

INSTRUCTION MANUAL
CZAJKOWSKI STRIP TILL CULTIVATION UNIT
STK 300, STK 400,



**Translation of the original
instruction manual**

IM-STK-02

7th edition, 04.2025 issue

Before using the machine, read the instruction manual!

DECLARATION OF CONFORMITY

Czajkowski Maszyny Sp. z o.o.
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The person authorized to provide technical documentation is the Chairman of the Board
of CZAJKOWSKI MASZYN Y SP. z o.o., Sokołowo 1c, 87-400 Golub-Dobrzyń, Poland.

Machine:	Cultivation unit for strip till
Type/model:	STK / Czajkowski STK 300 4R / 6R / 7R / 8R STK 400 4R / 6R / 7R / 8R / 9R
Commercial name:	STK 300 / STK 400
Serial number/VIN:	_____
Function:	Strip tillage and seeding

Product name: Czajkowski Strip Till Cultivation Unit STK 300 and STK 400, to which this declaration relates, complies with all the relevant provisions of 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 L 157 of 09.06.2006, p. 24).

In order to meet the health and safety requirements of the EC Directive, the following standards and technical specifications have been taken into account:

PN-EN ISO 4254-1:2016-02; PN-EN ISO 4254-8:2018-08;
PN-EN ISO 4254-9:2019-01; PN-EN ISO 12100:2012;
PN-EN ISO 3600:1998; PN-EN ISO 20607:2019-08

This declaration of conformity only refers to the machine in the state in which it was placed on the market and does not cover components added by the end user or any subsequent actions carried out by him.

The user manual is an integral part of the product. The product can only be transferred to another person if it is technically fully functional, together with the attached user manual and declaration of conformity.

EU APPROVAL (HOMOLOGATION)

The **STK** Strip Till cultivation unit has obtained EU whole-vehicle type-approval of a complete vehicle type. The approval was issued by the Transportation Technical Supervision in Warsaw (Transportowy Dozór Techniczny). The approval certificate was issued with regard to Regulation EU 167/2013, as last amended by European Parliament and of the Council Regulation (EU) Regulation No. 2019/519. The complete vehicle type meets all relevant requirements as listed in Annex I to Regulation (EU) No. 167/2013.

EU type-approval number : **e20*167/2013*00090**

The **DSTK1** type drawbar used in this machine has EU type-approval issued by the Transportation Technical Supervision in Warsaw. The approval certificate was issued on the basis of test carried out with regard to Annex XXXIV to Commission Delegated Regulation (EU) No. 2015/208 of 8 December 2014, as last amended by Commission Delegated Regulation (EU) No. 2020/540 of 21 January 2020 supplementing Regulation (EU) No. 167/2013 of the European Parliament and of the Council with regard to vehicle functional safety requirements for the approval of agricultural and forestry vehicles.

EU type-approval number : **e20*2015/208*2020/540ND*00110**

INTRODUCTION

The Czajkowski STK unit has been designed for strip soil preparation for sowing plants. Before using the machine, read the user manual carefully. Do not read the user manual carelessly, this may cause the machine to malfunction or endanger health or even life. The user manual contains basic rules of conduct and proper use of the machine, as well as instructions that must be strictly followed to ensure your own safety, failure-free operation of the machine, reduction of operating costs as well as reliability and durability of the machine. Everyone operating the machine must read the user manual, be trained and qualified. Machine users should also become familiar with the purpose of all machine components and how to use them. It is necessary to comply with occupational health and safety regulations and pay special attention to warning signs. The strip cultivation unit is intended for field work only. The manufacturer is not responsible for any damage to the machine resulting from its other use. The warranty expires as a result of unauthorized repairs or changes to the machine, as well as neglect and use of non-original parts. If you experience problems operating the machine, please contact the manufacturer's service department.

ATTENTION  The user manual is valid on the date of issue. The manufacturer reserves the right to make changes to manufactured products without making changes to the user manual.

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4. Service

Our company has made every effort to ensure that you are fully satisfied with our cooperation and with the continued use of our products. In case of problems, it is recommended to contact the company's service department or our distributor directly. In order for us to solve the problem as quickly as possible, please prepare the following details:

- full name and address;
- model and serial number of the machine;
- model and power of the tractor used with the machine;
- problem description;
- purchase date, number of hours or hectares worked.

Advice and minor faults - quick telephone assistance:

If you need information or advice beyond the scope of the user manual, or assistance in eliminating a minor fault, please contact the service department by phone.

Serious faults and defects - service request:

In the event of major problems or product defects, in addition to contacting us by phone, please submit a service request by sending an email to:

serwis@uprawapasowa.pl

The email must include the above-mentioned information required for the report, a detailed description, and photos showing the fault or defect.

5. Consequential damages

During the use of the machine, failures may occur due to:

- wear and tear of consumable parts;
- damage due to external factors;
- incorrect machine settings and failure to follow the recommended settings;
- excessive driving speed exceeding 30 km/h;
- failure to follow the operating manual;
- machine overloading;
- neglected or improperly performed maintenance and care.

During the use of the machine it needs to be inspected and checked whether it's working correctly. The company is not liable for consequential damages caused by errors resulting from incorrect handling or transportation. Claims for damages that do not occur within the machine are automatically rejected.

6. Safety



Fig. 1. Pictogram NP001

This manual contains safety instructions and warnings that apply to all of its chapters. The machines have been designed and built in accordance with the applicable technical rules and recognized safety principles. Despite this, during use, there may be risks to third parties and the health and property of the user, as well as material losses and damage to the machine. Before starting work, please read the information and follow the instructions contained in the user manual.



This warning symbol:  in this user manual indicates important information when there is a particular danger to the user or others.

Safety regulations:

1. In addition to the recommendations contained in this manual, occupational health and safety regulations must also be followed.
2. It is forbidden for minors and individuals under the influence of alcohol or drugs to operate the machine.
3. It is forbidden for unauthorized persons and animals to remain within the range of the machine.
4. Warnings (self-adhesive labels) placed on the machine provide information regarding the safety of the user and third parties and help to avoid accidents.
5. When driving on public roads, you must comply with the regulations of the applicable Road Traffic Code.
6. Before starting work, familiarize yourself with all components, systems and their operation.
7. The operator's clothing should not be too loose, this will prevent it from getting caught in the moving parts of the machine.
8. Personal protective equipment should be used appropriate to the hazards involved.
9. Each time before starting the tractor and the machine, check their connection to ensure safe driving and work.
10. Before moving off, check the immediate surroundings of the machine and tractor, especially to make sure there are no unwanted people around. Proper visibility is important.

ATTENTION  It is dangerous for children to be near the unit (especially in the field). Children should be under the supervision of their parents, legal guardian or other adult!!!

11. It is forbidden to stand on the machine during work and transport.
12. Exercise particular caution when attaching to or detaching the tractor.
13. Before attaching the unit, check whether the front axle of the tractor is sufficiently loaded.
14. Strictly follow rules for axle loads, allowable total weight and transport loads.
15. Before leaving on public roads, check the correct location and operation of traffic lights (road lights, reflectors) required by the regulations of the Road Traffic Code.
16. All lines (hoses, cables, etc.) must be secured in such a way that any unexpected disconnection is excluded, as this could result in accidents and damage.
17. Before leaving on public roads, the machine must be in the transport position.
18. When driving the tractor, never leave the operator's cabin.
19. The speed and driving style of the tractor must always correspond to the terrain and road conditions. In all circumstances, avoid sudden changes in direction
20. When cornering, you need to take into account the greater swing range and increased weight of the set.
21. It is forbidden to stay in the working area of the machine and tractor.
22. Before each machine departure, check that all safety devices are in good condition.
23. Pay attention to crush hazard zones, especially those that are remotely and hydraulically operated.
24. The hydraulic folding of the frame can only be activated when there are no people in the deviation zone.
25. Before leaving the tractor cabin, lower the machine to the ground, turn off the engine, remove the key from the ignition and make sure that all rotating units have stopped.
26. Do not stand between the tractor and the connected machine if the parking brake has not been applied or anti-rolling blocks (chocks) have not been placed under the tractor wheels
27. The folded frame and lifting system must be secured in the transport position.
28. Track markers must be locked in the transport position.
29. Before any activities performed on the machine, make sure that it will not start on its own.
30. Do not use a jack or crane to lift the machine when it is full.
31. Keep the machine clean to avoid fire hazards.
32. Pay attention to danger zones near the rotating parts of the machine.
33. When operating, starting, folding or unfolding the machine, stay outside the danger zone.
34. When filling the tank, do not place any unwanted objects inside the tank
35. Before filling, it is necessary to check that the fertiliser and seed chambers are empty and free of any dirt and foreign elements.
36. The specified tank filling amounts must be observed.
37. During each break, the machine drive should be switched off.
38. When filling the tank, do not under any circumstances enter the fertilizer or seed chamber.
39. The hydraulic system is under high pressure. Escaping liquid may penetrate the skin and cause severe injuries. If you are injured, seek medical attention immediately.

40. There are pressure accumulators in the hydraulic system. It is forbidden to modify or open pressure accumulators. Before maintenance, reduce the pressure in the hydraulic system. After emptying, there is gas pressure in the tank.
41. Use only telescopic shafts with CE marking allowed by the producer of the machine.
42. Anti-slip mats should be replaced with new ones if they are damaged or after a maximum of 5 years of machine use. New anti-slip mat strips must be at least 5 cm wide.
43. The machine with a filled tank must always be hitched to the tractor. The machine can only be disconnected from the tractor if the tank is empty.

7. Rules of conduct in event of a breakdown or accident

- In the event of a breakdown or accident on the road or during work, the scene of the incident must be immediately secured, the condition of the injured persons must be checked and the appropriate services must be notified, e.g. ambulance, fire brigade or police.
- In the event of unexpected breakdowns or faults, work must be stopped immediately, the tractor engine must be switched off and the manufacturer must be contacted, providing the contact details and the serial number of the device provided in the operating instructions.

8. Residual risk

Czajkowski Maszyny Sp. z o.o. has made every effort to reduce the risk of accidents. However, there is a certain residual risk that may lead to an accident if the following recommendations are not followed:

- read the user manual carefully;
- precise and careful operation of the machine;
- do not put your hands into forbidden places;
- secure the machine against children access;
- do not stay within area of the machine while it's working;
- keep a safe distance from dangerous places;
- have the machine maintained and repaired only by qualified individuals;
- have the machine operated by individuals familiar with the user manual.

By following the recommendations above, residual risk can be eliminated.

The most common mistakes while operating the machine are:

- use of the machine for purposes other than its intended use;
- having an untrained person operate it;
- having a person under the influence of alcohol or narcotics operate it;
- performing diagnostics while the machine is working;
- machine maintenance and cleaning with the tractor engine running;
- staying outside the tractor cabin while the machine is working;
- staying between the tractor and the machine while attaching them or while the machine is working.

9. Intended use of the machine

The machine is intended for soil cultivation in agriculture. Any other use (e.g. as a means of transport, etc.) is forbidden and may result in bodily injury or even death. The machine may only be used if it is technically sound and all faults must be repaired immediately. Applicable occupational health and safety regulations, generally accepted principles of occupational medicine, road and technical safety must be followed. The operating manual is an integral part of the machine and should be easily accessible. In the event of reselling the machine, the operating manual must also be passed on to the new owner. Original accessories and spare parts are designed specifically for this machine. The installation and use of non-original parts may result in adverse structural changes and negatively affect the safety of people and machines. The manufacturer is not liable for damage resulting from the use of unauthorized parts.

10. Use other than intended

The machine must not be used for activities that could be foreseen as improper use. The risk associated with using the machine other than for its intended purpose is borne solely by its user.

Examples of using the device contrary to its intended purpose:

- For transporting people or animals,
- For transporting building materials,
- For transporting fuels,
- For subsoiling.

11. Personnel qualifications

In order to avoid accidents, all people using the machine must meet the basic requirements:

- understanding the operation of the machine;
- recognize possible threats and prevent them from occurring;
- have proper physical attributes required to handle the machine;
- carrying out work in a safe manner as described in the manual;
- understanding the operating manual and following the information contained therein;
- have experience in driving vehicles;
- having a driving license for transport on public roads;
- adequate qualifications of people working with the machine;
- having appropriate physical conditions necessary to control the machine;
- supervision by a suitably qualified person of the person being trained in the use of the machine;

The owner or persons who will work with the machine must undergo training conducted by service employees during the first start-up and read the user manual.

It is the owner's responsibility to:

- train and instruct the operator;
- make the operating instructions available to the operator and ensure that the operator understands the information contained therein.

Machine operators must have appropriate knowledge to perform activities such as:

- maintenance;
- use;
- troubleshooting and repairing faults and defects;
- transport on public roads;
- adjustment and setting of the machine.

12. Fire regulations

- The tractor must be equipped with a fire extinguisher and placed in the holder;
- Fuel and hydraulic leaks from the machine and the tractor must be prevented;
- Using open fire or smoking is forbidden when fuelling up and operating the fuel system of the tractor;
- The fuel filler cap on the tractor must be tightly closed;
- The engine must remain turned off while refuelling;
- Flammable materials mustn't be stored in the vicinity of the machine.

13. Transportation on public roads

- Before transportation, the working elements of the machine should be properly folded and lifted according to the manufacturer's recommendations.
- During transport, the width of the folded machine must not exceed 3 m and the 4 m height. You should also remember about the appropriate transport clearance.
- When driving, the prevailing road conditions must be taken into account.
- Always abide by allowable dimensions and weights.
- The weight of the tractor must be appropriately matched to the machine to ensure proper handling and braking performance of the entire set.
- Before driving, check whether the road and warning lights are properly connected and working.

ATTENTION

- It is forbidden to transport people and objects on the machine.
- It is forbidden to drive on public roads with the filled tank.
- It is forbidden to drive the machine at a speed above 30 km/h.

14. Danger to children

Children in the close vicinity of the machine are subject to exceptional danger. It's forbidden for children to approach the machine. Before leaving the cabin, you must turn the tractor engine off and remove the keys from the ignition so children cannot start the machine by accident. Before starting work, you must check if there aren't any children in the danger zone. Always secure the machine where it's parked.

15. Complaints

Complaints should be submitted to the service department of Czajkowski Maszyny Sp. z o.o.

16. Mounted and trailed equipment

1. Before connecting and disconnecting the suspended device to the 3-point hitch system, the hydraulic lift arms (in an agricultural tractor) should be left in such a position that the hydraulic system cannot start operating automatically.
2. For a three-point linkage system for an aggregated tractor with an STK unit, three-point linkage categories 3 and 4 apply. For a three-point linkage system for an aggregated seeder with an STK unit, three-point hitch categories 1, 2 and 3 apply.
3. Be especially careful in the operating zone of the three-point linkage. You can get crushed or suffer cuts. No one should stand between the Czajkowski STK unit and the PS seed drill or precision seeder when reversing the unit towards the machine.



Fig. 2. Pictogram NP002

4. When operating the three-point linkage from the outside, it is prohibited to:
 - staying between the agricultural tractor and the unit,
 - staying between the aggregate and the precision seeder,
 - staying between the unit and the PS seeding attachment,
 - staying on the unit's platforms.
5. When the machine is in the transport position, pay attention to protruding elements (hooks, rods) of the three-point linkage (if the PS seeding attachment or precision seeder is not connected).
6. It is important to secure the device against unwanted movement and rolling by using the parking brake locks.
7. When hitching with a drawbar, make sure that the drawbar has sufficient range of movement at the hitch point.

17. Warning pictograms

An important safety element of the machine's equipment are warning pictograms that inform about possible threats in dangerous places. The lack of warning pictograms increases the risk of serious and fatal injuries. It is necessary to stick the appropriate warning stickers on spare parts. Dirty warning stickers must be cleaned. Damaged or invisible warning stickers must be replaced immediately. New ones can be purchased from the manufacturer.

Pictograms have the following meaning:

NP001 – Before starting the machine, read the operating manual and follow its recommendations



NP002 – It is forbidden for people to be between the machine and the tractor when hitching the device



NP003 – It is forbidden to transport people on the machine.



NP004 – Before starting inspection, maintenance or repair work, turn off the engine and remove the key from the ignition.



NP005 – Keep your distance



NP006 – Do not enter the folding/unfolding area of the machine



NP007 – As long as there is a possibility of parts turning/folding, never reach into the area where there is a risk of crushing



NP008 – The pressure accumulator is under gas and oil pressure. Disassembly and repairs should be performed only in accordance with generally accepted technical principles



NP009 – Keep caution when releasing the high-pressure liquid, follow the instructions of the user manual



NP010 – Do not step on rotating components. Use only the platforms provided for this purpose and use the parking brake



NP011 – After connecting the machine to the tractor, fold the drawbar support



NP012 – It's forbidden to touch working discs while the machine is working



NP013 – Never direct the water stream directly at electronic devices under the cover



NP014 – Pay attention to the possibility of excessive hydraulic pressure while operating the machine



NP015 – Never reach into the area around the gears where there is a risk of crushing



18. Warning pictograms placement

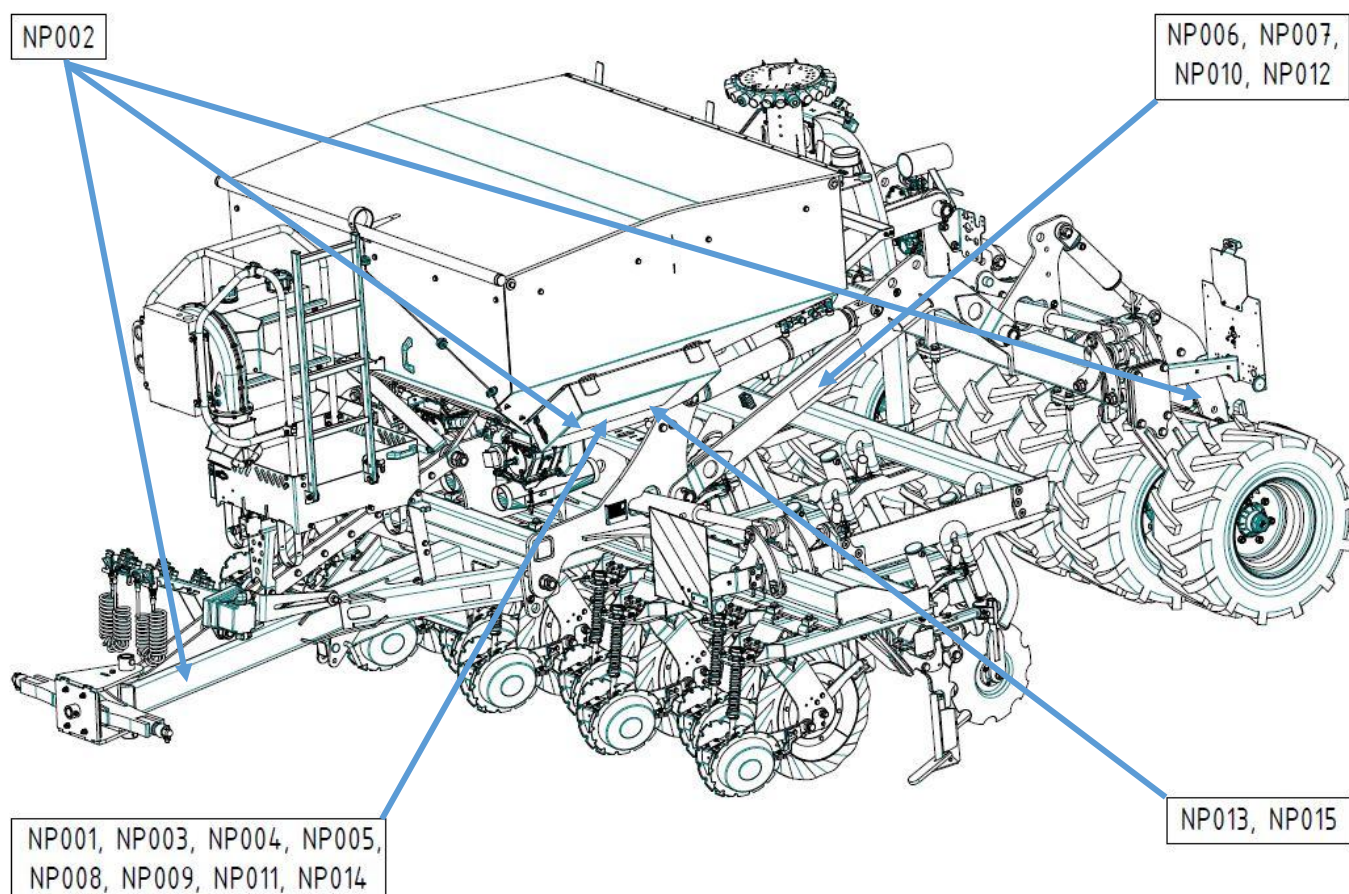


Fig. 3. Warning pictograms placement

19. Technical data

Table 1. Technical data

MODEL	STK 300	STK 400
Working width	4 x 75cm – maize, sunflower. 6 x 45cm – beetroot, rapeseed. 6 x 50cm – soybean. 7 x 44,4cm – grains, rapeseed. 8 x 37,5cm – grains, rapeseed.	4 x 75cm – maize, sunflower. 6 x 45cm – beetroot, rapeseed. 6 x 50cm – soybean. 6 x 70cm – maize, sunflower. 6 x 75cm – maize, sunflower. 8 x 37,5cm – grains, rapeseed. 9 x 44,4cm – grains, rapeseed.
Spacing of furrow openers [cm]	37,5; 44,4; 45; 50; 75;	37,5; 44,4; 45; 50; 70; 75;
Number of furrow openers	From 4 to 8	From 4 to 9
Weight [kg]*	5500	6500
Minimum power demand [KM]**	160	180
Transport width [m]	3	
Transport height [m]	3,1	
Transport length [m]	6,5	
Tank volume [l]	2800 (2 x 1400)	
Filling height of the tank [m]	2,6	
Working depth [cm]	from 20 to 35	
Roller Ø [cm]	89	
Seeders	2 x electrical	
Hydraulic connectors	3 or 4 pairs + free flow	
Rear 3-point linkage	Cat. I or cat. II or cat. III (2350kg)	
Rear PTO	Hydraulic	
Power supply	12V	
Lightning	LED	
Video camera [pcs.]	from 1 to 2	
Hydraulic filter [pcs.]	2	
Connector type	Beam, cat. III	

* The given values are the maximum weights and dimensions that occur in a full option of a given version of the machine.

** The minimum power demand will be correspondingly lower depending on the number of working sections.

STK 300

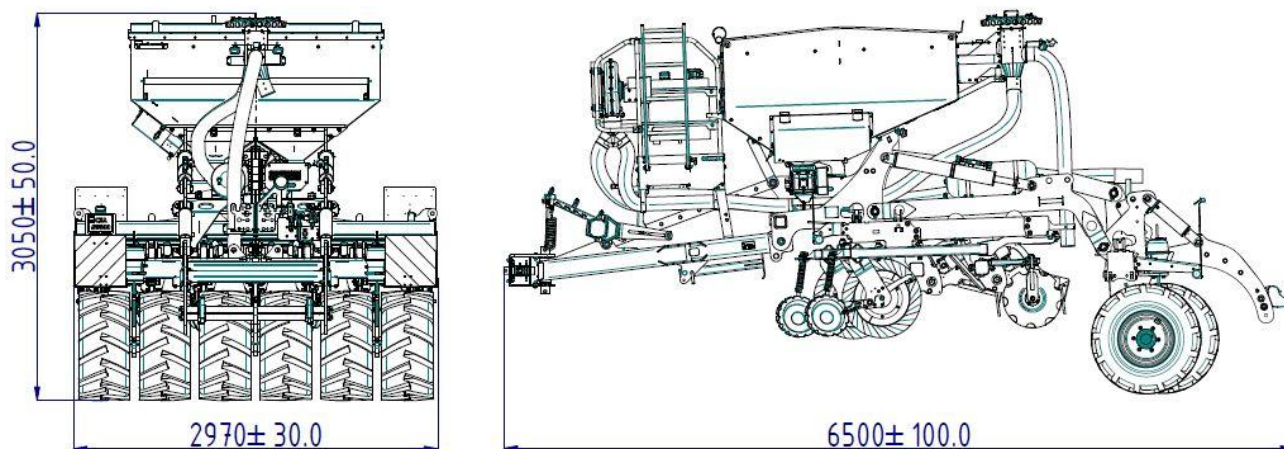


Fig. 4. Overall dimensions of STK 300

STK 400

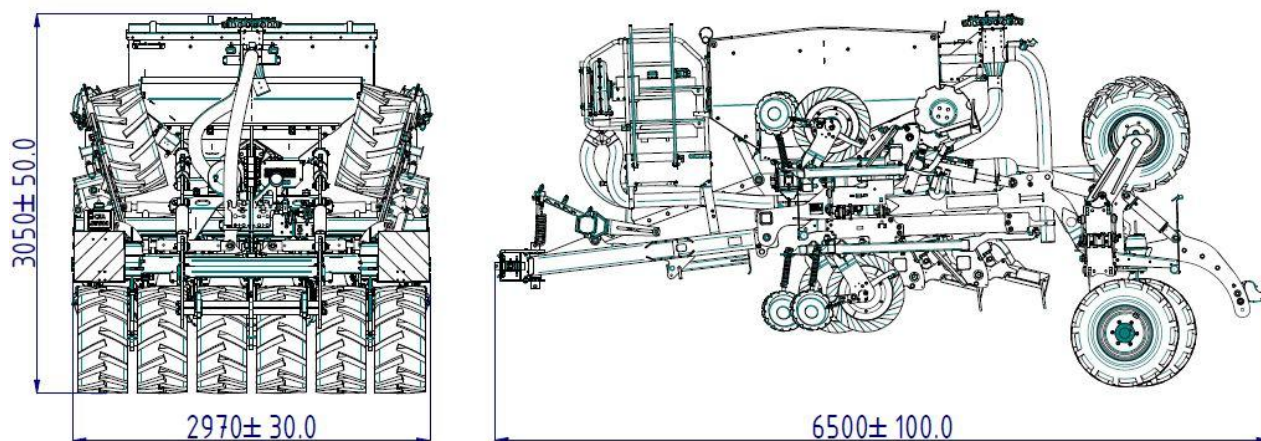


Fig. 5. Overall dimensions of STK 400

20. Load calculation

The permissible load capacity of the tyres, axles and tractor weight must not be exceeded when hitching or mounting the equipment. Before road transport, check whether the tractor being used has not been overloaded and is compatible with the machine. The front axle of the tractor must always be loaded with a weight of at least 20% of the tractor's own weight. Due to differences in equipment, machines must be weighed separately to determine their self-weight.

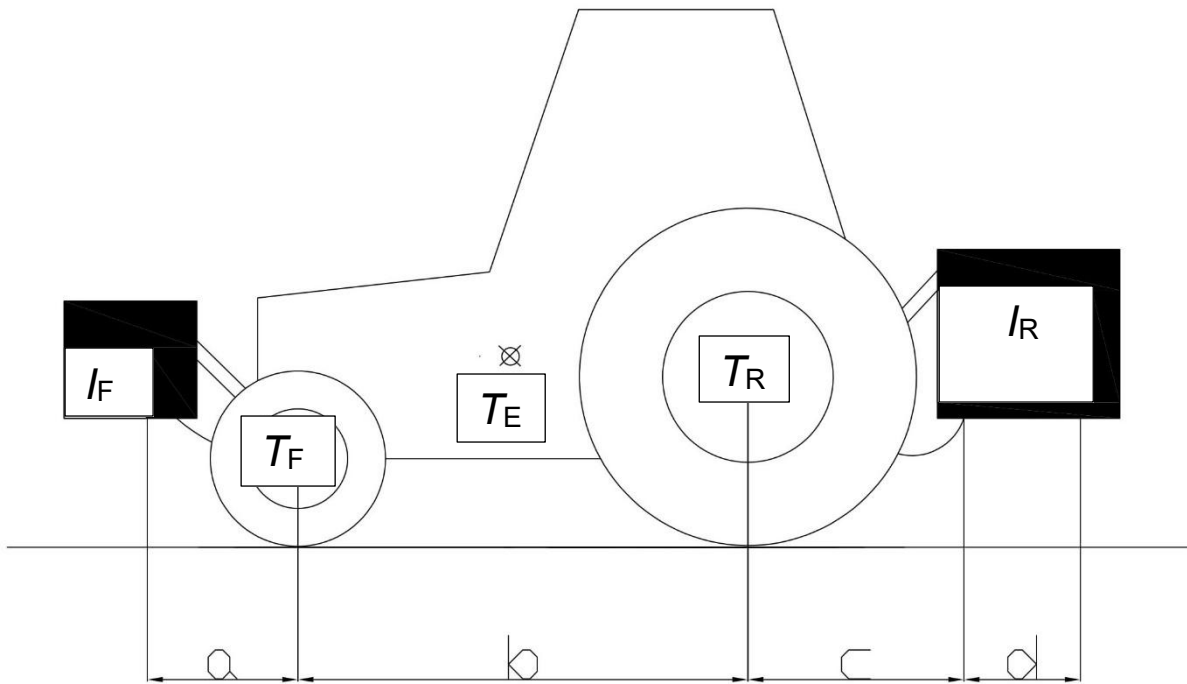


Fig. 6. Load calculation scheme

T_E [kg] – tractor's own weight

T_F [kg] – front axle load of the tractor without load

T_R [kg] – rear axle load of the tractor without load

I_R [kg] – total weight of the rear mounted machine/ rear weights

I_F [kg] – total weight of the front mounted machine/ front weights

a [m] – the distance from the center of the front axle to the center of gravity of the front mounted machine/front weights

b [m] – tractor wheelbase

c [m] – distance from the center of the rear axle to the center of the bottom mounting points

d [m] – distance from the center of the bottom mounting points to the center of gravity of the rear-mounted machine/rear weights

x - the tractor manufacturer's information refers to the minimum rear load (if no additional information is given, enter 0.45).

1. Calculation of the minimum front load when the equipment is mounted at the rear:

$$I_{Fmin} = \frac{[I_R \times (c+d)] - (T_F \times b) + (0,2 \times T_E \times b)}{a+b}$$

2. Calculation of the minimum rear load when the equipment is mounted at the front:

$$I_{Rmin} = \frac{(I_F \times a) - (T_R \times b) + (x \times T_E \times b)}{b+c+d}$$

3. Calculation of actual front axle load:

$$T_{Fmin} = \frac{[I_R \times (a+b)] - (T_F \times b) + [(T_R \times (c+d))]}{b}$$

4. Calculation of the real total weight:

$$T_{real} = I_f + T_E + I_R$$

5. Calculation of the actual rear axle load:

$$T_{R real} = T_{real} - T_{F real}$$

Verification of calculations

The calculations should be additionally checked. It is important to weigh up the front axle load and the rear axle load with the attached machine and the load. The measured values should be compared with the limit values.

In addition, the following should be checked:

- minimum front axle load (20% of the tractor's net weight),
- maximum front and rear axle load,
- allowable total weight.

21. Danger zone

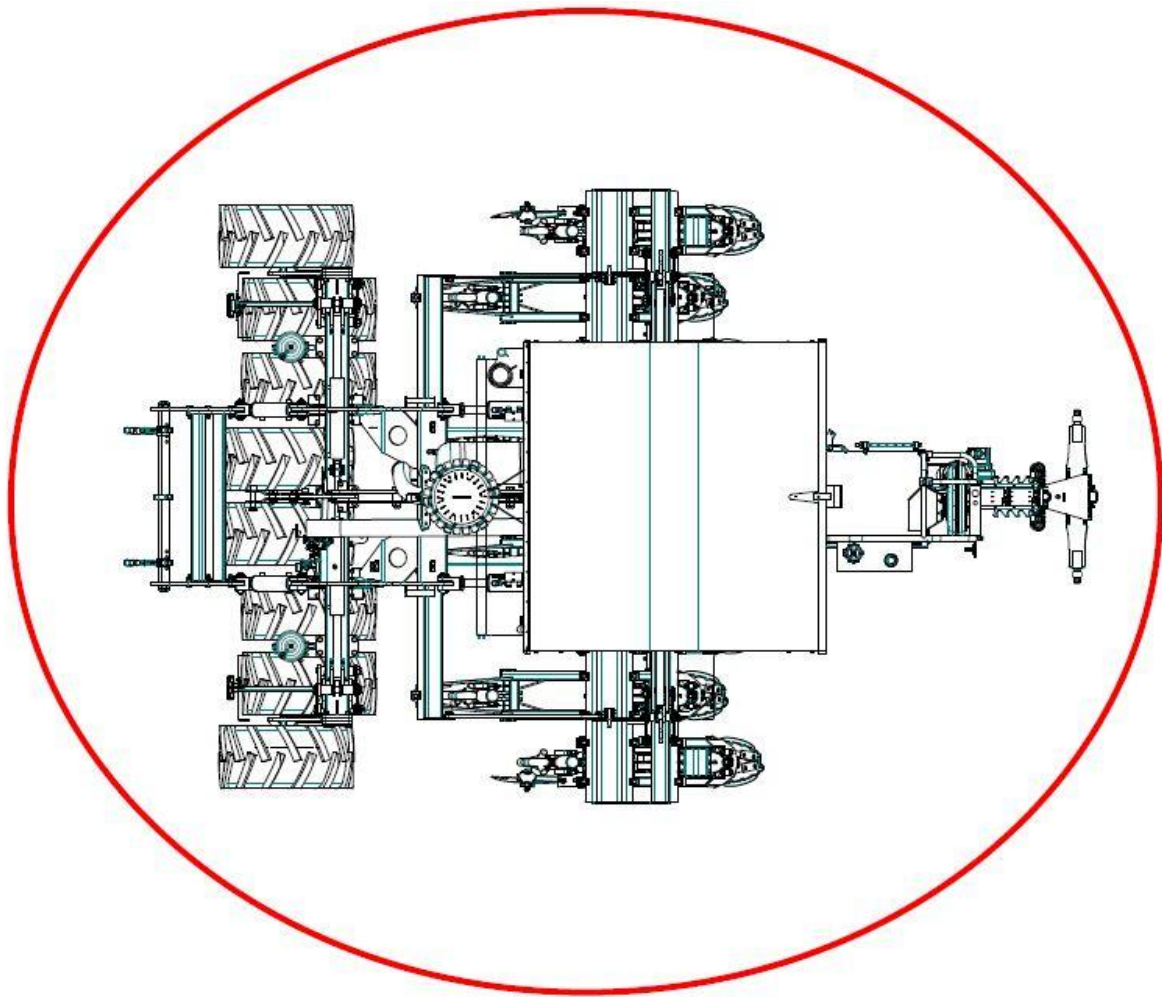


Fig. 7. Danger zone

Figure above shows the machine's danger zone.

The following hazards may occur in this area:

- hydraulically lifted parts may move unnoticed;
- machine movements;
- torn or partially insulated cables may cause electric shock;
- accidental activation of the hydraulic system may cause uncontrolled machine movements.

Entering or remaining in the danger zone may result in serious injury or death. It is forbidden for people to remain in the zone between the machine and the tractor. The tractor engine must be switched off when in the danger zone – this also applies to routine checks. It is forbidden to remain under raised machine elements. If the machine is equipped with a fertilizer spreader, special care must be taken to ensure that no one is on the platform when the side wheels are folded. Compliance with the operating instructions is mandatory

ATTENTION  When moving and unfolding the machine, check whether there are no bystanders within the danger zone.

22. Use of fertilizers and treated seeds

The manufacturer recommends using high-quality original fertilizers with a moisture content that allows the seeder to work without any issues. Both fertilizers and treated seeds must be handled in a professional manner that does not endanger the life and health of the operator.

The manufacturer's safety specifications must also be followed, if there aren't any, please contact the dealer or manufacturer

When working, you need to have personal protective equipment, that complies with information provided by the manufacturer, at hand.

