

CynkoMet Sp. z o.o.
ul. Fabryczna 7 W
16-020 Czarna Białostocka
phone (085) 710 24 56

MANURE SPREADER

N-264/1

Type N-2

INSTRUCTIONS FOR USE AND OPERATION

Identification of the machine

Symbol/Type: N-2

Version:

Variant:

VIN:.....

The factory number is punched on the rating plate and on the front beam of the spreader's bottom frame. The rating plate is riveted to the drawbar beam of the bottom frame.

When buying the machine, check the conformity of the serial numbers stamped on the spreader with the serial number written in the warranty card, in the sales documents and in the instruction manual.

NOTE!

The manufacturer reserves the right to introduce, in the manufactured machines, structural alterations facilitating servicing and improving the quality of their work. The information on significant design changes are communicated to the user by means of enclosed information (annexes).

Comments and observations about the design and operation of the machine should be sent to the manufacturer. This information will allow objective evaluation of the machine, and serve as guidelines in their further modernization.

 NOTE!	NOTE! Before the operation, the user should be familiar with this manual and follow all recommendations. This will ensure safe maintenance and trouble-free operation of the machine.
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According to the Regulation of the Minister of Infrastructure of 31 December 2002 on the technical conditions of vehicles and obligatory equipment, the Manufacturer announces that the agricultural tractors and low-speed vehicles, and trailers designed to connect with these vehicles should be marked with a distinctive plate (Section 3.6, fig. 2). The plates are not required when the vehicle is included in the kit and is the last vehicle in the set.

In accordance with the above Regulation, the Manufacturer has equipped the spreader with a plate holder.

The N-264/1 spreader complies with the rules of moving on public roads by machines with a speed of up to **30km/h** (Act on Road Traffic Law of 20 June 1997). The manufacturer also claims that the supplied spreader cannot be moved faster on public roads than the above-indicated speed.

If the information contained in the manual will prove to be insufficient or not fully understandable, it is advisable to seek help at the sales point in which the machine was purchased or go directly to the Manufacturer.

Manufacturer's Address:

CynkoMet Sp. z o.o.
ul. Fabryczna 7 W
16-020 Czarna Białostocka
phone: (085) 710 24 56

INSTRUCTIONS FOR USE AND SERVICE CONSTITUTES BASIC EQUIPMENT
OF THE MACHINE!

The machine is designed in accordance with the applicable standards, documents and legal regulations currently in force.

DETERMINATION OF DIRECTIONS IN THE MANUAL

Left side - side to the left hand of the observer facing in the forward direction of travel of the machine.

Right side - the right-hand side of the observer facing in the direction of travel of the machine forward.

Rear - behind the back of the observer facing in the direction of forward travel of the machine.

Front - in front of the observer facing in the direction of forward travel of the machine.

DECLARATION OF CONFORMITY

CynkoMet sp z o.o.

15-020 Czarna Białostocka ul. Fabryczna 7W Polska

acting as the producer

declare with full responsibility that the machine:

MANURE SPREADER

Type / Model: N-2 / N-2G4

Year of production:

Serial number:

BRIEF DESCRIPTION OF THE MACHINE AND ITS FUNCTIONS:

The spreader is a universal machine intended for spreading manure of any kind, lime, peat and compost. After installing the extension and replacing the adapter with a back wall it can be used as a volumetric dump trailer. The spreader consists of a box, drawbar, interior wall and adapter.

To which this declaration relates complies with the requirements:

- Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (OJ EU L157 of 09/06/2006, pages 24-86)
- Regulation of the Minister of Economy of 21 October 2008 on essential requirements for machines (Journal of Laws of 2008, no. 199, item 1228)

For the conformity evaluation, the following harmonized standards have been used:

- PN-EN ISO 4254-1 Agricultural machinery – Safety – Part 1: General requirements of 2014.
- PN-EN 690 Agricultural machinery – Manure spreaders – Safety
- PN-ISO 11684: 1998P Tractors, machinery for agriculture and forestry, powered lawn and garden equipment - - Safety signs and hazard pictorials - - General principles of 1998.
- PN-EN ISO 12100 –1:2012 – Safety of machinery - - General principles for design - - Risk assessment and risk reduction of 2012.
- PN-EN ISO 13857:2010 – Safety of machinery - - Safety distances to prevent hazard zones being reached by upper and lower limbs of 2010.

Person authorized to prepare technical documentation:

Head of Constructors and Technologists

Address: Fabryczna 7W, 16-020 Czarna Białostocka , Poland

THE DECLARATION LOSES ITS VALIDITY IF THE MACHINE IS MODIFIED OR REBUILT WITHOUT THE MANUFACTURER'S CONSENT.

Czarna Białostocka
Place and date of declaration

The identity and signature of the person
authorized to make declarations

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1. Introduction

This manual describes the basic principles of safe use and operation of manure spreader.

 NOTE!	NOTE! Before using the spreader, you should carefully read the content of the user's manual. Before each running of the spreader, it must be checked in terms of operational safety.
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If the information contained herein will prove to be not fully understood, seek help from the manufacturer of the machine or the sales point where it was purchased.

Particularly important information and recommendations, the observance of which is absolutely necessary in the text are highlighted in bold or preceded by the word **"CAUTION!"**.

Information, descriptions of danger and precautions, as well as commands and orders "related to the safety of use are highlighted in the user's manual with a sign  and furthermore mentioned in the chapter "SAFETY OF USE".

 NOTE!	NOTE! The operating instructions must absolutely be passed at the moment of delivering the machine to another user, allowing him to get acquainted with its content. It is recommended that the transfer of the instruction is done against a confirmation.
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1.1 Identification of the machine

The manure spreader is marked with the use of a nameplate (1) and a serial number (2). The serial number is located on the front beam of the lower frame, and the rating plate is located on the drawbar beam of the bottom frame - figure 1.1.

When buying the spreader, check the compatibility of the serial numbers on the machine with the number written in the WARRANTY CARD, in the sales documents and in the USER'S MANUAL.

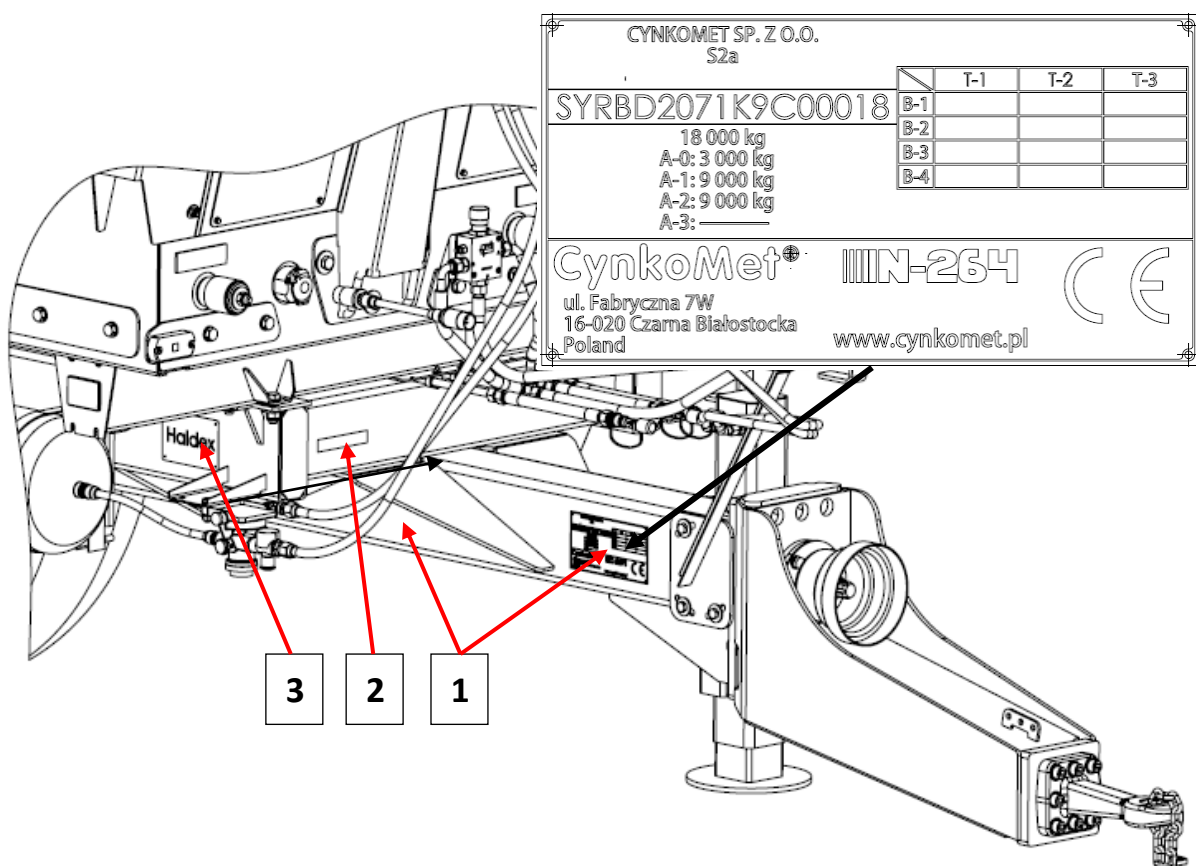


Figure 1.1. Potential location of the rating plate and issue of the serial number

1 - rating plate, 2 - serial number, 3 - rating plate of brake system,



NOTE!

NOTE!

It is forbidden to use the spreader when the nameplate is illegible or has been removed from the machine.

2. Purpose of the spreader

The spreader is a universal agricultural machine designed for spreading manure of any kind, lime, peat and compost. The suspension of TANDEM type on parabolic leaves ensures optimum driving characteristics. The adapter, with two horizontal crushing rolls and two spreading plates, equipped with a tiltable guard, guarantees precise application of manure. The machine is also equipped with a hydraulic wall, which allows you to adjust the dosage of the material located on the loading box. The spreader consists of a support frame, floor with a thickness of 3mm and walls with a height of 1.15 meters, which are constructed from high-strength steel sheet metal with a thickness of 4 mm.

The brake system and lighting and signaling system meet the requirements arising from the "Regulation of the Minister of Infrastructure of 31 December 2002 on technical conditions of vehicles and the range of their necessary equipment".

Failure to follow the transport and loading of goods specifications described by the Manufacturer and the rules on road transport in force in the country in which the spreader is used, will void the warranty service and is regarded as use of the machine incompatibly with its purpose.

The spreader is adapted to cooperation with agricultural tractors equipped with an external hydraulic system and lower trailer hitch with capacity of 3000 kg.

The spreader **IS NOT SUITABLE** and cannot be used to transport people and / or animals and other materials identified in the following pages.

Use in accordance with the product's destination also includes all activities related to correct and safe operation and maintenance of the machine. Therefore, the user is obliged to:

- read the content of the **USER'S MANUAL** of the spreader and the **WARRANTY CARD** and adhere to the recommendations contained in these elaborations,
- comply with the established maintenance plans and regulations,
- comply with general safety regulations while working

- Prevent accidents,
- comply with the road traffic regulations and transport regulations in force in the country in which the spreader is exploited,
- read the instructions for operating the agricultural tractor and comply with its recommendations, in combination with the spreader.

 NOTE!	NOTE! The spreader must not be incompatibly with its purpose, and in particular: • for transporting people and animals, • for transporting bulk hazardous toxic materials when there is a possibility of causing environmental contamination, • to transport machinery and equipment, • with removed safety guards and use without its covers • spreading manure, peat, lime, where in those materials there are stones, pieces of wood or other solid materials that can damage the adapter and threaten the safety of users and bystanders • to carry stones, gravel and other building materials.
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The spreader can be handled and operated only by persons of full age who:

- Are familiar with **ALL THE CONTENT** of the spreader's manual,
- have the required authorization to drive and are familiar with the road traffic regulations and transport regulations.

 NOTE!	NOTE! The operation and exploitation of the machine not in accordance with the Instruction Manual releases the Manufacturer from liability for the consequences resulting from non-compliance with the provisions contained therein. At the same time, it causes a loss of warranty.
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NOTE!

NOTE!

The manufacturer is not responsible for changes made by the user in the design of the spreader, and such changes will void the warranty.

3. Safety in use

3.1 General safety and accident prevention regulations

- Before using the spreader, you should carefully read the contents of the manual. During operation, observe all instructions contained in the manual.
- Before each use, check the spreader for operational safety (completeness of all screens, tightness of all the screws (table 7) if there are no cracks on the structure or visible damage, state of the tension of the chain "if it is not too loose")
- Entering onto the spreader is possible only during absolute motionlessness of the machine, when the tractor's engine is switched off and  **disconnection of the Power take-off from the tractor.**
- The spreader should be combined with tractors recommended by the manufacturer accordingly to table 2.
- Pay attention to the warnings in places of crushing and shearing when starting the machine and all the pictograms placed on the spreader.
- During transport, check the condition of preheat of the tires, brake drums and wheel bearings. In the case of detecting an excessively heating element, stop the machine from operating until determining the cause and rectifying the fault.



NOTE!

NOTE!

Before driving with the spreader in a place where there are flammable materials you should imperatively check the status of the heating elements of the spreader, especially the brake drums and driving wheel bearings, due to the risk of fire.

- The speed of driving must always be adapted to the environmental

conditions. Please take special caution when overcoming unevenness and avoid sudden turns.

- When switching and disconnecting the machine from the tractor, you must be careful.
- Exceeding the permissible load can cause accidents on the road and damage to the machine.
- When cornering, you should take into account the inertia of the machine.
- Before you start, check if the spreader has any loose parts.
- Within additional elements which are force operated (e.g. by hand), there are places of crushing and shearing.
- Malfunctioning of the trailer should be removed only during absolute motionlessness of the machine and  **disconnection of the PTO from the tractor.**
- No one can stay between the tractor and the spreader before the vehicle is not protected against self-running off through the parking brake (hand brake) and wedges under the wheels.
- The permissible transport speed 30 km / h cannot be exceeded.
- It is forbidden to transport people or animals on the spreader.
- It is forbidden to enter into the loading platform during operation and when coupling the tractor with the spreader.
- The machine is designed to work on slopes up to 8 °.
- Disconnecting the spreader from the tractor is not allowed with the engine running and key not removed.
- Modifications can be made only with the permission of the manufacturer. The basic condition for safety are original spare parts and components. Using other parts may result in exclusion of liability of the manufacturer for resulting consequences.
- Careless operation and use of the spreader can injure the operator or third parties and damage the tractor-spreaderset.
- It is forbidden to use the machine by persons not qualified to drive agricultural tractors, including under aged persons and persons under the influence of alcohol.

- It is forbidden to use the spreader in non-compliance to its purposes. The staff operating the machine should strictly observe basic safety rules
- Prior to every use of the spreader, check its technical condition, **especially the condition of the coupling system, drive system, brake system and light signaling system.**
- The machine is marked with information and warning inscriptions in the form of stickers as specified in Table 1. The user is obliged to constantly take care of the readability of signs and warning symbols on the machine. In the event of damage or destruction replace them with new ones.
- Labels with inscriptions and symbols are available from the manufacturer.

3.2 Attaching and detaching the machine to the tractor

- Before attaching the spreader, make sure that the tractor and spreader are technically efficient.
- Remove the chain protecting against unauthorized use from the eye of the drawbar (fig. 3.1).
- When connecting the spreader, use only the intended trailer hitch in accordance with the instruction manual of the tractor. After completion of the machine coupling, check the security of the hitch. Read the whole manual for the tractor's use. If the tractor is equipped with an automatic **hitch, make sure the coupling operation has been completed correctly.**
- Be very careful when you connect the machine.
- **When coupling, nobody may stay between the trailer and the tractor,** it is essential to take advantage of the adjustable drawbar support.
- Coupling and uncoupling of the spreader may only take place when the machine is immobilized with the parking brake.
- Before uncoupling the machine, lower the drawbar's support foot by resting it on the ground in a stable manner.
- After uncoupling the machine, mount the chain back on the drawbar's eye and secure it with a padlock.

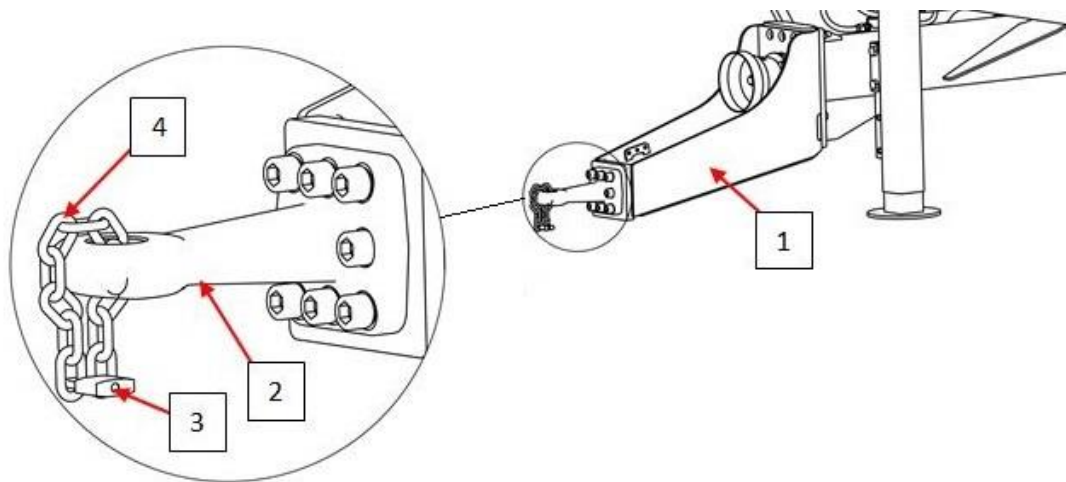


Figure 3.1. Securing the machine against unauthorized use.

1 - drawbar, 2 - drawbar eye, 3 - padlock, 4 - chain

3.3 Wheels

- When working with the wheels, secure the spreader, in case of self-launching of movement, using the parking brake and planting chocks under the wheels.
- Replacement of wheels should be carried out on stable ground, which prevents collapse of the jack or wheel on which the spreader is raised.
- Repair work on the wheels should be carried out in accordance with the wheel point exchange and using appropriate tools.
- After each installation of a wheel, tighten the nuts after the first 10 working hours, then every 50 working hours to check their tightening (according to Table 7).
- The air pressure is to be checked regularly. Observe the recommended air pressure.
- Dismantling the wheels can be carried out only in the case when the spreader is not loaded.
- Avoid damaged road surface, quick and variable maneuvers and high speed during turns.
- Tire valves are to be protected with caps to prevent penetration of impurities.

3.4 The pneumatic and hydraulic system

- The hydraulic and pneumatic installations during operation are under high pressure.
- Regularly check the technical condition of the connections and the hydraulic and pneumatic systems. Oil leaks and air leaks are unacceptable.
- In case of failure of the hydraulic or pneumatic installation, the spreader should be out of operation until failure removal.
- When connecting the hydraulic hoses to the tractor, pay attention that the hydraulic system of the tractor and the spreader are not under pressure. If necessary, reduce the residual pressure system.
- In the case of injury with a strong jet of hydraulic oil should, immediately consult a doctor. The hydraulic oil can penetrate the skin and cause an infection. If the oil gets into your eyes, rinse with plenty of water and consult a doctor.
- The oil in the working hydraulic installation may be heated to high temperatures. In the case of burns, cool the burned place and contact a physician.
- In the event of contact of oil with skin, wash the dirty spot with soap and water. Do not use organic solvents (petrol, kerosene).
- Use the hydraulic oil recommended by the Manufacturer.
- After replacing the hydraulic oil, the used oil must be disposed of Used oil or one that has lost its properties should be stored in its original containers or in substitute packages which are hydrocarbon-resistant. Replacement containers must be carefully described and stored properly.
- It is forbidden to store hydraulic oil in packaging designed for food storage.
- Rubber hydraulic couplings must be replaced every 4 years regardless of their technical condition. Hose replacement must comply with the technical requirements of the manufacturer.

3.5 Maintenance.

- Repair, maintenance and cleaning and the removal of function faults can be performed only when the tractor's engine is fully stopped. The keys have been

removed, and after the Power Take-Off has been disconnected.

- During maintenance and repair jobs use appropriate tools and protective clothing.
- Oils and lubricants are to be carefully removed. The used oil and grease is to be disposed of.
- Before electrical, welding and working works on the electrical system, separate the continuous supply of power to the electrical system of the tractor.
- Use the spare parts according to the catalog of spare parts.
- Modifications can be made only with the permission of the manufacturer. The basic condition for safety are original spare parts and components. Using other parts may result in exclusion of liability of the manufacturer for resulting consequences.
- Maintenance operations of the spreader should be carried out on a stable surface and with securing the spreader against uncontrolled rolling off (through planting chocks under the wheels, using the handbrake).
- It is forbidden to weld galvanized elements because of the harmful vapors.

3.6 The principles of movement on public roads.

- When driving on public roads you must adapt to the road traffic regulations and transport regulations in force in the country in which the spreader is operated.
- Do not exceed the speed limit.
- Adapt the speed to the prevailing road conditions and the degree of loading of the spreader.
- While driving on public roads, the spreader should be equipped with a certified or approved warning triangle. A triangular plate should be placed on the rear wall for slow-moving vehicles (1) as shown below (Fig. 3.2). The triangle must be attached to the handles located on the wall of the deflector.

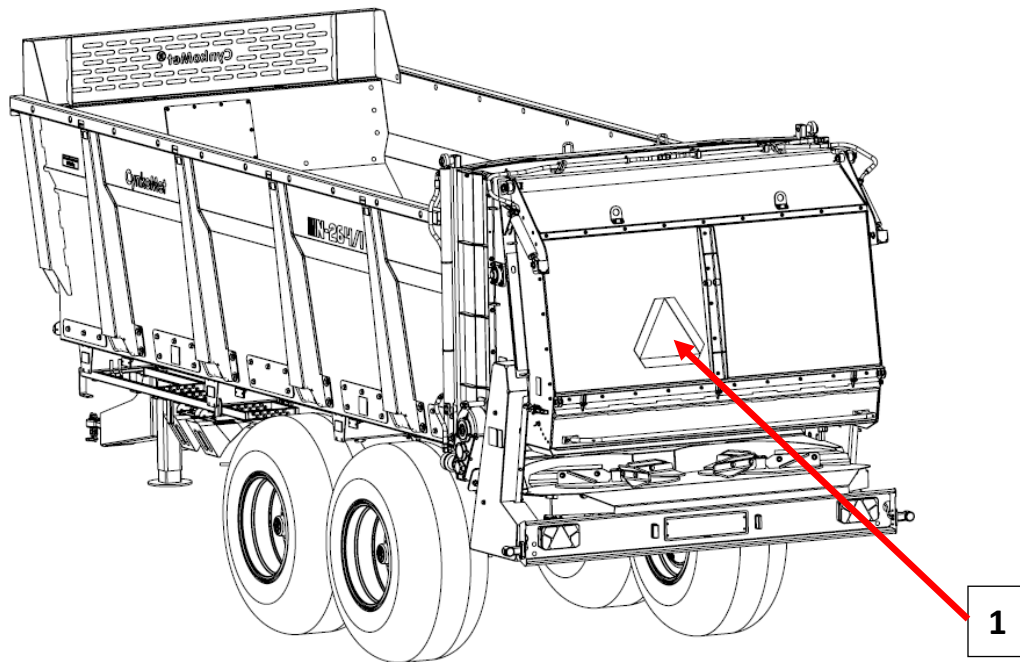


Figure 3.2. The location of the placement of the plate distinguishing slow-moving vehicles.

- The presence and transport of people in the load crate of the spreader is prohibited.
- Before driving, make sure that the spreader is properly connected to the tractor (in particular, check the link pin hook).
- It is forbidden to park on the slopes with a loaded and unsecured machine. Securing is based on stopping with the service brake, parking brake and planting chocks under the wheels. Chocks (1) should be planted only under one wheel (2) (one on the front of the wheel and the other on the back - Fig. 3.3).

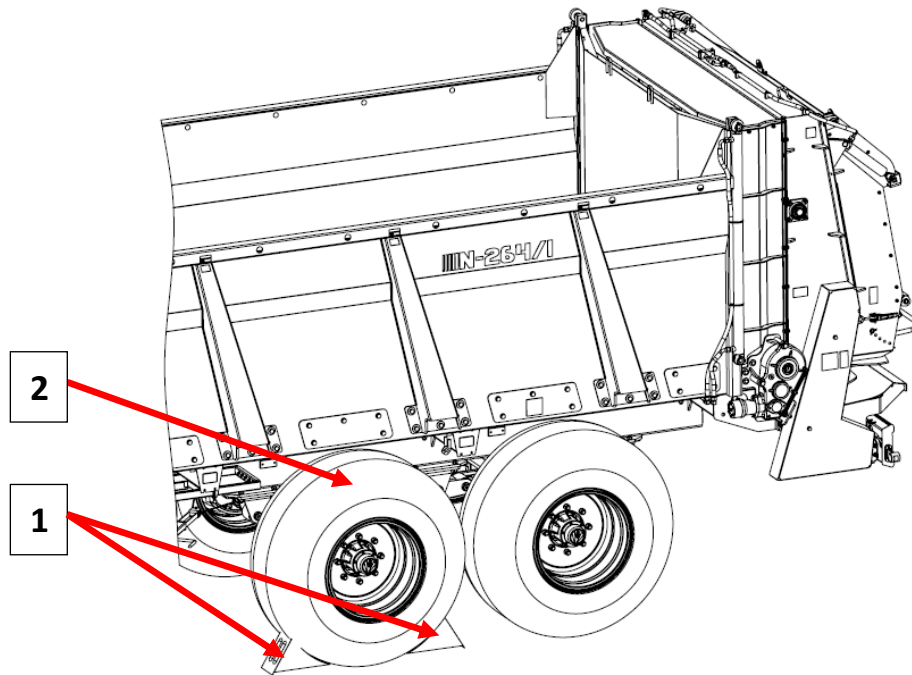


Figure 3.3. The way of placing the chocks.

1 - chock, 2 - road wheel

- Before driving, check that the pins and hitches securing the deflector are in place. Make sure that all the walls and guards and their fastenings are not damaged mechanically and if that malfunction could cause detachment of the particular item from the construction of the spreader.
- Prior to each spreader's use, check its technical condition, especially in terms of safety. In particular, check the technical condition of the coupling system, drive system, brakes and signaling lights and hydraulic, pneumatic and electrical connection elements.
- Before driving, check that the parking brake is released and the braking force regulator is set to the correct position (concerns pneumatic systems with a manual, three-position regulation).
- The spreader is adapted for driving on slopes up to a maximum inclination of 8°. Moving the spreader on steeper slopes may cause the spreader to tip over as a result of loss of stability.
- Each time, after finished work, drain the air reservoir in the pneumatic installation. During frosts, freezing water may cause damage to pneumatic system components.

- It is prohibited to exceed the admissible spreader load. Exceeding the carrying capacity may lead to equipment damage, loss of stability while driving, scattering of the load and cause a hazard to third parties during driving. The brake system of the machine has been adapted to the total weight of the spreader, which if exceeded will result in a drastic reduction in the effectiveness of the brake system.
- The load on the spreader should be distributed evenly and must not impede driving the set.
- When reversing, it is recommended to use the assistance of another person. During maneuvering, the person helping must keep a safe distance from the danger zones and at all times be visible to the operator of the tractor.
- If during reversing we are not using the help of a second person, before commencing the maneuver, make sure that nobody is in the danger zone. Before the start of the maneuver, use a sound signal.



NOTE!

NOTE!

Before each maneuver of reversing and start of spreading the material loaded on the load box, use of the beep signal 2 times is recommended in the tractor in order to inform bystanders about the threat.

3.7 Description of residual risk.

Although the "CYNKOMET" Czarna Białostocka company takes responsibility for the design and construction in order to eliminate the danger, and has made every effort to eliminate the risk of an accident, some elements of risk during operation of the spreader are unavoidable. The residual risk stems from the wrong behavior of the machine operator.

The greatest danger occurs when you do the following:

- use the spreader for purposes other than those described in the manual,
- Being between the spreader and the tractor during work of the engine during maneuvers, reversing, turning, or aggregation of the spreader to the tractor.
- operating the machine by unauthorized persons, under aged persons or under the influence of alcohol or other drugs,

- stay on the machine during operation,
- clean/maintain the machine during operation,
- not keeping a safe distance of bystanders when operating the machine including: reversing, driving, spreading materials to which the spreader has been designed,
- introduce structural changes without the consent of the manufacturer,
- clean, carry out maintenance and technical checks of the trailer,
- the presence of people or animals in areas invisible from the operator's position
- inserting arms, legs, or other items such as tools into rotating parts of the adapter, or the conveyor elements.

When presenting the residual risk, the spreader is treated as a machine, which until the start of production was designed and manufactured according to the current "state of the art".

3.8 Residual risk assessment.

When observing such recommendations as:

- careful reading of the operating instructions and strict adherence to its provisions,
- prohibition of placing hands and other parts of the body in inaccessible and forbidden places,
- prohibition of being on the machine during operation of the tractor, spreader,
- maintenance and repair of the machine according to instructions,
- Application of personal protection equipment for work with subassemblies and parts with sharp edges.
- securing the machine against the access of children and animals,
- use of the observations and recommendations contained in the operating instructions,
- Keeping a safe distance from forbidden or dangerous places during unloading, loading and coupling of the spreader,

- performing maintenance and repair jobs in accordance with the security service rules,
 - prohibition on being on the machine during driving, work, loading or unloading,
- residual risk can be eliminated by using the machine without risk to humans and the environment.

 NOTE!	NOTE! There is residual risk in the event of failure to comply with the set-out recommendations and guidelines.
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3.9 Information and warning stickers.

The spreader is marked with information and warning labels listed in table 1. The user of the machine is obliged to take care of the readability of the subtitles, warning symbols and information placed on the trailer throughout the whole period of its use. In the case of destruction, replace them with new ones. Labels with inscriptions and symbols are available from the manufacturer or the place where the machine was purchased.

New units replaced during repairs must be re-marked with the appropriate safety signs. When cleaning the spreader, do not use solvents that can damage the coating of labels and do not direct a strong stream of water.

Table 1. Information and warning stickers.

