle between the piston rod (1) and the expander arm (3) should be approximately 90 ° - compare Figure *(5.6)*. The braking force also decreases when the angle of operation of the brake cylinder piston rod (5) is not correct - figure *(5.5)* in relation to the expander arm (1). To obtain the optimum mechanical angle of operation of the cylinder rod, fork (6) must be mounted on the expander arm (1) so that when fully braked the angle of operation is approx. 90 °.

ADVICE

The correct stroke of the piston rod should be in the range of 25 - 45mm.

CAUTION

An improperly adjusted brake can cause the rubs to rub against the drum, which can result in faster wear of the brake linings and / or overheating of the brake.

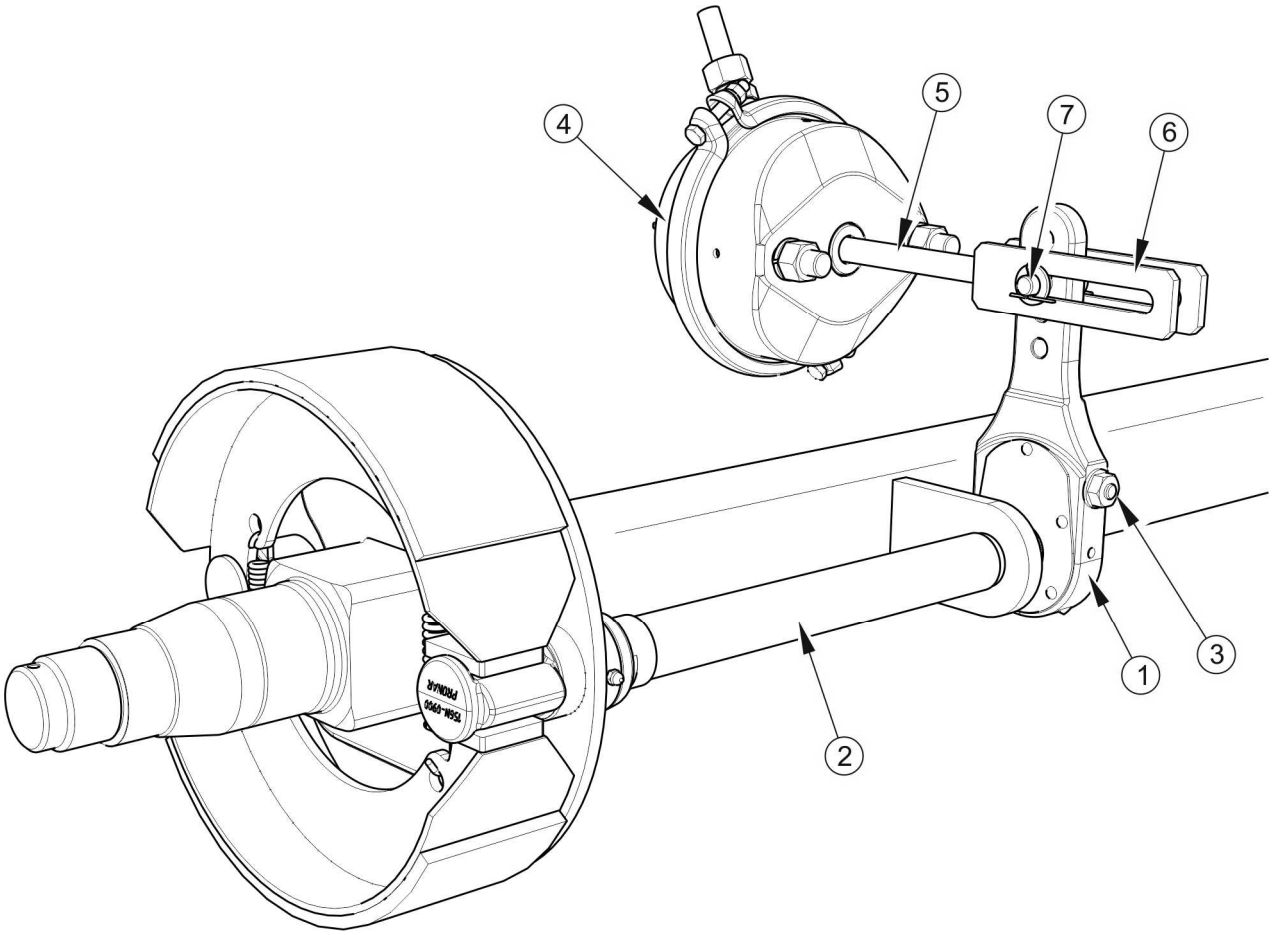


FIGURE 5.5. Construction of axle brake

(1) expander arm, (2) expander shaft, (3) adjustment screw, (4) brake cylinder, (5) cylinder piston rod, (6) cylinder fork, (7) fork pin

The control consists in measuring the extension length of each piston rod during braking at a standstill. If the piston rod stroke exceeds the maximum value (45 mm), the system should be adjusted.

The scope of service activities

- ➡ Hitch trailer to tractor.
- ➡ Turn off the tractor engine and remove the keys from the ignition.
- ➡ Immobilize tractor with parking brake.
- ➡ Make sure the trailer is not braked.
- ➡ Secure trailer against rolling with wheel chocks.

