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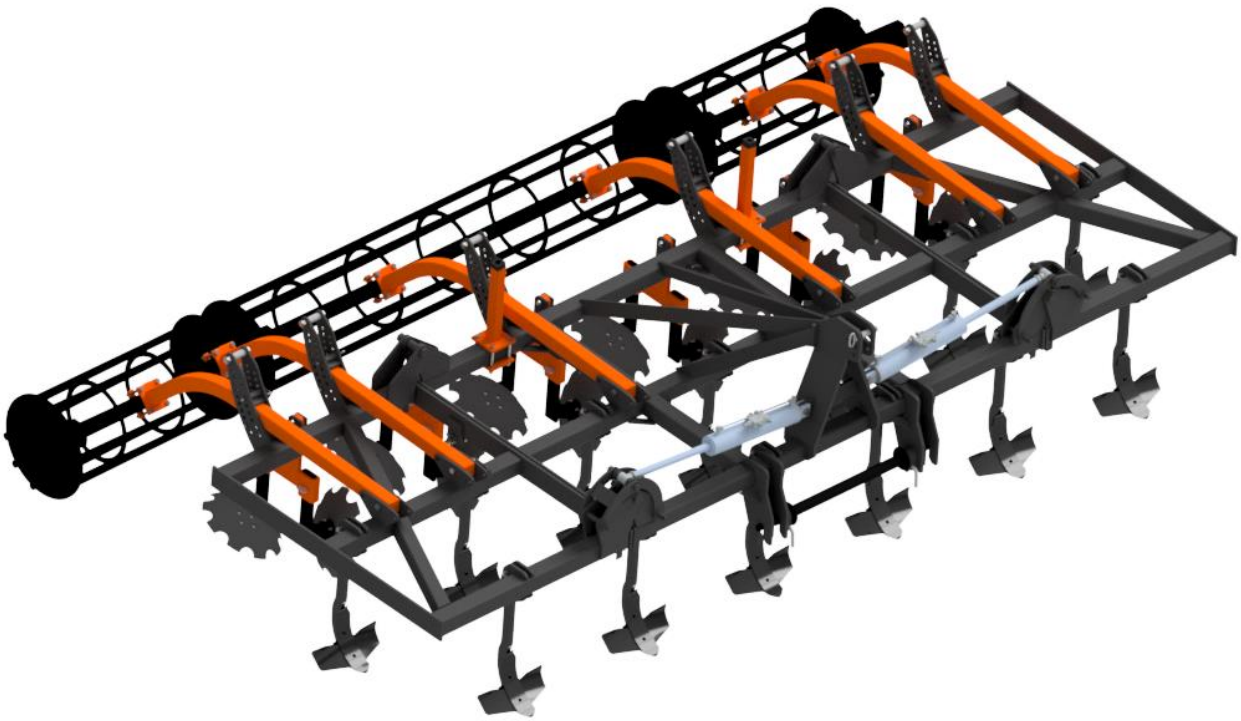
INSTRUCTION MANUAL

STUBBLE CULTIVATOR
KUS



Revision VI
Gliwice 2023

EC DECLARATION OF CONFORMITY

FOR MACHINERY

In accordance with the Regulation of the Minister 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

MANDAM Sp. z o.o.
14, Toruńska Street
44-100 Gliwice, Poland
hereby declares under its sole responsibility that the machine:

KUS CULTIVATOR

type/model: .....
year of production: .....
serial number: .....

to which this declaration relates, complies with:

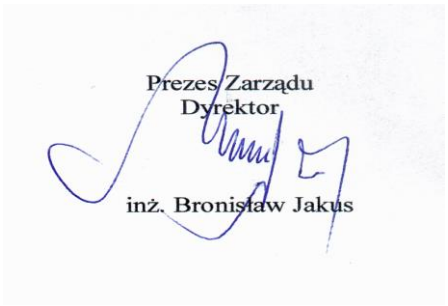
the **Regulation** of the Minister of Economy of 21 October 2008 on basic requirements for machinery (Journal of Laws No. 199, item 1228)
and the **Directive** of the European Union 2006/42/EC of 17 May 2006

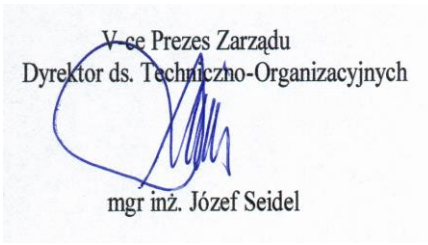
Persons responsible for the technical documentation of the machine: Jarosław Kudlek, Łukasz Jakus
14, Toruńska Street, 44-100 Gliwice

The following standards have also been applied for conformity assessment:

PN-EN ISO 13857:2010,
PN-EN ISO 4254-1:2016-02,
PN-EN ISO 12100-1:2005/A1:2012
PN-EN ISO 12100-2:2005/A1:2012
PN-EN 982+A1:2008

This EC Declaration of Conformity shall become invalid
if the machine is modified or redesigned without consent of the manufacturer.





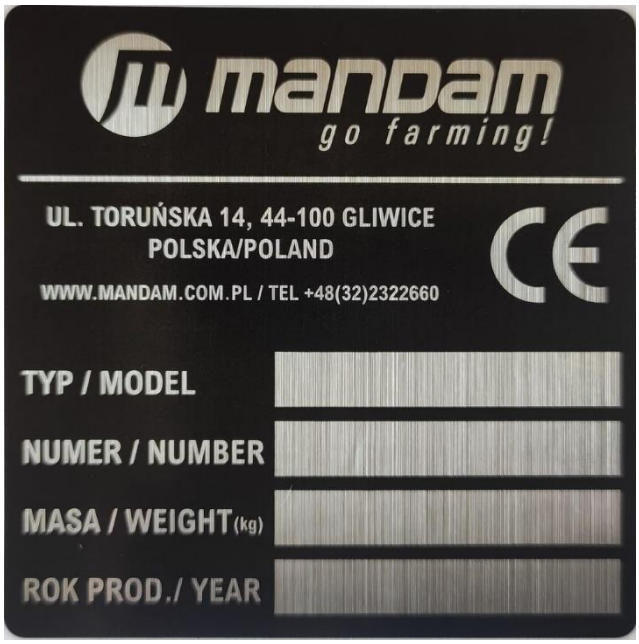
....
Place and date of issue *Last name, first name, position held and signature of the authorised person*

1. Introduction

Congratulations on your purchase of the KUS cultivator. This manual provides information on the hazards that may occur when working with the cultivator, technical data and the most important indications and recommendations, the knowledge and use of which is a prerequisite for proper operation. Keep this manual for future use. Should you have any problems with understanding any statement in the instruction manual, please contact the manufacturer.

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

The machine is provided with a nameplate on the main frame. The nameplate contains the CE mark and presents basic information on the manufacturer and the machine:



The warranty for the cultivator is valid for 12 months from the date of sale.

The warranty card is an integral part of the machine.

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

For information on spare parts:

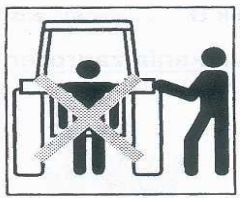
- visit the website: http://mandam.com.pl/parts/
- call at +48 668 662 289
- send an e-mail to: czesci@mandam.com.pl

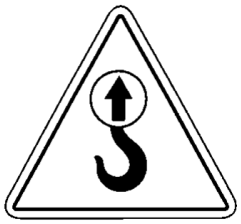
1.1. Safety signs and inscriptions

CAUTION! Special care must be taken when using the machine in areas marked with special information and warning signs (yellow stickers).

The following symbols and inscriptions can be found on the machine. Secure the safety signs and inscriptions against loss and make sure they are legible at all times. If lost or illegible, replace the signs and inscriptions with new ones.

Table 1. Information and warning signs

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

Safety sign	*Meaning of the safety sign*	*Location on the machine*
	Do not reach into the crushing zone if the elements can move	Middle frame adjacent to the 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 adjacent to the operating depth adjustment.

2. General information

The machine consists of the cultivator, discs and shaft. The frame of the cultivator is a welded structure. Working components are mounted to the lateral structural members of the frame by means of screw connections. With the high clearance and large spacing between the working teeth, the unit can work in fields with a large crop residue. The wide-cutting tines are designed so as to undercut the entire surface of the soil the machine is working on. The concave discs placed behind them level the field surface. The shaft located behind the discs is used to optimally adjust the working depth of the unit and to re-compact the ground.

