11/2026 F

USER MANUAL

ORION 3000
ORION 4000

SEED DRILL



Starting from serial number BB-54705

All rights to structural changes reserved

Read the manual before operating the machine!

Translation

EY- vaatimustenmukaisuusvakuutus koneesta
(Konedirektiivi 2006/42/EY, Liite II A)

Valmistaja: Tume-Agri Oy
Osoite: Sudenkorventie 1, 14200 TURENKI

Henkilön nimi, joka osoite, joka on valtuutettu kokoamaan teknisen tiedoston:
Nimi: Heimo Valli Osoite: Sudenkorventie 1, FI-14200 TURENKI
Vakuuttaa, että

Kylvökone Orion 3000 and Orion 4000
Sarjanumero _____

- ovat konedirektiivin (2006/42/EY) asiaankuuluvien säädösten mukaisia

ja lisäksi vakuuttaa, että

- seuraavia eurooppalaisia yhdenmukaistettuja standardeja on sovellettu

SFS-EN ISO 12100–1:2003

EG-försakran om maskinens överensstämmelse
(Maskindirektivet 2006/42/EG, Bilaga II A)

Tillverkare: Tume-Agri Oy
Address: Sudenkorventie 1, FI-14200 TURENKI

Namn och adress till den person som är behörig att ställa samman den tekniska dokumentationen:
Namn: Heimo Valli Address: Sudenkorventie 1, FI-14200 Turenki
Försäkrar härmed att

Såmaskin Orion 3000 och Orion 4000
Serienummer _____

- överensstämmer med tillämpliga bestämmelser i maskindirektivet (2006/42/EG)

Vi försäkrar dessutom att

- följande europeiska harmoniserade standarder har använts

SFS-EN ISO 12100-1:2003

EC Declaration of Conformity for the Machine
(Machine Directive 2006/42/EG, Annex II A)

Manufacturer: Tume-Agri Oy
Address: Sudenkorventie 1, FI-14200 TURENKI

Name and address of person authorized to compile a technical file:
Name: Heimo Valli Address: Sudenkorventie 1, FI-14200 Turenki
Hereby declares that
Seed drill Orion 3000 and Orion 4000 Serial number_____

- is in compliance with the applicable decrees of the Machine Directive (2006/42/EG)

and in addition, declares, that

- the following standardized European directives and standards have been applied:

SFS-EN ISO 12100-1:2003

Paikka ja aika / Ort och datum / Place and Date: Turenki 24.01.2022

Allekirjoitus / underskriften / Signature :

Jorma Lähetkangas
Toimitusjohtaja / Verkställande direktör / Managing Director

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1. TO THE MACHINE OPERATOR AND THOSE IN CHARGE OF THE MACHINERY

We wish you the best of success with your TUME seed and fertilizer sower. Instruction in this manual gives the guidance for correct use, adjustments, maintenance and storage of the Tume Orion. Following the guidance of this manual your machine will serve you impeccably and for a long time to come. It is very important to become acquainted with the machine operating instructions well before the operating season of the machine. Both the manufacturer, Tume-Agri Oy, as well as the authorized dealer, are happy to assist you with questions related to the machinery.

Remarks regarding the Operating Instructions

Because this publication is distributed in an international sales network, the machinery shown in the illustrations (as well as the standard equipment and accessories) can vary in different countries. In different countries the statutory and otherwise important covers have been opened or removed in some illustrations, in order to present a clearer view of the object. The equipment is not allowed to be used without the covers. For your own safety, make sure that all covers are in good condition or installed in place before commencing operations.

In this manual, the terms "left" and "right" in relation to the machine refer to the machine sides seen from behind towards the direction of travel.

Tume-Agri Oy continuously develops its products and reserves a right to make changes and improvements without commitment to carry out the said changes in machinery which is already sold.

2. GENERAL SAFETY PRECAUTIONS



Anyone using, maintaining or otherwise handling the TUME-seed and fertilizer sower, must become carefully acquainted with this manual before starting to work.

Working or staying under an unsupported raised machine is strictly prohibited. Make sure the machine stays up by closing the lift cylinder safety valves. Put the machine down if you have to leave it unattended.

Staying on the machine or on the step level when the machine is in motion is prohibited. The driver must ensure that nobody is near the machine when the machine is in motion.

Machine lubrication, adjustment or cleaning is not allowed when it is moving. Turn off the engine and turn on the hand brake during maintenance work.

All covers must be kept mounted in their respective locations.

Ensure the correct connection of drawbar, hydraulic lines and electrical wiring to the tractor and the work machine.

Damaged hydraulic hoses and connectors must be replaced without delay. Tractor hydraulic valves and connections must be leak-free and in good condition. Transportation position of the machine is dependent on these.

Due to the structure of the machine hydraulics, the hydraulics should be used only when a 12V supply voltage is connected to the machine. If the power supply is out of order, act with extreme caution in the use of hydraulics, because the movements taking place are unlimited!

Optional hydraulic row markers may move very quickly, especially if the hydraulic throttle valve is

open and the tractor hydraulic flow is high. Use extreme caution when trying out lift and a lowering of markers for the first time. Make sure that nobody is under a marker or trajectory.

Make sure that at least 20 per cent of the tractor's weight is left on the front axle of the tractor under all circumstances. If necessary, use additional weights. Be especially careful if the drill is connected to an interim processing device and you are raising it with the tractor's lifting gear i.e. in a case of reversal.

The machine is designed for a maximum transport speed of 40 km/h, both empty and fully loaded. When driving on public roads, always comply with applicable traffic regulations and restrictions concerning the tractor-machine combination. The permitted driving speed may be affected, for example, by the braking equipment of the machine and the mass of the towing tractor.

On rough or uneven roads, the driving speed must be reduced to a level appropriate for the road and driving conditions. Avoid driving over rocks and other obstacles to avoid flat tires.

Load being transported on the machine is prohibited.

Never select a driving lane, where the extreme wheels of the machine are "on empty". In such condition the machine can get too much swing. Choosing a wrong driving lane, can cause the machine to fall.

Always, use caution when moving on top of the machine for cleaning or maintenance work purposes, or filling the tanks.

When heated, machine painted surfaces can excrete gases harmful to health. Take care of efficient ventilation in your workspace for example during welding operations.

Use only manufacturer-approved accessories and equipment. The party carrying out alterations which does not follow manufacturer's instructions is responsible for the alterations and their consequences.

Seed Drill does not cause any substantial increase in the noise level at the driver's cabin. Possible hearing protection required depends on the tractor noise level. When handling heavy and sharp components (e.g. drawbar and coulter parts) the use of safety boots is recommended.

Keep your machine up to date also on the required road equipment, in case the machine has to be transported on public roads. Regulatory changes are often made.

Power should be taken directly from the tractor battery with its own power cable if tractor doesn’t have ISOBUS connector. Contact to your tractor dealer or manufacturer how to install power cable to your tractor and ask for an authorized mechanic to install the power cable with suitable and safe way. Tume-Agri Oy shall not be liable for any damage resulting from improperly connected or damaged cable.

Check power cable condition from time to time. A damaged cable may cause malfunction of the machine or tractor.

A damaged cable is a fire safety hazard. A damaged cable can cause electric shock.

It is forbidden to use the machine if the power cables are damaged. For example, if the insulation materials have rubbed.

Do not connect or operate the machine if the electrical connectors are wet.

3. MACHINE APPLICATION

Tume Orion – Combi seed drill is intended for simultaneous seeding and fertilization. It is well suited for minimally cultivated or normally cultivated soil sowing, and in good conditions, for direct sowing.
The machine can also be used only for seeding or only for fertilization under the boundary conditions stated below. The Orion also compacts the soil with its support wheels. Under most circumstances, the support wheels also close the furrows made by the coulters.

With additional accessories, the number of Orion's features may be increased, allowing the combination of the machine and the accessory to, among other things, till or level the field and sow grass seeds in the same pass as seeding and fertilization.

The use of the Orion for purposes other than those stated is prohibited. The machine is not, for example, intended for moving materials at high speed or for storing materials in the machine's containers. The filling station should be located close to the field to be sown. The transport speed when the machine is loaded must be low and in a reasonable relationship to the load in the containers and the unevenness of the road. Transporting passengers on the machine is completely prohibited!

3.1 Using the machine exceptionally for seeding only

If fertilizers are not being used, it is advisable to move the partition in the machine hopper to its forward position to maximize the space for the seed hopper.
To achieve maximum seeding capacity, seeds may also be sown through both containers simultaneously. In this case, the calibrations must be carried out for both feeders, and the sum of the results forms a result that describes the seeding rate.

3.2 Using the machine only for fertilizing

Tume Orion can also be used only for fertilizer placement. The fertilizer is then filled into either the fertilizer or seed hopper or both. Instructions for only fertilizer placement are roughly similar to the previous section's instructions. When filling the entire machine with fertilizer, it must be noted that fertilizer is usually heavier material than seeds. Therefore, the machine must not be filled completely.

4. GENERAL INSTRUCTIONS RELATED TO SEEDING

4.1 Coulter structure in seeding

The Orion is equipped with double-disc coulters, where the right and left discs are of the same diameter. Fertilizer and seed go to the same depth and into the same groove made by the coulter.

4.2 Driving instructions

Always lower the machine while moving it forward. Otherwise, the coulters may become clogged.
The machine is in its upper position on the tractor's hydraulic valve. Therefore, during transport, it must be ensured that the tractor's hydraulic valve does not accidentally open or leak.
NOTE! The transport locks of the lift cylinders must always be open during road transport!
A cylinder is available as an additional accessory for the drawbar. The cylinder can be used to lift the front end of the machine during seeding with the tractor's hydraulics, for example, to avoid blockages. This is done with the drawbar cylinder, which is controlled by its own 2-way valve. The mentioned cylinder can also be used during road transport, as it provides greater ground

clearance. The front cylinder is only used during seeding if necessary, for example, to release a blockage. Otherwise, the cylinder is in the shortest position during seeding.
The machine must operate on level ground in a horizontal position. If the machine tilts forward, the push rod of the drawbar should be adjusted longer. If the machine tilts backward, the push rod should be shortened. Check and adjust the seeding depths if necessary after driving a certain distance. Check the adjustment of the markers by examining the seam between the seeding sections.

NOTE! Raise and lower the machine only while it is moving forward. Never reverse the machine while the coulters or the rear harrow are in the ground.

Periodically check that the coulters are not clogged. Also, check the condition of all seed and fertilizer pipes and clean any blockages.

Do not store fertilizer or seed in the hoppers for several days. Wet fertilizer can cause feeding problems.

4.3 Driving speeds

- The appropriate driving speed is usually about 8-14 km/h.
- For peas and beans, the maximum speed is 6-10 km/h.
- During transport, the maximum speed is 40 km/h.

4.4 Noteworthy tips for using the machine

With some large and light seeds (e.g., certain types of oats), difficulties may arise in seeds passing through the screens. In this case, remove the screens from the seed hopper. Take special care when filling the hopper to ensure that no large particles get mixed with the seeds and damage the feeders.

Machine calibration tests are carried out on both the seed and fertilizer sides into trays located under the feed chambers. Be careful when inserting the trays into place. Keep them absolutely straight in line with the machine. If the tray is pushed forcefully so that its end points upwards, it may hit some of the feed chambers and damage them.

Be careful when removing screens from the hoppers. Hitting the screen on the height sensor can damage it.

5. COMMISSIONING THE MACHINE

5.1 Rear wheels

Rear wheels function in the way that the longer cylinders at the ends of the machine turn a tube frame with the width of the machine, in which are connected also the extreme wheel pairs. The intermediate wheel pairs in turn are mounted by means of joints to the tubular body and they operate with their own drive cylinders. All these cylinders have been connected to the same hydraulic circuit and thus they all share the same pressure. For this reason the wheel pairs can adjust to the ground irregularities but the rolling force is still standard throughout the working width (picture 1).

Geometry of rear wheels has been planned in the way, that in working position the pressure on all wheel pairs is nearly the same. On the other hand, with the machine lifted to its up position, the loose middle wheel pairs carry some more of the load. In this way the probability of peripheral wheel pairs becoming damaged is reduced, as those are the ones which most often are damaged in transit drive.

Also note when reversing the scrappers and the step of the back wheels, they are very close to the ground. Watch out for obstacles! When reversing over a high threshold etc. the above-mentioned scrapers rise higher if the machine is slightly lowered. Check that under the coulters will be enough room so that they will not hit obstacles.

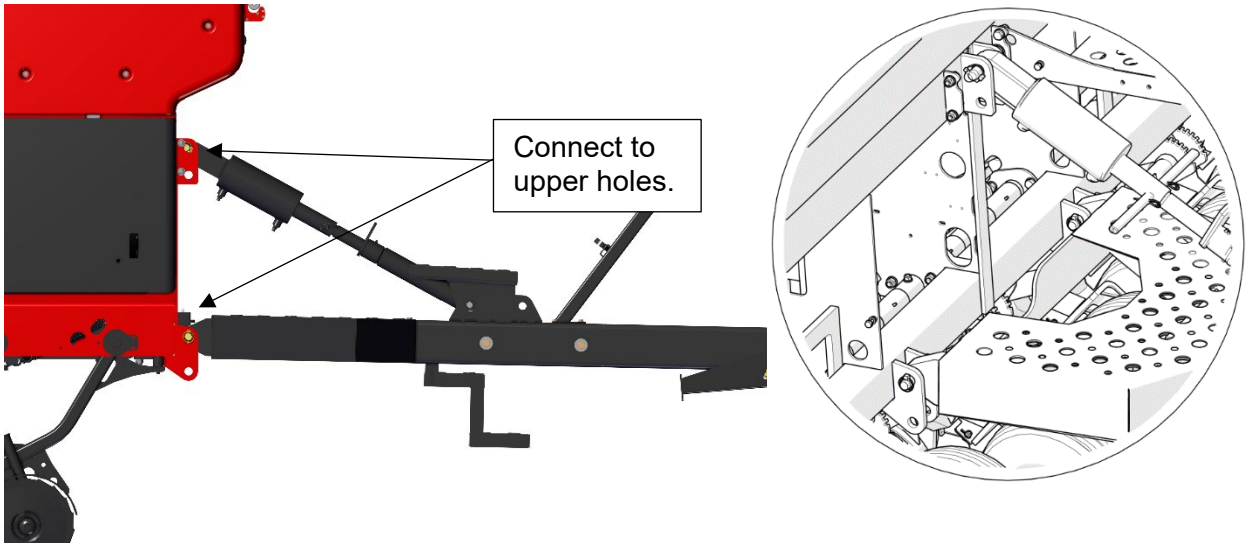


Picture 1. Rear wheels.

5.2 Drawbar installation

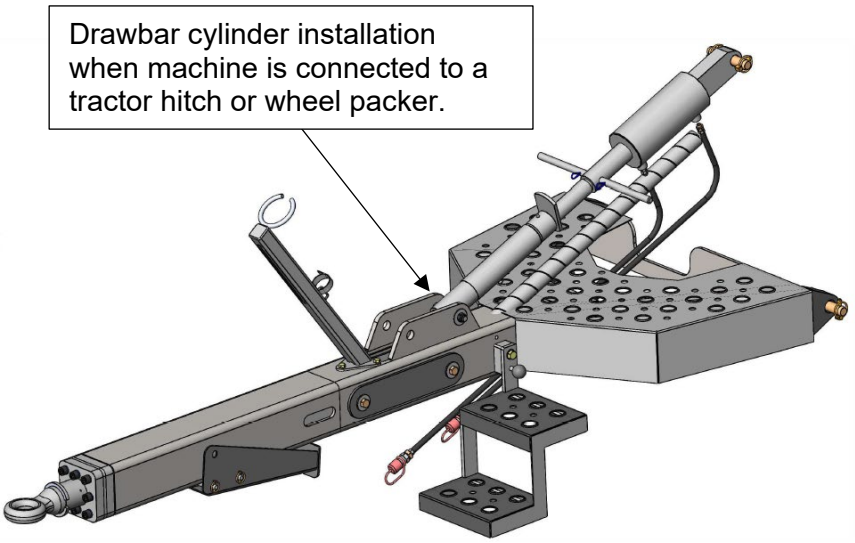
Drawbar is assembled according to picture 2 Note, that drawbar is always mounted to the upper holes of the machine's lower brackets. The hydraulic push rod is mounted also to its upper hole.

Hydraulic hoses and electricity wires are connected to the drawbar carefully so that they cannot be damaged in any driving situation. Pull hoses and wires through the drawbar.

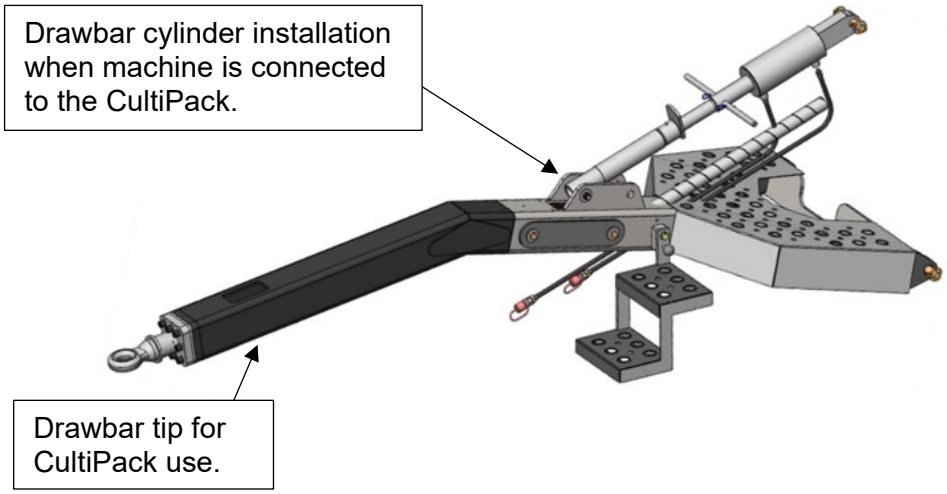


Picture 2. Drawbar installation.

Adjust the length of the push rod so that the machine is lowered and, in the tractor trailer hitch, the wheel packer or CultiPack are connected horizontally. Ensure, that the push rod cylinder is in its shortest position when adjustment is carried out. Fine adjustment of drawbar is done in the field in sowing conditions.



Picture 3. Drawbar cylinder is connected to the rear hole if machine is connected directly to the tractor trailer hitch or wheel packer.



Picture 4. Drawbar cylinder is connected to the front hole if machine is used together with CultiPack cultivator. This needs its own tip for to the drawbar.

5.3 Connecting the machine to tractor

Orion is normally connected to the tractor trailer hitch, wheel packer or CultiPack cultivator. Connecting machine to a drawbar connected to three point linkage is not recommended. It reduces weight from the front and impairs handling.

5.4 Hydraulic connections

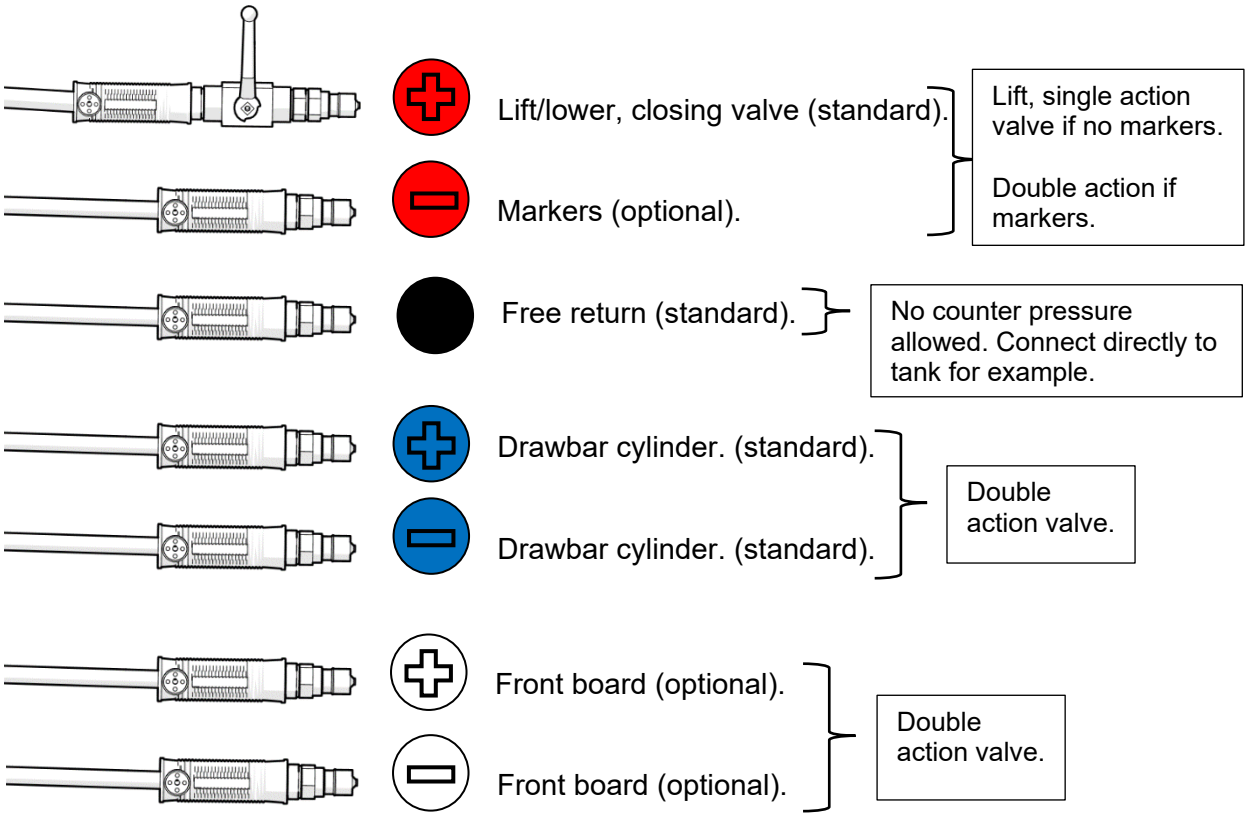
Standard Orion lift/lower hydraulics are connected to single action valve. Drawbar cylinder needs its own double action valve. Free return must not have counter pressure and it is best to connect directly to tank.

NOTE! Too big counter pressure in free return slows down rear harrow's downwards movement or can prevent it completely from going down.

Close the valve in the lift hydraulic hose before disconnecting it from the tractor by turning the lever crosswise to hose. Open valve after connecting the hose to tractor.

If machine has markers, the work with the same valve as machine lifting and lowering. Then the hoses (lift and markers) must be connected to double action valve.

Hydraulic front board needs its own double action valve.



It should be noted that, in some tractor types must be used its own type of hydraulic quick connectors recommended by the manufacturer. If necessary, please change the tractor parts in question to the right type, to ensure the proper functioning of of hydraulic system.

Hydraulic hoses are pulled inside the drawbar.

5.5 Electric connections

5.5.1 ISOBUS -tractors

Orion uses power from ISOBUS connector. Connect machine ISOBUS connector to tractor.



Picture 5. Machine's ISOBUS connector.

Machine has own plug for its rear lights. Connect it to tractors light socket.

5.5.2 External harness connection

In case there is no ISOBUS connector, the power is taken directly from tractor battery with power cable delivered with the Orion. Power cable should be installed in a way that it is not necessary to remove the cable from the tractor even the seed drill is uncoupled.

Contact to your tractor dealer or manufacturer how to install power cable to your tractor and ask for an authorized mechanic to install the power cable with suitable and safe way.

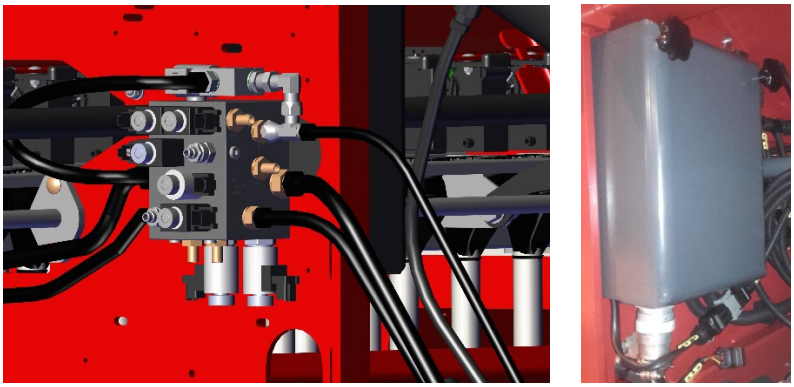
Ensure that the power cable cannot be harmed by any moving components, i.e. tractor's cabin suspension parts. Note also tractors own possible main power switch. Power cable has a fuse and main power switch for the seed drill. This cable is not needed to detach when seed drill is detached from the tractor. If you change tractor used for pulling the seed drill, move the cable to that other tractor or order and install another similar cable.

