JUNKKARI



JUNKKARI S-M-T-R-D

COMBI DRILLS

OPERATING MANUAL

OH000120
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CONTENT

1 DEAR CUSTOMER 5
1.1 Junkkari warranty 5
1.2 Spare parts 5

2 TECHNICAL SPECIFICATIONS 6

3 INTRODUCTION OF THE MACHINE 7
3.1 S-model 7
3.2 M-model 9
3.3 T-moodel 11
3.4 R-model 13

4 SAFETY 17
4.1 Symbols in the manual 17
4.2 General safety instructions 17
4.2.1 Operating restrictions 17
4.2.2 Before comissioning the machine 17
4.2.3 Moving the machine 17
4.2.4 Handling the machine 18
4.2.5 Storing the machine 18
4.3 Machine-specific safety instructions 18
4.3.1 Moving the machine 18
4.3.2 Hazard situations 18
4.3.3 Hydraulics 19
4.3.4 Noice 20
4.4 Warning stickers, safety components and type plate 20
4.4.1 Warning stickers 20
4.4.2 safety components of the machine 21
4.4.3 Type plate 21
4.5 Warranty terms 22
4.6 Responsibilities 23
4.7 Decomissioning 23

5 COMMISSIONING 24
5.1 Unpacking the transport package 25
5.1.1 unpacking the transport package – s-, m-, t- and r-models 25
5.1.2 unpacking the transport package – d model 26
5.2 Installing the following harrow 27
5.3 Installing the trackmarker 28
5.4 Installing the cover 28
5.5 Installing the control unit 29
5.6 Tractor requirements 30
5.7 Connecting and disconnecting the machine 30
5.7.1 Connecting – without a packer 30
5.7.2 Disonnecting – without a packer 31
5.7.3 Connecting – with a packer 31
5.7.4 Disconnecting – without a packer 31
5.8 Hydrauliletkujen ja sähkökaapeleiden kytkeminen 31
5.8.1 Connecting hydraulic hoses 31
5.8.2 Connecting electric cables 31

6 MACHINE ADJUSTMENT 33
6.1 Hopper wall (eco and plus) 33
6.2 Packer 34
6.3 Height of the machine frame 34
6.4 Horizontal machine position 37
6.5 Groud wheel 39
6.6 Seeding depth of seed coulters in S-series machines 39
6.6.1 Mechanical adjustment of coulter pressure 40
6.6.2 Hydraulic adjustment of coulter pressure 40
6.6.3 Coulter-specific adjustment and seeding depth 40

6.7 Working depth of fertiliser coulters – S-series 41
6.8 Seeding depth of seed coulters – M and T -series 42
6.9 Working depth of fertiliser coulters – M and T -series 42
6.10 Coulter side plate – S, M and T -series 43
6.11 Seeding depth and press wheel in R-series machines 43
6.12 Seeding depth and press wheel in D-series machines 44
6.13 Trackmarker 46
6.14 Following harrow 47
6.14.1 Half lisft of the harrow – S, M, T and R -series 47
6.15 Hopper roll cover 48
6.16 Feeding mechanism 49
6.16.1 Seed and fertiliser feeding 49
6.16.2 Cleaning the feed roll 50
6.16.3 Adjusting the bottom flap 50
6.16.4 Switch valve positions 50
6.16.5 Closing hatch 51

7 CALIBRATION AND DEFINING THE SEEDING VOLUME 52
7.1 Calibration using a manual volume control 52
7.2 Calibration using an electonic volume control 53
7.3 Calibration by driving 54

8 TRAMLINES 58
8.1 Symmetrical tramlines 61
8.2 Asymmetrical tramlines - left side 61
8.3 Asymmetrical tramlines - right side 62

9 SURFACE AREA METER 63
9.1 Technical specifications 63
9.2 General 63
9.3 Using the surface area meter 64
9.4 changing and resetting values 65
9.5 turning the area counter off 65
9.6 turning the area counter off 66
9.7 installing the sensor and magnet 66

10 G-WIZARD 67
10.1 general 67
10.2 Driving mode without remote fertiliser control (G-Wizard) 69
10.3 Driving mode without remote fertiliser control (G-Wizard Plus) 70
10.4 Machine guard 71
10.5 Calculators 71
10.6 Settings 72
10.6.1 Calibration (G-Wizard Plus) 72
10.6.2 User settings 73
10.6.3 Factory settings 74
10.6.4 Diagnostics 74
10.6.5 Alarm 74

11 JUNKKARI ISOBUS ECU TECHNICAL SPECIFICATIONS (PRO EQUIPMENT LEVEL) ..76
11.1 Functions – Junkkari 76
11.2 Alarms, warnings, indicator lights and buttons 77
11.3 Functions on screen (Pro equipmet level) 78
11.4 Tramline rhythm selection 79
11.4.1 Track marker menu (Visible only if track markers are installed) 80
11.4.2 Tramline rhythm selection 80
11.4.3 pause on/off 81
11.4.4 Settings 81
11.4.5 Hopper sensors on the main 87
11.4.6 Half lift on the main screen 87
11.4.7 Gearbox alarm on the main screen 87
11.4.8 Pole lift activation on the main screen 88
11.4.9 Fertiliser remote adjustment on the main screen 89

12 JUNKKARI ISOBUS ECU ECHNICAL SPECIFICATIONS (ELITE EQUIPMENT LEVEL) 90
12.1 Functions - Junkkari 90
12.2 Alarms, Warnings, Indicator Lights, and Buttons 91
12.3 Display Functions ELITE 92
12.4 Front Page Buttons – ELITE 94
12.4.1 Track Marker Menu 94
12.4.2 Tramline Rhythm Selection 95
12.4.3 pause on/off..... 95
12.4.4 Settings 96
12.4.5 diagnostics display 104
12.4.6 LS automation 107
12.4.7 Variety selection 108
12.4.8 STOPP ALL 108
12.4.9 PRE START 108
12.5 Calibration Test – ELITE 109
12.6 Coulter Pressure Adjustment – ELITE 111
12.7 Simulated driving speed 115
12.8 Half-Width Seeding 116
12.9 Coulter pressure automation 117
12.10 Elite I/O-list.....119
12.11 Fuse Box – Electric Motors..... 124

13 SEEDING 126
13.1 Start of seeding 126
13.2 Soil preparation 126
13.3 Fertilisation 127
13.4 Seeds and seed feeding..... 127
13.5 Economical seeding..... 128

14 OTHER OPTIONAL EQUIPMENT.....130
14.1 Packer..... 130
14.2 Small seed and fertiliser device 130
14.3 Front leveller..... 131
14.4 S-tine..... 132
14.5 Disc cultivator..... 132

15 MAINTENANCE AND SERVICE.....133
15.1 Emptying, cleaning and storing the machine 133
15.2 Lubrication and greasing..... 134
15.3 Gearbox 136
15.4 Tyres 136
15.4.1 Tyre pressures..... 136
15.4.2 Changing tyres 136
15.5 REPLACING WEARING COULTER PARTS 137
15.5.1 Replacing S-series wearing coulter parts..... 137
15.5.2 Replacing M-series wearing coulter parts 139
15.5.3 Replacing wearing D-series coulter parts 140
15.6 REPLACING THE METERING DEVICE'S BOTTOM FLAP AND ROLL 141
15.6.1 Replacing a bottom flap 141
15.6.2 adjusting a bottom flap 142
15.6.3 Replacing the feed roller 142

16 TROUBLESHOOTING.....143

17 HYDRAULIC DIAGRAM OF D-MACHINE COULTER PRESSURE 146

18 ELECTRICAL DIAGRAMS.....147

19 ASSURANCE OF COMPLIANCE WITH EC REGULATIONS 148

1 DEAR CUSTOMER

We wish to thank you for the trust you have shown in Junkkari, and wish you the best of success.

Please read this operating manual carefully because full knowledge of the machine, correct adjustments and thorough maintenance ensure the safety of users, productive results and continuous machine operations during busy working days. It is important that you understand every single section of this manual and follow all operating instructions.

Junkkari team

1.1 JUNKKARI WARRANTY

You can have two years' warranty for your new Junkkari machine by registering it!
Register it by using the link or QR-code below

https://share-eu1.hsforms.com/1-W61IJ9GSNyzjZuBEUHpyA5i7i7

1.2 SPARE PARTS

You can find Junkkari spare parts catalogues at https://junkkari.fi/en/expert-articles-2/manuals/

2 TECHNICAL SPECIFICATIONS

	S 300/S 400	M 300/M 400 | T 300/ T400	R300/R400 | D 300/D 400
COULTERS			
Soil preparation	Minimum or conventional tillage	Direct seeding (1), minimum or conventional tillage	Direct seeding, minimum or conventional tillage
Coulter type	Single disc	Single disc	Double disc
Depth control	Wedge-shaped coulter	Toothed wedge-shaped coulter	Depth control wheel
Coulter durability	Good	Excellent	Excellent
Coulter pressure range	10 - 60 kg	20 - 120 kg | 20 - 150 kg	50-250 kg | 60 - 250 kg
Coulter pressure adjustment	Mechanical central adjustment	Hydraulic central adjustment	Electrohydraulic central adjustment
Pressure element	Tension spring	Tension spring	Compression spring
Seed coulters, pcs	24/32	24/32	18/24
Row spacing, seed	12,5 cm	12,5 cm	R=15 cm/15,4 cm D=16,7 cm
Fertilizer placement	Fertlizer coulter/seed coulter	Fertlizer coulter/seed coulter	Seed coulter
S-tine fertilizer coulter	Option	-	-
Fertlizer disc coulter	Option	Option	-
Fertlizer double disc coulter	Option	-	-
HOPPER			
Volumes	300-models 4200L, 400-models 5700L		
Partition wall	Adjustable		
Sieves for fertilizer	Standard		
Sieves for seed	Option		
Tarpaulin cover	spring operated		
Metering device, fertilizer	Rifle feed, gearbox adjustment		
Metering device, seed	2 studded wheels, gearbox adjustement		
Small seed box	Option		
PACKER WHEELS			
Tyre options	7.5 - 16 / 7.5 - 20		
Brakes	Option		
Centralised lubrication	Option		
CONTROL UNIT			
Options	Classic / G-wizard / ISOBUS		
Tramlines for fertilizer	Option		
Tramlines for seed	Option		
Fertlilizer remote control	Option		
Seed remote control	ISOBUS		
Precision farming solution	ISOBUS		
OPTIONS			
Track marker, hydraulic	Option	Option	Option
Front packer, small	Option	-	-
Front packer, big	Option	Option	Option
1-row leveler	Option	Option	Option
2-row leveler	-	Option (requires Heavy draw equipment)	-
2-row s-tines	-	Option (requires Heavy draw equipment)	-
Disc cultivator	-	Option (requires Heavy draw equipment)	-
Calibration kit	Standard	Standard	Standard
DIMENSIONS			
Working width	300/400 cm		
Transport width	300/400 cm		
Transport height	352 cm	352 cm	352 cm
Working height	228 cm	228 cm	233 cm
Length	474-650 cm	539-798 cm	591-851 cm
Weight	min. 2500kg/3100kg	min. 3200kg/3900kg	min. 3950kg/ 4700kg
Power demand	55-95 kW /75-115 kW	60-115 kW /75-140 kW	65+ kW / 85+ kW
Strength of sound	70 dB(A)		

1) NOT SUITABLE FOR DIRECT SEEDING IN HEAVY SOILS

THE FACTORY RESERVES THE RIGHT TO CHANGES WITHOUT PRIOR NOTICE.

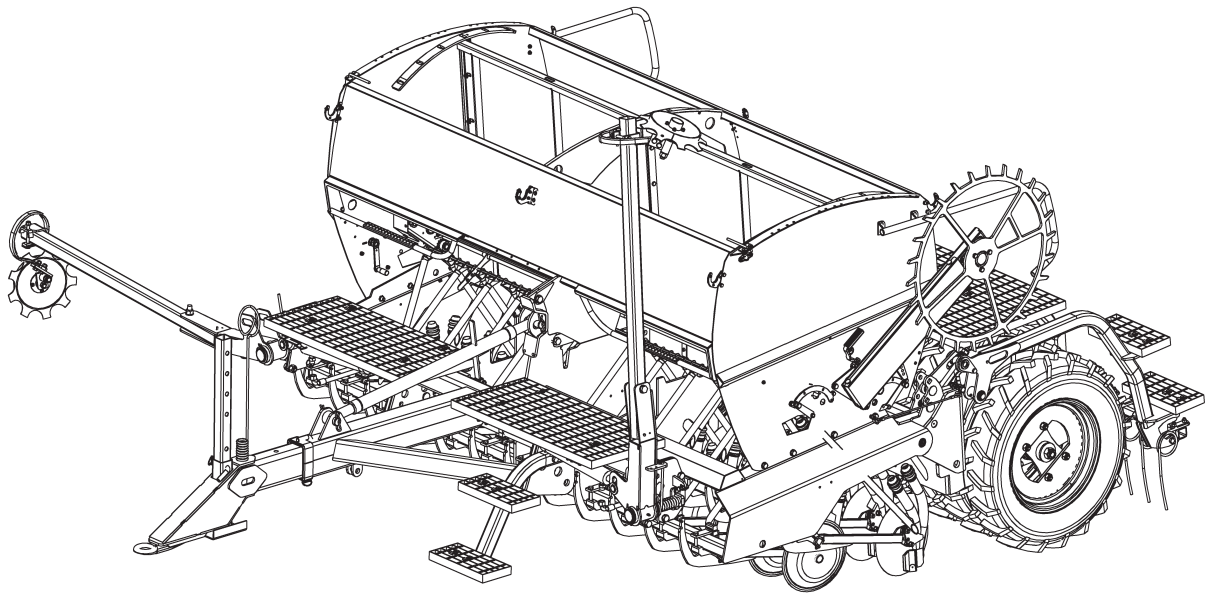
3 INTRODUCTION OF THE MACHINE

Junkkari S, M, T, R and D seed drills are modern mechanical seed drills designed, depending on equipment configuration, for sowing either seed only or both seed and granulated fertiliser.

The S, M, T, R and D models are powered by a ground wheel, and the seeding rate is adjusted using a gearbox that changes the rotation speed of the feed roller. Seeds are fed by a double-pin roller and fertiliser by a fluted roller. After using the coulters, the surface of the field is compacted with the wheel system and harrowed to improve water economy.

Two different drawbar options are available for the seed drills: Steady and Heavy. The Steady drawbar fits only S models, and the Heavy drawbar fits only the D model. M, T and R models can be used with either drawbar depending on the following conditions: the Heavy drawbar is used when a 2-row front tool or separate fertiliser coulter system is installed, and the Steady drawbar is used when a 1-row front tool is installed.

The ELITE equipment level, including ISOBUS, calibration test and other features, is described in a separate manual.



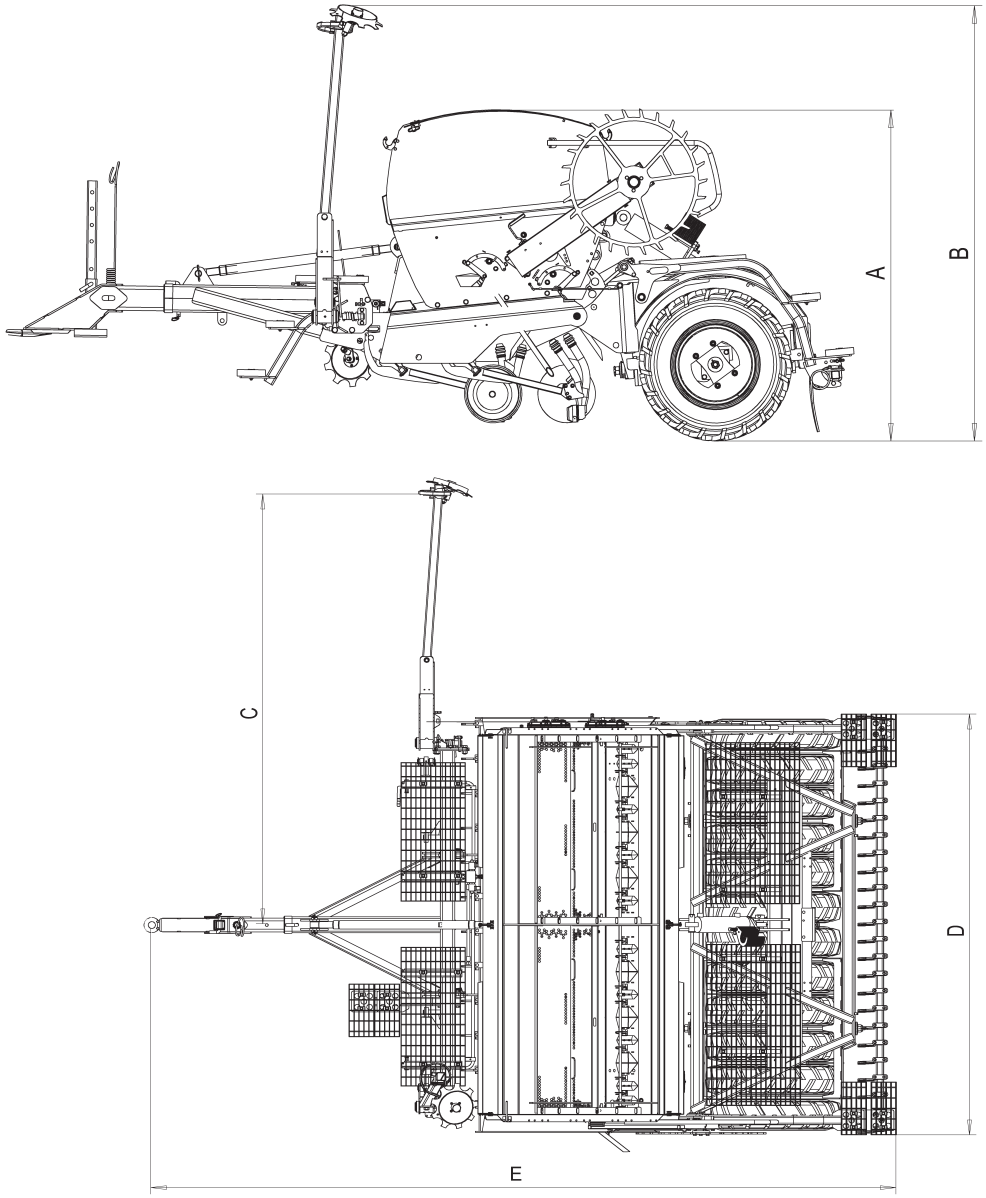
Picture 1. Model S (with optional track marker)

3.1 S- MODEL

The S model is designed for sowing in cultivated soil. During purchase, you can choose whether the coulter places the optional fertiliser in the seed row or in a separate fertiliser row. The seed coulters are simple and reliable wedge press coulters that maintain their working depth exceptionally well in varying soil types.

The maximum coulter pressure of the S model is 30–60 kg, depending on the spring constant of the traction spring.

Dimensions of model S

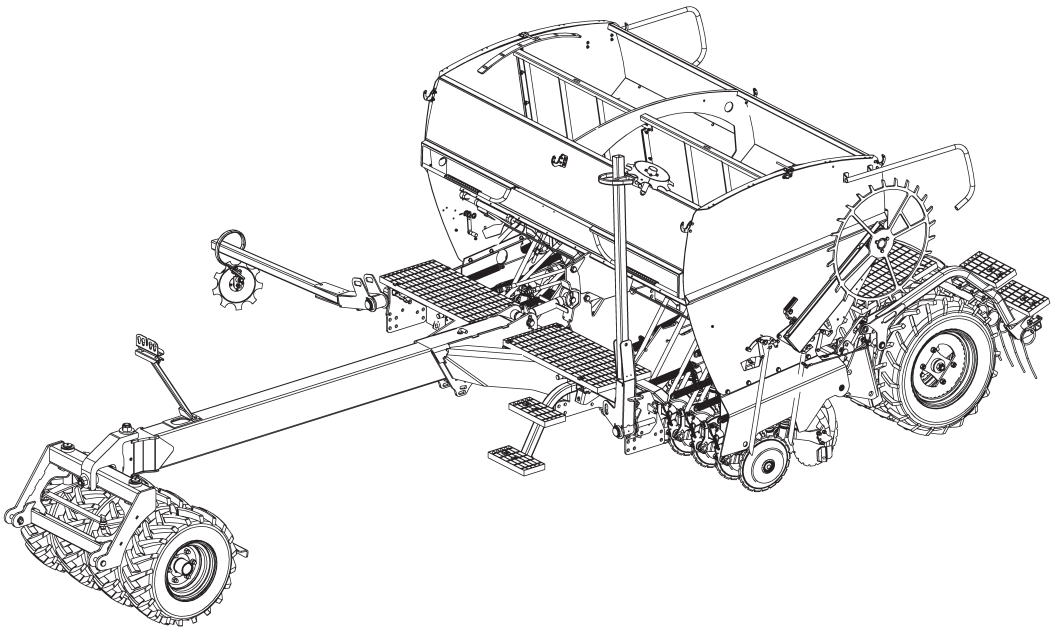


Picture 2. Dimensions of model S (optional line marker)

	S300ECO	**S300PLUS**	**S400PLUS**
A	1885	2160	2160
B	2485	2485	2485
Bmax	2860 (16”)	2910 (20”)	3410 (20”)
C	3000	3000	4000
D	3000	3000	4000
E	5475	5475	5475
Emin	4740	4740	4740
Emax	6450	6450	6450

Table 1. Dimensions of model S (cm)

3.2 M MODEL

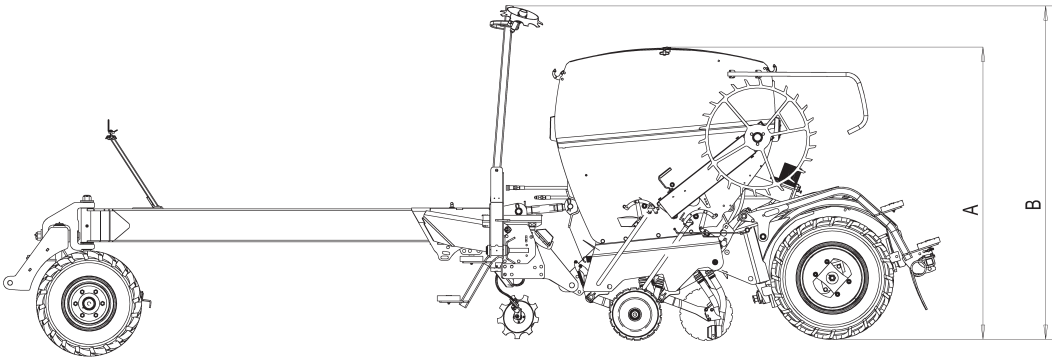


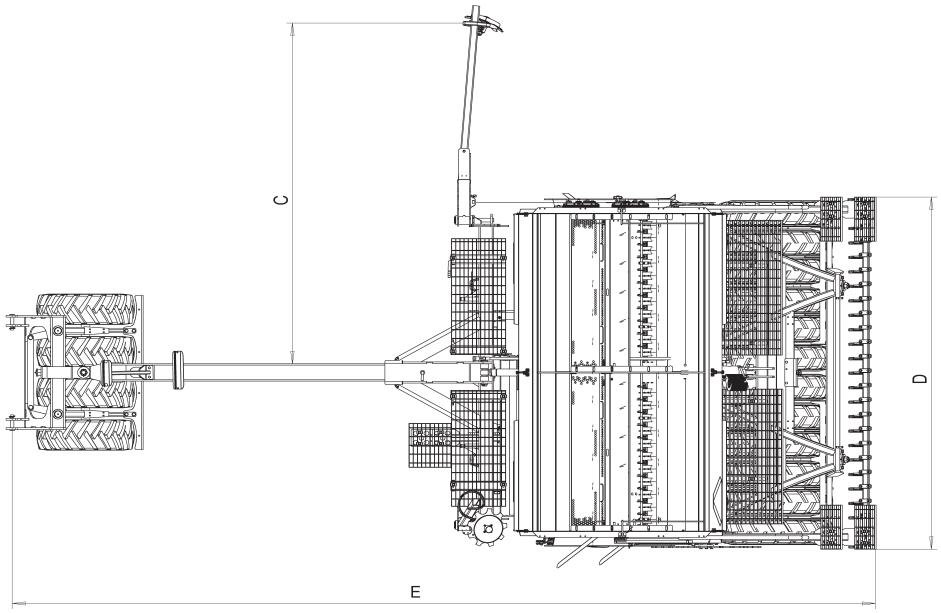
Picture 3. M model (with optional track marker and packer)

The M model is designed for versatile seeding, ranging from light direct seeding to cultivated soil and simultaneous tillage during seeding. During purchase, you can choose whether the coulter places the optional fertiliser in the seed row or in a separate fertiliser row.

The seed coulters are heavy-duty wedge press coulters with simple depth control and a wide adjustment range for hydraulic coulter pressure, making the machine highly versatile and efficient. A broad selection of front tools and accessories further enhances the machine's adaptability.

Picture 4. Dimensions of model Mt



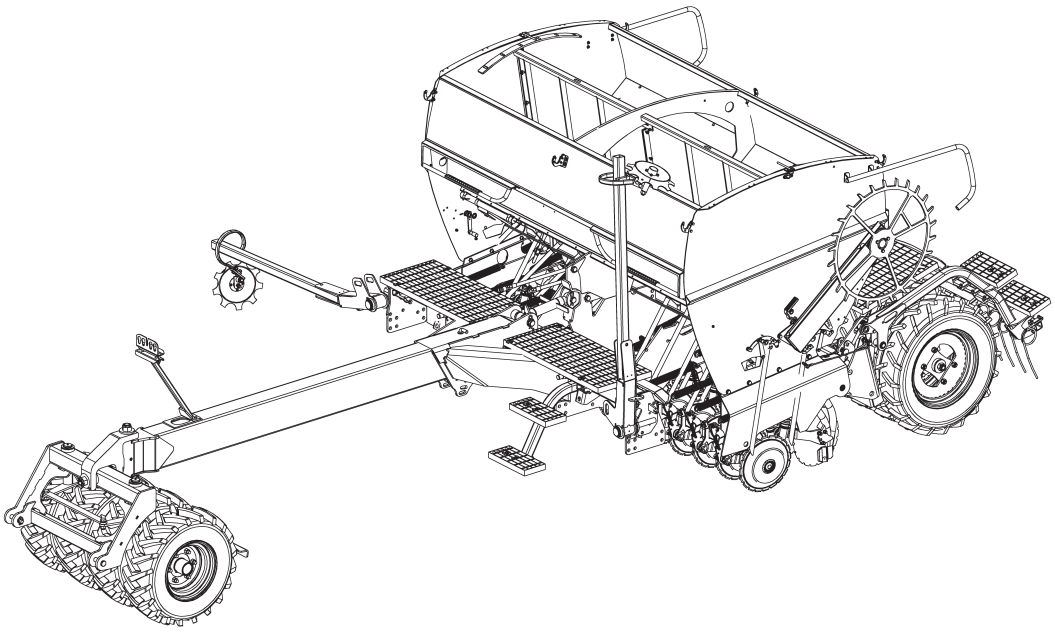


Picture 5. Dimensions of model M (with optional track marker and packer)

	M300PLUS	**M400PLUS**
A	2210	2210
B	2530	2530
Bmax	3020 (20”)	3520 (20”)
C	3000	4000
D	3000	4000
E	7050	7050
Emin	5390	5390
Emax	7980	7980

Table 2. Dimensions of model M (cm)

3.3 T MODEL

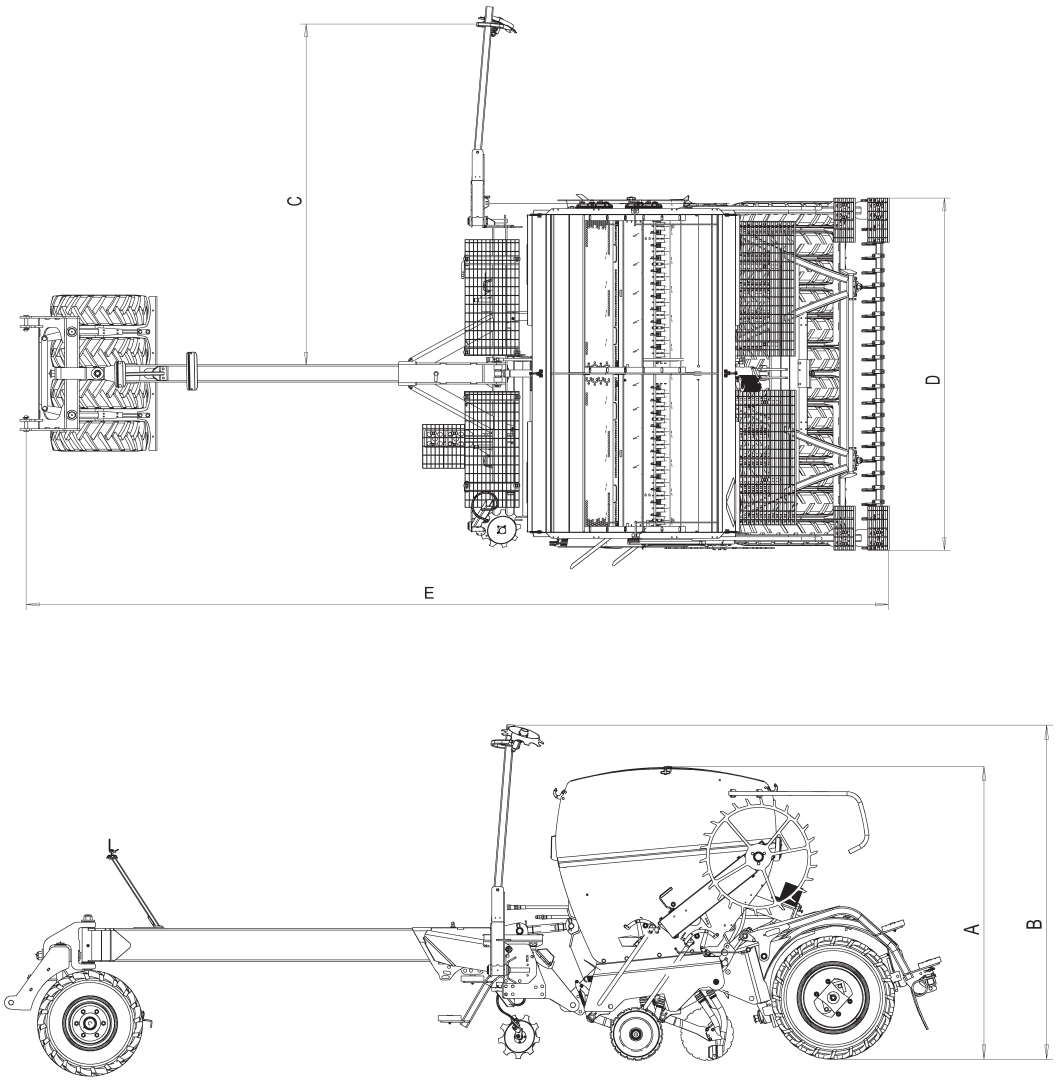


Picture 6. T-series (track marker and packer as optional equipment)

The T model is designed for versatile seeding, ranging from light direct seeding to cultivated soil and simultaneous tillage during seeding. The coulter disc in the T model is specifically designed for heavy soils, and the maximum coulter pressure is 30 kg higher than in the M model.