2.1. Design of the cultivator

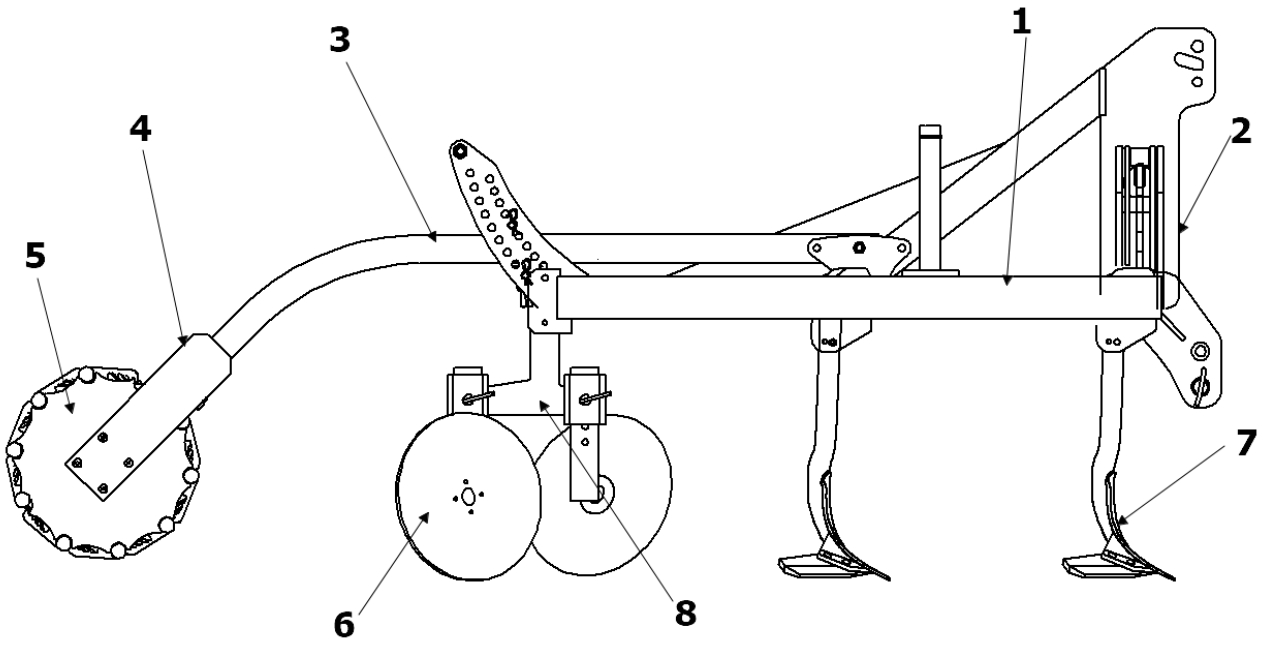


Fig. 1 KUS B unit design: 1 – cultivator frame, 2 – three-point hitch turret, 3 – shaft arm, 4 – shaft clamp, 5 – shaft, 6 – levelling disc, 7 – plough beam, 8 – levelling disc holder.

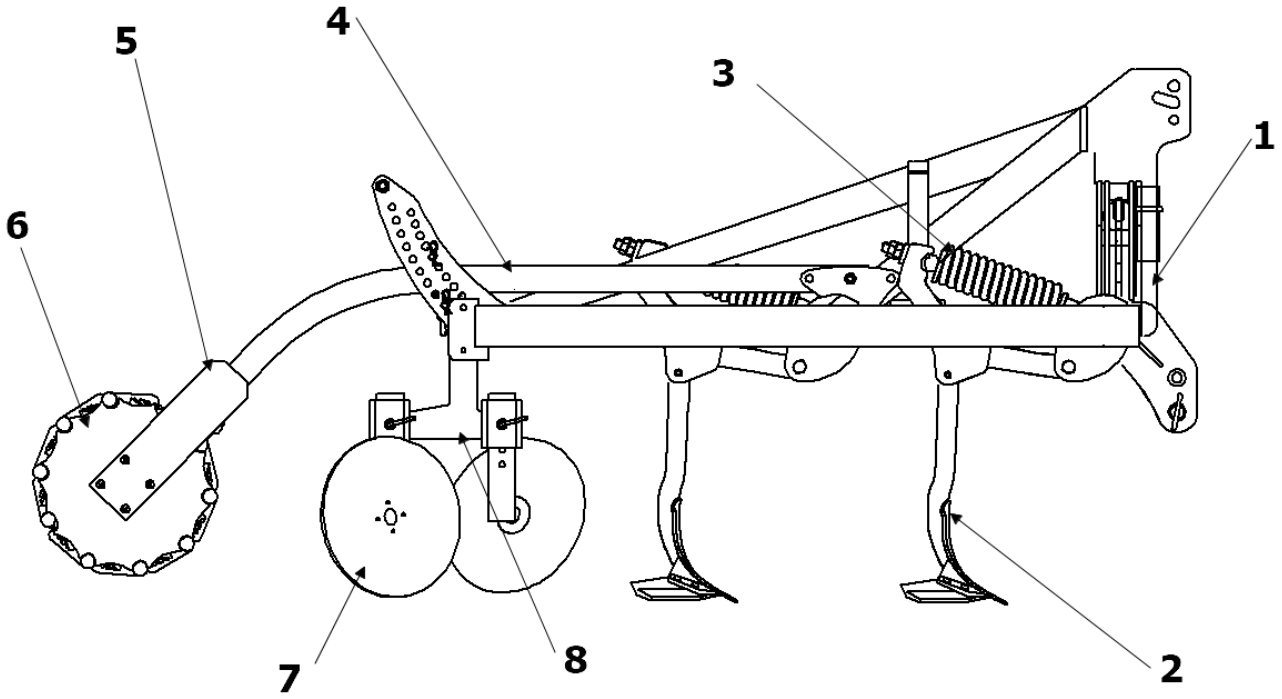


Figure 2 KUS S unit design: 1 – frame with three-point hitch, 2 – plough beam, 3 – spring system, 4 – shaft arm, 5 – shaft clamp, 6 – shaft, 7 – levelling disc, 8 – levelling disc holder.

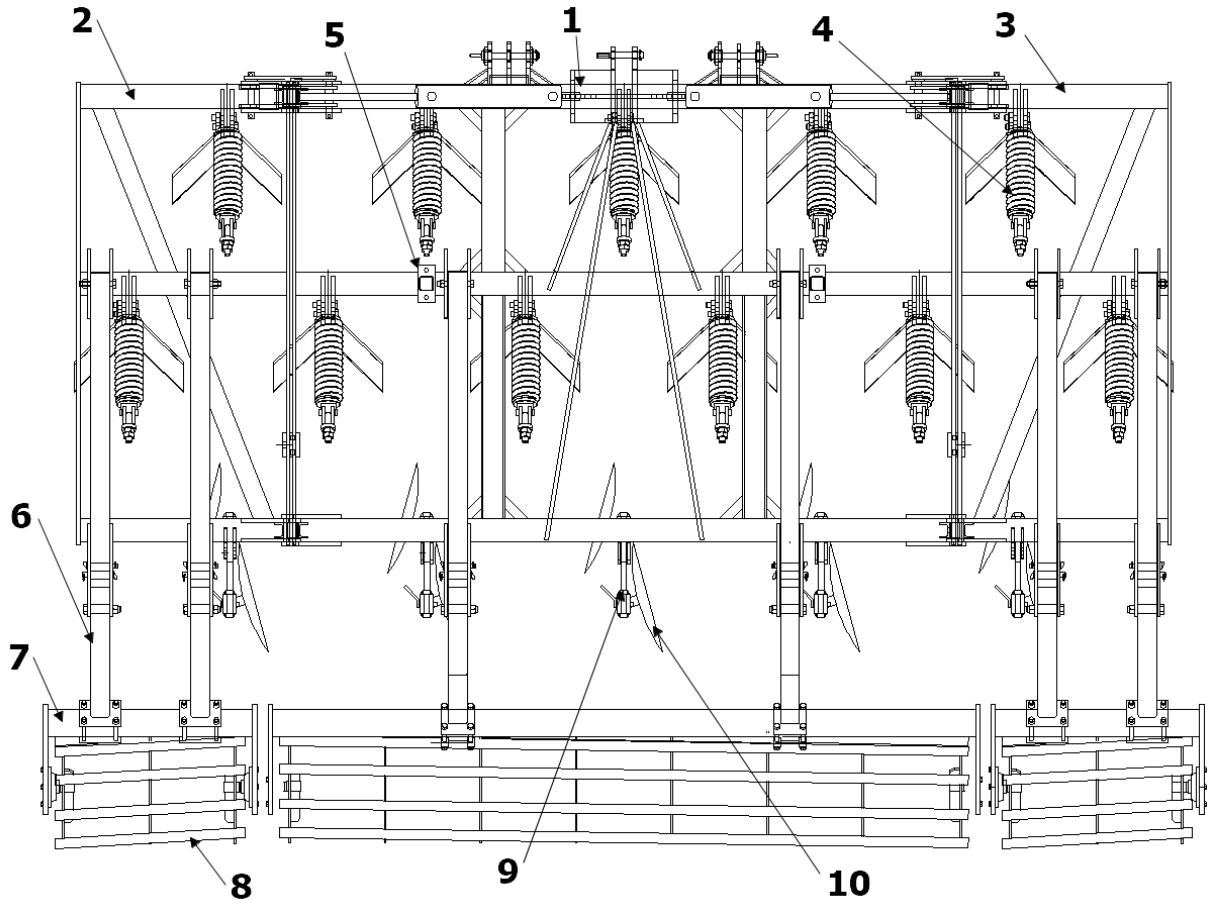


Figure 3 KUS 3.8, KUS 4.8, KUS 5.6 unit design: 1 - middle frame with three point hitch, 2 – left frame, 3 – right frame, 4 – spring system with a plough beam, 5 – side frame support, 6 – shaft arm, 7 – shaft clamp, 8 – shaft, 9 – levelling disc holder, 10 – levelling disc.