Check power cable condition from time to time. Damaged or broken cable should be replaced or fixed immediately. Damaged power cable can cause a safety hazard.

5.5.3 Electrically controlled up and down limits for lifting

NOTE! Machine's maximum lifting and lowering height is controlled by electrical valves (picture 9).

WARNING! Power should be connected always when machine is moved. If power is disconnected a serious coulter or tire/rim damage may occur!
If power is not connected, be careful when lifting and moving the machine!



Picture 8. Hydraulic valves and electric box.

Electric cables going from machine to tractor are put inside the drawbar.

5.5.4 Fuses

Fuses are located inside the electric box (picture 8).

A – F1 – 15 A – ECU/EPEC/Actuator motors
B – F2 – Empty
C – F3 – Empty
D – F4 – Empty
E – F5 – 5 A – Sensors and tramline servos
F – F6 – Empty

If the fuse burns, try to find out why. Do not replace any fuse with bigger one!

6. FILLLING THE HOPPERS

When starting the sowing, it is recommended that the machine is transferred to the field empty. Fertilizers and seed are brought to the field, for example, with a trailer, and the filling of the seed drill is done on the edge of a field. If the machine must be filled far away from the field to be sown, the transfer drive with full container loads should be done with caution. The greatest transfer speed of 40 km/h can be used on steady roads.

Emptying of the hoppers can be monitored by area meters after figuring out how many hectares you can seed with full hoppers. Terminal gives an alarm when there is a certain amount of seed or fertilizer in the hopper and the hopper level monitoring is turned on.

6.1 Adjustable hopper volume

Fertilizer and seed hoppers have an adjustable dividing wall, so the relationship between tanks, can be adjusted. Adjustment can be done by opening the locking screws of wall support rods and by turning the dividing partition to a desired position (picture 9). Remember to lock the support rods following the adjustment.



Picture 9. Container dividing wall control rod.

6.2 Filling method

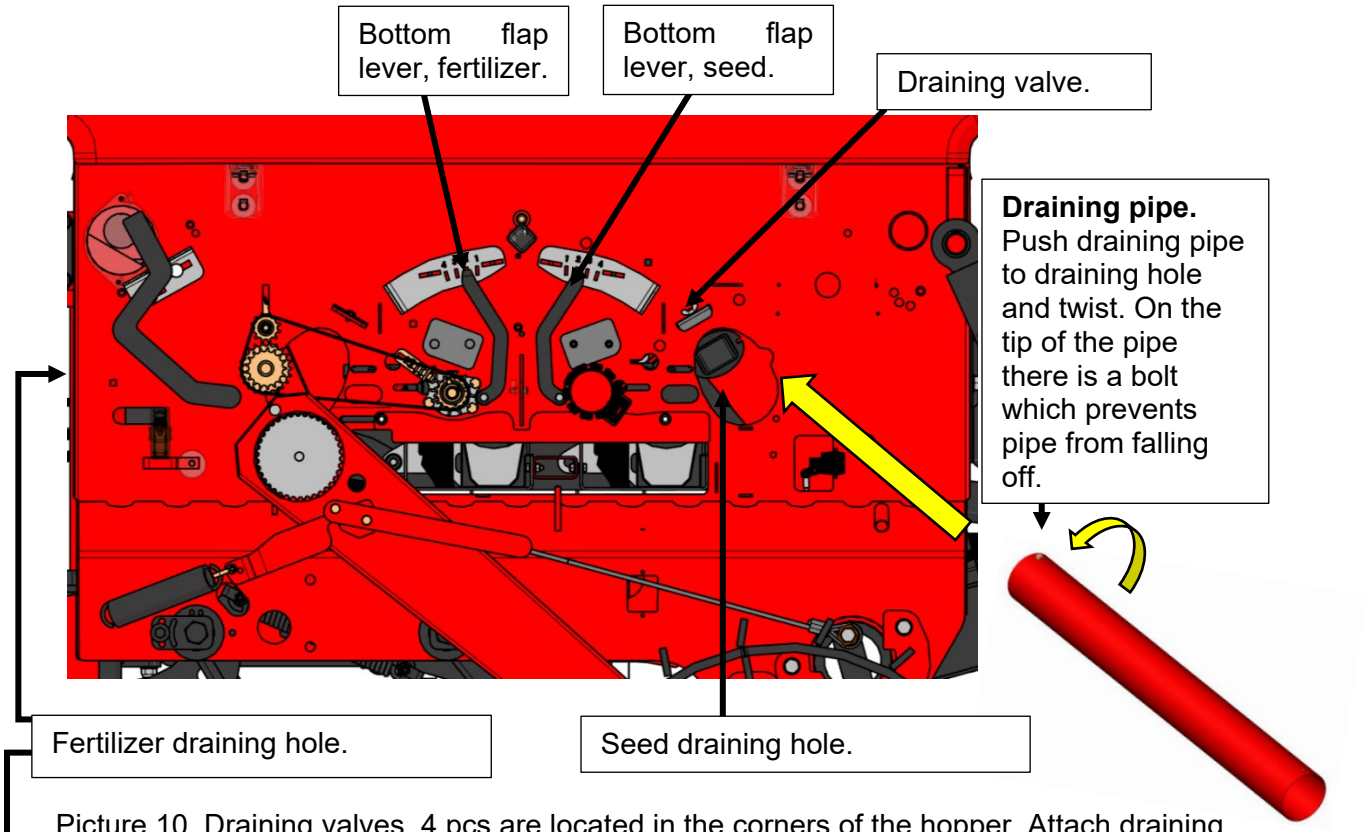
The filling height of the machine is quite large and container volume is large. For this reason, we recommend that for the filling method is used big bags (**NOTE**: sufficient lift equipment), or for example, the filling screw technology.

Big bags can be treated with a variety of loaders. Do not go under a hanging load. Big bag may not be put on the till seed drill structures. Do not overload the drill. Find out about the methods to partially drain a big bag.

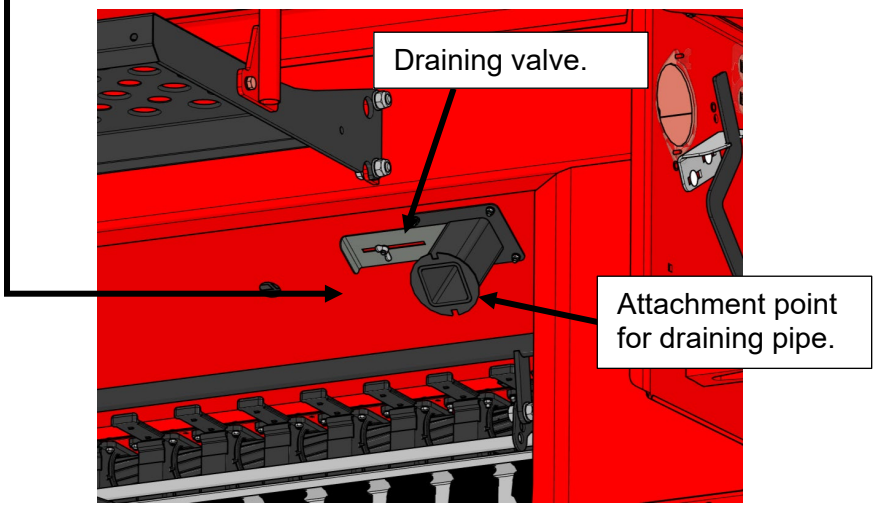
7. DRAINING OF HOPPERS

7.1 Draining of fertilizer hopper

Large amounts of fertilizer is recommended to remove from hopper through the draining holes (picture 10) using the draining pipe. After connecting the draining pipe to the draining hole, open the slide from the side. Draining can be done through the coulters as well. Spread the load cover under the machine and turn the fertilizer side bottom flaps lever over value 4. In this case, the tank empties almost completely. Guide the remaining fertilizer with a brush, or something similar, to the plenum. Rotate the ground wheel for a few turns, so that the chambers empty out. Finally, swing the bottom flaps with the lever quickly a few times, so that no fertilizer is left on top of the flaps.



Picture 10. Draining valves, 4 pcs are located in the corners of the hopper. Attach draining pipe to the draining hole and open the draining valve to empty the hopper



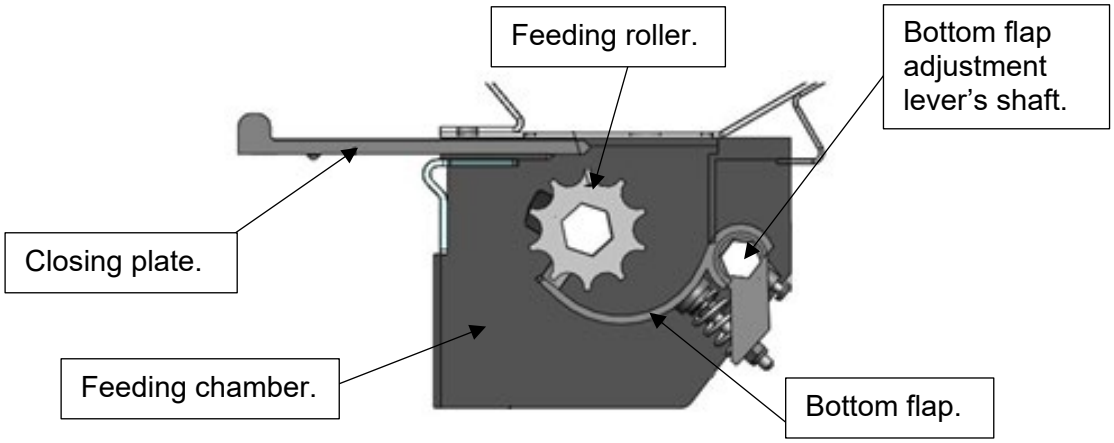
Picture 11. Fertiliser draining valve.

7.2 Draining the seed hopper

Seed tank is drained the same way as fertilizer tank.

7.3 Feeding units

The feeding devices are equipped with spiral rollers. Each unit has bottom flap and closing plate.



Picture 2. Feeding unit.

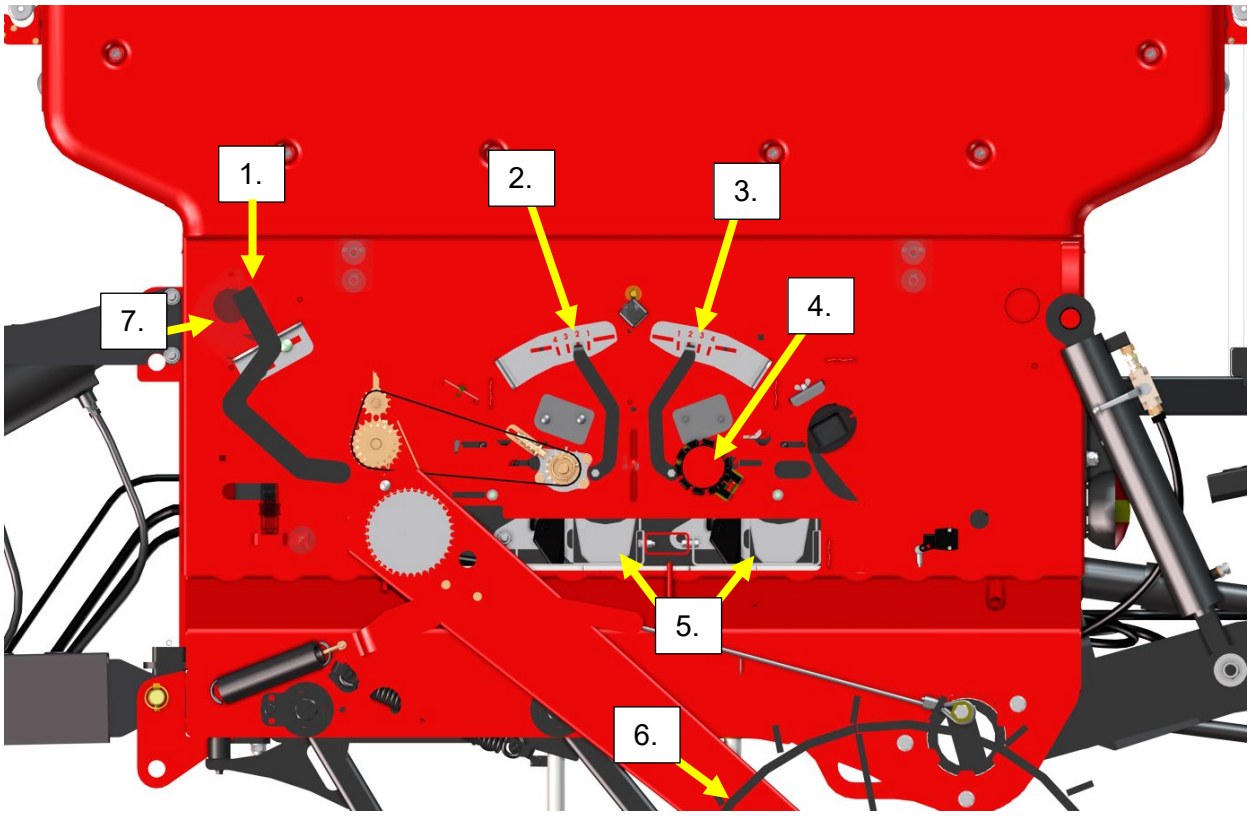
7.3.1 Bottom flaps

Feeding accuracy depends on the distance between the bottom flap and feeding roller (picture 12), for this reason it is important to have the bottom flaps in a right position, and that they will not be readjusted after the calibration test without repeating the test. The bottom flaps are flexible, in case some hard foreign item gets between the bottom flap and feeder roller. Bottom flaps are adjustable and there are four adjustment levers, two on both side of the hopper (pictures 13 and 14).

7.3.2 Closing plates

Between each feeding unit and hopper bottom there is a closing plate (picture 12). Plates are usually kept completely open. Single feeding units can be disabled by pushing the closing plate completely inside the feeding chamber. Closing feeding units can be an option if for example every second coulter is wanted to use for seeding.

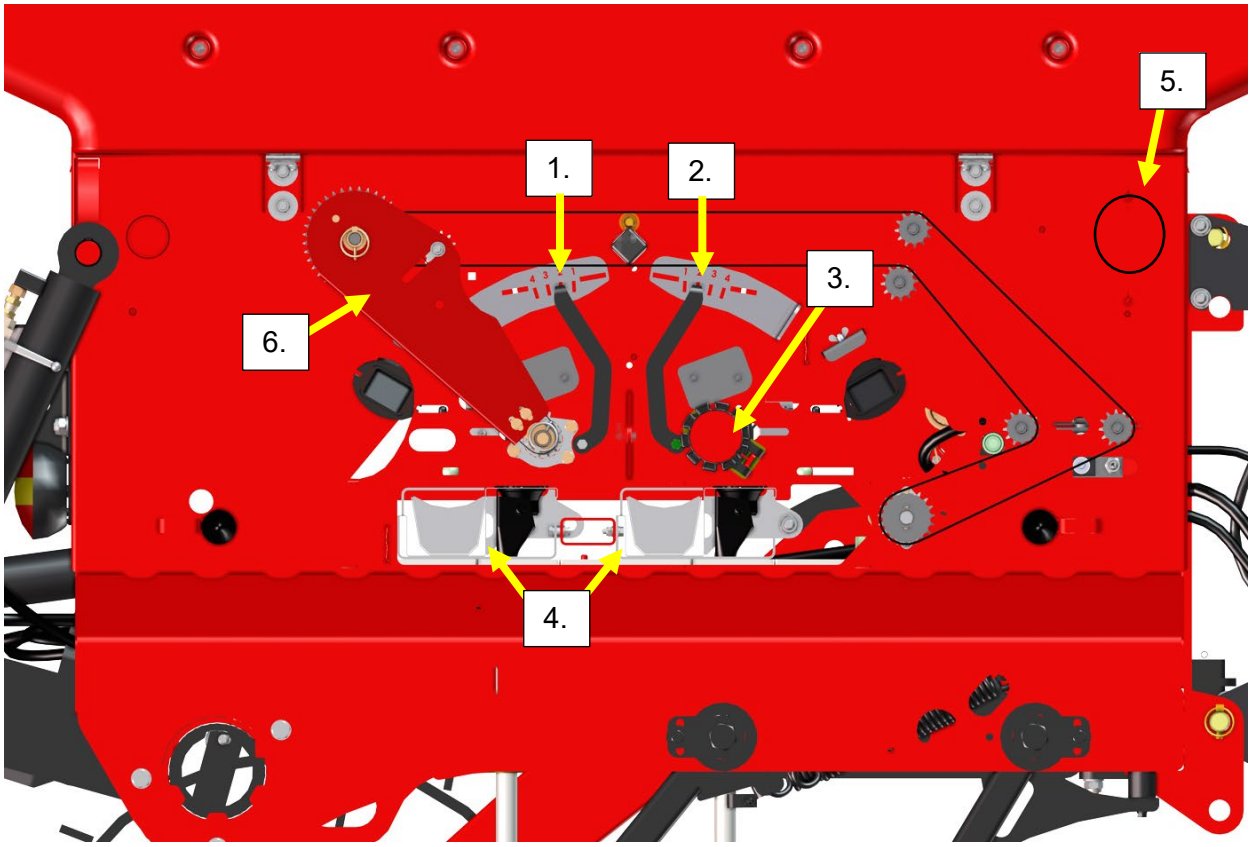
7.4 Adjustments on the sides of the machine



Picture 13. Adjustments on the left side of the machine

1. Lever to select calibration / seeding. In the picture the lever is in seeding position.
2. Bottom flap adjustment, fertilizer
3. Bottom flap adjustment, seed
4. Adjustment wheel for seed feeding (if electric adjustment is not equipped).
5. Calibration troughs
6. Ground wheel.
7. Storage box.

On the right side of the machine there are corresponding levers for bottom flaps.



Picture 14. Adjustments on the right side of the machine.

1. Bottom flap adjustment, seed
2. Bottom flap adjustment, fertilizer
3. Adjustment wheel for fertilizer feeding (if electric adjustment is not equipped).
4. Calibration troughs
5. Storage box.
6. Transmission cassette for seed feeding.

7.4.1 Lever for choosing calibration or seeding mode

Seeding mode is chosen when lever (1. picture 13) is in front and locked to the slot. By turning the lever completely to back, calibration troughs slide under the feeding units and calibration mode is chosen.

7.4.2 Bottom flap adjustment lever, fertilizer

Fertilizer bottom flap adjustment lever (picture 13 and 14) is used to adjust distance between feeding roller and bottom flap. Choose right position from the four-step scale while making calibration test according to the fertilizer to be sown.

NOTE! Adjustment lever must be set to the same setting on both sides of the machine!

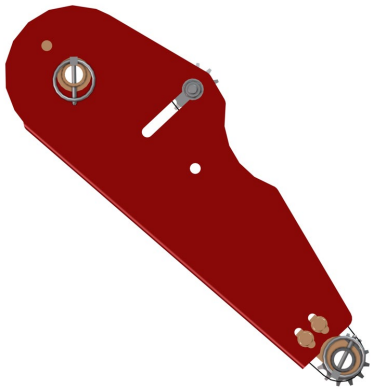
7.4.3 Bottom flap adjustment lever, seed

Seed bottom flap adjustment lever (picture 13 and 14) is used to adjust distance between feeding roller and bottom flap. Choose right position from the four-step scale while making calibration test according to the seeds to be sown.

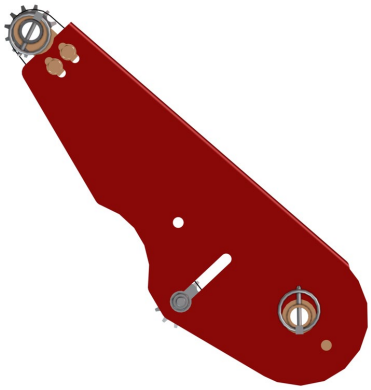
NOTE! Adjustment lever must be set to the same setting on both sides of the machine!

7.4.4 Transmission cassette, seed

Transmits power to the feeding shaft. Cassette can be turned.



Position for cereal seeding (big amounts).



Position for small seed seeding (small amounts).

7.4.5 Calibration troughs

Calibration troughs (picture 13 and 14) can only be emptied from the right side of the machine.

8. Adjustment of Sowing Depth / Coulter Pressure

Lower the machine while simultaneously driving forward. Stop the tractor while the machine is down. Do not allow the tractor to move backwards to avoid blocking the coulters. Check the correct position of the machine. The machine must be level. Adjust the level if necessary using the adjustment screw of the tractor hitch.

The Tume Orion has large-diameter, well-penetrating double-disc coulters with serrated edges. The coulter system is designed to be used in both minimum tilled and traditionally tilled conditions. If necessary, the sowing coulters can be weighted with up to 125 kg of pressure. The weighting is done by lowering the frame of the machine, causing the traction springs (picture 15) to tighten and the coulter pressure to increase.



Picture 15. Coulter System.

The coulter weighting is sufficient when the seed is properly placed in the seedbed or even slightly below it (the disc of the coulter creates a small groove in the seedbed).

Make sure that the weighting is not too strong, for example, with rapeseed, too deep a sowing depth can hinder germination.

As a general rule, the depth of sowing tillage should be such that the tillage is done to the intended sowing depth. The sowing depth should be chosen according to the crop to be sown and the moisture conditions of the soil. For all crops, it is essential that the sowing takes place in a moist soil layer to ensure germination. The seed must not be left in a dry, loose soil layer.

Also, the driving speed must be considered. Too high a speed increases the vertical distribution of the seed in the soil. In certain conditions, a high coulter pressure cannot be used, and in such cases, the bouncing of the coulters may increase excessively if the driving speed is high. As a rule of thumb, the risks increase when driving faster than 12 km/h.

Monitor the sowing depth occasionally even as the work progresses.

Performing coulter pressure adjustment

Coulter pressure depends on the height position of the machine. The lower the machine is lowered, the greater the coulter pressure becomes. The magnetic valves of the machine close the lifting/lowering hydraulics when the set limit is reached. The Tume Orion has automatic pressure correction, which raises the machine slowly upwards with pressure if the machine has been lowered lower than the set pressure value.

Increasing coulter pressure

Increase the coulter pressure with the **+** button on the pressure display or by changing the sowing profile. Since the coulter pressure is determined by the height of the machine, increasing the pressure requires lowering the machine further down. Press the machine down using the tractor's hydraulics, so that the machine reaches the selected pressure.

Decreasing coulter pressure

Decrease the coulter pressure value on the display with the **-** button or by changing the sowing profile. Since the coulter pressure is determined by the height of the machine, reducing the pressure requires raising the machine while it is down. This can be done by lightly lifting and lowering the machine again during sowing.

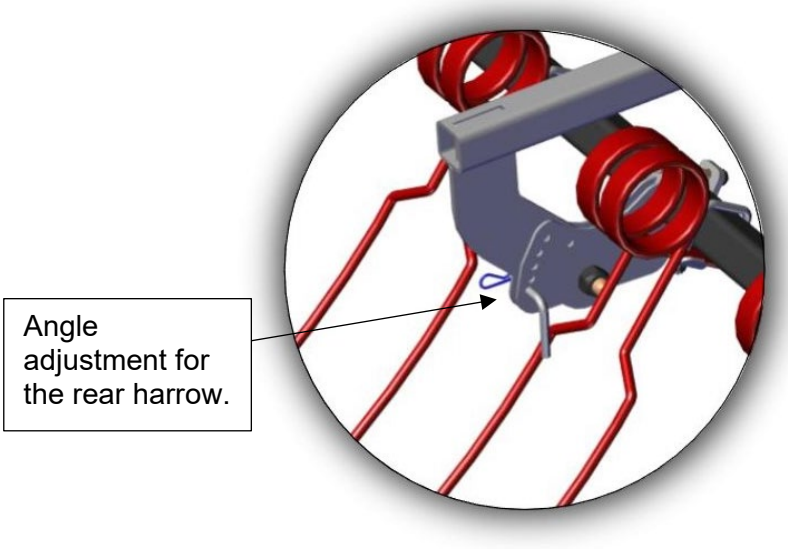
A more straightforward way is to use the pressure correction valve. In this case, the machine opens the valve, which raises the machine upwards when pressed down with pressure. This movement stops when the set coulter pressure is reached. When lifting at the headland and lowering the machine back down, the machine stops at the position determined by the pressure value automatically or rises slightly upwards with pressure if the pressure value is exceeded when the machine is lowered at high speed.

