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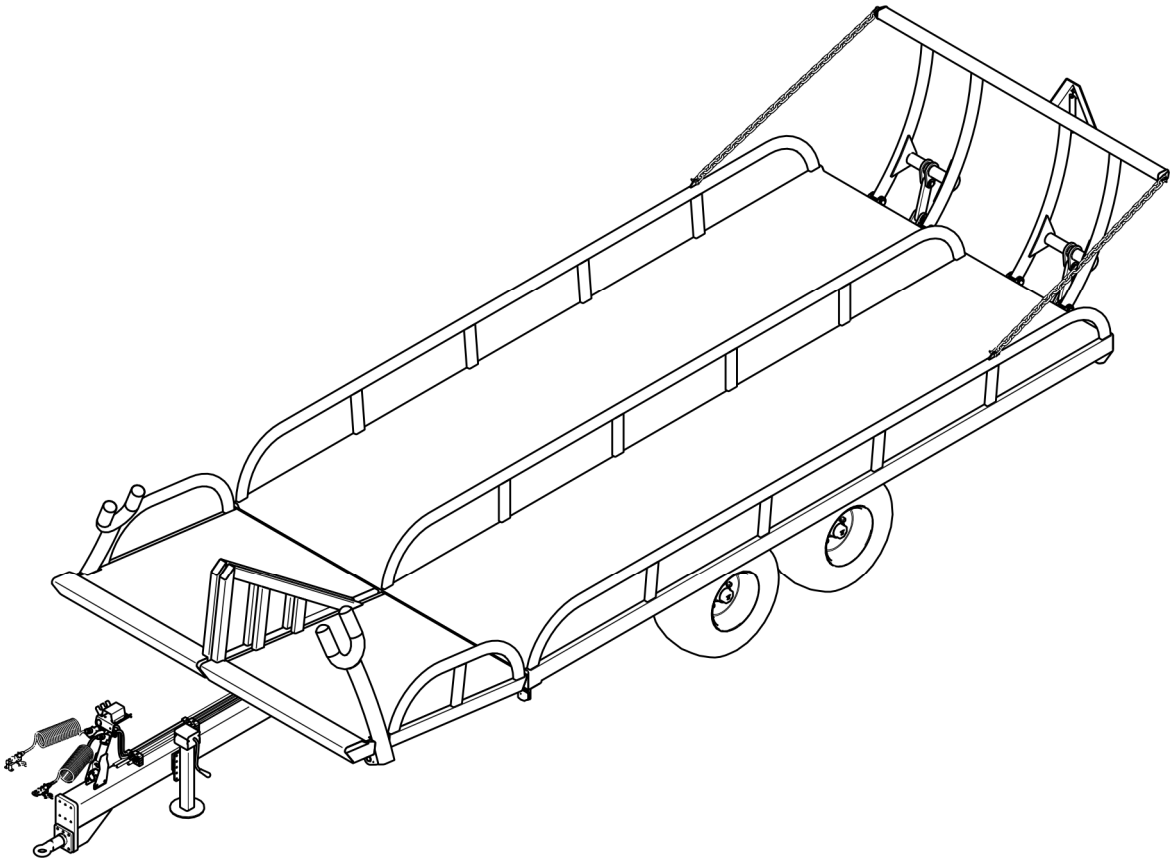
USER MANUAL

AGRICULTURAL TRAILER

PRONAR TB-4

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



REVISION 1A-08-2013

PUBLICATION NUMBER 341N-00000000-UM

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INTRODUCTION

Information contained herein is current at date of publication. As a result of improvements, some numerical values and illustrations contained in this publication may not correspond to the factual specification of the machine supplied to the user. The manufacturer reserves the right to introduce design changes in machines produced that facilitate operation and improve the quality of their work, without making minor amendments to this Operator's Manual.

This Operator's Manual is an integral part of the machine's documentation. Before using the machine, the user must carefully read this Operator's Manual and observe all recommendations. This guarantees safe operation and ensures malfunction free work of the machine. The machine is designed to meet obligatory standards, documents and legal regulations currently in force.

The manual describes the basic safety rules and operation of agricultural trailer Pronar TB-4.

If the information contained in the Operator's Manual needs clarification then the user should refer for assistance to the sale point where the machine was purchased or to the Manufacturer.

MANUFACTURER'S ADDRESS:

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17-210 Narew

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SYMBOLS APPEARING IN THIS OPERATOR'S MANUAL

Information, descriptions of danger and precautions and also recommendations and prohibitions associated with user safety instructions are marked:

and also preceded by the word **"DANGER”.** Failure to observe the instructions may endanger the machine operator's or other person's health or life.

Particularly important information and instructions, the observance of which is essential, are distinguished in the text by the sign:

and also preceded by the word **"CAUTION".** Failure to observe the instructions may lead to damage to the machine as a result of improper operation, adjustment or use.

In order to focus the user's attention on the need to perform maintenance, the relevant section of the Operator's Manual is marked with the pictogram:

Additional tips and advice for machine operation are marked:

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

DIRECTIONS USED IN THIS OPERATOR'S MANUAL

Left side – side to the left hand of the operator facing in the direction of machine's forward travel.
Right side – side to the right hand of the operator facing in the direction of machine's forward travel.

REQUIRED SERVICE ACTIONS

Service actions described in the manual are marked: ➡

Result of service/adjustment actions or comments concerning the performance of actions are marked: ⇨

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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:	**Trailer**
Type:	**TB-4**
Model:	–
Serial number:	
Commercial name:	**Trailer PRONAR TB-4**

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.

Narew, the 06 LIS. 2013

Place and date

Z-CA DYREKTORA
d/s technicznych
członek Zarządu
Roman Omelianiuk

Full name of the empowered person position, signature

CONTENTS

CHAPTER

1

BASIC INFORMATION

1.1 IDENTIFICATION

1.1.1 IDENTIFICATION OF TRAILER

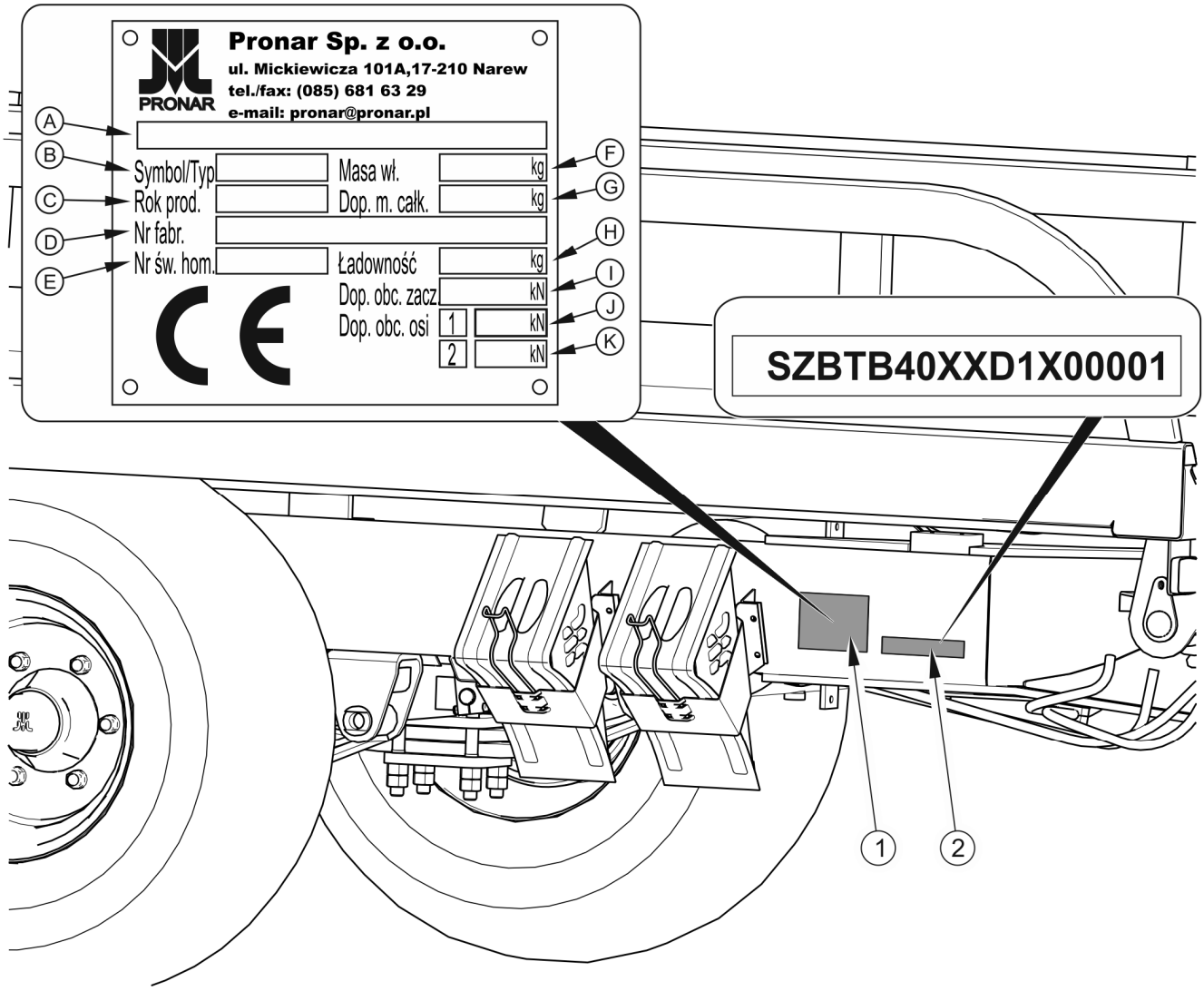


FIGURE 1.1 Location of nameplate and serial number

(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 serial number and the nameplate are located on the front beam of upper frame - 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.

FIGURE 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 (not applicable)
J	Permissible front axle load
K	Permissible rear axle load

1.1.2 IDENTIFICATION OF DRIVING AXLES

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*).

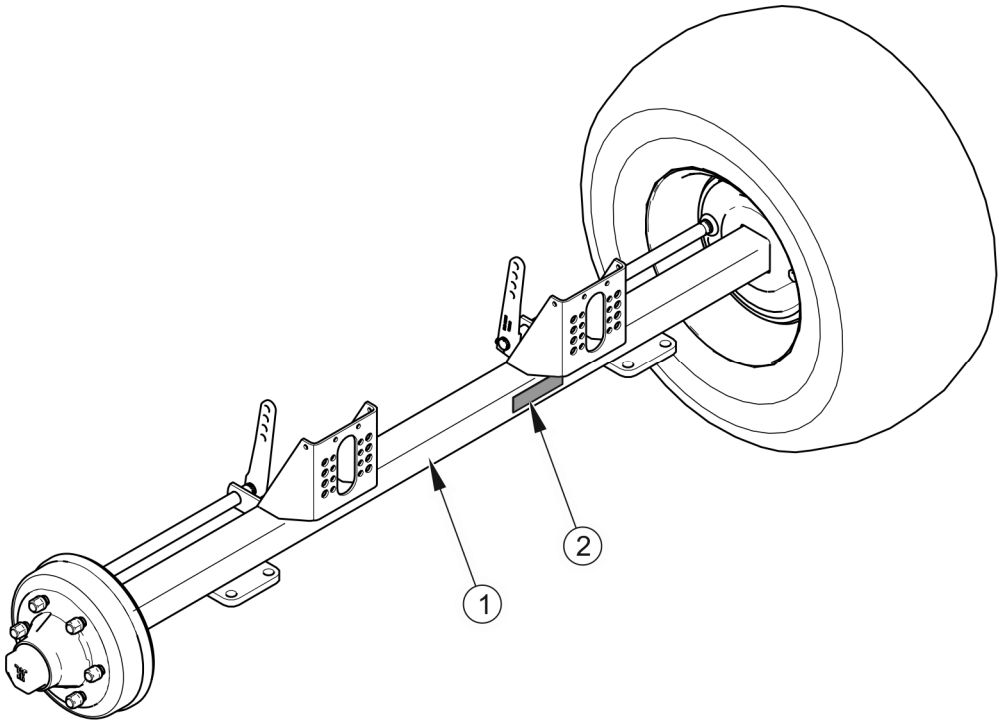


FIGURE 1.2 Location of the nameplate of driving axle

(1) driving axle, (2) nameplate

1.1.3 LIST OF FACTORY NUMBERS

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.

VIN Number

S	**Z**	**B**	**T**	**B**	**4**		**X**	**X**			**X**					

SERIAL NUMBER AND FRONT AXLE TYPE

SERIAL NUMBER AND REAR AXLE TYPE

1.2 INTENDED USE

The trailer is intended for loading and transporting straw, hay or silage in the form of bales. The machine allows you to quickly collect bales from the field, and transport them to the farm as well as to bring them to the edge of the field.

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.

CAUTION

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

- **transport people and animals,**
- **transport improperly secured cargo that could cause road and environmental pollution while driving,**
- **transport 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.**

The trailer was constructed in accordance with applicable safety requirements and machine standards. The braking system as well as the lighting and signaling 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.

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.

TABLE 1.2 Agricultural tractor requirements

CONTENT	UNIT	REQUIREMENTS
Braking system - sockets		
Pneumatic 2 - wire	-	in accordance with ISO 1728
Maximum system pressure		
Pneumatic 2 - wire	bar / kPa	8 / 800
The hydraulic system		
Hydraulic oil	-	L HL 32 Lotos (1)
Maximum system pressure	bar / MPa	160 / 16
Oil demand	l	22
Hydraulic sockets	-	in accordance with ISO - 7421-1 return socket with free oil drain (so-called "free sink")

CONTENT	UNIT	REQUIREMENTS
Electrical system		
Electrical system voltage	V	12
Connection socket	-	7 poles in accordance with ISO 1724
Tractor hitch required		
Type	-	transport hitch
Other requirements		
Min. tractor power		
Pronar TB-4	kW / KM	73 / 100

(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

TABLE 1.3 Trailer equipment

EQUIPMENT	STANDARD	ADDITIONAL	OPTIONAL
User manual	•		
Warranty Card	•		
Pneumatic 2 - wire system	•		
Plate for slow-moving vehicles		•	
Warning reflective triangle		•	
Hand brake	•		
Wheel chocks	•		
Drawbar with a rotating drawbar eye ∅50 mm	•		
Rigid cable Ø40			•

EQUIPMENT	STANDARD	ADDITIONAL	OPTIONAL
Wheel 400/60-15,5 ET=0	•		

Some standard equipment items that are listed in table (*1.3*), 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.

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*. Defects revealed during the warranty period will be removed by the Warranty Service within no more than 14 business days from the date of acceptance of the machine for repair by the Warranty Service, or at another agreed time.

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.

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.

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.

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 a trailer from a car should be carried out using a loading ramp using 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.

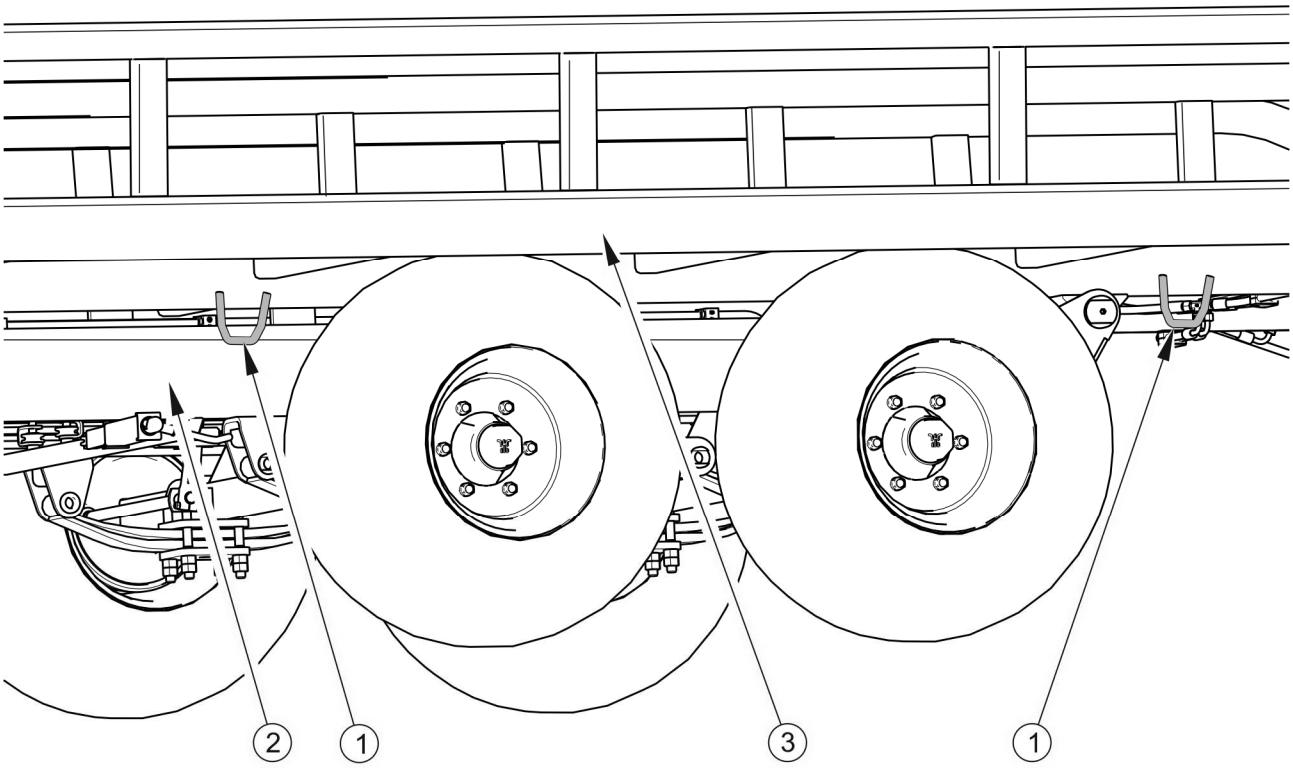


FIGURE 1.3 Arrangement of transport handles

(1) carrying handle, (2) bottom frame side member, (3) loading platform

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 fastening elements should be attached to the transport eyelets designed for this purpose (1) - *FIGURE (1.3*), or to the fixed structural elements of the trailer (stringers, crossbars, etc.). Transport handles are welded to the loading platform side member (2), one pair 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.

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 kerb weight of the trailer in running order is 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 debris mixed with absorbent material should be stored in -

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).

DANGER

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

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

In the event of parts being replaced, worn or damaged parts that cannot be regenerated or repaired should be sent to a recycling centre. Hydraulic oil should be taken to the appropriate facility dealing with the utilization of this type of waste.

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

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 manufacturer's requirements (minimum tractor power demand, no required tractor hitch, 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 connecting the trailer, make sure that the tractor and trailer are technically sound.
- 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 platform is raised.
- Hitching and unhitching the trailer may only take place when the machine is immobilized by means of the parking brake.

2.1.3 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.
- 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.

2.1.4 LOADING AND UNLOADING OF A TRAILER

- Loading and unloading work should be carried out by a person experienced in this type of work.
- 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 trailer's chassis. Loading bales only to one side of the platform may cause the trailer to tip over.
- Do not stay on the loading platform during loading.
- Make sure that there are no bystanders in the unloading/loading area. Before tipping the platform, ensure proper visibility and make sure that there are no bystanders nearby.
- During strong wind gusts tipping is prohibited.
- Pay attention to the unloading safety on uneven terrain, make sure that nobody is near the trailer.
- When unloading, secure the rear ladder by removing the fastening chains.
- Driving with the load platform raised is prohibited.

2.1.5 TRANSPORT PASSAGE

- When driving on public roads, comply with traffic regulations and transport regulations in force in the country where the trailer is used.
- During transport, the rear ladder must be secured against falling down using fastening chains.
- Do not exceed the maximum speed resulting from restrictions on road conditions and restrictions. Adjust speed to prevailing road conditions, trailer loading level, and restrictions resulting from road traffic regulations.