Two types of three-point hitch turrets are used in the machines. The available machines can be equipped with a turret bolted to the frame or a turret welded to the frame.

2.2. Technical specifications

Our KUS cultivators are available in the following widths: 2.2m; 2.6m; 3.0m; 3.8m; 4.8m and 5.6m.

Table 2. KUS cultivator types.

TYPE	Working width	Protection	Number of teeth	Number of discs	Min. power demand	Weight
	m		pcs	pcs	HP	kg
KUS 2.2 B	2.20	bolts	5	4	60	625
KUS 2.2 S		spring			70	835
KUS 2.6 B	2.60	bolts	6	5	80	756
KUS 2.6 S		spring			90	932
KUS 3.0 B	3.00	bolts	7	6	100	809
KUS 3.0 S		spring			110	1196
KUS 3.8 B	3.80	bolts	9	8	140	1197
KUS 3.8 S		spring			150	1622
KUS 3.8 BH		bolts			150	1552
KUS 3.8 SH		spring			160	1934
KUS 4.8 BH	4.80	bolts	11	10	160	1794
KUS 4.8 SH		spring			170	1953
KUS 5.6 BH	5.60	bolts	13	12	200	1990
KUS 5.6 SH		spring			210	2482

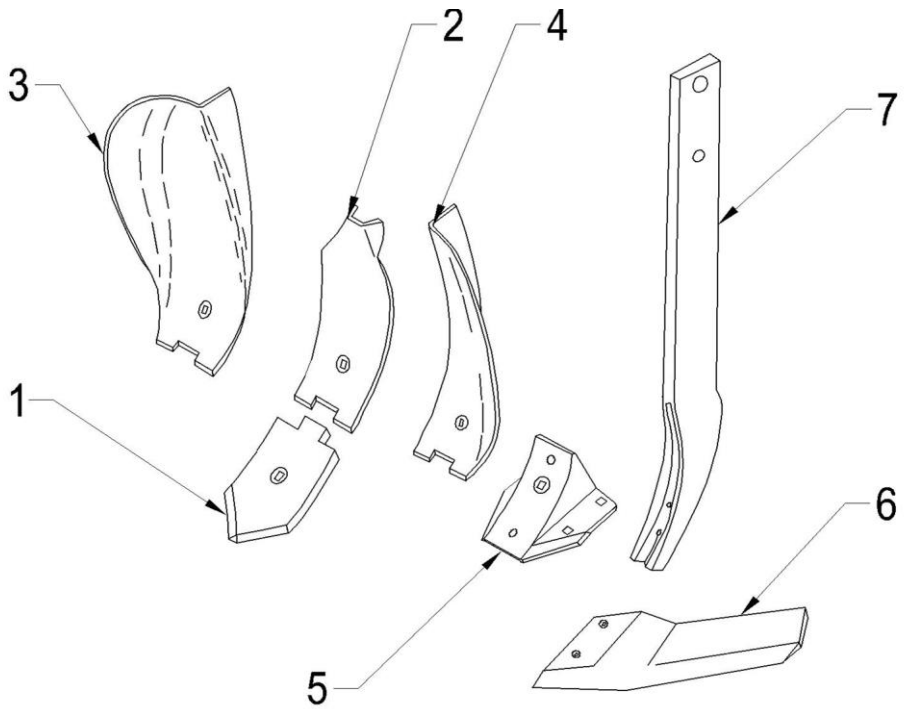


Figure 4 Design of the KUS cultivator working component: 1 – point, 2 – middle shield, 3 – right shield, 4 – left shield, 5 – share foot, 6 – left/right share, 7 – plough beam.

2.3. Intended use of the KUS cultivator

The KUS cultivators are designed for post-harvest cultivation on all types of soils. The main task is to:

- undercut across the entire working width of the stubble,
- mix crop residues with the soil,
- level the soil surface,
- re-compact the soil.

Such an operation allows you to stop soil water evaporation in one pass, accelerate the decomposition of plant residues and accelerate sprouting and growth of weeds and self-seeding plants. The levelled soil surface behind the discs allows for inter-crop sowing, while the shaft behind the discs compacts the soil to create optimal conditions for seeds to sprout.

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

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

3. General safety rules

The KUS cultivator can be run, operated and repaired only by persons familiar with operation of the unit 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 modifications to the cultivator design.

Only original factory parts manufactured by MANDAM are allowed to be used 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 to make sure that their conditions guarantee safe movement and operation,
- persons under age, disabled or under the influence of alcohol or drugs must not operate the machine,
- wear working clothes, footwear and gloves during maintenance,
- do not exceed permissible axle and tyre loads or transport dimensions,
- only original safety and split pins may be used,
- do not approach the plough while it is being raised and lowered,
- do not stay between the tractor and the cultivator when the engine is running,
- move forward, lift and lower the machine slowly and smoothly without sudden jerks, making sure that nobody stays in the vicinity,
- it is forbidden to reverse the tractor and make U-turns with the machine lowered to the working position,
- do not use independent tractor brakes when making U-turns,
- 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,
- do not operate the cultivator on slopes greater than 12º,
- any repairs, lubrication or cleaning of working components may be performed as long as the engine is not running and the cultivator is lowered,

- there is a hazard of head injury when performing maintenance or replacement of parts under the machine without adequate protection – wear a helmet,
- while taking a break, lower the machine onto the ground and stop the tractor engine,
- the cultivator is equipped with a mechanical lock to prevent uncontrolled falling down during transport,
- driving and parking the unit on an unstable slope may cause soil slipping,
- store the machine properly so that no person or animal can be injured.

3.1. Adequate hitching to and unhitching from a tractor

- Attaching the machine to a tractor must be carried out in accordance with the guidelines, bearing in mind the need to secure the suspension using bolts and to secure the bolts with cotter pins.
- While attaching the tractor to the cultivator, it is forbidden for any persons to stay between the machine and the tractor.
- The tractor used together with the plough must be fully operational. It is forbidden to attach the machine to any tractor with a defective hydraulic system.
- Make sure that balance of the tractor and the cultivator, tractor steerability and braking performance are maintained – the front axle load must not drop below 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 stable all the times.

3.2. Hydraulic system

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

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

3.3. Tyres

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

3.4. Safety for transport on public roads

For the time of transporting the cultivator, its side sections must be folded into transport position. During the transport, the clearance under the machine must be at least

30 cm.
When transporting the unit on public roads, it is mandatory to use the lighting equipment, identification plates for slow moving vehicles and reflective side lights.
Do not exceed the transport speed, which is:

- up to 20 km/h on smooth-surface (asphalt) roads,
- 6-10 km/h on field or paved 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 does not jump on the tractor's suspension system and there are no excessive loads on the machine frame and the tractor's suspension system. Take special care when passing, overtaking and travelling on bends. The permissible width of the machine travelling on public roads is 3.0 m.
Do not drive with the unit if the slope is inclined crosswise to the unit by more than 7°.

Warning! Any failure to observe the above rules may pose hazard to the operator and other people, and may also result in damaging the machine. 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 an accident. However, there is some residual risk that may result in an accident. The greatest risk occurs when:

- the machine is used for purposes other than described in the manual,
- the machine is operated by persons under age, disabled or under the influence of alcohol or drugs,
- persons or animals are present within reach of the machine,
- no caution is taken during transporting and manoeuvring with the tractor,
- persons are standing on the machine or staying between the machine and the tractor when the engine is running,
- maintenance is carried out and maintenance guidelines are not followed,
- travelling on public roads.

3.6. Assessment of residual risk

Residual risk may be minimised by observing the following recommendations:

- operate the machine carefully and in no hurry,
- read the manual carefully,
- maintain a safe distance from hazardous zones,
- it is forbidden to stand on the machine or be present in the working zone when the tractor's engine is running,
- perform maintenance works in accordance with safety rules,
- wear protective clothing as well as a helmet when working under the machine,
- prevent unauthorised persons from accessing the machine, in particular children.