9. REAR HARROW ADJUSTMENT



Picture 16. Rear harrow.

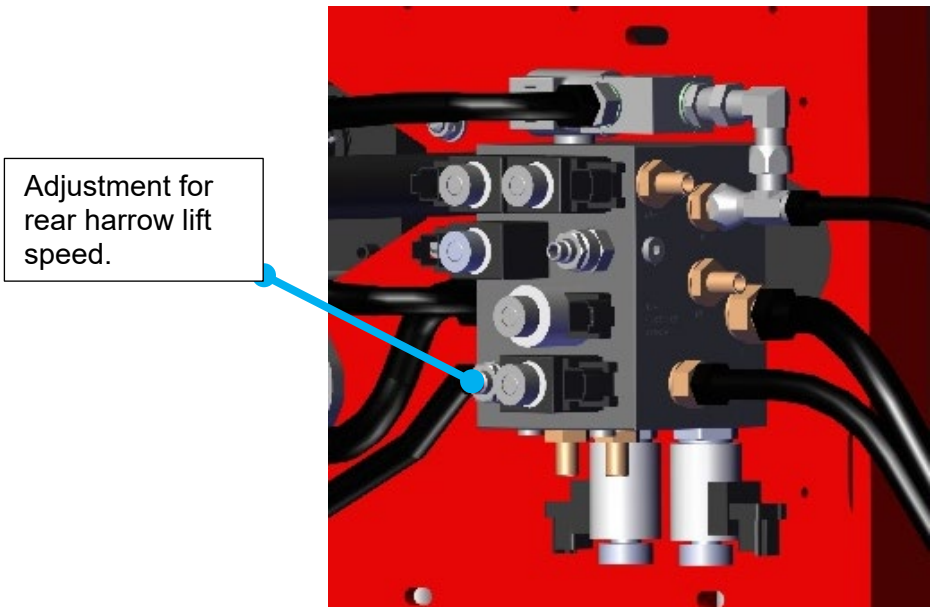
Harrow tines can be adjusted in sideways direction. In addition, the working angle can be adjusted. Sideways direction will be adjusted in such a way that the tines travel between the earth wall left between the supporting wheels and wheel track. Whenever the angle adjustment is changed afterwards, the working depth must also be checked.



Picture 17. Angle adjustment for the rear harrow.

Rear harrow can be controlled from terminal with a half lift function.

Rising speed of the rear harrow can be adjusted from a throttle valve, blue cap, located in front of the machine. For the adjustment, loosen the the hexagonal scew from side of the cap, rotate cap and lock it again with the screw. Adjustment is recommended to do with full hoppers and normal oil temperature.

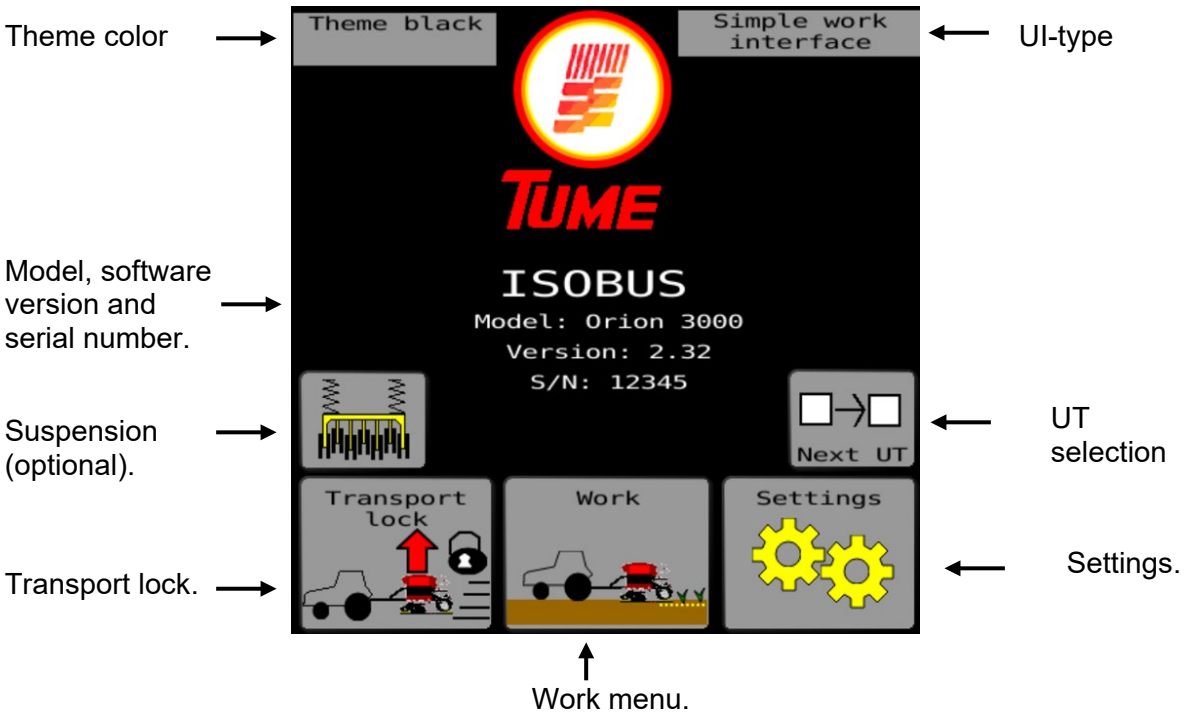


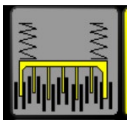
Picture 18. Rear harrow lift speed adjustment.

NOTE! Do not reverse when rear harrow is on ground!

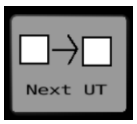
10. USER INTERFACE

Start menu

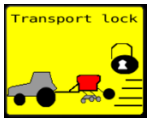




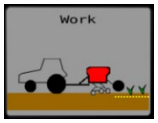
Rear wheel suspension on for road driving (yellow) or off (gray). Suspension is an optional equipment. Suspension works only when start menu is active.



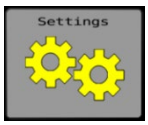
With **Next UT** button you can change the UT where seed drill user interface is shown, if you have more than one universal terminal.



Transport lock. Grey = off. Yellow = on. Can be activated only when machine is in up position. Ensure that the rear harrow is also up before activating this function. This prevents machine to go accidentally down, i.e. if hydraulics are used or tractors valve is leaking.

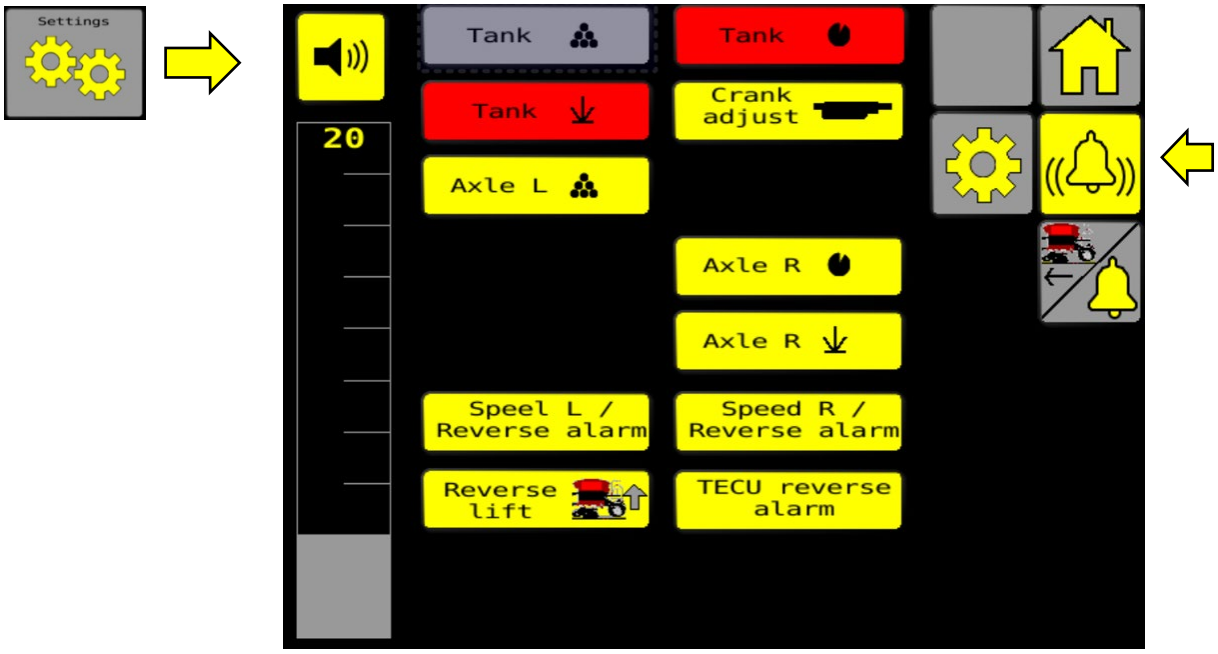


Work menu is selected when seeding.



Settings menu.

10.1 ALARM CONTROL



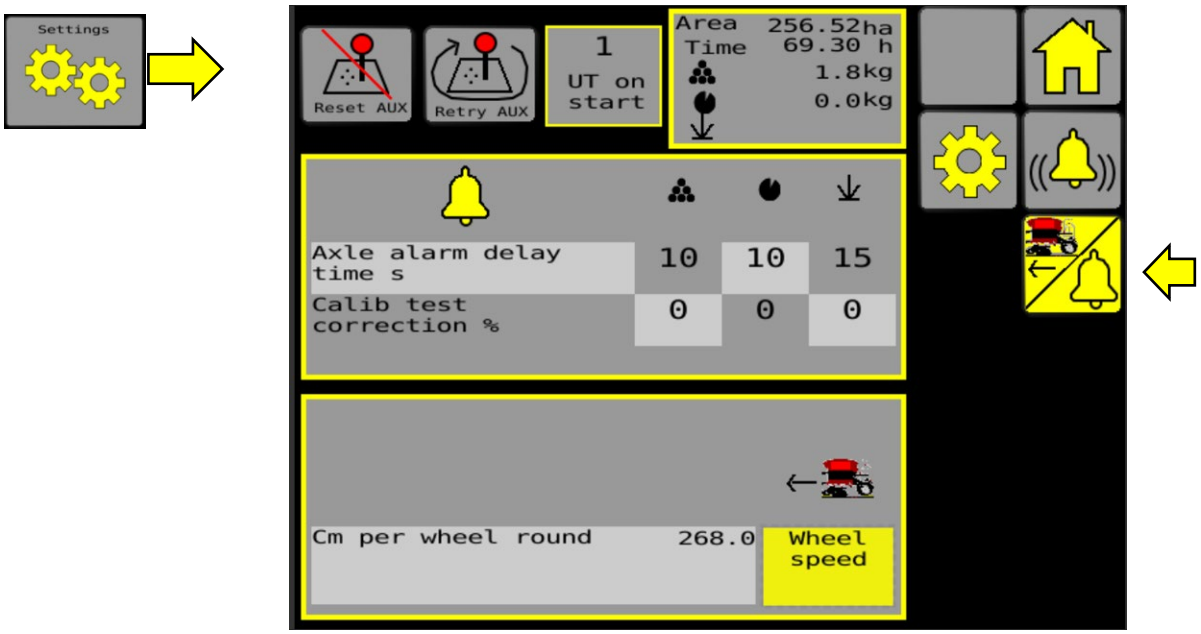
In the ALARM CONTROL menu you can activate/deactivate following functions.

- Tank = Fertilizer hopper level sensor.
- Tank = Seed hopper level sensor.
- Tank = Small seed/start fertilizer hopper level sensor.
- Axle L = Fertilizer feeding shaft rotation sensor.
- Axle R = Seed feeding shaft rotation sensor.
- Axle R = Small seed/start fertilizer feeding shaft rotation sensor.
- Speed L = Left side speed sensors. Reversing alarm.
- Speed R = Right side speed sensors. Reversing alarm.
- Reverse lift = Rear harrow reversing safety feature. Machine goes lower and harrow is lifted if reversed.
- Crank adjust = Actuator motor alarm.

Monitoring is in use when its icon is yellow. Make the selection by pressing the icon. Remove the selection by pressing the icon again when it turns to grey. Red icon means that the specific sensor is giving alarm. The alarm can be for example a nearly empty hopper.

Notice that if the selection is grey, you wont get any alarm from that function!

10.2 AUX, totals, alarm delays, speed settings





Reset AUX resets the auxiliary control device memory slots, which are stored in the seed drills ECU. When seed drill is restarted, these are not returned and AUX-N functions need to be set again.



Retry AUX tries to return auxiliary control devices memory slots, if the original automatic returning failed. Need in some tractors where UT is not accept programming before AUX-N functionality is activated.

AUX-N functionalities

AUX-N, Auxiliary control New, so new auxiliary control device. The machine can be controlled via ISOBUS using the tractor's own control devices or an additional controller provided by a third party. The AUX-N controller makes working easier because the buttons/lever are physical and their use is much easier compared to using the touch screen when the machine is moving and swinging. All functions of the seeder are accessible from the touch screen. The use of the AUX-N controller is not mandatory for sowing, but sowing is also possible without it. Controllable via AUX-N are:

1. Choosing seeding profile
2. Adjusting of seeding rates
3. Adjusting of coulter pressure
4. Tramline step + / -
5. Pole lift activating / deactivating
6. Markers

AUX-N programming

AUX-N functions are programmed via ISOBUS-UT whose number is 1. If there are several displays in the ISOBUS bus, each must have its own UT number. Even if the seeder's user interface is on screen 2, the functions of AUX-N must be programmed on screen 1. The screen's UT number can be found and can be changed in the screen's UT settings. Please note that the

existence of two screens with the same UT number on the bus will cause an error and the system will not work.

The programming protocol depends on UT's own practices. Familiarize yourself with UT's instructions on AUX-N programming and practices.

When the programming is done, the seeder links to the AUX-N controller via the UT and starts executing the commands given from the buttons. The seed drill stores the programmed functions in its memory, and remembers them after power outages.

AUX-N controller when restarted

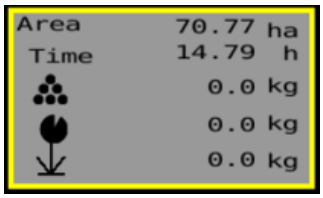
When the seeder is restarted or connected back to the same tractor after a break, the UT indicates that the programmed functions are trying to be restored. User must accept reset or AUX-N will not work. After this, AUX-N can be used if the tractor's or additional controller's own safety measures do not prevent it. Check that AUX-N is active on behalf of the controller before you start using it again.

In some terminals or tractors, automatic reset does not work until AUX-N is activated from the terminal. In this case, the Retry AUX button in the main view of the seed drill can be used to try to restore when AUX-N has been activated manually from the terminal first.

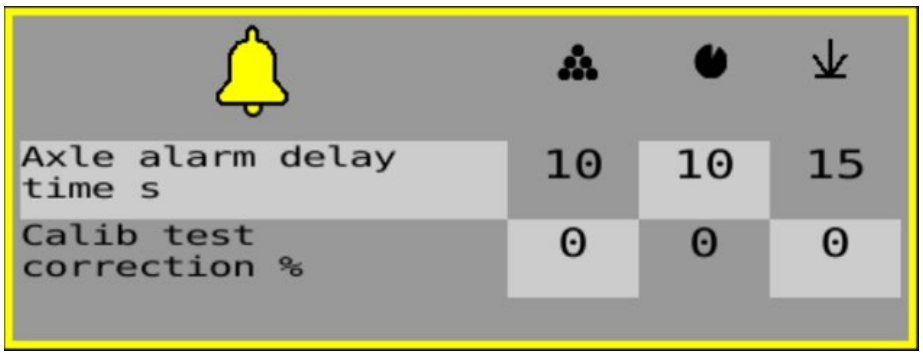


UT on start. With the number of the icon, you can choose which terminal (if you have more than one terminal) the user interface starts when you turn on the power.

NOTE: In some situations, the second terminal starts up so slowly compared to the other terminals that the seeder considers that it cannot be found on the bus. In this case, the seeder presents itself on the screen with the smallest UT number that it finds on the bus.

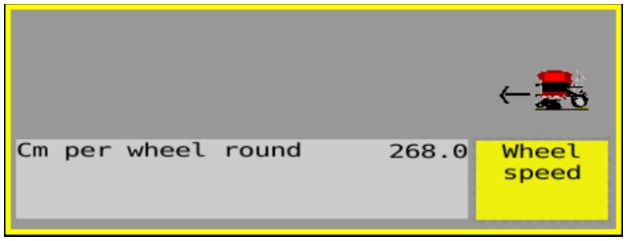


Total area, work time and sown amounts. Cannot be reseted.



Axle alarm delay time s
Time delay for shaft alarms. Note! too short time delay causes unnecessary shaft alarms.

Calib test correction %
Deviation of the seeding rate in relation to the calibration test. For example, if the sowing amount is systematically higher or lower with some fertilizer than the rotation test gives, the actual sowing amount can be corrected with this value.



Cm per wheel round
The advance of the machine in one revolution of the rear wheel. Affects area counter and speed measurement.

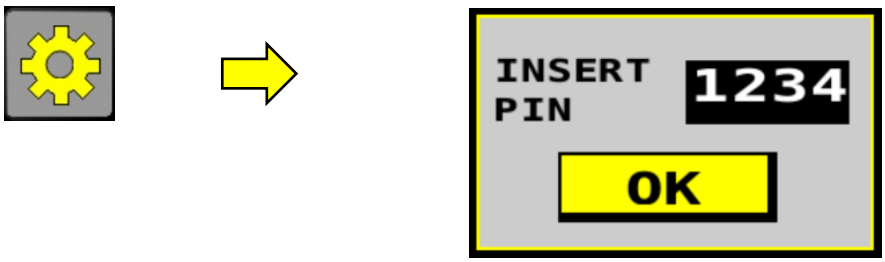
Factory settings:

Tire 7,5 – 16 = 240
Tire 7,5 - 20 = 268
Tire 280/70-18 = 262



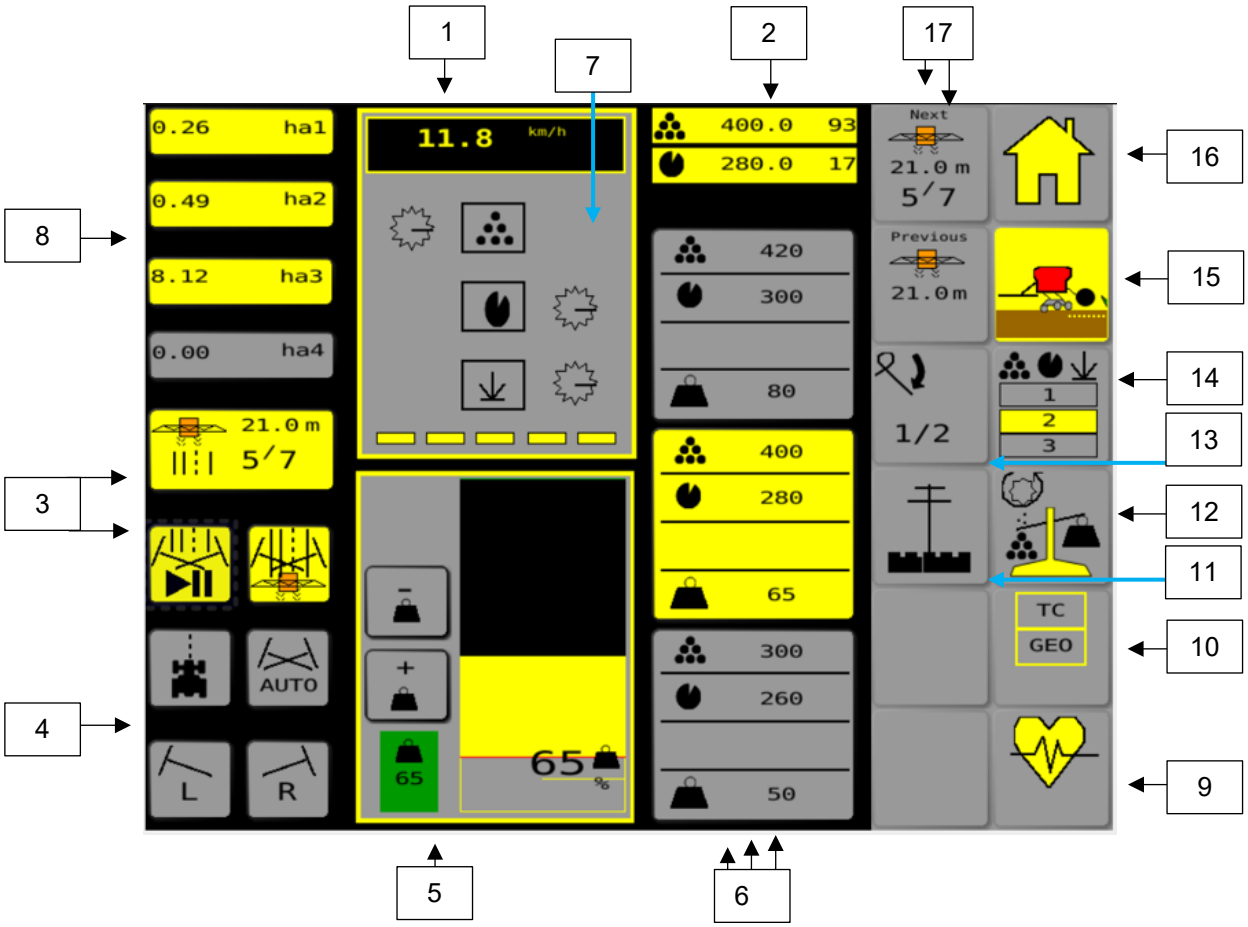
Selection of speed source. The factory setting is the speed coming from the seeder's wheels.

10.3 Equipment and features



Settings intended for use by the manufacturer.

10.4 Work menu (simple work interface)



Picture 23. Seeding menu.

User interface icons and buttons:

1. Speed display
2. Active feeding amounts
3. Tramlines
4. Markers
5. Coulter pressure / machine position
6. Seeding profiles 3 pcs.
7. Hopper and shaft rotation monitoring
8. Area counters
9. Diagnostics and alarm aknowledgement
10. ISOBUS-functionalities.
11. Pole-lift
12. Calibration settings
13. Half-lift
14. Seeding profile settings
15. Work menu.
16. Home menu
17. Next and previous wayline.

NOTE! Exit the seeding menu during transport by pressing button 16. (EXIT WORK).

Please note that depending on the equipment of the machine, not all of the icons mentioned above may be in use, in which case they will not appear on the screen. Missing icons can be the activity information of the ISOBUS task controller, the axle and tank monitors of the small seed device, the ritsi marking, left and right marker, the automatic function of the markers. Depending on the terminal used, the positions of the icons and the graphic representation may also differ from what is shown here.

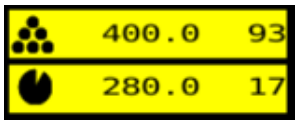
10.4.1 Speed display



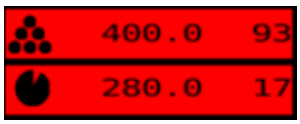
During seeding, the display shows the speed measured by the machine in km/h. The speed is normally measured from the support wheels, but another speed source can also be selected from the settings, if such are available (gps, tractor, radar). Speed data is needed for area measurement.

Note! The speed displayed by the monitor may differ from the speed of the tractor. This can be due to various reasons, such as slip, tire sinking, the tire size specified in the tractor settings in relation to the actual one, rounding of the speed value. A small speed difference does not cause any action.

10.4.2 Active seeding amounts



The icons show the amount to be sown in kg/ha at that moment and the percentage value of the maximum output amount when the electronic adjustment (accessory) is in use. A calibration test must be done so that the figure shows the real value.



If the icon is red, the target feeding amount has not been reached. The reason may be:
- too large or small amount kg/ha, which the feeder cannot feed.
- actuator motorl jamming, the feed shaft cannot move laterally
- damage to the actuator motor cable (the machine does not recognize the motor)

10.4.3 Tramlines



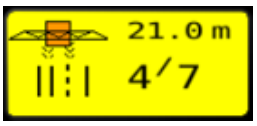
Pause/**play**. Tramline step is incremented and marker side is switched (if both markers are active) when machine is lifted.



Pause/play. Tramlines wont be incremented and markers wont go down.

