



VELOX



USER'S MANUAL

SOLÀ seed drills and fertilisers are manufactured in a factory exclusively specialised in this sector and are backed by the experience of many thousands of users.

They are high-tech machines designed for long, trouble-free service in a wide variety of conditions, with simple and effective devices for excellent performance with minimum maintenance.

By informing you of all your possibilities and settings we would like to help you to achieve what you expect from our machine.

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Specifications subject to change without notice.

The photographs do not necessarily show the standard version of the machine.

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1. INTRODUCTION

Before starting the **VELOX SEED DRILL**, it is necessary to **READ THE INSTRUCTIONS AND RECOMMENDATIONS** in this manual. This will reduce the risk of accidents, prevent damage to the seed drill due to incorrect use, increase its performance and service life.

The manual must be read by all persons involved in operation (including preparation, repair of faults in the field and general care of the machine), maintenance (inspection and servicing) and transport.

For your own safety and that of the machine, always observe the technical safety instructions. **SOLÀ** accepts no liability for damage or malfunctions caused by failure to comply with the instructions given in this manual.

In the first chapters you will find the Technical Characteristics and Safety Instructions. In the sections on Commissioning, Regulations and Maintenance you will find the basic knowledge necessary to operate the machine.

The manual is completed with metering tables for different types of seed, fertiliser, microgranulators and insecticides.



SOLÀ RESERVES THE RIGHT TO CHANGE ILLUSTRATIONS, TECHNICAL DATA AND WEIGHTS IN THIS MANUAL IF SUCH CHANGES ARE DEEMED TO IMPROVE THE QUALITY OF THE SEED DRILLS.

2. SAFETY INSTRUCTIONS

2.1 SAFETY SYMBOLS

In this manual you will find three types of safety and hazard symbols:



TO FACILITATE THE WORK WITH THE SEED DRILL.



TO PREVENT DAMAGE TO THE SEED DRILL OR OPTIONAL EQUIPMENT.



TO AVOID INJURY TO PERSONS.

You will find the following warning signs on the machine:



Carefully read and comply with the operating instructions and safety advice given in the operating instructions.



Stand clear of the rear of the tractor during coupling. Make sure that nobody is in the opening direction of the telescopic wings. Danger of serious injury.



Before carrying out repairs or maintenance on the machine, stop the tractor engine and remove the key from the ignition.



Danger of crushing, if working under the machine, secure it to prevent it from collapsing. Danger of serious injury.



Do not climb onto the machine when it is in operation. Danger of falling



Possibility of penetration of pressurised hydraulic fluid. Keep the lines in good condition. Danger of serious injury.



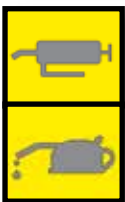
Do not stand under the row markers or in their range. Danger of serious injury.



Respect the maximum load



Coupling point for loading and unloading the machine by crane. See section 2.3 LOADING AND UNLOADING INSTRUCTIONS.



Keep the parts of the machine where these lubrication and greasing symbols are present in good condition and greased.

2.2 GENERAL PROVISIONS OF SECURITY



- Before starting the machine, always check the safety of the machine at work and with regard to traffic.



- Check that there are no persons in the working area of the machine and its surroundings.



- When using public roads, respect traffic signs and regulations.



- It is strictly forbidden to climb on the machine during work and transport.



- Before starting the machine, familiarise yourself with all drive elements and their function.



- Pay particular attention when coupling and uncoupling the machine to the tractor.



- Never leave the driver's seat while driving.



- Do not deposit foreign objects in the hopper.



- Before working on the hydraulic system, depressurise the circuit and stop the tractor engine.



- The tubes and hoses of hydraulic circuits undergo natural ageing under normal conditions. The useful life of these elements should not exceed 6 YEARS. Periodically observe their condition and replace them after this time.



- Before starting any movement with a foldable machine, make sure that the frame is completely folded.



- When the seed drill is raised, the front axle of the tractor is unloaded. Ensure that the front axle is sufficiently loaded to prevent it from tipping over. In this situation, check the steering and braking ability.



- When transporting with the seed drill raised, lock the lowering control. Before leaving the tractor, set the machine down on the ground and remove the starter key.



- When carrying out maintenance work with the machine raised, always use sufficient support elements to prevent the machine from lowering.



- Before sowing a field, assess the possible risks that the area may present, steep slopes, possible contact with overhead power lines, due to unevenness of the ground and/or the configuration of the moving parts of the machine.

2.3 LOADING AND UNLOADING INSTRUCTIONS



THESE OPERATIONS MUST BE CARRIED OUT BY QUALIFIED AND EXPERIENCED PERSONNEL.



ON RECEIPT OF THE MACHINE, CHECK FOR TRANSPORT DAMAGE OR MISSING PARTS. ONLY WITH IMMEDIATE COMPLAINTS TO THE FORWARDING AGENT IS A REPLACEMENT FOR DAMAGE POSSIBLE.



LOADING AND UNLOADING OF THE LORRY SHOULD BE CARRIED OUT WITH THE HELP OF AN OVERHEAD CRANE IF POSSIBLE.

The following pictures show the layout of the holes in the CHASSIS, where the ropes must be fastened to:



ATTENTION: RESPECT THE DISTANCES: **A** (2 METRES) TO AVOID DAMAGING THE MACHINE DURING THE LIFTING PROCESS.

3. IMPLEMENTATION



THESE WORKS MAY ONLY BE CARRIED OUT BY PERSONS AUTHORISED AND TRAINED BY THE COMPANY ALONE.



THERE IS AN INCREASED RISK OF ACCIDENTS DURING START-UP. OBSERVE THE INFORMATION IN THE SAFETY CHAPTER AND FAMILIARISE YOURSELF WITH THE MACHINE!

3.1 DELIVERY

The machine with optional equipment is usually delivered to the customer fully assembled on a truck.

If parts or modules have been disassembled for transport, they will be assembled on site by our official metering units or by our factory fitters.

To unload the machine, it must be lifted and placed on the ground with appropriate lifting equipment (forklift or crane).

only use approved lifting gear and lifting equipment with sufficient lifting capacity!

3.2 TRANSPORT

Depending on national regulations and working width, transport on public roads can be carried out by coupling to a tractor or on a trailer or gondola truck.

1. The permissible dimensions and weights specified for transport must be observed.
2. Choose a sufficiently large tractor to ensure sufficient turning and braking stability.
3. On machines with 2-point coupling, lock the lower links so that they do not swing sideways.
4. Secure the machine on a trailer or gondola with suitable securing devices (e.g. tensioning straps or chains).

3.3 INSTALLATION

The operator training and the first installation of the machine is carried out by our service personnel or by our official metering units.

it is forbidden to use the machine before!

Only after the instruction by our technician or the official metering unit has taken place, and the operator has read the operating instructions, can we release the machine for operation.



THERE IS AN INCREASED RISK OF ACCIDENTS DURING START-UP. OBSERVE THE INFORMATION IN THE SAFETY CHAPTER AND FAMILIARISE YOURSELF WITH THE MACHINE!

1. Remove loose supplied parts from the machine.
2. Remove all parts of the seed hoppers.
3. Check all important threaded connections.
4. Lubricate all lubrication points.
5. Check air pressure in all tyres and correct if necessary.
6. Check that all connections and hydraulic hoses are fixed in their positions and function properly.
7. Immediately remedy any deficiencies that may exist.



TO INSTALL THE CONTROL UNIT OF THE SEED DRILL, SEE THE CORRESPONDING OPERATING INSTRUCTIONS.

4. TECHNICAL DATA

4.1 TECHNICAL DATA

MODEL	TV 300/6 45-75	TV 300/6 50-80	TV300/7	TV 300/7 50-80	TV300/8	TV300/9	TV 330/8	TV 330/9	PF 300/8	PF 300/9	PV 300/12
TRANSPORT WIDTH (CM)	305						330		305		
TRANSPORT HEIGHT (CM)	174 (232 with fertiliser hopper, 283 with fertiliser distribution head)								345		
TRANSPORT HEIGHT WITH ROW MARKER (CM)	-				358				410		
TRANSPORT LENGTH (CM)	215								225		
TRANSPORT LENGTH WITH SECOND MICRO HOPPER (CM)	230								240		
NUMBER OF ROWS	6	6	7	7	8	9	8	9	8	9	12
MAX. ROWS SPACING (CM)	45-75	50-80	45-60 (6F 75-80)	50-80	45-75	40-55 (8F 70-75)	45-80	45-60 (8F 70-80)	70-80	65	45-50 (8F 70-80) (9F65)
SEED HOPPER CAPACITY (L)	70										
HYDRAULIC PRESSURE IN SEEDING BODY (kg)	90-300 (without seed weight)										
SPRING PRESSURE ON SEED BODY (kg)	90-165 (without seed weight)										
SOWING DEPTH (CM)	1-8,5										
DISTANCE FROM COUPLING TO SEED DROP POINT (CM)	146								157		
WORKING SPEED (km/h)	0,5-12										
TURBINE	Hydraulic turbine (20-30 l/min)										
TYRES	23X10.50-12 8PR			23X8.50-12 8PR	23X10.50-12 8PR						
FERTILISER FRONT HOPPER CAPACITY (L)	1400								-		
MICRO-NANULATE HOPPER CAPACITY (L)	17										
COUPLING CATEGORY	III										
WEIGHT WITHOUT OPTIONAL (KG)	-	-	-	-	1825	-	1850	-	-	-	2450
MINIMUM POWER (HP) ⁽¹⁾	120	120	120	120	135	135	135	135	150	150	150

4.2 TRACTOR REQUIREMENTS



WARNING: DANGER OF ACCIDENT DUE TO OVERLOADING THE TRACTOR. MAINTAIN THE TRACTOR'S PERMISSIBLE VALUES FOR AXLE LOADS, TOTAL WEIGHT, TYRE LOAD CAPACITY AND AIR PRESSURE.

Check the suitability of the tractor before starting up.

Incorporation of implements

VELOX	TV	PF	PV
Three-point linkage	Cat. III	Cat. III	Cat. III

Electrical System/Control Unit

Power supply	12 V
Lighting	7-pole power socket.
Control unit	ISOBUS
Electrical power	50 A on ISOBUS socket (ISO 11783-2)

Hydraulic system

TRACTOR	VELOX TV	VELOX PF / PV
Double-acting control units	- Telescopic folding. - Hydraulic pressure (optional).	- Foldable folding. - Hydraulic pressure (optional). - Row marker (optional)
Single-acting control units	- Tracer (optional)	-
Double-acting control units with adjustable flow rate	- Hydraulic motor for vacuum fan. Flow rate: 20-30 l/min. - Hydraulic motor for blower fan in the fertiliser hopper. Flow rate: 25-35 l/min (optional)	
Pressureless return (max. 5 bar)	- 1 general return	
Type of oil	Mineral hydraulic oil	
Maximum system pressure	210 bar	

Incorporation of implements

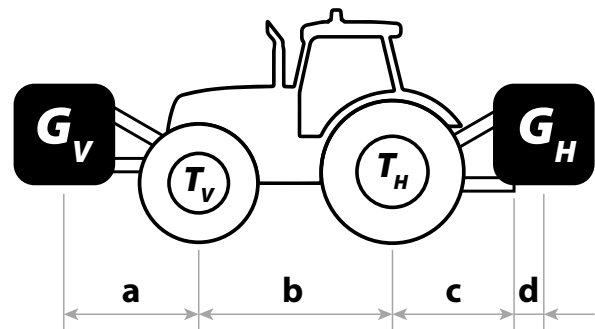
VELOX	TV 300/6 TV 300/7	TV 300/8 TV 330/8 TV 300/9 TV 330/9	FP / PV
Tractor (kW / hp)	90/120	100/135	110/150

4.2.1 CALCULATING THE BALLAST LOAD

The maximum permissible total weight, the maximum axle loads and the load-bearing capacity of the tractor tyres must not be exceeded when attaching or coupling implements. The front axle of the tractor must always be loaded with at least 20% of the tractor's unladen weight.

- Before road travel, check that the tractor used is suitable for this implement and is not overloaded.
- Weigh the implement separately. As there may be different equipment, the weight of the implement should be determined by weighing it.

Required data



T_L	Tractor unladen weight
T_V	Empty tractor front axle load
T_H	Empty tractor rear axle load
G_H	- Total weight of rear rigging - With coupled machines: Maximum permissible drawbar load for road transport.
G_V	Total front implement weight/front weight
a	Distance from the point of gravity of the front implement/front weight to the centre of the front axle.
b	Tractor wheelbase
c	- Distance from the centre of the rear axle to the centre of the lower link sphere. - With coupled machines: Distance from the centre of the rear axle to the centre of the coupling point.
d	- Distance from the centre of the lower links ball to the centre of gravity* of the rear implement/rear ballast. - For coupled machines it applies: $d = 0$.
x	Tractor manufacturer's instructions for the minimum rear ballast load. If there are no indications, enter 0.45.

* All data relating to weight in kilograms (kg).

* All dimensions in metres (m).



THE CENTRE OF GRAVITY OF THE MACHINES CANNOT BE GIVEN EXACTLY BECAUSE OF THE ADDITIONAL EQUIPMENT. TO CALCULATE IT, ENTER HALF THE DEPTH OF THE MACHINE (d).

Control calculations

Check the calculated values additionally by weighing them: Weigh the combined tractor and hitched or mounted machine to calculate the weight of the front and rear axles.

Calculations

1. Calculation of the minimum front ballast load for rear implement:

$$G_{Vmin} = \frac{[G_H \cdot (c + d)] - (T_V \cdot b) + (0,2 \cdot T_L \cdot b)}{a + b}$$

Record the result in the table.

2. Calculation of the load with minimum ballast at the rear for front implement:

$$G_{Hmin} = \frac{(G_V \cdot a) - (T_H \cdot b) + (x \cdot T_L \cdot b)}{b + c + d}$$

Record the result in the table.

3. Calculation of the actual front axle load:

$$T_{Vtat} = \frac{[G_V \cdot (a + b)] + (T_V \cdot b) - [G_H \cdot (c + d)]}{b}$$

Record in the table the calculation results obtained from the actual front axle load and the permissible front axle load of the tractor indicated in the tractor operating instructions.

4. Calculation of the actual total weight:

$$G_{tat} = G_V + T_L + G_H$$

Record in the table the calculation results obtained from the total weight and the permissible total weight of the tractor indicated in the tractor operating instructions.

5. Calculation of the actual rear axle load:

$$T_{Htat} = G_{tat} - T_{Vtat}$$

Record in the table the calculation results obtained from the actual rear axle load obtained and the permissible rear axle load given in the tractor operating instructions.

Compare the calculated values with the allowed values. These include:

- Total weight allowed
- Maximum front and rear axle load
- Minimum front axle load (20% of the tractor's unladen weight) - Minimum front axle load (20% of the tractor's unladen weight)

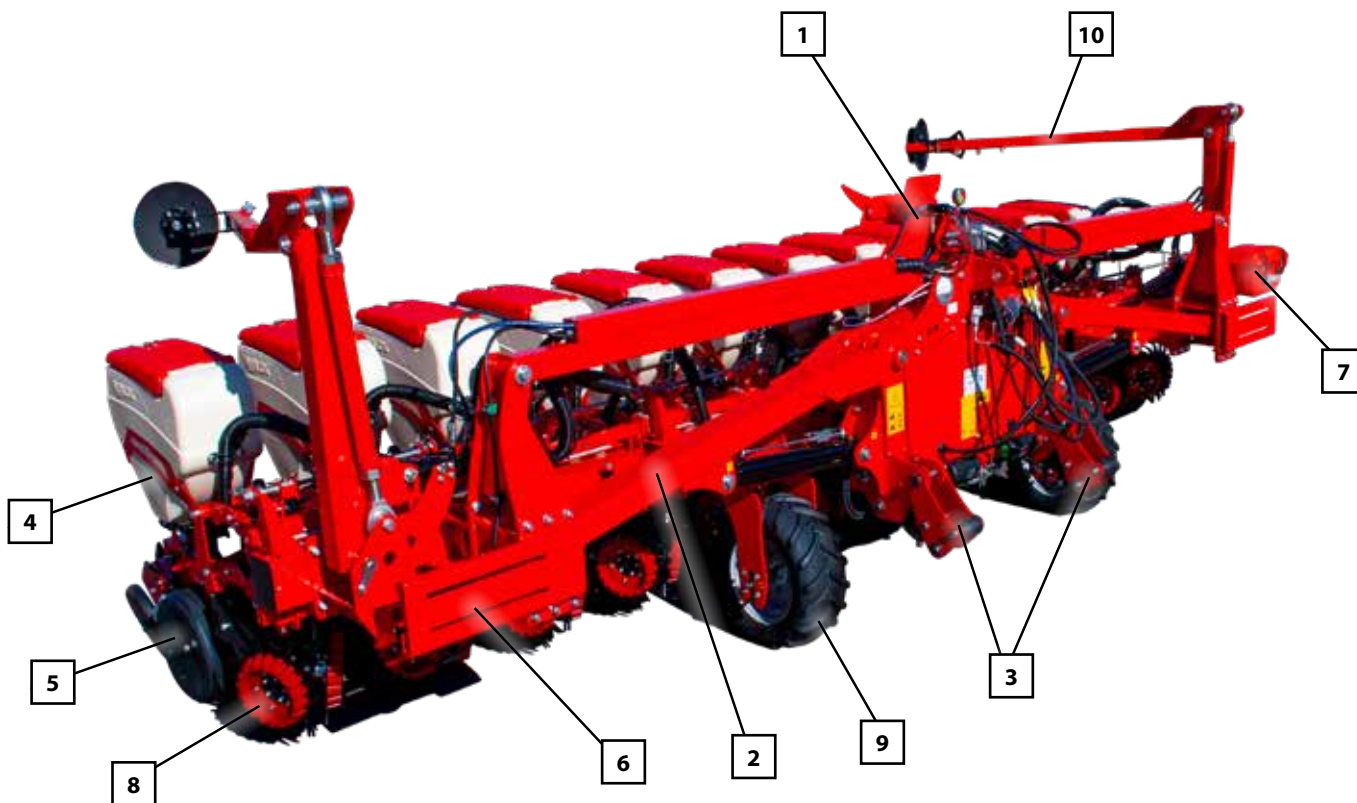
The calculated values must not exceed the permitted values:

	Actual value according to the calculation	Permissible value according to operating instructions	Double permissible load-bearing capacity of tyres
Minimum front ballast (with rear implement)	$G_{Vmin} = \text{--- kg}$		
Minimum rear ballast (with front implement)	$G_{Hmin} = \text{--- kg}$		
Total weight	$G_{tat} = \text{--- kg}$	$\leq \text{--- kg}$	
Front axle load	$T_{Vtat} = \text{--- kg}$	$\leq \text{--- kg}$	$\leq \text{--- kg}$
Rear axle load	$T_{Htat} = \text{--- kg}$	$\leq \text{--- kg}$	$\leq \text{--- kg}$

5. STRUCTURE

5.1 OVERVIEW

5.1.1 PV / FP



1- Vacuum fan.

2- Foldable frame.

3- Weight transfer arm.

4- Seed hopper.

5- Sowing body.

6- Support for side wheels.

7- Toolbox.

8- Waste cleaning stars.

9- Support wheel.

10- Row marker.

5.1.2 TV



1- Blower fan for fertiliser.

2- Telescopic frame.

3- Weight transfer arm.

4- Hopper microgranular.

5- Sowing body.

6- Aspiration lung.

7- Machine support foot.

8- Waste cleaning stars.

9- Row marker.

10- Fertiliser hopper.

11- Fertiliser element.

5.2 HYDRAULIC SYSTEM



WARNING: DANGER OF SERIOUS ACCIDENTS AND INJURIES DUE TO ACCIDENTAL HYDRAULIC MOVEMENTS!

- Lock or secure the control units on the tractor.
- Keep people away from the swivel range of the foldable machine parts.
- Before restarting the tractor, switch all control units to the locked position.
- Only connect hydraulic lines when they are depressurised.

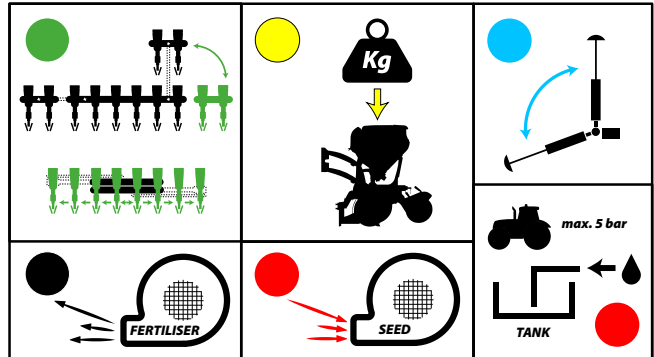


NOTICE:

- Operate the machine with mineral hydraulic oil. Do not mix with biogenic mineral oils or esters. Mineral hydraulic oil must be present in the hydraulic circuit of the tractor.
- Oil purity in accordance with iso 4406: 18/16/13
- Always connect all hydraulic lines! Otherwise, the related functions may damage components.
- Pay attention to cleanliness and correct seating of the connections!