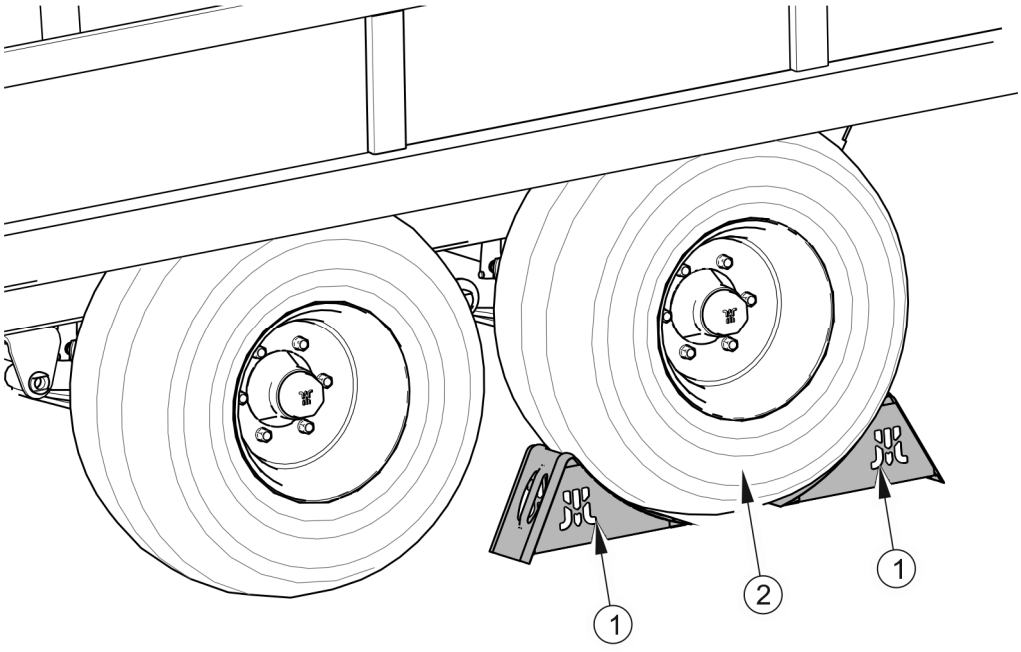


FIGURE 2.1 How to set the wedges

(1) securing wedge, (2) rear axle wheel

- 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 trailer wheels.
- Before driving, make sure that the trailer is correctly connected to the tractor (in particular check the safety of the hitch pin).
- Wedges (1) should only be placed under one wheel (one in front of the wheel, the other in the rear - Figure *(2.1)*). Wedges should not be placed under the front axle wheels.

- 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).
- 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.
- The trailer's maximum carrying capacity must not be exceeded. Exceeding the carrying capacity may lead to damage to the machine, loss of stability during and cause 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.
- 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 ladder.

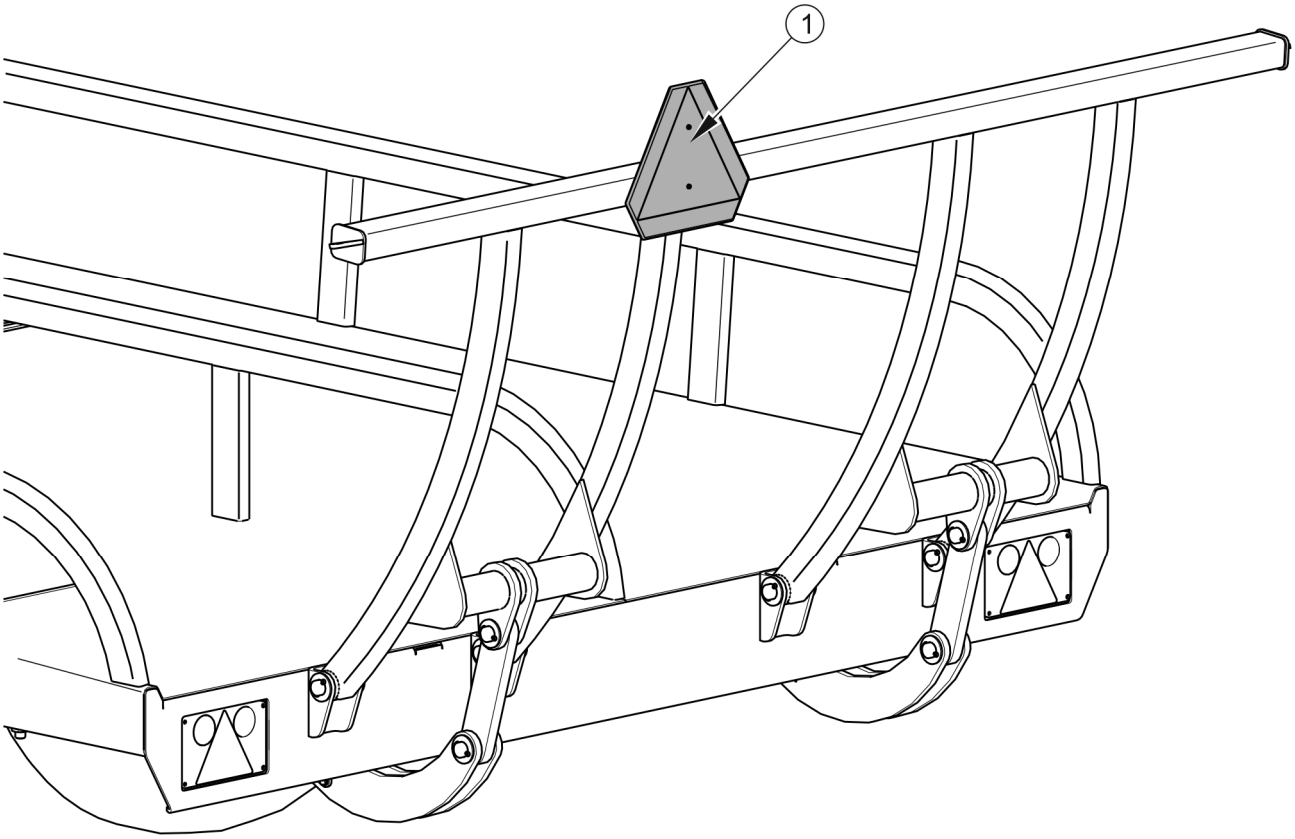


FIGURE 2.2 Mounting location for the slow-moving vehicle sign

(1) distinguishing sign

- The bales on the trailer must be evenly distributed and arranged so that they cannot move.
- 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.
- It is forbidden to get on the trailer while driving.
- Parking the trailer on a decline is prohibited.

2.1.6 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.
- Inspection of nut tightening should be carried out after the first use of the trailer, after the first journey with a load and then every 6 months of use, or every 25,000 km. In the event of intensive work, check the nut tightening at least every 10,000 kilometres. Each time, the inspection activities should be repeated if the trailer wheel has been disassembled.
- 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 caps to avoid penetration of dirt.

2.1.7 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.

- Inspect the trailer according to the frequency specified in this manual.
- Regularly check the technical condition of safety devices and correct tightening of screw connections (in particular the drawbar and wheels).
- Before starting work that requires lifting the platform, it must be unloaded. The platform should be lifted back and secured against accidental dropping. 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 platform 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 careful when entering the loading platform. Before entering, 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.
- It is forbidden to install additional devices or accessories that do not comply with the specification specified by the Manufacturer.

2.2 DESCRIPTION OF RESIDUAL RISK

Pronar Sp. z 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.

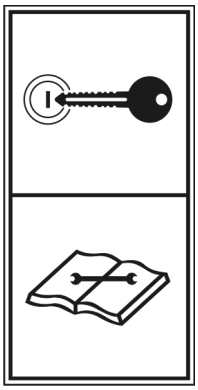
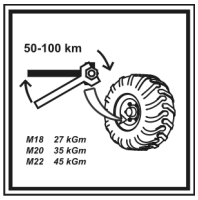
Residual risk can be reduced to a minimum by following these recommendations:

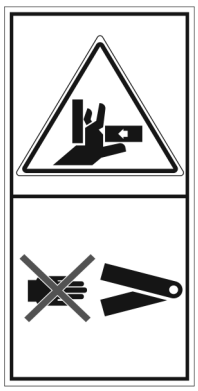
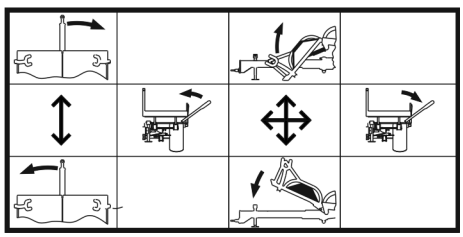
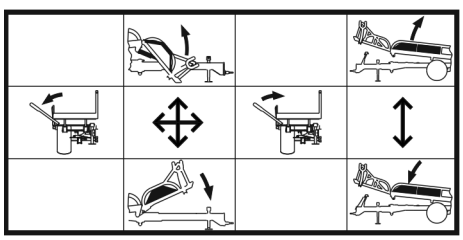
- prudent and leisurely machine operation,
- sensible application of the remarks and recommendations contained in the operating instructions,
- maintaining a safe distance from prohibited or dangerous places during unloading, loading and coupling the trailer,
- performing maintenance and repair work 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.

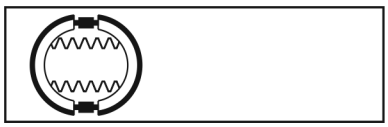
2.3 INFORMATION AND WARNING STICKERS

The trailer is marked with information and warning decals 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	**PRONAR TB-4**	Type of trailer
2		Before starting any servicing or repair work, switch off the tractor engine and remove the ignition key. Secure the tractor cab against unauthorized access.
3		Caution. Before starting work, read the User's Manual.
4		Lubricate the trailer according to the schedule outlined in the User's Manual.
5		Regularly check the tightness of wheel nuts and other bolted connections.

ITEM	STICKER	MEANING
6		Do not reach into the crushing area if the elements can move. There is a risk of crushing your fingers or hands
7		Risk of impact due to moving machine assemblies Keep a safe distance
8		Transport sticker. Fastening points for transport
9		Information sticker Trailer control
10		Information sticker II Trailer control

ITEM	STICKER	MEANING
11	**350 kPa**	Tire pressure. (1)
12		Hydraulic supply hose for the braking system.

(1) – the pressure depends on the used tires

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

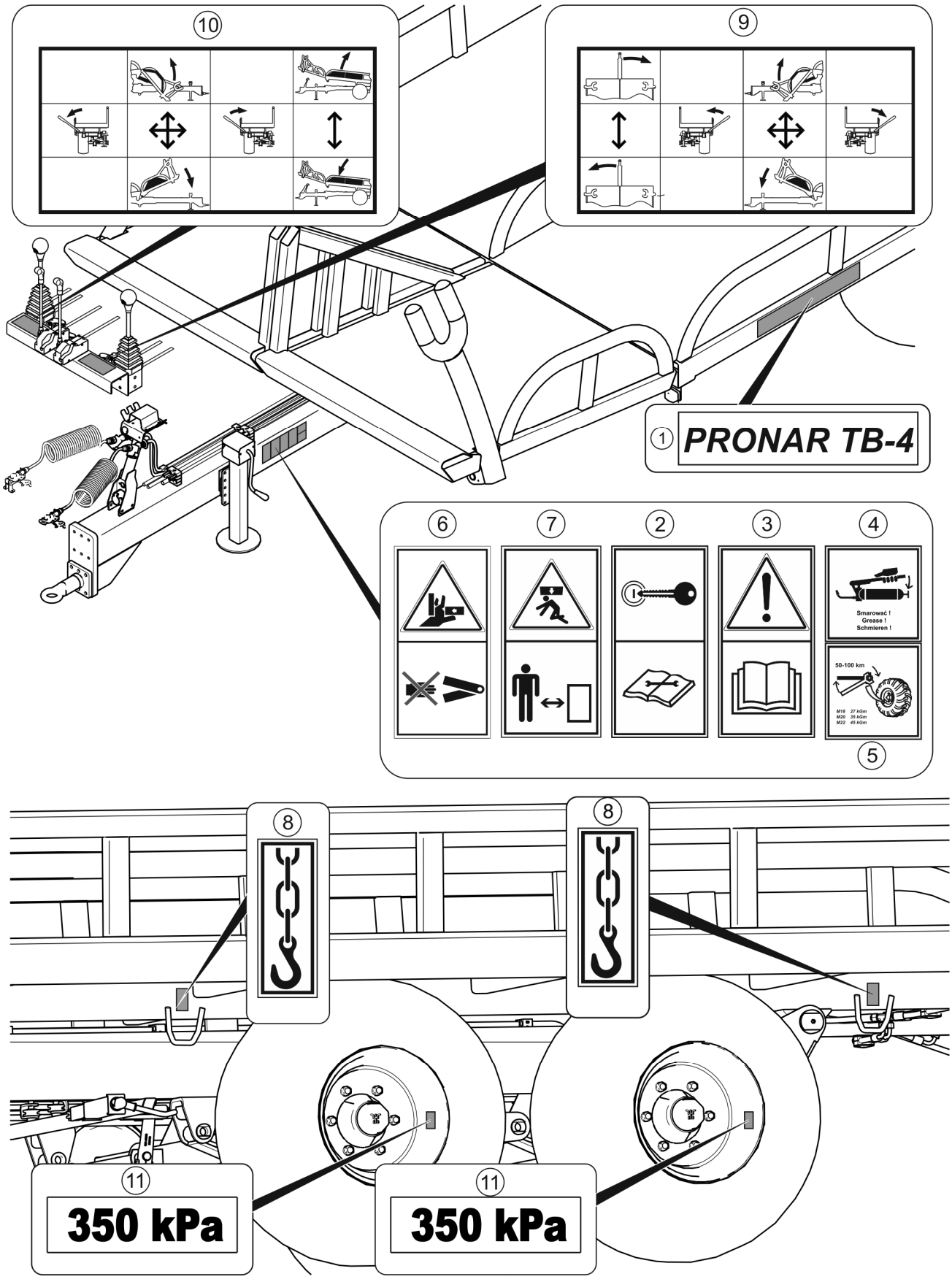


FIGURE 2.3 Arrangement of information and warning stickers

CHAPTER

3

CONSTRUCTION AND PRINCIPLE OF OPERATION

3.1 TECHNICAL CHARACTERISTICS

TABLE 3.1 Basic technical data of the TB-4 trailer

CONTENT	UNIT	DATA
Dimensions		
Total length	mm	8 940
Overall width	mm	2 720
Overall height	mm	1 980
Wheel track	mm	1 900
Platform internal dimensions		
- length	mm	6 910
- width	mm	2 550
Performance parameters		
Capacity	-	12 bales with Ø1200x1200 mm dimensions
Loading area	m^2	17.5
Platform height from the ground	mm	930
Weight and load capacity		
The trailer's karb weight	kg	3 500
Permissible gross weight	kg	10 500
Allowed package	kg	7 000
Loading of the drawbar hitch	kg	1 350
Other information		
Power demand	kW / KM	73 / 100
Electrical system voltage	V	12
Permissible design speed	km/h	30
Noise level	dB	below 70

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 rear part of the frame there are lugs (9) constituting pivot points when tilting the loading platform backwards.

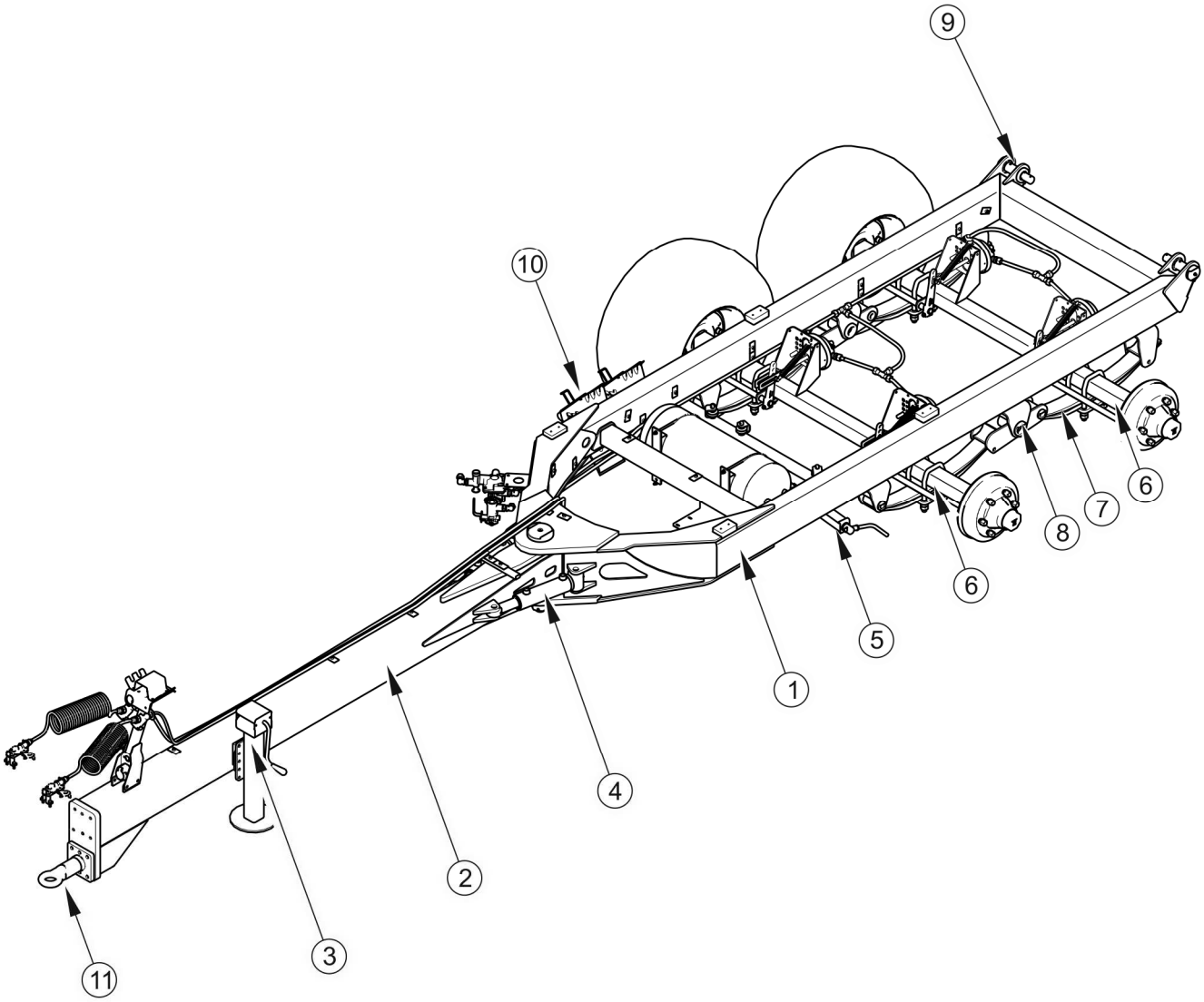


FIGURE 3.1 Trailer chassis

(1) lower frame, (2) drawbar, (3) mechanical support, (4), drawbar swing cylinder, (5) handbrake mechanism, (6) travel axle, (7) parabolic spring, (8) swingarm, (9) eye, (10) wheel chocks, (11) drawbar eye

In the front part of the chassis there is a torsion drawbar (2) to which the drawbar (11) is mounted (to choose: rotary drawbar Ø50 or rigid drawbar Ø 40). On the left side of the drawbar there is a mechanical support (3).

In the middle of the frame on the right-side wheel chocks (10) are placed, and on the left side the parking brake crank mechanism (5).

The trailer suspension consists of two driving axles (6) in a tandem arrangement on parabolic springs (7) connected by a swingarm (8). The axles are attached to the springs with a spring plate and U-bolts. They were made of a rod terminated with pins, on which road wheel hubs are mounted on tapered bearings. These are single wheels equipped with calliper brakes actuated by mechanical cam expanders.

3.2.2 LOADING PLATFORM

The trailer loading platform (1) is a welded structure. It consists of an upper frame welded of steel profiles, a floor, two side railings and one central railing. The platform is mounted on the lower frame - figure *(3.1)*. The tilting axis when tilting back is the pins located at the rear of the frame.

In the rear part of the platform is mounted tilted rear ladder controlled by hydraulic cylinders (2). The ladder is secured against falling down by means of fastening chains (5).

In the front part of the platform there are loading arms (3). These arms are used to collect and lift bales. The clamping device (4) is used to hold the bales when lifting them.