23. Identification plates

CZAJKOWSKI MASZYNY Sp. z o.o.	
S2a	e20*167/2013*00090*00
SU9STKxxxxSCM3xxx	
8000 kg	
A-0:	3000 kg
A-1:	8000 kg
A-2:	- kg
A-3:	- kg



Fig. 8. STK machine homologation ID plate

AGREGAT UPRAWOWO SIEWNY / CULTIVATION & SEEDING UNIT			Made in Poland
CZAJKOWSKI MASZYNY Sp. z o.o. Sokołowo 1C, 87-400 Golub-Dobrzyń, Poland. www.uprawapasowa.pl / www.czajkowski-st.com NIP PL 5030079262			
Numer seryjny / VIN / Serial number			
Typ / Type / Model / Model			
Rok produkcji / Year of manufacture			
Masa / Mass [kg]			
			

Fig. 9. STK machine certification ID plate

	00110ND		Made in Poland
e20*2015/208*2020/540ND*00110*00			
TYPE: DSTK1 D=68,7 kN S=3000 kg	CZAJKOWSKI MASZYNY Sp. z o.o. Sokołowo 1C 87-400 Golub-Dobrzyń Poland www.czajkowski-st.com		

Fig. 10. STK drawbar ID plate

24. Identification plates placement

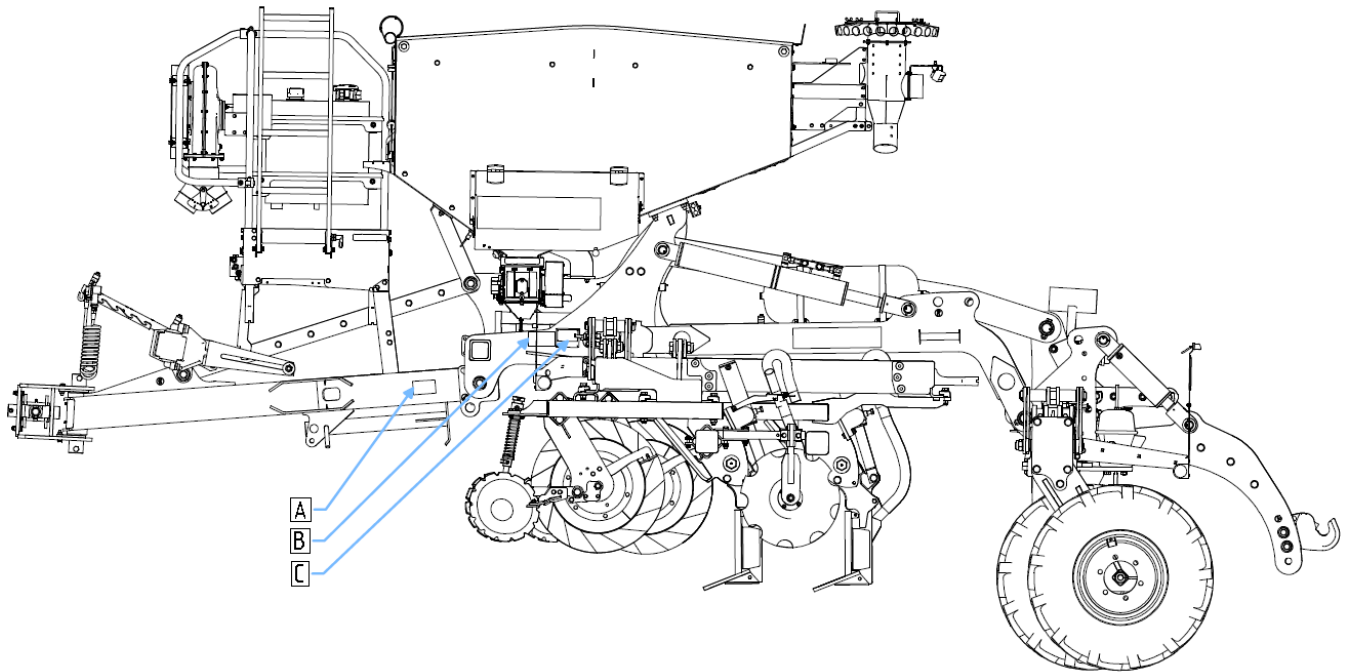


Fig. 11. Identification plates placement

- A. STK drawbar ID plate
- B. STK machine certification ID plate
- C. STK machine homologation ID plate

25. Design of the machine

The strip till cultivation units STK 300, STK 400 consist of the following main components:

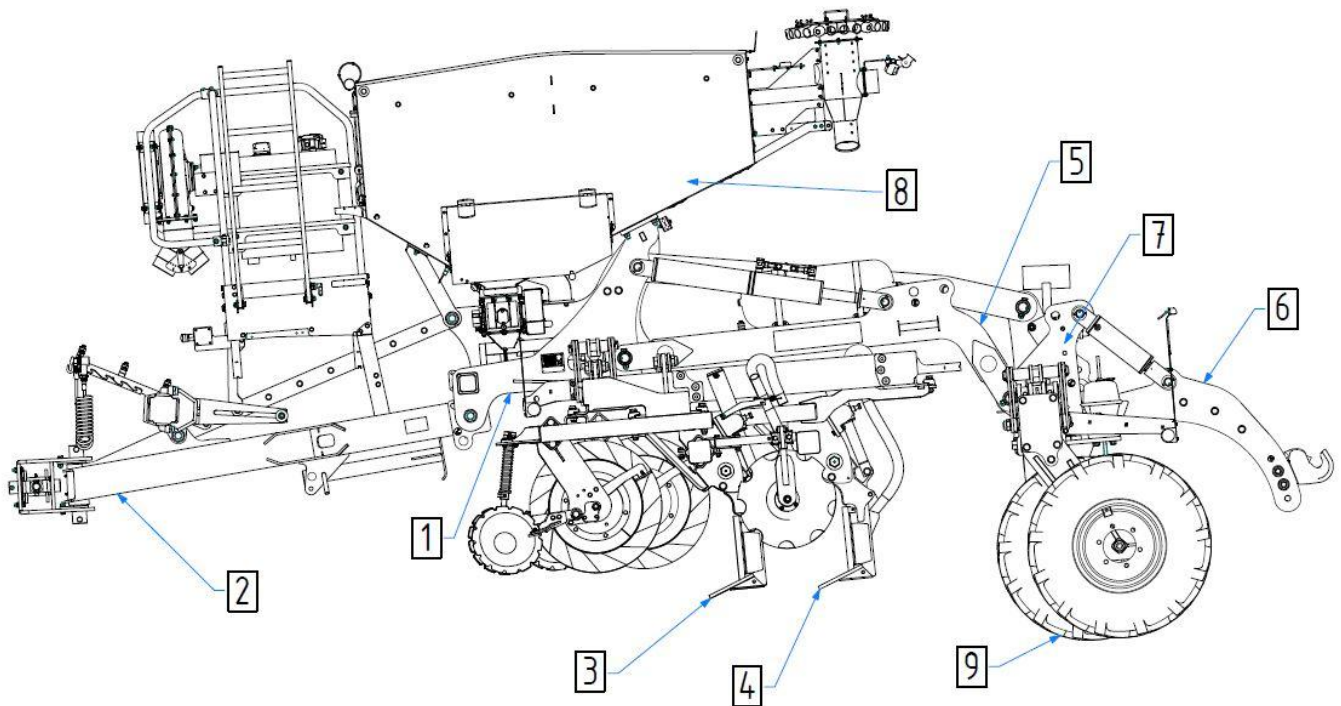


Fig. 12. General view of the machine

1. Main frame
2. Drawbar
3. Short working section
4. Long working section
5. Machine lifting arm
6. Rear 3-point linkage
7. Rear frame
8. Tank
9. Tire roller

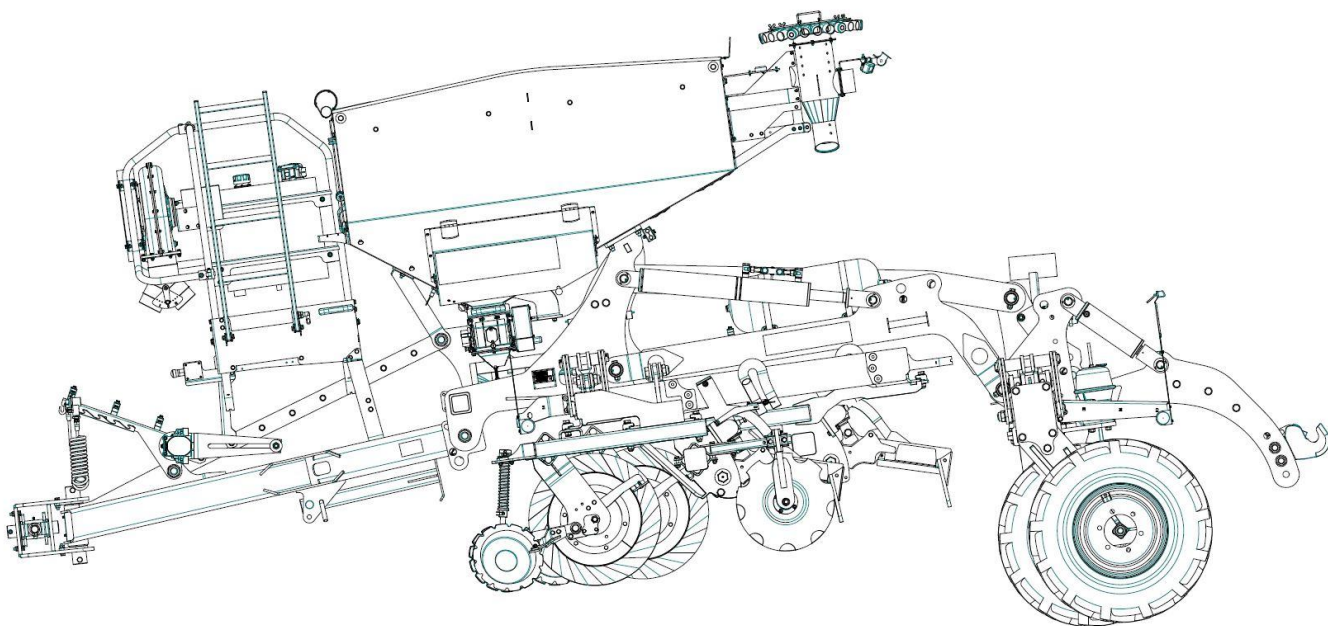


Fig. 13. Lifted machine, with working elements folded.

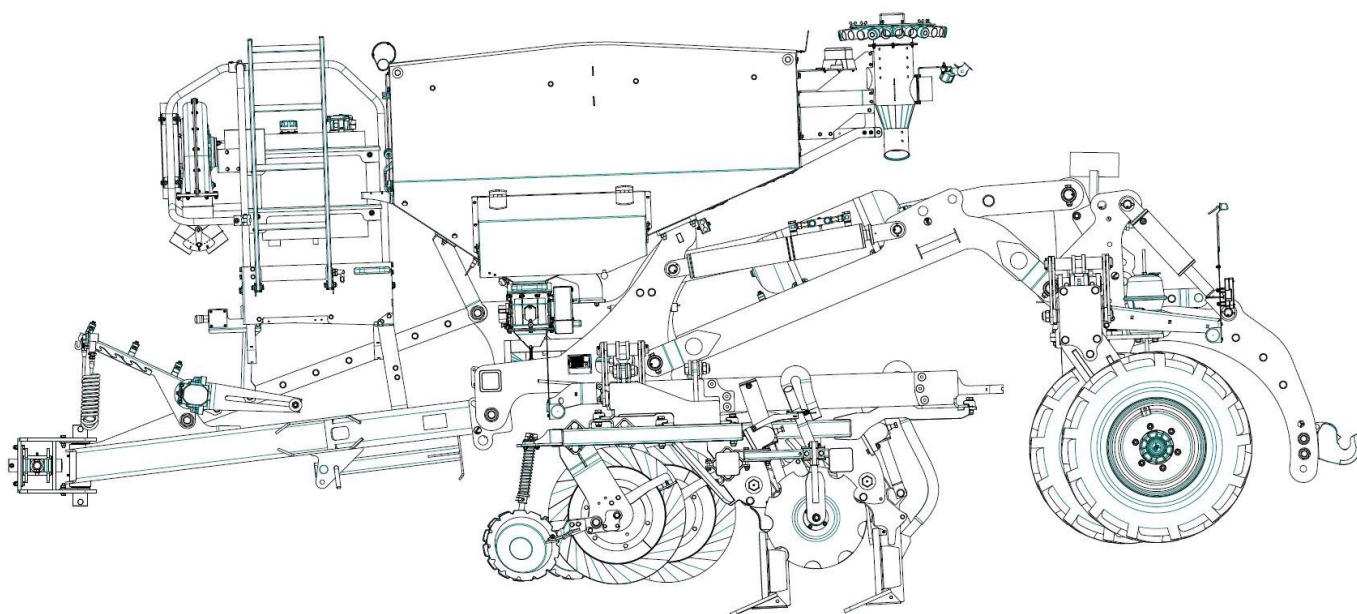


Fig. 14. Lowered machine, with the working elements unfolded.

The strip till machine has a drawbar with a hitch axle in the front part, which is connected to the main frame using pins. The main frame is connected to the lifting arm using pins. The STK 400 machine is an extension of the STK 300 machine. Hydraulically foldable side frames are attached to the main frame of the STK 400 machine. Hydraulically folding tire roller frames are attached to the rear frame. The STK 400 machine allows you to sow seeds at spacings of 6 x 70 cm, 6 x 75 cm and 9 x 44.4 cm. The hydraulics of the side frames and tire roller frames allow for quick adjustment of the machine to the transport width. Working sections are attached to the main frame and side frames. The tank with all fertilizer and seed sowing equipment is mounted on the main frame. In the rear part of the machine, the main frame is coupled with the rear frame with the tire roller using a lifting arm. The machine itself is lifted using hydraulic cylinders attached to the main frame on one side and to the machine's lifting arm on the other. The three-point linkage beam is attached to the rear frame of the machine using pins, and is also lifted using hydraulic cylinders. The three-point linkage beam is used to attach a precision seeder or grain attachment.

Description of actions performed by working parts of the machine:

- Spreading the pre-crop using spreading and tearing discs (mulch).
- Cutting the soil to a depth of 12 cm using a wavy cutting disc
- Loosening and aerating the soil to a depth of 35 cm using a furrow opener, covered with a replaceable, rotating, U-shaped shield together with a first-cut chisel and a self-sharpening, replaceable rotating sword.
- Applying fertilizer using a fertilizer coulter (applicator adjustable in 2 positions).
- Closing the gap using toothed closing discs.
- Compacting and levelling the soil surface using the compacting and levelling roller.
- Sowing plants using the PS attachment (if sowing wheat, peas or rapeseed).

In case of sowing other crops, the PS attachment must be replaced with a precision seeder of an external company. The unit is adapted to connect seeders that meet the spacing requirements of Polish standards

25.1. Working sections

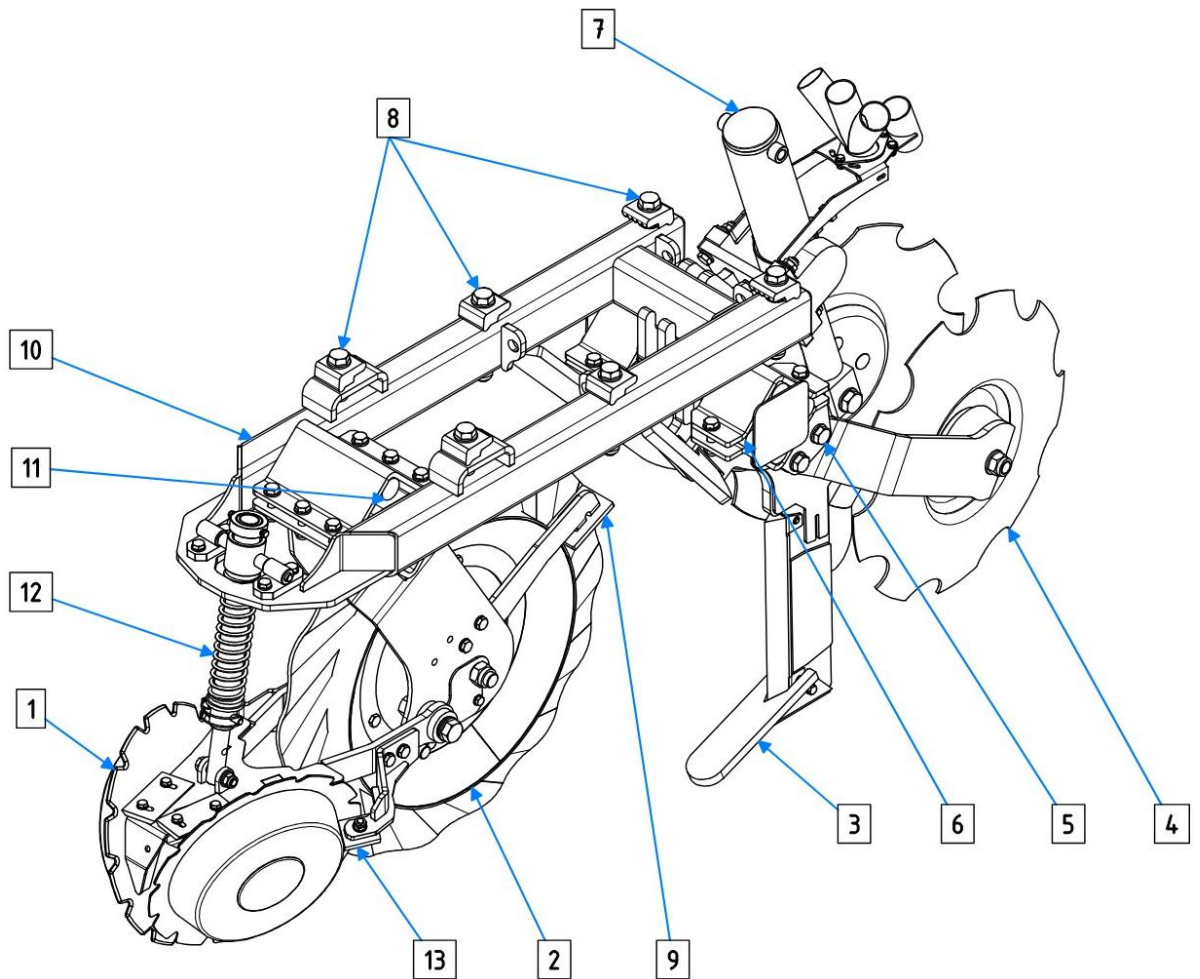


Fig. 15. Short section

1. Spreading and breaking disc
2. Wavy cutting disc
3. Furrow opener
4. Toothed closing disc
5. Adjustment of the toothed closing disc
6. Rubber protection of the toothed closing disc
7. Hydraulic protection of the furrow opener
8. Section mounting frame
9. Scraper
10. Short section frame
11. Rubber protection of the cutting disc
12. Shock absorber of the spreading and breaking discs
13. Scraper of the spreading and breaking disc

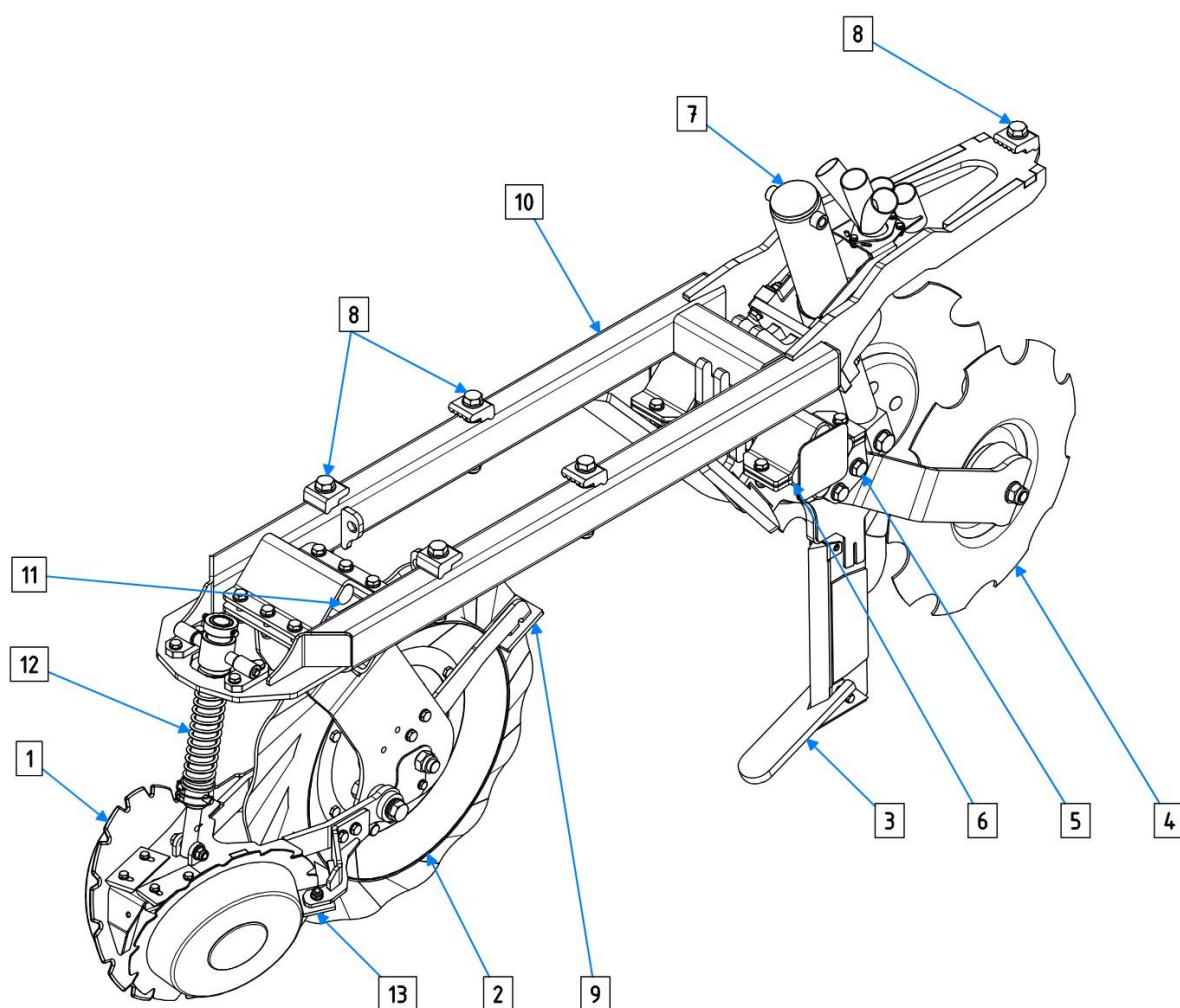


Fig. 16. Long section

1. Spreading and breaking disc
2. Wavy cutting disc
3. Furrow opener
4. Toothed closing disc
5. Adjustment of the toothed closing disc
6. Rubber protection of the toothed closing disc
7. Hydraulic protection of the furrow opener
8. Section mounting frame
9. Scraper
10. Short section frame
11. Rubber protection of the cutting disc
12. Shock absorber of the spreading and breaking discs
13. Scraper of the spreading and breaking disc

25.2. Design of the furrow opener

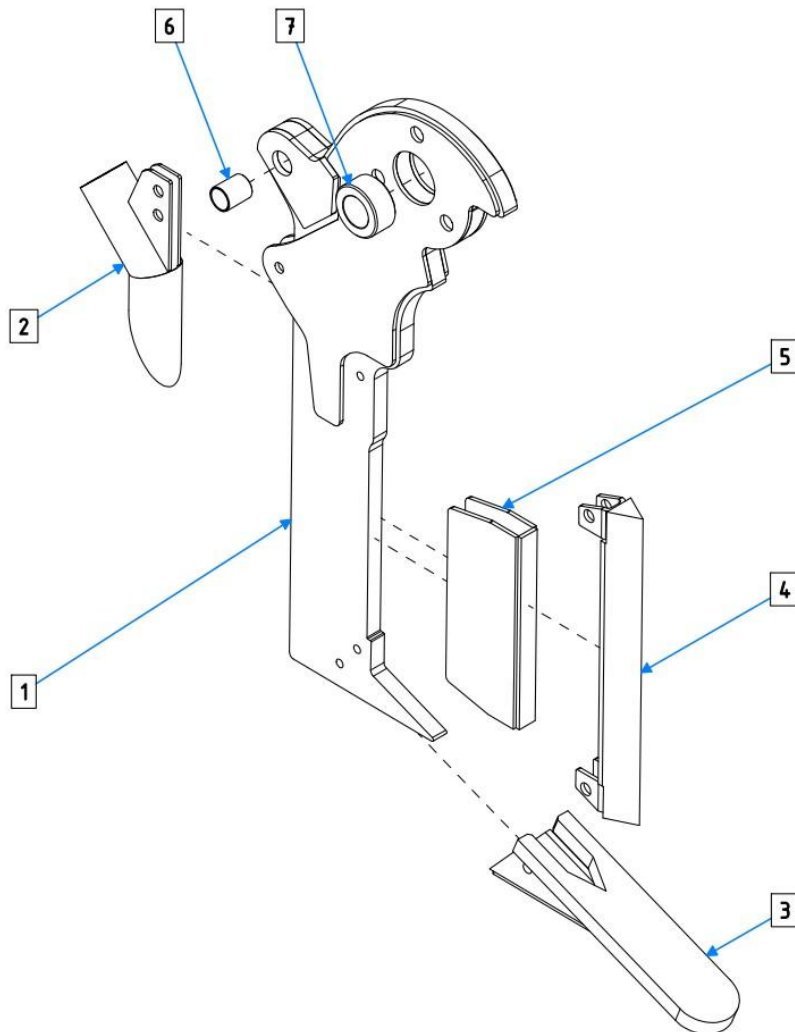


Fig. 17. Design of the furrow opener

1. Coulter beam (not replaceable, doesn't wear out)
2. Seed pipe (not replaceable, doesn't wear out)
3. Chisel fixed with a rawlplug (replaceable element, wears out)
4. Self-sharpening rotating sword (replaceable element, wears out)
5. Coulter beam cover (replaceable element, wears out)
6. d20/D23 sleeve (replaceable element, wears out)
7. d30/D50 L24 sleeve (replaceable element, wears out)

25.3. Types of chisels

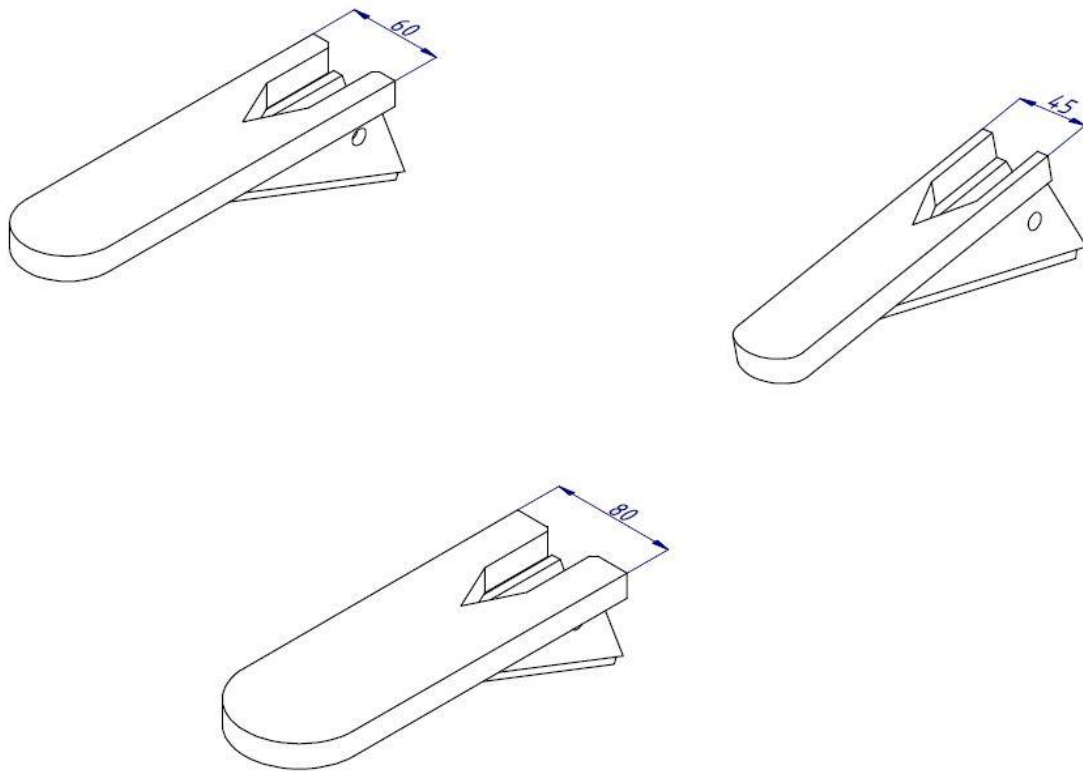


Fig.18. Types of available chisels

The manufacturer recommends using different types of chisels dedicated for specified plants:

- in rapeseed cultivation, it's recommended to use narrow chisels with working width of 45mm;
- in maize cultivation, it's recommended to use wide chisels with working width of 80mm;
- cultivation of plants other than those mentioned above, it's recommended to use standard chisels with working width of 60mm.

Each type of the above-mentioned chisels is available with a soldered carbide plate or an abrasion resistant hard-faced plate.

25.4. Tank

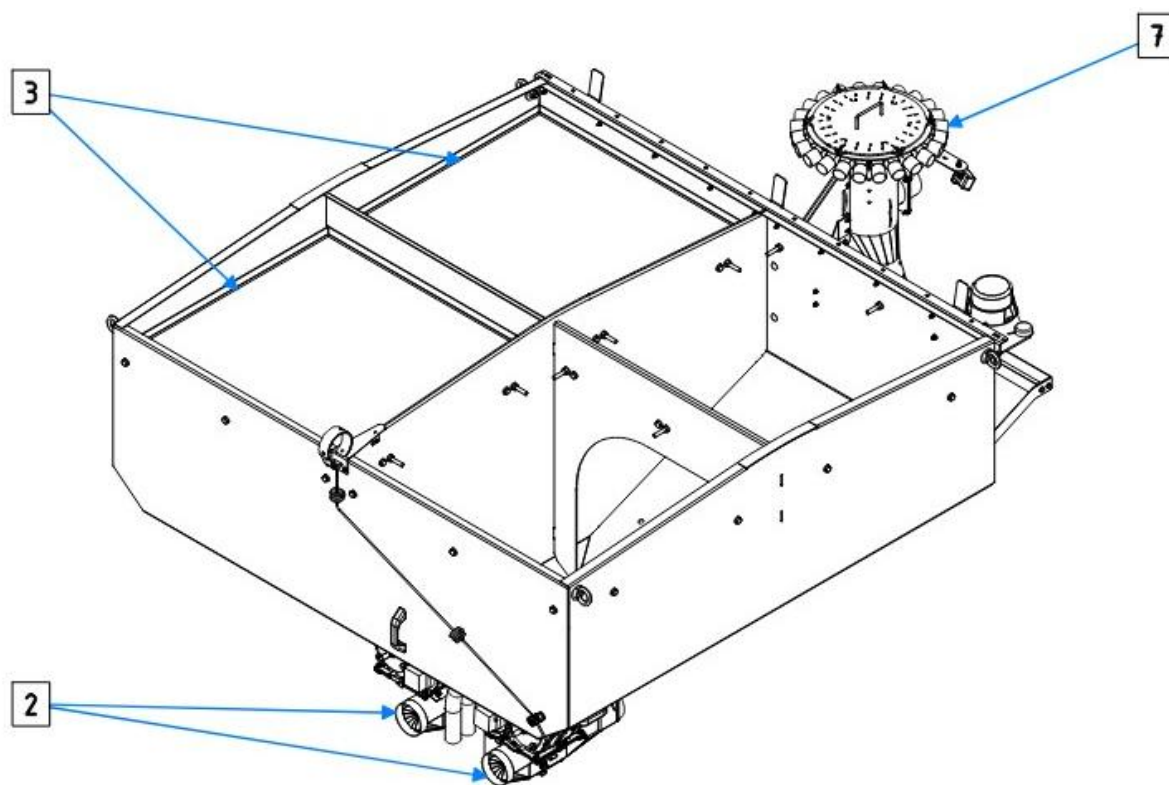


Fig. 19. Tank – View 1

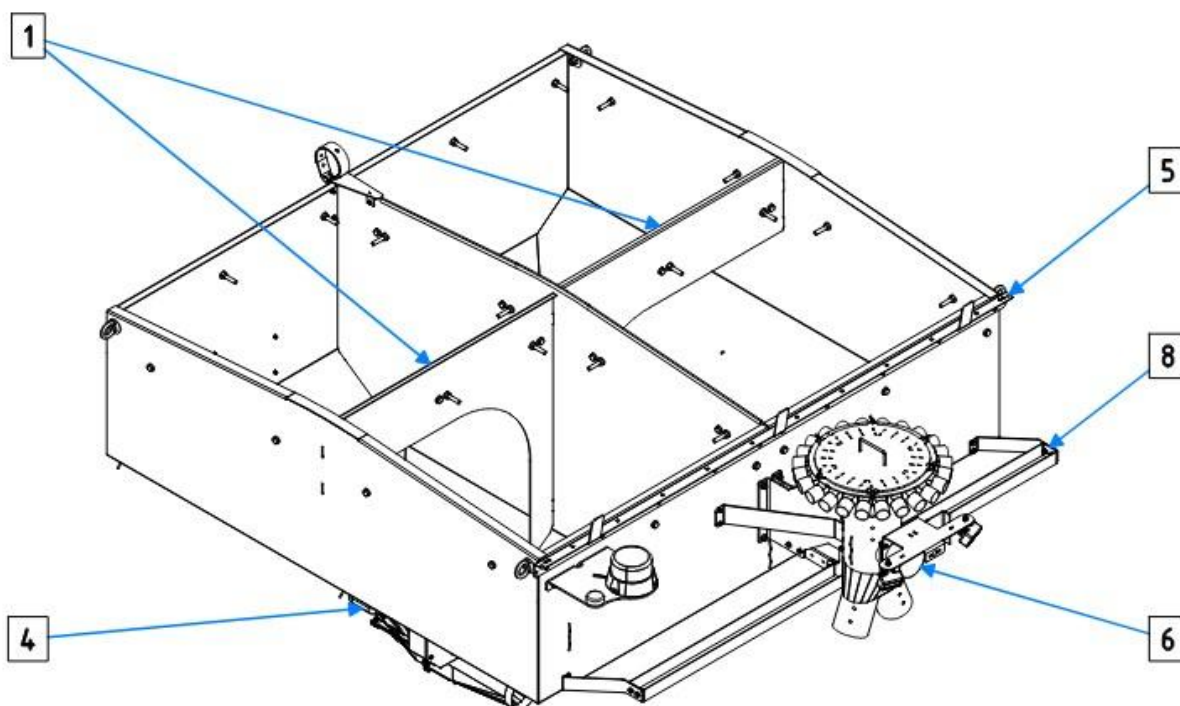


Fig. 20. Tank – View 2

1. Tank chambers
2. Seeders
3. Nets in the tank x4
4. Valve for cutting off the tank from the distributors
5. Tarpaulin fixing/limiter
6. Vent
7. Seed distributor with replaceable inserts.
8. Guide bars for sowing hoses

25.5. Seed level sensor setup

The sensor has two operating positions. In the upper position, it detects a low level with a load of about 40-50 kg. In the lower position, it detects a low level with a load of about 2-3 kg. When changing the position of the sensor, loosen the sensor nut and unscrew the sensor. Then unscrew the hole plug and plug the hole in which the sensor was previously placed. Place the sensor in the new hole, gently tightening the nut.

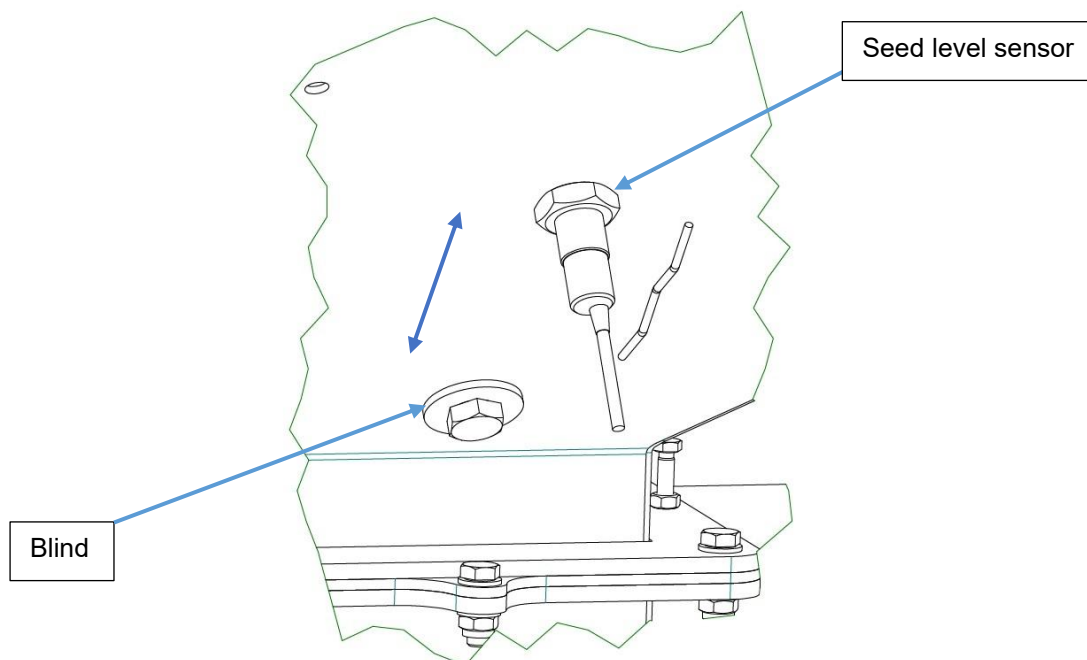


Fig. 21. Changing the place of the sensor in the tank

26. STK 300 frame arrangement for individual sowings

Please remember that with spacing of 37.5 cm, the toothed closing discs should only be mounted on the outer sections.

