

**PNEUSEJ**



**OPERATION MANUAL**  
**VENGA**

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## Introduction

This manual is assigned to trained farmers and persons with appropriate qualification for agricultural work and who have been instructed about manipulating the machine.

### Safety

Before operating the machine or before installing it, please familiarize yourself with the contents of this manual. In any case, read the safety instructions in the “Safety” chapter and follow the warnings in each chapter. You will achieve optimal work results and work safety.

### Employer

Before starting the machine for the first-time workers have to be instructed on how to handle it.

Training includes:

- checking the conditions for safe machine handling
- handing manual and relevant documents or intensive training which mainly involves the safe handling of the machine

### Regular instruction

Regularly, or at least once a year, learn workers about basic behavior rules to make the machine as safe as possible.

### Training

Seller will teach you about operating the machine and about basic service of the machine. It is prohibited to putting the machine into operation without training!

### Symbols

To make the text clearer, various symbols are used, such as:

- Triangle is in front of actions, which are necessary to do.
- The arrow is a reference to another location in the text.
- ✚ The plus sign indicates that this is a special accessory that is not part of standard version.

### Pictograms

Beside standard symbols, there are also pictograms in the text, that can help you search for places in text or otherwise specify text.

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The warning triangle draws attention to safety instructions, the non-compliance of which may have serious consequences, as there is a real risk of moderate or fatal injury. In the security chapter, there are also safety instructions that cannot be assigned to any other activity but which in, in various situations, promote safety and conscience.



This symbol contains machine instructions the failure of which may cause serious difficulties or damage to the machine.



This symbol indicates tips and warnings for the operator.



This symbol indicates tips for assembly or service work.

## Basic equipment for operating and setting up the machine

The basic equipment of the seed drill includes:

- weighing scale
- seed bag,
- electronic device,
- spare parts catalog,
- manual for electrical equipment.

## SAFETY

### For your safety

In this chapter, you will find general instructions for your safety. Other chapters include special safety instructions that are not described in this chapter. Follow the safety instructions in order to:

- your safety,
- safety of the other people,
- machine safety.

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In case of wrong machinery usage, many dangerous situations can be encountered.

Therefore, when operating the machine, work maximally consciously and never work under time pressure.

As an employer, regularly inform workers who work with machine about safety instructions in accordance with legal regulations.

### Warning stickers

Stickers for your safety are located on the machine. Stickers have to not be removed. If stickers become unreadable or they will be damaged, you can order new stickers and place them on required locations.



#### ***Read the manual and follow it***

Putting into operation is only permitted when manual have been read. This applies mostly to safety instructions.



#### ***Do not stay between tractor and machine***

It is forbidden to stay between tractor and machine especially while connecting and disconnecting.



#### ***It is prohibited to carry persons in the machine***

It is forbidden to transport persons and objects in the machine. Carriage on the machine is life-threatening and strictly forbidden.



#### ***Do not remove protecting device***

Never use the machine without the protecting devices. Do not open protecting devices.



#### ***Do not drive the road with full hopper***

It is not permitted to drive the road with full hopper. This ride can cause accidents.



#### ***Beware of leaking hydraulic fluid***

Follow safety instructions in the manual.

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### *Danger of grip*



Gaps between machine components can reduce. Avoid moving near the folding parts of the machine.

### *Tighten the screws*



All screw connections have to be checked and tightened after first operating hours. Vibrations may release the links.

### *Danger of overturning*



The machine and its components may overturn. Always use protective equipment. The machine can only be parked on a solid ground and secured by safety struts.

### *Do not stay within range of machine parts*



Pay special attention when folding and unfolding the machine. There is a risk of injury by machine.



## **Who can operate the machine?**

### ***Only qualified persons.***

Service and repair the machine can only be done by qualified persons, who were taught about the danger of handling the machine. As a rule, these persons have an agricultural education or have been instructed at the same intensity.

## **Connection**

### ***Increased risk of injury***

When connecting the machine, there is an increased risk of injury. For this reason, it is necessary to:

- secure the tractor against unexpected movement,
- checked category of the machine and the tractor,
- be sure, there are not any persons between tractor and the machine,
- control the three-point hitch carefully and slowly.

Failure to do so may result in severe to fatal injuries.

### **Electrical connections connect after assembly**

When installing the lights, a power to the tractor have to be unconnected. There could be short circuit and damage the electronics.

### **Connect hydraulic system only if it is not under pressure**

Do not connect the hydraulic hoses to the tractor hydraulic system of the tractor if the system is under pressure. Failure to observe this warning may cause unpredictable machine movements.

### **High pressure in the hydraulic system**

The hydraulic system is under high pressure. Always check all pipes, hoses and connections for leaks and damages. Only use suitable aids when searching for leakage. Remove the damage immediately. Splashing oil can cause fire and has adverse environmental effects. In case of injury, seek medical attention immediately.

### **Color marking of hydraulic hoses**

Hydraulic hoses are color marked, to avoid the change of them. Wrongly connected hoses can cause unpredictable machine movements.

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### **Distance of center of gravity**

#### ***Observe admissible weight, axle load, tire load and minimum balance***

The front or rear extensions of the machine have to not exceed the maximum permissible weight, the permissible axle load and the load on the tractor tires. The front axle shall be loaded to at least 20% of the unladen weight of the tractor to maintain its operability.

### **Ride on the road**

#### ***Ensure adherence to the prescribed technical condition***

If the machine is used on public roads, it have to comply with applicable regulations such as:

- installing the lights, warning and protection devices,
- maximum permissible dimension and weights.

Failure to comply with road traffic rules - it is the responsibility of the driver and the vehicle owner.

#### ***Closure of ball valves***

If the hydraulic system is equipped with safety ball valves, they have to be closed while driving. Failure to observe this warning could result in the risk of injury and spontaneous movement of the machine or its parts.

#### ***Carriage of persons on the machine is prohibited***

No persons or objects may be transported on the machine. Carriage on the machine is life-threatening and strictly forbidden.

#### ***Changing properties while driving and breaking***

Due to the connection of the machine, the properties for driving and braking are changed. The high center of gravity and the inertia force of the machine have to be considered especially in turns. Inappropriate driving can lead to accidents.

#### ***Drive at reasonable speed***

Always regulate speed to the road conditions. While driving too fast on an unsuitable road high forces can arise and thus overload the machine. Not regulating speed can cause machine damage and accidents.

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## **Putting into operation**

### ***First putting into operation after training***

Machine can be putted into operation only after proper training by sellers, service support or persons from the manufacturer. Putting into operation without training can cause damage to the machine or accidents.

### ***Take care of perfect technical condition***

Only operate the machine if it is in a faultless technical condition. Before use, check all important parts and replace the wrong parts that can cause injury and damage.

### ***Do not remove protective devices***

Protective devices cannot be removed. Before using, check all protective devices. Unprotected parts can cause serious or fatal injuries.

### ***Checking tire pressure***

Regularly check tire pressure. Too high or low pressure reduces tire life. It can also lead to unwanted work results and can cause accidents while driving.

### ***Transportation of persons is prohibited***

No persons or object can be carried on the machine. Carriage on the machine is life-threatening and strictly forbidden.

### ***Machine height and street electric line***

If height 4,00m while folding and unfolding is exceeded, do not fold the machine under electric line. It can cause contact between line and machine, in that case:

- do not leave the tractor cab,
- do not touch metal parts of the tractor,
- do not create conductive connections with ground,
- warn people not to go near tractor and machine,
- wait for professional rescue team.

Also, never run onto the machine under the electric line. Voltage can also skip without direct contact.

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### ***Checking the ambient***

Check the nearest machine surroundings before starting, pivoting and operating. Always care about good view. Drive with machine only when there are no objects and persons in the area. Using the machine without checking nearest area can lead to accidents.

### ***Tightening screws and nuts***

Regularly check tightening of screws and nuts. By using the machine, individual screws can deallocate. Tighten screws and nuts as required.

### ***Procedure for breakdowns***

When parts of machine are damaged, immediately stop the machine and secure it. Remove the fault immediately or call the service. Continued use of the machine can cause its damage or accidents.

### **Disconnect the machine**

#### ***Increased risk of injury***

When disconnecting the machine there is an increased risk of injury.

To prevent risk situations:

- secure tractor against unexpected movement,
- never stay between tractor and machine while disconnecting,
- operate the three-point hitch slowly and carefully,
- care about straight and safe machine location,
- disconnect hydraulic hoses only when hydraulic system is without pressure.

Failure to follow these rules can result in serious or fatal injuries.

### **Caring and maintenance**

#### ***Observe the care and maintenance periods***

Observe the prescribed inspection times in the manual. Failure to do so may result in damage to the machine, poor quality of work or accident.

#### ***Use only original spare parts***

Many components have special features that are critical to the machine's stability and function. Only spare parts and accessories supplied by manufacturer are tested and approved. Other products can have effect on function of the machine or affect its safety.

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When using other than original spare parts, the warranty and liability of the manufacturer for the product is void.

***For all maintenance work:***

- switch off the tractor PTO,
- depressurize the hydraulic system,
- if it is possible, disconnect tractor,
- keep the machine in safe location,
- do not step on the machine, use safe steps,
- secure the machine against movement,
- do not touch the running V-belt in any way.

***Interruption of electric current***

Before working on an electronic device, it is necessary to disconnect from the power supply. Work on a device under the current can cause injury and damage to the machine.

***Changing hydraulic hoses***

It is necessary to change hydraulic hoses every three years because they are aging without visible external damage. Damaged hoses can lead to severe or fatal injuries.

***Cleaning with high-pressure cleaner***

The machine can be cleaned with water or steam. Clean bearings, fans, signal distributors, plastic parts and hydraulic hoses only with little pressure to avoid damage.

***Remove the accumulator and alternator before welding***

Before electric welding, remove accumulator and alternator. This prevents the possibility of damage to the electronic device.

***Tighten screw connection***

After the care and maintenance work tight the loosened screws again. Unattached screw connections can cause injuries and material damage.