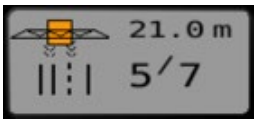


Tramlines activated. Set the function to active (yellow) when you want to make tramlines automatically. In this case, the tramline settings button also turns yellow.

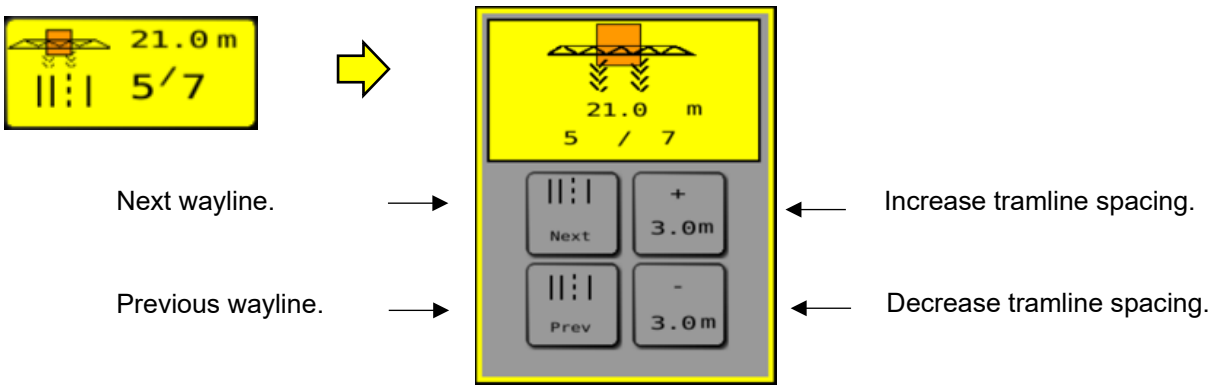




Tramlines off (grey). Set the function to off when you don't want to tramlines at all. In this case, the tramline settings button also turns gray.

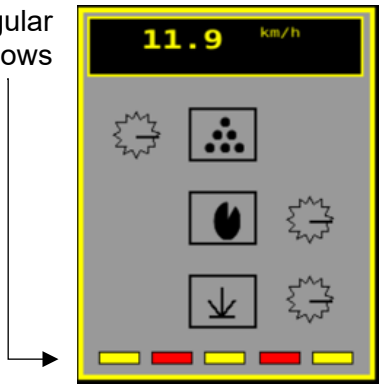


Tramline settings



The first number on the display indicates the current wayline. The second number indicates the tramline spacing. The second number is set according to the sprayer in use. In this example, it is a 3-meter seed drill and a 21-meter sprayer. The tramlines are formed in the middle of the tramline spacing. In this example in step 4/7.

When tramline is being made, the screen informs about it at regular intervals with a sound signal, in addition, the center of the screen shows the tramline devices in use in red.



10.4.4 Markers



Left marker not in use.



Left marker in use.



Right marker not in use.



Right marker in use.



Ritsi marking OFF.



Ritsi marking ON.

Ritsi marking means that the tramline locations are also marked mechanically to the field. This function is needed when sowing plants which need spraying before the plant has reached the surface. Actual tramlines are not yet visible then.

This is done using row markers. During the sowing next to the tramline both of the machine's row markers are lowered down. Then the other row marker draws a line to the centre of the previous tramline stage. So the mark works as a centre mark during spraying.

Ritsi marking is turned ON by pressing the icon shown above. Icon background color turns to yellow. Respectively it turns OFF by pressing the icon again, color changes to grey.



Be extra cautious when in Ritsi marking mode because both row markers are lowered down. This may cause a risk to the environment.



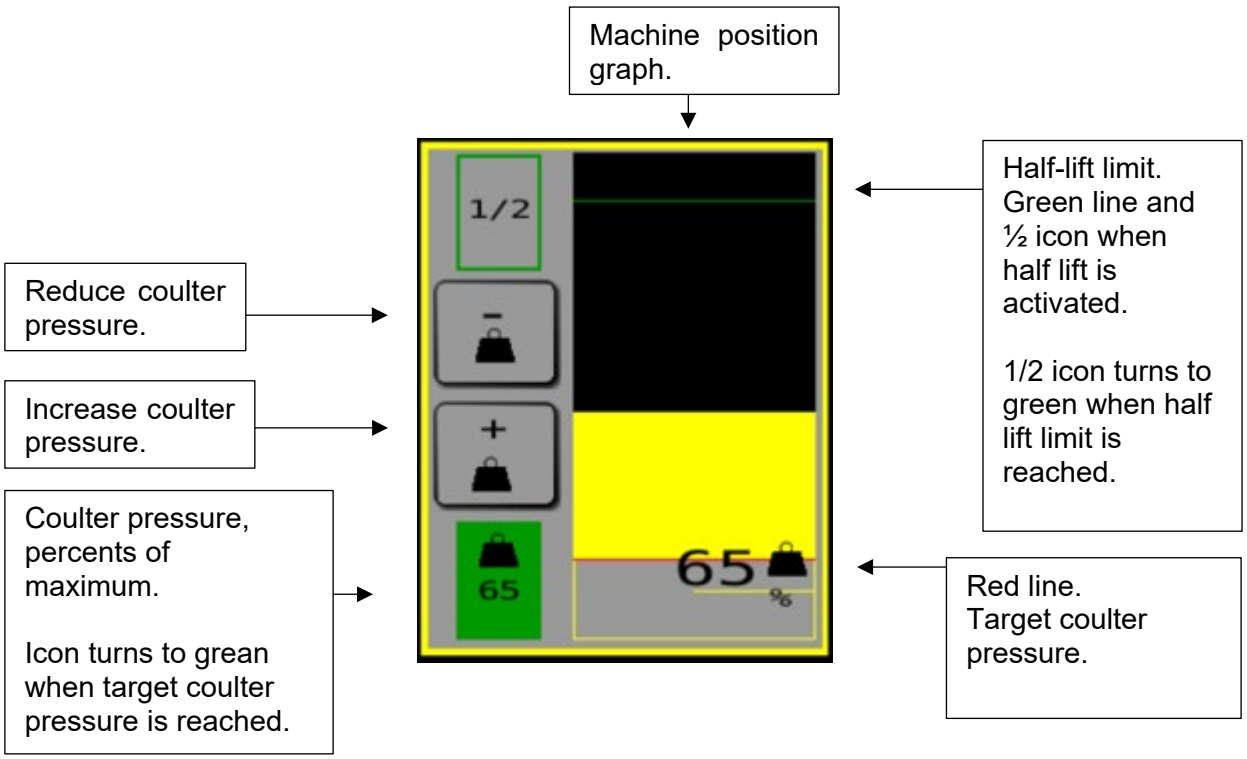
Left and right marker do not change turns automatically.



Left and right marker go down in turns.

When marker automatic function is on, the marker which goes down changes each time when machine is put down.

10.4.5 Coulter pressure adjustment, machine position



Coulter pressure depends on the height position of the machine. The lower the machine goes, the higher the coulter pressure rises. Machine's solenoid valves close lift/lowering hydraulics when the adjusted limit is reached. Proper coulter pressure can be monitored by looking the front wheels. Front wheels should touch the soil lightly and follow the soil surface.

Increasing coulter pressure

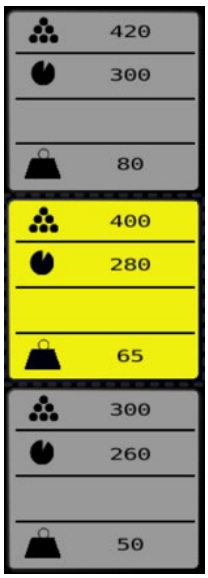
Increase coulter pressure with the + button on the print screen or by changing the seeding profile. Since the coulter pressure is determined by the height of the machine, increasing the pressure requires lowering the machine. Lower the machine using the tractor's hydraulics. If the machine descends too low, by pressing the pressure downwards, the machine will correct its height a little higher, correcting the error.

Decreasing coulter pressure

Reduce the value of the coulter pressure on the screen with the **-** button or by changing the seeding profile. Since the coulter pressure is determined by the height of the machine, reducing the pressure requires raising the machine when the machine is down. This can be done either by gently raising the machine and lowering it back down in the middle of sowing. It is easier to correct the pressure by pressing the machine down after the pressure has been reduced from monitor. In this case, the machine rises slowly upwards. When lifting the machine on the headland and lowering it back down, the machine automatically stops at the position determined by the weighting value by pressing down with pressure long enough.

After the coulter pressure setting has changed, return machine lifting/lowering hydraulic lever to central (closed) position from the tractor.

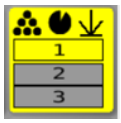
10.4.6 Seeding profiles 3 pcs



There are three seeding profiles in which you can save the fertilizer and seed seeding amounts and coulter pressure. You can change between the profiles e.g. between the fields or in the field between different soil types.

Setting on yellow background is in use. You can select the profile by pressing it. This can be done during the work.

Profile settings can be adjusted by pressing the profile setting button 123.



NOTE! The seeding rates cannot be changed in the settings, if the amount is adjusted with the handwheel.

NOTE! A calibration test must be done so that the fertilizer and seed quantities recorded in the sowing profiles are correct!

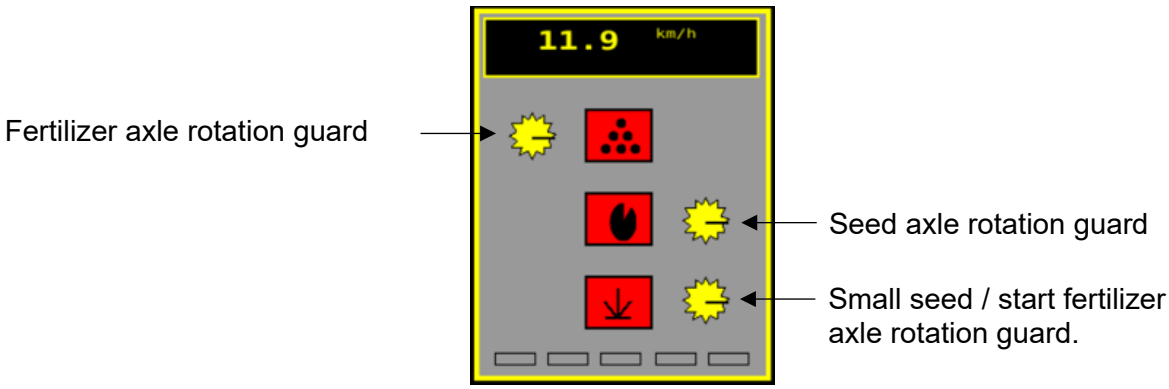
NOTE! Sowing profiles use the selected calibration test result!

Remember to select the rotation test results you want to use in order to achieve the correct seeding amount!

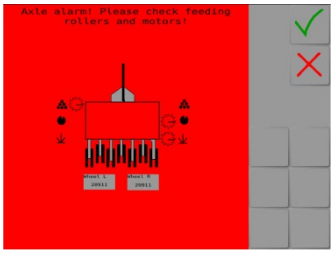
10.4.7 Axle and hopper level alarms

Axle alarms

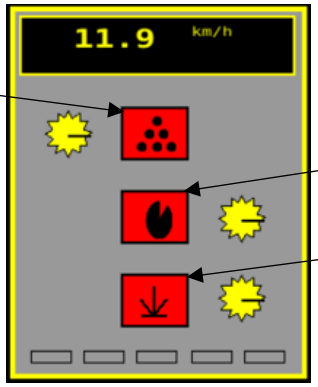
Axle alarm sensors are located at the end of each feeding shaft.



Yellow background color = axle guard in use, no alarm.
Gray background color = axle guard not in use.
Red background color = axle guard in use, axle does not rotate → Alarm!



Hopper level guards

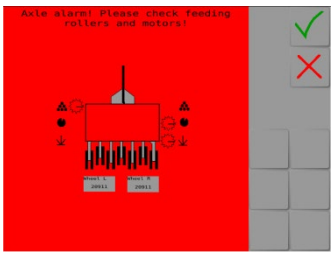


Ferilizer hopper level guard

Seed hopper guard

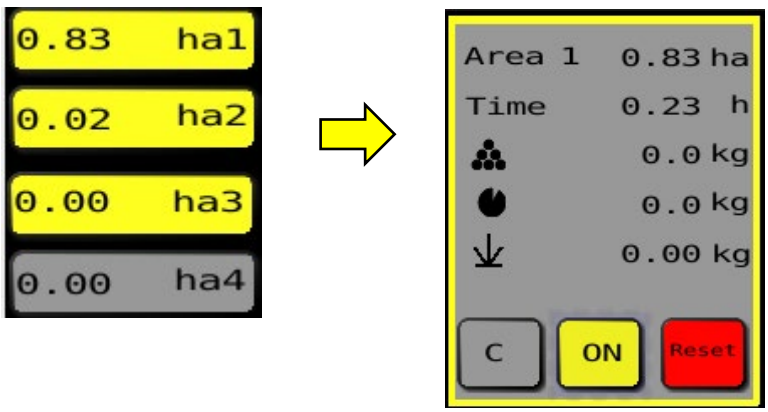
Small seed / start fertilizer hopper level guard.

Yellow background color = hopper level guard in use, no alarm.
Gray background color = hopper level guard not in use.
Red background color = hopper level guard in use, hopper empty → Alarm!



When the hopper is almost empty, the sensor gives an alarm, and the icon for that hopper turns red. At the same time, there will also be an audible alarm. The alarm can be turned off by pressing the alarm acknowledgment key. If the hopper monitor is off (switching on and off from the settings menu), the icon is gray.

10.4.8 Area-, work time and sowing rate meters 4 pcs



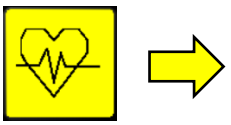
There are four area, working time and sowing rate meters. By pressing the area meter, the change menu for area meters opens. Area meters are selected for use by pressing the **ON** button of the respective meter to yellow. When the ON key is gray, the meter is not in use.

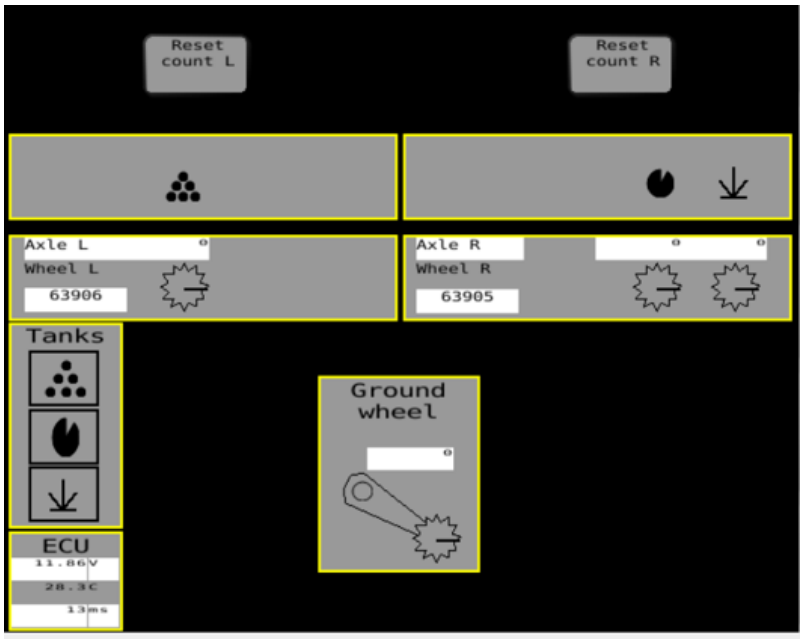
By pressing one of the **ha1**, **ha2**, etc. buttons, the stored data of that meter will open. These include worked area, working time, amount of fertilizer sown and amount of seed sown during the measurement period.

Note! Sown quantities are calculated, not weighed.
Note! Time is measured in hours, not hours and minutes. E.g. 0.5 h = 30 min.

The selected meter can be reset by pressing the **RESET** button. You can exit the menu without making any changes by pressing the **C** button.

10.4.9 Diagnostics and alarm acknowledgement





The diagnostics menu shows the pulses from the sensors. These values can be used for troubleshooting. The menu also shows active alarms. The counters can be reset with the Reset Count buttons. Below the ECU, its voltage, temperature and program cycle time ms.

10.4.10 ISOBUS functionalities



The ISOBUS task controller is managed from the settings of the tractor's ISOBUS terminal. The icons are for the user's information.

Using the different features of the task controller to control the seed drill requires their activation from the tractor terminal. Check the tractor manual for how to do it. These functions are only available if the tractor is equipped with these features.

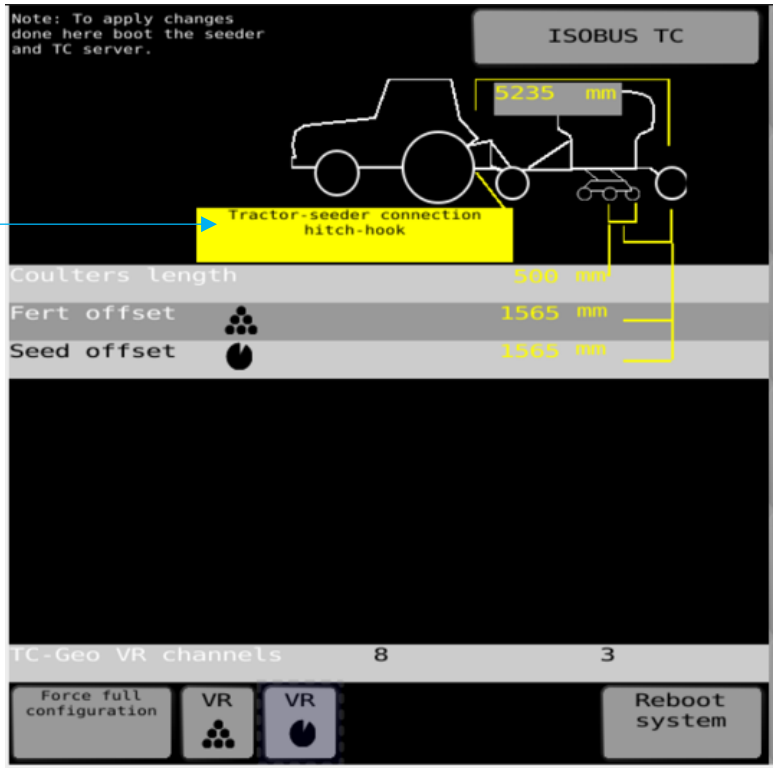
The ISOBUS task controller can be used:

- for recording accumulated area, working time and calculated seed and fertilizer rates (TC)
- for adjusting the sowing rates with the precision map (GEO)

The activity of the functions in use (TC, GEO) are shown in the user interface of the seed drill on a yellow background. The functionality of the icon on the gray background is not active.

The geometry to be notified to the task controller and the connection method of the machine can be changed from the menu. When the Isobus TC button in the upper right corner is blue, the task controller is in use from the seeder side. When the button is gray, the task controller cannot control the seeder.

Selection for connection type.

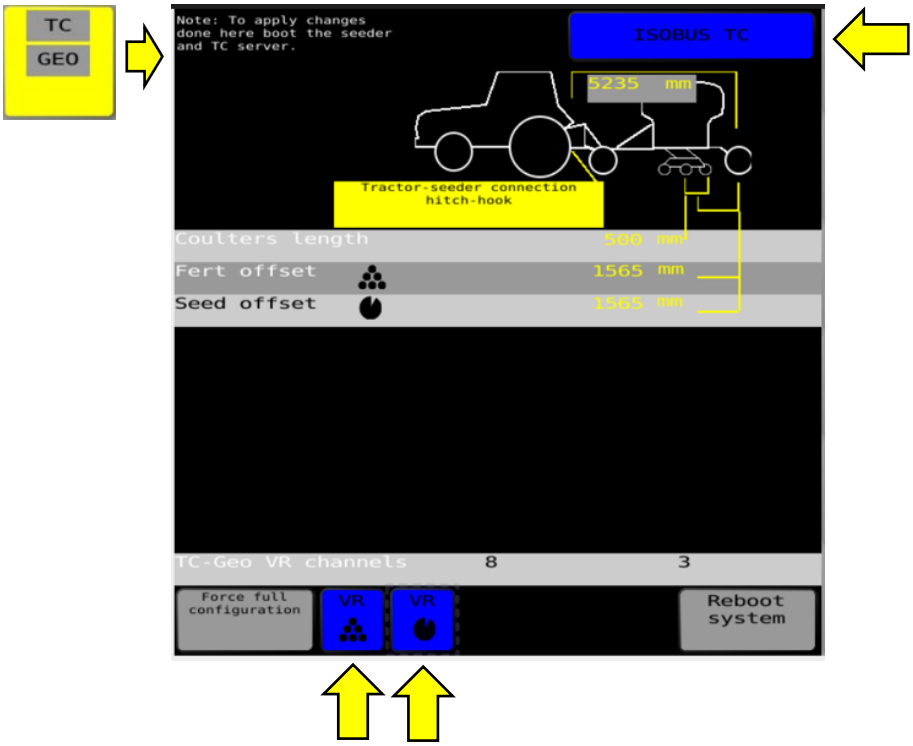


NOTE! Depending on the terminal, the position of the coulters can be interpreted either to the front or to the rear of the rear wheels, offset value + or -. With a ground wheel machine, this mainly affects the correctness of coverage map.

TC GEO functionality

With the TC-GEO functionality, the seed and/or fertilizer sowing quantities can be controlled according to the prescription map. Familiarize yourself with the instructions on the tractor terminal, how to activate the prescription map and how to use it.

Activate the TC-GEO functionality from the tractor terminal. After that, the button "ISOBUS TC" is selected from the user interface of the seeder and the fertilizer and/or seed that you want adjusted according to the map is selected from the bottom of the window.



When the task controller determines the amount of seed and fertilizer to be used, the sowing amounts shown in the sowing profiles are irrelevant.



+



The fertilizer feeding rate changes according to the command of the task controller (Variable Rate).



The sowing amount of the fertilizer is the sowing amount selected in the sowing profile.



+



The seed feeding rate changes according to the command of the task controller (Variable Rate).



The sowing amount of the seed is the sowing amount selected in the sowing profile.

10.4.11 Pole lift



Pole lift off. Marker rises when machine rises.



Pole lift on. Only marker rises when machine is lifted.

Pressing the pole lift on, the icon's background color turns to yellow. Then when lifting the machine, only marker rises, and the drill stays in seeding position. Function is used when you don't want to stop seeding but you need to rise the marker up because of some obstacle.

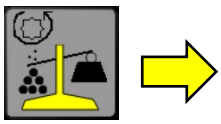
Pole lift goes off automatically after 20 seconds.

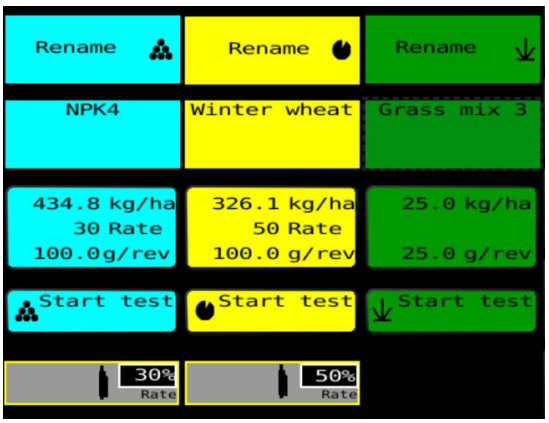
Do not reverse when pole lift is activated because the machine is in seeding position!

10.4.12 Calibration settings

The Calibration Settings menu stores the results of calibration tests. You can save up to eleven calibration tests for fertilizer, seed, and small-seed/start fertilizer, and name each product accordingly. The calibration test results are used as basic data for the feed quantity adjustment (electrical adjustment) and the counters, so it is important that they are correct and that the correct rotation test value is used at any given time.

More about the calibration test settings in the chapter **calibration test preparations** and **calibration test.**





10.4.13 Half lift



Half lift off. Rear harrow rises and lowers with the machine. Machine rises completely up.



Half lift on. Rear harrow stays in the position where it was when this function was activated, up or down. When liftin the machine, its stops to the set limit.

When half-lift is activated, the lifting height of the machine is limited. This can speed up headland work, for example.

With the half-lift function, the rear harrow can be locked in the upper or lower position. If you don't want to use the rear harrow and want it to stay up all the time, turn on the half lift when the rear harrow is up. If you want the rear harrow to stay on the ground even when the machine is raised, switch on the half-lift when the harrow is down.

The feature is good, e.g. in muddy conditions, when you want the rear harrow to break the tire tracks even on headland turns in the field.

