PRONAR SP. Z O.O.

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

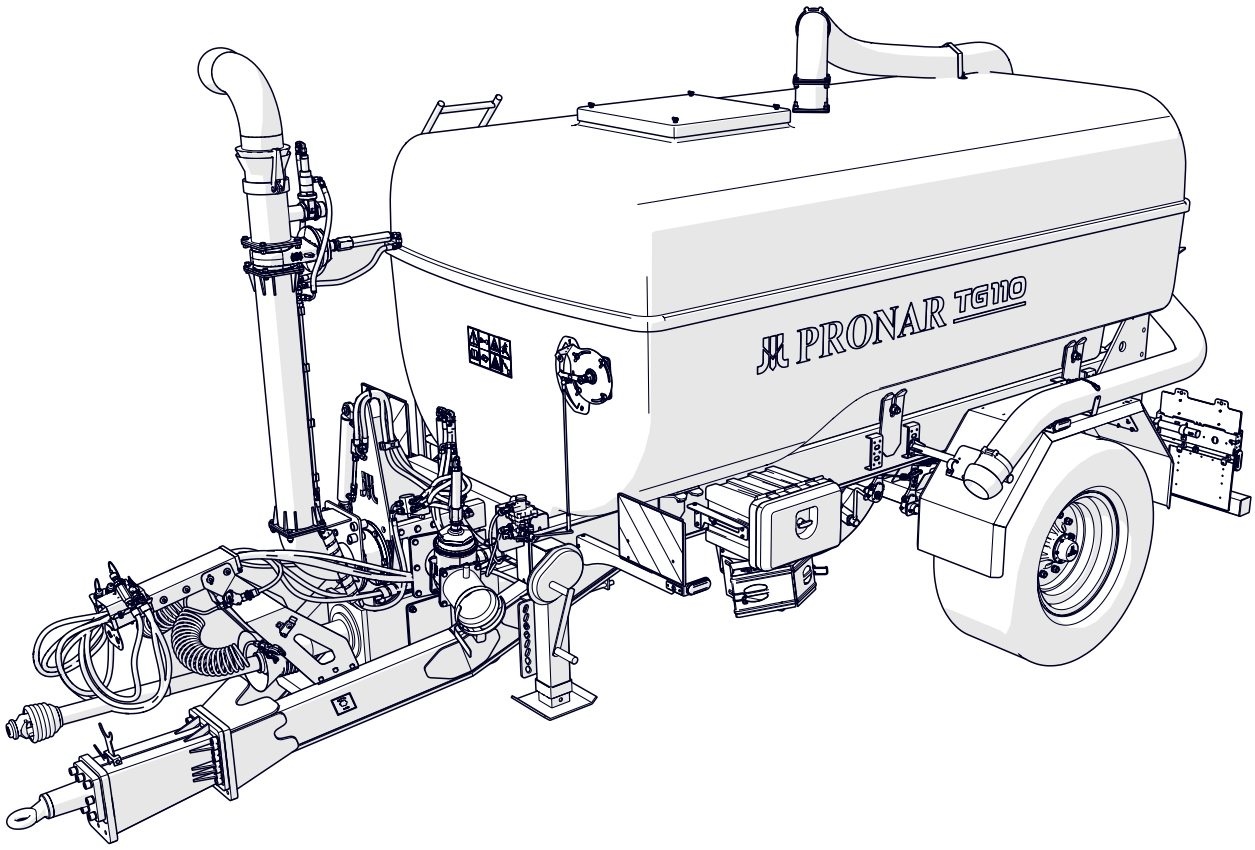
TEL.: +48 085 681 63 29 +48 085 681 64 29
+48 085 681 63 81 +48 085 681 63 82
FAX: +48 085 681 63 83 +48 085 682 71 10

USER MANUAL

SEPTIC TANKER

PRONAR TG110

TRANSLATION OF THE ORIGINAL MANUAL



ISSUE 1A

08-2022

EDITION NO. 649.01.UM.1A.EN

EN

Manufacturer's address
PRONAR Sp. z o.o.
ul. Mickiewicza 101A
17-210 Narew

Contact phones
+48 085 681 63 29
+48 085 681 64 29
+48 085 681 63 81
+48 085 681 63 82

Website
www.pronar.pl
https://pronar-recycling.com/pl/

Service hotline
+48 085 682 71 14
+48 085 682 71 93
+48 085 682 71 20
serwis@pronar.pl

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

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.

Table of contens

PRONAR Sp. z o.o.
ul. Mickiewicza 101 A
17-210 Narew, Polska
tel./fax (+48 85) 681 71 00,
fax (+48 85) 681 63 83
http://www.pronar.pl
e-mail: pronar@pronar.pl

EC Declaration of Conformity

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

Machine description and identification data	
General description and purpose:	**SLURRY TANKER**
Type:	**TG01**
Model:	**TG110**
VIN number:	
Commercial name:	**TG110 or PRONAR TG110 or slurry tanker TG110 or slurry tanker PRONAR TG110**

referred to in this declaration meets the requirements of the Directive **2006/42/EC** of The European Parliament and of The Council of 17 May 2006 on machinery.

The machine has been designed for and meets the requirements of the following standards:

PN-EN ISO 12100:2012, PN-EN 707:2019-03

This declaration applies exclusively to the machine in the condition, in which it was sold and does not include components or parts added or subsequent modifications made by the final user.

The operator's manual is an integral part of the machine.

The Implementation Department Manager of PRONAR Sp. z o.o., 17-210 Narew, ul. Mickiewicza 101A is authorised to provide the technical documentation.

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

Narew, on 2022-08-18
Date and place issued

Full name of the authorised person, position, signature

CHAPTER 1.

INTRODUCION

PRONAR TG110

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. The activities that can be performed by the operator are marked with the pictogram:

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.

Activities that can be performed by a qualified mechanic are marked with a pictogram:

Activities that can be performed by a qualified electrician are marked with a pictogram:

Activities that can be performed by a qualified plumber are marked with a pictogram:

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.C-002.01.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 Personal protective equipment pictograms

	Work shoes
	reflective vest
	industrial helmet
	working clothes
	respiratory protection
	safety goggles
	protective gloves
	hearing protectors

1.4.5 Qualification pictograms

	operator
	qualified mechanic
	qualified plumber
	qualified electrician

1.4.6 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 trailer 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

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

Defined list

List shows the to-do, which 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***

WST.3.B-004.02.EN

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

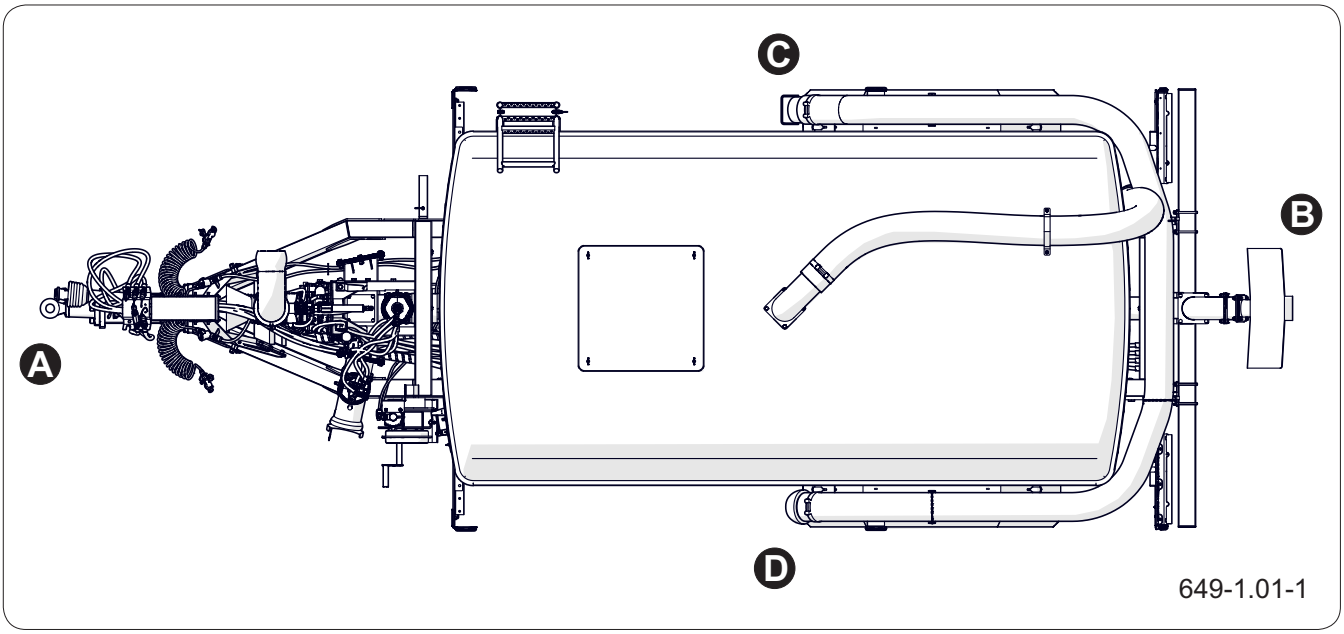
Also known as a bystander - person who has not been trained and has not been allowed to handle the machine.

PTO

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

WST.3.B-005.01.EN

1.6 DESIGNATION OF DIRECTIONS IN THE MANUAL



Rysunek 1.1 Determination of directions on the machine
(A) front *(B) rear (C) right side*
(D) left side

Left side – the left hand side of the observer facing the machine in the forward direction.
Right side - the right hand side of the observer facing the machine in the forward direction.
Turn right – turn the mechanism clockwise (operator facing the mechanism).
Turn *left* – turn the mechanism counterclockwise (operator facing the mechanism).

WST.3.B-006.31.EN

1.7 FINAL ACCEPTANCE

1.7.1 Preliminary information

Final acceptance takes place after the machine has been delivered. The acceptance covers the following issues:

- providing the required documents, including the “User Manual", “Warranty Card" and others,
- information from the seller about the method of use, hazards resulting from using the machine contrary to its intended use and about aggregating the machine with a tractor and working with it.
- checking the machine after delivery,
- first start-up of the machine and discussion of machine operation.

1.7.2 Checking the machine after delivery

The scope of control

- Check the completion of the machine in accordance with the order.
- Check technical condition of guards.
- Check the condition of the paint coating, check for any signs of corrosion.
- Check the machine for missing parts or damage resulting from incorrect transport of the machine to its destination point (dents, punctures, bends or broken parts, etc.).
- Check the condition of the tires on the road wheels and the air pressure in the tires. Check the correct tightening of the wheels.
- Check the technical condition of flexible conduits of the hydraulic and pneumatic systems. Make sure the layouts are tight.
- Inspect the hydraulic and/or pneumatic cylinders for leaks and leaks.

1.7.3 The first start of the machine

The start-up must be preceded by training conducted by the Seller or authorized employees of the Seller.

The scope of activities for the first start-up

- Make sure that the pneumatic, hydraulic and electrical connections on the agricultural tractor comply with the manufacturer's requirements.
- Check all lubrication points, re lubricate if necessary.
- Drain the air reservoir the brake system.

If the condition of the machine does not raise any objections, go to the test drive:

- Connect the machine to the tractor hitch.
- Connect the pneumatic, hydraulic and electrical conduits.
- By activating the individual lights, check the correct operation of the electrical system.
- Control the correct operation of the hydraulic system by controlling the appropriate circuits of the tractor's hydraulic distributor.

  Optionally, start the PTO and check the operation of the hydraulic system of the machine driven by the tractor's PTO shaft.
- Apply the brake.
- While moving off, check the operation of the main brake system.
- Release the tractor parking brake.

If during the test run, alarming symptoms appear, such as:

- Noise and unnatural sounds coming from the rubbing of moving parts against the machine structure,
- Leaking braking system,
- hydraulic oil leaks,
- Incorrect operation of hydraulic and/or pneumatic actuators,

or other faults, diagnose the problem. If the fault

cannot be repaired or repairing it may void the warranty, contact the point of sale to explain the problem or make repairs.
After completing the test run, check the tightness of the wheel nuts.

WST.3.B-007.01.EN

1.8 ENVIRONMENTAL HAZARD

DANGER

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

CAUTION

Oil waste may only be delivered to a point dealing with the utilization or regeneration of oils. Under no circumstances should oils be poured into drains or water bodies.

A leakage of hydraulic, lubricating or diesel oil is a direct threat to the natural environment due to the limited biodegradability of the substance.

When carrying out maintenance and repair works where there is a risk of leakage, perform these works in rooms with an oil-resistant surface. In the event of a substance leak into the environment, first secure the source of the leak, and then collect the spilled substance using available means. Collect the remaining oil with sorbents or mix with sand, sawdust or other absorbent materials. The collected contaminants should be stored in a sealed and marked container, resistant to hydrocarbons, and then transferred to a disposal point. The container should be kept away from heat sources, flammable materials and food.

Used oils or oils that cannot be reused due to the loss of their properties are recommended to be stored in their original packaging in the same conditions as described above.

WST.3.B-008.01.EN

1.9 PERSONAL PROTECTIVE EQUIPMENT

1.9.1 General

CAUTION

Personal protective equipment should be used in accordance with the recommendations of the security manufacturer.

Follow local regulations regarding personal protective equipment.

The personal protective equipment listed below is a minimum protection for the operator against the effects of unfavourable external factors and is only a recommendation for use.

We recommend carrying out a risk assessment at the machine's workplace and adjusting the personal protective equipment of operator depending on the actual working conditions.

1.9.2 Work clothing

Work clothing should fit the operator's body correctly. The material from which the clothing is made should be characterized by high tear strength. Clothing must not have any protruding elements that may be accidentally caught by the mechanisms of the machine.

1.9.3 Hearing protectors

It is recommended to use of ear muffs for use with a protective industrial helmet for hearing protection. The selection of the damping value should be selected individually depending on the noise level at the location of the machine, which is the result of various sources (e.g. tractor, loader, belt conveyors, etc.).

Remember to properly store and maintain your hearing protectors. Poorly stored and maintained hearing protectors lose their protective properties over time. Periodically replace the soundproofing cushions according to the manufacturer's recommendations.

1.9.4 Work shoes

Work shoes should have the following properties:

- non-slip sole,
- sole material made of a material resistant to oils, gasoline and other organic solvents.
- toe cap resistant to impact with an energy of 200 J,
- insert securing the foot against piercing of the sole.

The above properties correspond to the S3 shoe category according to PN-EN ISO 20345.

1.9.5 Warning vest

The warning (reflective) vest is designed to increase the operator's visibility to other users. Instead of a reflective vest, you may wear work clothes that meet the requirements of EN471. It is recommended that the warning vest (or work clothing) be class 2.

1.9.6 Protective gloves

Protective gloves should be selected depending on the currently performed work.

Strong protective gloves

Strong protective gloves for hand protection are used for protection during heavy work such as cleaning the machine, removing clogs and the like, where there is a risk of damaging the hands. Protective gloves should protect the hands from cuts, scratches, abrasions, punctures and similar injuries to the skin and

against light burns in contact with hot surfaces.

Light protective gloves

For light work (general operation, minor maintenance etc.), we recommend using light protective gloves for work in a dry or slightly oily environment. The working surface of the gloves (internal part should be covered with an impermeable material, e.g. nitrile.

Nitrile gloves

Nitrile gloves designed for working with urea, fuel or lubricants. They are designed for light work where there is a risk of skin contact with lubricants, fuel, urea, gear oil and hydraulic oil.

1.9.7 Safety glasses with side shields

Safety glasses to protect the eyes against contact with hazardous substances, splashing liquids or dust and airborne of the machine dust. Safety glasses with side shields increase the level of protection.

1.9.8 Industrial protective helmet

The industrial safety helmet is designed to protect the head against injuries related to the fall of thrown objects, parts or materials. The design of the helmet should be in accordance with the EN397 standard. During normal machine operation, wearing lightweight industrial helmets will not protect the user from injury and is therefore not recommended.

The protective helmet must fit correctly to the anatomical shape of the skull. There are adjustment straps for this purpose. The helmet has a limited shelf life.,

After this date, the material from which it was made loses its properties and does not fulfil the assumed task. The helmet must be replaced.

1.9.9 Anti-dust respirator

CAUTION

Remember that personal protective equipment should be regularly maintained and used in accordance with the recommendations of the product manufacturer. Following these guidelines will ensure safe use and the best protection.

Dust can become airborne when operating the machine. It is recommended to use disposable respirators with an exhalation valve to protect the respiratory tract.

The size of the mask should match the operator's face. The mask should fit snugly against the skin. The nasal part should be adjusted using the adjustment plate. Remember that facial hair can make it difficult to seal the face mask.

Minimum half mask recommendations:

- type FFP1, in accordance with EN-149: 2001 + A1: 2009, protection against non-toxic liquid or solid aerosols,
- P1 class.

WST.3.C-004.01.EN

CHAPTER 2

GENERAL

PRONAR TG110

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.

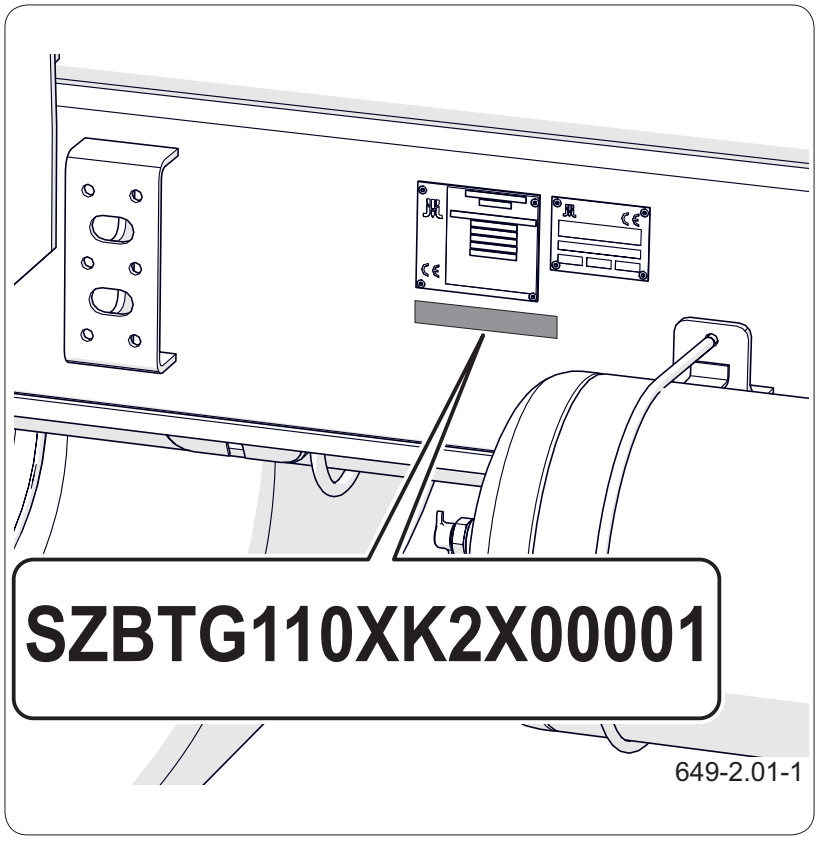


Figure 2.1 Machine identification
(1) rating plate *(2) CE rating plate*
(3) VIN number location

The machine is marked with the name plates (1) and the serial number (2) placed on the highlighted rectangular field on the machines frame. The serial number and rating plates are as shown in figure (2.1). When purchasing the machine, check the compliance of the serial numbers on the machine with the number written in the *Warranty Card*, in the sales documents and in *the User Manual*. Tables show the meaning of particular fields placed on rating plates.
Record the trailer's serial number in the top field.

Table 2.1. EU nameplate markings

Item	Meaning
A	Vehicle category, subcategory and speed rating
B	Approval certificate number
C	Product VIN number
D	Permissible total weight
E	Permissible load on the coupling
F	Maximum permissible weight per axle 1
G	Maximum permissible weight per axle 2
H	Maximum permissible weight per axle 3
I	Technically permissible towed masses

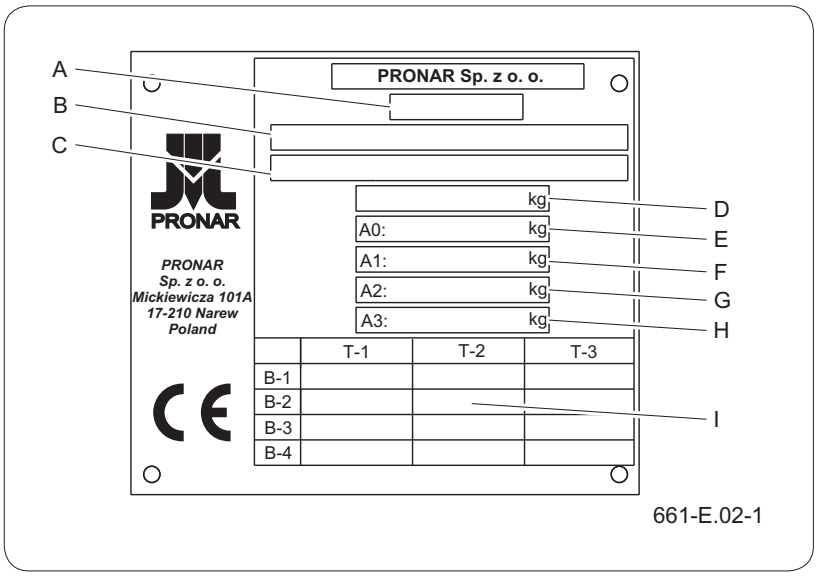


Figure 2.2 Name plate

Table 2.2. CE nameplate markings

Item	Meaning
A	Product trade name or generic designation and function
B	Product VIN number
C	Product type (assigned in the EU approval process)
D	Year of production of the machine
E	Product model

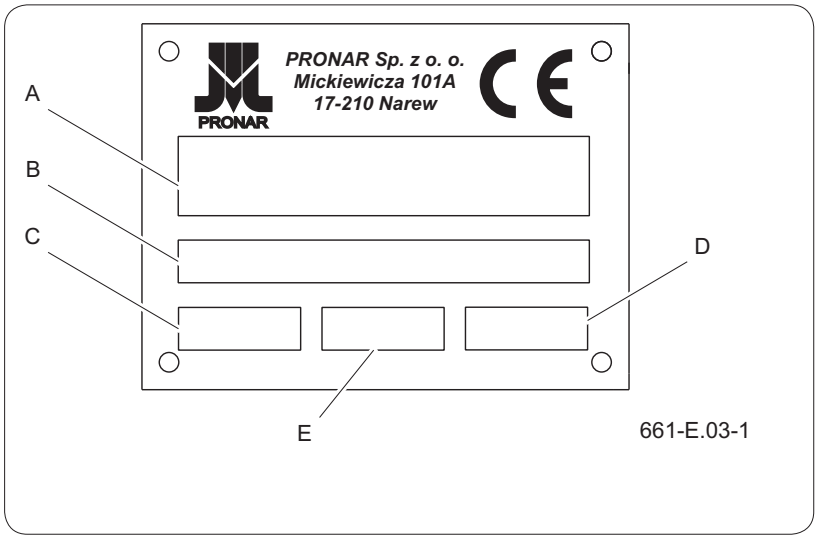


Figure 2.3 CE Name plate

2.1.2 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(2.3). After purchasing of the machine, it is recommended to enter the individual serial numbers in the fields below.

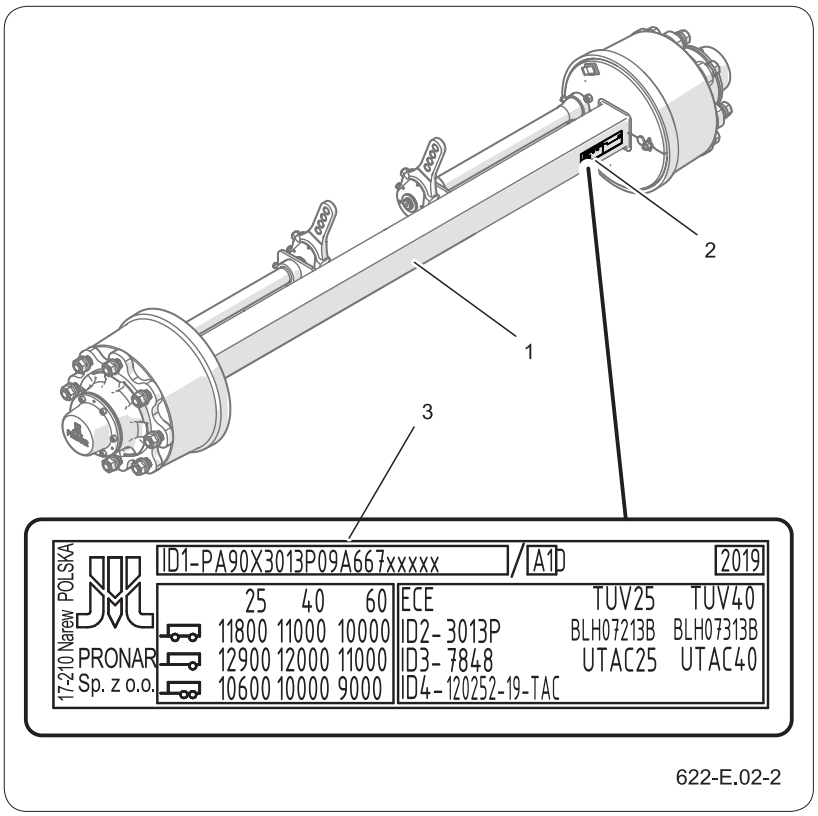


Figure 2.4 Axle identification
(1) driving axle
(2) name plate
(3) axle serial number

INF.3.G-001.11.EN

2.2 INTENDED USE OF THE MACHINE

2.2.1 Using the machine in accordance with intended use

DANGER

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

The septic tanker is designed for work related to the transport, pumping and spreading of liquid substances such as slurry, water (not intended for food purposes), municipal sewage and clarified sludge. The machine can be used in field work, within the farm and for driving on public roads.

Failure to comply with the recommendations for the transport and loading of goods specified by the Manufacturer and the regulations on road transport in force in the country in which the machine is used will invalidate the warranty and is treated as using the vehicle contrary to its intended use.

The septic tanker 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 machine is used, the limits stipulated by the road traffic law in force in a given country must be observed.

The machine speed cannot exceed the maximum design speed of 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,
- understanding of the principle of machine operation and the safe and proper operation of the vehicle,
- act in compliance with established maintenance and adjustment plans,

- work in compliance with general safety regulations,
- accident prevention,
- comply with the road traffic regulations and transport regulations in force in the country in which the machine is used,
- become familiar with the content of the tractor unit operator's manual and follow its recommendations,
- couple the vehicle only with such an agricultural tractor that meets all the requirements set by the machine's Manufacturer.

The septic tanker may only be used by persons who:

- become familiar with the contents of publications and documents attached to the machine and the contents of manual of agricultural tractor,
- have been trained in the use of the machine and work safety,
- have the required driving license and are familiar with the road traffic regulations 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,
- slurry storage (gas production and accumulation),
- transport of dangerous materials, loads that have an aggressive effect as a result of chemical reactions on the structural elements of the machine (causing steel corrosion, damaging paint coatings, dissolving plastic elements, destroying rubber elements, etc.),
- transport of improperly secured cargo that could cause road and environmental pollution while

driving,

- driving with improperly secured elements of the machine's equipment, which could cause dangerous road situations while driving,

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.G-002.01.EN

2.3 AGRICULTURAL TRACTOR REQUIREMENTS

Table 2.3. Agricultural tractor requirements

Content	Unit	Requirements
		TG110
Braking system - sockets		
Pneumatic 2 - line	-	in accordance with ISO 1728
Maximum pressure of the system		
Hydraulic	bar/MPa	200 / 20
Pneumatic	bar/kPa	8 / 800
The hydraulic system		
Hydraulic oil	-	L HL 32 Lotos (1)
Maximum pressure of the system	bar/MPa	200 / 20
Electrical system		
Connection of electrical installation	V	12
Lighting socket	-	7-pole according to ISO 1724
Remote control power socket		3-pole
Tractor hitch required		
Type of hitch	-	lower transport hitch
Minimum vertical load capacity of the hitch	kg	3,000
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		
Minimum tractor power requirement	kW/HP	59 / 80

(1) – it is allowed to use other oil, provided that it can be mixed with the oil flooded in the trailer. Detailed information can be found in the product information sheet.

2.3.1 Minimum load on the front axle of the tractor

CAUTION

The load on the front axle of the tractor must be at least 20% of its own weight - this also applies to transporting a loaded trailer. If this condition is not met, additionally load the front axle. danger

DANGER

Inadequate weighting of the front axle of the tractor may cause damage, insufficient stability and the ability to steer and brake the tractor.

The front axle of the agricultural tractor must always be loaded with at least 20% of the empty weight of the tractor.

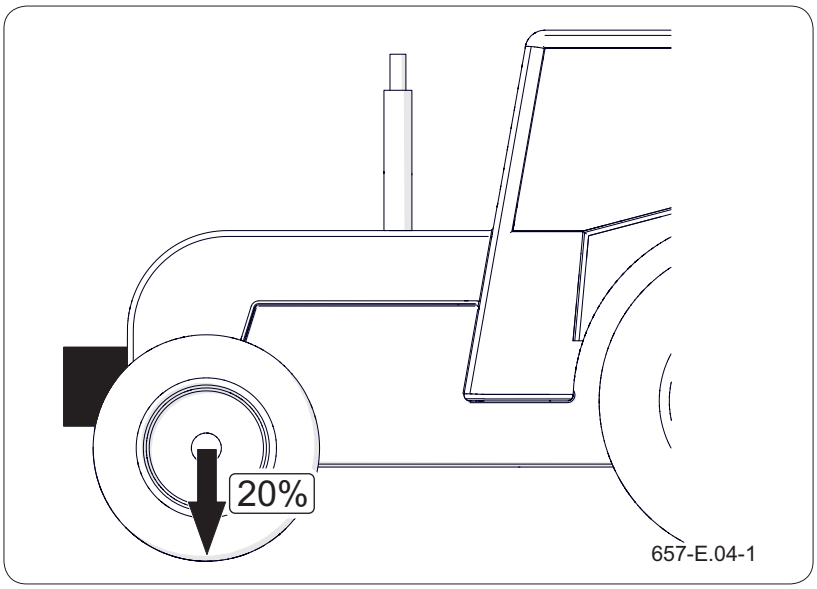


Figure 2.5 Minimum load on the front axle of the tractor

INF.3.G-003.01.EN

2.4 MACHINE EQUIPMENT

Table 2.4. Equipment of the septic tanker

Content	Standard	Additional	Optional
User manual	●		
Warranty Card	●		
connection cable of the electrical system	●		
Electrical lighting installation	●		
Wheel chocks	●		
Ladder	●		
Drawbar support	●		
Rotary tie rod 50	●		
K80 ball tie rod			●
Tank made of plastic	●		
Suction pipes	●		
Parking brake	●		
PTO shaft	●		
Two-line pneumatic brake system	●		
Dosing system (spreader)	●		
Filling and mixing system	●		
Docking mechanism		●	
Fill indicator	●		
Tool box	●		
Rear hydraulic outlets		●	

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

INF.3.G-006.01.EN

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 car or independent transport (towing the machine with a carrier).

