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INSTRUCTION MANUAL

FLEX Pre-Seeding Cultivator



ISSUE II/2014



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

<p>FLEX PRE-SEEDING CULTIVATOR</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

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Gliwice 28 April 2014
Place and date of issue

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

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WARRANTY CARD	

1. Introduction

Congratulations on your purchase of the FLEX Pre-Seeding Cultivator.

This instruction manual contains the information on hazards that may occur during work with the pre-seeding cultivator, technical data and the most important guidelines and recommendations to be known and applied to ensure a proper operation.

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, please provide the serial number.
A list of spare parts can be found at the end of the manual. It will help you place an order and become familiar with the construction of pre-seeding unit.

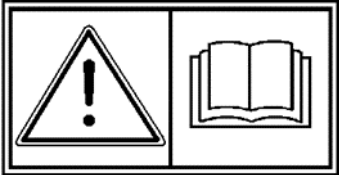
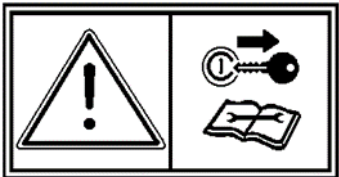




Machine identification

Identification data of the disc harrow can be found on the name plates attached to the main frame. The name plate provides basic information on the manufacturer, the machine and the CE marking.

The manufacturer reserves the right to make constructional, technological, and equipment changes.

1.1. Safety signs and messages

Below, signs and messages placed on the machine are detailed. The safety signs and messages should be protected from being lost and from readability loss. Lost and illegible signs and messages should be replaced with new ones.

Safety symbol	Meaning of the symbol	Placement on the machine
	Read the manual	Unit frame
	Switch off the engine and remove the key before commencing maintenance or repair	Unit frame
	Crushing – external segment of the cultivator	Side wing of the unit (left/right)
	Crushing of fingers	Hinge of the unit frame
	Crushing of fingers or toes	Tractor track openers
	Do not stay close to the lift links while operating the lift	Main frame

2. Application of the unit

The Flex cultivation unit is intended for soil cultivation before sowing. The Flex pre-sowing cultivator is intended for opening the topsoil, breaking up and crushing clod of encrusted field surface, leveling and pressing the subsoil for better ascent of ground waters. The Flex cultivator is especially useful during cultivation of plants which require particularly leveled field before sowing of seeds, e.g. before point sowing of sugar beet. Proper configuration of the unit enables preparation of the field for sowing in one passage. Working elements of the Flex unit include cultivator tines ending with cultivator points or duckfeet. The cultivator tines are placed in three rows, and the cultivator is equipped also with a double flatbar-pin shaft. Cultivation units may cooperate with tractors having power from 110 hpm to 210 hpm and an operable hydraulic system with rated pressure of 16 MPa.



CAUTION! The tractors cooperating with the cultivation unit must be equipped with a set of front axle weights. Slope of the field may not exceed 12°.

3. Safety of use



CAUTION! The machine may be operated only by an adult having a tractor driver license, thoroughly acquainted with and trained according to its application and operation, as well as OHS regulations.

The unit should be operated and used while observing all safety precautions. The machine must be operated by an adult, trained and acquainted with this manual, with particular consideration to information on the occupational health & safety (OHS). The machine should be used according to its intended application; the manufacturer is not responsible for damages resulting from using the machine for other purposes, arbitrary modifications, use of non-original parts. The following precautions should be strictly observed:

- operation of the machine by outsiders not acquainted with guidelines for the operation, sick or intoxicated persons, as well as minors, is forbidden;
- every tractor cooperating with the unit attached to the rear TUZ must be equipped with a set of front axle weights;
- while overtaking other vehicles, particular care should be exercised;
- standing between the tractor and the machine while the engine is working is forbidden;
- do not use independent brakes of the tractor while working with the unit;
- all operations at the machine should be carried out only when the tractor's engine is stopped and the unit is lowered to the ground;
- the unit on the linkage should be lifted and lowered without jerks and impacts;
- climbing the frame and other parts of the machine while it's working is forbidden;
- the machine should be operated by trained personnel only. Regulatory minimum age should be observed;
- the person operating the machine should wear protective clothes and shoes. The protective clothes should be well-fitted – with no dangling parts;

- one should exercise caution while handling elements of the hydraulic, because there is a risk of being crushed or hit;
- work with the unit on slopes higher than 12° is forbidden;
- use only manufacturer's cotter pins for securing the connection of the unit with the tractor;
- before exiting the tractor, stop its engine and lower the unit to the ground;
- the unit should be stored in a place inaccessible to livestock, in a dismantled form (hydraulic cylinder pistons protected with an anticorrosive);
- use and operation of the unit by children or persons not acquainted with the manual is forbidden.