You can change the height of the half lift in the profile settings with a value of 1/2. The higher the value, the lower the machine stays in half lift.

Half lifting does not affect the operation of markers or tramlines.



NOTE! Do not adjust the half-lift so low that the ground wheel or coulters do not rise sufficiently from the ground! When turning or reversing, the ground wheel and coulters can be damaged!

Half lifting does not affect the operation of markers or tramlines!

Note! Remember to switch off the half-lift when you reverse or go to road for transport. The structures of the rear harrow will be damaged if the rear harrow is left down!

The rear harrow has a protective function, where the rear harrow rises up using the oil pressure of the machine's lifting cylinders, if the machine is reversed and the rear harrow is not in the upper position. This can easily happen when using a half lift. In this case, the machine descends slightly and raises the rear harrow.

STILL DON'T REVERSE WHEN REAR HARROW IS DOWN! THE RISK OF DAMAGE EXISTS REGARDLESS OF THE PROTECTIVE FUNCTION!

10.4.14 Seeding profile settings



The values of the seeding profiles can be changed freely in each of the three profiles (Profile 1, Profile 2 and Profile 3). These include:

- Fertilizer feeding amount kg (kg/ha)
- Seed feeding amount kg (kg/ha)
- Small seed / start fertilizer feeding amount kg (optional, kg/ha)
- Coulter pressure, percentages of maximum %

Select the value to change by pressing the number field. Enter the desired value and accept it. Make the necessary changes to the fertilizer and seed amounts, as well as to the coulter pressure.

NOTE! The rotation test must be done carefully so that the fertilizer and seed amounts given in the sowing profiles are correct!

NOTE! The seeding rates cannot be changed in the settings, if the amount is adjusted with the handwheel.

10.4.15 Work menu



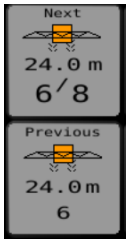
Opens work menu.
Closes all other open screens.

10.4.16 Home menu



Return to start menu. Exit work.

10.4.17 Next and previous wayline



The buttons can be used to change the wayline forward + or backward -.
You can, for example, quickly make a correction for an unintentional change of wayline.

11. CALIBRATION TEST

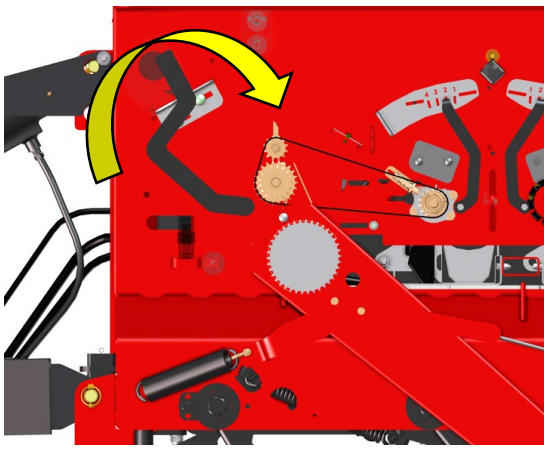
11.1 Preparations for calibration test

Before starting the calibration test, the machine is adjusted according to the seed and fertilizer to be sown.

1. Connect the seed drill to the tractor and turn on the power to the seed drill. Open the protective covers on the sides of the machine.

2. Move calibration troughs to calibration mode by turning the calibration lever from front to back. Calibration troughs slide under the feeding units.

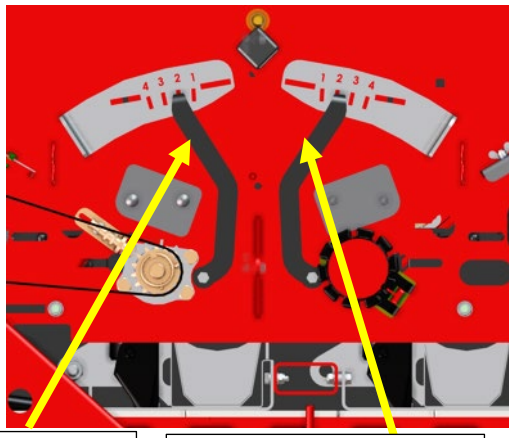
   If the machine is equipped with small seed / start fertilizer unit, it also adjusts to calibration mode. Hose rack moves away under the feeding units. Calibration troughs can be put to this free space. Take calibration troughs from the seed/fertilizer side.



3. Adjust bottom flap levers according to the seed / fertilizer to be sown.

SEED / FERTILIZER	BOTTOM FLAP POS.
Granular fertilizer	2
Grains	2
Small seeds	1
Pea	3
Large beans	4

NOTE! The bottom flaps must be adjusted to the same position on both sides of the machine.

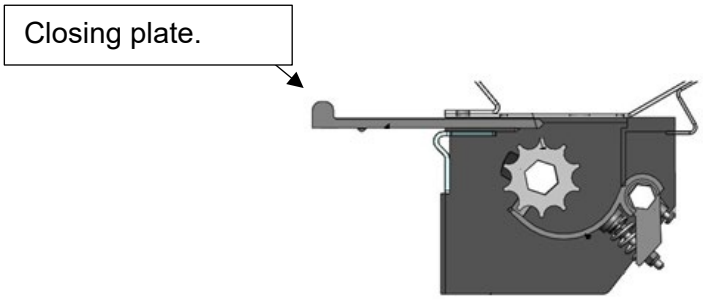


Fertilizer bottom flap adjustment. Left side.

Seed bottom flap adjustment. Left side.

Seeds other than those mentioned above: Compare the seed size with the seeds mentioned above and their corresponding settings.

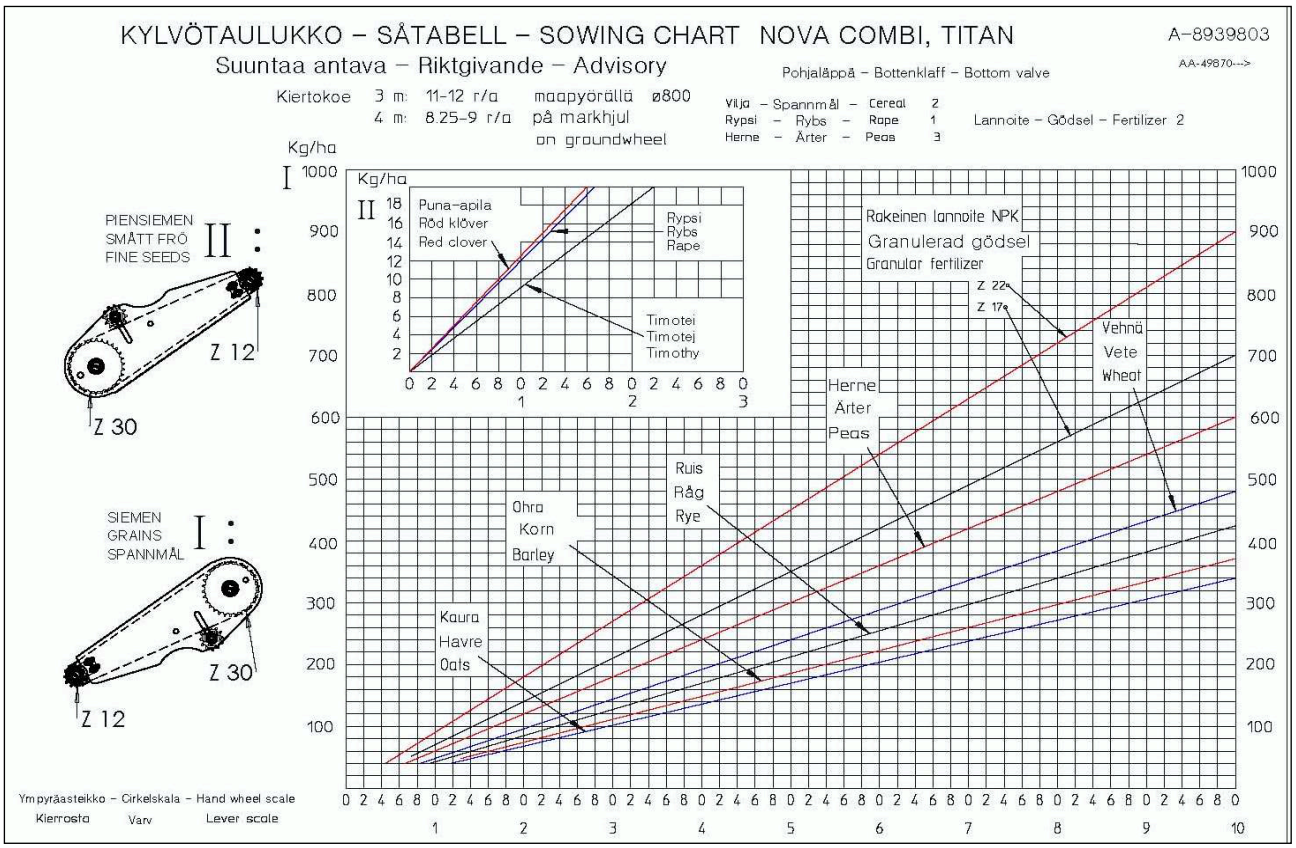
4. Make sure that closing plates are completely open and tramline device is turned off..



5. If the machine has a manual feed control (hand wheel) See the seeding chart for the setting value and adjust the hand wheel accordingly. The sowing table can also be found on the side of the machine.

   The handwheel has 10 complete turns and 10 partial turns. Unlocking is done by first pressing the handwheel locking lever towards the machine, and then by turning it. The locking lever also has a main feed scale of 0-10, where the number interval corresponds to one turn of the handwheel. The adjustment is read from the inner surface of the handwheel.

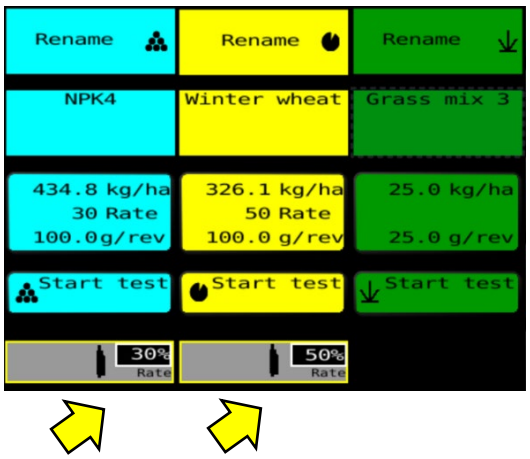




Seeding chart.

_ _

6. If the machine is equipped with an electric feeding control, the actuator motor is set according to the desired seeding rate. The higher the seeding rate, the higher the **Rate** value.



   You can also find the appropriate Rate value in the seeding chart. Read the **tens digit** from the lower number row and the **decimal digit** from the upper row.

   Example:
   Target seeding rate for oats is **200 kg/ha**.
   Lower row number: **5**, upper row number: **8**
   → **Rate = 58%**

   NOTE! Always use a Rate value of at least 10. Values below 10 may result in reduced metering accuracy depending on the seed. The actual seeding rate must be verified before sowing.

_ _

7. Add seed and fertilizer enough to the hoppers so that each feeding unit is well covered.

_ _

8. Rotate the ground wheel for a few revolutions to fill the feeding units. Empty the test trays.

_ _

Machine is now ready for the calibration test.

11.2 Calibration test for fertilizer, hand wheel adjustment

After you have made the preparations for the calibration test you can perform the calibration test.

1. Turn the calibration test lever to the rot calibration test position and make sure that the calibration test trays are empty.

2. Rotate the ground wheel. The wheel does not necessarily have to be rotated the number of are, as the pulse sensor in the ground wheel automatically calculates the area that is rotated in the test. However, the calculation is easiest to visualize using the one are.

   The number of revolutions per are of the ground wheel of different machine widths are below:

   - o Orion 3000 = 11-12 revolutions /are
   - o Orion 4000 = 8.25-9 revolutions /are

3. Weigh the amount of fertilizer fed into the test trays. This, multiplied by a hundred, is kg/ha, if an area equivalent to an are was rotated.

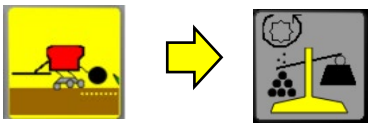
   - **NOTE!** Remember to remove the weight of the container/bag from the weighing result.

4. Adjust the handwheel smaller or larger as needed and repeat the calibration test until you are satisfied with the feed amount.

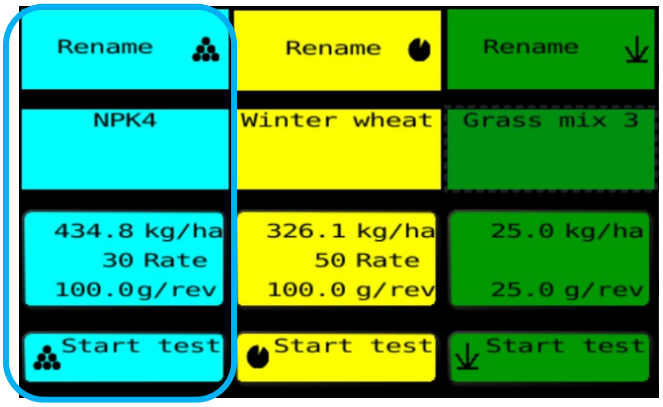
   - **NOTE!** when increasing the amount of feed, first turn the handwheel half a turn above the target value and then back down.

   - **NOTE!** If dirt accumulates in the feeder, the feed rollers may become blocked. This can have a decisive effect on the feed rate. We recommend cleaning from time to time. The rollers can be cleaned by adjusting the feed amount to zero and back again to the desired adjustment value. In this case, you must remember the aforementioned adjustment instruction, first turn 1/2-1 turn above the desired adjustment value.

5. To use the machine's counters, save the result of the calibration test.
   Select the calibration test menu from the seeding menu.



Select first the fertilizer for which you want to save the result.
You can also name the product.



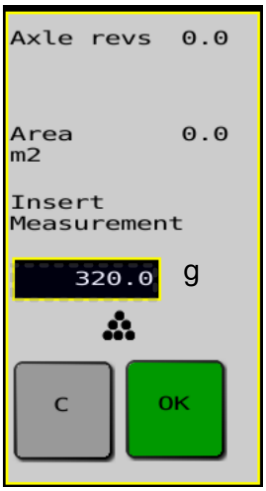
Press ⁂ **Start test**, grey window will open.

NOTE! The handwheel adjustment does not restore the correct setting by changing the selection, the adjustment must always be done by hand and confirmed by a calibration test!

Go through the calibration test one more time. The display shows the rotations of the axle and the area measured from the ground wheel. Enter the result of the rotation test in grams on the screen.

After that, press OK, and the machine calculates the result in kg/ha and g/shaft revolution.

Based on these results, the machine calculates the accumulated amount.

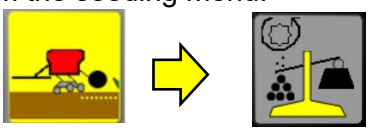


Tip: *you can also set the seed side to rotation test readiness at the same time in a similar way. This way you can take the results for fertilizer and seed with one rotation time of the ground wheel.*

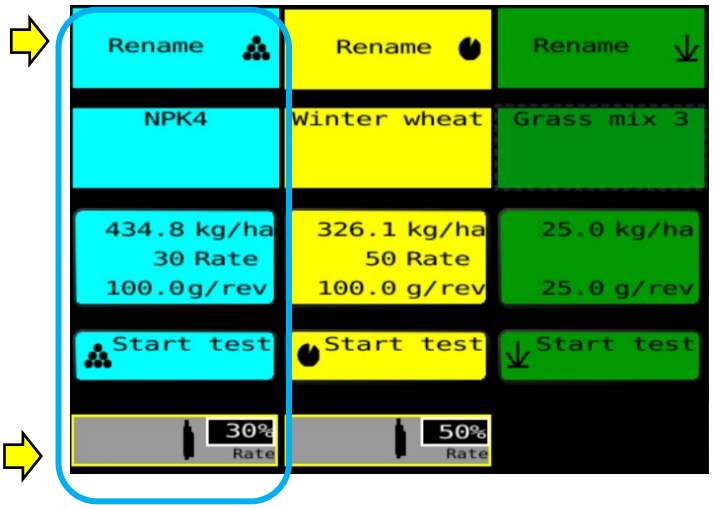
11.3 Calibration test for fertilizer / electric adjustment (optional)

After you have made the preparations for the calibration test you can perform the calibration test.

1. Turn the calibration test lever to the calibration test position and make sure that the test trays are empty. Select the calibration test menu from the seeding menu.

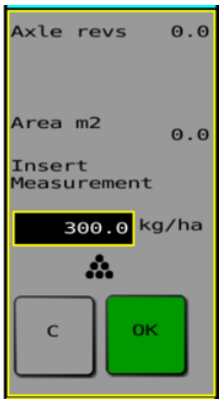


2. Select first the fertilizer for which you want to save the result. You can also name the product.



Adjust the **Rate** value to estimated value, and the actuator motor will drive itself to the corresponding position.

Press ⁂ **Start test**, grey window will open.



Tip: *you can also set the seed side to rotation test readiness at the same time in a similar way. This way you can take the results for fertilizer and seed with one rotation time of the ground wheel.*

3. Rotate the ground wheel until there is enough fertilizer in the test tray for weighing. (in the gray window, the unit kg/ha changes to g).

You can freely choose the number of revolutions, because the machine calculates the area with the pulse sensor of the ground wheel. If you want to do a calibration test for one are, the number of revolutions of the ground wheel is the following:

- Orion 3000 = 11-12 revolutions /are
- Orion 4000 = 8.25-9 revolutions /are

4. Carefully pull out the test trays and weigh the amount of fertilizer.

5. Check from the screen that "Axle revs" is more than 0.0 and "Area m2" is the area corresponding to the revolutions of the ground wheel.

6. In the "**Insert measurement"** field, enter the weighing result in **grams (g)** and press OK. The controller calculates the result in grams per rev and kg/ha from the entered amount and they remain valid in the selected memory location.

   The calibration test memory location of the fertilizer you have now selected is calibrated for that fertilizer.

   (C = exit without making changes).

7. When you want to sow the fertilizer in question, select the memory spot for the fertilizer in question to the use for which you took the calibration test.

Note! Remember that the calibration test must be done again when you change the fertilizer quality, if you use the same memory location.

Note! If you use different fertilizers, save the calibration test results of different fertilizers in your own fertilizer calibration test memory locations.

NOTE! After you have done the calibration tests, remember to turn the calibration test lever back to the front. After this, the seeds and fertilizers again go into the coulters instead of the test trays.

11.4 Calibration test for seed / hand wheel adjustment

After you have made the preparations for the calibration test you can perform the calibration test.

1. Turn the calibration test lever to the rot calibration test position and make sure that the calibration test trays are empty.

2. Rotate the ground wheel. The wheel does not necessarily have to be rotated the number of are, as the pulse sensor in the ground wheel automatically calculates the area that is rotated in the test. However, the calculation is easiest to visualize using the one are.

   The number of revolutions per are of the ground wheel of different machine widths are below:

   - o Orion 3000 = 11-12 revolutions /are
   - o Orion 4000 = 8.25-9 revolutions /are

3. Weigh the amount of seed fed into the test trays. This, multiplied by a hundred, is kg/ha, if an area equivalent to an are was rotated.

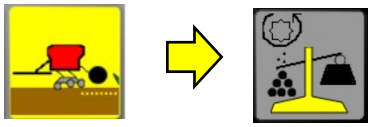
   - o **NOTE!** Remember to remove the weight of the container/bag from the weighing result.

4. Adjust the handwheel smaller or larger as needed and repeat the calibration test until you are satisfied with the feed amount.

   - o **NOTE!** when increasing the amount of feed, first turn the handwheel half a turn above the target value and then back down.

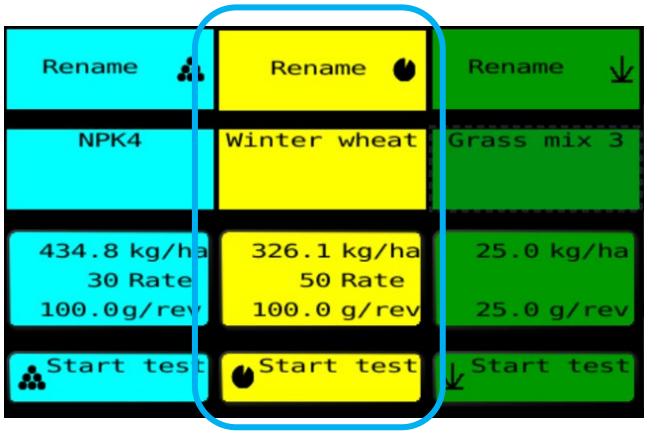
   - o **NOTE!** If dirt accumulates in the feeder, the feed rollers may become blocked. This can have a decisive effect on the feed rate. We recommend cleaning from time to time. The rollers can be cleaned by adjusting the feed amount to zero and back again to the desired adjustment value. In this case, you must remember the aforementioned adjustment instruction, first turn 1/2-1 turn above the desired adjustment value.

5. To use the machine's counters, save the result of the calibration test.
   Select the calibration test menu from the seeding menu.



Select first the seed for which you want to save the result.
You can also name the product.

Press **Start test**, grey window will open.

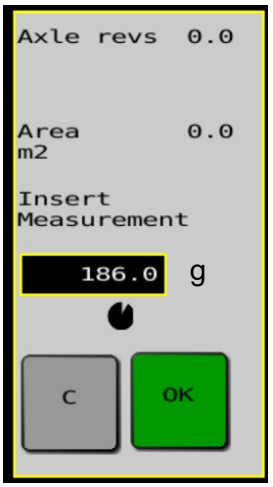


NOTE! The handwheel adjustment does not restore the correct setting by changing the selection, the adjustment must always be done by hand and confirmed by a calibration test!

Go through the calibration test one more time. The display shows the rotations of the axle and the area measured from the ground wheel. Enter the result of the rotation test in grams on the screen.

After that, press OK, and the machine calculates the result in kg/ha and g/shaft revolution.

Based on these results, the machine calculates the accumulated amount.



Tip: *you can also set the seed side to rotation test readiness at the same time in a similar way. This way you can take the results for fertilizer and seed with one rotation time of the ground wheel.*

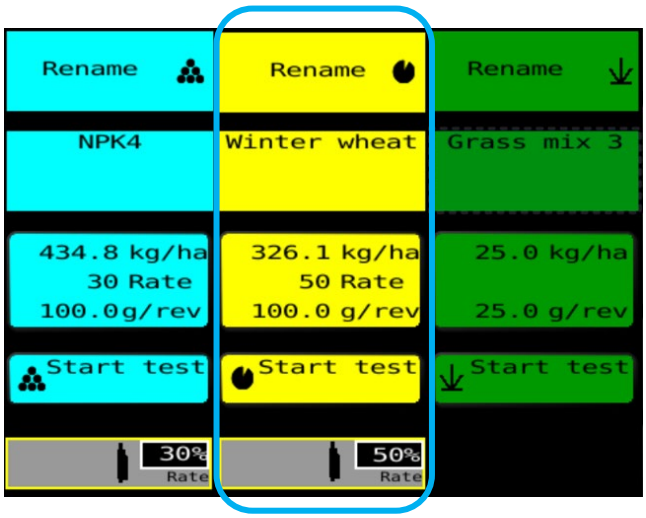
11.5 Calibration test for seed / electric adjustment (optional)

After you have made the preparations for the calibration test you can perform the calibration test.

1. Turn the calibration test lever to the calibration test position and make sure that the test trays are empty. Select the calibration test menu from the seeding menu.

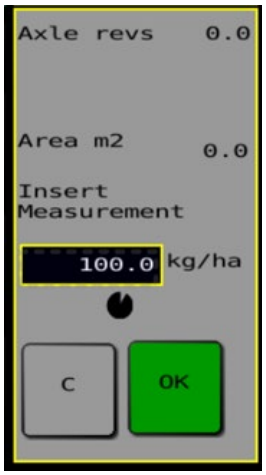


2. Select first the seed for which you want to save the result. You can also name the product.



Adjust the **Rate** value to estimated value, and the actuator motor will drive itself to the corresponding position.

Press **Start test**, grey window will open.



3. Rotate the ground wheel until there is enough seed in the test tray for weighing. (in the gray window, the unit kg/ha changes to g).

