METAL-FACH

TOOL CARRIER
U910
USER MANUAL
TRANSLATION OF THE ORIGINAL POLISH MANUAL
REV. I
SEPTEMBER 2017

Instruction manual No. U910-01-167/2013

EC DECLARATION OF CONFORMITY

The undersigned:	Jacek Kucharewicz, Chairman of the Board	
declares hereby with full responsibility, that the complete machine:		
Tool Carrier		
0.1.	Brand(s) (manufacturer's registered trademark):	Metal-Fach
0.2.	Type:	U910
	Variant:	
	Version:	
0.2.1	Vehicle trading name(s) (if any):	Metal-Fach sp. z o.o. ul. Kresowa 62 16-100 Sokółka, Poland
0.3.	Type identification, if marked on the vehicle:	
0.3.1.	Manufacturer's plate (location and method of its attachment):	On the main frame, right-hand side, glued
0.3.2.	Chassis identification number (Location):	
0.4.	Vehicle category(3):	
0.5	Manufacturer's name and address:	Metal-Fach sp. z o.o. ul. Kresowa 62 16-100 Sokółka, Poland

complies with all the relevant regulations of Directive 2006/42/EC and Regulation of the Minister of Economy dated 21 October 2008 on principal requirements for machines (Journal of laws of 2008, No. 199, item 1228, as amended)

The following harmonized standards were applied to assess the compliance:

PN-EN ISO 4254-1: 2016-02, PN-EN ISO 13857: 2010, PN-EN ISO 12100: 2012

and standards: PN-ISO 3600:1998, PN-ISO 11684:1998 and Regulation of the Minister of Infrastructure dated 31 December 2002 on technical conditions of vehicles and the range of their necessary equipment (Journal of Laws of 2003, No. 32, item 262, as amended).

Safety testing report No.: LBC/78/16

This declaration of conformity EC becomes null and void if the machine is changed or reconstructed with no consent of the manufacturer.

Sokółka
(Location)

06/07/2017
(Date)

Jacek Kucharewicz
(Signature)

Chairman of the Board
(Position)

Machine data

Machine kind:		_____
Type designation:		_____
Serial Number[1]:		_____
Machine manufacturer:		METAL-FACH Sp. z o.o. 16-100 Sokółka ul. Kresowa 62 Phone: (0-85) 711 98 40 Telefax: (0-85) 711 90 65
Seller:		_____
	Address:	_____
		_____
	Phone/fax:	_____
		_____
Delivery date:		_____
Owner or user:	Name:	_____
	Address:	_____
		_____
	Phone/fax:	_____

[1] The data is located on the machine rating plate located on the front part of the machine main frame

INTRODUCTION

The information included in the instruction manual is valid for the date of development. The manufacturer reserves himself the right to implement in machines construction changes and due to this fact some values or illustrations may not correspond to the actual state of the machine supplied to the user. The manufacturer reserves himself the right to implement construction changes without changing this instruction. The instruction manual constitutes the basic equipment of the machine. The user is obliged to acquaint himself with the contents of this instruction before commencing of operation and to meet the recommendations included in it. It will guarantee safe operation and assure trouble free machine operation. The machine was constructed according to the standards in force and current legal stipulations. The manual describes principal safety and operation rules for the Tool Carrier U910.

The substantial obligations of the manufacturer are presented in the guarantee card, which includes the complete and currently in force regulations on the guarantee coverage.

If the information included in the instruction manual prove to be incomprehensible, you should address the seller where the machine was purchased or the manufacturer directly for assistance.

The spare parts catalogue functions as a separate list and is attached in the form of a CD during the machine purchase and also is available at the Manufacturer's web site: www.metalfach.com.pl

Manufacturer address:

Metal-Fach sp. z o.o.

ul. Kresowa 62

16-100 Sokółka

Telephone:

Phone: (0-85) 711 98 40

Telefax: (0-85) 711 90 65

Symbols used in the instruction:

WARNING

Hazard warning symbol. It points to the occurrence of a serious hazard condition, which, if not avoided, may result in death or serious injury. The symbol warns against the most dangerous situations.

ATTENTION

The symbol pointing to especially important information and recommendations. Non-compliance with the described recommendations may result in serious damage of the machine due to its incorrect operation.

DANGER

The symbol indicating the possibility of occurrence of a hazard, which, if not avoided, may result in death or serious injury. This symbol informs about lower level of risk of injury than the symbol with the word “DANGER”.

The symbol indicating useful information.

Table of contents

1. General description

1.1. Tool Carrier Identification

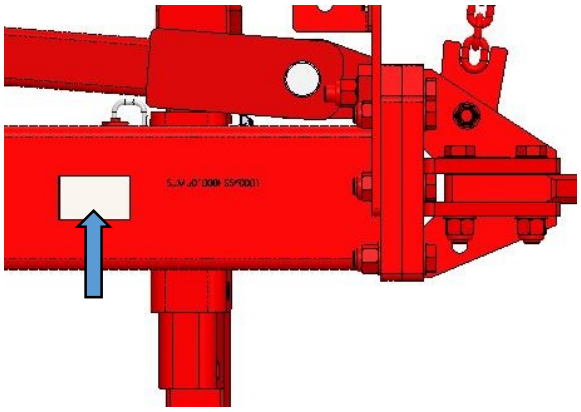


Figure 1. Location of the rating plate

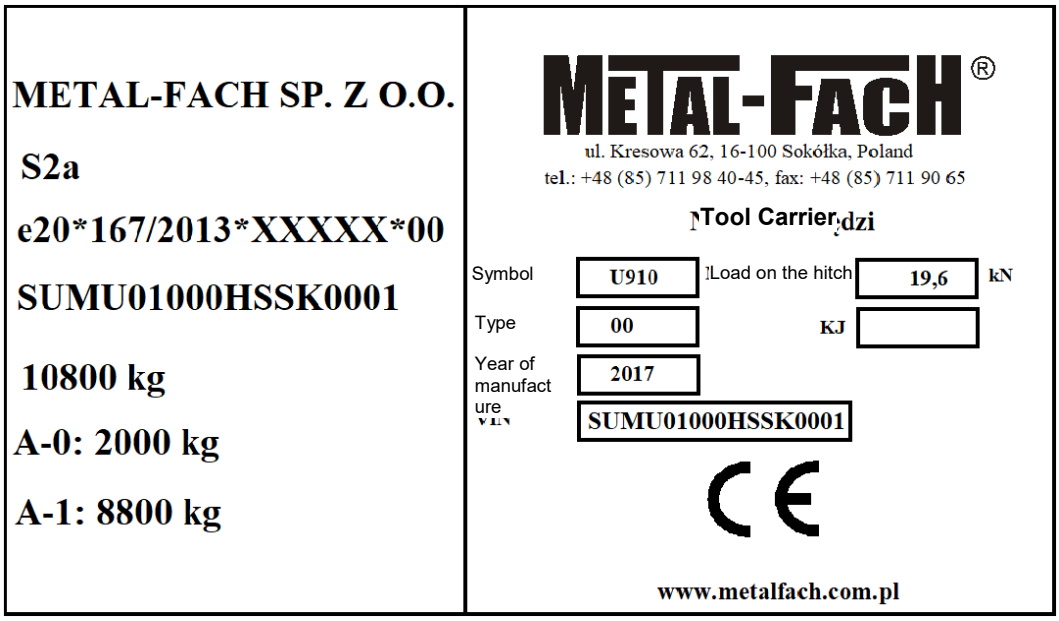


Figure 2. Rating plate.

The identification data is located on the rating plate attached to the main frame, right-hand side.

Please write down the type and serial number of your unit. Submit this number each time you contact the dealer.

THIS USER MANUAL IS PART OF THE BASIC ACCESSORIES OF THE TOOL CARRIER

2. Intended use

The Tool Carrier is a machine used for combining two identical Metal-Fach units. Depending on the work being done, it is possible to combine a disk-type cultivator and a spring-type cultivator. Combined with the disk-type cultivator, the Tool Carrier is used to cultivate the surface soil layer within the depth range of 5-15cm. This configuration enables post-harvest tillage, as well as pre-sowing soil cultivation and no-tillage cultivation, when vegetation residue are not covered, but mixed with the upper (surface) soil layer (the so-called mulching). The combination of the Tool Carrier with the spring-type cultivator is used for pre-sowing soil cultivation after ploughing and for pre-sowing cultivation on pre-seasoned fields (detailed description and use of working components is given in operation manuals of the machines).

A compact design of the Tool Carrier together with the working components ensures the transport width at no more than 3 m. The machine is equipped with a hydraulic or pneumatic brake system, which ensures safe ride on public roads.

2.1. Proper use:

The Tool Carrier can be started, used and repaired only by persons who are familiar with the operation of the machine and a connectable tractor, as well as with the rules of procedure concerning safe operation of the Tool Carrier.

The manufacturer shall not be liable for any unauthorised changes in the unit design.

During operation use only factory-made parts produced by METAL-FACH.

ATTENTION

ATTENTION!

Tool Carrier is intended solely for use in agriculture. Using it for purposes other than those specified in item 2 shall be construed as improper use. Any non-compliance with the machine operation, maintenance measures and perfect technical conditions recommended by the manufacturer shall be interpreted as improper use.

The manufacturer shall not be liable for any damage arising from improper use of the machine.

3. Safety of use

WARNINGIE

WARNING!
Before you start operating and using the machine, read this instruction manual, learn the design of its assemblies, their functioning and adjustment ranges, paying special attention to the notes regarding safety of operation.
It will be too late to do this during the operation!!!

3.1. General safety principles

The safety principles provided below refer to the unit. Notwithstanding, adhere to general safety and accident prevention rules, as well as the road traffic rules.

When operating the tillage unit (Tool Carrier with accessories + tractor), follow all precautions, particularly:

- before each time you start the operation, ensure that the Tool Carrier and tractor condition guarantees traffic and operation safety;
- to ensure manoeuvrability, the Tool Carrier must be connected with tractors fitted with a complete set of weights, a tractor rear axle load must not be too low, as it can lead to loss of stability, which may result in the tractor tipping over and, consequently, injury or death of the driver;
- follow the acceptable axle loads and transport dimensions;
- when connecting the Tool Carrier with a tractor, extending and folding the working components suspended on the carrier and at headland, verify whether there are any bystanders, particularly children, in the vicinity;
- never stand between the tractor and the machine, when the tractor engine is working;
- noise – equivalent A-weighted emission sound pressure level (LpA) is not above 70 dB;
- when connecting lines to the hydraulic system of the tractor, ensure proper connection of the sections, ensure that the hydraulic system is not under pressure, and check the position of the control lever of the tractor hydraulic system;
- start the devices controlled by the hydraulic system only when there are no persons within the range of their operation;
- inspect the hydraulic lines and tubes periodically, and replace with new ones if required;
- hydraulic lines must be replaced every 6 years;
- the actions of lifting, lowering, folding and extending, and starting the tractor to drive with the machine attached must be executed slowly and without any sudden jerks;
- never reverse the tractor or turn at headland when the machine is lowered in the working position;
- when turning at headland, consider far-projecting components, do not apply independent brakes of the tractor;
- working on slopes exceeding 8.5% is not allowed;
- during the tool carrier operation, there is a risk of lightning strike.
- check tyre pressure of the tractor and the tool carrier;
- after the first hour of operation, check all disjoint connections, i.a. screw connections;
- standing and/or riding on the machine or loading it with additional weights is forbidden during transport and operation,
- carrying with the machine items which are not part of the machine is forbidden;

- perform all repairs, lubrication or possible cleaning of the working components during operation only when you have switched off the engine and extended the unit;
- detach the machine from the tractor after you have set the working components on level, compact surface, unfolded the support foot and disabled the engine;
- never leave the vehicle while its engine is running, before leaving the tractor cab, apply the manual brake, disable the engine and remove the ignition key;
- store the machine in the extended position;
- during stoppages, store the unit at sites without the access of unauthorised persons or animals;
- operating the machine by persons under the influence of alcohol, drugs or medicines with narcotic effect;
- operation the tractor with a coupled machine by persons who do not hold a relevant driving licence is prohibited;
- unauthorised persons not familiar with this instruction manual are not allowed to operate the machine;
- no bystanders are allowed during folding and extending the machine due to the hazard of being crushed by the machine components;
- during transport on public roads, follow the local traffic law provisions in force;
- for the time of going on public roads, ensure you use the electrical lighting, check its good working order and visibility, keep it clean and mount a triangular board on the machine to indicate slow moving vehicles;
- adjust the transport speed to the surface condition and conditions on the road, do not exceed the speed of 25 km/h;
- do not leave the vehicle with the machine on a hillside or other sloping surfaces, without securing the vehicle from rolling down; apply the parking brake in the machine and place chocks under the wheels;
- during extending the working components, pay special attention to considerable load relief effect on the coupling (drawbar eye);
- prior to entrance on public roads, carry out visual inspection of the transported machine;
- during operation, use appropriate work clothing and footwear with non-slip soles;

WARNING

WARNING!
Failure to follow the above rules may be dangerous for the operator and bystanders and can cause damage to the tool carrier and working components.
The user is responsible for damage resulting from non-compliance with the above rules.

3.2. Technical service activities

Perform any technical service activities after you have lowered the unit to the ground. If the tractor is coupled with the machine, it must have the brakes enabled and the engine disabled.

To perform servicing, use only tools and instruments which are in good working condition and original materials and parts.

Use only common protections and cotter pins to secure pins which are components of the unit. Never use any substitute protections, such as bolts, rods, wires, which may become

a cause of damage of the tractor or unit, resulting in hazardous situations during operation or transport.

3.3. Transport on public roads

Pursuant to the road traffic safety provisions (Regulation of the Minister of Infrastructure, Journal of Laws, item 2022 of 15 December 2016.

ATTENTION

ATTENTION!
The set composed of a farming tractor and a farming machine coupled with it must comply with technical requirements specified by road traffic licensing regulations.

WARNING

WARNING!

It is forbidden to drive the unit (tractor + machine) on public roads without suitable conspicuity markings.

DANGER

DANGER!

Remember to connect the machine brake system to the tractor brake system. Before each new passage, check the condition of the brake system. A disconnected or defective brake system may prevent the tractor with the machine coupled to it from being slowed down sufficiently quickly. Consequently, an obstacle or other vehicle in front of the unit can be hit, which may result in injury or death of traffic participants.
Use only tractors which ensure sufficient braking force.

When driving the tractor with unit on public roads, adhere to all provisions of the Road Code in force for this type of vehicles, particularly:

- Set the tool carrier in the transport position and secure it with pins against uncontrolled extending,
- During the transport on public roads, the tool carrier coupled to agricultural tractors require:
  - marking with white-and-red-striped warning marker plates,
  - being fitted with lighting,
  - marking with a triangular board indicating slowly moving vehicles,
- adhering to speed limits during transport, which are:
  - on smooth surface roads (asphalt), up to 25 km/h,
  - on farm or stone-paved roads, up to 6-10 km/h,
  - on potholed roads, up to 5 km/h.

  adjust the speed to the quality of the road and traffic conditions on the road.
- exercise special care during driving past and overtaking and in curves (the long machine tail-swings in curves),
- do not exceed the maximum allowed terrain lateral inclination which is 8.5˚.

WARNING

WARNING!
Exceeding the maximum lateral inclination can cause the machine to tip over, which may lead to injury or death of the driver. When driving on uneven surfaces, reduce the driving speed.

ATTENTION

ATTENTION!
The maximum allowed width of the machine, which may ride on public roads, is 3 m. Set the unit in the transport position before entering public roads. Remember to install all the transport protections. The locations of transport protections are marked with relevant pictograms found on the machine frame.

ATTENTION

ATTENTION!
Remember to mount the guards which protect the sharp edges of the disc unit working components.