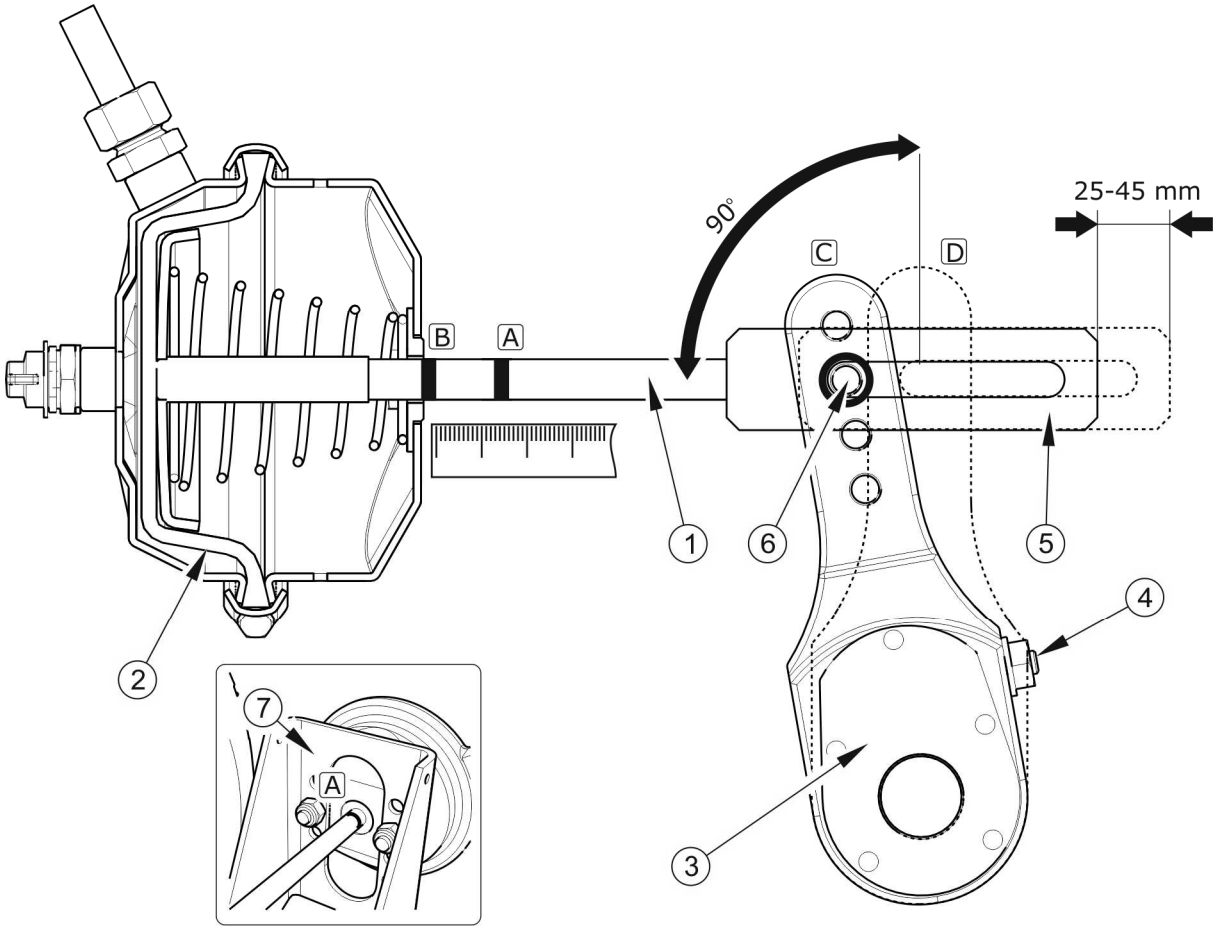


FIGURE 5.6. Brake adjustment principle

(1) cylinder piston, (2) cylinder diaphragm, (3) expander arm, (4) adjustment screw, (5) fork of the cylinder, (6) pin position of the fork, (7) support of the cylinder, (A) mark on the piston rod in the braked position, (B) mark on the piston rod in the fully braked position, (C) position of the arm in the unlocked position, (D) arm position in full braking position

- On the piston rod (1) of the cylinder, mark the position of the maximum retraction of the piston rod with the trailer brake switched off with a line (A).
- Press the brake pedal on the tractor, mark with a line (B) the position of maximum extension of the piston rod.
- Measure the distance between the lines (A) and (B). If the piston rod stroke is not within the correct working range, adjust the expander arm.
- Remove the actuator fork pin.
- Remember or mark the original position of the pin 6) - figure *(5.6)* of the cylinder, fork (5) in the expander arm bore (3).

- ➡ Check that the cylinder piston moves freely and within the full nominal range.
- ➡ Check that the actuator ventilation openings are not clogged with dirt and that there is no water or ice inside. Check the correct mounting of the actuator.
- ➡ Clean the actuator, defrost if necessary and remove water through the vent holes. If damage is found, replace the actuator with a new one. When mounting the actuator, keep its original position relative to the bracket (7).
- ➡ Turn the adjusting screw (4) so that the marked hole of the expander arm coincides with the hole of the cylinder fork
- ➡ During adjustment, the diaphragm (2) must rest on the rear wall of the actuator - compare figure *(5.6)*.
- ➡ Install the piston rod fork pin and washers and secure the pin with cotter pins.
- ➡ Turn the adjusting screw (4) clockwise to make one or two clicks in the expander arm adjustment mechanism.
- ➡ Repeat the adjustment on the second cylinder on the same axis.

- **Before the period of intensive use.**
- **Every 6 months.**
- **After repairing the braking system.**
- **In the event of uneven braking of the trailer wheels.**

CAUTION

The mounting positions of the brake cylinder in the bracket holes and the cylinder pin in the expander arm are determined by the Manufacturer and cannot be changed.

Whenever removing the pin or actuator, it is recommended to mark the location of the original attachment.

5.2.8 REPLACEMENT AND ADJUSTMENT OF PARKING BRAKE CABLE TENSION

The correct operation of the parking brake depends on the effectiveness of the brakes on the rear axle and the correct tension of the brake cable.

Before adjusting, make sure that the axle brake is properly adjusted and functions properly.

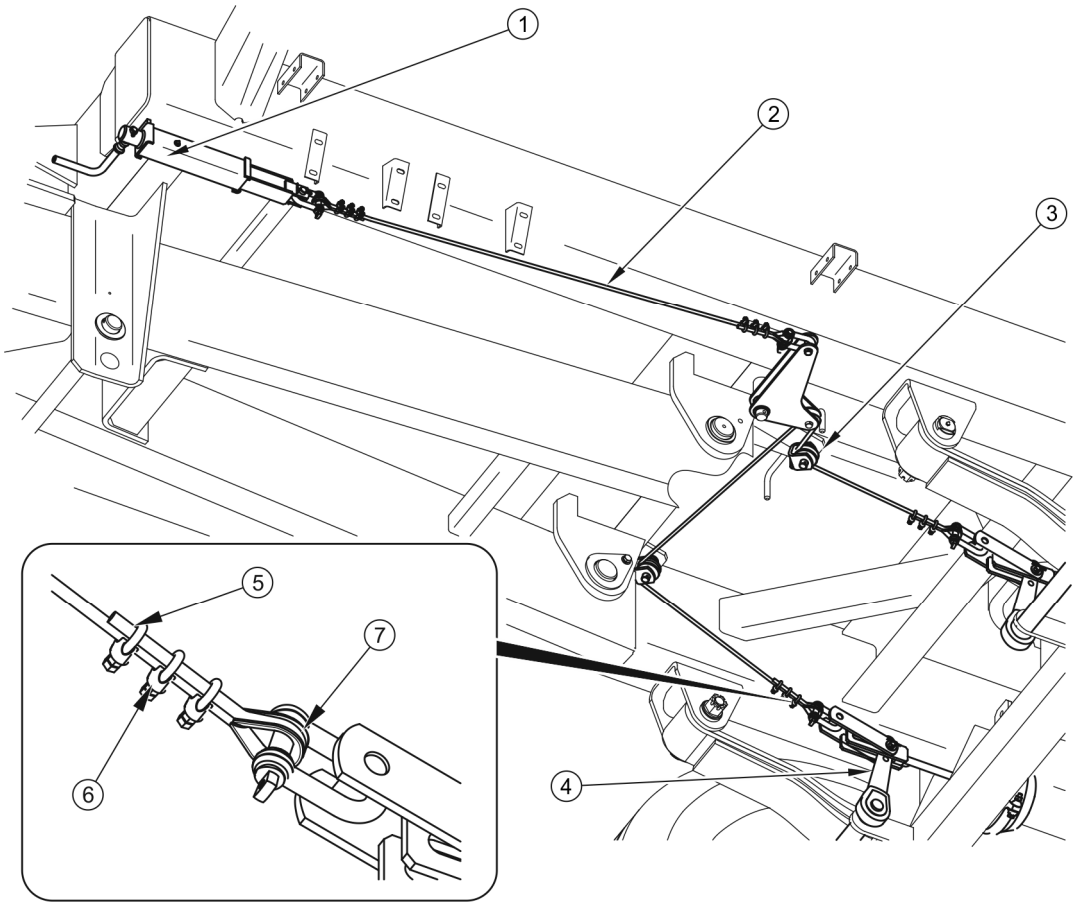


FIGURE 5.7. Service brake adjusting

(1) brake crank mechanism, (2) handbrake cable, (3) guide roller, (4) expander arm, (5) U-shaped clamp, (6) clamp nut, (7) shackle

Adjustment of parking brake cable tension should be carried out in the case of:

- cable stretching
- loosening the parking brake cable clamps,
- after adjusting the axle brake,
- after repairs to the axle brake system,
- after repairs to the parking brake system.

Parking brake cable replacement

➡ Hitch trailer to tractor. Hitch trailer to tractor.

➡ Place wedges under one wheel of the trailer.