During purchase, you can choose whether the coulter places the optional fertiliser in the seed row or in a separate fertiliser row. The seed coulters are heavy-duty wedge press coulters with simple depth control and a wide adjustment range for hydraulic coulter pressure, making the machine highly versatile and efficient. A broad selection of front tools and accessories further enhances the machine’s adaptability.

Dimensions of model T

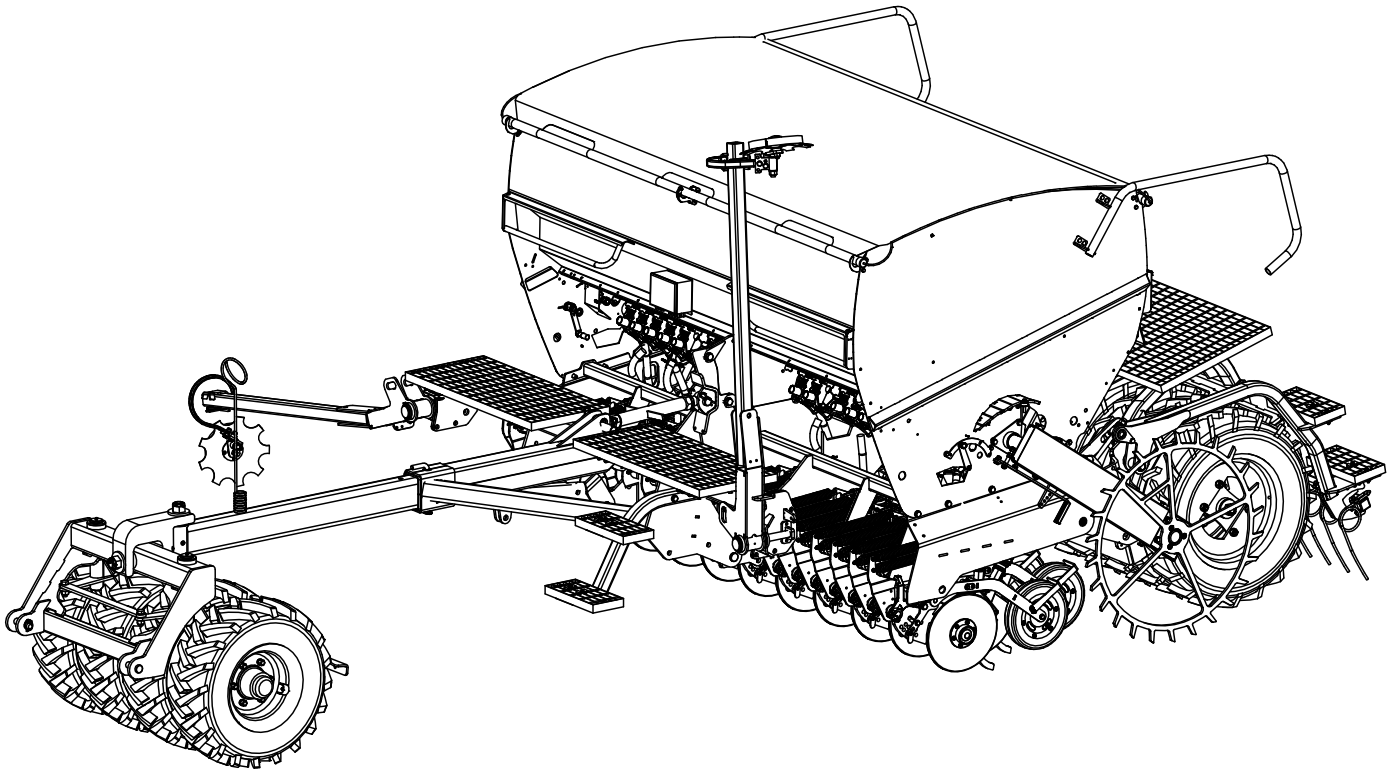


Picture 7. Dimensions of model T (with optional track marker and packer)

	T300PLUS	**T400PLUS**
A	2210	2210
B	2530	2530
Bmax	3020 (20”)	3520 (20”)
C	3000	4000
D	3000	4000
E	7050	7050
Emin	5390	5390
Emax	7980	7980

Table 3. Dimensions of model T (cm)

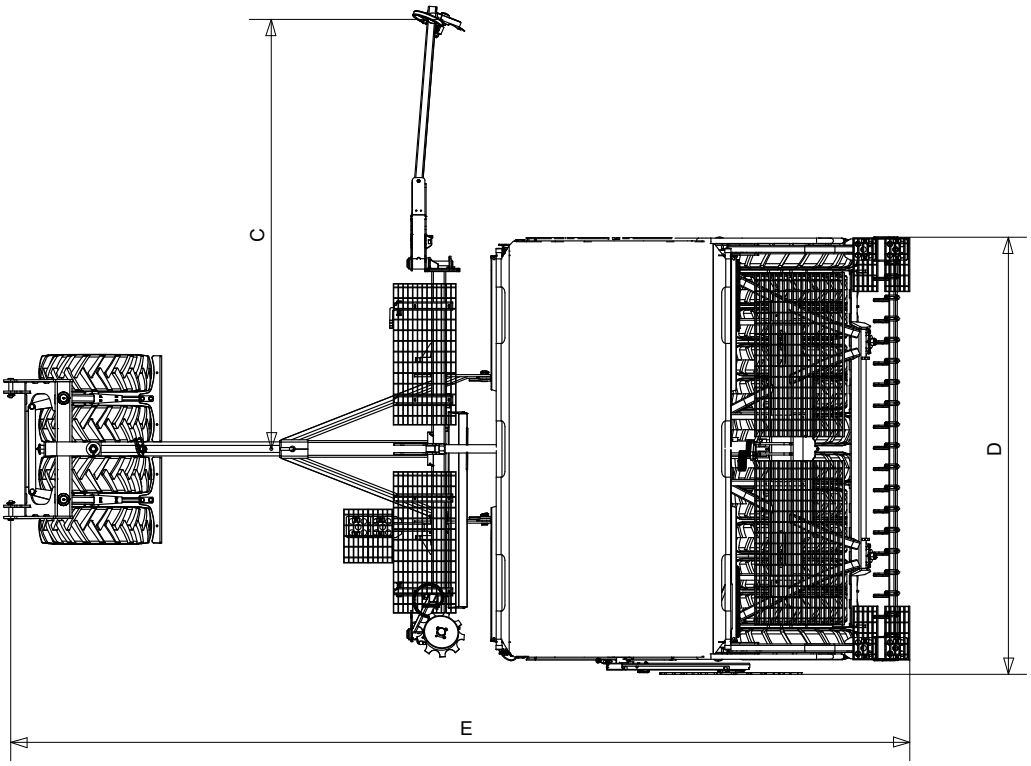
3.4 R MODEL



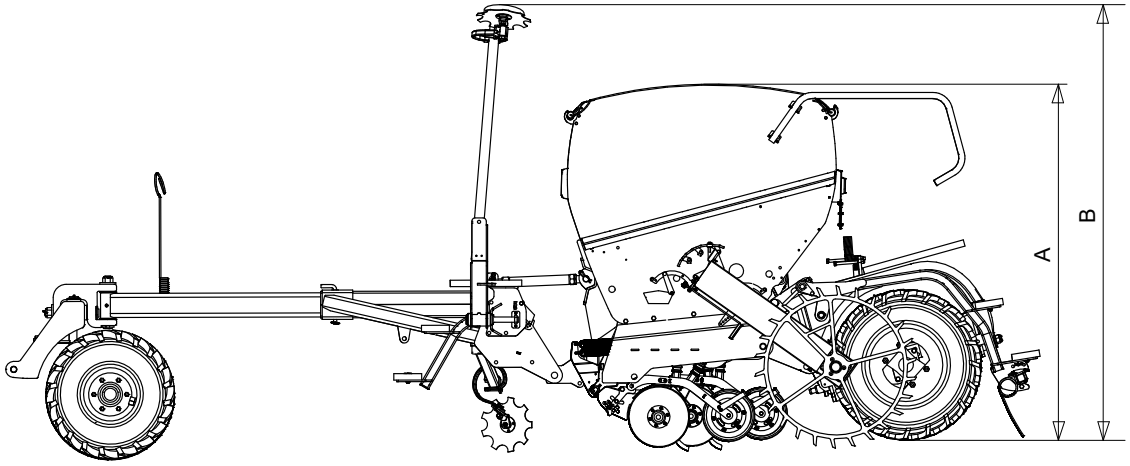
The R model is primarily designed for direct seeding, but thanks to its wide coulter pressure adjustment range and large depth control wheels, the machine can also be used flexibly on various types of cultivated ground. The seed coulters are heavy-duty double disc coulters that also place the optional fertiliser in the same row with the seed.

The seeding depth is adjusted individually for each coulter using a depth control wheel, and the seeding row is closed with a closing wheel. Coulter pressure is adjusted hydraulically, which is a significant advantage on uneven or sloped fields.

Dimensions of model R



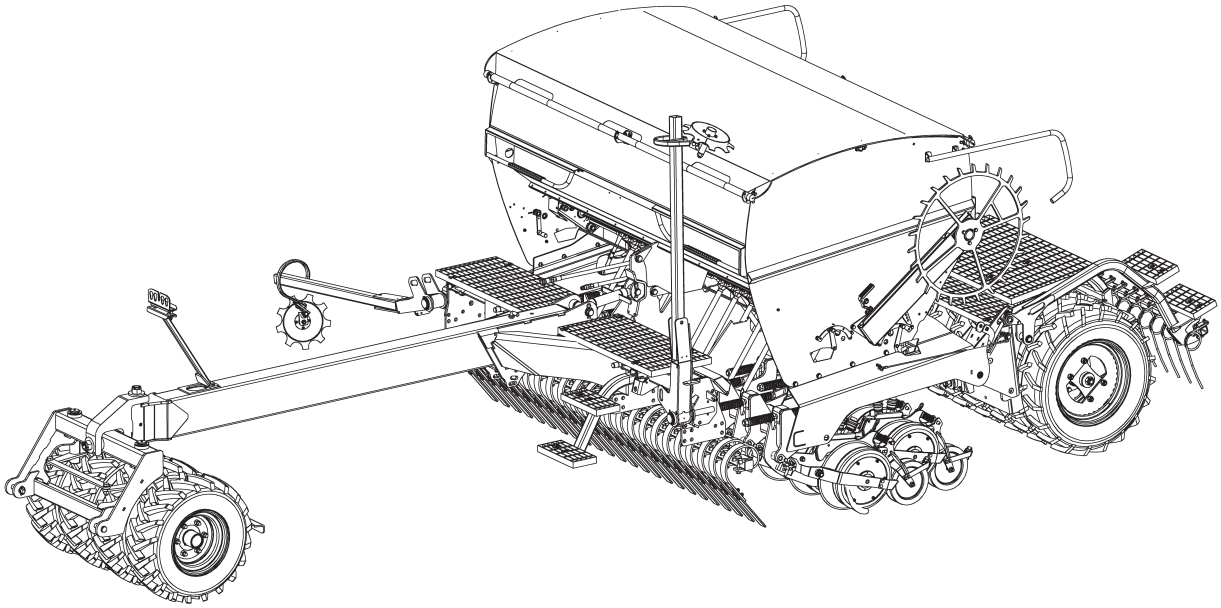
Picture 8. Dimensions of model R (with optional track marker and packer))



	R300	R400
A	2210	2210
B	2530	2530
B max	3020	3520
C	3000	4000
D	3000	4000
E	7050	7050
E min	5390	5390
E max	7980	7980

Table 4. Dimensions of model R

D MODEL

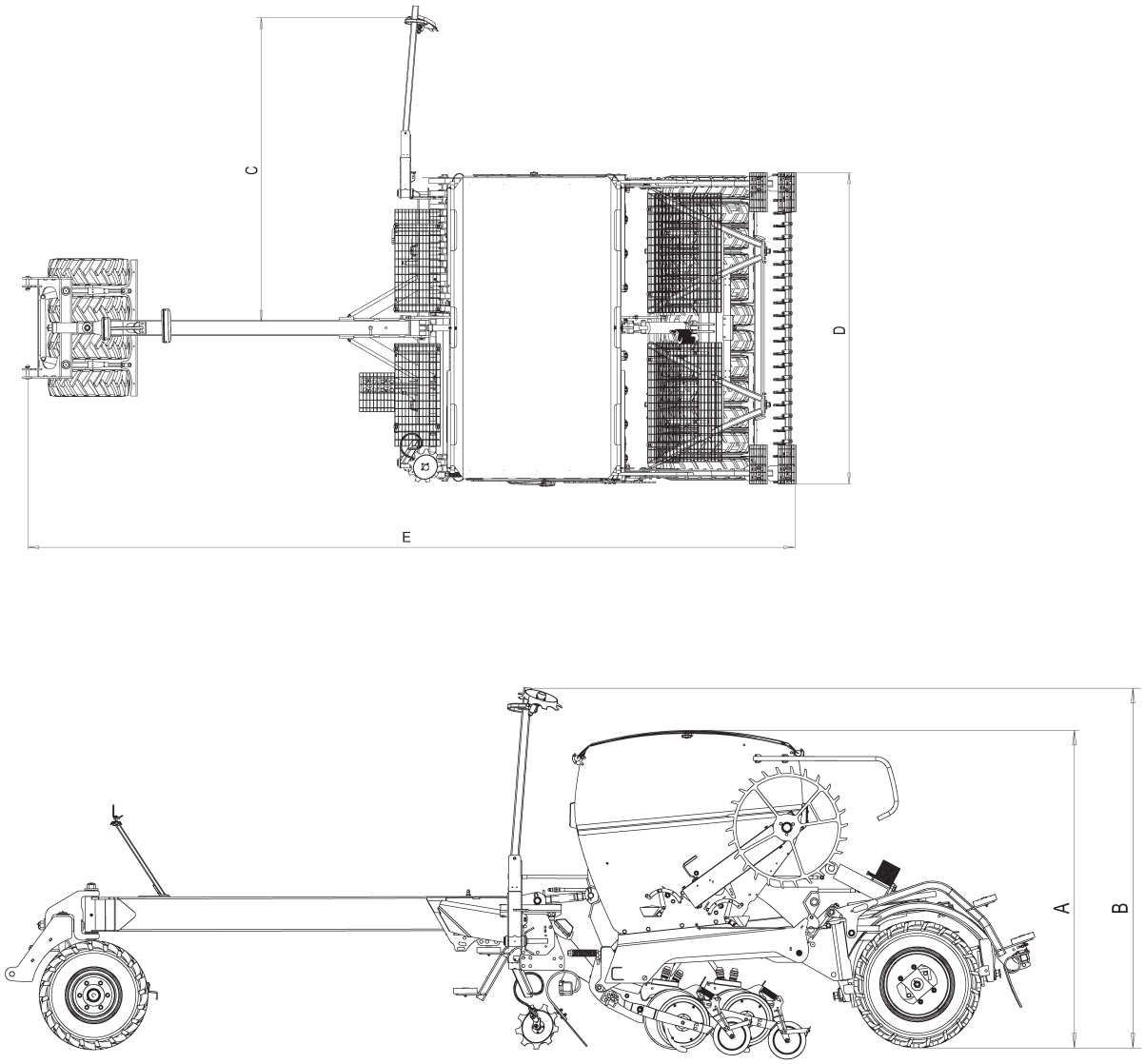


Picture 9. D model (with optional track marker and packer)

The D model is primarily designed for direct seeding, but thanks to its wide coulter pressure adjustment range and large depth control wheels, the machine can also be used flexibly on various types of cultivated ground. The seed coulters are heavy-duty double disc coulters that also place the optional fertiliser.

The seeding depth is adjusted individually for each coulter using a depth control wheel, and the seeding row is closed with a closing wheel. Coulter pressure is adjusted electrohydraulically, which is a significant advantage on uneven or sloped fields.

Dimensions of model D



Picture 25. Dimensions of model D (with optional track marker and packer)

	D300PLUS	D400PLUS
A	2325	2325
B	2645	2645
Bmax	3020 (20”)	3520 (20”)
C	3000	4000
D	3000	4000
E	7505	7505
Emin	5910	5910
Emax	8510	8510

Table 5. Dimensions of model D (cm)

4 SAFETY

Read the operating instructions carefully before using the machine and keep them for future reference.

4.1 SYMBOLS IN THE MANUAL



This symbol is used throughout the manual to indicate situations where there is a risk of danger to people, the environment or property.



This symbol highlights the importance of proper machine use in situations where misuse could otherwise cause problems.



This sign indicates additional information that may be useful when using the machine.

4.2 GENERAL SAFETY INSTRUCTIONS

4.2.1 OPERATING RESTRICTIONS

- The machine operator must not be under the influence of intoxicants, alcohol, or strong medication.
- In cases of illness or disability, a doctor may provide permission for machine operation.
- Use of the machine is prohibited for anyone lacking sufficient knowledge and skills in agriculture, as well as for persons under the age of 15.
- Avoid operating the machine in particularly wet or dry conditions where adequate seed moisture cannot be guaranteed.
- The machine must not be used on protected water zones or other nature conservation areas without official permission.
- Do not use the machine to apply liquids, flammable materials, sand, powders, or fibrous substances.

4.2.2 BEFORE COMMISSIONING THE MACHINE

- Familiarise yourself carefully with the operating instructions, the controls, and the functioning of the machine.
- Follow all warnings and instructions attached to the machine.
- Keep the operating instructions for future reference.
- For your own safety, wear suitable work clothing and footwear.

4.2.3 MOVING THE MACHINE

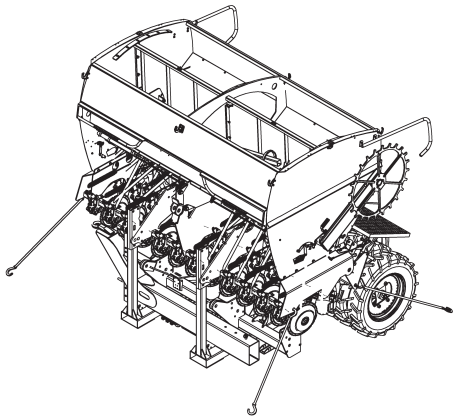
- Always obey road traffic laws when driving on public roads.
- Check that all the equipment required for transport on public roads, such as lights, reflectors and the low-speed triangle, is in order before entering the road.
- Always make sure there is no one behind the machine before reversing.
- No passengers may be carried on the machine.

With a tractor

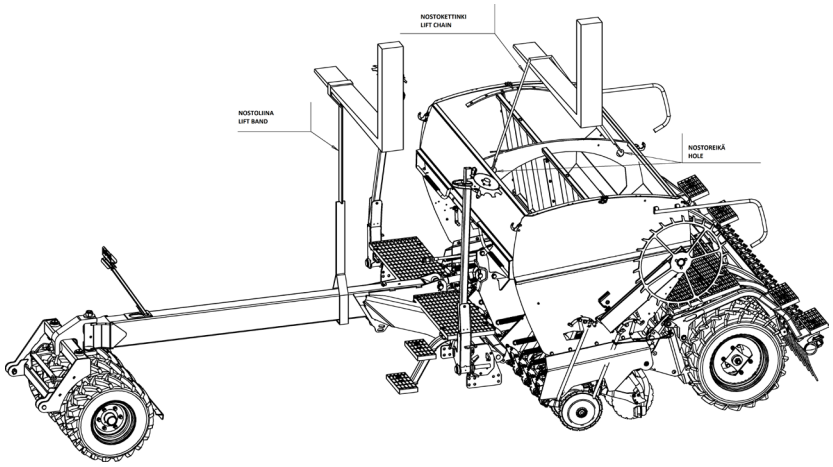
- Take special care when attaching or detaching the machine.
- Never go between the machine and the tractor while the machine is being hitched, lifted, lowered, or moved.
- Observe the maximum permissible drawbar and hitch loads.
- Take into account the allowed axle loads, total weight, and transport dimensions.
- Trailed or mounted implements and additional weights affect tractor handling, steering, and braking.
- Ensure that tractor steering and deceleration remain adequate at all times. At least 20% of the tractor's weight must remain on the front axle when the machine is filled and lifted.

With other equipment

- Transport the machine using suitable equipment.
- Secure the machine using approved lifting chains or slings at the marked lifting points (see Figures 10 and 11).
- Check the condition of lifting slings before use.
- When loading with a forklift or similar lifting device, ensure that the machine is balanced and stable.
- Fasten the cover securely with tensioning straps or equivalent. Do not load other items on top of the machine.



Picture 10. Tying the machine



Picture 11. Lifting the machine

4.2.4 HANDLING THE MACHINE

- Make sure that the machine cannot move when parked.
- When working with the machine, do not stay on top of or close to the machine.
- After use, check the condition of the machine, focusing on fastening and connecting surfaces.

4.2.5 STORING THE MACHINE

- When stored outdoors, make sure that no water or snow can accumulate inside or on the machine.
- • Any long-term storage must be performed indoors.
- • Machine dimensions and weights are presented in section “Technical specifications” of this manual

4.3 MACHINE-SPECIFIC SAFETY INSTRUCTIONS

4.3.1 MOVING THE MACHINE

- Lock the track markers in transport position, lift the ground wheel up, and ensure the cover is secured.
- Also turn the shut-off valve of the lifting hydraulics to the closed position.
- The maximum permitted speed for the seed drill is 40 km/h.
- Reduce speed significantly on uneven surfaces, as the wheel system may become overloaded if all wheels are not in contact with the ground.
- Do not carry items such as tools, seeds or fertiliser on the covers or steps of the machine. .

4.3.2 HAZARD SITUATIONS

- • There is a risk of crushing when installing the support leg or lowering the ground wheel.
- When lowering the ground wheel to the working position, support it with your right hand and rotate it outward with your left hand using the lever on the machine.

- Be careful not to let your foot get caught under the wheel as it descends.
- It is safest to lower the ground wheel while the machine is in transport position.
- Ensure the machine is properly connected and that all guards and safety devices are in place and undamaged before operation.
- Never operate the machine without its protective guards.
- Always maintain a safe distance from machine parts that cannot be fully shielded.
- The operator must ensure that bystanders are also kept at a safe distance, especially from moving track markers and the following harrow.
- Never go under a machine that is only supported by hydraulic cylinders or areas where there is a risk of crushing.
- Always use the yellow maintenance support on the lift cylinder and the hydraulic shut-off valve (ball valve) during service work.
- Never go under a machine lifted only by the tractor's lower links.
- Support the machine mechanically during maintenance work.
- Make sure that the supports are stable and do not sink into the ground.
- Always switch off the tractor hydraulics and PTO, stop the engine and remove the ignition key before performing any adjustment or maintenance.
- Before adjusting the semi-lift height (lift sensor), turn off the machine's controller.
- Do not overload the seed drill. Partially empty large bags if necessary.
- Avoid damaging machine components with swinging bulk bags.
- Ensure there are no people behind the machine when reversing.

4.3.3 HYDRAULICS

- Be cautious with all hydraulic components, as they can cause crushing or cutting hazards.
- Pay special attention to the pressure in the hydraulic system and the oils and greases used with it.

Pressure

- The maximum pressure in the hydraulic system is 210 bar.
- After connection, the hydraulic system remains under high pressure.
- Hydraulic oil escaping under pressure can penetrate the skin and cause serious injury.
- Do not disconnect hydraulic fittings when the machine is supported solely by the hydraulics, as pressure may remain in the system. Use the maintenance support if necessary.
- When connecting hydraulic hoses to the tractor, close the ball valve and make sure that the system is not pressurised on either the machine or tractor side.
- When servicing or repairing the hydraulic system, place the machine on level ground and support it so it cannot lower or move when the pressure drops. Always bleed the system after performing any maintenance work.
- When bleeding the hydraulic system, make sure no one is within the danger zone. Cycle the lift cylinder, track marker cylinder, coulter pressure cylinder (if installed), and front tool cylinder fully in and out several times until all air has been released from the system.
- During transport, close the ball valve on the lift cylinder's hydraulic hose if there is even a slight possibility of internal leakage in the tractor's hydraulic valve.
- You may also use the lift cylinder's maintenance support.

Oils and greases

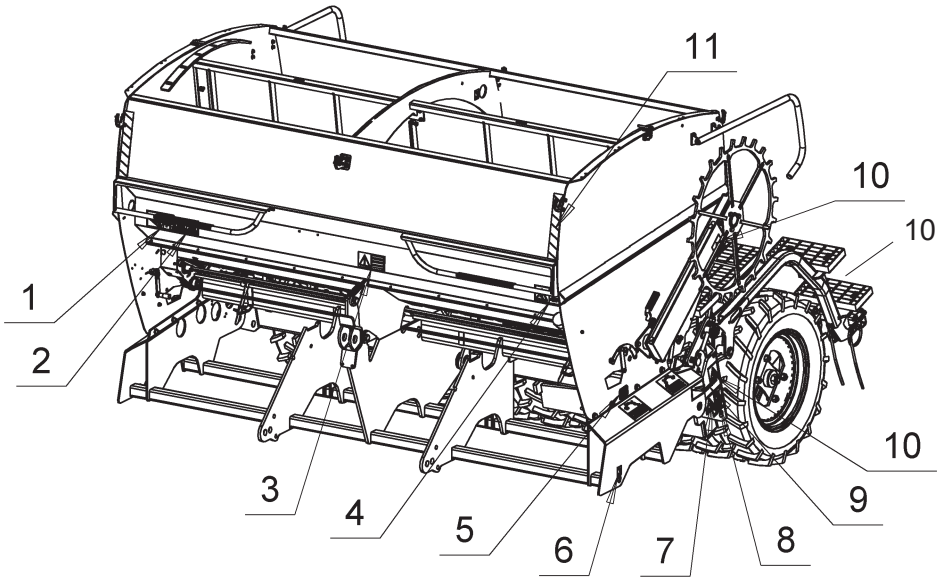
- Always follow the lubricant manufacturer's handling instructions and safety regulations.
- When handling oil or grease, wear appropriate protective clothing and oil-resistant gloves.
- Avoid skin contact with oil and grease, as they may cause skin damage.
- Never use oil or grease to clean your skin, as they may contain fine metal particles that can cause cuts or skin injuries.
- Synthetic oils are often corrosive and can cause severe skin irritation.
- Waste oil must be collected and disposed of in accordance with national regulations.
- If oil enters the soil, prevent it from spreading and collect it—for example.
-

4.3.4 NOISE

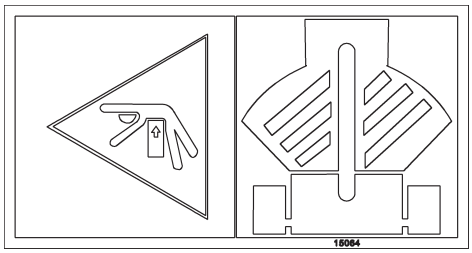
The machine's sound pressure level at the operator's position (inside the tractor cab) does not exceed 70 dB.

4.4 WARNINGS STICKERS, SAFETY COMPONENTS AND TYPE PLATE

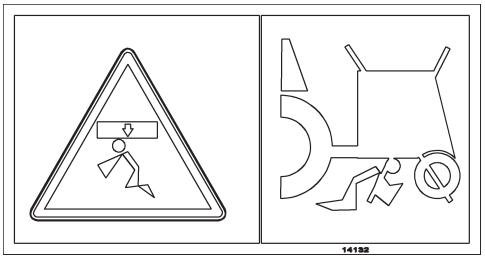
4.4.1 WARNING STICKERS



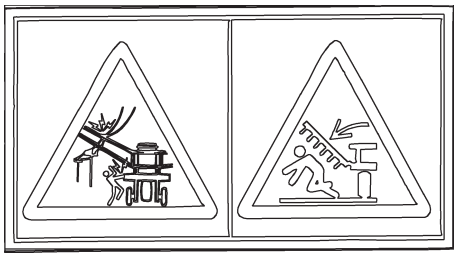
Picture 12. Locations of stickers on the machine



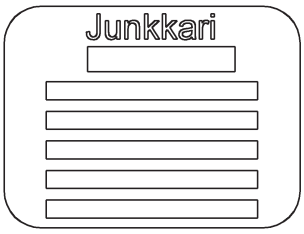
1. DANGER OF SQUEEZING



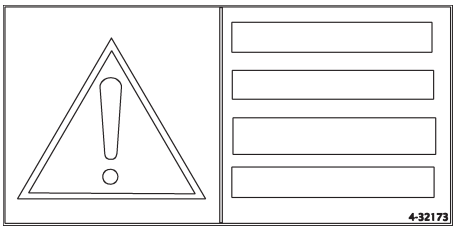
4. IT IS FORBIDDEN TO GO UNDER THE MACHINE



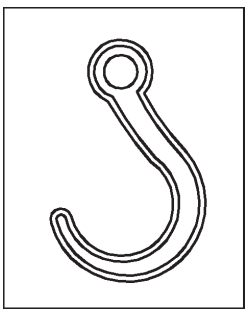
2. BEWARE OF FALLING BOOMS



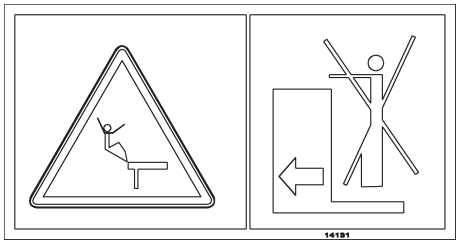
5. TYPE PLATE



3.BECOME FAMILIAR WITH THE OWNERS MANUAL AND SAFETY INSTRUCTIONS BEFORE STARTING TO OPERATE THIS MACHINE



6. LIFTING EYE



7. TRANSPORTING PASSENGERS IS FORBIDDEN

Tyre	kPa	
11.5*15.3"	200	
400*15"	210	
7.0*12"	180	
7.5*16"	180	
7.5*20"	180	
10*15.3"	200	16257

8. TYRE PRESSURE

HUOM! Kiristä pultit 3h ajon jälkeen.
OBS: Spänn bultarna efter 3 timmar körning.
NOTE: Tighten bolts after 3 hours of operation.
ACHTUNG: Bolzen nach 3 Stunden Fahrt festziehen.