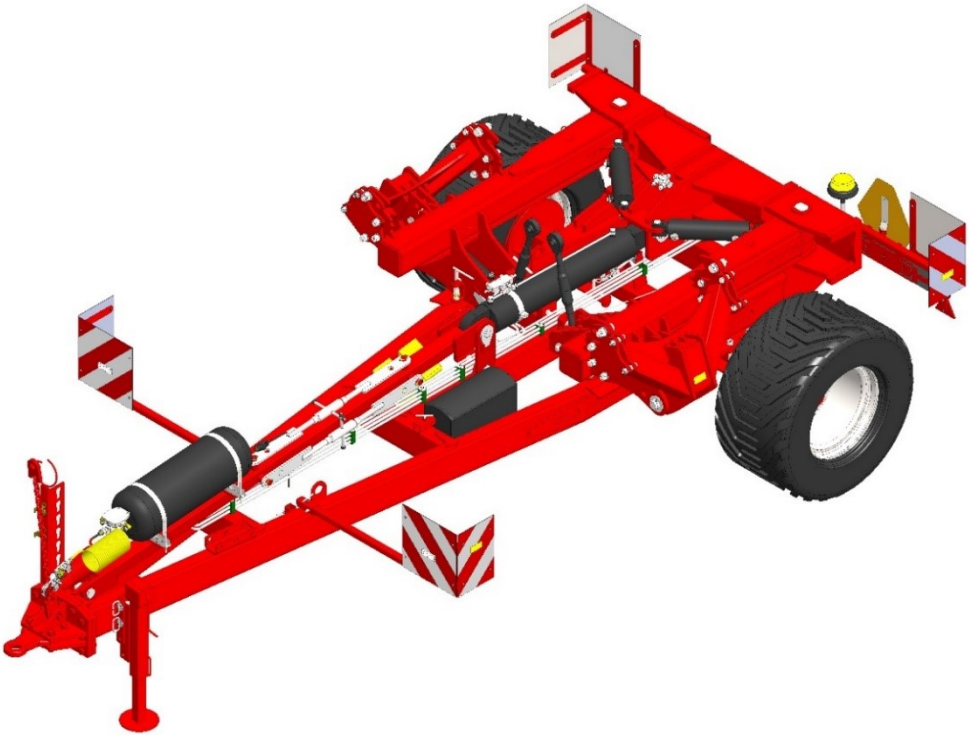


Figure 3. Transport position of the tool carrier without equipment

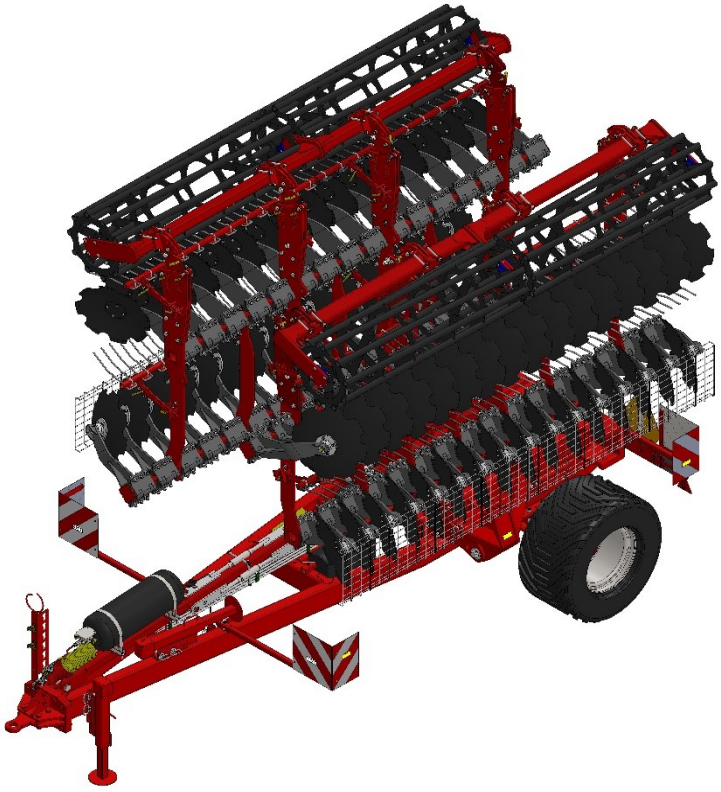


Figure 4. Transport position with working components guards mounted (side sections folded)

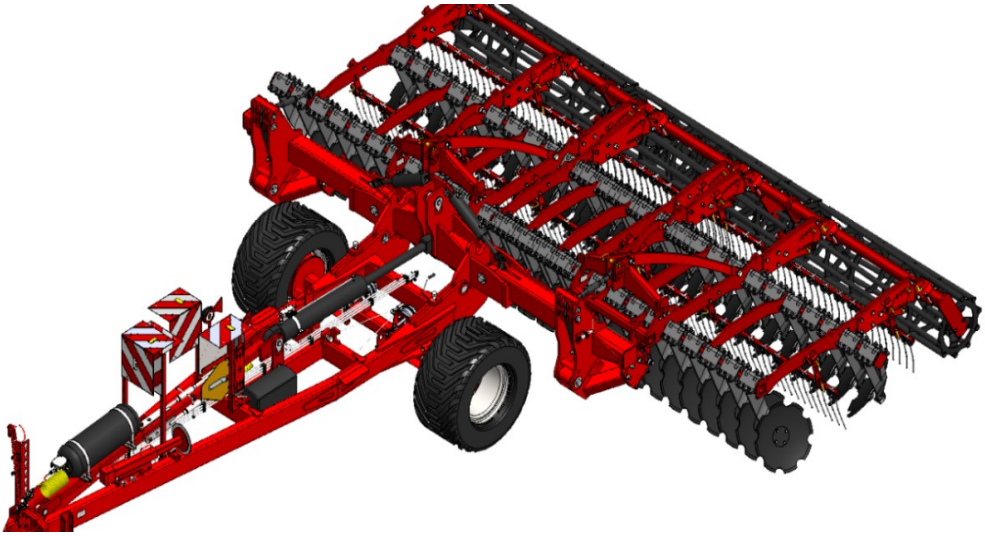


Figure 5. Working position (extended side sections)

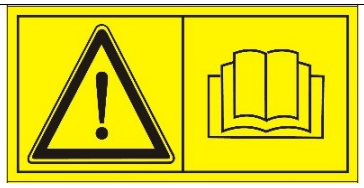
3.4. Safety signs

ATTENTION

ATTENTION!

The user of the tool carrier must maintain legibility of all warning inscriptions and signs attached on the machine or accessories over the whole period of operation. If they are damaged or destroyed, replace them with new ones. New safety signs can be purchased from the machine manufacturer. The assemblies replaced during the repair works must be marked with safety signs recommended by the manufacturer.

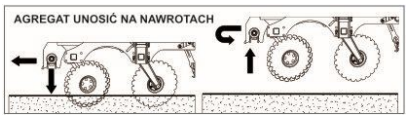
Table 1. Safety symbols

No.	Safety symbol (mark)	Meaning of the symbol or content of the inscription	Location on the machine
1	2	3	4
1	 1 pc. Dim.100x50 Colour: yellow background, black signs	Read the instruction manual.	On the front left section of the frame.

2	 1 pc. Dim.100x50 Colour: yellow background, black signs	Switch off the engine and remove the key before maintenance and repairs.	On the front left section of the frame.
3	 1 pc. Dim.100x50 Colour: yellow background, black signs	Keep a safe distance from the machine. Danger of crushing by the machine.	On the front left section of the frame.
4	 pcs 6 Dim.100x50 Colour: yellow background, black signs	Do not reach into the crushing area if the elements can move.	On the side arms of the carrier and on the central component of the rear section of the machine.
5	 1 pc. Dim.100x50 Colour: yellow background, black signs	Keep a safe distance from the machine. Danger of crushing toes or a foot. – Force applied from the top.	On the front left section of the frame.

6	 1 pc. Dim.100x50 Colour: yellow background, black signs	Keep a safe distance from power lines during operation.	On the front left section of the frame.
7	 4 pcs Dim.100x50 Colour: yellow background, black signs	Crushing – side section of the unit.	On both sides of the carrier, on the side arms.
8	 1 pc. Dim.100x50 Colour: yellow background, black signs	Riding on the machine is forbidden, you may ride on the tractor passenger seat only.	On the front left section of the frame.
9	 1 pc. Dim.100x50 Colour: yellow background, black signs	Do not stand near the motion zone of the articulated coupling joints if the engine is running.	On the front left section of the frame.

10	 1 pc. Dim.100x50 Colour: yellow background, black signs	Make sure that the rear axle load is sufficient.	On the front left section of the frame.
11	 4 pcs Dimensions: 50x50 Colour: white background, black signs	Pictogram marking the lifting points for loading the machine on transport means.	On the main frame, near the lifting eyes for transport.
12	 12 pcs Dimensions: 35x25 Colour: white background, black signs	Point of lubrication.	On the cylinders, three-point couplings and levers of the brake expander cams.
13	**UWAGA !!!** **ZABEZPIECZENIE TRANSPORTOWE** ATTENTION! TRANSPORT PROTECTION 4 pcs Dimensions: 100x70 Colour: white background, black signs	Transport protection.	On the main frame and on the side arms.
14	**UWAGA !!!** **PAMIĘTAJ O ZABEZPIECZENIU SWORZNIA ZACZEPOWEGO W CIĄGNIKU** ATTENTION! REMEMBER TO SECURE THE PIN IN THE TRACTOR 1 pc. Dimensions: 100x70 Colour: white background, black inscriptions	Securing the hitch pin in the tractor.	On the front left section of the frame.

15	 2 pcs Dimensions: 30x20 Colour: white background, black signs	Tyre pressure.	On the frame, near the wheels.
16	 1 pc. Dimensions, dia. 150mm Colour: white background, black inscription, red rim	Speed limit.	On the machine rear section.
17	 Maximum pressure in the hydraulic system - 16 MPa 1 pc. Dimensions: 165x40 Colour: white background, black inscriptions	Maximum pressure in the hydraulic system.	On the front left section of the frame.
18	 1 pc. Dimensions: 260x70 Colour: white background, black signs	Lift the unit at headland.	On the front left section of the frame.

4. Dismantling and Disposal

The tool carrier is composed of the materials which do not pose risks for the environment. After the period of use is terminated and further operation is not justified, the carrier must be disassembled.

Due to a large number of parts during the disassembly, you must use lifting devices, like an overhead crane or fork lift.

Send the metal parts to a scrap metal yard, and dispose of the rubber parts or send them to sites which are licensed to store such waste. Gather all the used oil from the hydraulic system in the leak-tight containers and carry out the disposal.

5. Lighting signalling system

Prior to entrance on the public roads, you should fit white-and-red-striped warning boards, which are fitted with marker lamps, and a holder for a board indicating slow-moving vehicles. Fit the locking pin with the warning light and install the triangular board in the holder on the left-hand side. Connect the supply cord with the tractor electrical system and check the function of all lights. The lighting installation is illustrated in the figure below. Insert the locking

pin 2 in the holes and tighten the locking bolt 1. It is required to use the tractor fitted with a warning flashing beacon.

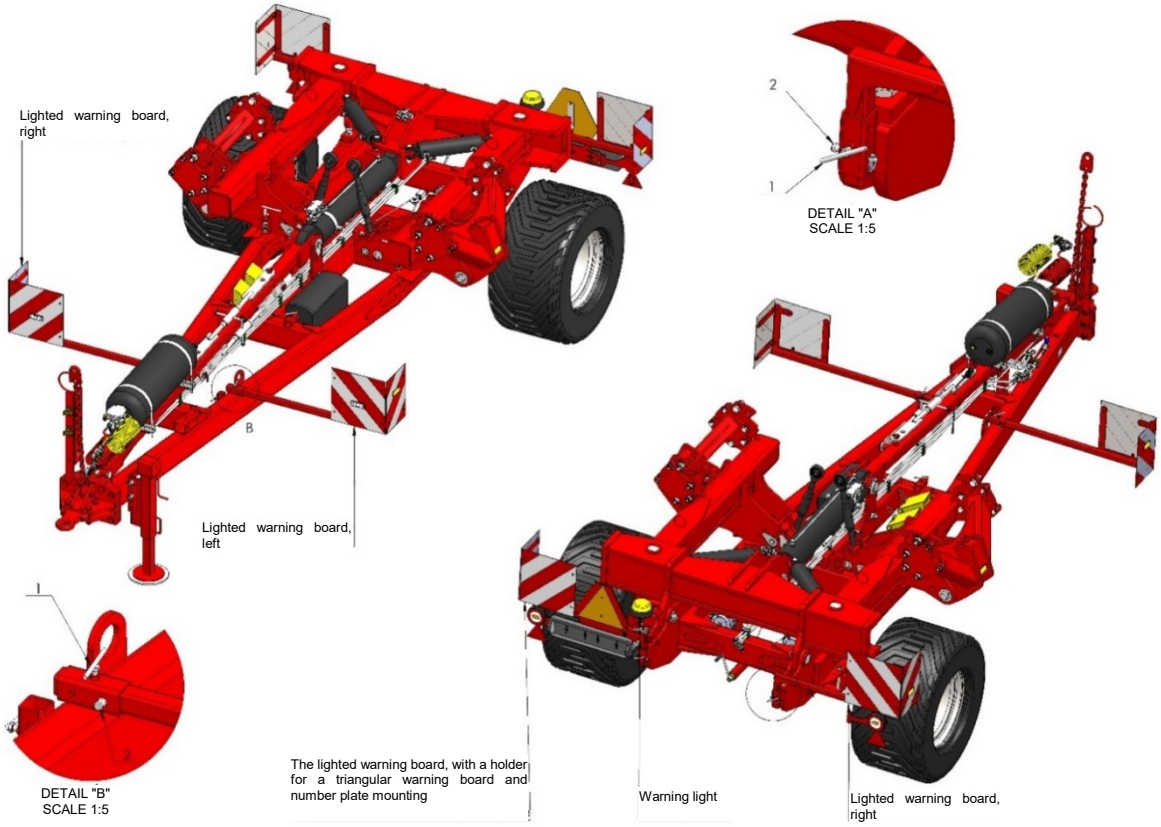


Figure 6. Fixing the lighting on the unit

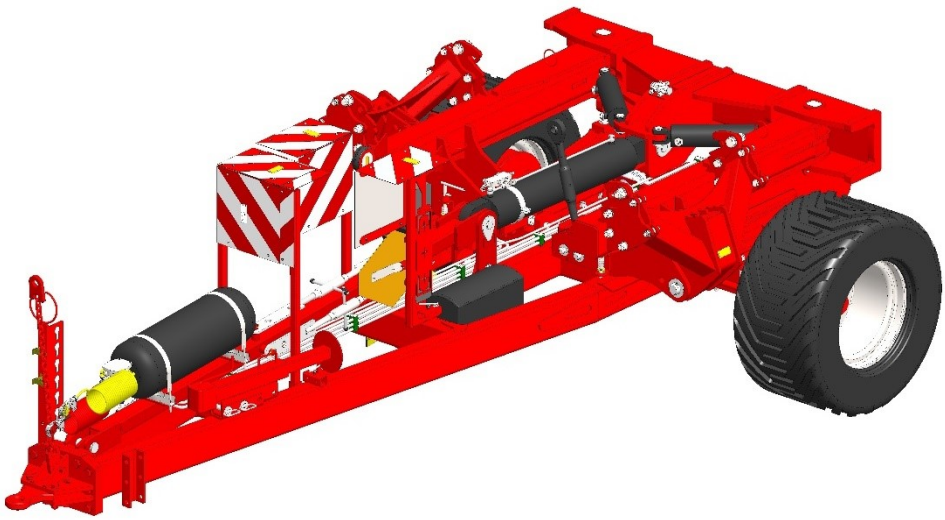


Figure 7. Location of the lighting brackets in the working position

6. Tool Carrier Design

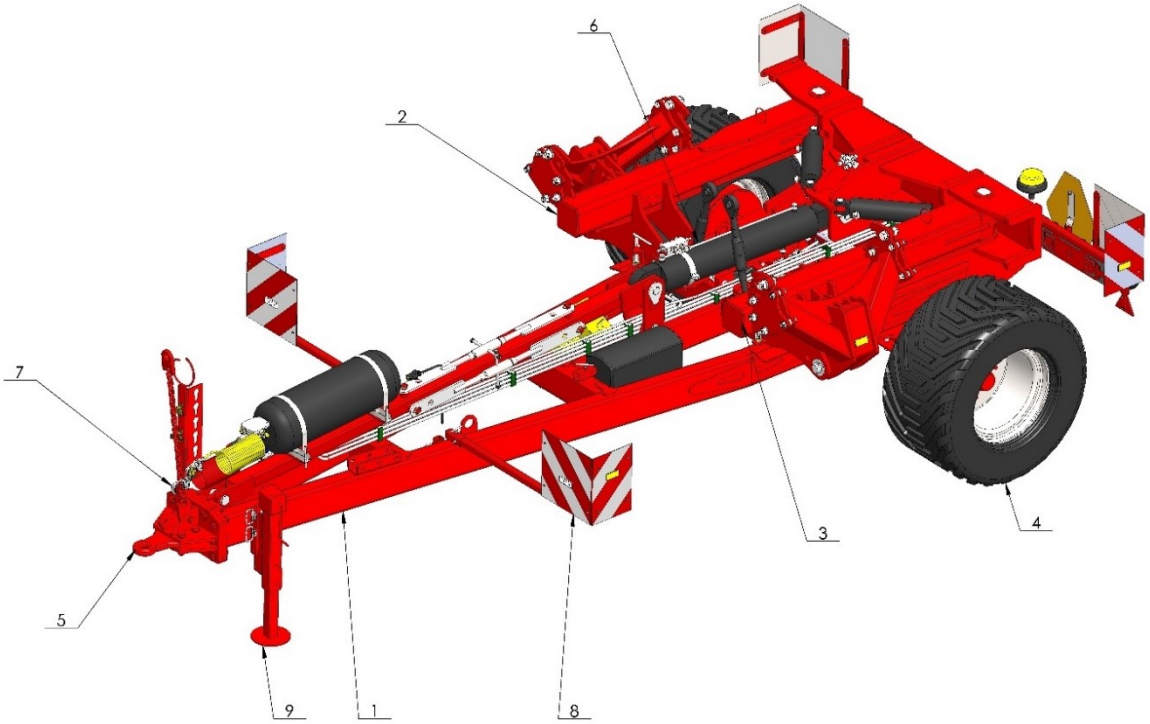


Figure 8. Tool Carrier Design

1) Lower frame;
2) Right arm with the three-point lifting system;
3) Left arm with the three-point lifting system;
4) Axle with wheels;
5) Hitch;
6) Hydraulic system;
7) Brake system (pneumatic or hydraulic);
8) Lighting;
9) Support foot.