You can freely choose the number of revolutions, because the machine calculates the area with the pulse sensor of the ground wheel. If you want to do a calibration test for one are, the number of revolutions of the ground wheel is the following:

- Orion 3000 = 11-12 revolutions /are
- Orion 4000 = 8.25-9 revolutions /are

_ _

4. Carefully pull out the test trays and weigh the amount of seed.

_ _

5. Check from the screen that "Axle revs" is more than 0.0 and "Area m2" is the area corresponding to the revolutions of the ground wheel.

6. In the **"Insert measurement"** field, enter the weighing result in **grams (g)** and press OK. The controller calculates the result in grams per rev and kg/ha from the entered amount and they remain valid in the selected memory location.

   The calibration test memory location of the seed you have now selected is calibrated for that seed.

   (C = exit without making changes).

_ _

7. When you want to sow the seed in question, select the memory spot for the seed in question to the use for which you took the calibration test.

_ _

Note! Remember that the calibration test must be done again when you change the seed quality, if you use the same memory location.

Note! If you use different seeds, save the calibration test results of different seeds in your own seed calibration test memory locations.

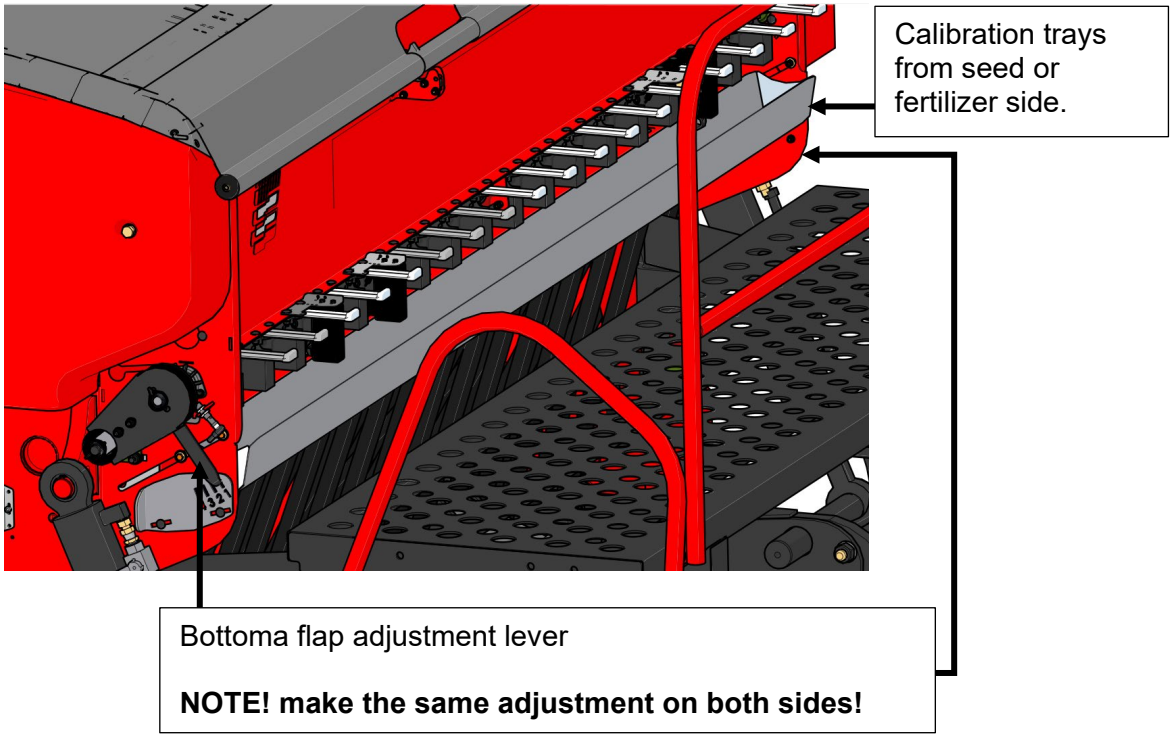
NOTE! After you have done the calibration tests, remember to turn the calibration test lever back to the front. After this, the seeds and fertilizers again go into the coulters instead of the test trays.

11.6 Calibration test for small seed and start fertilizer device (optional)

Make the preparations of chapter 11.1 with the following exceptions.

- The bottom flaps are adjusted from the edges of the small seed device. Remember to make the adjustment on both sides of the machine. The setting is 1 for small seeds and 2 for granular fertilizers.

- Use rotation test trays on the seed or fertilizer side.



_ _

1. Ensure calibration trays are empty and clean.

_ _

2. Rotate ground wheel corresponding of one are.
   - Orion 3000 = 11-12 revolutions / are
   - Orion 4000 = 8,25-9 revolutions / are

_ _

3. Weigh the amount of seed/fertilizer fed into the test trays. Multiply the result by one hundred to get the sowing rate in kilograms per hectare, kg/ha.

   - NOTE! Remember to remove the weight of the container/bag from the weighing result.

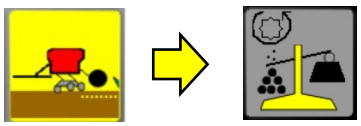
_ _

4. Adjust the handwheel smaller or larger as needed and repeat the rotation test until you are satisfied with the feed amount.

    - NOTE! when increasing the amount of feed, first turn the handwheel half a turn above the target value and then back down.

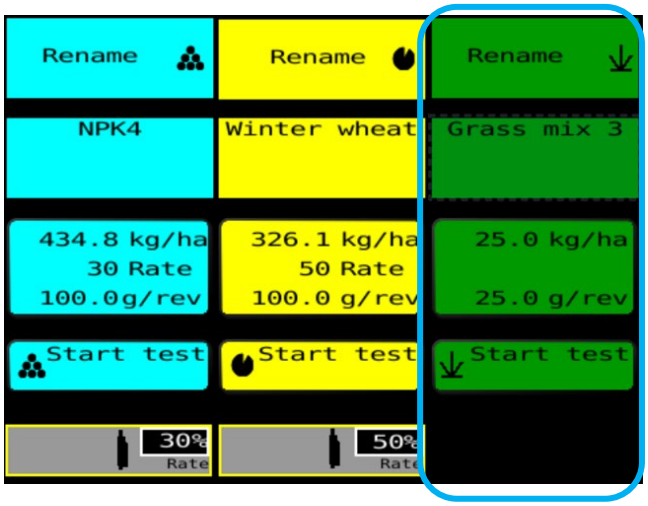
    - NOTE! If dirt accumulates in the feeder, the feed rollers may become blocked. This can have a decisive effect on the feed rate. We recommend cleaning from time to time. The rollers can be cleaned by adjusting the feed amount to zero and back again to the desired adjustment value. In this case, you must remember the aforementioned adjustment instruction, first turn 1/2-1 turn above the desired adjustment value.

5. To use the machine's counters, save the result of the rotation test.
Select the rotation test menu from the seeding menu.

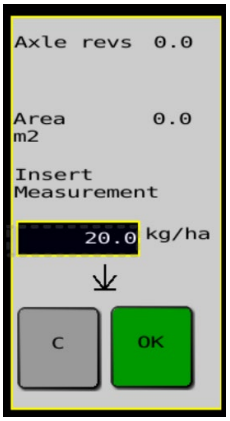


6. Select first the fertilizer / seed for which you want to save the result. You can also name the product

Press **Start test**, grey window will open.



7. Rotate the calibration test one more time and enter the result of the rotation test in grams on the screen. The machine automatically calculates kilograms per hectare from the accumulated area and the weighing result.



NOTE! The handwheel adjustment does not restore the correct setting by changing the selection, but the adjustment must always be done by hand and confirmed by a calibration test!

12. FIELD TEST

A field test is absolutely the most accurate testing format of feeding amount. If the field test is carried out on the field which is to be sown and on a prepared seedbed, conditions equivalent to sowing are accurately established. A field test can be done both to seed and fertilizer.

Carrying out the field test:

- Adjust the equipment according to the calibration guidelines. Leave calibration lever on calibration position (= calibration troughs are under the feeding units).
- Measure a drive corresponding to one are sown area, which based on machine type is:

Orion 3000 → 33,3 m
Orion 4000 → 25 m

- Drive outside the test area, about 10 meters, with the machine in working position so that each sowing chamber is feeding out the seeds.
- Empty calibration troughs.
- Drive a distance in accordance with the table above; the machine lowered to the sowing position with a normal sowing speed.
- Weigh the seeds in test sowing trays and/or the fertilizers and multiply the weighing results with 100 to get the resulting seed amount in kg/ha.

13. OPTIONAL EQUIPMENT

TUME develops its machines and accessories constantly. If accessories are wanted for the older machines, it is useful to ensure the compatibility by contacting the manufacturer representatives.

In TUME-seed and fertilizer drills only the following original TUME-accessories are allowed to be used. In the installation of accessories, the factory instructions must be followed without fail. Faulty installation or use of other than original TUME-accessories may endanger the user safety or damage the machine. The manufacturer is not responsible for the damages which occur from the changes that are against the factory instructions.

Optional equipment for Orion:

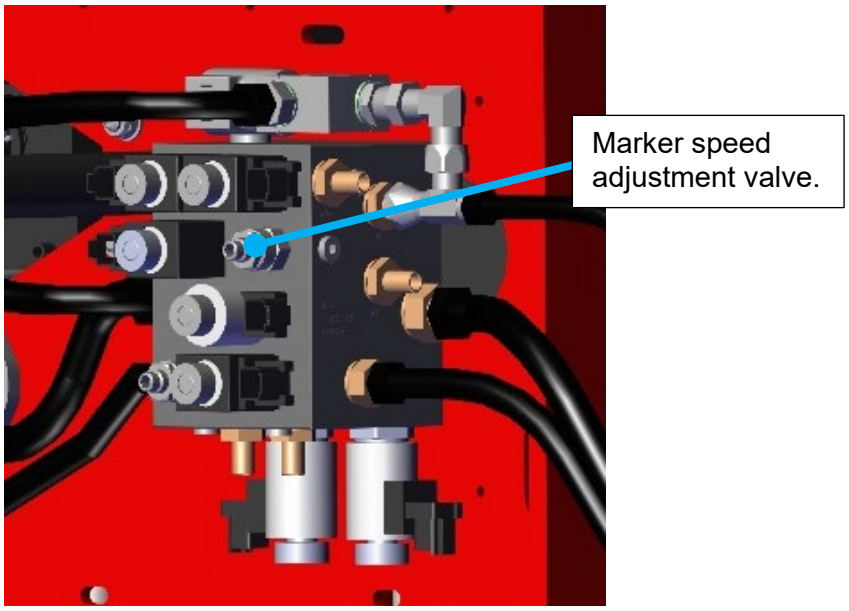
- Electric fertilizer remote control
- Electric seed remote control
- Row markers
- Grass seed/start fertilizer sowing unit
- Hydraulic front board
- Agitator shafts
- Wheel packer
- CultiPack intermediate cultivator
- Hydraulic drawbar cylinder
- Seed screens
- Hydraulic rear axle suspension
- Terminal 7” + wiring harness
- Terminal 12” + wiring harness
- Reversing camera package incl. 1 camera
- Additional camera
- Additional monitor

13.1 Row markers

If the machine is equipped with row markers, the machine must be connected to the tractor double-acting hydraulic valve. Markers have been connected parallel with the machine lifting and lowering circuit. The drill itself works with single-acting hydraulics, but the marker requires dual-acting valve. Marker will not start lowering, unless hydraulically pushed downwards.

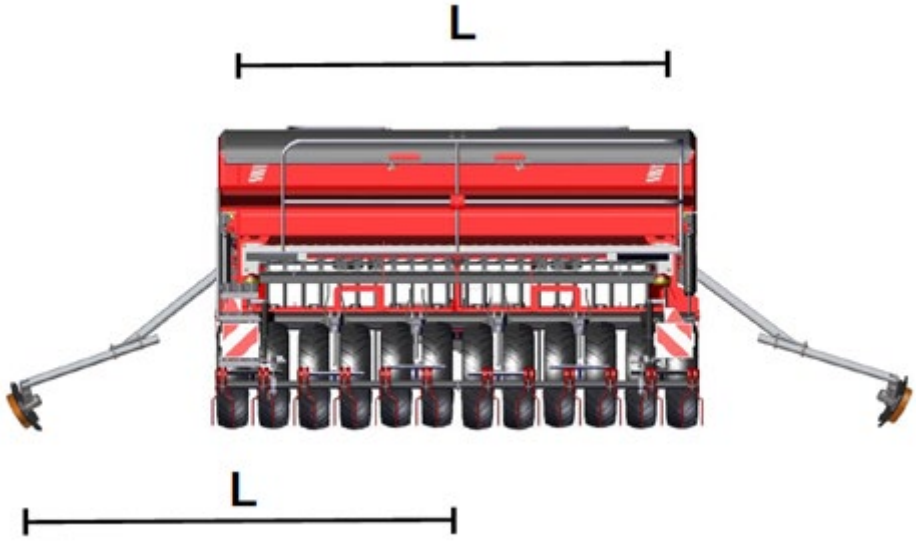
The speed of marker movement can be adjusted from the hydraulic unit (picture. 21). Adjust the speed to begin with a small flow. This is because the movement of marker arms is calm and does not cause damages or hazards. Adjust the screws for right speed for the actual drilling work at a time when, for example ,the tractor oil has reached a normal operating temperature.

NOTE! If you use markers, remember to always remove the marker arm lock pins. In road driving, a recommendation is made to place the lock pins back in their places.



Picture 21. Marker speed adjustment.

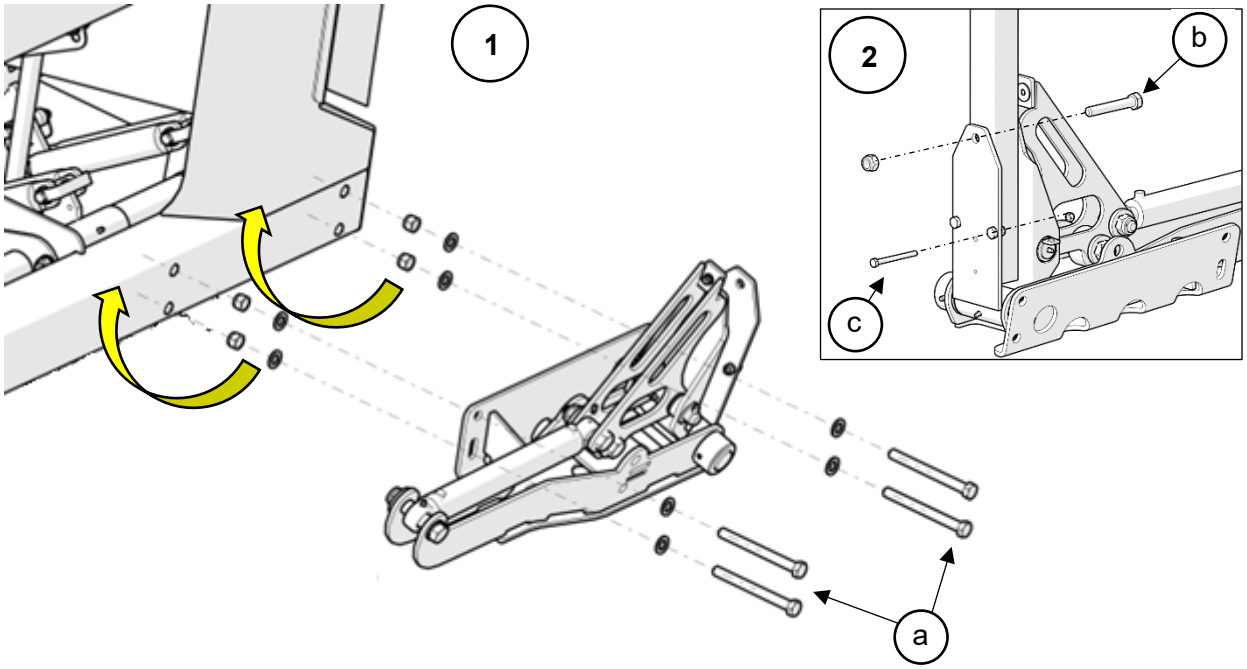
Marker disc angle and distance cab be adjusted. Adjust the length of the marker arm so that the distance from the bottom of the furrow made by the disc to the center of the machine is the same as the working width (picture 22). The disc angle should be so that it throws soil towards the machine. Disc angle affects to the visibility of the furrow. Use as low disc angle as possible to avoid unnecessary deep furrow. Length and angle adjustment is in chapter 13.1.1 Row marker installation, section 3.



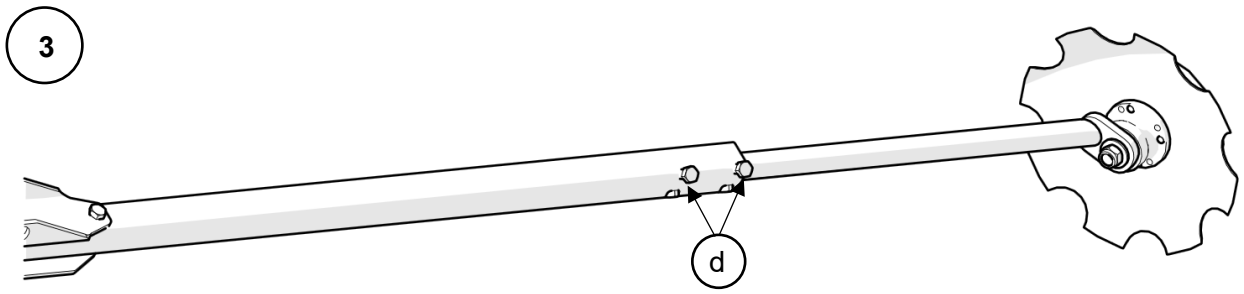
Picture 22. Marker length adjustment.

Making sharp turns while markers are down can damage markers!

13.1.1 Row marker installation

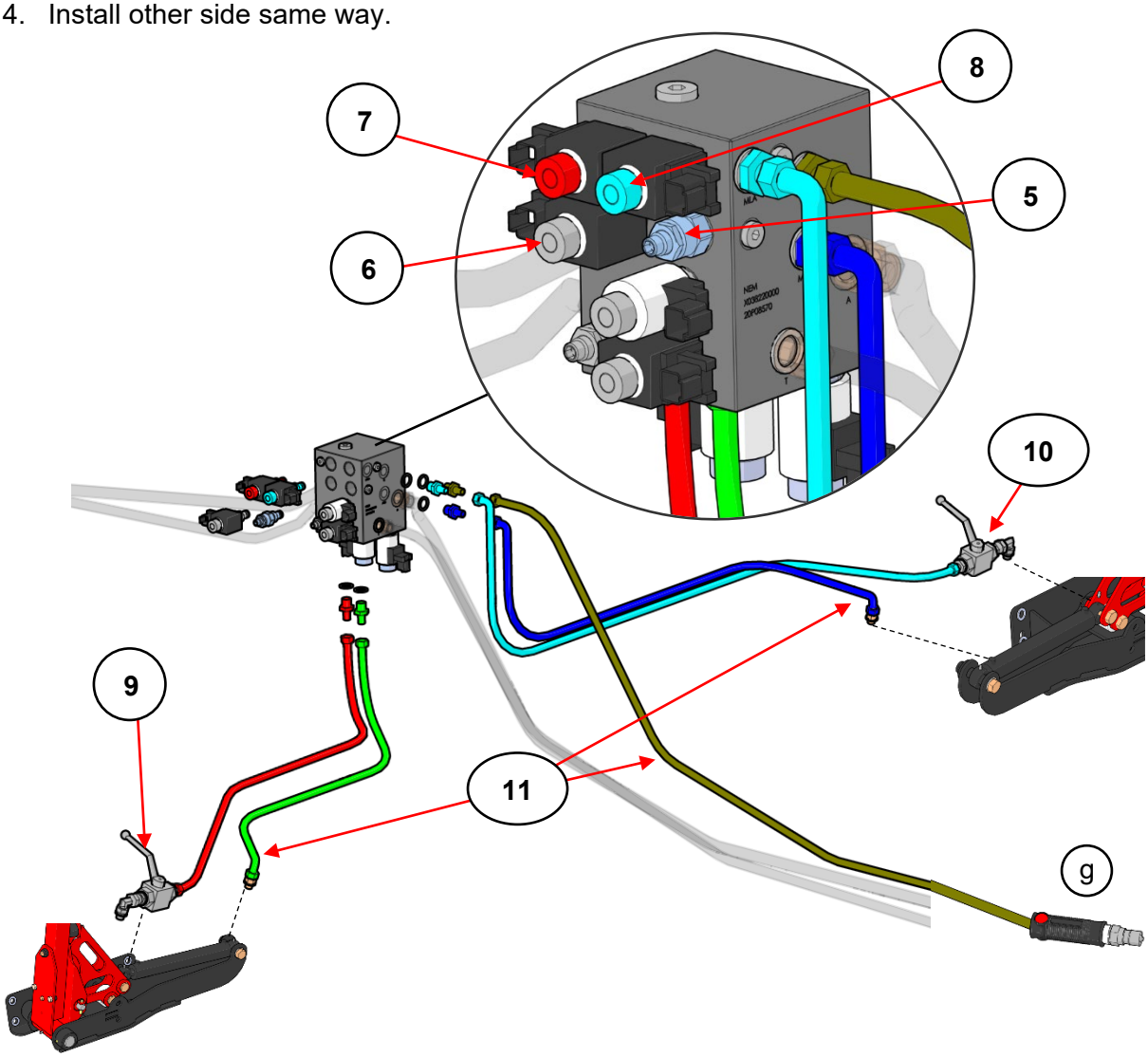


1. Install marker frame to drill frame with four M16x160 screws (a).
2. Install marker arm to the frame. M16x100 screw (b) works as a joint and M8x90 as a share bolt (c).



3. Install disc arm to marker arm. Length and angle can be adjusted after loosing the screws (d). Adjust and tighten the screws. Then angle of the disc should be so that it throws soil towards the machine.

4. Install other side same way.

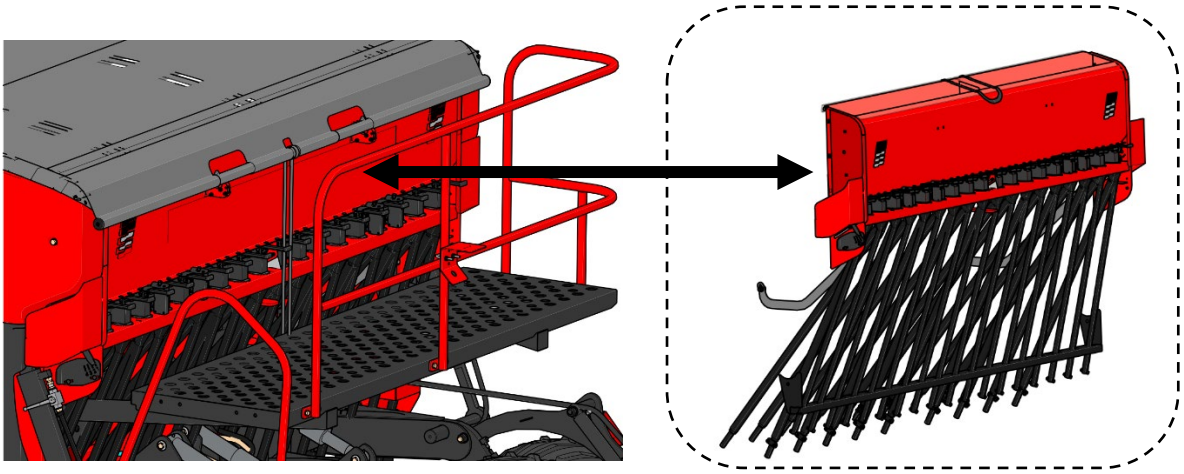


5. Install counter valve 01451327
6. Install marker cancel valve 01454250 and connect plug **CM**
7. Install right marker valve 01454248 and connect plug **R**
8. Install left marker valve 01454248 and connect plug **L**
9. Install right marker's cylinder rod side hose with tap.
10. Install left marker's cylinder rod side hose with tap.
11. Install cylinder piston side hoses. The longest hose to a quick coupler (g).
12. Finally select markers in use from the settings. See chapter 11.1.3 Features.

13.2 Small seed / start fertilizer unit

The unit is the same in both cases. As small seed unit seeds are guided and spread through the hoses in front of the rear wheels. If used as start fertilizer unit, fertilizer is through the hoses to the seed coulters. Fertilizer goes to the same furrow with the seeds.

Unit is integrated to the seed drill's rear wall. The tarpaulin also covers the small seed unit. The unit is installed partly inside the seed hopper, so it reduces the seed hopper volume.



Picture 23. Small seed / start fertilizer unit.