9. Kiristä pultit

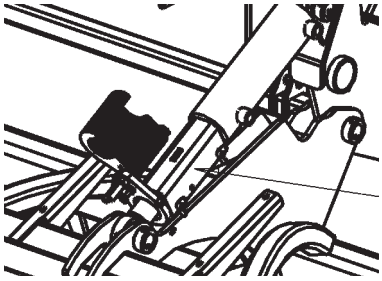


10.RISK OF CRUSHING OR CUTS

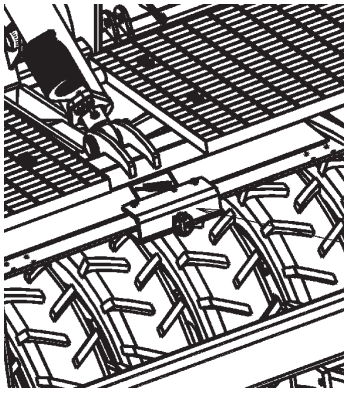


11. OVERSIZE MACHINE

4.4.2 SAFETY COMPONENTS OF THE MACHINE



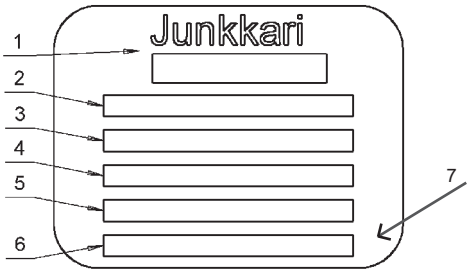
Service support



Serive support position

4.4.3 TYPE PLATE

1. Name and address of manufacturer
2. Name
3. Type
4. Serial number
5. Weight
6. Manufacturing year
7. CE-mark



Type plate

4.5 WARRANTY TERMS

Read the warranty terms and the limitations of warranty validity carefully.
Remember that agricultural machinery must be handled with care and serviced regularly to ensure long-term reliable operation.

WARRANTY PERIOD

- The warranty period is 24 months when the machine is used for its intended purpose.
- The warranty period begins on the delivery date of the new machine, provided that the dealer has reported the date of sale and the end user's contact information to Junkkari.
- In all cases, the warranty period ends no later than 36 months from the machine's delivery from Junkkari's factory.

WARRANTY COVERS

- The warranty covers manufacturing and material defects. Damaged parts will be repaired or replaced with functional parts either at the factory or at an authorised service partner.
- All warranty work must be agreed separately with Junkkari's After Sales Manager. Any work to be compensated under warranty must be approved in advance.
- Warranty repairs do not extend the warranty period.

WARRANTY DOES NOT COVER

- The warranty does not cover damage resulting from incorrect use or maintenance contrary to the manual, excessive loading, normal wear, or any faults arising from wear.
- The warranty does not cover consequential damage, downtime, loss of income, travel expenses, freight costs, daily allowances, overtime, or any modifications to the original machine structure.
- The warranty does not cover transport damage, vandalism, theft or similar incidents.

REPORTING A DEFECT

- Warranty claims must be submitted to Junkkari in writing without delay.
- The claim must include appropriate images and descriptions of the cause of the defect and its effect on the usability of the machine.
- Upon request, the defective part(s) must be returned to Junkkari in their original and unrepaired condition.

4.6 RESPONSIBILITIES 

- Junkkari is not responsible for any use of the seed drill that violates applicable laws, safety regulations, or the instructions in this manual. Since there may be situations during operation that are not covered by specific instructions or regulations, we recommend following general machine safety guidelines and directives.
- Note that incorrect use of fertilisers or plant protection products may cause harm to humans, animals, water systems, and soil. Always follow the instructions provided by the manufacturers and other experts when handling and applying such substances.
- Junkkari is not responsible for incorrect selection of seed, fertiliser, or plant protection product quantities. Consult experts when necessary.
- Junkkari is not responsible for unsuccessful seeding results. To ensure consistent seeding quantities across all metering units, monitor the consumption of seeds and fertiliser. Also ensure the correct seeding depth.
- Junkkari is not responsible for any damage caused by the use of components manufactured by other parties.
- Junkkari is not responsible for any damage caused to other machines or equipment due to the use of the seed drill.
- Junkkari reserves the right to further develop or modify the machine’s design.
- The machine owner is responsible for ensuring that all operators are familiar with the machine’s operating and safety instructions.

4.7 DECOMMISSIONING

- The end user or the person or company that owns the machine at the time of decommissioning is fully responsible for removing the machine from use.
- When decommissioning the machine and handling any resulting waste, follow all national laws, guidelines and regulations applicable in the country of use.
- As most seed drill components are made of non-biodegradable materials, the machine must be dismantled and its different materials disposed of in accordance with national waste management regulations.
- Recycle iron and other metals through authorised machinery and equipment dismantlers for reuse.
- Handle waste oil, plastic and rubber parts—including tyres—as hazardous waste, and dispose of them either by recycling or by transporting them properly to an authorised landfill.
- Tyres must be disposed of in accordance with Directives 83/189/EEC, 182/88/EEC and 94/10/EC by returning used tyres to designated recycling facilities or operators who forward them for further processing.
- For more information on disassembly and waste handling, contact your local environmental authorities.

5 COMMISSIONING

After delivery, check the contents of the shipment and the condition of the machine. Ensure that the machine has not been damaged during transport. In the event of any defects requiring a complaint, contact the dealer within eight days.

Depending on the machine model and equipment, the machine is delivered wrapped in plastic in one or more parcels.

The delivery includes:

- Operating manual in a protective tube located in the front corner of the machine
- Lights and reflectors installed in place
- Calibration crank in its holder in the front right corner of the machine
- Calibration trays placed on the frame or inside the hopper
- Fertiliser sieves installed in the hopper
- Top link inside the hopper
- Following harrow arms in the hopper and tine bar on top of the wheel unit
- Control unit in the hopper or mounted in front of it
- Accessory package in the hopper
- Track marker arms in the hopper
- Cover on top of the hopper or wheel unit
- Drawbar and drawbar arm under the machine or delivered as a separate parcel
- Small seed or starter fertiliser device mounted on the machine
- Large additional equipment is usually delivered in separate parcels

Wooden and cardboard packaging materials can be disposed of by burning. Plastics and any reusable pallets should be recycled. If local regulations differ from these instructions, always follow the requirements of local authorities.

5.1 UNPACKING THE TRANSPORT PACKAGE

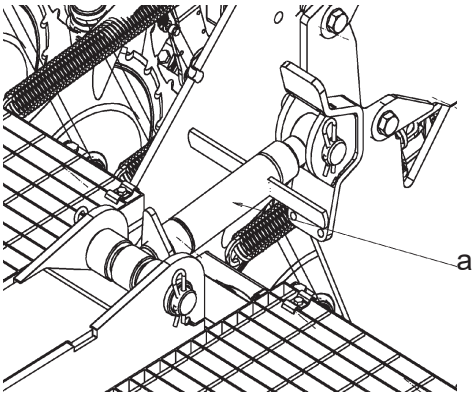
5.1.1 UNPACKING THE TRANSPORT PACKAGE – S-, M-, T- AND R-MODELS

Junkkari S, M, T and R models are delivered with the drawbar, harrow and track markers detached. The drawbar must be attached to the machine during the unpacking process.

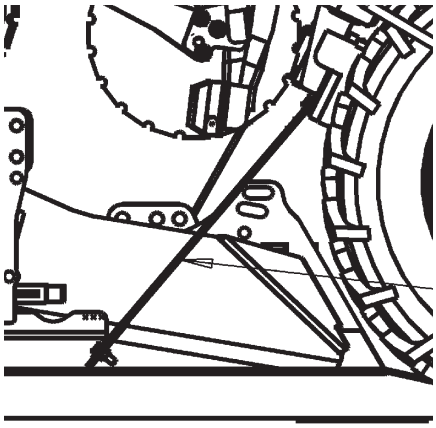
Take special care when unloading the machine's transport package due to the risks to persons and property.

Place the transport package on a level surface and reserve space behind the package to allow the seed drill to be moved backwards during unpacking.

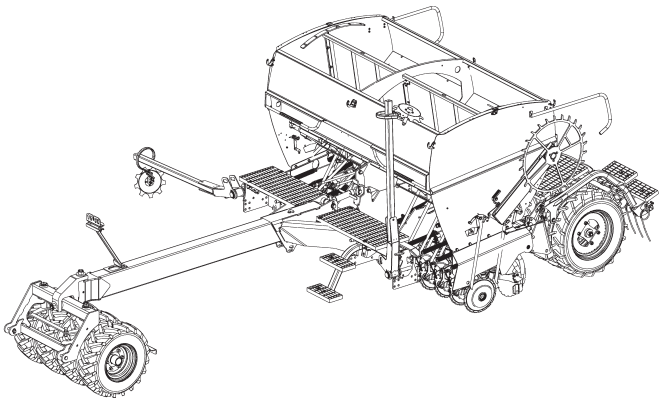
1. Remove the protective plastic.
2. Attach a lifting device with a capacity of over 2,500 kg to the top link mounting point of the seed drill and slightly lift the machine using strap. (Figure 13)
3. Detach the diagonal braces between the transport forks and the packer wheel frame. (Figure 14)
4. To remove the chassis locking pins from the transport base, slightly lift the front of the machine.
5. Move the machine backwards so it can be lowered onto maintenance supports or similar behind the transport package. Place supports under both front corners of the machine. Make sure the machine is securely supported before lowering it.
6. Move the transport base away from the front of the machine and attach the drawbar and top link to the front. (Figure 15)
7. Connect the drawbar and hydraulic hoses to the tractor. On M-models, hoses and cables are routed inside the drawbar. On S-models, they are routed outside the drawbar.
8. Lift the machine onto the drawbar.



Picture 13. Fastening point of the pushing arm



Picture 14. Diagonal supports



Picture 15. Machine with the drawbar and boom assembled

5.1.2 UNPACKING THE TRANSPORT PACKAGE – D MODEL

Depending on the delivery method, the Junkkari D model may be supplied with the wheel unit detached. In this case, the wheel unit and drawbar must be installed during unpacking.

The unpacking process for the D model consists of three phases:
1. Unpacking the parcels
2. Installing the hopper and packer wheel unit
3. Installing the drawbar and drawbar arm

Use a lifting device with a capacity of over 2,500 kg for unpacking.

Unpacking the parcels:
- Place the transport parcels on a level surface and reserve sufficient space around them.
- Remove the protective plastic.

Installing the hopper and packer wheel unit:
1. Attach the lifting device to the hopper and lift slightly using straps.
2. Detach the diagonal braces between the hopper and the wooden pallet.
3. Lower the hopper onto a level and solid surface, supported with maintenance stands or similar. Make sure the hopper is stable.
4. Attach the lifting device to the packer wheel unit and lift slightly using straps.
5. Detach the diagonal braces between the packer wheel unit and the wooden pallet.
6. Lift the packer wheel unit and install it onto the hopper.

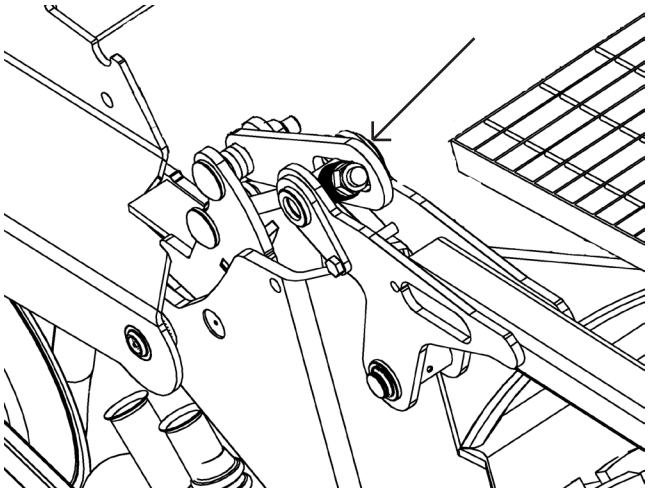
Installing the drawbar and drawbar arm:
1. **Detach the drawbar from the wooden pallet.**
2. **Lift the drawbar using straps and attach it to the hopper.**
3. **Detach the drawbar arm from the pallet.**
4. **Lift the drawbar arm with straps and attach it to the drawbar.**
5. **Route the hydraulic hoses and cables to the tractor through the inside of the drawbar.**

5.2 INSTALLING THE FOLLOWING HARROW

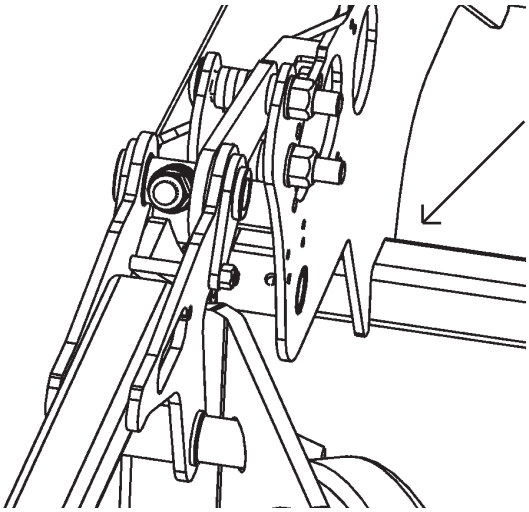
1. Attach the harrow arms to the pin located on the packer wheel unit. (Figure 16)
2. Install the harrow lifting mechanism to the brackets at the rear corners of the frame. (Figure 17)

(!) When installing, pay attention to the correct handedness of harrow arms.

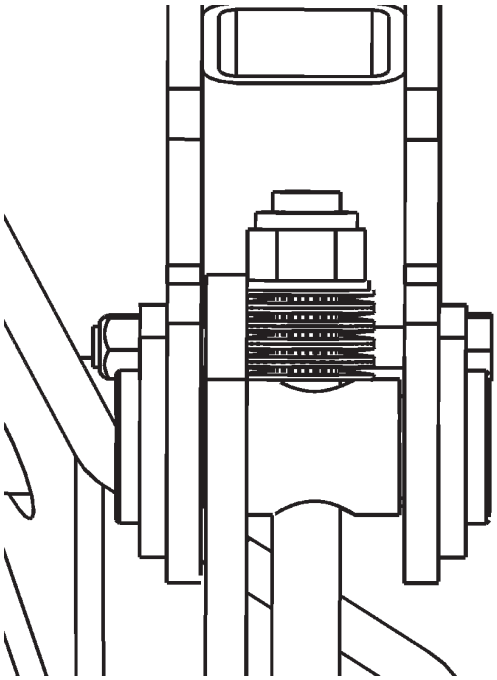
3. Once the arms have been installed, install the tine boom to the arms as shown in the picture. (Picture 19)



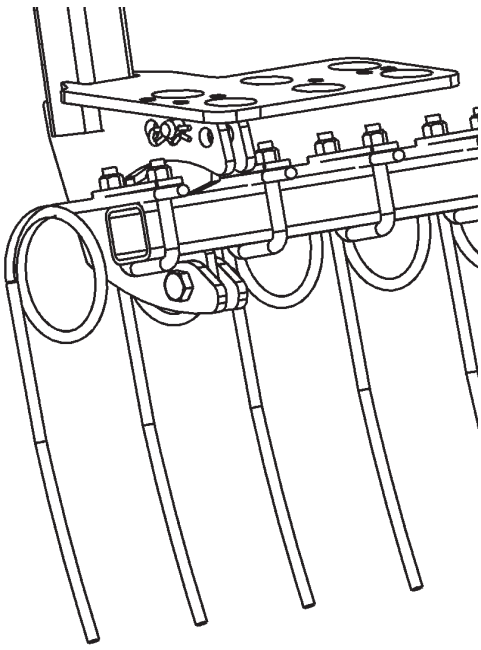
Picture 16. The pin in the wheel set



Picture 17. The lugs in the rear corners of the frame



Picture 18. In the forward direction of the track, the left hinge pin



Picture 19. Mounting the harrowshaft

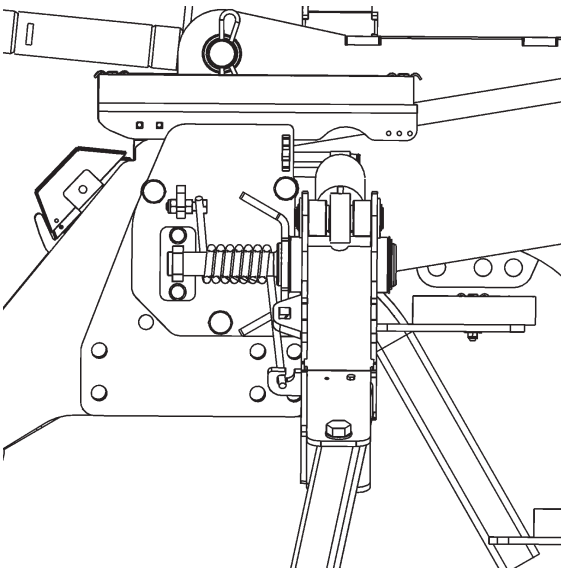
5.3 INSTALLING THE TRACKMARKER

1. Attach the hydraulic cylinders of the trackmarker to the trackmarker arms as shown in the picture 20.

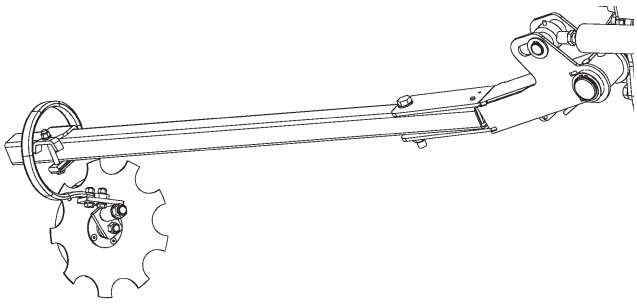
(!) Pay attention to the correct position of the spring.

1. If required, adjust the cylinder arm length so that the cylinder stroke length is correct.
2. Attach the top of the trackmarker to the lower arm as shown in the picture. (Picture 21)

(!) Pay attention to the correct ploughing direction of the disc.



Picture 20. Trackmarker hinge, cylinder and arm assembled in the draw frame

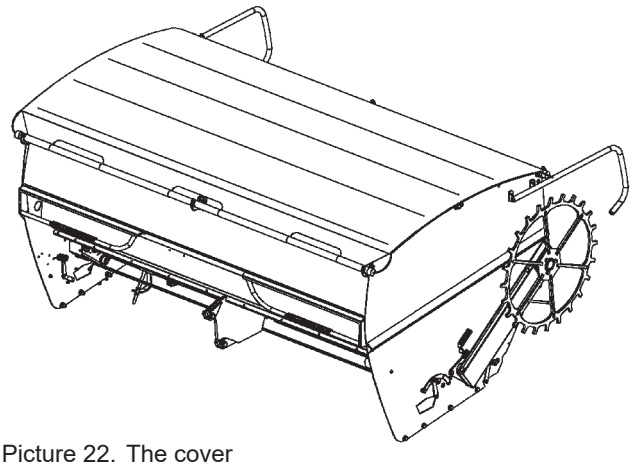


Picture 21. Fastening the assembled top part of the trackmarker

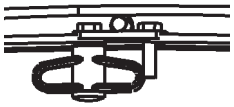
5.4 INSTALLING THE COVER

1. Install the cover so that front reinforcement pipe of the cover is aligned with the leading edge of the hopper.
2. The cover is attached using two fastening parts pushed to the ends of the reinforcement pipes in the cover.
3. You can tighten the cover using the fastening parts in the front and rear of the cover.

(!) The fastening position determines the cover rolling point. The adjustment of fastening parts in the front and rear of the cover ensures that the cover tightens slightly when locked so that it remains secured.

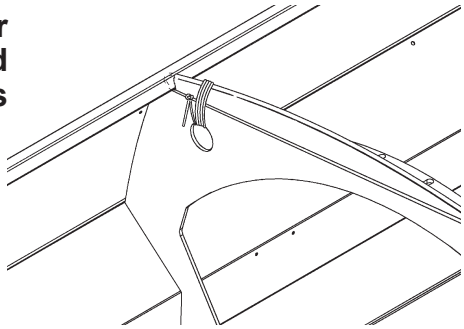


Picture 22. The cover



Picture 23. The fastening part

When fastening the cover opening cord to the hopper wall, make sure that the cord cannot get twisted around the mixer axle. Fasten the opening cord so that it stops the cover from rolling open..



Picture 24. The opening cord fastening

5.5 INSTALLING THE CONTROL UNIT

Junkkari seed drills can be equipped with a surface area meter, G-Wizard control unit or ISOBUS compatibility. The ISOBUS seed drill is not normally delivered with a terminal because the seed drill can be controlled directly from the terminal of an ISOBUS-compatible tractor.

1. The surface area meter can be installed in front of the hopper or inside the tractor.
2. Use the delivered fastening parts.

Install it in a place where it does not block visibility but can be seen easily while driving. Adjust the distance so that you do not need to reach to touch any buttons.

If you need to drill holes into the tractor, make sure that you do not weaken any supporting structures or damage electric cables located inside structures.

3. Connect the control unit's data transfer cable to the screen. Use a through hole designed for the purpose.

Make sure that the cable is not pressed under the tractor's rear window.Connect the cable properly so that it is not pressed between draw arms or any packer joints when turning or lifting.

4. Connect the control unit's power cord to the tractor socket.

If there is no socket, one should be installed in the tractor. Connect current to the device directly from the battery. Preferably, use a 6 mm² cable. Make sure that the polarity and all connections are correct.

An incorrect connection may cause the device to work improperly
Most faults in electrical devices of agricultural machines are caused by poor power supplies.

Never use the cigarette lighter plug as a power source!

5.6 TRACTOR REQUIREMENTS

The requirements for the tractor's hydraulic system depend on the equipment configuration of the seed drill:

Equipment	Hydraulic connection requirement
Lifting/lowering function and track marker control	Double-acting, 30–50 l/min, 180 bar
Hydraulic coulter pressure adjustment	S, M, R and T models: double-acting, 10–30 l/min, 180 bar D model: double-acting, 5–15 l/min, 180 bar
Control of single-row tine or S-tine cultivator	Double-acting, 10–20 l/min, 180 bar
Control of two-row cultivator tools	Double-acting, 10–30 l/min, 180 bar

Table 6. Hydraulic system requirements

i The tractor's required tractive power depends on the seed drill model, soil type and cultivator equipment. Indicative tractive power values can be found in the Technical Specifications on page 6.

i To reduce soil compaction and ensure sufficient traction, the tractor must be equipped with high-quality tyres. Use low tyre pressures whenever possible.
To ensure an even seedbed, the working width of the tractor and seed drill should match. We also recommend using a packer to firm the soil between the tyre tracks.

5.7 CONNECTING AND DISCONNECTING THE MACHINE

⚠ Always make sure that the seed drill is on level and firm ground. Make sure that any support stand is on sufficiently firm ground and the seed drill cannot move. Use the maintenance support when disconnecting the seed drill from the tractor. Never leave the machine hydraulics pressurised.

5.7.1 CONNECTING – WITHOUT A PACKER

1. Connect the seed drill to the tractor's drawbar.
2. Lift and lock the support stand to the upper position.
3. Connect hydraulic hoses and electric cables.
4. Make sure that the hoses and cables are not squeezed in tight turns.
5. Make sure that the tractor tyres or draw arms cannot collide with the seed drill's draw boom, platform, steps, cultivator, etc.
6. Regularly check the tractor drawbar and seed drill draw loop against wear.

5.7.2 DISCONNECTING – WITHOUT A PACKER

1. Install the maintenance support into place.
2. Remove hydraulic pressures from all hoses.
3. Make sure that the machine remains stationary and is on firm ground.
4. Lower the support stand.
5. Disconnect hydraulic hoses and electric cables.
6. Disconnect the seed drill from the tractor's drawbar.

5.7.3 CONNECTING – WITH A PACKER

1. Connect the packer to the tractor's draw arms.
2. Connect hydraulic hoses and electric cables.
3. Make sure that the hoses and cables are not squeezed in tight turns.
4. Lock the side limiters of the tractor's draw arms.
5. Make sure that the tractor tyres cannot collide with the seed drill's platform, steps, cultivator, etc.

5.7.4 DISCONNECTING – WITH A PACKER

1. Install the maintenance support into place.
2. Remove hydraulic pressures from all hoses.
3. Make sure that the machine remains stationary and is on firm ground.
4. Disconnect hydraulic hoses and electric cables.
5. Disconnect the seed drill from the tractor's draw arms.

5.8 HYDRAULILETKUJEN JA SÄHKÖKAAPELEIDEN KYTKEMINEN

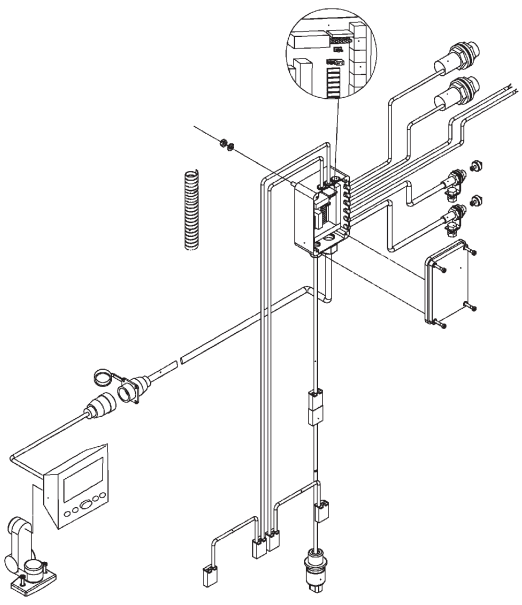
Varmista aina, etteivät hydrauliletkut tai sähkökaapelit jää puristuksiin tai muuten vaurioidu koneen nostoissa tai käännöksissä.

5.8.1 CONNECTING HYDRAULIC HOSES

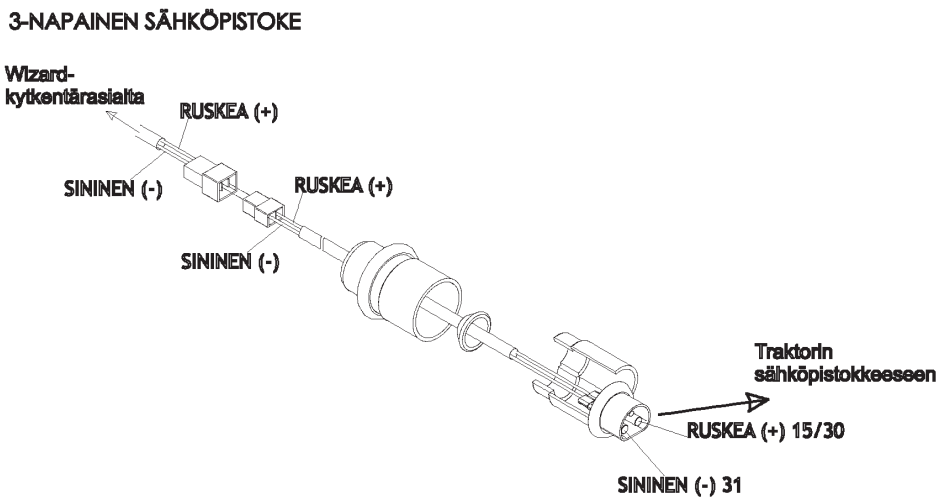
1. Always connect hydraulic hoses in pairs to the same hydraulic connectors on the tractor. Using the same control levers reduces the risk of operating the wrong function.
2. Check regularly that the hoses are in good condition and undamaged.
3. Always release the hydraulic pressure before disconnecting the hoses.

5.8.2 CONNECTING ELECTRIC CABLES

1. Remove the protective cap from the cable before connection.
2. Connect the cable carefully and ensure that the guide pins are correctly aligned.
3. Lock the cable using the locking nut on the connector.
4. When disconnecting the cable, reattach the protective cap to the connector.

