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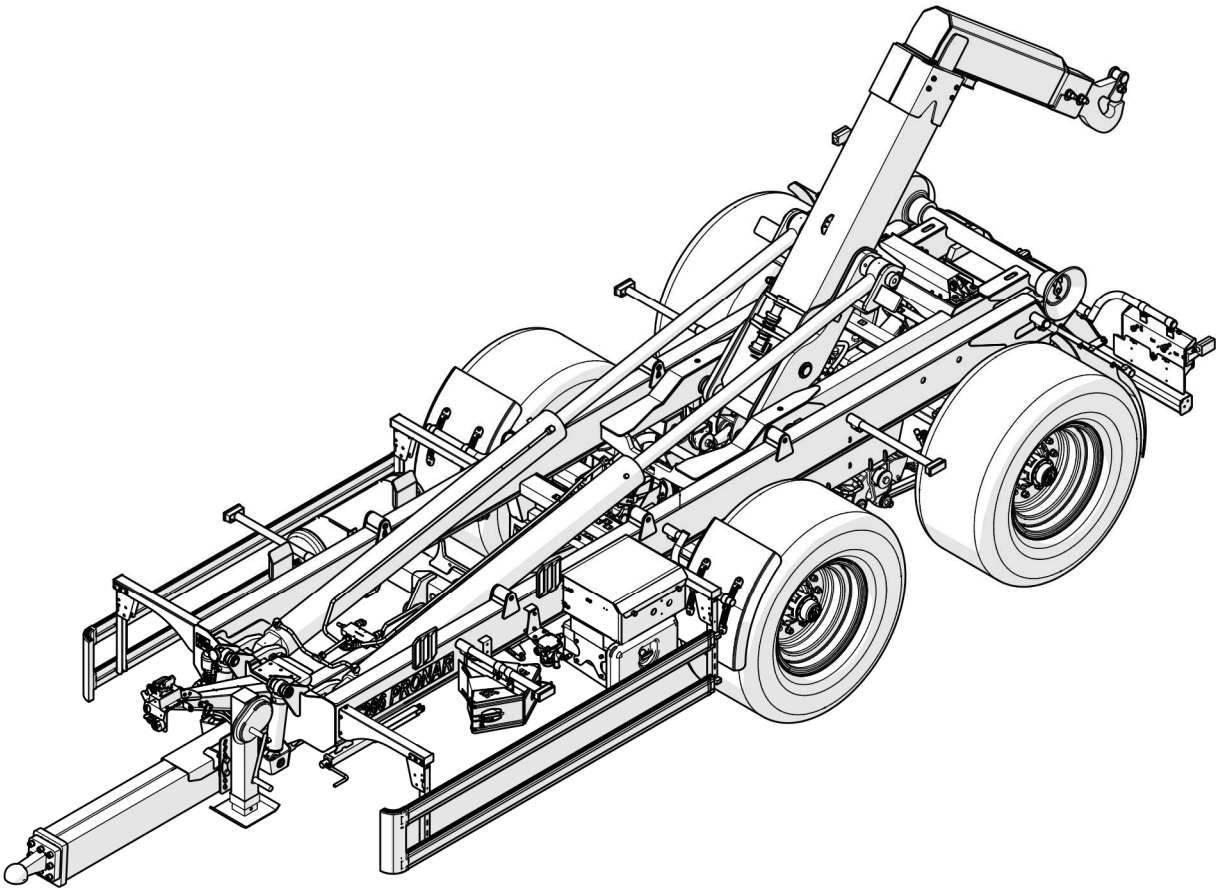
OPERATOR'S MANUAL

AGRICULTURAL TRAILER

PRONAR T286

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 T286.

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:

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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 **"IMPORTANT".** 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: ⇨

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EC DECLARATION OF CONFORMITY OF THE MACHINERY

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

Description and identification of the machinery	
Generic denomination and function:	**AGRICULTURAL TRAILER**
Type:	**T286**
Model:	**- - - - -**
Serial number:	
Commercial name:	**AGRICULTURAL TRAILER PRONAR T286**

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.

Z-CA DYREKTORA
d/s Technicznych
członek zarządu
Roman Cornelianiuk

Narew, the 2015-09-30

Place and date

Full name of the empowered person position, signature

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CONTENTS

SECTION

1

BASIC INFORMATION

1.1 IDENTIFICATION

1.1.1 TRAILER IDENTIFICATION

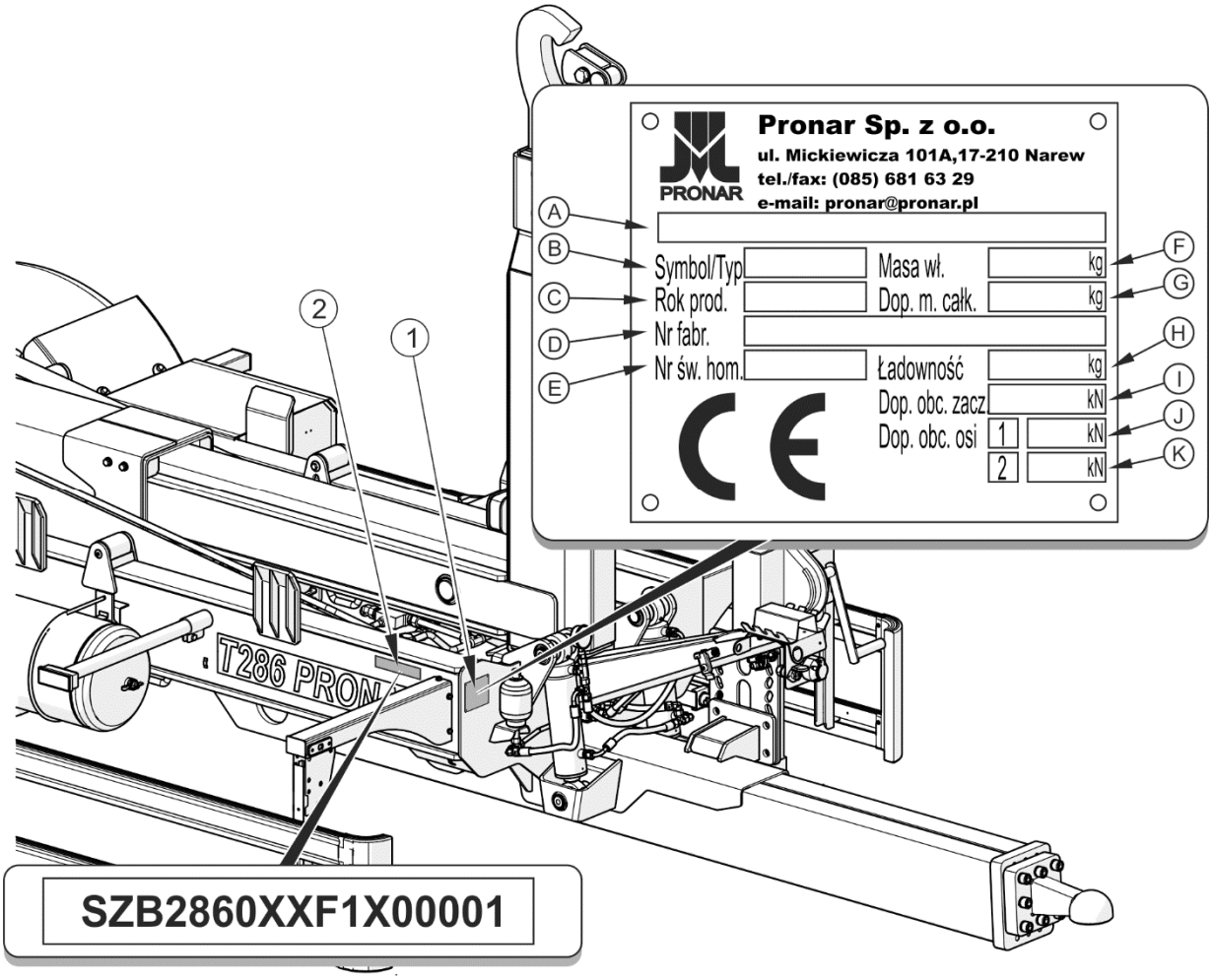


FIGURE 1.1 Location of the data plate and serial number

(1) data plate, (2) serial number

PRONAR T286 agricultural trailer is marked with the data plate (1) located on the faceplate and with serial number (2). The serial number is stamped into the data plate and into the right longitudinal member of the lower frame – 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	Symbol /Type
C	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 axle 1 load
K	Permissible axle 2 load

1.1.2 AXLE IDENTIFICATION

The factory number of the axle and its type are stamped onto the data plate secured to the axle profile.

1.1.3 LIST OF FACTORY NUMBERS

Identification number (VIN)

S	**Z**	**B**	**2**	**8**	**6**						**X**					

SERIAL NUMBER OF FRONT FIXED AXLE

SERIAL NUMBER OF REAR STEERING AXLE

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 above.

1.2 PROPER USE

The hook trailer is designed for use with various types of load boxes (agricultural, building, communal and special ones and transport platforms etc.), fulfilling the requirements described in table *(1.2)*. Trailer design enables connection and disconnection of load boxes and their unloading by tipping to the rear. Type of load carried depends on load box use. The trailer must not be used in any way other than that described above.

DANGER

The trailer must not be used for purposes other than those for which it is intended, in particular:

- **for transporting people and animals,**
- **for transporting loose unsecured toxic materials, if there is a possibility of causing environmental damage,**
- **for transporting machines and equipment, with high centre of gravity affecting trailer stability,**
- **for transporting loads with uneven loading and overloading of axles,**
- **for transporting unsecured loads, which may move in the load box.**
- **with load boxes not complying with the Manufacturer's requirements.**

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.

The trailer is not intended or designed for transporting people or animals.

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 Load box requirements

DATA	UNIT	VALUE
Minimum length★	[mm]	5,400
Maximum length★	[mm]	6,900
Maximum width	[mm]	2,550
Maximum height (internal)	[mm]	2,000
Maximum gross weight	[kg]	17,100
Hook height according to DIN 30722-1 standard	[mm]	1,570
Hook height according to SS 3021 standard	[mm]	1,450

★ *the length from hook axis to trailer rear edge*

The hook trailer is designed for work with load boxes made according to DIN 30722-1 standard and SS 3021 standard. The trailer may be used with load boxes of total length not less than 5400 mm and not greater than 6900 mm. Width and height of load box must not exceed the dimensions given in table *(1.2)*.

UWAGA

It is forbidden to use technically inoperative containers. The container should have adequate strength, allowing for its loading and unloading with full load.

Requirements concerning trailer operation with agricultural tractor are presented in the table below.

TABLE 1.3 Agricultural tractor's requirements

CONTENTS	UNIT	REQUIREMENTS
Brake system		
Double conduit pneumatic system	-	sockets compliant with PN-ISO 1728
Nominal pressure of the pneumatic system	bar / kPa	6.5 / 650
Hydraulic brake system	-	socket compliant with ISO 7241-1
Nominal pressure of the hydraulic system	bar / MPa	160 / 16

CONTENTS	UNIT	REQUIREMENTS
Hydraulic system		
Hydraulic oil	-	HL 32
Pressure rating of the system	bar / MPa	200 / 20
Minimum oil delivery	L	25
Sockets	-	according to ISO 7241-1
Electrical system		
Electrical system voltage	V	12
Connection socket	-	7-pole compliant with ISO 1724
Connection socket	-	3-pole
Tractor hitches		
Type	-	Lower transport hitch
Minimum vertical load capacity of hitch	kN / kg	29.43 / 3,000
Other requirements		
Minimum power demand	kW / Horsepower	92 / 125

1.3 EQUIPMENT

TABLE 1.4 Hook trailer equipment

EQUIPMENT	STANDARD	ADDITIONAL	OPTIONS
The Operator's Manual	•		
Warranty Book	•		
Connection lead for the electrical system	•		
Double conduit pneumatic system with manual regulator	•		
Double conduit pneumatic system with ALB or Hydraulic braking system			•

EQUIPMENT	STANDARD	ADDITIONAL	OPTIONS
Turning interlock hydraulic system	•		
Drawbar with hydraulic shock absorbers	•		
Mechanical support with two-stage gear	•		
Straight hydraulic support or folding hydraulic support			•
Rotating drawbar eye ∅50 mm	•		
Fixed drawbar eye ∅40 mm or fixed drawbar eye ∅50 mm or ball drawbar eye K80			•
Wheel chocks	•		
Automatic rear hitch or manual rear hitch		•	
Slow-moving vehicle warning sign		•	
Warning reflective triangle		•	
Lateral shields		•	
Toolbox		•	
Air suspension			•
Active steering system			•
Hydraulic system outlet on the hook		•	

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 *ATTACHMENT A.*

1.4 WARRANTY TERMS

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 guarantee 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 such cases as: mechanical damage, which is not the user's fault, factory defects of parts, etc.

In the event of damage arising from:

- mechanical damage which is the user's fault, 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.

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 guarantee or

not. For detailed Terms & Conditions of Warranty, please refer to the *WARRANTY BOOK* attached to each machine.

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.

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 hook 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 hook trailer from vehicle shall be conducted using loading ramp with the aid of an agricultural tractor. During work, adhere to the general principles of occupational health and safety (OHS) applicable to reloading work. Persons operating reloading equipment must have the qualifications required to operate these machines. The 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 hook 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 lugs designed for this purpose (1) – figure *(1.2).*

IMPORTANT!

Do NOT raise the trailer by the transport lugs. They are used only as attachment points for securing elements during transport.

Transport lugs are welded to the longitudinal members (2) of the lower frame. 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 contained in the Operator's Manual for the given securing measure. Chocks 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 secured to the load platform of the vehicle in a 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. To secure the trailer optimally on the load platform, support the drawbar with wooden blocks. 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.

DANGER

Incorrect application of securing measures may cause an accident.

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 paint coating. The tare weight of the trailer in condition ready for travel is given on the data plate.

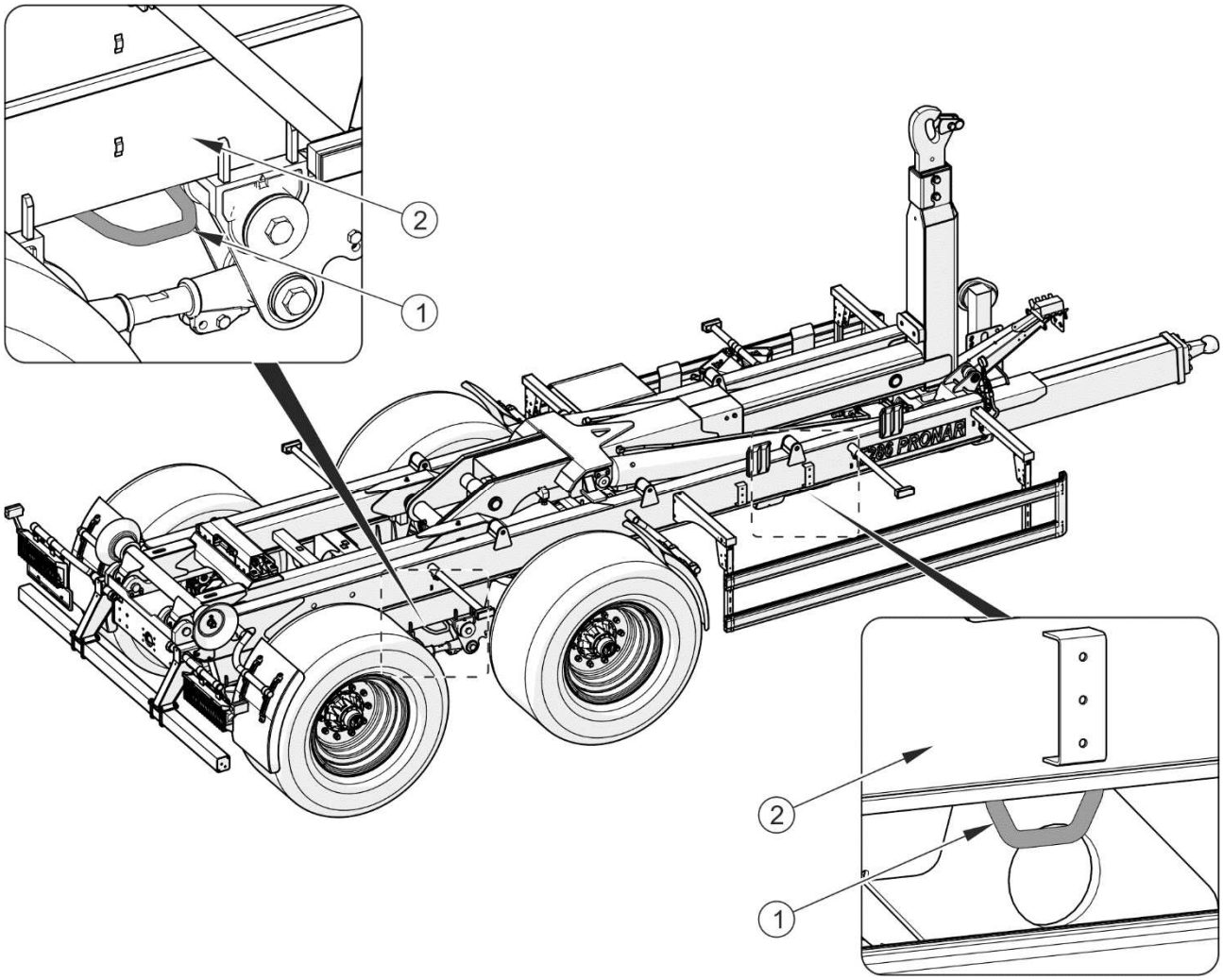


FIGURE 1.2 Positioning of transport lugs

(1) transport lug, (2) longitudinal member of the lower frame's drawbar

1.5.2 INDEPENDENT TRANSPORT BY THE USER

In the event of independent transport by the user after purchase of the hook 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!

When transporting independently, the user 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. Maintenance and repair work which involves the risk of an oil leak should be performed in the rooms with oil resistant surface. In the event of oil leaking into the environment, first of all contain the source of the leak, and then collect the leaked oil using available means. Remaining oil should be collected using sorbents, or by mixing the oil with sand, sawdust or other absorbent materials. The oil contaminations, once gathered up, should be kept in a sealed, marked, hydrocarbon resistant container, and then passed on to the appropriate oil waste recycling centre. The container should be kept away from heat sources, flammable materials and food.

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).

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.

During dismantling personal protection equipment shall be used i.e. protective clothing, boots, gloves and protective goggles etc.

DANGER

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

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 with a trailer.
- 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 hook trailer, and non-compliance with the recommendations given in this operator's manual is dangerous to your health.
- The user is obliged to acquaint himself with the construction, action and the principles of safe usage of the trailer.
- Be aware of the existence of a residual risk, and for this reason the fundamental basis for using this hook 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 for purposes other than those for which it is intended takes full responsibility 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.

2.1.2 HITCHING AND DISCONNECTING FROM TRACTOR

- Do NOT hitch the trailer to tractor if the tractor does not fulfil the requirements specified by the Manufacturer (minimum tractor power demand, wrong hitch, etc.) – compare table (*1.3*) *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 the trailer check that both machines are in good technical condition.
- While connecting the trailer to the tractor, use the appropriate hitch. 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 tipping frame is raised.
- Hitching and unhitching the trailer may only take place when the machine is immobilised with the parking brake. If the trailer is positioned on a slope or elevation it shall be additionally secured by the placing under the wheels of trailer equipment chocks or other objects without sharp edges.
- The trailer must not be moved when the parking stand is extended and rests on the ground. If moved there is a risk of damage to the parking stand.
- The trailer may not be unhitched from the tractor, if the tipping frame or central frame are not fully retracted and when hydraulic cylinder suspension blocks are extended.

2.1.3 PULLING THE LOAD BOX ON AND REMOVING THE LOAD BOX FROM THE TRAILER

- Before pulling the load box on the trailer one must take off the slow-moving vehicle warning sign.

- Selection of trailer's working mode is only possible when the tipping frame is in its rest position and the rear fender is maximally folded.
- Proper setting of the trailer to "hook trailer" function or "tipper" function must be signalled by a corresponding indicator light – see chapter 4.5 "TRAILER OPERATION".
- While connecting load box arrange it in such a way that the longitudinal axis of the trailer is aligned with the longitudinal axis of the load box. If not, the load box longitudinal members of the frame may not fit on the trailer rollers lengthwise. While pulling in the load box is necessary to observe whether its longitudinal members are properly supported on the trailer guide rollers. If necessary manoeuvre the trailer, to connect the load box properly.
- Lock the load box on the trailer using the hydraulic lock of the load box. Corresponding indicator light must light up when the load box is completely locked – see chapter 4.5 "TRAILER OPERATION".
- Other persons must NOT be in the immediate vicinity of the trailer and especially behind the connected or disconnected load box.
- Take particular care while working near electric power lines.

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 conduits. There must no oil or air leaks.
- 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 conduits 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 THE LOAD BOX

- Loading and unloading work should be carried out by persons experienced in this type of work.
- Do NOT exceed permissible load weight of trailer because this may cause danger to road traffic and cause damage to the machine.
- Do not carry people or animals either on the trailer chassis or in load boxes. The trailer is not intended for transporting people or animals.
- Individual types of load boxes are adapted to carrying various groups of materials, therefore the user is obligated to carefully read the load box operator's manual and comply with its recommendations.
- The load must be arranged in load box in such a way that it does not threaten the stability of the trailer, and does not hinder driving.
- The arrangement of the load in load box may not cause an overload on the axle and drawbar of the trailer.
- Loading and unloading work may be carried out only when the trailer is positioned on level and hard surface. Tractor and trailer must be placed to drive forwards.
- When unloading the load box, do NOT operate the middle frame interlock lever if the frame is raised.

- Ensure that there are no bystanders in the load box unloading or loading zone. Before tipping the load box ensure proper visibility and make certain that there are no bystanders near the machine.
- Do NOT move off or drive when load box is raised.
- Take particular care while working near electric power lines.
- When opening load box closure take particular care, because of the pressure of the load on the wall.
- When closing load box wall take particular care to avoid crushing fingers.
- Do NOT tip the load box in windy conditions.
- If the load does not pour from the raised load box immediately cease unloading. The trailer may only be tipped again after removing the problem (sticking, wedging), which prevented the load from pouring.
- Do NOT jerk the trailer forwards if load is bulky or reluctant to pour and does not unload.
- Do NOT raise the load box if there is any danger whatsoever that the trailer will tip over.
- After completing unloading, ensure that the load box is empty.
- Do NOT move with raised load box.

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, load and road traffic regulations limits.
- Chocks should be placed only under one wheel (one in front of the wheel, the other behind the wheel).
- The machine must NOT be left unsecured. When not connected to the tractor, the trailer must be immobilised with parking brake and protected against rolling with

chocks or other objects without sharp edges placed under the front and back wheels.

- Before driving make sure that the trailer is properly hitched to the tractor, especially if coupling bolts are secure.
- Vertical load borne by the trailer drawbar eye affects the steering of the agricultural tractor.
- If the journey takes place without load box, a slow-moving vehicle sign should be placed on the rear beam of the trailer, if the machine is the last vehicle in the group. If the trailer travels with the load box installed, then the slow-moving vehicle warning sign should be placed on the rear wall of the load box.
- While transporting the load box, the trailer must be set to "tipper" function".
- While transporting the load box, the hydraulic lock should be locked in order to protect the load box against shifting and shaking during transport on the trailer.
- Do NOT drive when load box is raised.
- 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.
- 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 5°. 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 tank in pneumatic system. During frosts, freezing water may cause damage to pneumatic system components.
- Reckless driving and excessive speed may cause accidents.

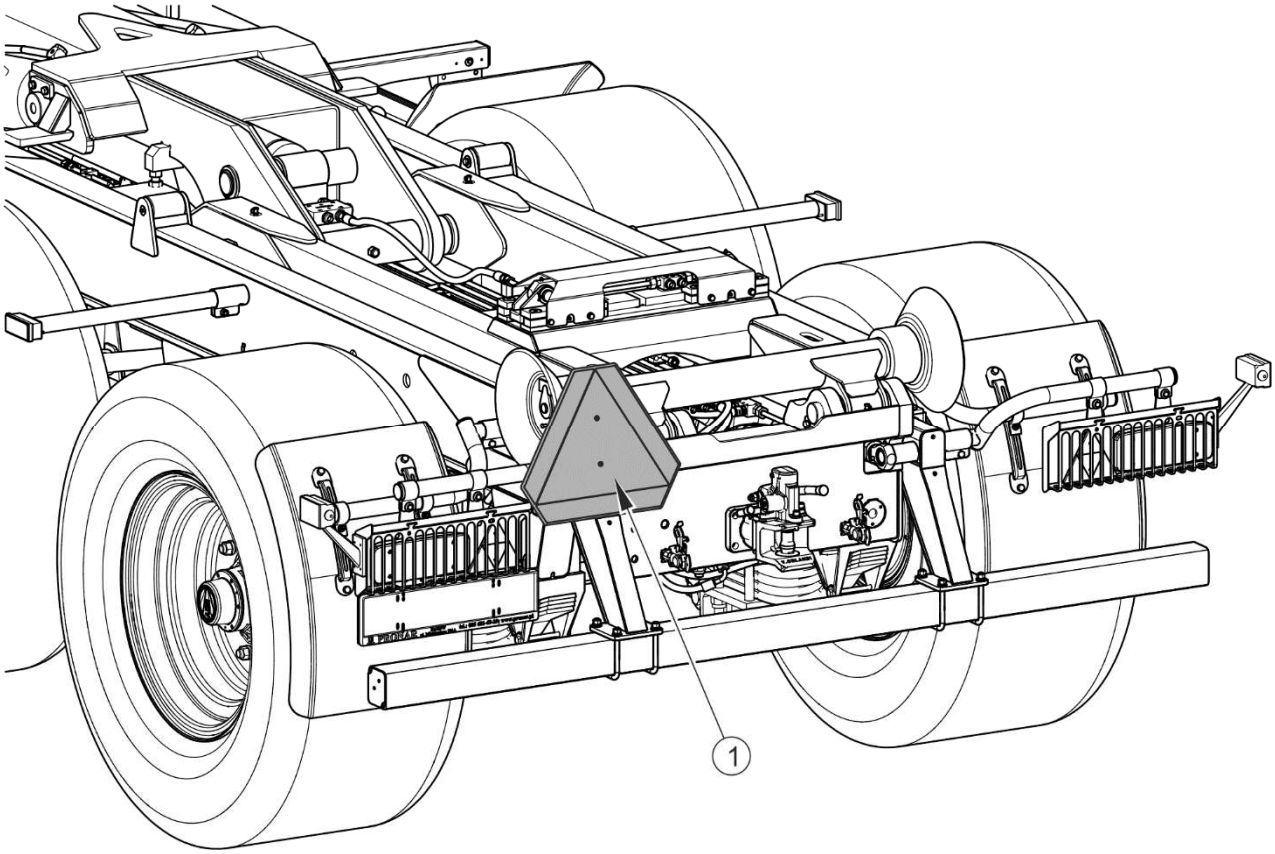


FIGURE 2.1 Location of the slow-moving vehicle warning sign

(1) slow-moving vehicle warning sign

- A load protruding beyond the edge of the trailer should be marked according to the road traffic regulations. Do NOT transport loads forbidden by the Manufacturer.
- Do NOT exceed the trailer's maximum carrying capacity. Exceeding the carrying capacity may lead to damage to the machine, loss of stability and danger while driving. The brake system is adjusted to the gross weight of the trailer, exceeding the weight limit causes drastic reduction of basic braking effectiveness.
- Prolonged driving across steep ground may lead to loss of braking efficiency.
- During reversing one should use the assistance of another person. During manoeuvring the 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.

- During travel, guards protecting rear light assemblies must be removed from the light beam profiles and secured on the other side of the profiles using star nuts (see figure *(3.1)* – item 13).
- When transporting the trailer with loaded load box on public roads, the maximum distance between the rear fender (underrun protection device) and the rearmost point of the vehicle (load box) should not exceed 400mm.
- 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 there is no load box on the trailer.
- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriate tools.
- Inspect tightness of wheel nuts after the first use of the trailer, every 2 - 3 hours during first month of work and then every 30 hours of use (travel). The inspection should be repeated individually if a wheel has been removed from the wheel axle. Wheel nuts should be tightened according to recommendations provided in section 5 *MAINTENANCE.*
- 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 hook 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.
- While performing maintenance work, use proper, close-fitting protective clothing, gloves, protective shoes, 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 immobilized with parking brake and chocks should be placed under the trailer wheels. Ensure that unauthorised persons do not have access to the tractor cab.
- Regularly check the condition of nut and bolt connections, in particular connections of drawbar eye and wheel nuts.
- Service inspections should be carried out according to the frequency specified in this Operator's Manual.
- 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 immobilized with parking brake and chocks should be placed under the trailer wheels. Ensure that unauthorised persons do not have access to the tractor cab.
- During maintenance or repair work, the trailer may be unhitched from tractor, but it must be secured with chocks and parking brake.
- Should it be necessary to change individual parts, use only those parts indicated by the Manufacturer. Non-adherence to these requirements may put the user and

other people's health and life at risk, and also damage the machine and invalidate the 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.
- The user must not repair by himself the components of the hydraulic or pneumatic system i.e.control valves, cylinders and regulators. In the event of damage to these elements, repair should be entrusted to authorised service point or replace elements with new parts.
- 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 hook trailer for purposes other than those for which it is intended,
- being between the tractor and the trailer while the engine is running and when the machine is being attached or hitched to second trailer
- being on the machine when it operates,
- failure to keep a safe distance from dangerous areas during loading, disconnecting, connecting or unloading the load box,
- operation of the trailer by unauthorised persons or persons under the influence of alcohol or other intoxicating substances,
- making modifications to the machine without the consent of the Manufacturer,
- presence of persons or animals in areas invisible from the driver's position.

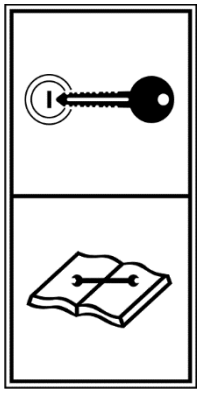
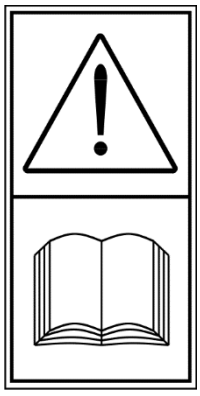
The residual risk may be kept to a minimum by following the recommendations below:

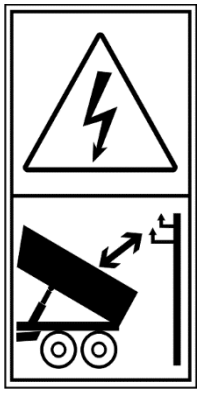
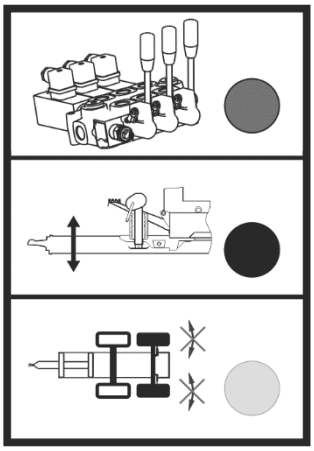
- prudent and unhurried operation of the machine,
- reasonably apply all the remarks and recommendations stated in the Operator's Manual,
- maintain safe distance from prohibited or dangerous places,
- carry out repairs and maintenance work in line with operating safety rules,
- repair and maintenance work should be carried out by persons trained to do so,
- use close fitting protective clothing and appropriate tools,
- ensure unauthorised persons have no access to the machine, especially children,
- do not climb on the machine when it is operating

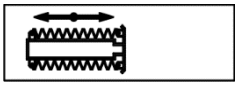
2.3 INFORMATION AND WARNING DECALS

The hook trailer is labelled with the information and warning decals mentioned in table (*2.1*). The symbols are positioned as presented in figure (*2.2*). 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 hook 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

NO.	DECAL	MEANING
1		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.
2		Caution! Before starting work, carefully read the Operator's Manual.

NO.	DECAL	MEANING
3		Caution! Danger of electric shock. Keep a safe distance from electric power lines during tipping or connecting and disconnecting load box
4		Regularly check if the nuts and bolts fixing the wheels and other components are properly tightened.
5		Grease the trailer according to the recommendations in the Operator's Manual
6		Machine type
7		Conduit functions. Hydraulic system control Plug cap - blue. Drawbar control Plug cap - black. Rear axle lock Plug cap - green.
8		Air pressure in the tyres.*
9		Maximum vertical load of drawbar eye

NO.	DECAL	MEANING
10		Transport decal Securing points for the transport
11		Maximum design speed.
12		Position of the hydraulic support leg control valve.
13		Extension/withdrawal of the hydraulic support

** – pressure value should be adapted to tyres*

Decal – position (12) is placed near the hydraulic valve of the support (option).

Decal – position (13) is placed on the hydraulic conduit of the support (option).

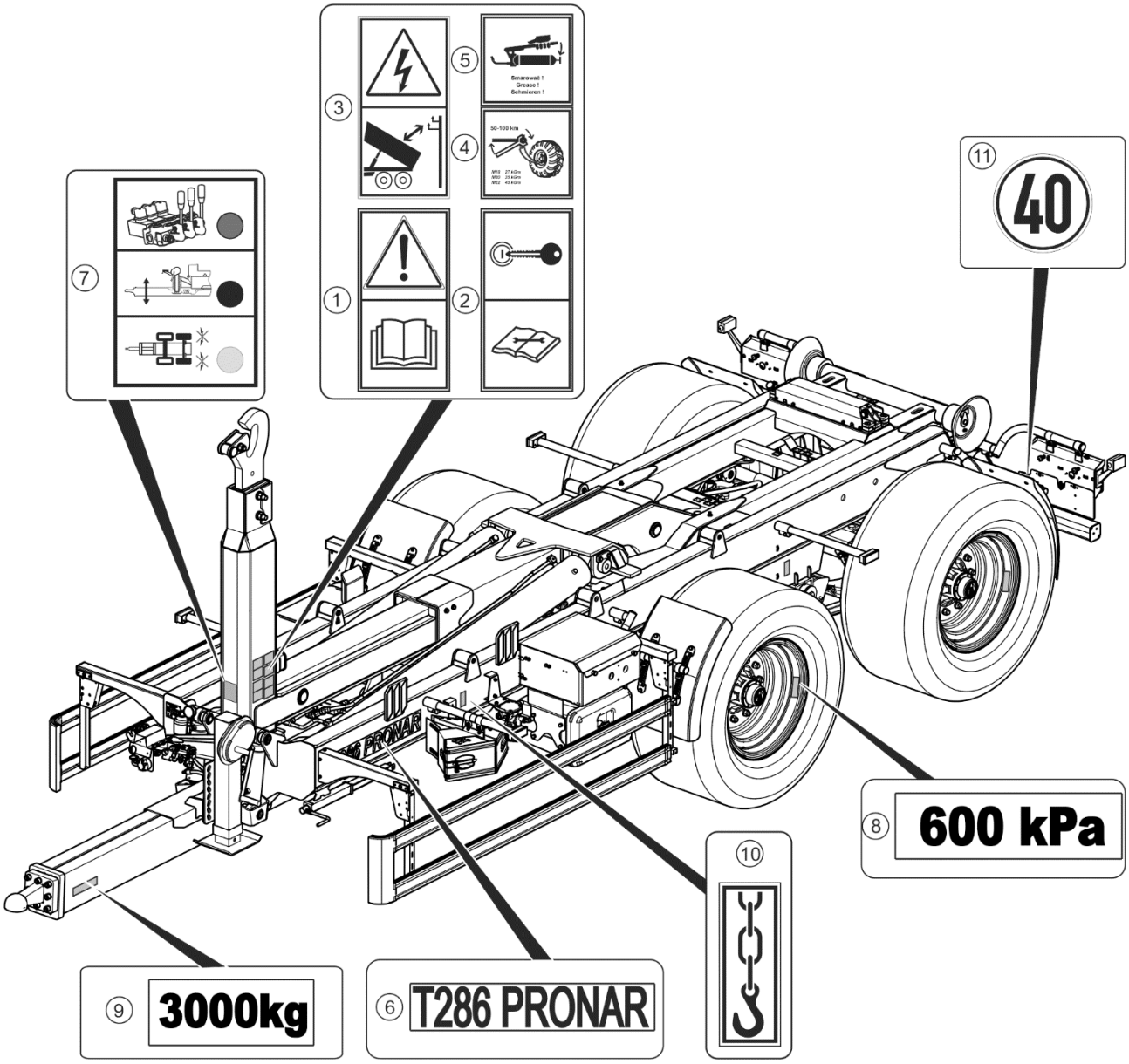


FIGURE 2.2 Locations of information and warning decals

Markings on the figure according to table 2.1

SECTION

3

DESIGN AND OPERATION

3.1 TECHNICAL SPECIFICATION

TABLE 3.1 Technical specification of hook trailer in standard version

CONTENTS	UNIT	T286
Dimensions		
Total length without load box	mm	7,870
Total width *	mm	2,550
Height (without load box)	mm	2,990
Length with shortest load box	mm	7,870
Length with longest load box	mm	8,940
Height of hook mounting (2 positions) **	mm/mm	1,450 / 1,570
Spacing of rollers	mm	1070
Technical specification		
Carrying capacity ***	kg	17,100
Tare weight of hook trailer	kg	5,900
Maximum gross weight	kg	23,000
Permitted load box dimensions		
Total length (min / max)	mm/mm	5,400 / 6,900
Internal length (min / max)	mm/mm	5,000 / 6,500
Maximum total width	mm	up to 2,550
Maximum internal height	mm	up to 2,000
Clearance under floor	mm	150
Other information		
Maximum load box tipping angle	(°)	50
Axle track	mm	2,000
Maximum design speed	km/h	40
Maximum drawbar eye load	kg	3,000
Oil demand ****	l	25
Pressure rating of the hydraulic system	MPa	20
Minimum tractor power demand	kW / Horsepower	92 / 125

Information concerning tires is provided at the end of this publication in *ATTACHMENT A.*

** - the trailer width exceeds 2 550 mm if tyres 600/55-22.5, 600/50R22.5, 620/50R22.5 are used,*

*** - height from load box base to hook axis*

**** - load capacity combined with load box weight,*

***** - without hydraulic braking system.*

Dimensions of the hook trailer, i.e. width, height and axle track, may differ depending on the tyres used (option).