**Other regulations**

***Compliance***

Beside these safety instructions, also follow:

- safety regulations,
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- general rules of safety health at work and road traffic,
  - instructions in this manual,
  - instructions for operating, maintenance and repair.

## **MACHINE DESCRIPTION AND TECHNICAL DATA – VENGA**

In this chapter, there are information about operating mode, use and technical data.

### **Machine description**

Seeding machine Venga is primarily intended for sowing cereal seeds. The sowing device allows sowing of all seeds with a seed size of up to 10 mm, such as:

- wheat, barley, rye, oats, corn, beans, peas, rape, grass.

Venga is equipped with DXD RC II sowings counters, which allows sowing in conditions with more crop residues.

### **Venga 600 Trailed**

The entire 1800 liter hopper is destined for seed. Accurate dosing is provided by one dosing unit, the seed is further being transported to the distributor. The folding frame with sowing coulters has a width of 6,00 m.

The machine can only be used for works described in this manual. Other use is considered as inappropriate, such as:

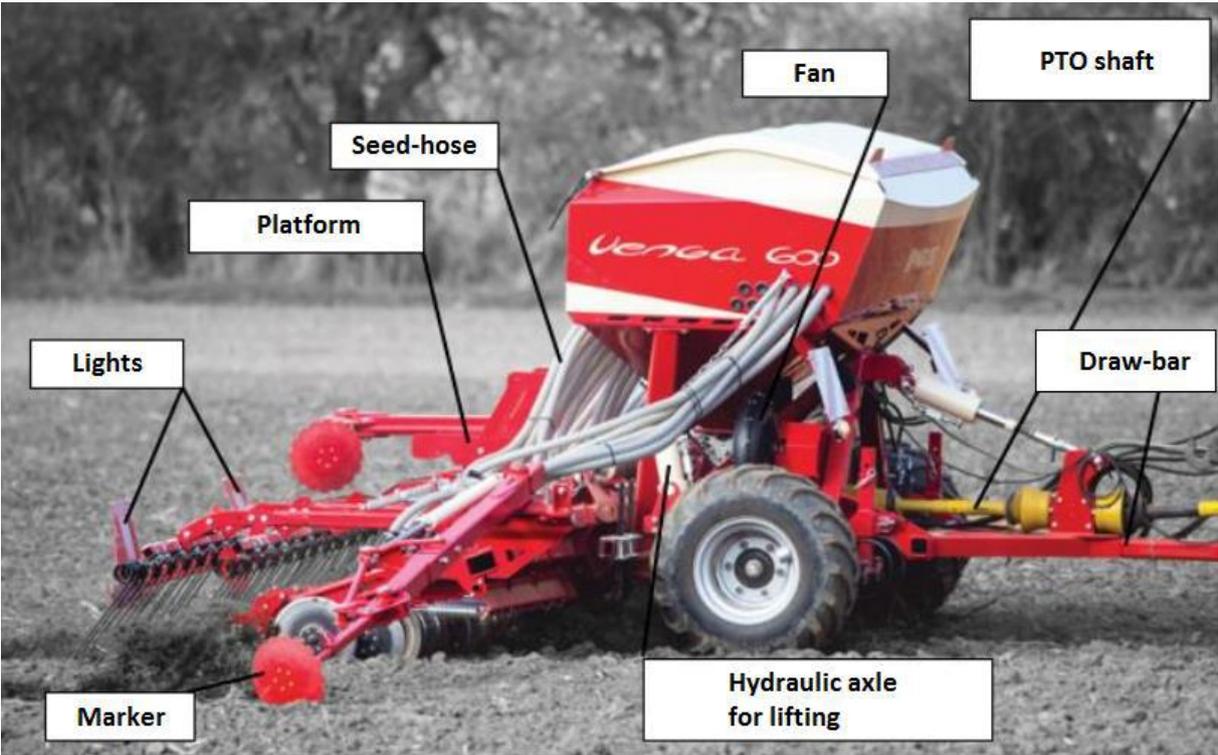
- transport of persons and objects,
- transferring power to other objects,
- installing other technology than is described in this manual.

Manufacturer or seller are not responsible for damages caused by wrong use of the machine. The risk is bear only by the user.

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Machine description – Venga



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### Function of seeding machine

The drive of the dosing unit can be designed either by a drive wheel or by electric motors. Depending on the dose setting on the dosing unit, a certain amount of seed is dispensed from the hopper into the diffuser. The air-flowing fan transmits the seed further into the distributor down to the coulters.

Venga seeding machine can be used in connection with all standard tractors of power class from 54 kW. Tractor have to be equipped with a lower linkage and at least 3 hydraulic circuits, and with a 540 RPM rear power take-off shaft. The working speed should be in the range of 5-12 km/h depending on the surface, type of soil and required sowing accuracy.

### Technical parameters

#### Technical parameters of the machine

	400	450	500	600
Height (m) *T/M	<b>2,75/2,08</b>	<b>2,50/2,08</b>	<b>2,75/2,14</b>	<b>3,25/2,61</b>
Width (m)	<b>3,00</b>			
Length (m) *T/M	<b>5,38/3,47</b>		<b>5,25/3,33</b>	<b>5,25/3,41</b>
Working width (m)	<b>4,00</b>	<b>4,50</b>	<b>5,00</b>	<b>6,00</b>
Total weight without seed (kg) *T/M	<b>2565/2040</b>	<b>2640/2110</b>	<b>2800/2280</b>	<b>2980/2460</b>
Filling height of hopper (m)	<b>2,07</b>			
Dimension of the hopper filling hole (cm)	<b>1,87 x 0,90</b>			

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Volume of hopper (l), seed	1800			
Number of rows (pc)	32	36	40	48
Row spacing (cm)	12,5			
Tires	31x15,5- 15 10PR T6			
Tire pressure (bar)	4,2			

**\*T/M – Trailed / Mounted**

#### Hydraulic and electric system

Fan oil flow (l/min)	43
Fan operating pressure(bar)	150
Supply voltage (V)	12

This chapter lists the operating mode, use and technical data.

#### Use in accordance with specifications

Other use, or use beyond a defined frame, such as transport, handling or power transfer to other machines, is not in accordance with intension of the machine. The risk is bear only by the user.

#### Characteristic signs

Thanks to robust material with optimized, flexible modular construction and favorable center of gravity, the efficient and accurate machine is a reliable working tool.

#### Sowing coulters

The machine is equipped with efficient DXD RC II sowing coulters.

#### Precise depth control

Depth control on Venga is set on the axles of the machine.

## MOUNTING

### Tractor connection (mounted version)



#### *Increased risk of injury*

When connecting, there is high risk of injury, so never stay between tractor and machine. Check categories of connected devices of machine and tractor, categories have to be the same.

- On the lower arms of the linkage, fit the appropriate balls of the lower arm and secure them with fuses.
- Set the lower arms to the same height.



Ensure, that fuses of lower arm click. If they don't click, the machine could be released from the lower arms.

- Connect machine to the tractor, ensure, that fuses of lower arms are clicked.
- Adjust the lower arms to keep the machine slightly free to left and right.



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**Tractor connection (trailed version)**

While connecting, there is high risk of injury, so never stay between tractor and machine. Check categories of connected devices of machine and tractor, categories have to be the same.

- Lock-off the pin on tractor`s lower linkage.
- Connect the seeder to the tractor.
- Lock the pin on tractor`s lower linkage.

**Fan drive**

Fan on the Venga seeding machine is driven by a pulley, which is through V-belt driven by tractors power shaft or by hydraulics directly from the tractor.

- Connect PTO shaft – if the machine is equipped with mechanic drive – on power take-off of the tractor.



PTO shaft - connect only when tractor engine is off.

- Power take-off speed set to 540 RPM. At this speed, fan should reach optimal speed. By increasing or decreasing power take-off speed, you will change fan speed.
  - If the machine is equipped with hydraulic fan drive, connect it to hydraulic circuit; oil overflow has to be connected directly to the tank- free fall. If tractor isn't equipped
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with Load sensing system, it is recommended to connect fan drive to preferred circuit. Then, set fan speed by control valve from 3500 to 4500 RPM.

## Connections

### *Electrical system*

- Connect the machine light connector.
- Connect the connector for additional electrical equipments.

### *Hydraulic system*

- Connect hydraulic hoses to the tractor.

→ chapter **Hydraulic system**

## Hydraulic system



Before connection check all hydraulic hoses and their fixed connection in couplers. Connect hydraulic only when it is not under pressure. Hydraulic system under pressure can cause machine movements.



Don't mix oil types. Machine use with different tractors can cause mixing two types of oils. This mix can damage tractors devices. Use only permitted type of oil.

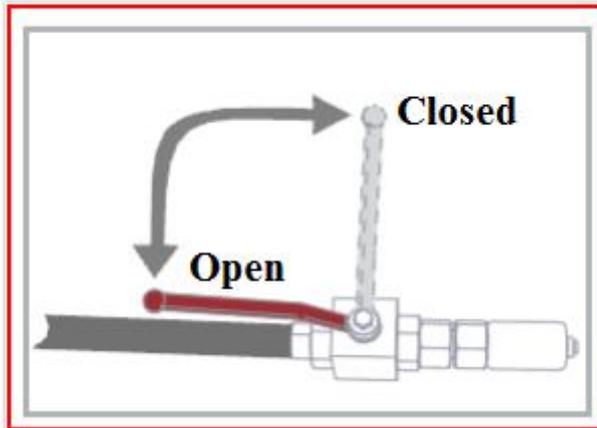


Fan speed can't be over 5000 RPM. Fan can be damaged by higher speed.

Connectors of hydraulic hoses or color coded. To one hydraulic circuit always connect only hoses with the same color code. Hydraulic circuits are equipped with ball valve, which are necessary to open.