6.1. Unit hydraulic system

ATTENTION

ATTENTION!

The tool carrier hydraulic system operates under high pressure. There is a risk of sustaining injuries from high pressure oil stream or from burns by hot hydraulic oil. If injured due to high pressure or hot oil burn, call medical help immediately.

ATTENTION

ATTENTION!

Before any work with the hydraulic system, dismount the working implements, disconnect the hydraulic hoses and deactivate the tractor engine.

Carry out routine inspections of the hydraulic hoses and if any damage is found, replace them immediately with new ones which meet technical requirements of the manufacturer.

6.1.1. Diagram and design of the hydraulic system

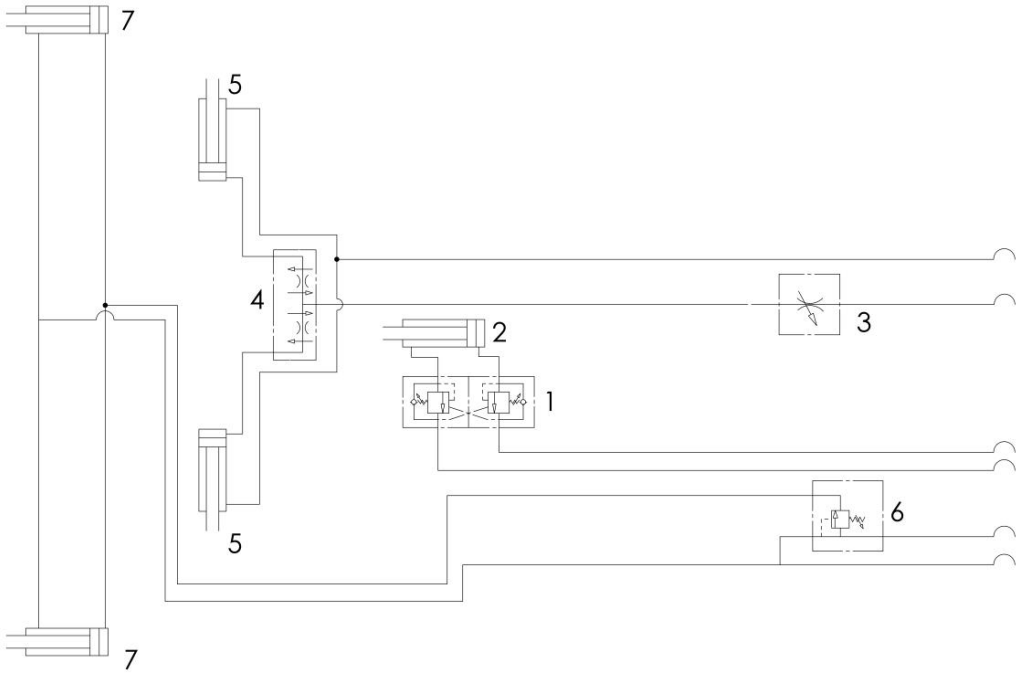


Figure 9. Hydraulic system diagram

1) Pressure and vacuum relief blocking valve, VBCD;
2) Central cylinder for folding the unit;
3) Throttling valve, VRFB;
4) Flow divider, V-EQ;
5) Lateral arm cylinder;
6) Overflow valve, VMP/L/D5;
7) Cylinder of three-point hitch system.

6.1.2. Hydraulic system connection

- When connecting the hydraulic hoses, make sure you connect them to the tractor correctly.
- When connecting the hydraulic hoses, ensure that there is no pressure in the hydraulic system.
- Connect the hydraulic hoses in pairs to one control section; the pairs of hoses in one hydraulic section are marked with the same colour.

6.1.3. Additional load of the disc-type unit

In the case of work in difficult soil conditions, when it is difficult for the disc units to enter the ground, it is possible to increase the load on the disc. Use the pressure limiting valve to adjust the load which will be transmitted from the tool carrier to the disc unit. When you screw in the adjustment screw clockwise, the load on the unit is raised. If the units enter soil too deep, reduce the pressure in the system by screwing out the adjustment screw from the valve counter-clockwise.

6.2. Brake system

The tool carrier has a high curb weight and this is why it is fitted with a pneumatic or hydraulic brake system and a parking brake.

DANGER

DANGER!

It is forbidden to drive the carrier on public roads with defective or disconnected brake system!!! The defective or disconnected brake system can lead to collision or accident. It may cause an injury or death of the driver or other traffic participants.

ATTENTION

ATTENTION!

Remember about inspecting the brake system before each time you start the machine. Repairs of the brake system may be executed only by persons trained for this purpose. Unauthorised repair of the brake system is forbidden!!!

6.2.1. Description of the pneumatic brake system

The tool carrier comes with a pneumatic dual cord brake system. The dual cord brake system is compatible with a tractor dual cord pneumatic system.

The brake system is started by the pneumatic brake system of the traction vehicle. Both brake cords connecting the pulled vehicle with the traction vehicle are fitted with filters. A red brake hose supplies the tool carrier brake system with compressed air. A yellow brake hose is a hose which controls the brake force of the tool carrier. The higher the pressure in the control hose, the stronger the performance of the pulled vehicle brakes. The pressure in the control cord rises together with stronger pressure applied on the brake pedal in the traction vehicle. If the red brake hose is disconnected from the traction vehicle, the emergency brakes of the tool carrier are enabled. The force of braking action of the implement is controlled by means of a two-range manual braking force control. Using the relief valve you can relieve the locked brake. If the operating pressure falls below 3 bar, the relief valve key is automatically pushed upwards, and the brake is actuated. Use the manual braking force control to set the pressure in the braking system, and at the same time the braking force. The manual braking control features two settings for the braking force (loaded and unloaded). If you drive the tool carrier without the working sections mounted, set the control in the unloaded position, as it prevents the wheels from locking when the axle load is low. After you mount the tools on the tool carrier, set the control lever in the loaded position to raise the braking force.

6.2.2. Diagram and design of the pneumatic brake system

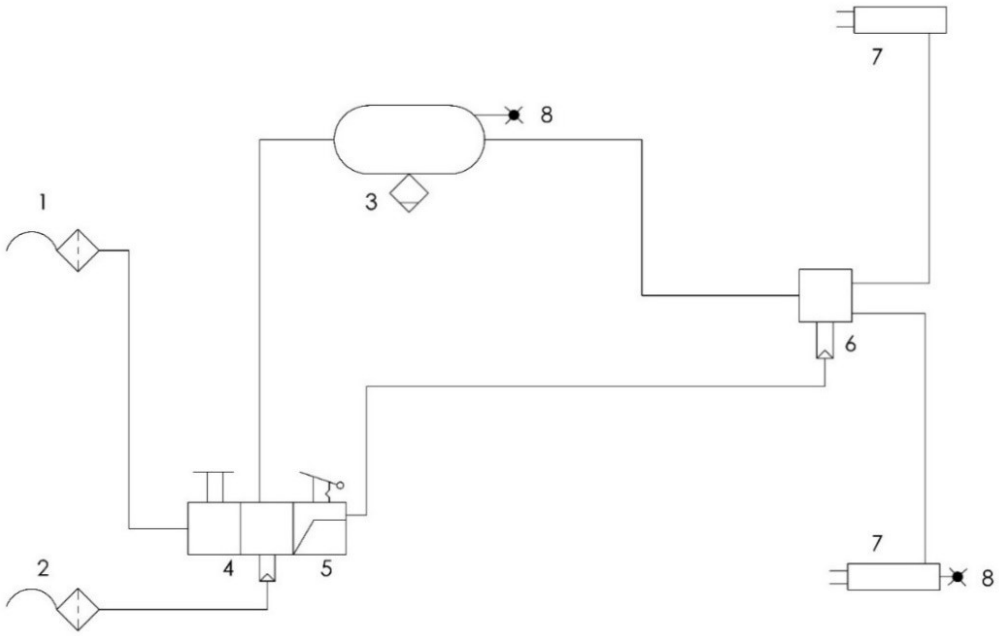


Figure 10. Diagram of the pneumatic brake system

1. Hose coupling with filter, supply.
2. Hose coupling with filter, control.
3. Air tank with drainage.
4. Trailer brake valve with a brake release.
5. Manual braking force control.
6. Relay valve.
7. Brake cylinder, membrane.
8. Inspection coupling.

6.2.3. Description of the hydraulic brake system

The machine brake system is fitted with an automatic brake valve with a battery, braking force control and unidirectional cylinders. The tractor connection is made by means of a double cord brake coupling and electrical connection which controls the valve function. The brake connection is connected with the automatic valve by means of main, auxiliary and return lines. The battery is controlled by a hydraulic signal from the auxiliary line, and by the electrohydraulic valve. If the signal from the auxiliary line or electrohydraulic valve is lost, the valve redirects the pressure from the battery to the brakes.

To apply brakes or release the parking brake, the electrical signal and pressure in the auxiliary line of the tractor is needed. After you disconnect the machine from the tractor, it is possible to control the brake system with a hand wheel on the automatic brake valve and by means of the manual pump integrated with the valve. Applying the pump and setting the handle wheel in position 2 causes the pressure release from the brake connection, which enables machine coupling (the machine brake is still engaged). Applying the pump and setting the handle wheel in position 1 causes the pressure release from the brakes, which enables machine motion. Re-applying the brakes is made when you set the hand wheel in position 0. When driving the tractor fitted with the double cord brake system, set the hand wheel on the valve in position 0. If the machine is coupled with a tractor fitted with a single cord brake system, the hand wheel must be set in position 2 (by connecting the brake system to the tractor

fitted with the single cord brake system, the system has emergency and service brake features, but the other valve features are lost). Position 1 is not used during passages.

6.2.4. Diagram and design of the hydraulic brake system

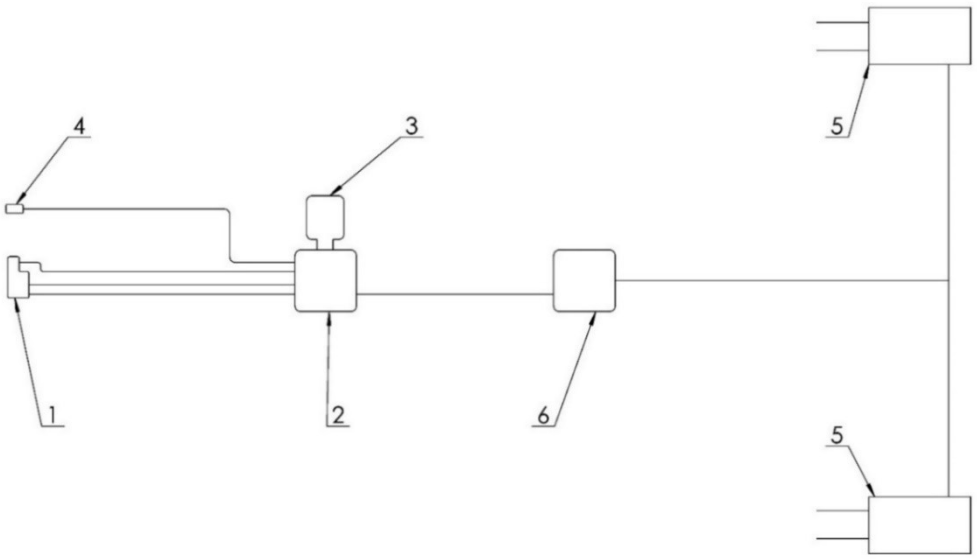


Figure 11. Diagram of the hydraulic brake system

1) Connection of the double cord brake system.
2) Automatic brake valve with a battery.
3) Battery.
4) Electrical plug of the automatic brake valve.
5) Hydraulic brake cylinder.
6) Manual braking force control.

6.2.5. Description of the parking brake assembly

The tool carrier comes with a parking brake controlled manually. A bolt tension of the cords connected with brake levers is an actuating component. By making clockwise turns of the crank (1), the position of the brake lever (3) is changed by the cord and a set of locks (2), which activates the tool carrier parking brake. Changing the direction of the crank turns, the parking brake is released.

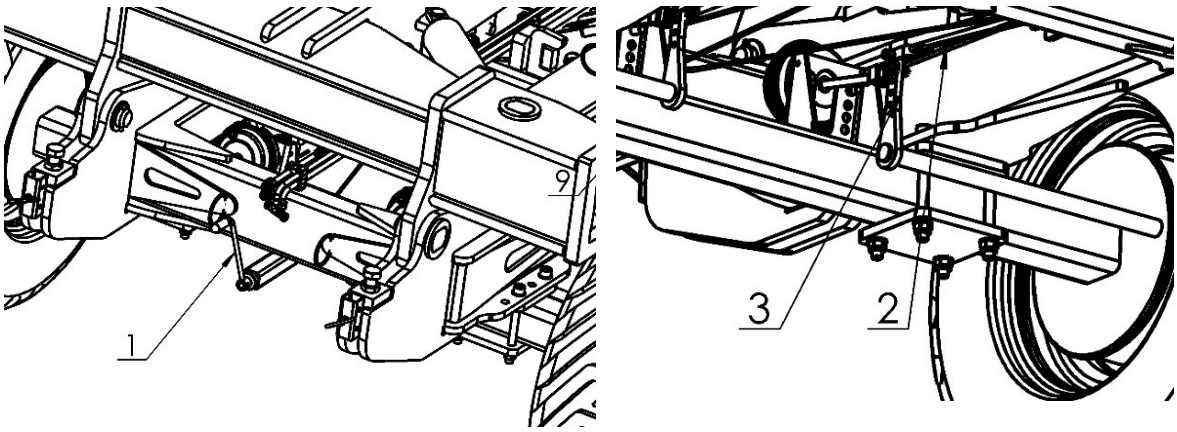


Figure 12. Parking brake assembly view.

6.2.6. Diagram and design of the parking brake

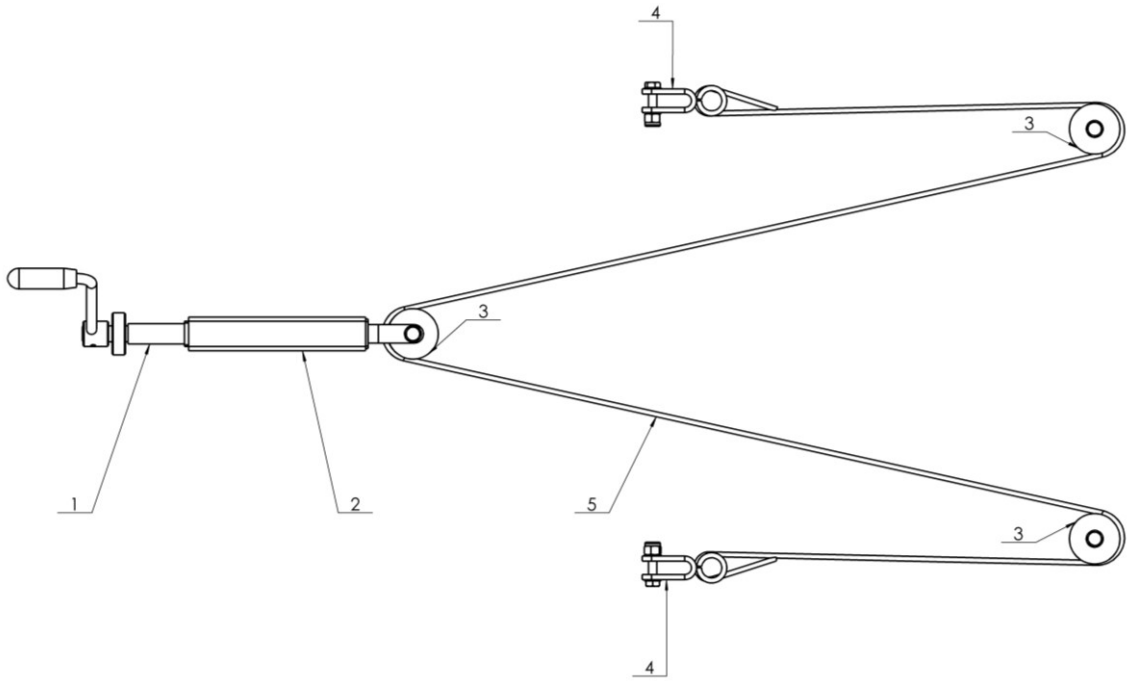


Figure 13. Diagram of the parking brake

1) Trapezoidal screw.
2) Tensioning slide.
3) Line pulley.
4) Cord holder.
5) Cord of the parking brake.