- Unscrew the brake crank bolt (1) as far as possible.
- Loosen the nuts (6) of U-shaped clamps (5) at the ends of the cable to be replaced.
- Disassemble the appropriate shackles (7) on the ends of the cable to be replaced.
- Remove the parking brake cable.
- Clean the parking brake components, lubricate the crank mechanism and pins of the cable guide pulleys.
- Install a new cable.
  - The parking brake cable must be fitted carefully.
  - Thimbles and three clamps must be fitted at the ends of the rope.
  - The clamps must be tightened securely. The distance between the clamps must not be less than 20 mm.
  - Clamp jaws must be placed on the load-carrying cable side - figure *(5.8)*.
  - The first clamp should be placed directly on the thimble.
- After the first loading of the cable, check the condition of the cable ends again and make corrections if necessary.

Adjustment of parking brake cable tension:

- Hitch trailer to tractor. Hitch trailer to tractor.
- Place the trailer and tractor on a level surface.

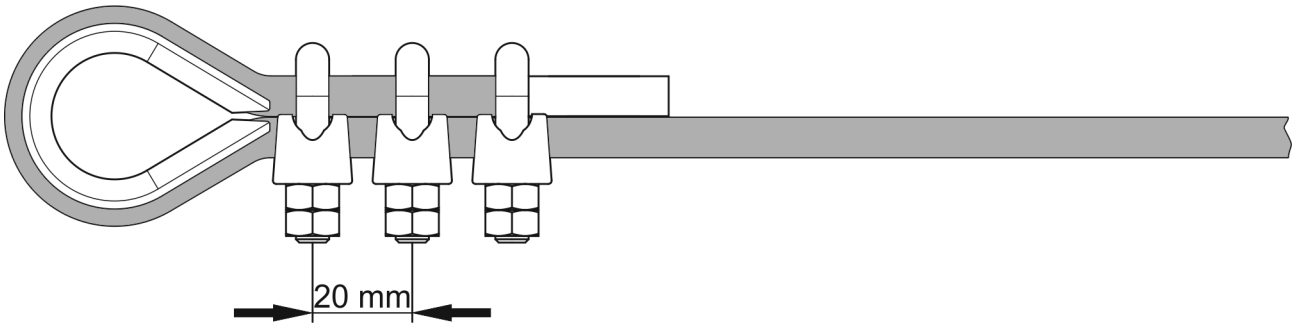


FIGURE 5.8. Installation of brake cable clamps

➡ Unscrew the screw of the brake mechanism (1) maximally - figure *(5.7)*, (counter clockwise).

➡ Loosen the nuts (6) of the bow clamps (5) on the handbrake cable.

➡ Tighten the cable and tighten the clamps.

⇨ The length of the parking brake cable should be selected so that when the service and parking brake is completely released, the cable is loose and hangs 1-2 cm.

Parking brake control and/or adjustment:

- **Every 12 months.**
- **If necessary.**

5.3 PNEUMATIC SYSTEM SERVICE

5.3.1 PRELIMINARY INFORMATION

Work related to the repair, replacement or regeneration of system components (brake cylinders, lines, control valve, braking force regulator, etc.) should be entrusted to specialized workshops that have the appropriate technologies and qualifications to perform this type of work.

The user's obligations related to the operation of the pneumatic system include only:

- checking system tightness and visual inspection of the system,
- cleaning the air filter (filters),
- air tank drainage,
- cleaning the drainage valve,
- cleaning and maintenance of pneumatic conduit connectors.

DANGER

It is forbidden to use the trailer with inefficient braking system.

5.3.2 TIGHTNESS CHECK AND VISUAL INSPECTION OF THE INSTALLATION

Checking the tightness of pneumatic systems

- Hitch trailer to tractor.
- The tractor and trailer should be immobilized with the parking brake. Additionally, place wedges under the wheel of the trailer.
- Start the tractor to supplement the air in the trailer braking system tank.
  - In single conduit systems air pressure should amount to approx. 5.8–6.3 bar.
  - In double conduit systems, the air pressure should be around 6.5- 8 bar.
- Switch off the tractor engine.
- Check the system components with the tractor brake pedal released.
  - Pay special attention to cable connections and brake cylinders.
- Repeat the system check with the tractor brake pedal depressed.
  - The help of another person is required.

In the event of a leak, the compressed air will leak out in places of damage with a characteristic hiss. The system leak can also be detected by coating the checked elements with washing liquid or other foaming agent, which will not aggressively affect the elements of the installation. It is recommended to use commercially available preparations intended for leak detection. Damaged elements should be replaced or sent for repair. If the leak appeared around the connections, the user can tighten the connector on their own. If air still leaks, replace the connector components or seals with new ones.

Checking the installation for leaks:

- **after covering the first 1,000 km,**
- **each time after repair or replacement of system components,**
- **once a year.**

Visual assessment of the system

When checking for leaks, pay attention to the technical condition and degree of cleanliness of the system components. Contact of pneumatic conduits, seals etc. with oil, grease, gasoline etc. may damage them or accelerate the aging process. Bent, permanently deformed, cut or frayed wires are only eligible for replacement.

Visual assessment of the system

- **carry out a visual inspection of the system at the same time as the leak test.**

CAUTION

Repair, replacement or regeneration of pneumatic system components may only be carried out in a specialized workshop.

5.3.3 CLEANING THE AIR FILTERS

Depending on the trailer's working conditions, but at least once every three months, the air filter inserts, which are located on pneumatic system connection hoses, should be removed and cleaned. Cartridges are reusable and cannot be replaced unless they are mechanically damaged.

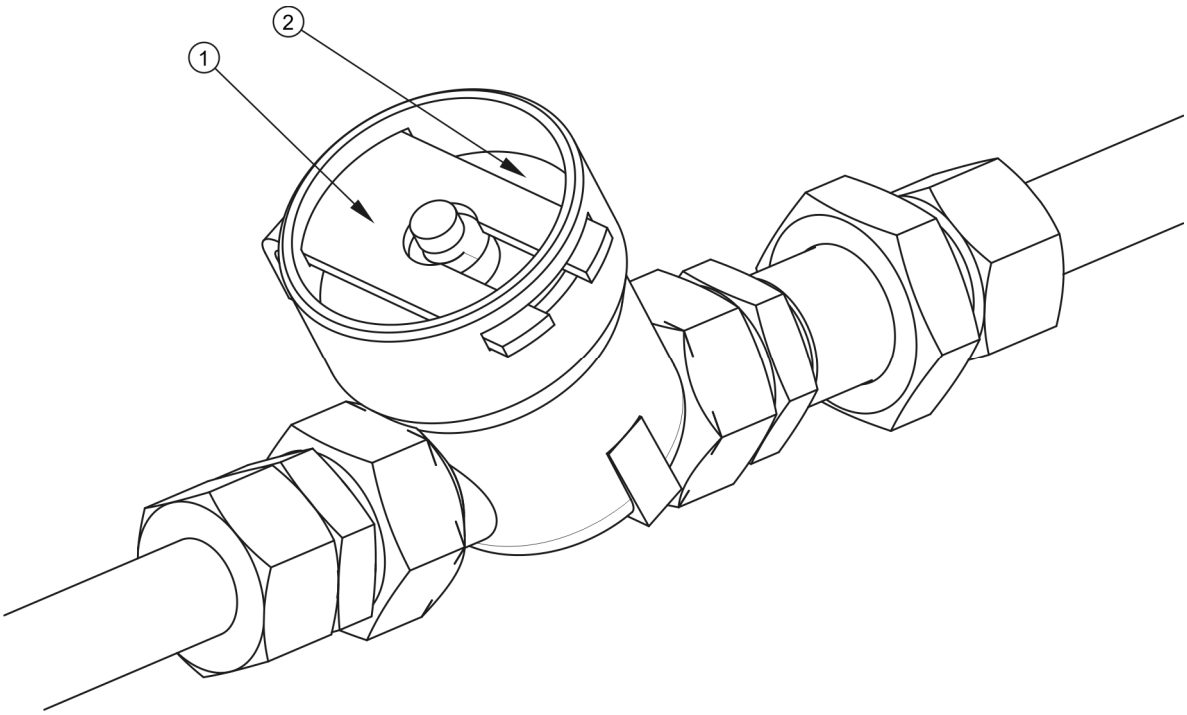


FIGURE 5.9. Air filter

(1) securing slide, (2) filter cover

Cleaning the air filter (filters),

- **every 3 months of use.**

The scope of service activities

➡ Reduce pressure in the supply line.

