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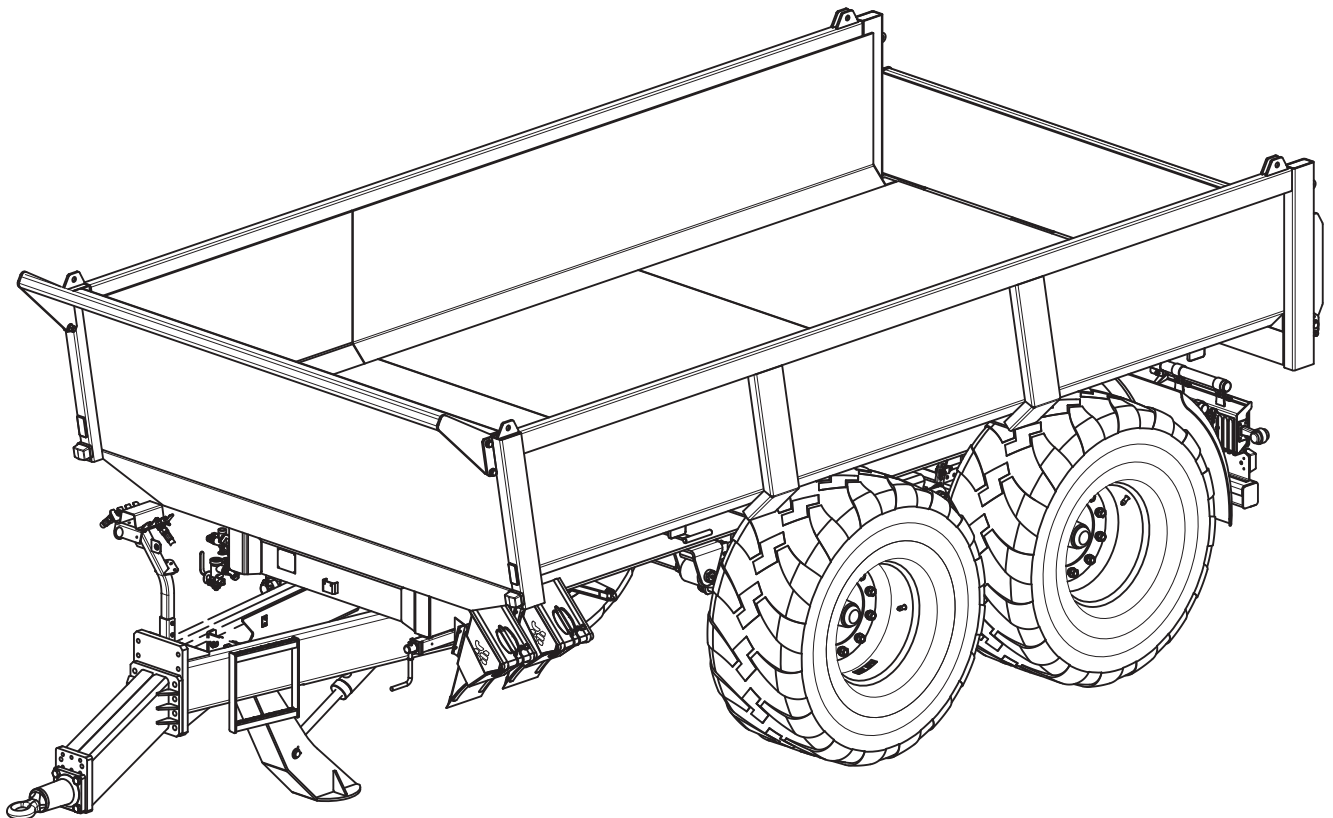
[www.pronar.pl](http://www.pronar.pl)

## OPERATOR'S MANUAL

### AGRICULTURAL TRAILER

### PRONAR T679/2

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



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

***Remember!!!***

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



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# INTRODUCTION

## INTRODUCTION

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

The operating instruction is the basic equipment of the machine. Before using the machine, the user must read the con-

tents of this manual and observe all recommendations contained therein. This will guarantee safe and trouble-free operation of the machine. The machine was constructed in accordance with applicable standards, documents and current legal regulations.

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

After purchasing the machine, we recommend to enter the machine serial number in the fields below.

Machine serial number

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## SYMBOLS USED IN THE MANUAL

### **DANGER**

Information, descriptions of hazards and precautions as well as instructions and orders related to the safety of use in the content of the manual are marked with a frame with the word **DANGER**. Failure to comply with these recommendations may endanger the health or life of persons operating the machine or bystanders.

### **CAUTION**

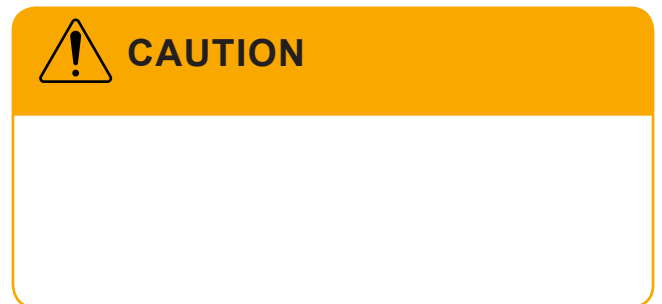
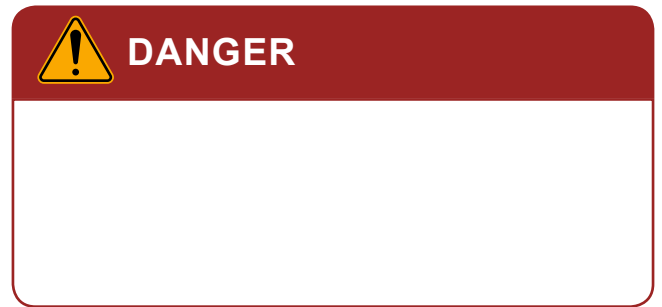
Particularly important information and recommendations, the observance of which is absolutely necessary, are highlighted in the text with a frame and word **CAUTION**. Failure to comply with these recommendations creates the risk of damage to the machine due to improper handling, adjustment or use.

### **ADVICE**

Additional instructions contained in the manual describe useful information on operating the machine and are marked with a frame with the word **ADVICE**.

### **REFERENCES TO PAGES**

There are references to the page in the



machine's operating procedures for a description of additional information. References to pages are marked with underlined bold.

Example: **7.13**.

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## DESIGNATION OF DIRECTIONS IN THE MANUAL

*Left side* – the left hand side of the observer facing the machine in the forward direction.

*Right side* – the right hand side of the observer facing the machine in the forward direction.

*Turn right* – turn the mechanism clockwise (operator facing the mechanism).

*Turn left* – turn the mechanism counterclockwise (operator facing the mechanism).

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## CHECKING THE MACHINE AFTER DELIVERY

The manufacturer ensures that the trial is fully functional, has been checked in accordance with control procedures and is approved for use. However, this does not release the user from the obligation to check the machine after delivery and before first use. The trial is delivered to the user completely assembled. After delivery of the machine to the recipient, the user is obliged to check the technical condition of the trailer. During the purchase, the user must be informed by the seller about the use of the machine, the dangers arising from improper use, how to connect the machine with the principle of operation and construction. Detailed information on the transfer can be found in the WARRANTY BOOK

### **THE SCOPE OF CONTROL ACTIVITIES**

- Check the completeness of the machine in accordance with the order (standard and optional equipment).
- Check technical condition of guards, safety devices.
- Check the condition of the paint coating, check for any signs of corrosion.
- Carry out visual inspection of indi-

### **ADVICE**

The delivery of the machine includes a detailed inspection and check of the operation of the machine, as well as instructing the buyer on the basic principles of use. The first start-up takes place in the presence of the Seller.

- vidual 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 correct tightening of the wheels.
- Check the technical condition of the drawbar eye and its attachment.
- Check technical condition of pneumatic conduits.
- Check the technical condition of the flexible hydraulic hoses.
- Make sure there are no hydraulic oil leaks.
- Check tipping cylinder, tailgate cylinder and brake cylinders for hydraulic oil leaks.

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## START-UP OF THE TRAILER

### ADVICE

Servicing activities: connecting/disconnecting from the tractor, adjusting the drawbar position, tipping the loading box, etc. are described in detail in the further part of the manual in CHAPTER 4.

### THE SCOPE OF ACTIVITIES

- Read the contents of this OPERATOR'S MANUAL and follow the recommendations contained therein.
- Adjust the height of the drawbar eye to the hitch on the tractor.
- Check all trailer lubrication points, if necessary lubricate machine as recommended in CHAPTER 5.17.
- Check the tightness of the nuts securing the road wheels.
- Inspect the machine before traveling in accordance with the guidelines in CHAPTER 5.8.
- Drain the brake system air tank (CHAPTER 5.5).
- Make sure that the pneumatic, hydraulic and electrical connections on the agricultural tractor comply with the requirements, otherwise do not connect the trailer.

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



### CAUTION

The first start-up involves checking the machine in the presence of the Seller. The Seller is obliged to carry out training in the safe and proper operation of the machine.

Training by the seller does not release the user from the obligation to become familiar with the contents of this manual and to follow the recommendations contained therein.

and carry out a test run of the trailer and perform a test drive without load (without a loading box). It is recommended that visual inspection be carried out by two people, one of them should be permanently in the tractor's cab. The test run must be carried out in the order shown below.

- Connect the trailer to the appropriate hitch on the agricultural tractor.
- Connect the brake, electrical and hydraulic system lines.
- By activating individual lights, check the correct operation of the electrical system.
- Perform a test tipping of the loading box.
- Start and check the correct operation of the rear flap control system.
- When moving off check the operation of the service brake.
- Perform a test drive.

If during the test trip, disturbing symptoms such as:

- Noise and unnatural sounds from rubbing moving parts against the trailer structure,
- Leaking brake system
- Hydraulic oil leakage,
- 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.

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

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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:	<b>TRAILER</b>
Type:	<b>T672/2</b>
Model:	-----
Serial number:	
Commercial name:	<b>TRAILER PRONAR T672/2</b>

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 \_\_\_\_\_

*Place and date*

Z-CA DYREKTORA  
d/s technicznych  
członek zarządu

*Roman Omelaniuk*

\_\_\_\_\_  
*Full name of the empowered person  
position, signature*



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## TIRE ASSEMBLY



# CHAPTER 1

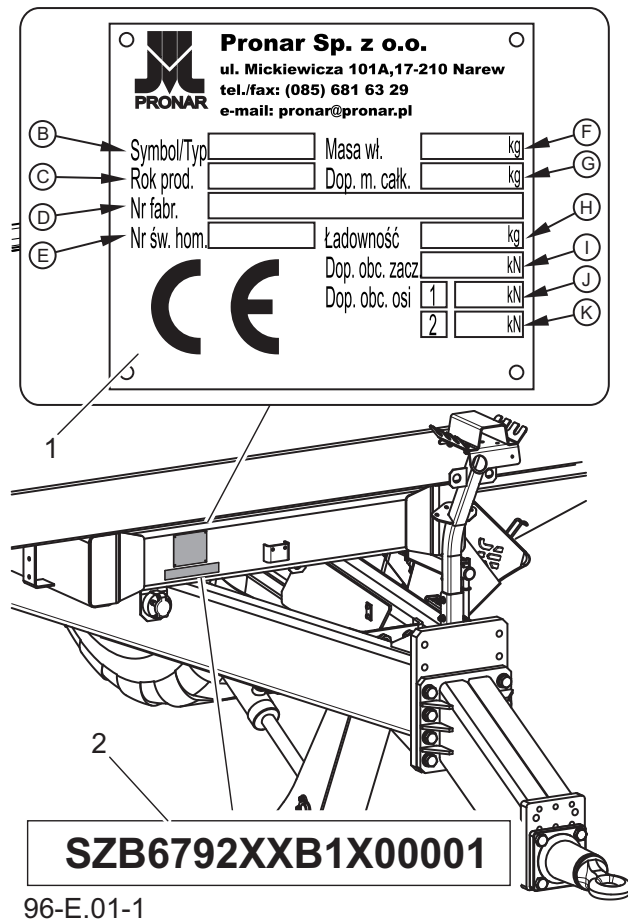
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GENERAL

## 1.1 IDENTIFICATION

**Table 1.1.** Nameplate markings

Item	Meaning
B	Machine symbol / type
C	Year of machine production
D	VIN Number
E	Certificate approval number
F	The machine's karb weight
G	Permissible gross weight
H	Capacity
I	Permissible load on coupling
J	Permissible axle 1 load
K	Permissible axle 2 load



**Figure 1.1** Location of the nameplate.

(1) nameplate (2) serial number

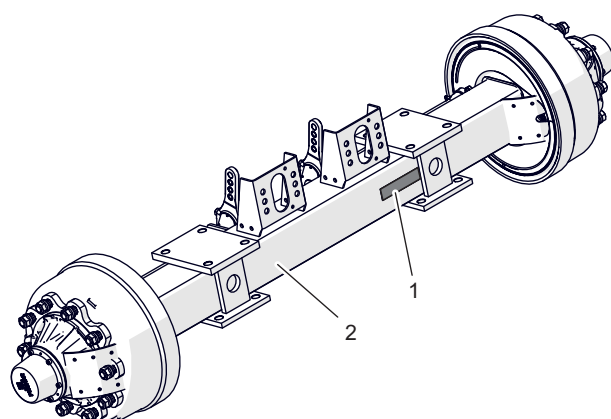
The trailer has been marked with a name plate (1) and a serial number (2) - figure (1.1). Additional information on

dimensions, masses and axle loads of the trailer is provided on the plate (1).

The type plate and serial number are located on the right beam of the lower frame. When purchasing the trial, 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*.

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## 1.2 IDENTIFICATION OF DRIVE SHAFTS



589-E.02-1

**Figure 1.2** Location of the nameplate of driving axle.

(1) axle nameplate (2) driving axle

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

After purchasing the machine, we recommend writing down the factory number of the driving axle in the fields below.

### 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 trailer or axle, so it is recommended to write these numbers in the fields below.

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Axis serial number 1	
Axis serial number 2	

## 1.3 INTENDED USE

The trailer is designed for transporting and unloading heavy materials such as debris, stones, crushed stone, gravel used during construction works, earthworks, demolition works, on the farm and on public roads. The construction of the loading platform enables loading and transporting of machines and construction vehicles as well as transport of goods on EURO pallets. The transport of the above-mentioned loads is possible provided that the recommendations contained in this manual are complied with, in particular the recommendations regarding load securing included in the further part of the document. The trailer is adapted to traffic on public roads. The trailer may only be aggregated with



### DANGER

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

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

agricultural tractors that meet all the requirements set out in table (1.3).

The braking system as well as the lighting and signalling system meet the

**Table 1.2.** Recommended pallet types

Palette name - Type	Length [mm]	Width [mm]	Height [mm]
EUR pallet - standard	1,200	800	144
EUR pallet - 1/2	800	600	144
EUR pallet - large	1,200	1,200	144
ISO Pallet	1,200	1,000	144

requirements arising from traffic regulations. The maximum speed of the set may not be exceeded (the speed limit depends on the country in which the trailer is used). The trailer speed must not, however, be greater than the maximum design speed 40 km/h.

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 the *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,
- 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 machine 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

**CAUTION**

It is forbidden to use the machine contrary to its intended use, in particular to transport people and animals.

the requirements set by the trailer Manufacturer.

The machine may only be used by persons who:

- Become familiar with the contents of publications and documents attached to the machine 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 1.3.** Agricultural tractor requirements

Content	Unit	Requirements
<b>Connection sockets for the braking system</b>		
Pneumatic 1 - wire		in accordance with A DIN 74 294
Pneumatic 2 - wire		in accordance with ISO 1728
Hydraulic		in accordance with ISO - 7421- 1
<b>Nominal pressure of the system</b>		
Pneumatic 1 - wire	bar	5.8 – 6.5
Pneumatic 2 - wire	bar	6.5
Hydraulic	bar	150
<b>The hydraulic system</b>		
Hydraulic oil	-	L HL 32 Lotos <sup>(1)</sup>
Maximum system pressure	bar	200
Oil demand	l	28
<b>Electrical system</b>		
Electrical system voltage	V	12
Connection socket	-	7 poles in accordance with ISO 1724
<b>Tractor hitches</b>		
Type of hitch		upper or lower transport hitch
Minimum vertical load capacity of the hitch	kg	2,000
<b>Other requirements</b>		
Min. tractor power	KM/ kW	83.2 / 61

(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.

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## 1.4 EQUIPMENT

**Table 1.4.** Trailer equipment

Equipment	STANDARD	ADDITIONAL	OPTIONAL
User manual	•		
Warranty Card	•		
Electrical installation connection cable	•		
Electrical lighting installation	•		
Wheel chocks	•		
Hydraulically opened rear flap	•		
Tilt and turn rear flap			•
Hydraulic tipping installation	•		
Hydraulic straight drawbar support	•		
Hydraulic scissor drawbar support	•		
Mechanical drawbar support			•
Double line pneumatic braking system			•
Single line pneumatic braking system			•
Pneumatic-hydraulic braking system			•
Hydraulic braking system			•
Parking brake	•		
Front roof of the load box	•		
800mm load box extensions		•	
Overrun covers		•	
Tool box		•	
Slow-moving vehicles distinguishing sign		•	
Warning reflective triangle		•	
Rear hook		•	

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## 1.5 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. Deadline for completion of repairs is specified in the *Warranty Card*.

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

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

The warranty services apply only 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

### 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.

user's fault, road accident,

- from improper operation, adjustment and maintenance, use of the machine contrary to its purpose,
- use of damaged or inefficient machine,
- repairs carried out by unauthorized persons, improper repairs or without the consent of the Manufacturer,
- execution of user changes in machine design,

the user loses the warranty.

The user is obliged to immediately report all noticed defects in the paint coatings or traces of corrosion, and order removal of defects regardless of whether the damage is covered by the warranty or not. Detailed warranty conditions are given in the *WARRANTY CARD* attached to the newly purchased machine.

Modifications to the machine 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



working with not permitted.

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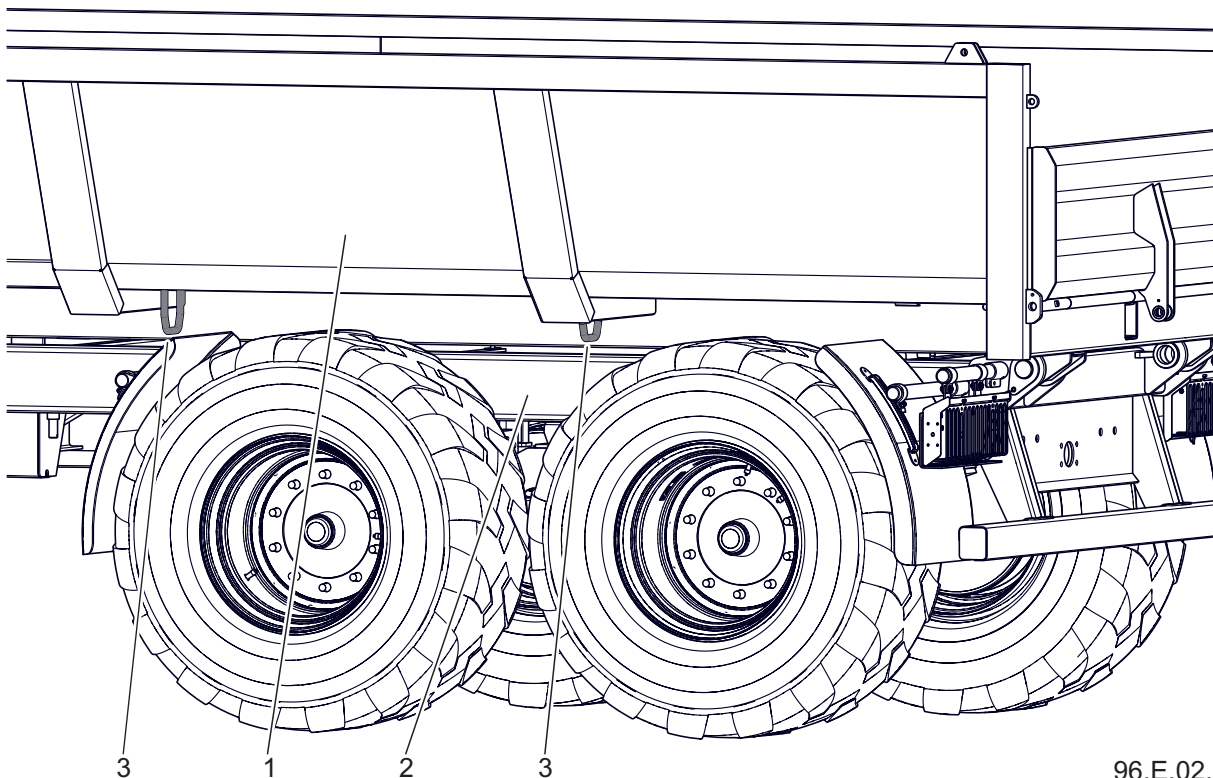
## 1.6 TRANSPORT

The machine 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

### CAUTION

The trailer drawbar eye and other structural elements that are not strong enough to carry out this type of operation must not be used to attach and attach the trailer.



96.E.02.1

**Figure 1.3** Transport handles

(1) load box

(2) lower frame

(3) frame transport handle

(4) box transport handle

or independent transport (towing with an agricultural tractor).

### TRUCKING

Loading and unloading a trailer from a car should be carried out using a loading ramp using a farm tractor, lever of lift. 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. Moving the machine with lifting equipment can only take place with the use of fixed machine

structural elements. These mainly include the frame and transport handles.

When transporting by vehicle, the machine should be securely fastened to the loading platform using certified belts or chains equipped with a tensioning mechanism. In order to properly fasten the machine, it is recommended to use the transport brackets (3) - figure (1.3), wrap the driving axles, bottom side members and possibly drawbar elements.

Chocks, wooden beams or other elements without sharp edges should be placed under the trailer wheels, protecting the machine against rolling. wheel blocks must be nailed to the load platform planks of the car or secured in another way preventing their movement.

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. 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



## DANGER

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. The centre of gravity of the vehicle carrying the machine shifts up, which threatens the stability of the transport unit.

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

fastening plan in detail.

A properly attached machine 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 machine should be used. If necessary, protect the sharp edges of the trailer, thus securing the securing means against damage during transport. During reloading work, particular attention should be paid so as not to damage the machine equipment components and the paint coating. The weight of the trailer is given in table (3.1).

## USER'S TRANSPORT

In the case of independent transport by the user, read the *Operating Manual* and follow its recommendations. Independent transport involves towing a machine with own agricultural tractor to its destination.

The driver of the tractor should be acquainted with the contents of the operating instructions, especially the safety information and the principles of connection and transport on public roads. While driving, adjust the speed to the prevailing road conditions, but it must not be greater than the maximum design speed

**DANGER**

When transporting independently, the operator should read the instructions the operating and follow the recommendations contained therein. When transporting by car, secure the machine to the transport means platform in accordance with the safety requirements during transport. The car driver should exercise extreme caution when transporting the machine. This is due to the vehicle's centre of gravity shifting upwards with the machine loaded.

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## 1.7 THREAT TO THE ENVIRONMENT

A hydraulic oil leak is a direct threat to the natural environment owing to its limited biodegradability. Repair works with a risk of leakage of oil, 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, and then transferred to an oil waste disposal point. The container should be kept away from heat sources, flammable materials and food.

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



### 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.



### DANGER

Do not store oil waste in food containers. Store used oil in containers resistant to hydrocarbons.

### ADVICE

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

original packaging in the same conditions as described previously. Waste code 13 01 10 (hydraulic oil). Detailed information on oil can be found in the product safety data sheet.

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## 1.8 WITHDRAWAL FROM USE

If the user decides to withdraw the machine from use, comply with the provisions in force in the given country regarding withdrawal from use and recycling of machines withdrawn from use.

Before dismantling the machine, the oil must be completely removed from the hydraulic system.

In the event of parts being replaced, worn or damaged parts should be sent



### **DANGER**

During dismantling, use appropriate tools and equipment (overhead cranes, elevators, lifts, etc.) and use personal protective equipment, i.e. protective clothing, footwear, gloves, glasses, etc.  
Avoid oil contact with skin. Do not allow oil to leak.

to a recycling centre. Used oil as well as rubber or plastic elements should be taken to plants dealing with the utilization of this type of waste.