Hoses color coding:

- **White** – control of lifting an axle
  - **Blue** – disc markers
  - **Yellow** – folding / unfolding
  - **Red** – hydraulic fan drive
- 
-



### Hydraulic fan drive



Hydraulic fan drive should connect to tractors pre-fitted control valve. This minimize fan speed fluctuation when lifting and putting down the machine or other hydraulic loan.

The oil flow leads to a three-way valve for flow regulation and is regulates the hydraulic motor speed. Fan speed have to be controlled by tractor’s terminal.

### Fan’s technical parameters

	Parameters
Capacity of hydromotor (ccm)	<b>8</b>
Working pressure (bar)	<b>150</b>
Maximum pressure on return flow (bar)	<b>5</b>
Oil flow (l/min)	<b>43</b>
Maximum fan speed (RPM)	<b>5000</b>

### *No-pressure return*

No-pressure return reduces the risk of hydromotor’s damage. It is important to choose the right position of connecting the hydromotor to hydraulic system, because:

- returning oil have to flow through the hydraulic filter,
- **returning oil can’t flow through control valves, because pressure in return will be too high.**

## *Operation*



Speed set only when fan is stopped. Changing it while fan in on can damage the machine.



Fan speed can't be over 5000RPM, it can destroy the fan.

## **Regulation valve of hydraulic drive**

There is three-way control valve on the machine. By using it, you can set oil flow and fan speed. Check right speed using electronics.



### *Check hydraulic connections*

Before operating the machine, check hydraulic hoses and their connection. In consequence of poorly connected and damaged hoses, leak hot oil under pressure can happen. It can cause fatal accidents.

## *Setting of control valve for tractors with flow control*

- Completely open the three-way valve for flow control on the seeding machine, control screw have to be tightened.
- Activate control device of the tractor.
- Set required speed by flow regulation on the tractor.

## *Setting of control valve for tractors without flow control*

- Required speed set by three-way valve.

## *Tractors without valve for flow control, but with adjustable pump*

Three-way valve for flow control have to be set to two-way valve:

- Loosen the safety nut.
- Tighten the screw. By tightening it, the valve will change to two-way valve for flow control set up.
- Tight the safety nut again.
- Required speed set by regulated screw on two-way valve for flow control.



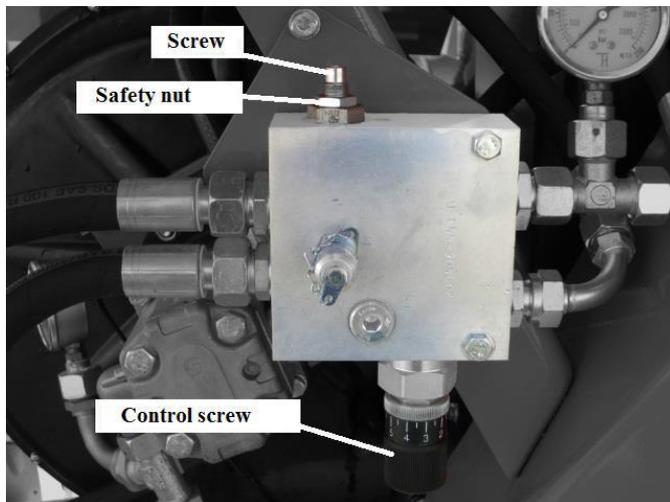
Setting from three-way to two-way valve for flow control or back have to be done when fan is stopped. Otherwise, it can damage the machine.

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Hydraulic fan drive is tested by manufacturer on hydraulic aggregate.



### Operating the markers



Take special attention on persons near marker. When folding or unfolding the marker, there can't be any persons near or under marker.



The marker exceeds working width of the machine by half. Take special attention to people or objects.

Marker is used to indicate the path of next ride. Markers are controlled by hydraulic section and are alternately switched by pressure changeover valve.

### Operating the markers

Markers are started alternately by tractor's hydraulic and are automatically alternately switched.

#### *Folding the marker:*

- make sure, that hydraulic hoses are safely connected and machine is in working position,
- by pulling the lever in tractor, you activate marker.

Marker should fold.

#### *Unfolding the marker:*

- by pulling the lever in opposite direction like in folding, you activate marker.

Marker should unfold.

Repeating this procedure, other marker should be activated. Both markers are controlled by one hydraulic circuit by this.



Switching valve works by switching two outputs by back pressure. For switching, it is not necessary to make the entire stroke of the piston, which is suitable for obviating obstacles.

### ***Activate of both markers:***

If it is necessary, it is possible to use both markers together. Near switching valve, there is ball valve that connects both markers.

To activate both markers, you need to open it. For alternate use of markers, turn off.

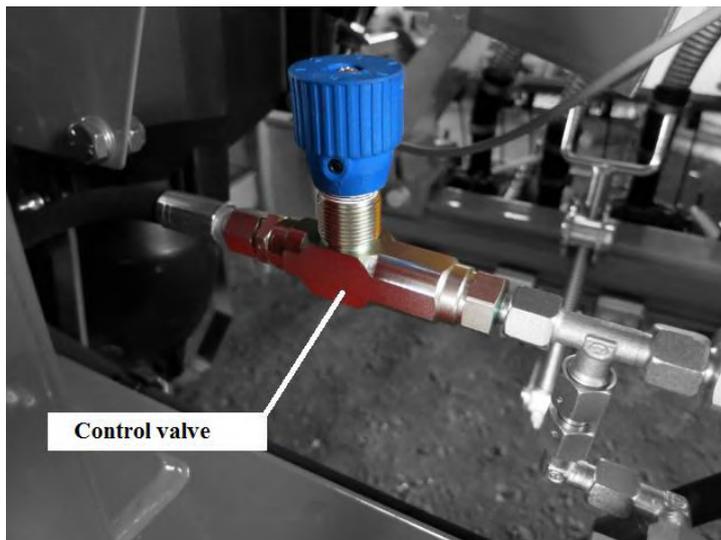
- Turn ball valve to the “open” position.
- You control both markers together.

### ***Speed regulation of folding markers***

There is control valve on hydraulic system for markers. By this valve you can set speed of folding / unfolding of markers.

For speed reduction of folding:

- partially tight the control valve,
- check speed of the marker.



## Electronic control

You can find all information about electronic control in special operating manuals.

## Preparation for seeding

In this chapter, you will find general information about using seeding machine, about seeding preparation and setting the seeding machine.

### Dosing unit

It is possible to set:

- Setting value.
- Microdosing (ON or OFF).
- Switch (for normal or fine seed).

For setting the right value, make sure, if it is normal or fine seed.

- Normal seed
  - seed size: 4-10 mm
  - for example: wheat, barley maize, peas, oats, beans, triticale, rye, soybean.
- Fine seed
  - seed size: 1,5-4 mm
  - for example: grass, rape, clover, phacelia

### Seeding chart

In next chart, you will find values for normal and fine seed. Values in the table are indicative because specific weight and size of seeds may be different. Set the correct value by calibrating. When sowing a small amount of seed, use microdosing system.

→Preparation for seeding – Dosing unit – Microdosing

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NASTAVOVACIA TABUĽKA PNEUSEJ - ACCORD																			
DRUH OSIVA	PŠENICA	RAŽ	JÄČMEŇ	OVOS	FAZULEA	HRACH	BÖB	VIKA	KUKURICA	TRÄVA	DRUH OSIVA	REPKA	ĎATELINA	TRÄVA					
kg/dm <sup>3</sup>	0,77	0,74	0,68	0,5	0,85	0,81	0,76	0,83	0,79	0,36	kg/dm <sup>3</sup>	0,65	0,77	0,39					
Ventilätör „A“ NORMÄLNY VÝSEV kg/ha											Ventilätör „Z“ JEMNÝ VÝSEV kg/ha								
NORMÄLNY VÝSEV STUPNICA	10	34	33	32	24	23	21	28	32	8	STUPNICA JEMNÝ VÝSEV	2,50	1,80	0,90	2,30	1,15			
	15	51	49	48	35	42	40	45	51	24		18	5,00	4,60	2,30	5,30	2,65		
	20	69	66	64	47	61	59	62	70	47		26	7,50	6,80	3,40	8,60	4,30	2,80	1,40
	25	86	83	79	59	79	78	79	89	70		34	10,00	9,10	4,55	12,00	6,00	5,20	2,60
	30	104	100	95	71	98	97	96	108	92		42	12,50	11,40	5,70	15,30	7,65	7,20	3,60
	35	122	117	111	82	116	117	113	127	115		50	15,00	13,70	6,85	18,00	9,00	9,20	4,60
	40	140	134	127	94	135	136	130	146	137			17,50	15,90	7,95	21,30	10,65	11,20	5,60
	45	157	151	143	106	154	155	147	165	156			20,00	18,20	9,10	24,00	12,00	13,20	6,60
	50	174	168	159	118	172	174	164	184	175			22,50	20,50	10,25	26,60	13,30	15,00	7,50
	55	192	184	174	130	191	194	181	203	194			25,00	22,80	11,40	27,50	13,75	16,20	8,10
	60	210	200	190	141	209	213	198	222	212				N	M	N	M	N	M
	65	228	217	206	153	228	232	216	241	231			<p>M – KLAPKA DÄVKOVAĈA V POLOHE „F“</p>						
	70	246	235	222	165	246	251	234	260	249									
	75	264	252	238	177	265	270	251	279	267									
	80	281	269	253	189	283	289	268	298	285									
	85	298	286	268	200	302	309	285	317	304									
	90	316	302	284	212	320	328	302	336	323									
	95	335	319	300	224	338	347	320	355	342									
100	352	337	316	236	356	366	337	374	361										
105	370	354	332	248	374	385	354	393	380										
110	387	371	348	260	393	404	371	412	398										
											85 ot = 1/10 ha				N - NORMAL				
															M - MIKRO				

### Fertilizer chart

The chart shows setting values of dosing unit for ammonium phosphate. Values in the table are indicative. You can add your data to other types of fertilizer in free columns of the table.

Calibrating test is done in the same way as for normal seed.