Item no.	The symbol (sign) of safety or the content of the inscription	Meaning of the symbol (sign)	The placement on the machine
1.		Note Before starting work, please read the User's Manual.	Front wall
2.		Note Turn off the engine and remove the key before starting maintenance or repair	Front wall
3.	CynkoMet	Informational note	The right-side wall, left side wall
4.		Model designation	The right-side wall, left side wall
5.	1000 min ⁻¹	PTO revolutions	Front wall
6/7.		Ejected objects. Risk to whole body. Maintain a safe distance from the spreader. / Pulling in of hand or upper trunk Maintain a safe distance from the spreader.	Adapter guards
8.	General safety mark and note: "It is prohibited to enter the trailer while the drive is engaged"	-	Front wall

9.	Note: "Machine coupling only with hitch for single-axle trailers."	-	Front wall
10.	Note "Maximum load capacity 14,000kg"	-	The right-side wall, left side wall
11.		Marking of conveyor chain tensioning points	Front wall
12.	Sticker "Hose designations..."	Information on the color of covers for individual hydraulic installations	Front wall
13.		Note Hazard of pulling in by chain, transmission or belt.	Side walls, near bottom edge
14.		Hazard of torso crushing. Do not occupy the space in the area of the articulated joints of hitches while the engine is running.	Front wall
15.		Do not open or dismount safety guards when the engine is running.	Adapter guards
16.		Do not touch components of the machine prior to stopping of all its units.	Front wall

17.		Do not occupy the space under a raised cover prior to fastening of the safeguarding device.	Adapter guard
18.		Take special caution when working near power lines	Front wall
19.		Three-way valve instruction manual	Right channel bar of the adapter, next to the valve
20.		Designation of lifting points for lifts	On axles between U-bolts
21.		Adapter's hitching point	Left channel; bar, right channel bar of the adapter
22.	Note: "1250kg"	Adapter weight	Left channel bar of adapter

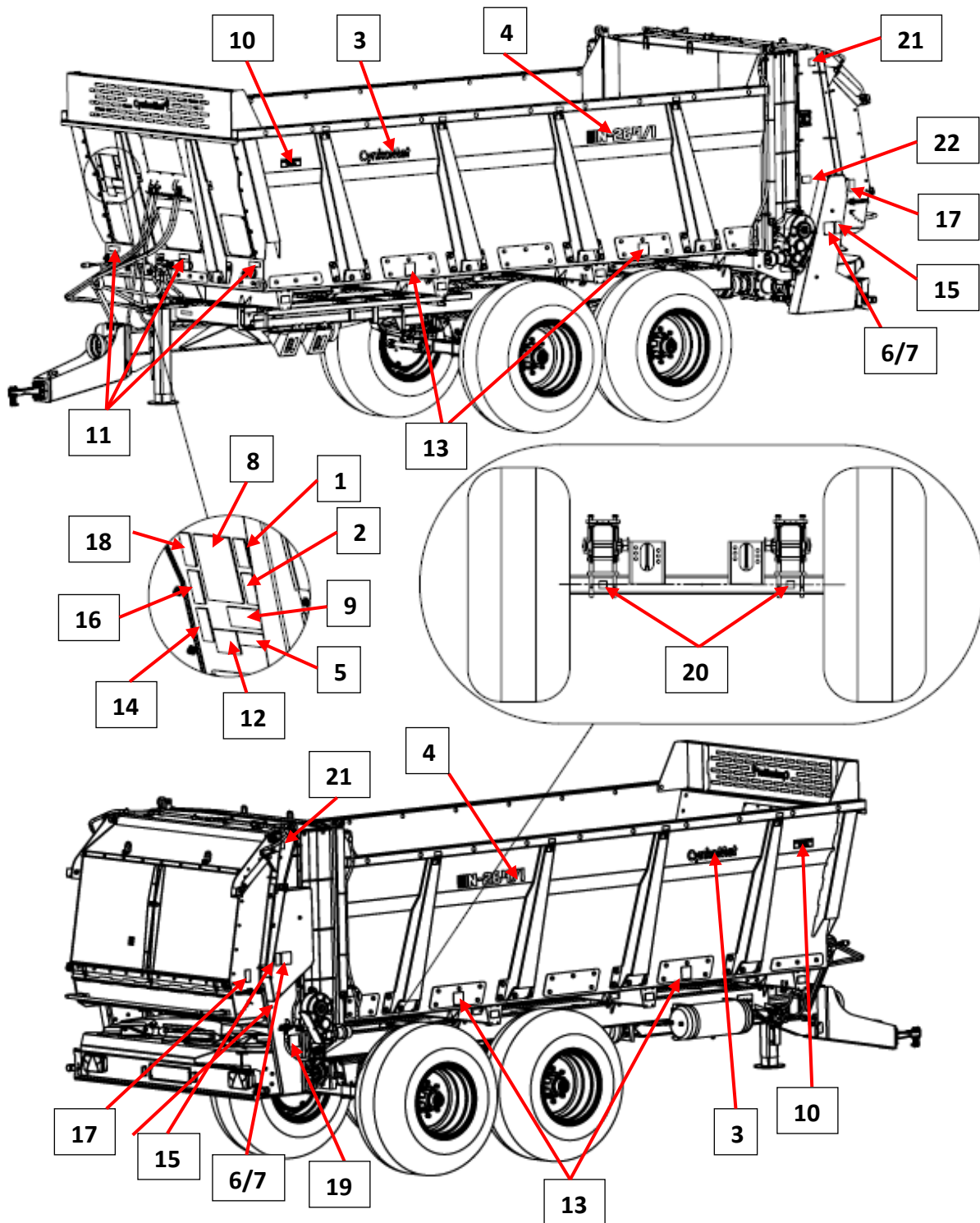


Figure 3.4. Distribution of stickers.

4. Information regarding use

4.1 Technical characteristics.

Table 2. Basic technical specifications of the spreader

NO.	Content	Unit of measure	N-264/1
1.	Total length	mm	8,240
2.	Total width	mm	2,460
3.	Total height	mm	3,055
4.	Track of wheels	mm	1,900
5.	Interior dimensions of the loading crate: • Length • width • height	mm	5,120 2,190 1,150
6.	cargo capacity	m ³	12.9 ⁽¹⁾
7.	Loading surface	m ²	11.2
8.	Height of the loading surface	mm	1,570
9.	Gross vehicle weight rating	kg	21,000
10.	Vehicle weight	kg	6,780
11.	Allowed payload of the vehicle	kg	14,000
12.	Wheelbase	mm	1320
13.	Maximum axle load • 1 • 2	kg	9,000 9,000
14.	Tire size		550/60-22.5 600/50-22.5
14.1	Tires Speed Index		min. A8 (40km/h) ⁽³⁾
14.2	Tires Load Index		min. 161 (4 625kg) ⁽⁴⁾
14.3	The maximum tire pressure	bar/kPa	2.8/280 ⁽²⁾
15.	Rated voltage	V	12 V
16.	Permissible design speed	km/h	40
17.	Power requirement	kW/KM	88/120
18.	The level emitted of noise	dB	68
19.	Working speed of PTO	rpm	1000

(1) – capacity depends on the equipment of the spreader

(2) – always check the guidelines of the given tire manufacturer.

(3) – may vary depending on the mounted tires, but the index is not lower than A8 (40 km/h)

(4) – may vary depending on the mounted tires, but the index is not lower than 161 (4,625kg)

4.2 Description of construction and operation.

4.2.1 General Description

The spreader (fig. 4.1) is an agricultural machine designed for spreading manure of any kind, as well as lime, peat. The spreader is constructed from a lower frame with a drawbar and the upper frame on which vertical side walls 1.15 m in height are fastened and on which a moving conveyor chain is mounted. On the upper frame, there is tightened and riveted sheet metal (floor) with a thickness of 3mm. The cargo box consists of the side walls, front wall and safety mesh, as well as the hydraulic rear walls terminated by a wide strip of rubber (also called the hydraulic lock), which moves on guides in the side walls. The loading crate is finished with an adapter. It consists of a bolted frame with profiled sheets on which two horizontal drums and spreading rotors are mounted. The adapter drums are driven by a horizontal transmission shaft and a chain transmission.

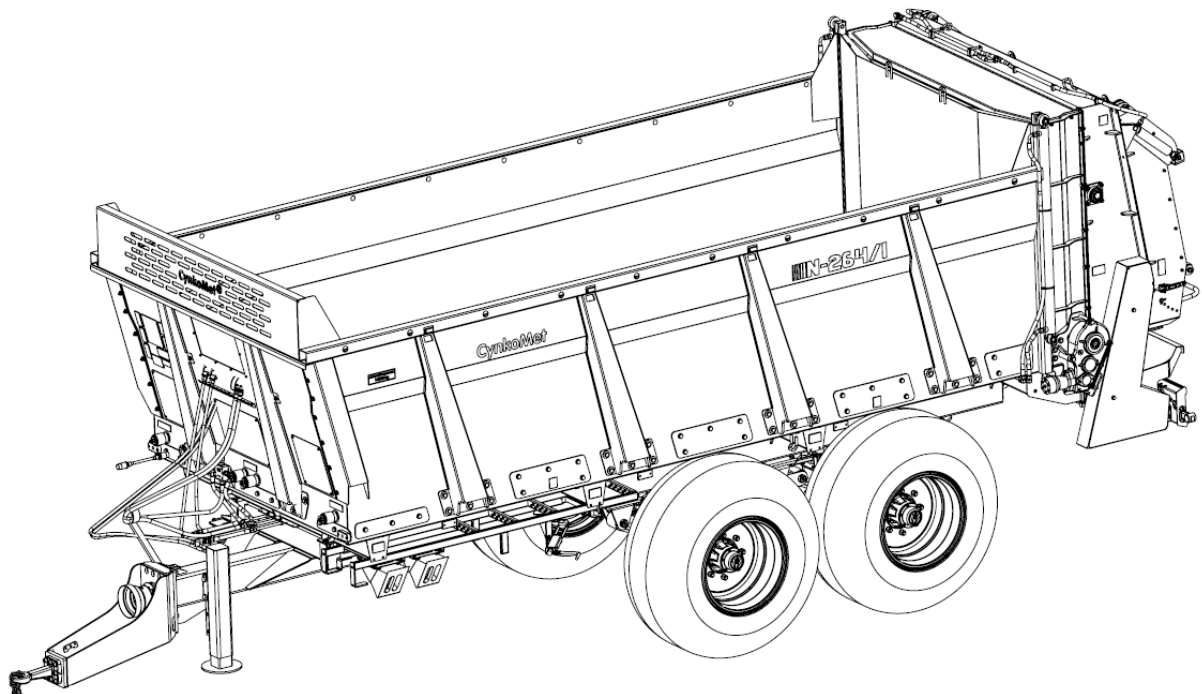


Figure 4.1. N264/1 Spreader

4.2.2 Chassis

The bottom frame (fig. 4.2, item 1) is a welded construction consisting of two stringers joined by cross-bars, and the drawbar beam.

The spreader's driving system is found in the rear part of the chassis, and it consists of: axles (4) and tandem spring suspension (3). Driving axles are made of square bars ending with pivots on which on the tapered roller bearings, wheel hubs are mounted (2). The axles are equipped with shoe brakes channeled with mechanical cam expanders. The trailer's suspension consists of 4 steel leaf springs attached to the bottom frame by pins and slides. The wheel sets are attached to the springs with glomerular bolts.

Drawbar (6), being a welded sheet construction with fastened tension member (7), is fastened to frame (1). Drawbar height can be adjusted by changing the extension of the hydraulic support (5).

The drive, consisting of rigid and articulated shafts, runs along the bottom frame (1) and through the drawbar (6). It is tasked with transmitting, via the power take-off shaft, revolutions from the output in the tractor to the adapter's gearbox, powering drums and rotors.

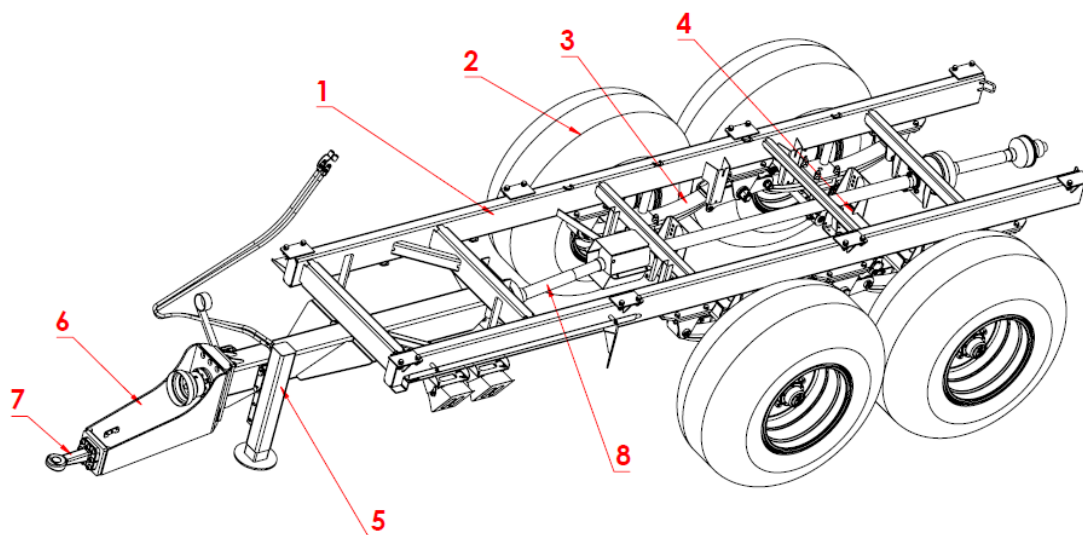


Figure 4.2. Spreader's chassis

- 1 – bottom frame, 2 – driving wheel, 3 – spring, 4 – axle, 5 – hydraulic support,
5 – drawbar, 7 – drawbar tension member, 8 – drive

 NOTE!	NOTE! Use PTO shafts with appropriate and complete guards protecting against direct contact with spinning parts. Guard chains must be fastened to fixed elements, e.g. frame/grips of fixed guards. The shape and size of a guard may limit the tolerable inclination of the shaft. The edge of the guard may not come into contact with the shaft, and no gap larger than 30 mm should form. Contact with the spinning shaft may cause serious injury.
--	--

4.2.3 The upper frame / loading crate

The top frame (fig. 4.3, item 1), fastened to the bottom frame, consists of stringers and cross-bars. On the upper frame, a floor panel (2) of sheet metal having a thickness of 3mm is attached by means of screws and rivets as well as replaceable sliders (3) of the floor conveyor's strips. A profile preventing chains from diverging is found between floor panels. Exchangeable, fastened sliders (4) ensuring proper guiding of the chains are found under the frame, above the wheels. The wood applied in them reduces the noise generated as the chain slides over them. A ladder is fastened to the frame (fig. 4.4, item 2), which, after unfastening of the suspension (fig. 4.4, item 3), may be pulled out and hooked on the edge of the box for the purpose of inspecting its interior.

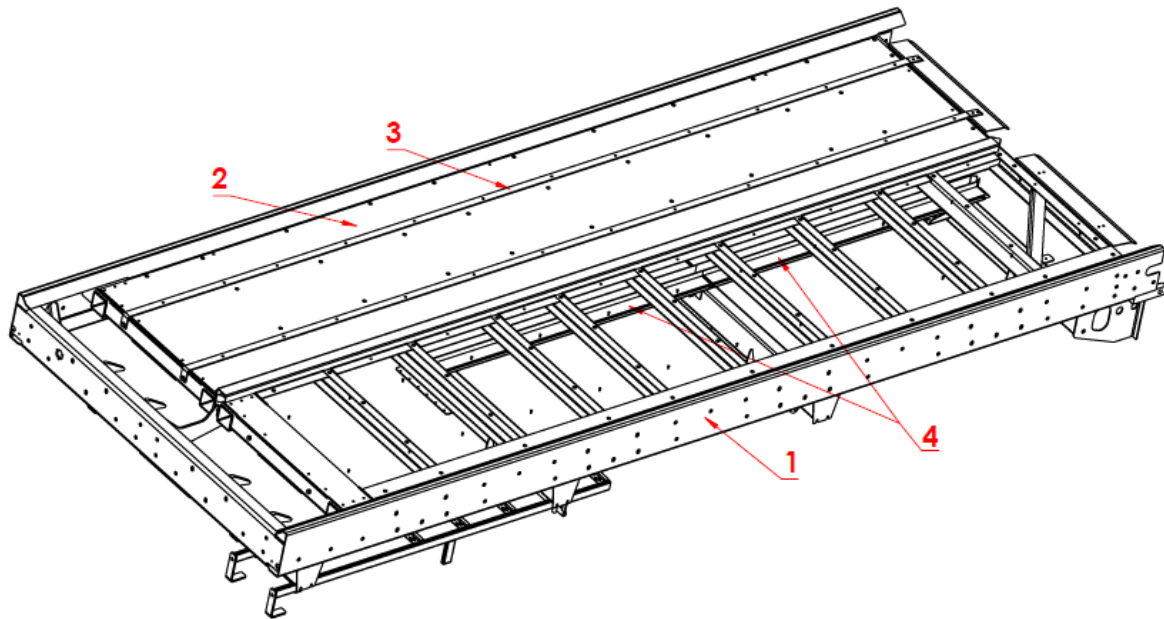


Figure 4.3. Upper frame of spreader

1 – upper frame, 2 – floor panel, 3 – slider, 4 – bottom slider

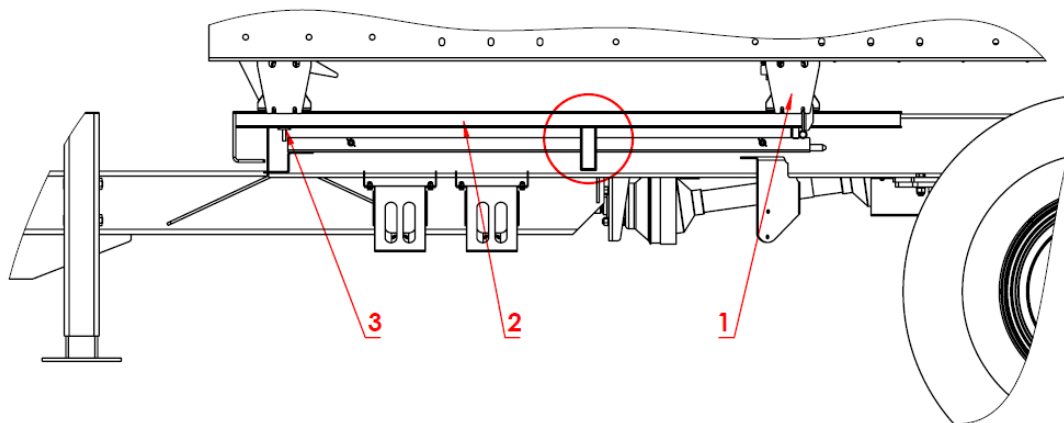


Figure 4.4. Ladder in transport position

1 – top frame, 2 – ladder, 3 – ladder suspension



NOTE!

NOTE!

Make sure to fasten the ladder in the position shown in fig. 4.4. The marked bracket and other protruding parts should be oriented downwards (towards the ground)

Walls with a height of 1.15m are screwed to the frame (fig. 4.5, item 1). The cargo box is terminated by the hydraulic wall (lock, item 3), moving along guides situated in the side walls. One end of the lock is equipped with thick

rubber with notches shaped to accommodate the conveyor chain, which stops semi-fluid material found in the cargo box during operation. Guard (4), joining the rear of the cargo box and securing material against ejection of material by the adapter's drums onto the top of the spreader, is fastened behind the hydraulic wall.

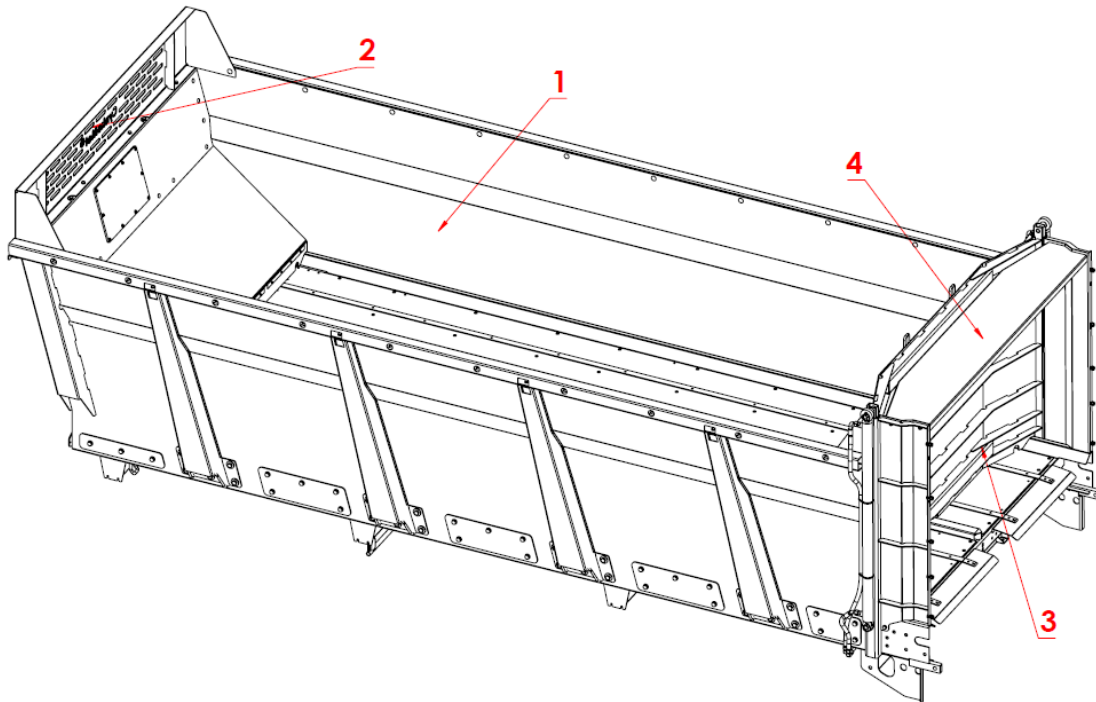


Figure 4.5. Spreader box

1 – walls, 2 - mesh, 3 – hydraulic wall, 4 – guard set



NOTE!

NOTE!

After raising, the rear wall increases the spreader's height substantially. Before driving under overhead power lines, make sure that there is no risk of coming into contact with them.

4.2.4 Adapter

The adapter (fig. 4.6), fastened to the spreader, consists of a welded frame made of profiled sheets. Two horizontal drums with a diameter of 600 mm are placed in the frame, serving for crushing of material, along with spreading rotors. Drums are powered by two side chains from the gearbox. Rotors have exchangeable, screwed-on strips and are powered directly from

the gearbox. The adapter is also equipped with a maintenance guard with a tiltable part enabling adjustment of dumping of material onto rotors.

The adapter's gearbox is designed to be powered by a power take-off shaft with a speed of 1000 rpm. A lower speed may result in insufficient speed of drums and rotors, and as a consequence, clogging of the adapter.

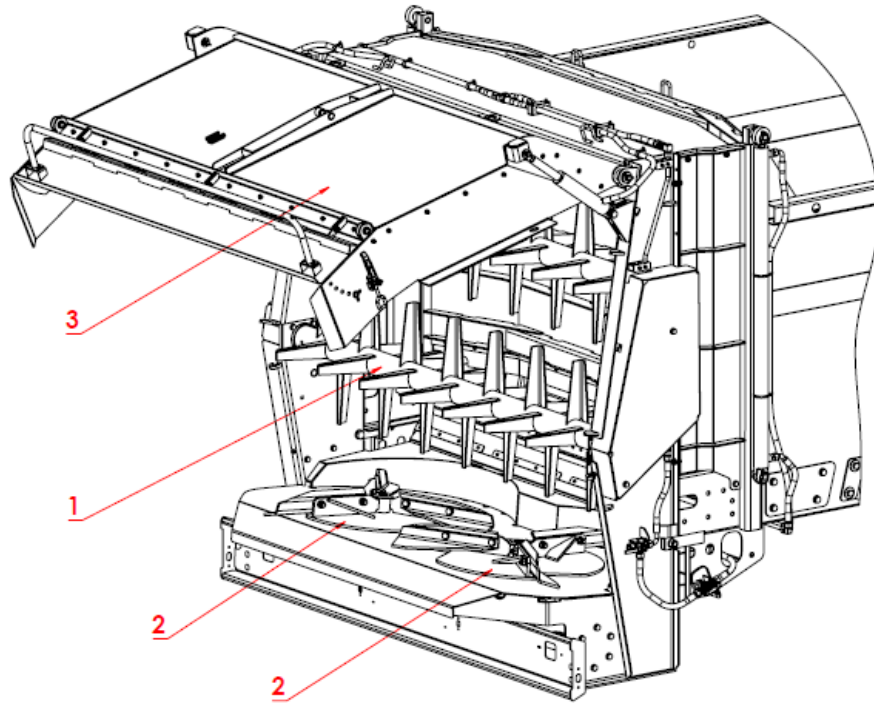


Figure 4.6. Horizontal A2H adapter

1 – drum, 2 – rotor, 3 – rear guard

4.2.5 Hydraulic system

The spreader is equipped with four hydraulic installations equipped with quick-coupler covers of different colors for the purpose of their unambiguous identification:

- Red – floor conveyor
- Blue – rear wall
- Black – support
- Green – adapter guard

Installations are fed with oil from the tractor's hydraulic system. To control their operation, the oil distributor of the external hydraulic tractor is used.

 NOTE!	NOTE! The factory-made hydraulic system of the machine is filled with Agrol U oil. It is possible to fill the hydraulic system with a different oil with similar specifications. The system must be thoroughly flushed out beforehand. The hydraulic oil change operation is to be performed by authorized service stations
--	--

Table 3. Characteristics of Agrol U oil

Item no.	Requirements	Research method based on	Unit	Value
1.	kinematic viscosity at 100°C	ASTM D 445	mm ² / s	10.0-11.5
2.	flow temperature	ASTM D 97	°C	<-24
3.	flash point	ASTM D 92	°C	>230
4.	base number	ASTM D 2896	mgKOH/g	9.9
5.	viscosity index	ASTM D 2270		>95
6.	CCS structural viscosity at -18°C	ASTM D 5293	mPa*s	<9000

Equivalents of Agrol U oil:

- API GL-4
- DIN HLP
- ISO VG 100
- John Deere J20C
- MF CMS M1145
- Volvo WB101
- ZF TE-ML-03E, ZF TE-ML-05F

4.2.5.1. Hydraulic system of conveyor

The conveyor's hydraulic installation (Fig. 4.7) powers two engines (2) powering transmissions (1) on both sides of the spreader. This makes it possible to move material inside the box in the direction of the adapter. A regulator (3) with a knob enabling stepless regulation of the conveyor's feed rate is found on the front of the machine. This makes it possible to control

the intensity of spreading. Furthermore, a built-in overflow valve protects transmissions against overloading in the case of jamming or excessive load. By changing the input of the feed, it is possible to retract material for the purpose of removing jamming of the mechanism.

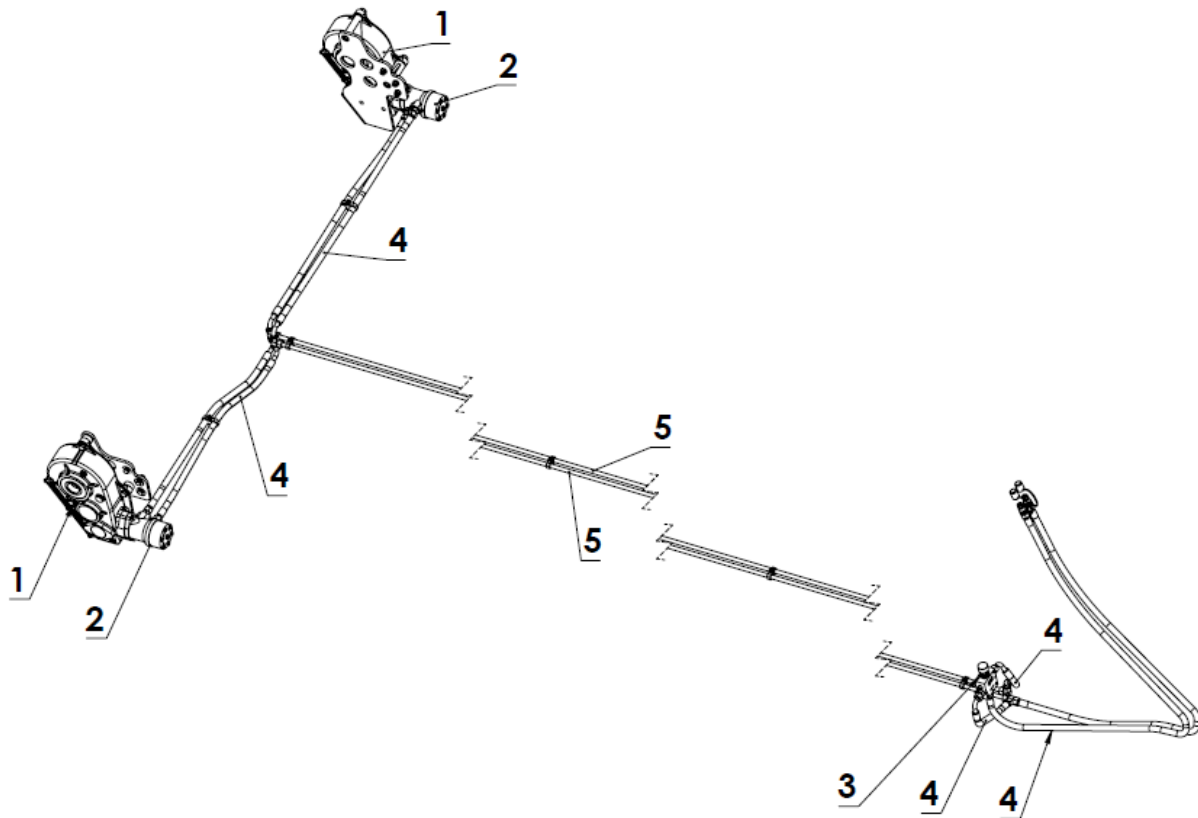


Figure 4.7. Design of conveyor drive

1 – Transmission; 2 – Hydraulic motor; 3 – Flow regulator; 4 – Flexible hoses; 5 – Rigid tubes;

4.2.5.2. Hydraulic system of the rear wall

The rear wall's hydraulic system (Fig. 4.8) serves for raising and lowering it by means of two hydraulic actuators (2). The wall (1) is tasked with enabling or preventing penetration of material from inside the box into the adapter. A stream splitter (3) has been installed on the top frame in order to divide the oil stream equally between both actuators and ensure their even operation. Its precision depends on the oil flowrate, so extension of one of the actuators may be slightly delayed in the case of cooperation with different tractors.

When the material is running out, the horizontal adapter may eject material up to a great height, throwing it above the front mesh in the direction of the tractor. In such a situation, it is recommended to lower the

rear wall to about half of its height, which will prevent this phenomenon. The wall must not be completely closed while the conveyor is running, as this may damage components of the conveyor and of the rear wall. Remember that partial lowering of the wall while the cargo box is full and the conveyor is running may cause excessive build-up of material on the wall and overloading of the conveyor, resulting in stoppage.

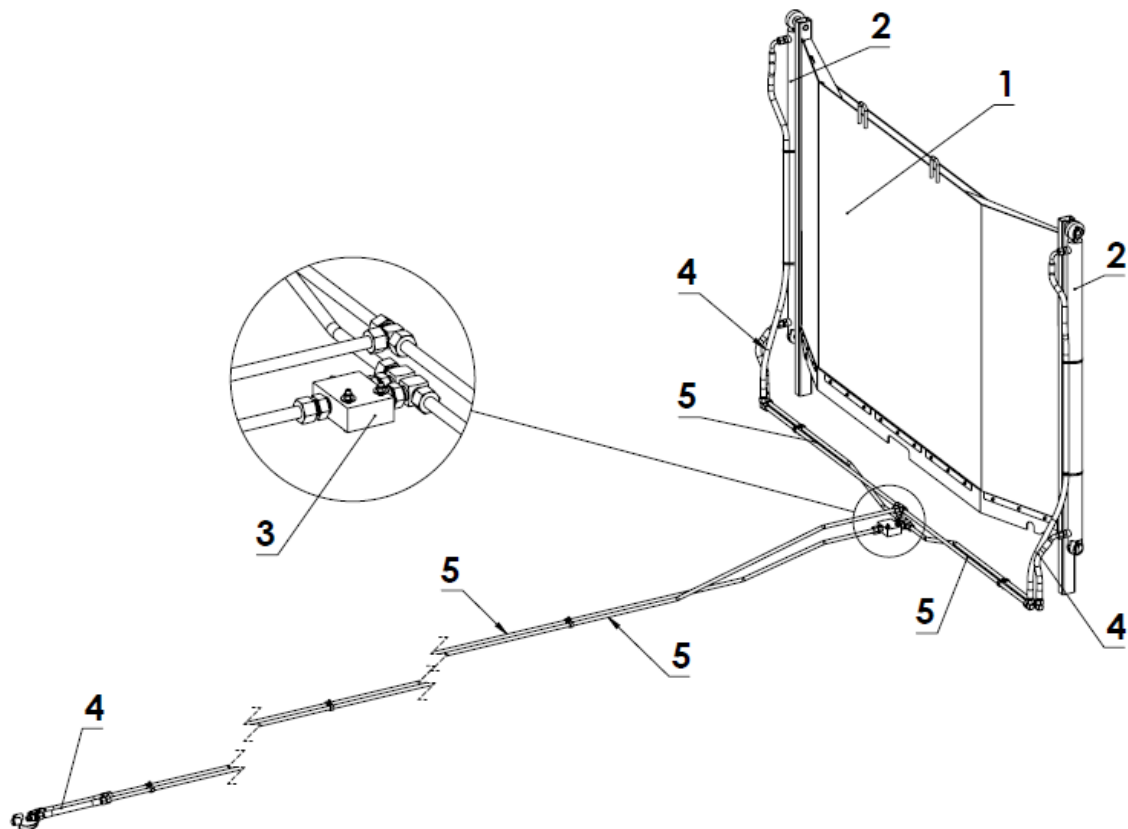


Figure 4.8. Design of the hydraulic rear wall

1 – Wall; 2 – Hydraulic actuator; 3 – Stream splitter; 4 – Flexible hoses; 5 – Rigid tubes;

4.2.5.3. Hydraulic system of support

The hydraulic system (fig. 4.9) is used to adjust the height of drawbar support (1) in order to support the trailer when it is detached from the tractor. The hydraulic support system can be used to achieve suitable drawbar height during disconnection and connection of the trailer to the tractor.