5.2.1 MARKING OF THE HYDRAULIC SYSTEM

The hydraulic couplings to the tractor are colour-coded according to the drive. On the sticker on the front of the machine you can see all the functions and colours.



Machine folding: Green colour.

- Pressure on coupling 1: Fold.
- Pressure on coupling 2: Deploy.

Hydraulic vertical force: Yellow.

- Pressure on coupling 1: Vertical force.
- Pressure on coupling 2: Lifting of seed drills.

Row marker: Blue colour.

- Pressure on coupling 1: Fold row marker.
- Pressure on coupling 2: Deploy row marker (VELOX PF/PV only).

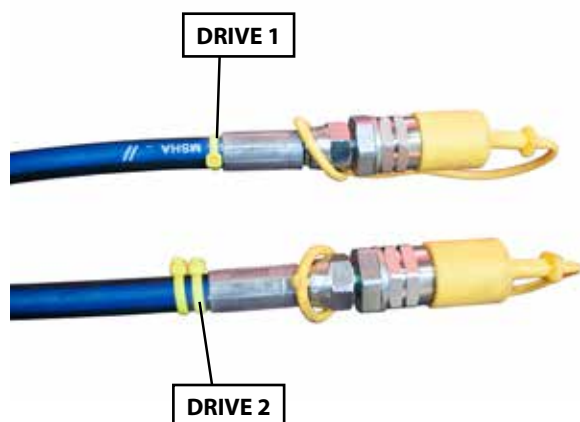
Seed vacuum fan: Colour red

- Pressure in coupling 1 (must be connected free return).

Blower fan for fertiliser: Colour black.

- Pressure in coupling 1 ((must connect free return).

Free return to tank: Red





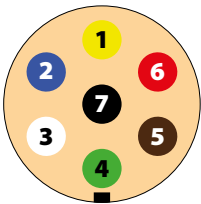
WARNING: DAMAGE TO THE HYDRAULIC MOTOR.

- Whenever couplings of vacuum or blower fans are connected, it is mandatory to connect the return not free. Failure to connect the free return will cause the hydraulic motor to break.
- Ensure that the free return is properly connected or it may be disconnected during use.



ATTENTION: DAMAGE TO THE HYDRAULIC MOTOR, THE RETURN PRESSURE OF THE BLOWER DRIVE MUST NOT EXCEED 5 BAR.

5.3 LIGHTING



Pin No	Standard	FUNCTION
1	L	Left indicator
2	54G	Fog lamps
3	31	Mass
4	R	Right indicator
5	58R	Position light right
6	54	Brake
7	58L	Left position light



WARNING: TRAFFIC ACCIDENTS DUE TO FAULTY LIGHTING.

- Pay attention to the cleanliness and correct seating of the connections.
- Check the lighting before setting off.
- Check that the indicators and lights are clean.

5.4 ADHESIVE WITH INSTRUCTIONS

1. Clean dirty stickers.
2. Replace damaged or illegible stickers immediately.
3. Apply the stickers provided on the spare parts.

	<p>On VELOX PF and VELOX PV models, it is forbidden to uncouple the tractor with the VELOX folded down. The VELOX must be unfolded for uncoupling.</p>
	<p>Instructions for use weight transfer</p>
	<p>Hydraulic vertical force on the row units.</p>
	<p>Do not clean with a high pressure cleaner.</p>
	<p>The return pressure of the blower drive must not exceed 5 bar.</p>

6. HANDLING



WARNING: FOR ALL WORK ON THE MACHINE, PLEASE OBSERVE THE RELEVANT SAFETY INSTRUCTIONS IN THE CHAPTER ON SAFETY AND ACCIDENT PREVENTION AS WELL AS THE ACCIDENT PREVENTION REGULATIONS!

6.1 COUPLING/PARKING



DANGER: SERIOUS ACCIDENTS DURING MANOEUVRING AND COUPLING!

- Pay attention to the environment.
- Keep people away from the swivelling area of the machine.
- Direct all persons between the tractor and the machine out of the area.
- When the tractor approaches or moves away from the machine, there must be no persons in the danger zone!
- Activate the three-point linkage movements only from outside the danger zone.



WARNING: SPILLED HYDRAULIC FLUID CAN CAUSE SERIOUS INJURIES! DANGER OF INJURY FROM UNINTENTIONAL MACHINE MOVEMENTS. CONNECT AND REMOVE HYDRAULIC LINES ONLY WHEN THEY ARE DEPRESSURISED.

6.1.1 COUPLING

Before any movement on the machine, properly coupling the machine to a tractor.



NOTICE:

- Observe the permissible total weight of the tractor or the seed drill trolley, the maximum load capacity, the permissible axle loads and the weight distribution, see chapter Ballast load and technical data.
- Align the lower links with the same distance to the centre of the tractor and lock to prevent them from swinging sideways.



NOTICE:

- All the inserted connections (hydraulic, electrical and pneumatic) must be clean and well tightened.
- Dirt can enter the hydraulic fluid through dirty connectors and cause malfunctions.

Tractor coupling

1. Clean and check the connection mechanisms of the machine and tractor for wear.
2. Carefully approach the tractor to the machine.
3. Ensure that the weight transfer arms are in their lowered position.
4. Hook the machine into the three point linkage. Lock the lower links so that they do not swing sideways.
5. Connect the ISOBUS connector of the seed drill to the ISOBUS socket of the tractor.
6. Connect the hydraulic lines, see chapter Hydraulics.
7. Connect the Extra-Power cable if necessary.
8. Connect the lighting cable.
9. When using a front hopper: Mount the fertiliser spreader tube tightly and fix it to the distribution head.

6.1.2 TRANSPORT POSITION



WARNING: DANGER OF TRAFFIC ACCIDENTS.

Before starting the march:

- Clean the entire machine to remove adhering soil.
- Check the operation of the lighting.
- Lock the hydraulic drives during transport travel, either mechanically or electrically, depending on the model. Never switch on in the floating position.
- Check that all safety elements of the coupling are correctly fitted.
- Check coupling components for wear.



BEFORE TRAVELLING ON PUBLIC ROADS, ENSURE THAT THE MACHINE COMPLIES WITH ALL RELEVANT NATIONAL ROAD TRAFFIC REGULATIONS IN FORCE.

Before road transport, also make the following adjustments:

1. Raise the hitched machine completely.
2. If it has support legs, fold or remove them and secure them in the parking position.
3. Fold the machine, see section Folding.

6.1.3 PARK



DANGER: SERIOUS ACCIDENTS DUE TO LOSS OF STABILITY!

- Only park the machine on a firm, level surface .
- Always park the machine in the working position. The machine can only be parked in transport position or closed frame on TV models.



NOTICE:

- Clean the machine and prepare it accordingly, see chapter care and maintenance.
- Thoroughly clean the fertiliser hopper and fertiliser spreader. Fertiliser is aggressive and accelerates corrosion. It particularly attacks galvanised parts such as screws.
- Clean all metering units.
- If possible, park the seed drill in a shed so that no moisture can accumulate in the hopper, metering unit and seed tubes.

Parking with tractor coupling

1. On PF/PV models the machine can be deployed in working position. On TV models the machine can be parked in transport position.
2. If the Velox is equipped with the tractor weight transfer kit, lower the weight transfer arms to their lowest point. See chapter 9.2 TRACTOR WEIGHT TRANSFER.
3. If it has support legs, unfold them in the parking position.
4. Lower the machine to the ground until the sowing units and support wheels 2 are resting on the ground.
5. Disconnect all hydraulic and electrical connections.
6. Uncoupling the machine from the tractor

Parking in a warehouse

The seed drill must be parked in a shed or under cover so that no moisture can accumulate in the metering units and seed tubes.



PARKING OUTDOORS CAN LEAD TO RAINWATER DAMAGE DUE TO WATER ENTERING THE METERING UNITS AND THE SEED AND FERTILISER DELIVERY TUBES.

Store at the end of the season

1. Park the machine in a shed when it is to be stored at the end of the season.
2. Clean the metering units at the end of the season.
3. Do not clean the metering units with water. Use brushes and compressed air.



WARNING: RISK FROM DUST HARMFUL TO HEALTH (FERTILISER, TREATMENT PRODUCT). WEAR SUITABLE PERSONAL PROTECTIVE EQUIPMENT (SAFETY GOGGLES, RESPIRATORY PROTECTION MASK, PROTECTIVE GLOVES) WHEN CARRYING OUT CLEANING AND MAINTENANCE WORK.

6.2 FOLDED AND UNFOLDED



WARNING: DANGER, SERIOUS CRUSHING INJURIES DUE TO FALLING OR LOWERING MACHINE PARTS.

- There must be no persons underneath the raised parts of the machine.
- Keep people away from the danger area of the machine. Before folding, ensure that there are no persons in the danger zone.
- Observe accident prevention regulations.



WARNING: DANGER OF ACCIDENT DUE TO LACK OF STABILITY

- Fold the machine only when it is fully coupling.
- When folding the machine, it must not be tilted.
- Fold the machine only on a flat and firm base.



CAUTION: DAMAGE TO THE MACHINE. BEFORE FOLDING, CLEAN THE JOINT AREA AND THE CORRESPONDING HYDRAULIC CYLINDERS.

6.2.1 FOLDING AND UNFOLDING OF TV MODELS

Unfold/open:

1. Raise the machine completely.
2. Fold out the telescopic frame until all the frame stops come to an end.
3. Ensure that the telescopic frame is completely open and that the distances between elements are correct.

Fold/close:

1. Raise the machine completely.
2. Fold the telescopic frame of the machine to its inner stop.
3. Check that the frame is completely closed.

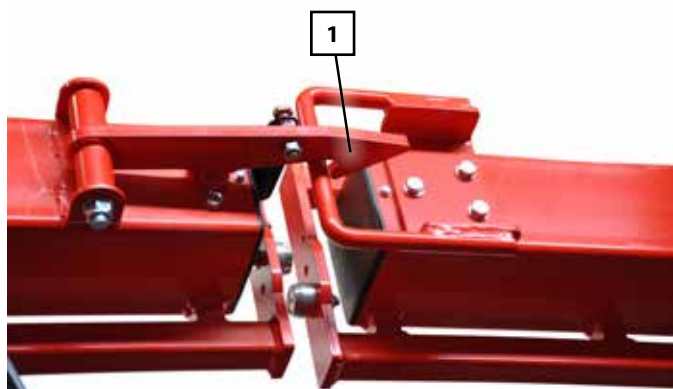
6.2.2 FOLDING AND UNFOLDING OF THE PF/PV MODELS

Expand/Open:

1. Raise the machine completely.
2. Before unfolding the frame, the safety hook must be unlocked. To unlock the safety hook (1), operate the folding control and then operate the unfolding control.
3. When unfolding, check that the hook disengages correctly. If it does not, repeat step 2.
4. Fold out the frame until the folding cylinder is completely closed.

Fold/Close:

1. Before folding the machine, check that the hopper lids are all closed.
2. Raise the machine completely.
3. Fold the machine until the safety hook (1) is correctly engaged.



6.3 WORK IN THE FIELD

For the settings of the vacuum fans and the seed drill, please refer to the information in the corresponding chapters.

6.3.1 TO BE TAKEN INTO ACCOUNT

When coupling to the tractor

Adjust the length of the tractor top link so that the machine frame is horizontal to the tractor (see section 6.3.3 HORIZONTAL MACHINE ADJUSTMENT).

If the machine is equipped with fertiliser incorporation elements, adjust the position of the support wheels according to the hardness of the soil (see section 6.3.4 ADJUSTING SUPPORT WHEELS).

During sowing

Periodically check the pressure of the hydraulic vertical pressure system.

Do not reduce the speed of the seed blowers at the headland too much. Otherwise the seeds could fall out of the holes in the suction disc.

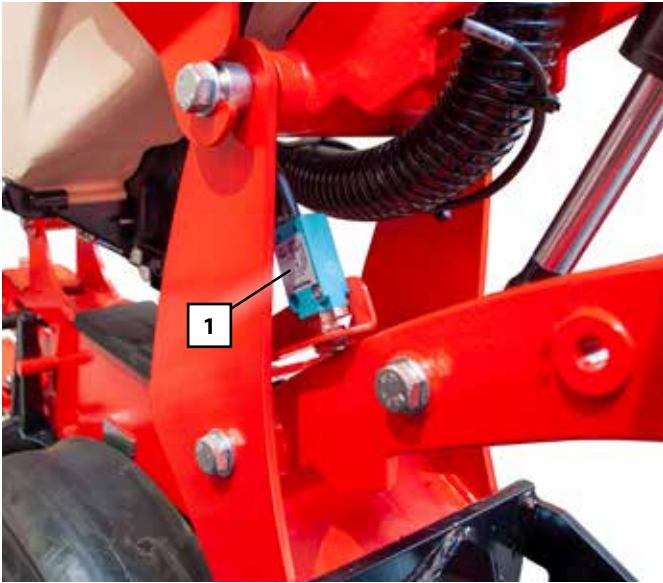
Do not reduce the speed of the fertiliser blower fans at the headland too early or too much. Otherwise fertiliser will remain in the hoses and could clog them. The ISOBUS system does not monitor the hoses or the fertiliser fan.

Working signal

Sensors for the work signal are mounted on 2 elements of the seed drill.

No. of rows Max.	Elements for mounting the sensors	
4	1	4
5	1	5
6	3	4
7	3	5
8	3	6
9	4	6
10	4	7
11	4	8
12	4	9
13	4	10

* Sensor position table according to machine.



* Working sensor deactivated in transport position.

In transport position the sowing units are suspended. When the switches (1) are actuated, the work signal is not active.

The work signal is activated when at least one switch is no longer actuated. One of the two sensors must be deactivated to activate the work signal.

6.3.2 CONTROLS

Adjusting the tractor lift/lower unit.

Do not operate the control unit at full volumetric flow (maximum speed), as the speed of the vacuum fan will decrease too much.

- To adapt, start with a low volumetric flow and then increase it.
- Increase the volumetric flow only until the blower speed drops a little.

Working speed

The appropriate working speed depends on soil conditions (soil type, remaining stubble, etc.), seed, seed quantity and other factors.

1. Reduce the working speed if the seed drills run unevenly, the soil is wet or sticky.



IN DIFFICULT CONDITIONS, IT IS GENERALLY NECESSARY TO REDUCE THE WORKING SPEED.

Machine

- are the hydraulic lines unambiguously connected?
- is the machine level in working position and is the sowing depth well defined?
- are the sowing unit settings correctly adjusted?

Pneumatic system/ Hydraulic system

Check the vacuum pressures on the vacuum gauge, see section 7. PNEUMATIC SYSTEM.

Check the blowing pressures on the pressure gauge on the fertiliser hopper, see section 7. PNEUMATIC SYSTEM.

are all suction hoses properly fitted and airtight?

Sowing

Check the quality of sowing, see section 10. SEEDING METEERING UNIT.

6.3.3 THIRD POINT ADJUSTMENT

With the machine on the ground, adjust the length of the third point of the tractor until the tripod is vertical to the ground ($\theta = 90^\circ$).

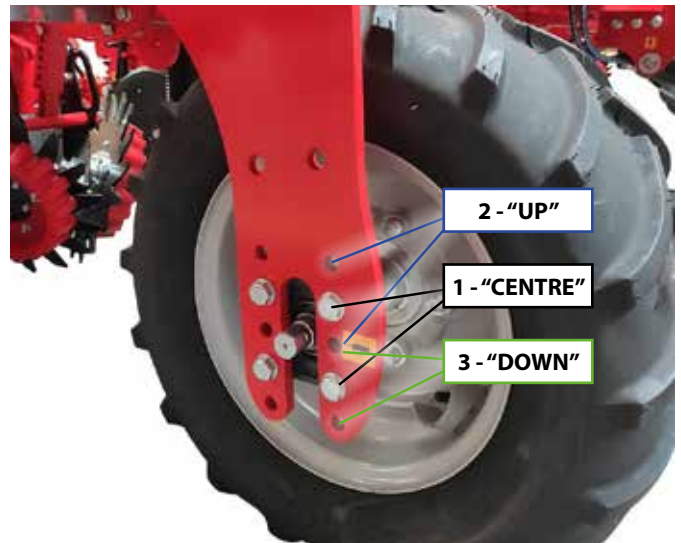


NOTICE: SEEDING ERROR DUE TO INCORRECTLY SET THIRD POINT OF THE TRACTOR!

- If the third point is set too far back, the parallelograms of the element will hang down too much and the working signal could be disconnected.
- Incorrect adjustment of the third point can result in poor seed finish, poor seed placement in the furrow, open furrows, etc.

6.3.4 ADJUSTING SUPPORT WHEELS

The support wheels can be adjusted in 3 height levels. In the factory they are set to the centre position and in the field they can be adjusted up or down.



To check the correct position of the support wheels it is necessary to measure the distance between the ground and the element support. The correct distance is between 50 and 52 cm (A) in field sowing conditions.



1. With the machine hitched to the tractor, let the machine rest lightly on the ground, so that the support wheels contact the ground without weight.
2. Remove the 8 bolts from each wheel.
3. Raise or lower the tractor linkage until the position of the bolts matches.
4. Re-tighten the 8 bolts of each wheel (92 Nm tightening torque).
5. Adjust both support wheels equally.



CAUTION: DANGER OF INJURY DUE TO WHEEL FALLING OFF. ALWAYS SUPPORT THE WHEEL WHEN REMOVING THE FASTENING SCREWS.



WARNING: IT IS IMPORTANT TO ADJUST THE SUPPORT WHEEL CORRECTLY WHEN WORKING WITH FERTILISER SPREADER DISCS. AN INCORRECTLY ADJUSTED SUPPORT WHEEL CAN LEAD TO:

- The fertiliser disc is working too deep.
 - If an obstacle is encountered, the fertiliser disc will not be able to avoid it and could be damaged.
-



WARNING: SEEDING ERROR DUE TO INCORRECTLY ADJUSTED SUPPORT WHEELS!

- If the support wheels are positioned too far down, the coulter bar will be too high and the parallelograms will hang too far down.
 - If the ground is uneven, the working signal could be switched off, which would cause skips during sowing.
-

7. PNEUMATIC SYSTEM

7.1 VACUUM FAN

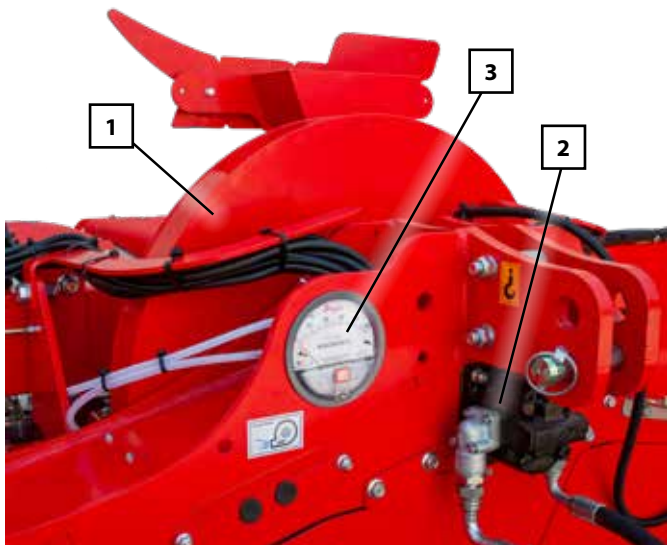
The vacuum fan (1) is driven by a hydraulic motor (2) connected to the tractor's hydraulic system. In order to be able to regulate the speed, the tractor must be fitted with a regulating valve.

The tractor's hydraulic pump must pump enough oil so that the fan speed does not decrease, even if the tractor speed decreases or when other hydraulic functions are activated.

Vacuum is necessary for the operation of the single-grain metering unit. The vacuum is generated in the fan and directed to the metering units via the hose system and the distribution in the frame.

All components of the vacuum system must be completely leak-tight. Lack of airtightness can lead to seeding errors.

The vacuum pressure is monitored by a vacuum manometer or vacuum gauge (3).



* Vacuum blower



WARNING: DANGER OF INJURY ON THE VACUUM FAN.

- Do not operate the fan without the tank return connected.
- Remove the fan outlet only when the machine is at stands-till.

7.2 DISTRIBUTION HEAD OF FERTILISER

For fertiliser distribution there is a distribution head. All components (lid, pipes, etc.) must be airtight. The slightest leakage and air leakage will cause uneven distribution. During operation, the spreading tower must be vertical to prevent the fertiliser from being distributed unevenly across the width of the machine.