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# CHAPTER 2

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SAFETY OF USE

## 2.1 SAFETY RULES WHEN USING THE MACHINE

### 2.1.1 BASIC SAFETY RULES

- Before using the trailer, the user should carefully read the content of this document. During its operation, all recommendations contained therein must be observed. The trailer may only be used and operated by persons authorized to drive agricultural tractors and the agricultural machine.
- 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 machine.
- 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.
- The trailer may not be used for purposes other than those for which it was intended. Everyone who uses the machine in a manner contrary to its intended use, thus takes full responsibility for all consequences arising from its use. Use of the trailer for purposes other than envisaged by the Manufacturer is inconsistent with the purpose of the machine and may void the warranty.
- Any modification of the trailer releases PRONAR Narew from any liability for damage or injury.
- Climbing and lowering on the trailer is possible only when the machine is absolutely stationary and the tractor engine is switched off. Adequate height, safe and durable platforms or ladders should be used.
- In the event of damage to the braking system, the trailer must not be used until the fault has been rectified.
- The trailer disconnected from the tractor must be immobilized with the parking brake. If the machine stands



on a slope, it must be additionally secured against rolling by placing wedges or other elements without sharp edges under the wheels.

- It is forbidden to transport people and animals.
- It is forbidden to connect the trailer to an agricultural tractor if the hydraulic oils used in both machines are of a different type.
- It is forbidden to use a damaged machine.
- The trailer's maximum carrying capacity must not be exceeded. Exceeding the carrying capacity may lead to damage to the machine, loss of stability while driving, scattering of the load and a hazard while driving or working.
- Before each use of the trailer, check the technical condition of the trailer and tractor hitch system as well as connection elements of the braking and electrical systems.
- Take special care when connecting or disconnecting the machine from the tractor.
- When connecting, nobody may be between the trailer and the tractor.
- When connecting the trailer to the tractor, use only the upper or lower transport hitch depending on the

drawbar eye and drawbar position. Check securities.

- The load must be evenly distributed.
- Keep a safe distance during loading and unloading. Keep bystanders away from the work area.
- The load must be secured against shifting with straps, chains, straps or other securing measures. They must be equipped with a tensioning mechanism and have appropriate safety approvals.
- Check the condition of plumbing frequently. Oil leaks in installations are not permitted.
- Regularly check the technical condition of connections and pneumatic and hydraulic hoses.
- When connecting the hydraulic conduits to the tractor, make sure that the tractor hydraulic system and trailer are not under pressure.
- Before beginning repair or maintenance work on pneumatic or hydraulic systems, reduce air or oil pressure.
- In the event of injuries being caused by pressurized hydraulic oil, contact a doctor immediately. Hydraulic oil can penetrate the skin and cause infection.
- Use hydraulic oil recommended by the manufacturer. Never mix two

types of oil.

- After changing the hydraulic oil, the used oil must be disposed.
- 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.
- The paint coating should be cleaned before welding. 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 and easily fusible elements (elements of hydraulic, pneumatic, electrical installations, elements made of plastic and rubber). If there is a risk of ignition or damage, they must be removed before welding.
- Repair work on wheels or tires should be carried out by persons trained and authorized to do so. These works should be carried out using appropriately selected tools.
- Checking the tightening of the wheel nuts should be carried out after the first use of the trailer, every 2-3 hours during the first month of using the machine and then every 30 hours of

driving. Each time, repeat all operations if the wheel was disassembled. Wheel nuts should be tightened in accordance with the recommendations contained in the chapter 5. TECHNICAL SUPPORT

- Check tire pressure regularly.
- In the event of any faults or damage, the trailer should be decommissioned until repaired. It is forbidden to use a damaged trailer.
- When operating the machine, use protective gloves, close-fitting clothing and appropriate tools.
- 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.
- Regularly check the condition of the screw connections.
- Before welding or electrical work, the trailer should be disconnected from the power supply.
- During the warranty period, any repairs may only be carried out by

a Warranty Service authorized by the manufacturer.

- 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.
- 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 the first).
- After completing work associated with lubrication, remove excess grease or oil.
- When operating, maintaining or cleaning the machine, use carefully selected tools, close-fitting clothing and protective gloves.

### **2.1.2 RULES OF TRAVELING ON PUBLIC ROADS**

- Comply with traffic regulations.
- Exceeding the maximum load

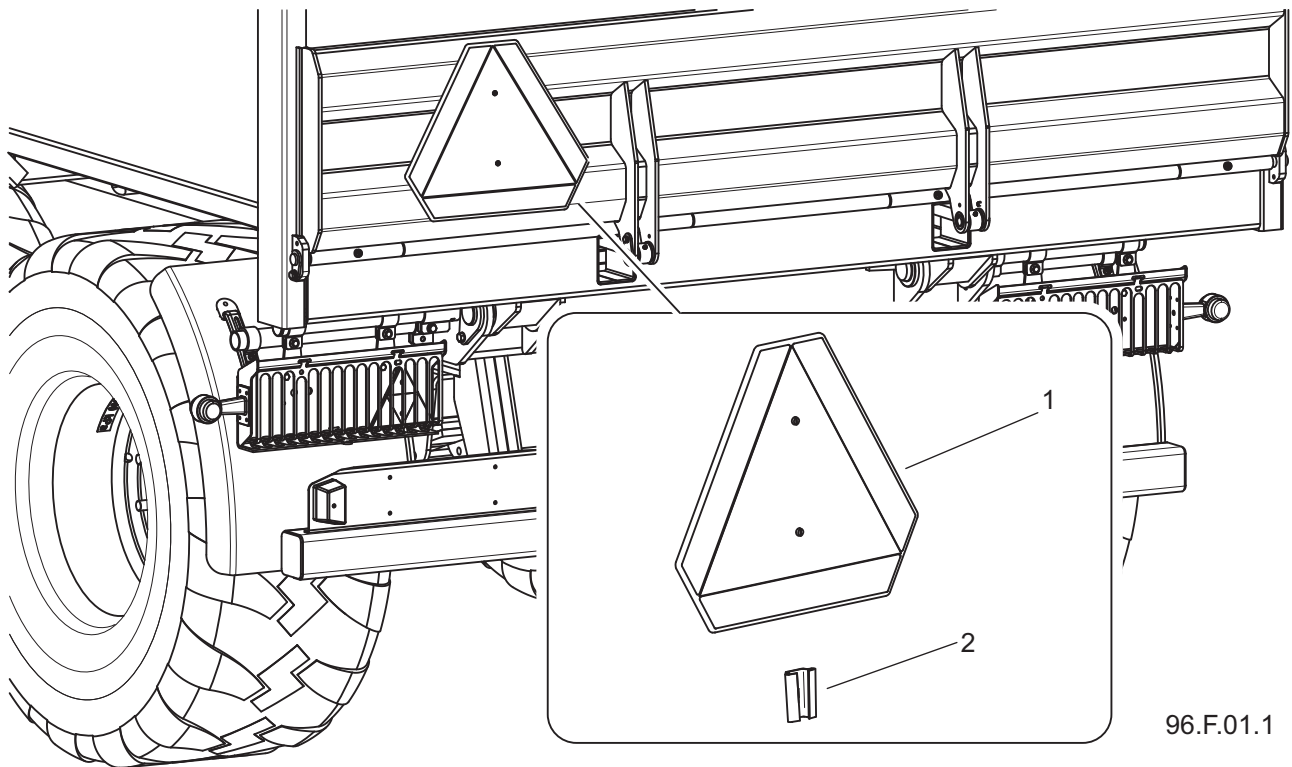
capacity of the trailer may damage it and also threaten road safety.

- The speed limit should not be exceeded. Adjust speed to road conditions.
- It is forbidden to leave the trailer unsecured. The protection consists in immobilizing it with the parking brake and possibly placing chocks under the wheels
- When driving on public roads, the trailer must be equipped with an approved or approved warning reflective triangle.
- It is forbidden to drive on public roads with the load box raised. It is unacceptable to move with an unsecured load.

### **2.1.3 DESCRIPTION OF RESIDUAL RISK**

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

- Using the trailer for purposes other than described in the manual,
- Being between the tractor and the trailer when the engine is running and when connecting the machine,
- Operation of trailer made by unauthorized persons under the influence



**Figure 2.1** Distinguishing sign  
(1) plate for slow-moving vehicles (2) plate holder

of alcohol or drugs,

- Operation of the trailer by unauthorized persons,
- Being on the machine during work,
- Careless cleaning, maintenance and technical inspection of the trailer.

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

- Prudent and careful machine operation,
- Reasonable use of the notes contained in the User and User Manual,

- Keeping a safe distance from prohibited and dangerous places,
- A ban on being on the machine while it is operating.
- Carrying out maintenance and repair work by trained persons,
- Using appropriate fitted protective clothing,
- Securing the machine against access by unauthorized persons, especially children.

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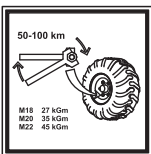
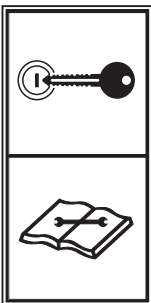
## 2.2 INFORMATION AND WARNING STICKERS


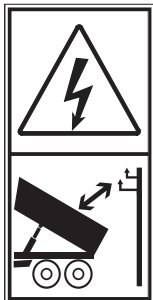




The trailer is marked with information and warning decals mentioned in table (2.1). The arrangement of symbols on the machine is shown in figure (2.2). The machine user is obliged to ensure that the inscriptions, warning and information symbols placed on the trailer are legible throughout the entire period of use.



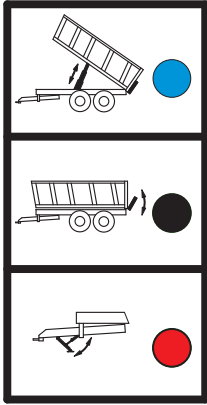


In the event of their destruction, they must be replaced. Information and warning stickers can be purchased directly from the Manufacturer or in the place where the

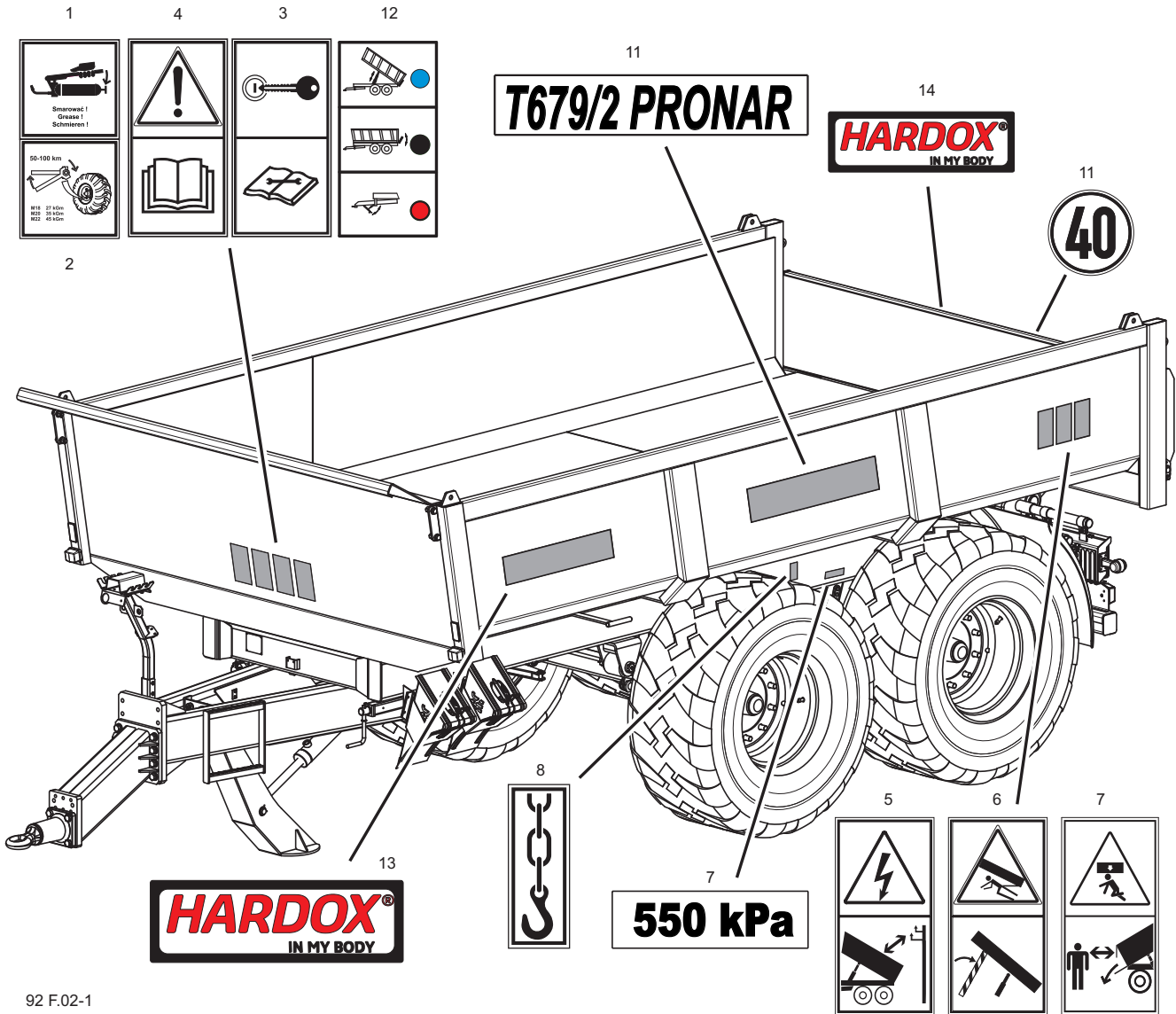
machine was purchased. The catalogue numbers of the information stickers can be found under the pictogram description in the table (2.1) and in the SPARE PARTS CATALOG. New assemblies replaced during repair must be marked again with the appropriate safety signs. When cleaning the trailer, do not must use solvents that may damage the label coating and do vehicles not direct a strong water jet.

**Table 2.1.** INFORMATION AND WARNING Stickers

Item	Sticker	Meaning
1		Lubricate the trailer according to the schedule outlined in the User's Manual. <i>104N-00000006</i>
2		Regularly check the tightness of wheel nuts and other bolted connections. <i>104N-00000004</i>
3		Before starting any servicing or repair work, switch off the tractor engine and remove the ignition key. Secure the tractor cab against unauthorized access. <i>70N-00000005</i>

Item	Sticker	Meaning
4		<p>Caution. Before starting work, read the User's Manual.</p> <p><i>70N-00000004</i></p>
5		<p>Caution. Danger of electric shock. When unloading the trailer keep a safe distance from overhead power lines.</p> <p><i>58N-0000020</i></p>
6		<p>Danger of being crushed. It is forbidden to carry out repair or maintenance works under a loaded and/or unsupported load box.</p> <p><i>58N-0000012</i></p>
7		<p>Danger of being crushed. Keep a safe distance when closing and opening the rear flap.</p> <p><i>96N-00000006</i></p>
8		<p>Transport sticker. Fastening points for transport.</p> <p><i>58N-0000019</i></p>
9		<p>Hydraulic supply hose for the braking system.</p> <p><i>187N-00000033</i></p>

Item	Sticker	Meaning
10		<p>The position of the valve controlling the operation of the support hydraulic system.</p> <p style="text-align: center;"><i>45N-2600002</i></p>
11		<p>Trailer type.</p> <p style="text-align: center;"><i>96N-00000005</i></p>
12		<p>Cable functions.</p> <p style="text-align: center;"><i>58N-0000045</i></p>
13		<p>HARDOX 380x123 sticker.</p> <p style="text-align: center;"><i>302-610-000764</i></p>
14		<p>HARDOX 290x94 sticker.</p> <p style="text-align: center;"><i>302-610-000763</i></p>



92 F.02-1

Figure 2.2 Arrangement of information and warning stickers.

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# CHAPTER 3

---

CONSTRUCTION AND PRINCIPLE  
OF OPERATION

## 3.1 TECHNICAL CHARACTERISTICS

**Table 3.1.** Basic technical data\*

Content	Unit	T679/2
<b>Dimensions</b>		
Length	mm	6,230
Width	mm	2,540
Height	mm	2,080
<b>Specification of the loading box</b>		
Height of loading box inside	mm	700
Length of loading box inside (bottom/top)	mm	6,250 / 4,500
Width of loading box inside	mm	2,410
Floor/wall sheet thickness	mm	10 / 8
Tipping angle (backwards)	°	55
<b>Performance parameters</b>		
Capacity	kg	12,000*
Permissible gross weight	kg	16,350*
The machine's karb weight	kg	4,350
Loading height	mm	1,240
Load capacity (without extensions)	m <sup>3</sup>	7.7
<b>Other information</b>		
Permissible design speed	km/h	40
Wheel track	mm	1,860
Loading of the drawbar hitch	kg	2,000
Min. tractor power	KM/kW	83.2 / 61
<b>Telescopic cylinder</b>		
Stroke	mm	2,150
Oil demand	L	28
Pressure	bar	200
Tipping system	-	one to the rear-sided telescopic cylinder

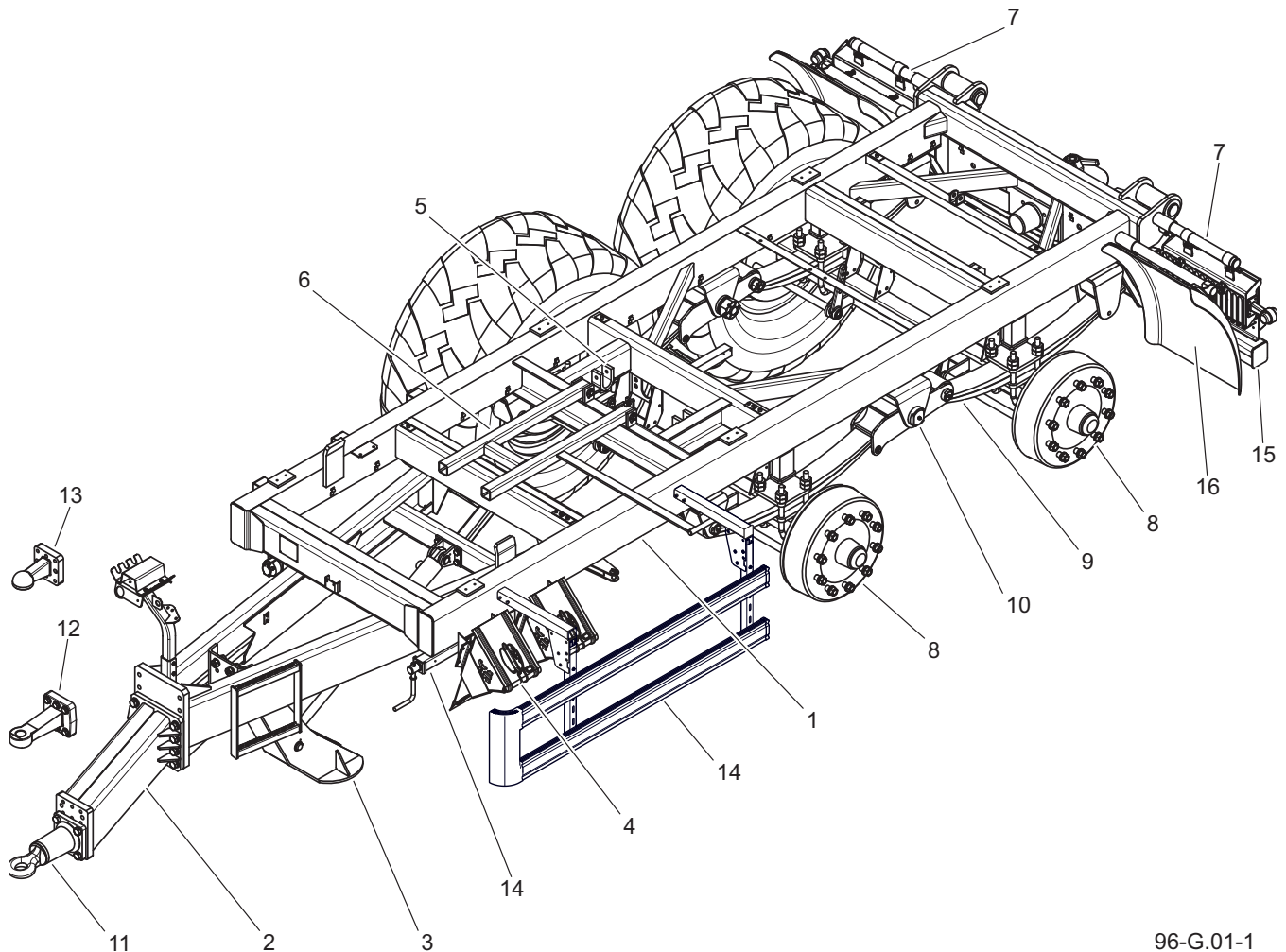
\* - depending on the legal restrictions in the country of sale and the completion of the trailer, the data may differ from those given.



### CAUTION

Depending on the additional equipment of the trailer, some technical parameters may change.

## 3.2 CHASSIS



96-G.01-1

**Figure 3.1** Trailer chassis

- |                        |                           |                      |
|------------------------|---------------------------|----------------------|
| 1) lower frame         | (2) drawbar               | (3) scissor support  |
| (4) support wedges     | (5) tipping cylinder seat | (6) box support      |
| (7) lighting beam      | (8) driving axle          | (9) spring           |
| (10) spring arm        | (11) - (13) rod tie       | (14) brake mechanism |
| (15) rear cross member | (16) rear fender          | (17) overrun shields |

T679/2 trailer chassis is made with tandem suspension (figure 3.1). The lower frame (1) is a welded structure made of steel sections of triangle shape. The basic load-bearing element of the frame are two longitudinal members connected with crossbars. The left side member has

a parking brake crank mechanism (14). Next to the parking brake mechanism there are support wedges (4). In the central part of the frame there is a tipping cylinder bed (12), next to it there is a service platform for the load box (6). There is a rear beam (15) in the rear part

of the frame. At the rear of the frame there is a tandem wheel set. The trailer suspension consists of two driving axles (8) in a tandem arrangement on parabolic springs (9) connected by a swingarm (10). 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.