6.3. Electrical installation

The tool carrier comes with a 12V electrical system. After you connect the supply plug, check all the lighting components for correct functioning. During the tool carrier position change from the transport to the working one, dismount the lighting brackets by disconnecting relevant electrical bundle components. After you have finished work, re-install the lighting and connect the lighting with the electric bundle of the carrier. The carrier lighting is fitted with a yellow warning light too. During field works, dismount the warning light. After you have dismounted the lamp, mount a rubber guard on the locking pin to protect it from dust and dirt. The machine is fitted an electrical pin socket compliant with the ISO 1724 standard.

ATTENTION

ATTENTION!
No fuse repair is allowed. Short circuit in the electrical system may result in fire.

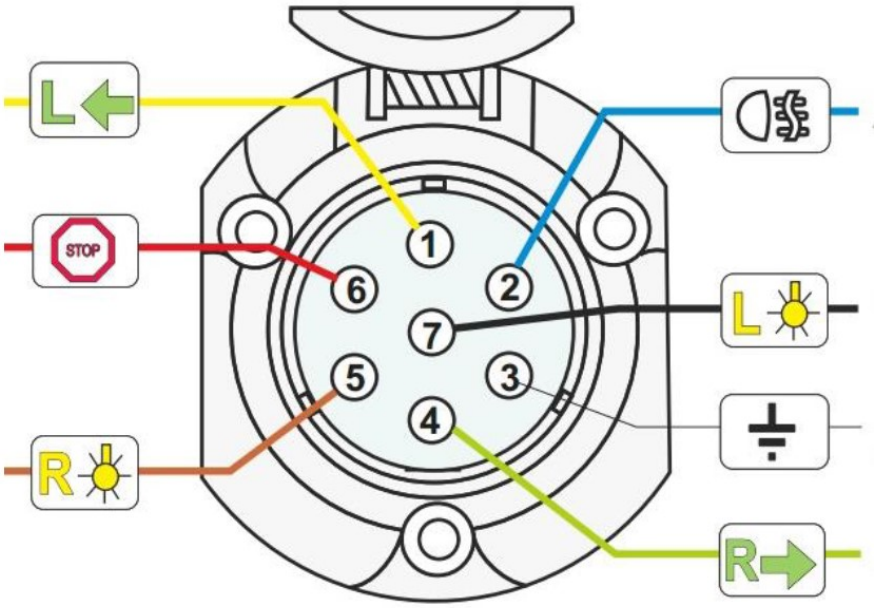


Figure 14. Diagram of the electrical plug connection

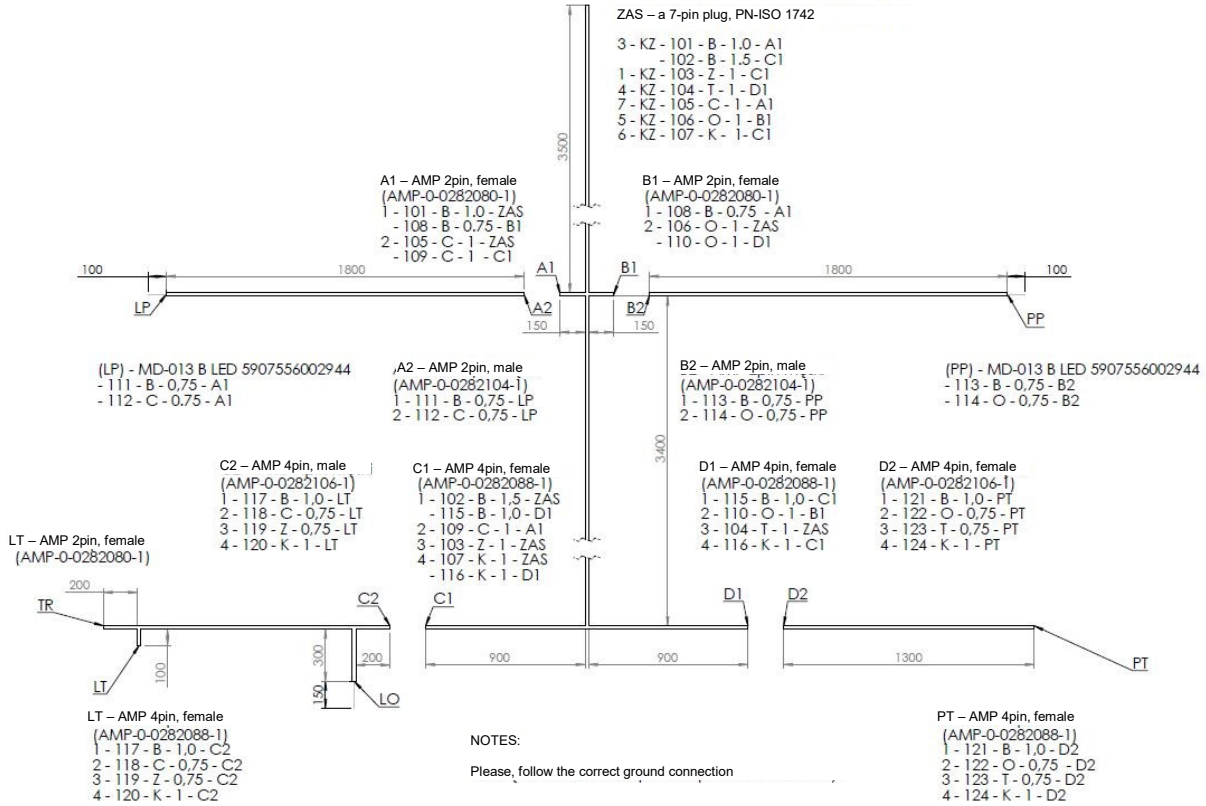


Figure 15. Electrical system diagram

6.4. Tyres (ground wheels)

The tool carrier comes with tyres with a size of 550/45-R22.5 and rims with a size of 16.00 x 22.5.

- When handling the tyres, ensure that the tool carrier may not move on its own.
- The repair work of tyres and wheels should be carried out by skilled persons who are equipped with suitable tools.
- Check the air pressure regularly. Incorrect tyre pressure may result in faster tyre wear or tyre damage. (The correct tyre pressure value is given on the side wall of the tyre, and also is marked with a suitable pictogram).
- Tyres must be protected from sunlight over longer machine stoppages.
- Avoid driving on sharp edges.

The tyres the tool carrier is fitted with are shown in the table below.

Table 2. Tyre type of the tool carrier

Tyre type/size	Maximum tyre pressure
Aliance 328 Value Plus 550/45-22.5	2.5 bar
Staco SG Flotation 550/45-22.5	2.8 bar

ATTENTION

ATTENTION!
Driving the tool carrier is prohibited when the tyre pressure is not correct of tyres are damaged. Driving with damaged tyres may result in accidents. The maximum tyre pressure is given on the tyre external side. The value for tyre pressure may differ depending on the tyres used. Exceeding the recommended tyre pressure values may result in its damage.

ATTENTION

ATTENTION!
Inspect regularly the tightening of the ground wheel nuts.
Tighten the wheel nuts during weekly inspections, or after any play of the axle and rim connection is found. Wheel tightening torque 380 Nm

7. Technical specification of the tool carrier together with coupled machines

Table 3. Technical specification of the tool carrier

No.	Parameters	Machine type		
		U910	U910+U786	U910+U457
1	Machine type (configuration)	Tool Carrier	Tool carrier with disc units	Tool carrier with cultivators
Dimensions and weights				
2	Dimensions in transport position L/W/H [mm]	5990/2980/1720	6435/2980/3850	6100/2980/3990
3	Dimensions in working position W/H/L [mm]		9050/8520/1970	8800/8115/1970
4	Weight [kg]	3815	10800	8200
5	Wheels and tyres	16.00 x 22.5 550/45 R22.5		
6	Wheel track [mm]	2400		
7	Load on the hitch (negative load value) [kN]	5.8	18.8 (24)	15.3
8	Load on the hitch [kg]	3225	22.8	6500
9	Support load [kg]	706	2162	1678
10	Hitch [mm]	Ø40 or Ø50		
11	Transport speed [km/h]	25		
Brake system				
12	Service brake			
	Type	Mechanical, drum brake		
	Control	Pneumatic and hydraulic (two-hose pneumatic system or two-hose hydraulic system)		
13	Parking brake			

	- type	Mechanical, drum brake		
	– control system	Manual, via crossed helical gear		
Electrical installation				
14	Electrical installation	12V, from the tractor to work with		
Technical data depending on tool configurations				
15	Working width [m]		8	8
16	Number of working components [pcs]		64	72
17	Shaft type [mm]		tubular (Ø600) or string (Ø600)	tubular (Ø330) Crosskill (Ø500)
18	Disc diameter/Working component size [mm]		Ø620	32x12
19	Number of working component rows		2	3
20	Number of scrapers [pcs]		42 (2 rows with 21 pcs per each)	-
21	Working depth range [cm]		from 5 cm to 15 cm	from 5 cm to 13 cm
22	Scale between discs/tines [mm]		250	110
23	Working speed [km/h]		8-15	8-15
24	Effective capacity [ha/h]		6.0-12.0	6.0-10.0
25	Power demand [kW/(HP)]		210-300 (280-400)	180-255 (240-340)
26	Operation		operator	operator
27	Working depth adjustment		Mechanical and hydraulic	Mechanical and hydraulic
28	Clearance under frame [mm]		400	400
29	Edge shields		Optional	

* Find full specification of the working tools in operation manuals of those machines.

8. Delivery and loading on means of transport

The tool carrier with working sections is delivered for use in a partly disassembled condition. The extent of disassembly depends on the means of transport used. When loading and unloading, use pars of the frame marked on the machine with relevant pictogram as lifting points, see Fig. 16. Only skilled and trained persons may execute the machine installation. The lifting eyes are shown in the figure below, they are located symmetrically on both sides of the main frame. The lifting gear for loading and unloading must be operated by skilled persons only.

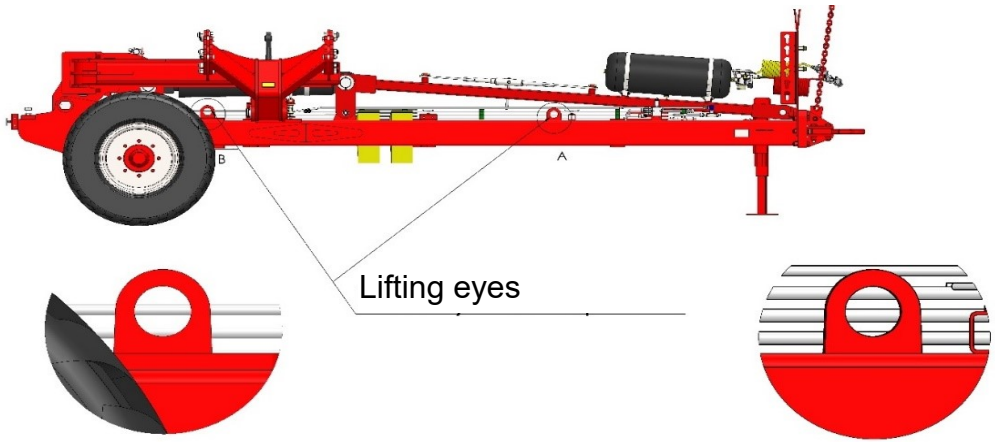


Figure 16. Lifting eyes

9. Operation and use

9.1. Unit preparation

During preparation, check the technical condition of the machine.

Additionally, perform the following:

- Check the condition of the bolted joints and if any play is found, tighten according to the table of torques,
- Check the machine for completeness,
- Turn the discs and rollers manually to check if the rotation is free and unhindered,
- Lubricate relevant components, as per instruction given in item *Lubrication*,
- Check the condition of hydraulic hoses,
- Check tyre pressure of the tool carrier,
- Check the condition of rotational component pins and their protections,
- Check the condition of the lighting system,
- Check the condition of the brake system,
- Check the condition of the coupling.

DANGER

DANGER!
When you prepare the machine for operation, follow the items above to check its technical condition. Operating the defective unit is a threat for health and life of the operator and persons present near the machine.
Operation of the defective machine is forbidden!!!

9.2. Requirements for the tractor

The tractor used for operating the unit should be fitted with suitable coupling enabling the transmission of the unloading force. The maximum unloading force occurs at configuring the tool carrier with the disc unit fitted with a heavy re-compaction roller. The maximum value of the unloading force is ca. 2,400 daN. The minimum rear axle load without mounted tools may not be lower than 6,000kg. During coupling the tool carrier to the tractor, check the tyre pressure.

DANGER

DANGER!
Use only tractors with equal or higher rear axle load recommended by the manufacturer. Using the tractor with a load lower than that given in the manual is a risk of rear axle traction loss, which may lead to tipping over of the tractor. This may result in an injury or death of the driver.

ATTENTION

ATTENTION!
Use great care during driving at headland, as it is then, when the rear tractor axle may be unloaded.

ATTENTION

Connecting the machine with the tractor if the tractor is not fitted with a coupling transmission of the unloading force is forbidden. The value of the unloading force is ca. 2400 daN.

Necessary tractor equipment:

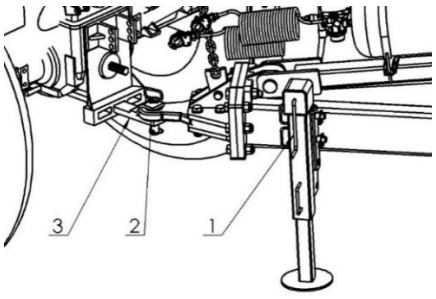
- Dual-cord brake system (pneumatic or hydraulic);
- Electric socket;
- Rear axle weight;
- Coupling transmission of the unloading force.

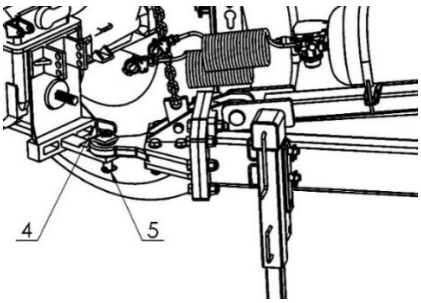
9.3. Coupling to the tractor

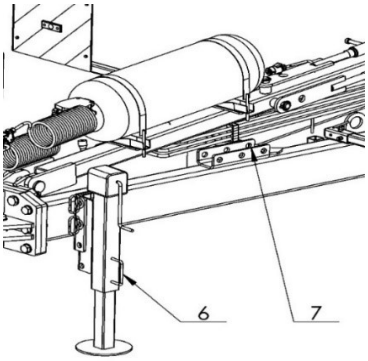
To ensure correct and safe coupling of the unit to the tractor, it should stand on solid and level surface.

When you connect the tool carrier to the tractor, follow the steps indicated in the table below.

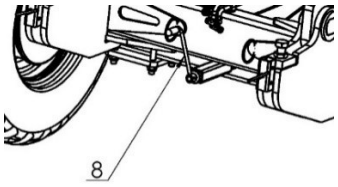
Table 4. Connecting the carrier to a tractor

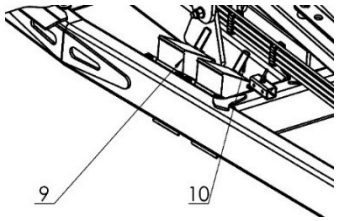






1. Use the crank (1) of the support foot to set a correct height of the lifting eye (2), which enables problem-free coupling with the tractor hitch (3).
2. Reverse the tractor to a distance which enables connecting the unit hitch with the lower pulling coupling (3).
3. If necessary, install a spacer over the lifting eye of the machine (2), and allow for enough freedom of movement.
4. Connect the tractor with a machine by means of a connecting pin (4). Secure the connecting pin (4) with a locking pin (5).
5. Connect the safety chain.
6. Lean the hitch eye on the tractor coupling to lower the carrier.
7. Dismount the support foot (6), insert it in the transport holder (7) and secure with connecting pins and locking pins.
8. Connect the lighting cables.
9. Connect the hydraulic system.
10. Connect the brake system.
11. Release the parking brake of the carrier (8), remove the securing chocks (9) and insert them in appropriate holders (10).