⇨ The pressure in the pipe can be reduced by pushing the plug of the pneumatic connection as far as it will go.

➡ Slide out the securing slide (1) - figure *(5.6)*.

⇨ Hold the filter cover (2) with your other hand. After removing the slide, the cover will be pushed out by the spring located in the filter housing.

➡ The filter element and filter body should be thoroughly washed and blown with compressed air. Installation should be in reverse order.

DANGER

Before removing the filter, reduce the pressure in the supply line. When removing the filter slide, hold the cover with the other hand. Point the filter cover away from you.

5.3.4 AIR TANK DRAINAGE

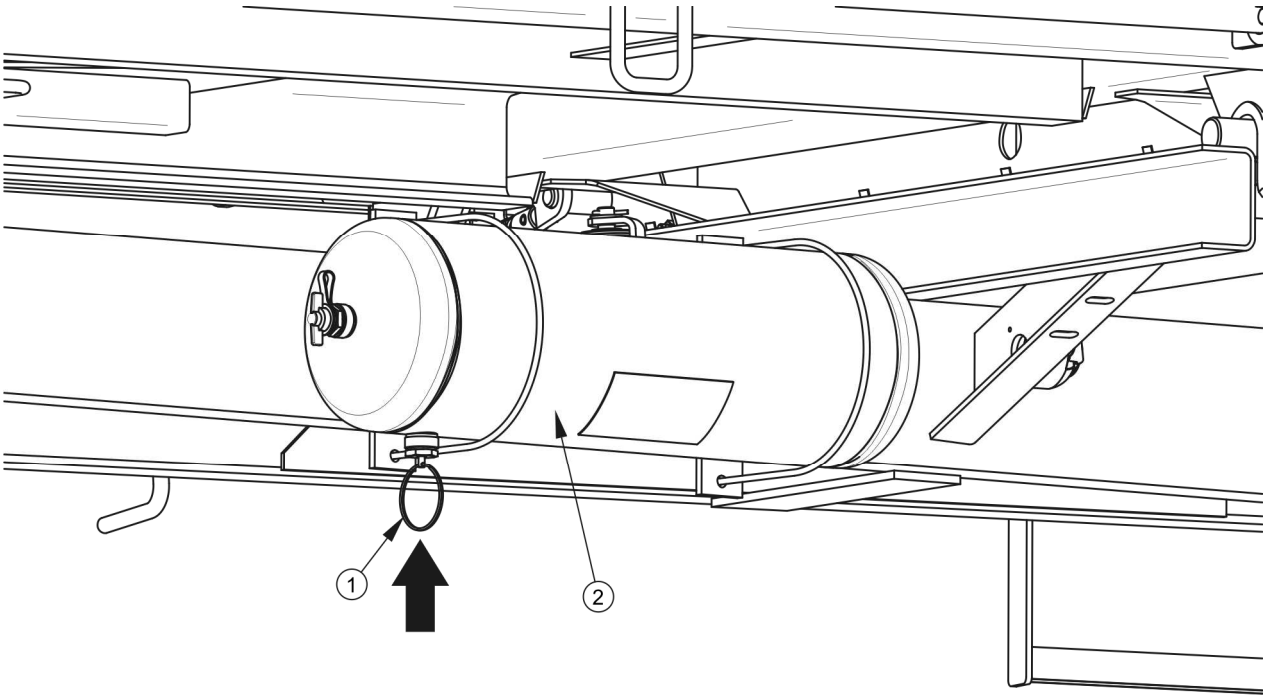


FIGURE 5.10. Air tank drainage

(1) drain valve, (2) air tank,

The scope of service activities

- Swing out the drain valve pin (1) located in the lower part of the tank (2) - the tank is located on the brackets of the right longitudinal member of the lower frame.
  - ⇨ The compressed air in the tank will remove water outside.
- After releasing the stem, the valve should close automatically and stop the outflow of air from the tank.
  - ⇨ In the event that the valve stem does not want to return to its position, the entire drainage valve must be unscrewed and cleaned, or replaced with a new one (if it is damaged) - see chapter 5.3.5.

Air tank drainage:

- **every 7 months of use.**

5.3.5 CLEANING THE DRAINAGE VALVE

DANGER

Bleed the air tank before removing the drain valve.

The scope of service activities

➡ Fully reduce the pressure in the air reservoir.

⇨ The pressure in the tank can be reduced by swinging the drain valve stem.

➡ Unscrew the valve.

➡ Clean the valve, blow with compressed air.

➡ Replace the copper gasket.

➡ Screw in the valve, fill the tank with air, check the tank for leaks.

Cleaning the valve:

- **every 12 months (before the winter period).**

5.3.6 CLEANING AND MAINTAINING PNEUMATIC CONNECTORS AND SOCKETS

DANGER

Faulty and dirty trailer connections can cause the braking system to malfunction.

A damaged connector body or socket for connecting a second trailer qualifies them for replacement. In the event of damage to the cover or gasket, replace these elements with new, functional ones. Contact of pneumatic connection seals with oils, grease, gasoline etc. may damage them and accelerate the aging process.

If the trailer is disconnected from the tractor, connections should be protected with covers or placed in their designated sockets. Before the winter period, it is recommended to preserve the seal with preparations intended for this purpose (e.g. silicone lubricants for rubber elements).

Each time before connecting the machine, check the technical condition and degree of cleanliness of connections and sockets on the agricultural tractor. If necessary clean or repair tractor sockets.

Checking the trailer connections:

- **each time before connecting the trailer to a tractor or connecting a second trailer.**

5.3.7 REPLACEMENT OF PNEUMATIC HOSE

Pneumatic hoses should only be replaced when they are permanently deformed, cut or frayed.

To connect pipes with pneumatic system elements, connectors have been used, enabling simple, quick and tight connection by pressing the pipes. If the leak appeared around the connections, the user can tighten the fitting to his own torque according to the table (5.3). If air still leaks, replace the connectors with new ones.