13.2.1 Using for seeding small seeds

Grass seed sowing unit is meant for the sowing of different grass seed varieties and their mixtures. Seeds are led to the field through hoses. Hoses have been installed in such a way, that the sowing coulter slightly earths the seeds. Sowing speed affects to how strongly the grass seeds are covered by the soil.

The closing flaps between the bottom of the tank and the feed chamber should be adjusted in a semi-closed position, if small and easily flowing materials (such as clover) are sown with the device. On the other hand, with lightweight, easily arching grass seeds (e.g. fescue), the closing doors must be fully opened.

13.2.2 Using for seeding start fertilizer

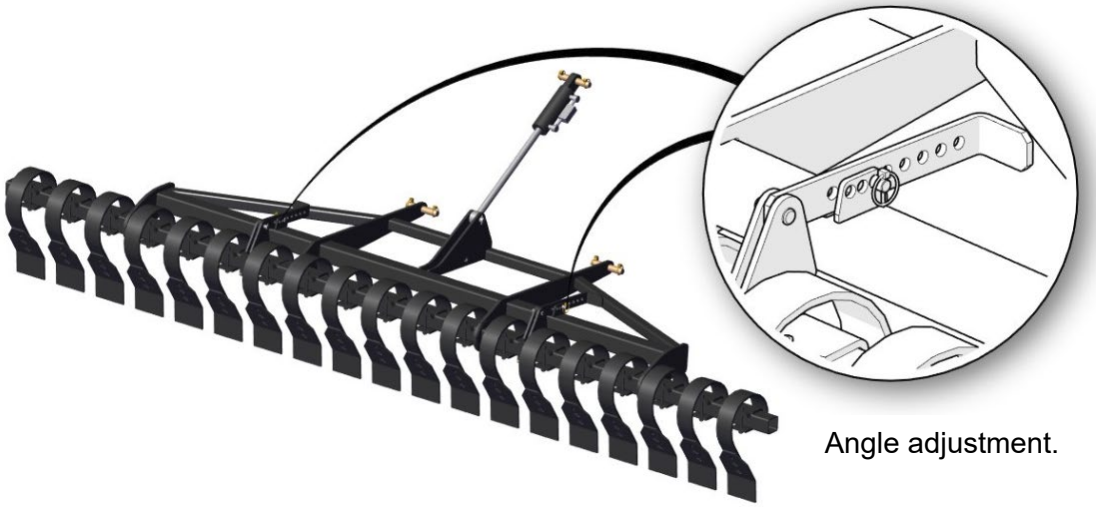
Start fertilizer unit is meant to sow fertilizer to the same furrow as seeds. Fertilizer flows through hoses to the upper part of the seed coulters.

The closing flaps between the bottom of the tank and the feed chamber should be adjusted fully open.

NOTE! Only granulated fertilizers can be used in this machine. Powder fertilizers can block the system!

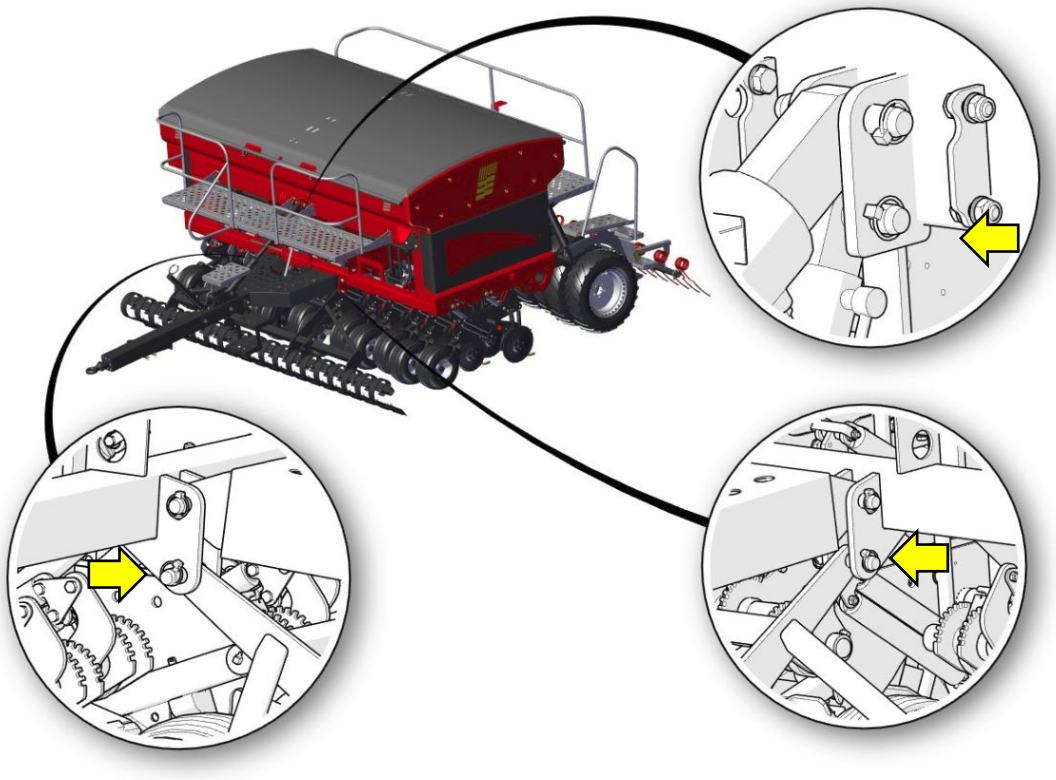
13.3 Hydraulic front board

Hydraulic front board can be used to even the soil during sowing. In good conditions seeding directly to a ploughed soil is possible. Hydraulic front board needs one two phased hydraulic output. This way the board can be adjusted during work without affecting to seed drill's other functionalities. Working depth is recommended to keep as low as possible. This reduces the need of pulling power. The angle of the board is changed by moving the perforated plate and locking it with a pin. The same adjustment must be carried out on both sides (picture 24).



Picture 24. Orion hydraulic front board.

Front board's arms are installed with pins under the drawbar's attachment holes. Front board's cylinder is installed with a pin to the holes under the drawbar's cylinder. Hydraulic hoses are pulled inside the drawbar as other hoses and cables.



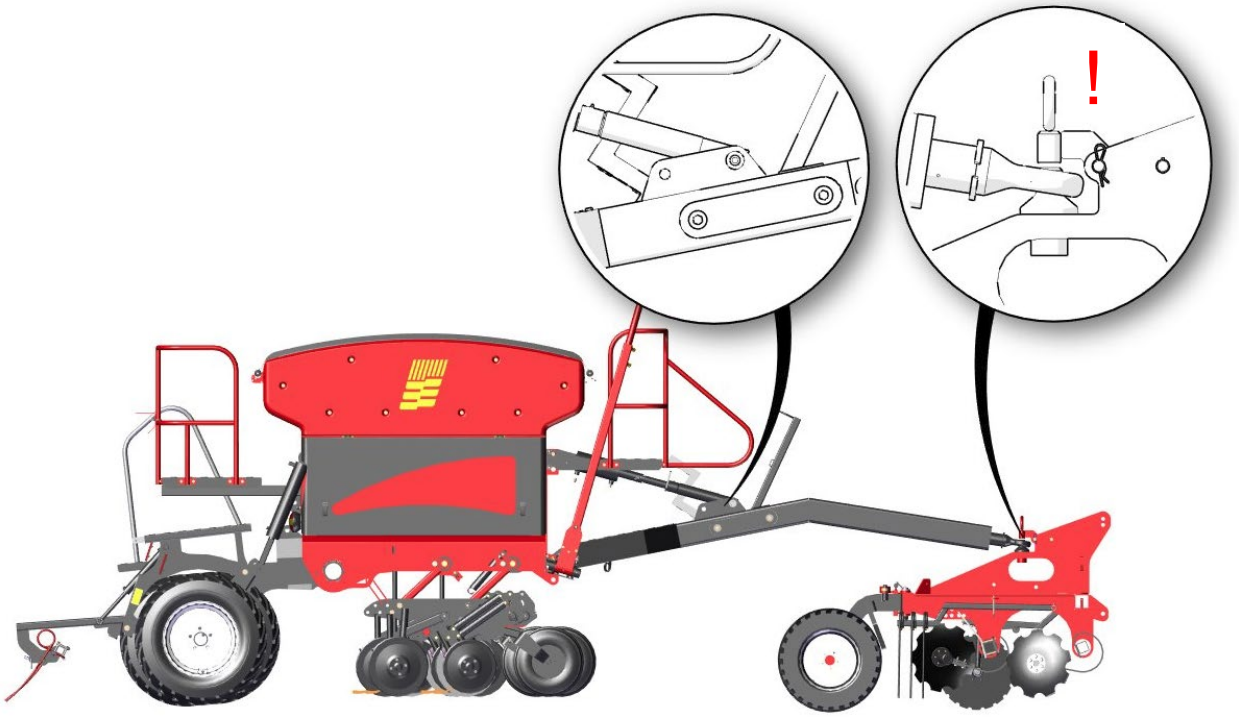
Picture 25. Hydraulic front board installation.

13.4 CultiPack disc cultivator

Orion is connected to CultiPack with a special drawbar (see section 5.2 drawbar installation). Drawbar cylinder's lower end is connected to front hole of the drawbar. Seed drill's drawbar is connected to a CultiPack towing point (picture 29). Remember to lock the latch with a pin.

During transport drive the CultiPack can be on the ground, when cultivator discs are turned up with hydraulics. CultiPack rear wheel turning must be locked. CultiPack must be lifted up from the ground when reversing.

NOTE! CultiPack has its own user manual. Read the manual before using the CultiPack.



Picture 26. Seed drill and CultiPack combination. Make sure the drawbar is locked to the CultiPack towing hitch with a latch and pin.

13.5 Wheel packer

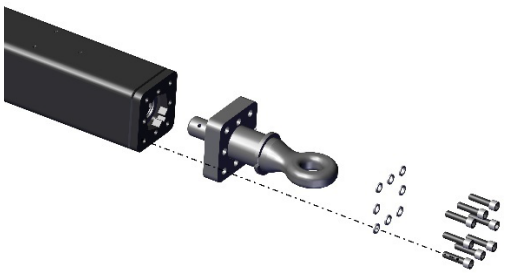


For wheel packer operation, the lower end of the hitch cylinder is connected to the rear hole of the towing device (Picture 27). It is recommended to keep the wheel packer raised during road transport. When reversing, the wheel packer must be lifted off the ground.



Picture 27. Wheel packer connection.

The wheel packer is attached to the end of the drawbar by first removing the towing eye. The flange of the packer fits into the same bolt holes at the end of the drawbar.



Picture 28. The wheel packer is connected to the end of the drawbar by first removing the towing eye. The flange of the packer fits into the same bolt holes at the end of the drawbar. It is absolutely essential to ensure that the bolts do not loosen and that they are sufficiently strong. Hardness 12.9, tightening torque 375 Nm, use a Nord-Lock washer.

NOTE! Check the tightness of the fastening screws at least once per season!

14. SERVICE

In the more demanding cases we recommend contacting the dealer. In the following some measures are presented which in most cases can be carried out on a farm. Please read the service instructions carefully. According to the guidelines the seed drill works flawlessly year after year. In the instructions it is stated that a service failure will void the warranty.

Always turn off the tractor engine before starting the service and turn on the hand break. Make sure no one can use the machine during service.

DANGER! ALWAYS CLOSE THE SAFETY VALVES OF BOTH CYLINDERS, IF THE MACHINE NEEDS LIFTING UP DURING MAINTENANCE. DO NOT GO UNDER A MACHINE WHICH IS ONLY SUPPORTED BY HYDRAULICS!

Please check the tightness of all screw connections every 100 hours of use. On a new machine the aforementioned check must be carried out twice every 25 hours of use and after this every 100 hour.



Picture 29. Lifting cylinder safety valve closed.

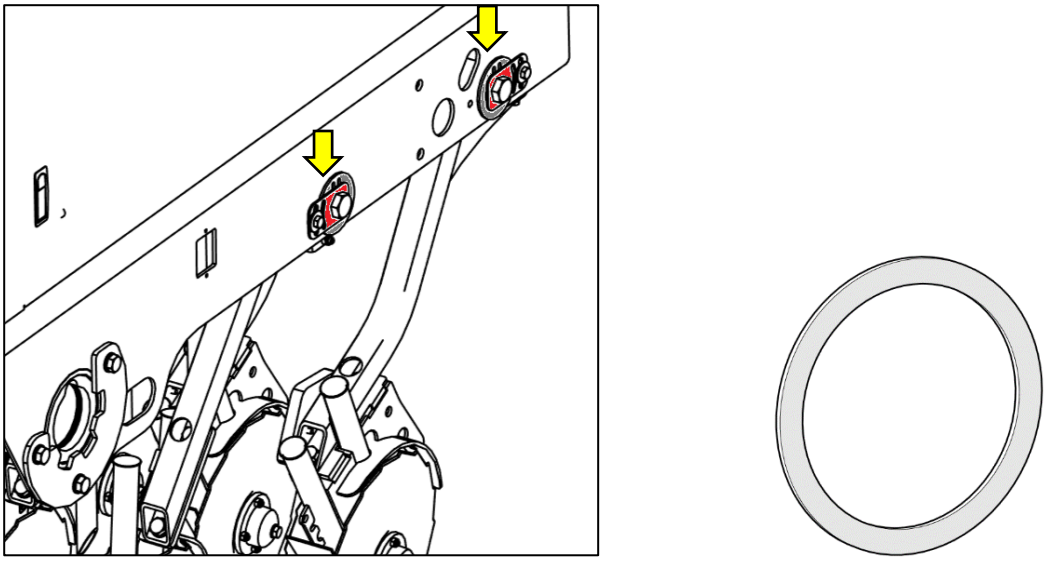
NOTE! Transport drive is not allowed with closed safety valves (picture 29).

In the machine hydraulic circuit there is also pressure when it has been removed from the tractor.

DANGER! WHEN HEATED, PAINTED SURFACES OF THE MACHINE CAN EXCRETE GASES HARMFUL TO HEALTH. PROVIDE ADEQUATE VENTILATION IN THE WORKSPACE, FOR EXAMPLE DURING THE WELDING WORKS.

14.1 Removing coulter arms axial endplay

In each end of the machine there are two screws M24 (key 36), with which the coulter arm endplay is axially tightened with clamping pieces. These screws have been equipped with separate rotation-prevention parts, which need to be removed for the duration of tightening. In addition, the machine is supplied with pass plates (inner diam. 50 mm) which, if the endplay is big, such that the inner surface of a clamping piece touches the end plate of the machine (=backlash used up), then these can be installed behind the clamping pieces as needed.



Picture 30. Tightening screws and pass plate.

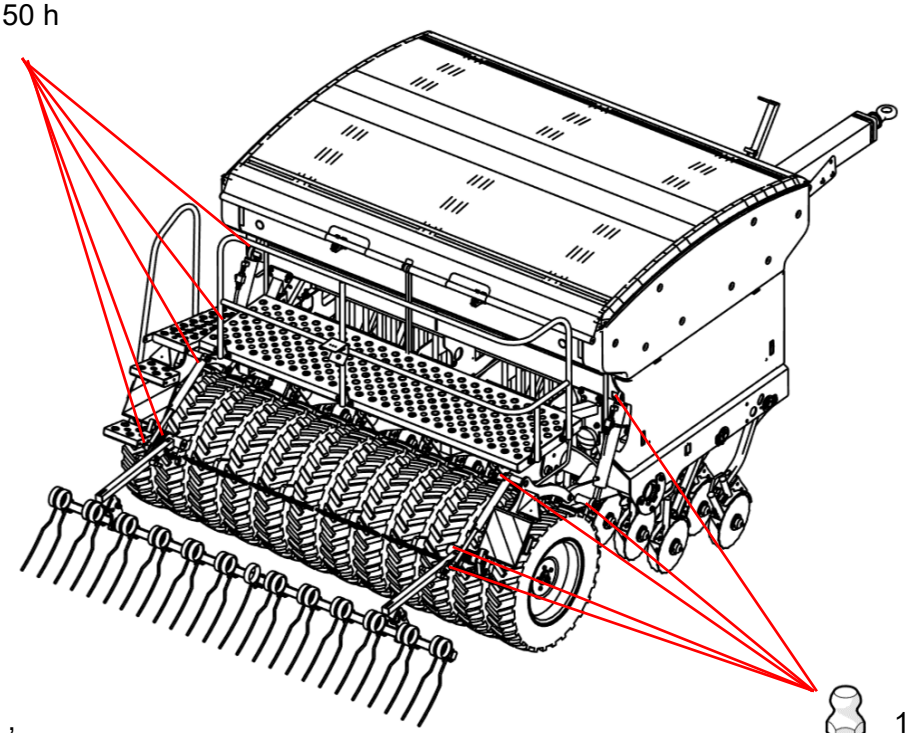
14.2 Lubrication

Machine must be lubricated at least once in the season and always after washing. Machine must be lubricated before storage.

Coulter disc bearings do not need greasing.