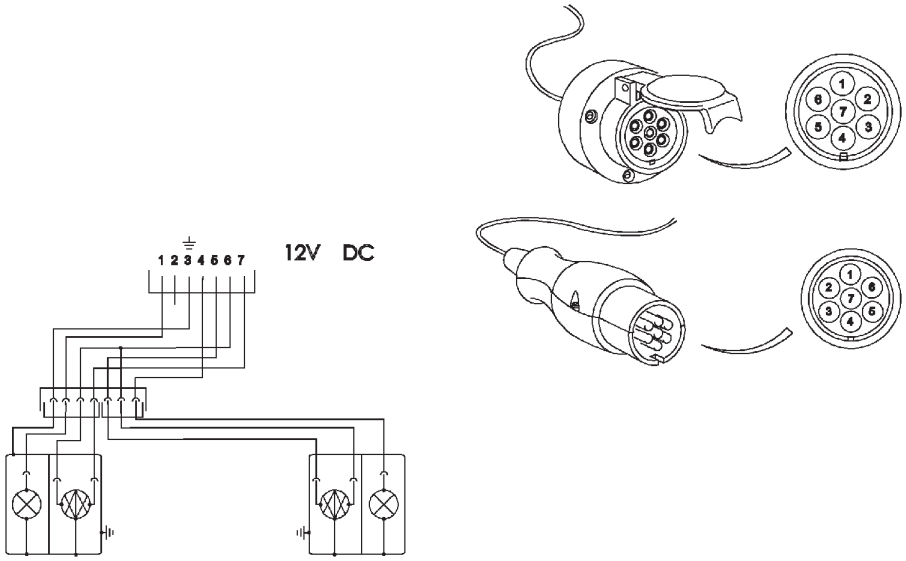


Picture 26. Connection of the signal cable



Picture 27. Connection of the power supply cable

Connect the control unit's power supply cable to the tractor socket.



Picture 28. Connection of the light cable

Connect the seed drill's light cable to the tractor's 7-pin light socket

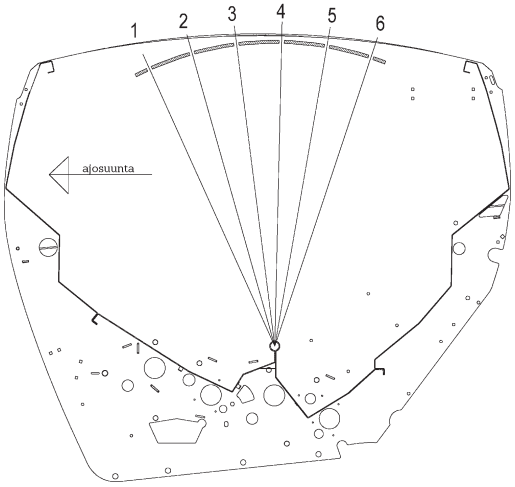
6 MACHINE ADJUSTMENT

Adjust the seed drill on level ground before starting any fieldwork. For optimal seeding results, it is essential that the machine and any optional equipment are adjusted correctly. We recommend performing the basic machine adjustments in the following order:

1. Adjusting the hopper divider wall
2. Centering the packer (optional equipment) and adjusting the tractor's lower link arms
3. Adjusting the frame height of the machine
4. Leveling the machine in working position using the top link
5. Adjusting the lift height of the ground wheel
6. Adjusting the seeding depth
7. Adjusting the track marker alignment, ploughing line and driving speed
8. Adjusting the harrow height and aggressiveness
9. Adjusting the half-lift height

6.1 HOPPER WALL (ECO AND PLUS)

The hopper divider wall can be adjusted to six different positions. The corresponding volumes of the fertiliser and seed compartments for each position are shown in Table 7. (Figure 29)



Picture 29. Hopper wall positions

	1	2	3	4	5	6
300 Eco seed fertilizer	 1485 l 960 l	 1365 l 1170 l	 1240 l 1340 l	 1105 l 1495 l	 970 l 1635 l	 835 l 1770 l
300 Plus seed fertilizer	 2565 l 1480 l	 2370 l 1735 l	 2165 l 1960 l	 1955 l 2175 l	 1735 l 2390 l	 1515 l 2585 l
400 Plus seed fertilizer	 3500 l 2015 l	 3230 l 2370 l	 2950 l 2675 l	 2665 l 2970 l	 2370 l 3360 l	 2065 l 3530 l

Table 7. The volumes of fertiliser and seed

The wall is locked in place using three locking pins. Release the pin lock by lifting the pin upwards and turning it 90 degrees, after which the pin is released in its lower position. Lock in reverse order. If the cover is rolled open in the middle of the hopper, the cover rolling point can be adjusted according to the wall adjustment.

i If the hopper cover is rolled open at the centre of the hopper, the cover's rolling point can be adjusted according to the wall position.
See "Cover adjustments" in section 6.15 for more information.

6.2 PACKER

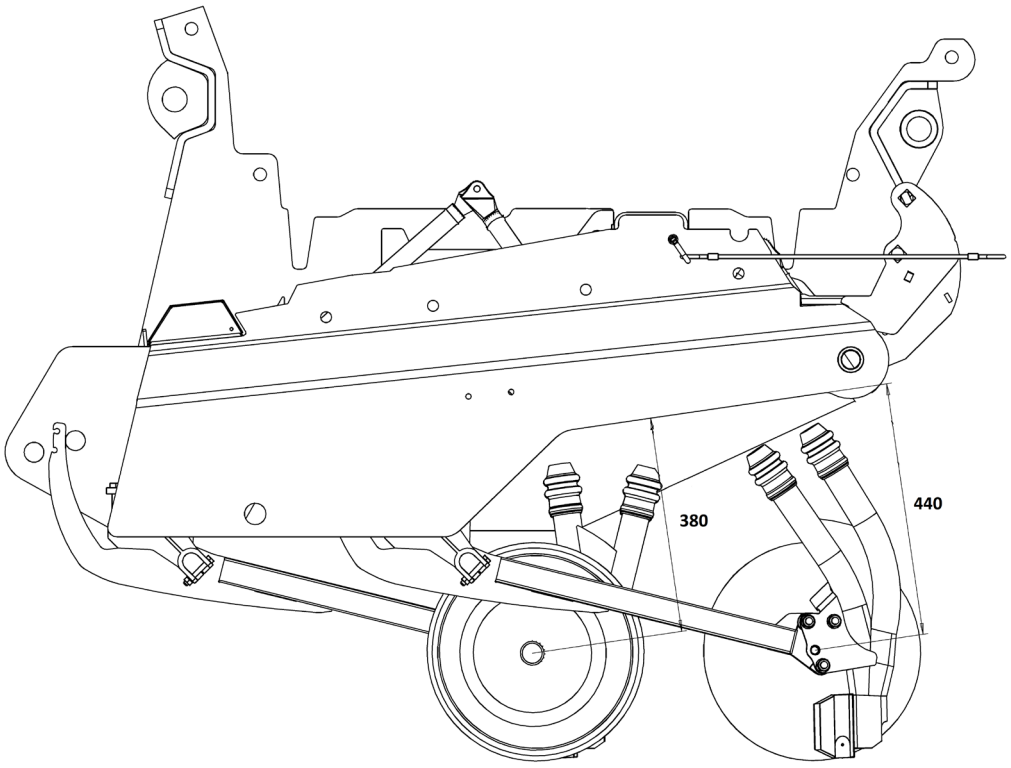
If the seed drill is equipped with a packer, lock the side limiters of the tractor's lower link arms in the centre position to ensure that the seed drill follows the tractor along its centre line.
If the limiters are not locked, the seed drill may drift downhill when working on a slope.

Always raise the packer when reversing to avoid damage.

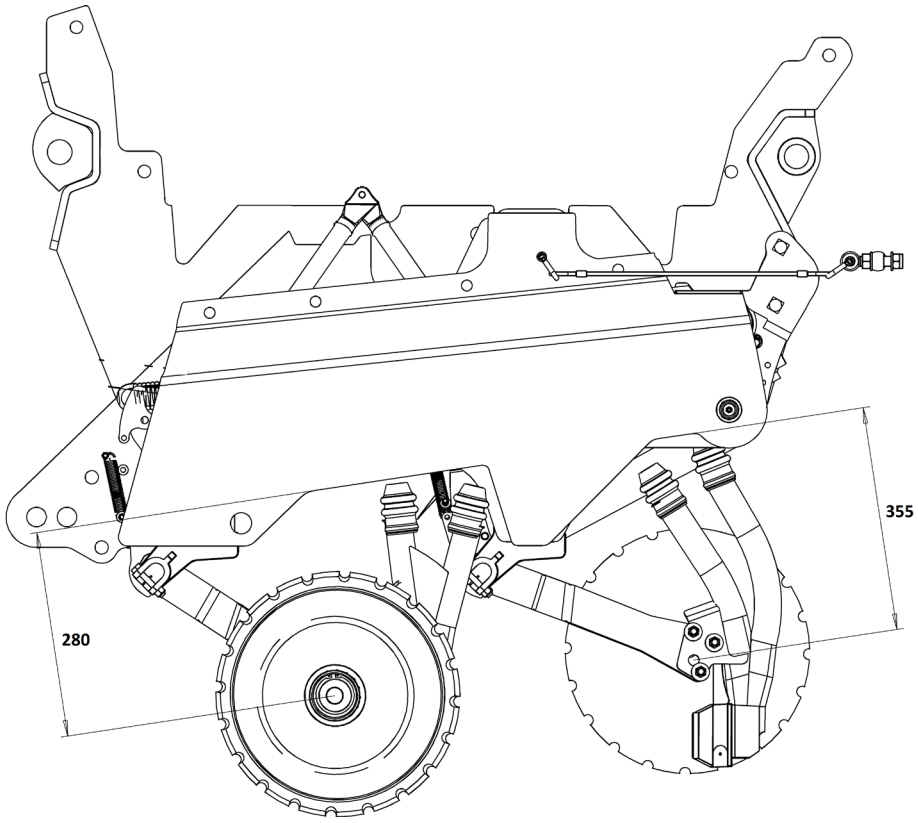
6.3 HEIGHT OF THE MACHINE FRAME

Adjust the height of the seed drill frame for seeding position using the lamellas mounted on the lift cylinder shaft.
Refer to Figures 30, 31 and 32 for the correct working position dimensions of the coulters.

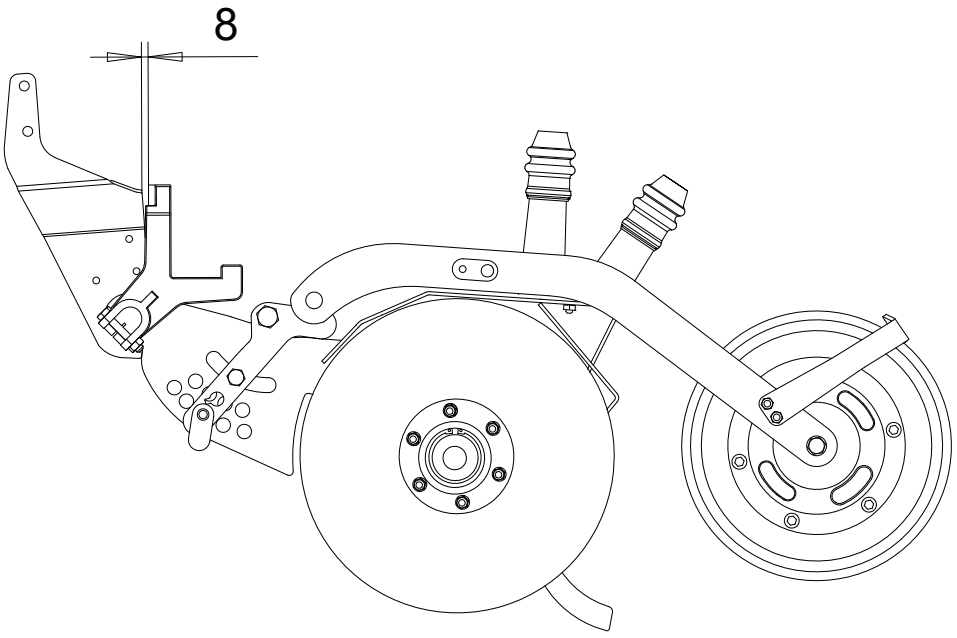
! In the seeding position, seed coulters must be raised by 50 mm from their lower position. In this case, the coulter is able optimally to follow any changes in the field surface and cross any obstacles. If the machine frame is adjusted too high, the coulter will not be able to follow any depressions in the field at the correct working depth. If the machine frame is adjusted too low, the movement range reserved to cross obstacles will be too small, and the coulter may be damaged when crossing high obstacles.



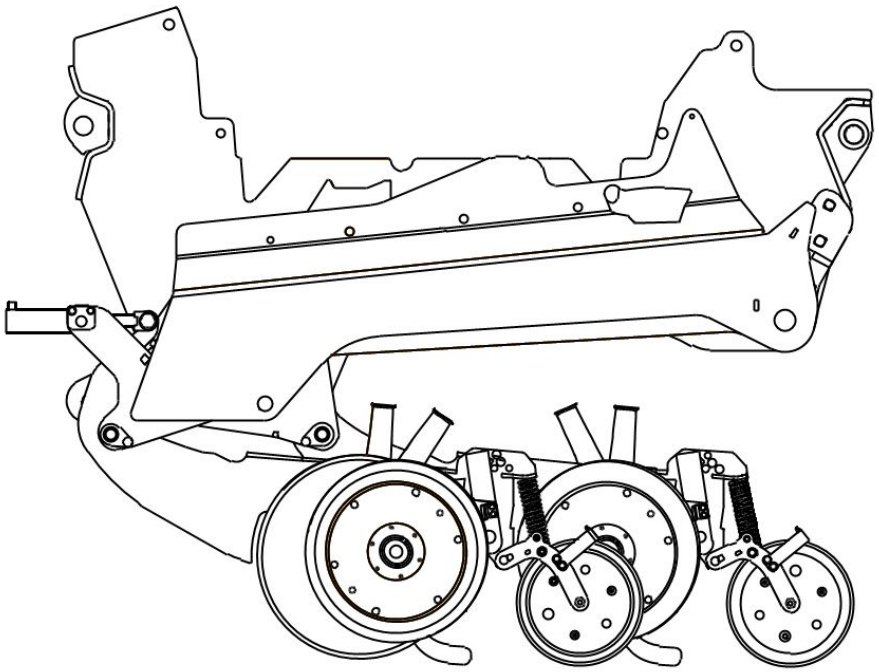
Picture 30. S-coulter raised 50 mm



Picture 31. M- and T-coulter raised 50 mm

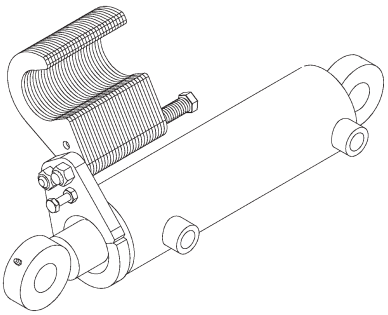


Picture 32. R-coulter raised 50 mm



Picture 33. D-coulter raised 50 mm

CYLINDER AND LAMELLS



Picture 34. Cylinder and lamells

A table indicating the number of lamells placed onto the lifting cylinder at each seeding depth is presented below. The precise number of lamellas depends on how much the machine wheels sink into the ground.
When the machine is used for the first time, it should be pre-adjusted according to the table in advance, after which the frame height and coulter depth should be adjusted accurately in the field. The adjustment of the coulter pressurisation is described later in a section 6.6

NUMBER OF LAMELLS						
	S - modell		M- and T-modells		R-modell	D-modell
Työsyvyys mm	7.5 x 16 R	7.5 x 20 R	7.5 x 16 R	7.5 x 20 R	7.5 x 20 R	7.5 x 20 R
0	105	105	80	75	115	110
10	100	100	75	70	110	105
20	95	95	70	65	105	100
30	90	90	65	60	100	75
40	85	85	60	55	95	90
50	80	80	55	50	90	85
60	75	75	50	45	85	80
70	70	70	45	40	80	75
80	65	65	40	35	75	70

Table 8. Theoretical number of lamellas to be placed on the lifting cylinder at different sowing depths

6.4 HORIZONTAL MACHINE POSITION

Before adjusting the horizontal position:

- **S, M and T models:** Place a sturdy maintenance support under the frame mounting lug and lower the machine onto it.
- **R and D models:** Lower the empty machine onto the ground, supported by the coulters.

Adjusting horizontal position:

Adjust the machine to horizontal in working position by turning the top link located between the machine frame and the drawbar.
The machine is level when the coulter mounting beams on the frame are at the same height.

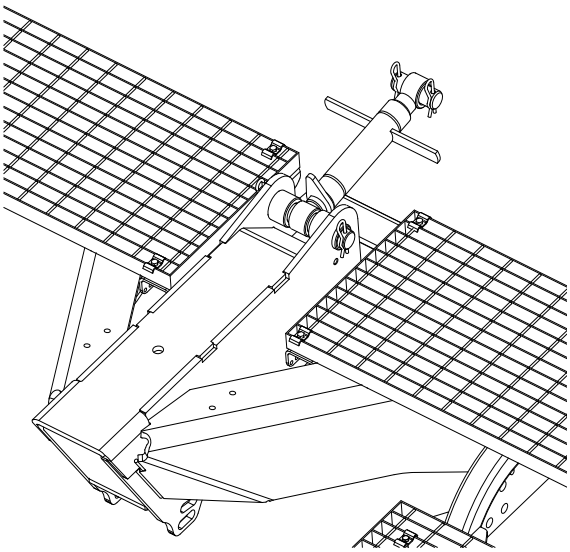
After adjustment:

- Tighten the locking mechanisms on the top link to prevent it from moving while driving.

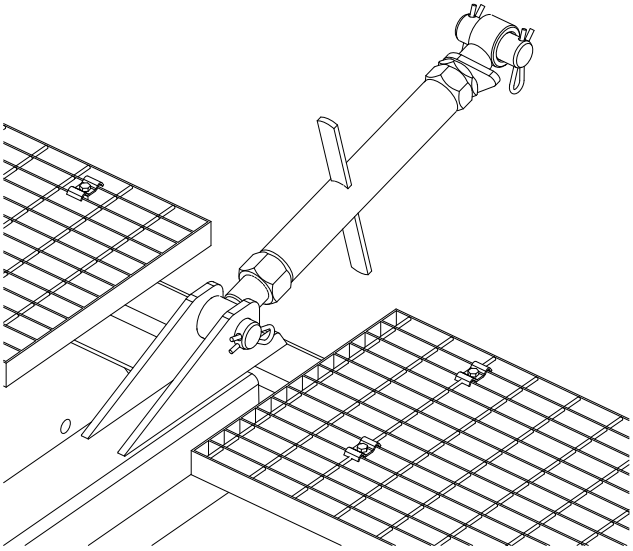
i When the machine is horizontal, the front and rear coulters will seed at the same depth. If the working depth is significantly changed, the machine may need to be levelled again.

i To check whether the machine is horizontal, place a bubble level on top of the coulter beams. When adjusting visually, the straight horizontal part of the rear railing attached to the end of the seed box can be used as a visual reference.

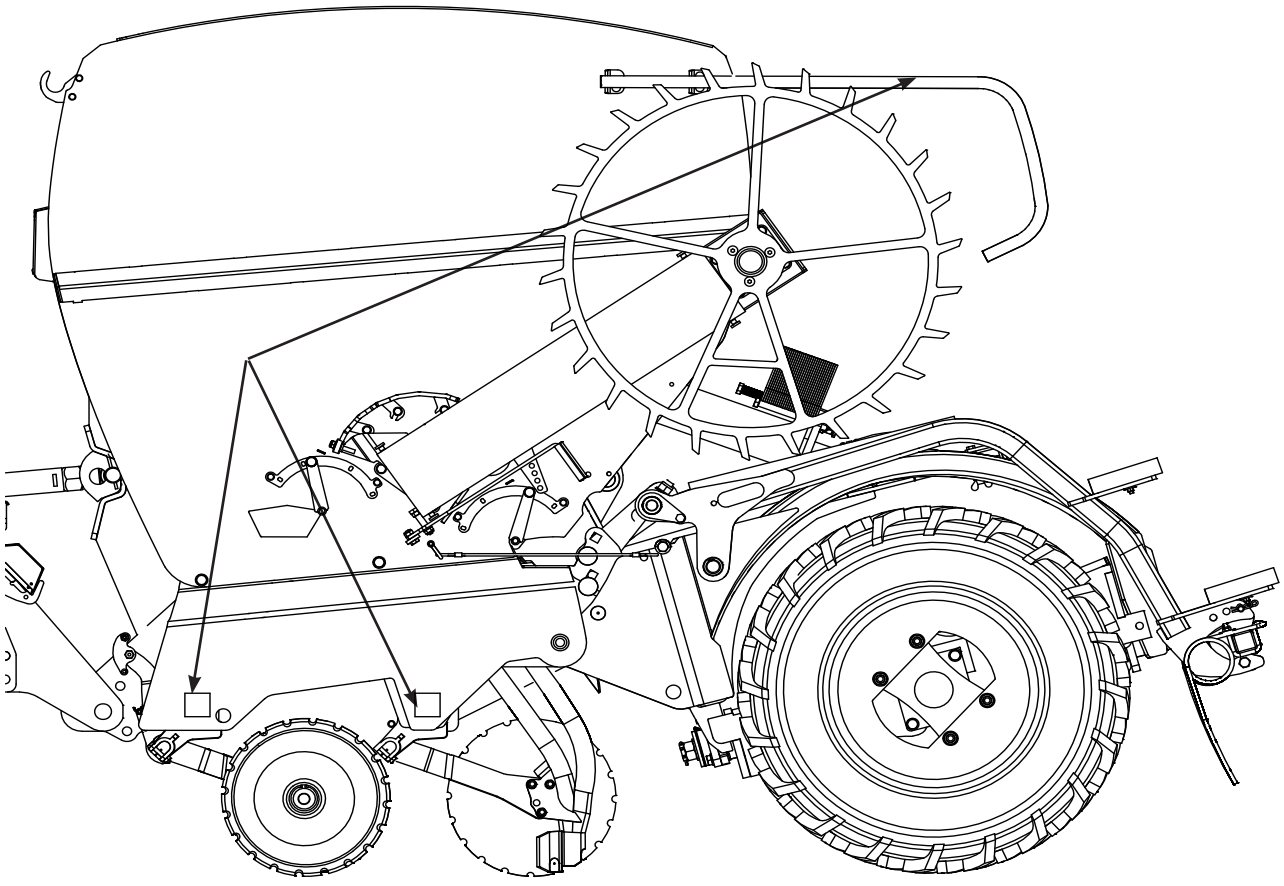
! Note: The supporting bar at the end of the machine and the bending lines are not horizontal!



Picture 35. Pushing-arm in Heavy



Picture 36. Pushing-arm in Steady



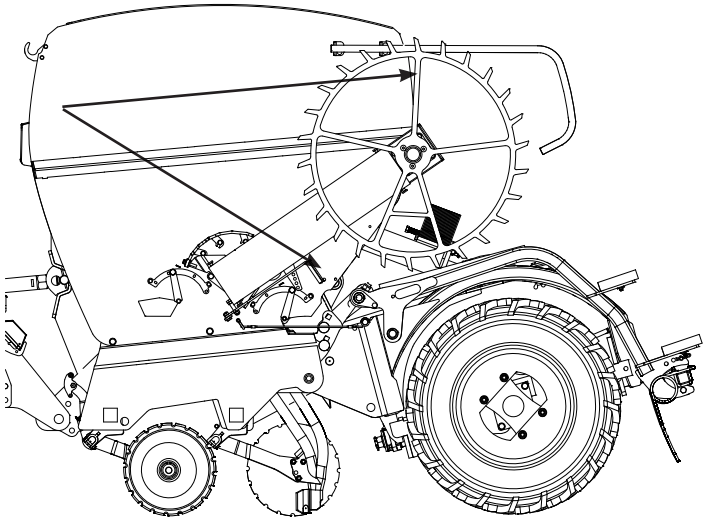
Picture 37. Horizontal machine lines (top surfaces of coulter beams, rail pipe)

6.5 GROUND WHEEL

Always raise the seed drill before lowering the ground wheel to avoid risk of crushing.

LOWERING THE GROUND WHEEL

1. Raise the machine fully.
2. Grab the extraction handle with your left hand and the lifting handle with your right hand.
3. Turn the ground wheel outwards using the extraction handle, while supporting and gently lowering it with the lifting handle. (Figure 38)



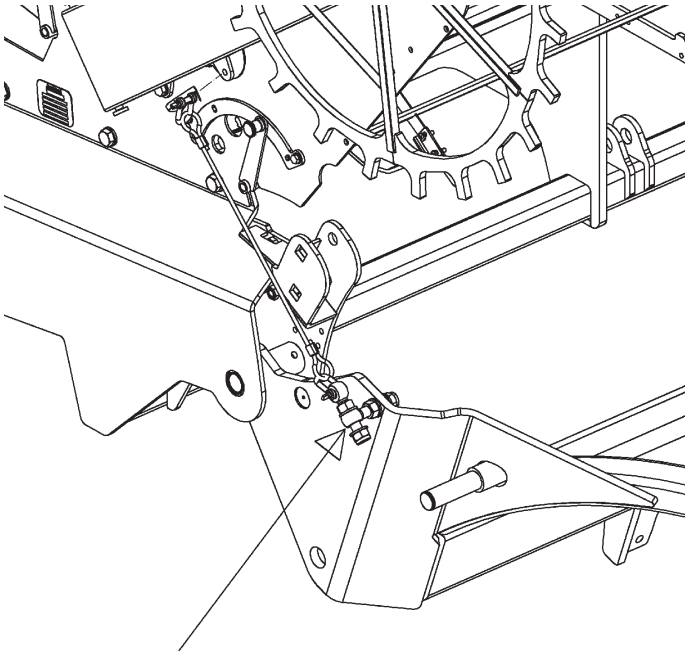
Picture 38. Lowering the friction wheel

ADJUSTING THE LIFT HEIGHT OF THE GROUND WHEEL

Adjust the lift height of the ground wheel using the threaded rod at the end of the lifting cable.

! Check the adjustment whenever using a low-lift setting or when changing the seeding depth.

! The ground wheel should lift off the ground at the same time as the coulters.
Ensure that the ground wheel also has sufficient downward movement in the working position so that the feeding mechanism operates correctly even when the wheel drops into a hollow in the field.

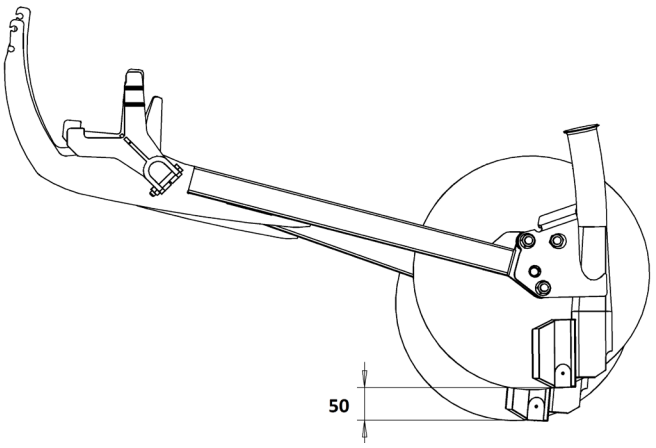


Picture 39. Adjusting the lifting height of the friction wheel

6.6 SEEDING DEPTH OF SEED COULTERS IN S-SERIES MACHINES

The correct working position of the coulter and frame ensures a successful seeding result and a sufficient coulter movement range when crossing obstacles. In a correctly adjusted machine, the coulter has risen 50 mm from its lower position to the seeding position.

The coulter pressure in the S-series can be adjusted up to 30 kg. As optional equipment, the coulter weight can also be adjusted hydraulically.



Picture 40. S-series coulter in rest/seeding position

Remove large stones and other obstacles from the field to prevent damage to the coulters, wheels, or machine frame.

6.6.1 MECHANICAL ADJUSTMENT OF COULTER PRESSURE

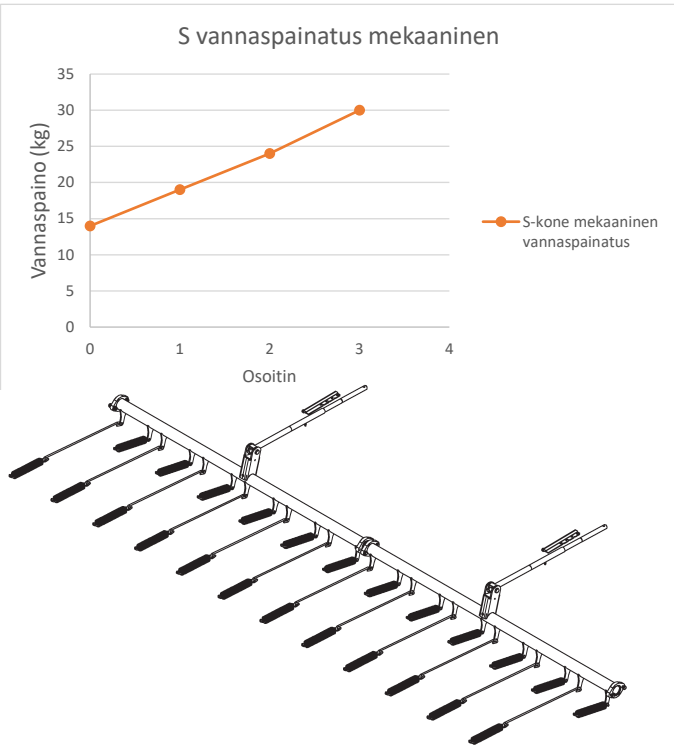
Always use the cylinder maintenance support during any adjustment or maintenance work.

The coulter pressures of seed coulters in the S-series are adjusted collectively in their separate blocks on both sides of the machine. The coulter pressure in the S-series can be adjusted up to 30 kg.

1. The adjustment is made by turning the left and right adjustment rods using the calibration lever at the rear of the machine.

2.
The scale located next to the rod indicates the position of the adjustment.

Never set the coulter pressure lower than zero because the coulter pressurisation springs might be damaged during seeding.