26.1. 37,5 cm spacing for 8 frames of STK 300

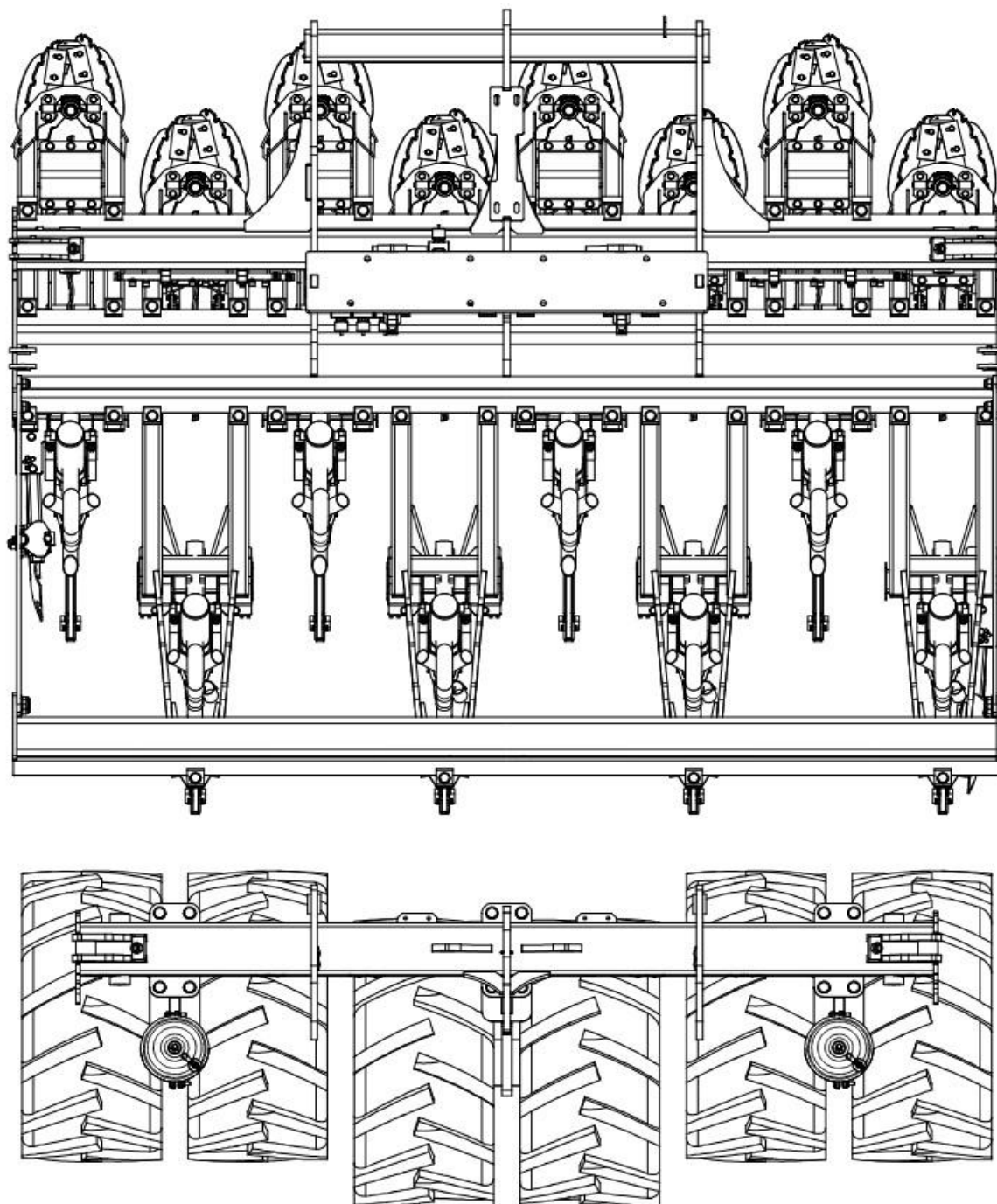


Fig. 22. 37,5 cm spacing for STK 300

26.2. 44,4 cm spacing for 7 frames of STK 300

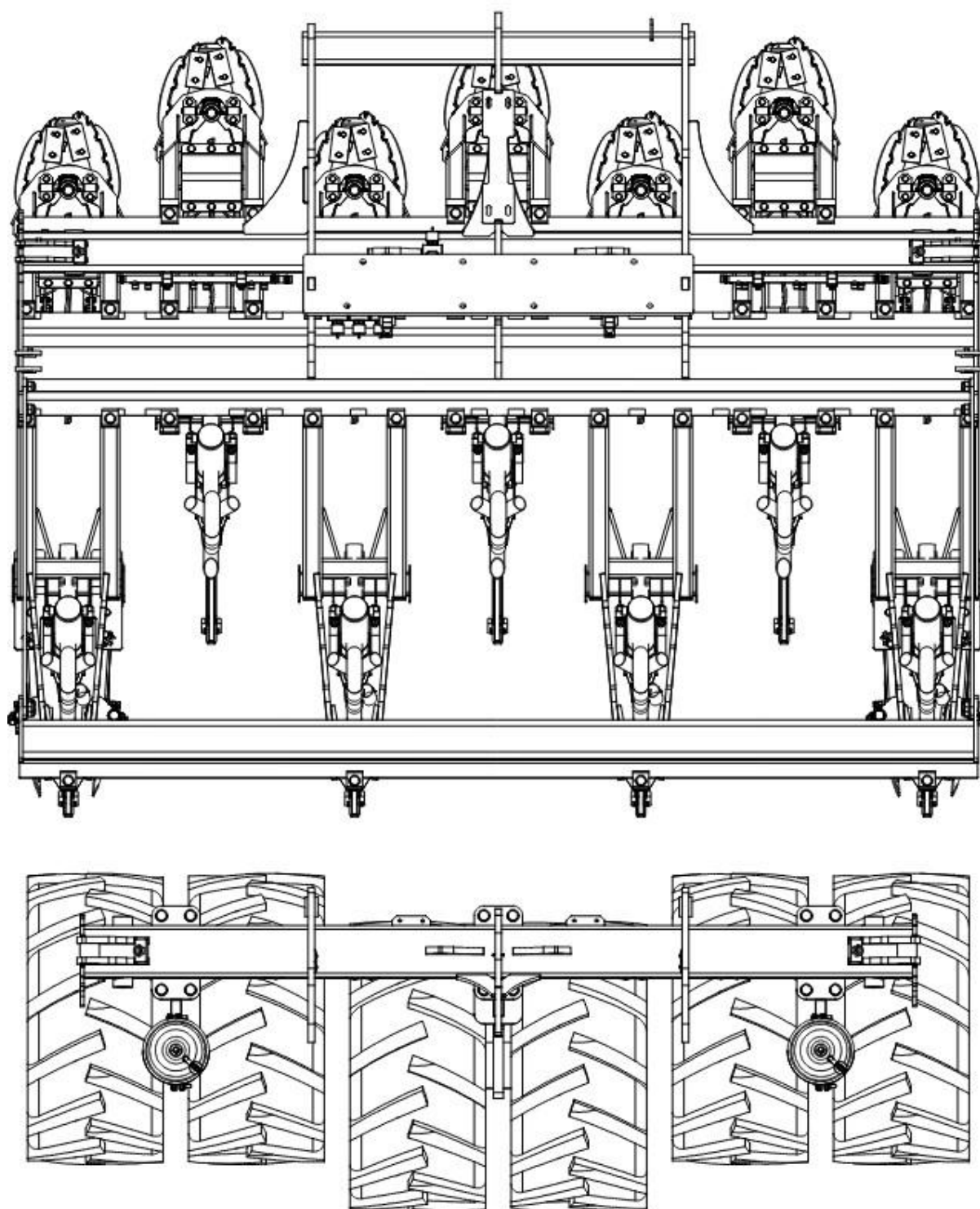


Fig. 23. 44,4 cm spacing for STK 300

26.3. 45 cm spacing for 6 frames of STK 300

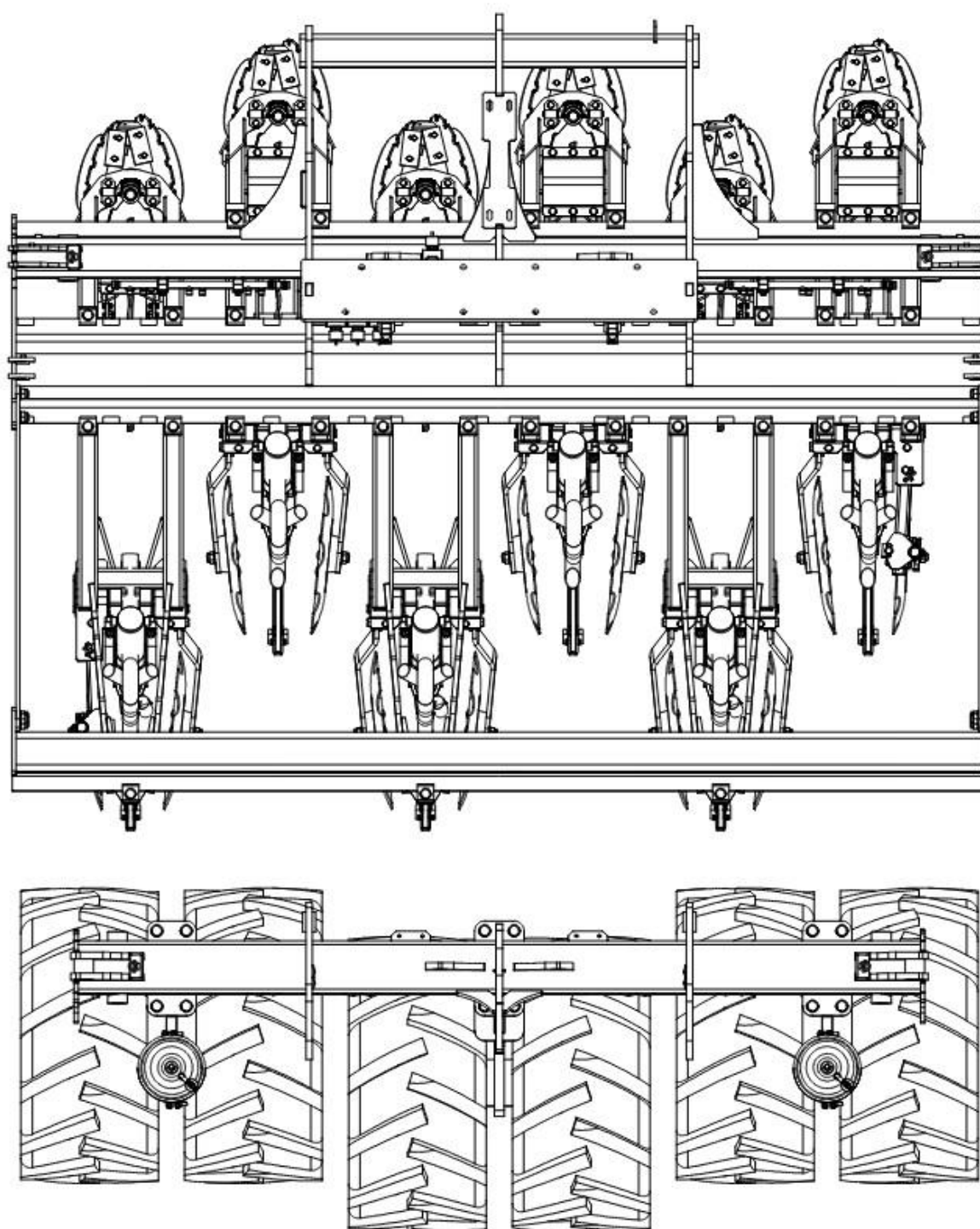


Fig. 24. 45 cm spacing for STK 300

26.4. 75 cm spacing for 4 frames of STK 300

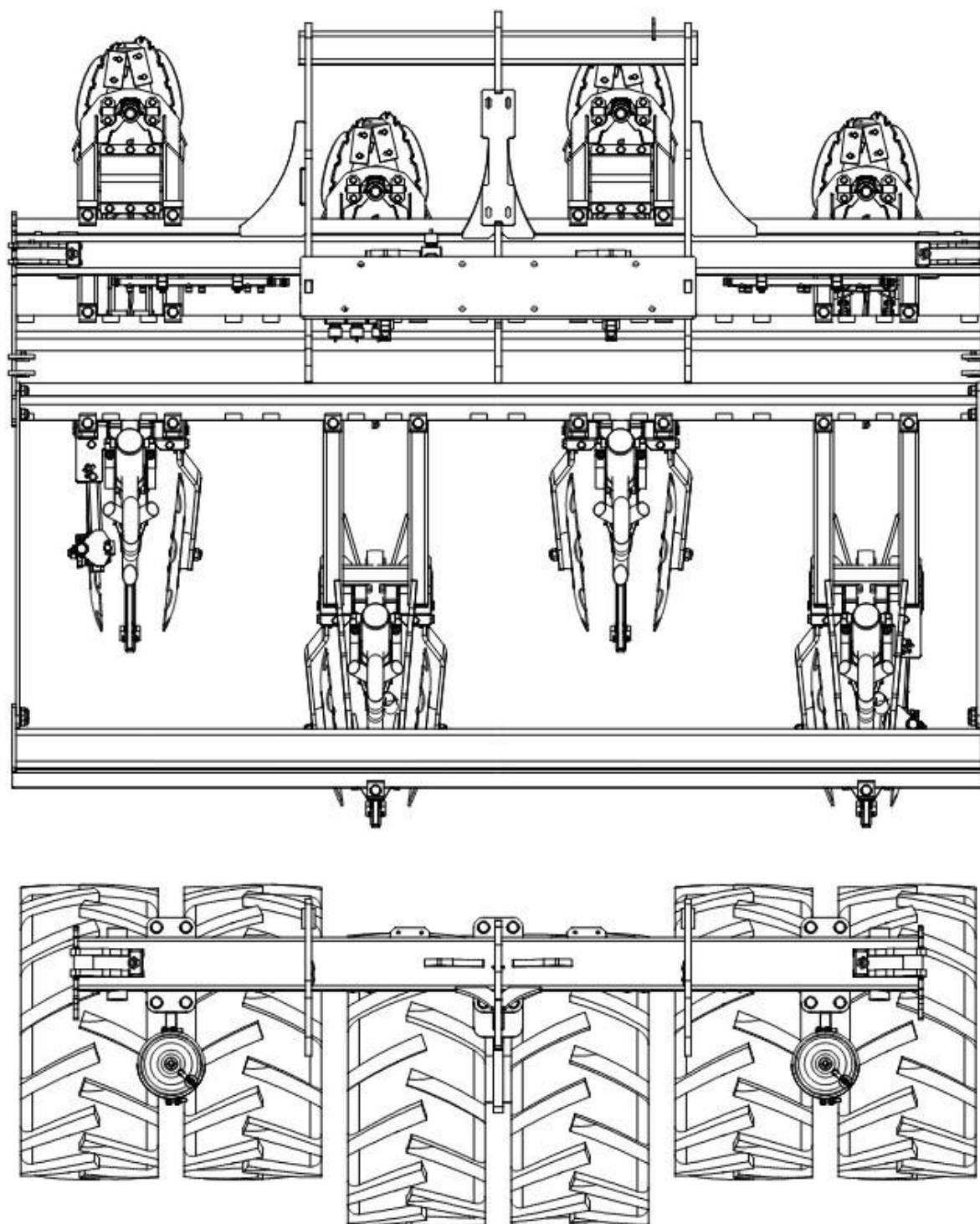


Fig. 25. 75 cm spacing for STK 300

27. STK 400 frame arrangement for individual sowings

27.1. 37,5 cm spacing for 8 frames of STK 400

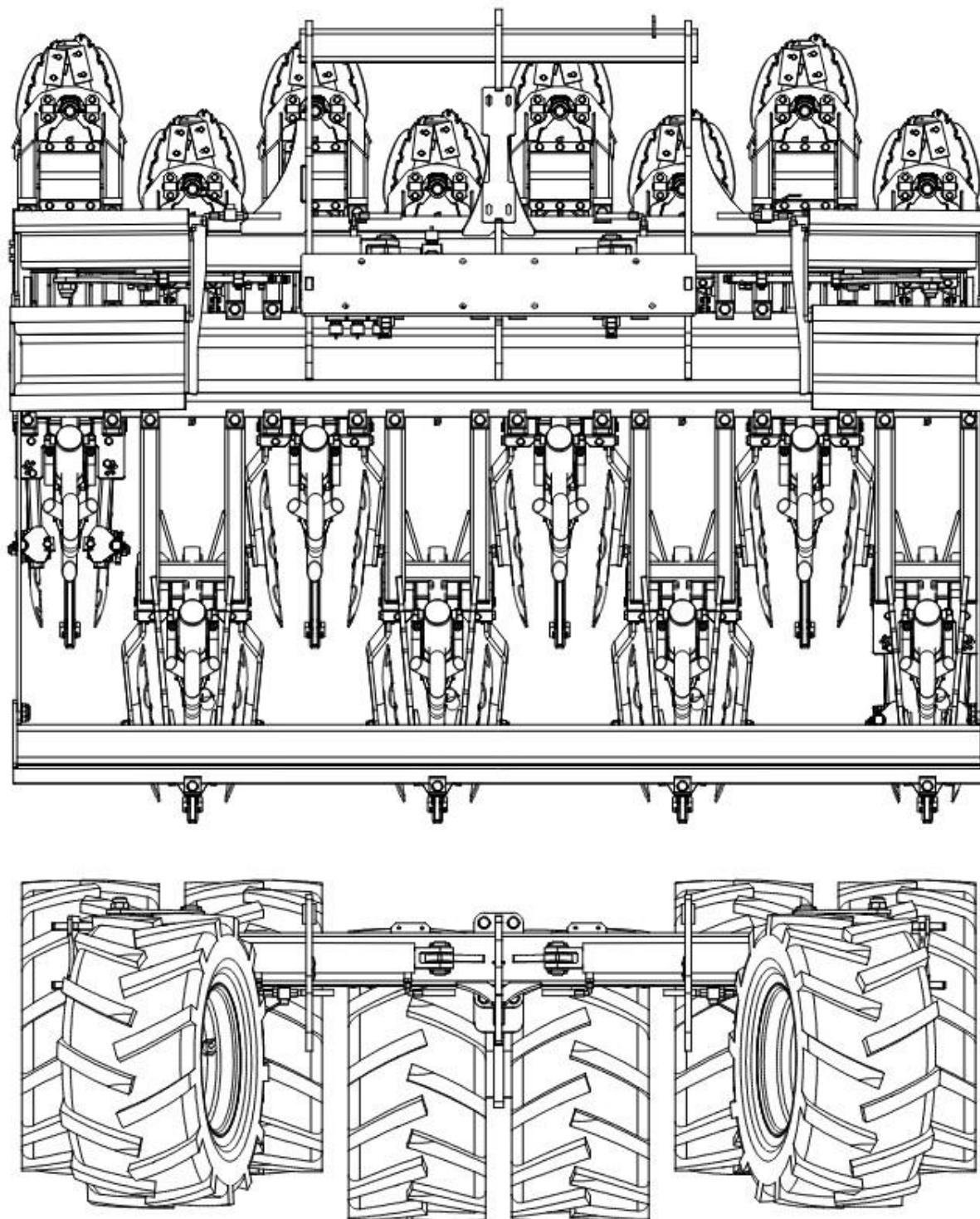


Fig. 26. 37,5 cm spacing for STK 400

27.2. 44,4 cm spacing for 9 frames of STK 400

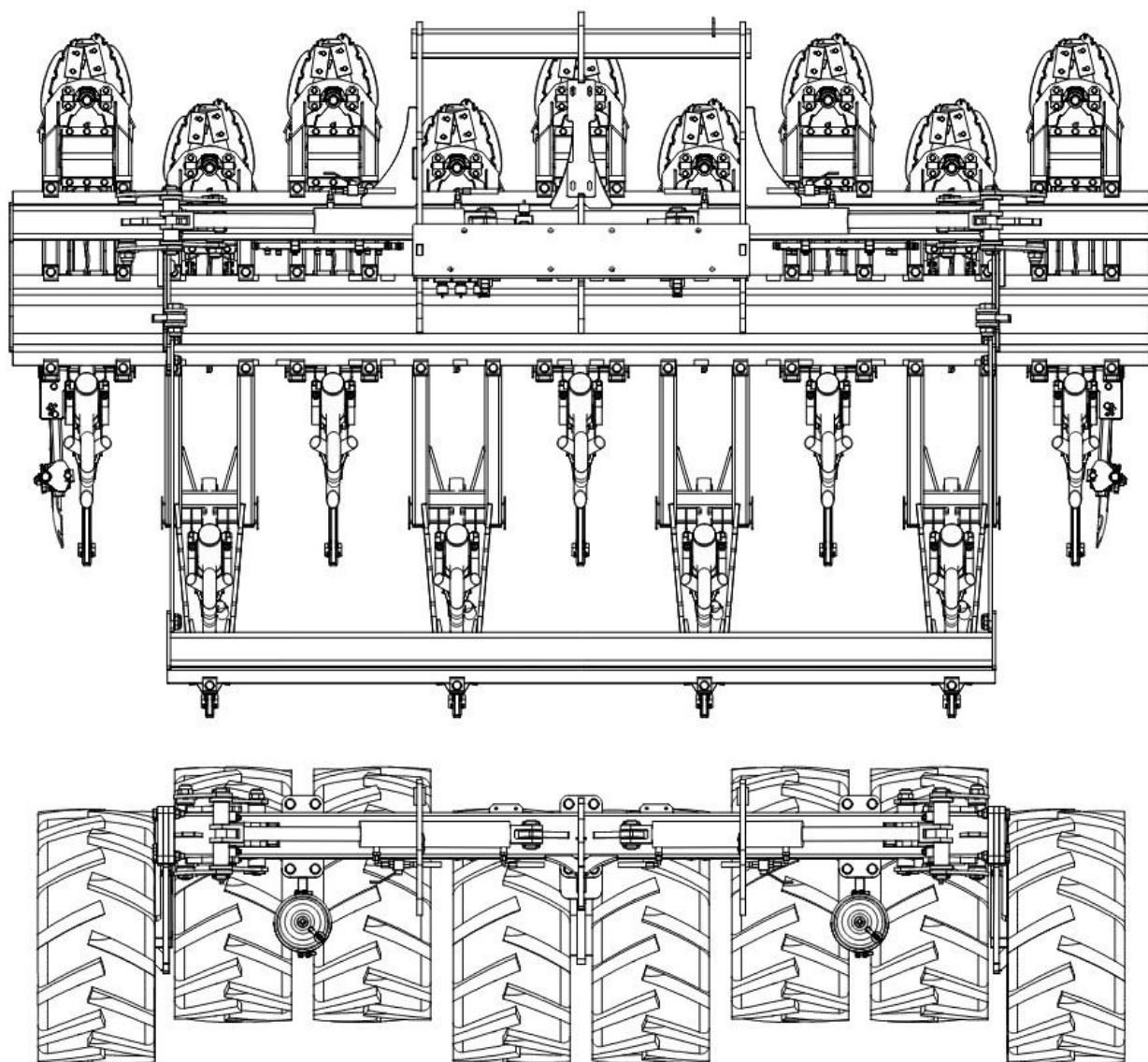


Fig. 27. 44,4 cm spacing for STK 400

27.3. 45 cm spacing for 6 frames of STK 400

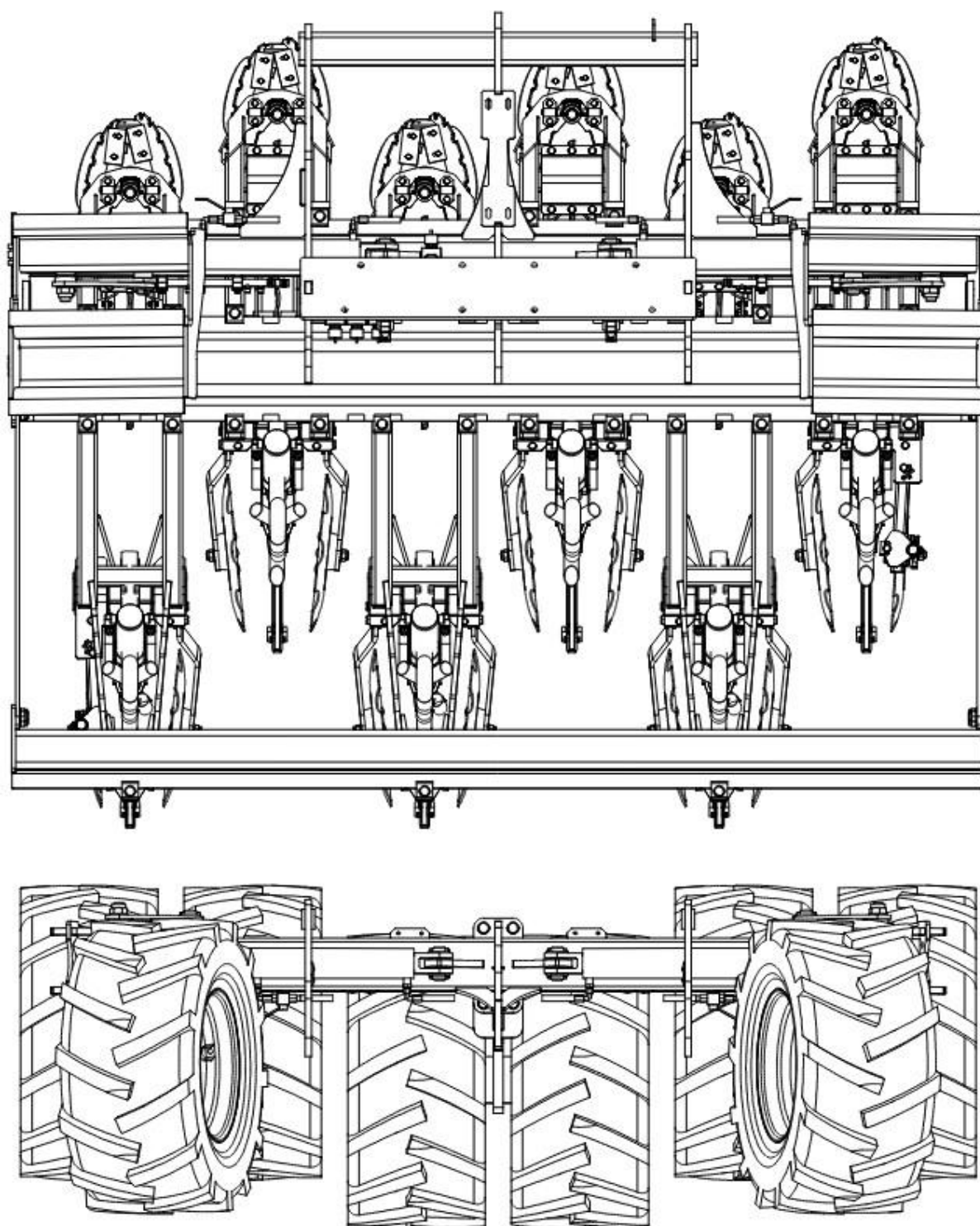


Fig. 28. 45 cm spacing for STK 400

27.4. 75 cm spacing for 6 frames of STK 400

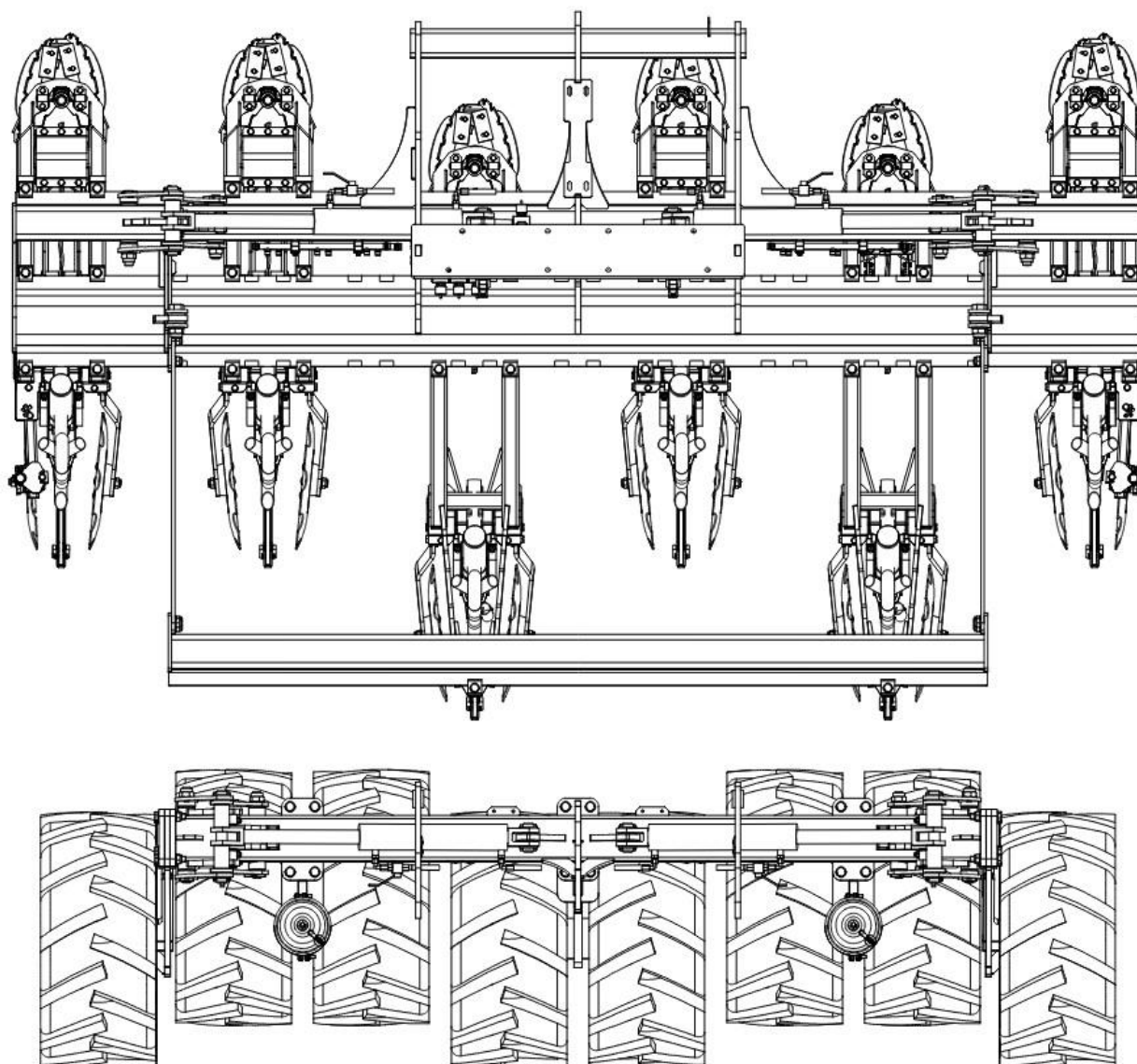


Fig. 29. 75 cm spacing for STK 400

28. Attaching and detaching the working sections

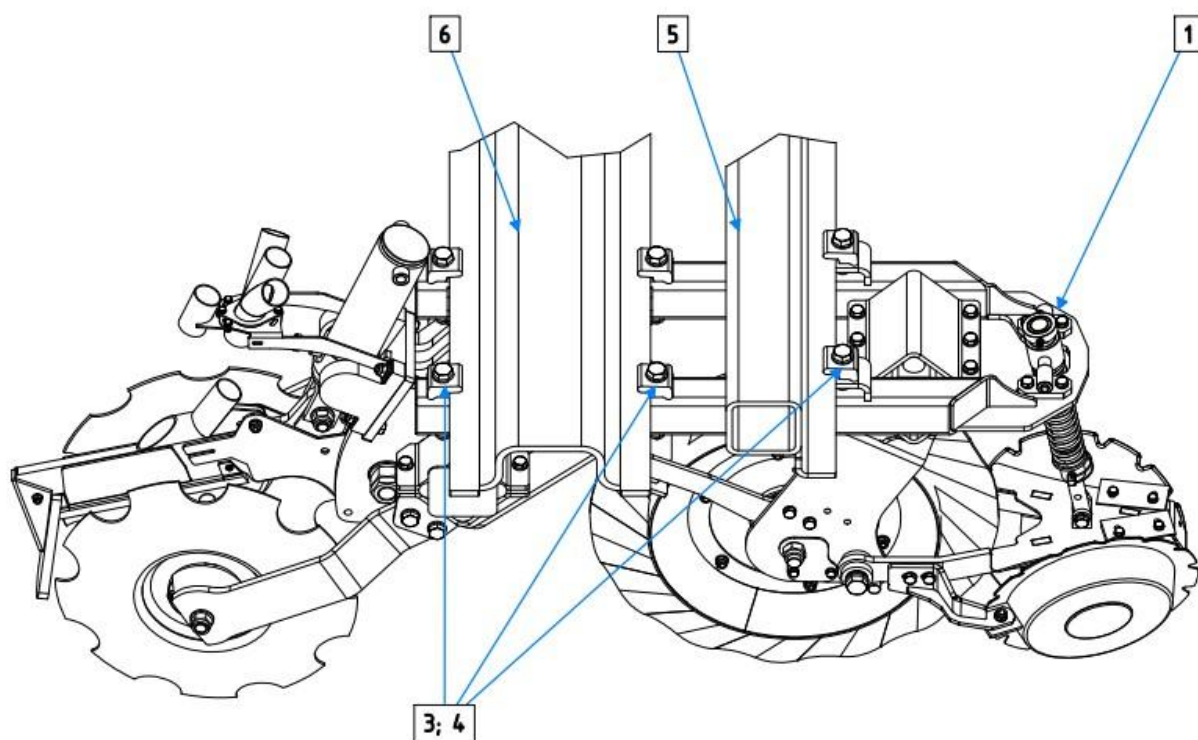


Fig. 30. Attaching the short working section

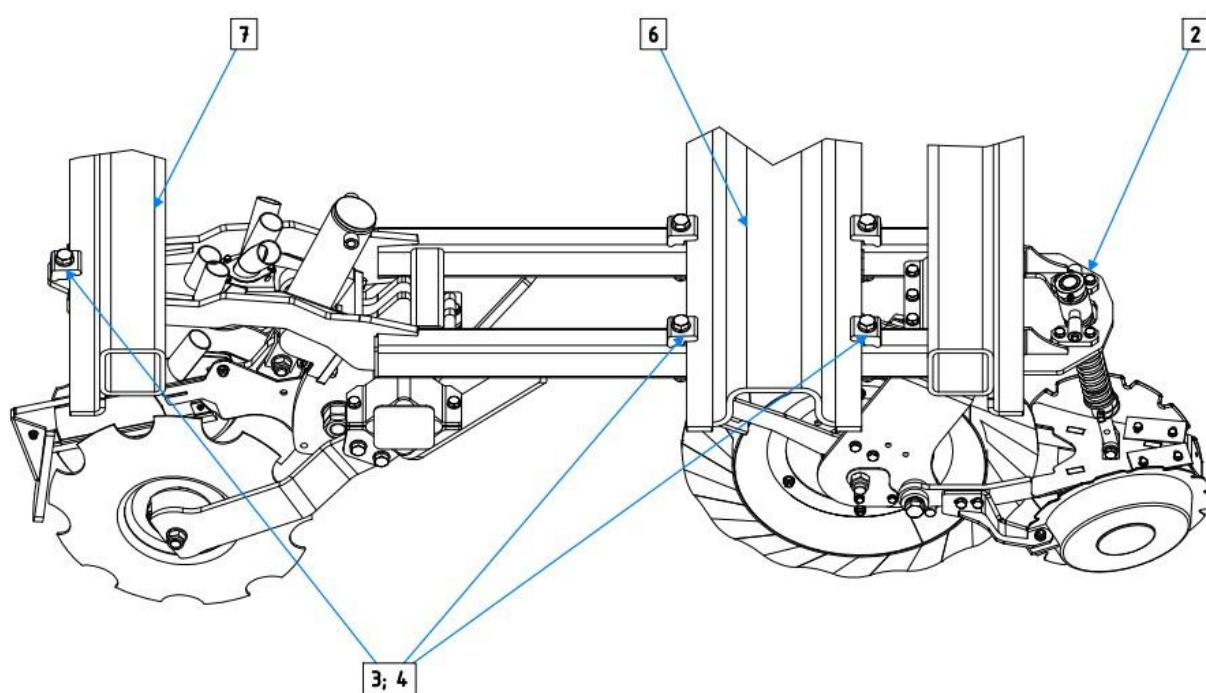


Fig. 31. Attaching the long working section

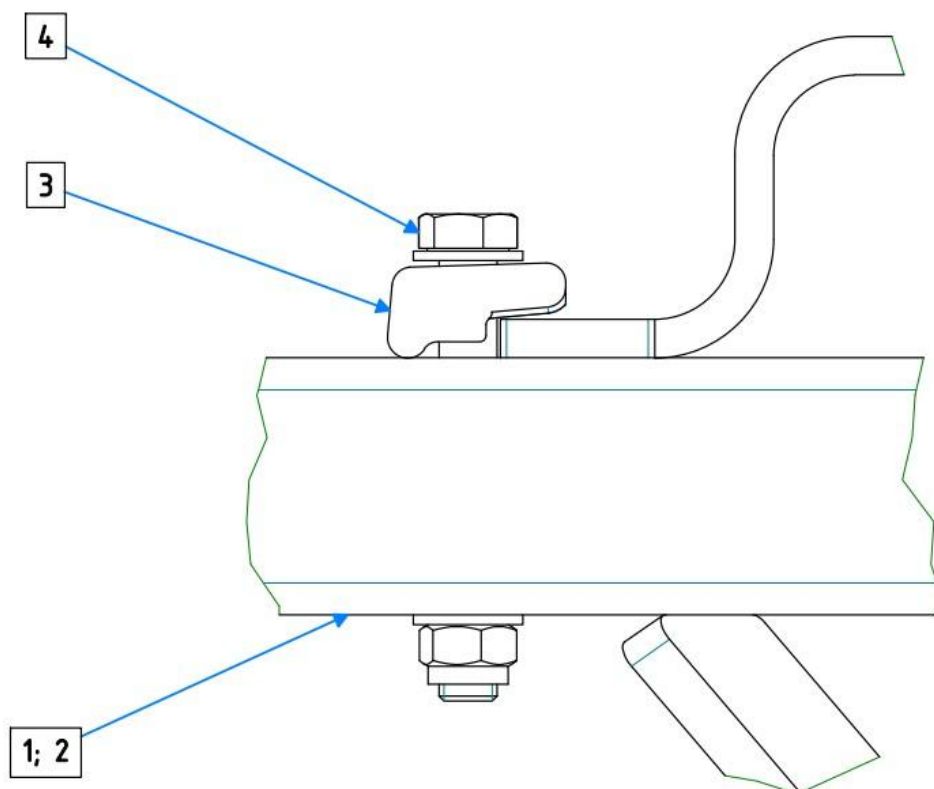


Fig. 32. Attaching the working sections

Working sections are attached to the frame with brackets [3] tightened using the M18 screw [4].

The short working section [1] is attached at the middle [6] and the front [5] section of the frame with 6 brackets [3].

The long working section [2] is attached at the middle [6] and the front [7] section of the frame with 5 brackets [3].

During assembly, the coulter beams must be folded. To dismantle the section, we can use a dedicated trolley.

29. Changing the spacing of working sections

In order to change the spacing of working sections do the following:

1. Fold the coulter beams of the working sections.
2. Set the machine at a height allowing the working sections to move freely.
3. Reduce the pressure in the hydraulic coulter beam protection system.
4. Mount two middle trolleys [8] to the mounting holes for the short section [1].
For the long section [2], attach one middle trolley [8] and one rear trolley [9] in place of the mounting bracket [3]
5. If necessary, unscrew the hydraulic hoses from the hydraulic manifolds.
6. Remove the fertilizer hose from the fertilizer distributor (vent).
7. Loosen the M18 screws [4] which hold the brackets [3] until the trolley rollers [8; 9] start resting on the track of the middle [6] and rear [7] (for the long section) part of the frame.
8. Move the section to the intended location on the frame. To position the section, use the linear division located on the frame
9. To attach the frame, do the above in the reverse order.

