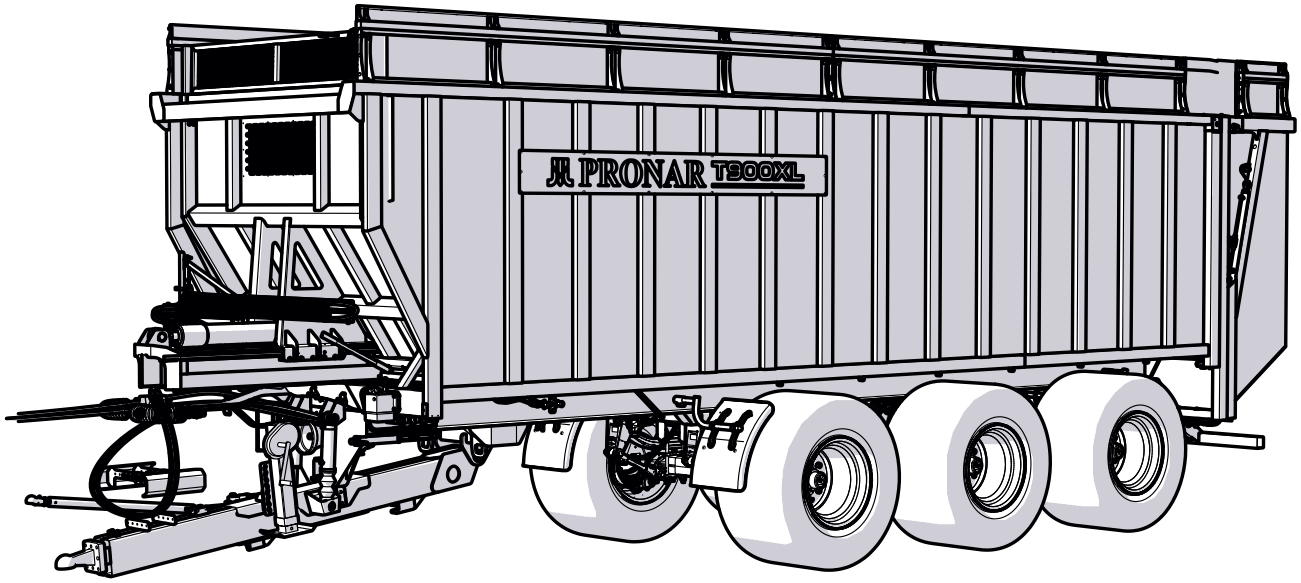
**PRONAR SP. Z O.O.**

17-210 NAREW, UL. MICKIEWICZA 101A, WOJ. PODLASKIE

# USER MANUAL

## TIP TRAILER
## **PRONAR T900XL**

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL

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*This manual contains important safety and operating instructions for the machine. The manual should be kept near the machine so that it is available for authorized persons.*

*Keep this manual for future reference. If the manual is lost or damaged, contact the seller or the manufacturer for a duplicate.*

*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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## CHAPTER 6
## PERIODIC INSPECTIONS AND TECHNICAL MAINTENANCE 6.1

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# EC DECLARATION OF CONFORMITY OF THE MACHINERY

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

| Description and identification of the machinery | |
|---|---|
| Generic denomination and function: | **AGRICULTURAL TRAILER** |
| Type: | **T900XL** |
| Model: | - - - - - |
| Serial number: | |
| Commercial name: | **AGRICULTURAL TRAILER PRONAR T900XL** |

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.

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Narew, the 2021-07-13
*Place and date*

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

CHAPTER 1

# INTRODUCTION

PRONAR T900XL

## 1.1 DEAR USER

The manual instruction is intended for the end user. For this reason, some required maintenance is listed in the inspection tables but the procedure is not described in this publication. To perform them, call the manufacturer's authorized service center.

Before starting the machine, you will be familiarized with its construction, principle of operation, available equipment and operation, and above all safety rules. The operator and qualified personnel should be trained during final reception.

Remember!!! You can run the machine only when you have read the content of this "User Manual", you have been trained and you can handle it safely. In case of any doubts, contact the seller to clarify the problem.

The most important thing during operation is your safety, therefore, regardless of everything, all recommendations contained in the "User's Manual" should be observed and guided by reasonable procedure. Remember that the correct service, in accordance with the manufacturer's instructions, reduces the risk of an accident to a minimum, and working with the machine is more efficient and less emergency.

When buying machines, check the compatibility of serial numbers placed on the machine with the number entered in the "Warranty card" and in the sales documents. For information on identifying the machine, see "Basic information" chapter. We recommend that you have the most important serial numbers entered the field below.

Machine serial number:

WST.3.B-001.01.EN

## 1.2 RULES FOR USING THE USER'S MANUAL

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 drawings contained in this publication are aimed at clarifying the principle of machine operation and may differ from the facts. This can not be a reason for any claims for this. 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. If the information contained in this study prove not fully understandable to ask for aid to the point of sale in which the machine has been purchased or directly to the manufacturer.

The machine was constructed in accordance with applicable standards, documents and current legal regulations.

Separate studies can be attached to this manual that can be found in the chapter "*Attachments and additional materials*".

WST.3.B-002.01.EN

## 1.3 TARGET GROUP

The User Manual is intended for staff operating the machine called end users, and qualified persons (electrician, mechanic, plumber). Detailed information on the competences and liability of end users and qualified personnel can be found later in this chapter.

### 1.3.1 End user (User, Authorized User, Operator)

**Who is the end user?**

An end user, otherwise known as the user or operator, call the person authorized to operate the machine. The user can be authorized to handle the machine if the following conditions have been met.

- The user has familiarized with the content of the "User's Manual".
- He gets acquainted with the contents of the farm tractor instruction manual and observes its recommendations.
- He complies with road traffic regulations and transport regulations in force in the country in which the machine is used,
- He has been trained in terms of compliance with established maintenance and regulation plans.
- He has authorizations to drive vehicles (vehicle assemblies) required in the country of use.

**Responsibilities and permissions**

The user acquired by the user allows for safe handling of the machine. In unforeseen cases, the user should follow a reasonable procedure and take care of their safety, people located near a working machine and other traffic users.

The knowledge and skills are entitled to the end user to handle the machine, carry out maintenance and repair or adjustment procedures in the scope specified by the manufacturer.

### 1.3.2 Qualified person (qualified personnel)

**Who is a qualified person?**

We call a qualified person any person admitted to perform some maintenance, repair or regulatory work in the scope specified by the machine manufacturer and who gained appropriate technical education in a specific profession and confirmed by the relevant document, completed the training carried out by the authorized manufacturer's or seller staff, can see threats and counteract them. Professional experience and professional skills entitle a qualified person to carry out some repairs of the machine and perform basic maintenance procedures in the scope provided by the manufacturer. A qualified person in addition to the necessary knowledge has the skills to use the specialized accessories necessary to perform the obligations. The following persons include qualified persons:

- Qualified mechanic.
- Qualified electrician.
- Qualified plumber.

### 1.3.3 Service personnel

**Who is the service personnel?**

Service personnel, otherwise known as the manufacturer's service or service, is a person or a group of qualified persons who have a much greater experience and knowledge to perform certain corrective and maintenance activities than qualified personnel. It has the right tools necessary to carry out work. The manufacturer's service has the required permissions and is a representative of a machine manufacturer or other equipment.

### 1.3.4 Unauthorized user

**Who is an unauthorized user?**

An unauthorized user also known as a bystander is a person who has not been trained by the manufacturer or an authorized seller, has not been familiarized with the basic issues of security, knowledge of the machine, did not familiarize with the entire content of the operating instructions, and therefore there are no authorizations to operate the machine. A bystander can not be admitted to work with the machine.

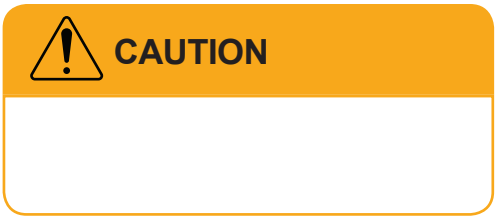
WST.3.B-003.01.EN

## 1.4 SYMBOLS AND TAGS USED IN THE MANUAL

### 1.4.1 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.

### 1.4.2 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.

### 1.4.3 Advice


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

### 1.4.4 Typography of the User Manual

**Bulleted list**

The bulleted list presents actions to perform whose order is not relevant.

**Example of using a bulleted list**

- ....
- Check the condition of connections and hydraulic and pneumatic hoses. Hydraulic oil leaks and air defects from a leaky installation are unacceptable.
- In the event of a hydraulic or pneumatic installation failure, the shredder should be turned off from operation until the failure is removed.
- .....

**Comment on the text**

Comment is most often a supplement and additional explanation to order a specific activity. Additional information can also be included in the comment.

**An example of a comment**

**Defined list**

***The required air pressure is described on the sticker placed on the machine frame, over the wheel.***

List shows the to-do, whose execution order is important.

**Example of using a defined list**

1. .....
2. Unscrew the handles (2) securing the crank (1).
3. Insert the crank into a square shaft of the gear and turning the clock clockwise on the direction of the clock.
4. ....

**References to pages**

Reference to chapter (place in the manual) related thematically

**An example of a reference application**

📖 *page 9.4*

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## 1.5 GLOSSARY

**Agricultural tractor**

A motor vehicle constructed for use together with agricultural, forest or gardening equipment; such tractor can also be adapted for pulling trailers and for earthworks.

**Tractor**

A car vehicle designed only to pull the trailer; This term includes a tractor and a ballast tractor.

**Final acceptance**

Group of activities associated with the preparation and actual transfer of the finished product for use. The final acceptance contains the transmission of documentation, basic training, reception for transport and the first launch of the machine.

**Bystander**

See - an unauthorized user

**Qualified person**

A person admitted to perform some maintenance, repair or regulatory work in the scope specified by the machine manufacturer and which has gained appropriate technical education in a specific profession and confirmed by the relevant document and completed the training carried out by the authorized manufacturer's or seller staff, can notice the threats and counteract them.

**Truck**

A car vehicle designed structurally for carriage; This term also includes a cargo-passenger car designed for transporting loads and people in a number from 4 to 9 including the driver.

**Danger zone**

A dangerous zone is an area around the machine in which people who are vulnerable to the risk of losing health or life.

**TUZ**

A three-point suspension system - a lever system used in agricultural tractors for aggregation of machines and devices suspended on a hydraulic lifter.

**End user**

Otherwise known as the user, an authorized user or operator, the person authorized to operate the machine.

**Unauthorized user**

Also known as a bystander - person who has not been trained and has not been allowed to handle the machine.

**PTO**

Power reception shaft - transmitting a drive from the vehicle to the moving machine.

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CHAPTER 2

# GENERAL

PRONAR T900XL

## 2.1 IDENTIFICATION

### 2.1.1 Machine identification

**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.

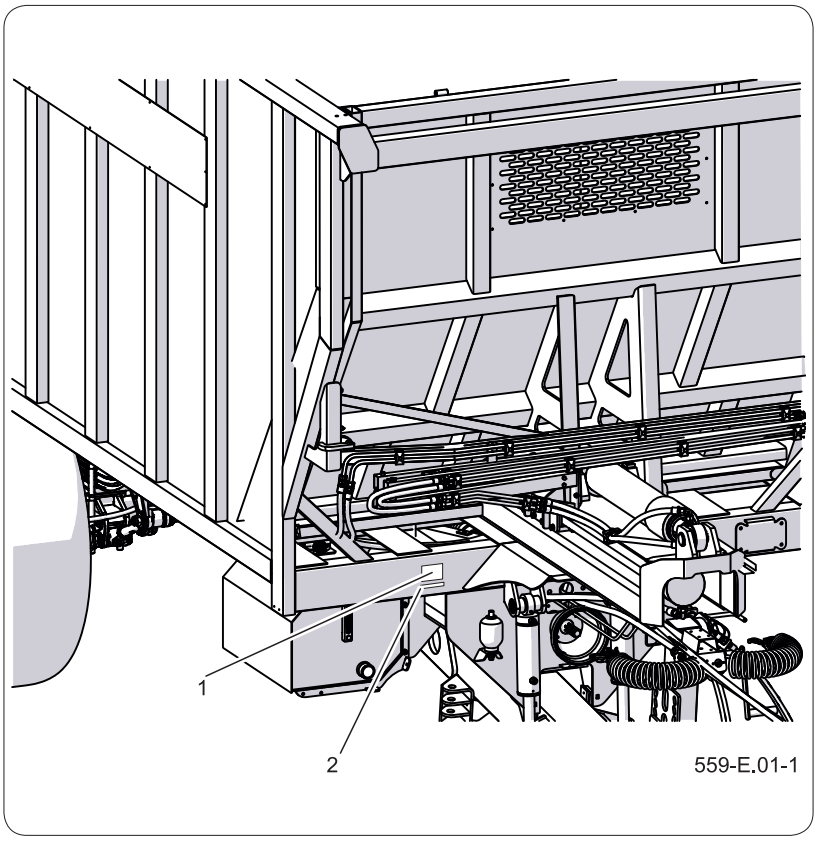


**Figure 2.1** Identification of trailer
*(1) nameplate*
*(2) trailer VIN number location*

The trailer is marked with the name plate (1) and the serial number (2) placed on the highlighted rectangular field on the trailer frame. The serial number and the name plate are as shown in the "*Trailer identification*" figure

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. The meaning of the individual fields on the nameplate is shown in the table. Record the trailer's serial number in the top field.

**Table 2.1.** Nameplate markings

| Item | Meaning |
|---|---|
| A | General information and function |
| B | Trailer 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 load for individual axles |

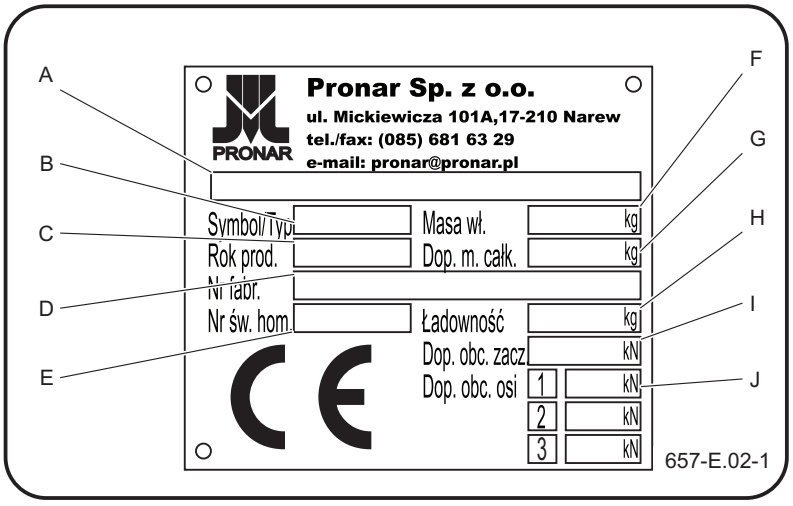


**Figure 2.2** Name plate

### Driving axle identification

The serial number of the driving axles and their type is stamped on the name plate (2) attached to the driving axle profile - figure“ *Axis identification*”. After purchasing the trailer, it is recommended to enter the individual serial numbers in the fields below.

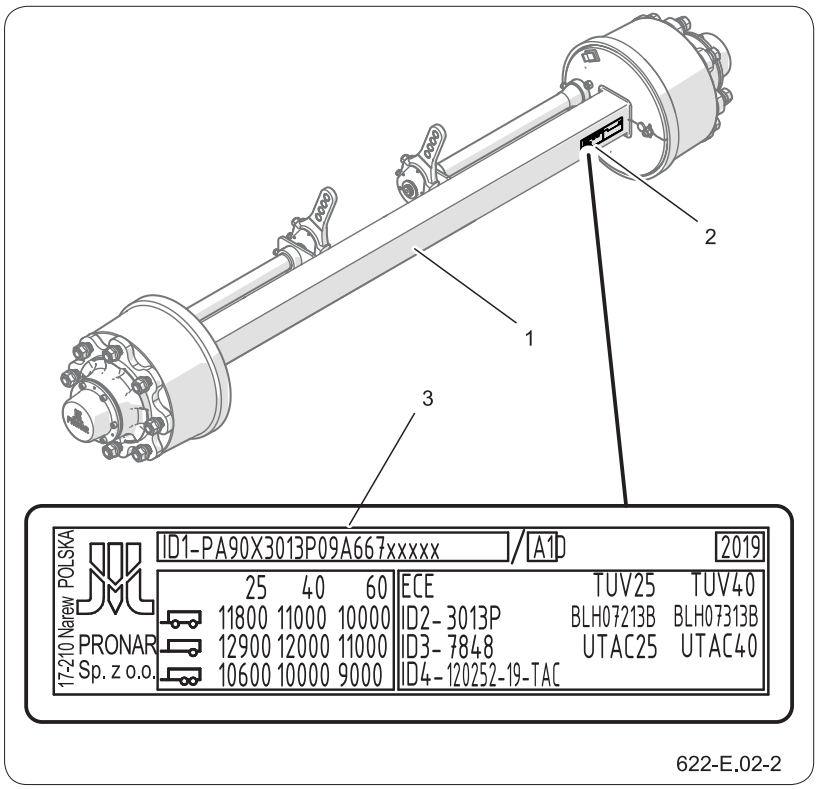


**Figure 2.3** Axis identification
*(1) driving axle (2) name plate*
*(3) axle serial number*

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## 2.2 INTENDED USE OF THE MACHINE

### 2.2.1 Use for the intended purpose

**DANGER**

The machine may not be used for purposes other than those for which it is intended.

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

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

The braking system as well as the lighting and signalling system meet the requirements arising from traffic regulations.

In the countries where the trailer is used, restrictions related to the road traffic laws in force in a given country must be observed.

The trailer speed must not 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 trailer's *USER MANUAL* and with *WARRANTY CARD* and to the guidelines contained in these documents,
- understand the principle of machine operation and the safe and proper operation of the trailer,
- work in compliance with established maintenance and adjustment plans,

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

The trailer may only be used by persons who:

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

### 2.2.2 Expected misuse

The expected improper use of the machine is related primarily to the transport of materials that do not comply with the manufacturer's recommendations, for example:

- transport of people, animals,
- dangerous materials, loads that react aggressively as a result of chemical reactions to structural elements of the trailer (causing steel corrosion, destroying paint coatings, dissolving plastic elements, destroying rubber elements, etc.),
- transport of 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.

An employee who has not been trained in the field of operation and safety at work, does not have appropriate qualifications and the required skills cannot be allowed to operate the machine.

When operating the machine, it is strictly forbidden to:

- stay in the danger zone,
- climb onto the machine while it is working,
- make any unauthorized design changes,
- repairs and service by unauthorized and unqualified personnel.

INF.3.B-002.01.EN

## 2.3 AGRICULTURAL TRACTOR REQUIREMENTS

**Table 2.2.** Agricultural tractor requirements

| Content | Unit | Requirements |
|---|---|---|
| | | **T900XL** |
| **Braking system - sockets** | | |
| Pneumatic 2 - wire | - | in accordance with ISO 1728 |
| Hydraulic | - | in accordance with ISO - 7421-1 |
| **Maximum system pressure** | | |
| Pneumatic 2 - wire | bar/kPa | 8 / 800 |
| Hydraulic | bar/MPa | 150 / 15 |
| **Hydraulic tipping system** | | |
| Hydraulic oil | - | L HL 32 Lotos (1) |
| Maximum system pressure | bar/MPa | 200 / 20 |
| Oil demand | l | 80 |
| **Electrical system** | | |
| Electrical system voltage | V | 12 |
| Connection socket | - | 7 poles in accordance with ISO 1724 |
| **Tractor hitch required** | | |
| Type of hitch | - | Upper, lower transport hitch |
| Minimum vertical load capacity of the hitch | kg | 4,000 |
| **Rear power take-off (PTO)** | | |
| Type | - | Type 1 (1 3/8”) according to ISO 730-1 |
| Rotational speed | rpm | 540 |
| Number of splines on the shaft | pcs | 6 |
| Rotation direction | - | clockwise |
| **Other requirements** | | |
| Min. tractor power | kW/KM | 162/220 |
| System of connecting the steering system of the tractor with the trailer [2] | | in accordance with ISO 26402 |

*(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.*
*(2) - The trailer is not equipped with a tractor steering system*

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## 2.4 TRAILER EQUIPMENT

**Table 2.3.** Trailer equipment [1]

| Content | STANDARD | ADDITIONAL | OPTIONAL |
|---|---|---|---|
| User manual | ● | | |
| Warranty Card | ● | | |
| Electrical installation connection cable | ● | | |
| Electric lighting system 12V (LED) | ● | | |
| Wheel chocks | ● | | |
| Ladder | | | |
| Drawbar support | ● | | |
| Sliding wall, sealed | ● | | |
| Front wall sliding hydraulic system | ● | | |
| PLEXI Window on the front wall of the load box | ● | | |
| Hydraulically lifted tailgate | ● | | |
| Universal rigid drawbar with hydraulic shock absorption | ● | | |
| Drawbar hitch: ball-type rigid K80mm (4000kg) | ● | | |
| Hydraulic steering system | ● | | |
| The system of connecting the steering system with the tractor in accordance with ISO 26402[2] | ● | | |
| Braking system: two-conduit, pneumatic | ● | | |
| Pneumatic parking brake | ● | | |
| Plastic fenders | ● | | |
| Rear underrun protection device (bumper) - homologated, foldable | ● | | |
| Load box extensions 400mm, | | ● | |
| Load box extensions 500mm (400mm + 100mm), | | ● | |
| Spare wheel | | ● | |
| The triangle distinguishing slow-moving vehicles | | ● | |

| Content | STANDARD | ADDITIONAL | OPTIONAL |
|---|---|---|---|
| Hydraulic, foldable drawbar support | | | ● |
| Metal fenders | | | ● |
| Braking system: two-conduit, pneumatic with ALB | | | ● |
| Hydraulic braking system | | | ● |

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

*(2) - The trailer is not equipped with a tractor steering system.*

*Tire information is provided at the end of the publication in TIRES chapter.*

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## 2.5 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 or independent transport (towing a trailer with an agricultural tractor).

### 2.5.1 Trucking

**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. This is due to the vehicle's centre of gravity shifting upwards with the machine loaded.

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

Incorrect use of securing measures can cause an accident.

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

The machine should be attached firmly to the platform of the vehicle using straps, chains, lashings or other fastening devices equipped with a tensioning mechanism. The fastening elements should be attached to the transport eyelets designed for this purpose (1) - figure “*Points for lifting*”.

Chocks or other elements without sharp edges should be placed under the trailer wheels, protecting the machine against rolling. The wheel must be secured to the vehicle loading platform in such a way that it cannot move.

Use approved 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 manual of the manufacturer of the securing material used. The number of fastening elements

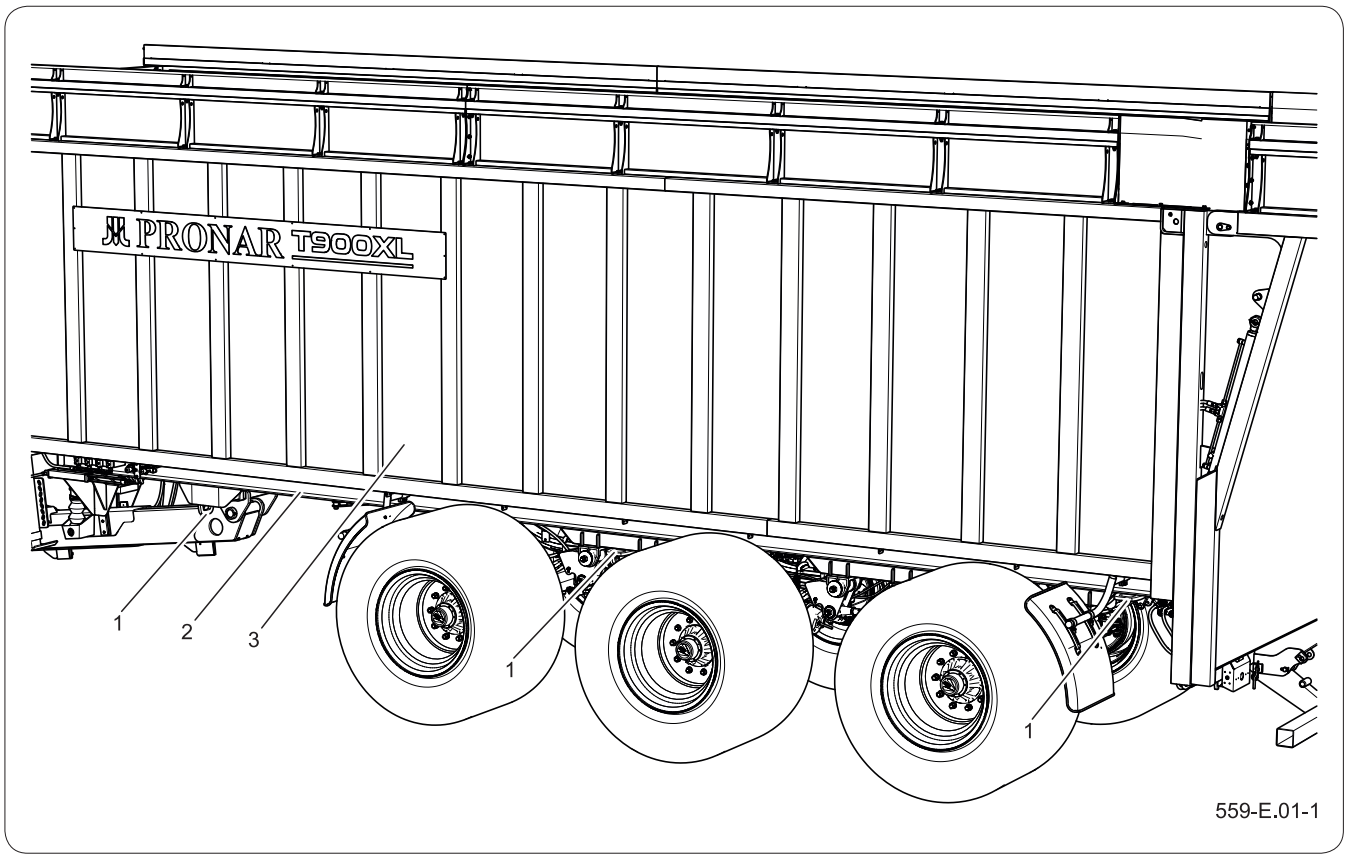


**Figure 2.4** Trailer attachment points
*(1) handle (2) lower frame (3) load box*

**CAUTION**

It is forbidden to attach slings and all kinds of fastening elements to the elements of the hydraulic and electrical systems as well as the slender elements of the machine (e.g. covers, wires).

(ropes, belts, chains, lashings, etc.) and the force needed for their tension depends, among others, on the weight of the trailer, the construction of the car carrying the trailer, the speed of travel and other conditions. Therefore, it is not possible to specify the fastening plan in detail.

In order to correct attach the trailer to the loading platform, support the drawbar by placing a support in the form of a wooden block under it. A properly attached trailer will not change its position relative to the transporting vehicle. The fastening means must be selected according to the manufacturer's instructions. In case of doubt, a larger number of attachment and securing points for the trailer should be used. If necessary, protect the sharp edges of the trailer, thus securing the securing measures against damage during transport.

During reloading work, pay special attention not to

damage elements of the machine equipment and the paint coating.

### 2.5.2 User's transport

If the user decides to transport the trailer independently after purchasing the trailer, read the trailer Operator's Manual and follow its recommendations. Independent transport involves towing a trailer with own agricultural tractor to its destination. While driving, adjust the speed to the prevailing road conditions, but it must not be greater than the maximum design speed.

**CAUTION**

When transporting independently, as an operator, read the contents of this User's Manual and follow the recommendations contained therein.

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## 2.6 TERMS OF WARRANTY

**ADVICE**

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

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

The warranty does not apply to parts and sub-assemblies of the machine, which are subject to wear in normal operating conditions, regardless of the warranty period.

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

In the event that damage occurs as a result of:

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

the user loses the warranty.

The user is obliged to immediately report all noticed defects in the paint coatings or traces of corrosion, and order removal of defects regardless of whether the damage is covered by the warranty or not.

Detailed warranty conditions are given in the WARRANTY CARD attached to the newly purchased machine.

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 during use are not permitted

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## 2.7 THREAT TO THE ENVIRONMENT

**ADVICE**

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

**DANGER**

Do not store oil waste in food containers.

Store used oil in containers resistant to hydrocarbons.

**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.

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 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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## 2.8 WITHDRAWAL FROM USE

**DANGER**

Before commencing dismantling, reduce residual pressure in pneumatic and hydraulic systems.

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

Before starting to disassemble the gas accumulator, the accumulator pressure must be relieved on both the liquid and gas side.

In the event of decision by the user to withdraw the machine from use, comply with the regulations on withdrawal from use and recycling of machines withdrawn from use in force in a given country.

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.

Works related to the disassembly of the hydraulic system should be performed by suitably qualified personnel.

Before proceeding to dismantling, reduce the residual pressure in the hydraulic system, drain the oil completely. Remove all air from the pneumatic system of the machine by draining the air reservoir.

In the event of replacement of parts, take the worn or damaged elements to a collection point for recyclable materials. Take used oil as well as rubber or plastic elements to plants dealing with the utilization of this type of waste.

Codes of waste generated by dismantling of the machine

| Item | Code | Meaning |
|---|---|---|
| 1 | 07 02 13 | Plastic waste |
| 2 | 13 01 10 | Other hydraulic oils |
| 3 | 13 02 04* | Mineral engine, gear and lubricating oils containing halogenated organic compounds |
| 4 | 13 02 06* | Synthetic engine, gear and lubricating oils |
| 5 | 13 02 08* | Other engine, gear and lubricating oils |
| 6 | 13 05 02* | Sludges from oil dewatering in separators |
| 7 | 13 05 08* | A mixture of sand trap waste and oil dewatering in separators |
| 8 | 15 01 10* | Packaging containing residues of or contaminated by hazardous substances |
| 9 | 15 02 02* | Sorbents, filter materials and protective clothing contaminated with hazardous substances |
| 10 | 16 01 03 | End-of-life tyres |
| 11 | 16 01 17 | Ferrous metal |
| 12 | 16 01 22 | Components not otherwise specified |

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CHAPTER 3

# SAFETY OF USE

PRONAR T900XL

## 3.1 BASIC SAFETY RULES

**CAUTION**

The trailer may only be used and operated by **persons qualified** to drive agricultural tractors with a trailer.

