PRONAR Sp. z o.o.

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

tel.:	+48 085 681 63 29	+48 085 681 64 29
	+48 085 681 63 81	+48 085 681 63 82
fax:	+48 085 681 63 83	+48 085 682 71 10

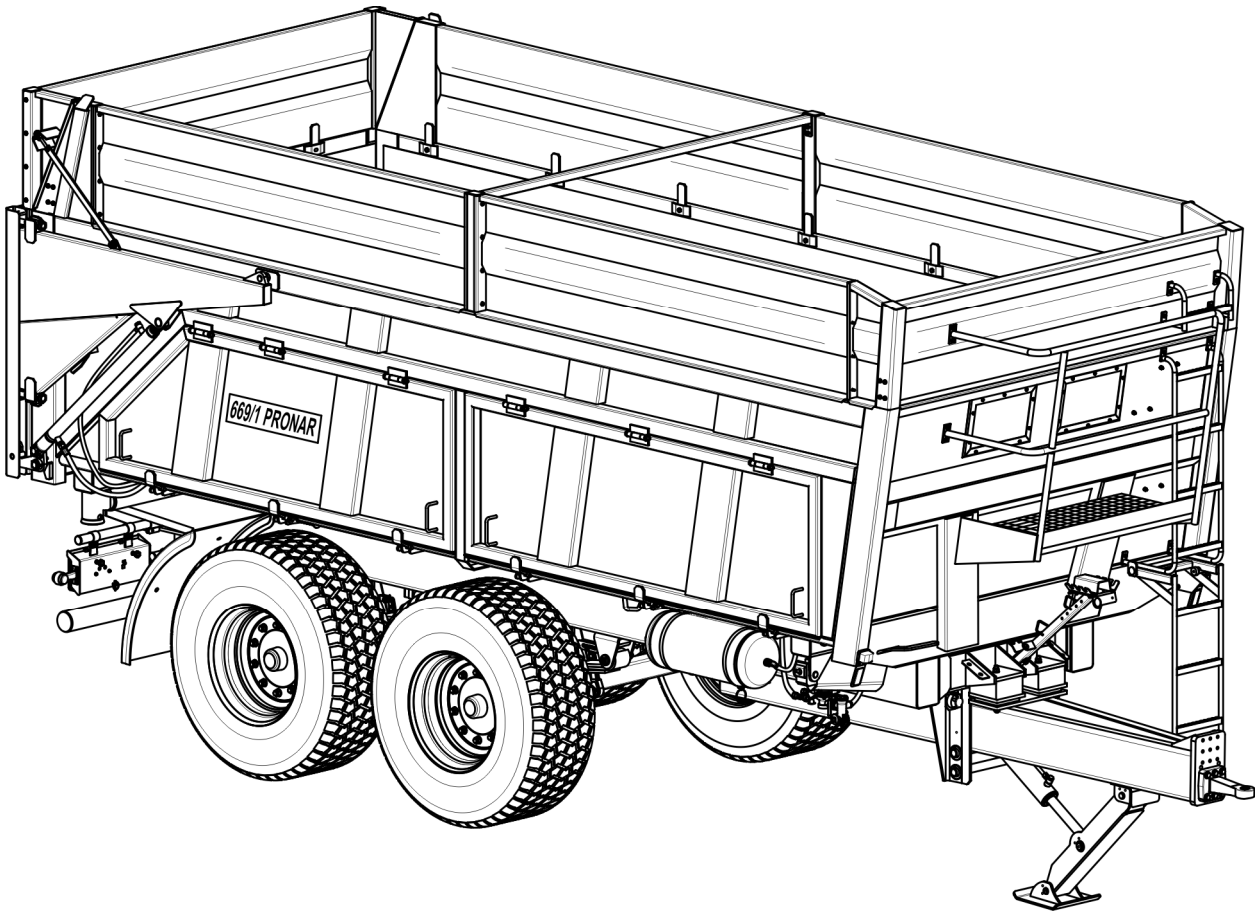
www.pronar.pl

OPERATOR'S MANUAL

AGRICULTURAL TRAILER

PRONAR T669/1

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



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INTRODUCTION

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

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

The manual describes the basic safety rules and operation of agricultural trailer Pronar T669/1.

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

MANUFACTURER'S ADDRESS:

PRONAR Sp. z o.o.
ul. Mickiewicza 101A
17-210 Narew

CONTACT TELEPHONES

+48 085 681 63 29 *+48 085 681 64 29*
+48 085 681 63 81 *+48 085 681 63 82*

SYMBOLS APPEARING IN THIS OPERATOR'S MANUAL

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

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

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

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

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

Additional tips and advice for machine operation are marked:

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

DIRECTIONS USED IN THIS OPERATOR'S MANUAL

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

REQUIRED SERVICE ACTIONS

Service actions described in the manual are marked: ➡

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

PRONAR Sp. z o.o.
ul. Mickiewicza 101 A
17-210 Narew, Polska
tel./fax (+48 85) 681 63 29, 681 63 81, 681 63 82,
681 63 84, 681 64 29
fax (+48 85) 681 63 83
http://www.pronar.pl
e-mail: pronar@pronar.pl

EC DECLARATION OF CONFORMITY OF THE MACHINERY

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

Description and identification of the machinery	
Generic denomination and function:	**TRAILER**
Type:	**T669**
Model:	- - - - -
Serial number:	
Commercial name:	**TRAILER PRONAR T669** **TRAILER PRONAR T669/1**

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 29 GRU. 2009

Place and date

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

Full name of the empowered person
position, signature

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SECTION

1

BASIC INFORMATION

1.1 IDENTIFICATION

1.1.1 TRAILER IDENTIFICATION

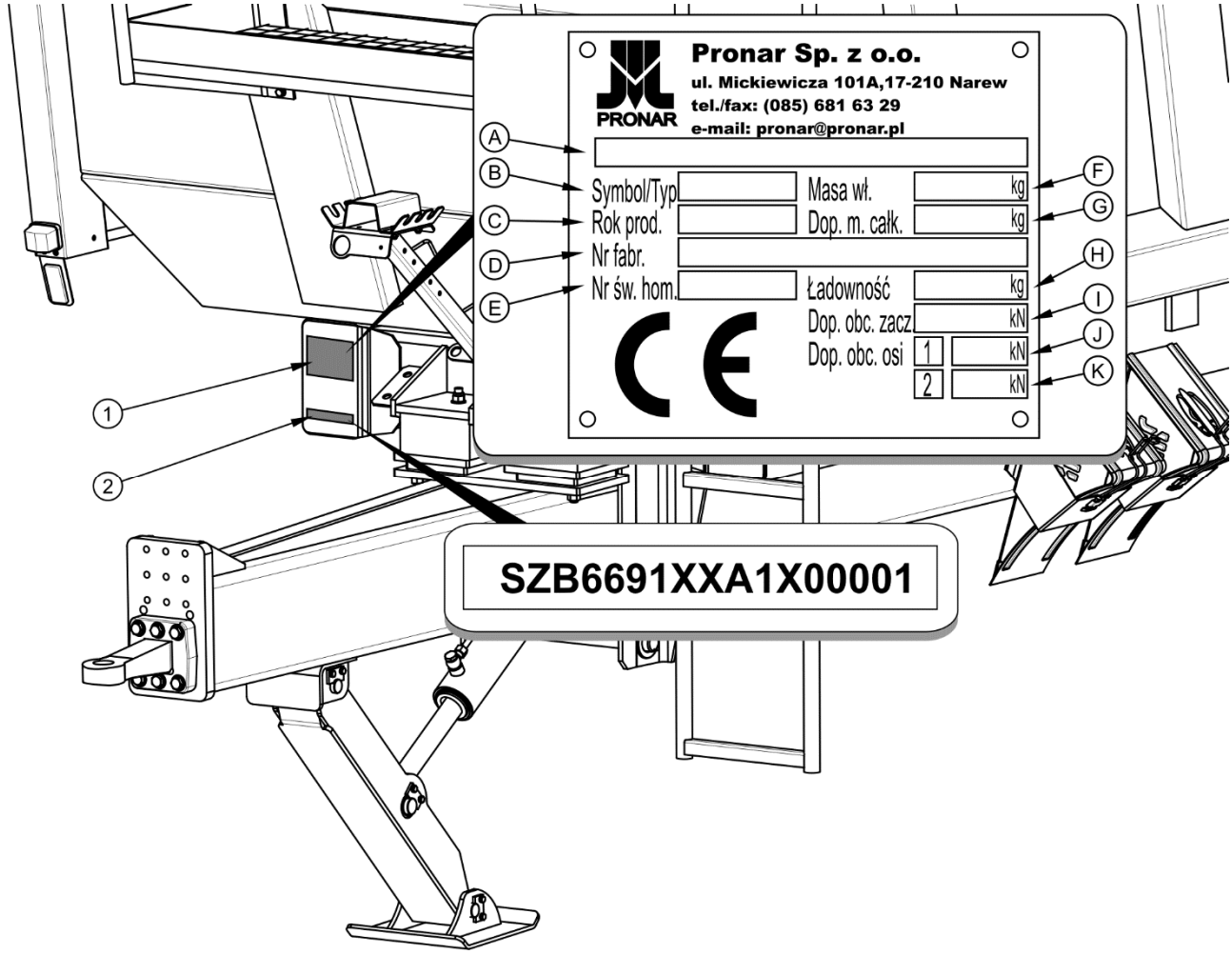


FIGURE 1.1 Location of the data plate and serial number

(1) data plate, (2) serial number

The trailer is marked with the data plate (1), and the serial number (2) located on a gold painted rectangle. The serial number and data plate are located on the front beam of the lower chassis frame longitudinal member – figure *(1.1)*.

When buying the trailer check that the serial numbers on the machine agree with the number written in the *WARRANTY BOOK*, in the sales documents and in the *OPERATOR'S MANUAL*. The meanings of the individual fields found on the data plate are presented in the table below:

TABLE 1.1 Markings on data plate

ITEM	MARKING
A	General description and purpose
B	Trailer symbol / type
C	Trailer year of manufacture
D	Seventeen digit vehicle identification number (VIN)
E	Official certificate number
F	Tare weight
G	Maximum gross weight
H	Carrying capacity
I	Permissible hitching system loading
J	Permissible front axle load
K	Permissible rear axle load

1.1.2 AXLE IDENTIFICATION

The factory number of the axle shaft and its type are stamped onto the data plate (2) secured to the axle shaft beam (1) – figure (*1.2*).

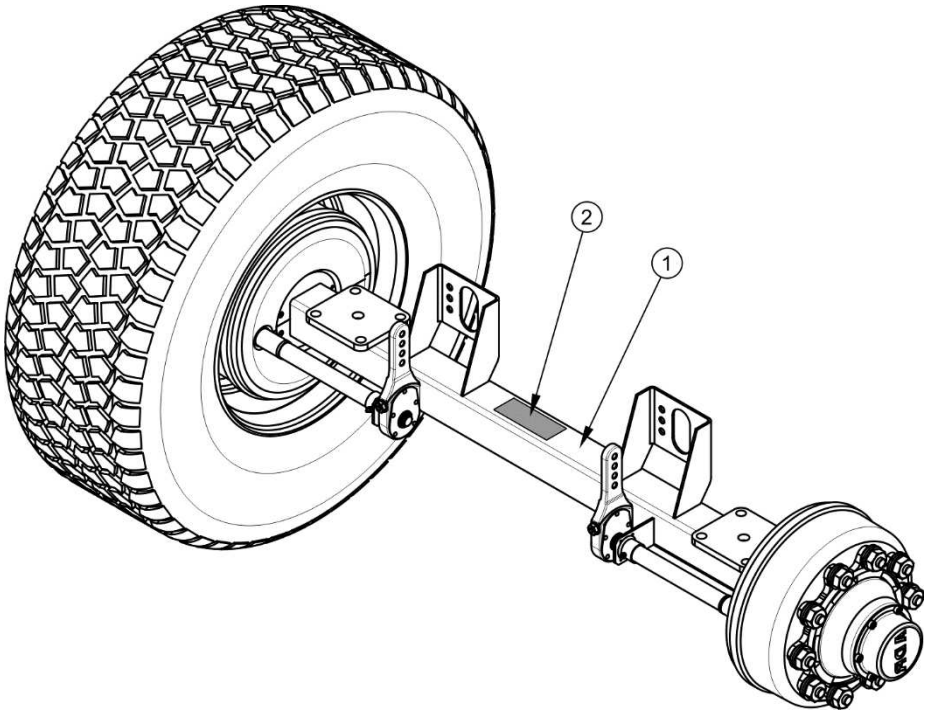


FIGURE 1.2 Location of the axle data plate

(1) wheel axle, (2) data plate

1.1.3 LIST OF FACTORY NUMBERS

TIP

In the event of ordering a replacement part or in the case of the appearance of problems it is often essential to give the factory numbers of parts or the VIN number of the trailer, therefore it is recommended that these numbers are inscribed in the spaces below.

VIN

S	**Z**	**B**	**6**	**6**	**9**	**1**	**X**	**X**			**X**					

FRONT AXLE FACTORY NUMBER AND TYPE

REAR AXLE FACTORY NUMBER AND TYPE

1.2 PROPER USE

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 fertilisers and other loads, if fulfilling conditions indicated in section 4. Non-compliance with the recommendations of 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 not according to its intended purpose.

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

IMPORTANT

The trailer must not be used for purposes other than those for which it is intended. The user MUST NOT:

- **transport people, animals, hazardous materials, chemically aggressive loads that will corrode the construction elements of the trailer (causing corrosion of steel, destruction of paint coat, dissolving plastic elements and destruction of rubber elements etc.),**
- **transport incorrectly secured load, which during travel may cause contamination of the road and natural environment,**
- **transport incorrectly secured load, which during travel may change position in load box,**
- **transport loads, whose centre of gravity may destabilise the trailer,**
- **transport loads, which have uneven load distribution and/or overload axles and suspension elements.**

The trailer is constructed according to current safety requirements and engineering standards. The brake system and the light and indicator system meet the requirements of road traffic regulations. The maximum speed of the trailer on public roads in Poland is 30 km/h (pursuant to Traffic Law Act of June 20th 1997, article 20). 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. In connection with this the user is obliged to:

- carefully read the *OPERATOR'S MANUAL* of the trailer and the *WARRANTY BOOK* and conform with the recommendations contained in these documents,
- understand the trailer's 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's Manual and comply with its recommendations,
- only hitch the trailer to an agricultural tractor, which fulfils all the requirements made by the trailer's Manufacturer.

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's Manual,
- have been trained in trailer operation and safe operation,
- have the required authorisation to drive and are familiar with the road traffic regulations and transport regulations.

TABLE 1.2 Agricultural tractor's requirements

CONTENTS	UNIT	REQUIREMENTS
Brake system - sockets		
Pneumatic system 1 line	-	according to ISO 1728
Pneumatic system 2 line	-	according to ISO 1728
Hydraulic system	-	according to ISO 7421-1
Maximum system pressure		
Single conduit pneumatic system	bar / kPa	5.8 / 580
Double conduit pneumatic system	bar / kPa	8 / 800
Hydraulic system	bar / MPa	150 / 15
Hydraulic tipper system		
Hydraulic oil:	-	L HL 32 Lotos (1)
Maximum system pressure	bar / MPa	200 / 20
Oil demand:	l	29
Electrical system		
Electrical system voltage	V	12
Connection socket	-	7 polar compliant with ISO 1724
Required tractor hitch		
Type	-	transport hitch
Other requirements		
Minimum tractor power	kW / Horsepower	76.4 / 104
Minimum vertical load capacity of hitch	kg	2,000

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

In the event that the trailer shall be hitched to a second trailer it must fulfil the requirements stipulated in table (*1.3*).

TABLE 1.3 Requirements for second trailer

CONTENTS	UNIT	REQUIREMENTS
Maximum gross weight	kg	20,000
Brake system - connectors		
Pneumatic system 1 line	-	connector compliant with ISO 1728
Pneumatic system 2 line	-	connector compliant with ISO 1728
Hydraulic system	-	connector compliant with ISO 7421-1
Maximum system pressure		
Single conduit pneumatic system	bar / kPa	5.8 / 580
Double conduit pneumatic system	bar / kPa	8 / 800
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 polar compliant with ISO 1724
Drawbar of trailer		
Diameter of drawbar shaft	mm	40

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

1.3 EQUIPMENT

Some standard equipment elements, which were listed in table (*1.4*), 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 concerning tires is provided at the end of this publication in *ANNEX A.*

TABLE 1.4 Trailer optional equipment

EQUIPMENT	STANDARD	ADDITIONAL
Operator's Manual	•	
Warranty book	•	
Single line pneumatic system without rear connector	•	
Frame with tarpaulin cover		•
Fenced platform		•
Automatic hitch		•
Rear hitch,		•
Complete set of wall extensions (580)	•	
Hand brake	•	
Wheel chocks	•	
Drawbar with rotating drawbar eye ∅50 mm	•	
Chute		•
Slow-moving vehicle warning sign		•
Warning reflective triangle		•

1.4 TERMS & CONDITIONS OF WARRANTY

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'S MANUAL*. The repair period is specified in the *WARRANTY BOOK.*

The warranty does not apply to those parts and sub-assemblies of the machine, which are subject to wear in normal usage conditions, regardless of the warranty period. Consumables include the following parts/sub-assemblies:

- drawbar hitching eye,
- pneumatic system connector filters,
- tyres,
- brake shoes,
- bulbs and LED lamps,
- seals,
- bearings.

The warranty service only applies to factory defects and mechanical damage that is not due to the user's fault.

In the event of damage arising from:

- mechanical damage which is the user's fault, caused by road accidents,
- by inappropriate use, adjustment or maintenance, use of the trailer for purposes other than those for which it is intended,
- use of damaged machine,
- repairs carried out by unauthorised persons, improperly carried out repairs,
- making unauthorised alterations to machine design,

the user will lose the right to warranty service.

TIP

Demand that the seller carefully and precisely 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.

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 machine.

Modification of the trailer without the written consent of the Manufacturer is forbidden. 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.

1.5 TRANSPORT

The trailer is ready for sale completely assembled and does not require packing. Packing is only required for the machine's technical documentation and any extra fittings. 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).

1.5.1 TRANSPORT ON VEHICLE

Loading and unloading of trailer from vehicle shall be conducted using loading ramp with the aid of an agricultural tractor. During work adhere to the general principles of Health and Safety at Work applicable to reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines. The trailer must be properly connected with the tractor according to the requirements in this Operators Manual. The trailer brake system must be started and checked before driving off or onto ramp.

The trailer 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 catches designed for this purpose (1) – figure *(1.3)*, permanent structural elements of the trailer (longitudinal and transverse frame sections etc.). Transport lugs are welded to the members of the load box (3), a pair on each side of the trailer, and marked with decals (8) - see table *(2.1).* Use certified and technically reliable securing measures. Worn straps, cracked securing catches, bent or corroded hooks as well as other damage may disqualify use of the given element from use. Carefully read the information stated in the Operator's Manual for the given securing measure. Chocks, wooden blocks or other objects without sharp edges should be placed under the wheels of the trailer to prevent it from rolling. Trailer wheel blocks must be nailed to the low platform planks of the vehicle or secured in another manner preventing their movement. The number of securing elements (cables, straps, chains and stay etc.) and the force necessary for their tensioning depends on a number of things,

including weight of the trailer, the construction of vehicle carrying trailer, speed of travel and other conditions. For this reason it is impossible to define the securing plan precisely. 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 immobilise the trailer. If necessary, sharp edges of trailer should be protected at the same time protecting the securing straps from breaking during transport.

IMPORTANT

When being road transported on a motor vehicle the trailer must be mounted on the vehicle's platform in accordance with the transport safety requirements and the regulations.

Driver of the vehicle should be particularly careful during travel. This is due to the vehicle's centre of gravity shifting upwards when loaded with the machine.

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

During reloading work, particular care should be taken not to damage parts of the machine's fittings or the lacquer coating. The tare weight of the trailer in condition ready for travel is given in table *(3.1).*

DANGER

Incorrect application of securing measures may cause an accident.

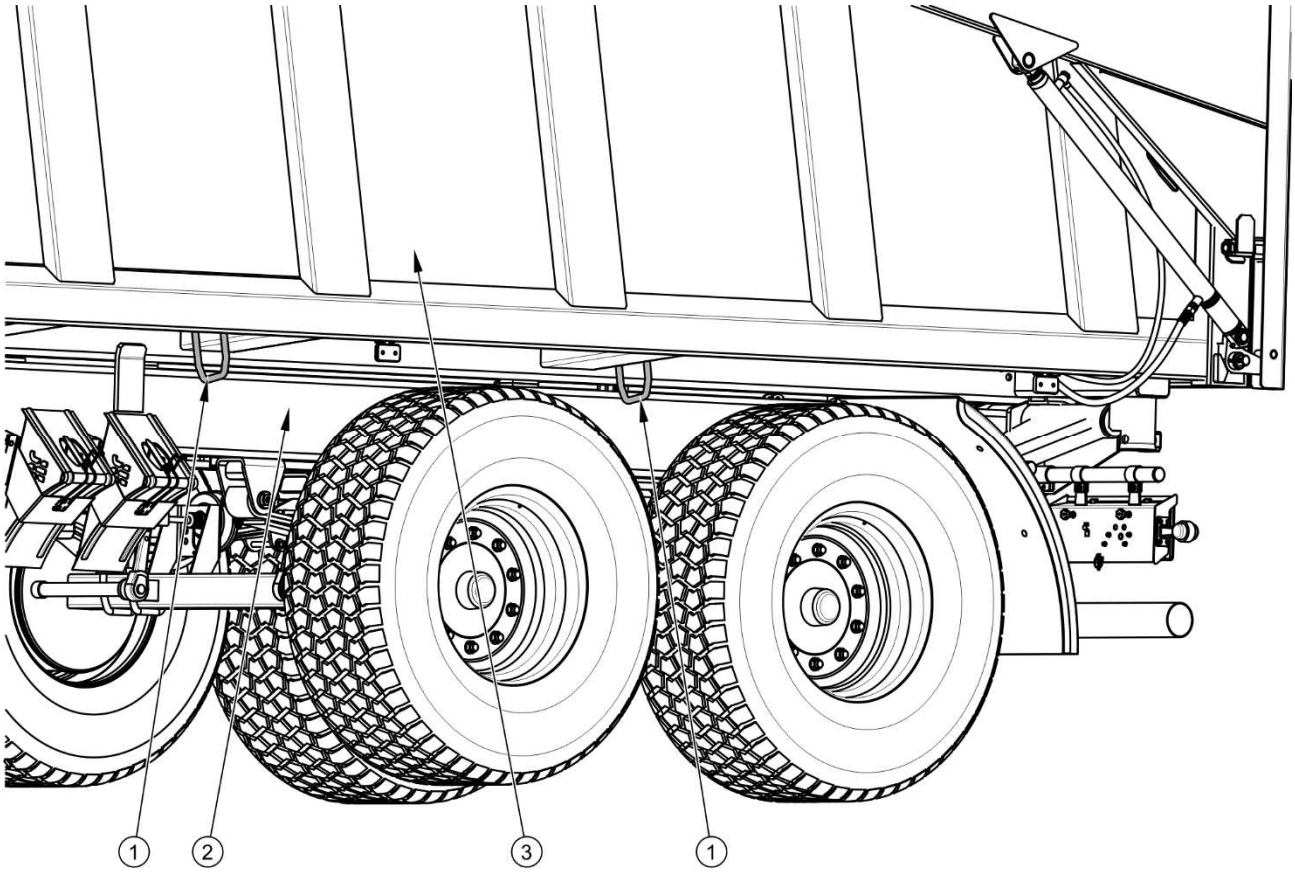


FIGURE 1.3 Positioning of transport lugs

(1) transport lug, (2) lower longitudinal frame, (3) load box

1.5.2 INDEPENDENT TRANSPORT BY THE USER

In the event of independent transport by the user after purchase of the trailer, the user must read the trailer Operator's Manual and adhere to the recommendations contained therein. Independent transport involves towing the trailer with own agricultural tractor to destination. During transport adjust travel speed to the prevailing road conditions, but do not exceed the maximum design speed.

IMPORTANT

Before transporting independently, the tractor driver must carefully read this operator's manual and observe its recommendations.

1.6 ENVIRONMENTAL HAZARDS

A hydraulic oil leak constitutes a direct threat to the natural environment owing to its limited biodegradability. The negligible solubility of hydraulic oil in water does not cause extreme toxicity of organisms living in the aquatic environment. The formation of a film of oil on the water may be the direct cause of physical action on organism, perhaps causing change of oxygen values in the water because of lack of direct contact of air with the water. An oil leak into water reservoirs may however lead to a reduction of the oxygen content.

While carrying out maintenance and repair work, which involves the risk of an oil leak, this work should take place on an oil resistant floor or 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 pollution, once gathered up, should be kept in a sealed, marked, hydrocarbon resistant container. The container should be kept away from heat sources, flammable materials and food.

DANGER

Used hydraulic oil or gathered remains mixed with absorbent material should be stored in a precisely marked container. Do not use food packaging for this purpose.

Oil, which has been used up or is unsuitable for further use owing to a loss of its properties should be stored in its original packaging in the conditions described above. Waste oil should be taken to the appropriate facility dealing with the re-use of this type of waste. Waste code: 13 01 10. Detailed information concerning hydraulic oil may be found on the product's Material Safety Data Sheet.

TIP

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

IMPORTANT

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

1.7 WITHDRAWAL FROM USE

In the event of decision by the user to withdraw the trailer from use, comply with the regulations in force in the given country concerning withdrawal from use and recycling of machines withdrawn from use. Before commencing dismantling, totally remove the oil from the hydraulic system and reduce air pressure completely in the pneumatic brake system (e.g. using air tank drain valve).

DANGER

During dismantling, use the appropriate tools, equipment (overhead travelling 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.

When spare parts are changed, worn out or damaged parts that cannot be reclaimed should be taken to a collection point for recyclable raw materials. Hydraulic oil should be taken to the appropriate facility dealing with the re-use of this type of waste.

SECTION

2

SAFETY ADVICE

2.1 BASIC SAFETY RULES

2.1.1 USE OF TRAILER

- Before using the trailer, the user must carefully read this Operator's Manual and the *WARRANTY BOOK*. When operating the machine, the operator must comply with the recommendations.
- The trailer may only be used and operated by persons qualified to drive agricultural tractors and agricultural machines and trained in the use of the machine.
- If the information stated in the Operator's Manual is difficult to understand, contact a seller, who runs an authorised technical service on behalf of the Manufacturer, or contact the Manufacturer directly.
- Careless and improper use and operation of the trailer, and non-compliance with the recommendations given in this operator's manual is dangerous to your health.
- Be aware of the existence of a residual risk, and for this reason the fundamental basis for using this trailer should be the application of safety rules and sensible behaviour.
- 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 or other drugs.
- Non-compliance with the safety rules of this Operator’s Manual can be dangerous to the health and life of the operator and others.
- The trailer must not be used for purposes other than those for which it is intended. Anyone who uses the trailer other than the way intended takes full responsibility for himself for any consequences of this potentially improper use. Use of the machine for purposes other than those for which it is intended by the Manufacturer may invalidate the warranty.
- 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 fittings 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.

2.1.2 HITCHING AND DISCONNECTING FROM TRACTOR

- Do NOT hitch the trailer to tractor, if the tractor does not meet the requirements of the Manufacturer (minimum tractor power demand, lack of required tractor hitch etc.) – compare table (1.2) *AGRICULTURAL TRACTOR REQUIREMENTS*. Before hitching trailer make certain that oil in external hydraulic system of tractor may be mixed with the hydraulic oil of the trailer.
- Before hitching trailer to tractor check that tractor and trailer are in good technical condition.
- To hitch the trailer to a tractor, use exclusively the tractor hitch for single axle trailers. After completing the hitching of the machines check the safety of the hitch Carefully read the tractor Operator's Manual. If the tractor is equipped with an automatic hitch, make certain that the coupling operation is completed.
- Be especially careful when hitching the machine.
- When hitching, there must be nobody between the trailer and the tractor.
- Do NOT proceed with disconnecting trailer from the tractor when load box is raised.
- Coupling and uncoupling the trailer may only take place when the machine is immobilised by use of the parking brake.

2.1.3 COUPLING AND UNCOUPLING SECOND TRAILER

- Do NOT connect a second trailer, if it does not fulfil the requirements made by the Manufacturer (lack of required drawbar eye, exceeding permissible total weight etc.) – compare table (*1.3*) *REQUIREMENTS FOR SECOND TRAILER*. Before connecting machines make certain that the oil in both trailers may be mixed.
- Only double axle trailers may be hitched to the trailer.

- Before hitching trailer to tractor check that both machines are in good technical condition.
- After completing the coupling of the trailer check the safety of the hitch.
- Be especially careful when hitching the machine.
- When hitching, there must be nobody between the trailers. Person assisting hitching up machines should stand outside the area of danger and be visible to the tractor driver at all times.
- Do NOT proceed with disconnecting the second trailer from the tractor when load box is raised.

2.1.4 HYDRAULIC AND PNEUMATIC SYSTEMS

- When operating, the hydraulic and pneumatic systems are under high pressure.
- Regularly check the technical condition of the connections and the hydraulic and pneumatic leads. There must no oil or air leaks.
- Cut-off valve in the hydraulic tipping system limits the tipping angle of the load box when tipped to the side and to the rear. The length of the control cable controlling this valve is factory adjusted by the Manufacturer and must not be changed when the trailer is used.
- 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 tractor hydraulic system and 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 oil, which has lost its properties, should be stored in original containers or replacement containers resistant to action of 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 conduits must be replaced every 4 years regardless of their technical condition.

