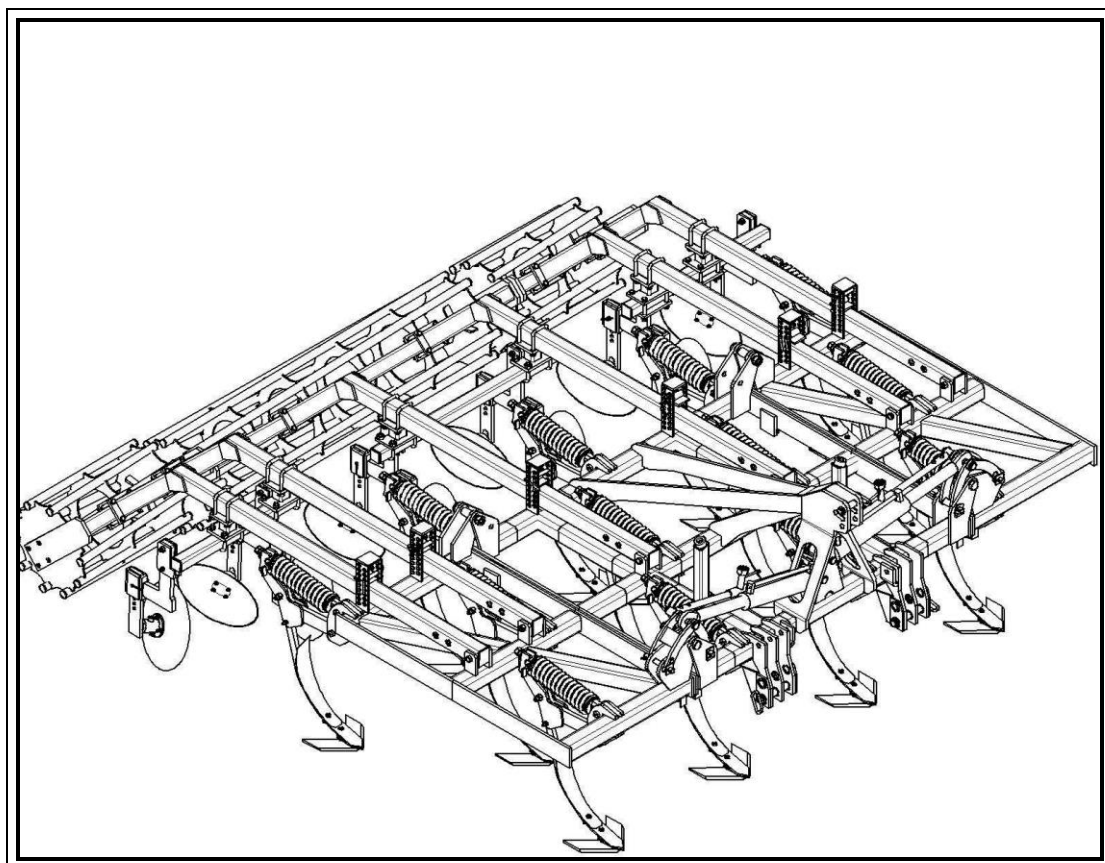


# MANDAM

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## INSTRUCTION MANUAL

### TOP cultivator



ISSUE 1/2015



**EC DECLARATION OF CONFORMITY  
FOR A MACHINE**



*Pursuant to the Ordinance of the Ministry of Economy of 21 October 2008 (Journal of Laws No. 199, item 1228) and the Directive of the European Union 2006/42/EC of 17 May 2006,*

Przedsiębiorstwo Produkcyjno-Handlowe „MANDAM” Sp. z o.o.  
ul. Toruńska 2  
44-100 Gliwice, Poland

**herby declares at its sole responsibility that the following machine:**

<p><b>TOP CULTIVATOR</b></p> <p>year type/model: .....</p> <p>year of manufacture: .....</p> <p>serial number: .....</p>
--

**under this declaration, complies with:**

the **Ordinance** of the Ministry of Economy of 21 October 2008 on fundamental requirements for machinery (Journal of Laws No. 199, item 1228)  
and the **Directive** of the European Union 2006/42/EC of 17 May 2006.

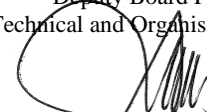
*The persons responsible for the technical documentation for the machine: Jarosław Kudlek, Łukasz Jakus, ul. Toruńska 2, 44-100 Gliwice*

**For the compliance assessment, the following standards have been applied:**

- PN-EN ISO 13857:2010,
- PN-EN ISO 4254-1:2009,
- PN-EN ISO 12100-1:2005/A1:2009,
- PN-EN ISO 12100-2:2005/A1:2009,
- PN-EN 982+A1:2008

*This EC Declaration of Conformity shall be cancelled if the machine is altered or redesigned without consent of the manufacturer.*

Board Manager  
Director  
  
inż. Bronisław Jakus

Deputy Board President  
Technical and Organisational Director  
  
mgr inż. Józef Seidel

Gliwice 24 April 2014  
Place and date of issue

.....  
Surname, first name, position and  
signature of the authorised person

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## 1. Introduction

Congratulations on your purchase of the TOP cultivator.

This instruction manual contains the information on hazards that may occur during work with the cultivator, technical data and the most important guidelines and recommendations to be known and applied to ensure a proper operation. Keep this manual for future reference. Should you have any problems with understanding any statement in the instruction manual, please contact with the manufacturer.

The following mark indicates the guidelines that are important due to safety reasons:



The machine is provided with a name plate to be found on the main frame. The name plate presents basic data allowing the identification of the machine.

**Type** \_\_\_\_\_ **Number** \_\_\_\_\_  
**Weight** \_\_\_\_\_ **Year of manufacture** \_\_\_\_\_

**The warranty for the machine is valid for 24 months and runs from the date of sale.**

The warranty card can be found at the end of the manual.

The warranty card is an integral part of the machine.

Whenever you request any information on spare parts, provide the serial number.

For more information on spare parts, you can:

- visit the website <http://mandam.com.pl/parts/>
- call +48 668 662 239
- send an e-mail [czesci@mandam.com.pl](mailto:czesci@mandam.com.pl)

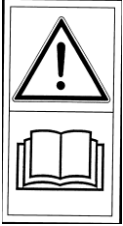



### 1.1. Safety signs and inscriptions






**Remember! While working with the cultivator, act with due caution in places marked by special information and warning signs (yellow stickers).**

The following signs and inscriptions can be found on the machine. Protect the signs and safety inscriptions so that they cannot be lost or become illegible. If lost or illegible, replace the signs and inscriptions with new ones.