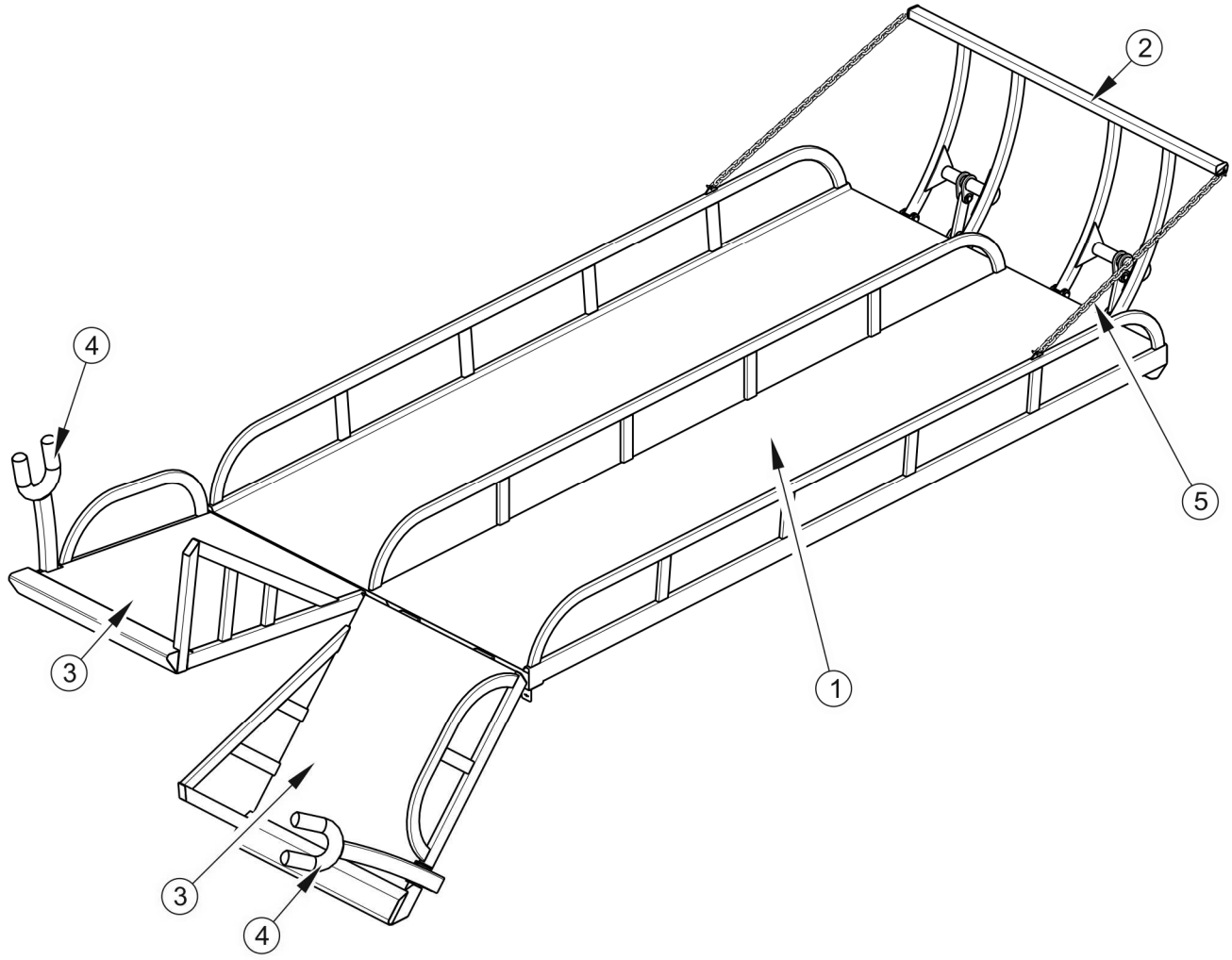


FIGURE 3.2 Loading platform

(1) loading platform, (2) rear ladder, (3) loading arm, (4) pressure arm, (5) fastening chain

3.2.3 SERVICE BRAKE

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

- double conduit pneumatic system with three-position regulator, figure *(3.3)*,
- hydraulic braking system, figure *(3.4)*.

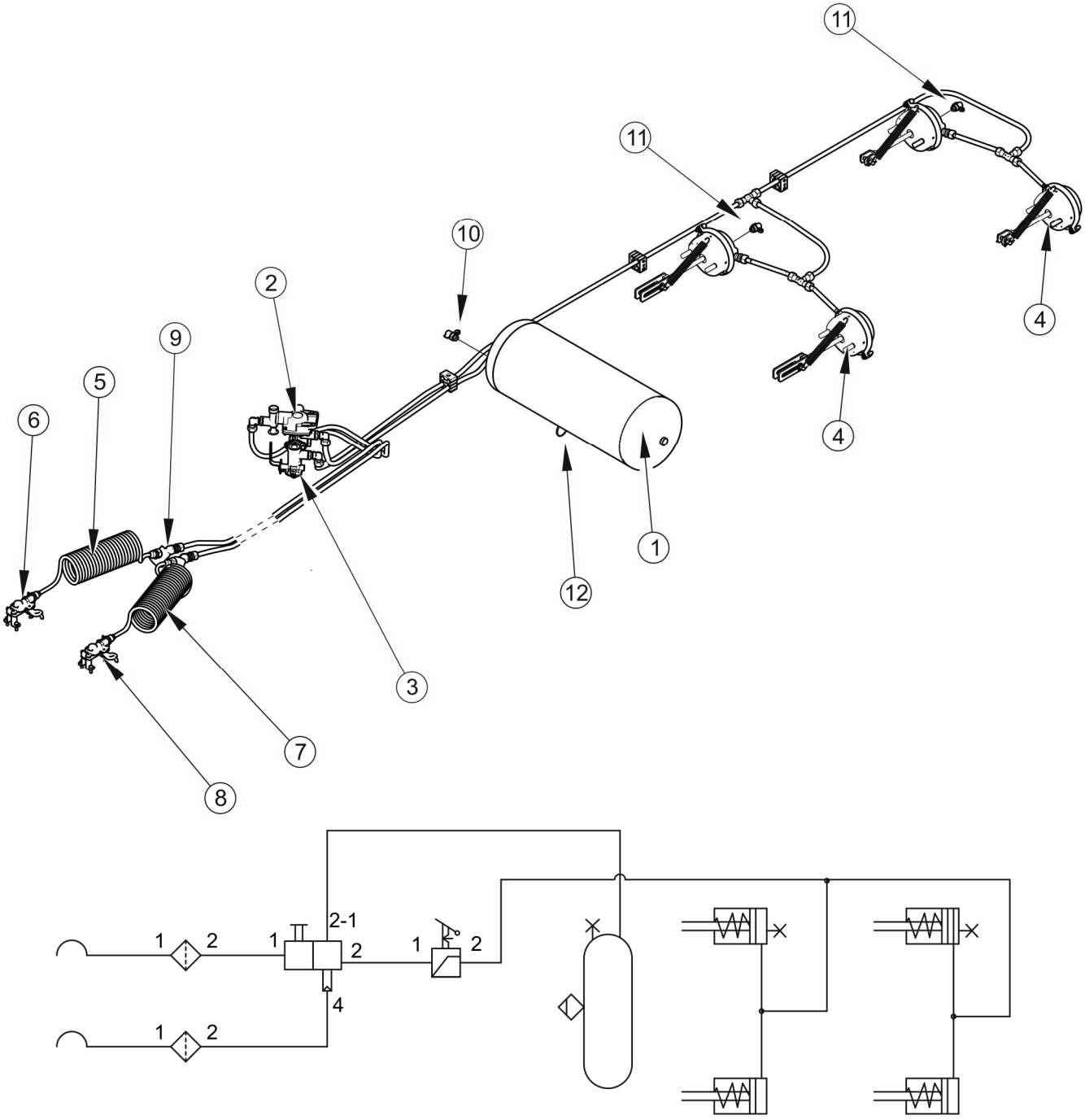


FIGURE 3.3 Construction and diagram of the dual-line pneumatic braking system

(1) air tank, (2) control valve, (3) braking force regulator, (4) pneumatic cylinder, (5) spiral hose (red), (6) hose connector (red), (7) spiral hose (yellow) , (8) hose connector (yellow), (9) air filter, (10) air tank control connector, (11) pneumatic cylinder control connector, (12) drain valve

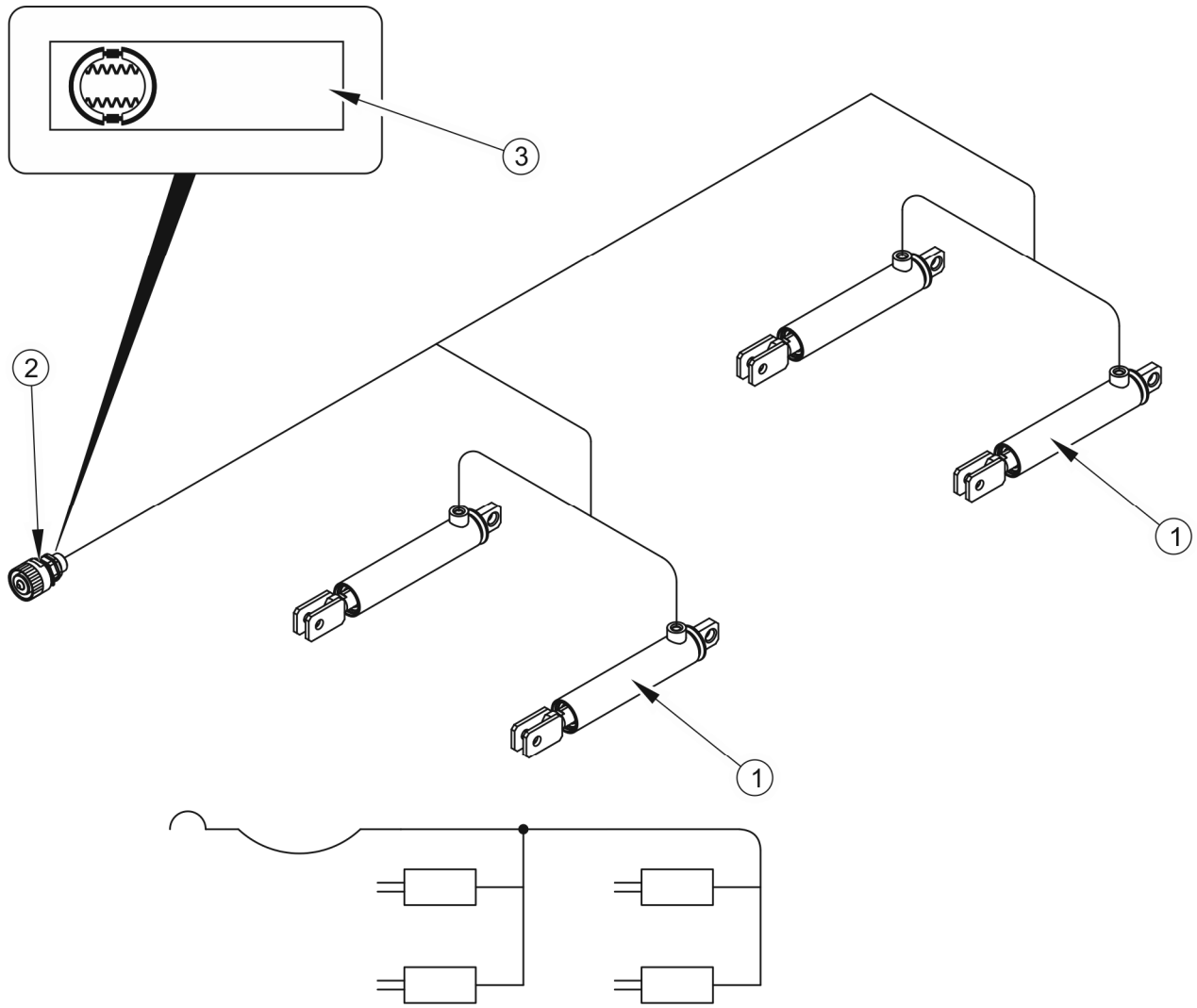


FIGURE 3.4 Construction and diagram hydraulic braking system

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

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 *(3.3)*,- 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 valve used has a brake release button, used when the trailer is disconnected from the tractor, compare Figure *(3.5)*. After connecting the air line to the tractor, the release device automatically adjusts to the position enabling normal operation of the brakes.

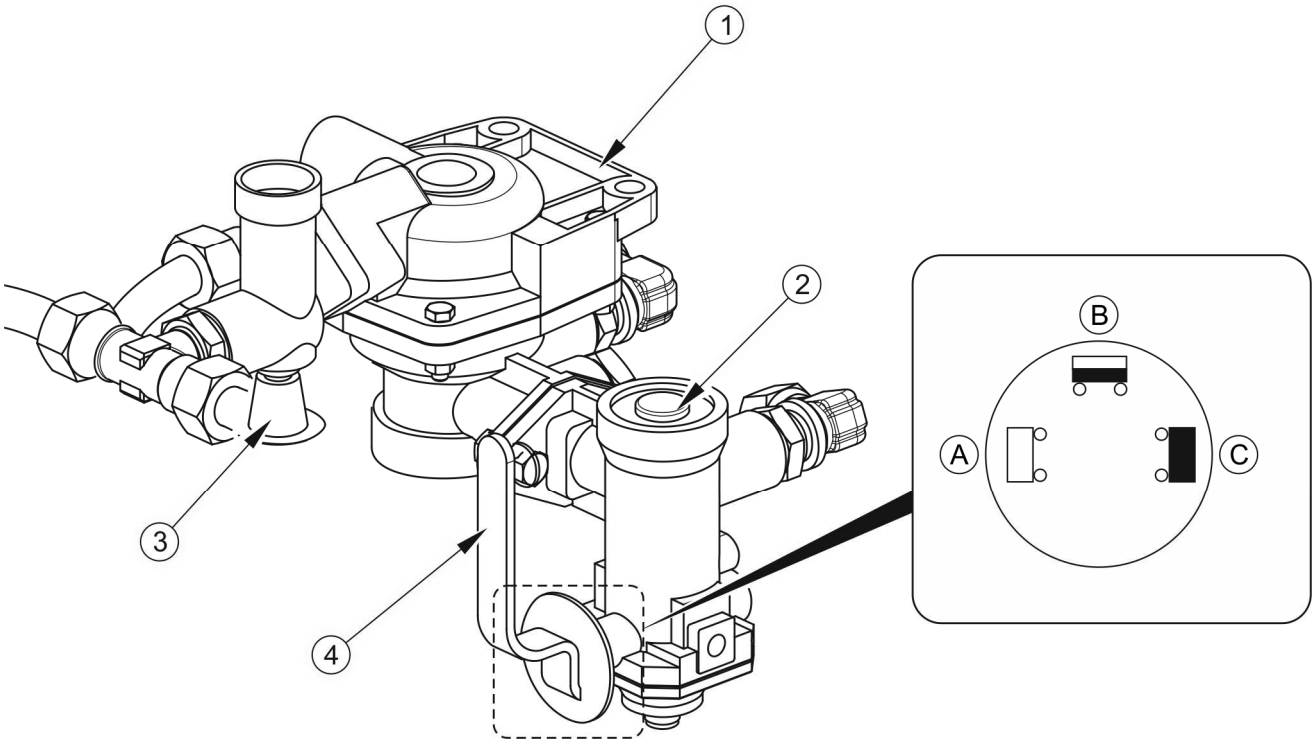


FIGURE 3.5 Control valve and braking force regulator

(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

Three-band braking force regulator (2) - figure *(3.5)*, 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'.

The main hydraulic brake (available as an option) is activated from the driver's cab by pressing the tractor brake pedal. To operate the hydraulic braking system an agricultural tractor with an appropriate hydraulic braking system is required.

ADVICE

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

3.2.4 PARKING BRAKE

The parking brake is used to immobilize and secure the trailer against rolling away when parked.

The brake crank mechanism (2) is welded to the left longitudinal member of the lower frame. A steel cable (3), routed through the wheels (4), connects the crank mechanism to the expander levers (1) of the front axle. Tensioning the cables (turning the crank mechanism clockwise) causes swinging of the expander levers, which by opening the brake shoes immobilize the trailer.

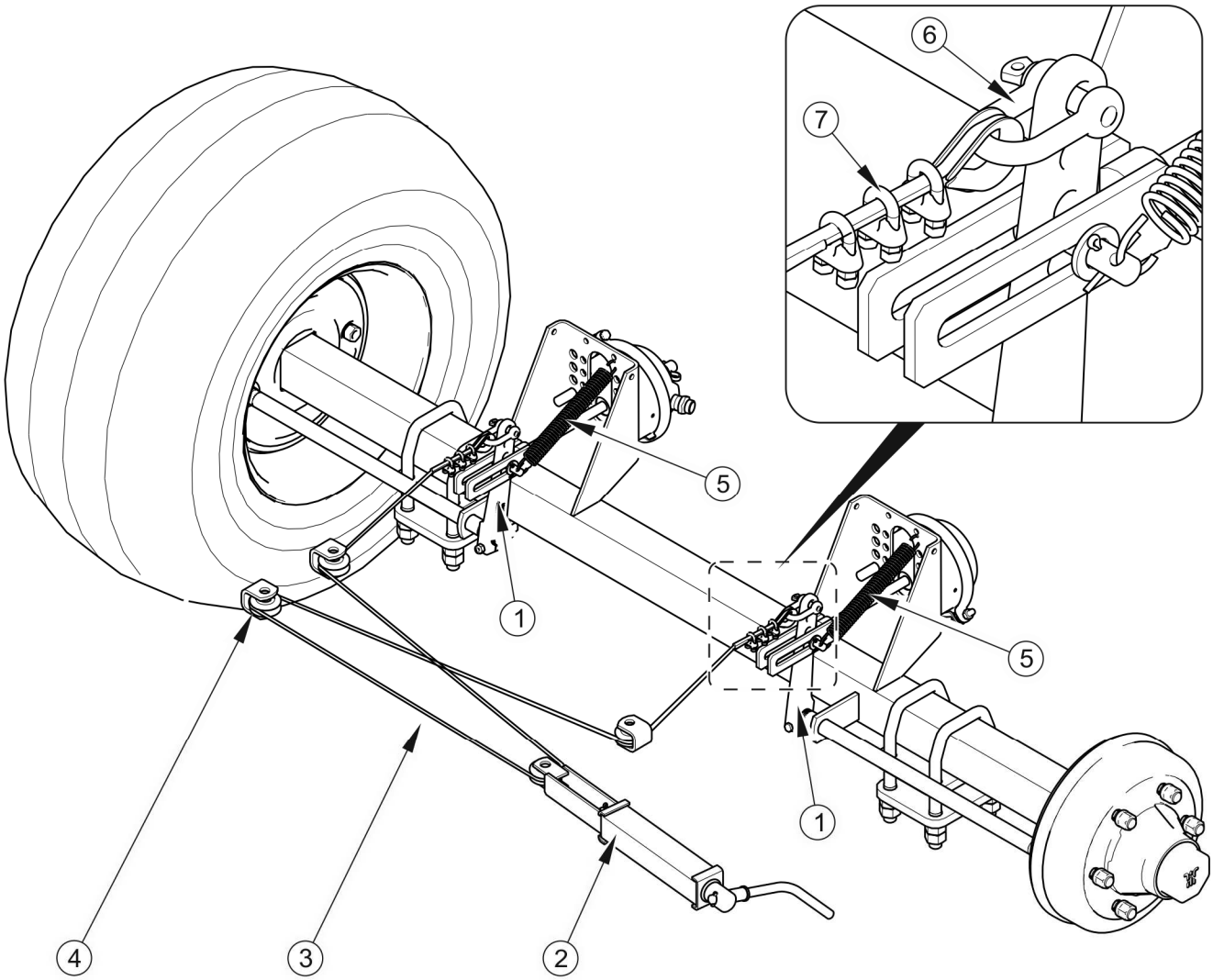


FIGURE 3.6 Parking brake construction

(1) spreader lever, (2) crank mechanism, (3) steel handbrake cable, (4) guide pulley, (5) spring, (6) shackle, (7) bow clamp

3.2.5 REAR LADDER HYDRAULIC SYSTEM

The TB-4 trailer is equipped with a hydraulic ladder control system (1). Thanks to this solution, the operator raises or lowers the ladder without leaving the tractor.