* Distribution head with fertiliser tubes

Maintenance

1. Check connections and pipes for leaks on a daily basis. Replace or repair damaged or crushed pipes immediately.
2. Check the metering unit and pipes daily for deposits or blockages and clean if necessary.



WARNING: RISK FROM DUST HARMFUL TO HEALTH (FERTILISER, TREATMENT PRODUCT). WEAR SUITABLE PERSONAL PROTECTIVE EQUIPMENT (PROTECTIVE GOGGLES, RESPIRATORY PROTECTION MASK, PROTECTIVE GLOVES) WHEN CARRYING OUT CLEANING AND MAINTENANCE WORK.



WARNING: DANGER OF INJURY WHEN WORKING ON THE METERING UNIT

- Always carry out work under the supervision of a second person.
- Use a suitable access element.

7.2.1 BLOWER FAN FOR FERTILISER

Information on the fertiliser fan can be found in the operating manual for the AURA front hopper.

7.2.2 MAXIMUM FERTILISER QUANTITIES

The maximum fertiliser quantity that can be spread with the fertiliser distribution head depends on the working speed of the seed drill. The table below shows the maximum quantities at a **speed of 8 km/h**.

Number of rows/ Working width (cm)	Pressurized Aura front hopper	Max. dose at 8km/h (kg/ha)
6 / 450	Ø120 mm transport tube and 6-row head.	350
7 / 490	Ø120 mm transport tube and 7-row head.	350
8 / 600	Ø120 mm transport tube and 8-row head.	350
9 / 585	Ø120 mm transport tube and 9-row head.	400
12 / 600	Ø120 mm transport tube and 12-row head.	400
12 / 600	Double metering unit, double Ø100 mm transport tube and a 12-row head.	600
12 / 600	Double metering unit, double Ø100 mm transport tube and double 6-row head.	750

These maximum quantities have been tested with the SOLA AURA front hopper. With other front hoppers on the market we do not guarantee these quantities.

If you sow at a different speed (V), the maximum fertiliser quantity (RM) will be inversely proportional to the speed. In the following formula, you can calculate the new maximum amount of fertiliser:

$$RM = \frac{[\text{Max. dose at 8 km/h}] \cdot 8}{V}$$

Where the values for "[Max. dose at 8 km/h]" can be found in the table above.



WARNING: DEPENDING ON THE TYPE OF FERTILISER, THE MAXIMUM POSSIBLE AMOUNT MAY ALSO BE LOWER.

7.3 FERTILISER FAN FOR TV MODELS

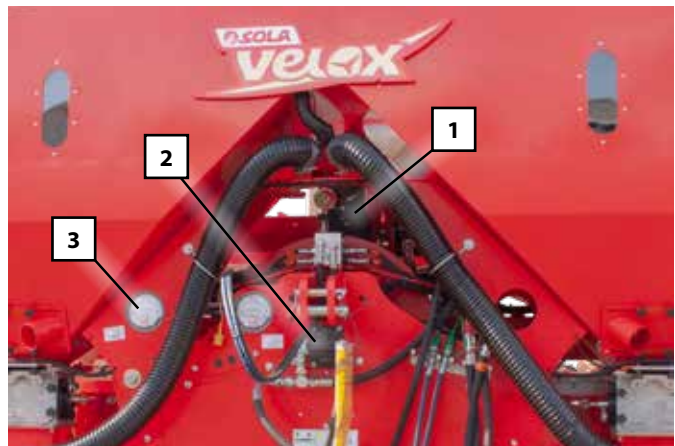
The fertiliser fan (1) is a positive pressure blower which is driven by a hydraulic motor (2) connected to the tractor's hydraulic system. In order to be able to regulate the speed, the tractor must be fitted with a regulating valve.

The tractor's hydraulic pump must pump enough oil so that the blower fan speed does not decrease, even if the tractor speed decreases or when other hydraulic functions are activated.

The blowing pressure is necessary for conveying the fertiliser from the metering units to the incorporation elements. The blowing pressure is generated in the blower and is directed to the metering units via the hose system.

All components of the pressure system must be completely leak-tight. Lack of tightness can lead to fertiliser distribution errors.

The blowing pressure is monitored by a pressure gauge (3).



7.3.1 BLOWER FAN SPEEDS

The speed required for the blower fan is different depending on the amount of fertiliser.

The speed, weight and form of the fertiliser, such as granulate or powder, as well as other factors also influence the amount of air required.

Blower fan speeds are monitored and controlled via the IS-OBUS application. Recommended speeds range from 3000 to 4000 RPM.

Blower fan speed too low

In case of insufficient blower fan speed,

- fertiliser residues may remain in the hoses and clog them.
- the distribution may be negatively affected:
 - Increase the fan speed. Make sure that the grains are not deposited outside the furrow.
 - Reduce the working speed, as the maximum amount of fertiliser may have been reached.



WARNING: THE SPEED SETTINGS MUST BE RECHECKED WHEN THE OIL IS HOT.

7.3.2 MAXIMUM FERTILISER QUANTITIES

The maximum fertiliser quantity that can be spread with the hopper of the combined machine depends on the working speed of the seed drill. The table below shows the maximum quantities at a **speed of 8 km/h**.

Number of rows/ Working width (cm)	Combined machine tank	Max. dose at 8km/h (kg/ha)
6 / 450	1400 l pressurized tank	500
7 / 490	1400 l pressurized tank	500
8 / 600	1400 l pressurized tank	500
9 / 585	1400 l pressurized tank	500

If you sow at a different speed (V), the maximum fertiliser quantity (RM) will be inversely proportional to the speed. In the following formula, you can calculate the new maximum amount of fertiliser:

$$RM = \frac{[\text{Max. dose at 8 km/h}] \cdot 8}{V}$$



WARNING: DEPENDING ON THE TYPE OF FERTILISER, THE MAXIMUM POSSIBLE AMOUNT MAY ALSO BE LOWER.

7.3.3 CONTROLS AND MAINTENANCE

Check the setting of the blower fan for fertiliser application at the start of work and regularly during machine operation.

Check that the fertiliser outlets on all fertiliser spreading elements are not clogged at the start of work and regularly during operation.

Return oil: Make sure that the return pressure does not exceed a maximum of 5 bar.

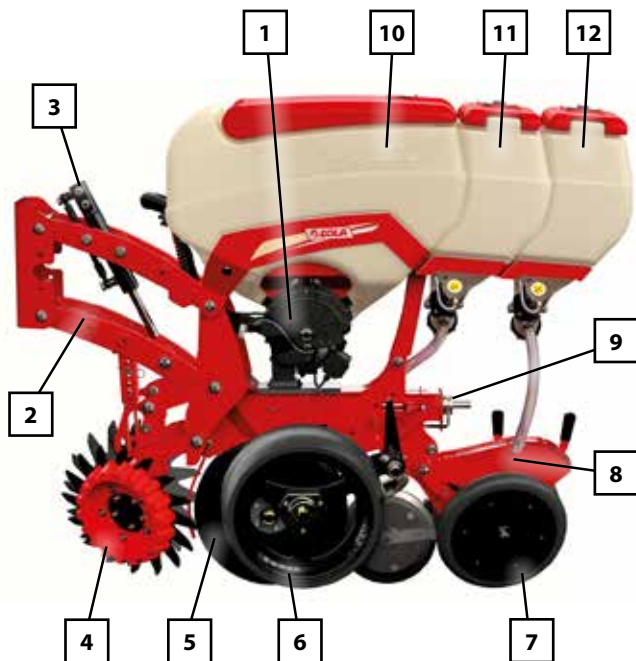
Clean the suction protection grille regularly so that the air flow is not reduced, thus preventing blockages. Accumulated dirt on the protective grille leads to air leaks which clog the pipes.

Accumulated dirt on the fan blades must be removed to prevent unbalance and vibrations. Dirt accumulated on the fan impeller can unbalance the impeller and thus damage the bearings and the hydraulic motor.

8. SOWING BODY

The single-grain seed drills of the VELOX PF/PV are attached to a foldable frame.

On the VELOX TV the sowing units are attached to a telescopic frame.



* Sowing unit with seed hopper and 2 microgranular hoppers.

NO.	DESCRIPTION
1	Metering unit
2	Parallelogram
3	Vertical hydraulic pressure cylinder
4	Residue-cleaning stars or Non-till kit
5	Groove opening discs
6	Depth control wheels
7	Closing wheels
8	Microgranule incorporator tube.
9	Depth adjustment
10	Seed depot
11	First microgranular metering unit tank
12	Second microgranular metering unit reservoir

8.1 COMPONENTS

8.1.1 SEED DEPOSIT

The seed hopper has a capacity of 70 litres. A lid closes the hopper and protects the seeds from dust and moisture.

Filling the seed hopper

Dust and moisture can penetrate when the tank is open. These increase wear and tear and lead to metering errors. Foreign particles can block the metering unit and damage it. Disinfectant dust may leak out, or seeds may fall out during transport.



WARNING: HEALTH HAZARD DUE TO LACK OF PERSONAL PROTECTIVE EQUIPMENT.

- Comply with the data in the manufacturer's safety data sheets of the substances used.
- Wear personal protective equipment (e.g. respiratory protection mask FFP3).



NOTE: IT IS RECOMMENDED TO ADD A MIXTURE OF 80% TALC AND 20% GRAPHITE TO THE SEEDS (EFLOW). THIS IMPROVES THE SOWING QUALITY, REDUCES THE REQUIRED TORQUE AND REDUCES THE WEAR OF THE DISC AND THE SUCTION SEAL.

- Add 35-70 ml per 100 l of seed or 25-50 ml per seed hopper (70 l). Approximately 1/8 to 1/4 cup per bag of seed.
- Mix the mixture well with the seeds.
- Do not exceed the recommended amount.
- If the seeds are wet or very small, the recommended amount can be slightly increased.
- Never use pure graphite as it can cause malfunctioning of the sensors.

1. Open and evenly fill the seed hopper.
2. Close the seed hopper.

Maintenance

Plastic parts of the metering system, seed hoppers, parts of the metering unit and the spray tube must not be sprayed with oil, rust inhibitor, diesel or similar. The plastic parts could crack and break.

8.1.2 DOUBLE DISC GROOVE OPENING DISCS

The opening discs open the seed channel by means of their wedge-shaped alignment.
The two opening discs must touch each other at the tips.

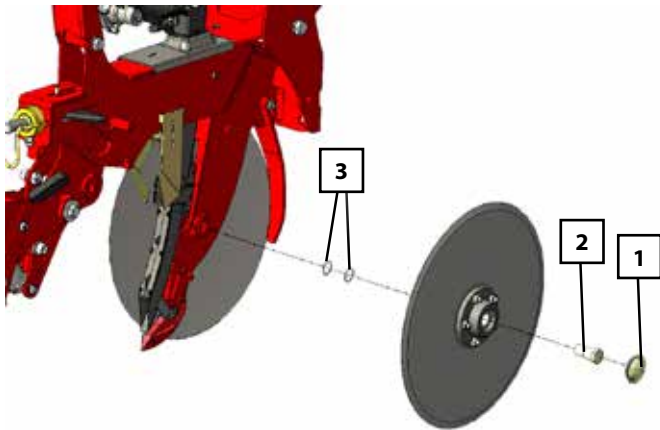
Check adjustment of the opening discs

The opening discs are set correctly when the following conditions are met:

- When rotating one of the two opening discs, the other disc rotates automatically at the same time...
- It is possible to rotate the two discs by hand, one layer in the opposite direction.

Resetting the opening discs

If there is wear, the pre-tension will be reduced and the discs will no longer touch each other. In such a case, the discs must be replaced or readjusted:



* Adjusting the opening discs

1. Remove the depth control rods. See section Depth control wheels.
2. Remove the disc hub cap (1), loosen the screw (2) and remove with the opening disc.
3. Remove one or two spacer washers (3).
4. Re-fix the opening disc with the screw (1). Tighten the screw with a torque of 140 Nm.
5. Make the modifications to the two opening discs.
6. Check the setting of the opening discs as explained above.
7. Replace the disc hub cap (1).
8. If necessary, readjust the distance of the depth control wheels to the opening disc.



NOTE: THE SCREWS ON THE RIGHT-HAND SIDE ARE RIGHT-HAND THREAD, THE SCREWS ON THE LEFT-HAND SIDE ARE LEFT-HAND THREAD.

Replacing the blade between discs



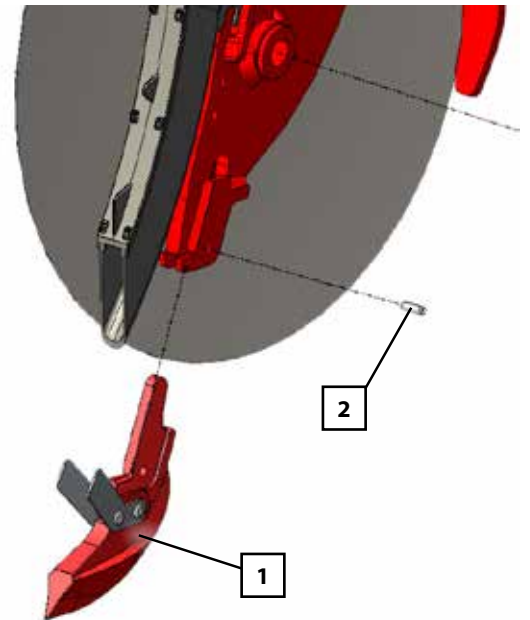
NOTICE:

- Never work without a blade between discs!
- To change the blade between the discs, the sowing discs must first be removed

Replace the blade (1) between discs when it is completely worn. The blade fits into the sowing unit and is fixed with the aid of a spring pin (2).

The blade between discs has the following functions:

- Scraping of the inside of the opening discs
- Protect the discs and seed drop tube from damage.
- Firm the bottom of the groove.



* Blade between discs

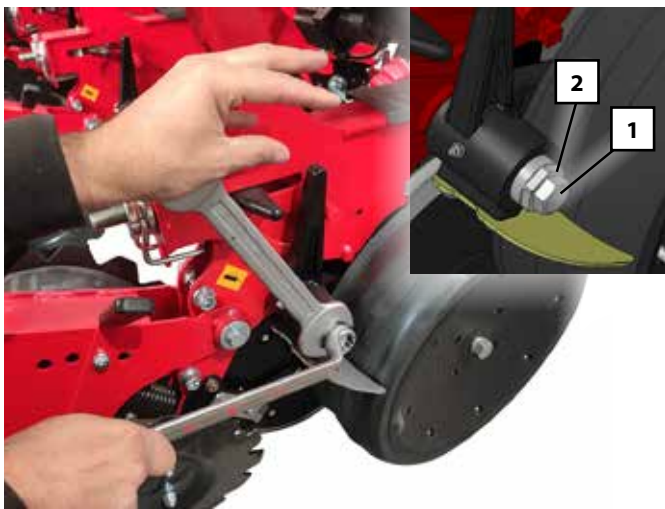
8.1.3 DEPTH CONTROL WHEELS

During sowing, the depth control wheels must rest on the opening discs and be cleaned.

The position of the wheels in relation to the opening discs must be adjusted, e.g. when readjusting the opening discs.



WARNING: PLACE THE DEPTH CONTROL WHEELS AS CLOSE AS POSSIBLE TO THE OPENING DISCS. DO NOT REST THEM TOO FIRMLY ON THE OPENING DISCS. **CONTROL:** LIFT THE DEPTH CONTROL WHEELS AND RELEASE THEM. THEY SHOULD FALL UNDER THEIR OWN WEIGHT.



Wheel adjustment

To adjust the adjustment of the wheels in relation to the opening discs, it is not necessary to remove the wheel or to add or remove any washers. There is a thread on the inside of the connecting rod which, by turning the threaded sleeve (2), moves the wheel away from the opening disc. This is only necessary for adjustment:

- 32-gauge fix spanner.
- 24-gauge angled spanner.

Proceed as indicated:

1. Unscrew the screw (1) by half a turn.
2. Turn the threaded sleeve (2) clockwise or anti-clockwise depending on whether you want to tighten or loosen the wheel.
3. Retighten the screw (1).
4. Check the setting again and if necessary readjust the depth control wheels.

Variants

There are three variants of depth control wheels.

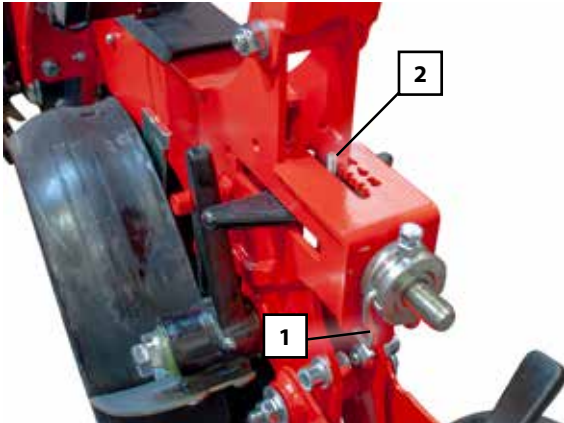


NO.	DESCRIPTION
1	Standard model.
2	Depth control wheel with spokes. Soil can more easily come out of the depth control wheel when the ground is viscous. However, the wheels are not suitable for stony soil or large stubble.
3	Narrow depth control wheel. Suitable for non-till with high residue and rows spacing less than 45 cm.

8.1.3.1 SET SOWING DEPTH

The sowing depth of the opening discs is limited by the depth control wheels.

The sowing depth is infinitely variable from approx. 1 to 8.5 cm. As the opening discs wear down, this depth decreases.



NO.	DESCRIPTION
1	Adjustment/locking hand.
2	Indicator for depth adjustment

1. Raise the machine.
2. Remove the hand (1) from its locked position and turn the hand until the indicator is at the chosen sowing depth.
3. Re-lock the hand (1).
4. Set the same sowing depth in all sowing units.

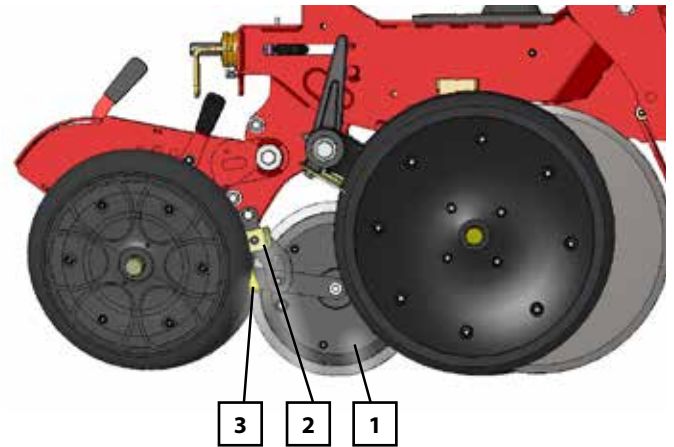


NOTICE:

- Check the seed depth in the field each time the depth setting is changed.
- If set to a greater sowing depth, the vertical pressure of the sowing unit must be checked. If necessary, increase the vertical pressure to guarantee the sowing depth. The depth control wheels must be pressed firmly into the ground and must always turn at the same time. The pressure must not be higher than necessary.
- If the opening discs on the sowing units behind the tractor wheels are subject to heavy wear, a greater sowing depth must be set on these sowing units. Regularly check the wear and the sowing depth on the sowing units behind the tractor wheels.

8.1.4 SEED PRESSING WHEEL

After exiting the drop tube, the seed pressing wheel immediately captures the seed and presses it gently into the ground. In this way, the seed can no longer jump.



NO.	DESCRIPTION
1	Seed pressing wheel
2	Blocking for exclusion.
3	Mud scraper

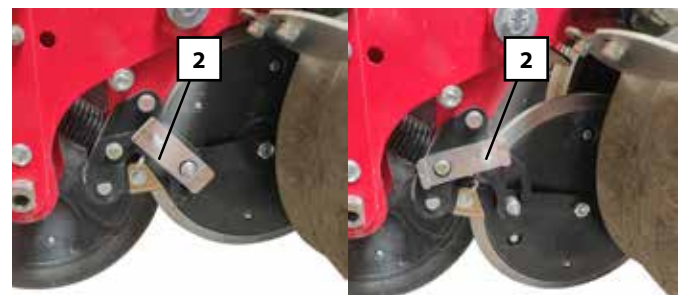


NOTICE:

- Regularly check the function of the seed pressing wheel. A blocked wheel can displace the grains during seed placement and thus lead to uneven distribution.
- Check that the scraper (3) on the wheel is working properly and does not rub excessively against the wheel.
- When the ground is wet and viscous, exclude the seed pressing wheels.

Exclusion of the wheel

1. Lift the wheel and turn the locking plate (2) forward to lock the wheel.
2. In working position, ensure that the locking plate (2) is in the correct housing.