CAUTION! Lifting and lowering of the supports and hydraulic unfolding and folding of the side arms are particularly dangerous operations while using the cultivation unit.



CAUTION! Never perform any handling works at the unit nor in its immediate vicinity, if the protective chains are disconnected (hazard of squeezing). Never try to unfold nor fold the unit arms manually, that is without the tractor's hydraulics.



CAUTION! While using the unit, exercise particular caution in places marked on the unit with special information-warning signs [yellow stickers].



CAUTION! Exercise particular caution while handling the hydraulics (leak of oil under pressure). Replacement of hydraulic hoses – every 5 years.

3.1. Residual risk description

Residual risk results from erroneous or improper behavior of the person operating the cultivation unit. The highest danger occurs while performing the following forbidden actions:

- operation of the unit by minors, as well as persons not acquainted with the manual or not authorized to drive agricultural tractors;
- operation of the unit by persons intoxicated with alcohol or other narcotic drugs;
- not exercising proper caution while transporting and maneuvering with the tractor;
- presence of persons and animals within the reach of the unit;
- transporting persons on the unit;
- standing between the unit and the tractor while the tractor's engine is working;
- performing actions connected with handling and adjustment during operation of the machine with the tractor's engine running;
- traveling on public roads;

While considering the residual risk, the cultivation unit is treated as a machine designed and manufactured according to the current state of art from the start of production.

3.2. Assessment of the residual risk

When the recommendations such as:

- careful reading of the manual;
- prohibition of presence of persons on the unit while working and during transfers;
- prohibition of presence between the machine and the tractor while the tractor's engine is running;
- maintenance, adjustment and lubrication of the unit only when the tractor's engine is stopped;
- maintenance and repair of the machine carried out only by properly trained persons;
- operation of the machine by persons authorized to drive agricultural tractors and acquainted with the manual;
- protection of the unit from the access of children

are observed, the residual risk while using the unit may be limited to minimum.



CAUTION! In case of non-observance of the above recommendations, there is a possibility for the residual risk to occur.

4. General information on use of the unit

4.1. Description of the cultivation unit

The unit for pre-seeding cultivation consists of three operating stems, i.e. supporting string shafts, frames with cultivator tines, and press-down pin shafts. Thanks to being fixed to the unit frame, the operating sections may freely adjust to irregularities of the field. Adjustment of the working depth is done on the basis of articulated parallelogram using bottle screws. The pin shafts are the last segment of the operating section. The operating element of the shaft is constituted by Ø 400 wheels cast from cast iron resistant to mechanical damage, with improved resistance to abrasion. The shaft is mounted on two bearing assemblies. When the unit work on damp soil, special cleaning scratchers prevent covering the shaft with soil.

4.2. Rules of proper use of the machine

The machine is shipped to the client completely or partially dismantled. All actions connected with the assembly should be carried out on an even surface.

4.2.1. Mounting and leveling of the unit on a tractor:

- insert coupling pins of the unit into the hanger plates of the unit frame;
- secure the coupling pins with cotter pins;
- execute the coupling of the unit with the tractor by moving the tractor on reverse;
- connect the upper connector of the tractor with the hanger of the unit using a pin;

- connect the hydraulic hoses to sockets of the tractor's external hydraulics (concerns the working widths of 4 m, 5 m, 6 m);
- lift slightly the unit on the tractor's lift;
- lift the supports and secure them with a pin;
- disconnect the transport protective chains;
- unfold the unit hydraulically (concerns the working widths of 4 m, 5 m, 6 m);
- level the unit crosswise using the crank of the right tractor's hanger;
- level the unit lengthwise using the upper connector of the tractor.