Table 1. Information and warning signs

<i>Safety sign</i>	<i>Meaning of the safety sign</i>	<i>Location on the machine</i>
	<p>Read the instruction manual prior to operating the machine.</p>	<p>Subsoiler frame adjacent to the mounting of the upper fastener</p>
	<p>Danger of toe or foot crush</p>	<p>Subsoiler frame adjacent to the mounting of the upper fastener</p>
	<p>Keep clear of lift bars while controlling the lift</p>	<p>Subsoiler frame adjacent to the mounting of the upper fastener</p>
	<p>Keep a safe distance from foldable and moving parts of the machine</p>	<p>Front part of the mid frame adjacent to side frames</p>

<i>Safety sign</i>	<i>Meaning of the safety sign</i>	<i>Location on the machine</i>
	Do not reach into the crushing zone if the elements can move	Mid frame adjacent to side frames
	Liquid jet under pressure – injury	Cylinders
	Fixing point for transport belts	Upper part of the drawbar (upper fastener bolt) Rear part of the frame: <ul style="list-style-type: none"> <li>• rigid frame (adjacent to the roller depth adjustment)</li> <li>• foldable frame (adjacent to the upper fastener bolt on the mid frame)</li> </ul>

## 1.2. Machine design

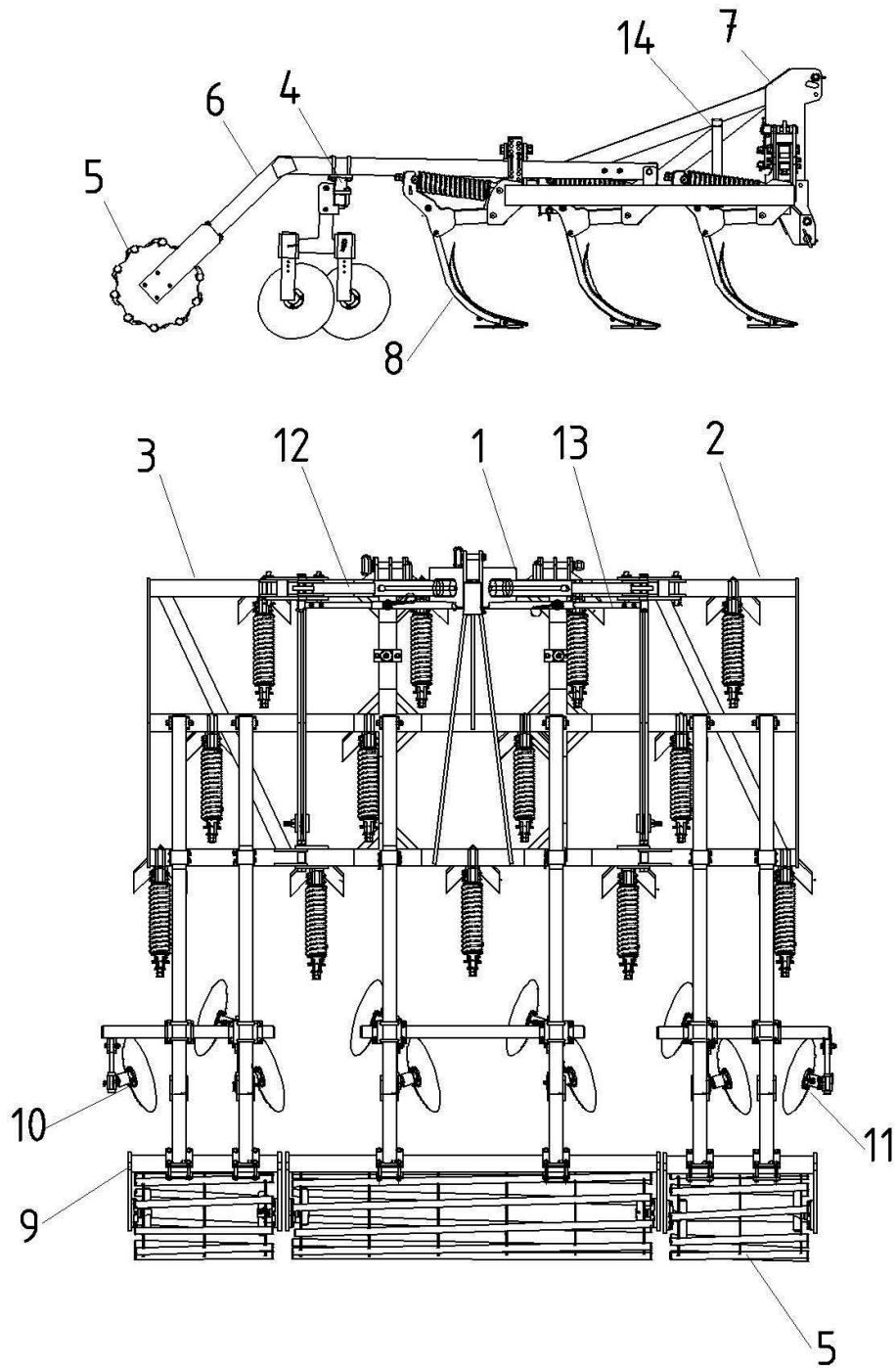


Fig. 1 TOP unit design: 1 – frame, 2 – right side frame, 3 – left side frame, 4 – disc beam, 5 – shaft, 6 – shaft arm, 7 – drawbar, 8 – working component, 9 – shaft clamp, 10 – right disc, 11 – left disc, 12 – cylinder, 13 – hydraulics mechanical lock, 14 – bumper

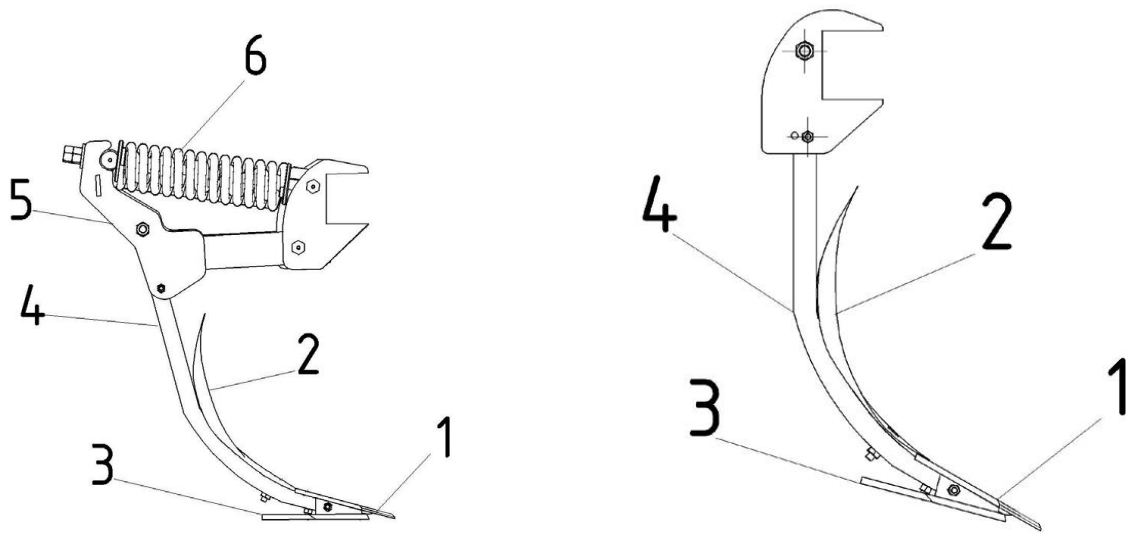


Fig. 2 Working components of the TOP cultivator: 1 – coulters, 2 – right/left shield, 3 – tines, 4 – plough beam, 5 – beam arm, 6 – external and internal springs