3.2 TRAILER CONSTRUCTION

3.2.1 CHASSIS WITH MECHANICAL SUSPENSION

The main load bearing element of the hook trailer is the lower frame (1) – figure (*3.1*), which is a welded structure made of steel closed profiles. At the front of the frame, there is drawbar (2) to which hitching eye (3) is attached. Depending on the version, the trailer may be equipped with one of the hitching eyes (17-19). The support with two-stage mechanical gear (3) or straight hydraulic support (optional) (15) or hydraulic folding support (16) can be installed on the left side of the drawbar.

The parking brake mechanism (5) is located on the left longitudinal member, at the front of the trailer (5). Rollers guiding the brake cable and the brake lever are mounted to the lower part of the frame. Side shields (7) can be mounted on both sides of the trailer. Toolbox (20) can be mounted on the left side of the trailer Mudguards (11) are mounted to brackets on lower frame.

The trailer's axle system consists of tandem mechanical suspension with steel suspension springs (8), front fixed axle (9) and steering axle (10) with hydraulic turning interlock. The trailer's axles are equipped with drum brakes. The actuators which activate the brakes are pneumatic or hydraulic cylinders, depending on the brake system mounted.

Hydraulically extended rear fender (rear under-run protection device) (14) is installed at the rear of the trailer's frame. Complete lights support beams (12) are installed on both sides. Lamp assemblies and reflective warning triangles, included in the complete lighting system, are protected against damage by guard shields. While driving on public roads these guard shields must be removed and secured on the other side of the light beams profiles using star nuts (13).

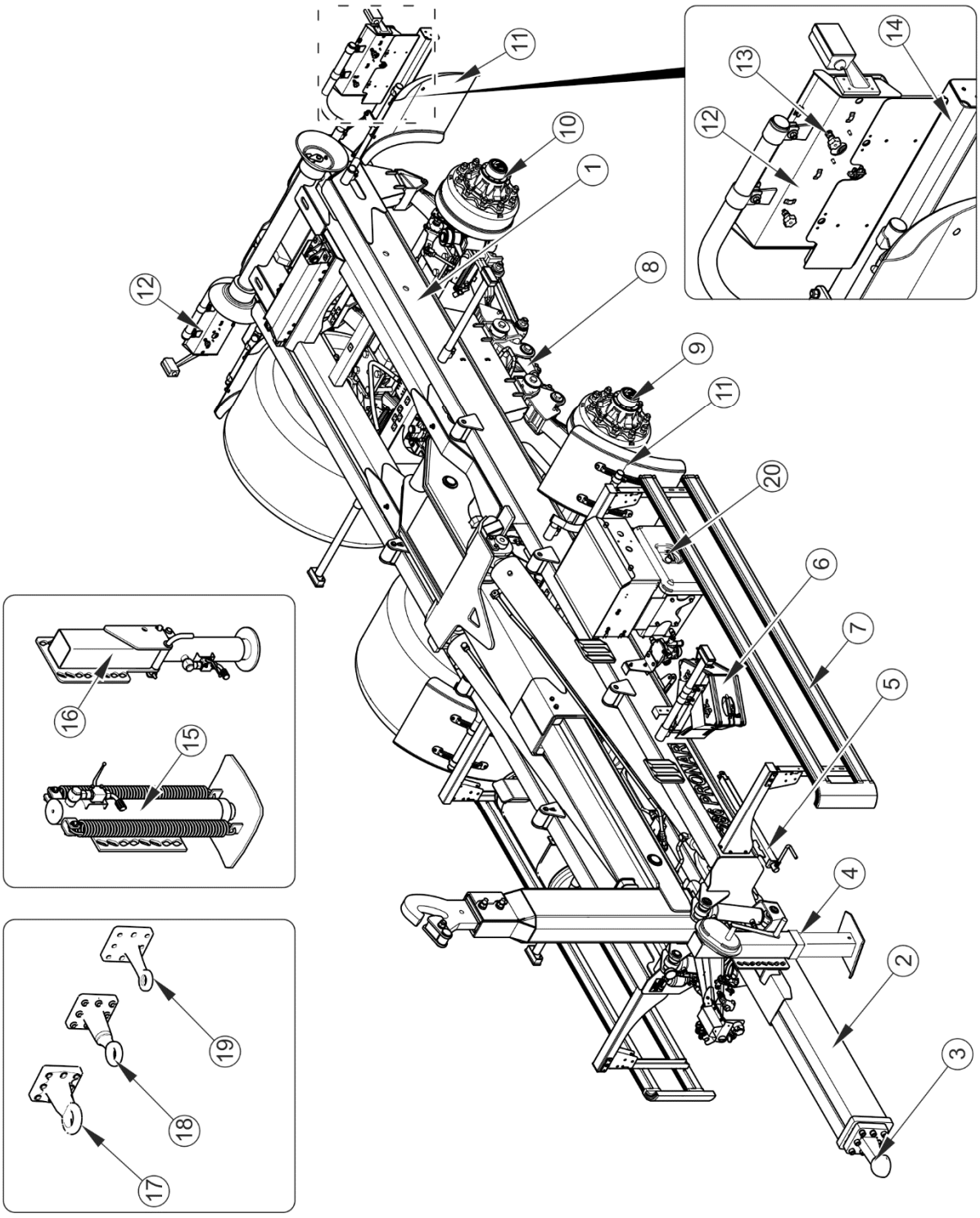


FIGURE 3.1 Trailer chassis

(1) lower frame, (2) drawbar, (3) ball drawbar eye, (4), straight support with mechanical gear, (5) handbrake mechanism, (6) wheel chocks, (7) side shields, (8) tandem suspension, (9) rigid axle, (10) steering axle, (11) mudguards, (12) lamp assembly, (13) star nut, (14) rear fender, (15) straight hydraulic support, (16) folding hydraulic support, (17-19) drawbar hitching eye, (20) toolbox

3.2.2 AXLE SYSTEM WITH AIR SUSPENSION

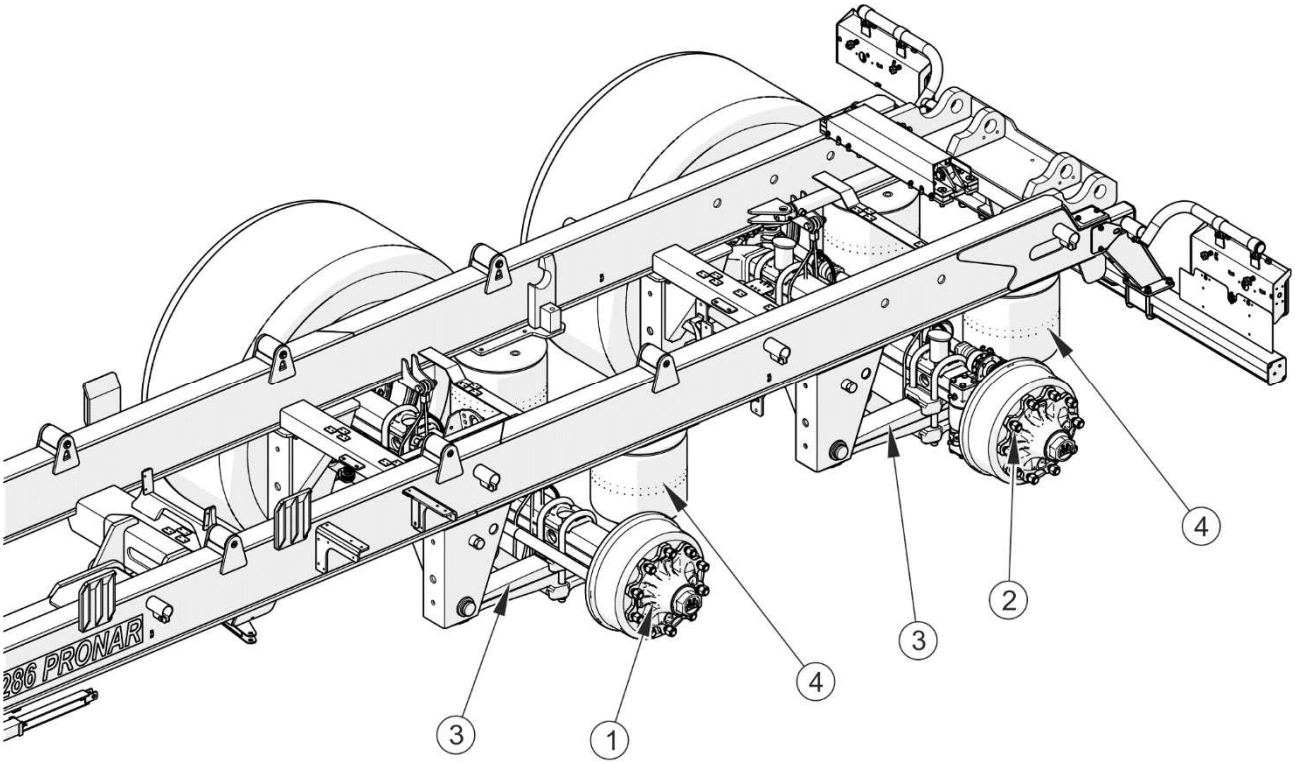


FIGURE 3.2 Air suspension

(1) rigid axle, (2) steering axle, (3) rocker arm, (4) air bellows

Axle system with air suspension consists of a front rigid axle (1) and a rear steering axle (2). Axles shock absorbing function is performed by a cylindrical rubber bellows (4) with front elements made of metal. The upper element is fixed to the vehicle's main frame. The lower element is attached to the end of trailing rocker arm (3) connected with a telescopic hydraulic shock absorber featuring suitable shock absorbing characteristics.

The system maintains the trailer on the same level thanks to the use of a levelling valve (3) - figure *(3.3)*. Elasticity of air bellows changes according to the trailer load. In case of trailer load increase, air is supplied from air tank (2) to air bellows (4) that are interconnected with pneumatic conduits. Consequently, pressure inside the air bellows increases. If the trailer load decreases, air is released from the system in order to maintain a specified trailer height. Pressure inside the air bellows decreases.

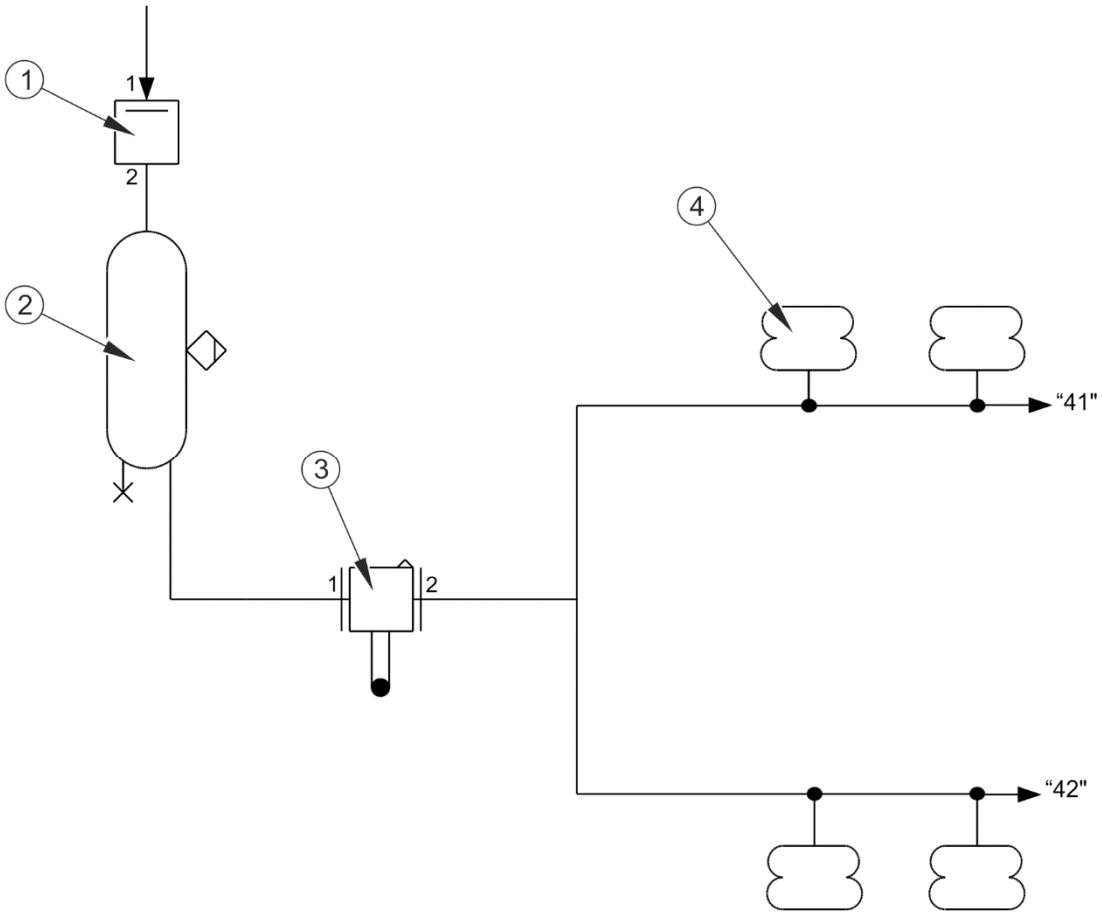


FIGURE 3.3 Diagram of air suspension system

(1) straight-run valve, (2) air tank, (3) levelling valve, (4) air bellows, („41"), („42") signal leads to ALB regulator in the brake system

3.2.3 TIPPING FRAME

The complete tipping frame consists of three cooperating frames which are made of steel closed profiles: rear frame (1), central frame (2) and telescopic hook frame (3) – figure (*3.4*). The rear part of the complete tipping frame is connected with the trailer's lower frame by means of pins which are pivot points when tipping the load box. The front part of the trailer's lower frame is connected with the central frame (2) by means of two hydraulic cylinders (4). The hook (5) (for load boxes made according to DIN 30722-1 and SS 3021 standards) is equipped with a gravity safety latch which prevents unlocking the load box eye during operation and transport.

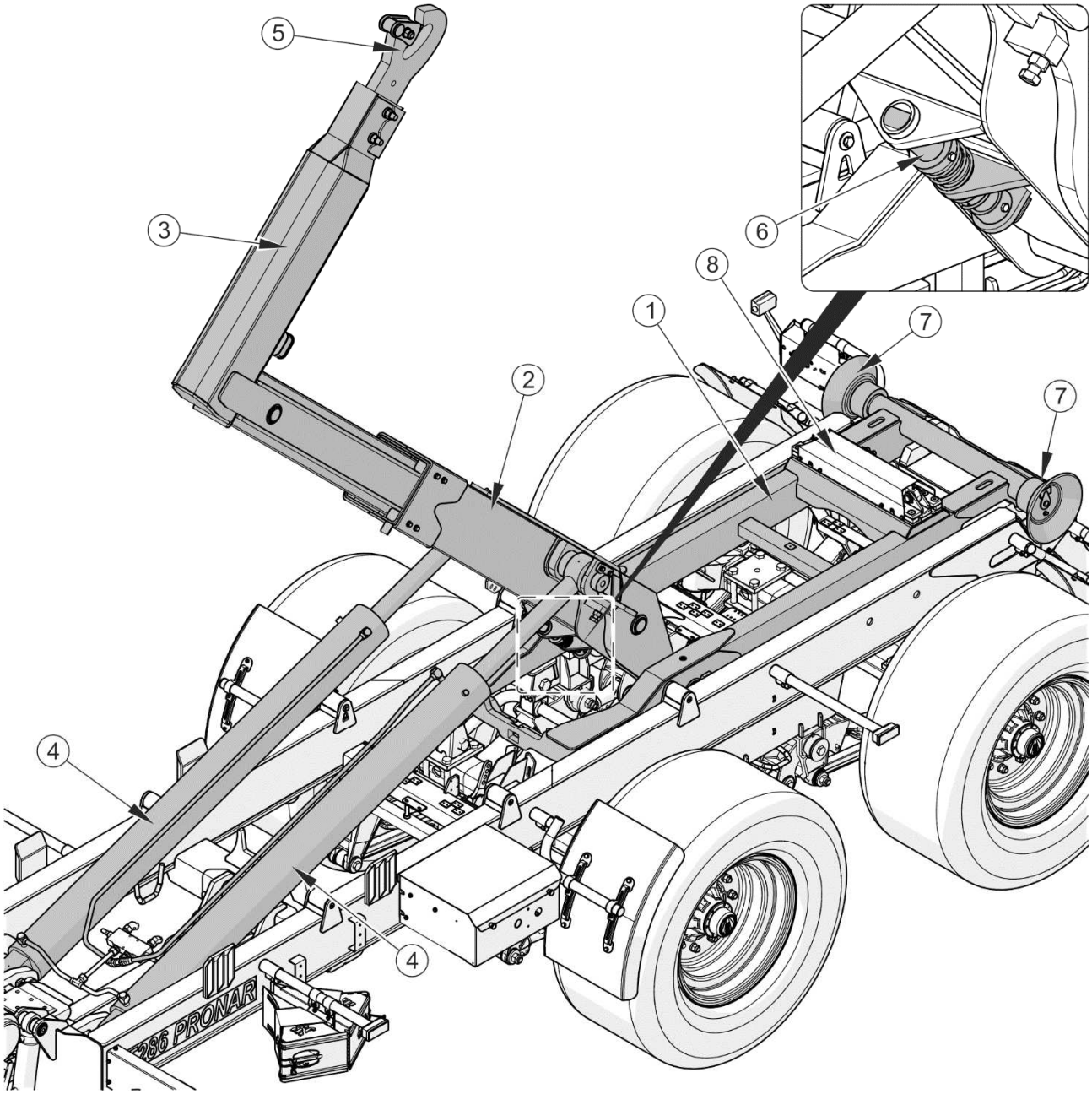


FIGURE 3.4 Tipping frame

(1) rear frame, (2) central frame, (3) hook frame, (4) tipping cylinder, (5) hook with latch, (6) tipping frame interlock, (7) guide roller, (8) hydraulic interlock of load box

The rear frame (1) is equipped with two guide rollers (7) which ensure correct position of the load box while pulling the load box on and removing it from the trailer. Rear frame (1) and central frame (2) are connected by means of pins (which are pivot points when pulling the load box on and removing it from the trailer) and are mechanically coupled by means of locking pin (6).

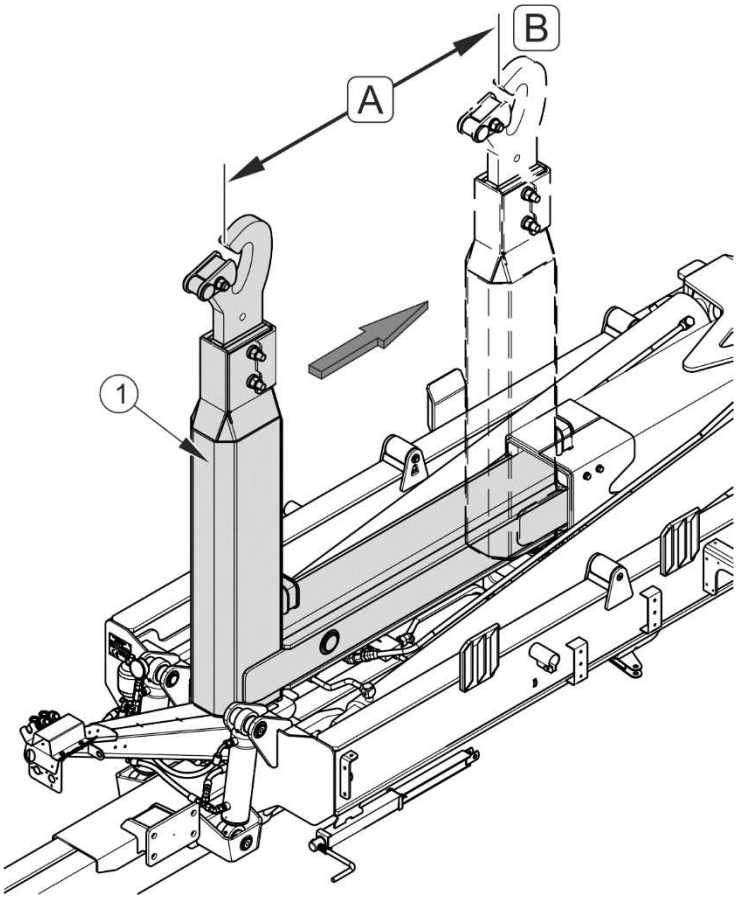


FIGURE 3.5 Switching the trailer to "hook trailer" mode

(1) hook frame, (A) "tipper" position (full range), (B) "hook trailer" position (after complete folding)

"Tipper" or **"hook trailer"** operation mode of the trailer is selected automatically by means of slidable telescopic hook frame (1) - figure (*3.5)* , which shifts the interlock mechanism (6) - figure (*3.4)*. The interlock is released when the frame is shifted to position B.

IMPORTANT!

The interlock mechanism can be shifted by moving the hook frame only when the tipping frame is in the resting position, the rear fender is withdrawn and the slides of the load box interlock are in folded position.

The trailer is switched to "hook trailer" mode when the hook frame is shifted to position B. In the whole range, the trailer will work as "tipper".

3.2.4 MAIN BRAKE- MECHANICAL SUSPENSION

The hook trailer is equipped with one of three types of main brake:

- double conduit pneumatic braking system with manual braking force regulator, figure (*3.6*),
- double conduit pneumatic braking system with automatic braking force regulator (optional equipment), figure (*3.7*),
- hydraulic braking system (optional equipment), figure (*3.8*).

In standard configuration, the trailer is equipped with double conduit pneumatic system with manual braking force regulator.

The main pneumatic brake is activated from the tractor driver's cab by depressing the brake pedal. The function of the control valve (2) - figure (*3.6*) and (*3.7*) is to activate the trailer's brakes simultaneously with the tractor's brakes. Furthermore, in case of an inadvertent disconnection of the conduit 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. When compressed air line is connected to the tractor, the device automatically applying the brakes now changes its position to allow normal brake operation.

The main hydraulic brake (available as optional equipment) is activated from the tractor driver's cab by depressing the brake pedal. Agricultural tractor equipped with suitable hydraulic system is required to operate the hydraulic braking system.

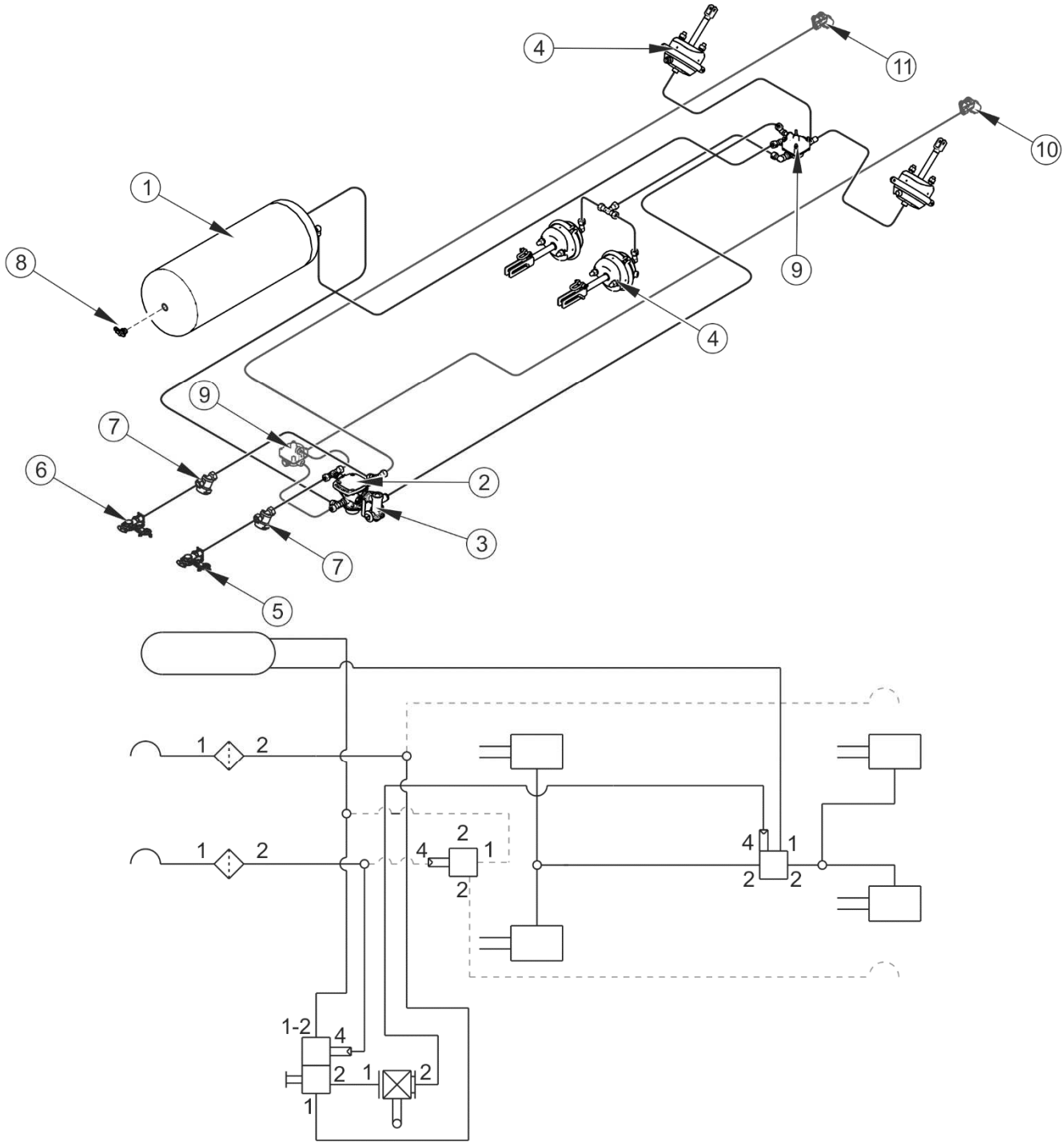


FIGURE 3.6 Design and diagram of double conduit pneumatic braking system with manual braking force regulator

(1) air tank, (2) control valve, (3) braking force regulator, (4) pneumatic cylinder, (5) conduit connector (yellow), (6) conduit connector (red), (7) air filter, (8) air tank control connector, (9) relay valve, (10) socket (yellow), (11) socket (red)

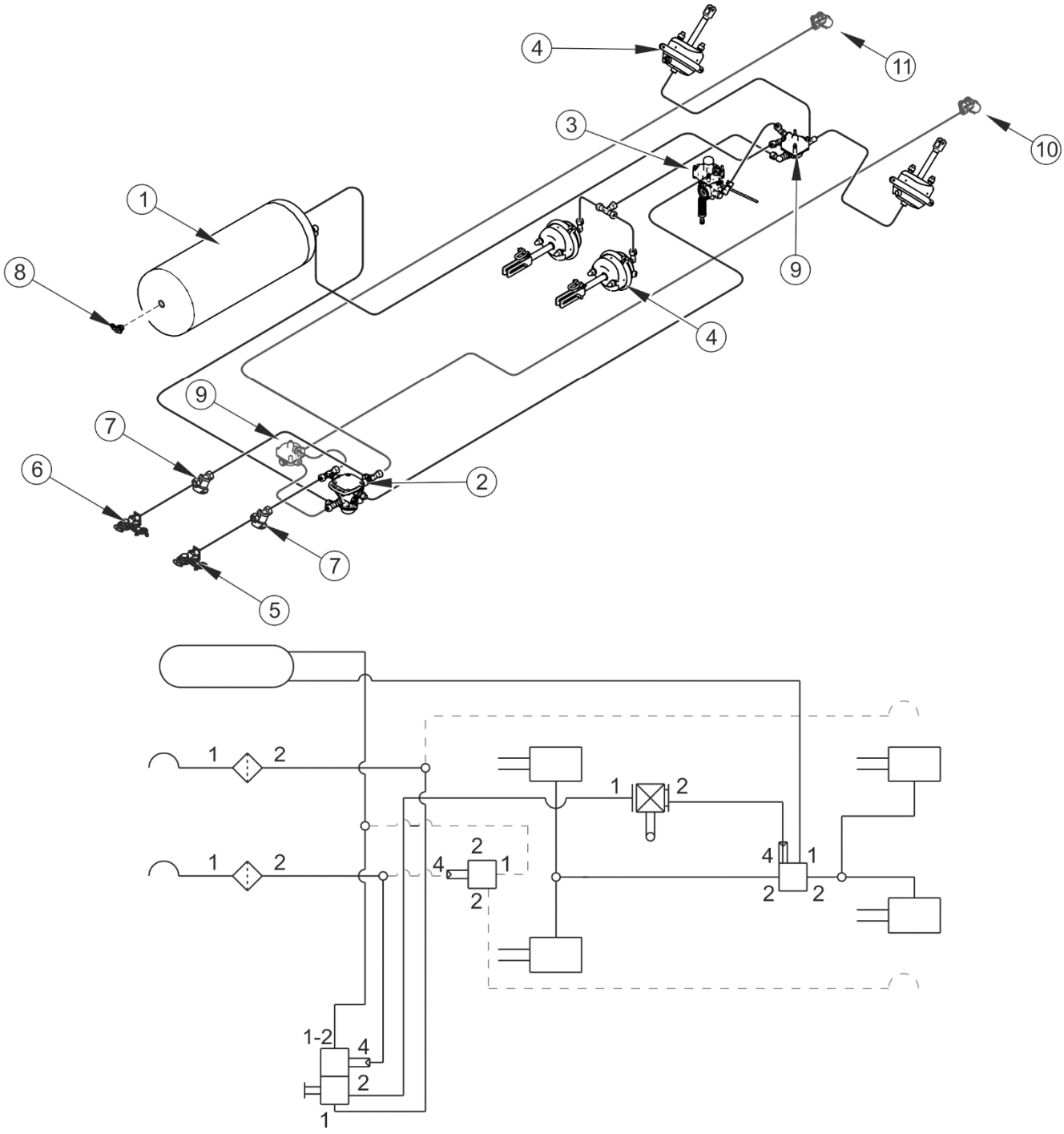


FIGURE 3.7 Design and diagram of double conduit pneumatic braking system with automatic braking force regulator ALB

(1) air tank, (2) control valve, (3) braking force regulator, (4) pneumatic cylinder, (5) conduit connector (yellow), (6) conduit connector (red), (7) air filter, (8) air tank control connector, (9) relay valve, (10) socket (yellow), (11) socket (red)

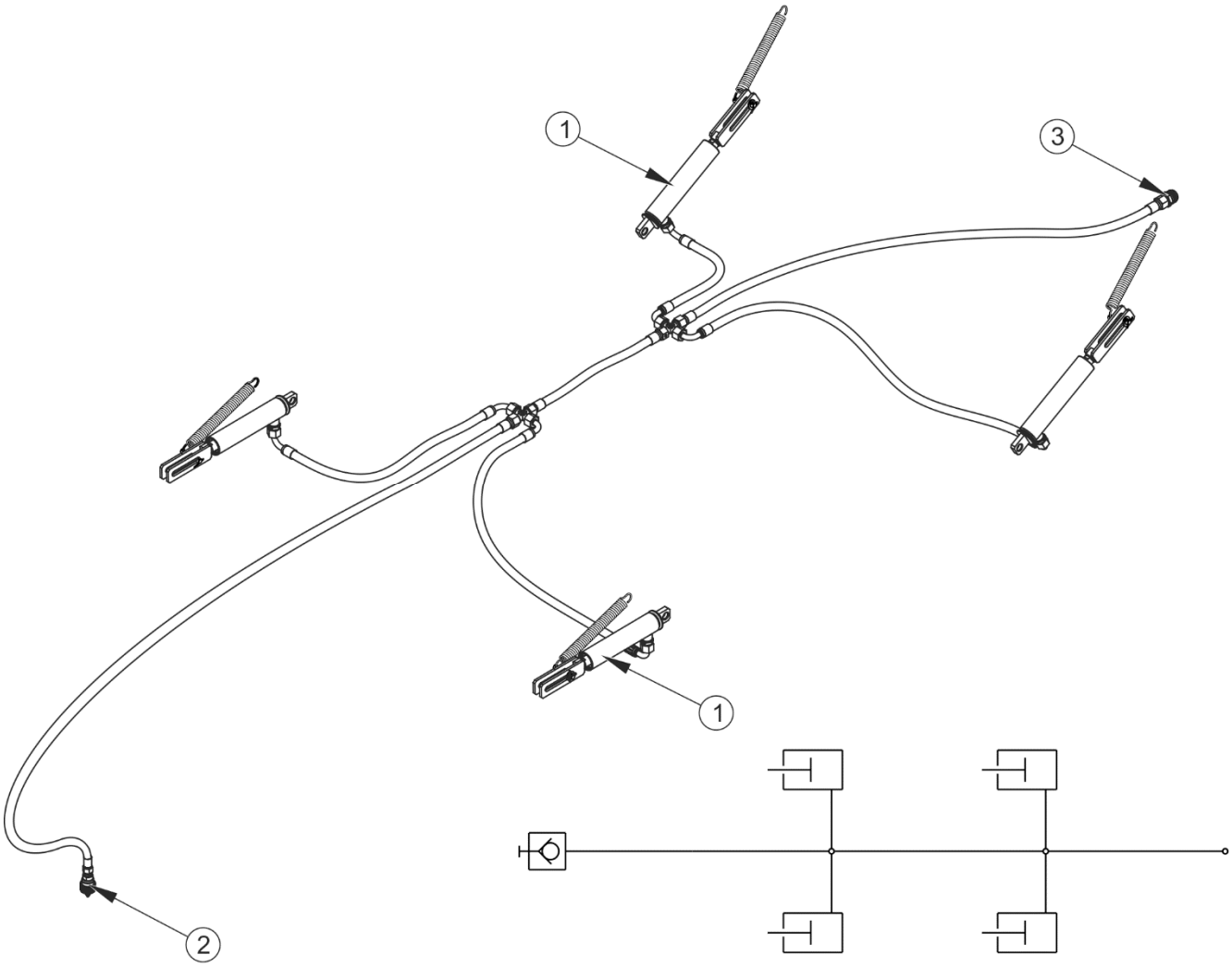


FIGURE 3.8 Design and diagram of hydraulic braking system

(1) hydraulic cylinder, (2) hydraulic quick coupler, (3) socket

Three-step braking force regulator (2)- figure *(3.9)* 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”.

