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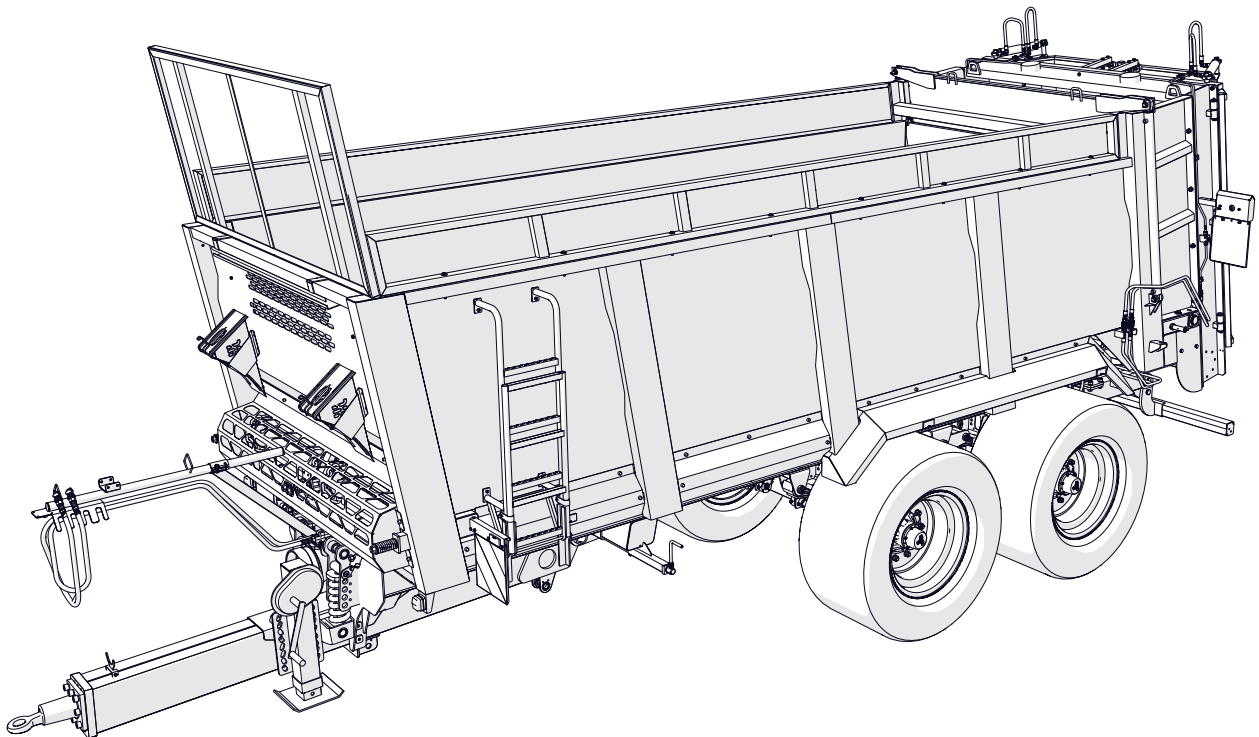
[www.pronar.pl](http://www.pronar.pl)

# OPERATOR'S MANUAL

**MANURE SPREADER**

**PRONAR N262/2**

TRANSLATION OF THE ORIGINAL COPY OF THE MANUAL



ISSUE 2B

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# INTRODUCTION

## INTRODUCTION

The information contained in the publication is current as at the date of publication. As a result of improvement, some sizes and illustrations contained in this publication may not correspond to the actual state of the machine delivered to the user. The manufacturer reserves the right to introduce constructional changes in the manufactured machines to facilitate operation and improve the quality of their work, without making any current changes to this publication.

The operating instruction is the basic equipment of the machine. Before using the machine, the user must read the

contents of this manual and observe all recommendations contained therein. This will guarantee safe and trouble-free operation of the machine. The machine was constructed in accordance with applicable standards, documents and current legal regulations.

If the information contained in the operating instructions does not turn out to be comprehensible, please contact the sales office where the machine was purchased or directly to the Manufacturer.

After purchasing the machine, we recommend to enter the machine serial number in the fields below.

Machine serial number

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

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

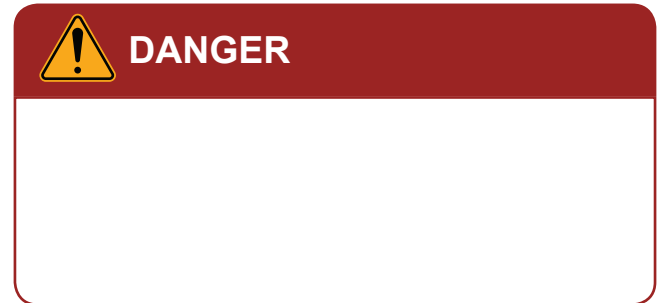
*The manual instruction is intended for the end user. For this reason, some required maintenance is listed in the inspection tables but the procedure is not described in this publication. To perform them, call the manufacturer's authorized service center.*

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## SYMBOLS USED IN THE MANUAL

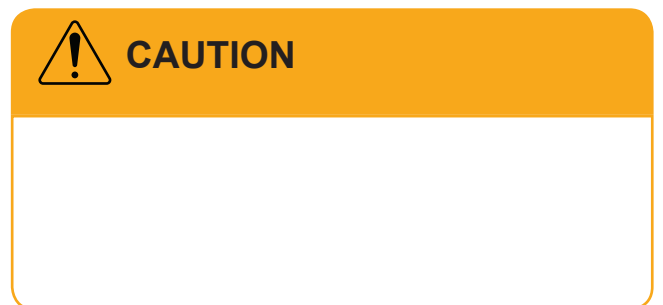
### **DANGER**

Information, descriptions of hazards and precautions as well as instructions and orders related to the safety of use in the content of the manual are marked with a frame with the word **DANGER**. Failure to comply with these recommendations may endanger the health or life of persons operating the machine or bystanders.



### **CAUTION**

Particularly important information and recommendations, the observance of which is absolutely necessary, are highlighted in the text with a frame and word **CAUTION**. Failure to comply with these recommendations creates the risk of damage to the machine due to improper handling, adjustment or use.



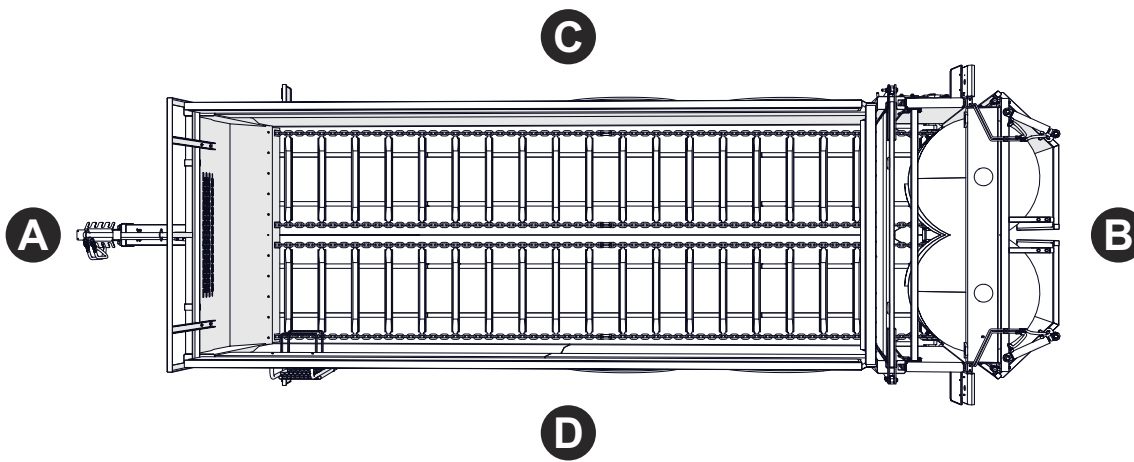
### **ADVICE**

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



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## DESIGNATION OF DIRECTIONS IN THE MANUAL



**Figure 1.1** Determining directions on the machine

(A) - front

(B) rear

(C) right side

(D) left side

*Left side* – the left hand side of the observer facing the machine in the forward direction.

*Right side* – the right hand side of the observer facing the machine in the forward direction.

*Turn right* – turn the mechanism clockwise (operator facing the mechanism).

*Turn left* – turn the mechanism counter-clockwise (operator facing the mechanism).

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## CHECKING THE MACHINE AFTER DELIVERY

The manufacturer ensures that the machine is fully functional, has been checked in accordance with control procedures and is approved for use. However, this does not release the user from the obligation to check the vehicle after delivery and before first use. The machine is delivered to the user completely assembled.

### THE SCOPE OF CONTROL ACTIVITIES

- Check that the completion of the delivered machine matches your order.
- Check if the PTO shaft for connecting to the tractor complies with the operating parameters of your tractor.
- Check the condition of the paint coating.
- Visually inspect machine components for mechanical damage resulting, e.g., from incorrect machine

### ADVICE

The delivery of the machine includes a detailed inspection and check of the operation of the machine, as well as instructing the buyer on the basic principles of use. The first start-up takes place in the presence of the Seller.

transportation.

- Check the technical condition of telescopic articulated shafts and their covers.
- Check gears for leaks.
- Check the condition of the tires on the road wheels and the air pressure in the tires.
- Check the technical condition of the flexible hydraulic and pneumatic hoses.
- Make sure there are no hydraulic oil leaks.
- Check the manure lighting lamps.

U.31.1.EN

## START-UP



### CAUTION

The first start-up involves checking the machine in the presence of the Seller. The Seller is obliged to carry out training in the safe and proper operation of the machine.

- Familiarize yourself with the content of this manual and the operation manual of the PTO shaft attached to the machine and follow the recommendations contained therein.
- Before connecting the manure spreader, check the suitability of the tractor for this purpose. The manure spreader may only be aggregated with agricultural tractors that meet all the requirements specified in the table *Agricultural tractor requirements*.
- Before connecting, make sure that the hydraulic oils used in both machines can be mixed.
- Adjust the height of the drawbar to the hitch on your tractor.
- Perform a daily review according to the guidelines in the schedule.
- Check the correct tightening of screw connections (in particular the suspension, drawbar eye and road wheels).
- Make sure that the articulated telescopic shaft (WPT) can be connected to the tractor (the shaft should be adapted to the specific tractor in terms of length, type, strength, etc.).
- Check the length of the telescopic articulated shaft in the lightest and toughest operating conditions.
- Check if there is sufficient coverage of the pipes for the widest angle.
- Check if it can still be pushed down at the smallest angle (turn).
- Check the compatibility of PTO shaft turns
- Check the compliance of the tractor PTO speed setting with the required rotational drive speed of the manure spreader.
- Connect the machine to the tractor.
- By activating individual lights, check the correct operation of the electrical system.
- Perform a test drive. While driving, check the braking effect of the manure spreader.
- Perform a test run - chapter (4.5). Start and check the operation of: feeding mechanism, gate valve control, rear cover control, hydraulic support control (if present), adapter drive.
- Stop the tractor and turn off the engine, immobilize the tractor and



the manure spreader with the parking  
brake.

U.33.1.EN





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## EC DECLARATION OF CONFORMITY OF THE MACHINERY

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

Description and identification of the machinery	
Generic denomination and function:	<b>Manure spreader</b>
Type:	<b>N262/2</b>
Model:	-----
Serial number:	
Commercial name:	<b>Manure spreader PRONAR N262/2</b>

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

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

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

Narew, the 31.03.2020r.  
Place and date

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Z-CIA WYDZIAŁOWA  
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CZŁONEK ZARZĄDKU  
*Roman Opatowski*

Full name of the empowered person  
position, signature



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## TIRE ASSEMBLY

# CHAPTER 1

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GENERAL





**Table 1.1.** Nameplate markings

Item	Meaning
A	General information and function
B	Symbol / type
C	Year of machine production
D	Seventeen-digit serial number (VIN)
E	Certificate approval number
F	The machine's karb weight
G	Permissible gross weight
H	Capacity
I	Permissible load on the coupling device
J	Permissible front axle load
K	Permissible rear axle load

**ADVICE**

Contact with the service department requires providing the factory number of the manure spreader and often the number of axle, so we recommend that you write these numbers in the manual and have access to them.

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## 1.2 INTENDED USE

Pronar manure spreader is designed for even spreading of all types of manure, peat and compost. Using the manure spreader in a manner other than described above is not allowed. Intended use also includes all activities related to the correct and safe operation and maintenance. The manure spreader is not intended for the transport of people and animals.

The manure spreader may only be aggregated with agricultural tractors that meet all the requirements specified in the table *Agricultural tractor requirements*.

The braking system as well as the lighting and signaling system meet the requirements arising from traffic regulations. The set speed must not be exceeded (the speed limit is based on traffic laws and depends on the country in which the manure spreader is operated). The manure spreader speed must not, however, be greater than the maximum design speed **40 km/h**.

Intended use also includes all activities related to the correct and safe operation and maintenance of the machine. Therefore, the user is obliged to:

- Read the content of the *USER MANUAL* and with *WARRANTY CARD* and to the guidelines contained



### DANGER

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

in these documents,

- understand the principle of machine operation and the safe and proper operation,
- work in compliance with established maintenance and adjustment plans,
- work in compliance with general safety regulations,
- accident prevention,
- comply with road traffic regulations and transport regulations in force in the country in which the machine is used,
- get acquainted with the contents of the farm tractor and PTO shaft manual (WPT) and comply with their recommendations,
- couple the machine only with such an agricultural tractor that meets all the requirements set by the spreader Manufacturer.

The machine may only be used by persons who:

- Become familiar with the contents of publications and documents attached to the machine and the contents of

**Table 1.2.** Agricultural tractor requirements

Content	Unit	Requirements
<b>Pneumatic braking system</b>		
Pneumatic control socket	-	Yellow according to PN-ISO 1728
Pneumatic supply socket	-	Red accordance with PN ISO 1728
Nominal pressure of the pneumatic system	bar/ kPa	6.5 / 650
Hydraulic brake connection	-	in accordance with ISO - 7241-1
Nominal pressure of the pneumatic system	bar / MPa	160 / 16
<b>Electrical system</b>		
Supply voltage	V	12
Supply socket	-	7 poles in accordance with ISO1724
<b>The hydraulic system</b>		
Number of connections for controlling the floor conveyor (control from the tractor)	-	1 pair
Number of connections for controlling the lock (control from the tractor)	-	1 pair
Number of connections for controlling the rear flaps (control from the tractor)	-	1 pair
Number of connections for controlling the hydraulic support (option)	-	1 pair
Number of connections to control the distributor from the manure spreader (option)	-	1 pair
Hydraulic oil	-	L HL 32 Lotos <sup>(1)</sup>
Nominal pressure of the system	bar / MPa	160 / 16
<b>Coupling device</b>		
Pin or ball coupling	mm	45 or 50 or K80
Minimum capacity (vertical load) on the coupling device	kg	4 000
<b>Other requirements</b>		
Min. tractor power	KM/ kW	150 / 110.3
PTO rotational speed	rpm	1 000
PTO rotation direction		Clockwise (looking at the shaft head)
<i><sup>(1)</sup> – a different oil may be used, provided it can be mixed with oil in the manure spreader. Detailed information can be found in the product information card.</i>		

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

The manure spreader may not be used for purposes other than those for which it is intended, in particular:

- for transporting people, animals, hazardous materials, aggressive loads as a result of chemical reactions to manure spreader elements,
- for transporting and spreading toxic and flammable materials,
- for spreading liquids, sand or fibrous substances,
- for transporting machines and devices whose location of the centre of gravity negatively affects the stability of the manure spreader,
- for the transport of building materials, individual objects or any materials and substances that do not fall within the scope of intended use,
- overloading the manure spreader over the maximum load capacity.

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## 1.3 EQUIPMENT

### ADVICE

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

### STANDARD EQUIPMENT

- *User manual*
- *Warranty Card*
- *electrical installation connection cable - spiral*
- Wheel chocks
- reinforced lock
- mechanism indicating lifting of the lock
- drawbar with a rotating drawbar eye 50mm
- telescopic support with gear
- rigid mechanical suspension
- pneumatic 2-wire braking system
- manual parking brake

### ADDITIONAL AND OPTIONAL EQUIPMENT

- rear flaps
- K80 ball link
- rear beam

- mechanical suspension with steering axle
- SILO extensions
- Hydraulic folding drawbar support
- pneumatic 2-wire braking system with ALB controller
- hydraulic braking system
- warning reflective triangle
- marking plate for low-speed vehicles
- PTO shaft (selected depending on the tractor PTO shaft profile)

Recommended PTO shafts for connecting the manure spreader with a tractor:

- B&P 7 106 101 CE 007 007, (6/6) <sup>(1)</sup>,
- B&P 7 1R6 091 CE WR7 007, (6/6) (wide angle shaft) <sup>(1)</sup>,
- B&P 7 106 101 CE 008 007, (21/6) <sup>(2)</sup>,
- B&P 7 1R6 091 CE WR8 007, (6/6) (wide angle shaft) <sup>(2)</sup>,
- B&P 7 106 101 CE R10 007, (20/6) <sup>(3)</sup>,
- B&P 7 1R6 091 CE WR0 007, (6/6) (wide angle shaft) <sup>(3)</sup>,

<sup>(1)</sup> shaft end on the tractor side, 6-splines

<sup>(2)</sup> shaft end on the tractor side, 21-splines

<sup>(3)</sup> shaft end on the tractor side, 20-splines

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## 1.4 TERMS OF WARRANTY

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

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



### DANGER

Incorrect use of securing measures can cause an accident

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

In the event that damage occurs as a result of:

- mechanical damage caused by the user's fault, road accident,
- from improper operation, adjustment and maintenance, use contrary to its purpose,
- use of a damaged machine,



### DANGER

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

While driving, the car driver should exercise extreme caution. This is due to the vehicle's center of gravity shifting upwards with the machine loaded.

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

- repairs carried out by unauthorized persons, improper repairs,
- execution of user changes in machine design,

the user loses the warranty.

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

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

Modifications to the machine without the written consent of the Manufacturer are prohibited. In particular, welding, reaming, cutting and heating of the main machine components that directly affect safety during use are not permitted.

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## 1.5 TRANSPORT

The machine is ready for sale completely assembled and does not require packing. Only the machine's technical documentation and any additional equipment elements are packed. Delivery to the user is carried out by road or independent transport (towing a spreader with an agricultural tractor).

### TRUCKING

Loading and unloading a spreader from a car should be carried out using a loading ramp using a farm tractor. During work act in compliance with the general principles of workplace health and safety for reloading work. Persons operating reloading equipment must have the required permissions to use these devices. The spreader must be correctly connected to the tractor

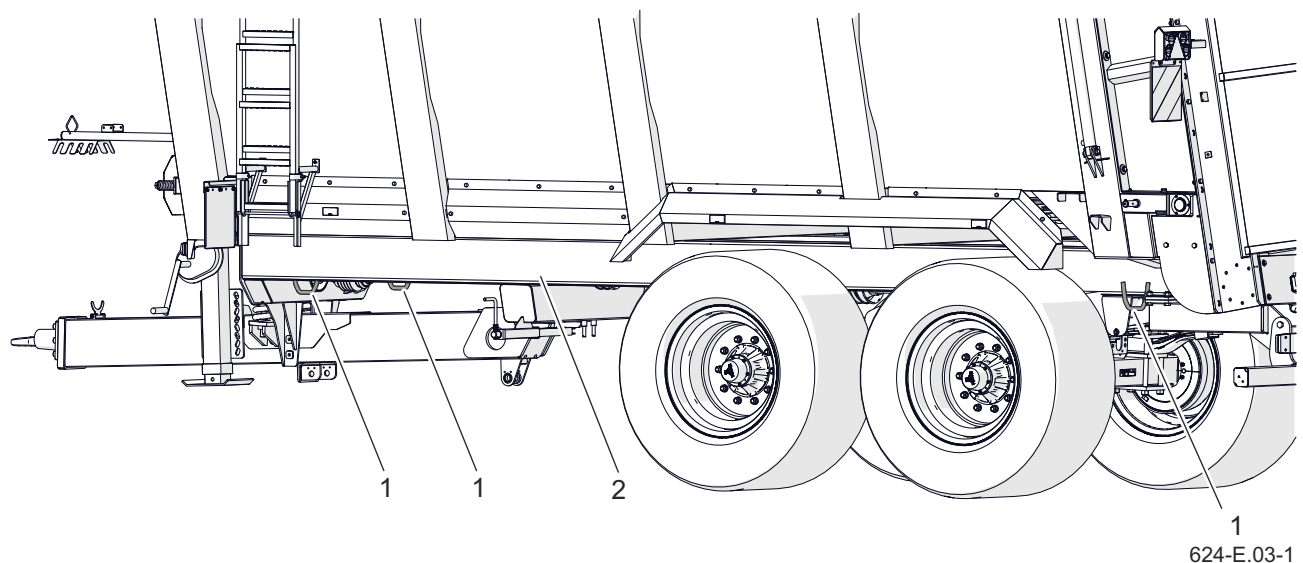


### CAUTION

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

in accordance with the requirements contained in this manual. The braking system must be activated and checked before going down or onto the ramp.

The spreader should be attached firmly to the platform of the vehicle using straps, chains, lashings or other fastening devices equipped with a tensioning mechanism. The fastening elements should be attached to the transport eyelets designed for this purpose (1) or to the fixed structural elements of the spreader (stringers, crossbars). Transport handles are welded



**Figure 1.3** Arrangement of transport handles spreader  
(1) carrying handle (2) bottom frame side member

to the bottom frame longitudinal members (2), one pair on each side - figure (1.3). Use approved and technically reliable securing measures. Wiping belts, cracked fasteners, bent or corroded hooks or other damage may disqualify the product from being used. Please refer to the instructions in the manual of the manufacturer of the securing material used. Chocks or other elements without sharp edges should be placed under the spreader wheels, protecting the machine against rolling. The manure spreader wheel lock must be secured to the vehicle loading platform in such a way that it cannot move. The number of fastening elements (ropes, belts, chains, lashings, etc.) and the force needed for their tension depends, among others, on the weight of the spreader, the construction of the car carrying the spreader, the speed of travel and other conditions. A properly attached spreader will not change its position relative to the transporting vehicle. The fastening means must be selected

according to the manufacturer's instructions. In case of doubt, a larger number of attachment and securing points for the machine should be used. If necessary, protect the sharp edges of the spreader, thus securing the fixing elements against damage during transport.

During reloading work, particular attention should be paid so as not to damage the machine equipment components and the paint coating. The kerb weight of the spreader in running order is given in table (3.1).

### **USER'S TRANSPORT**

In the case of independent transport by the user after purchasing the manure spreader, read the *Operating Manual* and follow its recommendations. Independent transport involves towing a spreader with own agricultural tractor to its destination. While driving, adjust the speed to the prevailing road conditions, but it must not be greater than the maximum design speed.

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## 1.6 THREAT TO THE ENVIRONMENT

A hydraulic oil leak is a direct threat to the natural environment owing to its limited biodegradability. When carrying out maintenance and repair work where there is a risk of leakage of oil, this work should be carried out in rooms with an oil resistant surface. In the event of oil leaking into the environment, first of all contain the source of the leak, and then collect the leaked oil using available means. Collect oil residue with sorbents or mix the oil with sand, sawdust or other absorbent materials. Collected oil contaminants should be stored in an airtight and marked container, resistant to hydrocarbons, and then transferred to an oil waste disposal point. The container should be kept away from heat sources,



### DANGER

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

flammable materials and food.

Oil which has been used up or is unsuitable for further use due to the loss of its properties is recommended to be stored in its original packaging in the same conditions as described previously.



### CAUTION

Oil waste can only be delivered to a point dealing with the utilization or regeneration of oils. It is prohibited to throw or pour oil into the sewage system or water reservoirs.

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## 1.7 WITHDRAWAL FROM USE

If the user decides to withdraw the machine from use, comply with the provisions in force in the given country regarding withdrawal from use and recycling of machines withdrawn from use.

Before disassembly of the machine, remove all oil from the hydraulic system and completely reduce air pressure in the pneumatic braking systems (e.g. by means of the air tank drain valve).

In the event of parts being replaced, worn



### **DANGER**

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

or damaged parts should be sent to a recycling centre. Used oil as well as rubber or plastic elements should be taken to plants dealing with the utilization of this type of waste.

E.3.10.624.07.1.EN

# CHAPTER 2

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SAFETY OF USE

## 2.1 BASIC SAFETY RULES

- Use of the spreader for any other purpose is prohibited. Everyone who uses the trailer in a manner contrary to its intended use, thus takes full responsibility for all consequences arising from its use. Using the manure spreader in a manner not in accordance with the manufacturer's instructions may void the warranty.
- Before using the machine, you are required to read the contents of this manual, the instruction manual attached to the PTO shaft and the Warranty Card. During their operation, all recommendations contained therein must be observed.
- The spreader may only be used and operated by persons authorized to drive agricultural tractors.
- Familiarize yourself with all machine controls before starting work. Do not use the machine without knowing its function.
- Familiarize yourself with the construction, operation and principles of safe operation of the manure spreader.
- Before each start-up of the manure spreader, check that it is properly prepared for work, first of all in terms of safety.
- The spreader is not intended for transporting people, animals and hazardous materials.
- Before each start-up of the manure spreader, make sure that all guards are in good working order and correctly positioned. Damaged or incomplete components must be replaced with new original ones.
- If the information contained in the User's Manual is difficult to understand, contact a seller who runs an authorized technical service on behalf of the manufacturer, or contact the manufacturer directly.
- Access to the machine is possible only with the manure spreader absolutely still. Stop the agricultural tractor, remove the ignition key of the tractor, secure the manure spreader and tractor against rolling by placing wedges. Immobilize manure spreader and tractor with parking brake. Use the appropriate height and strength of the platform or ladder to climb. It is forbidden to climb onto the manure spreader using mudguards and wheels.
- Careless and improper use and

- operation of the manure spreader as well as non-compliance with the recommendations contained in this manual puts the health and life of unauthorized persons and/or the machine operator at risk.
- The manure spreader may only be used when all the covers and other protective elements are functional and properly fastened.
  - Pronar sp.z o.o. warns of the existence of a residual risk, therefore the application of the principles of safe and wise use should be the basic principle for using the machinery. Remember that your safety is the most important thing.
  - Do not allow the machine to be used by unauthorized persons and who are not able to operate the manure spreader, in particular children, intoxicated persons, persons under the influence of drugs or other intoxicants etc.
  - Any modification of the manure spreader is prohibited and exempts Pronar from liability for any damage or injury.
  - Warning and information stickers must always be legible and not dirty. Missing or illegible stickers should be replaced.
  - When operating the machine, use protective gloves and appropriate tools.
  - Loading work should be carried out by a person experienced in this type of work.
  - Due to the danger of stones, pieces of wood, etc. in the spreading material, it is forbidden to stay in the spreading material area.
  - Use extreme caution when spreading near roads and vehicles.
  - Pay special attention when people and animals are nearby during spreading.

F.3.10.624.01.1.EN

## 2.2 SAFETY WHEN THE MACHINE AGGREGATING

- Take special care when connecting the machine.
- When connecting, nobody may be between the manure spreader and the tractor.
- Do not aggregate the manure spreader if the agricultural tractor does not meet the minimum requirements set by the manufacturer.
- Before connecting spreader, make sure that the oil in the tractor's external hydraulic system can be mixed with the spreader's hydraulic oil.
- Before coupling the manure spreader, make sure that both machines are technically sound.
- When coupling, use the appropriate tractor hitch. After coupling the machines, check the the hitch safety device. The manure spreader's linkage height should be optimally adapted to the height of the hitch. If necessary, read the tractor's manual.
- If the tractor is equipped with an automatic hitch, make sure that the coupling operation is completed.
- Hitching and unhitching the spreader may only take place when the machine is immobilized by means of the parking brake.

F.3.10.624.02.1.EN

## 2.3 SAFETY RULES FOR OPERATING HYDRAULIC AND PNEUMATIC SYSTEMS

- The hydraulic and pneumatic systems are under high pressure during operation.
- Check the technical condition of connections and hydraulic and pneumatic hoses. The machine may not be operated with leaking installations.
- In the event of a failure of the hydraulic or pneumatic system, the spreader should be decommissioned until the failure is removed.
- Repairs and replacements of pneumatic and hydraulic system elements should be entrusted to appropriately qualified persons.
- When connecting the hydraulic conduits to the tractor, sure that the tractor hydraulic system and spreader are not under pressure. If necessary, reduce the residual pressure of the system.
- In the event of injuries being caused by pressurized hydraulic oil, contact a doctor immediately. Hydraulic oil can penetrate the skin and cause infection. If the oil gets into the eyes, rinse with plenty of water and if irritation occurs, contact a doctor. In the event of contact of oil with skin the area of contact with water and soap. Do not use organic solvents (petrol, kerosene).
- Use hydraulic oil recommended by the manufacturer. Never mix two types of oil.
- Dispose of used oil. Used oil or oil which has lost its properties should be stored in original containers or replacement packaging resistant to hydrocarbons. Replacement containers must be accurately described and properly stored.
- It is forbidden to store hydraulic oil in packaging intended for food storage.
- Rubber hydraulic conduits must be replaced every 4 years regardless of their technical condition.

F.3.10.624.03.1.EN

## 2.4 SAFE OPERATION OF THE PTO SHAFT

- Before starting work, familiarize yourself with the propeller shaft operating instructions provided by the shaft manufacturer and follow the recommendations contained therein.
- The manure spreader may be connected to the tractor only by means of a suitably selected articulated telescopic shaft, recommended by the Manufacturer.
- Before starting PTO shaft make sure that the PTO rotation direction is correct.
- The PTO shaft has markings on the housing indicating which end of the shaft should be connected to the tractor.
- The drive shaft must be equipped with covers. It is forbidden to use the shaft with damaged or missing safety elements.
- After installing the shaft, make sure that it is correctly and securely connected to the tractor and manure spreader.
- It is forbidden to wear loose clothing, loose belts or anything that could get caught in the rotating shaft. Contact with rotating PTO shaft may cause serious injury.
- Before disconnecting the shaft, turn off the tractor engine and remove the key from the ignition.
- When working in conditions of limited visibility, the articulated telescopic shaft and its surroundings should be illuminated with the help of tractor work lights.
- Do not touch the telescopic shafts after stopping the machine. Shafts equipped with friction clutches may become hot during slipping.
- During transport, the shaft should be stored in a horizontal position to avoid damage to guards and other safety devices.
- When using the shaft and manure spreader, do not use PTO shaft speed other than 1000 rpm. It is prohibited to overload the shaft and manure spreader and to suddenly engage the clutch.
- It is forbidden to walk over and under the embankment and stand on it both during work and when the manure spreader is at a standstill.
- Never use a damaged PTO shaft as it may cause an accident. A damaged shaft must be repaired or replaced.
- Disconnect the shaft drive each



time when there is no need to drive the machine, or when the tractor and manure spreader are in an unfavourable angular position with respect to each other.

- Secure the shaft guard against

turning during operation. The chain should be attached to the fixed element of the manure spreader.

- It is forbidden to use safety chains to support the shaft during standstill or transporting the manure spreader.

F.3.10.624.04.1.EN

## 2.5 RULES OF SAFE TECHNICAL SERVICE

- During the warranty period, any repairs may only be carried out by a Warranty Service authorized by the manufacturer. After the end of the warranty period, it recommend that any repairs to the spreader be carried out by specialized workshops.
- In the event of any faults or damage, the spreader should be decommissioned until repaired.
- During maintenance work, use appropriate, close-fitting protective clothing, gloves, shoes, glasses and the right tools.
- Any modification of the manure spreader exempts the manure spreader manufacturer from any liability for damage or injury.
- Regularly check the technical condition of the safety devices and the correct tightening of bolt connections (in particular the drawbar eyes and wheels). Checking the tightening of the nuts is described in the chapter *Technical Support*.
- Inspect spreader according to the frequency specified in this manual.
- Before starting repair work on hydraulic or pneumatic systems, the residual oil or air pressure must be reduced.
- Before entering the manure spreader's load box, secure the tractor against unauthorized access, disconnect PTO shaft and disconnect the hydraulic system hoses from the tractor.
- Be careful when entering the manure spreader.
- Entering the manure spreader's load box is only possible with the use of a ladder when the machine is completely stationary.
- Perform maintenance and repair activities applying the general principles of health and safety at work. In case of injury, wash and disinfect the wound immediately. In case of serious injuries consult a physician.
- Repair, maintenance and cleaning work should only be carried out with the tractor engine switched off and the ignition key removed. Always secure the tractor and manure spreader with the parking brake and wedges under the manure spreader wheel. Close the tractor cab and secure it against access by unauthorized persons.
- During maintenance or repair work, the manure spreader may be

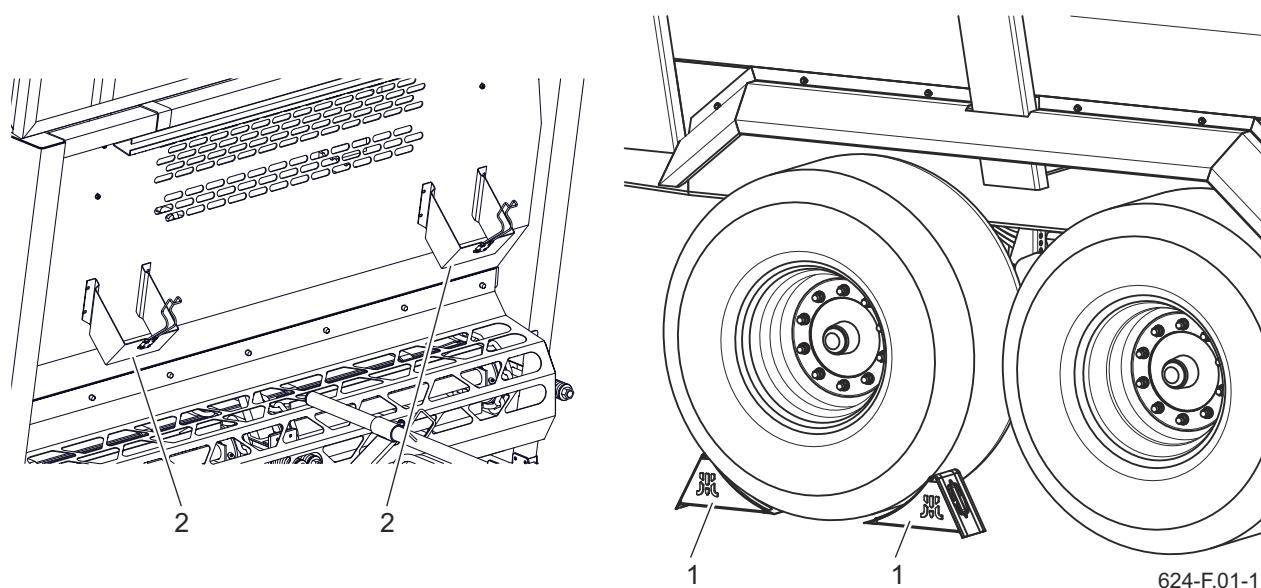
disconnected from the tractor, but it must be secured by means of wedges and parking brake.

- If it is necessary to replace individual parts, use only parts recommended by the manufacturer. Failure to comply with these requirements may endanger the health or life of bystanders or persons operating the spreader, cause damage to the machine and constitute the basis for withdrawing the warranty.
- Before welding or electrical work, the spreader should be disconnected from the power supply. Clean the paint coating. The fumes of burning paint are poisonous to humans and animals. Welding work should be carried out in a well-lit and ventilated room.
- During welding work pay attention to flammable or fusible elements (elements of pneumatic, electric, hydraulic systems, elements made of plastic). If there is a risk of ignition or damage, they must be or covered with non-flammable material before welding. Before starting work, it is recommended to prepare a CO<sub>2</sub> or foam extinguisher.
- In the event of work requiring the spreader 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. It is forbidden to work under a machine raised only with a lift.
- It is forbidden to support the spreader with fragile elements (bricks, hollow bricks, concrete blocks).
- The used lift should have adequate load capacity, it should be technically sound. The lift must be placed on an even, hard surface that will prevent it from sinking or slipping during operation. If necessary, use properly selected sleepers to reduce the unit pressure of the lift base on the ground to prevent penetration into the ground.
- When carrying out maintenance work with the lifted gate, secure it against falling down by means of a stop valve and a properly selected, durable and stable mechanical support.
- After completing work associated with lubrication, remove excess grease or oil. The spreader should be kept clean.
- It is forbidden to carry out independent repairs of elements of the hydraulic or pneumatic system, i.e. control valves, modules, actuators and regulators. In

- case of damage to these elements, the repair should be entrusted to authorized repair centres or replace the elements with new ones.
- It is forbidden to install additional devices or accessories that do not comply with the specification specified by the Manufacturer.
  - The manure spreader may only be towed when the running gear, lighting and braking systems are efficient.
  - Repair of the drawbar and rod (welding, surfacing, straightening, etc.) is prohibited and requires replacement of parts with new ones.

