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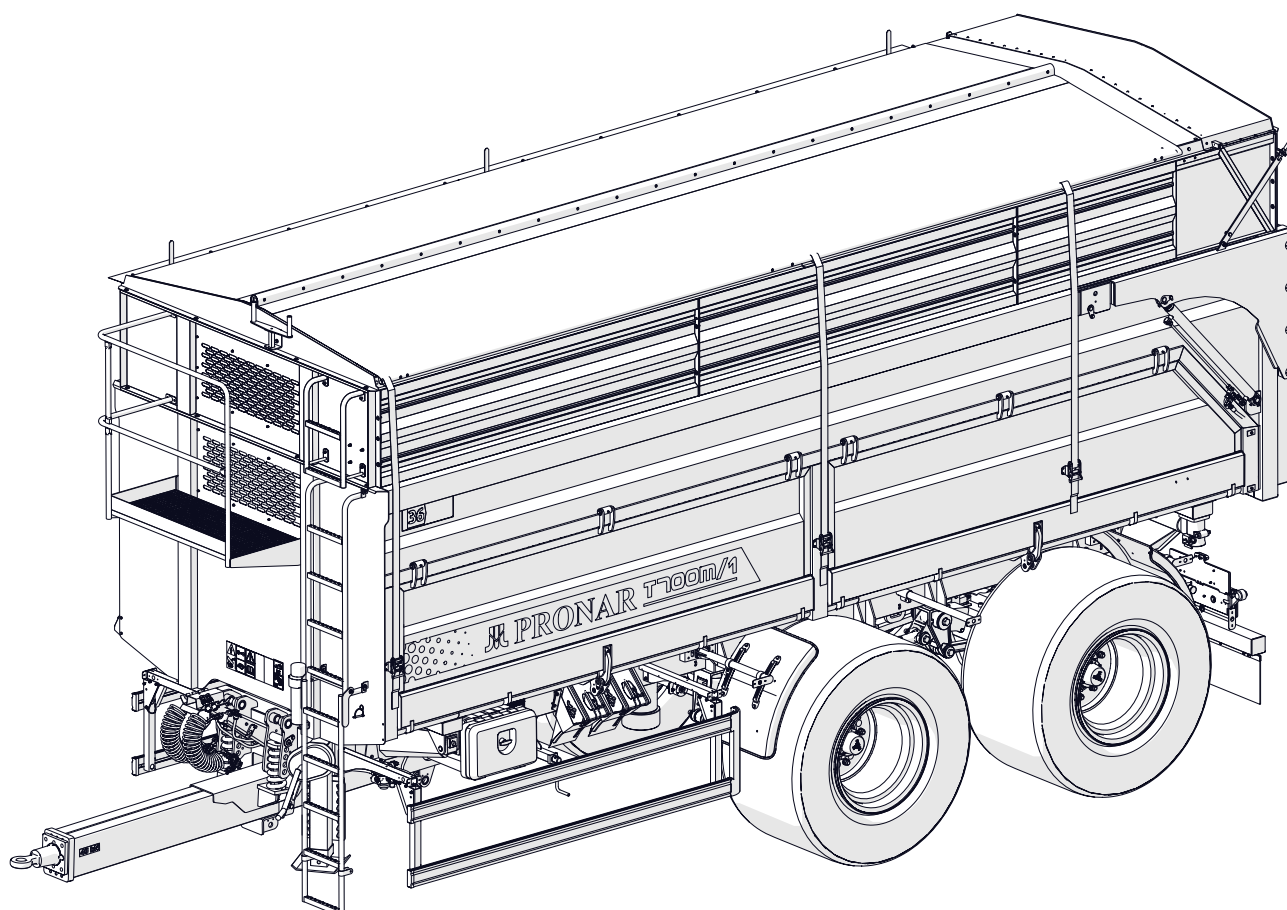
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OPERATOR MANUAL

AGRICULTURAL TRAILER

PRONAR T700M/1

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



EDITION: 1B

08-2020

PUBLICATION NO.: 623.00.UM.1B.EN

EN

INTRODUCTION

INTRODUCTION

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

This Operator's Manual is an integral part of the machine's documentation. Before using the machine, the user must carefully

read this Operator's Manual and observe all recommendations. This guarantees safe operation and ensures failure-free work of the machine. The machine is designed to meet obligatory standards, documents and legal regulations currently in force.

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

It is recommended that the serial number of the machine is inscribed in the spaces below after purchase of the machine.

Machine serial number

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

This Operator's Manual contains important safety and operating instructions for the machine. The Operator's Manual should be kept near the machine so that it is accessible to authorized operators.

Keep this manual for future reference. If the Operator's Manual is lost or damaged, contact the seller or the manufacturer for a copy.

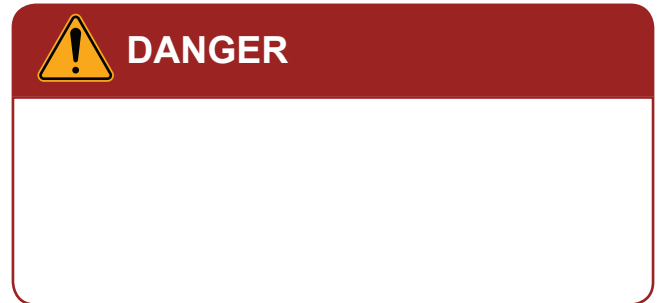
The Operator's Manual is intended for the end user. For this reason, some required maintenance activities are listed in the inspection tables but the procedure is not described in this Operator's Manual. To perform these activities, call the manufacturer's authorized service centre.

U.10.1.EN

SYMBOLS APPEARING IN THIS OPERATOR'S MANUAL

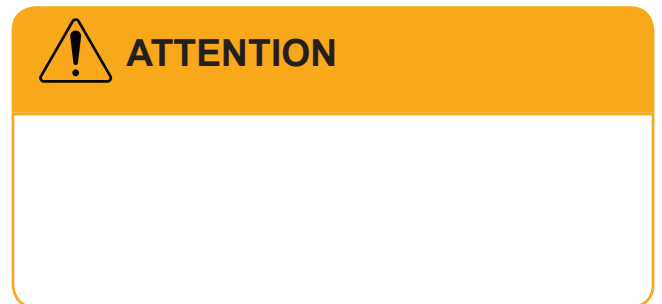
DANGER

Information, descriptions of danger and precautions as well as recommendations and prohibitions associated with the safety of use are marked in the text with the sign **DANGER**. Failure to observe the instructions may endanger the machine operator's or other person's health or life.



ATTENTION

Particularly important information and instructions, the observance of which is essential, are distinguished in the text by the sign **ATTENTION**. Failure to observe the instructions may lead to damage to the machine as a result of improper operation, adjustment or use.



TIP

Additional tips included in the Operator's Manual describe useful advice for the machine operation and are marked with the sign **TIP**.



U.02.1.EN

DIRECTIONS USED IN THIS OPERATOR'S MANUAL

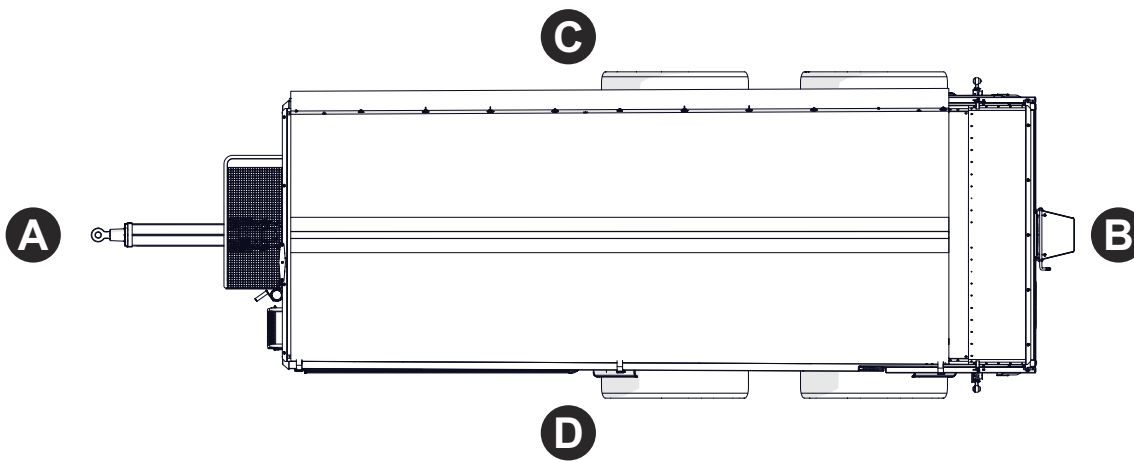


Figure 1.1 Directions used with reference to the machine

(A) - front

(B) rear

(C) right side

(D) left side

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

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

Rotation to the right – clockwise rotation of a mechanism (the operator is facing the mechanism).

Rotation to the left – counterclockwise rotation of a mechanism (the operator is facing the mechanism).

U.03.1.EN

CHECKING THE TRAILER AFTER DELIVERY

The manufacturer guarantees that the trailer is fully operational and has been checked according to quality control procedures and is ready for use. This does not release the user from an obligation to check the machine's condition after delivery and before the first use. The machine is delivered to the user completely assembled. Detailed information concerning the machine hand-over are included in the WARRANTY BOOK.

SCOPE OF INSPECTION ACTIVITIES

- Check completeness of the machine according to order (standard and optional equipment).
- Check the machine for missing parts or damage resulting from wrong transport of the machine to its destination (crushing, piercing, bending or breaking of parts etc.).
- Check technical condition of covers and protection devices.
- Check condition of paint coating; check the machine for traces of corrosion.

TIP

Hand-over of the trailer to the buyer involves a detailed visual inspection and verification of the trailer operation, as well as instructing the buyer on the basic usage rules. The trailer is operated for the first time in the presence of the Seller.

- Check technical condition of tyres and tyre pressure.
- Check if the nuts and bolts fixing the wheels are properly tightened.
- Check technical condition of drawbar eye and if correctly installed.
- Check technical condition of elastic hydraulic lines.
- Check technical condition of pneumatic conduits.
- Check that there are no hydraulic oil leaks.
- Check the electric lamps of the machine.
- Check hydraulic cylinders for leaks of hydraulic oil.

Discovered defects should be notified directly to the seller in order to remove them.

U.11.2.EN

FIRST USE OF THE TRAILER



ATTENTION

During the first use, the trailer is checked in the presence of the Seller. The Seller is obliged to conduct the training in safe and correct operation of the trailer. Training by the seller does not release the user from the obligation to read this manual and follow the instructions in it.

Before you start using the machine, you should familiarize yourself with its design, principle of operation, available equipment and operation and, above all, with safety rules.

PROCEDURE

- The user must read this Operator's Manual and observe all the recommendations contained in it.
 - Perform the daily inspection of the machine in accordance with the guidelines in the inspection schedule.
 - Check all the machine lubrication points, lubricate if necessary according to the recommendations in the lubrication schedule.
 - Check correct tightening of bolt and nut connections (in particular connections of suspension system, drawbar eye and wheels).
 - Ensure that pneumatic, hydraulic and electrical connections in agricultural tractor are according to the requirements, if not the trailer should not be hitched to the tractor.
 - Make sure that the oil of the same kind and grade is used in the trailer hydraulic system and the tractor hydraulic system.
 - Adjust the height of the drawbar eye to the tractor hitch
- If all the above checks have been performed and there is no doubt as to the trailer good technical condition, it can be connected to tractor.
- Start the tractor, check all systems and conduct test run without load (no load in load box). It is recommended that the inspection is conducted by two people, one of which should always remain in the tractor cab. Test start should be conducted according to the sequence shown below.
- Connect the machine to the appropriate hitch on the agricultural tractor.
 - Connect the braking, electrical and hydraulic systems.
 - Raise support to transport position.
 - Turn on individual lights, check the operation of the electrical system.
 - Activate and check the operation of the following hydraulic systems: tailgate, side walls, raising and lowering the load box, hydraulic parking stand (if present), axle turning

interlock (if present).

- When moving off check if the main brakes operate correctly.
- Perform test drive.
- Stop tractor and turn off the engine, immobilise the tractor and the machine with parking brake.

If during test run worrying symptoms occur such as:

- excessive noise and abnormal sounds originating from the rubbing of moving elements,
- leakage and pressure drop in braking system,
- incorrect operation of hydraulic and / or pneumatic cylinders,
- other faults,



NIEBEZPIECZEŃSTWO

Careless and incorrect use and operation of the machine, and failure to follow instructions in this Operator Manual is dangerous to your life and health. The machine must never be used by unauthorised persons, including children, and people under the influence of alcohol or other abusive substances. Non-compliance with the safety rules of this Operator's Manual can be dangerous to the health and life of the operator and others.

stop operating the trailer and do not operate it until the malfunction is corrected. If a fault cannot be rectified or the repair could void the warranty, please contact retailer for additional clarifications or to perform the repair.

After completion of test drive check tightness of wheel nuts.

U.34 1.EN



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EC DECLARATION OF CONFORMITY OF THE MACHINERY

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

Description and identification of the machinery	
Generic denomination and function:	AGRICULTURAL TRAILER
Type:	T700M/1
Model:	-----
Serial number:	
Commercial name:	AGRICULTURAL TRAILER T700M/1

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

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

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

Narew, the 2020-07-22

Place and date

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**Z-CA DYREKTORA
d/s technicznych
członek zarządu**

Roman Ormelianik

*Full name of the empowered person
position, signature*

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TYRE SYSTEM

ANNEX A

SECTION 1

BASIC INFORMATION

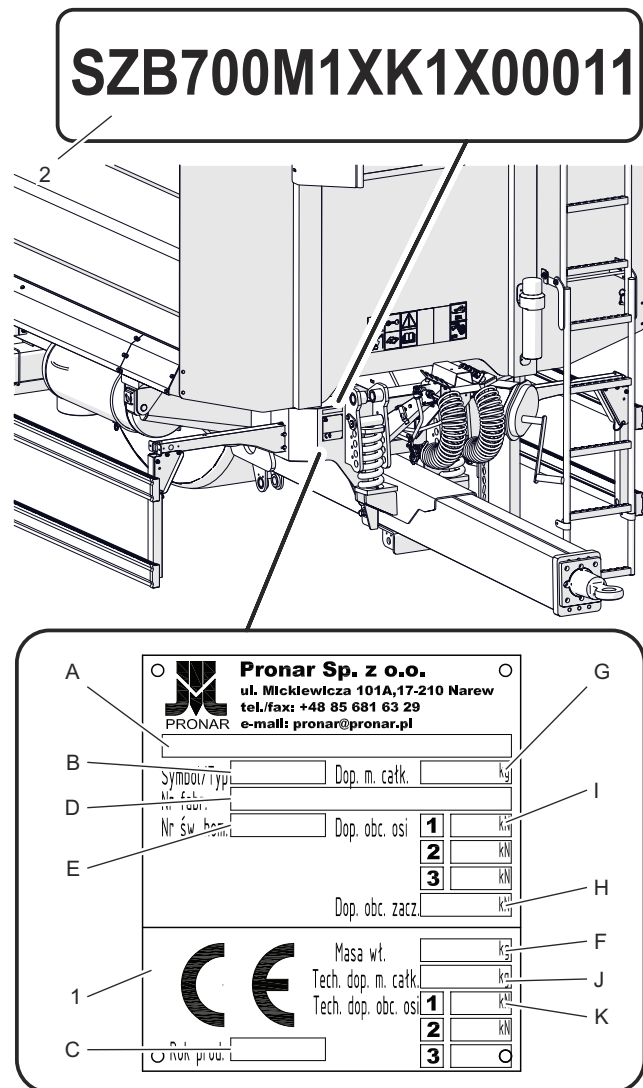
1.1 IDENTIFICATION

S Z B 7 0 0 M 1 X

The PRONAR T700M/1 agricultural trailer is marked with the rating plate (1) and serial number (2) on the front beam of the lower frame - figure (1.1). The meaning of the individual items found on the name-plate are presented in table (1.1). Write down the serial number of the trailer in the upper box.

Table 1.1. Markings on nameplate

Item	Meaning
A	General description and purpose
B	Symbol / type of trailer
C	Year of manufacture
D	VIN
E	Official certificate number
F	Tare weight
G	Maximum gross weight
H	Permissible hitch load
I	Permissible axle load
J	Technically permissible gross weight
K	Technically permissible axle load



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Figure 1.1 Trailer identification

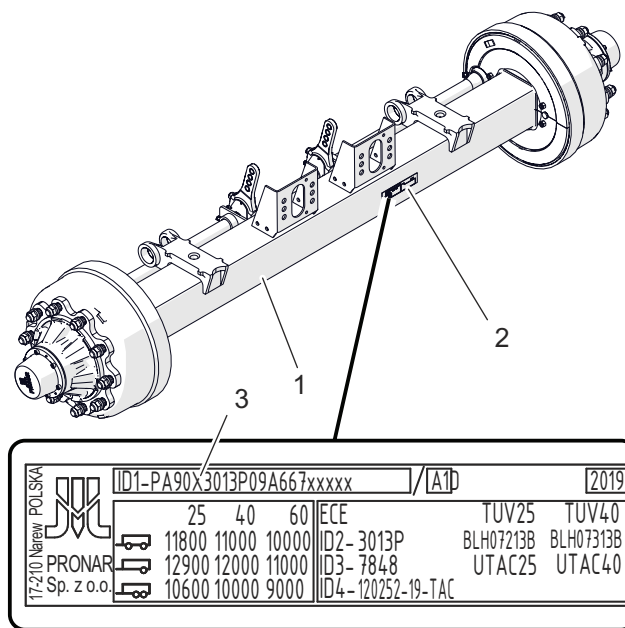
(1) nameplate

(2) trailer VIN

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1.2 AXLE IDENTIFICATION

The serial number of the driving axles and axle type are stamped on the rating plate (2) attached to the axle beam - figure (1.2). After purchasing the trailer, it is recommended that individual serial numbers be entered in the boxes below.



623-E.02-1

Figure 1.2 Axle identification

- (1) wheel axle
- (2) nameplate
- (3) axle serial number

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1.3 INTENDED USE



DANGER

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



IMPORTANT

The trailer speed must not, however, be greater than the maximum design speed of 40 km/h.

The trailer is designed for transport of harvested crops and agricultural products as well as loose, bulk and long load materials at the farm and on public roads.

It is acceptable to transport construction materials, mineral fertilizers and other loads, if fulfilling conditions indicated in section 4. Non-compliance with the recommendations for the carriage and loading of goods described by the Manufacturer and the road transport regulations in force in the country in which the trailer is used shall void the warranty and is regarded as use of the machine contrary to its intended purpose.

The trailer may only be aggregated with agricultural tractors that meet all the requirements specified in table (1.2) “*Agricultural tractor requirements.*”

The trailer is not intended or designed for transporting people, animals or goods classified as dangerous materials

In the event that a second trailer is to be hitched to the trailer, it must meet the requirements specified in table (1.3) “*Second trailer requirements.*”

The brake system and the light and indicator system meet the requirements of road traffic regulations. In the countries where the trailer is used, the limits stipulated by the road traffic legislation in force in a given country must be observed. The trailer speed must not, however, be greater than the maximum design speed of **40 km/h**.

Using it as intended also involves all actions connected with the safe and proper operation and maintenance of the machine. Due to the above, the user is obliged to:

- carefully read the *Operator Manual* and the *Warranty Book* and follow instructions in these documents,
- understand the trailer operating principle and how to operate it safely and correctly,
- adhere to the established maintenance and adjustment plans,
- comply with general safety regulations while working,
- prevent accidents,
- comply with the road traffic regulations

and transport regulations in force in a given country, in which the trailer is used,

- carefully read the Operator Manual and comply with its recommendations,
- only hitch the trailer to an agricultural tractor which meets all the Manufacturer's requirements.

The trailer may only be used by persons, who:

- are familiar with the contents of this publication and with the contents of the agricultural tractor Operator Manual,
- have been trained in trailer operation and work safety,
- have the required authorisation to drive and are familiar with the road traffic regulations and transport regulations.

Do NOT use the trailer for purposes other

than those for which it is intended, in particular:

- transport people, animals, hazardous materials, chemically aggressive loads that will corrode the structural elements of the trailer (causing corrosion of steel, destruction of paint coat, dissolving plastic elements and destruction of rubber elements etc.
- for transporting loose unsecured toxic materials, if there is a possibility of causing environmental damage,
- for transporting machines and equipment, with high centre of gravity affecting trailer stability,
- for transporting loads with uneven loading and overloading of axles,
- transport unsecured loads, which may move in the load box.
- overload the machine beyond the maximum load capacity.

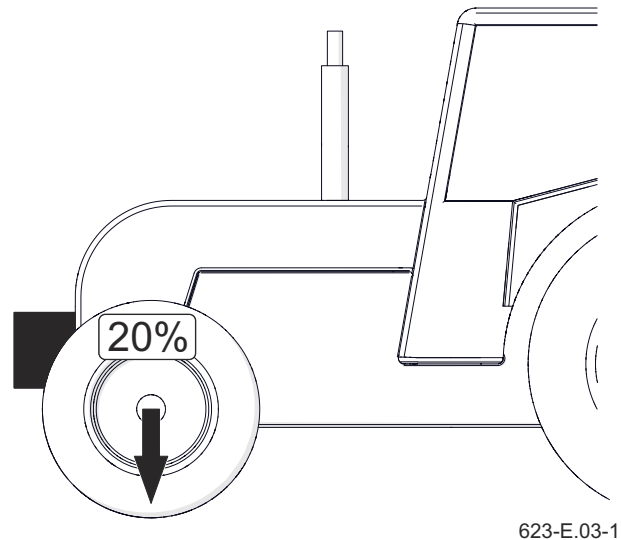
Table 1.2. Requirements for agricultural tractor

Contents	JM	Requirements
Brake system connection sockets		
Double line pneumatic system	-	according to ISO 1728
Hydraulic system	-	in accordance with ISO 7241-1
Nominal pressure of the brake system		
Double line pneumatic system	bar / kPa	6.5 / 650
Hydraulic system	bar / MPa	150 / 15
Hydraulic system		
Hydraulic oil	-	L HL 32 Lotos ⁽¹⁾
Maximum system pressure	bar	200
Oil demand:	L	40
Number of external hydraulic sockets		
Load box tipping control	-	1 pair
Tailgate control	-	1 pair
Side wall control	-	1 pair
Axle lock control (option)		1 pair
Hydraulic support control (option)	-	1 pair
Electrical system		
Electrical system voltage	V	12
Connection socket	-	7-pole, ISO 1724
Tractor hitches		
Type		Transport hitch (upper or lower position). Hitch, piton fix or K80 ball couplings
Minimum vertical load capacity of hitch	kg	4,000
Other requirements		
Minimum tractor power demand	kW / hp	100,5 / 136,7

(1) – use of other oil is permitted on condition that it may be mixed with the oil in the trailer. Detailed information can be found on the product information card.

**IMPORTANT**

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



623-E.03-1

Figure 1.3 Minimum tractor front axle load**Table 1.3.** Requirements for second trailer

Contents	JM	Requirements
Maximum gross weight	kg	24,000
Brake system connection sockets		
Double line pneumatic system	-	according to ISO 1728
Hydraulic system	-	according to ISO 7241- 1
Nominal pressure of the brake system		
Double line pneumatic system	bar / kPa	6.5 / 650
Hydraulic system	bar / MPa	150 / 15
Hydraulic tipper system		
Hydraulic oil	-	L HL 32 Lotos ⁽¹⁾
Maximum system pressure	bar / MPa	200 / 20
Electrical system		
Electrical system voltage	V	12
Connection socket	-	7-pole, ISO 1724
Trailer drawbar		
Diameter of drawbar eye	mm	40 or 50

(1) – use of other oil is permitted on condition that it may be mixed with the oil in the trailer. Detailed information can be found on the product information card.

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1.4 EQUIPMENT

Table 1.4. Trailer's equipment.

Equipment	Standard	Additional	Optional
Operator Manual	•		
Warranty Book	•		
Lighting system connection cable	•		
12V (LED) lighting system with clearance lighting	•		
Tail lamps with safety mesh	•		
Wheel chocks	•		
Hand brake	•		
Drawbar - spring shock absorption	•		
2-line pneumatic system with manual regulator	•		
Double line pneumatic system with ALB			•
Hydraulic brake system			•
Hydraulic system of the lower walls	•		
Rear protection	•		
Telescopic drawbar support with two-stage gear	•		
Scissor hydraulic support ⁽¹⁾			•
Rotating drawbar eye Ø50 mm	•		
K80 rigid ball drawbar			•
Complete set of wall extensions (600)		•	
Complete set of wall extensions (800)		•	
Tarpaulin cover		•	
Fenced platform		•	
Chute		•	
Side under-run protective devices		•	
Turning interlock hydraulic system ⁽¹⁾			•
Automatic manual hitch		•	

Automatic rear hitch		•	
Slow-moving vehicle warning sign		•	
Reflective warning triangle		•	
Toolbox		•	
Document holder		•	
Active steering system			•

⁽¹⁾ a pair of hydraulic sockets in the tractor is required for operation

Some standard equipment components, which are listed in the table, may not be present in the delivered trailer. This allows the possibility of ordering new machines with a different set of optional equipment, replacing standard equipment.

Information on tires can be found at the end of the publication in section 7 "Tire assembly."

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1.5 TERMS & CONDITIONS OF WARRANTY

TIP

Demand that the seller carefully and accurately fills out the *Warranty Book* and warranty repair coupons. A missing date of purchase or sale point stamp may make the user ineligible for any warranty repair or refund.

PRONAR Sp. z o.o. Narew guarantees the reliable operation of the machine when it is used according to its intended purpose as described in the *Operator Manual*. The repair period is specified in the *Warranty Book*.

The warranty does not cover those parts and sub-assemblies of the machine which are subject to wear in normal usage conditions, regardless of the warranty period. The warranty service only applies to such cases as: mechanical damage which is not the user's fault, factory defects of parts, etc.

In the event of damage arising from:

- mechanical damage which is the user's fault, damage caused by road accidents,
- inappropriate use, adjustment or

maintenance, use of the machine for purposes other than those for which it is intended,

- use of damaged machine,
- repairs carried out by unauthorised persons, repairs carried out improperly,
- making unauthorised alterations to machine design,

the user will lose the right to warranty service.

The user is obliged to report immediately on noticing any wear in the paint coating or traces of corrosion, and to have the faults rectified whether they are covered by the warranty or not.

For detailed Terms & Conditions of Warranty, please refer to the *Warranty Book* attached to each newly purchased machine. Modification of the machine without the written consent of the Manufacturer is prohibited. In particular, do NOT weld, drill holes in, cut or heat the main structural elements of the machine which have a direct impact on the machine operation safety.

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1.6 TRANSPORT

The machine is prepared for sale completely assembled and does not require packing. Packing is only required for the machine's technical documentation and possibly some elements of additional equipment. The trailer is delivered to the user either transported on a vehicle or, after being attached to a tractor, independently (trailer towed with a tractor).

SHIPPING BY ROAD



DANGER

Incorrect use of securing measures may cause an accident.

Loading and unloading of trailer from vehicle shall be conducted using loading



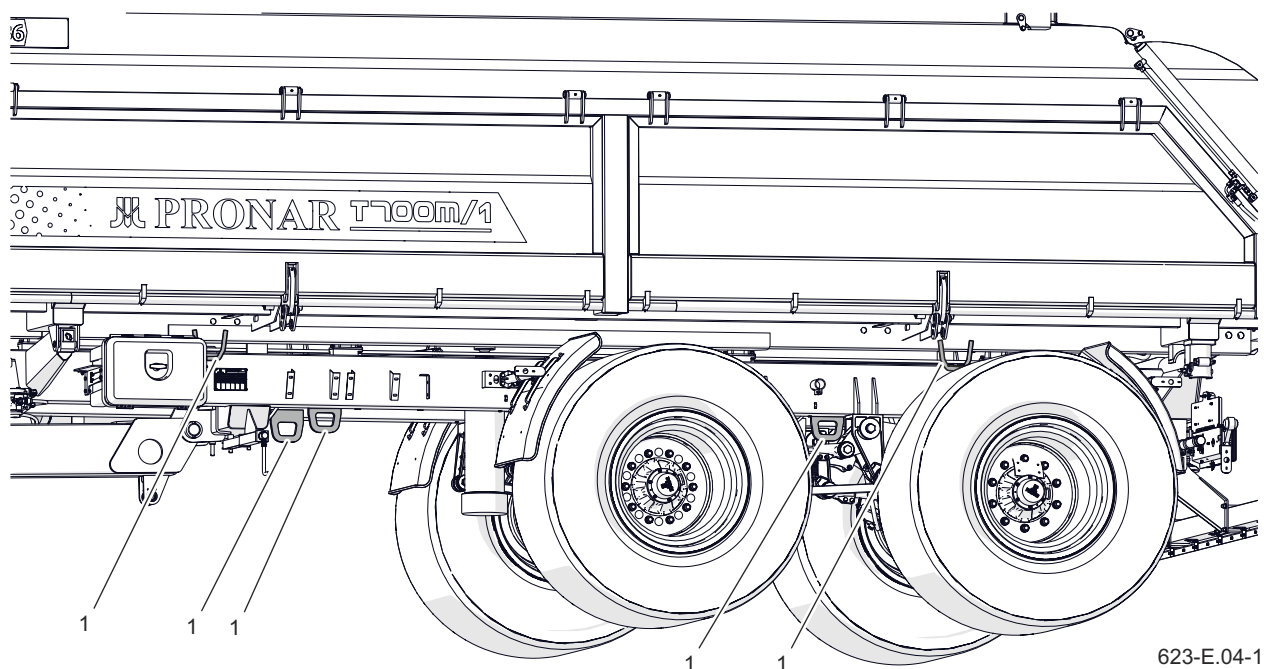
DANGER

When shipped by road on a motor vehicle the machine must be mounted on the vehicle's platform in accordance with the safety requirements and regulations.

Vehicle driver should be especially careful when driving. This is due to the vehicle's centre of gravity shifting upwards when the machine is loaded.

Use only certified and technically reliable securing measures. Carefully read the manufacturer's instructions for the securing measures.

ramp with the aid of an agricultural tractor. During work, adhere to the general principles of occupational health and safety (OHS) applicable to reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines. The machine



623-E.04-1

Figure 1.4 Attachment points on the trailer
(1) transport lug

must be properly hitched to the tractor according to the requirements specified in this Operator's Manual. The trailer brake system must be started and checked before driving off or onto ramp.

The machine should be attached firmly to the platform of the vehicle using straps or chains fitted with a tightening mechanism. Securing elements should be attached to the transport lugs designed for this purpose (1) – figure (1.4). The transport lugs are welded to the lower frame side members and to the load box side members.

Chocks or other objects without sharp edges should be placed under the wheels of the trailer to prevent it from rolling. Wheel blocks must be secured to the load box of the vehicle in a manner preventing their movement.

Use certified and technically reliable securing measures. Worn straps, cracked securing catches, bent or corroded hooks as well as elements damaged in a different way may be unsuitable for use. Carefully read the information stated in the Operator Manual for the given securing measure. The number of securing elements (cables, straps, chains, stays etc.) and the force necessary for their tensioning depend on a number of factors, including weight of the machine, carrying vehicle design, ground speed and other conditions. For



IMPORTANT

Do NOT secure lifting slings or any types of securing elements to hydraulic and electrical system components and fragile elements of the machine (e.g. shields, conduits)

this reason it is impossible to define the securing plan precisely.

To secure the trailer optimally on the load box, support the drawbar with a wooden block. A correctly secured trailer does not change its position with regard to the transport vehicle. The securing elements must be selected according to the guidelines of the Manufacturer of these elements. In case of doubt apply a greater number of securing straps in order to secure the load. If necessary, cover the sharp edges of the machine in order to protect the securing elements from tearing or breaking during transport.

During reloading work, take special care not to damage any accessories or paint finish. The tare weight of the trailer in condition ready for travel is given in table (3.1).

TRAILER TRANSPORTED BY THE USER

In the event of independent transport by the user, after purchasing the trailer, the user should read the trailer *Operator Manual* and adhere to its instructions. Independent transport involves towing the trailer with own agricultural tractor to

destination. During shipping adjust ground speed to the prevailing road conditions, but do not exceed the maximum design speed.

E.3.4.622.07.1.PL

1.7 ENVIRONMENTAL RISK

A hydraulic oil leak constitutes a direct threat to the natural environment owing to its limited biodegradability. Maintenance and repair work which involves the risk of an oil leak should be performed in the rooms with 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. Remaining oil should be collected using sorbents, or by mixing the oil with sand, sawdust or other absorbent materials. The oil contaminations, once gathered up, should be kept in a sealed, marked, hydrocarbon resistant container, and then passed on to the appropriate oil waste recycling centre. 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 owing to loss of its properties should be stored in its original



IMPORTANT

Waste oil should only be taken to the appropriate facility dealing with the re-use of this type of waste. Do NOT dispose of or pour oil into sewerage drains or water reservoirs.



DANGER

Do not store oil waste in containers for food. Used oil should be stored in containers resistant to action of hydrocarbons.

TIP

The hydraulic system of the trailer is filled with L-HL32 Lotos hydraulic oil.

packaging in the conditions described above. Waste code: 13 01 10 (hydraulic oil). Detailed information on hydraulic oils can be found in the Material Safety Data Sheets.

E.3.4.622.08.1.PL

1.8 WITHDRAWAL FROM USE

Should you decide to withdraw the machine from use, comply with the regulations in force in the given country regarding withdrawal from use and recycling of machines withdrawn from use.

Before proceeding to dismantle machine, oil shall be completely removed from hydraulic system.

When spare parts are changed, worn out or damaged parts should be taken to a collection point for recyclable raw materials.



DANGER

During dismantling, use the appropriate tools, equipment (overhead crane, crane or hoist etc.) and use personal protection equipment, i.e. protective clothing, footwear, gloves and eye protection etc.

Avoid contact of skin with oil. Do not allow used hydraulic oil to spill.

Used oil and also rubber and plastic elements should be taken to the appropriate facilities dealing with the recycling of this type of waste.

E.3.4.622.09.1.PL

SECTION 2

SAFETY ADVICE

2.1 BASIC SAFETY RULES

- The trailer must not be used for purposes other than those for which it is intended. Anyone who uses the machine in any other way than the way intended takes full responsibility for any consequences of this use. Use of the trailer for purposes other than those for which it is intended by the Manufacturer may invalidate the guarantee.
- Before use, the user must carefully read this Operator Manual and the Warranty Book. When operating the machine, follow all instructions in these documents.
- The trailer may only be used and operated by persons qualified to drive agricultural tractors with a trailer.
- The user is obliged to learn about the design, operation and how to safely use the machine.
- If the information in this Operator Manual is difficult to understand, contact the seller who runs the authorised technical service on behalf of the Manufacturer, or contact the Manufacturer directly.
- Entering the trailer is only allowed when the machine is absolutely motionless. Stop the tractor, remove the key from the ignition and secure the tractor and trailer against rolling by placing chocks under the wheels. Immobilise tractor and trailer with parking brake. When entering the trailer load box, use platforms or ladders with proper height and load capacity. Do not climb the underrun protection devices and wheels to enter the trailer load box.
- Careless and improper use and operation of the trailer, and non-compliance with the instructions of this operator manual is dangerous to your health.
- The trailer may only be used when all safety guards and other protective elements are technically sound and correctly mounted.
- Be aware of the residual risk. Use caution when operating this machine and follow all relevant safety instructions.
- The machine must never be used by persons who are not authorised to drive agricultural tractors, including children and people under the influence of alcohol, drugs or other abusive substances.
- Non-compliance with the safety rules

of this Operator's Manual can be dangerous to the health and life of the operator and others.

- Assembly and disassembly of extension walls, the frame and tarpaulin cover, can only be carried out with the use of appropriate platforms, ladders or from a ramp. These devices must be in good condition to fully protect
- the persons working on them against falling. The above procedure should be performed by at least two persons.
- In the final phase of folding the tarpaulin cover, at all times hold with one hand the top of the front frame or other permanent structural element. Non-compliance with this rule can put the user at risk of falling.