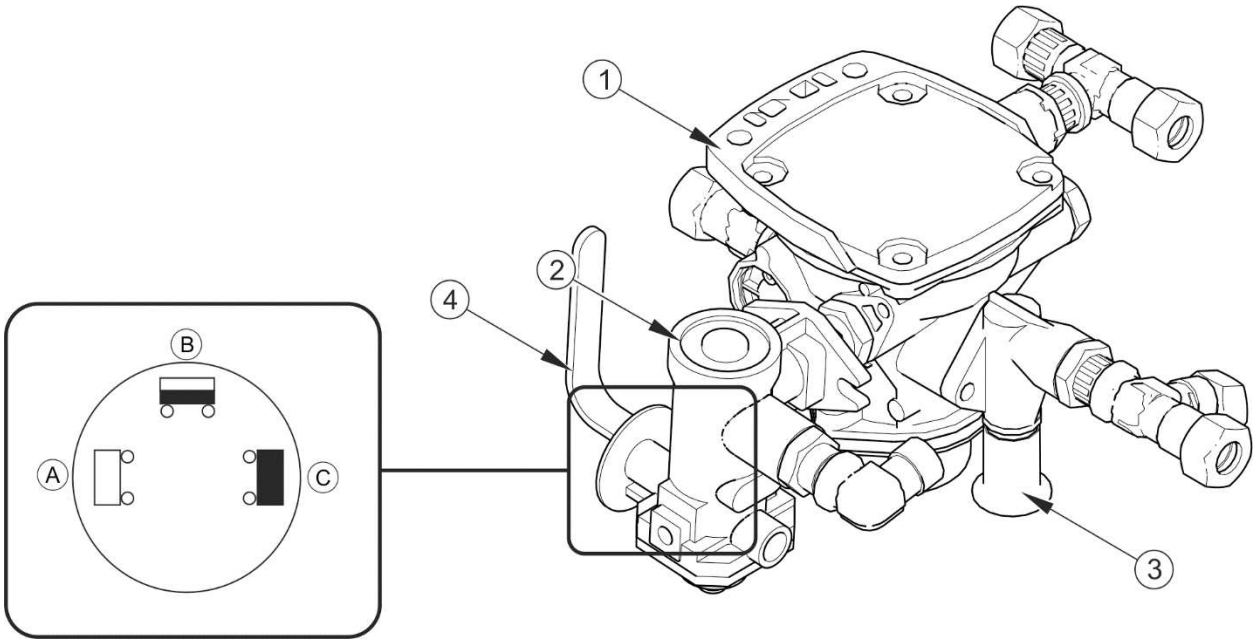


FIGURE 3.9 Control valve and braking force regulator

(1) control valve, (2) braking 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"

3.2.5 BRAKING SYSTEM - AIR SUSPENSION

The hook trailer with air suspension system is equipped with pneumatic braking system with automatic braking force regulator ALB (6) - figure (*3.10*). Proper operation of the braking system is possible only when two pneumatic connections (red supply connection and yellow control connection) are connected.

The system is equipped with parking brake for immobilising trailer while standing motionless. The parking brake is activated by loosening-parking valve (4) – figure *(3.10)*. The valve is equipped with the emergency brake function which is activated in the event of pressure drop in the supply conduit (as a result of conduit disconnection or damage). Two push-buttons located in this valve make it possible to set the machine to an appropriate working mode. Black push-button controls the manoeuvre valve. It is designed for engaging or releasing the brake if the trailer is unhitched from the tractor. The black push-button can not be depressed when pneumatic conduits are connected. In the depressed position, the spring (parking) brake is released. Red push-button controls operation of the parking valve when the trailer is hitched to tractor. If the push-button is released, the parking (spring) brake is engaged.

Information concerning setting of operation mode of the loosening-parking valve is given in table (3.2).

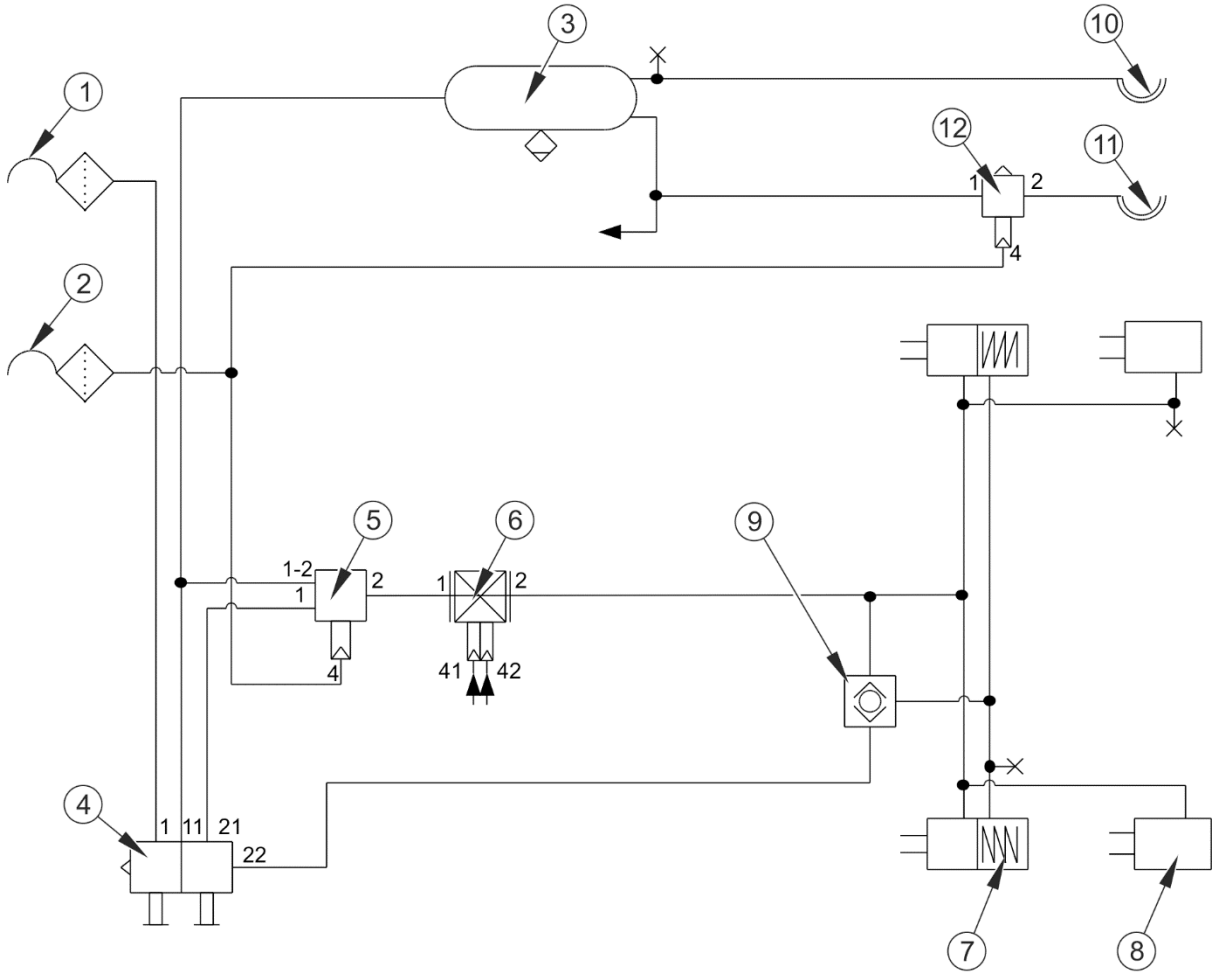
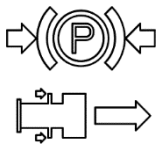
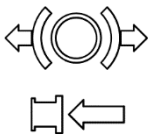
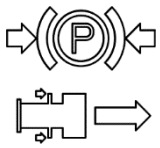
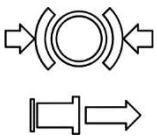
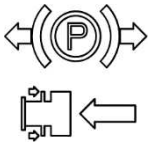
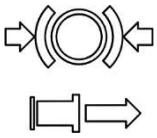
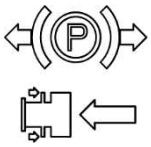
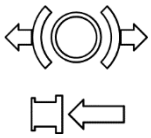


FIGURE 3.10 Diagram of pneumatic braking system

(1) conduits connection with a filter (red) - supply connection, (2) conduits connection with a filter (yellow) - control connection, (3) air tank, (4) loosening-parking valve, (5) brake valve, (6) automatic braking force regulator ALB, (7) membrane-spring cylinder, (8) membrane cylinder, (9) three-way valve, (10) rear conduits connection (red) - supply connection, (11) rear conduits connection (yellow) - control connection, (12) relay valve

TABLE 3.2 Working modes of the loosening-parking valve

VALVE OPERATION MODE	RED PUSH-BUTTON	BLACK PUSH-BUTTON	DESCRIPTION
A	RELEASED 	DEPRESSED 	The machine is braked with parking brake. If the red push-button is released, the trailer is immobilized with parking brake regardless of the black push-button position.
B	RELEASED 	RELEASED 	
C	DEPRESSED 	RELEASED 	Machine is prepared for travel. Pneumatic conduits are connected to the trailer. Black push-button can not be depressed. Machine is braked Pneumatic conduits are not connected. If the black push-button is depressed, the brake will be released.
D	DEPRESSED 	DEPRESSED 	Parking brake is released, manoeuvre position. The trailer's brake is completely released. Pneumatic conduits are not connected.

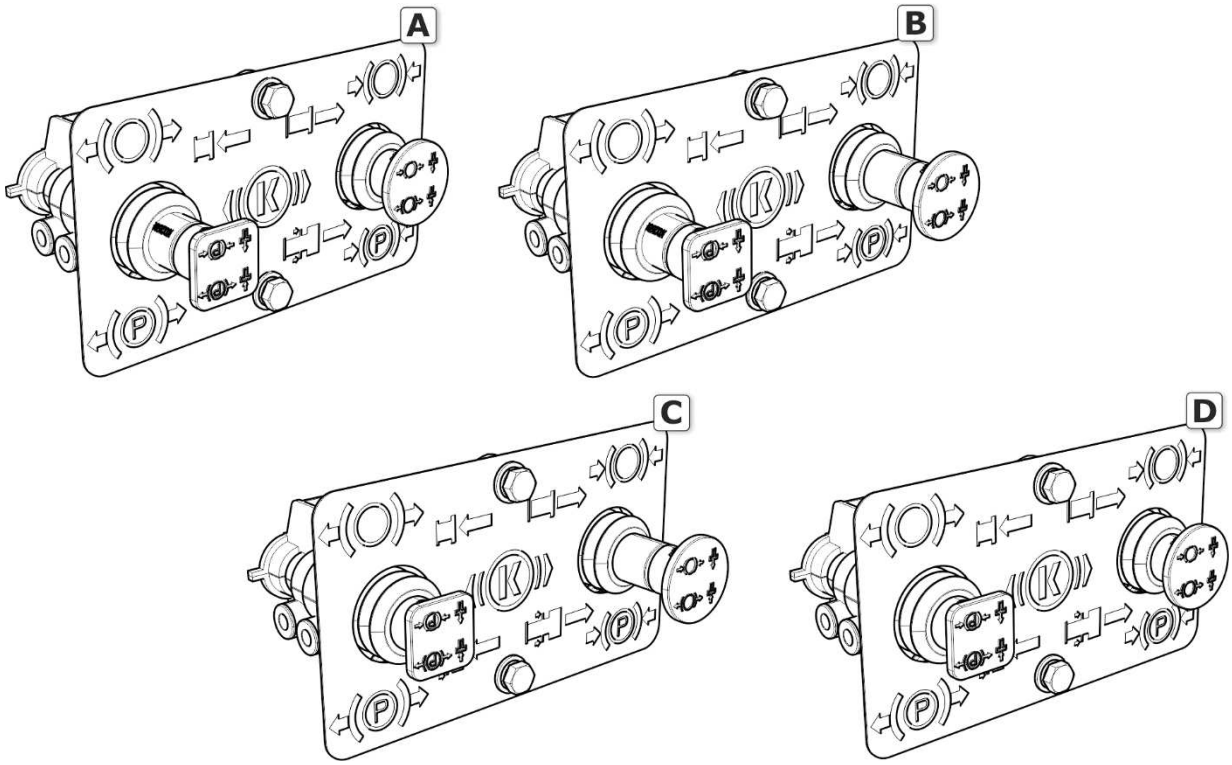


FIGURE 3.11 Positions of loosening-parking valve

(A), (B), (C), (D)- valve working modes

3.2.6 PARKING BRAKE - MECHANICAL SUSPENSION

The parking brake is used for immobilising trailer while standing motionless. System design is shown in Figure *(3.12).* The brake crank mechanism (2) is mounted on the bracket placed on the left longitudinal member of the lower frame, on the front of the trailer.

Expander levers (1) of wheel axle are connected to lever (5), through arms (7), by means of cable II (4) guided in rollers (6). Lever (5) is connected to the brake crank mechanism (2) by means of steel cable I (3).

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

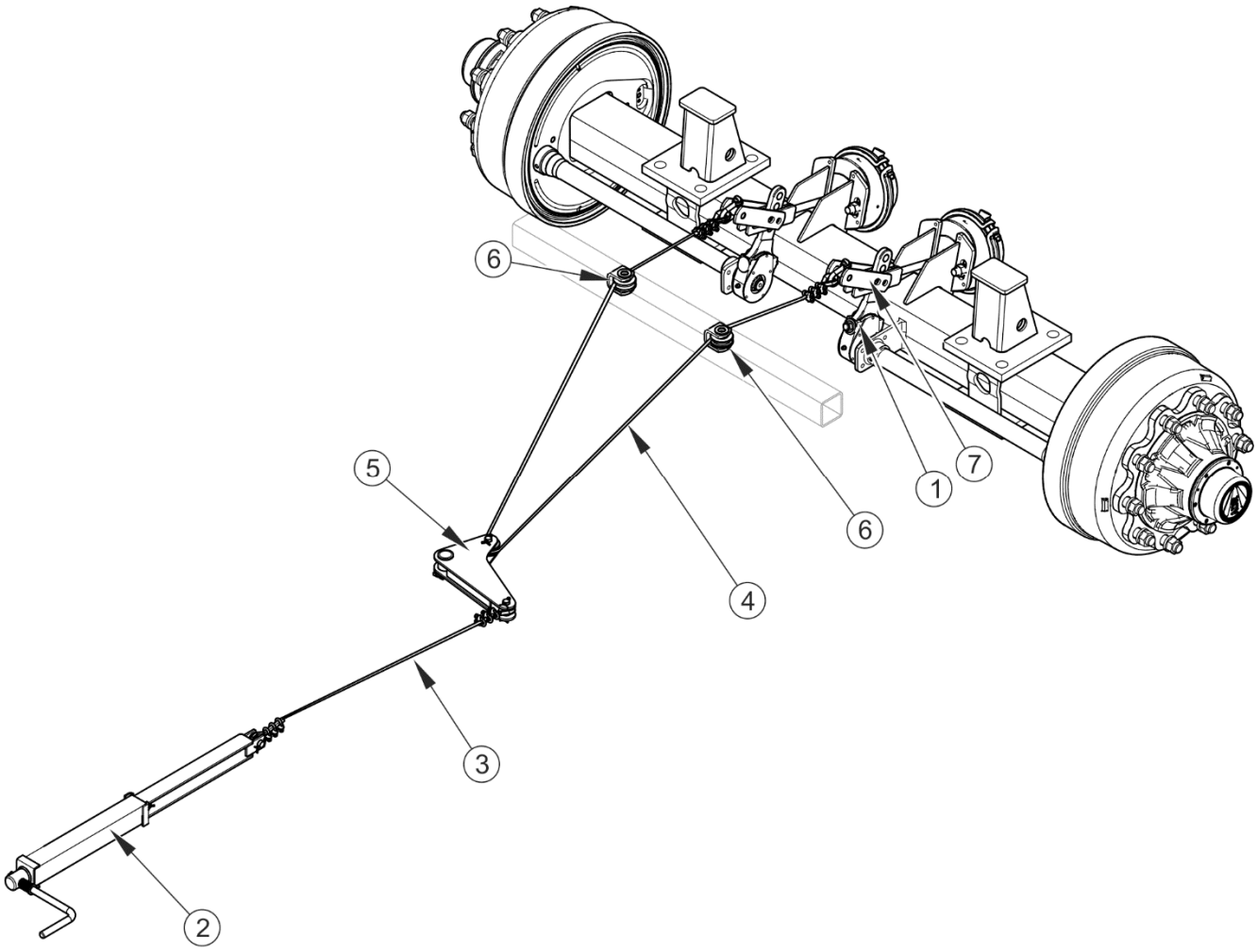


FIGURE 3.12 Parking brake design

(1) expander arm, (2) brake crank mechanism (3) steel cable I, (4) steel cable II (5) lever, (6) guide roller, (7) arm

3.2.7 HYDRAULIC SYSTEM OF THE SUPPORT (OPTION)

TIP

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

The hydraulic system of the support is used for positioning the support in order to support the trailer disconnected from the tractor or when the trailer is parked in the garage after use. The drawbar height can be adjusted using hydraulic support when hitching and unhitching the trailer. The support is supplied from the tractor's external hydraulic system and controlled by means of the manifold lever in the tractor cab.

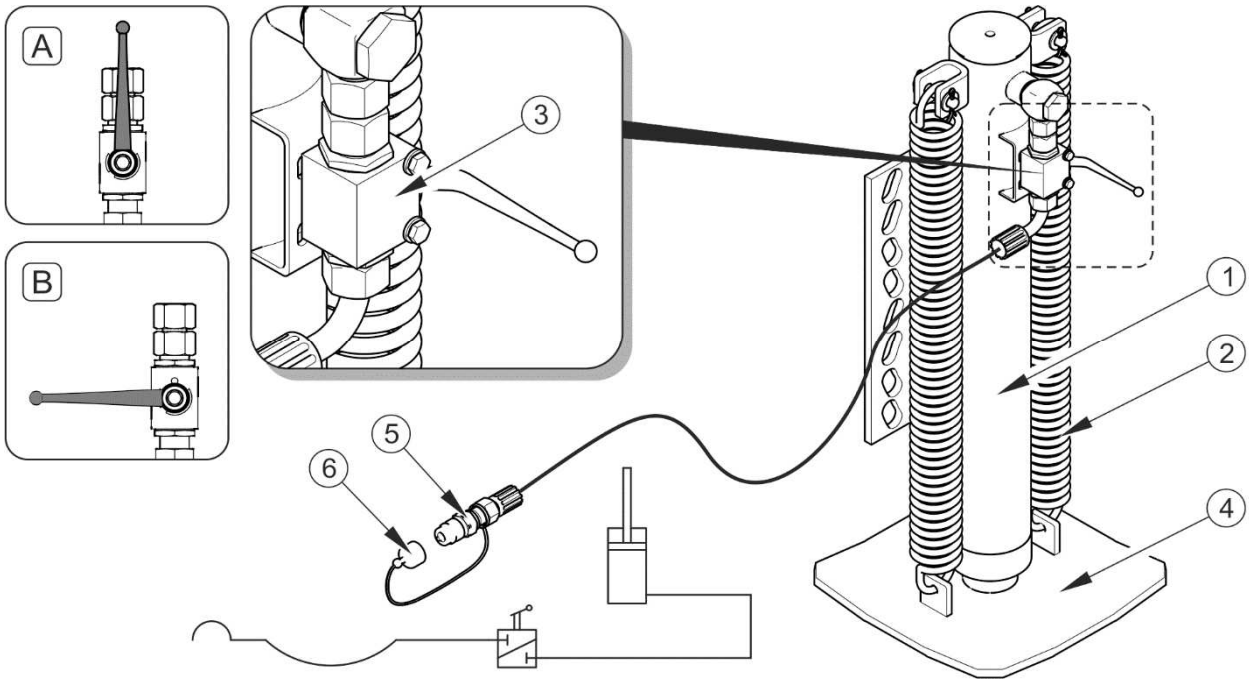


FIGURE 3.13 Design and diagram of the hydraulic system of the straight support

(1) hydraulic cylinder, (2) spring, (3) valve, (4) support foot, (5) quick coupler - plug, (6) plug cap (red), (A) valve in open position, (B) valve in closed position

The trailer can be equipped with straight hydraulic support – figure *(3.13)*or folding hydraulic support – figure *(3.14)*.

Unfolding and folding the support is done by extending or retracting the hydraulic cylinder rod (4). If the valve handle (3) is shifted to position (B), the support is locked in fixed position. The support is lowered by shifting the valve handle to open position (A), i.e. along the valve.

Hydraulic oil supplied from the tractor's hydraulic manifold extends the cylinder rod to a desired height. Return of the straight support to transport position is done by setting the tractor manifold section to floating position and is accomplished by means of springs (2) – figure *(3.13)*. The hydraulic conduit for controlling the support is terminated with a quick coupler - plug (5) and protected by means of a cap (6).

In case of the folding support, the support return spring is located inside the cylinder sleeve (2) – figure *(3.14)*. The support is locked in transport position (folded) or in parking position (unfolded) by means of interlock pin (4).

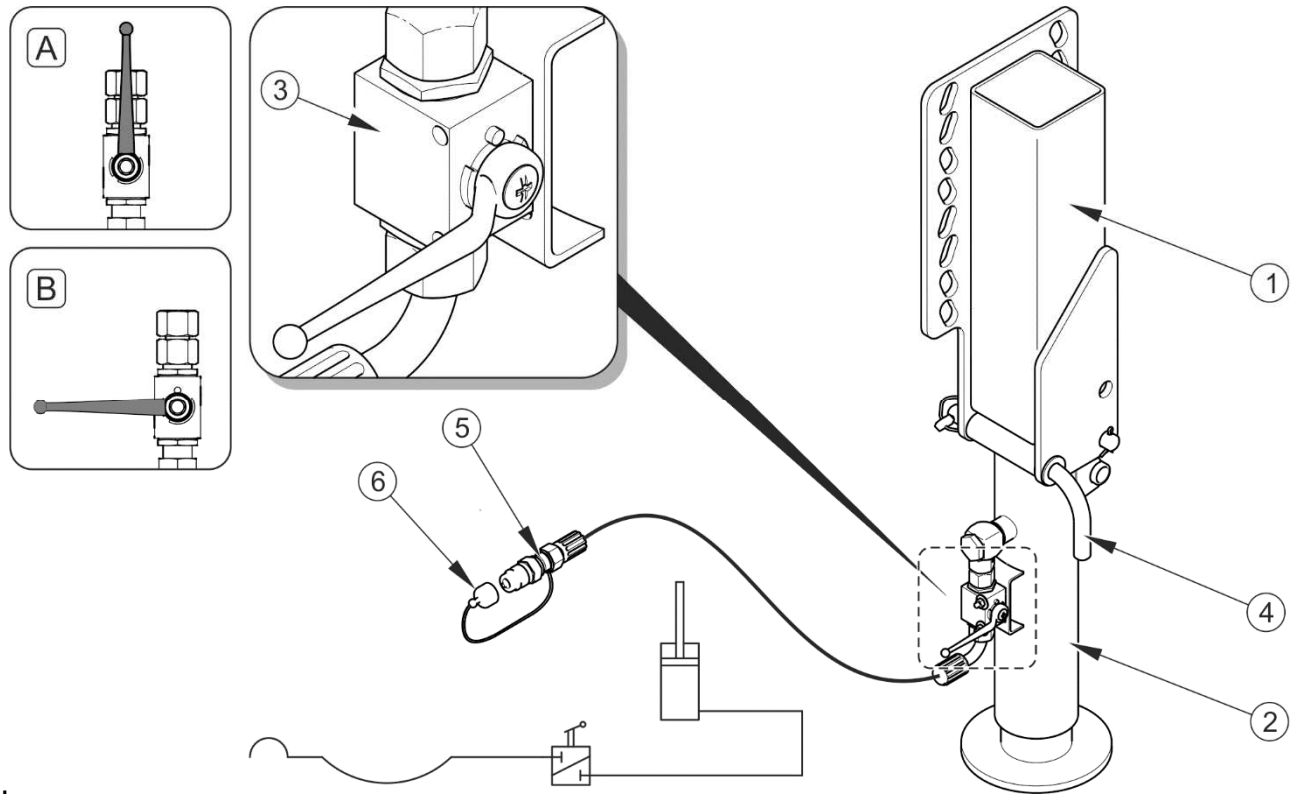


FIGURE 3.14 Design and diagram of the hydraulic system of the folding support

(1) body, (2) hydraulic cylinder, (3) valve, (4) interlock pin, (5) quick coupler - plug, (6) plug cap (red), (A) valve in open position, (B) valve in closed position

IMPORTANT!

Before disconnecting the supply conduit from tractor, the valve must be in closed position. Otherwise, it will be impossible to reconnect the conduits.

3.2.8 HYDRAULIC SYSTEM OF THE DRAWBAR

The trailer is equipped with the drawbar with hydraulic shock absorption and smooth height adjustment for connecting with tractor hitches (hitch, piton fix, transport hitch, ball hitch).

TIP

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

The drawbar's hydraulic system is supplied by the tractor's external hydraulic system through the hydraulic conduits which are connected to the sockets of a single section of the tractor's hydraulic system by means of quick couplers (1). Rising or lowering the drawbar is carried

out in order to level the trailer and is done by withdrawing or extending the hydraulic cylinders rods (2). The system includes the hydraulic accumulator (3) which is preset for pressure of 50 bar. The purpose of the accumulator is to amortize vibrations transferred to the tractor.

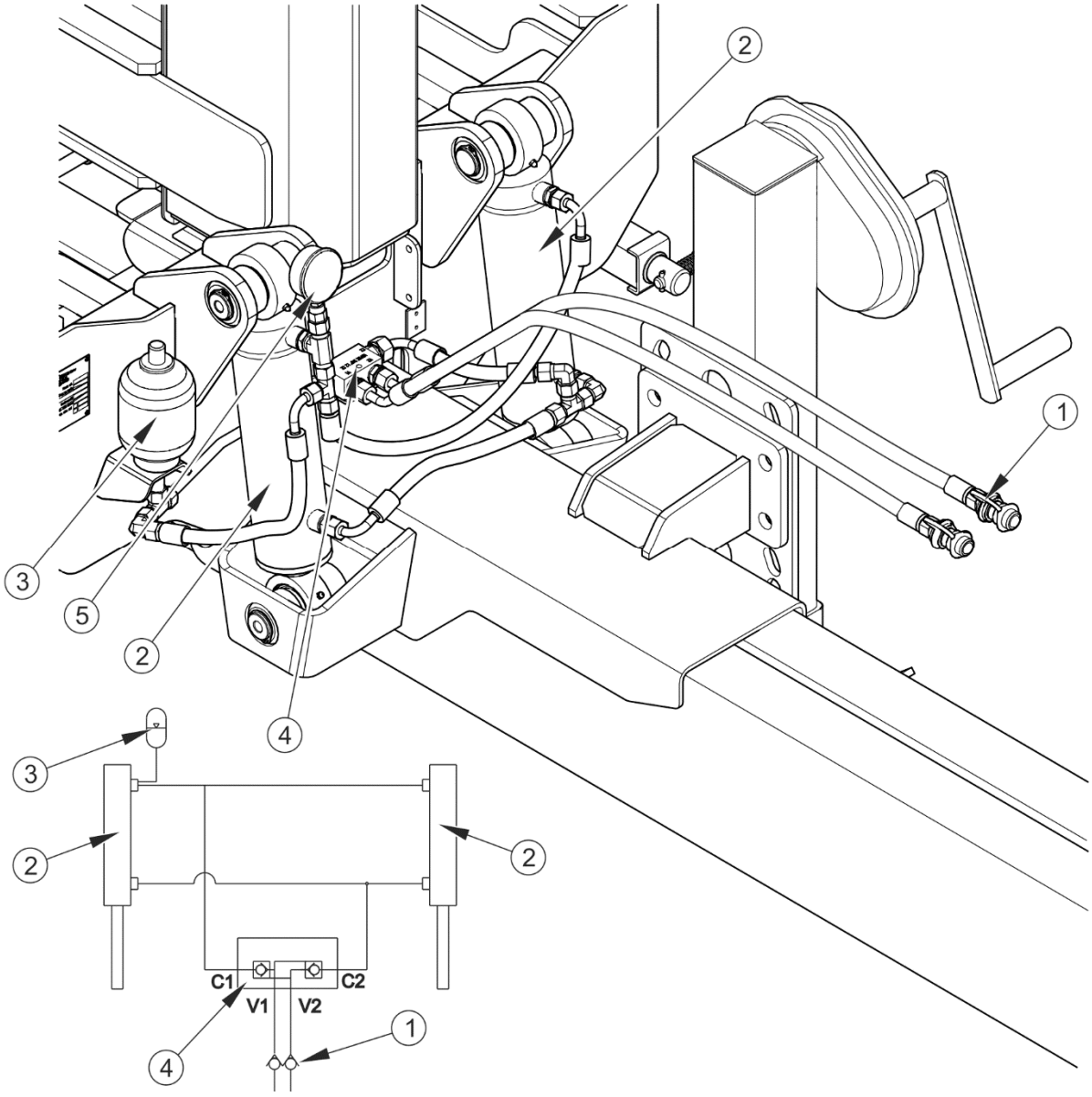


FIGURE 3.15 Design and diagram of the drawbar's hydraulic system

(1) quick coupler - plug, (2) hydraulic cylinder, (3) hydraulic accumulator, (4) hydraulic lock, (5) manometer

The system is protected by means of hydraulic lock. In the event of damage to hydraulic system conduits (rupture, loss of tightness), the hydraulic lock will lock the cylinder in a fixed position. Thanks to the use of the hydraulic lock, the supply conduits can be connected without a cut-off valve.

3.2.9 HYDRAULIC STEERING SYSTEM

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

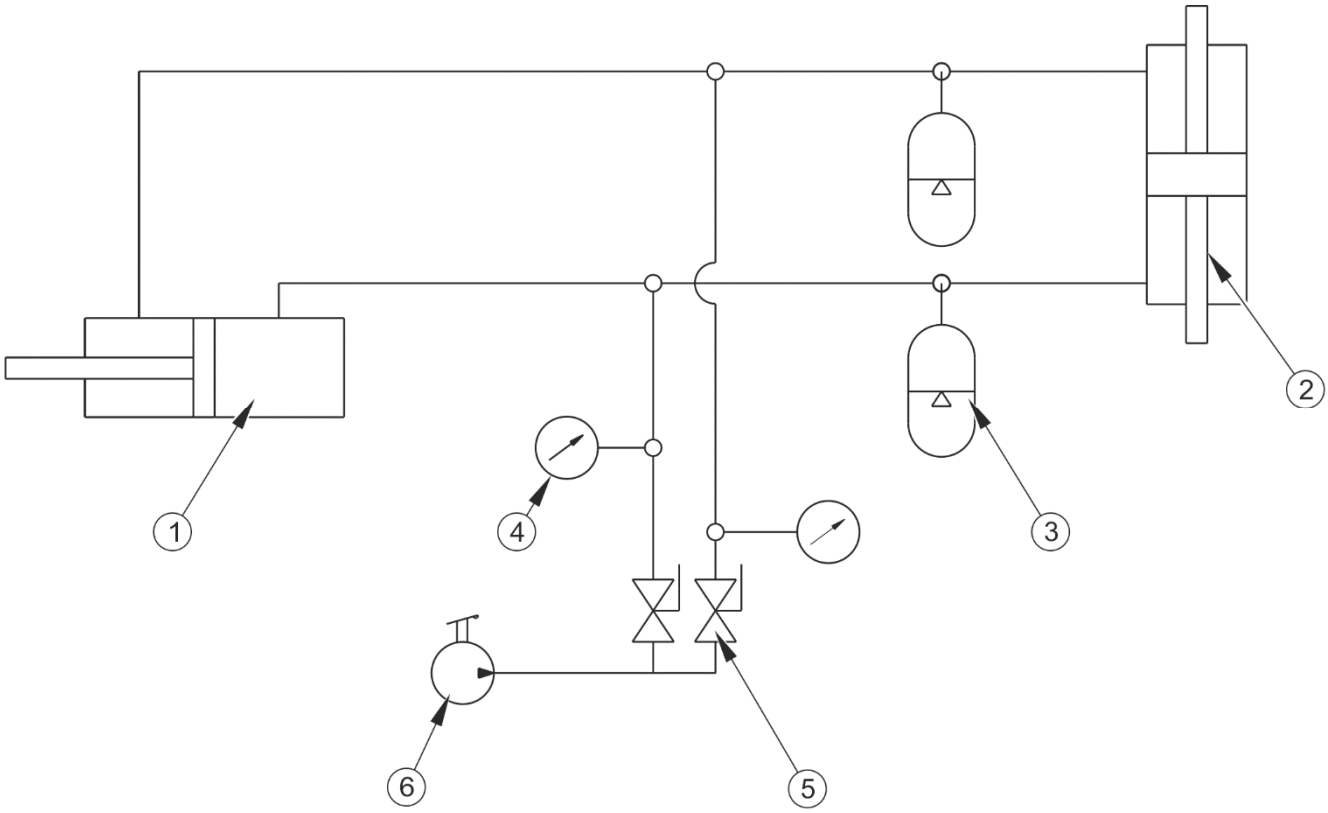


FIGURE 3.16 Diagram of the hydraulic steering system

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

The rear steering axle is equipped with cylinder (2) – figure (*3.16*), which is connected with double-acting cylinder (1) located next to the drawbar by means of rigid and flexible conduits creating a closed-circuit. The system is controlled using the string located on the right side of the drawbar. The string's ball-shaped end is connected with the tractor's hitch.

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

During movement of cylinder (1), oil in the system flows to axle turning cylinder (2) turning the wheels. Rod of cylinder (1) moves when the trailer's drawbar changes its angular position with regard to tractor hitch when manoeuvring. Hydraulic accumulators (4) are used in order to eliminate a minimal swing of axle steering cylinder and reduce load applied to the system while manoeuvring. On the left side of the trailer, there is a hydraulic hand pump (6) for filling and setting the pressure in the steering system – see chapter *(4.11) "HYDRAULIC STEERING SYSTEM OPERATION"*.

3.2.10 TURNING INTERLOCK HYDRAULIC SYSTEM

The hook trailer is equipped with a passively steered rear steering axle. This solution facilitates manoeuvring the vehicle, improves stability while driving on turns, reduces disadvantageous forces in suspension system and chassis which occur while turning. Consequently, the wear of tyres is reduced and it is easier to drive the tractor with a trailer.

While reversing, the rear axle steering knuckles should be locked. Otherwise, the trailer will tend to turn in an uncontrolled manner to the left or to the right. The hydraulic system of the interlock is supplied by the tractor's external hydraulic system through the hydraulic conduits (2) which are connected to the sockets of a single section of the tractor's hydraulic system by means of quick couplers (3). The axle is locked by withdrawing or extending the hydraulic cylinders rods (1). Shock absorber (4) ensures stability of the steering axle and reduces its excessive vibrations.