* Seed pressing wheel; working and exclusion position.

8.1.5 CLOSING WHEELS

The closing wheels close the seed furrow with their V-arrangement and press the soil into the seed furrow.

The pressure of the closing wheels can be adjusted with the pressure adjustment lever (1). The angle of incidence of the wheels can also be adjusted with the angle adjustment lever (2).

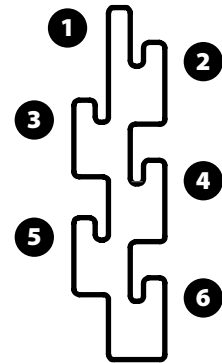
Pressure, angle of incidence and closing wheel spacing should be adjusted according to soil conditions and sowing depth.



Adjust the pressure of the capping wheels

1. Raise the machine high enough so that the wheels do not touch the ground.
2. Pull the adjustment lever backwards and move it in the central area until it clicks into the new position.
3. Adjust the spring pressure equally on all sowing units.

POSITION	KG
1	29
2	33
3	37
4	43
5	47
6	53



Adjusting the angle of incidence of the closing wheels

1. Raise the machine high enough so that the wheels do not touch the ground.
2. Pull the adjustment lever outwards and move it until it snaps into the new position.
3. Adjust the spring pressure equally on all sowing units.

The positions of the regulator are:

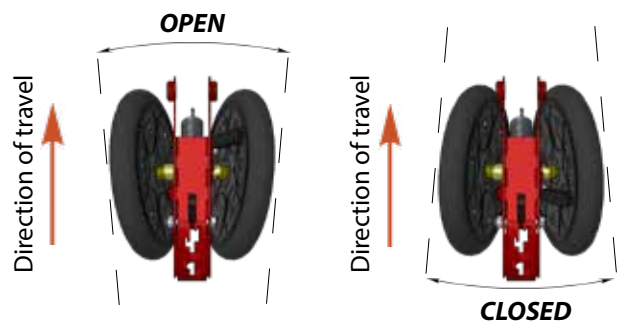
POSITION	DESCRIPTION
1	OPEN
2	OPEN
3	CLOSED
4	CLOSED



* Adjusting pressure rollers



WARNING: DANGER OF INJURY FROM ROTATING CAPPING WHEELS. DO NOT CLIMB ON TOP OF ROTATING CAPPING WHEELS.

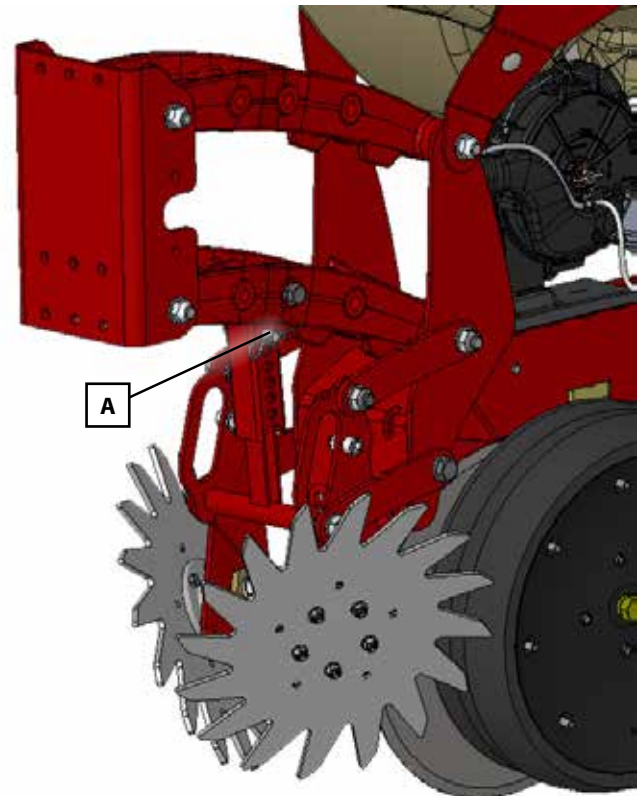


8.1.6 CLEANING STARS

The cleaning stars remove residues, stones and clods from the sowing line by means of a rotating movement. These are deposited in the area between the rows where they do not hinder the development of the crop.

The stars generally work on the surface of the floor, but can also be slightly embedded in the floor to ensure better cleaning.

8.1.6.1 WIPER STARS WITH PARALLELOGRAM



WARNING: SERIOUS CRUSHING INJURIES DUE TO FALLING OR LOWERING MACHINE PARTS.

- Support the lifted machine with suitable means.
- Do not work under the raised machine without safety measures.

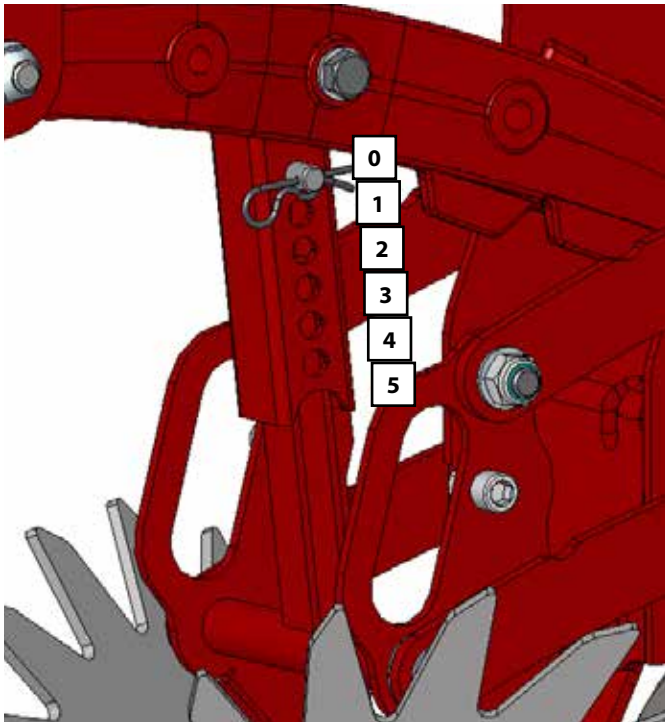
Parallelogram stars work by copying the surface of the ground and adapting to the relief of the ground. In order to prevent them from becoming too embedded in the floor, it is advisable to fix the lower limit. The lower limit can be adjusted by means of the bolt (A) and 6 height positions are possible.

Lower limit setting

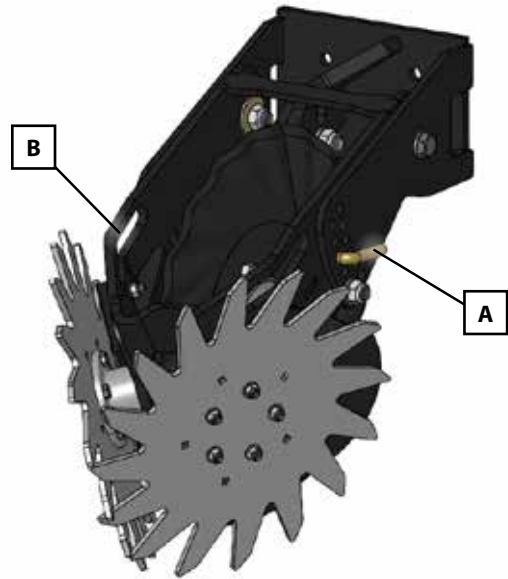
1. Lift the stars slightly so that the bolt (A) can be removed.
2. With the stars raised, place the bolt in the correct position.
3. Carry out this operation on all sowing units.



WARNING: IN THE UPPER POSITION (0) STARS ARE EXCLUDED.



8.1.6.2 CLEANING STARS FOR TURBO DISCS



WARNING: SERIOUS CRUSHING INJURIES DUE TO FALLING OR LOWERING MACHINE PARTS.

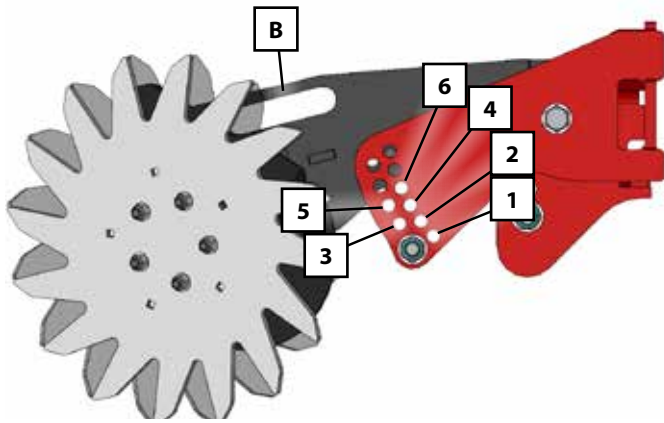
- Support the lifted machine with suitable means.
- Do not work under the raised machine without safety measures.

The cleaning stars for turbo discs can be adjusted in two different ways: floating or fixed height.

1. Adjusted in floatation.
2. Fixed height adjustment.

1. Cleaner stars set in flotation

In this case the stars work by copying the surface of the ground and adapting to the relief of the ground. In order to prevent them from digging too deep into the floor, it is advisable to fix the lower limit. The lower limit is adjusted by means of pin A and 6 positions are possible. Position 1 is the lowest and position 6 the highest.



To adjust the lower limit, the following must be done:

1. Slightly lift the star arm (B) to remove the pin (A). Use the handle to lift the star arm.
2. With the stars raised, insert the pin in the desired position. Always insert the pin under the arm of the stars without blocking the arm.
3. Carry out this operation on all sowing units.

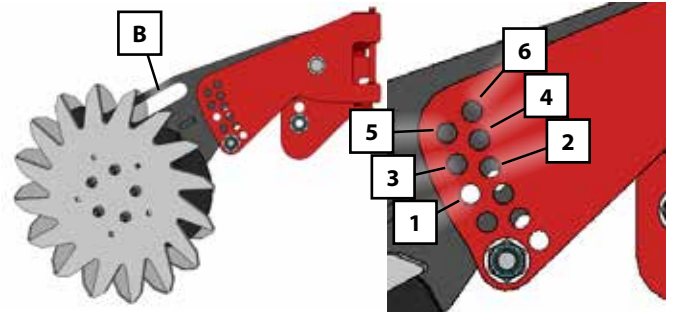


NOTICE:

- Cleaning stars with the lower limit set in points 4, 5 and 6 do not allow the complete hydraulic lifting of the sowing unit.
- Before hydraulically lifting the sowing unit, check that the wiper stars are at points 1, 2 or 3.

2. Fixed height adjustable cleaning stars

In this case, the starwheels are locked at a fixed height. This setting is suitable for extreme conditions where there is a lot of straw residue and stubble from previous harvests. The same pin A is used to fix the working height of the stars. It can be inserted in 6 positions. Position 1 is the lowest and position 6 the highest.



To adjust the working height, the following must be done:

1. Slightly lift the star arm (B) to remove the pin (A). Use the handle to lift the star arm.
2. With the stars raised, insert the bolt in the correct position. Always insert the pin in line with the hole in the star arm. With this, the star arm should be locked when the bolt is inserted.
3. Carry out this operation on all sowing units.



NOTICE:

- The wiper stars set at fixed height in points 4, 5 and 6 do not allow the sowing unit to be raised hydraulically completely.
- Before hydraulically lifting the sowing unit, check that the wiper stars are at points 1, 2 or 3.

8.1.6.3 CLEANING STARS WITH DEPTH CONTROL RINGS

Depth control rings can be fitted to all cleaning star models. The control rings are suitable for cleaning star models operating in floating mode. The control rings ensure a better copying of the ground surface and a better adaptation to the ground relief.

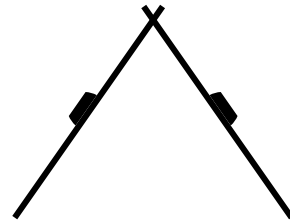


* Cleaning stars with control rings

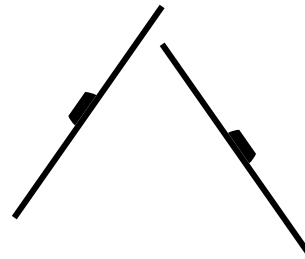
8.1.6.4 WIDTH ADJUSTMENT OF THE WIPER STARS

The cleaning stars with parallelogram and the cleaning stars for turbo discs can be mounted in 3 different ways thanks to the double fixing holes in each of the stars:

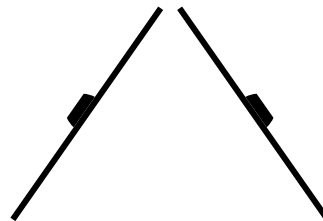
1. Both stars mounted in the front holes. The wheels are crossed for more aggressive work.



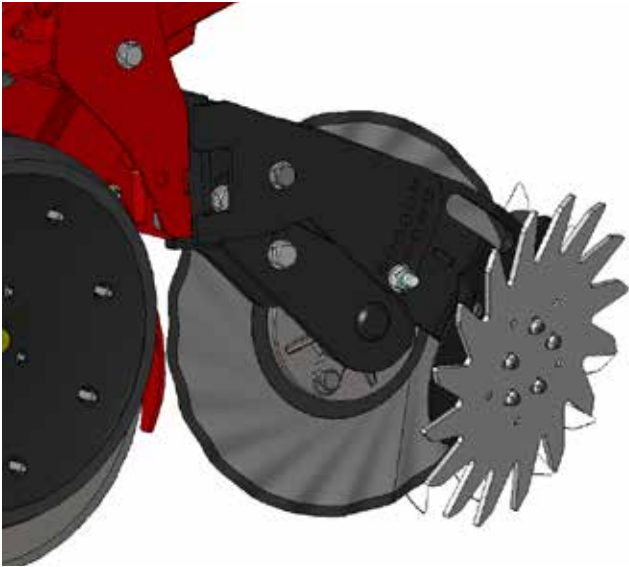
2. One wheel mounted in the rear hole (right or left), - Wheels are offset for mounting in narrow rows spacing.



3. Both wheels mounted in the rear holes - Wheels are spaced apart for a larger cleaning area



8.1.7 TURBO DISC OPENING DISC



The turbo disc opening disc and cleaning stars for turbo discs are particularly suitable for non-till sowing conditions (non-till sowing).

The turbo disc cuts the surface and at the same time, thanks to its wavy discs, prepares the sowing furrow...

For the correct functioning of the opening disc turbo disc:

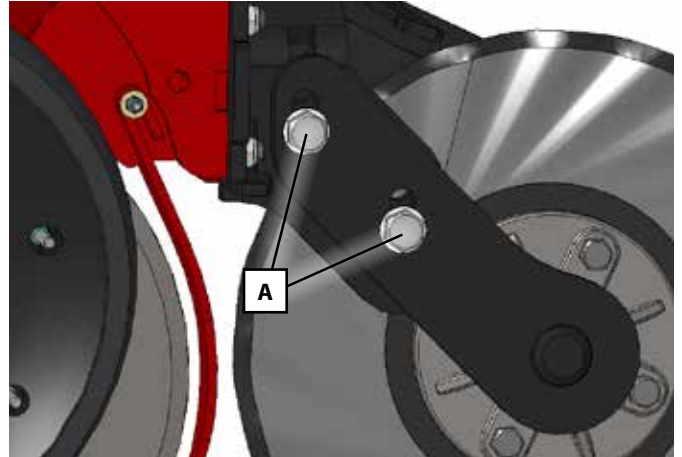
1. It must be aligned with the seeding line.
2. Its penetration depth must always be less than the penetration depth of the double disc opening disc



WARNING: NEVER WORK AROUND THE SEED DRILL BOOM WHILE IT IS IN THE RAISED POSITION WITHOUT USING SAFETY LOCKS.



CAUTION: NON-TILL COMPONENTS ARE VERY HEAVY. PAY SPECIAL ATTENTION TO LIFTING TECHNIQUES WHEN HANDLING AND/OR MANOEUVRING THE TURBO DISC DURING ASSEMBLY. PERSONAL INJURY COULD OTHERWISE OCCUR.



To adjust the depth of the turbo discs, it is necessary to adjust the screws (A). The depth positions are shown in the table below:

POSITION	HEIGHT WITH RESPECT TO PLANTING DEPTH(cm)
1	-1
2	+0,8
3	+1,5
4	+3,3

It is only necessary to change the position of the turbo disc if the wear between the double opening disc and the turbo disc is different.

9. SEEDING UNIT PRESSURE

During sowing, the sowing units press down on the opening discs with their own weight until the depth control wheels rest on the ground.

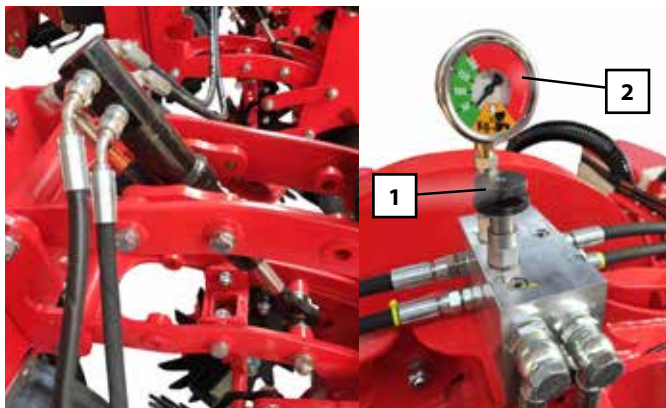
On VELOX planters, additional pressure can be transmitted to the sowing units. This additional pressure can be transmitted in 2 different ways:

- Mechanical pressure with tension springs.
- Hydraulic pressure with hydraulic cylinders.

9.1 HYDRAULIC PRESSURE

The hydraulic pressure cylinders transmit additional pressure to the sowing units. This additional pressure can be adjusted between 0-200 kg. In addition to the weight of the seeding unit itself, the seeding unit can exert up to 300 kg of pressure on the ground.

To transfer more than 80 kg of additional pressure, it may be necessary to transfer weight from the tractor to the seed drill. There are tractors that can transfer about 500 kg of vertical force to the seed drill. Another option is to equip the machine with the tractor weight transfer system, which can transfer up to 1000kg.



* Hydraulic body pressure cylinder and regulating valve.

The pressure of the pressure cylinders is adjusted by means of the control knob (1) and the pressure gauge (2) on the control valve.

Hydraulic pressure adjustment:

1. Actuate the hydraulic drive on the tractor with continuous hydraulic pressure on the coupling 1.
2. With the hydraulic pressure in continuous operation, adjust the knob (1) until the pressure gauge (2) reaches the selected pressure.



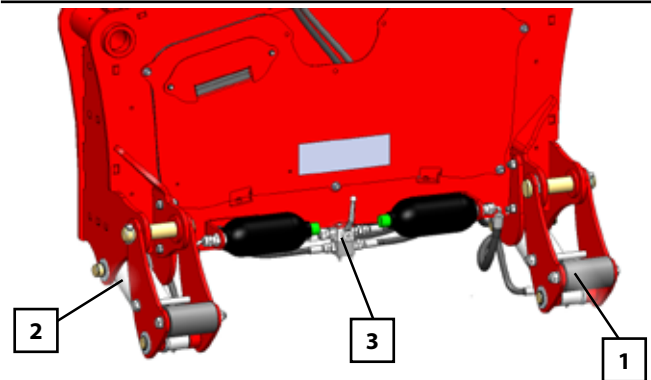
WARNING: DURING OPERATION, THE HYDRAULIC PRESSURE DRIVE MUST ALWAYS WORK WITH CONTINUOUS PRESSURE.

9.2 TRACTOR WEIGHT TRANSFER



WARNING: MOVEMENT OF HYDRAULICALLY OPERATED ELEMENTS. DANGER OF INJURY DUE TO CRUSHING OF BODY PARTS.

- Only operate the levers for weight transmission when there are no persons in the danger zone of the machine....
- Ensure that no collisions are caused by the clamping process



With the tractor weight transmission equipment it is possible to reach the maximum pressure of the seeding units. Up to 1000 kg of weight can be transferred from the tractor to the coulter bar.

The weight transfer system consists of:

- Weight transmission arms (1)
- Hydraulic cylinders for weight transmission (2).
- Disconnect tap (3).

The two cylinders (2) are connected to the pressure of the seed drums and when sowing the pressure level of the cylinders is equal to the pressure of the drums. The shut-off valve (3) is used to shut off the weight transfer system. During operation, the tap lever must be in a horizontal position.

For coupling and uncoupling the machine, the arms must be in the disconnected position. The 2 cylinders must be fully retracted.



WARNING: ALTHOUGH THE WEIGHT TRANSFER SYSTEM CAN BE SWITCHED OFF, IT IS RECOMMENDED TO ALWAYS WORK WITH THE SYSTEM ACTIVE.