4. Information on the operation and use of the cultivator

4.1. Preparation of the cultivator

The KUS stubble cultivator is usually supplied for sale in a ready-to-operate condition. Due to the limitations of the means of transport, it is also possible to deliver the machine as partially disassembled, i.e. usually with the shafts dismounted and the

disc holders repositioned. For preparing the unit for use for the first time, its components (shaft and disc holders) must be assembled. To do this, the cultivator must be placed on a flat hard surface, where the shaft can be manoeuvred freely. First, set the disc holders in the working position (Fig. 5). Then position the arms on the cultivator holders and use the screws to connect the arms with the shaft clamp (Fig. 6).

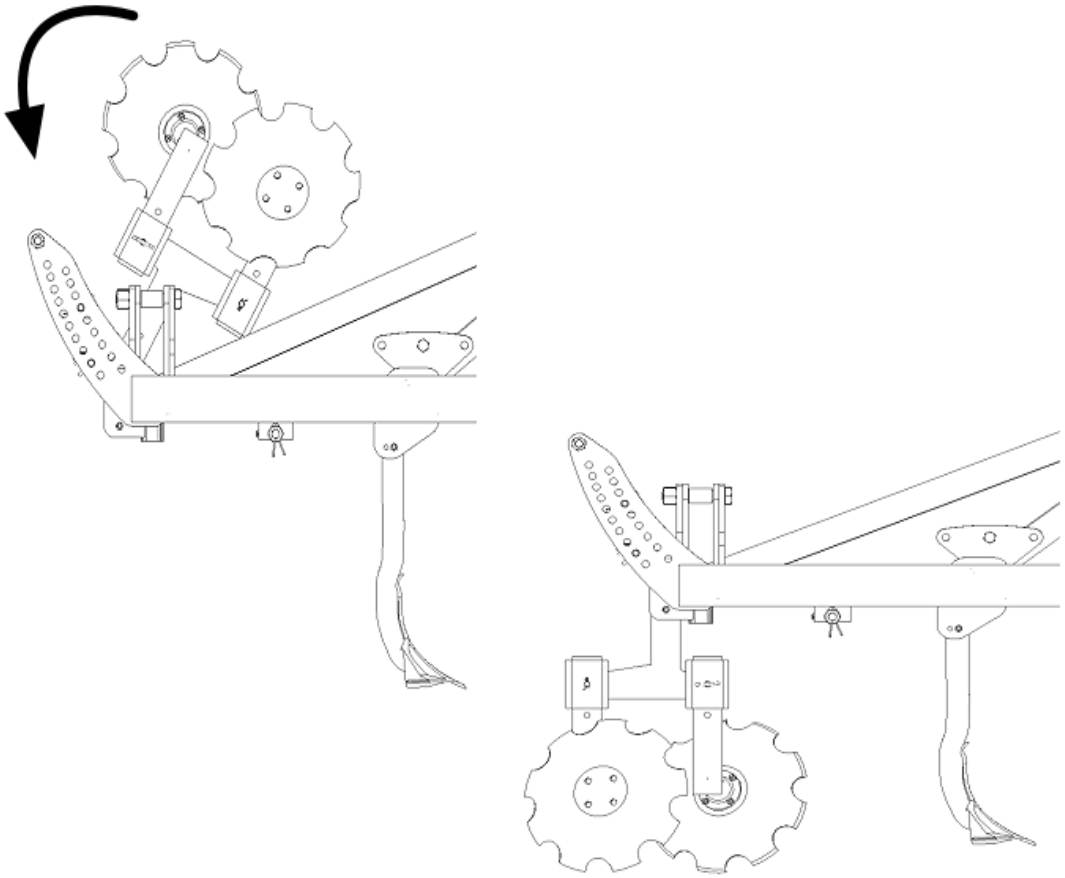


Fig. 5 Setting the disc holders with discs in the working position.

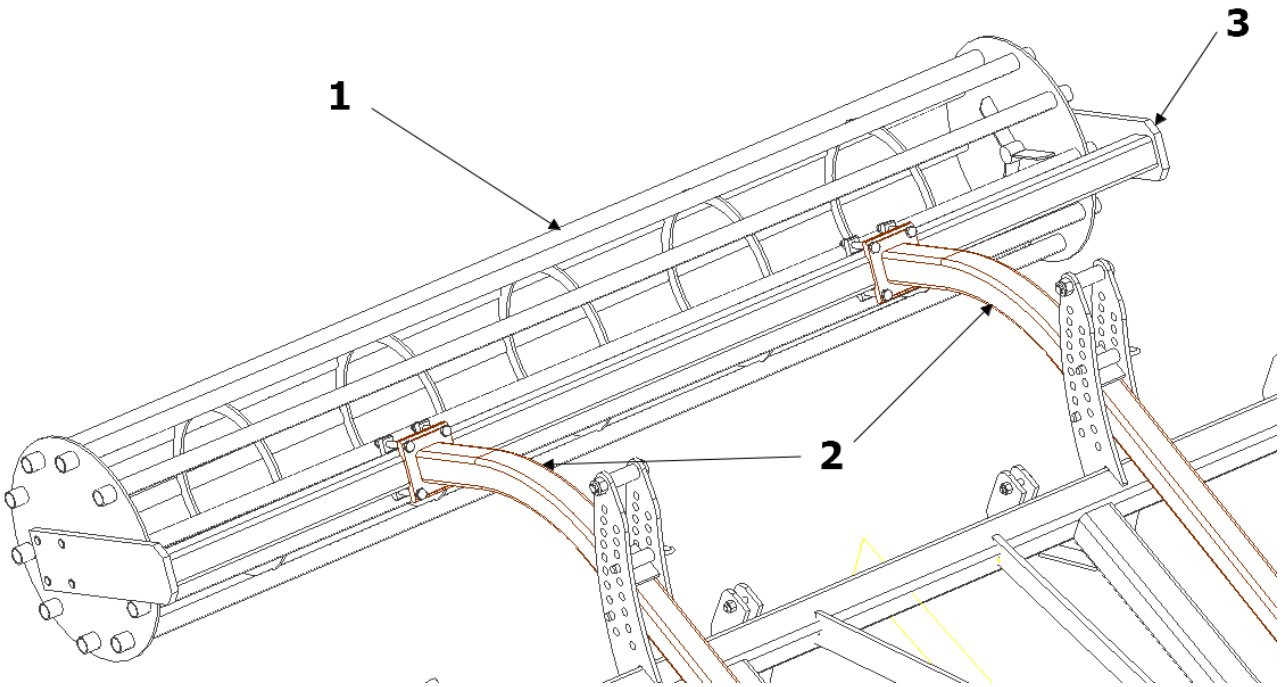


Figure 6 Connecting the arms with the shaft clamp: 1 – tubular shaft, 2 – arms, 3 – shaft clamp.

CAUTION! The correct procedure for mounting the shafts in the arm holders requires the screws to be tightened evenly diagonally so that the entire surface of the arm holders adjoins the surface of the shaft clamp's profile. This is the most reliable way to connect the shaft arms with the machine!

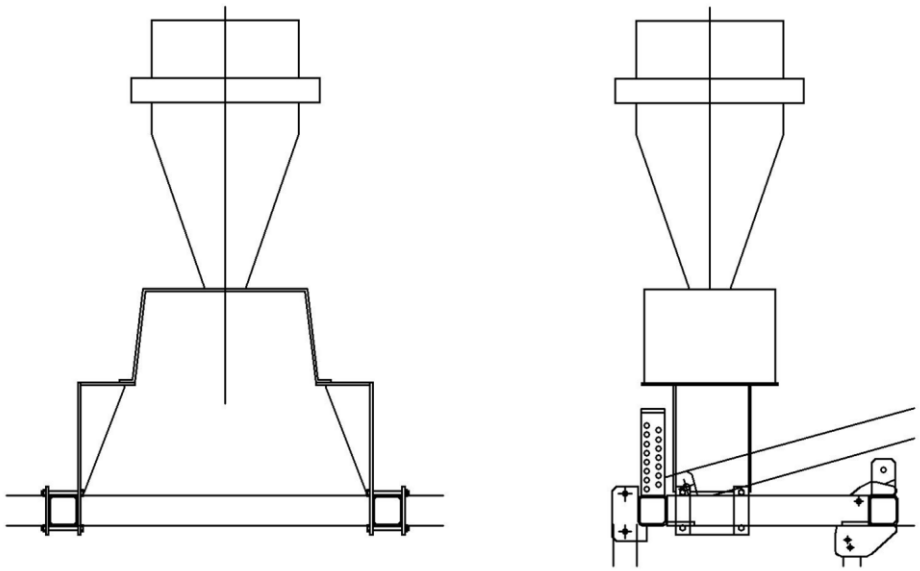


Fig. 7 Mounting the SP 5 seeder to the KUS frame.