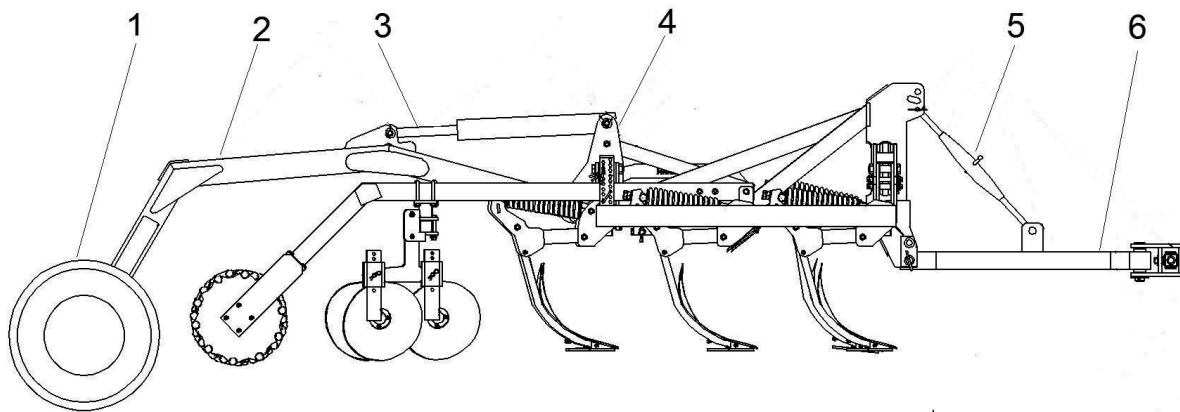


Fig. 3. Design of the transport carriage for the TOP cultivator: 1 – axle with wheels, 2 – carriage frame, 3 – cylinder with hydraulic system (Fig. 13), 4 – frame holder, 5 – turnbuckle, 6 – drawbar

## 2. Intended use of the TOP cultivator

The TOP cultivator is an all-purpose machine for shallow ploughing or used instead of ploughing for:

- shallow stubble cultivation (up to 15 cm) to mix post-harvest residues, stop soil water evaporation, increase the growth of weeds and self-seeding plants, and reduce ploughing resistance, or deep cultivation,
- deep cultivation (up to 35 cm) to loosen cultivated soil, mix mineral and organic fertilizers, and prevent mineralisation of humus in the ploughing soil.



The application of right and left side shields improves the degree of stubble mixing. As a result, the concentration of phenol compounds affecting the growth of crops in the following year in the crop rotation system is reduced. The application of the TOP cultivator for deep cultivation eliminates the need of ploughing, and as such, this allows cost reduction, eliminates the risk of excessively compacted soil, and helps to complete farming work on time.



**CAUTION! The cultivator is designed for agricultural use only. Operating the machine for other purposes shall mean an instance of misuse and will cease the warranty.**



**CAUTION! Any failure to observe the guidelines provided in this manual shall also mean an instance of misuse. The manufacturer shall not be liable for any damage caused by improper use of the machine.**

### **3. General safety information**

The cultivator can be operated and repaired only by persons familiar with its operation and the attached tractor as well as the rules of safe operation and maintenance of the cultivator. The manufacturer shall not be liable for any unauthorised alternation of the cultivator design. Only genuine factory parts manufactured by MANDAM are allowed during the warranty period.

The cultivator must be operated with all precautionary measures, in particular:

- before every start-up, check the cultivator and the tractor, make sure that their conditions guarantee safety of traffic and operation,
- persons under age, disabled or intoxicated (under the influence of alcohol or drugs) must not operate the machine,
- wear work clothes, shoes and gloves during maintenance,
- do not exceed permissible axle loads or transport dimensions,
- only genuine safety and split pins may be used,
- while using the cultivator, nobody (particularly children) can be present in the vicinity when the cultivator is being lowered, lifted or unfolded,
- do not stay between the tractor and the cultivator when the engine is running,
- move forward, lift and lower the cultivator slowly and smoothly without sudden jerks, making sure that nobody stays in the vicinity,
- do not stand on the machine or apply additional loads during operation and transport,
- while making U-turns, pay due caution if anyone is in the vicinity,
- any repairs, lubrication or cleaning of working components may be performed as long as the engine is not running and the machine is lowered and unfolded,

- while taking a break, lower the machine onto the ground and stop the tractor engine, store the machine properly so that no person or animal can be injured,
- it is forbidden to make U-turns and reversing with the machine in its lowered position.

### **3.1. Attaching the tractor**

- Attaching the machine to the tractor must be carried out in accordance with the guidelines, bearing in mind the need to secure the suspension using bolts.
- While attaching the tractor to the cultivator, it is forbidden for any person to stay between the machine and the tractor.
- The tractor used together with the cultivator must be fully operable. It is forbidden to attach the cultivator to any tractor with a malfunctioning hydraulic system.
- Make sure that the tractor with the attached unit is stable, and the tractor steerability and stopping power can be maintained. The load on the front axle cannot decrease to less than 20 % of the total load on the tractor axle – use a set of front-mounted weights (see section 4.1.).
- When in resting position and disconnected from the tractor, the machine must be permanently stable.

### **3.2. Hydraulic system**

The hydraulic system operates under high pressure. Apply all precautionary measures, in particular:

- do not connect and disconnect hydraulic hoses when the tractor hydraulic system is pressurised (hydraulics set to neutral),
- check regularly the conditions of connections and hydraulic hoses,
- withdraw the machine from service for the period of repairing a hydraulic malfunction.

### **3.3. Tyres**

- Tyre pressure cannot exceed the value recommended by the manufacturer. Transporting the machine when the pressure is too low is prohibited. This may cause damage to the machine or an accident when travelling too fast and on very uneven surfaces.
- Considerably damaged tyres (particularly in the case of tyre profile) must be replaced immediately.
- Protect the machine from rolling away when replacing the tyres.
- The repair work on wheels or tyres must be performed by persons trained and authorised for this purpose. Such work must be performed with properly selected tools.
- Following every assembly of wheels, check the tightening of nuts after travelling a distance of 50 km.

### 3.4. Transport on public roads

For the period of transport, the side sections of the TOP cultivator must be put in transport position using the hydraulic system. Before folding, the machine must be lifted sufficiently high until the folded side sections do not collide with the ground.

The cultivator must be protected against unfolding by means of the mechanical lock. While folding and unfolding, remember to release the lock by using the cord.

#### **While transporting, the clearance under the machine must be at least 30 cm.**

While transporting the unit on public roads, it is mandatory to apply lighting equipment, an identification emblem and reflective side lights if the rear 3-point hitch is used.

While transporting, do not exceed the speed, which is:

- up to 20 km/h on a smooth-surface (asphalt) roads,
- 6-10 km/h on field or sett paving roads,
- up to 5 km/h on bumpy roads.

Travelling speed must be adapted to the road and the existing conditions so that the cultivator cannot jump on the tractor suspension system and excessive loads on the machine frame and the tractor suspension system can be avoided.

Act with due caution when passing and overtaking or travelling at bends. The permissible width of the machine travelling on public roads is 3.0 m.