9.4. Folding and extending the unit

WARNING

WARNING!
Before you unfold the machine, make sure that there is enough space for safe unit unfolding.
Carry out unfolding the unit to the working position only when the machine is coupled with a tractor.

ATTENTION

ATTENTION!
When folding and extending the unit, bystanders are not allowed near the machine.

ATTENTION

ATTENTION!
Carry out machine folding and extending on solid, level and horizontal surface. Performing the above-mentioned activities with the unit tipped may result in unfolding of only one working section, which may cause machine tip over.
Make sure that the working sections unfold evenly.

ATTENTION

ATTENTION!
Remember to secure the arms with locking pins each time you fold the unit. Failing to secure the arms in the transport position may cause the working tools to swing outwards. It may lead to accidents due to which other participants of road traffic may die.

9.5. Risk zones during folding and extending the unit

DANGER

DANGER!
Bystanders in the risk zones are not allowed during folding and extending the unit, as there is a risk of crushing by the working sections. Standing in this zone is a hazard to health or life!!!

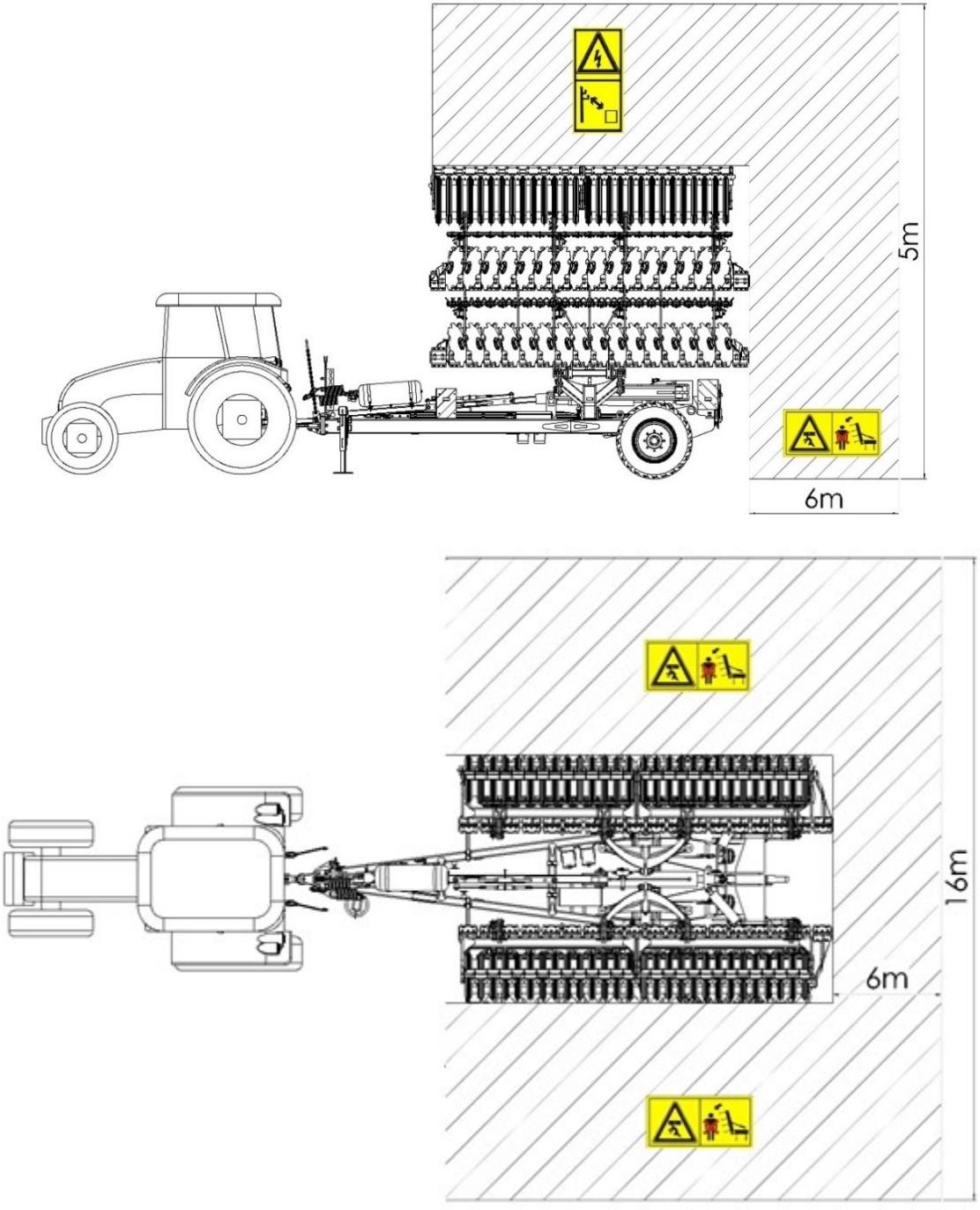


Figure 17. Danger Zones

9.6. Installing the working components on the tool carrier

Depending on the field work performed on the tool carrier, various tools can be installed.

ATTENTION

ATTENTION!

The disc units have both right and left configuration. Remember to set the units correctly, otherwise damage to the machine may occur.

The configuration of the units before coupling with the tool carrier is shown in the figure below. The units have both right and left configuration. Before you position the units next to each other, check the distance between the side wall of the roller frame and roller fixing. The place of measuring and the value to set (225 mm) is shown in Fig. 18.

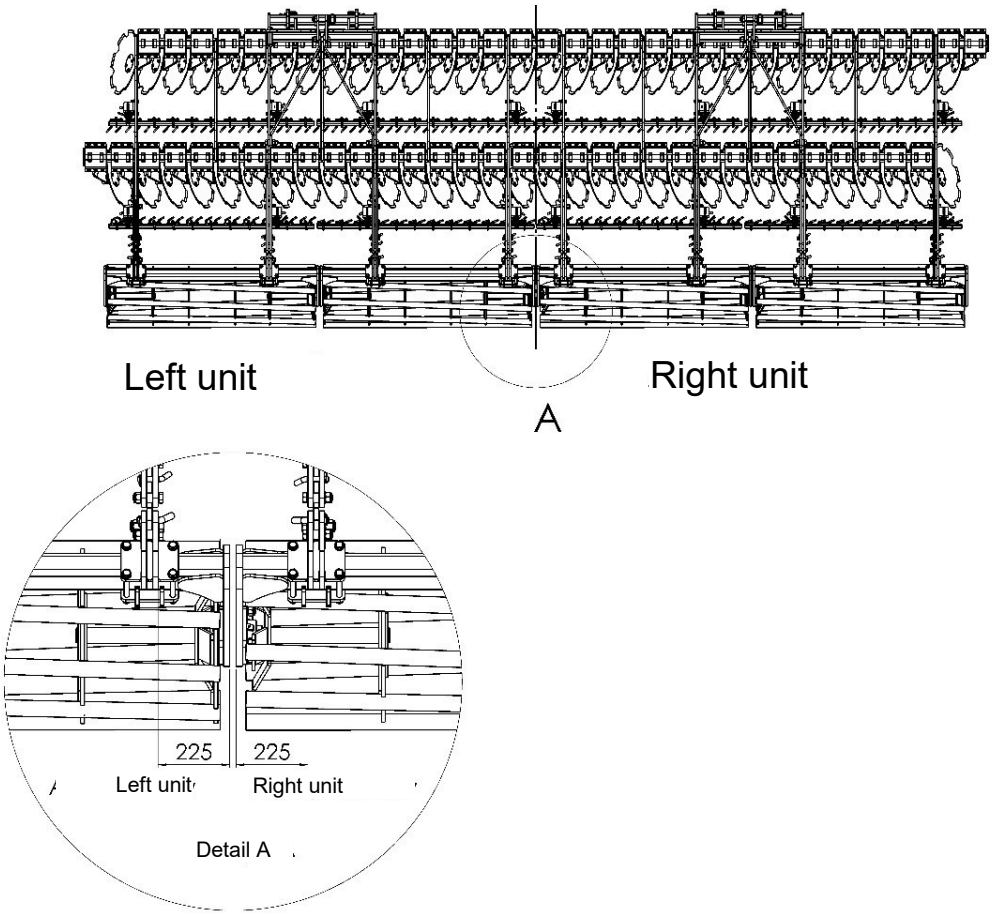
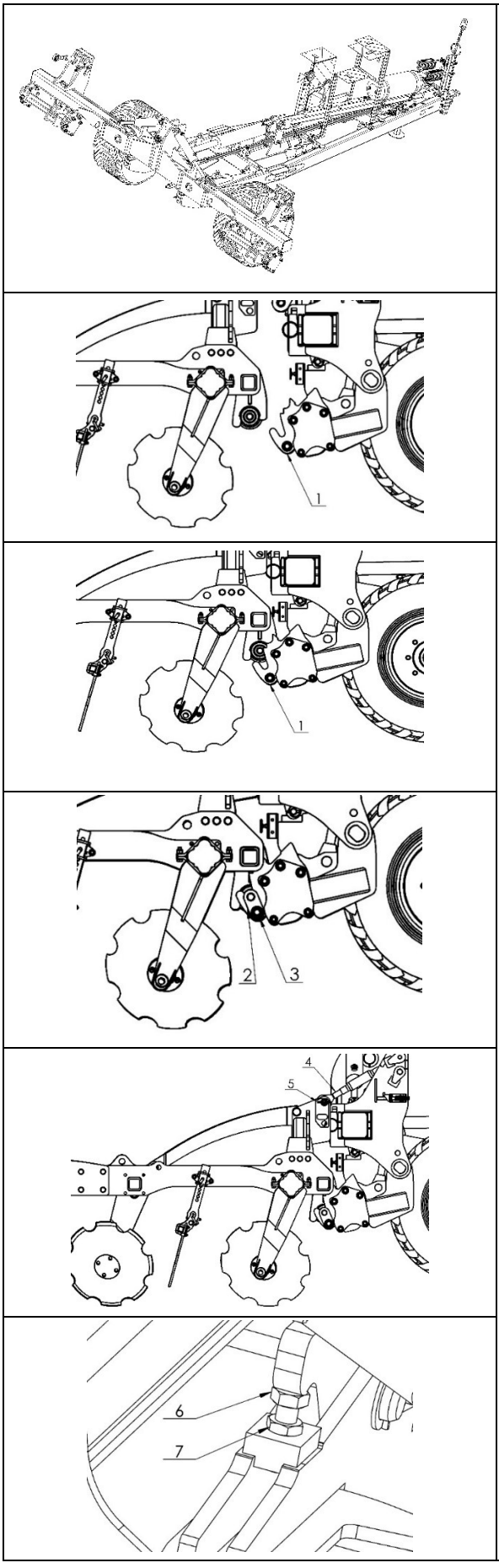


Figure 18. The configuration of the units before connecting with the tool carrier

Table 5 shows the procedure of connecting the working tools on the tool carrier.

Table 5. Connecting the working tools to the carrier

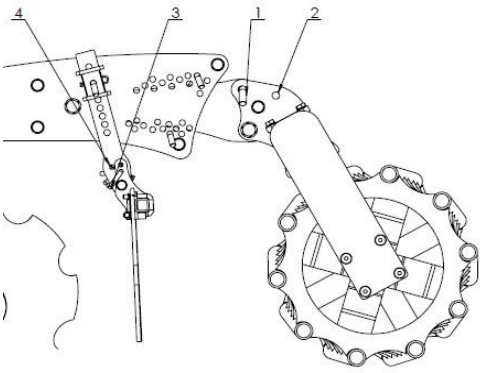


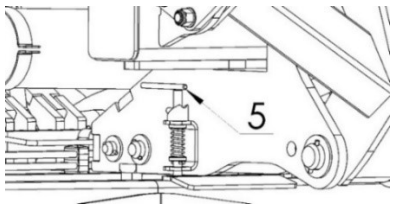
1. Position the units next to each other on a solid, level ground (Fig. 18).
2. Dismount the lighting brackets of the carrier and mount them in respective holders for the working position (see Chapter 5).
3. Unfold the carrier to the working position.
4. Use the hydraulic system of the tractor to lower the three-point hitch (1).
5. Reverse the tractor with the coupled tool carrier to the distance which enables hitching the units on the three-point hitch.
6. Use the control lever from the tractor to lower the three-point hitch (1).
7. Mount the protective sheet cover (2) and fix it with the bolt (3).
8. Install the central connector (4) and secure it with the pin (5) (install the central connector only with the upper hole in the unit, as installing it in any other position will damage it).
9. Adjust the central connectors so that their lengths are equal.
10. Check all the coupling of the working sections with the tool carrier.
11. Use the bolt (6) to adjust the side arm positions. The side arms should be set parallel to the tool carrier frame. The adjustment screws are located on both sides of the tool carrier. After you set the adjustment screws, secure them with the jam nut (7) from loosening.
12. Lift the units on the three-point hitch and fold the tool carrier in the transport position.
13. After you have folded the carrier, protect it from uncontrolled extending.
14. Install the lighting.

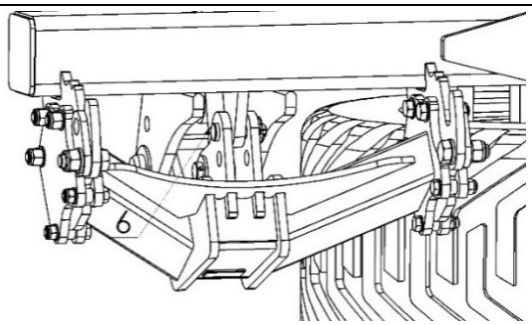
9.7. Folding the unit into the transport position

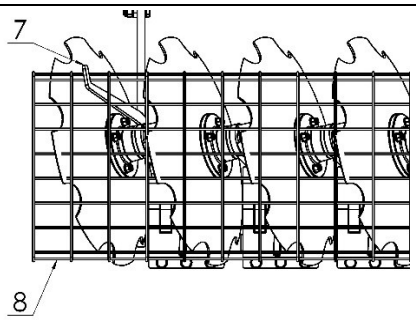
The procedure of folding the unit into the transport position is shown in the table below.

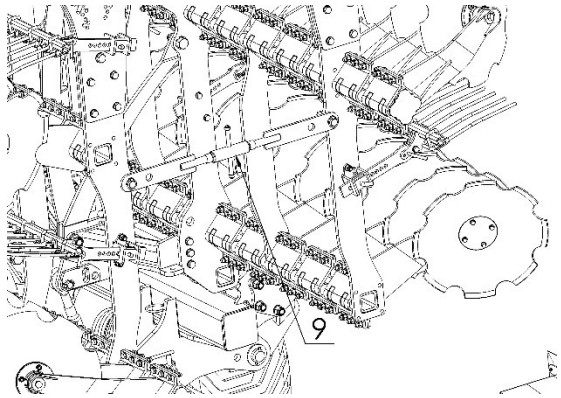
Table 6. Folding the unit into the transport position











1. Before you start folding the unit, remove the pin (1) and insert it in the hole (2). Next, remove the pin (3) and insert it in the hole (4). The above-mentioned activities enable the rollers to shift to the transport position during the folding action.
2. Make sure that the pin lever (5) is set in the suitable which automatically protects the side arm from uncontrolled unfolding.
3. Use the control lever of the tractor hydraulic system to start the three-point lifting system in the tool carrier.
4. Use another control lever to start the section which makes the units rise to the vertical position.
5. Then, start the third hydraulic section which make the side arms fold forward.
6. Use the pin (6) to secure the carrier hydraulic lift.
7. Install lighting system devices in relevant fixing points.
8. Install the safety mesh fixing (7) on the disc bracket (4 fixings for one unit).
9. Hang the safety net (8) on the fixings (7) and use tensioning belts to secure it.
10. Mount the safety connector (9) and secure it with locking pins. Use the rigging screw to pull the units to the centre of the machine.