The seeder is mounted between the last row of the teeth and the levelling disc beam in the axis of the cultivator. When mounting the seeder to the KUS type "S", make sure that the screw of the spring system does not hit the seeder when the spring system is activated.

Before working, check the technical condition of the cultivator, especially the condition of the working components and screw connections.

CAUTION! Do not exceed the permissible axle loads and the tyre load-bearing capacity. The front axle load cannot be lower than 20%.

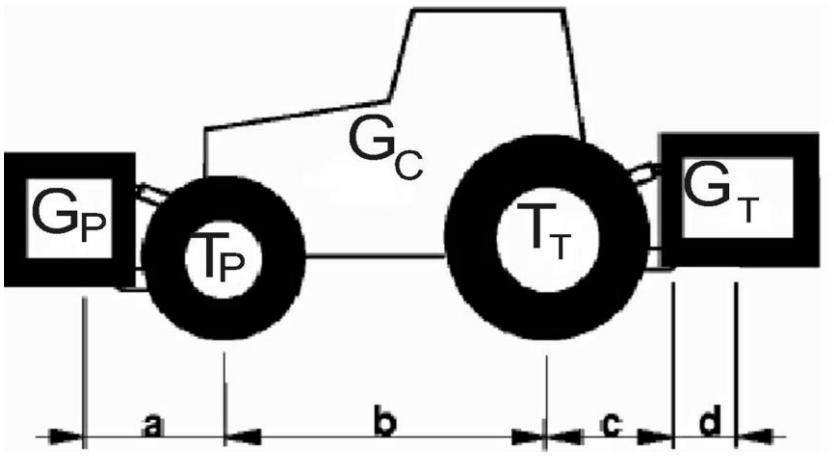


Figure 8 Key of symbols in formulas.

Axle load calculation
Key:
GC – tractor weight,
TP – front axle load if the tractor is empty,
TT – rear axle load if the tractor is empty,
GT – total weight of the rear-mounted implement,
GP – total weight of the front-mounted equipment,
a – distance between the centre of gravity of the front-mounted implement 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 implement,
d – distance of the machine's centre of gravity to the hitch bolts at the tractor - assume 1.4 m,
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 in case of a rear-mounted machine:

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

Actual load on the front axle:

$$T_{P\,cal}=\frac{G_P\cdot(a+b)+T_P\cdot b-G_T\cdot(c+d)}{b}$$

Actual total weight:

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

Actual load on the rear axle:

$$T_{T\,cal}=G_{cal}-T_{P\,cal}$$

4.2. Hitching the cultivator to a tractor

Tyre pressure must comply with the values recommended by the manufacturer. The lower TPH bars should be at the same height, spaced correspondingly to the spacing of the lower hitch points.

While hitching the cultivator to the tractor, complete the following steps:

- switch the tractor's hydraulic system into adjustment position,
- remove the lower hitch bolts if the tractor is not equipped with hooks,
- for a cultivator with a drawbar, install the drawbar on the tractor's lower bars,
- reverse carefully, suspend the machine on the lower bars and secure it,
- attach the tractor's upper fastener,
- check the lifting and lowering of the cultivator and the operation of the hydraulic system.

4.3. Operation and adjustments

Pre-set the position of the individual working components of the KUS stubble cultivator before working in the field. Also level the machine lengthwise with the upper fastener and laterally with the support rail of the right lower bar. Then, make the first work passage to set the optimum working speed and to correct the adjustment based on the assessment of the correct operation of the individual components. The working speed should be 8 - 12 km/h. In a well-adjusted machine, the frame must be parallel to the ground and all working components should equally penetrate the soil over the entire working width.

The working depth of the cultivator is determined by the position of the shaft whose arms are locked in the bolt holders (Fig. 9). The shaft should be pre-positioned below the lower edge of the duckfoot shares corresponding approximately to the intended working depth, and the setting should be then adjusted during the operation taking into account the shaft recess. To change the position of the shaft, the bolts should be mounted in the respective holes when the cultivator is raised, making sure that the bolts are in the same holes in both drilled plates.

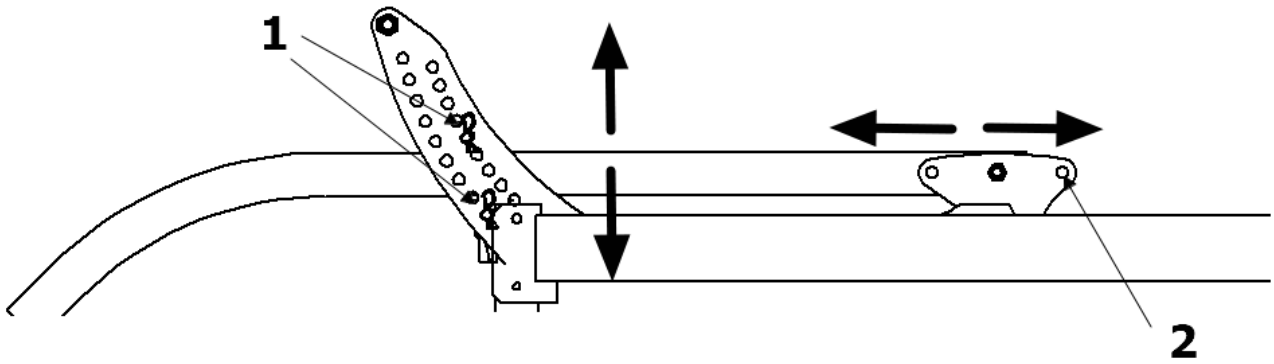


Figure 9 Depth and shaft distance adjustment: 1 – bolts for adjusting the working depth with a stabiliser plate; 2 – screw for fixing the shaft arms.

The distance of the shaft from the cultivator depends on the hole where the shaft arms are mounted (Fig. 9). The distance should be increased when the soil thrown out by the discs runs over the shaft or the amount of crop residue is large enough to clog it.

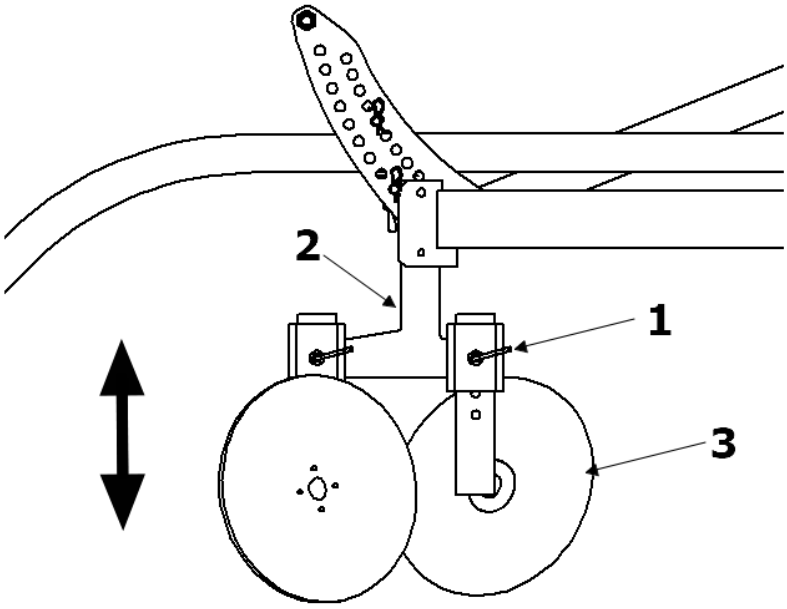


Fig. 10 - Adjusting the levelling discs: 1 – levelling disc bolt, 2 - levelling disc holder, 3 – levelling disc.

The disc with the frog is adjusted vertically. The frog has 5 holes for adjusting the height of the disc depending on the working depth of the cultivator. The discs should work at a small depth, just to level the furrows made by the last row of teeth. If lowered too much, the discs can cause the formation of furrows.

The components of the KUS 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 and for medium- and low-compacted soils (Fig. 11, opening A; Fig. 12 nut C, unscrewed). A steep coulter arrangement facilitates the penetration and loosens the soil to a larger extent. This is recommended for hard and dry soils (Fig. 11, opening B; Fig. 12 screw C, screwed). For working components with a spring-type protection, bear in mind that any change in screw tightening changes the protection activation force.