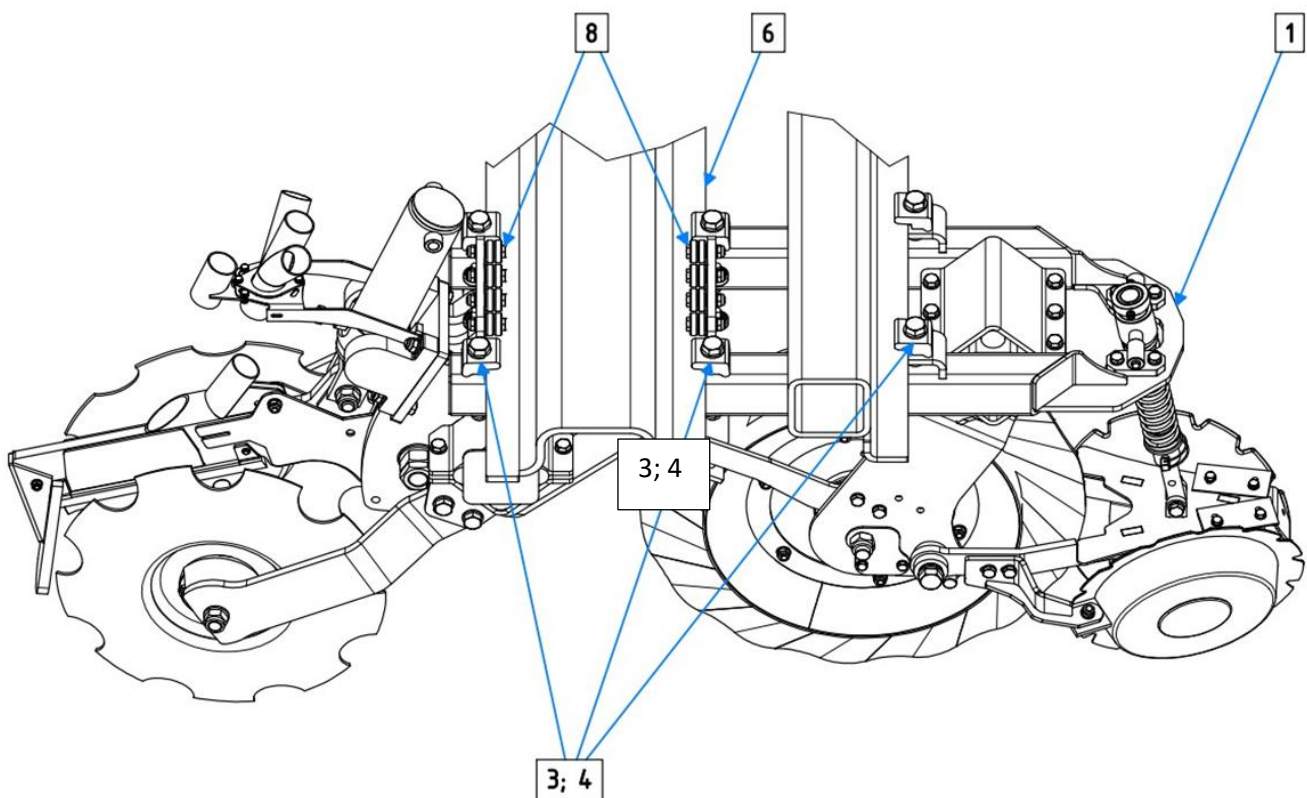


Fig. 33. Changing the spacing of the short working section

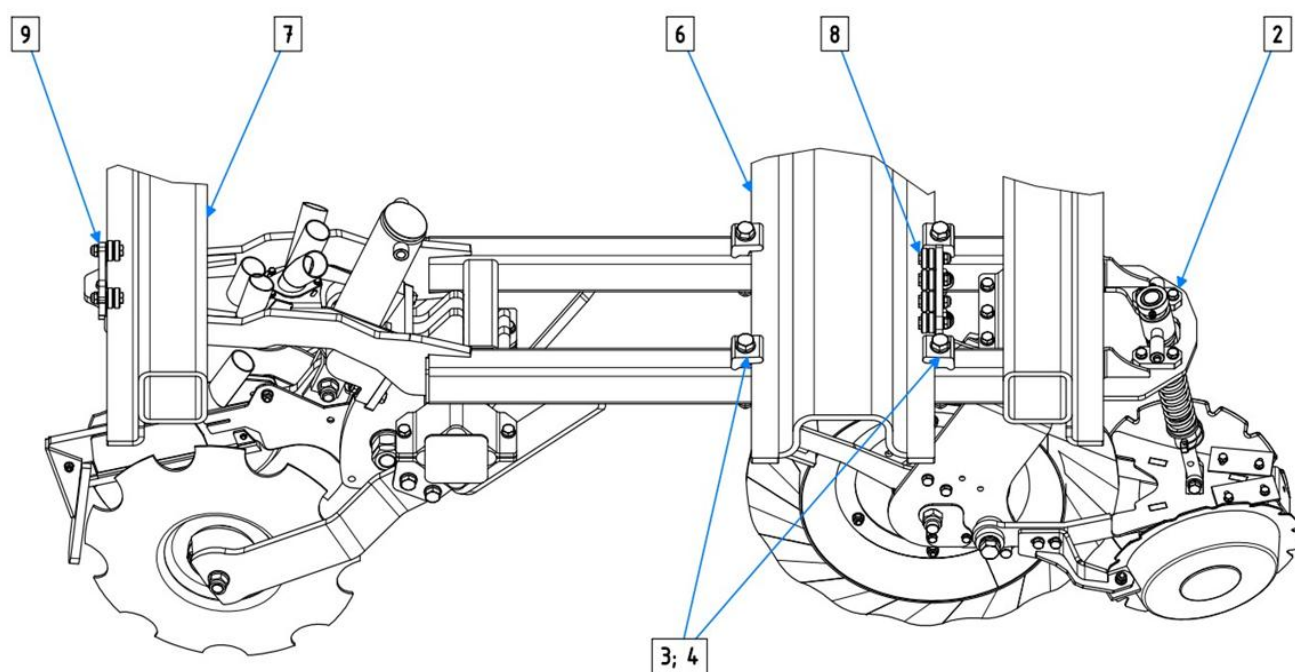


Fig. 34. Changing the spacing of the long working section

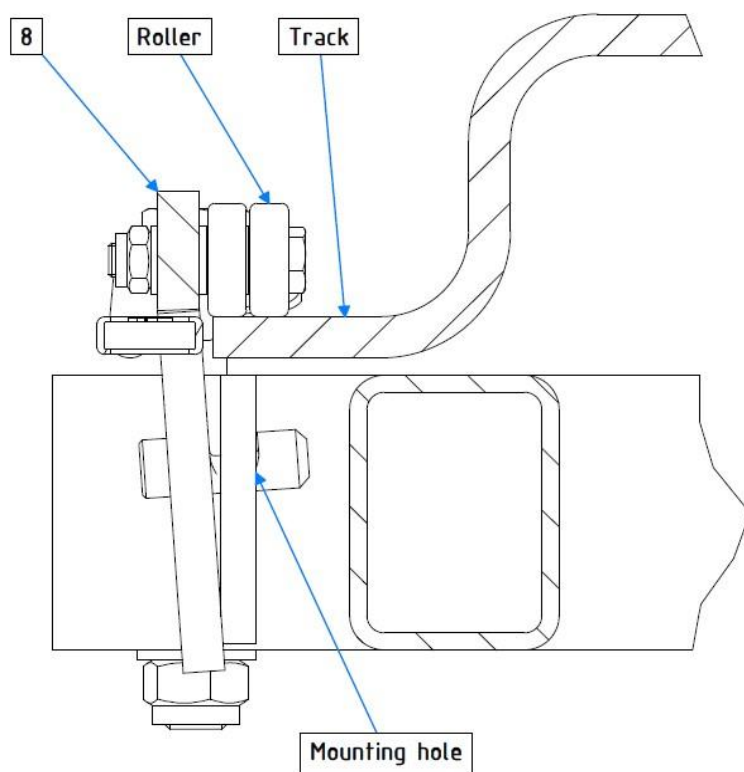


Fig. 35. Mounting the middle trolley

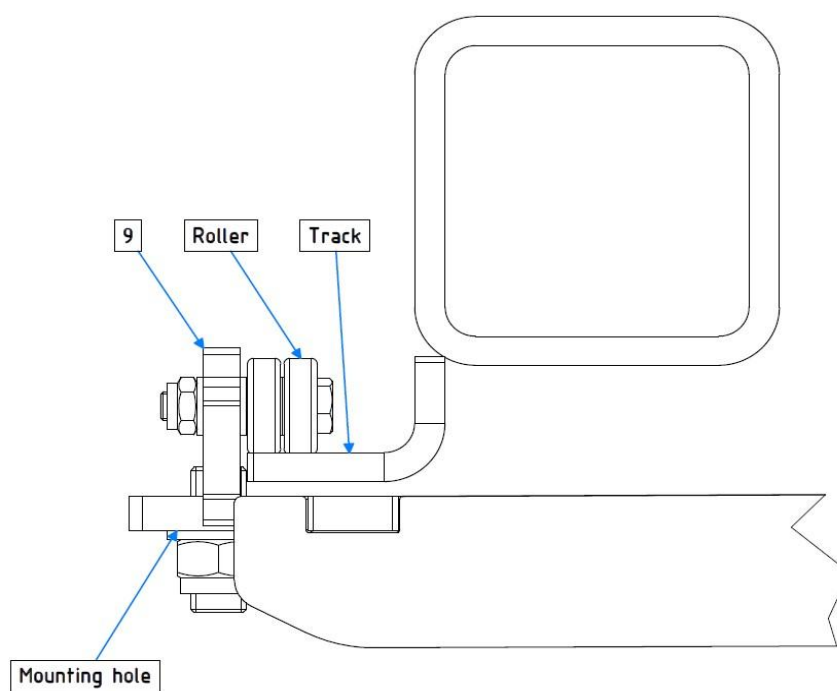


Fig. 36. Mounting the rear trolley

ATTENTION ⚠ Each time the work sections spacing is adjusted, make sure not to exceed the maximum transport width of 3 meters.

30. Hydraulic system

- The hydraulic system is under high pressure (about 200 bar).
- When connecting hydraulic cylinders or hydraulically driven engines, special attention must be paid to the correct connection of the hydraulic lines.
- When connecting the machine's hydraulic lines to the tractor's hydraulics, make sure that the lines on both (machine and tractor) are not under pressure.
- You need to pay attention to the correct hydraulic systems connection (between tractor and machine). Incorrect connection may result in the opposite effect than expected (e.g. alternating lowering and lifting, damage to the hydraulic motors of the blower and multiplier).
- Inspections of hydraulic lines should be carried out systematically and damaged elements should be replaced with new ones.
- If a leak is located, take all precautions to avoid the risk of personal injury.
- Hydraulic oil escaping under high pressure can cause serious injury when in contact with the skin. In this case, seek medical attention immediately, as there is a risk of infection.
- Before repairing the hydraulic system, lower the machine, release the pressure from the circuit to 0 and turn off the key.
- Hydraulic hoses must be replaced every 6 years.
- Used oil should be taken to designated locations for disposal.
- You must control the oil level in the system.

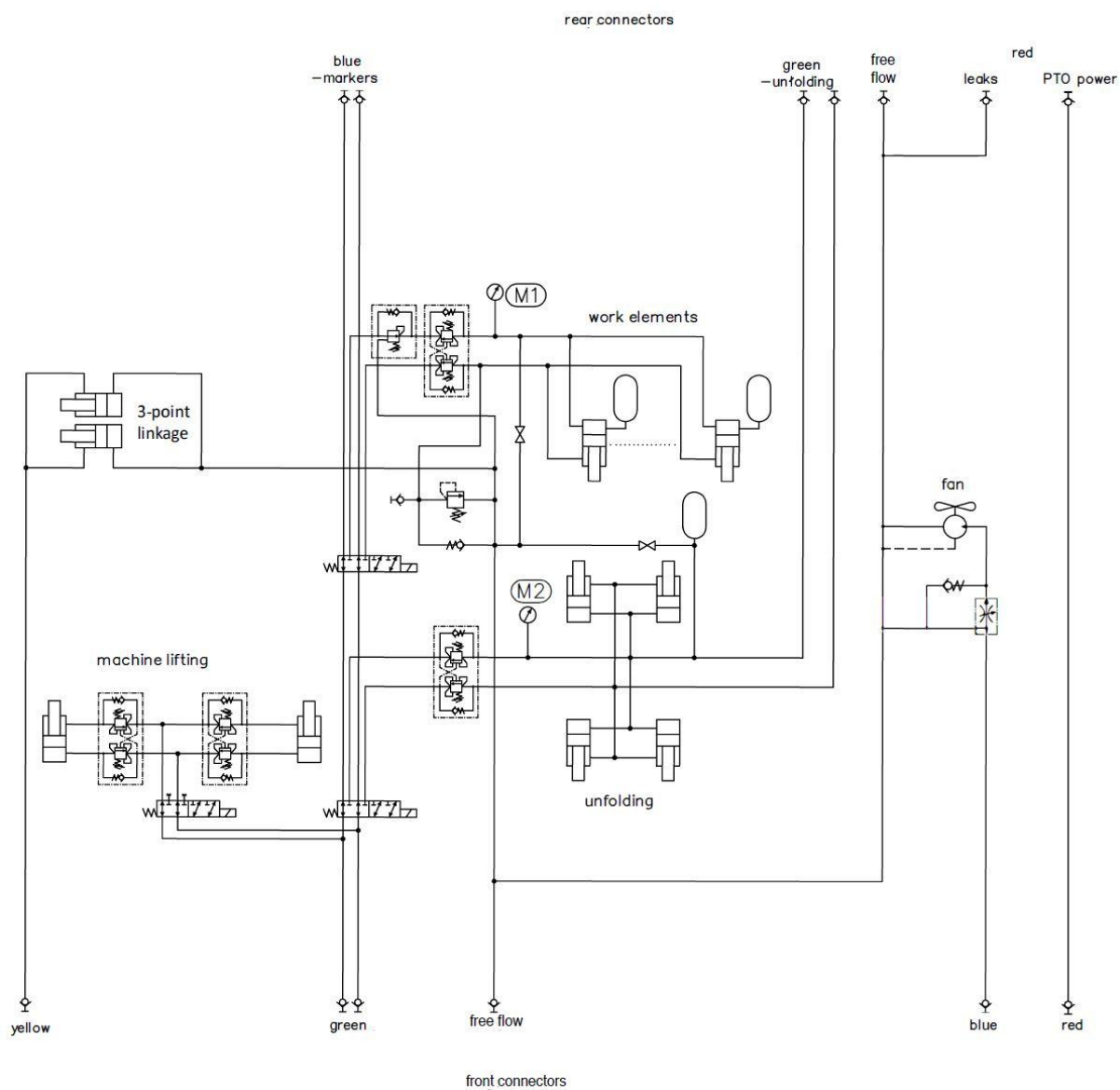


Fig. 37. Hydraulic system of STK 400.

STKn FOLDABLE WITH ELECTROVALVES
AND ITS OWN PTO-DRIVEN PUMP

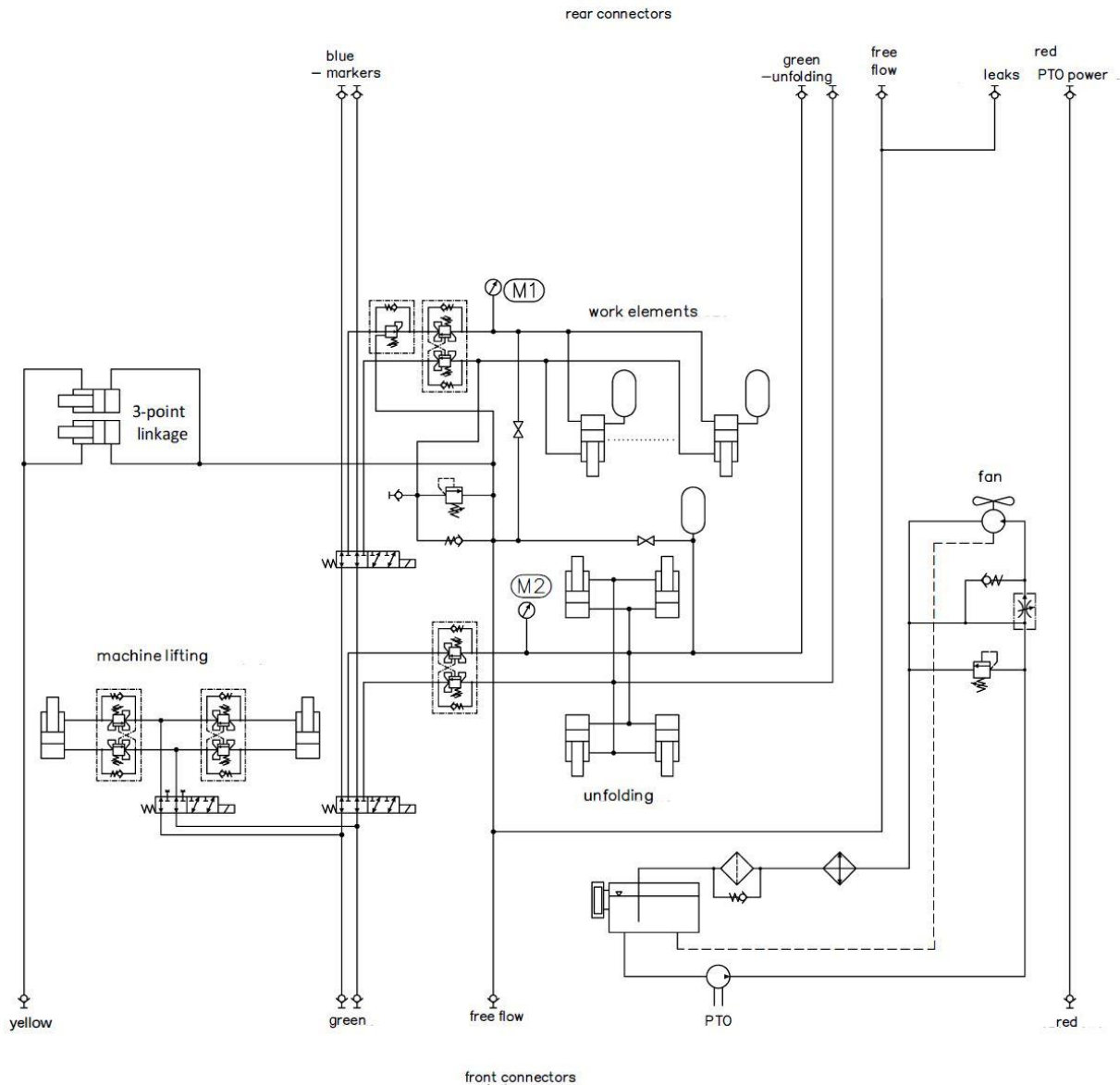


Fig. 38. Hydraulic system of STK 400 with external hydraulic system.

Front connectors (to the tractor):

Red – air vent and PTO power supply (or the seeder air vent),,

Yellow – 3-point linkage

WS – free flow

Green – lifting the machine, folding side frames (only STK 400) and working elements

Rear connectors (to the seeder):

Red – air vent or PTO

Blue – markers

WS – free flow

Green – unfolding of the machine (only STK 400)

31. Brake system

The cultivation unit STK is equipped with a pneumatic brake system.

The brake system must always be connected and operational when driving on the road. Always check the operation and condition of the brake system before transport. Remember to release the parking brake before setting off. Before disconnecting, secure the machine against rolling away. All repairs and adjustments of the brake system can be performed only by specialized workshop or employees specially trained for that purpose by Czajkowski Maszyny Sp. z o.o.

Brake diagram

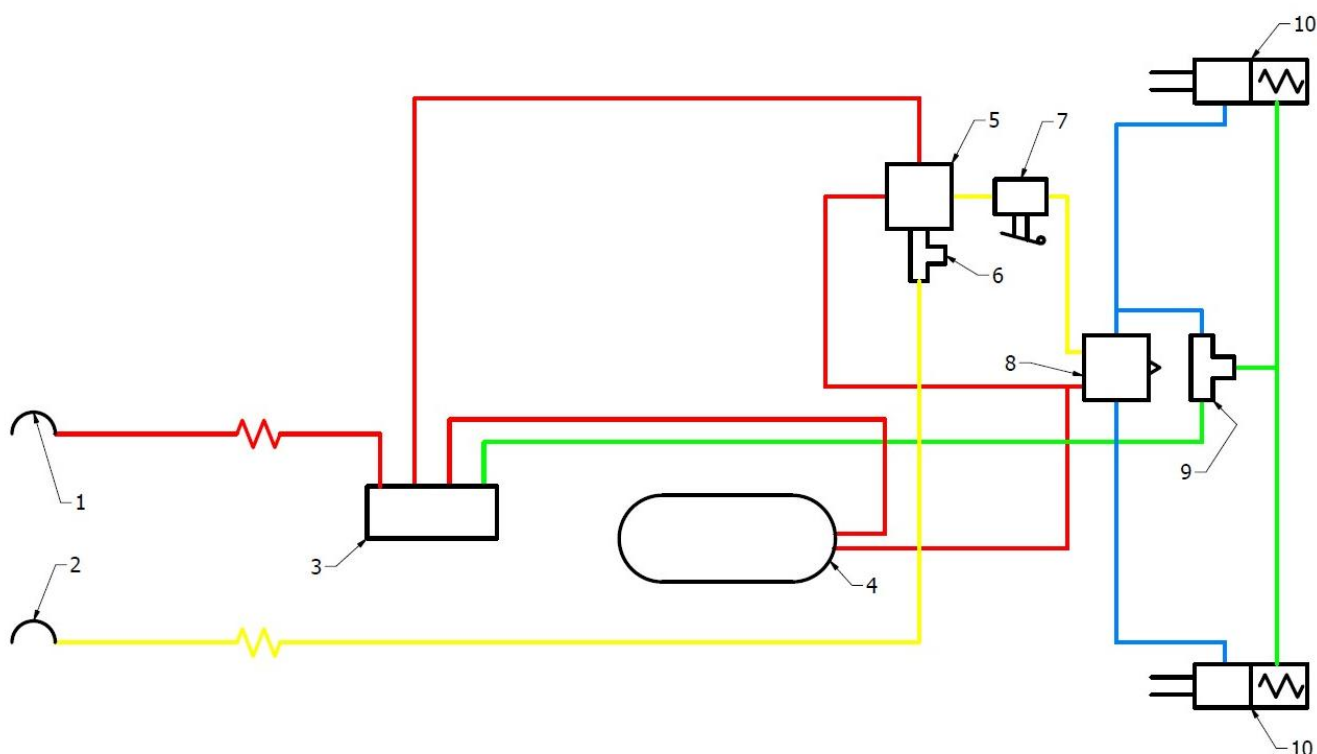


Fig. 39. Brake diagram.

1	Red coupling head
2	Yellow coupling head
3	Park and shunt valve
4	Air reservoir
5	Main valve
6	Control connection
7	Control valve
8	Relay valve
9	Double non-return valve
10	Brake cylinder

Parking brake

The Czajkowski unit is equipped with a parking brake. It is used to immobilize the vehicle when stationary and to prevent the vehicle from rolling away.



Fig. 40. Parking brake.

Red button – to park the machine.

Regardless of whether the machine is coupled or uncoupled, the red button must be pulled out to properly park the machine using the spring brake.

Black button – to release the machine.

Release valve – allows the automatically braked, disconnected machine to be moved. Pressing the black button releases the brake.

MACHINE DECOUPLED FROM THE TRACTOR				
Button color	Button position	Button color	Button position	Brakes
Black	Pressed in	Red	Pressed in	Released
Black	Pulled out	Red	Pressed in	Braked
Black	Pressed in	Red	Pulled out	Braked
Black	Pulled out	Red	Pulled out	Braked
MACHINE COUPLED TO THE TRACTOR				
Button color	Button position	Button color	Button position	Brakes
Black	Pulled out	Red	Pressed in	Released
Black	Pulled out	Red	Pulled out	Braked

32. Lightning

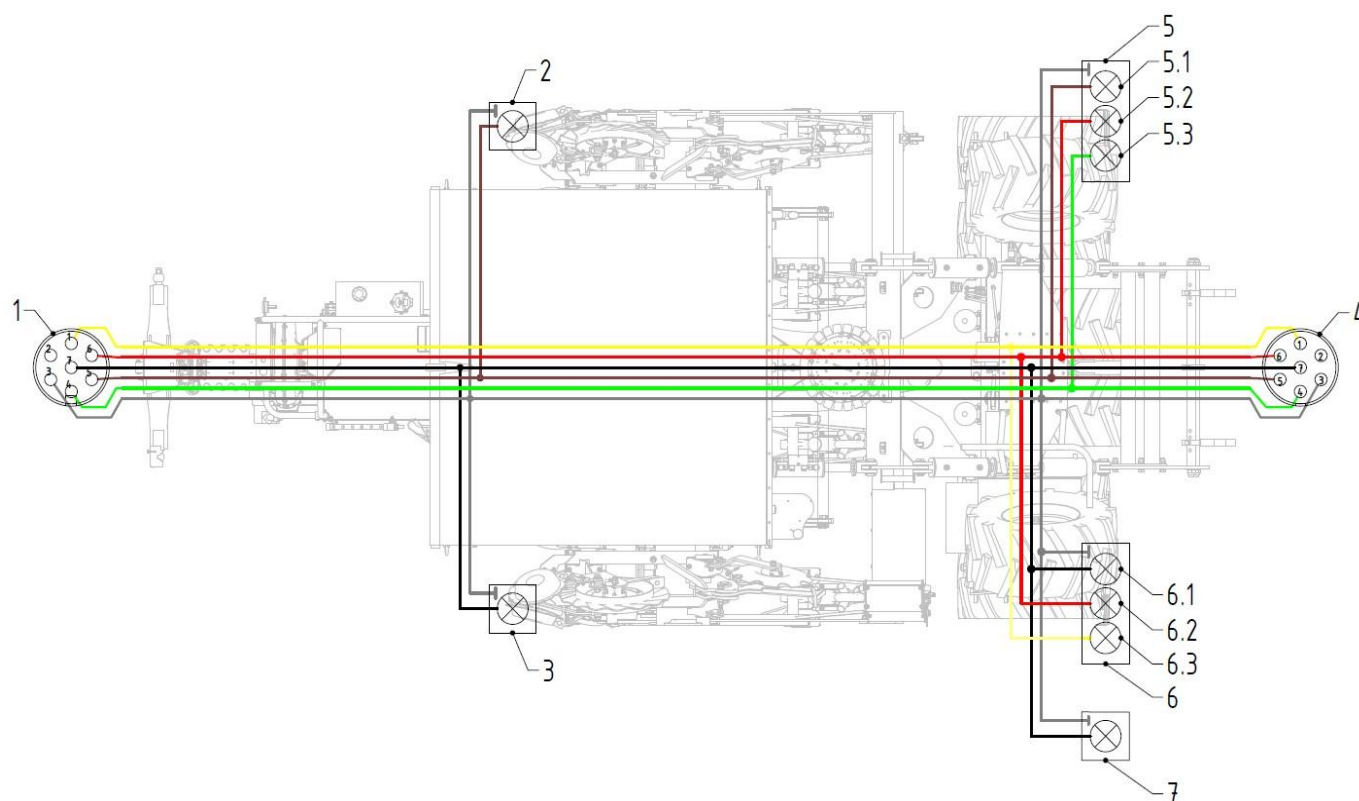


Fig. 41. Lightning system

Lightning installation
1. 7-PIN male connector
2. Right front lamp
3. Left front lamp
4. 7-PIN female connector
5. Right rear lamp 5.1 Right tail light 5.2 Stop 5.3 Right indicator
6. Left rear lamp 6.1 Left tail light 6.2 Stop 6.3 Left indicator
7. License plate lamp

Connectors and wires markings			
Nr.	Symbol	Colour	Function
1.	L	Yellow	Left indicator
2.	-	-	-
3.	31	White/Grey	Ground
4.	R	Green	Right indicator
5.	58R	Brown	Right tail light
6.	54	Red	Stop
7.	58L	Black	Left tail light

ATTENTION

- Electrical repairs can only be performed by a person with electrical qualifications.
- Damaged lighting can lead to an accident.
- Regularly check if the lights are working properly, that they are clean and that the marker boards are clean.

33. Function-describing pictograms

N017 – Working pressure of hydraulic protection



34. Handling

34.1. Preparing machine for work

Before starting work, check the technical condition of the machine, in particular the condition of the working elements. Once the working elements are worn out, replace them with new ones.

Furthermore:

- Check the screw connections and pins of the rear three-point linkage, working sections; tighten any loose connections, secure the pins.
- Check folding, unfolding, lifting and lowering of the machine.
- Check the condition of the machine's hydraulic and pneumatic hoses for leaks, pressure losses, and damage. Replace damaged hoses with new ones.
- Check whether quick release couplings of hydraulic hoses fit into the hydraulic sockets, adjust if necessary (in particular the free flow)
- Check the cable (extension cable) between the tractor and the precision seeder.
- Check whether the spacing of the working sections corresponds to the planned sowing, adjust if necessary.
- Set the hydraulic distributor section in the tractor used to operate the Seeding Attachment to the open position - free flow.

34.2. Operator position

The machine operator's position is located in the tractor cabin. The machine is operated by one person.

34.3. Noise level

The measured sound pressure level at the workplace was 90.1 dB(A). The measured sound power level of the machine was 76.1 dB(A). The need to use hearing protection depends on the noise level of the towing vehicle with which the cultivator will work. The machine manufacturer recommends the use of hearing protection.

34.4. Operating the fan

The hydraulic fan is powered directly by the tractor's hydraulic system or by an optional external system powered by the tractor's PTO. The air flow generated by the fan moves the seed from the sowing unit through the seed distributor heads to the coulters. The amount of air required for correct seeding depends on the weight and type of seed, the sowing speed and the working width, which is why determining the correct speed must be specified during field tests. The air flow must be set as precisely as possible; if the air flow speed is set too low, the seed may remain in the hoses and cause them to clog. Too low air speed may also result in incorrect distribution of the seed material. Therefore, it is recommended to set the fan speed as high as possible. The seed should be placed correctly on all sections immediately after sowing begins. When sowing large areas, it is recommended to check the correctness of the sowing process. Special attention should be paid to eliminating contamination on the protective grid and fan blades, as this contamination can lead to air loss, hose clogging, unbalance of rotating elements, which can damage the bearing. The fan speed is regulated by the amount of oil (see photo below). The hydraulic pump must deliver sufficient amount of oil so that the fan speed does not decrease even when the tractor speed drops or another hydraulic function is switched on.

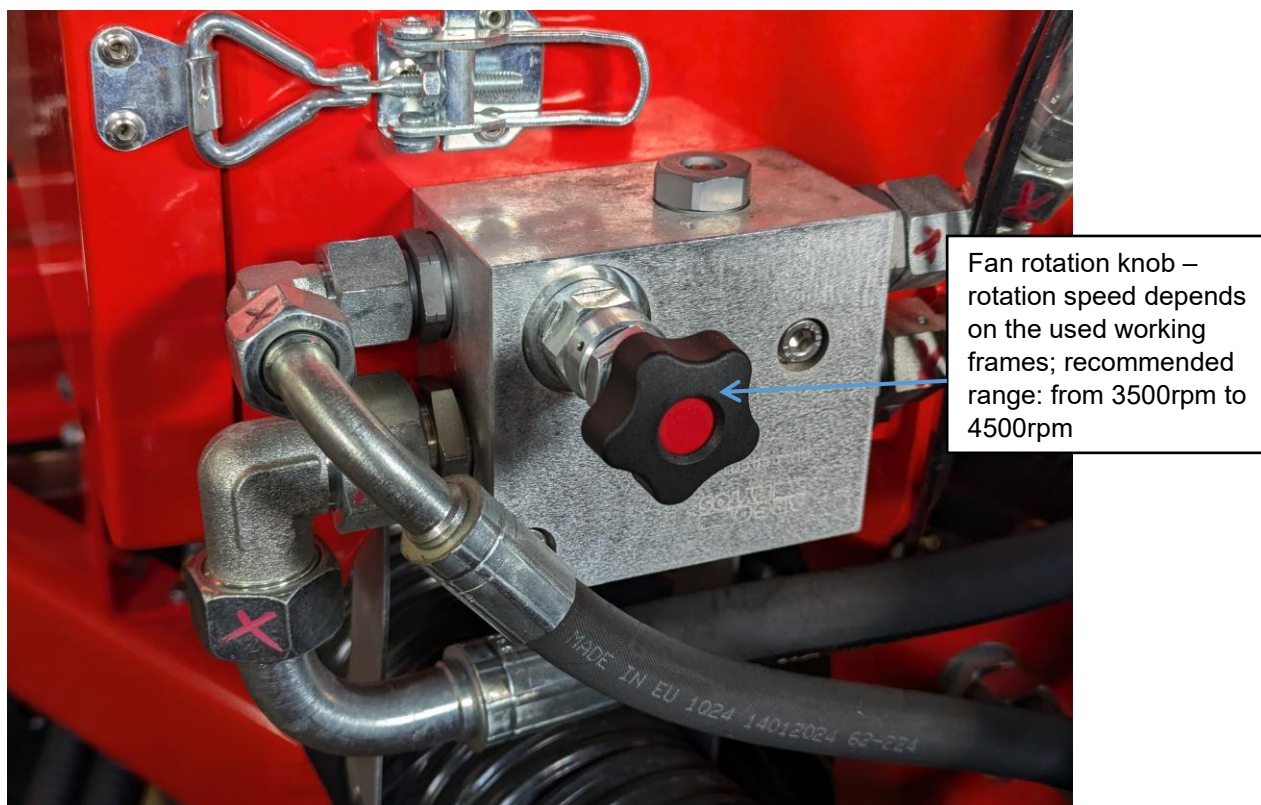


Fig. 42. Knobs for adjusting fan and PTO rotational speed of the attached equipment.

The airstream is regulated by means of the airstream controller. To change the direction of the airstream, change the position of the flap in the appropriate direction using the lever, placing it in the correct hole on the adjustment comb. Setting the lever to position 0 means the neutral position. In the neutral position, the air flow is divided equally into each of the two outlets. When the lever is directed in direction I, a larger amount of air will flow in pipe I. If we direct the lever in direction II, a larger amount of air will flow in pipe II. The position of the adjustment lever indicates the direction of increased flow.

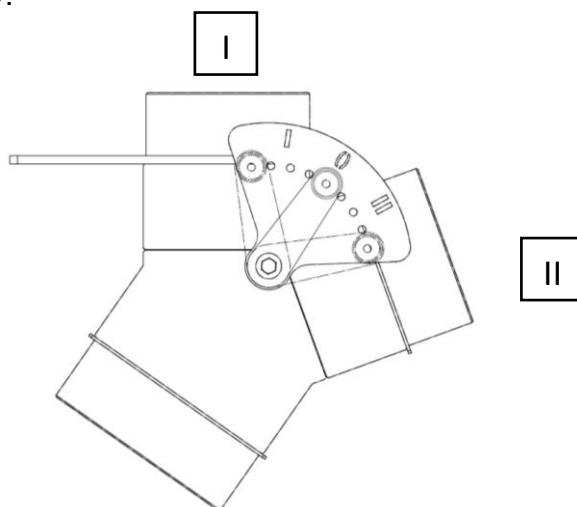


Fig. 43. Airstream controller.

34.5. Changing the number of rows

The hose system is always ready for complete equipment. If only half of the frames are used (75 cm spacing STK 300 4 frames), two hoses lead to one distributor in the frame. In the case of other frame spacings, the hoses must be attached individually to the distributors.

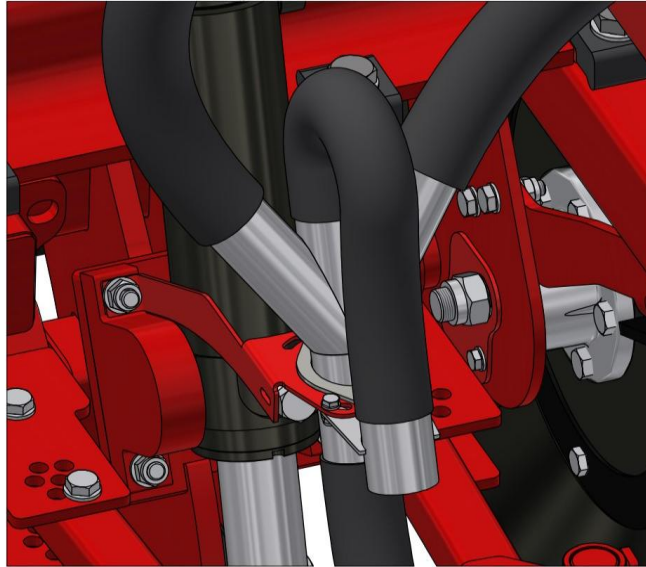


Fig. 44. Connecting the fertilizer hoses to the distributor of the working section

34.6. Operating the hydraulic system

The hydraulic system is under high pressure. Escaping fluid can penetrate the skin and cause serious injury. If you are injured, seek medical attention immediately. The hydraulic system of the machine can pose a risk to people and the machine itself in the event of incorrect operation.

It is important to pay attention to the following aspects:

- The system is under high pressure;
- Hydraulic hoses may only be connected to the tractor when the hydraulic systems of the tractor and the implement are depressurized.
- Leaking oil can cause fires and endanger health.
- All hydraulic lines (hoses, fittings) should be regularly checked for visible damage or leaks. If any exist, they should be removed immediately.
- Plugs and sockets for hydraulic connections must be marked to prevent operating errors.
- Hydraulic hoses should be replaced at least every 6 years.
- There are pressure accumulators installed in the hydraulic system.

It is forbidden to modify pressure accumulators. Before maintenance, it is necessary to reduce the pressure in the hydraulic system. After emptying, the gas pressure is present in the tank.

34.7. Connecting the hydraulic hoses to the tractor

ATTENTION  To ensure that the machine works correctly, please follow the diagrams below, which show the correct connections of the hydraulic hoses!

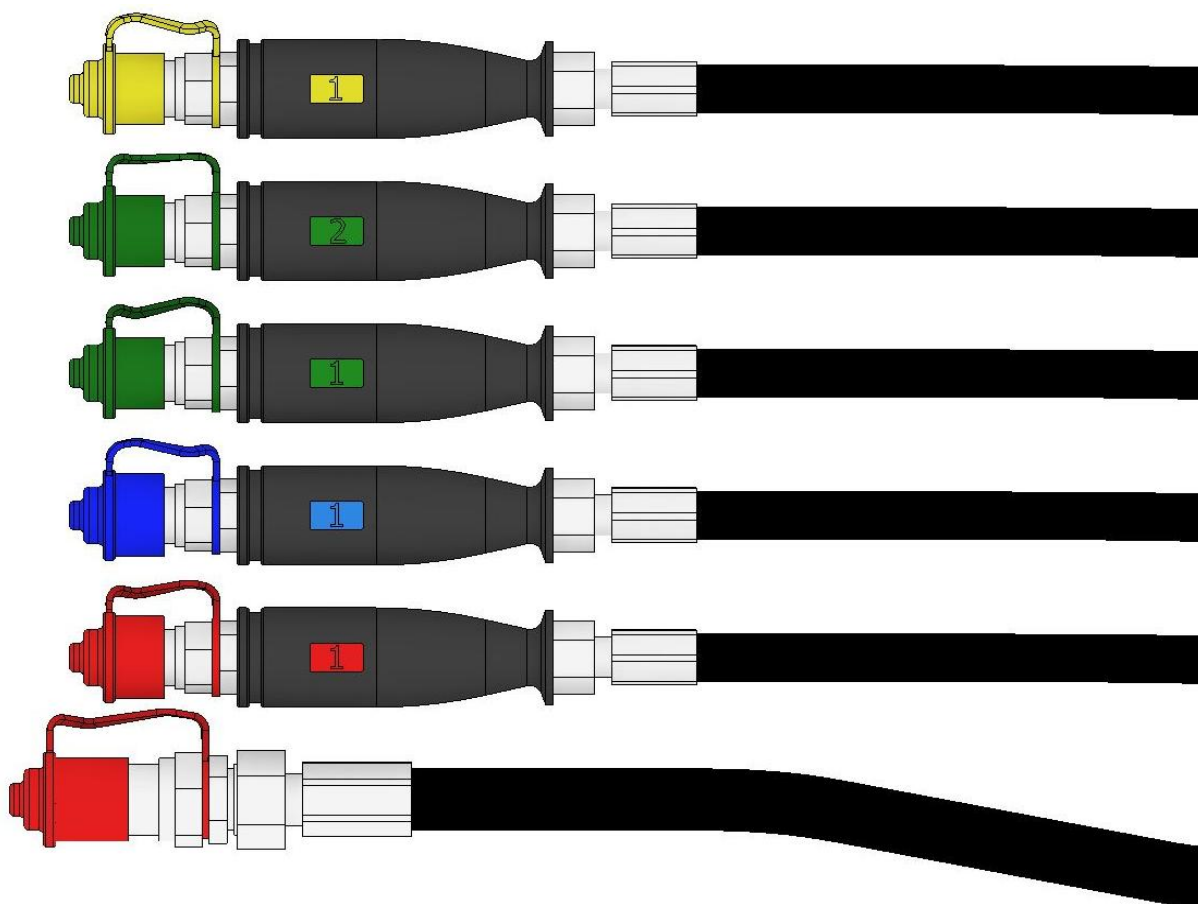


Fig. 45. Hoses connections to the tractor

Colours of hydraulic hoses connected to the tractor

- Yellow – Rear 3-point linkage
- Green (1 & 2) – Hydraulic bank power supply (lifting the machine and folding side frames and working parts)
- Blue – Front fan
- Red – Rear fan
- Red (without plastic handle) – Free flow (overflow)

If an external hydraulic system is used, the blue hydraulic hose is not used.