SIDES AND BACK

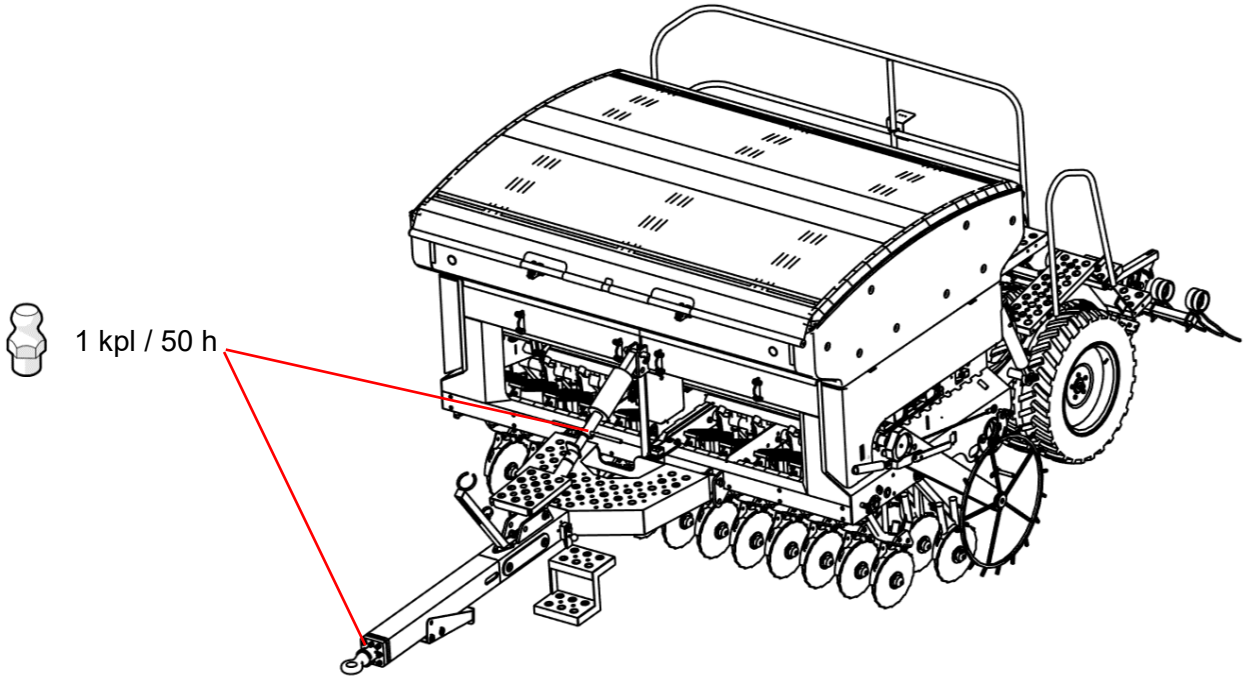
1 kpl / 50 h



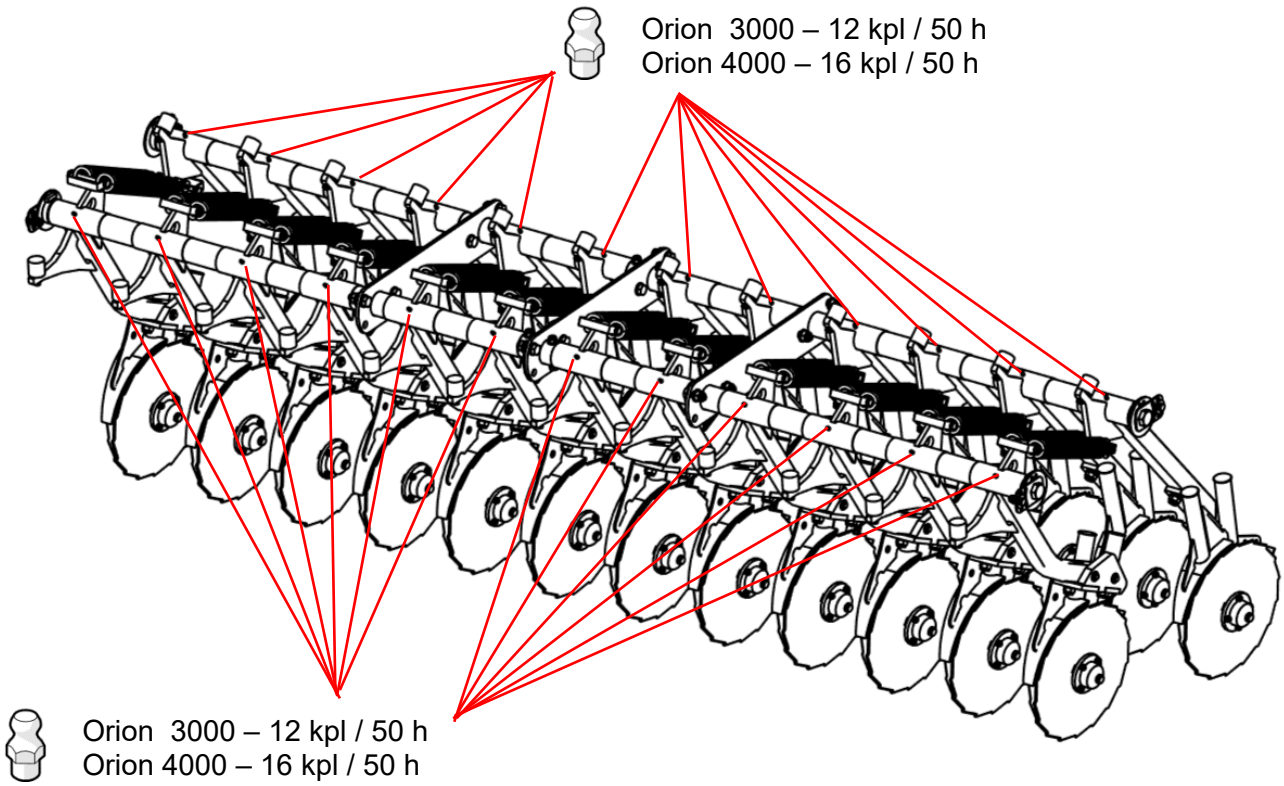
,

1 kpl / 50 h

FRONT



COULTERS

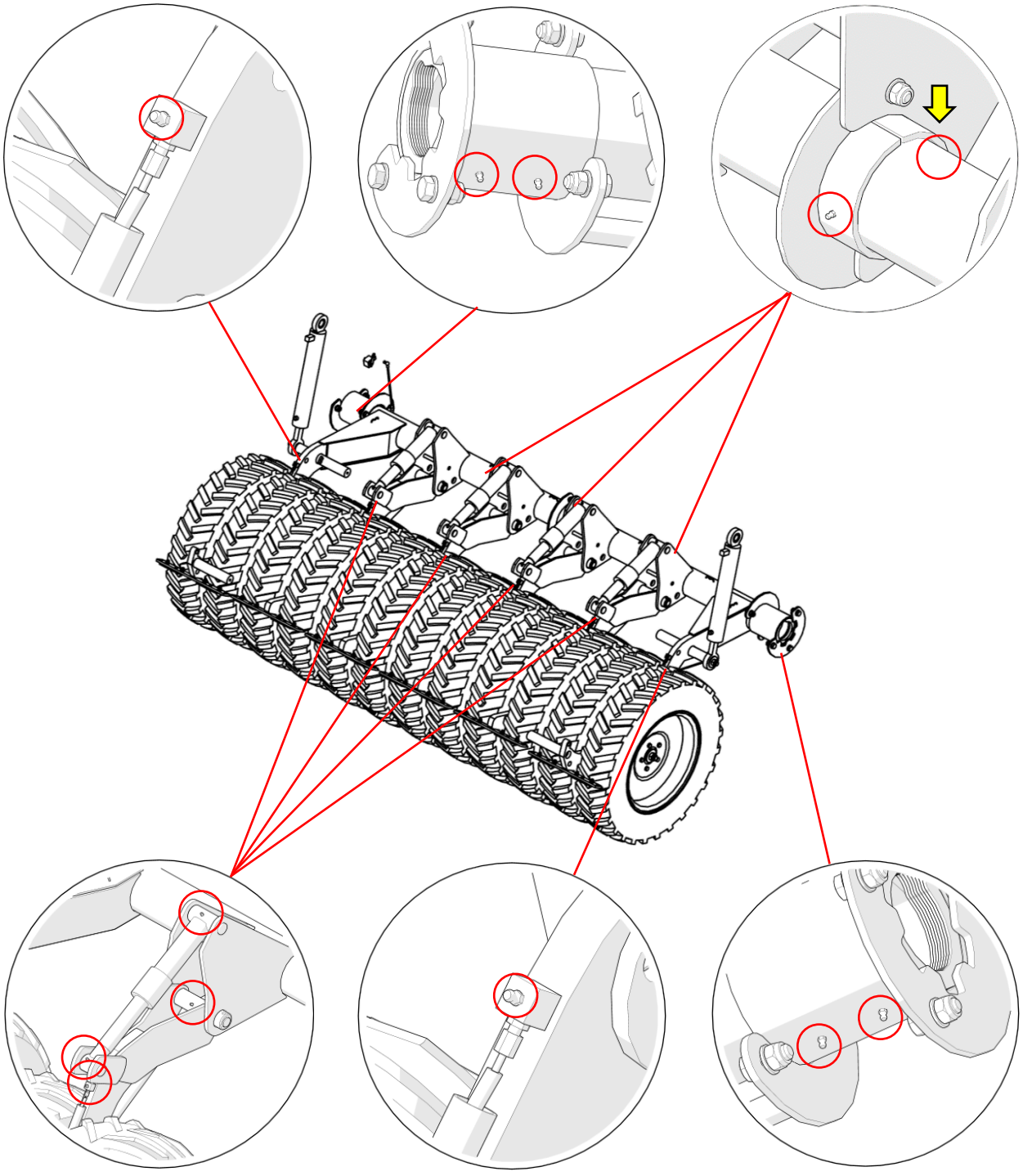


REAR WHEELS

1 pcs / 50 h

2 pcs / 50 h

Orion 3000 – 2 x 2 pcs / 50 h
Orion 4000 – 3 x 2 pcs / 50 h



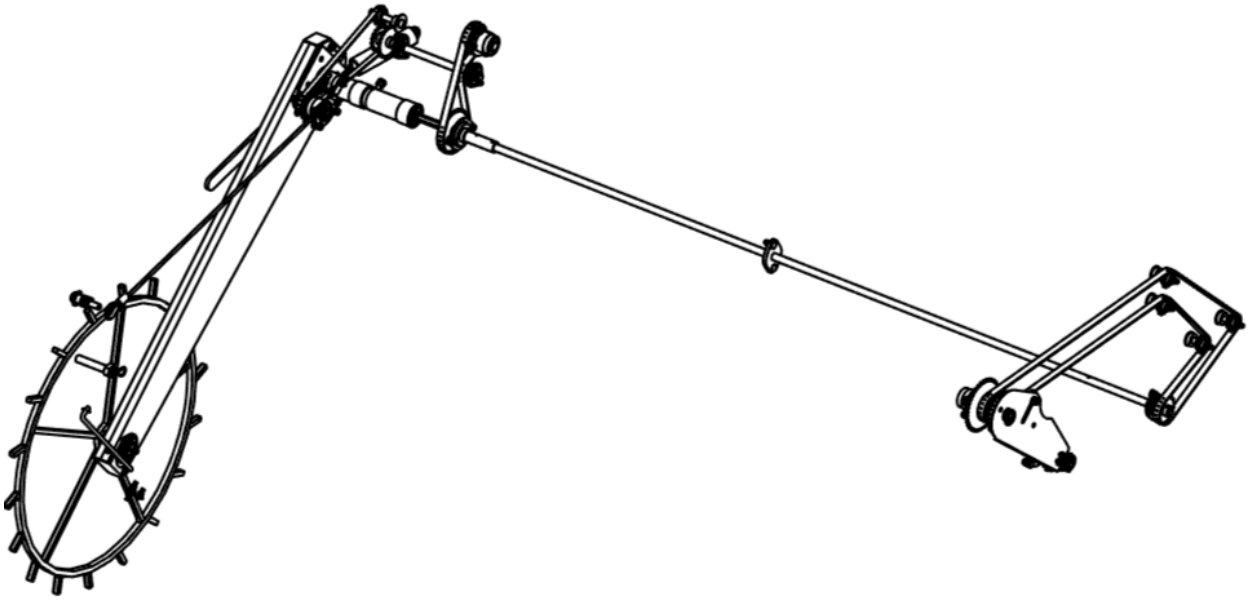
SNC 3000 – 3 x 4 pcs / 50 h
SNC 4000 – 4 x 4 pcs / 50 h

1 pcs / 50 h

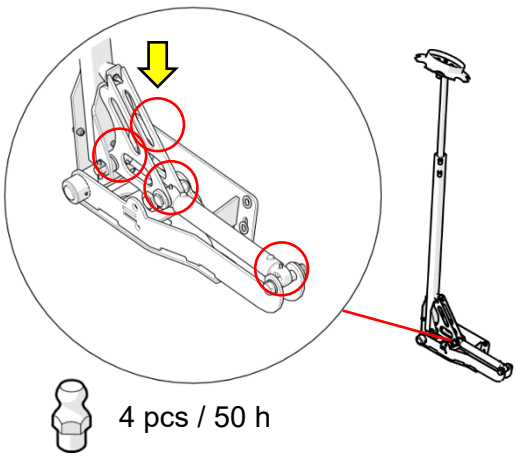
2 pcs / 50 h

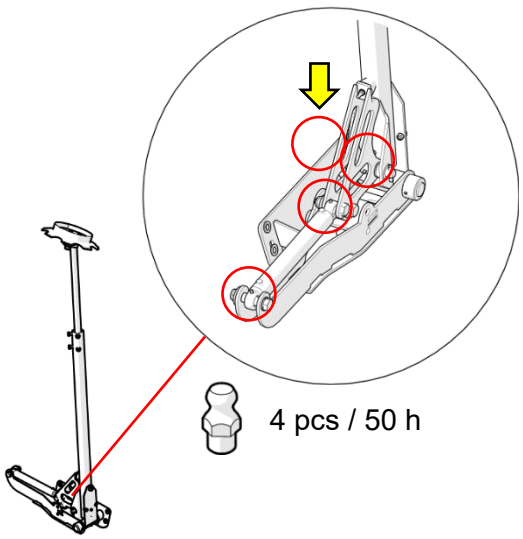
TRANSMISSION

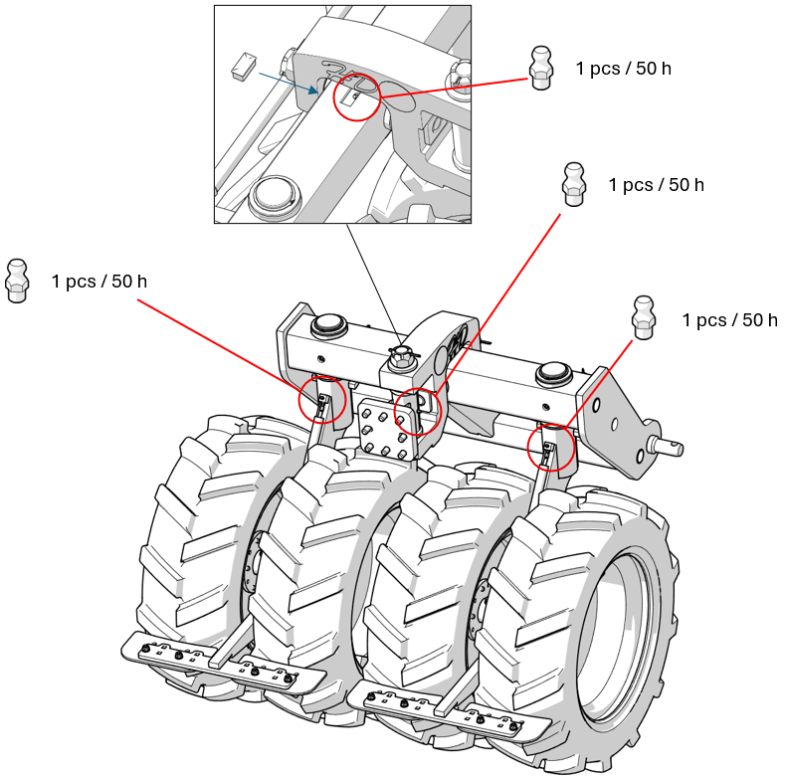
Chainspray every 50 h.



MARKERS (OPTIONAL)







14.3 Tire pressure

Rear tires 1,5 – 2.0 bar.

Tire pressures are easiest to check with a tool provided with the machine. Tires have automatic valves, so no separate valve caps need to be removed. First clean the valve with air pressure and put the tool after that to the valve. Measure and adjust tire pressure.

NOTE! If dirt goes into the automatic valve, it can leak. Cleaning is usually accomplished by blowing and venting air back and forth a few times.

14.4 Replacing tires

Empty machine and drive it on solid and even surface before replacing the tire.

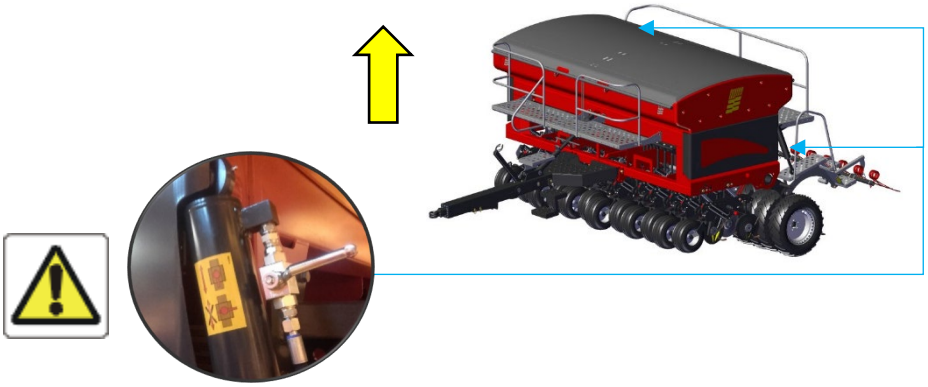
When changing tires, always make sure that the machine cannot move or be moved by outsiders.

The tires and the structures that support them are heavy and can cause damage if dropped!

14.4.1 Rear tire replacing

1. Power on. Lift machine up.

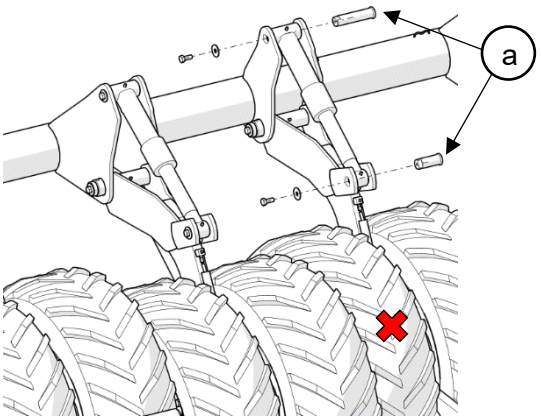
2. Close lift cylinders safety valves!



3. Set lifting hydraulics from tractor to float.

Machine stays up, but the pressure from the middle cylinders removes.

4. Remove cylinder pins (a) from that wheel arm in which the replaceable tire (x) is.



Be careful not to damage the hydraulic hoses of the removed cylinder! The risk of the hose connection breaking is high when lifting the wheel arm!

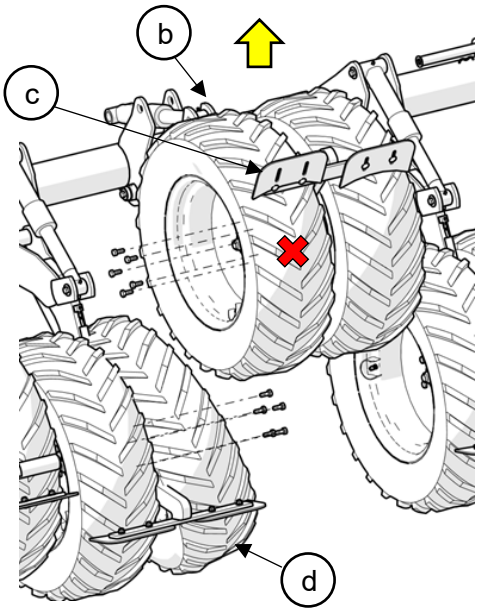
5. Lift pair of wheels up (b).

You can use a cargo strap attached to the scraper and rear platform for example.

6. Loosen the scraper (c).

7. Lighten the tire next to it (d) and remove its bolts to get more space.

8. Remove the tire to be replaced (x).



Assembly is done in reverse order.

14.5 Replacing coulter pressure springs

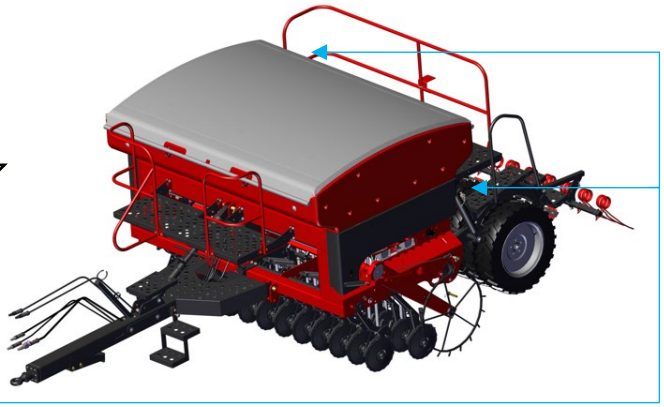
The machine will have to be raised and lowered during the change. Always lock the safety valves on the lifting cylinders on both sides of the machine between raising and lowering.

WARNING! When the machine is down, the coulter pressure springs are under high tension. Do not attempt to remove any spring while it is under tension. A released spring can cause serious injury.

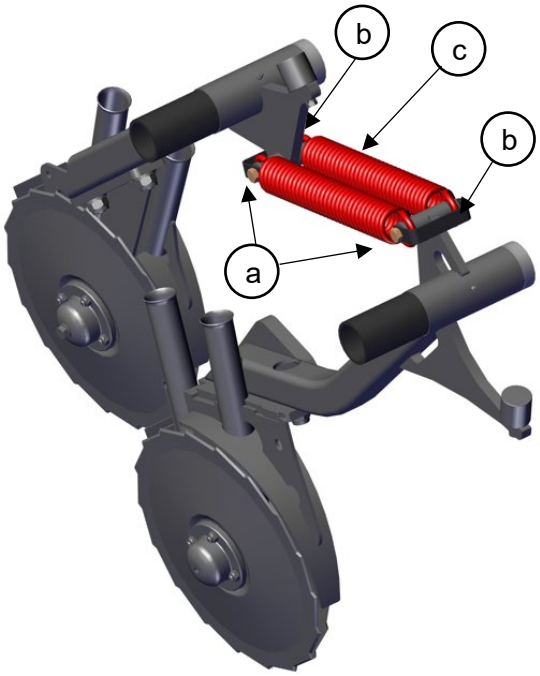
1. Lower the machine so that the coulters lightly touch the ground. The pressure springs will loosen.

The appropriate point must be found very precisely.

Close the safety valves.



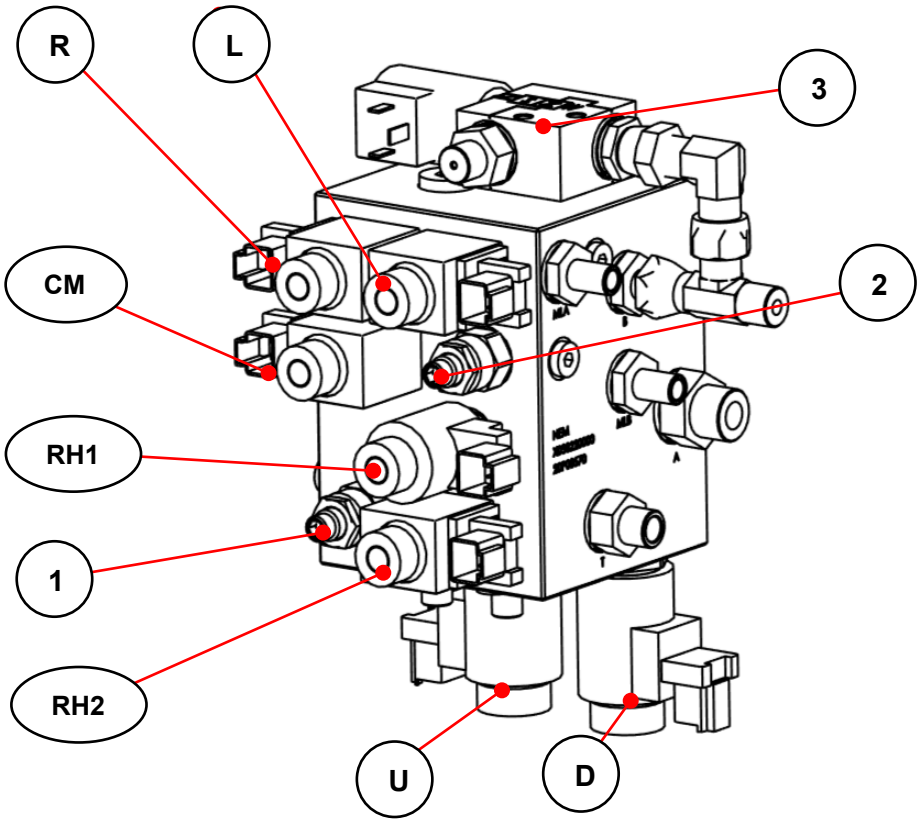




2. Remove the spring holder screws (a), spring holders (b) and springs (c).

Assembly is done in reverse order.

14.6 Hydraulic valves



RH1	–	Rear harrow operation valve.
RH2	–	Rear harrow free return valve. Allows harrow to float.
1	–	Rear harrow lift speed adjustment valve.
2	–	Marker lift speed adjustment valve.
CM	–	Cancel marker valve. Makes delay for the marker rising.
R	–	Right marker valve. Allows right marker to go down.
L	–	Left marker valve. Allows left marker to go down
U	–	Up limit. Stops machine's upwards movement.
D	–	Down limit. Stops machine's downwards movement.
3	-	Coulter pressure adjustment valve.

15. STORAGE

When the machine is not being used, it must be stored in sheltered place, cleaned up and maintained. Put the machine down. Do not leave the machine with the tractor hydraulics. Tanks are emptied of fertilizer and seeds.

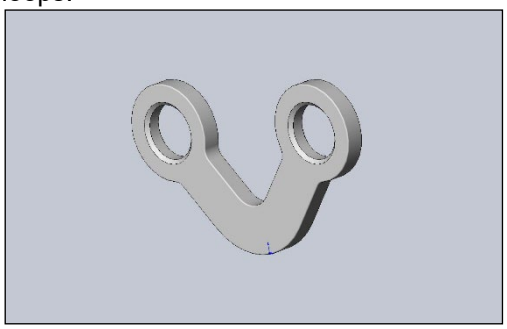
The machine is washed inside out with water. Use a pressure washer carefully, (Max. water temperature is 60 degrees, pressure 100 bars), do not point the pressure directly on the bearings. Lubricate the machine according to instructions after washing. Parts where the paint has become worn out can be protected with anti-rust oil. Let the machine dry before storage.

16. TECHNICAL DATA

	ORION 3000	ORION 4000
Working width cm	300	400
Hopper volume, l		
– Total	4020	5570
– Seed, min	1545	2140
– Seed, max	2475	3430
– Fertilizer, min	1545	2140
– Fertilizer, max	2475	3430
Basic unit weight, kg		
– Hopper empty	3450	4450
– Hopper full	app. 6450	app. 9500
Dimensions of basic unit, cm		
– Height to the top of hopper	240	240
– Width	300	400
Support wheels		
– Size	7,50–20	7,50–20
– Number	12	16
– Pressure, bar	1,5–2,0	1,5–2,0
Coulter pressure		
– Pressure/coulter, kg	20–125	20–125
– Runtime weighting adjustment	Standard	Standard
Hydraulics		
– Pressure, bar	140	160
– Connection	2-function + free return	2-function + free return
Noise level	less than 70 dB(A)	less than 70 dB(A)

Appendix 1. Loading and transport guide

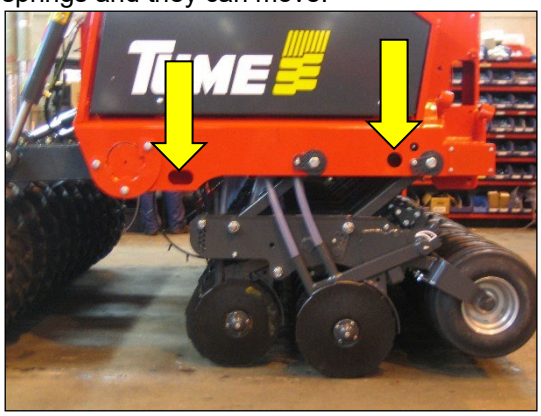
If the loading takes place by lifting the machine, then the lift takes place by the holes in the middle wall inside the machine tank with respective loops.



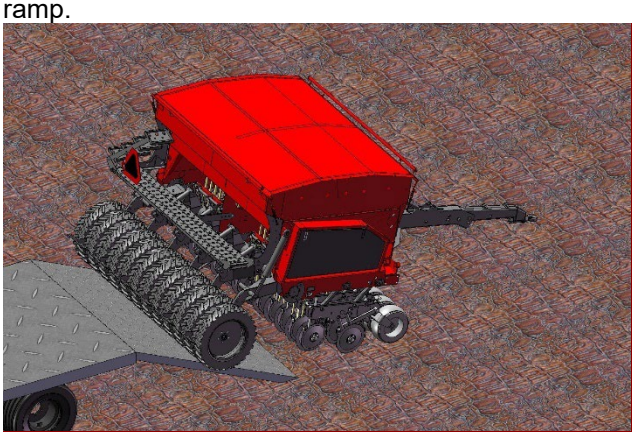
Or chains.



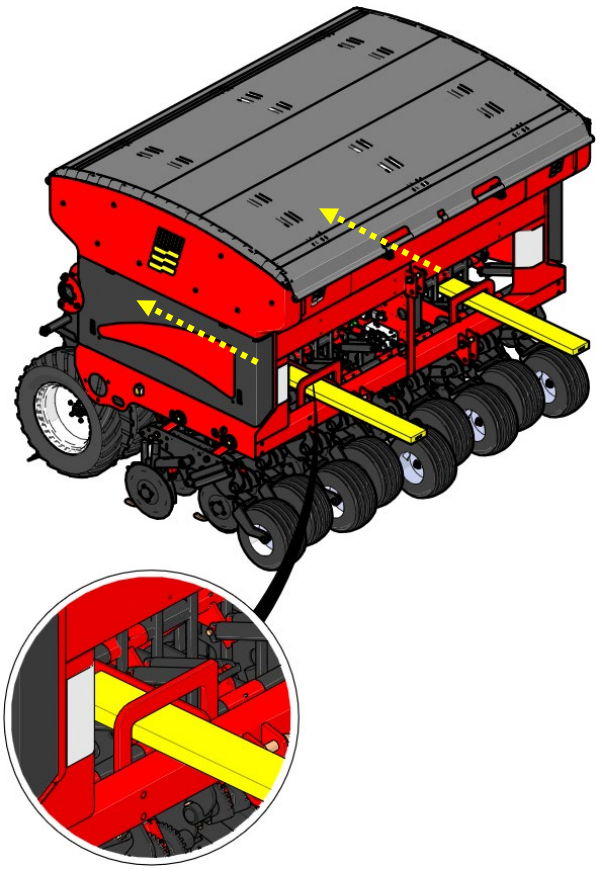
For the transport there are holes made to the ends of the machine. Note that coulters have springs and they can move.



Loading of the machine with either tractor or a truck must be done in such a way that under each pair of back tires there must be a support or a ramp.



Machine in transport package can be lifted using a heavy forklift. Forks are pushed inside the loops under the hopper. Forks must be long enough to reach also to the rear loops. Move seed and fertilizer hoses away from the forks.



17. NOTES



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