2.1.5 LOADING AND UNLOADING

- Before raising load box the tipping pins should be placed on the intended unloading side. Check if the pins are correctly inserted.
- 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 forwards.
- Loading and unloading work should be carried out by someone experienced in this type of work.
- The load must be arranged in such a way that it does not threaten the stability of the trailer, and does not hinder driving.
- Do NOT drive with the load box raised.
- Ensure that during unloading / loading or raising the load box nobody is near the trailer. Before tipping load box ensure that there is visibility and make certain that there are no bystanders.
- The trailer is not intended for transporting people, animals or hazardous materials.
- Keep a safe distance from overhead electric power lines during unloading and when load box is raised.
- The arrangement of the load may not cause an overload on the axle or hitch system of the trailer.
- Do NOT tip of the load box in windy conditions.

- When closing or opening the rear grain chute gate take particular care to avoid crushing fingers.
- Incorrect load distribution and overloading the machine may cause the trailer to tip over or cause damage to its components.
- Do NOT go or place hand between open side, tailgate and load box.
- If the load does not pour from the raised load box immediately cease unloading. The trailer may only be tipped again after removing the problem (sticking, wedging), 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 forwards if load is bulky or reluctant to pour and does not unload.
- Do NOT climb on load box during loading and unloading.
- Lower the load box before proceeding to deal with a malfunction. If it is necessary to raise the load box then secure it against dropping with the aid of load box support. The load box may not be loaded, and the trailer must be connected to a tractor and secured with the aid of chocks and also immobilised with the parking brake.
- After completing unloading, ensure that the load box is empty.

2.1.6 TRANSPORTING THE MACHINE

- During travel on public roads comply with the road traffic regulations and transport regulations in force in a given country, in which the trailer is used.
- Do not exceed the permitted speed arising from road conditions and design limitations. Adjust travel speed to the prevailing road conditions, trailer load and road traffic regulations limits.
- The machine must NOT be left unsecured. Trailer disconnected from the tractor must be immobilized with parking brake and protected against rolling with chocks
- Before driving off make certain that the trailer is correctly hitched to the tractor.
- Chocks (1), should be placed only under one wheel (one in front of the wheel, the second behind the wheel - figure (*2.1*)). Do not place chocks under wheels of the front steering axle.
- Do NOT move off or drive when load box is raised.
- Prior to moving off make sure that tipping pins connecting the loadbox and the lower frame and the side wall hinge pins are secured against falling out. Check if rear side pouring chute is secure. Check that all sides and tailgate is securely closed.
- 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 connective elements of the hydraulic, pneumatic and electrical systems.

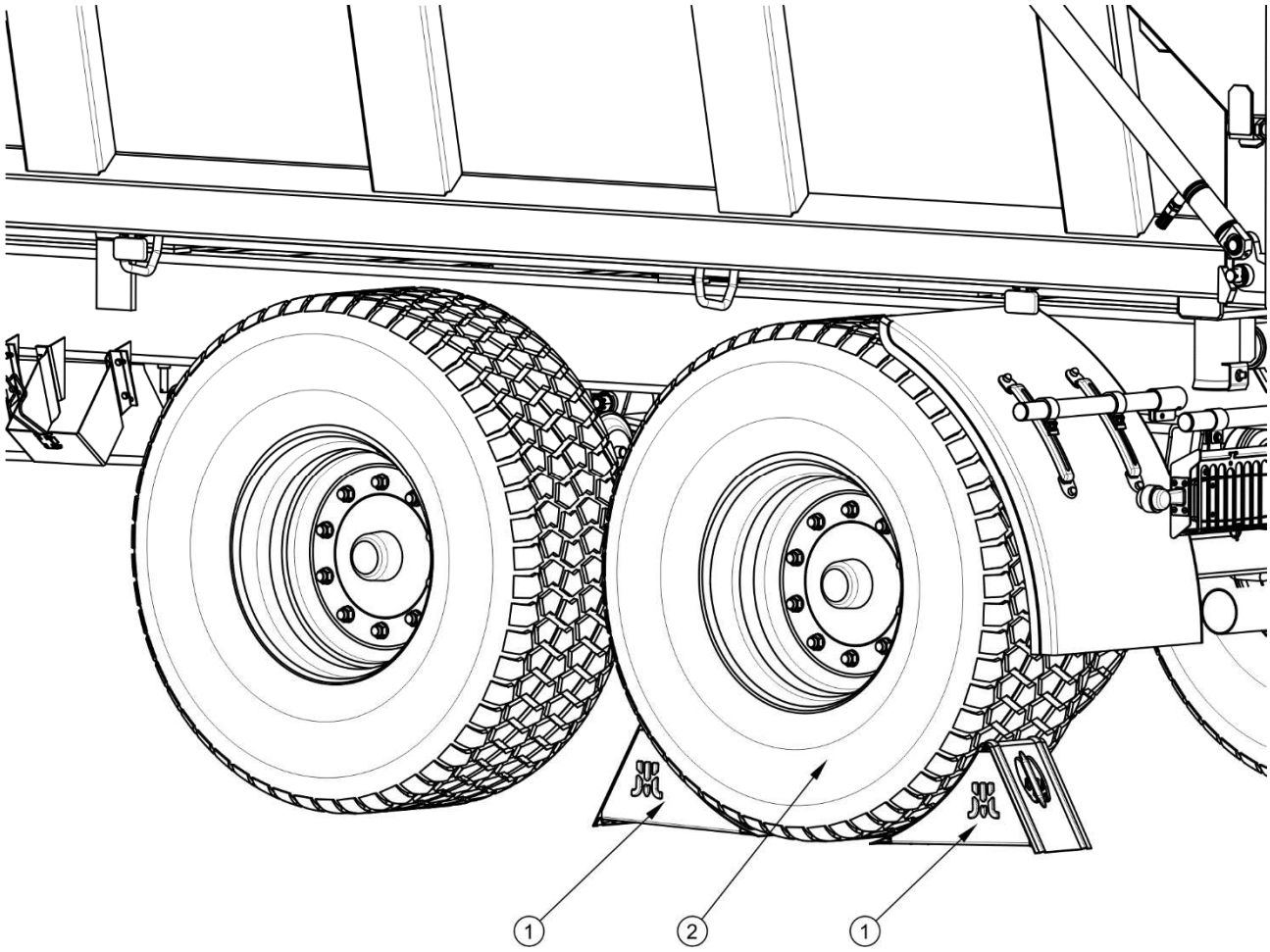


FIGURE 2.1 Method of placing chocks

(1) wheel chock, (2) axle wheel

- Before driving off check that the parking brake is released, the braking force regulator is positioned in the proper position (applies to pneumatic systems with a manual three position regulator).
- The trailer is designed to operate on slopes up to 8° . Driving trailer across ground with 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.
- Periodically drain water from the air tanks in pneumatic system. 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 indicated according to the road traffic regulations. Do NOT transport loads forbidden by the Manufacturer.
- Do NOT exceed the trailer's maximum carrying capacity. Exceeding the carrying capacity may lead to damage to the machine, loss of stability while driving, scattering of the load 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.

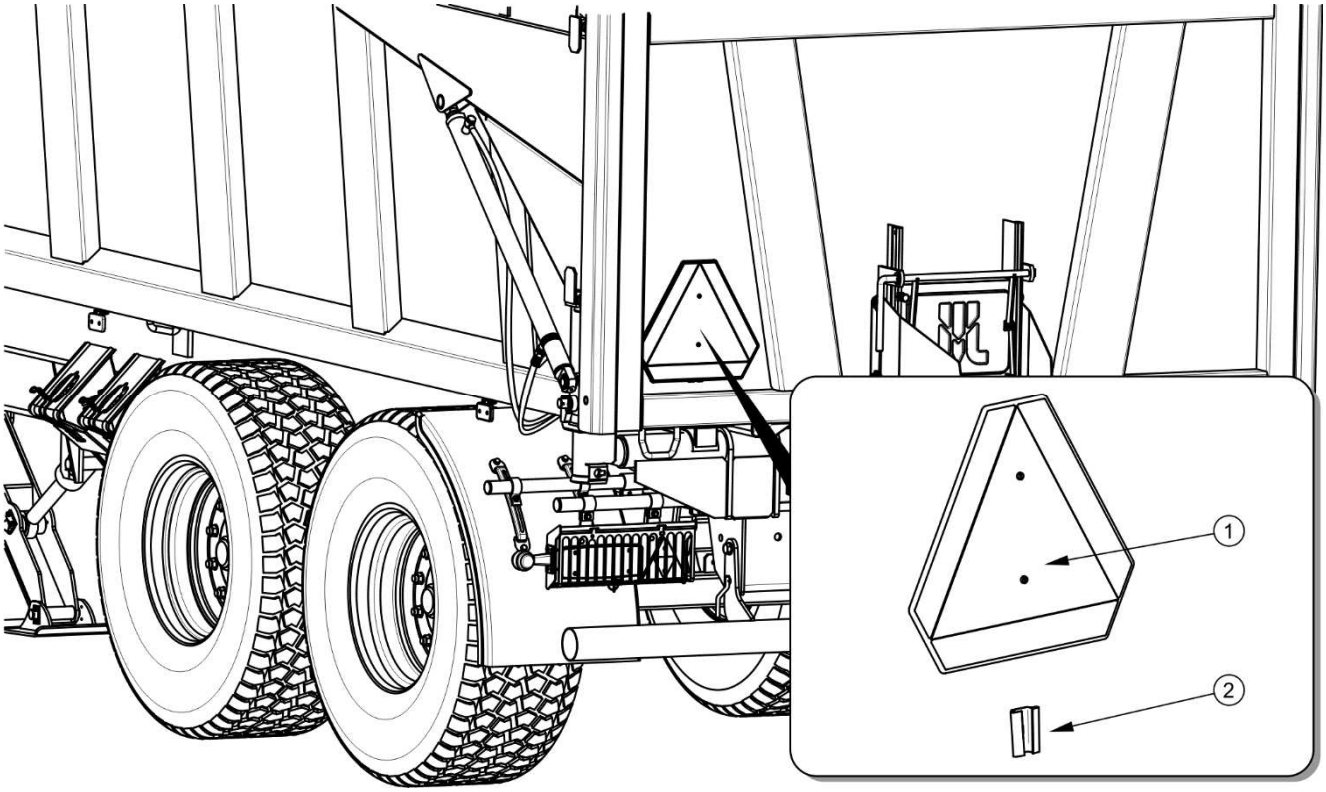


FIGURE 2.2 Mounting place for slow-moving vehicle sign

(1) warning sign, (2) attachment point

- If the trailer is the last vehicle in the group, a slow-moving vehicle sign should be placed on the trailer's rear load box wall - figure *(2.2)*. The warning sign (1) should be attached using the specifically prepared holder (2), riveted to the rear wall of the load box.
- 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.

- During reversing one should use the assistance of another person. During manoeuvring the person helping must stay at a safe distance from the danger zone and be visible all the time to the tractor driver.
- Do NOT attempt to board trailer while travelling.
- Do NOT park trailer on slope.

2.1.7 TYRES

- When working with tyres, the trailer should be immobilised with parking brake and secured against rolling by placing chocks under wheel. 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.
- Inspection of nut tightening should be carried out after first use of trailer, after first travel with load and then after 6 months use. In the event of intensive work, check the nut tightening at least every 100 km. The inspection should be repeated individually if a wheel has been removed from the wheel axle.
- Avoid potholes, sudden manoeuvres or high speeds when turning.
- Check the tyre pressure regularly. Pressure and 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. At high temperatures 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.

2.1.8 MAINTENANCE

- 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 whatsoever, do not use the trailer until the fault has been fixed.
- During work use the proper, close-fitting protective clothing, gloves, protective goggles and appropriate 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 secured using parking brake and in addition chocks should be placed beneath 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 with drawbar and wheel nuts.
- Regularly service machine according to schedule defined by Manufacturer.
- Before beginning work requiring raising of load box, it must be emptied and secured by supports to prevent accidental falling. The trailer must at this time be hitched to the tractor and secured with chocks and parking brake.
- Before beginning repair works 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.
- 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 secured using parking brake and in addition chocks should be placed beneath

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

- During maintenance or repair work trailer may be unhitched from tractor, but secured with chocks and parking brake. During this work the load box may not be raised.
- 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 warranty.
- 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 CO□ 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.
- Exercise caution when climbing on top of the load box. Climbing on top of the load box is possible by use of ladders placed on the front wall, extension and draw bar and also folding steps inside the load box. Components not intended to aid access may not be used for this purpose. Before entering load box prevent trailer moving with parking brake and chocks.

- Do NOT make independent repairs of control valve, brake cylinders, tipping cylinder ram and braking force regulator. In the event of damage to these elements, repair should be entrusted to authorised service point or replace elements with new parts.
- Do NOT make repairs to drawbar (straightening, repairing or welding). A damaged drawbar must be replaced.
- 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.

2.2 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,
- not maintaining safe distance during loading or unloading of trailer,
- operation of the trailer by persons under the influence of alcohol,
- 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:

- prudent and unhurried operation of the machine,
- reasonably apply all the remarks and recommendations stated in the Operator's Manual,

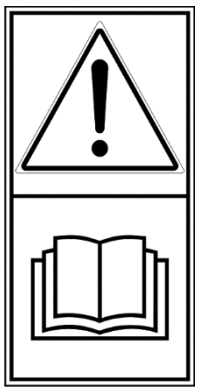
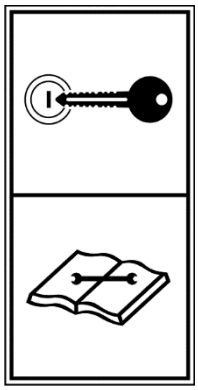
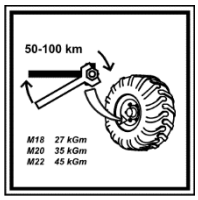
- maintain safe distance from forbidden or dangerous places during unloading, loading and hitching trailer,
- carry out repairs and maintenance work in line with operating safety rules,
- carry out repair and maintenance work by persons trained to do so,
- use close fitting protective clothing, and appropriate tools,
- ensure unauthorised persons have no access to the machine, especially children,
- maintain safe distance from prohibited or dangerous places,
- a ban on being on the machine during travel, loading or unloading.

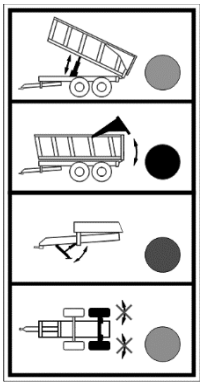
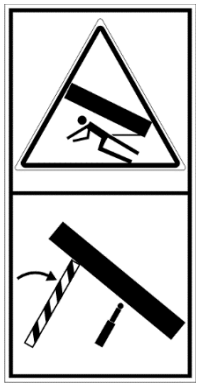
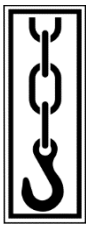
2.3 INFORMATION AND WARNING DECALS

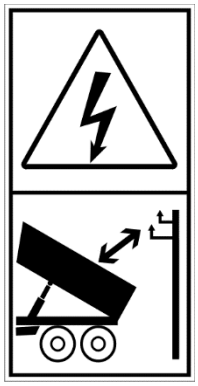
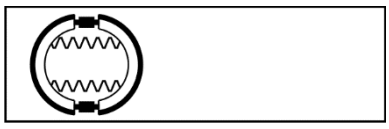
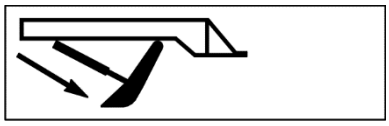
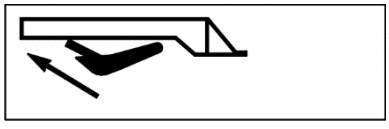
The trailer is labelled with the information and warning decals mentioned in table (*2.1)*. The symbols are positioned as presented in figure (*2.3*). Throughout the time it is in use, the user of the machine is obliged to take care that notices and warning and information symbols located on the trailer are clear and legible. In the event of their destruction, they must be replaced with new ones. Safety decals are available from your PRONAR dealer or directly from PRONAR customer service. New assemblies, changed during repair, must be labelled once again with the appropriate safety signs. During trailer cleaning do not use solvents which may damage the coating of information label stickers and do not subject them to strong water jets.

TABLE 2.1 Information and warning decals

ITEM	DECAL	MEANING
1	T669/1 PRONAR	Trailer version.

ITEM	DECAL	MEANING
2		Caution! Before starting work, carefully read the Operator's Manual.
3		Before beginning servicing or repairs, turn off tractor engine and remove key from ignition Ensure that unauthorised persons do not have access to the tractor cab.
4		Grease the trailer according to the recommendations in the Operator's Manual
5		Regularly check if the nuts and bolts fixing the wheels and other components are properly tightened.

ITEM	DECAL	MEANING
6		Line functions. Tipping the load box Plug stopper - blue Raising / lowering the tailgate Plug cap - black Hydraulic support Plug cap - blue Rear axle lock Plug cap - green
7		Danger of crushing Do NOT perform any maintenance or repairs on the load box that is loaded, raised or not supported.
8		Transport decal Anchorages for the transport
9		Danger of crushing Maintain a safe distance during opening and closing the tailgate.

ITEM	DECAL	MEANING
10		Caution! Danger of electric shock. Keep a safe distance from overhead electric power lines during unloading.
11		Air pressure in the tyres. [1]
12		Positions of control valve controlling work of hydraulic tipping system (1 or 2 trailers).
13		Line supplying hydraulic brake system.
14		Line supplying hydraulic tipping system.
15		Shear type drawbar support hydraulic system supply line (lowering)
16		Shear type drawbar support hydraulic system supply line (raising)

[1] – pressure value should be adapted to tyres

Numbers in the item column correspond to labels in figure (2.3)

Decal (12) is placed near the hydraulic valve. Decals (13)-(16) are placed on the hydraulic lines.

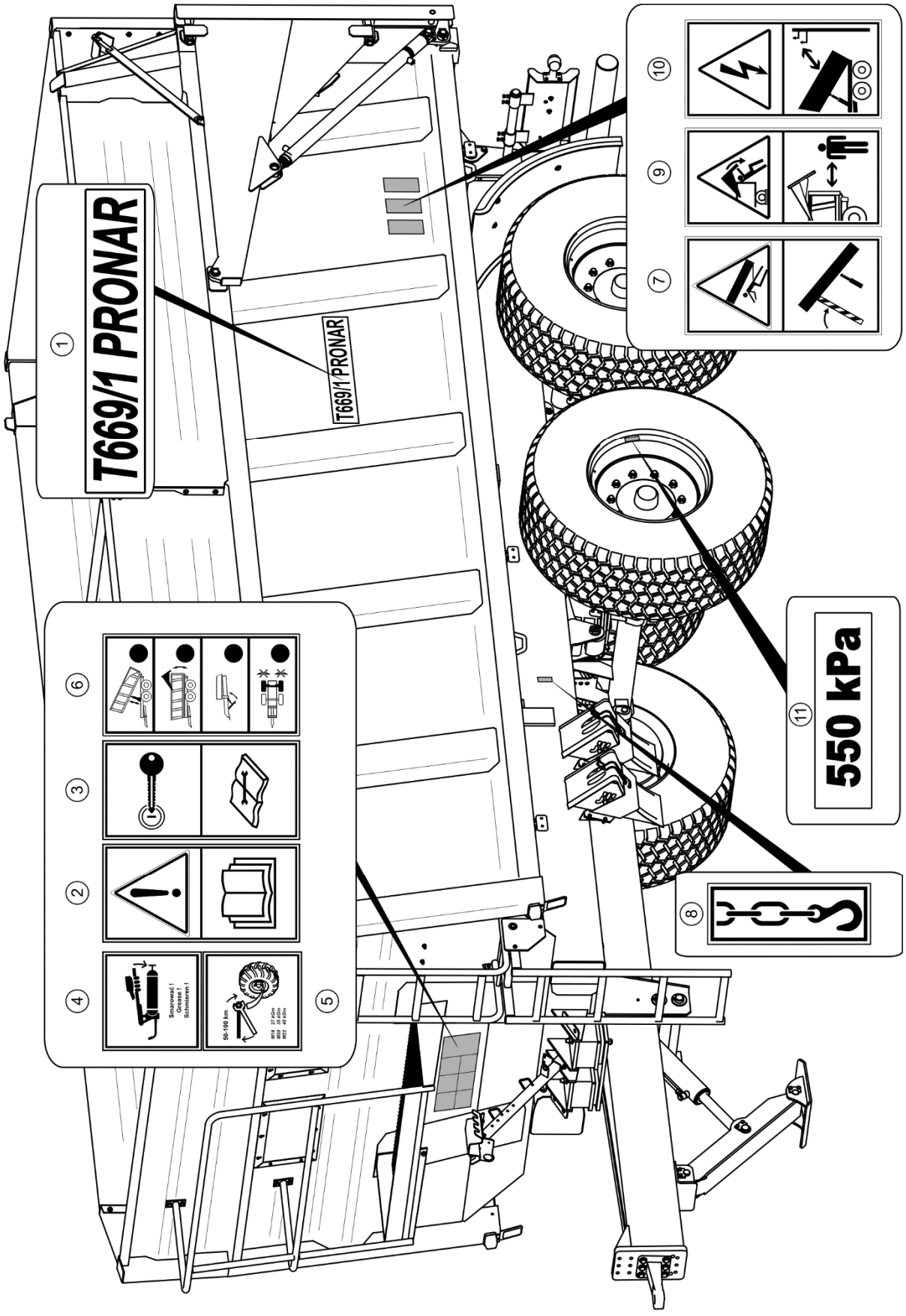


FIGURE 2.3 Locations of information and warning decals.

SECTION

3

DESIGN AND OPERATION

3.1 TECHNICAL SPECIFICATION

TABLE 3.1 Basic technical specification

CONTENTS	UNIT	T669/1
Trailer dimensions		
Total length	mm	7,255
Total width	mm	2,550
Total height	mm	3,160
Internal load box dimensions		
Length	mm	5,500
Width (front)	mm	2,200
Width (rear)	mm	2,250
Height	mm	1,200 + 580
Weight and carrying capacity		
Tare weight	kg	6,000
Maximum gross weight	kg	20,000
Maximum carrying capacity	kg	14,000
Other information		
Wheel track	mm	1,960
Maximum drawbar load	kg	2,000
Cargo capacity	m^3	22.7
Load surface	m^2	12.4
Lift of load surface	mm	1,435
Load box tipping angle		
- to the rear	(°)	50
- to the sides	(°)	45
Electrical system voltage	V	12
Hydraulic oil demand	l	29
Tractor power demand	kW / Horsepower	76.4 / 104
Maximum design speed	km/h	40
Noise emission level	dB	below 70

3.2 TRAILER CONSTRUCTION

3.2.1 CHASSIS

Trailer chassis consists of sub-assemblies indicated on figures (*3.1*) and *(3.2).* The lower frame (1) is a structure welded from steel shapes. It may be available in two variants depending on the unloading direction of the load box.

The main support elements are two longitudinal members connected with crossbars. In the middle section there are sockets (11) used for mounting the tipping hydraulic cylinder. In front of the sockets of the ram cylinder is mounted the load box support (9). At the rear part of the lower frame there is rear beam (18) terminated with ball pins. Hydraulic and pneumatic system sockets are mounted on the beam for connecting a second trailer. The support structure of the upper frame allows tipping of the load box to one of the sides and to the rear, depending on the lower frame design. The rear hitch (6) is bolted to the beam to enable coupling the second trailer (biaxial). A pin with diameter of ∅33 mm is suitable for connecting with drawbar eye of ∅40 mm. In the rear section of the chassis there are two lights support beams (12) and 13, and rear fender (5).

Trailer suspension consists of two wheel axles (4), in a tandem arrangement suspended on taper leaf springs (7) connected by rocker arm (8). Axles are secured to suspension springs using absorber plates and U bolts. Axles are made from square bars terminated with a pin, where wheel hubs are mounted on cone bearings. The wheels are single, equipped with brake shoes activated through mechanical expander cams.

In front there is a drawbar (2) to which shear type drawbar support is mounted (3). Drawbar is bolted to the drawbar front plate. Three types of drawbars are available: rotating drawbar (15) with eye of ∅50 mm (standard equipment), K80 ball drawbar (16) (optional equipment), fixed drawbar (17) with eye of ∅40 mm diameter (optional equipment).

Tandem chassis can be optionally equipped with a rear steering axle which improves the tractor and trailer driving comfort on 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. When driving forward, the front axle follows the path of the tractor, because the trailer wheels are directed in the opposite direction than the front wheels of the tractor.

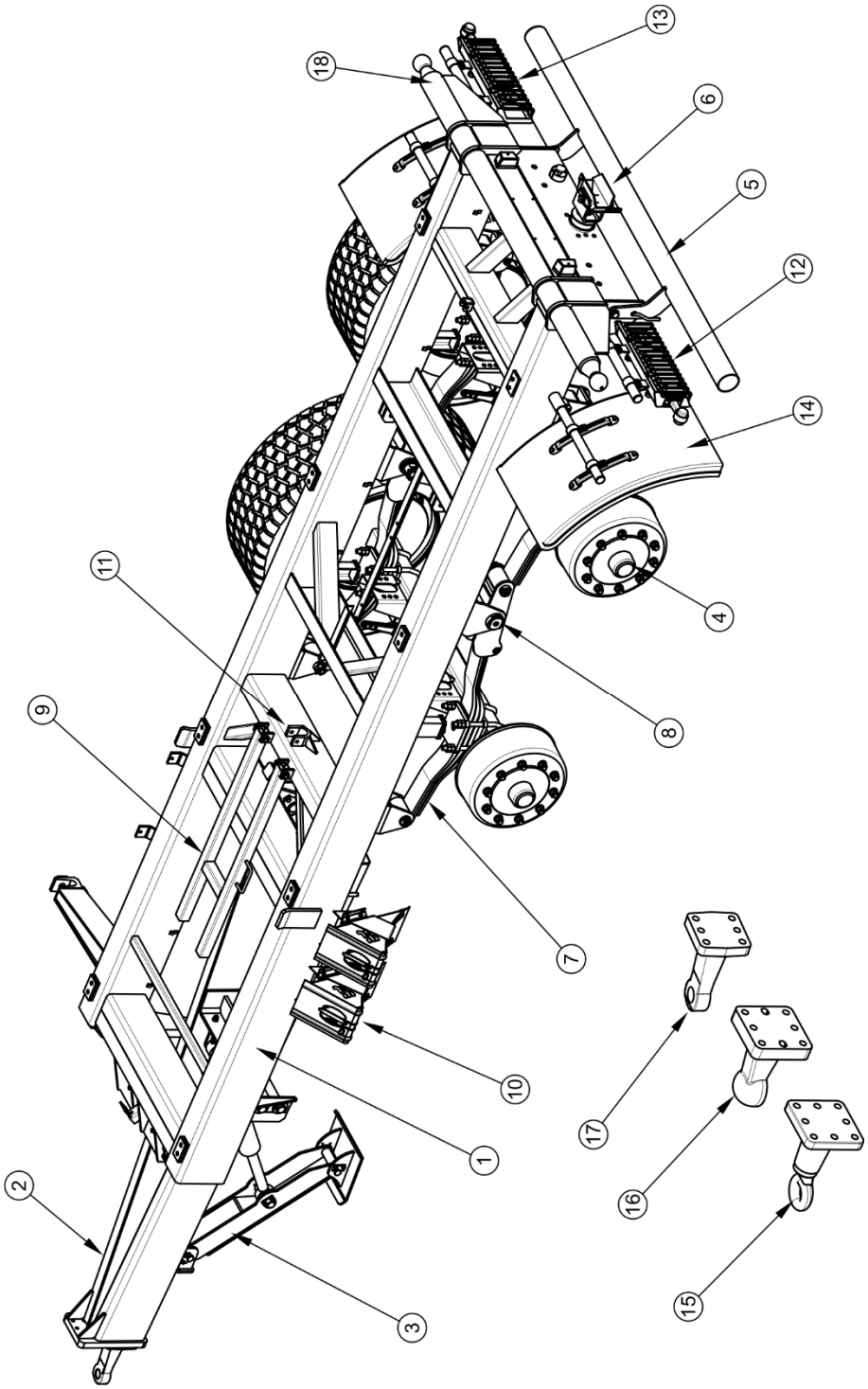


FIGURE 3.1 Trailer chassis

(1) lower frame, (2) drawbar, (3) shear type support, (4) wheel axle, (5) rear fender, (6) rear hitch, (7) leaf spring shock absorber, (8) shock absorber rocker arm, (9) load box support, (10), wheel chocks, (11) tipping ram cylinder mounting socket, (12) left lights support beam, (13) right lights support beam, (14) mudguard, (15) rotating drawbar, (16) ball drawbar, (17) fixed drawbar, (18) rear beam

3.2.2 LOAD BOX

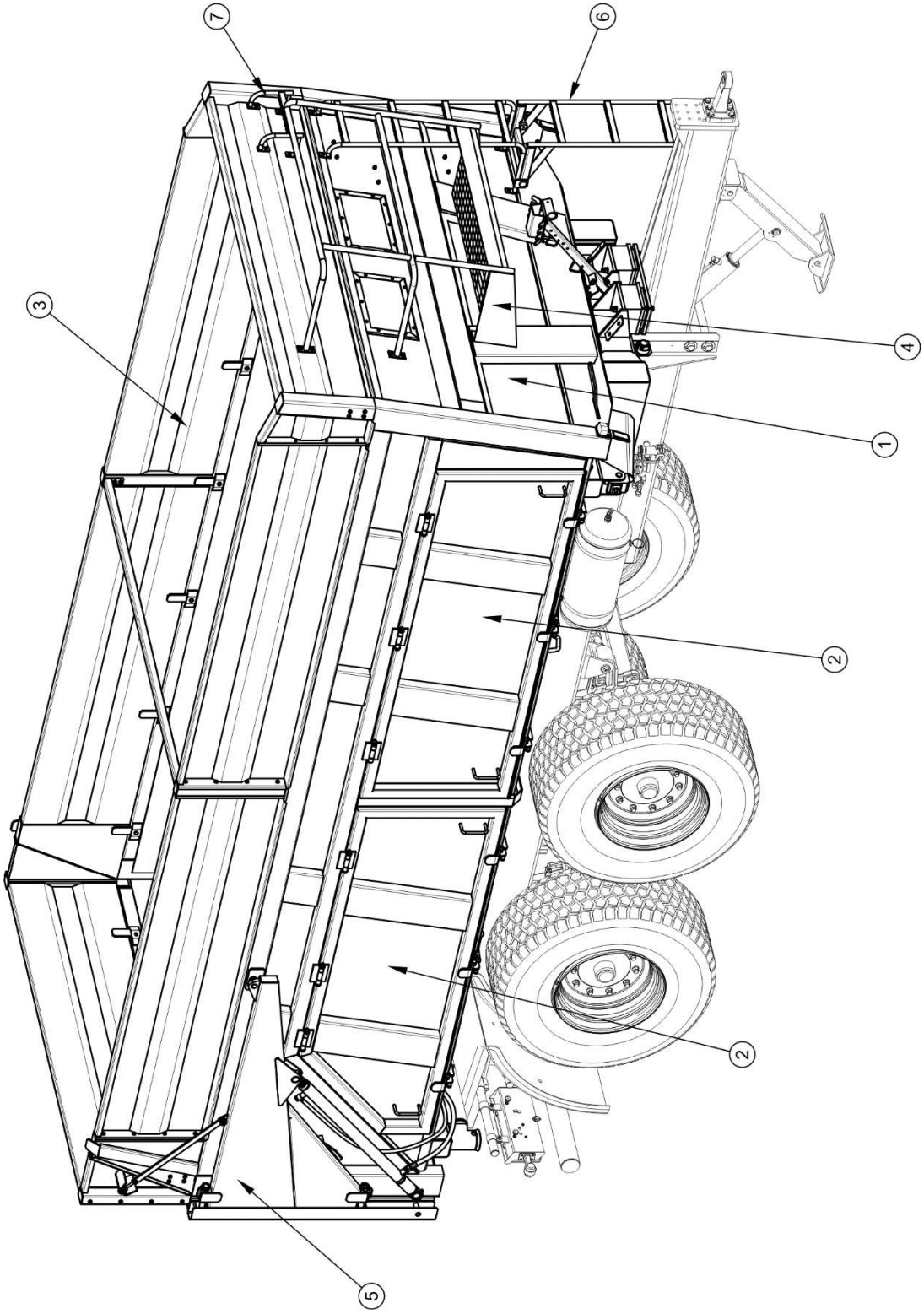


FIGURE 3.2 Load box

(1) load box, (2) side gate, (3) side extensions 580 mm, (4) fenced platform, (5) tailgate, (6) lower ladder, (7) wall extension ladder

The trailer load box (1) is a welded structure made from steel sheet and shapes. Depending on tipping direction, the load box is equipped with two centrally bolted side gates (2) on the unloading side – figure *(3.2)*. To ensure smooth unloading to the rear it is in a shape of a cone. The width of the side walls extends gradually towards the rear, which increases the width by 5 cm. The load box is equipped with 580 mm-high wall extensions (3).