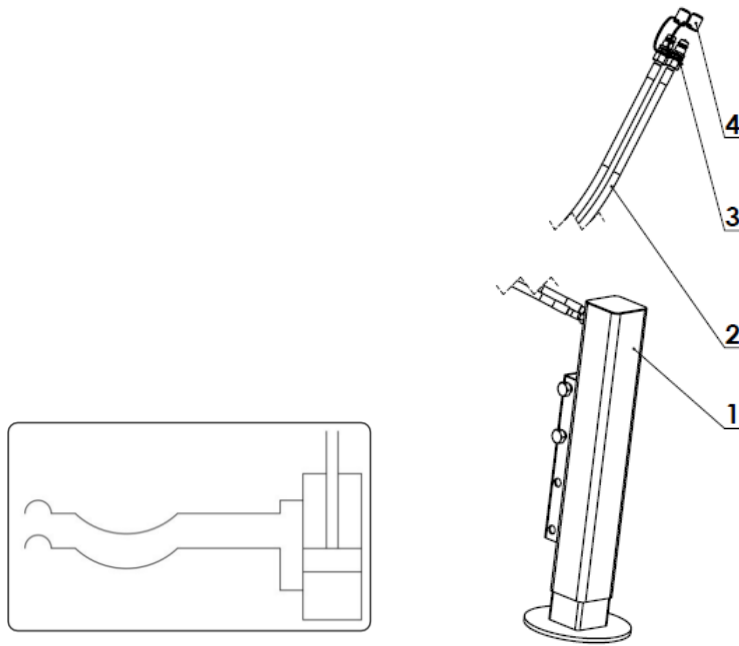


Figure 4.9. Design and diagram of the adjustable drawbar support

1 - Hydraulic support; 2 - Flexible hose; 3 - Plug; 4 - Plug cover

4.2.5.4. Hydraulic installation of adapter guard

The installation (fig. 4.10) makes it possible to raise and lower the maintenance guard by means of two actuators (1) with unilateral operation (instructions concerning raising of the guard during maintenance are given in section 6). The raising motion is realized through powering of the installation by the tractor, and lowering occurs spontaneously after oil is drained. The installation consists of a three-way valve (6), which can perform the following functions as the lever's position is changed:

- Open oil flow to actuators – opening and closing of the guard is possible.
- Closed oil flow to actuators – securing of the flap against opening/closing.

The valve should permanently cut off fluid flow to the guard's actuators and should only be switched prior to opening / closing of the guard, after first making sure that the latches on both sides of the flap are open.

A hydraulic socket (3) and plug (2) are found near the point where the adapter is joined to the frame. If necessary to disassemble the adapter, first disconnect its installation at this point. After assembly, it must be reconnected.

Closed flow

Open flow

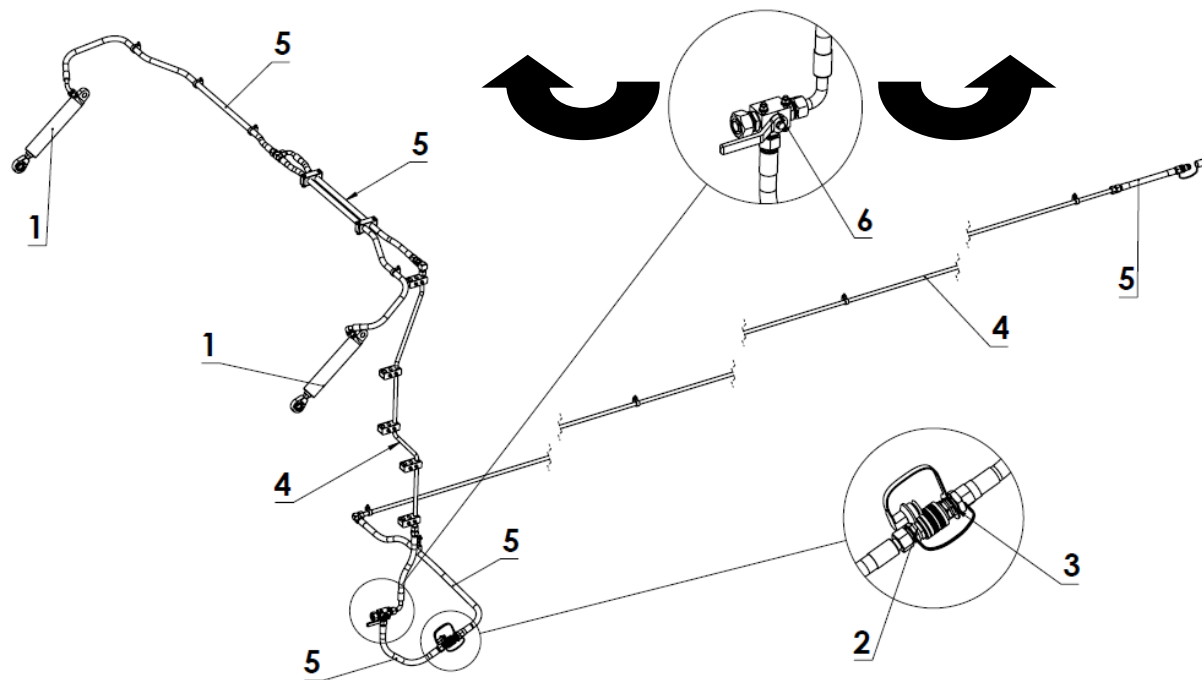


Figure 4.10. Design of adapter guard system

1 – Wall; 2 – Quick-coupler plug; 3 – Quick-coupler socket; 4 – Flexible hoses; 5 – Rigid tubes;
6 – Three-way valve

4.2.6 Brake system/ handbrake

The spreader is equipped with a brake system consisting of:

- a pneumatically or hydraulically controlled service brake, acting on four wheels of both axles,
- a parking brake actuated manually by means of a crank mechanism on the side of the trailer, acting on the two front driving wheels.

The pneumatic or hydraulic service brake is activated from the workplace of the tractor driver by pressing the brake pedal of the tractor. The construction of this system provides automatic inhibition of all the road wheels of the trailer with an unexpected disconnection of the pneumatic installation of the trailer and tractor.

The brake valve (fig. 4.11, item 2) of the pneumatic installation has a system releasing the brake, which is used in the case when the trailer is disconnected from the tractor.

The braking force regulator in the pneumatic system (fig. 4.11, item 3) is controlled automatically depending on the load of the trailer.

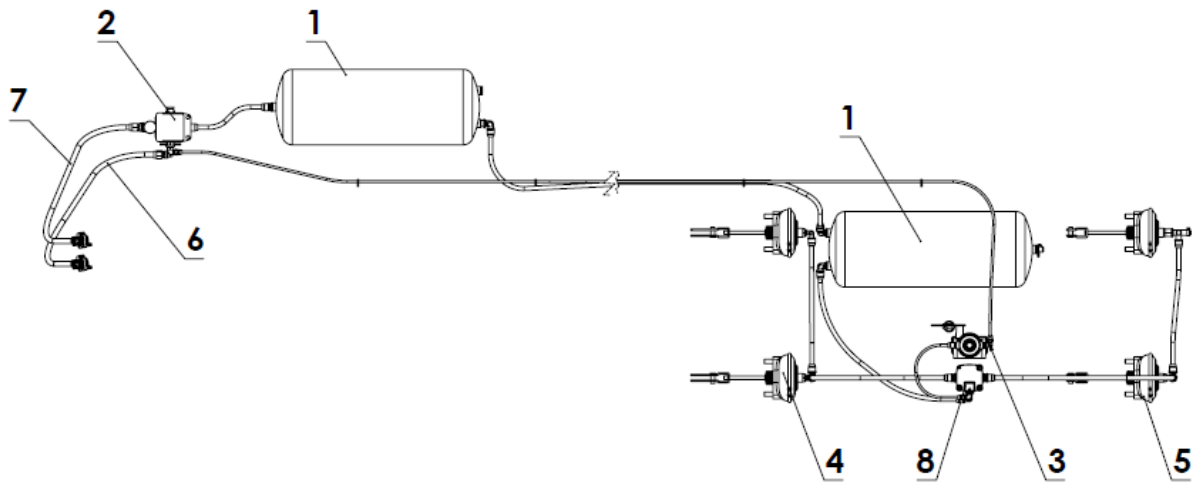


Figure 4.11. A diagram of the pneumatic two-wire braking installation

1 - air tank, 2 - control valve, 3 - automatic braking force regulator, 4 - front axle pneumatic cylinder, 5- rear axle pneumatic cylinders, 6 - filter hose connector (yellow), 7- filter hose connector (red), 8 - relay valve.

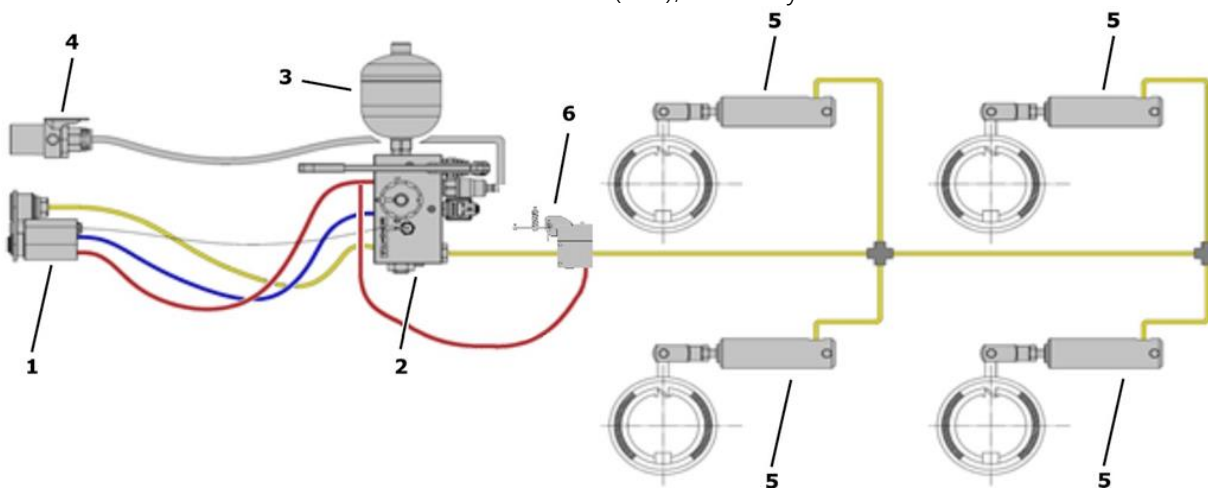


Figure 4.12. Diagram of a hydraulic brake system.

1 – double brake coupling (compliant with ISO 5676 and ISO 16028); 2 – brake valve; 3 - accumulator; 4 – electrical connector (ISO 7638-2); 5 – brake cylinders; 6 – automatic braking force regulator;

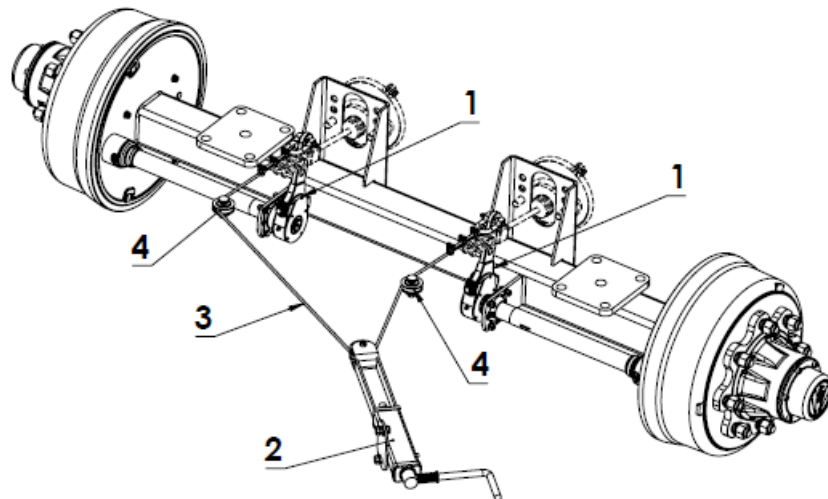


Figure 4.13 Parking brake

1 - spreader lever, 2 - crank mechanism, 3 - cord, 4 - pulley

The parking brake is used to immobilize the trailer when stationary. The brake's crank mechanism (fig. 4.13, item 2) is fastened to the bracket near the left stringer of the lower frame. The steel cord (3), guided by rollers (4), connects the levers of the front driving axle spreader (1) to the crank mechanism. Tightening the string (rotation of the crank mechanism in the direction of the clock's rotation) causes a shift of the lever spreader that, when parting the brake linkage, immobilize the trailer.

Table 4

Ite	Nominal pressure in the brake system	Unit	Value
1.	Single-cable pneumatic installation	Bar (kPa)	5,8-6.5 (580-650)
2.	Two-wire pneumatic installation	Bar (kPa)	6,5-8 (650-800)
3.	Hydraulic installation	Bar (kPa)	150 (15000)



NOTE!

NOTE!

Before connecting the trailer, check whether the nominal pressure given in table 4 is reached on the brake lines. If the pressure is lower than specified, it is PROHIBITED to use the trailer with such a tractor.



NOTE!

NOTE!

In the event of pressure drop below 4.5 bar in the pneumatic double-hose brake system, the trailer's brake system may be blocked.

4.2.7 Electrical installation, lighting and signaling.

Electrical installation of the spreader (fig. 4.14) is adapted to be powered from a DC voltage source of 12V. Joining the electrical installation of the trailer of the tractor should be made with a suitable connecting line.

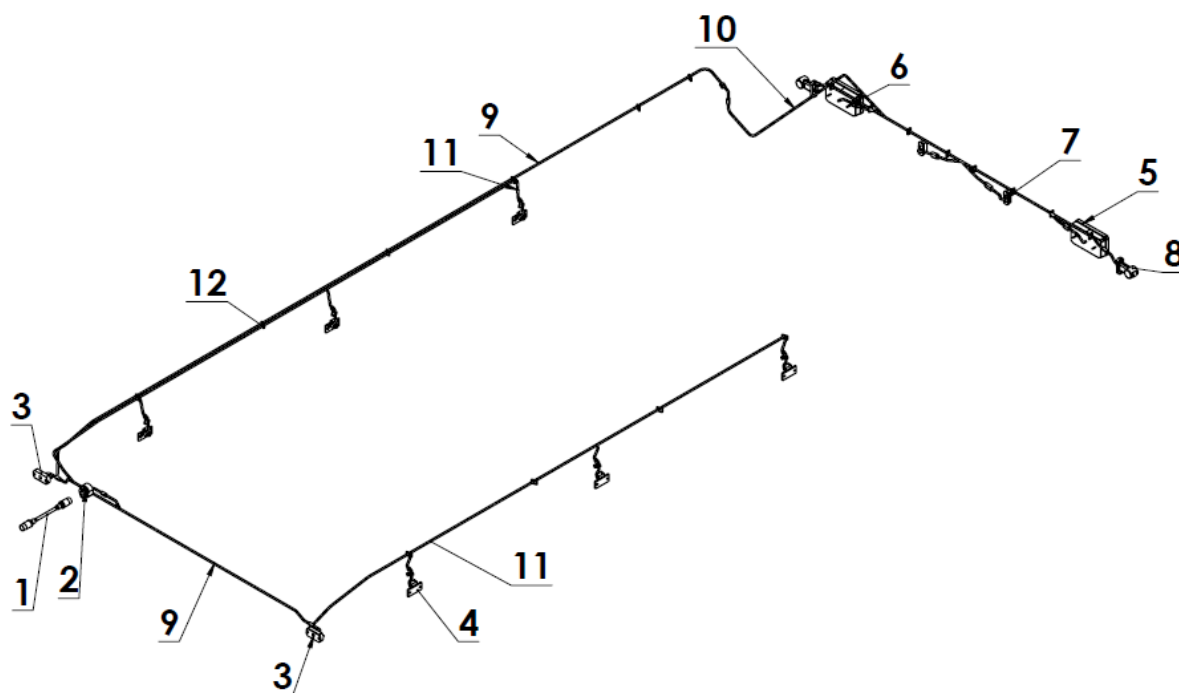


Figure 4.14. Wiring diagram of the spreader.

1 - complete connector cable; 2 - plug-in socket; 3 - front position lamp with reflector; 4 - side perimeter light (OPTIONAL); 5 - rear left cluster lamp; 6 - rear right cluster lamp; 7 - registration plate lighting lamp; 8 - side perimeter lamp (rear), 9 - front position lights harness; 10 - rear harness; 11 - side perimeter lights harness (OPTIONAL)

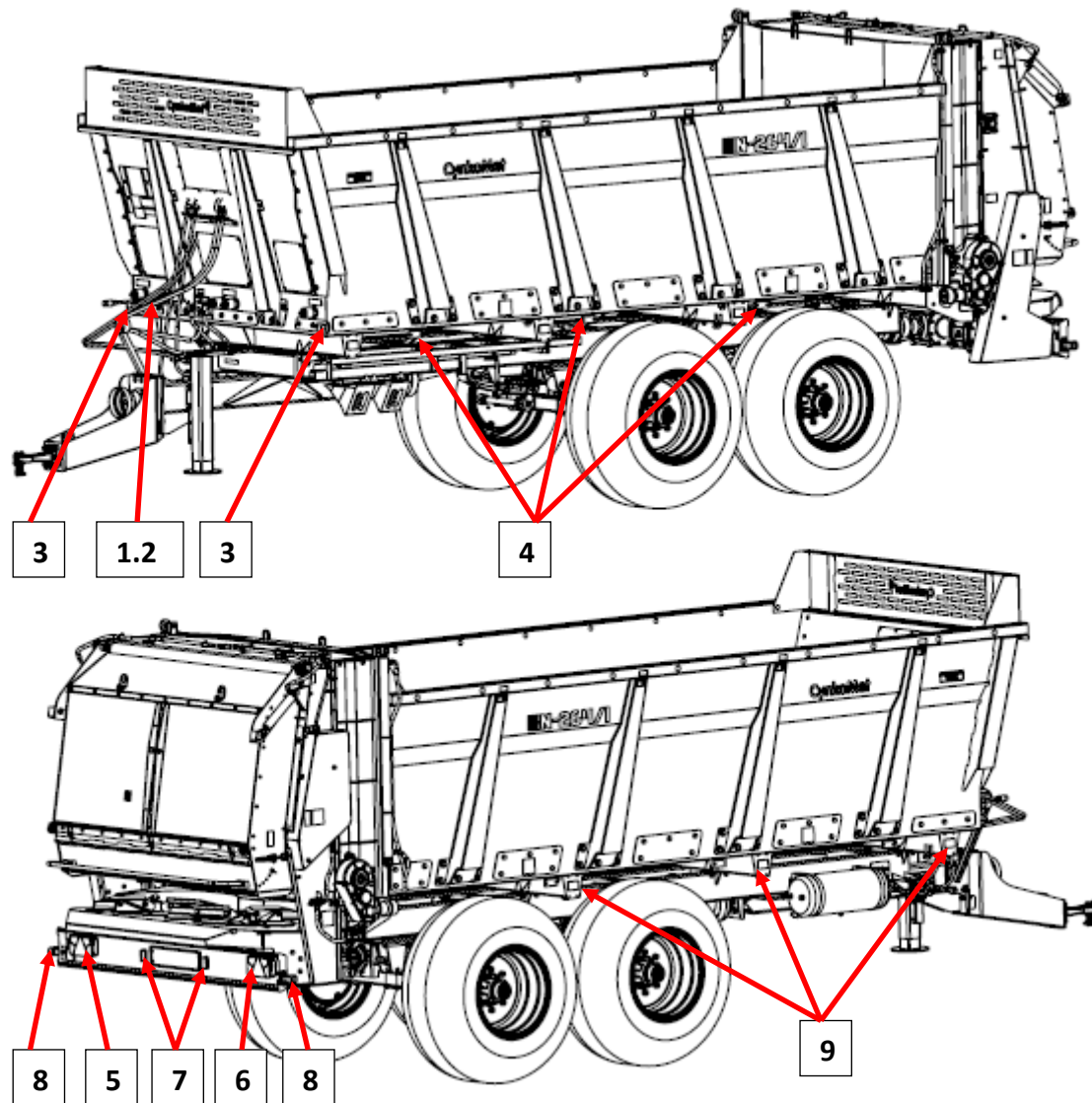


Figure 4.14. Lighting and signaling diagram

1 - complete connector cable; 2 - plug-in socket; 3 - front position lamp with reflector; 4 - side perimeter light (OPTIONAL); 5 - rear left cluster lamp; 6 - rear right cluster lamp; 7 - registration plate lighting lamp; 8 - side perimeter lamp (rear), 9 - side reflector

4.3 Principles of correct spreader use.

4.3.1 Preparation before running for the first time.

4.3.1.1 Control of the spreader after delivery

The manufacturer guarantees that the spreader is fully operational and complete, and has been checked according to quality control procedures and

is approved for use. However, this does not relieve the user from the obligation of checking the vehicle after delivery and before first use.

Before starting work, the operator of the spreader must carry out an inspection of the technical condition of the spreader and prepare it for the first run. Please refer to the content of this manual supplied with the spreader and apply the recommendations contained in it, take a look at the design and understand the principle of operation of the machine.



NOTE!

NOTE!

Before connecting and before starting the spreader, read this manual and follow the instructions contained therein.

External visual inspection:

- Check the completion of the machine (standard and optional equipment).
- Check the condition of the anti-corrosion coatings.
- Perform a visual inspection of the individual components of the spreader for mechanical damage resulting inter alia due to improper transport of the machine (dents, piercing, bending or broken components).
- Check the condition of tires of the driving wheels and the air pressure in the tires.
- Inspect the technical state of the flexible hydraulic hoses.
- Check the technical condition of pneumatic cables.
- Make sure that there are no leaks of hydraulic oil.
- Check the electric lamps of lighting.
- Check the markings on the machine according to table 1 and figure

4.3.1.2 Preparing the spreader for the first connection.

Preparation

- Check all lubrication points of the spreader, if necessary, lubricate the machine.
- Check for proper tightening of nuts fixing the driving wheels.
- Dehydrate the air tank in the brake installation.

- Make sure that the pneumatic, hydraulic and electrical connections in the agricultural tractor comply with the requirements, otherwise do not connect the spreader.
- Adjust the height of the shaft location in the spreader or the position of the upper transport hitch on the tractor through a regulated bracket.



NOTE!

NOTE!

Before each maneuver of reversing and start of spreading the material loaded on the load box, use of the beep signal 2 times is recommended in the tractor in order to inform bystanders about the threat.



NOTE!

NOTE!

Presence of third parties between machines is absolutely prohibited at the time of aggregation of the spreader to the tractor. Failure to follow these instructions and perform the maneuver correctly can lead, in extreme cases, to death of the person who are between the spreader and the tractor



NOTE!

NOTE!

It is absolutely forbidden to leave the tractor cab by the operator with the engine running and the key inserted in the ignition.

Trial drive / start

If the above activities have been carried out and the spreader's technical condition does not raise any reservations, connect the machine to the tractor: start the tractor, inspect individual systems, and perform trial start-up of the trailer and a test drive without load. It is recommended for two people to carry out the inspection, where one of them should always be in the agricultural tractor's operator's cabin. The test run should be carried out in the order shown below.

- Connect the spreader to the appropriate hitch in the agricultural tractor.

- Check the correctness of the connection of the drawbar to the hitch in accordance with the instruction manual of the tractor.
- Connect the PTO shaft and fasten guard chains. Pay attention to the direction of the shaft's installation.



NOTE!

NOTE!

Take caution when coupling and decoupling the PTO shaft. This activity must be performed while the tractor's engine is switched off and the key is not present in the ignition switch.

- Connect the hoses of the brake, hydraulic and electrical installations according to the instructions of the tractor and spreader.
- Running individual lights, check the correct operation of the electrical system.
- Raise the adjustable hydraulic support.
- Check that the deflector / guard is in a closed and secured position.
- Set the feed speed.
- Open the hydraulic wall (check the proper up / down operation), leave in an open position.
- Activate drum revolutions, gradually increasing the speed.
- Switch on the conveyor feed. Test the feed in both directions.
- Moving from place, check the brake operation.
- Perform a test drive.

If during the test drive/start up, you experience disturbing symptoms such as:

- noise and unnatural noises coming from the rubbing of moving parts on the construction of the spreader.
- leakage of hydraulic oil,
- pressure drop in the brake system,
- incorrect operation of hydraulic and / or pneumatic actuators or other failures, diagnose the problem. If a fault cannot be removed or removing it will invalidate the warranty, please contact your dealer to resolve the problem or repair.

After completion of the test drive / start-up, check the tightness of the nuts of the driving wheels, with the engine switched off (key removed from the ignition), handbrake secured in the spreader and trailer.



NOTE!

NOTE!

If it is possible, it is recommended that the inspection before the trial run is performed by 2 persons, and the operator of the tractor must always see the other person.



NOTE!

NOTE!

Take special care in the case of inspections by two people, do not make attempts of regulation and insertion of limbs in dangerous places marked with pictograms.



NOTE!

NOTE!

Careless and improper use and operation of the spreader, and non-compliance with the recommendations contained in this manual poses a threat to the health.

It is forbidden for persons not qualified to drive agricultural tractors, including underage persons and persons under the influence of alcohol, to use the spreader.

Failure to observe the rules of safe use poses a threat to the health and life of the operator or third parties.

4.3.2 Preparation for the spreader's work.

In preparation for the spreader's work, the following should be checked:

- the wear of the tires and driving wheels,
- Air pressure in the tires,
- springs condition, and in particular the completeness of the feathers
- tightening the nuts fixing the discs of the driving wheels to wheel hubs and the condition of other screw connections.

In addition, after combining the machine with the tractor check:

- the efficiency of the electrical system and lighting system and trailer signaling,
- the effectiveness of the brake system,
- the correctness of operation of hydraulic systems by raising the rear wall, starting the conveyor in both directions and stopping it, raising and lowering the adapter guard, lowering the rear wall.
- the operation of the adapter by test-starting the drums.



NOTE!

NOTE!

Prior to every start-up of the adapter's drums (also during test start-up without load), make sure that no third parties are found in the danger zone.



NOTE!

NOTE!

Before raising or closing the adapter guard, make sure that the latches on both sides are open. Otherwise, the construction may be damaged.

4.3.3 Connecting and disconnecting with the tractor.

The spreader can be connected to the agricultural tractor, if all connections (electrical, pneumatic, hydraulic), and the hook in the agricultural tractor comply with the requirements of the Manufacturer of the spreader and the tractor.

In order to connect the spreader to the tractor, perform the following steps:

- Prior to coupling the spreader with the tractor, check if the spreader is braked with the parking brake.
- Set the drawbar hitch anchorage on the height of the transport hitch of the tractor (this can be achieved by adjusting the drawbar spring tension).
- Reversing the tractor, connect the drawbar end with the upper transport hitch of the tractor (if in the agricultural tractor, an automatic coupler is used,

ensure that the aggregate operation has been completed correctly and the drawbar anchorage is secured).

- Stop the tractor engine and remove the key from the ignition.
- Install and secure the hitch swivel from falling out or check the hook clasp automatically.
- Connect with the electric, hydraulic and brake installation wiring with the trailer.
- Connect the PTO shaft and in guard chains
- Release the parking brake of the machine.

 NOTE!	NOTE! At the time of the coupling, unauthorized people cannot be between the spreader and the tractor. The operator of the tractor, when connecting the machine should be particularly careful when working and make sure that in the course of coupling, other people are not in the danger zone. When connecting the hydraulic hoses to the tractor, pay attention that the hydraulic system of the tractor and the spreader are not under pressure. When coupling ensure adequate visibility. If the case of restricting visibility, use the sound signal from the tractor or use the help of another person.
 NOTE!	NOTE! Connecting the spreader with another transport hitch is unacceptable because it threatens the safety of road traffic and to third parties. After completion of the machine coupling, check the security of the hitch.

When connecting the braking system (two-wire pneumatic), the correct sequence of connecting cables is important **Be the first to connect the plug marked yellow to a yellow socket in the tractor, and then the plug marked in red to the red socket in the tractor.** When you connect the second cable, the

brake release system will switch to the normal mode of operation (disconnection or interruption of the air duct causes the trailer control valve to automatically switches to the position of actuating the brakes of the machine). The cables are marked with colored protective caps that identify the correct cable installation

In order to disconnect the spreader from the tractor, perform the following steps:

- Stop the tractor and pull the parking brake in the tractor securing against the possibility of the tractor driving off.
- Switch off the engine and remove the keys from the ignition.
- After stopping the tractor, brake the trailer with a parking brake.
- If the spreader with the cargo is located on a steep slope or an elevation, it should be protected additionally against rolling by planting chocks under wheels.
- Disconnect the hydraulic, electrical and brake system cables and the PTO shaft from the tractor.
- When removing the pin, disconnect the drawbar from the transport hitch of the tractor and drive the tractor away.



NOTE!

NOTE!

When disconnecting the spreader from the tractor, keep particular caution.

Provide yourself a good visibility.

Before disconnecting the hoses and rods, the cabin of the tractor must be closed to prevent it from unauthorized access. The tractor engine is to be turned off and remove the key from the ignition.



NOTE!

NOTE!

Pay attention to the compatibility of oils in the tractor hydraulic system and the hydraulic system of the spreader.

4.3.4 Loading the cargo box.

 NOTE!	NOTE! Loading of the box can take place only when the spreader is connected to the tractor, set on level ground with the drawbar directed to drive forward, and when the brake has been pulled in the tractor and spreader.
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 NOTE!	NOTE! It is absolutely required from the user to verify whether the material loaded on the spreaders are not solids such as stones, pieces of wood, metal parts, wires, etc .. Failure to comply with this guideline may cause permanent damage to the machine's structure and void the warranty, and striking bystanders or animals with such elements poses a risk of loss of health, or in extreme situations, of life.
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You should aim for even distribution of the load in the loading crate which has a significant impact on the uniformity of dispersion of the material located on the spreader. When loading or unloading the spreader, it is recommended to use a crane, loader or a conveyor according to general safety rules. Before loading, check that all the moving parts are closed (locks, guards, etc.)

Lightweight, volumetric materials may be loaded even above the cargo box's extensions, **however, up to 5cm** above them at the most, with particular attention to the stability of the spreader.

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

Due to the varied density of the materials, the use of the total capacity of the container may result in exceeding the permissible load of the trailer.

The approximate bulk weights of various materials are given in table 5*.

Table 5.

Item no.	Material type	Volume weight [kg / m3]
1	Root:	
2	raw potatoes	700 - 820
3	steamed mashed potatoes	850 - 950
4	dried potatoes	130 - 150
5	sugar beet - roots	560 - 720
6	fodder beet - roots	500 - 700
7	Organic fertilizers:	
8	Old manure	700 - 800
9	Long laying manure	800 - 900
10	Fresh manure	700 - 750
11	compost	950 - 1 100
12	dry peat	500 - 600
13	Mineral fertilizers:	
14	ammonium sulfate	800 - 850
15	potassium salt	1 100 - 1 200
16	superphosphate	850 - 1 440
17	basic phosphate	2 000 - 2 300
18	potassium sulphate	1 200 - 1 300

19	kainite	1,050 – 1 440
20	lime-rich ground fertilizer	1,250 - 1,300
21	Building Materials:	
22	cement	1 200 – 1 300
23	dry sand	1 350 – 1 650
24	wet sand	1 700 – 2 050
25	Full bricks	1 500 – 2 100
26	hollow bricks	1 000 – 1 200
27	stone	1 500 – 2 200
28	Soft wood	300 - 450
29	Hard timber	500 - 600
30	impregnated timber	600 - 800
31	steel structures	700 – 7 000
32	roasted ground lime	700 - 800
33	Slag	650 - 750
34	Gravel	1 600 – 1 800
35	plant litter and roughage:	
36	dry meadow hay for swath	10 - 18
37	hay wilted for swath	15 - 25
38	hay in a collective trailer (dry withered)	50 - 80

39	cut wilted hay	60 - 70
40	compressed dry hay	120 - 150
41	pressed wilted hay	200 - 290
42	stored dry hay	50 - 90
43	stored cut hay	90 - 150
44	clover (Lucerne), wilted for swath	20 - 25
45	clover (Lucerne), wilted cut on the trailer	110 - 160
46	clover (Lucerne), wilted on the collective trailer	60 - 100
47	stored dry clover	40 - 60
48	cut stored dry clover	80 - 140
49	dry straw in rolls	8 - 15
50	moist straw in rolls	15 - 20
51	damp straw cut on a volumetric trailer	50 - 80
52	dry straw cut on a volumetric trailer	20 - 40
53	dry straw on a collective trailer	50 - 90
54	Dry straw cut in a haystack	40 - 100
55	compressed straw (low degree of deformation)	80 - 90
56	compressed straw (high degree of deformation)	110 - 150
57	grain mass in rolls	20 - 25

58	grain mass cut on a volumetric trailer	35 - 75
59	grain mass on a collective trailer	60 - 100
60	green forage for swath	28 - 35
61	green forage cut on a volumetric trailer	150 - 400
62	green forage on a collective trailer	120 - 270
63	Fresh beet leaves	140 - 160
64	Freshly cut beet leaves	350 - 400
65	beet leaves on a collective trailer	180 - 250
66	Concentrated feed and compound feed:	
67	stored husks	200 - 225
68	oilcake	880 – 1 000
69	Ground fascine	170 - 185
70	Compound feed	450 - 650
71	Mineral feedingstuffs	1 100 – 1 300
72	Oat middling	380 - 410
73	wet beet skins	830 - 1,000
74	Extruded beet skins	750 - 800
75	Dry beet skins	350 - 400
76	bran	320 - 600
77	bone meal	700 – 1 000

78	Fodder salt	1 100 – 1 200
79	molasses	1 350 – 1 450
80	Silage (lower silo)	650 – 1 050
81	hay silage (tower silo)	550 - 750
82	Seeds:	
83	Vicia faba	750 - 850
84	charlock	600 - 700
85	pea	650 - 750
86	lentil	750 - 860
87	bean	780 - 870
88	barley	600 - 750
89	clover	700 - 800
90	grass	360 - 500
91	corn	700 - 850
92	wheat	720 - 830
93	rape	600 - 750
94	flax	640 - 750
95	lupine	700 - 800
96	oat	400 - 530
97	Lucerne	760 - 800

98	rye	640 - 760
99	Other:	
100	dry soil	1 300 – 1 400
101	Wet soil	1 900 – 2 100
102	fresh peat	700 - 850
103	Gardening soil	250 - 350

Source: "The technology of machine works in agriculture", PWN, Warsaw 1985

* - the loading height no higher than 5 cm above the height of the walls

* - Material is to be charged according to the table of the goods mass



NOTE!