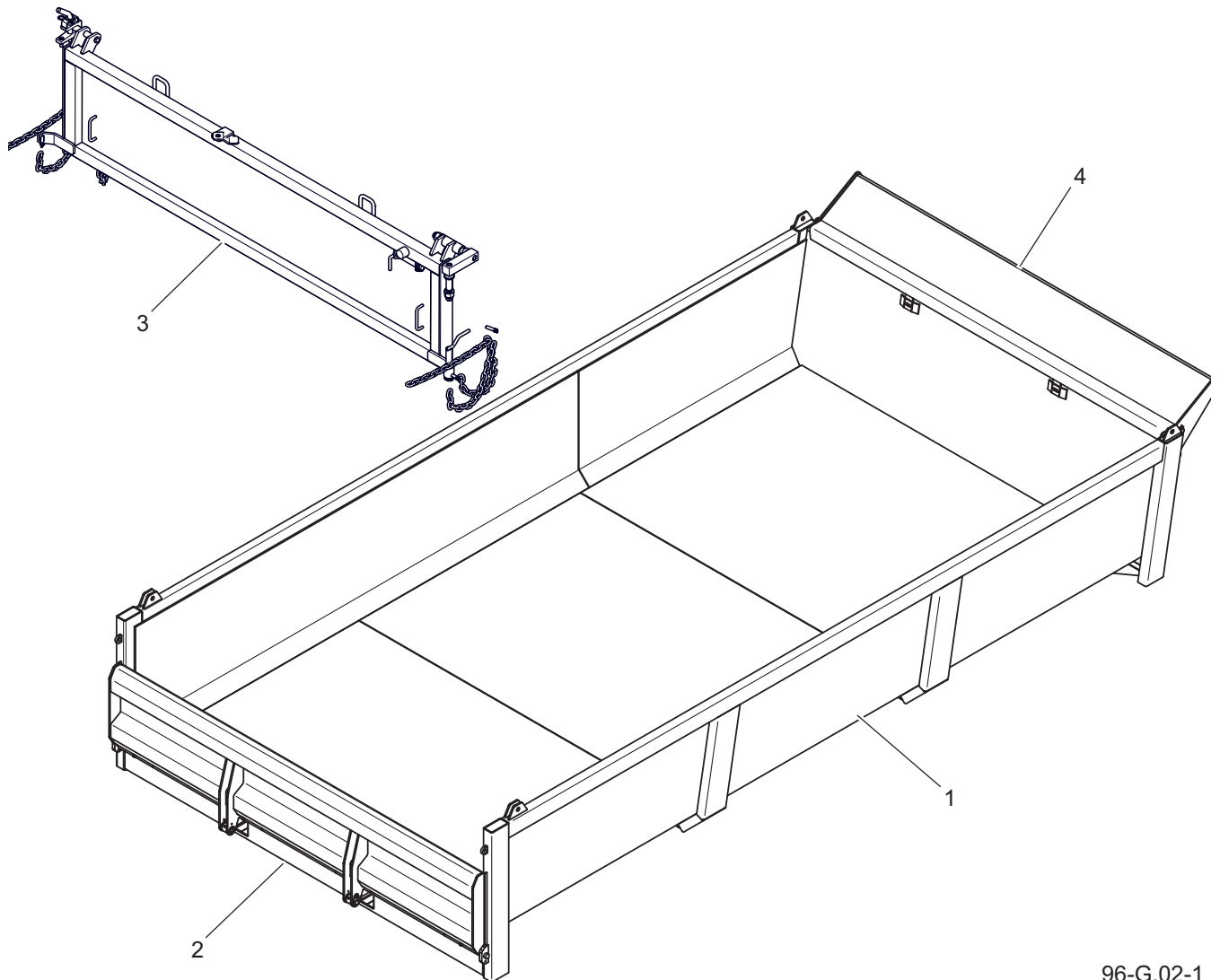
The drawbar eye (11 - 13) is screwed to the drawbar (2). A parking support (3) is installed in the front part of the chassis to support the trailer disconnected from the tractor. Depending on the assembly, the trailer can be equipped with one of the following supports:

- hydraulic straight support,
- hydraulic scissor support,
- mechanical support.

The cable support is located in the front of the frame.

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### 3.3 LOAD BOX



96-G.02-1

**Figure 3.2** Load box

(1) load box

(2) hydraulic flap

(3) tilt and turn flap

(4) the roof

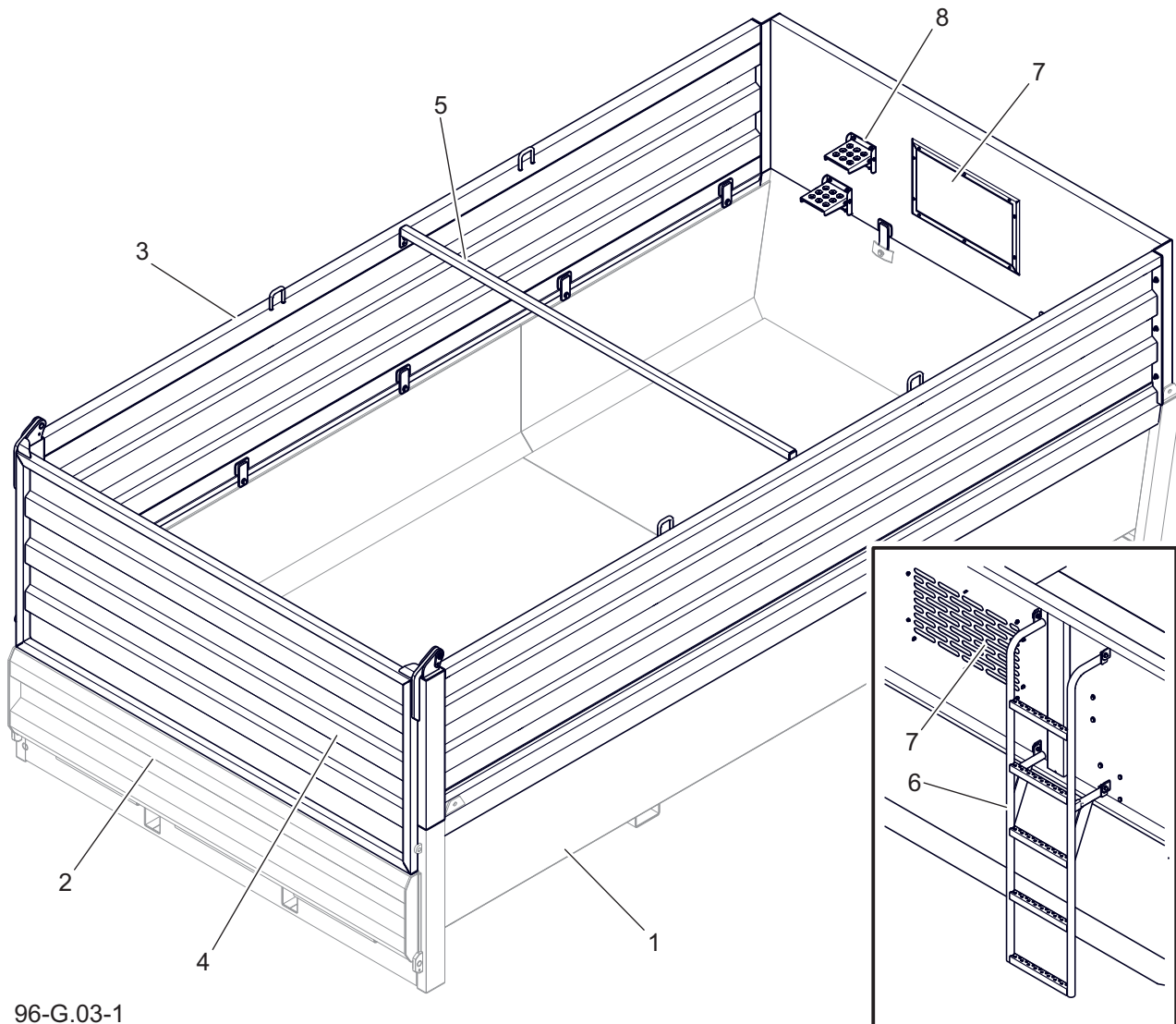
The trailer load box (1) is a shell structure. It is made of steel sheets and steel sections - figure (3.2). In the rear part of the box there is a rear flap (2), opened by a hydraulic cylinder. The hatch is opened up and down, which allows easy loading and unloading of construction vehicles. The trailer's additional equipment is a tilt-and-turn flap (3), which allows obtaining

the desired layer thickness when unloading loose materials, in addition, the flap can be opened to the right side of the trailer, giving quick access to the loading space of the trailer. A roof (4) serving as a protective element has been installed in the front of the chest.

Meeting the expectations of customers, PRONAR offers the construction of

a loading case and tailgate made of two different grades and thickness of steel. Additional equipment of the box (1) with the option of a hinged flap (2) are the extensions of the load box 800mm high

- figure (3.3). In this configuration, there is an additional crossbar (5) connecting the side adjustments (3). The front extension has a window (7) and a ladder (6) to facilitate access to the trailer's cargo space.



96-G.03-1

**Figure 3.3** Loading box with extensions

(1) load box

(2) hydraulic flap

(3) 800mm extension

(4) extension flap

(5) crossbar

(6) ladder

(7) front window

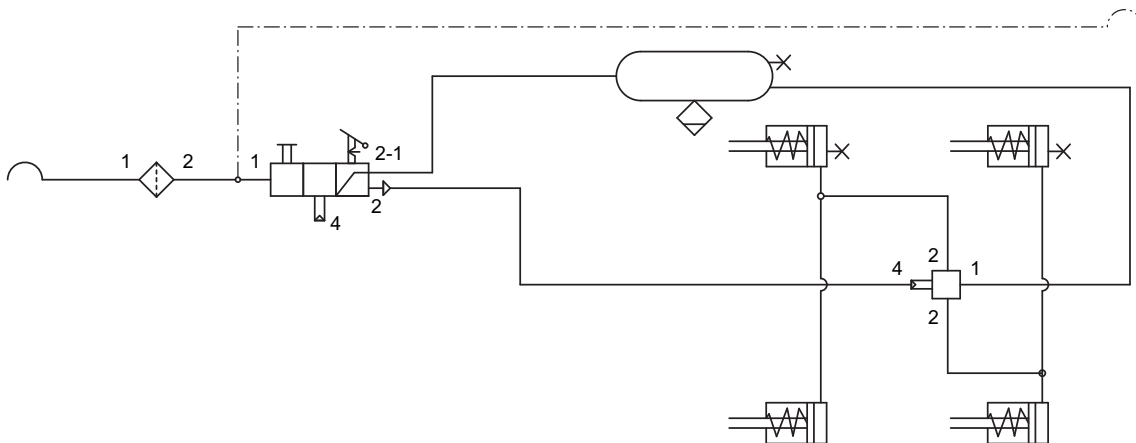
(8) side step

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### 3.4 SERVICE BRAKE

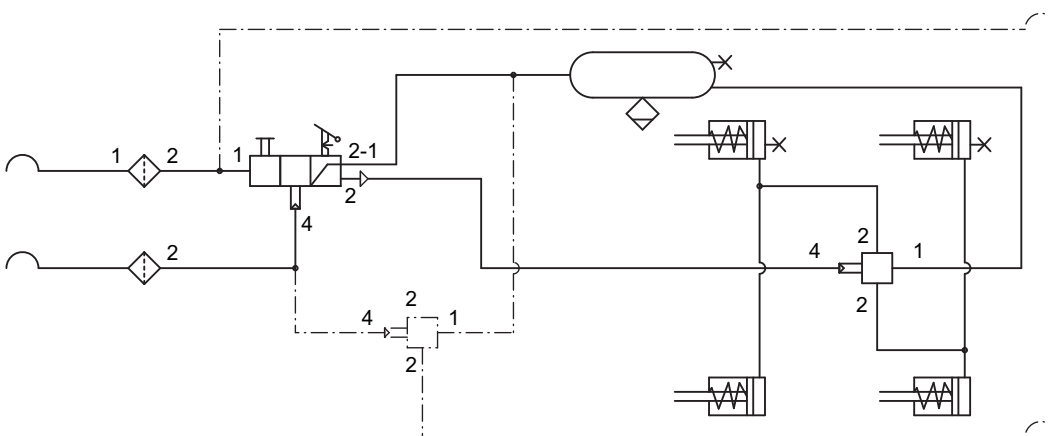
Depending on the version of the trailer, the machine is equipped with one of five types of service brake:

- single-circuit pneumatic braking system - figure (3.4).
- double-circuit pneumatic braking system with manual braking force regulator - figure (3.5).
- double-circuit pneumatic braking system with automatic braking force regulator - figure (3.6).
- pneumatic-hydraulic braking system - figure (3.7).
- hydraulic braking system - figure (3.8).



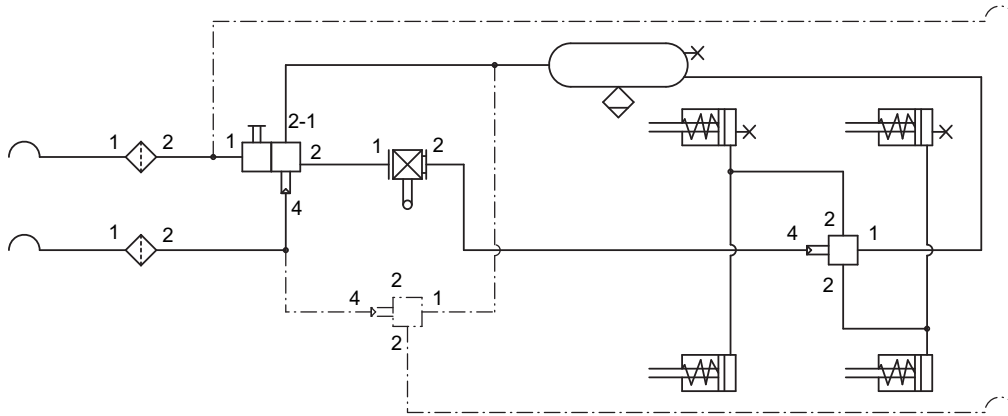
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**Figure 3.4** Diagram of a single-line pneumatic braking system.



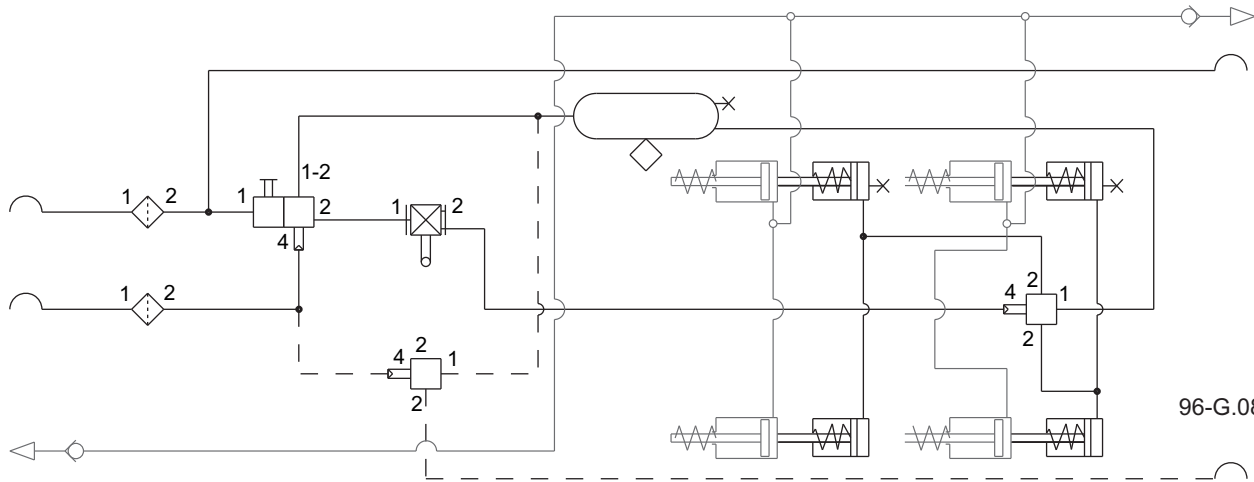
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**Figure 3.5** Diagram of a dual-line pneumatic braking system with a manual regulator.



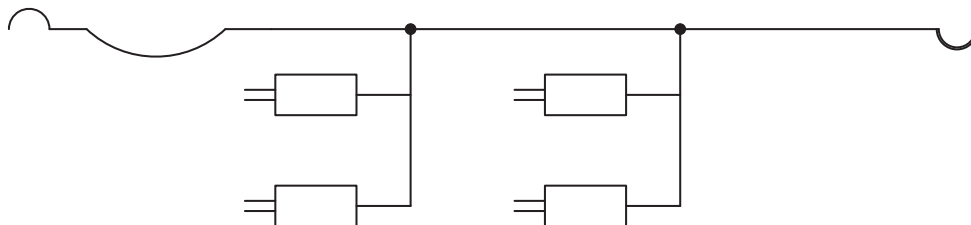
96-G.07-1

**Figure 3.6** Diagram of a dual-line pneumatic braking system with an automatic regulator.



96-G.08-1

**Figure 3.7** Diagram of the pneumatic-hydraulic braking system.









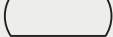





96-G.09-1

**Figure 3.8** Diagram of the hydraulic braking system.



**Table 3.2.** List of symbols used in the schemes

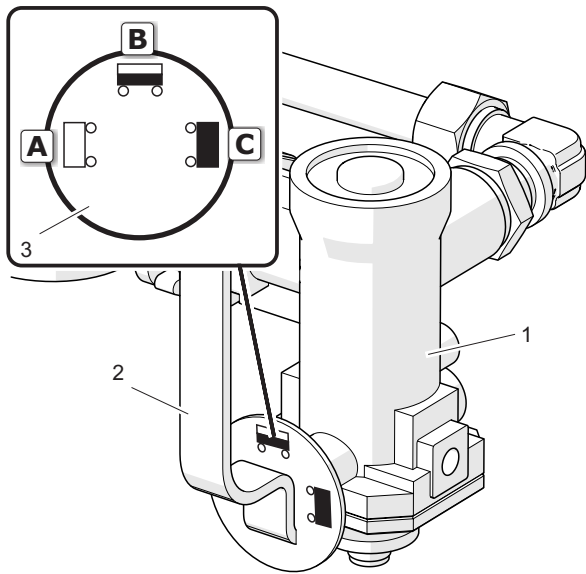
Symbol	Description
	Pneumatic connection, plug
	Pneumatic connection, socket
	Drainage valve
	Main control valve
	Relay valve
	Automatic braking force regulator
	Manual braking force regulator
	Wire connection
	Air tank
	Brake cylinder
	Control valve (connector)
	Air filter

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 (1) - figure (3.10), - 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 (applies

### ADVICE

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

only to pneumatic systems). The valve used has a brake release button (2), used when the trailer is disconnected from the tractor. After connecting the air line to the tractor, the release device automatically adjusts to the position enabling normal

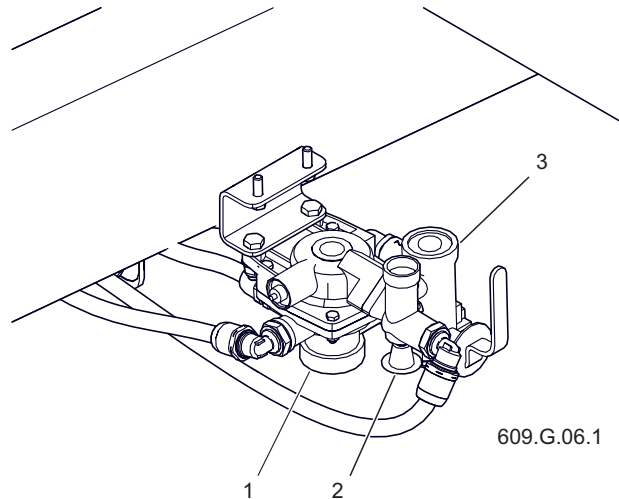


526-G.08-1

**Figure 3.9** Tri-band braking force regulator

(1) regulator (2) lever  
(3) disc settings (A) (B) (C)

operation of the brakes. The three-band braking force regulator - figure (3.9) used in pneumatic systems adjusts the braking force depending on the setting. Switching



609.G.06.1

**Figure 3.10** Control valve

(1) control valve (2) release button  
(3) manual braking force regulator

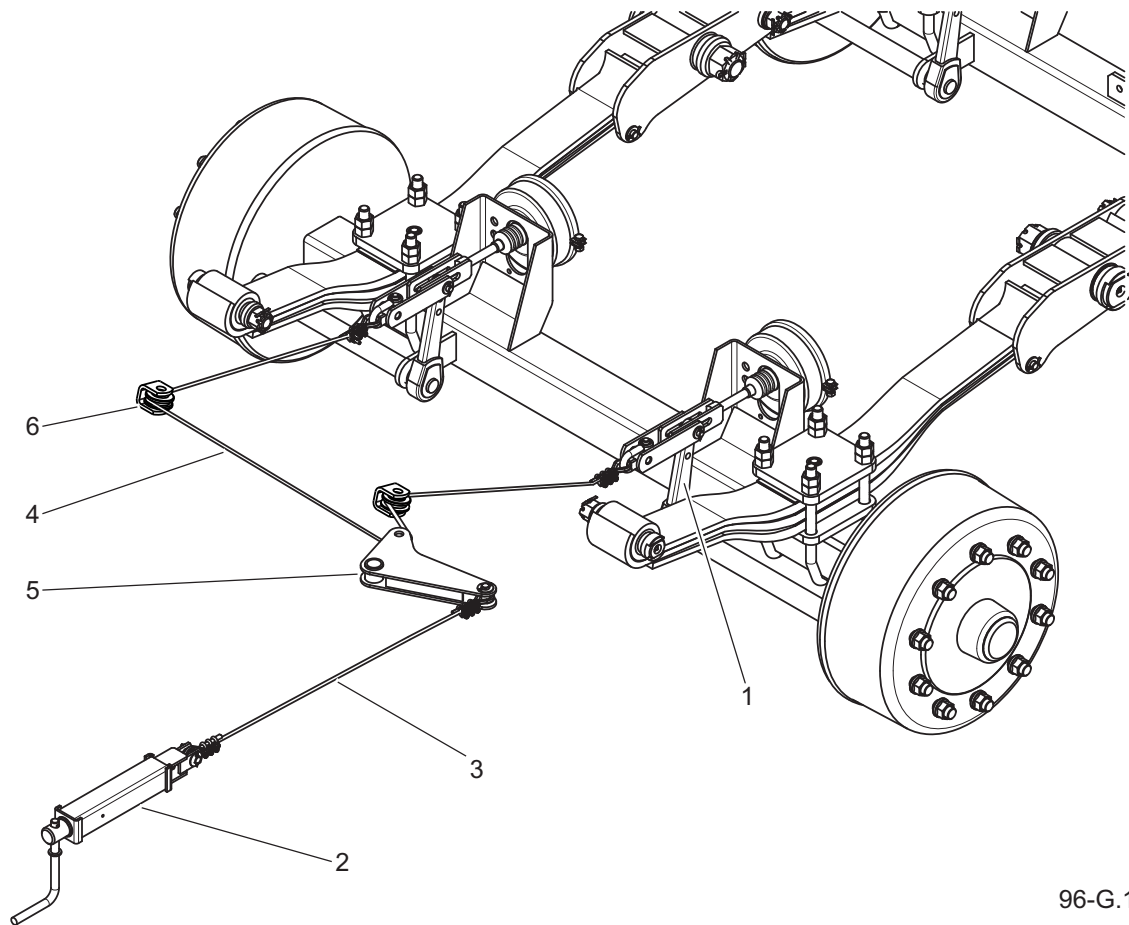
to the appropriate operating mode is done manually by the machine operator before starting the journey using the lever (2).

Three work positions are available:

- A - "Without load"
- B - „Half-load"
- C - „Full load".

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### 3.5 PARKING BRAKE



96-G.10-1

**Figure 3.11** Parking brake

(1) expander lever

(2) brake mechanism

(3) cable I

(4) cable II

(5) lever

(6) guide roller

Parking brake - figure (3.11) - is used to immobilize the trailer during parking. The brake crank mechanism (2), located at the front, on the left side of the frame, is connected to the lever (5) by a steel cable (3). The cylinder levers (1) of the axles are connected by a cable (4). By turning the crank of the mechanism (2) clockwise, the steel cable tightens, causing the lever

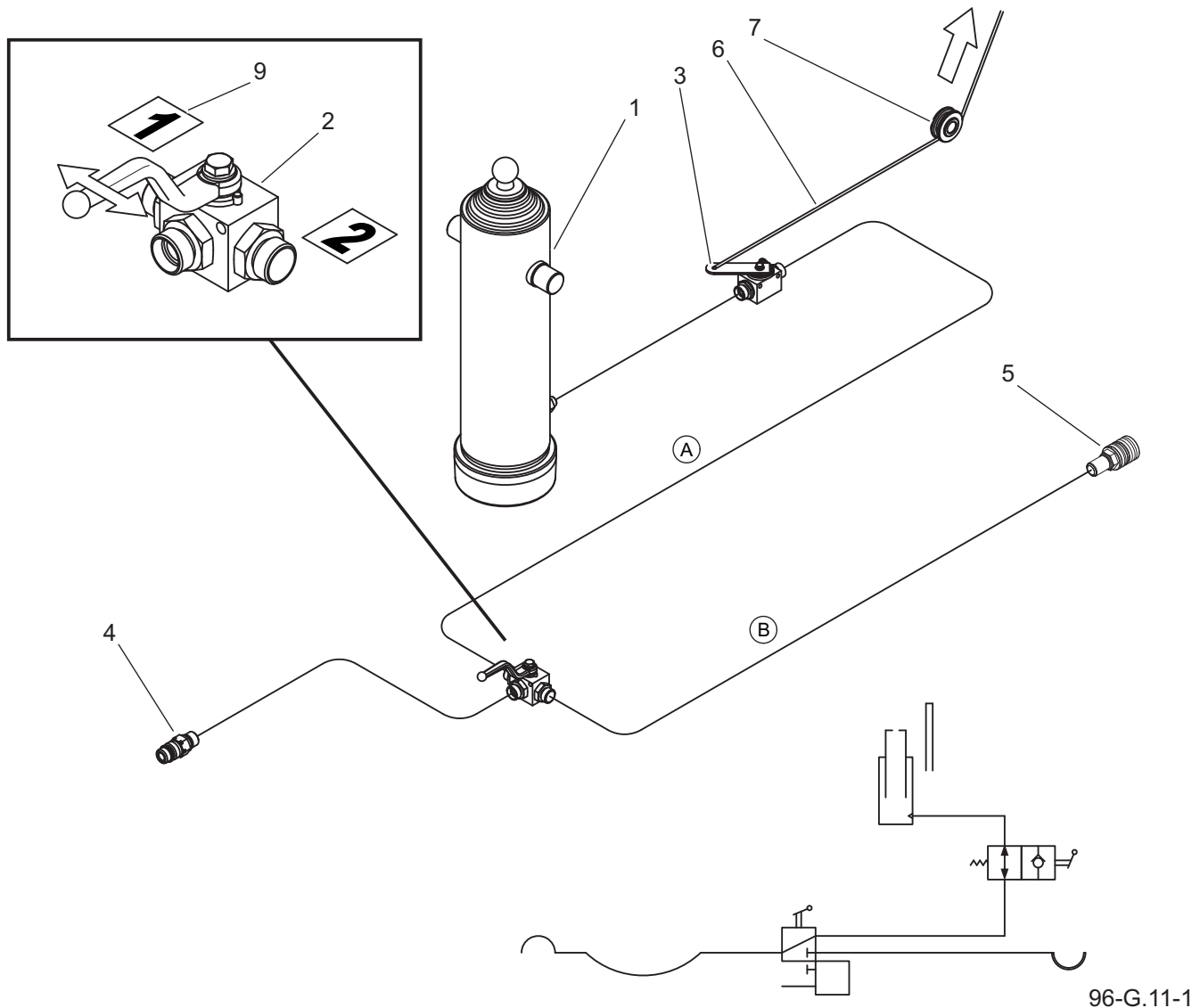
#### CAUTION

Before driving, make sure that the parking brake is unlocked.