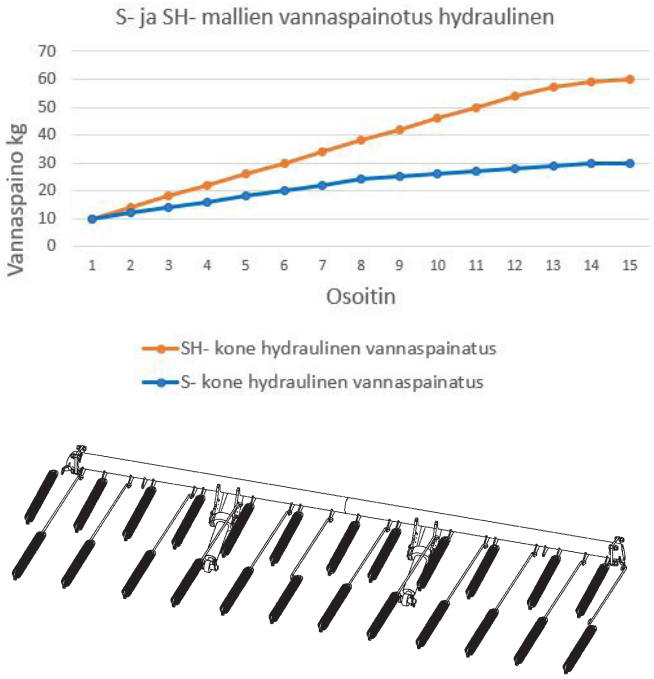
Picture 41. Mechanical coulter pressure

6.6.2 HYDRAULIC ADJUSTMENT OF COULTER PRESSURE

(For S, M, T and R models)

Hydraulic coulter pressure is adjusted using the tractor's double-acting hydraulic system. The pressure indicator is located on the front wall of the hopper.

Before disconnecting the seed drill from the tractor, set the coulter pressure to the minimum. This relieves pressure in the hydraulic system and makes hose connection/disconnection easier.



Picture 42. Hydraulic coulter pressure

6.6.3 COULTER-SPECIFIC ADJUSTMENT AND SEEDING DEPTH

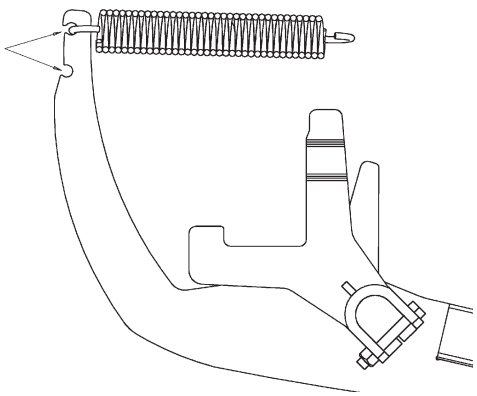
(S models)

Coulter pressure can also be adjusted individually per coulter using the notches in the spring plate at the front of each coulter arm.

1. First, loosen the central pressure adjustment so the springs are relaxed enough for repositioning.

2. Change the spring tension by selecting a different notch:
- Upper notch = higher pressure
- Lower notch = lower pressure

3. After repositioning, return the central pressure to the correct setting.



Picture 43. Coulter specific adjustment of the spring

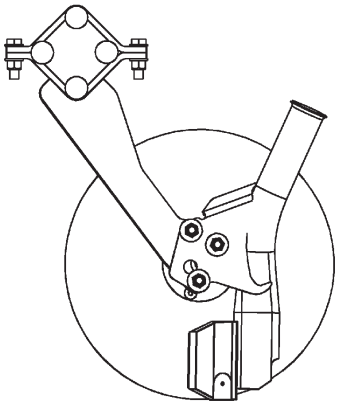
i Check seeding depth in the field using the depth gauge supplied with the machine. Adjust frame height and coulter pressure if necessary.

i During spring seeding and in particularly dry conditions, the optimal location of the seed is between the cultivated and uncultivated layers, in which case moisture rises to the seed from the uncultivated layer through capillary action. The cultivated layer breaks the action, thus protecting the soil from evaporation. Avoid any unnecessarily deep cultivation. During autumn seeding and in wet conditions, deeper seeding and cultivation improve the ability of the soil to accept moisture.

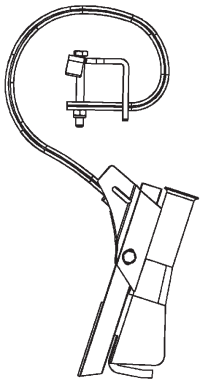
6.7 WORKING DEPTH OF FERTILISER COULTERS – S SERIES

Junkkari S-series seed drills can be equipped with separate fertiliser coulters at the time of purchase. These coulters place fertiliser between the seed rows at a row spacing of 250 mm.
The fertiliser is applied approximately 20 mm deeper than the seed.
There is no separate depth adjustment for fertiliser coulters – their working depth depends on the height of the seed drill frame.

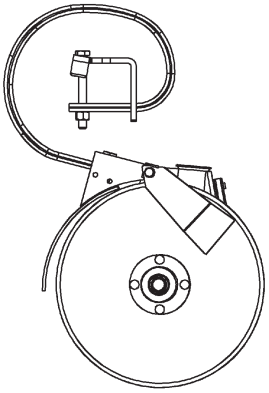
FERTILISER COULTER OPTIONS



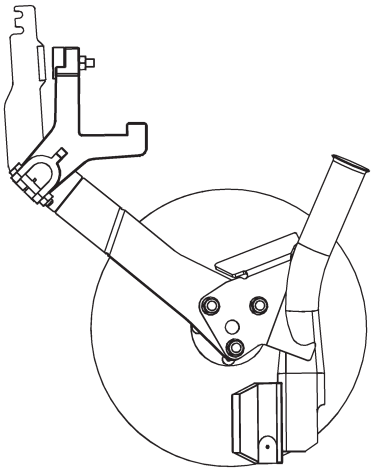
Picture 44. Rubber stick fertiliser coulter



Picture 45. S-tine fertiliser coulter



Picture 46. Double-disc fertiliser coulter



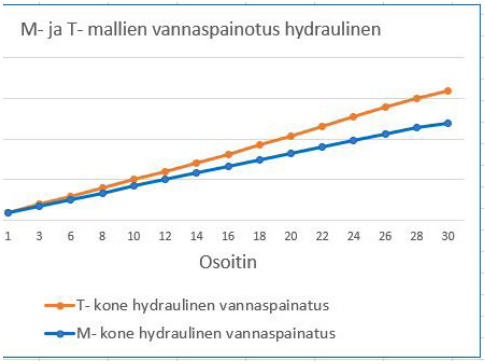
Picture 47. S-series fertiliser coulter

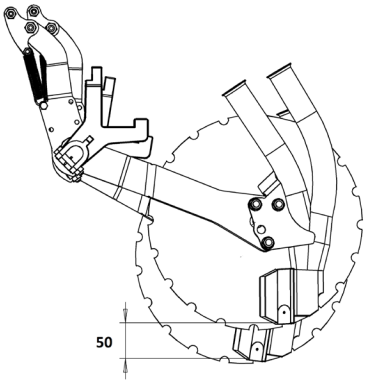
6.8 SEEDING DEPTH OF SEED COULTERS – M AND T SERIES

In M- and T-series machines, the coulter pressure is hydraulically adjustable as standard using the tractor's double-acting hydraulic system.
The adjustment indicator is located on the front wall of the hopper.

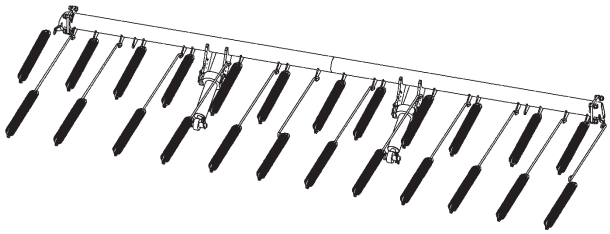
- In M-series machines, the pressure can be adjusted between 10–120 kg
- In T-series machines, the pressure range is 10–160 kg

A correctly adjusted coulter rises approximately 50 mm from its resting position into the working position. This ensures accurate seeding and allows the coulters to pass over obstacles effectively.





Picture 49. Coulter in rest/seeding position



Picture 48. Hydraulic coulter pressure

Remove any large stones or other obstacles from the field before seeding. These may damage the coulters, wheels or frame if hit during operation.

i Check the seeding depth in the field using the depth gauge supplied with the machine. Adjust the frame height and coulter pressure if necessary.

i In spring seeding and dry conditions, the optimal seed placement is at the boundary between the cultivated and uncultivated soil layers. This allows moisture to rise through capillary action from the uncultivated layer. The cultivated layer breaks this action, reducing evaporation. Avoid unnecessarily deep tillage. In autumn seeding and wet conditions, deeper seeding and cultivation can improve the soil's ability to absorb moisture.

! When disconnecting the machine from the tractor, always set the coulter pressure to minimum to depressurise the hydraulic system and allow safe removal of hoses.

6.9 WORKING DEPTH OF FERTILISER COULTERS – M AND T SERIES

Junkkari M- and T-series seed drills can be equipped with a separate fertiliser coulter system at the time of purchase. These coulters place fertiliser between the seed rows at a 250 mm row spacing.
The working depth is adjusted using the adjustment rods in front of the drawbar. Turn the rods using the calibration lever.

! It is recommended to check and finalise the fertiliser coulter adjustment only after setting the correct machine frame height, as it directly affects the working depth.

6.10 COULTER SIDE PLATE – S, M AND T SERIES

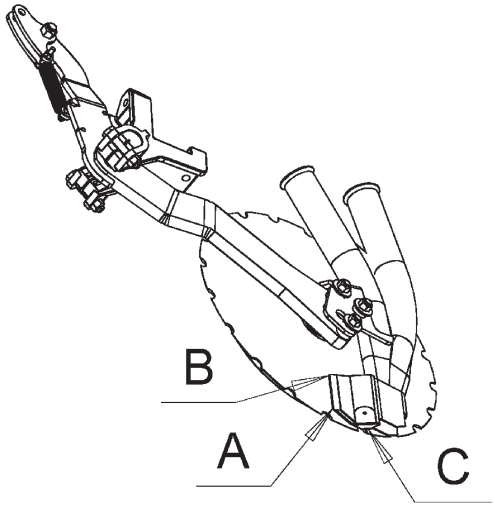
The side plate is mounted with three bolts, and flexible spring washers push the side plate against the coulter disc. By tightening the nuts, the plate is pressed more firmly against the disc.1.

1. Adjust the gap so that the plate touches the disc at point A.There should be a small gap at points B and C (Figure 50).

! If the side plate is incorrectly adjusted, plant debris may accumulate in the gaps at B and C.

! The side plate should only be pressed lightly against the disc. Excessive tightening increases wear and rolling resistance.

In shallow or soft soil conditions, it may be necessary to slightly loosen the nuts.



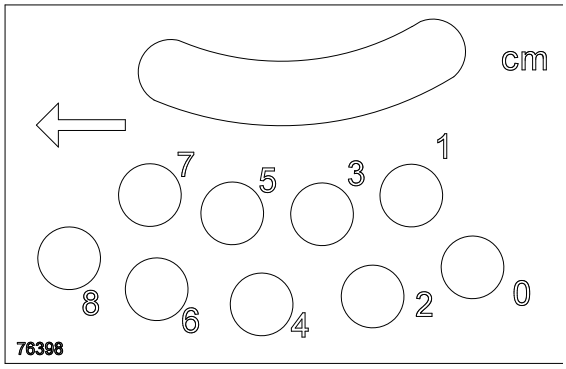
Picture 50. Assembled coulter

6.11 SEEDING DEPTH AND PRESS WHEEL IN R-SERIES MACHINES

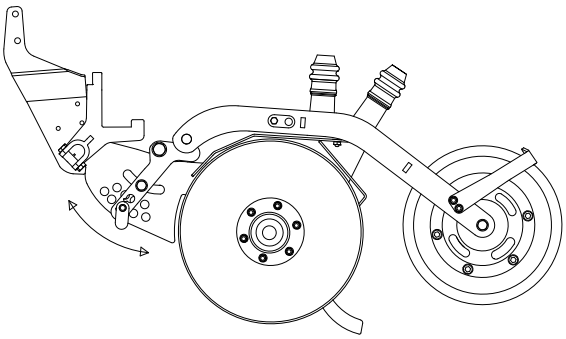
The seeding depth in the R-series is adjusted per coulter. The sticker shown in Figure 51 (located on the left side of the machine) indicates a depth range from 0 to 8 cm.

Figure 52 shows the point in Vantaa where the working depth is obtained. The working depth is adjusted for each coulter separately. The coulter weight of the R machine can be adjusted from 40 to 250 kg.

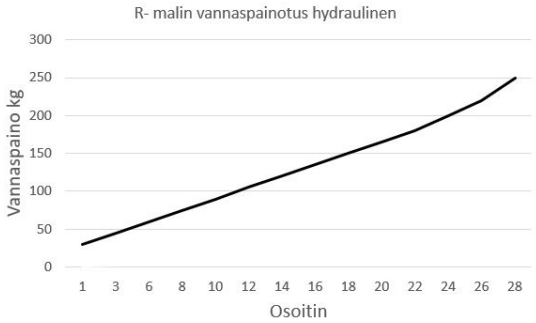
Figure 53 shows an approximate graph of how much coulter weight (40-250 kg) is obtained with different values of the pointer. The pointer is located in front of the tank, on the right-hand side of the direction of travel. The bucket weight is adjusted centrally by the tractor's hydraulics.



Picture 51. Working depth sticker



Picture 52. Adjustment of the depth control wheel



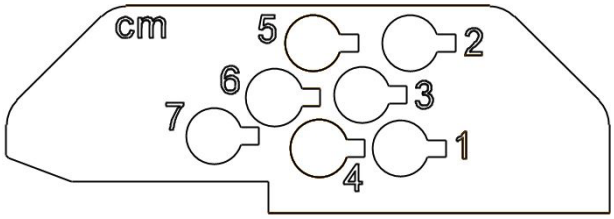
Picture 53. Adjustment of coulter pressure

6.12 SEEDING DEPTH AND PRESS WHEEL IN D-SERIES MACHINES

ADJUSTMENT THE DEPTH CONTROL WHEEL

In the D-series, the coulter seeding depth is adjusted for each coulter by adjusting the height of the depth control wheel. Adjust the height of the wheel by changing the position of the stopper pin at the back of the arm. Release the pin by turning it half a turn and pulling it out.

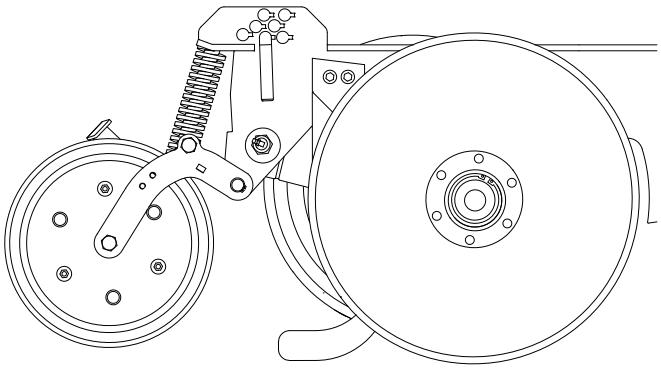
i The seeding depth can be adjusted between 1 and 7 cm at 1 cm intervals. For pin locations and corresponding seeding depths, see Pictures 54 and 55



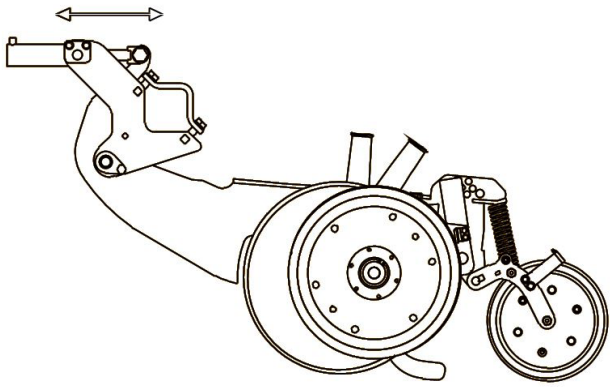
Picture 54. Working depth sticker

Adjusting the pressure in the tractor when the tractor has a load-bearing hydraulic system

Hydraulic coulter pressurisation consists of two hoses: pressure and return. Connect the pressure hose to the tractor's valve block and the return line preferably to a free return connection. If no return connection is free, connect this line to the valve block, from which pressure is fed. Activate coulter pressurisation by switching on a continuous flow from the tractor block to the pressure line. The flow can be adjusted to be relatively low (5–15 l/min) to prevent oil from overheating. Pressure in the coulter pressurisation line is adjusted by an electric 3-way pressure reducing valve, which returns any excess oil back into the tank. The pressure gauge indicates the pressure in the coulter pressurisation line. The maximum coulter pressure of 250 kg can be achieved when the system is adjusted to a pressure of 80



Picture 55. Adjustment of the depth control wheel



Picture 56. Measuring the spring

Säätöarvo	Vannaspaino
10 bar	80 kg
20 bar	100 kg
30 bar	115 kg
40 bar	140 kg
50 bar	160 kg
60 bar	180 kg
70 bar	200 kg
80 bar	220 kg
90 bar	240 kg
100 bar	260 kg

Table 22. Coulter pressure table

ADJUSTMENT OF COULTER PRESSURE (WHEN USING OPEN-CENTER HYDRAULICS)

Turn off the ball valve on the strapping valve assembly, the electric three-way valve will not close and continuous flow from the tractor is not required. The tractor's hydraulics adjust the desired strap pressure See table 22. The pressure can be monitored by a large pressure gauge on the front of the machine. The coulter pressure should be adjusted in the sowing position, with the coulters normally on the ground. When the machine is lifted up, the pressure in the system decreases. The two pressure accumulators act as a spring for the rim pressure and the pressure relief valve acts as a protection against sudden pressure spikes, for example when driving over a hard obstacle. Adjustment of the coulter pressure should be made at low flow, so that the pressure relief valve does not trip. A hydraulic diagram of the pressure relief valve can be found at the end of this manual, in section 16.

! **NOTE! Do not adjust the pressure above 100 bar.**

Remove large stones and other obstacles on the ground that could damage the machine's coulters, wheelset or other structures.

The correct working position of the coulter and frame ensures a successful seeding result, and sufficient movement of the coulter when crossing the obstacle. In a correctly adjusted machine, the coulter is in its seeding position about 50 mm above its lower footprint and the coulter weight is sufficient to hold the seeding depth wheel in its stop position.

PRESS WHEEL PRESSURE ADJUSTMENT

Adjust the compression force of the press wheel by changing the pre-tension of the spring. Move the pin in the spring adjustment shaft to a new position.

i If needed, you can also adjust the lowering height of the press wheel by moving the shaft position.

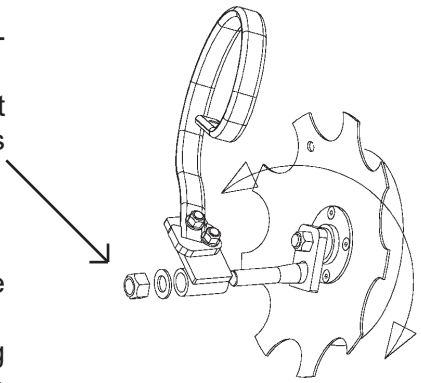
! Take special care during transportation, when crossing obstacles, and when reversing – the lowering press wheel may be damaged if not raised properly.

Always adjust seeding depth and coulter pressure with the machine lifted.Use the cylinder maintenance support to avoid any risk of crushing during adjustments or service.

6.13 TRACKMARKER

ADJUSTING THE PLOUGHING ANGLE

1. The ploughing aggression of the trackmarker disc can be adjusted by loosening the shaft bolt nut and turning the shaft.
2. After loosening, hit the end of the shaft lightly using an impact tool to detach the cone which unlocks the position from its lock.



Picture 57. Adjusting the ploughing angle

THE LATERAL POSITION

1. The trackmarker position is measured from the middle of the drawbar or machine frame.
2. The lateral position of the trackmarker is adjusted by moving the spring fastener position along the marker pipe. (Picture 58)

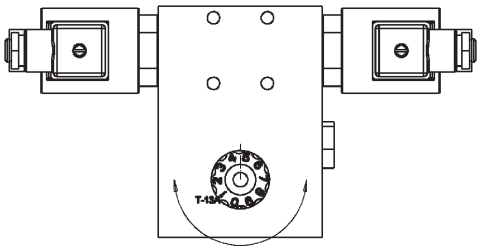
i Depending on the working width, the dimension must be 3,000 mm in 3-metre machines and 4,000 mm in 4-metre machines



Picture 58. The lateral position

i The position of the trackmarker line can easily be checked in the field by driving the machine along a straight line with the markers down and by measuring the dimension between the outermost seeding row and the line drawn by the marker. Correct dimensions are presented in table *9*.

3. Check the fastening of the trackmarker spring after a few operating hours.



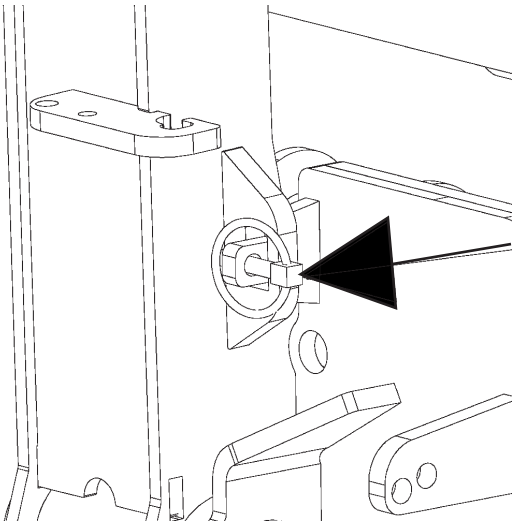
Picture 59. The rising speed

! **Note that the machine must travel behind the tractor on the centre line so that the line drawn by the trackmarker guides the driving line in the correct position. If required, check packer alignment on the tractor's centre line in Section 6.2. Errors may also be caused if the driver is not seated in the middle of the tractor. There may also be driver-specific differences in the track line.**

THE RISING SPEED

This adjustment is necessary because there are significant differences in the hydraulic output of tractors.

1. The rising speed of the trackmarker is adjusted from the valve in the rear of the drawbar using the flow adjustment knob. (Picture 59)
2. The rising speed is adjusted so that, when rising, the marker does not collide with its upper stopper with unnecessarily high force.
3. Always lock the markers in their upper position during transportation, maintenance and storage. (Picture 60)



Picture 60. Markers lock

6.14 FOLLOWING HARROW

The harrow tines are located between the seed rows and act both on the wheel centre line and between the wheels.
The purpose of the harrow is to loosen the topsoil compacted by the wheels, which improves water infiltration. The loosened top layer also forms a barrier against evaporation.
The harrow also lifts coarse soil particles to the surface, which are less prone to crusting in rainy conditions.

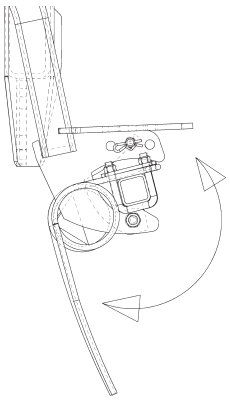
ADJUSTING THE WORKING HEIGHT OF THE HARROW

The harrow height is adjusted by changing the position of the nut on the threaded rod located at the top of the harrow arm.

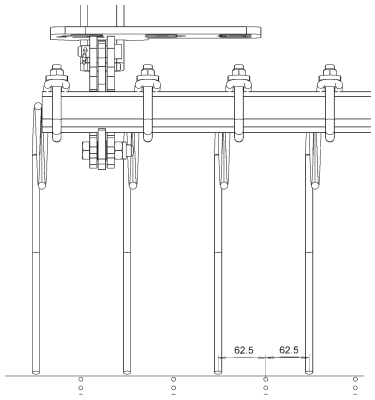
ADJUSTING HARROW AGGRESSION

The aggression of the harrow tines is adjusted using pins at the lower end of the harrow arms.

i If there is no need for aggressive harrowing, the harrow should be set at a relatively flat angle. This helps it pass through plant debris without disturbing the seed rows—even while turning.



Picture 61. Adjusting the aggression of the harrow



Picture 62. Harrow location between seed rows

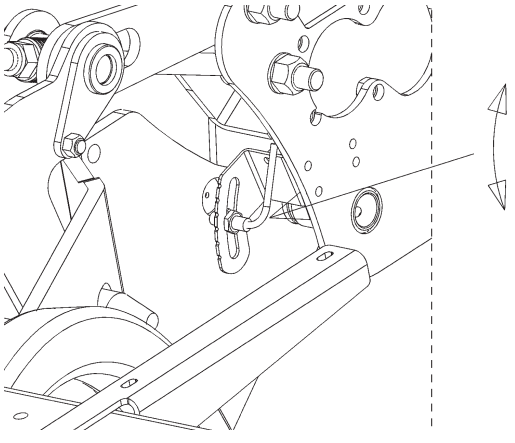
6.14.1 HALF LIFT OF THE HARROW – S, M, T AND R SERIES

The half-lift function is available as an option for the S-, M-, T- and R-series machines and is controlled through the seed drill control unit.
When activated, it lifts the coulters and friction wheel slightly off the ground while keeping the harrow on the soil. This allows the headlands or wheel tracks on cultivated fields to be harrowed, helping to prevent crusting and the formation of puddles.

ADJUSTING THE HALF-LIFT HEIGHT

The half-lift height is adjusted by moving the lift sensor located in a slot at the rear left corner of the machine near the roller wheel pivot point.

- To increase the lift height: **lower the sensor**
- To reduce the lift height: **raise the sensor**



Picture 63. Half-height adjustment

Always lift the machine fully before reversing.

Before adjusting the sensor, always switch off the seed drill's control unit.

! tWhen performing the basic adjustment of the half-lift function, it may also be necessary to adjust the friction wheel's lifting height and the harrow height setting.

6.15 HOPPER ROLL COVER

Junkkari seed drills are equipped with either manually rolled or spring-loaded roll covers, depending on the size of the hopper. Regardless of the rolling mechanism, the adjustment principles are the same.

Always ensure the cover cord does not hang inside the hopper, as it may become entangled in the agitator shaft or feed roll and damage the machine.

Keep the roll cover closed at all times. Moisture and dust in the fertiliser can interfere with the operation of the seed drill.

SELECTING THE ROLLING POSITION

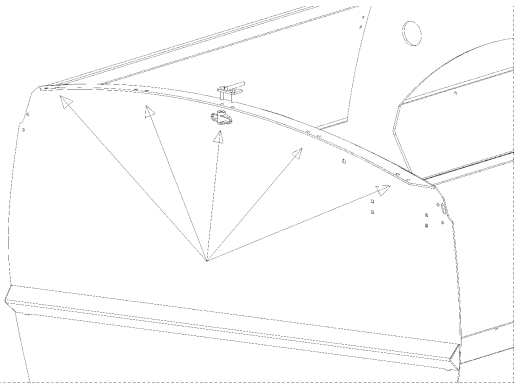
The rolling position is set using the middle fasteners on top of the hopper's end arches. (Picture 64)
These fasteners can be installed in several positions depending on the internal wall position or at the front edge of the hopper, in which case the cover rolls fully forward.
The cover is locked at both ends using the central locking mechanism.

To open the lock:

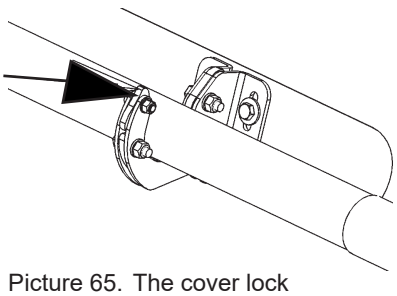
1. Press the frame tube (which acts as a handle) downwards while simultaneously releasing the lock with your thumb. (Picture 65)

i The frame tube can also be used as a handle, supported at the machine ends by support hooks. These hooks should be adjusted so that the cover is slightly tensioned when closed.

2. The fastener position can be changed by loosening the finger screws located below the box end curve when the cover is closed.



Picture 64. Selecting the rolling position



Picture 65. The cover lock

6.16 FEEDING MECHANISM

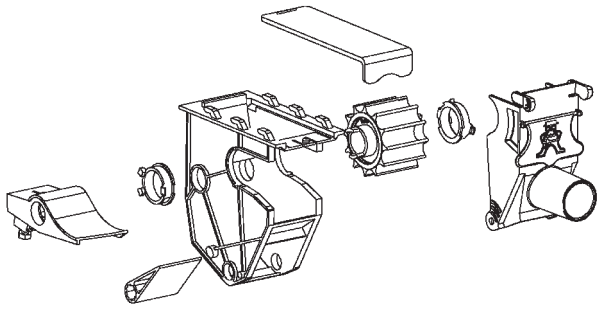
The feeding mechanism is part of the seed and fertiliser metering system.
In all Junkkari models, the feed rate is steplessly adjusted by the gearbox of the metering system, which regulates the rotation speed of the feed shaft.
The gearboxes are protected by mechanical freewheel clutches, preventing reverse rotation.

The feeding mechanism includes:
- Feed chamber
- Cover and overflow hatch
- Feed roll
- Bottom flap
- Switching flap
- Shut-off hatch

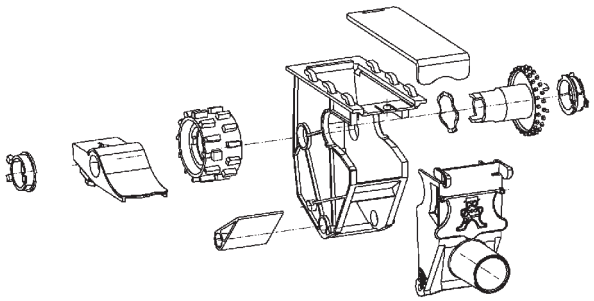
6.16.1 SEED AND FERTILISER FEEDING

Fertiliser feed rolls are **rifle-type**.
Seed feeding uses **a double studded roll** with:

- Yellow roll = for small seeds
- Black roll = for normal seeds
- For small seeds, use only the yellow roll: Turn the red locking pin left via the overflow hatch. This disconnects the black roll and locks it in place.
- For normal seeds, use both rolls: Open the cover and turn the locking pin fully to the right – both rolls will rotate.