- Before using the trailer, carefully read the content of this publication and the „*Warranty Card*". During operation, follow all recommendations.
- The user manual should be available to the operator for all the time. Protect the manual from damage.
- 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.
- If you ignore the recommendations contained in these document, you create a threat to the health and life of bystanders and/or the machine operator.
- Use and operate the trailer carefully! By a careless work, you create a threat to the health and life of bystanders and/or the machine operator.
- You are obliged to familiarize yourself with the construction, operation principles and safe operation of the trailer.
- Familiarize yourself with all machine controls before starting work. Do not use the machine without knowing its function.
- Before each start-up of the trailer, check that it is properly prepared for work, first of all in terms of safety.
- There is a residual risk of threats, therefore the basic principle of using the trailer should be the application of the principles of safe use and sensible behaviour. Remember that your safety is the most important thing.
- It is forbidden to use the machine by persons who are not authorized to drive tractors, including children, people under the influence of

alcohol, drugs or other intoxicating substances, etc.

- The trailer may not be used for purposes other than those for which it was intended. Everyone who uses the trailer in a manner contrary to its intended use, thus takes full responsibility for all consequences arising from its use.
- Use of the machine for purposes other than envisaged by the Manufacturer is inconsistent with the intended use and may void the warranty.

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## 3.2 SAFETY WHEN THE MACHINE AGGREGATING

- Do not connect the trailer to the tractor, if it does not meet the requirements set by the Manufacturer (minimum power demand of the tractor, inadequate connections, etc.) - see the section "*Tractor requirements*".
- Before connecting the trailer, make sure that the oil in the tractor's external hydraulic system can be mixed with the trailer's hydraulic oil.
- Before coupling the trailer, make sure that both machines are technically sound.
- When coupling of the trailer use the appropriate

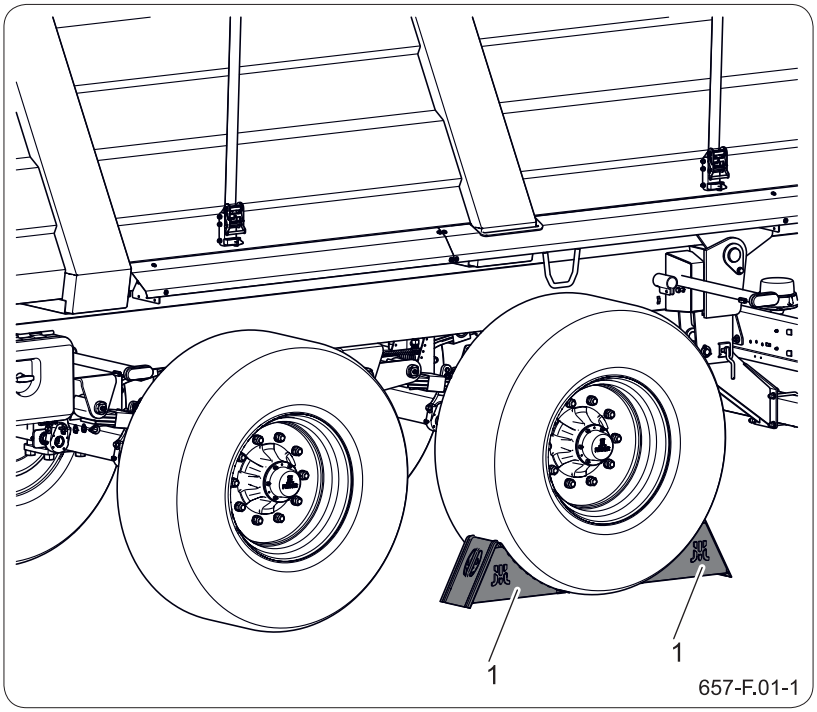


**Figure 3.1** Arrangement of locking wedges
*(1) support wedge*

tractor hitch. After coupling the machines, check the the hitch safety device. Read the tractor operating instructions. If the tractor is equipped with an automatic hitch, make sure that the coupling operation is completed.

**CAUTION**

Place the wedges only under the wheels of the rigid axle.

- Take special care when connecting the machine.
- When connecting, nobody may be between the trailer and the tractor.
- Hitching and unhitching of the trailer may only take place when the machine is blocked with the parking brake. If the trailer stands on a slope, it must be additionally secured against rolling by placing wedges or other elements without sharp edges under the wheels. Make sure that the the trailer is equipped with wedges.
- Do not move the trailer when the support is extended and rests on the ground. While the machine is in motion, there is a risk of the support damage.

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## 3.3 SAFETY RULES FOR OPERATING OF HYDRAULIC AND PNEUMATIC SYSTEMS

**DANGER**

The hydraulic and pneumatic systems are under high pressure during operation.

- Check the technical condition of connections and hydraulic and pneumatic hoses. The trailer may not be operated with leaking installations.
- In the event of a failure of the hydraulic or pneumatic system, the trailer should be decommissioned until the failure is removed.
- When connecting the hydraulic conduits to the tractor, sure that the tractor and trailer hydraulic system are not under pressure. If necessary, reduce the residual pressure of the system. See section "*Maintenance of the hydraulic system ...*".
- Use hydraulic oil recommended by the manufacturer.
- After changing the hydraulic oil, the used oil must be disposed. Used oil or oil which has lost its properties should be stored in original containers or replacement packaging resistant to hydrocarbons. Replacement containers must be accurately described and properly stored.
- It is forbidden to store hydraulic oil in packaging intended for food storage.
- Rubber hydraulic hoses should be replaced every 4 years regardless of their technical condition.

**Procedure in the event of an accident**

- In the event of injuries caused by pressurized hydraulic oil, contact a doctor immediately. Hydraulic oil can penetrate the skin and cause infection.
- If the oil gets into the eyes, rinse with plenty of water, if irritation occurs, contact a doctor.

- In the event of contact of oil with skin the area of contact with water and soap. Do not use organic solvents (petrol, kerosene).

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## 3.4 RULES OF SAFE TECHNICAL SERVICE

- The trailer should be kept clean.
- The load must be evenly distributed.
- You cannot transport people or animals on the trailer.
- Keep a safe distance during loading and unloading. Keep bystanders away from the work area of machine.
- During the warranty period, any repairs should only be carried out by a Warranty Service authorized by the manufacturer. After the end of the warranty period, it is recommended that any repairs to the be carried out by specialized workshops.
- In the event of any faults or damages on trailer, it shouldn't be in use until repair.
- During maintenance work, use appropriate, close-fitting protective clothing, gloves, shoes, glasses and the right tools.
- Any modification of the trailer releases PRONAR Narew from any liability for damage or injury.
- You can enter the trailer only when the trailer is absolutely stationary and the tractor engine is switched off. Secure the set with the parking brake. Secure the tractor cab against unauthorized access.
- Regularly check the technical condition of the safety devices and the correct tightening of bolt connections (in particular the drawbar eyes and wheels).
- Inspect the trailer according to the frequency specified in this manual.
- Before starting repair work on hydraulic or pneumatic systems, the residual oil or air pressure must be completely reduced. For the procedure see section: „*Hydraulic system operation*" ,

„*Pneumatic system operation*”

- Repair, maintenance and cleaning work should only be carried out with the tractor engine switched off and the ignition key removed. Tractor and trailer should be secured with parking brake and wedges should be placed under trailer wheels. Secure the tractor cab against unauthorized access.
- Before commencing maintenance or repair work, secure the trailer with wedges and parking brake. Only a stationary trailer may be disconnected from the tractor.
- If it is necessary to replace individual parts, use only parts recommended by the manufacturer. Failure to comply with these requirements may endanger the health or life of bystanders or persons operating the trailer, cause damage to the machine and constitute the basis for withdrawing the warranty.
- Before welding or electrical work, disconnect the trailer from the power supply. Clean the paint coating. The fumes of burning paint are poisonous to humans and animals. Perform welding work in a well-lit and ventilated room.
- During welding work pay attention to flammable or fusible elements (elements of pneumatic, electric and hydraulic systems, elements made of plastic). If there is a risk of ignition or damage, they must be or covered with non-flammable material before welding. Before starting work, it is recommended to prepare a $CO_2$ or foam extinguisher.
- In the event of work requiring the trailer to be raised, use properly certified hydraulic or mechanical lifts for this purpose. After lifting the machine, be sure to use additional, stable and durable supports. You cannot perform any work

under the trailer, which has only been lifted with the jack.

- It is forbidden to support the trailer with fragile elements (bricks, hollow bricks, concrete blocks).
- After completing work associated with lubrication, remove excess grease. The trailer should be kept clean.
- It is forbidden to carry out independent repairs of elements of the hydraulic or pneumatic system, i.e. control valves, actuators and regulators. In case of damage to these elements, the repair should be entrusted to authorized repair centres or replace the elements with new ones.
- You may not install additional devices or accessories that do not comply with the specifications defined by the Manufacturer.
- You may tow the trailer only when the axle, lighting and braking systems are functional.

**Procedure in the event of an accident**

- Perform maintenance and repair activities applying the general principles of health and safety at work.
- In case of injury, wash and disinfect the wound immediately.
- In case of serious injuries consult a physician.

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## 3.5 RULES OF TRAVELING ON PUBLIC ROADS

- When driving on public roads, the tractor operator must ensure that the trailer and tractor are equipped with an approved or homologated warning reflective triangle.

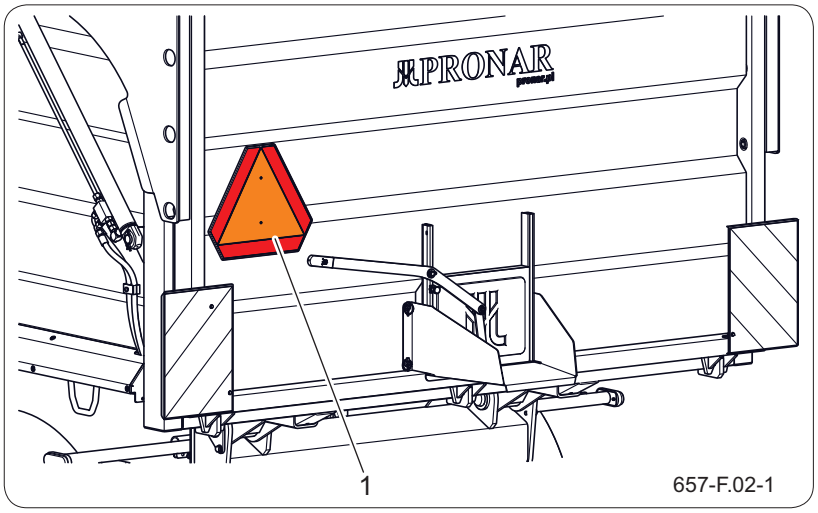


**Figure 3.2** Warning triangle
*(1) Plate for slow-moving vehicles*

- A triangular plate for *slow moving vehicles* should be placed on the rear wall, if the trailer is the last vehicle in the set - Figure (2.2).
- Before driving on the road, remove the tail light covers.
- When driving on public roads, comply with traffic regulations and transport regulations in force in the country where the trailer is used.
- Do not exceed the maximum design speed - 40 km/h. The travel speed must be adapted to the ambient conditions and the load. If possible avoid driving over uneven terrain and unexpected turns.
- Never leave the machine unsecured. The trailer disconnected from the tractor must be blocked with the parking brake and secured against rolling with wedges or other elements without sharp edges placed under the vehicle wheels.

- Before driving, make sure that the trailer is correctly connected to the tractor, especially that the hitch pins are secured.
- Vertical load carried by the trailer drawbar eye affects the steering of the agricultural tractor.
- Before using the trailer always check its technical condition, especially in terms of safety. In particular, check the technical condition of the hitch system, the running gear, the braking system and traffic lights as well as the connecting elements of the hydraulic, pneumatic and electrical systems.
- Before driving, check that the parking brake is released and the braking force regulator is in the correct position (applies to pneumatic systems with a manual three-position regulator).
- The trailer is adapted for driving on slopes up to a maximum of $8^0$. Moving the trailer over slopes may cause the trailer to overturn as a result of loss of stability.
- Periodically drain air tanks in the pneumatic system. During frosts, freezing water may cause damage to pneumatic system components.
- Reckless driving and excessive speed can cause an accident.
- Load protruding beyond the outline of the trailer should be marked in accordance with traffic regulations. It is forbidden to transport loads not allowed by the manufacturer.
- Do not exceed the maximum trailer capacity. Exceeding the carrying capacity may lead to damage to the machine, loss of stability and cause a hazard while driving. The braking system of the machine has been adapted to the total weight of the trailer, exceeding of which will drastically reduce the operation of the service brake.

- Prolonged driving on sloping ground creates a risk of loss of braking efficiency.
- Use the help of another person while reversing. During manoeuvres, the helping person must keep a safe distance from danger zones and be visible to the tractor operator at all times.
- It is forbidden to get on the trailer while driving.
- Parking the trailer on a decline is prohibited.
- If the trailer has a hydraulic suspension, you may start driving only when it is fully raised. You cannot move the trailer if the suspension is even slightly lowered.

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## 3.6 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 of alcohol or drugs,
- operation of the trailer by unauthorized persons,
- being on the machine during work,
- trailer cleaning, maintenance and technical inspection.

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

- prudent and leisurely machine operation,
- reasonable use of the notes contained in the 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 protective clothing,
- securing the machine against access by unauthorized persons, especially children.

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## 3.7 INFORMATION AND WARNING STICKERS

- The trailer is marked with information and warning stickers mentioned in table“*Information and warning stickers*”.
- Arrangement of symbols is shown in the figure “*Location of information and warning stickers*". Dear User, you are 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 stickers can be found in the table table“*Information and warning stickers*” and in the Spare Parts Catalogue. 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 not direct a strong water jet on them.

**Table 3.1.** Information and warning stickers

| Item | Sticker | Meaning |
|---|---|---|
| 1 |  | Danger of being crushed.<br>Keep a safe distance when closing and opening the rear flap.<br>**58N-0000013** |
| | | |

| Item | Sticker | Meaning |
|---|---|---|
| 2 |  | Crushing the whole body - force applied from the side<br>Crushing - the front sliding wall of the trailer<br>**193N-0000003** |
| 3 |  | Before starting any servicing or repair work, switch off the tractor engine and remove the ignition key.<br>**70N-00000005** |
| 4 |  | Regularly check the tightness of wheel nuts and other bolted connections.<br>**104N-00000006** |
| 5 |  | Lubricate the machine according schedule outlined in the USER MANUAL.<br>**104N-00000004** |
| 6 |  | Before starting use, read the User's Manual.<br>**70N-00000004** |
| 7 |  | High pressure fluid jet.<br>Keep a safe distance.<br>**535N-0000009** |

| Item | Sticker | Meaning |
|---|---|---|
| 8 |  | Minimum hitch strength of the tractor.<br>**544N-00000003** |
| 9 |  | Place of fastening transport belts or chains<br>**58N-0000019** |
| 10 |  | Vehicle maximum speed.<br>**204N-00000008** |
| 11 |  | Trailer type T900XL<br>**559N-00000001** |
| 12 |  | Company branding<br>**62N-0000014-02** |

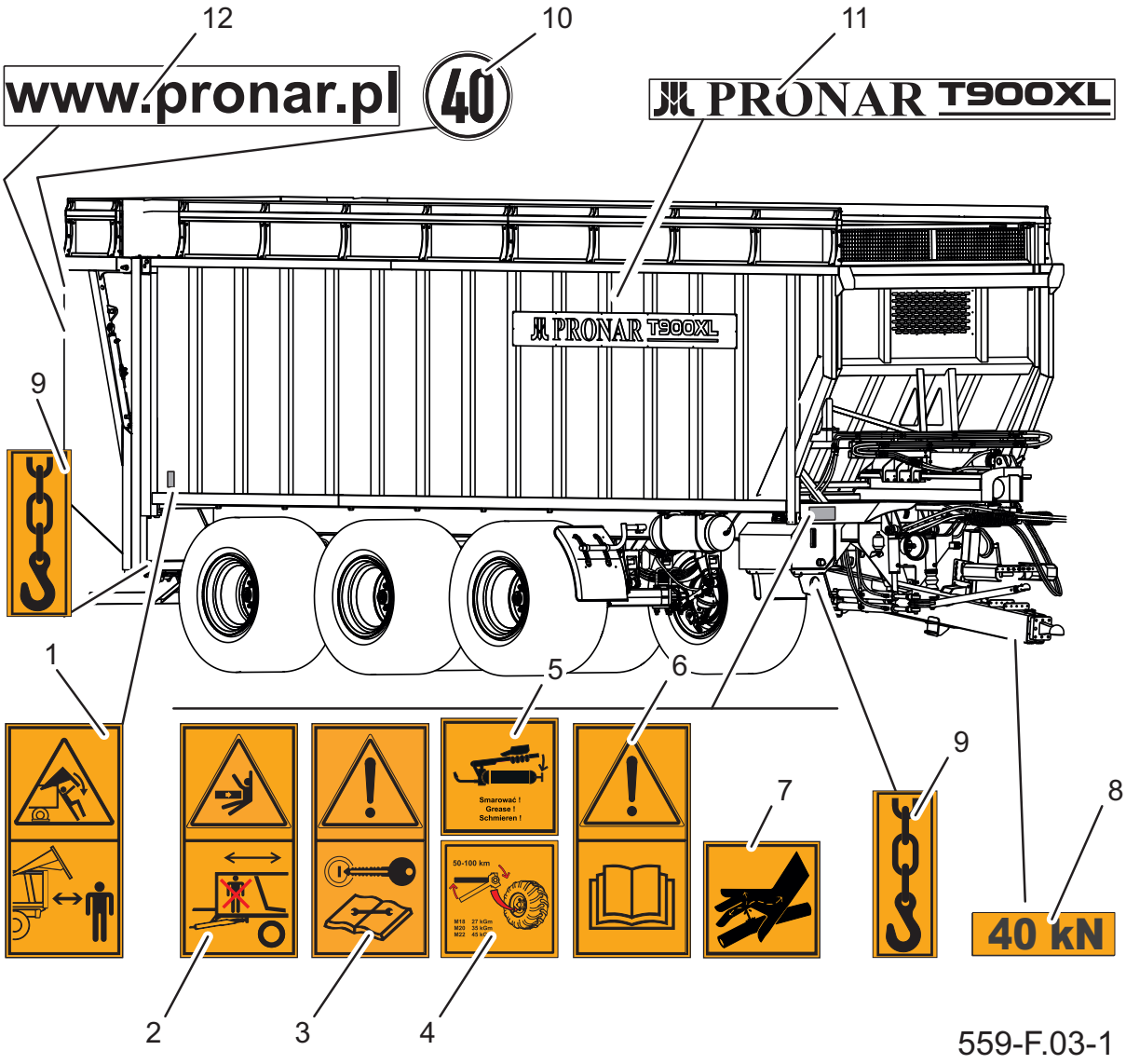


**Figure 3.3** Arrangement of information and warning stickers

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## 3.8 WORKING WITH THE MACHINE WITH THE POWER TAKE-OFF (PTO)

**CAUTION**

Before starting work, read the operator's manual of the drive shaft provided by the shaft's manufacturer.

- Before starting work, familiarize yourself with the propeller shaft operating instructions provided by the shaft manufacturer and follow the recommendations contained therein.
- if necessary, adjust the length of the articulated-telescopic shaft to the cooperating tractor in accordance with the shaft's instruction manual.
- The trailer may only be connected to the tractor with the use of a properly selected articulated telescopic shaft, recommended by the Manufacturer.
- The drive shaft must be equipped with covers. It is forbidden to use the shaft with damaged or missing safety elements.
- Some parts of the PTO shaft (especially the clutch) can become very hot. Do not touch hot parts.
- After installing the shaft, make sure that it is correctly and securely connected to the tractor and trailer.
- It is forbidden to wear loose clothing, loose belts or anything that could get caught in the rotating shaft. Contact with rotating PTO shaft may cause serious injury.
- Before disconnecting the shaft, turn off the tractor engine and remove the key from the ignition switch.
- When working in poor visibility, illuminate the articulated telescopic shaft and its surroundings using the tractor's working lights.
- During transport, the shaft should be stored in a horizontal position to avoid damage to guards and other safety devices.
- When using the shaft and trailer, do not use PTO shaft speed other than 540 rpm. Do not overload

the shaft and the machine, do not engage the clutch suddenly. Before starting PTO shaft make sure that the PTO rotation direction is correct.

- It is forbidden to walk over and under the shaft and stand on it both during work and when the trailer is at a standstill.
- The PTO shaft has markings on the housing indicating which end of the shaft should be connected to the tractor.
- Never use a damaged PTO shaft as it may cause an accident. A damaged shaft should be repaired or replaced for new one.
- do not use drive shaft extensions/adapters.
- Disconnect the shaft drive each time when there is no need to drive the machine, or when the tractor and trailer are in an unfavourable angular position with respect to each other.
- Protect chain securing the shaft cover against turning while the shaft is working, attach it to a fixed structural element of the trailer.
- It is forbidden to use safety chains to support the shaft during standstill or transporting the trailer.

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CHAPTER 4

# CONSTRUCTION AND PRINCIPLE OF OPERATION

PRONAR T900XL

## 4.1 TECHNICAL CHARACTERISTICS

**Table 5.1.** Basic technical data

| Content | Unit | T900XL |
|---|---|---|
| **Dimensions** | | |
| Total length | mm | 12,000 |
| Overall width | mm | 2,550 |
| Overall height | mm | 3,490 |
| **Specification of the loading box** | | |
| Internal length | mm | 9,700 |
| Internal width | mm | 2,370 |
| Internal height | mm | 2,000 |
| Floor/wall sheet thickness | mm | 5 / 4 |
| Tipping system | - | not applicable |
| Tipping angle (rear) | o | not applicable |
| **Performance parameters** | | |
| Permissible gross weight | kg | 34,000 |
| Capacity | kg | 22,500 |
| The machine's karb weight | kg | 11,500 |
| Load capacity (without extensions) | $m^3$ | 49 |
| Load capacity (400mm extensions) | $m^3$ | 58.7 |
| Load capacity (500mm extensions) | $m^3$ | 61.2 |
| Platform height from the ground | mm | 1,440 |
| **The hydraulic system** | | |
| Cylinder stroke | mm | not applicable |
| Oil demand | L | 80 |
| Pressure of the system | bar | 200 |
| Hydraulic oil | - | L-HL32 Lotos |
| **Other information** | | |
| Design speed | km/h | 40 |
| Wheel track | mm | 2,100 |
| Loading of the drawbar hitch | kg | 4,000 |
| Min. tractor power | KM/kW | 220 / 169 |
| Electrical system voltage | V | 12 |
| Noise level | dB | below 70 |
| Machine operating temperature range | °C | -20 – +40 |

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

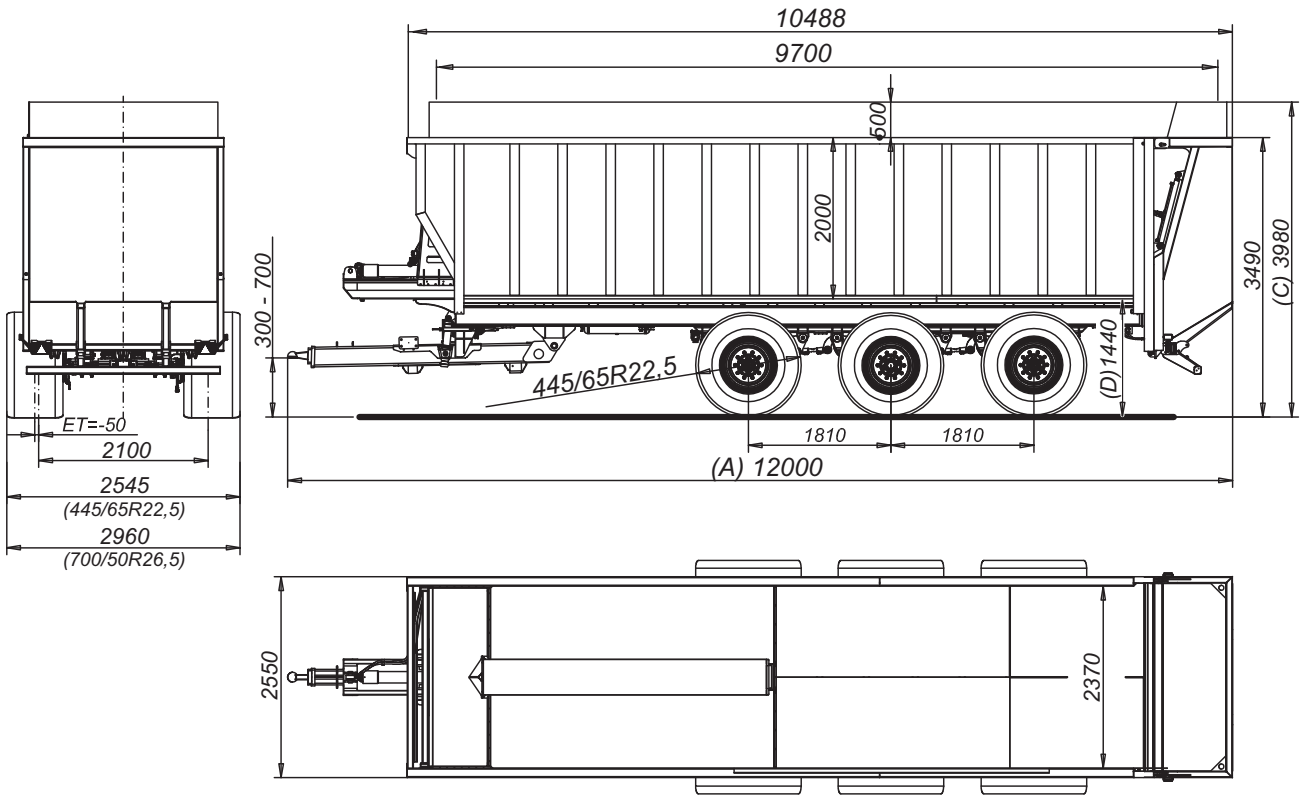


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**Figure 5.1** Basic dimensions of the trailer

**CAUTION**

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

**Table 5.2.** Main dimensions of the trailer

| Content | Unit | T900XL |
|---|---|---|
| Total length A | mm | 12,000 |
| Overall height C[1] | mm | 3,988 |
| Length of the loading box B | mm | 9,700 |
| Platform height from the ground D | mm | 1,440 |

*[1] for 445/65R22.5 wheel and 500 extension*

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## 4.2 CONSTRUCTION OF A TRAILER

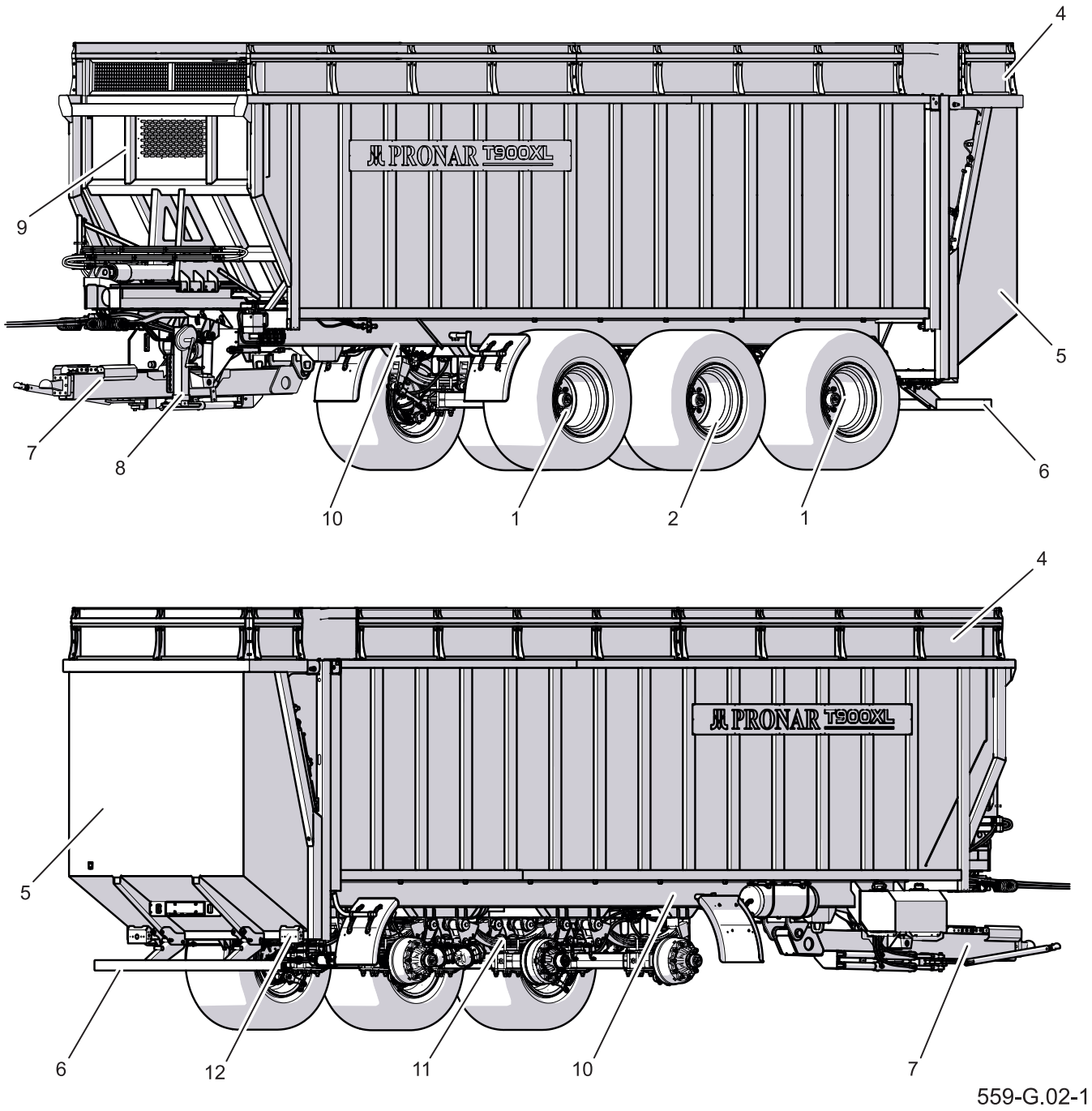


**Figure 4.2** Basic dimensions of the trailer

*(1) steering axle wheel* *(2) rigid axle wheel* *(3) load box*
*(4) extensions* *(5) rear flap* *(6) bumper*
*(7) amortized drawbar* *(8) parking stand* *(9) sliding wall*
*(10) Trailer frame* *(11) mechanical suspension* *(12) rear lighting*

The running gear is a tridem (11) mechanical suspension with torsion (2) and central (1) - rigid axles. The suspension is attached to the lower frame (10). The side walls of the load box (3) and a sliding (pushing out) front wall (9) with a hydraulic shift system are mounted on the frame (10). The tailgate (5) is a hydraulically lifted tailgate. The box can be equipped with extensions (4). The machine is coupled with the tractor by means of a hydraulically amortized drawbar (7).