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## 2.6 SAFE DRIVING RULES



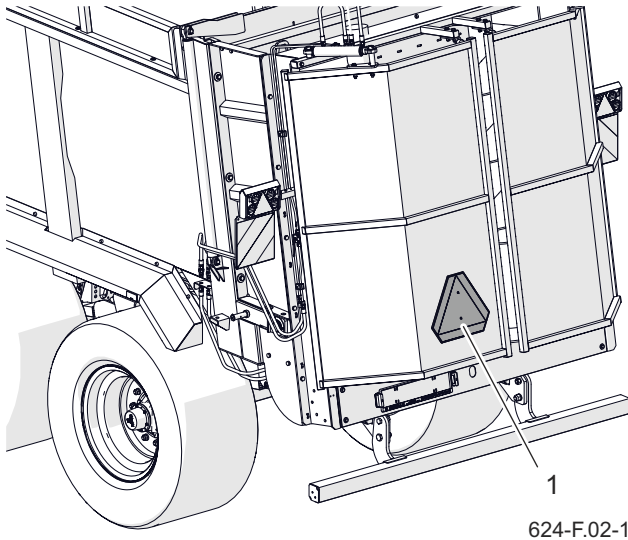
**Figure 2.1** How to set the wedges under wheel  
(1) wedges (2) wedge handle

- When driving on public roads, comply with traffic regulations and transport regulations in force in the country where the machine is used.
- When driving on public roads, comply with the road traffic regulations and transport regulations in force in the country where the machine is used. While driving, adapt your speed to the prevailing road conditions and the restrictions resulting from traffic laws.
- It is forbidden to leave the machine unsecured. The manure spreader disconnected from the tractor must be absolutely secured against rolling away using the parking brake and wedges under the vehicle wheel.

Wedges should be placed on one axle, at the front and rear of the wheel - figure (2.1).

- The manure spreader must be loaded so that the material does not pollute the road when driving on public roads.
- Before driving, make sure that the machine is correctly connected to the tractor.
- Before using the machine always check its technical condition, especially in terms of safety. In particular, check the technical condition of the hitch system, the running gear, the braking system and traffic lights as well as the connecting elements of the hydraulic and electrical systems.

- Before driving on public roads, place a triangular sign for slow moving vehicles on the rear wall - figure (2.2).



**Figure 2.2** Location of the board (1) distinguishing sign

- When driving on public roads, the tractor operator must ensure that the machine and tractor are equipped with an approved or homologated warning reflective triangle.
- Make sure the parking brake has been released before driving off.
- Prolonged driving on sloping ground creates a risk of loss of braking efficiency.
- The arrangement of the load must not cause overloading of the running gear, as well as the hitch spreader and tractor.
- Reckless driving and excessive speed can cause an accident.
- It is forbidden to transport loads not allowed by the manufacturer.
- The travel speed must be adapted to the ambient conditions and the load. If possible, avoid driving over uneven terrain and unexpected turns.
- It is forbidden to get on the spreader while driving.
- Exceeding the carrying capacity spreader may lead to damage to the machine, loss of stability during driving and cause a hazard while driving.
- The braking system of the machine has been adapted to the total weight of the spreader, exceeding of which will drastically reduce the operation of the service brake.
- When reversing (especially if visibility is limited), it is recommended to use the assistance of another person. During manoeuvres, the helping person must keep a safe distance from danger zones and be visible to the tractor operator at all times.
- Use extreme caution when passing near overhead power lines.

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## 2.7 TIRES

- When working with tires, the spreader should be secured against rolling by placing wedges or other elements without sharp edges under the wheels. It is recommended to disassemble the wheel when the manure spreader is not loaded.
- Repair work on wheels or tires should be carried out by persons trained and authorized to do so. These works should be carried out using appropriately selected tools.
- Check the correct tightening of the wheel nuts according to the assumed schedule.
- Avoid damaged surfaces, sudden and variable manoeuvres, and high speeds when turning.
- Check air in tire pressure regularly. Tire pressure should also be checked during all-day intensive work. It should be taken into account that an increase in tire temperature can increase the pressure inside the tire. With such a rise in temperature and pressure, reduce the load or speed. Never reduce pressure by venting if it increases due to temperature.
- Tire valves should be protected with suitable caps to avoid penetration of dirt.

F.3.10.624.07.1.EN

## 2.8 DESCRIPTION OF RESIDUAL RISK

Pronar Sp. z o. o. in Narew made every effort to eliminate the risk of an accident. However, there is some residual risk that can lead to an accident and is primarily associated with the following activities:

- using the spreader contrary to its purpose,
- being between the tractor and the spreader when the engine is running and when connecting the machine,
- being on the machine during engine work,
- operation of the machine with the covers removed or inoperative,
- failure to maintain a safe distance from hazardous areas or occupying a place in these zones during machine operation,
- machine operation by unauthorized persons under the influence of alcohol or drugs,
- introducing design changes without the consent of the Manufacturer,
- spreader cleaning, maintenance and technical inspection,

- presence of persons or obstacles in areas invisible from the operator's position.

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

- prudent and leisurely machine operation,
- sensible application of the remarks and recommendations contained in the operating instructions,
- performing maintenance and repair work in accordance with the principles of operating safety,
- carrying out maintenance and repair work by trained persons,
- using appropriate, fitted protective clothing,
- securing the machine against access by unauthorized persons, especially children.
- keeping a safe distance from prohibited and dangerous places,
- a ban on being on the machine while it is operating.

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## 2.9 INFORMATION AND WARNING STICKERS

The machine is marked with information and warning decals mentioned in table 2.1. The machine user is obliged to ensure that the inscriptions, warning and information symbols placed on the machine are legible throughout the entire period of use. In the event of their destruction, they must be replaced. Labels with inscriptions

and symbols are available from the Manufacturer or in the place where the machine was purchased. New assemblies replaced during repair must be marked again with the appropriate safety signs. When cleaning the machine, do not use solvents that may damage the label coating and do not direct a strong water jet.

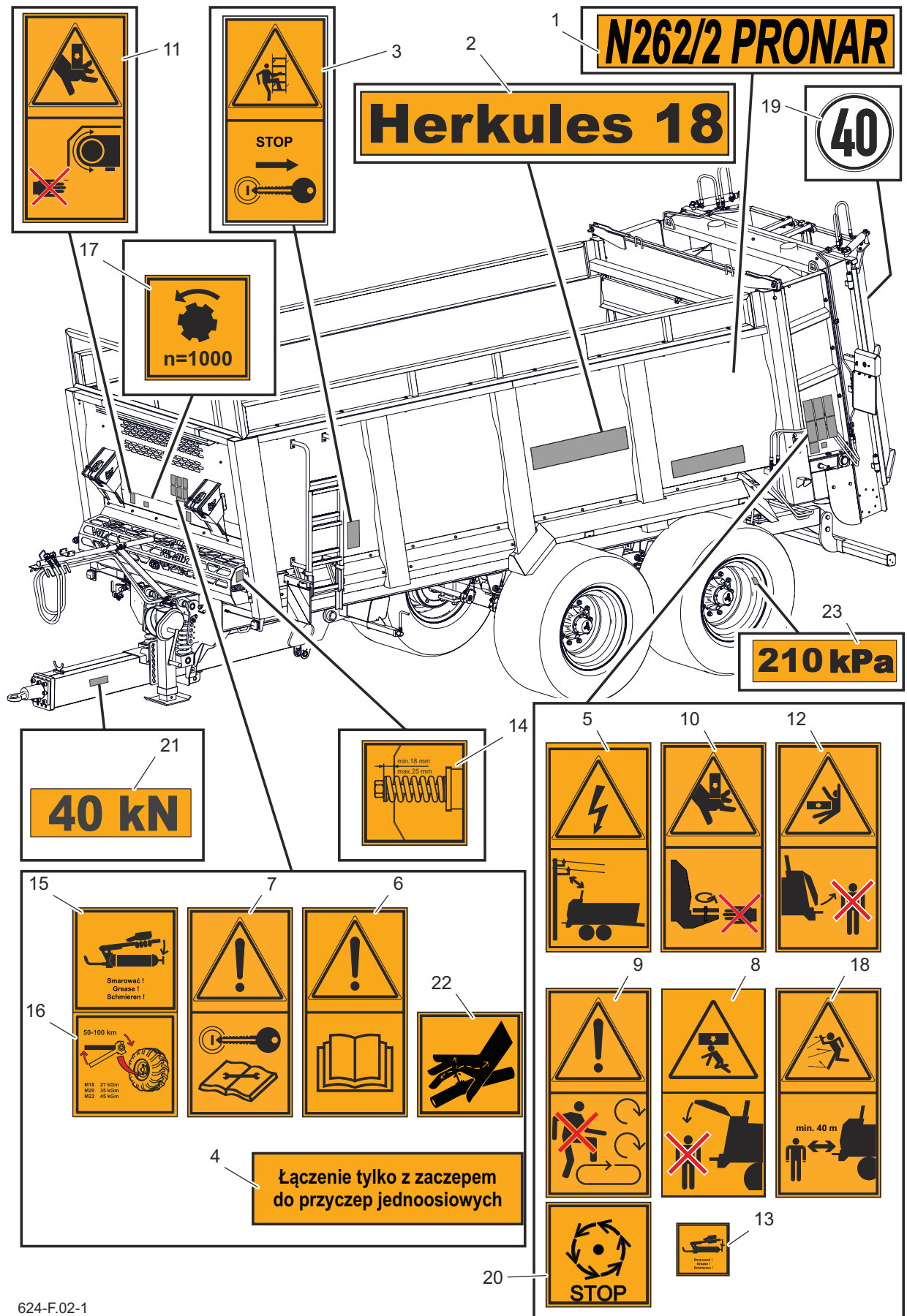
**Table 2.1.** Information and warning stickers

Item	Description	Catalogue number
1	Machine type sticker.	624N-00000001
2	Machine name sticker.	624N-00000002
3	Before climbing the ladder to perform maintenance and repair operations inside the gearbox, switch off the engine and remove the ignition key. Secure the tractor against unauthorized access.	29N-0000030
4	Coupling only with the hitch for single-axle trailers.	37N-0000002
5	Caution. Danger of electric shock. Use extreme caution when working near power lines.	70N-00000003
6	Caution. Before starting work, read the User's Manual.	70N-00000004
7	Before starting repair, maintenance or other servicing activities, switch off the engine and remove the key from the ignition.	70N-00000005
8	Caution. Danger of being crushed. Do not take up space under the raised tailgate of the adapter.	70N-00000007
9	Caution. Do not step on the chain conveyor if the engine is running and the PTO shaft is engaged.	70N-00000008
10	Caution. Danger of crushing. Keep a safe distance from rotating spreading discs.	70N-00000009

Item	Description	Catalogue number
11	Caution. Danger of crushing. Do not reach into the working parts of the chain conveyor.	70N-00000010
12	Danger of crushing. Do not place near the opening tailgate of the adapter.	70N-00000011
13	Lubricate according to the instructions in the user manual.	70N-00000022
14	Check the tension of the chain conveyor.	70N-00000025
15	Regularly carry out spreader lubrication activities according to the schedule.	104N-00000004
16	Regularly check the tightness of wheel nuts and other bolted connections.	104N-00000006
17	PTO shaft speed n=1000 rpm	153N-00000009
18	Warning! Thrown debris. Thrown out objects, endanger the whole body. Keep a safe distance from the adapter, min. 40 meters.	153N-00000010
19	Permissible vehicle speed.	204N-00000008
20	Wait for the machine components to stop completely before touching them.	535N-00000008
21	Permissible load on the coupling device.	544N-00000003
22	High pressure fluid - body injection.	535N-00000009
23	The air pressure in the wheels depends on the used tires <sup>(1)</sup>	

<sup>(1)</sup>- The air pressure in the wheels depends on the used tires .

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624-F.02-1

Figure 2.3 Arrangement of information and warning stickers



# CHAPTER 3

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CONSTRUCTION AND PRINCIPLE  
OF OPERATION

## 3.1 TECHNICAL CHARACTERISTICS

**Table 3.1.** Basic technical data

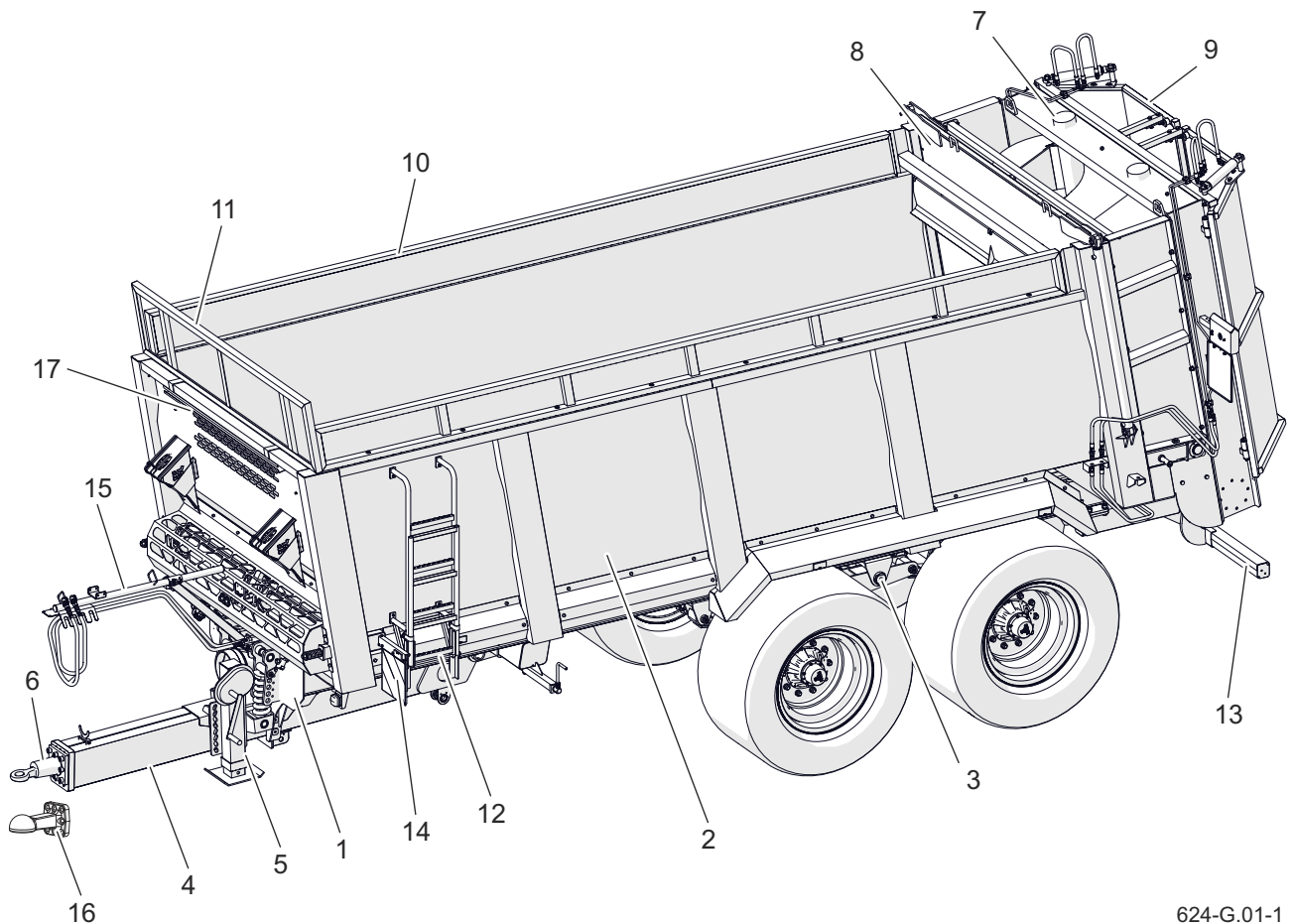
Content	Unit	N262/2
Dimensions		
Total length	mm	8,780
Overall width	mm	2,540
Overall height	mm	3,780
Loading area dimensions		
Loading area length	mm	5,600
Loading space width inside (front/rear):	mm	1,955 / 1,995
Height of walls/extensions of the load box / SILO extensions	mm	1,200 / 300 / 500
Performance parameters		
Technical (structural) load capacity	kg	18,000
Load capacity <sup>(1)</sup>	kg	14,800
Permissible total weight (construction)	kg	25,600
Permissible total weight <sup>(2)</sup>	kg	22,000
The machine's karb weight	kg	7,600
Loading height without extensions/with extensions/ with SILO extensions	mm	2800 / 3100 / 3600
Loading area	m <sup>2</sup>	11.1
Loading capacity with extensions / with SILO extensions	m <sup>3</sup>	18 / 22.4
Maximum spreading width	m	12
Other information		
Wheel track	mm	1,940
Electrical system voltage	V	12
Loading of the drawbar hitch	kg	4,000
Permissible design speed	km/h	40
Min. tractor power	KM/ kW	170 / 125
PTO speed	rpm	1,000
Adapter type	-	vertical 2-roller AV20

<sup>(1)</sup> -Parameter: Load capacity - depending on legal restrictions on the target market and on the completion of the manure spreader, it may differ from the given one.

<sup>(2)</sup> -Parameter: Permissible total weight - depending on legal restrictions on the target market, may differ from the given.

Information on tires is provided in Chapter 7 'Tire assembly'

## 3.2 GENERAL CONSTRUCTION



624-G.01-1

**Figure 3.1** Spreader construction

- |                               |                      |                           |                       |
|-------------------------------|----------------------|---------------------------|-----------------------|
| (1) lower frame               | (2) load box         | (3) tandem suspension     | (4) drawbar           |
| (5) support                   | (6) rotating cable   | (7) AV20 vertical adapter | (8) gate valve (lock) |
| (9) rear flaps of the adapter | (10) setting gearbox | (11) protective net       | (11) rear beam        |
| (12) ladder                   | (13) rear beam       | (14) warning boards       | (15) bracket          |
| (16) ball link                | (17) slide indicator |                           |                       |

The construction of the manure spreader is shown in Figure (3.1). The basic structural element is the bottom frame (1) with the suspension (3). A load box (2) was welded to the frame. The (6) spreader suspension consists of two driving axles in a tandem arrangement on parabolic springs connected by a swing arm. The

axles are attached to the springs with a spring plate and U-bolts. They were made of a square rod terminated with pins, on which road wheel hubs are mounted on tapered bearings. These are single wheels equipped with calliper brakes actuated by mechanical cam expanders.

A ladder (12) is mounted on the left side

of the loading case to observe the loading space and enter the loading case during cleaning or maintenance. Extensions (10) are screwed to the side walls of the load box, while a protective mesh (11) is mounted in the front part of the load box.

The height-adjustable drawbar (4) is used to connect to the upper or lower hitch of the tractor. It is possible to mount a rotary drawbar (6) or K80 ball tie (16) to the drawbar front plate. The left parking stand (5) has been mounted to the left drawbar to support the manure spreader at a standstill when it is not connected to the tractor, and to adjust the height of the drawbar during aggregation.

The main working element is the shredding adapter (7) with two impellers arranged

vertically. Behind the adapter there are hydraulically operated rear flaps (9). There is a hydraulically controlled shutter (8) between the load box space and the shredding adapter.

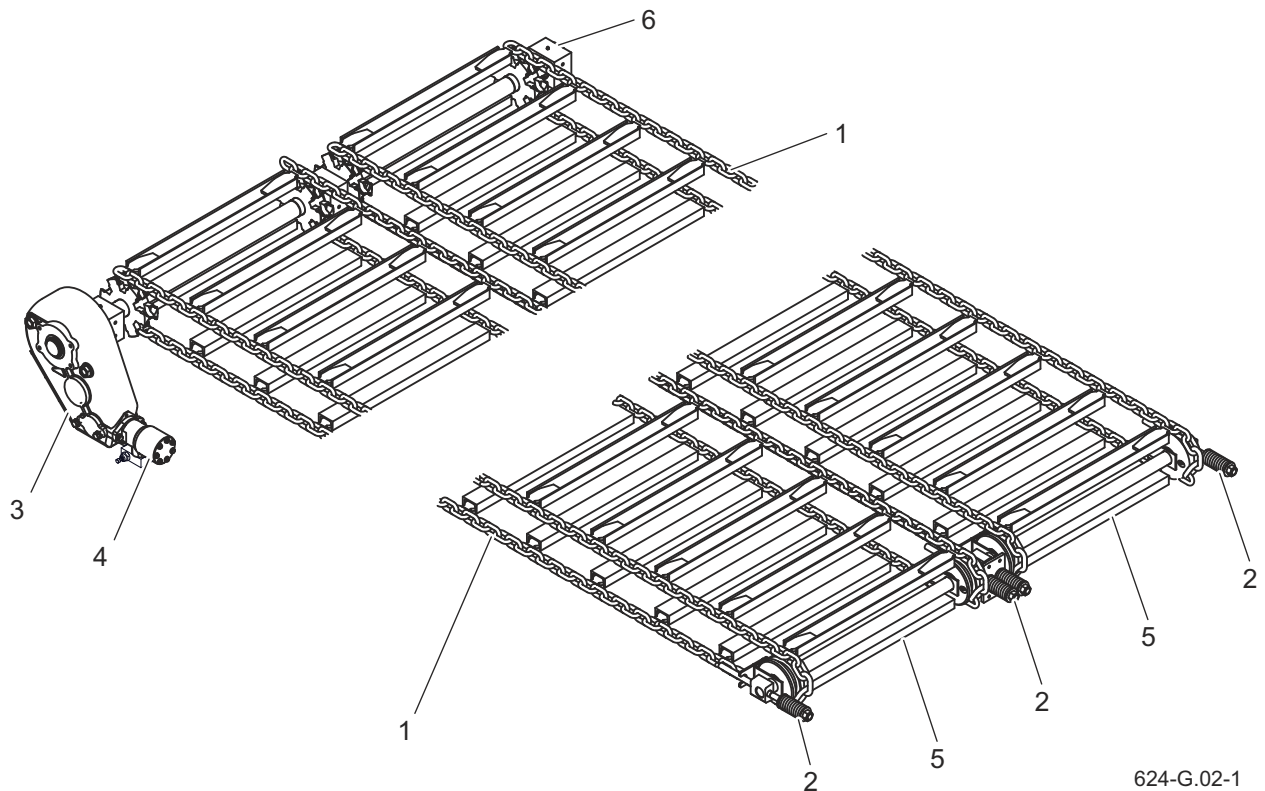
In order to check the valve's opening degree by the operator, the manure spreader is equipped with the valve raise indicator (17) located on the front wall of the load box.

There is a support (15) in the front of the machine. Depending on the customer's order, the hydraulic system components for controlling from the spreader or from the tractor are mounted on the support. At the customer's request, the manure spreader can be equipped with a rear beam (19).

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### 3.3 FEEDING MECHANISM



**Figure 3.2** Construction of the feeding mechanism

(1) transfer unit      (2) tensioning screw      (3) reduction gear  
 (4) hydraulic motor      (5) tensioning axle      (6) drive shaft

The spreader feeding mechanism consists of two transfer units (1).

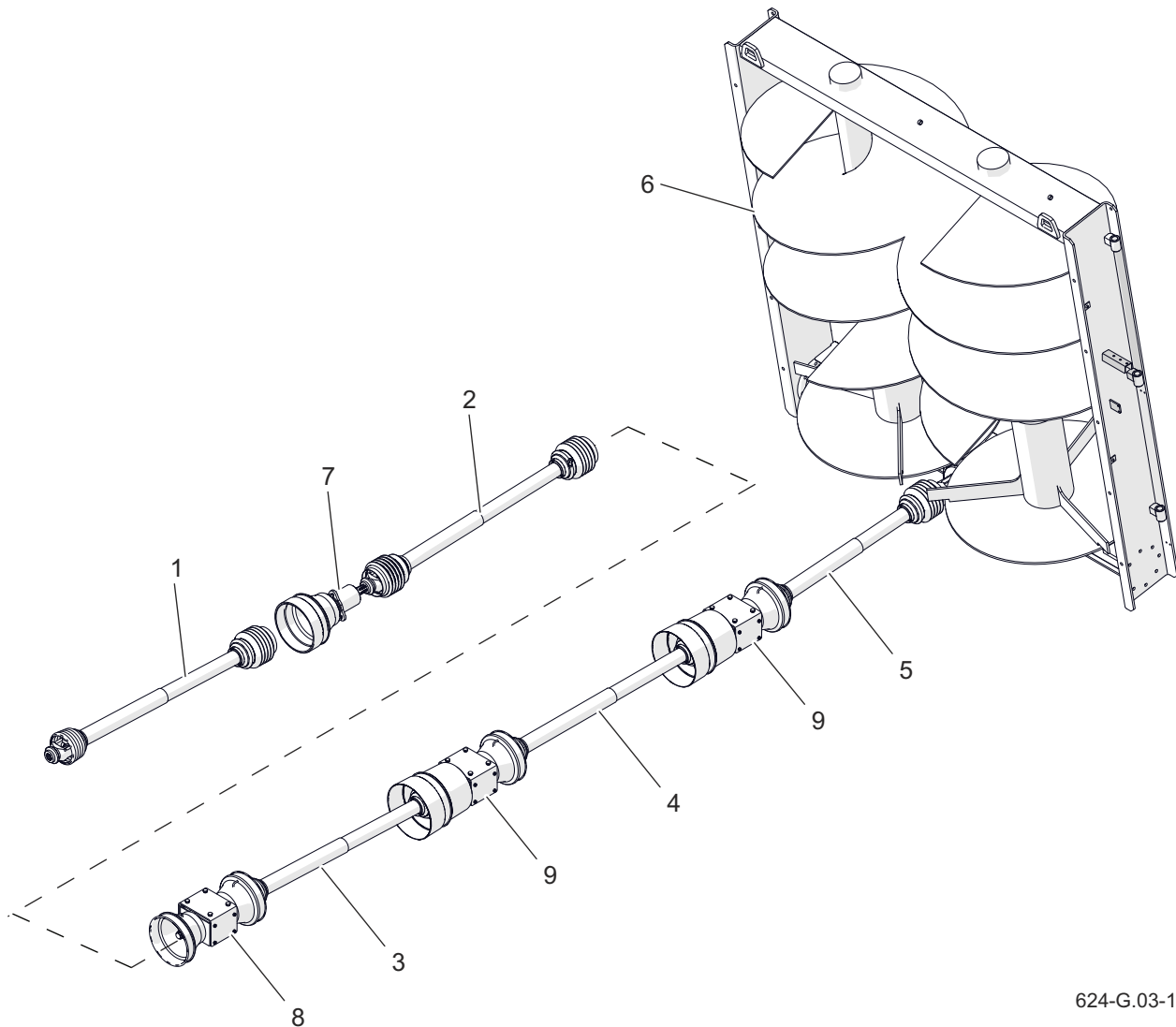
The transfer unit consists of two chains and scraper bars. The chains of the transmission assembly are driven by cast iron gears mounted on the shaft of the driving mechanism (6) and on the front wheels of the tensioning assembly (5). Four

tensioning bolts (2) with anti-shock springs are used to adjust the chain tension.

The entire mechanism is driven by power from the tractor's hydraulic system. The transmission units are driven by a hydraulic motor (4) mounted to the reduction gear (3).

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## 3.4 POWERTRAIN



624-G.03-1

**Figure 3.3** Powertrain

- |   |                    |                               |
|---|--------------------|-------------------------------|
| (1) PTO shaft for coupling to the tractor | (2) PTO shaft      | (3) PTO shaft with a backstop |
| (4) PTO shaft with automatic clutch       | (5) PTO shaft      | (6) shredding adapter         |
| (7) front PTO shaft                       | (8) rear PTO shaft | (9) central PTO linkage       |

The spreading adapter (6) is driven by the powertrain, the construction of which is shown in figure (3.3).

The torque is transferred from the tractor PTO shaft to the manure spreader mechanisms through the articulated shafts (1), (2), (3), (4), (5) to the reduction gear of the

shredding adapter (6).

The element protecting the system elements is the PTO shaft with an automatic clutch (4) which interrupts the power transmission when the torque exceeds the calibration value of the clutch. After reducing the speed or stopping the power take-off,

it is automatically restarted.



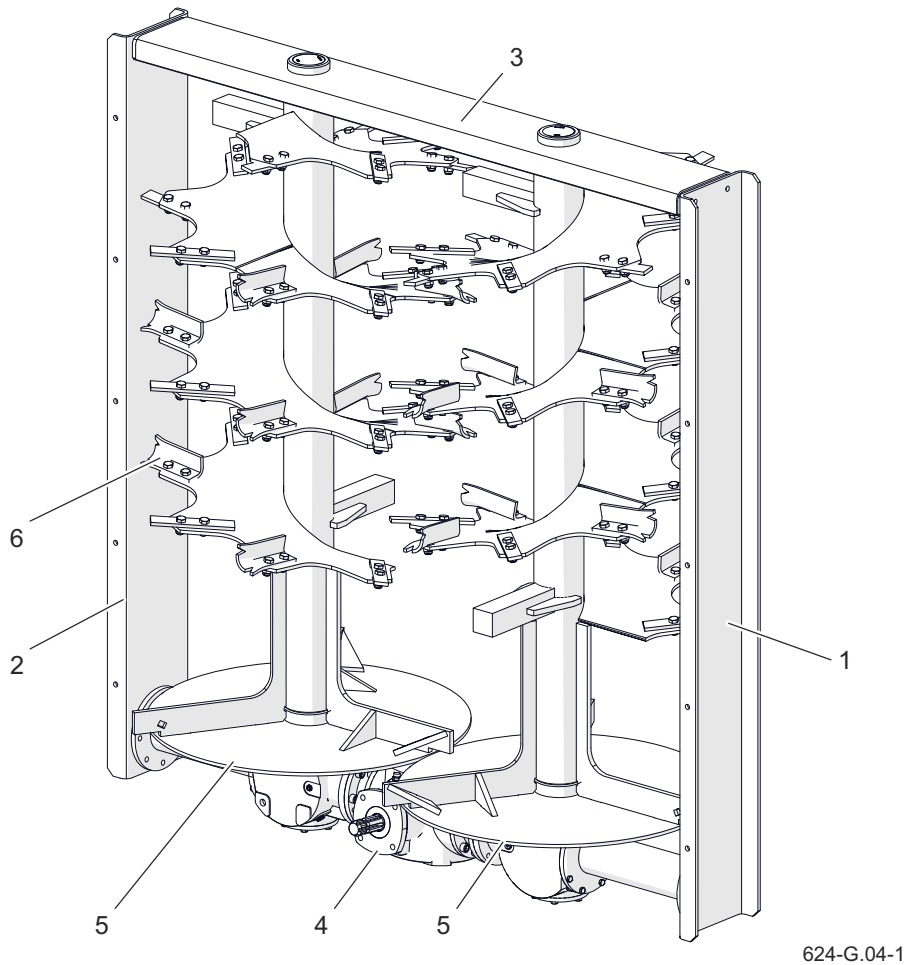
**CAUTION**

The shredding adapter can be driven by the tractor's power shaft only at a speed of 1 000 rpm.

The use of a different PTO speed will cause the spreading drums to have insufficient rotation, or the drive will be exposed to damage.

G.3.10.624.04.1.EN

### 3.5 2-ROLLER SPREADING ADAPTER



624-G.04-1

**Figure 3.4** Construction of the vertical spreading adapter

(1) left side wall      (2) right side wall      (3) upper beam      (4) transmission  
 (5) spreading drum      (6) chopping knife

The 2-roller spreading adapter is used for shredding and spreading material fed through the floor conveyor. The adapter has been mounted in the rear part of the manure spreader.

The construction of the manure spreader is shown in Figure (3.4). It is made in the form of a frame with worm spreading drums. The frame is made up of the left side wall (1) and right side wall (2)



#### CAUTION

The shredding adapter can be driven by the tractor's power shaft only at a speed of 1 000 rpm.

When working with the adapter, the rear covers must be opened and the shutter should be raised to the maximum.

connected by an upper beam (3). In the lower part there is a gearbox (4) on which vertical spreading drums (5) are mounted

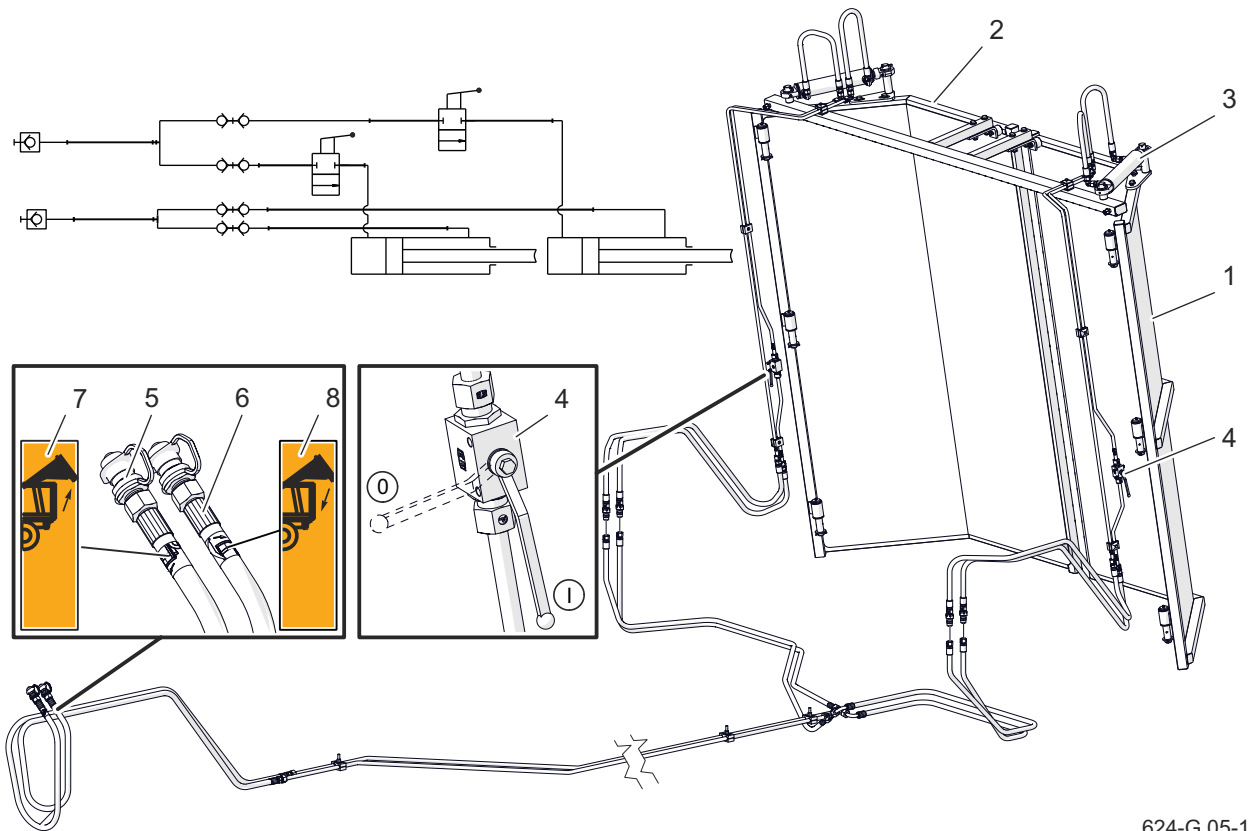
from above mounted in bearing units.  
Working tools are replaceable crushing  
knives (6) twisted to the spreading shafts.

Used knives should be replaced.

The adapter is driven by the tractor drive  
and PTO shaft at a speed of 1 000 rpm.

G.3.10.624.05.1.EN

## 3.6 REAR FLAPS OF THE ADAPTER



**Figure 3.5** Construction and diagram of the hydraulic installation of the adapter flaps  
 (1) rear left flap (2) rear right flap (3) hydraulic cylinder  
 (4) hydraulic shut-off valve (5) flap opening pipe (6) flap closing pipe (7), (8) information stickers  
 (I) open valve (O) closed valve



### CAUTION

The rear flaps should be closed during transport.

Do not open or close the flaps when they are blocked by shut-off valves on both sides. This may damage the hydraulic cylinders and / or the adapter flaps.

### ADVICE

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

The hydraulic hoses for installing the rear flaps of the adapter are marked with blue plugs.

Adapter flaps are mounted as additional equipment of the manure spreader. They consist of two wings attached to the side walls of the adapter with hinges. The flaps are opened sideways using hydraulic cylinders.