9.2.1 DISCONNECTION OF THE WEIGHT TRANSFER

The weight transfer arms can be moved with the hydraulic control unit of the bodies' hydraulic pressure system:

- **Press on actuator 1:** to move the arms upwards
- **Press on actuator 2:** to move the coulter arms downwards. When the arms are lowered, the sowing coulters are also raised



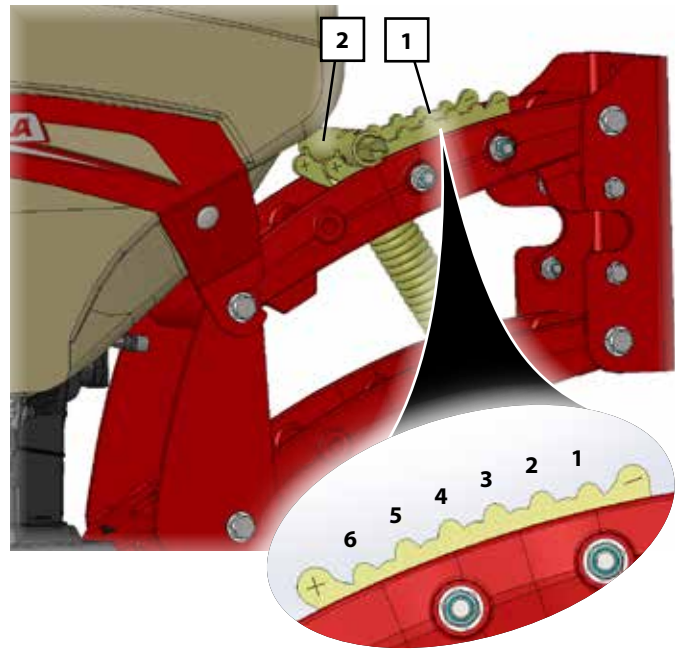
WARNING: MOVEMENT OF HYDRAULICALLY OPERATED ELEMENTS. DANGER OF INJURY DUE TO CRUSHING OF BODY PARTS.

- Only operate the levers for weight transmission when there are no persons in the danger zone of the machine...
- Ensure that no collisions are caused by the clamping process

To disconnect the system, proceed as indicated:

1. Ensure that the shut-off valve is in a horizontal position.
2. Move the arms downwards. This will raise the seed bodies.
3. With the cylinders fully retracted, close the shut-off valve (vertical lever).
4. Lower the seeding bodies again.

9.3 MECHANICAL PRESSURE



* Body pressure spring and spring adjustment positions.

The spring installed in the body parallelogram transmits additional pressure to the seeding units. This additional pressure can be adjusted between 0-65 kg. In addition to the weight of the coulter body itself, the coulter body can apply 165 kg of pressure to the ground.

By means of the 2 toothed plates (1) mounted on the parallelogram and the rotating cam (2) of the spring, the pressure of the bodies can be adjusted in 6 stages. Table 9.2.1 shows the pressure exerted in each position.

A ½" ratchet spanner is required to turn the cam. On machines equipped with the mechanical pressure system, this spanner is supplied with each machine.

POSITION	ADDITIONAL SPRING PRESSURE (KG)
1	0
2	11
3	23
4	36
5	50
6	65

Spring pressure adjustment:

1. Raise the machine.
2. Place the key in the square hole in the cam.
3. Turn the key backwards or forwards to the desired position.
4. Set the same position on all bodies.
5. At the start of work, check that the groove formation is correct and if necessary readjust the pressure.

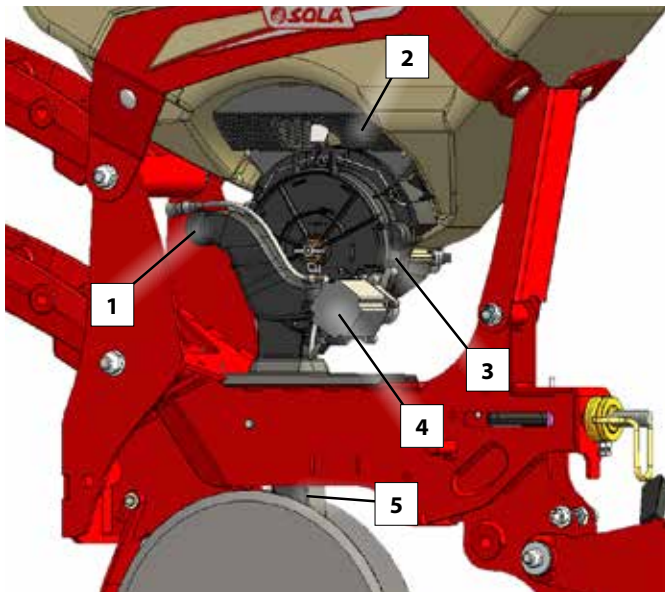


WARNING: CHECK THE FORMATION OF THE FURROW ON THE ELEMENTS BEHIND THE TRACTOR WHEELS AND IF NECESSARY ADJUST THE POSITION OF THESE ELEMENTS ALONE.

10. SEED METERING UNIT

The seed metering unit ensures the correct transport and distribution of the seed in the soil. In the metering unit, the seeds are separated by an electrically driven disc metering unit and conveyed to the soil via the drop tube.

10.1 OVERVIEW



NO.	DESCRIPTION
1	Pneumatic vacuum tube.
2	Air inlet grille.
3	Metering unit.
4	Engine.
5	Seed drop tube.

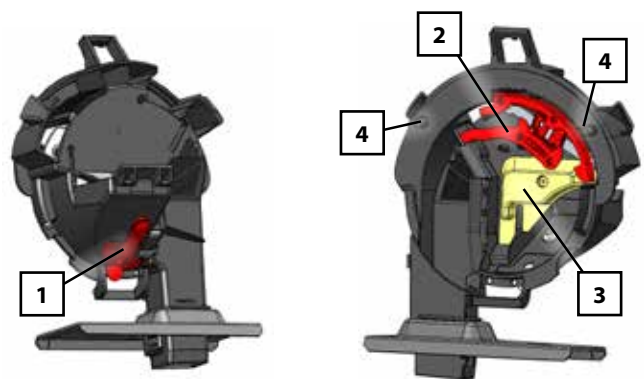
10.2 COMPONENTS

10.2.1 METERING UNIT

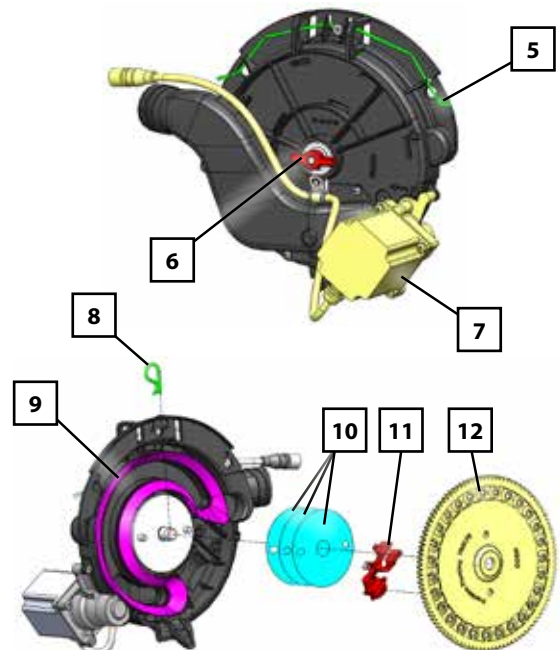


WARNING: DANGER OF CRUSHING IN THE METERING UNIT!

- Do not touch the metering unit when it is rotating.



* View of the fixed housing on the hopper.



* View of the removable cover.

NO.	DESCRIPTION
1	Emptying gate.
2	Singulator.
3	Seed inlet gate.
4	Lid fixing posts.
5	Closing spring.
6	Manually operated handle.
7	Engine.
8	Pin type R.
9	Vacuum seal.
10	Disc adjustment blades.
11	Ejector.
12	Metering unit disc.

Operation

By means of vacuum pressure, the grains are sucked into the rotating metering unit and conveyed from there.

The singulator removes the excess grains. There is one bean in each hole of the metering unit.

At the grain outlet, the grains are separated from the metering unit disc and fed into the fall tube.

Components

- Metering disc unit

Depending on seed type, sowing rate and seed properties (seeds/kg), different metering discs are available. Please refer to the "Crop Configuration Guide" for the recommended metering disc according to cultivator.

The metering units differ in the number of rows of holes and the number and diameter of the holes.

- Ejector

The function of the ejector is to eject clogged grains, broken grains or foreign particles from the holes of the metering unit. Depending on the cultivator disc used, there are different types of ejectors. Refer to the "Crop Configuration Guide" for the recommended ejector.

- Adjustment blades of the metering unit disc

The function of these blades is to keep the metering unit disc axially tight to the metering unit housing. If it is not correctly adjusted, this can lead to grinding or loss of seed. If it is too tight it can cause excessive wear.

- Seed inlet gate

The seed inlet flap controls the filling level in the seed metering chamber.



The damper has 4 positions (1,2,3,4) or can even be removed if necessary.

- Position 1: minimum opening.
- Position 4: maximum opening.

A very low seed level in the metering chamber impairs the seed intake of the metering unit. On the other hand, a very high seed level also impairs the function of the singulator. Refer to the "Crop Configuration Guide" for recommended settings according to cultivator. As a rule of thumb, set the gate to the lowest possible position, but be assured that the seed will flow at all times and will not clog at the metering unit entry point.

- Singulator

The singulator (1) removes the remaining seeds on the metering unit disc.

If the singulator and metering unit are correct for the seed type, only one seed per hole should remain in the metering unit after it has passed through the singulator.

Please refer to the "Crop Configuration Guide" for the recommended singulator according to cultivator.

Variants:

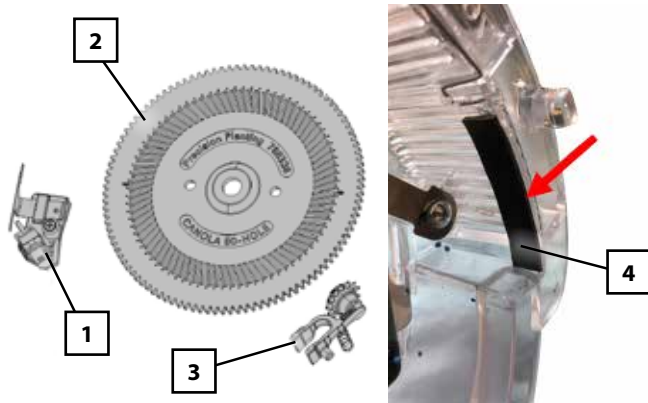
MODEL	DISC TYPE
CORN	Metering discs in a row
SOYBEAN	Two-row metering disc units Large seed metering units in a row.
MED ED BN	Large seed metering units in two rows.



- Scraper for rape

For small seeds such as rape, a scraper should be incorporated to ensure that some seeds come off the metering unit disc. The scraper is included in the rape cultivator kit along with the disc, ejector and a rubber adhesive strip.

The assembly instructions for the scraper are included in the rape cultivator kit package.



NO.	DESCRIPTION
1	Scraper.
2	Rapeseed metering unit.
3	Rape ejector.
4	Rubber adhesive strip.

When changing cultivators:

- Remove the scraper, as it could interfere with normal seed flow.
- Replace disc, ejector and singulator (if necessary).
- The rubber adhesive strip does not need to be removed. It can remain attached to the metering unit until the next rape sowing.

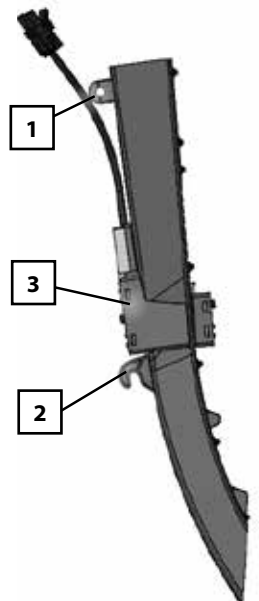
10.2.2 SEED DROP TUBE

After seed selection in the metering unit, the seed falls to the ground through the drop tube.

The seed sensor is the basis for monitoring the sowing quality. The sensor detects each seed and registers it in the control units.

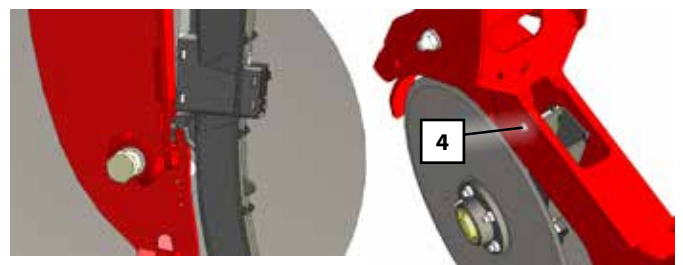
These evaluate the data and the times between the signals of each seed and calculate from this the coefficient of variation (seeding accuracy), failures and doublings.

For this reason, the drop tube and the sensor must be correctly mounted and fixed.



NO.	DESCRIPTION
1	Top anchor.
2	Hook.
3	Seed sensor.

Mount drop tube



* Seed tube blockage.

1. Guide the drop tube down through the central hole until the hook (2) is locked in the seed drill body.
2. Insert the upper bolt and nut (4) to fix the upper anchorage (1).
3. The sensor cable shall exit out the front of the pipe.



WARNING: DANGER OF ACCIDENT.

- Secure the machine to prevent it from lowering or moving unexpectedly.
- It is forbidden to stand under raised and unsecured parts of the machine.
- Work on raised machine parts only when they are mechanically fastened with suitable means.

4. Check from below that it is correctly fitted to the sowing unit. The drop tube must be fixed and clamped between the opening discs. If the tube can move forwards and backwards, the tube is mounted incorrectly.



WARNING: THE DROP TUBE MUST NOT BE DAMAGED OR DIRTY.

- Dust accumulations in the sensor eyes can prevent signals in the sensor. This can be the cause of erroneous data (poor points) in the computer
- Damage at the tube outlet such as tube breaks or wear burrs are the cause of uneven seed application.
- Accumulations/ clogging at the outlet of the tube due to wet or sticky soil are also the cause of uneven seed placement. In such cases, the drop tube slowly becomes clogged. It starts with a build-up behind the tip, until it is completely clogged.



WARNING: THE SENSOR CANNOT DETECT FAULTS IN THE LOWER PART OF THE DROP TUBE! ONLY WHEN THE TUBE IS CLOGGED AND FILLED UP TO THE HEIGHT OF THE SENSOR, THE SENSOR WILL BE ABLE TO GIVE AN ALARM. FOR THIS REASON, THE DROP TUBE MUST BE CHECKED AND CLEANED SEVERAL TIMES A DAY UNDER UNFAVOURABLE CONDITIONS.

10.3 METERING UNIT OPERATION

10.3.1 GENERAL INDICATIONS

the components in the metering unit are precision parts!

1. Negative external influences such as dirt, leaks, moisture or wear and tear have a negative effect on the quality of the sowing.
2. Handle the parts carefully and without applying force.
3. Replace parts if they are worn or damaged.
4. Do not grease parts with oil, lubricate or spray with anti-corrosion agent. The parts would stick together and become porous.
5. When replacing components, tighten screws by hand only. Do not use an electric screwdriver.
6. Do not damage the cables.
7. When assembling the housing parts, fit the parts together correctly by exerting light pressure.

10.3.2 EMPTYING THE SEED HOPPER

The seed hopper must be emptied in the following cases:

- Internal inspection of the metering unit.
- Installation of the cultivator kits.
- Change of cultivator.
- At the end of the sowing season.

The discharge chute supplied with each machine, which can be found inside the document box, is required for emptying:

1. Place the flange of the trough into the corresponding slot of the metering unit as shown in the picture. The carcass must rest on the sowing unit with the flange in the groove.



2. With the flume in place, open the drain damper by pulling it slightly and turning it to the left. Do not pull the flap too far apart as this could deform the closing spring and result in the flap not closing properly.
3. Close the emptying flap again. Do not leave any of the flaps open, as the seed will flow out freely when the hopper is refilled.

10.3.3 INSTALLATION OF THE CULTIVATOR KITS

In order to make it easier to adjust the metering unit to different crops, so-called "cultivator kits" are available. Most seeds have the specific components for that crop grouped together as a "cultivator kit". The cultivator kits consist of:

- Metering unit disc.
- Ejector.
- Singulator (depending on the cultivator).
- Scraper/brush (rape only).
- Brushes (according to cultivator).

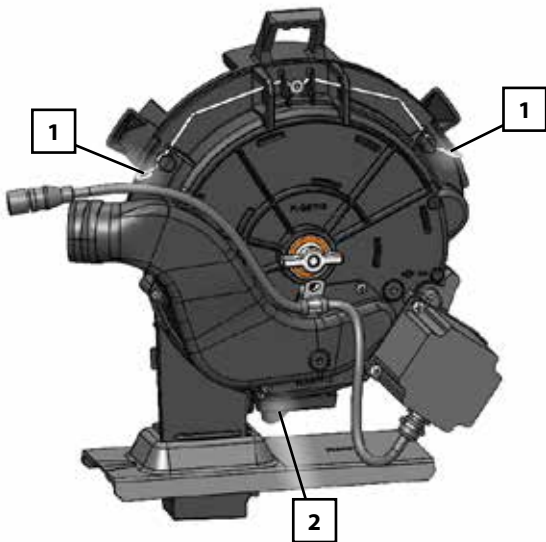
There are no cultivator kits for sunflower, sweet corn and pumpkin cultivation. For these, the individual components must be ordered separately.

For the installation of a cultivator kit, proceed as follows:



WARNING: BEFORE OPENING THE METERING UNIT MAKE SURE THAT THE SEED HOPPER IS COMPLETELY EMPTY. SEE SECTION 10.3.2 (EMPTYING THE SEED HOPPER).

1. Release the two retaining springs (1).
2. Remove the cover by first separating it from the top and lifting it out of the lower groove (2) until it can be removed completely.



The metering unit cover contains the disc and the ejector wheel. The singulator is assembled on the opposite half of the metering unit which is fixed to the seed hopper and which we call the housing.

3. The ejector must first be placed on the lid and behind the metering unit disc. To begin, place the lower pin into the spring before bending the plastic into place. The pictures illustrate how to insert the ejector into place. To remove it, simply apply pressure to the end of the bracket that holds it in place.



4. Place the disc in position by matching the 2 lugs and putting the pin "R" in place. The pin has less resistance if inserted vertically. The metering unit will have plastic shims inserted between the disc and the cover. The shimming process can be found in section 10.3.4. When inserting the disc, be sure not to pinch or roll the vacuum seal. If there are cracks or broken seams in the seal, replace it immediately. To remove the pin, hold the disc in place and pull the pin with it in an upright position, similar to the picture below, do not misplace the pin. Also, be sure to leave the disc adjustment blades in place when removing the disc.

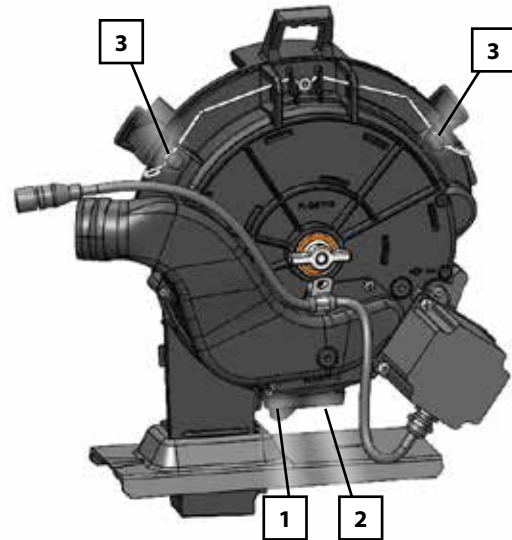


5. The final step in the installation of the cultivator kit is to place the singulator into the metering unit housing. Insert the base of the singulator into the bottom clip first and press into the top clip. Make sure that both the top and bottom sides of the singulator are flush with the spring tabs. Make sure the singulator is fully seated to ensure proper connection of the metering unit when assembling the cover and housing.

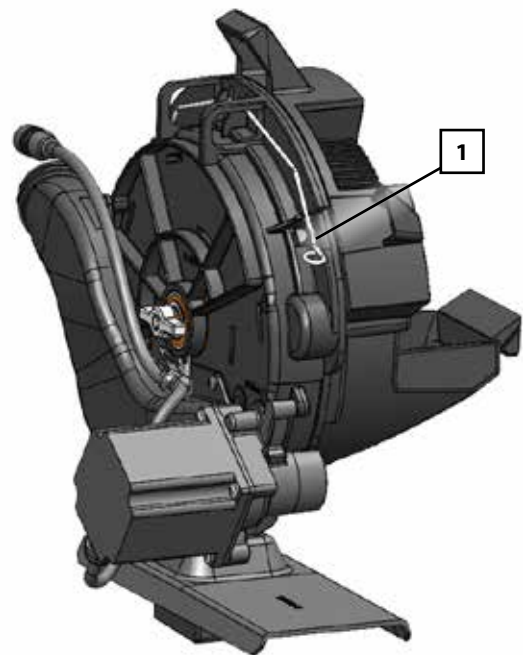


6. To remove the metering unit components for replacement, remove the parts in the same manner as installed in steps 1 through 5. To remove the singulator, pull back on the release tab and it will pop out.