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## 4.3 PNEUMATIC BRAKING SYSTEM

The working brake is activated from the tractor operator's workplace by pressing the tractor brake pedal. The control valve actuates the trailer's brakes simultaneously with the tractor's brake. Moreover, in the event of an unexpected disconnection of the conduit between the trailer and the tractor, the control valve automatically activates the trailer's brake. After connecting the conduit to the tractor's connector, the system automatically moves to a position enabling normal operation of the brakes.

The two-line pneumatic system with a manual regulator is equipped with a three-range brake force regulator, it adjusts the brake force depending on the

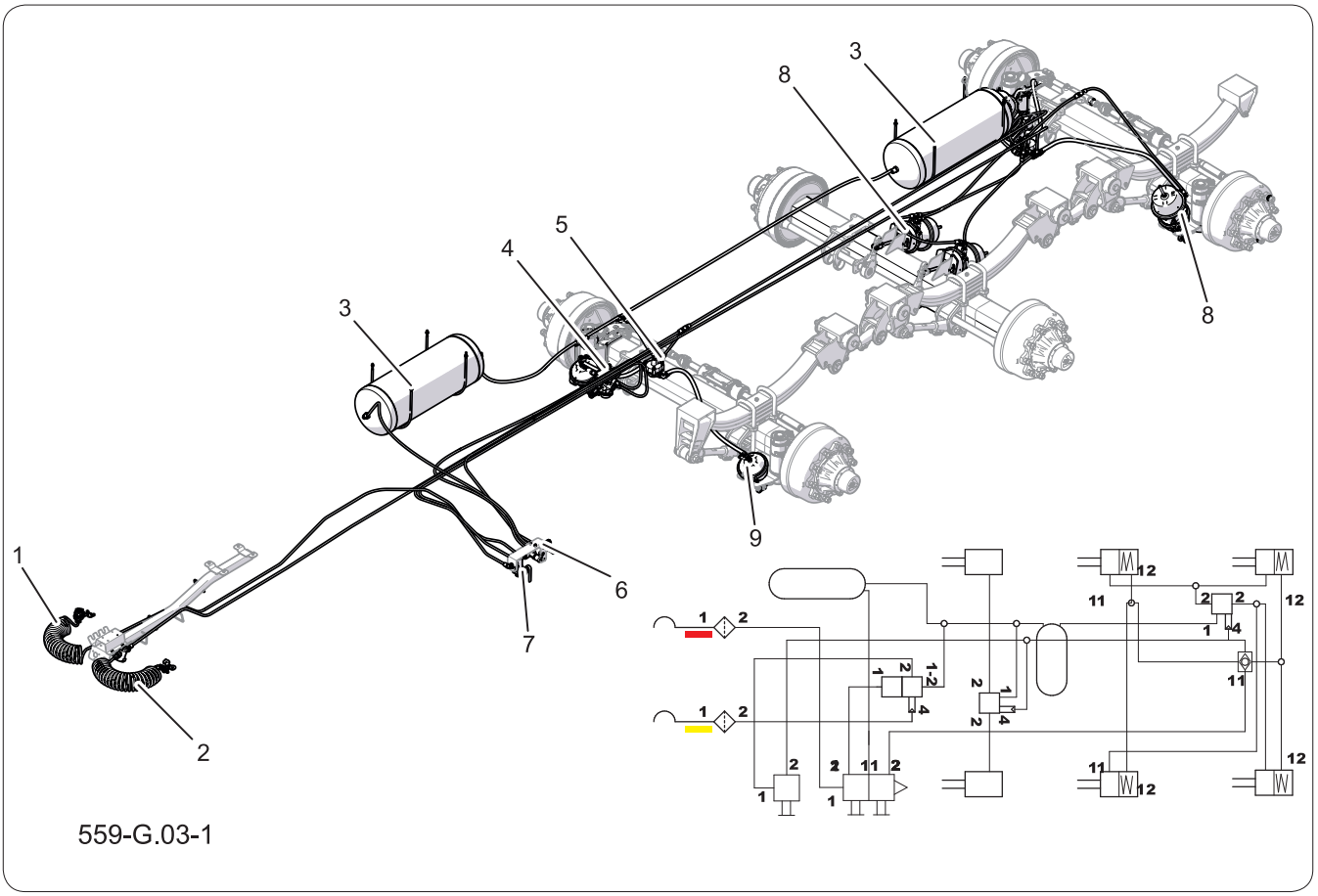


**Figure 4.3** Diagram of the pneumatic braking system
*(1) power connector (red)* *(2) control connector (yellow)* *(3) air tank*
*(4) main valve* *(5) relay valve* *(6) parking valve*
*(7) three-range braking force regulator (8) diaphragm-spring actuator* *(9) diaphragm actuator*

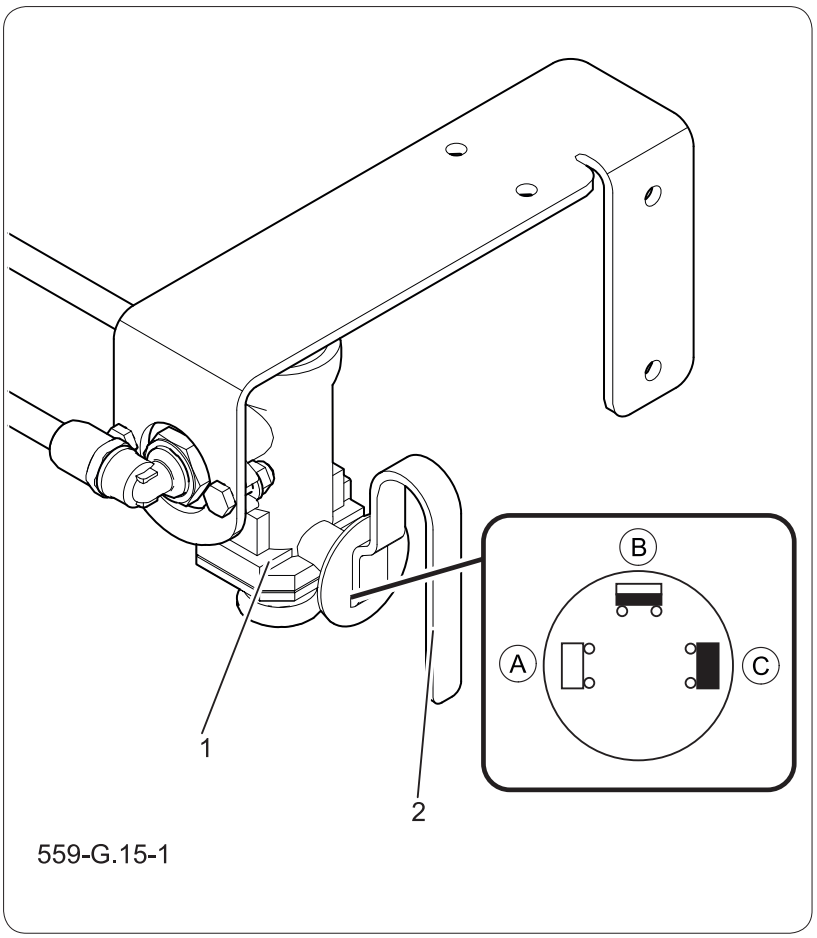


**Figure 4.4** Three-range brake force regulator
*(1) braking force regulator (2) adjustment lever*
*(A) "NO LOAD" position*
*(B) "HALF LOAD" position*
*(C) "FULL LOAD" position*

setting. Switching to the appropriate operating mode is done manually by the machine operator before starting travel using the lever (3). There are three working positions: A - "No load", B - "Half load" and C - "Full load".

The two-line braking system with an automatic regulator is equipped with a mechanical brake force regulator. It adjusts the braking force depending on the current degree of loading and during normal operation it does not require the operator of the trailer.

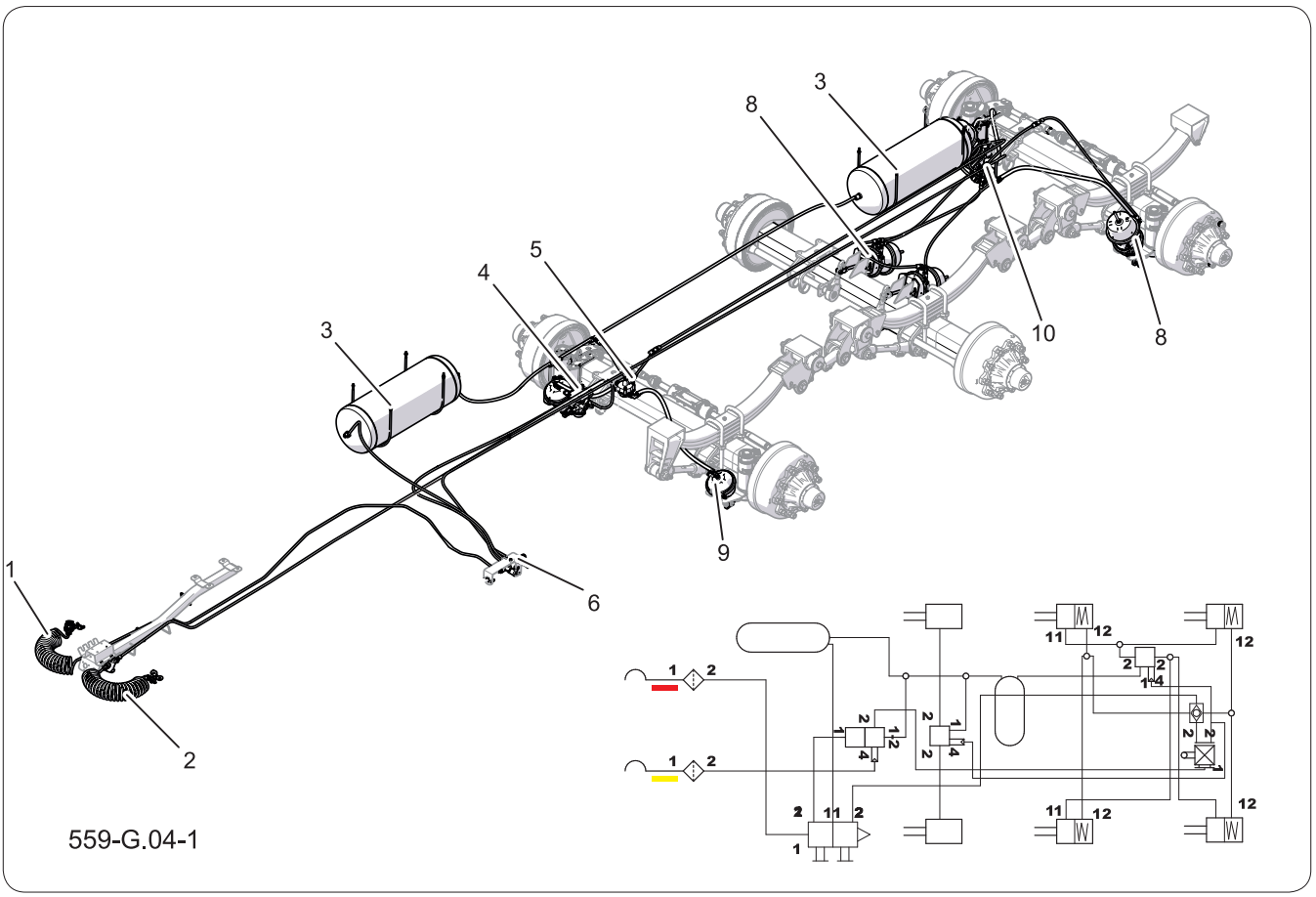


**Figure 4.5** Scheme of the LSV pneumatic braking system

*(1) power connector (red)* *(2) control connector (yellow)* *(3) air tank*
*(4) main valve* *(5) relay valve* *(6) parking valve*
*(8) diaphragm-spring actuator* *(9) diaphragm actuator* *(10) LSV regulator*

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## 4.4 PNEUMATIC PARKING BRAKE

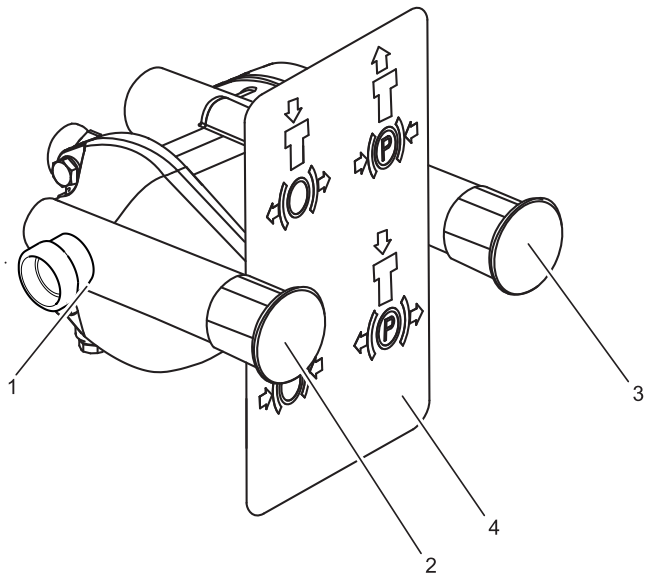


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**Figure 4.6** Loosening-parking valve
*(1) loosening and parking valve, (2) black button, (3) red button, (4) information plate*

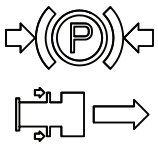
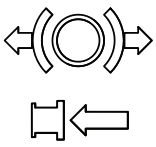
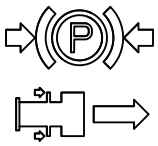
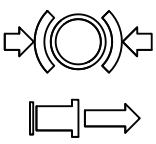
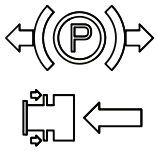
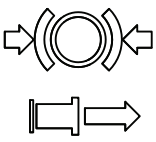
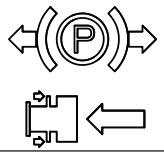
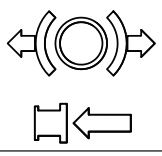
The parking brake is used to immobilize the trailer when parked. It is activated by the loosening and parking valve (1). Two buttons located in this valve allow to set the trailer to the appropriate operating mode.

The black button (2) controls the release valve, which is designed to release or activate the brake when the trailer is disconnected from the tractor. It is not possible to press this button when the pneumatic connectors are connected to the tractor.

The red button controls the operation of the parking valve. In the trailer properly connected to the tractor with the use of connectors (red and yellow), the black button of the release valve should be pulled out and the trailer wheels are braked by pulling the red button (3).

The applied parking loosening valve is equipped with an emergency brake function, which is activated in the event of a pressure drop in the supply line (cable disconnection, cable damage).

**Table 4.3.** Modes of operation of the loosening-parking valve

| Op-tion | Button Red | Button Black | Description |
|---|---|---|---|
| **A** | NOT PRESSED  | PRESSED  | The machine is braked with the parking brake. When the red button is pulled out, the trailer is immobilized with the parking brake, regardless of the position of the black button. |
| **B** | NOT PRESSED  | NOT PRESSED  | |
| **C** | PRESSED  | NOT PRESSED  | The machine is ready to drive. Pneumatic hoses connected to the trailer. It is not possible to press the black button.<br><br>The machine is braked. Pneumatic hoses are not connected. Pressing the black button will release the brake. |
| **D** | PRESSED  | PRESSED  | Parking brake released, manoeuvring position The trailer is completely unbraked. Pneumatic hoses are not connected. |

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## 4.5 HYDRAULIC BRAKING SYSTEM

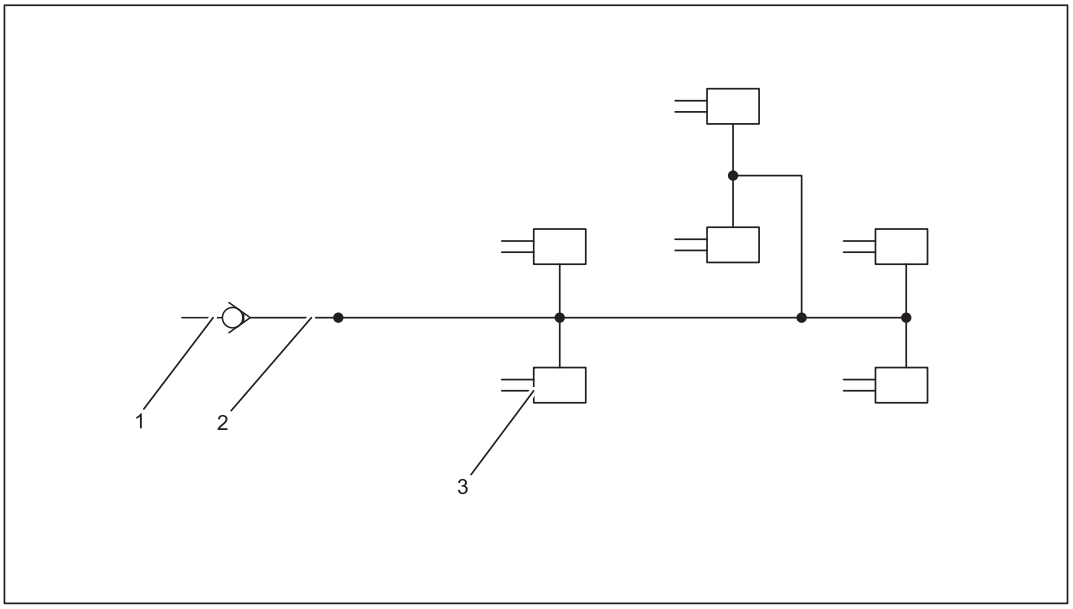


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**Figure 4.7** Scheme and construction of the hydraulic braking system
*(1) quick coupler socket (2) connecting cable (3) hydraulic cylinder*

The hydraulic service brake is activated from the operator's cabin by pressing the tractor brake pedal. To operate the hydraulic brake system, an agricultural tractor with a hydraulic brake system outlet is required.

BIZ.3.8-004.01.EN

## 4.6 PARKING BRAKE

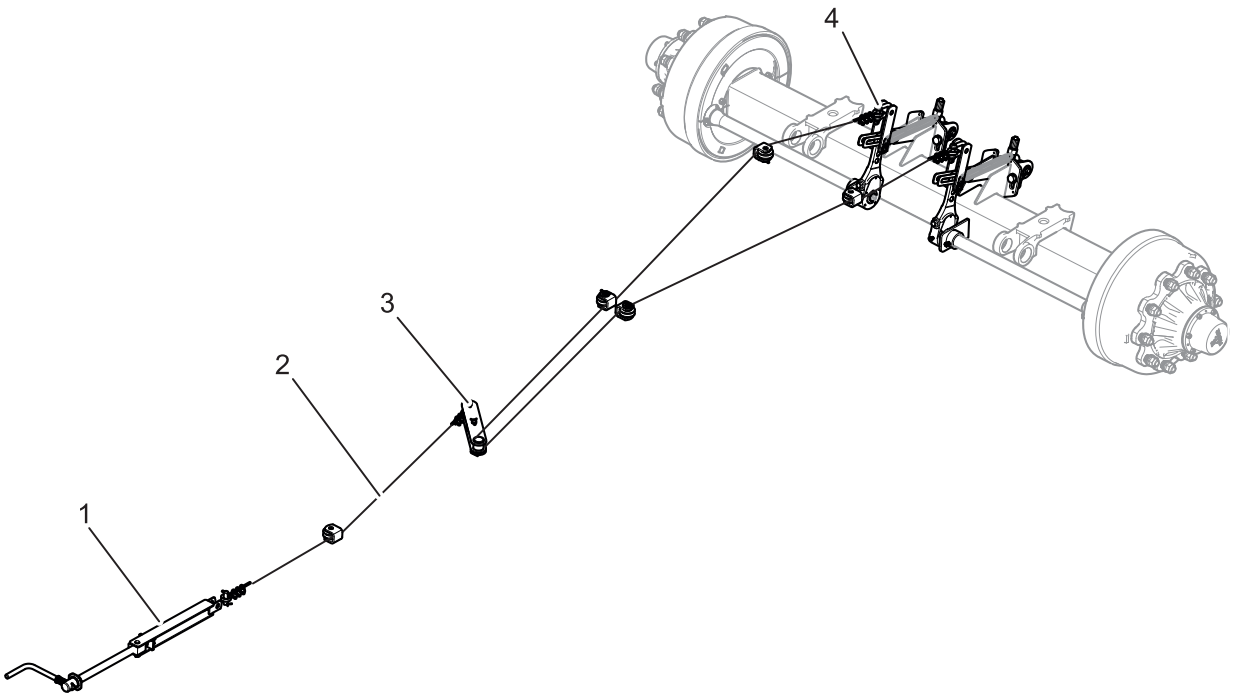


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**Figure 4.8** Construction of the parking brake
*(1) brake mechanism* *(2) cable* *(3) lever*
*(4) expander lever*

**CAUTION**

Make sure that the parking brake is unlocked before driving.

The parking brake is used to immobilize the trailer when parked. The brake crank mechanism (1) is connected with steel cables to the levers of the wheel axle expanders (4). By turning the crank of the mechanism (1) clockwise, the steel cable is tightened, causing the lever of the brake expanders to deflect, which, by spreading the brake shoes, immobilizes the trailer. Before driving, release the parking brake - the steel cable must hang loosely.

BIZ.3.8-005.11.EN

## 4.7 HYDRAULIC STEERING INSTALLATION

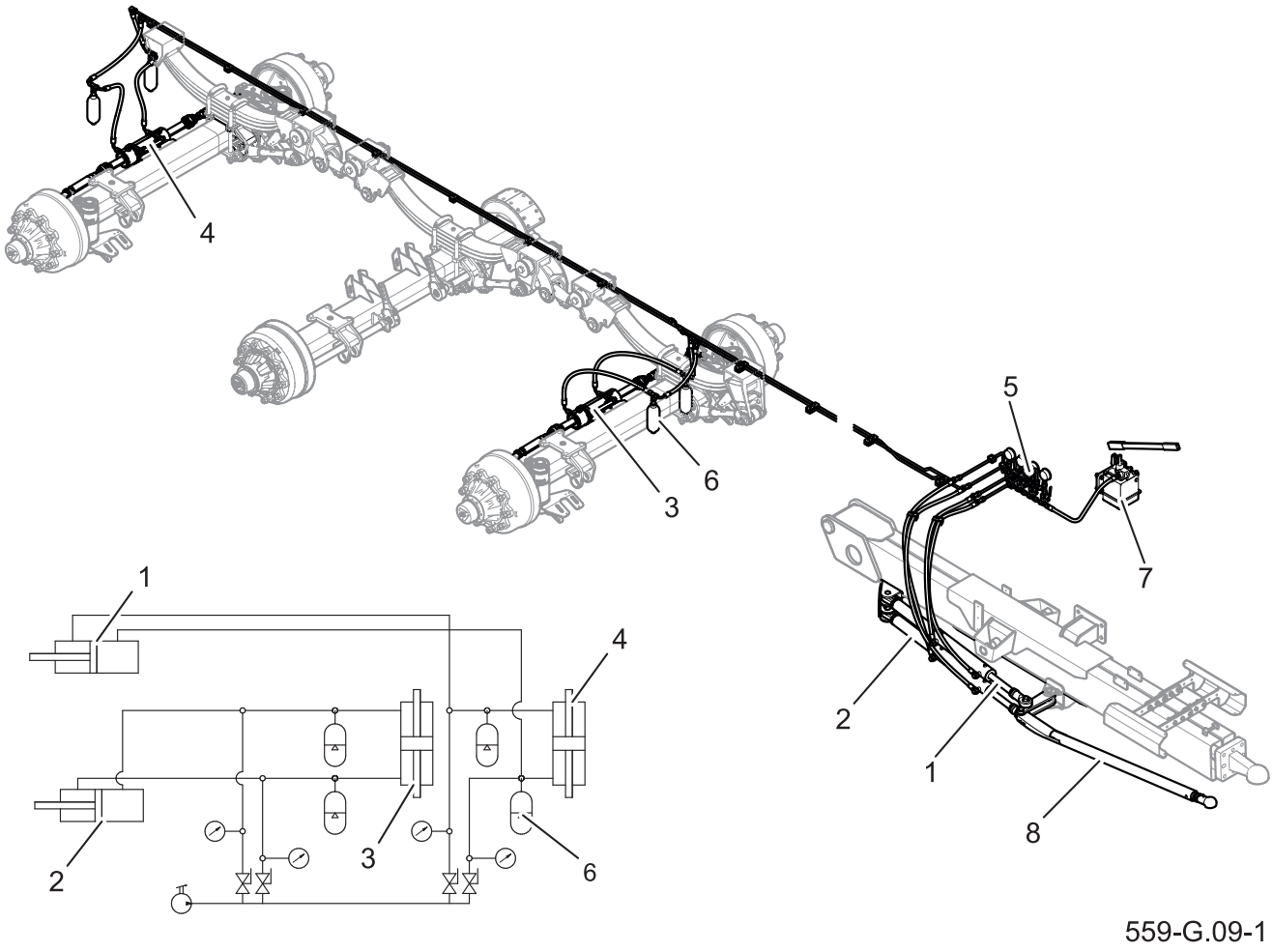



**Figure 4.9** Construction and diagram of the steering hydraulic system
*(1) front axle steering cylinder* *(2) rear axle steering cylinder* *(3) front axle steering cylinder*
*(4) rear axle cylinder* *(5) hydraulic valves* *(6) hydraulic accumulator*
*(7) manual pump* *(8) drawbar*

**ADVICE**

The steering lock hydraulic system was filled with L-HL32 Lotos hydraulic oil.

The trailer is equipped with a hydraulic steering system used to steer the wheels of the first and third axle of the trailer.

Steering axles are equipped with cylinders (3) and (4) connected by means of hydraulic hoses and pipes with double-acting cylinders (1) and (2) located on the right side of the drawbar, creating a closed system. The drawbar cylinders are connected to the drawbar (8) by means of a lever. The drawbar eye (8) is connected with the spherical part to the tractor's

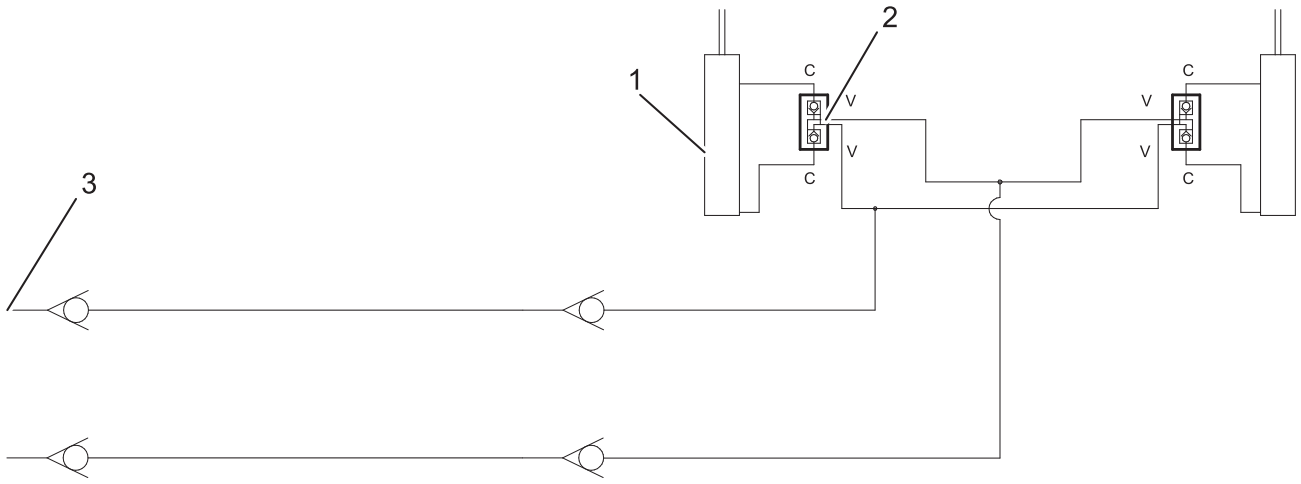
hitch which meets the requirements of the ISO 26402 standard.

The installation is filled with oil in the amount of about 8 litres. During the movement of the piston rod of the cylinders (2) and (1), the oil flows to the steering cylinders (3) and (4) located on the outer axles, causing the trailer to turn. The piston rod of the cylinders (1) and (2) moves by changing the angle of the trailer's drawbar position relative to the tractor's hitch during manoeuvring.

In order to eliminate the minimum play of the axle steering cylinders and to reduce the system load during maneuvering, steering accumulators (6) were used. Under the loading box on the left side there is a hydraulic hand pump (7) for filling and setting the system pressure.

BIZ.3.8-006.01.EN

## 4.8 TAILGATE HYDRAULIC SYSTEM




559-G.07-1

**Figure 4.10** Construction and diagram of the hydraulic system of the tailgate
*(1) hydraulic cylinder (2) hydraulic lock (3) hydraulic plug*

**ADVICE**

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

**DANGER**

It is forbidden to drive with the tailgate raised.

Before opening the tailgate, make sure there is adequate visibility and sufficient space behind and above the trailer.

Check that no one is in the unloading area

The hydraulically lowered and raised tailgate facilitates loading and unloading of transported materials. The tailgate is lifted and lowered by means of two cylinders (1) with hydraulic locks (2) installed, the task of which is to block the automatic lowering of the tailgate in case of unsealing of the hydraulic system.