**WARNING! Any failure to observe the above rules may pose hazard to the operator and other people. It may result in damaging the machine as well. The user is liable for any damage caused by the failure to observe the rules!**

### 3.5. Description of residual risk

Mandam Sp. z o. o. spares no effort to eliminate the risk of accident. However, there is some residual risk that may result in an accident. The greatest risk is posed whenever:

- the machine is misused within the meaning of this manual,
- the machine is operated by persons under age, disabled or intoxicated (under the influence of alcohol or drugs),
- persons or animals are present within reach of the machine,
- no caution is paid during transport and manoeuvring with the tractor,
- persons are standing on the machine or between the machine and the tractors when the engine is running,
- maintenance is carried out maintenance guidelines are not followed,
- travelling on public roads.

### 3.6. Residual risk assessment

Residual risk may be reduced to the minimum provided the following recommendations are applied:

- operate the machine carefully and in no hurry,
- read the manual carefully,
- keep a safe distance from hazardous zones,
- it is forbidden to stand on the machine or in be present in the working zone when the engine is running,
- perform maintenance in accordance with safety rules,
- wear safety clothes and safety helmet during your work under the machine,
- prevent unauthorised persons from accessing the machine, in particular children.

Hazards:

**Noise:** If the TOP cultivator is used on rocky soil, it can generate considerable noise. Then, closing tractor windows and doors is recommended. Ear protectors may be worn as well.

**Dusting:** Heavy dusting is likely under very dry conditions. Closing the doors and windows is recommended when such conditions apply. Use a dusk mask under extreme conditions.

## 4. General operation instructions

The main frame of the cultivator is the basic bearing element of the entire machine. The cultivator wider than 3 m comprises a mid frame and side frames that can be folded by hydraulics for transport. There are plough beams with working components attached to the frame. Standard cultivators are equipped with a shaft and a disc beam mounted to the shaft arms. The discs even the surface of soil moved by the last row of the working components. The shafts are used to compact opened soil and maintain the working depth of the cultivator.

### 4.1. Prior to the operation

The cultivator is usually supplied for sale in a ready-to-operate condition. Due to limited transport means, it is possible to deliver the machine as partially disassembled, i.e. usually with the rear shaft, disc beam and discs dismantled.

For preparing the unit for use for the first time, its components (cultivator, shaft and discs) must be assembled. For this purpose, the cultivator must be placed on a flat hard surface, where the shaft can be manoeuvred freely. Position the shaft arms on the cultivator holders. Use the screws to connect the arms with the shaft clamp (Fig. 1). Next, mount the disc beam to the shaft arms. Position the discs so that the operating discs can fill back the furrows made by the coulter in the last row of the cultivator. There is one pair of disc per one plough beam in the last row (right and left discs – Fig. 1).

The arrangement of hydraulic adjustment unit is presented in Fig. 6. For the diagram of hydraulic hose installation, see Fig. 14 and Fig. 15.



**CAUTION!** While preparing the machine for deep soil cultivation, dismantle all cutting wings as they may contribute to extensive compaction of the soil, resulting in plough pan, and increase the operating resistance.



**CAUTION!** Do not exceed the permissible axle load and tyre carrying ability. The front axle load cannot be lower than 20 %. Tyre pressure must comply with the values recommended by the manufacturer.

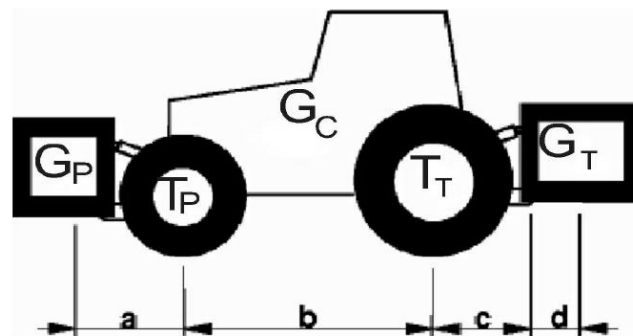


Fig. 4 Diagram of the marking of tractor loads.

Axle load calculation

Key:

$G_C$  – tractor weight,

$T_P$  – front axle load if the tractor is empty,

$T_T$  – rear axle load if the tractor is empty,

$G_P$  – total weight of the rear-mounted equipment,

$G_T$  – total weight of the front-mounted equipment,

$a$  – distance between the centre of gravity of the front-mounted equipment and the axle centre,

$b$  – tractor wheel track,

$c$  – distance between the centre point of the rear axle and the centre point of the hitch bolt of the rear-mounted equipment,

$d$  – distance between the machine centre of gravity from the hitch bolts at the tractor (assume 1.9 m for all widths),

$x$  – distance of the centre of gravity from the rear axle (assume 0.45 if the manufacturer does not provide this parameter).

Minimum load at the front if this is a rear-mounted machine:

$$\frac{G_T \cdot (c+d) - T_P \cdot b + 0,2 \cdot G_C \cdot b}{a+b}$$

Minimum load at the back for front-mounted machines:

$$\frac{G_P \cdot a - T_T \cdot b + x \cdot G_C \cdot b}{b + c + d}$$

Actual load on the front axle:

$$\frac{G_P \cdot (a + b) + T_P \cdot b - G_T \cdot (c + d)}{b}$$

Actual total weight:

$$G_{total} = G_P + G_C + G_T$$

Actual load on the rear axle:

$$T_{Total} = G_{total} - T_{Ptotal}$$

While attaching the cultivator to the tractor, the shaft must be placed on hard and even ground. While attaching the cultivator to the three-point hitch of the tractor, complete the following steps:

- switch the tractor hydraulic system into adjustment position,
- remove lower hitch bolts (if the tractor lift is not equipped with hooks),
- carefully drive up, suspend the machine on the lower bars and secure,
- attach the tractor upper fastener; during operation of the unit, the hitch point of the upper fastener at the unit must be higher than the attachment point of this fastener at the tractor,
- check the operation of cultivator lifting, lowering and the hydraulic system.



**CAUTION! Attaching the tractor to the cultivator must be carried out carefully with the tractor moving at the minimum speed! While attaching the machine, make sure nobody is present in the vicinity.**

#### 4.2. Cultivator adjustments

The working depth is adjusted by changing the shaft height relative to the cultivator frame. For this purpose, there are bolts inserted into a drilled plate mounted on the frame with stabiliser plates (Fig. 5) and by adjusting the hydraulic lifter at the tractor.