2.5.1 Trucking

Loading and unloading of a machine 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 of this manual. The machine's braking system must be started and checked before driving off 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

DANGER

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

The driver of the car should exercise particular care while driving. 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 application of securing measures may cause an accident.

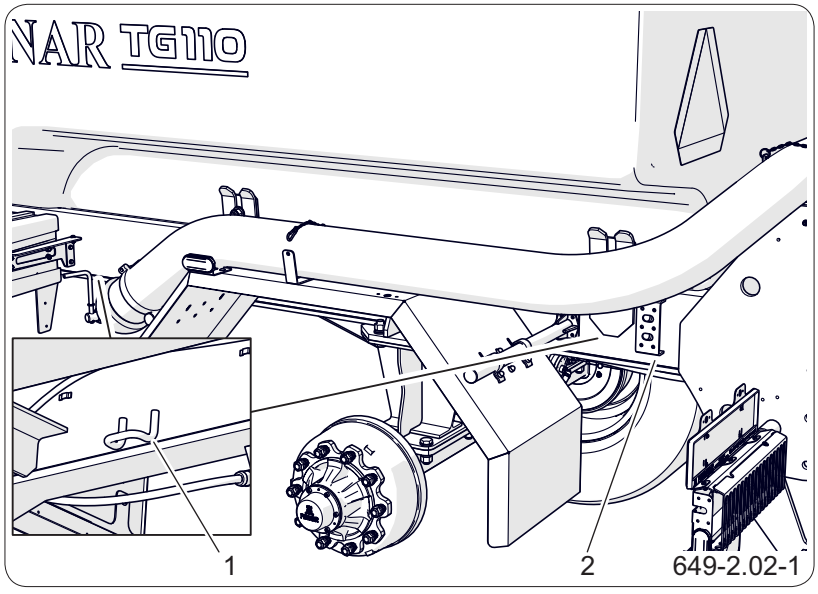


Figure 2.6 Trailer attachment points
(1) handle *(2) lower frame*

CAUTION

It is forbidden to attach slings and any kind of fastening elements to the elements of the hydraulic system, electric system and fragile elements of the machine (e.g. covers, wires).

mechanism. Attach the securing elements to the intended transport lugs (1).

Chocks or other elements without sharp edges should be placed under the machine 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 certified and technically efficient securing measures. Worn straps, cracked fasteners, bent or corroded hooks or other damage may disqualify the agent from use. Familiarize yourself with the information contained in the operating instructions of the manufacturer of the securing agent used. The number of fastening elements (ropes, belts, chains, lashings, etc.) and the force needed to tension them depend, among others, on the weight of the machine's own, the structure of the transporting car, travel speed and other conditions. Therefore, it is not possible to specify the fastening plan in detail.

In order to correct attach the machine to the loading platform, support the drawbar by placing a support in the form of a wooden block under it. A properly attached machine will not change its position relative to the transporting vehicle. The fastening means must be selected in accordance with the guidelines of the manufacturer of these elements. In case of doubt, a larger number of attachment and securing points for the machine should be used. If necessary, protect the sharp edges of the machine, 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 machine, read the

CAUTION

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

machine Operator's Manual and follow its recommendations. Independent transport involves towing a machine 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.

INF.3.G-005.21.EN

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

INF.3.B-006.01.EN.

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.

INF.3.B-007.01.EN.

2.8 WITHDRAWAL

DANGER

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

DANGER

During dismantling, use appropriate tools and equipment (overhead cranes, elevators, lifts, etc.) and use personal protective equipment, i.e. protective clothing, footwear, gloves, glasses, etc.

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

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.

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.

INF.3.B-008.01.EN

Table 2.8. 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	Worn tires
11	17 04 05	Iron and steel
12	17 04 11	Cables other than those mentioned in 17 04 10

CHAPTER 3

SAFETY OF USE

PRONAR TG110

3.1 BASIC SAFETY RULES

CAUTION

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

- Before using the machine, please read carefully 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 machine 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 machine.
- Familiarize yourself with all machine controls before starting work. Do not use the machine without knowing its function.
- Before each start-up of the machine, 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 machine 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 carriers, including children, people under the influence of alcohol, drugs or other intoxicating substances, etc.

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

BHP.3.G-001.01.EN

3.4 SAFETY WHEN OPERATING THE HYDRAULIC AND PNEUMATIC SYSTEMS

DANGER

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

- Regularly check the technical condition of the connections and the hydraulic and pneumatic lines. Machine operation with a leaking system is forbidden.
- In the event of a hydraulic or pneumatic installation failure, the trailer should be turned off from operation until the failure is removed.
- When connecting the hydraulic conduits to the tractor, make sure that the tractor and machine hydraulic systems are not under pressure. If necessary, reduce the residual pressure in the installation. See chapter „*Hydraulic system handling...*".
- Use hydraulic oil recommended by the manufacturer.
- After changing the hydraulic oil, the used oil must be disposed of. 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 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 being caused by pressurized hydraulic oil, contact a doctor immediately. Hydraulic oil can penetrate the skin and cause infection.
- If the oil gets into the eyes, rinse with plenty of water and if irritation occurs, contact a doctor.
- In the event of contact of oil with skin wash the

area of contact with water and soap. Do not use organic solvents (petrol, kerosene).

BHP.3.G-003.01.EN

3.3 SAFETY DURING COUPLING OF THE MACHINE

DANGER

Be especially careful when connecting the machine.

- Do not connect the machine 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 machine, make sure that the oil in the external hydraulic system of the tractor may be mixed with the hydraulic oil of the machine.
- Before coupling of the machine, make sure that both machines are technically sound.

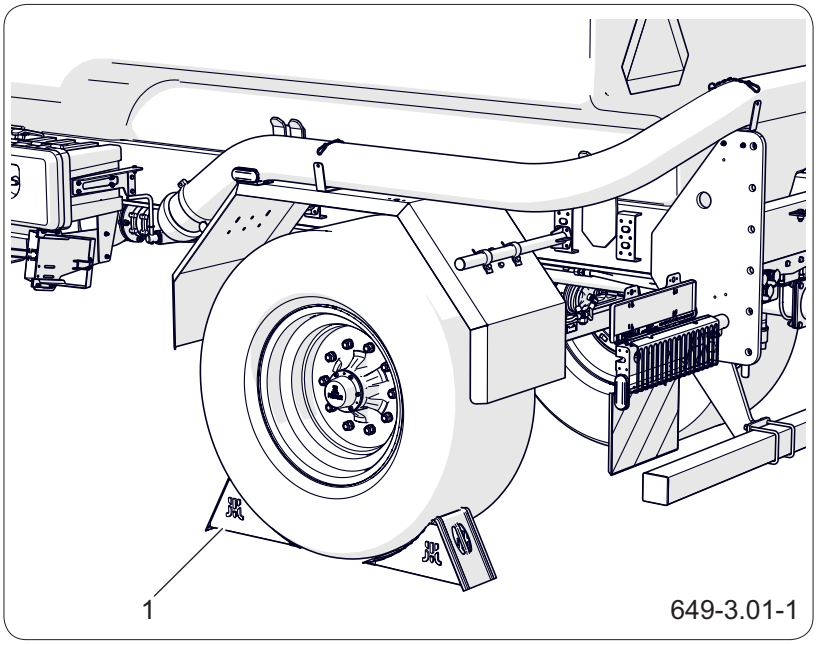


Figure 3.1 Position of the locking wedges
(1) support wedge

- When connecting of the machine to the tractor, use the the appropriate hitch of the tractor. After completing the coupling of the machines, check the coupling protection. Familiarize yourself with the content of the tractor operator's manual. If it is equipped with an automatic hitch, make sure the aggregation operation is complete.

CAUTION

Place wedges only under the wheels of the rigid axle.

- Be especially careful when connecting the machine.
- When attaching, there must be nobody between the machine and the tractor.
- You may couple and uncouple the machine only when the machine is immobilized with the parking brake. If the trailer is standing on a slope or hill, additionally protect it against rolling by placing chocks or other elements without sharp edges under the wheels. Secure the thru-axle wheels. Make sure that the wedges are on the machine.
- Do not move the machine when the support is extended and rests on the ground. While the machine is moving, there is a risk of damage to the support.
- It is forbidden to support the loaded machine with the parking stand. Unload the load before disconnecting the machine from the tractor.

BHP.3.G-002.21.EN

3.6 PRINCIPLES OF SAFE MAINTENANCE

- Keep the machine clean.
- You cannot transport people or animals on the machine
- Keep a safe distance during loading and unloading. Keep bystanders away from the working area of the machine.
- During the warranty period, any repairs should be performed only by Warranty Service authorized by the manufacturer. After the end of the warranty period, it is recommended that any repairs shall be carried out by specialized workshops.
- Whenever you find any faults in operation or damage to the machine, do not use it until it is repaired.
- During maintenance work, use appropriate, close-fitting protective clothing, gloves, shoes, glasses and the right tools.
- Any modifications to the machine release the PRONAR Narew company from liability for any damage or health detriment.
- The machine may only be entered when it is absolutely motionless and the tractor engine is turned off. Secure the set with the parking brake. Secure the tractor cabin against access by unauthorized persons.
- Regularly check the technical condition of the safety devices and the correct tightening of the screw connections (in particular the drawbar eye and wheels).
- Carry out inspections of the machine in accordance with the frequency specified in this manual.
- Before commencing repair works on hydraulic or pneumatic systems, reduce residual oil or air pressure completely. How to proceed See

chapter „*Hydraulic system handling...*" , „*Pneumatic system handling...*"

- Carry out repair, maintenance and cleaning works only with the tractor engine turned off and the ignition key removed. Secure the tractor and the machine with the parking brake and additionally place chocks under the machine wheel. Secure the tractor cabin against access by unauthorized persons.
- Only a completely immobilized machine can be disconnected from the tractor.
- Should it be necessary to replace individual elements, use only the parts recommended by the Manufacturer. If you do not comply with these requirements, you may pose a threat to the health or life of bystanders or machine operators, and contribute to machine damage. This is grounds for voiding the warranty.
- Before welding or electric works, disconnect the machine from the power supply. Clean the paint coating. Burning paint fumes 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 plastics). If there is a risk that they will catch fire or be damaged, remove them or cover them with non-flammable material before welding. Before starting work, have a CO_2 fire extinguisher or foam extinguisher ready.
- In the event of work requiring the machine to be raised, use properly certified hydraulic or mechanical lifts for this purpose. After lifting the machine use additional stable and durable supports. You cannot perform any work under the machine, which has only been lifted with the

jack.

- Do not support the machine with fragile elements (bricks, hollow blocks, concrete blocks).
- After completing work connected with lubrication, remove excess oil or grease. Keep the machine clean.
- You cannot repair elements of the hydraulic or pneumatic system yourself, i.e. control valves, actuators and regulators. In the event of damage to these elements, have them repaired at an authorized repair point 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 machine 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.
- If you experience more serious injury, seek medical advice.

BHP.3.G-004.01.EN

3.5 DESCRIPTION OF RESIDUAL RISK

Pronar Sp. z o. o. in Narew has 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 machine for purposes other than described in the manual,
- being between the tractor and the machine when the engine is running and when connecting the machine,
- operation of the machine by people under the influence of alcohol or other intoxicants,
- operation of the machine by unauthorized persons,
- being on the machine during work,
- cleaning, maintenance and technical inspection of the machine.

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

- prudent and unhurried operation of the machine,
- 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 working,
- maintenance work carried out by trained personnel,
- using appropriate fitted protective clothing,
- securing the machine against access by unauthorized persons, especially children.

BHP.3.G-005.01.EN

3.6 DRIVING ON PUBLIC ROADS

- When driving on public roads, you must make sure that the machine and tractor are equipped with a certified or approved reflective warning triangle.
- Place a triangular *"slow-moving vehicle"* sign on the rear wall;
- Before driving on the road, remove the tail light covers.
- When driving on public roads, comply with the road traffic regulations and transport regulations in force in the country in which the machine is used.
- Do not exceed the maximum design speed 40km/h. The driving speed must be adapted to the environmental conditions and the load. If possible avoid driving over rough terrain and unexpected turns.
- Never leave the machine unsecured. The machine disconnected from the tractor must be without load, immobilized with the parking brake and secured against rolling away with the use of wedges or other elements without sharp edges placed under the vehicle wheel.
- Before driving, make sure that the machine is correctly attached to the tractor, especially that the hitch pins are secured.
- Vertical load carried by the machine drawbar eye affects the steering of the agricultural tractor.
- Before each use of the machine, check its technical condition, especially in terms of safety. In particular, check the technical condition of the hitch system, chassis, braking system and light signaling, as well as connection elements of the hydraulic, pneumatic and electrical systems.
- Make sure the parking brake is released before

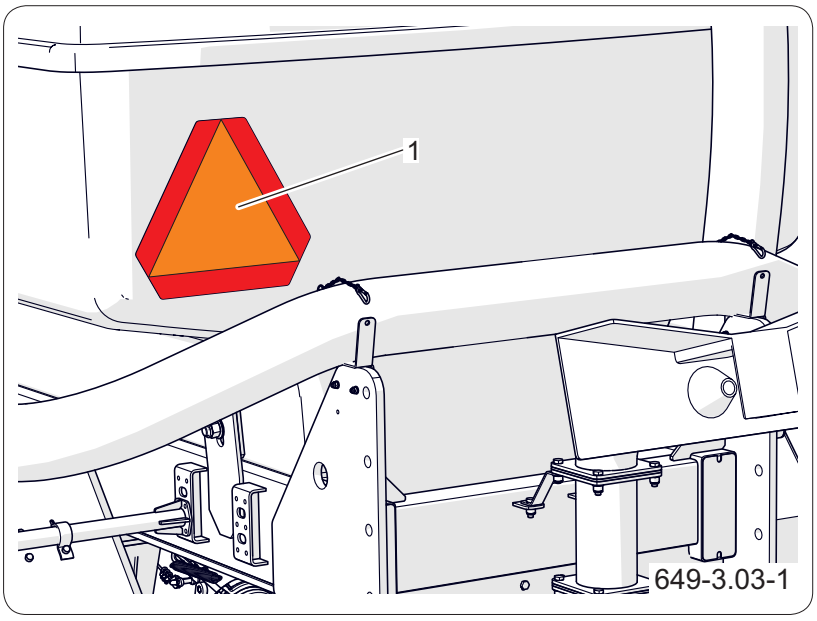


Figure 3.2 Warning triangle
(1) Plate for slow-moving vehicles

driving.

- The machine is adapted for driving on slopes up to a maximum of 8^0 Driving with machine on steeper slopes may of the machine the set to tip over as a result of loss of stability.
- Periodically drain the air reservoir in the pneumatic system. During frosts, freezing water may cause damage to pneumatic system components.
- Reckless driving and high speed can cause an accident.
- It is forbidden to transfer materials not permitted by the Manufacturer.
- Do not exceed the maximum machine loading capacity. Exceeding of the loading 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 adjusted to the total weight of the machine, exceeding which will drastically reduce the operation of the main brake.
- Prolonged driving on slopes creates the risk of

losing braking effectiveness.

- When reversing, use the help of another person. While manoeuvring, the helping person must keep a safe distance from the danger zones and be visible to the tractor operator at all times.
- It is forbidden to get on the machine while driving.
- Parking the the machine on a decline is prohibited.

BHP.3.G-006.01.EN

3.7 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 manufacturer.

- Before starting work, read the operator's manual of the drive shaft provided by the shaft's 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 machine 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 guards. 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 the machine.
- Do not wear loose clothing, loose belts or anything that could get caught in a rotating shaft. Contact with the rotating articulated telescopic shaft may cause serious injuries.
- Before disconnecting the shaft, turn off the tractor engine and remove the key from the ignition switch.
- When working in conditions of limited visibility, use the tractor's working lights to illuminate the articulated telescopic shaft and its surroundings.
- During transport, the shaft should be stored in a horizontal position so as to avoid damaging the guards and other securing elements.
- When using the shaft and the machine, do not use PTO rotation speed other than 540 rpm. Do

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

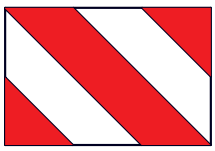
- Do not go over or under the shaft and do not stand on it, both during operation and when the machine is stopped.
- The articulated telescopic shaft has markings on the casing, indicating which end of the shaft should be connected to the tractor.
- Never use a damaged PTO shaft, it may cause an accident. Repair the damaged shaft or replace it with a new one.
- Do not use PTO shaft extensions / adapters.
- Disconnect the drive of the shaft each time when there is no need to drive the machine, or when the tractor and the machine are in an unfavourable angular position to each other.
- Prevent the shaft cover securing chain from turning while the shaft is working, and attach it to a fixed structural element of the machine.
- Do not use safety chains to support the shaft when the machine is parked or transported, use the handle on the drawbar of the machine.

BHP.3.G-007.01.EN

3.8 INFORMATION AND WARNING STICKERS

- The machine is marked with information and warning decals mentioned in table (3.1).
- The arrangement of symbols is shown in figure (3.3). As a user, you are obliged to take care of the legibility of notices, warning and information symbols on the trailer throughout its lifetime.
- 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 catalog numbers of the stickers can be found in the table (3.1) and in the Spare Parts Catalogue. New assemblies replaced during repair must be marked again with the appropriate safety signs. When cleaning of the machine, do not use solvents that may damage the label coating and do not direct a strong stream of water at them.

Table 3.1. Information and warning stickers

Item	STICKER	Meaning
1		The value and direction of rotation of the PTO shaft **75N-00000004**
2		Before starting work, read the User's Manual. Before beginning of any servicing activities or repairs, turn off the tractor and screen engine and remove the key from the ignition switch. Danger of poisoning and explosion. High pressure fluid. Electric shock hazard. Keep a safe distance from overhead power lines **661N-00000003**
3	pronar.pl	Company branding. **566N-97000003-03**
4	PRONAR TG110	Trailer type TG110. **649N-00000001**
5	V=14000L	Tank capacity label. **661N-00000002**
6		Left warning sticker. (282x423)
7		Right warning sticker. (282x423)

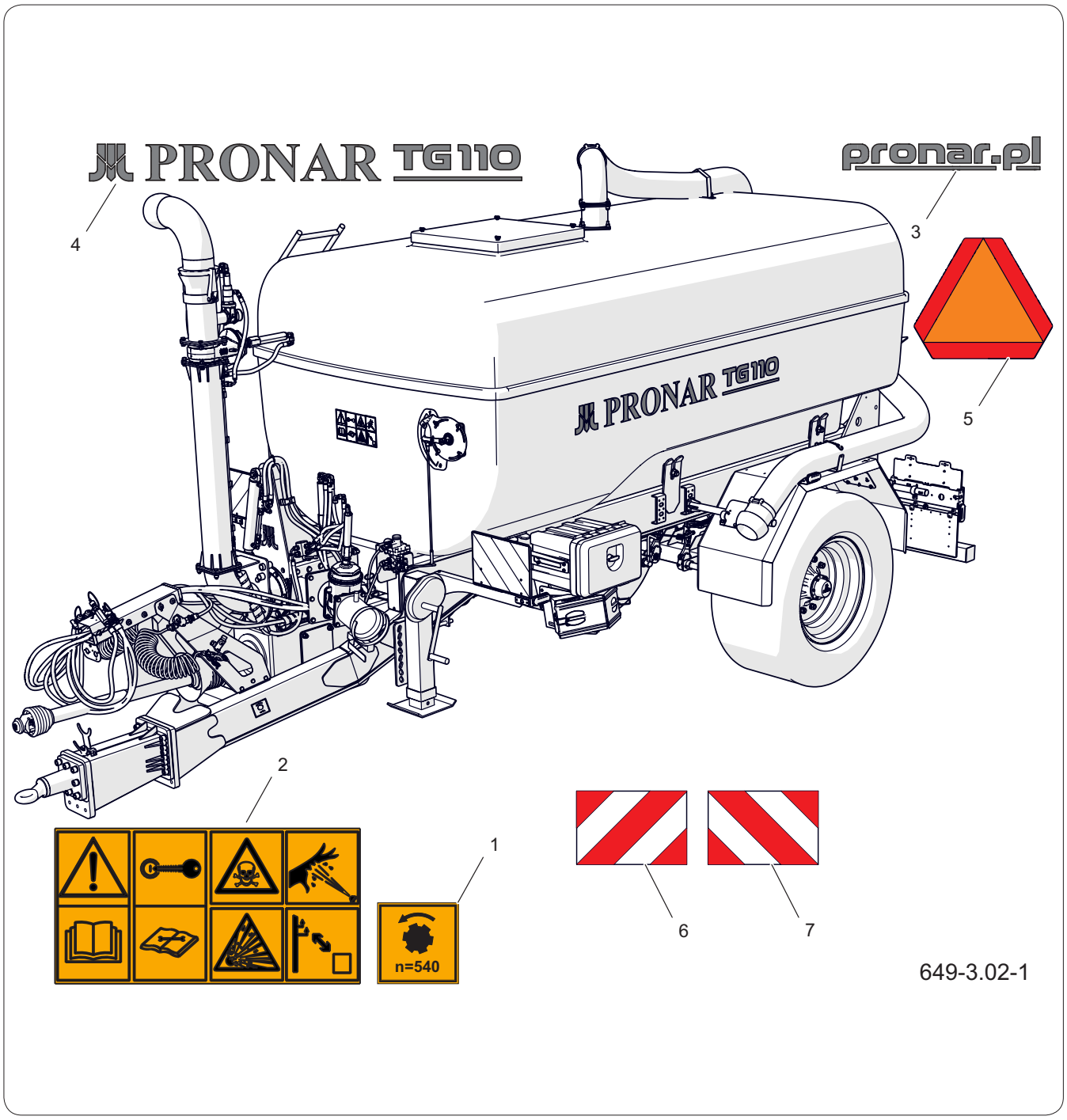


Figure 3.3 Arrangement of information and warning stickers

BHP.3.G-009.01.EN

CHAPTER 4

CONSTRUCTION AND PRINCIPLE OF OPERATION

PRONAR TG110

4.1 TECHNICAL CHARACTERISTICS

Table 4.1. Basic technical data

Content	Unit	TG110
Overall dimensions		
Total length	mm	7 330
Total width	mm	2 550
Total height	mm	3 370
Tank parameters		
Length	mm	4 050
Width	mm	2 080
Height	mm	1 730
Capacity	l	10 000
Tank suspension	-	rigid to the chassis frame
Tank material	-	Plastic
Performance parameters		
Permissible total weight	kg	13 000
Karb weight	kg	3 450
Filling-draining pump	-	cavitation pump (screw)
Maximum hydraulic pump performance	m^3/h	240
Tank filling time	min	4
PTO speed	rpm	540
Direction of PTO rotation	mm	in the clockwise direction
Suction connection	-	6” Perrot type, left / right side
The hydraulic system		
Shutter control	-	hydraulic, automatic with remote control
Pressure of the system	bar	200
Hydraulic oil	-	L-HL32 Lotos
Other information		
Design speed	km/h	40
Track width	mm	1 980
Drawbar eye load	kg	3,000
Min. tractor power	HP/kW	80 / 59
Connection of electrical installation	V	12
Emitted noise level	dB	below 70

** - 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.*

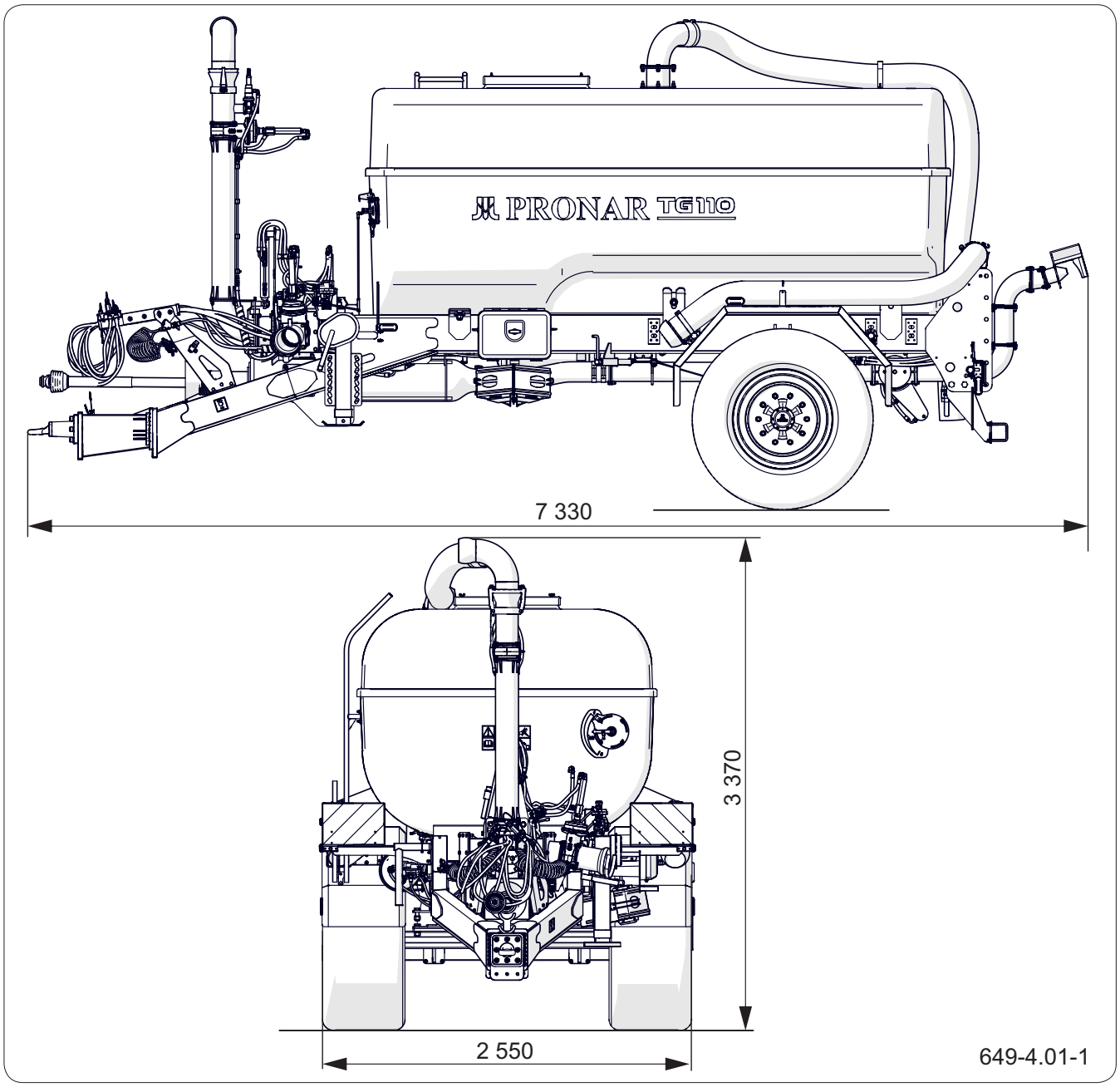


Figure 4.1 Dimensions of the slurry tanker

Table 4.2. Main dimensions of the machine

Content	Unit	TG110
Length	mm	7 330
Height	mm	3 370
Width	mm	2 550

CAUTION

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

BIZ.3.G-012.01.EN

4.2 MACHINE CONSTRUCTION

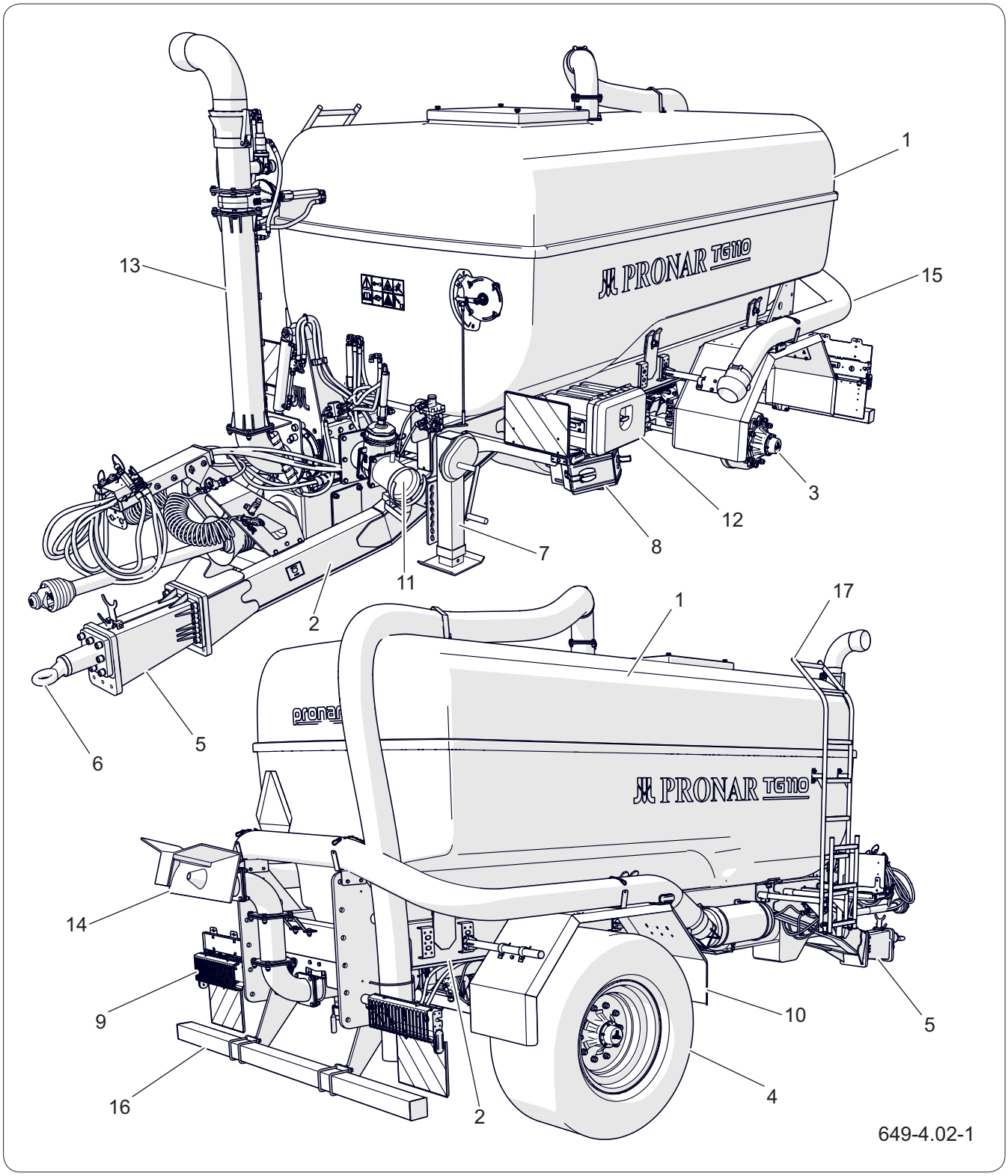


Figure 4.2 Machine construction

(1) tank *(2) lower frame* *(3) axle*
(4) wheel *(5) drawbar* *(6) drawbar eye*
(7) parking stand *(8) support wedges* *(9) lighting beam*
(10) mudguards *(11) filling system* *(12) tool box*
(13) docking system *(14) spreader* *(15) suction pipes*
(16) rear beam *(17) ladder*

The driving system of the machine consists of wheels (4) mounted on axles (3), which in turn are attached to the lower frame (2), on which the tank (1) made of plastic is mounted with screws. The tank is filled and unloaded using the system (11) driven by the tractor's power take-off shaft. The control is carried out using a remote control that performs individual functions of the liquid distribution system.