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2.2 SAFETY WHEN HITCHING

- Be especially careful when hitching the machine.
- When hitching, there must be nobody between the trailer and the tractor.
- Do not hitch the trailer if the agricultural tractor does not meet the minimum requirements set by the Manufacturer, see table (1.2) "Agricultural tractor requirements."
- Before hitching the trailer, make certain that oil in external hydraulic system of the tractor is allowed to be mixed with hydraulic oil in the trailer.
- Before hitching the trailer check that both machines are in good technical condition.
- Use the proper tractor hitch for hitching the trailer. After completed hitching of the machines check that the hitch is properly secured. The height of the trailer drawbar eye should be optimally adjusted to the height of the hitch. If necessary, read applicable sections in the tractor Operator Manual.
- If the tractor is equipped with an automatic hitch, make certain that the hitching is completed.
- Hitching and unhitching the trailer may only take place when the machine is immobilised with the parking brake. If the trailer is parked on a slope, it should be additionally secured against rolling by placing chocks under the wheels.
- Do NOT hitch a second trailer, if it does not meet the requirements made by the Manufacturer (incompatible drawbar eye, excessive permissible total weight etc.) – see table (1.3) "*Second trailer requirements.*"
- Before hitching the second trailer check that both machines are in good technical condition.
- Before hitching the machines make certain that the oil in both trailers may be mixed.
- Only double axle trailers may be hitched to the trailer.
- When hitching, there must be nobody between the trailers. Person assisting in hitching the machines should stand outside the area of danger and be visible to the tractor driver at all times.
- Do NOT proceed with unhitching the trailer from the tractor when load box is raised.

F.3.11.623.02.1.EN

2.3 SAFETY RULES WHEN MAINTAINING HYDRAULIC SYSTEM AND PNEUMATIC SYSTEM

- When operating, the hydraulic and pneumatic systems are under high pressure.
- Regularly check the technical condition of the connections and the hydraulic and pneumatic lines. Do NOT use the trailer with leaky system.
- In the event of malfunction of the hydraulic or pneumatic system, do not use the trailer until the malfunction is corrected.
- When connecting the hydraulic lines to the tractor, make sure that the hydraulic system of the tractor and the hydraulic system of the trailer are not under pressure. If necessary, reduce residual pressure in the system.
- In the event of injuries being caused by pressurised hydraulic oil, contact a doctor immediately. Hydraulic oil may find its way under the skin and cause infections. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. In the event of contact of oil with skin wash the area of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene).
- Use the hydraulic oil recommended by the Manufacturer.
- After changing the hydraulic oil, the used oil should be properly disposed of. Used oil or deteriorated oil should be stored in original containers or replacement containers resistant to hydrocarbons. Replacement containers must be clearly marked and appropriately stored.
- Do not store hydraulic oil in packaging designed for storing food or foodstuffs.
- Rubber hydraulic lines must be replaced every 4 years regardless of their technical condition.

F.3.4.622.05.1.EN

2.4 SAFE MAINTENANCE PRINCIPLES

- During the warranty period, any repairs may only be carried out by warranty service authorised by the Manufacturer. After the expiry of the warranty period it is recommended that possible repairs to the trailer be performed by specialised workshops.
- In the event of any fault or damage, do not use the trailer until the fault has been fixed.
- When servicing, use appropriate, close-fitting protective clothing, gloves, shoes, glasses and the correct tools.
- Any modification to the trailer frees the manufacturer from any responsibility for damage or detriment to health, which may arise as a result.
- The trailer can only be stood on when it is absolutely motionless and the tractor engine is switched off. Tractor and trailer should be immobilized with parking brake and chocks should be placed under the trailer wheel. Ensure that unauthorised persons do not have access to the tractor cab.
- Regularly check the condition of nut and bolt connections, in particular connections of drawbar eye and wheel nuts.
- Service inspections should be carried out according to the schedule in this Operator Manual.
- Before beginning repair work on hydraulic or pneumatic systems reduce oil or air pressure completely.
- Servicing and repair work should be carried out in line with the general principles of workplace health and safety. In the event of injury, the wound must be immediately cleaned and disinfected. In the event of more serious injuries, seek a doctor's advice.
- Before performing technical service or maintenance of the trailer, the load box must be lowered. If it is necessary to raise the load box, it should be tipped to the rear and secured against dropping with the aid of load box support. The load box may not be loaded. The trailer must be hitched to the tractor and secured with chocks and parking brake.
- Repair, maintenance and cleaning work should be carried out with the tractor engine turned off and the ignition key removed. Tractor and trailer should be immobilized with parking brake and chocks should be placed under the trailer wheel. Ensure that

- unauthorised persons do not have access to the tractor cab.
- During maintenance or repair work, the trailer may be unhitched from tractor, but it must be secured with chocks and parking brake.
 - Should it be necessary to change individual parts, use only those parts indicated by the Manufacturer. Non-adherence to these requirements may put the user and other people's health and life at risk, and also damage the machine and invalidate the guarantee.
 - Before welding or electrical work, the trailer should be disconnected from the power supply. The paint coating should be cleaned. Burning paint fumes are poisonous for people and animals. Welding work should be carried out in a well lit and well ventilated space.
 - During welding work, pay attention to flammable or fusible elements (parts of the pneumatic, electric and hydraulic systems, plastic parts). If there is a risk that they will catch fire or be damaged, they should be removed or covered with non-flammable material before commencing welding work. Before beginning work, prepare a CO₂ or foam extinguisher.
 - In the event of work requiring the trailer to be raised, use properly certified hydraulic or mechanical lifts for this purpose. After lifting the machine, stable and durable supports must also be used. Work must not be carried out under a trailer, which has only been raised with a lift or jack.
 - The trailer must not be supported using fragile elements (bricks or concrete blocks).
 - After completing work associated with lubrication, remove excess oil or grease. The trailer should be kept clean and tidy.
 - The user must not repair by himself the components of the hydraulic or pneumatic system i.e. control valves, cylinders and regulators. In the event of damage to these elements, repair should be entrusted to an authorised service point or elements should be replaced with new ones.
 - Do NOT install additional appliances or fittings not according to the specifications defined by the Manufacturer.
 - The trailer may only be towed when axles and wheels, lighting system and brakes are reliable.

F.3.11.623.04.1.EN

2.5 DRIVING ON PUBLIC ROADS

- When driving on public roads, observe all road traffic regulations in force in the country, in which the machine is used.
- Do not exceed the maximum speed resulting from road conditions and design restrictions. Adjust the speed to the prevailing road conditions, the load capacity of the load box, and the limitations resulting from road traffic regulations.
- Chocks should be placed only under one wheel (one in front of the wheel, the second behind the wheel)- figure (2.1)).
- The machine must NOT be left unsecured. When not connected to the tractor, the trailer must be immobilised with parking brake and protected against rolling with chocks or other objects without sharp edges placed under the wheels.
- Before driving make sure that the trailer is properly hitched to the tractor, especially if coupling bolts are secure.
- The vertical load carried by the drawbar eye of the machine affects the steering of the tractor unit.
- Before using the trailer always check its technical condition, especially in terms of safety. In particular, check the technical condition of the hitch system, the axle system, the brake system, indicator lights and the connection elements of the hydraulic, pneumatic and electrical systems.
- Before driving off check that the

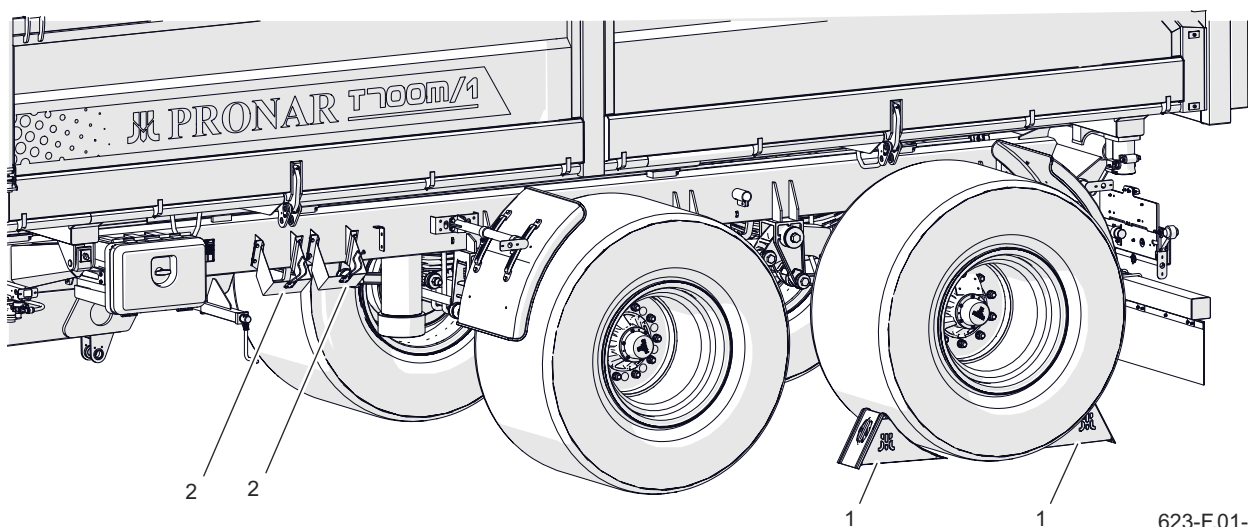
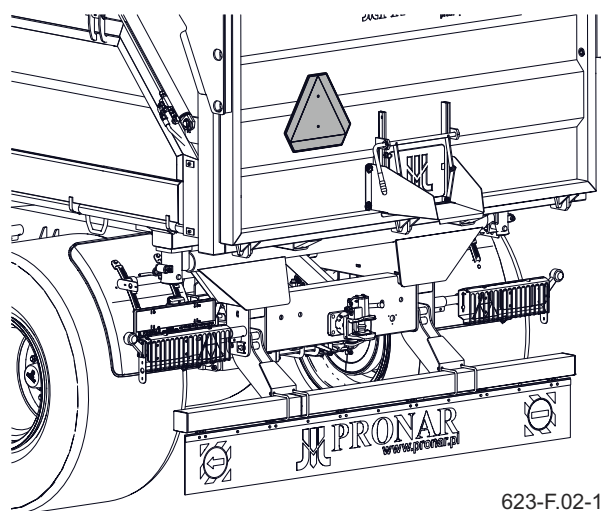


Figure 2.1 Arrangement of chocks
 (1) wheel chock (2) wheel chock handle

parking brake is released, the braking force regulator is positioned in the proper position (applies to pneumatic systems with manual three-position regulator).

- Before driving, check if the pins connecting the load box with the lower frame are secured against accidental falling out. Check if the rear wall slide gate is secured.
- Make sure that the tailgate and the lower walls are properly closed.
- Do NOT move off or drive when load box is raised.
- The trailer is designed for driving on slopes up to a maximum of 8°. Driving the trailer on steeper slopes may cause the trailer to tip over as a result of loss of stability.
- While driving on public roads the trailer must be fitted with a certified or authorised reflective warning triangle.
- If the trailer is the last vehicle in the group, a slow-moving vehicle warning sign should be placed on the trailer tailgate, figure (2.2). The triangle warning sign should be attached using the specifically prepared holder, riveted to the rear wall of the load box.
- Periodically drain water from the air tanks in pneumatic system.



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Figure 2.2 Mounting place for the slow-moving vehicle warning sign

During frosts, freezing water may cause damage to pneumatic system components.

- Reckless driving and excessive speed may cause accidents.
- A load protruding beyond the edge of the trailer should be marked according to the road traffic regulations. Do NOT transport loads forbidden by the Manufacturer.
- Load must be uniformly distributed and it must not obstruct visibility or hinder driving. The load must be secured so that it cannot move or fall over.
- Do NOT exceed the trailer maximum carrying capacity. Exceeding the carrying capacity may lead to damage to the machine, loss of stability and danger while driving. The brake system is adjusted to the gross

weight of the trailer, exceeding the weight limit causes drastic reduction of basic braking effectiveness.

- Prolonged driving across steep ground may lead to loss of braking efficiency.
- During reversing one should use the assistance of another person. During

manoeuvring the assistant must stay at a safe distance from the danger zone and be visible all the time to the tractor driver.

- Do NOT attempt to climb on the trailer while driving.
- Do NOT park the trailer on a slope.

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2.6 LOADING AND UNLOADING THE TRAILER

- Loading and unloading work should be carried out by persons experienced in this type of work.
- Use only original tipping pins with a handle. The use of third-party pins may damage the trailer.
- The trailer is not intended for transporting people, animals or hazardous materials.
- The load must be arranged in such a way that it does not threaten the stability of the trailer and does not hinder driving.
- The arrangement of the load may not cause an overload on the axle of the trailer.
- Incorrect load distribution and overloading the machine may cause the trailer to tip over or cause damage to its components.
- Do NOT climb on load box during loading and unloading.
- Unloading and loading of trailer may only take place when the machine is positioned on level and hard surface and connected to tractor. Tractor and trailer must be placed to drive forward.
- Ensure that during unloading / loading or raising the load box nobody is near the trailer. Before tipping the load box ensure proper visibility and make certain that there are no bystanders near the trailer.
- Before raising the load box, the tipping pins should be placed on the intended unloading side. Check if the pins are correctly inserted.
- When opening the tailgate or the lower walls, do not remain in the opening zone or within the range of the falling load.
- Keep a safe distance from overhead electric power lines during unloading and when load box is raised.
- Do NOT tip of the load box in windy conditions.
- If the load does not pour from the raised load box immediately cease unloading. The trailer may only be tipped again after removing the object, which prevented the load from pouring.
- During winter, particular attention must be paid to loads which may freeze during transport. When tipping the load box with frozen load the trailer may become unstable and tip over.
- Do NOT raise the load box if there is

any danger whatsoever that the box will tip over.

- Do NOT jerk the trailer forward if load is bulky or reluctant to pour and does not unload.
- After completed unloading, ensure that the load box is empty.
- When closing or opening the rear

chute gate, be very careful to avoid crushing your fingers.

- Do NOT step on or put your hands between the open lower walls or the tailgate and the load box.
- Do NOT unload the trailer to the rear, when a second trailer is connected to it.

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2.7 TYRES

- When working with tyres, the trailer should be immobilised with parking brake and secured against rolling by placing chocks under wheels. Wheel may be taken off the trailer axle only when the trailer is not loaded.
- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriate tools.
- Inspect tightness of wheel nuts after the first use of the trailer, every 2 - 3 hours during first month of work and then every 30 hours of use (travel). The inspection should be repeated individually if a wheel has been removed from the wheel axle. Wheel nuts should be tightened according to recommendations provided in sections. *TECHNICAL MAINTENANCE / Wheel assembly and disassembly, PERIODIC INSPECTIONS / Inspect bolt connections.*
- Avoid potholes, sudden manoeuvres or high speeds when turning.
- Check the tyre pressure regularly. Air pressure in tyres should be also checked during the whole day of intensive work. Please note that higher temperatures could raise tyre pressure by as much as 1 bar. With this increase in temperature and pressure, reduce load or speed. Do not release air from warm tyres to adjust the pressure or the tyres will be underinflated when temperatures return to normal.
- Protect tyre valves using suitable caps to avoid soiling.

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2.8 DESCRIPTION OF RESIDUAL RISK

Pronar Sp. z o. o. in Narew has made every effort to eliminate the risk of accidents. There is, however, a certain residual risk, which could lead to an accident, and this is connected mainly with the actions described below:

- using the trailer for purposes other than those for which it is intended,
- being between the tractor and the trailer while the engine is running and when the machine is being attached or hitched to second trailer
- being on the machine when it operates,
- failure to maintain a safe distance when loading, disconnecting, attaching or unloading the trailer,
- operation of the machine by unauthorised persons or persons under the influence of alcohol or other intoxicating substances,
- making modifications to the machine without the consent of the Manufacturer,
- cleaning, maintenance and technical checks of the trailer,

- presence of persons or animals in areas invisible from the driver's position.

The residual risk may be kept to a minimum by following the recommendations below:

- operate the machine in prudent and unhurried manner,
- reasonably apply all the remarks and recommendations stated in the Operator Manual,
- maintain a safe distance from prohibited or dangerous places
- carry out repairs and maintenance work in line with operating safety rules,
- repair and maintenance work should be carried out by persons trained to do so,
- use close fitting protective clothing and appropriate tools,
- ensure unauthorised persons have no access to the machine, especially children,
- a ban on being on the machine during travel, loading or unloading.

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2.9 INFORMATION AND WARNING DECALS

The trailer is labelled with the information and warning decals listed in table (2.1). The arrangement of symbols is shown in figure (2.3). Throughout the machine use, you must ensure that any warning messages and information decals located on the machine are clear and legible.

If any are destroyed or damaged, they must be replaced with new. Information and warning decals may be purchased directly from the Manufacturer or your

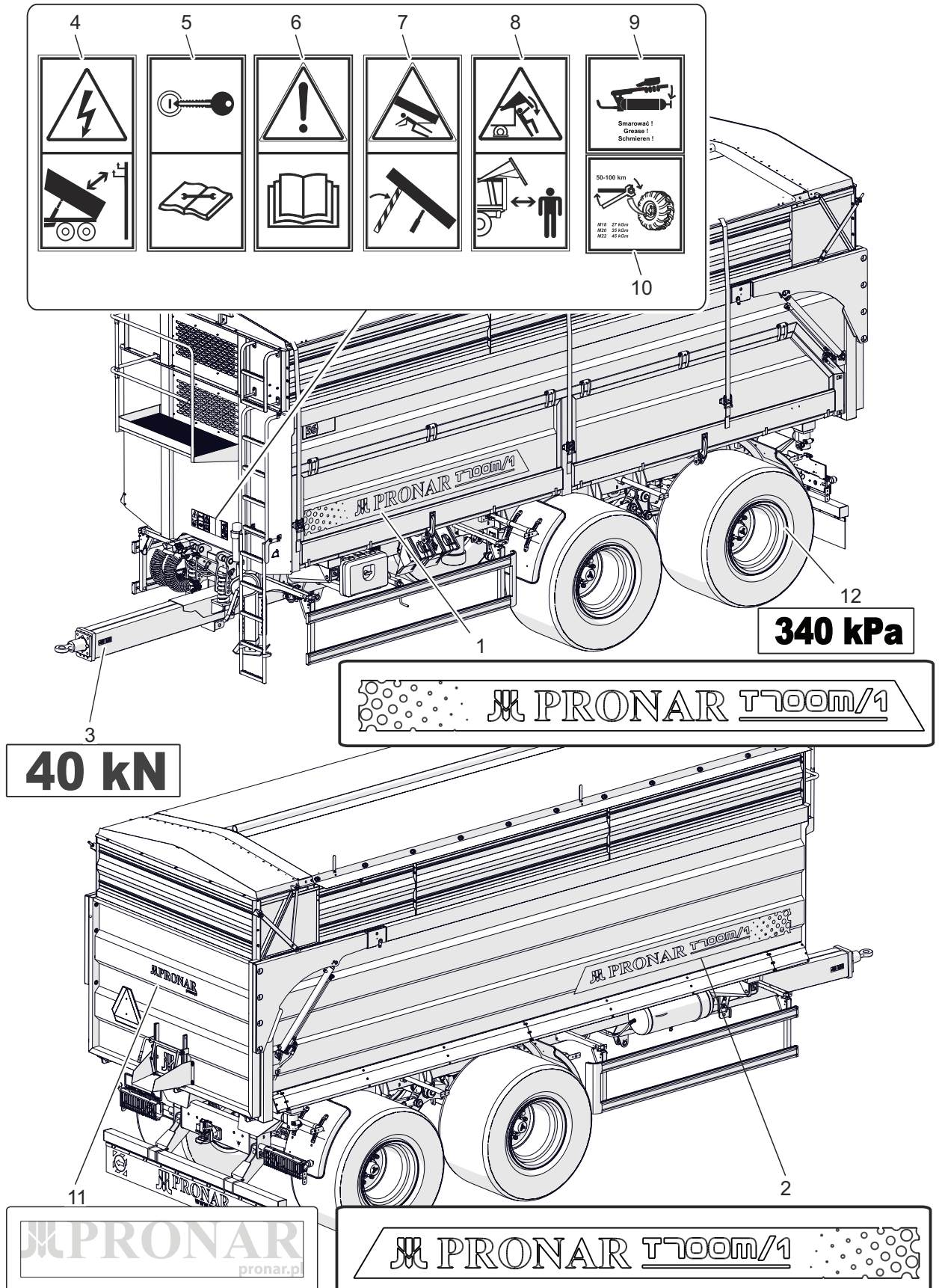
PRONAR dealer.

Part numbers of information decals are given in table (2.1) and in *Spare Parts List*. New assemblies, changed during repair, must be labelled once again with the appropriate safety signs. During machine cleaning do not use solvents, which may damage the coating of information decals and do not subject them to strong water jets.

Table 2.1. Information and warning decals

Item	Description	Part number
1	"Machine type" decal, left	623N-00000001
2	"Machine type" decal, right	623N-00000002
3	Drawbar eye load "40kN"	544N-00000003
4	Note Danger of electric shock. Keep a safe distance from overhead electric power lines during unloading.	58RPN-00.00.020
5	Before beginning servicing or repair work, turn off the tractor engine and remove the key from the ignition. Ensure that unauthorised persons do not have access to the tractor cab.	70RPN-00.00.00.05
6	Note Before starting work, carefully read the Operator Manual.	70N-00000004
7	Danger of crushing Do NOT perform any maintenance or repairs on the load box that is loaded, raised or not supported.	58RPN-00.00.012
8	Danger of crushing Maintain a safe distance when opening and closing the tail-gate.	58RPN-00.00.013
9	Lubricate the trailer in accordance with the schedule presented the <i>Operator Manual</i>	104RPN-00.00.00.04
10	Information decal. Regularly check if the nuts and bolts fixing the wheels and other components are properly tightened.	104RPN-00.00.00.06
11	Company branding	614N-00000001
12	Air pressure in the tyres.*	-

* – pressure value should be adapted to tyres



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Figure 2.3 Locations of information and warning decals

DESIGN AND OPERATION

SECTION 3

3.1 TECHNICAL SPECIFICATION

Table 3.1. Basic technical specification

Contents	unit	T700M/1
Dimensions		
Length	mm	8,610
Width	mm	2,670
Height	mm	3,020
Internal load box dimensions		
Length	mm	6,700
Width (front / back)	mm	2 230 / 2300
Load box wall / extension height	mm	1500 / 800 or 600
Technical specification		
Load capacity with 800 (600) extensions / without extensions	m ³	35 (32) / 23
Load surface	m ²	15.2
Platform height from the ground	mm	1,520
Load box tilt angle - to the rear / side	degree	55 / 35
Weight and carrying capacity		
Technically permissible gross weight	kg	25,260
Maximum gross weight	kg	24 000 ⁽¹⁾
Technically permissible carrying capacity	kg	18,000
Carrying capacity	kg	16 740 ⁽²⁾
Tare weight	kg	7,260
Other information		
Minimum tractor power demand	kW / HP	100,5 / 136,7
Wheel track	mm	2,100
Drawbar eye load	kg	4,000
Electrical system voltage	V	12
Maximum design speed	km/h	40
Noise emission level Lwa	dB	below 70
Telescopic cylinder		
Stroke	mm	2,990
Oil demand:	L	40
Pressure	bar	200

⁽¹⁾ -Parameter: Permissible total weight - depending on the legal restrictions on the target market, may differ from that indicated.

⁽²⁾ -Parameter: Carrying capacity - depends on the legal restrictions on the target market and on trailer version, it may differ from the specification.

Information on tires can be found at the end of the publication in section 7 "Tire assembly."

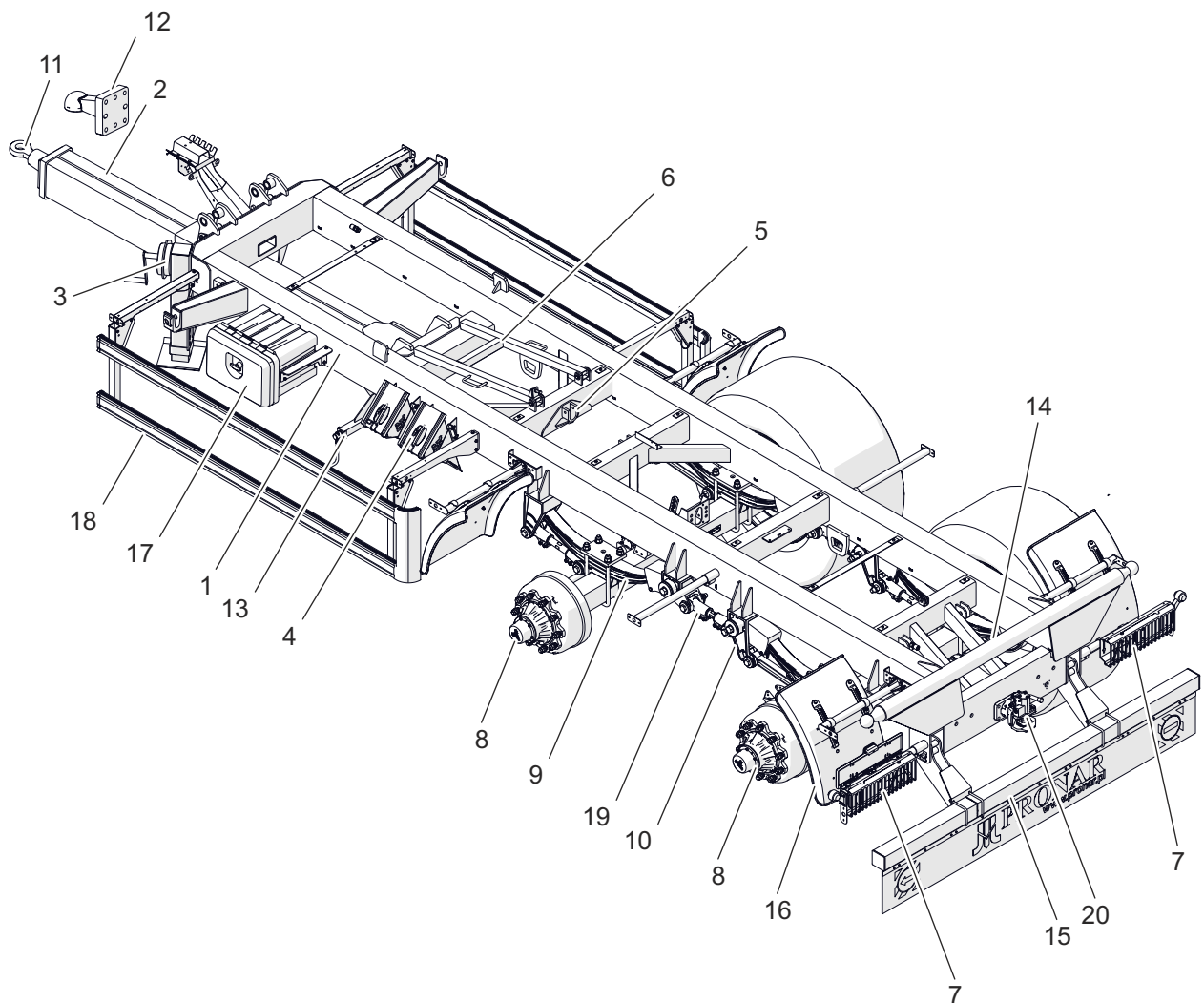
3.2 GENERAL DESIGN

TRAILER CHASSIS

Trailer chassis consists of subassemblies indicated on figure (3.1). Lower frame (1) is a structure welded from steel sections. The main support elements of the frame are two longitudinal members connected

TIP

An example of the equipment configuration is presented in the figures showing the trailer design. For detailed information on all options, see *Equipment*.



623-G.01-1

Figure 3.1 Trailer chassis

(1) lower frame, (2) drawbar, (3) parking support, (4) wheel chocks, (5) tipping cylinder suspension socket, (6) load box support, (7) lighting beam, (8) wheel axle, (9) spring, (10) tandem suspension arm, (11) 50 mm rotating drawbar eye, (12) K80 ball drawbar, (13) parking brake mechanism, (14) rear beam, (15) rear protection, (16) mudguards, (17) tool box, (18) side underrun protection, (19) suspension adjustment bolt, (20) rear hitch

with crossbars. On the left side, the wheel chocks (4), the parking brake crank mechanism (13) and the tool box (17) are mounted on the longitudinal member.

At the customer's request, the trailer can be additionally equipped with side underrun protection (18).

In the middle section there are sockets (5) used for mounting of the tipping ram cylinder. Load box support (6) is mounted in front of the sockets of the tipping cylinder. At the rear part of the frame there is rear beam (14) terminated with ball pins. Below there is a rear hitch (20) and connections for hydraulic and pneumatic systems for connecting the second trailer. Under the hitch socket there is an under-run protective device (15). On both sides at the rear of the frame lights support beams (7) are bolted and plastic wheel mudguards (16).

Axle system of the trailer consists of a leaf

spring tandem suspension and two wheel axles (8). As an option, the rear rigid axle can be replaced with the rear steering axle, which improves the comfort of driving the tractor and trailer in the field. In addition, steering axle facilitates change in the driving direction, and during sharp turns does not create ruts in the ground and provides better stability during cornering.

The tandem suspension consists of taper leaf springs (9), rocker arms (10) and adjustment bolts (19). Axles are secured to leaf springs using absorber plates and U bolts.

Suspended drawbar (2) with height adjustment connects the tractor hitch. The drawbar front plate can be fitted with a 50 mm rotating drawbar eye (11) or a K80 ball drawbar eye (12).

On the left side of the front part of the trailer, a parking stand with a two-speed transmission (3) is installed.

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3.3 LOAD BOX

The trailer load box (1) is a welded structure made from steel sheet and shapes. It is available in three versions, depending on the direction of unloading the load box:

- left tipping
- right tipping
- left and right tipping.

The trailer has hinged side walls (5) locked with hydraulically operated lower walls (4). The load box has a conical shape to ensure smooth rearward discharge. The side walls gradually widen towards the rear, which increases the width by 5 cm. There is a sight glass in the front wall covered with a grille and a PLEXI glass cover.

The load box is seated in the rear beam sockets and on the brackets welded to the lower frame in its front part. These sockets are the pivot point when tilting the box backwards or to the side. The tipping direction is selected by means of two tipping pins, the design of which prevents their inappropriate placement by the trailer operator.

The trailer can be additionally equipped

TIP

An example of the equipment configuration is presented in the figures showing the trailer design. For detailed information on all options, see *Equipment*.

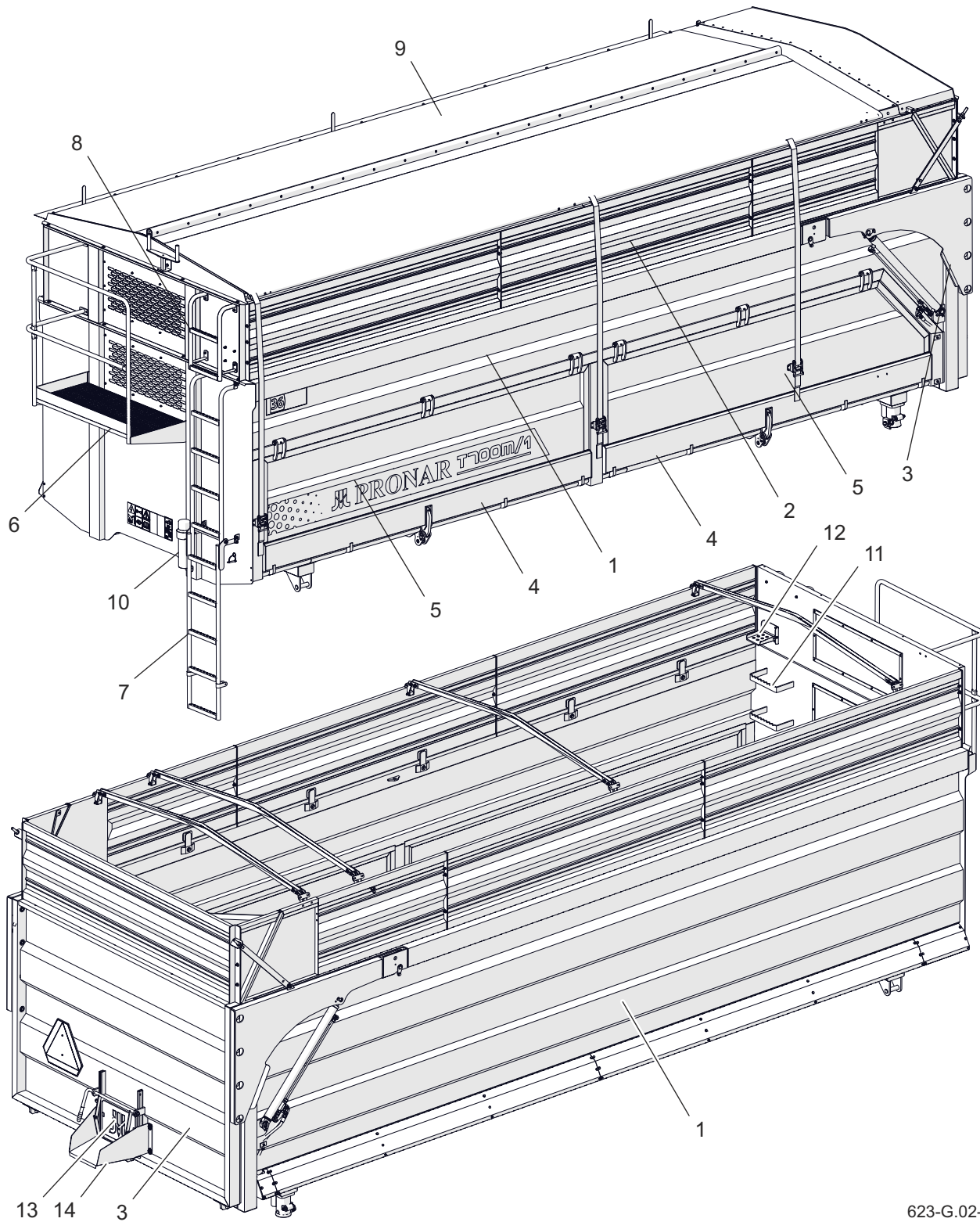
with 600 or 800 mm high wall extensions (2).

In the front part of the trailer there is a document tube (10) and the access ladders (7) and (8) are fixed to the wall and to the front extensions. On the inside of the wall and the front wall extension, there are steps (11) and a folding step (12) to facilitate access to the load box.

In the rear part of the load box there is the tailgate (3) which is opened and closed using hydraulic cylinders. In order to enable more precise unloading of loose materials, a slide gate (12) is located in the tailgate. As additional equipment of the trailer, it is possible to mount the rear chute (13), mounted under the lower edge of the slide gate.

The trailer can be additionally equipped with a tarpaulin (9) and a fenced platform (6) serving as a platform for the operator handling the tarpaulin.

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623-G.02-1

Figure 3.2 Load box

(1) load box, (2) extensions, (3) tailgate, (4) bottom wall, (5) side wall, (6) fenced platform, (7) lower ladder, (8) wall extension ladder, (9) tarpaulin, (10) document holder, (11) box step, (12) foldable step, (13) slide gate, (14) chute

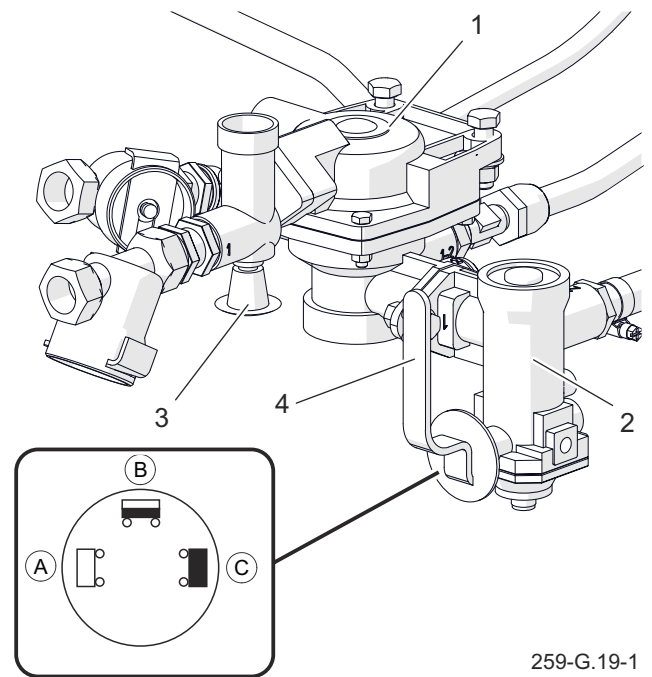
3.4 MAIN BRAKE

Depending on the version, the trailer is equipped with one of the three main brake types:

- 2-line pneumatic system - figure (3.4).
- 2-line pneumatic system with ALB - figure (3.5)
- hydraulic brake system - figure (3.6).

The main brake is activated from the tractor driver's cab by pressing on the brake pedal. The purpose of the control valve (1) - figure (3.3) used in pneumatic systems is to actuate the trailer brakes simultaneously with the tractor brakes. Furthermore, if a line between the trailer and the tractor gets disconnected inadvertently, the control valve will automatically activate the trailer brakes.