ATTENTION

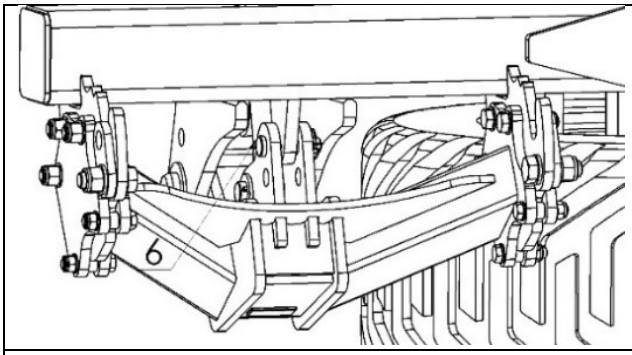
ATTENTION!
Remember to follow the correct order of starting the carrier hydraulic sections.
The order of starting sections during folding the carrier:

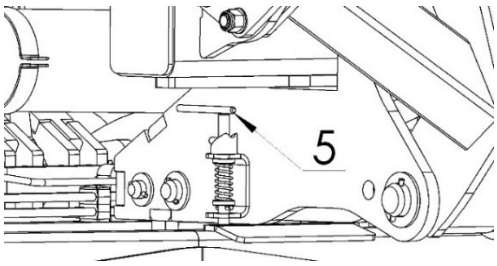
1) Three-point lifting system (red).
2) Central cylinder of the unit folding to horizontal position (yellow).
3) Side axle cylinders (green).

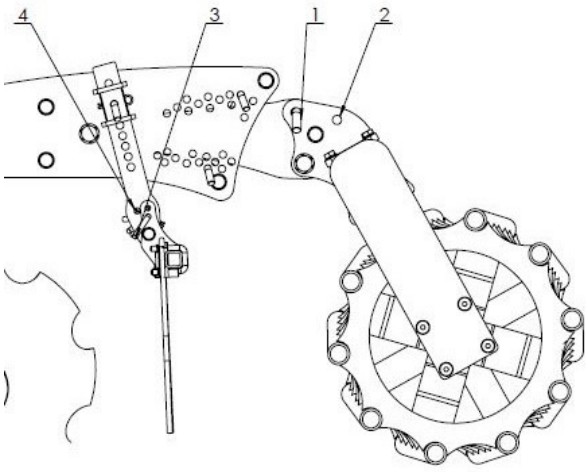
9.8. Unfolding the unit to the working position

The procedure of unfolding the unit to the working position is shown in the table below.

Table 7. The procedure of unfolding the unit to the working position







1. Dismount the lighting components and install them in proper brackets for the working positions. Dismount the safety nets protecting working components and the net brackets. Unscrew and remove the protective connectors. Mount them in proper places on the tool carrier frame guy ropes. Dismount the warning light from the fixing pin and put it to the tool container.
2. Remove the pin (6) and insert it in the empty hole next to the pin.
3. Shift the pin lever (5) by 180˚ to the position which prevents the lateral arms from extending.
4. Use the hydraulic control lever to start the hydraulic section enabling the lateral arms to unfold.
5. Start the section controlling the central cylinder, which enables the unit to extend backwards.
6. Use the three-point hitch to lower the unit on the ground.
7. Insert the locking pins (1) to lock the rollers in the working position.
8. Use the pin (4) to set the correct position of scraper.

ATTENTION

ATTENTION!
Remember to follow the correct order of starting the carrier hydraulic sections.
The order of starting sections during unfolding:

1. Side axle cylinders (green).
2. Central cylinder of the unit unfolding from the transport to working position (yellow).
3. Three-point lifting system (red).

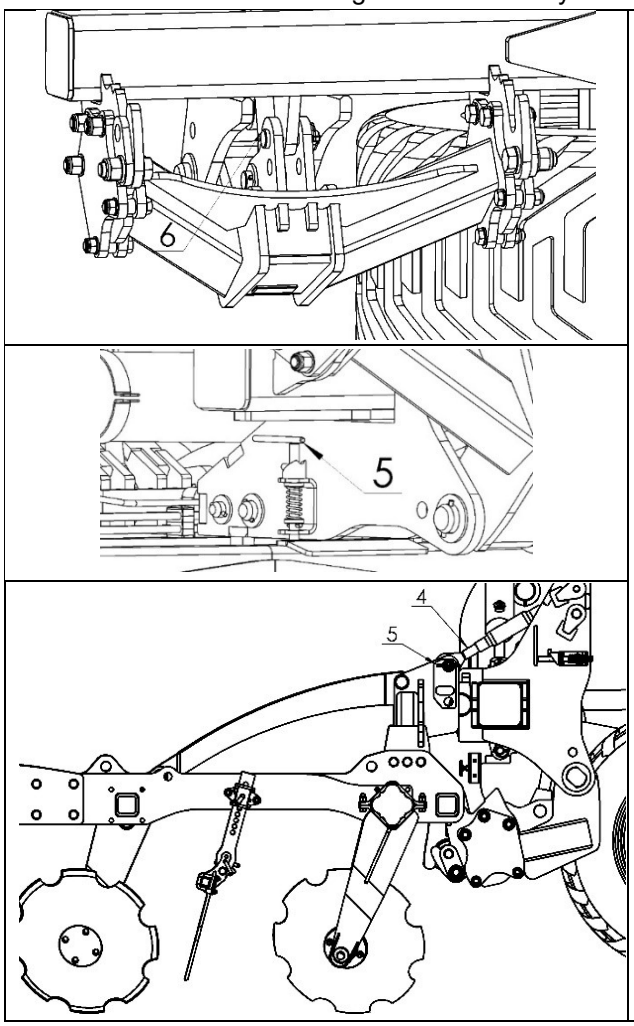
9.9. Working tool disassembly

ATTENTION

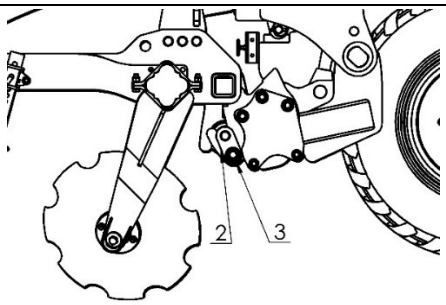
ATTENTION!
Before you start disassembly the working tools, make sure that there is enough space for unfolding the unit and that there are no bystanders near the unfolding site (see Fig. 17).

The steps of the working tool disassembly are listed below:

Table 8. Working tool disassembly



1. Position the tool carrier on level ground.
2. Dismount the lighting and install them in proper fixing points in the working position (see Chapter 5)
3. Dismount the connectors which protect the units and remove the locking pins (6) and dismount the safety meshes.
4. Unblock the protections for lateral arms (5).
5. Use appropriate control device in the tractor to activate the cylinders of the lateral arm unfolding.
6. Then, activate the central cylinder and unfold the unit to the horizontal position.
7. Use the third hydraulic section to lower the units on the ground.
8. Remove the pins of the upper connectors of the units.
9. Loosen the bolts (2) of the protections (3) of the hitch bars and dismount them.
10. Lower the tool carrier lift to the height which enables you to drive off from the units freely.
11. Fold the tool carrier to the transport position.



10. Operating the tool carrier with working implements connected

Connected to a pair of identical implements, the tool carrier may reach the working length of 8m. Connecting the carrier with working tools is described in item 9.6

Installing the working components on the tool carrier.

10.1. Coupling

ATTENTION

ATTENTION!
Setting too long coupling may cause its damage and disconnection of the unit from the tool carrier. Do not exceed the acceptable length of the coupling. The bolts in the coupling should be set symmetrically. The maximum unscrewing of the bolt is marked on the coupling by thread relief. Setting the coupling too long may cause excessive transport width of 3m. After you complete the adjustment, secure the coupling against uncontrolled change of length.

DANGER

DANGER!
Mount the coupling of the three-point only with the upper hole in the unit. Mounting the coupling in a different position may cause hitting the arm bar and breaking the unit connection with the tool carrier. Remember to secure the connecting pins carefully. Before each work, inspect the coupling connection with the tool carrier and the unit.

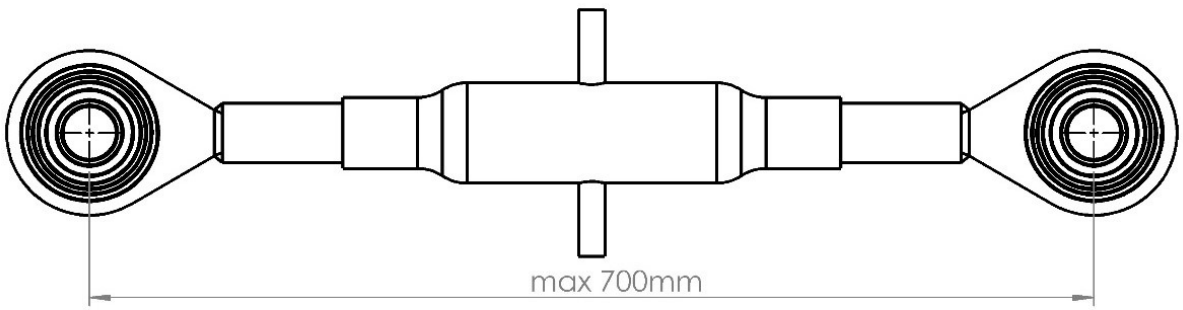


Figure 19. Coupling

During first passage in a field, adjust the coupling. Shorten or lengthen its length to adjust it. The disc unit should be set in parallel to the surface of the field during work. Correct

adjusting of the coupling allows for obtaining optimised performance. If the tool carrier is coupled with the spring cultivator, the coupling can be lengthened, which will result in unloading the front unit rollers.

10.2. Adjusting working depth and position settings of the scrapers

Setting the working depth of the scrapers should be done by means of cotter pins fixed in proper holes of the plough frogs, secured with locking pins. The angle however can be adjusted with lower pins of the scraper fixing.

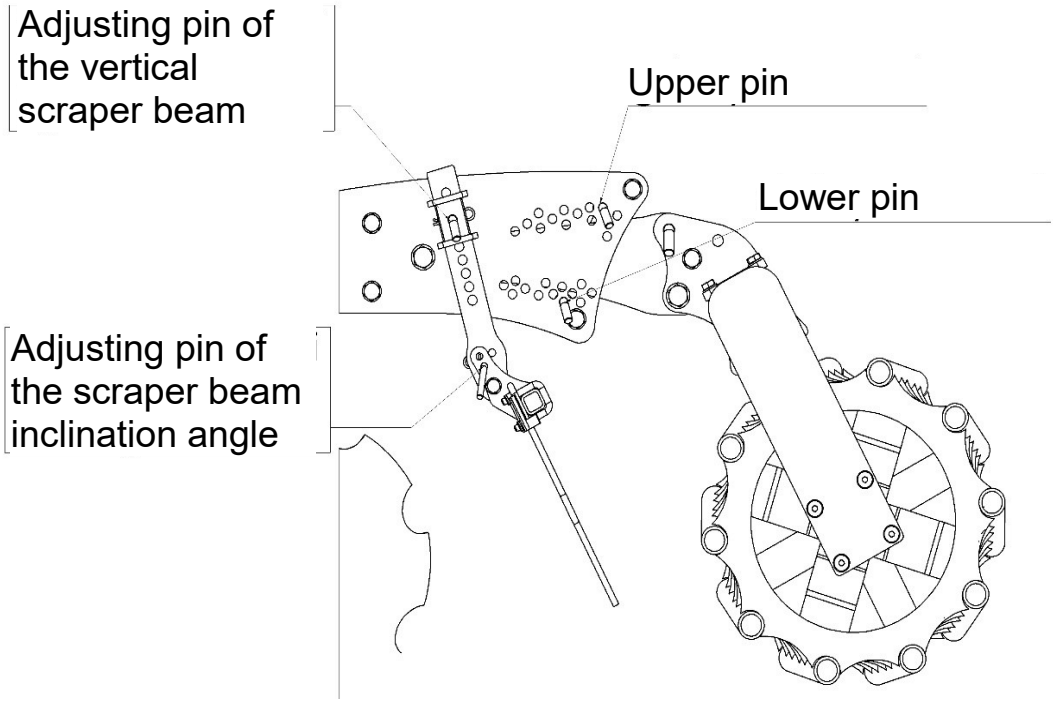


Figure 20. Working depth adjustment

The working depth of the disc blades can be adjusted with the three-point hitch system of the tool carrier and mechanical adjustment of the rollers. The roller adjustment should be performed with the use of cotter pins fixed in respective holes of the roller fixing sheet, secured with locking pins (see Fig. 20).

To set the maximum working depth, insert the pin in the upper hole in the sheets of the roller fixing. To set a proper position of the lower pin, lift the roller and insert the pin in a proper hole. The adjustment can be made after stopping at the edge of the field next to elevated ground. Lower the unit roller on the elevated ground, which will make the roller rise and allow for the pin to be inserted in a relevant lower hole. Secure the pins with spring pins (the locking pins must be in the same holes on both sides of the unit).

Make the adjustment after you have stopped the tractor engine and follow all the safety rules. Use special care when working with components which can crush feet or hands.

10.3. Re-compaction roller working depth and clamp adjustment

Setting the depth of the working components should be done by means of cotter pins fixed in proper holes of the plough frogs, secured with locking pins.

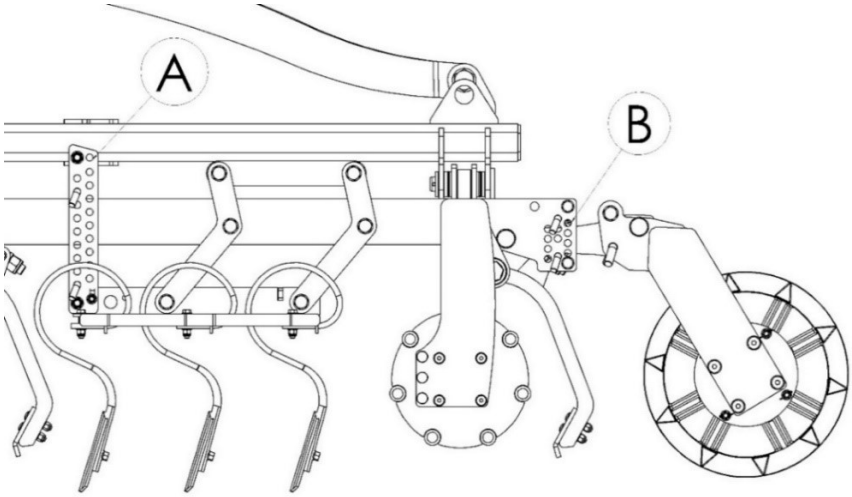


Figure 21. Cultivator working depth adjustment

The working depth of the cultivator springs can be adjusted with the three-point hitch system of the tool carrier and mechanical adjustment of the working sections.

To increase/decrease the work depth, lift the cultivator over the surface and remove lower pins which lock the change of working section positions in the sheets of depth adjustment (see Fig. 21 - A). Then, lower the cultivator to the ground, which will make the working sections rise and allow for the pin to be entered in a relevant upper hole; after that, lift the cultivator and insert a lower pin in a relevant adjustment hole to lock the working section position.

The roller adjustment should be performed with the use of cotter pins fixed in relevant holes of the roller fixing sheet, secured with locking pins (see Fig. 21 - B). The adjustment can be made after stopping at the edge of the field next to elevated ground. Lower the cultivator roller on the elevated ground, which will make the roller rise and allow for the pin to be inserted in a relevant lower hole.

Secure the pins with spring pins (the locking pins must be in the same holes on both sides of the cultivator). Make the adjustment after you have stopped the tractor engine and follow all the safety rules. Use special care when working with components which can crush feet or hands.

10.4. Unit operation

Before you start the operation of the unit:

- Check condition of the bolted joints – if any play is found, tighten bolts and nuts,
- Remove the warning marking,
- Dismount the safety nets,
- Unfold the tool carrier with sections to the unit working position,
- Set the unit working depth,
- Lower the tool carrier lift and leave it in the floating position.

If during the operation the unit is clogged with excessive amount of vegetative residue, clean it by lifting the units on the tool carrier hydraulic lift for a moment during the passage.

The unit must be adjusted during first passage. The unit frame is correctly levelled when it is parallel to the field surface.

ATTENTION

ATTENTION!
During turns at headlands in the field, make sure that you lift the units on the three-point hitch systems of the tool carrier.

11. Service activities

ATTENTION

ATTENTION!
The inspection activities apply to the tool carrier and machines connected to the carrier. Use spare parts recommended by the manufacturer only.

WARNING

WARNING!
Carry out the servicing activities, when the machine is in unfolded position. Carrying out the servicing activities in the transport position may lead to uncontrolled unfolding of the unit, and consequently, to bodily injury or death.

11.1. Servicing activities during the start-up

The servicing activities during the start-up are described in the table below.

Table 9. Servicing activities during the start-up

Inspected assembly	**Activity**
Wheels and tyres	Tighten the wheel nuts according to the tightening torque table. Check tyre pressure.
Thread connections	Tighten the bolts and nuts according to the tightening torque table.
Transport protection components	Check the condition of the locks and pins securing the machine against uncontrolled unfolding.
Brake system	Check the proper operation of the braking system.
Hydraulic system	Check the proper operation of the hydraulic system. If you find any leaks at the connections, tighten the nuts of hydraulic hoses.