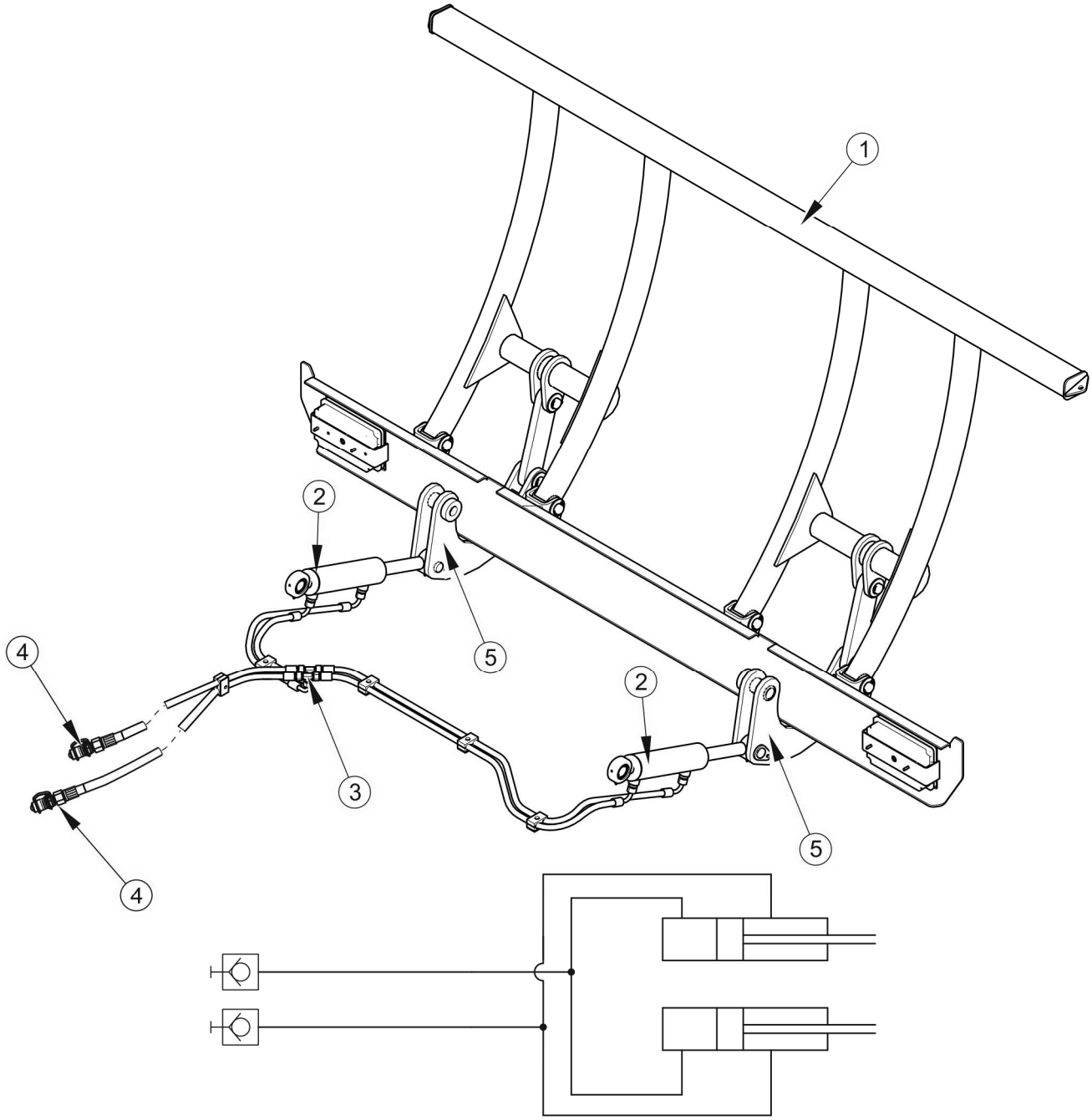


FIGURE 3.7 Construction and diagram of the rear ladder hydraulic system

(1) ladder, (2) telescopic cylinder, (3) T-connector, (4) quick coupling - plug, (5) steering arm

To control the system, use the lever of the external hydraulic distributor in the tractor. Changing the ladder position is carried out using two double-acting hydraulic cylinders (1) which by means of the control arm (5) cause the ladder to swing out.

CAUTION

Before unloading work requiring rear ladder control, the fastening chains must be removed. Failure to dismantle the chains may result in damage to the trailer.

ADVICE

The hydraulic ladder control hydraulic system was filled with L-HL32 Lotos hydraulic oil.

3.2.6 THE HYDRAULIC SYSTEM

The trailer's hydraulic system consists of six independent hydraulic circuits. A hydraulic distributor (11) is used to control the operation of individual circuits. The distributor is supplied from the tractor's external hydraulic sockets by means of the hydraulic hoses (1) and (2) equipped with connecting plugs. The pipe (2) coming out of the manifold equipped with a check valve is a return pipe which should be connected to the socket in the tractor with free oil drain "Free sink". Manifold operation is controlled by means of cables (4) using levers and joysticks located on the control bracket (3) - figure *(3.8)*. The control bracket is designed to be mounted in the driver's cab of an agricultural tractor.

The operation of individual sections of the manifold is illustrated by information stickers (1), (2), glued onto the bracket - figure *(3.10)*.

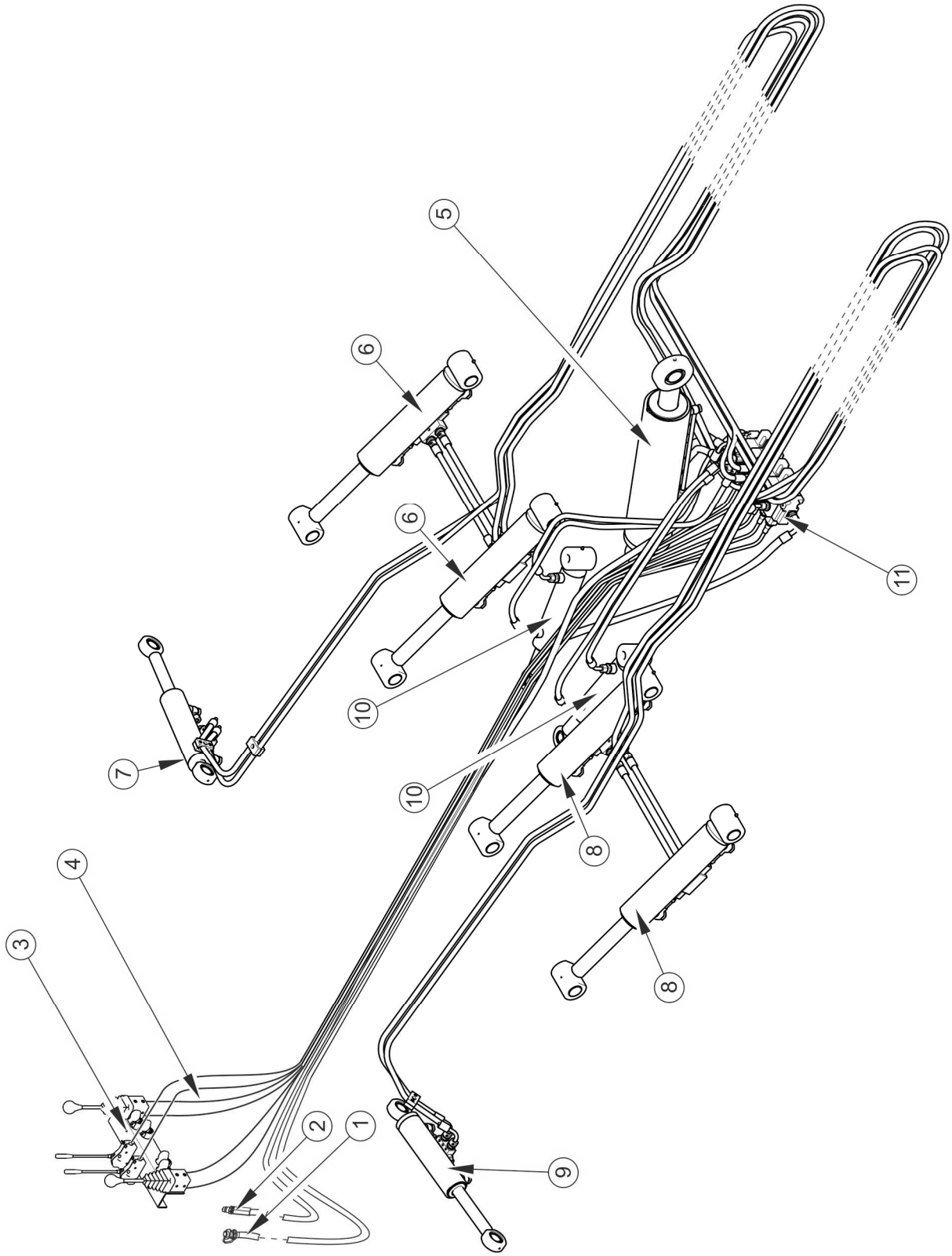


FIGURE 3.8 Construction of a hydraulic system

(1) power cord, (2) return hose, (3) control bracket, (4) control cable, (5) platform cylinder, (6) right loading arm cylinder, (7) right pressure arm cylinder, (8) cylinder left loading arm, (9) left pressure arm cylinder, (10) drawbar cylinder, (11) distributor

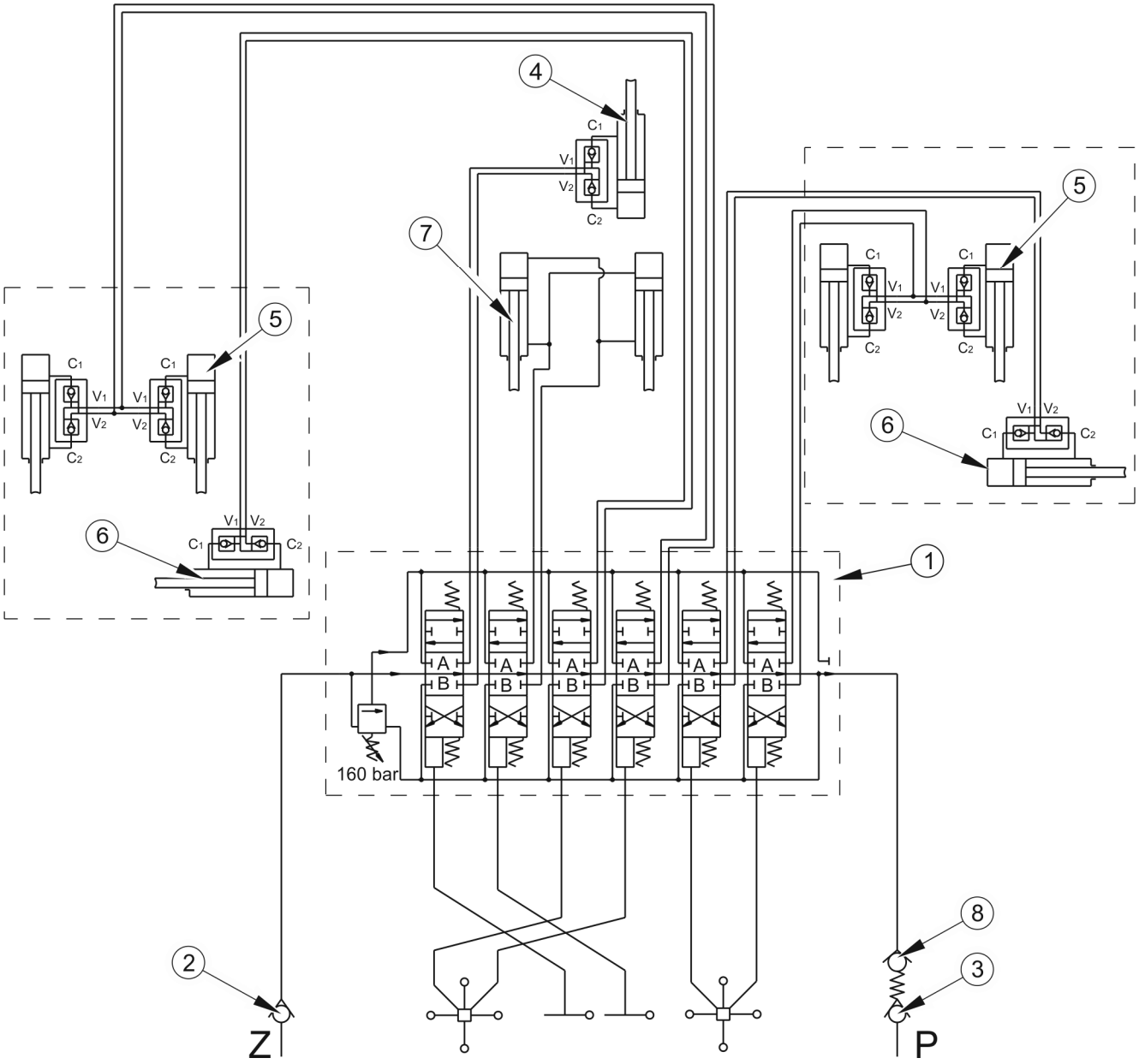


FIGURE 3.9 Diagram of the trailer hydraulic system

(1) hydraulic distributor, (2) quick coupling - supply, (3) quick coupling - return, (4) platform cylinder, (5) loading arm cylinder, (6) pressure arm cylinder, (7) drawbar cylinder, (8) valve return, (Z) supply, (P) return

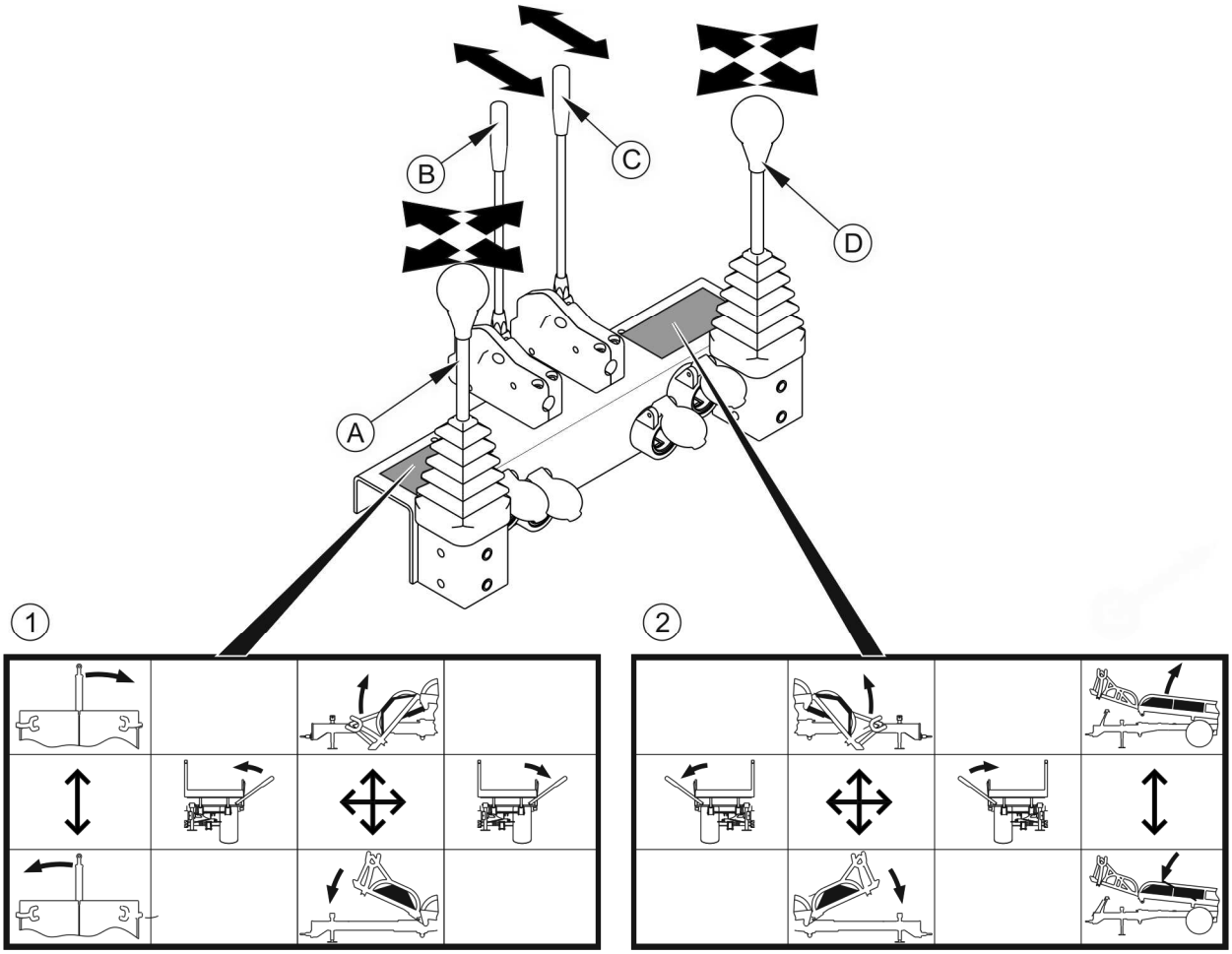


FIGURE 3.10 Elements and scheme of trailer operation control

(1), (2) information decals, (A), (B), (C), (D) - control levers

TABLE 3.2 Description of trailer control function

LEVER	MOVEMENT DIRECTION	SYSTEM (ACCORDING TO FIGURE 3.9)	FUNCTION
A	Front / rear	Actuators (6)	Raising / lowering the right loading arm
	Left / Right	Actuator (7)	Control of the right pressure arm
B	Front / rear	Actuators (10)	Drawbar position control
C	Front / rear	Actuator (5)	Raising / lowering the loading platform

LEVER	MOVEMENT DIRECTION	SYSTEM (ACCORDING TO FIGURE 3.9)	FUNCTION
D	Front / rear	Actuators (8)	Raising / lowering the left loading arm
	Left / Right	Actuator (9)	Control of the left pressure arm

The markings are in accordance with the markings in Figures (3.8) and (3.10)

CAUTION

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

CAUTION

The hydraulic distributor is equipped with a valve protecting the system against overload. It is forbidden to break seals and adjust factory settings.

3.2.7 LIGHTING INSTALLATION

The trailer's electrical installation is adapted to be powered by a 12 V DC source. LEDs are used as the light source for all trailer lamps. Impact guards were used as additional protection for the rear lamps.

Connecting the trailer's electrical system with the tractor should be made with a suitable connecting cable attached to the newly purchased trailer.