(5) to deflect and tensioning the cable (4), causing the spreader lever to rotate. The brake shoes immobilize the trailer. The parking brake must be released before driving - the steel cable must hang loosely.

G.3.2.96.04.1.PL

## 3.6 HYDRAULIC TIPPING SYSTEM



**Figure 3.13** Hydraulic tipping system

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

The hydraulic tipping system is used for automatic unloading of the trailer by tilting the load box backwards. The hydraulic system of the unloading mechanism is supplied with oil from the tractor's hydraulic system. The tractor's external hydraulic oil distributor is used to control the

### ADVICE

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

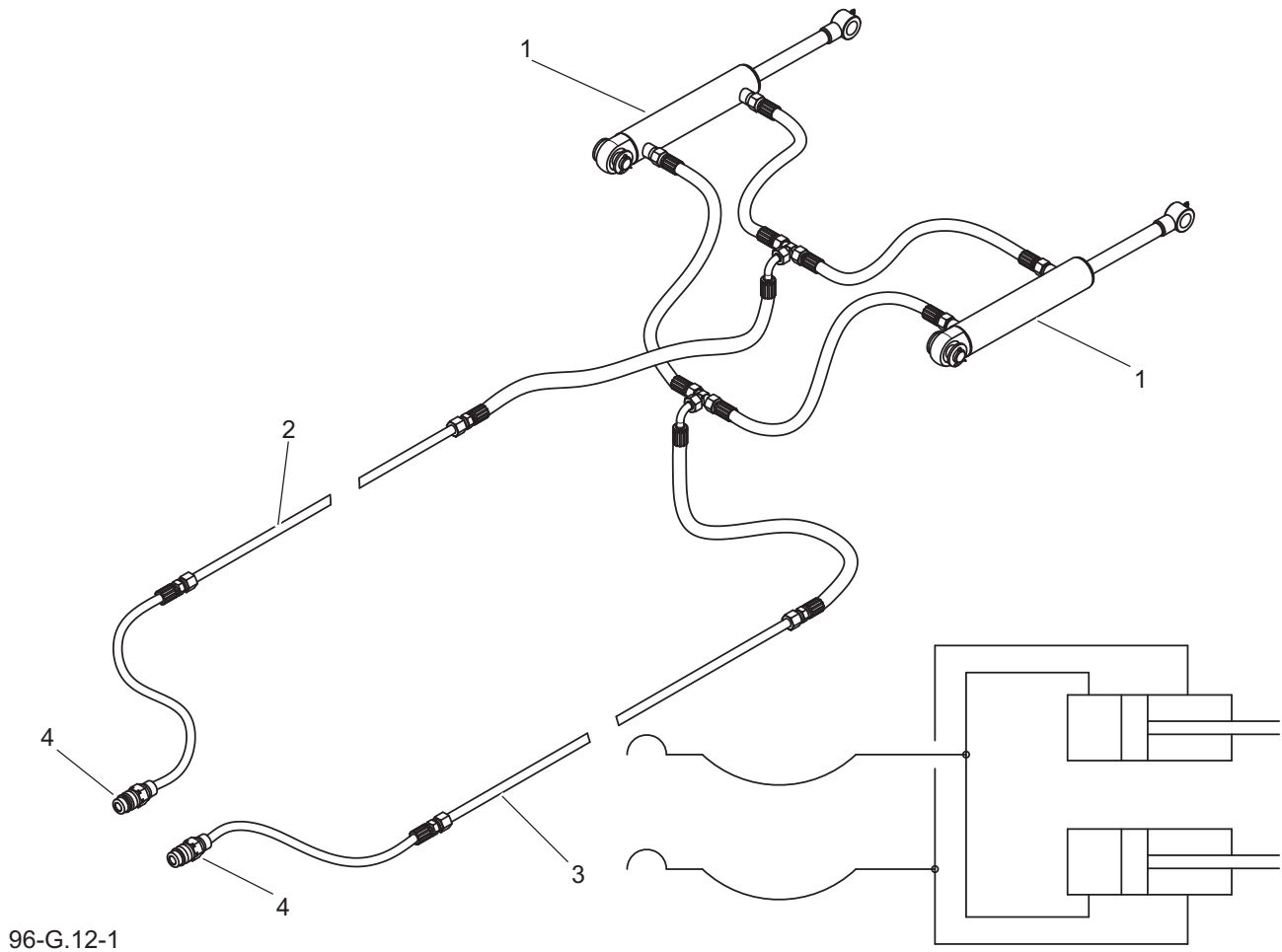
lifting of the load box.

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

- circuit (A) - to power the trailer's hydraulic cylinder,
  - circuit (B) - to power the hydraulic cylinder of the second trailer (in case two trailers are connected to the tractor).
- A three-way valve (2) is used to turn on these circuits - figure (3.13). The lever on this valve can occupy 2 positions:
- 1 - trailer tipping open circuit - circuit (A),
  - 2 - second trailer tipping circuit open - circuit (B).

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### 3.7 REAR FLAP HYDRAULIC SYSTEM



96-G.12-1

**Figure 3.14** Rear flap hydraulic system  
 (1) hydraulic cylinder (2) supply pipe  
 (4) quick coupler

(3) return pipe

The hydraulic installation of the tailgate is used to control its opening and closing; the tailgate can be stopped in any position using the lever of the tractor's external hydraulics distributor. Hydraulic cylinders (1) are connected with hydraulic lines with quick connectors (4). The plugs (4) should be placed in appropriate sockets of

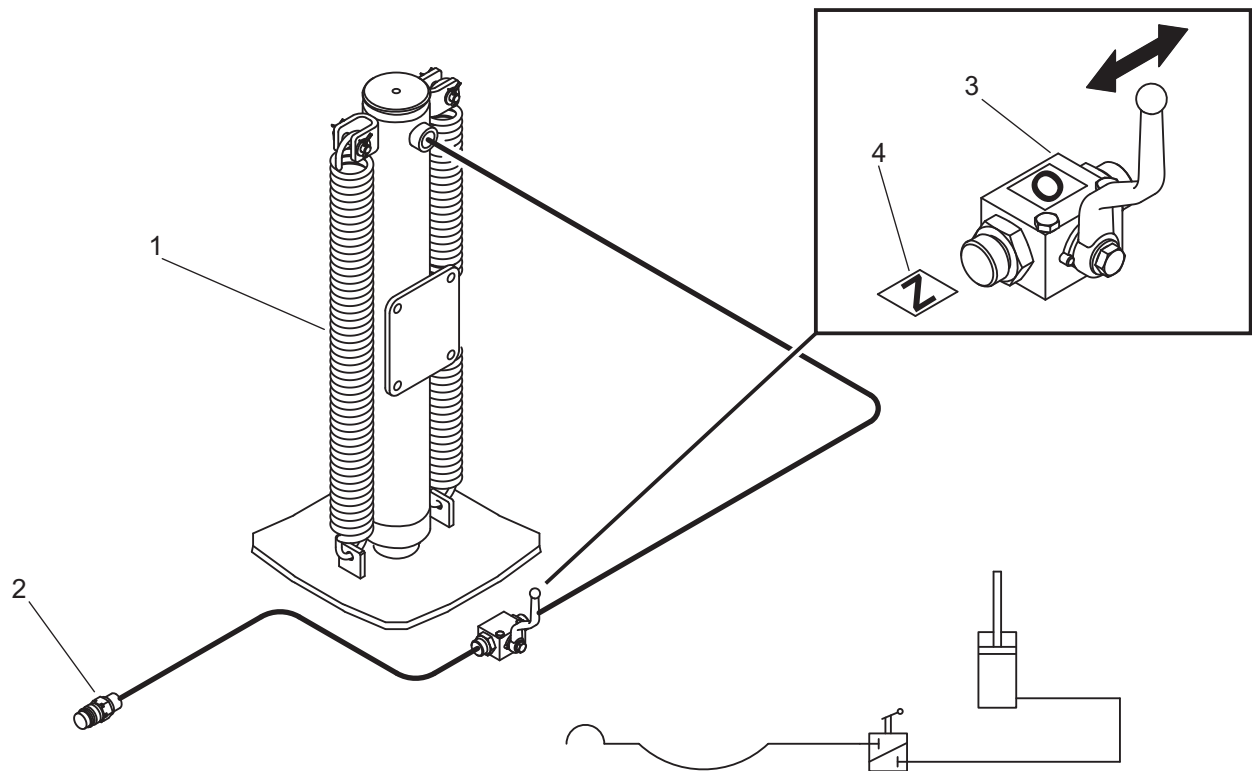
#### ADVICE

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

the hydraulic distributor of the agricultural tractor. The installation is supplied with oil from the tractor's hydraulic system. The tractor's external hydraulic oil distributor is used to control the rear flaps box.

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### 3.8 HYDRAULIC SYSTEM OF THE SUPPORT



96-G.13-1

**Figure 3.15** Hydraulic system of the straight support

(1) hydraulic support

(2) quick coupler

(3) valve

(4) Information sticker

The trailer is equipped with a hydraulic support. By using the hydraulic system of the support, you can obtain the appropriate drawbar height when coupling and uncoupling the trailer. The support installation is powered by the tractor's hydraulic system. The support is unfolded or folded by moving the piston rod of the hydraulic actuator. The oil distributor of the tractor's external hydraulics is used to control the operation of the support cylinder.

Two types of hydraulic supports are used in the trailer:

- straight hydraulic support – figure

#### ADVICE

The hydraulic system of the support was filled with L-HL32 Lotos hydraulic oil.

(3.15).

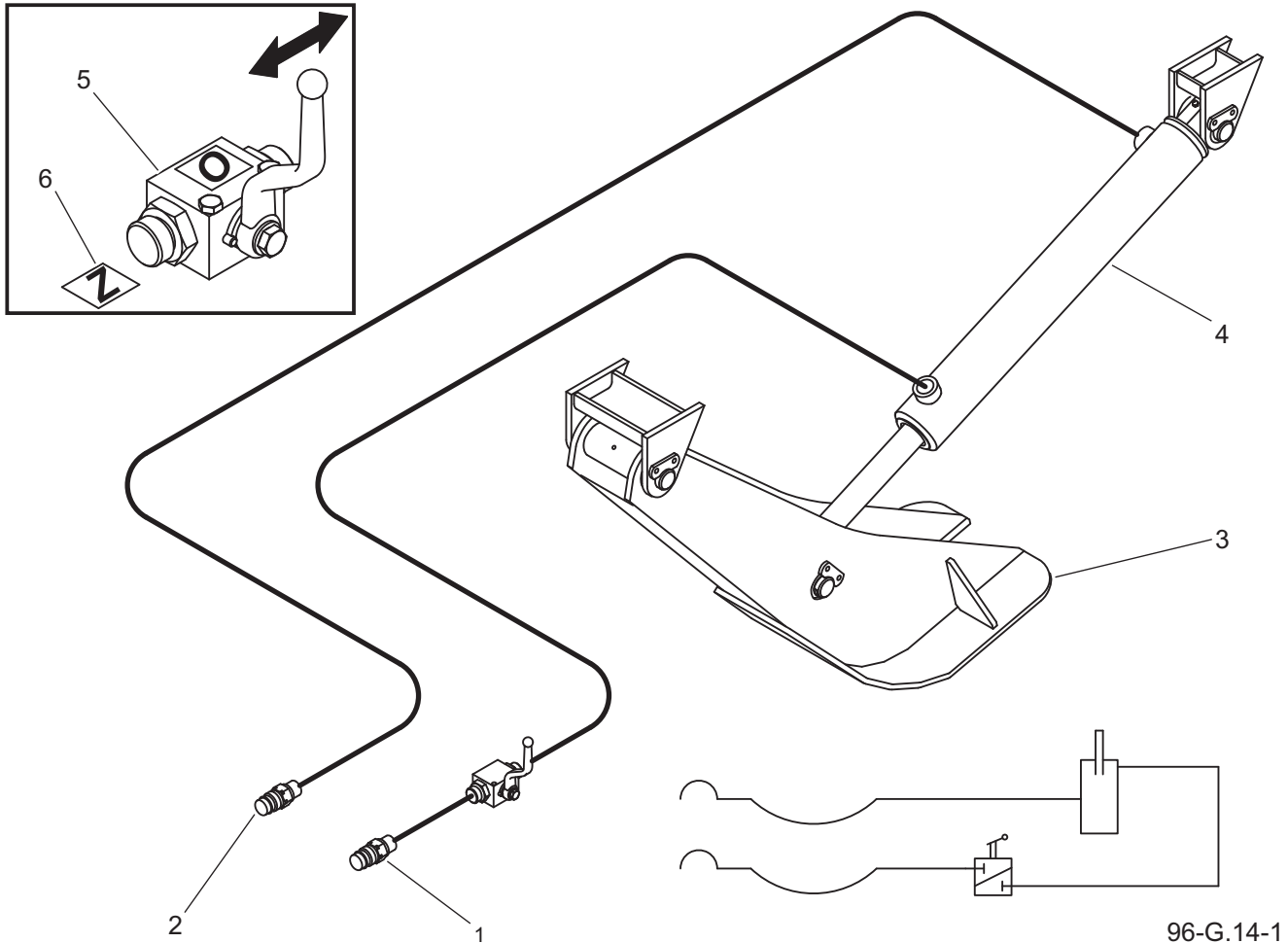
- hydraulic scissor support – figure (3.16).

Lowering of the straight hydraulic support, figure (3.15), is done by opening the valve (3) located on the trailer drawbar. Hydraulic oil fed from the tractor's hydraulic distributor extends the cylinder piston to the desired height. The return of the support to the transport position after reducing the pressure in the hydraulic conduit is forced

by springs and the trailer's own weight. The function of the valve (3) is to lock the support in a fixed position.

The hydraulic installation of the scissor support - figure (3.16) consists of a return pipe (1) on which a shut-off valve (5) is

tractor's hydraulic distributor goes to the pipe (2) and extends the actuator piston rod (4), lowering the support. The oil returns to the tractor distributor after opening the valve (5) located on the trailer drawbar, which raises the support.



**Figure 3.16** Hydraulic system of the foldable support

(1) return pipe

(2) supply pipe

(3) hydraulic support

(4) cylinder

(5) valve

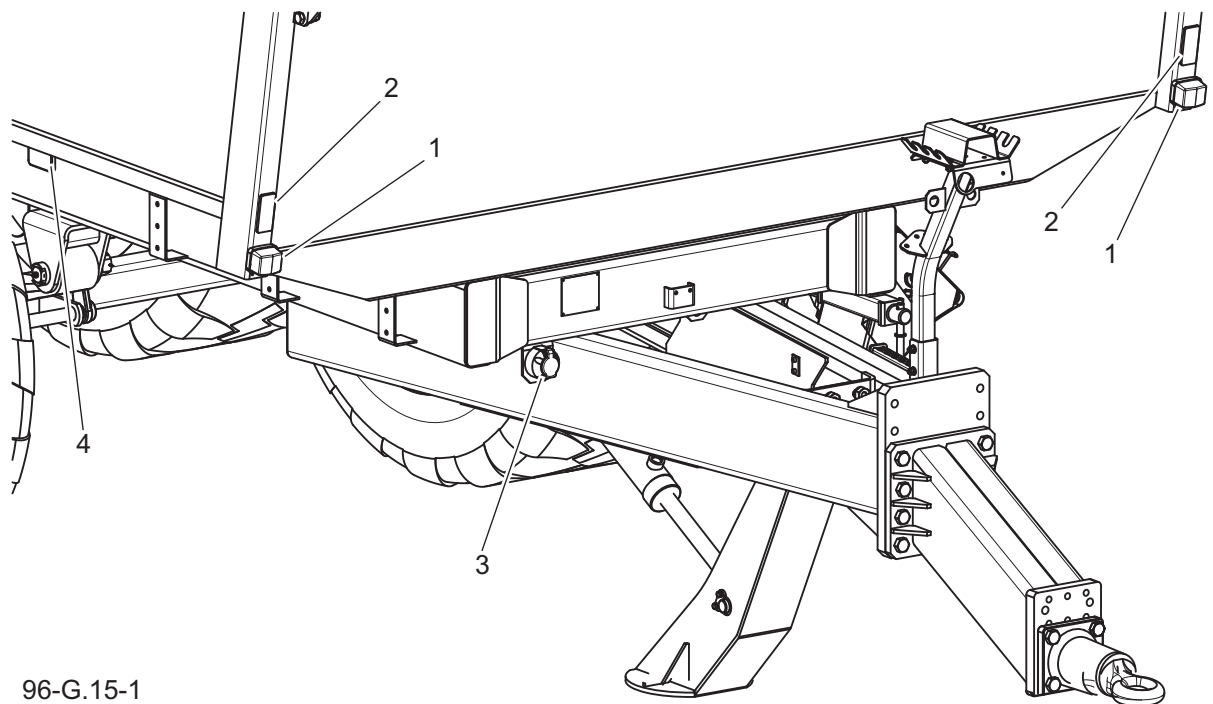
(6) information sticker

mounted. Hydraulic oil supplied from the

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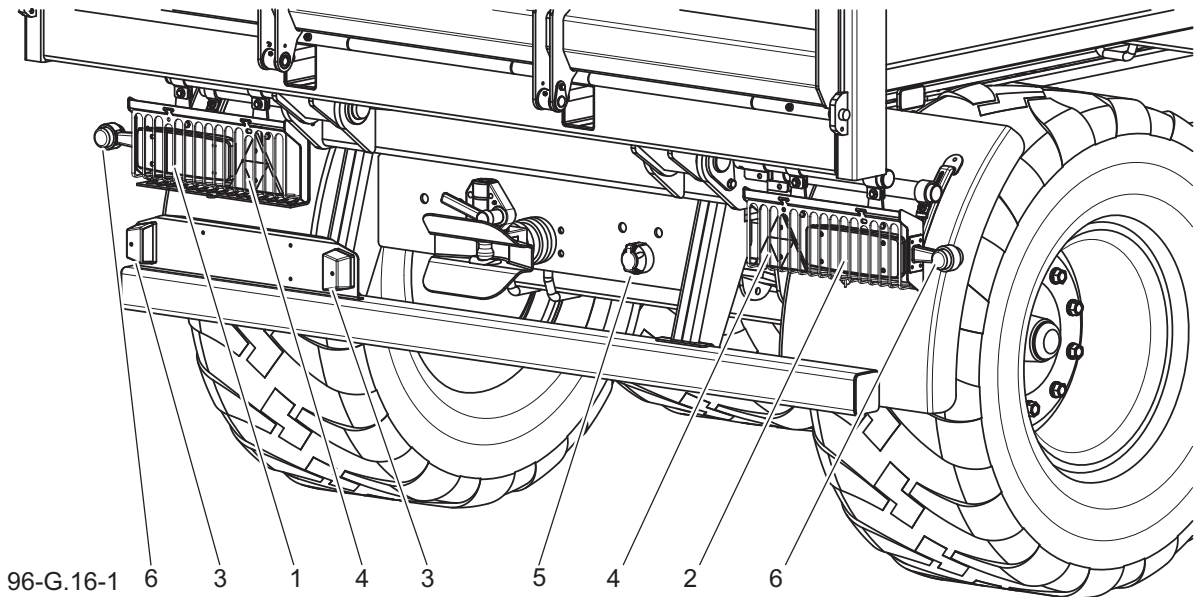
### 3.9 ELECTRICAL SYSTEM



96-G.15-1

**Figure 3.17** Arrangement of electric and reflective elements at the front

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



96-G.16-1

**Figure 3.18** Arrangement of electrical and reflective elements at the back

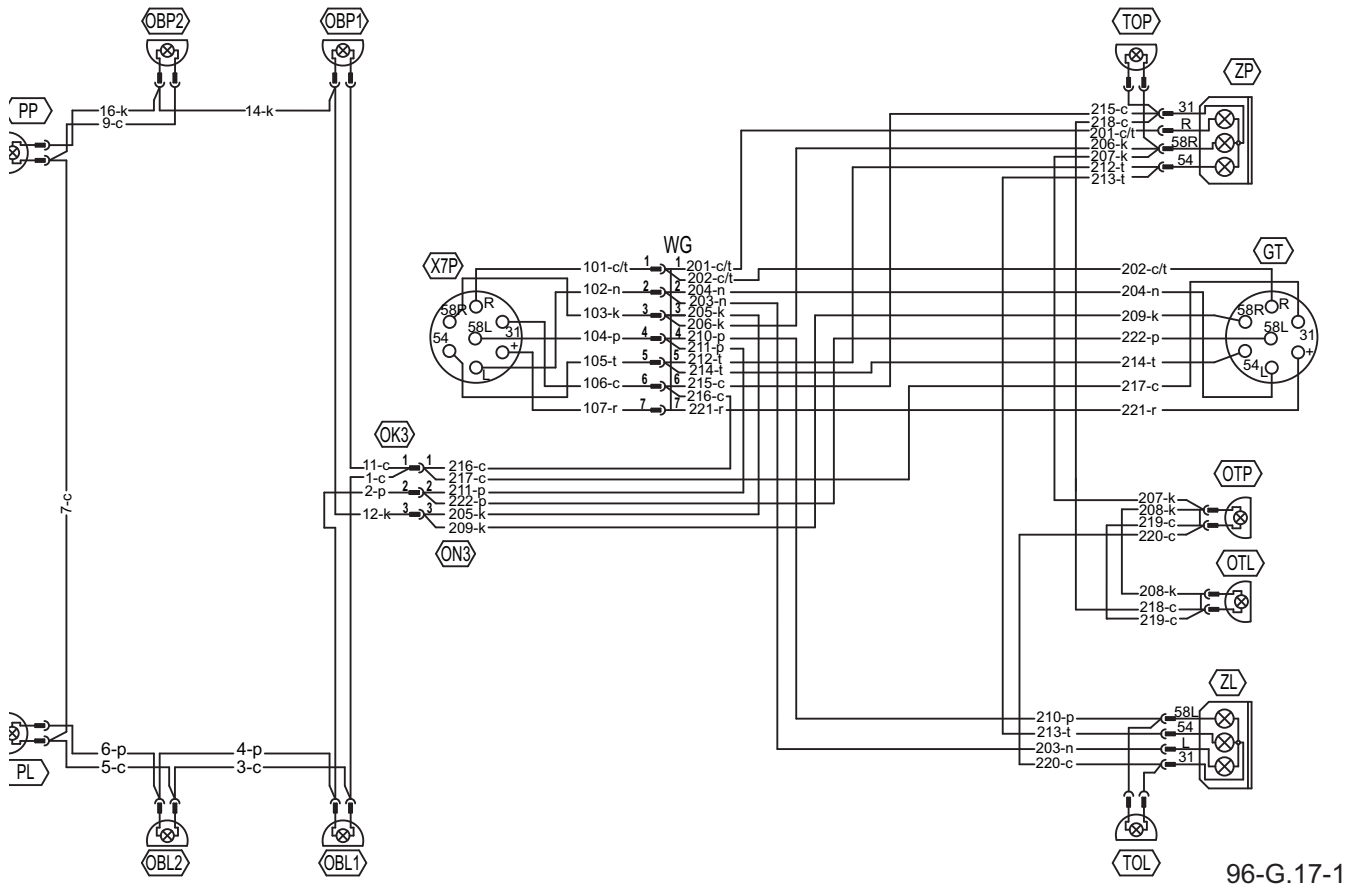
- (1) rear left combination lamp
- (2) rear right combination lamp
- (3) license plate lamp
- (4) reflector triangle
- (5) 7-pin socket
- (6) rear marker lamp

The electric system of the trailer is adapted for 12V DC supply. Connecting the trailer's electrical system with the tractor should be

made with a suitable connecting cable.