To enable precise fertilization of the field, the flaps are used as deflectors limiting the scope and direction of material spreading. The selection of the spreading limitation side is done by means of the hydraulic valves (4). When using dampers as deflectors, i.e. blocking the damper on one

side, opening adjustment is allowed.

The flaps are closed and opened from the tractor cab through the lever of the external hydraulic distributor in the tractor.

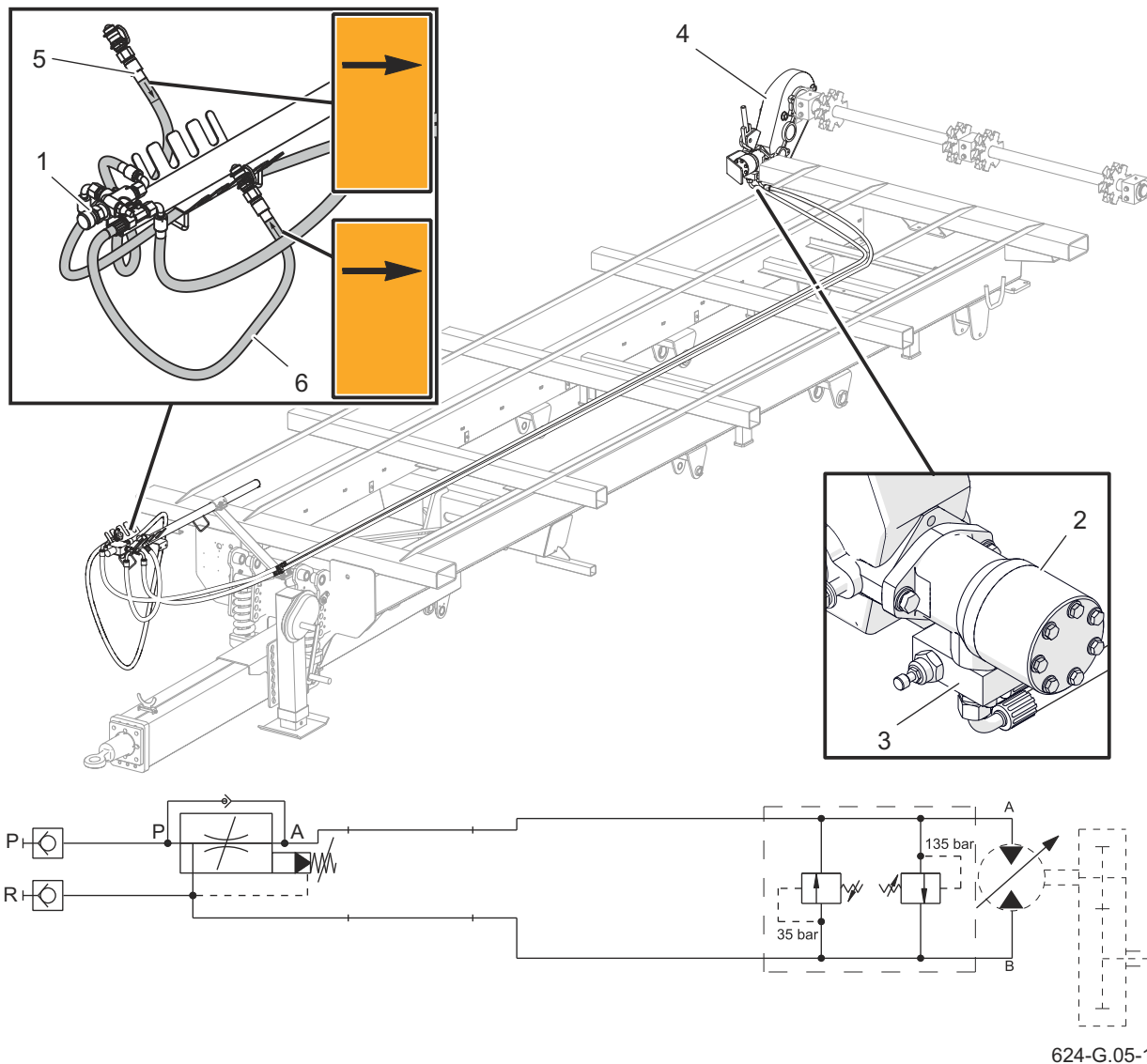
The hydraulic hoses for controlling the adapter flaps around the connection plugs have been marked with the information

stickers (7) and (8).

Oil under pressure through the pipe (5) goes to the hydraulic cylinders (3), which open the flaps. Closing is accomplished by changing the spreader setting on the tractor.

G.3.10.624.06.1.EN

### 3.7 HYDRAULIC SYSTEM OF THE FEEDING MECHANISM



**Figure 3.6** Construction and diagram of the hydraulic installation of the feeding mechanism

(1) flow regulator      (2) hydraulic motor      (3) overload valve      (4) reduction gear  
 (5) supply pipe      (6) return pipe      (Z) supply      (P) return

The hydraulic system of the feeding mechanism is used to control the floor conveyor. The system is supplied from the tractor's external hydraulic system via the hydraulic lines (5) and (6). Labels in the form of arrows indicating the direction of hydraulic oil flow have been placed on the cables in the vicinity of the connection plugs to

identify them. The system is connected to a hydraulic motor (2), which drives the floor conveyor.

The feeding mechanism is protected against damage by a hydraulic overload valve (3) located at the hydraulic motor. At the moment of reloading, when the conveyor is overloaded or mechanically



blocked, the conveyor will be stopped.

The valve protects the system against excessive pressure increase above the spreader's working parameters set in the factory.

The circuit is controlled by means of a distributor in the tractor cabin. The use of this solution allows you to change the direction of travel and shortens the response time. The conveyor speed is regulated by

**CAUTION**

It is forbidden to remove seals and change factory settings on the overload valve and flow regulator.

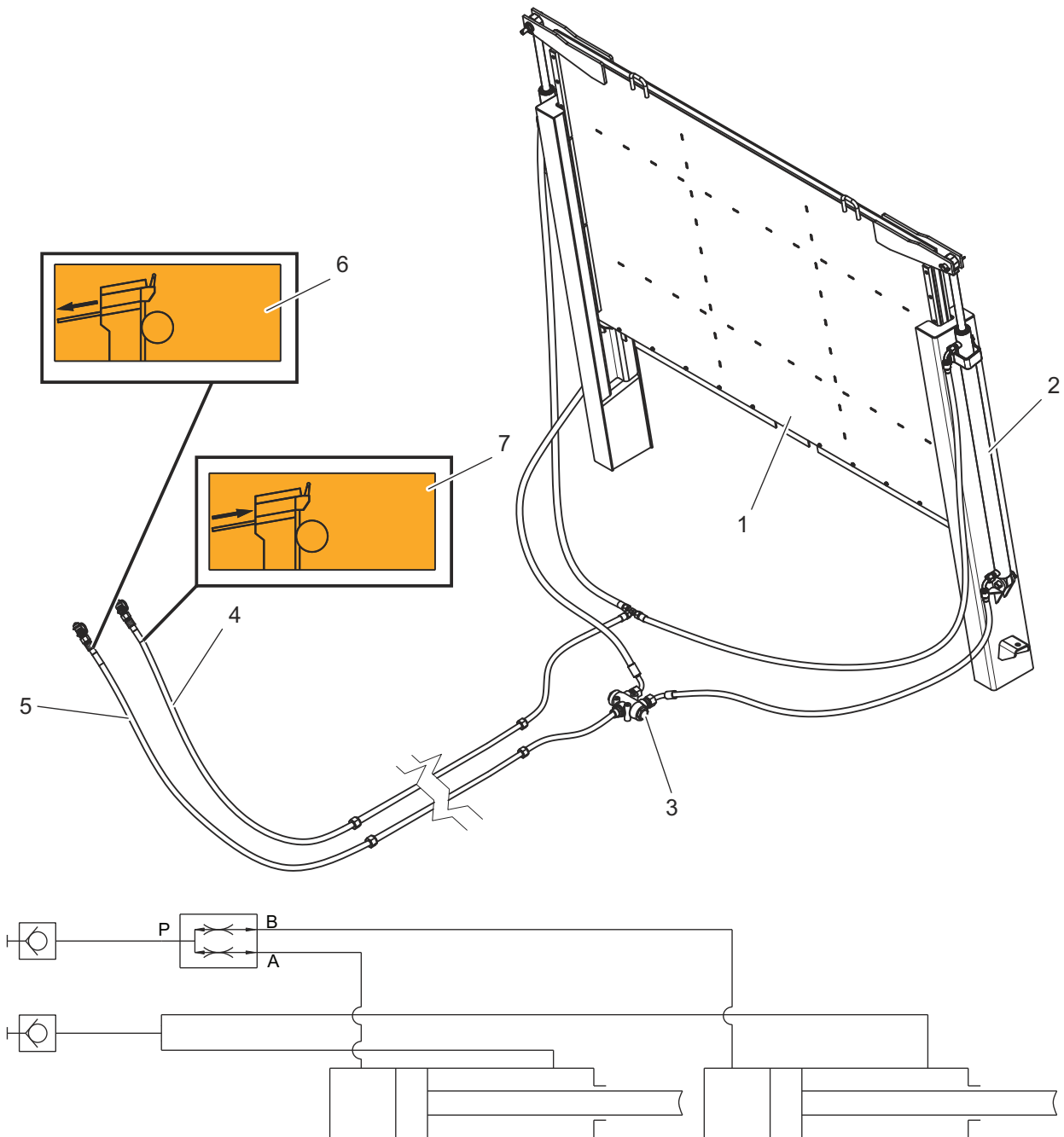
a knob on the hydraulic flow rate regulator (1) on a scale of 0 to 10. The flow regulator is mounted on the cable boom located in the front of the manure spreader. The maximum flow rate (highest speed) is obtained when the regulator is set to position 10, while the lowest is at position 0. The structure and diagram of the hydraulic system of the feeding mechanism is shown in figure (3.6).

**ADVICE**

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

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### 3.8 HYDRAULIC VALVE SYSTEM



624-G.07-1

**Figure 3.7** Construction and diagram of the lock hydraulic installation

(1) slide                      (2) hydraulic cylinder      (3) flow divider      (4) return pipe  
 (5) power cord              (6), (7) information stickers

The manure spreader is equipped with a loading box slide (1) as standard. It is mounted in front of the spreading

adapter in the side guides and ensures safe transport of transported materials (e.g. compost, peat) on public roads, and

ensures safe start of the spreading shafts of the adapter.

The loading bay gate valve is hydraulically controlled by cylinders (2). The system is supplied from the tractor's external hydraulic system. The hydraulic cylinders opening and closing the slide are controlled by means of a distributor in the

tractor cabin.

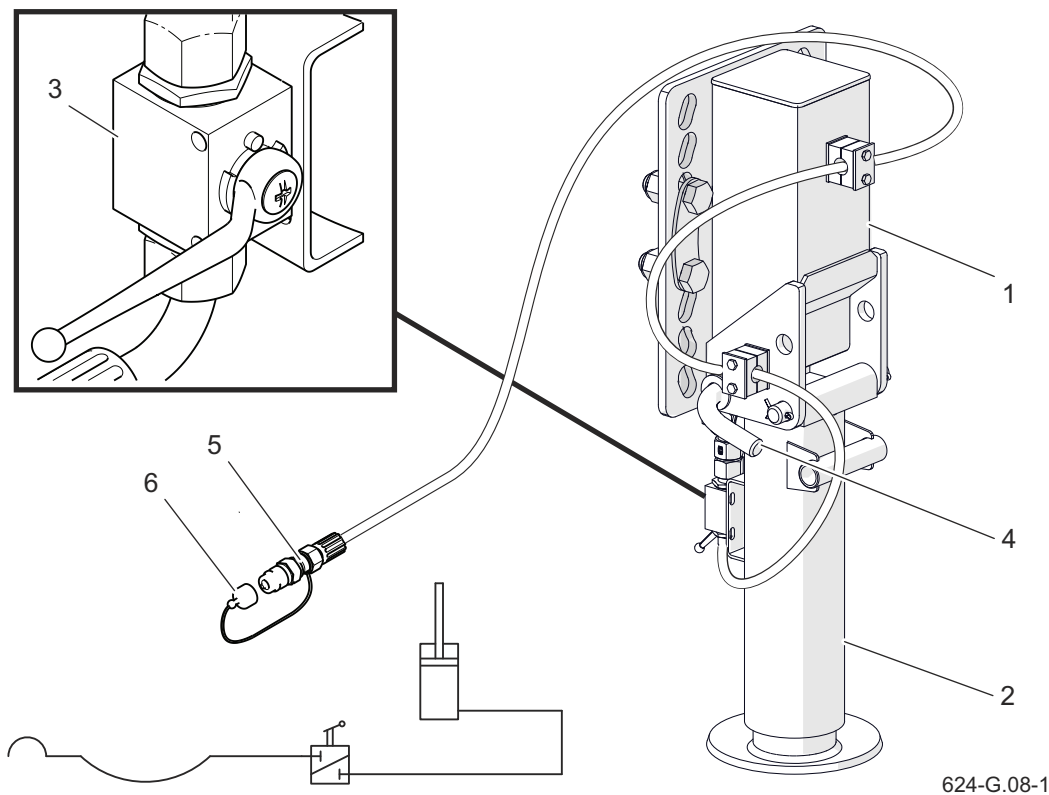
In order to identify the hydraulic lines of the valve, stickers (6) and (7) have been placed in the vicinity of the connection plugs.

#### **ADVICE**

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

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### 3.9 HYDRAULIC SYSTEM OF THE BROKEN SUPPORT



**Figure 3.8** Construction and diagram of the hydraulic installation of the broken support  
 (1) body (2) hydraulic cylinder (3) shut-off valve (4) lock pin  
 (5) quick coupler - plug (6) plug

The hydraulic installation of the support is used for automatic positioning of the support of the disconnected manure spreader from the tractor, or to park the manure spreader after use. By means of the hydraulic support system, the drawbar height can be reached when connecting and disconnecting the manure spreader. The support is supplied from the tractor's hydraulic system. Disassembly and assembly is performed by ejecting or inserting a single-acting hydraulic piston rod.

#### ADVICE

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

The stop valve (3) is used to block the support. Moving the handle perpendicular to the valve will block the support in a fixed position. The support is lowered by moving the valve handle to the open position, i.e. along the valve. Hydraulic oil fed from the tractor's hydraulic distributor extends the cylinder piston to the desired height. The

straight support returns to the transport position after the pressure in the hydraulic conduit has been reduced and is forced by means of a spring located inside the cylinder sleeve (2). The hydraulic hose for controlling the support is terminated with a quick coupler - plug (5) and secured with a stopper (6).

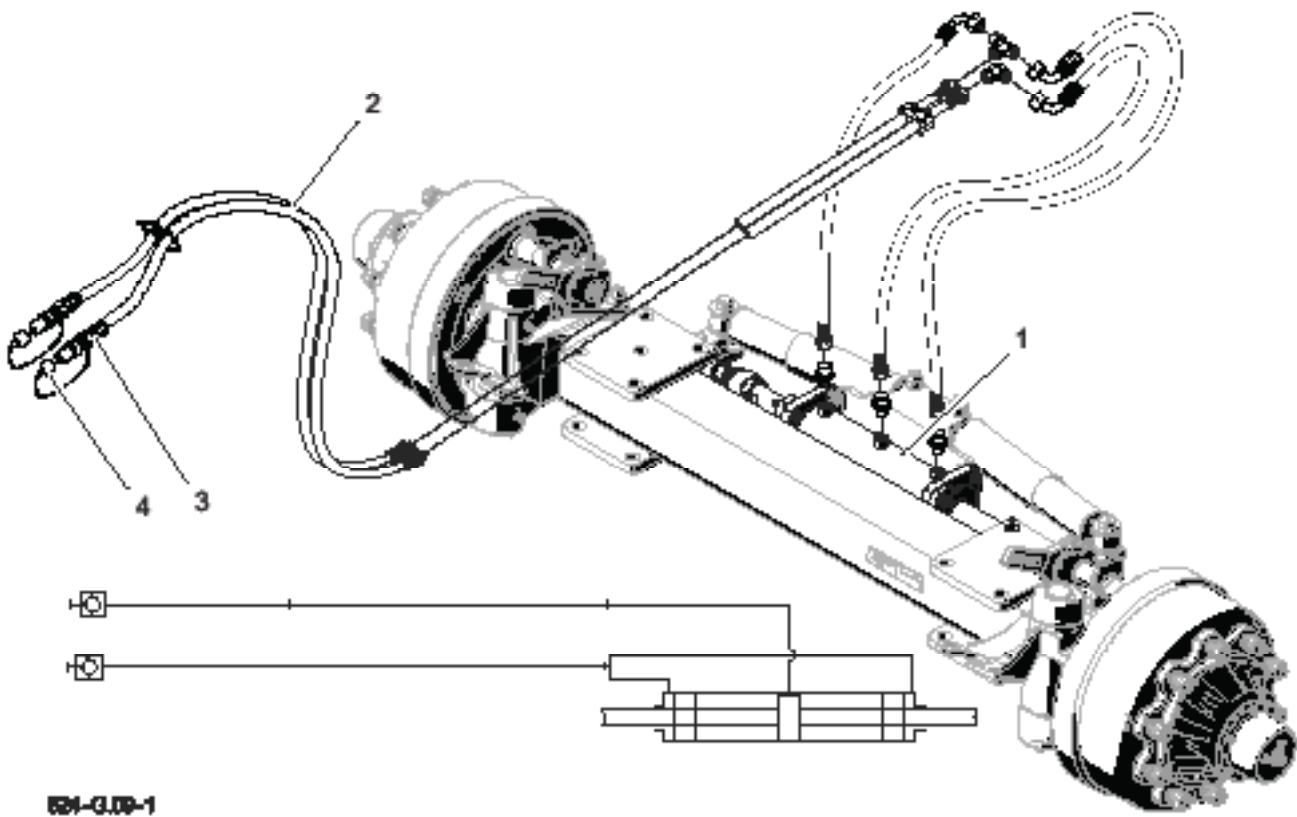
To lock the support in transport or parking position, use the locking pin (4).

**CAUTION**

During travel, the support must be folded into transport position and secured with a lock pin and a split pin. The shut-off switch must be in the closed position.

G.3.10.624.09.1.EN

### 3.10 HYDRAULIC STEERING LOCK SYSTEM



**Figure 3.9** Construction and diagram of the hydraulic steering lock system  
 (1) hydraulic cylinder (2) hydraulic hose (3) quick coupler - plug (4) plug

The manure spreader can be completed with a rear steering axle, steered passively. The axle design allows for smoother cornering and manoeuvring on marshy terrain, which reduces machine tire wear. When reversing, the axle switches must be locked, otherwise the manure spreader will tend to steer uncontrollably to the left or right.

The axle steering lock is made possible by the 2-pipe hydraulic system shown in figure (3.9).

#### ADVICE

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

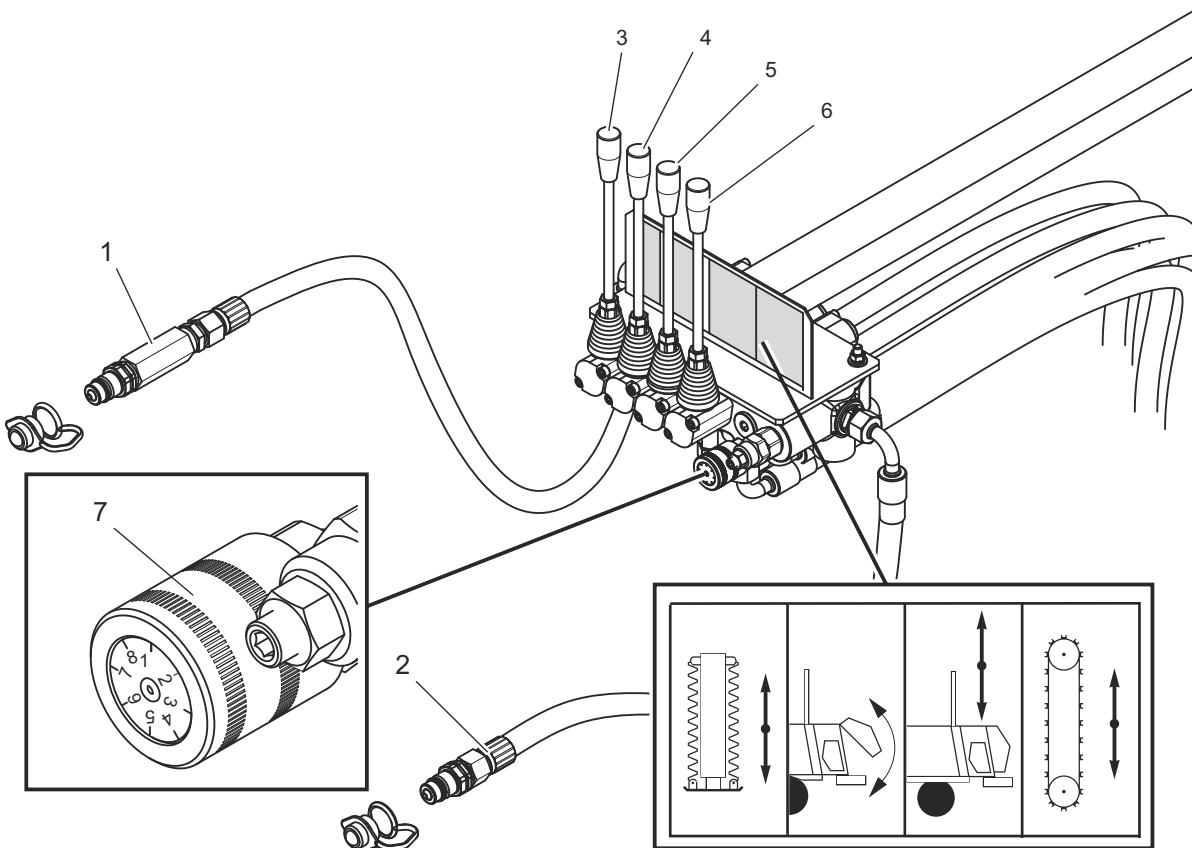
The hydraulic hoses of the steer lock system are marked with green plugs.

The steering lock is controlled from the tractor cabin by the lever of the external hydraulic distributor in the tractor. Locking and releasing the lock is done by extending or retracting the hydraulic cylinder piston rod (1). The hydraulic hoses (2) for connecting to the tractor are equipped with

quick couplings - plugs (3) and secured  
with plugs (4).

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### 3.11 HYDRAULIC SYSTEM (CONTROL FROM THE SPREADER)



624-G.11-1

**Figure 3.10** Hydraulic distributor

- (1) return line with check valve      (2) supply line (3) lever to control the hydraulic support  
 (4) lever to control the rear cover of the adapter      (5) slide control lever  
 (6) chain conveyor control lever      (7) chain conveyor speed adjustment knob

#### ADVICE

The spreader's hydraulic system was filled with L-HL32 Lotos hydraulic oil.

The hydraulic system for controlling the distributor from the manure spreader can be mounted optionally. It consists of four independent circuits controlling individual machine components:

- chain conveyor drive,
- hydraulic support,
- rear flaps of the spreading adapter,
- lock.

To control the operation of these circuits, a hydraulic distributor is supplied from the tractor's external hydraulic system. The control is carried out by means of levers 3, 4, 5, 6 - figure (3.10).

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### 3.12 SERVICE BRAKE













Depending on the version of the manure spreader, the manure spreader may have one of three types of service brake

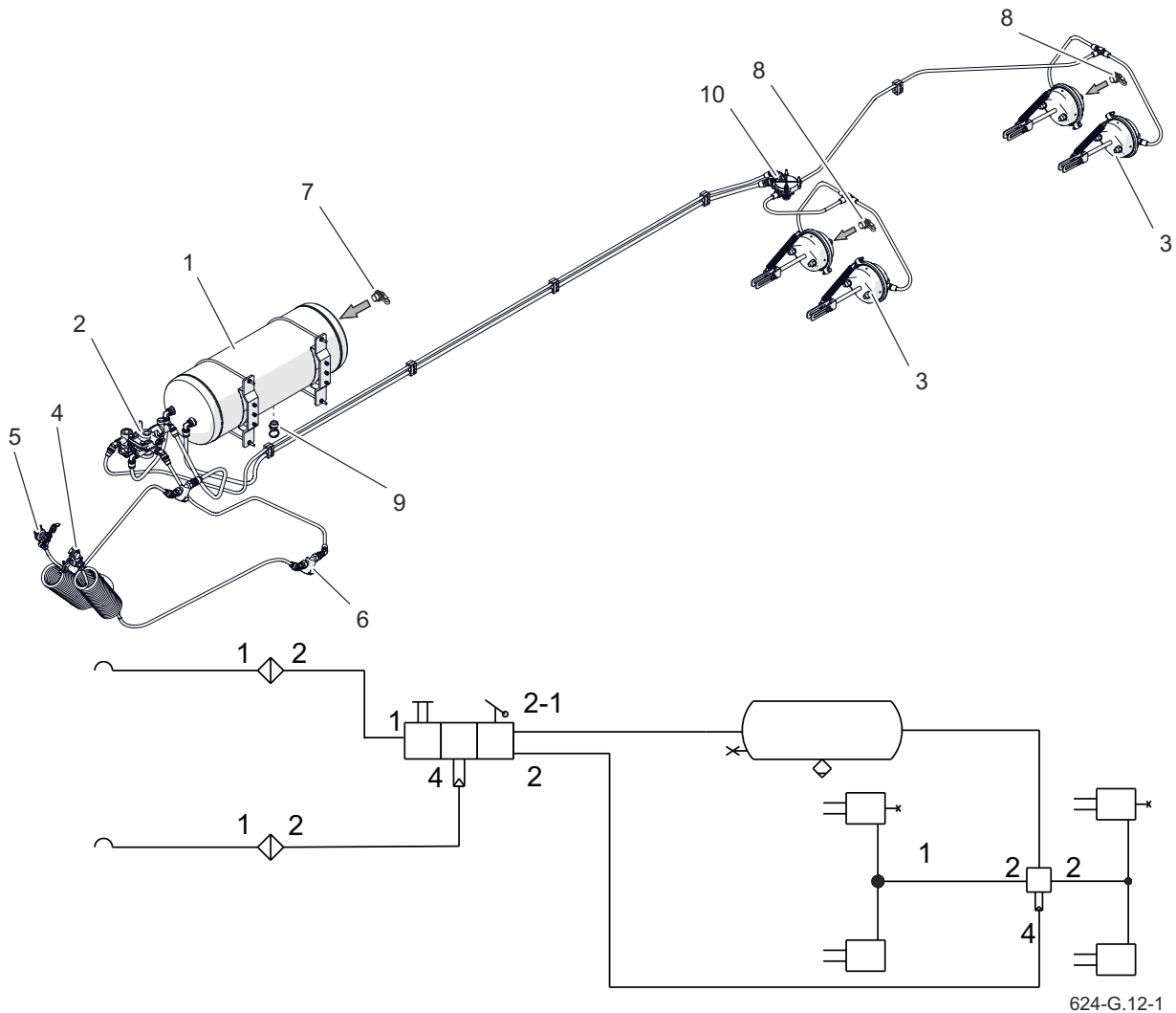
- 2-line pneumatic system with manual braking force regulator - figure (3.11),
- 2-line pneumatic system with automatic braking force regulator - figure (3.12),

- hydraulic braking system, figure (3.13).

The service brake is activated from the driver's cab by pressing the tractor brake pedal. The task of the control valve (2) used in pneumatic systems - figure (3.11), (3.11) is to activate the spreader brakes simultaneously with the tractor brake applied.

**Table 3.2.** List of symbols used in the schemes

Symbol	Description
	Pneumatic connection, plug
	Pneumatic connection, socket
	Drainage valve
	Main control valve
	Relay valve
	Automatic braking force regulator
	Manual braking force regulator
	Wire connection
	Air tank
	Brake cylinder
	Control valve (connector)
	Air filter



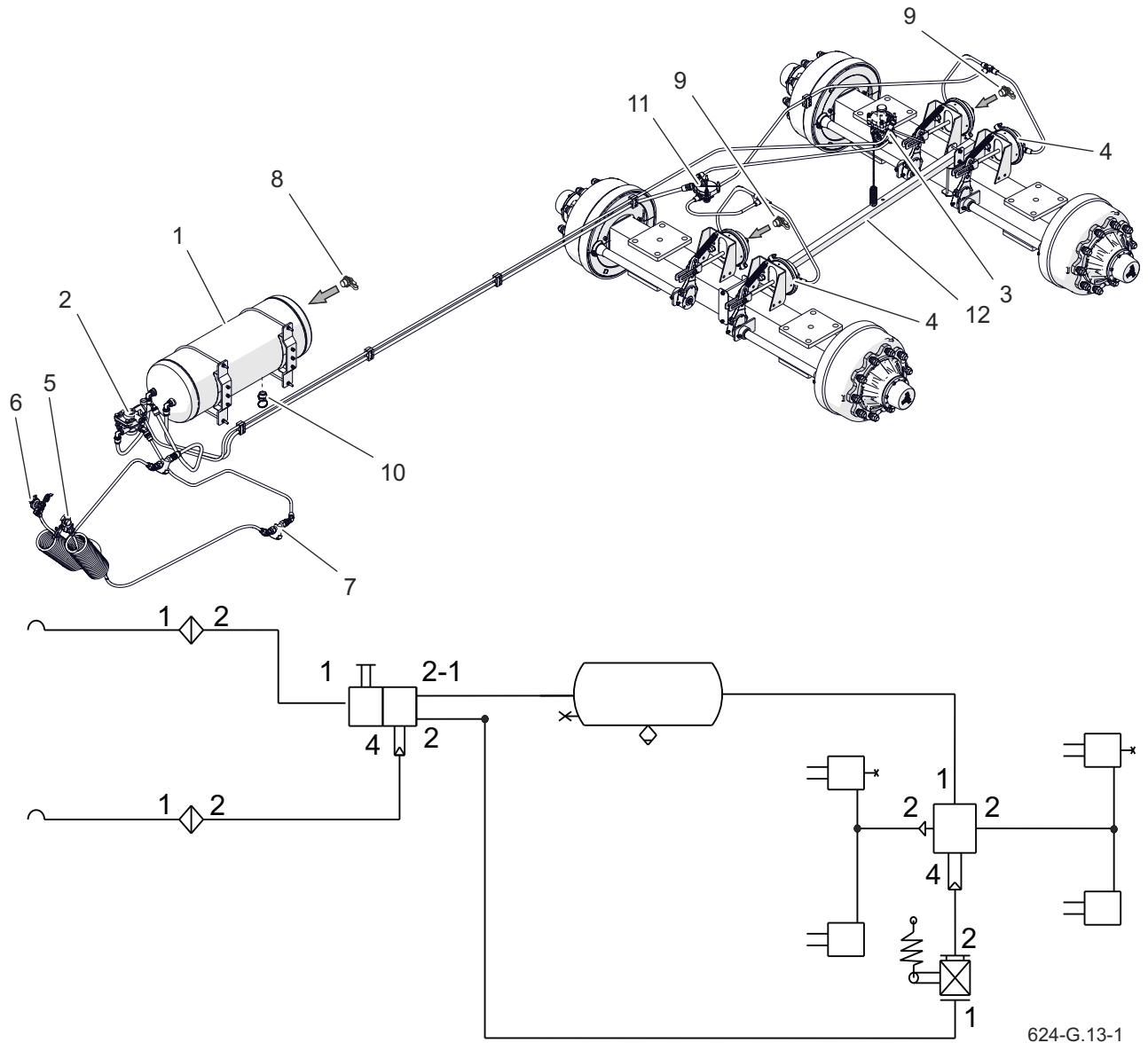
**Figure 3.11** Construction and diagram of a 2-wire pneumatic system with a manual regulator

- |                        |   |                                |
|------------------------|---|--------------------------------|
| (1) air tank           | (2) control valve with manual brake force regulator |                                |
| (3) pneumatic cylinder | (4) wiring connector (yellow)                       | (5) wiring connector (red)     |
| (6) air filter         | (7) air tank control connector                      | (8) actuator control connector |
| (9) drain valve        | (10) relay valve                                    |                                |

In addition, in the event of an unforeseen disconnection of the hose between the spreader and the tractor, the control valve automatically applies the machine's brake (applies only to pneumatic systems). The valve used has a button (2) - figure (3.15) releasing the brake used when the manure spreader is disconnected from the tractor. After connecting the air line to the tractor,

the release device automatically adjusts to the position enabling normal operation of the brakes.

The three-band braking force regulator - figure (3.14) used in pneumatic systems adjusts the braking force depending on the setting. Switching to the appropriate operating mode is done manually by the machine operator before starting the journey



624-G.13-1

**Figure 3.12** Construction and diagram of a 2-wire pneumatic system with an automatic regulator

- |                        |                                |                                |
|------------------------|--------------------------------|--------------------------------|
| (1) air tank           | (2) control valve              | (3) braking force regulator    |
| (4) pneumatic cylinder | (5) wiring connector (yellow)  | (6) wiring connector (red)     |
| (7) air filter         | (8) air tank control connector | (9) actuator control connector |
| (10) drain valve       | (11) relay valve               |                                |

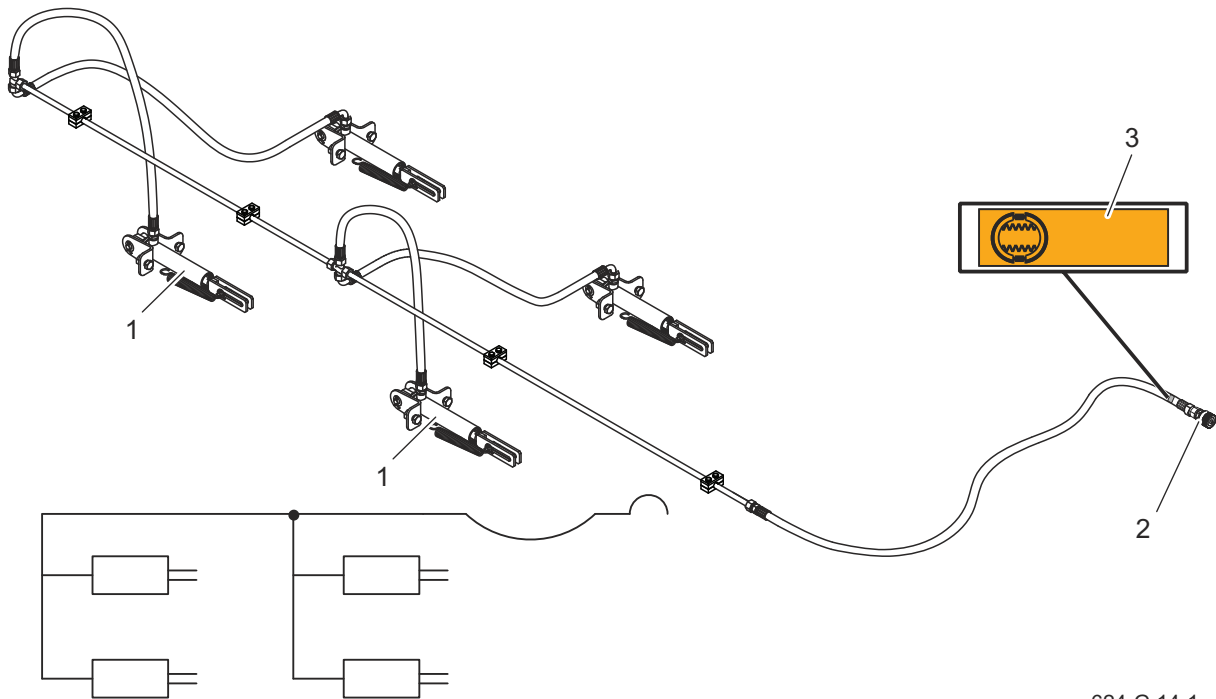
using the lever (2). Three work positions are available:

- A - "Without load"
- B - „Half-load"
- C - „Full load".

Pneumatic brake cylinders used in the

system are mounted on specially prepared brackets welded to the driving axles.