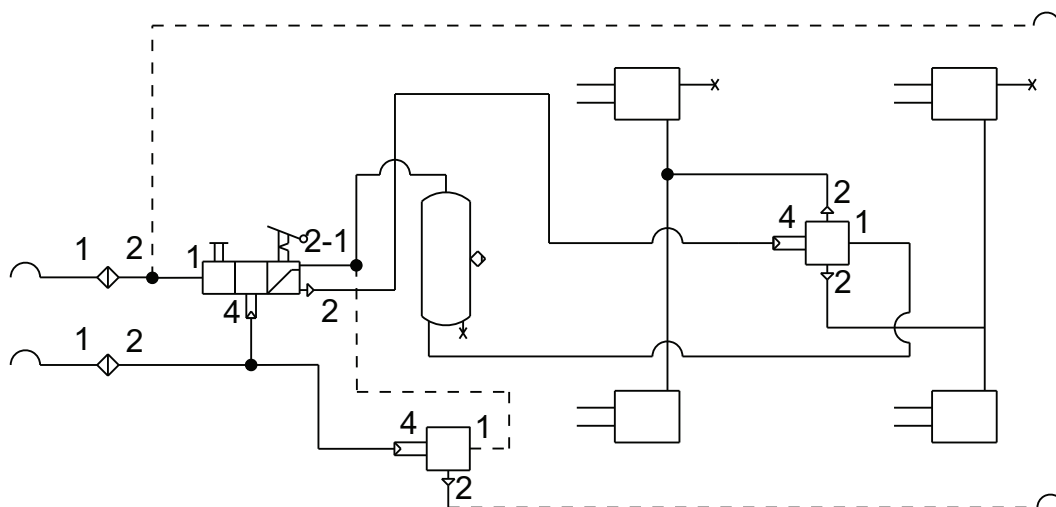
To released the trailer brakes (automatically



259-G.19-1

Figure 3.3 Control valve and braking force regulator

- (1) control valve
- (2) braking force regulator
- (3) brake release button
- (4) adjustment lever
- (A) "NO LOAD" position
- (B) "HALF LOAD" position
- (C) "FULL LOAD" position



623-G.03-1

Figure 3.4 Diagram of 2-line pneumatic braking system

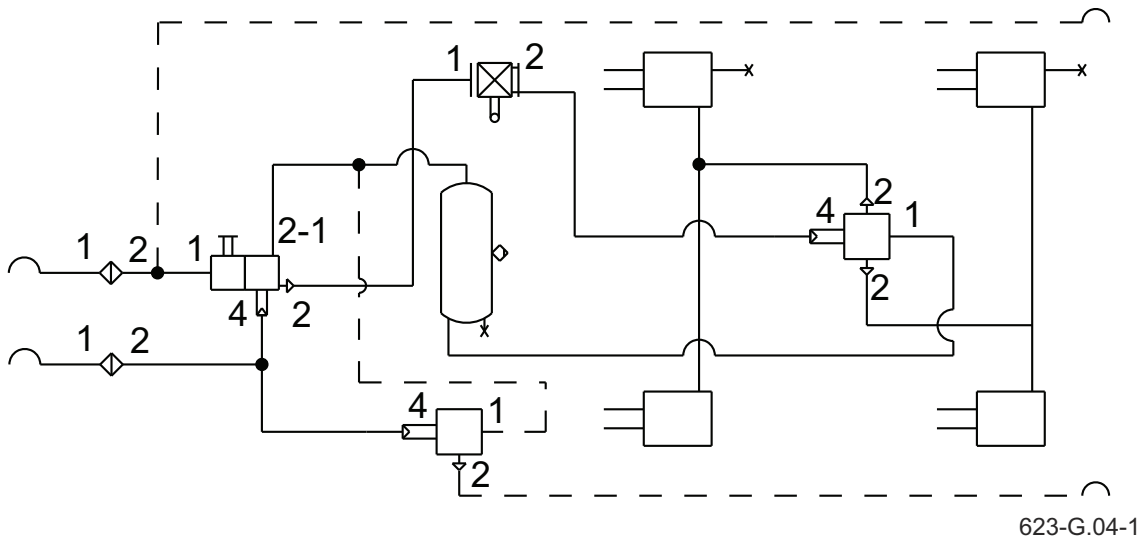


Figure 3.5 Diagram of the ALB 2-line pneumatic braking system

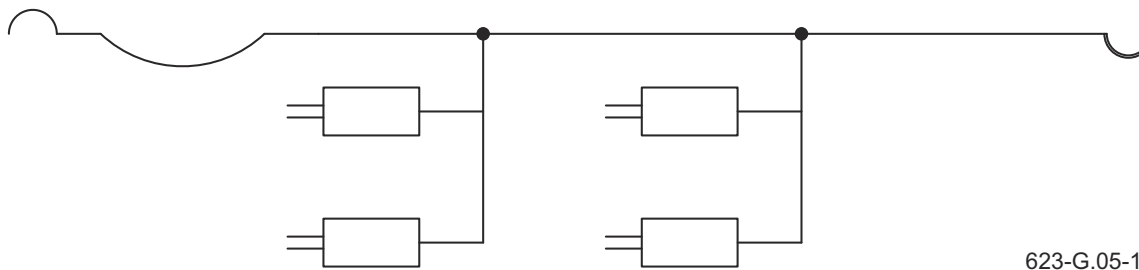


Figure 3.6 Diagram of hydraulic braking system

braked) press the button (3) as far as it will go. Valve used in the system is equipped with a circuit causing the brakes to be applied when trailer is disconnected from the tractor. When compressed air conduit is connected to the tractor, the device automatically applying the brakes changes its position to allow normal brake operation. Three-step braking force regulator (2), used in pneumatic systems, adjusts braking force depending on setting. Switching to the appropriate working mode before moving off is done manually by the machine operator, using the lever

TIP

The hydraulic brake system of the trailer is filled with L-HL32 Lotos hydraulic oil.












(4) - figure (3.3).

The main hydraulic brake (available as optional equipment) is activated from the tractor driver's cab by depressing the brake pedal. To operate the hydraulic brake system, you need an agricultural tractor with a suitable brake connection that prevents it from being confused with a power connection.

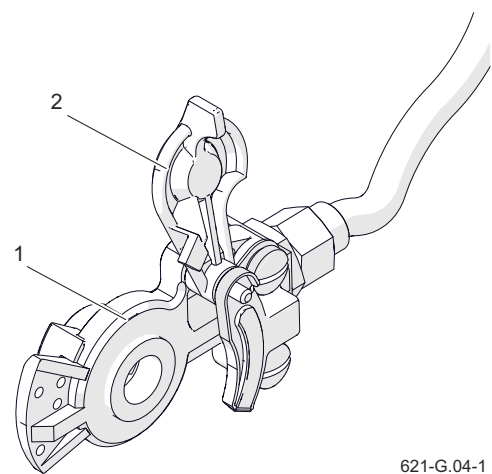
PNEUMATIC CONNECTIONS

Pneumatic connections are equipped

Table 3.2. List of symbols used in diagrams

Symbol	Description
	Pneumatic connection
	Drain valve
	Main control valve
	Relay valve
	Automatic regulator of braking force
	Manual regulator of braking force
	Line connection
	Air tank
	Brake cylinder
	Valve - control connection
	Air filter

with covers (2), that protect the connections against contamination and entrance of dirt into the system. They are made of coloured plastic (black connector - supply and control air for a 1-wire system, red connector - supply air for a 2-wire system, yellow connector - control air for a 2-wire system). The connections are made according to recommendations of DIN ISO 1728 standard. Thanks to this, the connections cannot be incorrectly connected



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Figure 3.7 Pneumatic connection
 (1) connection body
 (2) connection cover

to the agricultural tractor sockets. After unhitching the trailer, place the pneumatic connections in the specifically prepared sockets, located on the drawbar.

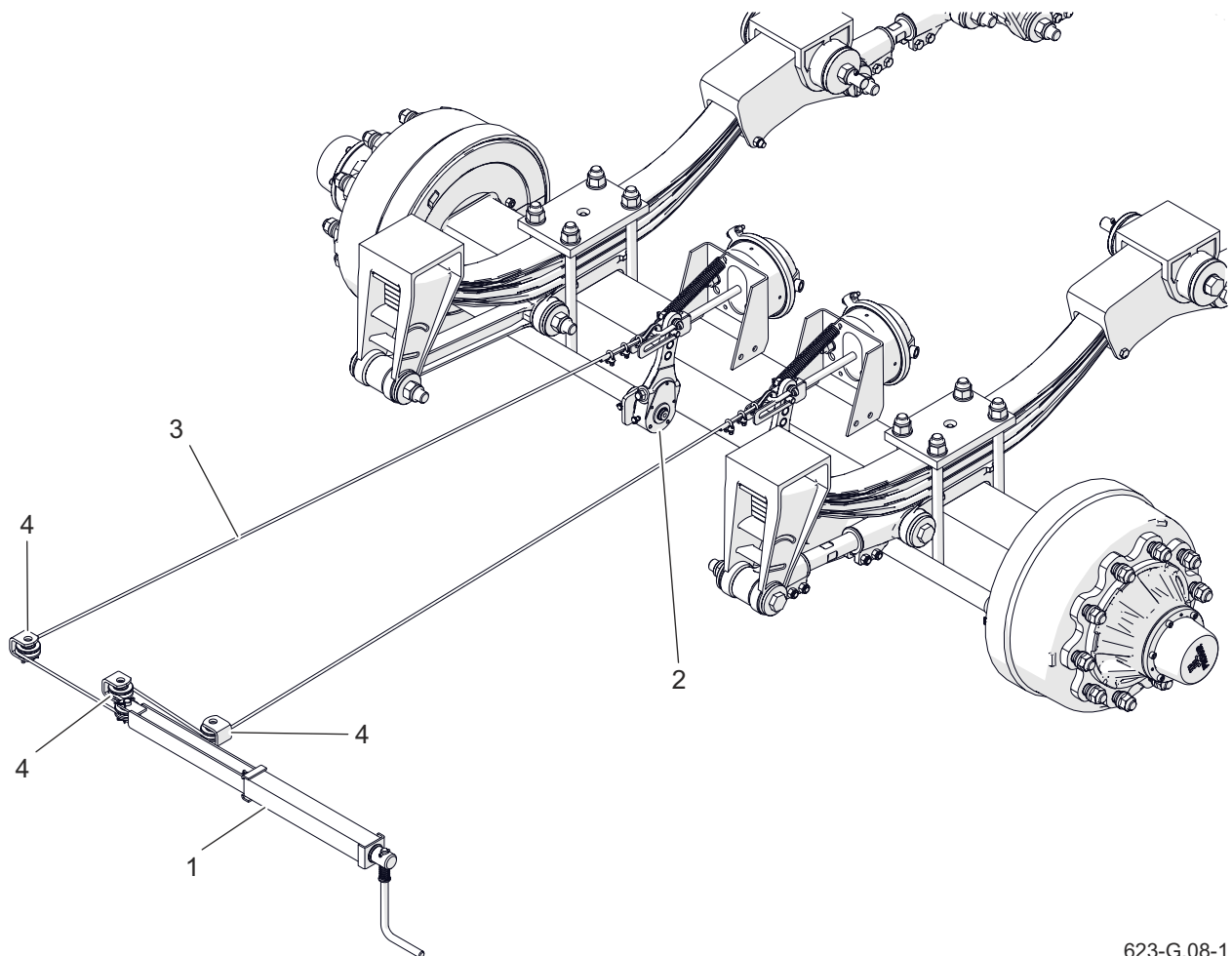
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3.5 PARKING BRAKE

The parking brake is used to immobilise the trailer while parking. System design is shown in Figure (3.8).

The brake crank mechanism (1), located on the left side of the frame, is connected by a steel cable (3) guided in rollers (6) with the expander arm levers (2) of the first axle.

By turning the crank of the mechanism (1) (clockwise), the steel cable becomes tense causing the brake expander lever to deflect, which, by spreading the brake shoes, immobilize the trailer. Prior to moving off, handbrake must be released - steel cable must hang loose.



623-G.08-1

Figure 3.8 Parking brake

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

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3.6 HYDRAULIC TIPPER SYSTEM

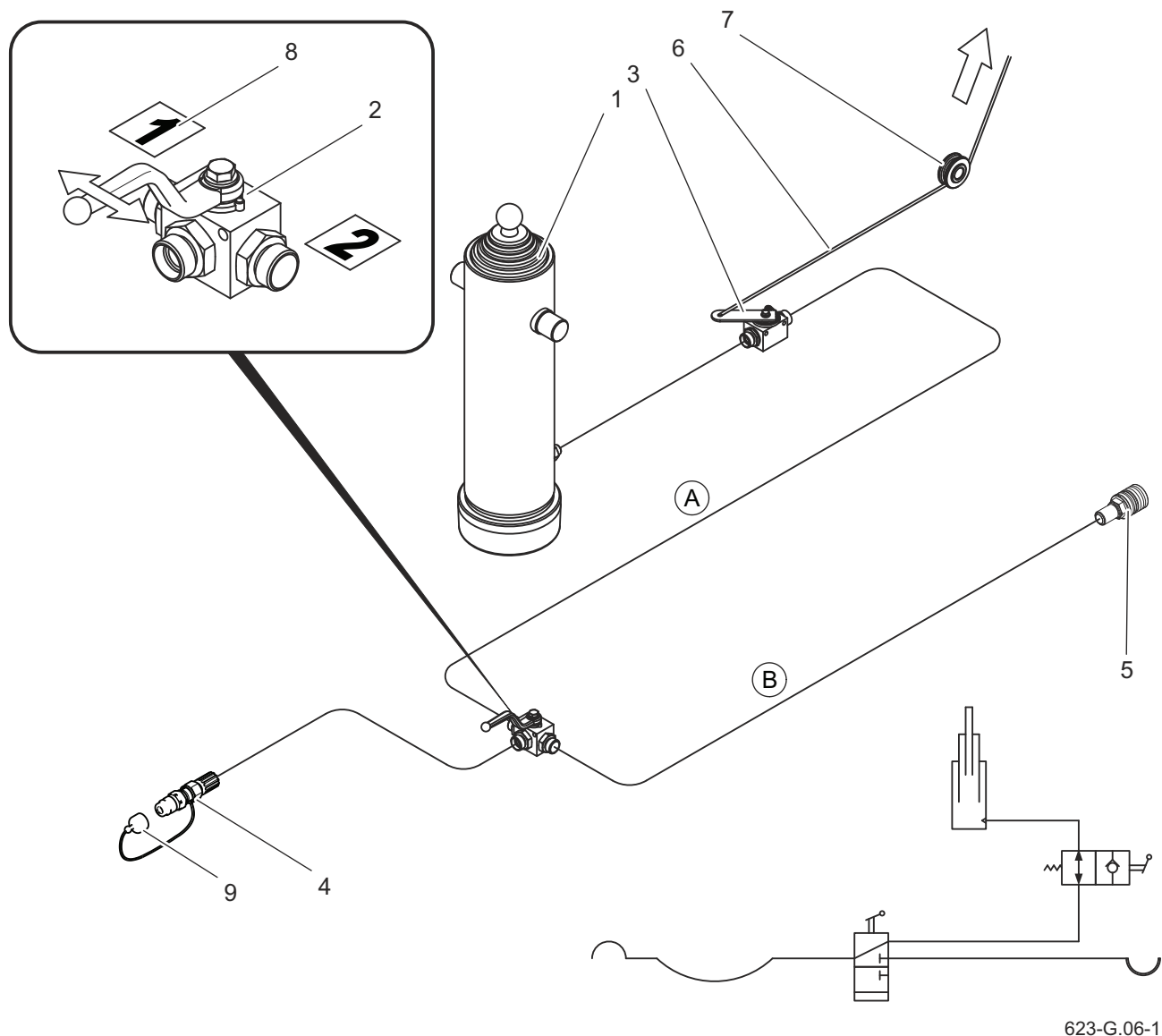


Figure 3.9 Hydraulic tipping system design and diagram

(1) telescopic cylinder, (2) three-way valve, (3) cut-off valve, (4) quick coupler - plug, (5) quick coupler - socket, (6) control cable, (7) guide roller, (8) information decals, (9) plug cap (blue)

Hydraulic tipping system is used for automatic unloading of trailer by tipping the load box to the rear or sideways. The hydraulic tipping system is supplied with oil from the tractor hydraulic system. Hydraulic oil manifold of the tractor external hydraulic system is used to control the

TIP

The hydraulic tipping system of the trailer is filled with L-HL32 Lotos hydraulic oil.

load box tipping mechanism.

The hydraulic line for connection with the tractor has a plug (4) secured with a blue

plug (9).

The trailer system consists of two independent circuits:

- circuit (A) - to supply the hydraulic cylinder of the first trailer,
- circuit (B) - to supply the hydraulic cylinder of the second trailer, if two trailers are hitched to the tractor.

The three-way valve (2) is used to switch these circuits on. This valve's lever can be

placed in two positions:

- 1 - trailer tipping circuit opened - circuit (A),
- 2 - second trailer tipping circuit opened – circuit (B).

The hydraulic system has a cut-off valve (3) controlled by a cable (6) limiting the tilt angle of the load box.



IMPORTANT

The length of the control cable is set by the Manufacturer and it must not be adjusted by the User.

G.3.3.259.05.1.EN

3.7 HYDRAULIC SYSTEM OF THE SHEAR TYPE DRAWBAR SUPPORT

The parking stand hydraulic system is used to control the support to set drawbar at the correct height. Support hydraulic system is fed by the tractor hydraulic system through the hydraulic lines (1) and (2). The line have plugs (7) secured with red plugs (8).

Raising or lowering the support is done by extending or retracting the hydraulic

TIP

The hydraulic system of the shear type drawbar support is filled with L-HL32 Lotos hydraulic oil.

cylinder piston rod (4). Hydraulic oil selective control valve of the tractor external hydraulic system is used to control the support cylinder.

The system is equipped with a hydraulic

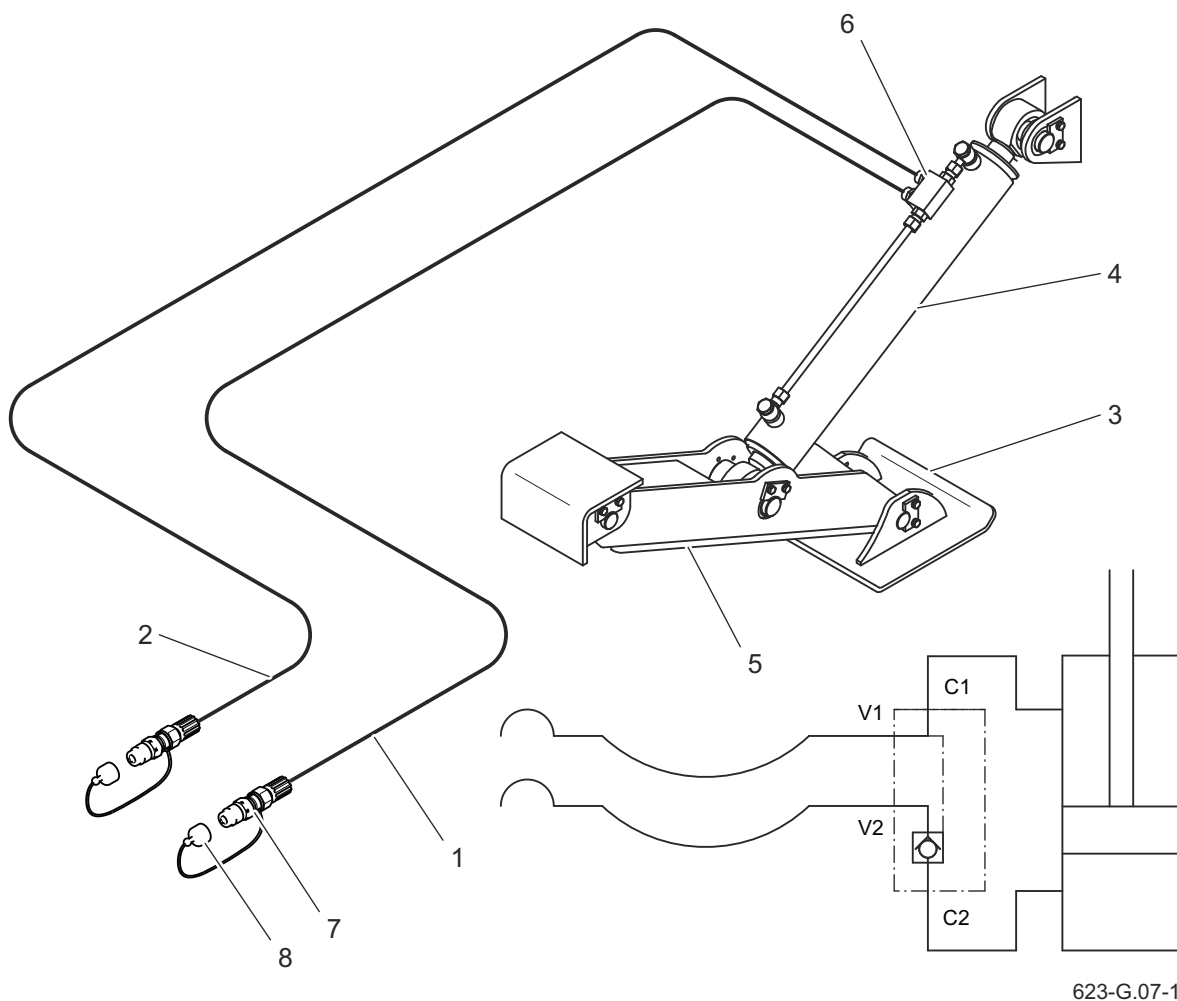


Figure 3.10 Hydraulic tipping system design and diagram

(1), (2) hydraulic line, (3) support leg, (4) hydraulic cylinder, (5) support arm, (6) hydraulic lock, (7) quick coupler - plug, (8) plug cap (red)

lock (6) located on the hydraulic cylinder position in case of damage to hydraulic
(4). The lock locks the support in a fixed lines (abrasion, breaking).

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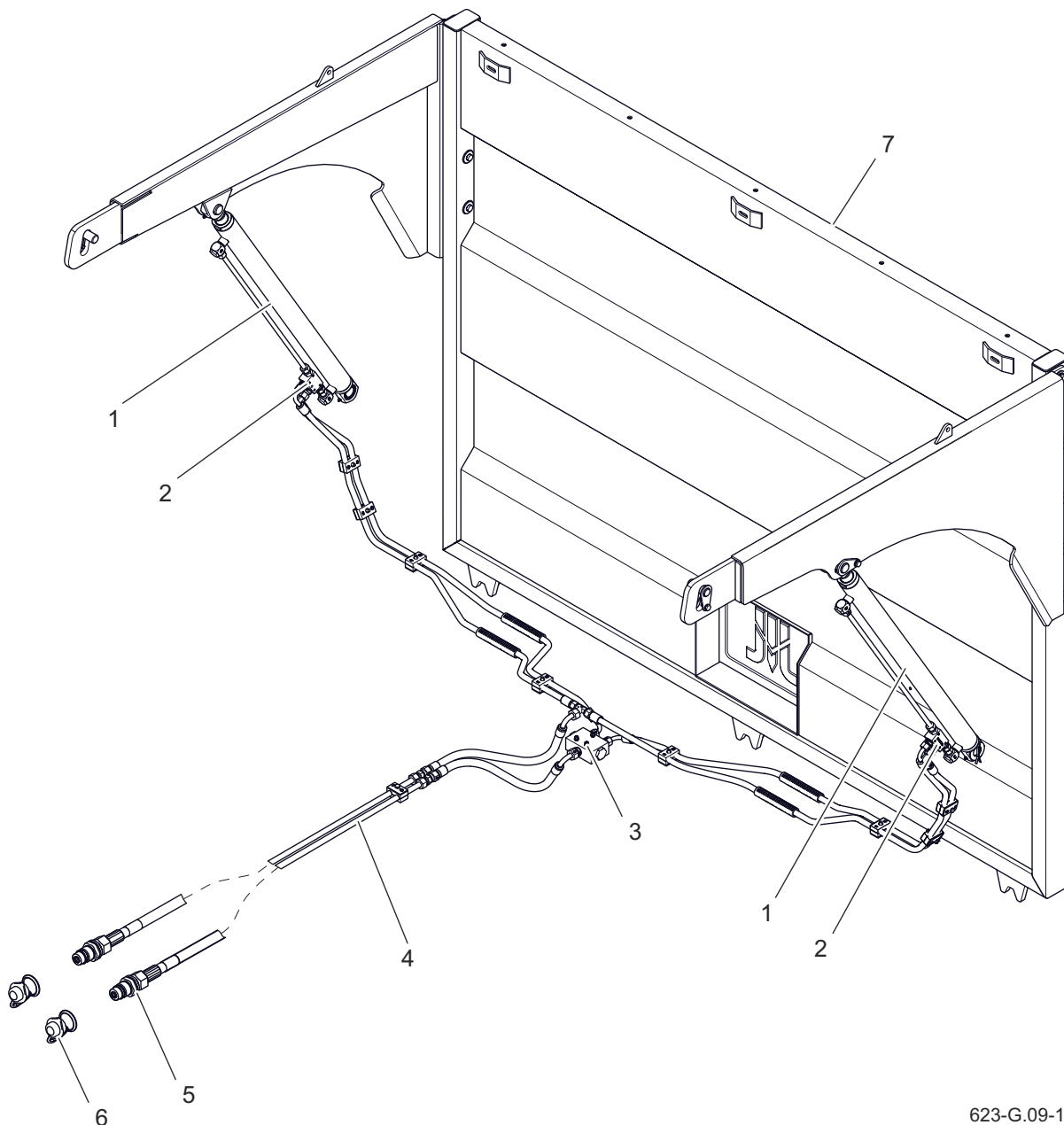
3.8 TAILGATE HYDRAULIC SYSTEM

Hydraulic system - figure (3.11) is used to close and open the tailgate (7). The hydraulic system is supplied with oil from the tractor external hydraulic system. Pressurised oil is fed to flow divider (3) through hydraulic lines (4) connected to tractor by

TIP

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

means of quick couplers (5). The flow divider divides the oil stream proportionally



623-G.09-1

Figure 3.11 Design of the hydraulic system of the tailgate

(1) hydraulic cylinder, (2) hydraulic lock, (3) flow divider, (4) hydraulic line, (5) quick coupler - plug, (6) plug cap (black), (7) tailgate

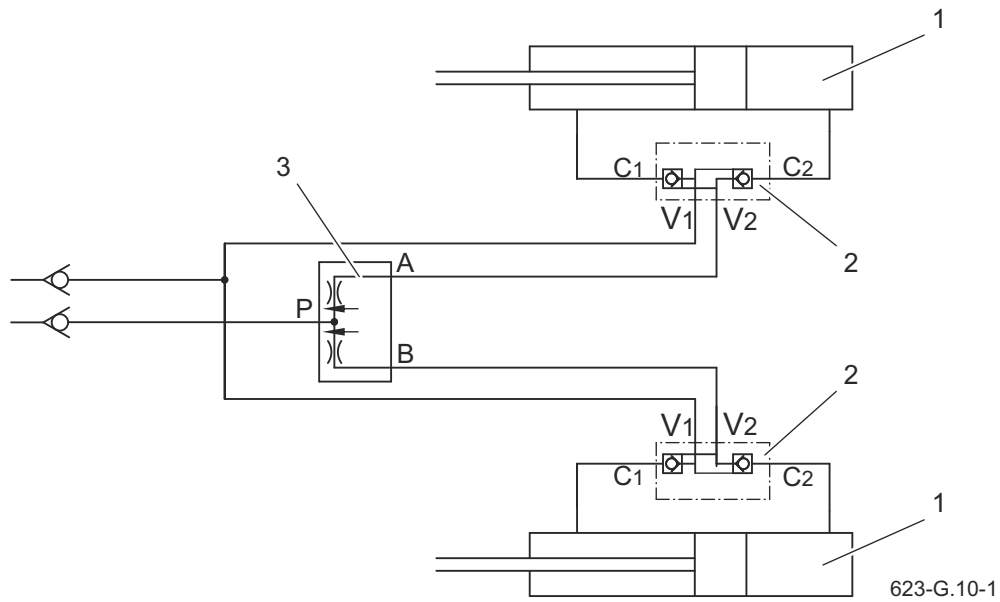


Figure 3.12 Diagram of the hydraulic system of the tailgate
 (1) hydraulic cylinder, (2) two-sided hydraulic lock, (3) flow divider

to the two hydraulic cylinders (1) which extend or withdraw in order to close or open the tailgate. Quick couplers (5) at the line ends are protected with black stoppers (6).

In the initial stage of opening, the tailgate raises slightly and releases the locks in the form of hooks (in the floor frame) and forks (in the tailgate) and then, it tilts upwards.

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3.9 HYDRAULIC SYSTEM OF THE LOWER WALLS

The trailer is equipped with a hydraulic unlocking of the side doors of the trailer from the tractor cabin. This solution ensures greater operator comfort and safety during unloading.

Depending on the load box design, the system can be in three versions:

- left tipping
- right tipping
- left and right tipping.

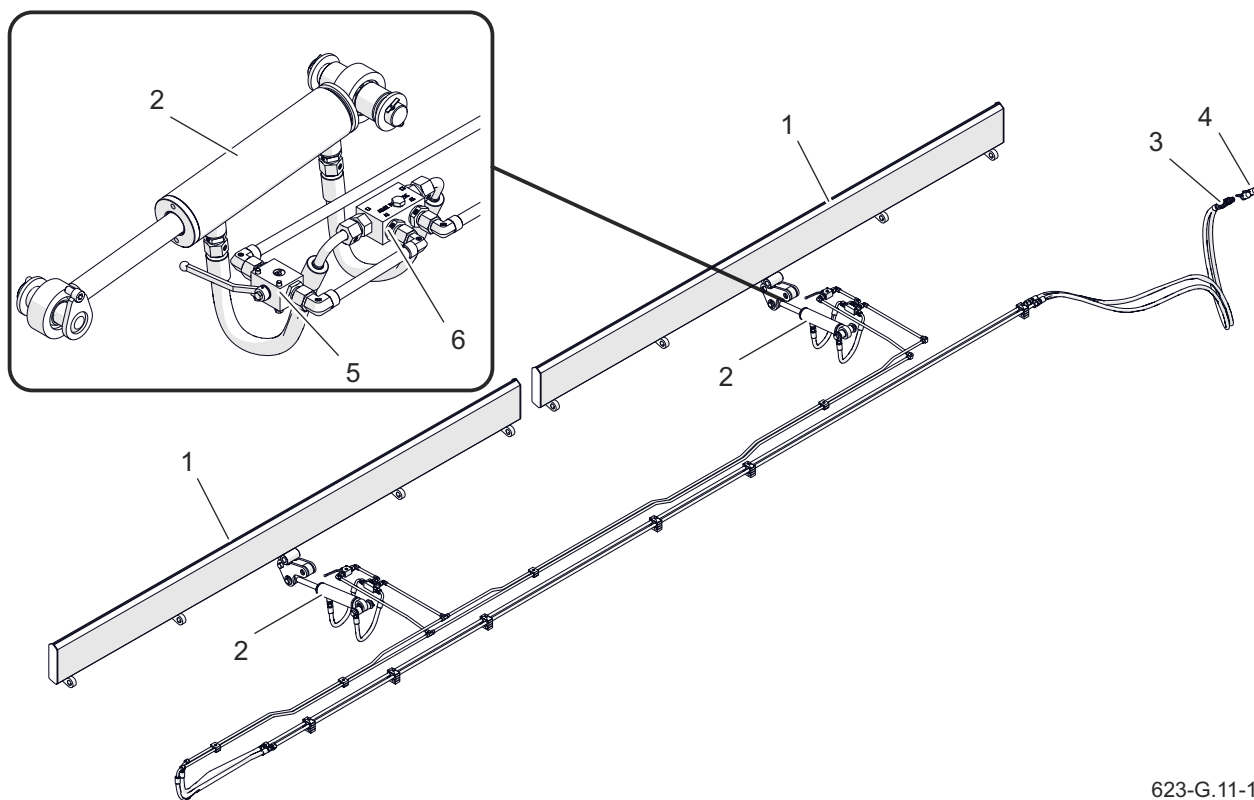
The system is supplied with oil from the tractor hydraulic system. The system is controlled by means of the oil manifold

TIP

The hydraulic system of the lower walls is filled with L-HL32 Lotos hydraulic oil.

of the tractor external hydraulic system. Hydraulic lines to connect with the tractor have plugs (3) secured with green plugs (4).

Locking and unlocking of the side walls is performed by controlling the position of the lower walls with hydraulic cylinders (2). Lower the lower walls to unlock them or lift them to lock. Lifting or lowering is done by



623-G.11-1

Figure 3.13 Diagram of the hydraulic system of the tailgate

(1) bottom wall, (2) hydraulic cylinder, (3) quick coupler - plug, (4) plug cap (green), (5) cut-off valve, (6) two-way hydraulic lock

extending or retracting the piston rods of hydraulic cylinders (2).

Shifting the valve handle (5) perpendicular to the valve body causes the lower walls to lock (e.g. during transport). To unlock shift the valve handle (5) to the open position,

i.e. along the valve body.

The system is equipped with hydraulic locks (6) to protect against unwanted unlocking of the walls in the event of damage (abrasions, cracks) to hydraulic lines.

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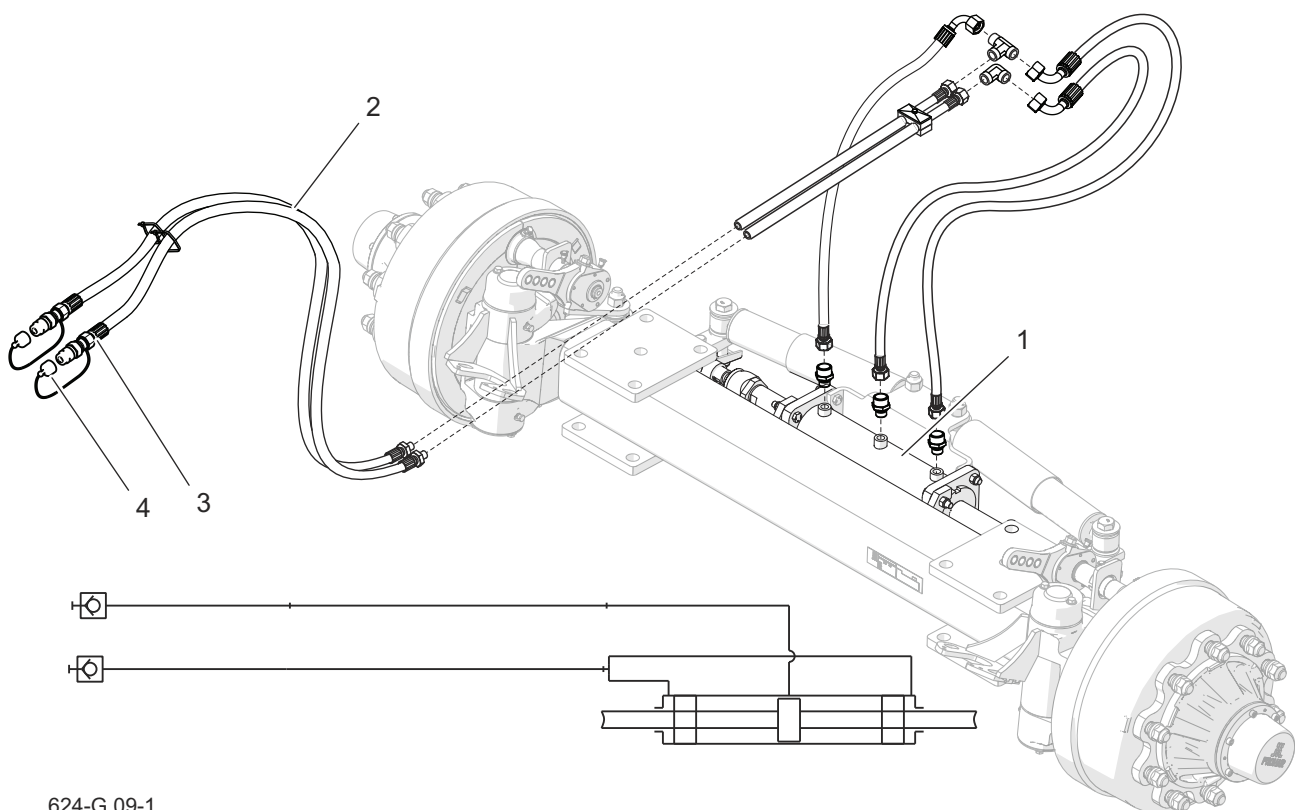
3.10 TURNING INTERLOCK HYDRAULIC SYSTEM

The trailer can be delivered with a passively steered rear steering axle. Axle design enables easier cornering and easier manoeuvring on marshy terrain, due to which there is less tyre wear on machine. The steering arms must be locked when reversing, otherwise the trailer will tend to turn uncontrollably to the left or right when reversing.