34.8. Connecting the hydraulic hoses to the STK unit

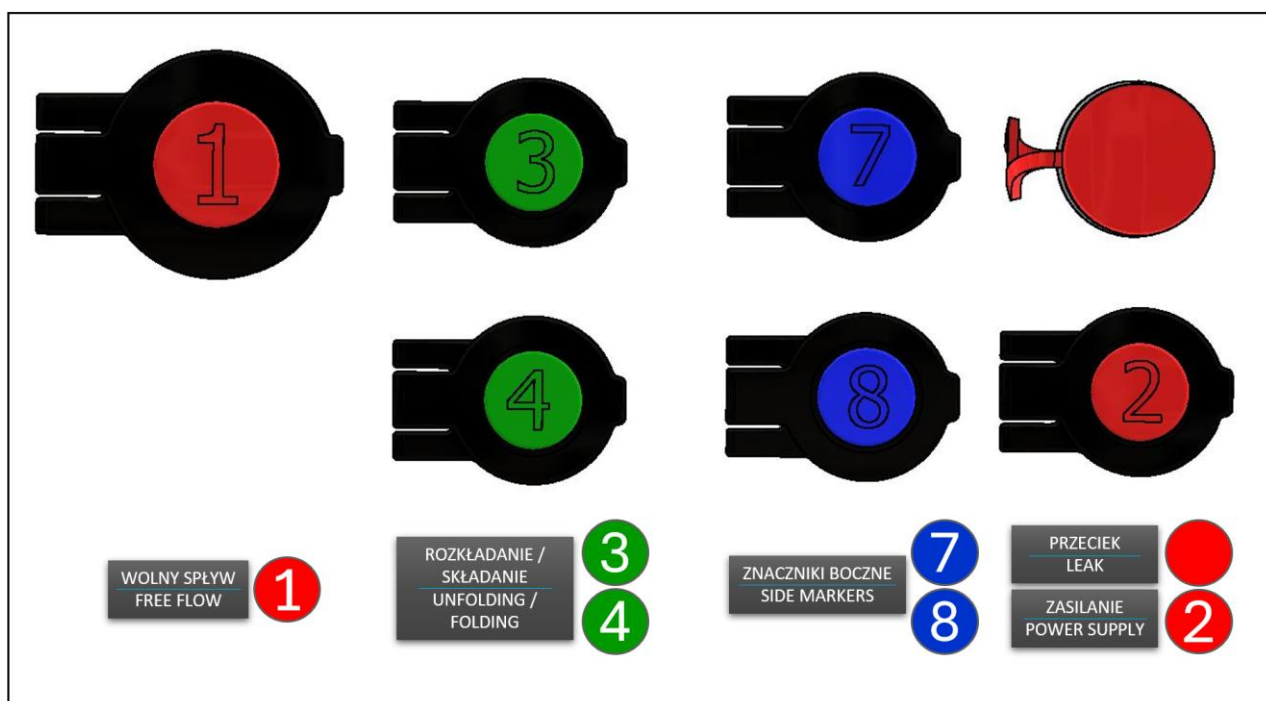


Fig. 46. Hydraulic sockets of the STK unit

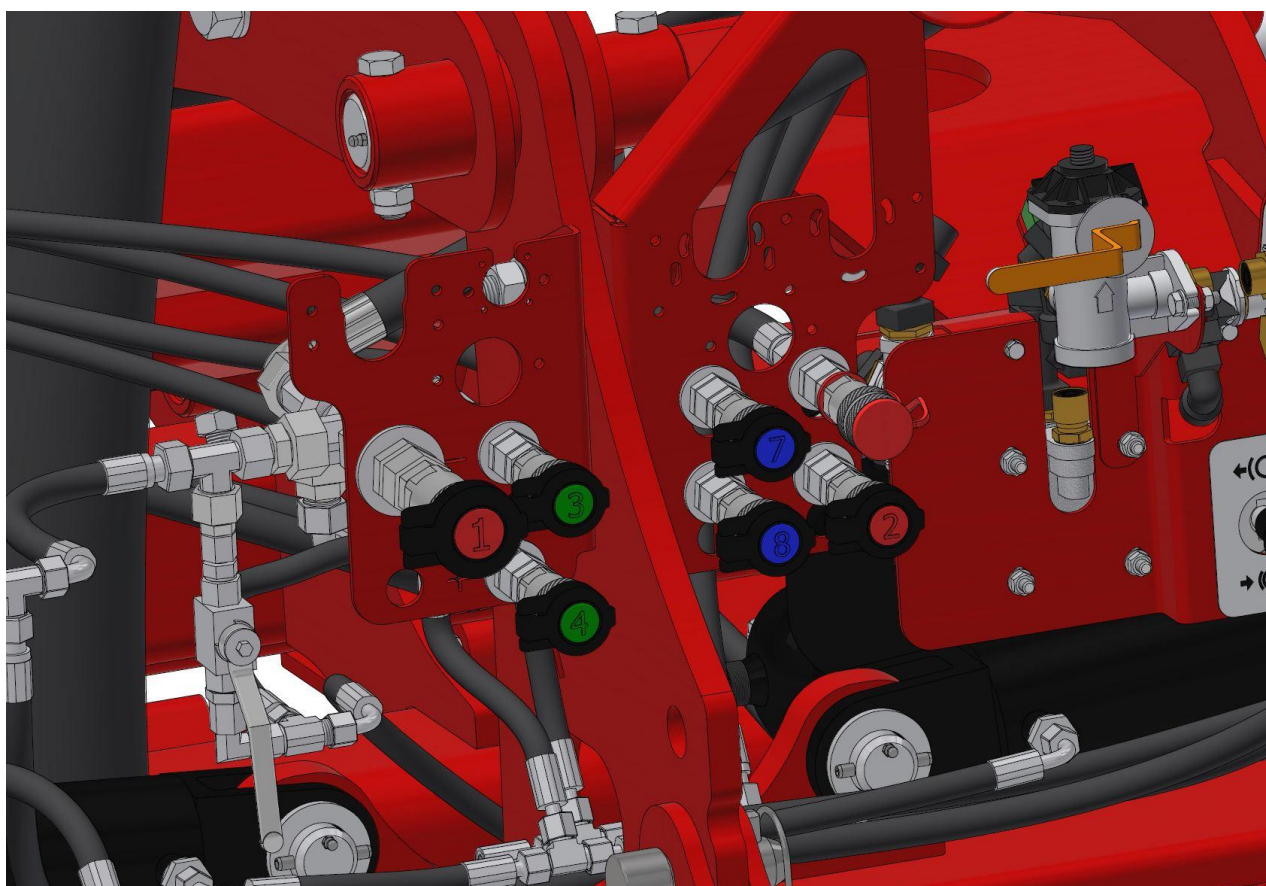


Fig. 47. STK hydraulic connections plan

34.9. Opening – closing the tarpaulin

In order to open the tank, release the cable [1] from the clamp [2] located on the face of the tank. Then, slowly let the cable [1] go and the tarpaulin [3] should fold. To close the tank, pull the cable [1], and the tarpaulin [3] should unfold. After the tarpaulin unfolds, secure the cable in the clamp [2] and roll the cable between two clamps [4].

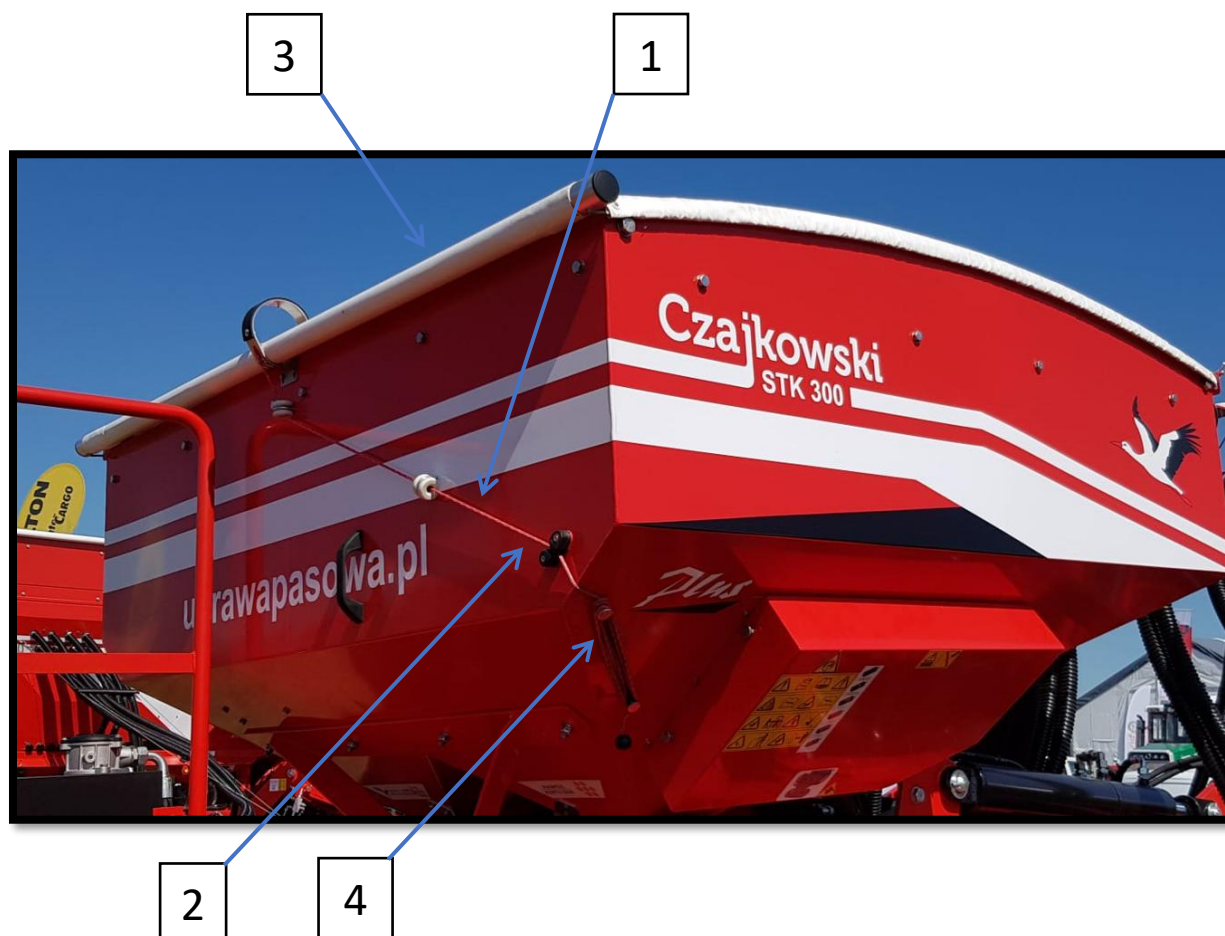


Fig. 48. Securing the tarpaulin

34.10. Adjusting the three-point linkage hooks

The rear three-point linkage of the unit has hooks with different spacing configurations. It allows for attaching units of linkages cat. 1, 2 and 3. To change spacing of the hooks loosen the nuts and counter screws. Then move the hooks to the desired width and lock them with the screw. In order to work properly, the hooks should be positioned symmetrically.

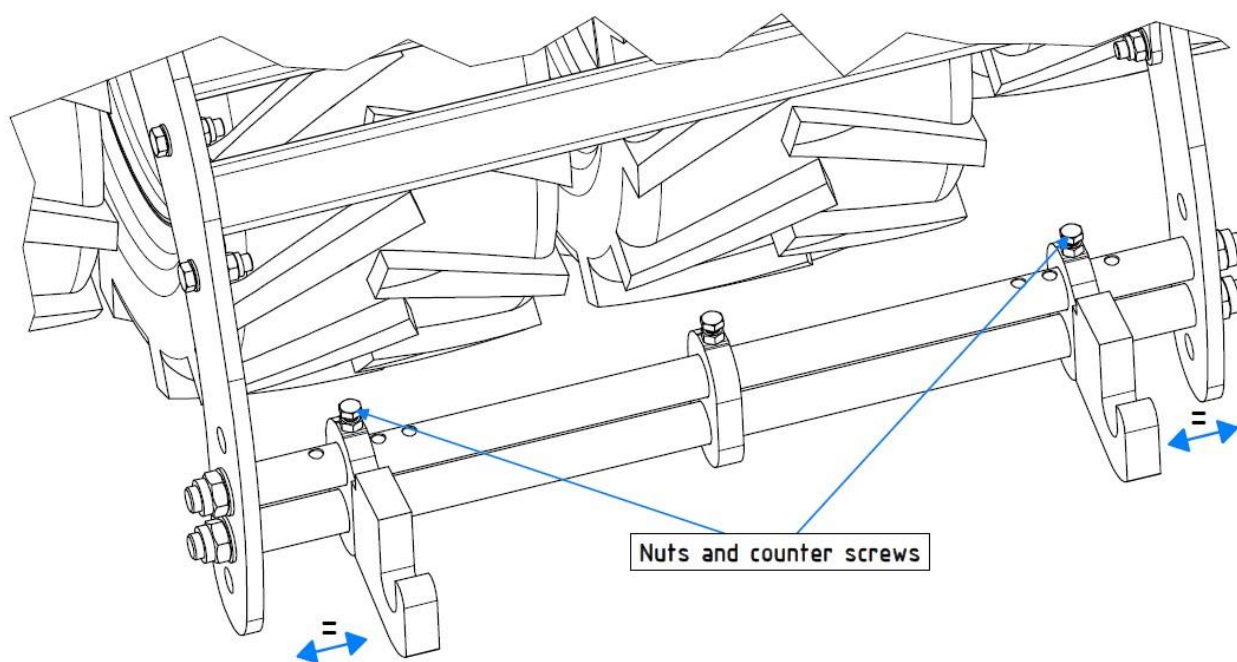


Fig. 49. Setting the linkage hooks

34.11. Adjusting the coulter pressure valve



Fig. 50. Adjusting the coulter pressure valve

Valve adjustment procedure:

- Loosen the lock nut
- Adjust using the knob – turning clockwise increases the pressure / turning counterclockwise decreases the pressure
- Tighten the lock nut after the pressure has been adjusted

The pressure must only be set when all coulters are fully open and the hydraulic system is still supplying oil to the coulter opening function.

The valve operates in conjunction with a hydraulic lock that maintains pressure in the coulters. Because of this adjustment is only possible "upwards" (you can only increase the system pressure).

If you need to reduce the pressure, proceed as follows:

- Retract the coulters.
- Unscrew the valve knob (turn counterclockwise).
- Activate the coulters opening function.
- Adjust the pressure.

34.12. Emergency mode for electronic controls

If machine electronics fail, the machine individual elements can be folded and unfolded in emergency mode. To start the emergency operation mode, screw the knob all the way into one of the three places that control the given components:

1. folding and unfolding of working elements,
2. folding, unfolding side frames,
3. lifting, lowering the main frame,

Mechanically activated coil in the valve bank will enable free flow of oil.

As standard, the knob is partially screwed into coil no.2. This knob is adapted to all three coils, so we can also control coils number 1 and 3 by removing the plastic covers.

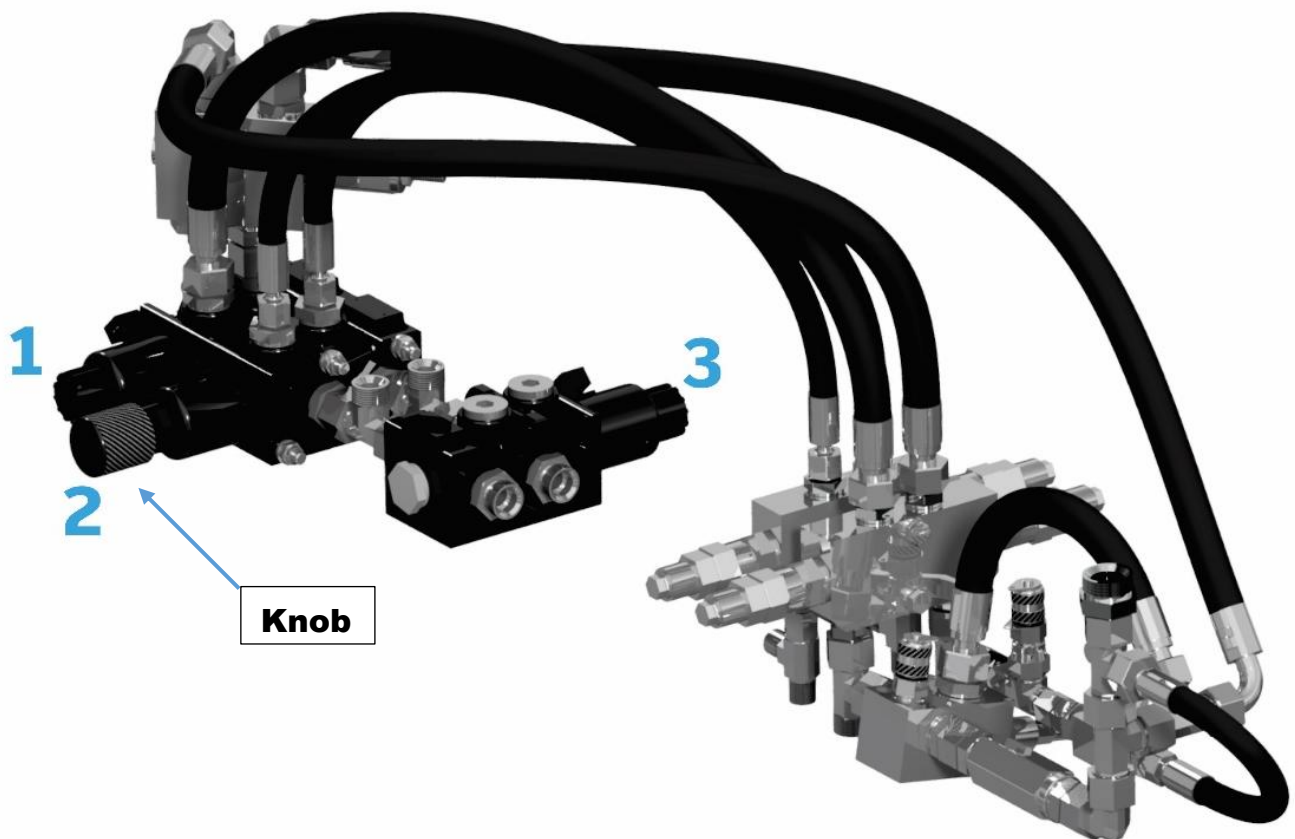


Fig. 51. Hydraulic bank

ATTENTION  Secure the system by closing the oil flow when transporting the folded machine in emergency mode.

34.13. External hydraulic system

Optionally, STK can be equipped with an external hydraulic system. The main parts of the external hydraulic system include:

1. Oil tank with a capacity of 50 liters.
2. Oil pump mounted on the tractor PTO.
3. Hydraulic oil cooler.
4. Hydraulic oil filter.

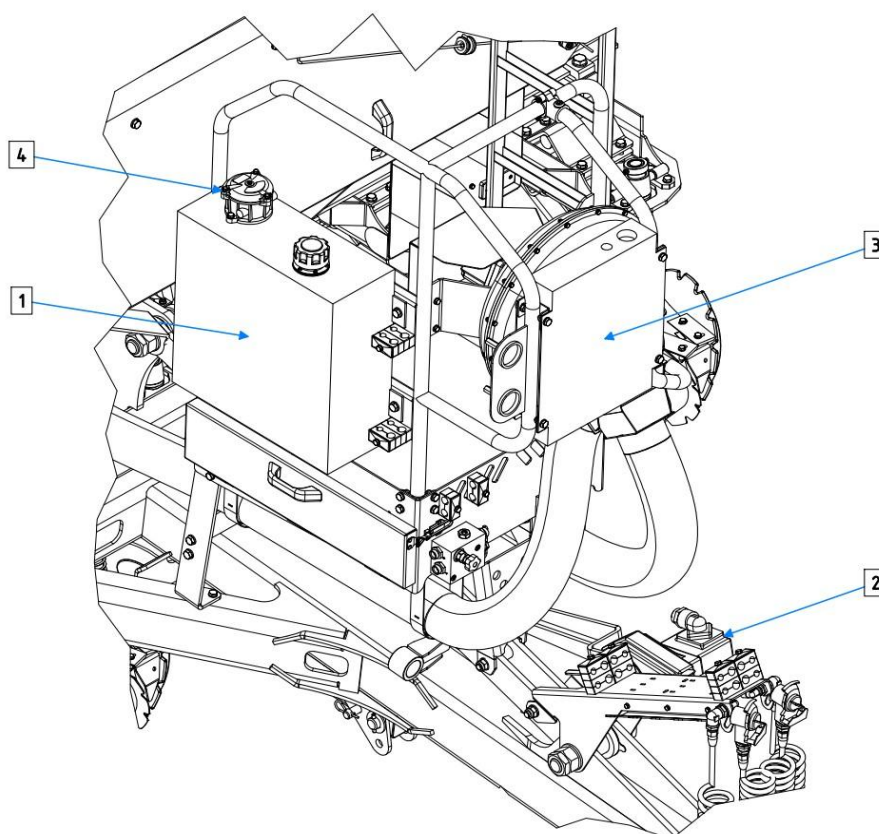


Fig. 52. External hydraulic system

After mounting the oil pump on the tractor's PTO shaft, it must be secured against automatic rotation as this may damage the pump.

The hydraulic oil filter must be replaced at least once a year.

You must control the tank filling level, which should optimally be half of the indicator's scale. The maximum working temperature should not exceed 80 degrees C.

It is recommended to use 540 rpm of the PTO shaft to operate only the STK fan. If we also drive the machine attached to the rear three-point linkage of the STK, the PTO speed should be increased to 1000 rpm.

35. Seeding device

Seeding device consists of the following parts:

1. Apparatus body,
2. Drive motor,
3. Sowing shaft,
4. Side cover,
5. Mixer,
6. Gears
7. Gust attachment.

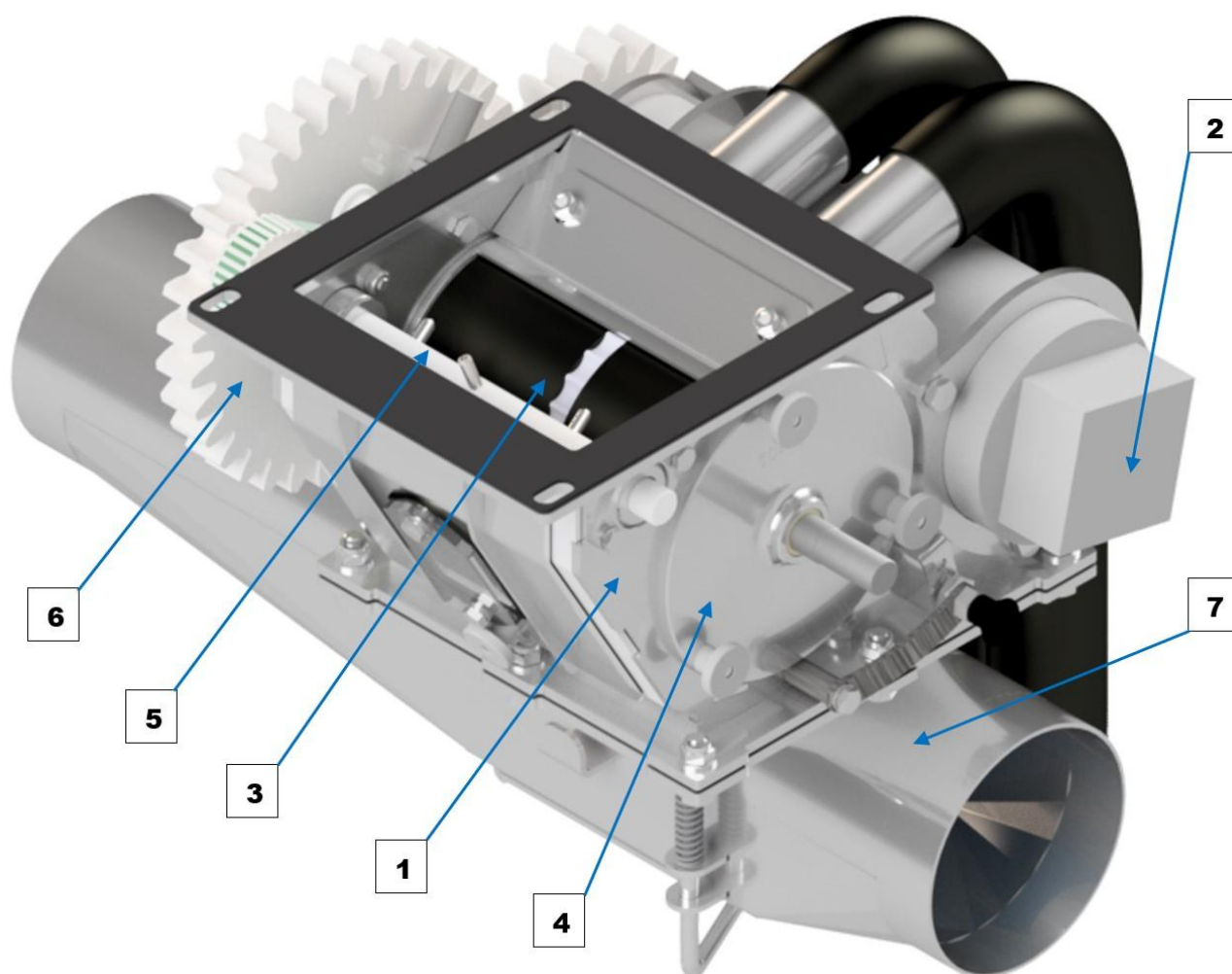


Fig. 53. Seeding device.

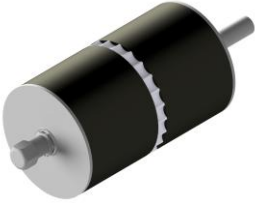
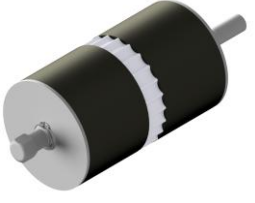
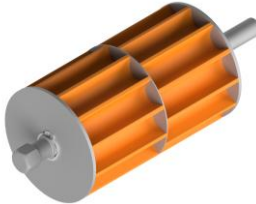
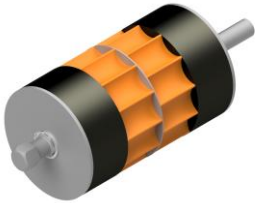
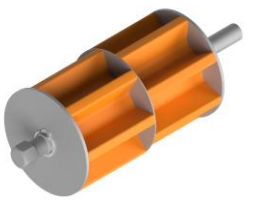
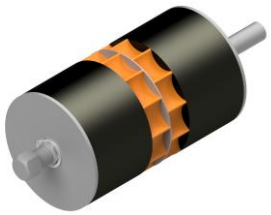
Parts necessary to operate the seeding device can be removed without tools. The device's flap enables verification of the correct functioning of the seeding device. It is also used to empty the tank of remaining seed material and makes it easier to clean the device. The mixer is used to crush the seed material and ensure that the seeder shafts are completely filled. At the top, there's a hatch that separates the seeds from the seeding device. A gust attachment is mounted at the bottom. The gear is protected by a cover that allows easy access to the gears and selection of the appropriate ratio.

When assembling the device, the edges of the contact must be sealed. Leaks may lead to changes in seed rates.

35.1. Sowing shafts (Rotors)

Dedicated sowing shafts have been made for the seeder device, which differ in relation to profiles of seeders. The table below shows the seeding shafts with their numbers from 1 to 7 and the exact values of dosed volumes. The use of several types of seeding shafts allows for a wide range of sown doses and different sizes of seed material. During the operation of the sowing shaft 1 and 2, only the sowing disc rotates, the other elements are blocked by a limiter against the body of the device.

Table 2. Sowing shafts

Name	Picture	Suggested dose
Sowing shaft 1		Rotor rapeseed - working width to 3 m
Sowing shaft 2		Rotor rapeseed - working width from 4 to 6 m
Sowing shaft 3		Rotor 100-200 kg
Sowing shaft 4		Rotor 200-280 kg
Sowing shaft 5		Rotor 50-100kg
Sowing shaft 6		Rotor 280-400 kg
Sowing shaft 7		Rotor 25-50 kg

35.2. Replacing the sowing shaft

To replace the sowing shaft, close the hatch and empty the body of the device from the seed material. Then perform the following steps in the correct order:

1. Open 3x star knobs [1],
2. Remove the side cover [2],
3. Take out the sowing shaft [3],
4. Put in a suitable shaft [3] and check the limiter settings [4],
5. Put back the side cover and tighten it [2]

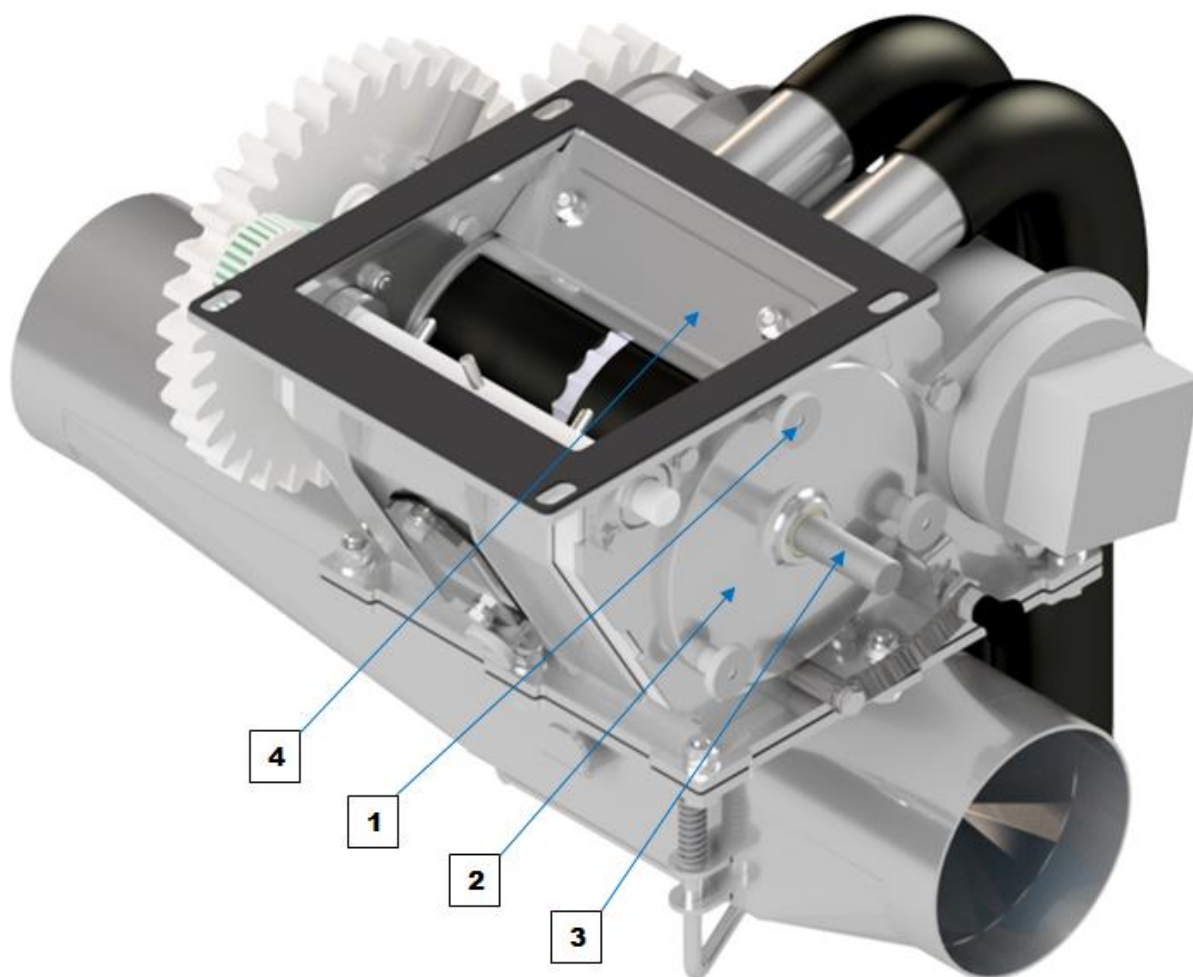


Fig. 54. Replacing the sowing shaft.

You must check the position of the limiter [4] and the guide seal [5] each time after replacing the sowing shaft [3].

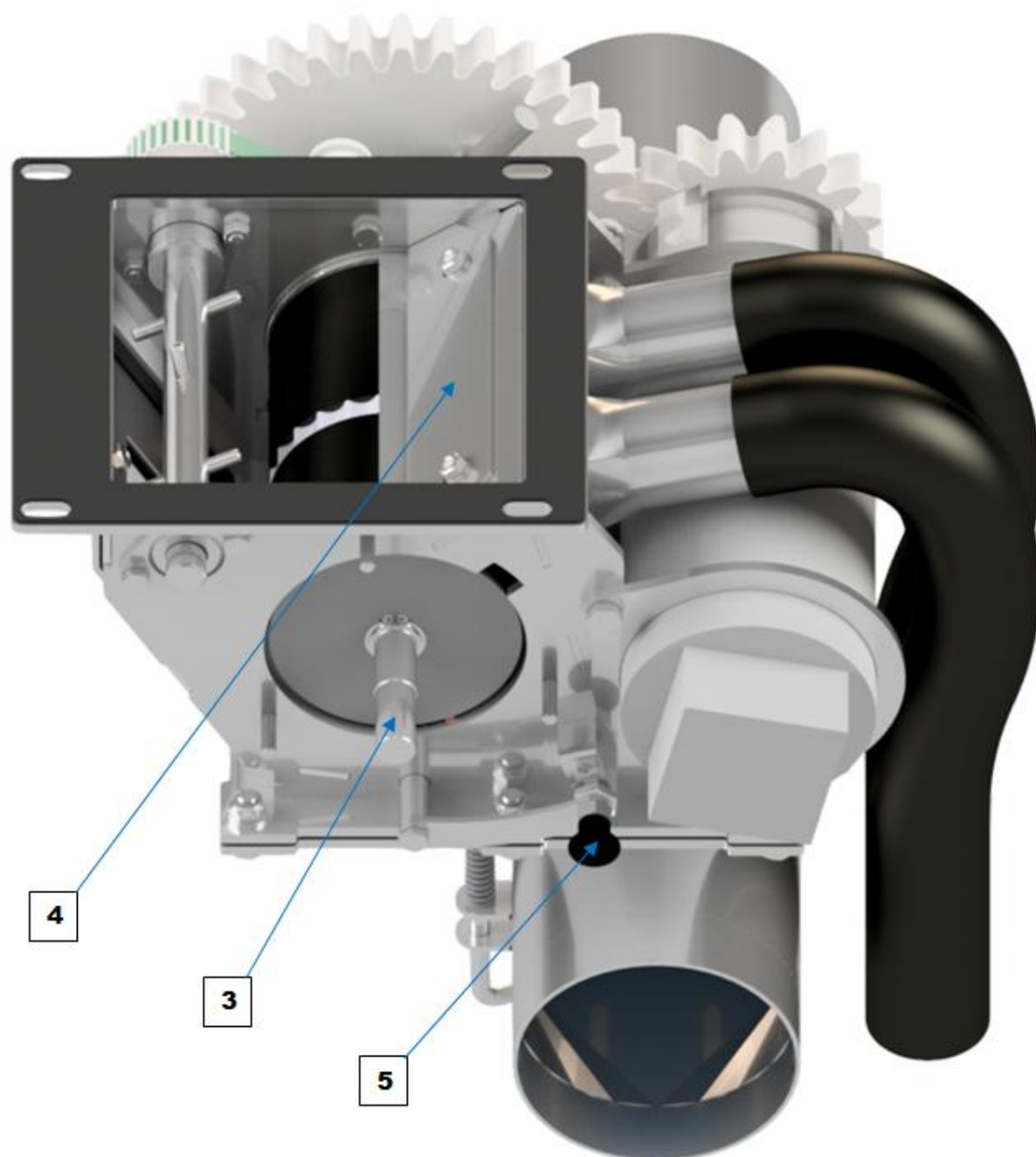


Fig. 55. Placement of the sowing shaft.

35.3. Gears

The seeding device has a set of gears to drive the sowing shafts. The available gears have the ratio of 1:2 and 1:1. Gears can be installed interchangeably, the device must be checked for correct functioning after gears are replaced.

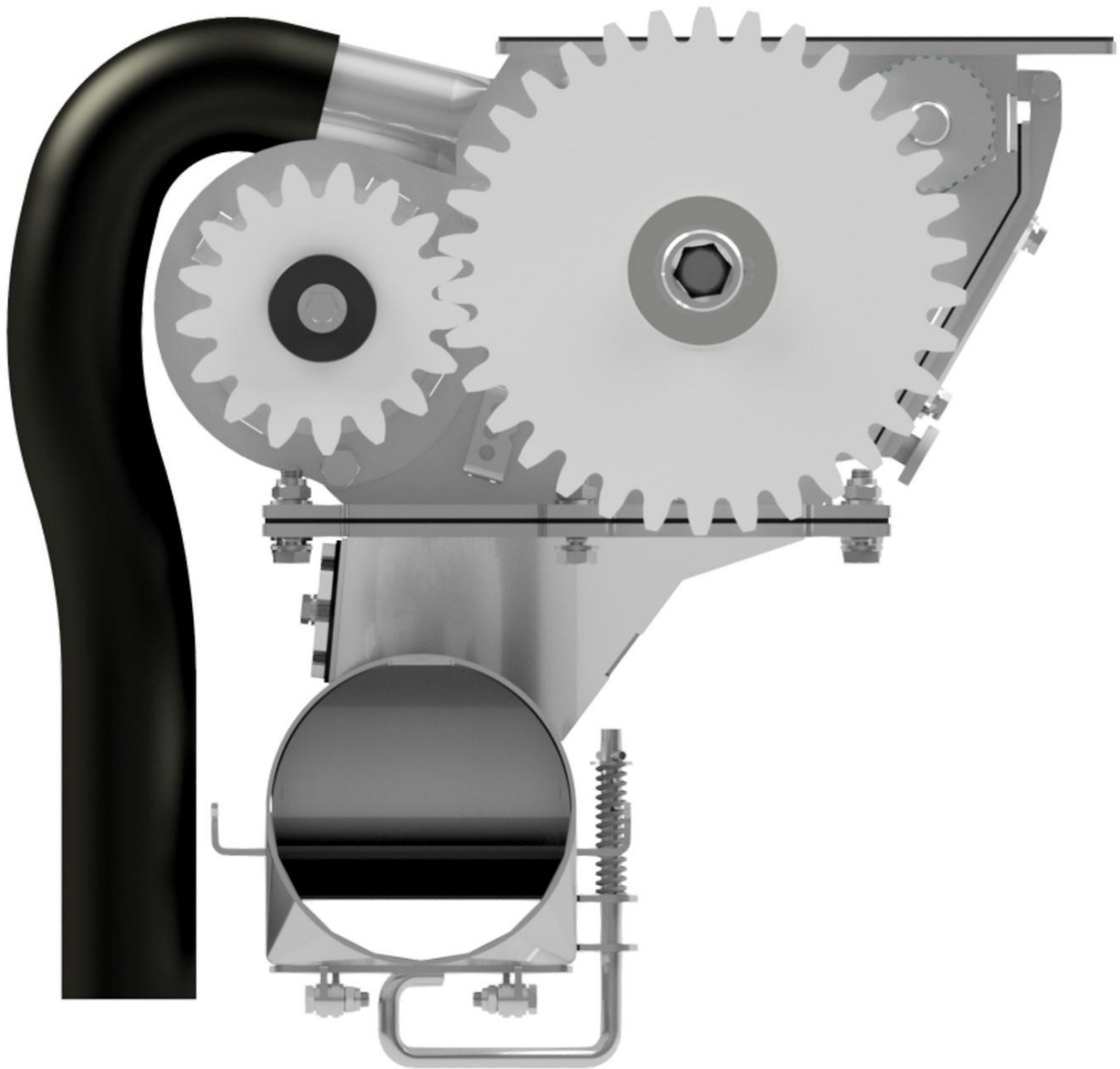


Fig. 56. Gears of the seeding device.