The arrangement of the electrical installation elements and the trailer's signaling

reflective lamps is shown in figures 3.17 and 3.18.



96-G.17-1

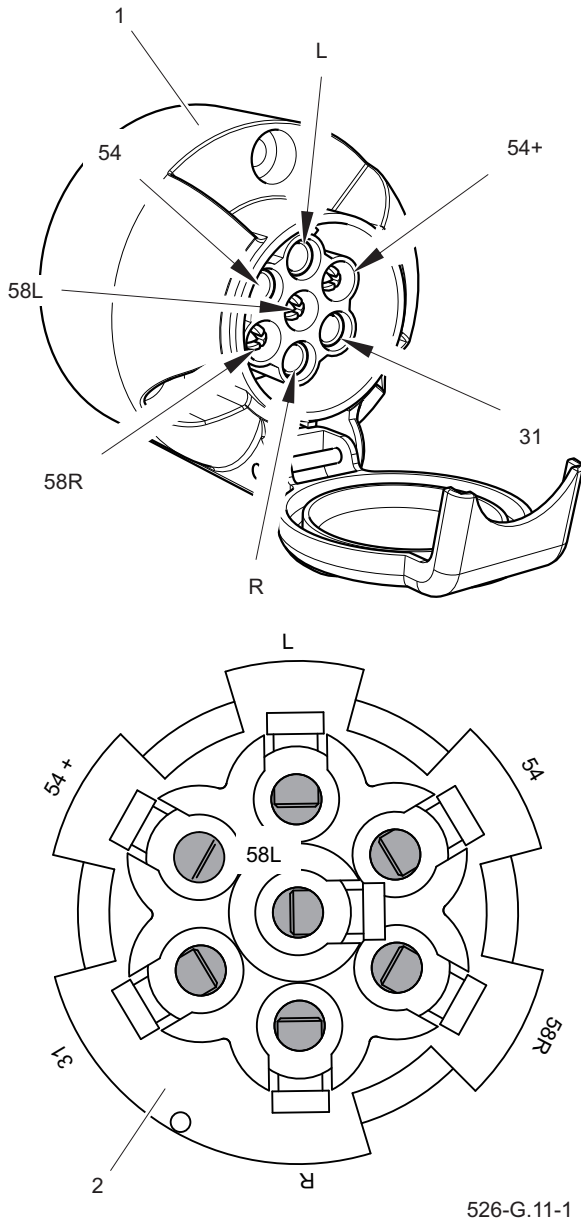
**Figure 3.19** Diagram of the trailer electrical system.  
Designations according to the table 3.4 and 3.5

**Table 3.3.** Markings Fig. 3.19

Symbol	Function
GP	Front 7 poles socket
PP	Front right plate lamp
PL	Front left plate lamp
ZP	Multifunctional rear right lamp
ZL	Multifunctional rear left lamp
OT	Board lighting lamp
TOP	Multifunctional rear right lamp
TOL	Multifunctional rear left lamp
OBP	Multifunctional right lamp
OBL	Multifunctional left lamp

**Table 3.4.** Colour coding of wires.

Symbol	Barwa
B	White
C	Black
K	Red
N	Blue
P	Orange
T	Green
C/T	Black-green
R	Pink
O	Brown
Z	Yellow



**Table 3.5.** Markings of connection socket

Marking	Function
31	Weight
54+	12V supply
L	Left direction indicator
R	Right direction indicator
54	STOP light
58L	Rear left position light
58R	Rear right position light
R	Right direction indicator

**Figure 3.20** Connection socket

(1) socket(2) beam side view

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# CHAPTER 4

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RULES OF USE

## 4.1 ATTACHING OF THE TRAILER



### DANGER

During hitching, unauthorized persons must not be 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 or pneumatic conduits to the tractor, make sure that the tractor and the trailer installations are not under pressure.

Ensure good visibility during coupling.

After completing the coupling check the safety of the coupling bolt.



### CAUTION

The trailer may only be connected to a technically sound agricultural tractor, if all connections (electrical, hydraulic and pneumatic), as well as the hitch on the agricultural tractor are in accordance with the manufacturer Cause's requirements. Pay attention to the compatibility of oils in the tractor's hydraulic system and in the hydraulic systems of the trailer.

In order to connect the trailer with the tractor, perform the following actions in order.

Make a visual assessment of the trailer's technical condition.

- Block the trailer with parking brake.

*Turn the brake mechanism clockwise as far as it will go.*

*Immobilize the trailer with the parking brake.*

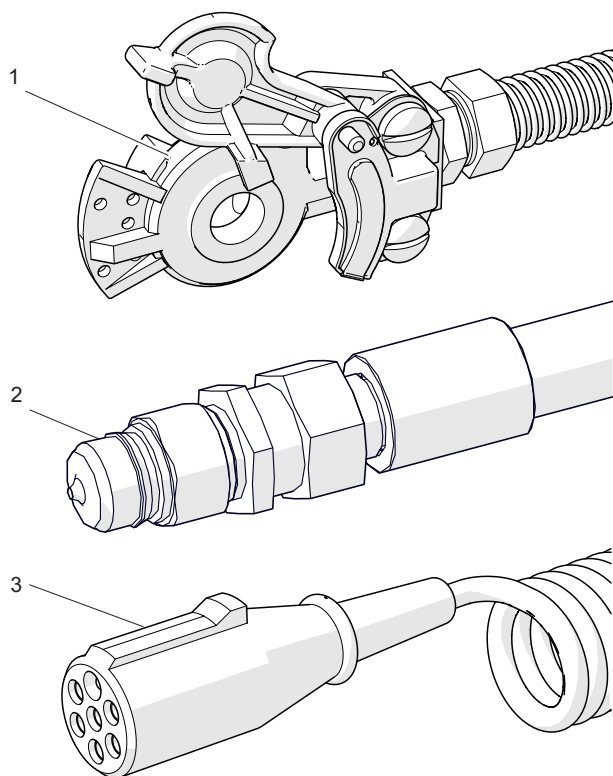
- Position the agricultural tractor directly in front of the drawbar eye of the trailer.



### DANGER

The use of defective trailers is forbidden.

- Adjust the height of the drawbar using the support so that the trailer can be connected.
- Reverse the tractor, connect the trailer to the the appropriate hitch tractor, 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.
- Fold the support and check its security.
- Turn off the tractor engine and remove the keys from the ignition. Close the tractor cabin and secure it against unauthorized access. Secure the tractor with the parking brake.
- Connect the braking system lines.
- Connect the hydraulic tipping system pipe.
- Connect the tailgate hydraulic system hoses. Connect the wires to the same section in the tractor manifold.
- Connect the main power supply cable for the lighting installation.



609 H.01-1

**Figure 4.1** Brake and electrical connections

(1) pneumatic brake plug, (2) hydraulic plug,  
(3) electric wire



### CAUTION

If the trailer is parked for a long time, it may turn out that the air pressure in the pneumatic braking system is insufficient to release the brake shoes. In this case, after starting the tractor and the air compressor, wait until the air in the pneumatic tank is topped up.



### CAUTION

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.

- Perform daily inspection of the trailer.
- If the trailer is functional, you can start working.
- Immediately before driving, remove the wheel chocks and release the machine parking brake.

Turn the crank handle anti-clockwise as far as it will go.

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## 4.2 DISCONNECTING THE TRAILER

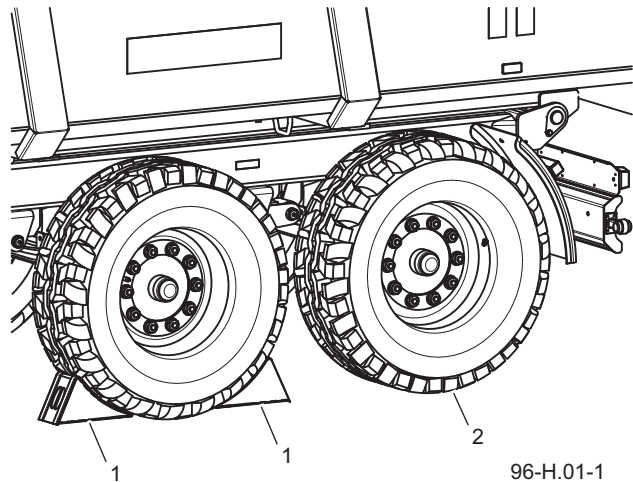


### DANGER

It is forbidden to disconnect the trailer with the load box raised.

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



96-H.01-1

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

- Place the trailer on a hard and flat surface.
- Immobilize tractor with parking brake, turn off tractor engine.
- Close the tractor cabin and secure it against unauthorized access.
- Place chocks under the trailer wheel to secure the machine against rolling away - figure (4.2).
- Lower the trailer parking stand and secure it.

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

- Disconnect the hydraulic system hoses from the tractor. Secure the ends of the cables with the caps and hang them on the hanger.

**Figure 4.2** Correct wedge setting

(1) locking wedges

(2) wheel axle



### CAUTION

In the case of a double conduit pneumatic system, first disconnect the conduit marked red and then the conduit marked yellow.

It is forbidden to disconnect the trailer when the machine is loaded.

- Disconnect the electric cable.
- Disconnect pneumatic system conduits and mount in proper place on the trailer applies to versions of trailers with pneumatic braking system.
- Disconnect the hydraulic brake system hose and hang it on the hanger (applies to trailer version with hydraulic brake system).
- Release tractor hitch, disconnect trailer drawbar from tractor hitch and drive tractor away.

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### 4.3 LOADING AND SECURING OF THE LOAD



#### CAUTION

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

Keep a safe distance from overhead power lines during operation.

When loading or unloading, bystanders must be careful and keep a safe distance from hazardous areas.

The trailer is designed for transporting and unloading heavy materials such as debris, stones, crushed stone, gravel used during construction works, earthworks and demolition works. Transport can take place either within the farm or on public roads.

Before loading, the trailer must be placed for driving straight ahead on level ground and connected to the tractor. Before loading, make sure the tailgate is properly closed and secured.

The technical condition of hydraulic and pneumatic systems should also be checked, especially the tightness of the brake cylinders. Loading and driving a trailer with damaged rear cover system, braking system or hydraulic tipping system is prohibited. Keep a safe distance during loading and unloading. Keep bystanders away from the work area of trailer.

The load should be evenly distributed over the length and width of the box to ensure

the correct distribution of axle load and the proper stability of the trailer. The load cannot protrude beyond the outline of the load box. The permissible height specified in road traffic regulations and the permissible structural capacity of the trailer may not be exceeded.

Due different density of materials, the use of the total capacity of the load box may exceed the allowable capacity of the trailer. Approximate specific weight of selected materials is presented in Table 4.1.



#### CAUTION

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

The load on the loading platform must be evenly distributed and properly secured.

During travel on public roads, the tailgate must be closed.

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

Transported machines must be secured against movement by means of suitable and good condition belts.

Therefore, pay special attention not to overload the trailer.

Loading should be performed by a person with appropriate authorization to operate the equipment (if required).

Regardless of the type of transported load, the user is obliged to secure it in such

**TABLE 4.1** *Approximate volumetric weights of selected loads*

Type of material	Volumetric weight kg/m <sup>3</sup>
<b>Building Materials:</b>	
cement	1,200 – 1,300
dry sand	1,350 – 1,650
wet sand	1,700 – 2,050
solid bricks	1,500 – 2,100
brick blocks	1,000 – 1,200
stone	1,500 – 2,200
soft wood	300 - 450
hardwood timber	500 - 600
impregnated timber	600 - 800
steel structures	700 – 7,000
ground quicklime	700 - 800
slag	650 - 750
gravel	1,600 – 1,800
rubble	1,050 – 1,200
<b>Root Crops:</b>	
raw potatoes	700 - 820
steamed mashed potatoes	850 - 950
dried potatoes	130 - 150
sugar beets - roots	560 - 720
fodder beets - roots	500 - 700
<b>Mineral fertilizers:</b>	
ammonium sulphate	800 - 850
potassium salt	1,100 – 1,200
super phosphate	850 – 1,440
basic slag	2,000 – 2,300
potassium sulphate	1,200 – 1,300
ground lime fertilizer	1,250 - 1,300
<b>Concentrated feed and compound feed:</b>	
stored chaff	200 - 225
oil cake	880 – 1,000
dried mince	170 - 185
compound feed	450 - 650
mineral mixtures	1,100 – 1,300
oat middlings	380 - 410
wet beet pulp	830 - 1,000
expeller pressed beet	750 - 800
dry beet pulp	350 - 400
bran	320 - 600
bone meal	700 – 1,000
fodder salt	1,100 – 1,200
molasses	1,350 – 1,450

Type of material	Volumetric weight kg/m <sup>3</sup>
<b>Seeds:</b>	
broad bean	750 - 850
mustard	600 - 700
pea	650 - 750
lentil	750 - 860
bean	780 - 870
barley	600 - 750
Shamrock	700 - 800
grass	360 - 500
maize	700 - 850
wheat	720 - 830
rape	600 - 750
flax	640 - 750
lupine	700 - 800
oat	400 - 530
Lucerne	760 - 800
rye	640 - 760
<b>Other:</b>	
dry soil	1,300 – 1,400
wet soil	1,900 – 2,100
fresh peat	700 - 850
compost soil	250 - 350

a way that the load cannot move freely and cause contamination of the road. If this is not possible, it is prohibited to transport this type of load.

The number of safeguards used depends on the method of loading, type of load and size of the load. If the transport will take place on slopes and/or with strong gusts of wind, the height of the load should be limited depending on the situation.

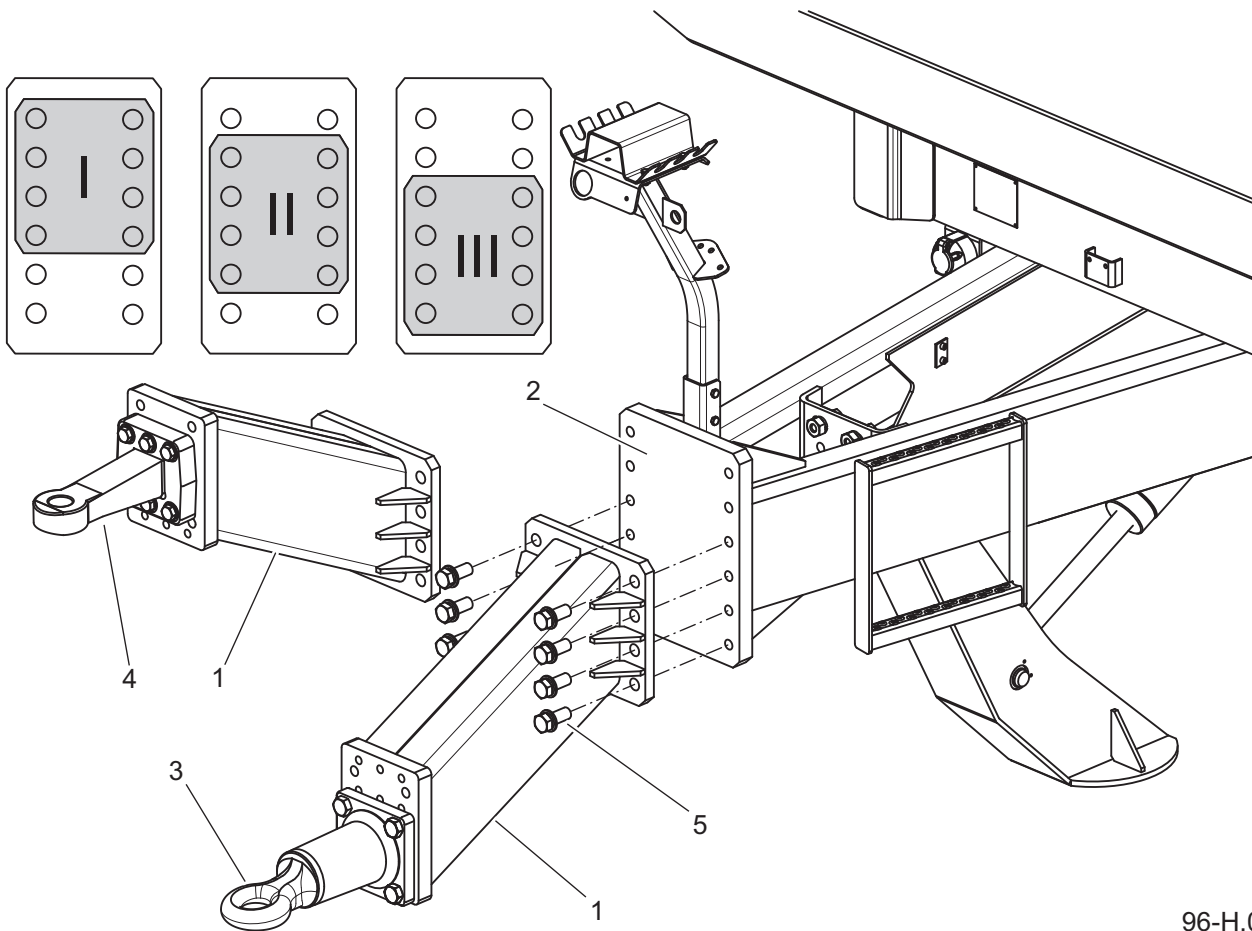
Before travelling on a public road, clean horizontal elements of the trailer such as

the drawbar, wall edges from accidentally sprinkled material (aggregate). Before driving, check the correct closing of the rear flap cover.

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

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## 4.4 ADJUSTING THE POSITION OF THE DRAWBAR



**Figure 4.3** Unloading of the loading box

(1) drawbar

(2) face

plate (3) swivel link

(4) fixed link (5) mounting screw

The position of the trailer drawbar 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 so that the trailer drawbar is horizontal.

Moving from the lower hitch to the upper hitch and vice versa is accomplished by turning the drawbar (1) of 180° and fitting it to the front plate (2).

- Block the trailer with parking brake.
- Place safety wedges under the trailer wheel.
- Remove the drawbar (1) from the face plate (2) by unscrewing the fastening screws (5).
- If necessary, turn the drawbar (1) 180° and move it to the new position.

*Tighten the screws (5) with the correct torque.*

*The design of the drawbar (1),*

### THE SCOPE OF ACTIVITIES

*and the face plate (2) allows three combinations of its positioning (I), (II), (III).*

- Set and install the rotating link (3) or the fixed link (4) in the appropriate position.

*• The drawbar design (1) allows two variations of the linkage setting.*



## DANGER

Be especially careful due to the possibility of crushing limbs, use appropriate tools and personal protective equipment.

After adjusting the position of the drawbar or drawbar rod, carefully check the tightening of the threaded connections - see section (5.18) Inspection of screw connections.

Damaged screws must be replaced with new ones.

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## 4.5 LOAD TRANSPORTATION



### DANGER

It is forbidden to transport people and animals. Manure spreader overloading, inefficient loading and securing of loads are the most common causes of accidents during transport. Keep a safe distance from overhead power lines during operation.

When driving 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. Check that the parking stand is in the driving position.
- Set the appropriate braking force regulator operating mode.
- Vertical load carried by the trailer drawbar eye affects the steering of the agricultural tractor.
- The trailer must not be overloaded, the load must be 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, the condition of the trailer, the type of load carried and other conditions affecting the behaviour of the set while driving.

- The trailer disconnected from the tractor must be secured by immobilizing it with the parking brake and placing it under the wheel chocks. Fold out the parking stand. Leaving an unsecured trailer is prohibited. In the event of a machine breakdown, stop at the side of the road without



### CAUTION

It is forbidden to pull the trailer forward if the bulk or scattering load has not been unloaded. It is forbidden to start or drive with the load box raised. Tilting of the load box may only be performed on firm and level ground.

endangering other road users and mark the stopping place in accordance with traffic regulations.

- When travelling on public roads, the trailer must be marked with a slow-moving vehicle warning sign located on the rear wall of the load box, if the trailer is the last vehicle in the set.
- The tractor operator is required to equip the trailer with an approved or approved warning reflective triangle.
- While driving, obey the rules of the road, signal the change of direction by means of direction indicators, keep clean and take care of the technical condition of the lighting and signalling installation. Damaged or lost lighting and signalling components must be repaired or replaced immediately.
- Avoid ruts, depressions, ditches, or driving along roadside slopes. Driving across such obstacles can cause the trailer and tractor to tilt suddenly. This is particularly important because the centre of gravity of the trailer with load (and especially with volumetric load) adversely affects driving safety. Driving near the edges of ditches or canals is dangerous due to the risk of landslides under the wheels of a trailer or tractor.
- The travel speed should be reduced sufficiently in advance of driving to curves, when driving on uneven or sloping terrain.
- When driving on public roads, the hydraulic tailgate must be closed and secured.
- 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.
- Prolonged driving on sloping ground creates a risk of loss of braking efficiency.
- The manure spreader is adapted for driving on slopes up to a maximum of 8°. Moving the trailer over slopes may cause the trailer to overturn as a result of loss of stability.

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## 4.6 UNLOADING

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

The trailer must be placed for straight ahead and connected to the tractor. Unloading should take place only when the trailer is placed on level and stable ground. When working, ensure good visibility and extreme caution. The trailer and tractor should be immobilized with the parking brake. Immediately before unloading, remove all load securing devices. Unload the trailer using generally accepted principles of health and safety.

In case of goods on pallets or volumetric loads, it is recommended to unload the trailer using a loader, conveyor or forklift. When working, ensure good visibility and



### CAUTION

It is forbidden to pull the trailer forward if the bulk or scattering load has not been unloaded.  
It is forbidden to start or drive with the load box raised.  
It is forbidden to tilt the load box during strong gusts of wind.  
Tilting of the load box may only be performed on firm and level ground.  
Tilting of the load box may be performed only when the trailer is connected to the tractor.



### DANGER

Make sure that nobody is near the unloading area during unloading.  
Keep a safe distance from overhead power lines during operation.

extreme caution.

The trailer is unloaded in the following order:

- the tractor and trailer should be placed for straight ahead on flat and hard terrain,
- immobilize tractor with parking brake.
- open the hydraulic rear flap, by means of servomotors, by adjusting the lever of the hydraulic distributor in the tractor or open the tilt and turn flap,
- using the distributor lever in the operator's cab cause the load box to be tilted using a telescopic cylinder,
- after unloading, lower the load box and clean the edges of the floor,
- close the hydraulic rear hatch by controlling the appropriate hydraulic circuit from the tractor or close the tilt and turn hatch,
- before moving off make sure that the hydraulic tailgate or swinging tailgate is correctly locked.

During unloading with the use of a tilting flap, the load box must be lifted slowly



and smoothly. Rapid lifting of the load box will cause very high pressure on the rear part of the load box as a result of the load shifting and may threaten the stability of the machine.

**CAUTION**

It is forbidden to tip over the load box when it is open and unsecured with a tilt and turn hatch. Always secure the tilt and turn hatch when opening to the side.