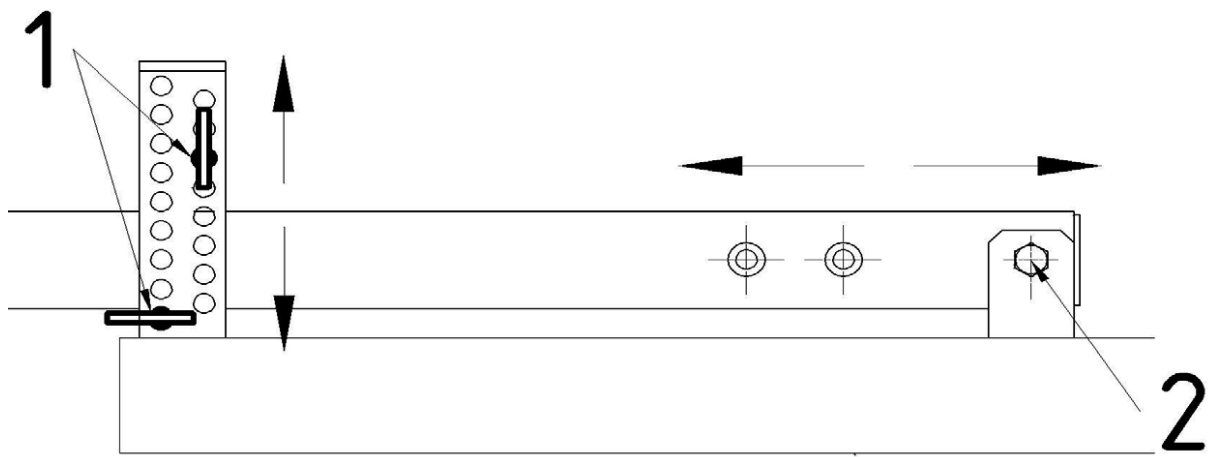


Fig. 5 Depth and tubular shaft distance adjustment: 1 – bolts for adjusting the working depth with a stabiliser plate; 2 – screw for fixing the shaft arms.

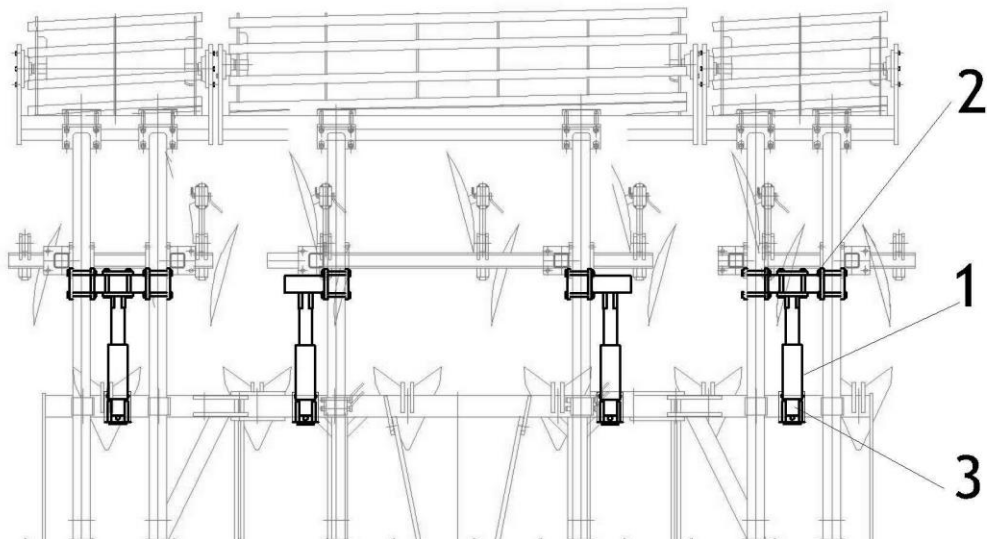
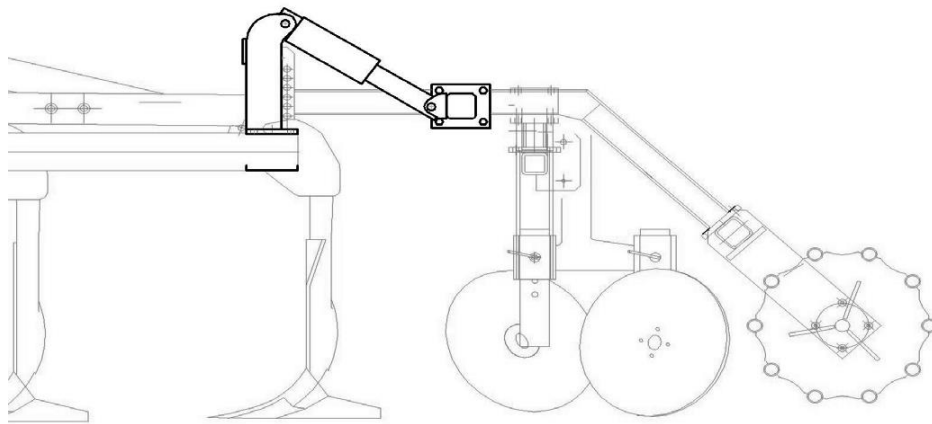


Fig. 6 Roller hydraulic adjustment: 1 – actuator, 2 – beam with arm holder, 3 – actuator holder.

It is also possible to change the distance of the tubular shaft from the cultivator frame (see the screw in Fig. 5). Remember that an insufficient distance between the teeth and the discs may cause clogging by plant remains.

The working depth of the discs is adjusted depending on the working depth of the cultivator. The discs must operate on the surface to spread the soil behind the plough beams evenly.

Elements of the TOP cultivator can be adjusted in terms of the angle of approach. A more horizontal arrangement of the coulters reduces operating resistance and undercuts the stubble to a small degree and loosens the soil. This is recommended for compact soils with an optimum moisture of mid and low compact soils (Fig. 7, opening A, Fig. 8 nut C, unscrewed). A steep coulters arrangement facilitates going deeper and loosens the soil more profoundly thoroughly. This is recommended for hard and dry soils (Fig. 7, opening B; Fig. 8 screw C, screwed). For working elements with a spring-type protection, remember that any change in screw tightening changes the releasing force of the protection.

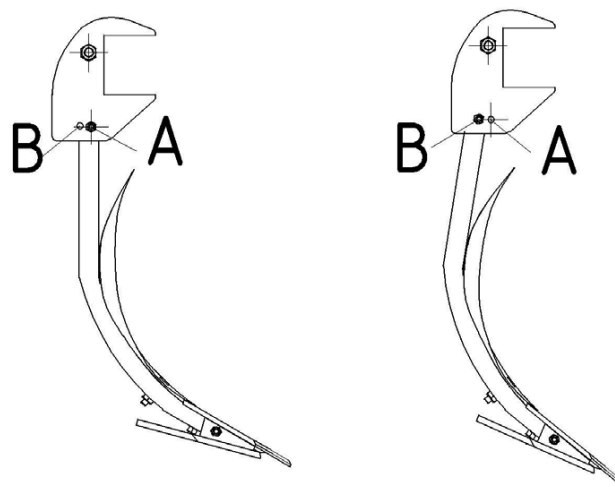


Fig. 7 Adjustment of tooth tilt with screw-type protection



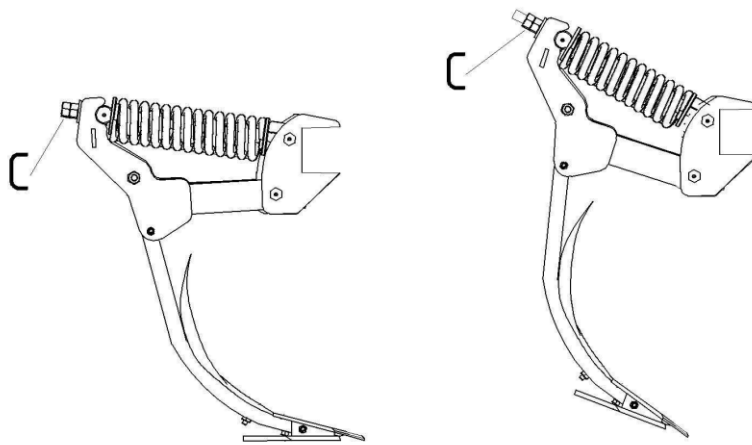
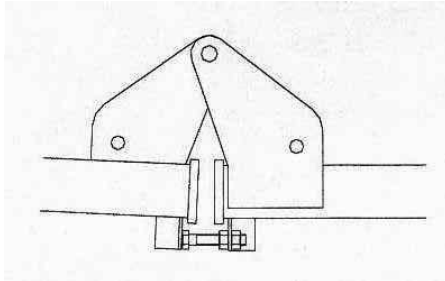