Setting value	Ammonium phosphate 1,03kg/dm <sup>3</sup> Throttle flap „N“ (kg/ha)	My values	My values
10	39		
15	58		
20	77		
25	97		

30	116		
35	135		
Setting value	Ammonium phosphate 1,03kg/dm <sup>3</sup> Throttle flap „N“ (kg/ha)	My values	My values
40	155		
45	174		
50	193		
55	213		
60	232		
65	251		
70	270		
75	290		
80	309		
85	328		
90	348		
95	367		
100	386		
105	406		
110	425		

In case of two dosing units, it is necessary to set each dosing unit separately. Also, it is necessary to make the calibration test for each dosing unit.

For example:

Required sowing rate is 210 kg of wheat per hectare.

➤ you will find setting value in the table – normal seed – wheat. In this case, setting value is 60.

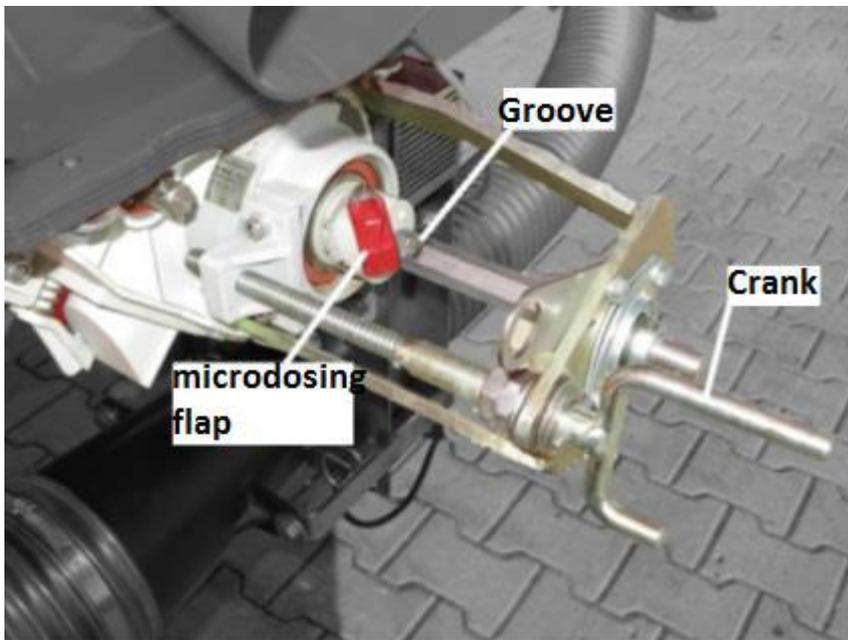
→ Preparation for seeding – Dosing unit – Seed table

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## Setting required quantity

- read necessary information's in setting chart
- in normal seeding set:
  - red switch on dosing unit to "N" position
  - throttle flap on fan to "N" position
- in fine seeding set:
  - dosing unit to position "0"
  - red switch to the right until it fits into groove on 6-shaft, letter "F" on the switch is visible
  - throttle flap on fan to "F" position



## Microdosing

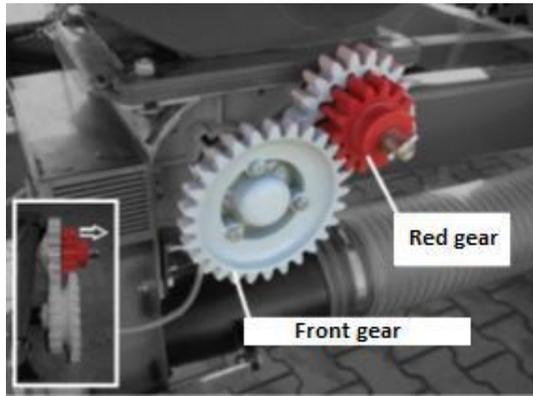
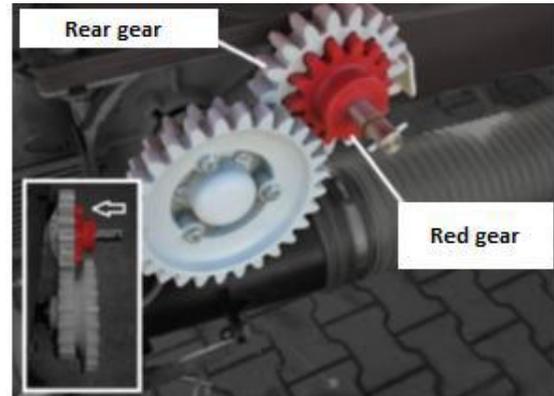
Microdosing allows seeding fine seeds or very small sowing rate per hectare. By pulling the red gear wheel to front bigger gear, dosing unit rotations will be lowered to half of normal speed. The advantage of this system is double increasing of cell width while maintaining the same seed quantity.



Warning! When microdosing is turn on, dosing unit can be set to max value of 25, otherwise it can be damaged.

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**Microdosing is on****Microdosing is off****Hopper filling**

Don't drive on the road with filled seed hopper.

It is not allowed to ride the road with filled seed and fertilizer hopper. Fill the hopper on field. A ride with filled hopper can cause an accident.

→ Ride on the road – Safety

- Secure the machine against movement.
- Open the hopper cover.
- Fill the seed hopper at least 3 cm above seed level sensor in the hopper.



Before filling the seed, close the emptying hole on hopper and also drain hole on dosing unit.

**Calibration of seeding rate**

Reducing seeding rate is allowed only when dosing unit is turning or when hopper is empty. Failure to observe this warning can damage dosing unit.



Calibration test have to be done on both dosing units.

- Find setting value for specific crop and desired sowing rate in the seeding chart.

- Adjustment scale shows set values from 0 to 110 (for fine seed it is only 25 – in the case of larger opening, the red switch can be broken). Turn the crank until on the edge of the cover you will see desired value.



Warning! When fine seeding is turn on, dosing unit can be set to max value of 25, otherwise it can be damaged.

- Fill hopper with seed.
- Lock off and remove the knee from diffuser.
- Hang weighing scale to a firm place, hang the empty calibration bag on weighing scale and reset it.
- Hang calibration bag under the hole in diffuser.



Dosing unit has to rotate 85 times, which corresponds to an area of 1/10 ha.

- Using the calibration crank, turn in the direction of an arrow, until axle of dosing unit turns 85 times.
- Weight the captured seed on weighing scale.
- Compare seed quantity to desired quantity. Adjust the dosing unit according to the example below.
- Pull the knee and lock it on the diffuser.

#### *Calibration example:*

- Setting by seeding chart to 60 (210 kg/ ha of wheat),
  - Seeding test gives 19 kg (required 21 kg),
  - find the relative difference between given and required quantity – 10%
  - increase setting by 10% on value 66,
  - repeat seeding test until given and required quantity is the same,
  - dosing unit is calibrated.
- 
-



Don't forget to pull the knee to diffuser after calibration. If knee is not placed properly, seed fall right from diffuser to the ground and isn't transported to sowing coulters.



While weighting, deliberate precision of the weight. Don't overload the weight.

## Ride on road

### Safety

Before machine's transport, read following directions. Not following them can cause accidents and injuries.

#### *Take care about prescribed technical condition*

When you drive on public roads, machine have to comply with road conditions such as:

- Installing light warnings and protective equipment.
- When the machine is fold, break, end lights and registration marks have to be seen.
- Compliance with regulation in terms of permitted transport width, weights and payloads.
- Empty hopper have to be covered.

The driver of vehicle and its owner are responsible for not complying with the conditions of operation of the vehicle on road.



#### ***Before driving on a road***

Hopper have to be empty when driving on road. If hopper isn't empty, it can cause an accident.



#### ***Closing ball valves***

If there are ball valves on hydraulic hoses, they have to be closed. Otherwise, the machine can move and it can cause an accident.



#### ***Checking tire pressure***

Before the drive, check tire pressure.

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## *Fixation of lights*



Install lights or warning signs. All blinkers and sidelights have to be seen. Light's cables have to be set not to strain while driving in curves and not touch tractor's wheels. Wrong installed blinkers or sidelights may cause an accident.



## *Clean dirt*

Clean all stones, harvest residues and dirt. They can fall and cause an accident.



## *Checking the lock*

Check setting of all secure mechanisms. Loosed locks can move while driving and cause unwanted machine movement.

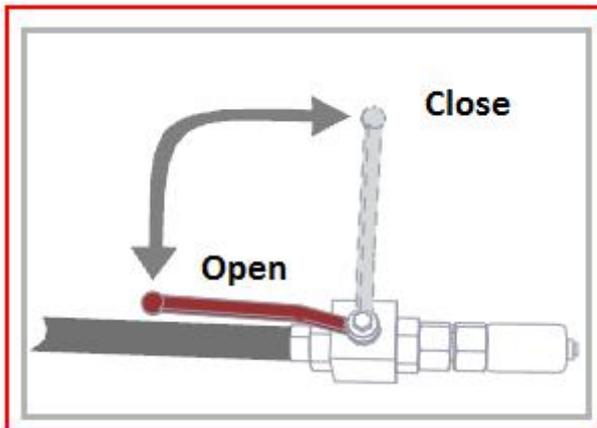
## **Sowing machine**

If the sowing machine is in working position, it has to be lifted to transport position.

## **Driving the road**

### *Locking control devices*

While driving, it is necessary to lock ball valves on hydraulic hoses.



### *Transporting people is forbidden*

Never transport persons or objects on the machine. It is life threatening and forbidden.

### *Drive at reasonable speed*

Always regulate speed to road condition. In case of bad road conditions and too high speed, the machine can be overloaded and damaged.

Before driving, check:

- clipping and securing all working tools

- securing support legs in transport position
- locking against opening the machine
- functionality of lighting
- closing the quick-releasing opening

## Field preparation

### Filling the seed hopper



Use ladders or stairs to enter the platform. Platform is designed only to watch filling.



Close the emptying hole on the hopper and emptying hole on the dosing unit.