NOTE!

Under no circumstances may bystanders be present near the loading zone or nearby during activation of the adapter. Before commencing the loading of the spreader and during its work, ensure that there is proper visibility and make sure that there are no bystanders nearby.



NOTE!

NOTE!

It is advised to aim at an even distribution of the load in the loading crate.



NOTE!

NOTE!

It is prohibited to exceed the admissible spreader load, because it threatens the safety of road traffic and might cause damage to the machine.



NOTE!

NOTE!

Overloading the spreader, incompetent loading are the most common causes of accidents during transport.

NOTE!	The load must be arranged so as not to threaten the stability of the spreader and not obstruct driving the set. The distribution of the load cannot cause an overload of the chassis, and the trailer hook system.
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4.3.5 Load transport

When driving on roads (public and private) you must adapt to the road traffic regulations in force in the given country, be guided by prudence and reasonable conduct. Below are the most important tips to drive the tractor with an attached spreader.

- Before starting, make sure that in the vicinity of the spreader and the tractor there are no bystanders, especially children. Ensure sufficient visibility.
- Make sure that the trailer is properly connected to the tractor, and the tractor hitch is properly secured, as well as the ring hitch is not carved out.
- The trailer must not be overloaded, the load must be uniformly distributed so as not to exceed the permitted pressure on the trailer axle chassis. Exceeding the maximum load capacity of the vehicle is prohibited and may cause damage to the machine, as well as pose a risk when traveling on the road for the operator of the tractor and trailer or other road users.

 NOTE!	NOTE! Before driving, make sure that: • the spreader braking system is connected to the tractor and works properly • the spreader hydraulic system is connected to the tractor and works properly • the trailer electric installation is connected to the tractor and works properly • all the elements of the spreader are in good general condition (no mechanical defects)
--	--

- Do not exceed the maximum construction speed and speed limitations

resulting from road traffic law. The travel speed must be adapted to the prevailing road conditions, trailer load, type of cargo and other conditions.

- The spreader can be towed on slopes of up to 8° and unloading must be carried out only on level ground.
- The spreader disconnected from the tractor must be secured by immobilizing it with a parking brake and planting chocks under wheels. Leaving the trailer unsecured is prohibited. In case of failure of the machine, stop on the roadside, without endangering other road users and mark the spot in accordance with the rules of the road.
- During travel on public roads the spreader must be marked with a plate distinguishing slow-moving vehicles, placed on the deflector.
- The operator of the tractor is obliged to equip the spreader with a certified or approved warning sign in accordance with applicable regulations of the country in which it is driven.
- When driving, observe the traffic rules, signal the change of direction with indicators, keep clean and take care of the technical condition of the lighting and signaling installation.
- Damaged or lost lighting and signaling elements are to be immediately repaired or replaced with new ones.
- Avoid ruts, depressions, ditches or driving on slopes of the road. Driving through such obstacles can cause sudden tilting of the spreader and tractor. This is particularly important because the center of gravity of the spreader with the load (especially with a volumetric load), adversely affects the safety. Driving near the edge of ditches or canals is dangerous because of the risk of landslides under the wheels of the spreader or tractor.
- The driving speed must be reduced early enough before driving to the corners, when driving on uneven or sloping terrain.
- When driving avoid sharp corners, especially on slopes.
- Please note that the braking system increases significantly with increasing mass of the traffic load and increase in speed.
- Control the behavior of the spreader while driving on uneven terrain, and adjust the speed to terrain and traffic conditions.

- The spreader is adapted for driving on slopes up to a maximum inclination of 8°. Moving the spreader through the grounds of steeper slopes may cause the spreader to tip over as a result of loss of stability. Prolonged moving on an incline poses a risk of loss of braking efficiency.

4.3.6 Unloading of the crate serving as a transporter.

Before unloading the loading crate of the spreader / transporter you should:

- check that the area around the spreader / transporter is safe
- Before raising / opening the rear wall you must absolutely use the beep twice (honk),
- open the rear wall,
- turn on the conveyor feed,
- after unloading turn off the conveyor feed,
- using the horn signal twice, signal readiness to close the wall,
- close the rear wall.



NOTE!

NOTE!

Be extremely careful when opening and closing the wall because of the risk of crushing fingers or hands.

5. Equipment and accessories

Table 6. Equipment of the spreader

Equipment	Standard	Option
User manual	•	
Warranty Card	•	
Connecting cable of the electrical system	•	
Chocks under wheels	•	
Two-wire pneumatic installation	•	
Hydraulic brake installation		•
Electrical installation with LED lamps		•
Side perimeter light harness		•
Steel guard of inspection window		•
Power take-off shaft for coupling with the trailer (regular or wide-angle)		•
600/50-22.5 16PR wheels		•
Signboard distinguishing slow-moving vehicles		•

6. Technical Support

When using the spreader, constant monitoring of the technical condition and the execution of maintenance procedures is required to keep the machine in good technical condition. Therefore, the user of the spreader is obliged to perform all maintenance and regulatory tasks specified by the Manufacturer.

In order to function properly and to avoid serious failure of the spreader, it must be kept in good technical condition, repaired on time and reasonably exploited (operation within the technical parameters of the spreader).

An important element of the operation is the daily maintenance of the spreader (before commencing work), it foresees:

- Control of tightening screw connections and securing them against undesired loosening (table 7: screw tightening torques),
- Checking the tightness of the hydraulic system
- Checking the tightness of the pneumatic system,
- Checking the correct operation of mechanisms (including conveyor feed).
- Check the functioning of the brake system,
- Check the functioning of the electrical system,
- Checking and performance of lubrication, as indicated by the instructions,
- Checking the tire pressure,
- checking the wall and extensions lock - whether they are properly closed and secured and there is no risk of spontaneous opening

Any faults detected should be removed on a regular basis, use of the trailer, even with a slight failure could have serious consequences.

 NOTE!	NOTE! In the case of noting any irregularities in the operation or damage to systems or assemblies of the spreader, the machine must be taken out of use until repair and removal of defects. It is forbidden to carry out service and repair work under a burdened loading crate and with the tractor engine running. All maintenance and repair tasks should be performed with the general principles of health and safety. In the case of injury, the wound should immediately be washed and disinfected. In the case of serious injuries, consult a physician. All maintenance work performed after disconnecting the PTO.
--	---

 NOTE!	NOTE! If you need to lift the wheels of the spreader, observe the following rules: • The spreader attached to the tractor is to be set in the direction for driving straight ahead on a flat, paved ground and then tractor should be braked. • Under the wheels, which will not be lifted, plant securing chocks. • Place a lift under the axle close to the lifted wheel and raise the axle so that the wheel does not touch the ground. • Protect the spreader from collapsing to the ground by placing a platform of the right height under the axis
--	---

If it is necessary to raise the guard of the A2H horizontal adapter, before starting work, secure the guard against dropping by cutting off oil flow using the three-way valve and supporting it with the support with which the spreader is equipped. The support is found on the bottom frame of the spreader, above the wheel chocks. It is prohibited to perform works or occupy the space under the guard when it has not be secured in the aforementioned manner. Before starting the activities described below, the

adapter and conveyor must be shut down, and the power take-off shaft must be disconnected from the tractor.

Secure the guard with the assistance of a second person. One person should control the guard's hydraulic system from the tractor and the other should operate the three-way valve and support the guard. Perform this activity according to the method described below.

After opening the latches on both sides of the guard, set the three-way valve to the position opening flow to the guard's actuator's and raise the flap using the hydraulic system. When raising the guard, the person standing to the rear of the spreader should step back and keep a safe distance, taking a position from the side of the machine, until the flap comes to a complete stop. Slide the end of the support, terminated by a bent strip of sheet, into the hole in the adapter's body, as shown in figure 6.2, and align the second end with the pin with the hole on the side of the guard. After preparing the support in the proper position, give the person in the tractor a signal to start lowering the guard. During this activity, make sure that the support's pin goes into the hole. If it does not go into the hole, repeat the guard opening activity. After resting the guard on the support, give a signal to the person in the tractor to stop lowering of the flat, and immediately set the three-way valve to the position cutting off drainage from the guard's actuators. Before starting work, make sure that the support is supporting the flap in a stable way, and that the guard is not drooping.

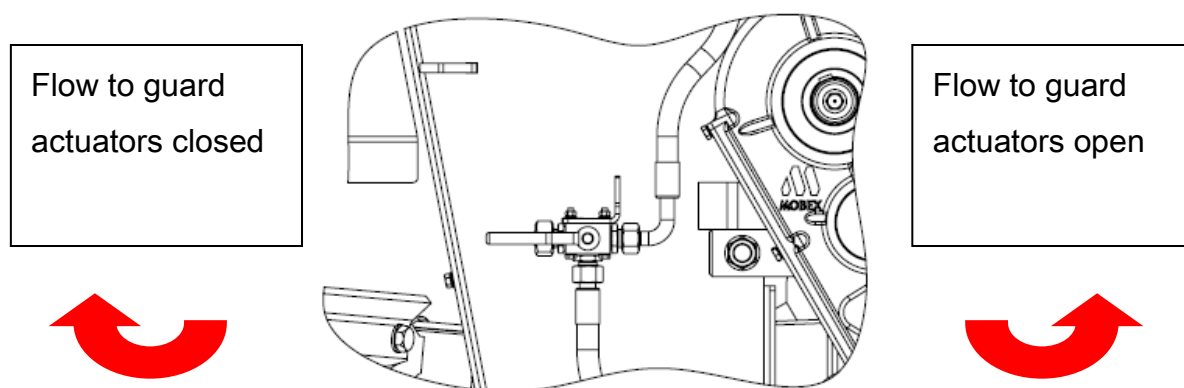


Figure 6.1. Three-way valve of adapter guard

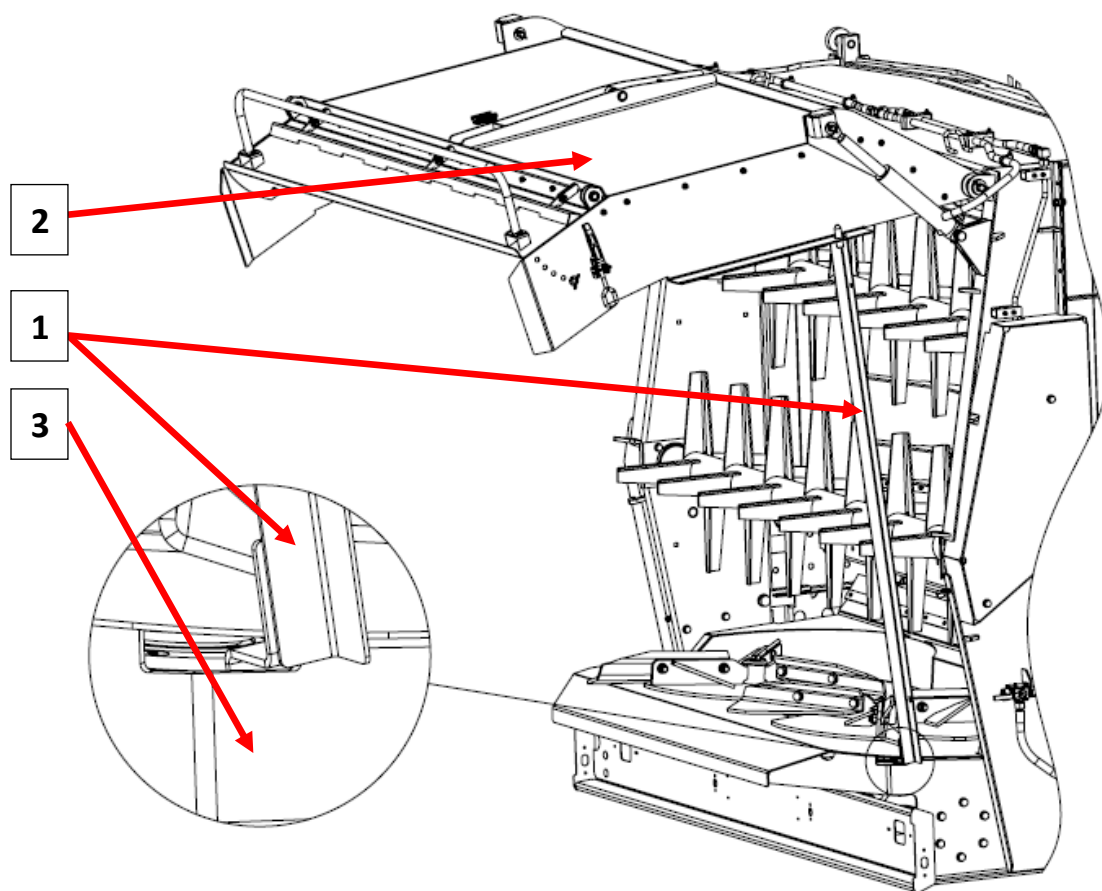


Figure 6.2. Support of adapter guard

1 - support, 2 – guard, 3 - body



NOTE!

NOTE!

It is prohibited to operate or carry out repairs on the machine or occupy the space under the adapter's guard if it is not secured against falling by closure of the three-way valve and application of the support with which the spreader is equipped. Make sure that the support has been installed properly and is securing the guard in a stable way.

Before starting the guard support activities, the adapter and conveyor must be shut down, and the power take-off shaft must be disconnected from the tractor.

Failure to comply with the above may result in severe injury, and in extreme cases, even in loss of life.

 NOTE!	NOTE! Avail yourself of the assistance of a second person in order to support the guard. This person should try to remain visible and audible to the tractor's operator as much as possible. If a hazard is detected, this person should immediately step back to a safe distance and inform the tractor's operator of the need to stop the activity being performed. Due to the risk of impact by the guard as it is opening, do not stand to the rear of the spreader. A safer position is on the sides of the machine.
--	--

 NOTE!	NOTE! The guard is raised and lowered at a similar speed. If improper operation of the guard's actuators is detected, or excessively fast and sudden cover raising movement is observed, the activity of supporting the guard should be abandoned. Secure the guard in its current position by closing the three-way valve, and contact the service. It is prohibited to occupy the space or work under an unserviceable guard.
--	---

6.1 Tightening torques for screws.

For corrective maintenance work, use the proper tightening torques for the screw connections. The recommended tightening torques of the most commonly used screw connections are shown in the table below. The provided values refer to non-lubricated steel bolts.

Table 7. Tightening torques for screws.

Metric thread	Screw class		
	5.8	8.8	10.9
	Nm		
M6	5	7	11
M8	12	18	26
M10	23	35	52
M12	40	60	89
M14	64	98	144
M16	95	145	213
M18	133	209	297
M20	186	292	416
M22	247	389	553
M24	320	502	715
M27	464	729	1039
M30	634	997	1420

6.2 Regulation of driving wheel bearings backlash.

In a newly purchased machine, after the first 100 km, while during further use - after driving another 1500- 2000 km - check and if necessary adjust the backlash of the wheel bearings. To do this you need to:

- Connect the spreader to the tractor, set such a set on a hard surface in the direction of driving straight ahead...
- Brake the trailer.
- Place the blocking wedges under the wheels of a spreader, raise the spreader wheel on the opposite side of the wedges so that the wheel does not touch the ground and secure it from falling.

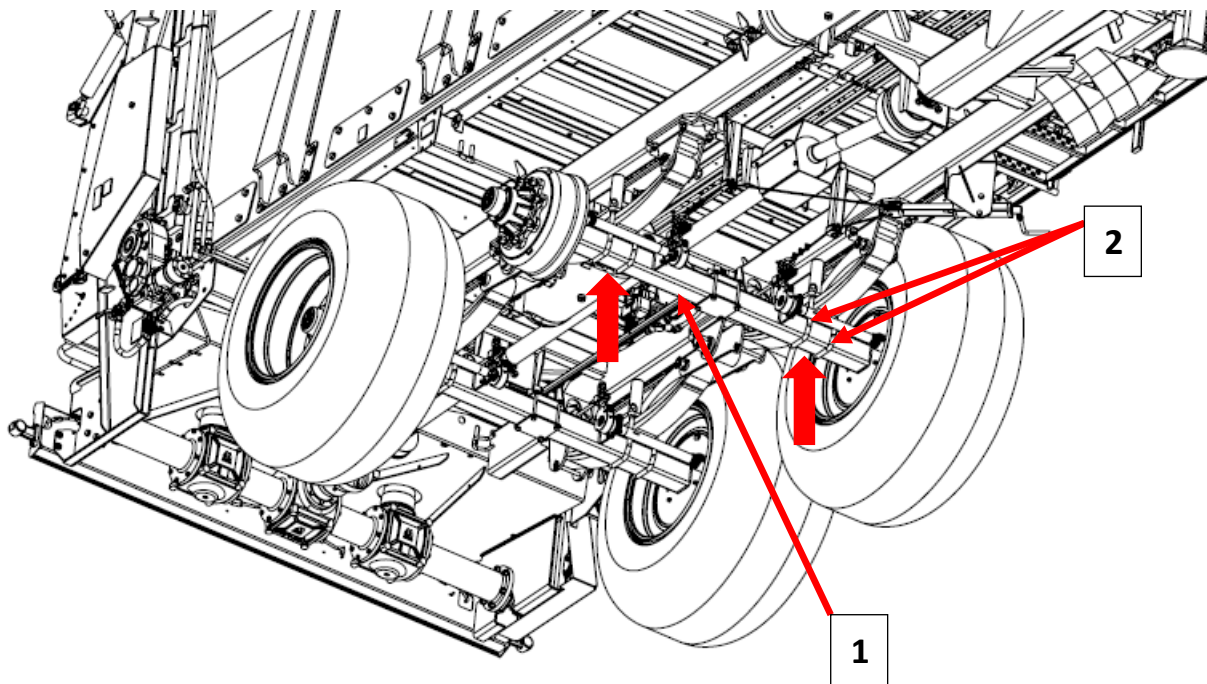


Figure 6.3. Jack support point

1 – axle, 2 – glomerular bolts

- Check the backlash:
 - By turning the wheel slowly in both directions, check that movement is smooth, and if the wheel rotates without excessive resistance and jams
 - Spinning the wheel so that rotates very quickly, check that the bearings do not make unnatural sounds.
 - Moving the wheel, try to feel the backlash.
 - Repeat for each wheel individually, remembering that the lift must be on the opposite side of the wedges
- If the wheel shows excessive backlash, a regulation should be carried out:
 - remove the hub cap by prying it out with a screwdriver in several places around the circumference and remove the cotter pin of the castellated nut.
 - Turning the wheel, simultaneously tighten the castellated nut until the wheel stops completely.
 - Unscrew the nut by $1/6 - 1/3$ turn, until covering the next groove on the pin with a hole in the pivot. The wheel should turn without excessive resistance, the nut cannot be tightened too much. It is not

recommended to use too strong pressure due to the deterioration of the working conditions of bearings.

- Secure the nut with a new cotter pin, and firmly press the hub cap.
- The mentioned steps should be repeated checking the remaining wheels.

The wheel, after correct adjustment of the bearings should turn smoothly without stops and perceptible resistance.

The soundness of bearings backlash has to be finally checked after driving a few kilometers with the trailer controlling the degree of the hubs heat by hand.

The cause of the occurrence of significant resistance when turning the wheel, and strong heating of the hubs apart from improper adjustment of the bearings backlash can be contaminants in the lubricant or bearing damage. The above symptoms require dismantling the wheel hub and removing the fault (replacement of grease or bearings).

6.3 Mounting and removal of the wheel and inspection of nut tightening.

In order to remove the wheel, perform the following steps:

- Immobilize the trailer with a parking brake.
- Place locking chocks on the side of the trailer opposite to the wheel to be removed (Fig. 3.3).
- Make sure that the trailer has been correctly immobilized and that there is no risk of rolling during wheel removal.
- Loosen the nut of the wheel to be removed.
- Place a jack under the axle near the wheel to be dismantled and raise the trailer to the height required in order for the wheel to turn freely.



NOTE!

NOTE!

The jack must:

- Have suitable capacity.
- Be operable.
- Be set on a hard, level surface.

- Loosen the wheel nuts.

- Remove the wheel.

Follow these steps to mount the wheel:

- Clean the pins and nuts and check their condition. If necessary, replace them with new ones. DO NOT USE lubricants on wheel nuts and pins.
- Mount the wheel on the hub and tighten the nuts so that the rim tightly adheres to the hub.
- Lower the trailer.
- Tighten the nuts using suitable torque.



NOTE!

NOTE!

Wheel nuts should be tightened with the following torque:

- nuts with M18x1.5 thread – 270–290 Nm
- nuts with M20x1.5 thread – 350–380 Nm
- nuts with M22x1.5 thread – 450–510 Nm.

Wheel nuts should be tightened gradually and diagonally until suitable torque is reached. Use a torque wrench to tighten the wheel nuts.

If you do not have a torque wrench, use a regular wrench with a suitable adapter. Table 8 indicates the approximate weight to be applied at the end of the adapter depending on its length to achieve suitable torque. This method is not as accurate as using the torque wrench.

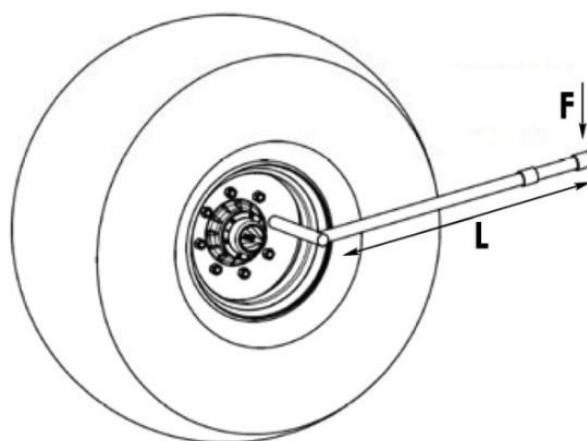


Figure 6.4. Wheel nut tightening.

Table 8. Data for key extension

Nut tightening torque	Wrench adapter length	Weight at the end of the adapter
[Nm]	[mm]	[kg]
360	600	60
	510	70
	350	80
	400	90
	360	100



NOTE!

NOTE!

Wheel nuts cannot be tightened with an impact wrench because this could result in exceeding the permissible torque and damage the nut and/or pin.



NOTE!

NOTE!

Check wheel nut tightening in the following situations:

1. After purchasing the trailer
2. After the test drive
3. After first 5 km of driving with a loaded trailer
4. After every 50 hours of trailer driving or once a week.

Repeat items 2–3 every time the wheel is removed and mounted.

6.4 Brake inspection after trailer purchase.

After purchasing the trailer, the user has to conduct a general inspection of trailer brakes.

Assistance of a second person will be required to conduct the inspection in order to activate the trailer brake:

- Connect the trailer to the tractor and place chocks under the wheels (Fig. 3.3).
- Check if the driving axles are complete. In particular, check the visible brake components (clip pins in the castellated nuts, expansion rings, etc.).
- Check the brake cylinders for leaks.

- Check the method of installation of brake cylinders.
- Engage and release the service brake and the parking brake. The expander arm (1) (fig. 6.5) should move and return without any significant resistance and jamming.

**NOTE!****NOTE!**

Do not use the trailer with an inoperable brake system.

6.5 Brake adjustment.

Brakes regulation should be carried out if:

- brakes of both wheels brake unevenly and / or non-simultaneously.
- expander levers are not parallel to each other during braking.
- a repair of the brake system was carried out.

With properly adjusted brakes, complete braking of both wheels should take place at the same time.

- **Version I:**

Brakes adjustment involves changing the position of expander arm 1 (fig. 6.5) with respect to the expander roller 2. To do this, remove the retaining ring 3 of roller 2, and then remove arm 1 of shaft 2. Then move the expander arm on the conjunction with the roller by one or more teeth in the right direction, namely:

- back - if the brake is too late;
- forward - if the brake is too early.

Once the proper position of the arm 1 is achieved relative to expander roller 2, you must insert the retaining ring 3.

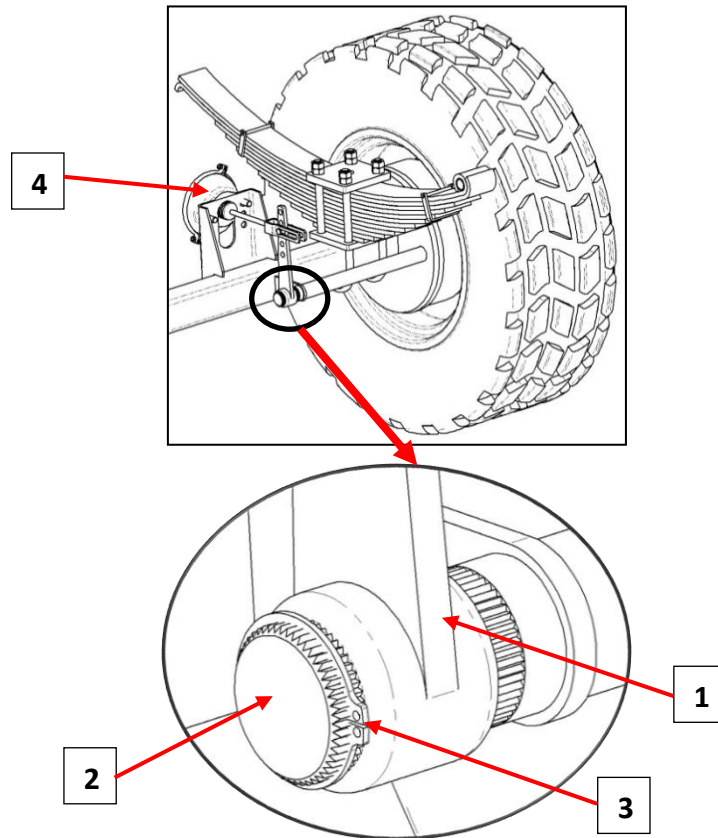


Figure 6.5. Brakes regulation

1 – expander arm, 2 – expander shaft, 3 -retaining ring (Segar), 4 – brake cylinder

- **Version II:**

Brake adjustment involves changing the position of expander arm (3) (fig. 6.6) with respect to the expander shaft (4). To do so, turn the adjusting screw (1) until you hear two clicks in the adjusting mechanism.

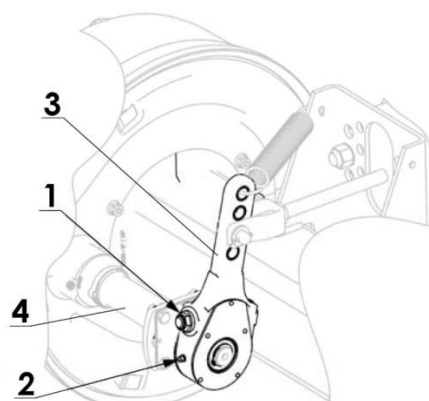


Figure 6.6. Brakes regulation

1 – adjusting screw; 2 – lubricating point; 3 – expander arm.

The adjustment should be conducted separately for each spreader wheel. After proper brake adjustment, at full braking, the expander arms should form an angle of about 90° with the piston rod of the actuator, and the spring should be about half the length of the spring of the total piston rod. After releasing the brake, the expander arms may not be based on any structural elements, because too little withdrawal of the piston rod can cause friction of the jaws against the drum and result in overheating of the trailer brakes. The expander arms arranged on one axis must be parallel to each other at full braking. If not, adjust the position of the lever, which has a longer spring. When removing, the actuator fork you must remember or mark the original setting of the swivel of the actuator fork. The mounting position is chosen by the manufacturer and cannot be changed.

6.6 Handling the break system.

As part of routine maintenance, check the tightness of the pneumatic system (pay most attention to places of all connections). If the conduits, seals or other components are damaged, compressed air will penetrate outside with a typical hiss. The damaged seals or conduits causing leaks should be replaced.

Periodically, remove the condensate gathering in the water from the air tank. For this purpose, pull out the mandrel of the drain valve at the bottom of the tank to the side. The compressed air in the tank will push the water out. After releasing the mandrel, the valve should automatically close and stop the airflow from the tank.

Once a year, before the winter, unscrew the drain valve and clean off the accumulated dirt.

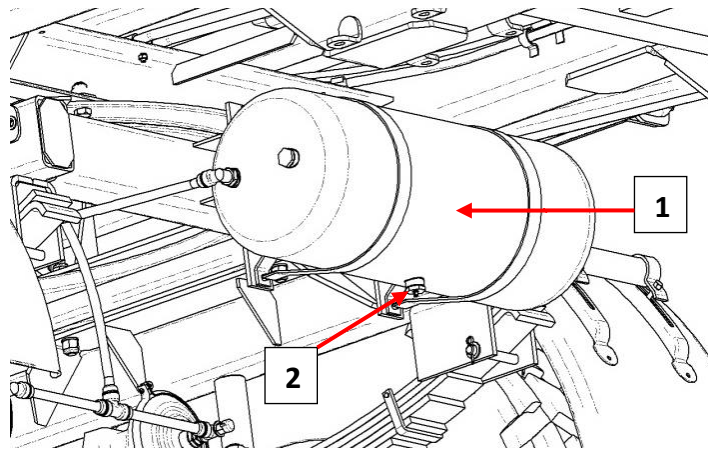


Figure 6.7. Draining the air tank

1 - air tank, 2 - drain valve



NOTE!

NOTE!

Before dismantling the drain valve, reduce the pressure in the air tank.

Depending on the operating conditions of the spreader, but not less frequently than once every three months, remove and clean the air filter inserts, which are located on the connection cables of the pneumatic system. The inserts are reusable and cannot be replaced unless they are damaged by mechanical means.

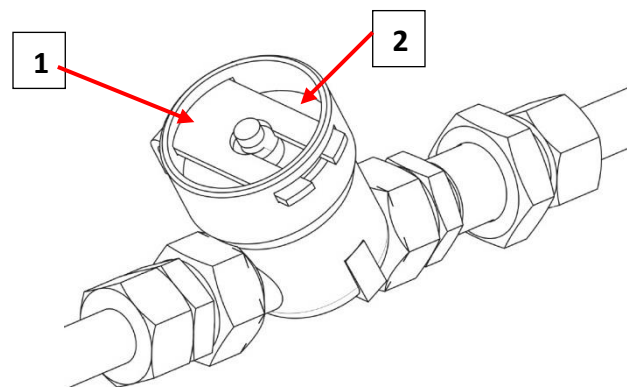


Figure 6.8. Wired air filter

1 - filter cover protection, 2 - filter lid



NOTE!

NOTE!

Before demounting the air filters, reduce the pressure in the brake system.

6.7 Hydraulic installation maintenance.

Always follow the principle that the oil in the spreader hydraulic system and the oil in the external hydraulic system of the tractor are to be of the same type. The use of different types of oil is not permitted.

The hydraulic system of the spreader should be completely tight. Checking tightness of the hydraulic system consists of connecting the spreader to the tractor, engaging the hydraulic cylinder and holding it in the position of maximum extension for 30 seconds.

In the case of noticing oil leaks on connections of hydraulic conduits, you must tighten the connector, if this does not rectify the fault, replace the conduit or the connector with a new one. If the oil leak occurs beyond the connection, the leaking conduit system should be replaced. Exchange of a component to a new one is also required for any damage of mechanical nature.

Hydraulic hoses should be replaced at least every four to six years from their date of manufacture, unless previously found to be damaged and replaced.

In the case of noting oiling on the body of the hydraulic cylinder, check the nature of the leak. When fully taking out the cylinder actuator, check all sealing places. Minor leaks with symptoms of "sweating" are acceptable, but if you see a leak of a "drip" type, you must stop the operation and repair the failure.



NOTE!

NOTE!

The state of the hydraulic system should be controlled up to date during its use. Using a trailer with a leaking hydraulic system is unacceptable.

6.8 Handling the spring leaf system.

Operation of the spring leaf system is based on controlling the current state of spring leaves (for the presence of cracks). These springs should be

kept covered with a thin layer of grease. It should not be allowed to accumulate a thick layer of dried mud on the springs.



NOTE!

NOTE!