The machine is coupled to the tractor by means of a drawbar (5) with a drawbar eye (6).

BIZ.3.G-013.01.EN

4.3 PNEUMATIC BRAKING SYSTEM

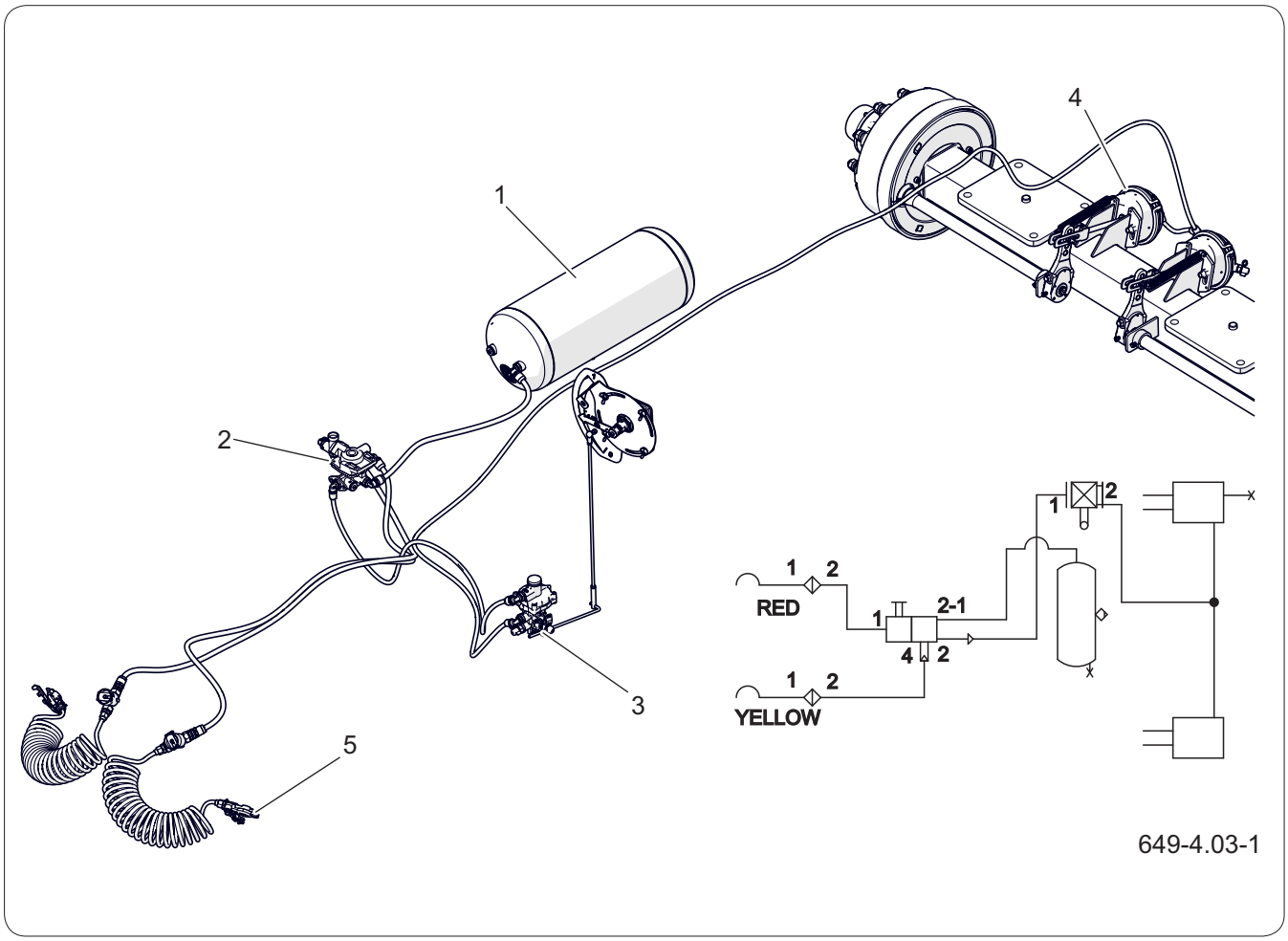


Figure 4.3 Scheme and construction of the pneumatic braking system
(1) air tank *(2) control valve* *(3) brake force regulator*
(4) brake cylinder *(5) pneumatic connection*

ADVICE

Connect the yellow wire first, then the red wire.

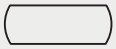
Disconnect the pneumatic hoses in the reverse order.

The pneumatic main brake is activated from the operator's cabin by pressing the tractor brake pedal. In the event of unforeseen disconnection of the brake line between the machine and the tractor, the control valve (2) automatically activates the brake of the machine.

The braking system is equipped with an automatic braking force regulator (3), which adjusts the braking force of the machine to the weight of the transported load.

The control valve has a button (2) that releases the brake, used when the trailer is disconnected from the

Table 4.3. List of symbols used in diagrams

Symbol	Description
	Pneumatic connection, plug
	Pneumatic connection, seat
	Drain valve
	Main control valve
	Relay valve
	Automatic brake force regulator
	Manual braking force regulator
	Connection of wires
	Air reservoir
	Brake cylinder
	Control valve (connector)
	Air filter

tractor. As soon as the air hose is connected to the tractor, the retarder device automatically adjusts itself to the position which enables the brakes to operate normally.

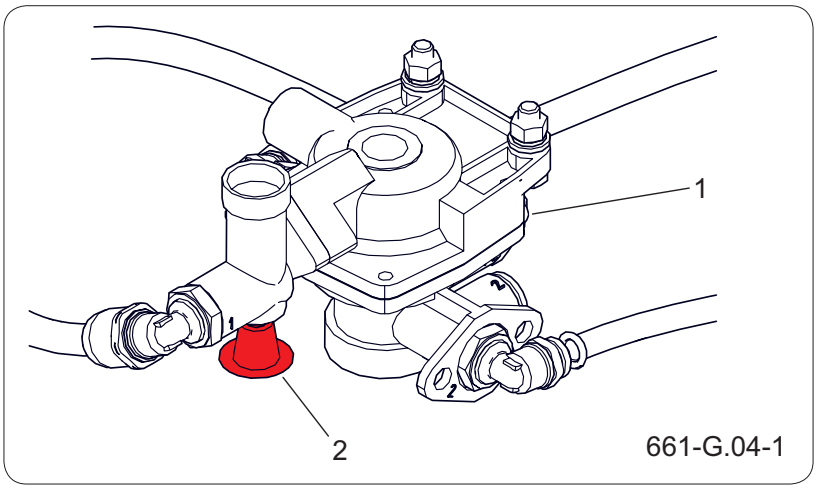


Figure 4.4 Control valve
(1) control valve *(2) release button*

BIZ.3.G-014.01.EN

4.4 PARKING BRAKE

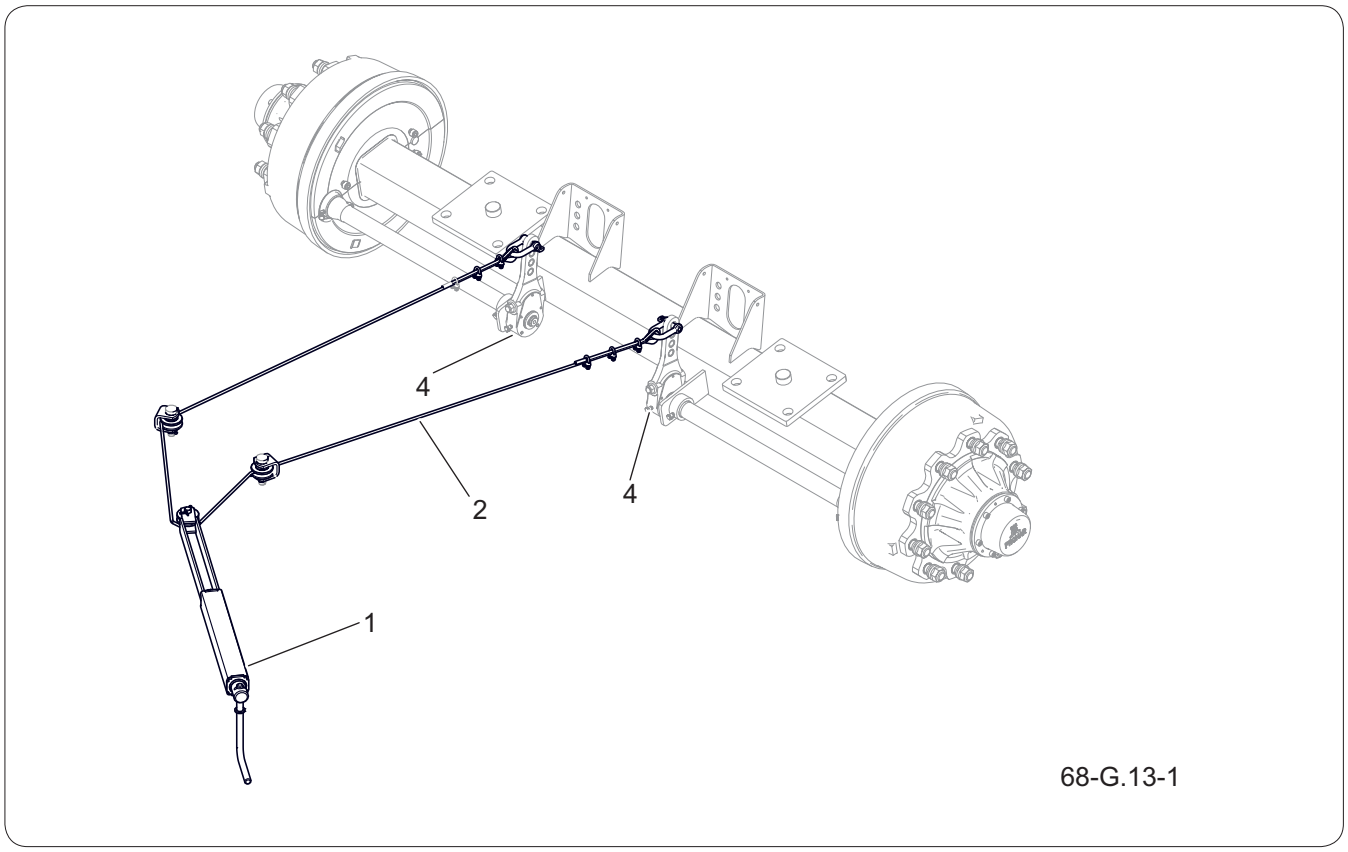


Figure 4.5 Construction of the parking brake
(1) brake mechanism *(2) cable* *(3) lever*
(4) expander lever

The parking brake is used to immobilize the machine 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 machine. Before driving, release the parking brake - the steel cable must hang loosely.

BIZ.3.G-004.01.EN

1.1 TANK

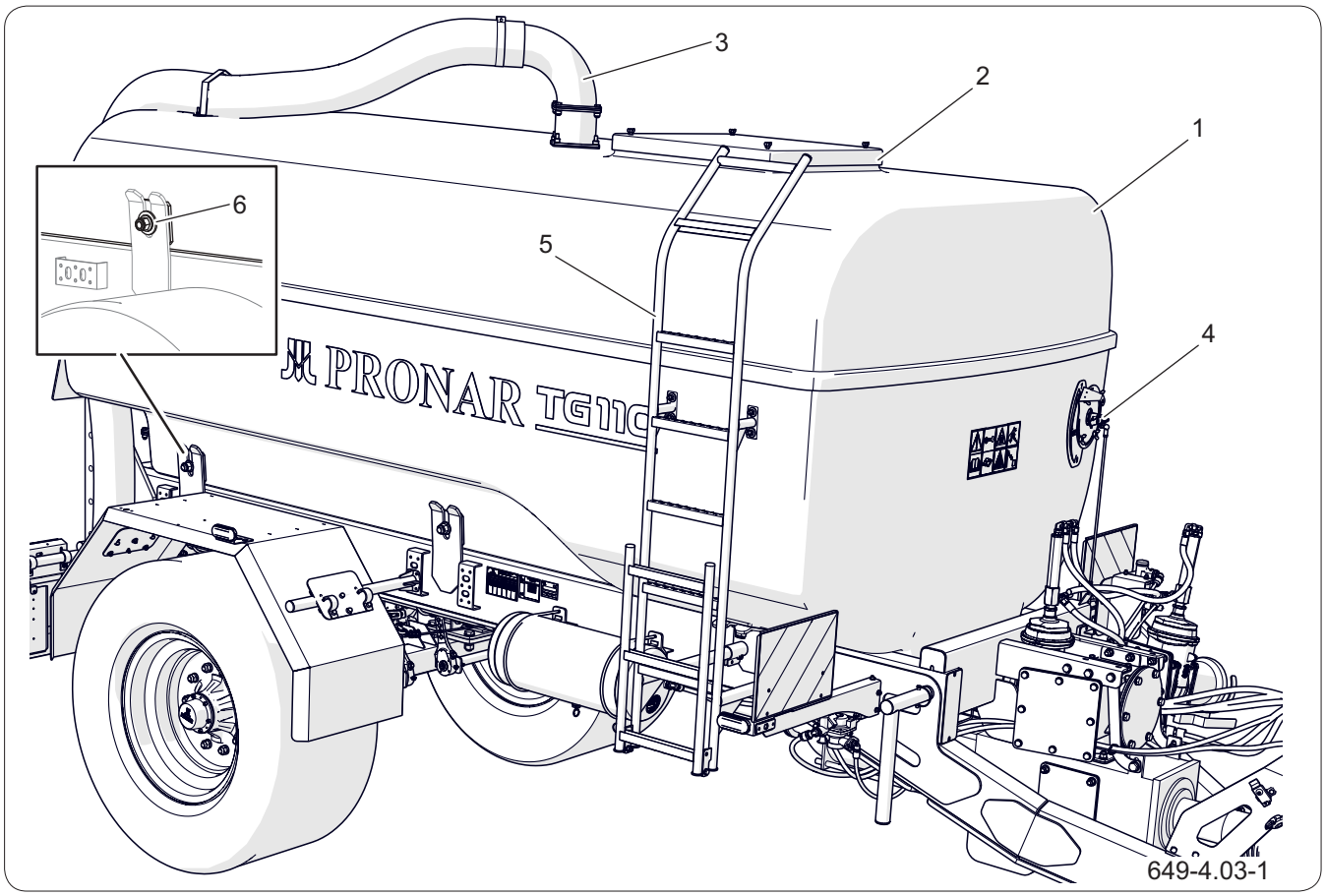


Figure 4.6 Tank construction
(1) tank *(2) manhole* *(3) vent pipe*
(4) filling indicator *(5) ladder* *(6) fasteners*

DANGER

Never leave the tank full due to the possibility of collecting poisonous vapours and gases.

CAUTION

After several trips with a load, check the tightness of screw connections (6).

The tank (1) is made of plastic, resistant to the aggressive action of the transported loads. It is attached to the lower frame with bolted connections (6). A vent line (3) is fitted to the top of the tank for pressureless operation of the machine. The pressure or vacuum generated inside the tank may damage it. Take care of the patency of the vent.

Access to the vent line (3) and manholes (2) is provided by a ladder (5). On the front part there is a float indicator (4).

BIZ.3.G-005.11.EN

4.5 LIQUID DISTRIBUTION SYSTEM

4.5.1 Construction of the pumping system

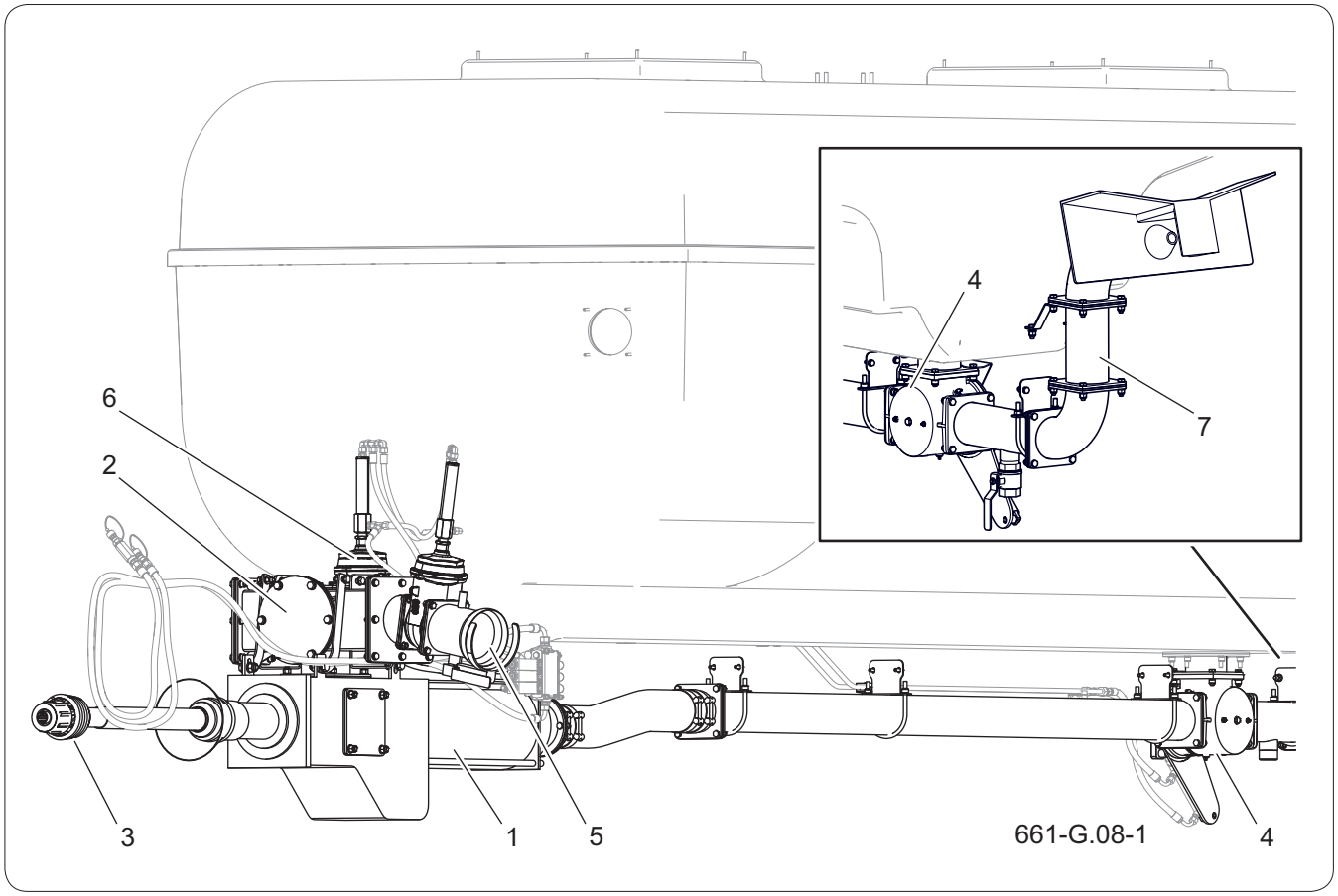


Figure 4.7 Construction of the liquid distribution system
(1) pump *(2) hose connection* *(3) PTO shaft*
(4) three-way gate valve *(5) suction gate valve* *(6) tank gate valve*
(7) spreader

CAUTION

Before starting the PTO drive, check that the shaft is properly secured, that the direction of rotation is clockwise and that the rotation value is 540 rpm.

It is unacceptable to start the PTO drive in the event of a malfunction of the shaft, damaged shields and when there are bystanders in the vicinity. Be especially careful!

The drive from the tractor is transmitted by means of the PTO shaft (3) to the cavitation (screw) pump (1), which fills or empties the tank by means of gate valves. Appropriate setting of the gate valves mixes the transported medium. The design of the system allows the suction of liquid from the right or left side of the machine.

A spreader (7) is installed in the rear part of the vehicle.

Table 4.4. Rear power take-off PTO

Parameter	Unit	Requirements
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

4.5.2 Hydraulic liquid distribution system

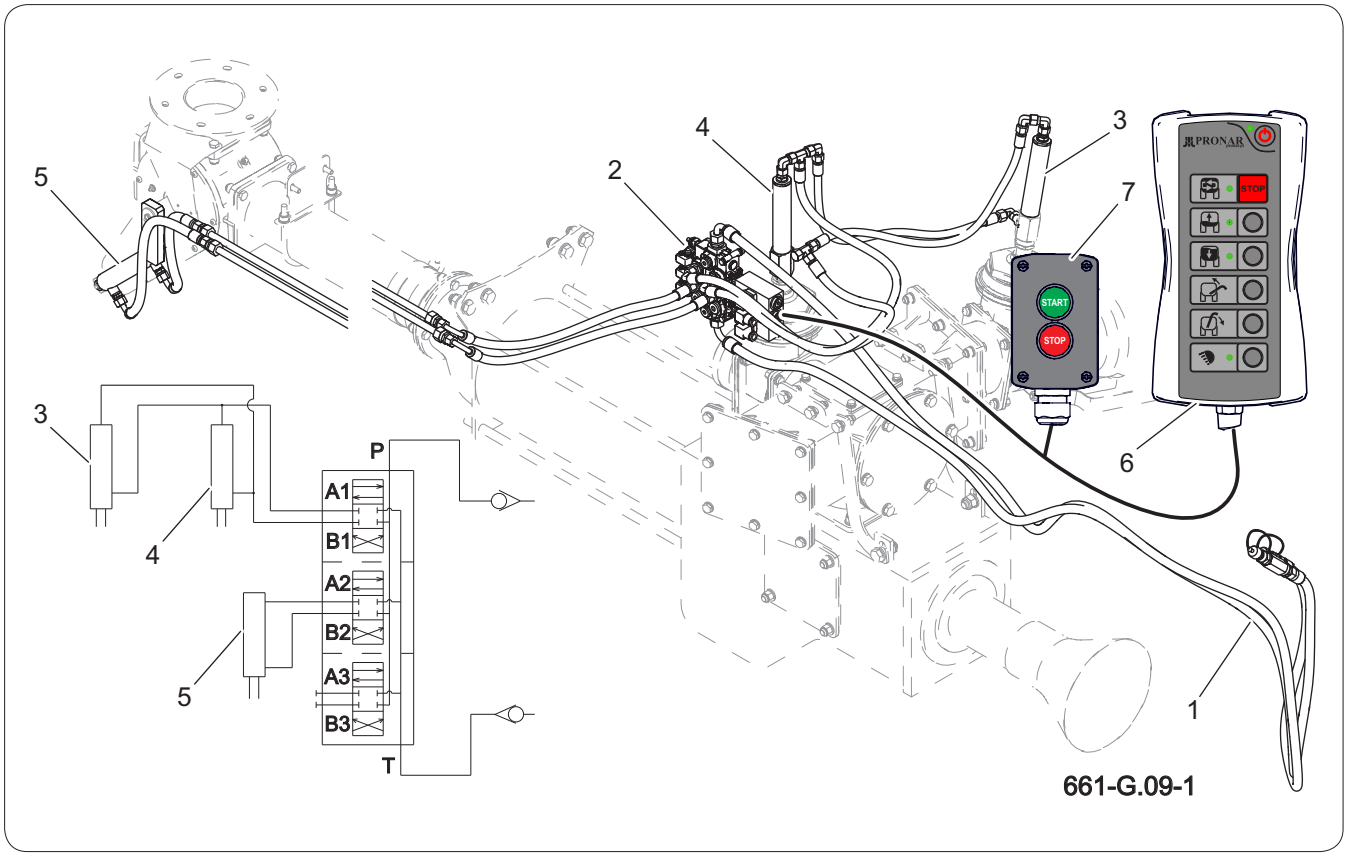


Figure 4.8 Hydraulic liquid distribution system
(1) hydraulic conduits *(2) hydraulic distributor* *(3) suction slide actuator*
(4) tank gate valve actuator *(5) three-way valve actuator* *(6) remote control*
(7) external remote control

ADVICE

The hydraulic system has been filled with L-HL32 Lotos hydraulic oil.

The individual functions of the machine are performed by means of a hydraulic distributor (2), whose individual sections are controlled by remote controls (6) and (7). The oil from the appropriate sections of the distributor goes to the next actuators of the gate valves. In this way, the functions of loading, mixing and unloading of the transported medium are performed.

BIZ.3.G-007.01.EN

CAUTION

Connect the hydraulic hoses first. Then start the remote control, in the last step turn on the tractor's PTO drive.

4.6 DOCKING MECHANISM

4.6.1 Construction of the docking mechanism

ADVICE

The hydraulic system of the docking mechanism has been filled with L-HL32 Lotos hydraulic oil.

DANGER

Before driving, make sure that the docking mechanism is disconnected from the auxiliary suction hoses and folded to the transport (vertical) position.

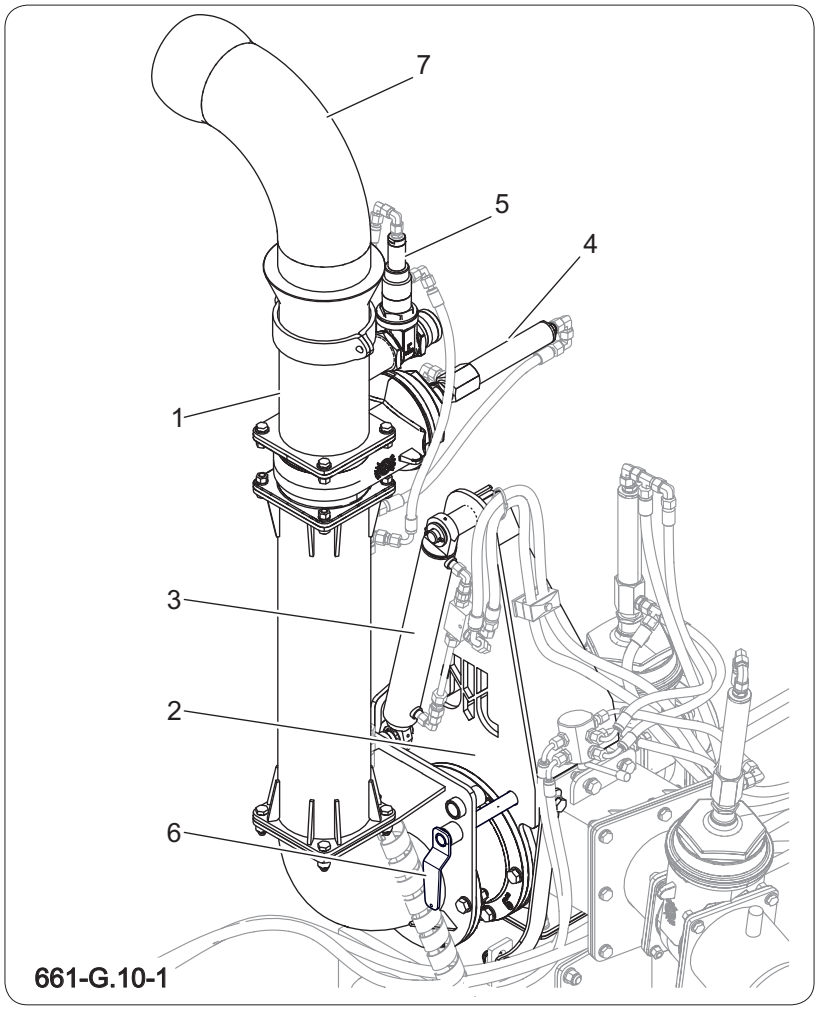


Figure 4.9 Construction of the docking mechanism
(1) suction pipe
(2) mast
(3) hydraulic cylinder
(4) suction gate
(5) vent valve
(6) pin
(7) suction elbow

The docking mechanism is used to load the medium using the suction pipe (1) placed on the mast (2). Lowering and lifting is carried out by means of a hydraulic system operated from the remote control.
The design of the mechanism allows the medium to be sucked from the right or left side of the machine. Changing of the working side of the machine consists in changing the position of the actuator (3) in relation to the mounting mast (2) and rotating the suction elbow (7).

The control of individual gate valves and the change of the position of the docking mechanism are described in the further part of the study. After finishing work, fold the docking mechanism and block its rotation with the pin (6).