**DANGER**

It is forbidden to unload the trailer by tipping the box backwards while the swing gate is open to the side. Make sure that during unloading nobody is near the tilted load box and the falling load.

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## 4.7 USE OF TIRES

- When working with tires, the manure spreader should be secured against rolling by placing chocks 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.

- Regularly check the tightness of the wheel nuts..
- 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 breaks in the tire cooling cycle.
- Avoid damaged surfaces, sudden and variable manoeuvres, and high speeds when turning.

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## 4.8 CLEANING OF 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.

### THE SCOPE OF ACTIVITIES

- Before washing the trailer, open the tailgate. Thoroughly clean the load box from any cargo residues (sweep or blow with compressed air), especially around the tailgate adjacent and extensions.
- 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 work. 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



### DANGER

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

cylinders, hydraulic cylinders, pneumatic, electric and hydraulic plugs, lights, electrical connectors, information and warning stickers, rating plate, cable connectors Spring leaves, 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.
- 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 temperatures above 0 °C.
- After washing and drying the trailer, lubricate all control points, regardless of the period of the last treatment.

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## 4.9 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 (against the effects of sun and rain), which cause corrosion of steel and accelerate the aging of tires. Perform security according to the instructions given below.

- The machine must be unloaded, set on paved ground on its own wheels and secured with wedges.
  - The trailer should be thoroughly cleaned of plant residues, as this material absorbs moisture, which promotes corrosion.
  - 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.
  - Cover tires where they may be exposed to sunlight.
  - 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.

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# CHAPTER 5

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## TECHNICAL INSPECTION SCHEDULE

## 5.1 GENERAL

This chapter describes all activities related to periodic inspections that you as the user are required to carry out in accordance with the assumed schedule. Constant control of the technical condition and the performance of maintenance operations are necessary to keep the machine in good technical condition. Maintenance activities that you can do yourself are described in the *Maintenance* chapter.

Repair of the machine during the warranty period may only be carried out by Authorized Sales and Service Points (APSiO). In the event of unauthorized



### CAUTION

It is forbidden to use a damaged trailer.  
The trailer may only be towed when the braking system, lighting, draw bar and running gear are functional.  
Repairs during the warranty period may only be carried out by authorized service centres.

repairs, changes to factory settings or activities that have not been considered as being possible by the Cause operator (not described in this manual), the user loses the warranty.

The trailer's warranty inspection is only carried out by authorized service centres.

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## 5.2 PERIODIC INSPECTIONS OF THE TRAILER

**Table 5.1.** Review categories

Category	Description	Responsible	Frequency
A	Daily review	Operator	Every day before first start-up or every 10 hours of continuous shift work.
B	Maintenance	Operator	The inspection is carried out periodically every 1000 kilometres travelled or every month the trailer works, whichever comes first. Each time before performing this review, a daily check must be carried out.
C	Maintenance	Operator	Inspection carried out periodically every 3 months. Each time before carrying out this inspection, carry out a daily inspection and inspection every one month of use of the trailer.
D	Maintenance	Operator	Inspection carried out periodically every 6 months. Each time before carrying out this inspection, perform a daily inspection, inspection every 1 month of the trailer use and inspection every 3 months.
E	Maintenance	Operator	Inspection carried out periodically every 12 months. Each time before carrying out this inspection, perform a daily inspection, inspection every 1 month of the trailer use and inspection every 3 months.
F	Guarantee	APSiO <sup>(1)</sup>	Inspection carried out for a fee after the first 12 months of use of the trailer, after reporting the owner.
G	Maintenance	Service <sup>(2)</sup>	Inspection carried out every 4 years of trailer use

(1) - Authorized Sales and Service Centre

(2) - post-warranty service

**Table 5.2.** Technical inspection schedule

Description of activities	A	B	C	D	E	F	Page
Measurement of air pressure	•						5.7
Tank drainage	•						5.8
Checking plugs and connection sockets	•						5.9
Covers inspection	•						5.10
Checking the trailer before driving off	•						5.11
Measurement of air pressure, check tires and wheels		•					5.7
Cleaning the air filters			•				5.12
Checking brake lining wear				•			5.13
Checking the clearance of the axle bearings				•			5.14
Checking of mechanical brakes				•			5.16
Cleaning the drainage valve				•			5.17
Checking of parking brake cable tension					•		5.18
Hydraulic system checking					•		5.20
Control of pneumatic system					•		5.21
Lubrication	See table: <i>Trailer lubrication schedule</i>						5.22
Screw connections inspection	See table: <i>Tightening schedule for important bolted connections</i>						5.25
Replacement of hydraulic hoses						•	

**Table 5.3.** Control parameters and settings

Description	Value	Notes
<b>Braking system</b>		
Piston rod stroke in pneumatic systems	25 - 45 mm	
Piston rod stroke in hydraulic systems	25 - 45 mm	
Piston rod stroke in pneumatic and hydraulic systems	25 - 45 mm	
Minimum brake lining thickness	5 mm	
Angle between the trailer axis and the fork	90°	With the brake depressed
<b>Parking brake</b>		
Permitted parking brake cable clearance	20 mm	

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## 5.3 PREPARATION OF THE TRAILER

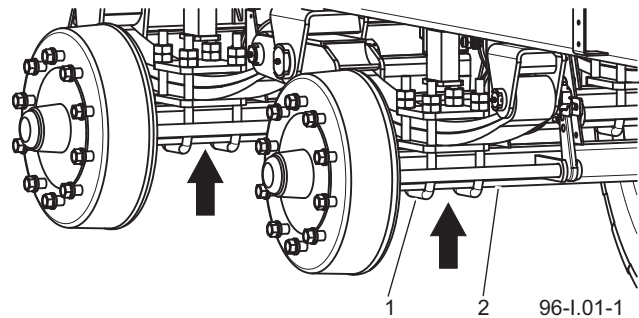


### DANGER

Secure the tractor cab against unauthorized access. When working with the jack, the user must read the instructions for this device and follow the manufacturer's instructions. The jack must stand firmly against the ground and the trailer elements. Before starting maintenance and repair work with the trailer lifted, make sure that the trailer is properly secured and will not roll during operation.

### THE SCOPE OF ACTIVITIES

- Hitch trailer to tractor.
- Place the tractor and trailer on firm and level ground for straight travel.
- Apply the tractor parking brake.
- Turn off the tractor engine and remove the keys from the ignition. Close the tractor cabin, thus protecting the tractor against unauthorized access.
- Place safety wedges under the trailer wheel. Ensure that the trailer will not roll during inspection.
- In case when the wheel needs to be raised during the inspection, place



**Figure 5.1** Recommended jack substitution points

(1) U-bolt

(2) driving axle

the locking wedges under the wheel on the opposite side under the rigid axle. Place the jack in places marked with an arrow. The jack must rest on a firm and stable surface.

- The jack must be suited to the trailer weight.
- In exceptional cases, release the trailer parking brake, e.g. when measuring the play of the axle bearings. Take special care.

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## 5.4 MEASUREMENT OF AIR PRESSURE, CHECK TIRES AND WHEELS

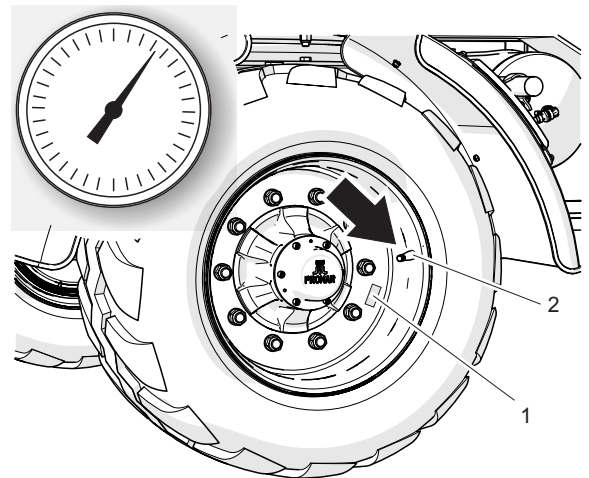
### ADVICE

The tire pressure value is on the information sticker on the wheel rim - figure (5.2).  
In the event of intensive use of the trailer, we recommend more frequent pressure checks

During pressure measurement the trailer must be unloaded. The inspection should be carried out before driving, when the tires are not warmed up or after a long stop of the trailer.

### THE SCOPE OF ACTIVITIES

- Connect a pressure gauge to the valve and check the air pressure. If necessary, inflate the wheel to the required pressure.
- Check the technical condition of the tires (tread depth, side wall of the tire).
- Inspect the tire for defects, cuts, deformations, bumps indicating mechanical damage to the tire. In the event of mechanical damage, consult your nearest tire service centre and ensure that your tire defect is eligible for replacement.
- Check that the tire is correctly positioned on the rim.



526-I.07-1

**Figure 5.2** Trailer wheel

(1) information sticker

(2) valve



### CAUTION

Incorrect tire pressure can lead to permanent tire damage as a result of delamination of the material and also causes faster tire wear.



### DANGER

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

- Check tire age.

When checking the pressure pay attention to the technical condition of the rims. Rims should be checked for deformation, material cracks, weld cracks, corrosion, especially around welds and in the place contact with the tire.

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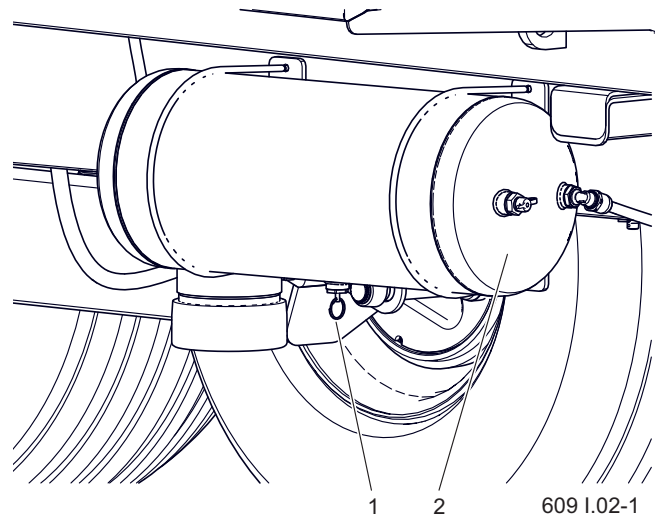
## 5.5 TANK DRAINAGE

### THE SCOPE OF ACTIVITIES

- Press the stem of the drain valve (1) located at the bottom of the tank (2).

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.
- If the valve stem does not want to return to its position, wait until the tank empties. Then unscrew and clean or replace the valve with a new one.



**Figure 5.3** Air tank  
(1) drain valve (2) air tank

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## 5.6 CHECKING PLUGS AND CONNECTION SOCKETS

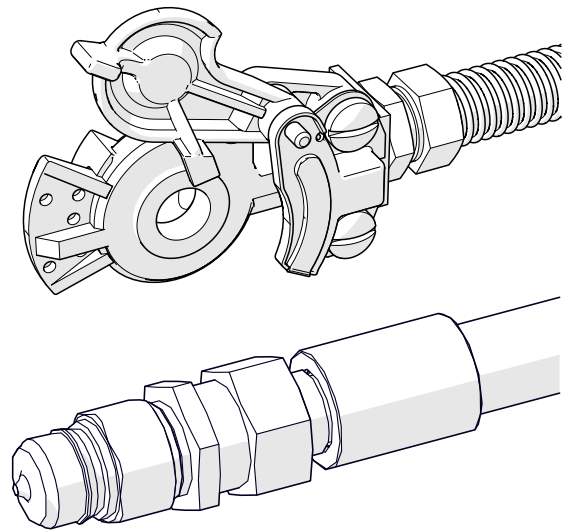


### DANGER

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

A damaged body of the hydraulic or pneumatic hose connector or socket 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.



609 I.03-1

**Figure 5.4** Trailer connections

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.

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## 5.7 COVERS INSPECTION



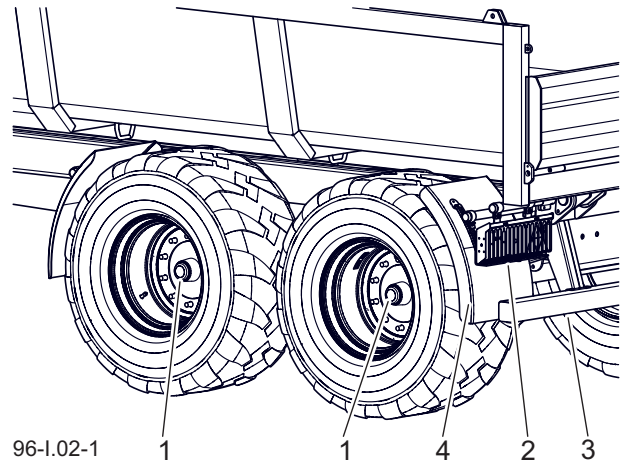
### DANGER

The trailer must not be used with damaged or incomplete covers.

Covers protect the trailer user against loss of health or life or constitute a protective element of machine components. Therefore, their technical condition must be checked before commencing work. Damaged or lost components must be repaired or replaced immediately.

### THE SCOPE OF ACTIVITIES

- Check the completeness of the safety guards.
- Check that the covers are correctly mounted, assess the condition of the bumper (3) and fastening of the lamp



**Figure 5.5** Trailer covers

- |                         |                 |
|-------------------------|-----------------|
| (1) drive shaft hubcaps | (2) lamp covers |
| (3) bumper              | (4) fenders     |

shade covers (2).

- Check protection and completeness of hubcaps (1).
- If necessary, tighten the screw connections of the covers.

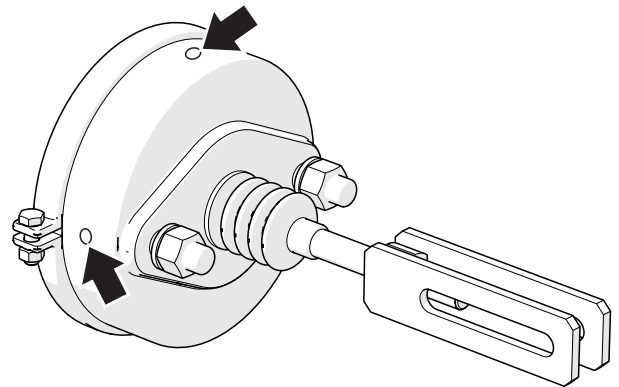
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## 5.8 CHECKING THE TRAILER BEFORE DRIVING OFF

- Before connecting trailer to the tractor make sure that the hydraulic and pneumatic conduits are not damaged.
- Check the completeness, technical condition and correct functioning of the trailer lighting.
- Check the cleanliness of all electric lamps and reflectors.
- Check the correct mounting of the triangular plate holder for slow moving vehicles and the plate itself.
- Make sure that the tractor has a reflective warning triangle.
- Check that the ventilation holes of the actuator (5.6) are not clogged with dirt and that there is no water or ice inside. Check the correct mounting of the actuator.

*Clean the actuator if necessary. In winter, it may be necessary to defrost the actuator and remove accumulated water through unclogged ventilation holes. If any damage is found, replace the actuator. When installing the*



**Figure 5.6** Brake cylinder



### DANGER

Driving with defective lighting installations braking is prohibited. If the trailer is damaged, it should be discontinued until it is repaired.

*actuator, keep its original position relative to the bracket.*

- When moving off check the operation of the service brake system. It should be remembered that for proper operation of the pneumatic system, an appropriate level of air pressure in the trailer air tank is required.
- Check the correct operation of the other systems while operating the trailer.

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## 5.9 CLEANING THE AIR FILTERS

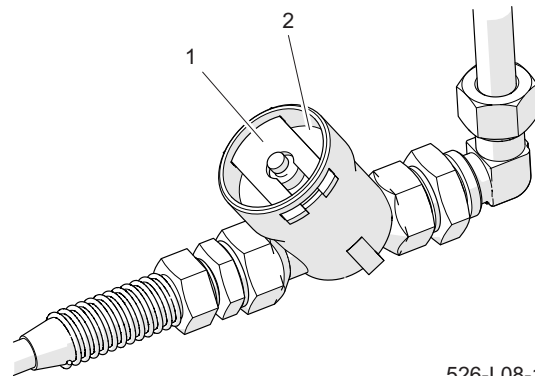
Air filter inserts are placed on pneumatic system connection lines. They are reusable and cannot be replaced unless they are mechanically damaged.

### THE SCOPE OF 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 filter securing lock (1).
- Hold the filter cover (2).
- Hold the filter cover (2) with your other hand. After removing the slide, the cover will be pushed out by the



526-I.08-1

**Figure 5.7** Air filter

(1) filter

(2) cover

spring located in the filter housing.

- After removing the slide, the cover will be pushed out by the spring located in the filter housing. Installation should be in reverse order.

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## 5.10 CHECKING BRAKE LINING WEAR

### ADVICE

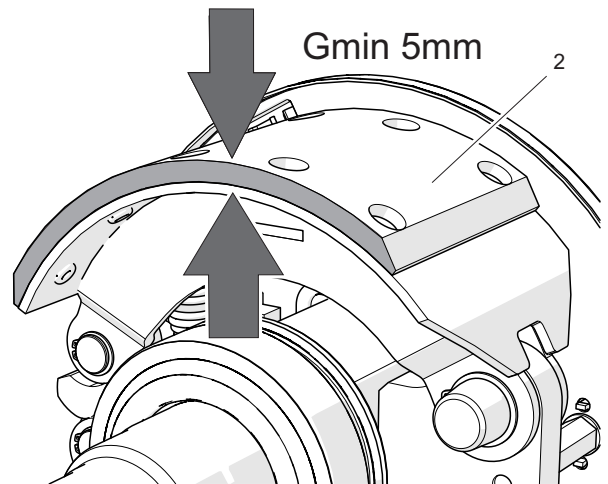
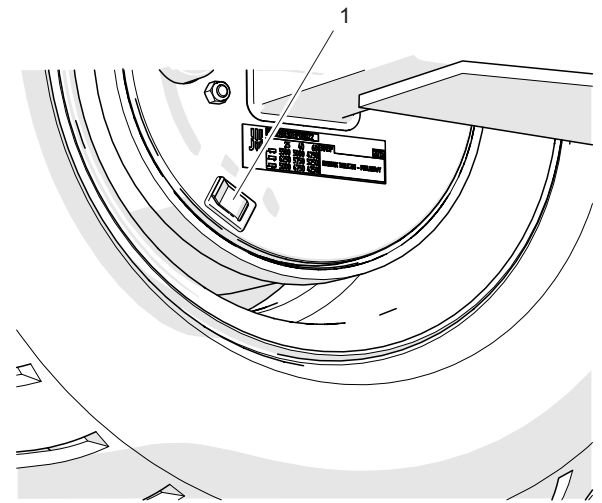
Brake lining wear control,

- according to the schedule of inspections,
- if the brakes overheat,
- if the stroke of the brake cylinder piston significantly increases,
- in the event of unnatural noises coming from around the road axle drum.

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.

### THE SCOPE OF ACTIVITIES

- Find the inspection hole (depending on the version of the road axle, the inspection hole may be located in a different place than the figure shows, but it will always be located on the brake shield).
- Remove the upper and lower plugs and then check the thickness of the lining.
- The brake shoes should be replaced if the thickness of the brake lining is



526-I.09-1

**Figure 5.8** Checking the brake lining thickness

(1) blanking plug (2) brake lining

less than 5 mm.

- Check the remaining linings for wear.

I.3.2.589.10.1.EN

## 5.11 CHECKING THE CLEARANCE OF THE AXLE BEARINGS



### DANGER

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

The jack must stand firmly against the ground and the spring plate.

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

Checking bearing looseness can only be carried out when the trailer is connected to the tractor and the loading box is empty and not lifted.

### THE SCOPE OF ACTIVITIES

- Hitch trailer to tractor, immobilize tractor with parking brake.
- Place the tractor and the trailer on firm and level ground for straight driving.
- 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). The jack should be placed under the spring plate securing the road axle to the spring - figure (5.1). The jack must be suited to the trailer weight.
- Turn the wheel slowly in two directions. Check that the movement is smooth and the wheel rotates without excessive resistance and jamming - figure (5.9).
- Turn the wheel so that it rotates very



526-I.10-1

**Figure 5.9** Clearance inspection

quickly, check that the bearing does not make any unusual sounds.

- Try to feel looseness by moving the wheel.
- Repeat for each wheel separately, remembering that the jack must be on the opposite side of the wedges.
- If play is felt, adjust the bearings - figure (6.3). 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).

- Check the technical condition of the hub cover, Dimensions if necessary.

### **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.

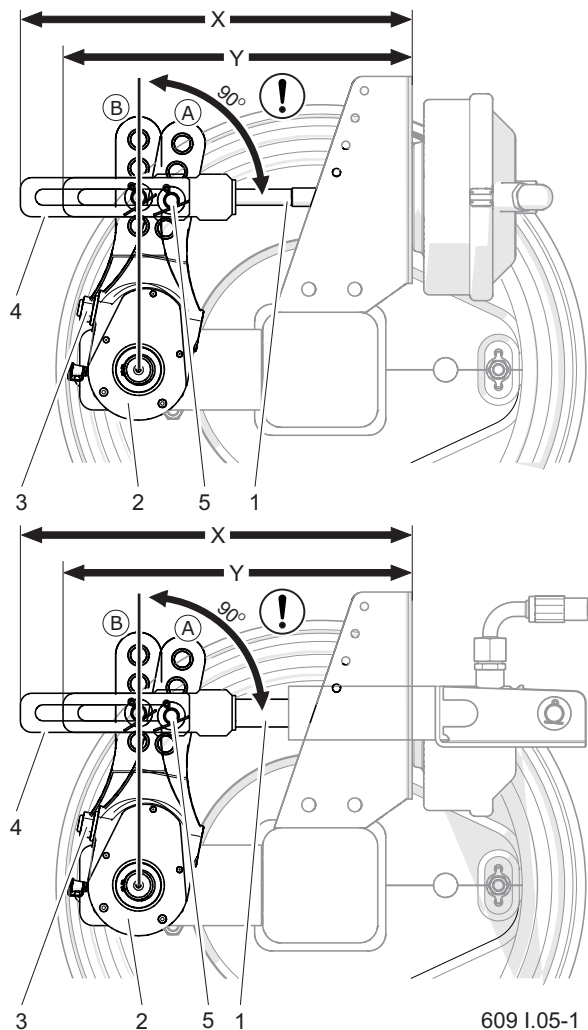
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## 5.12 CHECKING OF MECHANICAL BRAKES

In a correctly adjusted brake, the piston stroke (X-Y) (FIGURE 5.10) of the cylinder should be within the range given in Table 5.3 and depends on the type of cylinder used. When the wheel is fully braked, the optimal angle between the expander lever and the piston rod should be approx. 90°. With this setting, the braking force is optimal. Checking the brakes consists in measuring this angle and the piston rod stroke in each wheel.

### THE SCOPE OF ACTIVITIES

- Measure the distance X with the tractor brake pedal released.
- Measure the distance Y with the tractor brake pedal pressed.
- Calculate the distance difference X-Y (rod stroke).
- Check the angle between the cylinder piston axis and the expander lever.
- If the expander arm angle (2) and piston rod stroke exceed the range given in table 5.3, the brake should be adjusted.



**Figure 5.10** Service brake control

- (1) cylinder piston (2) expander arm  
 (3) adjustment screw (4) of the cylinder fork  
 (5) pin position  
 (A) position of the arm in the released position  
 (B) arm position in braking position

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## 5.13 CLEANING THE DRAINAGE VALVE



### DANGER

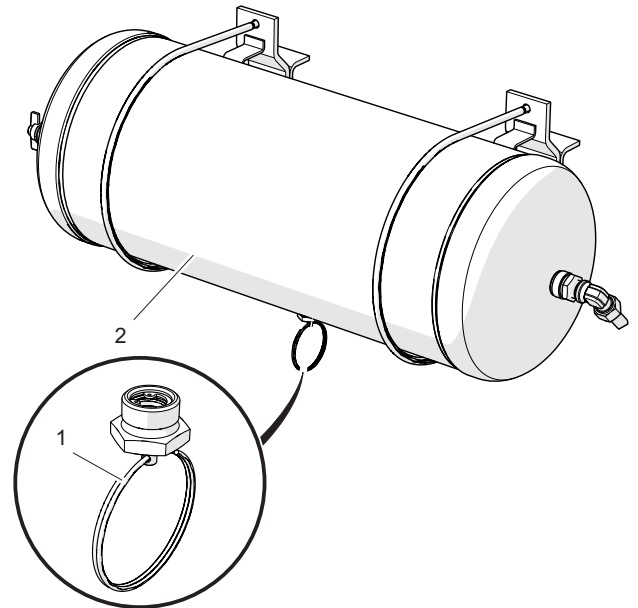
Bleed the air tank before removing the drain valve.