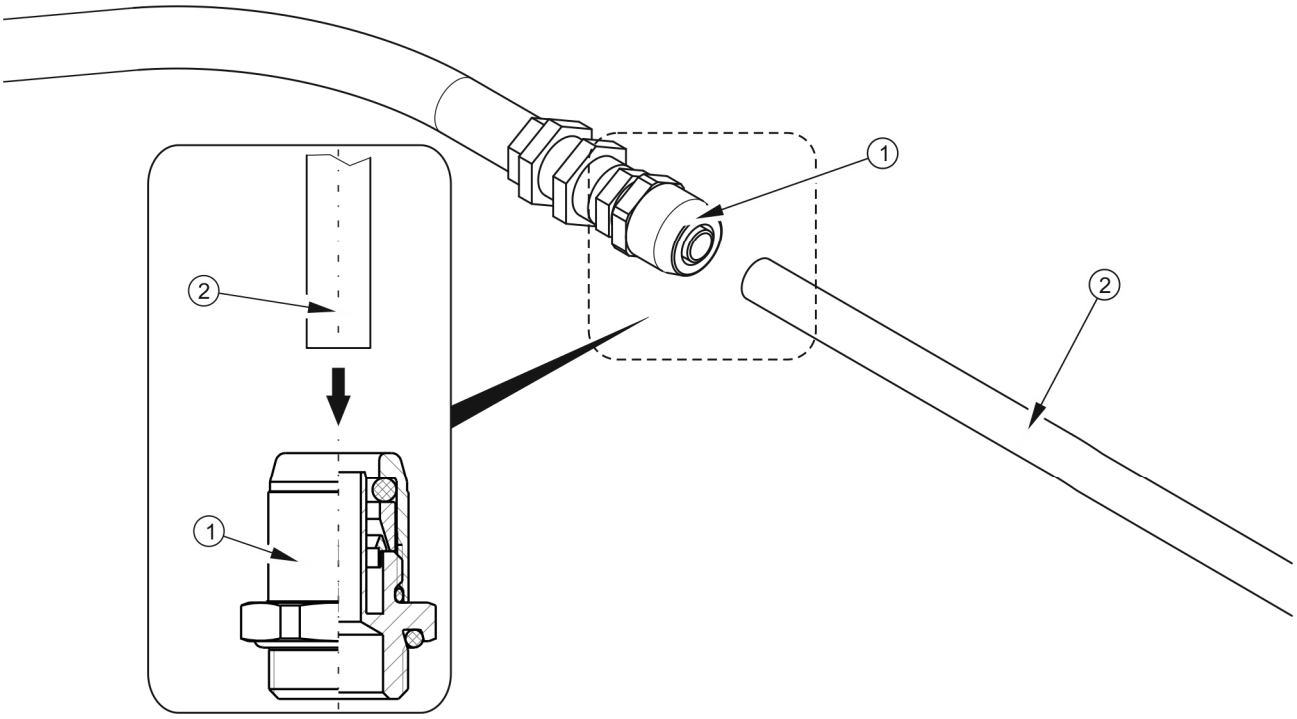


FIGURE 5.11. Assembly of pneumatic hose

(1) plug-in nipple, (2) pneumatic conduit

PART NAME	THREAD	TIGHTENING TORQUE (Nm)
Pneumatic system connector	M22x1.5	24
	M14x1.5	30
	M16x1.5	35
	M18x1.5	36
	M22x1.5	40

5.4 HYDRAULIC SYSTEM OPERATION

5.4.1 PRELIMINARY INFORMATION

Work related to the repair, replacement or regeneration of hydraulic system components (tipping cylinder, valves, etc.) should be entrusted to specialized workshops that have the appropriate technologies and qualifications to perform this type of work.

The user's obligations related to the operation of the hydraulic system include only:

- checking system tightness and visual inspection of the system,
- checking the technical condition of the hydraulic connectors.

DANGER

It is forbidden to perform tipping with a faulty hydraulic tipping system.
It is forbidden to drive with faulty hydraulic system of the support.
It is forbidden to use the trailer with a defective hydraulic brake system.
The hydraulic system is under high pressure during operation.

5.4.2 CHECKING THE THIGHTNESS OF THE HYDRAULIC SYSTEM

The scope of service activities

- ➡ Hitch trailer to tractor.
- ➡ Connect all hydraulic system hoses according to the instructions in the manual.
- ➡ Clean the couplings and cylinders (tipping cylinder, supports, and possibly hydraulic brake cylinders).
- ➡ Perform several tipping of the trailer's load box to the rear or to the side.
- ➡ Press the brake pedal on the tractor several times
  - ⇨ If the trailer is equipped with a hydraulic braking system or a combined pneumatic-hydraulic system.
- ➡ Check hydraulic cylinders and hydraulic lines for leaks.
- ➡ Tighten the connector if moisture is visible.

In the event of oiling on the hydraulic cylinder body, the nature of the leakage must be checked. When the cylinder is fully extended, check the seal locations. Slight leaks are permissible with symptoms of "sweating", however in the event of noticing leaks in the form of "droplets" stop using the trailer until the fault is remedied. If a malfunction has appeared in the brake cylinders, it is forbidden to drive the trailer with a damaged system until the fault is removed.

Checking for leaks:

- **after the first week of use,**
- **every 12 months of use.**

5.4.3 CHECKING THE TECHNICAL CONDITION OF THE HYDRAULIC CONNECTORS AND SOCKETS

Hydraulic connections and sockets intended for connecting a second trailer must be technically sound and kept clean. Each time before connecting, make sure that the sockets on the tractor or the plugs of the second trailer are in good condition. The tractor's and trailer's hydraulic systems are sensitive to the presence of solid impurities that can cause damage to precise components of the installation (impurities can cause stuck hydraulic valves, scratch the surface of cylinders, etc.)

Checking the hydraulic plugs and sockets:

- **each time before connecting the trailer to the tractor or connecting a second trailer.**

5.4.4 REPLACEMENT OF HYDRAULIC HOSES

Rubber hydraulic hoses should be replaced every 4 years regardless of their technical condition. This operation should be entrusted to specialized workshops.

Replacement of hydraulic hoses:

- **Every 4 years.**

5.5 ELECTRICAL SYSTEM SERVICE AND WARNING ELEMENTS

5.5.1 PRELIMINARY INFORMATION

Work related to the repair, replacement or regeneration of electrical installation components should be entrusted to specialized workshops that have appropriate technologies and qualifications to perform this type of work.

User responsibilities include only:

- technical inspection of the electrical installation and reflectors,
- replacement of bulbs.

CAUTION

Driving with defective lighting installations is prohibited. Damaged lampshades and burned-out bulbs should be replaced immediately before driving off. Lost or damaged reflectors should be replaced with new ones.

The scope of service activities

➡ Connect the trailer to the tractor with a suitable connection lead.

⇨ Make sure the connection cable is OK. Check the connection sockets on the tractor and on the trailer.

➡ Check the completeness, technical condition and correct functioning of the trailer lighting.

➡ Connect the connecting line for the brake solenoid valve.

⇨ Applies to trailers equipped with hydraulic and pneumatic braking systems.

⇨ If there is no voltage on the solenoid valve, the trailer's brakes will be activated, which will immobilize the trailer.

➡ Check the completeness of all reflectors.

➡ Check the correct installation of the triangular plate holder for slow moving vehicles.

➡ Before travelling on a public road, make sure that the tractor has a reflective warning triangle.

Electrical system check:

- **each time when connecting the trailer.**

ADVICE

Before travelling, make sure that all lamps and reflectors are clean.

5.6 LUBRICATION OF THE TRAILER

The trailer should be lubricated with a hand or foot grease gun, filled with the recommended lubricant. If possible, remove old grease and other contaminants before starting work. After finishing work, wipe off excess grease.

Parts that should be lubricated using machine oil should be wiped with a dry clean cloth and then applied to the lubricated surfaces with a small amount of oil (oiler or brush). Wipe off excess oil.

The replacement of grease in wheel hub bearings should be entrusted to specialized service points equipped with the appropriate tools. According to the axle manufacturer's recommendations, the entire hub must be disassembled, the bearings and individual sealing rings removed. After thorough cleaning and inspection, install lubricated components. If necessary, bearings and seals should be replaced. Lubrication of axle bearings should be carried out at least once every 2 years or after covering 50,000 km. In the event of intensive use, this should be done more often.

Empty containers of grease or oil should be disposed of in accordance with the lubricant manufacturer's instructions.