BIZ.3.8-007.01.EN

## 4.9 HYDRAULIC SYSTEM OF DRAWBAR

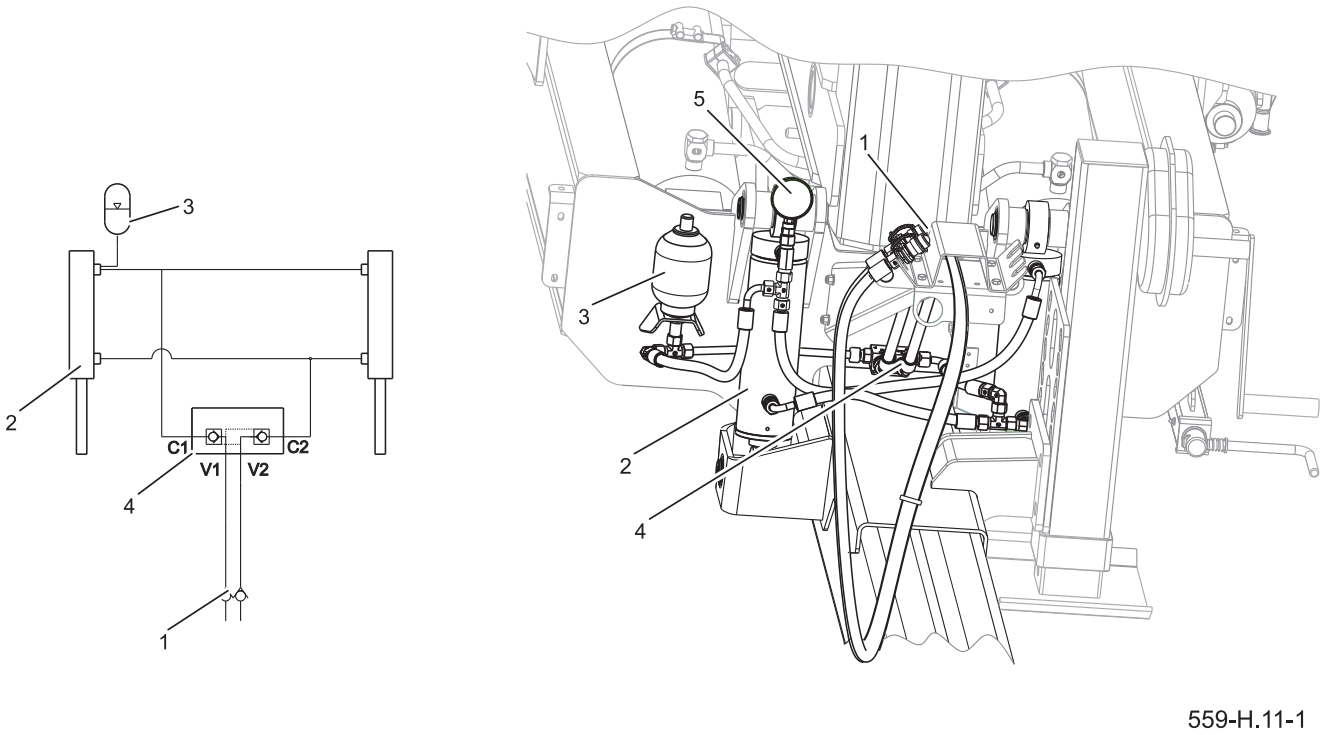



**Figure 4.11** Construction and diagram of the hydraulic system of the drawbar
*(1) quick coupler - plug, (2) hydraulic cylinder, (3) hydraulic accumulator, (4) Hydraulic lock, (5) pressure gauge*

**ADVICE**

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

The trailer is equipped with a hydraulically sprung drawbar with smooth height adjustment for connecting to the tractor hitch.

The drawbar system is supplied from the tractor's external hydraulic system through hydraulic conduits connected to the sockets of one section of the tractor by means of quick couplers (1).

Raising or lowering of the drawbar is used to level the trailer and is done by sliding in or out the piston rods of the hydraulic cylinders (2). The system uses a hydraulic accumulator (3) set to a pressure of 50 bar, whose task is to absorb

vibrations transmitted to the tractor.

The system was secured with a hydraulic lock.

In the event of damage to the system conduits (abrasion, unsealing), the lock locks the actuator in a fixed, unchanging position. The use of a hydraulic lock allows to connect the supply lines without using a shut-off valve.

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## 4.10 ELECTRICAL LIGHTING INSTALLATION

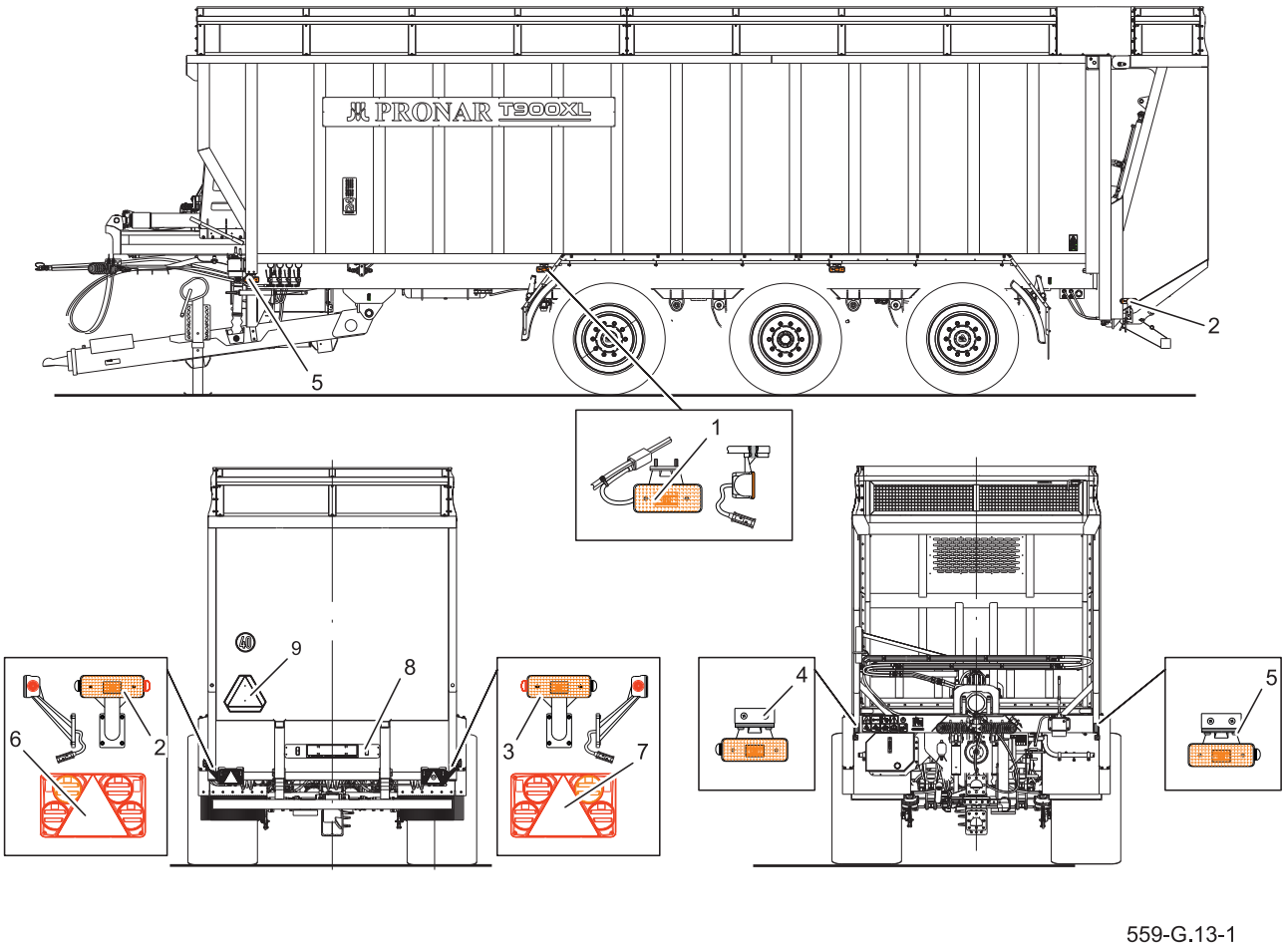


**Figure 4.12** Arrangement of elements of electrical installation

*(1) side marker lamp*
*(2) rear left marker lamp*
*(3) rear right marker lamp*
*(4) front left clearance lamp*
*(5) front right clearance lamp*
*(6) rear left combination lamp*
*(7) rear right combination lamp*
*(8) license plate lamp*
*(9) rear reflective triangle*

**CAUTION**

Before driving, check the operation and completeness of the electrical system.

Driving with faulty lighting installation is forbidden.

The electrical lightning installation of the trailer is adapted to be supplied from a DC source with a voltage of 12V.

Connect the electrical system of the machine with the tractor using the connection cable (1) attached to the trailer.

*PP- front right position lamp PL- front left position lamp*
*ZP - rear right combination lamp*
*ZL - rear left combination lamp*
*OT- Plate illumination lamp*
*TOP - front-rear marker lamp and right side position lamp*
*TOL - front-rear marker lamp and left side position lamp*
*OBP- Right marker lamp*
*OBL- Left marker lamp*
*GP- Front 7-pin socket*
*GT- Rear 7-pin socket*
*W - 7-pin socket plug*

*b - white*
*c - black*
*f - violet*
*k - black*
*l - lapis lazuli*
*n - blue*
*o - brown*
*p - orange*
*r - pink*
*s - gray*
*t - green*
*z - yellow*

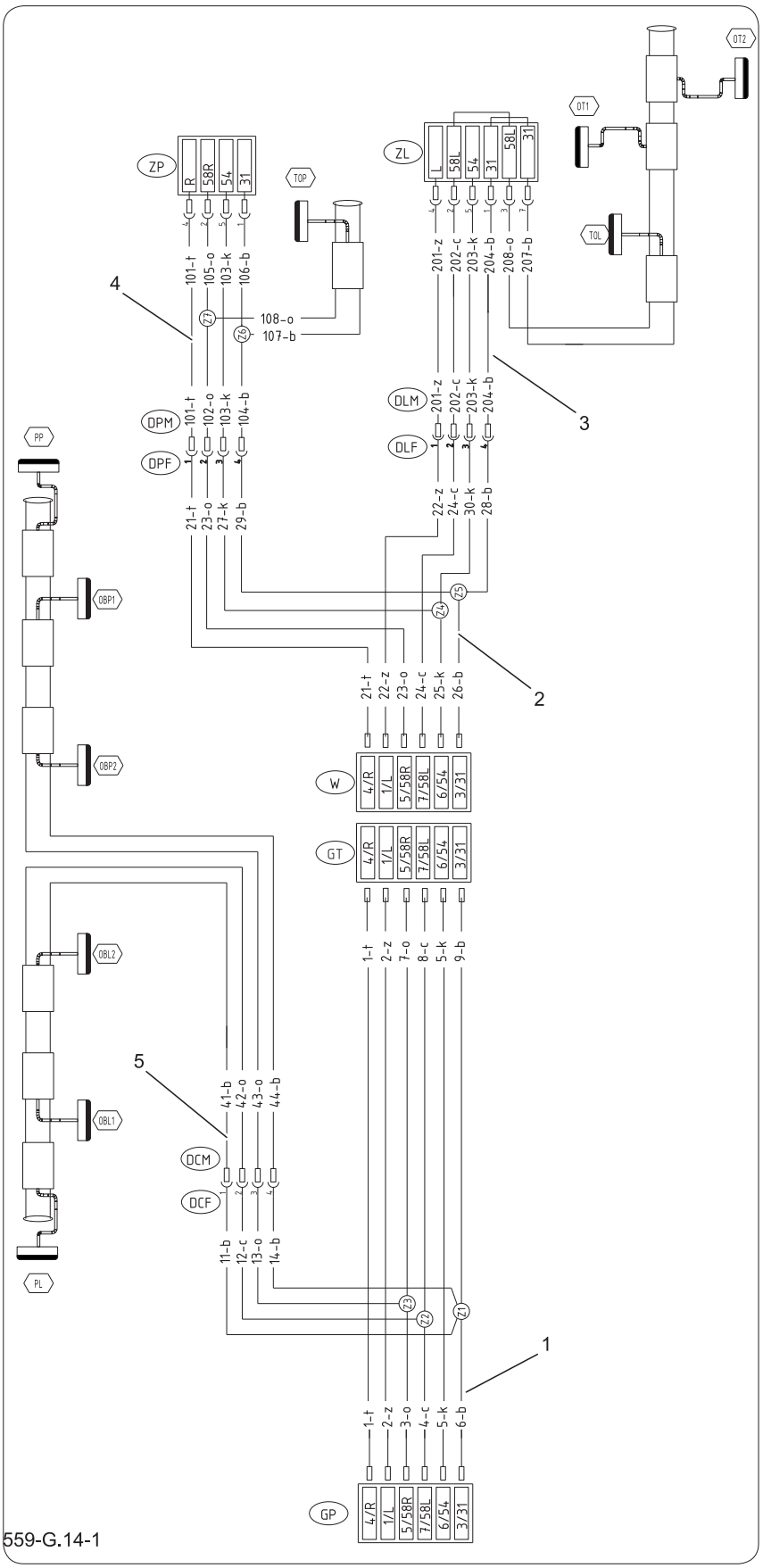


**Figure 4.13** Diagram of the electrical system
*(1) central harness* *(2) connecting harness*
*(3) rear left harness* *(4) rear right harness*
*(5) front harness*

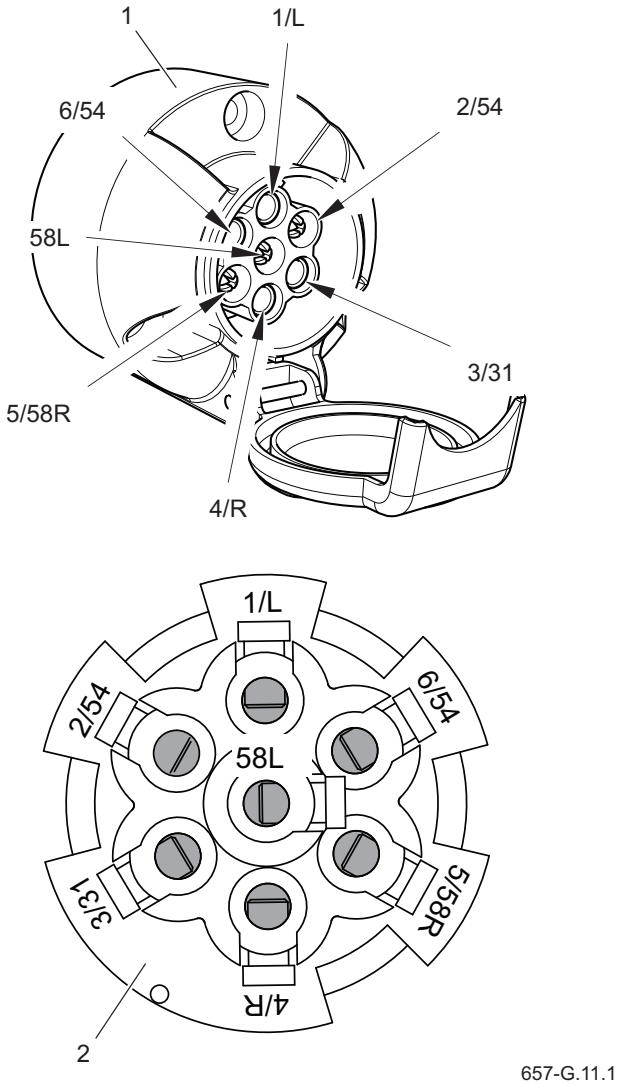


**Figure 4.14** 7 pin socket
*(1) socket (2) view from the beam side*

**Table 4.4.** Connection markings for the connection socket

| Marking | Function (wire colour) |
|---|---|
| 1/L | Left indicator (yellow) |
| 2/54 is cancelled | Not used |
| 3/31 is cancelled | Ground (white) |
| 4/R | Left indicator (yellow) |
| 5/58R | Rear right position light (brown) |
| 6/54 is cancelled | STOP light (red) |
| 58L | Left rear position lamp (black) |

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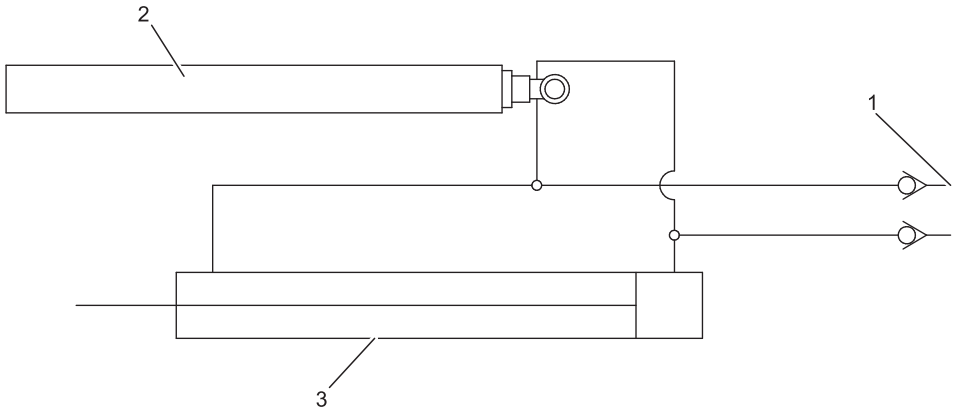
## 4.11 HYDRAULIC PUSH WALL INSTALLATION




559-G.08-1

**Figure 4.15** Scheme of the hydraulic system with the oil tank
*(1) hydraulic plug* *(2) telescopic cylinder* *(3) actuator*

**ADVICE**

The hydraulic system has been filled with L-HL32 Lotos hydraulic oil. Installation capacity about 55 litres.

The unloading of the trailer is carried out by means of a push wall. The movement of the wall is carried out by a hydraulic system consisting of a telescopic cylinder (2) and an actuator (3). These cylinders are positioned horizontally and move the wall back along the load box. The installation is connected to the tractor by means of hydraulic couplings (1). The mechanism installation is supplied with oil from the tractor's external hydraulic system.

BIZ.3.8-010.01.EN

## 4.12 FOLDING HYDRAULIC SUPPORT

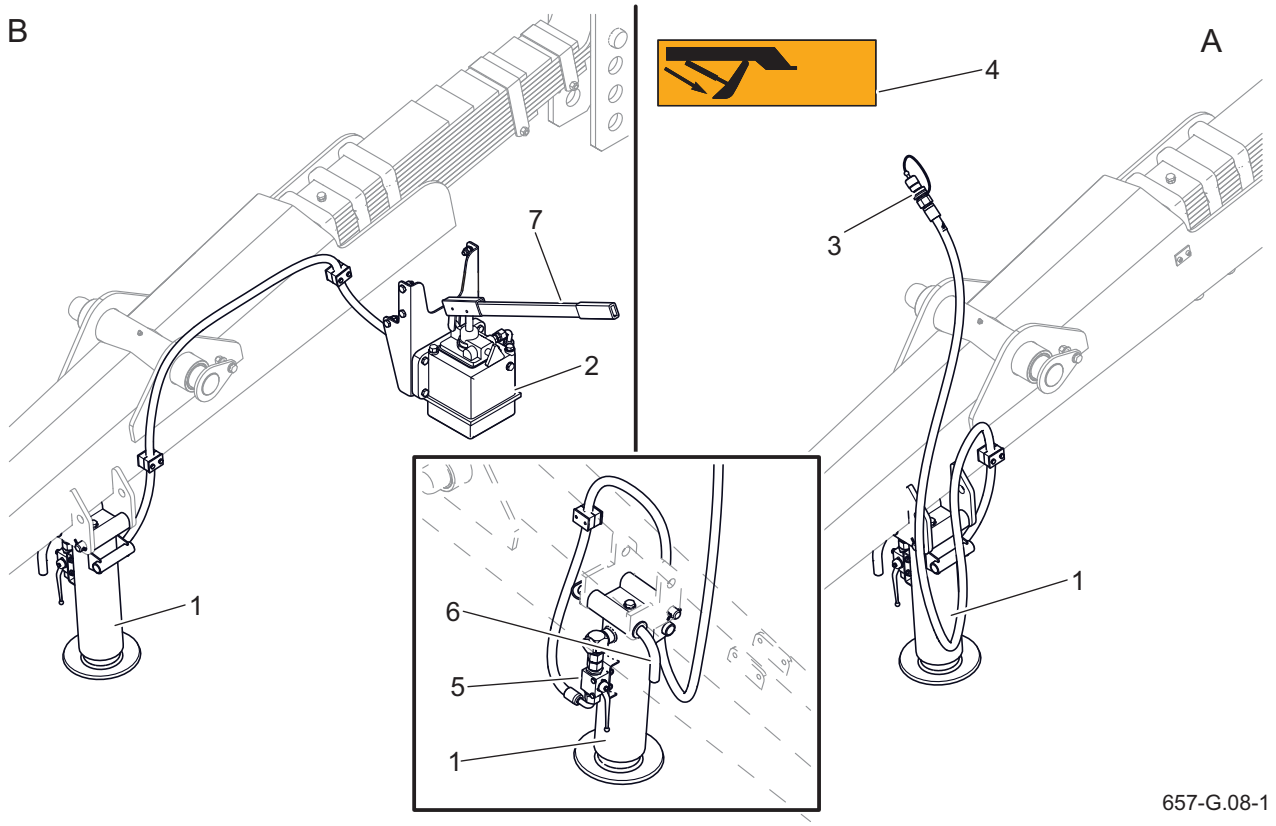



**Figure 4.16** Construction of the hydraulic system of the support
*(1) hydraulic support* *(2) hydraulic hand pump* *(3) plug*
*(4) information sticker* *(5) hydraulic valve* *(6) pin*
*(7) lever*

**ADVICE**

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

**CAUTION**

Before driving, make sure that the support is raised and folded to the transport position.

When parked, secure the machine with the parking brake, support wedges and hydraulic jack. When aggregating the machine, set the drawbar eye at the appropriate height using the support. Before driving, raise and fold the support to the transport position.
Depending on the equipment, the trailer is equipped with a support powered by the tractor's external hydraulics (A) or a support with its own hydraulic pump (B).

BIZ.3.8-011.01.EN

CHAPTER 5

# RULES OF USE

PRONAR T900XL

## 5.1 DRAWBAR HEIGHT ADJUSTING

The position of the drawbar should be selected individually depending on the size of tires of the trailer, and depending on the height of the hitch on the tractor with which the machine is to be aggregated. The height should be set so that, after connecting to the tractor, the trailer is levelled, which ensures even weight distribution of the machine on the axles.
After connecting the trailer to the tractor, connect the

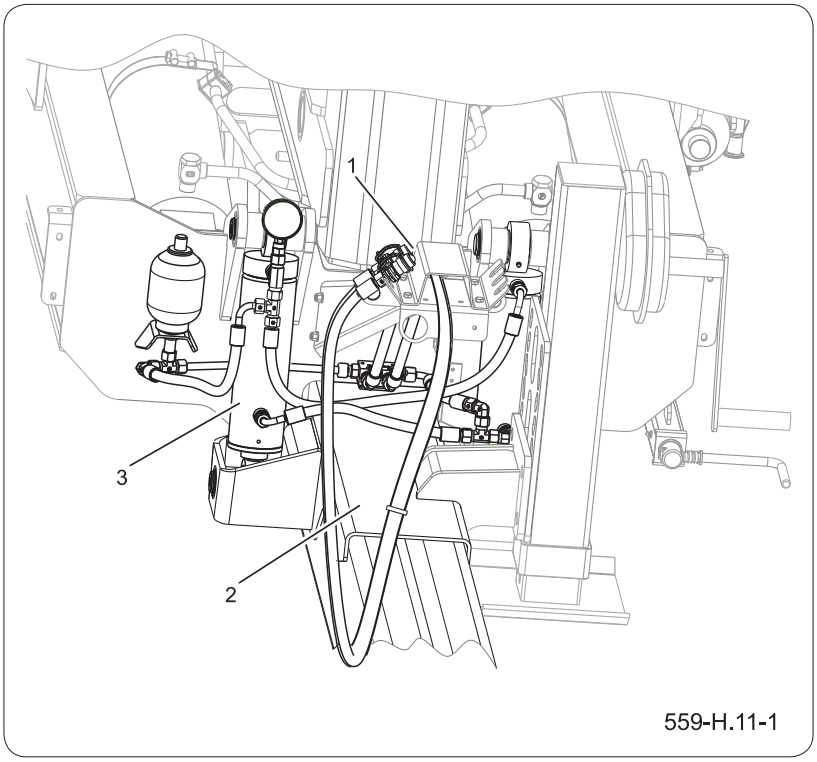



**Figure 5.1** Drawbar height adjusting
*(1) hydraulic quick couplers (2) drawbar*
*(3) cylinder*

quick-hydraulic couplers (1) of the drawbar hydraulic system to one section of the hydraulic manifold in the tractor. If it is necessary to adjust the drawbar position, use the manifold lever in the tractor to set the position of the hydraulic cylinders (3) so that the trailer is level.

Check that the piston rods of the drawbar suspension cylinders are able to work at a minimum height of 30 - 50 mm.
Keeping this distance ensures that the drawbar cushioning works correctly. It is forbidden to drive when the piston rods of the cylinders are maximally retracted (drawbar eye in the maximum upper position), drawbar shock absorption will not be possible.

OBS.3.8-001.01.EN

## 5.2 OPERATION OF THE BROKEN HYDRAULIC SUPPORT

**DANGER**

Take special care when operating the support - it also applies to bystanders or assistants.
Be especially careful when rotating the support. Do not put your hands between the support mounting socket and the support. Danger of cutting or crushing.

**Placing the support in driving position**

- Immobilize the tractor and trailer with parking brake.

  ***The machine must be connected to the tractor. Connect the hydraulic hose (6) to the hydraulic socket on the tractor.***

- Open the valve (5) by moving the handle along the valve body to the open position.
- By operating the distributor in the tractor, raise the support foot.
- Lock the support position by moving the handle

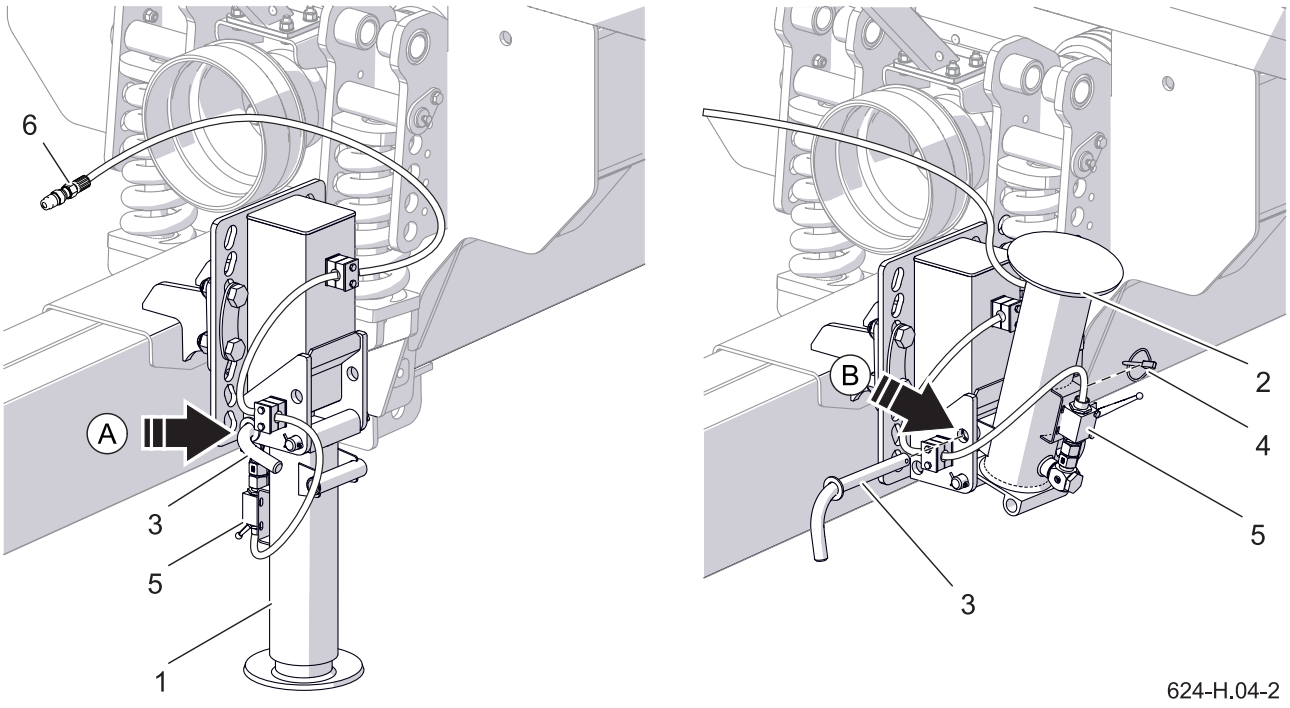



**Figure 5.2** Operation of the hydraulic support
*(1) support in parking position (2) support in driving position (3) safety pin*
*(4) pin cotter pin (5) shut-off valve (6) hydraulic hose*
*(A), (B) safety pin position*

perpendicular to the valve body (5) in the closed position.

- Release the cotter pin (4) and remove the locking pin (3) from the hole in position (A).
- Turn the support foot to position (2).

**CAUTION**

You cannot move the set (tractor and trailer) with the support raised only with the use of the cylinder. The support must be moved to the driving position.

It is forbidden to pass the set if the elements of the support protection - pin (3) and cotter pin (4) are damaged or lost.

- Place it with the cotter pin (4).
- Release the parking brake of the trailer before driving.

**Positioning of the support to parking position**

- Immobilize the tractor and trailer with parking brake.
- Release the cotter pin (4) and pull the safety pin out of position (B) - figure (4.4).
- Turn support to position (1).
- Move the pin to position (A) and secure with a cotter pin (4).
- Set the shut-off valve (5) to the open position.
- By operating the distributor in the tractor, lower the the support foot.
- The drawbar hitching eye should be slightly raised in relation to the hitch on the tractor, which will facilitate later connection of the manure spreader.
- When the height of the drawbar eye is set, set the tractor manifold lever in the "neutral" position.
- Lock the support position by moving the valve lever (5) to the closed position.

OBS.3.8-002.01.EN

## 5.3 MECHANICAL SUPPORT

**DANGER**

Be careful as there is a risk of crushing your feet

Determining the correct height of the drawbar eye in relation to the tractor hitch is obtained using the support with mechanical transmission - figure (4.1).