Picture 66. Syöttölaite lannoite

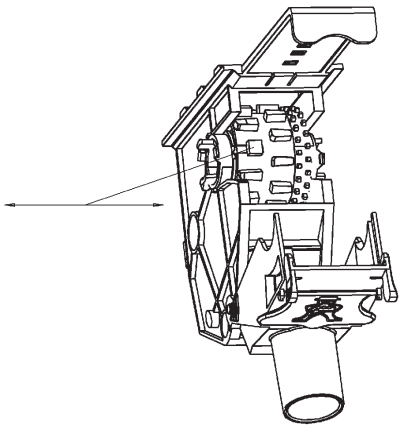


Picture 67. Syöttölaite siemen

CLICKING THE LOCKING PIN

Make sure the locking pin clicks fully into position.
If it doesn't move fully to the right, rotate the black roll one tooth in either direction and try again.

! iA partially disengaged feed roll can damage the feeding mechanism.



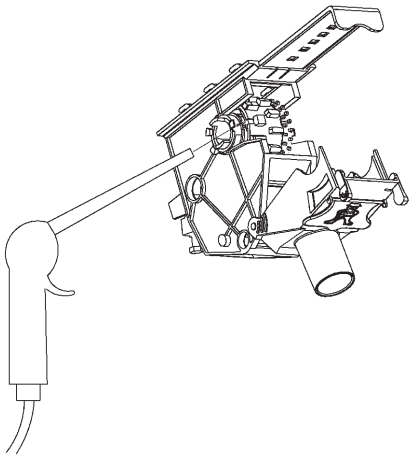
Picture 68. Clicking the locking pin

6.16.2 CLEANING THE FEED ROLL

Clean the inside of the feed roll with compressed air during the seeding season if necessary.
This is especially important if:

- the locking pin is hard to move
- there are impurities inside the black roll

Picture 69. Feed roll cleaning



Picture 69. Syöttötelan puhdistus

6.16.3 ADJUSTING THE BOTTOM FLAP

Inside the feed chamber, there is a curved bottom flap located under the feed roll. Its tightness is adjusted using two levers underneath the metering unit – one lever affects the left-hand side flap and the other the right-hand side.

The flap is spring-loaded, meaning it can flex slightly if a lump of fertiliser or a foreign object enters the feed chamber.

When using standard granulated fertilisers, set the flap to position 1, which is the second-tightest notch on the adjustment scale. For coarser material, loosen the flap accordingly.

When sowing seeds, adjust the flap tightness based on seed size according to Table 9 (also found on the seeding chart on the end of the machine).

Switching valve	Grain size
0	Small seed
1	Cereals, fertilise
2 tai 3	Pea
3 tai 4	Horsebean

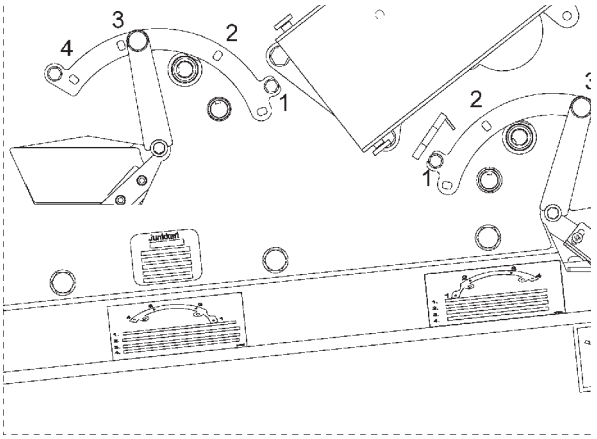
Table 9. Switching valve positions

6.16.4 SWITCH VALVE POSITIONS

The switch valve directs the flow of seed or fertiliser either to the coulters or the calibration tray. It is also used to select how small seeds are applied: either on the surface or via the coulters.
The switch valves for the seed and fertiliser sides are adjusted separately using the control handles on the left side of the machine.

Refer to Picture 70 and Table 11 on page 51 for position diagrams and functions.

If your machine is equipped with ELITE features, the switch valve settings are described in detail in the ELITE-specific manual.



Picture 70. Switch valve positions and handles

Position	Function	Description	Notice
1	Seeds or fertilisers left in the machine can be emptied into calibration trays.	The bottom flap can be turned fully open so that small volumes of material can be drained easily into the calibration tray.	Large volumes of seeds or fertilisers can be drained onto the ground through coulters when the switch valve is in position 3.
2	Calibration.	Seeds and fertilisers are drained in calibration trays installed next to the metering devices.	The small seed device is calibrated with the switch valve in position 3.
3	Regular seeding.	Seeds or fertilisers are forwarded from the metering device to coulters. Material from the small seed device is drained onto the ground randomly.	
3	Small seed device calibration.		Seeds and fertilisers are drained in calibration trays installed next to the metering devices.
3	Emptying the machine.	The content of the hopper flows freely onto the ground.	Turn the switch valve to position 3 and fully open the bottom flap.
4	Regular seeding and start-fertilizing	Material from the metering device flows to coulters. Seeds or starter fertilisers from the small seed device also flow to coulters on the same seeding row.	

Table 10. Switching valve positions and functions

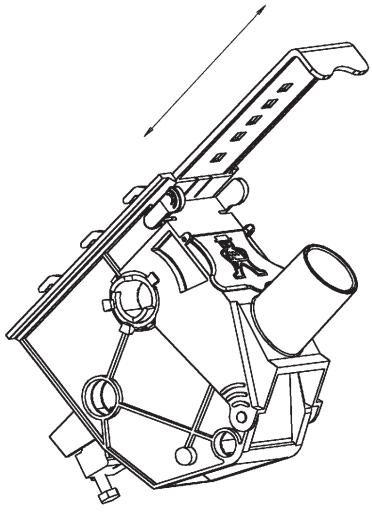
6.16.5 CLOSING HATCH

Between the hopper and the feed chamber, there is a closing hatch that allows you to shut off either the seed or fertiliser supply **for each metering unit individually**.

When the hatch is in the open position, make sure it is fully open to maintain even and consistent flow.

If you are sowing particularly **large seeds**, such as **broad beans or peas**, the hatch **should be completely removed** to avoid blockages or damage.

.



Picture 71. Closing hatch

7 CALIBRATION AND DEFINING THE SEEDING VOLUME

Calibration is essential for successful seeding. A seeding table is located at the end of the seed drill box, which indicates example values for seeding volume settings. However, seeds vary greatly in size, weight and flow properties, so the actual seeding volume must always be verified through calibration.
Seeded crops have recommended seeding densities, which are also affected by soil type, fertility and moisture conditions. As a general rule, the seeding volume is slightly increased when germination conditions are impaired due to drought or poor soil condition.

! Always use clean, germinating seed only. Contaminated seed can cause blockages or damage the seed drill.

Calculating the seeding volume

The seed rate can be calculated by multiplying the thousand seed weight (in grams) by the desired plant density and dividing the result by the germination percentage:

$$\textit{Seed rate (kg/ha)} = \frac{\textit{Thousand seed weight (g) x density (seeds/m²)}}{\textit{germination\%}}$$

Seeding volume may also be specified in units (Unit). A single unit refers to one milling germinating seeds. In this case, the seeding volume is calculated by multiplying the unit weight by the targeted unit volume:

Seed rate (kg/ha) = Unit weight (kg/unit) x Target units (units/ha)

! When using the calibration scale and weighing bag provided with the machine, remember to subtract the weight of the bag from the result.

i When calibrating the small seed/starter box (available as additional equipment), seeds are drained through the actual seed metering device into calibration trays so that the switch valve is set to position 3.

7.1 CALIBRATION USING A MANUAL VOLUME CONTROL

1. Set the bottom flap tightness according to the value shown in the seeding table.
2. Set the gearbox control lever to the position indicated in the table.
3. Turn the switch valve to calibration position 2.

- For small seed/starter box calibration, turn the main seed side switch valve to position 3 to direct the material into the calibration tray.

4. Place the calibration trays on their holders next to the metering device.

- For small seed/starter calibration, use the holders next to the main seed metering device.

5. Attach the calibration crank to the gearbox calibration shaft and turn it until all metering devices feed evenly. Empty the trays.
6. Perform the actual calibration into the trays.

   i The required number of turns is shown in the seeding table and depends on the machine width. The rotation direction is indicated by an arrow near the gearbox shaft. Ensure that the material forms even piles in the trays. For small seed quantities, double the amount for accuracy, then divide the weight by two.

7. Weigh the material and subtract the weight of the weighing bag. Adjust the gearbox if needed.

   i To calculate the seed rate per hectare, multiply the weight by 100 (e.g. 3.50 kg = 350 kg/ha). Repeat the calibration as needed until the desired rate is achieved.

8. Set the switch valve to seeding position 3 or 4.
9. Store the crank and trays in their holders.

Repeat calibration after a few hectares of seeding, as machine vibration can cause material to settle more tightly in the hopper, slightly increasing the feed rate.

7.2 CALIBRATION USING AN ELECTRONIC VOLUME CONTROL

Junkkari seed drills can optionally be equipped with electronic volume control for seed and fertiliser, depending on the control unit. This allows volume adjustments during operation. If calibration results differ significantly from factory defaults, repeat the calibration at least four times to improve accuracy. The actuator accuracy is approx. 0.7 mm.

1. Turn on the control unit and select **the calibration function**. The system asks for an average target volume

   i For example, if you aim for 200–400 kg/ha, set the average to 300 kg/ha. The calibration is then performed at this setting.

2. Confirm the average seeding volume.

   The control unit sets the actuator accordingly and prompts for the calibration result.

3. Ensure that the bottom flap tightness matches the value in the seeding table.
4. Turn the switch valve to calibration position 2.

   For small seed/starter box calibration, turn the seed side switch valve to position 3.

5. Place calibration trays in their holders.

   In the seed and starter box rotation test, the troughs are placed on their supports next to the actual seed feeder.

6. Attach the calibration crank to the gearbox shaft and rotate it until all outlets feed evenly. Empty the trays.
7. Perform the calibration.

   i tThe seeding table indicates the number of rotations depending on the width of the machine. The arrow next to the shaft indicates the direction of rotation. Make sure that identical piles are fed from metering devices into the calibration trays. For example, if small volumes of small seeds are applied, double the volume should be rotated into the trays in order to get a more accurate weighing result. Then, divide the weighing result by two.

8. Weigh the result and subtract the bag's weight.
9. Enter the weight (in kg, not kg/ha) into the control unit and confirm.

   ! Note that the weighing result of the calibration is entered directly in the control unit in kilograms. Do not enter kg/hectare.

10. Repeat calibration until the target volume is achieved. If needed, enter the new value again.
11. Set the switch valve to seeding position 3 or 4.
12. Return the crank and trays to storage.
13. Repeat calibration after a few hectares as feeding volume may increase slightly due to compaction from vibration.

7.3 CALIBRATION BY DRIVING

Drive-based calibration provides the highest accuracy. It accounts for possible wheel slip and vibration effects. All gearboxes rotate during driving. If needed, close flow using shut-off valves.

1. Perform a regular static calibration and adjust the feed rate (see 7.1 or 7.2).
2. Leave the machine in calibration mode (valve, trays in place).
3. Lower the friction wheel.
4. Measure a distance corresponding to 100 m².

   i For 3 m machines: 33.3 m. For 4 m machines: 25 m.

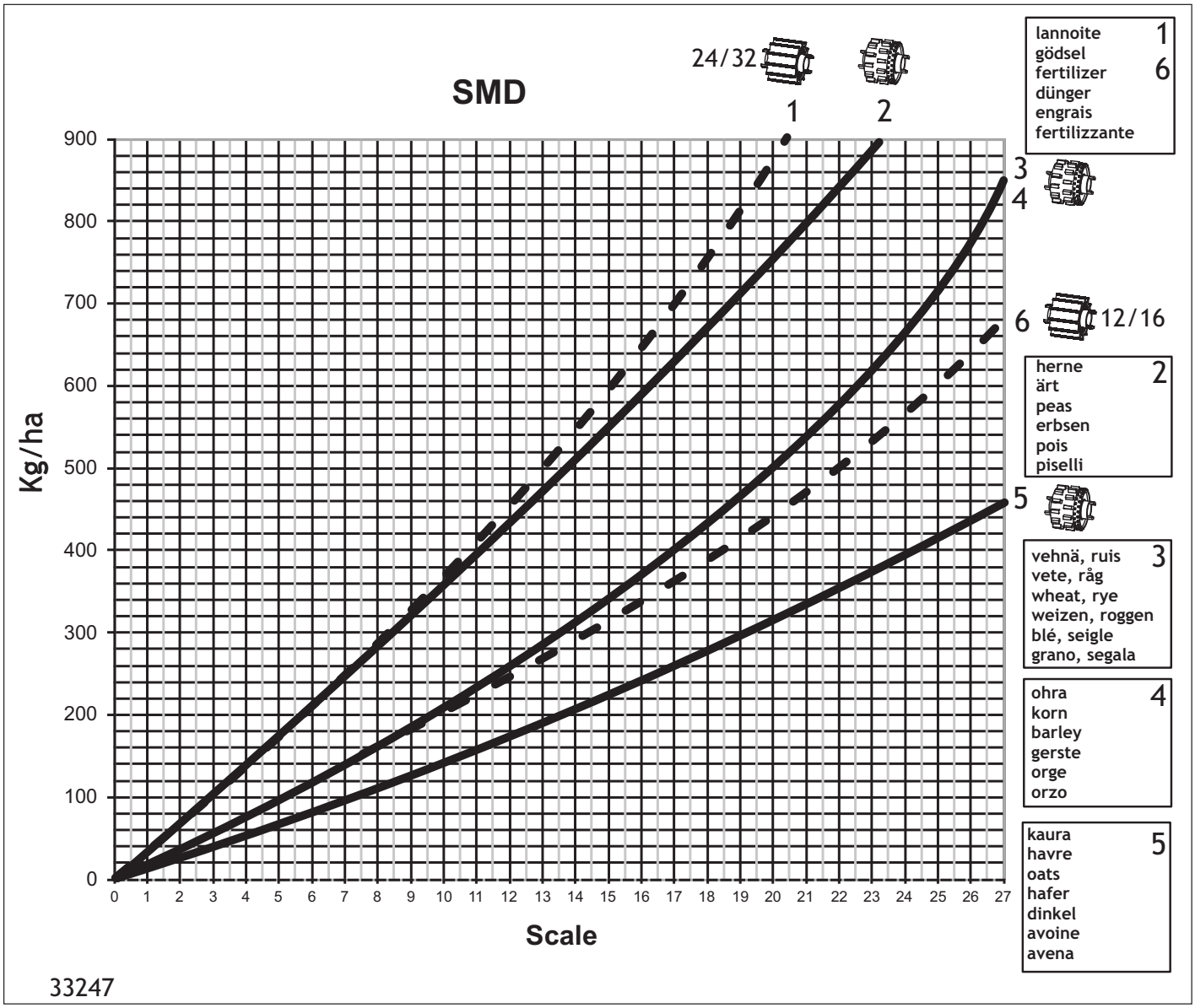
5. Turn the friction wheel to ensure all metering devices are full.
6. Drive the set distance with the machine down. Verify that trays receive even amounts.

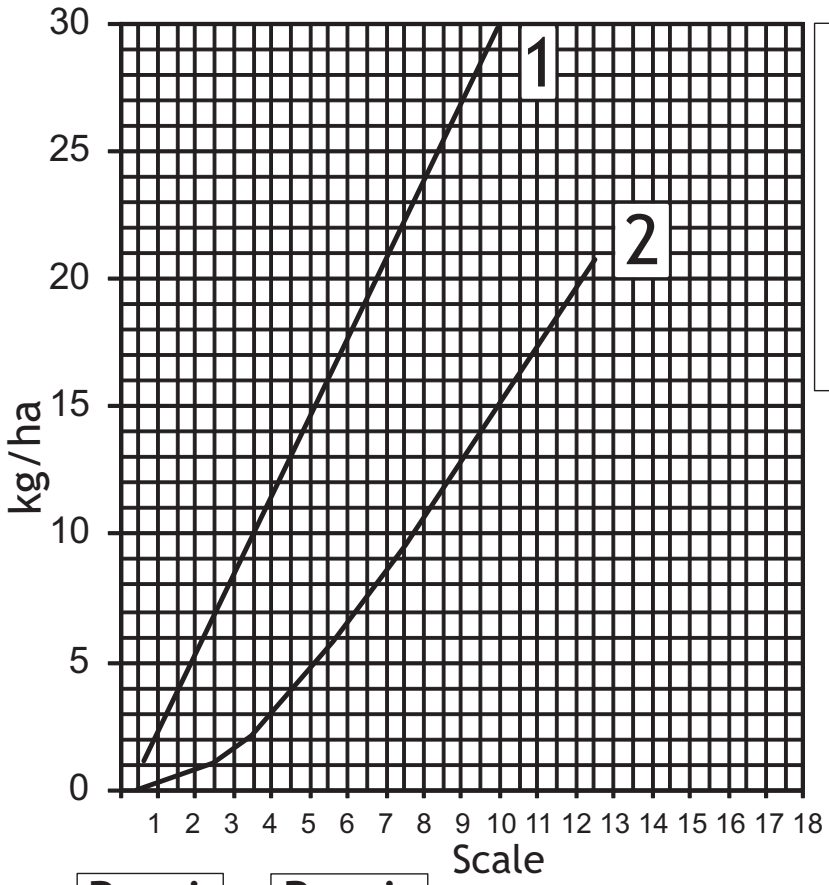
   i For small quantities, drive double the distance for better accuracy and divide the weight by two.

7. Weigh the result and adjust the gearbox accordingly.

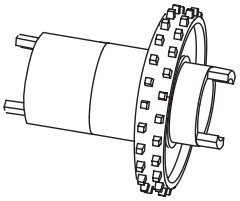
   i To get kg/ha, multiply by 100 (e.g. 3.50 kg = 350 kg/ha). Subtract the bag weight and repeat as needed.

8. Set the switch valve to position 3 or 4.
9. Store the calibration trays.


SMD
24/32
1
2
3
4
6
12/16
5
Kg/ha
900
800
700
600
500
400
300
200
100
0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Scale
lannoite
gödsel
fertilizer
dünger
engrais
fertilizzante
1
6
herne
ärt
peas
erbsen
pois
piselli
2
vehnä, ruis
vete, råg
wheat, rye
weizen, roggen
blé, seigle
grano, segala
3
ohra
korn
barley
gerste
orge
orzo
4
kaura
havre
oats
hafer
dinkel
avoine
avena
5
33247



S300 M300 D300	29r/100m²
S400 M400 D400	22r/100m²



POHJALÄPÄN ASENNOT
BOTTENKLAFFENS LÄGE
POSITION OF THE BOTTOM FLAP
BODENKLAPPEN STELLUNG
POSITION DU LEVIER INFERIEUR
POSIZIONE LEVA INFERIORE

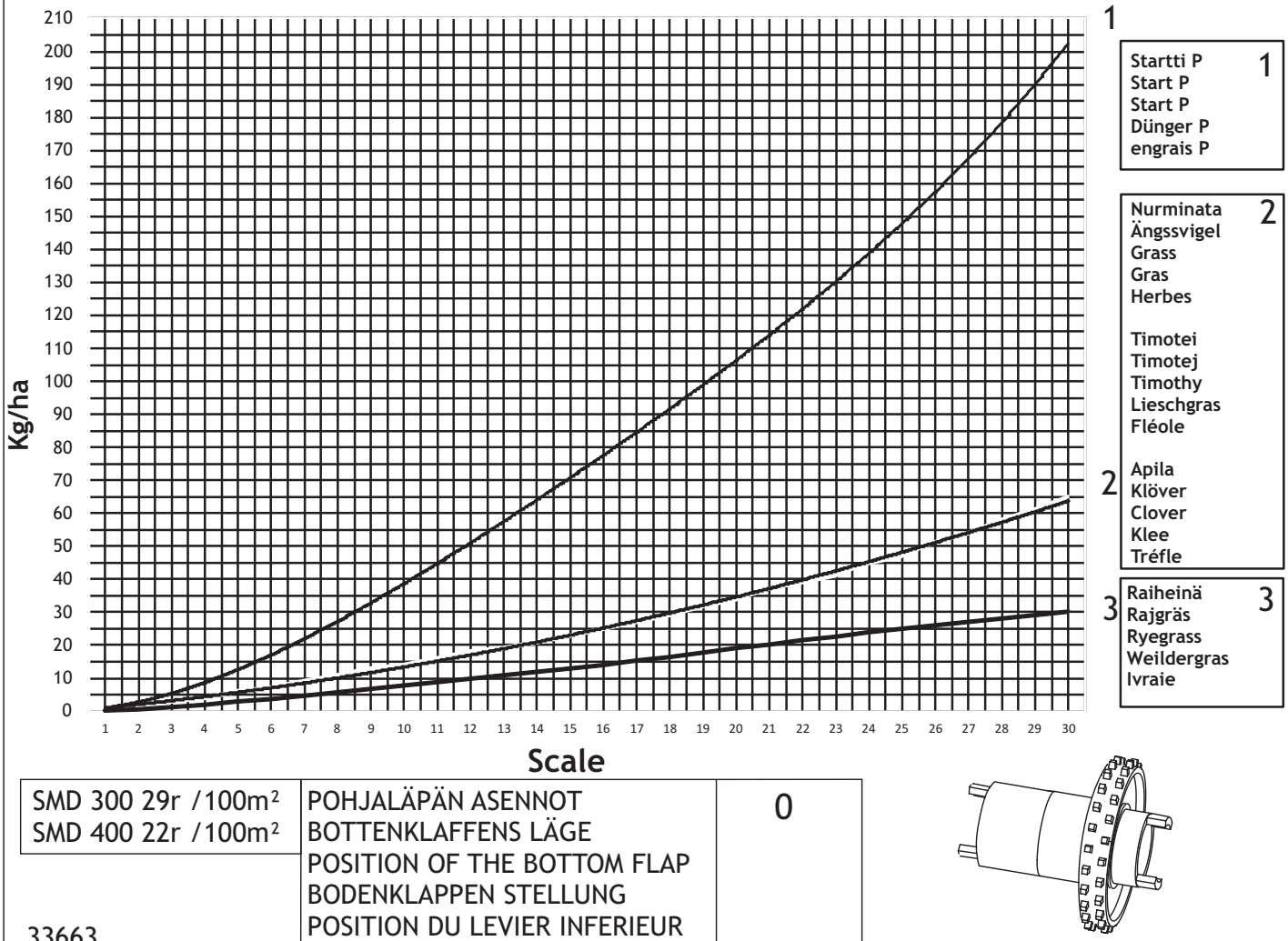
0	1	2	4	1
PIENSIEMEN SMÅFRÖ SMALL SEED KLEINSAMEN PETITES GRAINENS SEME PICCOLO	VILJA SPANNMÅL GRAIN SEEDS GETREIDE GRAINS CEREALI	HERNE ÄRTER PEAS ERBSEN POIS PISELLI	HÄRKÄPAPU BÖNER BEANS BOHNEN HARICOTS FAGIOLI	LANNOITE GÖDSEL FERTILIZER DÜNGER ENGRAINS FERTILIZZANTE

Rypsi
Rybs
1

Rapsi
Raps
Rape
Colza
2

33248

SMD PSL



SMD 300 29r /100m² SMD 400 22r /100m²	POHJALÄPÄN ASENNOT BOTTENKLAFFENS LÄGE POSITION OF THE BOTTOM FLAP BODENKLAPPEN STELLUNG POSITION DU LEVIER INFERIEUR	0

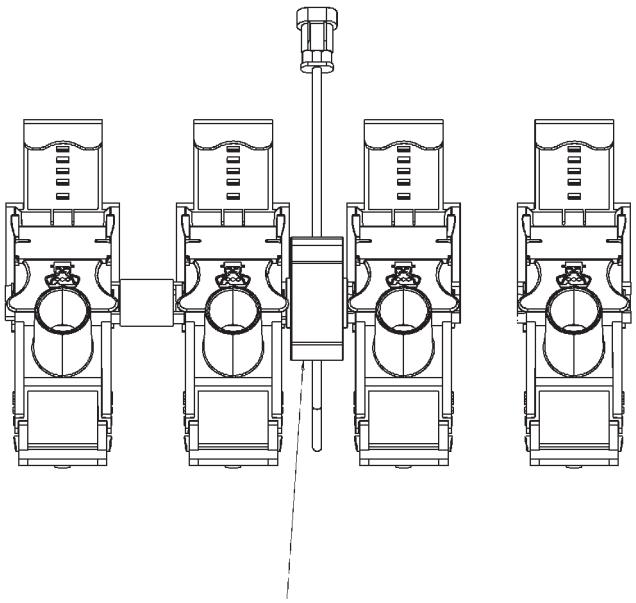
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8 TRAMLINES

As optional equipment, Junkkari seed drills can be equipped with tramline clutches controlled using the G-Wizard or ISOBUS control unit. Tramlines improve spraying accuracy and reduce crop trampling, resulting in more even crop growth.

There are three different tramline types:

- **Symmetrical**: The most common and simple method, suitable for typical seed drill and sprayer combinations. In a symmetrical tramline, the sprayer track line is centered on the seeding pass.
- **Asymmetrical left** and **asymmetrical right**: Methods where one tramline is created over two separate passes, positioning the center line of the tramline between the two seeding passes.



Picture 72. Tramlines clutch

TRAMLINE SPACING AND SPRAYING

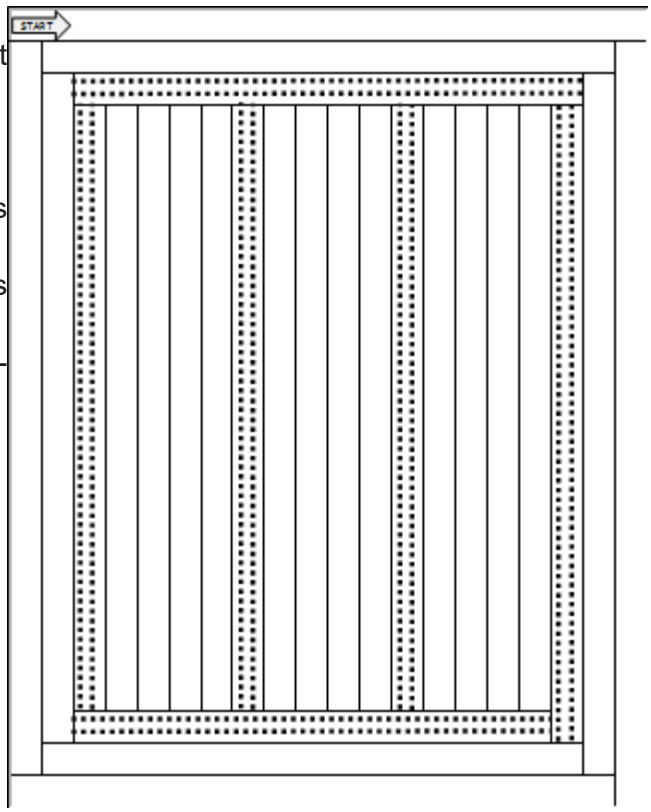
Before using tramlines, plan the driving method so that tramlines match the spraying width.

Recommended approach:

1. Drive around the field until one set of tramlines has been created around the perimeter.
2. If needed, make a few extra passes on the headlands to ensure enough turning space.
3. Then begin back-and-forth seeding passes so the automatic counter of the control unit can be used.

i *A simple diagram (picture 73) shows the field being driven around three times, followed by back-and-forth passes.*

i The plant protection sprayer width is typically 5 times the seed drill width. For example, a 4-meter seed drill matches a 20-meter sprayer.



Picture 73. Tramlines

Drill width (m)	Sprayer width (m)	Tramline rhythm	Tramline counter start value	Notice
3 m	12 m	4	2	First round sown with half machine width
	15 m	5	3	
	18 m	6	3	First round sown with half machine width
	21 m	7	4	
	24 m	8	4	First round sown with half machine width
	27 m	9	5	
	30 m	10	5	First round sown with half machine width
	33 m	11	6	
	36 m	12	6	First round sown with half machine width
4 m	12 m	3	2	
	16 m	4	3	First round sown with half machine width
	20 m	5	3	
	24 m	6	4	First round sown with half machine width
	28 m	7	4	
	32 m	8	5	First round sown with half machine width
	36 m	9	5	
	40 m	10	6	First round sown with half machine width

Table 11. Sprayer width and symmetrical tramlines

Drill width (m)	Sprayer width (m)	Tramline rhythm	Tramline counter start value	Notice
3 m	12 m	4	2	First round sown with half machine width
	15 m	5	3	
	18 m	6	3	First round sown with half machine width
	21 m	7	4	
	24 m	8	4	First round sown with half machine width
	27 m	9	5	
	30 m	10	5	First round sown with half machine width
	33 m	11	6	
	36 m	12	6	First round sown with half machine width
4 m	12 m	3	2	
	16 m	4	3	First round sown with half machine width
	20 m	5	3	
	24 m	6	4	First round sown with half machine width
	28 m	7	4	
	32 m	8	5	First round sown with half machine width
	36 m	9	5	
	40 m	10	6	First round sown with half machine width

Table 12. Sprayer width and asymmetrical tramlines

8.1 SYMMETRICAL TRAMLINES

Symmetrical tramlines are made by stopping feeding under the sprayer tractor's wheels during marking. See Table 12 on page 56 for symmetrical tramline settings for 3 m and 4 m drills with different sprayer widths.
During the first pass, close feeding either with the optional half-machine shut-off or by closing the metering unit hatches on one side. Remember to restore the full working width after the first pass. (Picture 74)

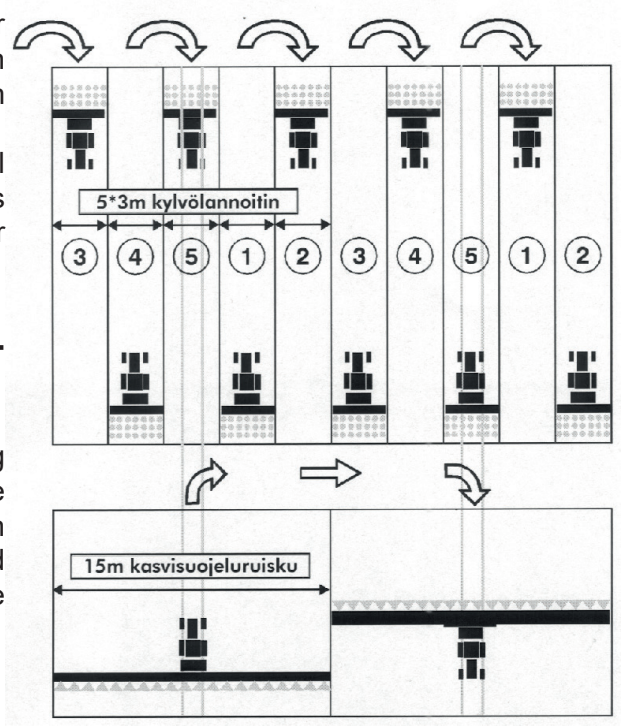
8.2 ASYMMETRICAL TRAMLINES – LEFT SIDE

Asymmetrical tramlines on the left are created by stopping feeding on the left-hand side of the drill for two consecutive passes. This method is suitable when the sprayer width is an even multiple of the drill width. Asymmetrical tramlines avoid the need to seed with half the machine on the first pass. See Table 13 for examples with 3 m and 4 m seed drills.