11.2. Service activities during daily operation

The servicing activities during daily operation are described in the table below.

Table 10. Servicing activities during daily operation

Inspected assembly	**Activity**
Wheels and tyres	If any wheel nuts are loose, tighten them according to the manual. Check the condition of tyres for damage. Check tyre pressure. The correct tyre pressure is marked in the pictogram on the carrier frame and on the tyre side wall.
Thread connections	Check the condition of the bolted joints and if any play is found, tighten according to the table of bolt tightening torques.

Brake system	Check the condition of brake hoses and couplers. If they are damaged, replace with new ones.
Hydraulic system	Check the condition of the hydraulic hoses and connections for damage and leaks. If they are damaged, replace with new ones.
Transport protection components	Check the condition of the locks and pins securing the machine against uncontrolled unfolding.
Work Tools	Check the condition and completeness of the working tools. Replace worn or damaged working components with new ones.
Bearing units	Check the condition of bearing unit housings and replace as required.

11.3. Weekly service activities

Table 11. Service activities

Inspected assembly	**Activity**
Wheel nuts	Tighten the wheel nuts according to the bolt tightening torque table.
Thread connections	Tighten the bolts and nuts according to the bolt tightening torque table.
Brake system	Check the condition of lines, working and control components of the brake system (pneumatic or hydraulic brake). Use the drainage valve to drain water from the compressed air tank (pneumatic system). Check the condition of the rigging screw and parking brake cable.
Bearing units	Check and lubricate all bearing units, cylinders and upper connecting rods. The tool carrier pivot points do not require lubrication).
Coupling	Check the condition of the coupling. If it is damaged, replace with a new one.

11.4. Lubrication

ATTENTION

Carry out lubrication according with recommended lubrication frequency depending on the point of lubrication.

Durability and good working order of the unit depends primarily on systematic lubrication.

Use mineral greases for lubrication. Before applying the grease, clean the lubrication points. Carry out the lubrication as per Fig. 22, 23, 24.

Use ŁT-4S-3 grease.

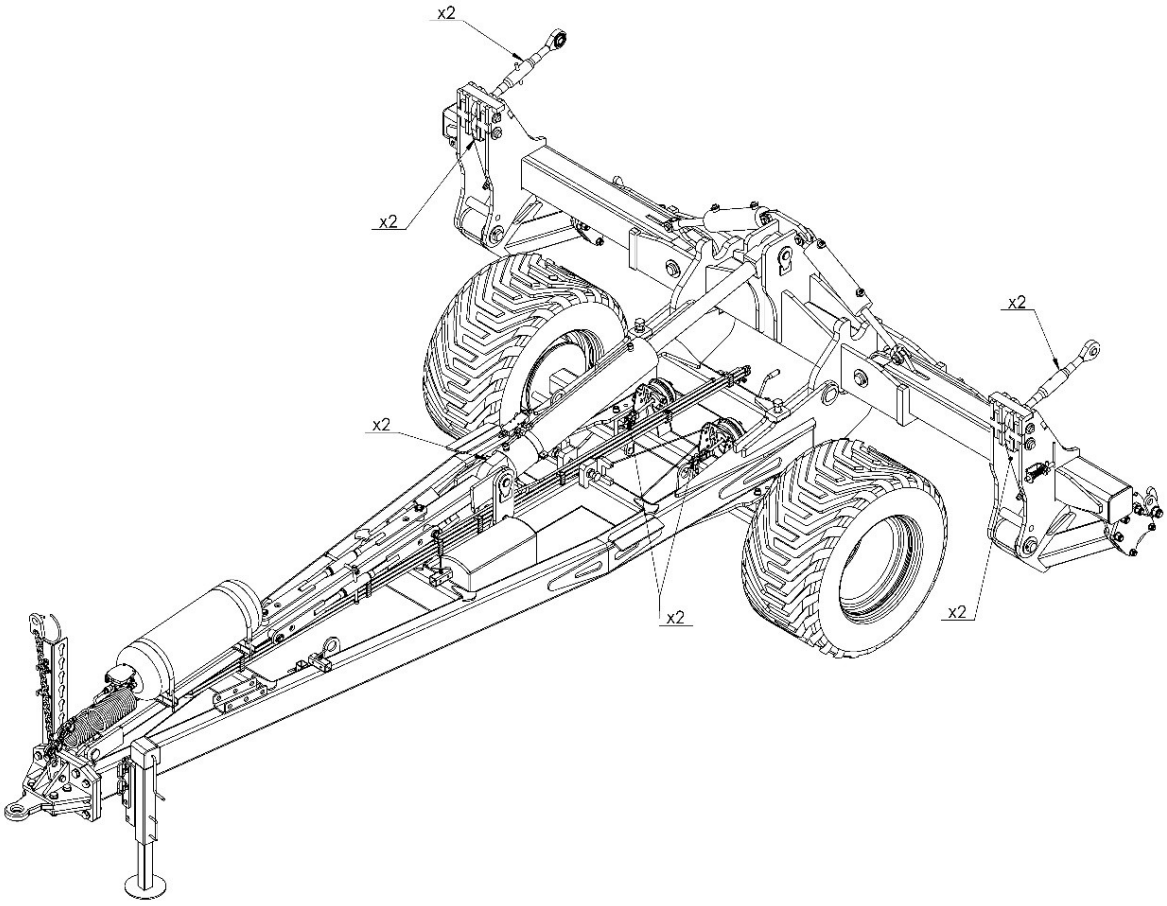


Figure 22. Lubrication points of the tool carrier

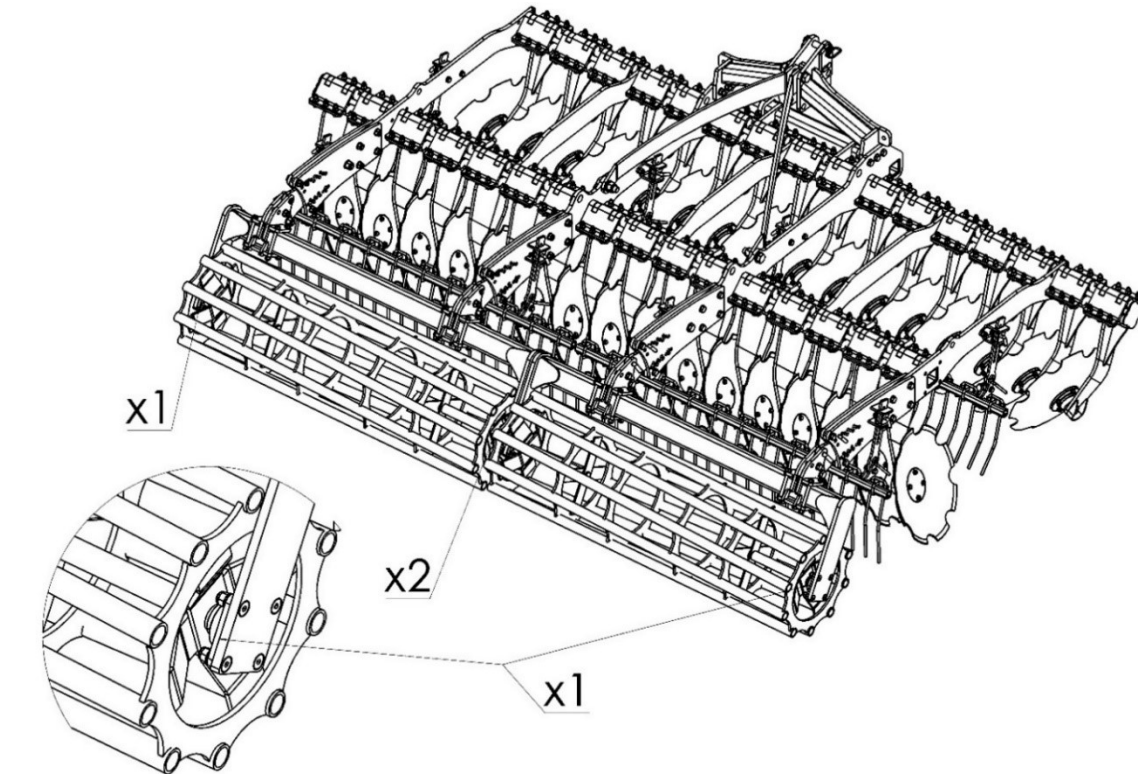


Figure 23. Lubrication points of the disc unit

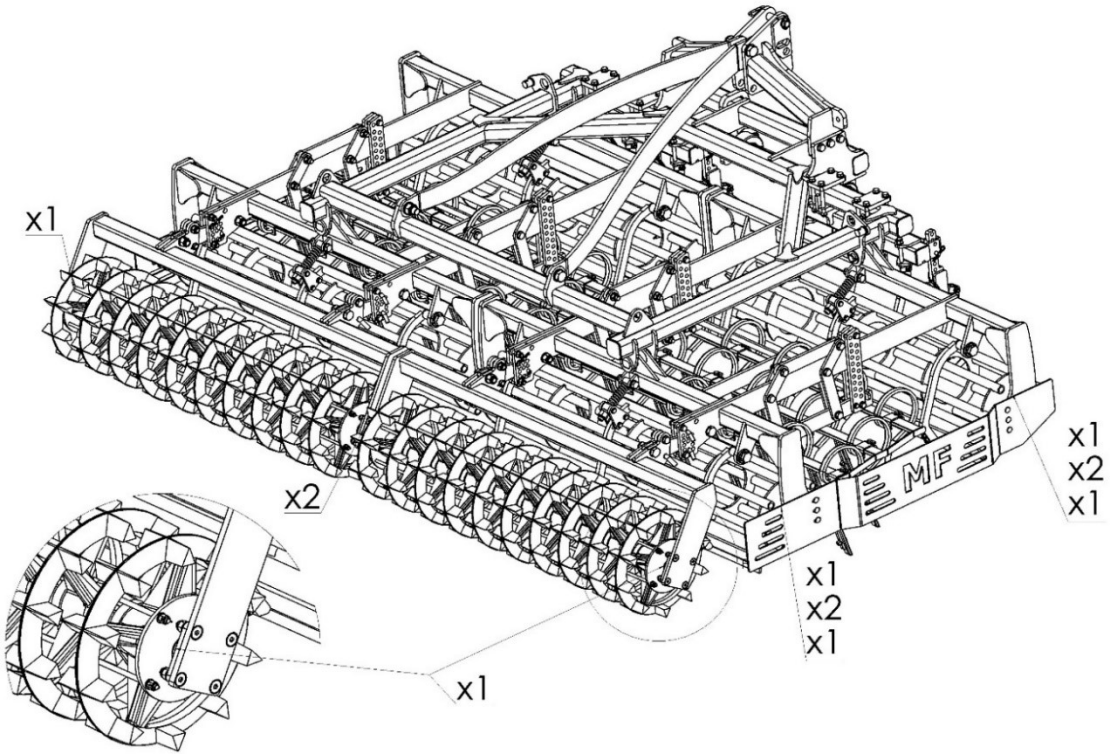


Figure 24. Lubrication points of the tine unit

Before a long-term storage, clean the unit and remove faults found. Protect it from the adverse weather conditions. Store the unit in the extended setting on level compact ground.

11.5. Brake system adjustment

Adjust the brakes when:

- Due to wearing out of the brake shoes, excessive play forms between the brake lining and drum, and the brake performance is reduced.
- The wheel brakes action is not simultaneous and not equal.

You can adjust the play using the pusher rod of the brake cylinder or by means of the adjustment screw on the brake lever. Carry out the adjustment for both wheels.

If the adjustment of friction components is carried out correctly, the wheel should rotate freely, without stoppage or evident resistance resulted from friction of the brake shoes against the drum. Slight friction of the shoes against the drum in a new machine or after brake replacement is a typical occurrence.

After you have made the adjustment, check and adjust the parking brake as required. Adjust the parking brake by adjusting the length of the cord connecting the expander cam roller lever with the activating device. The required sum of the braking forces must be obtained at the maximum force on the manual crank of the device of 40 daN (with the right angle preserved formed by the cord and expander cam roller lever).

11.6. Wheel dismounting and mounting

ATTENTION

ATTENTION!
Carry out the dismounting and mounting on solid and level surface. Lifting the machine on inclined terrain may cause tipping over of the unit. Never place items between the lift and the jacking point in the machine (Fig. 25). Never climb the machine if it is on the lift!!!

Before you start lifting the machine, disable the engine of the tractor, apply the parking brake of the tractor and tool carrier. Prop the wheels on the ground with chocks. Place the hydraulic lift at the places for lifting the machine, which are shown in Fig. 25. Loosen the wheel nuts counter-clockwise by half a turn. Lift the machine so that the wheel has no contact with the ground. Unscrew the nuts and dismount the wheel. When mounting the wheel, ensure that you embed the rim on the axle drum correctly. Tighten the wheel nuts with a torque wrench to the torque of 380 Nm. Lower the machine to the ground and check the tightening of the wheels again. After you drive for a few kilometres, check the wheel nuts for tightening, and if loose nuts are found, re-tighten.

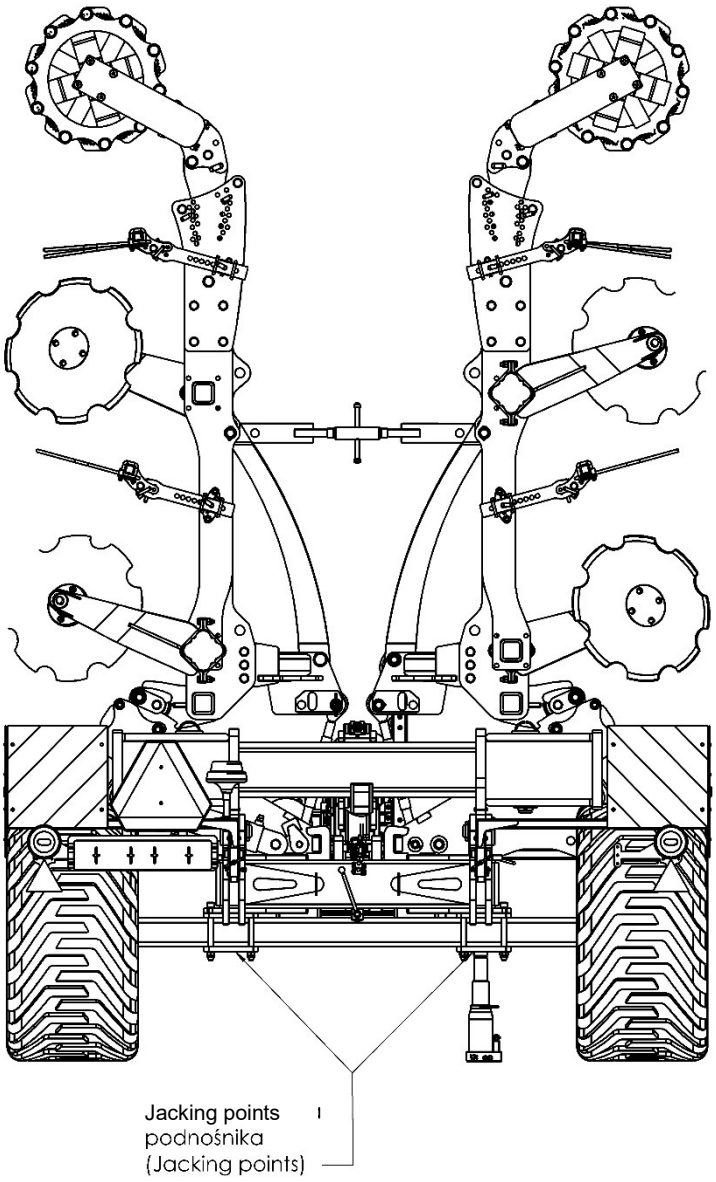


Figure 25. Jacking point

11.7. Metrical bolt tightening torques

Optimised tightening torque values for bolts or screws and nuts [Nm] are shown in table 12.