In the case of noticing a crack of a spring leaf in any of the springs, the trailer should be out of operation until the fault has been rectified.

6.9 Adapter maintenance

Use of the adapter is based on controlling the current state of the elements cooperating directly with the spread material (knives, scattering strips), and of elements used to cover the drums of the adapter (guards / deflectors, levers), as well as the tension of the chain.

Each time, before working with the spreader it is essential to check the tightening of screws used for mounting the blades and spreading strips. If you loosen the nut, tighten it in accordance with the table of tightening torques, or in the absence thereof, supplement the lack of it.

In the case of noticing damage to a strip in the form of cracking or deformation that can cause damage to associated components such as: guard / deflector, inner wall, cooperating rotor, it must be replaced immediately.



NOTE!

NOTE!

It is essential, before each use of the spreader to check the status of the tightening of the adapter's rotors. Failure to observe this activity can lead to severe damage to the machine or persons located in the proximal and distal distance from the working machine.



NOTE!

NOTE!

Absolutely use original drums, rotors and scattering strips. Failure to do so excludes the Manufacturer's liability for warranty and safety of the machine.

The tensioner (item 1, fig. 6.9 and fig. 6.10) serves to adjust the tension of the floor conveyor's and adapter's drive chain. To inspect tension, dismount the side guards by unfastening screws. The play on the working part of the chain at half of its length should be 5-15mm. In the case of detecting greater play than mentioned above:

- **Tensioner on right side of spreader (fig. 6.9)**
 - Loosen the fixing screws (item 2, fig. 6.9).
 - Slide the tensioner (item 1, fig. 6.9) in the direction of the chain (item 3, fig. 6.9) until the proper play is achieved and then fasten screws once again.

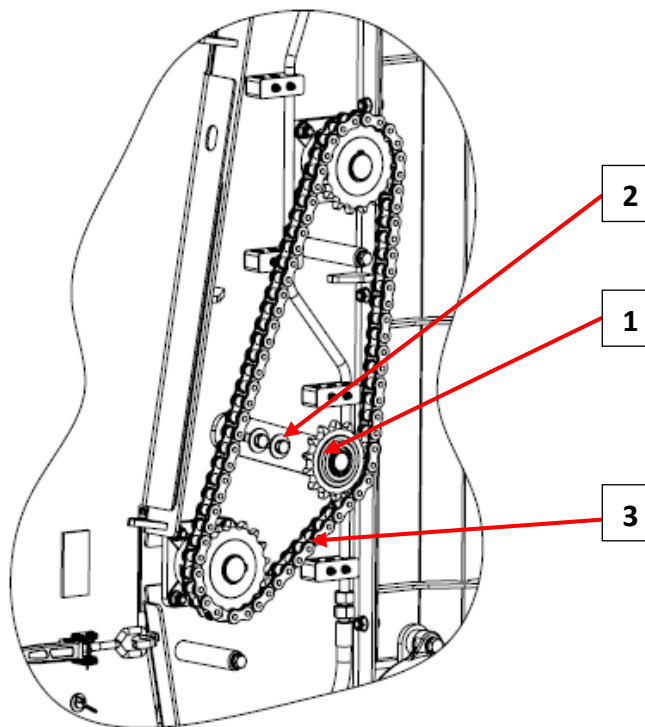


Figure 6.9 tensioning of the right chain

1 – tensioner, 2 – fixing screws, 3 – chain

- **Tensioner on right side of spreader (fig. 6.10)**
 - Loosen the counternut (item 3, fig. 6.10).
 - While tightening the nut (item 2, fig. 6.10), tighten the tensioner (the direction of the threaded rod during tensioning is marked in fig. 6.10) until the proper play is achieved, then refasten the counternut.

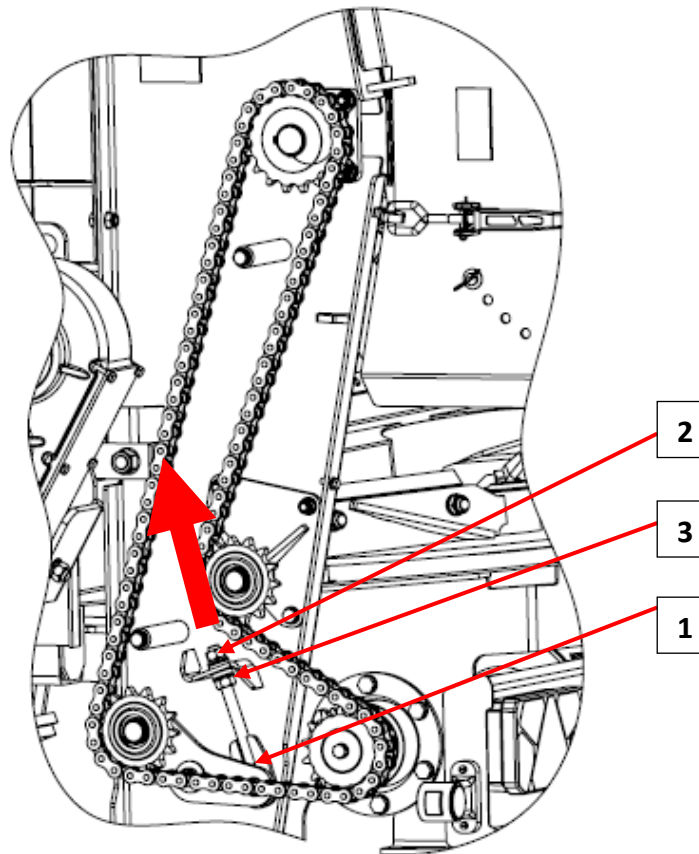


Figure 6.10 tensioning of the left chain

1 – tensioner, 2 – fixing nut, 3 – counter nut

If elimination of play by means of tensioners proves to be impossible, shorten the chain by one or more links

6.10 Operation of the floor conveyor

The work associated with operating the conveyor consists of checking the technical condition of: front and rear socket wheels, the state of the chain, support points, sliders riveted to floor panels and fastened under the frame, and bearing elements of the conveyor. Check that the socket wheels are not damaged, cracked. Check that the scrapers mounted on the back beam are not damaged, if the bolts that secure them are not loose.

Checking the condition of the chain (to see if it is not stretched) is based on lifting it in the middle part of its length from the top side (on the floor panel) to the top and checking whether this height is not excessive or exceeds 50 mm. If this height exceeds 50 mm and the tensioner is able to

move forward (gut of the tensioner), adjust the chain tension by screwing the nut on the tensioner.

In the case of exceeding the height by 50 mm and lack of space for the possibility of tensioning the chain with a tensioner, it is advisable to shorten the conveyor chain by 2 links.

Shortening the chain consists of releasing the connecting links of the chain, cutting 2 links so that the final link is in a vertical position (with the hole facing the side wall) and again, connecting the chain with the connecting link. In case of insufficient effect of tension, this action should be repeated shortening the chain by another 2 links. The chains must be shortened in pairs by the same number of links.

Shortening should be done with extreme care with maintaining compliance with the basic safety rules and using personal protective equipment.

Checking the condition of the sliders under the frame must be carried out every time before starting work. This is based on evaluating whether a wooden strip has been damaged or worn to a height lower than the wall of the steel slider to which it is fastened. In the case where its height is lower than or equal to this wall, it is necessary to replace the slider.

 NOTE!	NOTE! Is absolutely forbidden to start the conveyor loaded with material (e.g. manure, peat, lime, etc.) with the power adapter of or a closed rear wall. Failure to do so may cause irreparable damage to the adapter and your warranty.
 NOTE!	NOTE! It is essential before each use to check the state of tension of the chains and their technical condition (the thickness of the cells, whether the cells are not kneaded)

6.11 Handling electrical equipment.

The work connected with the repair, replacement or regeneration of electrical components should be entrusted to specialized workshops, which have the appropriate technology and qualifications for this type of work.

The duties of the user include only:

- Technical inspection of electrical installations and reflectors,
- Replacing light bulbs.

 NOTE!	NOTE! Driving with a faulty lighting system is prohibited. Damaged shades, and burned-out bulbs must be replaced immediately before driving. Lost or damaged reflective lights must be replaced with new ones.
--	--

6.12 Lubrication

Lubrication of the spreader should be carried out in the points specified in figure 6.12 and listed in table 9

Table 9. The frequency and method of lubrication of the spreader's mechanisms

No. in fig. 6.12	Place of lubrication	Number of lubrication points	Grease type	The frequency and method of lubrication
1	Ring hitch	1	Graphite grease	Every 2 weeks
2	Screw of the parking brake crank	1	Solid grease	Every 3 months
3	Front socket wheels	4	Solid grease	Every 3-4 months
4	Tensioner pulley	4	Solid grease	Every 3-4 months

5	Rear socket wheels	4	Solid grease	Every 3-4 months
6	Conveyor's rear shaft	2	Solid grease	Every 3-4 months
7	Bearing of the conveyor's shaft	1	Solid grease	Every 3-4 months
8	Driving wheels bearings	4	Solid grease	Every 10-12 months
9	Spring leaves swivels	4	Solid grease	Every 3-4 months
10	Rocker pins	2	Solid grease	Every 3-4 months
11	Leaf spring sliders	4	Graphite grease	Every 3-4 months spread grease on the surface of the slider with a loaded leaf spring
12	Spring feathers	4	Solid grease	Every 6-8 months
13	Expanders bars	4	Solid grease	Every 3 months
14	Bearings of drive shafts	4	Solid grease	Every month
15	Cylinder eyes	8	Solid grease	Every 3 months
16	Articulated shafts	2	Solid grease	According to manufacturer's recommendations (fig. 6.11) - frequency expressed in work hours
17	Bearings and chain of adapter	6	Solid grease	Every 2 months

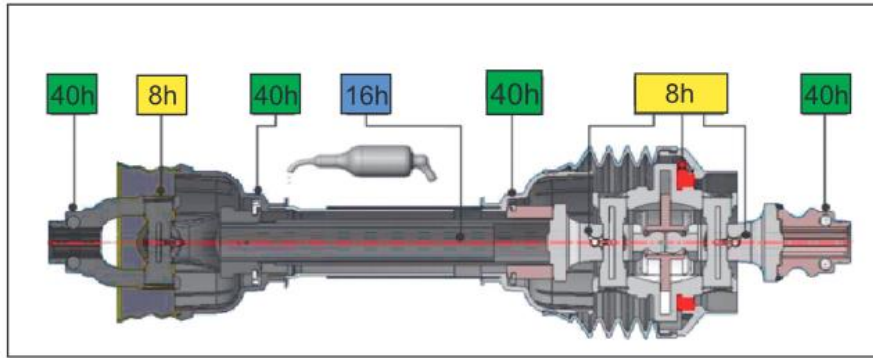


Figure 6.11. Frequency of lubrication of articulated shaft

Source: www.catteloni.com/

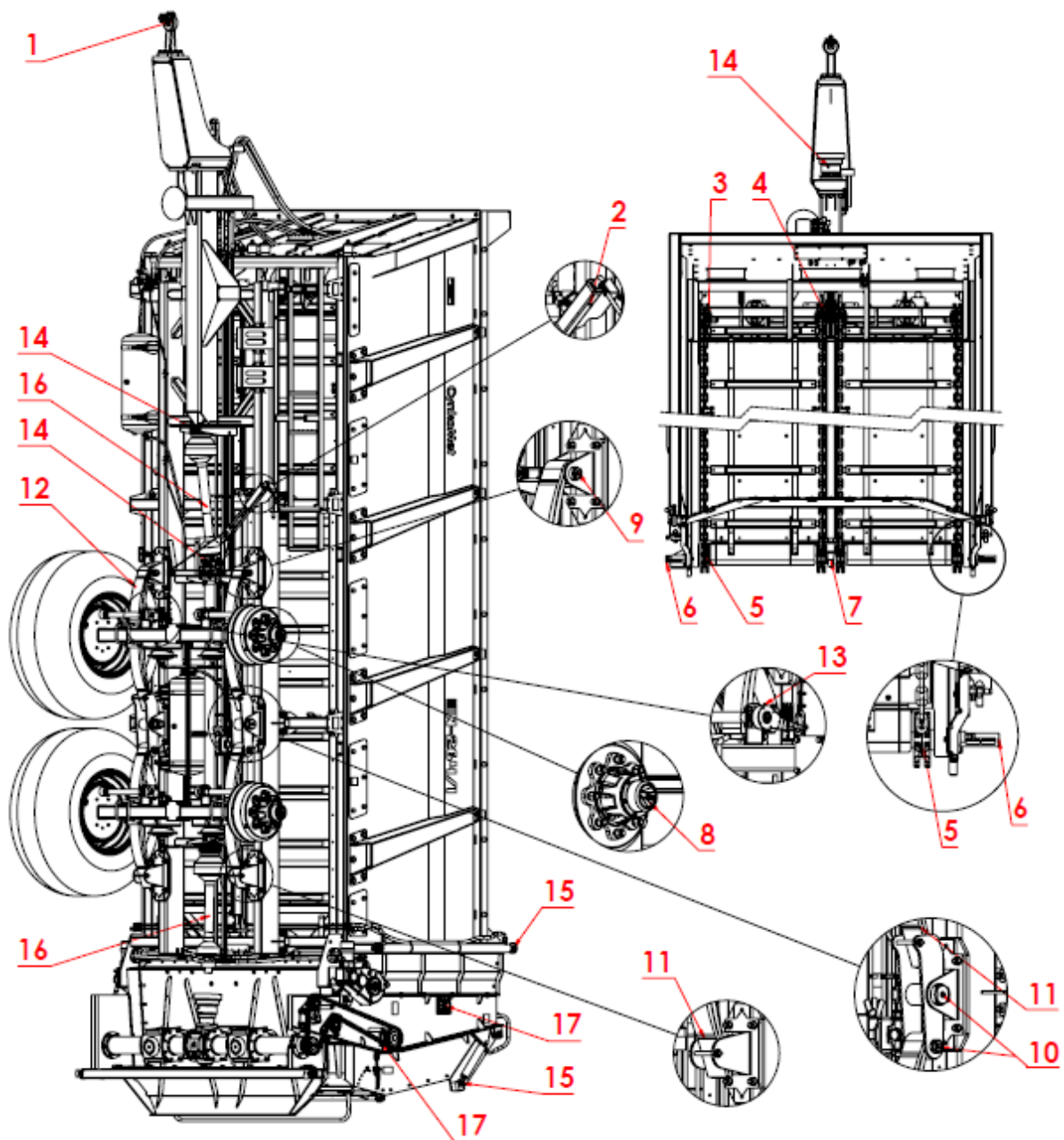


Figure 6.12. Positions of lubrication points

Before commencing the lubrication of the grease fitting, the greased surfaces and places nearby lubrication points must be thoroughly cleaned of mud and dust. The grease should be injected in the grease fitting until release of fresh grease in the gaps between the mating parts.

6.13 Storage and maintenance.

After ending operation, the spreader must be carefully cleaned and washed with a stream of water, and then left it in a dry and ventilated area. In the event of failure of these actions on the zinc coating, dark and light gray areas (spots) may occur, which do not constitute grounds for complaint if the zinc coating still has the required minimum thickness (PN-EN ISO 1461: 2000). In the case of damage of the external paint coating, the damaged areas must be cleaned of rust and dust, degreased, and painted retaining the same color and uniform thickness of the protective coating. Until painting, the damaged areas should be covered with a thin layer of grease or anticorrosion preparation.

During a long break in the use of the spreader, it is desirable to place it indoors or in a covered, ventilated place. It is also advisable that the metal parts not coated with paint are secured with an anti-corrosion preparation of temporary protection or a layer of grease. During a long break in the use of the trailer it cannot be loaded.

6.14 Troubleshooting.

Table 10. Faults and remedies

Failure	Reason	Way of removal
Problems with moving	Unconnected hoses Of the brake installation	Connect the brake hoses
	launched parking Brake	Release the parking brake.
	Damaged connection cables of the pneumatic	Replace.

Problems with moving	system	
	Connections leakage	Tighten, replace washers or seal sets, replace the cables.
	Damaged control valve or brake force regulator	Check the valve, repair or replace it.
Noise in the hub of the driving Axle	Excessive clearance on the bearings	Check clearance and adjust if necessary.
	defective bearings	replace bearings
	damaged items	Replace
Low efficiency of the braking system Excessive heating of the driving axle hub	Pressure too low in the system	Check the pressure gauge on the tractor, wait till the compressor fills the tank to the required pressure.
	Improperly adjusted essential or parking brake	Adjust the position of the spreader arms
	Worn out brake linings	Replace the brake shoes
	Installation leakage.	Check the installation for leaks.
	Damaged air compressor in the tractor.	Repair or replace.
	Damaged brake valve in the tractor.	Repair or replace.
Uneven feed	Damaged flow regulator	Replace
	Damage of the conveyor elements	Remove the damaged element, clean the socket wheel
Uneven spreading of the material on the box	Spreading element (the knife, scattering strip) absent or damaged	Replacement of the damaged item with a new one

Clogging adapter	Mismatched conveyor feed to the spread material	Adjust the feed conveyor in accordance with the spread material
Excessively loud work of the adapter, chain hits guards	Weak chain tension	Tension the adapter's chains according to subsection 6.9.
Improper operation of the hydraulic system	Improper hydraulic oil viscosity	Check the quality of oil, make sure that the oil in both machines is of the same type. If necessary, replace the oil in the tractor and / or trailer
	Insufficient efficiency of the tractor hydraulic pump, damaged tractor hydraulic pump.	Check the hydraulic pump on the tractor.
	Damaged or contaminated actuator	Check the cylinder piston (bending, corrosion), check the cylinder for tightness (piston rod sealing), if necessary, repair or replace the actuator.
	Too much actuator load	Check and, if necessary, reduce the load on the actuator
	Damaged hoses	Check to make sure that the hydraulic hoses are tight, not refracted and properly looped. If necessary, replace or tighten.

7. Transport

The spreader is prepared for sale in a complete state and does not require packing. The instruction manual of the machine and the cable connecting the electrical system, the PTO shaft only undergo packaging.

Delivery of the spreader to the user is done by independent transport after coupling to a tractor or motor vehicle (in this case, due to its height, the spreader can be mounted on the platform of the means of transportation on the hubs - with wheels unscrewed and removed).

Loading and unloading of a spreader from a car should be carried out using the loading ramp with an agricultural tractor or using a crane, lever. During operation, observe the general safety rules with handling operations. Persons operating the reloading equipment must have the required permissions to use these devices.

When loading / unloading using the tractor, the trailer must be properly connected with the tractor according to the requirements contained in this manual. The spreader braking system must be running and tested before running off or driving on the ramp.

When loading / unloading using a crane or a lever, the spreader is to be lifted with the help of approved fasteners designed to carry the load with sufficient capacity. The belts must be in good condition, they cannot show any signs of damage.

The belts should be placed under the upper or lower frame of the spreader in such places that, when lifting the machine, the belts do not have the possibility of moving, and the spreader does not tilt while moving. If there is a possibility of damage or frayed belts against components of the machine, put washers in sensitive areas.

In order to avoid compression of the walls to the inside the spreader, when loading with the use of a crane, use a special traverse, where the places of hooking the belts will be spaced wider than the total width of the machine.

The spreader should be attached firmly to the platform of the transport mean with belts, chains, lashing or other fastening means equipped with a tightening mechanism. The fasteners should be hooked in the designated

transportation eyebolts Fig.7.1 or permanent structural elements of the trailer (side-members, crossbars, etc.). Transport handles are welded to the stringer of the top frame, one pair on each side of the spreader and on the rear of the bottom frame. Use certified and technically efficient fastening means. Frayed belts, cracked mounting brackets, opened or corroded hooks or other damage may disqualify the given mean for use.

Under the wheels of the spreader chocks, it is advisable to put wooden beams or other elements without sharp edges, preventing the machine from rolling. The spreader wheels chocks must be attached to the loading platform of the car so as to prevent their shifting.



NOTE!

NOTE!

During car transport, the parking brake should be used in the spreader (parking brake action is described in section 4.2.6).



NOTE!

During independent transport, the trailer operator should be familiar with the contents of this manual and follow the recommendations contained in it. During road transport, the spreader is fastened on the platform of the means of transport in accordance with the manufacturer's technology. The driver of the car, while transporting the machine, should take extra caution. This is due to the upward movement of the vehicle's center of gravity with a loaded machine.

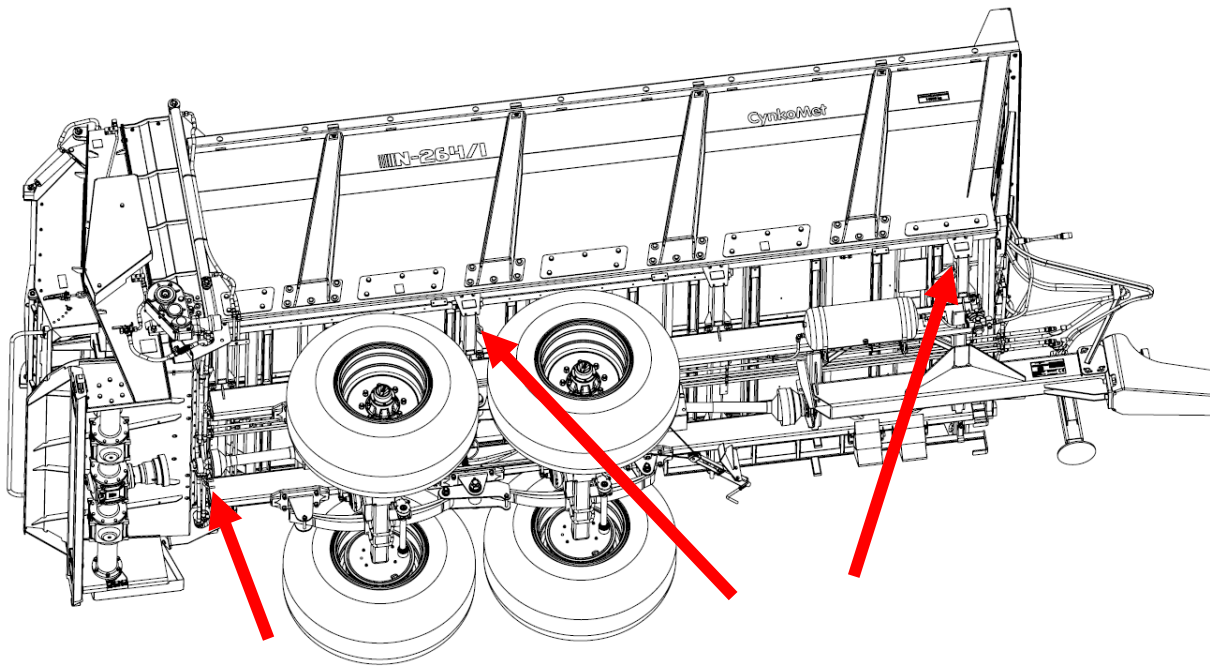


Figure 7.1. Transport handles

8. Spreader cassation

Should the user make a decision on cassation of the machine, he must pass the entire spreader to the scrap depot designated by the Governor or a Starost.

The dismantled parts remaining after repair of the spreader must be submitted to the collection point of recyclable materials.

The certificate obtained from this facility is the basis for the de-registration of the trailer.

Hydraulic oil, lubricants and oil and lubricant packaging should be transferred to a company that disposes of such waste.

9. Guarantee

"CYNKOMET" Sp. z o.o. in Czarna Białostocka ensures the smooth operation of the machine according to the technical-operational terms described in the operating manual. The condition of accepting a complaint is to follow all the recommendations contained in the operating and use manuals.

TERMS OF THE WARRANTY:

The guarantee will be respected after the presentation by the customer of a clearly and correctly filled warranty card of the machine undergoing reclamation.

- 1) Failures detected during the warranty period will be removed by warranty service no later than 14 working days from the date of delivery by the repair station or any other agreed period.
- 2) In a written notification claim (mail, fax, e-mail, etc.) you must give the data and contact of the owner of the machine, its name, serial number, purchase date and a description of the complaint.
- 3) Parts subject to wear during exploitation are not covered by the warranty e.g. tires, brake linings, lighting, damage caused by external causes, such as: mechanical injuries, improper handling, as well as the operation incompatible with the intended purpose.
- 4) This manual does not allow you to make changes, alterations, modifications to the discretion of the Customer without consulting with the manufacturer.

Detailed warranty conditions are mentioned in the warranty card attached to each newly purchased machine.

 NOTE!	NOTE! It is advisable to require from the seller to fill in the warranty card and reclamation coupons. Lack of e.g. the date of sale or point of sale stamp exposes the user to non-recognition of any complaints.
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10. Environmental hazard

Hydraulic oil leakage is a direct threat to the environment because of the limited biodegradability of the substance.

The created layer of oil on the water can a result of direct physical action on organisms, can cause change in the oxygen content in the water due to absence of direct contact of the air with water.

Maintenance - repair work at the time of which there is a risk of leakage should be performed in rooms with oil resistant surface.

In the event of an oil spill, you must first secure the source of the leak, and then collect the spilled oil using available means. Collect the oil residues using sorbents, or mix the oil with sand, sawdust or other absorbent materials. The collected oil waste should be kept in a sealed and marked container, resistant to hydrocarbons. The container should be kept away from heat sources, flammable materials and food.



NOTE!

NOTE!

Used hydraulic oil or gathered remains mixed with absorbent material should be stored in a carefully marked container. For this purpose, do not use food containers.

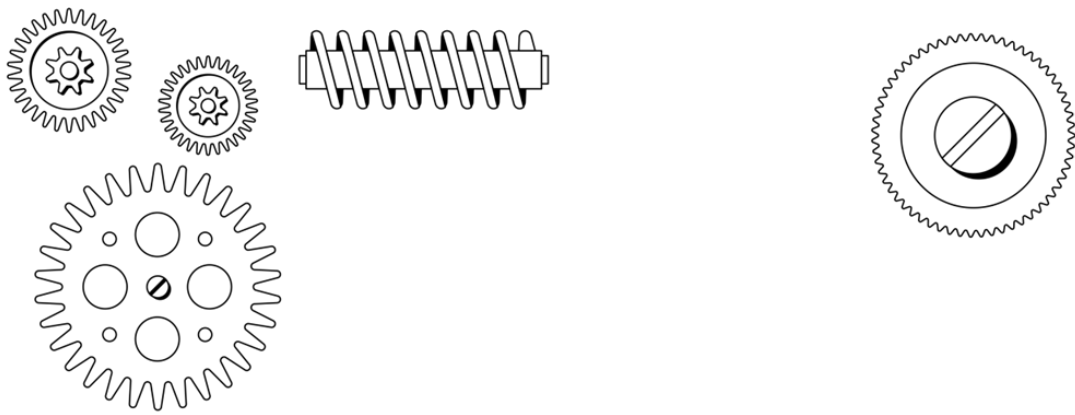
Used oil or unsuitable for reuse due to the loss of its properties should be stored in its original packaging in the same conditions as previously described. Oil waste must be transferred to a point taking care of recycling or oils regeneration. Waste code: 13 01 10. Detailed information concerning hydraulic oil can be found in the safety data sheet.



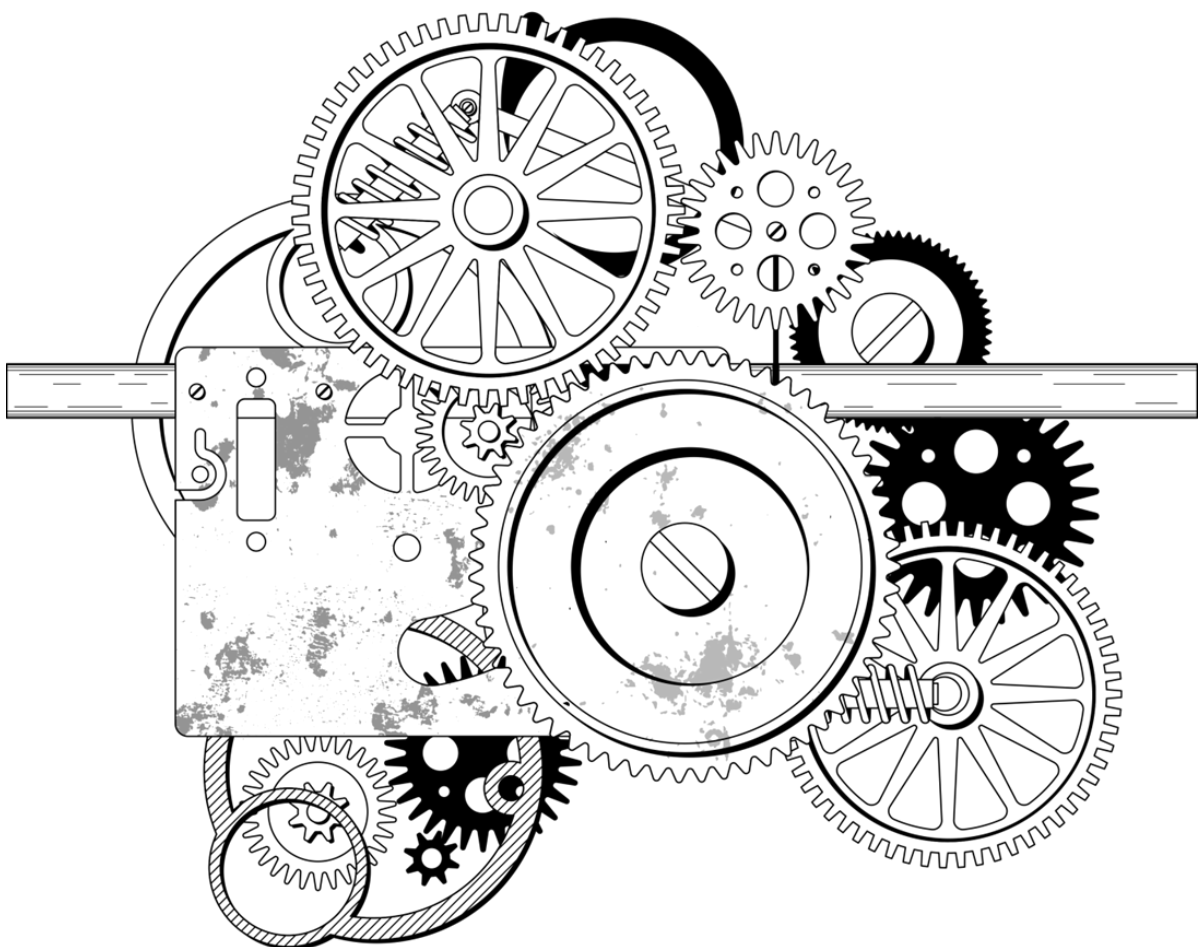
NOTE!

NOTE!

Oil waste can be delivered only to the point taking care of disposal or oils regeneration. It is forbidden to throw or pour oil into drains or water.



PARTS CATALOGUE



SPARE PARTS CATALOGUE

Introduction

The "Spare parts catalog" is, next to the "Instruction manual", the basic operation and maintenance document intended for users of the spreader. The catalogue includes:

- drawings of all assemblies and mechanisms of the trailer;
- lists of parts of individual units and mechanisms.

How to use the catalogue

For each drawing, there is a text table added, containing the list of parts of the unit or the mechanism.

In order to obtain the part number, select an assembly or mechanism drawing, which includes the part from the catalogue, read the number of its position, and then on the appropriate plate, find the appropriate position under this name and part symbol When ordering please specify:

- the exact address of the contracting authority (recipient of the parts);
- part name compatible with the catalog;
- part number compatible with the catalog;
- the number of pieces of the ordered parts;
- year of production and serial number of the machine.