#### THE SCOPE OF ACTIVITIES

- Fully reduce the pressure in the air reservoir (2).

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

- Unscrew the valve (1).
- Clean the valve, blow with compressed air.
- Replace the copper gasket.
- Screw in the valve, fill the tank with



526-I.12-1

**Figure 5.11** Air tank

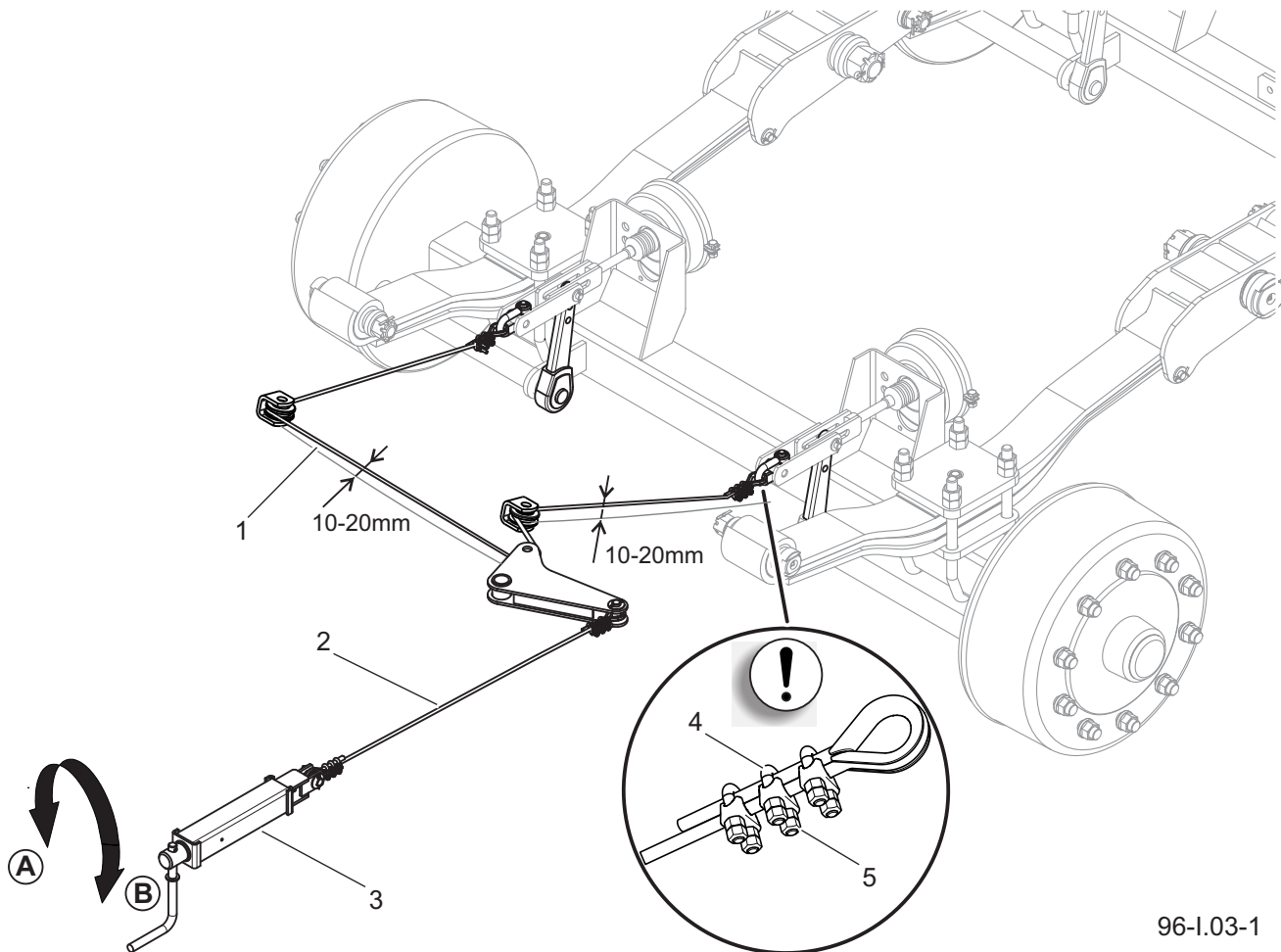
(1) drain valve

(2) tank

air, check the tank for leaks.

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## 5.14 CHECKING OF PARKING BRAKE CABLE TENSION



96-I.03-1

**Figure 5.12** Checking of parking brake cable tension

(1) expander cable, (2) mechanism cable, (3) brake mechanism, (4) bow clamp (5) clamp nut

### VOLTAGE CONTROL

*Check the parking brake after checking the mechanical brake of the axle.*

- Hitch trailer to tractor. Hitch trailer to tractor.
- Place wedges under one wheel of the trailer.
- By turning the crank of the brake mechanism (2) in direction (B), apply

the parking brake - figure (5.12).

- Check cable tension (1).
- When the mechanism screw is completely removed, the cable should hang about 10- 20 mm.

### CABLE TENSION ADJUSTMENT

- Unscrew the brake mechanism screw (2) as far as possible by turning the crank in the direction (A).
- Loosen the nuts (4) of the bow clamps



(3) on the handbrake cable (1).

- Tighten the cable (1) and tighten the nuts (4) of the clamps.
- Apply the parking brake and release it again. Check (approximately) cable slack. When the service and parking brakes are completely released, the cable should hang about 10- 20 mm. The axle trailer levers should be in

**DANGER**

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

the rest position.

If it is necessary to change the brake cable, refer to CHAPTER 6.2 *Replacing the parking brake cable*”.

I.3.2.589.14.1.EN

## 5.15 HYDRAULIC SYSTEM CHECKING

### CHECKING THE TIGHTNESS OF THE HYDRAULIC SYSTEM

- Hitch trailer to tractor. Connect all hydraulic system hoses according to the instructions in the manual.
- Clean hose connections, hydraulic cylinders and couplings.
- Activate all hydraulic systems in turn, extending and retracting the piston rods of the cylinders. Repeat all operations 3- 4 times.
- Leave the hydraulic cylinders fully extended. Check all hydraulic circuits for leaks.
- After completing the inspection, put all cylinders to the rest position.

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



### DANGER

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

removed.

If visible moisture appears on the cable connectors, tighten the connector with a specified torque and carry out the test again. If the problem persists replace the leaking element. Rubber hydraulic hoses should be replaced every 4 years regardless of their technical condition. This operation should be entrusted to specialized workshops.

### CHECKING THE TECHNICAL CONDITION OF HYDRAULIC CONNECTORS

Hydraulic couplings for connecting to the tractor must be technically sound and kept clean. Each time before connecting, make sure that the sockets in the tractor are maintained 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 (scratch the surface of cylinders, etc.)

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## 5.16 CONTROL OF PNEUMATIC SYSTEM



### DANGER

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



### DANGER

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

### THE SCOPE OF ACTIVITIES

- 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.
- 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.

In the event of a leak, the compressed air will leak out in places of damage with a characteristic hiss. The system leak

can be detected by coating the checked elements with washing liquid or foaming agent, which will not aggressively affect the elements of the installation. 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. In the event air still leaks, replace the connector components or seals with new ones.

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.

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## 5.17 LUBRICATION

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

Parts that should be lubricated using machine oil should be wiped with a dry clean cloth. Apply the oil with a brush or oiler. Wipe off excess oil.

The replacement of grease in wheel hub bearings should be entrusted to specialized service points equipped with the appropriate tools. Dismantle the entire hub, remove the bearings and individual sealing rings. After thorough cleaning and inspection, install lubricated components. If necessary, bearings and seals be replaced.



### CAUTION

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

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.). Lubricate the spring surface and

**Table 5.4.** Symbols in Table 5.5

Symbol	
<b>Type of grease</b>	
A	general purpose machine grease (lithium, calcium),
B	solid grease for heavily loaded components with the addition of $\text{MOS}_2$ or graphite
C	anti-corrosive spray
<b>Frequency</b>	
D	working day (8 hours of trailer),
M	month

**Table 5.5.** Trailer lubrication schedule

Item	Name	Number of lubrication points	Type of grease	Frequency
1	Hub bearings	4	A	24M
2	Drawbar eye	1	B	14D
3	Brake expander arm	4	A	3M
4	Parabolic spring leaves	4	C	6M
5	Tipping cylinder sockets and cylinder suspension	4	B	1M
6	Ball bearing of the tipping cylinder	1	B	3M
7	Parking brake mechanism	1	A	6M
8	Spring sliding surface	4	A	3M
9	Spring pin	4	A	3M
10	Scissor support pin	2	B	3M
11	Scissor support cylinder bearing	2	B	3M
12	Mechanical support unit	1	A	6M
13	Tipping pins	2	B	3M
14	Tailgate actuator bearings	2	A	3M
15	Tailgate hinges	4	A	3M
16	Control arm pin	2	B	3M
17	Parking brake guide roll pins	2	A	6M
18	Extension flap pins	2	A	3M
19	Hinges of the tilt-and-turn flap	2	A	6M

spring pin according to the instructions in Table 5.4.

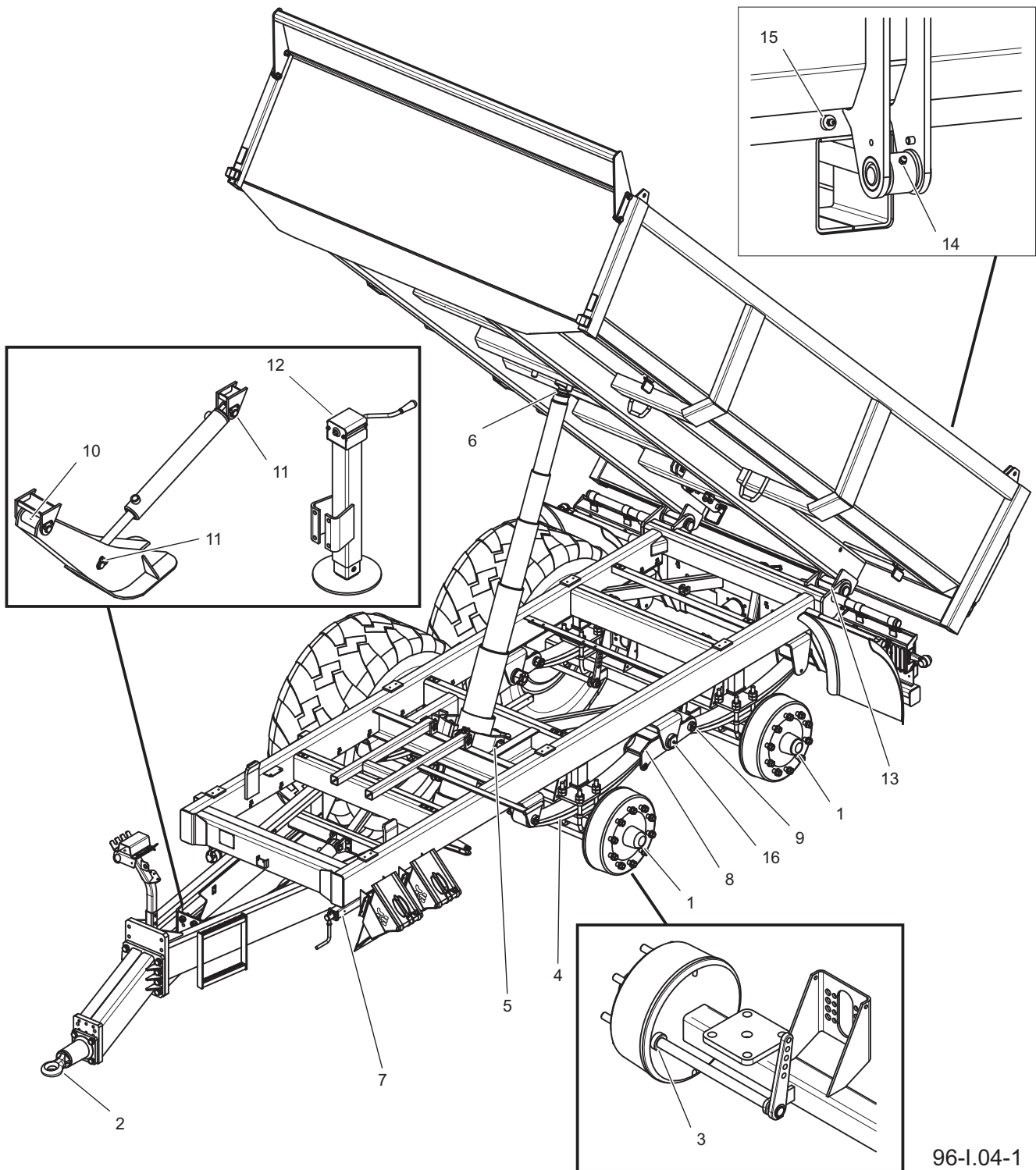


Figure 5.13 Lubrication point

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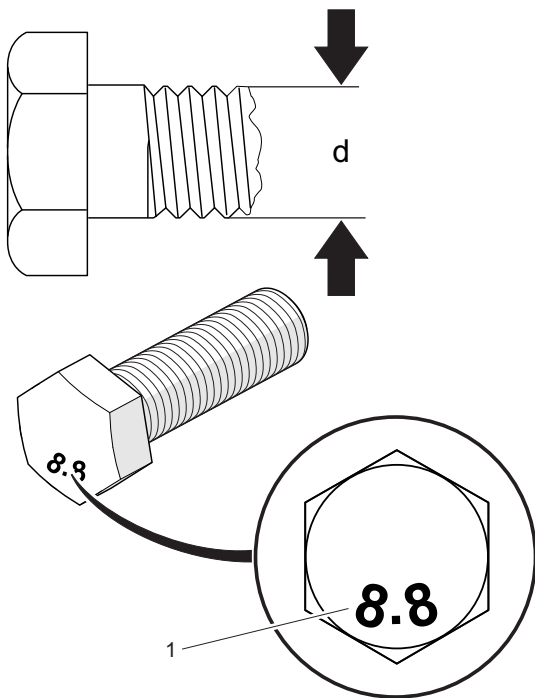
## 5.18 SCREW CONNECTIONS INSPECTION

### TIGHTENING TORQUES FOR SCREW 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 5.6. The given values apply to non-lubricated steel bolts.

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

The tightness should be checked using a torque wrench in accordance with the guidelines in the chapter Tightening the



**Figure 5.14** Metric thread screw  
 (1) strength class, (d) thread diameter

**Table 5.6.** Tightening torque

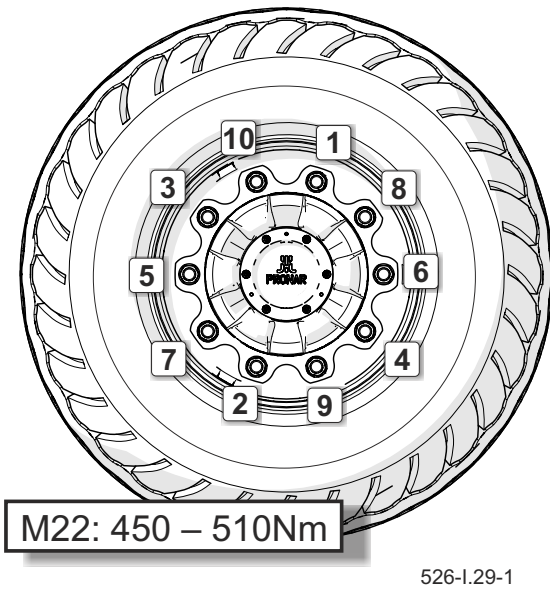
Metric thread	Tightening torque		
	5.8(*)	8.8(*)	10.9(*)
M8	18	25	36
M10	37	49	72
M12	64	85	125
M14	100	135	200
M16	160	210	310
M20	300	425	610
M24	530	730	1,050
M27	820	1,150	1,650
M30	1,050	1,450	2,100

(\*) - strength class according to DIN ISO 898

road wheels and Table 5.9 Schedule for checking bolted connections. During daily inspection of the trailer pay attention to loose connections and tighten the connector if necessary. During daily inspection of the trailer pay attention to loose connections and tighten the connector if necessary. Replace lost items with new ones.

### TIGHTENING ROAD WHEELS

The wheel nuts should be tightened gradually diagonally (in several stages until the required tightening torque is achieved), using a torque wrench. The recommended order of tightening the nuts and the tightening torque is shown in figure 5.14.



exceeding the permissible tightening torque, which may result in breaking the connection thread or breaking the hub pin. The wheels should be tightened according to the following scheme:

- after first use of the trailer (one-time inspection),
- every 2- 3 hours of driving during the first month of use,
- every 30 hours of driving.

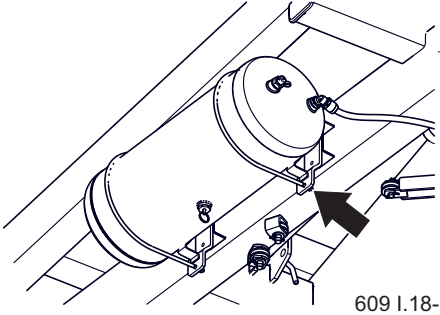
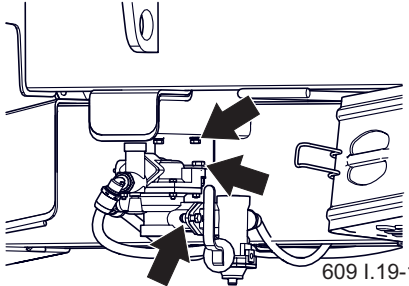
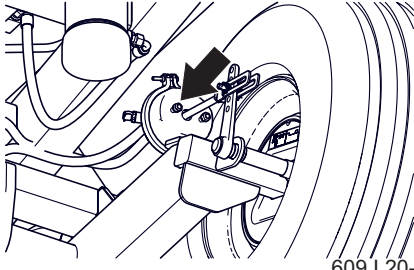
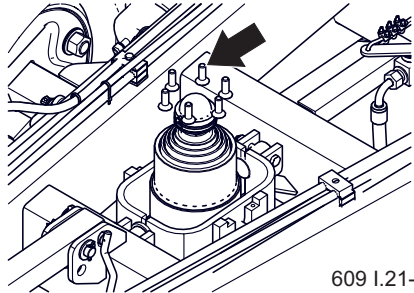
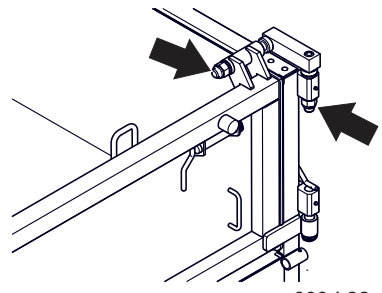
If the wheel was disassembled, the above steps should be repeated.

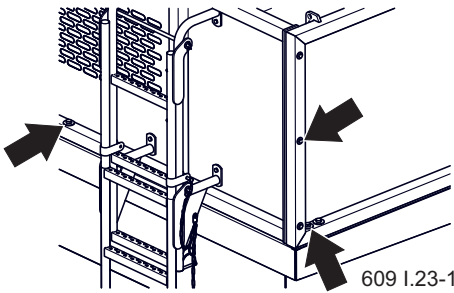
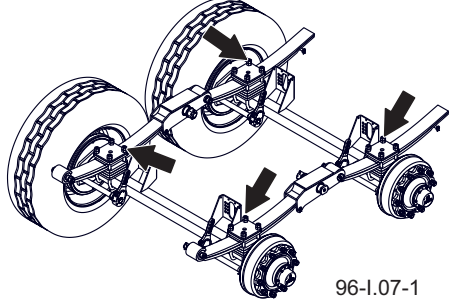
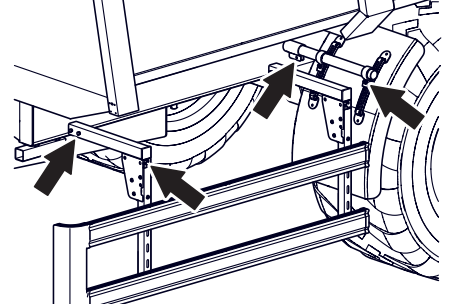
**Figure 5.15** The order of the nuts tightening  
Wheel nuts must not be tightened with impact wrenches, due to the danger of

**Table 5.7.** Schedule for checking screw connections

System / part name	Frequency	
Wheel nut (1)	acc. to chapter <i>Dokręcanie kół jezdnych na stronie 5.18</i>	<p>609 I.16-1</p>
Drawbar and drawbar tie	3M	<p>96-I.05-1</p>



System / part name	Frequency	
Air tank	6M	 <p>609 I.18-1</p>
Control valve and braking force regulator	6M	 <p>609 I.19-1</p>
Pneumatic brake cylinders	3M	 <p>609 I.20-1</p>
Tipping cylinder joint	3M	 <p>609 I.21-1</p>
Hinged tilt and turn flap	6M	 <p>609 I.22-1</p>

System / part name	Frequency	
Superstructures	6M	 <p>609 I.23-1</p>
Fastening of the axles	3M	 <p>96-I.07-1</p>
Underrun protection and mudguards	6M	 <p>96-I.06.1</p>

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# CHAPTER 6

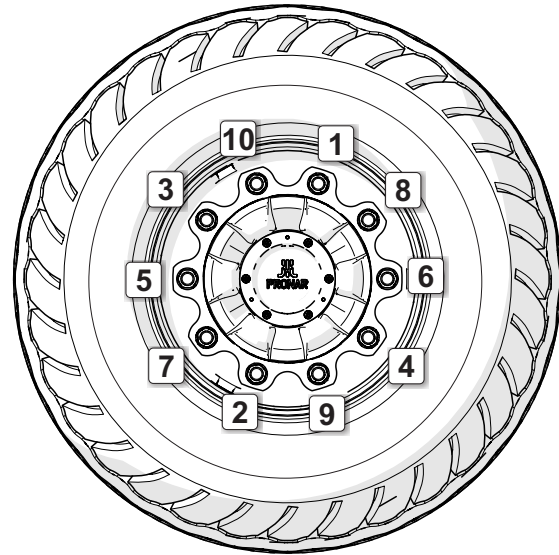
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TECHNICAL SUPPORT

## 6.1 WHEEL ASSEMBLY AND DISASSEMBLY

### WHEEL DISASSEMBLY

- Block the trailer with parking brake.
- Locking wedges should be placed under the trailer wheel opposite to the lift wheel.
- Ensure that the trailer is properly secured and will not move during wheel dismantling.
- Loosen the wheel nuts according to the order given on FIGURE 6.1.
- Place the jack and raise the trailer to such a height that the wheel being changed does not rest on the ground. The used lift should have adequate load capacity, it should be technically sound. The lift must be placed on an even, hard surface that will prevent it from sinking or slipping during operation. If necessary, use properly selected sleepers to reduce the unit pressure of the lift base on the ground to prevent penetration into the ground.
- Remove the wheel.



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**Figure 6.1** The order of the nuts unscrewing and tightening

### 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 appropriate order.

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**CAUTION**

Clamp jaws must be placed on the load-carrying cable side - figure (6.2).

Secure the ends of the cable with a shrink tube.

The distance between the clamps should be 15 mm, with the first clamp placed as close as possible to the thimble.

the shackle pin and secure it with new cotter pins.

- Pass the other end of the cable

through the guide wheels and mount the other end of the cable in a similar manner.

- Adjust cable tension.
- Tighten the nuts.
- Tension the cable with the crank mechanism and loosen again. If necessary, correct the brake cable tension.

J.3.2.589.02.1.EN

## 6.3 ADJUSTING THE CLEARANCE OF THE AXLE BEARINGS



### CAUTION

Adjusting of the bearing looseness can only be carried out when the trailer is connected to the tractor and the loading box is empty.