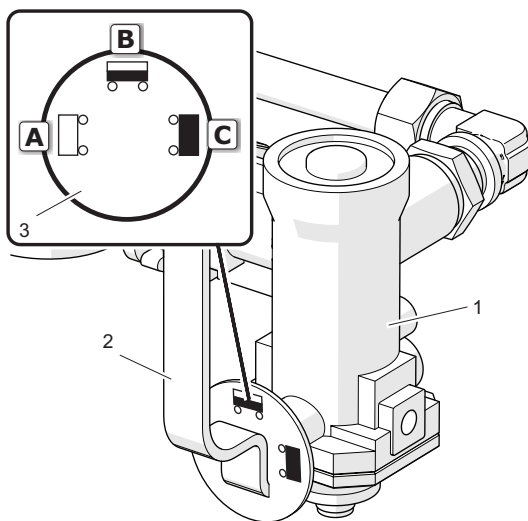
In the case of pneumatic cylinders, the air supplied to the cylinder exerts pressure on the diaphragm, which in turn moves the cylinder piston rod and rotates the axle



624-G.14-1

**Figure 3.13** Construction and diagram hydraulic braking system

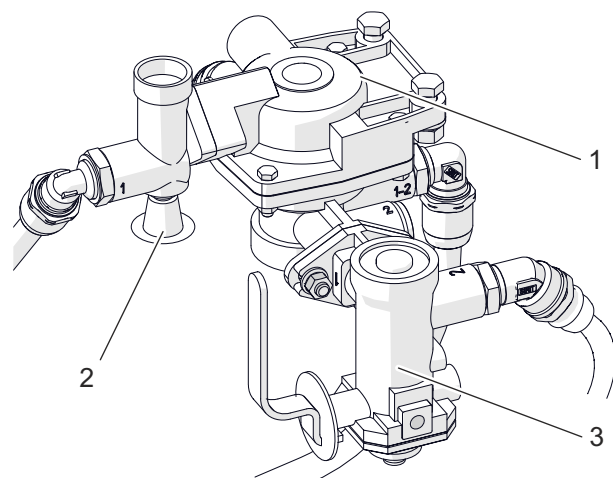
(1) hydraulic cylinder (2) hydraulic quick coupler (3) information sticker



526-G.08-1

**Figure 3.14** Tri-band braking force regulator

(1) regulator (2) lever (3) setting disc (A) (B) (C)



624-G.15-1

**Figure 3.15** Control valve

(1) Main control valve (2) brake release button (3) manual braking force regulator

axle expander lever. The return of the actuator to the neutral position is supported by the extraction springs. The relay valve (10) is designed to increase the aeration

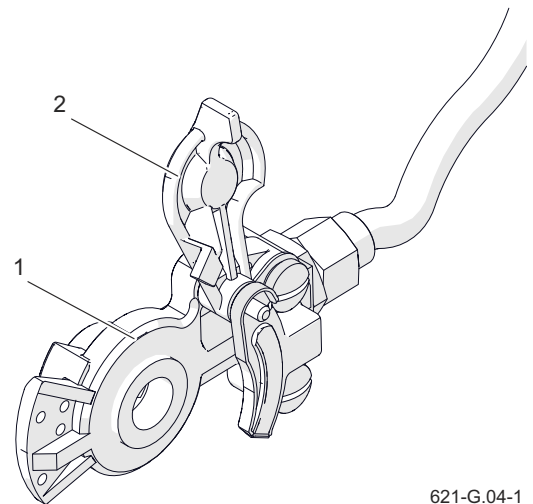
and deaeration speed of pneumatic cylinders during the braking process.

Automatic braking force regulator (3) - figure (3.12) adjusts braking pressure depending on how much the manure

spreader is loading. It requires no maintenance during normal operation.

### PNEUMATIC CONNECTIONS

Pneumatic connections are equipped with covers (2) - figure (3.16), protecting them against dirt and dust entering the system. They are made of coloured plastic (red connector - supply air, yellow connector, control air). The connectors are made in accordance with the recommendations of DIN ISO 1728, which makes it impossible to mistakenly connect the connectors to agricultural tractor sockets. After uncoupling the manure spreader, pneumatic connections should be placed in sockets



621-G.04-1

**Figure 3.16** Pneumatic connections

(1) connection body

(2) connection body

prepared for this purpose, located on the pipe support.

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### 3.13 PARKING BRAKE

The parking brake is used to immobilize the manure spreader during parking. The brake crank mechanism (1) is located on the left side of the manure spreader, it is attached to the lower frame longitudinal member.

The expander levers (2) of the front axle axle are connected to the crank mechanism by means of a cable (3).

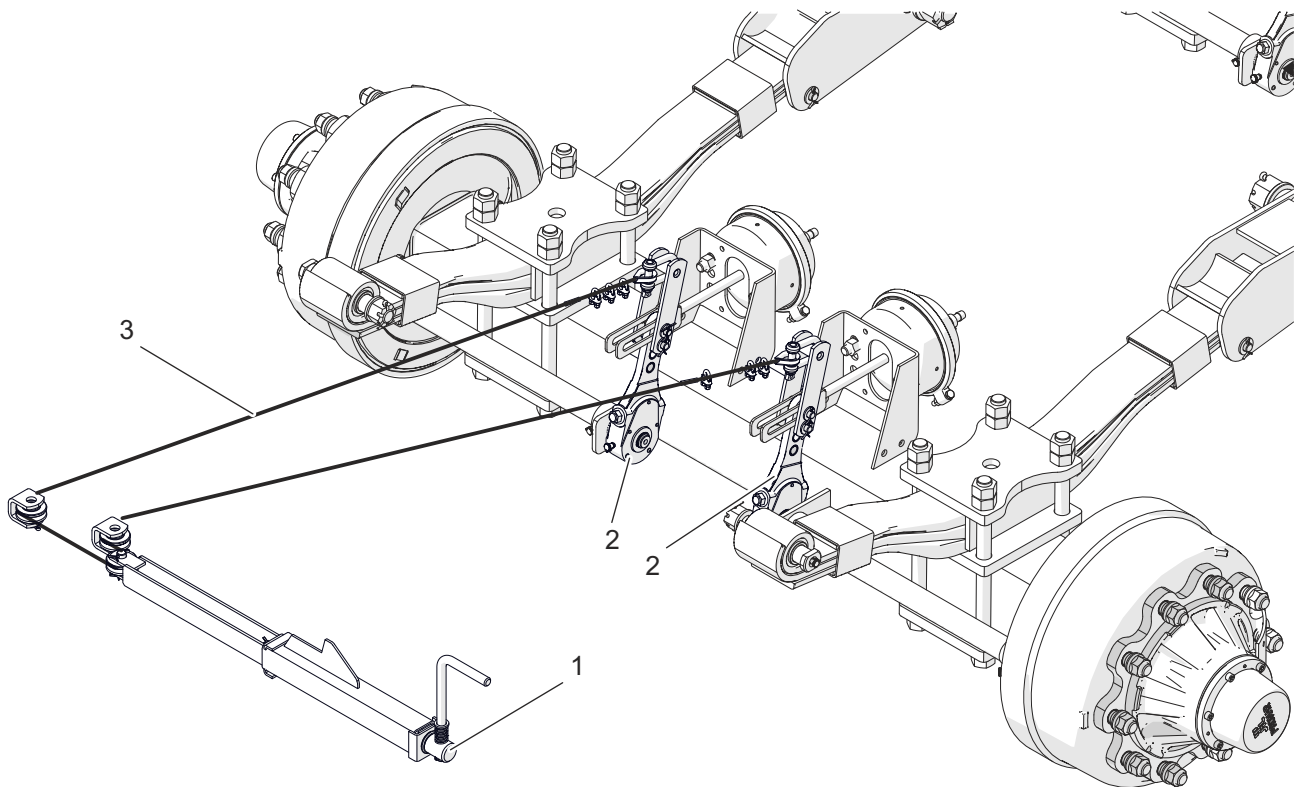
By turning the mechanism crank (1) (clockwise), the steel cable tensions,

#### CAUTION

Before driving, make sure that the parking brake is unlocked.

causing the brake expander levers to swing, which, by opening the brake shoes, cause the manure spreader to stop.

The parking brake must be released before driving - the steel cable must hang loosely.



624-G.16-1

**Figure 3.17** Parking brake construction

(1) crank mechanism    (2) spreader lever    (3) steel cable

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### 3.14 HYDRAULIC LOCK SYSTEM

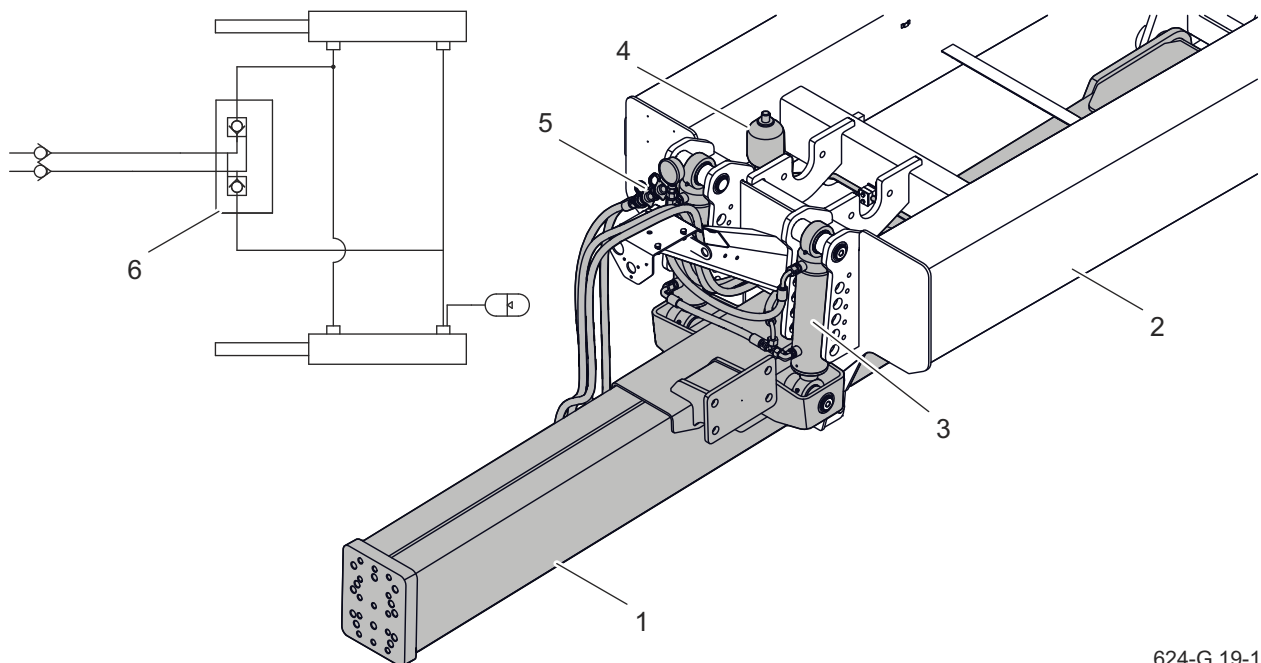
The manure spreader can optionally be equipped with a hydraulically damped drawbar with smooth height adjustment for connecting to the tractor. The hydraulic system is supplied from the tractor's external hydraulics system through hydraulic hoses connected to the sockets of one tractor section by means of quick couplings (5).

Raising or lowering the drawbar is used to

#### ADVICE

The spreader's hydraulic system was filled with L-HL32 Lotos hydraulic oil.

level the manure spreader and it is done by extending or extending piston rods of hydraulic cylinders (3). The system has a hydraulic accumulator (4) which is designed to absorb vibration transmitted to the tractor.



624-G.19-1

**Figure 3.18** Construction of drawbar with hydraulic shock absorption

(1) drawbar                      (2) lower frame    (3) hydraulic cylinder    (4) hydraulic accumulator  
(5) quick coupler - plug    (6) hydraulic lock

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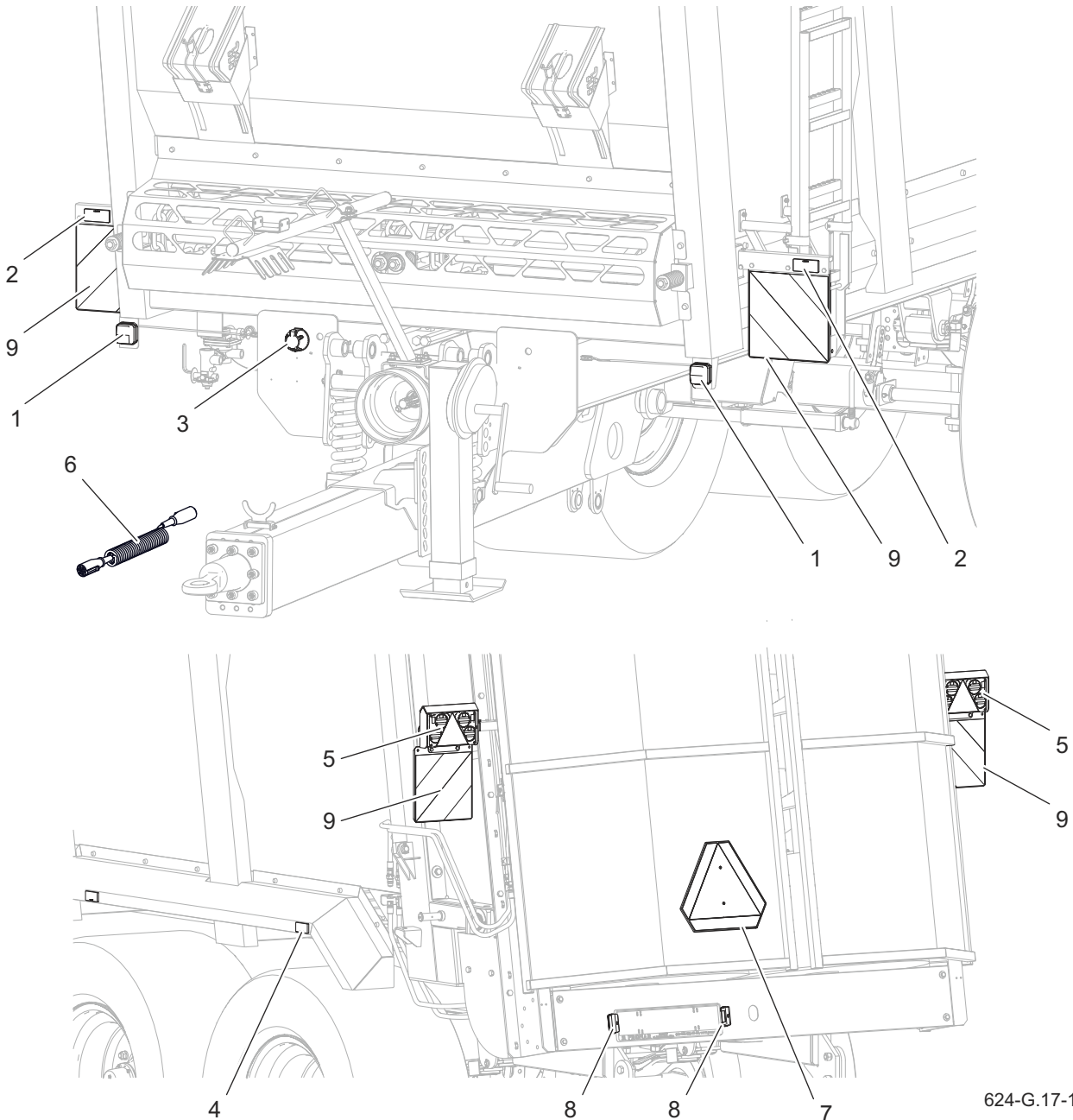
### 3.15 ELECTRICAL LIGHTING INSTALLATION

The electric lighting system of the manure spreader is adapted for 12 V DC supply.

Connecting the machine's electrical

system with the tractor should be done with a suitable connection cable attached to the

manure spreader as standard equipment.



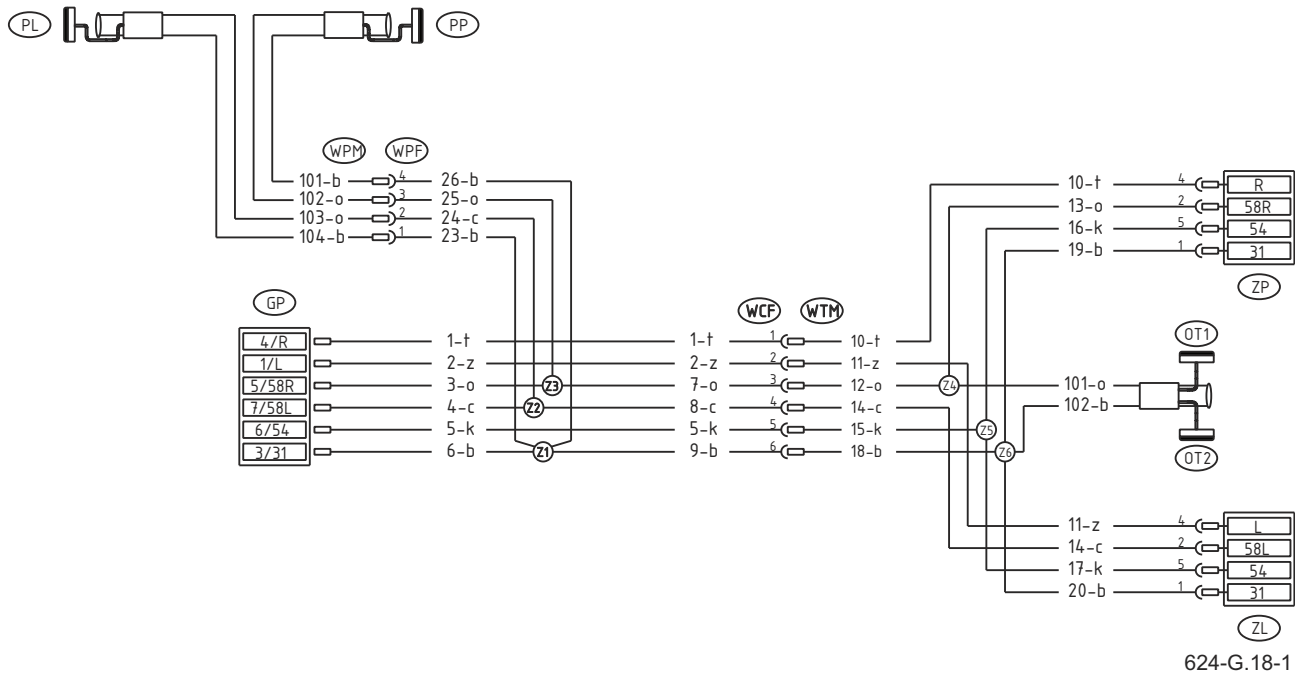
**Figure 3.19** Arrangement of electric installation elements and reflective elements

- |                               |                                |                       |                      |
|-------------------------------|--------------------------------|-----------------------|----------------------|
| (1) front position lamp       | (2) white reflector            | (3) connection socket | (4) orange reflector |
| (5) rear multifunctional lamp | (6) connection cable 7pin-7pin | (7) distinctive plate |                      |
| (8) license plate lamp        | (9) warning plate              |                       |                      |

624-G.17-1

G.3.1.624.14.1.EN





**Figure 3.20** Electrical system diagram  
Designations according to the table (3.3) and (3.4)

**Table 3.3.** Electrical scheme markings

Symbol	Function
GP	Front 7 poles socket
PP	Front right plate lamp
PL	Front left plate lamp
ZP	Multifunctional rear right lamp
ZL	Multifunctional rear left lamp
OT	Board lighting lamp

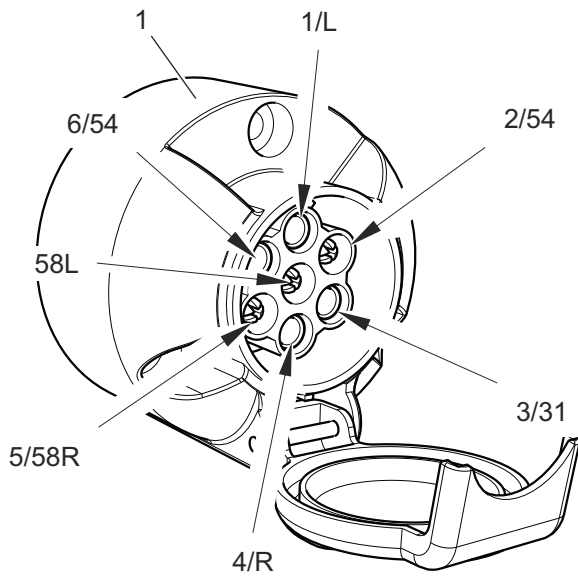
**Table 3.4.** Colour coding of wires

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



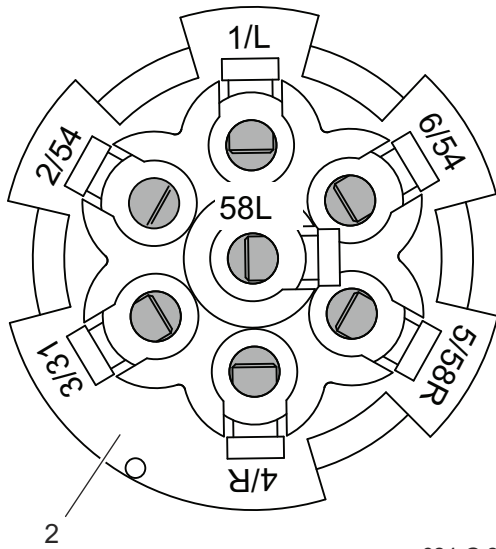
**CAUTION**

The machine lamps work only when the manure spreader is connected to the agricultural tractor and the position lights are on.



**Table 3.5.** Markings of connection socket

Marking	Function (wire colour)
1/L	Left indicator (yellow)
2/54	Not used
3/31	Weight (white)
4/R	Right indicator (green)
5/58R	Rear right position light (brown)
6/54	STOP light (red)
58L	Rear left position light (black)



624-G.20-1

**Figure 3.21** Connection socket

(1) socket

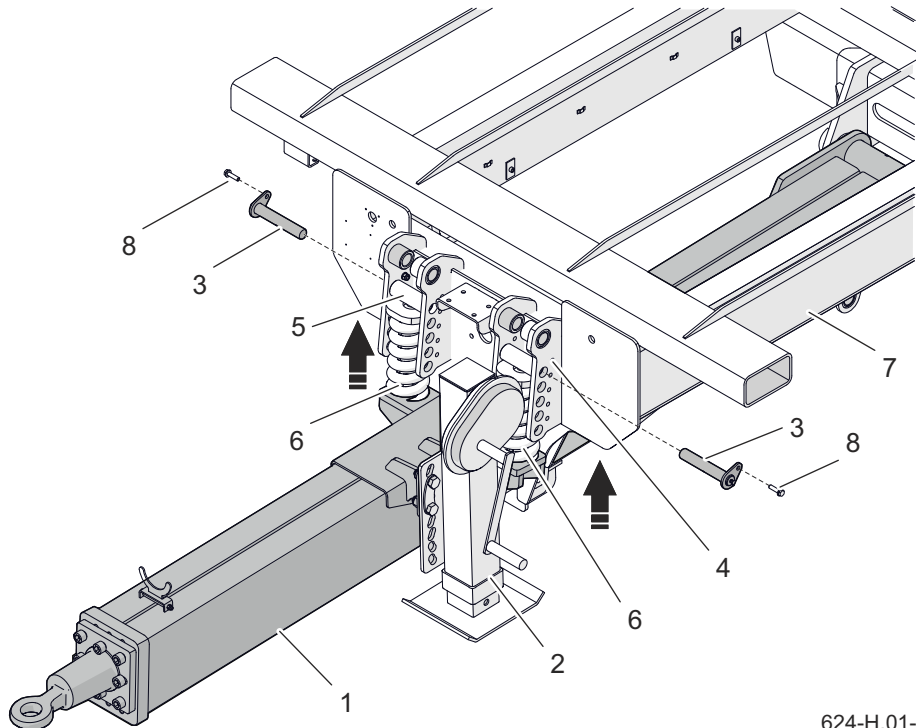
(2) beam side view

# CHAPTER 4

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RULES OF USE

## 4.1 ADJUSTING THE POSITION OF THE DRAWBAR



624-H.01-1

**Figure 4.1** Adjusting the height of the cushioned drawbar using springs

(1) drawbar                      (2) support                      (3) spring bolt                      (4) spring guide  
 (5) spring mount                      (6) spring                      (7) lower frame                      (8) screw

The position of the drawbar should be selected individually depending on the size of tires in the manure spreader, and depending on the height of the hitch on the tractor with which the machine is to be aggregated. The height should be set so that, after connecting to the tractor, the manure spreader is leveled, which ensures even weight distribution of the manure spreader on the axles. If it is necessary to adjust the drawbar position, perform the following actions - figure (4.1):

- immobilize manure spreader with parking brake.

- secure the manure spreader against rolling by placing wedges under the wheels,
- support the manure spreader on both sides of the drawbar under the front beam of the lower frame (7) (places marked with an arrow) using brackets of appropriate height and strength.
- the drawbar (1) should be supported by a telescopic support (2) or a hydraulic support,
- remove the coupling of the drawbar with the lower frame (7) by unscrewing the screws (8) and pulling

**CAUTION**

The drawbar spring tension is selected and set by the manufacturer and cannot be changed. Take special care during adjustment due to the significant weight of the drawbar and the possibility of limbs crushing.

the pins (3) from the mounting sleeve (5) of the springs (6),

- adjust the position of the drawbar relative to the lower frame using the telescopic support crank (2) or in the case of hydraulic support using the manifold lever on the tractor. Adjust the height of the drawbar so that the holes in the spring guide (4) coincide with the holes in the spring mounting sleeve (5). The manure spreader design enables 5 different drawbar heights.
- after determining the height of the drawbar, mount the pins (3) and tighten the screws (8) to the torque according to table 5.8.

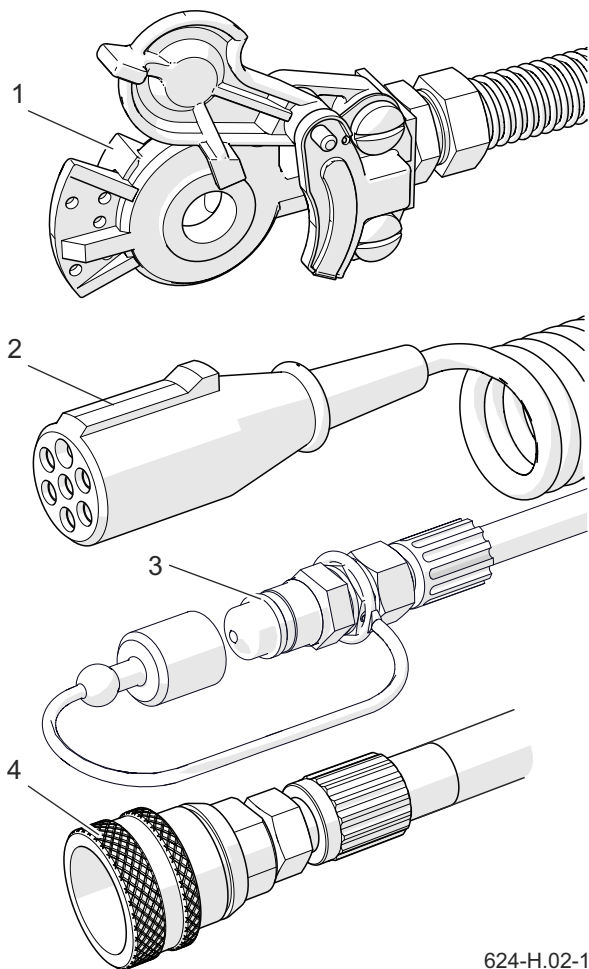
The manure spreader can optionally be equipped with a hydraulically suspended drawbar - figure (3.18).

After connecting the manure spreader to the tractor, connect hydraulic quick couplings (5) of the drawbar hydraulic system (1) to one section of the hydraulic distributor in the tractor. If it is necessary to adjust the drawbar position, use the manifold lever on the tractor to determine the position of the hydraulic cylinders (3) so that the manure spreader is levelled.

It should also be checked whether the piston rods of the drawbar suspension cylinders can work at a minimum distance of 30 - 50 mm. Keeping this distance ensures that the drawbar cushioning works correctly. It is unacceptable to drive when the cylinders' rods are retracted to the maximum (drawbar eye in the maximum upper position), drawbar cushioning will not work.

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## 4.2 CONNECTING AND COUPLING OF THE MANURE SPREADER



624-H.02-1

**Figure 4.2** Manure spreader connections

- (1) pneumatic brake plug  
 (2) 7pin electric plug (3) hydraulic plug  
 (4) hydraulic brake socket

In order to connect the spreader with the tractor, perform the following actions in order.

- Make a visual assessment of the manure spreader's technical condition.
- Immobilize manure spreader with parking brake.

*Turn the brake mechanism*

*clockwise as far as it will go. Immobilize the manure spreader with the parking brake.*

- Position the agricultural tractor directly in front of the drawbar eye.
- Adjust the height of the drawbar eye using the support so that the manure spreader can be connected.
- For telescopic support, adjust the height of the drawbar eye by turning the crank in the correct direction.



### DANGER

During hitching, unauthorized persons must not be between the manure spreader and the tractor. The agricultural tractor operator when connecting the machine should take particular care during work and make sure that unauthorized persons are not in the danger zone during coupling.

When connecting the hydraulic or pneumatic conduits to the tractor, make sure that the tractor and manure spreader installations are not under pressure.

When coupling, take special care to ensure proper visibility.

After completing the coupling check the safety of the coupling bolt.



### CAUTION

The manure spreader may only be connected to a technically sound agricultural tractor, if all connections (electrical, hydraulic and pneumatic), as well as the hitch on the agricultural tractor are in accordance with the manufacturer's requirements. Pay attention to the compatibility of oils in the tractor's hydraulic system and in the hydraulic systems of the manure spreader.

Refer to subchapter (4.3).

- If you have a folded hydraulic support - figure (3.8), pull back the tractor and connect the hydraulic hose of the support to it. Adjust the height of the drawbar eye using the tractor manifold lever.

Refer to subchapter (4.4).

- Connect the manure spreader to the appropriate hitch on the tractor, check the coupling safety device protecting the machine against accidental disconnection. If an automatic coupling is used in the agricultural tractor, make sure that the aggregation operation is completed and the drawbar eye is secured.
- Raise support leg up. In case of an folded hydraulic support, turn to driving position and secure with a pin and a split pin.

Refer to subchapters (4.3), (4.4).

- After hitching to the tractor, the manure spreader must be levelled. The empty manure spreader can be tilted slightly forward (approx. 50mm) from the level. If the manure spreader is not level, adjust the position of the manure spreader drawbar - chapter (4.1) or tractor hitch.
- Turn off the tractor engine and remove the keys from the ignition.

Close the tractor cabin and secure it against unauthorized access. Secure the tractor with the parking brake.

- Connect the brake pneumatic system lines.



**CAUTION**

When connecting pneumatic conduits of a 2-wire system, first connect the pneumatic conduit marked yellow to the pneumatic yellow socket on the tractor and then the conduit marked red to the pneumatic red socket on the tractor.

- If the manure spreader has a hydraulic braking system, connect the hose terminated with the pos.4 socket - figure (4.2) to the tractor hydraulic braking system plug.
- Connect the hydraulic hoses of the floor conveyor installation to one section on the tractor.

*The conduits used to connect the conveyor have been marked with stickers in the form of arrows indicating the direction of hydraulic oil flow - see chapter (3.7).*

**ADVICE**

If the manure spreader is parked for a long time, it may turn out that the air pressure in the pneumatic braking system is insufficient to release the brake shoes. In this case, after starting the tractor and the air compressor, wait until the air in the pneumatic tank is topped up.

**ADVICE**

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

- Connect the hydraulic hoses of the adapter rear control flaps to one section on the tractor.

*The cables used to control the rear flaps have been marked with labels - see chapter (3.6).*

- Connect the hydraulic hoses of the slide control system to one section on the tractor.

*The cables used to control lock have been marked with labels - see chapter (3.8).*

- Connect the PTO shaft to the tractor and secure it against turning with the aid of safety chains.

*Make sure that the coupling ends on the power take-off shaft fit together correctly and the coupling is securely fastened.*

- Connect the main connection cable for the lighting installation - see chapter (3.15).
- Perform daily inspection of the manure spreader.
- If the manure spreader is functional, you can start working.
- Immediately before driving, remove

**DANGER**

Before connecting the PTO shaft, it is essential to read the instructions attached by the shaft manufacturer and follow all the recommendations contained therein.

Before connecting to the tractor, check the technical condition of the shaft covers, completeness and condition of the chains protecting the cover against rotation.

**CAUTION**

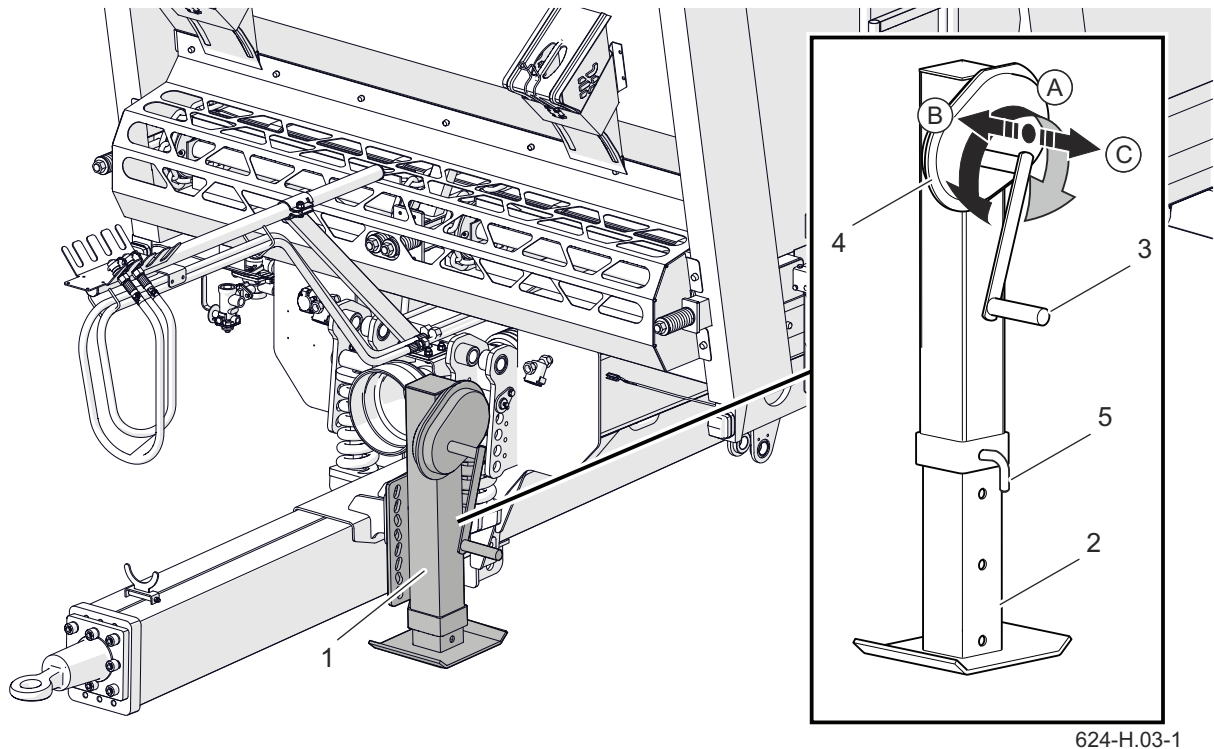
After completing the coupling, secure the hydraulic, braking and electrical wiring in such a way that they do not become entangled in the moving parts of the agricultural tractor during travel and are not exposed to kinking or cutting during turning.

the wheel chocks and release the machine parking brake.

H.3.10.624.02.1.EN



## 4.3 TELESCOPIC SUPPORT SERVICE



**Figure 4.3** Drawbar height setting

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

Determining the correct height of the drawbar eye relative to the tractor's hitch can be obtained with the help of a telescopic support with a mechanical transmission - figure (4.3).

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

### Raising the support



### DANGER

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

- Remove the securing bolt (5).
- Move the crank (3) of the support from neutral (A) to position (B).
- By turning the crank in the right direction, raise the support foot (2) maximally up.
- Install the safety pin.
- Set the crank to neutral (A).

### Lowering the support

- Remove the securing bolt.

*Raise the support foot slightly up, this will make it easier to remove the safety pin.*

- Set the crank (3) to position (B) or (C).
- By turning the crank in the right

direction, lower the support to the ground, or adjust the height of the tendon in relation to the hitch (if the manure spreader is to be connected to the tractor).