35.4. Gear wheels cover of the seeding device

The seeding device is equipped with a gear wheel cover. For safety reasons, the cover must always be present on the device. After each removal of the cover, e.g. during maintenance, remember to mount the cover back on.

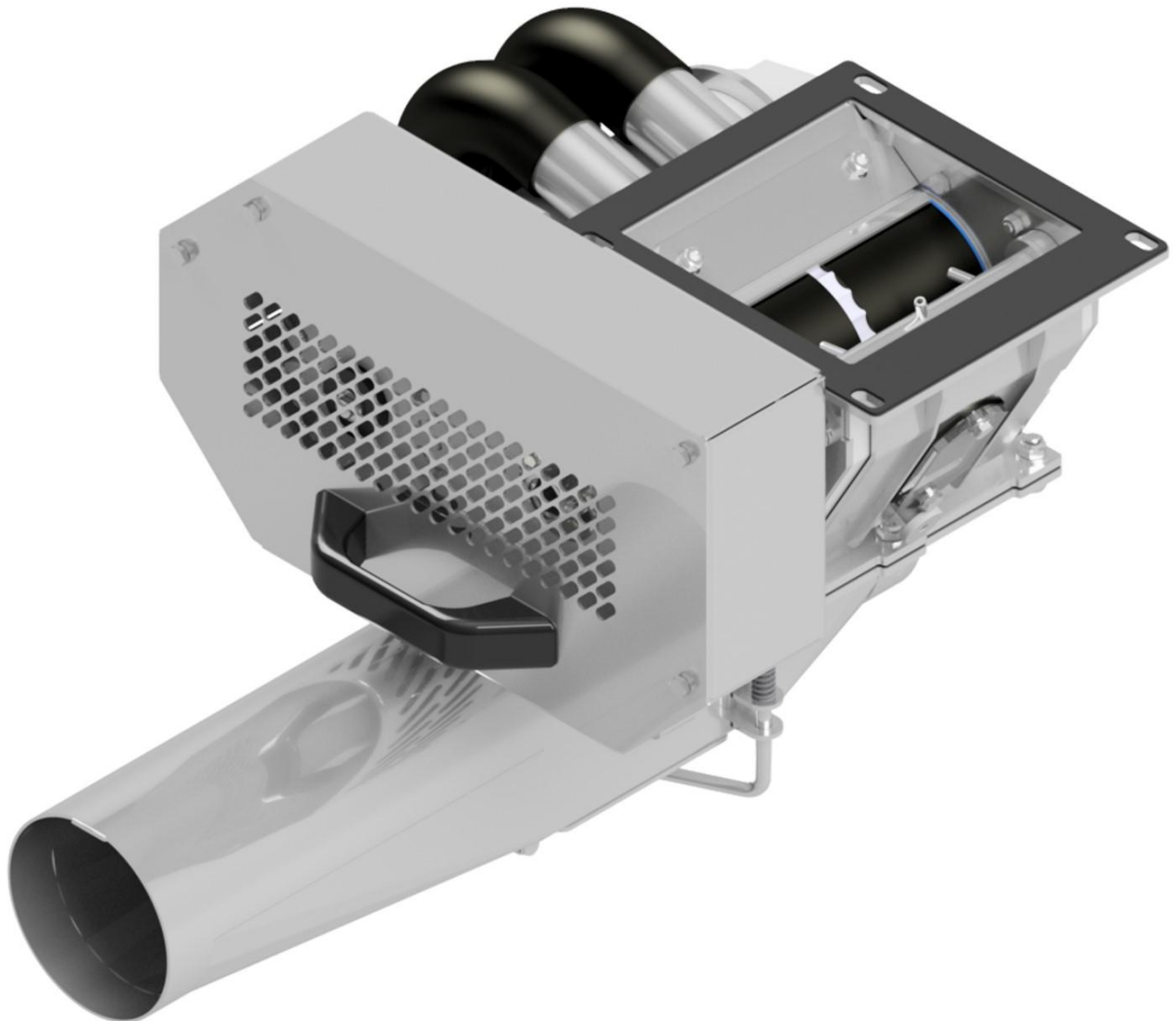


Fig. 57. Gear wheels cover

35.5. Adjusting the scraper

The Scraper [5] adhering to the sowing shaft can be adjusted in 3 positions. Check the position of the scraper and its condition before starting the machine, any damage may lead to inaccurate sowing doses. When sowing small seeds, set the scraper to the highest adjustment position, and for sowing large seeds, set it to the lowest position.

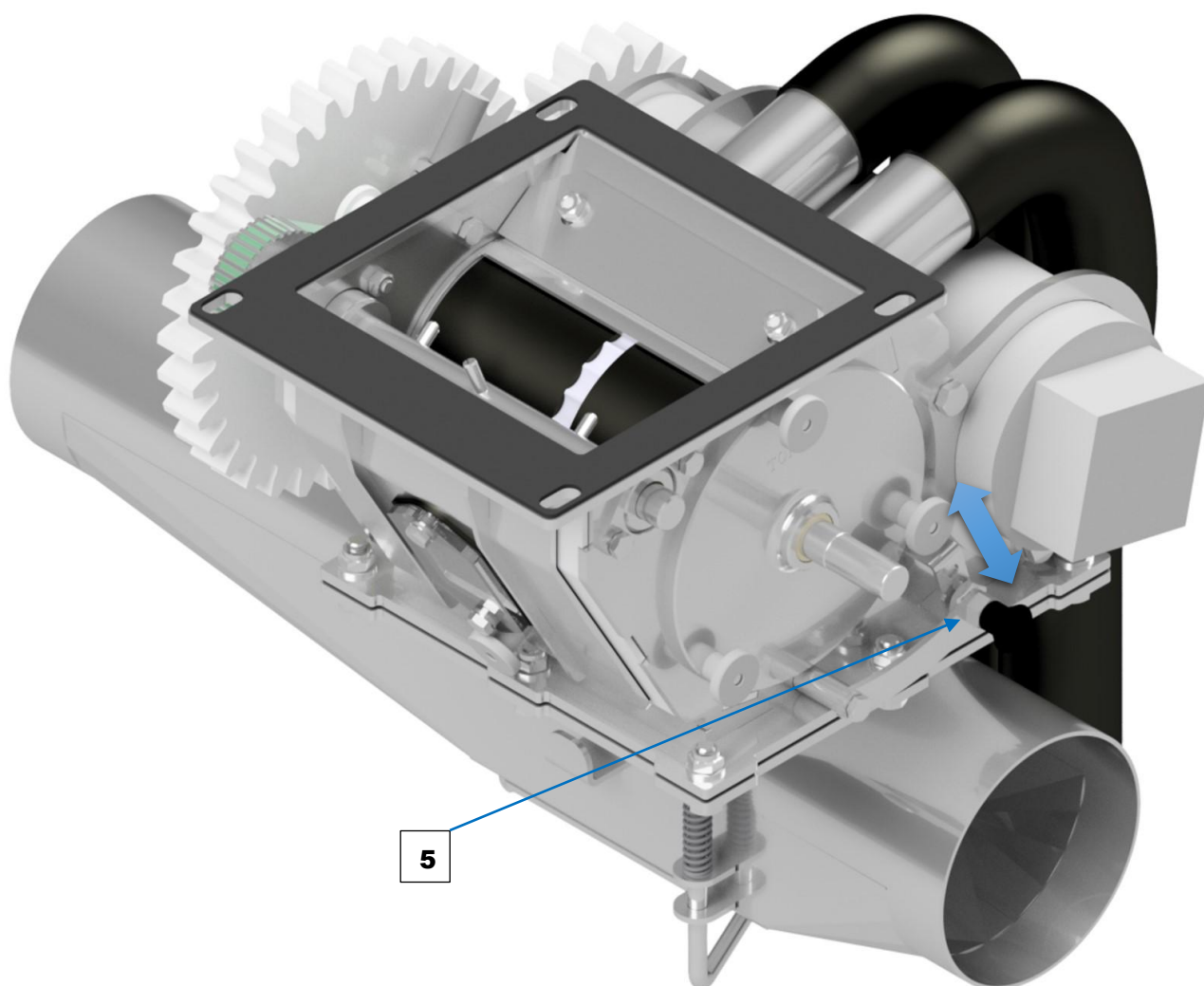


Fig. 58. Adjusting the scraper.

35.6. Adjusting the limiter

The limiter affects the tightness of the seeding device. It should be set relative to the sowing shaft; it is recommended to select the smallest gap possible. In addition, the adjustment plate should be set in the appropriate position depending on the type of material being sown; for small seeds, it is recommended to set the adjustment plate as close to the sowing shaft as possible. After the above-mentioned adjustments are done, check if the sowing shaft can move freely. Incorrect adjustment may damage the device.

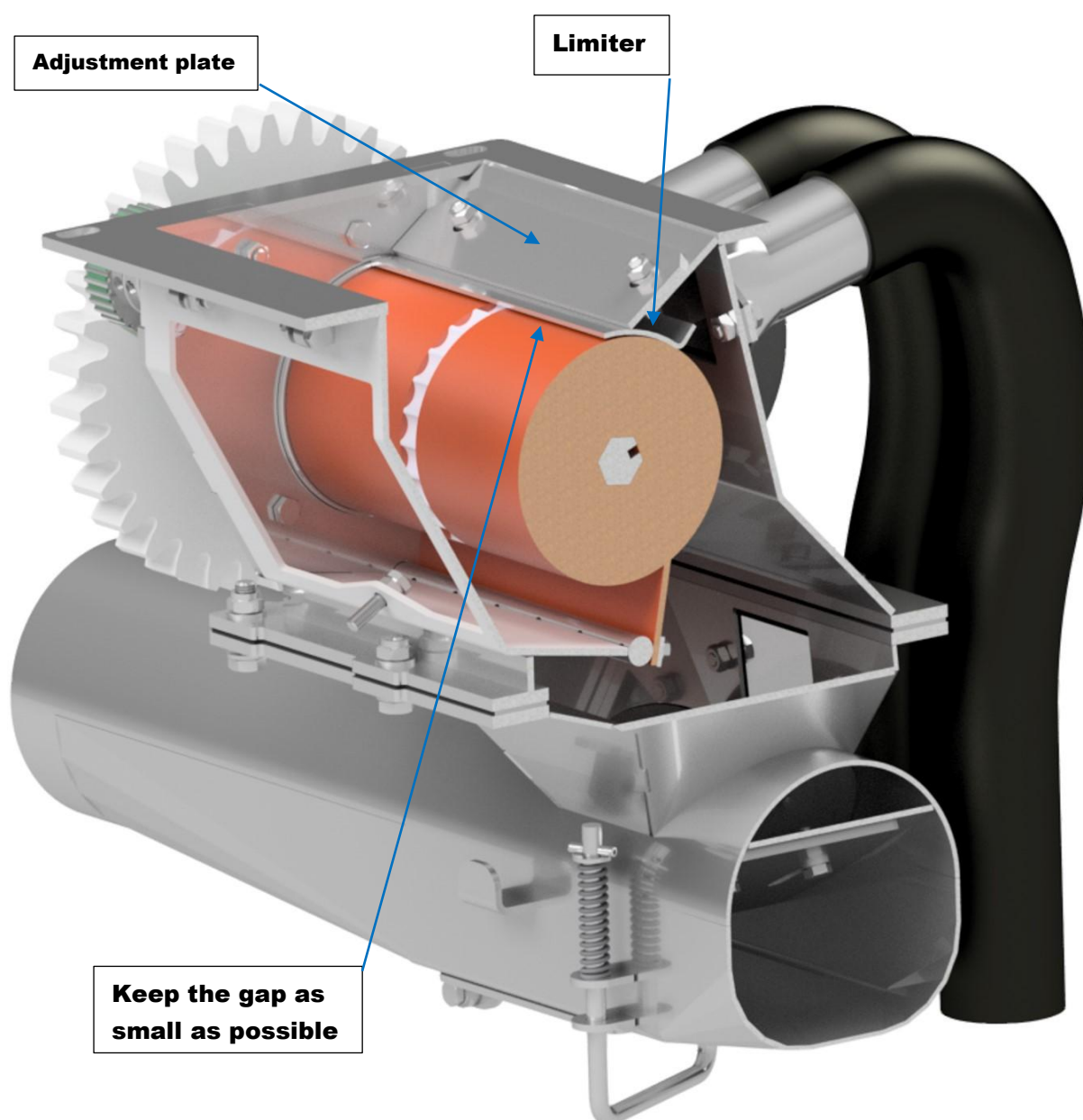


Fig. 59. Adjusting the limiter.

35.7. Tensioner

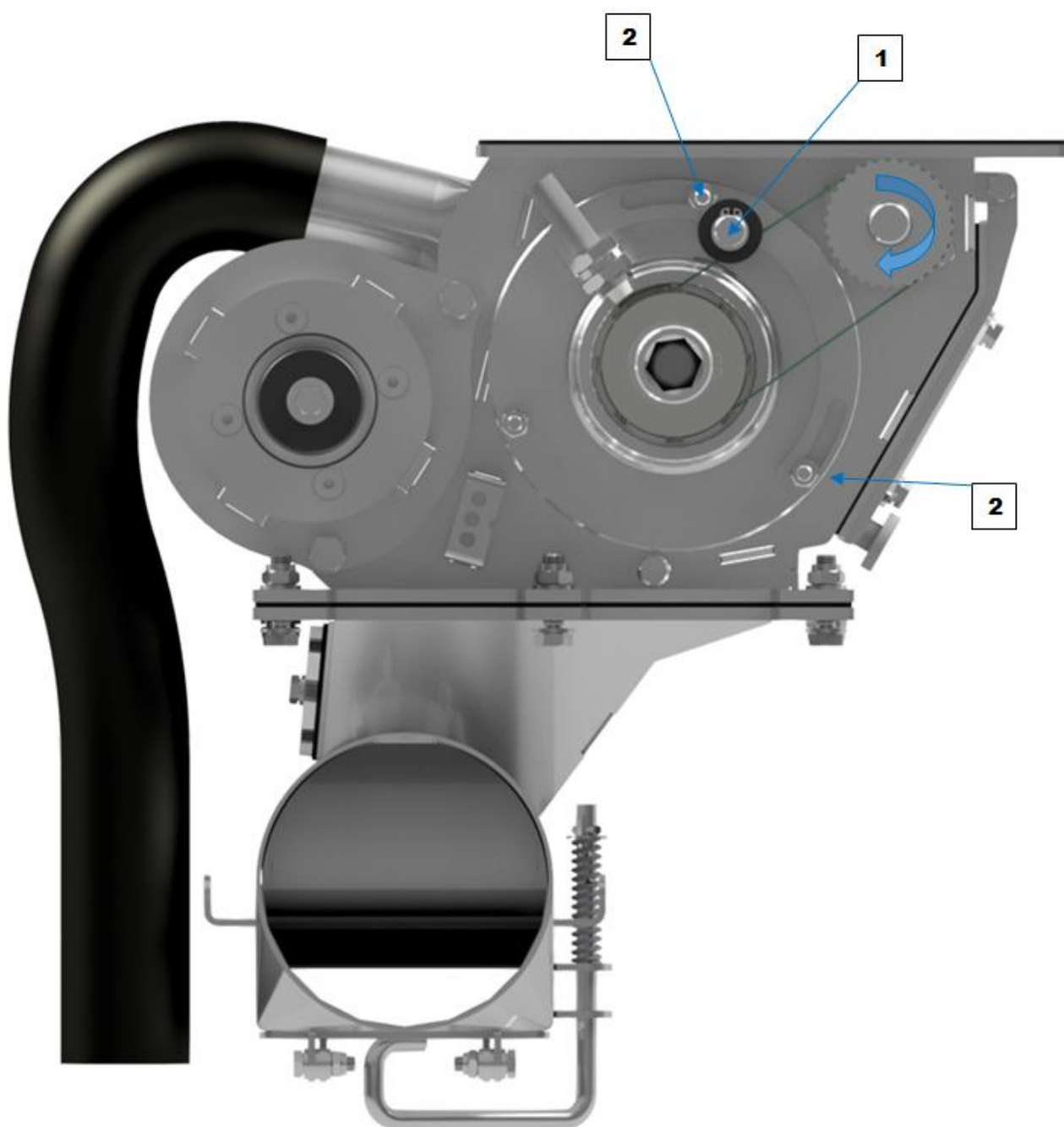


Fig. 60. Tensioner.

The tensioner (item 1) is for adjusting the tension of the mixer drive belt. You must check its condition before starting work. In order to adjust the position of the tensioner, unscrew the two m6 bolts (item 2).

35.8. Gust attachment

The gust attachment is equipped with a flap, which allows for taking the material from the calibration test. After the test the flap must be tightly closed.

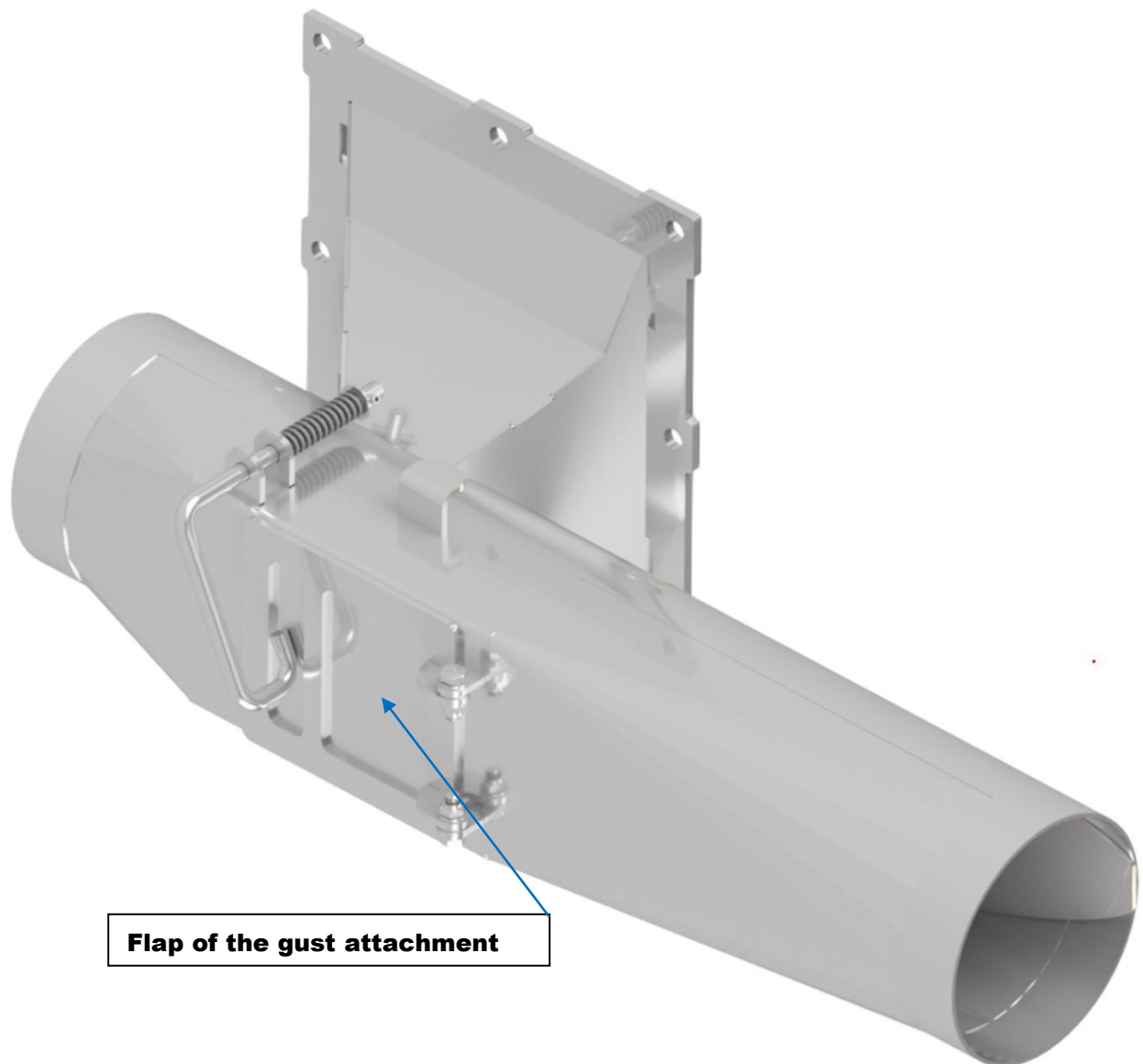


Fig. 61. Flap of the gust attachment

The gust attachment allows for adjusting the air inlet, which must be properly set in relation to the sowed dose.

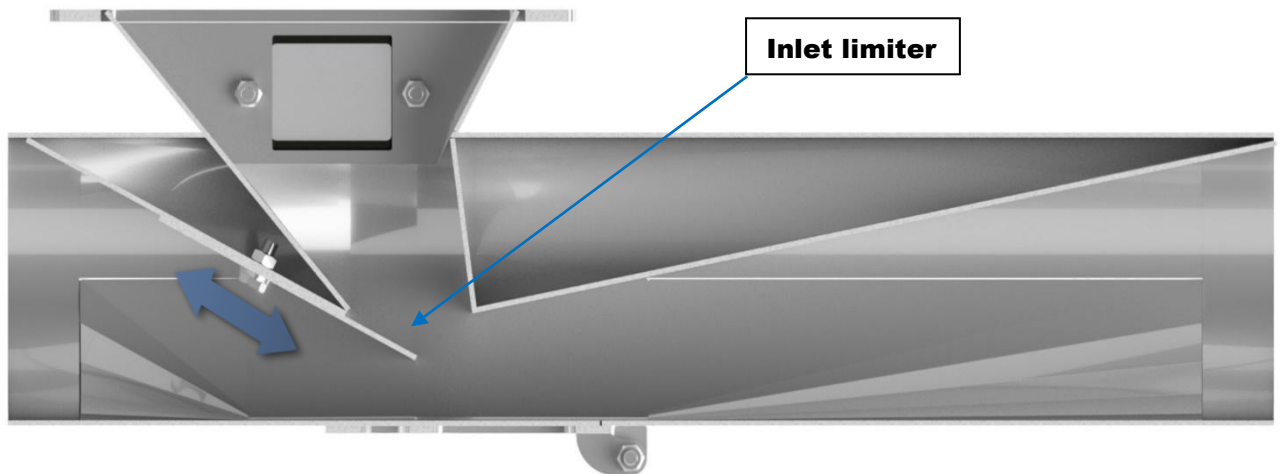


Fig. 62. Inlet limiter.

35.9. Seeding device calibration test button

In order to start the calibration test of the seeding device, press the yellow button with the gear icon located above the sowing device.



Fig. 63. Seeding device calibration test button placement



Fig. 64. Seeding device calibration test button

36. Maintenance

1. Before performing any maintenance, cleaning or repair work on the machine, turn off the PTO relay, the tractor engine and remove the key from the ignition.
2. You should regularly check the tightness of screws and nuts and tighten them if necessary (including wheels, mounting of working frames). These activities should be performed before each machine start-up.
3. Tighten the clamps securing the working sections after the first 50 ha of work and each time after 50 ha from the moment of changing the width of working sections.
4. Before starting maintenance work on the lifted machine, it is recommended to use appropriate supports or clips on the cylinders to prevent the machine from lowering itself.
5. Always wear protective gloves and use proper tool when replacing working parts of the machine.
6. Always disconnect the machine's power supply before working on the electrical installation.

ATTENTION  The electrical box may only be opened by Czajkowski Service or authorized persons!

7. Spare parts must meet the technical requirements of the machine manufacturer. This is ensured only by original spare parts.
8. Before starting any welding work, disconnect the clamps from the alternator and tractor battery. The manufacturer recommends disconnecting the machine from the tractor.
9. Protective devices exposed to damage should be checked regularly, and damaged ones should be replaced immediately.
10. Don't exceed the temperature of 60°C when washing the machine. In addition, it is recommended to:
 - empty the tank and dosing devices,
 - unfold and lower the machine,
 - use recommended and certified cleaning agents,
 - avoid places exposed to damage caused by a strong water stream, such as: the fan, electrical system, lamps, diodes, solenoid valves, electrical and electronic boxes, machine controller, transmitter, electrical sensors, various types of warning stickers, logo and wrapping.
11. The stroke limiter of the coulter beam cylinder should be cleaned every 200 ha or 100 hours of operation.
12. Coulter beam should be protected against corrosion between seasons to avoid problems with folding/unfolding.
13. Regularly check protective devices prone to damage, damaged ones must be replaced immediately.
14. The axle manufacturer recommends checking every 500h of work the tightness of the wheel nuts, brake linings, brake lever stroke and its eventual possible regulation. Then every 1500h, check the bearing play and its possible regulation.

36.1. Maintenance of the hydraulic system

Maintenance of the hydraulic system may only be performed by trained persons. Read and follow the contents of the "Safety" chapter.

Before each start-up of the machine, you should:

- visually check the tightness of the entire hydraulic system,
- check the hydraulic lines for visible damage to the hoses (abrasions, cracks, thickening, fractures, crushing),
- check the tightness of the screws and nuts,
- check the condition of the joints and mountings of the hydraulic cylinders.

ATTENTION  Hydraulic hoses should be replaced at least every 6 years.

36.2. Maintenance and adjustment of the distributor head

Cleaning must be performed in the following way:

- pull the parking brake of the tractor, turn off the engine and remove the key from the ignition,
- unscrew the wing nuts and remove the cover of the distributor head,
- remove deposits and dirt first with a brush and then compressed air,
- fix the cover of the head and close the wing nuts.

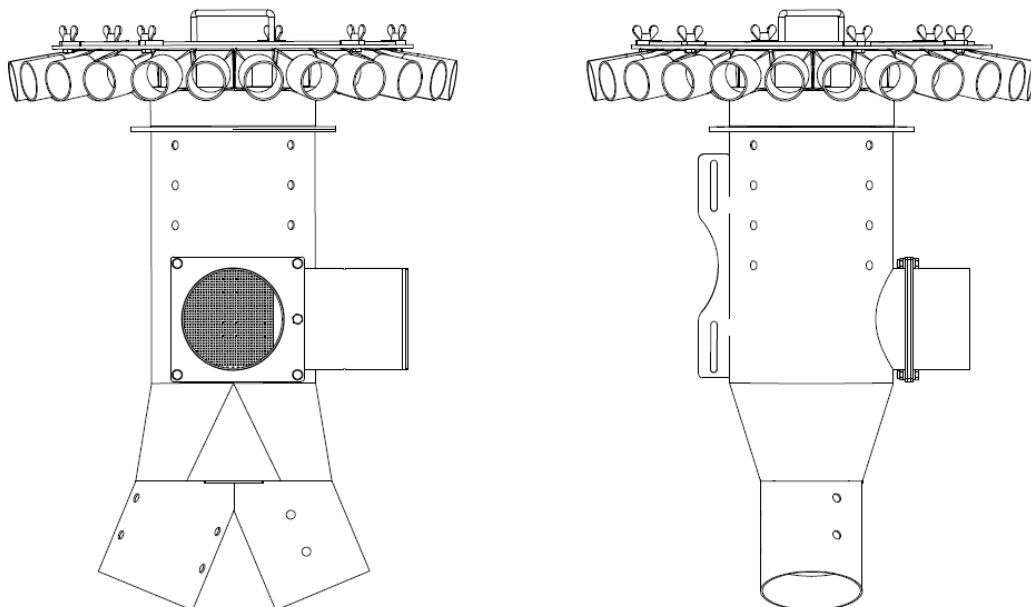


Fig. 65. Head of the seed distributor

36.3. Maintenance of the seeder

The sowing device does not require any special maintenance procedures, however, the device body should be emptied of any remaining seed material and cleaned thoroughly after work is finished, and its correct operation should be checked. If the machine will not be used for a long time, it is also recommended to dismantle the sowing shaft and set the device scraper in the inner, lower part of the body to the open position.

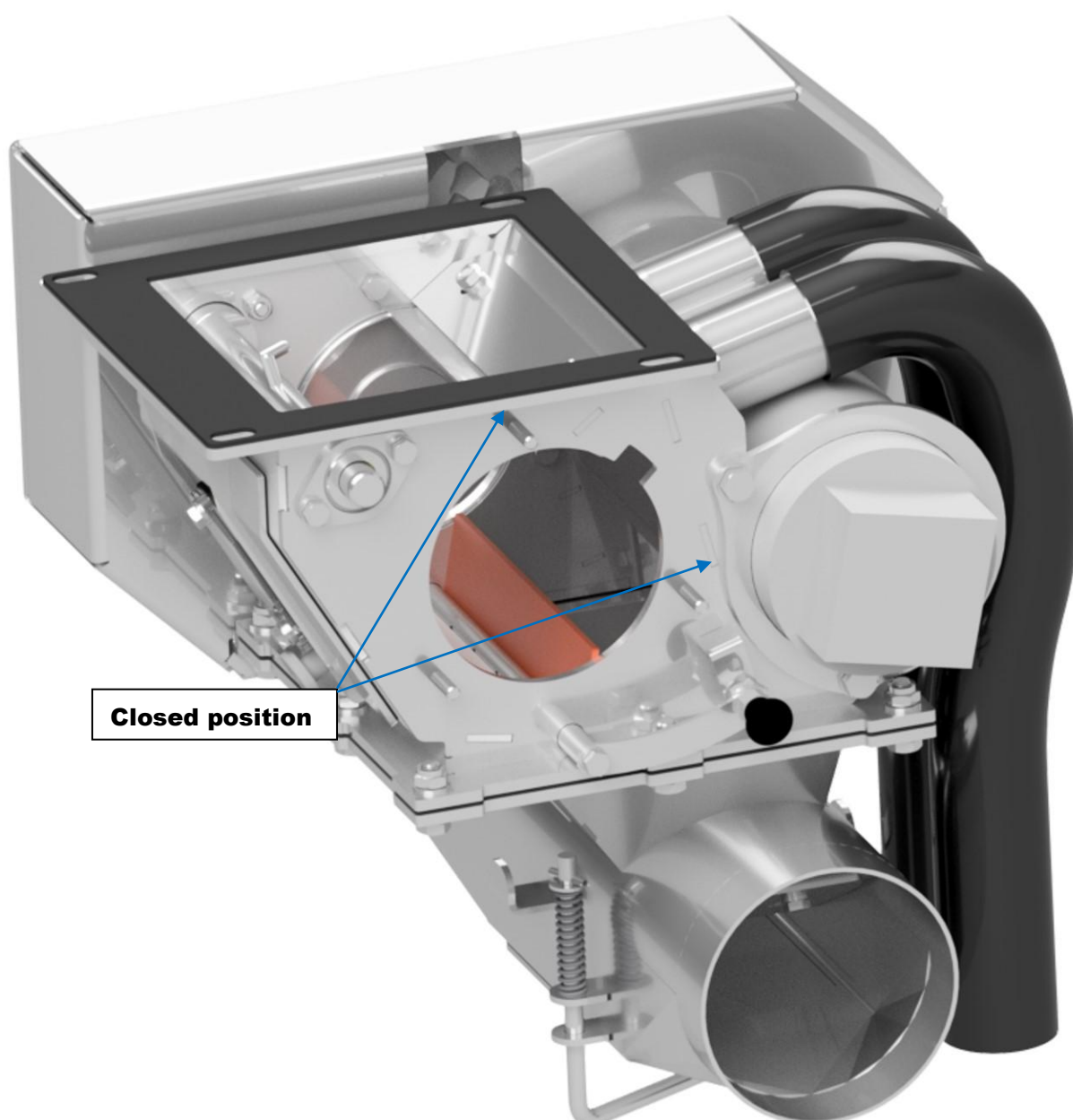


Fig. 66. Closed position of the scraper inside the seeder

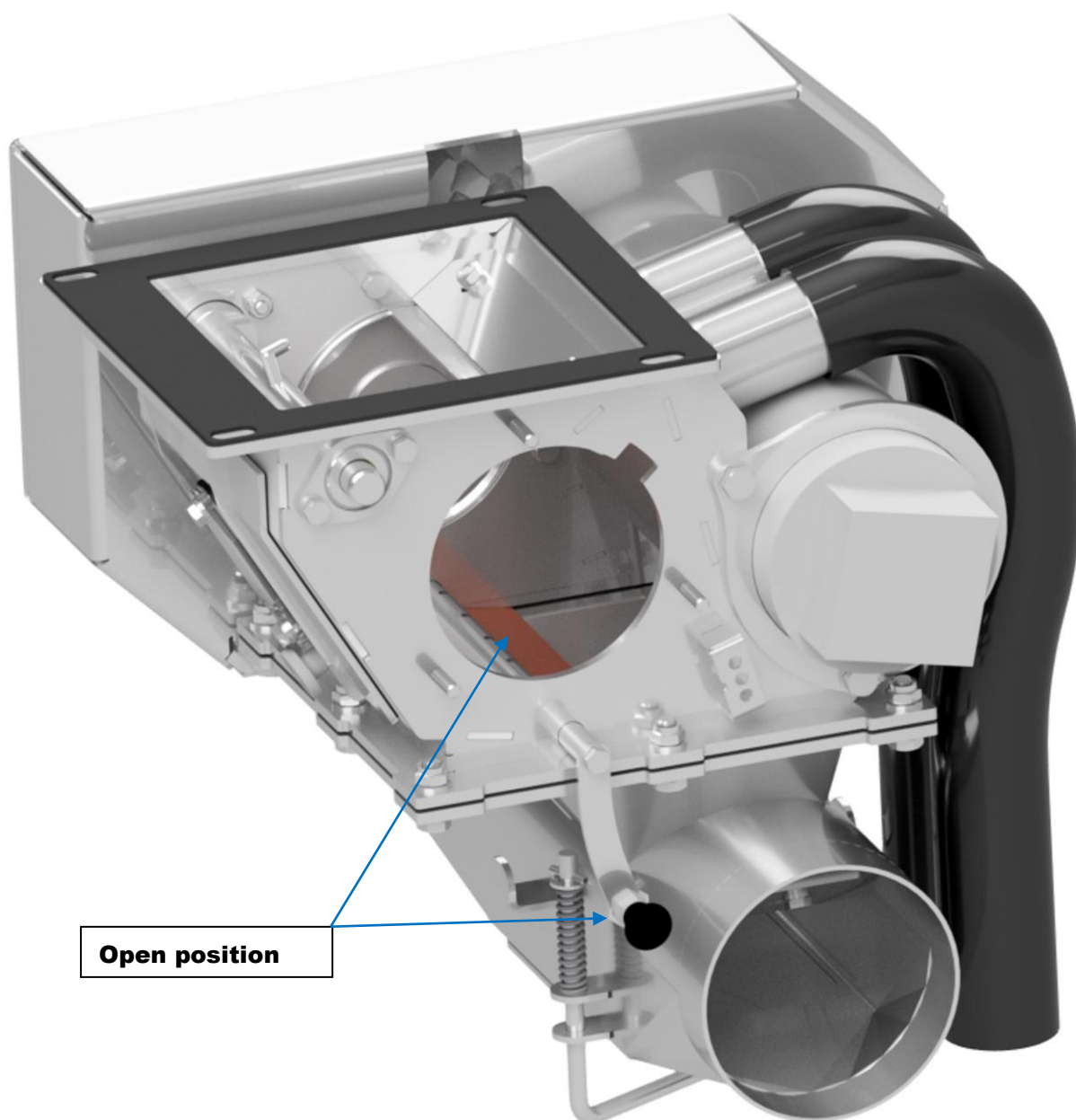


Fig. 67. Open position of the scraper inside the seeder

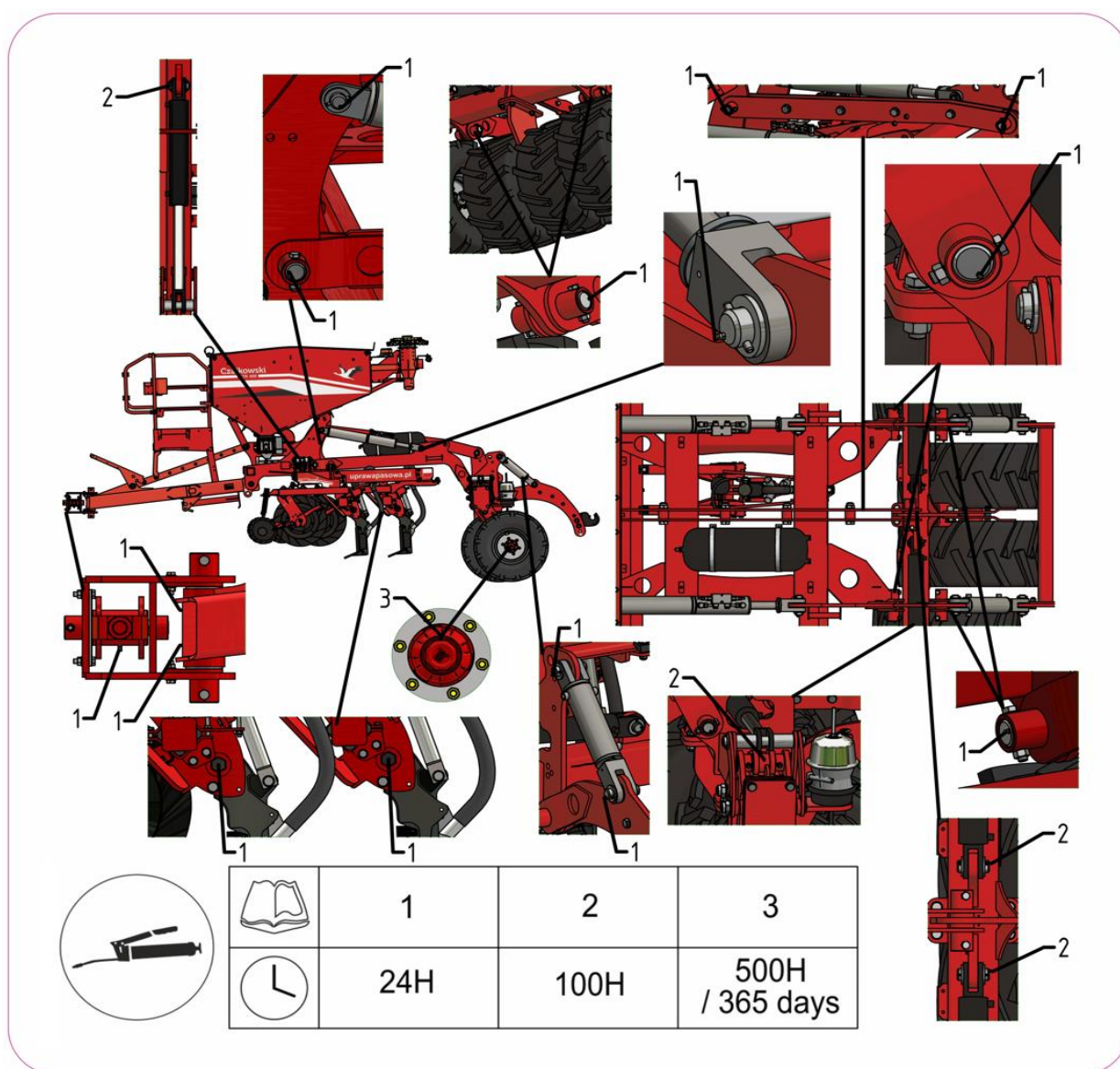
Frequency of cleaning the device depends on many factors, which include working conditions such as the type of used material, working speed, weather conditions etc. To ensure trouble-free operation, it is important to follow inspection and maintenance work.