Table 12. Bolt tightening torques

Bolt tightening torques - metrical bolts in Nm							
Size ∅ mm	**Pitch mm**	**Bolt version - strength classes**					**Wheel nuts, wheel bolts**
		4.8	**5.8**	**8.8**	**10.9**	**12.9**	
3	0.50	0.9	1.1	1.8	2.6	3.0	
4	0.70	1.6	2.0	3.1	4.5	5.3	
5	0.80	3.2	4.0	6.1	8.9	10.4	
6	1.00	5.5	6.8	10.4	15.3	17.9	
7	1.00	9.3	11.5	17.2	25	30	
8	1.25	13.6	16,8	25	37	44	
8	1.00	14.5	18	27	40	47	
10	1.50	26.6	33	50	73	86	45
10	1.25	28	35	53	78	91	
12	1.75	46	56	86	127	148	
12	1.50						80
12	1.25	50	62	95	139	163	
14	2.00	73	90	137	201	235	
14	1.50	79	96	150	220	257	140
16	2.00	113	141	214	314	369	
16	1.50	121	150	229	336	393	220
18	2.50	157	194	306	435	509	
18	1.50	178	220	345	491	575	300
20	2.50	222	275	432	615	719	
20	1.50	248	307	482	687	804	400
22	2.50	305	376	502	843	987	
22	2.00						450
22	1.50	337	416	654	932	1090	500
24	3.00	383	474	744	1080	1240	
24	2.00	420	519	814	1160	1360	
24	1.50						550
27	3.00	568	703	100	1570	1840	
27	2.00	615	760	1200	1700	1990	
30	3.50	772	995	1500	2130	2500	
30	2.00	850	1060	1670	2370	2380	

12. Residual Risk

12.1. Residual risk description

Most frequently, residual risk stems from improper procedures implemented by unit operators, their lack of care of knowledge. The greatest hazard occurs in the following cases:

- Operating the unit by underage persons or persons who do not know the instruction manual,
- Operation of the unit by persons under the influence of alcohol or other intoxicating substances,
- Using the unit for purposes other than this described in the instruction manual,
- Standing between the tractor and the unit while the tractor engine is running,
- Bystanders, children in particular, standing close to the running unit,
- Cleaning the unit during operation,
- Handling the moving components of the unit during operation,
- Checking the technical condition of the unit.

When specifying the residual risks, the unit is interpreted as a machine which was designed and made in accordance with the state of art in the year of its manufacture, and meeting basic H&S rules.

12.2. Residual risk assessment

The occurrence of residual risk may be reduced by meeting the recommendations presented below:

- Adhere to the safety rules described in the instruction manual,
- Read the operation manual carefully,
- Reaching into dangerous and prohibited places with your hands forbidden.
- Operating the unit in the presence of bystanders, children in particular, forbidden,
- The unit may be maintained and repaired by properly trained persons only,
- The unit may be operated only by persons who were trained and know the instruction manual,
- Protect the unit against the access by children,
- The unit may be operated by non-disabled persons who are not under the influence of stimulants.

ATTENTION

ATTENTION!
Failure to comply with the instructions and guidance provided herein may result in residual risks!

13. Stability of the tractor with coupled tool carrier with a connected machine

The traction vehicle should be loaded in the front and back with the relevant weights to ensure correct steering and braking actions. When you change the unit position from the transport to working one, and also during field work, the hitch drawbar is under the effect of the unloading force, which may cause the tractor wheel to be detached from the ground and the machine to tip over. The minimum recommended rear axle load is 6,000 kg.

Remember that the road surface and the pulled machine affect the standard of ride. How you drive must be adjusted to terrain conditions and soil type.

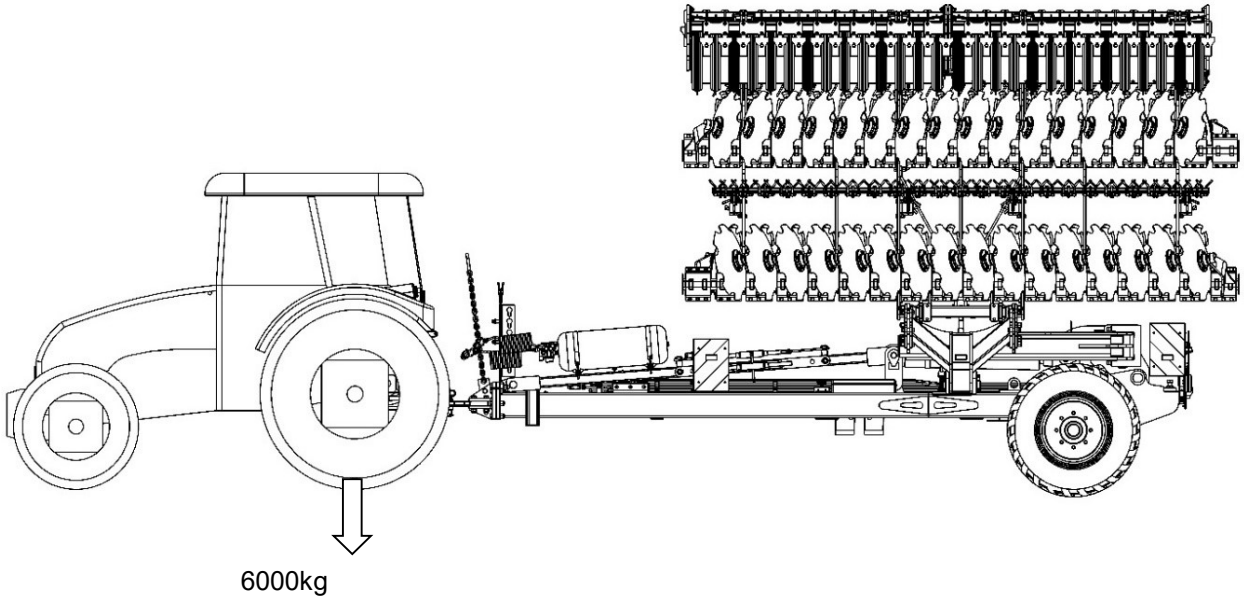


Figure 26. Tractor stability

13.1. Position of the machine centre of gravity

ATTENTION

ATTENTION!
Because of the centre of gravity of the tool carrier laying high, pay special attention when driving through turns and on bumpy roads. Failing to adjust the driving speed to the road conditions may result in tipping over of the machine.

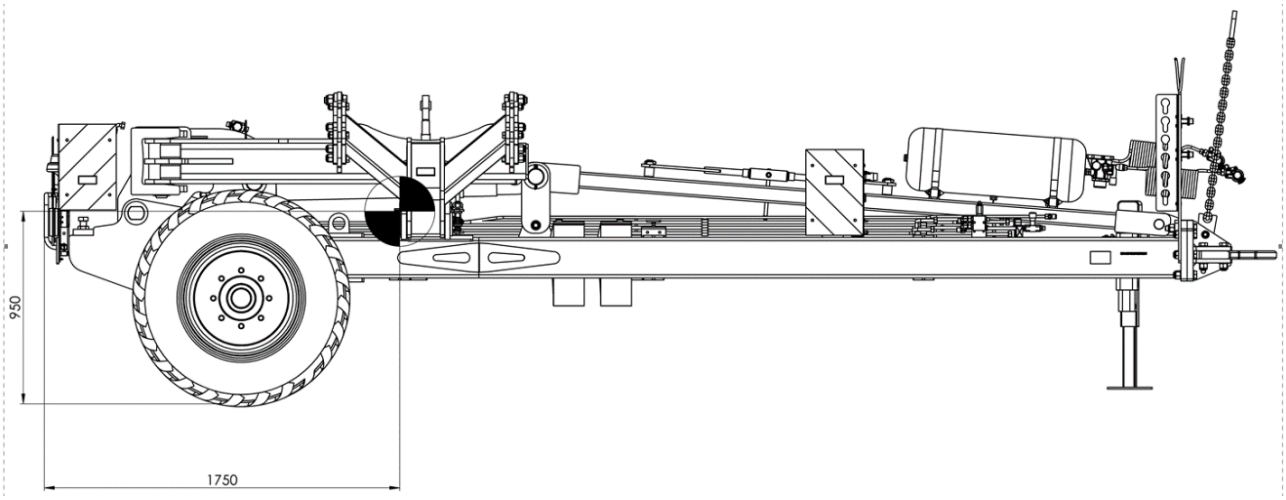


Figure 27. Position of the tool carrier centre of gravity

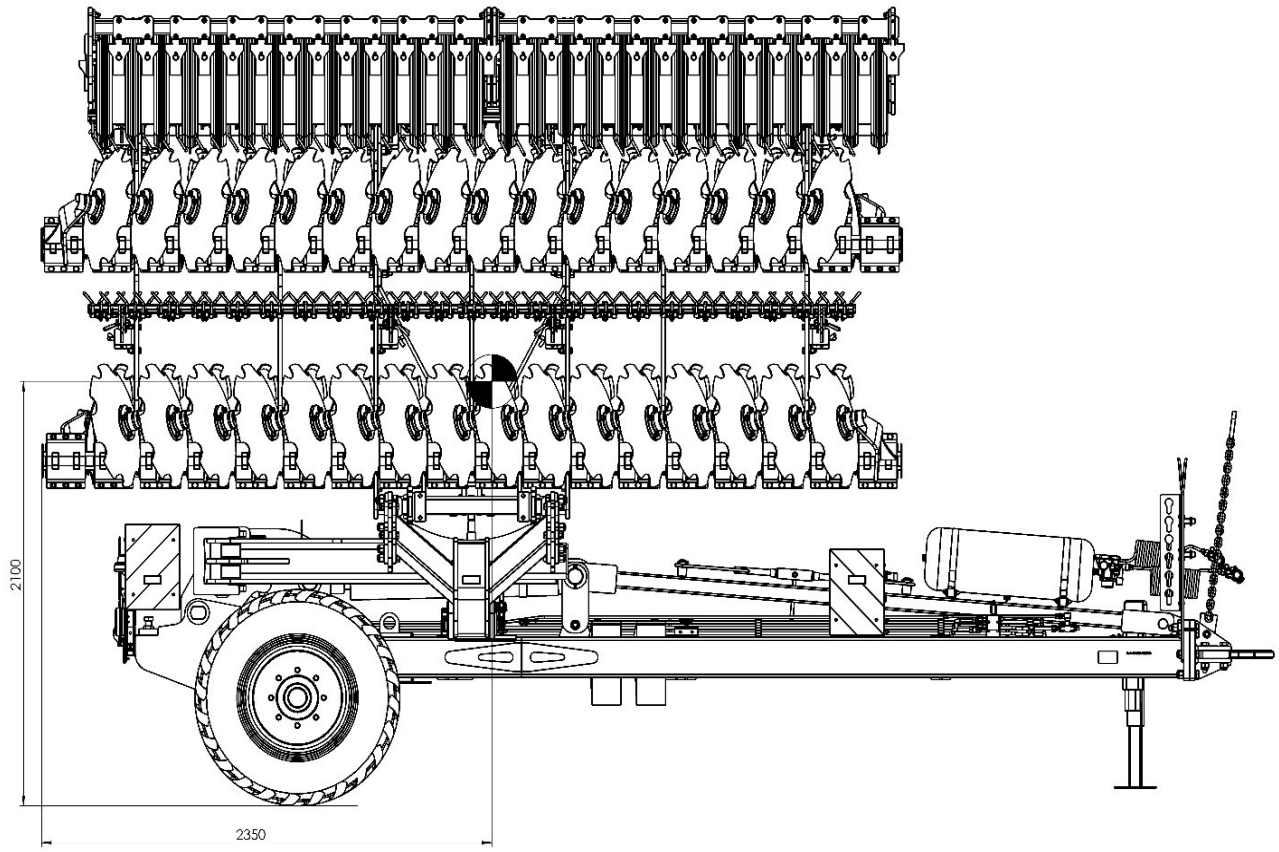


Figure 28. Position of the tool carrier centre of gravity with a disc-type unit mounted

14. Spare parts catalogue

14.1. How to use the spare parts catalogue

The Catalogue should be used as follows:

1) Determine in which unit of the machine the part to be exchanged is located.
2) Find respective drawing of the unit, and the corresponding number of the part to be found.
3) With reference to this number, look in the description of the table for a relevant number in the drawing or order number and the number of pieces.

14.2. How to order spare parts

Order spare parts on the telephone or sending an e-mail including the following:

1) The exact address of the customer,
2) Name, code and serial number of the machine, manufacture year,
3) Exact name of the part,
4) No. of the drawing or standard in the spare parts catalogue,
5) Number of pieces,
6) Terms of payment.

The parts are delivered by courier company or the customer can collect them on its own from the manufacturer or from the local Metal-Fach distributor.

GUARANTEE TERMS

Detailed information on the guarantee terms for the agricultural equipment are stipulated in the Civil Code, Section III, Guarantees, Article 577-581. That information should be available in all the distribution centres of the agricultural equipment and in all repair garages of such equipment.

The services under the guarantee are to be executed by: (seller/dealer) - entered in the guarantee certificate during the sale.

Terms of guarantee:

1. Prior to the commencement of the operation, the user shall read this instruction manual carefully to avoid unnecessary defects, as failure to comply with the rules of proper operation leads to decreasing the fitness of the machine and loss of the guarantee entitlement.
2. The manufacturer hands over the machine designed and made according to the standards in force. The manufacturer guarantees that the supplied machine is free from any manufacturing faults.
3. Metal-Fach Sp. z o.o. provides the machine with the guarantee period service during 24 months counted from the date of the first sale, at its use as intended, complying at the same time with the recommendations included in this instruction.
4. The prove of providing the guarantee by the manufacturer is the guarantee card correctly filled up by the dealer with the customer signature, confirming acceptance of the guarantee terms.
5. The guarantee shall include the defects of the machine caused by:
    - Defective assembly,
    - Incomplete delivery,
    - Faulty manufacturing of parts or assemblies,
    - Hidden defects of material,
    - Damage during transport (only manufacturer's transport).

1. The guarantee does not cover damages of the hydraulic system resulting from oil contamination.
2. The guarantee does not cover the parts subject to general wear, i.e. working components, cultivator points, springs, hydraulic hoses, Packer roller sweepers, bearings, fluids and lubrication agents, bulbs.
3. The guarantee does not cover mechanical damages and damages resulting from incorrect operation, incorrect maintenance and incorrect setting of the unit.
4. The guarantee does not cover damages resulting from incorrect storage of the machine.
5. Loss of the guarantee results from any unauthorised changes performed by the user.
6. The manufacturer is not liable for loss, damage or destruction of the product resulting from the causes other than the inherent faults of the supplied machine.
7. During the guarantee period the manufacturer shall perform all guarantee repairs of the faults caused by the manufacturing plant, except for the faults mentioned in points 6 to 10.
8. The guarantee repair shall be executed within 14 work days from the date of reporting/supplying the machine to the indicated service centres or on any other time agreed upon.
9. The guarantee shall be extended for the duration of the repair period.

10. The repairs under the guarantee shall be executed by the service centres for full charge.
11. The repairs performed by the service points in the guarantee period that are not covered by the guarantee shall be fully paid for. Prior to execution of such a repair the service point shall agree its performance with the user, proposing the scope of the repair, its planned costs and time of execution.
12. The decision on performing a machine repair for a charge during the guarantee period is taken by the customer.

GUARANTEE CARD

Metal-Fach sp. z o.o.
ul. Kresowa 62
16-100 Sokółka

.....

(name of the machine)

Guarantee services on behalf
of the manufacturer are rendered by _____

Filled up by the Seller

Product manufacturing date _____

Serial number of the machine _____

Date of sale _____

Seller signature _____

Buyer's first and last name _____

Address _____

_____

_____

Seller signature _____

GUARANTEE REPAIRS

No.	Date of breakdown removal	Description of performed actions and replaced parts	Guarantee period of the indicated part extended till	Seal and legible signature

NAME AND ABBREVIATION INDEXES

daN – dekanewton, power unit;

OHS - occupational health and safety;

dB (A) - decibel A, sound pressure unit;

kg - kilogram, weight unit;

km/h - kilometre per hour, linear speed unit;

HP – horse power, power unit;

kN – kilonewton, power unit;

kW - kilowatt, power unit;

mm - millimetre, an auxiliary length unit equal to 0.001m;

Nm – newton metre, a unit of torque and moment of force;

Pictogram - an information plate;

Rating plate – a manufacturer's plate unambiguously identifying the machine;

UV – ultraviolet radiation, invisible electromagnetic, invisible electromagnetic radiation with negative effect on human health, the UV radiation has a negative effect on rubber parts;

V - Volt, voltage unit;

ALPHABETICAL INDEX

NOTES

Since Metal-Fach Sp. z o.o. is continuously perfecting its products and adapting its commercial offer to the needs of clients, we reserve the right to modify our products without prior notice. Therefore, we advise contacting an authorised dealer or sales representative of Metal-Fach Sp. z o.o., prior to making your decision about purchase. Metal-Fach Sp. z o.o. will not accept any complaints, regarding the data and pictures contained in the catalogue, as the presented offer shall not constitute an offer, within the meaning of the provisions of the Civil Code.

The pictures do not necessarily show standard accessories.

Original spare parts are available from authorised dealers, located both in Poland and abroad, and also at the Metal-Fach retail outlet.

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16-100 Sokółka, ul. Kresowa 62

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