WALLS SET

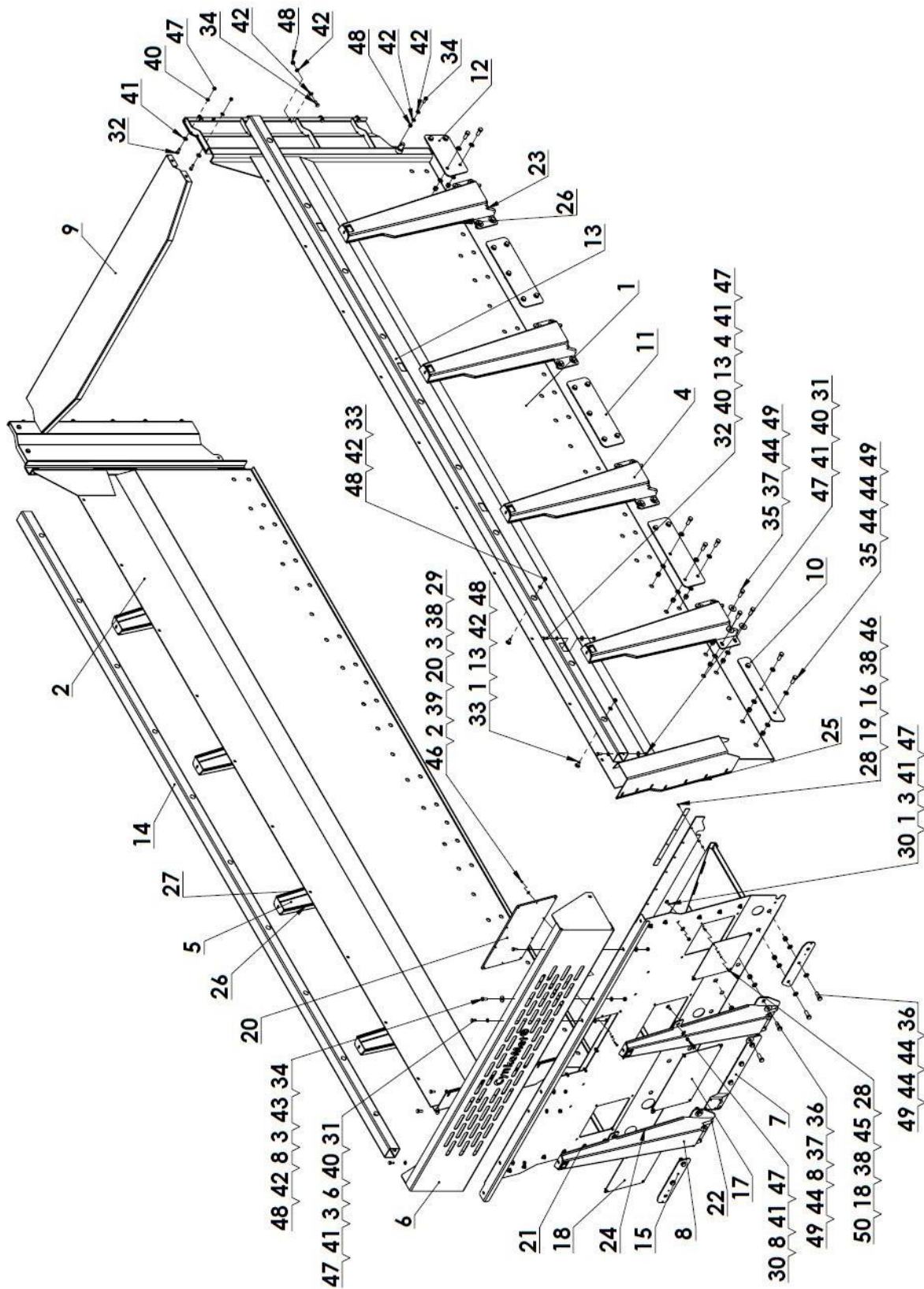


Table 1 Set of walls

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Left wall set	2264/22.01.000	1
2	Right wall set.	2264/22.02.000	1
3	Front wall set	2264/22.03.000	1
4	Bracket set - L	2264/22.04.000	4
5	Bracket set - R	2264/22.05.000	4
6	Mesh	2264/22.06.000	1
7	Extension with bracket	2264/22.07.000	1
8	Front bracket set	2264/22.08.000	2
9	Guard set	2264/22.09.000	1
10	Front extension	2264/22.00.001	2
11	Central extension	2264/22.00.002	6
12	Rear extension	2264/22.00.003	2
13	Edge-L	2264/22.00.004	1
14	Edge-R	2264/22.00.005	1
15	Short extension	2264/22.00.006	2
16	Sealant	2264/22.00.007	1
17	Cover I	2264/22.00.008	1
18	Cover II	2264/22.00.009	2
19	Cap	2221/35.00.005	4
20	Window	7617/00.14.001/1	1
21	Reinforced edge seal 4 mm L-400	33.420X	4
22	Reinforced edge seal 4 mm L-440	33.420X	2
23	Reinforced edge seal 4 mm L-550	33.420X	8
24	Reinforced edge seal 4 mm L-580	33.420X	4
25	Reinforced edge seal 4 mm L-1050	33.420X	2
26	Reinforced edge seal 4 mm L-1110	33.420X	8
27	Reinforced edge seal 4 mm L-1350	33.420X	8
28	Screw M6x20 8.8 B	PN-85/M-82105	28

29	M6x25 8.8 screw	PN-85/M-82105	10
30	M10X25 8.8 screw	PN-87/M-82406	18
31	M10x25 8.8 screw	PN-85/M-82105	6
32	M10X30 8.8 screw	PN-85/M-82105	12
33	M12X30 screw	PN-87/M-82406	20
34	M12x30 8.8 screw	PN-85/M-82105	14
35	M16x40 8.8 screw	PN-85/M-82105	84
36	M16x45 screw	PN-85/M-82105	14
37	Washer n 17	PN-59/M-82030	46
38	Washer Ø 6.4	PN-78/M-82005	38
39	Washer n 6.5	PN-59/M-82030	10
40	Washer 10.5	PN-78/M-82005	18
41	Washer n 10.5	PN-59/M-82030	36
42	Washer 13	PN-78/M-82005	46
43	Enlarged washer 13	PN-78/M-82030	2
44	Washer 17	PN-85/M-82005	150
45	Spring washer 6.1	PN-77/M-82008	12
46	Nut with insert M6	PN-85/M-82175	26
47	Nut with insert M10	PN-85/M-82175	36
48	Nut with insert M12	PN-85/M-82175	34
49	Nut with insert M16	PN-85/M-82175	98
50	Steel, knurled M6 rivet nut		12

ALB PNEUMATIC BRAKE SYSTEM

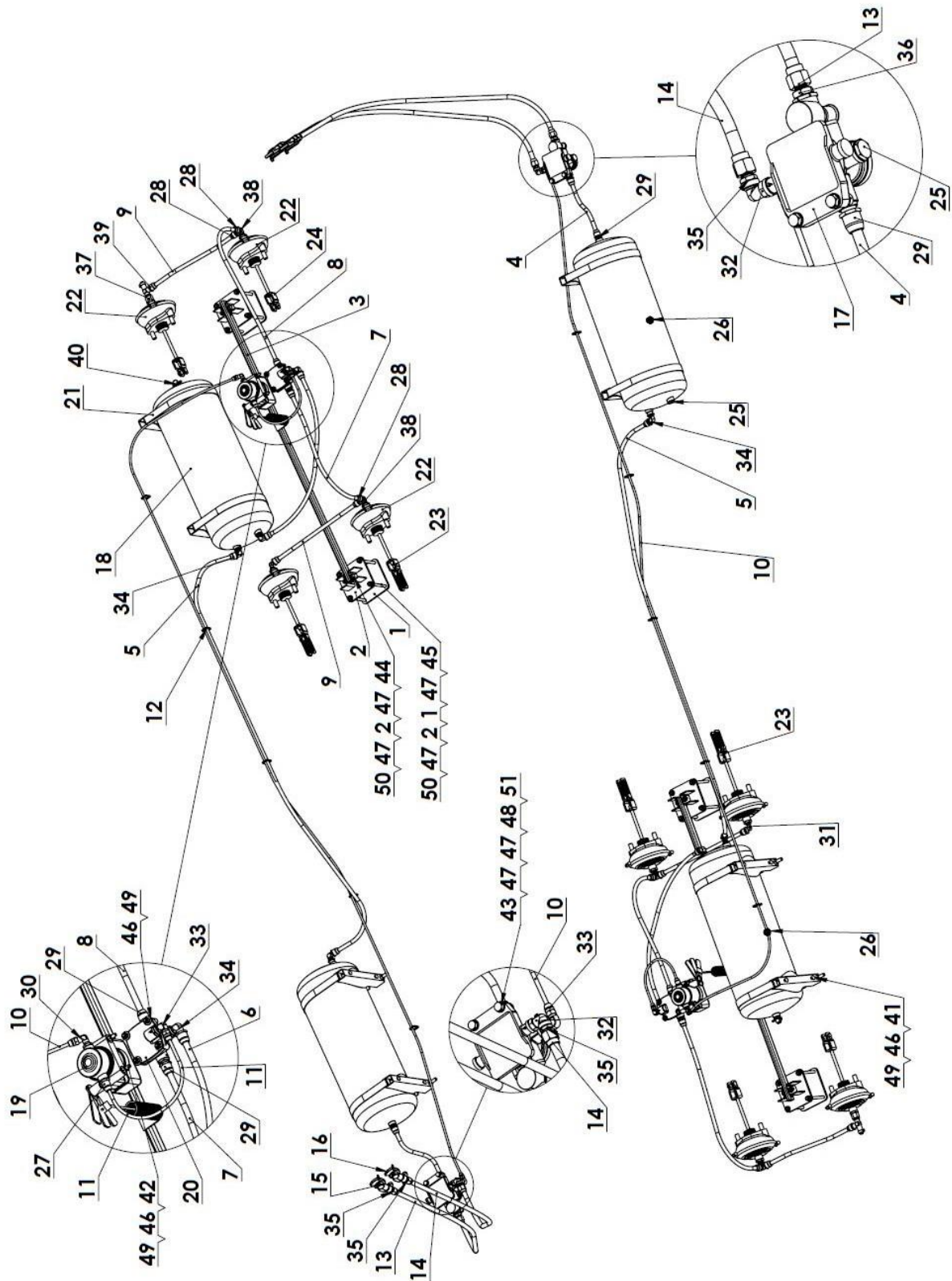


Table 2 ALB pneumatic brake system

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Plate	7617/19.01.001	2
2	Bracket	7617/19.01.000	2
3	Beam set	7649/02.02.100	1
4	Hose tekalan dia. 15x1.5 L=300	2264/17.00.001	1
5	Hose tekalan dia. 15x1.5 L=2100	2264/17.00.002	1
6	Hose tekalan dia. 15x1.5 L=750	2264/17.00.003	1
7	Hose tekalan dia. 15x1.5 L=600	2264/17.00.004	1
8	Hose tekalan dia. 15x1.5 L=800	2264/17.00.005	1
9	Hose tekalan dia. 15x1.5 L=450	2264/17.00.006	2
10	Hose tekalan dia. 8x1 L=4100	2264/17.00.007	1
11	Hose tekalan dia. 8x1 L=400	2264/17.00.008	1
12	250x4.8 clamp		5
13	Spiral red hose Haldex	33016509	1
14	Spiral yellow hose Haldex	33016009	1
15	Front connector of power cables with filter Haldex	334086101	1
16	Front connector of control cables with filter Haldex	334085111	1
17	Brake valve Haldex	350 026 102	1
18	40L/276 air tank	30351209	2
19	Automatic braking force regulator Haldex	601002021	1
20	Relay valve Haldex	355 018 011	1
21	Tank ring clamp n276mm Haldex	307027600	2
22	24" Diaphragm actuator Haldex	123240002	4
23	Long fork Haldex	3033609	2
24	Short fork Haldex	003561409i	2
25	M22 plug Haldex	3236280222	2
26	Cut-off valve M22x1.5 Haldex	315019031	2
27	Straight M16x1.5/8 Haldex	3230108162	1
28	Straight M16x1.5/15 Haldex	3230115162	4

29	Straight M22x1.5/15 Haldex	3230115222	4
30	Elbow M16x1.5/8 Haldex	3230508162	1
31	Elbow M16x1.5/15 Haldex	3230515162	1
32	Elbow M16x1.5/M16x1.5w Haldex	3271506600	1
33	Elbow M22x1.5/8 Haldex	3230508222	2
34	Elbow M22x1.5/15 Haldex	3230515222	4
35	Nipple Haldex M16x1.5/M18x1.5	3280112162	3
36	Nipple M22x1.5/M18x1.5 Haldex	3280112222	1
37	M16-M22w reducer Haldex	3236116222	1
38	T-pipe 90~ M16/M16w/M16w Haldex	3274206600	2
39	T-pipe inspection connector/15/M22 Haldex	3236514942	1
40	M22 Inspection coupling Haldex	3236509225	1
41	M8x25 8.8 screw	PN-73/M-82406	8
42	M8x95 - 8.8-B Screw	PN-85/M-82101	2
43	M10x40 8.8 screw	PN-85/M-82105	2
44	M10x50 8.8 screw	PN-85/M-82105	2
45	M10x130 8.8 screw	PN-85/M-82101	8
46	Washer n 8.5	PN-59/M-82030	14
47	Washer 10.5	PN-78/M-82005	24
48	Spring Washer 10.2	PN-77/M-82008	2
49	Nut with insert M8	PN-85/M-82175	14
50	Nut with insert M10	PN-85/M-82175	10
51	M10 Nut	PN-86/M-82144	2

REAR HYDRAULIC WALL

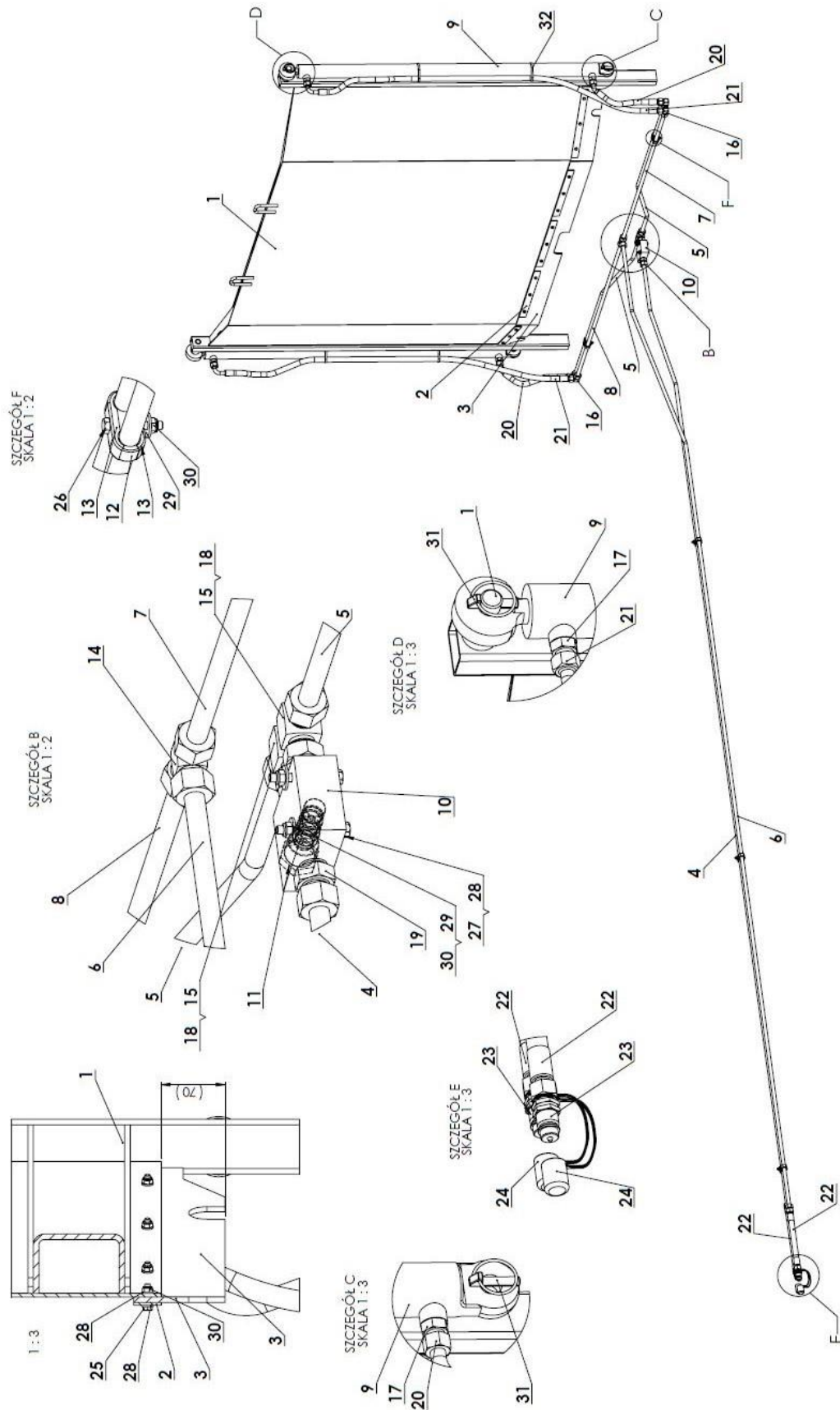


Table 3 Rear hydraulic wall

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Rear wall	2264/11.01.000/2	1
2	Cap	2264/11.00.007	5
3	Sealant	2264/11.01.009/1	1
4	Tube I set	2264/11.00.110	1
5	Tube II set	2264/11.00.120	2
6	Tube II set	2221/35.00.120/1	1
7	Tube IV set	2221/35.00.140	1
8	Tube V set	2221/35.00.150	1
9	Hydraulic cylinder	SJ2F-16-28/50/1250	2
10	Stream splitter - body	ML-10W4-G04-A 11	1
11	Cartridge valve of stream splitter 22-54l	FD-10W-40-54-N	1
12	Double clamp	ROPD-315	5
13	Cap	DP-03	10
14	BBB-M22x1.5 T-piece coupling	PN-147 16-13 15L	1
15	AB 22x1.5 male elbow coupling	AB90 M22x1.5 15L	2
16	BB-M22x1.5 elbow coupling	PN-143 16-13 15L	4
17	Body of M22x1.5-M22x1.5 straight connector with seal	PN-65/M-73144 15L	4
18	Straight connector with seal	GM 3/8 - 22x1.5	2
19	Straight connector with seal	GM 1/2 - 22x1.5	1
20	A45 - M22x1,5, A-M22x1.5 L15 L-390 hydraulic hose	BN-81/1903-01	2
21	A90 - M22x1,5, A-M22x1.5 L15 L-1650 hydraulic hose	BN-81/1903-01	2
22	AB-M22x1.5, L15 L-3000 hydraulic cord	BN-81/1903-01	2
23	ISO-12,5 (16L) Plug cover	ISO 7241-A	2
24	ISO-12.5 Plug cover (blue)	ISO 7241-B	2
25	M6x25 8.8 screw	PN-85/M-82105	15
26	M6x40 8.8 screw	PN-85/M-82105	5
27	M6x50 8.8 screw	PN-85/M-82101	2
28	Washer Ø 6.4	PN-78/M-82005	32
29	Washer 6.5	PN-59/M-82030	7

30	Nut with insert M6	PN-85/M-82175	22
31	Pin A11x45	BN-81/1802-31	4
32	Band 250x7.6		4

DRIVE

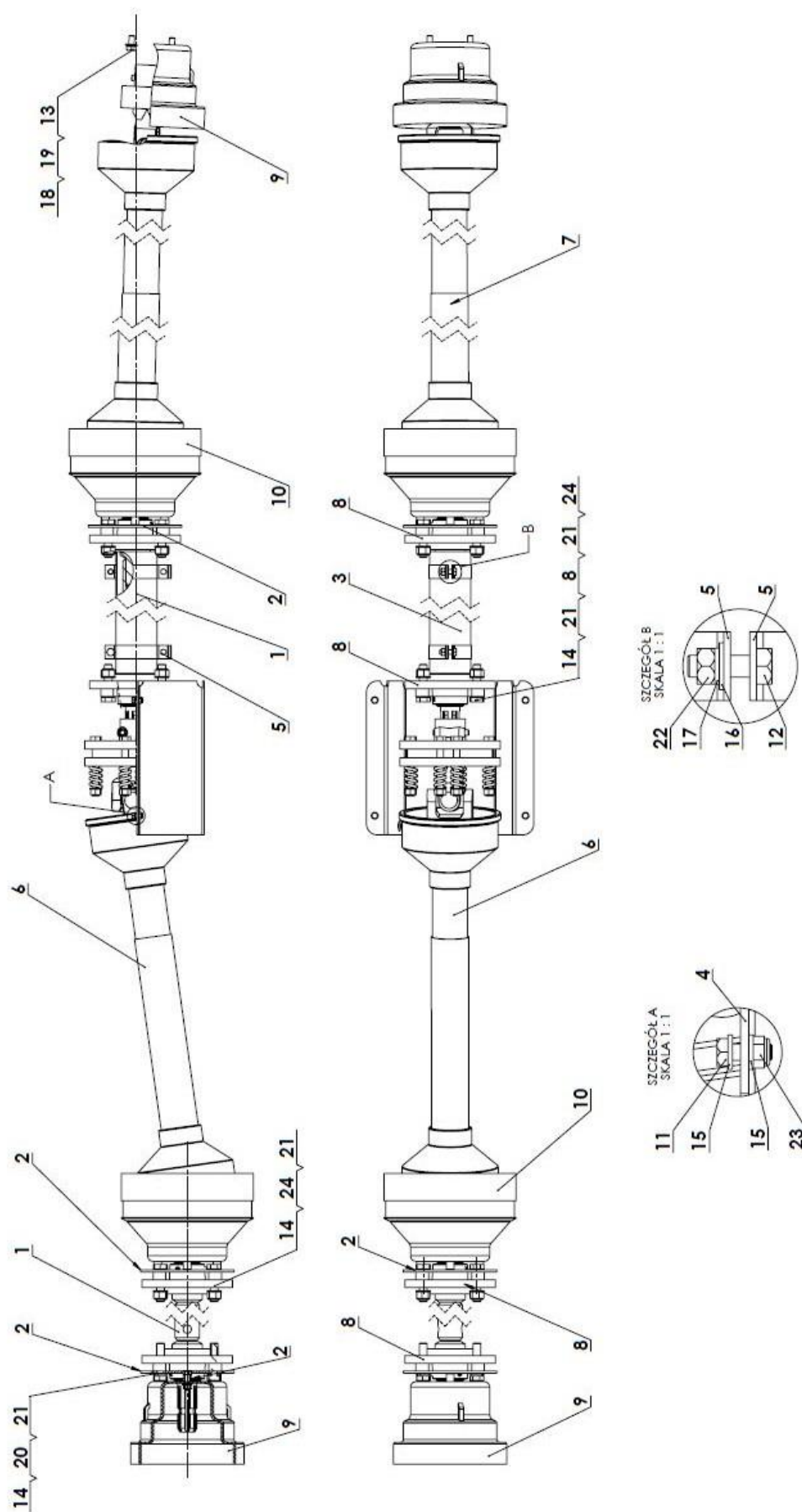


Table 4 Drive

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Shaft set	2221/06.15.000	2
2	Guard spacer	2221/06.00.100	3
3	Guard	2221/06.00.008	1
4	Shaft guard	2221/02.00.034/1	1
5	Clamp II	2219/73.00.005	4
6	Articulated shaft with friction clutch (L=820)	OP5.101.960.082	1
7	Articulated shaft with uni-directional clutch (L=950)	OP5.101.922.095	1
8	Bearing unit	UCFC 210	4
9	PTO shaft guard		2
10	Guard WPM 21 903		2
11	M6x16 8.8 B screw	PN-85/M-82101	4
12	M8x25 - 8.8-B Screw	PN-85/M-82105	2
13	M10x20 8.8 screw	PN-85/M-82105	4
14	M14x60-8,8-B Screw	PN-85/M-82101	16
15	Washer Ø 6.4	PN-78/M-82005	8
16	Washer 8.4	PN-78/M-82005	14
17	Spring washer 8.2	PN-77/M-82008	14
18	Washer 10.5	PN-78/M-82005	4
19	Spring washer Ø 10.2	PN-77/M-82008	4
20	Spring washer Ø 14.2	PN-77/M-82008	4
21	Round washer 15	PN-78/M-82005	28
22	M8 Nut	PN-86/M-82144	14
23	Nut with insert M6	PN-85/M-82175	4
24	Nut with insert M16	PN-85/M-82175	12

CONVEYOR SET

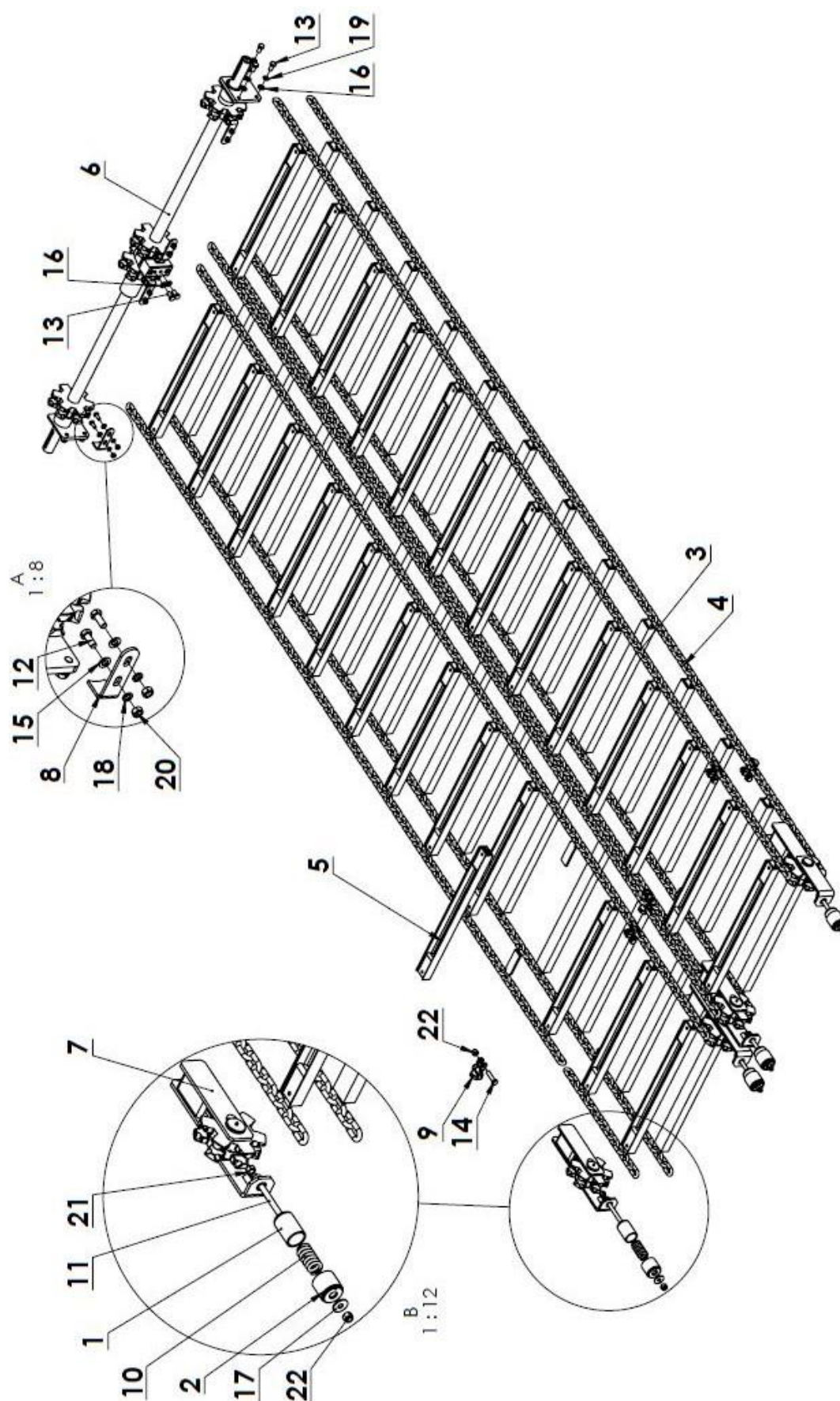


Table 5 Conveyor set

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Spring guard I	2221/07.00.100	4
2	Spring guard II	2221/07.00.200	4
3	Chain with attachments part I	2221/07.01.100/1	4
4	Chain with attachments part II	2221/07.01.200/1	4
5	Strip set	2221/07.02.000/4	54
6	Rear shaft set	2221/07.07.000/3	1
7	Conveyor tensioner	2221/07.14.000	4
8	Scraper	2221/07.00.008/1	4
9	14X50 SKAT lock		8
10	Pressure spring d-9, Dz-45, Sk-13, Zi-10		4
11	M16 threaded rod		4
12	M12x30 8.8 B screw	PN-85/M-82101	8
13	M16x30 8.8 B screw	PN-85/M-82101	8
14	M16x65 8.8 B screw	PN-85/M-82101	8
15	Washer 13	PN-78/M-82005	8
16	Washer 17	PN-85/M-82005	8
17	Washer n 17	PN-59/M-82030	4
18	Spring Washer 12.2	PN-77/M-82008	8
19	Spring washer ø16.3	PN-77/M-82008	6
20	M12 Nut	PN-86/M-82144	8
21	M16 8.8 nut	PN-86/M-82144	4
22	Nut with insert M16	PN-85/M-82175	12

REAR SHAFT SET

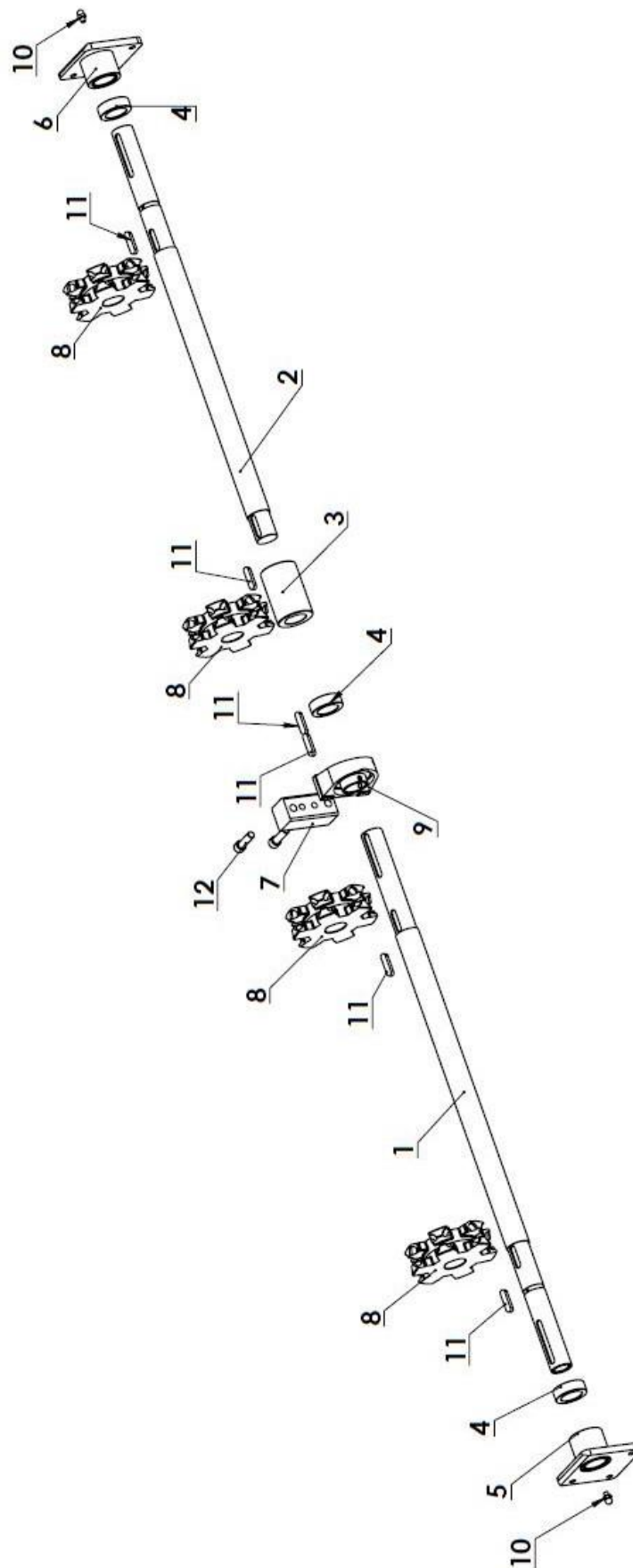


Table 6 Rear shaft set

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Rear shaft part I	2221/07.00.001/3	1
2	Rear shaft part II	2221/07.00.002/2	1
3	Sleeve	2221/07.00.003/1	1
4	Exterior sleeve	2221/07.00.005/2	3
5	Bearing I set	2221/07.12.000/1	1
6	Bearing II set	2221/07.13.000/1	1
7	Bearing base	2221/01.03.003/2	1
8	Rear socket wheel	CNK-3	4
9	Self-aligning bearing	UCPA 210	1
10	M10 grease fitting	PN-76/M-86002	2
11	Parallel key A14x9x56	PN-70/M85005	6
12	Hex screw M16x55-8.8	DIN 912	2