4.6.2 Hydraulic system of the docking mechanism

The hydraulic oil is supplied through the hydraulic conduits (1) to the hydraulic distributor (2), which is controlled by the remote control (9). Individual work

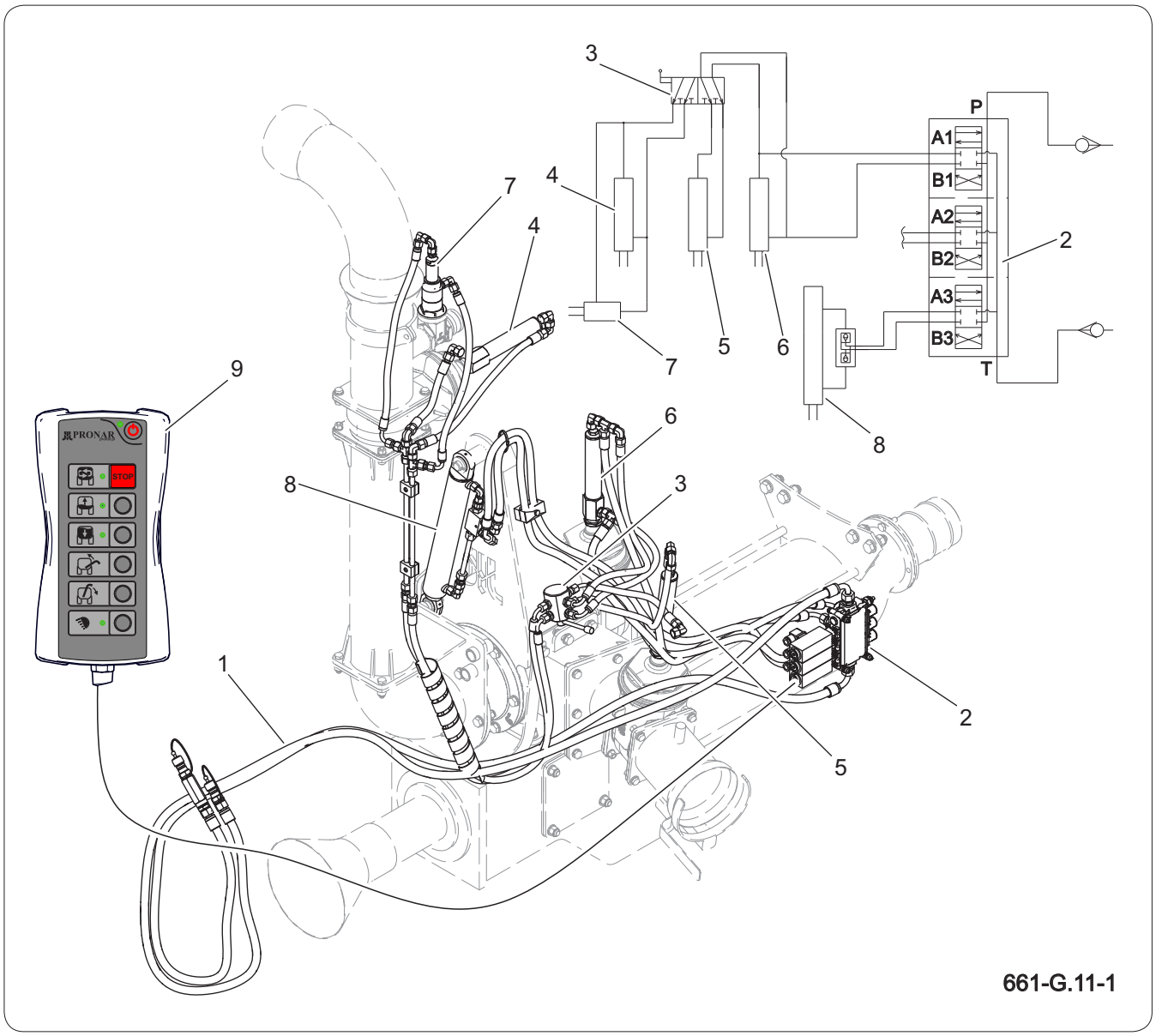


Figure 4.10 Hydraulic system of the docking mechanism
(1) hydraulic conduits *(2) hydraulic distributor* *(3) 6-way valve*
(4) docking latch actuator *(5) suction latch actuator*
(6) tank latch actuator *(7) docking mechanism vent actuator*
(8) cylinder lifting / lowering the docking mechanism tube *(9) remote control*

functions are performed by means of appropriate hydraulic gate valves. The valve (3) switches the side suction to the docking mechanism.

BIZ.3.G-008.01.EN

1.1 REAR HYDRAULIC OUTLETS

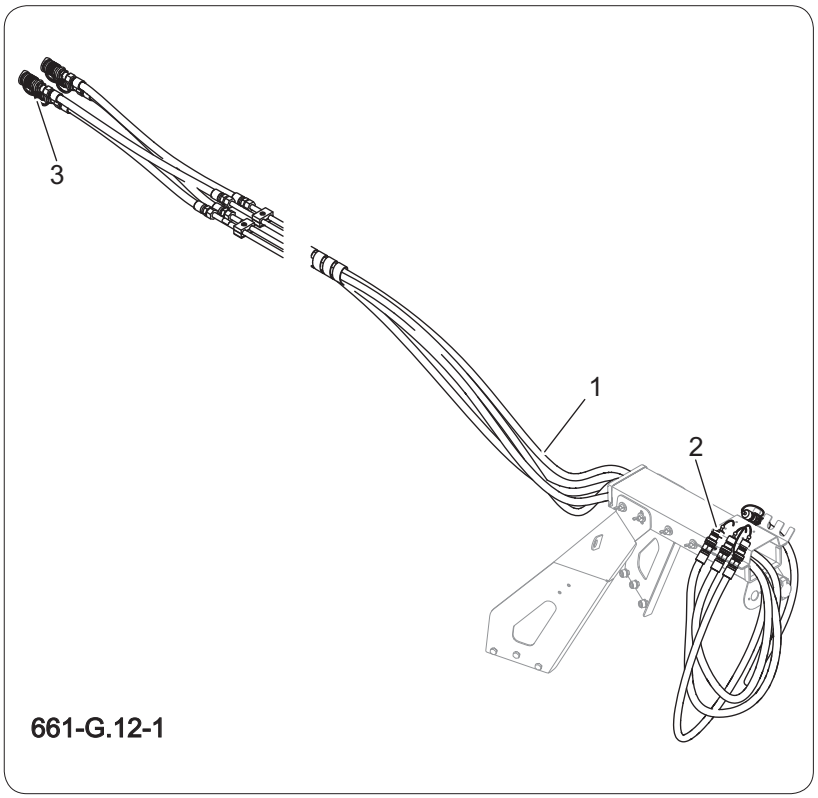


Figure 4.11 Rear hydraulic outlets
(1) hydraulic hoses *(2) hydraulic plug*
(3) hydraulic socket

ADVICE

The hydraulic system has been filled with L-HL32 Lotos hydraulic oil.

DANGER

Depressurize the system before connecting the hydraulic hoses.

The machine can be equipped with additional hydraulic outputs to operate the car's accessories, e.g. applicators, sprinklers, etc. It is possible to place two hydraulic sections controlled from the agricultural tractor's external hydraulic manifold.

BIZ.3.G-009.01.EN

4.7 ELECTRICAL LIGHTING INSTALLATION

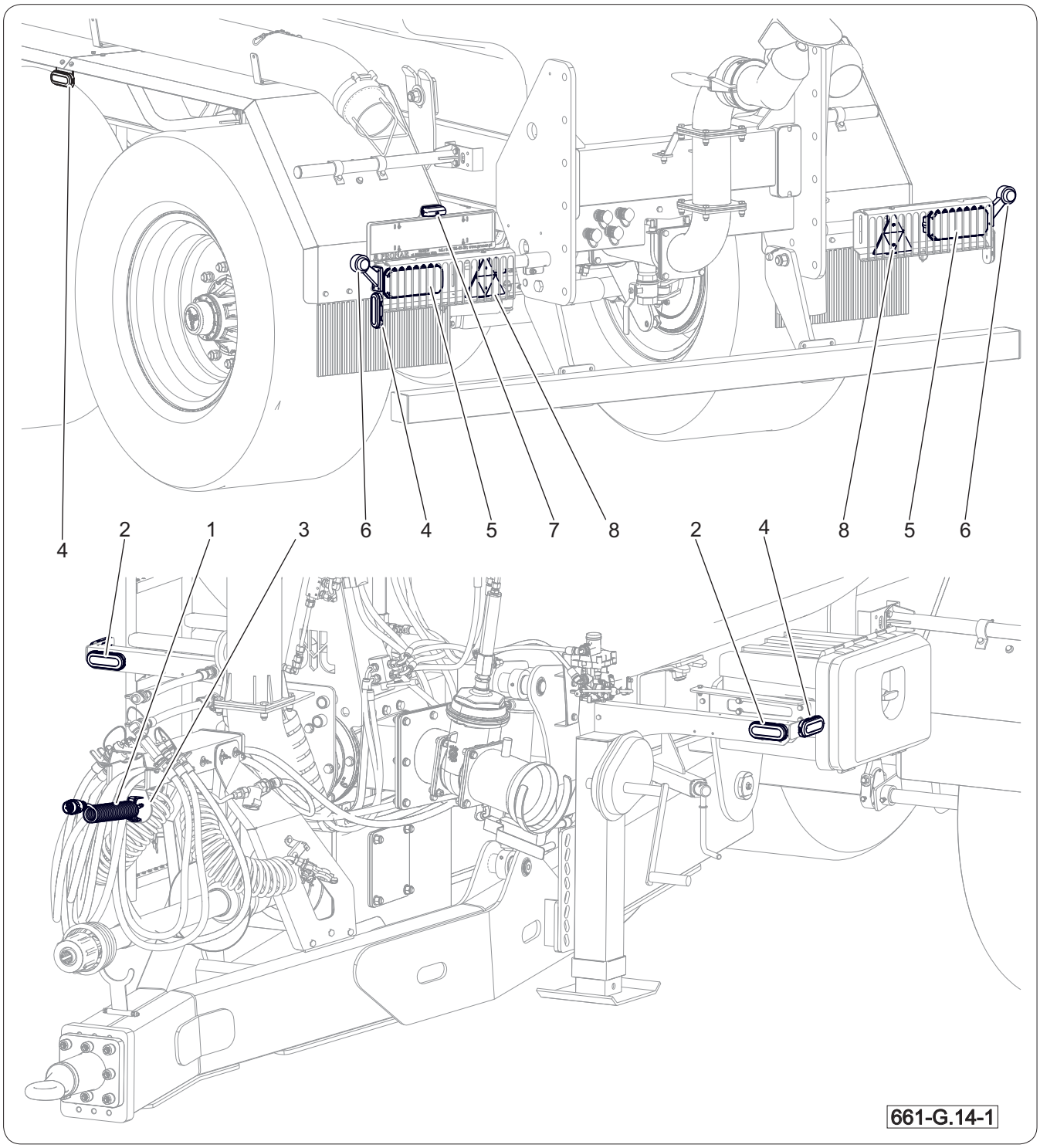


Figure 4.12 Arrangement of electrical system components and reflective elements

(1) 7 pin connection cable *(2) front position lamp* *(3) 7 pin socket*
(4) side marker lamp *(5) rear combination lamp* *(6) rear marker lamp*
(7) license plate lamp *(8) rear triangle reflector*

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

CAUTION

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

Driving with faulty lighting installation is forbidden.

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

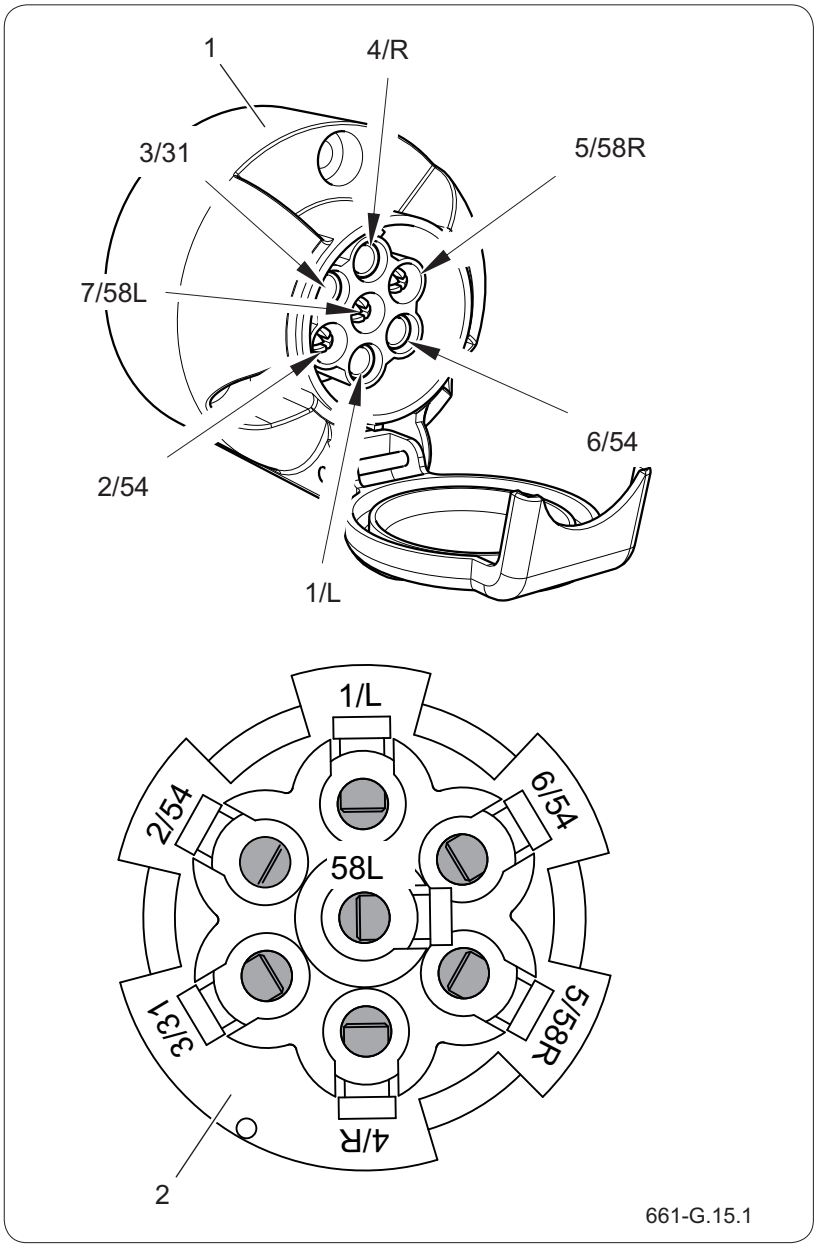


Figure 4.13 7 pin socket
(1) socket *(2) view from the beam side*

Table 4.5. 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)

BIZ.3.G-011.01.EN

CHAPTER 5

CONTROL PANEL

PRONAR TG110

5.1 CONTROL SYSTEM

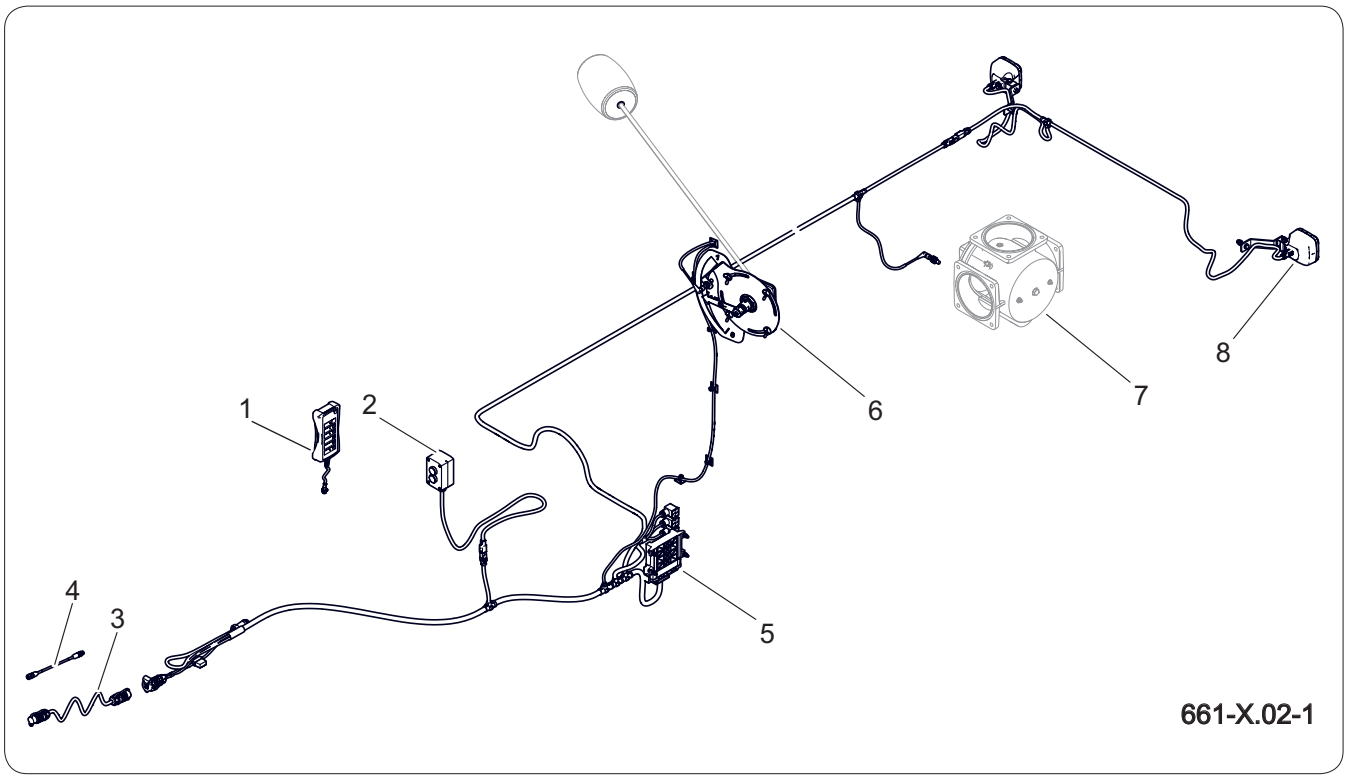


Figure 5.1 Arrangement of elements of the electrical control system
(1) main remote control (2) additional remote control (3) 3pin connection cable
(4) remote control connection cable (5) controller (6) indicator with sensor
(7) gate valve with sensor (8) additional lighting

CAUTION

Fasten the pilot's control cable so that it does not get tangled in the driving system while driving and operating the PTO shaft.

Pay attention to the possibility of cutting or crushing the wiring harness at the point of entry of the cable by the elements of the cabin.

Remote controls powered by the tractor's electrical system via a 12V three-pin cable. Place the main remote control (1) in the tractor operator's cabin. On the other hand, attach the additional external remote control (2) to the flat surface of the machine with a magnet, allowing easy access to the remote control buttons.

5.1.1 Main control pilot

Table 5.1. Operation with the main remote control

Function	Description
Aggregation	Connect the three-pin power connector to the tractor's 12V socket. Activate the appropriate section on the tractor's external hydraulic manifold, supplying the machine's hydraulic system. Press the ON/OFF button - (1) figure 5.1)
Filling	Switch the two-position distributor - figure (5.3) to the appropriate work cycle - side loading (A) / docking mechanism (B) (if the slurry tanker is equipped with a docking mechanism). Activate the appropriate section on the tractor's external hydraulic manifold, supplying the machine's hydraulic system. Connect the suction pipe to the side loading mechanism or use buttons (5) and (6) to connect the docking mechanism (option). Press and hold the button (3) for 2 seconds (the LED flashes and turns on). Engage the PTO drive (pumping). Press the STOP button (2) - the mixing LED will light up or wait until the level sensor placed on the filling indicator switches the damper from suction to mixing. Off the PTO drive.
Transport	a) Mixing of cargo: Activate the appropriate section on the tractor's external hydraulic manifold, supplying the machine's hydraulic system. Engage the PTO drive. b) No cargo mixing: Turn off the tractor's hydraulic system. Off the PTO drive.
Emptying	Activate the appropriate section on the tractor's external hydraulic manifold, supplying the machine's hydraulic system. Press and hold the button (4) for 2 seconds (the LED flashes and turns on). Engage the PTO drive (pumping). After emptying the tank, press the STOP button (2) - the mixing diode will light up. Off the PTO drive.

ADVICE

First, apply pressure to the hydraulic system of the manifold, then activate the control pilot.

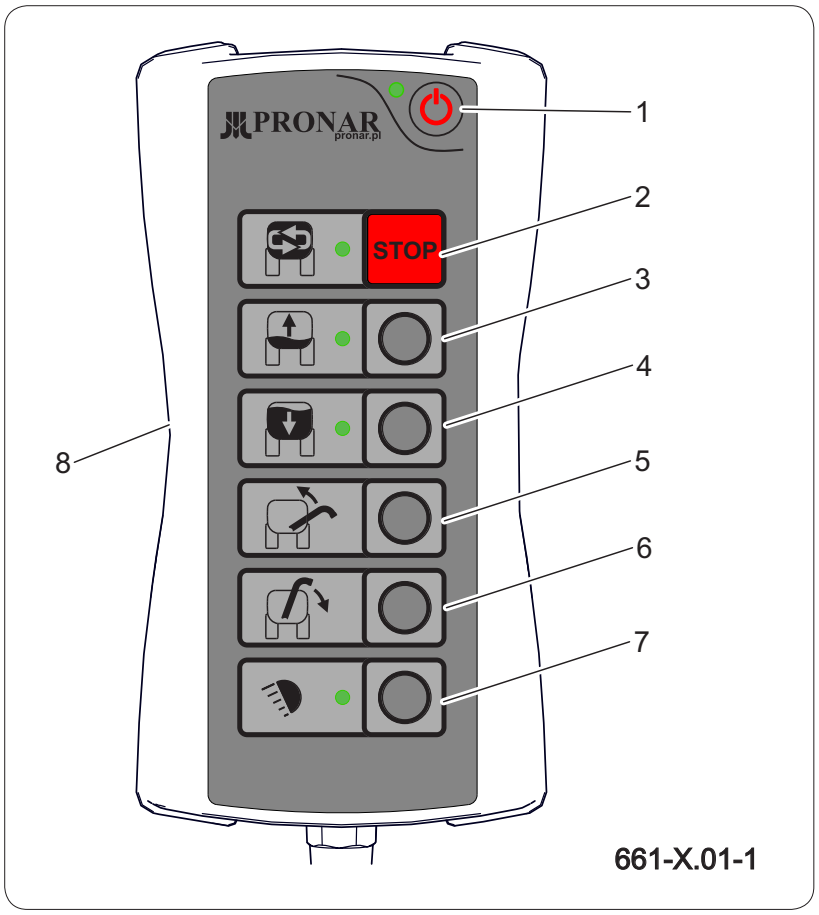


Figure 5.2 Main control pilot
(1) power
(2) STOP (mixing)
(3) filling
(4) emptying
(5) lifting
(6) lowering
(7) additional lighting
(8) housing

5.1.2 Additional remote control

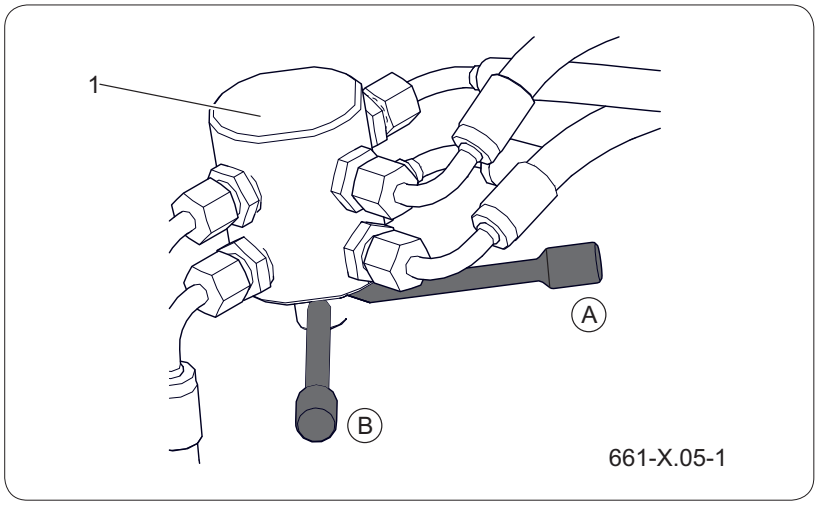


Figure 5.3 Two-position distributor
(A) side loading (2) loading docking mechanism
(3) distributor

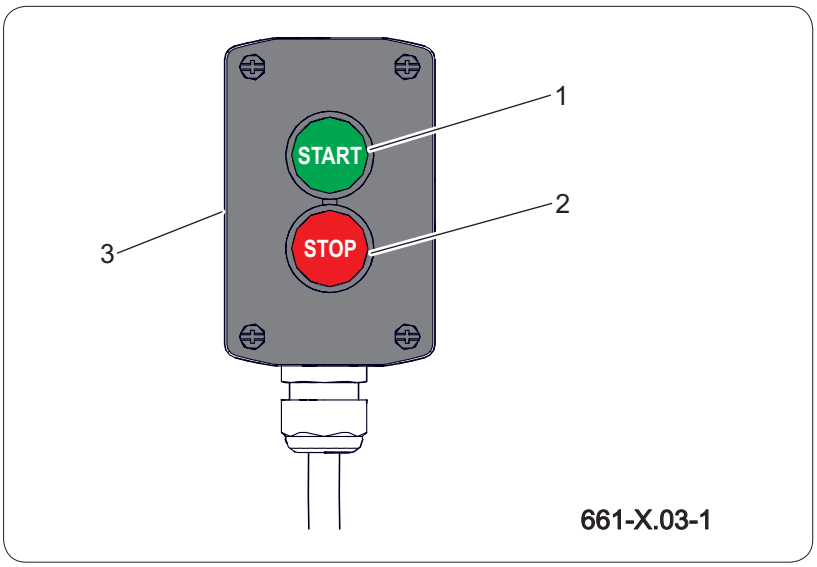


Figure 5.4 Additional remote control
(1) START button (2) STOP button
(3) housing

ADVICE

The activity of the sensors, i.e. reading a nearby element, is signalled by a yellow LED.

Set the distance of the sensor from the approaching element to the value of 4 - 6mm.

The additional remote control - figure (5.4) has a built-in magnet that facilitates the installation of the device on the steel structure of the machine. The two START and STOP buttons correspond respectively to the filling (3) and STOP (mixing) (2) buttons on the main remote control - figure (5.2).
The operation of the remote control is analogous to the main control device of the machine.

5.1.3 Inductive sensors

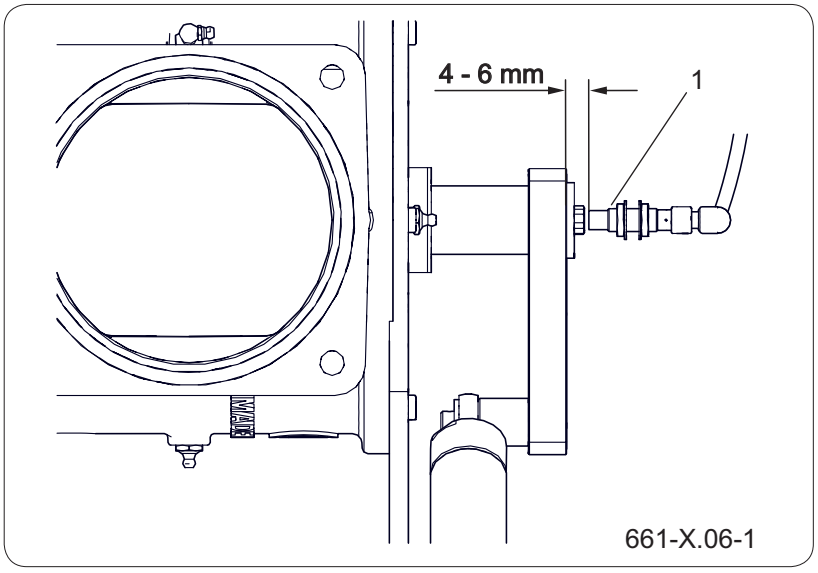


Figure 5.5 Three-way valve position sensor
(1) inductive sensor

The opening status of the three-way gate valve and

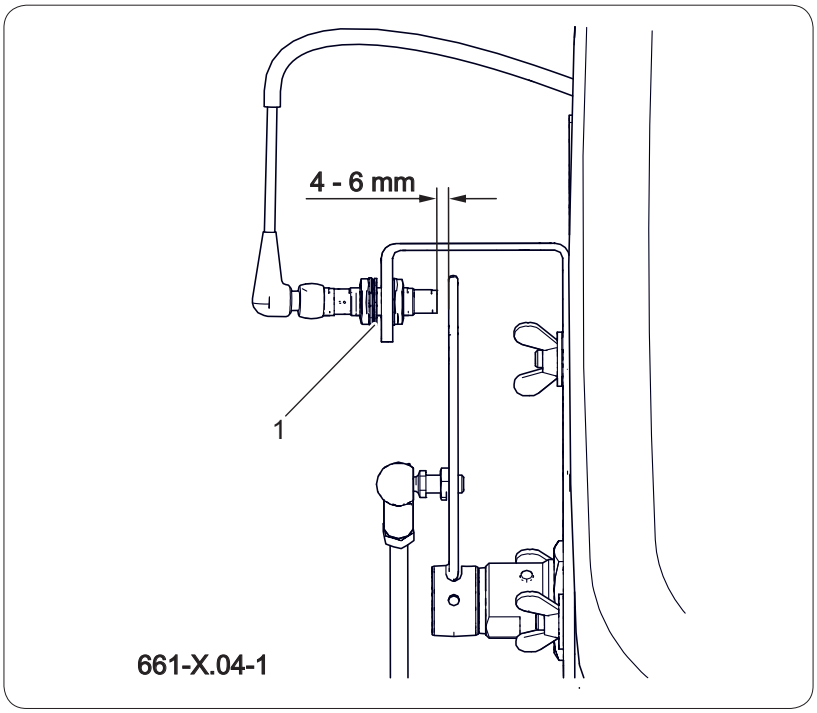


Figure 5.6 Fill indicator sensor
(1) inductive sensor

the filling of the tank are monitored by inductive sensors.

STR.3.G-001.01.EN

CHAPTER 6

RULES OF USE

PRONAR TG110

6.1 DRAWBAR HEIGHT ADJUSTING

DANGER

When adjusting, be especially careful because of the possibility of crushing limbs.

CAUTION

Pay attention to the technical condition of the drawbar eye and its screw connections. Lubricate the recommended lubrication points.