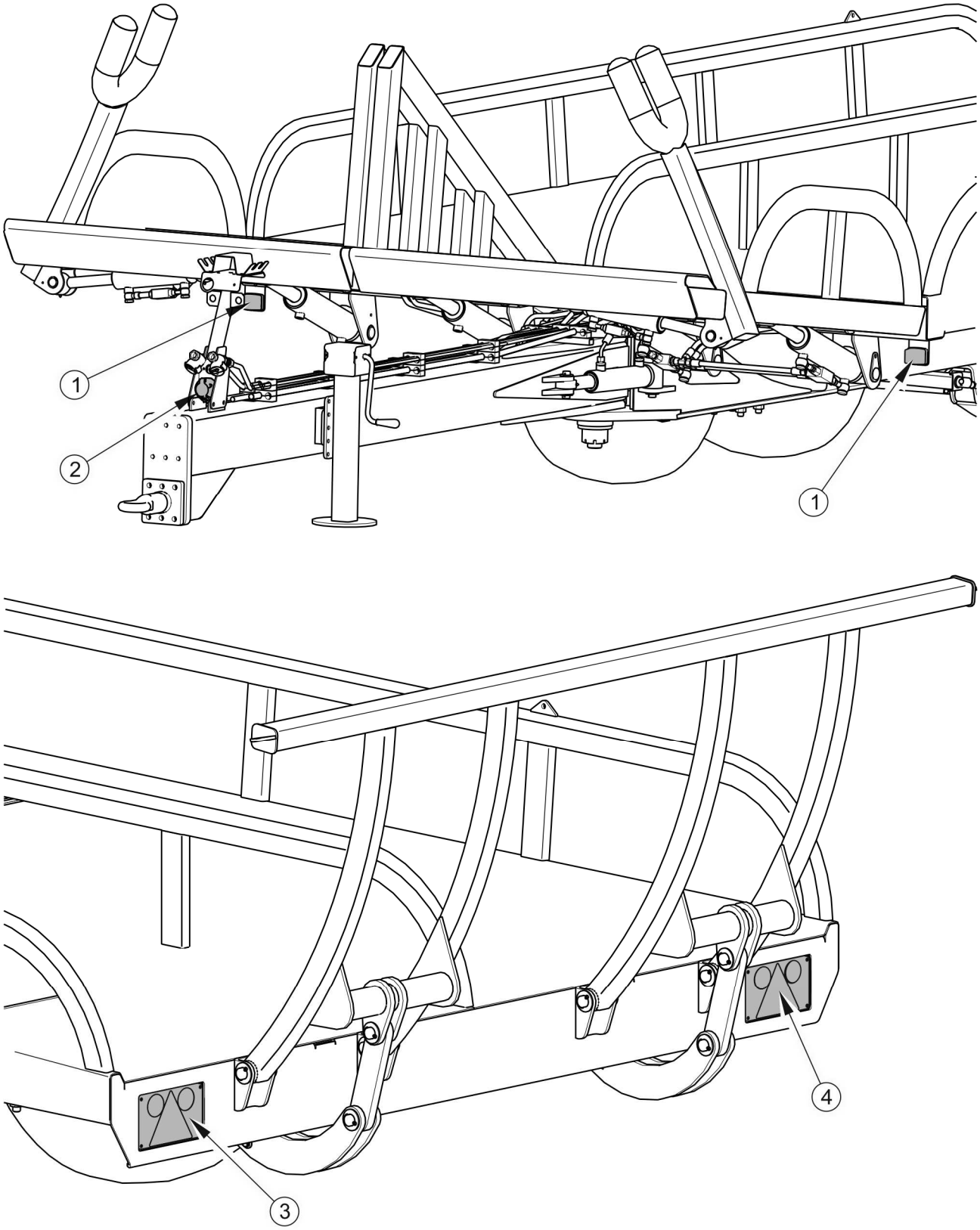


FIGURE 3.11 Arrangement of electric and reflective elements

(1) front position lamp, (2) 7-pin socket, (3) rear left composite lamp, (4) rear right rear lamp

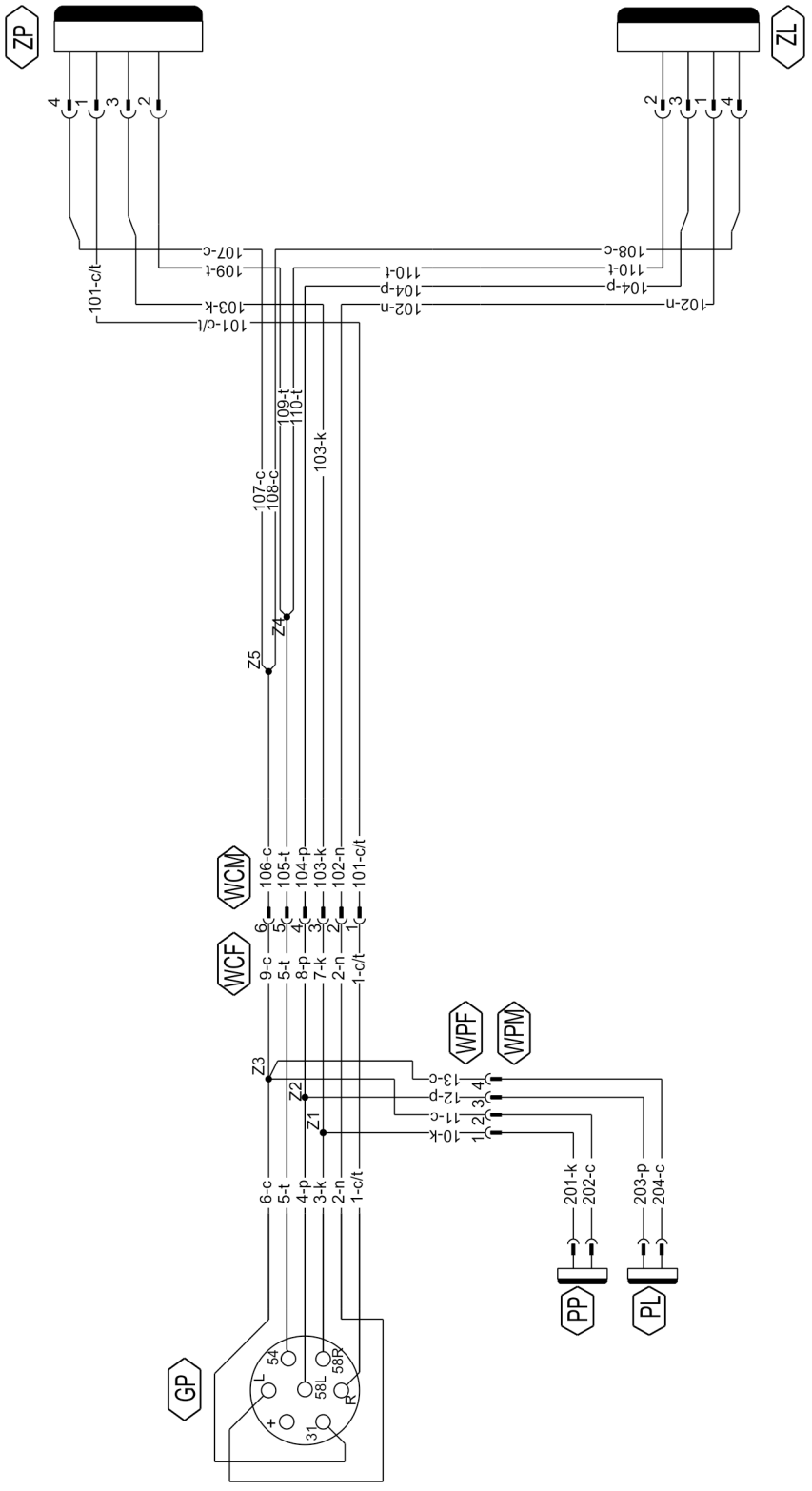


FIGURE 3.12 Electrical system schematic diagram

Designations according to the table (3.3) (3.4).

TABLE 3.3 List of electrical components markings

SYMBOL	FUNCTION
ZP	Multifunctional rear right lamp (LED)
ZL	Multifunctional rear left lamp (LED)
GP	Front seven-pin socket
PP	Multifunctional front right lamp (LED)
PL	Multifunctional front left lamp (LED)

TABLE 3.4 Colour coding of wires

MARKING	COLOUR
C	Black
K	Red
N	Blue
P	Orange
T	Green
C/T	Black-green

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 trailer 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 hydraulic 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 position of the trailer drawbar eye or the position of the tractor's upper transport hitch.
    - ⇨ a detailed description can be found in chapter 5.10.

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 platform). 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.
- ➡ By activating individual lights, check the correct operation of the electrical system.
- ➡ Run and check the correct operation of the rear ladder control system.
    - ⇨ Unlock the chains before starting.
    - ⇨ Make a few moves with the appropriate lever of the external hydraulic system on the tractor and check the correct operation.
- ➡ Operate and check correct operation of all trailer hydraulic control systems.

⇨ Use each lever on the control bracket to make a few moves and check for proper operation.

➡ When moving off check the operation of the service brake.

➡ Perform a test drive.

ADVICE

Maintenance operations: connecting/disconnecting from the tractor, adjustment of the drawbar position, are described in detail in the further part of the manual in chapters 4 and 5.

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.
- ➡ Set the height of the drawbar eye using the parking stand or the height of the tractor's transport hitch at such a height that it is possible to connect 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 coupling is used in the agricultural tractor, make sure that the aggregation operation is completed and the drawbar eye is secured.
- ➡ Raise the parking stand.
  - ⇨ After coupling the vehicle, the support should be raised so that it does not hit the ground or any other obstacle.
- ➡ 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.

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

- ⇨ The hydraulic brake system hose is marked with an information sticker (12) - table (*2.1*).

➡ Connect hydraulic system hoses.

- ⇨ Return pipe coming out of the manifold equipped with a non-return valve should be connected to the socket on the tractor with free oil drain "Free sink". Connect the supply hose coming out of the manifold to the tractor's external hydraulic socket.
- ⇨ The hydraulic system pipes used to control the rear ladder are marked with black plugs. They should be connected to one section of the tractor's external hydraulics.

➡ Connect the main power supply cable for the lighting installation.

➡ Place the control bracket in the tractor cabin.

- ⇨ Mount in such a place that it can be freely controlled.

DANGER

Before connecting the individual installation cables, read the tractor manual and follow the manufacturer's instructions.

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.

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

Pay attention to the compatibility of oils in the tractor hydraulic system and in the hydraulic system of the trailer system.

The trailer may only be coupled with such an agricultural tractor that has a suitable transport 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.
- Switch off the tractor engine. Close the tractor cabin and secure it against unauthorized access.
- Reduce residual pressure in the hydraulic system by moving the appropriate hydraulic circuit control lever on the tractor.
- Disconnect all hydraulic system lines and put in appropriate sockets. Protect plugs of these wires against contamination by putting on caps.
- 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 hydraulic brake system hose (applies to trailer version with hydraulic brake system).
    - ⇨ Disconnect the hydraulic supply hose.
- Secure the cable ends with plugs. Insert the plugs into their respective sockets.

➡ Lower the parking stand.

➡ 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 rear wheel - see chapter 2.

➡ Release the tractor hitch, disconnect the trailer drawbar eye and drive away with the tractor.

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 LOADING

Before loading bales, make sure that the trailer is correctly connected to the tractor. Harvested bales must be placed perpendicular to the direction of travel.

Loading takes place through the ramp under the loading arm (2) or (3) - figure (*4.1*) and picking it up from the ground. The bale moves to the rear of the trailer by gravity on an inclined plane by raising the loading platform upwards using a distributor.

The bales should be loaded in the order described below:

➡ Set the drawbar in the correct direction.

⇨ The drawbar is controlled by means of the lever (B) - figure (3.10).

➡ Raise the loading platform to a suitable height, which should be determined experimentally.

⇨ The lifting of the platform is controlled by means of the lever (C) - figure (3.10).

⇨ In the case of poorly formed or poorly pressed bales, the platform should be raised until the bale rolls.

- Lower the loading device (arm) from the side to be loaded, maintaining a distance from the ground of 5-10 cm.
    - The right loading arm is controlled with the lever (A) in the forward / backward direction - figure (3.10).
    - The left loading arm is controlled with the lever (D) in the forward / backward direction - figure (3.10).
- Drive the tractor to the bale so that it can be pressed with the pressure arm.
    - The right pressure arm is controlled by means of the lever (A) in the left/right direction (3.10).
    - The left pressure arm is controlled by means of the lever (D) in the left/right direction (3.10).
- Press the bale with the pressure arm.
- Raise the bale with the loading arm until it is in a position where it can roll back automatically.
- Unlock the pressure arm (the bale should roll gently onto the loading platform).

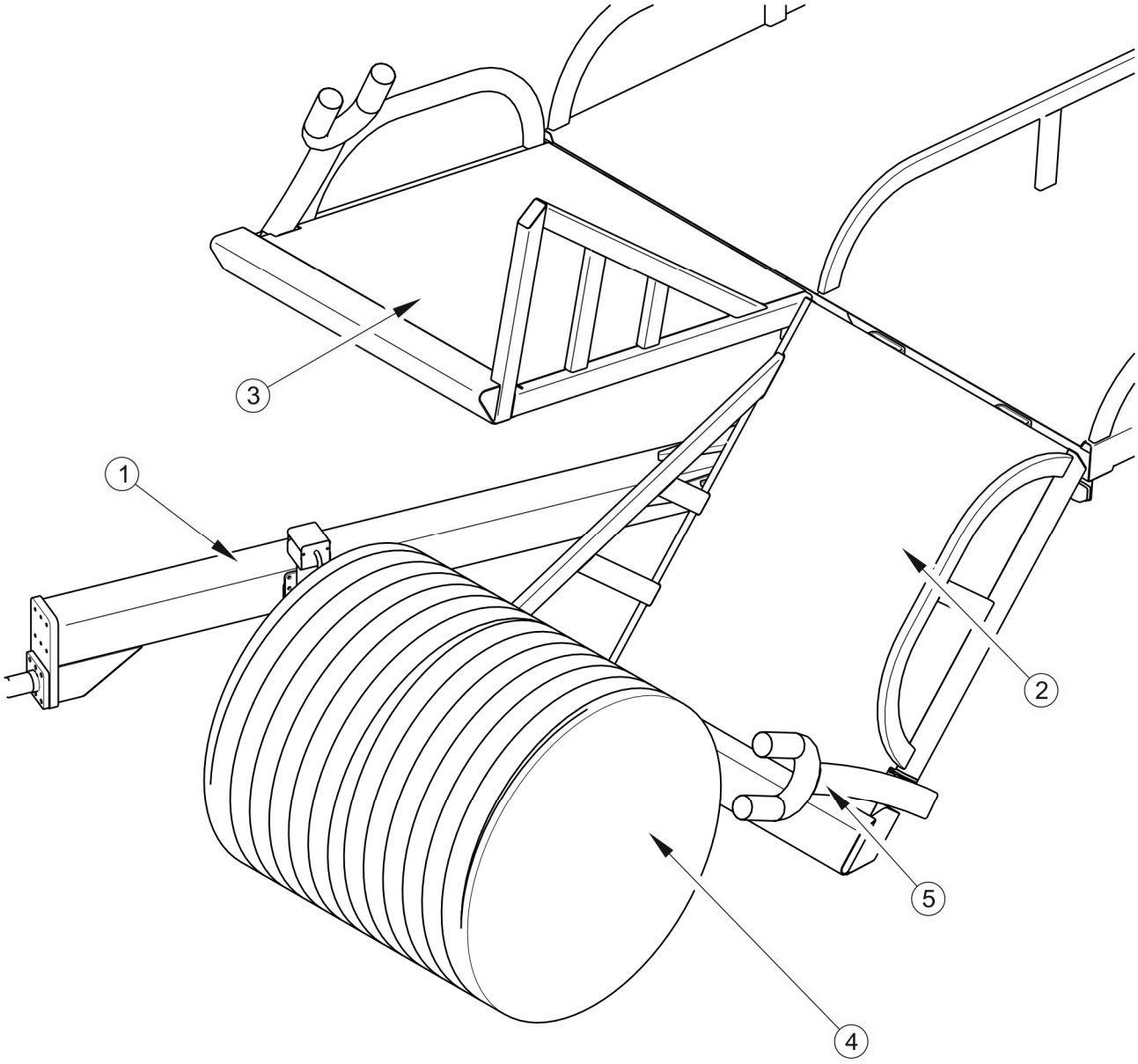


FIGURE 4.1 Bale loading

(1) drawbar, (2) left loading arm, (3) right loading arm, (4) bale, (5) pressure arm

DANGER

Make sure that there are no bystanders in the unloading/loading area. Before unloading, ensure proper visibility and make sure that there are no bystanders nearby.

CAUTION

The bales should be evenly distributed on both sides of the loading platform. Loading bales only to one side of the platform may cause the trailer to tip over. The trailer's maximum carrying capacity must not be exceeded.

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

The trailer load must be secured against slipping and road pollution during transit. If it is not possible to properly secure the load, it is forbidden to transport this type of material.

During loading operations pay special attention not to collide the loading arm with the trailer's drawbar.

4.4 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.
- The trailer must not be overloaded, the load must be distributed evenly in such a way that it does not exceed the permissible pressure on the trailer's running gear. 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.
- During transport, the rear ladder must be secured against falling down using fastening chains.
- When traveling on public roads, the trailer must be marked with a slow-moving vehicle warning sign located on the rear ladder.

- 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 laden trailer 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.
- 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.

4.5 UNLOADING

The trailer is equipped with a hydraulic installation for lifting the loading platform and a hydraulically controlled rear tilting ladder. This solution allows quick unloading of bales.

Unloading the trailer should be done in the order described below:

- Before unloading work requiring control of the rear ladder, the fastening chains must be removed. During disassembly no one may be in the field of operation of the rear ladder,
- the tractor and trailer should be placed for straight ahead on flat and hard terrain,
- using the divider lever in the operator's cabin cause the rear ladder to open,
- raise the loading platform to a suitable height (so that the bales roll off the platform),
    - ⇨ The lifting of the platform is controlled by means of the lever (C) - figure (3.10).
- after unloading, lower the loading platform, close the rear ladder and drive away.

CAUTION

Before unloading work requiring control of the rear ladder, the fastening chains must be removed. Failure to dismantle the chains may result in damage to the trailer.

It is forbidden to tilt the loading platform during strong gusts of wind.

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

It is forbidden to jerk the trailer during unloading.

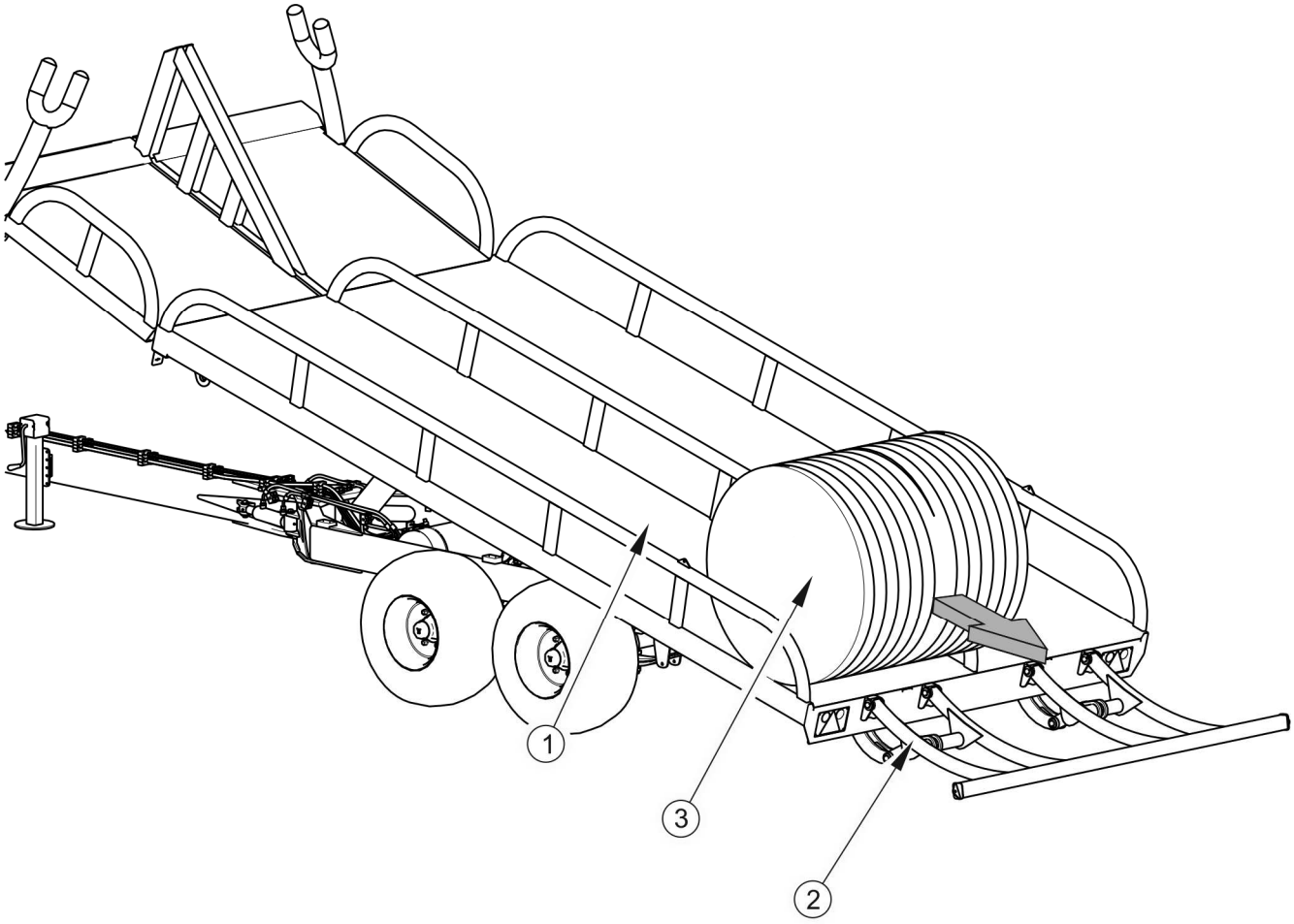


FIGURE 4.2 Platform unloading

(1) loading platform, (2) rear ladder, (3) bale

DANGER

Tilting the loading platform may only be performed on firm and level ground.