CAUTION! While folding the arms of the unit to their transport position hydraulically, one should remember to secure the transport chains using pins, in order to protect the side arms of the unit from random unfolding during transport.

4.2.2. Adjustment of working parameters of the unit

Adjustment of the unit's operation should be carried out during the first passage, with such speed as that which will be used during cultivation. The operational depth of the cultivator tines is adjusted using bottle screws fixed to the fields with tines. Proper leveling of the unit has a decisive influence on the quality of cultivation. Pressure of the shafts will be adjusted correctly when their first and second rows press the opened layer of soil with the same force.



CAUTION! The fundamental requirements for obtaining optimum effects of cultivation are proper leveling of the unit (lengthwise and crosswise) and proper working speed: 7–10 km/h.

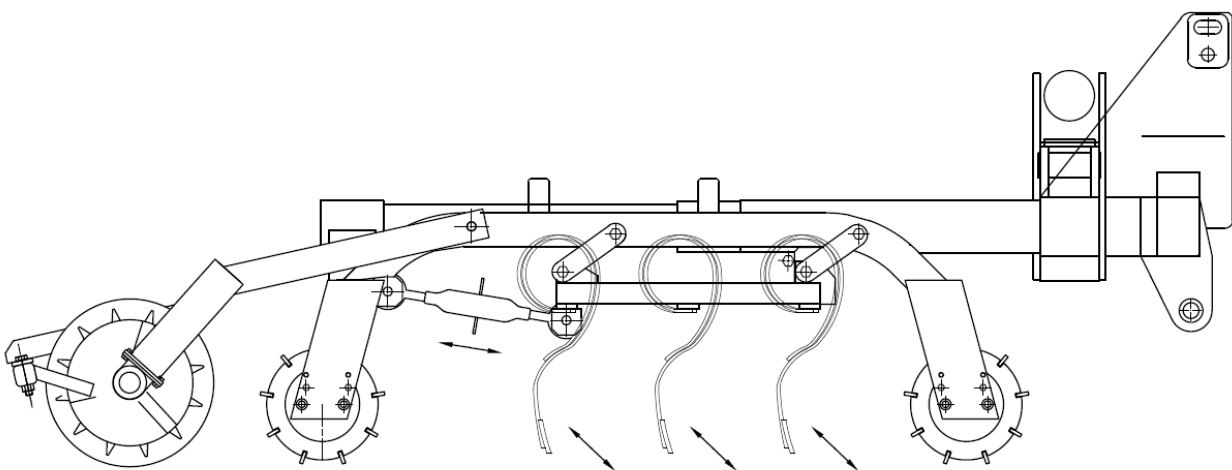


Fig. 1 Height adjustment

4.3. Faults and defects of the units operation

Defect	Repair
Hydraulic cylinder does not work	Disconnect the hydraulic hoses and check passability of the opening in the flange
String shaft does not rotate or excessive play of the shaft	Check the condition of bearing assemblies of the string shaft
Uneven pressure of string shafts onto the ground	Check the lengthwise and crosswise leveling of the unit
Hydraulic hoses	Replace with the same type

CAUTION! In case when the hydraulic actuator needs to be repaired, send it only to a specialized workshop.

5. Technical specification



Fig. 2. Flex cultivator – parts list

		Type of the pre-sowing cultivator			
		Flex 3,0	Flex 4,0 H	Flex 5,0 H	Flex 6,0 H
Working width	[m]	3.00	4.00	5.00	6.00
Hydraulic folders	-	-	+	+	+
Number of duckfeet	[pcs.]	24x16	32x22	40x28	48x34
Min. power demand	[hpm]	110	140	180	210
Weight	[kg]	1557	2334	2850	3335

Table 1. Flex cultivator – technical data

6. Servicing

Every time after work, the unit should be lubricated, the actuators and bearing assemblies of the shaft should be cleaned from dirt, and connections and assemblies should be inspected – loosened screw connections should be tightened. Damaged or worn out part should be replaced with new ones or regenerated parts. Replace the hydraulic hoses every 5 years preventively.



CAUTION! During all servicing, the unit must rest on the surface in the unfolded state. The tractor's engine must be stopped.