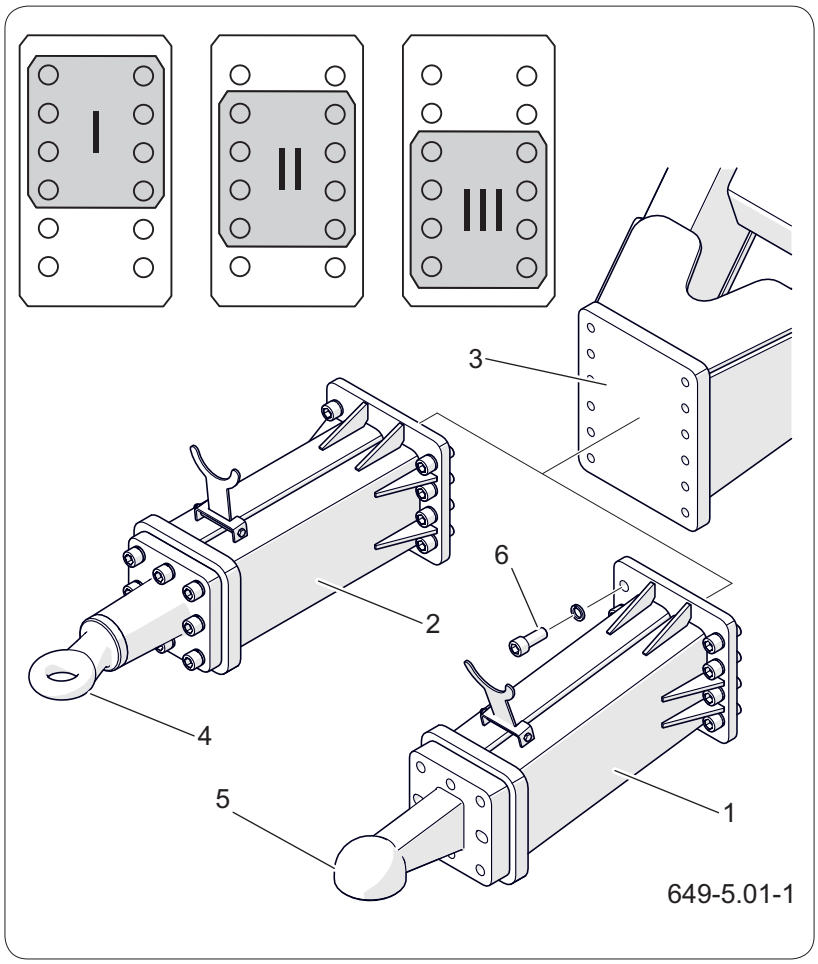


Figure 6.1 Drawbar height adjusting
(1) diagonal drawbar *(2) straight drawbar*
(3) connection plate *(4) rotating link*
(5) ball tie rod *(6) screw*

Select the position of the drawbar individually depending on the size of the machine's tires and the type and height of the tractor hitch with which the machine will be aggregated. Set the height so that the machine is level when connected to the tractor, which will ensure an even distribution of the machine weight on the axles.

- Block the machine with the parking brake.
- Place support wedges under the axle wheel.
- Unfold the parking stand.
- Dismantle the drawbar by unscrewing the screws (6).

CAUTION

It is forbidden to make adjustments when the machine is loaded with a load that presses on the parking stand. Danger of an accident.

- Set the drawbar in the right position in relation to the front plate (3).
- Tighten the screws with the correct torque.

  The design of the drawbar - front plate connection allows three combinations of setting the cooperating elements (I), (II) and (III).
- Position and install the drawbar eye properly.
- Check the screw connections of the drawbar and the drawbar eye.

OBS.3.G-011.01.EN

6.2 HANDLING OF THE PARKING STAND

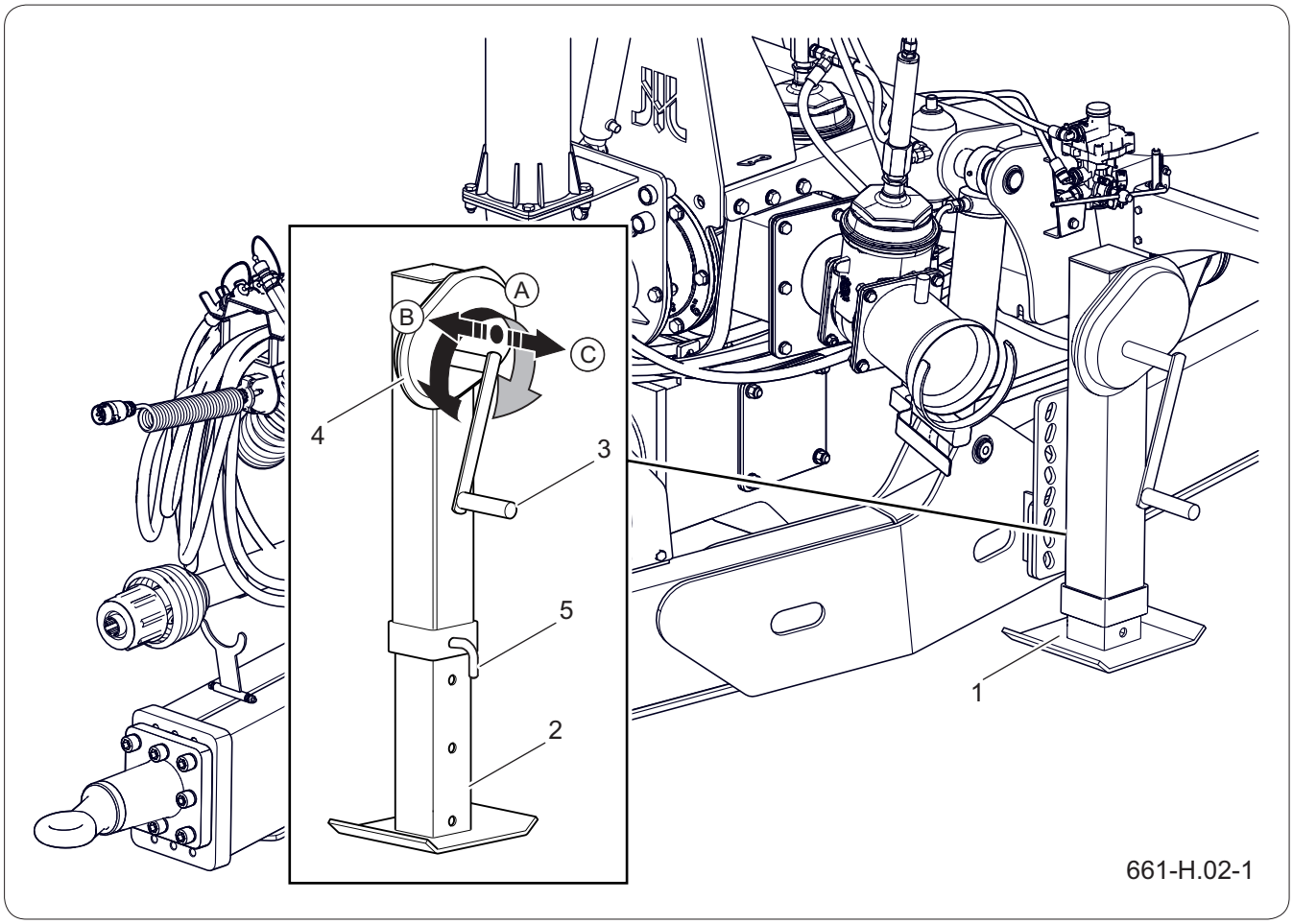


Figure 6.2 Telescopic stand
(1) stand *(2) foot* *(3) crank*
(4) gearbox *(5) securing pin (A) neutral position*
(B) 1st gear (slow) *(C) 2nd gear (fast)*

DANGER

Take special care when operating the support - it also applies to bystanders or assistants.

Determining the correct height of the drawbar eye relative to the tractor's hitch can be achieved by means of a telescopic support with a mechanical transmission. Use position (C) to quickly lower and raise the support foot. Position (C) is used to lower and raise the unladen machine. In position (B), the support foot (2) extends more slowly and you do not need to apply much force to raise the machine.

Lifting up of the support

- Remove the pin (5).
- Move the crank (3) of the support from neutral

CAUTION

It is forbidden to start and drive with the support lowered.

Before driving, make sure that the support is fully raised and the crank is in the neutral position (A). Be sure to secure the support foot with the safety pin.

(A) to position (B) - slowly.

- By turning the crank counterclockwise, raise the support foot (2) as far as possible.
- Put on the safety pin (5), turn the crank to the neutral position (A).

Lowering of the support

- Remove the pin (5).
- Move the crank (3) of the support from the neutral position (A) to the position (B) - slow or (C) fast.
- By turning the crank clockwise, lower the support to the ground or adjust the height of the hitch in relation to the hitch (if the machine is to be hitched to a tractor).
- Put on the safety pin (5), turn the crank to the neutral position (A).

OBS.3.G-002.01.EN

6.3 CONNECTING AND DISCONNECTING OF THE MACHINE

6.3.1 Connecting of the machine

CAUTION

After connecting the machine, 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.

You can connect the machine to a farm tractor if all connections (electric, pneumatic, hydraulic) in the tractor are compliant with the machine manufacturer's requirements given in the table *Farm tractor requirements*.

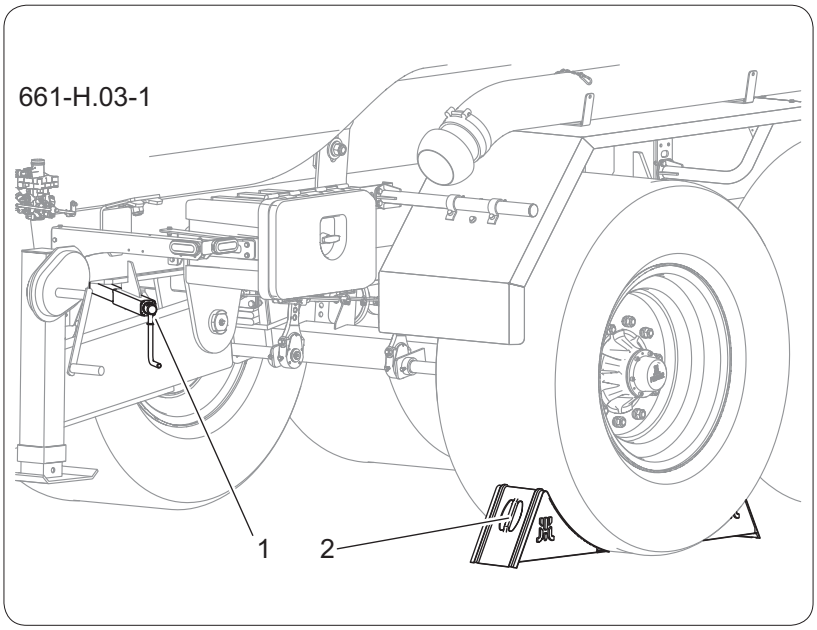


Figure 5.3 Parking brake
(1) parking brake (2) support wedges

Preparation

- Make sure the machine is immobilized with the parking brake.

  Turn the brake mechanism (1) clockwise as far as it will go.
- Make sure that blocking chocks are placed under the trailer wheel (2).
- Position the agricultural tractor directly in front of the drawbar eye.

Drawbar height adjusting

- Using the parking stand, set the appropriate height of the drawbar eye in relation to the hitch of the aggregated agricultural tractor. Follow the

DANGER

During hitching, there must be no bystanders between the machine 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 connecting the machine.

Ensure good visibility during coupling.

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

CAUTION

When the machine is parked for a longer period, it may turn out that the air pressure in the air braking system is insufficient to release the brake shoes. In this case, wait until the air in the pneumatic system tank is replenished after starting the tractor and the air compressor.

Stand operation chapter.

Drawbar height adjusting

- Set the height of the drawbar using the parking stand with a mechanical transmission, the change of height is carried out using the stand transmission - see *Mechanical stand.*

Connecting of the machine to the tractor hitch

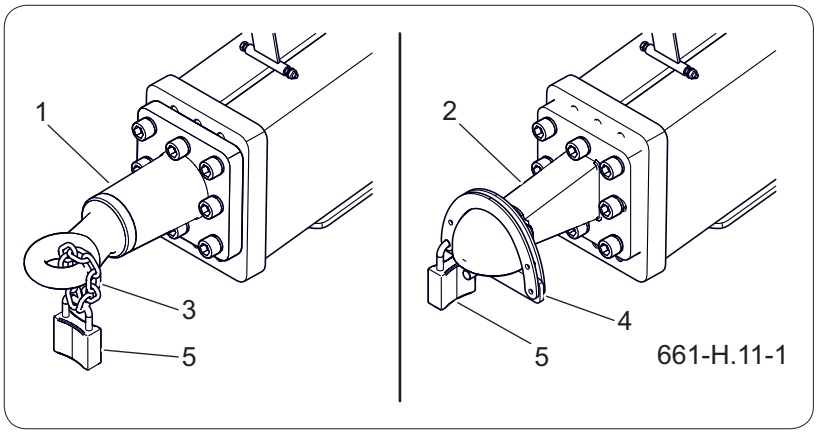


Figure 5.4 Drawbar eye protection
(1) swivel link *(2) ball link*
(3) chain *(4) safety device*
(5) padlock

- Remove the tie rod protection.

  Open the padlock (5) and unfasten the chain (3) or the safety device (4).
- Reverse the tractor and connect the machine 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

- Connect the pneumatic system lines.

CAUTION

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

DANGER

Driving with faulty or damaged hydraulic system is forbidden.

Be especially careful, the hydraulic system may be under high pressure.

First, 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 revert to normal operating mode (disconnecting or breaking the air conduit of the machine the machine control valve to automatically set itself to the machine brake actuating position).

- If the brakes do not respond after connecting the pneumatic conduits, it may be a sign of low air pressure in the tank. In order for the system to start working, it is necessary to fill the air in the tank to the appropriate pressure value.

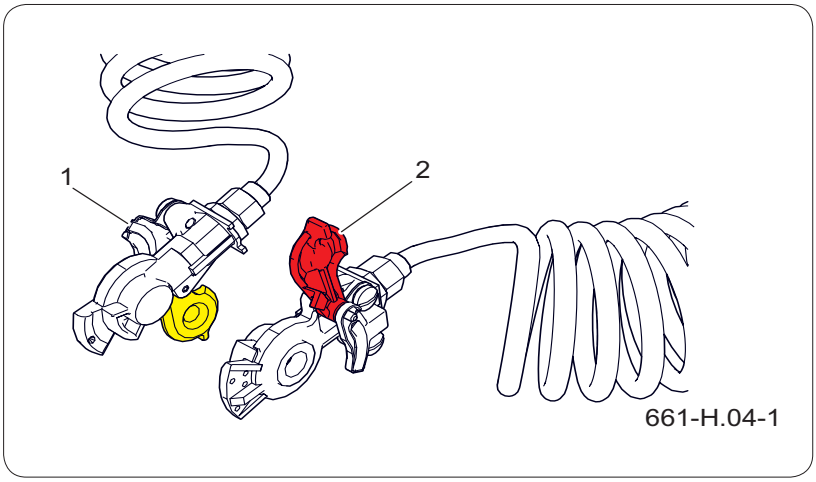


Figure 5.5 The pneumatic braking system lines
(1) yellow plug (2) red plug

Connecting of the hydraulic system

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

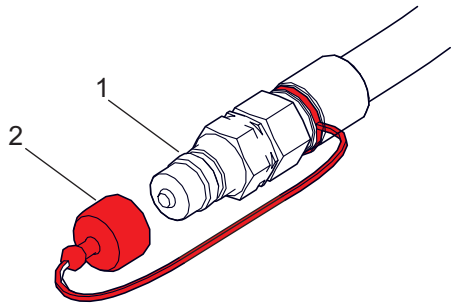
- Connect the hydraulic system quick couplers marked with red plug caps.
- If necessary, connect the hydraulic system conduits of the additional rear outputs, the corresponding pairs of which are marked with yellow and blue plug caps

DANGER

The use of a faulty machine is prohibited.

CAUTION

The power take-off shaft is supplied with the original operating manual of the shaft manufacturer, which describes all maintenance activities related to the delivered product.



661-H.05-1

Figure 5.6 Hydraulic system connection
(1) hydraulic plug *(2) plug*

Connecting of the PTO shaft

The liquid distribution system is an independent installation driven by the tractor's PTO shaft.

- Connect the previously matched shaft to the PTO of the agricultural tractor.
- Check the shaft guards and the condition of the fastening chains.
- Connect the 3-pin cable, place the remote control in the tractor cabin.

Set the agricultural tractor's PTO speed to 540 rpm

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

- Make sure that they will not get entangled in moving parts of the tractor or machine during operation. Secure cables if necessary.
- Perform daily inspection of the machine.

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.

DANGER

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

Ensure good visibility. Make sure that no one is between the trailer and the tractor.

Before disconnecting of the conduits, shaft and drawbar eye, close the tractor cab and secure it against unauthorized access. Switch off the tractor engine.

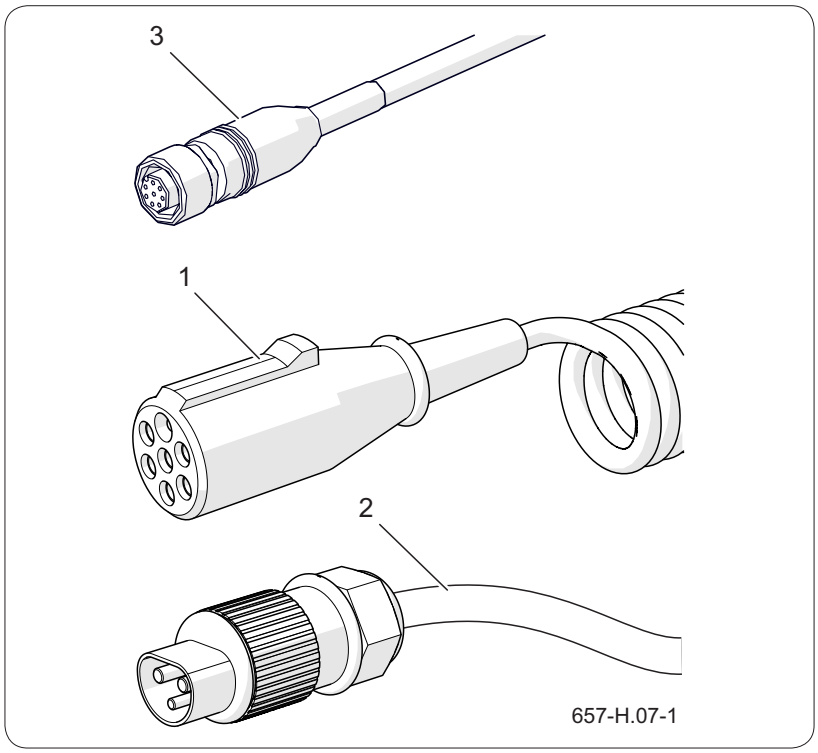


Figure 5.7 Connections of electrical installation
(1) 7-pin cable *(2) 3-pin cable*
(3) Remote control cable

- If the machine is in good state, you can start working.
- Immediately before driving, remove the wheel chocks and release the machine's parking brake.

  Turn the brake mechanism crank counterclockwise as far as it will go.

6.3.2 Disconnecting the trailer

- Place the machine on a hard and flat surface.
- Turn off the tractor engine and remove the ignition key, secure the tractor with the parking brake.
- Lower the stand to parking position.
- Block the machine with the parking brake.
- Place blocking wedges under one wheel of the machine, one in the rear and the other in front of the wheel.
- Disconnect all hoses one by one, securing the ends by fitting plug caps to the hydraulic connections.

CAUTION

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

CAUTION

Always secure the uncoupled machine against unauthorized use by attaching the tie rod protection.

- Place the hoses on the wire bracket.
- Disconnect the power take-off shaft.
- Release the drawbar eye, start the tractor and drive away with the tractor.
- Install the drawbar eye protection.

OBS.3.G-012.01.EN

6.4 LOADING

DANGER

It is forbidden to transport people and animals.

CAUTION

It is forbidden to exceed the permissible load capacity of the machine, as it threatens safety while driving and may cause serious damage.

DANGER

The transported load must be protected against spillage and contamination of the road during the journey. If the septic tanker is not sealed, it is forbidden to use it.

CAUTION

Dry operation of the screw pump is unacceptable and leads to the destruction of the device.

Always check that the pump is filled with liquid before starting work.

Pumping medium into a closed line / gate valve will irreparably damage the pump.

Freezing temperatures will damage the pump, empty the device when the device is not in use during the freezing temperature period.

Load the machine when the septic tanker is connected to the tractor and placed on level ground.
Before loading, check that the 3-way gate valve is closed. Check whether the cavitation pump is flooded - it is unacceptable to run it "dry". Check the setting of the gate valves before starting the pump. Check the patency of the vent line. Inspect the tank carefully for leaks and damage. Any leak disqualifies the machine from further operation.
The septic tanker is designed for work related to the transport, pumping and spreading of liquid substances such as slurry, water (not intended for food purposes), municipal sewage and clarified sludge.
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 area may exceed the allowable capacity of the machine.

Suction of the medium

A well-mixed medium free of foreign particles should be sucked up. Solid impurities, stones, etc. will damage the cavitation pump, so use suitable suction hoses with inlet protection.
The cavitation (screw) pressure pump cannot work without the medium, before starting work, flood the pump with water. If there is a risk of temperatures below zero and freezing of the medium, there is a possibility of damage to the pump. Drain the pump.
You cannot pump the medium into the closed pipe, the pump will fail. Always check that the discharge line is open before starting the pump.

6.4.1 Loading via suction connection (left or right)

Load the machine by performing the following steps:

- Set the tractor with the machine to drive straight ahead on flat, stable and hard ground as close

DANGER

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

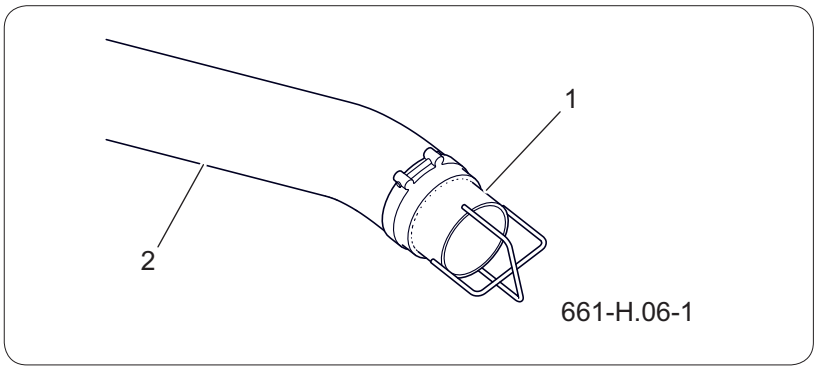


Figure 5.8 Suction line
(1) cover (2) 6” suction hose

as possible to the place of loading.

- Immobilize the set with parking brake.
- Connect the appropriate hose to the suction valve stub (4). Make sure that the valve (7) is in position (B) - closed.
- Start the remote control and select the tank filling option, hold the button for about 2 seconds.

  Side suction valve (4) open

  Closed tank gate valve (5)

  Three-way valve - mixing
- Make sure there are no bystanders near the PTO shaft. Engage the tractor's PTO drive.

  The pump starts pumping the medium
- On the remote control, press the STOP button or wait until the filling indicator (8) indicates the full tank level and automatically closes the suction gate valve (4). The pump (1) is still working and mixing is taking place in the tank (the diode of the mixing button is on).

  Closed side suction gate valve (4)

  Open tank gate (5)

  Three-way valve - mixing
- Disengage the tractor's PTO drive.
- Open the valve (7) - position (A) - wait for a moment until the liquid column in the hose (3) drops to the tank, disassemble the hose and

DANGER

When working with slurry, pay attention to adequate ventilation of places where loading work is carried out. Use forced ventilation in confined spaces.

During loading and unloading, harmful gases such as carbon dioxide, ammonia, hydrogen sulphide and methane may be released.

Escaping gases are poisonous and explosive.

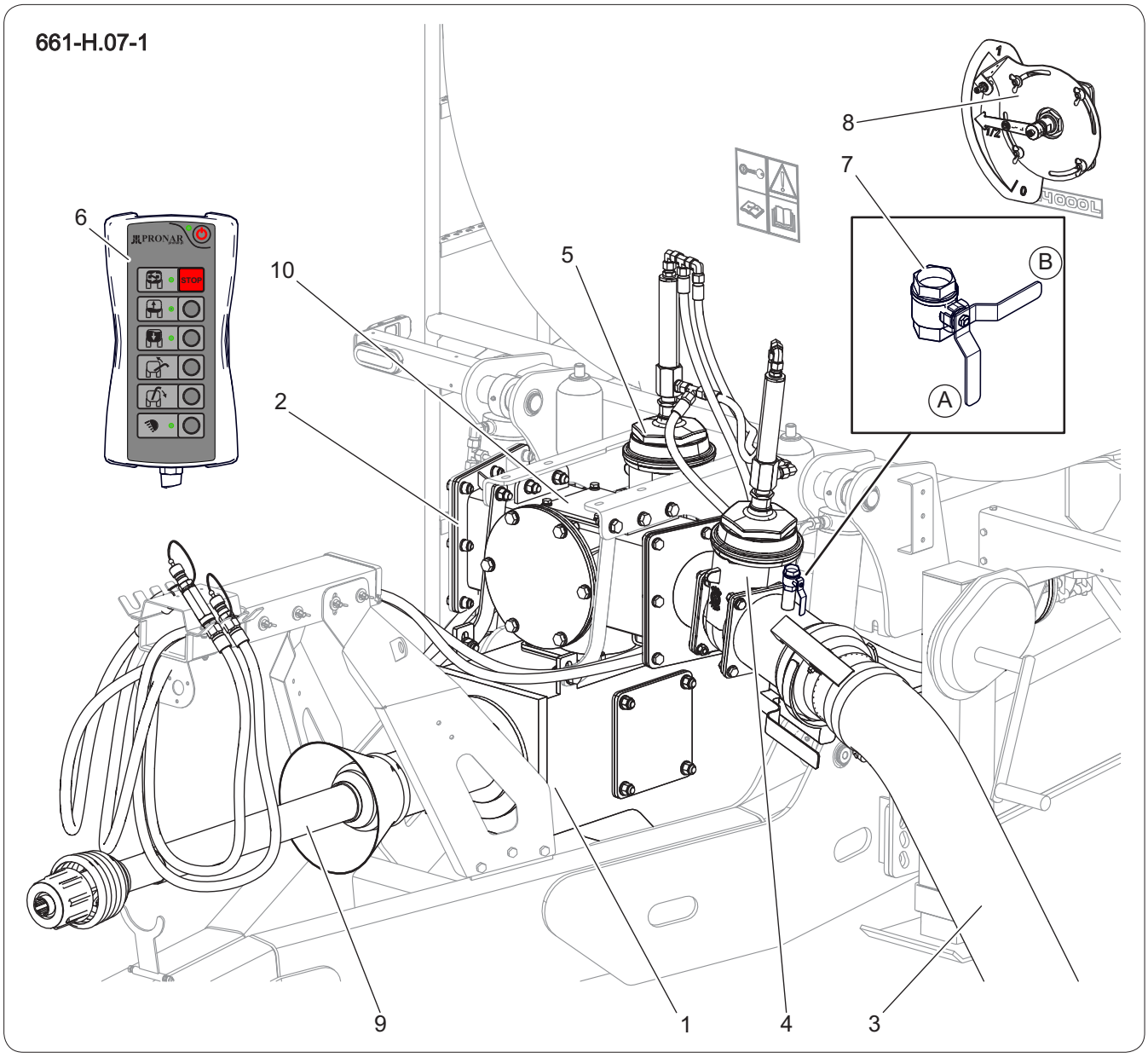


Figure 5.9 Loading side connection

(1) screw pump
(2) suction connection
(3) hose
(4) suction gate valve
(5) tank gate valve
(6) remote control
(7) valve
(8) filling indicator
(9) PTO shaft
(10) pump priming flap
(A) open position
(B) closed position

place it in the appropriate holder.

6.4.2 Loading via docking system (left or right)

The additional equipment of the machine is a docking mechanism that you can use interchangeably with the side suction connector.

- Set the tractor with the machine to drive straight ahead on flat, stable and hard ground at the place of loading.

- Immobilize the set with parking brake.
- For loading with the docking mechanism, move the divider (8) to position (B).
- Use the remote control (6) to lower the suction connection (2). Make sure that the suction pipe

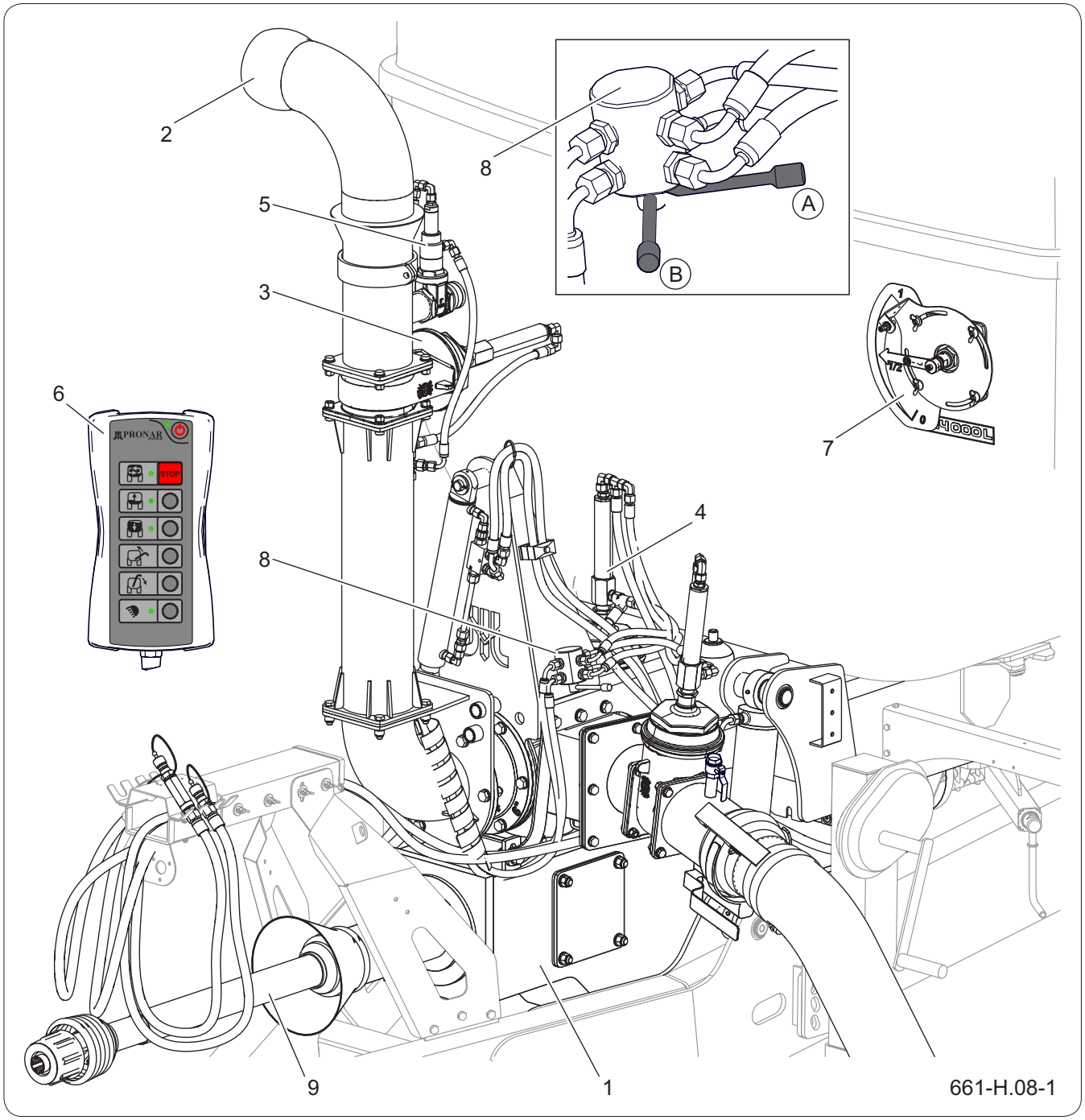


Figure 5.10 Loading docking mechanism

(1) screw pump *(2) suction connection* *(3) suction gate valve*
(4) tank gate valve *(5) vent valve* *(6) remote control*
(7) filling indicator *(8) hydraulic distributor* *(9) PTO shaft*
(A) side loading *(B) loading docking mechanism*

DANGER

During loading work, it is necessary to use additional personal protective equipment (masks, rubber gloves, etc.).