When removing the fastening chains, nobody may be in the field of operation of the rear ladder. Take special care.

Make sure that during unloading nobody is near the tilted platform and sliding bales.

Tilting the loading platform may be performed only when the trailer is connected to the tractor.

Take special care when unloading. It is forbidden to tip the load platform on uneven and wetland, as well as to move and jerk the trailer during unloading. Be careful and calm during your work. Careless handling of the trailer may pose a threat to operators and bystanders, and may also damage the machine.

4.6 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.
- Inspection of nut tightening should be carried out after the first use of the trailer, after the first journey with a load and then every 6 months of use, or every 25,000 km. In the event of intensive work, check the nut tightening at least every 10,000 kilometres. Each time, the inspection activities should be repeated if the trailer wheel has been disassembled.
- 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.
- Tire valves should be protected with caps to avoid penetration of dirt.
- 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.

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 vehicle service stations.

5.2.2 CHECKING THE CLEARANCE OF THE AXLE BEARINGS

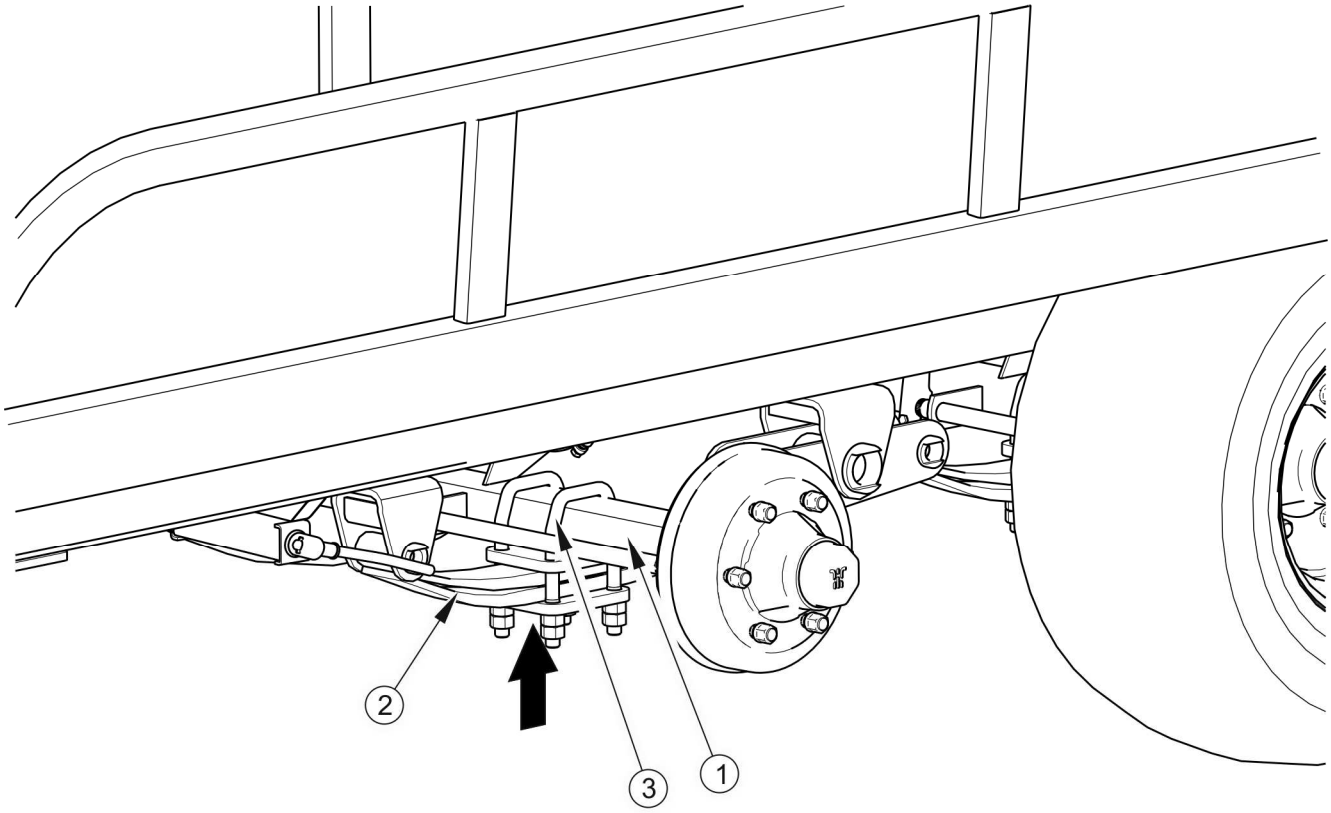


FIGURE 5.1 Hoist support point

(1) driving axle, (2) spring, (3) U-bolt

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
- ➡ Locking wedges should be placed under the trailer wheel opposite to the lift wheel. Ensure that the trailer will not roll during inspection.
- ➡ Raise the wheel (located on the opposite side of the placed wedges).
  - ⇨ It is recommended to place the jack between the bow bolts (3) - figure *(5.1)*, fixing the axle (1) to the spring (2). The support point is marked with an arrow. The lift must be suited to the machine 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 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.

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

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.**

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

- 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.

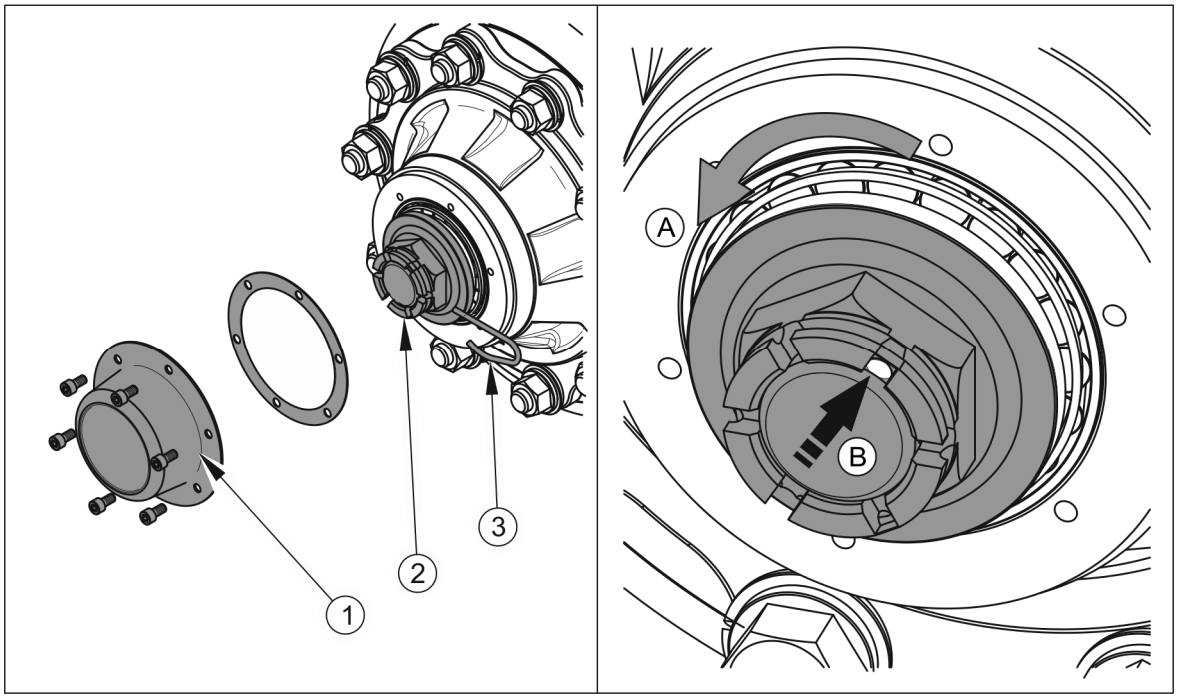


FIGURE 5.2 Adjustment of axle bearings

(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 wedges under the rear wheel.
- 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.

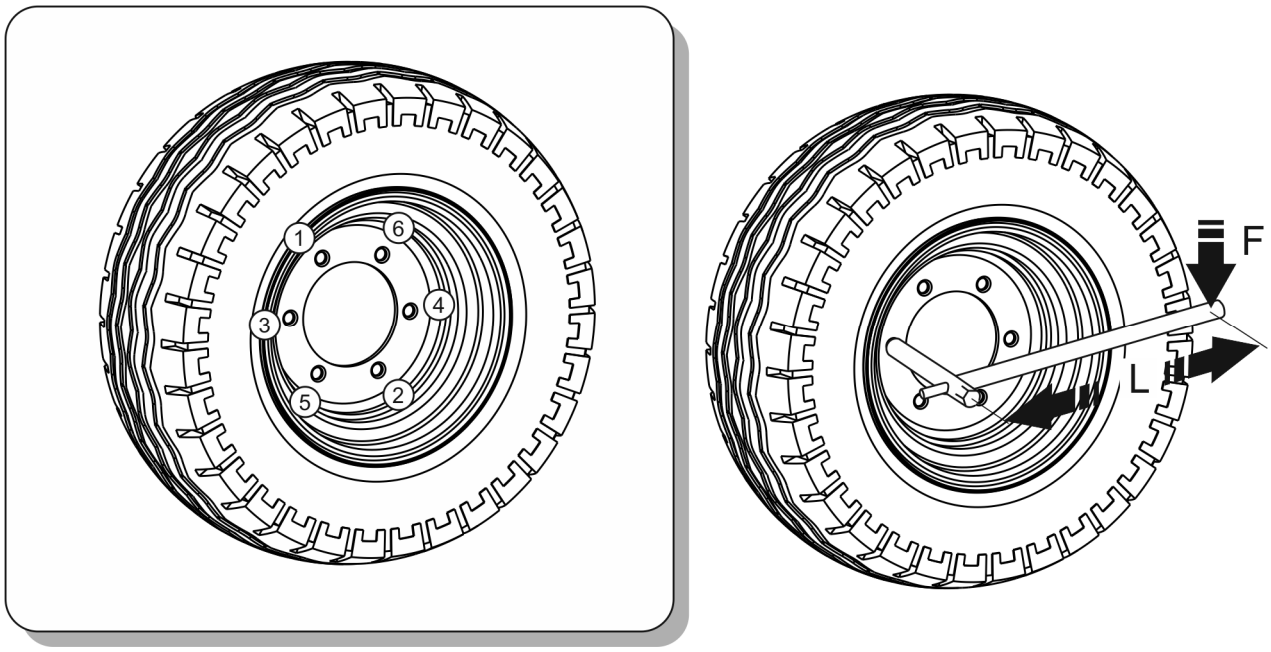


FIGURE 5.3 Order of nuts tightening, axles with 6 pins M18x1.5

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

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.

Checking wheel axle tightening:

- **after the first use of the trailer,**
- **after the first trip with a load,**
- **after covering the first 1,000 km,**
- **every 6 months of use or 25,000 km.**

All operations should be repeated if the wheel was disassembled.

ADVICE

Wheel nuts should be tightened to 270 Nm - M18x1.5 nuts.

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.

TABLE 5.1 Key arm selection

TIGHTENING TORQUE	BODY WEIGHT (F)	ARM LENGTH (L)
[Nm]	[kg]	[m]
270	90	0.3
	77	0.35
	67	0.4
	60	0.45

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,**
- **every week in case of intensive use,**
- **after changing the wheel.**

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)*.

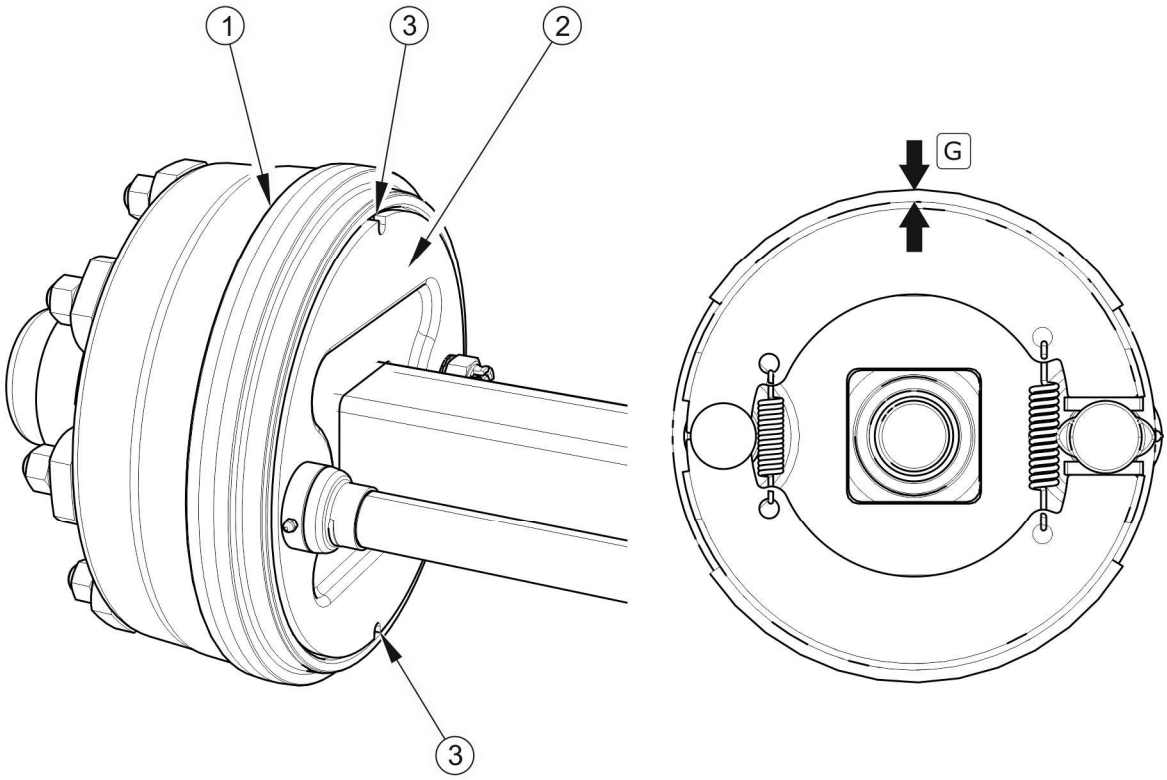


FIGURE 5.4 Brake lining control

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

ADVICE

The minimum thickness of the brake linings is 2 mm.

- **The lining thickness should be checked every 6 months.**

5.2.7 ADJUSTMENT OF MECHANICAL BRAKES

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

ADVICE

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

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 piston rod fork (6) must be mounted on the expander arm (1) so that when fully braked the angle of operation is approx. 90 °.

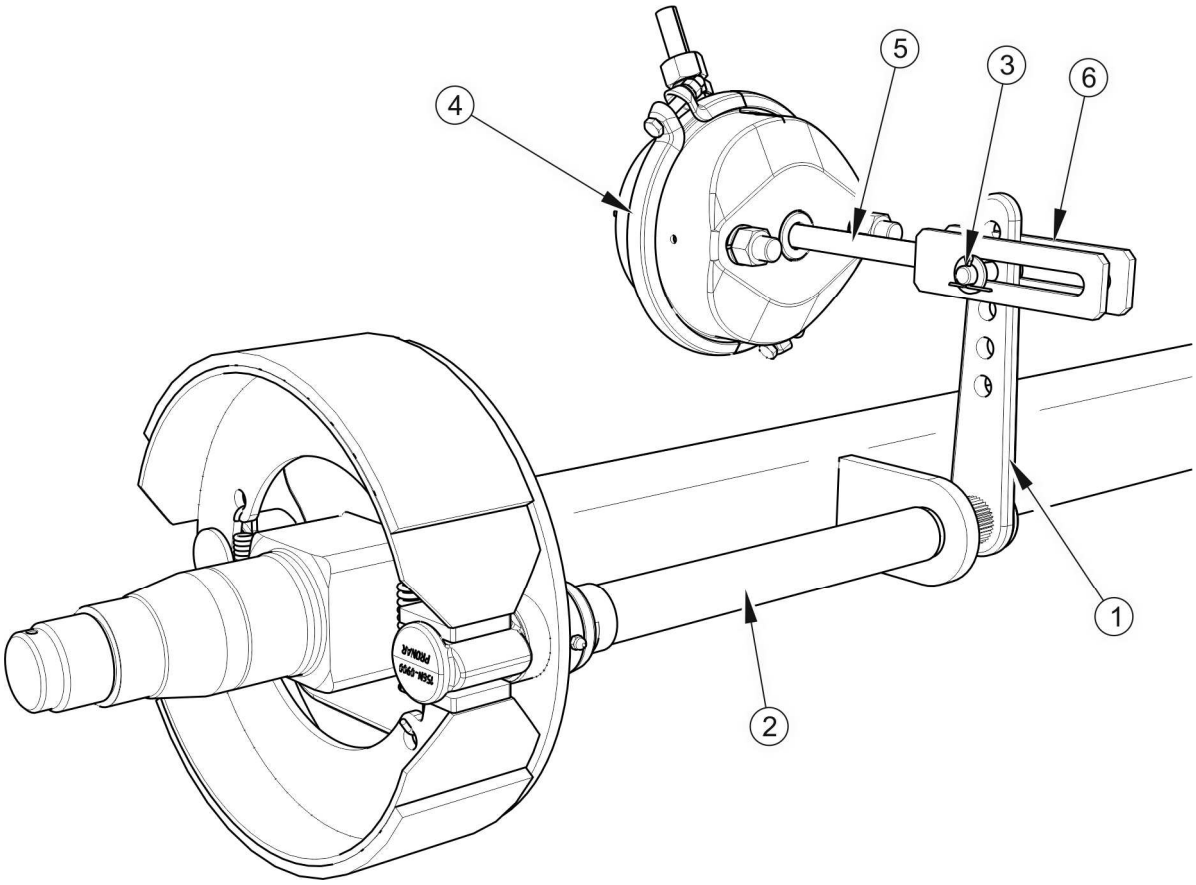


FIGURE 5.5 Construction of axle brake

(1) expander arm, (2) expander shaft, (3) fork bolt, (4) brake cylinder, (5) cylinder piston, (6) cylinder fork

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.

TABLE 5.2 Pneumatic cylinder operational data

NOMINAL ACTUATOR OPERATING RANGE L [mm]	MINIMUM CYLINDER STROKE L_{MIN} [mm]	MAXIMUM CYLINDER STROKE L_{MAX} [mm]
75	25	45

- **Every 6 months check the technical condition of the brake**

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 the trailer with wheel chocks.
- ➡ On the piston rod (1) of the cylinder mark with a line (A) the position of the maximum retraction of the piston rod with the trailer brake off - figure *(5.6)*.
- ➡ Press the brake pedal on the tractor, mark with a line (B) the position of maximum extension of the piston rod.