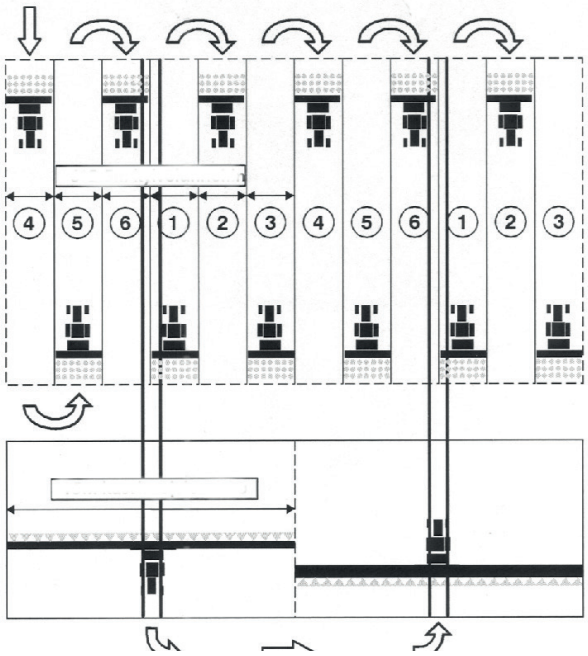
Drill width (m)	Sprayer width (m)	Tramline rhythm	Tramline counter start value
3 m	12 m	4	3
	18 m	6	4
	24 m	8	5
	30 m	10	6
	36 m	12	7
4 m	16 m	4	3
	24 m	6	4
	32 m	8	5
	40 m	10	6

! Tramline clutch location may differ between symmetrical and asymmetrical systems.

! Automatic half-lift cannot be used with asymmetrical tramlines.



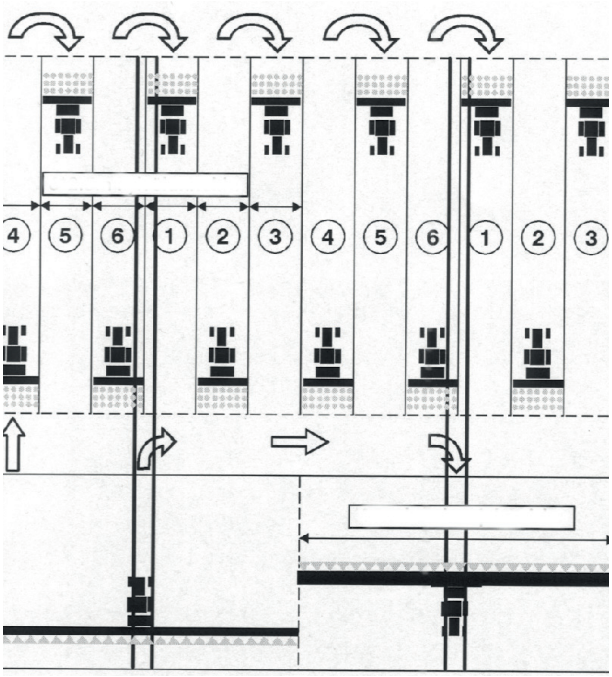
Picture 74. Symmetrical tramlines



Picture 75. Asymmetrical tramlines (left)

8.3 ASYMMETRICAL TRAMLINES – RIGHT SIDE

This method mirrors the asymmetrical left-side technique, but feeding is stopped on the right-hand side. The side is chosen based on the driving direction of the first pass. See Picture 76 for an example of right-side tramline creation.



Picture 76. Asymmetrical tramlines (right)

9 SURFACE AREA METER

9.1 TECHNICAL SPECIFICATIONS

Display	4 digits
Power supply	2 x 1,5 V (AA battery)
Temperature limits	-10˚C - +70˚C (may vary depending on the battery type)
Pulses from the sensor	max. 167 pulse per second
Min. pulse-time	0,6 ms
Internal memory	Speed ratio, width and 2 area counters saved
Other	Splash water protected

Table 13. Technical specifications

9.2 GENERAL

The surface area meter calculates the surface area on the basis of the travelled distance indicated by the speed sensor and the machine width entered in the meter. The speed multiplier (symbol o on the screen) refers to the distance (cm) travelled between two pulses sent by the speed sensor.

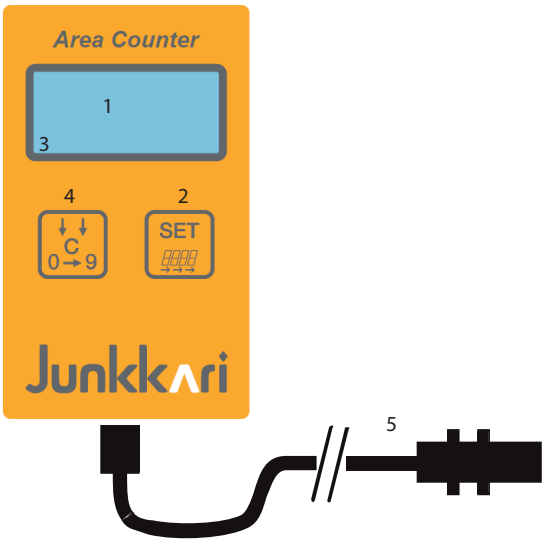
- If the surface area meter is installed at the Junkkari factory, the speed multiplier (symbol o on the screen) and the machine's working width (symbol |---|) have already been set, and the user does not need to change them. If the surface area meter is installed afterwards, the setting values are presented in the table 14.

Variable	Symbol	SMD400	SMD300
Speed multiplier	o	56.00	56.00
Working width	|----|	4.00	3.00

Table 14. Speed multiplier table

If the speed multiplier table does not offer the correct result, it is easy to fix. For example, if the actual surface area is 4.0 hectares and the meter indicates 4.4 hectares, multiply the speed multiplier value by 0.90 (90%) and enter the adjusted speed multiplier in the meter.

9.3 USING THE SURFACE AREA METER



Number	Part	Function	Instruction
1	Display		
2	SET-button	Start-up	Press button
		Activate the change function	
		Resetting speed multiplier and work width	
		PA-counter reset	Press **SET**, until PA parameter flashes, then press **C**-button
3	Left segment	While geting speed pulses the lower “bar” of the first digit will flash during work	
4	C-button / F-button	Start-up	Press button
		Change of active parameter displayed	Look section **9.4**
		Turning off	Press button until you see text **STOP**
		Moving from one function to other	**F.2** -> **HA.1** -> **HA.2** -> **|---|** -> **o**
5	Cable and speed sensor	Speed input to counter.	

Table 15. Surface area meter parts and functions

9.4 CHANGING AND RESETTING VALUES

The surface area meter speed multiplier **o** and work width **|---|** values can be changed and the values of the counters **HA.1** and **HA.2** can only be reset.

CHANGE THE SPEED MULTIPLIER

1. Press **C**-button until the speed multiplier symbol **o** and values appear.
2. Press **SET**-button for two seconds.
   Dot starts to blink on the screen.
3. Press the **C**-button to move the point to the desired position.
4. Press the **SET**-button repeatedly until the number you want to change starts blinking.
5. Press **C-button** to change the number until the number is correct.
6. Repeat steps 4-5 as many times until the value is correct.
7. Finally, press the **SET**-button until you see the symbol **o**.
   Speed multiplier has been saved.

SURFACE COUNTERS RESET

The surface area meter has two different area counters **HA.1** and **HA.2**, both of those can be reseted.

HA.1 reset

1. Press the **C-**button until **HA.1** and the accumulated surface reading appear.
2. Press **SET**-button for two seconds.
   Surface reading blinks on the screen.
3. Press **C**-button to reset the area.
4. Press **SET**-button until you see symbol **HA.1.**

HA.2 reset

HA.2 is reset by providing security code 236 :

1. Press the **C-**button until **HA.2** and the accumulated surface reading appear.
2. Press **SET**-button until first digit starts to blink.
3. Press **C**-button until the first digit is the first digit of security code.
4. Repeat steps 2-3 until **HA.2**:n security code **236** has been added.
5. Press **SET**-button to reset the area.

(!) The area meter goes out of the programming mode if any buttons are not pressed for 10 seconds.

9.5 TURNING THE AREA COUNTER OFF

- The area meter can be switched off by pressing the **C**-button until **STOP** is displayed.
- The meter restarts if it receives speed pulses or if you press the **C** or **SET**-button.
- If the area counter within a period of ½ hour has not received any pulse or key-press signals, the computer is automatically set in stop-mode.
- The values of the area counters remain in memory even when the device is switched off.

(!) If batteries are removed without turning off the area meter, the counter values will reset .

9.6 TURNING THE AREA COUNTER OFF

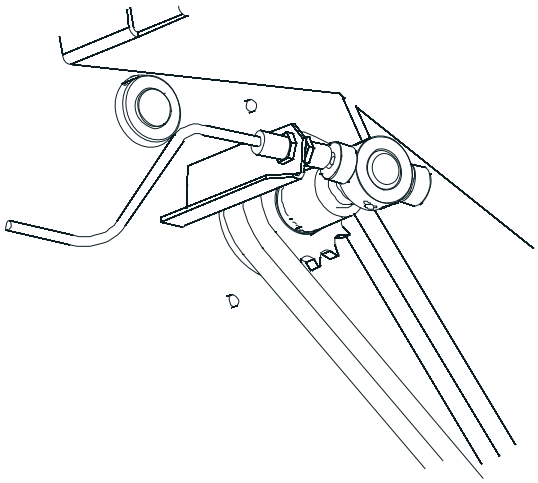
- The area meter can be switched off by pressing the **C**-button until **STOP** is displayed.
- The meter restarts if it receives speed pulses or if you press the **C** or **SET**-button.
- If the area counter within a period of ½ hour has not received any pulse or key-press signals, the computer is automatically set in stop-mode.
- The values of the area counters remain in memory even when the device is switched off.

(!) If batteries are removed without turning off the area meter, the counter values will reset .

9.7 INSTALLING THE SENSOR AND MAGNET

Position of the speed sensor at the right end of the machine.

.



Picture 77. Installing the speed sensor

10 G-WIZARD

10.1 GENERAL

The G-Wizard control unit measures or monitors:

- Surface area (total area and two resettable calculators)
- Driving speed (km/h)
- Average seeded area per hour (ha/h)
- Shaft rotation
- Tramline switch operation
- Gearbox operation
- Hopper level
- Operation of the sensors

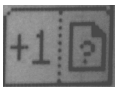
The G-Wizard control unit controls or adjusts:

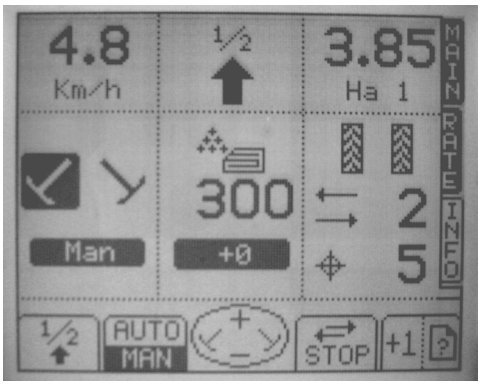
- The operation of trackmarkers manually or automatically
- The operation of tramline switches manually or automatically
- Machine half lift (additional equipment S/M/T/R)
- Fertiliser rate electronically (optional equipment)

MAIN TABS

The control unit screen includes four main tabs that can be browsed using the left shift -key.

The tab number is displayed in the tab key icon:

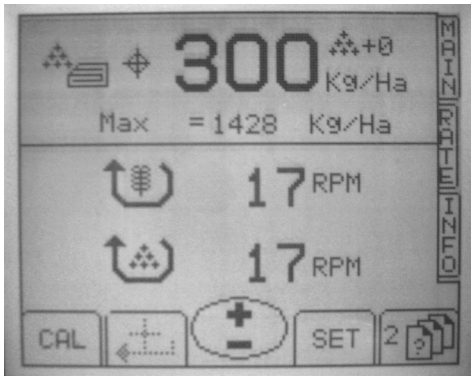




Picture 78. Driving tab

Driving tab

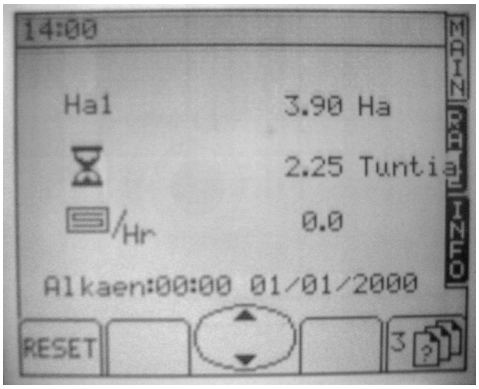
The driving tab serves to control driving functions, such as trackmarkers, tramlines, fertiliser rate and half lift. Some of the functions displayed in the image are optional.



Picture 79. Machine guard

Machine guard tab

- Calibrate the seed metering device guard.
- Displays the rotating speeds of feed shafts.
- If the machine is equipped with an electronic remote control of fertiliser (G-Wizard Plus), you can also change the basic fertiliser rate setting



Picture 80. Calculator tab

Calculator tab

Total surface area and two resettable surface area calculators (HA.1 and HA.2).



Picture 81. Menu tab

Menu tab

In the menu tab, you can perform a calibration (G-Wizard Plus), change settings and carry out diagnostics ¬functions.

10.2 DRIVING MODE WITHOUT REMOTE FERTILISER CONTROL (G-WIZARD)

The appearance of the driving screen varies according to optional equipment selected. Depending on equipment, the screen displays the driving speed, half lift status, hectares driven, trackmarker status, average availability, tramline status and calculator value.

.

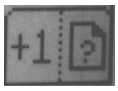
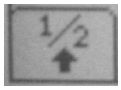
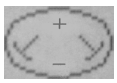
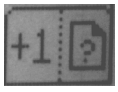
Buttons	Functions	Instructions
 Shift button	Browse four main tabs	• To go directly to the driving tab, press the button for two seconds • Press the button for three seconds to turn off the controller
 Half lift activation button	Activate or deactivate the half lift function	Always lift the machine up before reversing.
 Trackmarker control button  Trackmarker manual control button	Manual or automatic control of the trackmarker	• The automatic function changes the trackmarker side automatically after lifting the machine. In the automatic mode, the trackmarker side can be changed when the machine is raised. • Manual control, trackmarkers can be controlled as selected while driving. • An active marker is highlighted on the screen.
 Calculator stop button	Tramline calculator stop button, trackmarker side change can be stopped	i This function is needed if the machine needs to be raised in the middle of a round
 Tramline calculator	You can change the tramline calculator value.	

Table 16. Driving mode without remote control- buttons

10.3 DRIVING MODE WITH REMOTE FERTILISER CONTROL (G-WIZARD PLUS)

The appearance of the driving screen varies according to optional equipment selected. Depending on equipment, the screen displays the driving speed, half lift status, hectares driven, trackmarker status, fertiliser rate, tramline status and calculator value. Buttons and functions (Table 17).

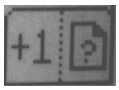
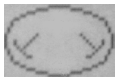
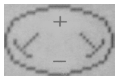
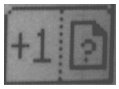
Buttons	Functions	Instructions
 Shift button	Browse four main tabs	• To go directly to the driving tab, press the button for two seconds • Press the button for three seconds to turn off the controller
 Trackmarker control button  Trackmarker manual control button	Manual or automatic control of the trackmarker	• The automatic function changes the trackmarker side automatically after lifting the machine. In the automatic mode, the trackmarker side can be changed when the machine is raised. • Manual control, trackmarkers can be controlled as selected while driving. • An active marker is highlighted on the screen.
 Fertiliser rate adjustment button	You can increase or reduce the fertiliser rate by the percentage defined in settings	i **For example:** If the step is set at 10%, one push of the button will increase or reduce the fertiliser rate by 10%. When pressing ”+” or ”-” button 2s, the new basic fertilizer setting can be set using the arrow keys The change is accepted with the OK button. If you want to return to the driving tab without any changes, press the **ESC** button**.**
 Calculator stop button	Tramline calculator stop button, trackmarker side change can be stopped	i This function is needed if the machine needs to be raised in the middle of a round. i The calculator should also be stopped when filling the machine.
 Tramline calculator	You can change the tramline calculator value	
 Half lift activation button	Activate or deactivate the half lift function	! Always lift the machine up before reversing.

Table 17. Driving mode with remote control- buttons

10.4 MACHINE GUARD

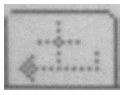
Buttons	Functions	Instructions
 CAL-button	You can calibrate the rotating guard of the seed feeding mechanism if the seed shaft tramline clutches required have been installed in the machine.	The guard monitors the rotating ratio between the cardan shaft and the seed feed shaft. If the ration changes, the guard gives an alarm. At the factory, the change rate has been set at 35%. When the seed volume is changed, the rotating guard must be re-calibrated. It is calibrated on the screen below while driving. When the ratio stabilises, press **OK**. After calibration, the calibration tab will be displayed.
 SET-button	Change the basic fertiliser rate setting	Enter a new basic setting using the arrow keys and accept by pressing **OK**. Return without saving by pressing **ESC**.
 Return button	You can return directly to the basic fertiliser rate setting if the fertiliser rate was changed on the driving screen using the **+** and **-** buttons. This tab also displays the rotating speed (revolutions per minute) of the seed and fertiliser feed shafts if tramline clutches have been installed in the shafts.	

Table 18. Calculators buttons and functions

10.5 CALCULATORS

The calculator tab includes three calculators that measure the surface area and operating hours. Two of these calculators can be reset, whereas the third displays the machine's total surface are and operating hours.

Buttons	Functions
 RESET-button	You can reset the displayed calculator.

Table 19. Calculators buttons and functions

10.6 SETTINGS

In the settings tab, you can select four functions:



- Calibration (G-Wizard Plus)
- User settings
- Factory settings (The factory's PIN code required)
- Diagnostics

10.6.1 CALIBRATION (G-WIZARD PLUS)

Machines equipped with the electronic remote control of fertiliser as optional equipment are calibrated as described in this section. Instructions for the actual calibration are presented in Section 7 of this manual

CALIBRATION

1. Select calibration from the settings tab

   The control unit requests the average rate of fertiliser.

2. Press **SET**-button and set target rate.

   i **For example**: If 300–400 kg/hectare of fertiliser is applied, set 350 kg/hectare as the target rate. As a result, the calibration will be performed in the middle of the range to produce as accurate a result as possible.

3. Press **OK** to accpet the target rate.

   The machine will set the fertiliser rate according to the target rate based on the previous calibration.

4. Make calibration and enter the weighing result into the controller by using the arrow button.

   ! Remember to deduct the weight of the weighing bag. Do not convert the result into kg/ha.

   i Press **ESC** to exit the calibration without saving any changes.

5. Press **OK** to accept the calibration result entered.

The control unit displays a summary of the calibration result.

Summary symbols

- **Previous refers:** The previous correction factor with which the curve illustrating the control unit's fertiliser feed rate is adjusted according to the nominal weight of fertiliser.
- **New refers:** The new correction factor obtained through the calibration.
- **Error:** Corrected by the calibration.
- **Maximum:** The theoretical maximum fertiliser rate which can be applied using the machine.

6. Press **OK** to accept calibration changes or press **ESC** to cancel the calibration result and return to the settings tab without saving any changes.

i It is recommended that changes are tested and a new calibration is performed. If a significant change in the feed rate is made in the calibration, the calibration should be repeated to make sure that the feed rate corresponds with the target rate. If required, enter any correction in the control unit as described above.

10.6.2 USER SETTINGS

See the user settings functions in the table *20.*

.

Function	Description	Instructions
1. Screen	You can change the screen contrast and brightness	
2. Customisation	You can set the fertiliser rate step	The target value must be set as **kg/ha**, and the **zero point offset** and **calibration offset** must be set at **0**.
3. Time/date	You can set the date and time	
4. Technical support	contact details of technical support.	
5. Language	You can change the control unit language	
6. Seed drill	You can define the seed drill width, set the speed sensor calibration factor manually or calibrate the speed sensor by driving.	• By calibrating the speed sensor, you can improve the accuracy of the displayed speed and surface area. Due to different soil properties, the slippage and sinking of the friction wheel vary. • In factory settings, the multiplier is 1.034. **Calibration** 1. Measuring a distance of 100 metres in the field. 2. Drive the tractor to the starting marker and lower the machine and friction wheel to the ground. 3. Start calibration by pressing **OK.** 4. Drive to the finishing marker and press **OK.** 5. Accept the calibration result by pressing **OK** or reject it by pressing **ESC**
7. Tramlines	You can edit tramline settings.	1. Change the width of the tramline interval by pressing up and down arrow keys. 2. Use left and right arrow keys to change between symmetrical and asymmetrical driving methods. 3. Confirm your changes by pressing **OK**. Press **ESC** if you wish to cancel your changes.
8. Alarm settings	• Hopper level guard • Axle alarm • Gearbox alarm • Speed alarm • Low voltage alarm	i **For example:** if you are seeding small seeds or small amount of fertiliser, the alarm should be disabled.

Table 20. User settings functions

10.6.3 FACTORY SETTINGS

Factory settings can only be changed by persons authorised by the factory. As a result, factory settings can only be accessed by entering a PIN code..

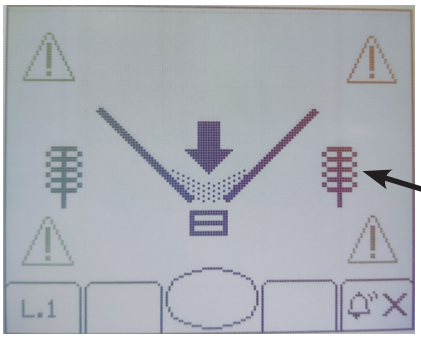
10.6.4 DIAGNOSTICS

Using diagnostics, you can examine the operations of machine sensors.(Table *21.)*

Function	Description
1. Device	Displays: The control unit's supply voltage, The voltage provided by hopper level guards. When the hopper is full, the voltage is 12 V. The status of the machine lifting sensor.
2.Metering device	Displays rotating speeds of the machine's speed sensor, seed shaft (if switches installed) and fertiliser shaft (if switches installed), and their corresponding sensor pulse frequencies. The target length of the remote fertiliser control (optional equipment) and the measured length.
3. History	Displays the machine's total hectares and operating hours.
4.Functiong testing	Function testing to test machine sensors.

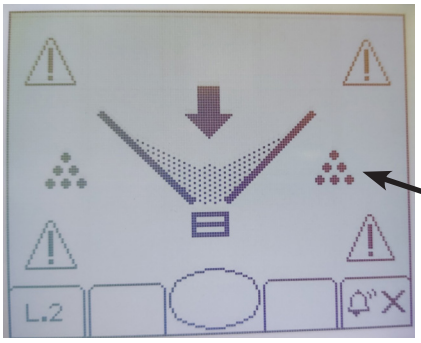
Table 21. Diagnostics functions

10.6.5 ALARM



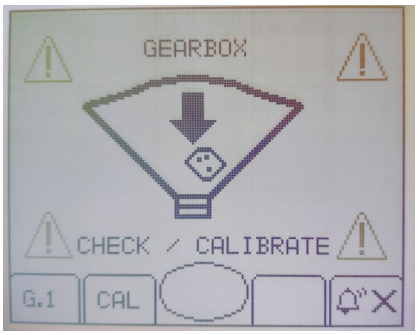
This **L.1** alarm means that the seed hopper is starting to run out of seeds. In other words, the seed level has dropped below the capacitive sensor.

The ear icon refers to the seed hopper.

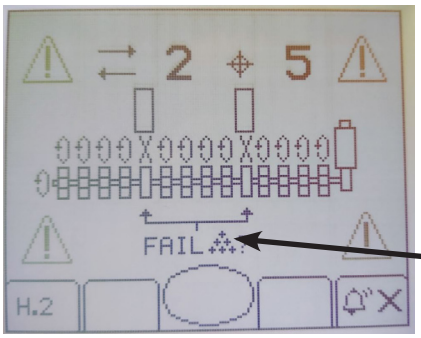


This **L.2** alarm means that the fertiliser hopper is starting to run out of fertiliser. In other words, the fertiliser level has dropped below the capacitive sensor.

The fertiliser grain icon refers to the fertiliser hopper.

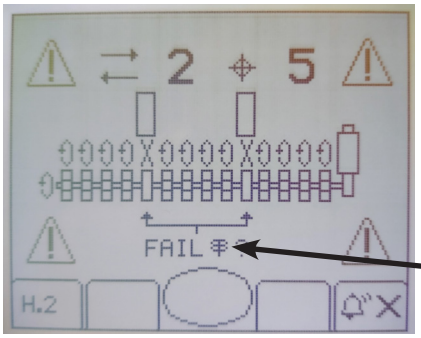


If the seed gearbox setting is changed by more than ±25%, this image **G.1** will be shown on the main screen to indicate that the seed gearbox has not been calibrated. Calibration is carried out on screen page 2 using the CAL button during normal seeding.
If this alarm persists after calibration, check the condition of the seed gearbox as follows: Use the calibration lever to rotate the gearbox and check that the feed shaft rotates evenly.



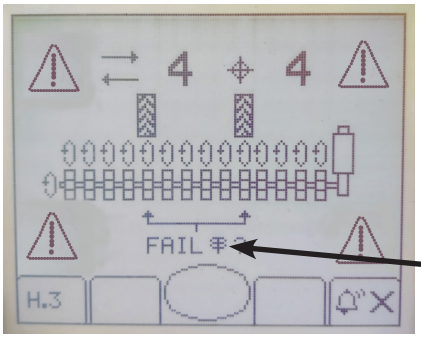
This **H.2** alarm means that speed pulses cannot be received from the seed shaft, even though the machine is in the seeding position and moves forward. Check the condition of the tramlines for seed on the left-hand side in the driving direction. You can also check whether pulses are even on screen page 4 under Diagnostics / Metering device.

The ear icon refers to the seed shaft.



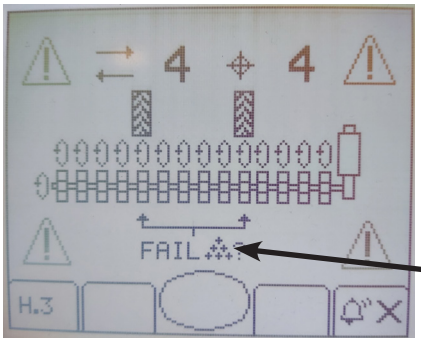
This **H.2** alarm means that speed pulses cannot be received from the fertiliser shaft, even though the machine is in the seeding position and moves forward. Check the condition of the tramlines for fertiliser on the right-hand side in the driving direction. You can also check whether pulses are even on screen page 4 under Diagnostics / Metering device.

The fertiliser grain icon refers to the fertiliser shaft.



This **H.3** alarm means that the tramline clutch for seed does not work properly. In other words, the feeding rifles rotate even though they should be stopped. Check the power supply to the tramlines; when the tramline switches are energised, the switches produce a tramline, i.e., the feeding rifles next to the tramlines do not rotate.

The ear icon refers to the seed shaft.



This **H.3** alarm means that the tramline for fertiliser does not work properly. In other words, the feeding rifles rotate even though they should be stopped. Check the power supply to the tramlines; when the tramline switches are energised, the switches produce a tramline, i.e., the feeding rifles next to the tramlines do not rotate.

The fertiliser grain icon refers to the fertiliser shaft.

11 JUNKKARI ISOBUS ECU TECHNICAL SPECIFICATIONS (PRO EQUIPMENT LEVEL)

The instructions in Chapter 11 apply to the PRO equipment level. Junkkari ISOBUS ECU is programmed into the 3724 control unit manufactured by EPEC Oy. The ISOBUS



Picture 82. ISOBUS cable of the seed drill and plug on the tractor.

11.1 FUNCTIONS – JUNKKARI

1. Driving speed (km/h).
2. Surface area counter

- The controller includes two resettable area counters shown on the main screen. In addition, there is a total area counter located behind a PIN code, which cannot be reset.

3. Tramline marker

- Both symmetrical and asymmetrical tramlines can be created.

4. Track marker

- Can be used in automatic mode: the marker switches side when coulters are lifted/lowered. In manual mode, the selected side lowers each time the coulters are lowered.