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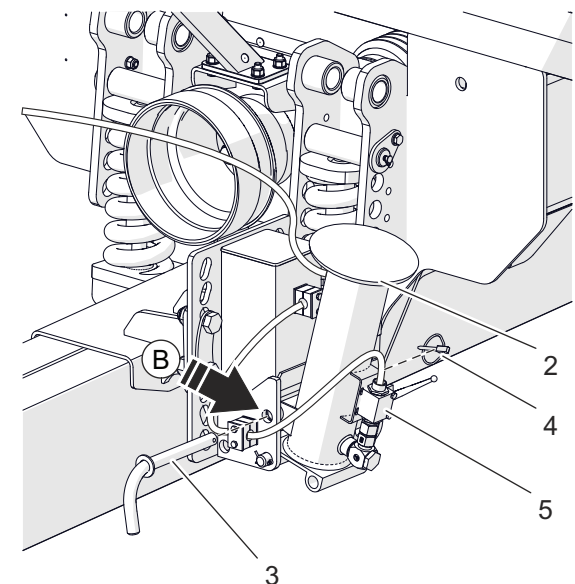
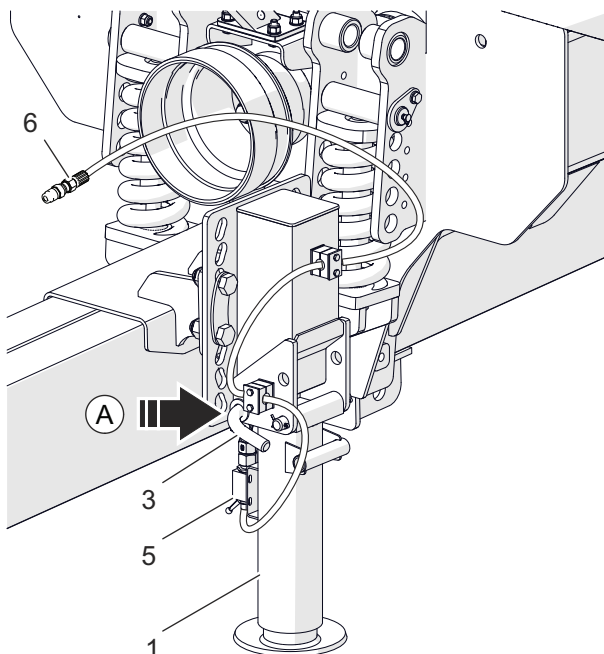
## 4.4 OPERATION OF THE BROKEN HYDRAULIC SUPPORT

### MOVING THE SUPPORT IN DRIVING POSITION

- Immobilize tractor and manure spreader with parking brake.

*The manure spreader must be connected to the tractor.*

*Connect the hydraulic hose (6) to the hydraulic socket on the tractor.*



624-H.04-1

**Figure 4.4** Operation of the hydraulic support

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

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



### DANGER

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

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



### CAUTION

It is forbidden to start and drive with the support raised only by means of an actuator. The support must be moved to the driving position. The manure spreader must NOT be driven if the support securing elements - bolt (3) and cotter pin (4) are damaged or lost.

- Release the cotter pin (4) and remove the locking pin (3) from the hole in position (A).
- Turn the support foot to position (2).
- Transfer the pin (3) to position (B) and secure with a cotter pin (4).
- Release the parking brake of the manure spreader before driving.
- Transfer the bolt to position (A) and secure with a cotter pin (4).
- Set the shut-off valve (5) to the open position.
- By operating the distributor in the tractor, lower the the support foot.
- The drawbar hitching eye should be slightly raised in relation to the hitch on the tractor, which will facilitate later connection of the manure spreader.
- When the height of the drawbar eye is set, set the tractor manifold lever in the "neutral" position.
- Lock the support position by moving the valve lever (5) to the closed position.

### **MOVING THE SUPPORT TO PARKING POSITION**

- Immobilize tractor and manure spreader with parking brake.
- Release the cotter pin (4) and pull the safety pin out of position (B) - figure (4.4).
- Turn support to position (1).

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## 4.5 TEST RUN

Start the tractor, check individual systems and carry out a test run of the manure spreader without a load. It is recommended that visual inspection be carried out by two people, one of them should be in the tractor's cab all the time. The test run must be carried out in the order shown below.

- Connect the manure spreader to appropriate hitch on agricultural tractor.
- Connect the PTO shaft and secure it properly.
- Raise parking support.
- Connect the brake, electrical and hydraulic system lines.
- Check the efficiency of the lighting system.
- Start the agricultural tractor.
- When moving off check the operation of the service brake.
- Check the operation of the chain conveyor (hydraulics controlled from the tractor).

---

*On the flow regulator (pos. 1 - figure (3.6)) mounted on the cable arm at the front of the manure spreader, set the feed speed by turning the regulator knob from "0" to the maximum "10" position. Use the appropriate tractor manifold lever to*

*start the chain conveyor and observe through the holes in the front cover to check that the feed direction is correct. The forward or backward movement of the conveyor is changed by the tractor's distribution lever. Check the correct connection of the hoses and the operation of the flow regulator.*

---

- Start and check the correct operation of the adapter rear flap control system.

---

*Open and close the hatches using the appropriate tractor manifold lever.*

---

- Start and check the correct operation of the slide control system.

---

*Use the appropriate tractor manifold lever to raise and lower the shutter.*

---

- If you have a manure spreader with hydraulics controlled from the manure spreader - figure (3.10), use the appropriate lever to start and check the operation of individual hydraulic systems.
- At low revolutions start the PTO drive in the tractor (starting the drive of the spreading drums of the adapter).

Leave at low speed for several minutes, during which you should check:

- whether the drive system and the adapter are subject to knocks or noise resulting from rubbing of metal elements,
- whether the adapter spreading drums rotate smoothly and without any jams.

- Switch off PTO drive, turn off tractor engine and disconnect the manure spreader from the tractor.

The manure spreader can be used when all preparatory activities have been completed successfully. If during the test run of the manure spreader, disturbing symptoms such as:

- noise and unnatural noises from rubbing moving parts against the spreader structure,
- hydraulic oil leakage,



## DANGER

Before starting tractor with connected machine make sure that the PTO drive is switched off. Otherwise, the machine may start uncontrolled.

It is forbidden to use a different PTO rotation speed than 1000 rpm. The use of a different PTO speed will cause the spreading drums to have insufficient rotation, and the drive will be exposed to damage.

- oil leakage from adapter gear and / or chain conveyor gear.
- pressure drop in the braking system,
- Incorrect hydraulic cylinders operation,
- brake cylinder blocking,
- other suspected faults

immediately cut off the oil supply, switch off tractor PTO drive and locate the fault. If the fault cannot be rectified or remedied, it may invalidate the warranty, contact the point of sale or the Manufacturer directly to clarify the problem or repair it.

H.3.10.624.05.1.EN

## 4.6 LOADING THE LOADING BOX

Before starting loading, check that there are no persons, animals or objects inside the load box and that the load box gate is completely closed. For loading, the correctly coupled manure spreader with the tractor should be placed on level and stable ground. Both machines should be immobilized with the parking brake.

When loading the manure spreader, it is recommended to use the appropriate type of loader or conveyor. If a forklift loader is used for loading, the width of the forklift should not exceed one machine box length. The forklift should be emptied by tilting at a height that does not exceed the height of the crate by more than 1 m. Do not artificially compact manure. When loading, be careful not to overload the manure spreader. The loading height must not exceed the height of the adapter clearance.



### CAUTION

It is forbidden to exceed the permissible load capacity of the manure spreader, as this threatens road safety and may cause damage to the machine. Uneven loading results in uneven spreading of material over the field. Before driving off, check that the adapter flaps and load box slide are closed. The loading height must not exceed the height of the adapter clearance. When loading the manure spreader without a gate, be careful not to throw manure on the adapter so that it has a no-load start.



### DANGER

It is forbidden to transport people and animals. Loading is prohibited if there is anyone inside the box. Manure spreader overloading, inefficient loading and securing of loads are the most common causes of accidents during transport. Keep a safe distance from overhead power lines during operation.

The load should be evenly distributed in the load box to ensure optimal spreading. Loading of material should take place from the rear to the front of the manure

**Table 4.1.** Approximate volumetric weights of selected loads

Type of material	Volumetric weight kg/m <sup>3</sup>
Organic fertilizers:	
Old manure	700 - 800
Settled down manure	800 - 900
Fresh manure	700 - 750
Compost	950 – 1,100
Fresh peat	700 - 850

spreader, which has a positive effect on the quality of subsequent spreading.

Due to the different density of materials for fertilization, the use of the total capacity of the load box may exceed the allowable capacity of the manure spreader. Approximate specific weight of selected materials is presented in table (4.1). Therefore, pay special attention not to overload the manure spreader.

Before travelling on a public road, clean the horizontal elements of the manure spreader such as the drawbar, wall edges from accidentally laden load.

Regardless of the type of transported load, the user is obliged to secure it in such a way that the load cannot move freely and cause contamination of the road. If this is not possible, it is prohibited to transport this type of load

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## 4.7 DISCONNECTING FROM THE TRACTOR

In order to disconnect the manure spreader from the tractor, perform the following actions.

- After stopping the tractor, brake the manure spreader with the parking brake.
- Place safety wedges under the manure spreader wheel.

*The wheel chocks must be set so that one of them is at the front of the wheel and the other at the rear.*

- Lower the drawbar support to parking position.

*Refer to subchapters (4.3), (4.4).*

- Reduce residual pressure in the hydraulic system by moving the appropriate hydraulic circuit control lever.
- Switch off the tractor engine. Close the tractor cabin and secure it against unauthorized access.
- Disconnect the lighting electrical wiring.
- Disconnect hydraulic system lines and put in appropriate sockets. Protect plugs of these wires against contamination by putting on caps.
- Disconnect the pneumatic system lines.
- Secure the cable ends with covers.



### CAUTION

It is forbidden to park the loaded manure spreader, disconnected from the tractor and supported by the support.

When disconnecting the spreader from the tractor, take particular care. Ensure good visibility. Unless it is necessary, do not stay between the machine and the tractor.

Before disconnecting cables, drawbar eye and PTO shaft, close tractor cab to secure it against unauthorized access. The tractor engine must be turned off.

The manure spreader disconnected from the tractor should be immobilized with the parking brake and secured against rolling by placing wedges under the wheels.



### CAUTION

When disconnecting the braking system pneumatic hoses, first disconnect the red line and then the yellow line.

Insert the plugs into their respective places.

- Disconnect the PTO shaft and place it on the bracket. If the machine will not be used for a long time, the shaft must be disconnected completely.
- Disconnect the manure spreader drawbar eye from the tractor hitch and drive the tractor away.

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## 4.8 LOAD TRANSPORTATION

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

- Before moving off make sure that there are no bystanders, especially children, near the spreader and tractor. Ensure proper visibility.
- Make sure that the manure spreader is correctly connected to the tractor and tractor's hitch is properly secured.
- Depending on the load condition of the manure spreader, set the appropriate operating mode of the braking force regulator figure (3.14).
- The vertical load carried by the spreader drawbar eye affects the steering of the agricultural tractor.
- The spreader must not be overloaded, the load must be distributed evenly in such a way that it does not exceed the permissible pressure on the spreader's running gear. Exceeding the permissible load capacity of the vehicle is forbidden and may cause damage to the machine, and may also pose a threat during road travel for the tractor and spreader operator, or other road users.
- The permissible design speed and speed resulting from restrictions on road traffic regulations must not be exceeded. The travel speed should be adjusted to the prevailing road conditions, the condition of the manure spreader, the type of load carried and other conditions affecting the behaviour of the set while driving.
- The manure spreader disconnected from the tractor must be secured by immobilizing it with the parking brake and placing it under the wheel chocks. Leaving the machine unsecured is prohibited. In the event of a machine breakdown, stop at the side of the road without endangering other road users and mark the stopping place in accordance with traffic regulations.
- When traveling on public roads, the manure spreader must be marked with a slow-moving vehicle warning sign located on the tailgate of the adapter.
- The tractor operator is required to equip the manure spreader with an approved or approved warning reflective triangle.
- While driving, obey the rules of the road, signal the change of direction

by means of direction indicators, keep clean and take care of the technical condition of the lighting and signaling installation. Damaged or lost lighting and signaling components must be repaired or replaced immediately.

- Avoid ruts, depressions, ditches, or driving along roadside slopes. Driving across such obstacles can cause the spreader and tractor to tilt suddenly. This is particularly important because the center of gravity of the loaded spreader adversely affects driving safety. Driving near the edges of ditches or canals is dangerous due to the risk of landslides under the wheels of a spreader or tractor.
- The travel speed should be reduced sufficiently in advance of driving to curves, when driving on uneven or sloping terrain.
- When driving, avoid sharp turns, especially on slopes.
- When traveling on public roads, the

hydraulic gate valve must be completely closed.

**CAUTION**

Travelling with a volumetric load through ruts, ditches, slopes etc. poses a great risk of tipping over. Take special care.

- It should be remembered that the braking distance of the set increases significantly with the increase in the weight of the transported load and the increase in speed.
- Control the behavior of the spreader when driving on uneven terrain and adjust the speed to terrain and road conditions.
- Prolonged driving on sloping ground creates a risk of loss of braking efficiency.
- The manure spreader is adapted for driving on slopes up to a maximum of 8°. Moving the manure spreader over steep slopes may cause overturning due to loss of stability.

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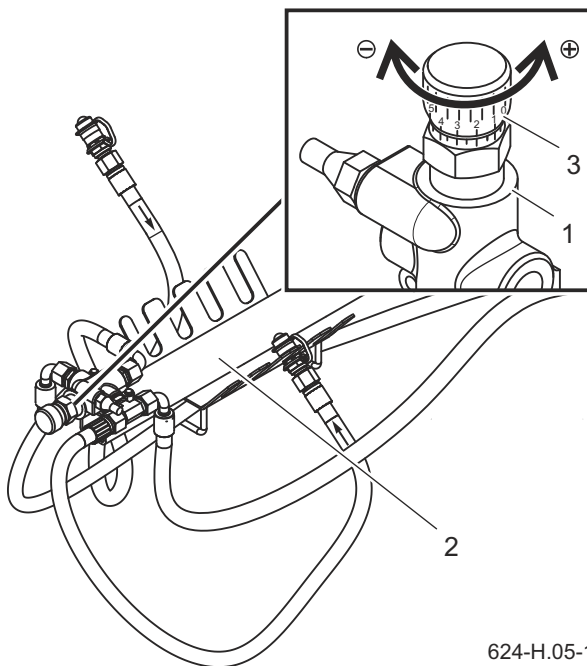
## 4.9 SPREADING AND FERTILIZING DOSE ADJUSTING

### ADJUSTING THE FERTILIZER DOSE

The amount of material scattered over a specific field surface depends on the following factors:

- loading height,
- working width - depends on the type of spread material,
- chain conveyor feed speed,
- driving speed.

The appropriate feed speed of the chain conveyor should be selected experimentally and set using the knob (3) of the flow regulator (1) located on the valve support (2) in the front part of the manure spreader - figure (4.5).



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**Figure 4.5** Feed speed adjustment  
 (1) flow regulator      (2) valve support  
 (3) adjustment knob

### ADVICE

The high travel speed and slow load travel give a small spread amount.

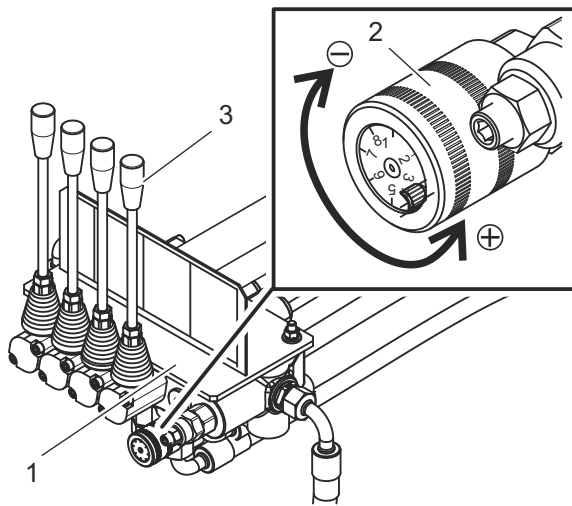
Low speed and fast load transfer give a large dose of spread

Different properties of the fertilized material (e.g. humidity, specific gravity, granulation), wind influence determine the spreading parameters, therefore it is not possible to determine in advance the settings of the spreader control devices. To do this, pre-set the machine, make a test and correct the settings if necessary.

- The feed speed is reduced by turning the regulator knob towards the "0" setting.
- The feed speed is increased by turning the regulator knob to the setting "10".

### SPREADER CONTROL

- If the manure spreader is equipped with a hydraulic system controlled from the manure spreader - figure (4.6) with a distributor (1) mounted on the cable support. Adjust the feed speed of the chain conveyor using the regulator knob (2) located on the distributor. To switch the conveyor feed and change the direction of movement, use the distributor lever (3).
- The feed speed is reduced by turning the regulator knob clockwise to the



624-H.06-1

**Figure 4.6** Feed speed regulation (spreader control)

(1) distributor (2) control knob  
(3) distributor lever

setting "1".

- The feed speed is increased by turning the regulator knob counterclockwise to the maximum setting of "8".

### ADVICE

The correct working range of the regulator begins with the second turn of the knob. Increasing the oil flow, and thus the speed of the hydraulic motor and the speed of the chain conveyor occurs by turning the knob counterclockwise. The dial is scaled from 1 to 8 (figure (4.6)). The highest conveyor speed is obtained by unscrewing the regulator knob until it stops.

## SPREADING THE MATERIAL IN THE FIELD

Before starting work, check the condition of the hydraulic connections and protective covers on the manure spreader and the articulated telescopic shaft again.

The procedure for starting the manure spreader to spread manure across the field.

- Set the tractor - straight ahead spreader set in the place where fertilization will start.
- Use the appropriate manifold lever on the tractor to open the rear flaps (if equipped). Spreading limitation and precise fertilization at the field boundaries is achieved by appropriate setting and immobilization of the adapter flaps.

*The damper is blocked by closing the hydraulic valve (4) - figure (3.5) on the flap side we want to close. The degree of opening of the second adapter flap is adjusted by means of the distributor lever from the tractor cabin.*

### ADVICE

To limit spreading to one side, open both flaps fully. Then, using the hydraulic valve, close the damper that will not be controlled and change the position of the second damper from the tractor.

- Set the tractor PTO shaft speed to the right for the machine  $n = 1000$  rpm.
- Activate the adapter by engaging the PTO drive on the tractor.

*Start the tractor PTO shaft at slow revolutions to avoid*

damaging the PTO shaft.

- Increase engine speed until proper shaft speed is 1000 rpm and keep within this range.
- Raise the load box slide to the maximum.
- Switch on the chain conveyor.

Check if we have the right direction of travel.

- Switch on the appropriate gear of the tractor and start work.

**ADVICE**

To get an even spread at the beginning of work, the PTO speed must be increased to 1000 rpm while the machine is at a standstill and the chain conveyor switched on. Start work only when sufficient material has been delivered to the adapter drums.

- At headland turns, disconnect the PTO shaft after first switching off the chain conveyor drive. This protects

**CAUTION**

It is forbidden to use a different PTO rotation speed than 1000 rpm. The use of a different PTO speed will cause the spreading drums to have insufficient rotation, and the drive will be exposed to damage. It is forbidden to use a different order of starting the manure spreader during spreading. The feeding mechanism can only be activated when the valve is raised. The load can be moved forward only in exceptional situations, e.g. when the spreading drums are blocked or if the tractor's rear wheels lose grip. When moving the load forward, the load should not come into contact with the front wall due to the possibility of damage to the load box or drive train. Before turning and during transport the tractor PTO drive should be turned off after first switching off the chain conveyor drive. Do not open or close the flaps when they are blocked by shut-off valves on both sides. This may damage the hydraulic cylinders and / or the adapter flaps.

the telescopic articulated shaft and ensures even spreading across the field.

**ADVICE**

If the wide-angle shaft is mounted to connect the manure spreader with the tractor, it is not necessary to disengage the PTO drive at the headland during work.

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## 4.10 CLOGGING OF THE SPREADING MECHANISM

During the spreading process, if the spreading drums of the adapter are blocked by the activation of the automatic safety clutch on the articulated telescopic shaft.

### UNLOCKING THE ADAPTER

- Switch off PTO drive and disconnect PTO shaft.
- Change the direction of movement of the feeding mechanism for a moment (towards the front wall) by switching the distribution lever on the tractor.

*Reverse the conveyor enough that the spread material does not press on the adapter shafts.*

- Stop the agricultural tractor and turn off the engine, remove the tractor ignition key, secure the manure spreader and tractor against rolling by placing wedges. Close the tractor cab and secure it against access by unauthorized persons.
- Remove the elements blocking the spreading adapter with a suitable



### DANGER

For maintenance work with the adapter flaps open, secure them against closing by closing the stop valve.



### CAUTION

The direction of movement of the feeding mechanism with the load box loaded can be reversed only briefly.

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

Perform maintenance and repair activities applying general principles of health and safety at work. In the event of a cut, the wound should be immediately washed and disinfected. In case of serious injuries consult a physician.

tool.

*Winded strings, possibly located in manure, should be removed, because otherwise they may lead to lower quality of manure spreading. The wound string is removed with a sharp tool.*

- Start the tractor and engage the PTO drive in order to clean the remaining material.

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## 4.11 USE OF TIRES

- When working with tires, the manure spreader should be secured against rolling by placing chocks under the wheels. It is recommended to disassemble the wheel only if the manure spreader is not loaded.
- Repair work on wheels or tires should be carried out by persons trained and authorized to do so. These works should be carried out using appropriately selected tools.
- Checking the tightening of the wheel nuts should be carried out after the first use of the manure spreader, every 2-3 hours during the first month of using the machine and then every 30 hours of driving. Each time, repeat all operations if the wheel was disassembled. Wheel nuts should be tightened in accordance with the recommendations contained in the *Technical Maintenance Schedule* chapter.
- Regularly check and maintain proper tire pressure as recommended in the instructions (especially after a long break of not using the spreader).
- Tire pressure should also be checked during all-day intensive work. It should be taken into account that an increase in tire temperature can increase the pressure by up to 1 bar. With such a rise in temperature and pressure, reduce the load or speed.
- Never reduce pressure by venting if it increases due to temperature.
- Tire valves should be protected with caps to avoid penetration of dirt.
- Do not exceed the maximum spreader speed.
- During the whole day cycle, take a minimum of one hour break at noon.
- Observe breaks while driving to cool the tires.
- Avoid damaged surfaces, sudden and variable maneuvers, and high speeds when turning.

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## 4.12 CLEANING

Every day after finishing work, it is necessary to thoroughly clean the manure spreader of any scattered material. The use of a pressure washer obliges the user to become familiar with the principle of operation and recommendations for the safe operation of this device.

Guidelines for cleaning the spreader.

- Immobilize the manure spreader and tractor with the parking brake, place chocks under the manure spreader wheel.
- Turn off the tractor engine and remove the keys from the ignition.
- Secure the tractor against unauthorized persons.
- Clean and wash the manure spreader with a strong stream of water and allow to dry in a dry and ventilated place.

*The use of pressure washers increases the effectiveness of washing, but be careful when work. During washing, the nozzle of the cleaning aggregate must not be closer than 50 cm from the surface being cleaned.*

*The water temperature should not exceed 55°C.*

*Paint damage may occur*



### DANGER

Refer to the instructions for using cleaning detergents and preservatives.

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

When cleaning the machine and staying on the slats of the chain conveyor, the tractor engine must be turned off and the articulated telescopic shaft must be disconnected.

*when washing with excessive pressure.*

*Do not direct the water jet directly at the elements of the manure spreader system and equipment, i.e. control valve, brake cylinders, pneumatic, electric and hydraulic plugs, lights, electrical connector, information and warning decals, nameplate, pipe connectors, lubrication points, etc. High water pressure may cause mechanical damage to these components.*

- For cleaning and maintenance of plastic surfaces, it is recommended to use clean water or specialized preparations intended for this purpose.
- Do not use organic solvents, preparations of unknown origin or other substances that may damage the lacquered, rubber or plastic surface.

It is recommended to make a test on an invisible surface in case of doubt.

- Surfaces oily or greasy by grease should be cleaned with petrol or degreasing agents, and then washed with clean water and detergent. Follow the cleaning agent manufacturer's instructions.
- Detergents intended for washing should be stored in their original containers, or alternatively, but marked exactly. The preparations cannot

be stored in containers intended for storing food and beverages.

- Observe environmental protection principles, wash manure spreader in designated places.
- Washing and drying the spreader must take place at an ambient temperature above 0 °C.

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

**CAUTION**

After each end of work, the manure spreader should be cleaned of residues of spreading material. After washing, wait for the manure spreader to dry and then grease all grease points as recommended. Wipe off excess grease or oil with a dry cloth. During work, use appropriate, close-fitting protective clothing, gloves and the right tools.

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## 4.13 PREPARATION FOR THE END OF THE SEASON

After finishing work, the manure spreader should be properly prepared for wintering.

To do this:

- thoroughly clean from manure debris and wash according to chapter 4.12.
- check technical condition of: bearings, shields, chains, electrical installation, pneumatic system and signaling,
- grease all lubrication points of the manure spreader,
- check tire pressure on road wheels,
- a corroded or damaged surface should be cleaned and properly protected with a thin layer of grease, anti-corrosive agent or primer,
- protect the PTO shaft, check the condition of the shaft covers, lubricate the moving parts of the shaft in accordance with the shaft manufacturer's operating instructions,
- inspect the most wearing parts and replace if necessary,
- tires should be maintained at least once a year using the available means for this purpose.

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## 4.14 PREPARATION FOR THE SEASON

- Check the technical condition of: bearings, covers, chains.
- Check the completeness and technical condition of the adapter's shredding knives and replace if necessary.
- Check the technical condition of the electrical system. Check the lighting operation.
- Check the tightness of the pneumatic and hydraulic systems.
- Check the condition of wear on the hydraulic hoses. Replace worn or damaged hydraulic hoses immediately.
- Check technical condition of PTO shaft, guards and securing chains.
- Check the oil level in the adapter gear.
- Check the oil level in the transmission gear.
- Lubricate all spreader points.
- Check the tire pressure on the road wheels.
- Check the tension of the floor conveyor chain and adjust if necessary.
- Check the setting of the brake lever and adjust if necessary.
- Check the condition of the screw connections, tighten if necessary according to the table (5.8).
- Check the degree of wear of the drawbar eye.
- Check the drawbar and frame for scratches and cracks.
- Check the condition of the slats of the floor conveyor mechanism, replace if necessary.

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## 4.15 STORAGE

- After finishing work, the manure spreader should be thoroughly cleaned and washed.
- In the event of damage to the paint coating, damaged areas must be cleaned of rust and dust, degreased, and then painted with paint while maintaining a uniform color and uniform thickness of the protective coating. Until painting, damaged areas should be covered with a thin layer of grease, anti-corrosive agent or primer.
- It is recommended that the manure spreader be stored indoors or under a roof.
- For long-term storage outside the room, it must be protected against the effects of weather conditions, especially factors causing corrosion of steel and accelerating the aging of tires.
- In the event of a longer stop, it is necessary to lubricate all points regardless of the period of the last treatment.
- Rims and tires should be carefully washed and dried. During longer storage, it is recommended to move the machine once every 2-3 weeks so that the place of contact of the tire with the ground is in a different position. The tires will not deform and will maintain proper geometry. You should also check your tire pressure from time to time, and if necessary inflate the wheels to the correct value.
- Store the articulated telescopic shaft to connect with the tractor in a horizontal position.

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# CHAPTER 5

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## TECHNICAL INSPECTION SCHEDULE

## 5.1 GENERAL

This chapter describes all activities related to periodic inspections that you as the user are required to carry out in accordance with the assumed schedule. Constant control of the technical condition and the performance of maintenance operations are necessary to keep the machine in good technical condition. Maintenance activities that you can do yourself are described in the *Maintenance* chapter.

Repair of the machine during the warranty period may only be carried out by Authorized Sales and Service Points (APSiO). In the event of unauthorized



### CAUTION

It is forbidden to use a damaged machine. The manure spreader may only be towed when the braking system, lighting, draw bar and running gear are functional. Repairs during the warranty period may only be carried out by authorized service centres.

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

The manure spreader's warranty inspection is only carried out by authorized service centres.

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## 5.2 PERIODIC INSPECTIONS OF THE MANURE SPREADER

**Table 5.1.** Review categories

Category	Description	Responsible	Frequency
A	Daily review	Operator	Every day before first start-up or every 10 hours of continuous shift work.
B	Maintenance	Operator	The inspection is carried out periodically every 1000 kilometres travelled or every month the manure spreader works, whichever comes first. Each time before performing this review, a daily check must be carried out.
C	Maintenance	Operator	Inspection carried out periodically every 3 months. Each time before carrying out this inspection, carry out a daily inspection and inspection every one month of use of the manure spreader.
D	Maintenance	Operator	Inspection carried out periodically every 6 months. Each time before carrying out this inspection, perform a daily inspection, inspection every 1 month of manure spreader use and inspection every 3 months.
E	Maintenance	Operator	Inspection carried out periodically every 12 months. Each time before carrying out this inspection, perform a daily inspection, inspection every 1 month of manure spreader use and inspection every 3 months.
F	Maintenance	Service <sup>(1)</sup>	Inspection carried out every 4 years of manure spreader use

(1) - post-warranty service

**Table 5.2.** Technical inspection schedule

Description of activities	A	B	C	D	E	F	Page
Checking the air pressure in the wheels	•						5.7
Air tank drainage	•						5.8
Checking plugs and connection sockets	•						5.9
Covers inspection	•						5.10
Transmission oil filling and top-up	•						5.11
Control and regulation of floor conveyor chains tension	•						5.13
Checking and replacing the adapter knives	•						5.14
Checking the manure spreader before driving off	•						5.16
Measurement of air pressure, check tires and wheels		•					5.17
Cleaning the air filters			•				5.18
Checking brake lining wear				•			5.19
Checking the clearance of the axle bearings				•			5.20
Checking of mechanical brakes				•			5.22
Cleaning the drainage valve				•			5.23
Checking of parking brake cable tension					•		5.24
Hydraulic system Checking					•		5.26
Control of pneumatic braking system					•		5.27
Suspension control	See table: <i>Suspension control schedule.</i>						5.28
Lubrication	See table: <i>Spreader lubrication schedule.</i>						5.30

Description of activities	A	B	C	D	E	F	Page
Screw connections inspection	See chapter: <i>Screw connections inspection</i>						5.36
Transmission oil change	See table: <i>Transmission oil change inspection</i>						5.38
Replacement of hydraulic hoses						•	5.40

**Table 5.3.** Control parameters and settings

Description	Value	Notes
<b>Braking system</b>		
Piston rod stroke in pneumatic systems	25 - 45 mm	
Piston rod stroke in hydraulic systems	25 - 45 mm	
Minimum brake lining thickness	5 mm	
Angle between the spreader axis and the fork	90°	With the brake depressed
<b>Parking brake</b>		
Permitted parking brake cable clearance	20 mm	

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## 5.3 PREPARATION OF THE MANURE SPREADER FOR INSPECTION

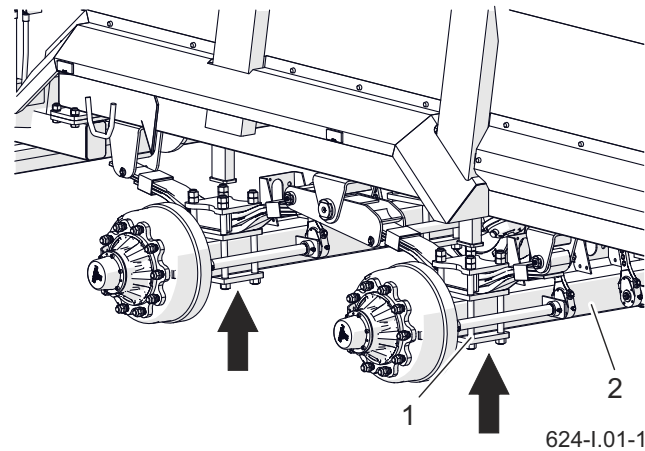


### DANGER

Secure the tractor cab against unauthorized access. When working with the jack, the user must read the instructions for this device and follow the manufacturer's instructions. The jack must stand firmly against the ground and the manure spreader elements. Before starting maintenance and repair work with the manure spreader lifted, make sure that the manure spreader is properly secured and will not roll during operation.

### THE SCOPE OF ACTIVITIES

- Hitch manure spreader to tractor.
- Place the tractor and spreader on firm and level ground for straight travel.
- Apply the tractor parking brake.
- Turn off the tractor engine and remove the keys from the ignition. Close the tractor cabin, thus protecting the tractor against unauthorized access.
- Place safety wedges under the manure spreader wheel. Ensure that the machine will not roll during inspection.
- In case when the wheel needs to be



**Figure 5.1** Recommended jack substitution points  
(1) axle fixing pin (2) road axle

raised during the inspection, place the locking wedges under the wheel on the opposite side under the rigid axle. Place the jack in places marked with an arrow. The jack must rest on a firm and stable surface.

- The jack must be suited to the spreader weight.
- In exceptional cases, release the manure spreader parking brake, e.g. when measuring the play of the axle shaft bearings. Take special care.

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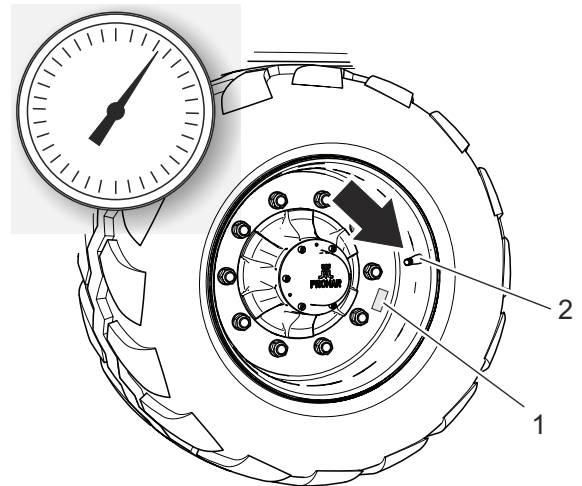
## 5.4 CHECKING THE AIR PRESSURE IN THE WHEELS

- Visually assess the degree of inflation of the road wheels.
- If you think the wheel is low on air, check the air pressure with a pressure gauge. If necessary, inflate the wheel to the required pressure.



### CAUTION

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



624-I.02-1

**Figure 5.2** Spreader wheel

(1) information sticker (2) valve

### ADVICE

The tire pressure value is on the information sticker on the wheel rim - figure (5.2).

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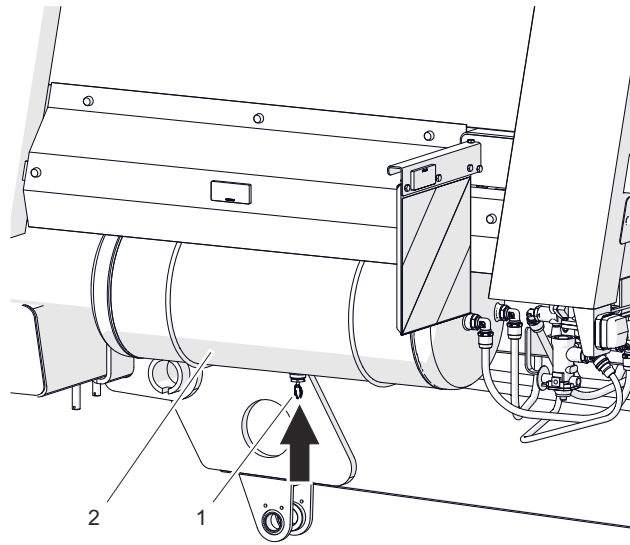
## 5.5 AIR TANK DRAINAGE

### THE SCOPE OF ACTIVITIES

- Press the stem of the drain valve (1) located at the bottom of the tank (2).

*The compressed air in the tank will remove water outside.*

- After releasing the stem, the valve should close automatically and stop the outflow of air from the tank.
- If the valve stem does not want to return to its position, wait until the tank empties. Then unscrew and clean or replace the valve with a new one.



624-I.03-1

**Figure 5.3** Air tank  
(1) drain valve (2) air tank

I.3.10.624.01.EN

## 5.6 CHECKING PLUGS AND CONNECTION SOCKETS



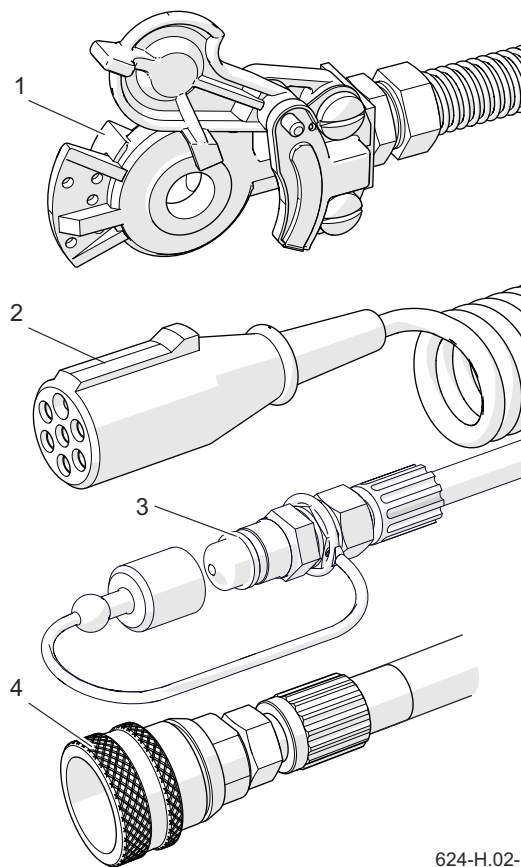
### DANGER

Faulty and dirty spreader connections can cause the braking system to malfunction.