The axle steering lock is enabled by the 2-line hydraulic system shown in figure

(3.14).

The steering lock is controlled from the tractor cabin with the lever of the external selective control valve in the tractor. Locking and releasing the lock takes place by extending or retracting the hydraulic cylinder piston rod (1). Hydraulic lines (2) to connect with the tractor are equipped with quick couplings - plugs (3) and secured with plugs (4).



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Figure 3.14 Diagram of the hydraulic system of the rear axle turning interlock

(1) hydraulic cylinder (2) hydraulic line (3) quick coupler - plug (4) plug cap

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3.11 ELECTRICAL LIGHTING SYSTEM

The trailer electrical system is designed for supply of 12 V DC. Connection of the trailer electrical system with the tractor should be made through an appropriate connection lead that is part of the trailer standard equipment. The arrangement

! IMPORTANT

The trailer's lights work only when the trailer is connected to the agricultural tractor and the parking lights are ON.

of electrical components of the lighting system in the standard trailer version is shown - figure (3.16).

Table 3.3. Markings of connection socket's connections

Marking	Function (lead colour)
1/L	Left indicator (yellow)
2/54	unused
3/31	Ground (white)
4/R	Right indicator (green)
5/58R	Rear right parking light (brown)
6/54	STOP light (red)
58L	Rear left parking light (black)

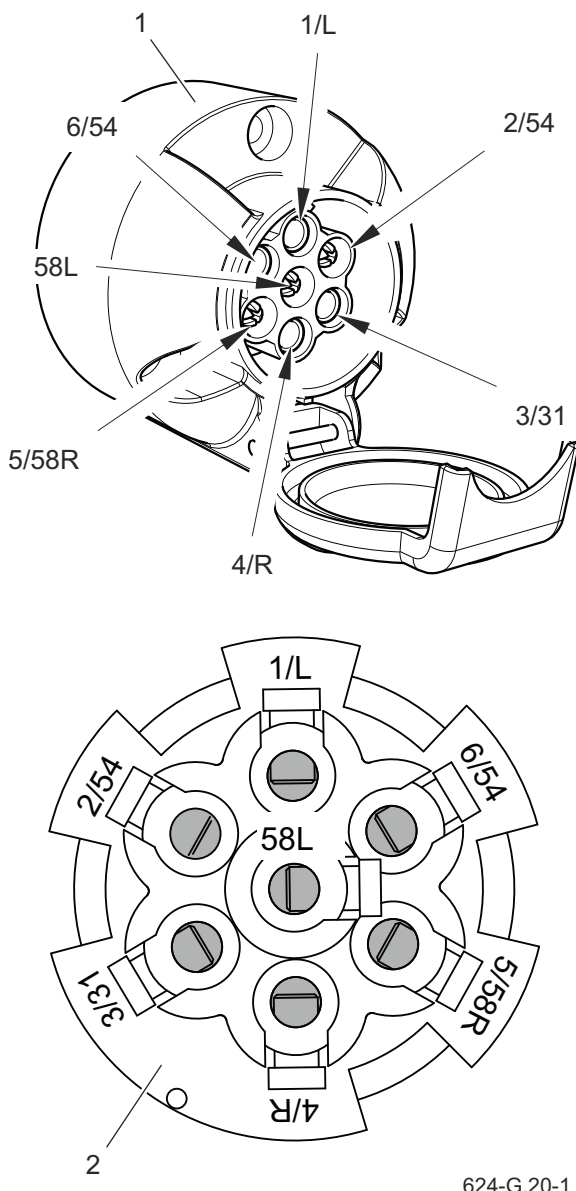
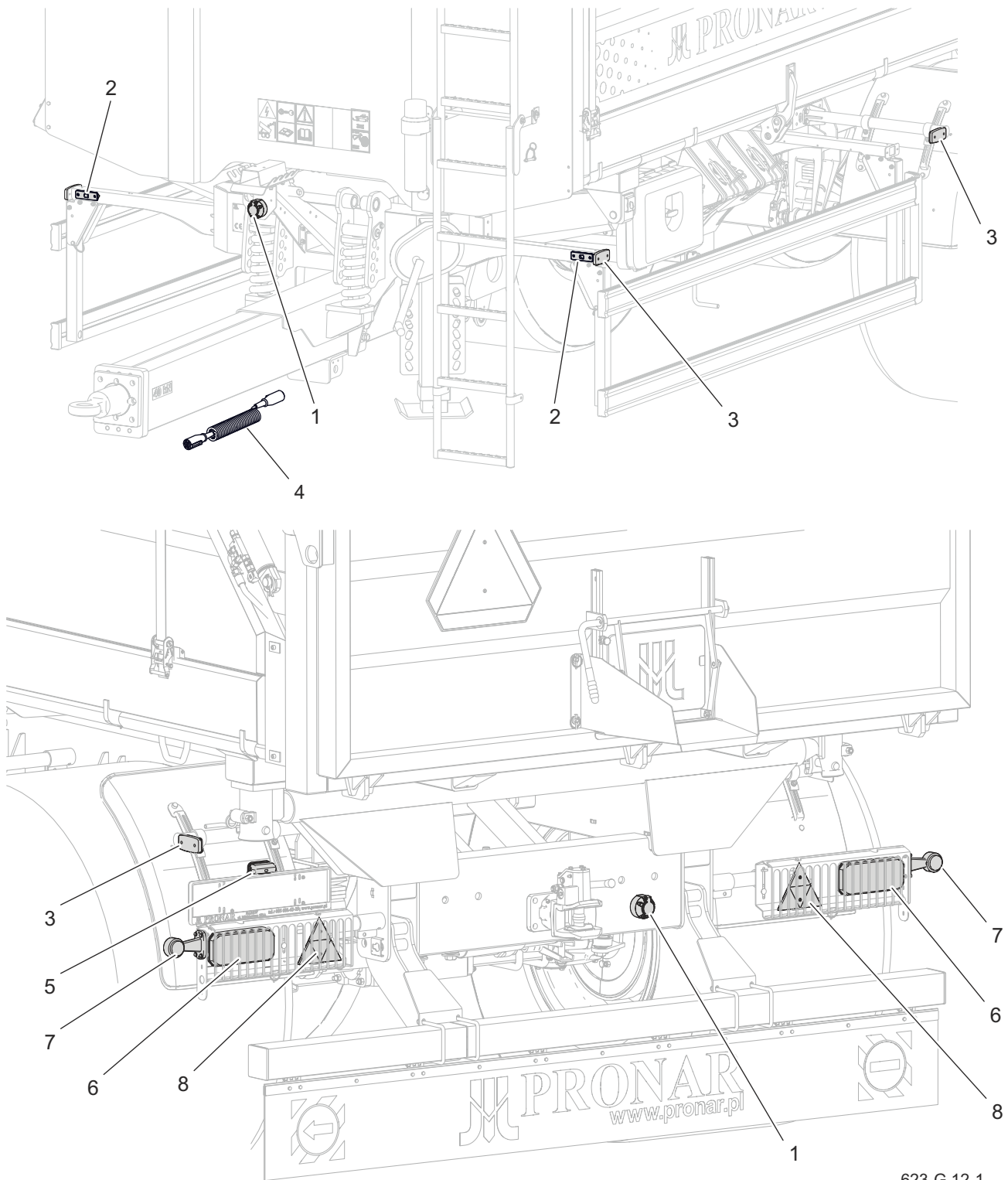


Figure 3.15 Connection socket
 (1) socket
 (2) view from the wiring harness side



623-G.12-1

Figure 3.16 Location of electrical and warning components

(1) 7-pin socket, (2) front position lamp, (3) side position lamp, (4) 7-pin-7pin connection cable, (5) license plate light, (6) rear lamp assembly, (7) rear clearance lamp, (8) reflective warning triangle

Table 3.4. List of electrical component markings

Symbol	Function
GP	7-pin socket, front
GT	Rear 7-pin socket
PP	Front right parking light
PL	Front left parking light
ZP	Rear right lamp assembly
ZL	Rear left lamp assembly
OT	License plate light
TOL	rear left clearance lamp
TOP	rear right clearance lamp
OBP	right clearance lamp
OBL	left clearance lamp

Table 3.5. Lead colour marking

Symbol	Colour
B	White
C	Black
K	Red
N	Blue
P	Orange
T	Green
O	Brown
Z	Yellow
C/T	Black and green

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3.12 HYDRAULIC STEERING SYSTEM

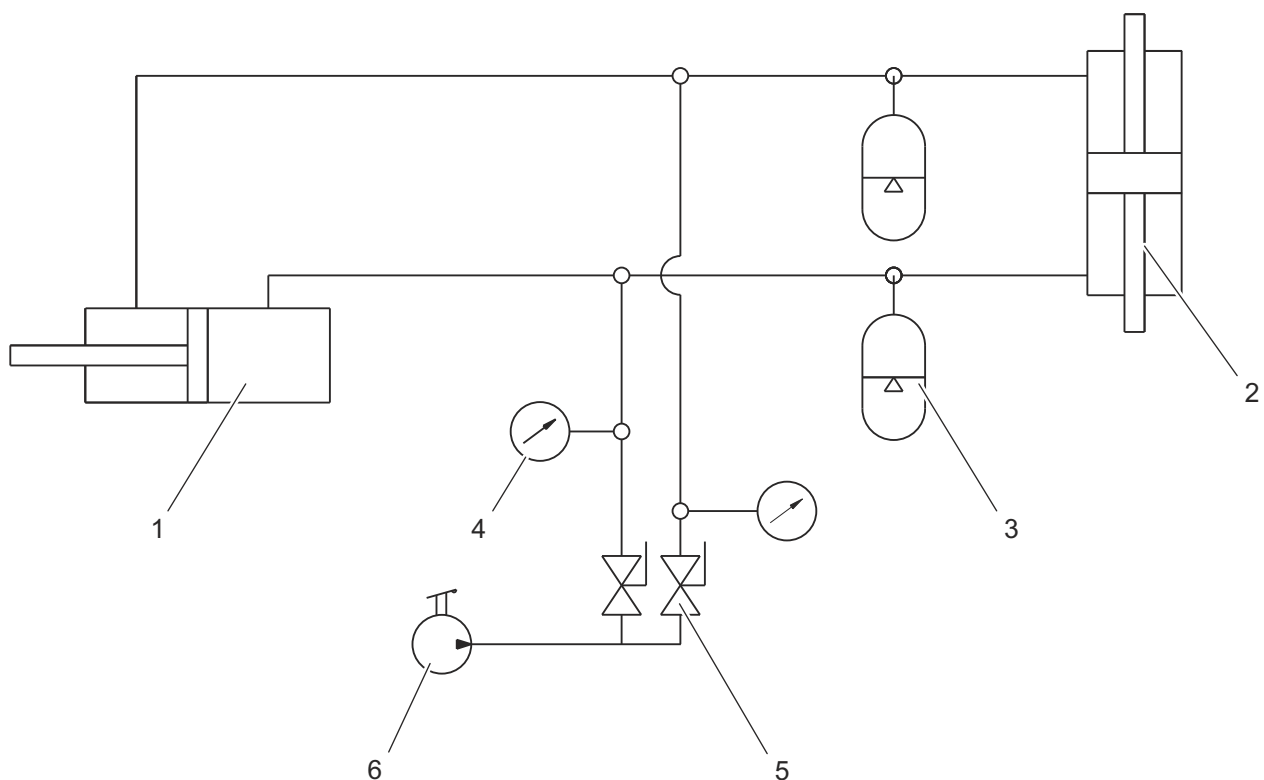
The trailer can be equipped with hydraulic steering system for controlling the rear axle of the trailer. This solution improves steering characteristics, reduces load applied to the trailer structural elements, reduces terrain damage and tyre wear as well as improves the comfort of driving the tractor with the trailer.

The rear steering axle is equipped with cylinder (2) – figure (3.18), which is connected with double-acting cylinder (1) located next to the drawbar by means of rigid and flexible conduits creating a closed-circuit.

The system is controlled using the string located on the right side of the drawbar. The string's ball-shaped end is connected with the tractor's hitch.

The system is filled with oil in the amount of approximately 5 litres. The reference list of oils is included in annex A to this publication.

During movement of cylinder (1), oil in the system flows to axle turning cylinder (2) turning the wheels. Rod of cylinder (1) moves when the trailer's drawbar changes its angular position with regard to tractor



623-G.14-1

Figure 3.18 Diagram of the hydraulic steering system

(1) axle steering cylinder, (2) axle turning cylinder, (3) hydraulic accumulator, (4) manometer, (5) hydraulic valve, (6) hand pump

hitch when manoeuvring. Hydraulic accumulators (4) are used in order to eliminate a minimal swing of axle steering cylinder and reduce load applied to the system while manoeuvring. On the left side of the

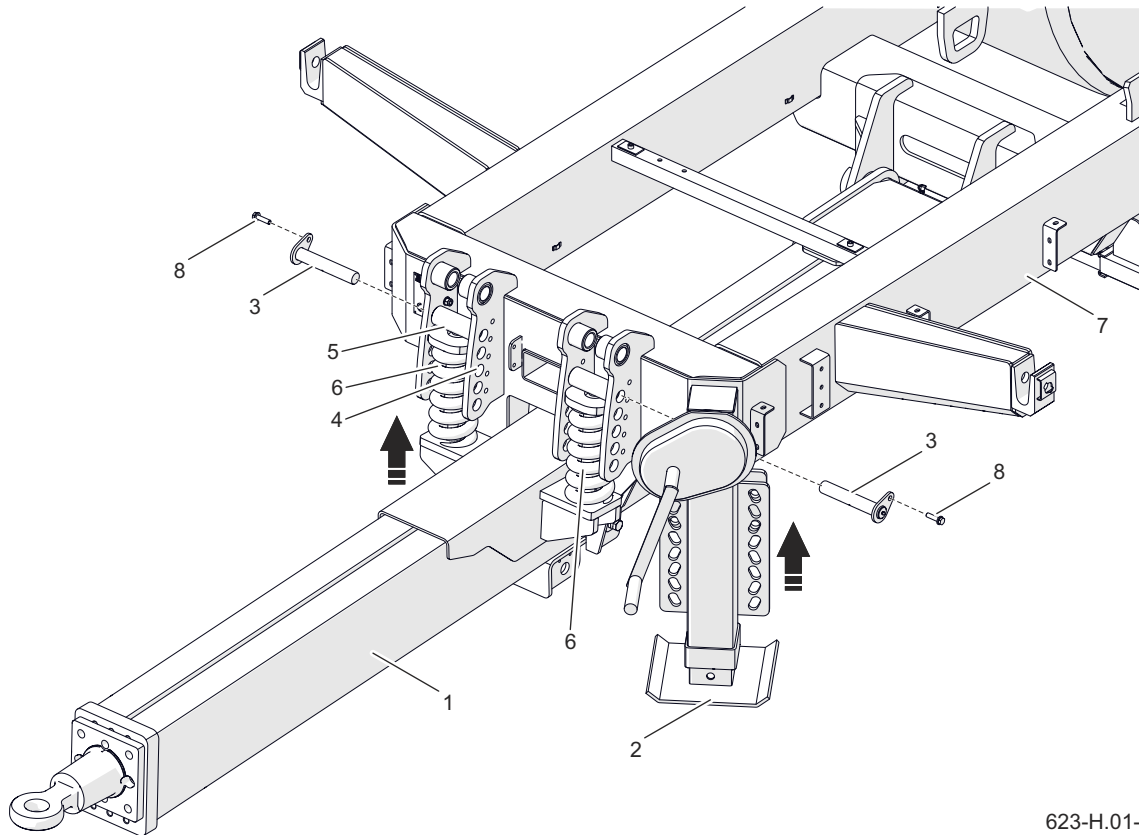
trailer, there is a hydraulic hand pump (6) for filling and setting the pressure in the steering system – see chapter “*Hydraulic steering system operation*”.

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SECTION 4

CORRECT USE

4.1 ADJUSTMENT OF DRAWBAR POSITION



623-H.01-1

Figure 4.1 Height setting of the drawbar with spring shock absorbers.

(1) drawbar, (2) support, (3) spring pin, (4) spring guide, (5) spring mounting, (6) spring, (7) trailer lower frame, (8) bolt

Location of the drawbar should be selected individually depending on the height of trailer tyres and the height of the tractor hitch to which the trailer will be coupled. The height should be set in such a manner as to ensure that the trailer hitched to the tractor is level. Empty trailer may be slightly tilted forward from the level (about 50 mm).

If you need to adjust the drawbar position, perform the following steps - figure (4.1):

- immobilise trailer with parking brake,
- prevent the trailer from rolling by

placing chocks under the wheels,

- support the trailer on both sides of the drawbar under the front beam of the lower frame (7) by means of supports of a suitable height and strength.
- the drawbar (1) should be supported with telescopic support (2) or hydraulic support,
- dismantle the connection of the drawbar (1) with the lower frame (7) by unscrewing the bolts (8) and pulling the pins (3) out of the spring (6) fixing sleeve (5),

**DANGER**

During the adjustment, take special care due to the significant weight of the drawbar and the risk of crushing limbs.

- using the telescopic support (2) crank, set the position of the drawbar in relation to the lower frame. Set the drawbar height in such a manner as to align the openings in the spring guide (4) with the openings in the

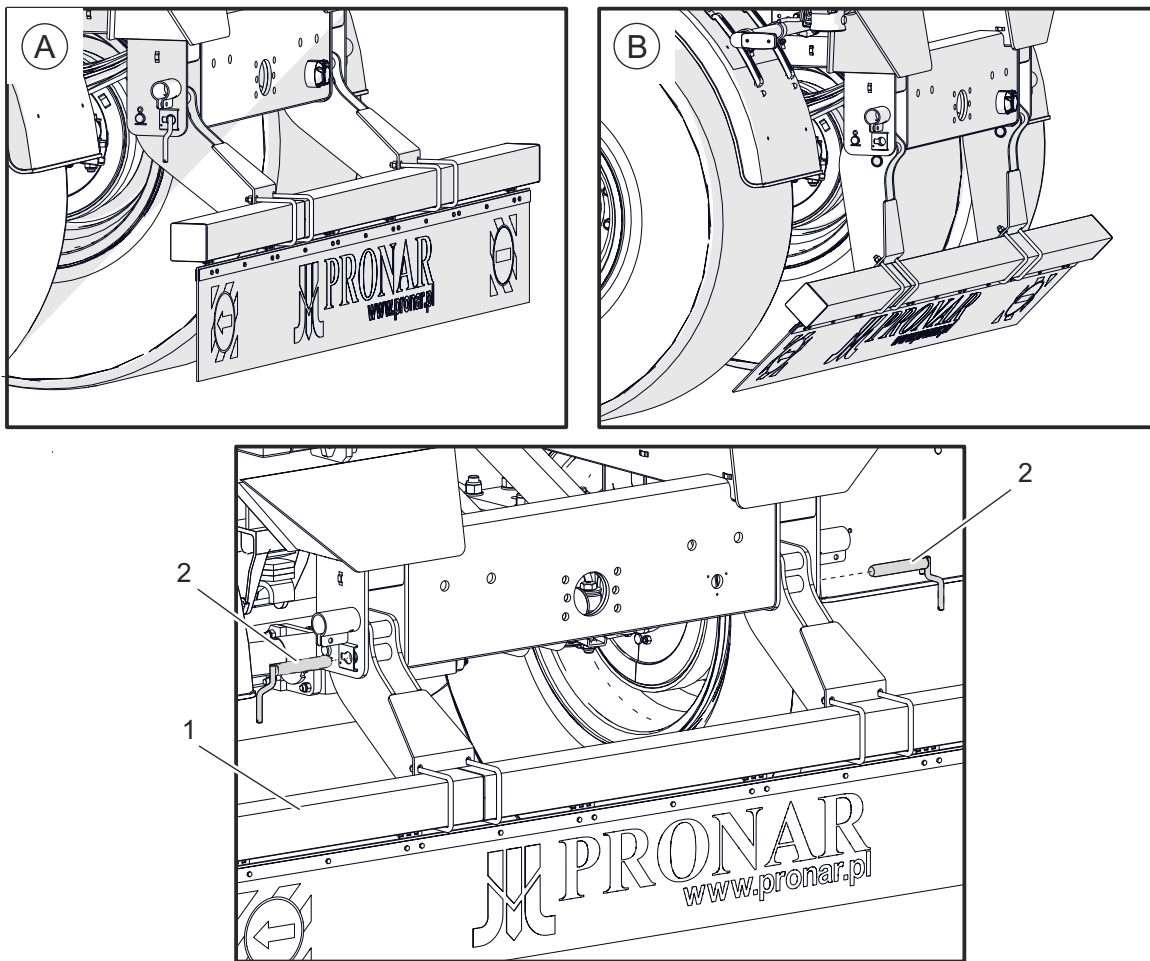
**IMPORTANT**

The tension of drawbar springs is selected and set by the Manufacturer and must not be changed.

- spring fixing sleeve (5). The trailer design makes it possible to set the drawbar in 5 different heights.
- When the drawbar height is set, install the pins (3) and tighten the bolts (8) using the tightening torque specified in Table 5.7.

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4.2 OPERATION OF REAR BUMPER



623-H.02-1

Figure 4.2 Rear bumper positions.

(A) rear bumper in raised position, (B) rear bumper in lowered position, (1) rear bumper, (2) pin

The rear bumper protects other road users from serious injuries in the event of an accident or a collision with the rear of the trailer while the trailer is moving on public roads.

When driving on public roads, the bumper should be raised (A). When unloading the trailer you will need to lower the rear bumper (B) in some situations.

In order to raise or lower the bumper:



DANGER

Danger of crushing Be especially careful when lowering / raising the rear bumper.

- unlock the bumper (1) by removing two pins (2).
- raise or lower the bumper,
- lock the bumper in a selected position using the pins (2).

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4.3 OPERATION OF THE SIDE UNDER-RUN PROTECTION DEVICES

SIDE UNDER-RUN PROTECTION DEVICES

The design of the side under-run protection devices enables their locking in the transport position and in the raised position.

LIFTING

- Remove the cotter pin (2) securing the under-run protection device.
- Raise the under-run protection device to the appropriate height so that it can be locked - position (B).
- Secure the under-run protection device with cotter pins in the hole marked with a black arrow in the

figure - position (C).

LOWERING

- To lower the under-run protection device, reverse the sequence.

Remember! The under-run protection device should be secured in the lower position with pins.



IMPORTANT

Side underrun protection devices must not be used as supporting elements while climbing on the trailer. Do NOT drive with raised under-run protection device. Before driving, make sure that underrun protection devices are lowered and locked in the lower position. Unless necessary, do not leave the underrun protection device in the raised position.

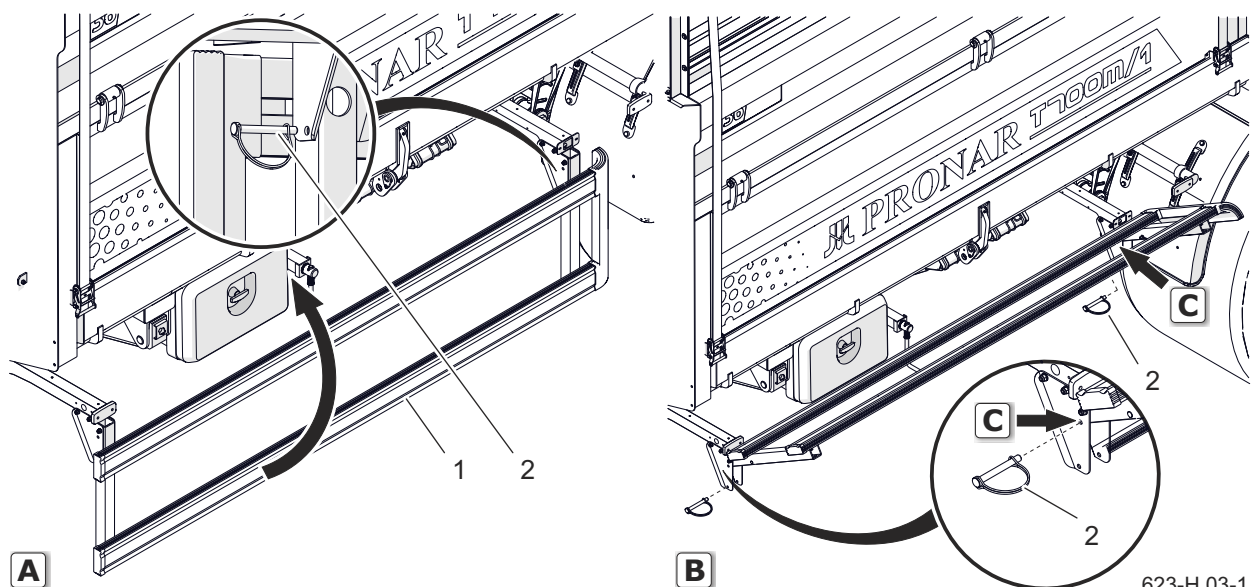


Figure 4.3 Under-run protection devices
 (1) underrun protective strip, (2) cotter pin, (A) underrun protective device in transport position,
 (B) underrun protective device in raised position, (C) hole for underrun protective device locking pin

4.4 TELESCOPIC SUPPORT OPERATION

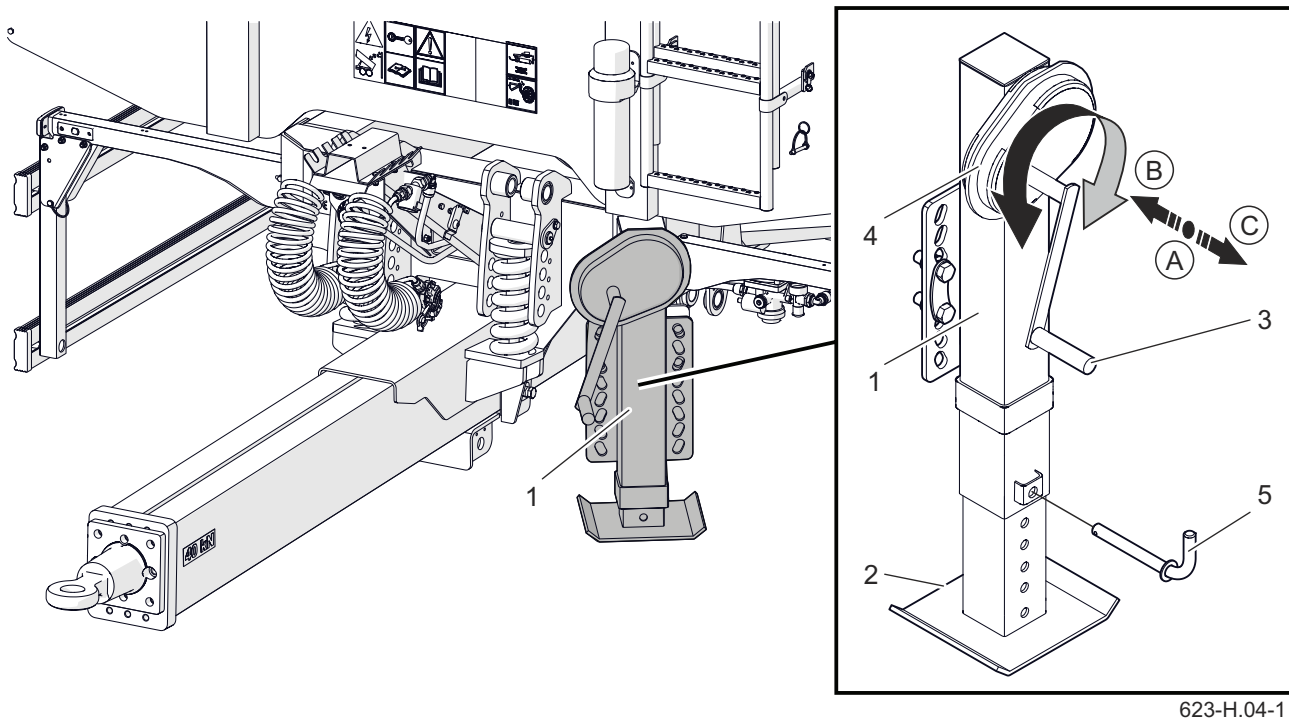


Figure 4.4 Adjusting the drawbar height

(1) telescopic parking stand, (2) parking stand foot, (3) crank, (4) gear, (5) securing pin
 (A) neutral position, (B) position - 1st gear (speed under load), (C) position - 2nd gear (high speed)



IMPORTANT

Remember that the high gear of the crank gear, position (C) of the crank, may be used only for operating the support if the support foot is not loaded. Use this gear only when the foot is not resting on the ground.



DANGER

Be especially careful when operating the support – this refers also to bystanders or helpers.

Proper height of drawbar eye in relation to tractor hitch can be set using the telescopic support with mechanical gear (figure 4.4). Position (C) is used for fast rising and lowering the support foot in order to reduce the distance between the support foot and the ground. Position (B) is used to lower and raise the drawbar of the unloaded

machine. In position (B), the support foot (2) moves slowly and a large force is not required to raise the machine drawbar.

POSITION THE PARKING STAND IN DRIVE POSITION

- Remove safety pin (5).
- Press the parking stand crank (3) from neutral position (A) to position (B).

- Turn the crank in proper direction in order to raise the parking stand foot (2) maximally upwards.
- If the parking support loses contact with the ground, the parking support gear can be shifted to a higher gear.

To do this, pull the crank in direction (C).

- Install securing pin.
- Set the crank in neutral position (A).

ADJUST THE PARKING STAND TO PARKING POSITION

- Remove safety pin.

Raise the parking stand foot slightly upwards, it will make it



IMPORTANT

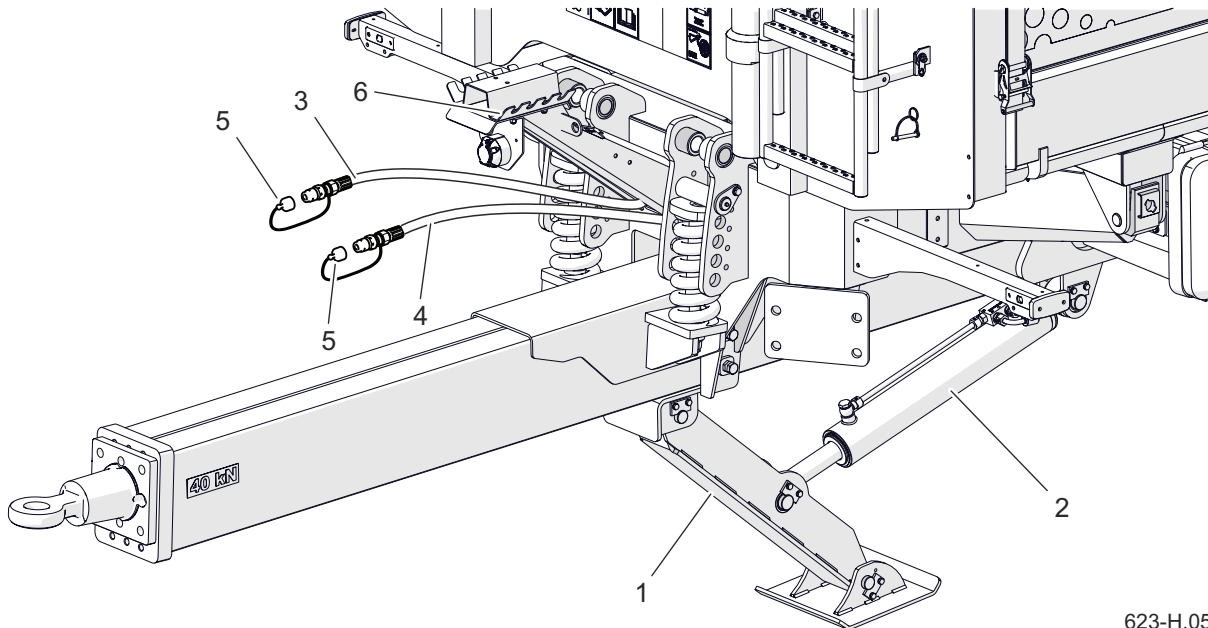
Do NOT drive off with the parking stand lowered. The parking stand must be in driving (raised) position.

easier to remove the securing pin.

- Set the parking stand foot position by turning the pin into the correct position.
- Move crank (3) to position (B) or (C).
- Turn the crank in correct direction in order to lower the parking stand foot to the ground or adjust the drawbar eye height in relation to the hitch (if the trailer is to be hitched to tractor)

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4.5 OPERATE OF THE HYDRAULIC SHEAR PARKING STAND



623-H.05-1

Figure 4.5 Adjusting the drawbar height

(1) shear type drawbar support, (2) hydraulic cylinder, (3) hydraulic line for lifting the support, (4) hydraulic line for lowering the support, (5) plug cap (red), (6) line hanger

TIP

To protect the plugs and identify the system, the lines are secured with red plugs (5).



IMPORTANT

Do NOT drive off with the parking stand lowered. The parking stand must be in driving (raised) position.

POSITION THE PARKING STAND IN DRIVE POSITION

- Immobilize the tractor and trailer with the parking brake.

The trailer must be hitched to the tractor. Connect the hydraulic lines (3) and (4) to the tractor hydraulic sockets.

- While controlling the selective control valve in the tractor, raise the parking stand foot by inserting the piston rod

of the hydraulic cylinder (2).

- Release the parking brake before driving off.

ADJUST THE PARKING STAND TO PARKING POSITION

- Immobilise tractor and trailer with parking brake.

The trailer must be hitched to the tractor.

- While controlling the selective control valve in the tractor, lower the parking

stand foot by extending the hydraulic cylinder piston rod (2).

- Drawbar eye should be slightly raised in relation to the hitch in the tractor, which will facilitate the subsequent

hitching of the trailer.

- When the drawbar eye height is set, set the manifold lever in tractor to "neutral" position.

H.3.11.623.05.1.EN

4.6 HITCHING THE TRAILER



DANGER

When hitching, there must be nobody between the trailer and the tractor. When hitching the machine, tractor driver must exercise caution and make sure that nobody is present in the hazard zone.

When connecting the hydraulic or pneumatic lines to the tractor, make sure that the hydraulic and pneumatic systems of the tractor and the trailer are not under pressure.

Ensure sufficient visibility during hitching.

After completed hitching, check that the hitch pin is properly secured.



IMPORTANT

The trailer may only be connected to an fully operational agricultural tractor, if all connections (electric, hydraulic and pneumatic) and the hitch on the agricultural tractor meet the requirements of the trailer manufacturer. Ensure compatibility of oils in the tractor hydraulic system and in the trailer hydraulic system.

In order to hitch the trailer to the tractor, perform the actions below in the sequence presented.

- Visually inspect the technical condition of the trailer.
- Immobilise trailer with parking brake.

Pull brake mechanism clockwise until resistance is felt. Make certain that chocks are placed under one trailer wheel.
- Position agricultural tractor directly in

front of the trailer's drawbar eye.

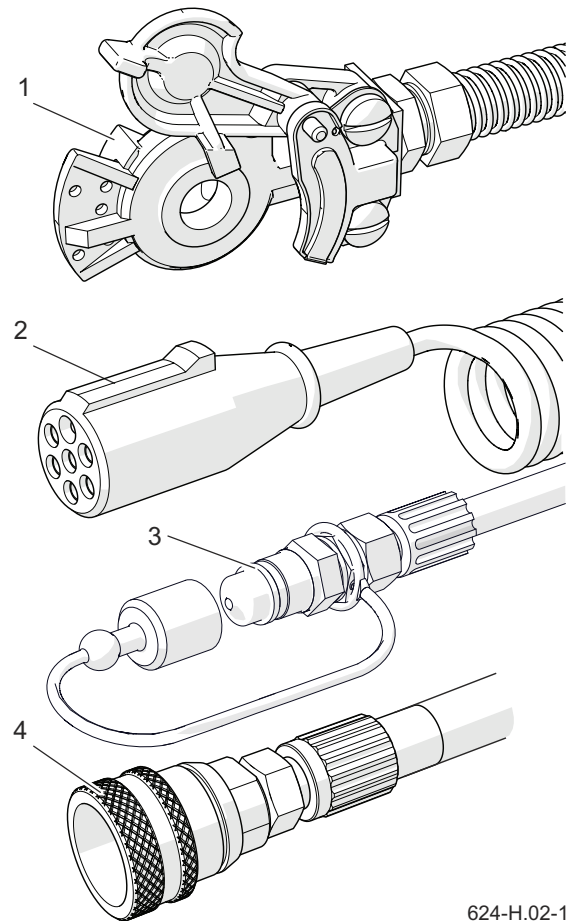
- Using the support, set the drawbar at such a height as to make it possible to hitch the trailer.
- If the telescopic parking stand is used, adjust the drawbar height by rotating the crank in correct direction (section 4.4).
- In the case of the shear hydraulic support - figure (4.5), reverse the tractor and connect the hydraulic lines of the support to it. Then, by controlling the selective control valve in the tractor, set the height of the drawbar eye to enable hitching the trailer. When the drawbar eye height is set, set the manifold lever in tractor to "neutral" position.
- Reverse tractor, hitch trailer to appropriate hitch on tractor, check hitch lock protecting machine against accidental unhitching. If the agricultural tractor is equipped with an automatic coupler, ensure that the hitching operation is completed and that drawbar eye is secured.
- Fold the support and secure it properly. If the telescopic parking stand is used, raise the parking stand and secure it with securing pin

TIP

Hydraulic and pneumatic lines are marked with coloured protective covers, which identify the appropriate system line.