HYDRAULIC CONVEYOR DRIVE

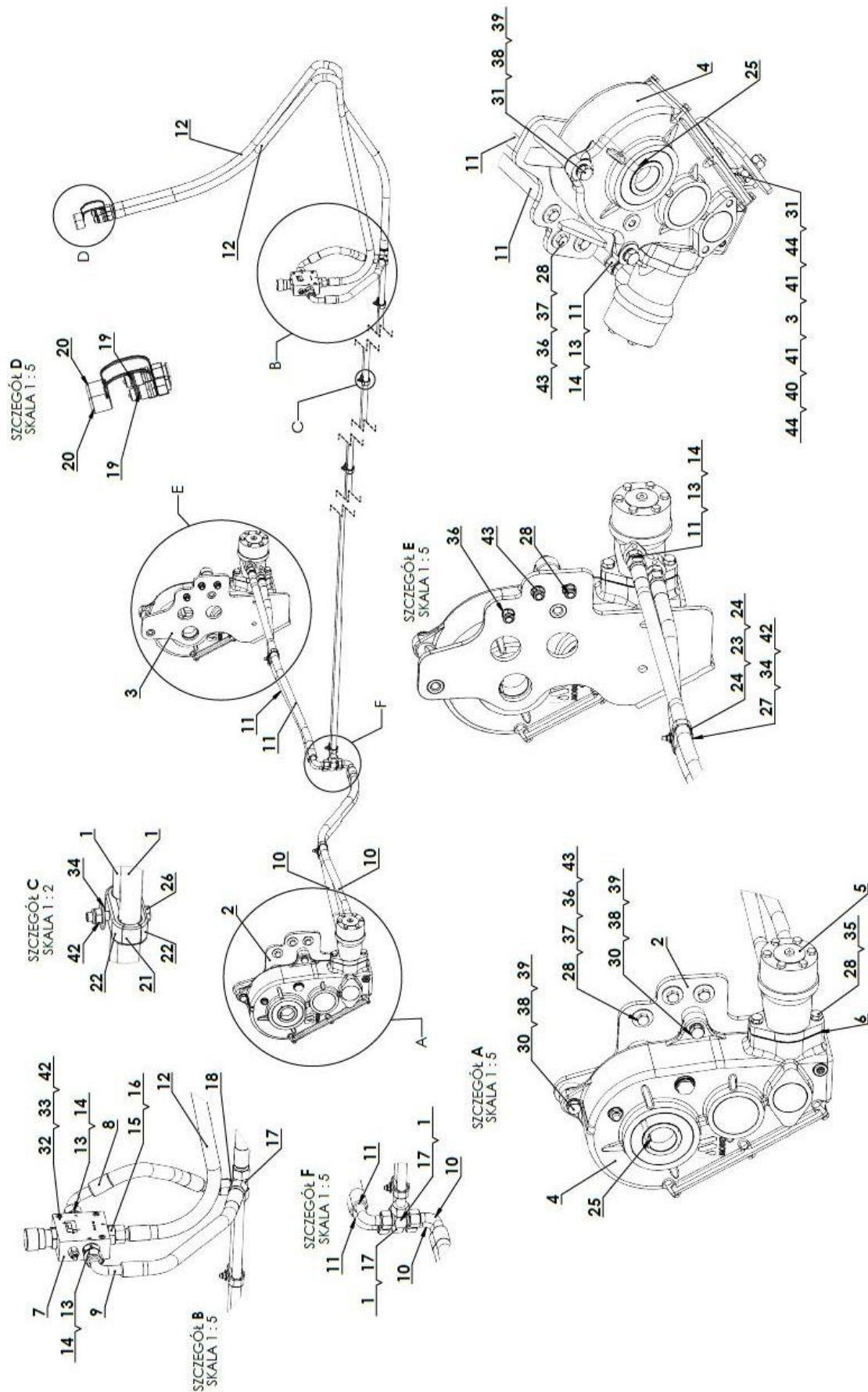


Table 7 Hydraulic conveyor drive

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Tube II set	2221/34.00.220/1	2
2	Transmission fastener plate set	2221/34.04.000	1
3	Transmission fastener plate set	2221/34.06.000	1
4	Gearbox	MB 26.40	2
5	Hydraulic motor	BMR -160 P1 AIYY-T4	2
6	Seal for hydraulic motor MGLR 160 A25	RT8671	2
7	Flow regulator	UDUE10-22/50-4 P 250	1
8	A90-M22x1.5 A45-M22x1.5 L15 L-375 hydraulic hose	BN-81/1903-01	1
9	A90 - M22x1/5, A-M22x1.5 , L15 L-510 hydraulic hose	BN-81/1903-01	1
10	A90 - M22x1/5, A-M22x1.5 , L15 L-1150 hydraulic hose	BN-81/1903-01	2
11	A90 - M22x1/5, A-M22x1.5 , L15 L-1200 hydraulic hose	BN-81/1903-01	2
12	AA-M22x1.5, L15 L-3000 hydraulic cord	BN-81/1903-01	2
13	Straight connector	GM 1/2 - 22x1.5	6
14	1/2 metal-rubber seal	U c1/2	6
15	Straight connector	GM 3/4 - 22x1.5	1
16	Metal rubber seal 3/4"	U c 3/4	1
17	BBB-M22x1.5 T-piece coupling	PN-147 16-13 15L	3
18	BB-M22x1.5 elbow coupling	PN-143 16-13 15L	1
19	ISO-12,5 (16L) Plug cover	ISO 7241-A	2
20	ISO-12.5 plug cover (red)	ISO 7241-B	2
21	Double clamp	ROPD-315	4
22	Cap	DP-03	8
23	Double clamp	ROPD-422	2

24	Cap	DP-04	4
25	Parallel key A14x9x56	PN-70/M85005	4
26	M6x40 8.8 screw	PN-85/M-82105	4
27	M6x50 8.8 screw	PN-85/M-82101	2
28	M12x35 8.8 B screw	PN-85/M-82105	10
29	M14 x 30 - 8.8-B screw	PN-85/M-82105	2
30	M14x50-8.8 screw	PN-85/M 82101	2
31	M16x55 8.8 screw	PN-85/M-82105	3
32	M6x50 hexagon screw	PN-85/M-82302	3
33	Washer Ø 6.4	PN-78/M-82005	3
34	Podkładka 6,5	PN-59/M-82030	6
35	Spring washer 12.2	PN-77/M-82008	4
36	Washer 13	PN-78/M-82005	6
37	Enlarged washer 13	PN-78/M-82030	6
38	Spring washer ø14.2	PN-77/M-82008	6
39	Round washer 15	PN-78/M-82005	6
40	Spring washer ø16.3	PN-77/M-82008	1
41	Washer 17	PN-85/M-82005	2
42	Nut with insert M6	PN-85/M-82175	9
43	Nut with insert M12	PN-85/M-82175	6
44	M16 8.8 nut	PN-86/M-82144	2

TANDEM SPRING SUSPENSION

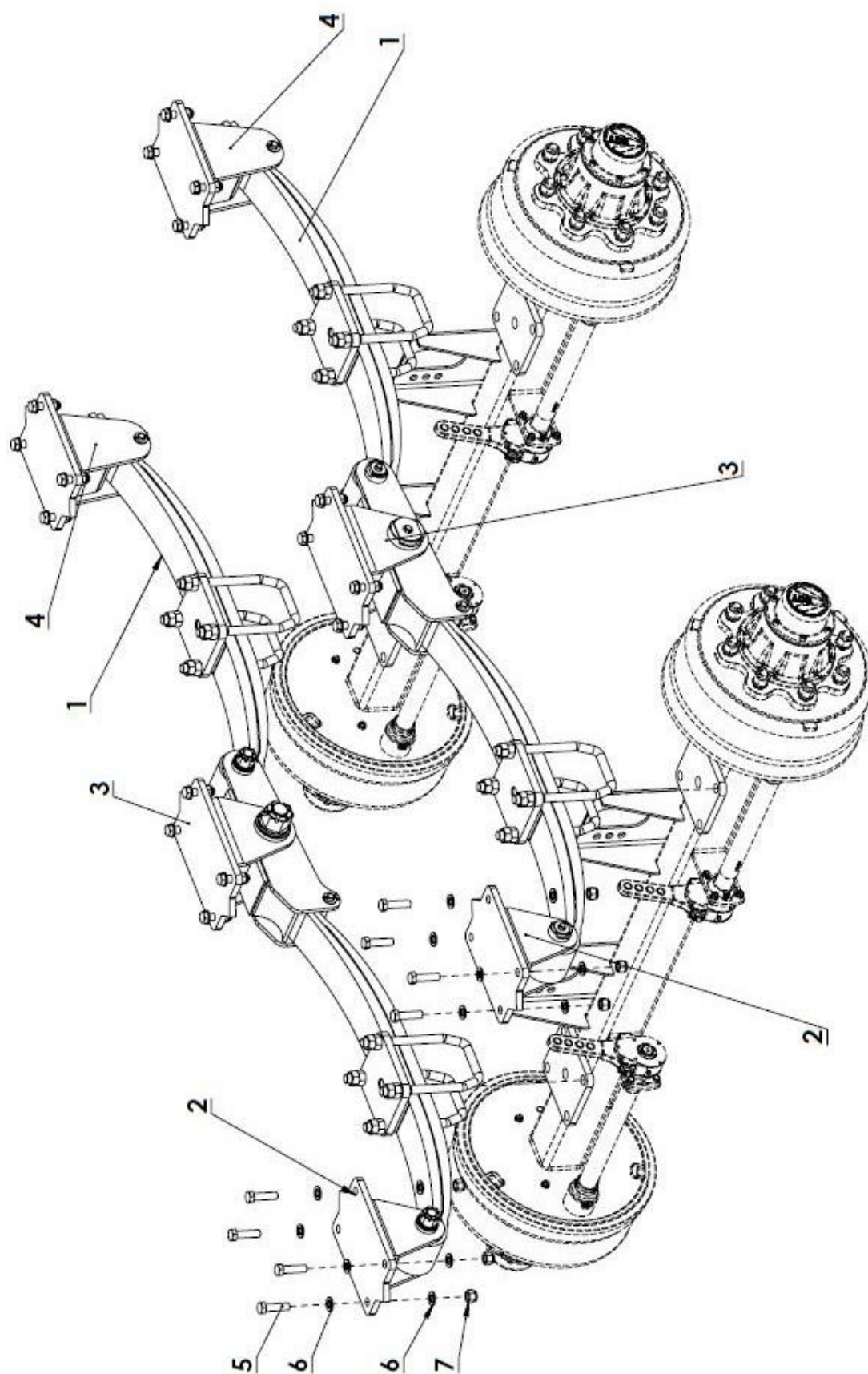


Table 8 Tandem spring suspension

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Tandem suspension 18-21T	SP2N1810132A	1
2	Front leaf spring eye set	2264/19.00.100	2
3	Central leaf spring eye set	2264/19.00.200	2
4	Rear leaf spring eye set	2264/19.00.300	2
5	M16x60 10.9 screw	PN85/M-82105	24
6	Washer 17	PN-85/M-82005	48
7	Nut with insert M16 - class 10	PN-85/M-82175	24

HAND BRAKE

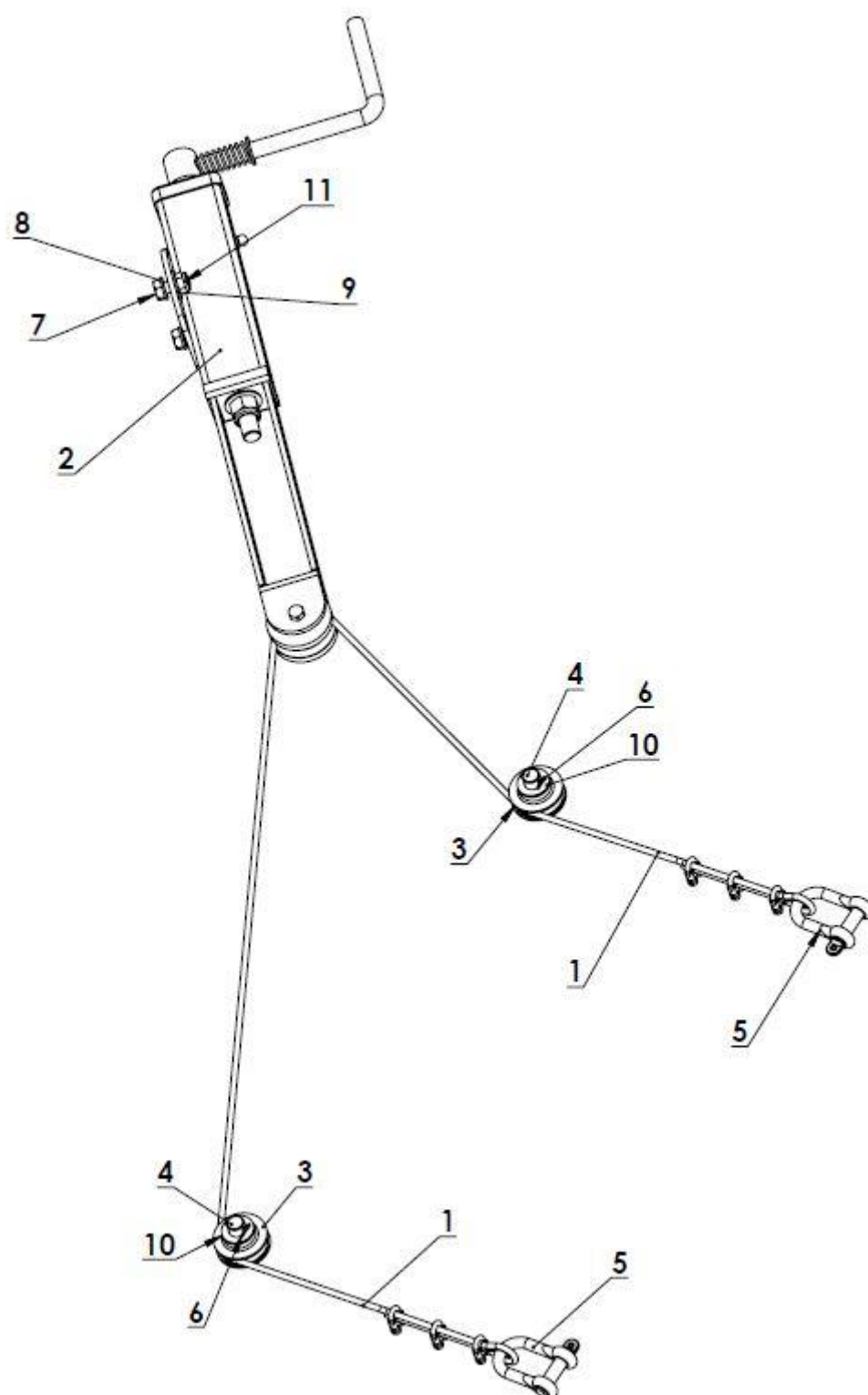


Table 9 Hand brake

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Handbrake cord set.	2264/16.00.100	1
2	Handbrake mechanism set	2221/05.03.000	1
3	Hand brake wheel	7110/16.00.001	2
4	Pin D16 L45/39	DIN 1444B	2
5	M12 shackle	DIN 82101-A	2
6	PIN S-ZN 3.2x25	PN-78/M-82001	2
7	M10x25 8.8 screw	PN-85/M-82105	2
8	Washer 10.5	PN-78/M-82005	2
9	Washer n 10.5	PN-59/M-82030	2
10	Washer 17	PN-85/M-82005	2
11	Nut with insert M10	PN-85/M-82175	2

SUPPORT

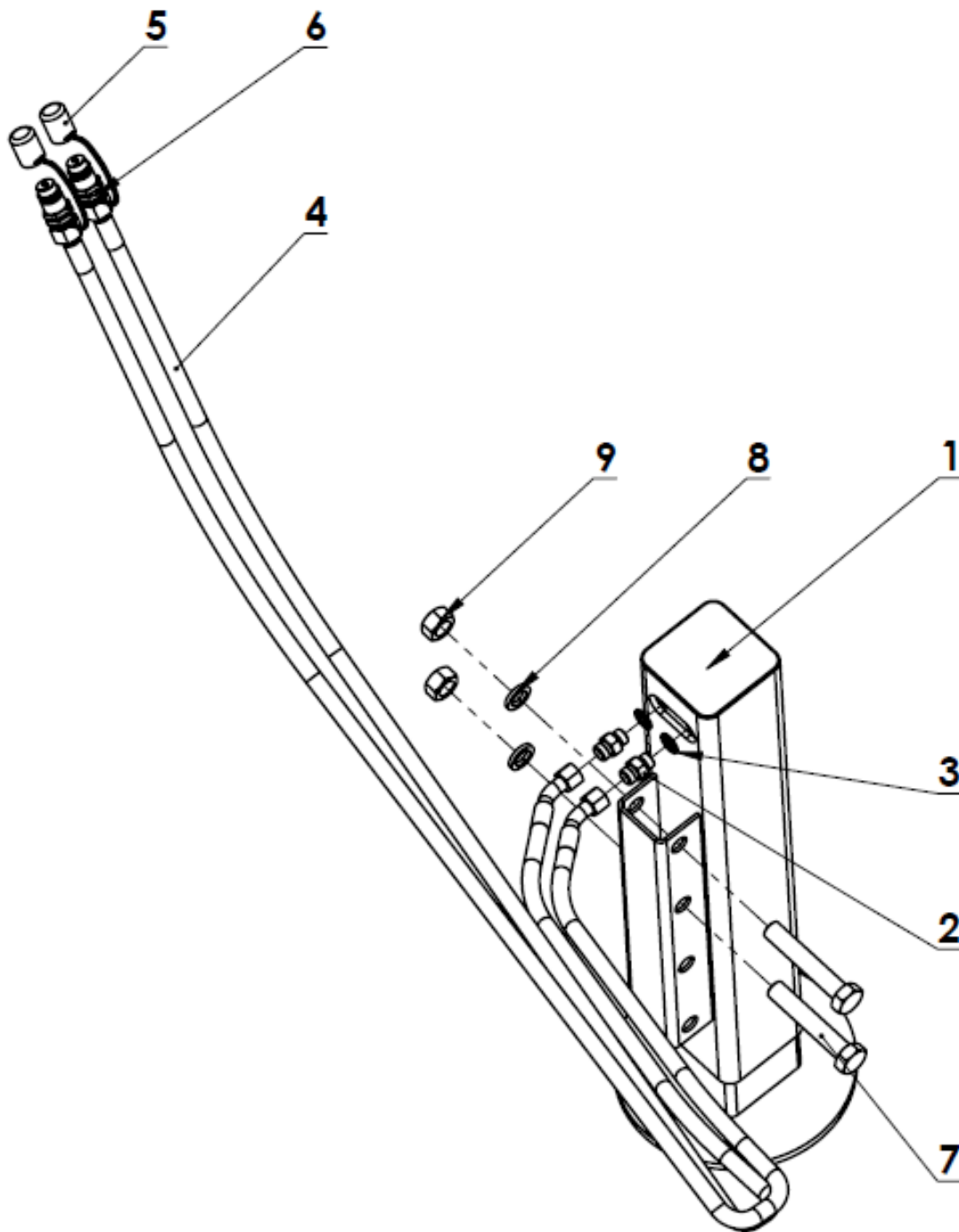


Table 10 Support

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Support foot	7617/14.02.000	1
2	Straight connector	GM 3/8 - M18x1.5	2
3	3/8 metal-rubber seal		2
4	A45-M18x1.5, A22x1.5 L15 L-2000 hydraulic hose	BN-81/1903-01	2
5	ISO-12.5 plug cover (red)	ISO 7241-B	2
6	ISO-12,5 (16L) Plug cover	ISO 7241-A	2
7	M20x110 screw	PN-86/M-82101	2
8	Spring washer 20.5 Fe/Zn 20.5	PN-77/M-82008	2
9	M20 Nut	PN-86/M-82144	2

CHASSIS

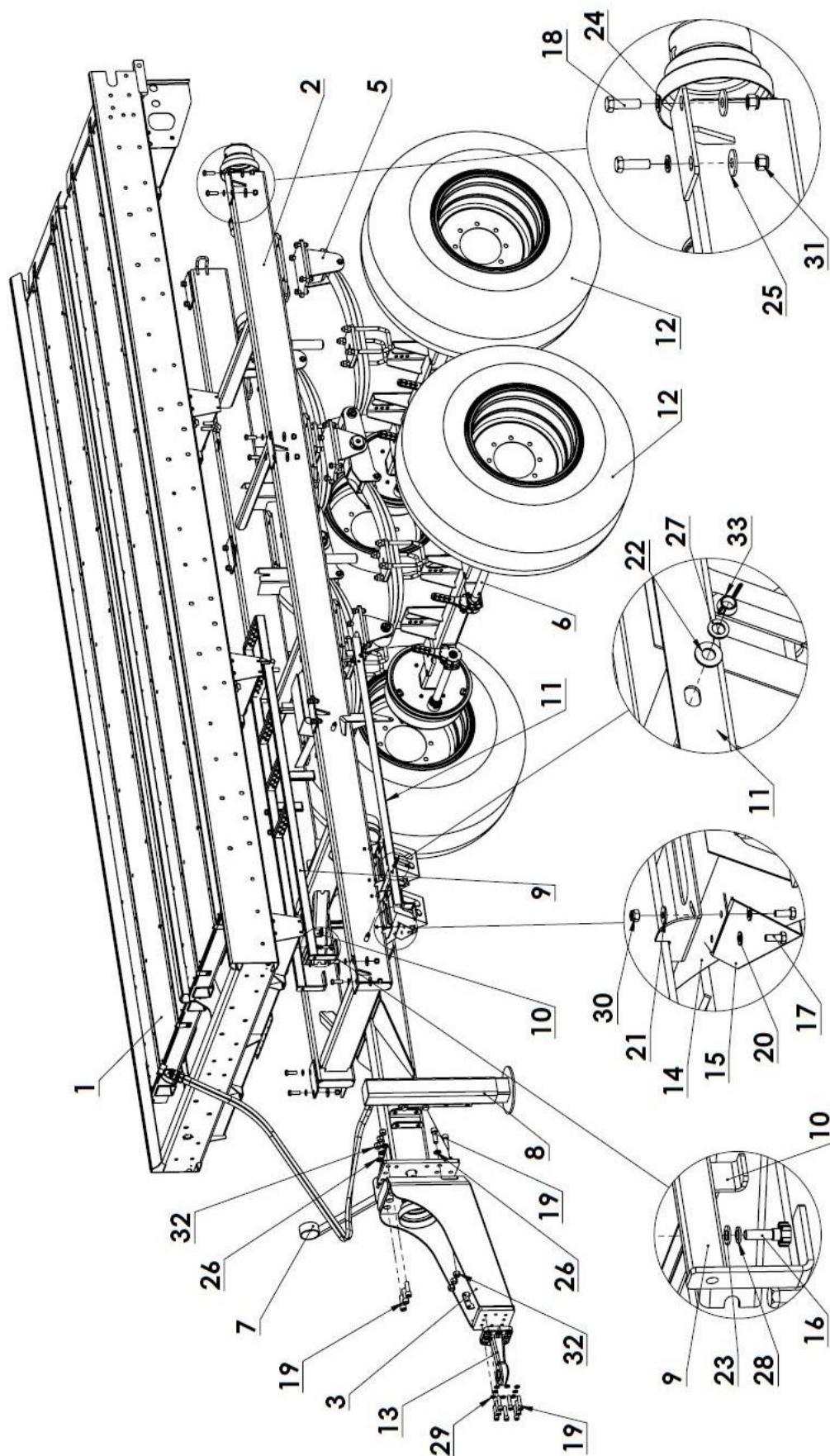


Table 11 Chassis

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Upper frame + floor	2264/21.00.000/0-1	1
2	Bottom frame	2264/02.00.000/1	1
3	Universal drawbar	2221/73.00.000/4	1
4	Drive	2221/06.00.000/9	1
5	Tandem spring suspension	2264/19.00.000	1
6	Braked driving axle	2264/08.00.000/1	2
7	Hose bracket	2221/00.10.000	1
8	Hydraulic system of support	7617/14.00.000/1	1
9	Ladder	2264/00.03.000/1	1
10	Ladder suspension I	2264/00.00.100	1
11	Support	2264/00.00.300	1
12	550/60-22.5 16PR (ET=0) wheel		4
13	TMW drawbar eye	D50-C.B8.T45	1
14	Wedge 46	UK 46	2
15	Wedge handle 46	HA 46	2
16	Star grip M12x35		1
17	M8x20 8.8 screw	PN-85/M-82105	8
18	M16x45 10.9 screw	PN-85/M-82105	16
19	M16x65 - 12.9 hex screw	PN 82302	15
20	Washer 8.4	PN-78/M-82005	8
21	Washer 8.5	PN-59/M-82030	8
22	Washer 10.5	PN-78/M-82005	2
23	Washer 13	PN-78/M-82005	1
24	Washer 17	PN-85/M-82005	16
25	Washer 17	PN-59/M-82030	16
26	Washer 21	PN-78/M-82005	7
27	Spring Washer 10.2	PN-77/M-82008	2
28	Spring washer 12.2	PN-77/M-82008	1
29	Spring washer $\varnothing 16.3$	PN-77/M-82008	8
30	Nut with insert M8	PN-85/M-82175	8
31	Nut with insert M16 - class 10	PN-85/M-82175	16

32	Nut with insert M20 - class 12	PN-85/M-82175	7
33	M10 wingnut	PN/M-82439	2

UPPER FRAME + FLOOR

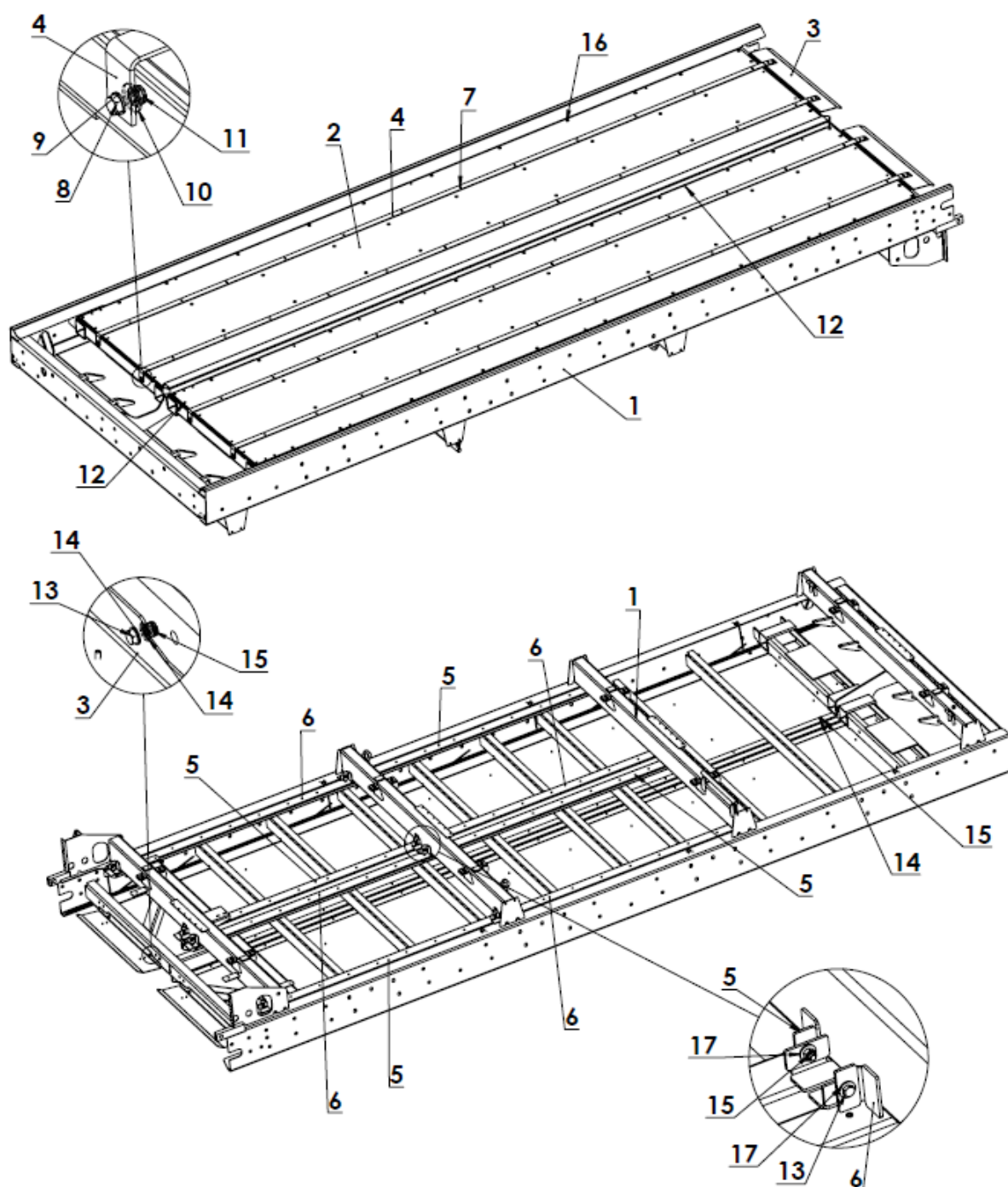


Table 12 Upper frame + floor

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Upper frame	2264/21.00.000	1
2	Floor panel 3x930x4860	2264/21.00.003	2
3	Floor sheet	2221/01.00.005/2	2
4	Slider	2221/01.00.083	4
5	Slider I set	2264/21.02.000	4
6	Slider II set	2264/21.03.000	4
7	Stainless steel riveted rivet n4,8x14	DIN 7337-A	56
8	M10X30 8.8 screw	PN-85/M-82105	4
9	Washer 10.5	PN-78/M-82005	4
10	Washer n 10.5	PN-59/M-82030	4
11	Nut with insert M10	PN-85/M-82175	4
12	Stainless steel riveted rivet n4,8x18	DIN 7337-A	42
13	M8x25 - 8.8-B Screw	PN-85/M-82105	20
14	Washer n 8.4	PN-78/M-82005	92
15	Nut with insert M8	PN-85/M-82175	104
16	M8x25 hex screw with conical head 8.8	DIN 7991	84
17	Washer n 8.5	PN-59/M-82030	32

ELECTRICAL INSTALLATION

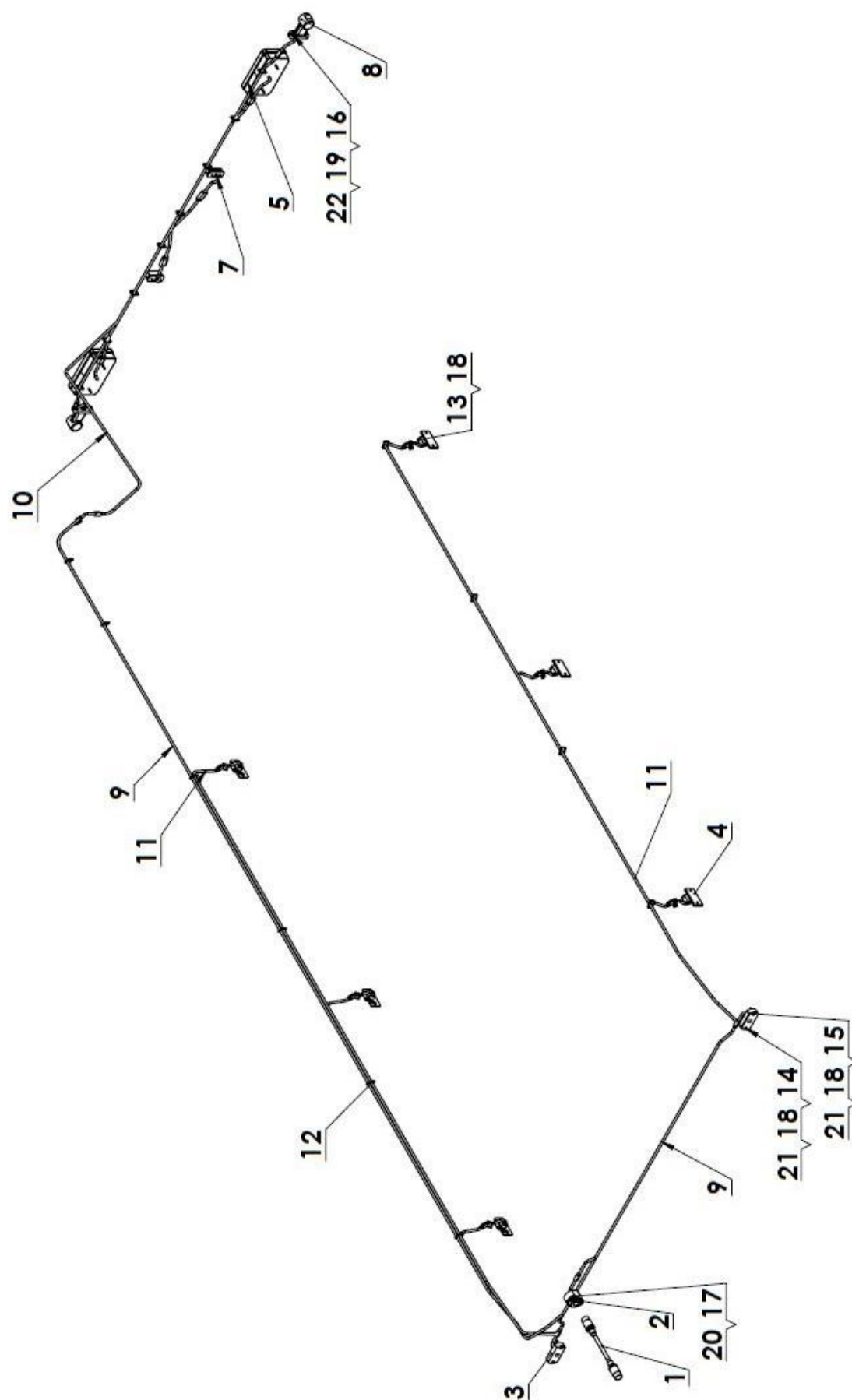


Table 13 Electrical installation

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Connecting cable	7104/57.10.004	1
2	Plug-in socket	2235/04.10.004	1
3	Front outline lamp	2221/54.10.003	2
4	Side outline lamp	2264/15.10.005	6
5	Rear left lamp	7608/04.10.006	1
6	Rear right lamp	7608/04.10.005	1
7	Lighting lamp of the registration plate	7149/20.10.004	2
8	Side perimeter lamp*	2264/15.10.004	2
9	Headlights harness	2264/15.10.001	1
10	Rear beam	2264/15.10.002	1
11	Side perimeter lights harness*	2264/15.10.003	2
12	250x4.8 clamp		25
13	M4x12 screw	DIN 7985	12
14	M4x45 screw	PN-85/M-82215	2
15	M4x45 screw	PN-85/M-82215	2
16	M5x25 screw	PN-85/M-82215	4
17	M6x35 screw	PN-85/M-82215	3
18	Spring washer 4.1	PN-77/M-82008	16
19	Spring washer 5.1	PN-77/M-82008	4
20	Spring washer 6.1	PN-77/M-82008	3
21	M4 Nut	PN-86/M-82144	4
22	M5 Nut	PN-86/M-82144	4