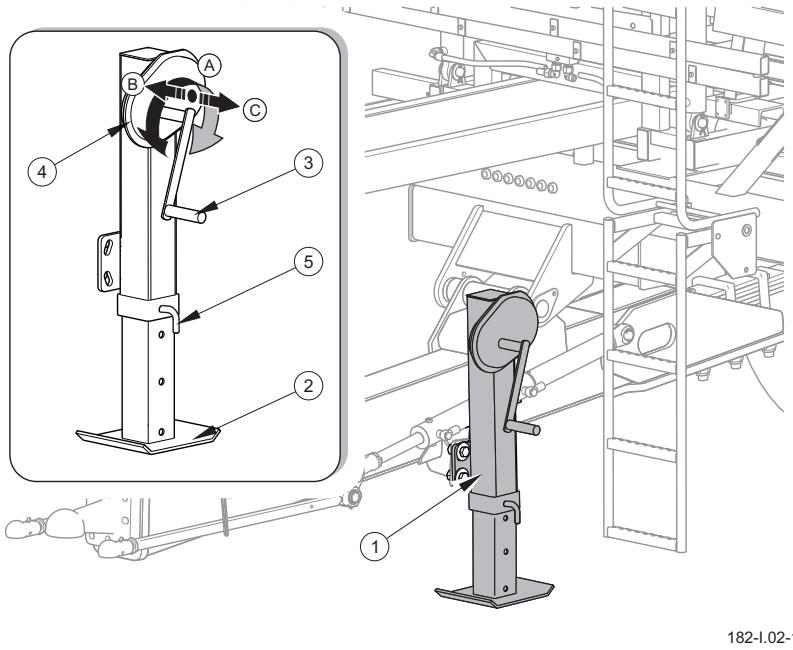



**Figure 5.3** Drawbar height setting
*(1) support, (2) support foot,*
*(3) crank, (4) gear,*
*(5) locking pin,*
*(A) neutral position,*
*(B) position - 1st gear (speed under load),*
*(C) position - 2nd gear (high speed)*

Position (C) is used to quickly lower and raise the support foot in order to compensate for the gap between the support foot and the ground. Position (B) is used to lower and raise the drawbar of an unloaded machine. In position (B), the support foot (2) extends more slowly and you do not need to apply much force to raise the machine's drawbar.

**Raising the support**

- Remove the locking pin (5).
- Move the crank (3) of the support from neutral (A) to position (B).

- Turn the crank in the appropriate direction to raise the support foot (2) maximally.
- Install the locking pin.
- Set the crank to neutral position (A).

**Lowering the support**

Remove the securing bolt.

Set the crank (3) to position (B) or (C).

By turning the crank in the right direction, lower the support to the ground, or adjust the height of the tendon in relation to the hitch (if the trailer is to be connected to the tractor).

OBS.3.8-003.01.EN

## 5.4 AXLE STEERING ADJUSTMENT

**DANGER**

Be careful as there is a risk of crushing your feet

**CAUTION**

Driving with an incorrectly adjusted steering system is prohibited.

For correct operation of the hydraulic steering system and safe use of the trailer, use appropriate approved tractor hitches according to ISO 26402: 2008.
When hitching the trailer to a tractor for the first time,

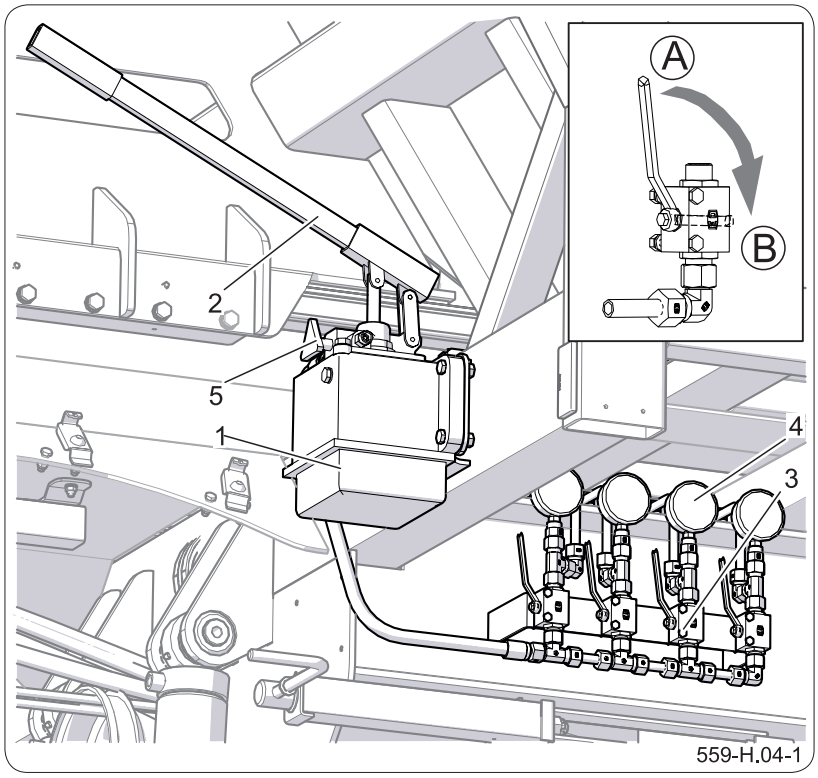



**Figure 5.4** Setting of the axle steering system
*(1) oil tank, (2) pump lever,*
*(3) hydraulic valve, (4) pressure gauge,*
*(5) pump valve knob*
*(A) open position, (B) closed position*

check the correct operation of the steering system. If you find that the system is not working properly, do the following:

- Connect the tractor to the trailer by means of a drawbar and a steering ball hitch and secure the drawbars,
- open all system valves (3) located at the hand pump - figure "Setting the axle steering system",
- Use the knob (5) on the pump to reduce the pressure so that the gauges indicate "0"
- drive the tractor with a hitched trailer to such

a distance that the wheels of the trailer are set to drive straight ahead,

- close the valve (5) on the pump,
- fill the installation with a pump using the hand lever (2) until the pressure on each pressure gauge (4) reaches 80 bar,
- do not add oil after generating the pressure,
- close all valves (3) and put down the pump lever (2),
- drive the tractor with the trailer attached and check the system operation.

OBS.3.8-004.01.EN

## 5.5 CONNECTING AND DISCONNECTING OF THE TRAILER

### 5.5.1 Connecting of the trailer

**CAUTION**

After connecting the trailer, perform a daily inspection of the machine before driving.

The external examination of the machine without connecting it to the tractor will not allow verification of its technical condition.

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

**Preparation**

- Make sure that the trailer is immobilized with the pneumatic parking brake - see the table "*Loosening-parking valve operation modes*".

  ***If there is a mechanical hand brake, turn the brake mechanism clockwise to the stop - figure (5.5).***
- Make sure that blocking chocks are placed under the trailer wheel - figure (5.6).
- Position the agricultural tractor directly in front of the drawbar eye.

**Drawbar height adjusting**

- If the trailer is equipped with a hydraulic support, first connect the hydraulic conduit of the system marked with a decal (1) - figure (5.7). Then follow

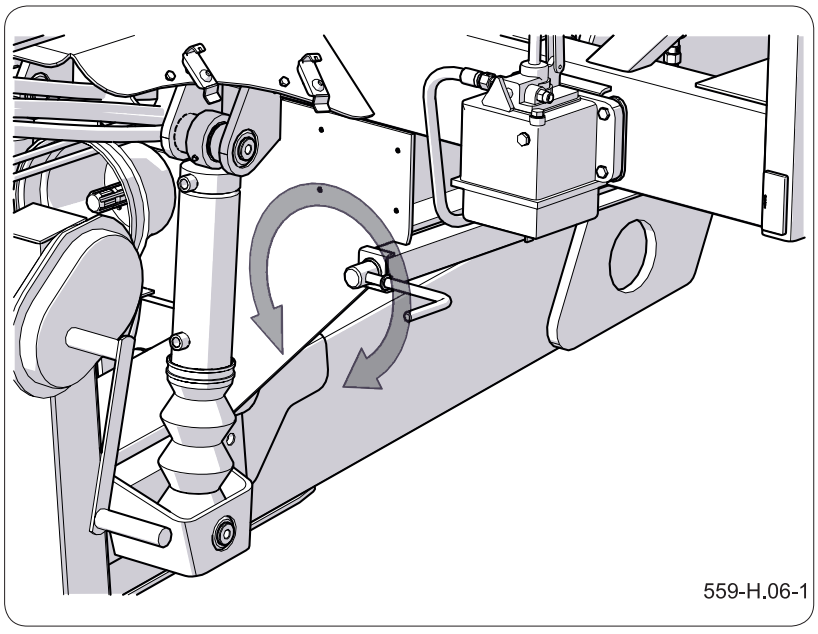



**Figure 5.5** Mechanical parking brake

**DANGER**

During hitching, there must be no by-standers between the trailer and the tractor. The agricultural tractor operator when connecting the machine should take particular care and be sure that unauthorized persons are not in the danger zone during coupling.

Be especially careful when coupling the trailer.

Ensure good visibility during coupling.

After completing the coupling check the safety of the pin hitch.

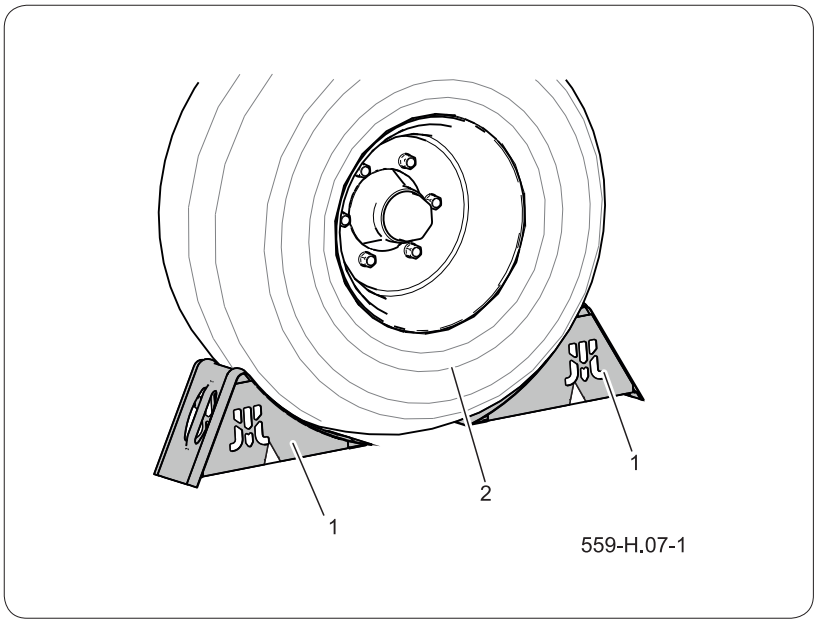



**Figure 5.6** Locking wedges
*(1) locking wedges (2) wheel*

the chapter on *Hydraulic support*.

***If the trailer is equipped with a parking stand with mechanical transmission, the adjustment is made with the support gear - see "Mechanical support".***

**Connecting the trailer to the tractor hitch**

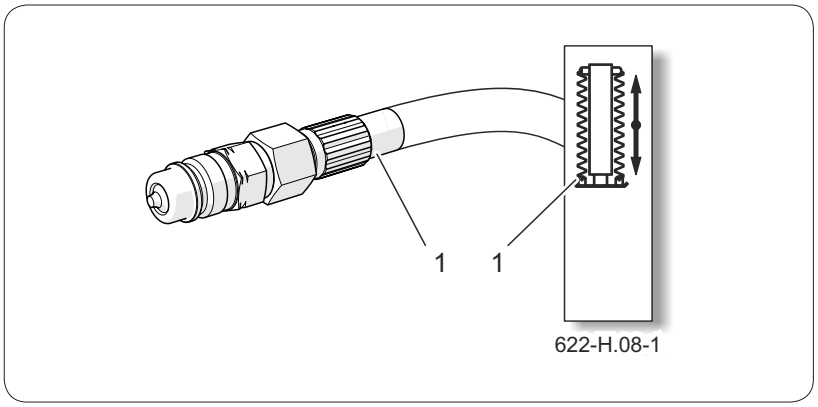



**Figure 5.7** Hydraulic support connection
*(1) Information sticker*

- Reverse the tractor and connect the trailer to the appropriate hitch.
- Check the coupling lock protecting the machine against accidental disconnection.
- If an automatic coupling is used in the tractor,

make sure that the aggregation operation is completed and the drawbar eye is secured.

- Set the parking stand to the transport position.
- Turn off the tractor engine and remove the ignition key. Secure tractor with parking brake. Close the tractor cabin and secure it against unauthorized access.

**Connecting of the braking system**

- Depending on the trailer configuration, connect the braking system connectors to the appropriate tractor sockets.

**CAUTION**

When connecting pneumatic conduits of a two-conduit system, connect the yellow conduit first, and then the red conduit.

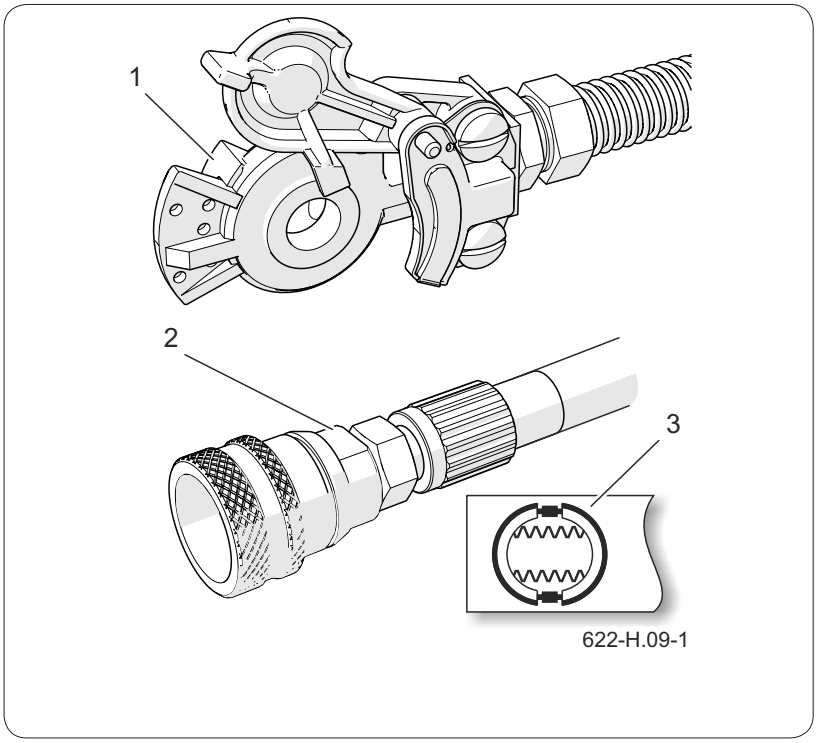
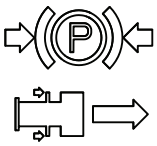
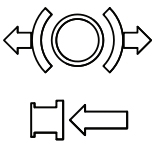
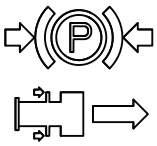
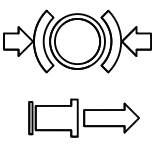
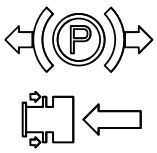
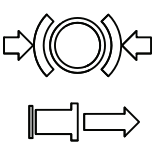
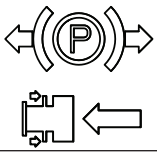
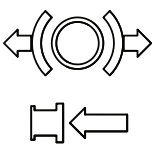



**Figure 5.8** Connections of the braking system
*(1) pneumatic plug (red, yellow)*
*(2) hydraulic plug, (3) sticker*

- Connect the pneumatic system lines.

  ***The first is to connect the yellow plug to the yellow socket on the tractor, and then to the red plug to the red socket on the tractor. After connecting the second conduit, the brake release system will switch to normal operation mode (disconnection or interruption***

**Table 5.1.** Modes of operation of the loosening-parking valve

| Option | Button Red | Button Black | Description |
|---|---|---|---|
| **A** | NOT PRESSED  | PRESSED  | The machine is braked with the parking brake. When the red button is pulled out, the trailer is immobilized with the parking brake, regardless of the position of the black button. |
| **B** | NOT PRESSED  | NOT PRESSED  | |
| **C** | PRESSED  | NOT PRESSED  | The machine is ready to drive. Pneumatic hoses connected to the trailer. It is not possible to press the black button.<br><br>The machine is braked. Pneumatic hoses are not connected. Pressing the black button will release the brake. |
| **D** | PRESSED  | PRESSED  | Parking brake released, maneuvering position The trailer is completely unbraked. Pneumatic hoses are not connected. |

***of the air conduits causes the trailer control valve to automatically move to the machine braking position).***

- If the brakes do not react after connecting the pneumatic hoses, this may indicate a low pressure in the tank. For the system to work, it must be filled with the correct pressure.
- Connect the the hydraulic brake system hose (applies to trailer version with hydraulic brake system).

**CAUTION**

After completing the coupling, secure the hydraulic, braking and electrical wiring in such 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.

**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.

### Connecting of the hydraulic system

Depending on the trailer configuration, connect the braking system connectors to the appropriate tractor sockets.

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

- The hydraulic brake system hose is marked with an information sticker (3) - figure "*Braking system connections*".

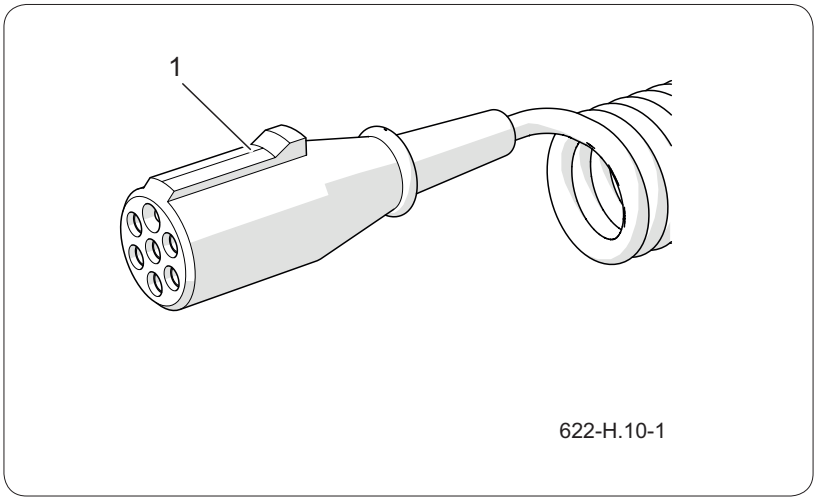



**Figure 5.9** Connection of electrical installation
*(1) 7 poles wire*

### Connecting the lighting electrical installation

- Connect the the main cable (1) supplying the lighting electrical installation (7-pin).
- If the tractor does not have such sockets or the sockets are of a different type then assembly should be carried out by a qualified person in accordance with the recommendations of the tractor manufacturer.

### Additional information

- After completing the connection of cables make sure that they will not get entangled in moving parts of the tractor or trailer during operation. Secure cables if necessary.
- Perform daily inspection of the trailer.
- If the trailer is functional, you can start working.

**DANGER**

The use of defective trailers is forbidden.

- Immediately before driving, remove the chocks from the wheel and release the parking brake of the machine - see the table "*Operation modes of the loosening-parking valve*".

  ***In the event of a mechanical handbrake, turn the crank of the brake mechanism counter-clockwise as far as it will go.***

### 5.5.2 Disconnecting the trailer

**DANGER**

Never disconnect a loaded trailer from the tractor!

**DANGER**

When disconnecting the trailer from the tractor, take particular care.

Ensure good visibility. Unless it is necessary, do not stay between the trailer and the tractor.

Before disconnecting wires and drawbar close tractor cab and secure it against unauthorized access. Turn off the tractor engine.

**CAUTION**

When disconnecting pneumatic conduits of a double conduit system, disconnect the conduit marked red first, and only then the conduit marked yellow.

- Place the trailer on a hard and flat surface.
- The tractor and trailer must be in a straight line. The tractor must not be turned in relation to the trailer axis because it will make it very difficult to aggregate the trailer.
- Lower the support to parking position.
- Turn off the tractor engine and remove the ignition key.
- Secure the tractor with the parking brake.
- Block the trailer with the mechanical parking brake (if present).
- Place blocking wedges under one wheel of the trailer, one in the rear and the other in front of the wheel.
- Disconnect all cables in turn. The parking valve of the trailer braking system automatically switches to the "braked" position. Secure the ends of the hydraulic hoses by fitting the rubber caps on the hydraulic connectors.
- Place the hoses on the wire bracket.
- Release the drawbar eye, start the tractor and drive away with the tractor.

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## 5.6 LOADING

**DANGER**

You cannot transport people or animals on the T900XL trailer.

**CAUTION**

It is forbidden to exceed the permissible load capacity of the trailer because it threatens road safety and may cause damage to the machine.

**CAUTION**

The load on the trailer must be evenly distributed and must not hinder driving. Farm work should be carried out by authorization person experienced in this type of work.

**CAUTION**

When loading silage or grain, while driving, keep a constant distance between the machines, adjust the travel speed to the speed of the combine.

**DANGER**

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

You can load the box only when the trailer is hitched to the tractor and positioned on level ground. Try to evenly distribute the load in the cargo box. This will ensure proper stability of the trailer while driving, correct axle loads and drawbar eye. When loading, use a loader or a conveyor. When loading silage directly from a self-propelled forage harvester or a combine harvester, you have the option of compacting it by pressing with a sliding wall, so you can transport much more goods at once.

When compacting the load, move the sliding wall very slowly so as not to put too much pressure on the tailgate.

Before starting loading, check that the tailgate and the chute slide gate are closed. Check if there are any items in the cargo box.

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

(abrasion of the paint coating, corrosion, etc.).

Avoid throwing loads from great heights that could damage the trailer. The use of loads other than those intended by the Manufacturer is prohibited.

Due different density of materials, the use of the total capacity of the load box may exceed the allowable capacity of the trailer.

**Loose materials**

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

**DANGER**

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

***ADVICE***

Damage to the paint coating inside the load box is a normal situation and is not subject to complaint.

**DANGER**

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

**DANGER**

Familiarize yourself with the contents of the manufacturer's information leaflets, adhere to the transport and handling instructions.

Make sure that additional personal protective equipment (masks, rubber gloves, etc.) is necessary during loading work.

**DANGER**

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

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

**Piece or lump loads**

Piece or lump loads are usually hard materials of much larger sizes than loose loads (stones, coal, bricks, aggregate). Load these materials from a low height. The load cannot fall with great force on the floor of the cargo box despite its protection.

**Dangerous goods**

Pursuant to the European ADR agreement regarding the international carriage of dangerous goods by road, this type of cargo (specified in detail in this agreement) is prohibited using agricultural trailers. The only exceptions are plant protection products and artificial fertilizers that can be transported with an agricultural trailer, provided that they are transported in appropriate packaging and in the quantities provided for in the ADR agreement.

**Loads in packaging**

Loads transported in packages (boxes, sacks) should be placed tightly next to each other starting from the front wall. If it is necessary to lay several layers, individual batches should be applied alternately (in a block system). The load must be laid tightly and over the entire surface of the trailer floor. Otherwise, the load will shift during the journey. Due to the construction of the trailer (adapting the cargo box to transport crops and agricultural products, no load fastening points), packed materials can be placed only below the contour of the walls or extensions of the cargo box.

Materials that can cause steel corrosion, chemical damage or react in a different way by adversely affecting the construction materials of the trailer may be transported only if the load is properly prepared. Materials must be tightly packed (in plastic bags, plastic containers, etc.).

**DANGER**

There must be no bystanders in the unloading / loading area. Before tipping the cargo box make sure that it is visible and make sure there are no bystanders nearby.

During transport, the contents of the packages must not get into the cargo box, so ensure that the containers are properly sealed.

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. Dear User, you are obliged to read the regulations regarding road transport and comply with their recommendations.

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## 5.7 WEIGHT OF THE TRANSPORTED MATERIALS

**DANGER**

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

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

Approximate specific weight of selected materials is presented in Table below. Therefore, pay special attention not to overload the trailer.

**Table 5.2.** Approximate volumetric weights of selected loads

| Type of material | Weight [kg/m$^3$] |
|---|---|
| **Root Crops:** | |
| raw potatoes | 700 – 820 |
| steamed mashed potatoes | 850 – 950 |
| dried potatoes | 130 – 150 |
| sugar beets - roots | 560 – 720 |
| fodder beets - roots | 500 – 700 |
| **Mineral fertilizers:** | |
| ammonium sulphate | 800 – 850 |
| potassium salt | 1,100 – 1,200 |
| super phosphate | 850 – 1,440 |
| basic slag | 2,000 – 2,300 |
| potassium sulphate | 1,200 – 1,300 |
| ground lime fertilizer | 1,250 – 1,300 |
| **Concentrated feed and compound feed:** | |
| stored chaff | 200 – 225 |
| oil cake | 880 – 1,000 |
| dried mince | 170 – 185 |
| compound feed | 450 – 650 |
| mineral mixtures | 1,100 – 1,300 |
| oat middlings | 380 – 410 |
| wet beet pulp | 830 – 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 |
| silage (underground silo) | 650 – 1,050 |

| Type of material | Weight [kg/m$^3$] |
|---|---|
| silage (tower silo) | 550 – 750 |
| **Seeds:** | |
| 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 |
| **Plant litter and roughage:** | |
| dry meadow hay on the swath | 10 - 18 |
| hay wilted on the swath | 15 - 25 |
| hay in a collecting trailer (dry) | 50 - 80 |
| hay wilted, cut | 60 - 70 |
| dry pressed hay | 120 - 150 |
| wilted pressed hay | 200 - 290 |
| dry stored hay | 50 - 90 |
| cut stored hay | 90 - 150 |
| clover (alfalfa) wilted on the swath | 20 - 25 |
| clover (alfalfa) withered cut on a trailer | 110 - 160 |
| clover (alfalfa) wilted on a collecting trailer | 60 - 100 |
| dry stored clover | 40 - 60 |
| dry chopped stored clover | 80 - 140 |
| dry straw in rollers | 8 - 15 |
| wet straw in rollers | 15 - 20 |
| wet straw cut on a volume trailer | 50 - 80 |
| Dry straw cut on a volume trailer | 20 - 40 |
| dry straw cut on a collecting trailer | 50 - 90 |
| dry straw cut in a haystack | 40 - 100 |
| pressed straw (low compaction) | 80 - 90 |
| pressed straw (high compaction) | 110 - 150 |
| cereal mass cut on a volume trailer | 35 - 75 |
| cereal mass cut on a collecting trailer | 60 - 100 |

| Type of material | Weight [kg/m$^3$] |
|---|---|
| forage | 28 - 35 |
| forage cut on a volume trailer | 150 - 400 |
| forage on a collecting trailer | 120 - 270 |
| fresh beet leaves | 140 - 160 |
| fresh cut beet leaves | 350 - 400 |
| beet leaves on a harvesting trailer | 180 - 250 |
| **Other:** | |
| dry soil | 1,300 – 1,400 |
| wet soil | 1,900 – 2,100 |
| fresh peat | 700 – 850 |
| compost soil | 250 – 350 |

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

OBS.3.8-005.01.EN

## 5.8 STORAGE

After finishing work, carefully clean and wash the machine.

In the event of damage to the paint coating, damaged areas must be cleaned of rust and dust, degreased, and then painted with paint while maintaining a uniform colour and uniform thickness of the protective coating. Until painting, damaged areas shall be covered with a thin layer of grease, anti-corrosive agent or primer.

It is recommended that the machine be stored indoors or under a roof.

For long-term storage outside the room, it must be protected against the effects of weather conditions, especially factors causing corrosion of steel and accelerating the aging of tires.

In the event of a longer stop, it is necessary to lubricate all points regardless of the period of the last treatment.

Wash and dry the rims and tires. During longer storage, 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.

Store the articulated telescopic shaft for connecting to the tractor in a horizontal position.

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## 5.9 UNLOADING

**DANGER**

The trailer must not be unloaded on unstable ground.

During unloading, nobody may stay in the vicinity of the falling load.

Be especially careful when closing the tailgate as injuries can seriously damage your health.

The load box of the T900XL trailer is unloaded using the front sliding wall mechanism. The hydraulic mechanism of the sliding wall is used for automatic unloading by pushing the load in the load box to the rear. This solution ensures unloading of the transported materials in difficult weather conditions or premises, e.g. in low buildings, on large slopes, or in strong winds. Unloading of the trailer should be carried out in the following steps while adhering to the following sequence:

- Set the tractor and trailer to drive straight ahead on flat, stable and hard ground,
- Immobilize the tractor and trailer with parking brake,
- Open the rear tailgate of the trailer by shifting the hydraulic manifold lever in the tractor,
- Move the front wall backwards. Activate the shift mechanism with the appropriate lever of hydraulic manifold in the tractor. The slide is carried out in such a way that the bottom and front wall moves, and then only the front wall moves,
- After unloading, with the use of the manifold lever in the tractor, return the walls to the initial position,
- Close the tailgate by controlling the appropriate hydraulic circuit from the tractor.