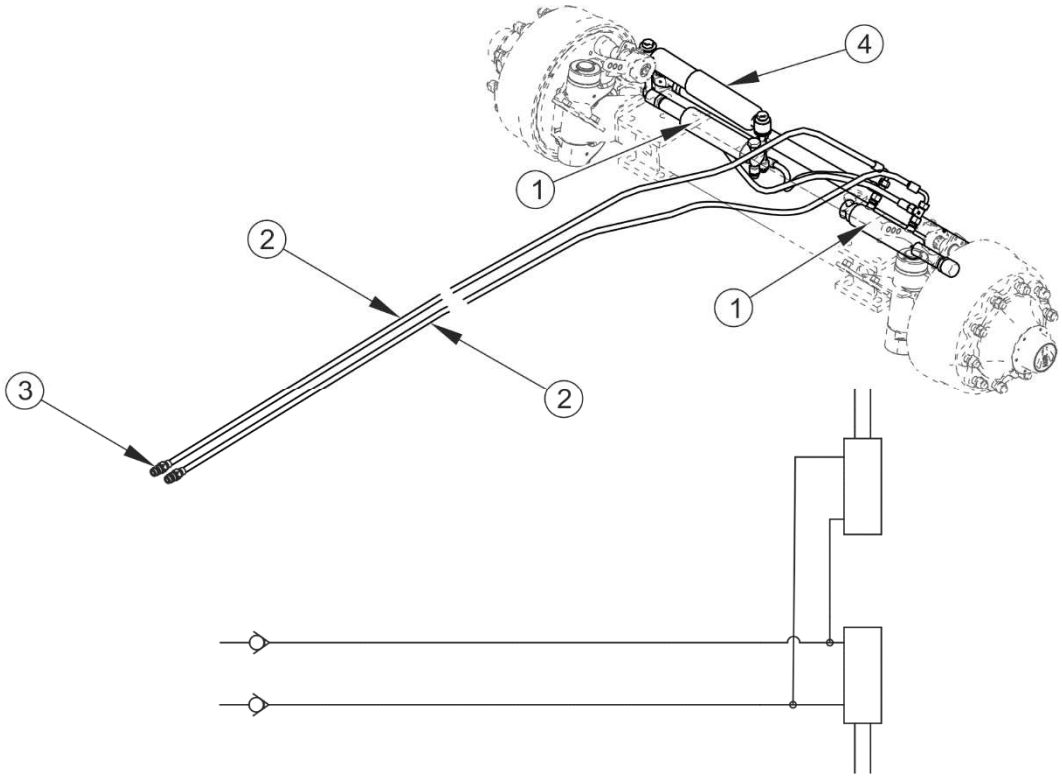


FIGURE 3.17 Design and diagram of the hydraulic system of the rear axle turning interlock

(1) turning interlock cylinder, (2) hydraulic conduit, (3) hydraulic quick coupler, (4) shock absorber

3.2.11 CENTRAL HYDRAULIC SYSTEM - MECHANICAL SUSPENSION

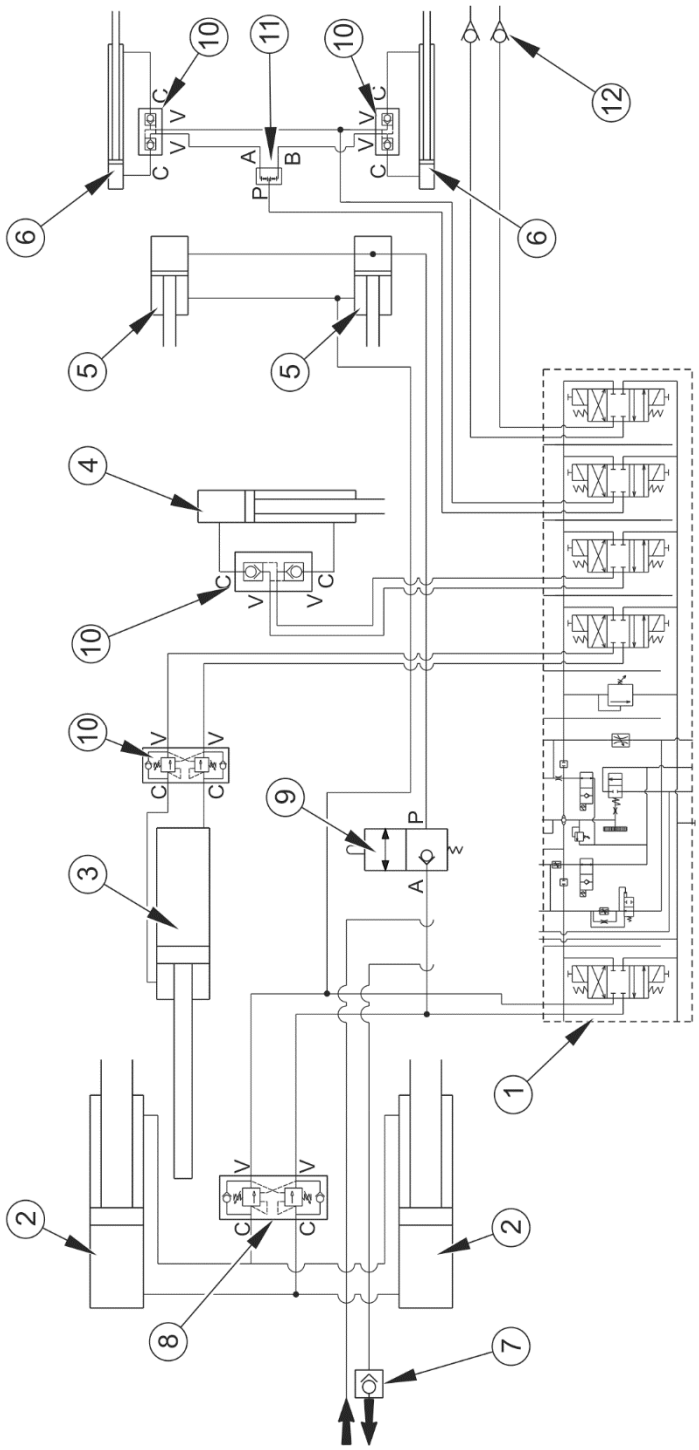


FIGURE 3.18 Hydraulic system diagram

(1) hydraulic manifold, (2) rising cylinder, (3) hook frame shifting cylinder, (4) load box interlock cylinder, (5) suspension interlock cylinder, (6) rear fender cylinder, (7) quick coupler - plug, (8) anti-shock valve, (9) limit valve, (10) two-sided lock, (11) flow divider, (12) quick coupler-socket

TIP

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

The hook trailer is equipped with the central hydraulic system with the system of electro-hydraulic protections. The trailer's system operation is controlled by hydraulic manifold (1), which is supplied by the tractor's external hydraulic system through two hydraulic conduits terminated with quick couplings (7). The manifold operation is controlled by means of the main control panel which is located in the tractor cab. Functions of the control panel are described in chapter 4.5.1.

The central hydraulic system controls the following functions:

- withdrawing and extending the rear fender (rear underrun protection device),
- locking the suspension,
- lowering and raising the tipping frame by means of two cylinders,
- withdrawing and extending the telescopic hook frame,
- locking the load box,
- rear outputs, e.g. connecting the load box gate.

The trailer is equipped with rear fender which is withdrawn and extended by means of two cylinders (6). Depending on the length of the transported load box, proper length of the fender should be set. Oil pumped under pressure from the tractor's hydraulic system is supplied to the manifold (1). Oil from the manifold is delivered to flow divider (11), which divides the oil stream proportionally to cylinders (6).

The hydraulic interlock of the suspension is used for supporting the rear axis of the trailer while pulling the load box on and removing the load box from the trailer and in tipper operation mode. Cylinders of the suspension interlock (5) - figure (*3.18*) are always extended when rising cylinders (2) are supplied and folded when the tipping frame is in the resting position.

When extending the raising cylinders (2), the limit valve (9) is activated to prevent unlocking the rear axle support suspension. The suspension will be unlocked when the raising cylinders

are completely withdrawn (the rest position of the tipping frame). Anti-shock valve (8) protects the system against sudden pressure jumps and ensures smoother operation of cylinders.

Hydraulic cylinder (4) controls the interlock which ensures attachment of the load box to the trailer's chassis during transport and unloading. If the load box interlock is in the locked position, the hook frame shifting cylinder (3) can not be controlled. The hook frame is controlled only when the rear fender is withdrawn, load box interlock cylinder (4) is unlocked and the tipping frame is in its resting position.

The system is equipped with hydraulic locks (10) located on cylinders (3, 4, 6). Hydraulic lock improves safety of trailer operation. In the event of damage to hydraulic system conduits (rupture, loss of tightness), the hydraulic lock will lock the cylinder in a fixed position.

On the rear beam of the trailer, there are hydraulic outputs terminated with quick couplers-sockets (12), which can be used, for example, for supplying the hydraulic gate of the load box.

3.2.12 CENTRAL HYDRAULIC SYSTEM - AIR SUSPENSION

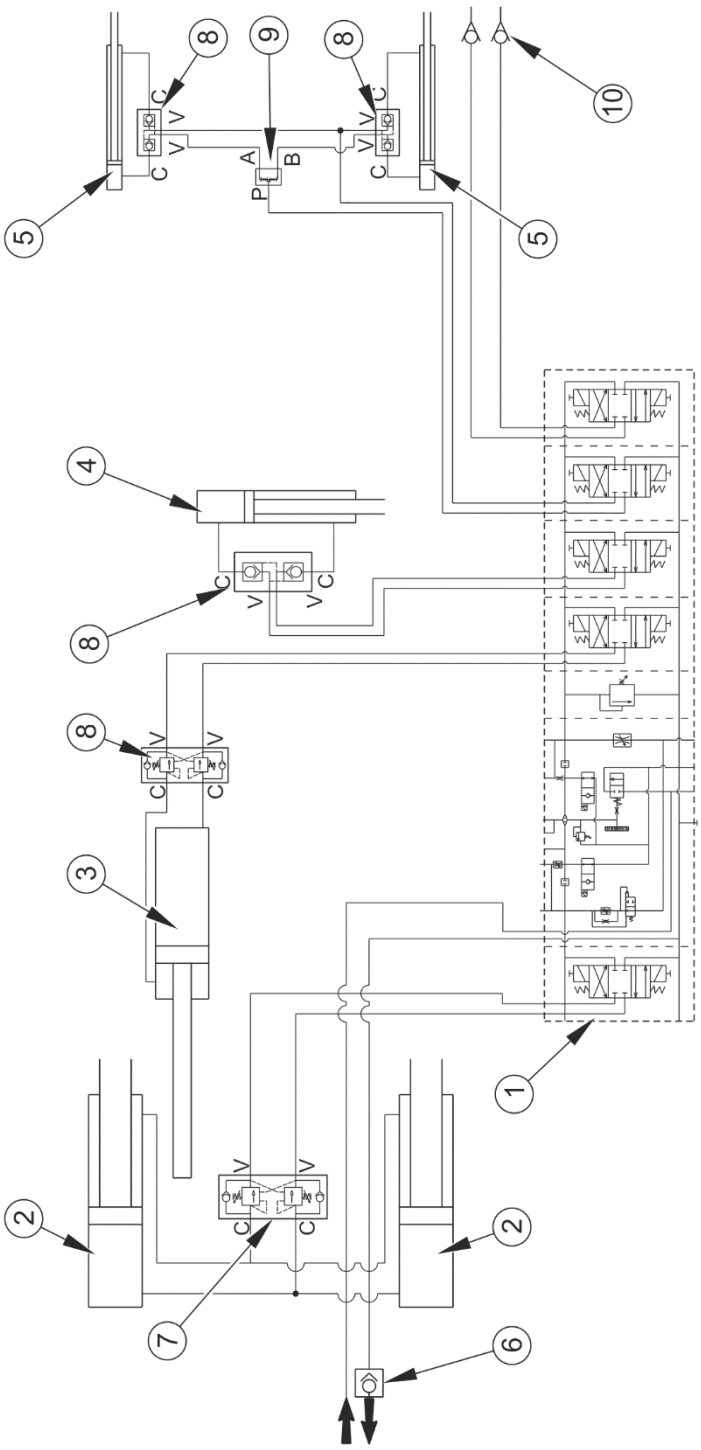


FIGURE 3.19 Hydraulic system diagram - air suspension

(1) hydraulic manifold, (2) rising cylinder, (3) hook frame shifting cylinder, (4) load box interlock cylinder, (5) rear fender cylinder, (6) quick coupler - plug, (7) anti-shock valve, (8) two-sided lock, (9) flow divider, (10) quick coupler-socket

3.2.13 HYDRAULIC SYSTEM OUTLETS ON THE HOOK

The trailer can be equipped with an additional pair of hydraulic outlets located on the hook. For example, the hydraulic gate of the load box can be connected to the system.

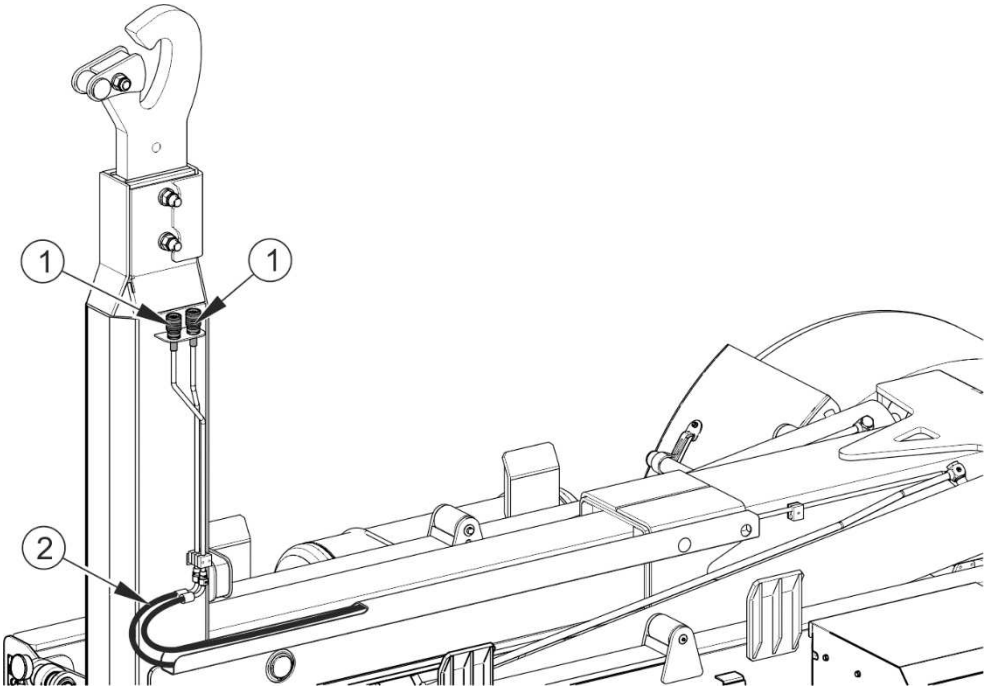


FIGURE 3.20 Hydraulic outlets on the hook

(1) quick coupler-socket, (2) hydraulic conduit

3.2.14 ELECTRICAL SYSTEM FOR CONTROLLING THE HYDRAULIC SYSTEM

The electrical system for controlling the hydraulic system is designed for 12 V DC supply. The system is supplied using the connection lead with a 3-pin plug at its both ends. The lead is used for connecting the 3-pin socket (4) on the trailer with the 3-pin electric socket on the tractor - see chapter 4.3 (*HITCHING AND DISCONNECTING THE TRAILER FROM TRACTOR*). If the tractor is not equipped with such a socket or is equipped with a different type of sockets, carry out the socket installation according to the recommendations of the tractor manufacturer. The standard equipment of the trailer includes a 3-pin socket for installing in the tractor.

The trailer's functions are controlled by means of the control panel (1) – figure *(3.21)*. The control panel is connected to socket (5) using a communication cable. Hydraulic manifold is controlled by means of actuator module (2). Control signals are collected from inductive sensors (C1) - (C9) located on the trailer – figure *(3.21)*.

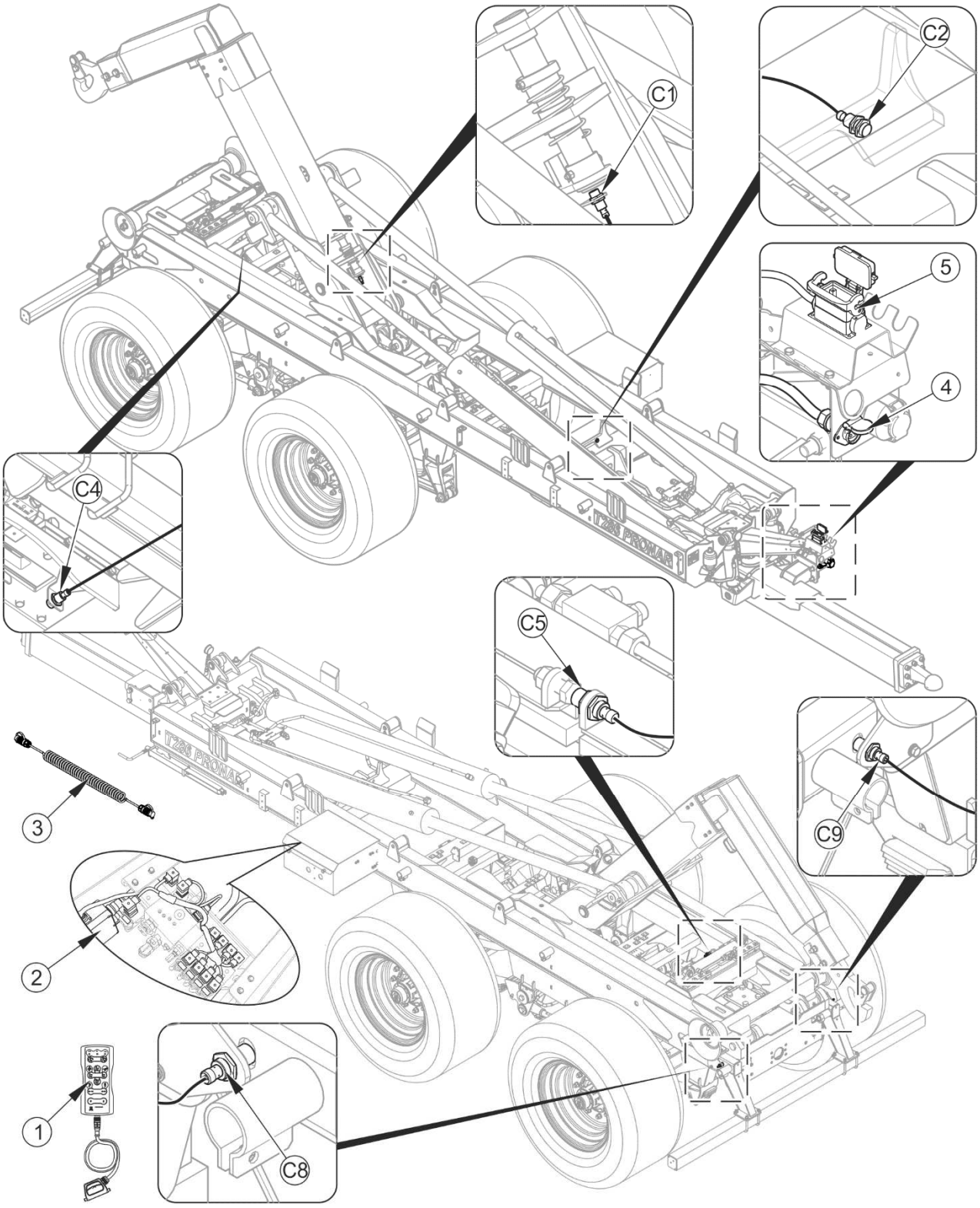


FIGURE 3.21 Arrangement of electrical controls

(1) control panel with a wiring harness, (2) actuator module, (3) 3-pin connection lead, (4) 3-pin socket, (5) communication socket, (C1)- (C9) inductive sensors

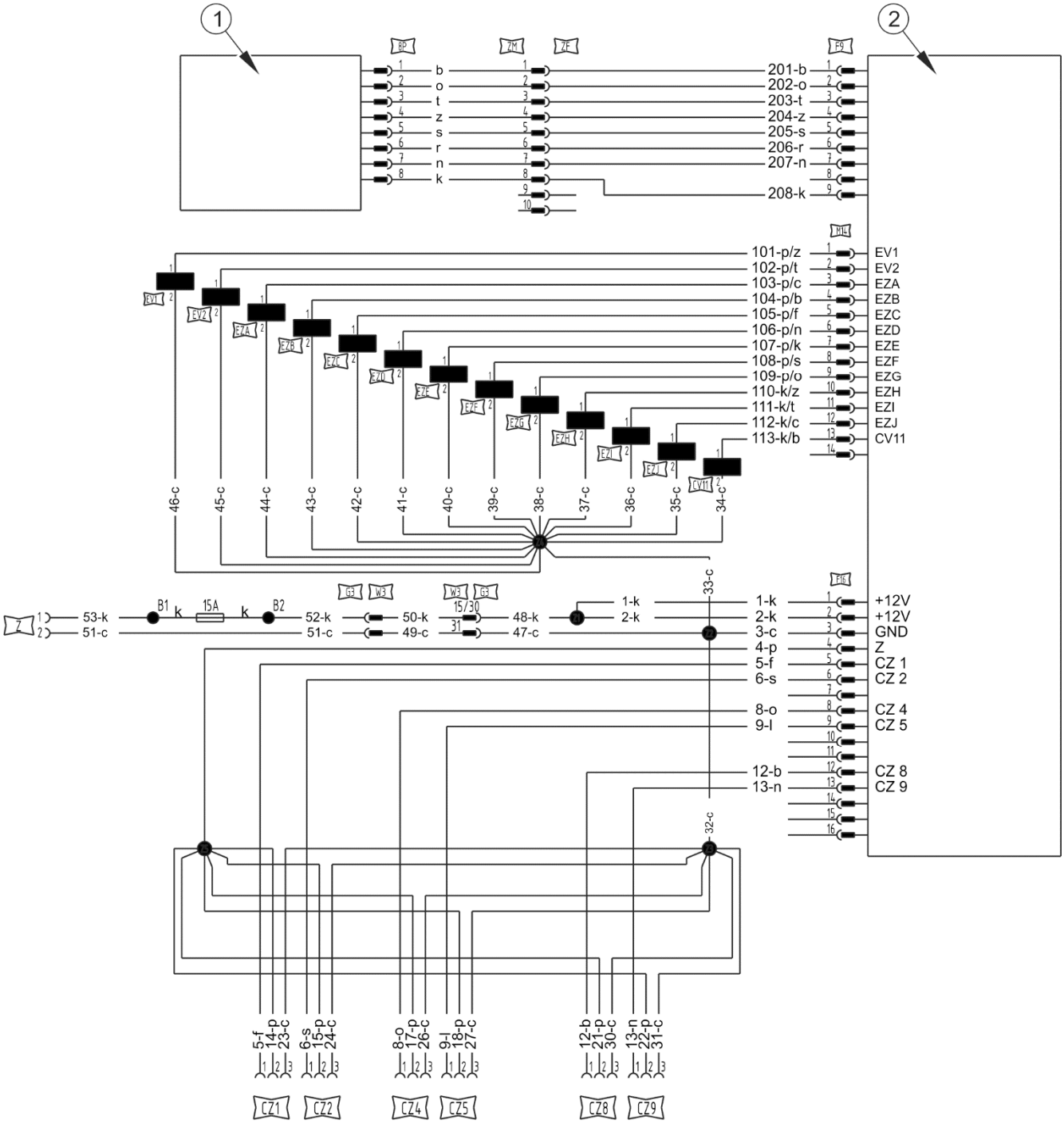


FIGURE 3.22 Diagram of electrical system of hydraulic system

(1) control panel (2) actuator module (Z) power supply of sensors, (CZ 1) sensor 1, (CZ 2) sensor 2, (CZ 4) sensor 4, (CZ 5) sensor 5, (CZ 8) sensor 8, (CZ 9) sensor 9

3.2.15 ELECTRIC LIGHTING SYSTEM

The trailer's electrical lighting system is designed for 12 V DC supply. In order to cooperate correctly with the trailer, the tractor should be equipped with a 7-pin electric socket. The trailer's electrical lighting system should be connected with the tractor using a suitable connection lead (10) with a 7-pin plug at both ends - figure *(3.23)*.

TABLE 3.3 List of electrical component markings

SYMBOL	FUNCTION
GP	Front socket
GT	Rear socket
OBP1	Right side clearance lamp (LED)
OBL1	Left side clearance lamp (LED)
PP	Front parking light, right side (LED)
PL	Front parking light, left side (LED)
ZP	Rear right lamp assembly (LED)
ZL	Rear left lamp assembly (LED)
OTP	Right license plate light (LED)
OTL	Left license plate light (LED)
OP	Rear clearance lamp, right side (LED)
OL	Rear clearance lamp, left side (LED)

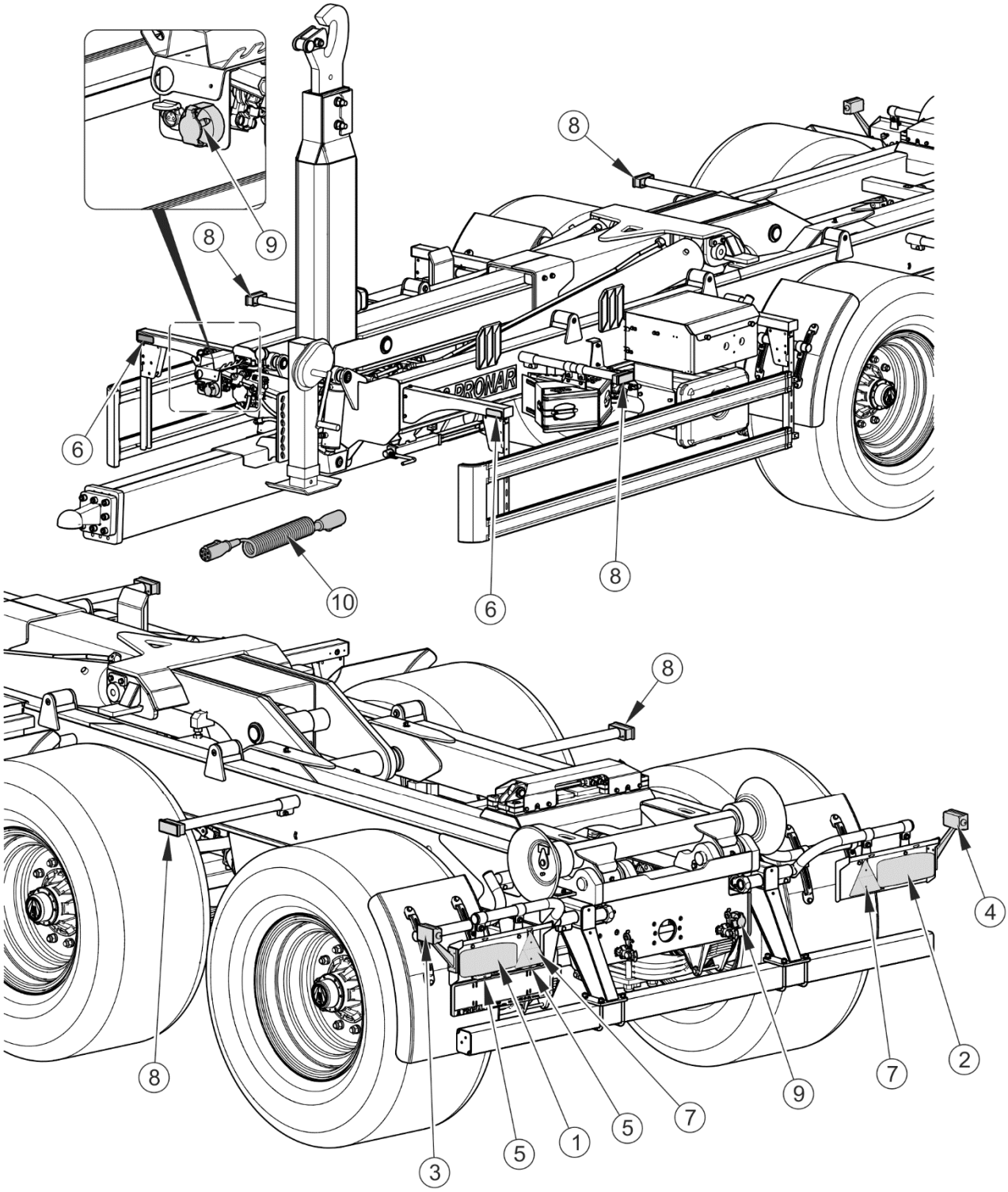


FIGURE 3.23 Arrangement of electrical lighting system components

(1), (2) left/right rear lamp assembly, (3), (4) rear left/right side clearance lamp, (5) licence plate light, (6) front clearance lamp, (7) reflective warning triangle, (8) side parking light, (9) 7-pin socket, (10) connection lead

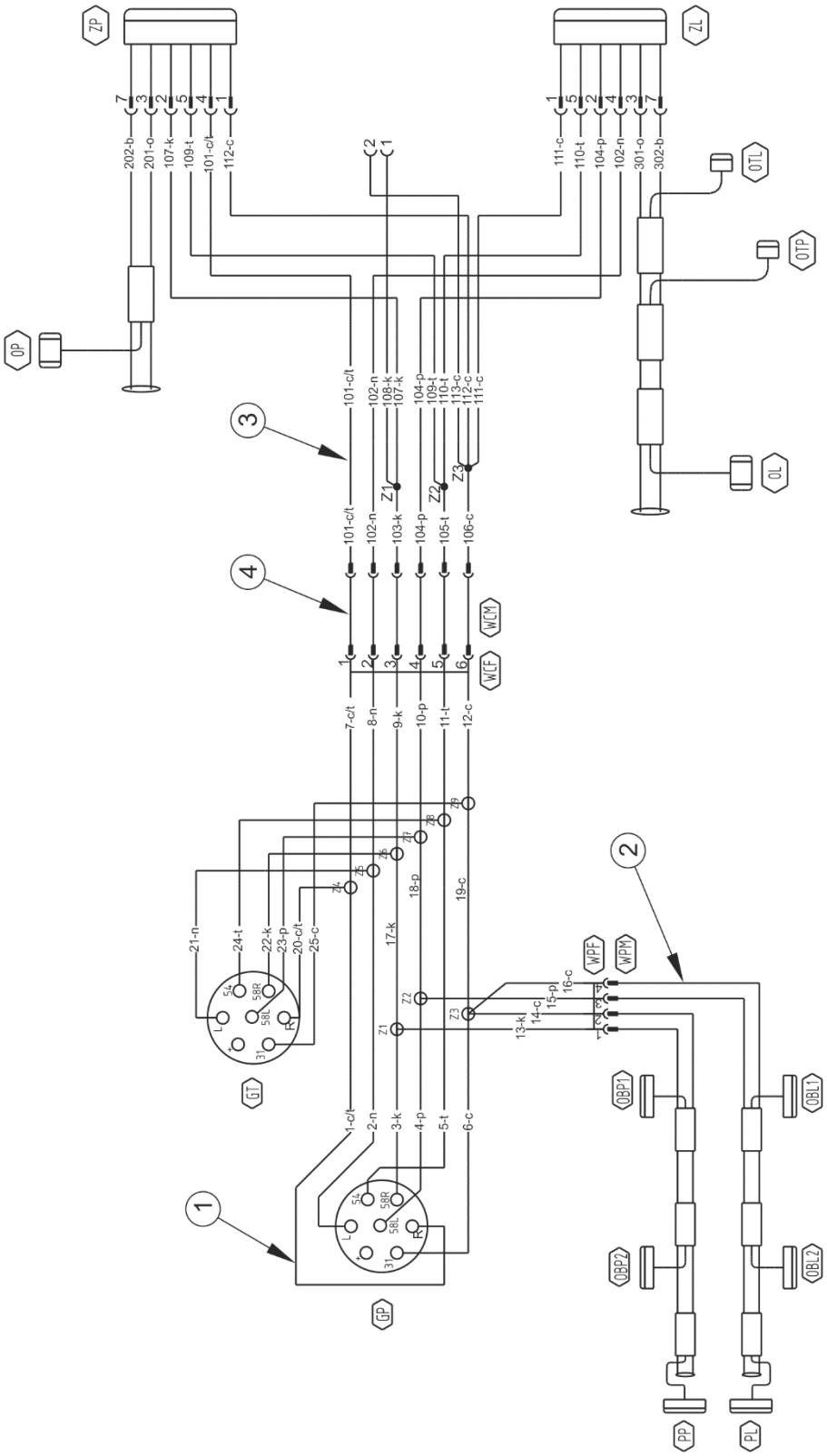


FIGURE 3.24 Electrical lighting system diagram

(1) central wiring harness, (2) front wiring harness, (3) rear wiring harness, (4) connecting wiring harness

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

TABLE 3.4 Marking of connections of GP and GT 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 3.5 Lead colour marking

MARKING	COLOUR
B	White
C	Black
F	Violet
K	Red
N	Blue
O	Brown
P	Orange
T	Green
C/T	Black and green

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 conduits.
- Check technical condition of pneumatic conduits.
- Check that there are no hydraulic oil leaks.
- Check electric lamps.
- Check electrical controls (panel, harness).
- Check hydraulic cylinders for leaks of hydraulic oil.

4.1.2 PREPARING THE TRAILER FOR FIRST HITCHING TO TRACTOR

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.

Preparation

- Check all the trailer's lubrication points, lubricate the machine as needed according to recommendations provided in section 5.7,
- Check correctness of tightening of all bolt and nut connections, in particular: wheels, bolts securing drawbar hitching eye and bolt and nut connections of the trailer's suspension system. Tighten, if necessary.
- Drain the air tank in the pneumatic braking system - see chapter 5.3.4.
- Ensure that pneumatic, hydraulic and electric connections in agricultural tractor are according to the requirements specified in table *(1.4*). Otherwise, the trailer should not be hitched to the tractor.
- Make sure that the oil of the same kind and grade is used in the trailer's hydraulic system and the tractor's hydraulic system.
- Check the hook height and, if necessary, adjust it to the requirements of the load boxes to be used, according to chapter 4.2.
- Using the parking stand, adjust the height of the drawbar hitching eye to ensure that it is at the height of the tractor hitch. If the trailer is equipped with the hydraulic support, first make the hydraulic connection.

If all the above checks have been performed and there is no doubt as to the trailer's good technical condition, test start should be conducted according to the sequence described below.

- Connect the trailer to appropriate hitch on agricultural tractor.
- Connect conduits of braking, electrical and hydraulic systems.

- ➡ Connect control panel.
- ➡ Raise support to transport position.
- ➡ Switch on individual lights of the lighting system and check if they work properly.
- ➡ Start and check correctness of operation of the hydraulic systems of the following assemblies: hydraulic support (if installed), rear axle turning interlock, rear fender, suspension interlock, load box interlock, hook frame shifting mechanism, the system for lowering and raising the tipping frame.
- ➡ When moving off check if the main brakes operate correctly.
- ➡ Perform test drive without load.

TIP

Such operating activities as hitching to/unhitching from tractor, pulling the load box on / removing the load box from the trailer etc. are described in detail in further parts of the Operator's Manual, in sections 4 and 5.

The trailer may be used only when all preparatory activities including inspection of technical condition have been completed satisfactorily. 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.

After completion of test drive, check tightness of wheel and drawbar eye nuts.

4.2 HOOK SETTING ADJUSTMENT

The hook trailer enables connection of load boxes with hitching eye at the height of 1570 mm according to DIN 30722-1 standard) or (1 450 mm according to SS 3021 standard). Changing height of hook should be performed by two persons. Self-locking nuts M20-8 should be replaced with new ones and tightened using appropriate tightening torque according to table 5.9 (*TIGHTENING TORQUE FOR NUT AND BOLT CONNECTIONS*).