TABLE 5.2. Trailer lubrication schedule

ITEM	LUBRICATION POINT	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	FREQUENCY
1	Hub bearings	4	A	24M
2	Drawbar eye	1	B	14D
3	The camshaft bushing	4	A	3M
4	Drawbar bolt	2	A	6M
5	Tipping cylinder seats and cylinder sling	4	B	1M
6	Ball bearing of the tipping cylinder	1	B	3M
7	Parking brake mechanism	1	A	6M
8	Parking brake guide roll pin	2	A	6M
9	Joints and sockets of the loading box seat	4	B	2M
10	Spring pin	4	B	3M
11	Control arm pin	2	B	3M
12	Spring surfaces	4	B	6M
13	Suspension spring	4	B	6M
14	Scissor support pin	1	B	3M

ITEM	LUBRICATION POINT	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	FREQUENCY
15	Scissor support cylinder bearings	2	B	3M
16	Chute guides	2	D	1M
17	Chute tie pins	6	D	1M
18	Extension hinges	4	D	1M
19	Wall lock	2	D	1M
20	Front locking mechanism pin	2	A	3M
21	Rear locking mechanism pin	3	A	3M
22	Bolts and wall locks	20	A	1M

lubrication periods - M month, D - day

TABLE 5.3. Recommended lubricants

DESIGNATION FROM TABLE (5.4)	DESCRIPTION
A	general purpose machine grease (lithium, calcium),
B	solid grease for heavily loaded components with the addition of MOS2 or graphite
C	plain machine oil, silicone spray grease

When using the trailer, the user is obliged to follow the lubrication instructions in accordance with the lubrication schedule.