The load box is mounted on sockets of the rear beam and on the bracket welded to the front section of the lower frame. These sockets are swivel points during the tipping of the load box to the rear or sideways – compare figure *(3.1)*. The chosen tipping direction is achieved by positioning the pin in the appropriately profiled socket opening, the construction of which prevents their inappropriate placing by trailer operator.

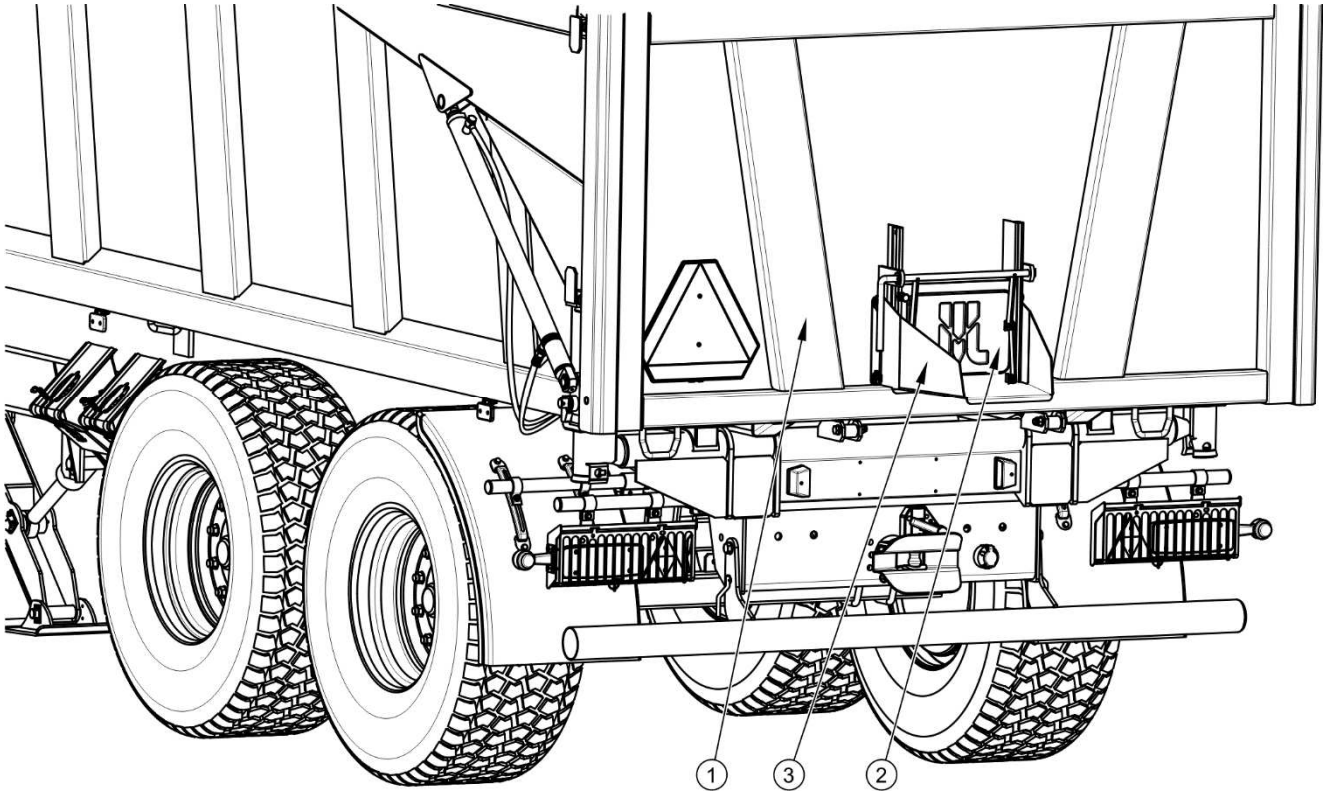


FIGURE 3.3 Rear wall slide gate

(1) tailgate, (2) slide gate, (3) chute

Access ladders (6) and (7) are secured to the front wall and extension. Folding steps are bolted on the inner side of the front wall to facilitate climbing into the load box. Fenced platform *(4)* and frame with tarpaulin cover can be ordered as accessories.

In the rear part of the load box there is the tailgate *(5)* which is opened and closed using hydraulic cylinders.

In order to enable more precise unloading of loose materials there is a slide gate opening (2) – figure (*3.3*), placed in the tailgate. A chute (3) for the trailer, secured under the lower edge of the slide opening may be supplied as additional equipment.

As an option, 1,000 mm silo wall extensions or 580 mm wall extensions with the net protection can be installed on the trailer.

3.2.3 MAIN BRAKE

The trailer is equipped with one of four types of main brake:

- single line pneumatic system with three position regulator, figure (*3.4*),
- double line pneumatic system with three position regulator, figure (*3.5*),
- double line pneumatic system with automatic regulator, figure (*3.6*),
- hydraulic brake system, figure (*3.7*).

The pneumatic or hydraulic brakes are activated from the tractor driver's cab by pressing on the brake pedal. The function of the control valve (2) - figures *(3.4)*, *(3.5)* and *(3.6)*, is the operation of the trailer's brakes simultaneously when tractor's brakes are applied. Furthermore, in case of an inadvertent disconnection of the line between the trailer and the tractor, the control valve will automatically activate trailer's brakes. Valve used in the system is equipped with a circuit causing the brakes to be applied when trailer is disconnected from the tractor, (compare with figure *(3.8)*. When compressed air line is connected to the tractor, the device automatically applying the brakes now changes its position to allow normal brake operation.

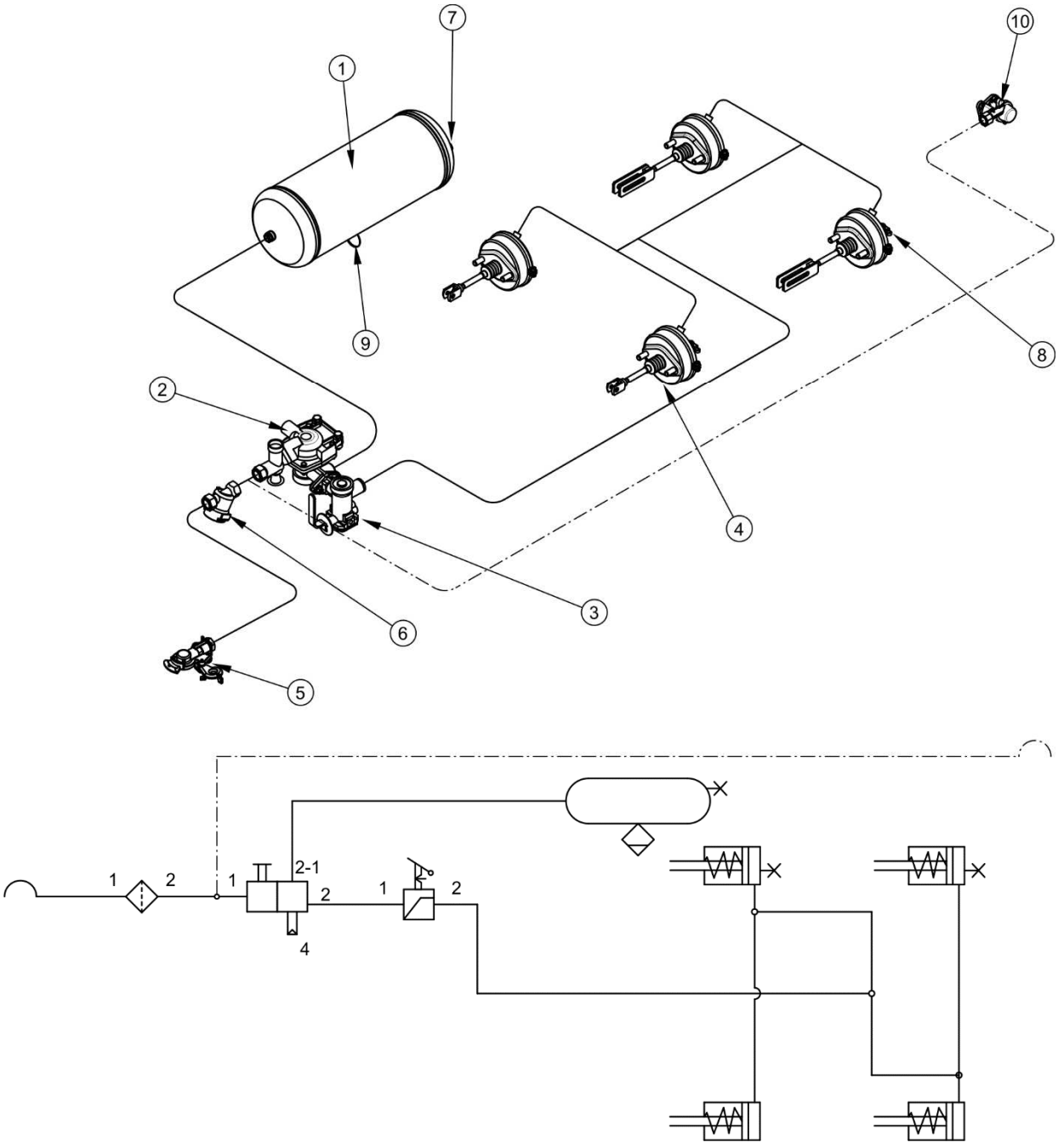


FIGURE 3.4 Design and diagram of the single conduit pneumatic brake system

(1) air tank, (2) control valve, (3) manual brake force regulator, (4) pneumatic ram, (5) line connectors, (6) air filter, (7) pneumatic ram control connectors, (8) pneumatic ram piston control connector, (9) drain valve, (10) socket (black) - option

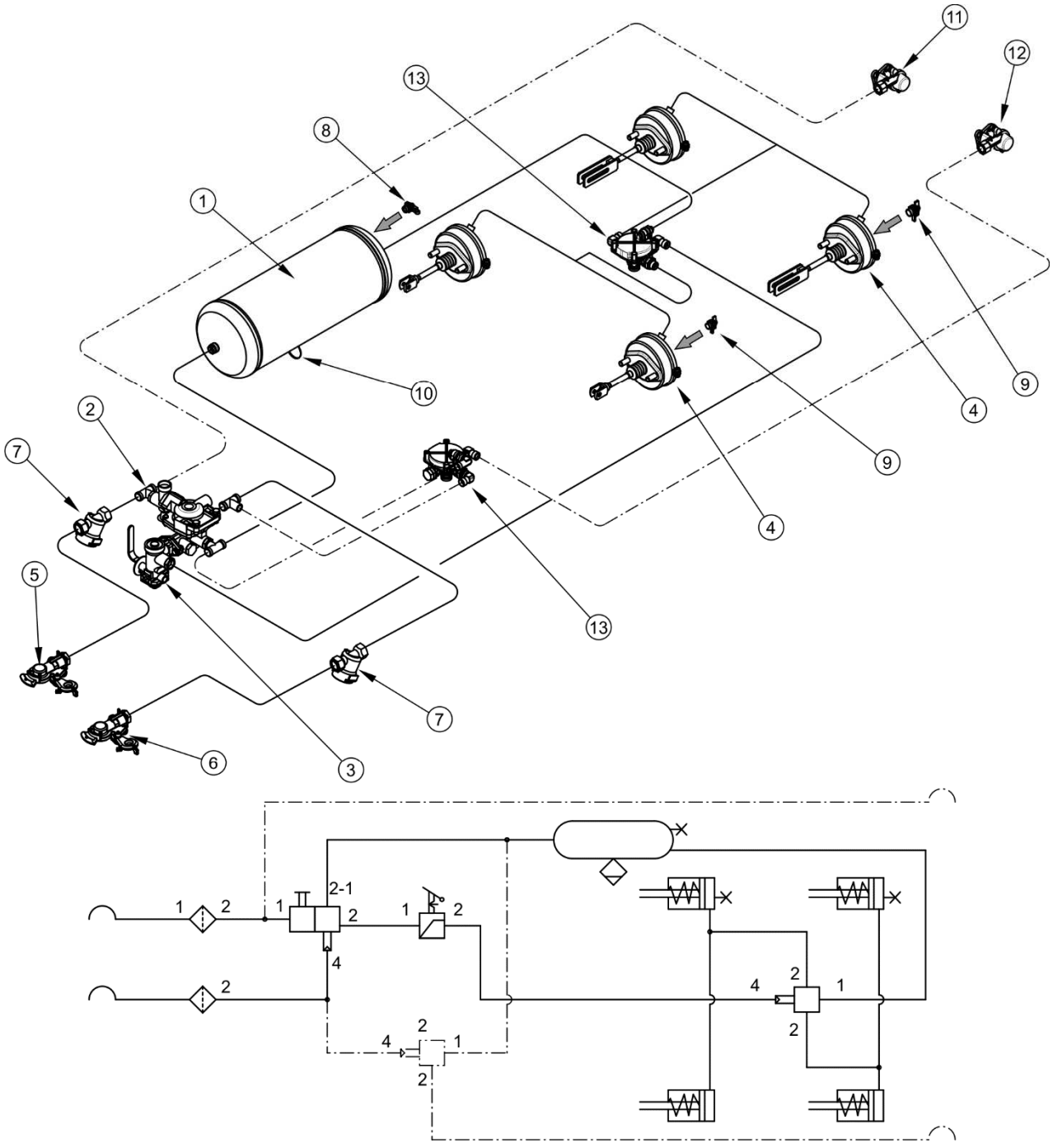


FIGURE 3.5 Design and diagram of the *double conduit* pneumatic brake system.

(1) air tank, (2) control valve, (3) manual brake force regulator, (4) pneumatic cylinder, (5) line connector (red), (6) line connector (yellow), (7) air filter, (8) air tank control connector, (9) pneumatic cylinder control connector, (10) drain valve, (11) socket (red) - option, (12) socket (yellow) - option, (13) relay valve.

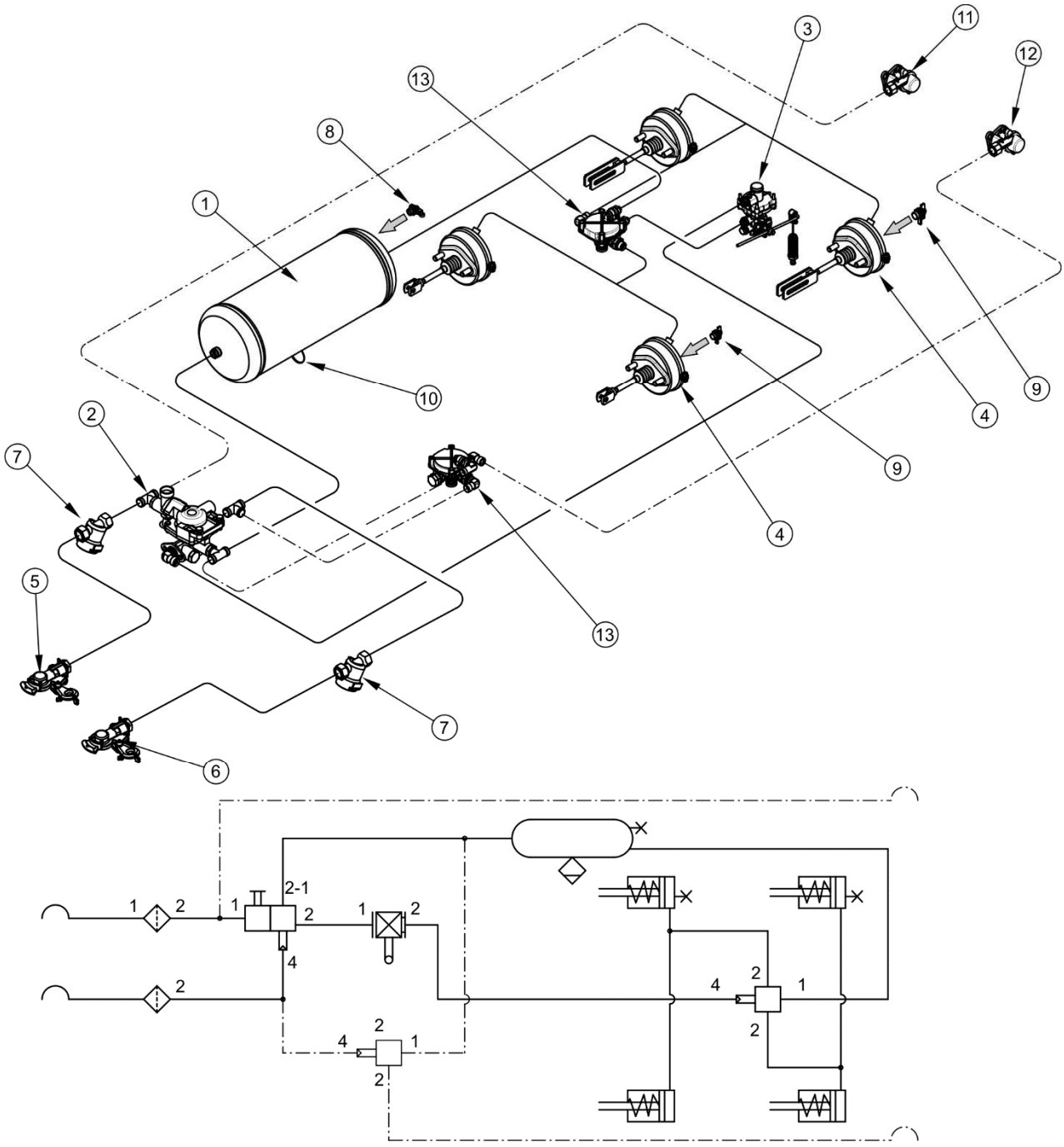


FIGURE 3.6 Design and system diagram of *double line pneumatic brake with automatic regulator*

(1) air tank, (2) control valve, (3) automatic brake force regulator, (4) pneumatic cylinder, (5) line connector (red), (6) line connector (yellow), (7) air filter, (8) air tank control connector, (9) pneumatic cylinder control connector, (10) drain valve, (11) socket (red) - option, (12) socket (yellow) - option, (13) relay valve.

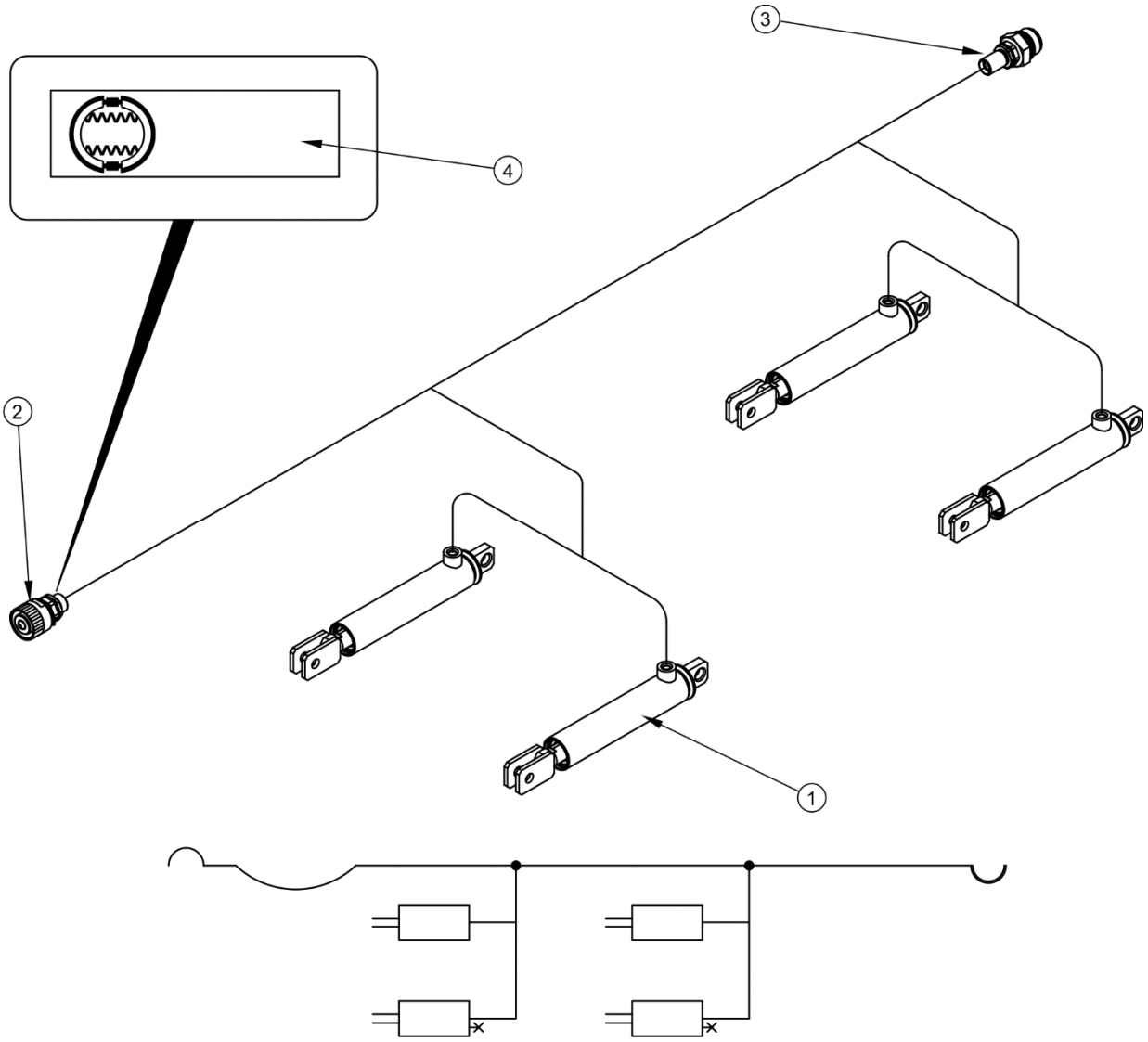


FIGURE 3.7 Design and diagram of hydraulic braking system

(1) hydraulic cylinder, (2) hydraulic quick coupler, (3) hydraulic socket, (4) information decal

Three-step brake force regulator (2)- figure *(3.8)*, adjusts braking force depending on setting. Switching to a suitable working mode is done manually by machine operator using the lever (4) prior to moving off. Three working positions are available: A - "no load", B - "half load" and C - "full load".

For systems with automatic regulator, braking force depends on trailer load.

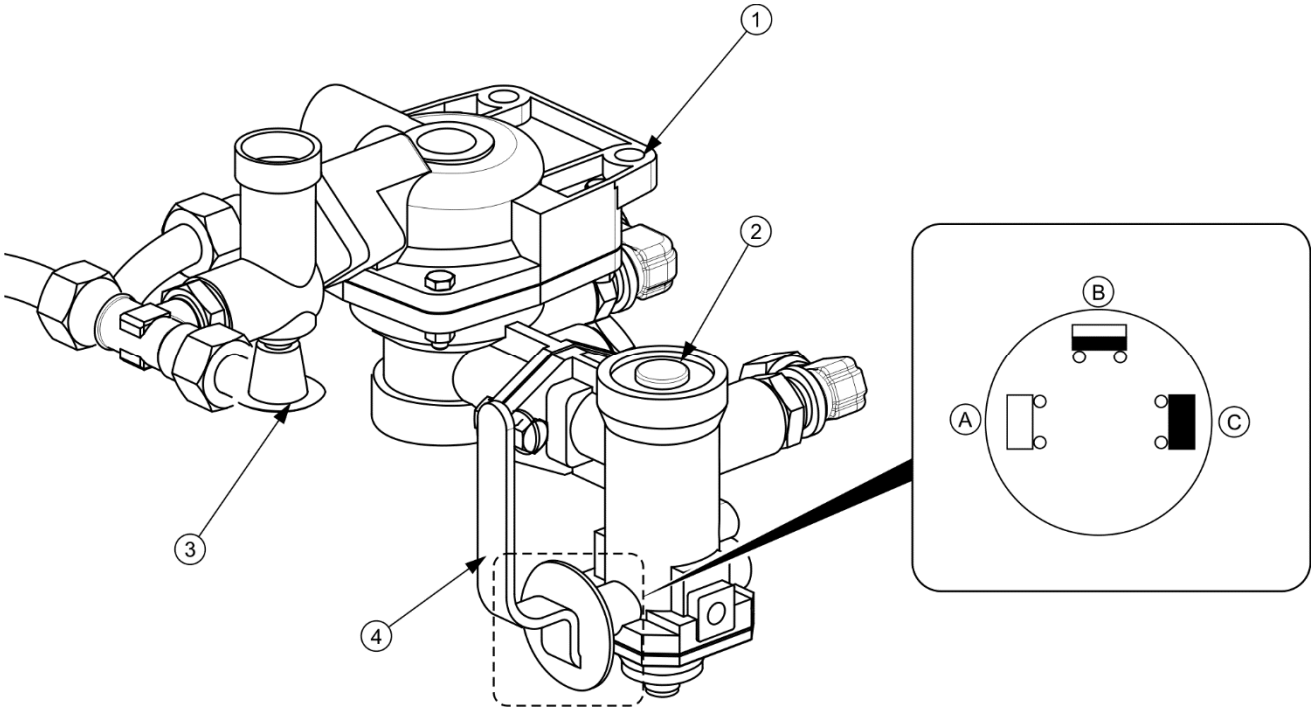


FIGURE 3.8 Control valve and brake force regulator

(1) control valve, (2) brake force regulator, (3) trailer parking brake release button, (4) work selection regulator lever, (A) position "NO LOAD", (B) position "HALF LOAD", (C) position "FULL LOAD"

3.2.4 HYDRAULIC TIPPER SYSTEM

Hydraulic tipping system serves in 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's hydraulic system. Hydraulic oil selective control valve of the tractor's external hydraulic system is used to control the load box tipping mechanism.