(5) - figure (4.6) For of the hydraulic parking stand, after lifting, set the selective control valve lever in the tractor to the “neutral” position.

- Turn off tractor engine and remove key from ignition. Close the tractor cab to ensure that unauthorised persons do not have access to the tractor cab. Immobilise the tractor with parking brake.
- The trailer hitched to the tractor must be level. Empty trailer may be slightly tilted forward from the level (about 50 mm). If the trailer is not level, adjust the position of the hitch on the tractor or the position of the trailer drawbar - section (4.1).
- Connect the pneumatic braking system lines (applies to a 2-line pneumatic system).
- Connect hydraulic brake system line (applies to hydraulic brake system). The connection socket is different than in other systems (female socket).
- Connect hydraulic tipping system line.
- Connect lines of the tailgate hydraulic



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Figure 4.6 Trailer connections
(1) pneumatic brake plug, (2) electric wire, (3) hydraulic line, (4) hydraulic brake socket

system. Connect the line to the same section of the tractor hydraulic

**IMPORTANT**

When connecting pneumatic lines of a 2-line system, first connect the pneumatic line marked yellow, and then the line marked red.

manifold.

- Connect the hydraulic system lines of the lower walls. Connect the line to the same section of the tractor hydraulic manifold.

TIP

In the event of a prolonged idle period of the trailer, the air pressure in the pneumatic brake system may be insufficient to release the brake shoes. In such a case, start the tractor engine and air compressor and supplement air in the pneumatic system tank.

- Connect main lead supplying electrical lighting system.
- Conduct daily inspection of the trailer.

- If the trailer is fully operational, one may commence work.
- Immediately before driving remove wheel chocks and release the parking brake.

Turn the brake mechanism crank anticlockwise until resistance is felt.

**IMPORTANT**

When hitching is completed, secure the electrical leads and hydraulic and braking system lines in such a way that they do not become entangled in tractor moving parts and are not at the risk of breaking or being severed when making turns.

H.3.11.623.06.1.EN

4.7 UNHITCH THE TRAILER



DANGER

Do NOT unhitch the trailer when the load box is raised.

Exercise caution when unhitching the trailer from the tractor. Ensure good visibility. Unless it is necessary, do not go between tractor and machine.

Before disconnecting lines and drawbar eye, close tractor cab and secure it against access by unauthorised persons. Turn off tractor engine.

In order to unhitch the trailer from the tractor follow these steps.

- Park the trailer on hard and level ground.
- Immobilise tractor with parking brake, turn off tractor engine
- Place chocks under the trailer wheels in order to prevent the machine from rolling.

Wheel chocks must be so placed that one is in front of the wheel and the second is behind the wheel.

- Lower the trailer's telescopic parking stand to the parking position.

Read subsection (4.4).

- For hydraulic shear type parking stand - figure (4.5), unfold it to the parking position.

Read subsection (4.5).

- Reduce residual pressure in the hydraulic system using the appropriate

hydraulic circuit control lever.

- Ensure that unauthorised persons do not have access to the tractor cab.
- Disconnect the hydraulic system lines from the tractor. Protect line ends with caps and place them on the hanger.
- Disconnect the electrical lighting system cable.
- Disconnect pneumatic system lines and place them in the suitable place on the trailer.
- Disconnect hydraulic brake system line and place it on the hanger (applies to trailer version with hydraulic brake system).
- Unlock tractor hitch and disconnect trailer drawbar from tractor hitch and drive tractor away.



IMPORTANT

When disconnecting the pneumatic lines of the brake system, first disconnect the red line and only then disconnect the yellow line.

The trailer must not be disconnected if it is loaded.



IMPORTANT

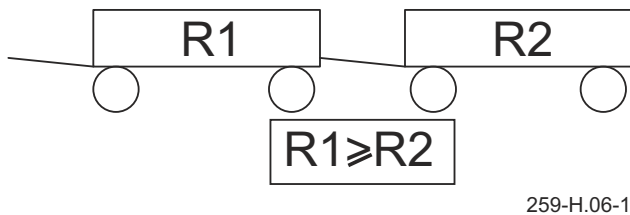
If the ball hitch is used, first unlock the tractor hitch and then raise the drawbar by means of the support and drive the tractor away from the machine.

4.8 HITCHING AND UNHITCHING THE SECOND TRAILER

A second trailer may only be hitched if it is a machine built on a dual axle chassis and if it meets all the requirements specified in section 1.

Hitching the second trailer to the tractor

- trailer unit requires experience in driving an agricultural tractor with a trailer. While hitching the second trailer, it is



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Figure 4.7 Permissible weight of trailers

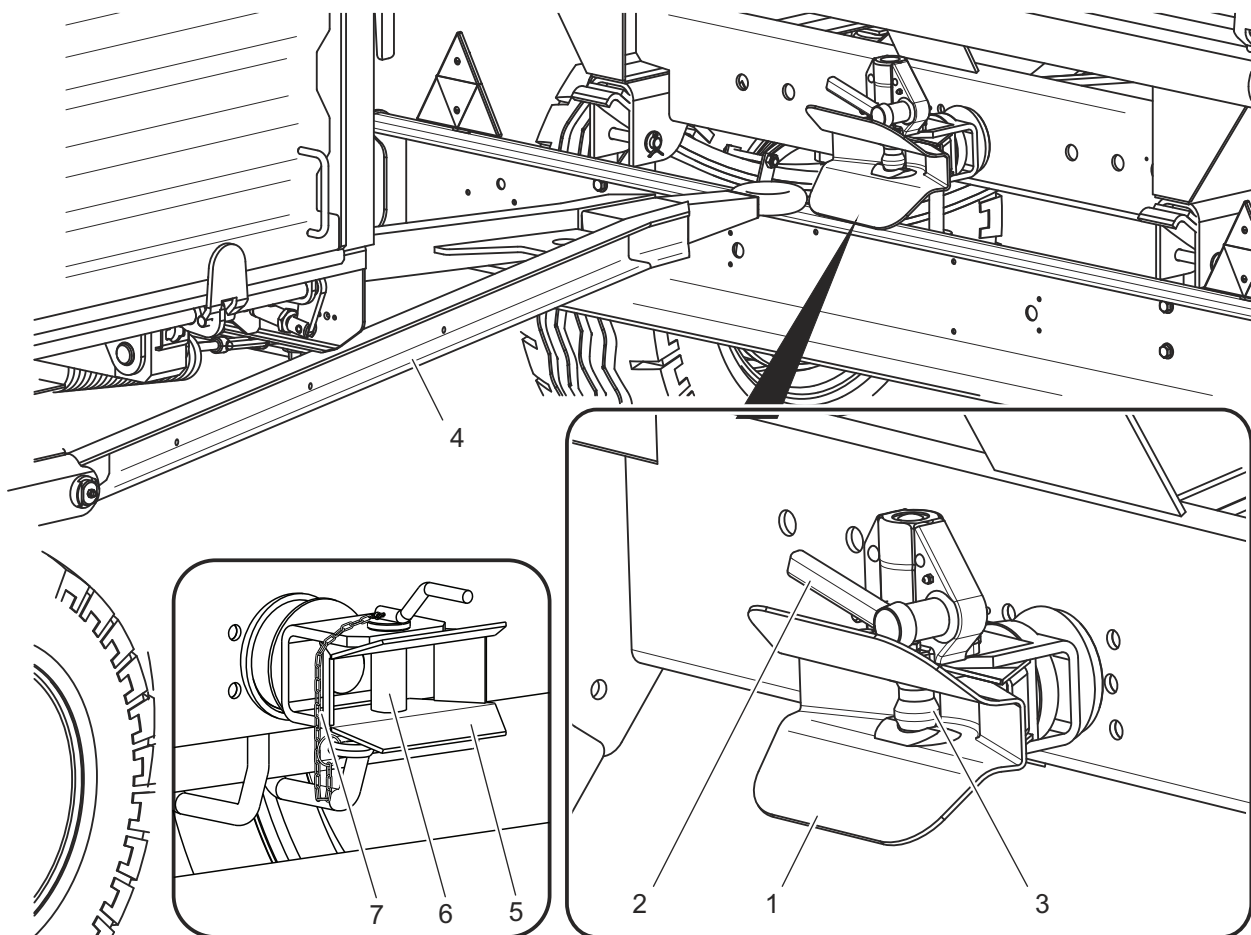


IMPORTANT

Only two-axle trailers with a permissible total weight not exceeding the load capacity of the drawbar and the rear hitch of the towed trailer may be hitched with the trailer.

Do NOT connect a second trailer with a permissible total weight exceeding that of the first.

When hitching two trailers to a tractor, both should have the same type of braking system.



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Figure 4.8 Coupling second trailer

(1) the body of the automatic hitch, (2) the handle for lifting the pin of the automatic hitch, (3) hitch pin, (4) second trailer drawbar, (5) manual hitch, (6) pin, (7) cotter pin

recommended to use the help of another person to guide the tractor driver.



DANGER

When hitching/unhitching the trailer, there must be nobody between the trailers. Be especially careful. Person assisting in hitching the machines should stand outside the area of danger and be visible to the tractor driver at all times.

After completion of hitching check the security of the hitching pin.

HITCH A SECOND TRAILER

- Before hitching the second trailer, make sure the oil in the hydraulic systems of both trailers can be mixed.
- Position the tractor with the first trailer hitched directly in front of the second trailer drawbar.
- Immobilise the second trailer with parking brake.
- Remove the cotter pin (7) securing the pin and take out the pin (6) of the hitch in the first trailer.

If the trailer is equipped with an automatic rear hitch, lift the pin using the handle (2) - figure (4.8).

- Adjust the height of the drawbar of the second trailer in such a manner as to enable coupling the machines.

- Reversing tractor, drive the rear hitch of the first trailer onto the drawbar of the second trailer.

For an automatic drawbar make sure that the hitching operation is completed and that the drawbar eye of the second trailer is secured.

- Insert drawbar pin and securing cotter pin.
- Connect the brake, hydraulic lines and electrical system wiring according to the instruction provided in section (4.6).

UNHTICH THE SECOND TRAILER

- Immobilise tractor and trailers with parking brake.
- Turn off tractor engine. Ensure that unauthorised persons do not have access to the tractor cab.
- Disconnect the brake, hydraulic lines and electrical system wiring according to the instructions provided in section (4.7).
- Unlock the pin of the hitch of the first trailer. Remove drawbar pin and drive tractor away.

H.3.11.623.08.1.EN

4.9 LOAD AND SECURE THE LOAD

GENERAL LOADING INFORMATION

Before starting loading, make sure that the tailgate, lower walls and the chute slide gate are properly closed and secured. In order to lock the bottom walls against accidental opening of the cut-off valves handle (5) - figure (3.13), it should be placed perpendicular to the valve body.

The trailer must be positioned to travel forward and be hitched to the tractor. Loading should only take place, when trailer is placed on flat level surface and hitched to tractor. If the trailer is equipped with tarpaulin cover, it should be rolled.

Regardless of the type of load carried, the user is obliged to secure it in such a manner that the load is unable to spread and cause contamination of the road. If this is impossible, do NOT transport this type of load.

Materials, which in contact with painted or steel surfaces may cause damage, should be transported in sealed packaging (bags, boxes, barrels, etc.). After unloading, the load box should be thoroughly cleaned with a strong jet of water.

If the transported materials exert high local pressure on the load box platform it should be protected against damage using thick planks, plywood or other materials of



IMPORTANT

The trailer is also designed for transport of harvested crops and agricultural products (volumetric or loose). It is permissible to transport other loads (timber, building materials packed loads), on the condition of securing the load box against damage (abrasion of paint covering, corrosion etc.). Always try to distribute the load uniformly in the load box.

Uneven distribution of the load may overload the axle and hitch system of the trailer.

Do NOT exceed permissible load weight of trailer because this may cause danger to road traffic and cause damage to the machine.

Loading should be carried out by a person having appropriate authorisation for operating the equipment (if required).



DANGER

Load on trailer must be secured against moving or contaminating road during travel. If it is impossible to properly secure the load, do NOT transport this type of material.

Overloading the trailer, erroneous loading and securing of the load is the most frequent cause of accidents during transport.

Do not carry people or animals.

Do NOT load the trailer if someone is inside the load box.

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

During work, keep a safe distance from overhead electric power lines.

similar properties.

Due to various densities of materials, the use of the total load box capacity may lead to exceeding permissible carrying capacity

Table 4.1 Guideline weights by volume of selected materials

Type of material	Weight by volume kg/m ³
Building materials:	
cement	1 200 – 1 300
dry sand	1 350 – 1 650
wet sand	1 700 – 2 050
solid bricks	1 500 – 2 100
hollow bricks	1 000 – 1 200
stones	1 500 – 2 200
soft wood	300 - 450
hard sawn timber	500 - 600
impregnated timber	600 - 800
steel structures	700 – 7 000
milled burnt lime	700 - 800
cinders	650 - 750
gravel	1 600 – 1 800
rubble	1 050 – 1 200
Root crops:	
raw potatoes	700 - 820
steamed crushed potatoes	850 - 950
dried potatoes	130 - 150
sugar beet - roots	560 - 720
fodder beet - roots	500 - 700
Mineral fertilisers:	
ammonium sulphate	800 - 850
potash salt	1 100 – 1 200
super phosphate	850 – 1 440
basic slag phosphate	2 000 – 2 300
potassium sulphate	1 200 – 1 300
milled lime fertiliser	1 250 - 1 300
Concentrated feeds and mixed feeds:	
stored chaff	200 - 225
pressed cake	880 – 1 000
milled dry feed	170 - 185
mixed feeds	450 - 650
mineral mixtures	1 100 – 1 300
ground oats	380 - 410
wet sugar beet pulp	830 - 1 000
pressed sugar beet pulp	750 - 800
dry sugar beet pulp	350 - 400
bran	320 - 600
bone meal	700 – 1 000
pasture salt	1 100 – 1 200
molasses	1 350 – 1 450
silage (pit silo)	650 – 1 050
hay silage (tower silo)	550 - 750

Type of material	Weight by volume kg/m ³
Seeds and grains:	
beans	750 - 850
mustard	600 - 700
peas	650 - 750
lentils	750 - 860
runner beans	780 - 870
barley	600 - 750
clover	700 - 800
grass	360 - 500
maize	700 - 850
wheat	720 - 830
oil seed rape	600 - 750
linseed	640 - 750
lupins	700 - 800
oats	400 - 530
lucerne	760 - 800
rye	640 - 760
Straw litter and bulk feeds:	
meadow hay dried in the swath	10 - 18
hay wilted in the swath	15 - 25
hay in gathering trailer (dry wilted)	50 - 80
wilted cut hay	60 - 70
dry baled hay	120 - 150
wilted baled hay	200 - 290
stored dry hay	50 - 90
stored cut hay	90 - 150
clover (lucerne) wilted in the swath	20 - 25
clover (lucerne) cut wilted on trailer	110 - 160
clover (lucerne) wilted on gathering trailer	60 - 100
dry stored clover	40 - 60
cut dry stored clover	80 - 140
dry straw in round bales	8 - 15
damp straw in round bales	15 - 20
cut damp straw in bulk trailer	50 - 80
cut dry straw in bulk trailer	20 - 40
cut dry straw in gathering trailer	50 - 90
cut dry straw in stack	40 - 100
baled straw (lightly crushed)	80 - 90
baled straw (heavily crushed)	110 - 150
cut cereal mass in bulk trailer	35 - 75
cut cereal mass in gathering trailer	60 - 100
green fodder in swath	28 - 35
cut green fodder in bulk trailer	150 - 400
green fodder in gathering trailer	120 - 270
fresh beet leaves	140 - 160
cut fresh beet leaves	350 - 400
beet leaves in gathering trailer	180 - 250

Type of material	Weight by volume kg/m ³
Others:	
dry soil	1 300 – 1 400
wet soil	1 900 – 2 100
fresh peat	700 - 850
garden soil	250 - 350

Source: "Technology of machine work in agriculture", PWN, Warszawa 1985

of the trailer. Guideline specific weight of selected materials is given in table (4.1). Take care not to overload the trailer.

BULK MATERIALS

Loading bulk materials is normally conducted with the use of loaders or conveyors and possibly loading manually. Do not load bulk materials to a height greater than that of side walls or extensions. On completion of loading, the load should be evenly spread over the whole surface of the load box. If the trailer is equipped with wall and extension linking cables, they should be connected with a linking cables when loading loose materials. Secure cable release mechanism with cotter pin. Oilseed rape or seeds of other plants of very small size or powder materials can be transported provided the load box is properly sealed in places where gaps are bigger than the seed diameter or other carried material. Profiled rubber seals, silicone sealers, plastic wrap, rope or textile materials are recommended materials to provide sealing of the load box.

Additionally it is essential to protect load with tarpaulin cover. It protects the load against spilling during travel, being blown away by the wind and also protects load against moisture, which is particularly dangerous in the case of bulk materials. They may absorb a significant amount of water, which may increase the bulk of the load during travel. In extreme cases the gross weight of the trailer may exceed the permissible vehicle gross weight.

Some bulk loads (e.g. building materials, such as gravel or slag) may cause more rapid damage to paintwork.

LOADS OF PIECES OR SOLID LUMPS

Loads of pieces or solid lumps are generally hard materials of significantly greater dimensions than bulk loads (stones, coal, bricks and ballast). These materials without prior preparation of the load box may cause indentation of the floor or walls and abrasion of paintwork. In order to protect it, lay thick plywood, hard particle board, thick planks or other materials of similar properties on the load

box platform and possibly on walls and wall extensions. Non-compliance with the instructions provided could invalidate the warranty. Loading of material in pieces or solid lumps must be from a low height. The load must not fall with great force on the floor of the load box, even if it is protected.

HAZARDOUS LOADS



DANGER

If it is necessary to carry permitted hazardous materials, acquaint yourself with the regulations concerning transport of hazardous materials in force in the given country and also the regulations of the ADR agreement.

Carefully read the information leaflets provided by the load manufacturer and observe the instructions for transporting and handling the load. Ensure whether during loading work it is necessary to apply additional personal protection (masks, rubber gloves etc.)

According to the European ADR agreement concerning the international road transport of hazardous materials, the transport of this type of load (defined in detailed by this agreement) is prohibited with the use of agricultural trailers. The only exception are plant protection chemicals and artificial fertilisers, which may be transported on agricultural trailers on the condition that they are transported in the appropriate packaging and in quantities envisaged by the ADR agreement.

HIGH VOLUME LOADS

Volumetric loads (light and large), such

as hay, pressed cubes or bales, straw, green forage, etc., are recommended to be loaded using appropriate equipment: bale grippers, forks, etc. The load can be loaded even above the extensions of the load box with a special attention paid to the stability of the trailer and proper fastening and securing of the load. Remember that higher loading has a negative effect on trailer stability.

LOADS IN PACKAGING

Loads transported in packaging (boxes, sacks) must be laid closely side-by-side beginning from the front side of the trailer. If it is essential to lay several layers, particular groups should be stacked alternately (in block system). The load must be laid tightly together and on the whole surface of the trailer floor. Otherwise, the load will move during travel. Due to the trailer design (the load box designed for the transport of agricultural crops and products, lack of load securing points), materials in packaging may not be loaded above the top of the walls or extensions of load box. If the trailer is equipped with net extensions, the height of the load layer may not be higher than 600 mm, i.e. it may not exceed the upper edge of the side walls. A higher load level may move during travel and cause significant damage to the net extensions and the load may spill.

Materials that may cause steel corrosion, chemical damage or otherwise adversely react with the trailer structure may only be transported if the load is properly prepared. Materials must be tightly packed (in plastic foil sacks, plastic containers etc.). During transport, packaging contents may not come into contact with load box. Therefore, ensure the appropriate

tightness of containers.

It is impossible to describe all methods of loading due to the diversity of materials, tools, means of fixing and securing a load. While working be guided by caution and own experience. The trailer user must carefully read the regulations concerning road transport and comply with them.

H.3.11.623.09.1.EN

4.10 TRANSPORT CARGO

When driving on public roads, respect the road traffic regulations, exercise caution and prudence. The most important guidelines for driving a tractor with a hitched trailer or trailers are presented below.

- Before moving off, make sure that there are no bystanders, especially children, near the trailer or the tractor. Ensure that the driver has sufficient visibility.
- Make sure that the trailer is correctly attached to the tractor and tractor hitch is properly secured.
- For a pneumatic system with a manual brake force regulator, set the appropriate operating mode of the regulator, depending on the trailer load - figure (4.9).
- The vertical load carried by the drawbar eye of the machine affects the steering of the tractor unit.
- The trailer must not be overloaded, loads must be uniformly distributed so that the maximum permissible axle loads are not exceeded. The trailer maximum carrying capacity must not be exceeded as this can damage the trailer and pose a risk to the operator or other road users.
- Do not exceed the design speed and



IMPORTANT

Prior to driving off with the trailer hitched, check the following:

- pins connecting the load box with the lower frame are secured against falling out,
- the tailgate and side walls are properly locked,
- The parking stand is raised (in driving position).

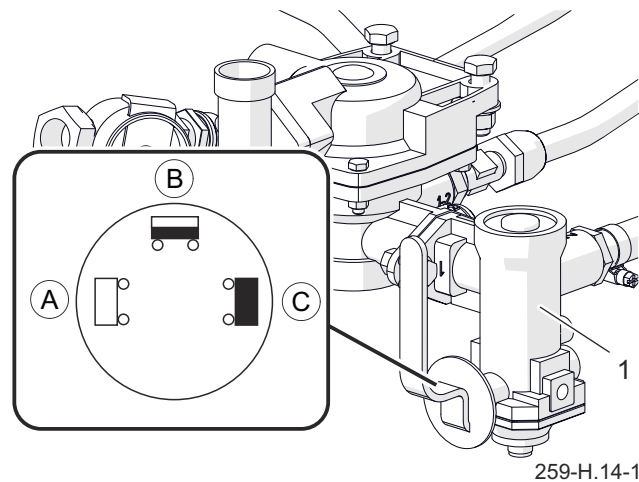


Figure 4.9 Brake force regulator

(1) regulator

(A) NO LOAD position

(B) HALF LOAD position

(C) FULL LOAD position

maximum speed allowed by road traffic regulations. The driving speed should be suitable for the current road conditions, the trailer load, type of load carried and other conditions relevant for driving performance of the trailer.

- When not connected to the tractor, the trailer must be immobilised using parking brake and with chocks

placed under the wheels. Do NOT leave unsecured trailer. In the event of machine malfunction, pull over on the hard shoulder avoiding any risk to other road users and position reflective warning triangle according to traffic regulations.

- When driving on public roads, the trailer must be marked with a slow-moving vehicle warning sign attached to the rear wall of load box, if the trailer is the last vehicle in the group.
- While driving on public roads the trailer must be fitted with a certified or authorised reflective warning triangle.
- When driving, comply with all road traffic regulations, indicate an intention to turn using indicator lamps, keep all road lights and indicator lights clean at all times and ensure they are in good condition. Any damaged or lost lamps or indicator lights must be immediately repaired or replaced.
- Avoid ruts, depressions, ditches or driving on roadside slopes. Driving across such obstacles could cause the trailer or the tractor to suddenly tilt. This is of special importance because loaded trailer centre of gravity is higher (especially a high volume load), which reduces safety. Driving near ditches or channels is dangerous as there is a risk of the wheels sliding down the slope or the slope collapsing.
- Speed must be sufficiently reduced before making a turn or driving on an uneven road or a slope.
- When driving, avoid sharp turns especially on slopes.
- While driving on public roads, the hydraulic tailgate must be closed and secured.
- Please note that the braking distance of the tractor and trailer combination is substantially increased at higher speeds and loads.
- Monitor trailer behaviour when travelling on an uneven terrain, and adjust driving speed to road conditions, slow down early enough when turning.
- Prolonged driving across steep ground may lead to loss of braking efficiency.
- The trailer is designed for towing on slopes of up to 8°. Driving the trailer on steeper slopes may cause the trailer to tip over as a result of loss of stability.

H.3.11.623.10.1.EN

4.11 UNLOADING

The trailer is equipped with a hydraulic tipping system which, depending on the direction of unloading the load box, may be available in three versions:

- left tipping
- right tipping
- left and right tipping.

Tipping of the load box is controlled from driver's cab using external tractor hydraulic system manifold.

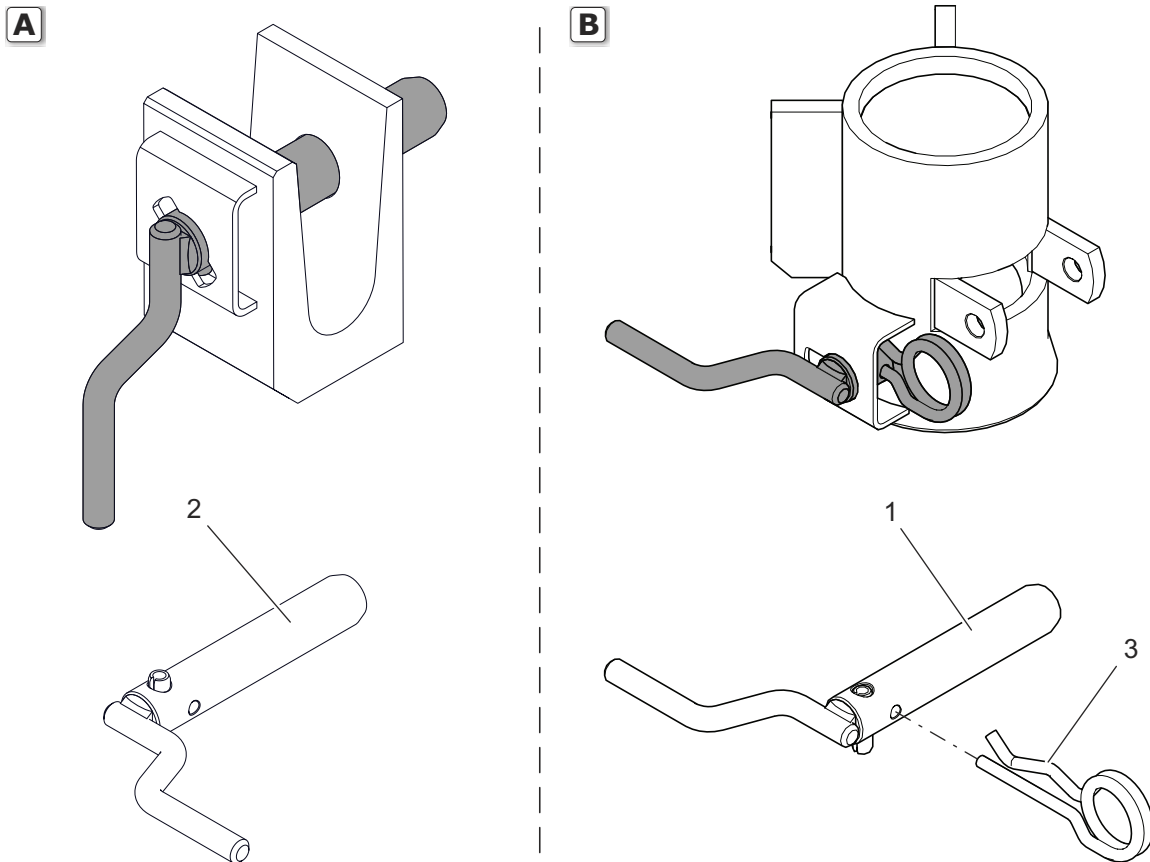
The trailer must be positioned to travel forward and be hitched to the tractor. Unloading should only take place when the



DANGER

Ensure that during unloading nobody is in the vicinity of the unloading zone.

trailer is placed on level and stable surface. During work, ensure good visibility and exercise due caution. Immobilise tractor and trailer with parking brake. Remove all load fastening devices immediately before unloading. Unloading the trailer should be carried out in accordance with the general principles of workplace health and safety.



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Figure 4.10 Bolting of tipping pins

(1) tipping pin I (rear left or front right), (2) tipping pin II (rear right or front left), (3) securing pin, (A) front socket, (B) rear socket

**IMPORTANT**

For rear tipping, pins in the rear sockets of the load box should be inserted and secured. For right side tipping, the pins in the load box right side sockets should be inserted and secured, while for left side tipping, the pins in the left side sockets should be inserted and secured.

The inserted and properly secured tipping pin is shown in the figure (4.10).

Unloading of the trailer is performed in the following sequence:

- tractor and trailer must be placed to drive forward on flat and hard ground,
- immobilise tractor with parking brake,
- Place the tipping pins (1), (2) (connecting the load box with the lower frame) on the side on which the unloading will take place. Rotate the bolts in the front seats with the handle down. Secure the bolts in the rear sockets with the cotter pin (3) - figure (4.10),

Tipping pins and individual sockets are designed so it is impossible to place them on the opposite diagonal side of the load box, which would damage the trailer,

- set the three-way valve lever (2) - figure (3.9) controlling the operation of the hydraulic tipping system circuits to the "1" position - tipping the first trailer,

**IMPORTANT**

Do NOT tip to the side any loads that are bulky or difficult to fall off. When unloading the trailer to the side, there is an increased risk of the following hazards: loss of trailer stability, trailer overturning, loss of strength of trailer elements.

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

- depending on the intended unloading direction, open the following: the lower walls, the trailer's tailgate, or the tailgate chute slide gate,
- by controlling the selective control valve lever in the operator's cabin, tilt the load box using a telescopic cylinder,
- after unloading, lower the load box and clean the floor edges,

**IMPORTANT**

For trailer wheels 700 mm wide and wider, do NOT move the trailer while tipping to the left or right side as the lower walls may rub against the tires.

- close the hydraulically driven walls by controlling the appropriate hydraulic circuit in the tractor,

Tailgate must be closed until the

tailgate forks are locked in the load box hooks.

- make sure that the hydraulic tailgate or side wall is properly locked before driving off.
- remove remains of load from the trailer.

During unloading through side walls, load box must be raised slowly and smoothly. Raising the load box quickly will exert large pressure on the upper part of the load box due to displacement of the carried material and could compromise trailer stability.



IMPORTANT

Unloading of trailer may only take place when the machine is positioned on level and hard surface and connected to tractor. Tractor and trailer must be placed to drive forward.

Only original tipping pins should be used. The use of third-party pins may damage the trailer. Tipping pins must be correctly interlocked.

The length of the cable controlling the valve limiting the tilt angle of the load box is set by the Manufacturer and the User must NOT adjust it.

Do NOT jerk the trailer forward if load is bulky or reluctant to pour and does not unload.

Ensure that during unloading nobody is near tipped load box or load material pouring out.

Do NOT tip load box in strong gusty winds conditions.

Do NOT move off or drive when load box is raised.

During work, keep a safe distance from overhead electric power lines.

H.3.11.623.11.1.EN

4.12 OPERATE CHUTE SLIDE GATE

As standard, the tailgate of the load box is equipped with a chute slide gate (1) - figure (4.11) and additionally it can be equipped with a chute (2) for unloading bulk materials.

Chute design allows very accurate dosing of the material to packaging (sacks, boxes etc.). The opening gap can be controlled using lever (3). To do this, loosen the bolt locking the slide gate (4), open the slide gate at the desired height and secure it again with the bolt.

During unloading through chute, load box must be raised slowly and smoothly. Raising the load box quickly will exert large pressure on the rear part of the load box due to displacement of the carried material

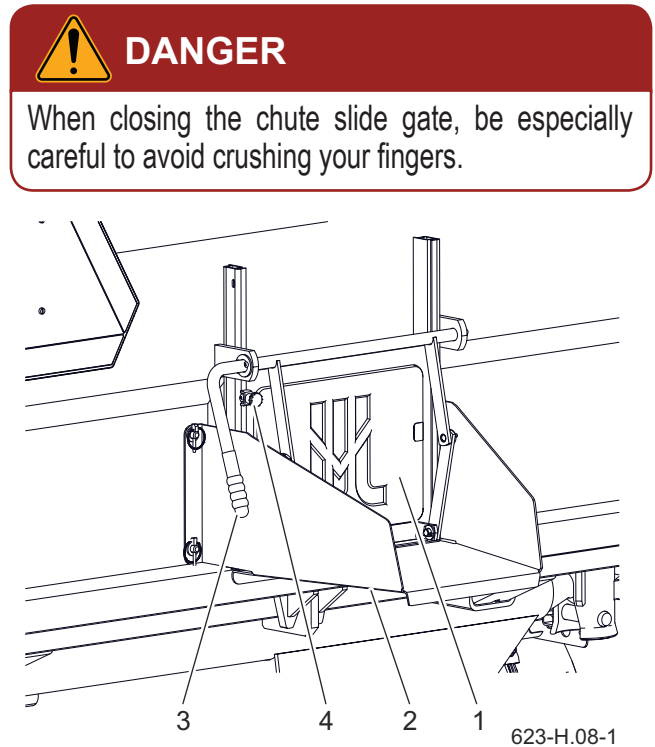
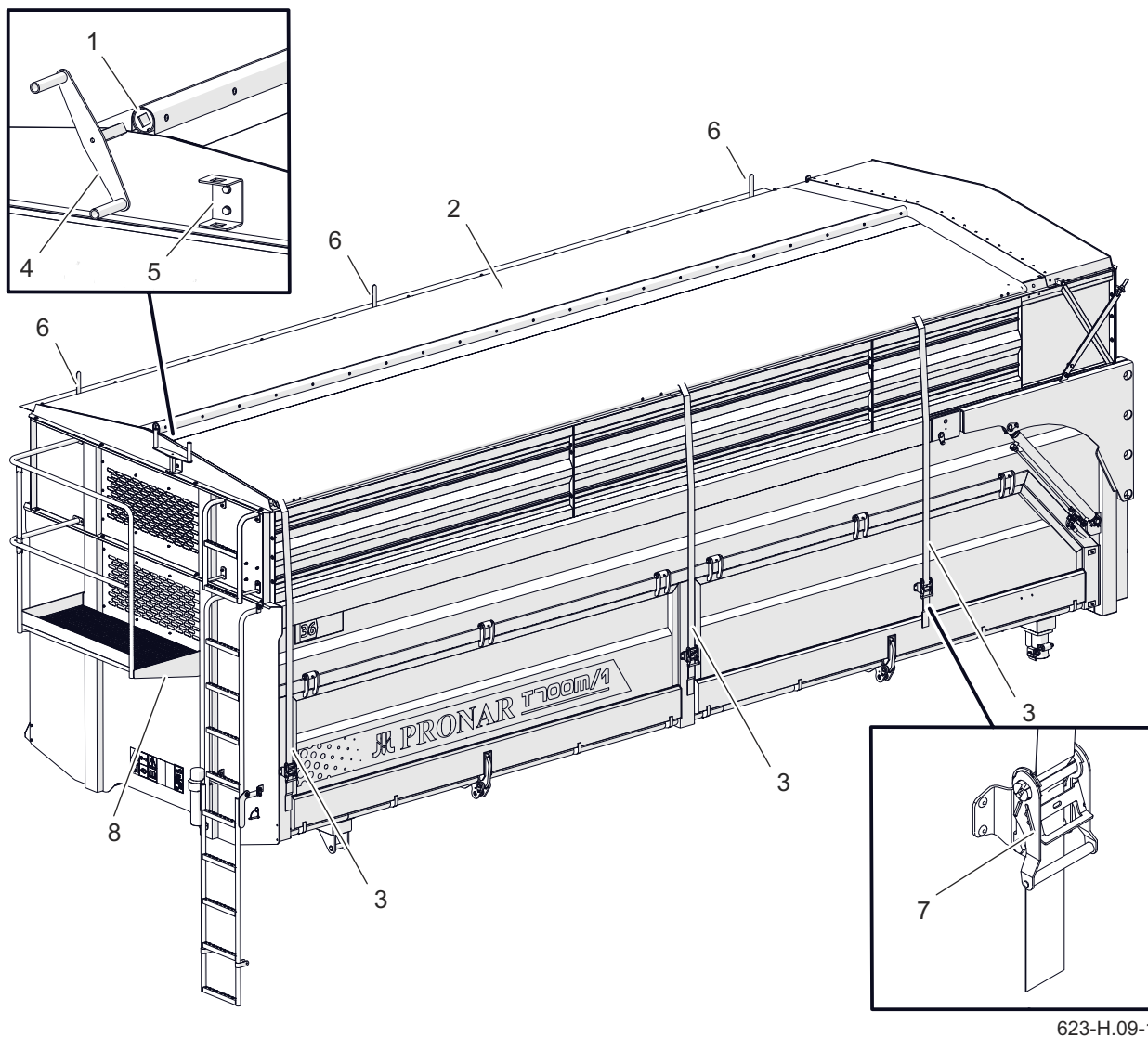


Figure 4.11 Operate the chute
(1) chute slide gate, (2) chute, (3) lever,
(4) locking bolt

and could compromise trailer stability.