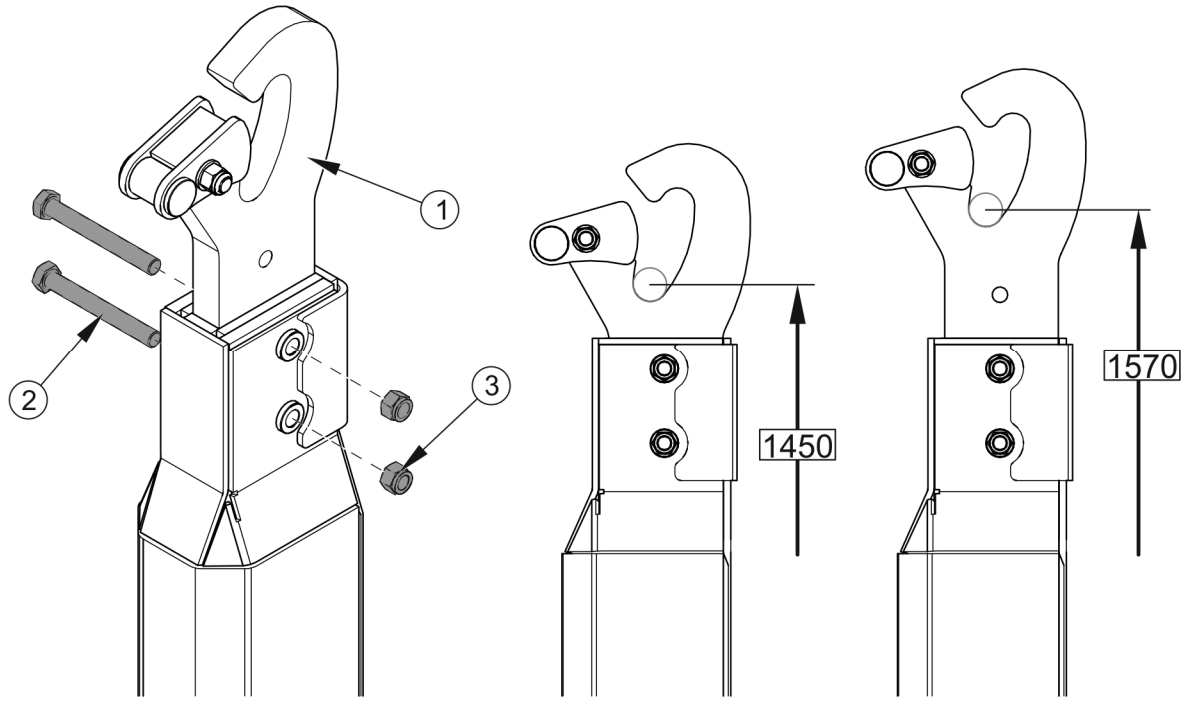


FIGURE 4.1 Hook position adjustment

(1) hook, (2) bolt, (3) nut

4.3 HITCHING AND UNHITCHING THE TRAILER FROM TRACTOR

IMPORTANT!

Trailer may only be hitched to a tractor which has the appropriate hitch, required connection sockets for braking, hydraulic and electrical systems. The oil used in the trailer's hydraulic system and the tractor's hydraulic system must be of the same kind and grade

Do NOT travel with trailer which has an unreliable brake, lighting or signalling system.

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

Ensure sufficient visibility during hitching.

Exercise particular caution while folding the support - danger of severing limbs.

The trailer may be hitched to the tractor only if all connections (electric, pneumatic, hydraulic) in the tractor meet the requirements of the trailer Manufacturer specified in table *(1.4*).

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

Hitching to tractor

- Visually inspect the technical condition of the trailer.
- Position agricultural tractor directly in front of drawbar eye.
- Reverse the tractor and, if hydraulic support is used, connect the conduit ended with a plug (3) to tractor - straight hydraulic support or folding hydraulic support – figure *(4.2)*.

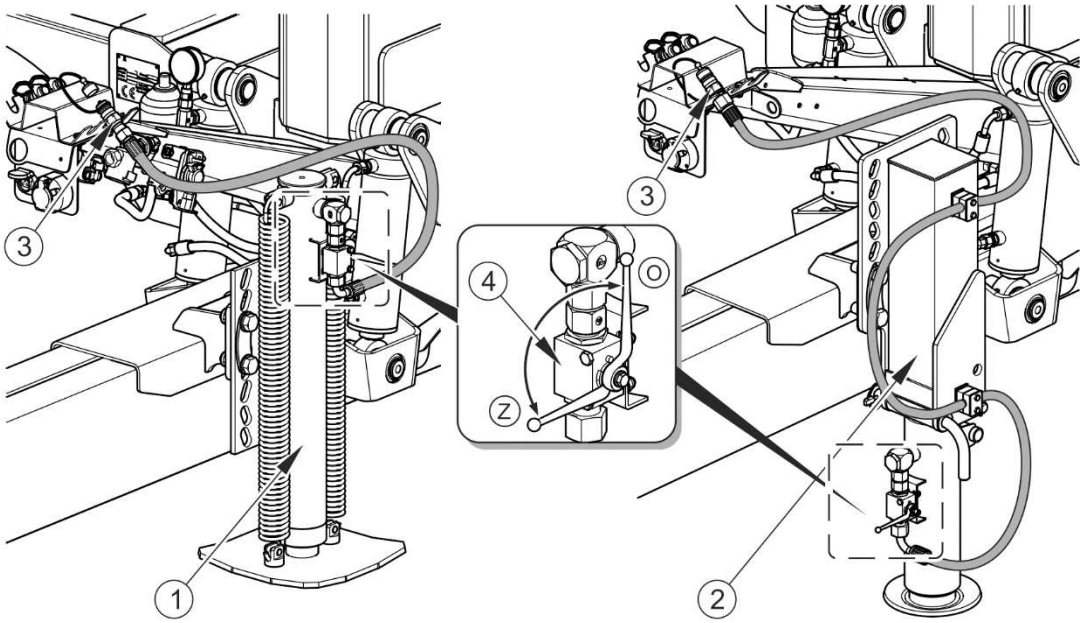


FIGURE 4.2 Connecting the hydraulic system of the hydraulic support

(1) straight hydraulic support, (2) folding hydraulic support, (3) quick coupler - plug, (4) ball valve, (O) "OPEN" valve position, (Z) "CLOSED" valve position

➡ Using the parking support set the drawbar eye at such a height so it is possible to hitch the machines.

⇨ In case of mechanical support, adjust the drawbar eye height by rotating the crank in proper direction - see chapter 4.3.1.

⇨ If the hydraulic support (folding or straight support) is used, set valve (4) to open position (O) – figure *(4.2)* and start a proper section of the manifold in the tractor in order to raise or lower the trailer drawbar eye until a required 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.

➡ Raise the parking stand and secure it properly.

⇨ In case of the telescopic support with gear, follow the instructions given in chapter 4.3.1.

- ⇨ In case of straight hydraulic support or folding hydraulic support, start a proper section of the manifold in the tractor in order to raise the support maximally.
- ⇨ In case of folding hydraulic support, fold and secure the cylinder according to chapter 4.3.2.

➡ Set valve (4) in hydraulic support to "Z" position - figure *(4.2)* and set the manifold lever in the tractor to "neutral" position.

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

➡ Connect the drawbar's hydraulic system (to the sockets of a single section of the tractor's external hydraulic system).

➡ Connect pneumatic system conduits.

- ⇨ Keep the correct sequence of conduit connections. 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 conduits causes the trailer's braking system control valve to automatically apply brakes).
- ⇨ If the brakes do not react after connecting the conduits, pressure in the tank may be too low. Increase the pressure to proper level in order to ensure operation of the system.

➡ Connect hydraulic braking system conduit (applies to trailer version with hydraulic braking system).

- ⇨ The connection socket is different than in other systems (female socket).

➡ Connect the conduits of the hydraulic system of the turning interlock (to the sockets of a single section of the tractor's external hydraulic system).

➡ Connect the central hydraulic system conduits.

- ⇨ Connection conduits are marked with red stoppers. The return conduit with a check valve should be connected to the drain connector in the tractor, so called "free drain".
- ⇨ If the tractor is not equipped with a drain connector, the conduits should be connected to a single section of the tractor manifold.
- ⇨ The control lever of the tractor manifold section must have a lock in "ON" position.

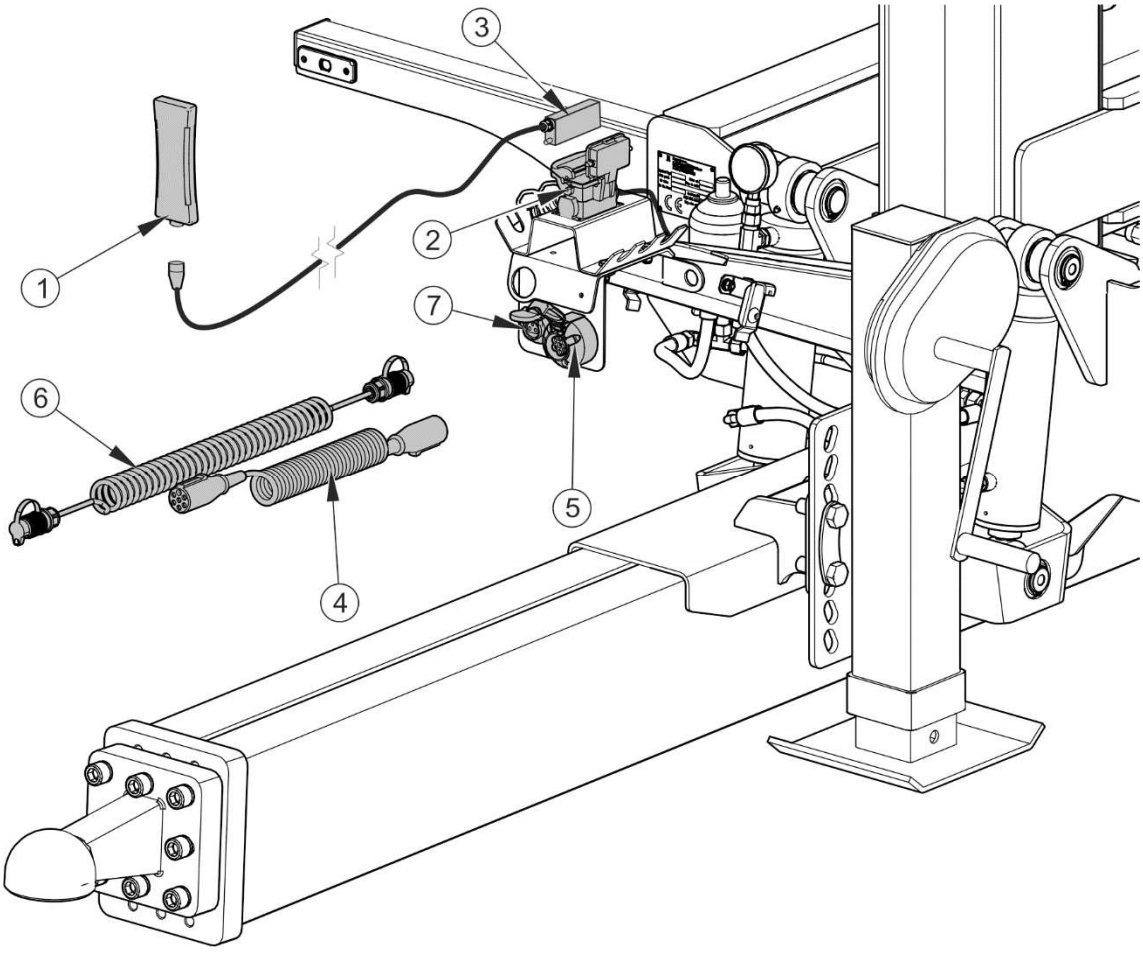


FIGURE 4.3 Connecting the electrical system

(1) control panel, (2) control socket, (3) communication lead, (4) 7-pin connection lead, (5) 7-pin socket, (6) 3-pin power lead, (7) 3-pin socket

- ➡ Connect main connection lead (4) of the electrical lighting system to 7-pin socket (5) on the trailer and to 7-pin socket on the tractor - figure *(4.3)*.

➡ Connect power lead (6) to 3-pin socket (7) on the trailer - figure *(4.3)* and to 3-pin socket on the tractor.

⇨ If the tractor is not equipped with such a socket, an authorized person should install the socket according to the recommendations of the tractor manufacturer

➡ Connect communication lead (3) to control panel (1). Install the panel in the operator cab in an easily accessible place.

➡ Connect the plug of communication lead (3) to control socket (2) located on the hanger for the trailer conduits.

➡ Release parking brake.

IMPORTANT!

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

Unhitching the trailer

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

➡ Immobilise tractor and trailer with parking brake and place chocks under the trailer wheel.

⇨ Wheel chocks shall be so placed that one of them is in front of the wheel and the second is behind it.

DANGER

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

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

➡ Set the support in such a position that one may safely unlock and unhitch the trailer.

⇨ If the trailer is equipped with the telescopic support with gear, follow the instructions given in chapter 4.3.1.

- ⇨ The folding hydraulic support should be folded and locked according to chapter 4.3.2.
- ⇨ In case of straight or folding hydraulic support, set valve (4) to "O" position –open – figure *(4.2),* and control the manifold in the tractor in order to lower the support.
- ⇨ When the hydraulic support is lowered, set the manifold lever in tractor to "neutral" position and set the support valve (4) to "Z" position - closed – figure *(4.2)*.

➡ Set the hydraulic section in the tractor, to which the support is connected, to "floating" position in order to reduce pressure in hydraulic conduits.

- ⇨ High pressure will occur at the connector after closing the support valve and it will be impossible to reconnect the conduit after taking it out.

IMPORTANT!

The trailer may not be unhitched from the tractor if the tipping frame or central frame are not fully retracted and when hydraulic cylinder suspension blocks are extended.

➡ Disconnect the connection lead of the control panel and dismount the panel from the operator cab.

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

➡ Disconnect from the tractor the conduits of the turning interlock hydraulic system, central hydraulic system, drawbar hydraulic system and hydraulic system of the hydraulic support (option).

➡ Disconnect pneumatic system conduits and electrical leads from the tractor.

➡ Protect conduit ends with caps and place them on the hanger.

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

IMPORTANT!

Do NOT park the loaded trailer, which is disconnected from the tractor and resting on the parking support.

Before moving off, make sure that the support is maximally raised and secured against dropping.

4.3.1 OPERATION OF SUPPORT WITH MECHANICAL GEAR

Proper height of drawbar eye in relation to tractor hitch is set using the support with mechanical gear - figure (*4.4*).

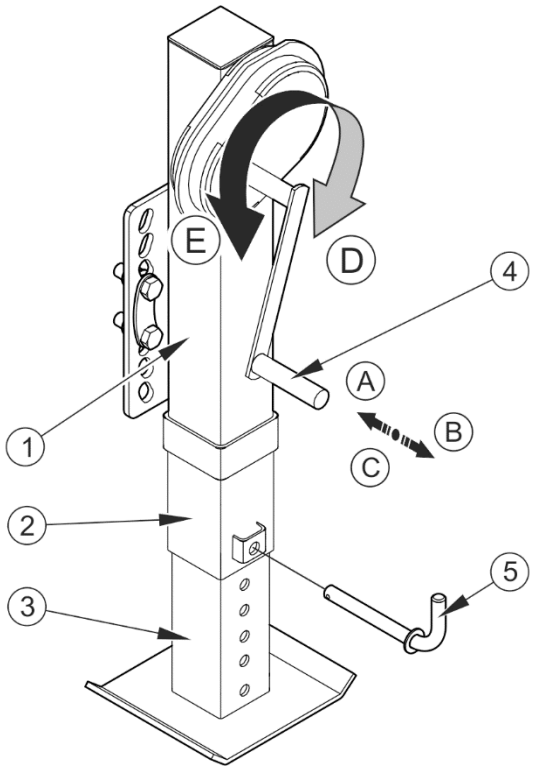


FIGURE 4.4 Support with gear

(1) support body, (2) internal pipe (3) lower foot, (4) gear crank, (4) pin, (A) position – gear I (speed under load), (B) position – II gear (high speed), (C) neutral position, (D) lowering the support, (E) raising the support

Raising the support

➡ Set support crank (4) in position (B) or (A).

⇨ Position (A) is used for rising and lowering the support under load.

⇨ Position B is used for fast rising or lowering the support in order to reduce the distance between the support foot and the ground, in unloaded trailer.

➡ Turn the crank in direction (E) to raise the support so that the foot (3) does not touch the ground.

➡ Set the crank in neutral position (A).

➡ Remove safety pin (5).

➡ Raise support foot (3) and secure it in its position by inserting pin (5) into proper hole.

Lowering the support

➡ While holding support foot (3) with one hand, remove safety pin (5) and lower the foot to a proper height.

➡ Secure foot (3) in its position by inserting pin (5) into proper hole.

➡ Set crank (4) in position (A) or (B).

➡ Turn the crank in direction (D) to lower the support to the ground and adjust drawbar height in relation to hitch (if the trailer is to be hitched to tractor)

IMPORTANT!

Before moving off, check that the support is maximally raised, and the crank is set in neutral position (C).

4.3.2 OPERATION OF FOLDING HYDRAULIC SUPPORT (OPTION)

In order to operate the support, first connect hydraulic conduit terminated with a quick coupler (6) to hydraulic system manifold in the tractor and then manually unfold cylinder (1) to vertical position.

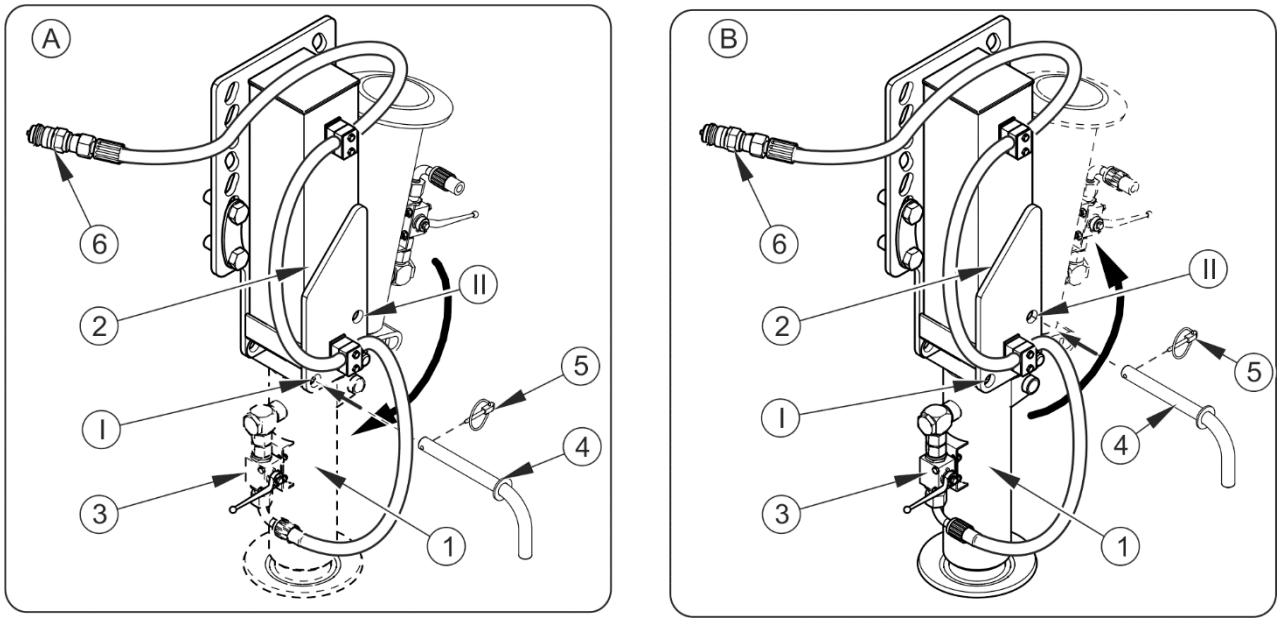


FIGURE 4.5 Operation of folding hydraulic support

(1) support cylinder, (2) body, (3) valve, (4) securing pin, (5) cotter pin, (6) quick coupler, (A) unfolding the support, (B) folding the support, (I) hole I, (II) hole II,

Unfolding the support

- ➡ Unlock cotter pin (5) and remove securing pin (4) from hole (II).
- ➡ Turn support foot (1) downwards –figure (4.5) item (A).
- ➡ Insert pin (4) to hole (I) and secure it with cotter pin (5).

Folding the support

- ➡ Unlock cotter pin (5) and remove securing pin (4) from hole (I).
- ➡ Turn support foot (1) upwards – figure (4.5) item (B).
- ➡ Insert pin (4) to hole (II) and secure it with cotter pin (5).

In order to operate the support:

- ➡ set the valve to "O" position – open – figure *(4.2).*
- ➡ operate the manifold in the tractor in order to lower or raise the support.
- ➡ set the manifold lever in tractor to "neutral" position and set the support valve to "Z" position - closed – figure *(4.2)*.

4.4 HITCHING AND UNHITCHING THE SECOND TRAILER

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

Hitching the second trailer to the tractor - trailer unit requires experience in driving an agricultural tractor with a trailer. While hitching the second trailer, it is recommended to use the help of another person to guide the tractor driver.

Hitching the second trailer

- ➡ Position the tractor with the first trailer hitched directly in front of the second trailer's drawbar.
- ➡ Immobilise the second trailer with parking brake.

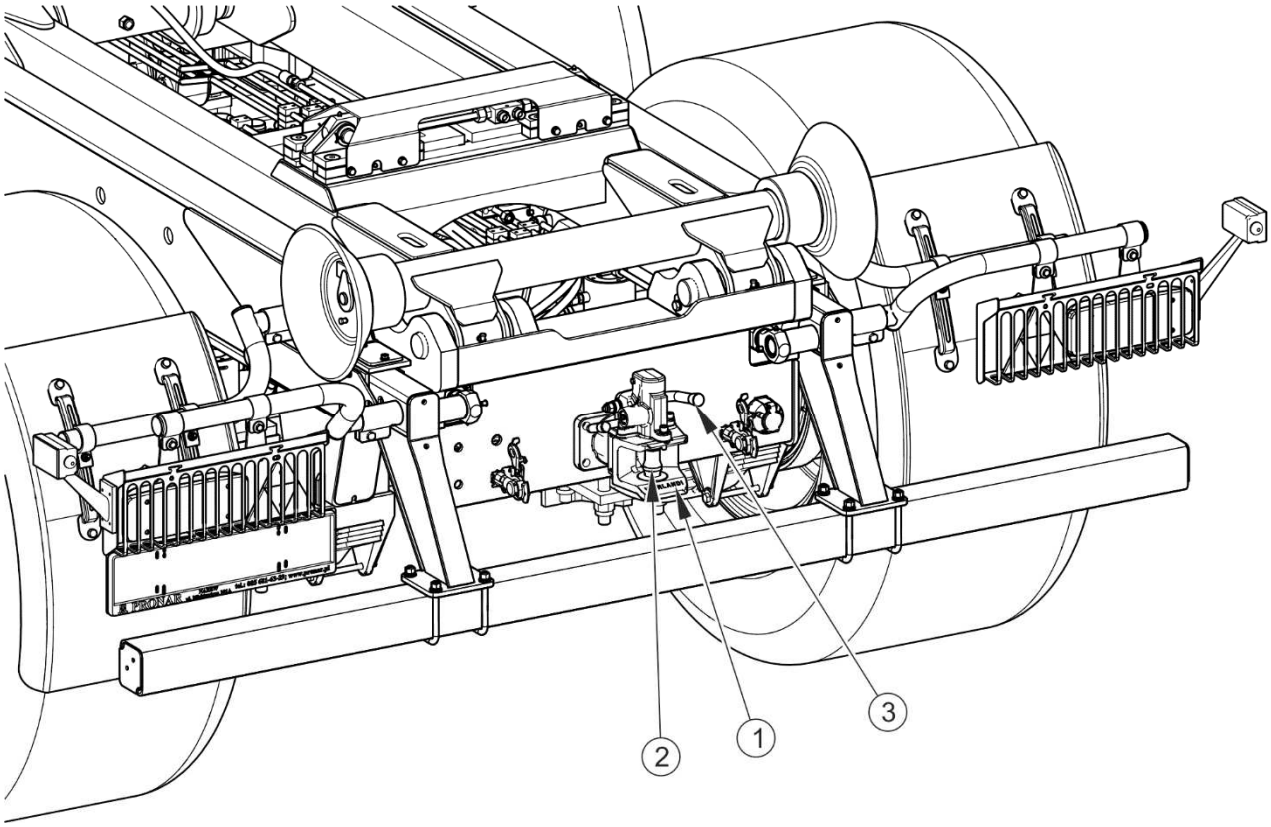


FIGURE 4.6 Rear hitch

(1) hitch body, (2) hitch pin, (3) hitch lifting handle

- ➡ Raise hitch pin (2) of the first trailer using handle (3) - figure *(4.6).*

- ➡ Adjust the height of the drawbar of the second trailer in such a manner as to enable hitching the machines.
- ➡ Reversing tractor, drive the rear hitch of the first trailer onto the drawbar of the second trailer.
    - ⇨ Make sure that the hitching operation was completed and the second trailer drawbar is secured.
- ➡ Connect conduits of pneumatic, hydraulic and electrical systems according to instructions contained in section *(4.3)*

Unhitching the second trailer

- ➡ Immobilise tractor and trailers with parking brake.
- ➡ Turn off tractor engine. Ensure that unauthorised persons do not have access to the tractor cab.
- ➡ Disconnect conduits of pneumatic, hydraulic and electrical systems according to instructions contained in section *4.3*.
- ➡ Unlock the pin of the rear hitch of the first trailer. Remove drawbar pin and drive tractor away.

DANGER

When hitching/unhitching the trailer, 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.

IMPORTANT!

Do NOT hitch a second trailer constructed on any chassis except dual axle chassis.

4.5 OPERATING THE TRAILER

4.5.1 OPERATION OF CONTROL PANEL

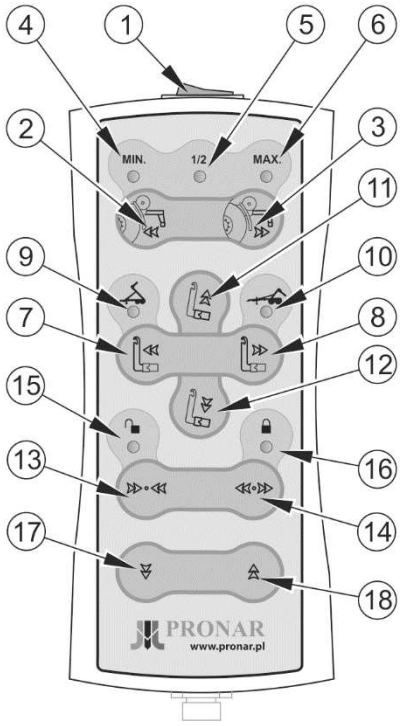
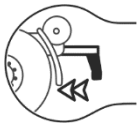
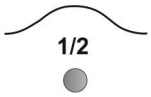
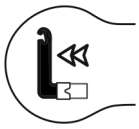
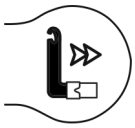
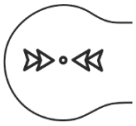
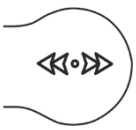


FIGURE 4.7 Control panel description

control panel is described in table 4.1

TABLE 4.1 Control panel description (Figure 4.7)

MARKINGS ON FIGURE 4.7	SYMBOL OF FUNCTION	DESCRIPTION
1	-	Switching on/off the control panel power supply.
2		Push-button for folding the rear fender.
3		Push-button for extending the rear fender.

MARKINGS ON FIGURE 4.7	SYMBOL OF FUNCTION	DESCRIPTION
4		Indicator light signalling that the rear fender is folded (tipping frame control function is unlocked).
5		Indicator light signalling that the rear fender is halfway the extension range.
6		Indicator light signalling that the rear fender is at the maximum position.
7		Push-button for extending the telescopic hook frame.
8		Push-button for withdrawing the telescopic hook frame.
9		Indicator light signalling that the trailer is in "tipper" operation mode.
10		Indicator light signalling that the trailer is in "hook trailer" operation mode.
11		Push-button for rising the tipping frame.
12		Push-button for lowering the tipping frame.
13		Push-button for withdrawing the load box interlock.
14		Push-button for extending the load box interlock.

MARKINGS ON FIGURE 4.7	SYMBOL OF FUNCTION	DESCRIPTION
15		Indicator light signalling that the load box interlock is unlocked.
16		Indicator light signalling that the load box interlock is locked.
17		Push-button for additional output (e.g. lowering the load box gate).
18		Push-button for additional output (e.g. rising the load box gate).

4.5.2 PULLING THE LOAD BOX ON THE TRAILER

IMPORTANT!

Before connecting load box one must take off the slow-moving vehicle plate.

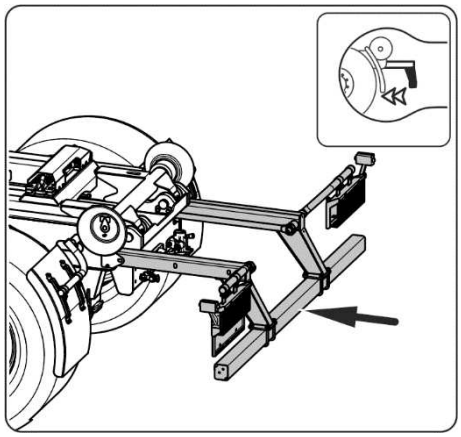
If the trailer or the load box is tilted sideways or the load box is not positioned in the trailer's axis of symmetry while pulling the load box on the trailer, stop pulling and take the load box off the trailer.

Before starting loading or unloading the container, it is recommended to extend the drawbar cylinders in order to initially tilt the frame back.

In order to pull the load box onto the trailer, carry out the following actions in the following sequence.

- ➡ Take off the slow-moving vehicle warning sign from the trailer.
- ➡ If necessary, adjust position of hook by setting proper height – see chapter 4.2.
- ➡ Switch on power supply of control panel by pressing push-button (1) - figure *(4.7).*

➡ Fold the rear bumper

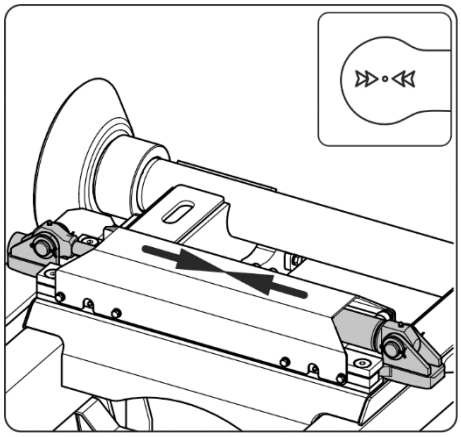


Press and hold the push-button for folding the rear fender. After folding the fender, indicator light (4) must light up on the control panel - figure *(4.7).*

If the fender is not completely withdrawn, the tipping function does not work.

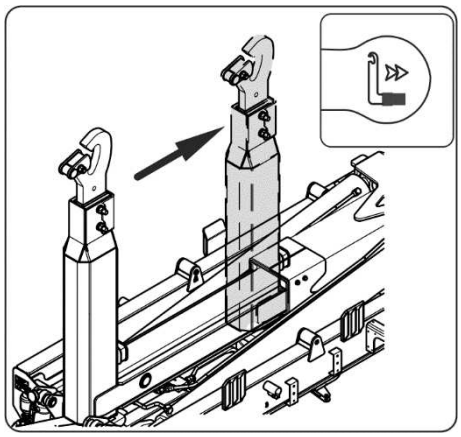
➡ Place the tractor and the trailer in front of the load box, in the straight line, at a distance of about 1 meter from the load box hitch.

➡ Withdraw the load box interlock (if it is extended).



Press and hold the push-button for withdrawing the load box interlock. Indicator light (15) must light up - figure (4.7).

➡ Set the trailer to "hook trailer" function.



Shift the hook frame maximally to the rear by pressing the push-button for withdrawing the hook frame. If the trailer is correctly set to "hook trailer" function, indicator light (10) will light up - figure *(4.7)*.

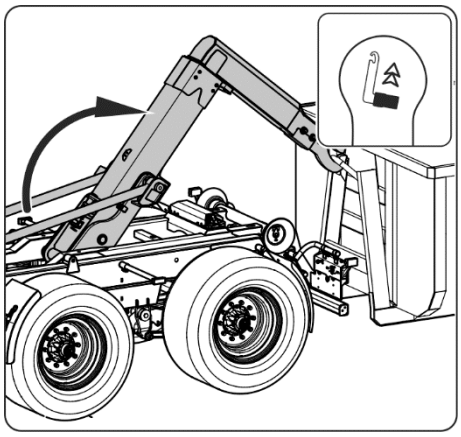
IMPORTANT!

Selection of the trailer's working mode is only possible when the tipping frame is retracted to resting position.

If the hook frame is not completely shifted to position B – figure (3.5), the trailer will work in "tipper" operation mode.

➡ Swing the central frame

Press and hold the push-button for rising the tipping frame to the position in which the hook is located at the height of the load box hitch.



Press and hold the push-button for about 3 seconds to continue rising the frames without the necessity of depressing the push-button. Press any push-button on the control panel to stop rising.

The suspension interlock cylinders will be automatically extended.

➡ Reverse the trailer to such a position in which the load box can be hooked, If necessary, correct the hook position according to chapter 4.2.

IMPORTANT!

In "hook trailer" position, after rising the central frame, the hook frame does not shift.

Pulling the load box onto the trailer should be carried out on flat, even and level ground. While connecting load box arrange it in such a way that the longitudinal axis of the trailer is aligned with the longitudinal axis of the load box. If not, the load box longitudinal members of the frame may not fit on the trailer rollers lengthwise. While pulling in the load box is necessary to observe whether its longitudinal members are properly supported on the trailer guide rollers. If necessary, stop pulling the load box, put the load box aside and position the trailer once again in a proper manner for pulling the load box.

DANGER

Bystanders must NOT be in the immediate vicinity of the trailer when pulling the load box onto the trailer.

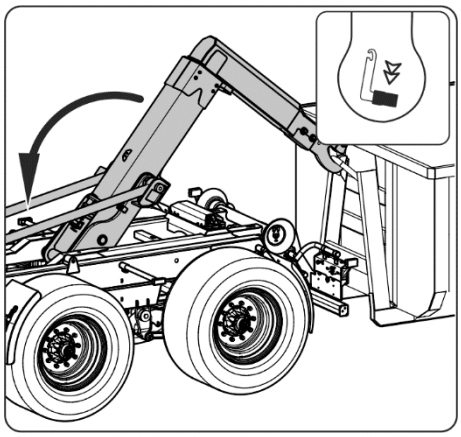
Exercise particular caution and keep a safe distance from the trailer when automatically folding and unfolding the frames.

Take particular care while working near electric power lines.

When disconnecting the load box from the trailer, the drawbar hitching eye and tractor hitch are subjected to great loads.

➡ Pull the load box onto the trailer by folding the central frame.

Press and hold the push-button for folding the tipping frame. Press and hold the push-button for about 3 seconds to fold the frames automatically.

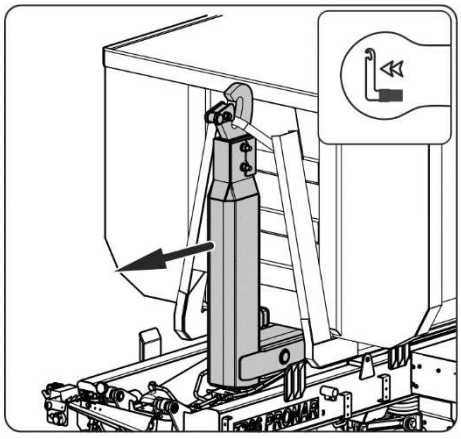


After folding the frames, hold the button for 2-3 seconds to retract the mechanical suspension lock cylinders.