The trailer system consists of two independent circuits:

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

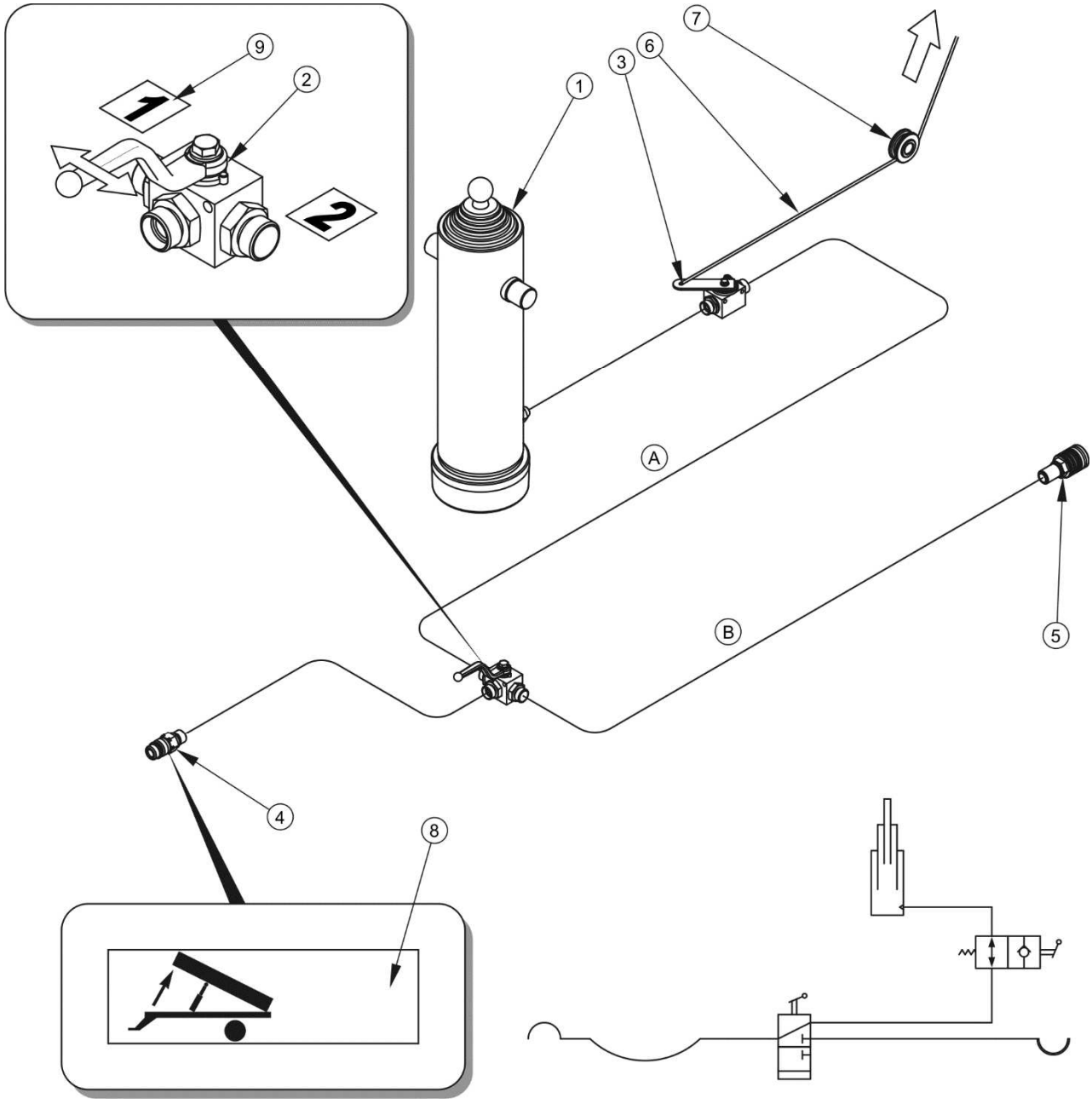


FIGURE 3.9 Hydraulic tipping system construction and diagram

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

Three-way valve (2) – figure (*3.9*) is used to activate these circuits. This valve's lever can be placed in two positions:

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

On the connection line, in the vicinity of socket (4) there is a decal (8) identifying the supply line of the hydraulic system tipping circuit.

IMPORTANT

Cut-off valve (3) – figure (3.9) limits the tipping angle of the load box when tipped to the sides and to the rear. The length of the control cable (6) controlling this valve is factory adjusted by the Manufacturer and must not be changed when the trailer is used.

TIP

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

3.2.5 SHEAR TYPE DRAWBAR SUPPORT HYDRAULIC SYSTEM

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). Identification decals are placed on the support lowering lines in the vicinity of connectors (item 15 - Table *(2.1)*) and support raising line (item 16 - Table *(2.1*)).

Raising or lowering the support is done by extending or retracting the hydraulic cylinder piston rod (4). Hydraulic oil selective control valve of the tractor's external hydraulic system is used to control the support cylinder.

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

TIP

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

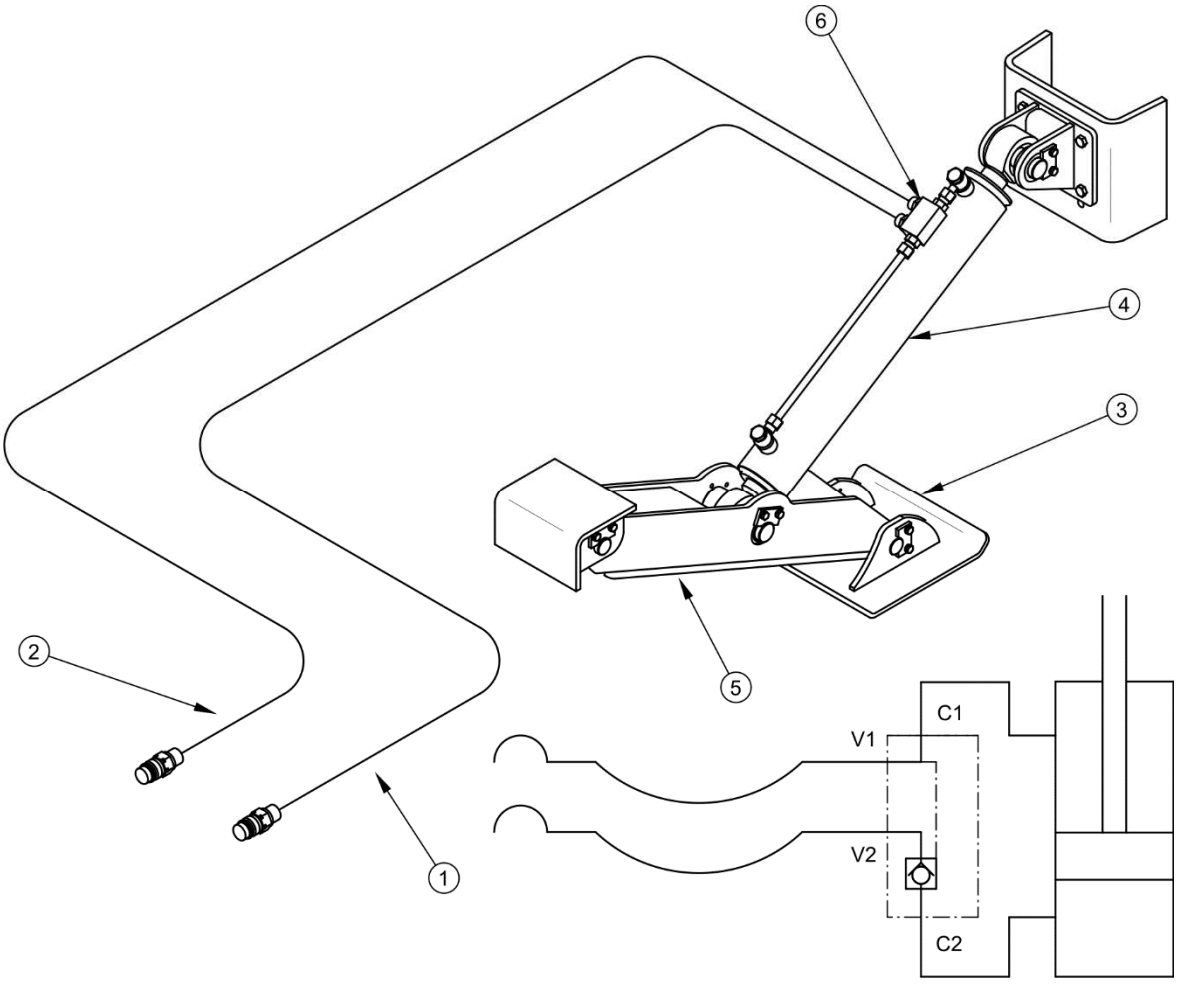


FIGURE 3.10 Design and diagram of the shear type support hydraulic system

(1), (2) hydraulic line, (3) support leg, (4) hydraulic cylinder, (5) support arm, (6) hydraulic lock

3.2.6 TAILGATE HYDRAULIC SYSTEM

Tailgate hydraulic system is used to raise and lower the trailer tailgate and control the operation of locking hooks (4).

The hydraulic system is supplied with oil from the tractor external hydraulic system. Through hydraulic lines (2) terminated with quick-couplers pressurised oil is fed to hydraulic cylinders (1), which open or close the tailgate.

Tailgate is controlled from the cab through the hydraulic selective control valve lever on the tractor. When raising the tailgate the locking hooks (4) unlock the tailgate, then cylinders raise it with two wings (5). When closing the tailgate, cylinders lower it and in the final stage locking hooks (4) lock it securely.

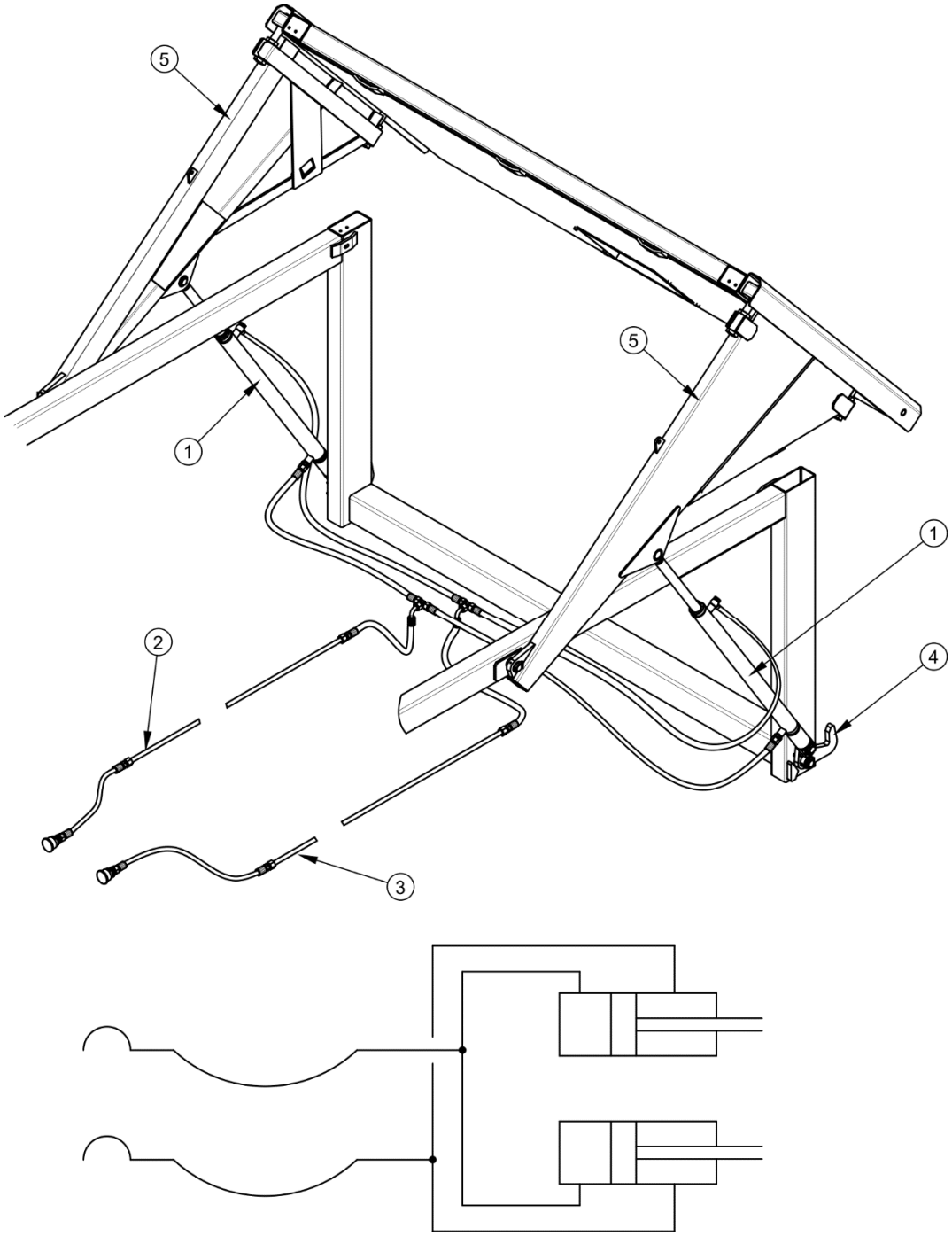


FIGURE 3.11 Tailgate hydraulic system construction and diagram

(1) hydraulic cylinder, (2) supply line, (3) return line, (4) locking hook, (5) tailgate wing

3.2.7 TURNING INTERLOCK HYDRAULIC SYSTEM

Turning interlock hydraulic system locks the rear steering axle (option) when reversing the trailer. The hydraulic system is supplied with oil from the tractor external hydraulic system. Through a hydraulic line (2) terminated with a quick coupler pressurised oil is supplied to hydraulic cylinders (1). Extending cylinder piston locks turning rear axle wheels.

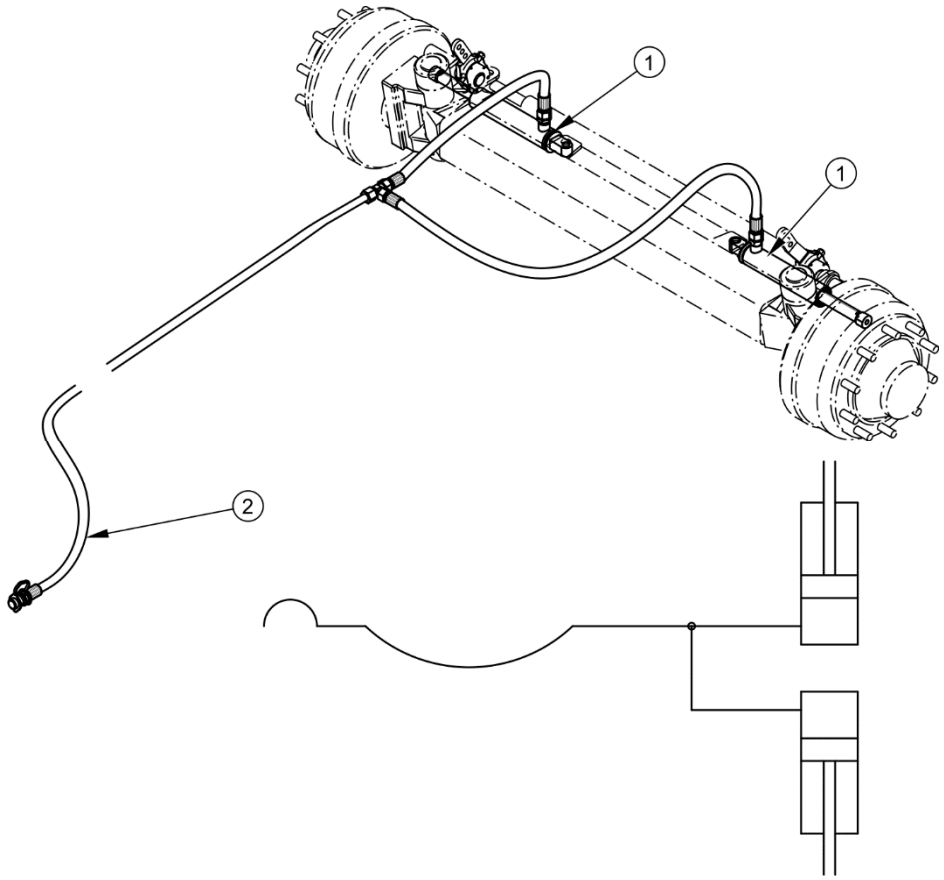


FIGURE 3.12 Construction and design of steering lock hydraulic system

(1) hydraulic cylinder, (2) hydraulic supply line

3.2.8 PARKING BRAKE

The parking brake is for immobilising trailer while standing motionless. System construction is shown in Figure *(3.13).* The brake crank mechanism (2), is welded on the left lower longitudinal frame on the front of the trailer. Wheel axle expander arm levers (1) are connected to the lever (5) by means of cable II (4) through guide rollers (6). Lever (5) is connected to the brake crank mechanism (2) by means of steel cable I (3).

Tensioning cable I (3) (turning the crank mechanism clockwise), causes deflection of the lever (5) and tension of cable II (4) causing a deflection of the brake expander arms (1), which immobilize the trailer by parting the brake shoes.

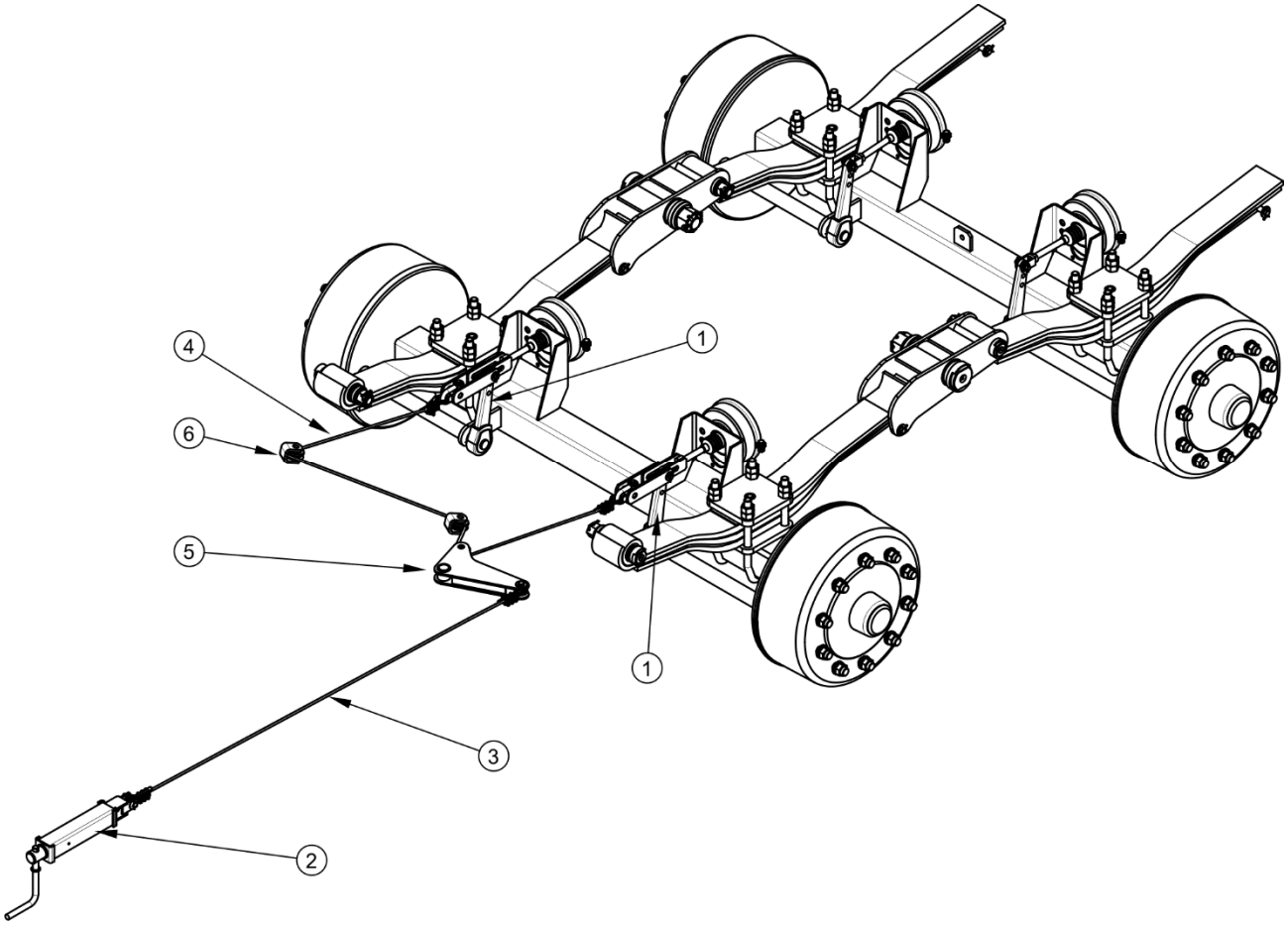


FIGURE 3.13 Parking brake design

(1) expander arm, (2) brake crank mechanism (3) steel cable I, (4) steel cable II (5) lever, (6) guide roller

3.2.9 LIGHTING SYSTEM

The trailer electrical system is designed for supply from direct current source of 12 V. Connection of the trailer electrical system with the tractor should be made through an appropriate connection lead.

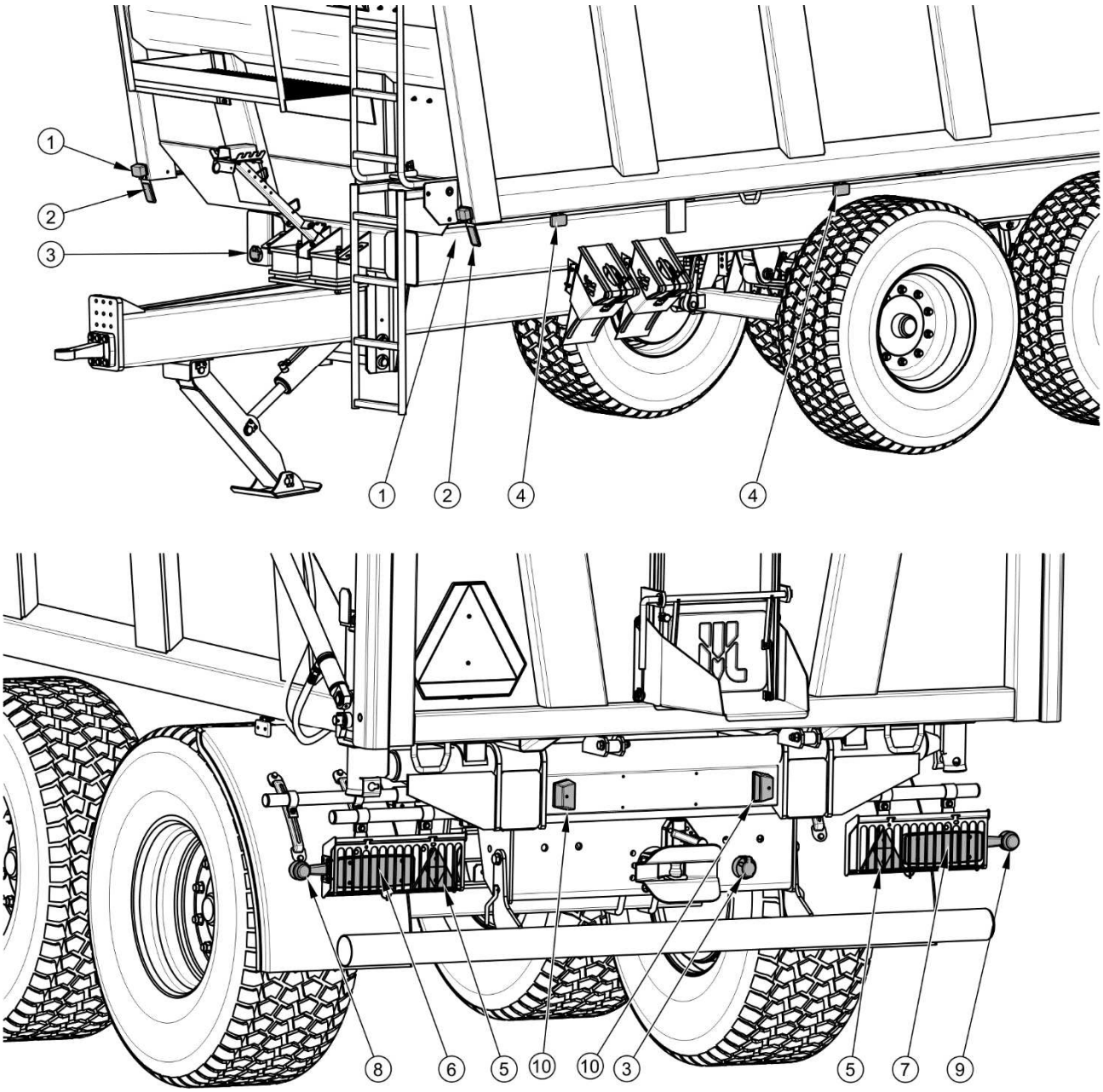


FIGURE 3.14 Positioning of electrical components and reflective lights

(1) front position lamp, (2) white front reflector, (3) 7-pin socket, (4) side position lamp, (5) triangular rear reflector, (6) rear left lamp assembly, (7) rear right lamp assembly, (8) rear left clearance lamp, (9) rear right clearance lamp, (10) license plate light

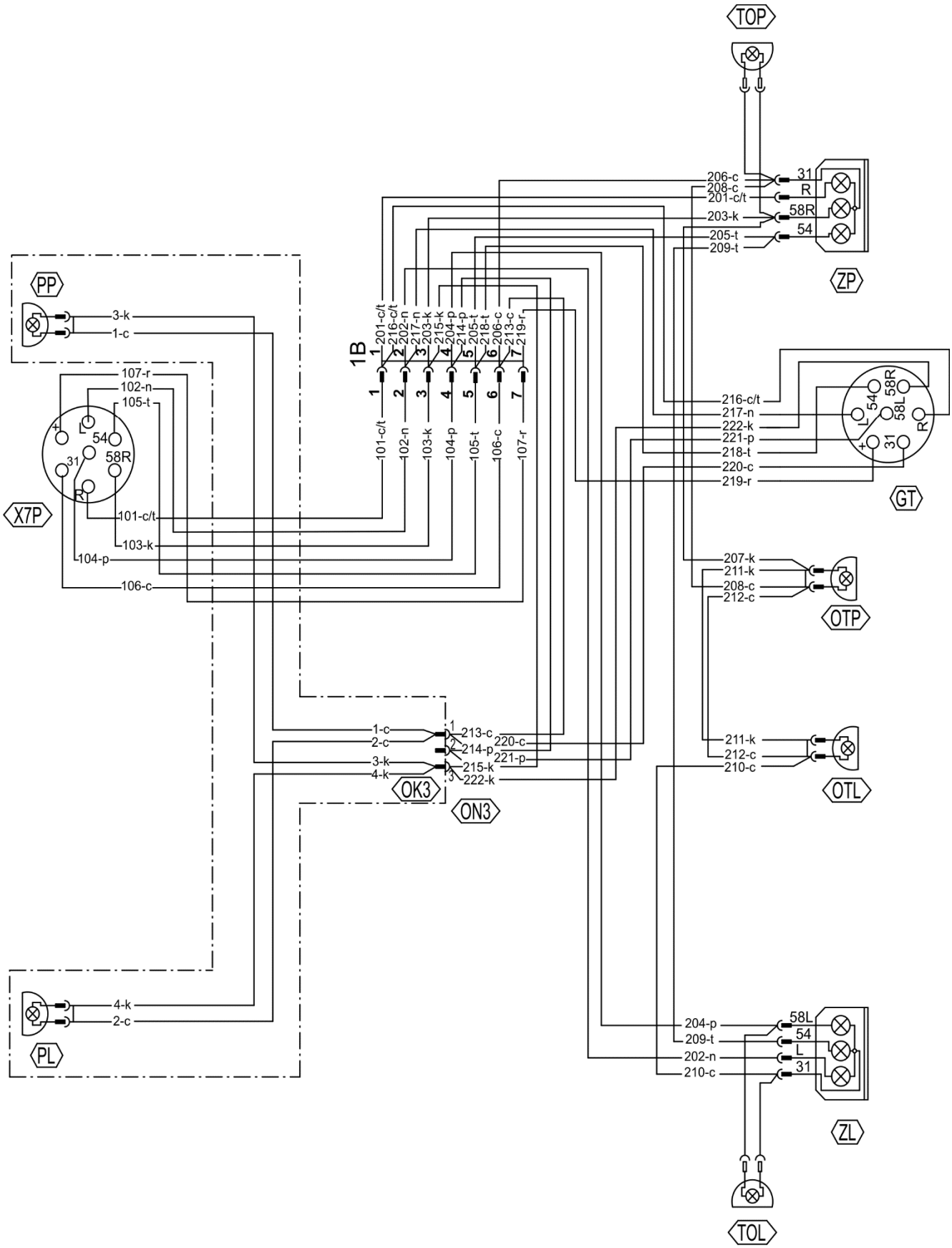

TOP
ZP
GT
OTP
OTL
ZL
TOL
PP
PL
X7P
OK3
ON3
1B
206-c
208-c
201-c/t
203-k
205-t
209-t
31
R
58R
54
216-c/t
217-n
222-k
221-p
218-t
220-c
219-r
58L
L
207-k
211-k
212-c
210-c
204-p
202-n
3-k
1-c
2-c
4-k
107-r
102-n
105-t
101-c/t
103-k
104-p
106-c
213-c
214-p
215-k