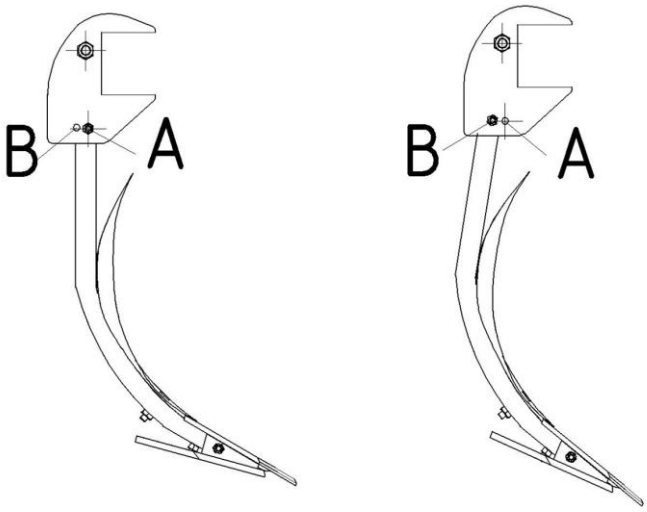


Fig. 11 Adjustment of tooth tilt with the screw-type protection.

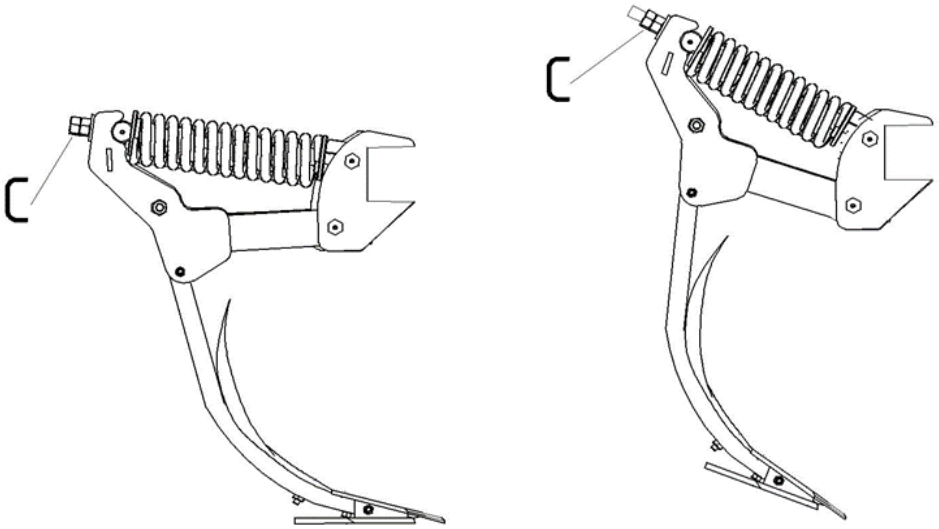


Fig. 12 Adjustment of tooth tilt with the spring-type protection.

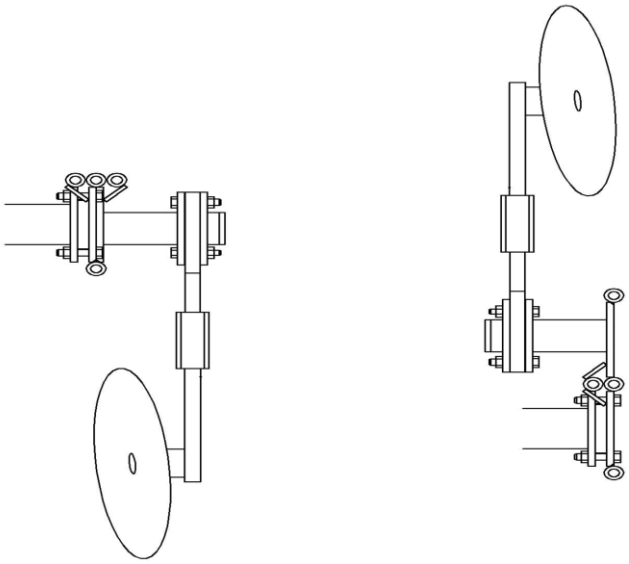


Fig. 13 Folding the outline discs

Machines equipped with outline levelling discs must be folded for transport. This applies especially to 3 m machines. The outline discs are mounted on the pivot pin and the safety transfer pin. To put the disc in the working position, unfasten the pin, lift the holder with the disc, and then reinstall and secure the pin.

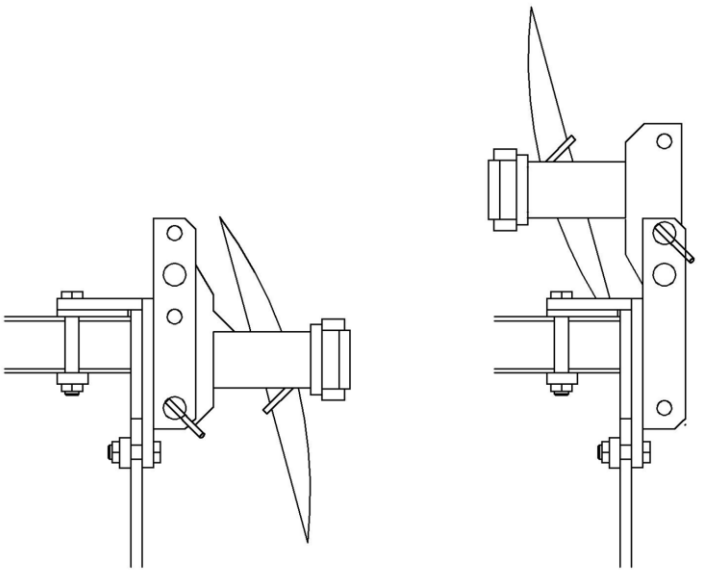


Figure 14 Folding the outline disc of KUS 5.6 and KUS 3.8 with an aftercrop seeder.

The KUS 3.8 cultivator with an aftercrop seeder and the KUS 5.6 cultivator are equipped with outline discs that are foldable to the rear. Whenever the cultivator is to be folded to the transport position, the outline discs must be folded down.

Cultivators with working width of more than 3 m are provided with foldable side frames. When unfolded, the side frames are locked at the front by means of the plate connecting the middle frame and the side frame. When applied to the pins, the plate should be secured with a cotter pin.

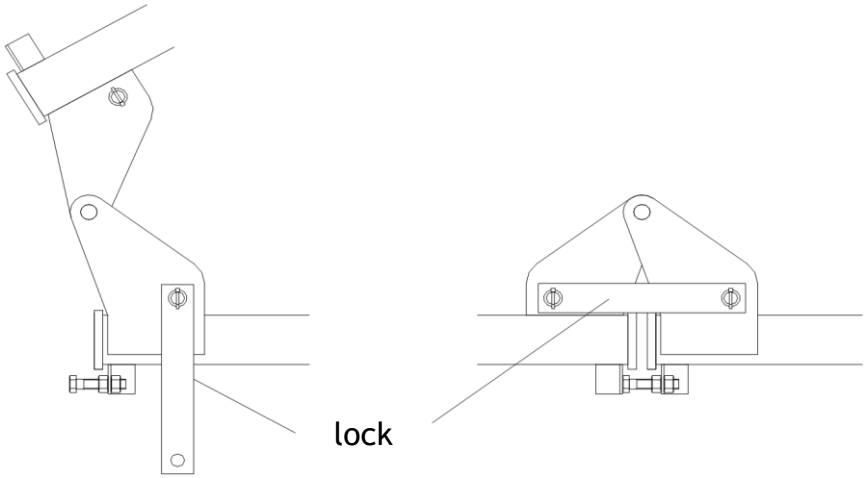


Figure 15 Locking the side arms at the front.

The rear of the side frame is locked by a screw. Locking is carried out by turning the screw so that it is in the groove and then tightening the wing nut.

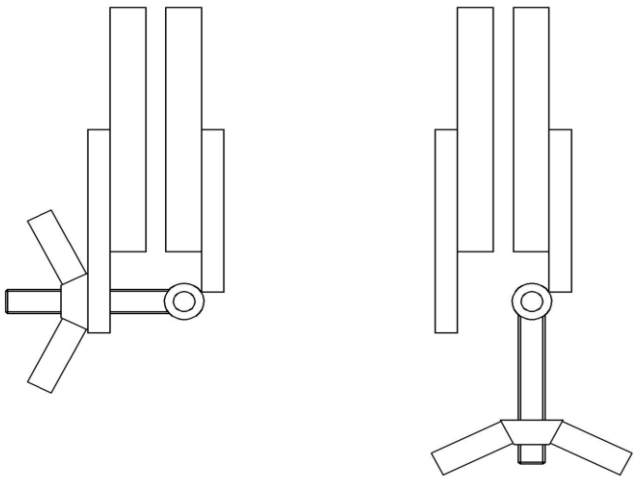


Figure 16 Locking the rear of the frame.