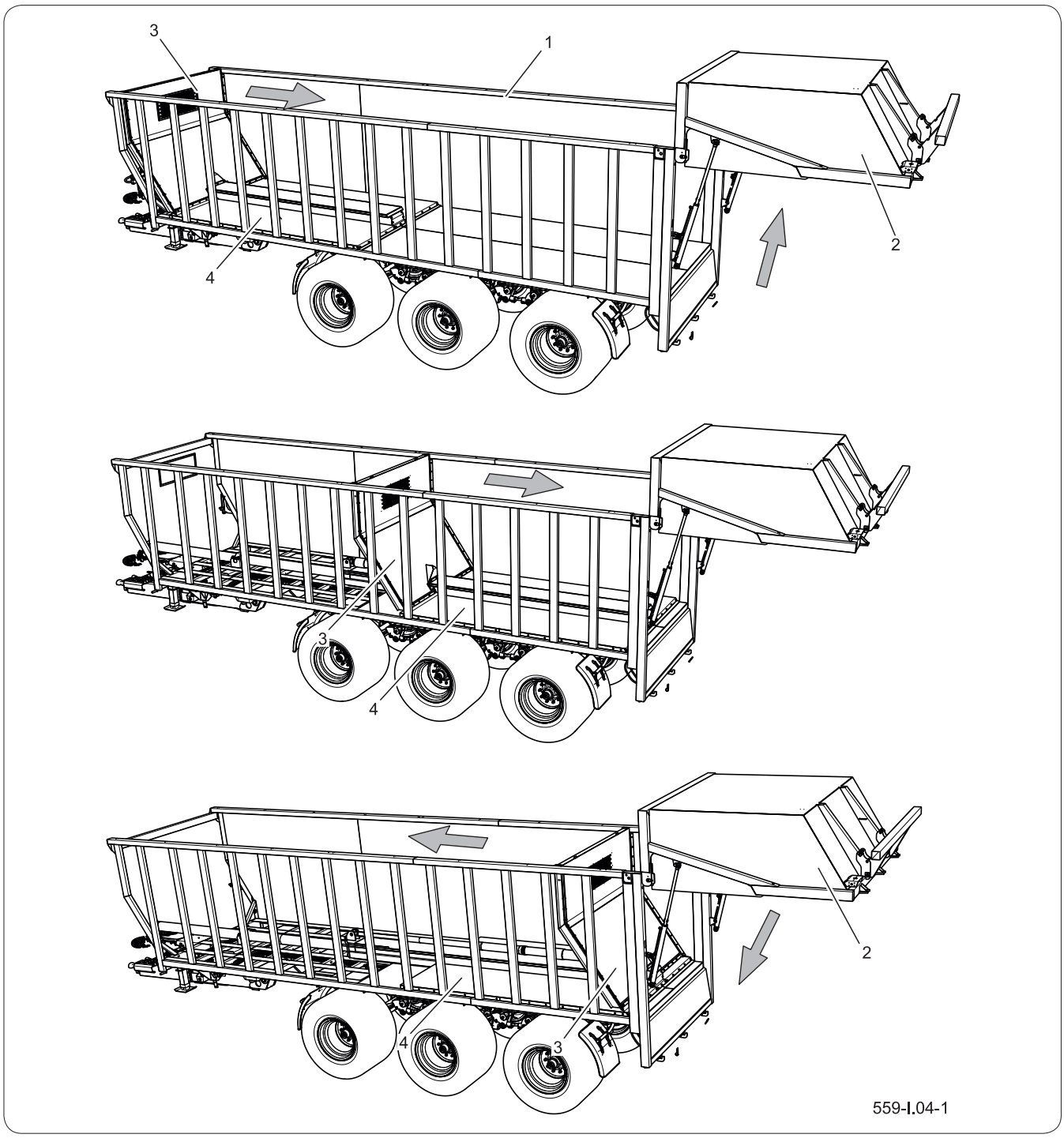


**Figure 5.10** Unloading of the load (cargo) box
*(1) load box, (2) tailgate (3) front wall*
*(4) bottom wall*

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## 5.10 USE OF TIRES

- When working with tires, the machine should be secured against rolling by placing chocks under the wheels. Wheels can be taken off the trailer only when the trailer is not loaded.
- Repair work on wheels or tires should be carried out by persons trained and authorized to do so. These works should be carried out using appropriately selected tools.
- Checking the tightening of the wheel nuts carry 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. Always repeat all operations if the wheel was disassembled. Wheel nuts should be tightened in accordance with the recommendations contained in the *Inspections and technical service*chapter.
- Regularly check and maintain proper tire pressure as recommended in the instructions (especially after a long break in the trailer use).
- Tire pressure should also be checked during all-day intensive work. Take into account that an increase in tire temperature can increase the pressure by up to 1 bar. With this increase in temperature and pressure, reduce the load or speed of the trailer.
- Never reduce the pressure by venting if it increases due to temperature.
- Valves must be secured with appropriate caps to avoid soiling.
- Do not exceed the maximum trailer speed.
- During the whole day cycle, take a minimum of one hour break at noon.

- Observe 30 minutes breaks for cooling the tires after driving 75 km or after 150 minutes of continuous driving, whichever comes first.
- Avoid damaged surfaces, sudden and variable manoeuvres, and high speeds when turning.

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## 5.11 CLEANING

**DANGER**

Refer to the instructions for using cleaning detergents and preservatives.

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

When cleaning the machine and staying on the cargo box, the tractor engine must be turned off, the articulated telescopic shaft must be disconnected.

Every day, after finishing, thoroughly clean the trailer of the remains of the transported material. If you use a pressure washer, learn about the principle of operation and recommendations for safe operation of this device.

**Guidelines for cleaning the trailer**

- Stop the tractor and trailer on a flat, even surface.
- Turn off the tractor engine and remove the ignition key.
- Secure the trailer and tractor with the parking brake, place wedges under the manure spreader wheel.
- Secure the tractor against unauthorized persons.
- Clean and wash the trailer with a strong stream of water and allow to dry in a dry and ventilated place.

***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 $55^0$C.***

***Paint damage may occur when washing with excessive pressure.***

Do not direct the water jet directly at the system components and trailer equipment, i.e. the control valve, brake cylinders, pneumatic, electric and hydraulic plugs, lights, electrical connectors, information and warning decals, data plate, conduit connections, lubrication points, etc. high water pressure may cause mechanical damage to these components.

- For cleaning and maintenance of plastic surfaces, use clean water or specialized preparations intended for this purpose.

**CAUTION**

Each time the work with trailer is finished, clean the trailer of the remains of the transported material.

After washing, wait for the machine to dry and then apply grease to all lubrication points as recommended. Wipe off excess grease or oil with a dry cloth.

During work, use appropriate, close-fitting protective clothing, gloves and the right tools.

- Do not use organic solvents, preparations of unknown origin or other substances that may damage the lacquered, rubber or plastic surface. Perform test on an invisible surface in case of doubt.
- Surfaces oily or greasy 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.
- Observe environmental protection principles, wash trailer in designated places.
- Washing and drying the trailer must take place at temperatures above $0\ ^{0}C$.

  ***In winter, frozen water can cause damage to the paint coat or machine components.***

OBS.3.8-011.01.EN

## 5.12 STORAGE

After finishing work, carefully clean and wash the machine.

In the event of damage to the paint coating, damaged areas must be cleaned of rust and dust, degreased, and then painted with paint while maintaining a uniform colour and uniform thickness of the protective coating. Until painting, damaged areas shall be covered with a thin layer of grease, anti-corrosive agent or primer.

It is recommended that the machine be stored indoors or under a roof.

For long-term storage outside the room, it must be protected against the effects of weather conditions, especially factors causing corrosion of steel and accelerating the aging of tires.

In the event of a longer stop, it is necessary to lubricate all points regardless of the period of the last treatment.

Wash and dry the rims and tires. During longer storage, 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.

Store the articulated telescopic shaft for connecting to the tractor in a horizontal position.

OBS.3.8-012.01.EN

CHAPTER 6

# PERIODIC INSPECTIONS AND TECHNICAL MAINTENANCE

PRONAR T900XL

## 6.1 GENERAL

**CAUTION**

It is forbidden to use a damaged machine.

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

When using the trailer, it is necessary to constantly check the technical condition and perform maintenance procedures that will allow the machine to be kept in good technical condition. Mandatory perform all maintenance and regulatory activities specified by the manufacturer in accordance with the assumed schedule.

Repair of the during the warranty period may only be carried out by Authorized Sales and Service Points (APSiO). The machine's warranty inspection is only carried out by authorized service centres.

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

Detailed information on the review schedule can be found in chapter entitled "*Maintenance and inspection schedule*".

After the warranty expires, it is recommended that inspections be carried out by specialized repair workshops.

During work, use protective clothing and protective equipment suitable for requirements.

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## 6.2 ENTERING AND STAYING IN HIGH-RISK AREAS

**CAUTION**

Depending on the type of work, use appropriate clothing and personal protective equipment.

During the normal operation of the trailer, it is often necessary to enter places (e.g. load box) where staying during the machine operation may cause serious injury or death to the operator. Situations that require entering and staying in such areas are:

- maintenance works,
- repair work,
- periodic and control inspections,
- removing of clogs, jamming mechanisms,
- cleaning of the trailer.

Persons who must perform the above-mentioned activities are strictly obliged to comply with the following requirements, the fulfillment of which is absolutely necessary due to the high risk of an accident, if they are ignored.

**DANGER**

Before entering high-risk places, the trailer should be hitched to the tractor, the tractor turned off, the key removed from the ignition switch, the tractor cabin closed.

- Before entering high-risk places, the trailer should be connected to the tractor and secured against unauthorized or accidental start-up.
- Secure the machine against rolling away.
- If necessary, use certified ladders and platforms.
- Before entering high-risk areas, take the key to start the tractor connected to the trailer with you and do not share it with anyone.
- Inform your co-workers about the planned work and the places where you will work.
- Never work alone. One additional person should stay outside the high risk zone.

Follow local labour laws.

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## 6.3 MAINTENANCE AND INSPECTION SCHEDULE

**Table 6.1.** Review categories

| Item | 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 | Service | Inspection carried out for a fee after the first 12 months of use of the trailer, after reporting the owner. |
| G | Maintenance | Service (1) | Inspection carried out every 4 years of trailer use |

*(1) - post-warranty service*

**Table 6.2.** Technical inspection schedule

| Description of activities | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| Checking of the air pressure in the wheels | • | | | | | | |
| Tank drainage | • | | | | | | |
| Checking of plugs and connection sockets | • | | | | | | |
| Checking of the trailer before driving off | • | | | | | | |
| Measurement of air pressure, check tires and wheels | | • | | | | | |
| Cleaning of the air filters | | | • | | | | |
| Checking of brake lining wear | | | | • | | | |
| Checking of the clearance of the axle bearings | | | | • | | | |
| Checking of mechanical brakes | | | | • | | | |
| Cleaning of the drainage valve | | | | • | | | |
| Checking of parking brake cable tension | | | | | • | | |
| Hydraulic system inspection | | | | | • | | |
| Control of pneumatic system | | | | | • | | |
| Lubrication | See table: *Trailer lubrication schedule* | | | | | | |
| Screw connections inspection | See table: *Tightening schedule for important bolted connections* and *Tridem Suspension Control* | | | | | | |
| Replacement of hydraulic hoses | | | | | | | • |

**Table 6.3.** Control parameters and settings

| Description | Value | Notes |
|---|---|---|
| **Braking system** | | |
| 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$^{O}$ | With the brake depressed |
| **Parking brake** | | |
| Permitted parking brake cable clearance | 150 mm | |

SER.3.8-002.01.EN

## 6.4 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.

- Connect the trailer to tractor.
- Place the tractor and trailer on firm and level ground. Position the tractor for straight-ahead travel.
- Apply the tractor parking brake.
- Turn off the tractor engine and remove the ignition key. Close the tractor cabin, thus protecting the tractor against unauthorized access.
- Place the 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 the locking wedges under the wheel on the opposite side. 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.

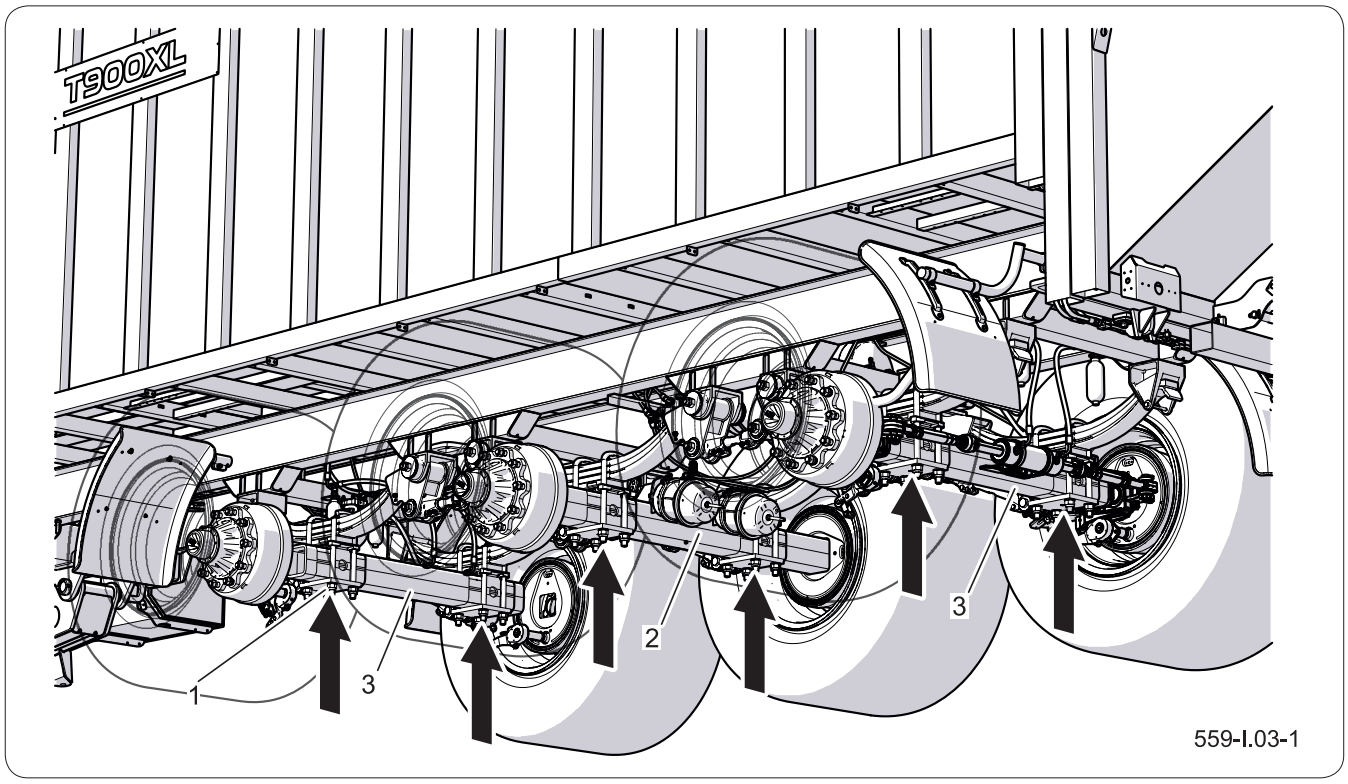



**Figure 6.1** Recommended jack substitution points
*(1) support points (2) rigid axle (3) steering axle*

- In exceptional cases, release the trailer parking brake, e.g. when measuring the play of the axle shaft bearings. Take special care.

SER.3.8-003.01.EN

## 6.5 CHECKING PLUGS AND CONNECTION SOCKETS

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,

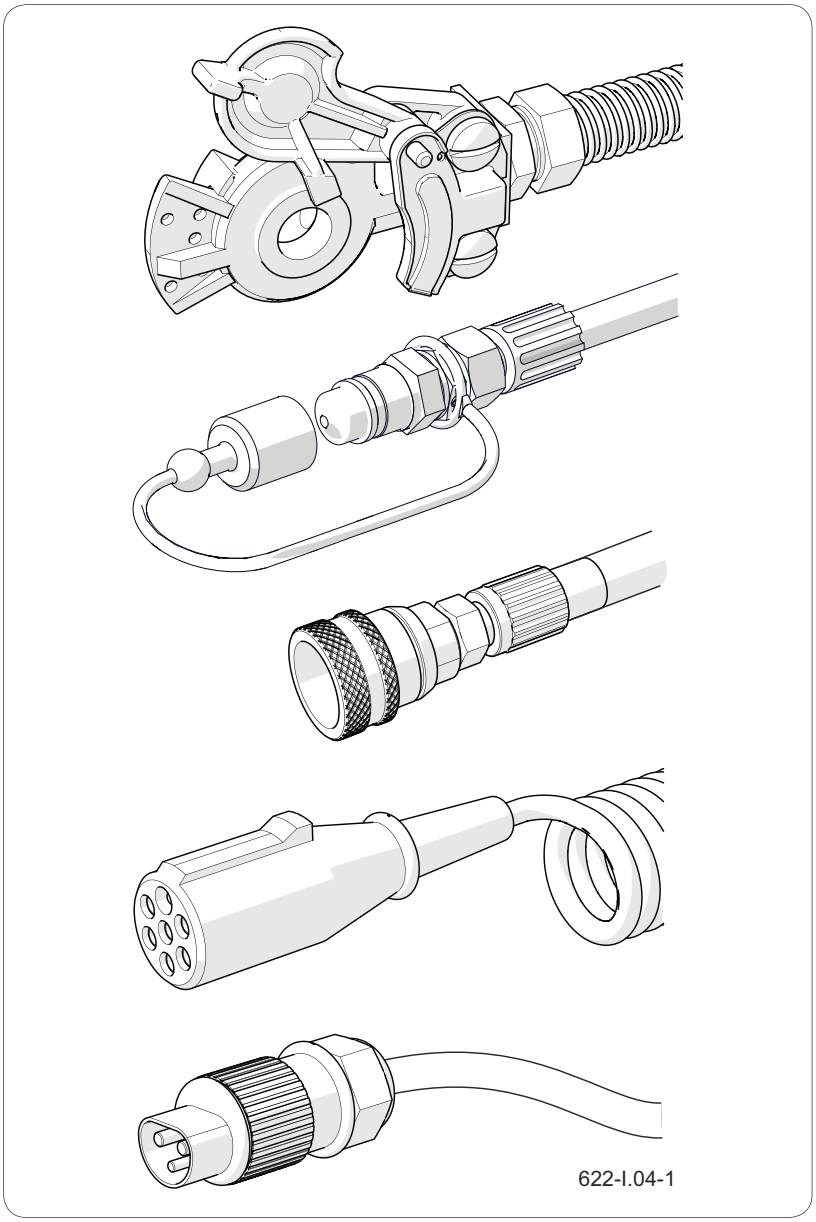



**Figure 6.2** Checking the trailer connections

it is recommended to preserve the seal with preparations intended for this purpose (e.g. silicone lubricants for rubber elements).
Each time before connecting the machine, check the technical condition and degree of cleanliness of connections and sockets on the agricultural tractor. If necessary clean or repair tractor sockets.

SER.3.8-005.01.EN

## 6.6 AIR TANK DRAINAGE

- 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.
- If it is necessary to clean the drain valve, follow the chapter "*Cleaning the drain valve"*.

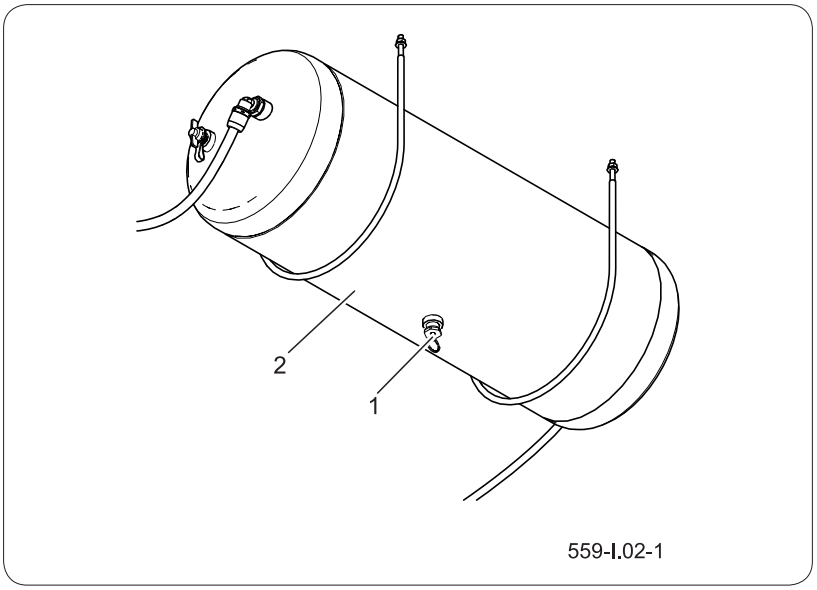



**Figure 6.3** Air tank
*(1) drain valve (2) air tank*

SER.3.8-004.01.EN

## 6.7 CHECKING THE TRAILER BEFORE DRIVING OFF

**DANGER**

Driving with defective lighting installations braking is prohibited.

If the trailer is damaged, it be discontinued until it is repaired.

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.

Before travelling on a public road, remove the rear lamp covers and place them in the designated place.

Check the correct mounting of the triangular sign holder for slow moving vehicles and the plate itself.

Make sure that the tractor has a reflective warning triangle.

Check the that the actuator ventilation openings are not clogged with dirt and that there is no water or ice

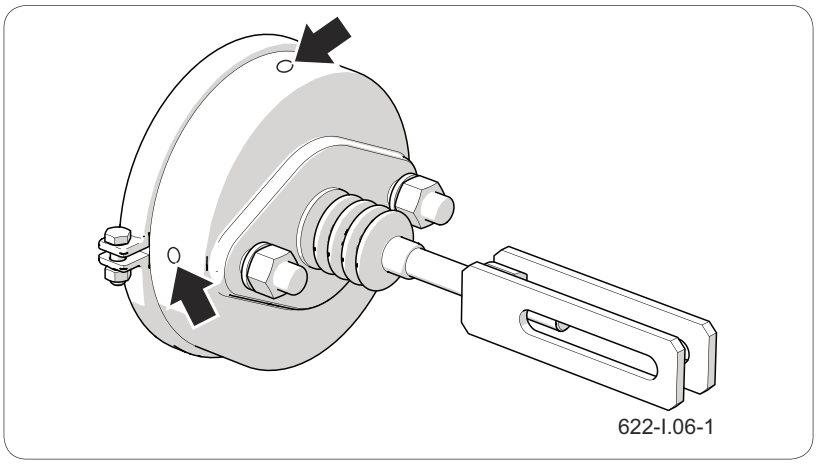



**Figure 6.4** Brake cylinder

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

While moving off, check the operation of the main

brake system. 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.

SER.3.8-006.01.EN

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

**ADVICE**

In the event of intensive use of the trailer, we recommend more frequent pressure checks

**CAUTION**

Using the trailer in which tires are not properly inflated may lead to permanent damage to the tire as a result of delamination of the material.
Incorrect tire pressure also causes faster tire wear.

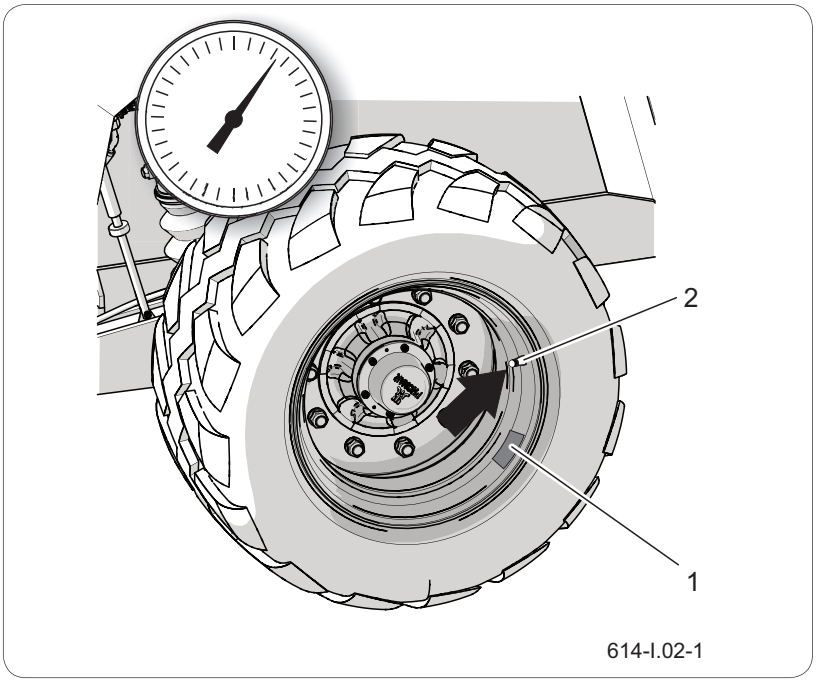



**Figure 6.5** Trailer wheel
*(1) sticker (2) valve*

During pressure measurement the trailer must be unloaded. Checking should be carried out before driving, when the tires are not warm, or after a long standstill of the trailer.

**The scope of activities**

- Connect the pressure gauge to the valve.
- Check the air pressure.
- If necessary, inflate the wheel to the required pressure.
- The required air pressure is described on a sticker (1) on the rim.
- Check the tread depth.
- Check the side wall of the tire.
- Inspect the tire for defects, cuts, deformations, bumps indicating mechanical damage to the tire.
- Check that the tire is correctly positioned on the rim.
- Check the tire age.

When checking pressure, pay attention to the technical

condition of rims and tires. In the event of mechanical damage, consult your nearest tire service centre and ensure that your tire defect is eligible for replacement. Rims should be checked for deformation, material cracks, weld cracks, corrosion, especially around welds and in the place contact with the tire.

SER.3.8-007.01.EN

## 6.9 CLEANING THE AIR FILTERS

**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 lock (1).

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

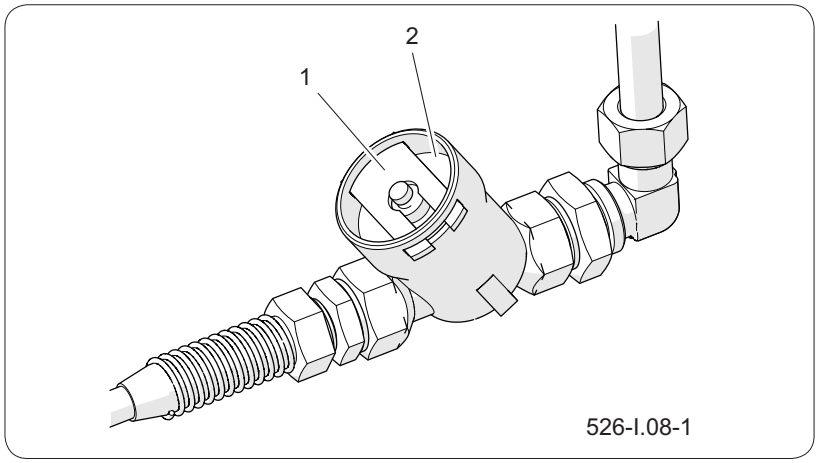



**Figure 6.6** Air filter
*(1) filter* *(2) cover*

- The cartridge and the filter body should be thoroughly washed and blowed out with compressed air. Installation should be made in reverse order.

SER.3.8-008.01.EN

## 6.10 CHECKING BRAKE LINING WEAR

**ADVICE**

Brake lining wear control,

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

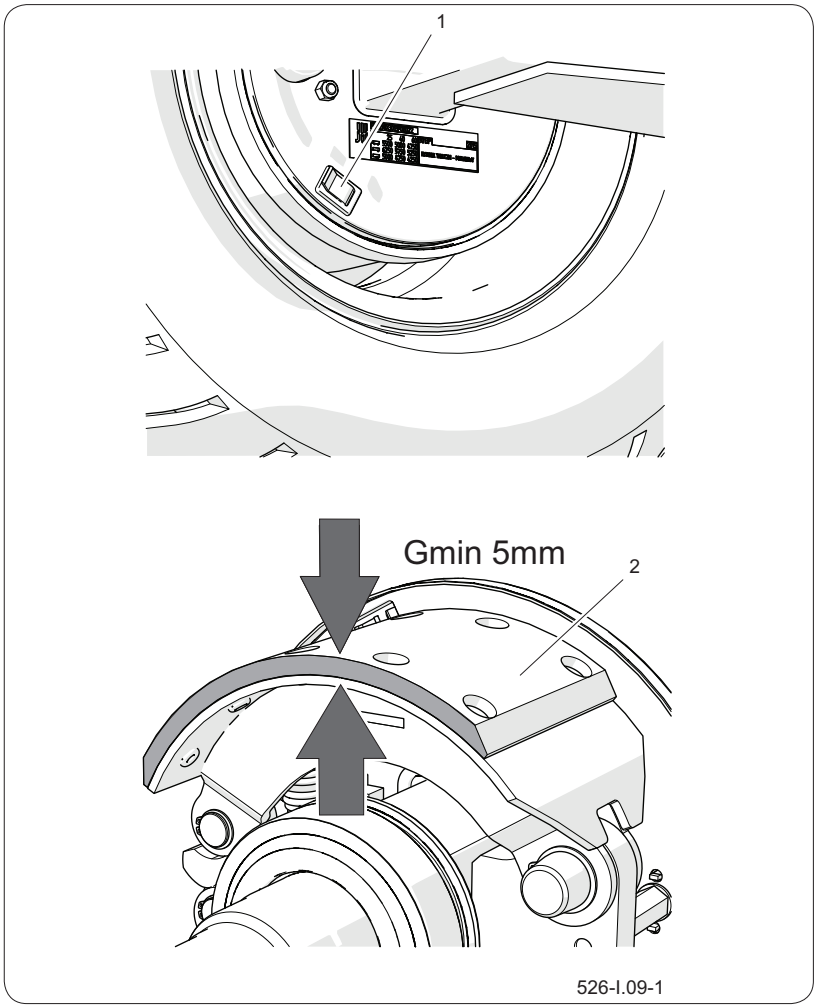



**Figure 6.7** Checking the brake lining thickness
*(1) blanking plug (2) brake lining*

- 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 must be replaced if the thickness of the brake lining is less than 5 mm.
- Check the the remaining linings for wear.

SER.3.8-009.01.EN

## 6.11 CHECKING THE CLEARANCE OF THE AXLE BEARINGS

**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.

**DANGER**

Before starting work, read the jack User's Manual.

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

Perform a clearance control of the bearings only and only when the machine is connected to the tractor, and the load box is empty and is not raised.

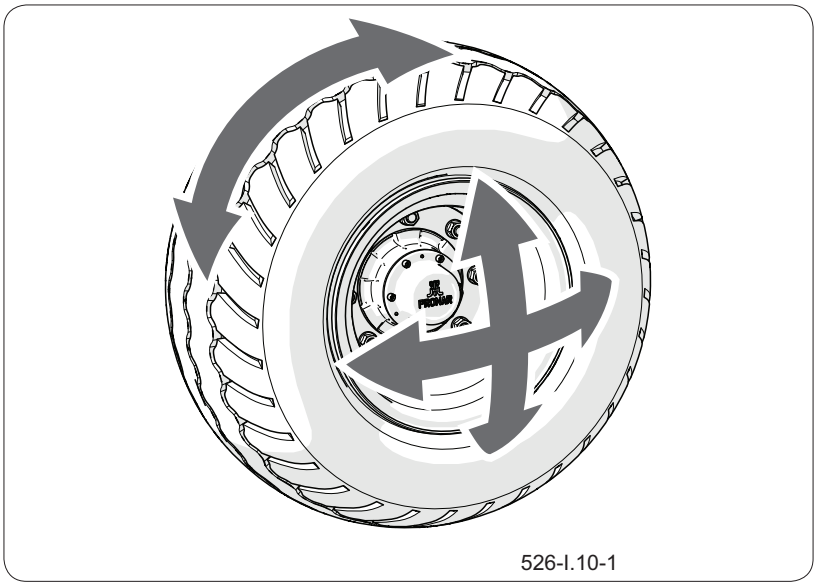



**Figure 6.8** Clearance inspection

- Raise the wheel with a jack.
- Turn the wheel slowly in two directions. Check that the movement is smooth and the wheel rotates without excessive resistance and jamming.
- Turn the wheel so that it rotates very quickly, check the that the bearing does not make any unusual sounds.
- Try to feel looseness by moving the wheel.
- Repeat steps separately for each wheel.