FIGURE 3.15 Electrical system schematic diagram, the versions without the side lamps

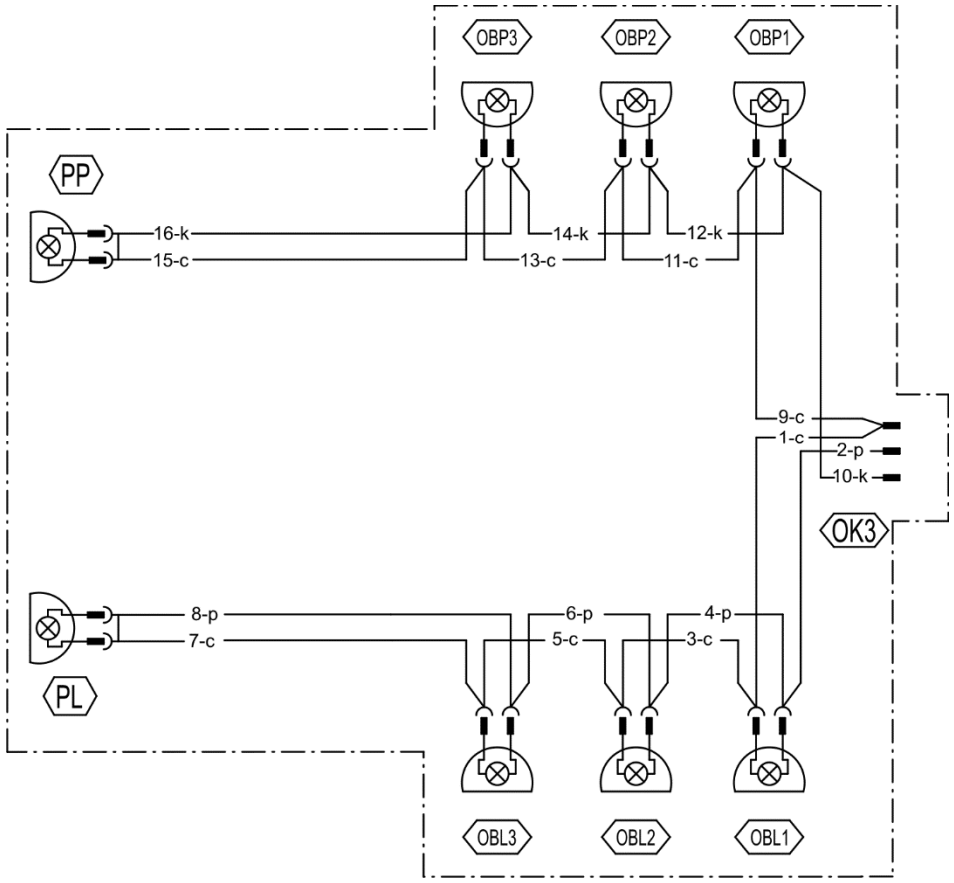


FIGURE 3.16 Schematic diagram of side lamp wiring harness electrical system

Marking according to table (3.2), (3.3) and (3.4)

TABLE 3.2 List of electrical component markings

SYMBOL	NAME
ZP	Rear right lamp assembly
ZL	Rear left lamp assembly
X7P	Front seven pin socket
GT	Rear seven pin socket
OTP	Right license plate light
OTL	Left license plate light
PP	Front right parking light

SYMBOL	NAME
PL	Front left parking light
TOP	Rear right clearance light
TOL	Rear left clearance light
OBL	Left clearance lamp
OBP	Right clearance lamp

TABLE 3.3 Marking of connections of GT and X7P sockets

MARKING	FUNCTION
31	Weight
+	Power supply +12V (not used)
L	Left indicator
54	STOP light
58L	Rear left parking light
58R	Rear right parking light
R	Right indicator

TABLE 3.4 Line colour marking

MARKING	COLOUR
B	White
C	Black
K	Red
N	Blue
P	Orange
T	Green
C/T	Black and green
R	Pink

SECTION

4

CORRECT USE

4.1 PREPARING FOR WORK BEFORE FIRST USE

4.1.1 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 first use. The machine is delivered to the user completely assembled.

Before commencing work, machine operator must inspect the technical condition of the trailer and prepare it for test start-up. The user must carefully read this Operator's Manual and observe all recommendations, understand the design and the principle of machine operation.

IMPORTANT

Before proceeding to hitching to tractor the user must carefully read this Operator's Manual and additional publications attached to machine and observe all recommendations.

External inspection

- Check completeness of machine (standard and optional equipment).
- Check condition of protective paint coat,
- Inspect trailer's individual components for mechanical damage resulting from incorrect transport (dents, piercing, bent or broken components).
- Check technical condition of tyres and tyre pressure.
- Check technical condition of elastic hydraulic lines,
- Check technical condition of pneumatic lines,
- Check that there are no hydraulic oil leaks.
- Check electric lamps.
- Check tipping cylinder, tailgate cylinders and shear type support cylinders for hydraulic oil leaks.

4.1.2 PREPARE A TRAILER FOR FIRST HITCHING TO TRACTOR

Preparation

- Check all the trailer's lubrication points, lubricate the machine as needed according to recommendations provided in section 5,
- Check if the nuts and bolts fixing the wheels are properly tightened.
- Drain air tank of the brake system.
- Ensure that pneumatic, hydraulic and electric connections in agricultural tractor are according to the requirements, if not the trailer should not be hitched to the tractor.
- Adjust the height of the drawbar eye to the tractor hitch
  - ⇨ A detailed description can be found in section 5.

Test start

If all the above checks have been performed and there is no doubt as to the trailer's good technical condition, it can be connected to tractor. Start the tractor, check all systems and conduct test run of trailer 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 trailer to appropriate hitch on agricultural tractor.
- Connect brake, electrical and hydraulic system conduits.
- Switch on individual lights, check correct operation of electrical system.
- Turn hydraulic system return valve to position 1. Conduct test tipping of load box backwards and sideways.
- Actuate and check tailgate control system.
- Actuate and check if hydraulic turning interlock (option) operates correctly.
- When moving off check if the main brakes operate correctly.
- Perform test drive.

TIP

Service actions: hitching/unhitching from tractor, adjustment of draw bar position, tipping of load box etc. are described in detail in further parts of the Operator's Manual in sections 4 and 5.

If during test run worrying symptoms occur such as:

- noise and abnormal sounds originating from the abrasion of moving elements of the trailer design,
- hydraulic oil leak,
- pressure drop in brake system,
- incorrect operation of hydraulic and/or pneumatic cylinders

or other faults, find the cause of the problem. If a fault cannot be rectified or the repair could void the warranty, please contact retailer for additional clarifications or to perform repair.

DANGER

Careless and improper use and operation of the trailer, and non-compliance with the recommendations given in this operator's manual is dangerous to your health.

The trailer must never be used by persons, who are not authorised to drive agricultural tractors, including children and people under the influence of alcohol or other drugs.

Non-compliance with the safety rules of this Operator's Manual can be dangerous to the health and life of the operator and others.

After completion of test drive check tightness of wheel nuts.

4.2 HITCHING AND DISCONNECTING FROM TRACTOR

Ensure that pneumatic, hydraulic and electric connections and the hitch of agricultural tractor are according to the Manufacturer's requirements, if not the trailer should not be hitched to the tractor.

In order to hitch the trailer to the tractor perform the actions below in the sequence presented. Machine must be immobilised by parking brake.

Connection

- ➡ Immobilise trailer with parking brake.
- ➡ Position agricultural tractor directly in front of drawbar eye.
- ➡ Reverse the tractor and connect two hydraulic lines that control the shear type drawbar support - see figure *(4.1).*

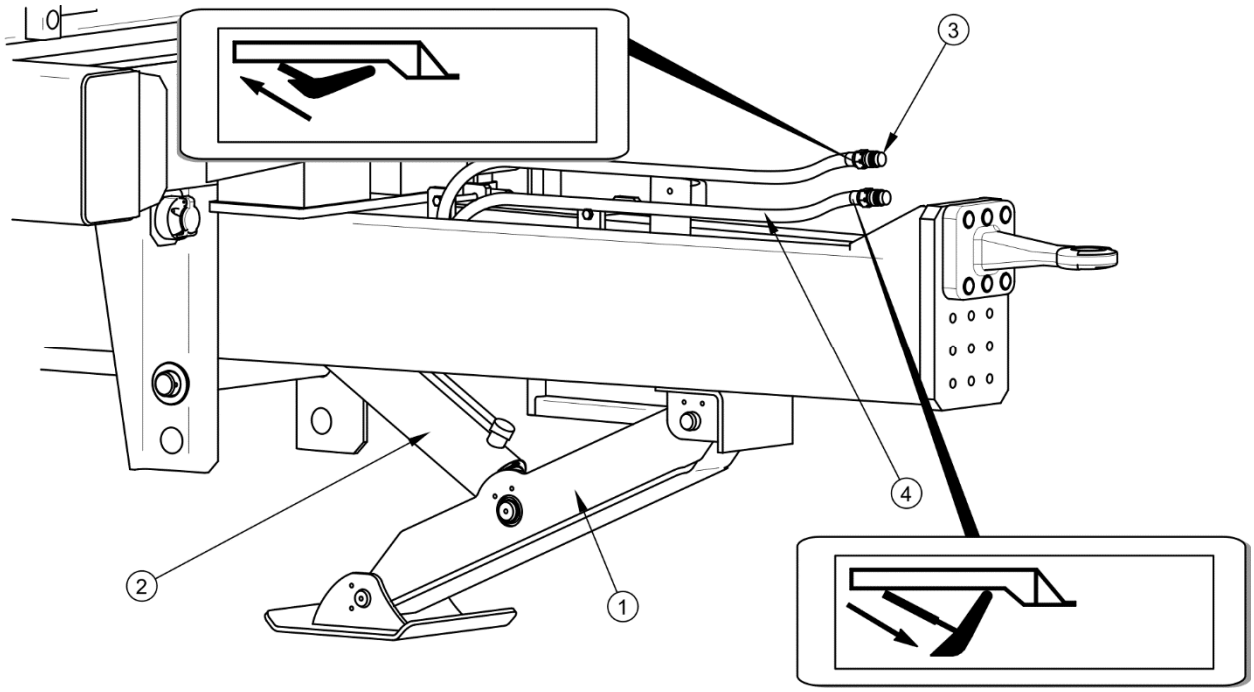


FIGURE 4.1 Connecting hydraulic shear type drawbar support

(1) shear type drawbar support, (2) hydraulic cylinder, (3) support raising hydraulic line, (3) support lowering hydraulic line

- Using the support set the drawbar eye at such a height so it is possible to hitch the machines.
  - Operate the selective control valve on the tractor to raise or lower the drawbar eye, until the correct height is achieved
- Reverse tractor, hitch trailer, check coupling 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.
  - When the trailer is coupled, the support must be folded as close as possible to the drawbar by the maximum extension of the hydraulic cylinder piston rod (2) - Figure *(4.1).*
  - When the support is completely withdrawn, set selective control valve lever in tractor to "neutral" position.
- Turn off tractor engine. Ensure that unauthorised persons do not have access to the tractor cab.
- Connect pneumatic system lines (applies to two line systems):
  - Connect pneumatic conduit marked yellow with yellow socket in tractor.
  - Connect pneumatic line marked red with red socket in tractor.
- Connect pneumatic system lines (applies to single line systems):
  - Connect pneumatic conduit marked black with black socket in tractor.
- Connect hydraulic brake system (applies to trailer version with hydraulic brake).
  - Hydraulic brake system conduit is marked with information decal (13) – table (*2.1*).
- Connect hydraulic tipping system line.
  - Hydraulic brake system line is marked with information decal (14) – table (*2.1*).

- ➡ Connect hydraulic turning interlock system lines (applies to trailer version with hydraulic turning interlock system).
- ➡ Connect the main wiring to power the electric lighting.

DANGER

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

When connecting the hydraulic lines to the tractor, make sure that the tractor hydraulic system and trailer are not under pressure.

Ensure sufficient visibility during hitching.

During connection of braking system lines (pneumatic double line) the correct sequence of line connection is very important. First connect the yellow connector to yellow socket in the tractor and only then connect the red connector to the red socket in the tractor. Once the 2nd line is connected, the braking system will switch to normal mode of operation (disconnection or interruption of the lines causes the trailer's braking system control valve to automatically apply brakes). Lines are marked with coloured protective covers, which identify the appropriate system line.

IMPORTANT

Trailer may only be hitched to a tractor, which has the appropriate hitch, connection sockets for braking, hydraulic and electrical systems, and hydraulic oil in both machines is the same type and may be mixed.

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's moving parts and are not at the risk of breaking or severed when making turns.

Ensure compatibility of oils in tractor hydraulic system and in the trailer hydraulic system.

Disconnecting the trailer

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

- ➡ Immobilise tractor and trailer with parking brake.
- ➡ Place chocks under trailer wheel.

- ⇨ Wheel chocks shall be so placed that one is in front of the wheel and the second is behind wheel of rear axle - see section 2.

➡ Lower shear type drawbar support to the ground.

- ⇨ Operate the selective control valve on the tractor in the direction corresponding to the support cylinder piston extension.
- ⇨ When the support is lowered, set selective control valve lever in tractor to "neutral" position.

➡ Turn off tractor engine. Ensure that unauthorised persons do not have access to the tractor cab.

➡ Disconnect all hydraulic support and tipping system lines from tractor.

➡ Disconnect electric lead.

➡ Disconnect pneumatic system conduits (applies to double conduit systems):

- ⇨ Disconnect pneumatic conduit marked red.
- ⇨ Disconnect pneumatic conduit marked yellow.

➡ Disconnect pneumatic system lines (applies to single line systems):

- ⇨ Disconnect pneumatic conduit marked black.

➡ Disconnect hydraulic brake system line (applies to trailer version with hydraulic brake).

➡ Disconnect hydraulic turning interlock system line (applies to trailer version with turning interlock system).

➡ Protect conduit ends with covers. Place line terminals in appropriate sockets.

➡ Unlock tractor hitch and disconnect trailer drawbar from tractor hitch and drive tractor away.

DANGER

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

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

4.3 COUPLING AND UNCOUPLING SECOND TRAILER

A second trailer may only be connected, if it is a machine built on a dual axle chassis and if it fulfils all the requirements specified in section 1. Coupling a second trailer to the assembly requires experience in driving an agricultural tractor with a trailer. It is recommended while coupling the second trailer to use the help of another person to guide the tractor driver.

DANGER

When hitching, there must be nobody between the trailers. Person assisting hitching up machines should stand outside the area of danger and be visible to the tractor driver at all times.

Coupling second trailer

- ➡ The tractor with the coupled first trailer is positioned directly in front of the drawbar of the second trailer.
- ➡ Immobilise second trailer with parking brake.
- ➡ Remove pin from the hitch of the first trailer.
  - ⇨ If the trailer is fitted with automatic rear hitch, lift the pin by the handle (3) - figure *(4.2).*
- ➡ Adjust the height of the drawbar of the second trailer in such a manner to enable coupling the machines.
- ➡ Reversing tractor, drive the rear hitch of the first trailer onto the drawbar of the second trailer.
  - ⇨ If the trailer is equipped with an automatic rear hitch, ensure that the hitching operation is completed and that drawbar eye of the second trailer is secured.

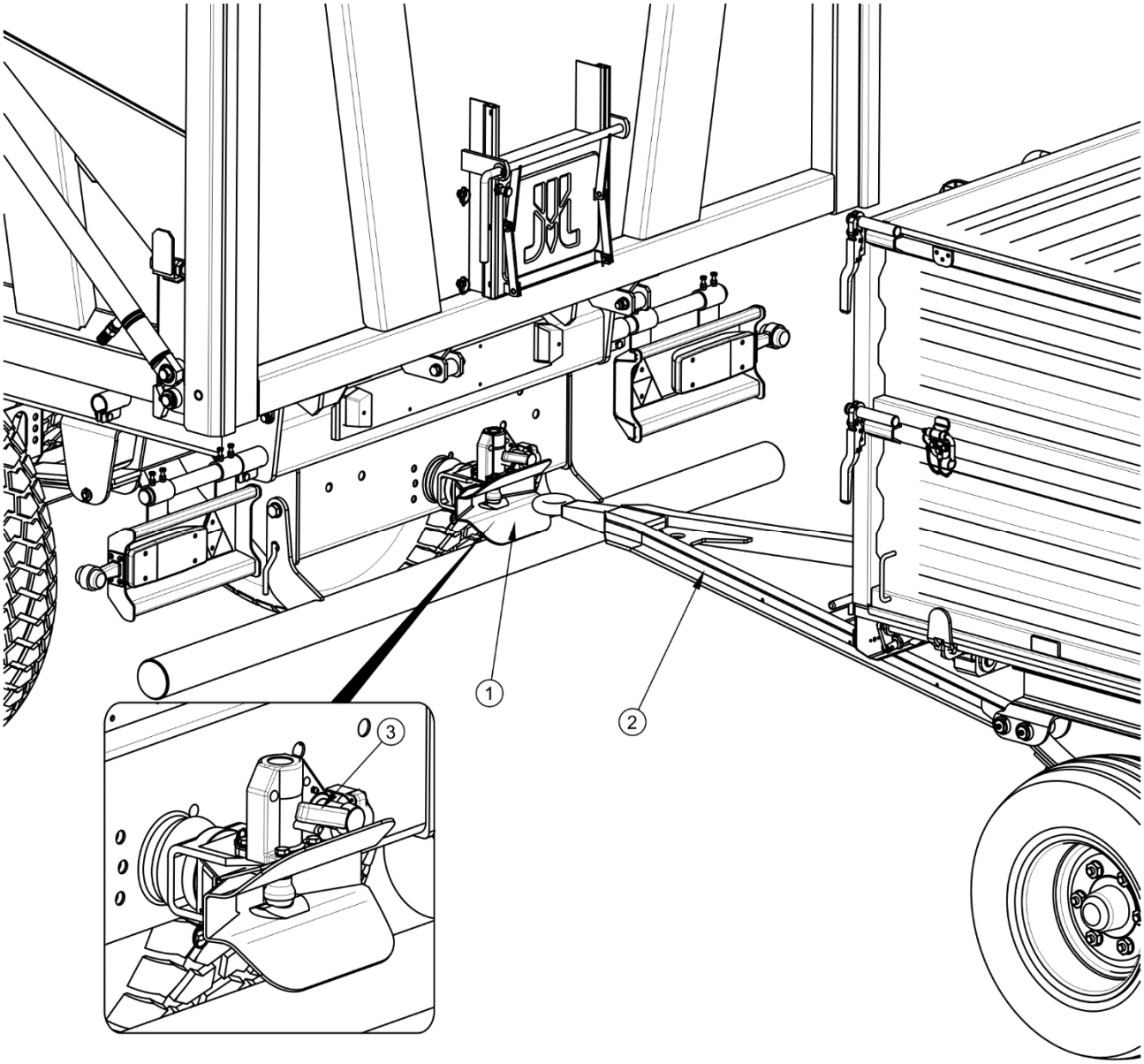


FIGURE 4.2 Coupling second trailer

(1) rear trailer hitch, (2) the second trailer drawbar, (3) automatic hitch pin lifting handle

- ➡ Insert drawbar pin and securing cotter pin.
- ➡ Connect lines of hydraulic, pneumatic and electrical systems according to instructions contained in section (4.2*).*

Disconnecting the second trailer

- ➡ Immobilise tractor and trailer with parking brake.

- ➡ Turn off tractor engine. Ensure that unauthorised persons do not have access to the tractor cab.
- ➡ Disconnect lines of pneumatic, hydraulic and electrical systems according to instructions contained in section (4.2).
- ➡ Remove cotter pin from pin of the hitch of the first trailer. Remove drawbar pin and drive tractor away.
    - ⇨ If the trailer is fitted with automatic rear hitch, lift the pin by the handle (3) - figure *(4.2).*

IMPORTANT

Only double axle trailers may be hitched to the trailer.

4.4 LOADING AND SECURING LOAD

4.4.1 GENERAL INFORMATION CONCERNING LOAD

Before beginning loading make certain that the tailgate, side gates and chute slide gate are properly closed and secured. The trailer must be positioned to travel forwards 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.

IMPORTANT

When a tailgate is tightly closed, that securing hooks must fully engage the rear gate securing pin.

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.

If transporting materials which may cause damage to the floor and load box (dents, deep scratches), it is recommended to shield the exposed surfaces with thick plywood, hard particle board, planks or other materials of similar properties.

Materials, which in contact with painted or steel surfaces may cause damage, should be transported in sealed packaging (sacks, boxes, barrels etc.), and after completing transport, thoroughly wash out load box with water jet.

IMPORTANT

Always aim at distributing the load uniformly in the load box.

Do NOT exceed the trailer's maximum carrying capacity.

Due to the various density of materials, using the total load box capacity may cause exceeding permissible carrying capacity of the trailer. Guideline specific weight of selected materials is shown in table (*4.1*). Take care not to overload the trailer.

TABLE 4.1 Guideline weights by volume of selected loads

TYPE OF MATERIAL	VOLUME WEIGHT KG/M^3
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
Organic fertilisers:	
old manure	700 - 800
mature manure	800 - 900
fresh manure	700 - 750
compost	950 – 1 100
dry peat	500 - 600
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

TYPE OF MATERIAL	VOLUME WEIGHT 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
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

TYPE OF MATERIAL	VOLUME WEIGHT KG/M^3
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
cereal mass in round bales	20 - 25
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
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
Seeds and grains:	
beans	750 - 850
mustard	600 - 700

TYPE OF MATERIAL	VOLUME WEIGHT KG/M^3
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
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

ATTENTION

The trailer is also designed for transport of harvested crops and agricultural products (volumetric or poured). 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.).

DANGER

The load on the trailer must be secured against slipping and contaminating the road during travel. If it is not possible to properly secure the load, do not transport it.

During loading the trailer the drawbar eye and the tractor hitch are subjected to great vertical loading.

Loose bulk material

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.

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. This 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 sidewalls and abrasion of paintwork. To provide necessary protection, lay thick plywood, hard particle board, thick planks or other materials of similar properties on the load box platform and possibly sidewalls and 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

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 forbidden with the use of agricultural trailers.

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 to observe the instructions for transporting and handling the load. Ensure whether during loading work it is necessary to apply additional personal protective equipment (masks, rubber gloves etc.)

The only exception are plant protection materials 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

High volume loads (light with large volumes) such as hay, presses blocks or bales, straw, silage etc. should be loaded with appropriate fittings: bale grabs, forks etc. Load may be loaded even exceeding the height of load box extensions but particular attention should be paid to the trailer stability and the proper attachment 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, during travel the load will move. With regard to the trailer construction (adaptation of the load box to 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 may not exceed the upper edge of the sides. A higher load level may move during travel and cause significant damage to the net extensions and the load may spill.

DANGER

If there is a danger of load packaging moving, do NOT transport this type of material. A moving load constitutes a serious hazard during travel for the tractor driver and other road users.

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

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

Ensure that during unloading / loading or raising the load box nobody is near the trailer. Before tipping load box ensure that there is visibility and make certain that there are no bystanders.

The arrangement of the load may not cause an overload on the axle or hitch system of the trailer.

Materials which may cause corrosion of steel, chemical damage or react in any other way negatively affecting the trailer structure may be transported only on condition of appropriate load preparation. 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.

4.5 TRANSPORTING LOADS

When driving on roads, respect the road traffic regulations, exercise caution and prudence. Listed below are the key guidelines for driving the tractor and trailer combination.

- Before moving off make sure that there are no bystanders, especially children, near the trailer or the tractor. Take care that the driver has sufficient visibility.
- Make sure that the trailer is correctly attached to the tractor and tractor's hitch is properly secured.
- Vertical load borne by the trailer drawbar eye affects the steering of the agricultural tractor.

- The trailer must not be overloaded, loads must be uniformly distributed so that the maximum permissible axle loads are not exceeded. The trailer's maximum carrying capacity must not be exceeded as this can damage the trailer and pose a risk to the operator or other road users.
- Permissible design speed and maximum speed allowed by road traffic law must not be exceeded. The towing speed should be adapted to the current road conditions, load carried by the trailer, road surface conditions and other relevant conditions.
- Trailer may be towed on slopes of up to 8° and unloading must take place only on a level surface.
- When not connected to the tractor, the trailer must be immobilised using parking brake and possibly also with chocks or other objects without sharp edges placed under the front and back 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 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's 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.
- Please note that the braking distance of the tractor and trailer combination is substantially increased at higher speeds and loads.
- Monitor trailer's behaviour when travelling on an uneven terrain, and adjust driving speed to road conditions, slow down early enough when turning.
- The trailer is designed to operate on slopes up to 8°. Driving trailer across ground with steeper slopes may cause the trailer to tip over as a result of loss of stability. Prolonged driving across steep ground may lead to loss of braking efficiency.

IMPORTANT

Travel with a high-volume load by ruts, ditches roadside slopes etc. constitutes a great risk of overturning the trailer. Exercise particular caution.

4.6 UNLOADING

The trailer is equipped with hydraulic tipping system and properly designed frame and load box allowing tipping to the rear and sideways. Tipping of the load box is controlled from driver's cab using external tractor hydraulic system selective control valve.

Unloading trailer is performed in the following sequence:

- ➡ tractor and trailer must be placed to drive forwards on flat and hard ground,
- ➡ immobilise tractor with parking brake,
- ➡ tipping pins (connecting load box and lower frame) should be placed and properly interlocked on the side, which will be used to unload,
  - ⇨ 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,
- ➡ depending on unloading method and direction, proceed as follows:

⇨ when unloading sideways, open side gates (1) by unlocking locking hooks (3) and pulling towards yourself lever (2) - figure (*4.3*). During opening exercise caution, because the load may exert great pressure on the sides,

⇨ It is possible to open only one side gate while unloading sideways. It can be achieved with the use of side gate locks (4),

⇨ when unloading to the rear, open the trailer's tailgate using hydraulic cylinders by operating the hydraulic selective control valve valve lever in the tractor cab,

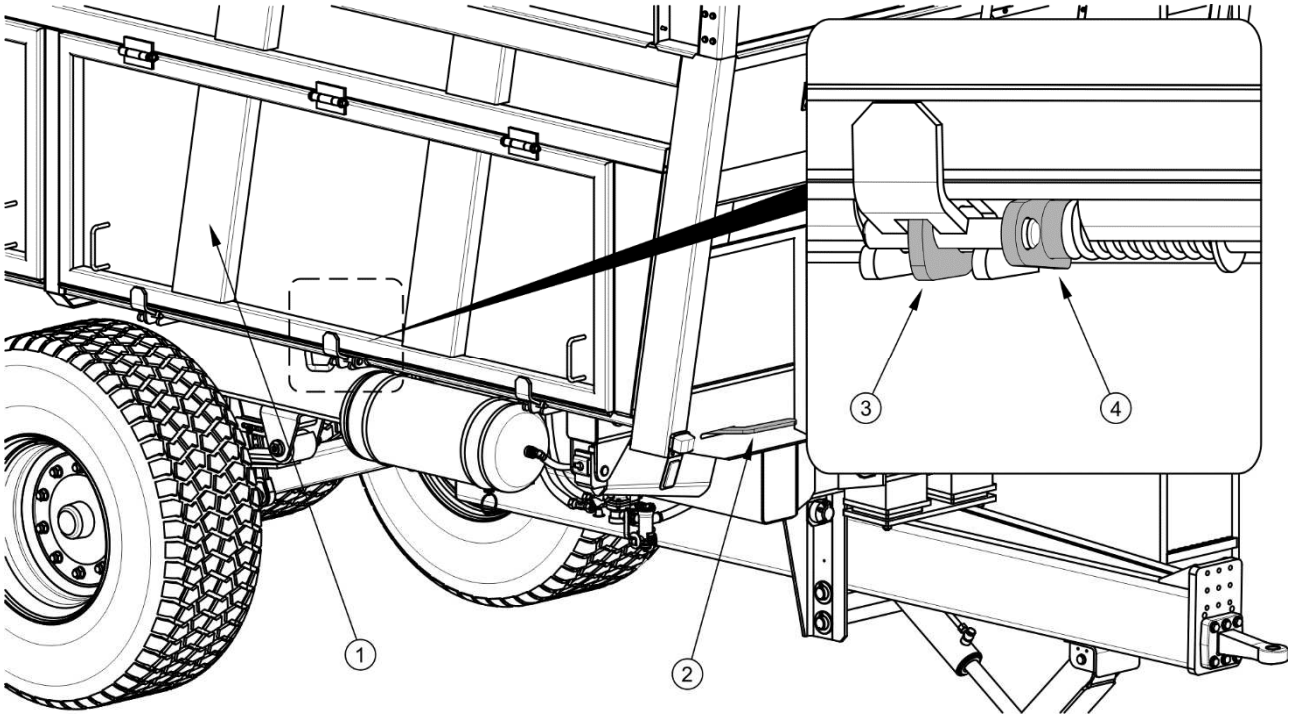


FIGURE 4.3 Opening side gates

(1) side gate, (2) side gate closing lever, (3) securing hook, (4) side gate lock

➡ Place the control lever controlling the hydraulic tipping system circuits in position 1 -- tipping of the first trailer,

➡ Using the selective control valve lever in the operator's cabin to initiate tipping of the load box,

➡ after unloading, lower the load box and clean edges of the floor and side gates,

- close side gates and block side gate locks (3) using lever (2),
- close the tailgate by operating the suitable hydraulic circuit in the tractor,
  - Tailgate must be closed until it is secured by securing hooks,
- before moving off make sure that the tailgate is properly locked.