- Fill the hopper as it is written in:
  - Preparation for seeding – Seed filling

### After filling the hopper

On the top of the hopper, there is a cover sheet against wind and rain. While seeding, hopper should be covered with this sheet.

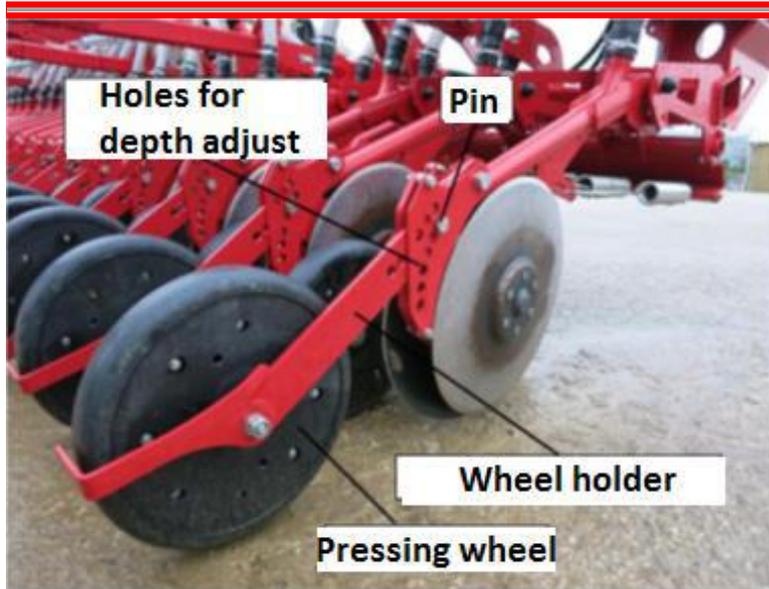
Straight the main frame parallel to the ground (horizontally on flat surface).

### Setting seeding depth

Seeding depth is set with pressing wheel on sowing pad.

Deep guidance ensures better plant emergence. Seed placing is the same at higher speeds.

- Prepare seeding machine to working position.
- Lock-off and pull the fuse from the pin on the wheel holder.
- Set desired depth by moving the pin to selected hole.
- Secure pin.



 All pins on all stub wheel holders have to be in the same hole.

## Setting pressure of seeding coulters

Pressure on seeding coulters can be set centrally.

### *Central setting*

All seeding coulters are pulled to the ground with springs that are held together on spring bar.

Central setting of pressure is set by screw. By loosening (turning left) the pressure is increased, tightening (turning right) the pressure is decreased.

 Key for setting the pressure:



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### **Setting the S-harrow springs**

S-harrow springs are designed to cover the seed with soil. It is necessary to set parameters on S-harrow springs:

- frame backstop,
- frame pressure,
- angle of S-harrow springs

#### ***Backstop of the S-harrow springs***

There is backstop holder on the top of S-harrow springs. By using it, you can set bottom position of S-harrow spring.

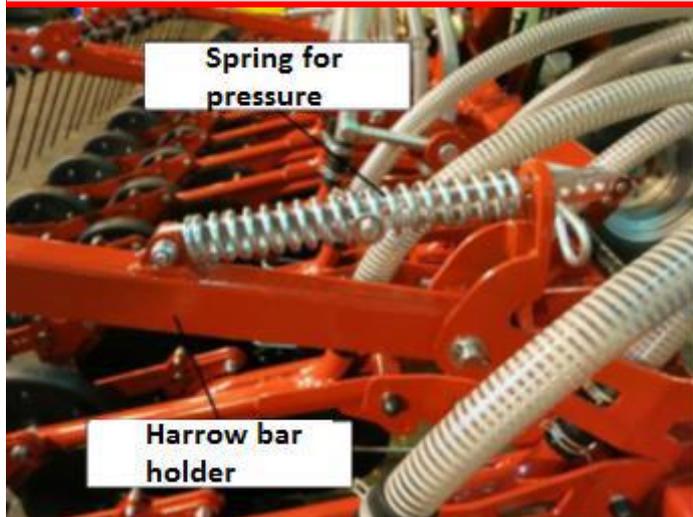


#### ***S-harrow pressure***

For the correct function of S-harrows, it is necessary to set pressure for different soil conditions. Pressure is set by spring. By loosening (turning left) the pressure is decreased, tightening (turning right) the pressure is increased.

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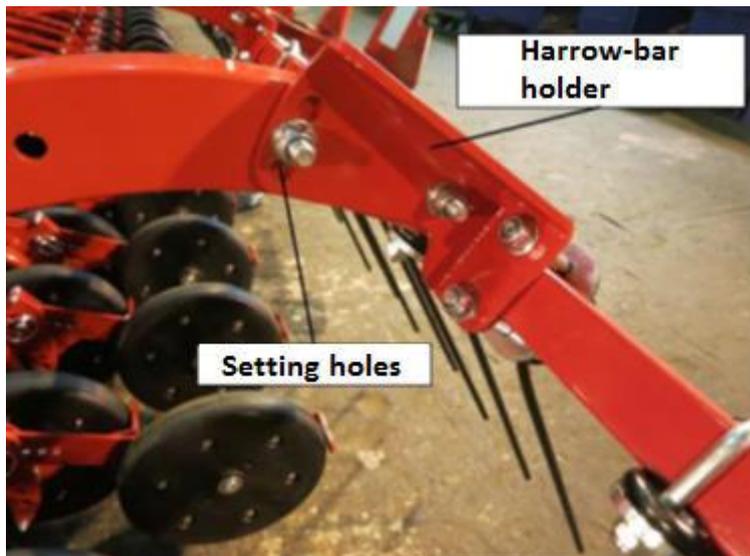
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### *S-harrow angle*

With S-harrow angle you can set intensity of its work. For increased work intensity, it is necessary to set bigger angle. You set angle by screwing the holder to other holes.

- Screw out S-harrow spring holder.
- Push the holder to other hole and screw it in.



### **Setting the marker**

Marker is used to sign track for next ride. You can set the marker to the center of the tractor or to tractor's wheel.

### *Setting the marker to the tractor's centre*

Necessary data:

- 
- width of seeder's row (=row width),
  - seeder's working width.

- Set the machine to the working position.
- Activate the marker.

Calculation:

Marker's length for the tractor's center = (row width + working width) / 2

Example:

Row width ..... 12,5 cm

Working scope ..... 800 cm

In this case, length of marker is 406,25 cm.

### *Setting the marker to the tractor's wheel*

Necessary data:

- width of seeder's row (=row width),
- seeder's working width,
- front wheel spacing

- Set the machine to the working position.
- Activate the marker.

Calculation:

Marker's length to tractor's wheel= (row width + working width – front wheel spacing) / 2

Example:

Row width ..... 12,5 cm

Working width ..... 800 cm

Front wheel spacing ..... 150 cm

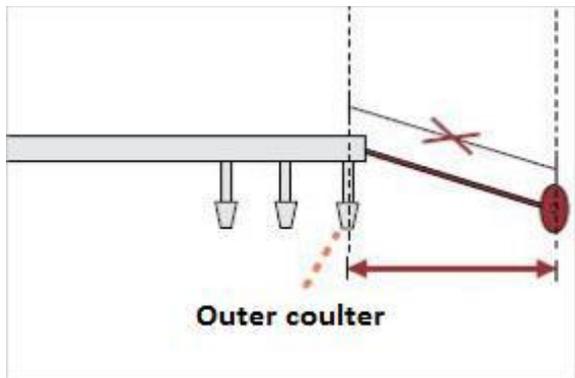
In this case, marker's length is 331,25 cm.

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Measure the calculated length of the marker on the ground, never on marker's arm. This leads to inaccuracies.



Arm of the **right** marker measure in the axis of right external sowing coulter.

Arm of the **left** marker measure in the axis of left external sowing coulter.

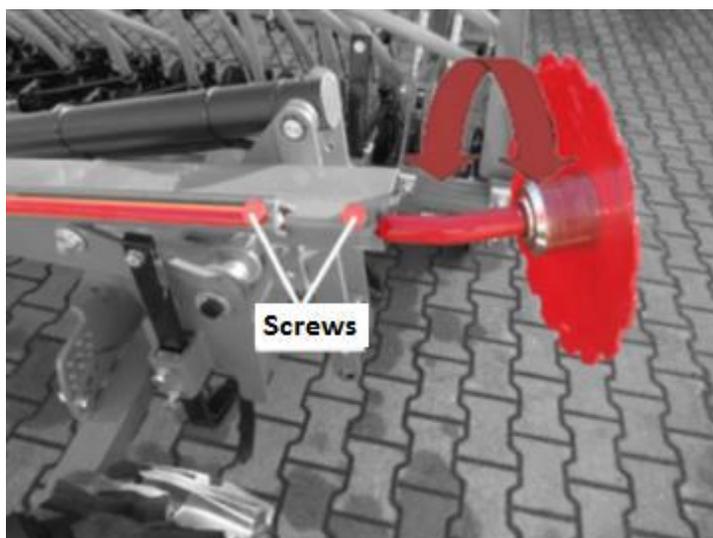
### *Setting an angle of marker's disc*

Setting an angle of marker's disc is determined by the soil conditions.

Heavy soil = disc in angle (angle of disc set as required).

Light soil = disc vertically (angle of disc is not set or only small).