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

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

SER.3.8-010.01.EN

## 6.12 CHECKING OF MECHANICAL BRAKES

**ADVICE**

Checking the technical condition of the brakes:

- according to the schedule of inspections,
- before the period of intensive use.
- after repairing the braking system.
- in the event of uneven braking of the trailer wheels.

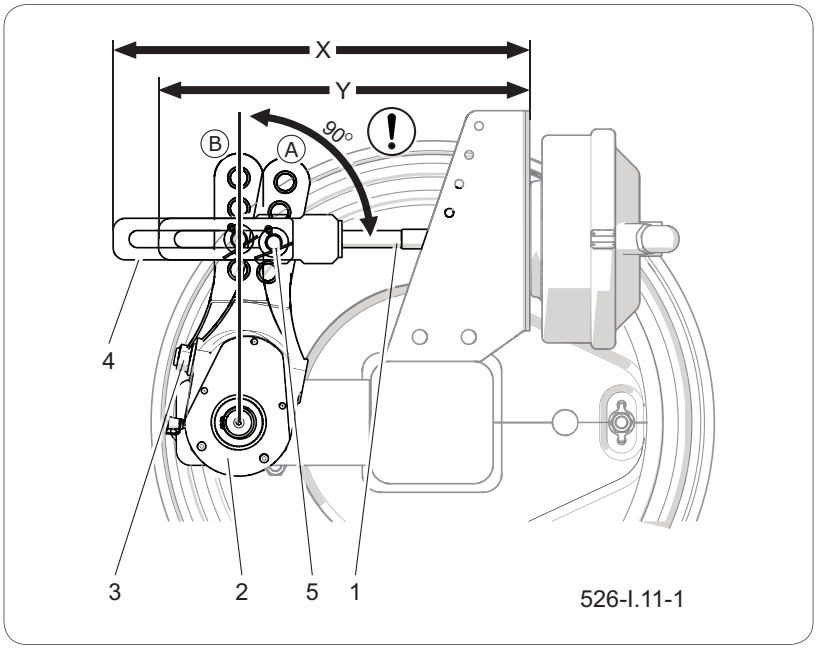



**Figure 6.9** Brake check
*(1) cylinder piston (2) expander arm*
*(3) adjustment screw (4) of the cylinder fork*
*(5) pin position*
*(A) position of the arm in the released position*
*(B) arm position in braking position*

In a correctly adjusted brake the cylinder piston stroke brake should be within the range given in Table 6.3 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.

SER.3.8-011.01.EN

## 6.13 CLEANING THE DRAINAGE VALVE

**DANGER**

Bleed the air tank before removing the drain valve.

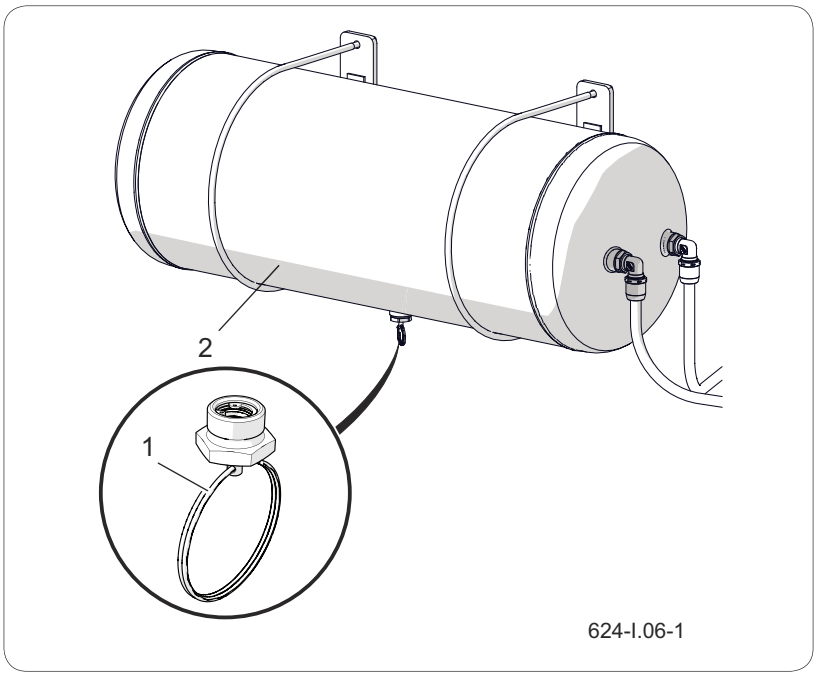



**Figure 6.10** Air tank
*(1) drain valve* *(2) tank*

**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 gasket.
- Screw in the valve, fill the tank with air, check the tank for leaks.

SER.3.8-012.01.EN

## 6.14 ADJUSTING OF THE PARKING BRAKE CABLE TENSION

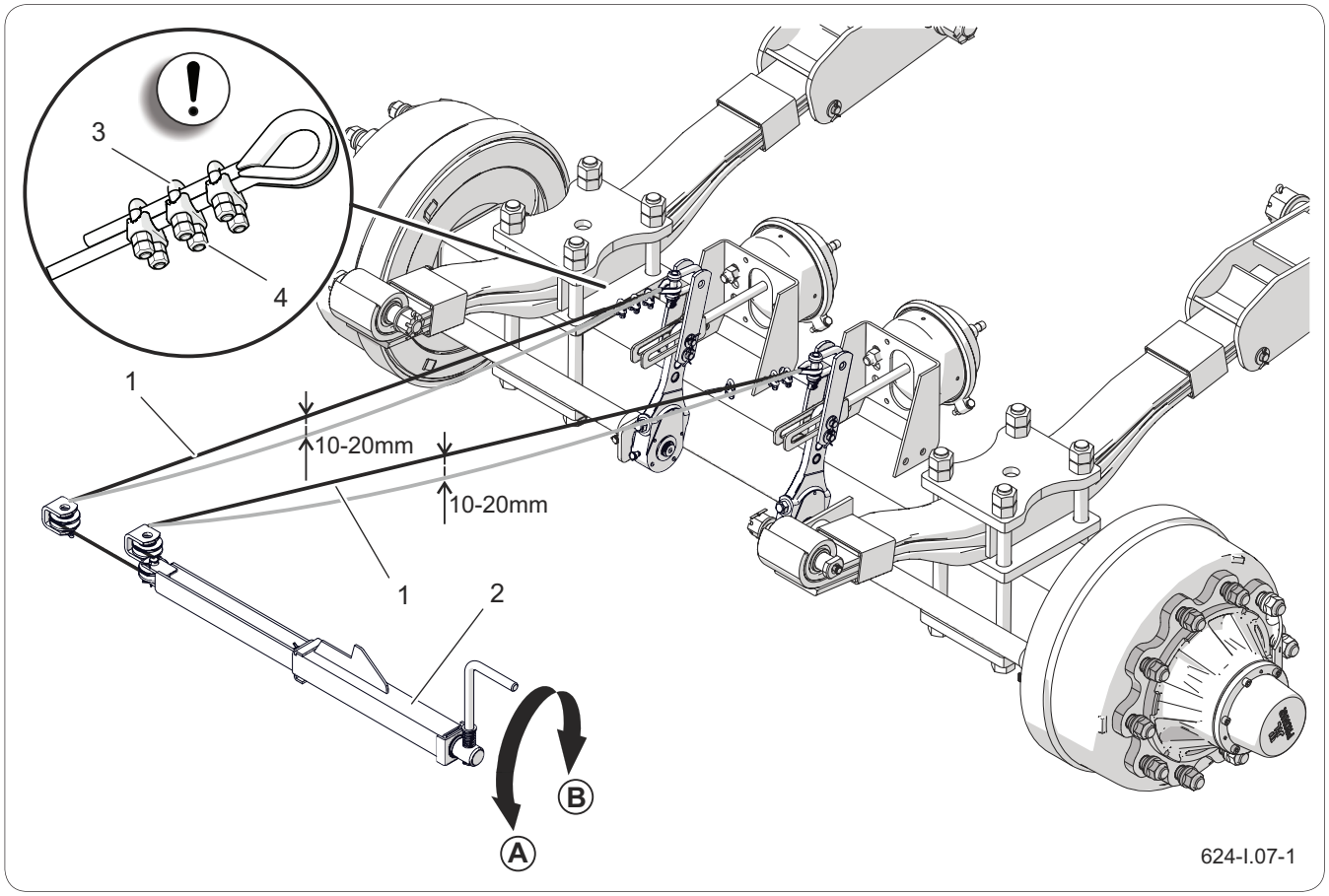



**Figure 6.11** Checking of cable tension (example)
*(1) cable, (2) brake mechanism, (3) bow clamp, (4) clamp nut*

**DANGER**

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

**Tension control**

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

- Connect the trailer to tractor. Place the machine and tractor on level ground.
- Under one wheel of the rigid axis put the wedges;
- Turn the parking brake crank (2) towards (B) and apply the parking brake.
- Check the cable tension (1).
- When the mechanism screw is completely removed, the cable should hang about 10 to 20 mm.

**Cable tension adjustment**

- Unscrew the bolt of the brake mechanism (2) as far as possible by turning the crank in direction (A).
- Loosen the the nuts (4) of the bow clamps (3) on the handbrake cable (1).
- Tighten the cable (1) and tighten the the nuts (4) of the clamps.
- Apply the parking brake and release it again. Check (approximately) cable slack. With the service and parking brakes fully released, the cable should hang about 10-20 mm. The axle spreader levers should be in the rest position.

SER.3.8-013.01.EN

## 6.15 HYDRAULIC SYSTEM CHECKING

**DANGER**

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

**Checking the tightness of the hydraulic system**

- Connect the trailer to tractor.
- Connect all hydraulic system hoses according to the instructions in the manual.
- Clean the 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 the 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 check.

When the cylinder is fully extended, check the the seal locations. Small leaks with symptoms of "sweating" are permissible. When you notice "droplets" type leaks do not use the machine until the fault is removed. If malfunctions appeared in brake cylinders or other brake installation elements, you can not move with the trailer until the fault is 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.

**Control of 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.)

SER.3.8-015.01.EN

## 6.16 CONTROL OF PNEUMATIC BRAKING SYSTEM

**The scope of activities**

**DANGER**

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

**DANGER**

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

- Connect the trailer to tractor.
- Block the tractor and trailer with the parking brake. Put the wedges under one wheel of the rigid axis.
- Start the tractor to supplement the air in the trailer braking system tank.
- Switch off the tractor engine.
- Check the 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 leakage of the system can detect coating checked elements for washing or other foaming preparation, which will not interact aggressively to the elements of the installation. Damaged elements should be replaced or sent for repair. If the leak appeared around the connections, user can tighten the connector on their own. If the air continues to leak replace the elements of the connector or sealing into 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. Bisted, permanently deformed, cut or damaged wires should be replaced for new ones.

SER.3.8-016.01.EN

## 6.17 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. The given values apply to non-lubricated steel bolts.

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

Check the tightness using a torque wrench. During daily inspection of the manure spreader pay attention to loose connections and tighten the connector if necessary. Replace lost items with new ones.

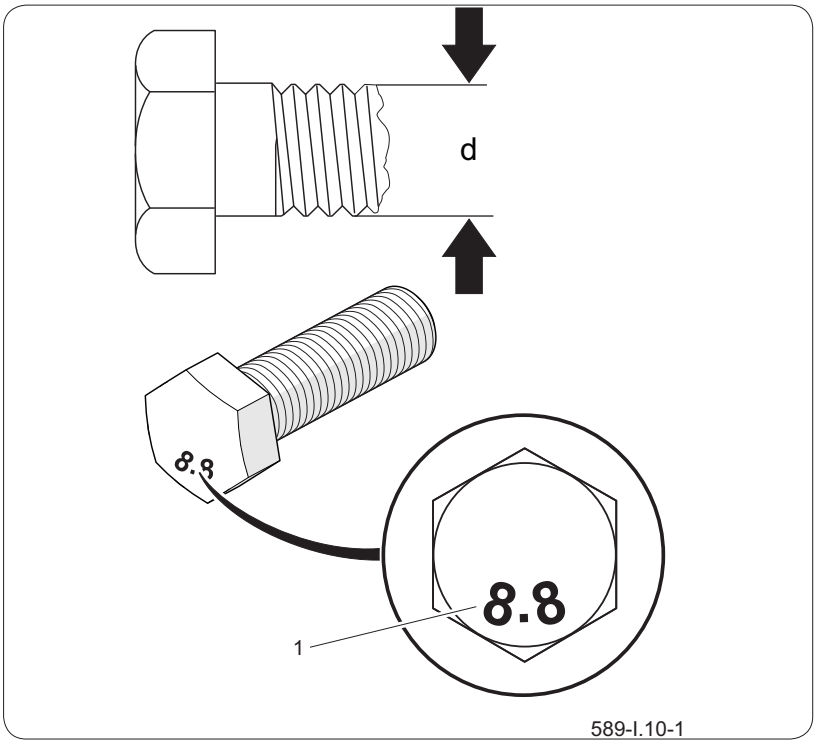



**Figure 6.12** Metric thread screw
*(1) strength class, (d) thread diameter*

**Table 6.4.** Tightening torques for screw connections

| Metric thread | | |
|---|---|---|
| | **8.8**(*) | **10.9**(*) |
| M8 | 25 | 36 |
| M10 | 49 | 72 |
| M12 | 85 | 125 |
| M14 | 135 | 200 |
| M16 | 210 | 310 |
| M20 | 425 | 610 |
| M24 | 730 | 1,050 |
| M27 | 1,150 | 1,650 |
| M30 | 1,450 | 2,100 |

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

**Table 6.5.** Tightening torques of hydraulic elements

| Thread of nuts | Wire diameter DN (inch) | Tightening torques [Nm] |
|---|---|---|
| M10x1 \| M12x1.5 \| M14x1.5 | 6 (1/4”) | 30÷ 50 |
| M16x1.5 \| M18x1.5 | 8 (5/16”) | 30÷ 50 |
| M18x1.5 \| M20x1.5 \| M22x1.5 | 10 (3/8”) | 50÷ 70 |
| M22x1 \| M24x1.5 \| M26x1.5 | 13 (1/2”) | 50÷ 70 |
| M26x1.5 \| M27x1.5 \| M27x2 | 16 (5/8”) | 70÷ 100 |
| M30x1.5 \| M30x2 \| M33x1.5 | 20 (3/4”) | 70÷ 100 |
| M38x1.5 \| M36x2 | 25 (1”) | 100÷ 150 |
| M45x1.5 | 32 (1.1/4”) | 150÷ 200 |

SER.3.8-017.01.EN

## 6.18 TIGHTENING ROAD WHEELS

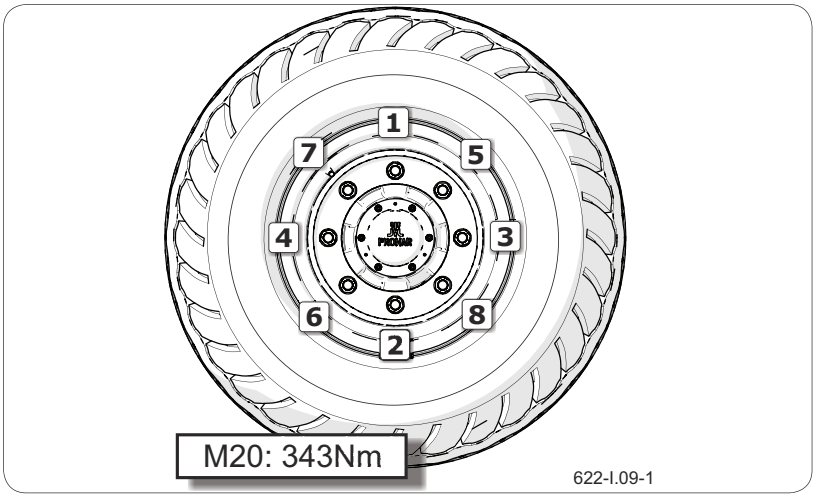



**Figure 6.14** The order of the nuts tightening (8 pcs)

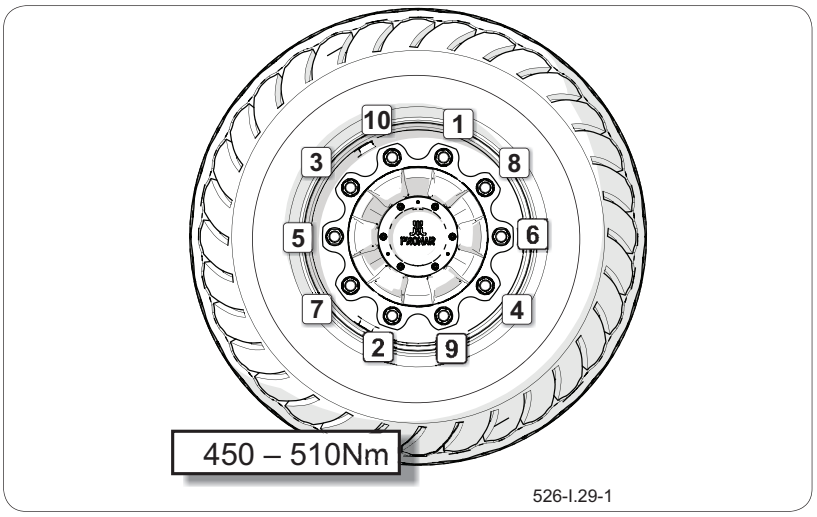



**Figure 6.13** The order of the nuts tightening (10 pcs)

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

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

The wheels should be tightened according to the following scheme:

- after first use of the machine (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.

SER.3.8-018.01.EN

## 6.19 THE DRAW BAR EYE TIGHTENING

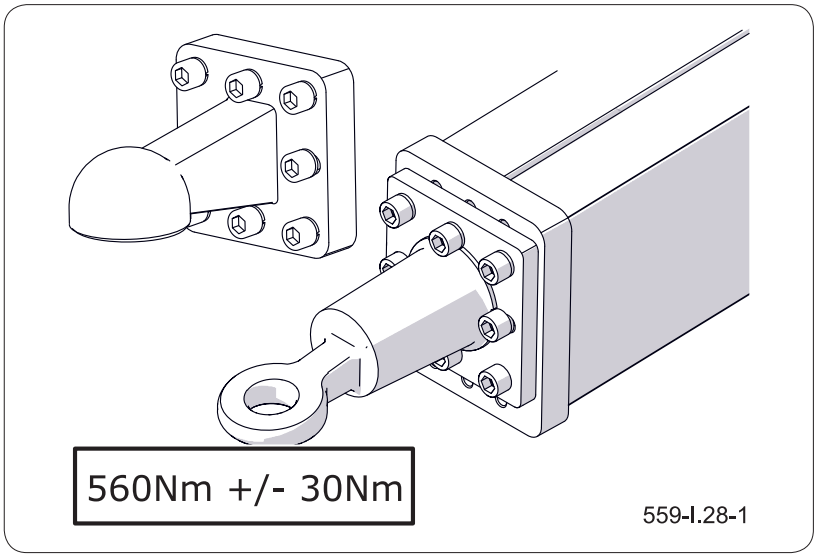



**Figure 6.15** The draw bar eye tightening

Checking the tightness of the draw bar eye should be done at the same time as checking the wheel nuts. The tightening torque of M20x80 bolts 10.9 class should be 560+/- 30 Nm. Tighten the screws diagonally with a torque wrench.

SER.3.8-019.01.EN

## 6.20 REPLACEMENT OF HYDRAULIC HOSES

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

SER.3.8-020.01.EN

## 6.21 LUBRICATION

**ADVICE**

Lubrication frequency (Table Trailer lubrication schedule):

D - working day (8 hours of trailer),

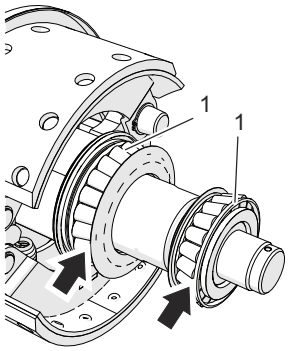
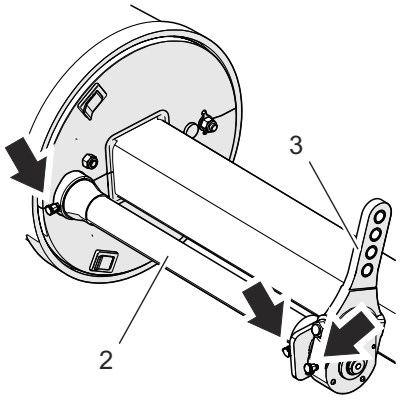
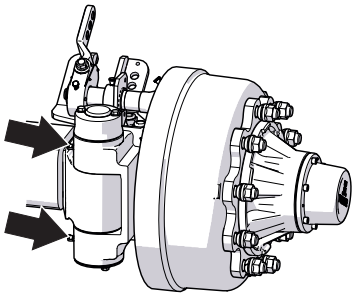
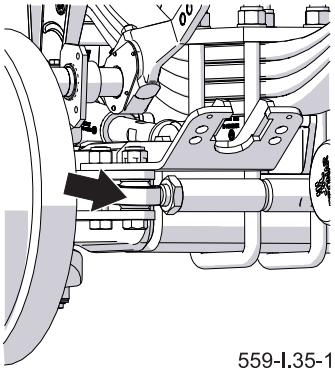
M-month

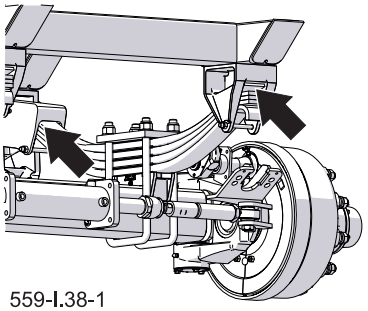
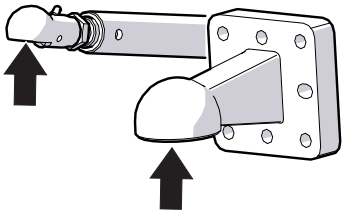
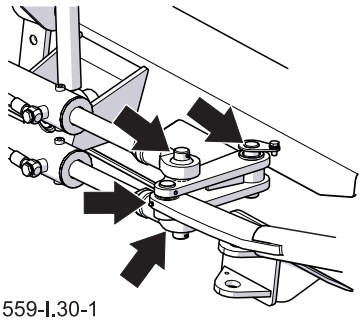
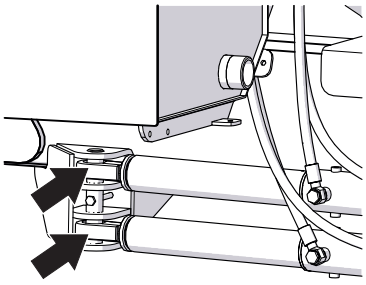
- Lubrication of the trailer perform with manual or foot lubricators filled with the recommended lubricant. Before starting work, remove the old grease and other pollution. After finishing work, wipe off excess grease.
- Parts that should be lubricated using machine oil should be wiped with a dry and 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, replace bearings and seals.
- Empty containers of grease or oil be disposed of in accordance with the lubricant manufacturer's instructions.

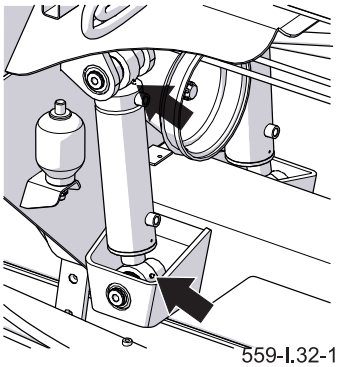
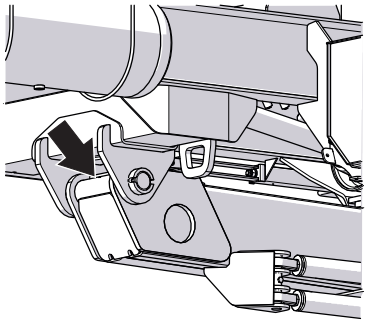
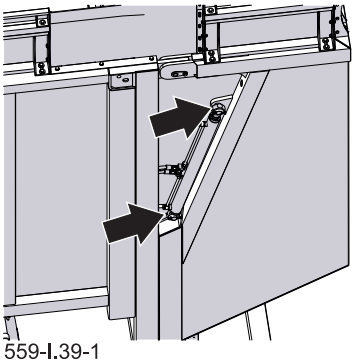
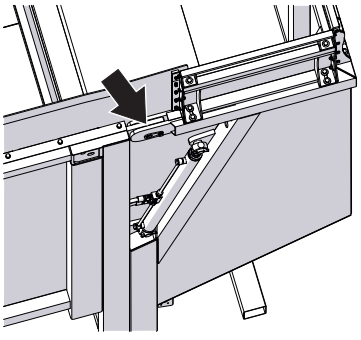
**Table 6.6.** Lubricants

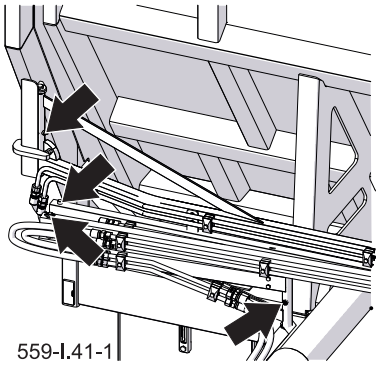
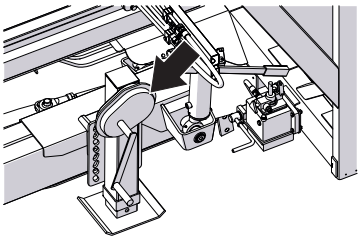
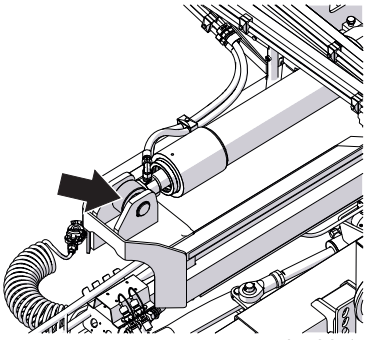
| Item | Symbol | Description |
|---|---|---|
| 1 | A | general purpose machine grease (lithium, calcium), |
| 2 | B | solid grease for heavily loaded components with the addition of $MOS_2$ or graphite |
| 3 | C | anti-corrosive spray |
| 4 | D | plain machine oil, silicone spray grease |

**Table 6.7.** Trailer lubrication schedule

| Item | Name | Number of points | Type of grease | Frequency | |
|---|---|---|---|---|---|
| 1 | Hub bearings (2 in each hub) | 4 | A | 24M |  |
| 2 | Camshaft sleeves | 4 | A | 3M |  |
| 3 | Expander arm | 2 | A | 3M | |
| 4 | The steering axis pin | 4 | B | 3M |  |
| 5 | Torsionic axle actuator bearings | 2 | B | 3M |  |

| Item | Name | Number of points | Type of grease | Frequency | |
|---|---|---|---|---|---|
| 6 | Spring surfaces<br>*Caution!*<br>*Do not allow to work in dry condition.* | 12 | B | 14D |  <br>559-I.38-1 |
| 7 | Drwabar eye and driving axle lever eye | 1 | B | 14D |  <br>559-I.29-1 |
| 8 | Driving system lever pin | 1 | A | 14D |  <br>559-I.30-1 |
| 9 | Driving system cylinders bearing | 1 | A | 14D | |
| 10 | Driving system drawbar eye pin | 1 | A | 14D | |
| 11 | Driving system cylinder pin | 1 | B | 3M |  <br>559-I.31-1 |

| Item | Name | Number of points | Type of grease | Frequency | |
|---|---|---|---|---|---|
| 12 | Drawbar cilnder bearing | 2 | B | 3M |  559-I.32-1 |
| 13 | Drawbar rocker pin | 1 | B | 3M |  559-I.33-1 |
| 14 | Tailgate actuator bearings | 4 | A | 3M |  559-I.39-1 |
| 15 | Tailgate hinges | 2 | A | 14D |  559-I.40-1 |

| Item | Name | Number of points | Type of grease | Frequency | |
|---|---|---|---|---|---|
| 16 | Wire arm bolts | 4 | A | 14D |  559-I.41-1 |
| 17 | Telescopic support | 1 | A | 3M |  559-I.37-1 |
| 18 | Wall movement cylinder bearing | 1 | B | 3M |  559-I.36-1 |

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## 6.22 TRIDEM SUSPENSION CONTROL

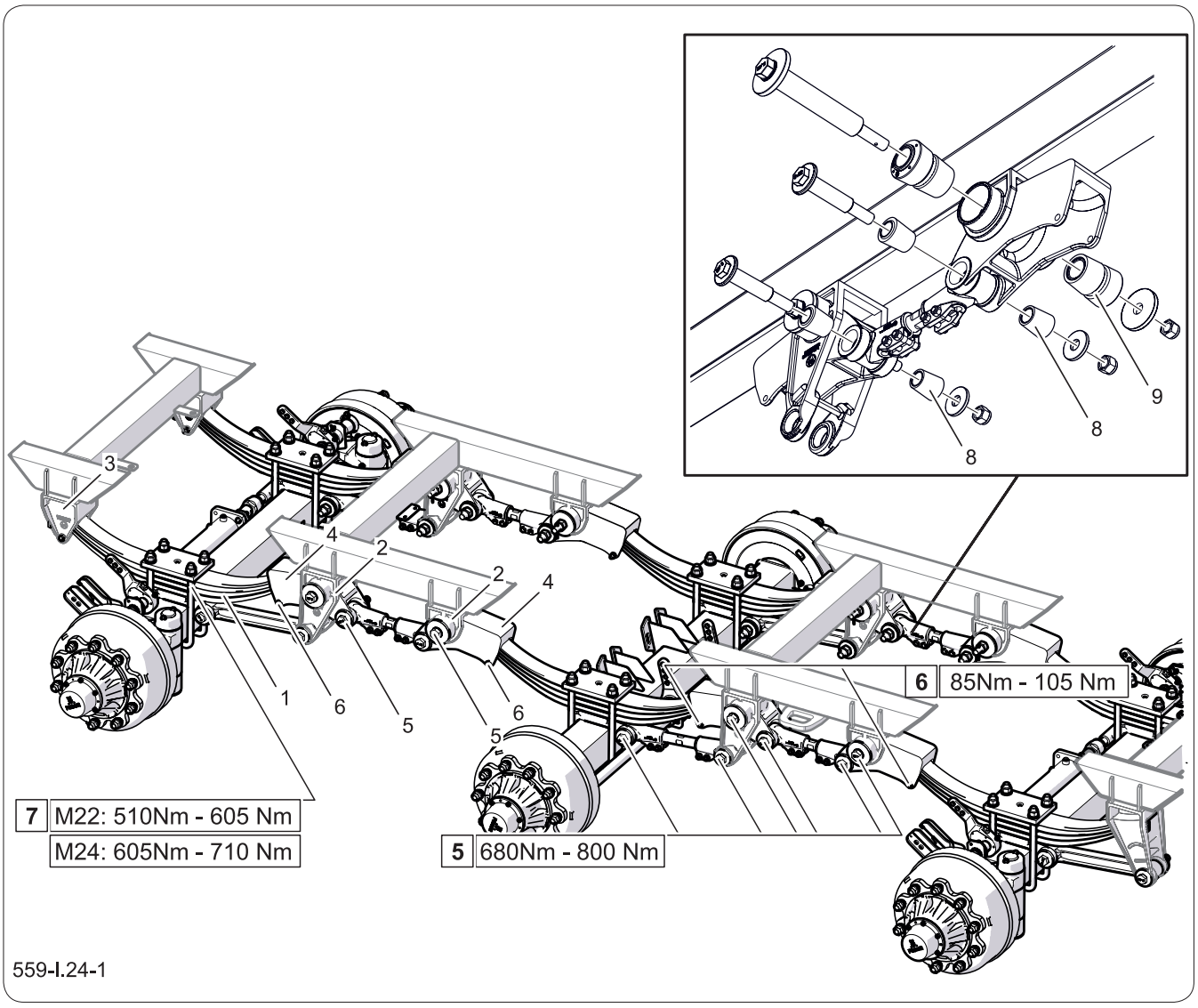


Figure 6.1 Support for Tridem mechanical suspension, axle mounted under suspension spring

*(1) Suspension spring, (2) Suspension arm bracket, (3) Suspension spring bracket,*
*(4) Suspension arm, (5) Suspension pin, (6) Fixing of the Suspension spring pen*
*(7) Screw "U" of axle fixing, (8) (9) Metal-rubber sleeve*

**Table 6.8.** Suspension control schedule

| Item | Service activities | Frequency |
|---|---|---|
| 1 | Tightening controls of "U" screws on axles should be performed using a dynamometric key with a set torque 550 - 580 Nm (M22x1,5) and 650 - 680 nm (M22x2). | first after travelling the 50 km with a load or after 500 hours of operation,<br>next after travelling 5000 km or after 1500 hours of operation,<br>then<br>once a year. |

| Item | Service activities | Frequency |
|---|---|---|
| 2 | Tightening controls of adjustable stick nuts should be performed using a dynamometric key with a set torque 85 - 105 nm. | first after travelling the 50 km with a load or after 500 hours of operation,<br>next after travelling 5000 km or after 1500 hours of operation,<br>then<br>once a year. |
| 3 | Tightening controls of the bolt nuts should be performed using a dynamometric key with a set torque 650 - 680 nm. The control relates to a swingarm pins and reaction rod bolts. In case of suspension arm pins, check the condition of the protective cover. In the event of their destruction, the must be replaced. | first after travelling the 50 km with a load or after 500 hours of operation,<br>next after travelling 5000 km or after 1500 hours of operation,<br>then<br>once a year. |
| 4 | Suspension spring support control consists in checking whether there is grease at the center of the resistance with a bracket or a rocker. For lubrication use lithium grease with EP addition | after reception of the trailer<br>then<br>once a year |
| 5 | Control of metal-rubber sleeves: It consists in a visual evaluation of the state of the sleeve. Pressure washers should not contact the bracket if they contact the rubber conical sleeves. | once a year |
| 6 | Check the condition of the suspension springs (1), thoroughly clean and brush the sides of the springs to check for cracks. | once a year |

**ADVICE**

In the event of severe conditions of use or heavy use, maintenance should be carried out more often.