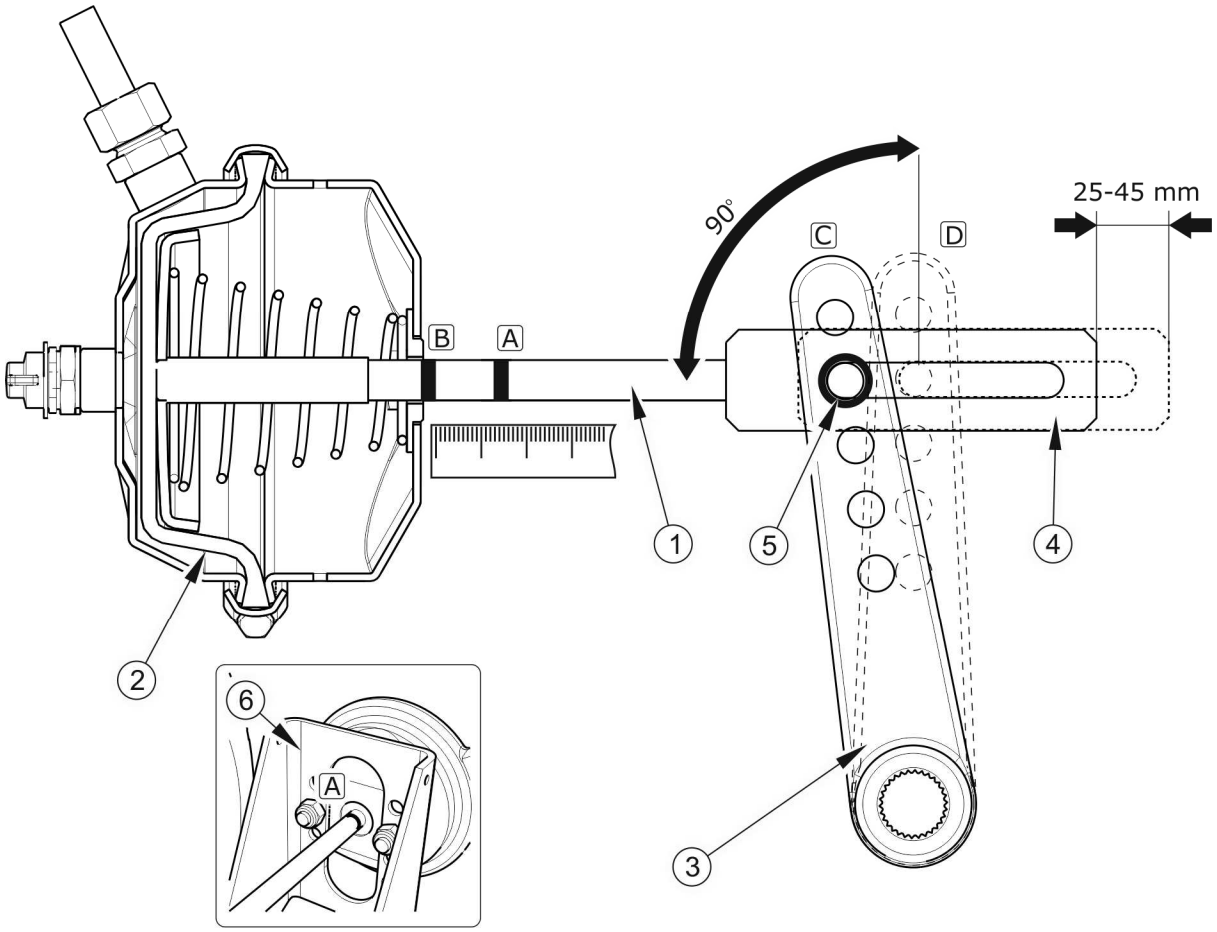


FIGURE 5.6 Brake adjustment principle

(1) cylinder piston rod, (2) cylinder diaphragm, (3) expander arm, (4) cylinder fork, (5) fork pin position, (6) cylinder bracket, (A) mark on piston rod in unlocking position, (B) mark on piston rod in full braking position, (C) arm position in unbraked position, (D) arm position in full braked position

- ➡ 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 (5) of the cylinder fork (4) 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 (6).
- ➡ Remove the expansion ring securing the expander arm.
- ➡ Adjust the expander arm so that the marked hole of the expander arm coincides with the opening 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.
- ➡ Repeat the adjustment on the second cylinder on the same axis.
- ➡ Apply the brake.
- ➡ Wipe previous markings and measure piston rod stroke again.
- ➡ If the piston rod stroke is not within the correct operating range, repeat the adjustment.

- **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.

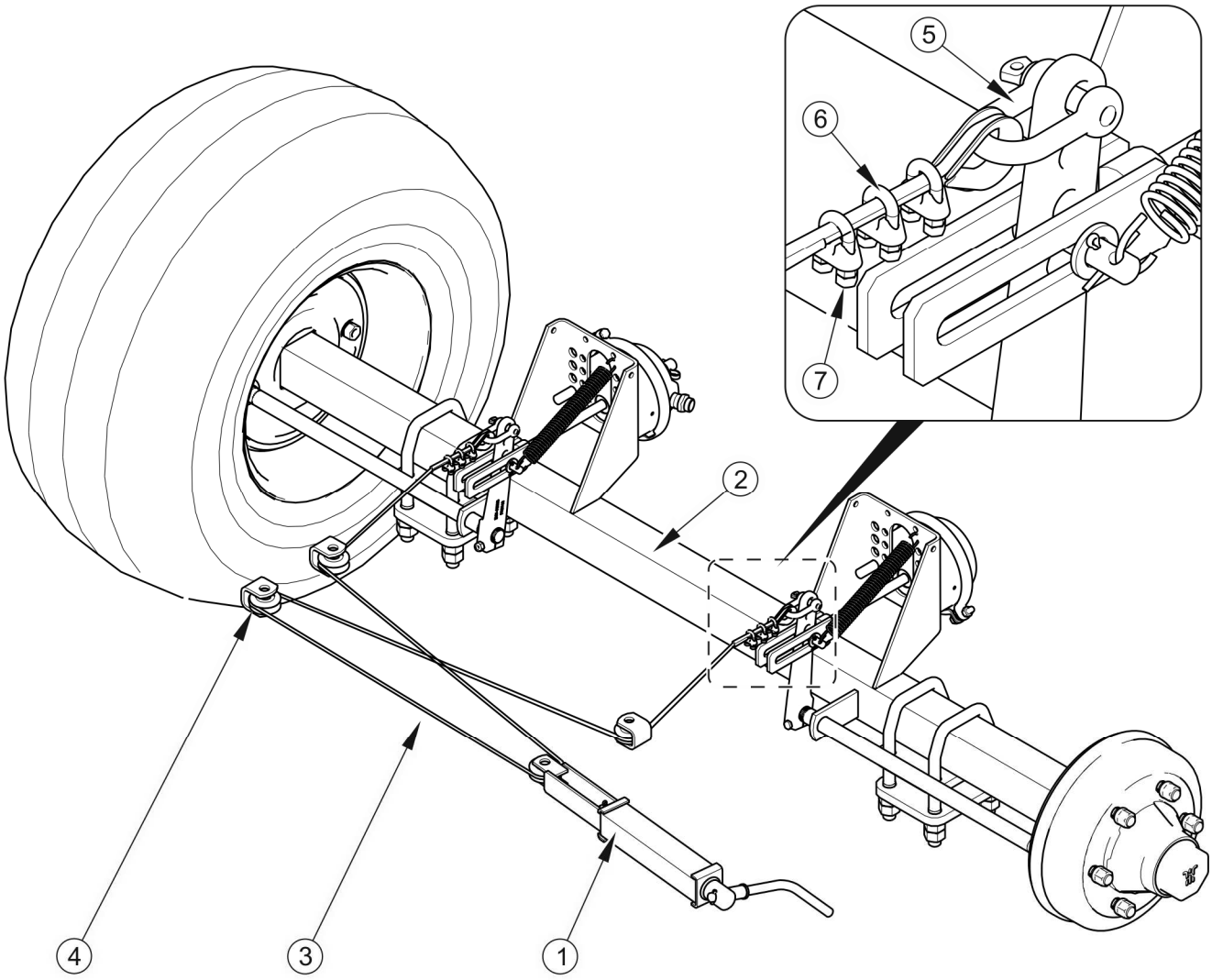


FIGURE 5.7 Adjustment of parking brake cable tension

(1) brake crank mechanism, (2) travel axle, (3) handbrake cable, (4) guide pulley, (5) shackle, (6) bow clamp, (7) clamping nuts

Parking brake cable replacement

- ➡ Hitch trailer to tractor. Hitch trailer to tractor.
- ➡ Place the trailer and tractor on a level surface.
- ➡ Unscrew the brake crank bolt (1) as far as possible.
- ➡ Loosen the nuts (7) of the bow clamps (6) at the ends of the cable (3).
- ➡ Remove the shackles (5).
- ➡ Remove the parking brake cable (3).

- Clean the parking brake components, grease the crank mechanism and the guide wheel pins (4).
- Install a new cable, adjust cable tension.
  - 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-bearing cable side (longer cable length) - see 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.

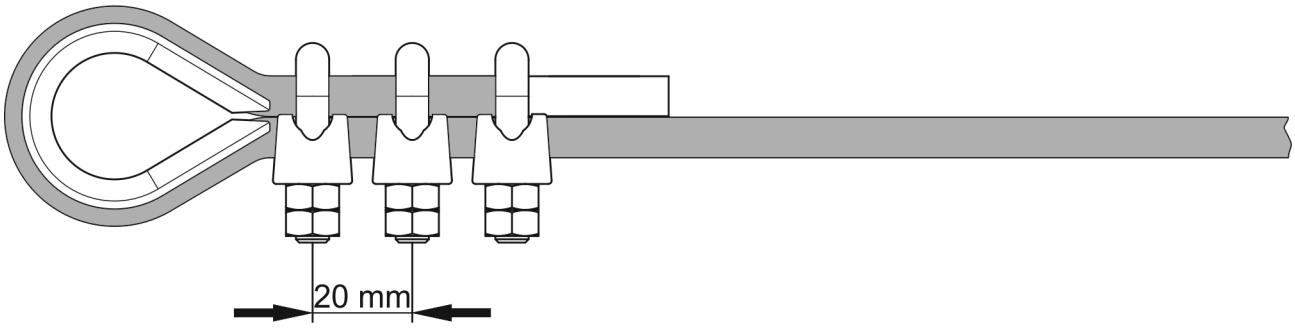


FIGURE 5.8 Installation of steel cable clamps

Adjustment of parking brake cable tension

- Hitch trailer to tractor. Hitch trailer to tractor.
- Place the trailer and tractor on a level surface.
- Unscrew the screw of the brake mechanism (1) maximally - figure *(5.7)*, (counterclockwise).
- Loosen the nuts (7) of the bow clamps (6) of the handbrake cable (3) on the brake mechanism side (1).
- 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.

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 control and/or adjustment:

- **every 12 months.**
- **in case of emergency.**

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 installation tightness and visual inspection of the installation,
- 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 rear wheel of the trailer.
- ➡ Start the tractor to supplement the air in the trailer braking system tank.
  - ⇨ In double conduit systems, the air pressure should be around 6.5 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.

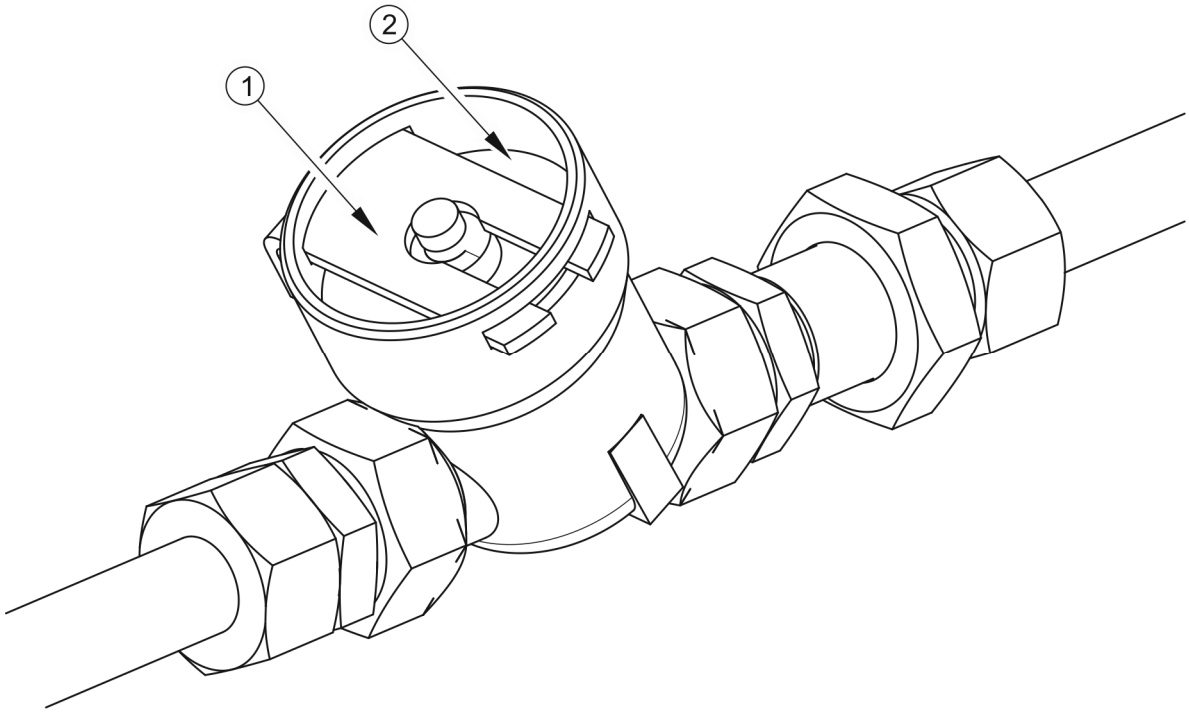


FIGURE 5.9 Air filter

(1) securing slide, (2) filter cover

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*(5.9)*.
  - ⇨ 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.

Cleaning the air filter (filters),

- **every 3 month of use.**

5.3.4 AIR TANK DRAINAGE

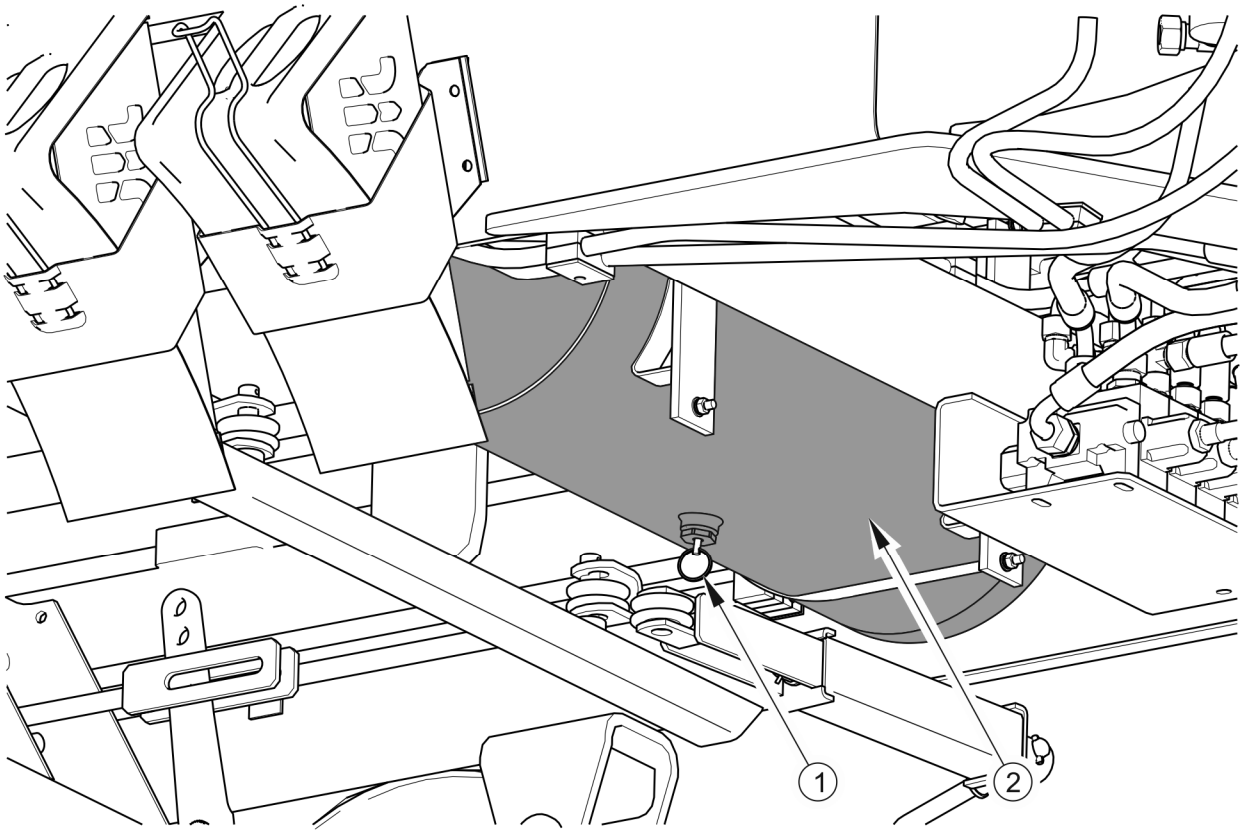


FIGURE 5.10 Air tank drainage

(1) drain valve, (2) air tank

The scope of service activities

➡ Deflect the drain valve stem (1) located at the bottom of the tank (2) - the tank is located at the rear of the turntable 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 month 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 need to be replaced when they are permanently deformed, cut or frayed.

The scope of service activities

➡ Relieve system pressure completely.

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

➡ Remove the pneumatic conduit by unscrewing the nut (2) - figure *(5.11)*.

➡ Install a new hose.

- ⇨ The inside of the pneumatic hose should be clean.
- ⇨ The ends of the pneumatic hose (1) must be cut exactly at right angles.
- ⇨ The cutting ring (3) should be fitted as per figure *(5.11)*.
- ⇨ The reinforcing sleeve (4) of the hose must be pressed in thoroughly.

Check the tightness of the connections according to chapter *(5.3.2).*

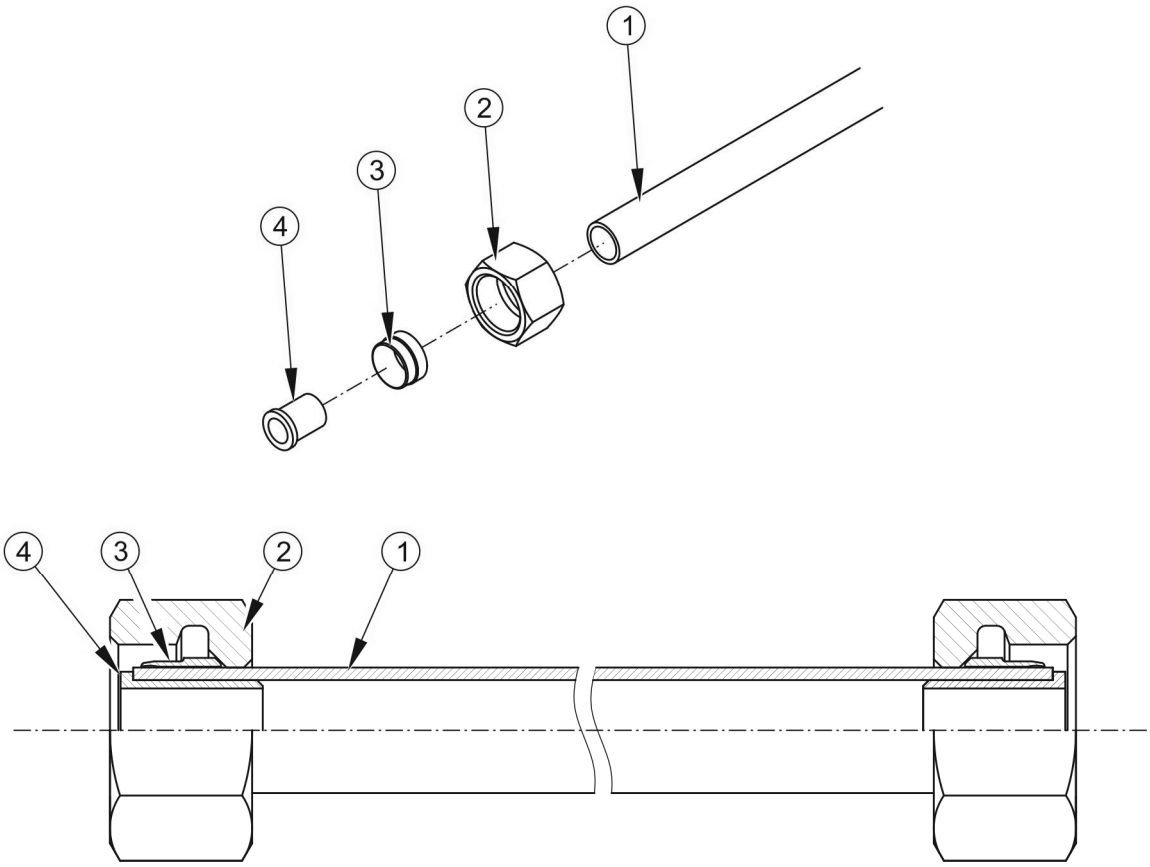


FIGURE 5.11 Assembly of pneumatic hose

(1) pneumatic hose, (2) connecting nut, (3) cutting ring, (4) reinforcing sleeve

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 (5.6). If air still leaks, replace the connectors with new ones.