* available as additional (optional) equipment

ADAPTER A2H

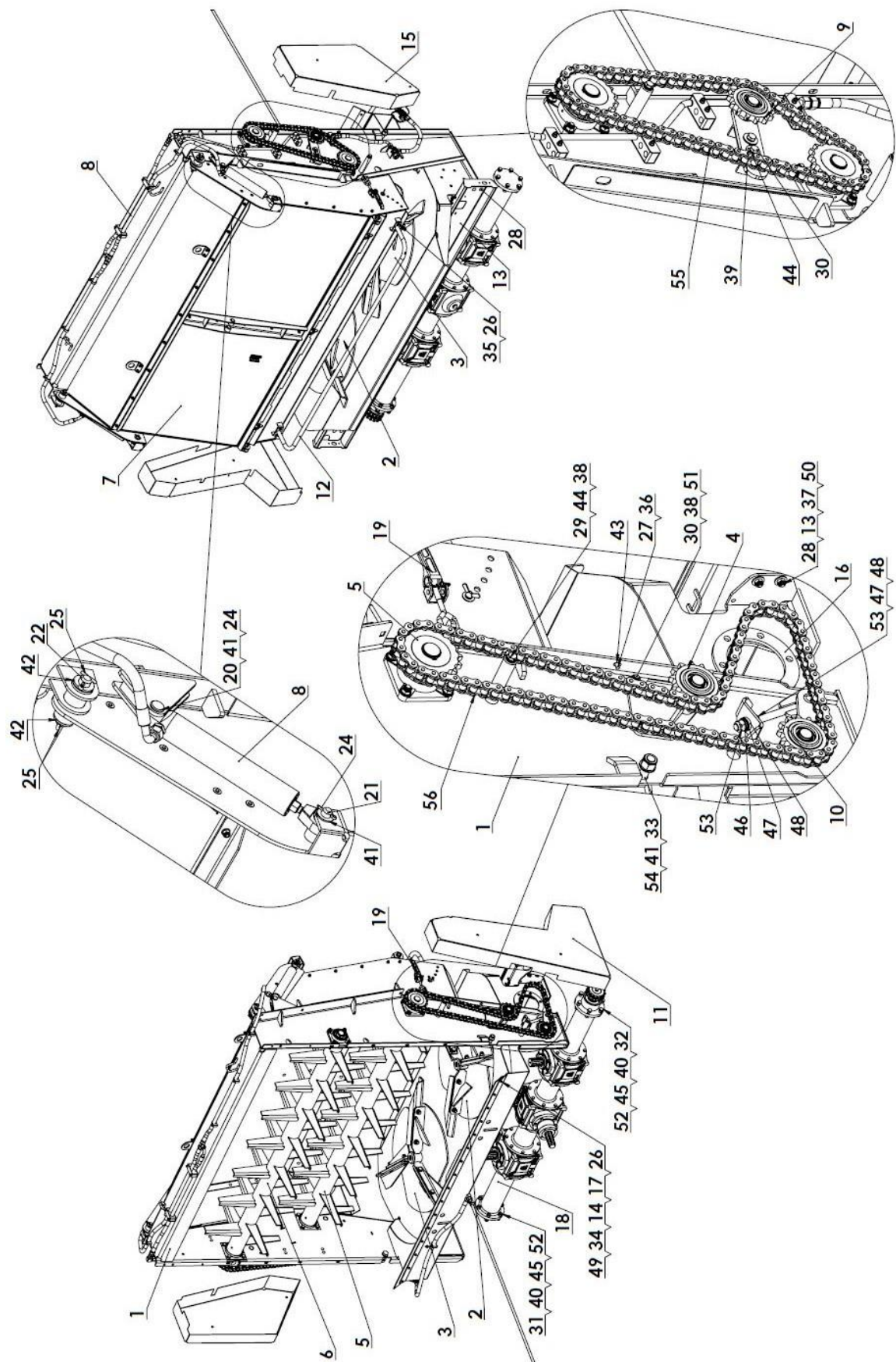
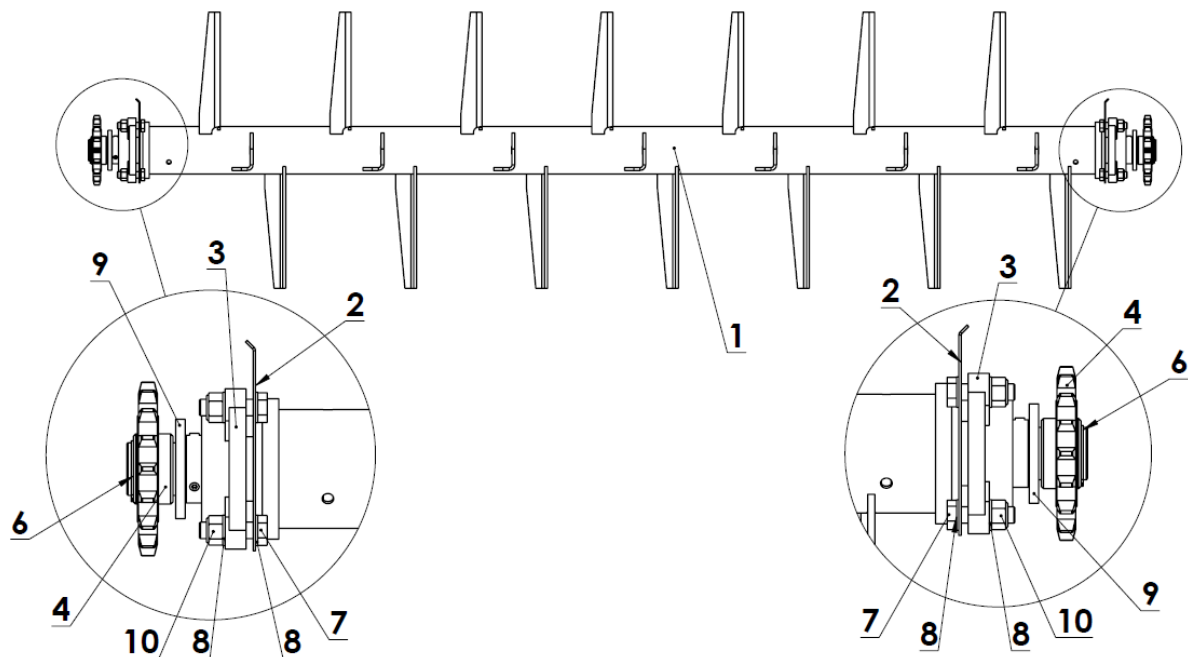


Table 14 Adapter A2H

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Body	2264/10.01.000/1	1
2	Left rotor	2264/10.02.000/1	1
3	Right rotor	2264/10.03.000/1	1
4	Fixed tensioner set	2264/10.13.000/1	1
5	Blade adapter spreader	2264/10.14.000/1	1
6	Blade adapter spreader II	2264/10.15.000	1
7	Rear guard	2264/10.16.000	1
8	Hydraulic installation of adapter	2264/10.17.000	1
9	Tensioner	2264/10.18.000	1
10	Tensioner set	2264/10.19.000	1
11	Left guard set	2264/10.20.000	1
12	Handrail set	2264/10.00.100	1
13	Light protection set	7149/20.01.100/3	1
14	Mud flap	2264/10.00.002	1
15	Right guard	2264/10.00.004	1
16	Drive ring	2264/10.00.005	1
17	Cap	2221/88.00.003	4
18	Gearbox	MB 10.27	1
19	Side wall latch set	ZB-15V.3	2
20	Pin D20 L55/47	DIN 1444B	2
21	Pin D20 L105/89	DIN1433B	2
22	Pin D24 L130/112	DIN 1433B	2
23	S-Zn 4x40 Pin	PN-82/M-85023	1
24	S-Zn 5x36 clip pin	PN-82/M-85023	6
25	S-ZN 6,3X40 Pin	PN-76/M-82001	4
26	M6x20 8.8 B screw	PN-85/M-82105	20
27	M8x20 8.8 screw	PN-85/M-82105	1
28	M10X25 8.8 screw	PN-87/M-82406	4

29	M12x25 8.8 B screw	PN-85/M-82105	4
30	M12x35 8.8 B screw	PN-85/M-82105	5
31	M14x50-8.8 screw	PN-85/M 82101	6
32	M14x60-8,8-B Screw	PN-85/M-82101	6
33	M20x65 8.8 B screw	PN-85/M-82105	2
34	Washer Ø 6.4	PN-78/M-82005	20
35	Washer 6.5	PN-59/M-82030	4
36	Washer 8.4	PN-78/M-82005	1
37	Washer 10.5	PN-59/M-82030	4
38	Washer 13	PN-78/M-82005	10
39	Enlarged washer 13	PN-78/M-82030	2
40	Round washer 15	PN-78/M-82005	12
41	Washer 21	PN-78/M-82005	10
42	Washer n 25	PN-78/M-82005	5
43	Spring washer 8.2	PN-77/M-82008	1
44	Spring washer 12.2	PN-77/M-82008	6
45	Spring washer ø14.2	PN-77/M-82008	12
46	Spring washer ø16.3	PN-77/M-82008	1
47	Ball washer 17	DIN 6319-C	2
48	Ball washer 17	DIN 6319-D	2
49	Nut with insert M6	PN-85/M-82175	20
50	Nut with insert M10	PN-85/M-82175	4
51	Nut with insert M12	PN-85/M-82175	3
52	M14 Nut	PN-86/M-82144	12
53	M16 8.8 nut	PN-86/M-82144	2
54	Nut with insert M20	PN-85/M-82175	2
55	16B L-1810 1" chain	PN-77/M-84168	1
56	16B L-2650 1" chain	PN-77/M-84168	1

BLADE ADAPTER SPREADER



BLADE ADAPTER SPREADER II

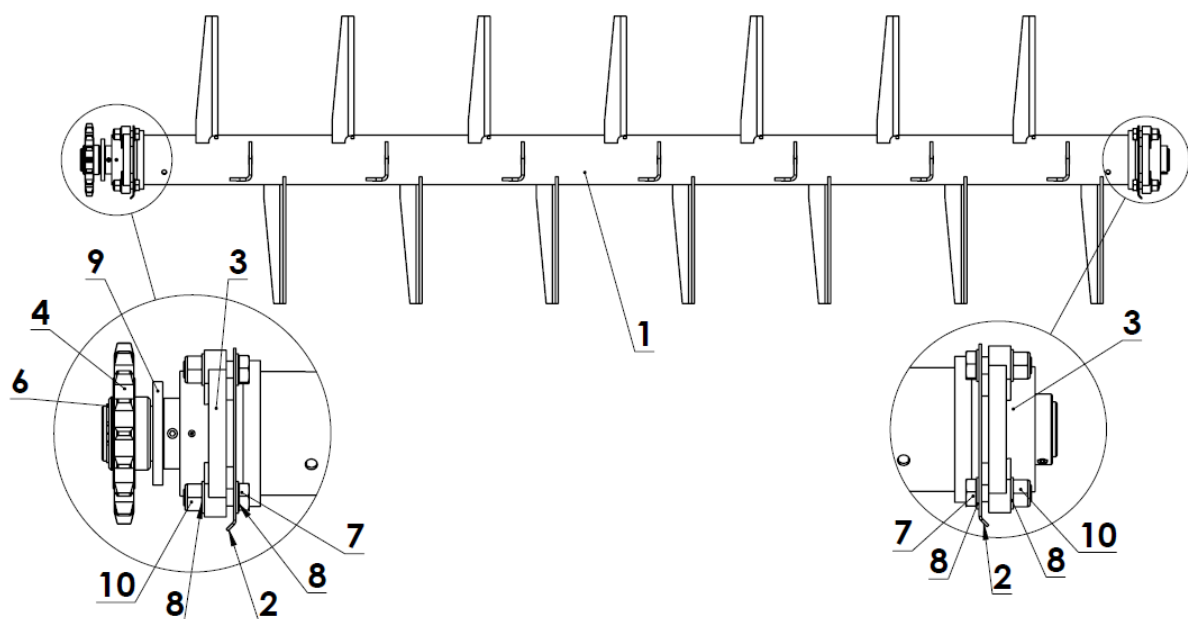


Table 15 Blade adapter spreader

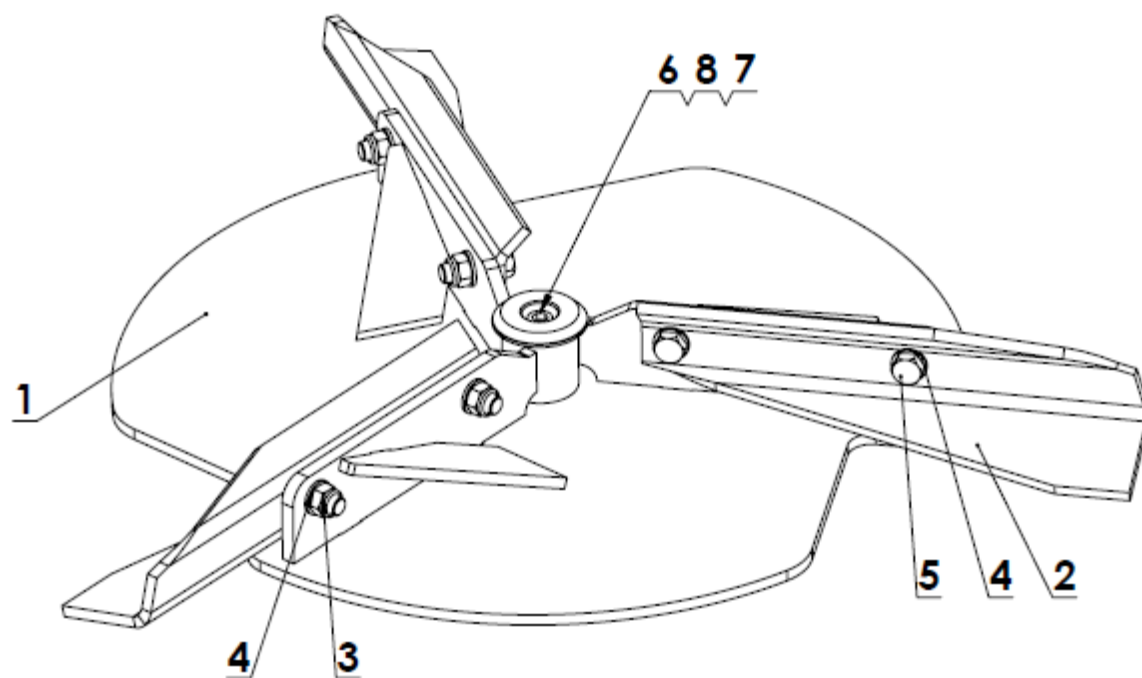
<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Bladed spreader drum	2264/10.14.100/1	1
2	Pivot guard	2264/10.04.010/1	2
3	Bearing unit	UCF-209	2
4	Chain wheel z-17	2244/18-003/0	2
5	Parallel key A14x9x30	PN-70/M85005	1
6	Z45 retaining circlip ring	PN-81/M-85111	2
7	M14x50-8,8-B Screw	PN-85/M-82105	8
8	Round washer 15	PN-78/M-82005	16
9	Washer 45	PN-78/M-82005	2
10	Nut with insert M16	PN-85/M-82175	8

Table 16 Bladed adapter spreader II

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Bladed spreader drum II	2264/10.15.100	1
2	Pivot guard	2264/10.04.010	2
3	Bearing unit	UCF-209	2
4	Chain wheel z-17	2244/18-003/0	1
5	Parallel key A14x9x30	PN-70/M85005	1
6	Z45 retaining circlip ring	PN-81/M-85111	1
7	M14 x 45 - 8.8-B screw	PN-85/M-82105	8
8	Round washer 15	PN-78/M-82005	16
9	Washer 45	PN-78/M-82005	1

10	Nut with insert M16	PN-85/M-82175	8
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LEFT ROTOR



RIGHT ROTOR

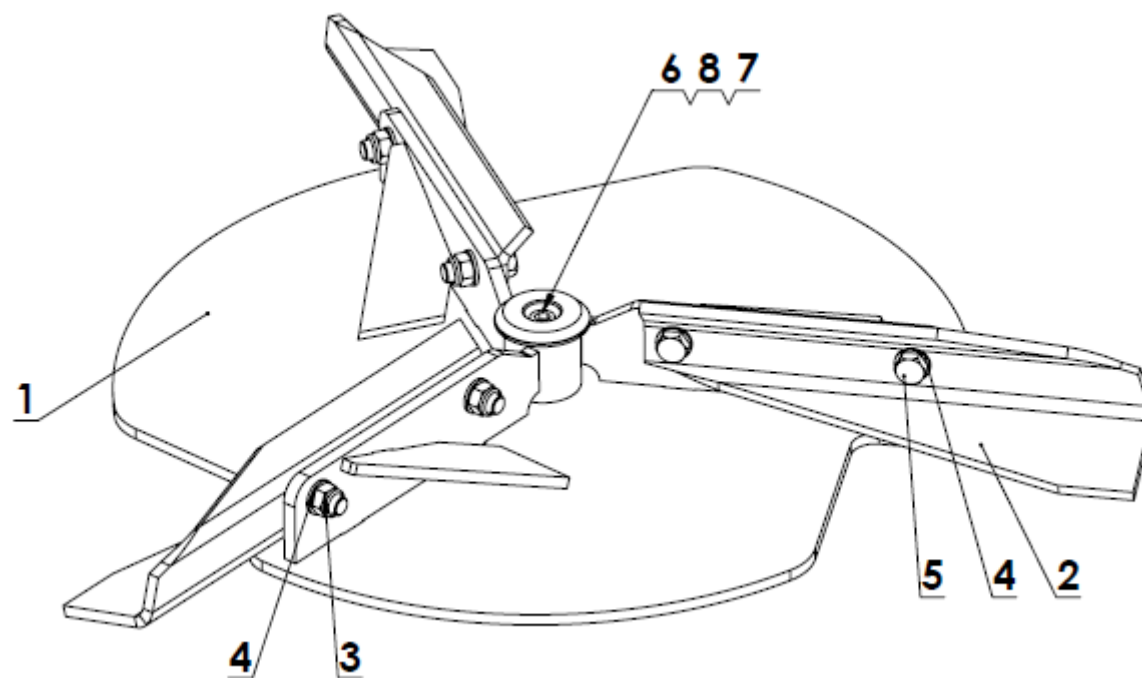


Table 17 Left rotor

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Left rotor body	2264/10.02.100/1	1
2	Right spreading strip	2221/88.04.001	3
3	Nut with insert M16	PN-85/M-82175	6
4	Washer 17	PN-85/M-82005	12
5	M16x50 8.8 screw	PN-85/M-82105	6
6	M14x90 hexagon screw	PN-M/82302	1
7	Round washer 15	PN-78/M-82005	1
8	Spring washer ø14.2	PN-77/M-82008	1

Table 18 Right rotor

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Right rotor body	2264/10.03.100/1	1
2	Left spreading strip	2221/88.03.002	3
3	M16x50 8.8 screw	PN-85/M-82105	6
4	Washer 17	PN-85/M-82005	12
5	Nut with insert M16	PN-85/M-82175	6
6	Round washer 15	PN-78/M-82005	1
7	Spring washer ø14.2	PN-77/M-82008	1
8	M14x90 hexagon screw	PN-M/82302	1

REAR GUARD

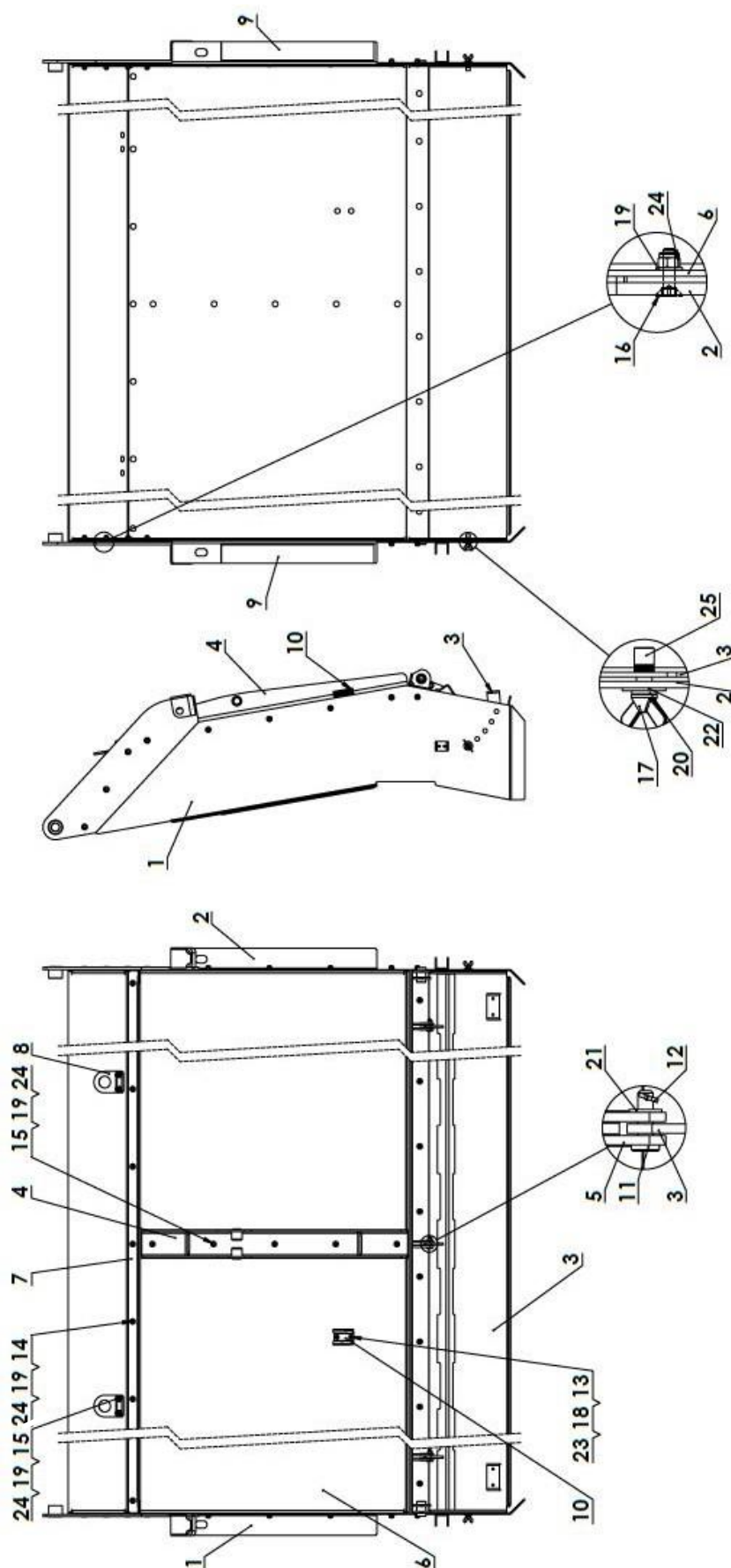


Table 19 Rear guard

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Side guard set - L	2264/10.16.100	1
2	Side guard set - R	2264/10.16.200	1
3	Tilttable guard set	2264/10.16.300	1
4	Deflector bracket set	2264/10.16.400	1
5	Angle bar II set	2264/10.16.500	1
6	Guard sheet	2264/10.16.001	1
7	Angle bar I	2264/10.16.002	1
8	Hitch	2264/10.16.003	2
9	Sealant	2264/10.16.004	2
10	Handle	PN-93/S-73103	1
11	Pin D10 L35/30.5	DIN 1444B	3
12	S-Zn-3.2x18 pin	PN-76/M-82001	3
13	M6x20 8.8 screw	PN-87/M-82406	2
14	M8x20 8.8 screw	PN-87/M-82406	29
15	M8x25 8.8 screw	PN-73/M-82406	9
16	M8x30 hex screw with conical head 8.8	DIN 7991	8
17	M10x20 butterfly screw	PN/M-82436	2
18	Washer Ø 6.4	PN-78/M-82005	2
19	Washer n 8.4	PN-78/M-82005	46
20	Spring Washer 10.2	PN-77/M-82008	2
21	Washer 10.5	PN-78/M-82005	3
22	Washer n 10.5	PN-59/M-82030	2
23	Nut with insert M6	PN-85/M-82175	2
24	Nut with insert M8	PN-85/M-82175	46
25	Steel, knurled M10 rivet nut		2

HYDRAULIC INSTALLATION OF ADAPTER

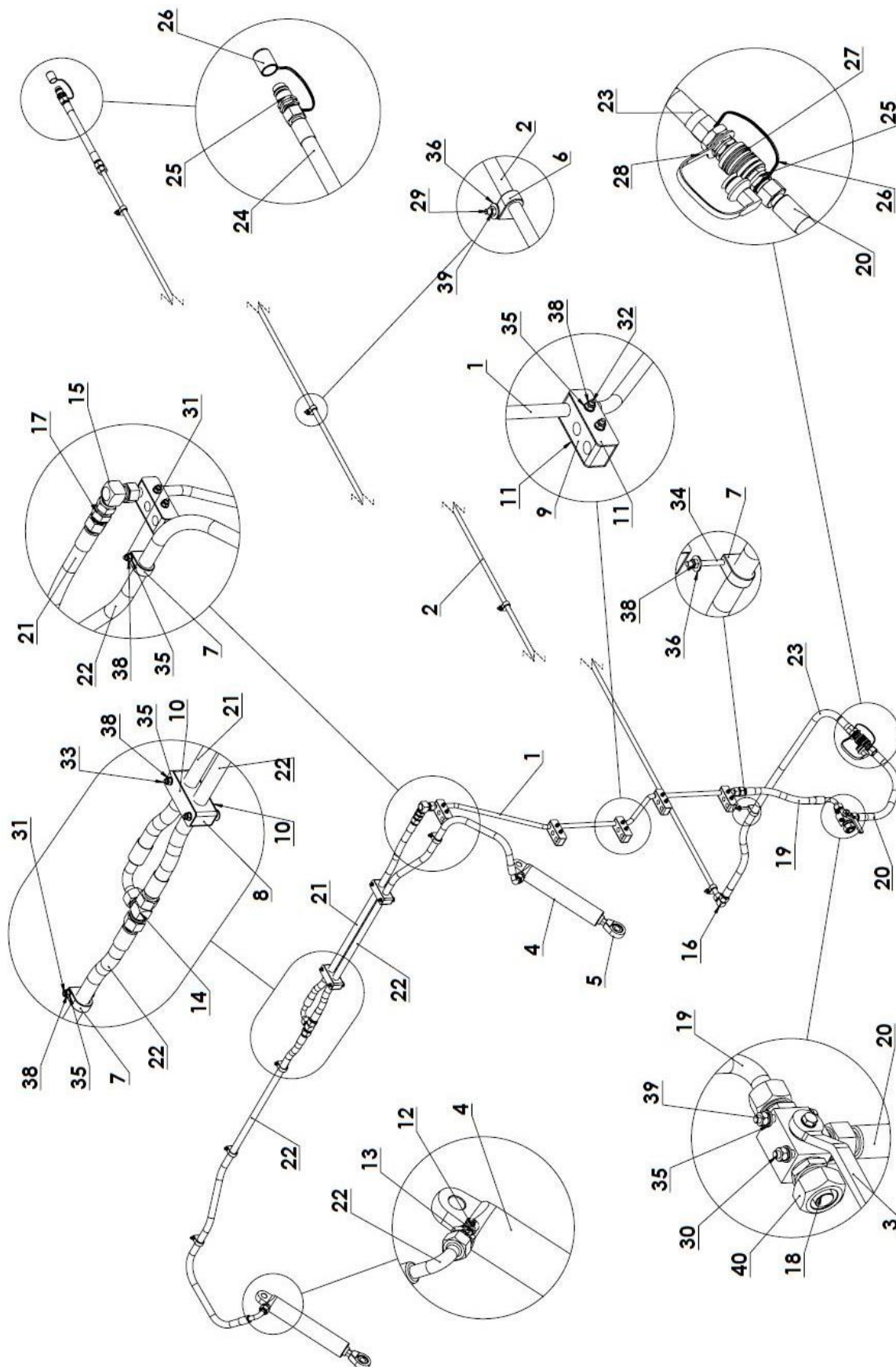


Table 18 Hydraulic installation of extensions 350

<i>Item no.</i>	<i>Part name</i>	<i>Number</i>	<i>Amount</i>
1	Tube I set	2264/10.17.110	1
2	Tube II set	2221/34.00.220/1	1
3	Three-way valve	BK3-15L 131.123	1
4	Hydraulic plunger cylinder (3/8" socket for the valve of the cracked hose)	CN2E-16-32-200z	2
5	Cylinder eye	UE2-63w	2
6	Single clamping ring	ROP-315	4
7	Single clamping ring	ROP-422	5
8	Double clamp	RAPRM-322/B2	2
9	Triple clamp	RAPRM-215/B3	5
10	Cap	DPM-A 3/B2	4
11	Cap	DPM-A 2/B3	10
12	Insert of cracked hose's valve	G 3/8"	2
13	Straight connector with seal	GM 3/8 - 22x1.5	2
14	BBB-M22x1.5 T-piece coupling	PN-147 16-13 15L	1
15	AB 22x1.5 male elbow coupling	AB90 M22x1.5 15L	1
16	BB-M22x1.5 elbow coupling	PN-143 16-13 15L	1
17	M22x1.5-M22x1.5 Choking connector		1
18	Conical plug for M22x1.5		1
19	A90-M22x1.5 B-M22x1.5 L15 L-400 hydraulic hose	BN-81/1903-01	1
20	AA-M22x1.5 L15 L-500 hydraulic hose	BN-81/1903-01	1
21	A90-M22x1.5 A-M22x1.5 L15 L-1050 hydraulic hose	BN-81/1903-01	1
22	A90 - M22x1,5, A-M22x1.5 L15 L-1550 hydraulic hose	BN-81/1903-01	2
23	AA-M22x1.5 L15 L-1150 hydraulic hose	BN-81/1903-01	1
24	AB-M22x1.5, L15 L-3000 hydraulic cord	BN-81/1903-01	1
25	ISO-12,5 (16L) Plug cover	ISO 7241-A	2
26	ISO-12.5 Plug cover (green)	ISO 7241-B	2
27	Quick-coupler socket ISO-12.5 (16L) long	ISO 7241-A	1

	thread M22x1.5		
28	ISO-12.5 Socket cover (green)	ISO 7241-B	1
29	M6x40 8.8 screw	PN-85/M-82105	4
30	M6x50 8.8 screw	PN-85/M-82101	2
31	M6x50 screw	PN-87/M-82406	4
32	M6x55 screw	PN-87/M-82406	10
33	M6x60 screw	PN-87/M-82406	4
34	M6x80 8.8 screw	PN-85/M-82101	1
35	Washer Ø 6.4	PN-78/M-82005	22
36	Washer n 6.5	PN-59/M-82030	5
37	Spring washer 6.1	PN-77/M-82008	2
38	Nut with insert M6	PN-85/M-82175	19
39	M6 Nut	PN-86/M-82144	6
40	M22x1,5 Nut	PN-86/M-82144	1

NOTES

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This image shows a full page of primary-ruled paper. It features multiple sets of horizontal dotted lines spaced evenly down the page, providing a guide for handwriting practice. The background is white, and there are no other markings or text present.

NOTES

[illegible]