7. Storage

When the working season ends, an inspection of parts and assemblies should be carried out. In case when damage or significant wear is found, the corresponding parts must be replaced with new ones. Clean the damaged spots of paint coats from rust and dirt, cover with anticorrosive paint, and next with topcoat paint.

Protect the working surface of the piston rod and the hydraulic quick-release coupling from dirt and corrosion. Store the cultivation unit in a roofed place protected from access of outsiders.



CAUTION! During the storage, the unit must rest on its supports with side arms unfolded.

Disconnect the unit from the tractor in case of longer breaks during the season.

8. Transport of the unit



CAUTION! While transporting the cultivation unit, only a tractor equipped with a complete set of front axle weights should be used.

Requirements for transport:

- place the unit on the hydraulic lift of the tractor;
- lower the wheels of the undercarriage using hydraulics,
- fold the unit arms using hydraulics and secure the transport chains with cotter pins.

During the transport, the unit should be lifted to a height ensuring about 30-cm clearance under the unit.

Transport speed cannot exceed 15 km/h.

Before entering a public road, a plate indicating a slowly moving vehicle and portable light warning devices should be placed in holders fixed to the unit.

A device including two warning plates with white position lamps and white reflective lights pointing forward, and two plates with grouped lamps and red reflective lights pointing backward should be used.

Use and operation of the unit by children and persons not acquainted with the manual is forbidden!

During the transport of the machine on public roads, the following items must be installed on the frame of the machine:

- a plate indicating a slowly moving vehicle according to PN-93 / R-36154, /at the back, in the middle of the unit/
- portable light warning devices (right and left) consisting of:

For 3-m units – install two plates with skew red-white stripes in special holders on the back of the machine, no further than 400 mm from the edge of the unit, containing

For 3-m units – install two plates with skew red-white stripes in special holders on the back of the machine, no further than 400 mm from the edge of the unit, containing red position lamps on the back;

For 4-m units – install two plates with skew red-white stripes in special holders on the back of the machine, no further than 400 mm from the edge of the unit, containing red lights on the back, white position lamps on the front;

For 6-m units – install two plates with skew red-white stripes in special holders on the back of the machine, no further than 400 mm from the edge of the unit, containing red lights on the back, white position lamps on the front;

In case when the machine is transported on a truck semitrailer or trailer, it should be protected from damage and slipping. Loading and unloading should be chosen according to the unit's weight.



Caution! Using public roads without warning signs and light required by traffic regulations poses a risk of ACCIDENT!



Caution! The light warning devices are not included into the unit's equipment. The user may purchase them in places of sale of agricultural machinery.

9. Dismantling and disposal

The dismantling should be carried out first. Disposal of a worn out cultivation unit may pose a hazard for the environment.



CAUTION! One should pay attention to complete draining of the oil from actuators. The oil should be collected in a vessel and pass on to disposal.

Dismantling of the unit should be started with disassembly of small elements (tines of the cultivator frame etc.), then the larger ones. A dismantled cultivation unit should be passed on to a scrap yard as recycled raw material. Elements made of plastics or rubber, and oils etc. should be passed on to proper collection points. While dismantling the machine, use protective gloves and workshop tools.

No.	Part name	Type of the cultivator				
		Flex 1.5	Flex 3.0	Flex 4.0 H	Flex 5.0 H	Flex 6.0 H
1	Main frame	1	1	1	1	1
2	Side frame	–	–	2	2	2
3	Central tool frame	1	2	1	2	2
4	Side tool frame	–	–	2	2	2
5	Central cast iron shaft	1	1	1	1	1
6	Side cast iron shaft	–	–	2	2	2
7	Rear flatbar shaft	2	2	3	4	4
8	Front flatbar shaft	2	2	3	4	4
9	Adjustment crank	1	2	4	6	6
10	Leveler	1	2	3	4	4
11	Cultivator tine	12	24	32	40	48
12	Track openers	4	4	4	4	4
13	Stay	–	–	2	2	2
14	Hydraulics	–	–	1	1	1