**CAUTION**

The manure spreader screw connections should be tightened under load.

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## 6.23 ADJUSTING THE CLEARANCE OF THE AXLE BEARINGS

**CAUTION**

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

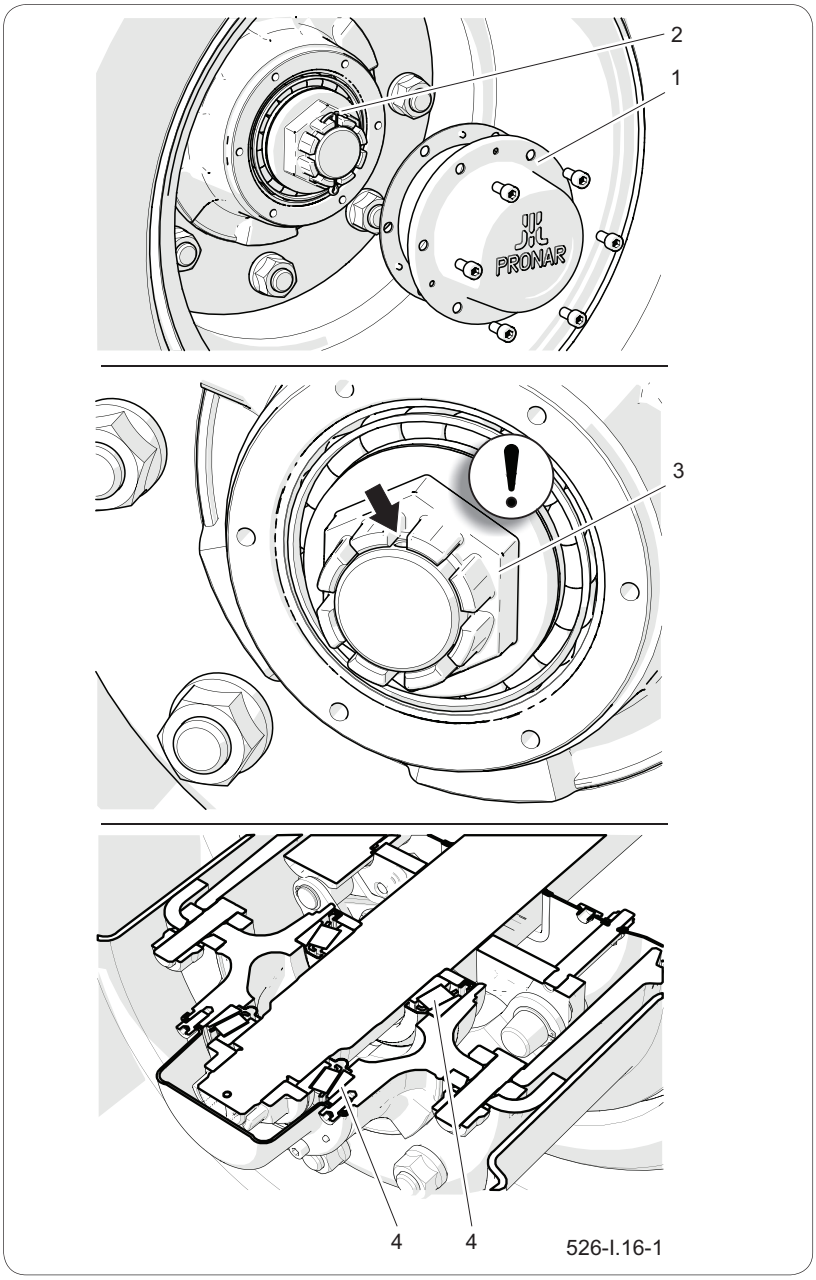


**Figure 6.16** The principle of bearing clearance adjustment
*(1) hub cover, (2) cotter pin, (3) nut, (4) tapered roller bearing*

**The scope of activities**

Prepare the tractor and machine for adjustment as described in chapter „Preparing of the machine”.

Remove the hub cover (1).

- Remove the cotter pin (2) securing the castellated nut (3).
- Tighten the 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 strong pressure is not recommended due to the deterioration of bearings.***
- Secure the castellated nut with a cotter pin and mount the hub cover (1).
- Gently tap the hub with a rubber or wooden hammer.

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## 6.24 BRAKE ADJUSTMENT

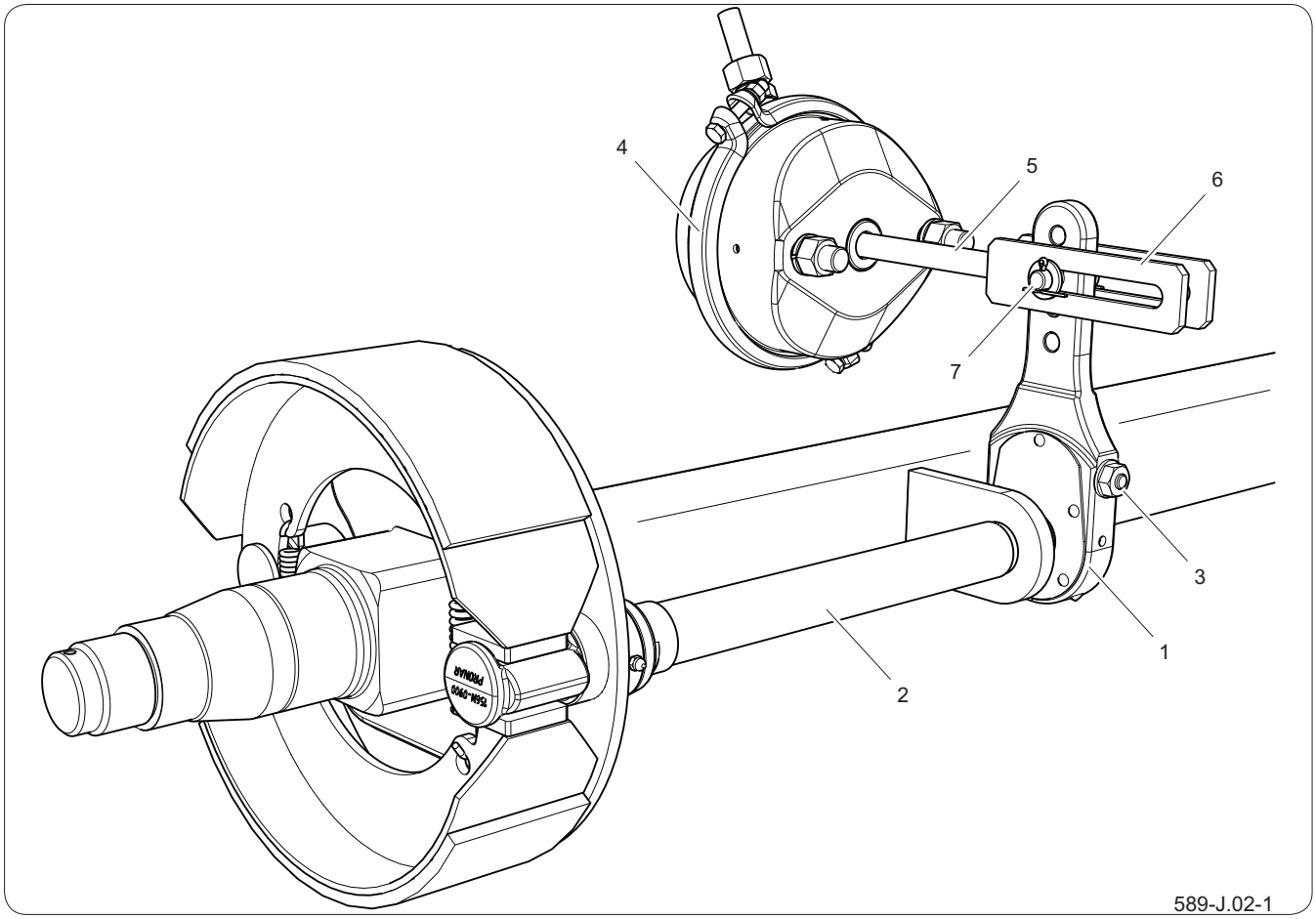


**Figure 6.17** Construction of pneumatic axle brake
*(1) expander arm, (2) expander shaft, (3) adjusting screw, (4) pneumatic cylinder, (5) cylinder, (6) cylinder fork, (7) cylinder pin*

**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 (6.7). The trailer wheels must brake simultaneously.

The braking force also decreases when the angle of operation of the brake cylinder piston rod (5) is not correct - figure (6.4), (6.5) in relation to the expander arm (1). To obtain the optimum mechanical angle of

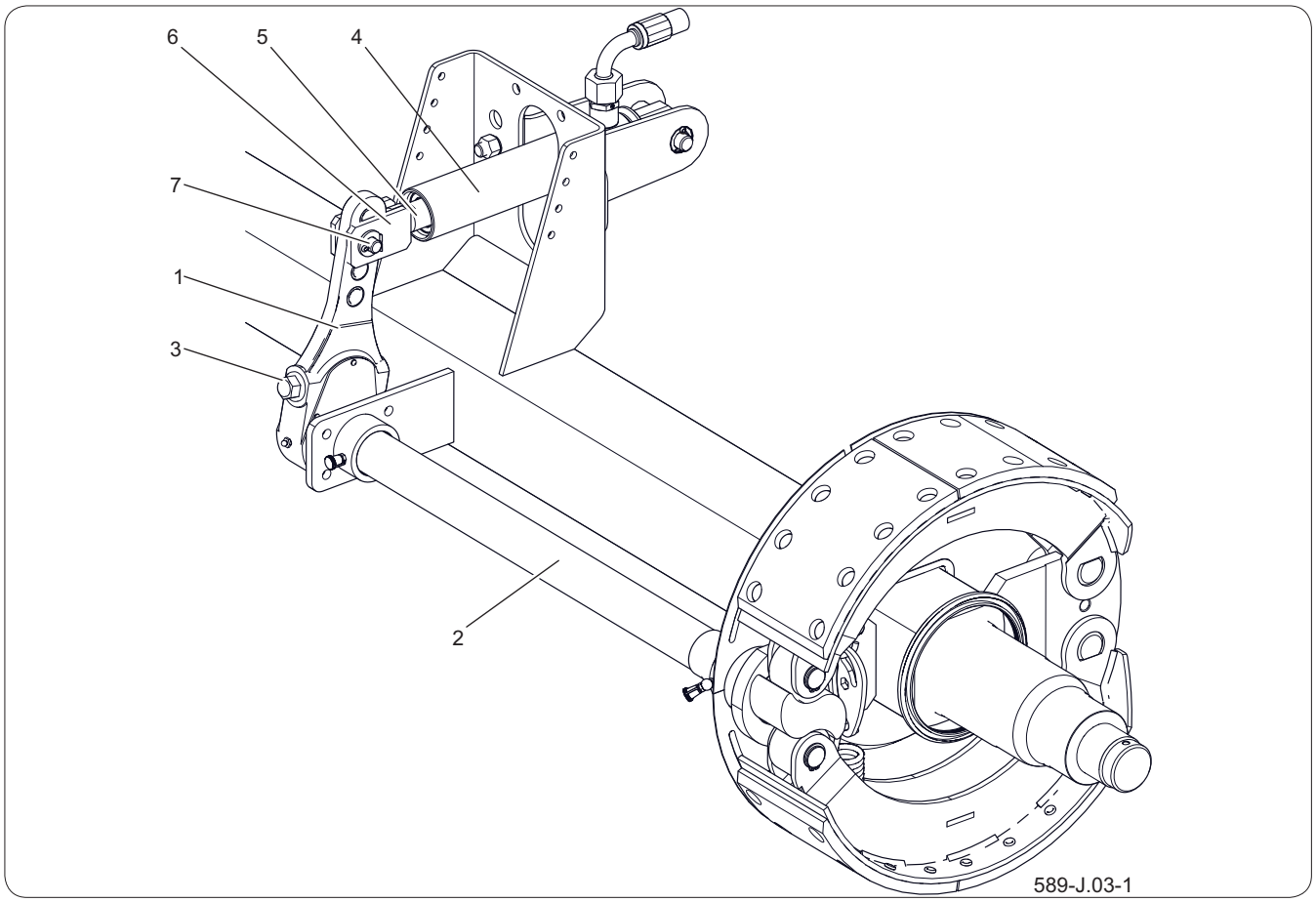


**Figure 6.18** Construction of hydraulic axle brake
*(1) expander arm, (2) expander shaft, (3) adjusting screw, (4) hydraulic cylinder, (5) cylinder piston rod, (6) cylinder fork, (7) cylinder pin*

**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.

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

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 (45mm), the system should be adjusted.

When removing the cylinder fork (6), 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 manure spreader, it is selected by the Manufacturer and cannot be changed.

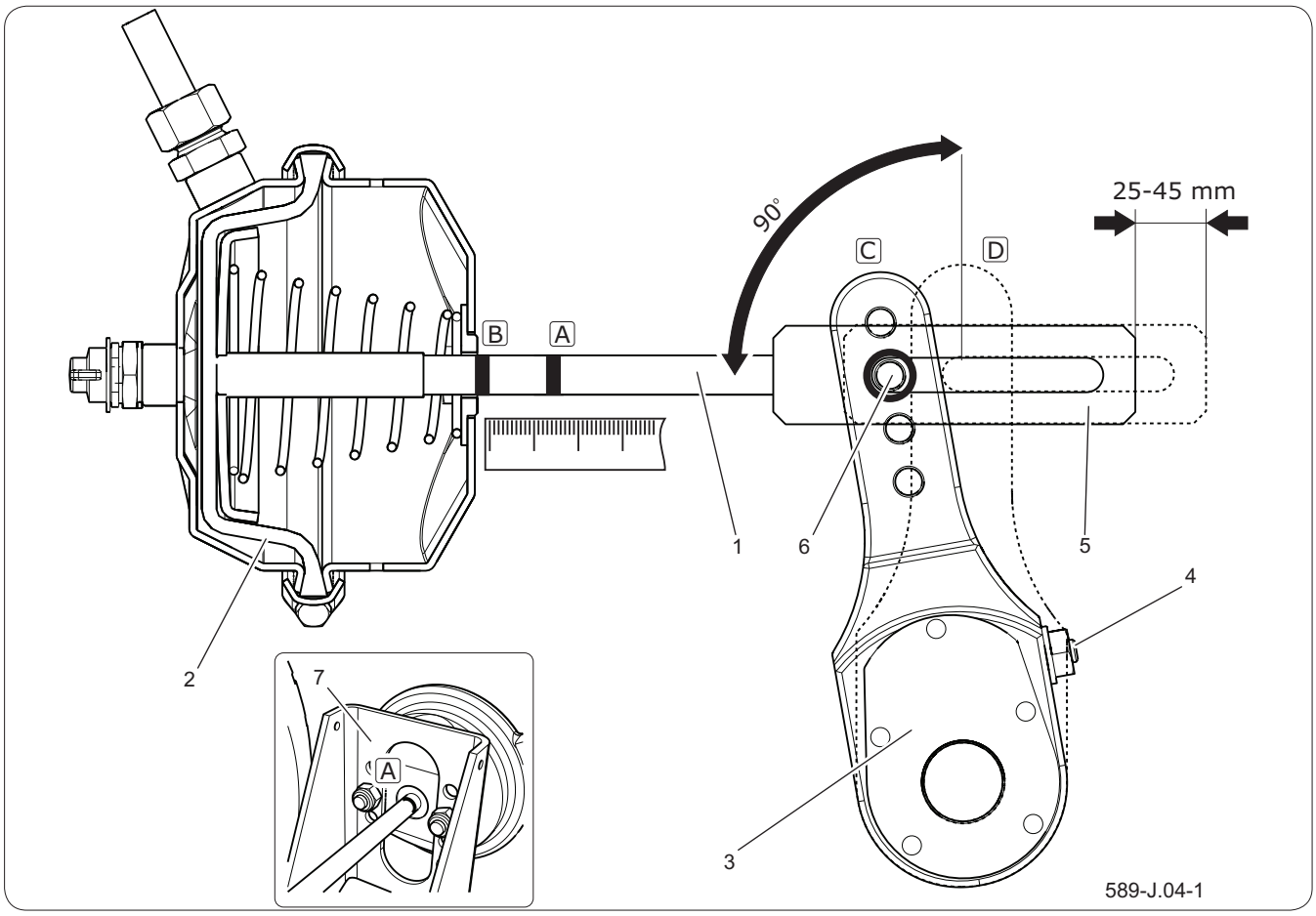


**Figure 6.19** Pneumatic brake adjustment
*(1) piston, (2) cylinder membrane, (3) expander arm,*
*(4) adjustment screw, (5) cylinder fork, (6) fork pin,*
*(7) cylinder support,*
*(A) the tag on the piston in the brake release position, (b) the tag on the pistons in the full stop position,*
*(c) the position of the arm in the brake release position,*
*(D) arm in full stop position*

**The scope of activities**

**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.

- Connect the 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), (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

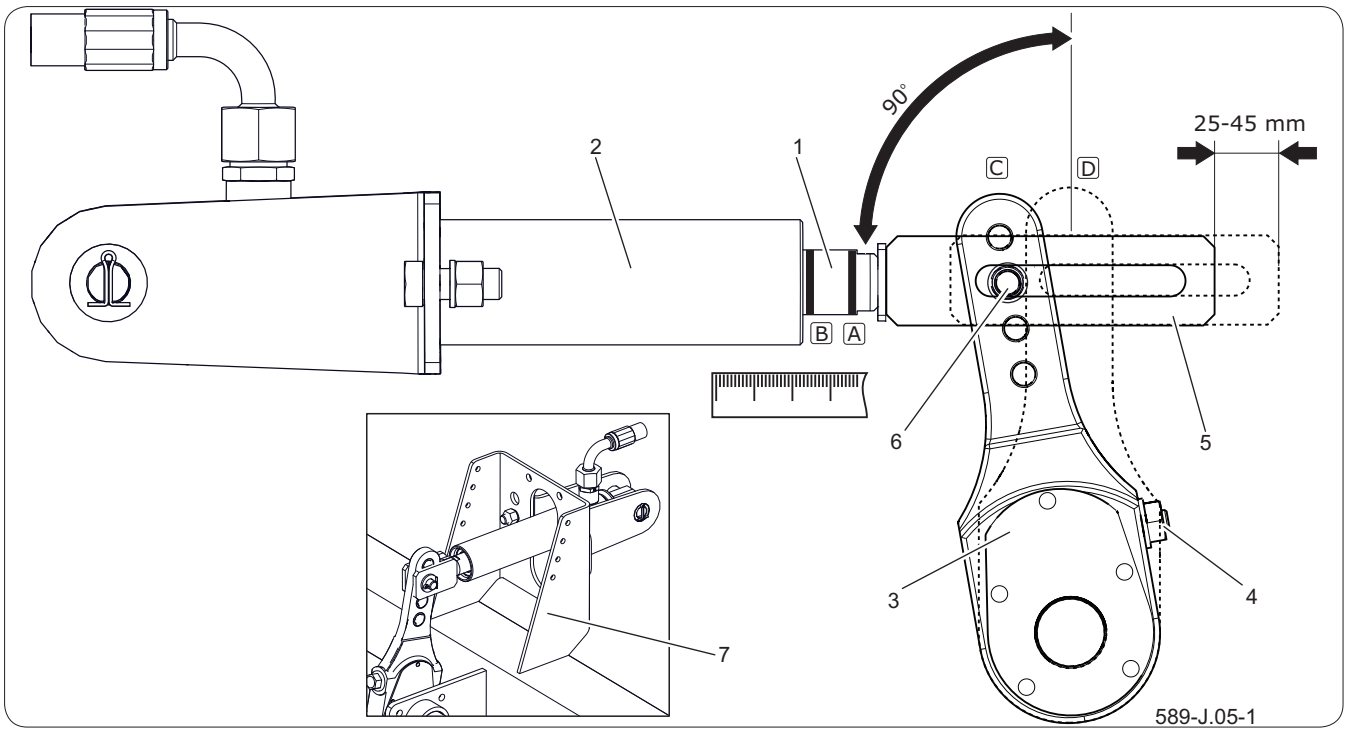


**Figure 6.20** Hydraulic brake adjustment
*(1) piston rod, (2) cylinder piston ,(2) expander arm,*
*(4) adjustment screw, (5) cylinder fork, (6) fork pin,*
*(7) cylinder support,*
*(A) the tag on the piston in the brake release position, (b) the tag on the pistons in the full stop position,*
*(c) the position of the arm in the brake release position,*
*(D) arm in full stop position*

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 the actuator fork pin (6).
- Remember or mark the original position of the cylinder fork (6) in the expander arm bore (3).
- Check the 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 drain 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 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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## 6.25 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.

***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.

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 the trailer to the tractor with a suitable connection lead.
- Make sure the connection cable is OK. Check the connection sockets on the tractor and on the trailer.
- Check the completeness, technical condition and correct functioning of the trailer lighting.

  ***Check the wiring harness for damage (rubbed insulation, wire break, etc.). Check the completeness of lamps and 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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## 6.26 CONSUMABLES

### 6.26.1 Hydraulic oil

**ADVICE**

In the hydraulic system of the trailer, L-HL 32 LOTOS oil was used.

It is absolutely necessary to observe that the oil in the machine's hydraulic system and the tractor's hydraulic system is 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, read the oil manufacturer's instructions carefully. If he recommends flushing the system with an appropriate preparation, follow these recommendations. It 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 area of contact with water and soap. Do not use organic solvents (petrol, kerosene). Soiled clothing should be removed

**Table 6.9.** Characteristics of oil L-HL 32

| Item | Name | Unit | |
|---|---|---|---|
| 1 | Viscosity classification according to ISO 3448VG | - | 32 |
| 2 | Kinematic viscosity at 400C | $mm^2/s$ | 28.8 – 35.2 |
| 3 | Qualitative classification according to ISO 6743/99 | - | HL |
| 4 | Quality classification according to DIN 51502 | - | HL |
| 5 | Flash-point | C | 230 |

**DANGER**

**Do not use water to extinguish a fire of oil!**

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. In the event of fire, the oil must be extinguished with carbon dioxide, foam or extinguishing steam

### 6.26.2 Lubricants

***ADVICE***

Lubrication frequency (Table Trailer lubrication schedule).

For heavily loaded parts, it is recommended to use lithium grease with the addition of molybdenum disulphide (MOS2) or graphite. For less loaded components, it is recommended to use general-purpose machine greases that contain anti-corrosive additives and are highly resistant to water washout. Aerosol preparations (silicone greases, anti-corrosive lubricants) should have similar properties.
Before using lubricants, read the information leaflet for the selected product. Particularly important are safety rules and how to handle a given lubricant and how to dispose of waste (used containers, contaminated rags, etc.). The information leaflet (product card) store together with the grease.

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## 6.27 TIRES

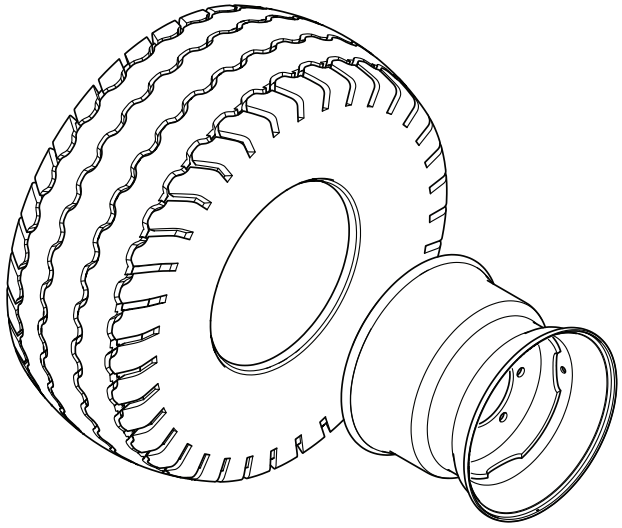

**Table 6.10.** Tire assembly

| Item | Tire | Rim | Pressure |
|---|---|---|---|
| 1 | 445/65 R22,5 169D | 14,00x22.5” ET=0<br>Catalogue number 225.14.101 | 825 kPa |
| 2 | 550/60-22,5 171A8 | 16,00x22.5; ET=0<br>Catalogue number 225.16.152 | 340 kPa |
| 3 | 560/60 R22,5 172A8 | 16,00x22.5; ET=0<br>Catalogue number 225.16.101 | 400 kPa |
| 4 | 600/55-22.5 16PR 169A8 | 20.00x22.5 H2 ET=-40<br>Catalogue number 225.20.165.6 | 280 kPa |
| 5 | 600/50 R22,5; 170A8 | 20.00x22.5; ET=-40<br>Catalogue number 225.20.165.6 | 400 kPa |
| 6 | 600/55R26.5; 176A8 | 20.00x26.5H2 ; ET=-50<br>Catalogue number 265.20.06 | 400 kPa |
| 7 | 600/55-26.5; 170A8 | 20.00x26.5H2 ; ET=-50<br>Catalogue number 265.20.06 | 260 kPa |
| 8 | 620/50R22,5 172A8 | 20.00x22.5H2 ET=-40<br>Catalogue number 225.20.165.6 | 400 kPa |
| 9 | 700/50-26,5 174A8 | 24.00x26.5 H2; ET=-80<br>Catalogue number 265.24.59 | 240 kPa |
| 10 | 710/45 -26,5 169A8 | 24.00x26.5 H2; ET=-80<br>Catalogue number 265.24.59 | 240 kPa |
| 11 | 710/50 R26,5 181A8 | 24.00x26.5 H2; ET=-80<br>Catalogue number 265.24.59 | 400 kPa |

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## 6.28 FAULTS AND HOW TO REMOVE THEM

**Table 6.11.** 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.<br>Damaged tractor air compressor. Repair or replace.<br>Damaged brake valve on the tractor. Repair or replace.<br>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 spreader. |

| | | |
|---|---|---|
| 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. |
| Damage to the PTO shaft. | Too much angular deviation during operation. | Use a wide angle shaft or disconnect the PTO when cornering. |
| | Roller too short or too long. | Change the PTO shaft to another one. Align the shaft according to the instructions in the manual provided by the shaft manufacturer. |
| The front wall does not move | Incorrectly connected hydraulic installations | Check and possibly improve |
| | Damaged quick coupling of hydraulic installation | Replace |
| | 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 |
| | Too small tractor hydraulic pump performance<br><br>hydraulic tractor pump damaged | Check the hydraulic pump in the tractor. |

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