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4.13 USE TARPAULIN COVER



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Figure 4.12 Use tarpaulin cover

(1) central tube, (2) tarpaulin, (3) tarpaulin belt, (4) crank, (5) crank handle, (6) tarpaulin limiter, (7) belt tensioner, (8) fenced platform

To protect the load from falling out and to protect it from adverse weather conditions, the trailer can be equipped with a tarpaulin cover and a securing frame.

UNROLL THE TARPAULIN COVER

- Enter the fenced platform (8) using the ladder on the front wall.
- Remove the crank (4) from the handle

(5) and insert it into the hole in the tube (1).

- Unroll the tarpaulin (2) by turning the crank (4).

Unroll the tarpaulin cover slowly to ensure its is evenly unfolded.

- Fasten the belts (3) and tighten the tarpaulin using the tensioners (7).

Water will collect on the

*incorrectly stretched tarpaulin.
As a consequence, the tarpaulin
may be deformed and fail to
serve its purpose.*

ROLL THE TARPAULIN COVER

- Loosen the belt tensioners (7) and unfasten the belts (3) securing the tarpaulin.
- Enter the fenced platform (8) using the ladder on the front wall.



IMPORTANT

Rolling up and unfolding the tarpaulin should be done while standing on the fenced platform. When driving with an unfolded tarpaulin, do NOT transport a load that protrudes beyond the outline of the walls.

- Roll up the tarpaulin by turning the crank (4) so that the tarpaulin rests on the limiters (6).
- After rolling the tarpaulin, put the crank in the holder (5).

H.3.11.623.10.1.EN

4.14 PROPER USE AND MAINTENANCE OF TYRES

- When working with tyres, the machine should be secured against rolling by placing chocks under the wheels. Wheels can be taken off the trailer axle only when the trailer is not loaded.
- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriate tools.
- Inspect tightness of wheel nuts after the first use of the trailer, every 2 - 3 hours during first month of work and then every 30 hours of use (travel). The inspection should be repeated individually if a wheel has been removed from the wheel axle. Wheel nuts should be tightened according to recommendations provided in the *Maintenance* section.
- Regularly check and maintain the correct pressure in tires in accordance with the instructions (especially if not used for an extended).
- Air pressure in tyres should be also checked during the whole day of intensive work. Please note that higher temperatures could raise tyre pressure by as much as 1 bar. With this increase in temperature and pressure, reduce load or speed.
- Do not release air from warm tyres to adjust the pressure or the tyres will be underinflated when temperatures return to normal.
- Protect tyre valves using suitable caps to avoid soiling.
- Do not exceed the trailer maximum design speed.
- When the trommel screen is operated all day, stop working for a minimum of one hour in the afternoon.
- Adhere to 30 minutes rest for cooling tyres after driving 75 km or after 150 minutes continuous travel depending on which occurs first.
- Avoid potholes, sudden manoeuvres or high speeds when turning.

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4.15 TRAILER CLEANING

Trailer should be cleaned depending on requirements and before longer idle periods (e.g. before winter period). Before using pressure washer the user is obliged to acquaint himself with the operating principles and recommendations concerning safe use of this equipment.

PROCEDURE

- Before washing the trailer, open the tailgate and the side wall. Thoroughly clean the load box from the remains of the load (sweep or blow it with compressed air), especially in the vicinity of the tailgate.
- To clean the trailer, use only clean running water or water with a cleaning detergent additive with neutral pH.
- The use of pressure washers increases the effectiveness of washing, but be careful when working. During washing, washer nozzle may not be closer than 50 cm from the surface being cleaned.
- The water temperature should not exceed 55°C.
- Do not direct water stream directly at system and equipment elements of trailer i.e. control valve, braking force regulator, brake cylinders, hydraulic cylinders, pneumatic, electric



DANGER

Carefully read the instructions for application of detergents and maintenance preparations. While washing with detergents wear appropriate protective clothing and goggles protecting against splashing.

and hydraulic plugs, lights, electrical connections, information and warning decals, identification plates, line connections, spring leaves and lubrication points etc. Great water jet pressure may cause mechanical damage to these elements.

- For cleaning and maintenance of plastic coated surfaces it is recommended to use clean water or special preparations designed for this purpose.
- Do not apply organic solvents, preparations of unknown origin or other substances, which may cause damage to lacquered, rubber or plastic surfaces. In the event of doubt it is recommended to make a test on an unseen surface area.
- Surfaces smeared with oil or grease should be cleaned by application of benzene or other degreasing agents and then washed with clean water with added detergent. Follow the cleaning

agent manufacturer instructions.

- Detergents should be kept in original containers, optionally in replacement containers, but very clearly marked. Preparations may not be stored in food and drink containers.
- Ensure flexibles lines and seals are clean. The plastic from which these elements are made may be susceptible to organic substances and some detergents. As a result of long-term reaction of some substances, the ageing process may be accelerated and risk of damage increased. Rubber elements should be maintained with the aid of special preparations after previous thorough washing.
- After completed washing wait until the trailer is dry and then grease all inspection points according to recommendations. Remove excess oil or grease with a dry cloth.
- Observe the environmental protection rules and wash the trailer in a place designated for this purpose.
- Washing and drying the trailer must take place at temperatures above 0°C.
- After washing and drying, trailer should be greased at all control points regardless of previous date of lubrication.

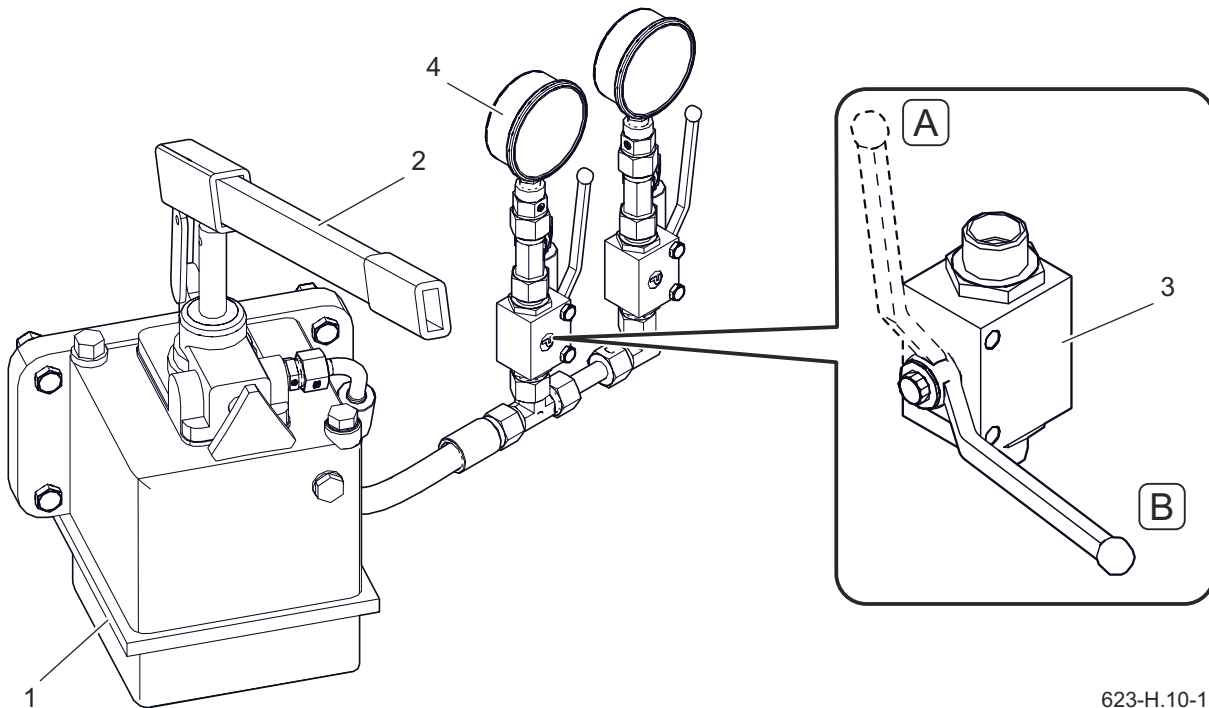
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4.16 STORAGE

- Trailer should be kept in a closed or roofed building.
- If the machine will not be used for a long time, it is essential to protect it from adverse weather, especially rust and accelerated tyre deterioration. During this time the machine must be unloaded. Trailer should be very carefully washed and dried.
- Corroded places should be cleaned of rust, degreased and protected using undercoat paint and then painted with surface paint according to colour scheme.
- In the event of a prolonged storage, it is essential to lubricate all components regardless of the date of the last lubrication.
- Wheel rims and tyres should be carefully washed and dried. During longer storage of unused trailer it is recommended that every 2 to 3 weeks the machine may be moved a bit so that the place of contact of tyres with ground is changed. The tyres will not be deformed and maintain proper geometry. Also, air pressure in tyres should be inspected from time to time and, if necessary, pressure should be increased to an appropriate value.
- Shield the tyres if they may be exposed to solar radiation.
- If trailer is equipped with tarpaulin cover, it should be carefully washed and dried. If it is possible, store the clean tarpaulin hanging, otherwise it should be carefully rolled up without causing any creases and folds in the material.
- Water or snow may collect on the tarpaulin, an excessive amount of which may damage the tarpaulin and its frame. Therefore, such precipitation build-up should be removed immediately.

H.3.3.259.14.2.EN

4.17 HYDRAULIC STEERING SYSTEM OPERATION



623-H.10-1

Figure 4.13 Hydraulic hand pump

(1) oil tank, (2) hand pump lever, (3) hydraulic valve, (4) pressure gauge, (A) open position, (B) closed position

In order to ensure proper operation of the hydraulic steering system and safe use of the trailer, suitable and certified tractor hitches according to ISO 26402 should be used.

During the first hitching of the trailer to the tractor, check correctness of operation of the wheel steering system. If system operation is found to be incorrect, follow these steps:

- Hitch trailer to tractor using drawbar eye and ball control hitch and then, secure the drawbar,
- open two valves (3) located near the

hand pump - figure (4.13),

- drive the tractor with the trailer attached at such a distance as to position the trailer wheels for forward driving,
- fill the system by means of the pump using hand lever (2) until each pressure gauge (4) indicates pressure of 80 bar,
- do not add oil when the above-mentioned pressure level is achieved,
- close all valves (3) and set the pump lever (2) aside,
- drive the tractor with the trailer

attached and check correctness of the system operation.

**IMPORTANT**

Do not drive if the steering system is incorrectly adjusted.

H.3.11.623.15.1.EN

SECTION 5

TECHNICAL INSPECTION
SCHEDULE

5.1 BASIC INFORMATION

This section describes all periodic inspection activities which must be carried out by the user according to the specified schedule. Regular inspections of technical condition and performance of maintenance procedures are essential for keeping the trailer in good technical condition. The maintenance activities which the user may perform by himself are described in section *Maintenance*.

Repairs during the warranty period may only be performed by the Authorised Points of Sale and Service (APSS). The warranty will be void if you attempt unauthorized



IMPORTANT

The trailer must not be used when not in working order.

The trailer may only be towed when the brake system, lighting system, drawbar and axle system are fully operational.

Repairs during the warranty period may only be performed by authorised service points.

repairs, modify factory settings or use the trailer not as intended (not described in this manual).

Warranty inspection of the trailer may be carried out only by an authorized warranty service point.

I.3.1.526.01.1.EN

5.2 PERIODIC INSPECTIONS OF THE TRAILER

Table 5.1 Inspection categories

Category	Description	Carried out by	Frequency
A	Daily inspection	Operator	Inspection conducted daily before the first start or every 10 hours of continuous operation in shift mode.
B	Maintenance inspection	Operator	Inspection carried out periodically every 1000 km or every month of trailer use, whichever occurs first. Daily inspection should be carried out each time before this inspection.
C	Maintenance inspection	Operator	Inspection carried out periodically every 3 months. Daily inspection and monthly inspection should be carried out each time before this inspection.
D	Maintenance inspection	Operator	Inspection made periodically every 6 months. Daily inspection, monthly inspection and 3-monthly inspection should be carried out each time before this inspection.
E	Maintenance inspection	Operator	Inspection made periodically every 12 months. Before each inspection, perform a daily inspection, inspection every 1 month of trailer use and inspection every 3 months and every 6 months.
F	Maintenance inspection	Service ⁽¹⁾	Inspection carried out every 4 years of the trailer use

(1) - post-warranty service

Table 5.2 Inspection schedule

Description of activities	A	B	C	D	E	F	Page
Check the air pressure in the tyres	•						5.7
Draining water from air tank	•						5.8
Inspection of connection plugs and sockets	•						5.9
Inspect shields	•						5.10
Inspection of trailer prior to moving off	•						5.11
Air pressure measurement, inspection of tyres and wheels		•					5.12
Cleaning the air filters			•				5.13
Checking brake shoe linings for wear				•			5.14
Checking wheel axle bearings for slackness				•			5.15
Inspection of mechanical brakes				•			5.17
Cleaning the drain valve				•			5.18
Inspection of parking brake cable tension					•		5.19
Inspect the hydraulic system					•		5.21
Inspection of pneumatic system					•		5.22
Suspension system maintenance	See section: <i>Suspension system maintenance</i>						5.23
Lubrication	See table: <i>Trailer lubrication schedule</i>						5.25
Inspection of nut and bolt connections	See section: <i>Inspect bolt connections</i>						5.32
Replace hydraulic lines						•	5.34

Table 5.3 Adjustment parameters and settings

Description	Value	Comments
Brake system		
Cylinder rod stroke in pneumatic systems	25 - 45 mm	
Cylinder rod stroke in hydraulic systems	25 - 45 mm	
Minimum thickness of brake linings	5 mm	
Angle between expander axle and fork	90°	With depressed brake pedal
Parking brake		
Maximum slackness of parking brake cable	20 mm	

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5.3 PREPARING THE TRAILER



DANGER

Ensure that unauthorised persons do not have access to the tractor cab.

Before using the lifting jack, read the Operator Manual of the jack and follow the manufacturer's recommendations. The lifting jack must be stably supported on the ground and trailer components.

Before performing maintenance work and repairs on raised trailer, make certain that the trailer is properly secured and will not move during work.

PROCEDURE

- Hitch trailer to tractor.
- Position the tractor and trailer to drive forward, on a hard and level surface.
- Engage the tractor parking brake.
- Turn off tractor engine and remove key from ignition. Close the tractor cab to ensure that unauthorised persons do not have access to the tractor cab.
- Place securing chocks under one trailer wheel. Ensure that the trailer will not move during inspection.
- If it is necessary to raise a trailer

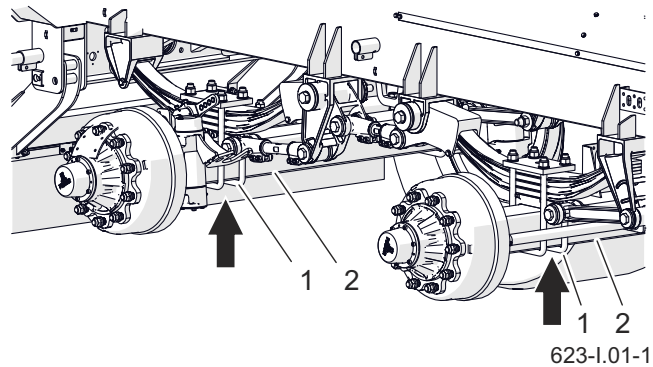


Figure 5.1 Recommended trailer support points

(1) U bolts of suspension system, (2) axle

wheel during inspection, place chocks under the rigid axle wheel on the opposite side. Lifting jack should be positioned in the places indicated by the arrow. Lifting jack must be supported on hard and stable ground.

- Lifting jack must be suitable for the weight of trailer.
- In exceptional cases, release the trailer parking brake, for example when measuring half axle bearing slackness. Be especially careful then.

I.3.2.589.03.1.EN

5.4 CHECK THE AIR PRESSURE IN THE TYRES

- Visually inspect if the tyres are properly inflated.
- If you think that air pressure in tyres is too low, check air pressure using a manometer. If necessary, inflate the tyre up to the recommended pressure.



IMPORTANT

Wrong air pressure in the trailer tyres may lead to permanent damage of tyres resulting from tyre material delamination.

Wrong air pressure in tyres also accelerates the wear of tyres.

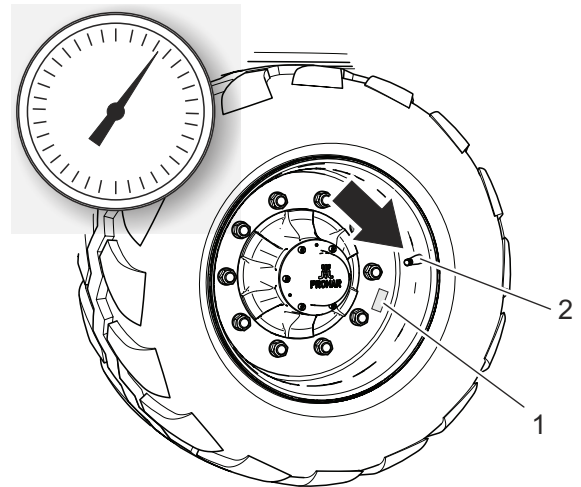


Figure 5.2 Trailer wheel
(1) information decal (2) valve

TIP

The tire air pressure value can be found on the information decal located on the wheel rim - figure (5.2).

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5.5 DRAINING WATER FROM AIR TANK

PROCEDURE

- Press drain valve stem (1) located in the lower part of tank (2).

The compressed air in the tank causes the removal of water to the exterior.

- Released valve stem should automatically close and stop flow of air from the tank.
- If the valve stem does not return to its position, wait until the tank is empty. Then, screw out and clean or replace

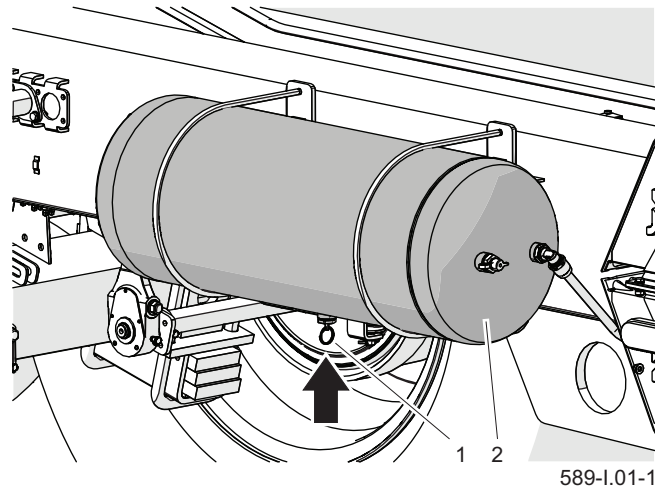


Figure 5.3 Air tank
(1) drain valve (2) air tank
the valve.

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5.6 INSPECTION OF CONNECTION PLUGS AND SOCKETS

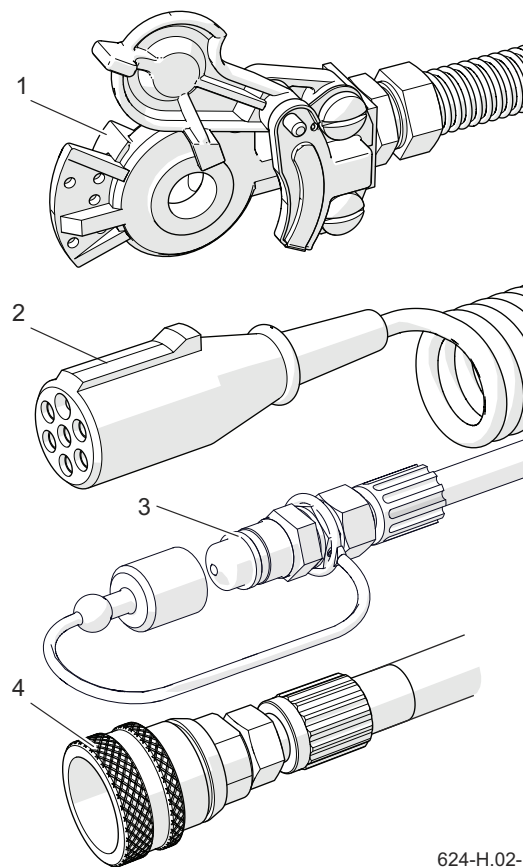


DANGER

Unreliable and dirty trailer connections may cause unreliability and malfunction of braking system.

Damaged connection body or socket for connecting the second trailer should be replaced. In the event of damage to cover or seal, change these elements for new reliable elements. Contact of pneumatic connection seals with oils, grease, petrol etc. may cause damage and accelerate ageing process.

If the trailer is unhitched from the tractor, connections should be protected by covers or placed in their designated sockets. Before the winter, it is recommended to preserve the seal with special preparations (e.g. silicon grease for rubber elements). Each time before hitching the machine, inspect technical condition and cleanness of



624-H.02-1

Figure 5.4 Trailer connections
 (1) air brake plug (2) 7-pin electrical plug (3) hydraulic plug
 (4) hydraulic brake socket

connectors and sockets in tractor. If necessary, clean or repair tractor sockets.

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5.7 INSPECT SHIELDS

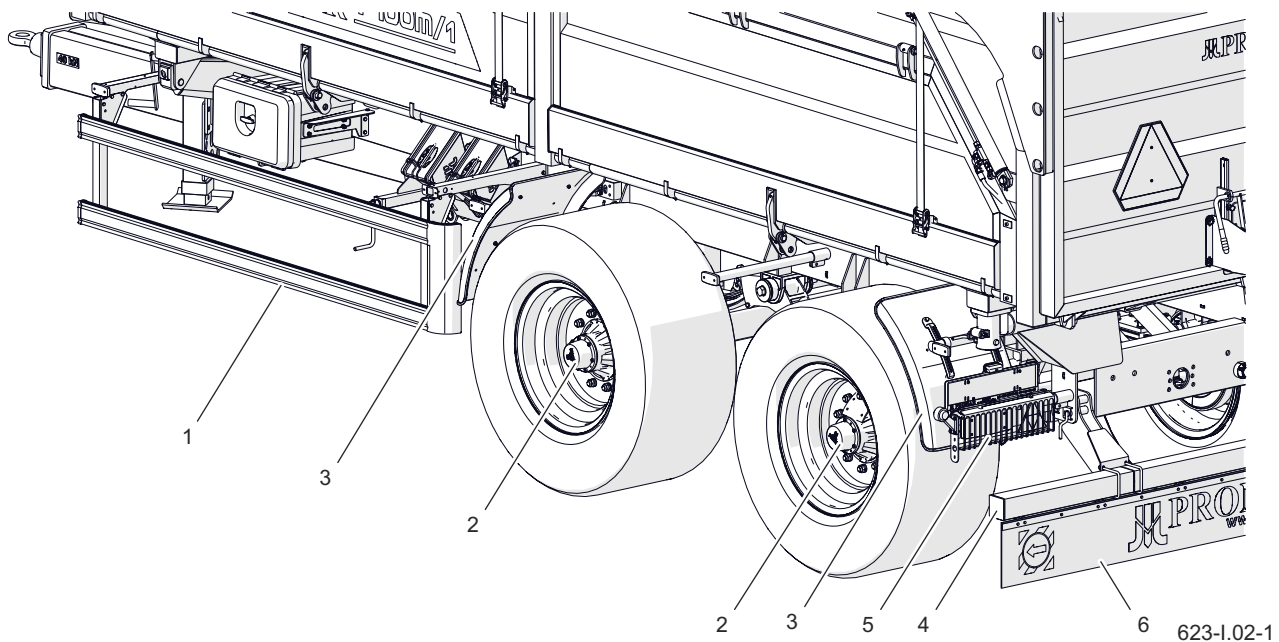


Figure 5.5 Trailer shields

(1) side cover, (2) axle covers, (3) plastic mudguard, (4) rear beam, (5) rear light brush guard, (6) rear mud wall

Shields protect the trailer user's health and life and the machine subassemblies against damage. Therefore, their technical condition must be checked before using the trailer. Any damaged or lost components must be repaired or replaced.

PROCEDURE

- Check completeness of protective shields.
- Check if the shields are properly mounted, check the condition of



DANGER

Do NOT use the trailer with damaged or incomplete shields.

mudguards and mud wall.

- Check if the side under-run protection device and the rear beam are operational.
- Check the integrity of caps
- If necessary, tighten the bolt connections fixing the shields.

I.3.11.623.08.1.EN

5.8 INSPECTION OF TRAILER PRIOR TO MOVING OFF



DANGER

Do NOT use the trailer with out of order lighting system or brake system.
Do not use out of order trailer until it is repaired.

- Before hitching the trailer to tractor, make certain that electrical leads and hydraulic and pneumatic lines are not damaged.
- Check the integrity, technical condition and proper operation of the trailer lighting.
- Check if all lights and reflectors are clean.
- Check correct mounting of the slow-moving vehicle warning sign holder and the sign itself.
- Make certain that the tractor is equipped with a warning reflective triangle.
- Check if the brake cylinder vent holes are not blocked with impurities and that there is no water or ice inside the brake cylinder. Check if the brake cylinder is correctly installed.

Clean the cylinder, if needed.

In winter, it may be necessary

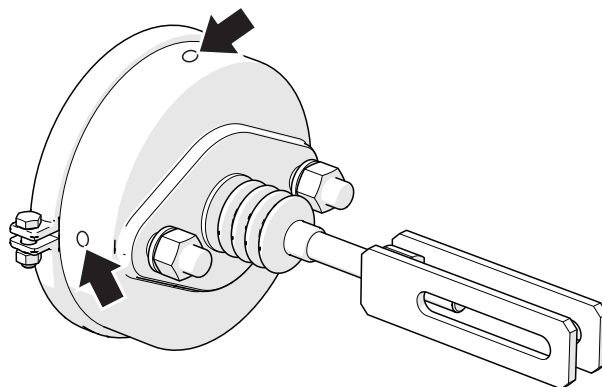


Figure 5.6 Brake cylinder

to defrost the cylinder and drain water through unblocked vent holes. Damaged cylinder should be replaced with a new one. When installing the brake cylinder, maintain its original position with regard to bracket.

- When moving off check if the main brake system operates correctly. Please note that the proper air pressure level in the trailer air tank is required to ensure proper operation of the pneumatic system.
- Correct operation of other systems should be checked regularly during operation of the trailer.

I.3.2.589.08.1.EN

5.9 AIR PRESSURE MEASUREMENT, INSPECTION OF TYRES AND WHEELS

During pressure measurement the trailer must be unloaded. Check tyres before you drive off when tyres are not warm, or after the machine has been parked for an extended period.

PROCEDURE

- Connect a manometer to tyre valve and check air pressure. If necessary, inflate the tyre up to the recom-

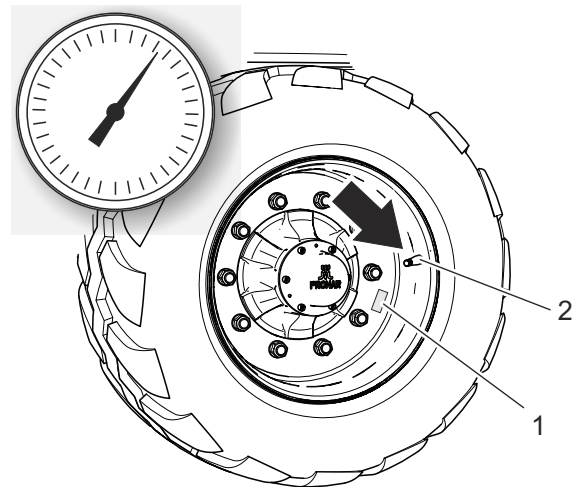
TIP

The tire air pressure value can be found on the information decal located on the wheel rim - figure (5.7).

mended pressure.

- Check technical condition of tyres (tyre tread depth, tyre side wall).
- Check tyre for mechanical defects such as loss, cut, deformation or bulging. In case of mechanical damage consult the nearest tyre service and check whether the tyre defect requires tyre replacement.
- Check that tyre is correctly installed on rim.
- Check tyre age.

While checking pressure, pay attention



624-I.02-1

Figure 5.7 Trailer wheel
(1) information decal (2) valve

to technical condition of wheels. Wheels should be inspected with regard to distortion, breaking of material, breaking of welds, corrosion, especially in the area of welds and contact with tyre.

TIP

If the trailer is used intensively, air pressure in tyres should be checked more frequently.



IMPORTANT

Wrong air pressure in the trailer tyres may lead to permanent damage of tyres resulting from tyre material delamination.
Wrong air pressure in tyres also accelerates the wear of tyres.

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5.10 CLEANING THE AIR FILTERS

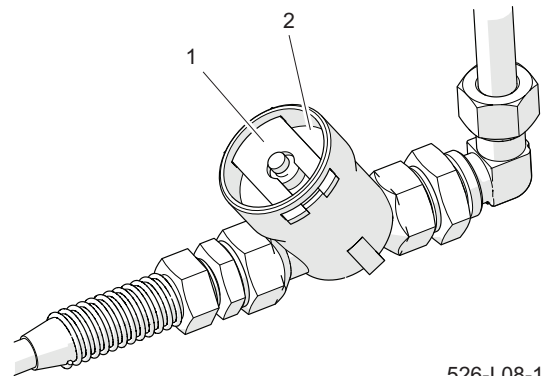
Air filter elements are installed on the connection lines of the pneumatic system. Filter elements are reusable and are not subject to change unless they are mechanically damaged.

PROCEDURE

- Reduce pressure in supply line.

Pressure in line can be reduced by pressing the head of the pneumatic connection until resistance is felt.

- Slide out the filter slide gate (1).
- Hold the filter cover (2).
- Hold the filter cover (2) with the other hand. After removing slide lock, the cover is pushed out by the spring



526-I.08-1

Figure 5.8 Air filter
(1) filter slide gate (2) cover

located in the filter housing.

- The filter element and the filter body should be carefully cleaned and blown through with compressed air. Assembly should be done in reverse order.

I.3.2.589.09.1.EN

5.11 CHECKING BRAKE SHOE LININGS FOR WEAR

During use of trailer, friction lining of brake drums is subject to wear. In such a case, the complete brake shoes should be replaced with new ones. Excessive wear of brake shoes is the condition in which the thickness of linings which are glued or riveted to steel structures of brake shoes is smaller than the minimum value.

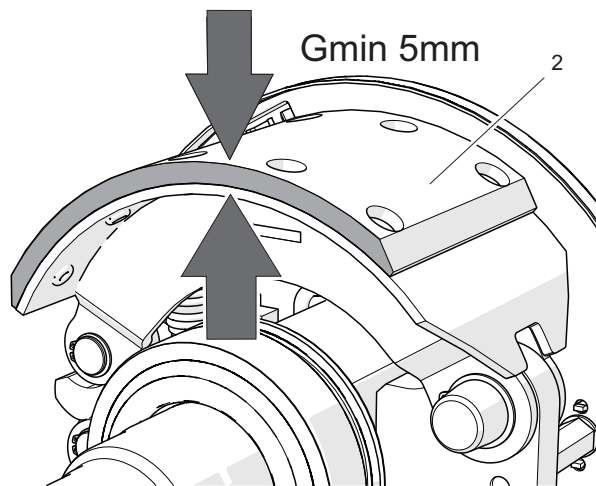
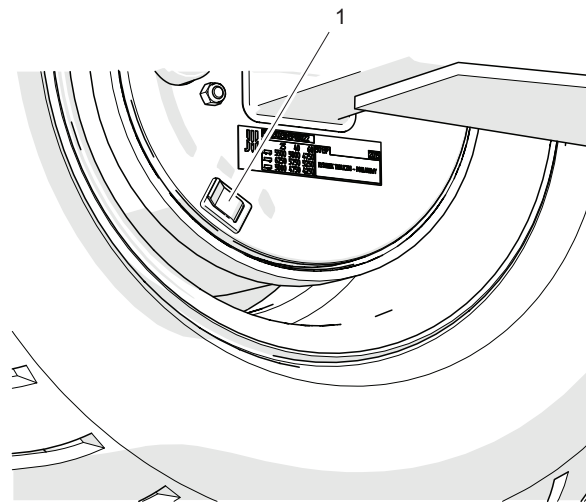
TIP

Check brake shoe linings for wear:

- according to the inspection schedule,
- if brakes overheat,
- if brake cylinder piston stroke is significantly longer,
- if there are unusual sounds originating from the wheel axle drum area.

PROCEDURE

- Find the inspection opening (depending on the axle version, the inspection opening may be located elsewhere than in the place indicated in the figure; however, it is always located on the brake shield disc).
- Remove the upper plug and lower plug and check the brake shoe lining thickness.



526-I.09-1

Figure 5.9 Checking thickness of brake shoe linings

(1) a plug, (2) a brake lining

- Brake shoes should be replaced when the lining thickness is less than 5 mm.
- Check the other linings for wear.

I.3.2.589.10.1.EN

5.12 CHECKING WHEEL AXLE BEARINGS FOR SLACKNESS



DANGER

Before commencing work, the user must read the instructions for lifting jack and adhere to the manufacturer's instructions.

The lifting jack must be stably supported on the ground and absorber plate.

Make sure that the machine does not roll when checking the wheel axle bearings slackness.

Inspect the bearing slackness only when the trailer is hitched to tractor and the load box is empty and not raised.

PROCEDURE

- Hitch trailer to tractor, immobilize tractor with parking brake.
- Position the tractor and trailer to drive forward, on a hard and level surface.
- Place the wheel chocks under the wheel opposite to the lifted wheel. Ensure that trailer is immobilised during inspection.
- Raise the wheel (opposite to the side where chocks are placed). The lifting jack should be placed under the absorber plate fixing the axle to the leaf spring, figure (5.1). Lifting jack must be suitable for the weight of trailer.
- Turn the wheel slowly in both directions. Check that movement is smooth and that the wheel rotates without excessive resistance and jamming figure (5.10).
- Turn the wheel so that it rotates very



526-I.10-1

Figure 5.10 Check slackness

- quickly, check that the bearing does not make any unusual sounds.
- Moving the wheel try to detect slackness.
- Repeat the procedure for each wheel individually, remembering that the jack must be on the side opposite to the chocks.
- If slackness is felt, adjust bearings figure (6.3). Unusual noise made by the bearing may be a symptom of excessive wear, dirt or damage. In such an event the bearing, together with sealing ring, should be replaced with new parts, or cleaned and greased again. During inspection of bearings, ensure that possibly detected slackness comes from the bearing and not from the suspension system

(e.g. slackness of leaf spring pins).

- Check technical condition of hub cover, if necessary replace it with a new one.

TIP

If hub cover is damaged or missing, contamination and dampness enter the hub, which causes significantly faster wear of bearings and hub seals. The bearing service life depends on the operating conditions, load, vehicle speed and lubrication conditions.

I.3.2.589.11.1.EN

5.13 INSPECTION OF MECHANICAL BRAKES

TIP

- Check technical condition of brakes:
- according to the inspection schedule,
 - before the period of intensive use,
 - after repair of braking system,
 - in case of uneven trailer wheels braking.

In a properly adjusted brake, the piston rod stroke should be within the range given in table (5.3) and depends on the type of cylinder used. When the wheel is fully braked, the optimal angle between the expander lever and the piston rod should be approx. 90°C. This setting ensures the best possible braking force. The inspection of brakes consists in measuring this angle and the brake cylinder rod stroke for each wheel.

PROCEDURE

- Measure the X distance when the tractor brake pedal is released.
- Measure the Y distance when the tractor brake pedal is depressed.
- Calculate the difference between the

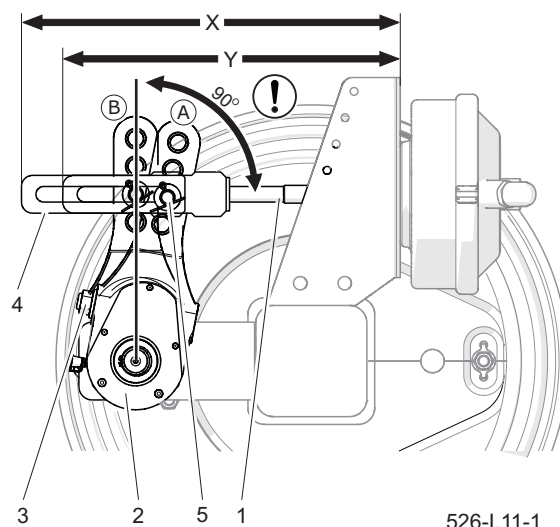


Figure 5.11 Inspection of brake
 (1) cylinder piston rod (2) expander arm
 (3) adjusting bolt (4) cylinder fork
 (5) pin position
 (A) position of arm at brake release position
 (B) position of arm at braking position

- distances (X-Y) (cylinder rod stroke).
- Check the angle between the cylinder rod axis and the expander lever.
- If the expander arm angle (2) and the cylinder rod stroke are outside the range specified in Table 5.3, adjust the brake.