Table 2. Flex cultivator – parts list

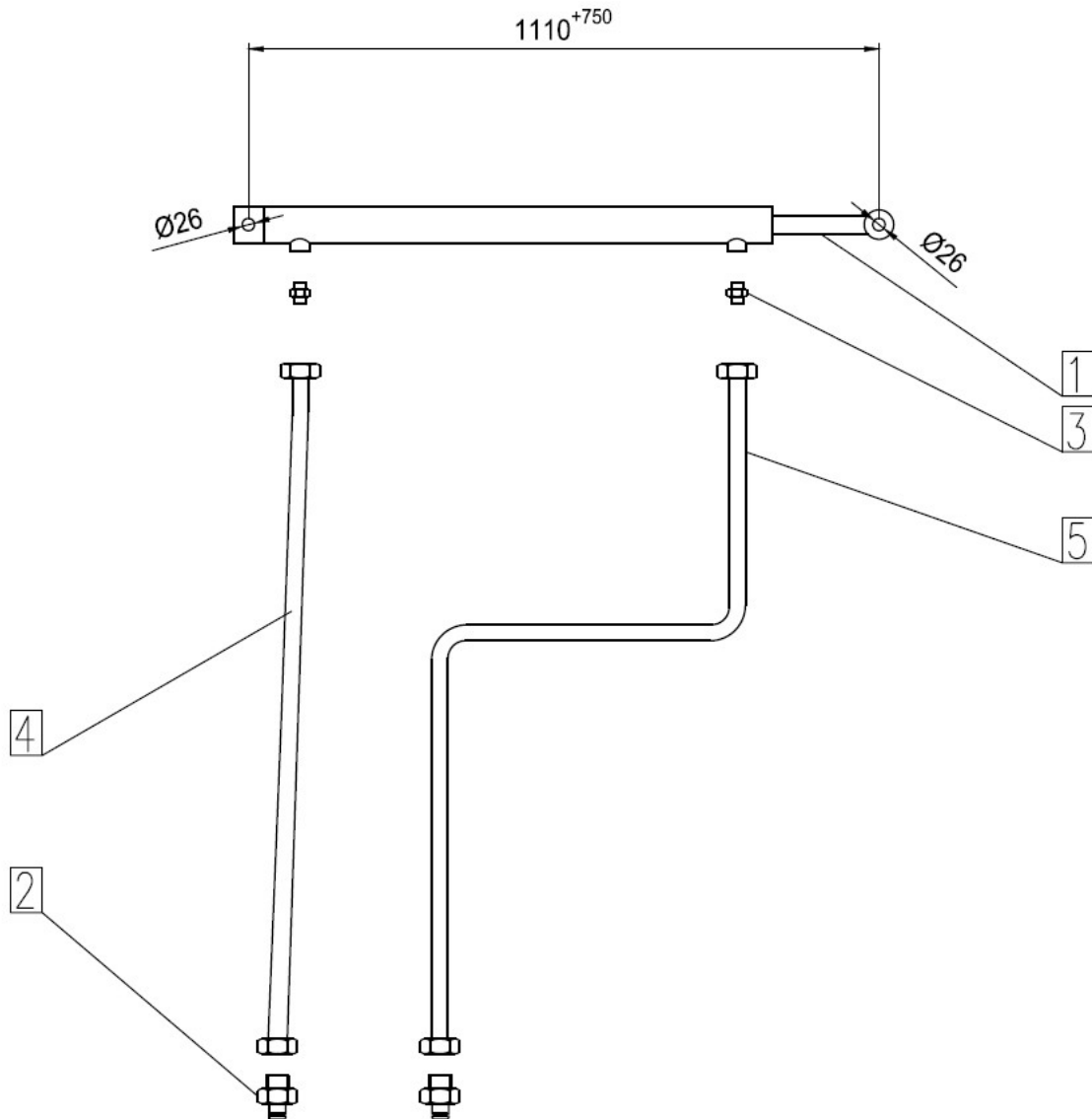


Fig. 4 Hydraulics

1 – actuator, 2 – valve plug, 3 – connector, 4 – flexible hose 1500 mm, 5 – hose 2200 mm