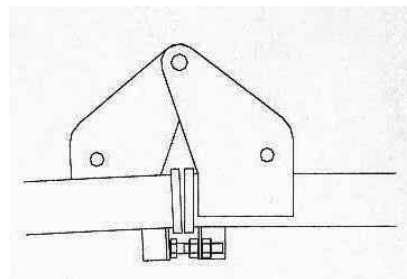
Fig. 8 Adjustment of tooth tilt with spring-type protection

For the cultivators with foldable side arms, adjust the arm level using the screws located at the front and at the back of the mid frame (at every hinge – Fig. 9). Correctly adjusted side arms should be at the same level as the mid frame is. Once adjusted, secure the screw with the lock nut.

a)



b)



c)

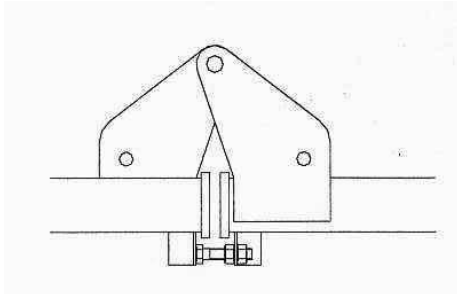


Fig. 9 Level adjustment of the side frame: a, b – incorrect, c – correct.



**WARNING! It is forbidden to adjust the machine while the tractor engine is running.**

### 4.3. Hydraulics protection

**TELESCOPE – LOCKING DEVICE THAT PREVENTS OPENING SIDE WINGS OF FARMING MACHINES IN ACCORDANCE WITH THE DIRECTIVE 2006/42/EC (EU PATENT APPLICATION).**

The telescope locks the cylinders mechanically. When folding machine wings, the locking device locks the telescope mechanism and the wings are locked mechanically.

### OPERATING INSTRUCTIONS OF THE LOCKING DEVICE IN THE TELESCOPE

In order to release the locking device at the telescope, retract the cylinders completely using the tractor hydraulic pump (fully close the wings), and at the same time, pull the cord and hold it until the machine opens completely (both wings). Then, the machine wings will open by gravity and forced by the movement of the cylinders (depending whether these are single-action or dual-action cylinders). The condition of the cord and its location must be checked. The cord must be located freely above the machine so that the operator can access it at any time from the tractor cab. The cord must not be obstructed by any object. While folding the machine, the cord does not need tensioning as it locks automatically.

### SAFETY LOCKING DEVICE INSTALLATION

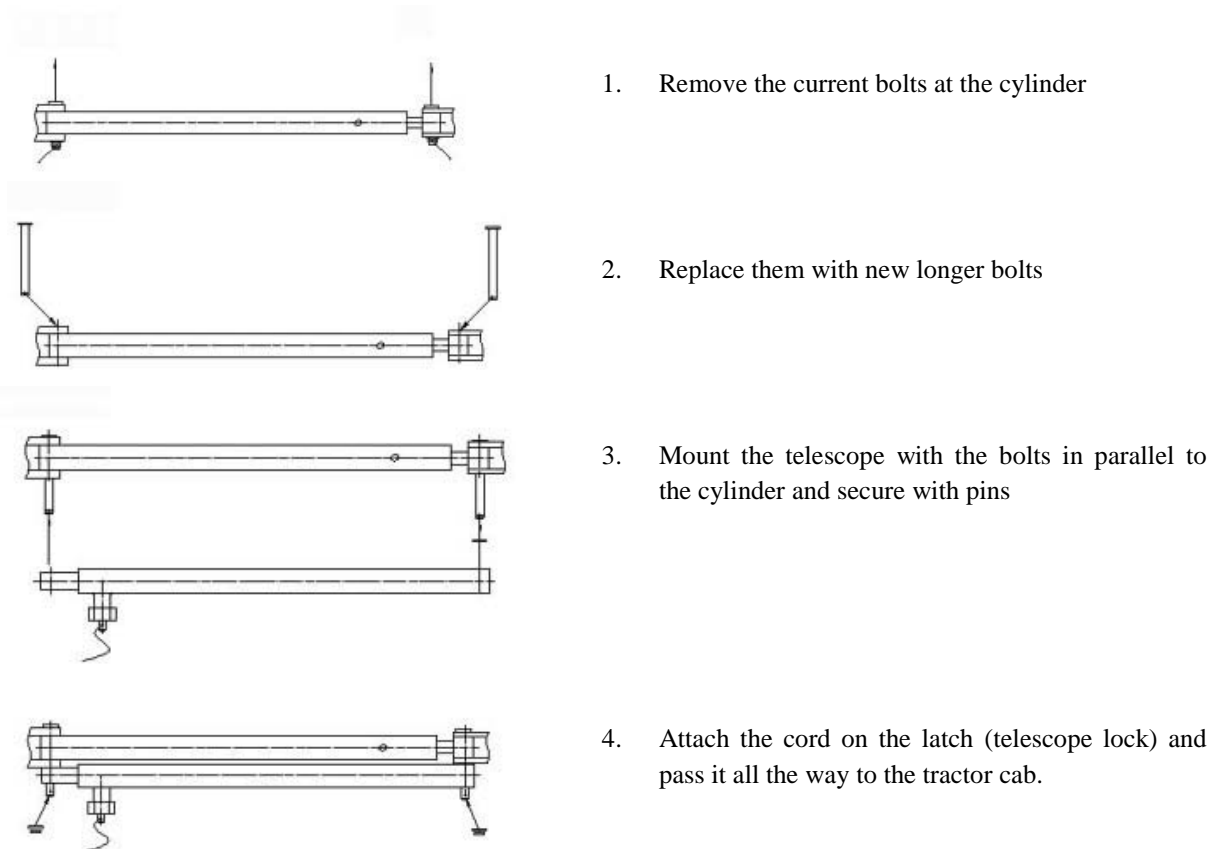


Fig. 10 Illustration of safety lock attachment

#### 4.4. Operation with the TOP cultivator

Before commencing the field work with the machine with foldable side arms, it is **imperative** to mount the hinge lock and secure it with a pin (Fig. 11).