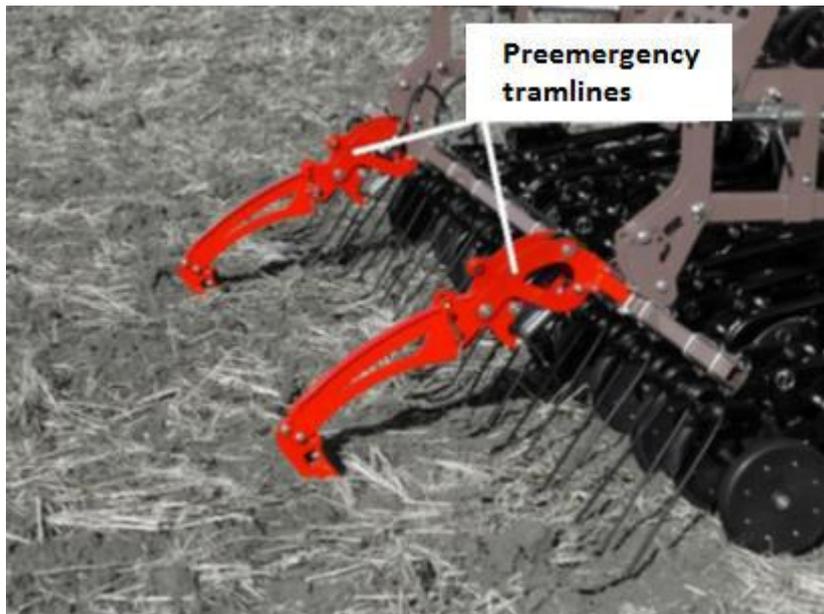
Set the angle of marker's disc so marker tracks are visible in the field. Markers should not dig soil.



- 
- Release screws.
  - Set angle as necessary.
  - Tight screws.

### **Setting pre-emergent markers for tramlines**

Marker for pre-emergent tramlines makes track lines for sprayer. Hydraulic cylinder is controlled by Drillmat III. The arm activates always when tramline valves for seed are closed.



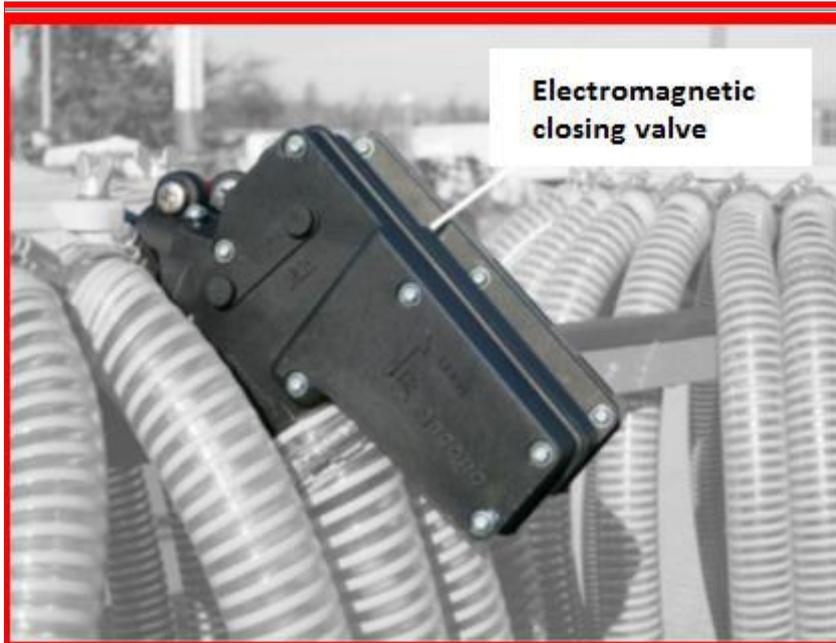
### **Electromagnetic tramline valves**

Electromagnetic tramline valves regulate track lines. They close seed flow to sowing coulters.

- Number of electromagnetic closing valves depends on tire width.
- Position of electromagnetic closing valves depends on tractor's wheel spacing.

When changing the wheel spacing or tire width, contact the seller. It can be necessary to install another electromagnetic closing valves or close other sowing coulters.

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### **Disconnection / deactivation of half working width [+]**

When setting up the stand with respect on tramlines, sometimes it is necessary to turn off half of the working width during first pass.

#### ***Turning off the half of machine's width mechanically***

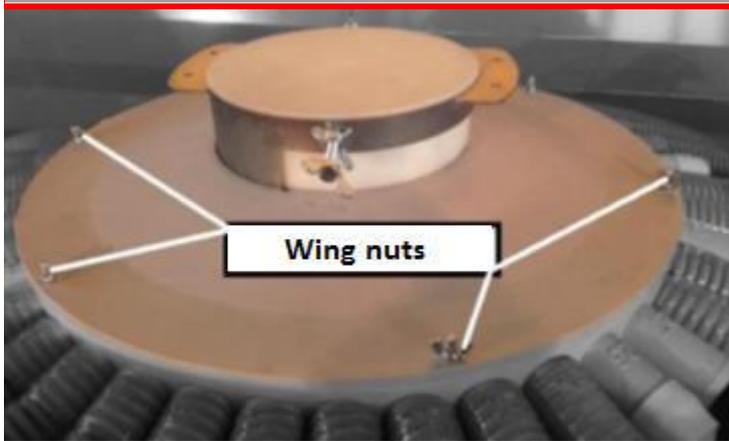
Turning off the half of machine's width on one dosing unit can be done with special cover of distributor. The cover installs in the place of the original cover.

- Screw out the wing nuts on distributor's cover.
- Take out the cover.
- Set the cover for turning off the half of width on distributor.
- Arrow on the distributor's cover have to face forward in direction of the ride.



Make sure, arrow face forward in direction of the ride. Outputs of active half of distributor have to be fully opened.

- Set and tight wing nuts on distributor.



### Disconnecting sowing coulters

Some crops need to have bigger row space than is set on the machine. On Venga seeding machine it is possible to set reduction cover of distributor that allows seed flow to every second or third sowing coulters. This increase row space to 250 – 300 mm or 250 – 375 mm.

→ Chapter – Service – Changing distributor's cover.

- Screw out wing nuts on distributor's cover.
- Take out distributor's cover.
- Set reduction cover on distributor.
- Arrow on distributor's cover have to face forward in direction of drive.
  - ⚠ Make sure arrow face forward in direction of drive. Outputs for active sowing coulters have to be fully passable.
- Set and tight wing nuts on distributor.
  - ⚠ When setting reduction cover, it is necessary to **preset disc markers**. It should be remembered that with "turn-by-turn" seeding, the required row spacing will change on the outer coulters.



### Check before work

Before seeding, check functionality and setting of the machine.

Make sure that:

- the function of electronic system is correct,
- the correct rhythm of tramlines is set
- tramline valves are set to the right width for sprayer
- microdosing and fine seeding are on or off,
- the throttle valve on the fan is correctly set,
- marker is correctly set,
- the emptying flap is closed,
- there are no broken or damaged seed hoses,



If height 4,00 m while folding is exceeded, don't fold the machine under electric lines. It can cause life-threatening situation and fire.

### Control ride

#### ***Transport of people is forbidden***



It is forbidden to transport people or objects on the machine. Transport on the machine is life-threatening and forbidden.

#### ***Controlling the environment***

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Before driving or folding, control the nearest area of the machine. Make sure you have good view. Move only when there are no persons or objects nearby.



First make control ride without seeding on part of field. Headlands are inappropriate.

- Do control ride with normal speed (10-12 kph)
- If it is necessary, set again seeding depth and tools for soil cultivation.

## Machine's operation

### Working lights

Working lights can be controlled electronically or mechanically.



Working lights are not part of standard equipment.



It is necessary to turn off the working lights while driving on the road. Traffic participants can be blinded with these lights, which can cause an accident.

### Controlling machine work

While seeding, control some parts of machine, especially:

- fan speed,
  - correct marker functionality,
  - seeding depth,
  - tramline valves, their passability and functionality,
  - covering seed with soil,
  - pressing of the soil using pressing wheels
  - fault-free switching of electromagnetic tramline valves,
  - cleaning brush functionality,
  - seed flow,
  - seed hoses, correct set of markers and track tillers.
- 
-

## ***Controlling the nearest area***



Before drive, folding, control the nearest area of the machine. Make sure you have good view. Move only when there are no persons or objects nearby.

## ***Don't remove protective devices***

Protective devices can't be removed. Before using, check all protective devices. Not protected machine's parts can cause injuries.

## ***Machine's height and external electric line***



If height exceeds 4,00 m while folding or unfolding, don't fold the machine under electric line!

If it comes to contact between machine and external electric line:

- do not leave the tractor cab,
- do not touch metal parts of the tractor,
- do not create conductive connections with ground,
- warn people not to go near tractor and machine,
- wait for professional rescue team.

Also, never run the machine under the electric line. Voltage can also skip without direct contact.

## **Working position and work**

First, you have to set the machine correctly.

- Turn on terminal.
- Turn on fan.
- Start seeding.

## ***Electronic control***

Once a dosing unit is powered, electronic control automatically displays required information. According to control system, on display you can see:

- actual seed quantity (kg/ha),
  - actual driving speed,
  - all data related to hectare output,
  - speed data.
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### ***Working speed***

While seeding, respect working speed in the range of 5-15 kph depending on sowing rate.

### ***Lifting markers***

When folding, marker's arm has to be folded to the stop and the control valve automatically switch to operate the second marker.

### ***Turning***

When turning, it is necessary to lift the machine. In trailed version, lift only axle of the seeding machine, in mounted version, lift tractor's arms.

- Lower the working speed before the edge of the field and lift the seeder while driving. Do not let the fan speed drop too much.



Dosing unit transport seed only when the machine is in working position. It takes some time to transport seed from dosing unit to sowing coulters.

- After turning, lower the seeding machine.

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## **Maintenance after seeding**

After seeding it is necessary to open dosing unit to maximum and empty seed hopper. You will open dosing unit using a slider above it. This slider isn't available in all versions on the machine.

### **Emptying**

If you do not plan to use the machine for a long time, it is necessary to empty seed hopper and dosing unit.

In bottom part of hopper there is emptying hole with flap. Opening this flap can empty the hopper.