7. When assembling the two metering unit halves, start by placing the tab (1) of the lid into the bottom slot(2) of the housing. Once inside the groove, close the lid until the clamping posts(3) snap into their sockets.



8. The two metering unit halves are correctly joined when the retaining springs (1) are fully engaged with the housing retaining posts. Make sure to keep the singulator pressed into the housing so that it fits correctly into the metering unit disc.



10.3.4 AXIAL ADJUSTMENT OF THE DISC METERING UNIT

The housing of the metering unit can be adjusted axially so that the metering unit disc has the correct distance to the housing. Incorrect adjustment can cause grinding or loss of seed. If it is too tight it can cause excessive wear.

The metering unit is fitted as standard with a number of adjustment blades inserted between the disc and the cover. The correct fit must be checked during use and when changing the metering discs:

1. On the lower edge of the metering unit cover there is an alignment indicator for the disc. The arrow points to the indicator.



2. View the surface of the disc in relation to the metering unit. The outer face of the disc must be between the lower and upper planes, as shown in the arrows below.



3. To check this, hold the disc flat against the centre plate of the unit. The number of adjustment blades required is determined by adding or removing blades so that the disc is within the lower and upper planes. The metering unit disc must be checked in at least two positions to determine the final blade count. Rotate 180 degrees for verification.

If you experience very small seeds escaping from the bottom of the metering unit, consider adding 1-2 adjustment blades (0.25 mm thick). The addition of blades may increase the current consumption of the motor and reduce stability, so only add them when necessary. These foils should be removed when switching to other cultivators. In most circumstances, the factory setting is recommended for lowest current draw, best stability and best spacing.

10.3.5 CULTIVATOR KIT CONFIGURATION GUIDE



NOTE: THE DATA IN THE TABLES ARE REFERENCE VALUES. DEPENDING ON SEED, WORKING SPEED AND OTHER FACTORS, FURTHER ADAPTATIONS MUST BE MADE FOR FINE ADJUSTMENT.

Component selection

The cultivator kits and the necessary components are selected and adjusted according to the cultivation configuration table (see below).

1. Select all components of the appropriate metering unit and/or cultivator kit according to crop, population and grain size.
2. Set the grain inlet flap to the indicated level. Start with the lowest level.
3. After the test has been carried out correctly, mount the appropriate components on all sowing units and adjust all metering units equally.
4. Check the values of singularity, faults and doubles obtained on the ISOBUS work monitor.
5. If the singularity is not satisfactory, fit the metering unit disc with the next smaller or larger bore diameter and re-test.
6. Select the metering disc with the best sowing quality and fit it to all metering units.

Vacuum pressure setting

The required vacuum pressure can be found in the cultivator settings table (see below).

1. Adjust the setting when the blower is running, see chapter Pneumatic system.
2. Check the pressure on the corresponding vacuum gauge.
3. After reaching the operating temperature in the hydraulic system, the fan speed must be corrected slightly if necessary.
4. Check the pressure again during sowing and adjust if necessary. The pressure changes when all metering discs have grain.
5. With sunflowers, set the vacuum pressure as low as possible.



WARNING: PERIODICALLY CHECK THE VACUUM PRESSURE DURING SOWING.

Selection of the disc according to the seed rate

The following formula shows how to calculate the seed rate (T); as a function of the desired population (P), the working speed (V) and the rows spacing (X)

$$T = \frac{P - V - X}{3\,600\,000}$$

Where:

T = seed rate (seeds/second)

P = population (seeds/Ha)

V = working speed (km/h)

X = distance between rows spacing (cm)

Select the appropriate metering unit disc according to the calculated seed rate, see below

General notes:

1. It is recommended to use eFlow Lubricant on all seeds at the rate of 1/8 to 1/4 cup per bag of seed, depending on the size of the seed. Do not over apply.
2. The 56-hole soy kit can work with either a corn or soy singulator.
3. Maize - If the seed is above 5500 seeds/kg, the Speciality disc with code 730085 (3.9 mm hole size) has a better singulation than the maize disc 730079. If planting corn in that seed size, try both discs for best performance.
4. Peanuts/Beans : If you use the peanuts/beans disc, it may be necessary to remove the seed inlet flap completely to avoid clogging the seed inlet. It may also be necessary to remove the singulator with large and long seeds.
5. With large seeds it is likely to be necessary to use a special drop tube for large seeds.



NOTICE:

- The colour of the table corresponds to the actual colour of the parts.
- The maize cultivator kit is included as standard with the machine.

CULTIVATION SIZE (Qualitative)		CORN	SWEET CORN				CORN POPPED CORN	
			S	M	L	XL	Small	Grande
Size (no. seeds/kg)		2200-6200	4400-10000					
Seed rate (seeds/second)		<32						
Recommended vacuum setting (cm. a.c.)		50	45-55				50	50
Seed inlet damper adjustment		2	4				2	
Code cultivator kit		768341						
Disc	Name	Corn	Speciality 3,2	Speciality 3,4	Speciality 3,7	Speciality 3.9	Speciality 2,9	Speciality 3,2
	no. of holes	27	27	27	27	27	27	27
	bore Ø (mm)	4,5	3,2	3,4	3,7	3,9	2,9	3,2
	Code	730079 *	730082	730083	730084	730085	730081	730082
Singulator	Name	CORN	CORN	CORN	CORN	CORN	CORN	CORN
	Code	768355 *	768355	768355	768355	768355	768355	768355
Ejector	Name	Corn	Speciality	Speciality	Speciality	Speciality	Speciality	Speciality
	Code	768291 *	768293	768293	768293	768293	768293	768293
Other components	Description							
	Code							

* Parts included in the cultivator kit

CULTIVATION SIZE (Qualitative)		PUMPKIN		SUNFLOWER						
		Edible	Orna-mental	Large edible	Small edible	XL	L	M	S	XS
Size (no. seeds/kg)				4400-8800		6600-22000				>22000
Seed rate (seeds/second)										
Recommended vacuum setting (cm. a.c.)		28-30	30-33		28-30		18-20	15-18	15-30	
Seed inlet gate adjustment		3		4			3	2		
Code cultivator kit				768341	768341					
Disc	Name	Speciality 3,2	Speciality 3,2	Corn	Corn	Speciality 3,9	Speciality 3,4	Speciality 3,2	Speciality 2,9	Speciality 2,5
	no. of holes	27	27	27	27	27	27	27	27	27
	bore Ø (mm)	3,2	3,2	4,5	4,5	3,9	3,4	3,2	2,9	2,5
	Code	730082	730082	730079 *	730079 *	730085	730083	730082	730081	730080
Singulator	Name	CORN	CORN	CORN	CORN	CORN	CORN	CORN	CORN	CORN
	Code	768355	768355	768355 *	768355 *	768355	768355	768355	768355	768355
Ejector	Name	Speciality	Speciality	Corn	Corn	Speciality	Speciality	Speciality	Speciality	Speciality
	Code	768293	768293	768291 *	768291 *	768293	768293	768293	768293	768293
Other components	Description			Upper brush for large seed						
	Code			768428						

CULTIVATION SIZE (Qualitative)		SOYA		JEWISH			PEANUTS	
				S	M	L	S / M	L
Size (no. seeds/kg)		4400-10000		>4400	2900-4400	<2900	1100-3000	440-1300
Seed rate (seeds/second)			<120				<50	
Recommended vacuum setting (cm. a.c.)		50		45-55	45-60	45-65	50-75	40-75
Seed inlet damper adjustment		2			3	4		REMOVE
Code cultivator kit		768342	768690	768342	768349	768343	768429	768650
Disc	Name	Soybean 80	Soybean 56	Soybean 80	Medium Edible Bean	Large Edible Bean	Peanut	Large Peanut
	no. of holes	80	56	80	70	32	32	29
	bore Ø (mm)	3,9	3,9	3,9	4,3	5,3	5,8	6,4
	Code	730039 *	768687 *	730039 *	730295 *	730294 *	730361 *	768651 *
Singulator	Name	SOYBEAN	CORN	SOYBEAN	MED ED BN	SOYBEAN	SOYBEAN	N/A
	Code	768360 *	768355	768360 *	768430 *	768360	768360	N/A
Ejector	Name	Soybean 80	Soybean 56	Soybean 80	Soybean 80	Large Edible	Large Edible	Large Edible
	Code	768292 *	768689 *	768292 *	768292 *	768294 *	768294 *	768294 *
Other components	Description				Upper brush for large seed	Upper brush for large seed	Upper brush for large seed	Upper brush for large seed
	Code				768428 *	768428 *	768428 *	768428 *

* Parts included in the cultivator kit

CULTIVATION SIZE (Qualitative)		CHICKPEA			BROAD BEANS	
		S	M	L	S/M	L
Size (no. seeds/kg)		>4400	2900-4400	<2900	1100-3000	440-1300
Seed rate (seeds/second)					<50	
Recommended vacuum setting (cm. a.c.)		45-55	45-60	45-65	50-75	40-75
Seed inlet damper adjustment		2	3	4		REMOVE
Code cultivator kit		768342	768349	768343	768429	768650
Disc	Name	Soybean 56	Medium Edible Bean	Large Edible Bean	Peanut	Large Peanut
	no. of holes	56	70	32	32	29
	bore Ø (mm)	3,9	4,3	5,3	5,8	6,4
	Code	768687 *	730295 *	730294 *	730361 *	768651 *
Singulator	Name	CORN	MED ED BN	SOYBEAN	SOYBEAN	N/A
	Code	768355	768430 *	768360	768360	N/A
Ejector	Name	Soybean 56	Soybean 80	Large Edible	Large Edible	Large Edible
	Code	768689 *	768292	768294 *	768294 *	768294 *
Other components	Description		Upper brush for large seed	Upper brush for large seed	Upper brush for large seed	Upper brush for large seed
	Code		768428 *	768428 *	768428 *	768428 *

CULTIVATION SIZE (Qualitative)		COTTON			MILO	WHEAT / BARLEY	RAPE	SUGAR BEET	
		1 - seed	2 - seed	3 - seed				Small	Grande
Size (no. seeds/kg)		9300-13900			26K-42K		165K-400K	>60K	<60K
Seed rate (seeds/second)		<35				<300			
Recommended vacuum setting (cm. a.c.)		50-55	25-75		25-40	15-40	40-65	25-50	
Seed inlet gate adjustment		1				1-2	1		
Code cultivator kit		768499	768344	768345	768347	768665	768348	768346	768347
Disc	Name	Singulated High Rate Cotton	2-Seed Hilldrop Cotton	3-Seed Hilldrop Cotton	Large Sugarbeet	Wheat	Canola	Small Sugarbeet	Large Sugarbeet
	no. of holes	32	40	39	32	164	80	32	32
	bore Ø (mm)	2,9	2,9	2,9	2,2	1,8	1,2	1,6	2,2
	Code	730296 *	730292 *	730298 *	730291 *	768663 *	768338 *	730290 *	730291 *
Singulator	Name	CORN	SOYBEAN	SOYBEAN	CORN	SOYBEAN	CORN	CORN	CORN
	Code	768355	768360	768360	768355	768360	768355	768355	768355
Ejector	Name	Sugarbeet	2-Seed Hilldrop Cotton	3-Seed Hilldrop Cotton	Sugarbeet	Wheat	Canola	Sugarbeet	Sugarbeet
	Code	768295 *	768296 *	768297 *	768295 *	768666 *	768680 *	768295 *	768295 *
Other components	Description		Upper restriction brush	Upper restriction brush		Upper restriction brush	Scraper for rape		
	Code		768379	768379		768379	768335		

* Parts included in the cultivator kit

Control in the field

Sowing quality depends on other factors in addition to the metering unit setting. It can be negatively affected by:

- The speed of the metering unit. This depends on the working speed and the seed rate per ha. Reduce the working speed.
- Shallow soil finish and fluctuating soil conditions causing the seeding units to shake. Raise the seed drill pressure and reduce speed.
- Condition of the drop tube and seed pressing wheel.



WARNING: CHECK THE QUALITY OF APPLICATION IN ALL AREAS (SOWING DEPTH, TRANSVERSE AND LONGITUDINAL SEED DISTRIBUTION) AT THE START OF WORK AND, ON LARGE AREAS, ALSO DURING WORK.

Rape sowing

When sowing rape at high sowing rates, the seed is not 100% correctly detected by the sensor.

For this reason, it is essential to reduce the alarm threshold in order to avoid continuous low seed alarms.



WARNING: IF THE METERING SYSTEM IS NOT CLEANED REGULARLY, THIS CAN LEAD TO SOWING ERRORS OR EVEN SHUTDOWN OF THE METERING UNIT! CLEAN THE METERING UNIT AS INTENDED, SEE MAINTENANCE TABLE.

10.3.6 ANNUAL MAINTENANCE OF THE METERING UNIT

1. Check the singulator for wear.
 - Replace it when excessive wear occurs. An increase in doubles may indicate excessive wear on this part.
 - A singulator checking tool can be used.
2. Check the vacuum seal for cracks or wear.
3. Check the disc for worn graphite (reapply graphite if it has worn away)
 - Replace the disc if the disc holes are excessively deformed or if significant marks occur on the vacuum side of the disc.
4. Check if the ejector wheel is worn.
 - Replace the assembly if excessive wear occurs on the arm inside the ejector wheel.
 - Inspect each wheel nipple to verify that they are intact.
 - Check the plastic tension and replace if loose at the mounting location on the metering unit.
5. Check that the brushes are not excessively worn.
 - Replace when gaps and/or wear of brush bristles become significant enough for seed to pass through.
6. Vacuum seal replacement.
 - Remove the vacuum seal by pulling it out of the metering unit cover.
 - Check that both the replacement seal and the groove in the metering unit housing are clean of debris. If cleaning is required, use warm water and a cloth or compressed air.
 - Insert a new seal into the beginning of the housing at one end. As the seal is being fitted, check that the retaining tabs are showing on the opposite surface of the metering unit. Ensure that the seal is firmly seated and that there are no waves or bumps.
 - All retaining tabs must be used and the seal must be seated in the raceway. Alignment of the retaining tabs will help ensure proper sealing.



10.3.7 TROUBLESHOOTING

Seeding problems and errors can occur, among others, in the seed inlet flap, in the singulator, in the grain outlet, in the vacuum seal seals or in the seed drop tube.

A good way to solve problems with specific rows is by the process of elimination. Try replacing the components of the "bad" rows with the components of the "good" rows until you reduce the root cause.

Symptom: The metering unit stops sowing.

Solution:

- If a metering unit stops seeding while the others continue planting and it is not due to a swath event, it is most likely because that swath ran out of seed, the swath control clutch failed or the vacuum was disconnected.
- The seed inlet flap is another possible cause of the metering unit not being able to seed. If you detect an unseeded section, consider opening the deflector to a higher position.
- If there are no foreign objects in the metering unit, look for evidence of seed grinding. If that appears to be the case, the disc may not be set correctly. The disc thicknesses are set at the factory, but it is possible for them to fall out. See section on adjusting disc thicknesses.

Symptom: Excessive faults.

Solution:

- Ensure that the correct singulator, disc and ejector are installed in the metering unit. Do not interchange components, as performance will degrade.
- If the metering unit constantly jumps, check that no fragments are lodged in any of the holes of the disc.
- When assembling the metering unit, ensure that the singulator is installed correctly and that the lobes are seated flush against the disc surface.
- Check the metering unit metering unit outlet line and seeding tube for debris that may be deflecting seed.
- Check that the disc is set with correct thicknesses. The disc may have difficulty loading if the wrong number of thicknesses are used.
- Increase vacuum until singulation improves. Check for leaks in the vacuum system that could cause certain rows to have less vacuum. However, in general, if singulation problems are the result of lack of vacuum pressure, you should see singulation errors throughout the seed drill.

Symptom: Excessive doubles.

Solution:

- Ensure that the correct singulator, disc and ejector are installed in the metering unit. Do not interchange components, as performance will degrade.
- When assembling the metering unit, ensure that the singulator is installed correctly and that the lobes are seated flush against the disc surface. Ensure that the radial spring (which pushes the singulator towards the centre of the disc) is installed and acting on the singulator.
- Check the metering unit metering unit outlet line and seeding tube for debris that may be deflecting seed.
- Check if the singulator is excessively worn.
- Decrease the vacuum. In general, 50 cm.w.c. vacuum is appropriate for all types of seeds, but decrease if necessary. Continue to decrease the vacuum until the metering unit singulation improves. If doubles are caused by excessive vacuum pressure, you should see singulation errors throughout the seed drill.

Symptom: Poor spacing

Solution:

- Check the metering unit metering unit outlet line and seeding tube for debris that may be deflecting seed.
- Try turning the metering unit manually. Look, feel and listen for unusual sounds as it rotates. If it hardens, remove the disc and look for debris that may be stuck in the metering unit and make sure the disc is correctly adjusted.
- Check for seed fragments between the teeth of the disc. Clean and check the suitability of the cultivator kit used.
- Check that the vents allow free air flow to the metering unit. The vent is integrated into the hopper housing.
- Reduce speed to see if poor spacing is due to driving the row unit.
- Ensure that eFlow is being used and that it is agitated in the seed group.

Symptom: Wrong population

Solution:

- Check the dose and number of holes settings in the ISOBUS controller.

11. MICROGRANULATOR

With the solid microgranular applicator, the product can be spread at the same time as the seed.

11.1 MICROGRANULAR APPLICATOR



WARNING: DANGER OF INJURY FROM MICROGRANULARS. UNPROTECTED HANDLING OF MICROGRANULARS CAN CAUSE SERIOUS DAMAGE TO HEALTH. BEFORE WORKING WITH MICROGRANULAR PRODUCTS, THE SAFETY INSTRUCTIONS OF THE RESPECTIVE MANUFACTURER MUST BE OBSERVED!



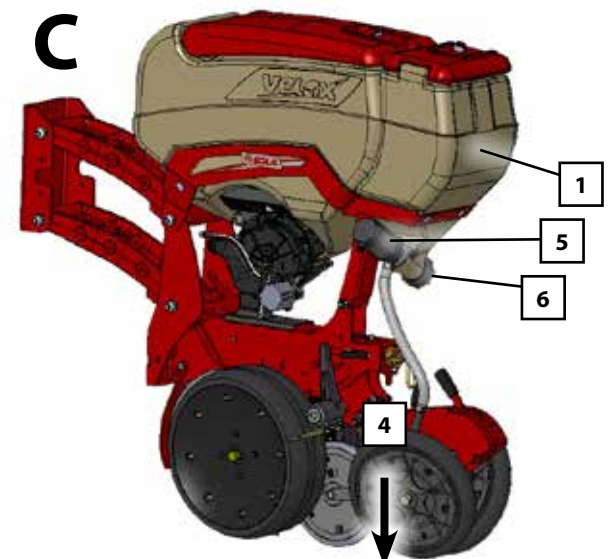
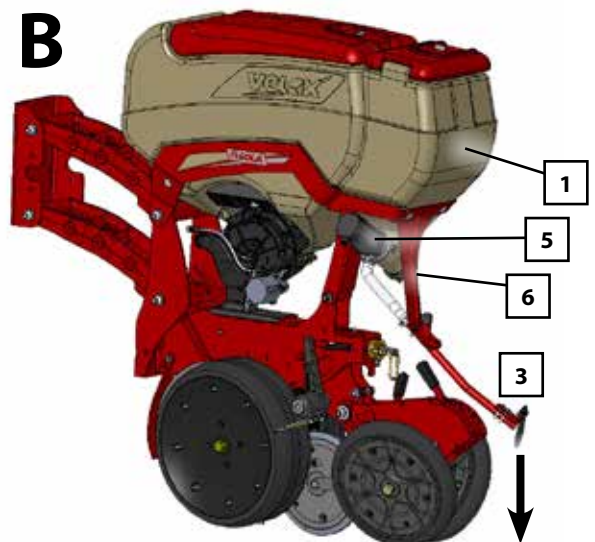
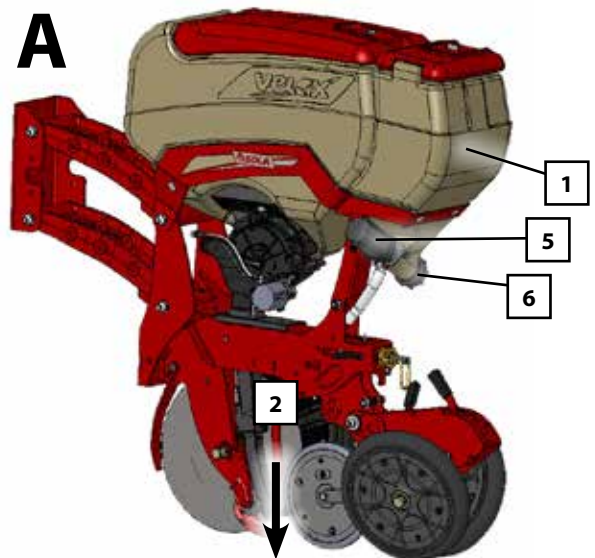
NOTICE:

- The microgranular applicator is designed for use with microgranulars only.
- Microgranulars with grain diameters from 0.3 mm to 4 mm can be applied.
- The microgranule applicator unit is only operational when working in combined operation with the precision planter.