In case of air suspension, after folding the frames, hold the button for 2-3 seconds to ensure their correct positioning on the lower frame.

➡ Shift the load box forwards.

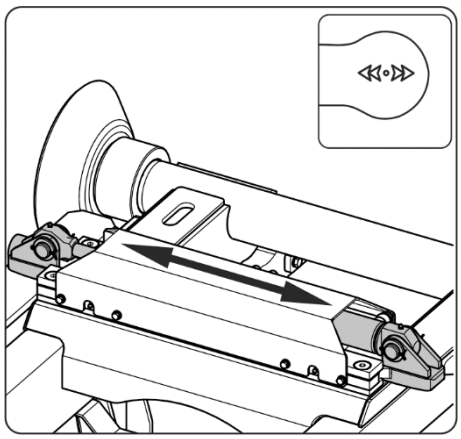
Press and hold the push-button for extending the hook frame until the required position of the load box is achieved.



IMPORTANT!

When shifting the short load box, make certain that the load box rollers are not in front of the trailer's rollers (mudguards may get damaged).

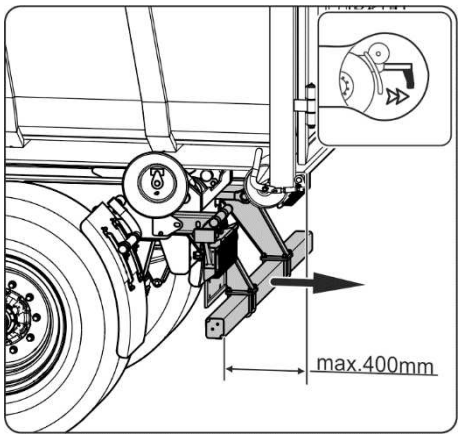
➡ Extend the load box interlock.



Press and hold the push-button for extending the load box interlock.

When indicator light (16) lights up, figure *(4.7)* keep the push-button pressed for 2-3 seconds.

➡ Extend the rear bumper (if the load box projects more than 400mm).



Press and hold the push-button for extending the rear fender until the required position of the rear fender is achieved. Extending is stopped when the rear fender reaches the central position. Press the push-button for extending the rear fender again to continue extending.

The maximum distance between the rear fender and the rearmost point of the vehicle (load box) should not exceed 400mm.

Position of the fender is defined by indicator lights (4), (5), (6) on the control panel – figure *(4.7).*

➡ Place slow-moving vehicle plate on rear wall of load box.

IMPORTANT!

Make sure that the electrical cables will not be damaged by moving parts of the trailer and the tractor during operation. If necessary, secure the cables in a proper manner.

The central frame in "hook trailer" position can be operated only when the rear fender is completely folded and the load box lock is unlocked - indicator lights 4, 10 and 15 must be ON – figure *(4.7).*

In the event of pulling the load box, which is not standing on hard ground, it is permissible to reverse the trailer after raising the load box to a height enabling it to be pulled in. Soft ground preventing easy rolling of the load box rollers significantly hinders the pulling process. Reversing the tractor and pulling the load box should be carried out simultaneousły while exercising particular caution.

4.5.3 REMOVING LOAD BOX FROM TRAILER

DANGER

When disconnecting the load box from the trailer, the drawbar hitching eye and tractor hitch are subjected to great loads.

Other persons must NOT be in the immediate vicinity of the trailer and especially behind the disconnected load box.

Do NOT travel with the trailer if the tipping frame is not completely folded.

Take particular care while working near electric power lines.

UWAGA

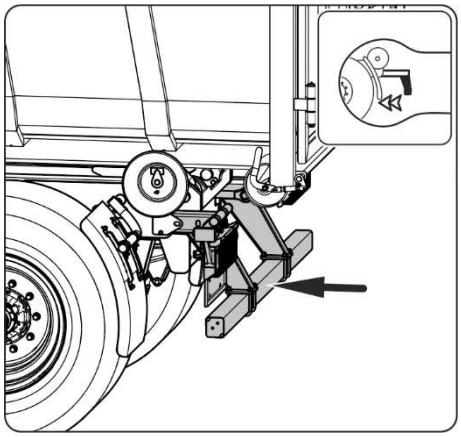
Before starting loading or unloading the container, it is recommended to extend the drawbar cylinders in order to initially tilt the frame back.

Removing load box from trailer must be done on hard, level and flat ground. If not, the load box rollers may dig into the earth and hinder disconnection from the trailer. The load box must not be left on a slope.

In order to disconnect the load box from the trailer carry out the following actions in the following sequence.

- ➡ Set tractor and trailer on hard level ground; tractor and trailer must be positioned in order to drive straight forwards.

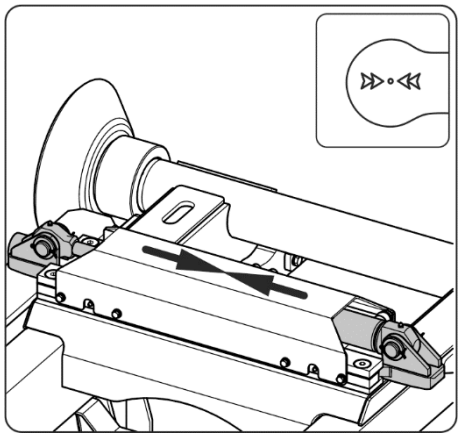
➡ Fold the rear bumper



Press and hold the push-button for folding the rear fender. If the fender is completely folded, indicator light (4) will light up on the control panel - figure *(4.7).*

If the fender is not completely folded, the tipping function does not work.

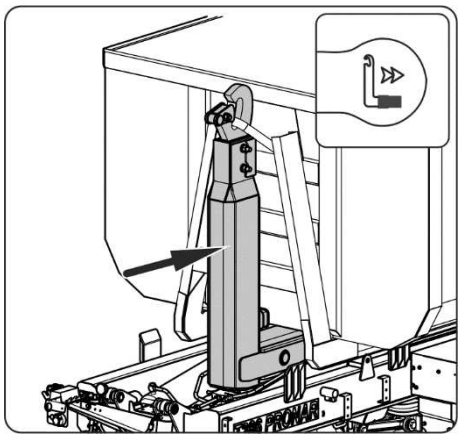
➡ Withdraw the load box interlock.



Press and hold the push-button for withdrawing the load box interlock. Indicator light (15) must light up - figure (4.7). When indicator light lights up, keep the push-button pressed for 1-2 seconds.

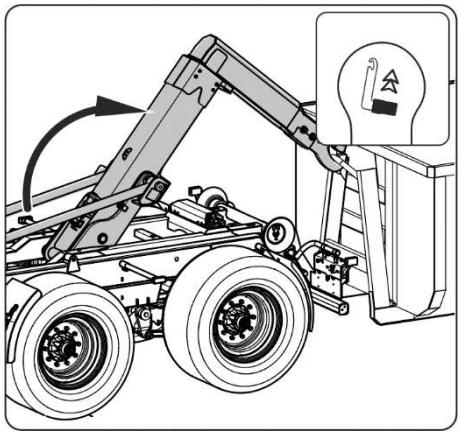
If the load box interlock is not completely withdrawn, the hook frame shifting does not work.

➡ Shift the load box maximally to the rear.



Press the push-button for withdrawing the hook frame in order to shift the hook frame maximally to the rear until the indicator light (10) lights up - figure *(4.7)*.

➡ Swing the central frame



Press and hold the push-button for rising the tipping frame until the load box is positioned on the ground.

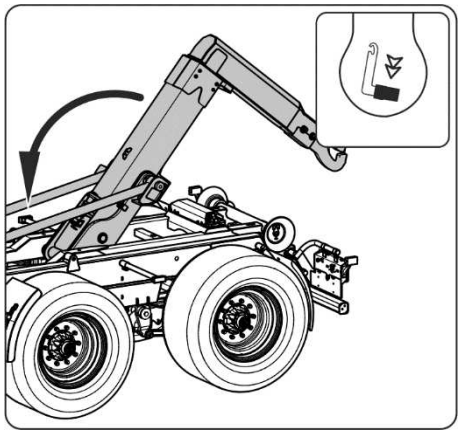
The suspension interlock cylinders will be automatically extended.

While removing the load box from the trailer, pay attention to ensure that the load box longitudinal members are not jammed by the trailer's guide rollers.

The trailer's hook should be set in such a position to enable unhitching the hook from the trailer.

➡ Drive the trailer away from the load box in order to disconnect it.

➡ Fold the central frame of the trailer



Press and hold the push-button for lowering the tipping frame until the central frame rests on the trailer's lower frame. Press and hold the push-button for about 3 seconds to fold the frames automatically.

After folding the frames, hold the button for 2-3 seconds to retract the mechanical suspension lock cylinders.

In case of air suspension, after folding the frames, hold the button for 2-3 seconds to ensure their correct positioning on the lower frame.

➡ Attach the slow moving vehicle warning sign.

ATTENTION!

When disconnecting the load box, user must take particular care that prior to lowering the load box to the ground it shall not strike any trailer's structural elements.

4.6 LOADING LOAD BOX

Before beginning loading make certain that the load box side walls 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.

Distribute load evenly in the load box using suitable tools (crane, loader, conveyor, etc.), depending on type of load. Loading should be carried out by a person experienced in this type of work and having appropriate authorisation for operating equipment (if required). Type of load carried depends on load box use.

Due to the various density of materials, using the total load box capacity may cause exceeding permissible carrying capacity of hook trailer. Please note that the weight of empty load box and its load must not exceed the 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 4.2 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

TYPE OF MATERIAL	VOLUME WEIGHT kg/m^3
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
kainite	1,050 – 1 440
milled lime fertiliser	1 250 - 1 300
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

TYPE OF MATERIAL	VOLUME WEIGHT kg/m^3
wilted baled hay	200 - 290
stored dry hay	50 - 90
stored cut hay	90 - 150
clover (lucerne) wilted in the swath	20 - 25
clover (lucerne) cut wilted on trailer	110 - 160
clover (lucerne) wilted on gathering trailer	60 - 100
dry stored clover	40 - 60
cut dry stored clover	80 - 140
dry straw in round bales	8 - 15
damp straw in round bales	15 - 20
cut damp straw in bulk trailer	50 - 80
cut dry straw in bulk trailer	20 - 40
cut dry straw in gathering trailer	50 - 90
cut dry straw in stack	40 - 100
baled straw (lightly crushed)	80 - 90
baled straw (heavily crushed)	110 - 150
cut cereal mass in bulk trailer	35 - 75
cut cereal mass in gathering trailer	60 - 100
green fodder in swath	28 - 35
cut green fodder in bulk trailer	150 - 400
green fodder in gathering trailer	120 - 270
fresh beet leaves	140 - 160
cut fresh beet leaves	350 - 400
beet leaves in gathering trailer	180 - 250
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

TYPE OF MATERIAL	VOLUME WEIGHT kg/m^3
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
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

IMPORTANT!

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

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

Individual types of load boxes are adapted to carrying various groups of materials, therefore the user is obligated to carefully read the load box operator's manual and comply with its recommendations.

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.

Mineral fertilisers and other materials, which by having contact with painted or steel surfaces may cause damage, are recommended to be carried in sealed packing (sacks, boxes, drums, barrels etc.).

4.7 TRANSPORTING LOADS

When driving on public or private roads, respect the road traffic regulations, exercise caution and prudence. Comply with this Operator's Manual and pay particular attention to the below guidelines for driving the tractor with the trailer hitched.

- 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 use of slidable telescopic hook frame makes it possible to change the location of centre of gravity of transported load box, which increases or decreases the load applied to the tractor's rear wheels.
- When driving with trailer, the trailer's rear fender must not be in folded position (indicator light (4) must not be ON– figure *(4.7)*).

- When transporting the trailer with loaded load box on public roads, the maximum distance between the rear fender (underrun protection device) and the rearmost point of the vehicle (load box) should not exceed 400mm.
- While transporting the load box, the trailer must be set to "tipper" function".(indicator light (9) is ON - figure *(4.7))*.
- While transporting the load box, the hydraulic load box interlock should be locked (indicator light (16) is ON - figure *(4.7))* in order to protect the load box against shifting and shaking during transport on the trailer.
- The trailer must not be overloaded, loads must be uniformly distributed so that the maximum permissible trailer axle and hitch 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 5° 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 with chocks placed under the wheels. Do NOT leave unsecured trailer. In the event of machine malfunction, pull over on the hard shoulder avoiding any risk to other road users and position reflective warning triangle according to traffic regulations.
- When driving on public roads trailer must be marked with a slow-moving vehicle warning sign attached to the rear chassis beam (travelling without load box), or on rear wall of load box.
- 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, 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.
- Monitor trailer's behaviour when travelling on an uneven terrain, and adjust driving speed to road conditions, slow down early enough when turning.
- When trailer is towed (with load box or without load box), hydraulic cylinder suspension blocks must be completely raised.
- Please note that the braking distance of the tractor and trailer combination is substantially increased at higher speeds and loads. Before beginning travel appropriately adjust trailer braking force, by appropriate brake force regulator setting (applies to pneumatic brake systems).
- While travelling on roads (public or private), take the guards protecting rear light assemblies from the light beam profiles and secure them on the other side of the profiles using star nuts.

4.8 UNLOADING

Unloading materials from the load box is carried out by tipping the load box to the rear by means of two hydraulic cylinders. Operation is controlled from the driver's cab using the control panel of the external tractor's hydraulic system manifold.

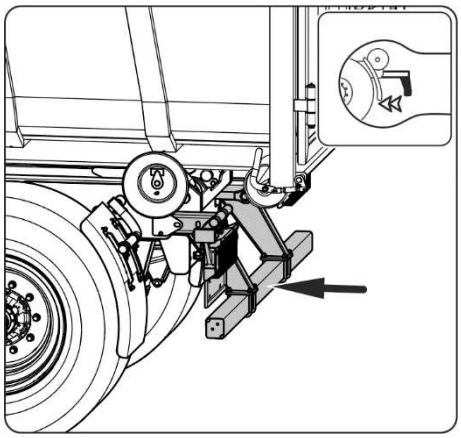
	DANGER
	Tipping may only be performed when trailer is hitched to tractor. **Do NOT tip load box in strong gusty winds conditions.** **Do NOT move off or drive when load box is raised.** **Take particular care while working near electric power lines.** **When opening load box closure take particular care, because of the pressure of the load on the wall.** **When closing load box wall take particular care to avoid crushing fingers.** **Ensure that during unloading nobody is near tipped load box or load material pouring out.**

In order to unload the load box, carry out the below activities in the following sequence.

- ➡ Tractor and trailer must be placed to drive forwards on flat, level and hard ground,
- ➡ Fold the rear bumper

Press and hold the push-button for folding the rear fender. If the fender is completely folded, indicator light (4) will light up on the control panel - figure *(4.7).*

If the fender is not completely folded, the tipping function does not work.



- ➡ Open the rear wall of the load box and protect it against closing. During opening, exercise particular caution because the load may exert great pressure on the wall. If the load box is equipped with the rear hydraulic wall, use the control panel.

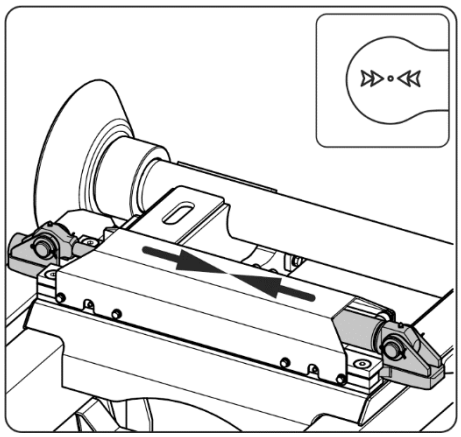
⇨ Press and hold the push-button (17) or (18) - figure *(4.7)* until the load box wall is completely opened.

IMPORTANT!

Symbols in the form of arrows (17), (18) - figure *(4.7)* located on the control panel do not define rising or lowering direction (it depends on the load box connection method).

➡ If needed, unlock the load box (if the load box position should be changed).

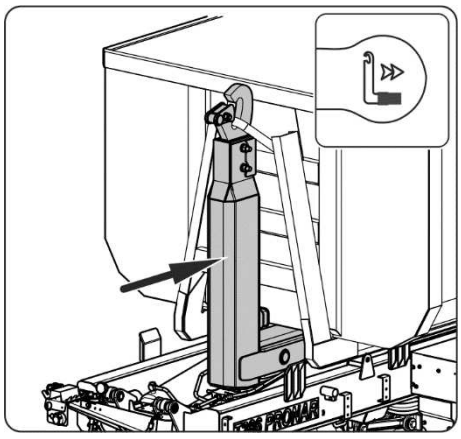
Press and hold the push-button for withdrawing the load box interlock. Indicator light (15) must light up - figure (4.7). When indicator light lights up, keep the push-button pressed for 1-2 seconds.



➡ Set the load box position on the trailer frame, depending on the load box length.

Shift the hook frame to the rear by pressing the push-button for withdrawing the hook frame.

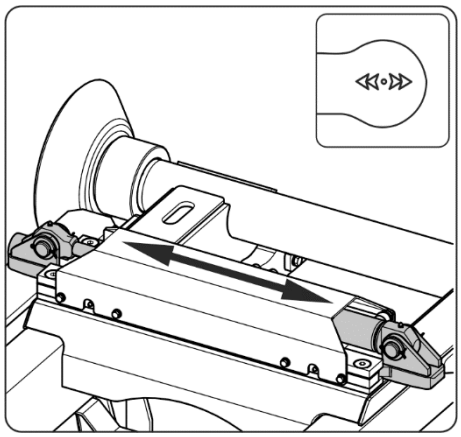
The trailer must be set to "tipper" mode – indicator light (9) is ON - figure *(4.7)*



➡ Lock the load box.

Press and hold the push-button for extending the load box interlock.

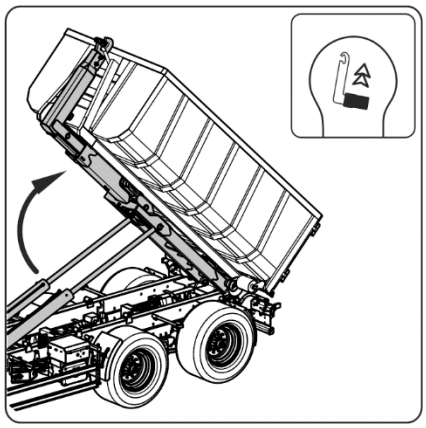
When indicator light (16) lights up, figure *(4.7)* , keep the push-button pressed for 2-3 seconds.



➡ Raise the tipping frame together with the load box.

Press and hold the push-button for rising the tipping frame until the load box is completely unloaded. Press and hold the push-button for 3 seconds to perform the function automatically.

The mechanical suspension interlock cylinders will be automatically extended.



IMPORTANT

Unloading will not be stopped if the push-button is released during automatic unloading of the load box.

IMPORTANT!

If the trailer is in "tipper" mode (indicator light (9) is ON – figure (4.7)) and the load box interlock is withdrawn (indicator light (15) is ON - figure (4.7)), the push-buttons for rising and lowering the tipping frame do not work.

If in the initial phase, the tipping frame can not raise the load box, lower the tipping frame completely, withdraw the load box interlock, shift the load box to the rear by means of the hook frame, extend the load box interlock and raise the tipping frame with the load box again.

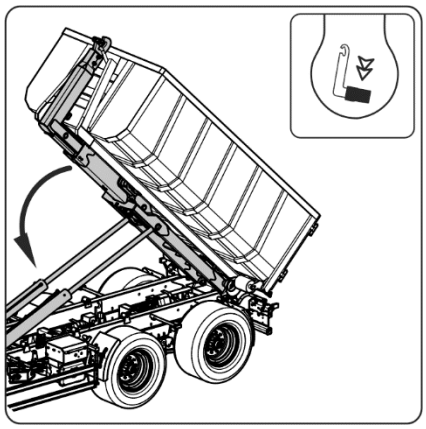
➡ Remove remains of load from the load box edges and the trailer components.

➡ Close the rear wall of the load box. If the load box is equipped with the rear hydraulic wall, use the control panel.

⇨ Press and hold the push-button (17) or (18) - figure *(4.7)* until the load box wall is completely opened.

➡ Lower the tipping frame.

Press and hold the push-button for lowering the tipping frame until the frame is in its resting position. Press and hold the push-button for 3 seconds to perform the function automatically.

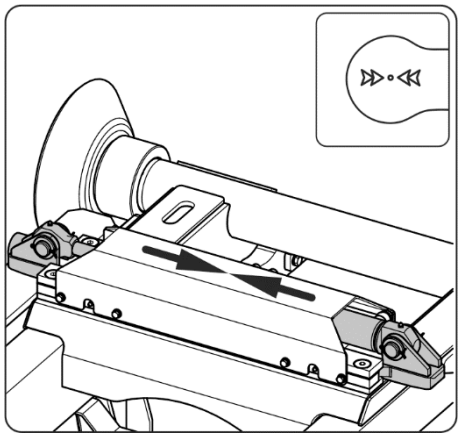


After folding the frames, hold the button for 2-3 seconds to retract the mechanical suspension lock cylinders.

In case of air suspension, after folding the frames, hold the button for 2-3 seconds to ensure their correct positioning on the lower frame.

➡ If needed, unlock the load box (if the load box position should be changed).

Press and hold the push-button for withdrawing the load box interlock. Indicator light (15) must light up - figure (4.7). When indicator light lights up, keep the push-button pressed for 1-2 seconds.



IMPORTANT!

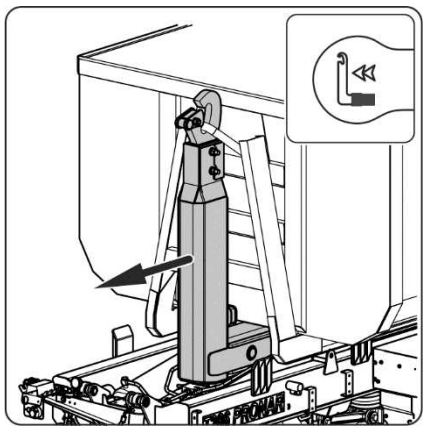
When shifting the short load box, make certain that the load box rollers are not in front of the trailer's rollers (mudguards may get damaged).

DANGER

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

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

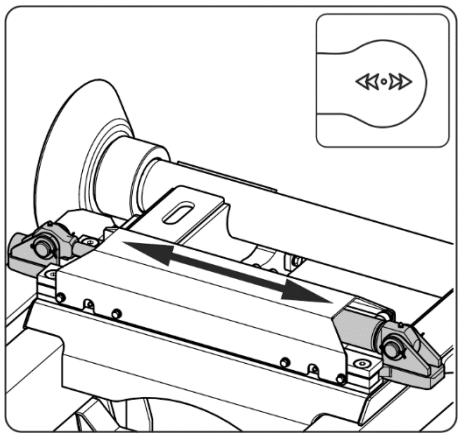
➡ Set the load box position on the trailer frame, depending on the load box length.



Press and hold the push-button for extending the hook frame until the required position of the load box is achieved.

The trailer must be set to "tipper" mode – indicator light (9) is ON - figure *(4.7).*

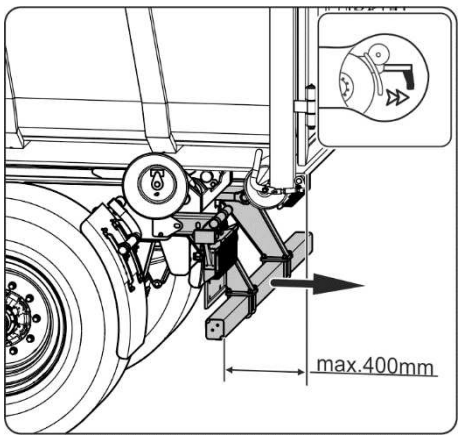
➡ Lock the load box.



Press and hold the push-button for extending the load box interlock.

When indicator light (16) lights up, figure *(4.7)*, keep the push-button pressed for 2-3 seconds.

➡ Set the rear bumper position (if the load box projects more than 400mm).



Press and hold the push-button for extending the rear fender until the required position of the rear fender is achieved.

The maximum distance between the rear fender and the rearmost point of the vehicle (load box) should not exceed 400mm.

4.9 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. Wheel may be taken off the trailer axle only when the trailer is not loaded.
- Repair work on the wheels or tyres should be carried out by persons trained and entitled to do so. This work should be carried out using appropriate tools.
- Inspect tightness of wheel nuts after the first use of the trailer, every 2 - 3 hours during first month of work and then every 30 hours of use (travel). The inspection should be repeated individually if a wheel has been removed from the wheel axle. Wheel nuts should be tightened according to recommendations provided in section 5 *MAINTENANCE.*
- 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.
- Protect tyre valves using suitable caps to avoid soiling.
- Do not exceed the trailer's maximum design speed.
- When the trailer 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.

4.10 USING UNDER-RUN PROTECTIVE DEVICES

Side under-run protection devices can be installed as additional equipment of the trailer. The under-run protection devices fulfil a very important role in road safety and therefore their good technical condition should be ensured.

The under-run protection devices are mounted to proper brackets (2) of the lower frame, by means of bolts and nuts. The design of the side under-run protection devices enables their locking in the transport position and in the raised position.

DANGER

Under-run protection devices must not be used as supporting elements while climbing on the trailer.

Do NOT move off or drive when under-run protection device is raised. Before driving, make sure that under-run protection devices are lowered and locked in the lower position.

Unless necessary, do not leave the under-run protection device in the raised position.

Lifting

- ➡ Pull the under-run protection device by holding its protective strip.
- ➡ Raise the protection device to a proper height.
- ➡ Move the under-run protection device away.
  - ⇨ Appropriate recesses and oblong holes of the bracket make it possible to lock the protection devices in the raised position.

Lowering

- ➡ Pull the underrun protection device.
- ➡ Lower the protection device and press it until clamping ring pin is locked in latch (4) – position (B) – figure *(4.8).*

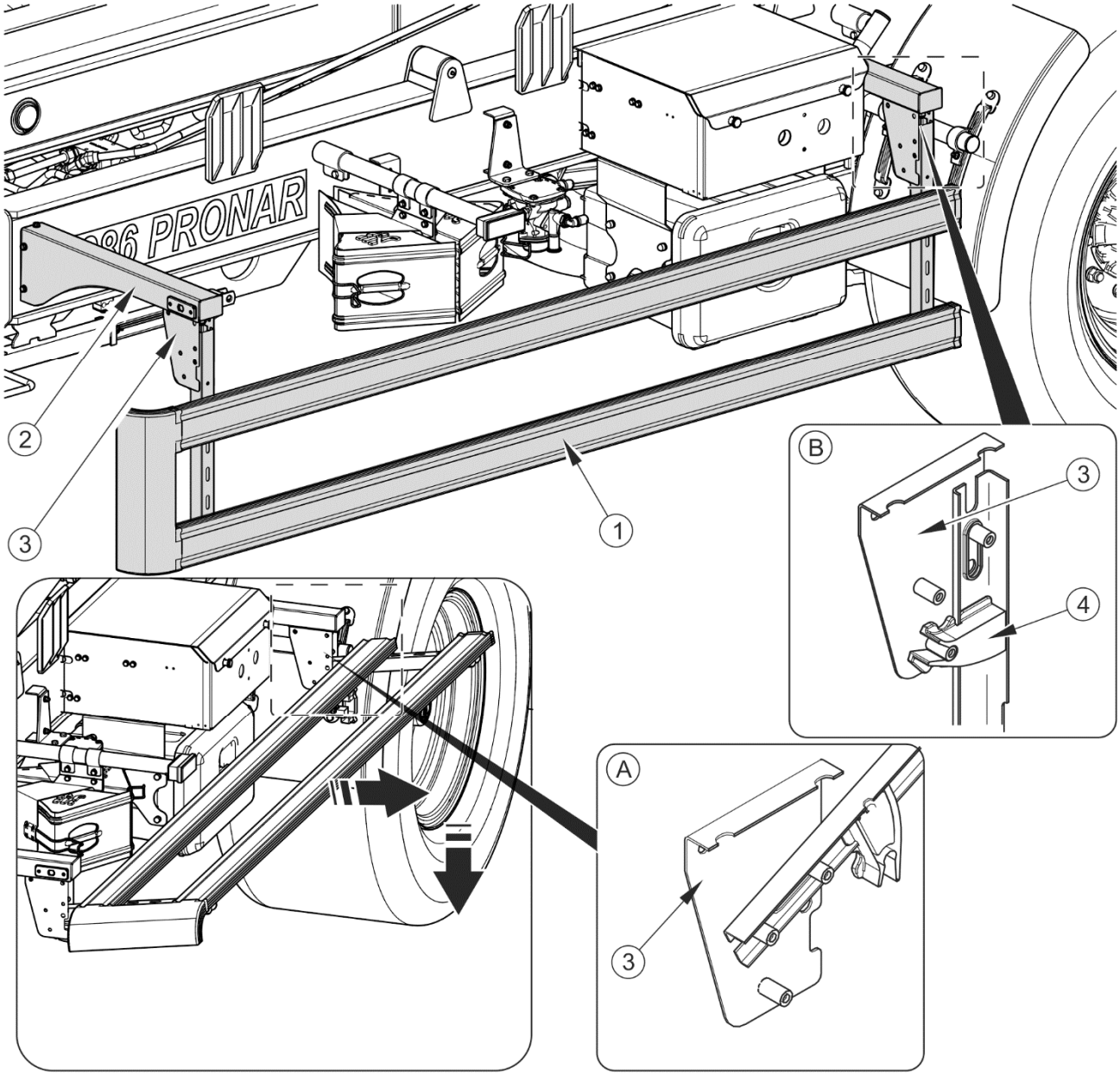


FIGURE 4.8 Underrun protection device, left

(1) underrun protection strip, (2) bracket, (3) clamping ring, (4) interlock latch, (A) underrun protection device in raised position, (B) underrun protection device in transport position

4.11 HYDRAULIC STEERING SYSTEM OPERATION

In order to ensure proper operation of the hydraulic steering system and safe use of the trailer, suitable and certified tractor hitches according to ISO 26402:2008 should be used.

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

- ➡ Hitch trailer to tractor using drawbar eye and ball control hitch and then, secure the drawbar,

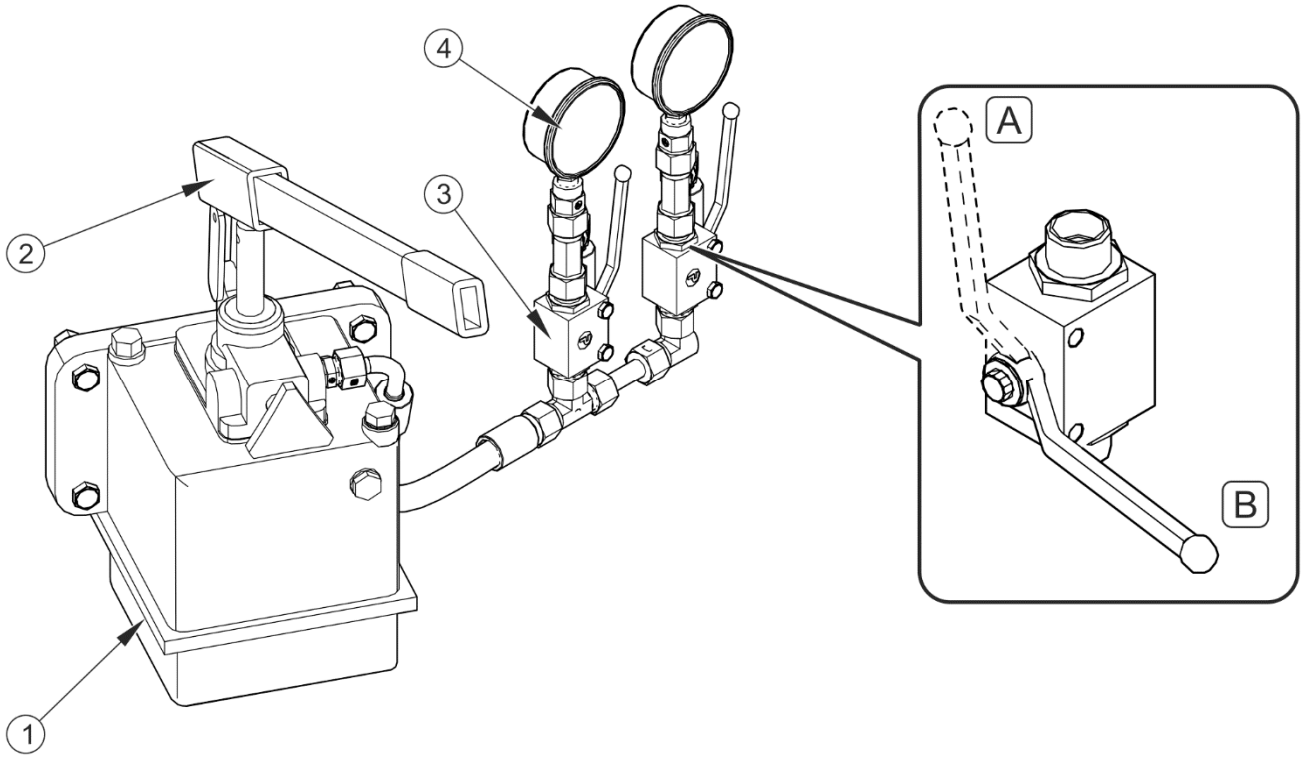


FIGURE 4.9 Hydraulic hand pump

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

- ➡ open two valves (3) located near the hand pump - figure *(4.9),*
- ➡ drive the tractor with the trailer attached at such a distance as to position the trailer wheels for forward driving,
- ➡ fill the system by means of the pump using hand lever (2) until each pressure gauge (4) indicates pressure of 80 bar,

- ➡ do not add oil when the above-mentioned pressure level is achieved,
- ➡ close all valves (3) and set the pump lever (2) aside,
- ➡ drive the tractor with the trailer attached and check correctness of the system operation.

IMPORTANT

Do not drive if the steering system is incorrectly adjusted.