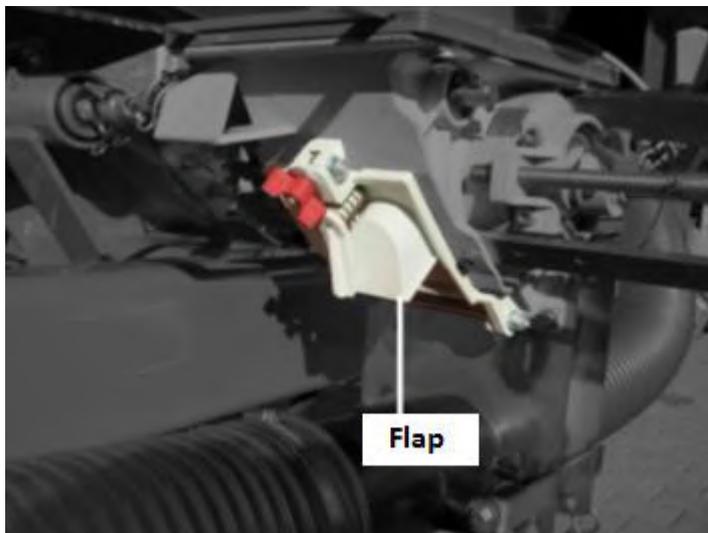
- Turn off fan drive.
  - Secure the machine against movement.
  - Place a collecting bin under the emptying flap.
  - Open emptying flap.
- 
-



- Wait until hopper isn't empty.
- Close drain flap.

For total emptying of the machine:

- Open emptying door on dosing unit,
- wait until the rest of seed drop out.



Never open emptying door of dosing unit when there is too much seed in hopper. They can't be closed then.

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### Cleaning the machine

You can clean the machine using air or water (water-pressure cleaner). Clean the machine from seed and fertilizer residues.

-  Insufficient cleaning reduces machine's life.
-  Clean the bearings only with low pressure. Water entering to bearings reduces their service life.
-  Be aware of electric drive motors, sensors and electrical set. Avoid direct contact of water with these devices.
-  Do not spray water directly on stickers.

It is allowed to clean seeding machine with water only from outside. It is necessary to clean platforms after every use. This reduces the risk of injury.

If water gets into hopper:

- open emptying door on dosing unit,
- disconnect air hoses from dosing unit so water can drain easily,



While using compressed air for cleaning the machine, the harmful dust from seed disinfectant and fertilizer can evaporate. While cleaning the machine with compressed air use protective breathing mask.

- supply hoses and hopper can only be cleaned with compressed air.

If the machine is shut down for a long time, we recommend that you treat the machine with a protective oil seal. This increases machine life. However, use only biodegradable oil.

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## Seed hoses

*When it is harmful dust, use protective breathing mask with corresponding class of protection.*



It is harmful dust if seed treatment was used or when leftovers of fertilizer settled on the walls.

- Hoses leading seed and hopper clean with compressed air.

## Sowing coulters and pressing wheels

Sowing coulters and pressing wheels clean with high pressure cleaner. Do not direct the water on bearings.

## Treating

In order to maintain the long service life of the machine, it is recommended to treat the machine with a protective oil coat after the end of each season and for storage.

Only use an approved and biodegradable oil, such as rapeseed oil.



Insulate the tire wheels before oiling. Oil can damage tires.

## Disconnecting and storage

Cleaned machine should stay in working position for storage. It should be stored on dry place and stand on horizontal, solid surface.

Apply a protective oil during storage. Use only an approved and biologically degradable oil.

## Maintenance

### Safety while maintenance



Works related with maintenance do only if you have experiences, knowledges and applicable tools. Repairs and maintenance do only, if:

- PTO is off
- 
-

- 
- 
- driving motor is off
  - key is not in ignition
  - electronic control is off

Unwanted machine's start can lead to accidents and injuries.



Use only original spare parts. Using non-original spare parts can result not only in machine failure but also in serious injuries due to poor quality of these components.



Before welding on machine or tractor disconnect all electronic devices from power. Otherwise there is a risk of damage of electronic and fire.



Do not use pneumatic grease press to lubricate the bearings. High pressure from this press can damage bearings.

### **Safety in using oils and lubricants**

Additives in oils and lubricants can have negative effect on health. Please note the following:



Beware of contact lubricant and skin. It can cause skin injury.

When using lubricants, protect skin using gloves that are resistant to oils or barrier cream.



Never use oil and lubricants with naked hand. Fragments from these oils increase risk of injury.

Change dirty clothes from oil more often.



Liquidate used oils in accordance with legal regulations.

### **Principals**

Instructions in this manual refer to maintenance work. When doing this work, machine's parts have to be in working position and secured.

Lubrication with manual lubrication press do with one or two press's strokes. Excessive lubrication forces the bearings from each other. Dust and dirt can penetrate the bearings. This can result in a reduction of bearing life.

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### Screw joints

Screw joint can be loosening over a time, so it is necessary to regularly tight all of them. They need to be tightened after first working hours and always if loose joint is visible, or at least once per season.

Tightening torques of screw joints:

Screw	Screw quality		
	„8.8“	„10.9“	„12.9“
	Tightening torques		
M6	9,9	14	17
M8	24	34	41
M10	48	68	81
M12	85	120	145
M16	210	290	350
M20	425	610	710
M24	730	1050	1220

### Maintenance intervals

#### *Before first use of a machine*

- control tire air pressure
  - control of electrical installation
  - control of hydraulic circuits
  - control and eventually add oil in oil reservoir and in gearbox
  - control air distribution
  - control seed hoses and other hoses
  - control of dosing unit
  - tight all screw joints
  - function of seed level sensor in hopper
  - function of tramline valves
  - attachment of seeding machine to lower tractor's arms
  - attachment seeding machine on three-point linkage
- 
-

- control of seeding coulters and row space
- control of functionality of disc markers
- tensioning the dosing unit drive chain

***After first 50 ha***

- control tire air pressure
- cleanliness in seed hopper
- control and eventually add oil in oil reservoir and in gearbox
- tight screws on holders for seed coulters
- control of PTO
- control of seed hoses for bending – all seed hoses need to go downway in all their

length

- control the three-point linkage

***After first 300 ha***

- change oil in gearbox (0,35 L – SAE 80)

***After 50 ha***

- cleanliness in seed hopper
- tight screws on holders for seed coulters
- control of seed hoses for bending – all seed hoses need to go downway in all their

length

- control and eventually add oil in oil reservoir and in gearbox
- control of PTO
- control the three-point linkage

***After 150 ha***

- same as “After 50 ha”
- control of hydraulic circuits
- control of air distribution
- control of seeding coulters and row space

***After 300 ha***

- same as “After 150 ha”
  - tensioning the dosing unit drive chain
- 
-

- lubricating the dosing unit drive chain
- control fan bearings
- function of seed level sensor in hopper
- function of tramline valves
- control dosing unit

### *After 600 ha*

- same as "After 300 ha"
- visually control of machine
- control air tire pressure

### *After 1000 ha*

- expert control by service technicians
- same as "After 600 ha"
- control parts of electrical wiring
- control the blade and sowing coulters bearings
- control all bearings
- control disc on disc markers
- tire abrasion
- control beam of sowing coulters
- control sowing coulters pressure

### *After 5000 ha*

- change oil in separate hydraulic circuit (50 L – HLP 32)
- change oil in gearbox (0,35 L – SAE 80)

### **Securing the machine**

Before doing works like maintenance and service you have to secure the machine properly.



Unsecured machine is danger, that is not obvious on first sign. Before doing any work on the machine, it is necessary to secure the machine. If the machine isn't secured, it can cause a fatal injury.

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## Lubrication

### Bearings lubrication

It is necessary to lubricate bearings regularly. For lubrication, you may not use pneumatic lubrication press, that can damage the bearings. Use only manual lubrication press, lubricate with only one or two strokes.

Maintenance-free bearings must not be lubricated.

### Lubrication review

Pins on coulter arms	50 hr
Pins on axle and axels hydraulic cylinders	50 hr
Pins on disc marker arms	50 hr

### Lubrication places review



### *Other lubrication places*

Beside lubrication places listed in this manual, on machine there can be other places that need lubrication. Typically, they are found near bearings and joints or other moving parts. Check entire machine with focusing on places like this.

Position of lubrication point is usually shown on some part of the machine. In case of multiple lubrication points, it is necessary to lubricate all of them.

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## Wheels

### *Tire check*

- Once a season check tires.

### *Tire air pressure check*

- Once a season, check tire air pressure.
- As necessary, pump the tires for right pressure

	Size	Pressure
Venga	31x15,5-15 10PR T6	4,2

## Dosing unit

### *Removing residual seed*

If there is residual seed in hopper, remove it.

### *Replacing cleaner*

It is necessary to replace the cleaner behind emptying door when it is worn.

- open emptying door
- screw out and replace worn sealing collar
- close emptying door

### *Replacing cleaning disc*

- screw out worn cleaning disc on back side of dosing unit and replace it

## Sensors

In this chapter, you will find instructions to set and replace sensors.

Machine can be equipped with these sensors:

- fan speed sensor,
  - radar sensor,
  - dosing unit's rotation sensor,
  - seed level sensor in hopper,
  - speed and distance sensor,
  - three-point hitch position sensor.
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**Setting fan speed sensor**

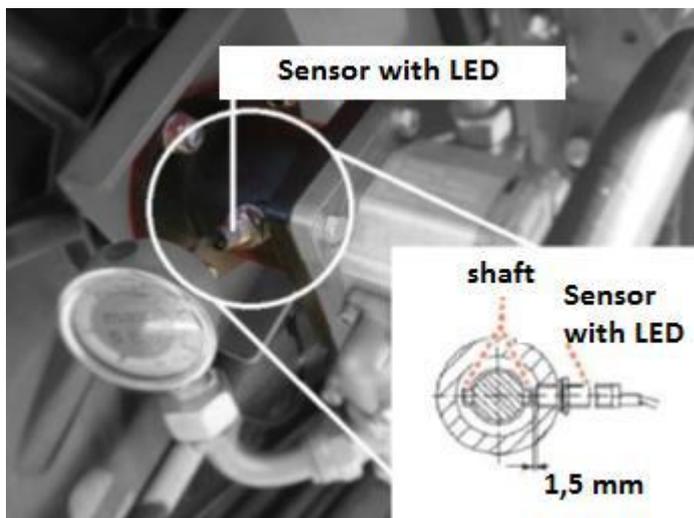
Set the fan speed sensor in case that:

- device don't show any fan speed,
- device shows lower fan speed values as actual.