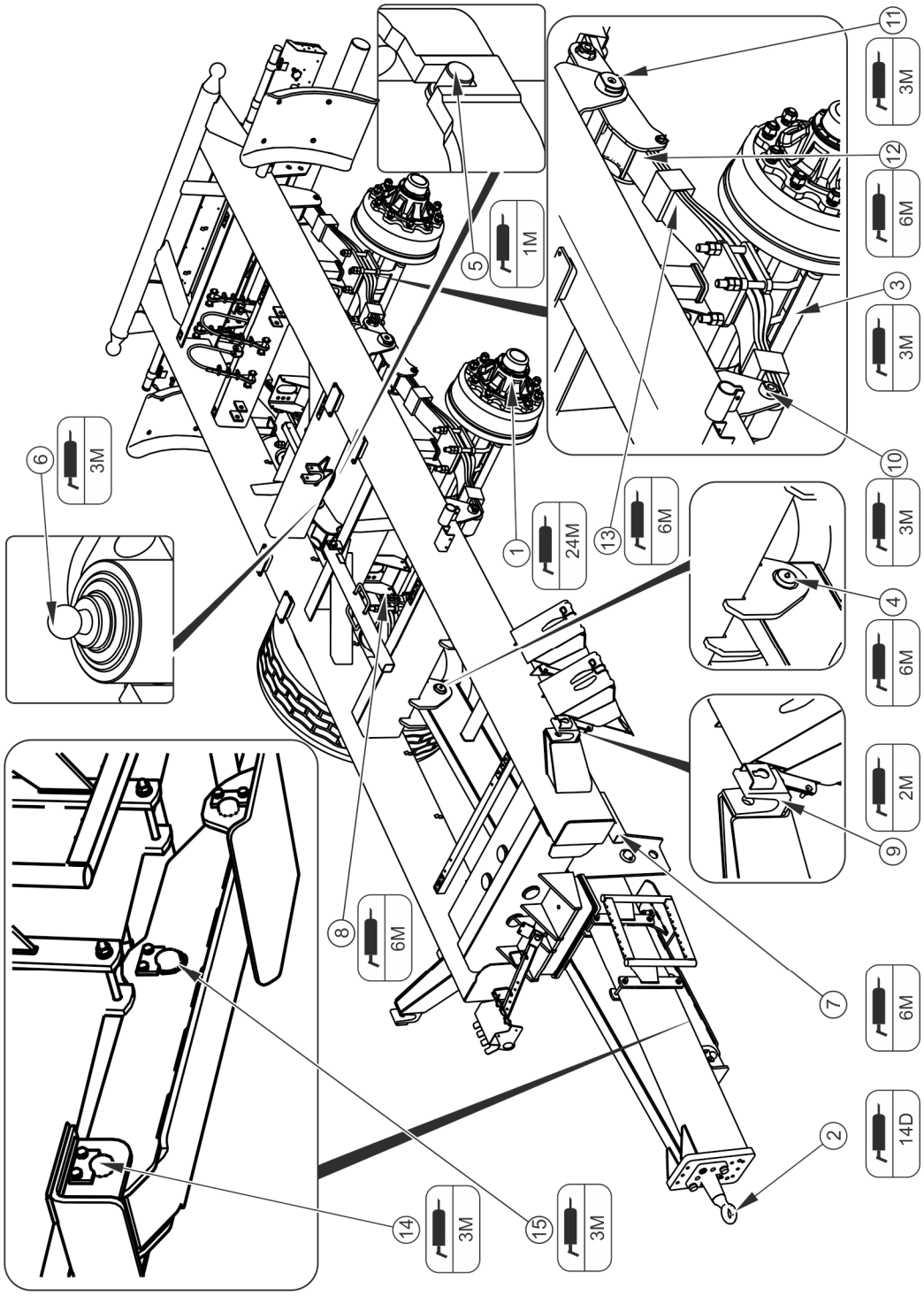


FIGURE 5.12. Trailer lubrication points, part 1

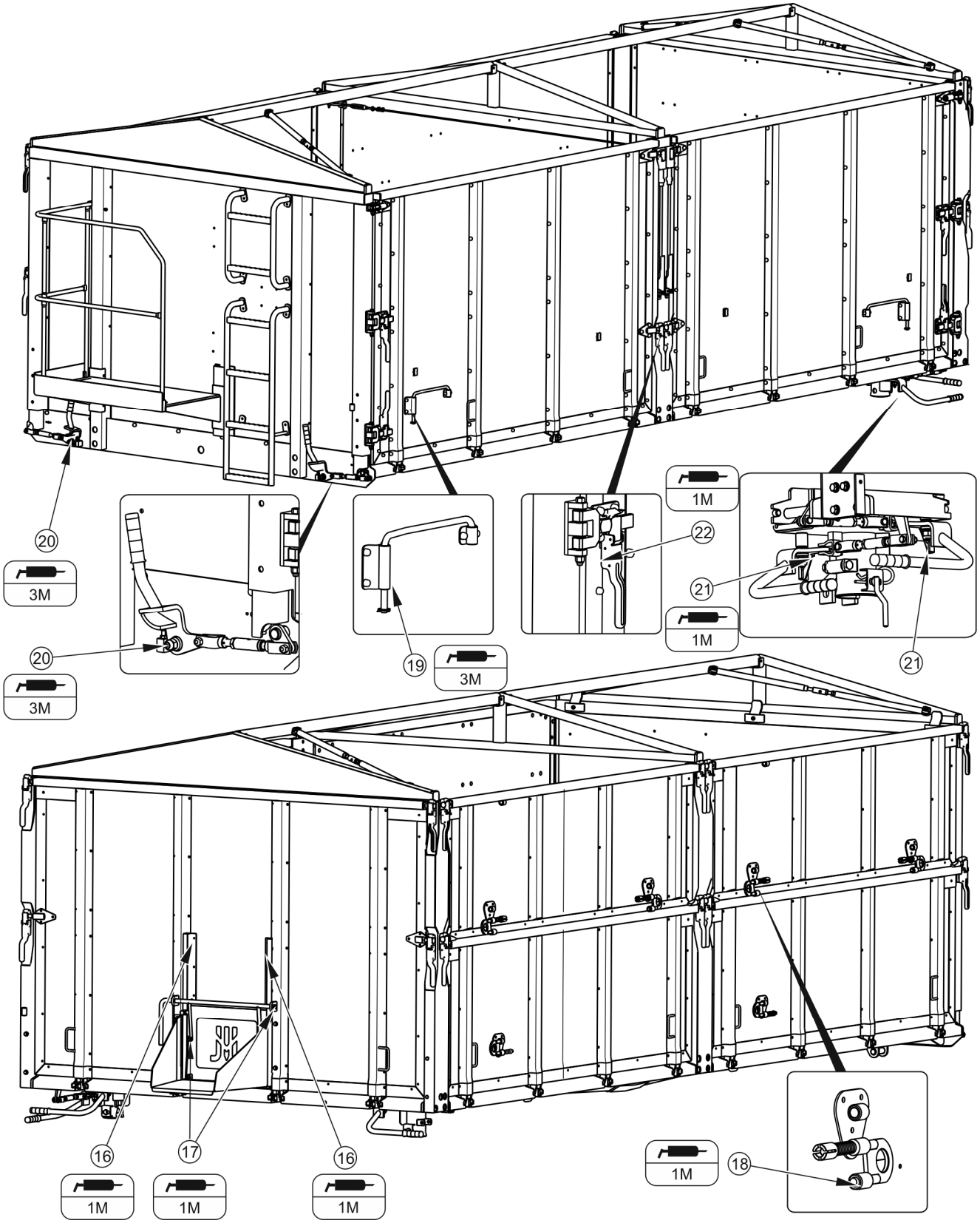


FIGURE 5.13. Trailer lubrication points, part 2

5.7 CONSUMABLES

5.7.1 HYDRAULIC OIL

It is absolutely necessary to observe that the oil in the trailer's hydraulic system and the tractor's hydraulic system must be of the same type. If different types of oil are used, make sure that both hydraulic means can be mixed together. The use of different types of oil may cause damage to the trailer or agricultural tractor. The new machine is filled with L HL32 Lotos hydraulic oil.

TABLE 5.4. Characteristics of hydraulic oil L-HL 32 Lotos

ITEM	NAME	UNIT	AMOUNT
1	Viscosity classification according to ISO 3448VG	-	32
2	Kinematic viscosity at 40^0C	mm^2/s	28.8 – 35.2
3	Qualitative classification according to ISO 6743/99	-	HL
4	Quality classification according to DIN 51502	-	HL
5	Flash-point	C	230

If you need to change the hydraulic oil for another oil, read the oil manufacturer's instructions carefully. If he recommends flushing the system with an appropriate preparation, follow these recommendations. It must be ensured that the chemicals used for this purpose do not act aggressively on the materials of the hydraulic system. During normal operation of the trailer, it is not necessary to change the hydraulic oil, however, if necessary, this operation should be entrusted to specialist service centres.

The oil used, due to its composition, is not classified as a dangerous substance, however long-term effects on the skin or eyes may cause irritation. In the event of contact of oil with skin, wash the place of contact with water and soap. Do not use organic solvents (gasoline, kerosene). Soiled clothing should be removed to prevent oil from getting on your skin. If the oil gets into your eyes, flush them with plenty of water and in case of irritation contact your doctor. Hydraulic oil under normal conditions is not harmful to the respiratory tract. The hazard only occurs when the oil is strongly atomized (oil mist), or in the event of a fire during which toxic compounds may be released. Oil should be quenched with carbon dioxide, foam or extinguishing steam. Do not use water to extinguish a fire.

5.7.2 LUBRICANTS

For heavily loaded parts, it is recommended to use lithium grease with the addition of molybdenum disulphide (MOS_2) or graphite. For less loaded components, it is recommended to use general-purpose machine greases that contain anti-corrosive additives and are highly resistant to water washout. Aerosol preparations (silicone greases, anti-corrosive lubricants) should have similar properties.

Before using lubricants, read the information leaflet for the selected product. Particularly important are safety rules and how to handle a given lubricant and how to dispose of waste (used containers, contaminated rags, etc.). The information leaflet (product card) should be kept together with the grease.

5.8 CLEANING THE TRAILER

The trailer should be cleaned depending on demand and before a longer standstill (e.g. before winter). The use of a pressure washer obliges the user to become familiar with the principle of operation and recommendations for the safe operation of this device.

Guidelines for cleaning the trailer

- Before washing the trailer, open the tailgate and the front extension. Thoroughly clean the load box from the remains of the load (sweep it or blow it with compressed air), especially in the chain guides.
- To clean the trailer, use only clean running water or water with a cleaning detergent additive with a neutral pH.
- The use of pressure washers increases the effectiveness of washing, but be careful when working. During washing, the nozzle of the cleaning aggregate must not be closer than 50 cm from the surface being cleaned.
- The water temperature should not exceed 55 ° C.
- Do not direct the water jet directly at the elements of the installation and equipment of the trailer, i.e. control valve, braking force regulator, brake cylinders, hydraulic cylinders, pneumatic, electric and hydraulic plugs, lights, electrical connectors, information and warning stickers, rating plate, cable connectors,

points lubricating trailers, etc. High pressure water jet may cause mechanical damage to these components.

- For cleaning and maintenance of plastic surfaces, it is recommended to use clean water or specialized preparations intended for this purpose.
- Do not use organic solvents, preparations of unknown origin or other substances that may damage the lacquered, rubber or plastic surface. It is recommended to make a test on an invisible surface in case of doubt.
- Surfaces oily or greasy by grease should be cleaned with petrol or degreasing agents, and then washed with clean water and detergent. Follow the cleaning agent manufacturer's instructions.

DANGER

Refer to the instructions for using cleaning detergents and preservatives.
When washing with detergents, wear suitable protective clothing and eye protection.

- Detergents intended for washing should be stored in their original containers, or alternatively, but marked exactly. The preparations cannot be stored in containers intended for storing food and beverages.
- Keep the hoses and gaskets clean. The materials from which these elements are made may be susceptible to organic substances and some detergents. As a result of long-term effects of various substances, the aging process is accelerated and the risk of damage increases. Elements made of rubber are recommended to be maintained with the help of specialized preparations after thorough washing.
- After washing, wait for the trailer to dry and then grease all control points as recommended. Wipe off excess grease or oil with a dry cloth.
- Observe environmental protection principles, wash trailer in designated places.
- Washing and drying the trailer must take place at an ambient temperature above 0 ^{o}C.
- After washing and drying the trailer, lubricate all control points, regardless of the period of the last treatment.

5.9 STORAGE

- It is recommended that the trailer be stored indoors or under a roof.
- If the machine will not be used for a long period of time, it must be protected against the effects of weather conditions, especially those that cause corrosion of steel and accelerate the aging of tires. During this time the machine must be unloaded. The trailer should be thoroughly washed and dried.
- Corroded areas should be cleaned of rust, degreased and protected with a primer paint, and then painted with a topcoat according to the colour scheme.
- In the event of a longer stop, it is necessary to lubricate all components regardless of the period of the last treatment.
- Rims and tires should be carefully washed and dried. During longer storage of the unused trailer, it is recommended to move the machine once every 2-3 weeks so that the place of contact of the tire with the ground is in a different position. The tires will not deform and will maintain proper geometry. You should also check your tire pressure from time to time, and if necessary inflate the wheels to the correct value.