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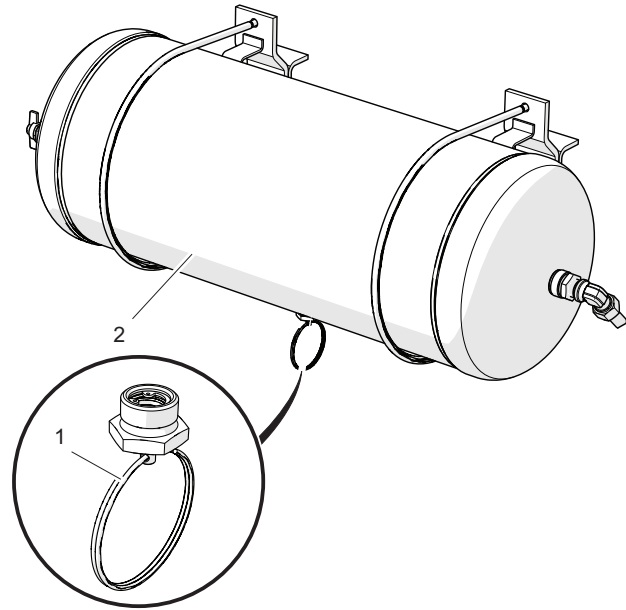
5.14 CLEANING THE DRAIN VALVE

PROCEDURE

- Completely reduce pressure in air tank (2).

Reduction of pressure in tank is achieved by tilting the drain valve stem.

- Unscrew valve (1).
- Clean the valve, blow it with compressed air.
- Replace the seal.
- Screw in valve, fill tank with air and check tank tightness.

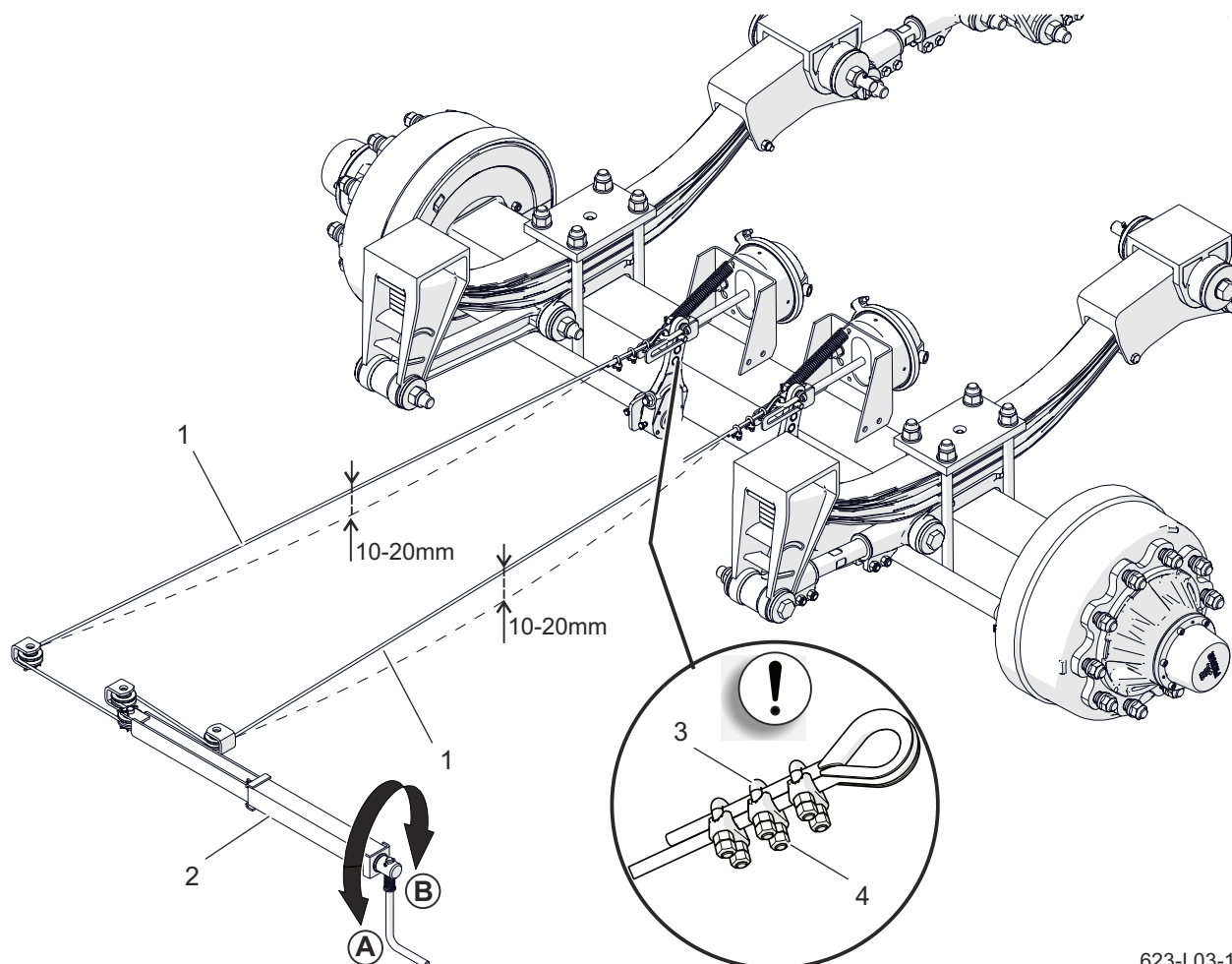


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Figure 5.12 Air tank
(1) drain valve (2) tank

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5.15 INSPECTION OF PARKING BRAKE CABLE TENSION



623-I.03-1

Figure 5.13 Inspection of cable tension
 (1) cable, (2) brake mechanism, (3) U-shaped clamp, (4) clamp nut

INSPECTION OF TENSION

Parking brake should be checked after checking the mechanical brake of the axle.

- Hitch trailer to tractor. Park trailer and tractor on level surface.
- Place securing chocks under one trailer wheel.
- Turn the brake mechanism crank (2) in direction (B) to engage the parking brake - figure (5.13).

- Check tension of the cable (1).
- When the brake mechanism bolt is maximally unscrewed, the cable should be loose and hanging by approximately 10 to 20 mm.

ADJUST CABLE TENSION

- Unscrew the brake mechanism bolt maximally (2) by turning the crank in direction (A).
- Loosen nuts (4) of U-bolt clamps (3) on handbrake cable (1).

- Tighten cable (1) and tighten nuts (4) of the clamps
- Engage the parking brake and release it. Check (approximate) cable slackness. When the working brake and parking brake are fully released, the cable should be loose and hanging by approximately 10-20 mm. The axle expander levers should be

**DANGER**

The trailer must not be used with a faulty parking brake system.

Do not use an unreliable trailer until it is repaired.

in their rest position.

Should it be necessary to replace the brake cable, follow the instructions in section (6.2) *Replace the parking brake cable*.

I.3.2.589.14.1.EN

5.16 INSPECT THE HYDRAULIC SYSTEM



DANGER

Do NOT use a trailer with faulty hydraulic system.

CHECK HYDRAULIC SYSTEM TIGHTNESS

- Hitch trailer to tractor. Connect all hydraulic system lines according to maintenance instructions.
- Clean line connections, hydraulic cylinders and connectors.
- Start all hydraulic systems in turn by extending and withdrawing the cylinder piston rods. Repeat the above steps 3 or 4 times.
- Leave the hydraulic cylinders in the maximally extended position. Check all hydraulic circuits for tightness.
- After completed inspection, fold all cylinders to their rest position.

If oil is found on hydraulic cylinder body, check origin of leak. Inspect seals when hydraulic cylinder is completely extended. Minimum leaks are permissible with symptoms of "sweating", however in the event of noticing leaks in the form of

"droplets" stop using the trailer until faults are remedied. If unreliability is evident in brake cylinders, do NOT use trailer with damaged system until faults are remedied. If leaks appear at line connections then tighten the connections using the specified torque and recheck the connections. If the problem still exists, replace the leaky component. Rubber hydraulic lines must be replaced every 4 years regardless of their technical condition. This should be done in specialised workshops.

INSPECT THE TECHNICAL CONDITION OF HYDRAULIC CONNECTORS

Hydraulic connections for connecting the trailer to tractor must be technically reliable and kept clean. Each time before connecting, check if sockets in tractor are maintained in good working condition. Tractor and trailer hydraulic systems are sensitive to the presence of permanent contamination, which may cause damage to precision system components (jamming of hydraulic valves, scratching of cylinder surfaces etc.)

I.3.2.589.15.1.EN

5.17 INSPECTION OF PNEUMATIC SYSTEM

PROCEDURE

- Hitch trailer to tractor.
- Immobilise tractor and trailer with parking brake. Place chocks under trailer rear wheel.
- Start tractor in order to supplement air in trailer brake system tank.

In 2-line systems, the air pressure should be about 6.5 bar.

- Turn off tractor engine.
- Check system components by releasing brake pedal in tractor.

Pay special attention to line connections and brake cylinders.

- Repeat the system check with depressed tractor brake pedal.

The help of a second person is required.

In the event of the appearance of leaks, compressed air will escape at the places of damage, with a characteristic hiss. Lack of system tightness may be detected by



DANGER

Do NOT use the trailer when the brake system is out of order.
Repair, exchange or regeneration of pneumatic system components may only be performed in a specialised workshop.

covering elements to be checked with washing fluid or other foaming preparations, which will not react aggressively with the system components. Damaged components should be replaced or repaired. If leaks appear at connections then tighten the connections. If air continues to escape, replace connection components or seals with new ones.

During tightness inspection attention should additionally be given to technical condition and degree of cleanness of the system components. Contact of pneumatic lines, seals etc. with oil, grease, petrol etc. may cause damage and accelerate the ageing process. Bent, permanently deformed, cut or worn lines should be replaced.

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5.18 SUSPENSION SYSTEM MAINTENANCE

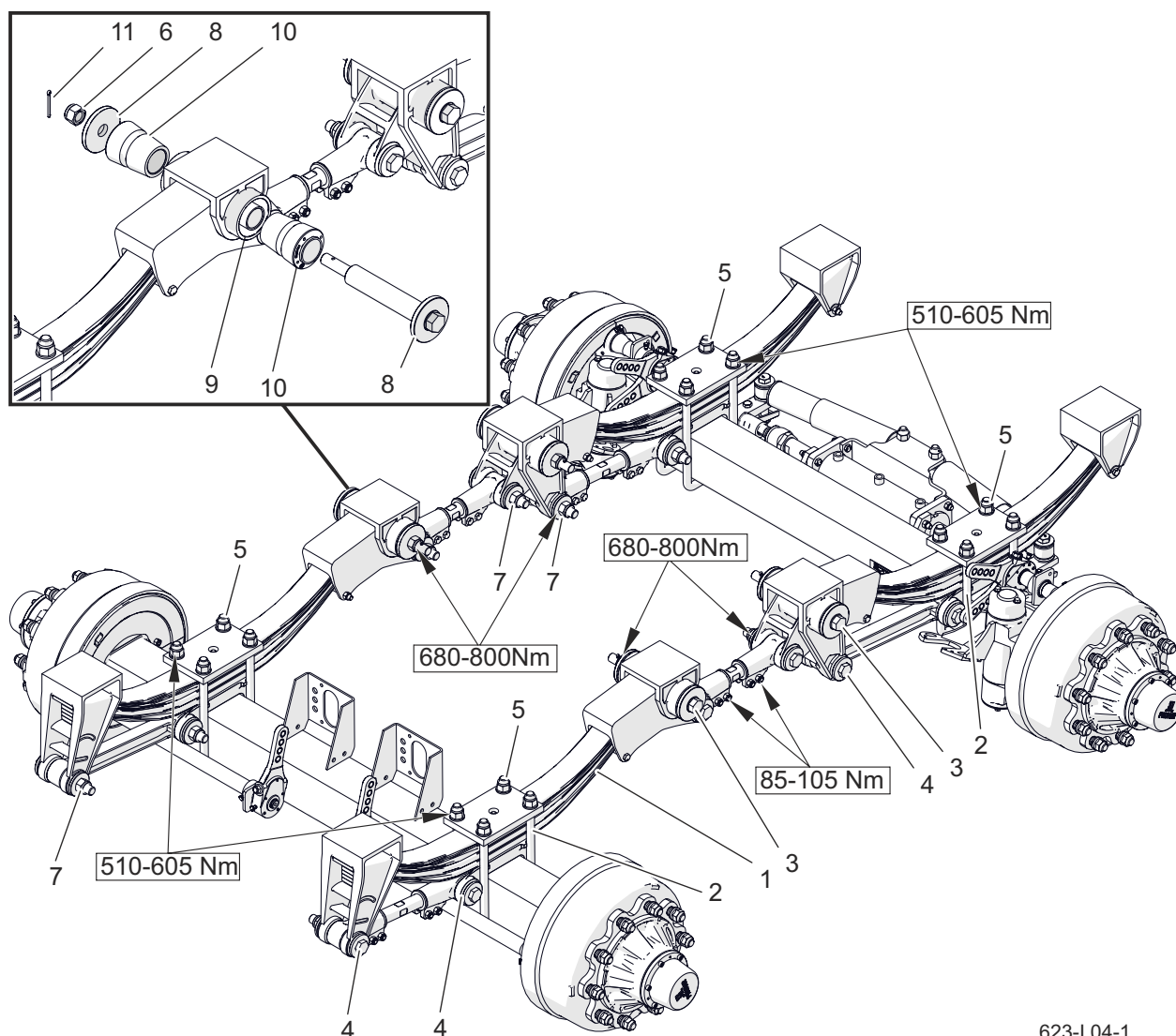
INSPECTION OF TIGHTENING OF U BOLT NUTS OF WHEEL AXLES

Check the tightening of the nuts (5) of U bolts (2) of the wheel axles using a torque wrench with the torque 510-605 Nm. The inspection should be carried out cyclically: the first inspection after traveling 50 km with a load or after

500 working hours, the next inspection after 5000 km or after 1500 working hours, then once a year. The nuts should be tightened diagonally.

CHECK THE TIGHTNESS OF THE BOLT NUTS

Check the tightness of the nuts (6) of the rocker arm bolts (3) and nuts (7) of



623-I.04-1

Figure 5.14 Mechanical suspension system maintenance

(1) spring, (2) U-bolt, (3) rocker arm pin, (4) connector pin, (5) U bolt nut, (6) rocker arm pin nut, (7) connector pin nut (8) clamping washer, (9) bracket, (10) rubber bushing, (11) securing cotter pin

the connector pin using a torque wrench with a set torque of 680-800 Nm. The inspection should be carried out cyclically: the first inspection after traveling 50 km with a load or after 500 working hours, the next inspection after 5000 km or after 1500 working hours, then once a year.

INSPECT RUBBER BUSHINGS

Check the wear of the rubber bushings (10) of the rocker arms, as well as the rigid and adjustable control rods.

The inspection should be carried out cyclically: the first inspection after traveling 50 km with a load or after 500 working hours, the next inspection after 5000 km or after 1500 working hours, then once a year.

The washers (8) should not be in contact with the bracket (9). If they are touching, replace the conical rubber bushings (10). Before installation, grease the rubber bushings.

INSPECT THE LOCKING OF THE NUTS

The inspection consists of a visual check of the completeness and condition of the cotter pins (11) securing the rocker arm pin nuts..

Perform the inspection once a year.

INSPECT THE ABSORBER SPRINGS

Once a year, check the condition of the springs (1) thoroughly clean and brush the sides of the springs to check for cracks.

I.3.11.623.18.1.EN

5.19 LUBRICATION



IMPORTANT

During trailer operation, the user is obliged to observe lubrication instructions according to attached lubrication schedule.

After the first month of trailer use grease all lubrication points.

After completed washing wait until the trailer is dry and then grease all inspection points according to recommendations. Remove excess oil or grease with a dry cloth.

Trailer lubrication should be performed with the aid of a manually or foot operated grease gun, filled with recommended grease. Before commencing work insofar as is possible remove old grease and other contamination. After completed lubrication, wipe off excess grease.

Parts to be lubricated with machine oil should be wiped with dry clean cloth. Apply oil to their surfaces using a brush or oil can. Wipe off excess oil.

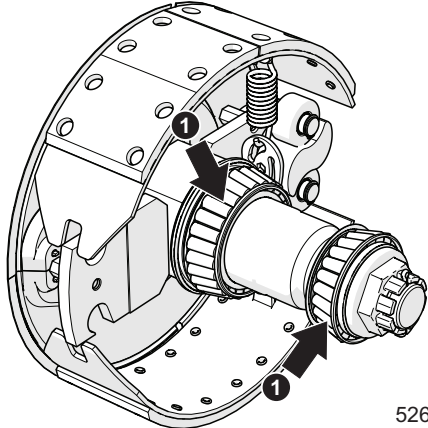
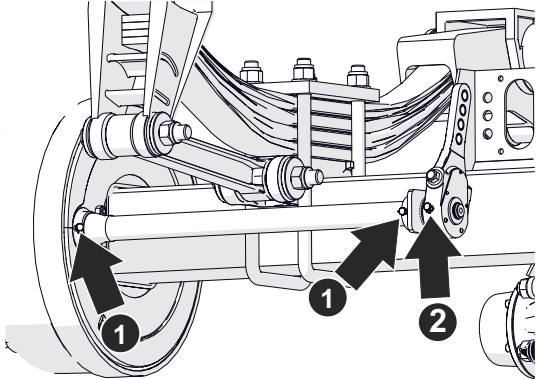
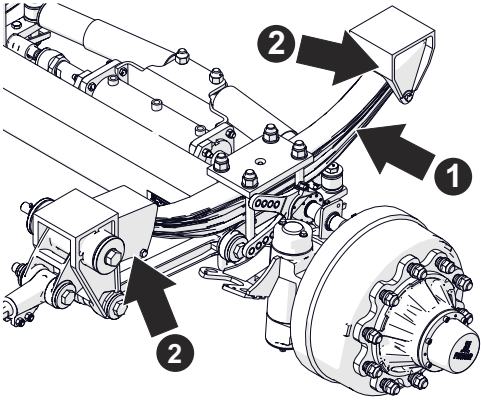
Change of grease in hub bearings should be made at specialised service points, equipped with the appropriate tools. In order to conduct this lubrication, the complete hub should be disassembled as well as bearings and individual sealing rings should be removed. After careful washing and inspection, mount lubricated elements. If necessary, bearing and seals

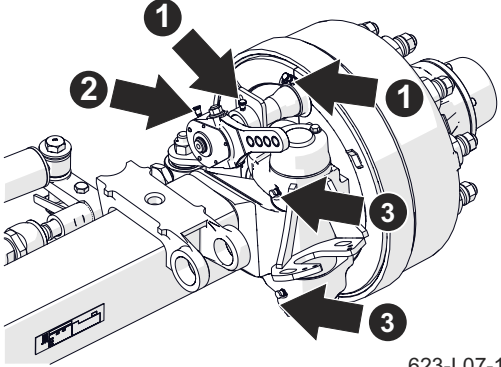
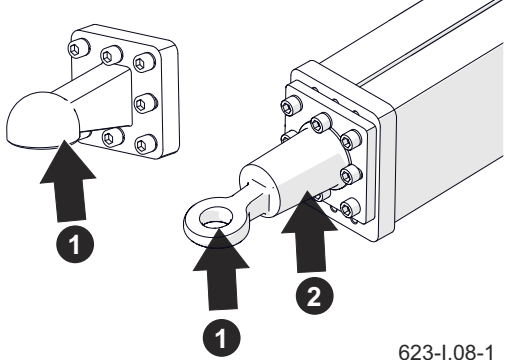
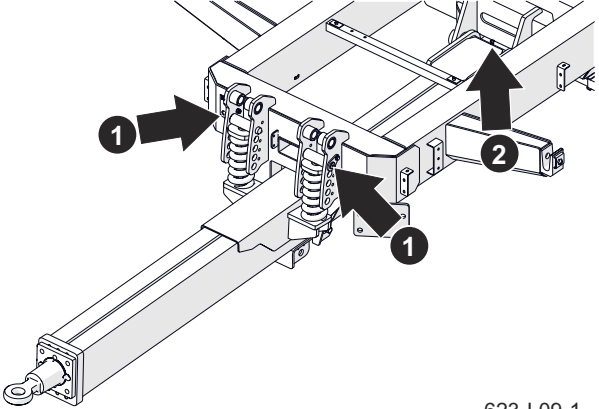
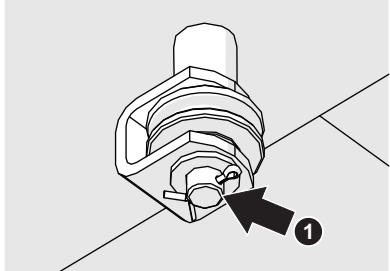
should be replaced with new ones.

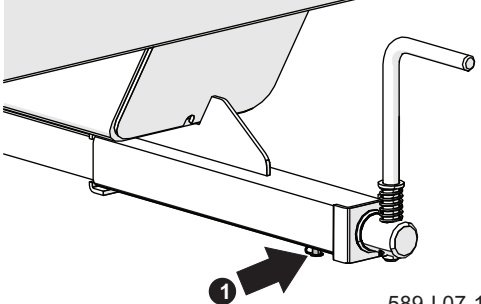
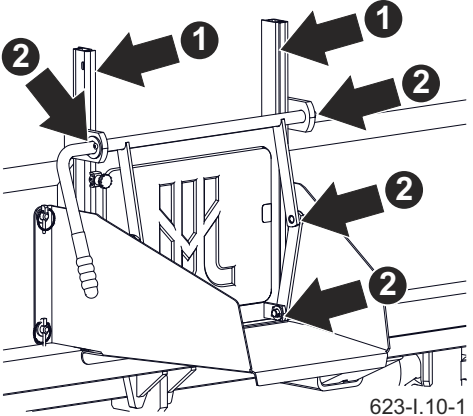
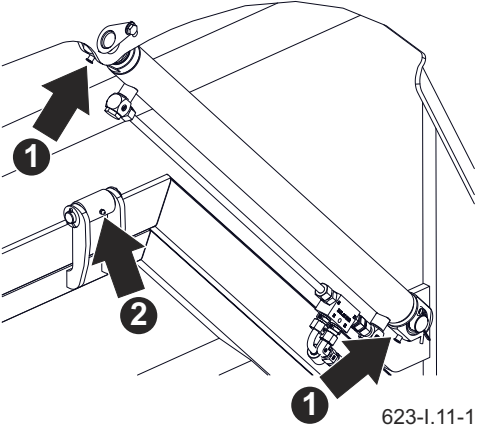
Before beginning to grease leaf springs remove contamination, wash with water and leave to dry. Do not use pressure washers, which may cause moisture penetration between individual leaf spring plates. Absorber plates should be lubricated using an agent having both anticorrosion and lubricating properties, it is recommended to apply on outer leaf spring surfaces very thin layer of lithium or lime alkali grease. For this purpose, silicone spray (for lubricating guides, locks, etc.) can be used. Sliding surface of leaf spring and leaf spring pin should be lubricated according to recommendations presented in Table 5.4.

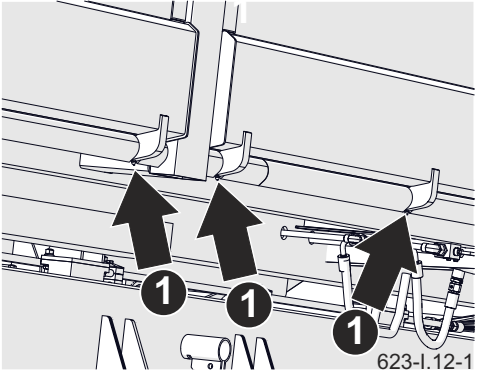
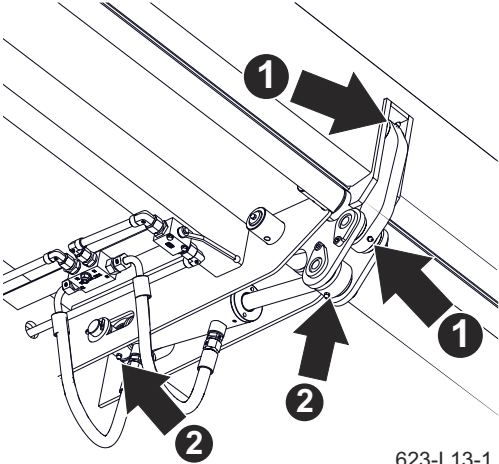
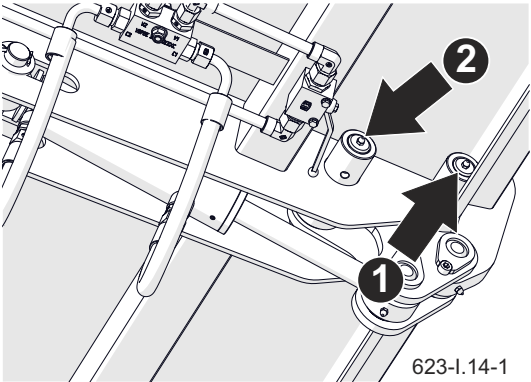
Empty grease or oil containers should be disposed of according to the recommendations of the lubricant Manufacturer.

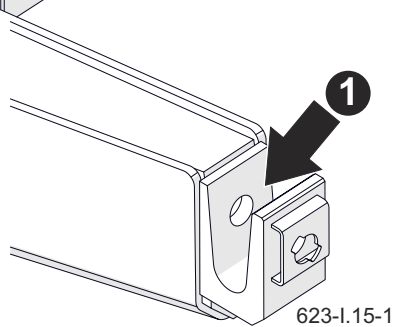
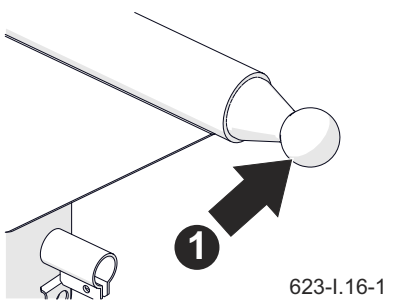
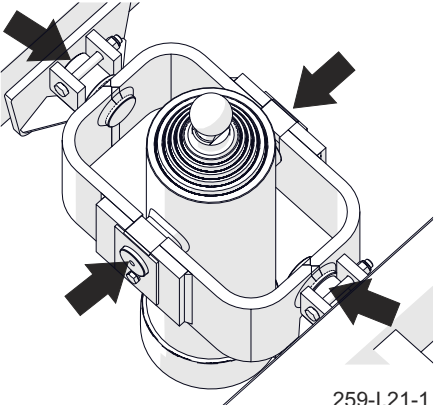
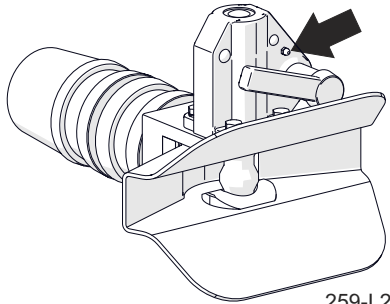
Table 5.4 Trailer lubrication schedule

Name	Number of lubrication points	Type of grease	Frequency	
Hub bearings (1) (2 bearings in each hub)	4	A	24M	 <p>526-I.19-1</p>
Expander shaft sleeves (1)	8	A	3M	 <p>623-I.05-1</p>
Expander arm (2)	4	A	3M	
Leaf springs (1)	4	C	3M	 <p>623-I.06-1</p>
Leaf spring sliding surface (2)	4	B	1M	

Name	Number of lubrication points	Type of grease	Frequency	
Steering axle expander shaft bushings (1)	4	A	3M	 <p>623-I.07-1</p>
Steering axle expander arm (2)	2	A	3M	
Axle steering arm pin (3)	4	A	3M	
Drawbar hitching eye (1)	1	B	14D	 <p>623-I.08-1</p>
Rotating drawbar eye (2)	1	B	1M	
Spring securing pin (1)	2	B	3M	 <p>623-I.09-1</p>
Drawbar pin (2)	1	B	3M	
Brake cable guide wheel axle (1)	3	A	6M	 <p>589-I.06-1</p>

Name	Number of lubrication points	Type of grease	Frequency	
Handbrake mechanism (1)	1	A	6M	 <p>589-I.07-1</p>
Chute guides (1)	2	D	1M	 <p>623-I.10-1</p>
Chute link pins (2)	6	D	1M	
Wall cylinder bearings (1)	4	B	3M	 <p>623-I.11-1</p>
Side wall bushing (2)	6 or 12*	B	3M	

Name	Number of lubrication points	Type of grease	Frequency	
Bottom wall short pin (1)	8 or 16 *	B	3M	 <p>623-I.12-1</p>
Hydraulically driven lower wall link pin (1)	4 or 8 *	B	3M	 <p>623-I.13-1</p>
Lower wall cylinder piston rod eyes (2)	4 or 8 *	B	3M	
Lower wall long pin (1)	8 or 16 *	B	3M	 <p>623-I.14-1</p>
Lower wall link lower pin (2)	2 or 4 *	B	3M	

Name	Number of lubrication points	Type of grease	Frequency	
Joints and sockets for mounting the load box - front	2	B	2M	 <p>623-I.15-1</p>
Joints and sockets for mounting the load box - rear	2	B	2M	 <p>623-I.16-1</p>
Tipping cylinder sockets and cylinder sling	4	B	1M	 <p>259-I.21-1</p>
Rear hitch mechanism (option)	1	A	1M	 <p>259-I.22-1</p>

* - Trailer version with right and left tipping

Table 5.5 Meaning of symbols in Table 5.4

Symbol	
Type of grease	
A	machine general-purpose grease (lithium, alkaline),
B	Grease for heavily loaded elements with addition of MoS ₂ or graphite
C	anticorrosion preparation in aerosol
Frequency	
D	working day (8 hours of trailer use)
M	month

I.3.11.623.19.1.EN

5.20 INSPECTION OF NUT AND BOLT CONNECTIONS

TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

During maintenance or repair work, apply appropriate torque when tightening bolt and nut connections, unless other tightening torque values are given. Recommended tightening torque values for the most frequently used bolt and nut connections are given in Table 5.6. Given values apply to non-lubricated steel bolts.

Hydraulic lines should be tightened with a torque of 50-70 Nm.

Tightening torque should be checked using a torque wrench. During daily inspection of the trailer, pay attention to loosen connections and tighten them, if necessary. Lost components must be replaced with new ones.

TIGHTENING OF WHEEL NUTS

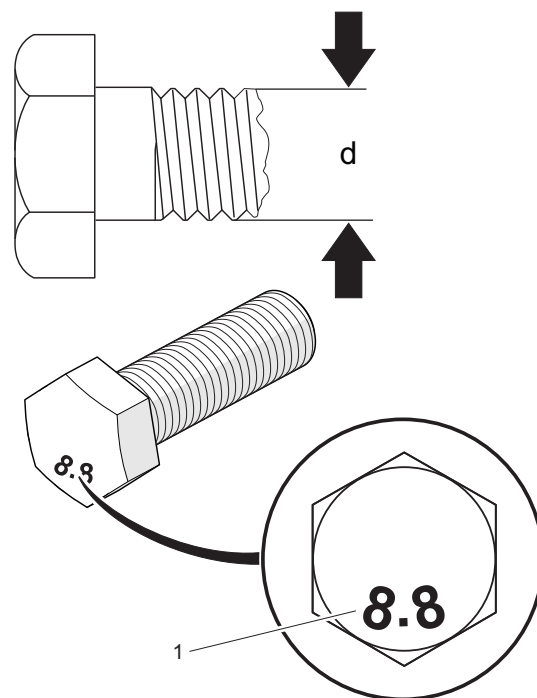
Wheel nuts should be tightened gradually and diagonally (in several stages, until the required tightening torque is obtained) using a torque wrench. See FIGURE 5.15 for the recommended nut tightening sequence and tightening torque value.

Wheel nuts must not be tightened with impact wrench because of danger of exceeding permissible tightening torque, the

Table 5.6 Tightening torque values

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

(*) – resistance class according to DIN ISO 898 standard



589-1.10-1

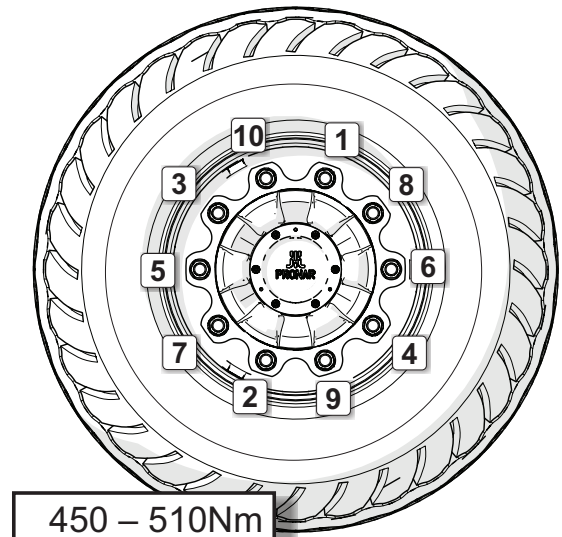
Figure 5.15 Bolt with metric thread
(1) strength class, (d) thread diameter

consequence of which may be breaking the connection thread or breaking off the hub pin.

Wheel nuts should be tightened:

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

The above activities should be repeated if a wheel has been removed from the wheel axle.

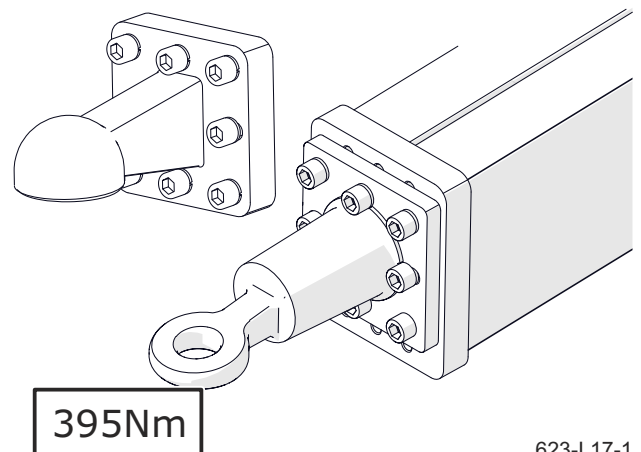


526-I.29-1

Figure 5.16 Sequence of nut tightening

TIGHTEN THE DRAWBAR EYE

Drawbar eye tightness should be checked simultaneously with wheel nut tightness checking. The tightening torque of the M20x80 bolts should be 395 Nm. Nuts should be tightened gradually diagonally, using torque spanner.



623-I.17-1

Figure 5.17 Tighten the drawbar eye

I.3.1.623.20.1.EN

5.21 REPLACE HYDRAULIC LINES

Rubber hydraulic lines must be replaced every 4 years regardless of their technical condition. This should be done in specialised workshops.

I.3.1.526.20.1.EN

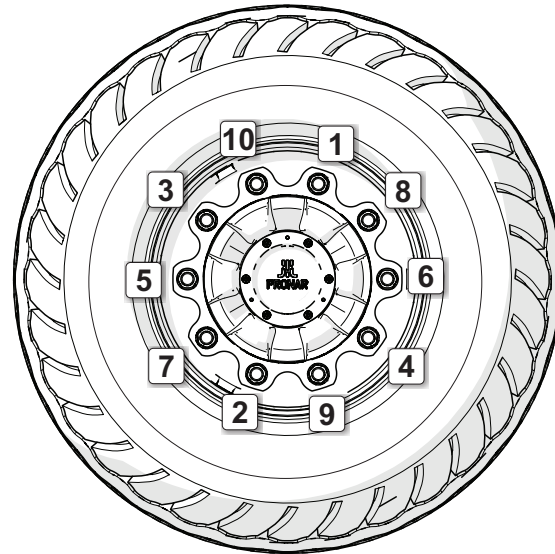
SECTION 6

MAINTENANCE

6.1 WHEEL MOUNTING AND DISMOUNTING

REMOVE WHEEL

- Immobilise trailer with parking brake.
- Place the wheel chocks under the wheel opposite to the dismantled wheel.
- Ensure that trailer is immobilised when wheel is being removed.
- Loosen wheel nuts according to the sequence shown in figure (6.1).
- Place a lifting jack and raise the trailer to a sufficient height so that the wheel to be replaced does not touch the ground. The lifting jack should have sufficient lifting capacity and should be technically reliable. The lifting jack must be positioned on a level and hard surface so as to prevent sinking into the ground or relocating the jack during lifting. If necessary, use proper backing plates in order to reduce unit pressure of the jack's base on the ground and prevent its sinking into the ground.
- Dismount wheel.