DANGER

Make sure that there are no bystanders in the unloading / loading area. Before unloading, take care of adequate visibility and make sure that there are no bystanders in the vicinity.

(2) fits the tank connection from which the material will be taken. The tightness of the connection is a key factor affecting the speed of loading.

- Using the remote control, select the tank filling option, hold the button for about 2 seconds.

  Suction valve open (3)

  Closed tank gate valve (4)

  Three-way valve - mixing

- Make sure there are no bystanders near the PTO shaft. Engage the tractor's PTO drive.

  The pump starts pumping the medium

- On the remote control, press the STOP button or wait until the filling indicator (7) indicates the full tank level and automatically closes the suction gate valve (3). The pump (1) is still working and mixing is taking place in the tank (the diode of the mixing button is on).

  Suction valve closed (3)

  Open tank gate (4)

  Open venting gate (5)

  Three-way valve - mixing

- Using the appropriate button on the remote control (6), raise the docking arm to the transport position.
- Disengage the tractor's PTO drive.
- Secure the rotation of the docking mechanism with the pin.

OBS.3.G-004.01.EN

6.5 TRANSPORT

CAUTION

Always use the agitation option when transporting a medium with a high solids content or when transporting material in freezing temperatures.

CAUTION

Refer to the drive shaft manual attached to the machine, check the maximum angle of inclination of the rotating shaft. Exceeding the permissible shaft deflection may damage it.

When driving comply with traffic regulations, be prudent and considerate. The most important guidelines for steering a tractor with a machine attached are presented below.

- Before moving make sure that there are no bystanders, especially children, near the machine and tractor. Ensure proper visibility.
- Make sure that the machine is correctly connected to the tractor and tractor's hitch is properly secured.
- You cannot drive on public roads with the docking mechanism pipe extended, always put the mechanism in the transport position.
- If mixing of the transported medium is not required; disengage the PTO drive.
- Vertical load carried by the machine drawbar eye affects the steering of the agricultural tractor.
- Do not overload the machine. Exceeding the permissible load capacity of the vehicle is prohibited and may damage the machine. Overloading is a road travel hazard for the tractor and machine operator or other road users.
- The permissible design speed and speed resulting from restrictions on road traffic regulations must not be exceeded. The travel speed should be adjusted to the prevailing road conditions, machine load condition, type of load carried and other conditions.
- If you disconnect the machine from the tractor, you must secure it by blocking it with the parking brake and placing wedges under the wheels. It is forbidden to park a loaded machine supported only by a parking stand.
- The tractor operator is required to equip the machine with an attested or approved warning

CAUTION

It is prohibited to leave the machine unsecured.

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

reflective triangle.

- When travelling on public roads, mark the machine with a slow-moving vehicle sign.
- While driving, obey the rules of the road, signal the change of direction by means of direction indicators, keep clean and take care of the technical condition of the lighting and signalling installation.
- Damaged or lost lighting and signalling components must be repaired or replaced immediately.
- Avoid ruts, depressions, ditches, or driving along roadside slopes. Driving across such obstacles can cause the machine and tractor to tilt suddenly. This is especially important because the centre of gravity of a laden machine adversely affects driving safety. Driving near the edges of ditches or channels is dangerous due to the risk of landslides under the wheels of the machine or tractor.
- Reduce speed before cornering, when driving on uneven or sloping terrain.
- When driving, avoid sharp turns, especially on slopes.
- It should be remembered that the braking distance of the set increases significantly with the increase in the weight of the transported load and the increase in speed.
- Control the behaviour of the machine while driving on uneven terrain. Adjust speed to terrain and road conditions.
- The machine is adapted for driving on slopes up to a maximum of 8°.

CAUTION

Travel with a load through ruts, ditches, slopes, etc. poses a high risk of overturning the machine. Be especially careful.

Moving the machine on steeper slopes may cause the vehicle to overturn due to loss of stability. Prolonged driving on slopes creates the risk of losing braking efficiency.

OBS.3.G-005.01.EN

6.6 UNLOADING

DANGER

Make sure that no one is near the spilled load during unloading.

Before starting the PTO drive, make sure that there are no people or objects near the shaft that may become entangled in the rotating mechanism.

The unloading of the transported medium is possible only through the rear spigot located behind the three-way gate valve. The standard equipment of the machine is a spreader.

Unload the machine by following steps below:

- Start the remote control and select the option to empty the tank, hold the button for about 2 seconds.

  Suction valve closed

  Tank gate valve open

  Three-way valve - ejection
- Make sure there are no bystanders near the PTO shaft. Engage the tractor's PTO drive.

  The pump starts pumping the medium
- When the tank is empty, press the STOP button on the remote control.

  Suction valve closed

  Tank gate valve open

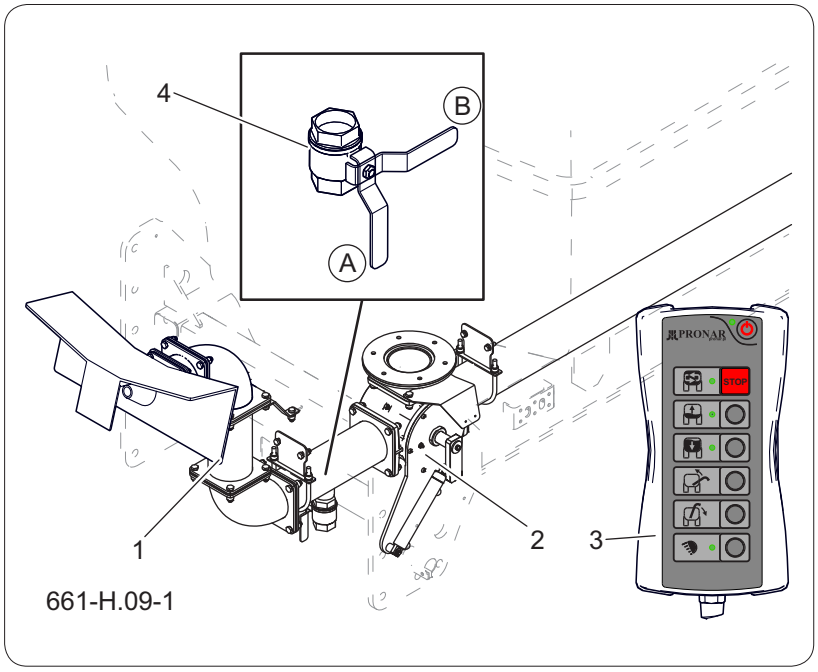


Figure 5.11 Unloading system

(1) spreader *(2) three-way gate valve*
(3) remote control *(4) drain valve*
(A) open position *(B) closed position*

CAUTION

When using spraying devices when unloading, pay attention to whether there are any unauthorized persons in the unloading area. Watch out for overhead power lines.

Three-way valve - mixing

- Disengage the tractor's PTO drive.

OBS.3.G-006.01.EN

6.7 FEED PUMP

DANGER

The pump may only be operated with the power take-off shaft disengaged.

The pumped medium must not exceed the temperature of 50°C, the temperature increase above this value may lead to seizing of the pump impeller.

CAUTION

A single impeller screw pump cannot run dry - running dry can damage the stator.

Before starting the machine for the first time or after a long standstill of the machine, fill the pump with water.

Pay attention to the direction and value of rotation of the PTO shaft; the pump runs at 540 rpm in a clockwise direction.

If there is a risk of freezing temperatures, empty the pump of liquid.

Pumping of media into a closed line will damage the pump, check the hoses for obstruction before starting the pump.

ADVICE

Pure the pump using the suction port flap - see figure (5.8)

The screw pump, driven by the tractor's PTO shaft, pumps the medium depending on the setting of individual gate valves.

When sucking in the medium, always use hose covers that prevent large solid impurities, e.g. stones, from entering the pump chamber. Check and clean the pump chamber (1) regularly. Check and replace the oil in the pump gear (2) according to the inspection schedule.

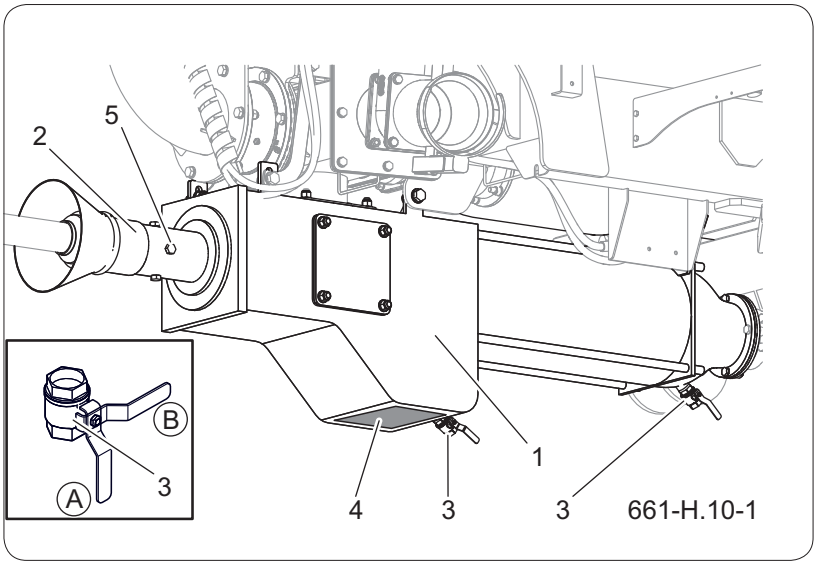


Figure 5.12 Feed pump
(1) discharge chamber
(2) gear
(3) valve
(4) flap
(5) inspection plugs
(A) open position
(B) closed position

Make sure that the discharge chamber of the pump (1) is filled with the medium before starting work and that the discharge line is open; operation of the pump without medium will lead to serious failure. Before starting work, check if the drain valves (3) of the pump are closed, the bottom flap (4) must be tightly closed. Any leakage of the pumping system disqualifies the machine from operation.

OBS.3.G-007.01.EN

5.17 RULES FOR THE 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 only when the machine is not loaded.
- Repair work on wheels or tires should be performed by persons trained and authorized for this purpose. These works should be performed with the use of appropriately selected tools.
- Checking the tightening of the wheel nuts carry out after the first use of the machine, 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 machine 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 machinee.
- 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 machine speed limit.
- 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.

OBS.3.G-008.01.EN

6.9 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 tank, the tractor engine must be turned off, the articulated telescopic shaft must be disconnected.

Every day, after work finishing, thoroughly clean the machine 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 of the machine

- Stop the tractor and the machine on a flat, even surface.
- Turn off the tractor engine and remove the ignition key.
- Secure the machine and tractor with the parking brake, place wedges under the manure spreader wheel.
- Secure the tractor against unauthorized persons.
- On the outside, wash the machine with a strong jet of water and leave it to dry in a dry and ventilated place.

  The use of pressure washers increases the effectiveness of washing, but particular care should be taken during work. While washing, do not put the nozzle of the cleaning aggregate closer than 50 cm from the surface to be cleaned.

  The water temperature should not exceed 55 °C.

  During washing with too high pressure, the paint may be damaged.
- Fill the inside of the tank with water. By moving and braking the set, the water will clean the inside of the tank.
- Fill the pump set with clean water, start the machine in mixing mode. Empty the impurities from the pump chamber.
- Clean suction lines, spreader and spreading equipment with pressurized water.

CAUTION

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, masks, gloves and the right tools.

- Drain residual fluids through the pump valves and three-way gate valve.

Do not direct the water stream directly at the system components and equipment of the machine, i.e. the control valve, brake cylinders, pneumatic, electric and hydraulic plugs, lights, electrical connector, information and warning stickers, rating plate, conduit connectors, lubrication points, etc. High pressure of the water stream may cause mechanical damage to these elements.

- For cleaning and maintenance of plastic surfaces, use clean water or specialized preparations intended for this purpose.
- Do not use organic solvents, preparations of unknown origin or other substances that may damage the lacquered, rubber or plastic surface. 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. Preparations cannot be stored in food and drink containers.
- Observe environmental protection principles, wash trailer in designated places.
- Washing and drying of the machine must take place at temperatures above 0 ^{0}C.

In winter, frozen water may cause damage to the pumping system and paint coating.

OBS.3.G-009.01.EN

6.10 STORAGE

DANGER

Use appropriate personal protective equipment when cleaning the machine.

Ensure adequate ventilation of the room where the machine is stored.

After finishing work, carefully clean and wash the machine. Open all drain valves of the liquid distribution system and empty the lines of the transported medium.

In the event of damage to the paint coating of metal elements, 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.

Any repair of a damaged tank shall be commissioned to specialized workshops.

It is recommended that the machine be stored indoors or under a roof. Open all drain valves and tank covers.

When storing the machine outdoors for a long time, it is necessary to protect the machine against the influence of weather conditions, especially factors causing corrosion of steel and accelerating the aging of plastics and 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 do not deform and maintain the correct 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.G-010.01.EN

CHAPTER 7

PERIODIC INSPECTIONS AND TECHNICAL MAINTENANCE

PRONAR TG110

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.

SER.3.B-001.01.EN

7.2 HIGH-RISK PLACES

CAUTION

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

During the normal operation of the machine, it is often necessary to enter places (e.g. tank) where staying during the machine operation may cause serious injury or death of 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,
- machine cleaning,

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

DANGER

Before entering high-risk areas, connect the machine to the tractor. The tractor must be turned off and the ignition key removed, and the tractor cabin must be closed.

- Before entering high-risk places, the machine 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 machine 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.

SER.3.G-002.01.EN

7.3 MAINTENANCE AND INSPECTION SCHEDULE

Table 7.1. Inspection categories

Catego-ry	Description	Performs	Frequency
A	Daily review	Operator	Inspection carried every day before first start-up or every 10 hours of continuous shift work.
B	Maintenance	Operator	Inspection performed periodically every 1000 kilometres driven or every month of machine operation, whichever comes first. Each time before carrying out this inspection, a daily inspection should be performed.
C	Maintenance	Operator	Inspection performed periodically every 3 months. Before each performance of this inspection, a daily inspection should be performed and a monthly inspection of the machine should be performed.
D	Maintenance	Operator	Inspection performed periodically every 6 months. Before each performance of this inspection, it is necessary to perform a daily inspection, inspection every 1 month of using the machine and inspection every 3 months.
E	Maintenance	Operator	Inspection performed periodically every 12 months. Before each performance of this inspection, it is necessary to perform a daily inspection, inspection every 1 month of using the machine and inspection every 3 months.
F	Warranty	APSiO(1)	Inspection carried out for a fee after the first 12 months of use of the machine, after reporting the owner.
G	Maintenance	Service (2)	Inspection performed every 4 years of the machine use

(1) - Authorized Sales and Service Point

(2) - post-warranty service

Table 7.2. Technical inspection schedule

Description of activities	A	B	C	D	E	F	Page
Air pressure measurement, tire and rim inspection	•						7.15
Air tank drainage	•						7.9
Checking plugs and connection sockets	•						7.11
Guard inspection	•						7.10
Checking of the machine before driving	•						7.13
Air pressure measurement, tire and rim inspection		•					7.15
Inspection and cleaning of the delivery pumps		•					7.17
Cleaning of the air filters			•				7.19
Checking brake lining wear				•			7.21
Checking of the clearance of the axle bearings				•			7.22
Checking of mechanical brakes				•			7.24
Cleaning of the drainage valve				•			7.21
Adjusting of the parking brake cable tension					•		7.26
Hydraulic system checking					•		7.28
The pneumatic system inspection					•		7.29
Lubrication	See table: *Trailer lubrication schedule*						7.46
Tightening torques for screw connections	See table: *Schedule for tightening of the critical bolted connections*						7.34
Replacement of hydraulic hoses						•	7.38

Table 7.3. Control parameters and settings

Description	Value	Notes
Breaking 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	
An angle between the expander axis and the fork	90^{O}	With the brake applied
Parking brake		
Permissible clearance in the parking brake cable	150 mm	

SER.3.G-001.01.EN

7.4 TRAILER PREPARATION

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 machine elements.

Before commencing maintenance and repair activities with the machine lifted, make sure that it is properly secured and will not roll during the inspection.

- Connect the machine to the tractor.
- Place the tractor and machine 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 machine wheel.

  Ensure that the machine 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 ob the Figure.

  The recommended place to support the trailer is the road axle in the place where the lower frame - axle connects.
- The jack must rest on a firm and stable surface.
- The jack must be suited to the trailer’s carb weight.
- In exceptional cases, release the parking brake of the machine, e.g. when measuring the play of axle bearings. In this case, be especially careful.

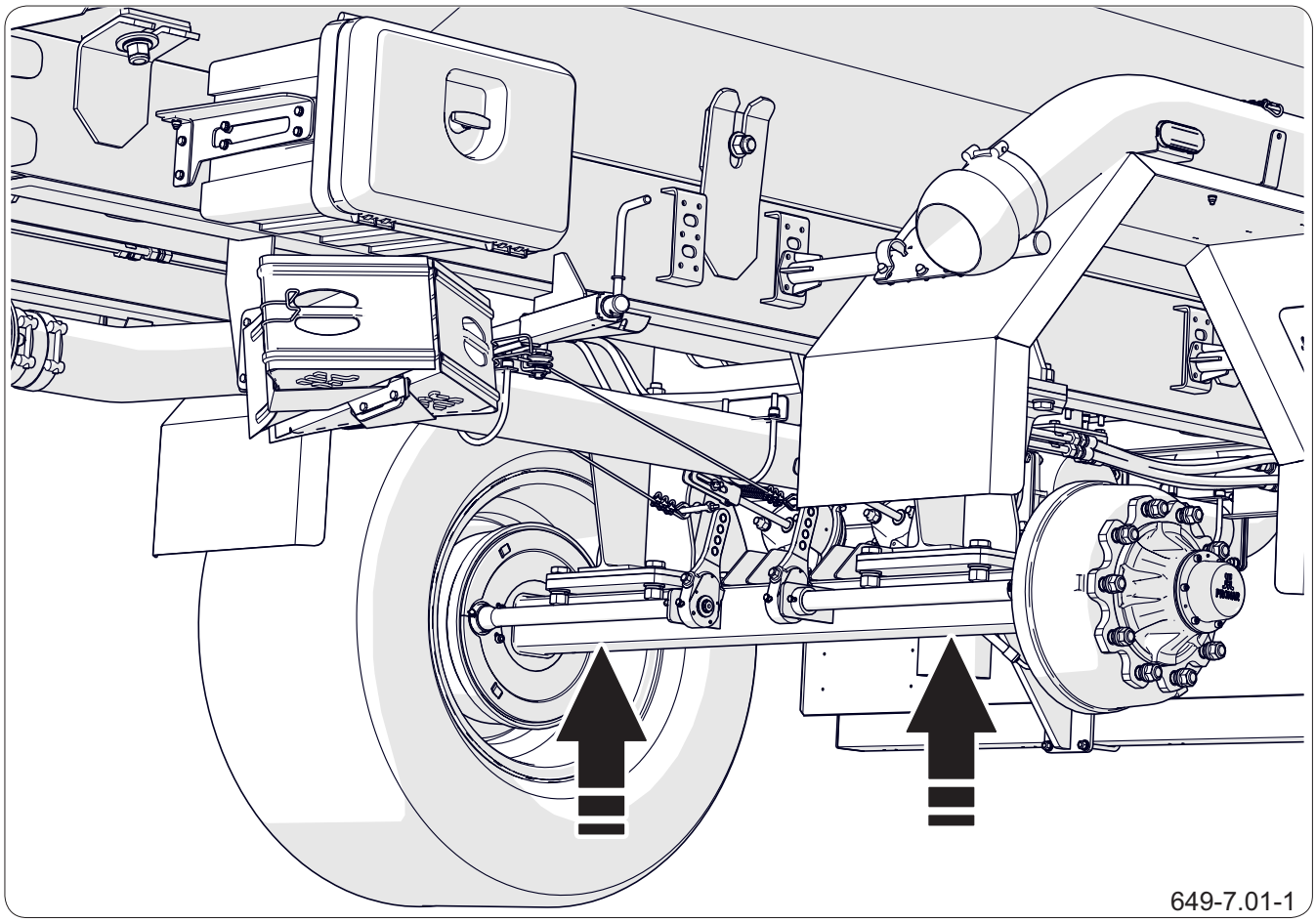


Figure 7.1 Recommended machine support points

SER.3.G-020.01.EN

6.4 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"*.

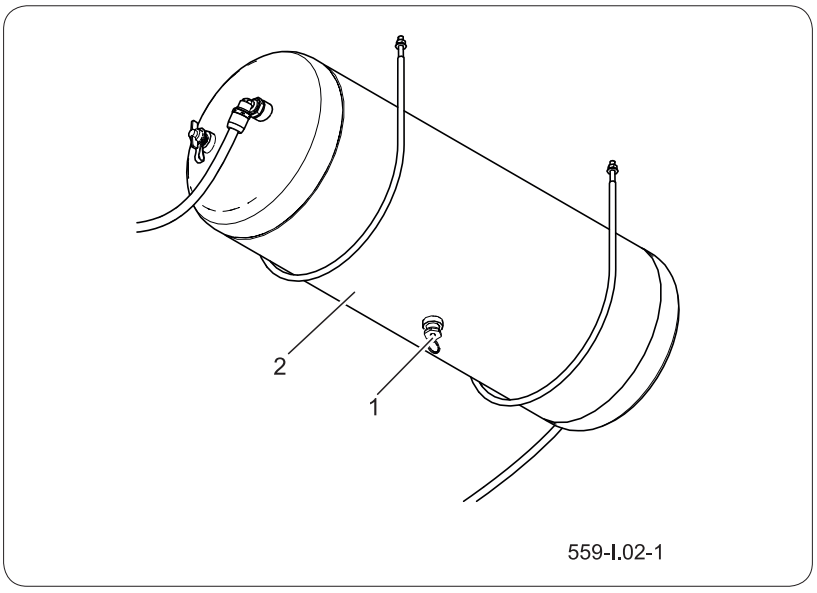


Figure 6.2 Air tank
(1) drain valve (2) air tank

SER.3.8-004.01.EN

7.6 GUARD INSPECTION

DANGER

It is forbidden to use the machine with damaged or incomplete guards.

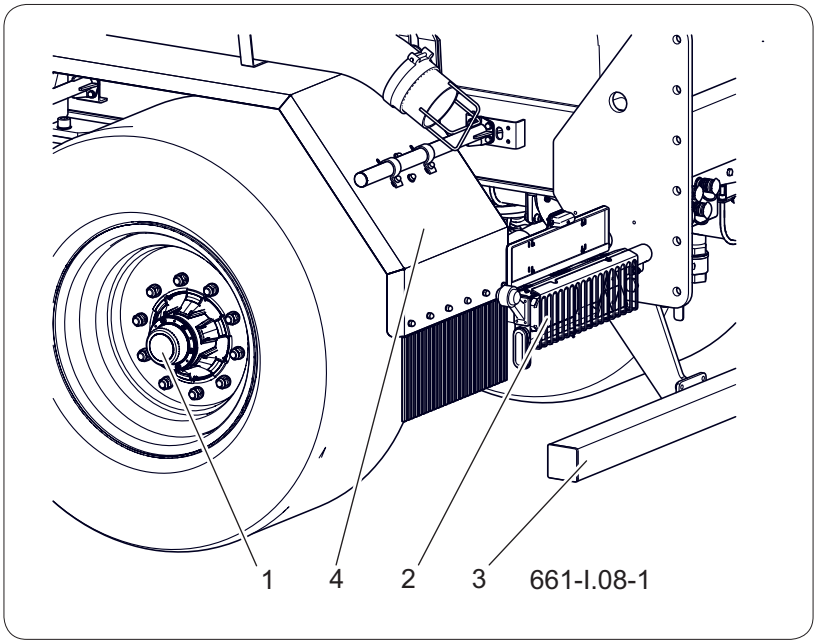


Figure 7.3 Trailer guards
(1) axle cap
(2) lamp cover
(3) bumper
(4) fender

The guards protect the user of the machine against loss of health or life and are a protective element of the machine's components. For this reason, their technical condition must be checked before starting work. Damaged or missing items must be repaired or replaced.

The scope of activities

- Check the completeness of the protective covers.
- Check if the covers are properly installed, assess the condition of the bumper (3) and the mounting of the lamp shade covers (2).
- Check that the caps (1) are secure and complete.
- Check the mudguards (4) for correct mounting.
- Tighten the screw connections of the cover fixings if necessary.

SER.3.G-004.01.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.

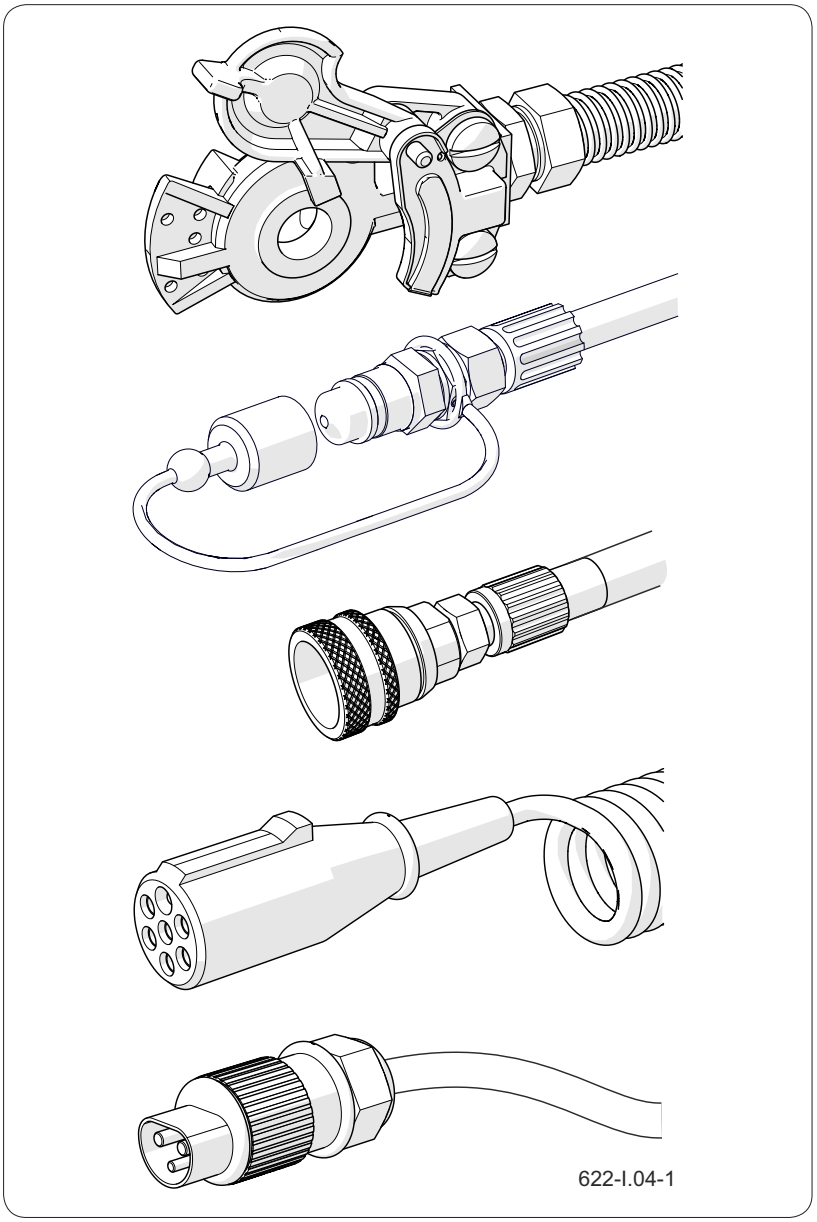


Figure 6.3 Checking the trailer connections

If the trailer is disconnected from the tractor, connections should be protected with covers or placed in their designated sockets. Before the winter period, it is recommended to preserve the seal with preparations intended for this purpose (e.g. silicone lubricants for rubber elements).
Each time before connecting the machine, check the technical condition and degree of cleanliness of connections and sockets on the agricultural tractor. If necessary clean or repair tractor sockets.

SER.3.8-005.01.EN

6.7 CHECKING OF THE MACHINE BEFORE DRIVING

DANGER

Driving with faulty lighting or brake system is prohibited.