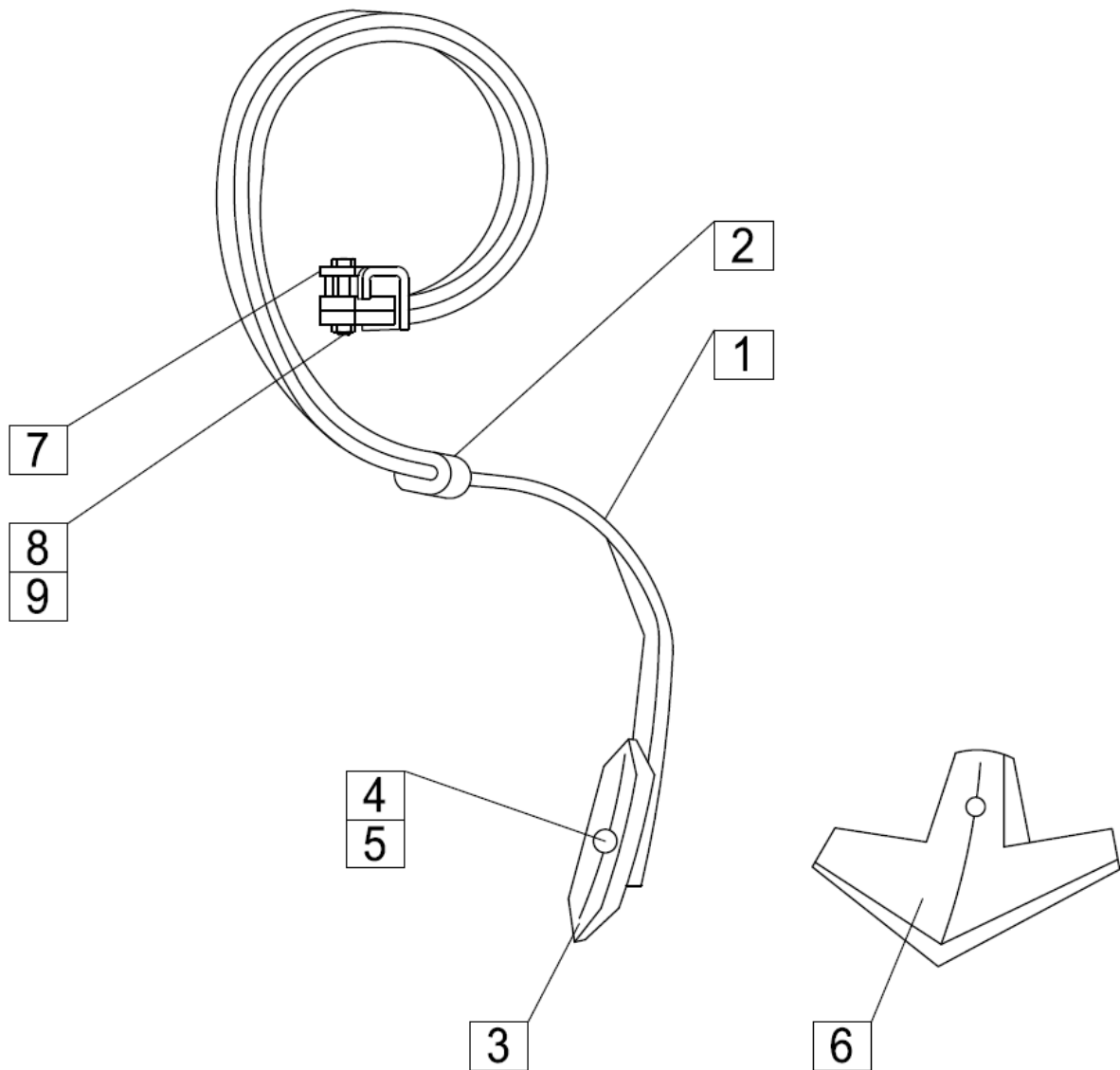


Fig. 5 Cultivator tine

1 – cultivator tine, 2 - spring of the cultivator tine, 3 – narrow drill opener,
 4 - M10x30 screw, 5 - M10 nut, spring washer 10.5,
 6 – hoe coulter “duckfoot”, 7 – tine fixing holder, 8.9 – screw and nut of the fixing holder

11. 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
FLEX PRE-SEEDING 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.