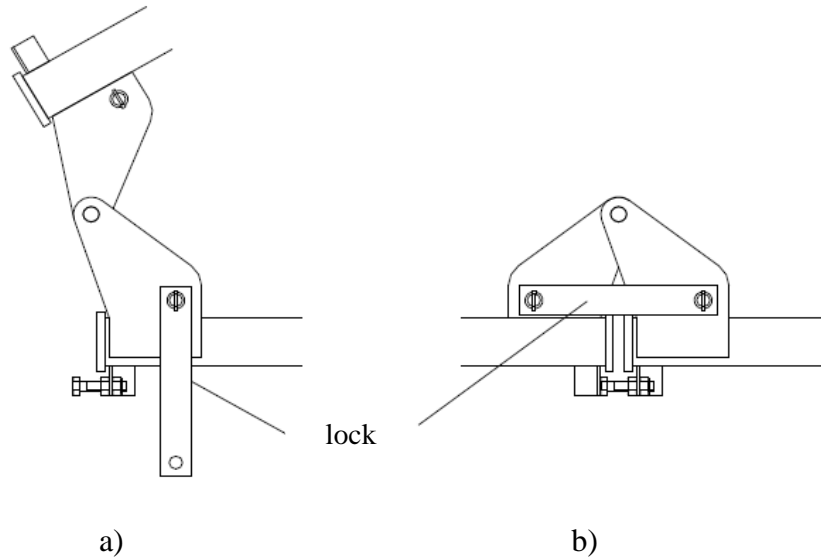


Fig. 11 The lock in transport position (Fig. a) and in working position (Fig. b).

A properly attached cultivator should travel behind the tractor along a straight line and open soil at the entire working width.

For lengthwise levelling, use the upper fastener of the tractor (turnbuckle), and for crosswise levelling, use the crank on the right tractor hanger.



**CAUTION! It is forbidden to carry out any field work with the machines with foldable side arms without the hinge lock mounted.**

The working speed of the TOP cultivator under normal conditions should range from 8 to 12 km/h.

Before making U-turns and when driving backwards, the machine must be lifted.

**Remember to remove the hinge lock before lifting the side arms to achieve the transport position.**

#### 5. Maintenance

- After the first four hours of operation, all screws must be retightened, and then periodically checked to make sure that they are tightened properly.
- Every time the work is finished, clean the machine thoroughly removing soil. Next, inspect connection points of the parts and units.
- While using the machine, grease the lubrication points at connections (hinge sleeves) every 10 hours of operation. Lubricate shaft bearings and moving elements of spring-type protections every 25 hours of operation.

- Tips of the shares can be used until they are almost entirely worn i.e. until their working surface reduces to the initial surface of sharer base. However, an earlier replacement of the tips is recommended before the share base is worn and damaged.
- Use only genuine screws and nuts when replacing worn parts.
- Always remember to tighten the screwed joints properly.
- Replace or refurbish any damaged or worn parts.

### Hydraulic system maintenance

The maintenance of the hydraulic system (Fig. 12, 13, 14, 15) consists in visual inspections to prove leak tightness. Remember to insert pins into quick-fit connectors. If there is an oil leak from connections of hydraulic hoses, the connector must be tightened. If the oil leak is not remedied, replace the element or the hose with a new one. If the leak occurs outside the connector, the leaking hose must be replaced with a new one. Mechanical damage also requires replacement of the sub-unit. It is recommended that the hydraulic hoses should be replaced every 5 years.

If oil appears on the piston rod of the hydraulic cylinder, check for the nature of the leak. Check the sealing once the piston rod is fully moved out. Small leakage which results in covering the piston rod with an oil film is acceptable (damaged wiper seal). If the amount of oil is greater or there are oil drops, shut down the unit for the period required to repair the malfunction (damaged sealing).

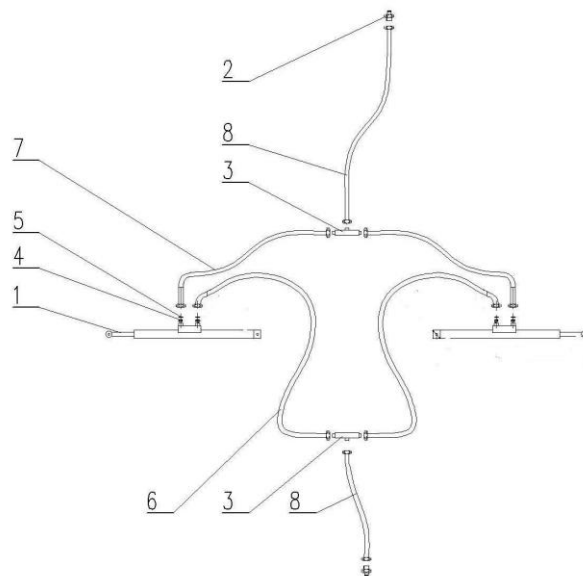


Fig. 12 Diagram of the TOP hydraulic system: 1 – cylinder, 2 – quick-fit connector, 3 – T-connection, 4 – orifice, 5 – copper pad, 6 – 1 m hydraulic hose, 7 – 0.7m hydraulic hose, 8 – 2.2 m hydraulic hose

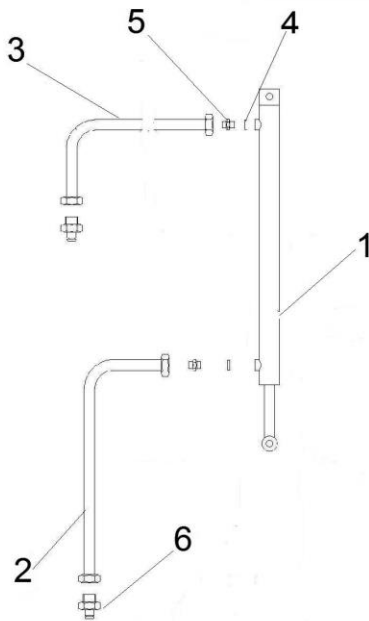


Fig. 13 Diagram of the hydraulic system of the TOP driving carriage: 1 – cylinder, 2, 3 – 6.5 m hydraulic hose, 4 – cooper pad, 5 – orifice, 6 – quick-fit connector

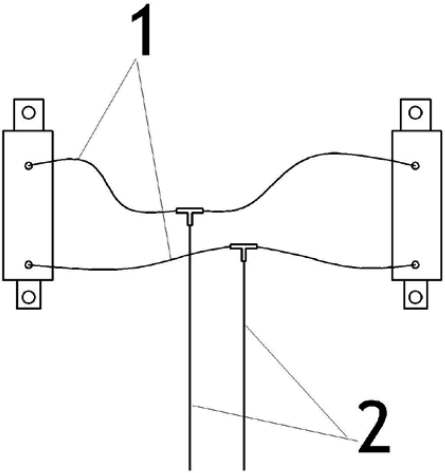


Fig. 14 Hydraulic system for adjusting the working depth of TOP 2,5 – 3,0: 1 – 1 m hydraulic hose (4 pcs), 2 – 2 m hydraulic hose (2 pcs)