526-I.14-1

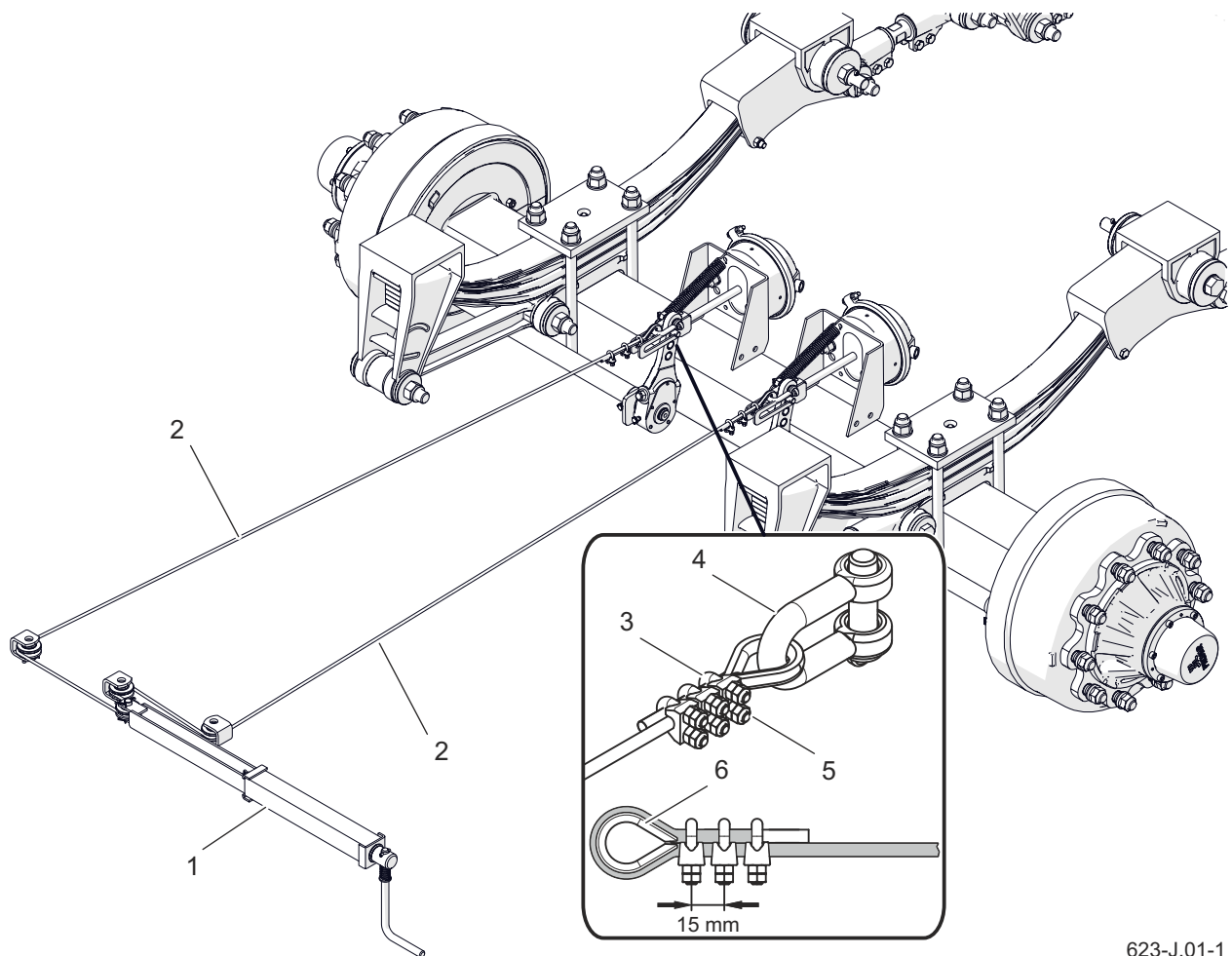
Figure 6.1 Sequence of undoing and tightening nuts

INSTALL WHEEL

- Clean axle pins and nuts of contamination.
- Do not grease thread of nuts and pins.*
- Check condition of pins and nuts, if necessary replace them.
 - Place wheel on hub, tighten nuts so that wheel rim tightly fits the hub.
 - Lower the trailer, tighten nuts according to recommended torque and given sequence, section (5.20).

J.3.2.589.01.1.EN

6.2 REPLACE THE PARKING BRAKE CABLE



623-J.01-1

Figure 6.2 Replace the parking brake cable
 (1) brake mechanism, (2) brake cable, (3) clamp, (4) shackle, (5) clamp nut, (6) thimble

PROCEDURE

- Hitch trailer to tractor. Park trailer and tractor on level surface.
- Place securing chocks under one trailer wheel.
- Fully unscrew the bolt of the brake crank mechanism (1) - figure (6.2).
- Loosen the nuts (5) of U-shaped clamps (3).
- Dismantle shackles (6), clamps and cable (2).
- Clean the parking brake components.
- Lubricate parking brake crank mechanism (1) and pins of cable guide rollers.
- Install shackle and U-shaped clamps on one end of cable (2). Make certain that clamps are correctly installed.
- Attach one end of cable, install shackle pin and secure it with new cotter pins.
- Pass the other end of the cable through guide rollers and attach the

**IMPORTANT**

Clamp jaws must be placed at the load bearing cable side figure (6.2).

Protect the cable ends using a heat shrink tubing.

The distance between the clamps should be 15 mm.

The first clamp must be located as close as possible to the thimble.

other end of the cable in the same way.

- Adjust tension of the cable - section (5.15.)
- Tighten the nuts.
- Tighten the crank mechanism cable and then loosen it. If necessary, correct the brake cable tension.

J.3.2.589.02.1.EN

6.3 ADJUST THE PLAY OF THE AXLE BEARINGS



IMPORTANT

Adjustment of bearing slackness may only be conducted when the trailer is hitched to tractor and the load box is empty.

PROCEDURE

- Prepare tractor and trailer for adjustment procedures according to description in section 5.3.
- Take off hub cover (1).
- take out split cotter pin (2) securing castellated nut (3)
- Tighten castellated nut in order to eliminate slackness.

Wheel should rotate with insignificant resistance.

- Undo nut (3) (not less than $\frac{1}{3}$ of a turn) to align the nearest thread groove with the opening in wheel axle pin (cotter pin opening is indicated by black arrow in the figure). Wheel should rotate without excessive resistance.

The nut must not be excessively tightened. Otherwise, operating conditions of the bearings will deteriorate.

- Secure castellated nut with cotter pin

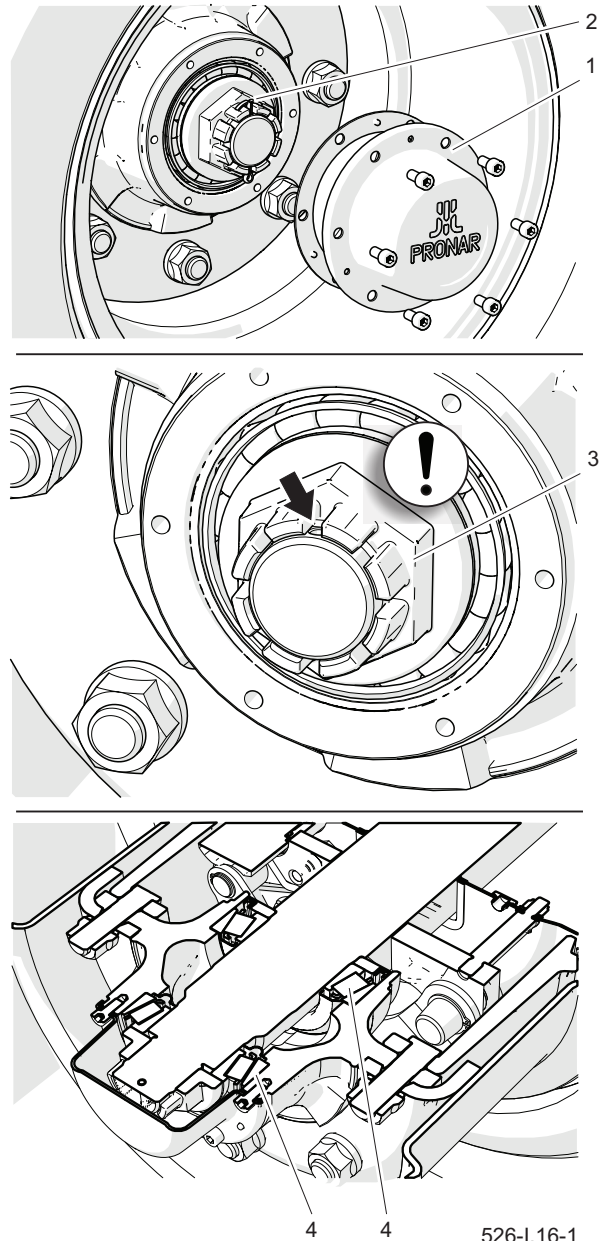


Figure 6.3 Bearing slackness adjustment principle

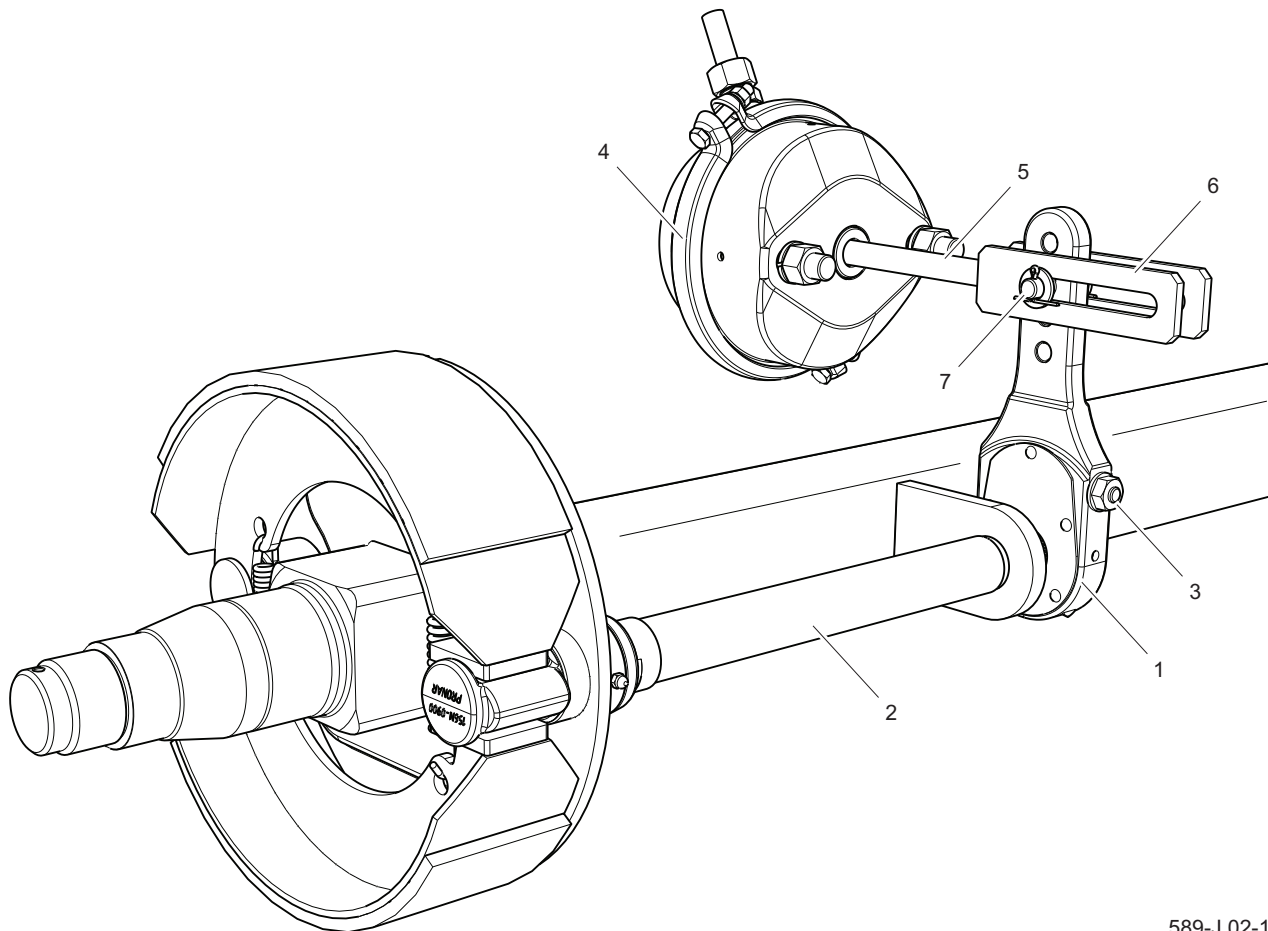
(1) hub cover, (2) cotter pin, (3) nut, (4) taper bearing

and mount hub cover (1).

- Delicately tap the hub cap with rubber or wooden mallet.

J.3.2.589.03.1.EN

6.4 BRAKE ADJUSTMENT



589-J.02-1

Figure 6.4 Design of pneumatic wheel axle brake
 (1) expander arm, (2) expander shaft, (3) adjustment bolt, (4) pneumatic cylinder, (5) cylinder piston rod, (6) cylinder fork, (7) cylinder pin

Considerable wear of brake shoe linings results in increased brake cylinder rod stroke and worse braking efficiency.

During braking, the brake cylinder piston

TIP

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

stroke should be within the specified operating range and the angle between brake cylinder piston (1) and expander arm (3) should be about 90° figure (6.6),

figure (6.7). Trailer wheels must brake simultaneously.

Braking force decreases also when the operating angle of the brake cylinder rod (5) – figure (6.4), (6.5) in relation to the expander arm (1) is wrong. In order to obtain the optimal mechanical operating angle, the cylinder piston fork (6) must be installed on the expander arm (1) as to ensure that the operating angle at full braking is about 90°.

The inspection involves measuring the

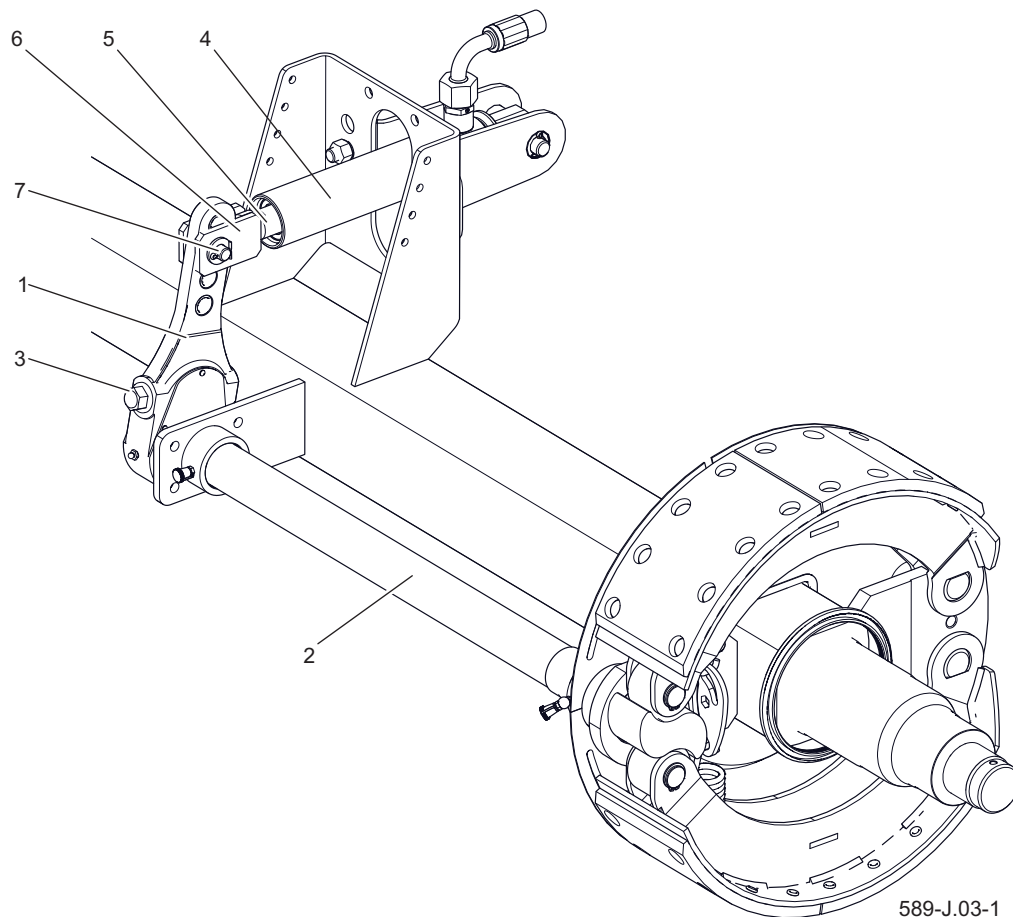


Figure 6.5 Design of hydraulic wheel axle brake

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



IMPORTANT

Incorrectly adjusted brake may cause rubbing of brake shoes against brake drums, which may lead to faster wear of brake linings and/or brake overheating.

extension length of each brake cylinder piston rod while braking at parking. If the piston rod stroke exceeds the maximum value (45mm), the system should be adjusted.

During dismantling of cylinder fork (6), remember or mark the original position of cylinder fork pin (7) Mounting position depends on the type of the braking system

and size of the trailer tires. It is selected by the manufacturer and cannot be changed.



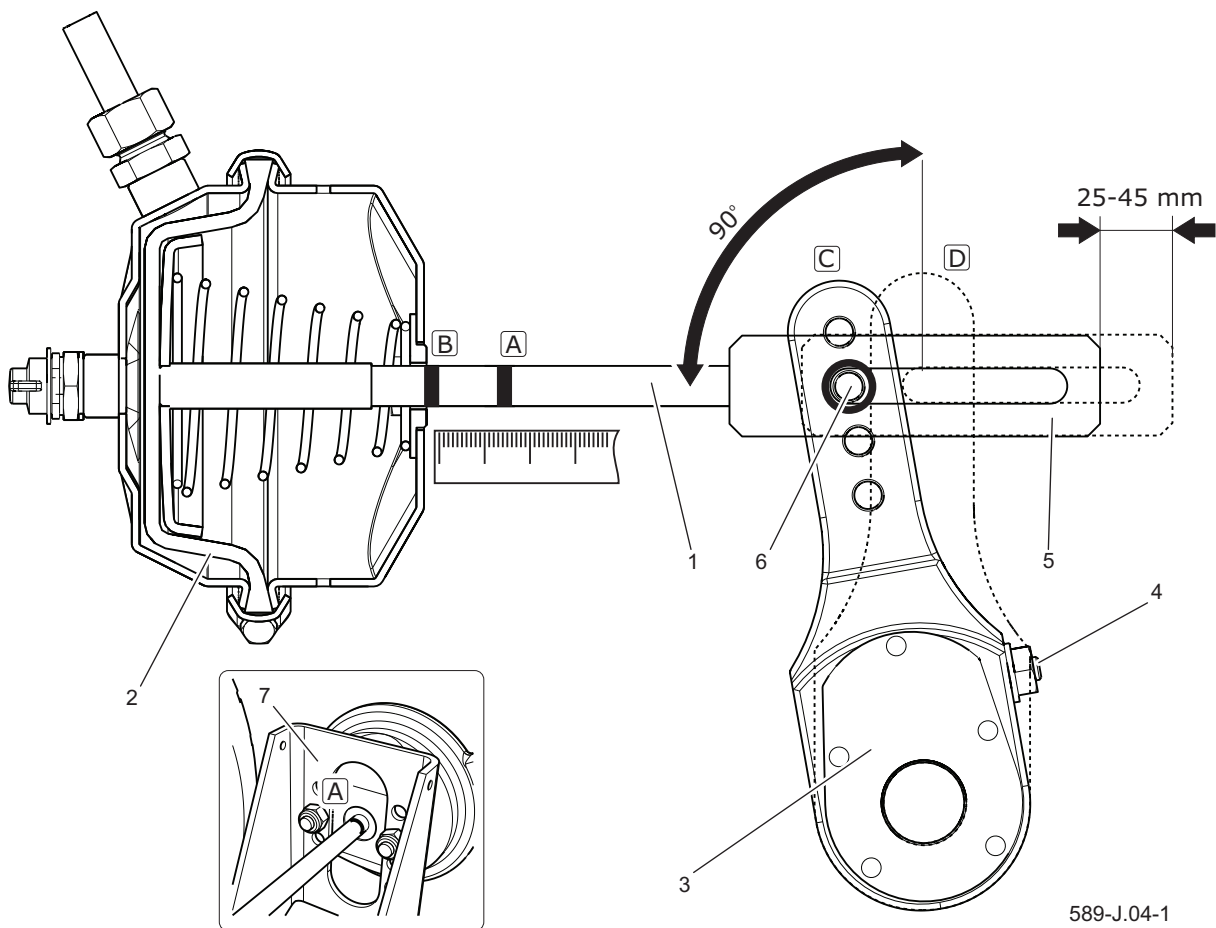
IMPORTANT

The positions for fixing the brake cylinder in the bracket openings and the brake cylinder pin in the expander arm are determined by the Manufacturer and must not be changed.

Each time when dismantling the pin or brake cylinder, the original fixing position should be marked.

PROCEDURE

- Hitch trailer to tractor.
- Turn off tractor engine and remove key from ignition.
- Immobilise the tractor with parking brake.



589-J.04-1

Figure 6.6 Principle of pneumatic brake adjustment

(1) brake cylinder piston rod, (2) brake cylinder membrane, (3) expander arm, (4) adjustment bolt, (5) brake cylinder fork, (6) fork pin, (7) brake cylinder bracket, (A) mark on the cylinder piston rod at brake release position, (B) mark on the cylinder piston rod at full braking position, (C) position of arm at brake release position, (D) position of arm at full braking position

- Make sure that the trailer brakes are not engaged.
- Secure the trailer against moving by placing wheel chocks.
- On the piston rod (1), figure (6.6), (6.7) of the cylinder mark with a line (A) the position of the maximum retraction of the piston rod with the trailer brake turned off.
- Press the tractor brake pedal and mark the position of the maximum extension of the brake cylinder piston rod with a line (B).
- Measure the distance between lines (A) and (B). If the stroke of the brake cylinder piston rod is outside the proper operating range (25 – 45 mm), adjust the expander arm.
- Dismantle brake cylinder fork pin (6).
- Remember or mark the original position of pin (6) in expander arm opening (3).
- Check if the brake cylinder piston rod moves freely and within the whole nominal range.
- Check if the brake cylinder vent holes

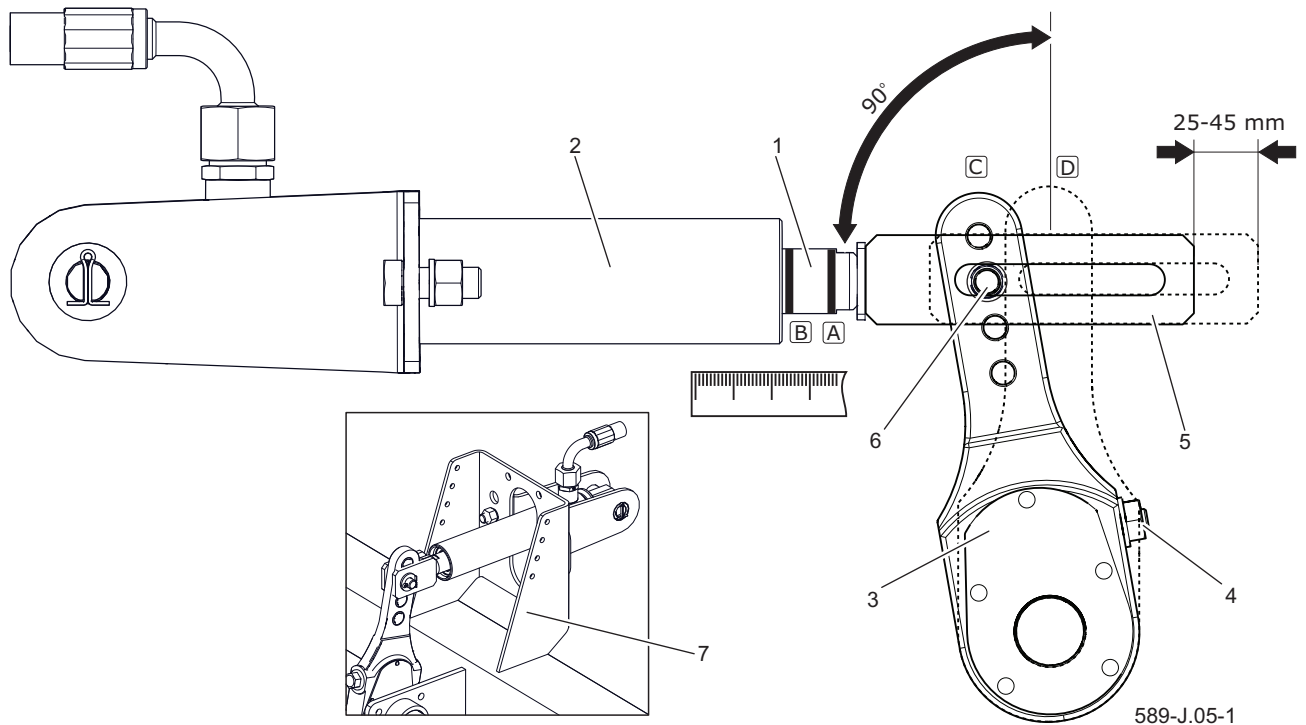


Figure 6.7 Principle of hydraulic brake adjustment

(1) brake cylinder piston rod, (2) brake cylinder housing, (3) expander arm, (4) adjustment bolt, (5) brake cylinder fork, (6) fork pin, (7) brake cylinder bracket, (A) mark on the cylinder piston rod at brake release position, (B) mark on the cylinder piston rod at full braking position, (C) position of arm at brake release position, (D) position of arm at full braking position

are not blocked with impurities and that there is no water or ice inside the brake cylinder (pneumatic cylinder). Check if the brake cylinder is correctly installed.

- Clean the brake cylinder. If necessary, defrost the brake cylinder and drain water through the unblocked vent holes. (pneumatic cylinder). Replace damaged brake cylinder with a new one. When installing the brake cylinder, maintain its original position



IMPORTANT

Do not disassemble the membrane cylinder. The membrane is glued into and may lose its tightness.

with regard to bracket (7).

- Rotate adjustment bolt (4) to align the marked expander arm opening with the brake cylinder fork opening.

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

- Install the brake cylinder fork pin and washers and secure the pin with cotter pins.
- Rotate adjustment bolt (4) to the right until one or two clicking sounds are heard in the expander arm regulating mechanism.
- Repeat adjustment activities for the

other brake cylinder on the same axle.

- Engage the brake.
- Remove previous marks and measure the brake cylinder piston rod stroke again.
- If the brake cylinder piston rod stroke is outside the proper operating range, repeat the adjustment.

CHECKING THE BRAKE OPERATION

- After completed adjustment, perform a trial run.
- Engage the brake several times. Stop the tractor with trailer and check the temperature of brake drums.
- If any of the drums is too hot, correct the brake adjustment and perform a trial run again.

J.3.2.589.04.1.EN

6.5 MAINTENANCE OF ELECTRICAL SYSTEM AND WARNING ELEMENTS



IMPORTANT

Do NOT travel with out of order lighting system. Damaged lamp lenses must be replaced immediately before travelling. Lost or damaged reflectors must be replaced.
Before driving off, make certain that all lamps and reflectors are clean.

Work connected with the repair, change or regeneration of electrical system components should be entrusted to specialist establishments, having the appropriate technology and qualifications for this type of work.

The duties of the user include only technical inspection of electrical system and reflectors.

PROCEDURE

- Connect trailer to tractor with appropriate connection lead.
- Check if the connection lead is reliable. Check connection sockets in tractor and trailer.
- Check completeness and technical condition of trailer lights.
- Check completeness of all reflectors.
- Check correct mounting of the slow-moving vehicle warning sign holder.
- Before driving on to public road, check that the tractor is equipped with a warning reflective triangle.

TIP

Light-emitting diodes (LED) are used as the source of light. Damaged lights can be replaced only as complete units. It is impossible to repair or regenerate them.

J.3.2.589.05.1.EN

6.6 CONSUMABLES

HYDRAULIC OIL

Always adhere to the principle that the oil in the trailer hydraulic system and in the tractor hydraulic system are of the same type. In the event of application of different types of oil make certain that both hydraulic substances may be mixed together. Application of different oil types may cause damage to trailer or tractor. In a new machine, the hydraulic system is filled with L HL32 Lotos hydraulic oil.

If it is necessary to change hydraulic oil for another oil, check the recommendations of the oil Manufacturer very carefully. If it is recommended to flush the system with the appropriate preparation, then comply with these recommendations. It should be ensured that the chemicals used for this purpose do not compromise the materials of the hydraulic system. During normal trailer use change of hydraulic oil is not

necessary, but if required, this operation should be entrusted to a specialist service point.

Because of its composition the oil applied is not classified as a dangerous substance, however long-term action on the skin or eyes may cause irritation. In the event of contact of oil with skin wash the place of contact with water and soap. Do NOT apply organic solvents (petrol, kerosene). Contaminated clothing should be changed to prevent access of oil to skin. In the event of contact of oil with eye, rinse with large quantity of water and in the event of the occurrence of irritation consult a doctor. Hydraulic oil in normal conditions is not harmful to the respiratory tract. A hazard only occurs when oil is strongly atomised (oil vapour), or in the case of fire during which toxic compounds may be released. Oil fires should be quenched with the use

Table 6.1 L-HL 32 Lotos oil characteristics

Item	Name	Unit	
1	ISO 3448VG viscosity classification	-	32
2	Kinematic viscosity at 40°C	mm ² /s	28.8 – 35.2
3	ISO 6743/99 quality classification	-	HL
4	DIN 51502 quality classification	-	HL
5	Flash-point	C	230

of carbon dioxide, foam or steam extinguishers. Do not use water to quench oil fires.

LUBRICANTS

For heavily loaded parts it is recommended to apply lithium greases with addition of molybdenum disulphide (MoS_2) or graphite. In the case of less loaded sub-assemblies the application of general purpose machine greases is recommended, which contain anticorrosion additives and have significant resistance

to being washed away by water. Aerosol preparations (silicon greases and anti-corrosive-lubricating substances) should have similar characteristics.

Before using the grease, read its information leaflet. Particularly relevant are safety rules and handling procedures for a given lubricant as well as waste disposal procedure (used containers, contaminated rags etc.). Information leaflet (material safety data sheet) should be kept together with grease.

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6.7 TROUBLESHOOTING

Table 6.2 Troubleshooting

FAULT	CAUSE	REMEDY
Problem with moving off	Brake system lines disconnected	Connect brake lines (applies to pneumatic systems)
	Applied parking brake	Release parking brake.
	Damaged pneumatic system connection lines	Replace.
	Leaking connections	Tighten, replace washers or seal sets, replace lines.
	Control valve or braking force regulator damaged	Check valve, repair or replace.
Noise in axle hubs	Excessive bearing slackness	Check slackness and adjust if needed
	Damaged bearings	Replace bearings
	Damaged hub parts	Replace
Poor reliability of braking system	Insufficient pressure in the system	Check pressure on tractor pressure gauge, wait till compressor fills tank to required pressure. Damaged air compressor in tractor Repair or replace. Damaged brake valve in tractor. Repair or replace. Leaking system lines or connections. Check system for tightness.
Excessive heating of axle hubs	Incorrect main or parking brake adjustment	Regulate positions of expander arms
	Worn brake linings	Change brake shoes
Incorrect hydraulic system operation	Improper hydraulic oil viscosity	Check oil quality, make sure that the oil in both machines is of the same type. If necessary change oil in tractor or in trailer.

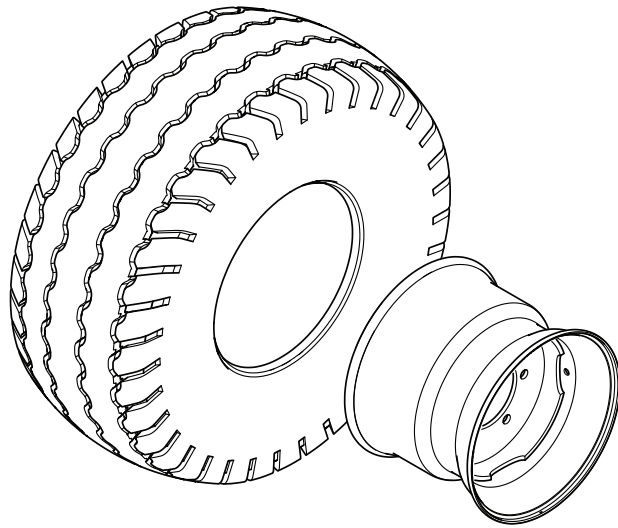
Incorrect hydraulic system operation	Insufficient tractor hydraulic pump output, damaged tractor hydraulic pump.	Check tractor hydraulic pump.
	Damaged or contaminated cylinder	Check cylinder piston rod (bending, corrosion), check cylinder for tightness (cylinder piston rod seal), if necessary, repair or replace the cylinder.
	Excessive cylinder loading	Check and reduce cylinder load, if necessary.
	Damaged hydraulic lines	Check and ascertain that hydraulic lines are tight, not fractured and properly tightened. If necessary, replace or tighten.
Excessive wear of left and right tyre shoulders on both sides.	Too low air pressure in tyres. Excessive ground speed of loaded trailer on turns. Too fast loss of air due to damaged wheel, valve, puncture, etc.	Check air pressure. Regularly check correctness of air pressure in tyres. Excessive loading of the trailer. Do not exceed the permissible gross weight of the trailer. Reduce ground speed while driving on turns on hardened surface. Check wheel and valve. Replace damaged parts.
Excessive wear of central part of tyre.	Excessive air pressure in tyres.	Check air pressure. Regularly check correctness of air pressure in tyres.
Excessive wear of left or right tyre shoulder, on one side	Incorrect toe-in. Incorrectly positioned wheel axles.	Damaged leaf spring on one side of the suspension system. Replace leaf springs.
Worn tyre tread.	Damaged suspension system, broken leaf spring. Damaged brake system, blocking of brakes, incorrectly adjusted brake system. Too frequent and violent braking.	Check suspension system for looseness, check leaf springs. Replace damaged or worn elements. Check brake system for malfunctions. Adjust expander lever.

Side crack.	Prolonged use of tyre with low air pressure. Excessive loading of the trailer.	Regularly check air pressure in tyres. Check weight of load while loading.
Abrasions on external side edge of tyre.	Too frequent driving over sharp or high obstacles (e.g. curbs).	Control driving technique.
Damaged rim (hardening and cracking near rim), brittleness of tyre.	Incorrect braking technique. Too frequent violent braking. Damaged brake system.	Check brake system. Control braking technique. Damage occurs due to excessive heating of hub which leads to heating of wheel.

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SECTION 7

TYRE SYSTEM



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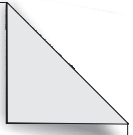
Table 7.1 Trailer tyres

Item	Tyre dimensions	Wheel rim size	Tyre pressure
1	550/60- 22,5 171A8	16.00x22.5H2; ET=-30	340 kPa
2	445/65 R22,5 168K TL 445/65 R22,5 169J TL 445/65 R22,5 169K TL 445/65 R22,5 169F TL	14.00x22.5; ET=-30	550 kPa
3	600/55R26,5 176A8 (165D) 600/55R26,5 175A8 (165D)	20.00x26.5H2; ET=0	320 kPa
4	560/60 R22,5 161D 560/60 R22,5 164D	16.00x22.5H2; ET=-30	400 kPa
5	600/50R22,5 170A8	20.00x22.5; ET=0	400 kPa
6	600/55R22,5 175A8 (162E) 600/55R22,5 172A8 (162D)	20.00x22.5; ET=-20	400 kPa
7	600/55R26,5 (165D)	20.00x26.5H2; ET=0	400 kPa
8	700/50-26.5 174A8	24.00x26.5H2; ET=-80	240 Kpa
9	710/45-26.5 169A8	24.00x26.5H2; ET=-80	240 Kpa
10	710/50R26.5 170D (181A8)	24.00x26.5H2; ET=-80	400 kPa

ANNEX A

Reference list of oils for the hydraulic steering system.

1	TOTAL Equivis ZS 22
2	ELF Hydrelf 22
3	SHELL Tellus T22
4	TEXACO Rando HDZ 22
5	BP Energol SHF 22
6	ESSO Unavis N22
7	AGIP Arnica 22



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