Groove on fan shaft generates impulses for the sensor. Normally, there are two impulses for one rotation.

***Adjusting the fan speed sensor***

- Lightly loose the nut on sensor.
- Slowly rotate fan shaft with hand and screw the sensor so it touches the shaft. Sensor have to touch the shaft and can't fit into the groove. Screws on the pulley that are on the same part of the shaft as grooves, will help you.
- Screw out the sensor by approx. 1,5 mm.
  - ❗ While setting the sensor, rotate with shaft carefully. Sensor can be damaged when you screw it wrongly and rotate shaft.
  - ❗ Never start the fan when you are not sure if sensor is set correctly. You can damage the sensor.
- Check, if the shaft rotates without scratching the sensor. Carefully rotate fan by hand. Shaft should not touch the sensor and it should generate two pulses per rotation. The groove gives a switching pulse when the sensor passes, the diode on the sensor flashes.
- Screw the nut on sensor.



## Hydraulic hoses

Hydraulic hoses wear and getting old without any visible signs. Hydraulic hoses have to be changed every 6 years according to internationally valid regulation.

When replacing hoses, make sure they are without pressure.

## Replacement of S-harrow springs

- Loose screws and nuts.
- Change the S-harrow spring
- Put on the holder and tight firmly.



## Replacement of DXD RC II disc



Discs can be very sharp, there is danger of cutting. Use protective gloves.

Without them, you can cut yourself.

- Loose screws on disc.
  - Replace the disc.
  - Set and tight screws.
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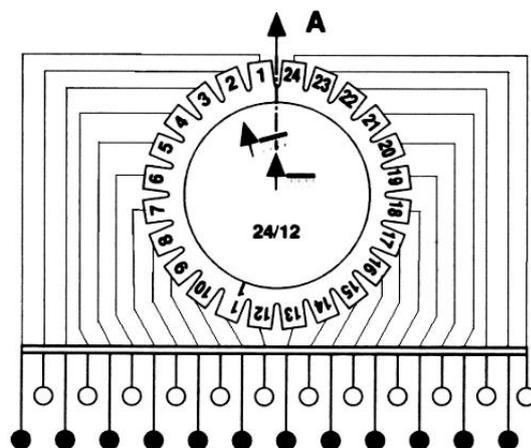
### Replacement of distributor cover

When distributor's cover is wear, replace it.

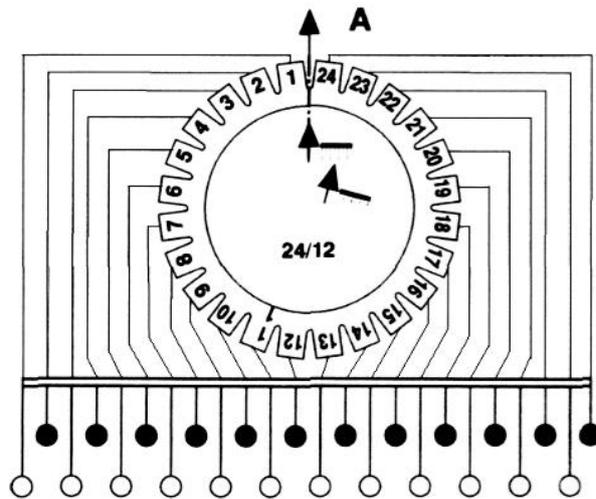
- Loose the wing nuts on distributor's cover and take it out.
- Replace distributor's cover.
- Screw new cover in right position under wing nuts.

Depending on which seed coulters you want to activate, rotate cover of distributor as shown in figure below. Screw reduction cover so arrow on it shows in direction of travel. With the 24/12 cover reductions you have two mounting options:

- Reduction cover's arrow in direction of travel – only long sections are sowing.



- Reduction cover's arrow is not in direction of travel – only short sections are sowing.



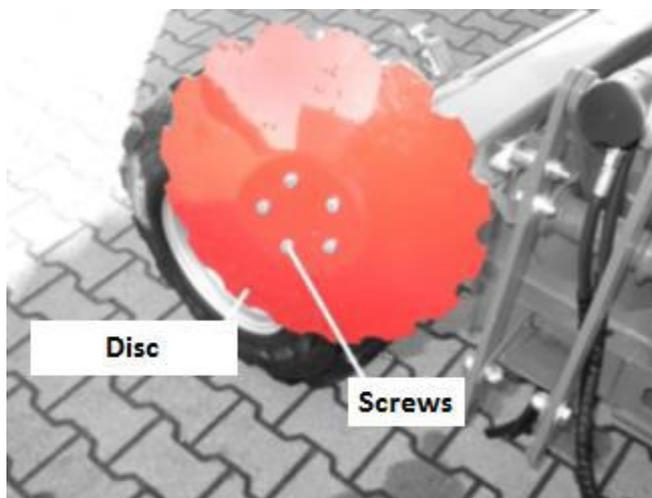
## Marker

Maintenance on markers is done in working position of machine when the marker is unfolded.

### Marker's disc

Check the marker's disc for wear and replace it as necessary.

- Tight screws.
- Replace marker's disc.
- Put screws on and tight them.



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## Track tiller

Maintenance on track tiller is done in working position of the machine. Check all tines for wear and replace it if necessary.

- Tight nut and change screw.
- Put on new tine.
- Put on new screw and lock it with nut.

## Troubleshooting

It is possible to fix some problems easily and quickly. Before you ask service, try if you can fix problems by yourself, with using these charts.

### Electronics

Problem	Cause	Fix
Electronic doesn't work.	Burned fuse.	Change fuse.
	Interrupted power.	Check the connection of power lead.
	Insufficient supply voltage.	Check voltage. It has to be 12 V.
Fan speed decrease on half value	Impulses are caused by only one groove on the drive shaft.	Adjust setting of fan speed sensor.
Fan speed is null.	Sensor without voltage.	Check electric voltage.
	Without impulses.	Adjust setting of fan speed sensor.
	Sensor is faulty.	Check fan speed sensor, change it if necessary.

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## Hydraulics

Problem	Cause	Fix
Fan doesn't rotate with needed speed.	Small oil flow, wrong size of joints.	Choose line with adequate diameter and big joints.
	Lack of oil.	Check and fill up oil.
	High feedback pressure.	Check oil filter, use joints with bigger flow.
Oil leakage near hydraulic motor.	Shaft seal is wear or wrongly mounted.	Change seal.
Fan speed is insufficient.	Incorrectly set three-way valve.	Check the three-way valve setting.
	Insufficient quantity or oil pressure.	Check the pressure limiting valve.
High temperature of hydraulic oil.	The oil flow has to be regulated on the tractor.	Fully open three-way valve for flow regulation on the machine and regulate oil flow on the tractor.
	Three-way valve is set as two-way.	Set three-way valve correctly.
Hydromotor skips shortly.	Too little oil.	Fill up oil.
Marker folds very fast.	Choke washer in hydraulic system is missing.	Install the washer.
	Regulation valve is set wrongly.	Set the regulation valve.
Marker folds very slow or doesn't fold.	Flap in hydraulic system is clogged.	Clean the flap.
	Flap in hydraulic is under-sized.	Replace flap.
Both markers fold together.	Switching valve is faulty.	Replace switching valve.
Marker doesn't move.	Flap in hydraulic is clogged.	Clean flap.

## Dosing unit

Problem	Cause	Fix
Cracking sounds in dosing unit.	Very large seed.	Unmount pins from tedder shaft
	Foreign object in the dosing unit.	Remove foreign object.

Amount of seed changes by itself.	Seed has drawn moisture.  Crank on seed rate setting is moving too easily	Seed hopper has to be emptied overnight.  Tighten the nut on the crank.
In case of fine seeding and microdosing, seeding amount doesn't go under 4-5 kg/ha.	Sealing cuff on dosing unit is worned.  The sealing cuff doesn't fit correctly with the roller.	Replace sealing cuff.  Place sealing cuff correctly.
Seeding amount is too high.	High speed in calibration test.  Wrongly fitted red tooth-wheel for microdosing.	Do calibration test with maximum 1 rotation per second  Turn on microdosing correctly.
Seeding amount is too high or too low.	Wrongly set value.  Mistake in seed weight.	Set the value correctly.  Check weighing scale functionality. Don't count weight of box/bag. Check weight unit on weighing scale.
Seeding amount is too low.	Microdosing is on.  Chambers are dirty.  Brush doesn't move.	Turn off microdosing.  Clean chambers.  Clean or replace the brush.
No seed comes to any seed coulters.	Injector is clogged.  Fan is off.  Restriction flap on the fan is closed.	Remove clogging and check fan speed.  Turn on the fan.  Open restriction flap.

### Seeding coulters

Problem	Cause	Fix
Tramlines are not set.	Too low power on connector.  Electromagnetic closing valve doesn't switch.	Check connection by corrosion.  Change electromagnetic closing valve.

Tramline valves are closed	Electromagnetic closing valve is stuck.  Foreign object in the main distributor.	Clean electromagnetic closing valve.  Remove foreign object.
Seed hose is clogged with seed.	Seed coulters are clogged with soil.  Hoses are bended or hanged.  Fan speed is too low.	Clean clogged seed coulters.  Check hoses outside of hopper. If needed, cut hoses.  Take care about correct fan speed.
S-harrow works too deep.	Pressure is too high.	Lower the press on S-harrows.
S-harrow is clogged.	S-harrow's angle is set too steep.	Decrease working angle.
Tramline valve doesn't switch at the end of the field.	Sensor on three-point linkage doesn't transmit any pulses to the computer.  Sensor is broken.	Check distance between sensor and three-point linkage.  Replace sensor.

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