37. Greasing points

The lubrication points on the machine and their lubrication frequencies are shown in the figure below. This drawing is also placed on the machine as a sticker. Before lubrication, clean the lubricator tip and the lubrication nipples. Lubrication of individual machine elements should be completed when fresh, clean grease appears on the given element. Replaced oils, greases and filters should be returned to special disposal points.

Oils and grease used by the manufacturer when the machine was first started up are:

- Hydraulic system – Dynatrans MPV
- External hydraulic system – Hydrol L-HV 46
- Multiplicator – 80W/90 GL-4
- Grease – L2-EP



Rys. 68. STK greasing points

38. Technical service

The operator's inspection of the technical condition of the machine before each use increases the operator's confidence and comfort of working with the device, and also reduces the risk of accidents. Typical activities included in daily maintenance and inspection of the technical condition that directly affect work safety include checking:

- cleanness of the machine;
- tire pressure and condition;
- brakes;
- external and internal lightning;
- correct oil level;

Seasonal maintenance depends on how much the machine has been used during the season or how the weather conditions have changed throughout the season. It should be based on:

- checking technical readiness;
- repairs of damaged parts and protective coating;
- replenishing and changing lubricants.

39. Attaching the machine to the tractor

When attaching a tractor with a Czajkowski STK unit and/or a seed drill and/or a precision seeder, it is prohibited to stand between these devices.



Fig. 69. Pictogram NP002

When attaching the machine to the tractor make sure that it stands on hard and even ground. Bottom linkage points of the tractor must be at the same height. The 3-point linkage must be parallel to the ground during work.

The machine must be attached to the tractor in the following way:

- reverse the tractor until the axis of linkage holes overlaps the fixing points,
- stop the tractor and pull the brake,
- attach the tractor linkage hooks to the fixing points on the machine and secure them from loosening using the original pin,
- slightly lift the machine using the rear three-point linkage and fold the support foot of the machine located at the front linkage,
- turn off the tractor engine,
- clean the hydraulic sockets on the tractor and connect the hydraulic system connectors to the tractor output sockets,
- connect the plug of the machine's electrical system to the tractor's electrical socket,
- start the tractor engine,
- turn on the tablet to operate the machine,
- check the lifting, lowering, folding and unfolding of the machine,
- check the tightness of the hydraulic system,
- connect a seeding attachment or a precision precision seeder to a functioning machine connected to the tractor.

ATTENTION  Please remember that the machine with a filled tank must always be coupled to the tractor. You can disconnect the machine from the tractor only when the tank is empty.

40. Detaching the machine from the tractor

The machine should be disconnected from the tractor on a firm and level surface, which will ensure safe disconnection.

The following steps should be taken:

- fold the machine into the transport position,
- unfold the support foot and lower the machine to a stable support,
- use support chocks under the wheels to prevent the machine from rolling away,
- disconnect hydraulic and electrical cables between tractor and machine,
- secure the quick release couplings against dirt, fixing to a intended clip,
- lower the arms of the three-point linkage to detach the machine.

41. Attaching the STK unit to the PS attachment or a precision seeder

When connecting the seeder/attachment, perform the following steps:

- reverse the machine to a seeder or a precision seeder so the linkage openings overlap the fixing points,
- stop the tractor and pull the brake – set the P position (parking),
- attach the machine linkage hooks to the fixing points of the seeder or the precision seeder and secure them against loosening using the original pin,
- attach the machine using the central bottle screw,
- connect the hydraulic system connectors to the machine sockets,
- connect the plug of the electrical system of the PS attachment or the precision seeder to the electrical socket of the machine,
- check lifting, lowering, folding, unfolding operations of the PS/precision seeder,
- check tightness of the hydraulic system,
- level the seeder (attachment) by shortening or lengthening the central connecting screw.

Detach in opposite order.

42. Configurations

42.1. Transport position

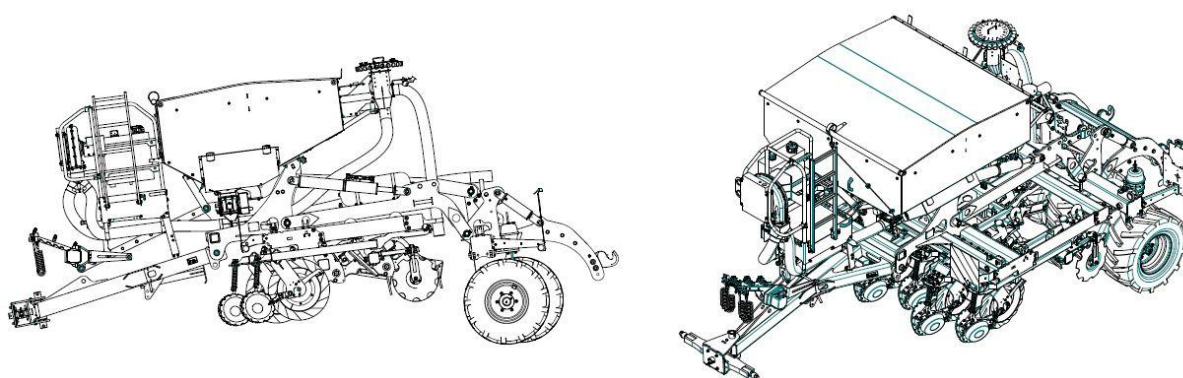


Fig. 70. Transport position of the STK 300 unit

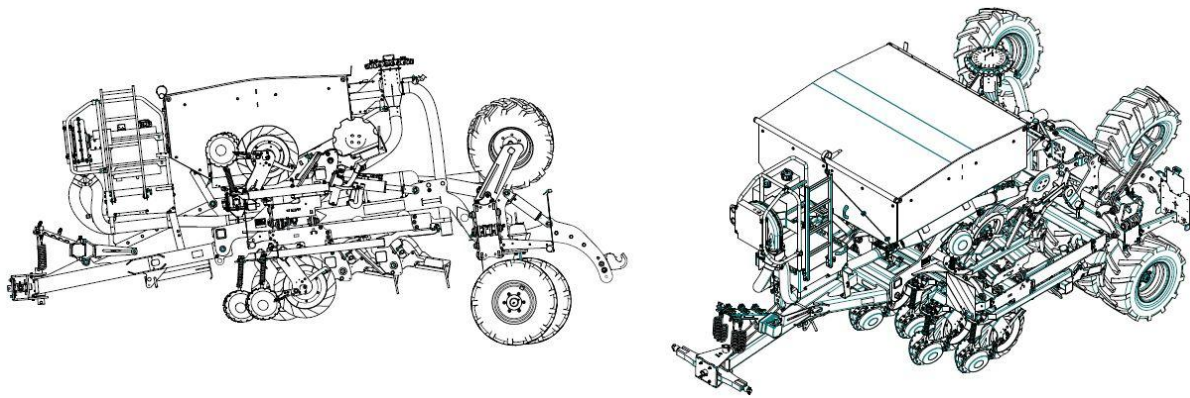


Fig. 71. Transport position of the STK 400 unit

Setting the tractor-machine-seeding attachment or precision precision seeder assembly in the transport position should be performed as follows:

- attach the tractor to the unit,
- attach the unit to the attachment/precision seeder,
- using the tractor's hydraulic system, raise the seed drill or precision seeder on the three-point linkage to the transport position,
- using the tractor's hydraulic system, lift the machine to transport position,
- using the tractor's hydraulic system, lift side frames of the machine, and then side rear beams of the wheels to transport position,
- level the machine in transport position by using the three-point linkage of the tractor,
- using the tractor's hydraulic system, set the furrow openers to transport position (fold them),
- check tightness of the hydraulic system for leaks and damage,
- turn on headlights and warning lights.

After performing the above-mentioned activities, the machine is ready for road transportation.

ATTENTION  When transporting on roads, it is necessary to move with an empty tank. Moving on roads with a filled tank is forbidden!

42.2. Working position

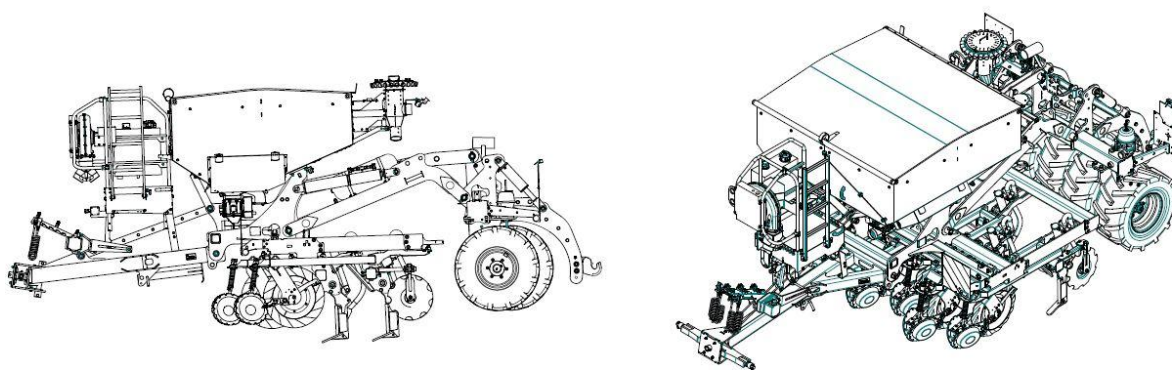


Fig. 72. Working position of the STK 300 unit

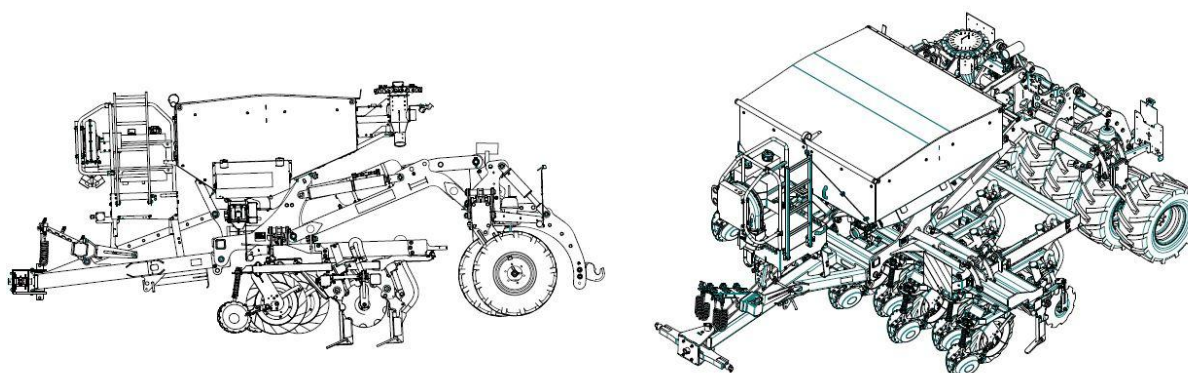


Fig. 73. Working position of the STK 400 unit

After transporting the folded machine, the following steps must be performed to unfold it to the working position:

- turn off headlights and warning lights,
- by using the tablet, and then by controlling the tractor hydraulic system, lower the offset frames of the unit and then side rear beams of the wheels to the work position
- by using the tablet, and then by controlling the tractor hydraulic system, set the furrow openers to work position (unfolded),
- by using the tablet, and then by controlling the tractor hydraulic system, lower the machine to work position,
- using the tractor's hydraulic system (the tablet is not required), lower the attachment or a precision seeder on the three-point linkage to work position,
- level the unit to work position by using the three-point linkage of the tractor.

After performing the above-listed actions, the unit is ready to work in the field.

43. Adjustments

43.1. Adjusting fertilizer application depth

Fertilizer application can be adjusted in the 2 following ways:

- from 0 cm neutral position [1]
- from -2.5 cm if the working depth is lower [2]

To adjust depth loosen the nut and remove the bolt, select the desired level, put back the bolt and tighten the nut

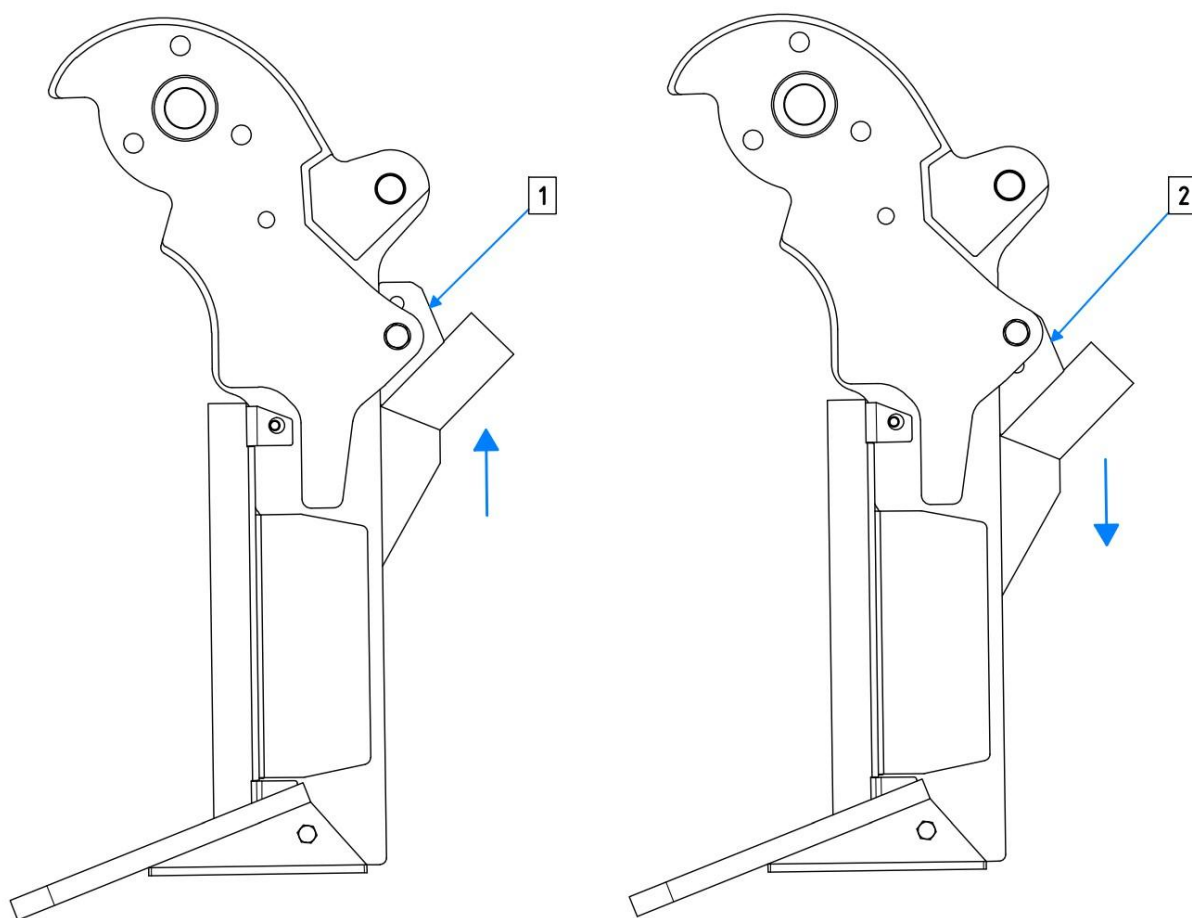


Fig. 74. Adjusting fertilizer application depth

43.2. Adjusting the spreading and breaking discs

The spreading and breaking discs can be adjusted with adjustment holes by changing the length of the shock absorber [2]. To adjust the spreading and breaking discs, you must:

- release and remove the pin [1]
- set the correct length of the shock absorber [2]
- insert the pin [1]

By shortening the length of the shock absorber [2] the discs work less aggressively. By shortening the length of the shock absorber to the maximum [2] the discs become inactive.

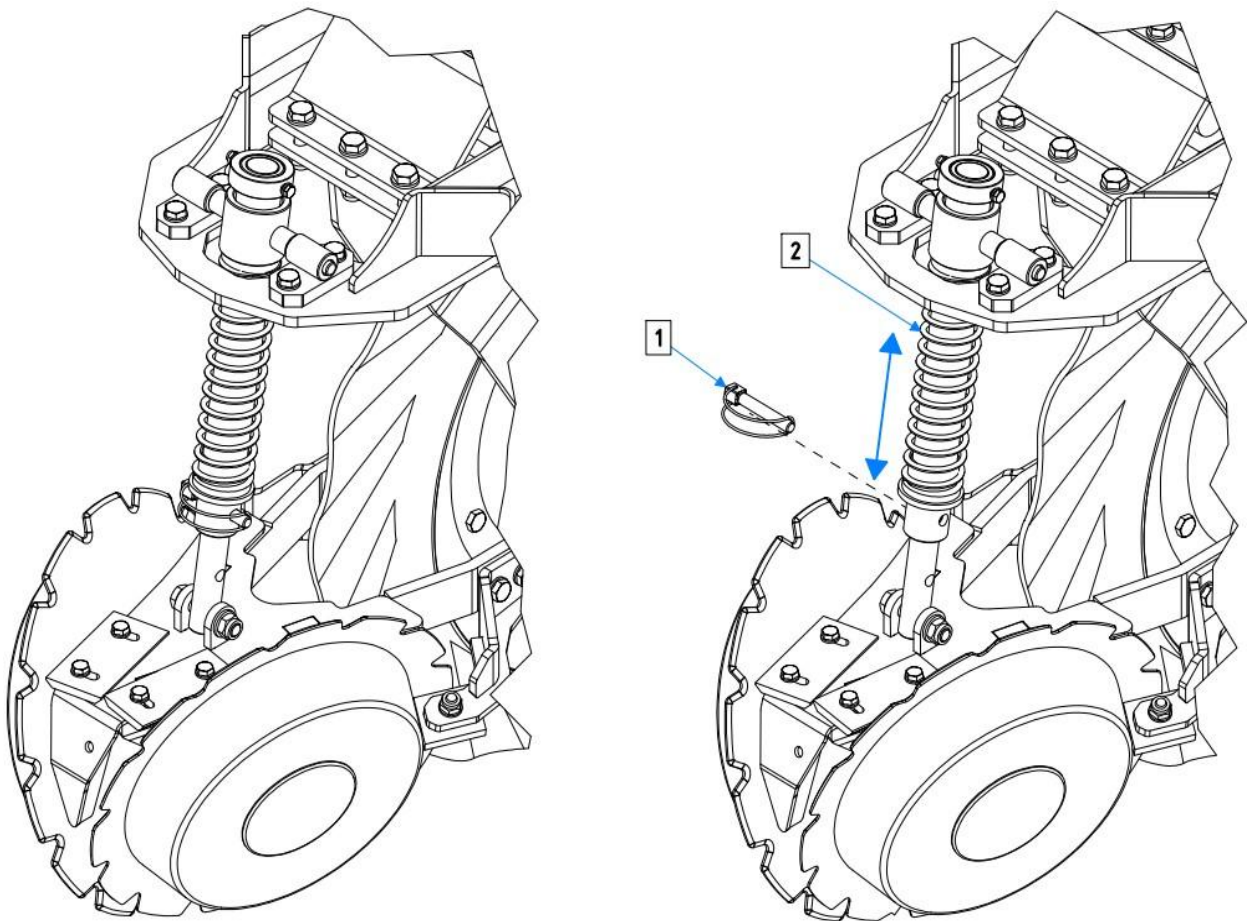


Fig. 75. Adjusting the pressing strength

43.3. Adjusting the cutting disc

The cutting disc can be adjusted using the 3-point linkage (the machine must be levelled).

ATTENTION  Perforated discs are intended for cutting the soil (up to 12cm), but they cannot be used as support wheels of the unit!

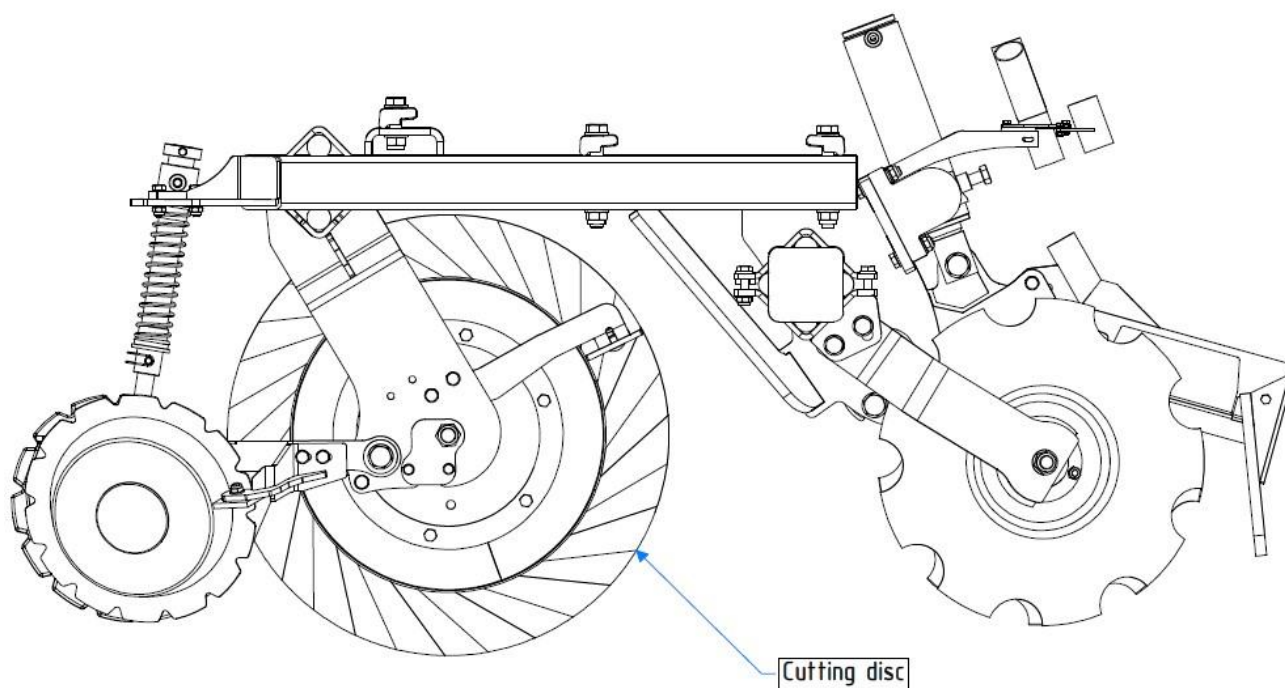


Fig. 76. Side view of the working section

43.4. Adjusting the toothed closing discs

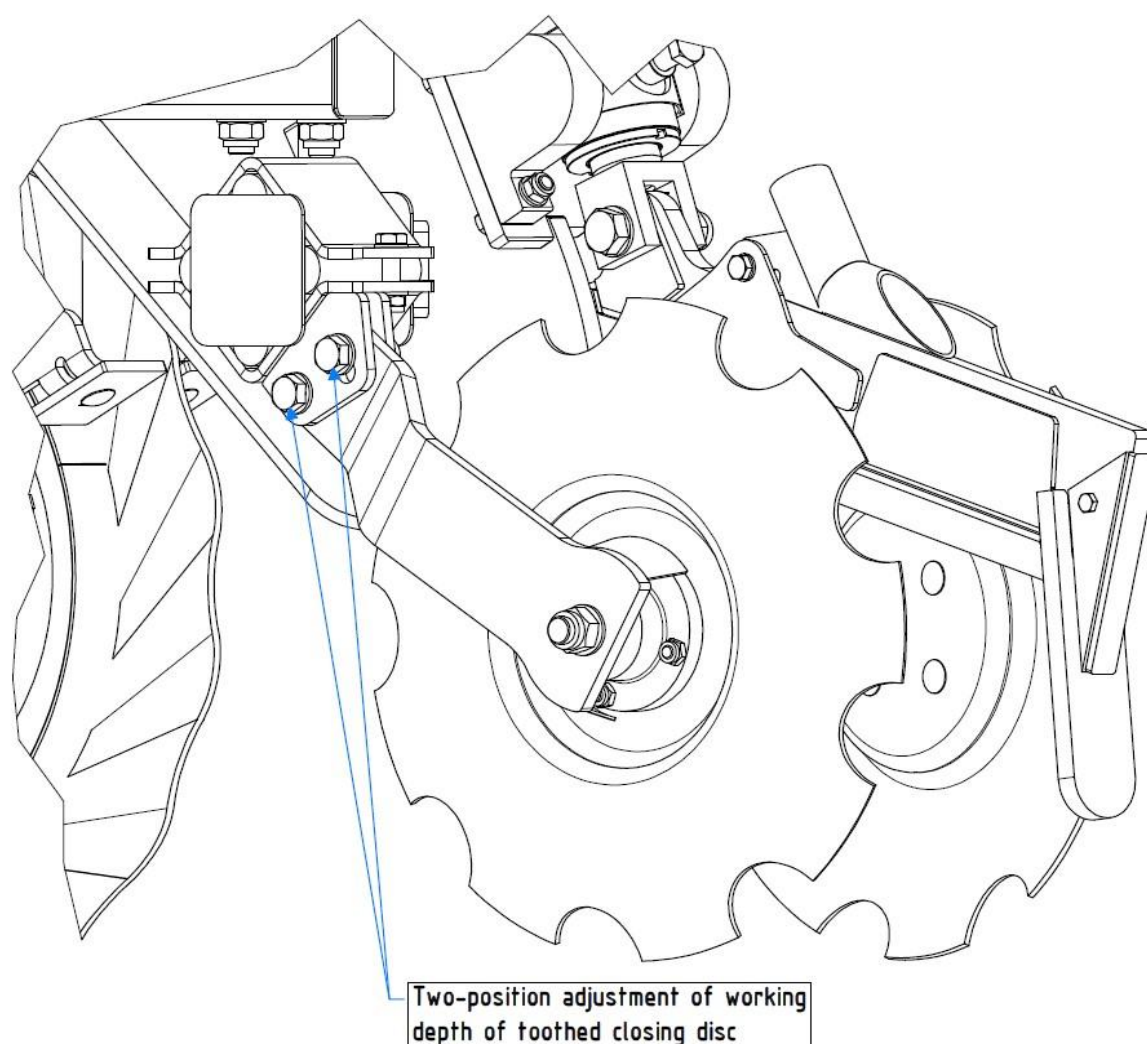


Fig. 77. Adjusting the toothed closing discs

Adjustment of the working depth of the toothed closing disc. To adjust it, loosen the nut, pull out the screw, carry out the adjustment, put in the screw, tighten the nut.

44. Wheel replacement

Wheel changes should be performed with the tractor coupled, on a firm and level surface, which will ensure safe performance of the task.

ATTENTION  Wheel replacement must be performed with the tank empty.

To remove the outer wheels of the outer wheel assemblies, you must drive onto a ramp of adequate strength and stability and engage the parking brake. The ramp should be about 10 cm high.

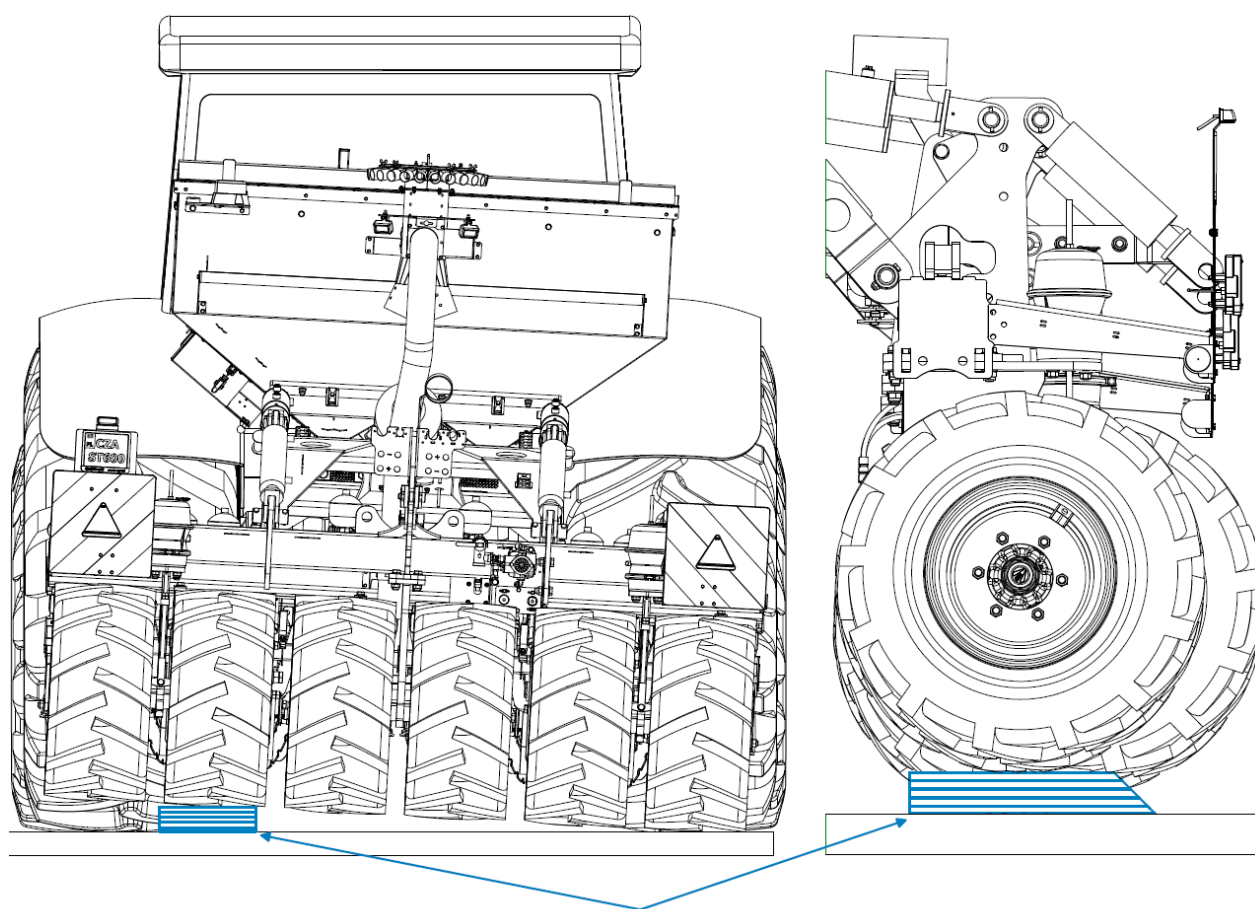


Fig. 78. Ramp under inner wheel

Then proceed to point number **8** below

To remove one of the four middle wheels, perform the following steps:

1. Level the rear frame of the machine relative to the ground.

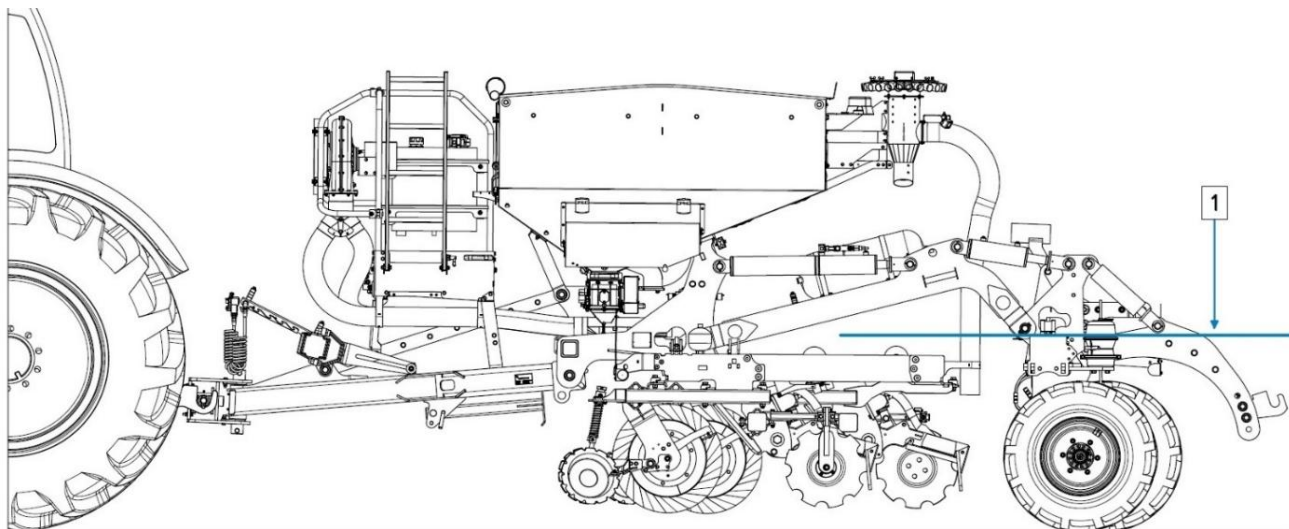


Fig. 79. Leveling the machine

2. Dismantle the 3-point linkage by removing the 4x pins.

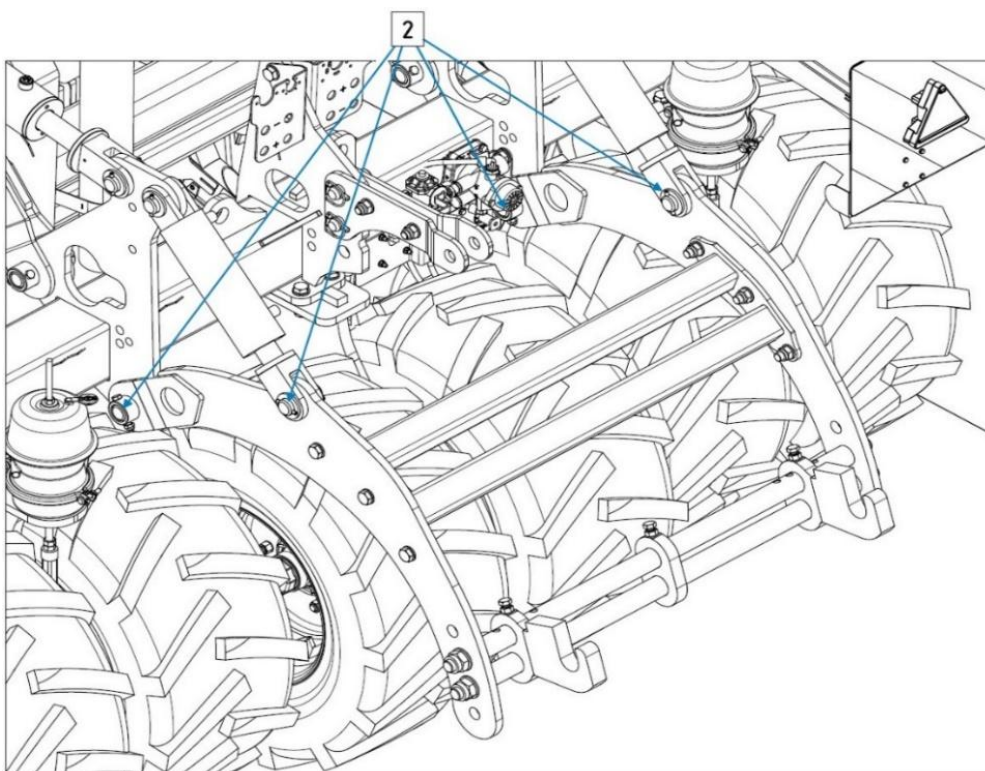


Fig. 80. Dismantling the 3-point linkage

3. Secure one of the wheels of the middle wheel assembly with chocks.

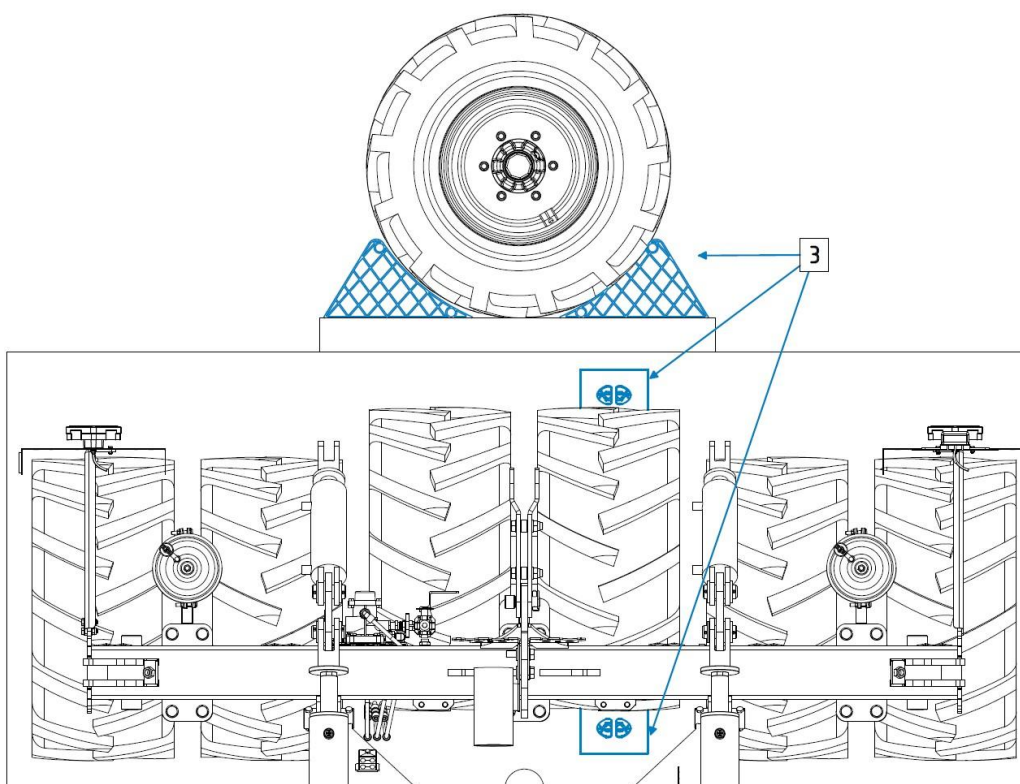


Fig. 81. Securing with chocks

4. Secure the wheel assembly mount with a support.

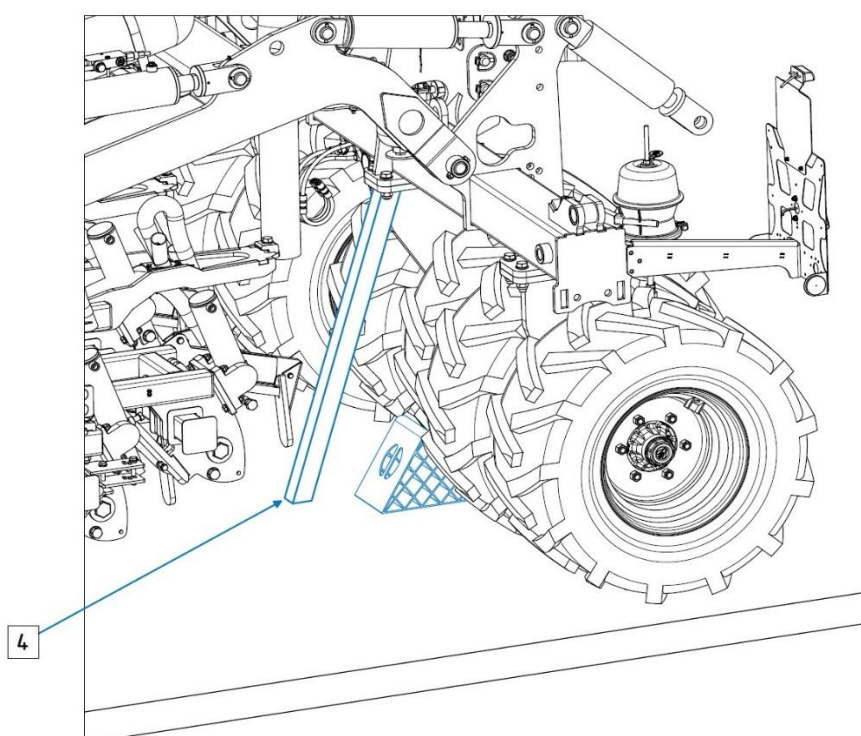


Fig. 82. Securing with support

5. Unscrew the 4x M20 bolts securing the middle wheel assembly.

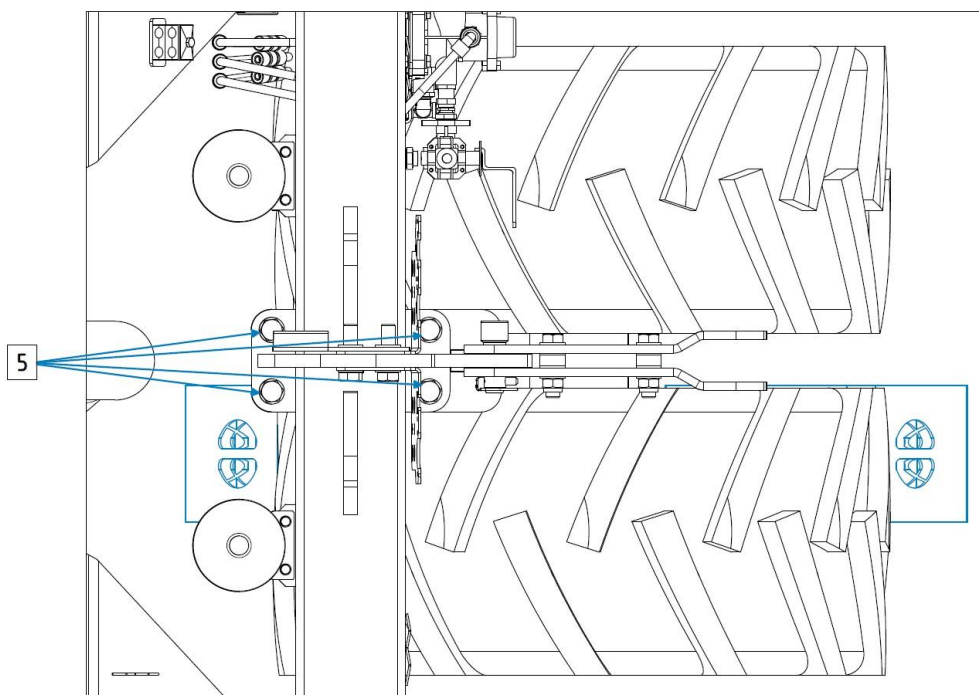


Fig. 83. Dismantling middle wheel assembly

6. Drive the tractor and machine forward, leaving the wheel assembly unscrewed and supported at the rear.

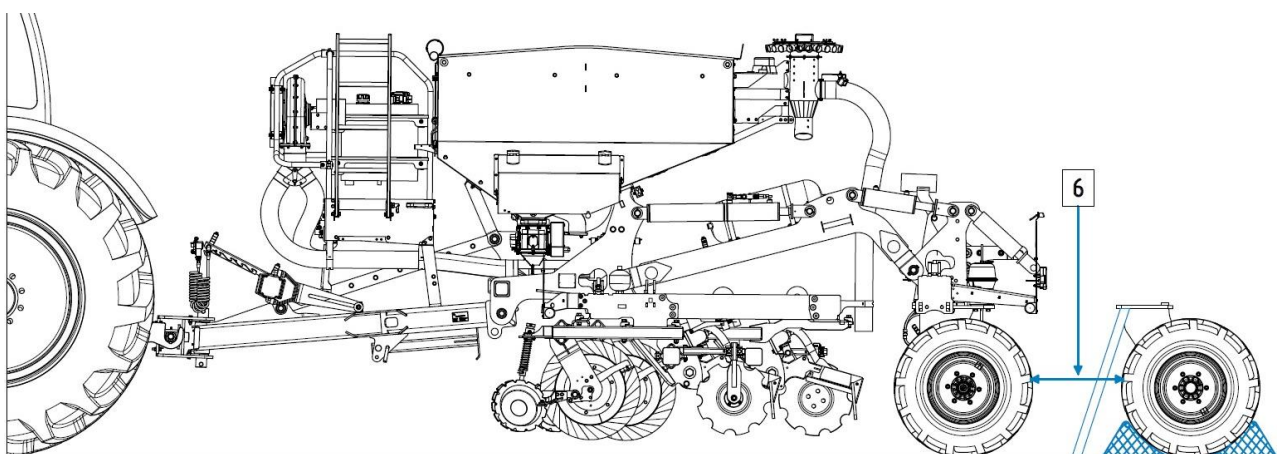


Fig. 84. Driving away from the dismantled wheel assembly

6.1. To remove one of the wheels of the central wheel assembly, use a crane that allows the entire wheel assembly to be safely lifted. For this purpose, use an approved belt sling (min. 500 kg), pulled through an M20 eye bolt/nut, which should be secured in one of the wheel assembly mounting holes.

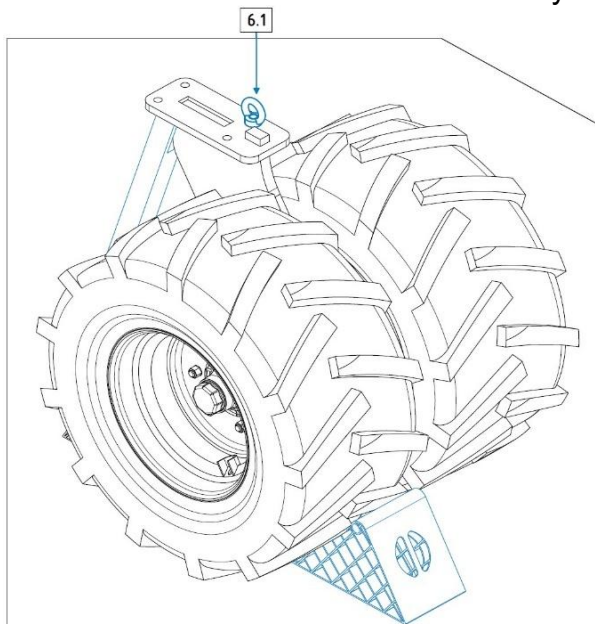


Fig. 85. Lifting the wheel assembly with an eye bolt/nut

Next proceed to point number **8** below

7. To dismantle the inner wheel of the outer wheel assembly, drive onto a ramp of appropriate strength and stability and engage the parking brake. The ramp should be approximately 10cm high.

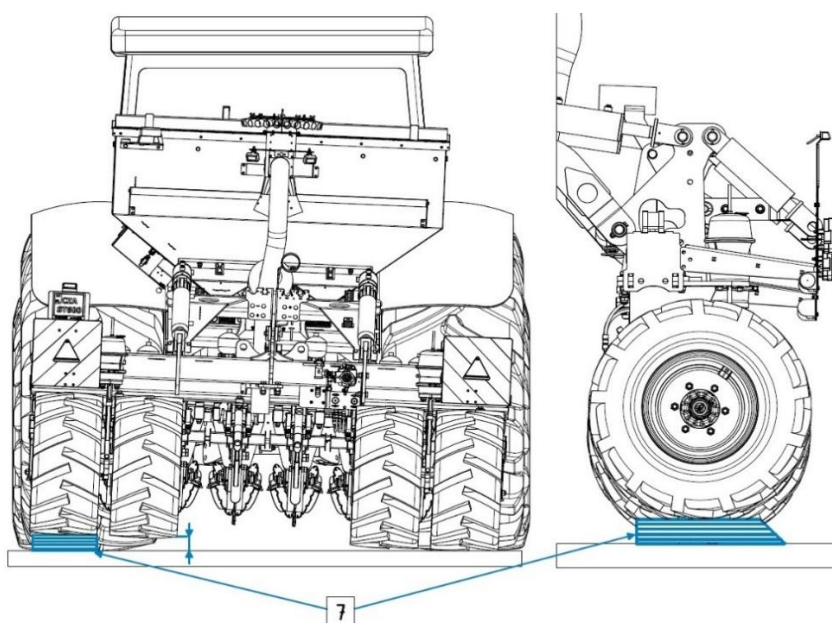


Fig. 86. Ramp under outer wheel

8. To disassemble the wheel, unscrew 6x M18 nuts of a given wheel of the wheel assembly.

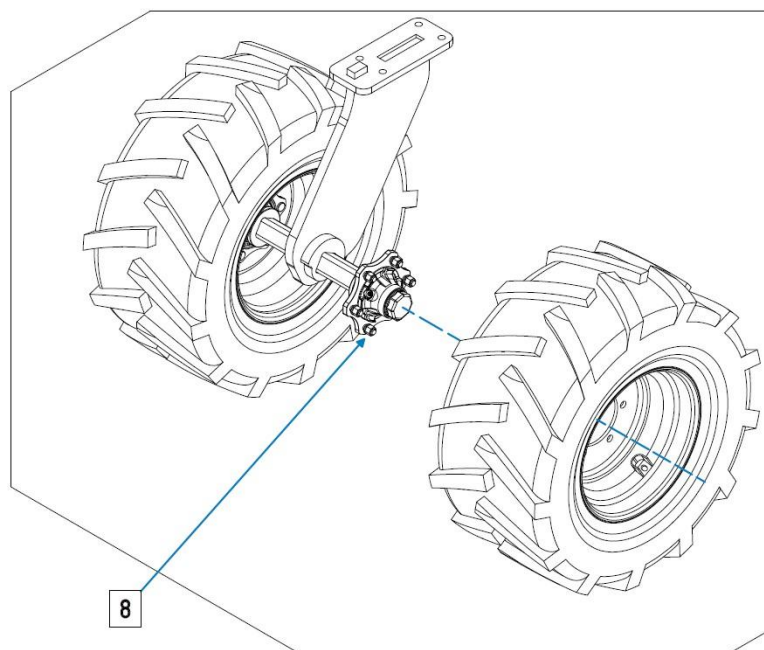


Fig. 87. Removing a single wheel from a wheel assembly

Install the wheels in reverse order, tightening the nuts according to the diagram below:

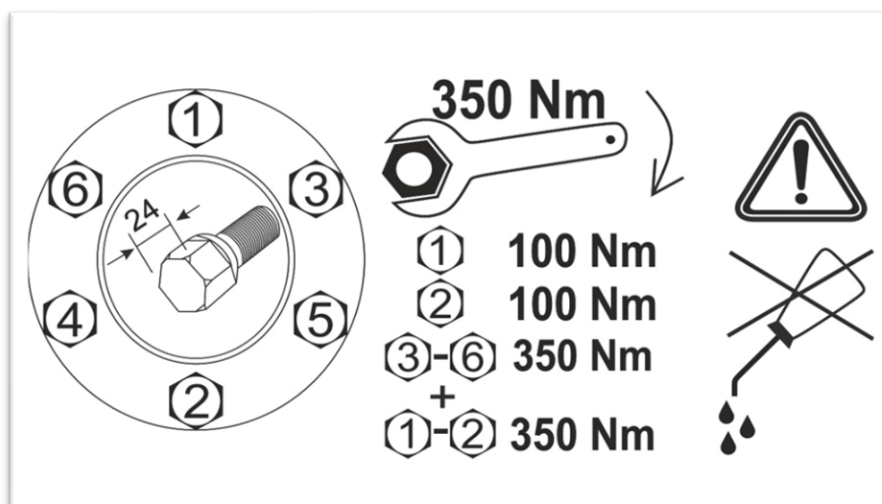


Fig. 88. STK wheel nut tightening diagram

- Tightening torque of the wheel assembly mounting bolts - 660Nm.
- Tighten the wheel assembly mounting bolts gradually, crosswise.
- After the first 20 hectares of operation, inspect the wheel bolt tightening torque and retighten if required.

ATTENTION  Tire pressure – **3,5 bar**. Tire size – **420/55-17**
Do not exceed the indicated tire pressure!

45. Lock against unwanted use of the machine

The Czajkowski STK aggregate is equipped with a device that prevents the coupling with tractor in order to transport the machine by unwanted third parties. After field work is completed, the properly parked machine, unhitched from the tractor, should be blocked against possible use. To do this, use the lock on the drawbar arm. First, slide the lock onto the beam's hitch ball and then put the padlock shackle through the lock holes in such a way that it is between the ball and the hitch beam. Then close the padlock and pull it to make sure that the lock is properly installed.

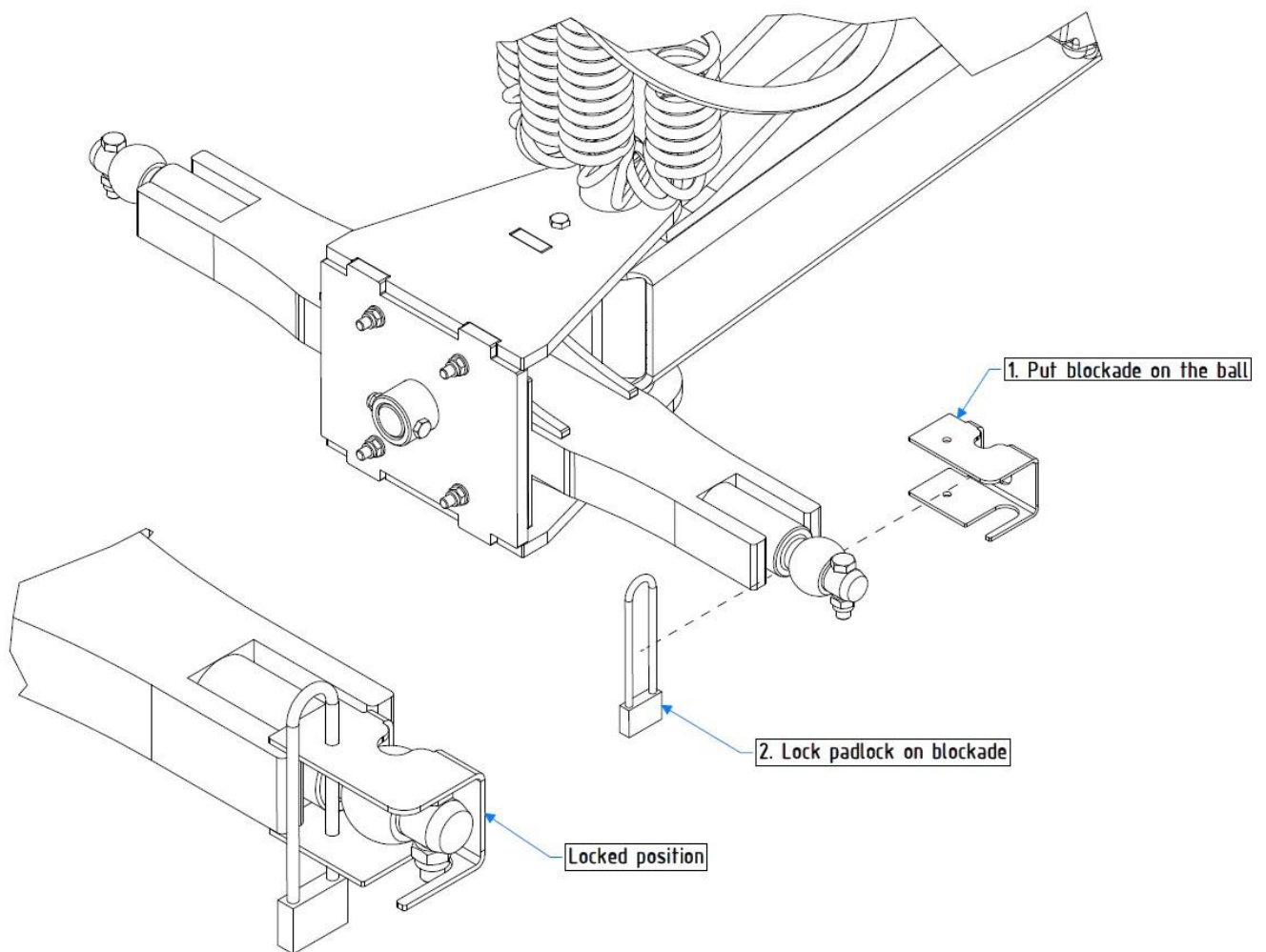


Fig. 89. Drawbar blockade

46. Long-term storage of the machine

- Before storage, the machine should be thoroughly cleaned,
- The machine must be stored in closed, roofed space.
- Working parts must be secured using an anti-corrosion agent.
- The machine should be stored with the tractor and seeder disconnected
- Lubricate necessary parts and add oil.
- Do not lubricate any parts of the seeding device.

Long-term storage of the machine should take place under a roof due to the presence of electronic components. Despite the very good quality of these components, this criterion should be met. It should be remembered that the machine's control tablet should be stored at positive temperatures and in a dry room when not in use. During long-term downtime, the tank should be emptied, the machine should be cleaned and washed. The cylinder piston rods, working elements and other glossy parts should be protected with an anti-corrosion agent. The manufacturer recommends that the cylinder piston rods be hidden. The machine should be rested on the support and folded into the transport position: - side frames folded, tire roller folded;

- arms lifted, in transport position;
- machine lowered – main piston rods retracted;
- 3-point linkage lowered;
- the machine is placed on a support foot on a hard and even surface.

During long-term machine downtime, disconnect the machine's electrical power supply (disconnect the plug from the 3 PIN socket), reduce the pressure in the roller, secure it with anti-roll chocks.

47. Transportation

If it is necessary to transport the machine on a trailer or other means of transport, the following cables must be connected before loading:

- free flow (red cap),
- machine lifting and lowering (green cap),
- three-point linkage, if the machine is coupled to a seeding attachment or a precision seeder (yellow cap),
- brake lines.

For safety reasons and for road traffic regulations, the manufacturer recommends transportation on a low-bed trailer with a "full" floor.

Loading on this type of means of transport should be carried out in the following way:

- before driving on, raise the seeding attachment or precision seeder (if present) as high as possible,
- place the machine centrally so that it does not exceed 3 m in width and 4 m in transport height,
- slowly lower the machine onto the working section plates on the ground,
- lower the seeding attachment or precision seeder using the three-point linkage (if present),
- immobilize and secure all moving and protruding parts of the machine so they don't pose a threat to other road users during transport,
- to improve stability, it is recommended to place a support of appropriate height and strength under the hitch,
- place support chocks under the tire roller,
- after loading, switch all connected sections to "free flow",
- disconnect all cables.

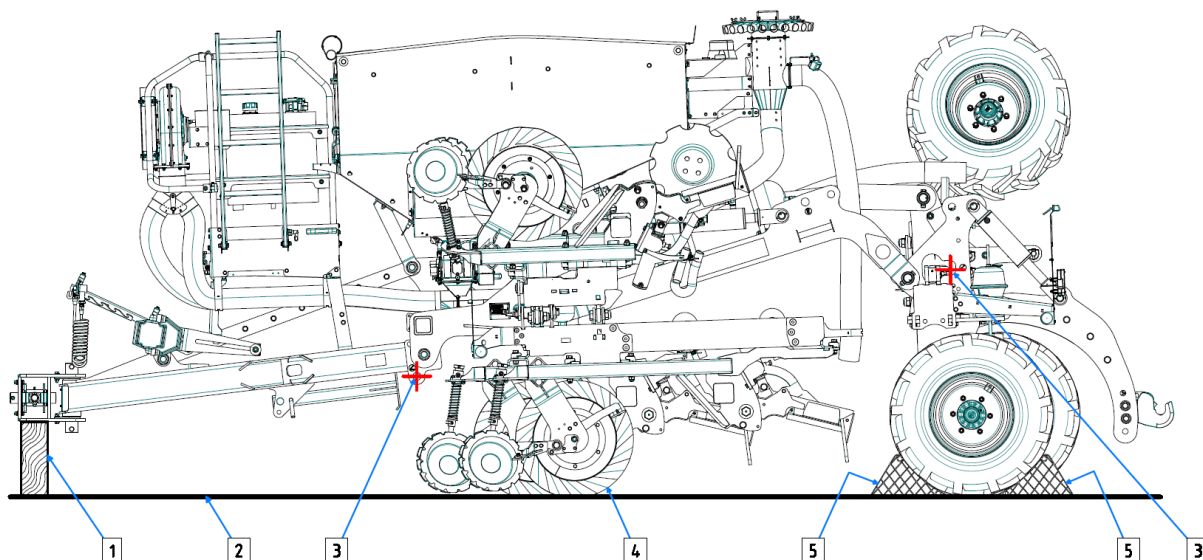


Fig. 90. Machine securing points on the means of transportation

1. Drawbar support
2. Flat surface of the means of transportation
3. Machine hitching points
4. Working sections lowered on the plates
5. Tire roller support chocks

ATTENTION  The machine must not rest on the coulter beams on the floor of the trailer.

48. Machine lifting points

If you need to lift the machine, use the lifting points on the machine. These points, indicated in the drawings below, are also located in the form of a sticker in the places designated for this purpose.

ATTENTION

- the machine can only be lifted using a certified H-type crane of appropriate length and load-bearing capacity,
- the machine should be lifted on its own, without a coupled seeding attachment or precision seeder,
- special attention should be paid to selecting the appropriate length of belts/chains of each of the arms of the H-type beam. This is particularly important because the centre of gravity of the machine is variable – it depends on the machine equipment, the number of working sections, etc.

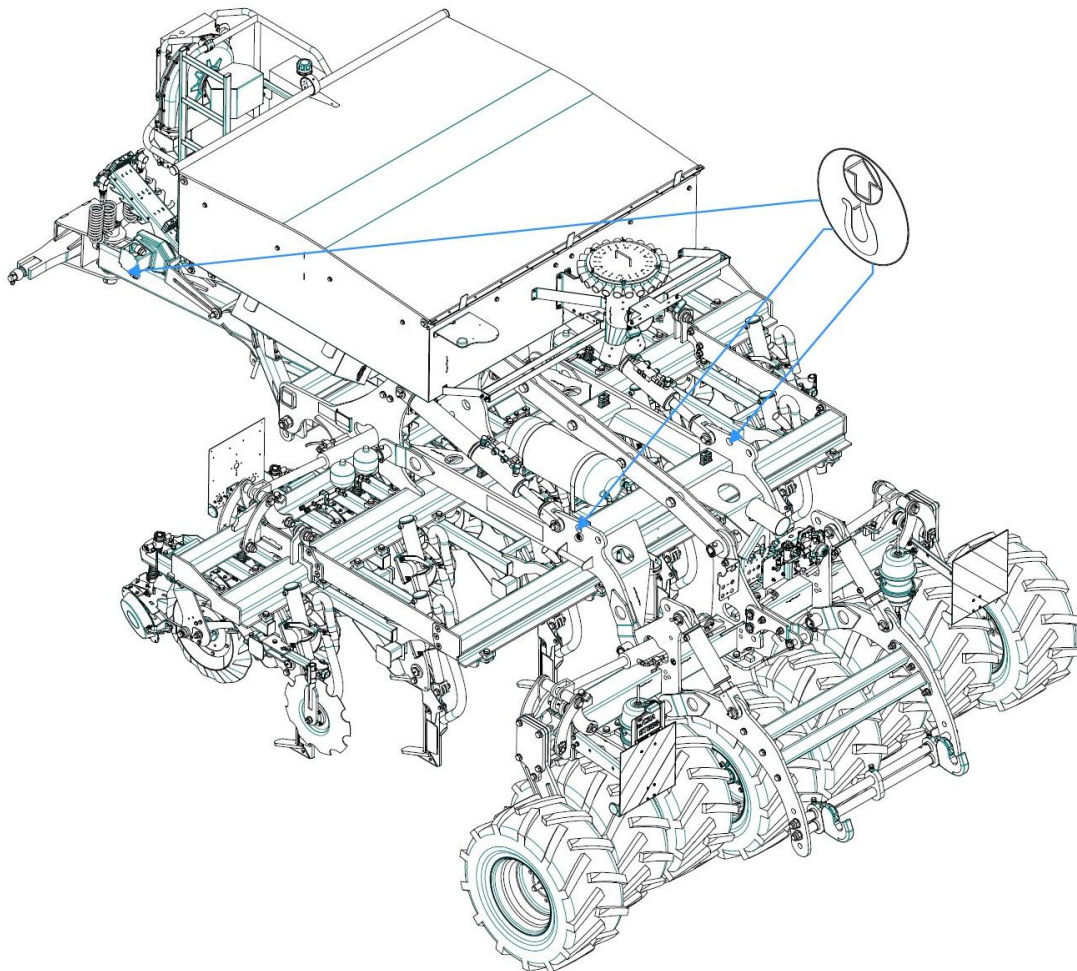


Fig. 91. Machine lifting points

Front lifting point of the machine

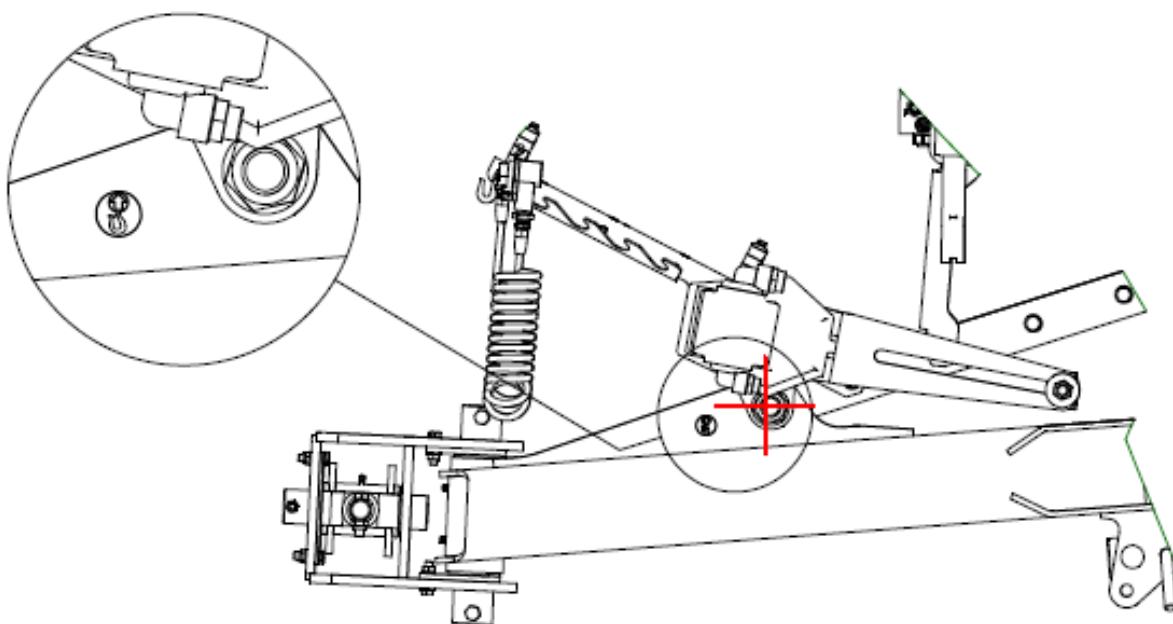


Fig. 92. Front lifting point of the machine

To lift the machine at its front, proceed as follows:

- unscrew the screw securing the upper drawbar connector (in the place where the hydraulic hose holder is also attached),
- dismantle all elements on the platform on which the belts/chains may interfere,
- use belts/chains in place of the removed screw,

ATTENTION  To lift the machine, use only approved belts/chains of appropriate strength and load-bearing capacity.

49. Disassembly and disposal

Oils, lubricants and parts for disposal covered in them pose serious threat to the environment and should be disposed according to the law and in an eco-friendly manner that's also safe for people. If necessary, consult with local authorities. While using and maintaining the machine different substances are created, which must be properly disposed of. In the case of excipients, consumable substances and other chemical agents, always follow instructions of the safety data sheets of those substances.

Decommissioning.

If the machine can no longer be used and should be utilized, it must be decommissioned. Machine parts should be segregated according to materials, and then handed over for eco-friendly disposal or recycling. While doing that you must obey the applicable regulations. Contact a disposal company if necessary.

50. Responsibility of the manufacturer

The manufacturer does not bear responsibility for using the machine in a manner inconsistent with the provisions of the law, safety regulations or instructions of this user manual. Due to the fact that events unforeseen in this manual may occur, it's crucial to always follow general safety regulations. Responsibility of the manufacturer is excluded when the user willingly uses spare parts other than original ones or parts approved by the manufacturer, or if elements of the machine have been modified. The manufacturer is not responsible for indirect damages, including damages to other machines or devices. The manufacturer is not responsible for the wrong choice of seeds, their type and quantity. If the experience of the user is not sufficient, it's recommended to ask for help of specialists or contact the Czajkowski Maszyny company. Responsibility of the manufacturer does not cover incorrect (or deviating from the expected) results of work. In every case, the user must control and supervise seeding and make sure that the dosage is correct for the given conditions. The user should also constantly monitor the correctness of sowing the seeds. Responsibility for use and maintenance lies in the hands of the owner. The owner of the machine is responsible for making sure that operators have proper qualifications and know how to use the machine. You must remember that incorrect use of the machine poses danger to people, animals, bodies of water and cultivation fields. Always follow the instructions provided by manufacturers of machinery and equipment, seeds, plant protection products and fertilizers contained in specialist instructions.

51. Warranty

The warranty period is 12 months and is counted from the day of the first start-up of the machine at the customer's by the Czajkowski Maszyny sp. z o.o. service. However, the warranty is also limited to a maximum of 400 ha worked per meter of the machine's working width. An additional condition for the warranty to be valid is the use of the machine with a tractor whose power does not exceed 100 HP (horsepower) per meter of the machine's working width.

The warranty covers defects and irregularities inherent in the machine at the time of its issue, resulting from material or manufacturing defects.

Artificial elements such as rubber or plastic are covered by the warranty only in the event of obvious material defects.

The warranty does not cover wear and tear of the machine's working elements that wear out during normal use, such as:

- Elements of the furrow opener (chisel, sword, beam cover, sleeves),
- Spreading and breaking disc,
- Wavey cutting disc,
- Toothed closing discs,
- Pre-emergence marker discs,
- Bearings in discs and road/field wheels,
- Rubber compaction tires,
- Cage compaction wheels,
- Fasteners (bolts, nuts, washers etc.),

ATTENTION  The manufacturer will not accept a complaint under the warranty when:

- Non-original spare parts were used,
- The machine, its individual components and accessories were not used, stored or maintained properly,
- Any repairs or technical changes were made without the manufacturer's consent,
- The contents of this instruction manual were not followed,
- The warranty card was not completed or was completed incompletely,
- The defects or faults that occurred are not related to a material or manufacturing defect,
- The defects or faults were caused by damage to the machine during transport,
- The defects or faults were caused by force majeure, the action of the elements or third parties.

52. Useful tools

While working with the cultivation unit for strip till Czajkowski ST, you should have the following tools in your toolbox. They might come in handy when operating the unit.

- hammer,
- striker (7 mm),
- wrench set: 1x7mm, 2x10mm, 2x13mm, 2x17mm, 2x19mm, 2x22mm, 2x24mm, 2x27mm, 2x30mm, 1x36mm, 1x46mm, 1x55mm,
- hex key set: 2,5mm, 4mm, 6mm, 8mm.

The above-mentioned tools are not included when buying Czajkowski machines.

53. Bolts tightening torque values

Table 3. Tightening torque values

Tightening torque values in Nm		
Diameter	8.8	10.9
M4	3.3	4.8
M5	6.5	9.5
M6	10	15
M8	25	35
M10	50	75
M12	90	130
M14	150	210
M16	220	330
M18	330	470
M20	460	660
M22	630	900
M24	800	1200
M27	1100	1700
M30	1600	2300
M33	2100	3100
M36	2800	4000
M39	3600	5100
M42	4400	6200

- The above-mentioned bolt tightening torques are approximate values,
- When tightening wheel bolts, the values given in the section on changing wheels should be used

54. Troubleshooting

Tabela 4. Fault detection

1.Equipment 2.Action 3.Issue	Main issue	Failure	Failure cause	Failure removal
Attaching the machine	Tractor	The tractor should be equipped with quick release connector for free oil flow	oil should return to the tractor freely	Fix the quick release connector for free oil flow directly to the oil tank
Attaching the machine	Tractor	The cabin should have at least two 3-pin 12v sockets	Power supply for the camera display and extension cord for the seeder	Install the sockets
Attaching the machine	External hydraulic system	Pump of the external hydraulic system should be installed in a way that does not allow it to move freely	Incorrect installation of the pump may lead to damaging the spline	Correct installation of the pump on the PTO shaft axis
Attaching the machine	Connecting hydraulic hoses	Machine works incorrectly	Connecting hydraulic hoses incorrectly will cause failure	Connect hoses according to colours and pairs.
Attaching the seeder	Connecting hydraulic hoses	Machine works incorrectly	Connecting hydraulic hoses incorrectly will cause failure	Connect hoses according to colours and pairs.
Attaching the seeder	Seeder	Signal cable is too short	Use a 10m extension cord between the tractor and the seeder	Use dedicated seeder extension cord
Attaching the PS attachment	Attachment	Connect: -pneumatic hose -hydraulic system (blue hoses) -electrical cable	- hose for transporting seeds between the device and the seeder -blue hydraulic outlets for marker control -electronics for controlling seeding and paths	Connect according to the user manual
ST unit	Notched discs	Don't break up harvest remains	Not enough depth	Slide out
ST unit	Furrow opener	Too shallow	Too many clips on hydraulic cylinders	Remove excessive clips
ST unit	Furrow opener	Chisels don't work efficiently, lose their track	Used opener, working parts replaced too late	Replace the coulter beam
ST unit	Furrow opener	No pressure in working parts	There's a release valve on the hydraulic accumulator	Close the valve
ST unit	Furrow opener	Deposits remain on the coulter beam	Not enough depth of the cutting disc	Lower on the three-point linkage of the tractor

ST unit	Fertilizer distributing tubes	Fertilizer must be applied deeper	Tubes have 3 depth adjustments	Put on lower holes
ST unit	Fertilizer distributing tubes	No flow	Clogged system or wrong connection of hoses	Check hose connections and clean the system
Seed distribution	Flow sensors	No flow is indicated	Seeds stay in the flow sensor or the coulter of the applicator	Clean the blocked system
Seed distribution	Tank	Seeds stay in the tank	Leaking apparatus	Check the tightening rubber under the rotor
Hydraulic system	Pressing roller	Pressing strength of the roller is too weak	Pressure is too low	Correct the pressing pressure. Recommended: 160 - 200 bar
Hydraulic system	Rear three-point linkage	Uncovered seeds on elevations	The three-point linkage is not copying the ground	The rear three-point linkage should work in „free flow” mode. Set the mode on the tractor.
Hydraulic system	Air blower	Oil is flowing out due to tightened engine	Oil is not flowing back to the tractor freely	Check the free flow connection
Hydraulic system	Unfolding	The machine is folding and unfolding very slowly	There's a pressure reduction valve at the rear section of the machine	Close the valve
Hydraulic system	Folding, unfolding, working parts, rear three-point linkage	All functions aren't working correctly	Hydraulic hoses have colour marking	Check the connection of hydraulic hoses to the tractor
Seed distribution	Flow sensors	No flow is indicated	Seeds stay in the flow sensor or the coulter of the applicator	Clean the blocked system
Seed distribution	Flow sensors	No flow is indicated	Seeds stay in the flow sensor or the coulter of the applicator	Clean the blocked system
Seed distribution	Tank	Seeds stay in the tank	Leaking apparatus	Check the tightening rubber under the rotor
Hydraulic system	Pressing roller	Pressing strength of the roller is too weak	Pressure is too low	Correct the pressing pressure. Recommended: 160 - 200 bar
Hydraulic system	Rear three-point linkage	Uncovered seeds on elevations	The three-point linkage is not copying the ground	The rear three-point linkage should work in „free flow” mode. Set the mode on the tractor.
Hydraulic system	Air blower	Oil is flowing out due to tightened engine	Oil is not flowing back to the tractor freely	Check the free flow connection
Hydraulic system	Unfolding	The machine is folding and unfolding very slowly	There's a pressure reduction valve at the rear section of the machine	Close the valve

Hydraulic system	Folding, unfolding, working parts, rear three-point linkage	All functions aren't working correctly	Hydraulic hoses have colour marking	Check the connection of hydraulic hoses to the tractor
Electrical system	Display screen	Displays screen isn't turning on	No power	Check the power cord between the tractor and the machine
Electrical system	Seeds	The device is not distributing the specified amount of seeds	Incorrect settings	Check settings for working width of the unit
Electrical system	Seeds	Rotor is rotating at maximum speed	Incorrect rotor size	Replace the rotor with a bigger one

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56. Notes

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