A damaged body of the hydraulic or pneumatic hose connector or socket qualifies them for replacement. In the event of damage to the cover or gasket, replace these elements with new, functional ones. Contact of pneumatic connection seals with oils, grease, gasoline etc. may damage them and accelerate the aging process.

If the manure spreader is disconnected from the tractor, connections should be protected with covers or placed in their designated sockets. Before the winter period, it is recommended to preserve the seal with preparations intended for this purpose (e.g. silicone lubricants for rubber elements).

Each time before connecting the machine, check the technical condition and



624-H.02-1

**Figure 5.4** Manure spreader connections  
 (1) pneumatic brake plug  
 (2) 7pin electric plug (3) hydraulic plug  
 (4) hydraulic brake socket

degree of cleanliness of connections and sockets on the agricultural tractor. If necessary clean or repair tractor sockets.

I.3.10.624.06.1.EN

## 5.7 COVERS INSPECTION



### DANGER

The manure spreader must not be used with damaged or incomplete covers.

Covers protect the manure spreader user against loss of health or life or constitute a protective element of machine components. Therefore, their technical condition must be checked before commencing work. Damaged or lost components must be repaired or replaced immediately.

### THE SCOPE OF ACTIVITIES

- Check that the covers are correctly

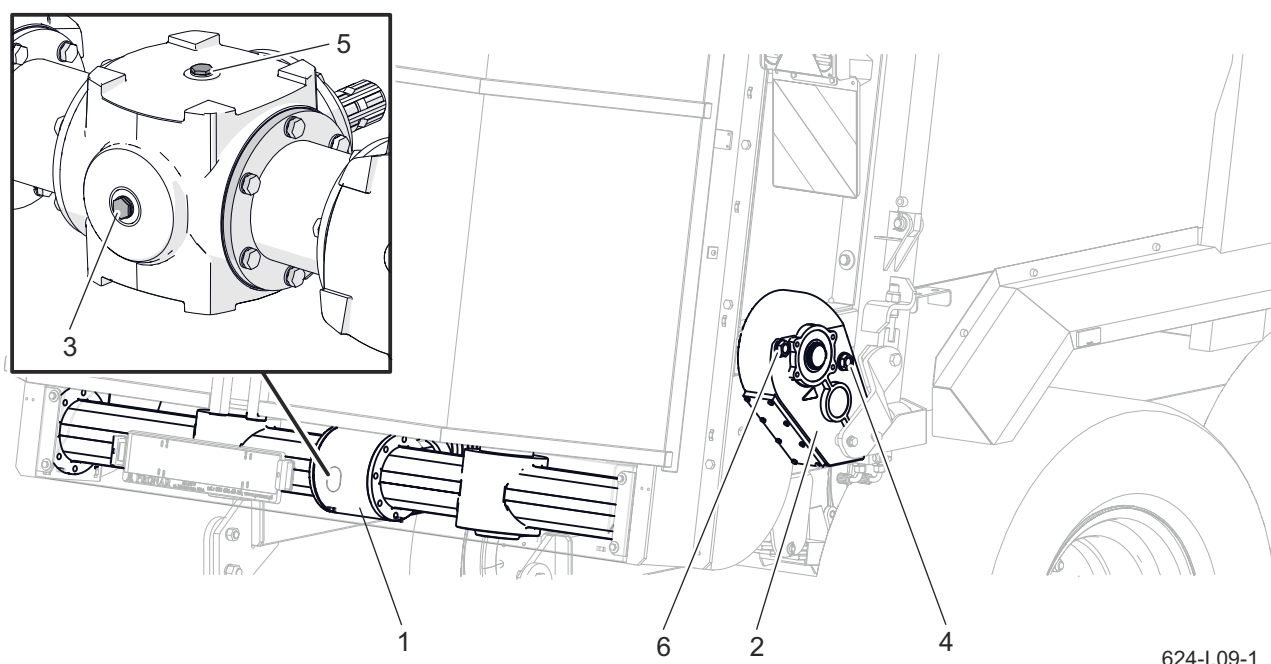
fitted, complete and undamaged, assess the condition of the fenders.

- Check the completeness of the wheel hubcaps.
- Check the condition of the front chain conveyor cover and adapter rear cover.
- Check the condition and completeness of the rear flaps of the adapter (if equipped).
- Check the condition of guards and safety chains of PTO shafts.
- If necessary, tighten the screw connections of the covers.

I.3.10.624.07.1.EN



## 5.8 TRANSMISSION OIL FILLING AND TOP-UP



624-I.09-1

**Figure 5.5** Gear check points

- |                        |                               |                       |
|------------------------|-------------------------------|-----------------------|
| (1) adapter drive gear | (2) floor conveyor drive gear | (3) oil sight glass I |
| (4) oil sight glass II | (5) filler plug I             | (6) filler plug II    |

### ADVICE

At the factory, the spreader gears are filled at the factory with SAE 90 EP gear oil (API GL-5 SAE 80W /90).



### DANGER

During work related to checking and replenishing oil, use appropriate personal protective equipment, i.e. protective clothing, footwear, gloves, glasses. Avoid oil contact with skin.

### OIL CHECK

- Set the machine level.
- Check the oil level in the adapter drive gearbox (1) through the transparent oil sight glass (3).

*The sight glass is visible in the notch on the rear cover of the adapter.*

- If necessary, unscrew the plug (5) and add oil to the required level. Tighten the plug.

*The oil level should be halfway*



### CAUTION

The oil level in gearboxes should be checked before each start up of the machine. During inspection, the transmission must be switched off and the oil must be cooled down. Avoid pouring excess oil. Too much oil can cause the transmission temperature to rise excessively. If you notice a leak, check the seal carefully and check the oil level. Transmission operation with low oil level or lack of oil may lead to permanent damage of its mechanisms.

*up the sight glass.*

- Check the oil level in the chain conveyor drive gear (2) through the

transparent oil sight glass (4).

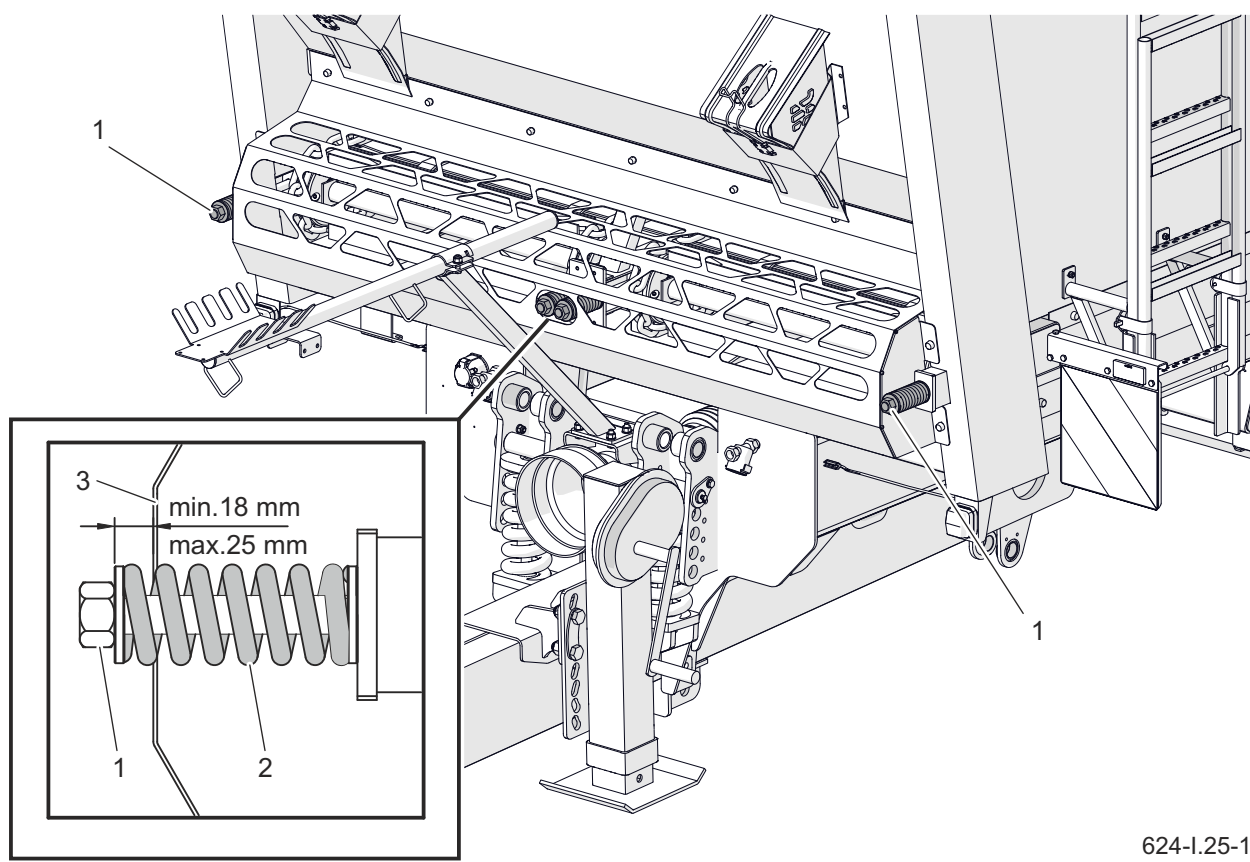
- If necessary, unscrew the plug (6) and add oil to the required level. Tighten

the plug.

The oil level should be halfway up the sight glass.

I.3.10.624.08.1.EN

## 5.9 CONTROL AND REGULATION OF FLOOR CONVEYOR CHAINS TENSION



624-I.25-1

**Figure 5.6** Floor chain tension adjustment

(1) adjustment screw

(2) tension spring

(3) conveyor front cover



### DANGER

Before starting inspection and adjustment, switch off the tractor engine and brake the tractor with the parking brake, remove the ignition key. Close the tractor cabin, thus protecting the tractor against unauthorized access.

The floor conveyor chain tension must be checked daily and in particular during the initial period of operation. The tension is measured on the springs of the front winding mechanism, at the front of the



### CAUTION

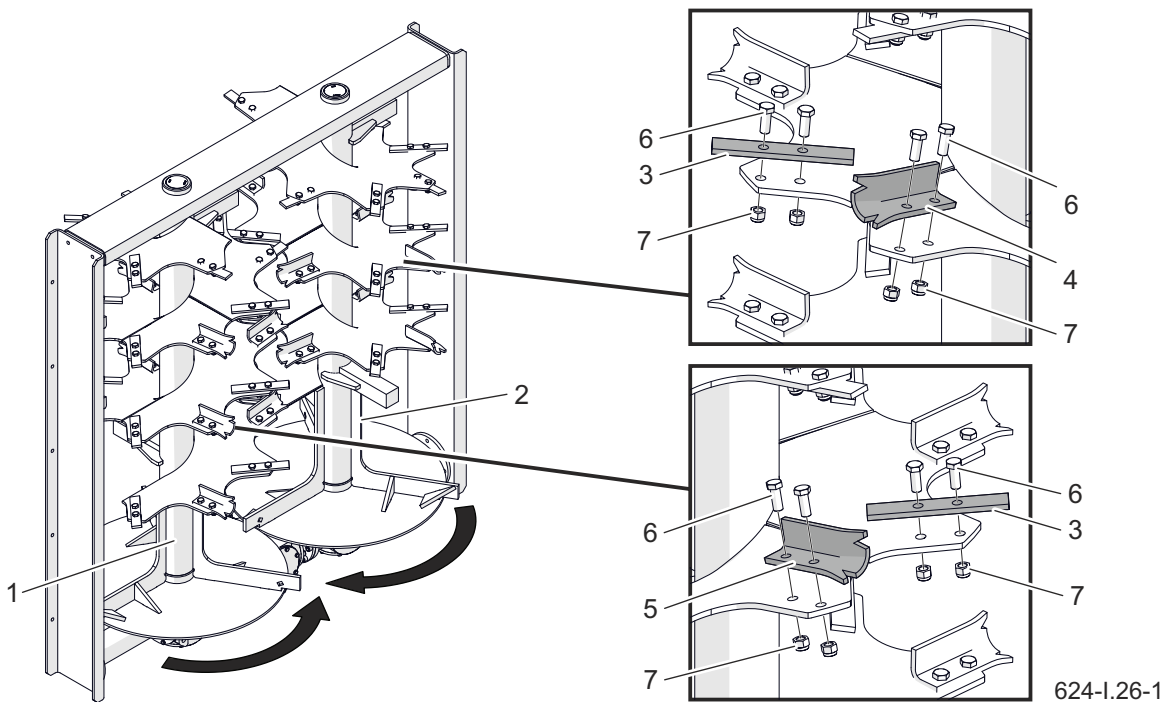
Each conveyor chain must be equally tensioned.

load box - figure (5.6).

The chain tension is adjusted by tensioning the springs (2) with the adjusting screws (1). The tension is adequate when the distance between the screw washer (1) and the conveyor front cover (3) is 18 - 25 mm - figure (5.6).

I.3.10.624.09.1.EN

## 5.10 CHECKING AND REPLACING THE ADAPTER KNIVES



**Figure 5.7** Checking and replacing the adapter knives  
 (1) drum spreading left, (2) drum spreading right, (3) straight chopping knife, (4) bent knife, (5) bent knife II, (6) screw, (7) nut

Check the condition of the chopping knives regularly, paying attention to mechanical damage, excessive wear and completeness of the fastening elements. In particular, it is important when spreading manure, which may contain stones or other foreign bodies, after installing new knives and after the first start of the machine.

Excessively worn or damaged blades and



### DANGER

Before starting inspection and replacement, switch off the tractor engine and brake the tractor with the parking brake, remove the ignition key. Close the tractor cabin, thus protecting the tractor against unauthorized access.

During working, pay attention to the unnatural vibrations and noises that can be generated by the machine.

Protect the rear covers (if equipped) by closing the shut-off valves for each cover.

**Table 5.4.** List of replaceable elements

Marking Figure 5.7	Name, catalogue number	Quantity
3	Flat knife / 535N-17010001	34
4	Bent knife / 535N-17010002	10
5	Bent knife II/ 535N-17020001	10
6	Screw M16x1,5x40-8.8 PN-EN ISO 8676	108
7	Self-locking nut M16x1,5-8 A2J PN-EN ISO 10512	108

clamping screws should be replaced. The list of replaceable elements is presented in the table (5.4).

Blades fixing bolts should be mounted with their heads up. Tighten the nuts with 170 Nm.

I.3.10.624.10.1.EN

## 5.11 CHECKING THE MANURE SPREADER BEFORE DRIVING OFF

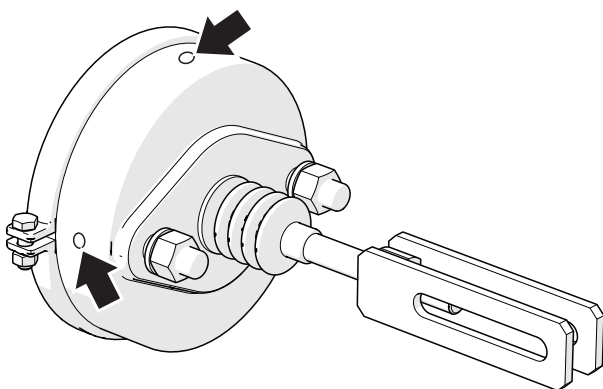
- Before connecting the manure spreader to the tractor make sure that the hydraulic and pneumatic conduits are not damaged.
- Check completeness, technical condition and correct operation of manure spreader lighting - chapter (6.5).
- Check the cleanliness of all electric lamps and reflectors.
- Check the correct mounting of the triangular plate holder for slow moving vehicles and the plate itself.
- Make sure that the tractor has a reflective warning triangle.
- Check that the ventilation holes of

dirt and that there is no water or ice inside. Check the correct mounting of the actuator.

*Clean the actuator if necessary.*

*In winter, it may be necessary to defrost the actuator and remove accumulated water through unclogged ventilation holes. If any damage is found, replace the actuator. When installing the actuator, keep its original position relative to the bracket.*

- When moving off check the operation of the service brake system. It should be remembered that for proper operation of the pneumatic system, an appropriate level of air pressure in the spreader air tank is required.
- Check the correct operation of the



526-I.05-1

**Figure 5.8** Brake cylinder

the actuator (6) are not clogged with

other systems while operating the manure spreader.



### DANGER

Driving with defective lighting installations braking is prohibited.

If the manure spreader is damaged, it should be discontinued until it is repaired.

I.3.10.624.11.1.EN

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

When measuring the air pressure in the wheels, the manure spreader must be unloaded. The inspection should be carried out before driving, when the tires are not warmed up or after a long stop of the manure spreader.

### ADVICE

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

### THE SCOPE OF ACTIVITIES

- Connect a pressure gauge to the valve and check the air pressure. If necessary, inflate the wheel to the required pressure.

### ADVICE

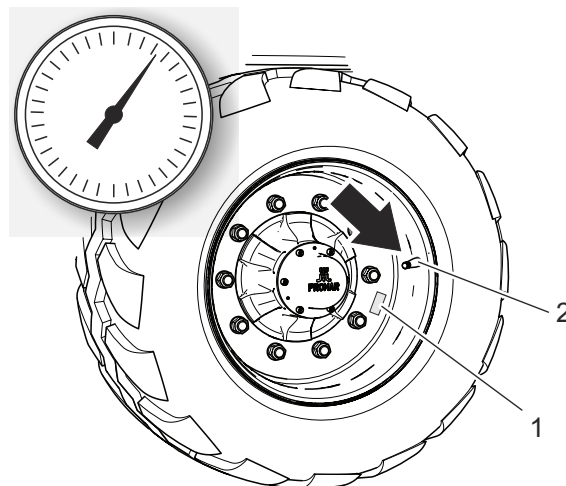
The tire pressure value is on the information sticker on the wheel rim figure (5.9).

- Check the technical condition of the tires (tread depth, side wall of the tire).

### CAUTION

Damaged tires or wheels can be the cause of a serious accident.

- Inspect the tire for defects, cuts, deformations, bumps indicating mechanical damage to the tire. In the



624-I.02-1

**Figure 5.9** Spreader wheel  
(1) information sticker (2) valve



### CAUTION

Incorrect tire pressure can lead to permanent tire damage as a result of delamination of the material and also causes faster tire wear.

event of mechanical damage, consult your nearest tire service centre and ensure that your tire defect is eligible for replacement.

- Check that the tire is correctly positioned on the rim.
- Check tire age.

When checking the pressure pay attention to the technical condition of the rims. Rims should be checked for deformation, material cracks, weld cracks, corrosion, especially around welds and in the place contact with the tire.

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## 5.13 CLEANING THE AIR FILTERS



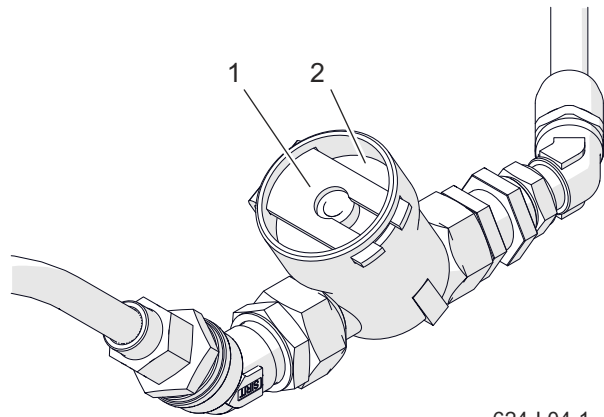
### DANGER

Before removing the filter, reduce the pressure in the supply line. When removing the filter slide, hold the cover with the other hand. Point the filter cover away from you.

Air filter inserts are placed on pneumatic system connection lines. They are reusable and cannot be replaced unless they are mechanically damaged.

### THE SCOPE OF ACTIVITIES

- Reduce pressure in the supply line.  
*The pressure in the pipe can be reduced by pushing the plug of the pneumatic connection as far as it will go.*
- Slide out the filter securing lock (1).
- Hold the filter cover (2).



624-I.04-1

**Figure 5.10** Air filter

(1) filter

(2) cover

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

I.3.10.624.13.1.EN



## 5.14 CHECKING BRAKE LINING WEAR

While using the spreader, the drum brake friction linings will wear out. While using the trailer, the drum brake friction linings will wear out. Excessive wear of the brake shoes is a condition in which the thickness of the brake linings glued or riveted to the steel structure of the shoes exceeds the minimum value.

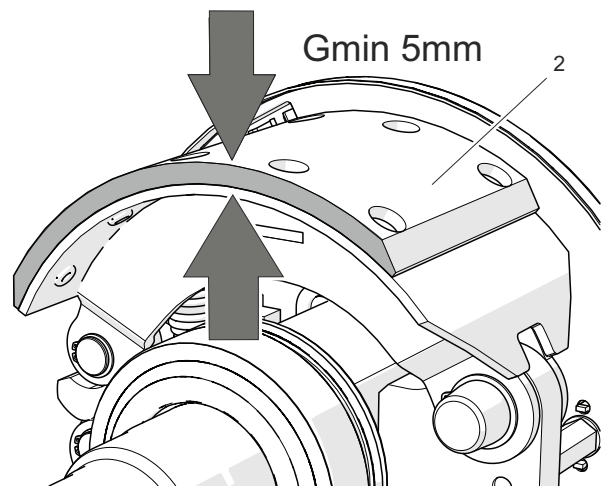
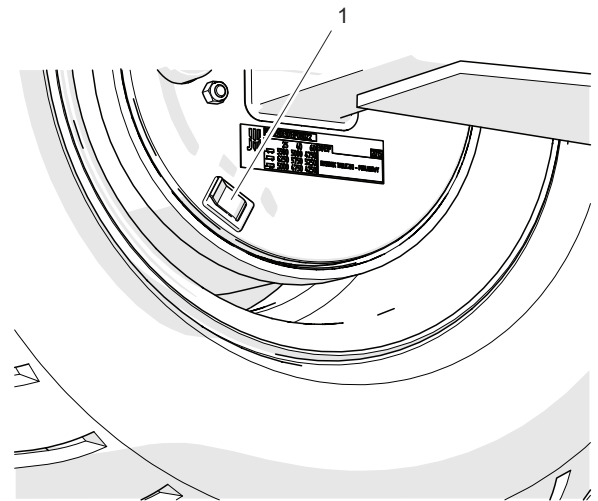
### THE SCOPE OF ACTIVITIES

#### ADVICE

Brake lining wear control,

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

- Find the inspection hole (depending on the version of the road axle, the inspection hole may be located in a different place than the figure shows, but it will always be located on the brake shield).
- Remove the upper and lower plugs and then check the thickness of the lining.



624-I.05-1

**Figure 5.11** Checking the brake lining thickness

(1) blanking plug, (2) brake lining

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

I.3.10.624.14.1.EN

## 5.15 CHECKING THE CLEARANCE OF THE AXLE BEARINGS

### THE SCOPE OF ACTIVITIES



#### DANGER

Before starting work, read the instructions for the lift and follow the manufacturer's instructions.

The jack must stand firmly against the ground and the spring plate.

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

Checking bearing looseness can only be carried out when the machine is connected to the tractor and the loading box is empty and not lifted.

- Hitch manure spreader to tractor, immobilize tractor with parking brake.
- Place the tractor and manure spreader on firm and level ground for straight driving.
- Place locking wedges under the manure wheel opposite to the lift wheel. Ensure that the machine will not roll during inspection.
- Raise the wheel (located on the opposite side of the placed wedges). The jack should be placed under the spring plate securing the road axle to the spring - figure (5.1). The jack must be suited to the spreader weight.
- Turn the wheel slowly in two directions. Check that the movement is smooth and the wheel rotates without excessive resistance and jamming - figure (5.12).
- Turn the wheel so that it rotates very



526-I.10-1

**Figure 5.12** Clearance inspection

- quickly, check that the bearing does not make any unusual sounds.
- Try to feel looseness by moving the wheel.
- Repeat for each wheel separately, remembering that the jack must be on the opposite side of the wedges.
- If play is felt, adjust the bearings - figure (6.3). Unnatural sounds coming from the bearing may be symptoms of excessive wear, dirt or damage. In this case, the bearing together with the sealing rings should be replaced or cleaned and regreased. When checking bearings, make sure that any noticeable looseness comes from the bearings, not the suspension system (e.g. looseness on the spring

- pins).
- Check the technical condition of the hub cover, Dimensions if necessary.

**ADVICE**

Damaged hub cover or lack thereof will cause the penetration of dirt and moisture into the hub, which will result in much faster wear of bearings and hub seals.

Bearing life depends on spreader operating conditions, load, vehicle speed and lubrication conditions.

I.3.10.624.11.EN

## 5.16 CHECKING OF MECHANICAL BRAKES

### ADVICE

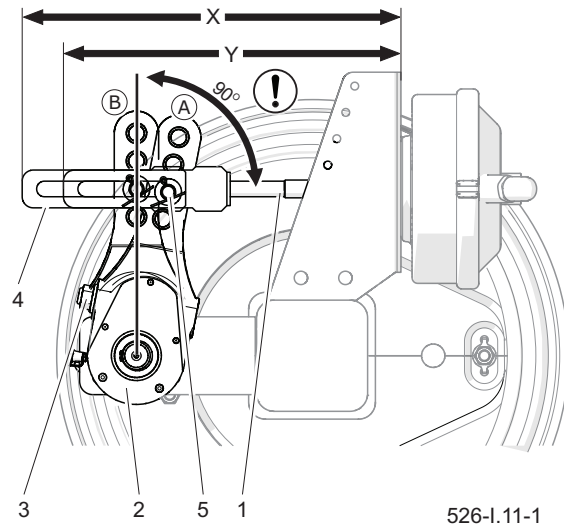
Checking the technical condition of the brakes:

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

In a correctly adjusted brake, the cylinder piston stroke should be within the range given in Table 5.3 and depends on the type of cylinder used. When the wheel is fully braked, the optimal angle between the expander lever and the piston rod should be approx. 90°. With this setting, the braking force is optimal. Checking the brakes consists in measuring this angle and the piston rod stroke in each wheel.

### THE SCOPE OF ACTIVITIES

- Measure the distance X with the tractor brake pedal released.
- Measure the distance Y with the tractor brake pedal pressed.
- Calculate the distance difference X-Y



**Figure 5.13** Brake check

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

(rod stroke).

- Check the angle between the cylinder piston axis and the expander lever.
- If the expander arm angle (2) and piston rod stroke exceed the range given in table 5.3, the brake should be adjusted.

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## 5.17 CLEANING THE DRAINAGE VALVE

### THE SCOPE OF ACTIVITIES



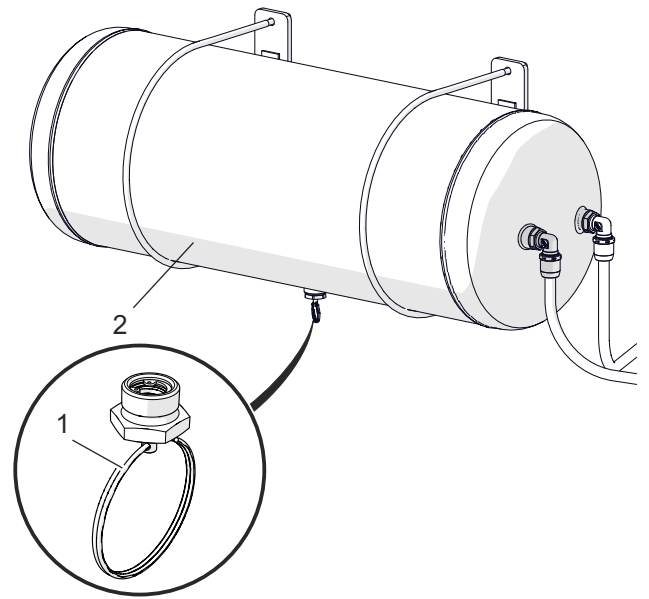
#### DANGER

Bleed the air tank before removing the drain valve.

- Fully reduce the pressure in the air reservoir (2).

*The pressure in the tank can be reduced by swinging the drain valve stem.*

- Unscrew the valve (1).
- Clean the valve, blow with compressed air.
- Replace the copper gasket.
- Screw in the valve, fill the tank with



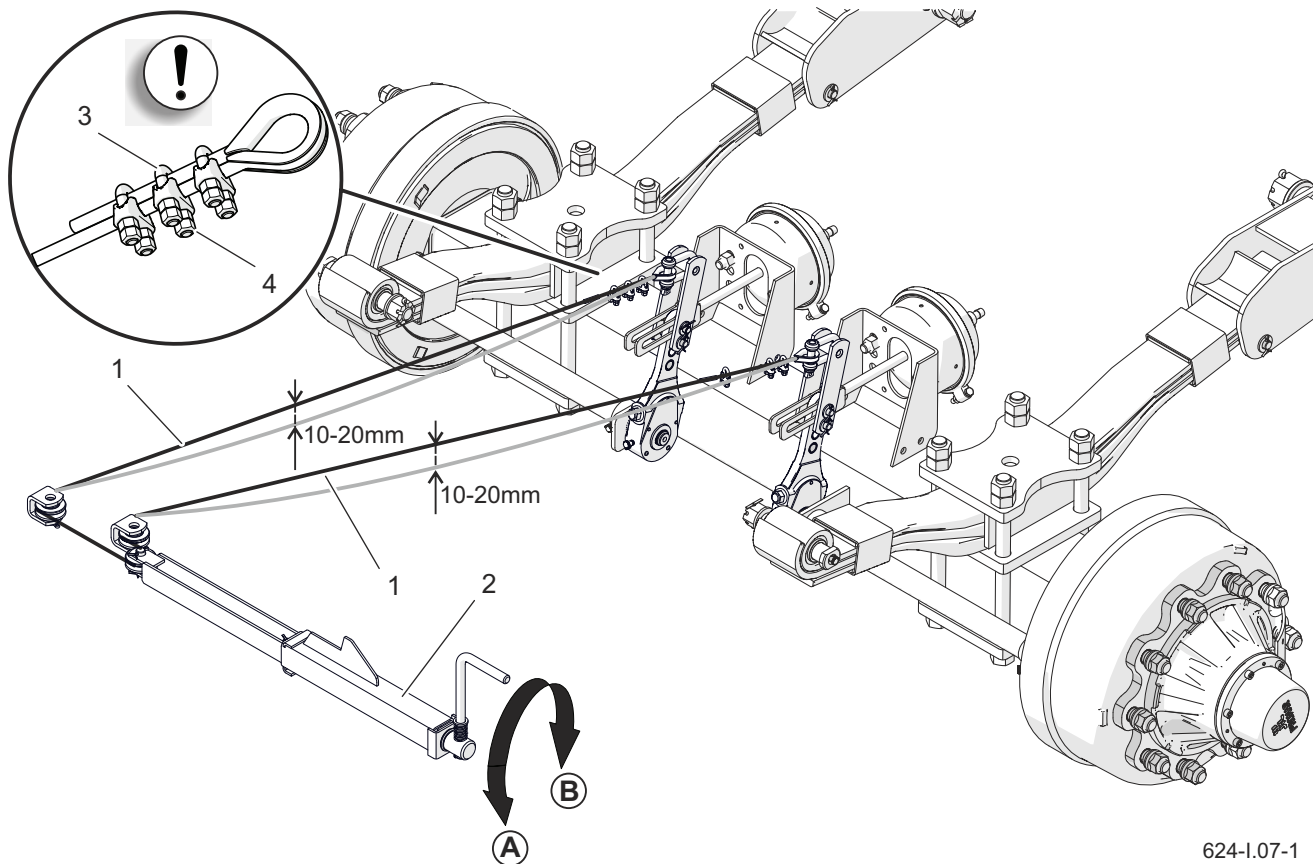
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**Figure 5.14** Air tank  
(1) drain valve (2) tank

air, check the tank for leaks.

I.3.10.624.17.1.EN

## 5.18 CHECKING OF PARKING BRAKE CABLE TENSION



624-I.07-1

**Figure 5.15** Cable tension inspection  
(1) cable, (2) brake mechanism, (3) bow clamp, (4) clamp nut

### VOLTAGE CONTROL

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

- Hitch manure spreader to tractor. Place the manure spreader and tractor on level ground.
- Place wedges under one wheel of the manure spreader
- Turn the parking brake crank (2) towards (B) and apply the parking brake.
- Check cable tension (1).



### DANGER

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

- When the mechanism screw is completely removed, the cable should hang about 10 to 20 mm.

### CABLE TENSION ADJUSTMENT

- Unscrew the brake mechanism screw (2) as far as possible by turning the crank in the direction (A).
- Loosen the nuts (4) of the bow clamps

- (3) on the handbrake cable (1).
- Tighten the cable (1) and tighten the nuts (4) of the clamps.
  - Apply the parking brake and release it again. Check (approximately) cable slack. When the service and parking brakes are completely released, the cable should hang about 10-20 mm. The axle spreader levers should be in the rest position.
- If it is necessary to change the brake cable, refer to chapter 6.2 „*Replacing the parking brake cable*”.

I.3.10.624.18.1.EN

## 5.19 HYDRAULIC SYSTEM CHECKING



### DANGER

It is forbidden to use the spreader with inefficient hydraulic system.

### CHECKING THE TIGHTNESS OF THE HYDRAULIC SYSTEM

- Hitch manure spreader to tractor. Connect all hydraulic system hoses according to the instructions in the manual.
- Clean hose connections, hydraulic cylinders and couplings.
- Activate all hydraulic systems in turn, extending and retracting the piston rods of the cylinders. Repeat all operations 3-4 times.
- Leave the hydraulic cylinders fully extended. Check all hydraulic circuits for leaks.
- After completing the inspection, put all cylinders to the rest position.

In the event of oiling on the hydraulic cylinder body, the nature of the leakage must be checked.

When the cylinder is fully extended, check the seal locations. Slight leaks are

permissible with symptoms of "sweating", however in the event of noticing leaks in the form of "droplets" stop using the spreader until the fault is remedied. If a malfunction has appeared in the brake cylinders, it is forbidden to drive the spreader with a damaged system until the fault is removed.

If visible moisture appears on the cable connectors, tighten the connector with a specified torque and carry out the test again. If the problem persists replace the leaking element.

### CHECKING THE TECHNICAL CONDITION OF HYDRAULIC CONNECTORS

Hydraulic couplings for connecting to the tractor must be technically sound and kept clean. Each time before connecting, make sure that the sockets in the tractor are maintained in good condition. The tractor's and spreader's hydraulic systems are sensitive to the presence of solid impurities that can cause damage to precise components of the installation (scratch the surface of cylinders, etc.)

I.3.10.624.19.1.EN



## 5.20 CONTROL OF PNEUMATIC BRAKING SYSTEM



### DANGER

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

### THE SCOPE OF ACTIVITIES

- Hitch manure spreader to tractor.
- The tractor and manure spreader should be immobilized with the parking brake. Additionally, place wedges under the rear wheel of the spreader.
- Start the tractor to supplement the air in the spreader braking system tank.
- Switch off the tractor engine.
- Check the system components with the tractor brake pedal released.
- Pay special attention to cable connections and brake cylinders.
- Repeat the system check with the tractor brake pedal depressed.

In the event of a leak, the compressed air will leak out in places of damage with a characteristic hiss. The system leak

can be detected by coating the checked elements with washing liquid or foaming agent, which will not aggressively affect the elements of the installation. Damaged elements should be replaced or sent for repair. If the leak appeared around the connections, the user can tighten the connector on their own. In the event air still leaks, replace the connector components or seals with new ones.

When checking for leaks, pay attention to the technical condition and degree of cleanliness of the system components. Contact of pneumatic conduits, seals etc. with oil, grease, gasoline etc. may damage them or accelerate the aging process. Bent, permanently deformed, cut or frayed wires are only eligible for replacement.