### THE SCOPE OF ACTIVITIES

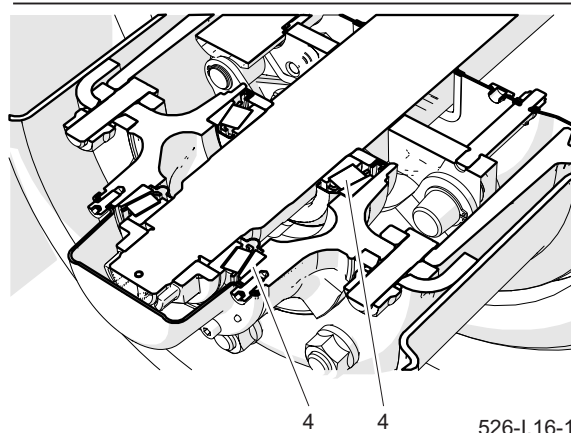
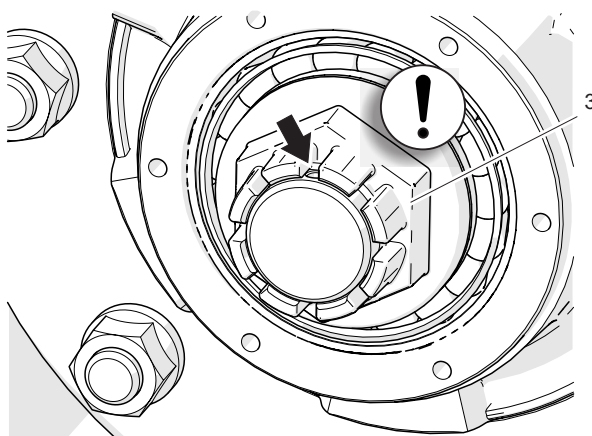
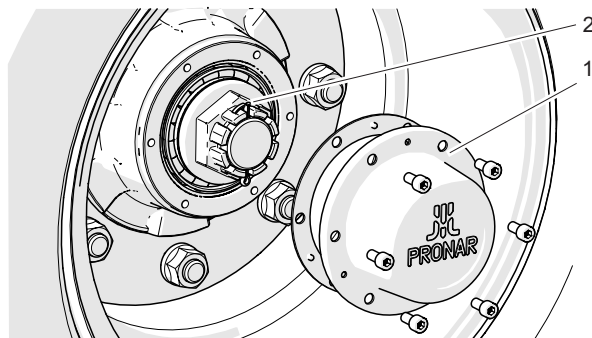
- Prepare the tractor and trailer for adjustment.
- Remove the hub cover (1).
- Remove the cotter pin (2) securing the castellated nut (3).
- Tighten the castellated nut to remove slack.

*The wheel should rotate with slight resistance.*

- Unscrew the nut (3) (not less than 1/3 of a turn) to cover the nearest groove of the nut with a hole in the journal of the axle (the pin's hole is marked with a black arrow in the drawing). The wheel should rotate without excessive resistance.

*The wheel should rotate without excessive resistance. Too much pressure is not recommended due to deterioration of bearing operating conditions.*

- Secure the castellated nut with a cotter pin and mount the hub cover



**Figure 6.3** The principle of bearing clearance adjustment

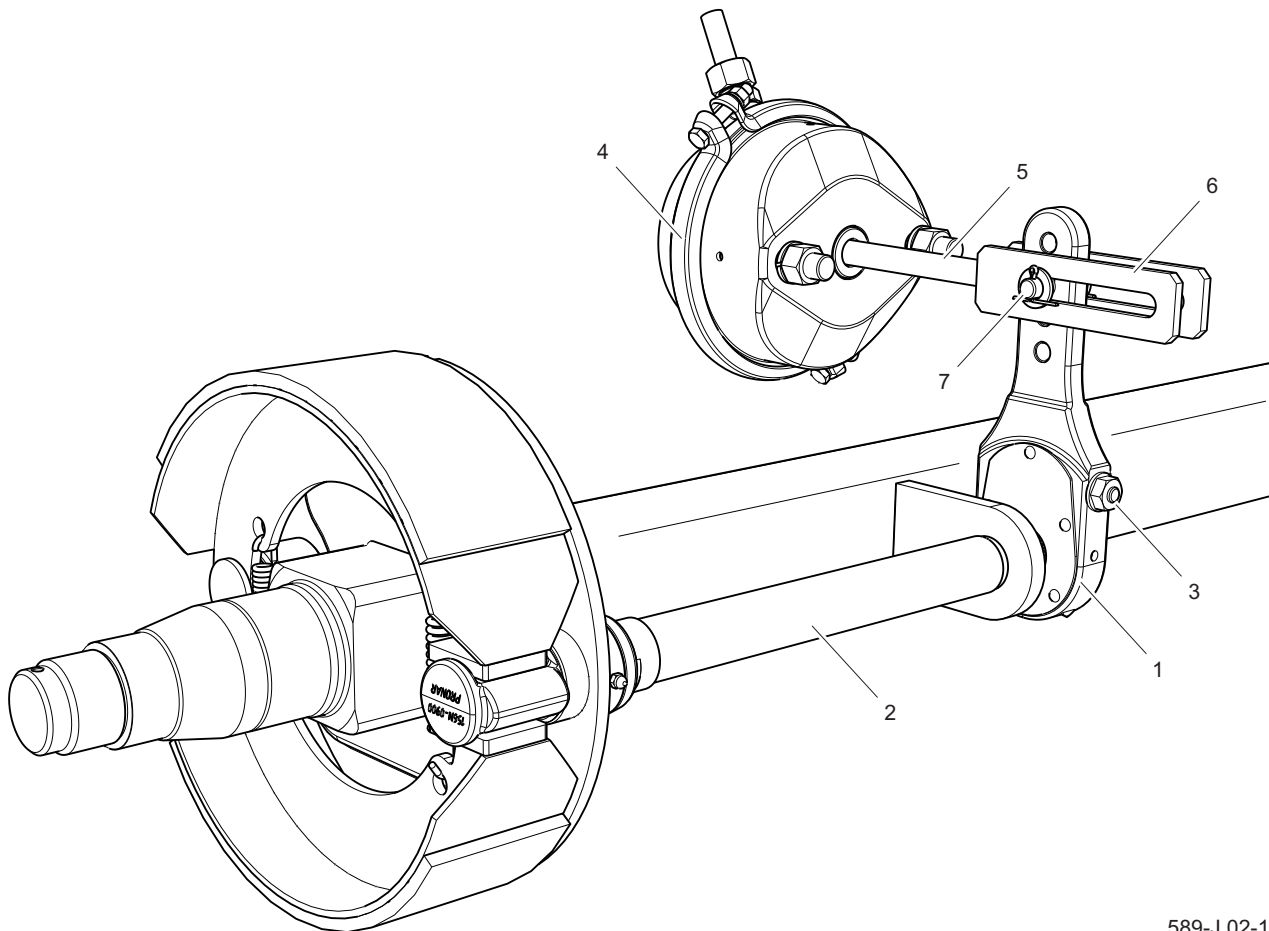
- |               |                            |
|---------------|----------------------------|
| (1) hub cover | (2) cotter pin             |
| (3) nut       | (4) tapered roller bearing |

(1).

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

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## 6.4 BRAKE ADJUSTMENT



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**Figure 6.4** Construction of pneumatic axle brake

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

### ADVICE

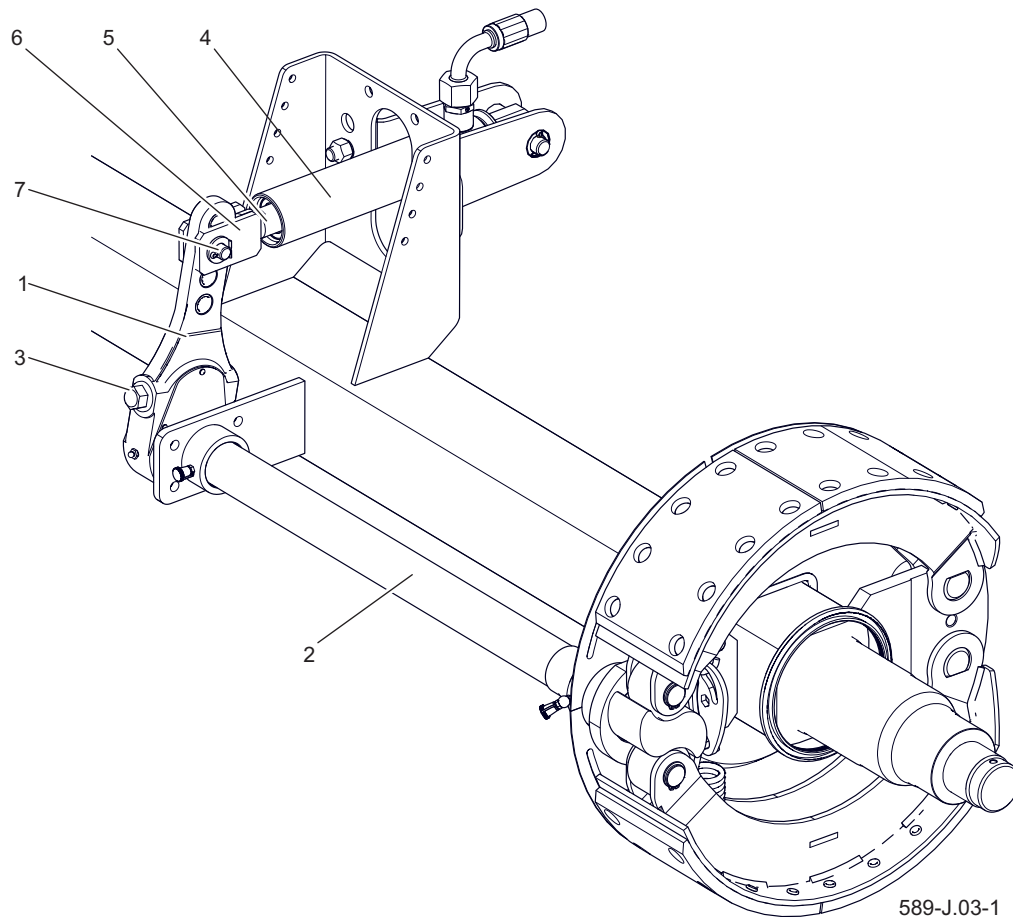
The correct stroke of the piston rod should be in the range of 25 – 45 mm.

Significant wear of the brake linings increases the stroke of the brake cylinder piston and deteriorates braking performance.

When braking, the piston rod stroke should be within the specified working range, and the angle between the piston rod (1) and

the expander arm (3) should be approximately 90 ° - figure (6.6) i figure(6.7). The trailer wheels must brake simultaneously. The braking force also decreases when the angle of operation of the brake cylinder piston rod (1) is not correct - figure (6.7) in relation to the expander arm (3). To obtain the optimum mechanical angle of operation of the piston rod fork (5) must be mounted on the expander arm (3) so that when fully braked the angle of operation is





**Figure 6.5** Construction of hydraulic axle brake

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



**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.

approx. 90 °.

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.

When removing the cylinder fork (6),

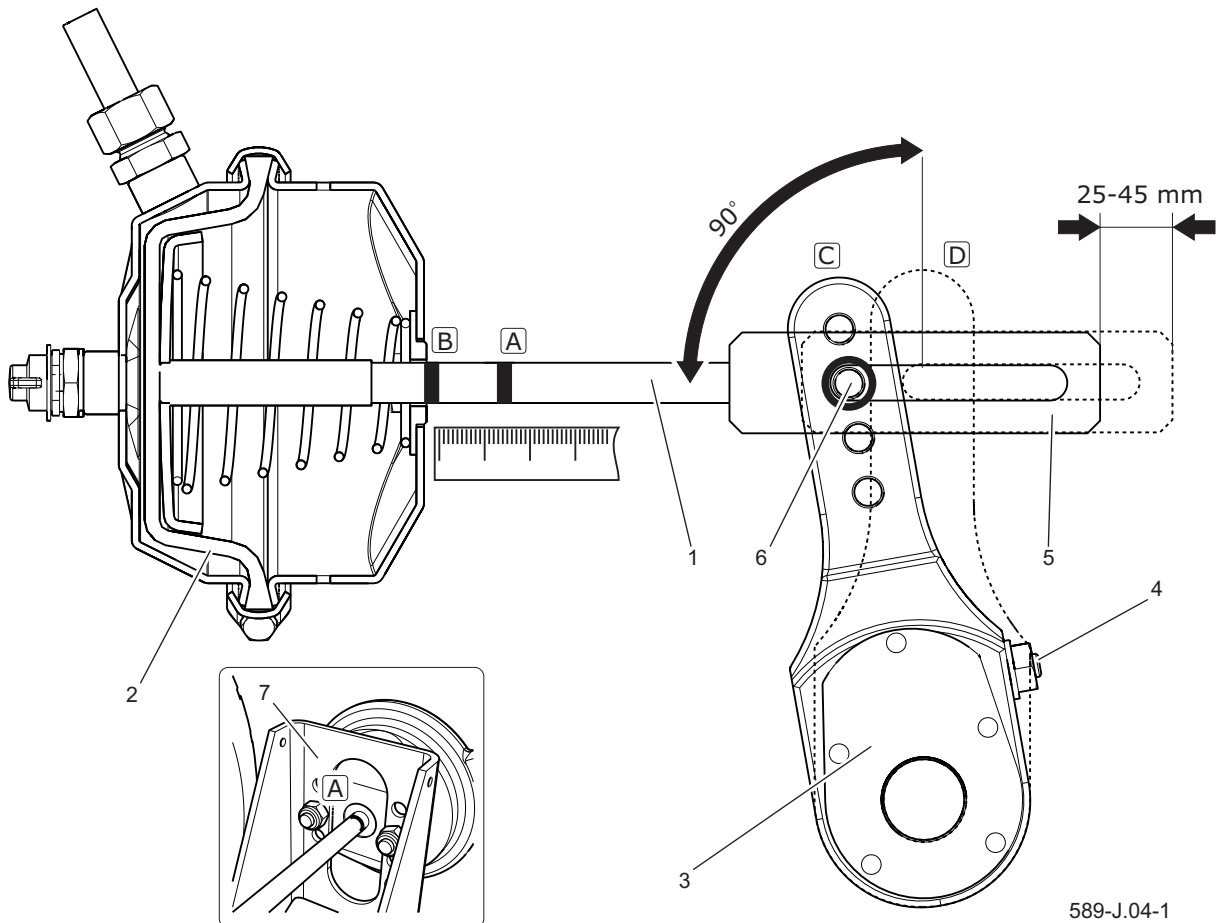


**CAUTION**

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.

remember or mark the original position of the cylinder fork pin (7). The mounting position depends on the type of braking system and the size of the tires used in the trailer, it is selected by the Manufacturer



**Figure 6.6** Pneumatic brake adjustment

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

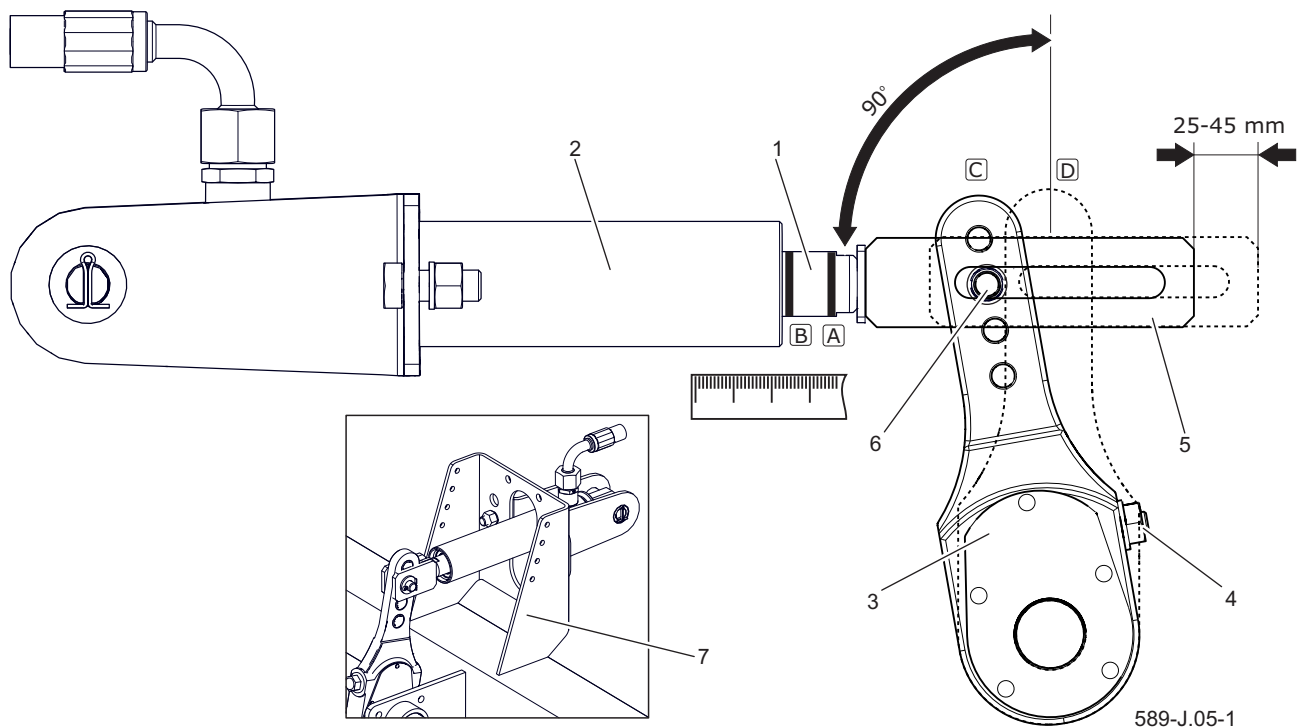
and cannot be changed - figure (6.5).

### THE SCOPE OF ACTIVITIES

- Hitch trailer to tractor.
- Turn off the tractor engine and remove the keys from the ignition.
- Immobilize tractor with parking brake.
- Make sure the trailer is not braked.
- Secure trailer against rolling with wheel chocks.
- On the piston rod (1) - figure (6.6) figure 6.7) of the cylinder mark with a line (A) the position of the maximum retraction of the piston rod with the

trailer brake off.

- Press the brake pedal on the tractor, mark with a line (B) the position of maximum extension of the piston rod.
- Measure the distance between the lines (A) and (B). If the piston rod stroke is not within the correct working range (25 – 45mm), adjust the expander arm.
- Remove the actuator fork pin (6).
- Remember or mark the original position of the cylinder fork (6) in the expander arm bore (3).



**Figure 6.7** Hydraulic brake adjustment

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



**CAUTION**

The diaphragm actuator should not be opened. The membrane is pasted and may lose its seal.

- Check that the cylinder piston moves freely and within the full nominal range.
- Check that the air vents of the actuator are not clogged with dirt and that there is no water or ice inside (pneumatic actuator). Check the correct mounting of the actuator.
- Clean the cylinder, defrost if necessary and remove water through the unblocked ventilation holes

(pneumatic cylinder). If damage is found, replace the actuator with a new one. When mounting the actuator, keep its original position relative to the bracket (7).

- Turn the adjusting screw (4) so that the marked hole of the expander arm coincides with the hole of the cylinder fork

*During adjustment, the diaphragm (2) must rest on the rear wall of the cylinder - figure (6.6) (pneumatic cylinder).*

- Install the piston rod fork pin and washers and secure the pin with cotter pins.

- Turn the adjusting screw (4) clockwise to make one or two clicks in the expander arm adjustment mechanism.
- Repeat the adjustment on the second cylinder on the same axis.
- 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.

#### **FUNCTIONAL CHECK**

- After completing the adjustment, carry out a test drive.
- Perform several brakes. Stop the trailer and check the temperature of the brake drums.
- If any drum is too hot, correct the brake adjustment and perform the test drive again.

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## 6.5 ELECTRICAL SYSTEM SERVICE AND WARNING ELEMENTS



### CAUTION

Driving with defective lighting installations is prohibited. Damaged lamps should be replaced immediately before driving off. Lost or damaged reflectors should be replaced with new ones.

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

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.

The user's duties include only technical inspection of the electrical installation and reflectors.

### THE SCOPE OF ACTIVITIES

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

### ADVICE

The light source in the lamps are LEDs and in case of damage are only replaced as a complete lamp without the possibility of repair or regeneration.

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

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## 6.6 CONSUMABLES

### 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.

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.

**Table 6.1.** Characteristics of oil L-HL 32

Item	Name	Unit	
1	Viscosity classification according to ISO 3448VG	-	32
2	Kinematic viscosity at 400C	mm <sup>2</sup> /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

## LUBRICANTS

For heavily loaded parts, it is recommended to use lithium grease with the addition of molybdenum disulphide ( $\text{MOS}_2$ ) 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, Z 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.

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## 6.7 FAULTS AND HOW TO REMOVE THEM

**Table 6.2.** Faults and how to remove them

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



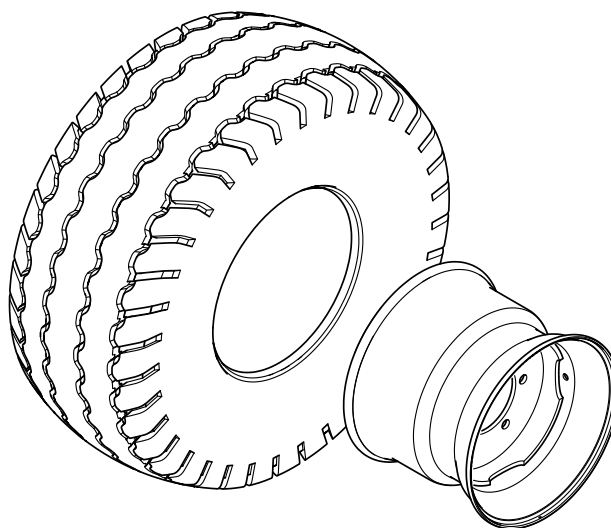
Incorrect hydraulic system operation	Insufficient tractor hydraulic pump performance, tractor hydraulic pump defective.	Check the hydraulic pump on the tractor.
	Damaged or dirty actuator	Check the cylinder piston rod (bending, corrosion), check the cylinder for leaks (piston rod seal), repair or replace 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.
Excessive wear of the left and right shoulder tires on both sides.	System pressure too low. Too high cornering speed with a loaded trailer. Too fast air loss due to damaged rim, valve, puncture etc.	Check air pressure. Check the road tires for proper inflation regularly. Too much load on the trailer. Do not exceed the permissible total weight of the machine. Reduce speed when cornering on a hardened surface. Check rim and valve. Replace damaged parts.
Excessive tire wear in the centre.	Air pressure too high.	Check air pressure. Check the road tires for proper inflation regularly.
Excessive unilateral wear on the left or right shoulder tires	Incorrect convergence. Driving axes incorrectly set.	Damaged spring leaf on one side of the suspension. Replace the springs.
Tread wear.	Damaged suspension system, broken spring. Damaged braking system, brake blocking, incorrectly adjusted braking system. Too frequent and sudden braking.	Check the slack in the suspension system, check the springs. Replace damaged or worn parts. Check the braking system for malfunctions. Adjust the trailer levers.

Lateral fracture.	Long-lasting ride on tires with low air pressure. Too much load on the trailer.	Check air pressure regularly. Check the weight of the load during loading.
Abrasions on the lateral outer edge of the tire.	Too frequent climbing over sharp, high obstacles (e.g. curbs).	Control the driving technique.
Rim damage (hardening and cracking around the rim), tire crumbling.	Incorrect braking technique. Too frequent sudden braking. Damaged braking system.	Check braking system. Control braking technique. Damage arises due to excessive heating of the hub and the resulting wheel rims.

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TIRE ASSEMBLY

# CHAPTER 7



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**Table 7.1** Trailer tires

Item.	Tire size	Wheel size
1	385/65- R22,5 18PR	11.75x22,5; ET=-30
2	425/65- R22,5 18PR	13.00x22,5; ET=0
3	445/65- R22,5 172A8	14.00x22,5; ET=0
4	500/60- R22,5 16PR	16x22,5; ET=-30
5	550/45- R22,5 16PR	16x22,5; ET=-50