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 use the trailer with a defective hydraulic brake system.

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 connectors and cylinders.
- ➡ Make several tilts of the trailer loading platform.
- ➡ Make a few moves by lowering and raising the left and right loading arms.
- ➡ Make a few left and right push arm movements.
- ➡ Make a few moves using the rear ladder to lower and raise it.
- ➡ Carry out several trailer drawbar turns.
- ➡ Press the brake pedal on the tractor several times
    - ⇨ If the trailer is equipped with hydraulic braking system.
- ➡ Check all hydraulic cylinders and hydraulic lines for leaks.

➡ Tighten joints 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 month 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

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.

➡ Check the completeness of all reflectors.

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

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

5.6 LUBRICATION OF THE TRAILER

TABLE 5.3 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	Drawbar bolt	2	A	3M
4	Expander shaft bushing in the drum hub	4	A	3M
5	Spring leaves	4	C	6M
6	Control arm pin	2	A	1M
7	Spring pin	4	A	1M
8	Parking brake mechanism	1	A	6M
9	Tipping pin	2	A	3M
10	Spring surfaces	4	A	1M
11	Cylinder eye and drawbar steering cylinder piston rods	4	A	50H
12	Parking brake guide roll pin	3	A	6M
13	Cylinder eye and rear ladder cylinder piston rods	4	A	50H
14	Eye of the cylinder and piston rod of the pressure arm	4	A	50H
15	Cylinder eye and loading arm cylinder piston rod	8	A	50H
16	The cylinder eye and piston rod of the platform lifting cylinder	2	A	50H

ITEM	LUBRICATION POINT	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	FREQUENCY
17	Pressure arm pin	2	A	3M
18	Rear ladder pin	2	A	3M

lubrication periods - M month, D - day, H - working hour

TABLE 5.4 Recommended lubricants

DESIGNATION FROM TABLE (5.3)	DESCRIPTION
A	general purpose machine grease (lithium, calcium),
B	solid grease for heavily loaded components with the addition of MOS2 or graphite
C	anti-corrosive spray

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.

Before lubricating the springs, clean them of impurities, wash with water and allow to dry. Do not use pressure washers for cleaning, the use of which may cause the penetration of moisture between individual leaves of the spring. To lubricate the space between the blades, use aerosol formulations that have generally available lubricating and anti-corrosive properties, the outer surface should be smeared with a very thin layer of lithium or calcium grease. For this purpose, you can also use a silicone aerosol preparation (also intended for lubrication of guides, locks, etc. - see table). Lubricate the spring surface and spring pin according to the instructions in table *(5.3)*.

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.

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

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

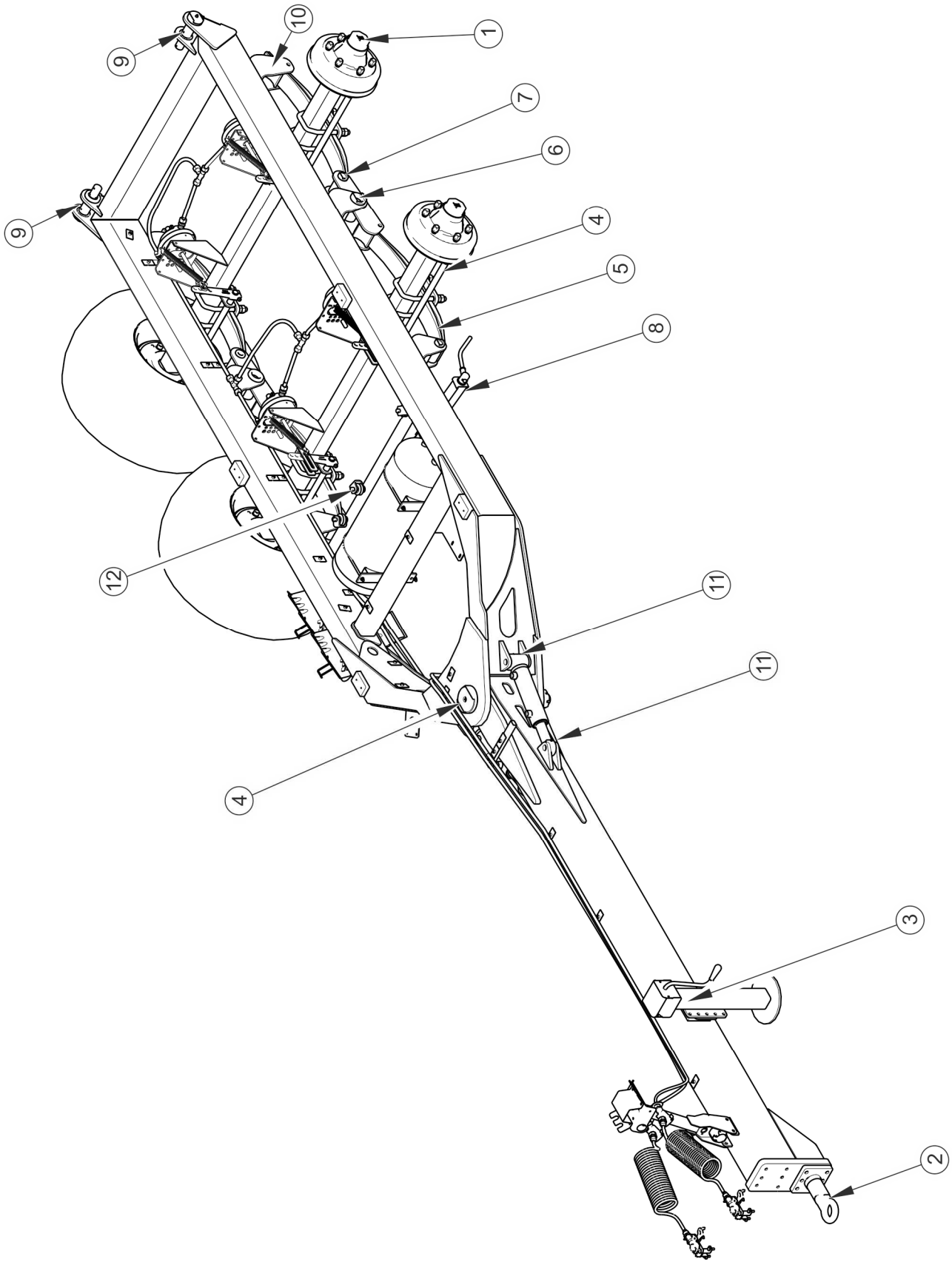


FIGURE 5.12 Trailer lubrication points, part 1

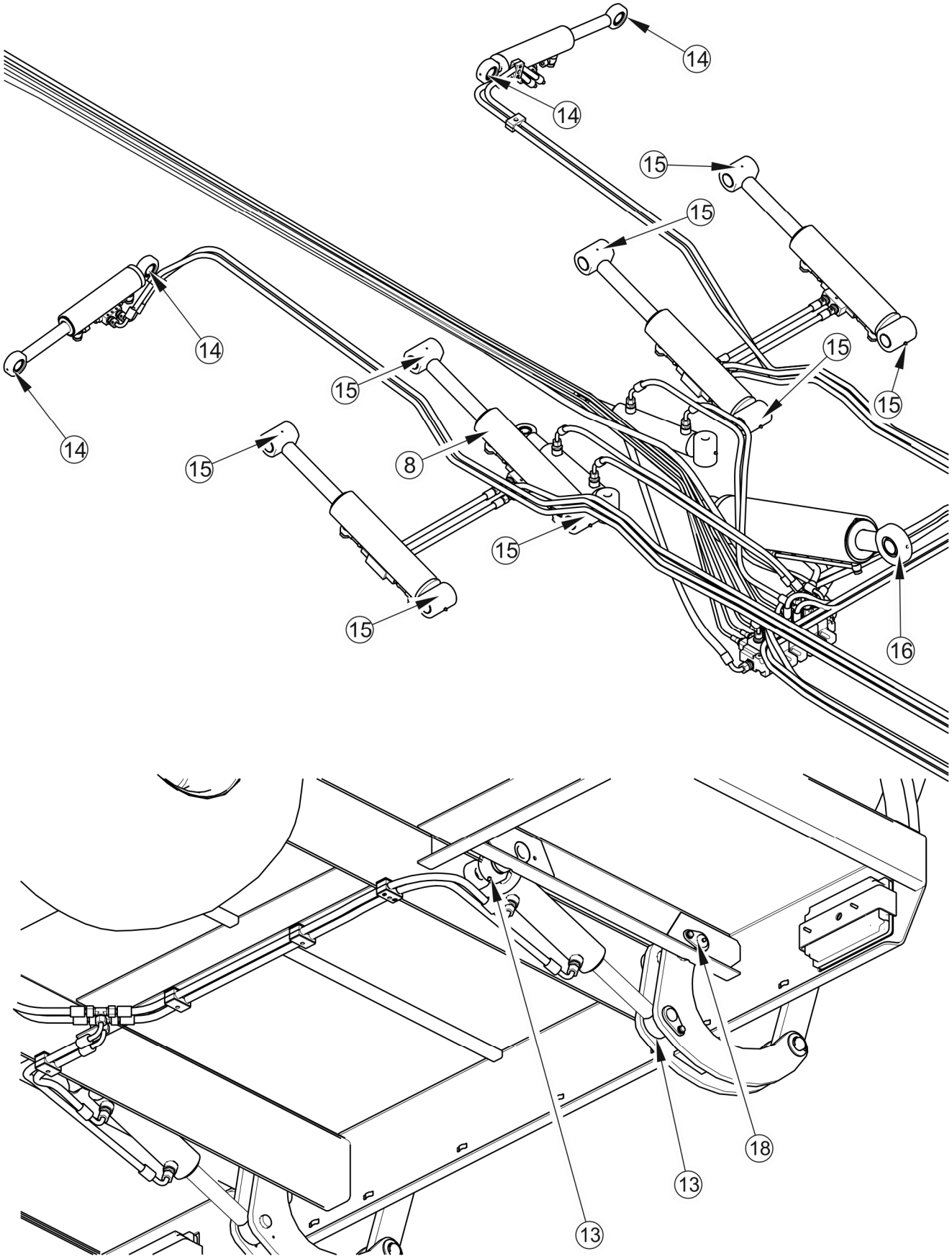


FIGURE 5.13 Trailer lubrication points, part 2

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 5.5 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

- 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.
- 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.

DANGER

Refer to the instructions for using cleaning detergents and preservatives.

When washing with detergents, wear suitable protective clothing and eye protection.

- 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 ADJUSTMENT OF THE DRAWBAR POSITION

The position of the trailer drawbar eye is regulated depending on the type of hitch of the agricultural tractor with which the trailer is to be aggregated. If possible, it is recommended to adjust the tractor hitch in such a way that the trailer's drawbar eye is laid flat when driving on straight ground.

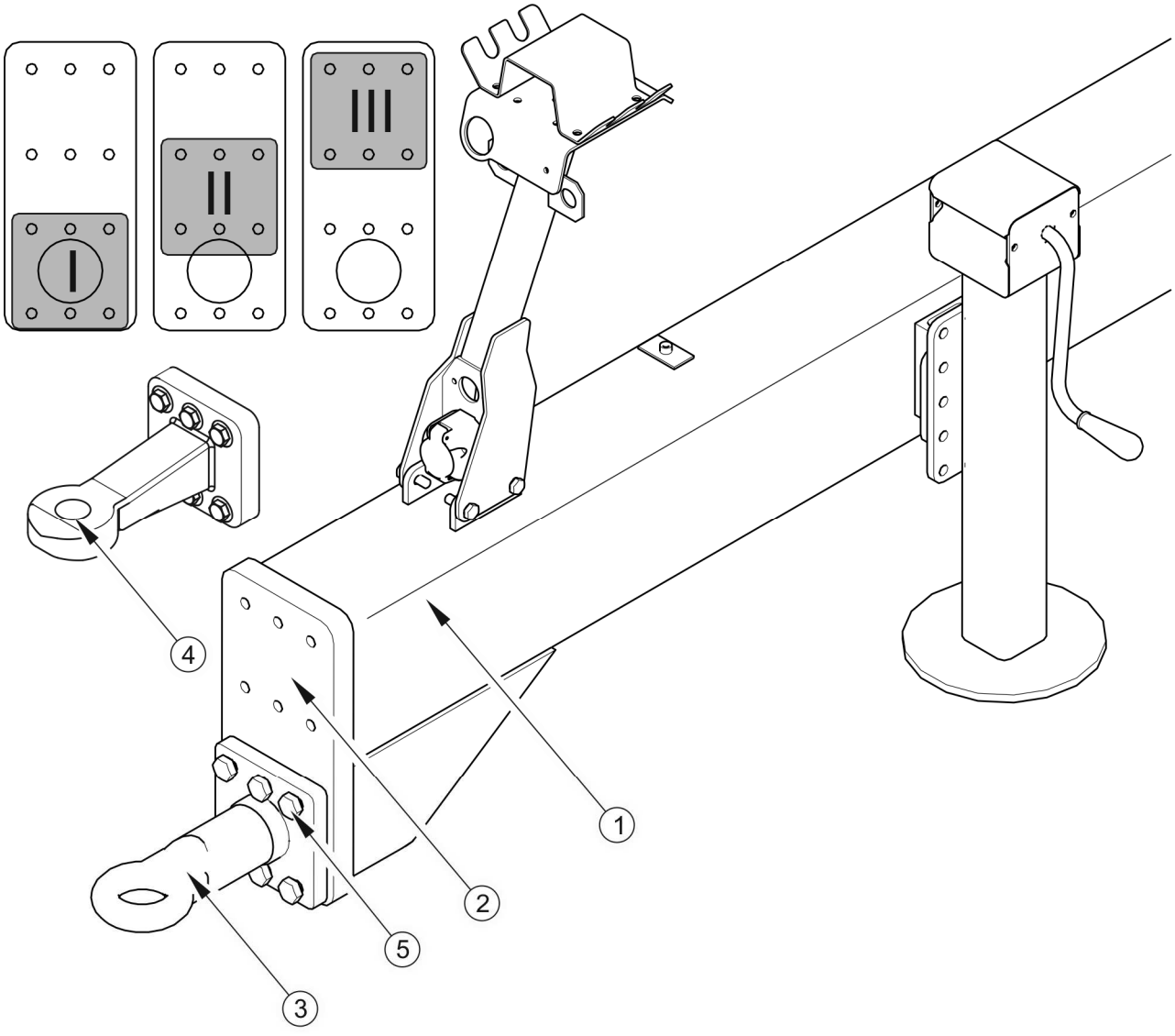


FIGURE 5.14 Adjusting the position of the drawbar eye

(1) drawbar, (2) face plate, (3) swivel eye Ø50, (4) rigid eye Ø40, (5) fixing bolt, I, II, III - position of tendons on the front plate

The position of the rigid cable (4) is determined by changing its position relative to the front plate (2) through appropriate use of holes - figure *(5.14)*. The swivel cable (3) can only be mounted in position I.

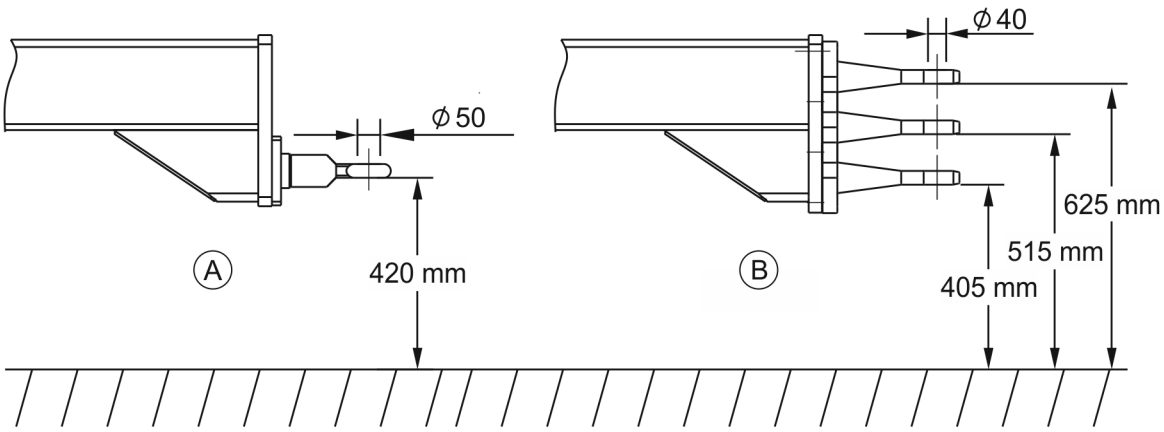


FIGURE 5.15 Height of tension members

(A) rotating cable Ø50, (B) rigid cable Ø40

5.11 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

TABLE 5.6 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

METRIC THREAD	5.8(1)	8.8(1)	10.9(1)
	Md [Nm]		
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

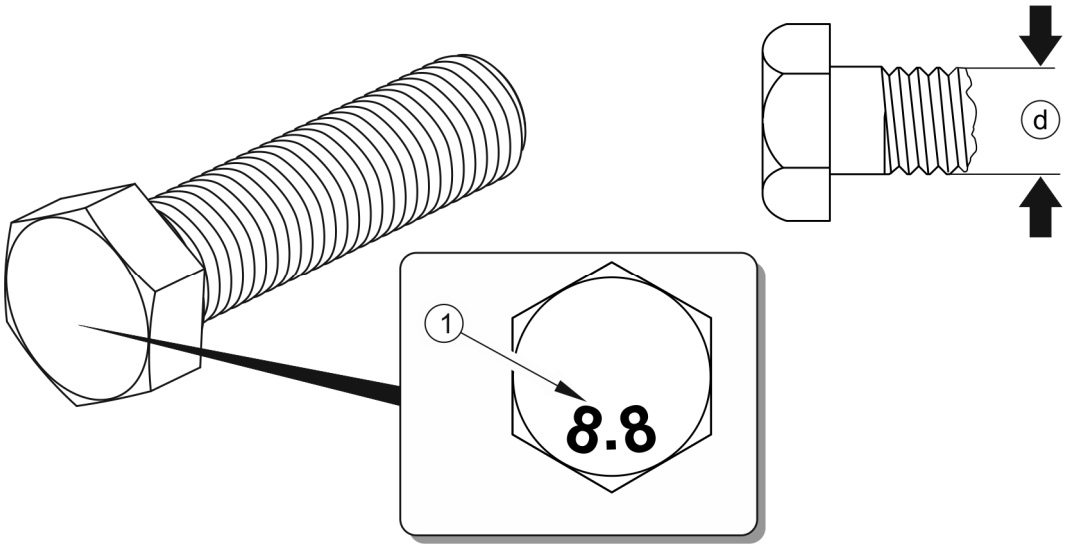


FIGURE 5.16 Metric thread screw

(1) strength class, (d) thread diameter

ADVICE

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

5.12 TROUBLESHOOTING

TABLE 5.7 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. Excessive heating of the axle hub.	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.
Low braking efficiency. Excessive heating of the axle hub.	Incorrectly adjusted service or parking brake	Adjust expander arm positions
	Worn brake pads	Replace brake shoes

FAULT	CAUSE	REMOVAL METHOD
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
	Supply and return wires swapped	Swap connectors
	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 and reduce the cylinder load if necessary
	Damaged hydraulic lines	Check and make sure that the hydraulic hoses are tight, not kinked and properly tightened. Replace or tighten as necessary.
The lighting is not working	Plug not connected	Check electrical connection
	The bulb has burned out	Replace the bulb

NOTES