In the event of damage to the machine, do not use it 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 machine 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 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 the accumulated water through the blocked vents. If any damage is found, replace the actuator. When mounting the actuator, keep its original position

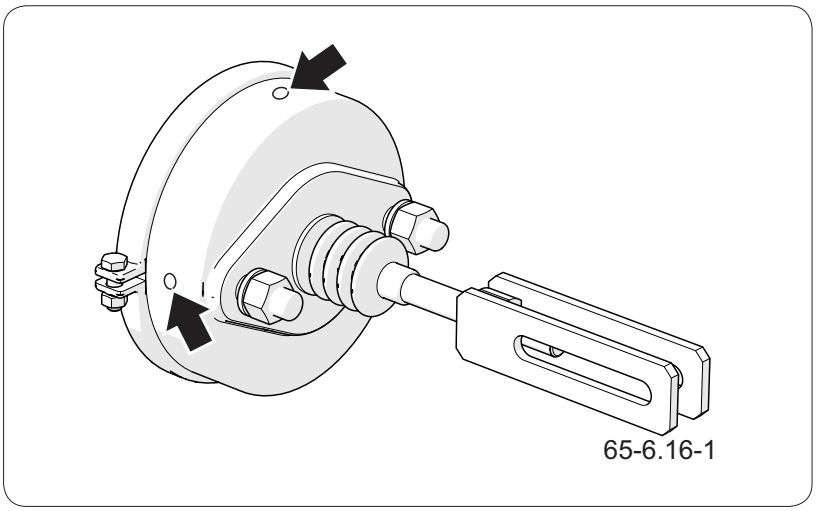


Figure 6.5 Brake cylinder

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 machine air tank is required.

Check the correct operation of the other systems while operating the machine.

SER.3.G-006.01.EN

6.8 AIR PRESSURE MEASUREMENT, TIRE AND RIM INSPECTION

ADVICE

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

CAUTION

Using a machine in which tires are not properly inflated may lead to permanent tire damage as a result of delamination of the material.

Incorrect tire pressure also causes faster wear of the tire.

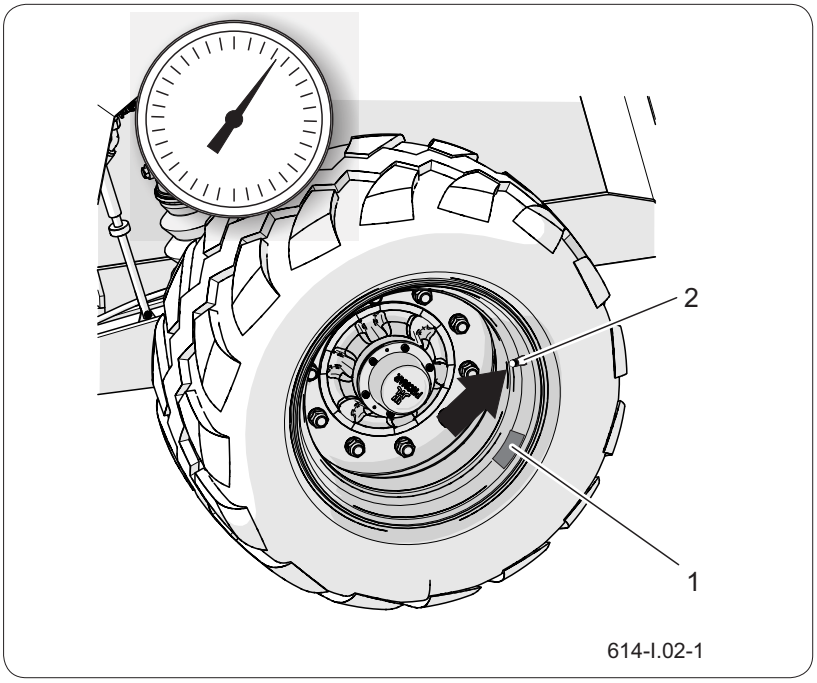


Figure 6.6 Trailer's wheel
(1) sticker *(2) valve*

The machine must be unloaded during pressure measurement. The inspection should be performed before driving, when the tires are not warm, or after the machine has been parked for a longer period of time.

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.G-007.01.EN

7.10 INSPECTION AND CLEANING OF THE DELIVERY PUMP

ADVICE

At the factory, the gearbox is filled with SAE 90 EP gear oil (API GL-5 SAE 80W/90).

CAUTION

Check the oil level in the gearbox before each working season or once every six months.

Perform the oil level check with the machine turned off, the oil should be cooled down.

Do not overfill the gearbox with oil. Too much oil can cause the gearbox to overheat.

If you notice an oil leak, carefully inspect the seals, check the oil level.

Operation of the gearbox with a low or no oil level can lead to permanent damage to its mechanism.

DANGER

During work related to the control and refilling of oil, use appropriate personal protective equipment, i.e. protective clothing, shoes, gloves, glasses. Avoid oil contact with skin.

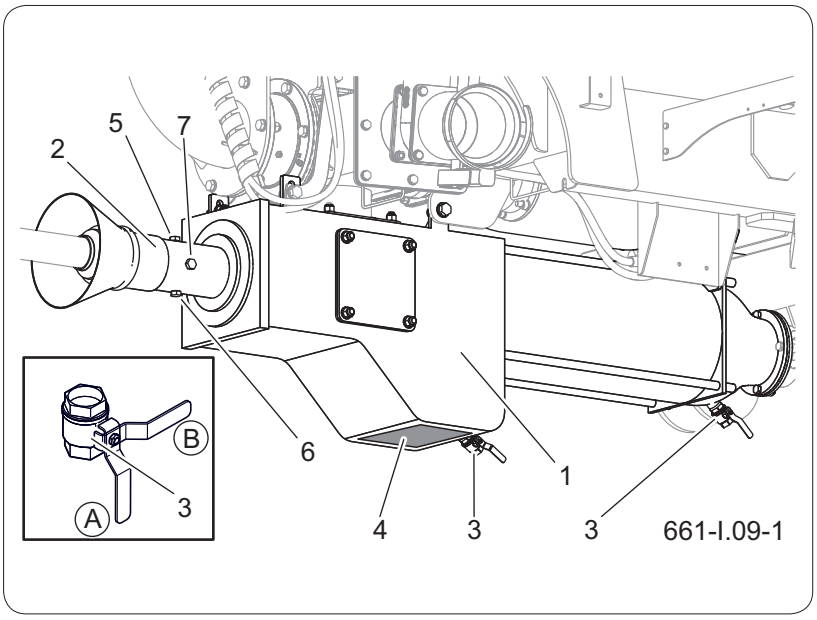


Figure 7.7 Checking the gearbox oil level

(1) pump chamber *(2) gear*
(3) drain valve *(4) flap*
(5) filler plug *(6) drain plug*
(7) inspection plug
(A) open position *(B) closed position*

Checking of the gearbox oil level

- Level the machine up and block it with the parking brake and,
- Disconnect the drive shaft,
- Check the lateral and axial play of the gear bearings by gripping the gear shaft,
- Unscrew the plug (7) and check the gearbox oil level (2).
- If necessary, unscrew the oil filler plug (5) and add oil to the required level. Tighten the plug.

  The oil level should coincide with the lower edge of the inspection hole of the plug (7).
- Tighten the plug (7).

ADVICE

Replace the transmission bearings after 20,000 hours of operation or after 5 years of machine operation.

CAUTION

After 50 hours of pump operation, check and, if necessary, tighten all screw connections of the pump.

Changing of the transmission oil

- Level the machine up and block it with the parking brake and,
- Disconnect the drive shaft,
- Unscrew the filler plug (5), then the drain plug (6), empty the gearbox of the used oil.
- Screw on the cap (6)
- Pour oil into the gearbox.

  The oil level should coincide with the lower edge of the inspection hole of the plug (7).
- Tighten the plug (7).

SER.3.G-008.01.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.
- The cartridge and the filter body should be thoroughly washed and blowed out with compressed air. Installation should be made in reverse order.

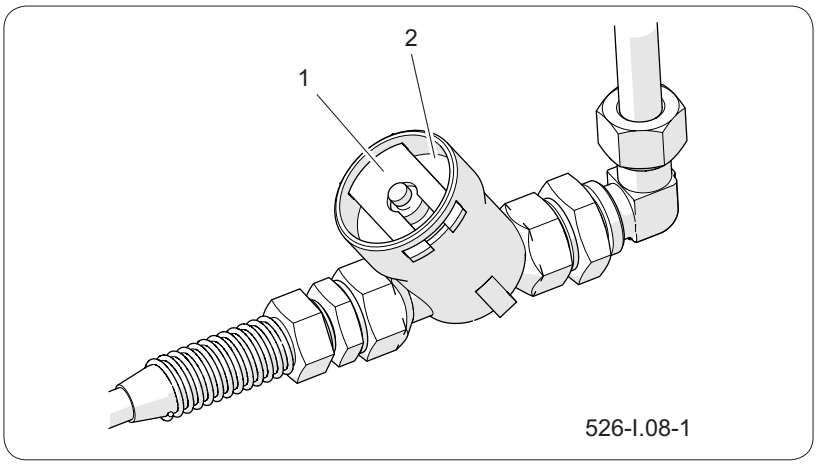


Figure 6.7 Air filter
(1) filter *(2) cover*

SER.3.8-008.01.EN

6.13 CLEANING THE DRAINAGE VALVE

DANGER

Bleed the air tank before removing the drain valve.

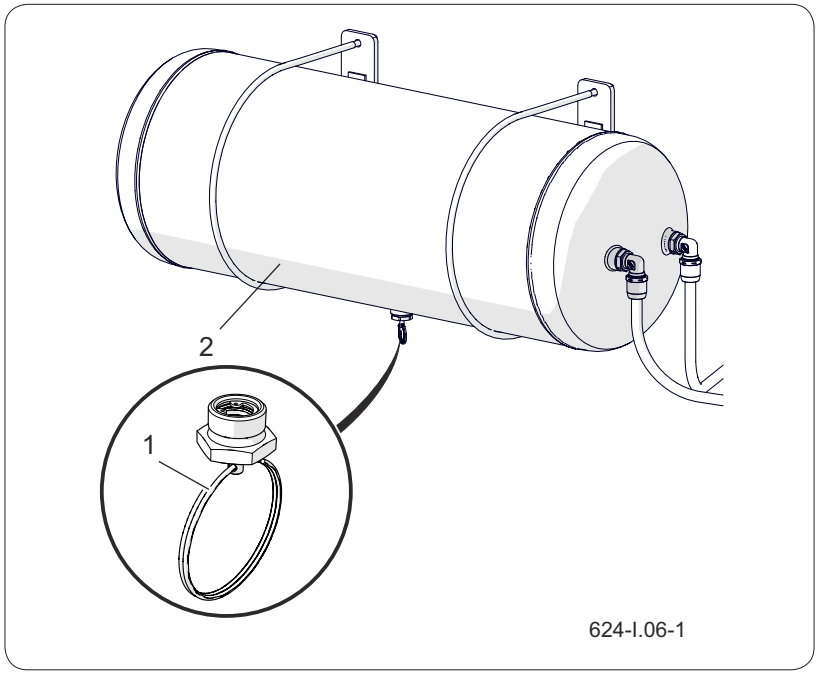


Figure 6.11 Air tank
(1) drain valve *(2) tank*

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

6.10 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.

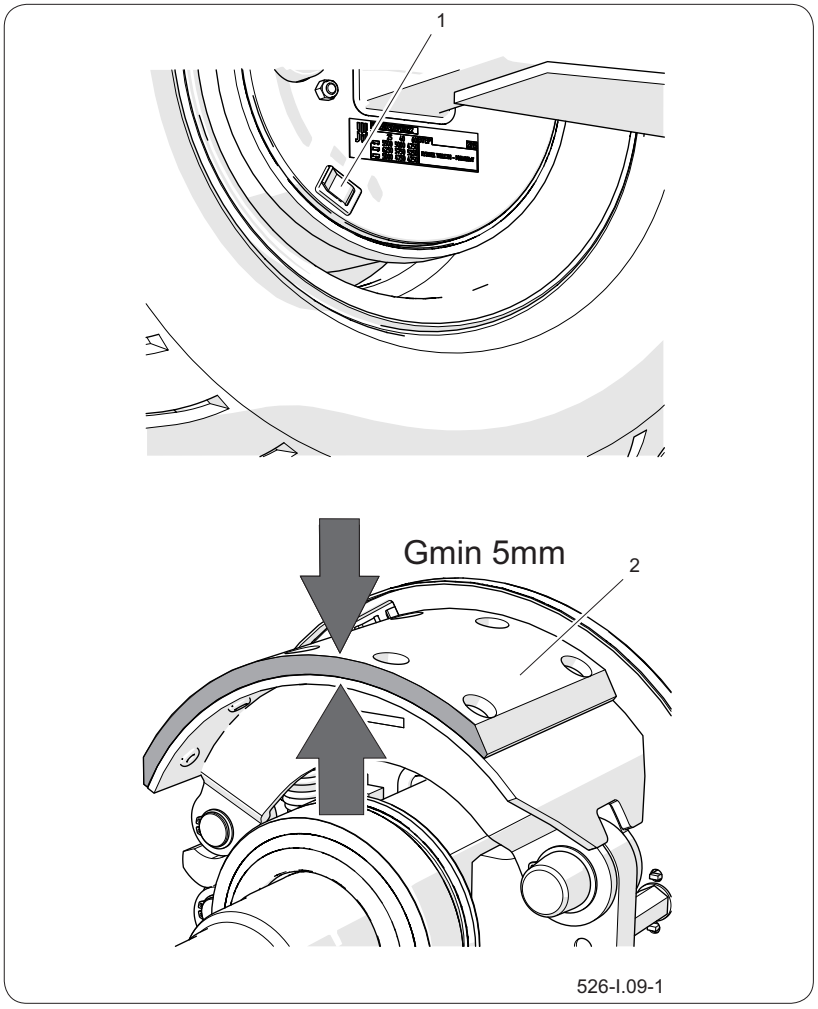


Figure 6.8 Checking the brake lining thickness
(1) blanking plug (2) brake lining

- 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 OF THE CLEARANCE OF THE AXLE BEARINGS

ADVICE

A damaged hub cover or lack of it will cause the penetration of dirt and moisture to the hub, which will result in much faster wear of the bearings and hub seals.

Bearing life depends on machine 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.

Control the play of bearings only when the machine is connected to the tractor and is unloaded.

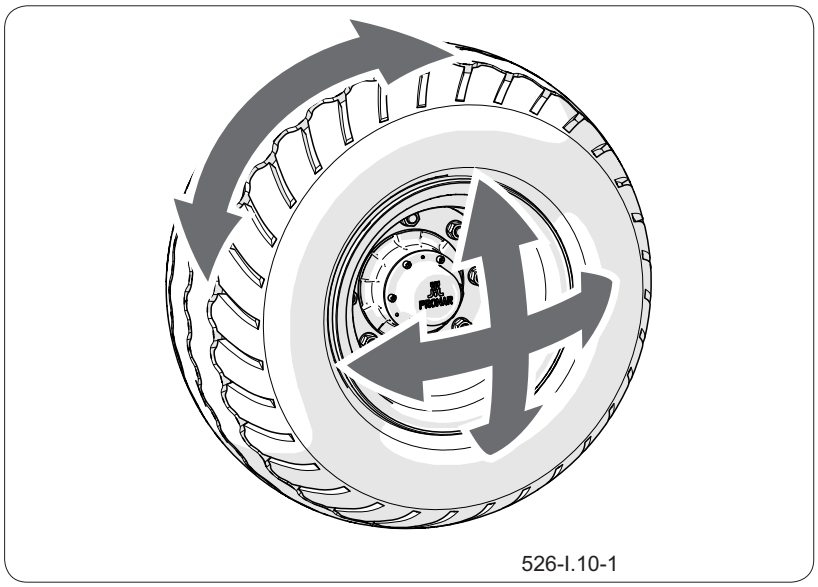


Figure 6.9 Clearance checking

- 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.G-009.01.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.

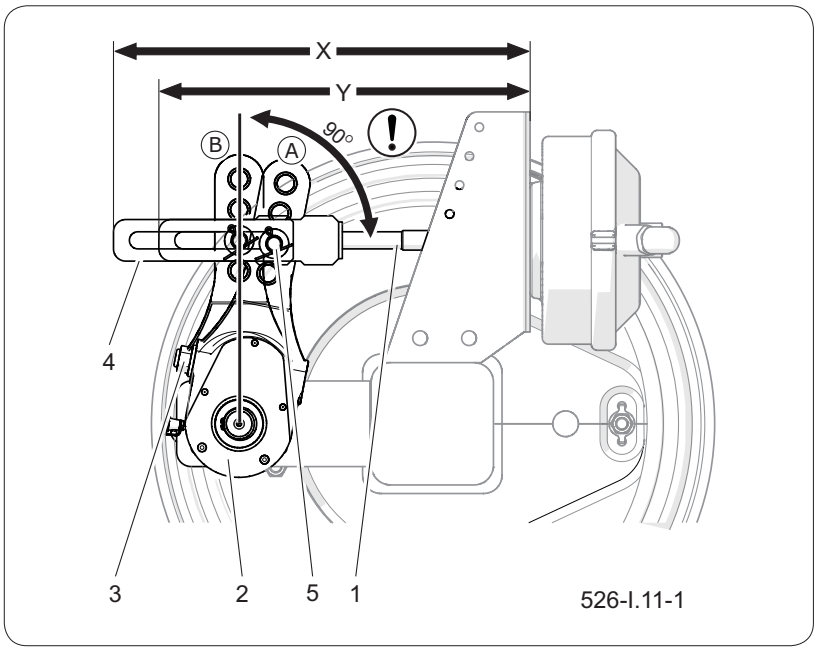


Figure 6.10 Brake check
(1) cylinder piston
(2) expander arm
(3) adjustment screw
(4) of the cylinder fork
(5) pin position
(A) position of the arm in the released position
(B) arm position in braking position

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.3.8-011.11.EN

7.16 ADJUSTING OF THE PARKING BRAKE CABLE TENSION

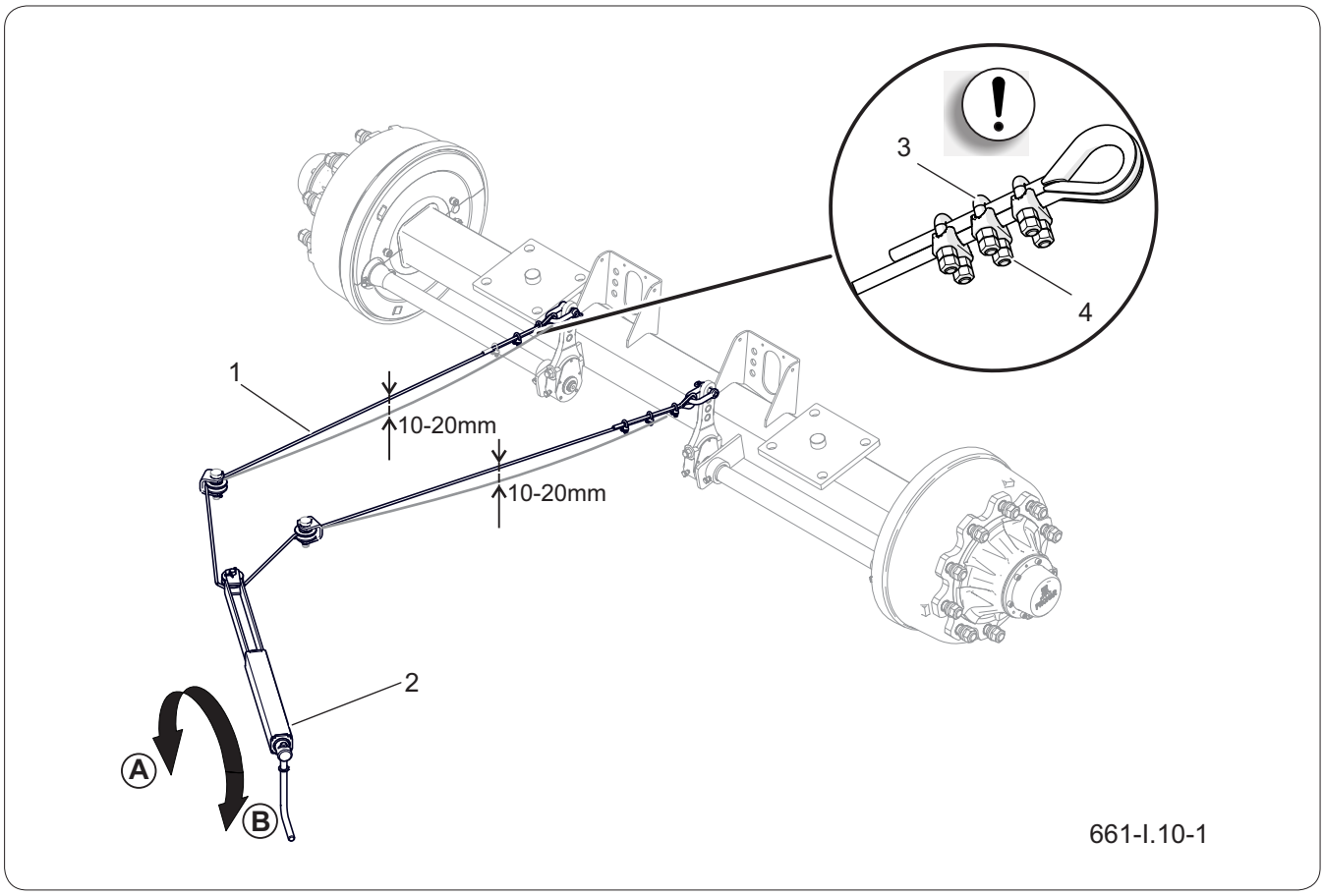


Figure 7.13 Cable tension adjustment
(1) cable, (2) brake mechanism, (3) bow clamp, (4) clamp nut

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 machine to the tractor. Place the machine and tractor on level ground.
- Under one wheel of the machine's 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.G-010.01.EN

6.15 HYDRAULIC SYSTEM CHECKING

UWAGA

It is forbidden to use the machine with a faulty hydraulic installation.

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 THE PNEUMATIC BRAKING SYSTEM INSPECTION

DANGER

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

DANGER

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

The scope of activities

- Connect the machine to the tractor.
- Block the tractor and the machine with the parking brake. Put the wedges under one wheel of the rigid axis of the machine.
- Start the tractor to supplement the air in the machine 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 actuators.
- 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.G-019.01.EN

6.19 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 *"Tightening torques for screw connections"*. The given values apply to non-lubricated steel bolts.

Hydraulic lines and other hydraulic components with rubber seals should be tightened with torque according to the Table *"Tightening torques of hydraulic elements"*.

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

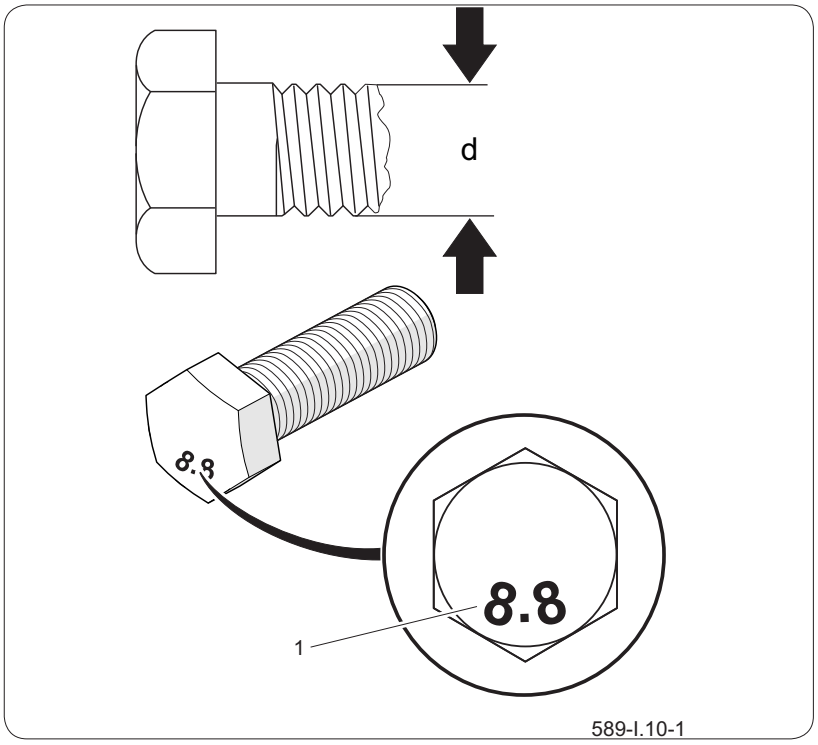


Figure 6.14 Screw with metric thread
(1) strength class, (d) thread diameter

Table 6.7. Tightening torques for screw connections

Metric		
	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 6.8. 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.G-011.01.EN

6.20 TIGHTENING ROAD WHEELS

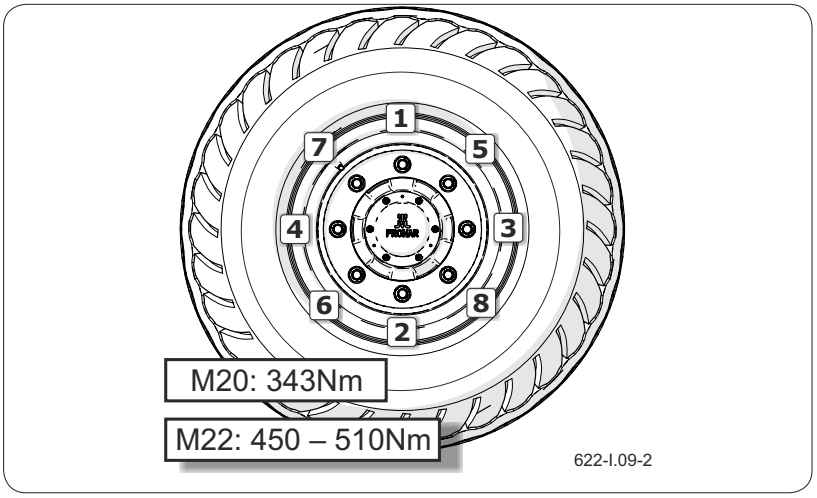


Figure 6.16 The order of the nuts tightening (8 pcs)

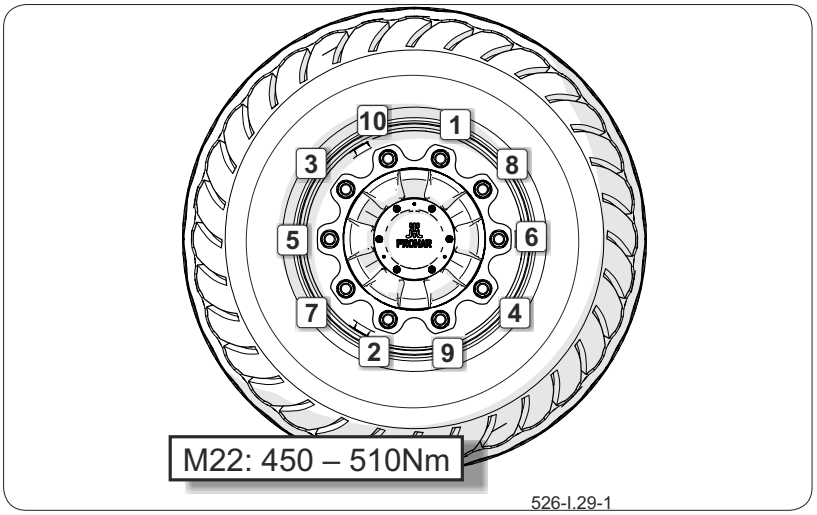


Figure 6.15 The order of the nuts tightening (10 pcs)

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

6.21 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

6.27 ADJUSTMENT OF THE CLEARANCE OF WHEEL AXLE BEARINGS

CAUTION

Adjust the play of bearings only when the machine is connected to the tractor and unloaded.

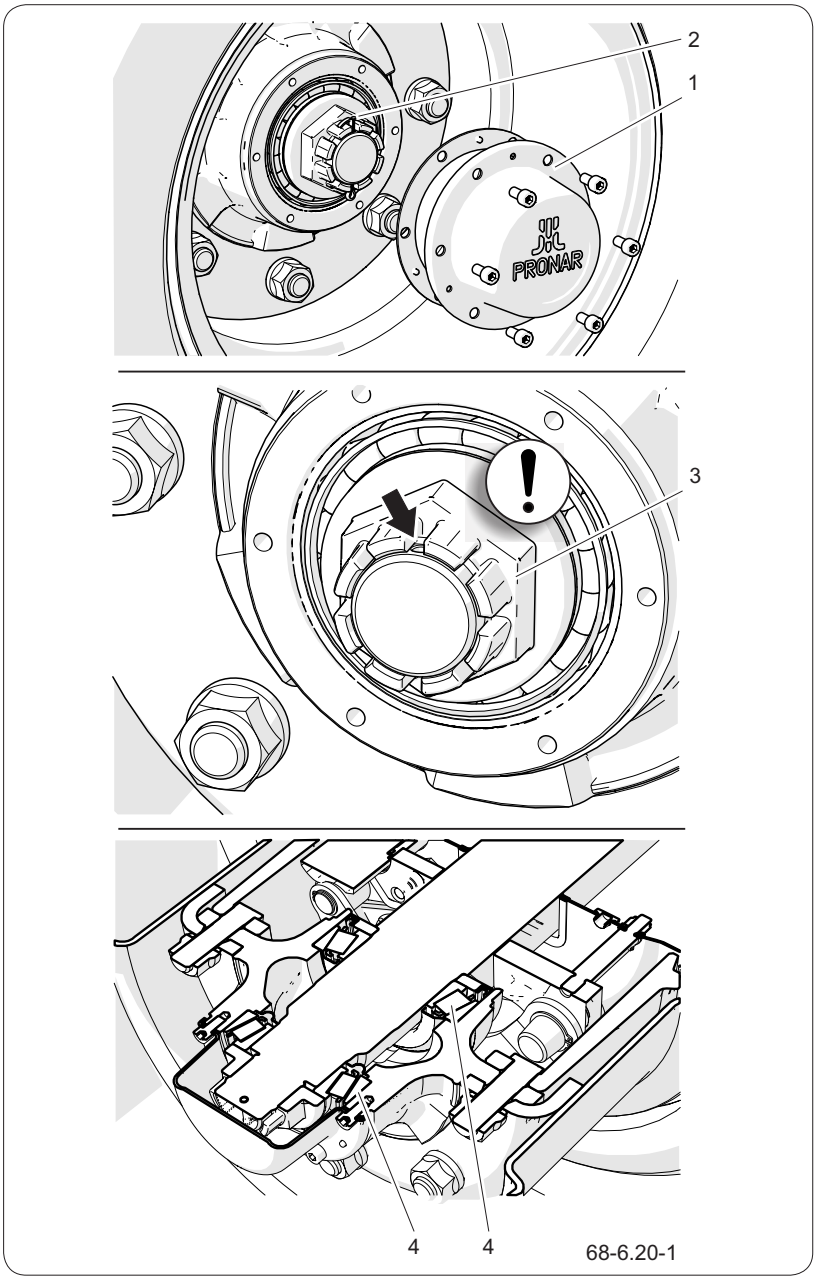


Figure 6.21 The principle of bearing clearance adjustment
(1) hub cover, *(2) cotter pin,*
(3) nut, *(4) tapered roller bearing*

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.