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:

- initial inspection of axle brakes,
- 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 then 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.**

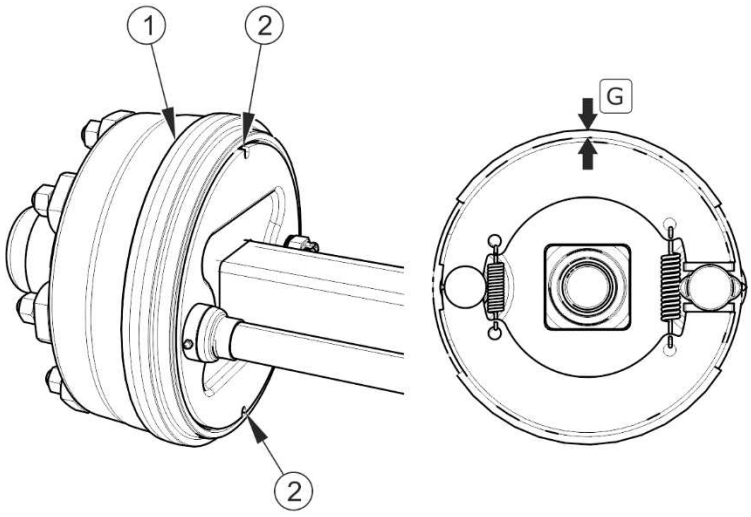


FIGURE 5.1 Checking brake shoe linings

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

5.2.4 CHECK WHEEL AXLE BEARINGS FOR LOOSENESS

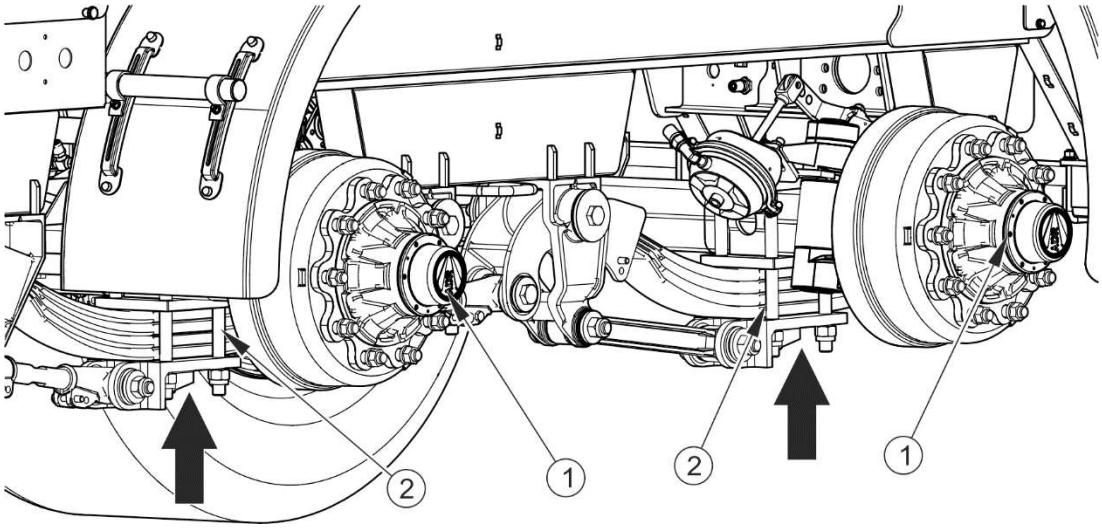


FIGURE 5.2 Lifting jack support point

(1) wheel axle, (2) U bolt

Preparation procedures

- ➡ Hitch trailer to tractor, immobilize 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.

DANGER

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

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

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

- ➡ Raise the wheel (opposite to the side where chocks are placed).
  - ⇨ The lifting jack should be placed under the axle between U bolts (2) securing axle (1) to leaf spring - figure *(5.2)* Recommended support point 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 slackness.
  - ⇨ 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 slackness 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 slackness comes from the bearing and not from the suspension system (e.g. slackness 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 slackness may only be conducted when the trailer is hitched to tractor and the load box is empty and not raised.

Check wheel axle bearings for slackness:

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

5.2.5 ADJUSTMENT OF SLACKNESS OF WHEEL AXLE BEARINGS

Preparation procedures

➡ Prepare tractor and trailer for adjustment procedures according to description provided in section 5.2.4.

Adjustment of slackness of wheel axle bearing

➡ 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 slackness.

⇨ Wheel should rotate with insignificant resistance.

➡ Unscrew nut (not less than1/3 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.

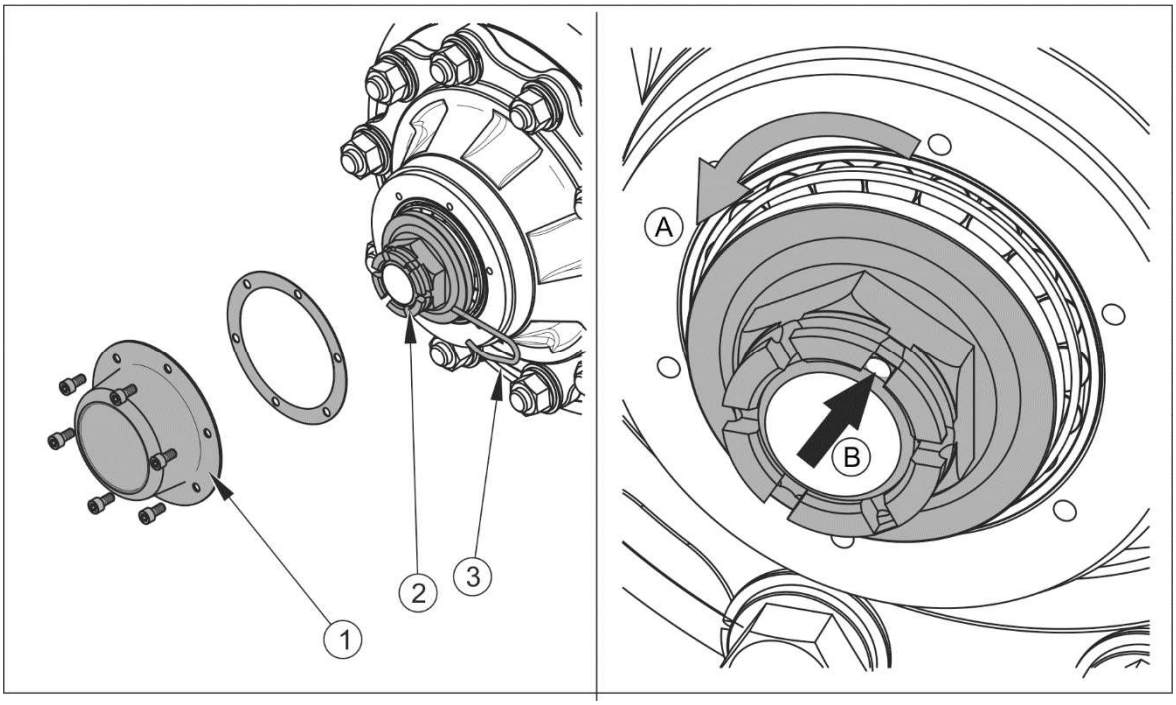


FIGURE 5.3 Adjustment of axle bearings

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

- ➡ Secure castellated nut with cotter pin and mount hub cap.
- ➡ Delicately tap hub cap with rubber or wooden hammer.

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

TIP

If the wheel is dismounted, bearing slackness 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 lifting jack and raise the trailer to a sufficient height so that the wheel to be replaced does not touch the ground.
    - ⇨ The lifting jack should have sufficient lifting capacity and should be technically reliable.
    - ⇨ The lifting jack must be positioned on a level and hard surface so as to prevent sinking into the ground or relocating the jack during lifting.
    - ⇨ If necessary, use proper backing plates in order to reduce unit pressure of the jack's base on the ground and prevent its sinking into the ground.
- ➡ Dismount wheel.

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.

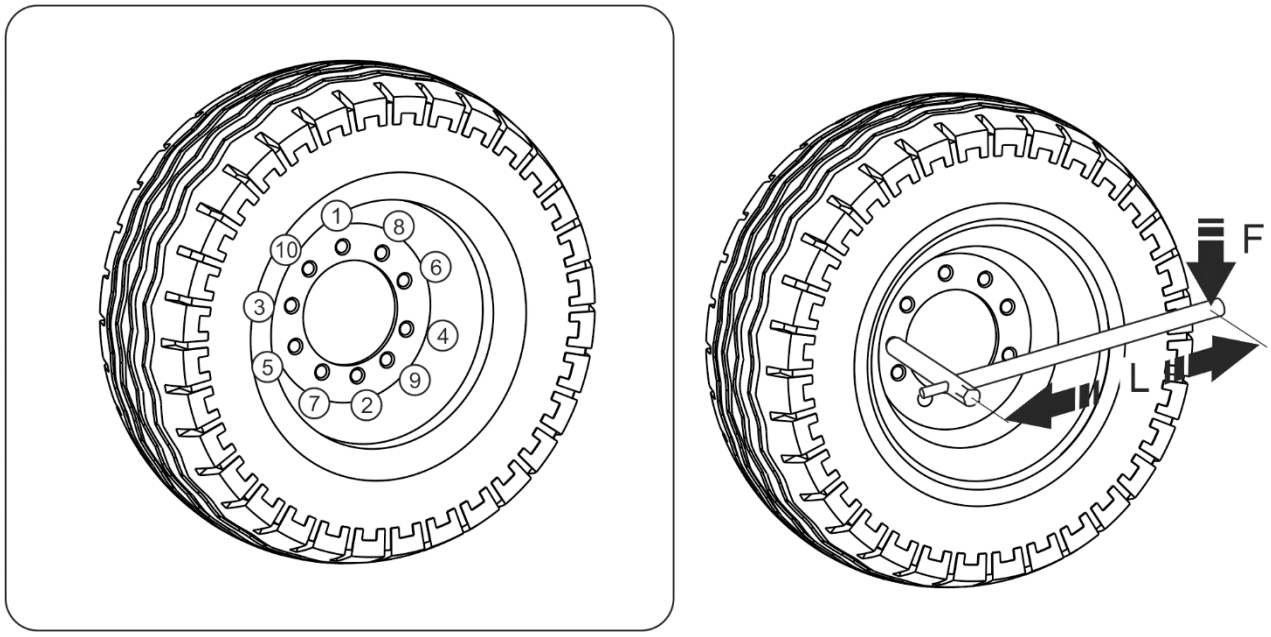


FIGURE 5.4 Sequence of tightening nuts, axles with 10 M22x1.5 pins

(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 the first use of trailer (one-time inspection).**
- **Every 2 – 3 hours of trailer travel (during the first month of trailer use).**
- **Every 30 hours of trailer travel.**

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

5.2.7 CHECKING AIR PRESSURE IN TYRES, EVALUATING TECHNICAL CONDITION OF TYRES AND STEEL WHEELS

Air pressure in tyres should be checked each time after changing a spare wheel and at least once a 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 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

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

TIP

Correct brake cylinder piston stroke should be within the range of 25 – 45 mm.

During braking, the brake cylinder piston stroke should be within the specified operating range. Braking force decreases when the operating angle of the brake cylinder piston (5) in relation to the expander arm (1) is wrong – figure *(5.5).* In order to obtain the optimum mechanical operating angle, the cylinder piston fork (5) must be installed on the expander arm (3) in such a manner as to ensure that the operating angle at full braking is about 90°- figure *(5.6).*

IMPORTANT!

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

TABLE 5.2 Operating data of pneumatic cylinder

NOMINAL CYLINDER STROKE L [MM]	MINIMUM CYLINDER STROKE L_{MIN} [MM]	MAXIMUM CYLINDER STROKE L_{MAX} [MM]
75	25	45

Checking technical condition of brakes:

- **Before the period of intensive use.**
- **Every 6 months.**
- **After repair of braking system.**
- **In case of uneven trailer wheel braking.**

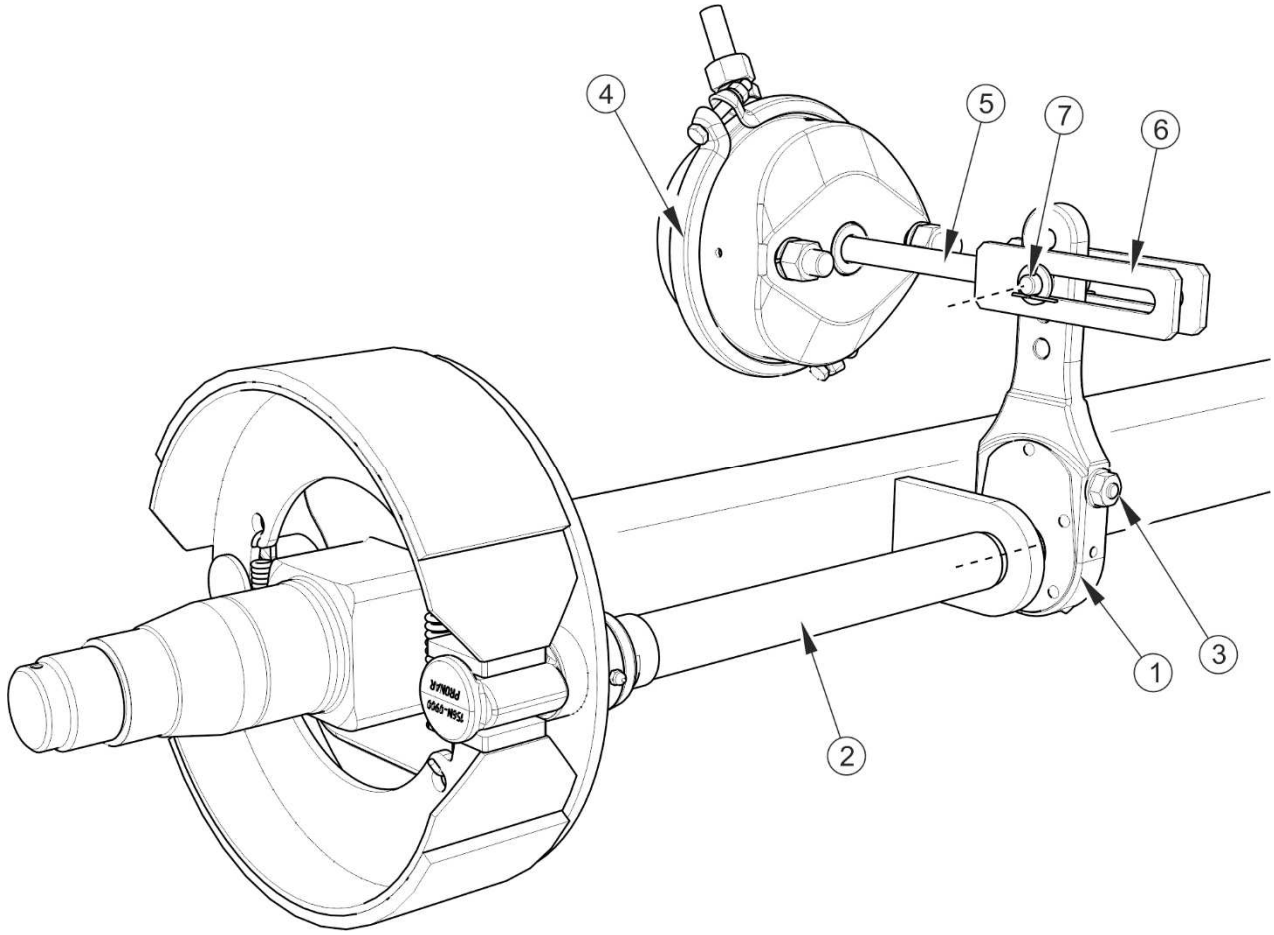


FIGURE 5.5 Design of axle brake system

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

IMPORTANT!

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

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

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

Required maintenance activities

➡ Hitch trailer to tractor.

- ➡ Turn off tractor engine and remove key from ignition.
- ➡ Immobilise tractor with parking brake.
- ➡ Make sure that the trailer's brakes are not engaged.
- ➡ Secure the trailer with wheel chocks.

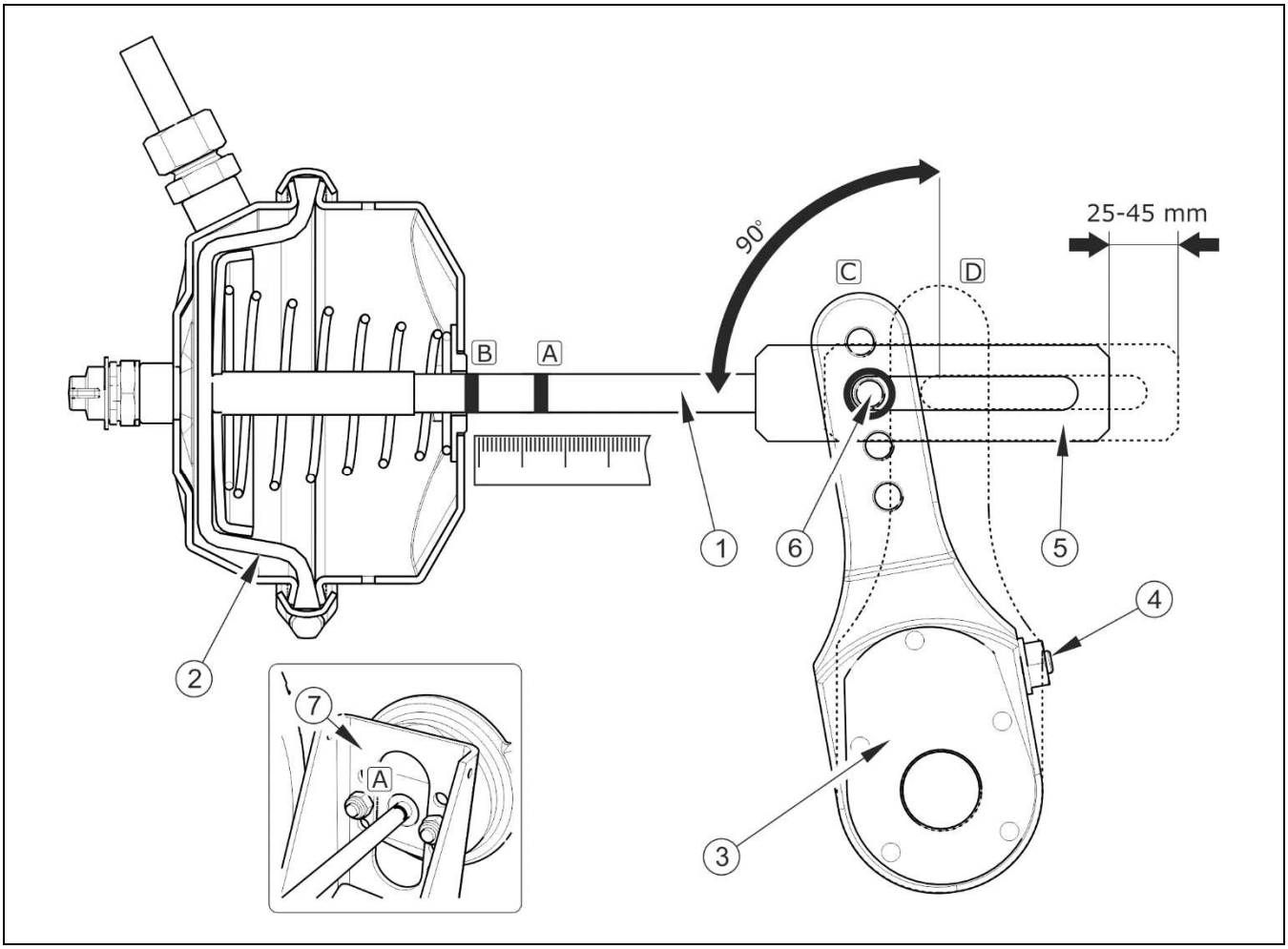


FIGURE 5.6 Principle of brake system adjustment

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

- ➡ Make a line (A) on the brake cylinder piston (1) to indicate the position of the maximum withdrawal of the brake cylinder piston when the trailer's brakes are released.

- Press the tractor brake pedal and mark the position of the maximum extension of the brake cylinder piston with a line (B).
- Measure the distance between lines (A) and (B). If the brake cylinder piston stroke is outside the proper operating range, adjust the expander arm.
- Dismantle brake cylinder fork pin.
- Remember or mark the original position of pin (6) of brake cylinder fork (5) in expander arm opening (3) – figure *(5.6)*.
- Check if the brake cylinder piston moves freely and within the whole nominal range.
- Check if the brake cylinder vent holes are not blocked with impurities and that there is no water or ice inside the brake cylinder. Check if the brake cylinder is correctly installed.
- Clean the brake cylinder. If necessary, defrost the brake cylinder and drain water through the unblocked vent holes. Replace damaged brake cylinder with a new one. When installing the brake cylinder, maintain its original position with regard to bracket (7).
- Rotate adjustment bolt (4) to align the marked expander arm opening with the brake cylinder fork opening.
    - ⇨ During adjustment, membrane (2) must rest on the rear wall of the brake cylinder – compare figure *(5.6)*.
- Install the brake cylinder fork pin and washers and secure the pin with cotter pins.
- Rotate adjustment bolt (4) to the right until one or two clicking sounds are heard in the expander arm regulating mechanism.
- Repeat adjustment activities for the other brake cylinder on the same axle.
- Engage the brake.
- Remove previous marks and measure the brake cylinder piston stroke again.
- If the brake cylinder piston stroke is outside the proper operating range, repeat the adjustment.

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.

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.

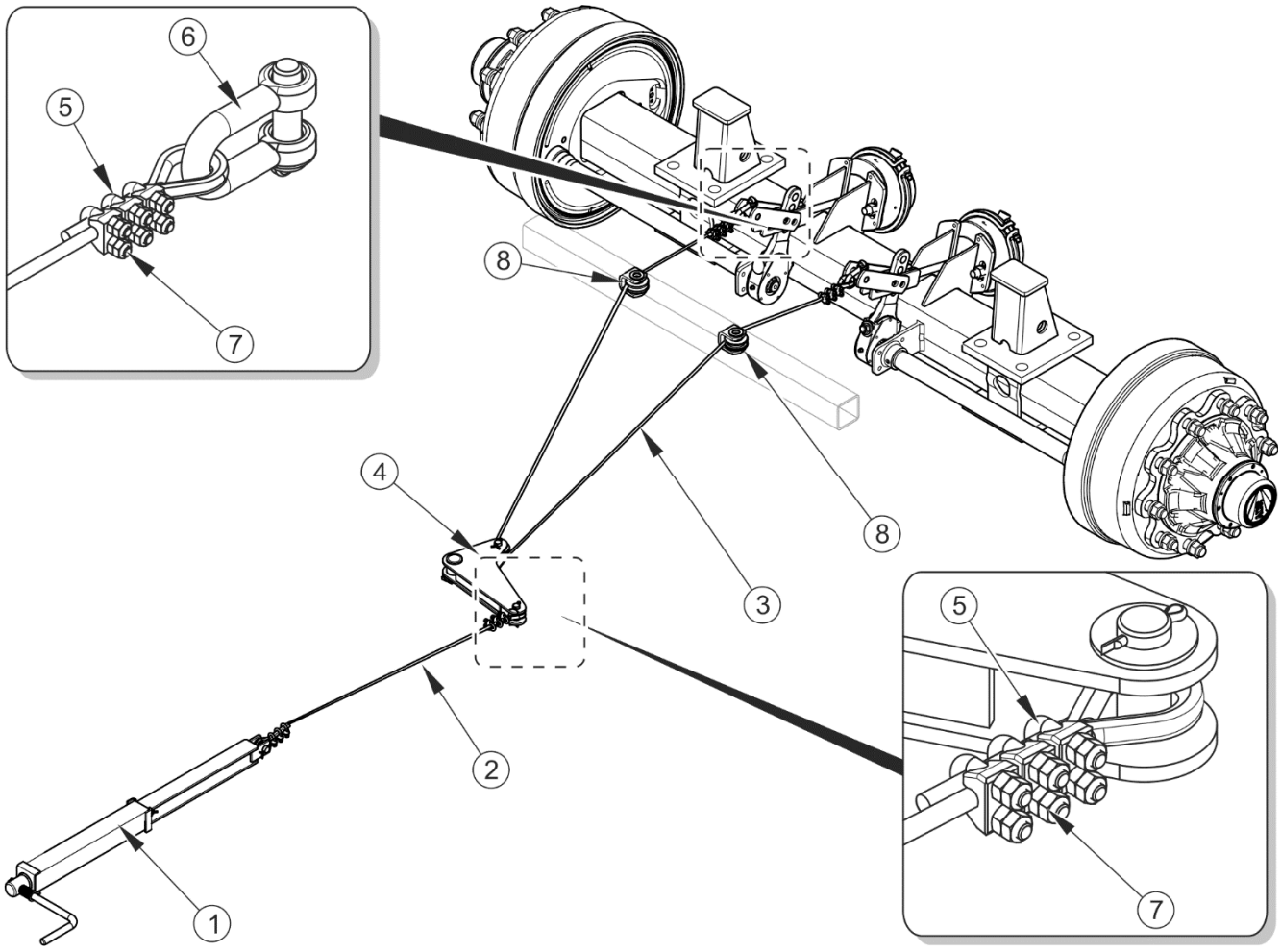


FIGURE 5.7 Adjustment of parking brake cable tension

(1) brake crank mechanism, (2) brake cable I, (3) brake cable II (4) brake lever, (5) U-shaped clamp, (6) shackle, (7) clamping nuts, (8) cable roller

Adjustment of parking brake cable tension

Checking and/or adjustment of parking brake:

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

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

- ➡ Hitch trailer to tractor. Park trailer and tractor on level surface.
- ➡ Place securing chocks under one trailer wheel.
- ➡ Unscrew the brake mechanism bolt maximally (1) – figure *(5.7)*, (counterclockwise).
- ➡ Loosen nuts (7) of clamps (5) of parking brake cable I (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 cable would be loose and hanging by approximately 1 - 2 cm compared to fully tensioned cables.

Replacing the parking brake cable

- ➡ Hitch trailer to tractor. Park trailer and tractor on level surface.
- ➡ Place securing chocks under one trailer wheel.
- ➡ Fully unscrew the bolt of the brake crank mechanism (1).
- ➡ Dismantle shackle (6) at the ends of parking brake cable II (3) (if replacing cable II (3)).
- ➡ Loosen nuts (7) of U-bolt clamps (5) on cables being replaced.
- ➡ If necessary, dismount guide rollers (8).
- ➡ Remove the pins from lever (4) and from crank mechanism (1).
- ➡ Dismantle the cable to be replaced.
- ➡ Clean parking brake components, lubricate parking brake crank mechanism (1) and pins of cable guide rollers (9).
- ➡ Install a new cable or cables.

➡ Install the pins and secure them with new securing cotter pins.

➡ After the first loading of cable, re-check the condition of cable ends, correct if necessary.

Installation of steel cable

IMPORTANT!

Clamp jaws must be placed at the load bearing cable side - see Figure *(5.8).*

➡ Secure cable ends by means of heat shrink tubing (5).

➡ Install thimble (3) on cable (1).

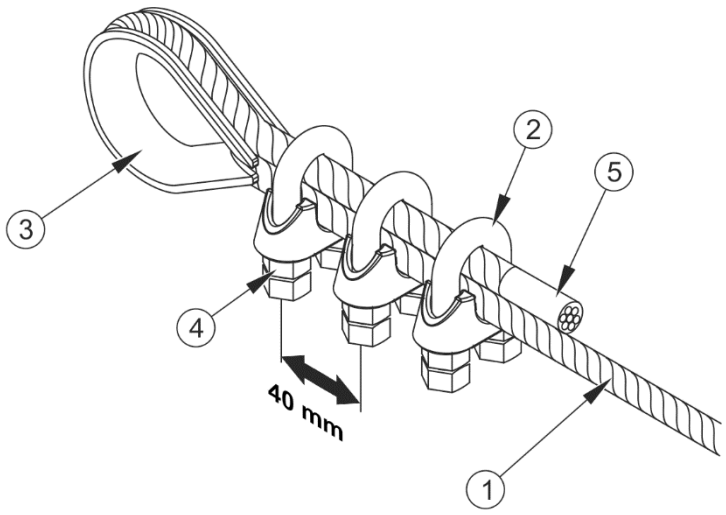


FIGURE 5.8 Installation of steel cable clamps

(1) steel cable, (2) clamp jaw, (3) thimble, (4) nut, (5) heat shrink tubing

➡ Install clamp jaws (2) and tighten nuts (4) using proper tightening torque.

➡ The distance between the clamps should be 40 mm.

➡ Clamp jaws must be placed at the load bearing cable side - see Figure *(5.8)*.

➡ The first clamp should be placed directly on the thimble.

5.3 PNEUMATIC SYSTEM MAINTENANCE

5.3.1 PRELIMINARY INFORMATION

Work connected with repair, replacement or regeneration of system components (brake cylinders, conduits, 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:

- checking tightness and visual inspection of the system.
- cleaning the air filter (filters),
- draining water from air tank,
- cleaning 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 CHECKING AIR TIGHTNESS AND VISUAL INSPECTION OF PNEUMATIC SYSTEM

Checking air tightness of pneumatic system

➡ 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 conduit systems, air pressure should be approx. 5.8 - 6.5 bar.

⇨ In double line systems air pressure should amount to approx. 6.5 bar.

➡ Turn off tractor engine.

➡ Check system components by releasing brake pedal in tractor.

⇨ Pay particular attention to conduit connections and brake cylinders.

➡ Repeat the system check with depressed tractor brake pedal.

⇨ The help of a second person is required.

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

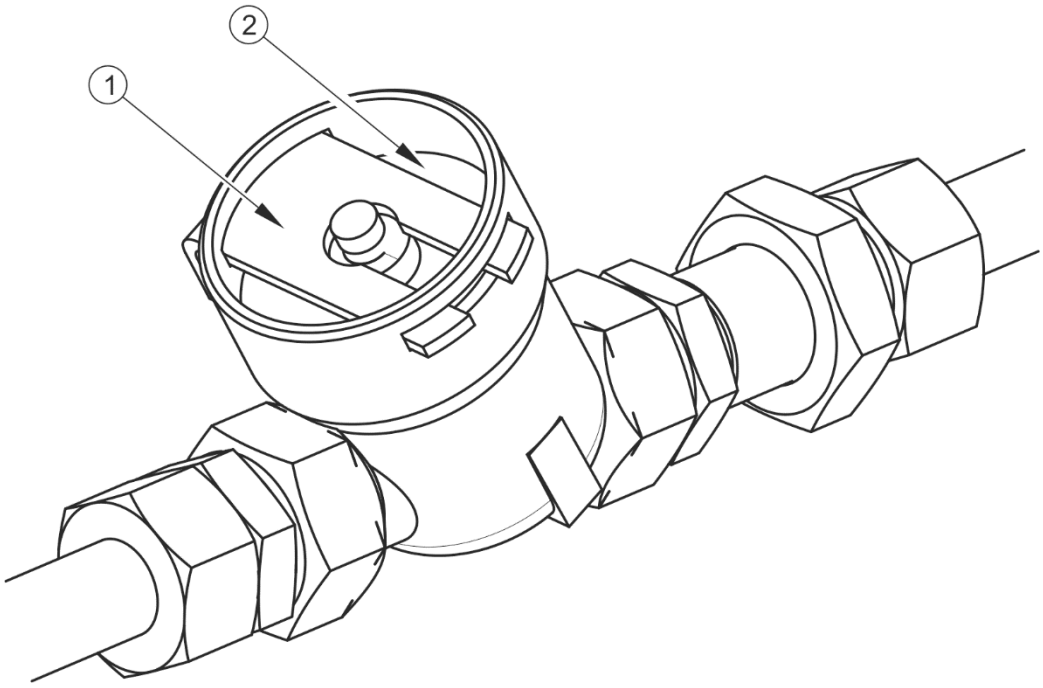


FIGURE 5.9 Air filter

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

DANGER

Before proceeding to dismantle filter, reduce pressure in supply conduit. 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 conduits. Inserts are used many times and are not subject to changing unless they are mechanically damaged.

Required maintenance activities

- ➡ Reduce pressure in supply conduit.
  - ⇨ Reduction of pressure in conduit may be achieved by pressing the head of the pneumatic connection until resistance is felt.
- ➡ Slide out securing slide lock (1) – figure (*5.9*).

⇨ 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 filter element and filter body should be carefully cleaned 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

Draining water from air tank:

- **every seven days of use.**

Required maintenance activities

➡ Open out drain valve (2) placed in lower part of tank (1).

⇨ 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.

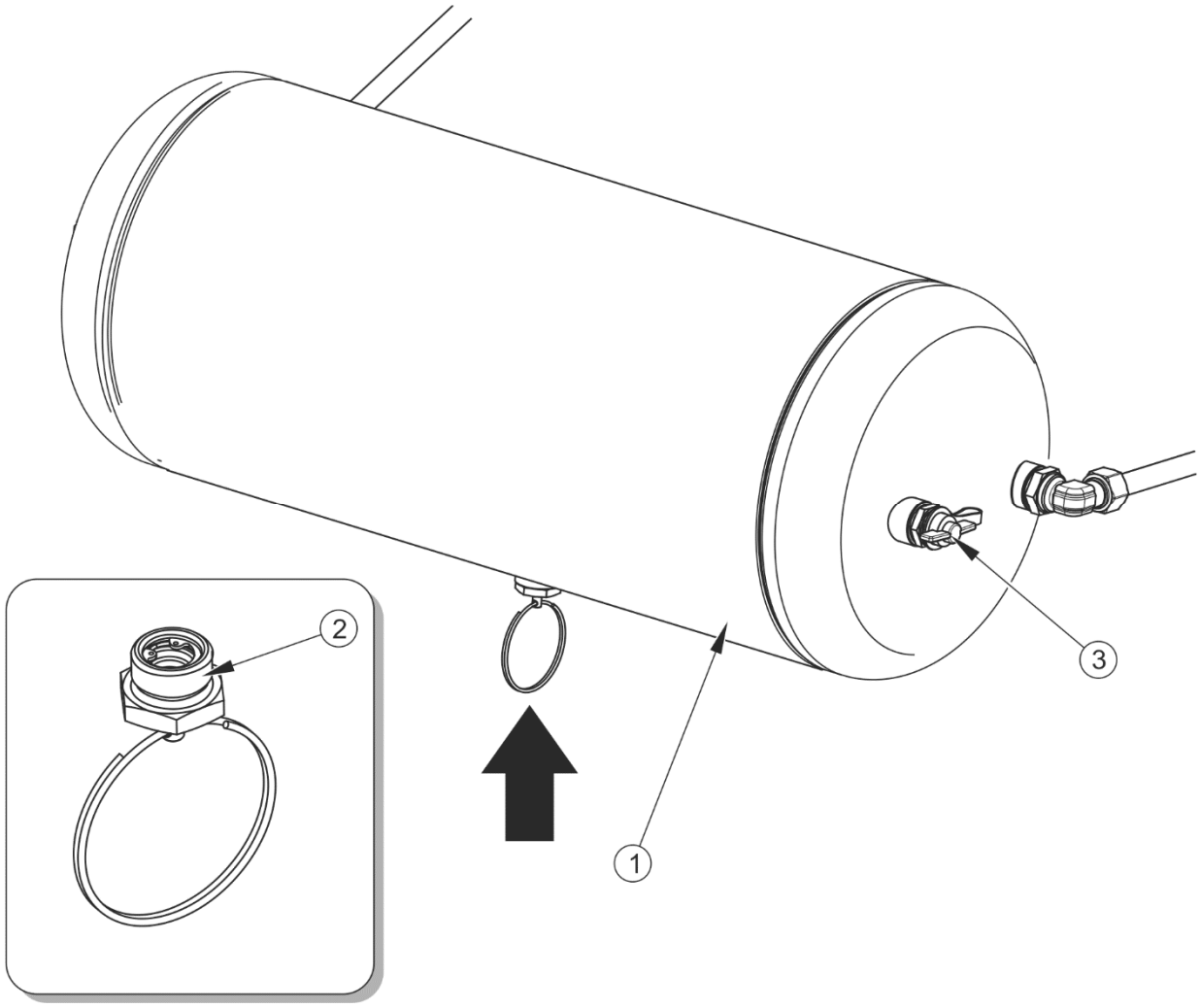


FIGURE 5.10 Draining water from air tank

(1) air tank, (2) drain valve, (3) control connector

5.3.5 CLEANING DRAIN VALVE

DANGER

Release air from tank before dismantling drain valve.

Required maintenance activities

➡ 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 CONDUIT CONNECTIONS AND PNEUMATIC SOCKETS

DANGER

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

Inspecting trailer connections:

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

Damaged connection body or socket for connecting the 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 sockets.