The microgranular applicator can place the microgranulars in 3 different shapes and positions:

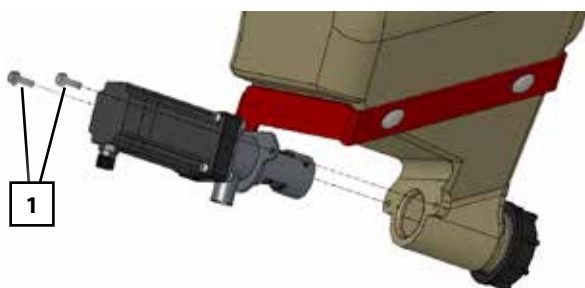
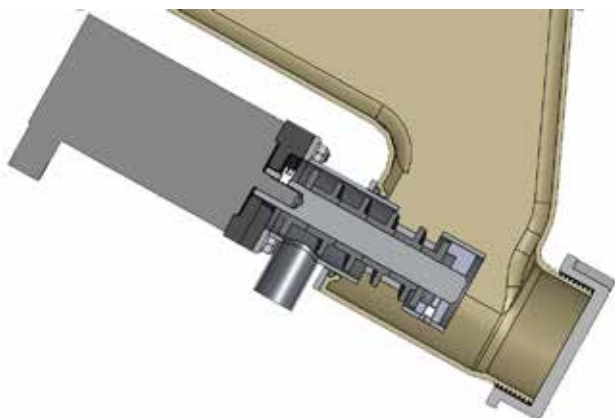
- A.** Buried within the furrow in contact with the seed.
- B.** Spread on the soil positioned over the sowing furrow.
- C.** Semi-buried. Partly in the furrow and partly on the ground.

NO.	DESCRIPTION
1	20 litre hopper for microgranulars.
2	In-furrow application.
3	Application in the sowing furrow.
4	Application half-buried in the furrow.
5	Motor/metering unit.
6	Drain plug.



11.1.1 METERING UNIT FOR MICROGRANULARS

The microgranular metering unit consists of an endless metering roller and is suitable for all products and doses. This roller allows dosing from 0.5 kg/ha to 70 kg/ha by simply changing the motor speed.



In case of blockage, remove the fixing screws (1), remove the metering unit and clean the blockage.



CAUTION: DANGER OF CRUSHING ON THE METERING UNIT! DO NOT OPERATE THE METERING UNIT WITH THE METERING UNIT OUTSIDE THE HOPPER.

11.1.2 CALIBRATION OF THE MICROGRANULAR METERING UNIT



NOTICE:

- Watch out for foreign particles in the granulate and in the hopper.
- Fill all hoppers with the same amount of product, so that the product is finished at the same time in all hoppers.

Before application, it is necessary to calibrate the microgranular applicator.

During the work, it is advisable to make frequent checks to validate or correct the initial calibration.

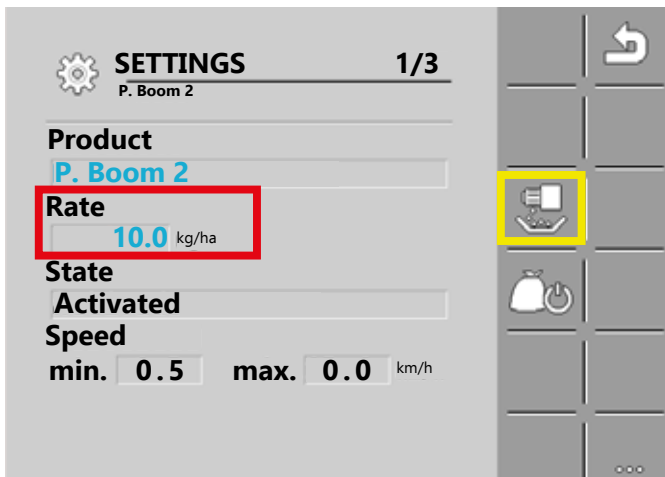
First the calibration of the microgranular applicator of body number 1 will be carried out and then the calibration for the rest of the bodies will be carried out.

For calibration, follow the steps below:

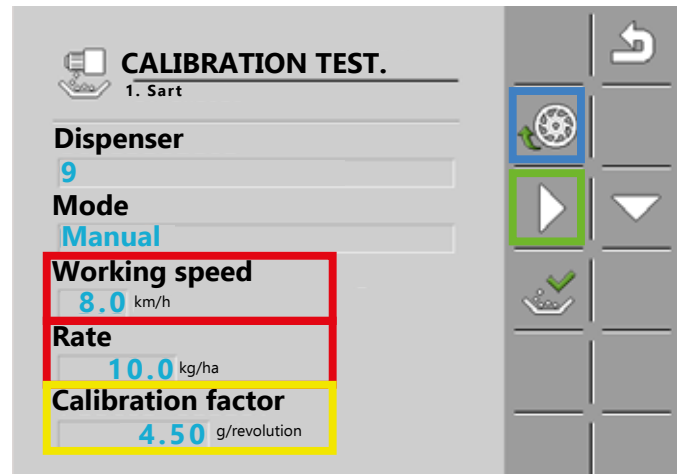
1. Raise the machine slightly until the calibration bucket can be placed under each microgranular outlet.



2. Fill the hopper with the product to be applied and place the calibration bucket.
3. Actuate the ISOBUS controller on the tractor monitor and go to the calibration screen for the product "P. Boom 2" product. Enter the desired application rate (red) and press the calibration button (yellow). See specific manual for ISOBUS controllers.



5. Pressing the "Play" icon (green) will start the calibration test.



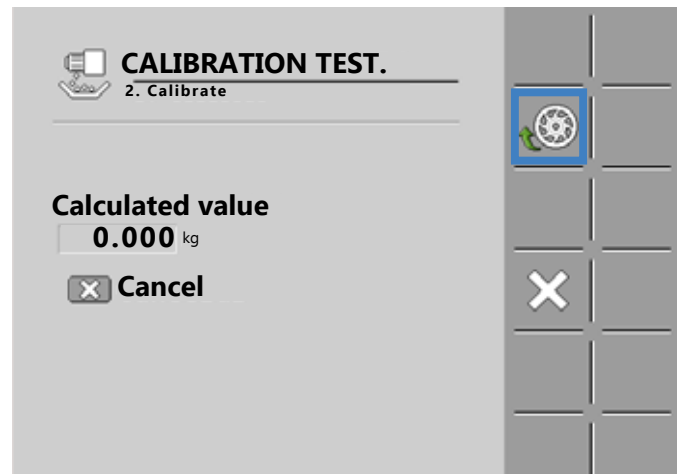
THE MICROGRANULAR APPLICATOR EQUIPMENT HAS AS MANY METERING UNITS AS THE NUMBER OF SEEDING UNITS. ALL METERING UNITS ARE IDENTIFIED BY A NUMBER. THE FIRST NUMBER CORRESPONDS TO THE SEED METERING UNITS. THE SECOND NUMBER IS FOR THE MICROGRANULAR APPLICATOR UNIT.

6. To perform the test, the calibration button must be pressed and held down. You can use the calibration button on the display (blue) or the calibration button on the sowing unit. Press and hold the calibration button until a minimum of 0.060 kg of calculated value is reached.

Enter value for working speed and desired application rate (in red). In the field "Calibration factor" (yellow), enter the following values depending on the type of granulate:

- For large granular products (Ø 2-4 mm): 3
- For medium-sized granular products (Ø 0.5-2 mm): 4,5
- For fine granular products (Ø 0.3-0.5 mm): 6

4. Before starting calibration, turn the metering unit by means of the pre-fill button (blue) until product starts to flow into the bucket.



EMPTY THE BUCKET BEFORE STARTING THE CALIBRATION TEST.



PRESS AND HOLD THE BUTTON TO PICK UP THE MAXIMUM AMOUNT OF PRODUCT, THE MORE PRODUCT YOU CAN PICK UP, THE MORE ACCURATE THE CALIBRATION TEST WILL BE.



11.1.3 EMPTYING THE HOPPER OF MICROGRANULARS

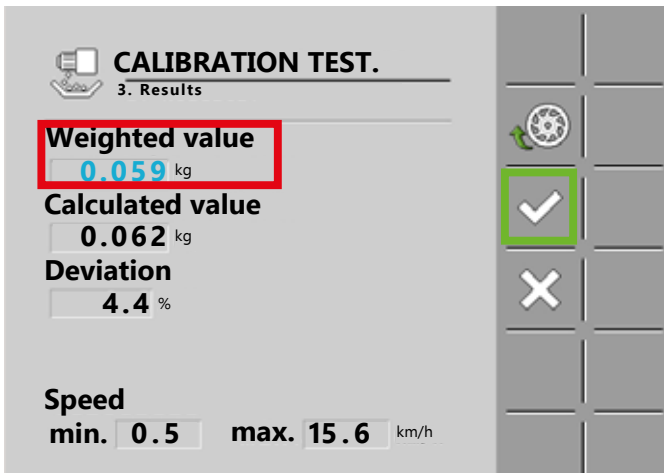
The microgranular hopper can be completely emptied by unscrewing the drain plug. Place a bucket under the cap to avoid product leakage when unscrewing the cap.

* Calibration button

7. Weigh the product obtained in the bucket and enter the weighed value on the display (in red). Then validate the calibration (green).
8. Repeat the process from 4 to 7 until the deviation is less than 5%.



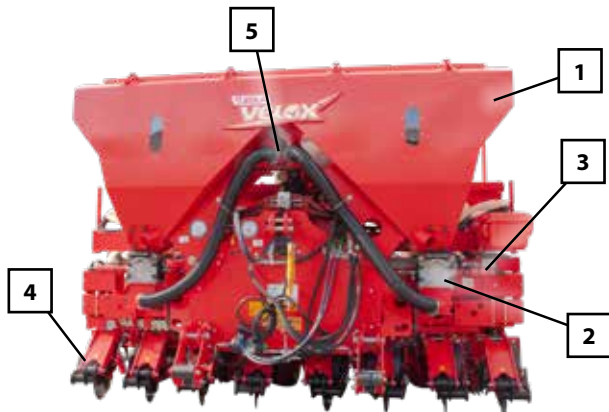
PERFORM THE CALIBRATION TEST ON ALL ME-
TERING UNITS AVAILABLE ON THE MACHINE .



12. FERTILISER

With the solid fertiliser applicator, the product can be spread at the same time as the seeds.

12.1 HOPPER FERTILISER SPREADER



* Fertiliser spreader.

NO.	DESCRIPTION
1	Hopper
2	Metering unit
3	Engine
4	Fertiliser incorporator element
5	Pneumatic system

In order to regulate the fertiliser distribution, it is necessary to know the rows spacing, the amount of fertiliser to be distributed on each hectare of land and the working speed. It must be taken into account that there is a great variety of fertilisers, with their different densities and irregular granulometry, so it is difficult to regulate precisely.

The fertiliser spreader consists of two electrically driven metering units: left and right. Each metering unit can feed several rows, depending on the machine model.



BEFORE WORKING WITH THE MACHINE, A CALIBRATION TEST OF THE ELECTRIC METERING UNITS MUST BE CARRIED OUT.

12.1.1 METERING UNIT

This metering unit has a roller that can be configured in sectors.



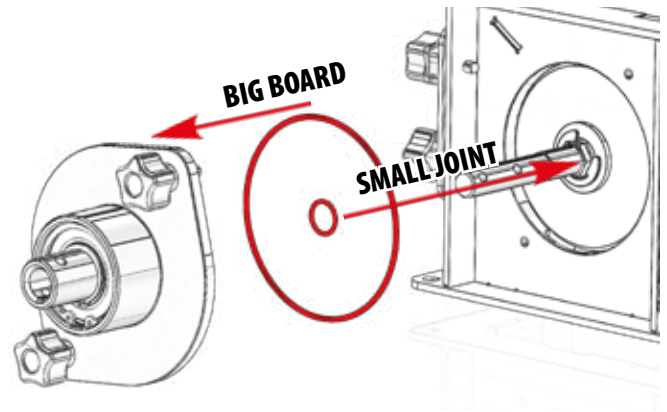
NOTICE:

- There are several types of sectors for: high, medium, low or very low doses.
- Mount the same type of sector on both rollers.



To set the number of sectors to adapt the metering unit to the desired dose, follow the steps below:

- 1- Remove the two knobs.
- 2- Remove the roller.



- 3- Mount the required number of sectors according to the desired dosage. To change the configuration of the sectors, remove a seeger ring, mount the desired sectors and replace the seeger ring.



TO DETERMINE THE NUMBER OF SECTORS TO BE MOUNTED, SEE PARAGRAPH 12.1.2).

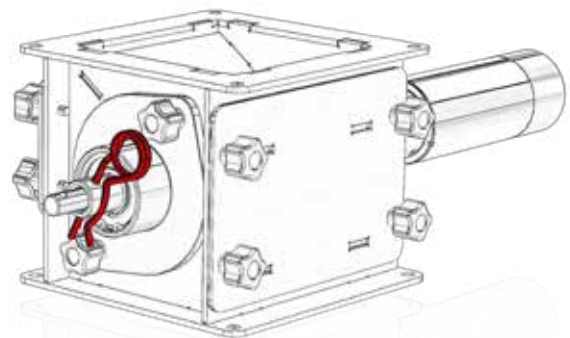


WARNING: CHECK THE NUMBER OF OUTLETS AVAILABLE ON THE METERING UNIT, INSTALL AS MANY SECTORS AS THERE ARE OUTLETS, OTHERWISE THE PRODUCT MAY NOT COME OUT OF ONE OF THE OUTLETS, OR YOU MAY OVERDOSE TOO MUCH.

- 4- Reassemble the roller, the side support and fix it with the two knobs.



MAKE SURE THAT THE SEEGER RINGS ARE CORRECTLY MOUNTED IN THEIR SEAT BY TURNING THE SEEGER RING OVER. DO NOT FORGET THE PIN "R", WITHOUT IT THE METERING UNIT WILL NOT WORK.

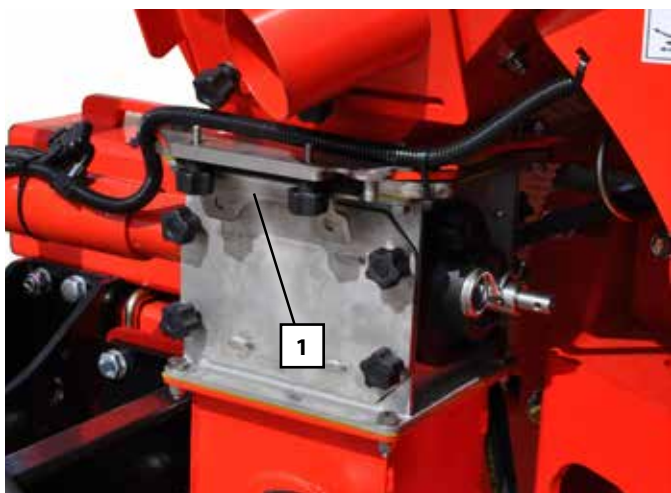


WHEN REMOVING THE ROLLER BE CAREFUL NOT TO LOSE THE O-RINGS ON THE SHAFT (SMALL) AND ON THE SIDE SUPPORT (LARGE), REASSEMBLE THE SEALS CORRECTLY WHEN ASSEMBLING THE ROLLER.

12.1.2 CALIBRATION TEST

To calibrate the product, follow the steps below:

- 1- Coupling the machine to the tractor.
- 2- Close the metering unit's flap (1).



- 3- Check that the roller is correctly mounted (See section 12.1.1)
- 4- Fill the fertiliser hopper with fertiliser.
- 5- Open the bottom cover of the metering unit and place the supplied bucket underneath.



- 6- Open the metering unit's flap.
- 7- To continue with the calibration, see the ISOBUS manual (see section TEST CALIBRATION). The following values must be entered.

- A. WORKING SPEED.
- B. Desired rate (dose) in (KG/Ha).
- C. CALIBRATION FACTOR depending on: the specific weight of the product to be used; the type and number of sectors mounted on the roller (see table below).



THE FERTILISER SPREADER HAS TWO METERING UNITS. ALL METERING UNITS ARE IDENTIFIED BY A NUMBER. THE FIRST ONES ARE FOR THE SEED METERING UNITS. THE SECOND NUMBER IS FOR THE MICROGRANULAR APPLICATOR UNIT (IF YOUR MACHINE MODEL IS EQUIPPED WITH ONE), AND THE NEXT TWO ARE FOR THE FERTILISER SPREADER.

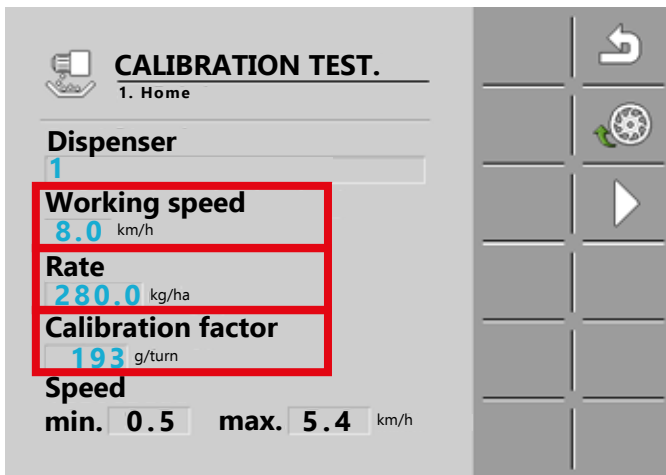
FACTOR CALIBRATION (g/turn)	NUMBER SECTORS	3			4			5			
		WEIGHT ESP. (Kg/L)	0,8	1	1,2	0,8	1	1,2	0,8	1	1,2
SECTOR TYPE		-	-	-	-	-	-	-	-	-	-
		154	193	231	206	257	308	257	321	386	
		84	105	126	112	140	168	140	175	210	
		-	-	-	-	-	-	-	-	-	-



ATTENTION: THE RED SCRAPER IS FITTED AS STANDARD INSIDE THE METERING UNIT. IN CASE OF CONTINUOUS BREAKAGE OF THE METERING UNIT MOTOR FUSES, REPLACE THE RED SCRAPER WITH THE YELLOW ONE.



BOTH METERING UNITS MUST BE CALIBRATED SEPARATELY, ON THE MONITOR, THE NUMBER OF THE LOWER METERING UNIT IS THE LEFT ONE.



* Screen 1



A VALUE FOR THE CALIBRATION FACTOR MUST BE ENTERED. IF THE FACTOR IS NOT CORRECT, THE CALIBRATION CANNOT BE PERFORMED.

8- Once the 3 desired values have been entered, check the minimum and maximum working speeds on the controller screen. When the desired working speed is in the middle of these two values (in red * Screen 2), open the guillotine door and fix it with the screw, fill the metering cells (in blue, * Screen 2) and then carry out the test (in yellow, * Screen 2).

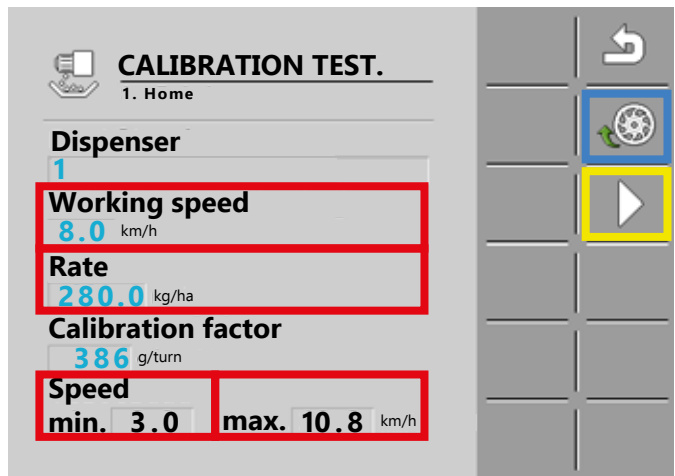


IF THE DESIRED SPEED IS HIGHER THAN THE MAXIMUM SPEED INDICATED BY THE CONTROLLER, MORE SECTORS OF THE SAME TYPE MUST BE MOUNTED ON THE ROLLER OR THE TYPE OF SECTORS MUST BE CHANGED, AND THEN THE CALIBRATION FACTOR MUST BE CHANGED TO THE NEW CONFIGURATION (SEE TABLE IN THE SECTION "CALIBRATION FACTOR OF THE ROLLER DOSING UNIT"). CHANGE THE CALIBRATION FACTOR TO THE NEW CONFIGURATION (SEE SECTION ON CALIBRATION FACTOR TABLE FOR THE METERING UNIT ROLLER).