SER.3.G-013.01.EN

6.28 BRAKE ADJUSTMENT

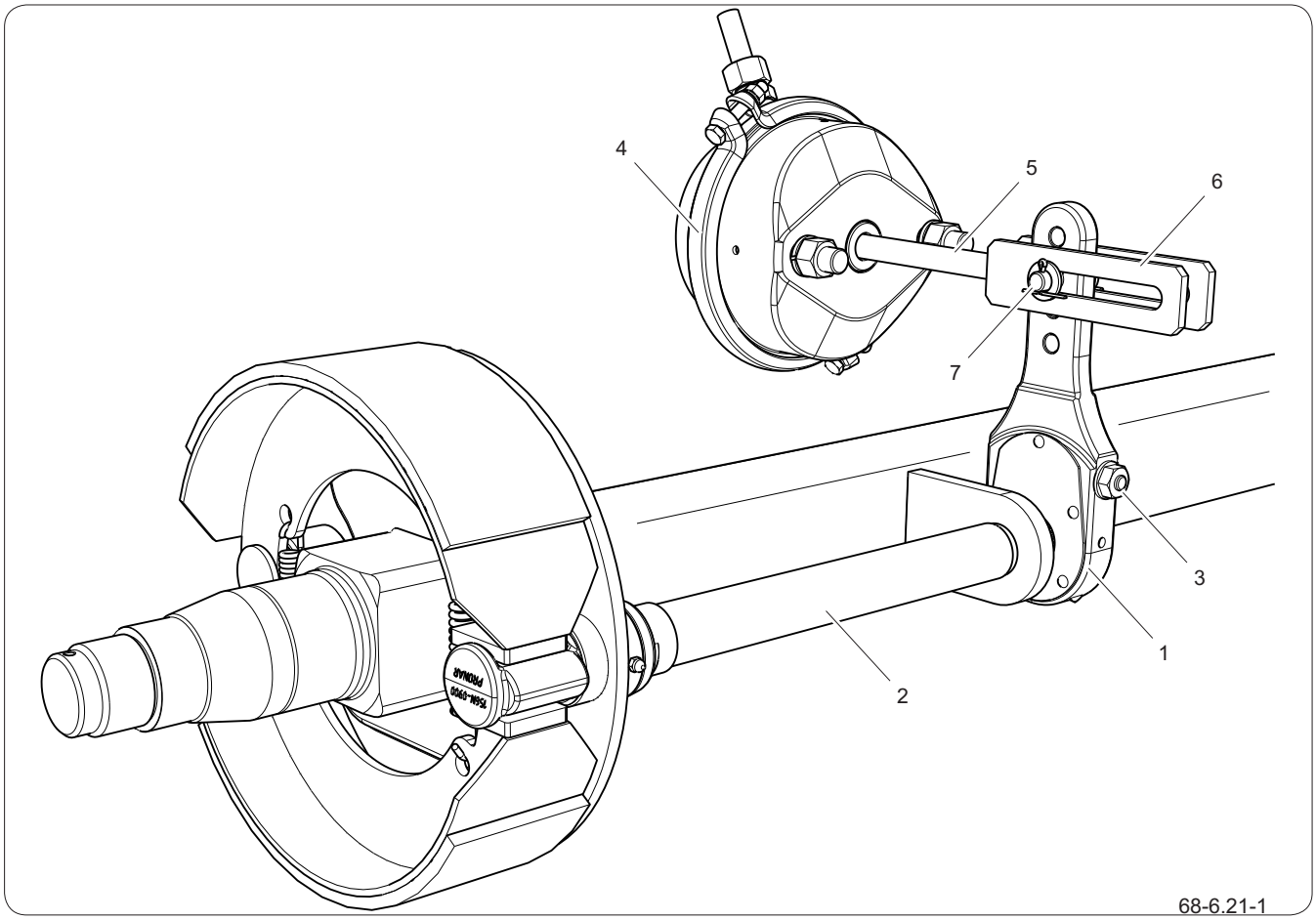


Figure 6.22 Construction of the pneumatic brake of the driving axle
(1) expander arm, *(2) expander shaft,* *(3) adjusting screw,*
(4) pneumatic cylinder, *(5) cylinder,* *(6) cylinder fork,*
(7) cylinder pin

ADVICE

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

Significant wear of brake shoe linings causes an increase in the stroke of the brake cylinder piston rod and deterioration of braking efficiency.

During braking, the piston rod stroke should be within the specified operating range, and the angle between the piston rod (1) and the expander arm (3) should be approximately 90°. The machine wheels must brake simultaneously.

The braking force also decreases when the angle of operation of the brake actuator piston rod (5) is not appropriate in relation to the expander arm (1).

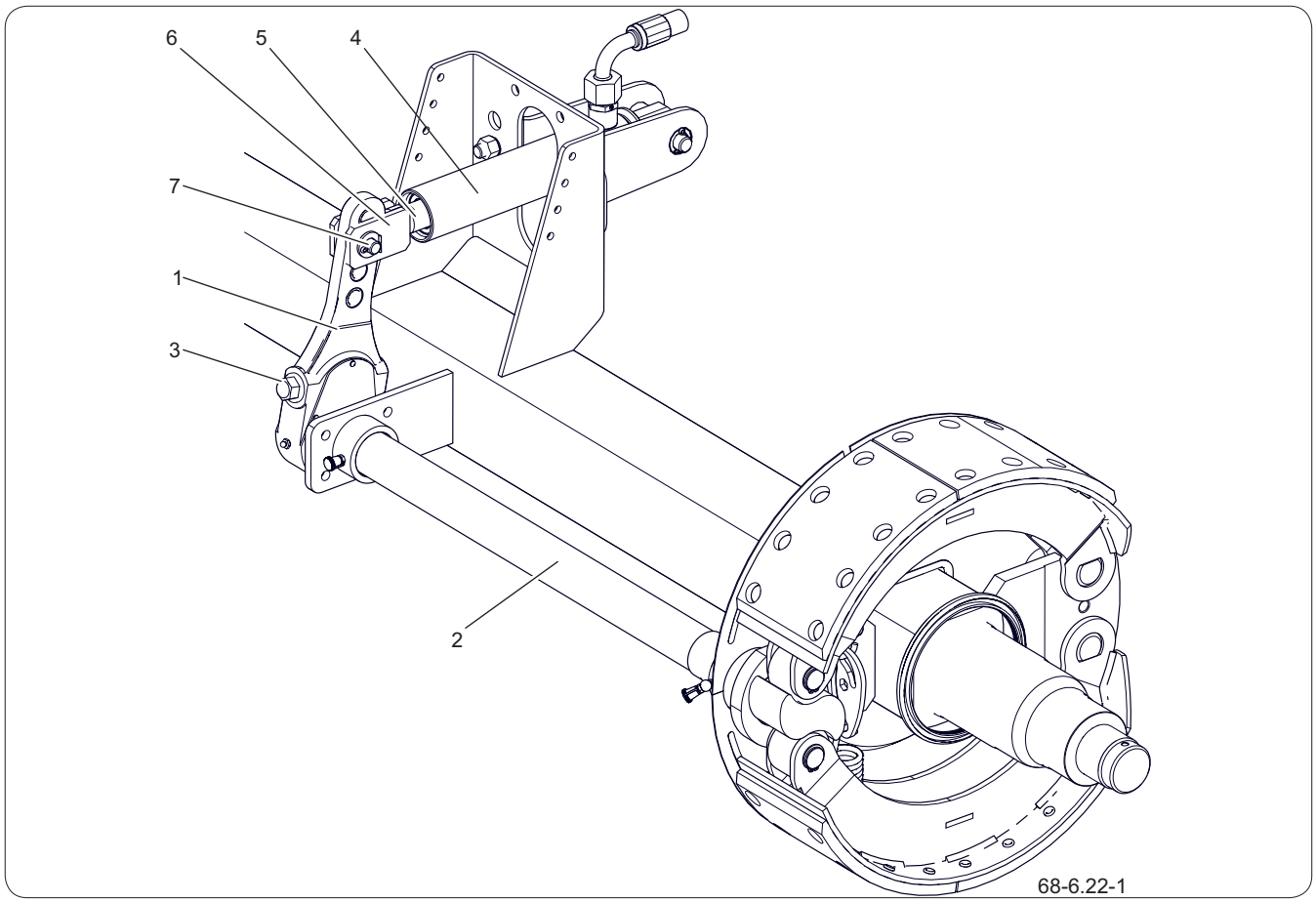


Figure 6.23 Construction of the hydraulic brake of the driving axle
(1) expander arm, (2) expander shaft, (3) adjusting screw, (4) hydraulic cylinder, (5) cylinder piston rod, (6) cylinder fork, (7) cylinder pin

CAUTION

Incorrectly adjusted brake may cause the brake shoes to rub against the drum, which may result in faster wear of the brake linings and/or overheating of the brake.

In order to obtain the optimal mechanical operating angle, the piston rod fork (6) must be mounted on the expander arm (1) in such a way that the operating angle amounts to approx. 90° when fully braking.

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

When disassembling of 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 machine, it is selected by the Manufacturer and cannot be changed.

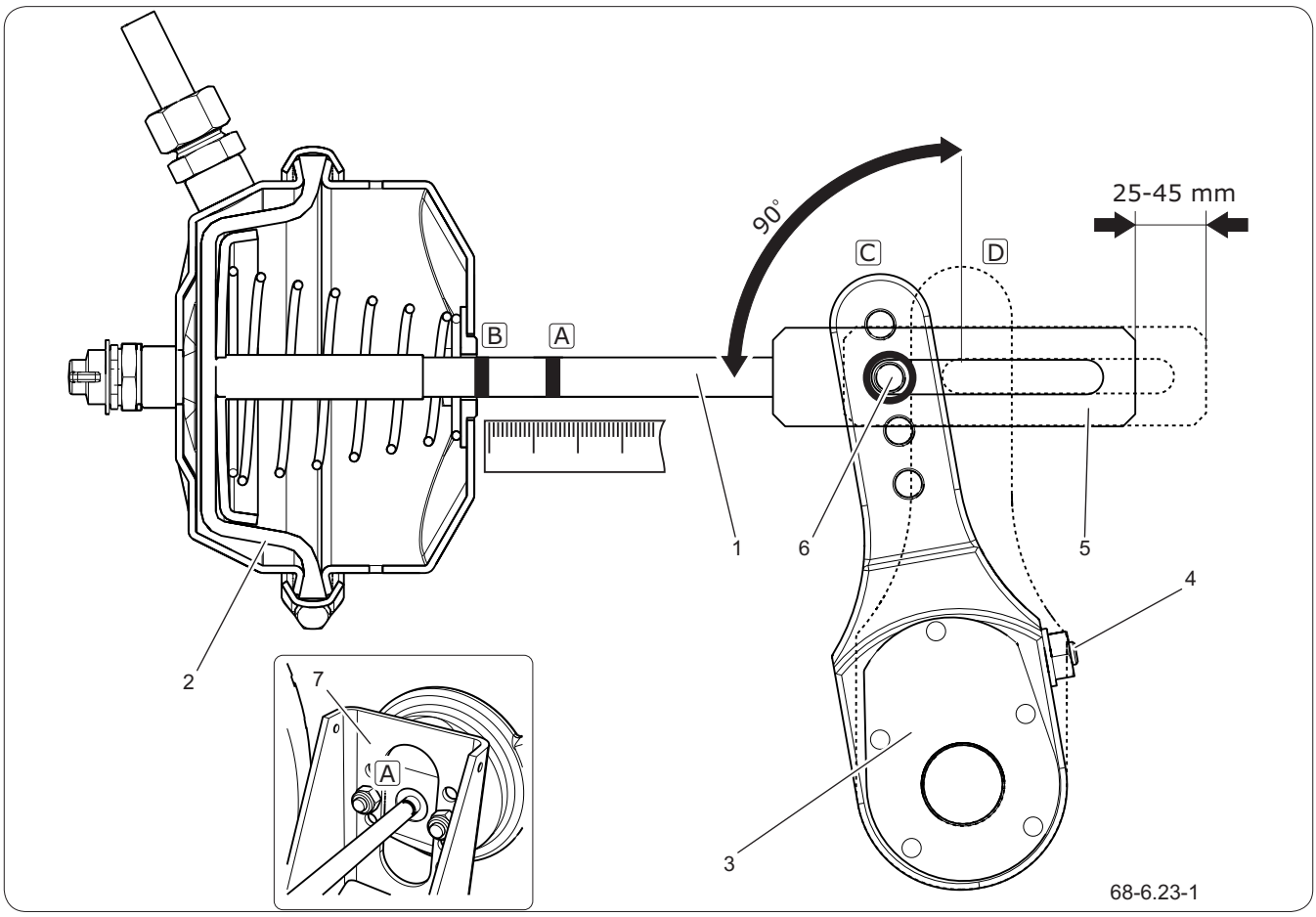


Figure 6.24 Pneumatic brake adjustment principle
(1) piston, (2) cylinder membrane, (3) expander arm,
(4) adjustment screw, (5) cylinder fork, (6) fork pin,
(7) cylinder support
(A) the tag on the piston in the brake release position, (b) the tag on the pistons in the full stop position,
(c) the position of the arm in the brake release position, (D) arm in full stop position

CAUTION

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

Each time when removing the pin or the actuator, it is recommended to mark the place of the original fastening.

The scope of activities

- Connect the machine to the tractor.
- Turn off the tractor engine and remove the ignition key.
- Immobilize tractor with parking brake.
- Make sure the machine is not braked.
- Secure the machine against rolling with wheel chocks.
- On the piston rod (1) of the cylinder mark with a line (A) the position of the maximum retraction of the piston rod with the trailer brake off.
- Press the brake pedal on the tractor, mark with a line (B) the position of maximum extension of

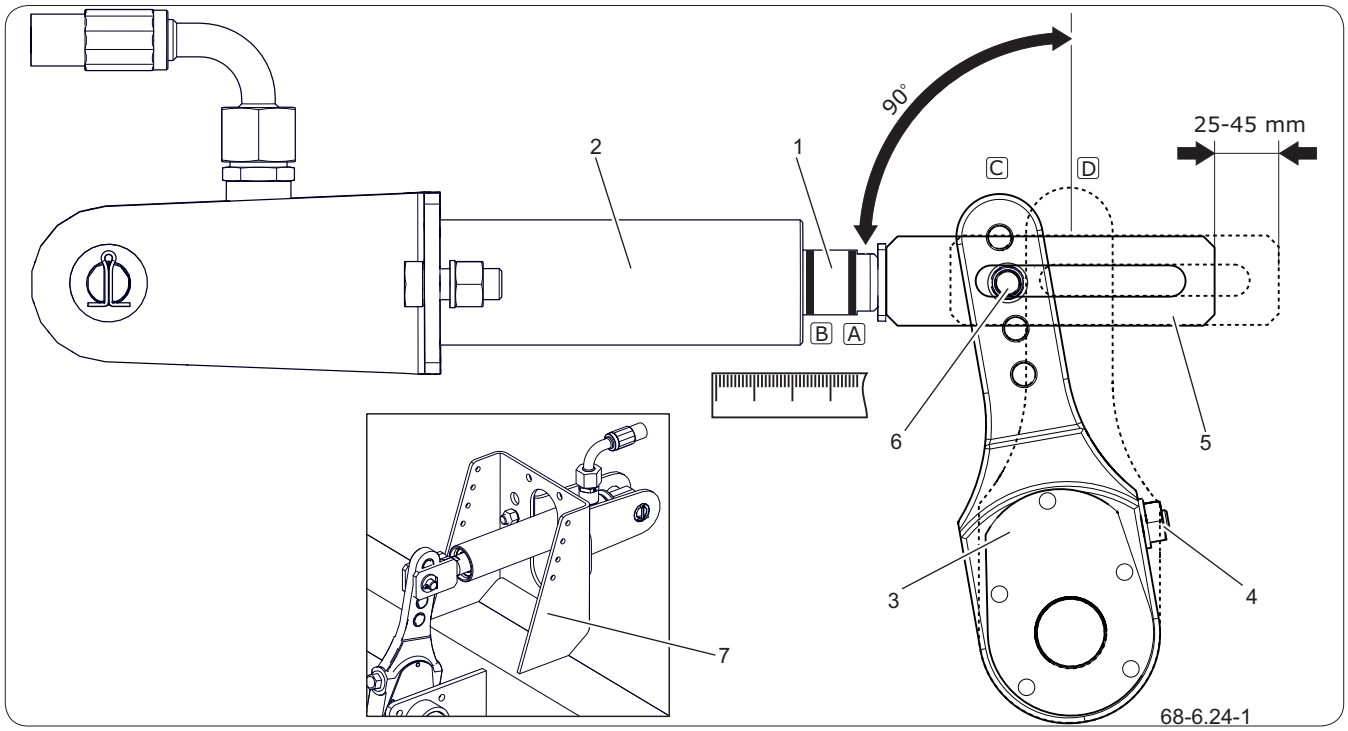


Figure 6.25 Hydraulic brake adjustment principle
(1) piston rod, (2) cylinder piston, (3) expander arm,
(4) adjustment screw, (5) cylinder fork, (6) fork pin,
(7) cylinder bracket (A) mark on the piston rod in the release position,
(B) the mark on the piston rod in the fully braked position,
(C) position of the arm in the unbraked 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 (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 machine and check the temperature of the brake drums.
- If any drum is too hot, correct the brake adjustment and perform the test drive again.

SER.3.G-014.01.EN

7.24 LUBRICATION

ADVICE

Lubrication frequency (Table Machine lubrication schedule):

D - working day (8 hours of trailer),

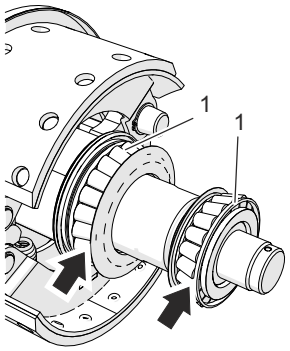
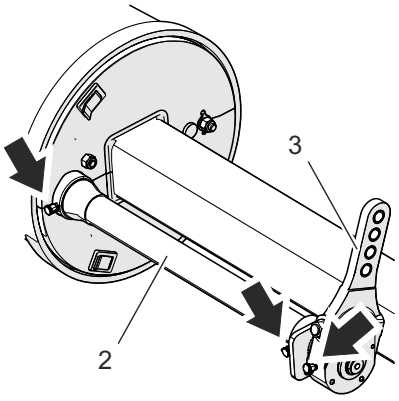
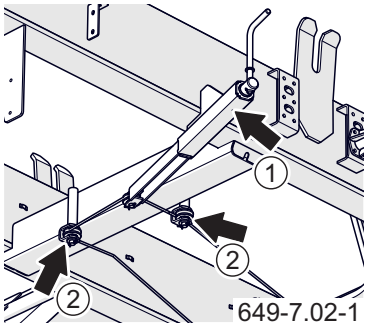
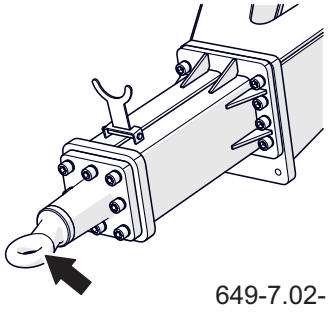
M - month

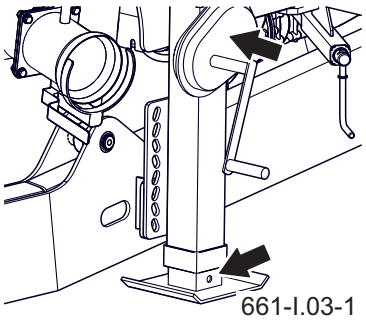
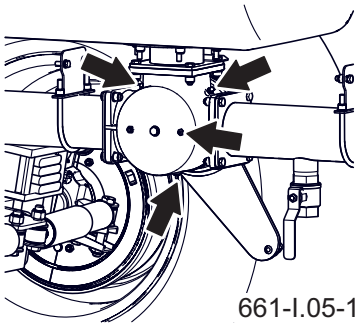
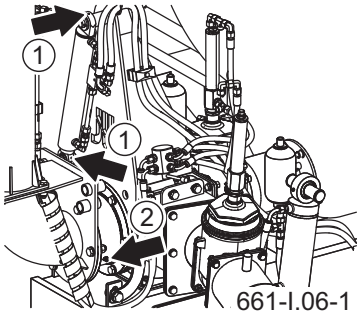
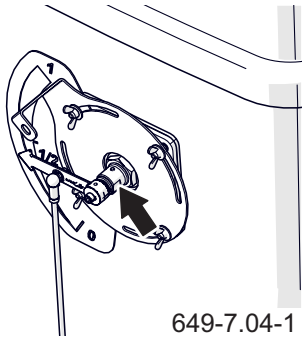
- Before starting work, remove the old grease and other pollution. After finishing work, wipe off excess grease.
- Parts that should be lubricated using machine oil should be wiped with a dry and clean cloth. Apply the oil with a brush or oiler. Wipe off excess oil.
- The replacement of grease in wheel 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 7.6. 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	anticorrosive spray
4	D	regular machine oil, silicone spray grease

Table 7.7. Machine lubrication schedule

Item	Name	Number of	Type of grease	Frequency	
1	Hub bearing (2 pieces in each hub)	4	A	24M	
2	Expander shaft bushing	8	A	3M	
3	Expander arm	4	A	3M	
4	Parking brake mechanism (1)	1	A	6M	
	Parking brake roller pins (2)	2	A	6M	
5	Drawbar eye	1	B	14D	

Item	Name	Number of	Type of grease	Frequency	
6	Parking stand	3	A	6M	 661-I.03-1
7	Three-way valve	5	A	3M	 661-I.05-1
8	Docking mechanism actuator bearings (1)	2	A	6M	 661-I.06-1
	Rotating joint of the docking mechanism	1	A	6M	
9	Fill indicator	1	A	12M	 649-7.04-1

SER.3.G-021.01.EN

6.24 MAINTENANCE OF ELECTRICAL INSTALLATION AND WARNING ELEMENTS

CAUTION

Driving with faulty lighting installation is prohibited. Damaged lighting must be replaced immediately before driving. Lost or damaged reflectors should be replaced with new ones.

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

ADVICE

The light source in the lamps are LED diodes and in the event of damage, they are replaced only 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 machine 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 machine.

Check the completeness, technical condition and correct functioning of the machine 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.

SER.3.G-015.01.EN

6.31 CONSUMABLES

6.31.1 Hydraulic oil

ADVICE

In the hydraulic system of the machine, 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 machine, it is not necessary to change the hydraulic oil, however, if necessary, this operation should be entrusted to specialist service centres.

Due to its composition, the oil used is not classified as a dangerous substance, however, long-term action on the skin or eyes may cause irritation. In the event

Table 6.10. Characteristics of the L-HL 32 oil

Item	Name	Unit	
1	Viscosity classification according to ISO 3448VG	-	32
2	Kinematic viscosity at 400°C	mm^2/s	28.8 – 35.2
3	Quality 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!

of contact of oil with skin wash the area of contact with water and soap. Do not use organic solvents (petrol, kerosene). Dirty clothing should be removed to prevent oil from getting on your skin. If the oil gets into your eyes, flush them with plenty of water and in case of irritation contact your doctor.
Hydraulic oil under normal conditions is not harmful to the respiratory tract. There is only a risk when the oil is sprayed strongly (oil mist) or in the event of a fire where poisonous compounds may be released. In the event of fire, the oil must be extinguished with carbon dioxide, foam or extinguishing steam

6.31.2 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. Similar properties should be characteristic of aerosol preparations (silicone lubricants, anti-corrosive lubricants). 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.

SER.3.G-016.01.EN

7.26 TIRES

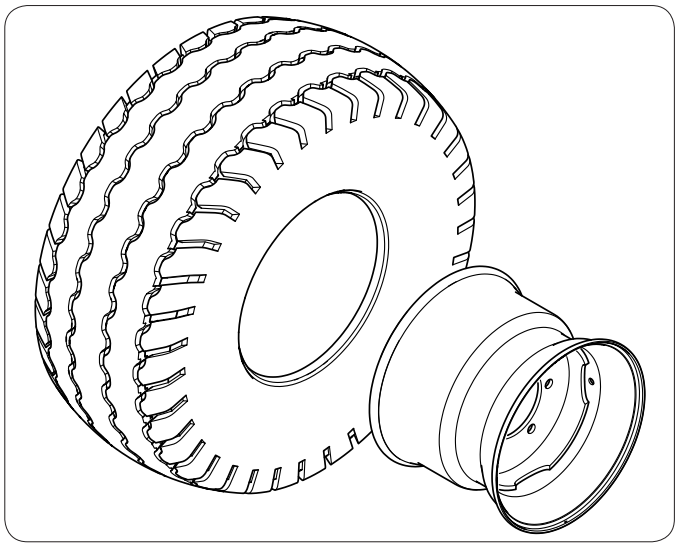


Table 7.9. Machine tires

Item	Tire size	Disc wheel size	Air pressure in the tires
1	560/60- R22,5 161D 172A8	16.00x22,5; ET=+10	400kPa
2	600/55- R26,5 165D 176A8	20.00x26,5; ET=0	400kPa
3	650/55- R26,5 169D	20.00x26,5; ET=0	400kPa
4	650/65- R30,5 176D	20.00x30,5; ET=+35	400kPa
5	710/50- R30,5 173D	24.00x30,5; ET=0	400kPa
6	28L26 173A8	ET=0	400kPa
7			

SER.3.G-017.01.EN

7.27 FAULTS AND METHODS TO REMOVE THEM

Table 7.10. Faults and methods to remove them

Fault	Cause	Removal method
Trouble with starting.	Braking system conduits not connected.	Connect the brake lines (applies to pneumatic systems).
	Damaged pneumatic system connection conduits.	Replace.
	Parking brake applied.	Apply the brake.
	Connections leak	Tighten, replace washers or sealing kits, replace wires.
	Defective control valve or brake force regulator.	
Low efficiency of the braking system.	System pressure too low.	Check the pressure on the manometer in the tractor, wait until the compressor fills the tank to the required pressure. Damaged air compressor in the tractor. Repair or replace. Damaged brake valve on the tractor. Repair or replace. Installation leak. Check systems for leaks.
Noise in the wheel axle hub.	Excessive clearance in the bearings.	Check the clearance and adjust if necessary
	Defective bearings.	Replace the bearings.
	Damaged hub components.	Replace.
Excessive heating of wheel axle hub.	Incorrectly adjusted main or parking brake.	Adjust the position of the expander arms.
	Worn brake linings.	Replace the brake shoes.
Incorrect hydraulic system operation.	Incorrect hydraulic oil viscosity.	Check the oil quality make sure that the oils in both machines are of the same grade. If necessary, change the oil in the tractor and/or trailer

Incorrect hydraulic system operation.	Insufficient tractor hydraulic pump performance, tractor hydraulic pump defective..	Check the hydraulic pump in the tractor.
	Damaged or dirty actuator.	Check the actuator piston rod (bending, corrosion), check the actuator for tightness (piston rod seal), repair or replace the actuator if necessary.
	The actuator is overloaded	Check and if necessary reduce the load on the actuator.
	Damaged hydraulic lines	Check and make sure that the hydraulic conduits are tight, not kinked and properly tightened. If necessary, replace or tighthen.
Damaged articulated telescopic shaft.	Too big angular deviation during operation.	Use a wide-angle shaft or disconnect the PTO when turning.
	Shaft too short or too long.	Align the shaft according to the directions in the operator's manual provided by the shaft's manufacturer.
Excessive wear on both sides of the left and right shoulder of the tire.	Air pressure too low. Driving speed too high when cornering with a loaded trailer. Too fast loss of air due to a damaged rim, valve, puncture, etc.	Check the air pressure. Check the road tires for proper inflation regularly. Trailer load too high. Do not exceed the permissible total weight of the machine. Reduce travel speed when cornering on paved surfaces. Check the rim and valve. Replace damaged parts.
Excessive wear of the tire in the centre section.	Air pressure too high.	Check air pressure. Check the road tires for proper inflation regularly.
Excessive one-sided wear of the left or right shoulder tire.	Incorrect convergence. Driving axles incorrectly adjusted.	Damaged spring leaf on one side of the suspension. Replace the springs.

Tread wear.	Damaged suspension system, broken spring. Damaged brake system, blocking of the brakes, incorrectly adjusted brake system. Too frequent and sudden braking.	Check the clearance in the suspension system, check the springs. Replace damaged or worn parts. Check the brake system for malfunction. Adjust the trailer levers.
Damage to the rim (hardening and cracking in the area of the rim), crumbling of the tire.	Incorrect braking technique. Too frequent sudden braking. Damaged braking system.	Check the braking system. Control the braking technique. The damage is caused by excessive heating of the hub and, as a result, of the road wheel rim.
The feed pump does not rotate	External object blockage.	Remove the external object.
	Medium dried during standstill	Clean the pump
	Too much solid matter	Pumped dilution medium
	The pump impeller does not rotate	Too high temperature of the pumped medium Wrong, aggressive medium
The pump does not suck in the medium	Incorrect direction of rotation of the drive shaft	Check the direction of rotation of the PTO drive shaft
	Suction valve closed	Open the suction valve
	Blocked suction line	Unclog the suction line Seal the suction line
	Pump not filled with liquid, pump impeller damaged	Avoid dry running, replace the pump impeller
	Excessive suction height	Correct the suction height
	Worn pressing elements	Replace impeller and impeller housing
The pump makes noise	Worn joints	Replace the joints
	Cavitation due to too high revolutions or too small a diameter of the suction line	Reduce the revs Increase the diameter of the suction pipe

SER.3.G-018.01.EN

ATTACHMENTS

PRONAR TG110