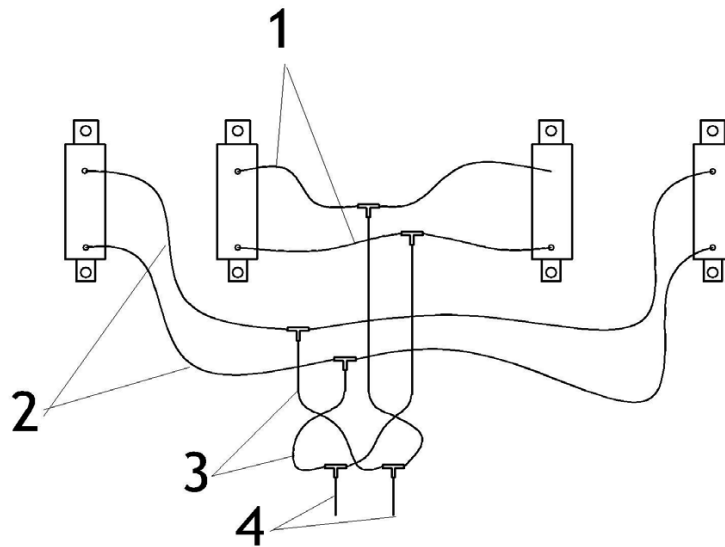


Fig. 15 Hydraulic system for adjusting the working depth of TOP 4,0 – 4,8: 1 – 1 m hydraulic hose (4 pcs), 2 – 1.7 m hydraulic hose (4 pcs), 3 – 1.8 m hydraulic hose (4 pcs), 4 – 0.6 m hydraulic hose (2 pcs)

### Maintenance of the TOP driving system

Regularly check tyre pressure. If air leakage in the tyres is considerable, check tightness of the air valve. Next, have the wheel inspected by a specialised company to locate and repair the damage. Considerably damaged tyres (particularly in the case of tyre profile) must be replaced immediately.

Setting the axle clearance of wheel bearings.

It is recommended that this task should be carried out by a specialised company. This is done by tightening the nut on the hub once the wheels are dismantled. A clearance of 0.12-0.15 mm is recommended. The inspection and adjustment must be performed every 2 years. Procedure:

- Dismount the hub cover and the spring pin securing the spring pin.
- While rotating the hub, press and tighten the castle nut.
- Stop tightening when with a vigorous manual rotation there is no more than a half-turn of the hub.
- Loosen the nut partially until the hub can rotate freely and repeat the tightening step.
- After repeated rotation locking, loosen the nut by max. 30° until the immediate nut locking is possible. Mark the position with a line.
- Untighten the nut from the marked position by a half-turn; tap slightly the hub, pressing the hub to the nut all the way down.
- Keep tightening the nut until it reaches the position marked with the line.
- Mount the hub cover.

## 6. Malfunctions and abnormal operation

Damaged bearings must be replaced:

- Place the machine on a stable ground.
- Unscrew the four screws securing ball bearings (the two screws between the rings in the case of the ring roller shaft and T-ring roller) on each side.
- Move the shaft away.
- In the case of the ring and T-ring roller, first remove the safety rings at the end of the shaft secured with headless screws and remove them from the shaft wheel.
- Remove the bearings using a puller.
- Mount new bearings on the roller loosely (for the ring and T-ring roller, mount safety wheels and rings; drive headless screws with a thread-locking fluid).
- Draw the shaft between bearing plates and screw the bearings to the plates.

**Do not replace the ball bearings on the levelling disc holders. Replace the entire disc holder if damaged.**

If damaged, have the cylinder repaired at a workshop specialised in the refurbishment or replace with a new one.

While re-mounting the cylinder, take the following steps:

- connect the hoses properly as for the other cylinder,
- first insert into the mid frame and secure,
- support the cylinder so that the piston rod does not collide with any machine parts while pulling out,
- run the working cycle several times to vent the cylinder, or otherwise the side frame will suddenly fall down, which may damage the machine or cause an accident,
- attach the cylinder to the lug and secure it with a bolt.

## 7. Storage of the cultivator

When the season is finished, inspect the parts and the units. If any part is found damaged or considerably worn, replace it with a new one. Areas of damaged paint must be cleaned out of dirt and rust. Apply anti-corrosive paint, and then apply a topcoat paint. Apply anti-corrosive protection to the working surface of the cultivator teeth and the shaft.

Store the unit under a roof. If no roofed space is available, the machine can be stored outdoors.



**CAUTION! Store the cultivator in a place that does not pose any hazard to people and the surrounding area.**

For safety reasons, if the cultivator's working width exceeds 3 m, store it as disassembled and with the discs and the tines positioned downwards.

## 8. Disassembly and withdrawal from service

If the degree of damage of the machine frame may pose hazard to life or cause an accident, withdraw the machine from service. The disassembled and withdrawn from use cultivator does not pose any particular threat to the natural environment. Start disassembling the cultivator by dismounting small parts (bolts, screws, etc.). Then, proceed with bigger parts. The withdrawal from use can be carried out once the cultivator is completely disassembled and all machine elements have been checked. While disassembling, group the parts according to their materials. Used parts made of ferrous metals have to be handed over in groups to metal scrap yards. Used oil, rubber covers on supports and flexible hoses must be disposed of as waste. They must be handed over to waste disposal companies.

## 9. Technical description

Table 2 Technical data of the TOP cultivator

Type	Working width [m]	Number of teeth [pcs]	Number of discs [pcs]	Min. power demand [HP]	Weight [kg]
TOP 2,5	2.50	9	6	105	1085
		11	8	120	1150
TOP 2,5S		9	6	120	1560
		11	8	140	1650
TOP 3,0	3.00	10	8	120	1302
		13	10	150	1380
TOP 3,0S		10	8	140	1872
		13	10	180	1980
TOP 4,0H	4.00	13	10	160	2182
		17	12	200	2260
TOP 4,0SH		13	10	180	3150
		17	12	240	3290
TOP 4,8H	4.80	16	12	190	2950
		22	16	300	3200
TOP 4,8SH		16	12	220	3246



## 10. GENERAL WARRANTY TERMS

- **Only genuine spare parts for the machines manufactured by Mandam can ensure long-lasting and efficient operation. The parts for all machines manufactured by Mandam can be purchased in our dealer network or directly from the manufacturer.**
  
- The warranty covers defects and damage arising from the manufacturer's fault caused by material defects, improper processing or assembly. The manufacturer, under the granted warranty, shall be obliged to the following actions, wherein the scope and total cost of a warranty repair shall be agreed between the Manufacturer and the other Party in each case:
  - a) repairing the equipment under complaint free of charge,
  - b) providing the User with new, properly manufactured parts free of charge,
  - c) incurring the costs of labour and transport,
- complete replacement of the equipment by a defect-free item if the actions stated in (a) and (b) are not successful in ensuring a proper operation of the equipment.
- Warranty servicing is performed by the Manufacturer or the assigned warranty service provider.
- The User shall report a warranty complaint immediately, at the latest within 14 days after the occurrence of such damage.
- The warranty period shall be extended by the period of servicing such equipment.
- The Manufacturer will not accept any warranty claims if the equipment has been altered or repaired without the Manufacturer's knowledge or improperly stored, maintained or operated.
- If the user finds that the executed warranty service is insufficient, the user has the right to request the seller to examine the issue with the participation of an expert to be assigned by both parties.







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**WARRANTY CARD**

**TOP cultivator**

Type .....  
Serial number .....  
Year of manufacture .....  
Date of sale .....

The warranty is valid for 24 months and runs from the date of sale.  
Warranty service will be performed on behalf of the manufacturer by:

.....  
(to be filled out by the seller)

.....  
(manufacturer's stamp)

.....  
(seller's stamp)

Present this warranty card when reporting a warranty complaint.