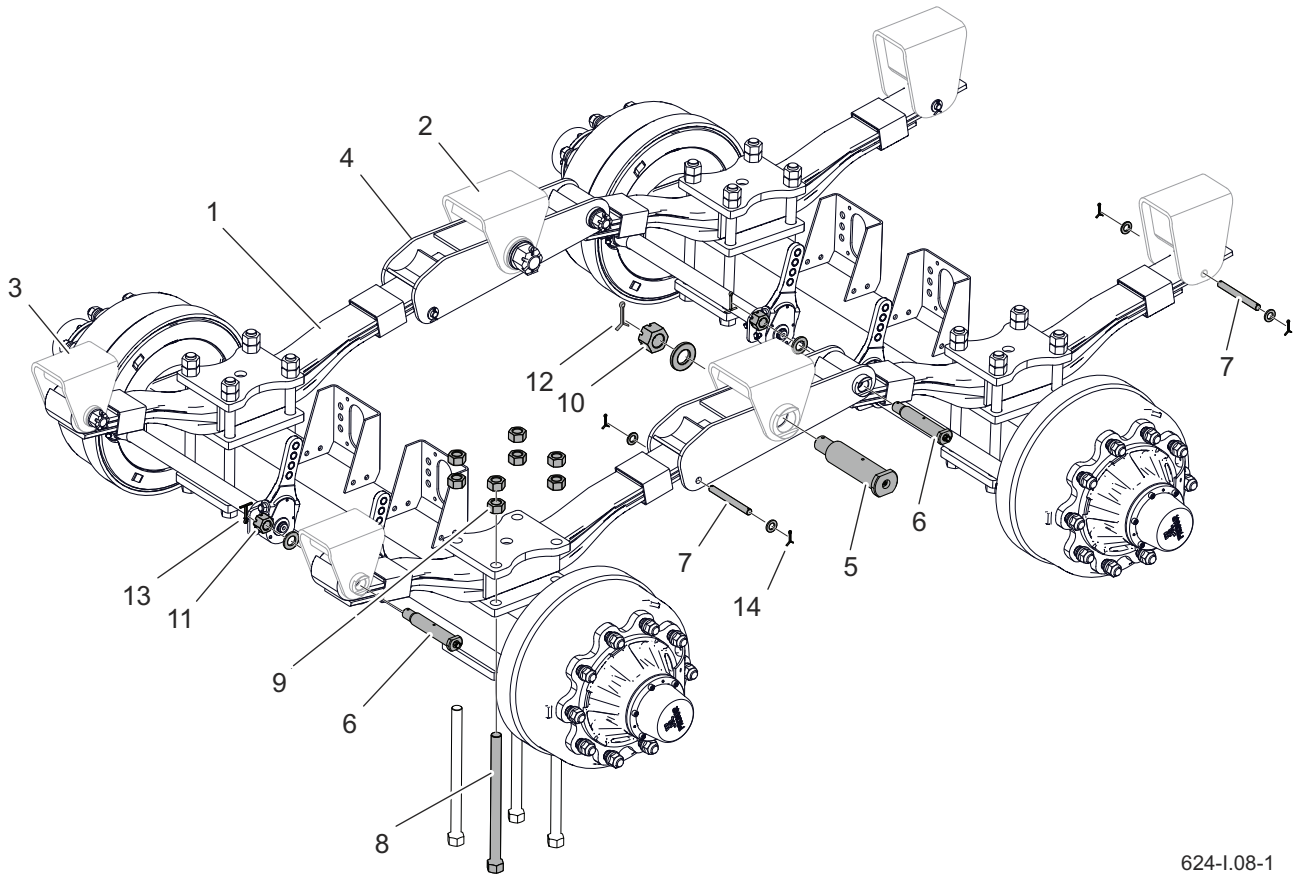


### DANGER

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

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## 5.21 SUSPENSION CONTROL



624-I.08-1

**Figure 5.16** Mechanical suspension support

(1) spring, (2) swingarm support, (3) spring support, (4) swingarm, (5) swingarm pin, (6) spring pin I, (7) spring pin II (8) axle mounting pin, (9) axle stud mounting nut, (10) swingarm pin castor nut, (11) spring pin castor nut, (12) - (14) securing pin

**Table 5.5.** Suspension control schedule

Item	Service activities	Frequency
1	<p>Checking the tightening of nuts (9) of pins (8) of driving axles should be performed using a torque wrench with a torque of 300-350 Nm. Audit flow:</p> <ul style="list-style-type: none"> <li>- unscrew the lock nuts,</li> <li>- tighten the nuts diagonally to the specified torque</li> <li>- screw on the lock nuts and tighten diagonally to the specified torque.</li> </ul>	<p>After travelling the first 50 km with a load, or after 500 hours of operation.</p> <p>After 5000 km or after 1500 hours of work, then once a year.</p>

Item	Service activities	Frequency
2	Checking the pivot bracket (3) and swingarm (2) sockets. The check consists in a visual assessment of the wear of the securing sockets in the welded bushings in the brackets (1) of the spring welded to the lower frame. The wear of the sockets (deformation and imprints) indicates improper lubrication of the pins. In this case, remove the swingarm pin and swingarm, assess the wear of the pin and slide sleeves, replace them if necessary, and regenerate the pin seat	Every 5000 km or every quarter.
3	Checking the protection of the crown nuts (10), (11) the swingarm pins (5) and the spring pins (6) and (7). The check consists in visual checking the completeness and condition of securing pins (12) - (14).	<i>Once in year</i>
4	Check the condition of the springs (1), clean thoroughly and brush the sides of the springs to check for cracks.	<i>Once in year</i>



**CAUTION**

The manure spreader screw connections should be tightened under load.

**ADVICE**

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

I.3.10.624.21.1.EN

## 5.22 LUBRICATION



### CAUTION

When using the spreader, the user is obliged to follow the lubrication instructions in accordance with the lubrication schedule.

After the first month of using the trailer, grease all lubrication points.

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

The spreader should be lubricated with a hand or foot grease gun, filled with the recommended lubricant. If possible, remove old grease and other contaminants before starting work. The grease should be forced into the grease nipple until fresh grease appears in the gaps between the mating parts. After finishing work wipe off excess grease.

Parts that should be lubricated using machine oil should be wiped with a dry clean cloth. Apply the oil with a brush or oiler. Wipe off excess oil.

The replacement of grease in wheel hub

bearings should be entrusted to specialized service points equipped with the appropriate tools. Dismantle the entire hub, remove the bearings and individual sealing rings. After thorough cleaning and inspection, install lubricated components. If necessary, bearings and seals be replaced.

Before lubricating the springs, clean them of impurities, wash with water and allow to dry. Do not use pressure washers for cleaning, the use of which may cause the penetration of moisture between individual leaves of the spring. To lubricate the space between the blades, use aerosol formulations that have generally available lubricating and anti-corrosive properties, the outer surface should be smeared with a very thin layer of lithium or calcium grease. For this purpose, you can also use a silicone aerosol preparation (also intended for lubrication of guides, locks, etc.). Lubricate the spring surface and

**Table 5.6.** Lubricants

Item	Symbol	Description
1	A	general purpose machine grease (lithium, calcium),
2	B	solid grease for heavily loaded components with the addition of $\text{MOS}_2$ or graphite
3	C	anti-corrosive spray
4	D	plain machine oil, silicone spray grease

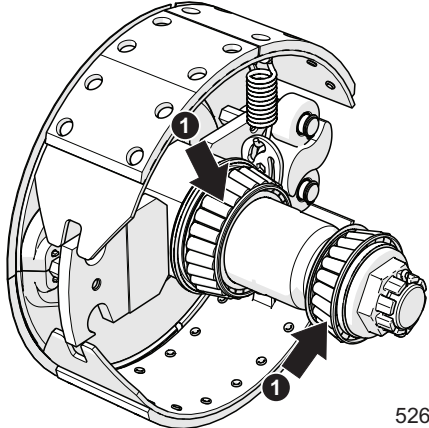
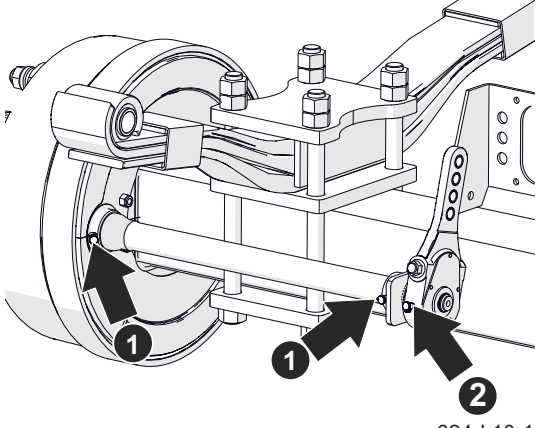
spring pin according to the instructions in table 5.7.

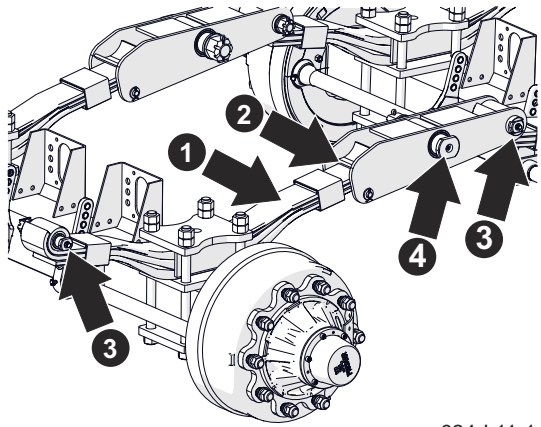
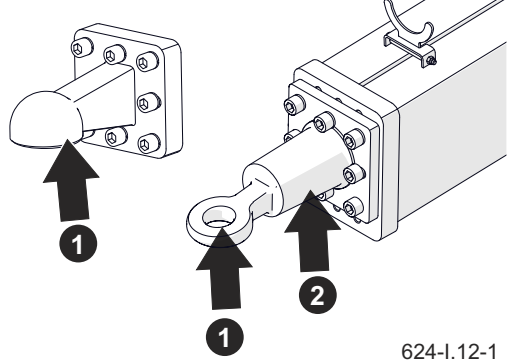
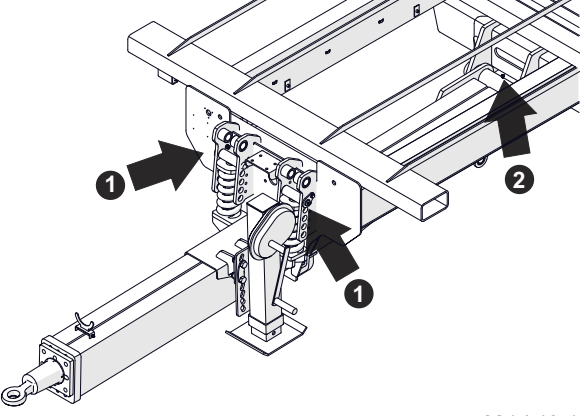
Empty containers of grease or oil be disposed of in accordance with the lubricant manufacturer's instructions.

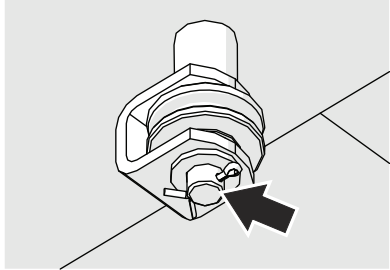
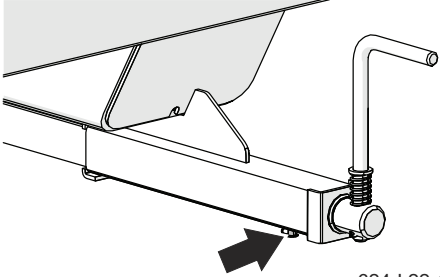
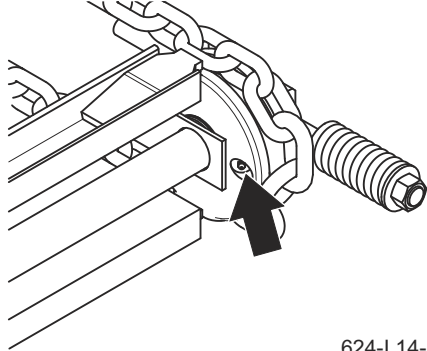
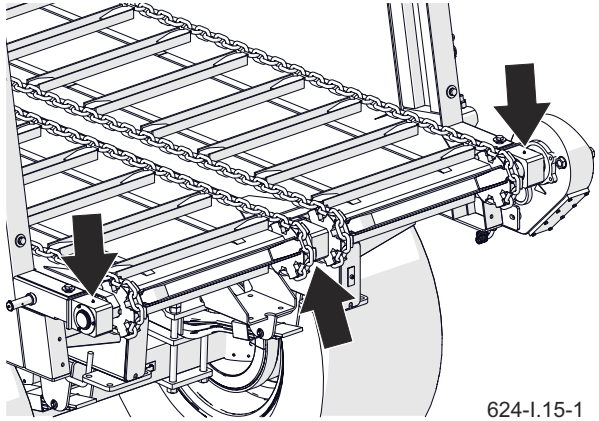
**ADVICE**

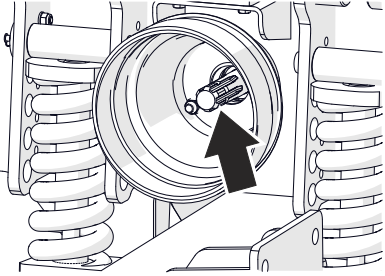
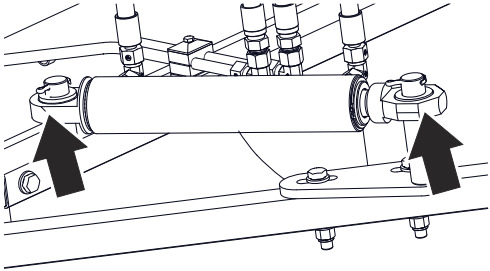
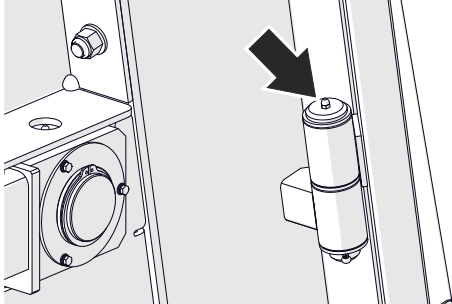
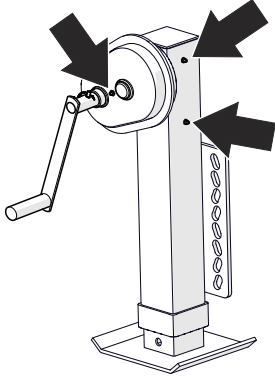
Lubrication frequency (*TableSpreader lubrication schedule*):  
 H - working hours of the machine  
 D - working day (8 hours of manure spreader operation),  
 M-month

**Table 5.7.** Spreader lubrication schedule

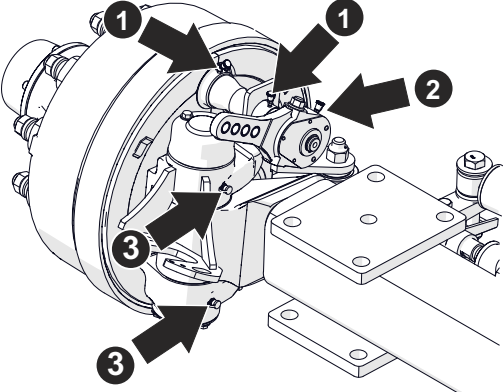
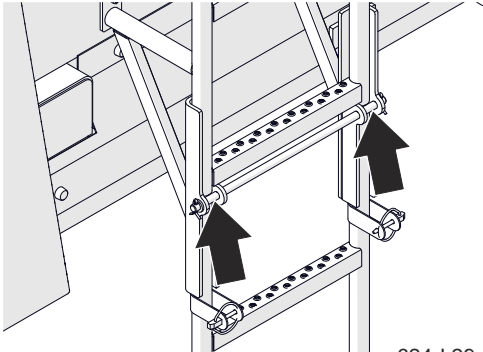
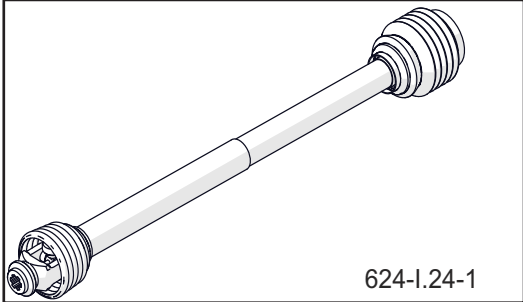
Name	Number of points	Type of grease	Frequency	
Hub bearings (1) (2 in each hub)	4	A	24M	 <p>526-I.19-1</p>
Rigid axle expander shaft bushings (1)	8	A	3M	 <p>624-I.10-1</p>
Rigid axle expander arm (2)	4	A	3M	

Name	Number of points	Type of grease	Frequency	
Spring leaves (1)	4	C	3M	 <p>624-I.11-1</p>
Spring sliding surface (2)	4	B	1M	
Spring pin (3)	4	B	3M	
Control arm pin (4)	2	B	3M	
Draw bar hitching eye (1)	1	B	14D	 <p>624-I.12-1</p>
Rotating cable (2)	1	B	1M	
Spring fixing pin (1)	2	B	3M	 <p>624-I.13-1</p>
Draw bar bolt (2)	1	B	3M	

Name	Number of points	Type of grease	Frequency	
Wheel axle guiding the brake cable	2	A	6M	 <p style="text-align: right;">624-I.21-1</p>
Parking brake mechanism	1	A	6M	 <p style="text-align: right;">624-I.22-1</p>
Front axle sprocket bearings	4	A	8H	 <p style="text-align: right;">624-I.14-1</p>
Chain conveyor drive shaft bearings	3	A	8H	 <p style="text-align: right;">624-I.15-1</p>

Name	Number of points	Type of grease	Frequency	
Surface of the spline of the shaft	1	A	6M	 <p>624-I.16-1</p>
Rear cover cylinder ears	4	A	3M	 <p>624-I.17-1</p>
Tailgate hinges	6	A	3M	 <p>624-I.19-1</p>
Telescopic support with gear	2	A	3M	 <p>624-I.20-1</p>



Name	Number of points	Type of grease	Frequency	
Steering axle camshaft sleeves (1)	4	A	3M	 <p>624-I.23-1</p>
Steering axle expander arm (2)	2	A	3M	
The steering spindle axis (3)	4	A	3M	
Ladder rotation pin	2	D	3M	 <p>624-I.29-1</p>
PTO shaft *	-	-	-	 <p>624-I.24-1</p>

\* - For detailed information on operation and maintenance, refer to the operating instructions supplied with the shaft.

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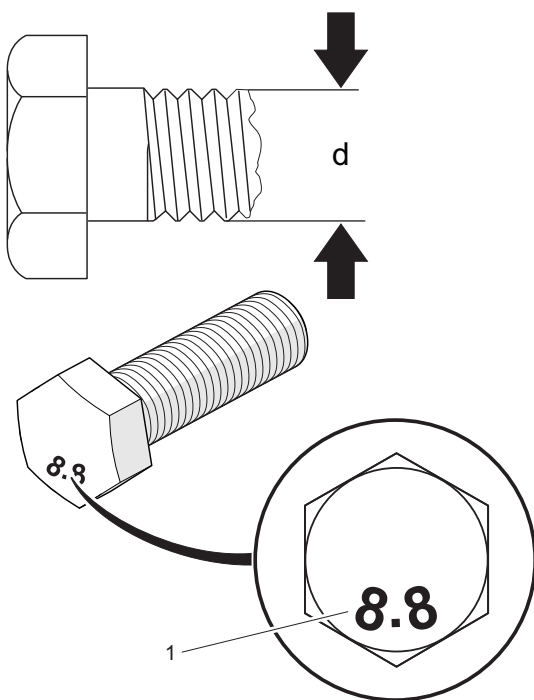
## 5.23 SCREW CONNECTIONS INSPECTION

### TIGHTENING TORQUES FOR SCREW CONNECTIONS

During maintenance and repair work, apply appropriate tightening torques to screw connections, unless other tightening parameters are given. Recommended tightening torques for the most commonly used bolted connections are shown in the Table 5.8. The given values apply to non-lubricated steel bolts.

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

Check the tightness using a torque wrench. During daily inspection of the



589-I.10-1

**Figure 5.17** Metric thread screw  
(1) strength class, (d) thread diameter

**Table 5.8.** Tightening torque

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

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

manure spreader pay attention to loose connections and tighten the connector if necessary. Replace lost items with new ones.

### TIGHTENING ROAD WHEELS

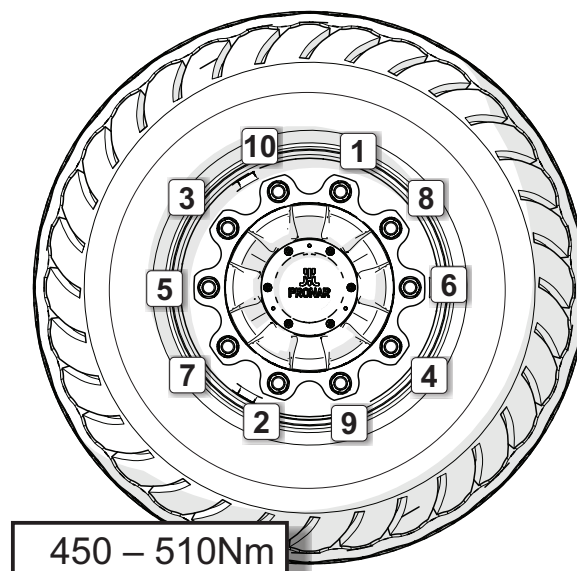
The wheel nuts should be tightened gradually diagonally (in several stages until the required tightening torque is achieved), using a torque wrench. The recommended order of tightening the nuts and the tightening torque is shown in figure (5.18).

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

connection thread or breaking the hub pin.  
The wheels should be tightened according to the following scheme:

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

If the wheel was disassembled, the above steps should be repeated.

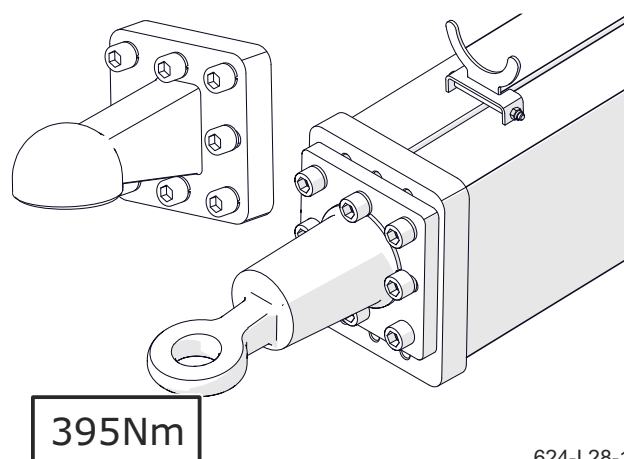


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**Figure 5.18** The order of the nuts tightening

**THE DRAW BAR EYE TIGHTENING**

Checking the tightness of the draw bar eye should be done at the same time as checking the wheel nuts. The tightening torque of M20x80 bolts should be 395Nm. Tighten the screws diagonally with a torque wrench.



624-I.28-1

**Figure 5.19** The draw bar eye tightening

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## 5.24 TRANSMISSION OIL CHANGE

**Table 5.9.** Transmission oil change inspection

Item	Gear position	The amount of oil	Type of oil	Frequency
1	Adapter drive mechanism (A)	7 l	SAE 90 EP (API GL-5 SAE 80W/90).	After the first 50 hours of work, then every 500 hours of work.
2	Chain conveyor mechanism (B)	6.6 l		



### CAUTION

Avoid pouring excess oil. Too much oil can cause the transmission temperature to rise excessively. If you notice a leak, check the seal carefully and check the oil level. Transmission operation with low oil level or lack of oil may lead to permanent damage of its mechanisms.



### DANGER

During work related to replacement of oil, use appropriate personal protective equipment, i.e. protective clothing, footwear, gloves, glasses. Avoid oil contact with skin.

### OIL CHANGE IN ADAPTER DRIVE TRANSMISSION (A)

- Set the machine level. Run the adapter drive for a few minutes (in case the machine has not been operated before and the transmission is not warmed up).
- Stop the adapter drive and turn off

the tractor engine.

- Prepare an oil container. Unscrew the filler plug (2) and drain plug (3) located on the bottom of the middle gear.
- Check the drain plug gasket (3), replace the gasket if necessary, and tighten the plug.
- Fill the gearbox with oil to the required level.



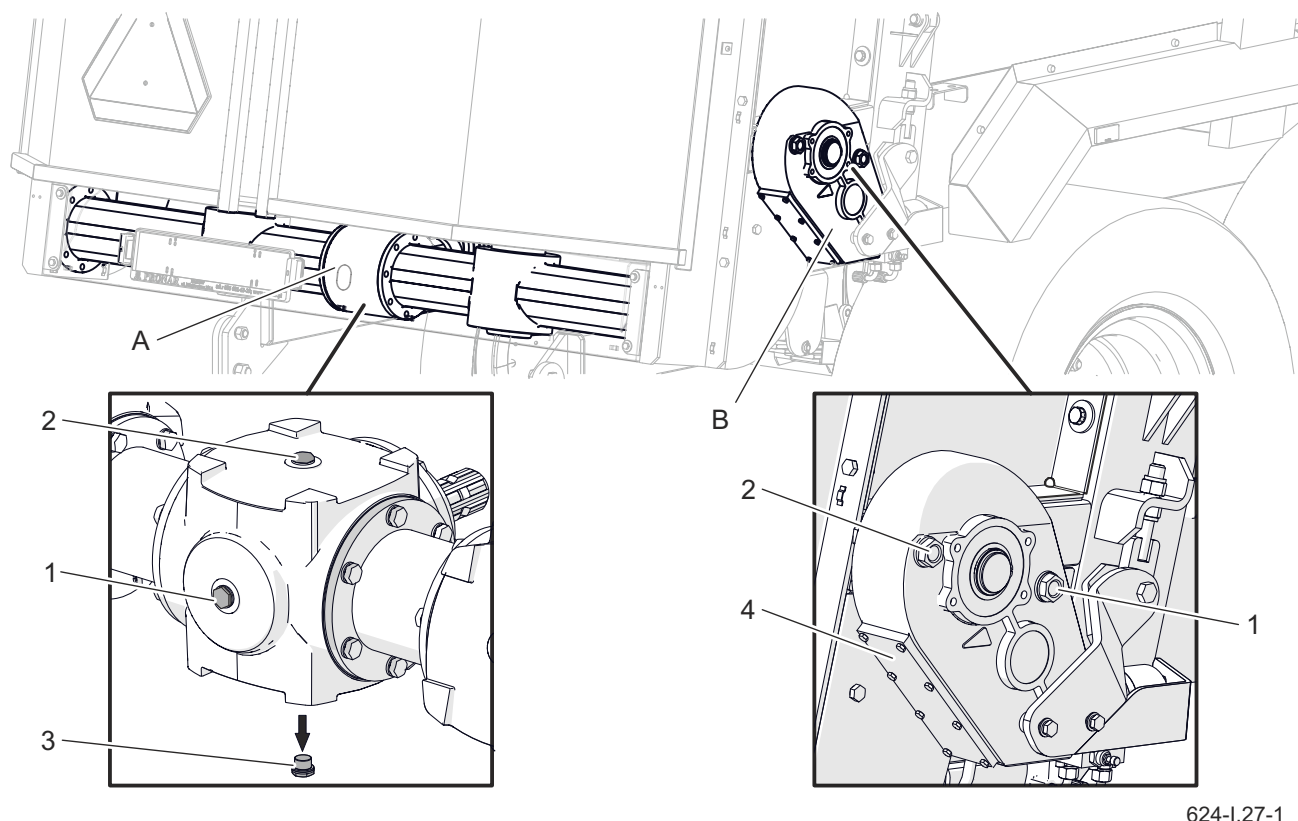
### CAUTION

When draining oil from the adapter gear with the drain plug (3) located only in the middle gear, wait until all the oil has drained from the side gears.



### CAUTION

When filling the gearbox, the oil must spread over the side gears, so adding oil to the appropriate level should be done in stages, periodically checking the oil level until it stabilizes.



624-I.27-1

**Figure 5.20** Changing oil in transmission  
 (A) adapter drive gear, (B) floor conveyor drive gear  
 (1) oil inspection opening, (2) filler plug, (3) drain plug, (4) cover

*The oil level should be halfway up the sight glass.*

**ADVICE**

The oil in the chain conveyor drive gear is easiest to change with an oil suction (suction).

**CHANGING OIL IN TRANSMISSION  
 CHAIN CONVEYOR (B)**

- Run the chain conveyor for a few minutes (in case the machine has not been operated before and the transmission is not warmed up).
- Stop the chain conveyor and turn off the tractor engine.
- Loosen the cover screws (4).
- Prepare the container and drain the

oil into the container.

- Unscrew the bottom cover completely. Check the condition of the gears.
- Replace the gasket and tighten the cover.
- Unscrew the filler cap and add oil to the required level.
- Check the plug seal, replace if necessary.

I.3.10.624.24.1.EN

## 5.25 REPLACEMENT OF HYDRAULIC HOSES

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

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# CHAPTER 6

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TECHNICAL SUPPORT

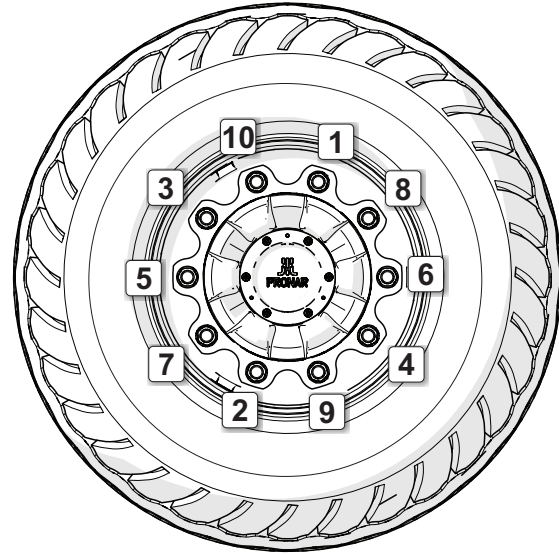
## 6.1 WHEEL ASSEMBLY AND DISASSEMBLY

### WHEEL DISASSEMBLY

- Immobilize manure spreader with parking brake.
- Locking wedges should be placed under the spreader wheel opposite to the lift wheel.
- Ensure that the manure spreader is properly secured and will not move during wheel dismantling.
- Loosen the wheel nuts according to the order given in figure (6.1).
- Place the jack and raise the manure spreader to such a height that the wheel being changed does not rest on the ground.

*The used lift should have adequate load capacity, it should be technically sound. The lift must be placed on an even, hard surface that will prevent it from sinking or slipping during operation.*

- If necessary, use properly selected sleepers to reduce the unit pressure of the lift base on the ground to prevent penetration into the ground.
- Remove the wheel.



526-I.14-1

**Figure 6.1** The order of the nuts unscrewing and tightening

### WHEEL MOUNTING

- Clean the axle pins and nuts from contamination.

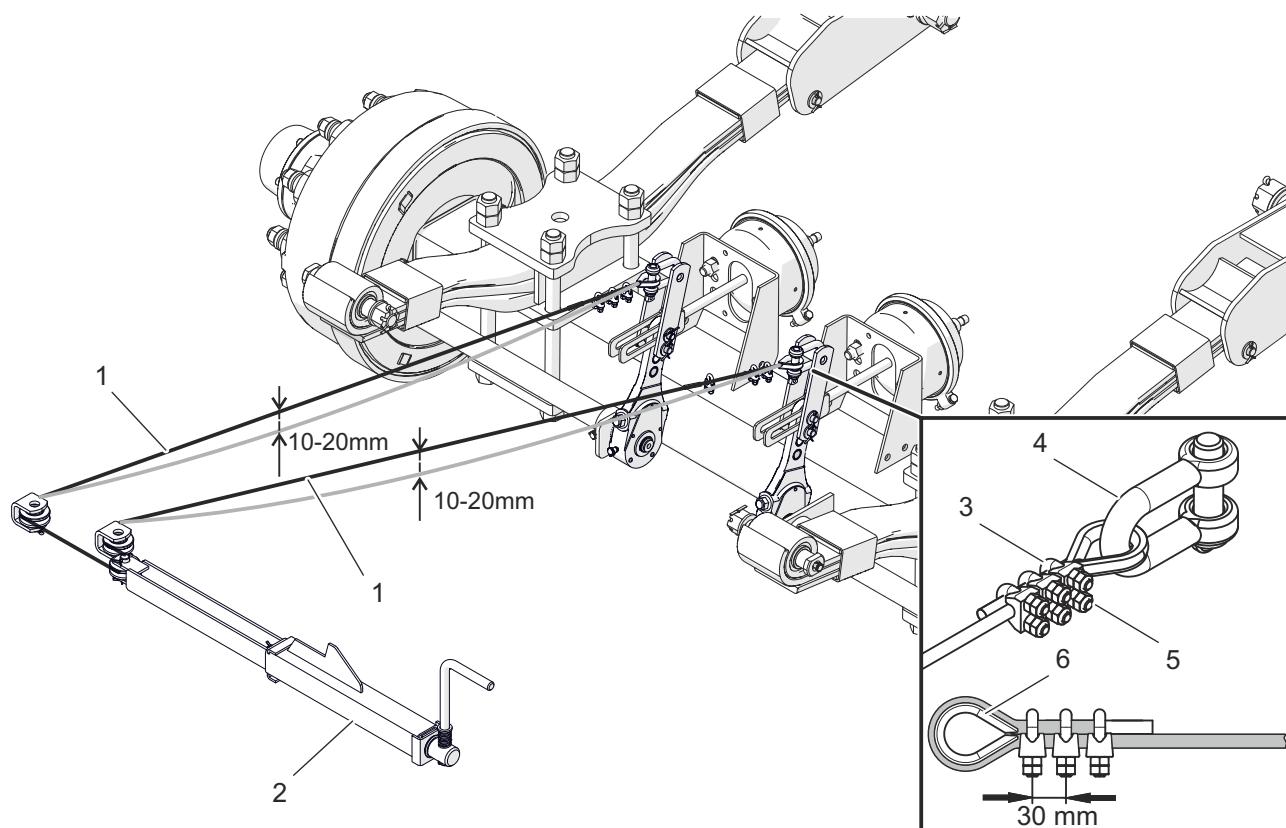
*Do not lubricate the threads of the nut and stud.*

- Check the condition of the pins and nuts, replace if necessary.
- Mount the wheel on the hub, tighten the nuts so that the rim fits snugly to the hub.
- Lower the manure spreader, tighten the nuts according to the recommended torque and the given order - see chapter 5.23, "Checking screw connections"

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## 6.2 PARKING BRAKE CABLE REPLACEMENT



624-J.01-1

**Figure 6.2** Parking brake cable replacement

(1) brake mechanism, (2) brake cable, (3) calliper, (4) shackle, (5) calliper nut, (6) thimble

### THE SCOPE OF ACTIVITIES

- Hitch manure spreader to tractor. Place the manure spreader and tractor on level ground.
- Place wedges under one wheel of the manure spreader.
- Unscrew the crank mechanism screw (1) - figure (6.2) to the maximum.
- Loosen the nuts (5) of the U-clamps (3).
- Remove the shackles (6), clamps and cable (2).
- Clean the parking brake components.
- Lubricate the parking brake crank

mechanism (1) and the cable guide pins.

- Attach a shackle and bow clamps to one end of the cable (2). Pay attention to the correct positioning of the terminals.
- Mount one end of the cable, attach the shackle pin and secure it with new cotter pins.
- Pass the other end of the cable through the guide wheels and mount the other end of the cable in a similar manner.
- Adjust the cable tension - see chapter

### 5.18 "Checking the parking brake cable tension".

- Tighten the nuts.
- Tension the cable with the crank mechanism and loosen again. If necessary, correct the brake cable tension.



#### CAUTION

Clamp jaws must be placed on the load-carrying cable side - figure (6.2).  
Secure the ends of the cable with a shrink tube.  
The distance between the clamps should be 30 mm, with the first clamp placed as close as possible to the thimble.

J.3.10.624.02.1.EN

## 6.3 ADJUSTING THE CLEARANCE OF THE AXLE BEARINGS



### CAUTION

Adjusting of the bearing looseness can only be carried out when the manure spreader is connected to the tractor and the loading box is empty.