IF THE DESIRED SPEED IS BELOW THE MINIMUM SPEED INDICATED BY THE CONTROLLER, WE MUST REMOVE SECTORS ON THE ROLLER OR CHANGE THE TYPE OF SECTORS. CHANGE THE CALIBRATION FACTOR TO THE NEW CONFIGURATION (SEE TABLE CALIBRATION FACTOR METERING UNIT ROLLER).

9- With the controller configured. Press and hold the calibration button (* Calibration button) to start the calibration test.



* Screen 2



PRESS AND HOLD THE BUTTON TO PICK UP THE MAXIMUM AMOUNT OF PRODUCT, THE MORE PRODUCT YOU CAN PICK UP, THE MORE ACCURATE THE CALIBRATION TEST WILL BE.



* Calibration button



PERFORM THE CALIBRATION TEST ON ALL METERING UNITS AVAILABLE ON THE MACHINE .



THE RATE IS WHAT THE MACHINE WILL DISTRIBUTE IN TOTAL PER HECTARE.



AFTER COMPLETION OF THE FLOW TESTS, CLOSE THE LOWER COVER OF THE METERING UNIT AND LOCK IT.



IMPORTANT: IN DOSAGE RATES GREATER THAN 350Kg/Ha, DO PERIODICALLY CHECK TO ENSURE THAT THERE IS NO ACCUMULATED OR OBSTRUCTING MATERIAL IN THE PNEUMATIC OR CONVEYOR SYSTEM.

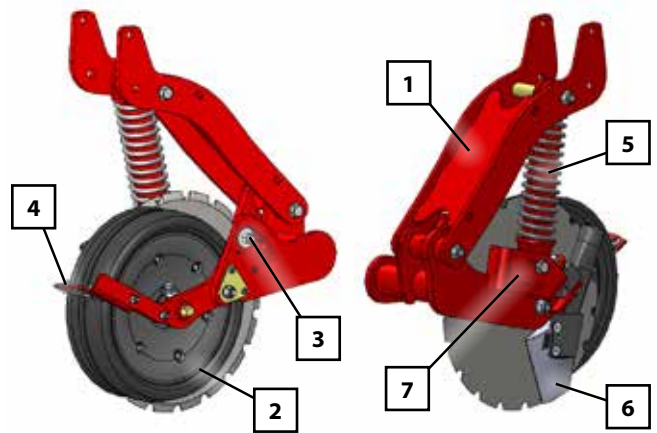


IMPORTANT: AFTER THE FIRST HECTARE OF WORK, THE DESIRED PRODUCT CONSUMPTION MUST BE CHECKED.

12.2 FERTILISER INCORPORATOR ELEMENTS

The incorporating elements for solid fertiliser are offset laterally by 6 cm from the row line. They are equipped with spring pressure which allows them to move upwards when they encounter an obstacle.

12.2.1 SINGLE-DISK FERTILISER SPREADER

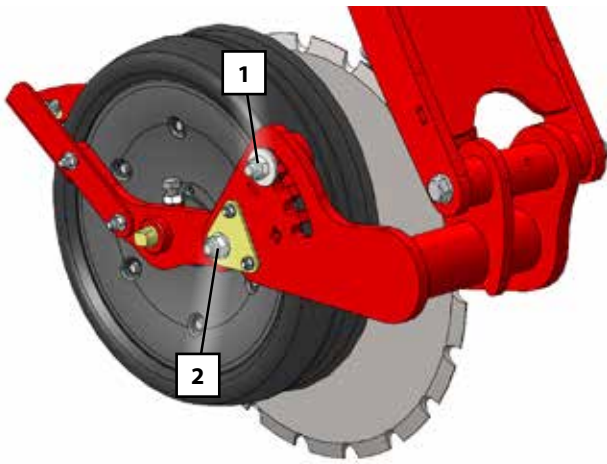


NO.	DESCRIPTION
1	Support.
2	Mono disc control wheel.
3	Depth control positioner.
4	Scraper
5	Pressure spring.
6	Opening suffolk coulter.
7	Selection of disc pressure.



THE DESIRED FERTILISER PLACEMENT DEPTH MUST BE ADJUSTED ACCORDING TO THE SOIL CONDITIONS.

Depth adjustment of the fertiliser disc.



To adjust the depth of each single disc it is necessary to adjust screws 1 and 2.

- 1- Loosen screws 1 and 2 by one turn.
- 2- Slide the screw 1 through the guide to the desired position.
- 3- Tighten the screws (1 and 2).



IT IS NECESSARY TO ENSURE THAT THE DEPTH CONTROL POSITIONER IS CORRECTLY FIXED.

The depth positions are as shown in the table below:

POSITION	WORKING DEPTH (cm)
1	2,5
2	4,6
3	7
4	9

Pressure regulation of the fertiliser disc.

To adjust the depth of the single disc it is necessary to adjust the positioning screw.

- 1- It is necessary to remove the screw (7).
- 2- Relocate to desired position (- or +)
- 3- Refit the screw.

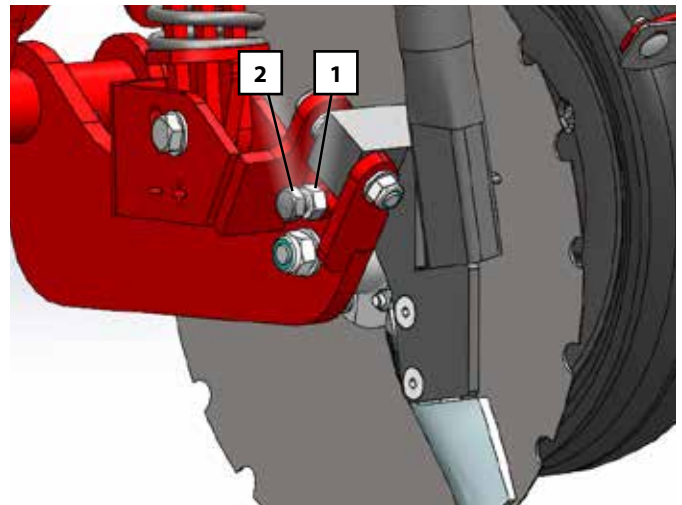


WARNING: THE PRESSURE OF THE FERTILISER ELEMENT MUST BE ADJUSTED ACCORDING TO THE SOIL CONDITIONS.

- It is advisable to start work by adjusting the spring to low pressure, and increase it only where necessary.

Lateral adjustment of the opening suffolk coulters.

The suffolk coultler must be adjusted so that it is no more than 2 mm from the sowing disc.



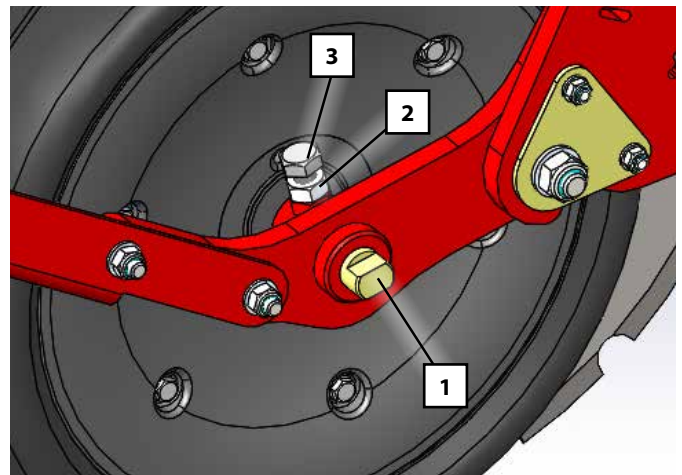
- 1- Loosen the lock nut (1).
- 2- Adjust the suffolk coultler with the screw (2).
- 3- Tighten the lock nut (1).

Axial adjustment of the single disc depth control wheel.

With use, the disc and wheel wear out and an axial adjustment is necessary. The wheel has to be adjusted to the disc in such a way as to comply at the same time:

- When the wheel is turned by hand, the disc must rotate in relation to the wheel.
- It is possible to turn the wheel and disc by hand in opposite directions.

To adjust the wheel axially, proceed as follows:

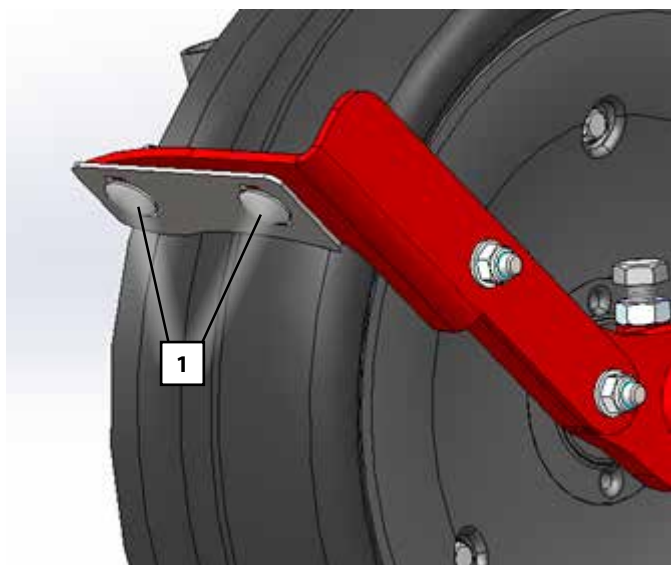


- 1- Loosen the locknut (2).
- 2- Loosen the screw (3).
- 3- Use a spanner to turn the wheel axle (1) clockwise to bring the wheel closer to the disc and anticlockwise to move it further away.

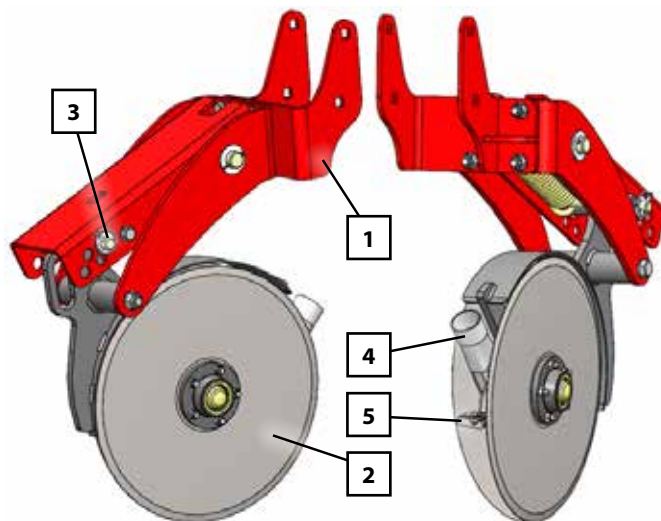
- 4- Ensure that the plane of the axle is aligned with the supporting plate
- 5- Tighten the screw (3).
- 6- Tighten the nut (2).

Scraper adjustment of the mono disc depth control wheel.

The scrapers on the depth control wheels of the single disc fertiliser spreader are adjusted by means of the screws (1). Set the scrapers at a distance of 3-4 mm from the wheel.



12.2.2 DOUBLE DISC FERTILISER SPREADERS



NO.	DESCRIPTION
1	Support.
2	Discs.
3	Depth positioning shaft.
4	Drop tube.
5	Internal scrapers.



THE SCRAPER MUST NEVER, UNDER ANY CIRCUMSTANCES, TOUCH THE DEPTH CONTROL WHEEL.



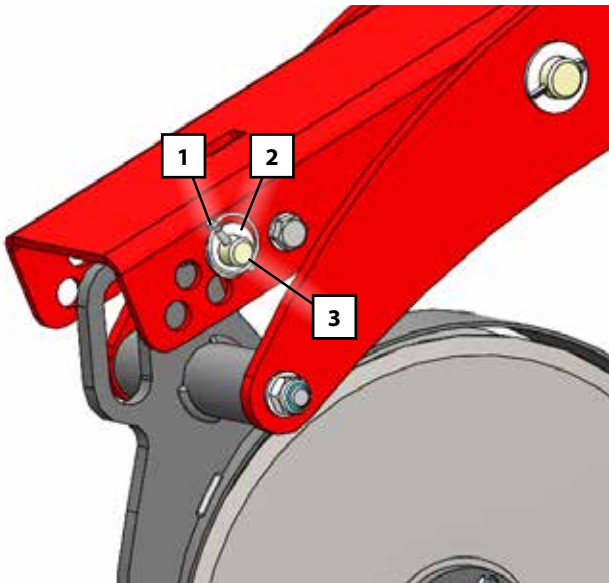
THE DESIRED FERTILISER PLACEMENT DEPTH MUST BE ADJUSTED ACCORDING TO THE SOIL CONDITIONS.



ON SOME MODELS THE INSTALLATION OF THE FERTILISER DISC INVOLVES THE REMOVAL OF THE DEPTH CONTROL WHEELS ON THE MACHINE FRAME.

Depth adjustment of the double disc fertiliser disc.

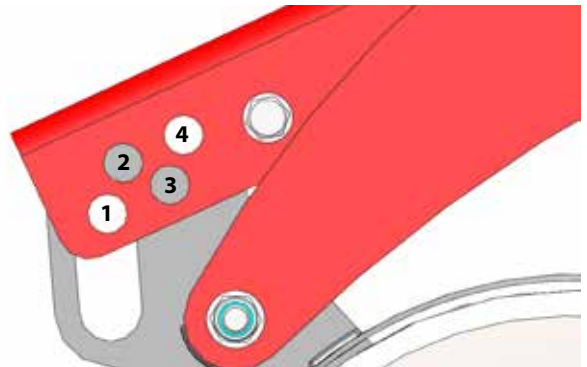
To adjust the depth of the double disc it is necessary to act on the positioning shaft.



- 1- It is necessary to remove the ring pin (1).
- 2- Remove the washer (2).
- 3- Move the shaft (3) to the desired position.
- 4- Fit the washer (2).
- 5- Fit the ring pin (1).

The depth positions are as shown in the table below:

POSITION	WORKING DEPTH (cm)
1	Exclusionary position
2	4
3	7
4	10



THE DEPTH POSITIONS ARE THEORETICAL. IF THE MACHINE WHEEL SINKS TOO LOW, THE FERTILISER DEPTHS MAY BE DIFFERENT. IF IT IS NECESSARY TO CHANGE THE HEIGHT OF THE MACHINE CONTROL WHEEL (SEE SECTION 6.3.3)

13. HYDRAULIC ROW MARKERS

The row markers are located at the ends of the frame and are hydraulically operated.

For UNFOLDING and FOLDING the row markers, pressurise the hydraulic circuit.

If the first row marker to unfold is the one on the opposite side to the desired side, fold it down and press the circuit again to lower the row marker on the correct side.

This element can be adjusted in **LENGTH** and in the **INCLINATION** of the disc.



NEVER COME WITHIN THE RANGE OF THE ROW MARKER.



CLOSE THE ROW MARKERS BEFORE FOLDING THE MACHINE FOR TRANSPORT.



BEFORE FOLDING OR UNFOLDING THE ROW MARKERS, MAKE SURE THAT DUE TO THE REGULATIONS MADE TO THE ELEMENT AND THE FIELD CONDITIONS, THE ROW MARKERS DO NOT TOUCH ANY HIGH VOLTAGE LINES TOO LOW WHEN DOING SO.



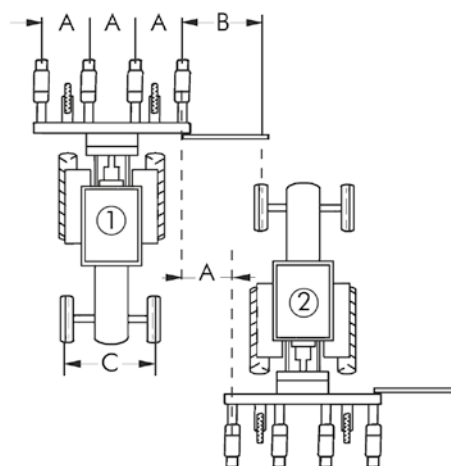
BE CAREFUL WHEN FOLDING THE ROW MARKERS, DEPENDING ON THE MACHINE CONFIGURATION AND THE SETTING OF THE ROW MARKER, THE ROW MARKER MAY INTERFERE WITH THE FERTILISER HOPPERS. IN SUCH CASES THE ROW MARKER SHOULD BE ADJUSTED EITHER BY CHANGING THE LENGTH OF THE ROW MARKER OR THE INCLINATION.



IN CASE THE ROW MARKER GETS STUCK DURING OPERATION, THE ROW MARKERS ARE EQUIPPED WITH A FUSE TO PREVENT FURTHER DAMAGE TO THE MACHINE.

13.1 LENGTH OF THE ROW MARKER

The row marker arms are extendable. To calculate the horizontal distance between the disc and the end element (B), apply the following formula:



$$B = \frac{A \cdot (\text{number of rows} + 1) - C}{b + c + d}$$

Where:

A = distance between rows spacing.

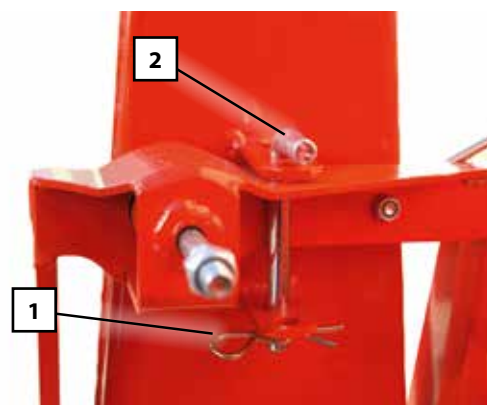
B = horizontal distance between the disc and the outer element.

C = tractor track gauge.

This adjustment makes it possible to maintain the same rows spacing A and B between the outward (1) and return (2) runs.

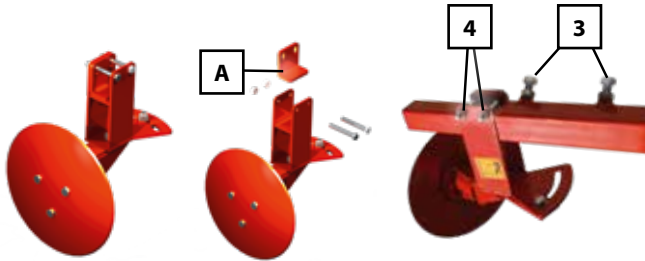
Once the distance B has been calculated, the length of the row marker arm can be adjusted.

- 1- Apply pressure to the hydraulic circuit of the row markers in order to close both of them so that the safety catch can be removed.
- 2- Remove the pin (1) and remove the lock (2).
- 3- Lower the row marker hydraulically.
- 4- Loosen the fixing nuts (3).
- 5- Position the row marker disc at the distance B previously calculated.
- 6- Retighten the fixing nuts.





THE ROW MARKER IS ADAPTABLE FOR BOTH THE NARROW TUBE OF THE TELESCOPIC HANDLER AND THE WIDE TUBE. THE TUBE ADAPTER (A), WHICH MUST BE INSTALLED TO ADJUST THE ROW MARKER ON THE NARROW TUBE SECTION, MUST BE REMOVED FOR THE WIDE TUBE SECTION.

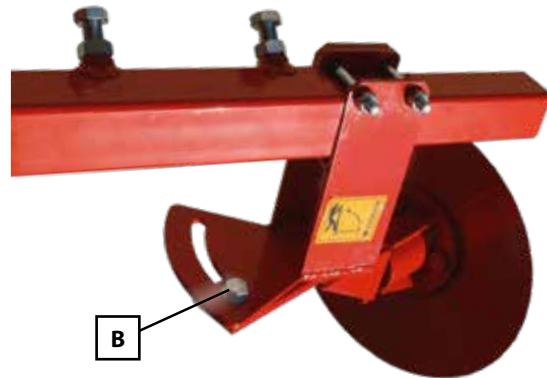


13.2 ROW MARKER DISC ORIENTATION

Adjust the inclination of the row marker disc by loosening the fixing nut (B) so that the disc has more or less incidence on the ground. Fix the nut at the end of the operation.



IT IS NOT ADVISABLE TO ORIENTATE THE DISCS TOO MUCH AS THIS COULD LEAD TO MALFUNCTIONS.





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