4.4. Operation of the KUS cultivator

The KUS stubble cultivators are available with two types of protection. The designation "B" refers to the bolt (screw)-type protection. When a stone or other obstruction is encountered, the bolt breaks and the plough beam tilts back freely. The remaining broken bolt should be removed with a drift. Breakable screw: M12x80-8.8-B

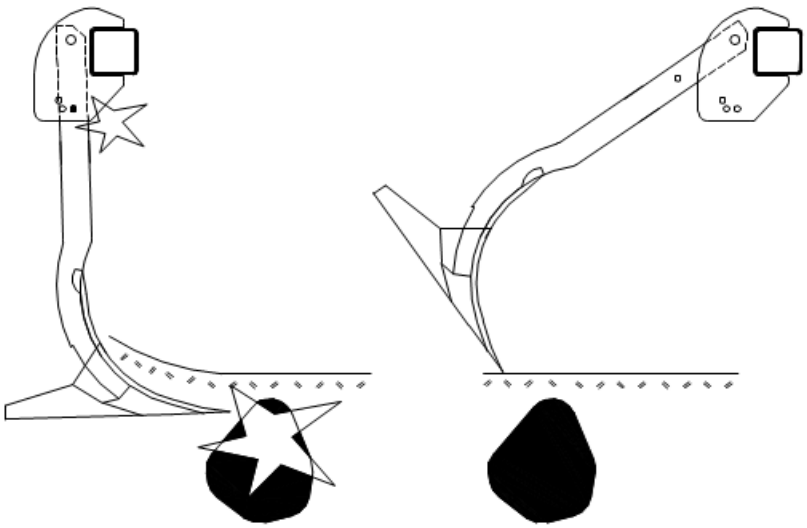


Fig. 17 Bolt-type protection of the KUS cultivator.

The designation "S" refers to the spring-type protection. When an obstacle is encountered, the spring system is activated and the plough beam tilts back while lifting up. When the obstacle is passed by, the spring system returns to its original position. The system activation force is adjusted by means of screws passing through inside the springs. When changing the activation force, remember that the angle of approach of the point also changes.

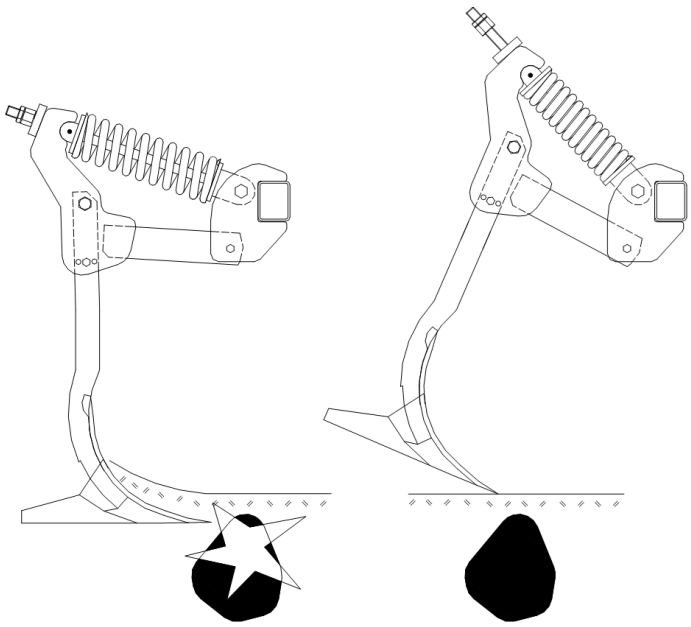


Fig. 18 Spring-type protection of the KUS cultivator.

The levelling discs have a bolt-type protection. The operating principle of the protection is identical to that of the plough beam. Breakable screw: M12x70-8.8-B

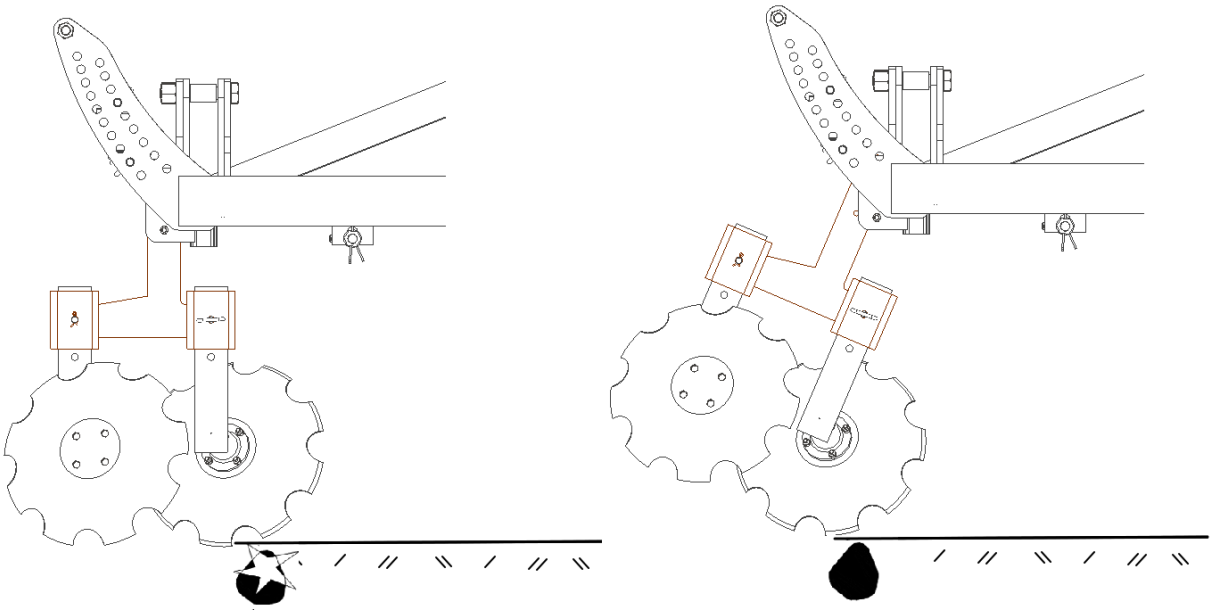


Fig. 19 Bolt-type protection of the levelling discs.

The KUS cultivators folded hydraulically for transport are equipped with the side frame level adjustment. If the side frames are not in the same level as the middle frame, adjust the settings. Use the adjusting screw at the front of the frame. Unscrewing lifts the side frames and screwing lowers them.

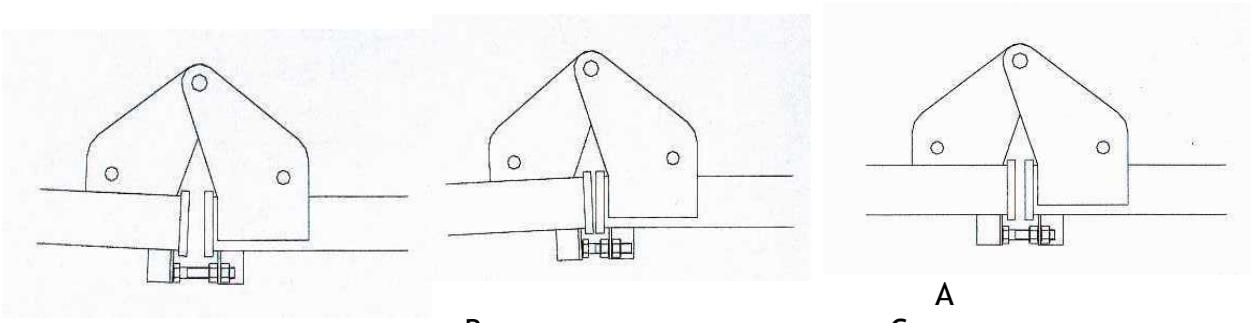


Fig. 20 Adjusting the side frame level: A - bolt unscrewed too far, B - bolt screwed too far, C - optimum bolt setting.

4.5. Maintenance and lubrication

- Clean the cultivator from soil after each use and inspect the parts and assemblies. **Otherwise, in the case of the components being clogged with soil and the additional load occurring due to this, there may be a problem with the folding of the machine!**
- After the first 4 hours of operation, all screws must be retightened, and then periodically checked to make sure that they are tightened properly.
- While using the machine, grease the lubrication points at the hinge pins, shaft bearings, disc bearings and spring-type protections every 25 hours of operation.
- When replacing worn parts, use a thread locking compound and the original bolts and nuts.
- Always remember to tighten the screwed connections properly.

CAUTION! Periodic lubrication guarantees the long service life of the machine.

The long service life and efficiency of the machine depends to a large extent on regular lubrication. Use mineral greases for lubrication. Clean the lubrication points thoroughly before pressing or applying grease.

CAUTION! It is forbidden to work on a damaged machine caused by any event resulting in a broken, or deformed frame, shaft or other assembly of the machine!

4.6. Screw tightening torque

Screws, bolts and nuts in the machine should be tightened with the appropriate torque depending on the strength class of the bolt and its thread size and pitch. The correct torque values for tightening them are shown in Table 3.

Table 3. Tightening torques of screws and nuts.