IMPORTANT

When a tailgate is tightly closed, that securing hooks must fully engage the rear gate securing pin.

When unloading the trailer sideways with only one side gate open there is an increased risk of: loss of trailer stability, trailer overturning, loss of structural strength of trailer components.

If a second trailer is hitched, it should be unloaded only when the load box of the first trailer has been lowered and the hydraulic tipping system control lever is placed in position 2 -- tipping of the second trailer.

DANGER

Use only original pins with a lug or handle. Using third-party pins could damage the trailer. Tipping pins must be correctly interlocked.

Tipping may only be performed when trailer is hitched to tractor.

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

Tipping the load box must be done on hard and level ground.

Do NOT tip load box in strong gusty winds conditions.

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

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

Rear load box wall is equipped with chute slide gate (1) – figure (*4.4*) and chute (2) (optional equipment) which is used for unloading of loose materials. Chute design allows very accurate dosing of the material to packaging (sacks, boxes etc.). The opening gap can be controlled using lever (3). In order to do that loosen the bolt interlocking slide gate (4), open the slide as required and lock again using 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 and could compromise trailer's stability.

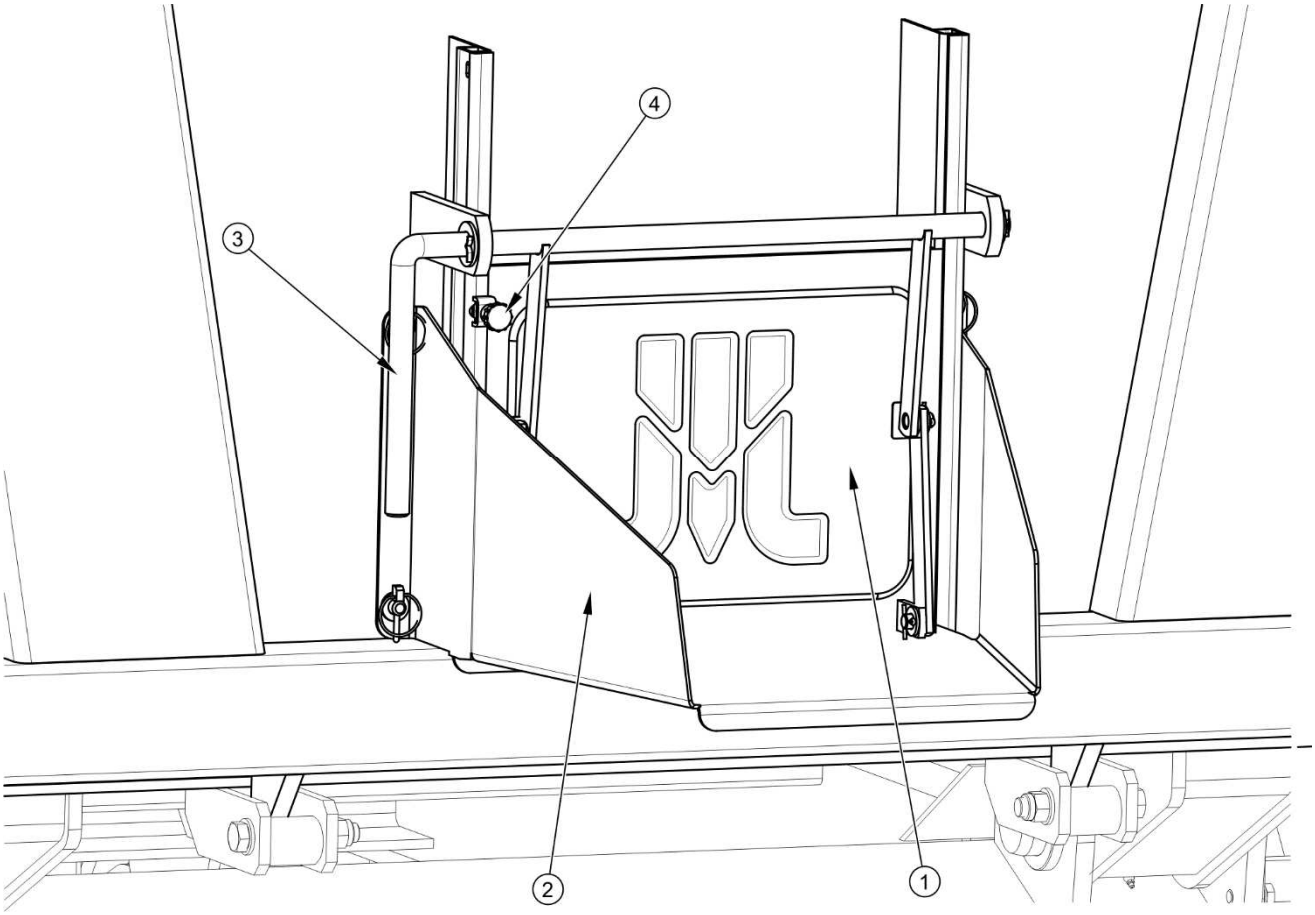


FIGURE 4.4 Chute

(1) chute slide gate, (2) chute, (3) lever, (4) locking bolt

While unloading bulky materials be especially careful. Do NOT tip load box on uneven or wet ground and move and jerk trailer during unloading. Bulky materials are normally difficult to unload therefore proceed cautiously and patiently. Careless operation of trailer may pose a danger to operators and bystanders can also cause damage to the machine.

DANGER

When closing side gates and the rear grain chute gate take particular care to avoid crushing fingers.

4.7 PROPER USE AND MAINTENANCE OF TYRES

- When working on the tyres, chocks or other objects without sharp edges should be placed under the wheels of the trailer to prevent it from rolling. 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 nuts after the first use of trailer, after the first travel under load and then every 6 months of use or every 25,000 km. In the event of intensive work, check the nut tightening at least every100 km. The inspection should be repeated individually if a wheel has been removed from the wheel axle.
- Regularly check and maintain correct pressure in tyres according to Operator's Manual (especially if trailer is not used for a longer period).
- Pressure and 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. At high temperatures 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.
- Tyre valves should be protected with caps to avoid soiling.
- Do not exceed the trailer's maximum design speed.
- When wrapper 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.

SECTION

5

MAINTENANCE

5.1 PRELIMINARY INFORMATION

When using the trailer, regular inspections of its technical condition are essential and the performance of maintenance procedures, which keep the machine in good technical condition. In connection with this the user of the trailer is obliged to perform all the maintenance and adjustment procedures defined by the Manufacturer.

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

Detailed procedures and extent of activities which the user may perform by himself are described in this section. In the event of unauthorised repairs, changes to factory settings and other actions, which are not regarded as possible for the trailer operator to perform, the user shall invalidate the warranty.

5.2 SERVICING BRAKES AND AXLES

5.2.1 PRELIMINARY INFORMATION

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

The responsibilities of the user are limited to:

- initial inspection of axle brakes,
- check brake shoe linings for wear,
- inspection and adjustment of loose play of axle bearings,
- mounting and dismounting wheel, inspection of wheel tightening,
- checking air pressure, evaluating technical condition of wheels and tyres,
- mechanical brakes adjustment,
- Replacing the parking brake cable and tension adjustment

Procedures connected with:

- changing grease in axle bearings,
- changing bearings, hub seals,

- changing brake linings, repairing brake,

may be performed by specialist workshops.

DANGER

Do NOT use the trailer when brake system is unreliable.

5.2.2 INITIAL INSPECTION OF AXLE BRAKES

After purchasing trailer, the user is responsible for general checking of brake system of trailer axle.

Inspection procedures

- ➡ Hitch trailer to tractor and place chocks under trailer wheel.
- ➡ Check means of securing cylinder and return springs.
- ➡ Engage and release in turn the main brake and then the trailer parking brake.
  - ⇨ Main brake and parking brake should be engaged and released without great resistance and severity.
- ➡ Check cylinder movement and correct return of piston to start position.
  - ⇨ The help of a second person is required, who shall engage trailer brake.
- ➡ Check if axle elements are in place, (cotter pins in castellated nuts, expansion rings etc.).
- ➡ Check hydraulic cylinders or pneumatic cylinders for tightness - compare sections 5.3.2 and 5.4.2.

Initial inspection of axle brakes must be conducted:

- **after first use,**
- **after first travel with load.**

5.2.3 CHECK BRAKE SHOE LININGS FOR WEAR

Trailer brake shoes should be replaced when the brake lining thickness is less than the minimum specified by the manufacturer.

ATTENTION

Minimum thickness of trailer brake linings is 5 mm.

Check brake shoe linings for wear through the inspection opening (2) – see Figure *(5.1).*

Check brake shoe linings for wear:

- **every 3 months,**
- **if brakes overheat,**
- **if brake cylinder piston stroke is significantly longer,**
- **if there are unusual noises from the drum of wheel axle.**

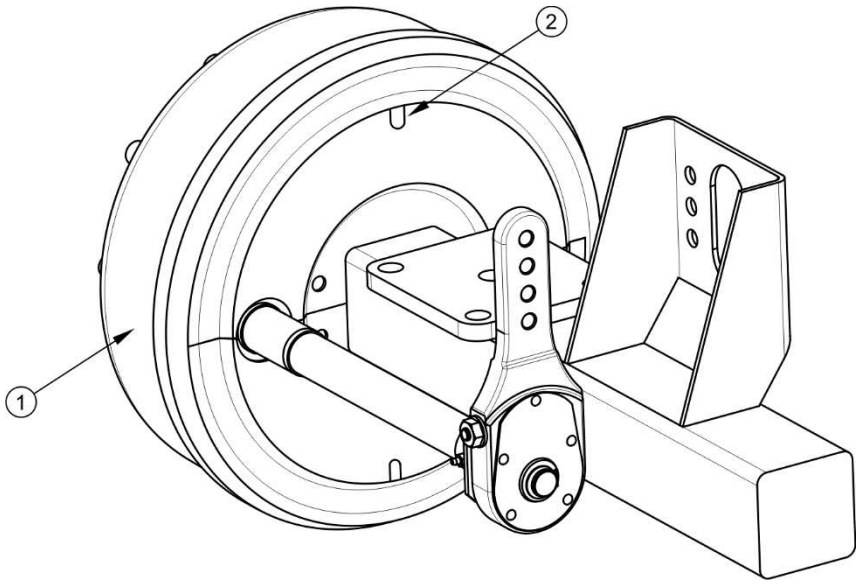


FIGURE 5.1 Checking brake shoe linings

(1) wheel axle drum, (2) brake shoe linings for wear inspection opening

5.2.4 CHECK WHEEL AXLE BEARINGS FOR LOOSENESS

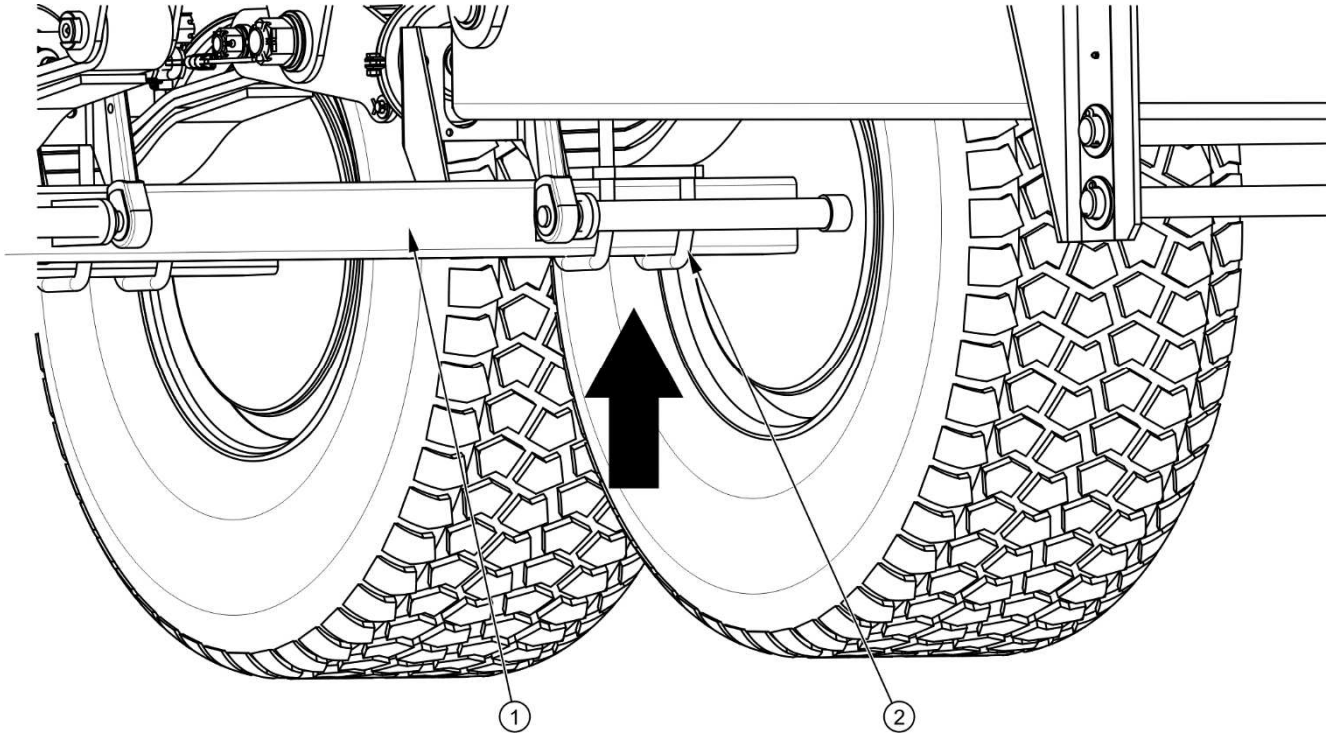


FIGURE 5.2 Lifting jack support point

(1) wheel axle, (2) U bolt

Preparation procedures

- ➡ Hitch trailer to tractor, braking tractor with parking brake.
- ➡ Park tractor and trailer on hard level ground.
  - ⇨ Tractor must be placed to drive forward.
- ➡ Place the wheel chocks under the wheel opposite to the lifted wheel. Ensure that trailer shall not move during inspection.
- ➡ Raise the wheel (opposite to the side where chocks are placed).
  - ⇨ The lifting jack should be placed between U bolts (2) - figure (*5.2*) securing axle (1) to shock absorber leaf springs, or as near as possible to leaf spring mounting. Recommended fulcrum is marked with an arrow. Lifting jack must be suited to weight of trailer.

Checking slackness of wheel axle bearings

- Turning the wheel slowly in both directions check that movement is smooth and that the wheel rotates without excessive resistance.
- Turn the wheel so that it rotates very quickly, check that the bearing does not make any unusual sounds.
- Turning the wheel try to detect looseness.
  - ⇨ You may use a lever placed under the wheel supporting the other end on the floor.
- Repeat procedure to each wheel individually, remembering that the jack must be on the side opposite to the chocks.

If play is felt, adjust bearing. Unusual sounds coming from bearing may be symptoms of excess 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 looseness comes from the bearing and not from the suspension system (e.g. looseness of leaf spring pins etc.).

TIP

If hub cover is damaged or missing, contamination and dampness enter the hub, which causes significantly faster wear of bearing and hub seals.

Bearing life is dependent on working conditions of trailer, loading, speed of travel and lubrication conditions.

Check condition of hub cover, if necessary replace with new cover. Inspection of bearing looseness may only be conducted, when the trailer is hitched to a tractor, and the load box is empty.

Check wheel axle bearings for play:

- **after travelling the first 1,000 km,**
- **after intensive use of trailer,**
- **every six months use or every 25,000 km.**

DANGER

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

The lifting jack must be stably supported by the ground and so must the axle.

Ensure that trailer shall not move during inspection of bearing looseness of axles.

5.2.5 ADJUSTMENT OF PLAY OF WHEEL AXLE BEARINGS

Preparation procedures

➡ Prepare tractor and trailer for adjustment procedures according to description provided in section 5.2.3.

Adjustment of road wheel axle bearings

➡ Take off hub cover (1) - figure (*5.3*).

➡ Take out split cotter pin (3) securing castellated nut (2).

➡ Tighten castellated nut in order to eliminate looseness.

⇨ Wheel should rotate with insignificant resistance.

➡ Unscrew nut (not less than 1/3 rotation) to cover the nearest thread groove with alignment to opening in wheel stub axle. Wheel should rotate with insignificant resistance.

⇨ Nut may not be excessively tightened. Do not apply excessive pressure because working conditions of the bearings may deteriorate.

➡ Secure castellated nut with cotter pin and mount hub cap.

➡ Delicately tap hub cap with rubber or wooden hammer.

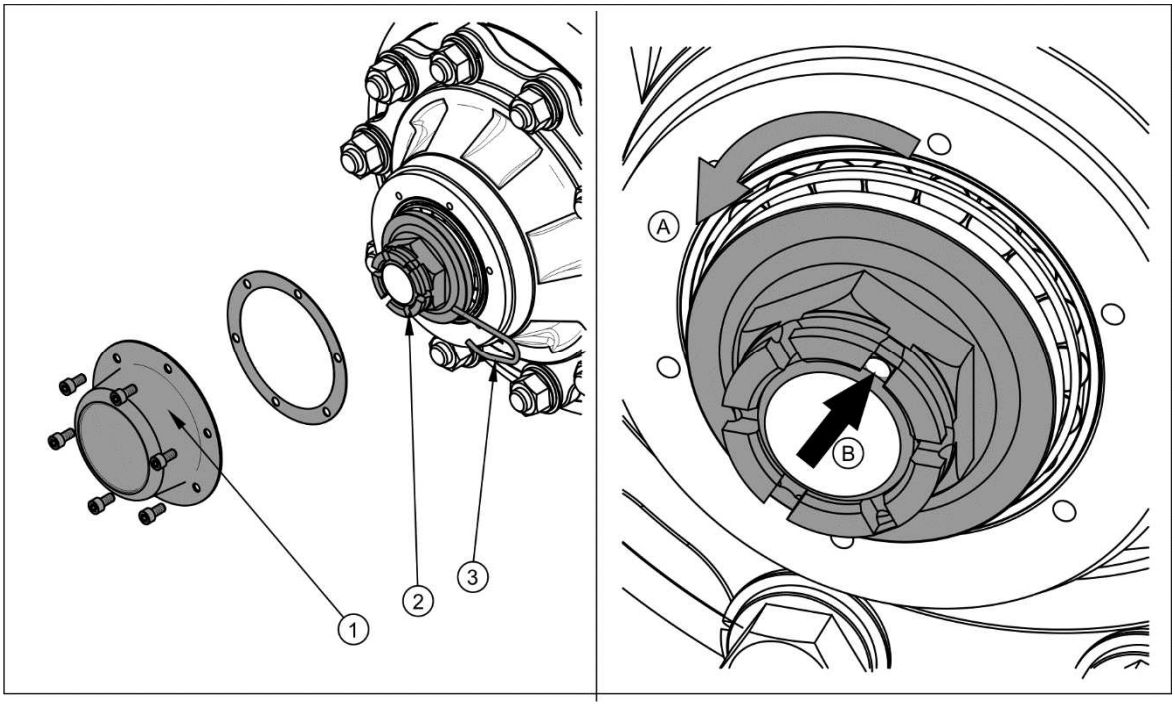


FIGURE 5.3 Adjustment of road wheel axle bearings

(1) hub cover, (2) castellated nut, (3) securing split cotter pin

The wheel should turn smoothly without stiffness or detectable resistance not originating from abrasion of brake shoes in brake drum. Adjustment of bearing looseness may only be conducted, when the trailer is hitched to a tractor, and the load box is empty.

TIP

If the wheel is dismounted, bearing looseness is easy to check and adjust.

5.2.6 MOUNTING AND DISMOUNTING WHEEL, INSPECTION OF WHEEL NUT TIGHTENING

Wheel removal

- Immobilise trailer with parking brake.
- Place the wheel chocks under the wheel opposite to the dismantled wheel.
- Ensure that trailer shall not move during wheel dismounting.

- ➡ Loosen wheel nuts according to sequence given in figure (*5.4*).
- ➡ Place a lift and raise the trailer to a sufficient height so that the wheel to be replaced does not touch the ground.
- ➡ Dismount wheel.

Wheel installation

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

TIP

Wheel nuts should be tightened using a torque of 450 Nm - nuts M22x1.5.

Tightening nuts

Nuts should be tightened gradually diagonally, (in several stages, until obtaining the required tightening torque) using a torque spanner. If a torque spanner is not available, one may use an ordinary spanner. The arm of the spanner (L) figure (*5.4*) should be selected according to the weight of the person (F) tightening the nut. Remember that this method of tightening is not as accurate as the use of a torque spanner.

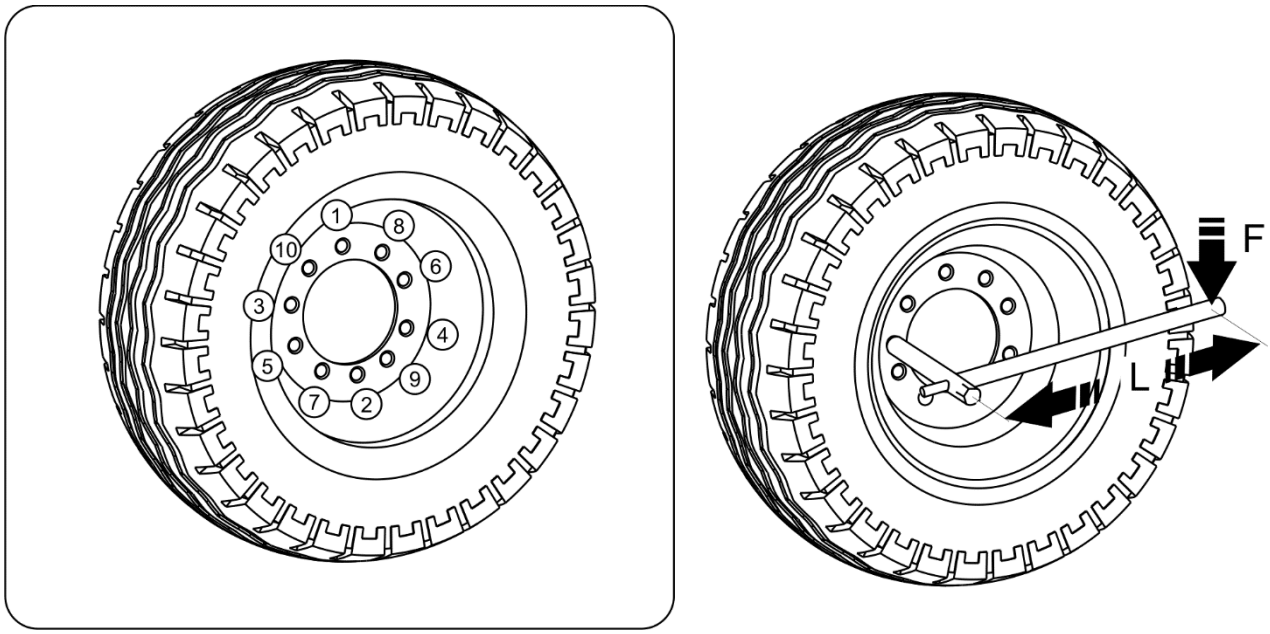


FIGURE 5.4 Sequence of tightening nuts, axles with 10 M22x1.5 pins

(1) - (10) sequence of nut tightening, (L) spanner length, (F) user weight

IMPORTANT

Axle nuts may not be tightened with impact wrench, because of danger of exceeding permissible tightening torque, the consequence of which may be breaking the thread connection or breaking off the hub pins.

The greatest precision is achieved using a torque spanner. Before commencing work, ensure that correct tightening torque value is set.

TABLE 5.1 Spanner arm

WHEEL TIGHTENING TORQUE	BODY WEIGHT (F)	ARM LENGTH (L)
[NM]	[KG]	[M]
450	90	0.5
	80	0.55
	70	0.65
	60	0.75

Checking wheel tightening:

- **after first use,**
- **after first travel with load,**
- **after travelling the first 1,000 km,**
- **every six months use or every 25,000 km.**

In the event of intensive work check the nut tightening at least every 100 km. The above actions should be repeated individually if a wheel has been removed from the wheel axle.

5.2.7 CHECK AIR PRESSURE, EVALUATE TECHNICAL CONDITION OF WHEELS AND TYRES

Tyre pressure should be checked each time after changing spare wheel and not less than every month. In the event of intensive use, air pressure in tyres should be checked more frequently. During this time trailer must be unloaded. Checking should be done before travelling when tyres are not heated, or after an extended period of parking.

TIP

Tyre pressure values are specified in information decal, placed on wheel or on upper frame above trailer wheel.

While checking pressure pay attention to technical condition of wheels and tyres. Look carefully at tyre sides and check the condition of tread.

In case of mechanical damage consult the nearest tyre service and check whether the tyre defect requires tyre replacement.

DANGER

Damaged tyres or wheels may be the cause of a serious accident.

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.

Proper technical condition and appropriate maintenance of wheels significantly extends the life of these components and ensures appropriate level of safety to trailer users.

Checking tyre pressure and steel rims:

- **every month of use,**
- **if needed.**

5.2.8 MECHANICAL BRAKES ADJUSTMENT

During trailer operation drum brake linings are subjected to wear. Piston stroke extends, and exceeding braking force limiting value declines.

Adjustment must be made when:

- piston stroke amounts to 2/3 of maximum stroke,
- expansion levers are not set in parallel to each other during braking,
- repairs are made to braking system.

Trailer wheels must brake simultaneously. Brakes adjustment involves changing the position of the expander arm (1) – figure (*5.5*), in relation to expander shaft (2). To do this rotate adjustment screw (3) in appropriate direction to displace the expander lever:

- to the rear - if brake brakes too late,
- forward - brake brakes too early.

The main brake system should be inspected annually and in case of need should be adjusted.

Adjustment should be conducted separately for each wheel. After proper brake adjustment, at full braking the axle shaft expander should create an angle of 90° with the pneumatic cylinder piston, and the stroke should amount to approximately half the length of the total stroke of the piston. After the brake is released, expander arms may not be supported on any structural elements, because insufficient withdrawal of a piston ram may cause abrasion of brake shoes in drum and result in overheating the brakes. Expander arms must be positioned

in parallel with regard to each other at full braking. If this is not so, adjust the position of the lever, which has the longer stroke.

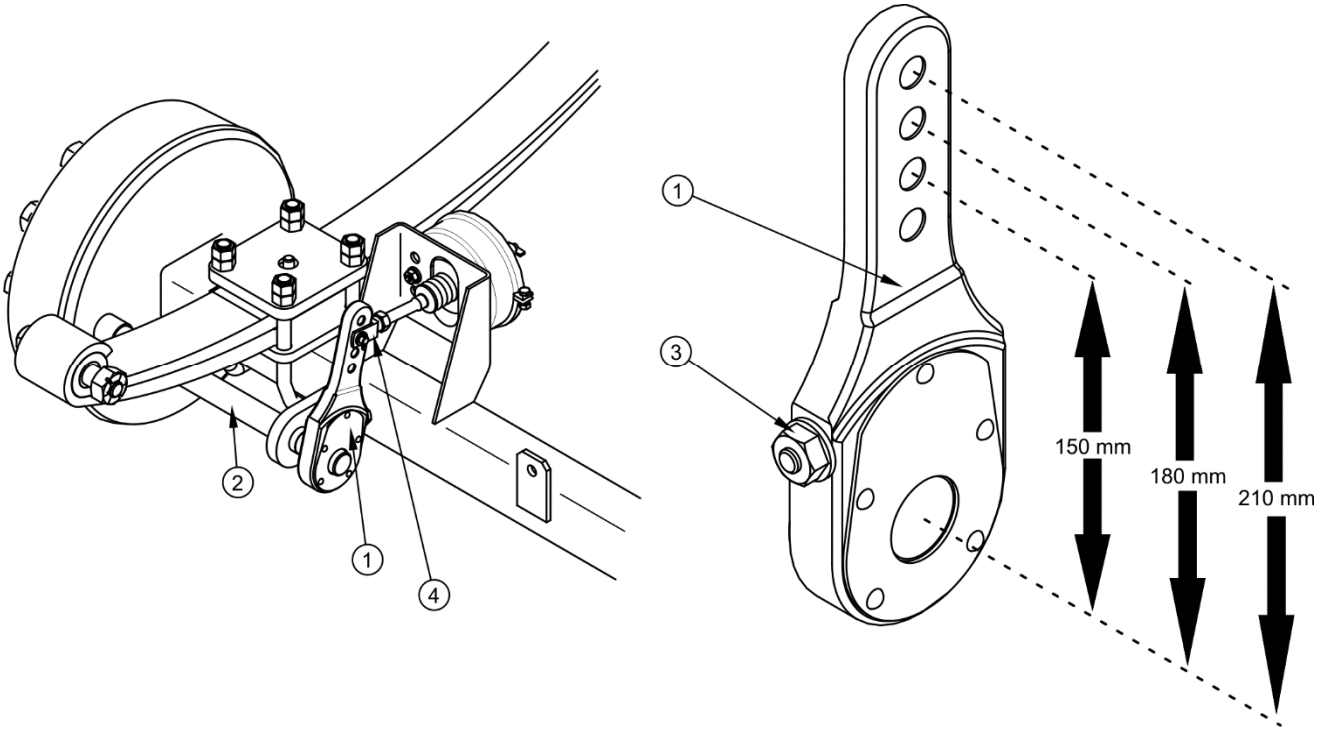


FIGURE 5.5 Adjustment of axle mechanical brakes

(1) expander arm, (2) expander shaft, (3) adjustment bolt, (4) cylinder fork

If it is necessary to dismantle the cylinder fork (4), remember or mark its original position in the expander arm. The mounting position is selected by the Manufacturer and may not be changed.