5.10 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

During maintenance and repair work, apply appropriate tightening torques to screw connections, unless other tightening parameters are given. Recommended tightening torques for the most commonly used bolted connections are shown in the table below. The given values apply to non-lubricated steel bolts.

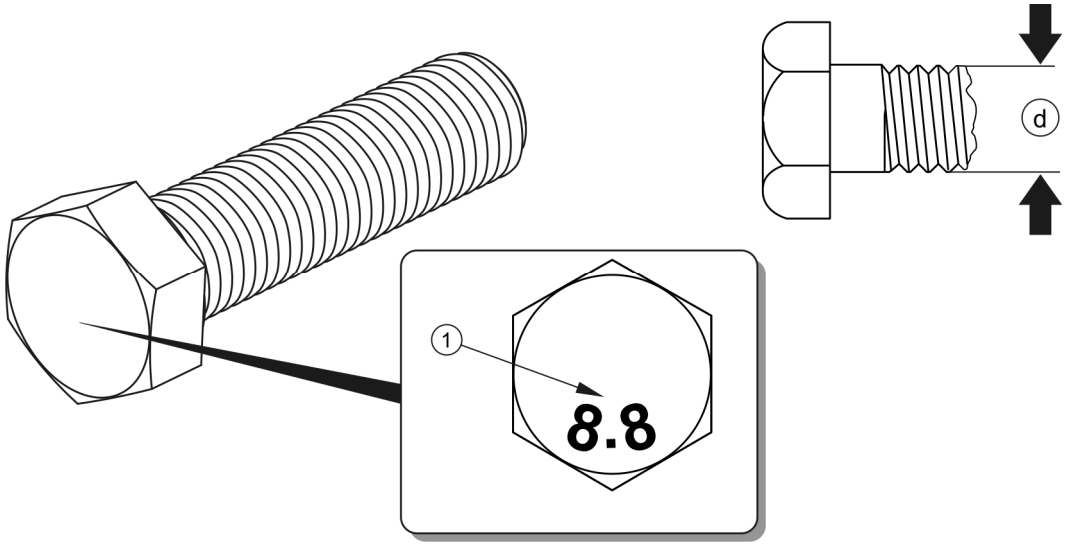


FIGURE 5.14. Metric thread screw

(1) strength class, (d) thread diameter

The hydraulic hoses should be tightened with a torque of 50 - 70 Nm.

TABLE 5.5. Tightening torques for screw connections

METRIC THREAD	5.8(1)	8.8(1)	10.9(1)
	Md [Nm]		
M10	37	49	72
M12	64	85	125
M14	100	135	200
M16	160	210	310
M20	300	425	610
M24	530	730	1,050
M27	820	1,150	1,650
M30	1,050	1,450	2,100

(1) - strength class according to DIN ISO 898

5.11 ADJUSTMENT OF THE DRAWBAR POSITION

Adjustment of the position of the drawbar eye (1) is performed by changing the position of the eye in relation to the drawbar faceplate (2).

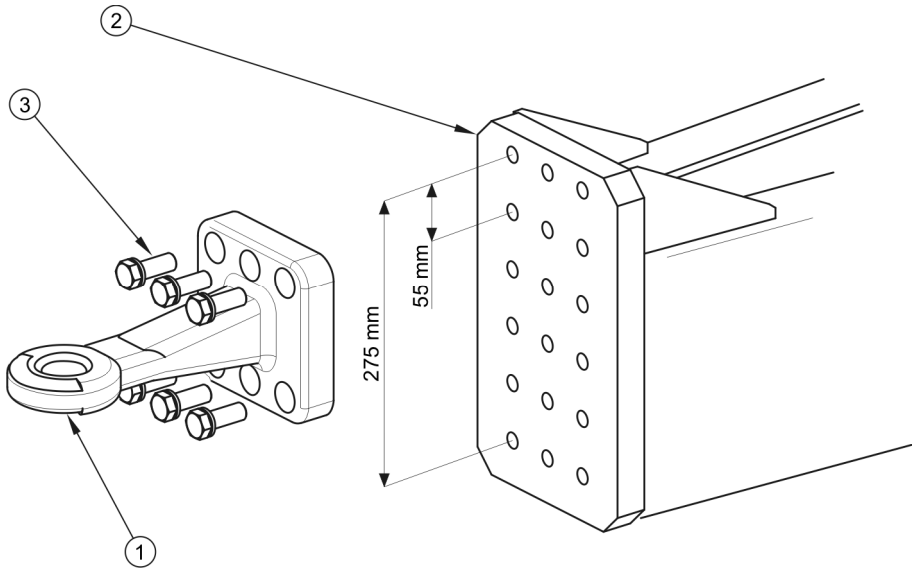


FIGURE 5.15. Adjusting the position of the drawbar eye

(1) drawbar with fixed drawbar eye, (2) faceplate, (3) bolted connection

The scope of activities

- Block the trailer with parking brake.
- Place wedges under one wheel of the trailer.
- Unscrew the drawbar eye (1) from the plate (2).
- Set the drawbar eye in a new position and tighten it with bolts (3) to the appropriate torque.
    - The design of the faceplate (2) allows 4 combinations of the tendon setting, figure *(5.15)*.
- Check degree of drawbar tightening after the first travel with load.

5.12 TROUBLESHOOTING

TABLE 5.6. Faults and how to remove them

FAULT	CAUSE	REMOVAL METHOD
Trouble with starting	Brake system lines not connected	Connect the brake lines (applies to pneumatic system).
	Parking brake applied	Release the parking brake.
	Pneumatic connection lines damaged	Replace.
	Connection leakage	Tighten, replace washers or sealing sets, replace hoses.
	Defective control valve or braking force regulator	Check valve, repair or replace.
Noise in the hub of the axle	Excessive bearing looseness	Check the clearance and adjust if necessary
	Damaged bearings	Replace bearings
	Damaged hub components	Replace
Low braking efficiency	System pressure too low	Check the pressure on the pressure gauge on the tractor, wait for the compressor to fill the tank to the required pressure. Damaged tractor air compressor. Repair or replace. Damaged brake valve on the tractor. Repair or replace. System leakage. Check systems for leaks.
Excessive heating of the axle hub	Incorrectly adjusted service or parking brake	Adjust expander arm positions
	Worn brake pads	Replace brake shoes.
Incorrect hydraulic system operation	Incorrect hydraulic oil viscosity	Check the oil quality, make sure that the oils in both machines are of the same grade. If necessary, change the oil in the tractor and/or trailer

FAULT	CAUSE	REMOVAL METHOD
	Insufficient tractor hydraulic pump performance, tractor hydraulic pump defective.	Check the hydraulic pump on the tractor.
	Damaged or dirty actuator	Check the cylinder piston rod (bending, corrosion), check the cylinder for leaks (piston rod seal), repair or replace the cylinder if necessary.
	Actuator load too high	Check the mechanisms controlled by the actuator for mechanical damage
	Damaged hydraulic lines	Check and make sure that the hydraulic hoses are tight, not kinked and properly tightened. Replace or tighten as necessary.

NOTES

APPENDIX A

Tire size

TYPE OF TRAILER	FRONT / REAR AXLE
T683P	385/65 R 22.5 160 F [1] 385/65 R 22.5 TL [1] 425/65 R 22.5 168 F [2] 425/65 R22.5 TL [2] 500/60 R 22.5 165 A8 [3] 550/60 R 22.5 163 A8 [3] 560/60 R 22.5 161 D [3]

[1] - disc wheel 11.75 x 22.5'' ET=-30

[2] - disc wheel 13.00 x 22.5'' ET=0

[3] - disc wheel 16.00 x 22.5'' ET=0