5.3.7 REPLACEMENT OF PNEUMATIC CONDUIT

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

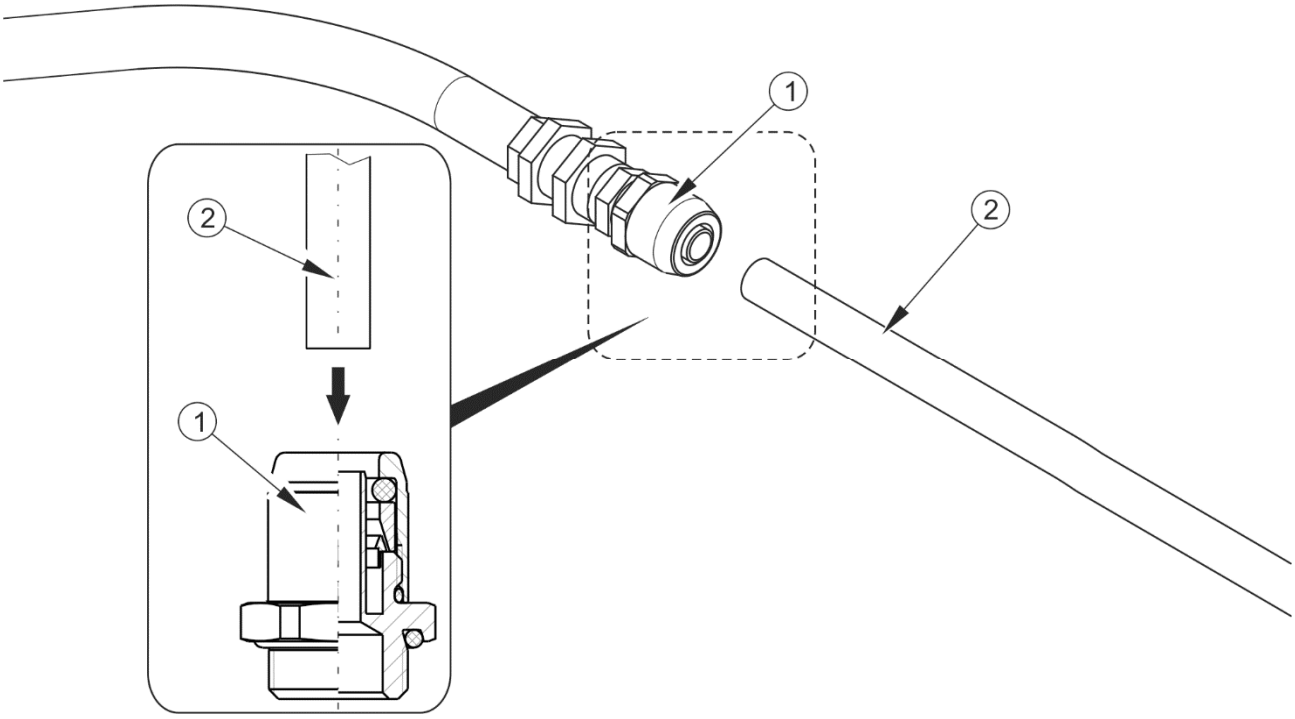


FIGURE 5.11 Installation of pneumatic conduit

(1) push-in fitting, (2) pneumatic conduit

Push-in fittings are used for connecting conduits with pneumatic system components. The fittings enable simple, fast and tight connection by pushing the conduits in. If leaks appear at connections, the user may tighten the fitting by himself using a tightening torque according to table *(5.3)*. If air continues to escape replace fittings with new ones.

TABLE 5.3 Tightening torques for pneumatic system fittings

PART NAME	THREAD	TIGHTENING TORQUE (NM)
Pneumatic system fittings	M12x1.5	24
	M14x1.5	30
	M16x1.5	35
	M18x1.5	36
	M22x1.5	40

5.4 HYDRAULIC SYSTEM MAINTENANCE

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:

- checking tightness and visual inspection of the system.
- Checking technical condition of hydraulic connections.

DANGER

Do NOT use the trailer if the central hydraulic system is unreliable.
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.

5.4.2 CHECKING HYDRAULIC SYSTEM TIGHTNESS

Required maintenance activities

- ➡ Hitch the trailer to the tractor according to chapter 4.3.
- ➡ Clean connections and cylinders (hydraulic support, rear fender, tipping cylinder, drawbar shock absorption, suspension interlock).
- ➡ Raise and lower the hydraulic support several times (if installed).
- ➡ Activate the rear axle turning interlock several times.
- ➡ Extend and withdraw the rear fender several times.
- ➡ Raise and lower the tipping frame several times, check the cylinders of the suspension interlock for correctness of operation.
- ➡ If the trailer is equipped with the hydraulic braking system, depress tractor brake pedal several times.
- ➡ Check hydraulic cylinders and conduits for tightness.

➡ If leaks are visible at connections, tighten the connections.

If oil is found on hydraulic cylinder body, check origin of leak. Inspect seals when hydraulic cylinder is completely extended. Minimum leaks are permissible with symptoms of "sweating", however in the event of noticing leaks in the form of "droplets" stop using the trailer until faults are remedied. If unreliability is evident in brake cylinders do NOT use trailer with damaged system until faults are remedied.

Checking tightness:

- **After the first 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:

- **each time before connecting trailer to tractor or before connecting the 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.

Replacement of hydraulic conduits:

- **every 4 years.**

5.5 ELECTRICAL SYSTEM MAINTENANCE

Electrical system maintenance is conducted during the periodical checking the operation of control system and lighting system.

All the trailer's lights are maintenance-free LED lights

Checking technical condition of electrical system:

- each time while connecting trailer.

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.

IMPORTANT!

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

Do NOT travel with unreliable lighting system.

Required maintenance activities

➡ After hitching the trailer to tractor, connect power leads of the electrical lighting system and the electrical system for controlling the hydraulic system.

⇨ Make sure that connecting leads are in good technical condition. Check connection sockets in tractor and trailer. If necessary, remove all contaminations and dust.

➡ Check completeness and technical condition of trailer lights.

⇨ Check wiring harnesses for damage (abrasion of insulation, broken leads, etc.).

⇨ Check completeness of all lights and reflectors.

➡ Connect hydraulic conduits of the control system and start individual functions of the trailer.

➡ Check operation of inductive sensors.

⇨ The sensor works properly if the diodes on the sensor light up when the sensor is placed near a metal part. The detection range of the trailer's inductive sensors is 8 mm, i.e. the sensors do not work if they are placed outside this range.

➡ Check correct mounting of triangular slow-moving vehicle sign.

➡ Before driving on to public road check that the tractor is equipped with a warning reflective triangle.

5.6 MAINTENANCE OF SUSPENSION SYSTEM

Maintenance of the suspension system includes checking technical condition of such elements as suspension springs, rods, rocker arms, U bolts and other connecting elements of suspension components. The scope of the suspension system maintenance includes also periodic lubrication of individual lubrication points according to chapter 5.7 as well as inspection and tightening of bolt connections.

When checking technical condition of the suspension system, pay attention to degree of wear of individual parts and looseness of system components and confirm that all components are complete and free from cracks and deformations. If any of the suspension system components is damaged or excessively worn, immediately stop operating the trailer and replace or repair the damaged element.

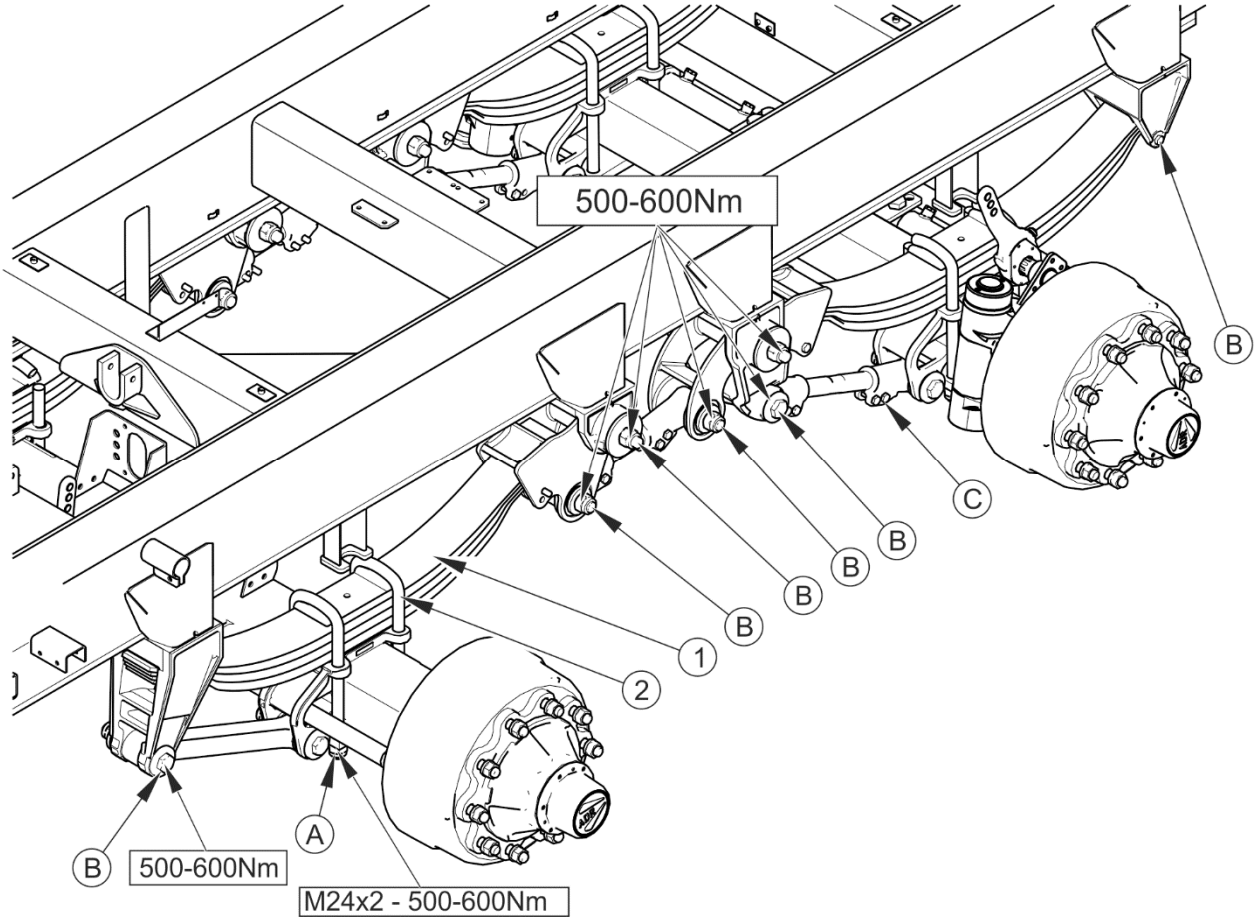


FIGURE 5.12 Tightening the bolt and nut connections of the mechanical suspension

(1) suspension spring, (2) U bolt, (A) U bolt nuts, (B) bolt and nut connections of the suspension system, (C) fixing of lateral control rods

ATTENTION!

Bolt and nut connections of the trailer's suspension system should be tightened under load.

Tightening of bolt and nut connections should be checked using a torque spanner. Tightening torque values are given in figure *(5.12)*and table *(5.8)*.

TABLE 5.4 Mechanical suspension system maintenance schedule

FREQUENCY	MAINTENANCE ACTIVITIES
After the first travel with load. Before intensive work or every 6 months.	Tighten all U bolt nuts on the axle using recommended tightening torque - figure *(5.12)* item A. The nuts should be tightened diagonally.
	Tighten all bolt and nut connections of the suspension system according to figure *(5.12)* (suspension spring stirrups, brackets, rigid and adjustable lateral control rods, rocker arms).
	Tighten the fixing of adjustable lateral control rods – figure *(5.12)* item C. If the bolts are loose, the length of rods may be wrong. Confirm that the distance between the axles on the right side and the left side of the trailer is the same. Confirm that wheels are positioned in parallel to direction of travel.
	Tighten the fixing of rubber sleeves in rigid and adjustable lateral control rods. Pressure washers (item 1) should not touch the bracket (item 2). Otherwise, replace the rubber sleeves (item 3) - figure *(5.13).* Before installation, cover the sleeves with lubricant.
Once a year	Check the condition of the suspension springs, carefully clean and brush the sides of the suspension springs in order to confirm that there are no cracks.
	If there is a clearance between suspension springs (1) and axle, check the complete fixing system: U bolts (2), and guiding and clamping plates – figure *(5.12).*

- **If the trailer is operated in severe conditions or is operated intensively, the maintenance activities should be performed more frequently.**

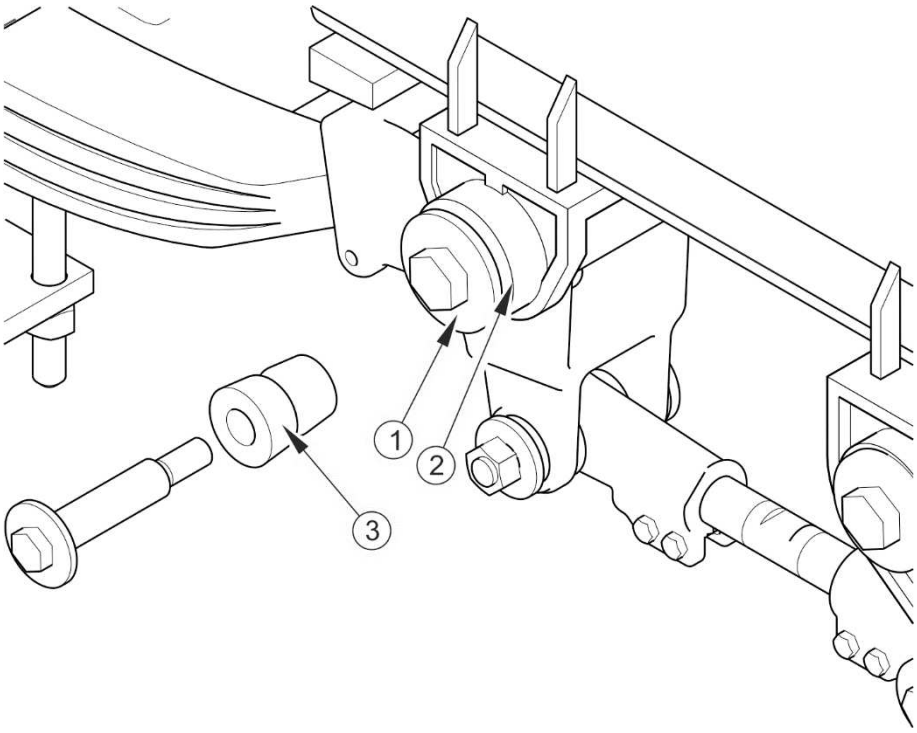


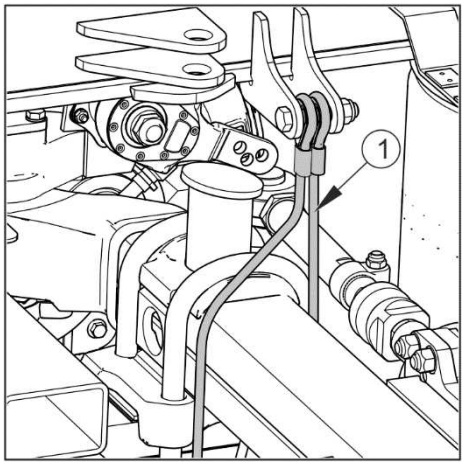
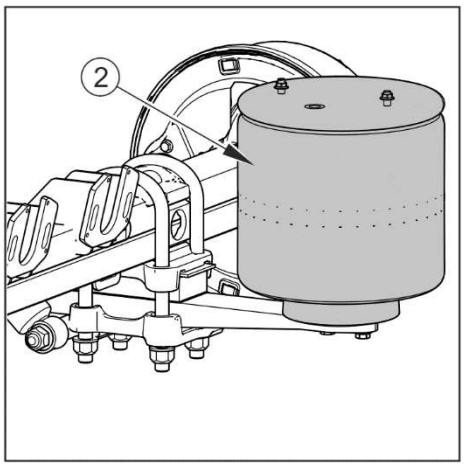
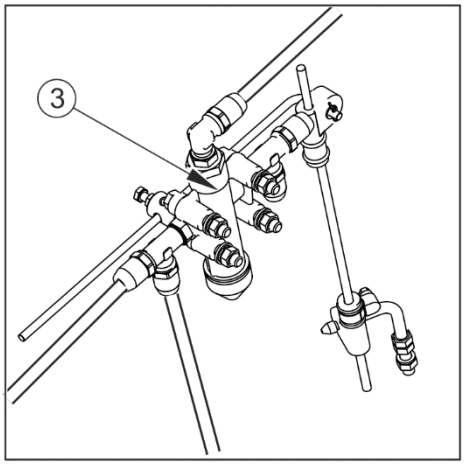
FIGURE 5.13 Maintenance of rubber sleeves

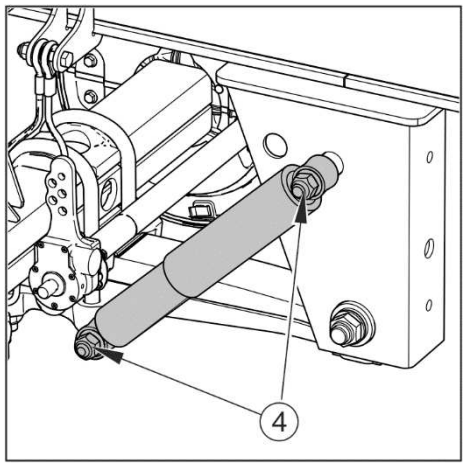
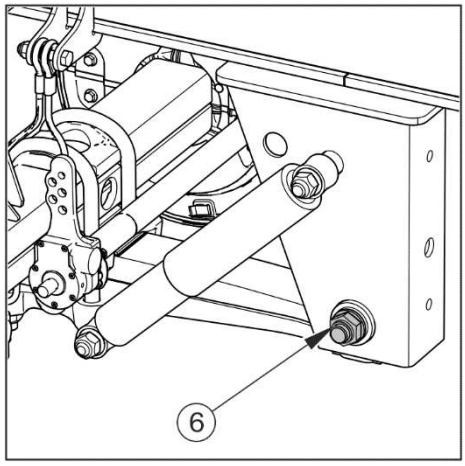
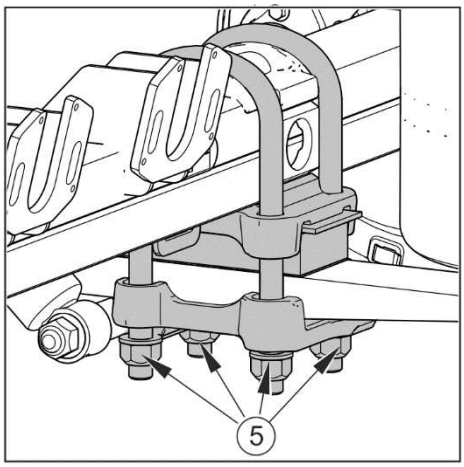
(1) pressure washer, (2) bracket, (3) rubber sleeve

5.7 MAINTENANCE OF AIR SUSPENSION SYSTEM

When checking technical condition of the suspension system, pay attention to degree of wear of individual parts and looseness of system components and confirm that all components are complete and free from cracks and deformations. If any of the suspension system components is damaged or excessively worn, immediately stop operating the trailer and replace or repair the damaged element.

TABLE 5.5 Maintenance of air suspension system

ITEM	FREQUENCY	MAINTENANCE ACTIVITIES	
1	Every 6 months.	- Check condition and fixing of travel limiting ropes, possibly replace.	
2	Every 6 months.	- Visually inspect the condition of air bellows (surface cracks, abrasion, folding, etc.). Replace damaged air bellows. - Check technical condition of air bellows base (external defects, deformations and correct fixing). - Check tightening of bolts and nuts fixing the air bellows. M 12 - M= 66 Nm M 16 - M= 230 Nm	
3	Every 6 months.	Maintenance of air suspension system - Check condition, tightness and fixing of the system's valves and conduits. - drain water from air tank of air suspension system. - check operation of push-buttons of loosening-parking valve, - Check condition of strings and lever of levelling valve (3).	

ITEM	FREQUENCY	MAINTENANCE ACTIVITIES	
4	At least once a year. For the first time after 2 weeks.	Check the shock absorbers' mounts - Check tightening of upper mount and lower mount of shock absorbers using a torque spanner. Tightening torque values: M20- M = 320 Nm M24- M = 420 Nm	
5	At least once a year. For the first time after 2 weeks.	Check leaf spring pin. - Visually inspect the condition of metal-rubber sleeves when moving the trailer forwards and backwards (the brake should be locked) or by moving the leaf spring eye with a lever. In both cases there must be no clearance of leaf spring eye. - Check tightening of nut of half-leaf spring pin (6). Tightening torque values: M24 - M = 650 Nm M30 - M = 900 Nm	
6	At least once a year. For the first time after 2 weeks.	Check U bolts and yoke of leaf springs. - check tightening of nuts and condition of plates under leaf springs. Tighten the nuts gradually diagonally so as not to bias the plates. Tightening torque values: M 20 - M = 340 Nm M 22 - M = 550 Nm M 24 - M = 650 Nm	

5.8 TRAILER LUBRICATION

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

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

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.

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 *(5.6)*.

In order to lubricate the hook frame guiding surfaces, first remove old grease and accumulated contaminations and then, apply grease using a brush. Remove and wipe off excess oil or grease

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

TABLE 5.6 Recommended lubricants

MARKING ACCORDING TO TAB. *(5.6)*	DESCRIPTION
A	machine general-purpose grease (lithium, calcium grease),
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

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

TABLE 5.7 Trailer lubrication schedule

ITEM	LUBRICATION POINT	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	FREQUENCY
1	Hub bearing	4	A	24M
2	Expander shaft sleeve	6	A	3M
3	Brake expander arm	4	A	3M
4	Stub axle pin	4	A	3M
5	Drawbar eye (fixed, rotating, ball type)	1	B	14D
6	Parabolic leaf springs *	4	C	6M
7	Leaf spring sliding surface *	8	A	3M
8	Parking brake mechanism *	1	A	6M

ITEM	LUBRICATION POINT	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	FREQUENCY
9	Telescopic support with gear	3	A	3M
10	Slide bearing of the cylinder of the drawbar with shock absorption	4	A	3M
11	Slide bearing of the tipping cylinder	4	A	3M
12	Roller pin	6	A	3M
13	Central frame rotation pin	2	B	3M
14	Slide bearing of the telescopic cylinder of the hook frame	1	A	3M
15	Tipping frame pin	2	B	3M
16	Slide bearing of the cylinder of the rear fender	4	A	3M
17	Guide roller sleeve	2	A	3M
18	Rear hitch mechanism	1	A	3M
19	Side slide	4	A	3M
20	Bearing of the load box interlock cylinder	1	A	3M
21	Parking brake guide roller pins	3	A	6M
22	Parking brake lever pin	1	A	6M
23	Hook frame guiding surfaces	4	B	50C

ITEM	LUBRICATION POINT	NUMBER OF LUBRICATION POINTS	TYPE OF GREASE	FREQUENCY
24	Working surface of hitching eye	1	B	14D
25	Tipping frame interlock pin	1	A	2M
26	Pin socket	2	A	50C or 1M

** - version with mechanical suspension*

*** - whichever comes first*

lubrication periods – M months, D – days, C - cycle

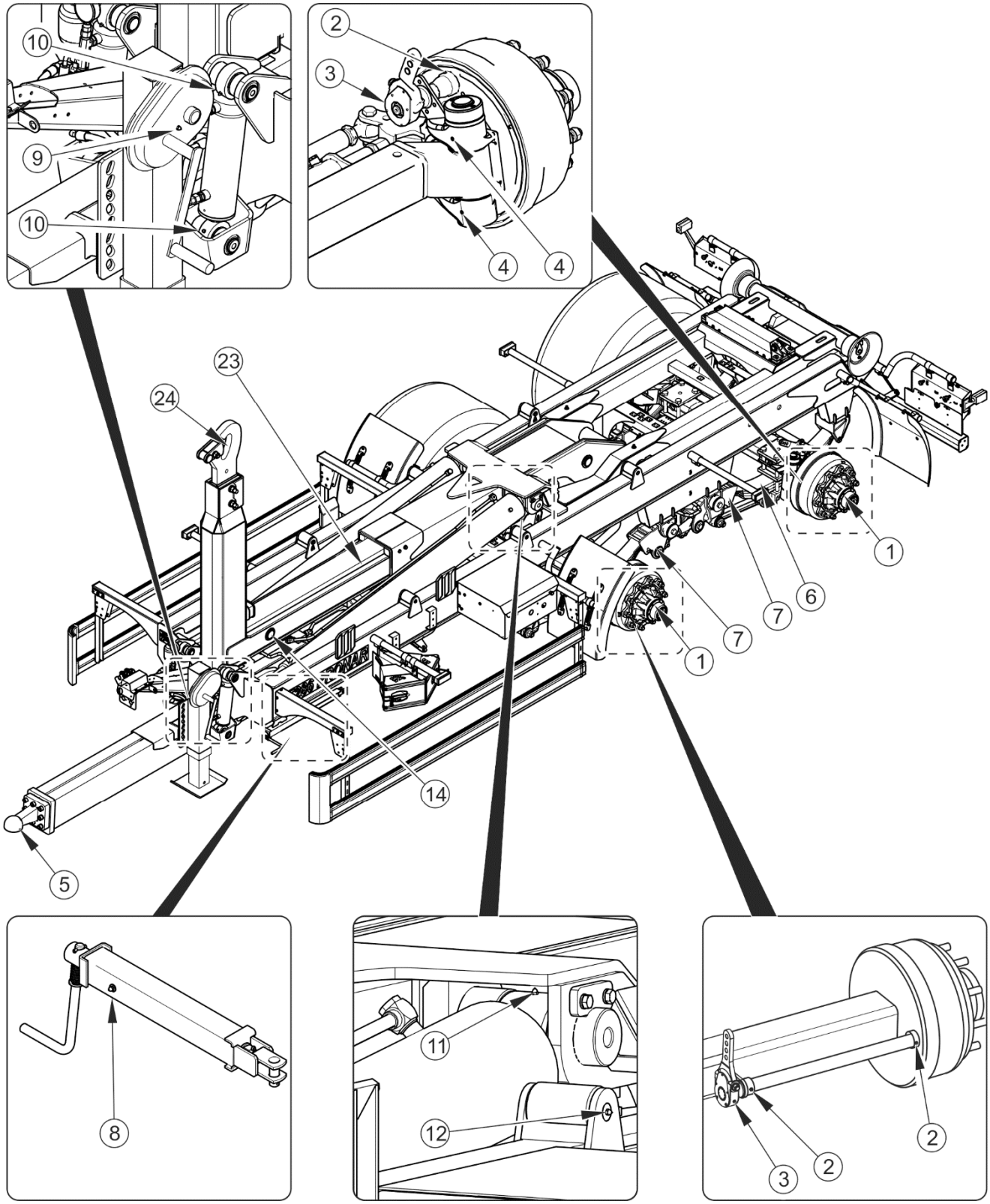


FIGURE 5.14 Trailer's lubrication points, part 1

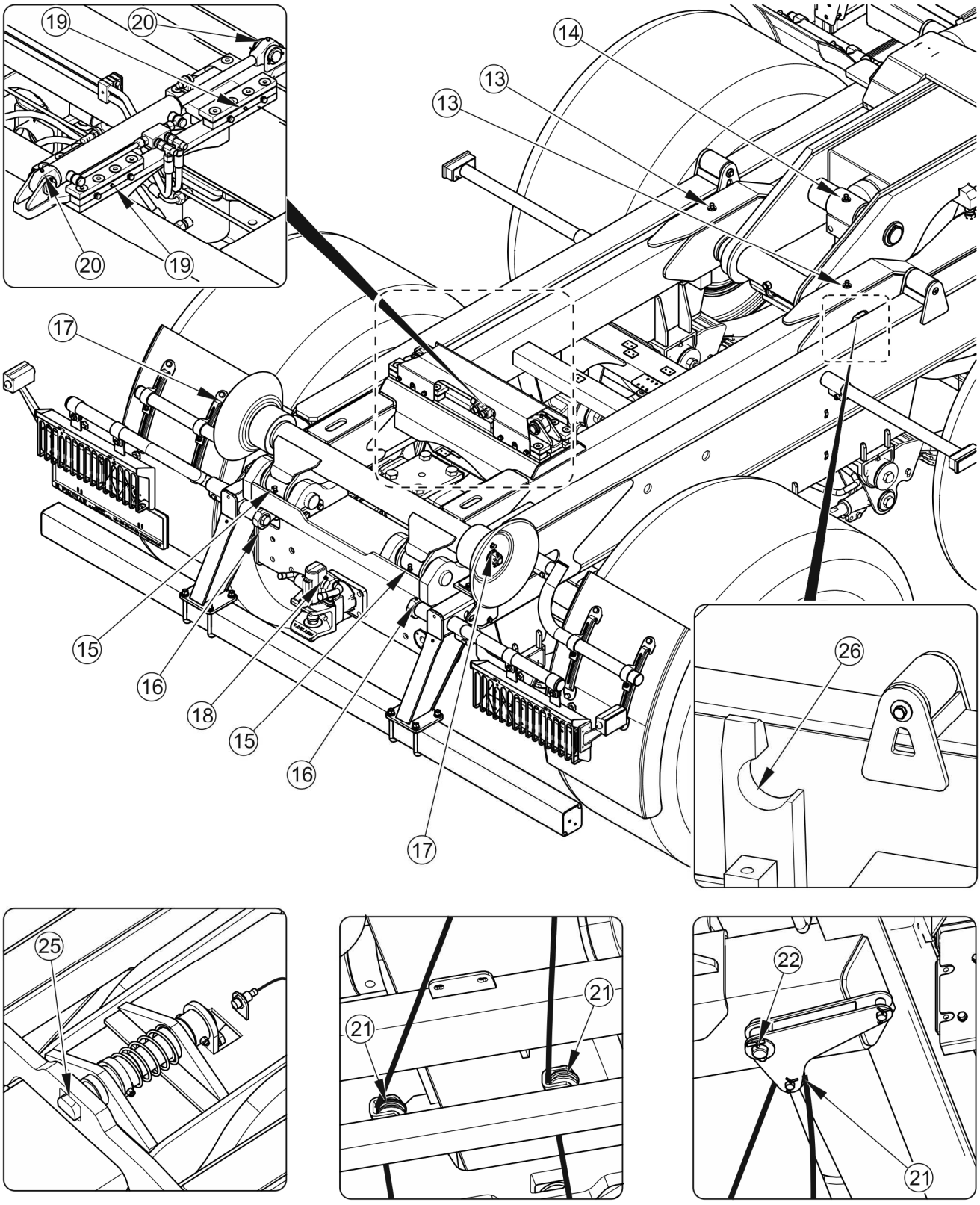


FIGURE 5.15 Trailer's lubrication points, part 2

5.9 CONSUMABLES

5.9.1 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 5.8 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.

5.9.2 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.

5.10 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

- 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 elements and equipment of the trailer i.e. control valve, braking force regulator, brake cylinders, pneumatic, electric and hydraulic plugs, lights, electrical connections, information and warning decals, identification plate, conduit connections and lubrication points etc. Great water jet pressure may damage 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.

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.

- 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.
- 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.
- 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 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.

5.11 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.

5.12 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 values for the most frequently used bolt and nut connections are given in table *(5.8)*. Given values apply to non-lubricated steel bolts.

TABLE 5.9 Tightening torque for nut and bolt connections

THREAD METRIC	**5.8(1)**	**8.8(1)**	**10.9(1)**
	Md [Nm]		
M8	18	25	36

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

TIP

Hydraulic conduits should be tightened using torque of 50 – 70 Nm.

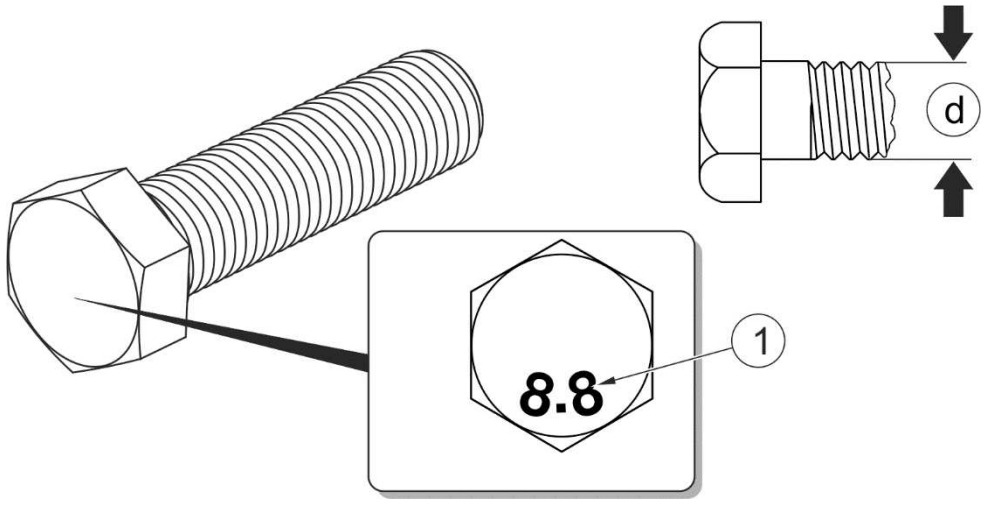


FIGURE 5.16 Bolt with metric thread

(1) resistance class, (d) thread diameter

5.13 TROUBLESHOOTING

TABLE 5.10 Troubleshooting

FAULT	CAUSE	REMEDY
Problem with moving off	Brake system conduits not connected	Connect brake conduits (applies to pneumatic systems)
	Parking brake applied	Release parking brake.
	Damaged pneumatic system connection conduits	Replace.
	Leaking connections.	Tighten, replace washers or seal sets, replace conduits.
	Low pressure in pneumatic system	Ensure proper pressure in the system.
	Control valve or braking force regulator damaged	Check valve, repair or replace.
Noise in axle hubs	Excessive bearing slackness.	Check play and adjust if needed
	Damaged bearings.	Replace bearings.
	Damaged hubs.	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.
Excessive heating of axle hubs	Incorrect main or parking brake adjustment.	Regulate setting of expander arms or tension of parking brake cable
	Worn brake linings.	Change brake shoes

FAULT	CAUSE	REMEDY
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 loading.	Check mechanism controlled by ram cylinder for mechanical damage.
	Damaged hydraulic lines.	Check and ascertain that hydraulic conduits are tight, not fractured and properly tightened. If necessary replace or tighten.
Tipping / pulling the load box on / removing the load box from the trailer is not possible.	Hydraulic system conduits are not connected or connected incorrectly.	Check the connection and connect the leads according to the Operator's Manual.
	The electrical system for controlling the trailer is not connected.	Check the connection and connect the leads according to the Operator's Manual.
	Control panel is switched off	Switch control panel on
	Control panel is damaged	Repair at an authorised service point
	Damaged hydraulic quick couplers	Replace.
	Insufficient quantity of hydraulic oil in tractor's hydraulic system	Use the tractor having hydraulic oil output compatible with the oil demand of the trailer

FAULT	CAUSE	REMEDY
Tipping / pulling the load box on / removing the load box from the trailer is not possible.	Faulty inductive sensor.	Check according to chapter 5.4, replace if necessary.
	Damaged actuator module.	Repair at an authorised service point
No lighting.	Electrical system is not connected.	Connect electrical system.
	Electrical system of the trailer is damaged (e.g. broken wiring harness).	Replace or repair at an authorised service point

NOTES

ANNEX A

Trailer Pronar T286 wheel dimensions

TYRE DIMENSIONS	WHEEL RIM SIZE
Wheel 445 / 65 R22,5	Wheel rim 14.00x22.5; ET=0
Wheel 500/ 60 R22,5 166A8	Wheel rim 16.00x22.5H2; ET=0
Wheel 550 / 60- 22.5 171A8	Wheel rim 16.00x22.5; ET=0
Wheel 560 / 60- 22,5 161D	Wheel rim 16.00x22.5; ET=0
Wheel 600/55R22,5 16PR 169A8	Wheel rim 20.00x22.5H2; ET=-40
Wheel 600/50R22,5 16PR 170A8	Wheel rim 20.00x22.5; ET=-40
Wheel 620/50R22,5 16PR 172A8	Wheel rim 20.00x22.5; ET=-40

ANNEX B

Reference list of oils for the hydraulic steering system.

TOTAL Equivis ZS 22
ELF Hydrelf 22
SHELL Tellus T22
TEXACO Rando HDZ 22
BP Energol SHF 22
ESSO Univis N22
AGIP Arnica 22