TABLE 5.2 Position of fork pin in expander arm

TYPE OF BRAKE SYSTEM	PIN POSITION [mm]	
	FRONT AXLE	REAR AXLE
Single line pneumatic system	150	210
Double line pneumatic system	150	210
Hydraulic brake system	180	180

5.2.9 CHANGE OF PARKING BRAKE CABLE AND ADJUSTMENT OF CABLE TENSION.

Proper operation of the parking brake is dependent on the effectiveness of the front axle brake and the correct brake cable tension.

Replacing the parking brake cable

- ➡ Hitch trailer to tractor. Park trailer and tractor on level surface.
- ➡ Place securing chocks under one trailer wheel.

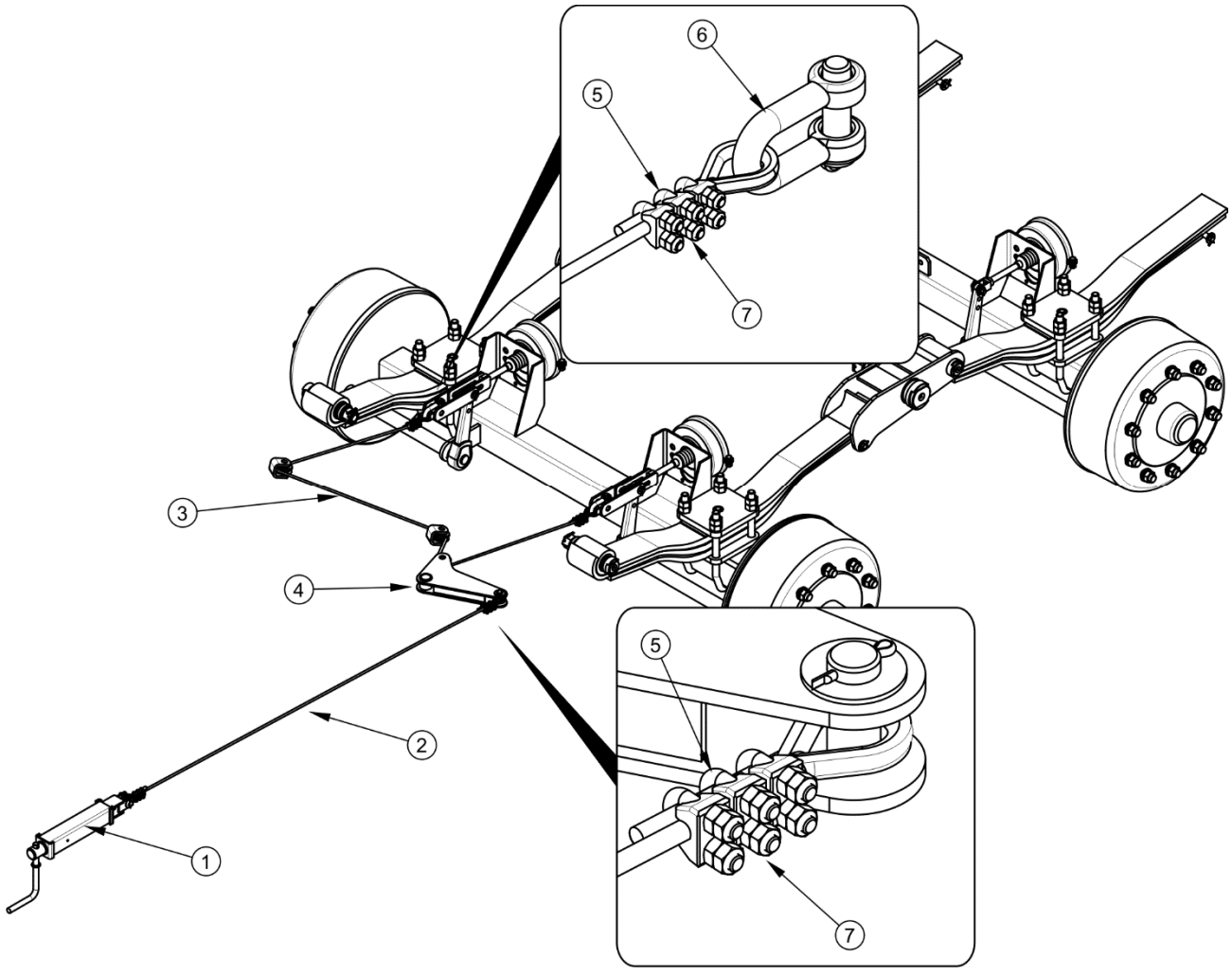


FIGURE 5.6 Adjustment of parking brake cable tension

(1) brake crank mechanism, (2) brake cable I, (3) brake cable II (4) brake lever, (5) U-shaped clamp, (6) shackle, (7) clamping nuts

- ➡ Fully unscrew the bolt of the brake crank mechanism (1).

- Loosen the nuts (7) of U-shaped clamps (5).
- Remove the pins of the lever (4) and crank mechanism (1), remove the shackles (6).
- Dismantle handbrake cables (2) and (3).
- Clean parking brake components, lubricate parking brake crank mechanism and pins of cable guide rollers.
- Install new cables (2) and (3)
  - Parking brake cables must be fitted carefully.
  - Thimbles and three clamps must be fitted at the ends of the cables.
  - Clamps must be tightened. The distances between the clamps may not be less than 15 mm.
  - Clamp jaws must be placed at the load bearing cable side - see Figure *(5.7).*
  - The first clamp should be placed directly on the thimble.

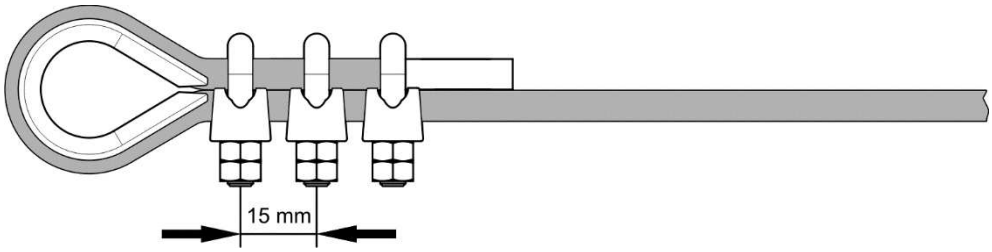


FIGURE 5.7 Installation of steel cable clamps

- Install bolts and new securing cotter pins.
- After the first load of cable, re-check the condition of cable end, correct if necessary.

Adjustment of parking brake cable tension

- Hitch trailer to tractor. Park trailer and tractor on level surface.
- Place securing chocks under one trailer wheel.
- Unscrew the brake bolt mechanism maximally (1) – figure (*5.6*), (anti clockwise).

➡ Loosen nuts (7) of cable clamps (5) of handbrake cable (2).

➡ Tighten cable and tighten clamps.

⇨ Length of parking brake cable (2) should be so selected that at total release of working and parking brake the cables would be loose and hanging by 1 - 2 cm compared to fully tensioned cables.

Adjustment of parking brake cable tension should be conducted in the event of:

- stretching of cable,
- loosening of parking brake cable clamps
- after adjustment of axle brakes,
- after repairs to axle brake system,
- after repairs in parking brake system.

Before commencing adjustment make certain that the main break is correctly regulated and is functioning properly.

Checking and parking brake adjustment:

- **every 12 months,**
- **if needed.**

5.3 PNEUMATIC SYSTEM MAINTENANCE

5.3.1 PRELIMINARY INFORMATION

Work connected with the repair, change or regeneration of system components (brake cylinders, lines, control valve, braking force regulator etc.) should be entrusted to specialist establishments, having the appropriate technology and qualifications for this type of work.

The duties of the operator connected with the pneumatic system include:

- inspecting and checking air tightness of system.
- cleaning the air filter (filters),
- draining water from air tank,

- clean drain valve,
- cleaning and maintaining pneumatic line connections,
- replacement of the pneumatic line.

DANGER

Do NOT use the trailer when brake system is unreliable.

5.3.2 INSPECTING AND CHECKING AIR TIGHTNESS OF PNEUMATIC SYSTEM.

Checking hydraulic system tightness

- ➡ 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 single line systems air pressure should amount to approx. 5.8 bar.
  - ⇨ In double line systems air pressure should amount to approx. 8 bar.
- ➡ Turn off tractor engine.
- ➡ Check system components by releasing brake pedal in tractor.
  - ⇨ Give particular attention to conduit connections and brake cylinders.
- ➡ Repeat 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 exposed by covering checked elements with washing fluid or other foaming preparations, which will not react aggressively with 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 component or seal.

Check system tightness

- **after travelling the first 1,000 km,**
- **each time after making repairs or changing system components,**
- **annually.**

Visual assessment of system

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

Visual assessment of system

- **Conduct inspection of system at the same time as when checking tightness.**

IMPORTANT

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

5.3.3 CLEANING THE AIR FILTERS

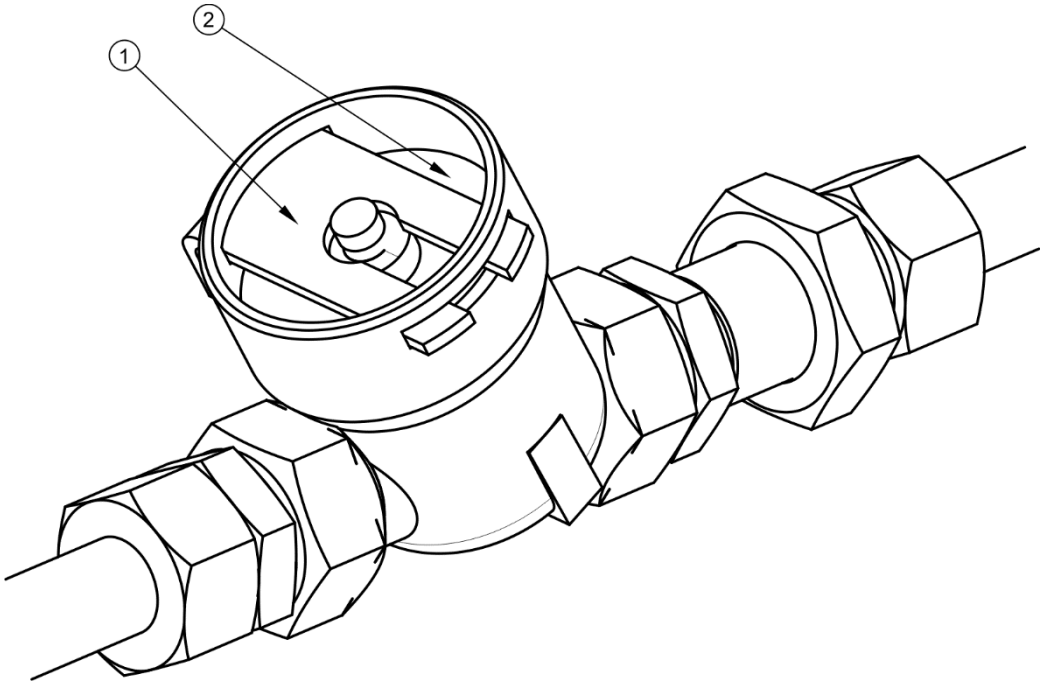


FIGURE 5.8 Air filter

(1) securing slide lock, (2) air filter cover

DANGER

Before proceeding to dismantle filter, reduce pressure in supply line. While disengaging filter slide gate, hold cover with other hand. Stand away from filter cover vertical direction.

Depending on trailer working conditions, but not less than once in three months, take out and clean air filter inserts, which are located in pneumatic system connection lines. Inserts are used many times and are not subject to changing unless they are mechanically damaged.

Required service actions

- ➡ Reduce pressure in supply line.
  - ⇨ Reduction of pressuring line may be achieved by pressing the head of the pneumatic connection to resistance point.
- ➡ Remove securing slide (1) – figure (*5.8*).

⇨ Hold the filter cover (2) with the other hand. After removing slide lock, the cover is pushed off by the spring, in the filter housing.

➡ The insert and the filter body should be carefully washed out and blown through with compressed air. Assembly should be done in reverse order.

Cleaning the air filter (filters):

- **every 3 months of use,**

5.3.4 DRAINING WATER FROM AIR TANK

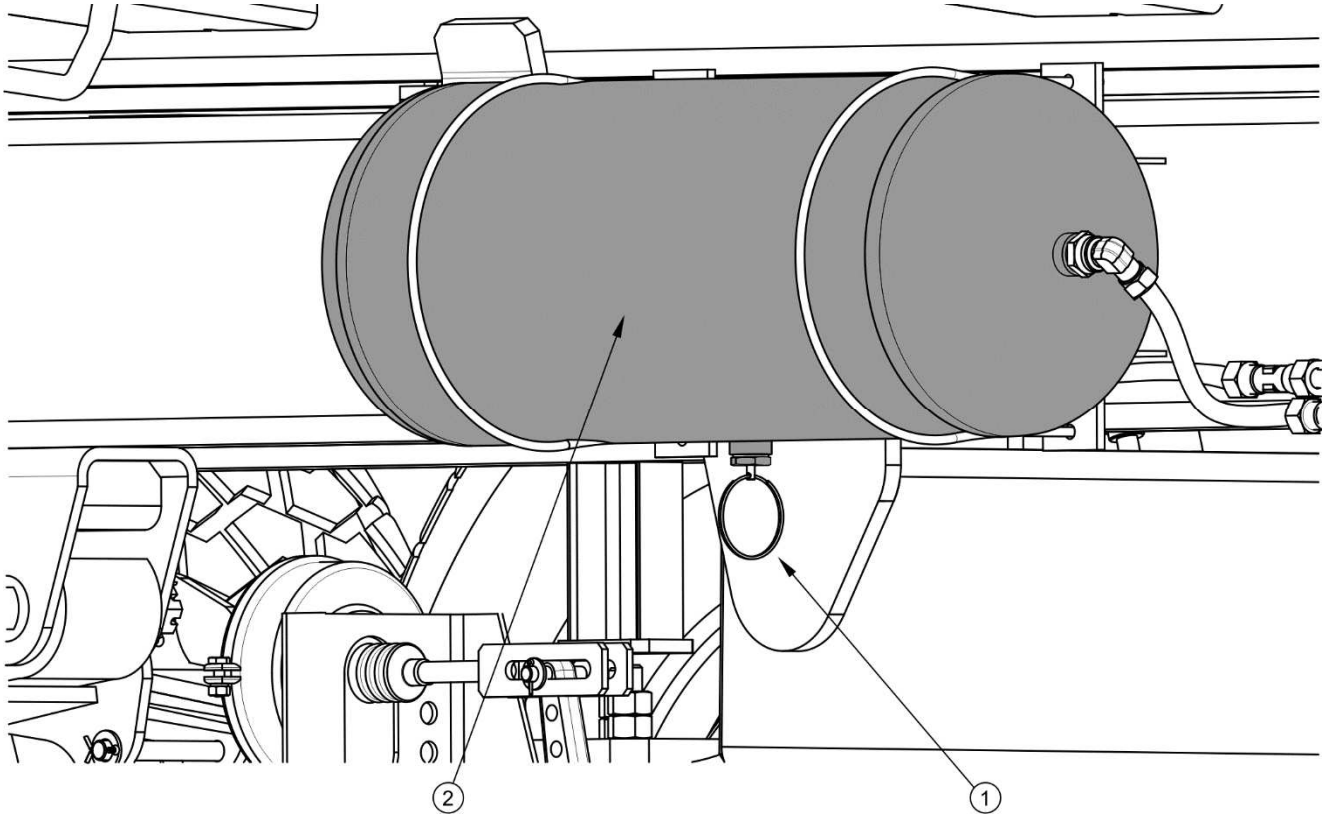


FIGURE 5.9 Draining water from air tank

(1) drain valve, (2) air tank

Required service actions

➡ Open out drain valve (1) placed in 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.

⇨ In the event, that the valve stem resists returning to its setting, then the whole drain valve must be unscrewed and cleaned, or replaced (if it is damaged) - see section 5.3.5.

Draining water from air tank:

- **after each week of use.**

5.3.5 CLEAN DRAIN VALVE

DANGER

Before dismantling drain valve release air from tank.

Required service actions

➡ Reduce pressure in air tank.

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

➡ Unscrew valve.

➡ Clean valve, purge with compressed air.

➡ Change copper seal.

➡ Screw in valve, fill air tank, and check tank tightness.

Cleaning valve:

- **every 12 months (before winter period).**

5.3.6 CLEANING AND MAINTAINING PNEUMATIC LINE CONNECTIONS AND PNEUMATIC SOCKETS

DANGER

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

Damaged connection body or connection socket to second trailer should be replaced. In event of damage to cover or seal, change these elements for new reliable elements. Contact of pneumatic connector 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 period it is recommended to preserve the seal with special preparations (e.g. silicon grease for rubber elements).

Each time before connection of the machine inspect technical condition and cleanness of contacts and sockets in tractor. If necessary clean or repair tractor socket.

Inspect trailer connections:

- **connection should be inspected every time before connecting trailer to tractor or second trailer.**

5.3.7 REPLACEMENT OF THE PNEUMATIC LINE

Pneumatic lines should be replaced when permanently deformed, cut or frayed.

Required service actions

➡ Release all pressure from the system.

⇨ Reduction of pressure is achieved by tilting the drain valve mandrel.

➡ Remove the pneumatic line by loosening the nut (2).

➡ Fit the new line.

⇨ The interior of the line should be clean.

⇨ The ends of the pneumatic line (1) must be cut exactly at right angles.

⇨ Clamping ring (3) should be fitted according to figure (*5.10*).

⇨ Reinforcing sleeve (4) of the line must be thoroughly depressed.

➡ Check tightness of connections in accordance with Chapter *(5.3.2).*

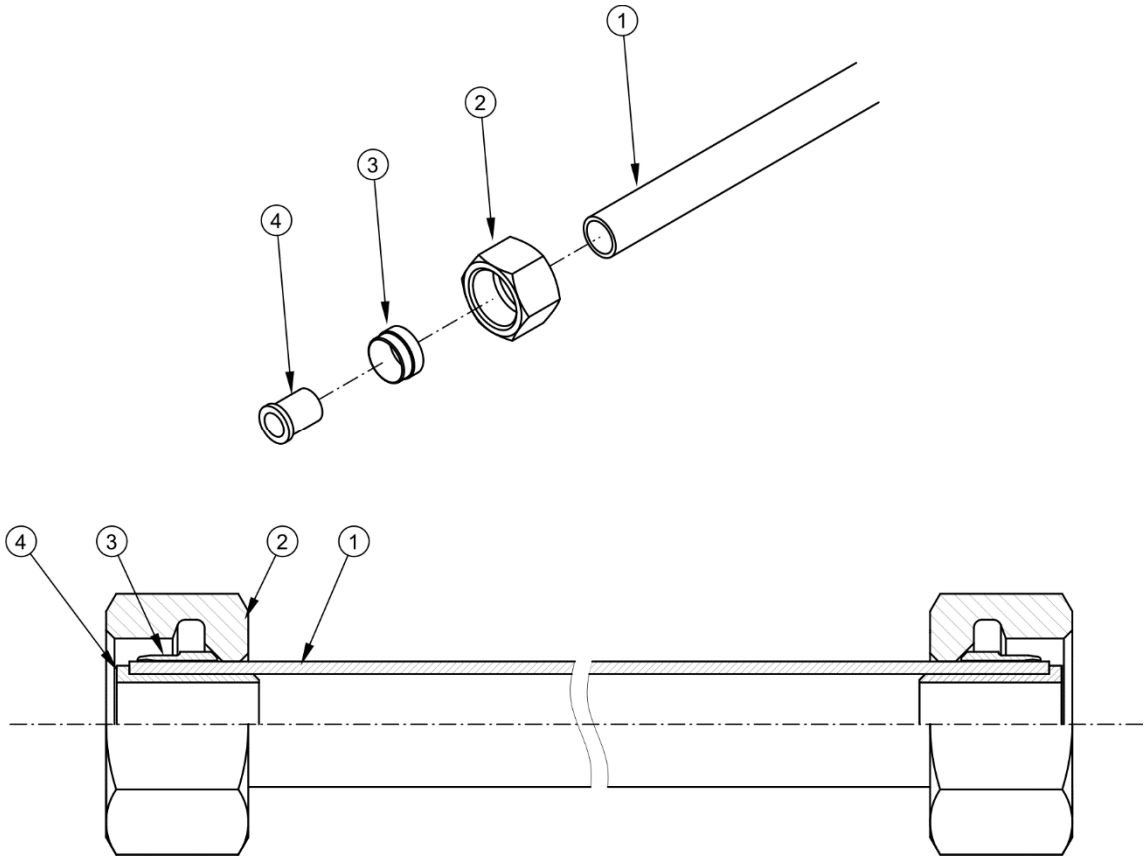


FIGURE 5.10 Installation of the pneumatic line

(1) pneumatic line, (2) connecting nut (3) clamping ring, (4) reinforcing sleeve

5.4 HYDRAULIC SYSTEM OPERATION

5.4.1 PRELIMINARY INFORMATION

Work connected with the repair, change or regeneration of hydraulic system components (suspension cylinders, valves etc.) should be entrusted to specialist establishments, having the appropriate technology and qualifications for this type of work.

The duties of the operator connected with the hydraulic system include:

- inspecting and checking air tightness of system.

- Checking technical condition of hydraulic connections.

DANGER

Do NOT tip trailer with unreliable hydraulic tipping system.
Do not use the trailer if the support hydraulic system is out of order.
Do NOT use the trailer if hydraulic brake system is unreliable.
Do NOT use the trailer if hydraulic tailgate system is unreliable.

5.4.2 CHECKING HYDRAULIC SYSTEM TIGHTNESS

Required service actions

- ➡ Hitch trailer to tractor.
- ➡ Connect all hydraulic system lines according to service instructions.
- ➡ Clean connections and cylinders (tipping cylinder, hydraulic tailgate cylinders and possibly hydraulic brake cylinders and axle turning interlock cylinders).
- ➡ Conduct tipping of load box sideways and backwards several times.
- ➡ Open and close the tailgate several times.
- ➡ Press tractor brake pedal several times.
  - ⇨ Only if the trailer is equipped with hydraulic brake system.
- ➡ Check tightness of hydraulic system, inspect cylinders and hydraulic lines.

In the event of confirmation of oil on hydraulic ram cylinder bodies ascertain origin of leak. Inspect hydraulic 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.

Checking tightness:

- **After a week of use**
- **every 12 months of use.**

5.4.3 CHECKING TECHNICAL CONDITION OF HYDRAULIC CONNECTIONS AND SOCKETS

Hydraulic connections and sockets designed for connection with second trailer must be in good working condition and kept clean. Each time before connecting check if socket in tractor or connection of second trailer 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 (contamination may cause scratching of hydraulic valves, abrasion of piston surfaces etc.)

Inspection of hydraulic connections and sockets:

- **connection should be inspected every time before connecting trailer to tractor or second trailer.**

5.4.4 REPLACEMENT OF HYDRAULIC CONDUITS

Rubber hydraulic conduits must be replaced every 4 years regardless of their technical condition. This should be entrusted to specialised workshops.

Replace the hydraulic lines:

- **every 4 years,**

5.5 OPERATION OF ELECTRICAL SYSTEM AND WARNING ELEMENTS

5.5.1 PRELIMINARY INFORMATION

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 responsibilities of the user are limited to:

- technical inspection of electrical system and reflectors,
- Changing bulbs

IMPORTANT

Do NOT travel with unreliable lighting system. Damaged lamp lenses, and burned-out bulbs must be replaced immediately before travelling. Lost or damaged reflective lights must be replaced.

Required service actions

- ➡ Hitch 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 triangular slow-moving vehicle sign.
- ➡ Before driving on to public road check that the tractor is equipped with warning reflective triangle.

Checking technical condition of electrical system:

- **each time while connecting trailer.**

TIP

Before driving away make certain that all lamps and reflective lights are clean.

5.5.2 CHANGING BULBS

Bulb set is presented in table (*5.3*). All light lenses are secured by screws and it is not necessary to dismantle whole lamp or trailer subassemblies.