### THE SCOPE OF ACTIVITIES

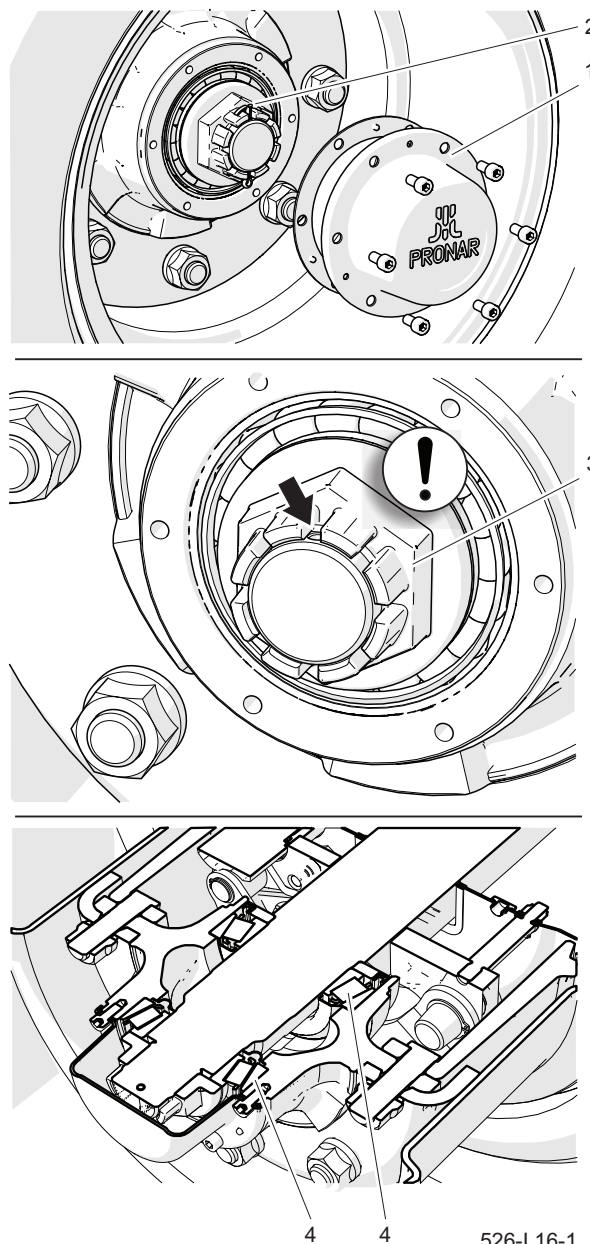
- Prepare the tractor and manure spreader for adjustment as described in chapter 5.3 „Preparing the manure spreader”.
- Remove the hub cover (1).
- Remove the cotter pin (2) securing the castellated nut (3).
- Tighten the castellated nut to remove slack.

*The wheel should rotate with slight resistance.*

- Unscrew the nut (3) (not less than 1/3 of a turn) to cover the nearest groove of the nut with a hole in the journal of the axle (the pin's hole is marked with a black arrow in the drawing). The wheel should rotate without excessive resistance.

*The wheel should rotate without excessive resistance. Too much pressure is not recommended due to deterioration of bearing operating conditions.*

- Secure the castellated nut with

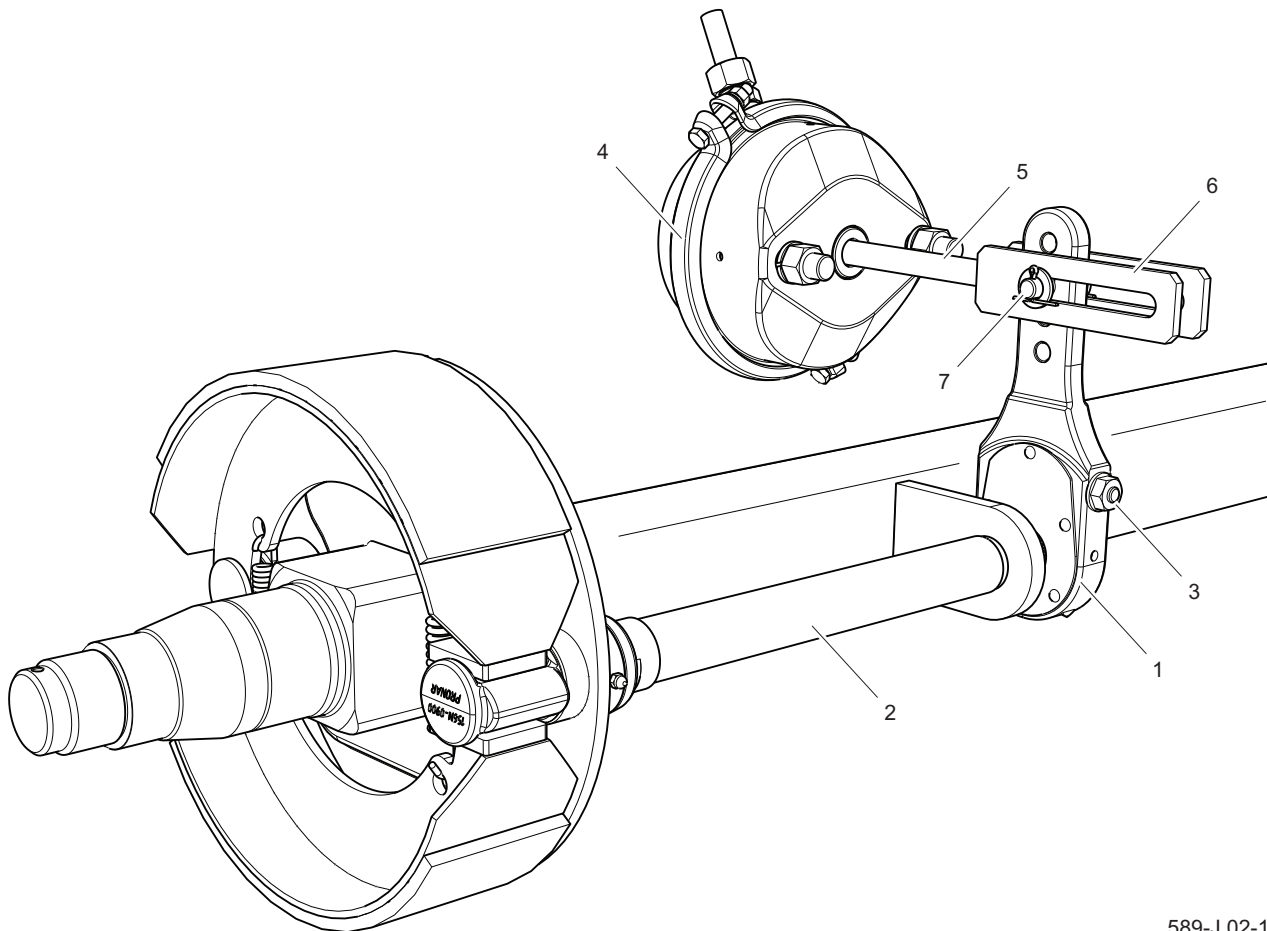


**Figure 6.3** The principle of bearing clearance adjustment  
 (1) hub cover, (2) cotter pin, (3) nut,  
 (4) tapered roller bearing

a cotter pin and mount the hub cover (1).

- Gently tap the hub with a rubber or wooden hammer.

## 6.4 BRAKE ADJUSTMENT



589-J.02-1

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

Significant wear of the brake linings increases the stroke of the brake cylinder piston and deteriorates braking performance.

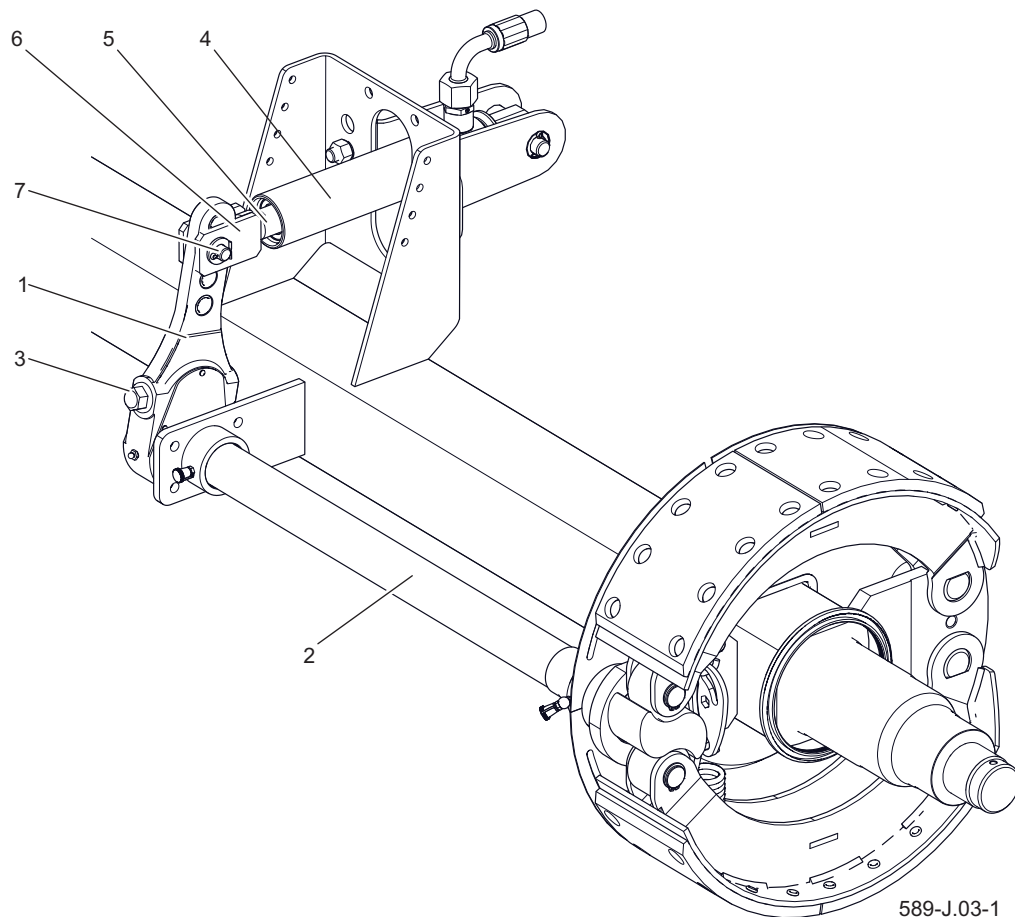
### ADVICE

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

When braking, the piston rod stroke should be within the specified working range, and the angle between the piston rod (1) and the expander arm (3) should

be approximately  $90^\circ$  - Figure (6.6) i (6.7). The manure spreader wheels must brake simultaneously.

The braking force also decreases when the angle of operation of the brake cylinder piston rod (5) is not correct - figure (6.4), (6.5) in relation to the expander arm (1). To obtain the optimum mechanical angle of operation of the piston rod fork (6) must be mounted on the expander arm (1) so that when fully braked the angle of operation is approx.  $90^\circ$ .



**Figure 6.5** Construction of hydraulic axle brake

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



**CAUTION**

An improperly adjusted brake can cause the rubs to rub against the drum, which can result in faster wear of the brake linings and / or overheating of the brake.

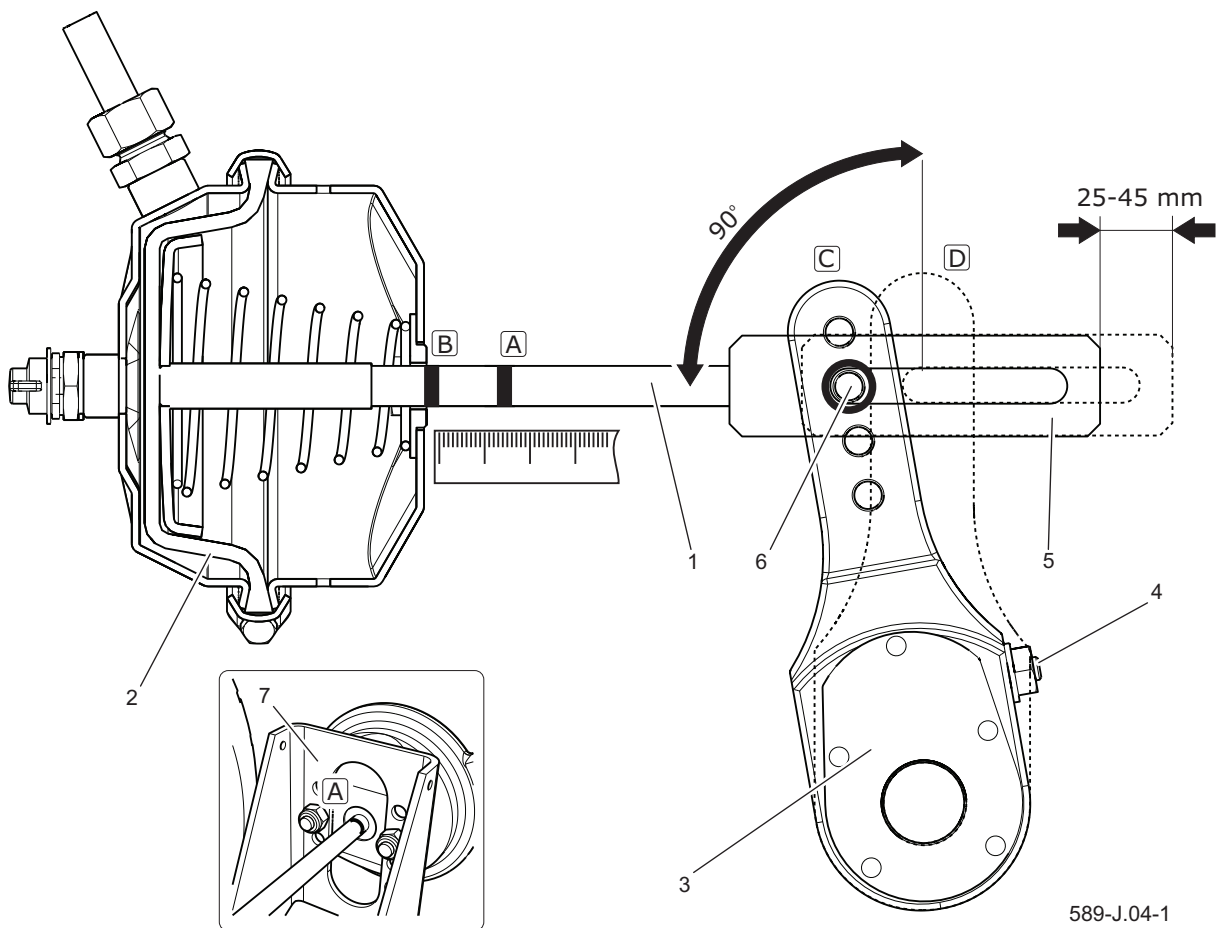
The control consists in measuring the extension length of each piston rod during braking at a standstill. If the piston rod stroke exceeds the maximum value (45mm), the system should be adjusted. When removing the cylinder fork (6), remember or mark the original position of the cylinder fork pin (7). The mounting position depends on the type of braking

system and the size of the tires used in the manure spreader, it is selected by the Manufacturer and cannot be changed.



**CAUTION**

The mounting positions of the brake cylinder in the bracket holes and the cylinder pin in the expander arm are determined by the Manufacturer and cannot be changed. Whenever removing the pin or actuator, it is recommended to mark the location of the original attachment.



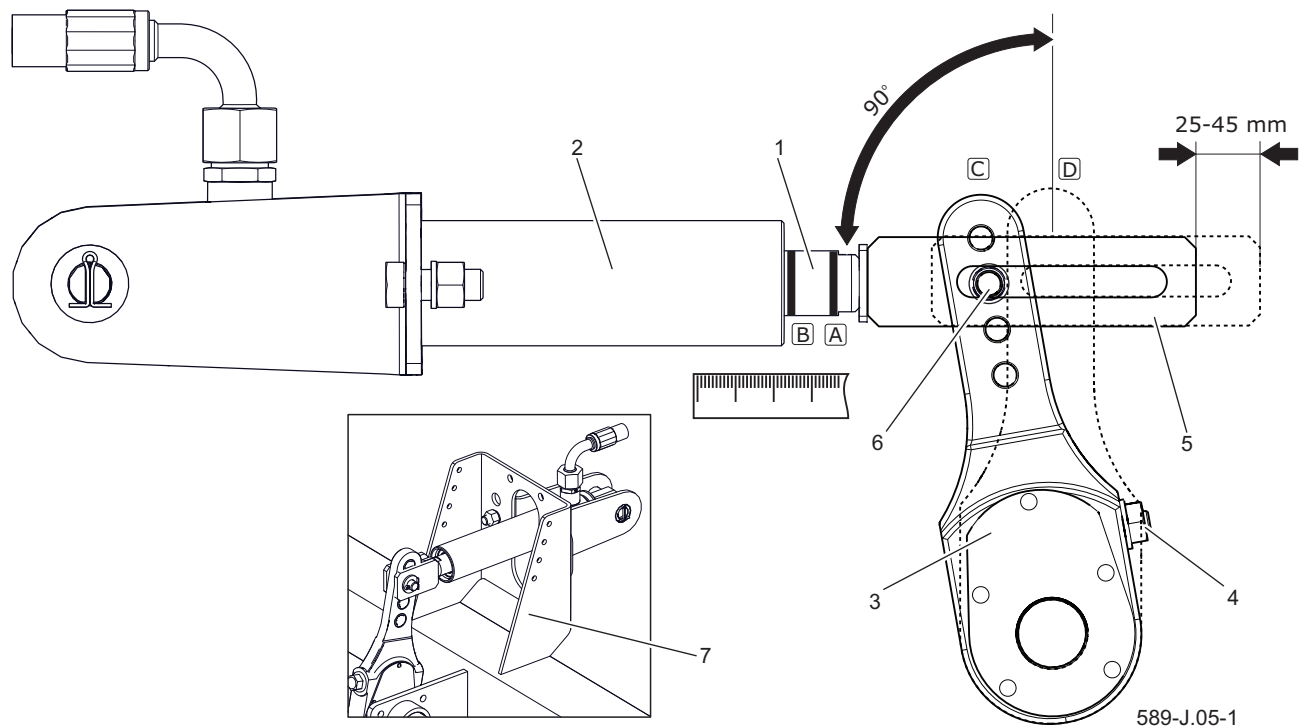
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**Figure 6.6** Pneumatic brake adjustment

(1) cylinder piston, (2) cylinder diaphragm, (3) expander arm, (4) adjustment screw, (5) fork of the cylinder, (6) fork of the fork, (7) cylinder of the cylinder, (A) mark on the piston rod in the braked position, (B) mark on the piston rod in the fully braked position, (C) position of the arm in the unlocked position, (D) arm position in full braking position

## THE SCOPE OF ACTIVITIES

- Hitch manure spreader to tractor.
- Turn off the tractor engine and remove the keys from the ignition.
- Immobilize tractor with parking brake.
- Make sure that the manure spreader is not braked.
- Secure the manure spreader against rolling with wheel chocks.
- On the piston rod (1) - figure (6.6), (6.7) of the cylinder mark with a line (A) the position of the maximum retraction of the piston rod with the spreader brake off.
- Press the brake pedal on the tractor, mark with a line (B) the position of maximum extension of the piston rod.
- Measure the distance between the lines (A) and (B). If the piston rod stroke is not within the correct working range (25-45mm), adjust the expander arm.
- Remove the actuator fork pin (6).
- Remember or mark the original position of the cylinder fork (6) in the expander arm bore (3).



**Figure 6.7** Hydraulic brake adjustment

(1) cylinder piston, (2) cylinder housing, (3) expander arm, (4) adjustment screw, (5) fork of the cylinder, (6) fork of the fork, (7) cylinder of the cylinder, (A) mark on the piston rod in the braked position, (B) mark on the piston rod in the fully braked position, (C) position of the arm in the unlocked position, (D) arm position in full braking position

- Check that the cylinder piston moves freely and within the full nominal range.
- Check that the air vents of the actuator are not clogged with dirt and that there is no water or ice inside (pneumatic actuator). Check the correct mounting of the actuator.
- Clean the actuator, defrost if necessary and remove water through the

vent holes. (pneumatic cylinder). If damage is found, replace the actuator with a new one. When mounting the actuator, keep its original position relative to the bracket (7).

- Turn the adjusting screw (4) so that the marked hole of the expander arm coincides with the hole of the cylinder fork

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

- Install the piston rod fork pin and washers and secure the pin with cotter pins.



**CAUTION**

An improperly adjusted brake can cause the rubs to rub against the drum, which can result in faster wear of the brake linings and / or overheating of the brake. The diaphragm actuator should not be opened. The membrane is pasted and may lose its seal.

- Turn the adjusting screw (4) clockwise to make one or two clicks in the expander arm adjustment mechanism.
- Repeat the adjustment on the second cylinder on the same axis.
- Apply the brake.
- Wipe previous markings and measure piston rod stroke again.
- If the piston rod stroke is not within the correct operating range, repeat

the adjustment.

#### **FUNCTIONAL CHECK**

- After completing the adjustment, carry out a test drive.
- Perform several brakes. Stop the manure spreader and check the temperature of the brake drums.
- If any drum is too hot, correct the brake adjustment and perform the test drive again.

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## 6.5 ELECTRICAL SYSTEM SERVICE AND WARNING ELEMENTS



### CAUTION

Driving with defective lighting installations is prohibited. Damaged lamps should be replaced immediately before driving off. Lost or damaged reflectors should be replaced with new ones.

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

Work related to the repair, replacement or regeneration of electrical installation components should be entrusted to specialized workshops that have appropriate technologies and qualifications to perform this type of work.

The user's duties include only technical inspection of the electrical installation and reflectors.

### THE SCOPE OF ACTIVITIES

- Connect the manure spreader to the tractor with a suitable connection lead.
- Make sure the connection cable is

OK. Check the connection sockets on the tractor and on the spreader.

- Check the completeness, technical condition and correct functioning of the spreader lighting.

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

- Check the correct installation of the triangular plate holder for slow moving vehicles.
- Before travelling on a public road, make sure that the tractor has a reflective warning triangle.

### ADVICE

The light source in the lamps are LEDs and in case of damage are only replaced as a complete lamp without the possibility of repair or regeneration.

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## 6.6 ADAPTER DISASSEMBLY AND ASSEMBLY



### CAUTION

Removing of the adapter is necessary when using the spreader as SILO.  
Disassembly and assembly of the adapter on the manure spreader frame should be performed using a lifting device with a capacity of min. 1250 kg.

### SCOPE OF ACTIONS

- Brake the manure spreader with the parking brake and prevent it from rolling away with wheel chocks.
- Disconnect and remove the PTO shaft from the adapter gear.
- On both sides of the manure spreader, disconnect the hydraulic conduit

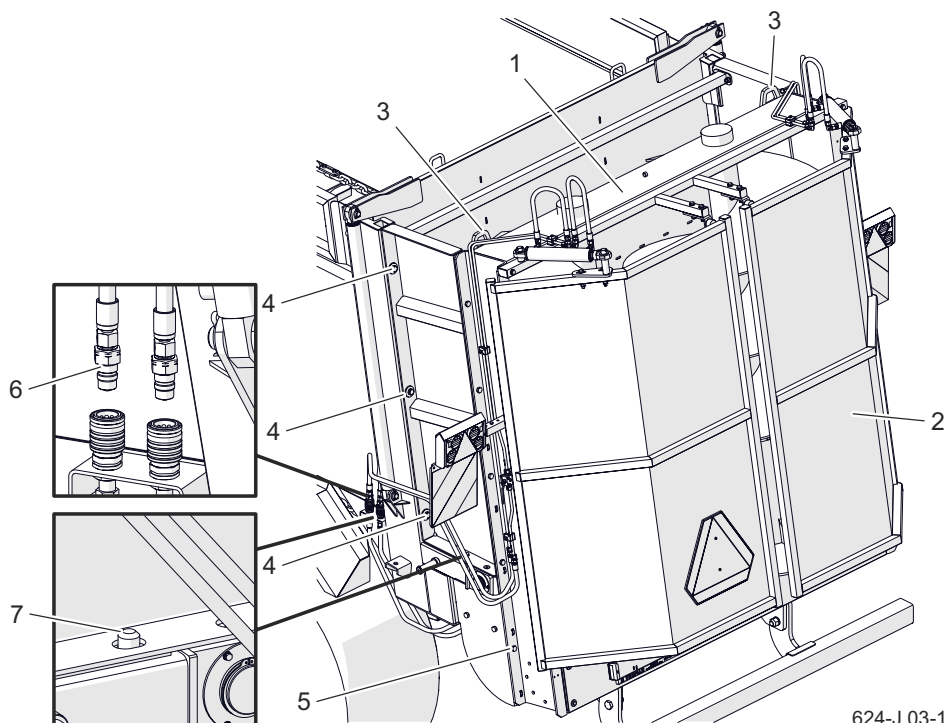


### DANGER

Before dismantling, relieve pressure in the hydraulic conduit for rear flap control (if equipped).  
When lifting the adapter, it is forbidden to climb under the suspended adapter.  
During disassembly and assembly, use appropriate tools, devices (overhead cranes, cranes, lifts, etc.), use personal protective equipment, i.e. protective clothing, shoes, gloves, etc.

plugs (6) of the adapter flap control (if available).

- Disconnect the connector of the manure spreader's rear lighting harness located on the right side under the adapter.



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**Figure 6.8** Adapter disassembly and assembly

(1) adapter, (2) adapter flaps (additional equipment), (3) transport hook for the adapter, (4) M16x40 screw, (5) M14x40 screw, (6) hydraulic conduit plug, (7) pin

- Connect the hooks of the sling with the transport eyes (3) of the adapter on its upper part.
- On both sides of the adapter, unscrew the screws (4) connecting the adapter with the load box.
- Unscrew the screws (5) that connect the adapter to the bottom side.
- Remove the adapter using a lifting device,
- When the adapter is disassembled, place it on a hard surface and secure it against tipping over.
- Installation should be made in reverse order.

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## 6.7 ASSEMBLY AND DISASSEMBLY OF SILO EXTENSIONS

### SCOPE OF ACTIONS

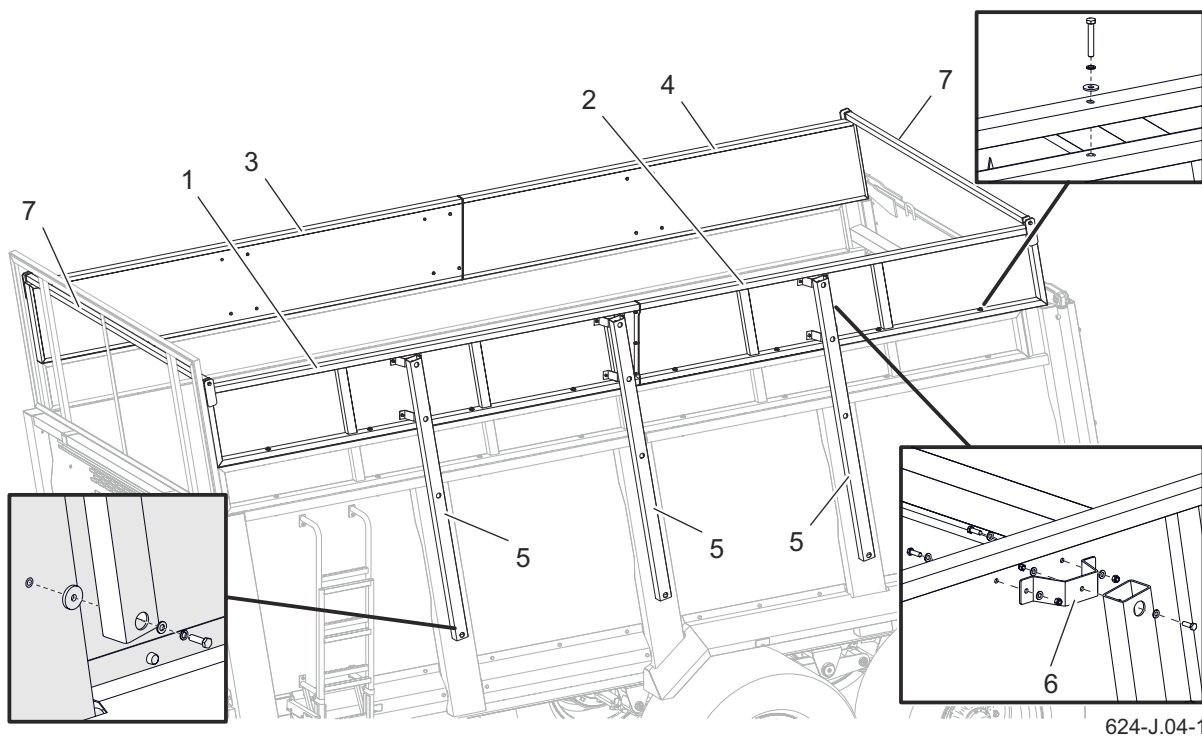
- Brake the manure spreader with the parking brake and prevent it from rolling away with wheel chocks.
- Install the extensions, items 1-4, see figure (6.9).
- Screw the post brackets (6) to the extensions.
- Install the post profiles (5) to the extensions and the load box.



### CAUTION

Assembly and disassembly of superstructures should be carried out using the appropriate height of platforms, ladders or a ramp. The condition of these devices must protect the workers from falling. The work should be performed by at least two people. Take special care.

- Install the crossbars (7).
- After installing the extensions, check the tightness of all bolted connections.
- Disassembly of the extensions should be performed in the reverse order.



**Figure 6.9** Assembly and disassembly of silo extensions

(1) front left extension, (2) rear left extension, (3) front right extension, (4) rear right extension, (5) post profile, (6) post support, (7) crossbar

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## 6.8 CONSUMABLES

### HYDRAULIC OIL

It is absolutely necessary to observe that the oil in the spreader's hydraulic system and the tractor's hydraulic system must be of the same type. If different types of oil are used, make sure that both hydraulic means can be mixed together. The use of different types of oil may cause damage to the spreader or agricultural tractor. The new machine is filled with L HL32 Lotos hydraulic oil.

If you need to change the hydraulic oil for another oil, read the oil manufacturer's instructions carefully. If he recommends flushing the system with an appropriate preparation, follow these recommendations. It must be ensured that the chemicals used for this purpose do not act aggressively on the materials of the hydraulic system. During normal operation of the spreader, it is not necessary to change the hydraulic oil, however, if necessary, this operation should be entrusted to specialist service centres.

The oil used, due to its composition, is not classified as a dangerous substance, however long-term effects on the skin or eyes may cause irritation. In the event of contact of oil with skin, wash the place of

contact with water and soap. Do not use organic solvents (gasoline, kerosene). Soiled clothing should be removed to prevent oil from getting on your skin. If the oil gets into your eyes, flush them with plenty of water and in case of irritation contact your doctor. Hydraulic oil under normal conditions is not harmful to the respiratory tract. The hazard only occurs when the oil is strongly atomized (oil mist), or in the event of a fire during which toxic compounds may be released. Oil should be quenched with carbon dioxide, foam or extinguishing steam. Do not use water to extinguish a fire.

### LUBRICANTS

For heavily loaded parts, it is recommended to use lithium grease with the addition of molybdenum disulphide ( $\text{MOS}_2$ ) or graphite. For less loaded components, it is recommended to use general-purpose machine greases that contain anti-corrosive additives and are highly resistant to water washout. Aerosol preparations

#### ADVICE

Lubrication frequency (Table *Spreader lubrication schedule*).

(silicone greases, anti-corrosive lubricants) should have similar properties.

Before using lubricants, Z read the information leaflet for the selected product.

Particularly important are safety rules

and how to handle a given lubricant and how to dispose of waste (used containers, contaminated rags, etc.). The information leaflet (product card) should be kept together with the grease.

**Table 6.1.** Characteristics of oil L-HL 32

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

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## 6.9 FAULTS AND HOW TO REMOVE THEM

**Table 6.2.** Faults and how to remove them

FAULT	CAUSE	REMOVAL METHOD
Trouble with starting.	Brake system lines not connected.	Connect the brake lines (applies to pneumatic system).
	Parking brake applied.	Release the parking brake.
	Pneumatic connection lines damaged.	Replace.
	Connection leakage	Tighten, replace washers or sealing sets, replace hoses.
	Defective control valve or braking force regulator.	Check valve, repair or replace.
Noise in the hub of the axle.	Excessive bearing looseness.	Check the clearance and adjust if necessary
	Damaged bearings.	Replace bearings
	Damaged hub components.	Replace.
Low braking efficiency.	System pressure too low.	Check the pressure on the pressure gauge on the tractor, wait for the compressor to fill the tank to the required pressure. Damaged tractor air compressor. Repair or replace. Damaged brake valve on the tractor. Repair or replace. System leakage. Check systems for leaks.
Excessive heating of the axle hub.	Incorrectly adjusted service or parking brake.	Adjust expander arm positions.
	Worn brake pads.	Replace brake shoes.
Incorrect hydraulic system operation.	Incorrect hydraulic oil viscosity.	Check the oil quality, make sure that the oils in both machines are of the same grade. If necessary, change the oil in the tractor and/or spreader.

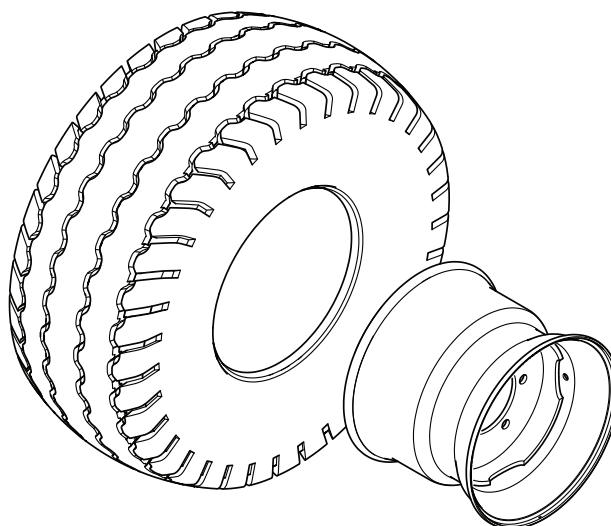
Incorrect hydraulic system operation.	Insufficient tractor hydraulic pump performance, tractor hydraulic pump defective.	Check the hydraulic pump on the tractor.
	Damaged or dirty actuator.	Check the cylinder piston rod (bending, corrosion), check the cylinder for leaks (piston rod seal), repair or replace the cylinder if necessary.
	Actuator load too high	Check and reduce the cylinder load if necessary.
	Damaged hydraulic lines	Check and make sure that the hydraulic hoses are tight, not kinked and properly tightened. Replace or tighten as necessary.
Conveyor impacts.	Excessive extension of the conveyor chains. Incorrect adjustment of conveyor chain tension.	Check the tension of the chains and adjust according to chapter 5.9 „ <i>Checking and adjusting the tension of the floor conveyor chains</i> ”.
The spreading adapter is blocked.	Too high speed of floor conveyor.	Reduce conveyor speed and change direction briefly.
The chain conveyor control does not work.	The chain conveyor control is not working. Oil flow is interrupted.	Check the degree of wear of the connector. Set the tractor's control valve to pressure.
Damage to the PTO shaft.	Too much angular deviation during operation.	Use a wide angle shaft or disconnect the PTO when cornering.
	Roller too short or too long.	Change the PTO shaft to another one. Align the shaft according to the instructions in the manual provided by the shaft manufacturer.
Small spreading width.	Incorrect selection of the PTO shaft speed in the tractor.	Change the PTO shaft speed on the tractor to 1000 rpm.



# CHAPTER 7

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TIRE ASSEMBLY



U-K.01-1

**Table 7.1.** Trailer tires

Item	Tire size	Wheel size	Tire pressure
1	600/55-22,5; 169A8	20.00x22.5 ET=-20	260 kPa
2	600/50R22,5; 159D 170A8 <sup>(1)</sup>	20.00x22.5 ET=-20	400 kPa
3	620/50R22,5 161D 172A8 <sup>(1)</sup>	20.00x22.5H2 ET=-40	400 kPa
4	600/50R22,5; 159D 170A8 <sup>(1)</sup>	20.00x22.5; ET=-40	400 kPa
5	600/55-22.5 16PR 169A8 <sup>(1)</sup>	20.00x22.5H2 ET=-40	260 kPa
6	600/55R22,5; 162E 175A8 <sup>(1)</sup>	20.00x22.5; ET=-40	400 kPa
7	600/55-26.5 16PR 170A8 <sup>(1)</sup>	20.00x26.5H2 ET=-50	260 kPa
8	600/55R26.5 165D 176A8 <sup>(1)</sup>	20.00x26.5H2 ET=-50	400 kPa
9	710/45-26,5 169A8 <sup>(1)</sup>	24.00x26.5; ET=-50	240 kPa
10	700/50-26.5 16PR 174A8 <sup>(1)</sup>	24.00x26.5H2; ET=-80	240 kPa
11	710/50R26,5 170D 181A8 <sup>(1)</sup>	24.00x26.5H2; ET=-80	400 kPa

<sup>(1)</sup> width over 2550