Screw, bolt and nut tightening torques [Nm]					
			Bolt strength class		
		Thread pitch	8.8	10.9	12.9
Size	M4	0,7	3,2	4,5	5,2
	M5	0,8	6	8,4	10
	M6	1,0	11	15	17
	M8	1,3	27	34	40
		1,0	21	30	35
	M10	1,5	46	65	76
		1,3	41	75	67
		1,0	36	50	59
	M12	1,8	79	111	129
		1,3	65	91	107
	M14	2,0	124	174	203
		1,5	104	143	167
	M16	2,0	170	237	277
		1,5	139	196	228
	M18	2,0	258	363	422
		1,5	180	254	296
	M20	2,5	332	469	546
		1,5	229	322	375
	M22	2,5	415	584	682
		1,5	282	397	463
	M24	3,0	576	809	942
		2,0	430	603	706
	M27	3,0	740	1050	1250
		2,0	552	783	933
	M30	3,5	1000	1450	1700
		2,0	745	1080	1270
	M36	4,0	1290	1790	2020
		2,0	960	1340	1500

CAUTION! It is forbidden to work on a damaged machine caused by any event resulting in a broken, or deformed frame, shaft or other assembly of the machine!

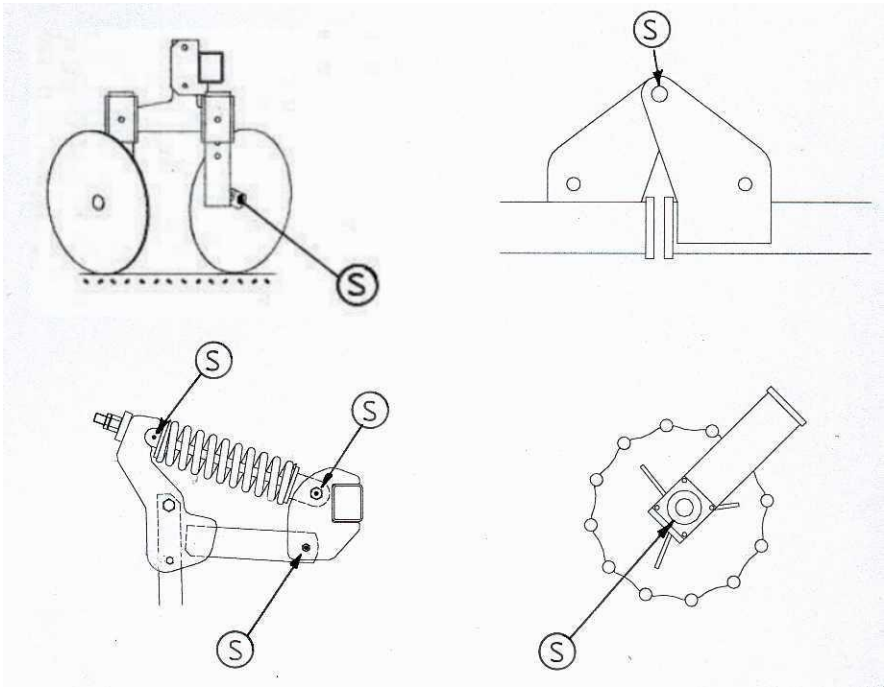


Fig. 21 Lubrication points of the KUS cultivator.

The long service life and efficiency of the machine depends to a large extent on regular lubrication. Use mineral greases for lubrication. Clean the lubrication points thoroughly before pressing or applying grease.

5. Daily maintenance

At the end of the each working session, clean the cultivator from soil and plant residues and inspect the screw and bolt connections and the condition of the working components and other parts. When cleaning, remove plant residues and ropes wound at the shaft bearing points. Replace any damaged or worn parts. Tighten any loose screw connections and replace damaged safety and split pins.

5.1. Post-season maintenance and storage

After the end of the working season, thoroughly clean the cultivator, repair the damaged paint coating. The abraded working surfaces of the teeth, discs, strings and shaft rings as well as the threads of the adjusting screws must be cleaned, dried and protected against corrosion. In addition, perform complete lubrication. During idle periods, storage under a roof is recommended. However, if this is not possible, check the condition of the protection from time to time and supplement the grease washed away by the rain, if necessary. **The cultivator should be stored in a place that does not pose any hazard to people and the surrounding area.** The machine, when disconnected from the tractor, should stand on a firm, level ground. Also, the components removed from the machine should be stored securely supported on the ground, excluding possible uncontrolled movement.

During winter and in the event of prolonged periods of non-use, clean the hydraulic cylinder rods and coat them with petroleum jelly or acid-free grease to protect from corrosion.

5.2. Maintenance of hydraulic system

The maintenance of the hydraulic system consists in visual inspections to prove leak tightness. Remember to insert plugs into the 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 component. 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 leakage. 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).

6. Replacement procedures

Replacement of bearings.
Damaged bearings must be replaced:

- Place the machine on a level surface.
- Remove the four bolts securing ball bearings on each side.
- Move the shaft away.
- Loosen both headless bolts in each bearing to pull the bearings out with a puller.
- Fit the new bearings on the shaft loosely.
- Roll the shaft to between the bearing plates and screw the bearings to the plates. Drive the headless screws with use of the thread locking compound.

Replacement of working components

Excessively worn working components make it difficult for implements to penetrate the soil, increase the operating resistance and mix crop residues insufficiently. The replacement of working components must be carried out on a machine that is lowered to the ground with the tractor's engine stopped. To prevent the parts being replaced from resting directly on the ground, place strong pads under the shaft. After lowering the cultivator, stopping the engine and applying the hand brake, check the stability of the unit and the tractor. Use only typical screws to mount the new components.

If the components of the machine are disassembled several times, it is necessary to inspect and replace, if required, the connecting elements such as bolts, washers or nuts, as their excessive wear can lead to uncontrolled loosening of the connected components resulting in damage to them.

Working with extremely worn work tools may cause e.g. damage to bearings in the event of a small disc diameter. Tools should be replaced when their wear and tear exceeds the limits allowed by the manual. Otherwise damage may occur for which the manufacturer SHALL NOT BE HELD RESPONSIBLE!

Replacement of cylinders

A malfunctioning cylinder (leakage, etc.) must be dismounted for inspection by a specialised company. The cylinder replacement must be performed when the machine is unfolded. Connect the cylinder to the system and, with one side mounted, repeat the operating cycle several times until the cylinder is completely filled with oil. Otherwise, the section being lowered may suddenly fall down.

The levelling disc bearings are not dismountable. Damaged bearings must be replaced as a whole part.

CAUTION! When performing repairs and maintenance operations, the machine should be lowered to the ground and rest on supports providing full stability and the tractor engine must be stopped. Use correct wrenches and safety gloves during maintenance and repairs.

7. Disassembly and disposal

When operated in accordance with the guidelines in the instruction manual, the machine will have a long life; however, worn or damaged parts must be replaced. In the event of an emergency damage (cracks and deformation of the frames) that deteriorates the machine and poses a hazard during its further operation, the machine must be withdrawn from service and disposed of.
The machine should be disassembled by persons who are familiar with its construction. These operations must be performed when the machine is placed on a level and firm surface. Sequence of the operations:

- Disconnect the shaft clamp from the arms. Remove the screws fixing the bearings and roll the shaft to its side.
- Disconnect the shaft arms from the frame.
- Remove the TPH turret arms that connect it to the main frame (for non-welded TPH).
- Remove the TPH turret.
- Place the frame on stable stands. For units with folding side arms, prepare additional stands.
- Remove the working components of the unit.
- Disconnect the side arm supports from the middle frame.
- When removing the hydraulic system components, use gloves and safety glasses. Before unscrewing the hoses, wrap the connectors with oily cloth. Drain the old oil into a container (bucket).

Store the machine firmly supported on a hardened surface so that no injury is caused to persons or animals.

CAUTION Take all precautions during the disassembly using efficient tools and personal protective equipment. Dispose of the disassembled parts in accordance with the environmental protection requirements.

8. Spare parts of the KUS cultivator

In order to search, find prices and order original spare parts to MANDAM machines, visit our website at: www.mandam.com.pl, the “parts” tab.

There you can find catalogues and spare part sheets in PDF format, containing current part drawings and diagrams for each machine, along with part numbers and prices.

Purchase orders for parts can be placed on and enquiries related to the same can be sent directly from this website (tab: “contact/order”), or sent by e-mail to: części@mandam.com.pl

A purchase order should contain part numbers and quantities, as well as details of the

ordering party/payer together with a contact phone number.

The parts are sent directly to the specified address on the COD basis.

If in doubt, please contact the Mandam Spare Parts Department at: +48 32-232-2660 ext. 39 or 45, or at + 48 668-66-22-89 (mobile).

Original MANDAM spare parts are also available from all authorised distributors of MANDAM machines.