TABLE 5.3 List of bulbs

LAMP	LAMP TYPE	BULB / QUANTITY IN 1 LAMP	NUMBER OF LAMPS
Rear left lamp assembly	WE 549L	R10W / 1 unit P21W / 2 units	1
Rear right lamp assembly	WE 549P	R10W / 1 unit P21W / 2 units	1
Licence plate light	LT-120	C5W – 1 unit	2
Front parking light	LO-110PP	C5W / 1 unit	2
Rear clearance lamp	127 021 00 00	R5W / 1 unit	2

5.6 TRAILER LUBRICATION

TABLE 5.4 Trailer lubrication schedule

ITEM	LUBRICATION POINT	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	FREQUENCY
1	Hub bearing	4	A	24M
2	Drawbar eye	1	B	14D
3	Expander shaft sleeve	8	A	3M
4	Brake expander arm	4	A	3M

ITEM	LUBRICATION POINT	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	FREQUENCY
5	Parabolic leaf springs	4	C	6M
6	Sockets for installation of tipping ram and cylinder suspension	4	B	1M
7	Tipping ram cylinder ball bearing	1	B	3M
8	Parking brake mechanism	1	A	6M
9	Parking brake guide roller pins (1)	1	A	6M
10	Leaf spring absorber sliding surface	4	A	3M
11	Absorber spring pins	4	A	3M
12	Drawbar pins	2	A	3M
13	Drawbar sliding surface	2	A	3M
14	Shear type drawbar support pin	2	B	3M
15	Shear type drawbar support cylinder bearing	2	B	3M
16	Articulated joints and sockets for installation of load box.	3	B	3M
17	Rear hitch mechanism	1	A	3M
18	Tailgate cylinder bearings	4	A	3M
19	Securing hook pins	4	B	3M

ITEM	LUBRICATION POINT	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	FREQUENCY
20	Tailgate wing securing pin	2	A	3M
21	Ladder pin and catch	1	D	3M
22	Slide gate guides	2	D	1M
23	Slide gate pull shaft pins	6	D	1M
24	Rocker arm pin	2	B	3M
25	Lateral gate hinge	6	D	3M
26	Lateral gate lock	6	D	3M

Lubrication periods – M months, D – days, (1) – not shown in figure

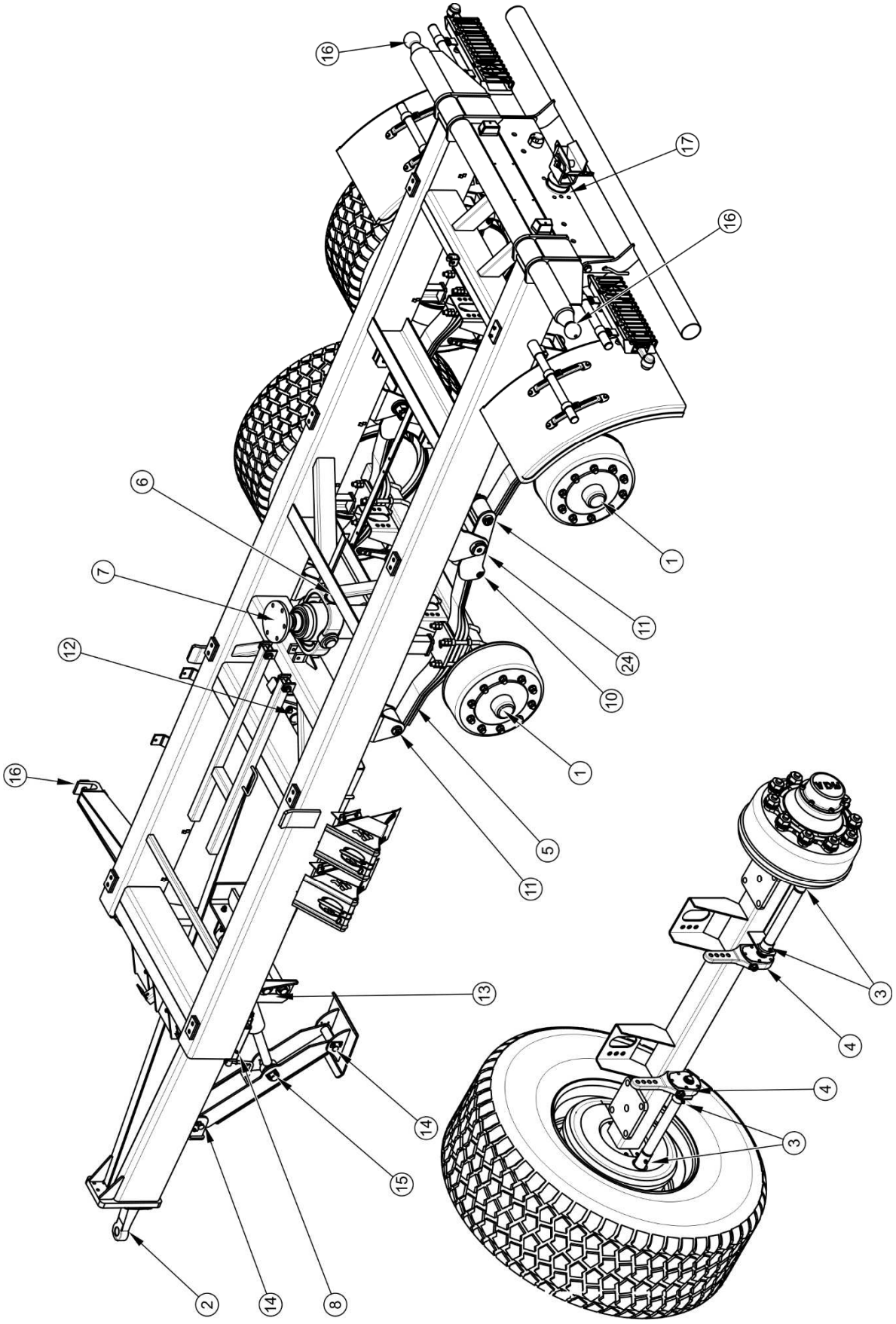


FIGURE 5.11 Trailer's lubrication points, part 1

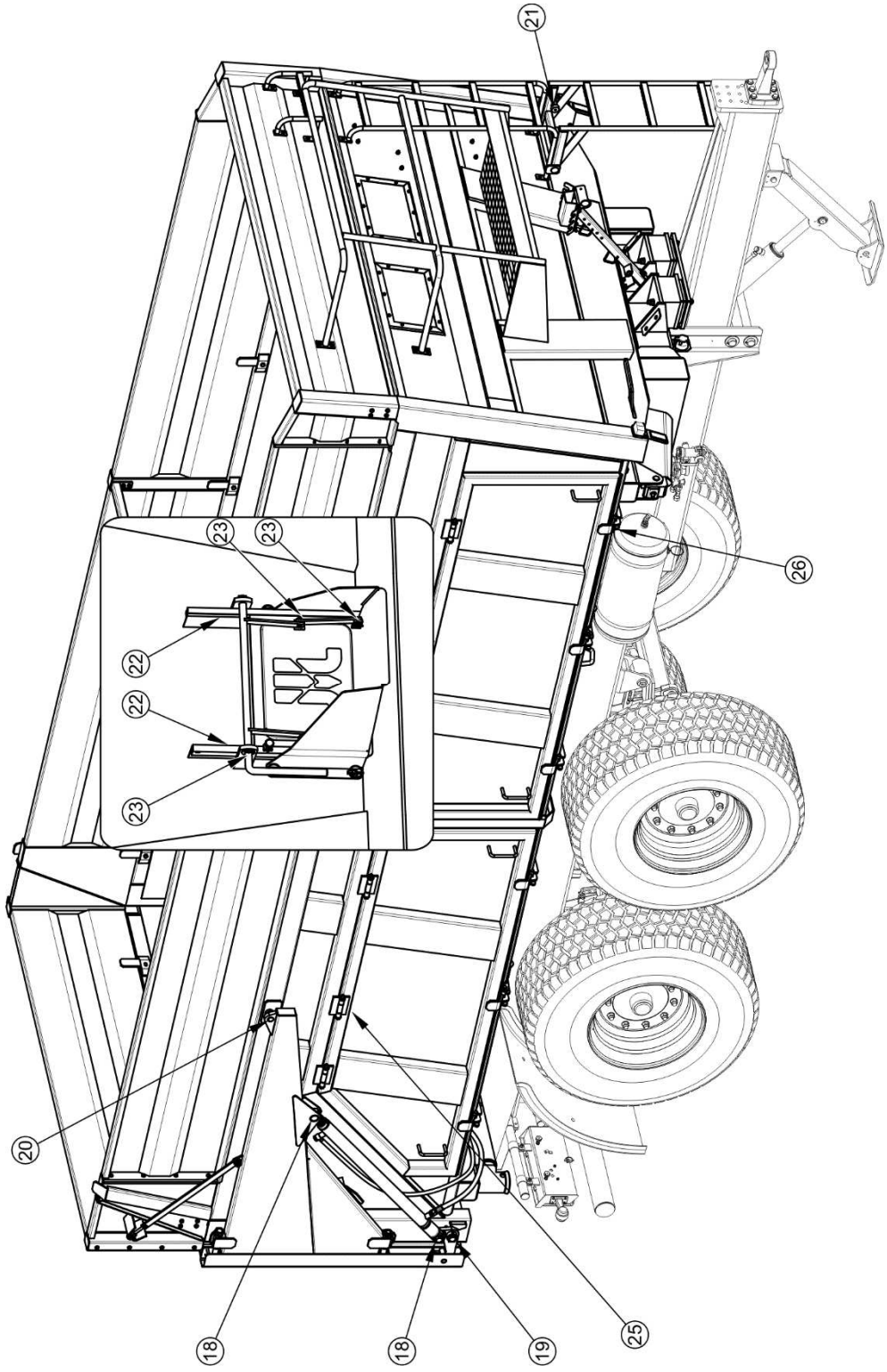


FIGURE 5.12 Trailer's lubrication points, part 2

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

TABLE 5.5 Recommended lubricants

LISTED ON TAB. (5.4)	DESCRIPTION
A	machine general-purpose grease (lithium, alkaline),
B	permanent grease for heavily loaded elements with addition of MOS_2 or graphite
C	anticorrosion preparation in aerosol
D	ordinary machine oil, silicon grease in aerosol

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 springs. 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 of guides, lock etc. see table) can be used. Sliding surface of leaf spring and leaf spring pin should be lubricated according to recommendations contained in table *(5.4)*.

Parts, which should be lubricated with machine oil, should be wiped with dry cleaning cloth and then a small quantity of oil should be applied do surfaces (with oil can or brush). Wipe off excess oil.

Change of grease in hub bearings should be entrusted to specialised service points, equipped with the appropriate tools. According to the recommendations of the axle Manufacturer, dismantle the entire hub, remove the bearing and individual sealing rings. After careful washing and inspection, mount lubricated elements. If necessary, bearing and seals should be replaced with new parts. Lubrication of axle bearings shall be performed at least once in 2 years or every 50,000 km. In the event of intensive use, lubrication should be performed more frequently.

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

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

5.7 CONSUMABLES

5.7.1 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.

In the event of necessity of changing 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. Attention should be given, so that chemical substances used for this purpose do not damage 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.

TABLE 5.6 L-HL 32 Lotos hydraulic oil characteristics

ITEM	NAME	UNIT	VALUE
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

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

5.7.2 LUBRICANTS

For parts under great load it is recommended to apply lithium grease with molybdenum disulphide (MOS_2) or graphite additive. In the case of less loaded sub-assemblies the application of general purpose machine greases is recommended, which contain anticorrosion additive and have significant resistance to being washed away by water. Similar characteristics should typify aerosol preparations (Silicon greases and anticorrosive lubricant substances).

Before starting to use greases acquaint oneself with the content off the information leaflet for the chosen product. Particularly relevant are safety rules and handling procedures for given lubricant product and waste utilisation (used containers, contaminated rags etc.). Information leaflet (material safety data sheet) should be kept together with grease.

5.8 CLEANING TRAILER

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.

Trailer cleaning guidelines

- Before cleaning the trailer open the tailgate. Carefully clean load remains from the load box (sweep out or blow out with compressed air), especially where tailgate and extensions join together.
- To clean trailer only use clean running water or water with a cleaning detergent additive with neutral pH.
- Using pressure washer increases washing effectiveness, but particular care must be taken during work. During washing, washer nozzle may not be closer than 50 cm from the surface being cleaned.
- Water temperature shall 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 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. Comply with recommendations of the Manufacturer.
- Washing detergent should be kept in original containers, optionally in replacement containers, but very clearly marked. Preparations may not be stored in food and drink containers.

DANGER

Carefully read the instructions for application of washing detergents and maintenance preparations.

While washing with detergents wear appropriate protective clothing and goggles protecting against splashing.

- Unsure cleanliness of elastic conduits and seals. 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 finishing washing wait until trailer is dry and then grease all inspection points according to recommendations. Remove excess oil or grease with a dry cloth.

- Observe environmental protection principles and wash trailer in a place designed for this purpose.
- Washing and drying trailer must take place at temperatures above 0°C.
- After washing and drying, trailer should be greased at all control points regardless of last lubrication period.

5.9 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 prolonged work stoppage, it is essential to lubricate all elements regardless of the period of the last lubrication process.
- 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 tyre pressure should be inspected from time to time, and if necessary pressure should be increased to appropriate value.
- If trailer is equipped with tarpaulin it should be carefully washed and dried. If possible clean tarpaulin should be stored unrolled, otherwise carefully roll it not causing crushing and breaking of material.

5.10 TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS

Unless other tightening parameters are given, during maintenance repair work apply appropriate torque to tightening nut and bolt connections. Recommended tightening torque of most frequently applied nut and bolt connections are given in table below. Given values apply to non-lubricated steel bolts.

TABLE 5.7 Tightening torque for nut and bolt connections

THREAD METRIC	5.8(1)	8.8(1)	10.9(1)
	Md [Nm]		
M10	37	49	72
M12	64	85	125
M14	100	135	200
M16	160	210	310
M20	300	425	610
M24	530	730	1,050
M27	820	1,150	1,650
M30	1,050	1,450	2,100

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

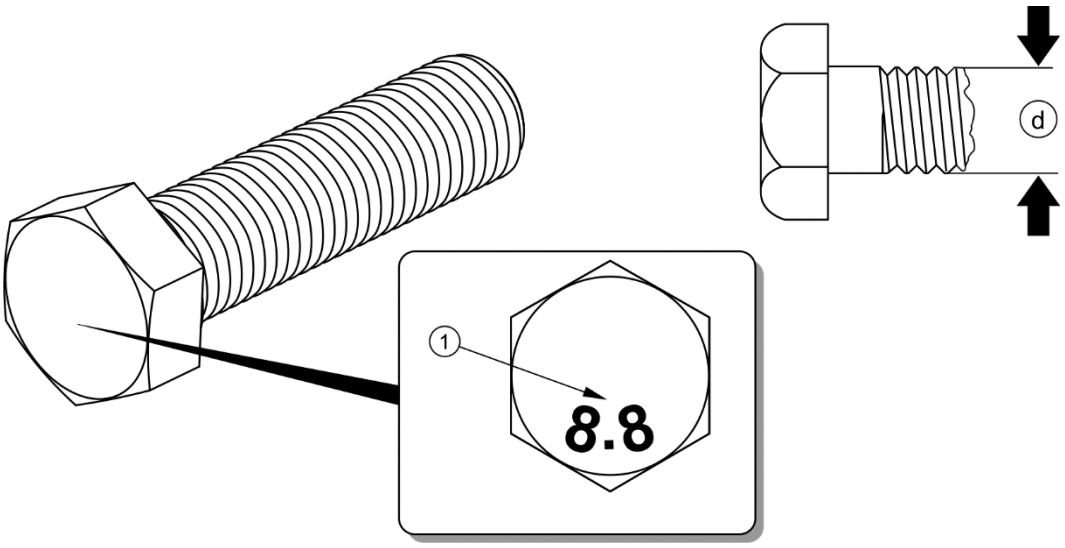


FIGURE 5.13 Bolt with metric thread

(1) resistance class, (d) thread diameter

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

5.11 INSTALLATION AND DISASSEMBLY OF EXTENSION WALLS

Extension mounting

- Install six wall extension supports (8) on the rear and lateral load box stakes and the lateral tailgate stakes.
- Install front wall extension (1).
  - Holes in wall extension stakes must align with holes in the supports.
  - Wall extension arms must be inserted into the appropriate mounting brackets welded to the load box.
- Install two front lateral wall extensions (3).
  - Lateral wall extensions must be bolted to the front wall extension.
- Install lateral stakes (5).
- Install two rear lateral wall extensions (4).
- Attach lateral wall extensions (3) and (4) to the lateral stakes (5).

- ➡ Install the rear stakes (6).
- ➡ Attach rear lateral wall extensions (4) to the stakes (6).
- ➡ Install tailgate extension (2).
- ➡ On both sides Install the rear profiles of wall extensions (7) and screw them to tailgate extension (2).
- ➡ Brace the structure by installing tension rod (10) on both sides of the load box.
    - ⇨ Tension rod (10) must be bolted to the tailgate wing and rear wall extension profile (7).
- ➡ Attach tie beam (9) to the lateral stakes (5).
- ➡ All wall extension arms must be bolted load box brackets.
- ➡ Attach the ladder to the front wall extension (1).

Disassembly of wall extensions should be performed in reverse order.

DANGER

Assembly and disassembly of wall extensions should be carried out with the use of appropriate platforms, ladders or when standing on a ramp. These tools must be in good condition to fully protect the persons working on them against falling. Work should be performed by at least two persons.

Exercise particular caution.

ATTENTION

When operating the trailer, pay close attention to proper installation of wall extensions, securing of individual segments, and make sure that any loose nuts are tightened.

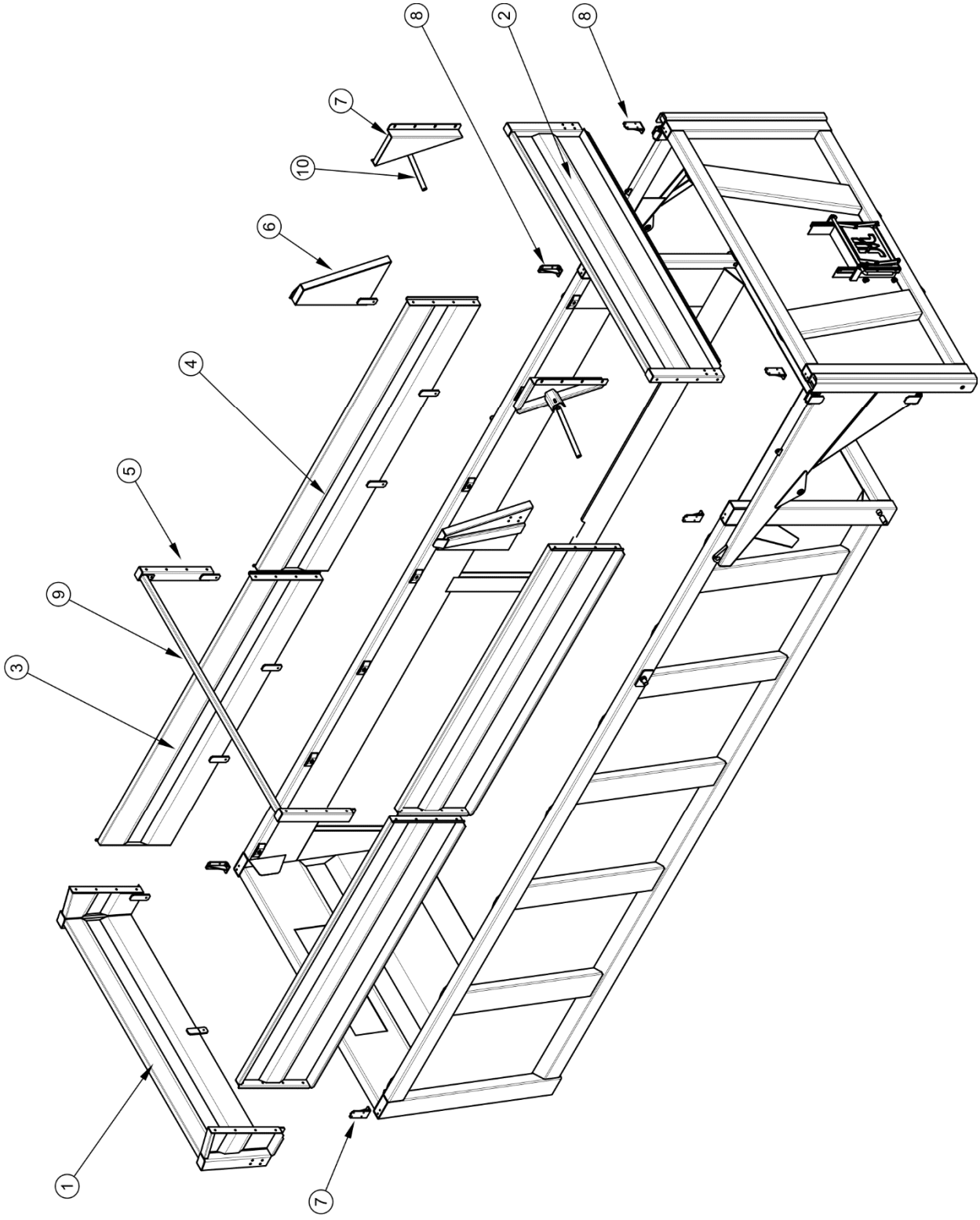


FIGURE 5.14 Load box with a set of wall extensions

(1) front wall extension, (2) tailgate extension, (3) front lateral wall extension, (4) rear lateral wall extension, (5) lateral stake, (6) rear stake (left, right), (7) rear wall extension (left, right), (8) wall extension bracket, (9) tie beam, (10) tension rod

5.12 INSTALLATION AND DISASSEMBLY OF THE FRAME AND TARPAULIN COVER

Tarpaulin cover can only be used together with the frame. The assembly of wall extensions should be carried out with the use of appropriate platforms, ladders, ramps or other stable raised surfaces. Particular care should be taken, holding onto the trailer with one hand. Work should be done with the help of another person

The frame structure comprises front apex (1), centre apex (2), rear apex (3), as well as connecting pipe (4) – figure *(5.15)*.

Assembly of frame and tarpaulin

- Attach front apex (1) to the front wall extension.
- Attach rear apex (3) to the rear wall extension.
- Attach centre apex (2) to lateral wall extensions.
- Screw the connecting pipe (3) to the front and centre apexes
- Install limiters (5) to side wall extensions on the right side of the load box.
- Place tarpaulin cover (6) so that it rests on the limiters on the right side.
    - ⇨ The tarpaulin should be laid so that it is possible to one role it without unnecessary laying of material.
- Install tarpaulin fastening straps (7) to mounting riveted to the right side wall extensions.
- Unroll tarpaulin using and secure with fastening straps (7) to holders (8) located on the left side of the trailer.
- Tighten tarpaulin and secure with fastening straps (7) the front and rear part of the tarpaulin.

Disassembly of the frame and tarpaulin cover should be performed in reverse order.

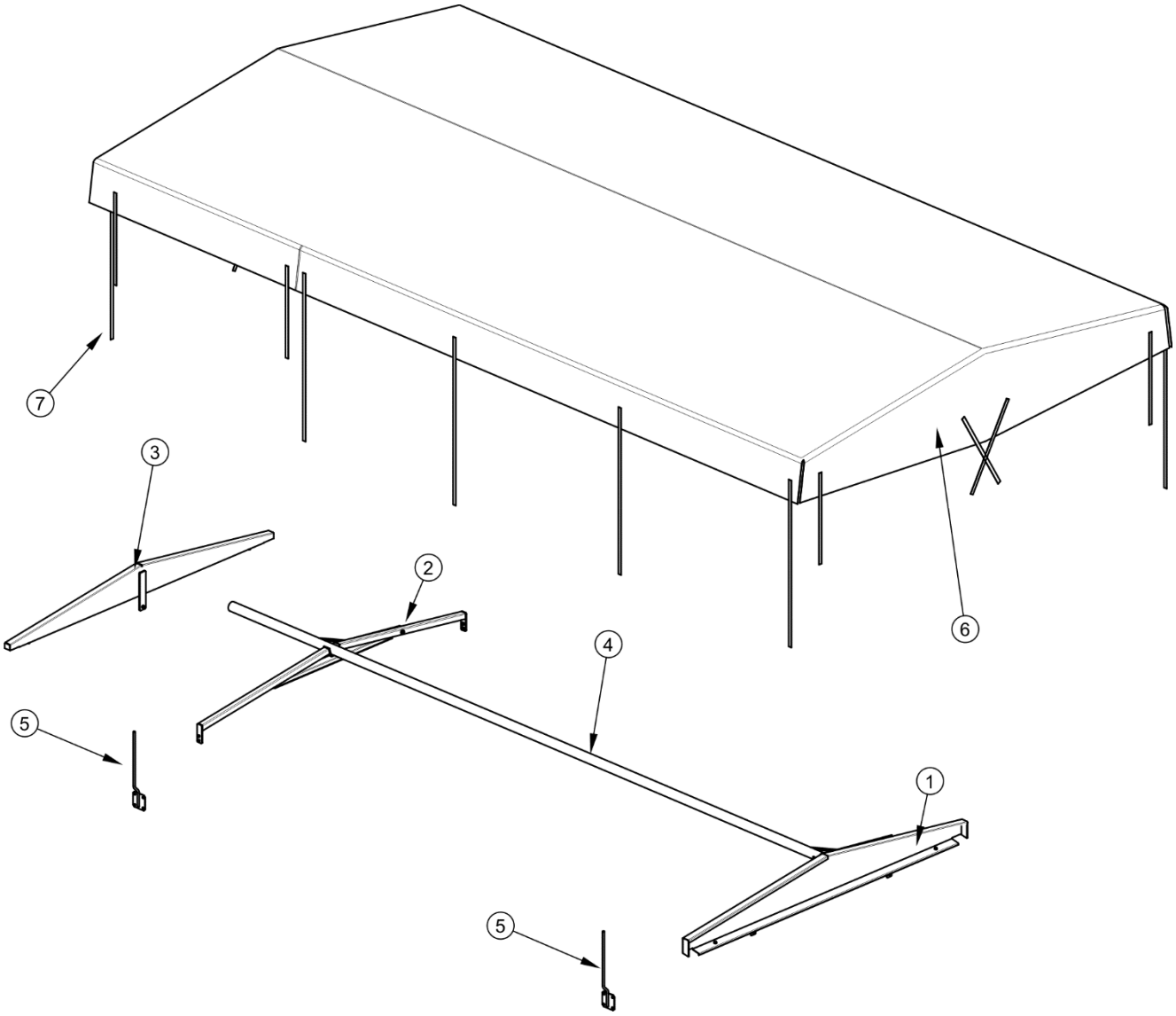


FIGURE 5.15 Frame with tarpaulin cover

(1) front apex, (2) centre apex, (3) rear apex (4) connecting pipe, (5) limiter, (6) tarpaulin cover, (7) fastening strap

DANGER

Assembly and disassembly of the frame should be carried out with the use of appropriate platforms, ladders or when standing on a ramp. These tools must be in good condition to fully protect the persons working on them against falling. Work should be performed by at least two persons. Exercise particular caution.

5.13 ADJUSTMENT OF DRAWBAR POSITION

Location of trailer drawbar depends on the type of farm tractor hitch. If possible, we recommend adjusting the tractor hitch so that the trailer drawbar is positioned horizontally while driving on a flat terrain.

To adjust drawbar position change the position of bolted drawbar eye (1) on the faceplate (2) - Figure *(5.16).*

Required actions

- ➡ Immobilise trailer with parking brake.

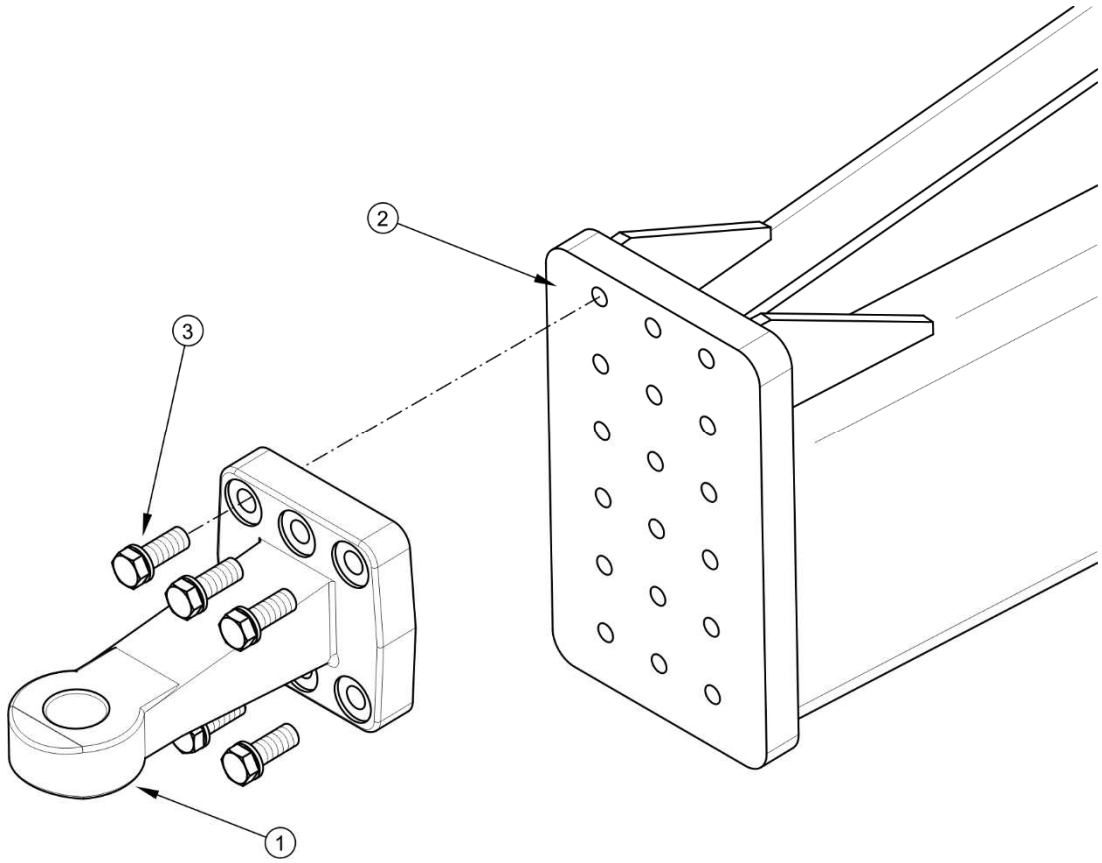


FIGURE 5.16 Adjustment of drawbar position

(1) fixed drawbar eye, (2) faceplate, (3) fixing bolt

- ➡ Place wheel chocks under trailer wheels.
- ➡ Unscrew drawbar eye (1) and remove from faceplate (2).

➡ Set the drawbar eye in its new position and tighten with bolts (3) using appropriate torque.

⇨ The faceplate design (2) allows 4 possible drawbar eye positions, Figure *(5.16)*.

⇨ To prevent premature wear of the ball drawbar make sure it is positioned horizontally at the tractor hitch point.

5.14 TROUBLESHOOTING

TABLE 5.8 Troubleshooting

FAULT	CAUSE	REMEDY
Problem with moving off	Brake system pneumatic lines not connected	Connect brake conduits (applies to pneumatic systems)
	Applied parking brake	Release parking brake.
	Damaged pneumatic system connection conduits	Replace.
	Leaking connections	Tighten, replace washers or seal sets, replace conduits.
	Control valve or braking force regulator damaged	Check valve, repair or replace.
Noise in axle hubs	Excessive play in bearings	Check play and adjust if needed
	Damaged bearing	Replace bearings.
	Damaged hub parts	Replace.
Poor reliability of braking system	Insufficient pressure in 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 conduits or connections. Check system for tightness.

FAULT	CAUSE	REMEDY
Excessive heating of axle hubs	Incorrect main or parking brake adjustment	Regulate setting 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.
	Insufficient tractor hydraulic pump output, tractor hydraulic pump is damaged	Check tractor hydraulic pump.
	Damaged or contaminated ram cylinder	Check cylinder ram piston (bending, corrosion), check ram cylinder for tightness (piston seal), in case of need repair or replace ram cylinder.
	Excessive cylinder ram loading	Check mechanism controlled by ram cylinder for mechanical damage.
	Damaged hydraulic conduits	Check and ascertain that hydraulic lines are tight, not fractured and properly tightened. If necessary replace or tighten.

ANNEX A

Tyre dimensions

TRAILER VERSION	AXLE FRONT / REAR
T669	Wheel 385 / 65 R22,5reg. 160F TL [1] Wheel 425 / 65 R22,5reg. 168F [2] Wheel 445 / 65 R22,5reg. 170F TL [3] Wheel 500 / 60-22,5 165A8 [4] Wheel 550 / 60-22,5 163A8 16PR [5] Wheel 560 / 60 R22,5 161D [5] Wheel 20.5 R22.5reg. (50 x 20.0 R22) 173A8 [6] Wheel 600 / 50-22,5 165A8 [7] Wheel 600 / 55-22.5 16PR 169A8 [7]

[1] - wheel disc 11.75x22.5; ET= -30

[2] - wheel disc 13.00x22.5; ET= 0

[3] - wheel disc 14.00x22.5; ET=0

[4] -wheel disc 16.00x22.5; ET= -30

[5] - wheel disc 16.00x22.5; ET= 0

[6] - wheel disc 16.00x22.5S; ET= 0

[7] - wheel disc 20.00x22.5; ET= -20