5. Pause function

- When the button is activated, the lift/lower sensor is disabled.
- This function can be used if the coulters need to be lifted temporarily and you don’t want to affect the tramline counter rhythm.
- Activate the pause function before the temporary lift and reactivate the counter by pressing the same button after the coulters are lowered again.

6. Fertiliser rate remote adjustment (optional)

- Fertiliser rate (kg/ha) can be adjusted from the controller. Adjustment steps can be set between 1–99%. Default setting: 10%.

7. Seed rate remote adjustment (optional)

- Seed rate (kg/ha) can be adjusted from the controller. Adjustment steps can be set between 1–99%. Default setting: 10%.

8. Marker lift

- If the track marker needs to be lifted while keeping the coulters in the working position, the marker lift function can be activated.

9. Precision seeding

- The controller supports ISOBUS TC-GEO functionality.
- The seed and fertiliser rates can be adjusted based on a location-specific task (TASK). Requires position data from the tractor's CAN bus.

Junkkari ISOBUS can control remote adjustment for a total of four different materials:

- For example, fertiliser, seed, small seed 1 and small seed 2. This means it can control four separate electric drive motors (optional equipment).

11.2 ALARMS, WARNINGS, INDICATOR LIGHTS, AND BUTTONS

1. Hopper Level Sensors

- The controller screen displays an indicator light for each installed level sensor. If the material in the hopper does not cover the sensor, the indicator light will appear red. The sensors are located on the right-hand end of the hoppers. As an optional accessory, sensors can also be installed on the left-hand side.

2. Gearbox Alarm

- When a gearbox icon appears on the main screen with a red background, it indicates a gearbox alarm. First, check the speed sensors on the machine shaft and seed shaft. If the sensors are functioning properly, use the calibration lever to check whether the seed shaft rotates evenly. If rotation is uneven, open the gearbox and inspect for faults.

3. Pole Lift

- When pole lift is activated, a red lock icon will appear in the center of the main screen. This allows the track marker to be raised while the coulters remain on the ground, so seeding can continue normally.

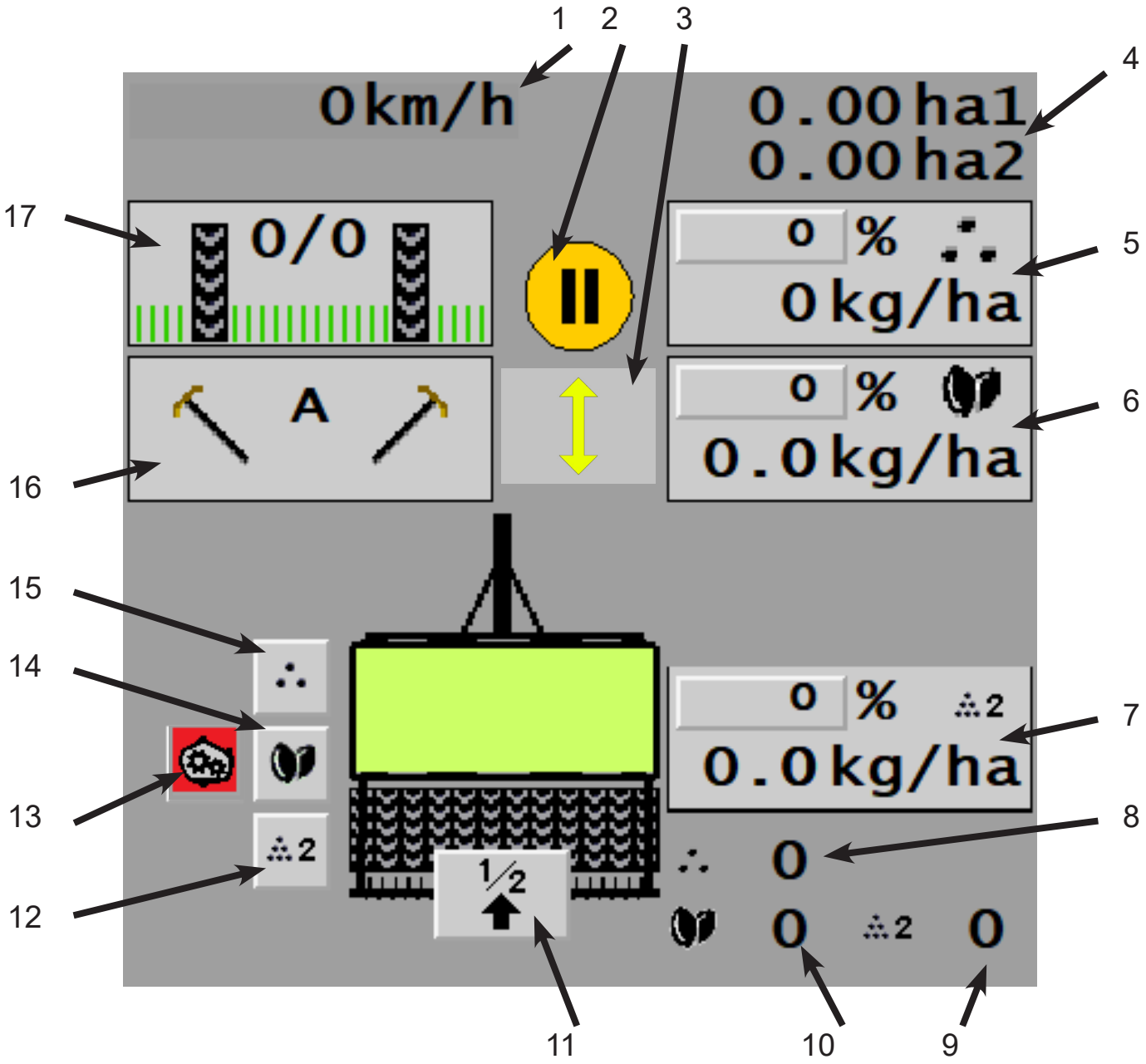
4. Pause

- When the pause button is pressed, a yellow pause indicator will appear in the center of the screen. While pause is active, the lift/lower sensor is disabled, and any extra lifting of the machine will not be counted.

5. Half Lift

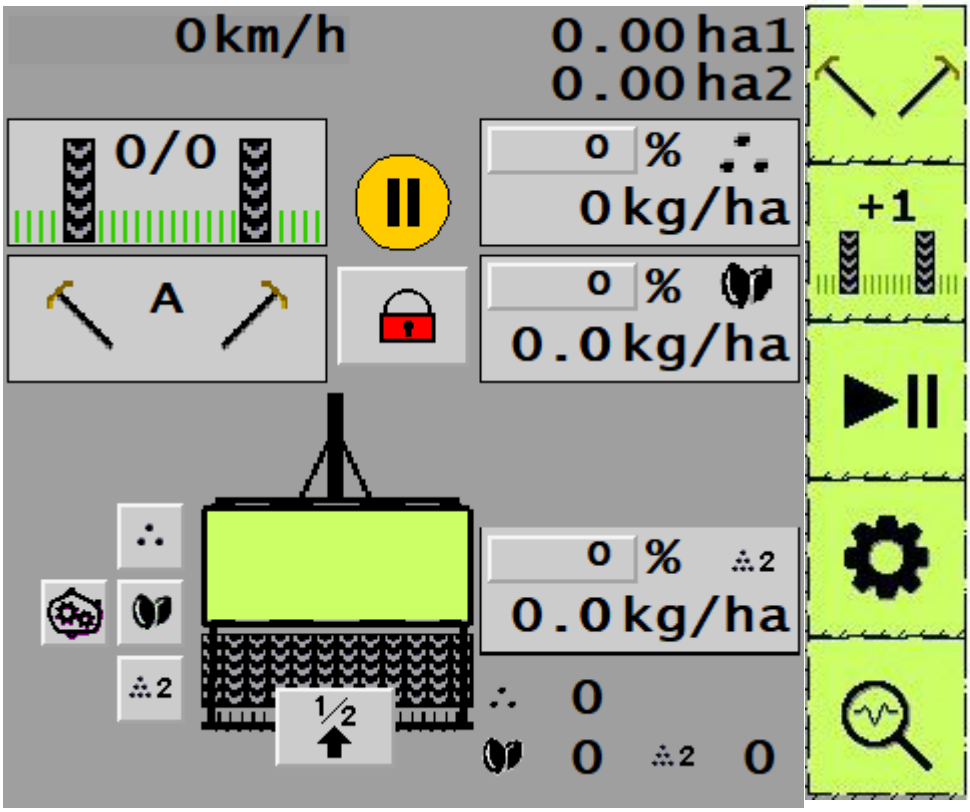
- When the half lift function is active (the half lift button is green), lifting the machine will raise the coulters and friction wheel slightly off the ground, while the following harrow remains down. The lift height can be adjusted by changing the position of the lift/lower sensor.

11.3 FUNCTIONS ON SCREEN (PRO EQUIPMENT LEVEL)



1. Driving speed	9. Small seed shaft rotating speed
2. Pause activated	10. Seed shaft rotating speed
3. Pole lift activation	11. Half lift activation
4. Surface area counters	12. Small seed device hopper sensor / activation
5. Fertiliser remote adjustment	13. Gearbox alarm. Red when an alarm is active
6. Seed remote adjustment	14. Seed device hopper sensor / activation
7. Small seed device remote adjustment	15. Fertiliser device hopper sensor / activation
8. Fertiliser shaft rotating speed	16. Track markers
	17. Tramline clutches

11.4 TRAMLINE RHYTHM SELECTION



Track marker menu 11.4.1

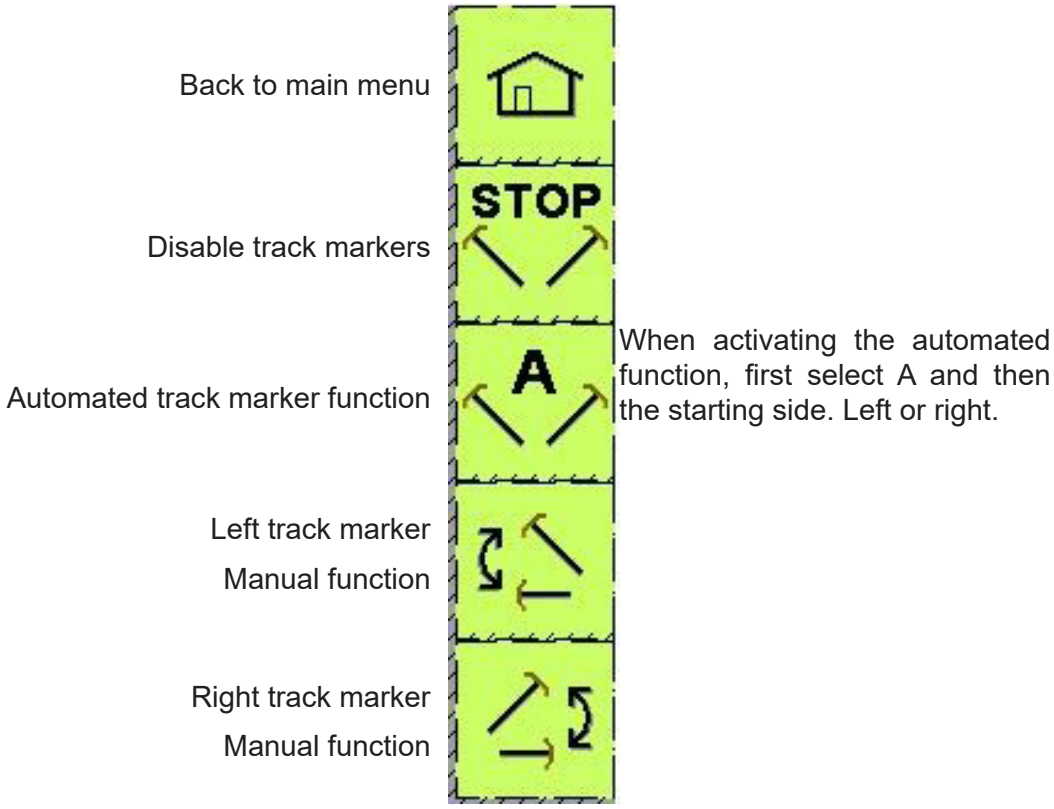
Tramline rhythm selection 11.4.2

Pause on/off 11.4.3

Settings 11.4.4

Diagnostics 11.4.5

11.4.1 TRACK MARKER MENU (VISIBLE ONLY IF TRACK MARKERS ARE INSTALLED)

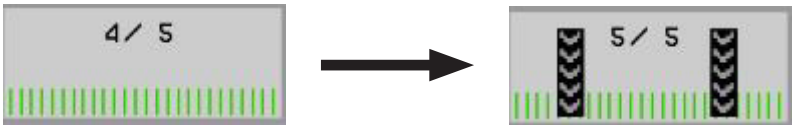


11.4.2 TRAMLINE RHYTHM SELECTION

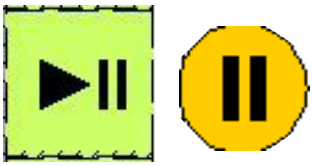
Note: This icon is only displayed if tramline clutches are installed on the machine.



- Pressing the +1 button increases the rhythm counter by one.
- Example: When the screen shows two identical numbers, such as 5/5, symmetrical tramlines are being produced.
- During seeding, the rhythm number changes automatically when the machine is lifted.
- When tramlines are activated, tyre icons will appear on the screen and a double beep sound will confirm activation.



11.4.3 PAUSE ON/OFF



When the pause button is pressed, i.e., the coulter lifting/lowering sensor is disabled, the yellow pause icon is shown on the main screen.

When the pause button is pressed again, no pause icon is shown and the lifting/lowering sensor is activated.

11.4.4 SETTINGS

Settings page 1



Back to main menu

Rotation test menu 11.4.4.1

Tramline settings 11.4.4.2

Surface area counter reset 11.4.4.3

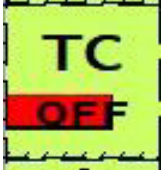
Factory settings

Change settings page

Settings page 2



All hopper sensors on/off



Task control on/off. On in precision farming, off in normal seeding.



Alarm menu 11.4.4.4



Pole lift timer 11.4.4.5



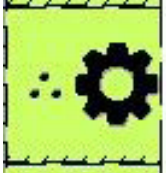
Change settings page

11.4.4.1 CALIBRATION MENU

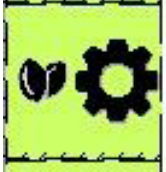
Note that the icons below and menu 11.4.4.1 are only displayed if the fertiliser and/or seed remote adjustment is installed in the machine.



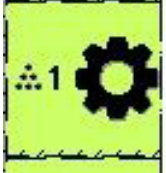
Back to main menu



Fertiliser rotation test



Seed rotation test



Front small seed device rotation test



Rear small seed device rotation test

An example of the fertiliser rotation test is given below. Seed and small seed rotation tests consist of identical stages.

1. Enter the targeted volume (kg/ha)

The cylinder movement is shown on this scale on the left..

2. Start test button moves the cylinder to the position in which the rotation test is carried out

3. Enter the desired value 1–99%%

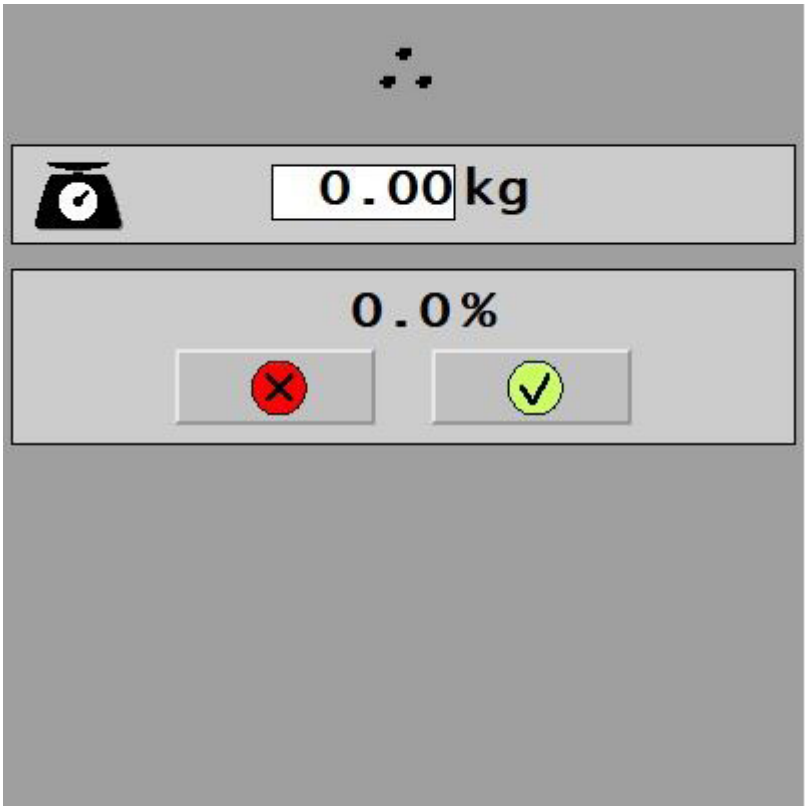
Restore factory settings. A dot after the text indicates which setting is active. Activate the fine adjustment for small seeds (rape, turnip rape, small amounts of grass seed)



When the start test button is pressed, the menu shown below will open in which the rotation test results are given. During the rotation test, gearboxes on the fertiliser side at the right end of the machine are rotated as many times as is shown in the rotation test sticker, corresponding to 100 m^2. Save the results by pressing the green V button

4. Enter the rotation test results here

5. Save the results by pressing the green V button



Once you have saved the rotation test results, the adjustment cylinder will make any corrections. The correction needed is shown as a percentage. After this, carry out one or two rotation tests to ensure that the results correspond to the desired kg/ha volume. When the percentage in the top menu is between 0% and 4%, the cylinder positioning accuracy has been reached and you can start seeding.

11.4.4.2 TRAMLINE SETTINGS

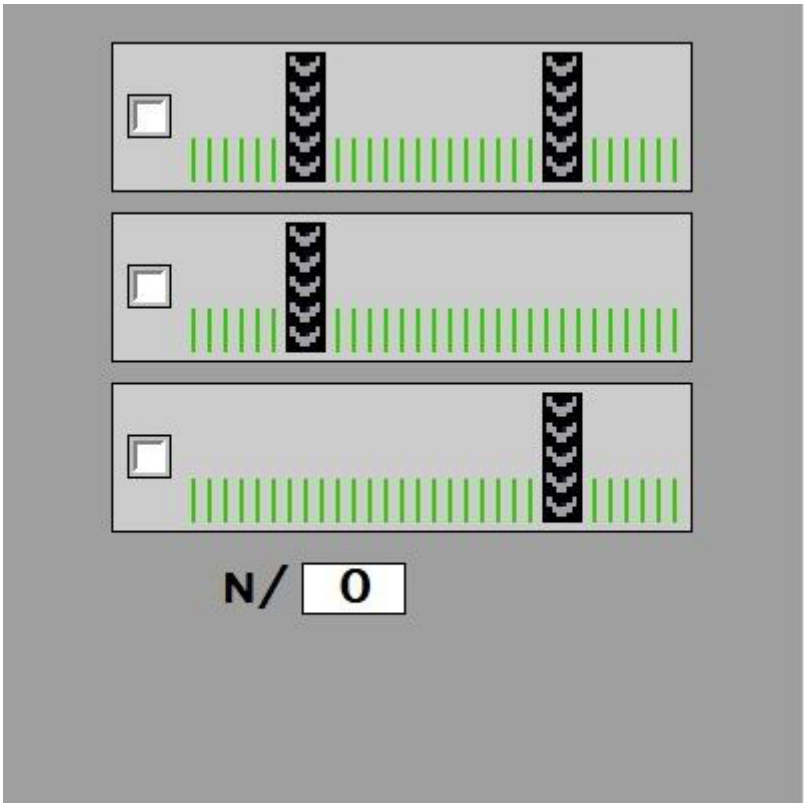
Note that the icons below and menu 11.4.4.2 are only displayed if the fertiliser and/or seed remote adjustment is installed in the machine.
.

Symmetrical tramline

Asymmetrical tramline left

Asymmetrical tramline right

Tramline rhythm selection



11.4.4.3 SURFACE AREA COUNTER RESET

By pressing surface area counter reset button 11.4.4.3, you can access a menu in which you can reset the ha1 and ha2 surface area counters.

Back to main menu

ha1 surface area counter reset

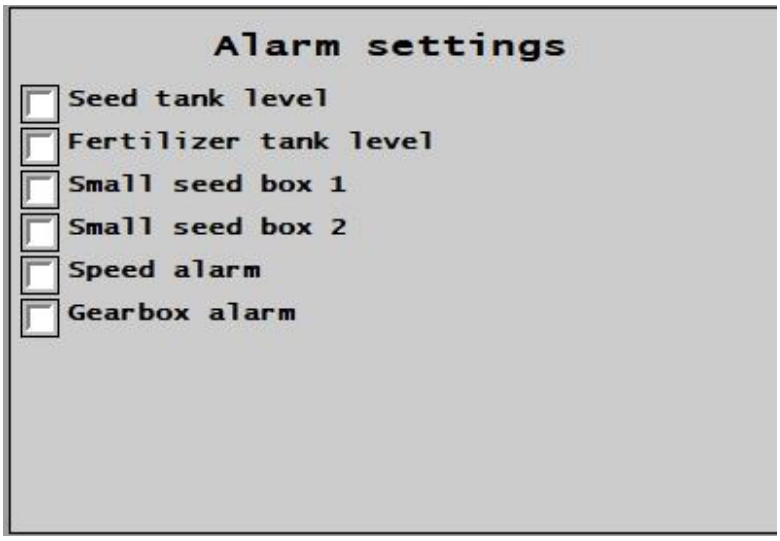
ha2 surface area counter reset



11.4.4.4 ALARMS

In the alarms menu, you can switch each alarm on or off. The list of level guard alarms only displays alarms for which sensors have been installed.

Seed hopper level guard
Fertiliser hopper level guard
Front small seed hopper level guard
Rear small seed hopper level guard
Coulters down, no speed pulses, alarm
Gearbox alarm

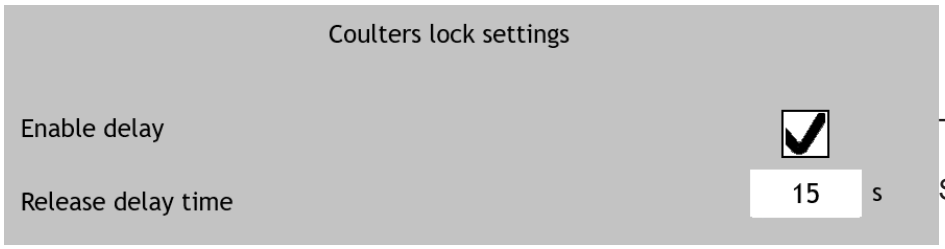


The “coulters down, no speed pulses” alarm is activated in ten seconds when the machine is down in the seeding position but no speed pulses are received. For example, if the friction wheel has been left in the transportation position or the friction wheel chain breaks.

The gearbox alarm is activated when the ratio between the rotating speeds of the cardan shaft and the seed shaft changes unexpectedly. For example, when the spring or eccentric in the seed hopper gearbox breaks.

11.4.4.5 POLE LIFT TIMER

If the pole lift timer is activated, it will automatically be disabled after the pre-defined time. This prevents any errors if the pole lift is accidentally activated when reaching a boundary strip.



Timer on/off

Setting time in seconds

When the ***Enable delay*** row is ticked, the timer is on. On the ***Release delay*** time row, select how long the pole lift remains active.

11.4.5 HOPPER SENSORS ON THE MAIN

Any hopper sensor can be disabled by touching the grey icon, after which it will turn yellow. This can be used in situations when small seeds are fed from the seed hopper, for example

When the button colour is grey, no alarms



When the button colour is red, alarms active



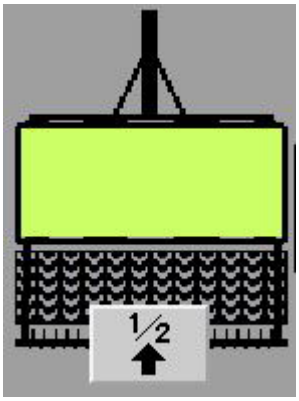
When the button colour is yellow, alarms disabled



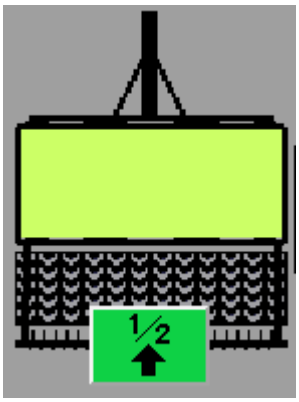
11.4.6 HALF LIFT ON THE MAIN SCREEN

When the half lift button is green, the half lift function is active.

OFF



ON



When the half lift function is active, the coulters and the friction wheel will be lifted slightly off the ground when the machine is lifted, while the following harrow will stay down. The half lift height can be adjusted by changing the lifting/lowering the sensor's height.

11.4.7 GEARBOX ALARM ON THE MAIN SCREEN

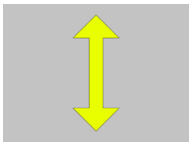
When the pole lift function is activated, a lock icon is shown in the middle of the main screen on a red background, after which the track marker can be lifted, while the coulters remain against the ground, and seeding can be continued normally. The use of the pole lift timer is presented in Section 11.4.4.5.



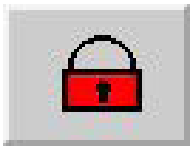
11.4.8 POLE LIFT ACTIVATION ON THE MAIN SCREEN

When the pole lift function is activated, a lock icon is shown in the middle of the main screen on a red background, after which the track marker can be lifted, while the coulters remain against the ground, and seeding can be continued normally. The use of the pole lift timer is presented in Section 11.4.4.5.

Pole lift activation button

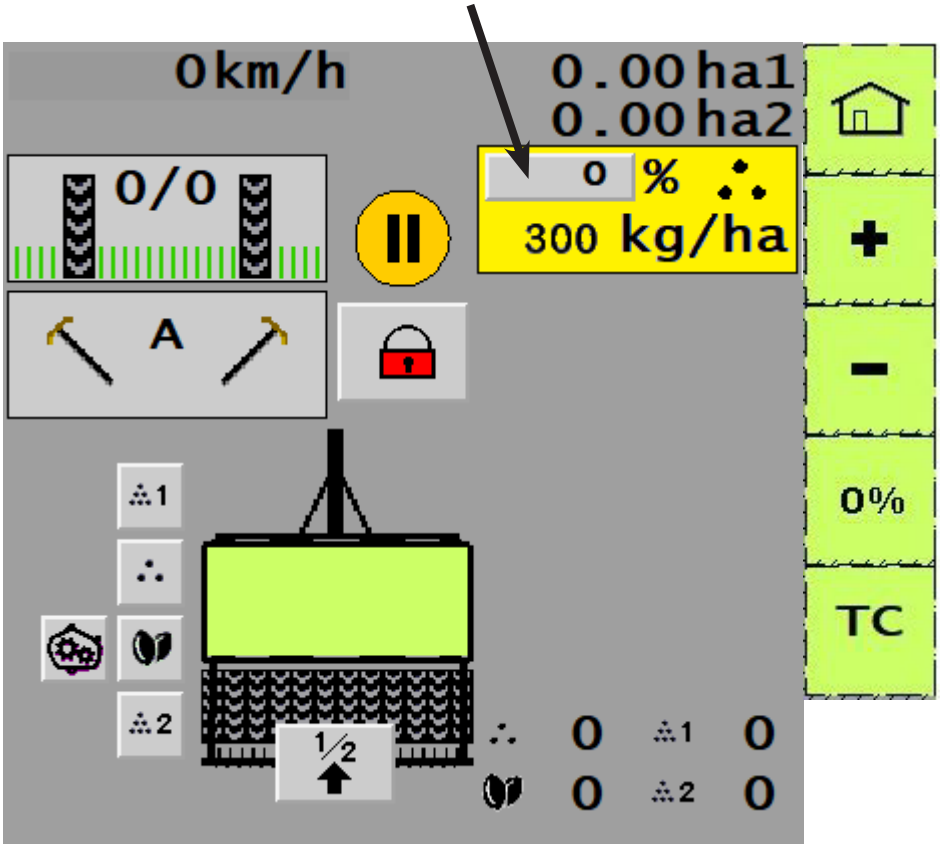


Pole lift active



11.4.9 FERTILISER REMOTE ADJUSTMENT ON THE MAIN SCREEN

When you press the button shown by the arrow on the main screen, the adjustment menu will open on the right-hand side of the screen.



Back to main menu

Increase feeding volume

Decrease feeding volume

Back to basic feeding volume

If TASK has been overridden using a manual adjustment, the TC button can be used to return the command back to TASK.

When the feeding volume is changed in the adjustment menu, the new feeding volume and the change in percentage are shown in the fertiliser remote adjustment icon. The adjustment value can be entered and changed in the rotation test menu 11.4.4.1.

If the seed and/or small seed remote adjustment is also installed in the machine, their icons are shown below the fertiliser icon on the main screen. They operate similarly to the fertiliser remote adjustment. Only one adjustment at a time can be active.

12 JUNKKARI ISOBUS ECU TECHNICAL SPECIFICATIONS (ELITE EQUIPMENT LEVEL)

The Junkkari ISOBUS ECU is programmed into the 3724 control unit manufactured by EPEC Oy.



Picture 83. The ISOBUS cable of the seeding drill and the plug on the tractor.

12.1 FUNCTIONS - JUNKKARI

1. Driving speed (km/h)
2. Area counter

- The controller includes two resettable area counters visible on the main screen. There is also a total area counter hidden behind a PIN code that cannot be reset.

3. Tramline marker (optional)

- Allows the creation of both symmetrical and asymmetrical tramlines.

4. Track marker (optional)

- Can be used in automatic mode, where the marker changes sides each time the coulters are lifted or lowered. In manual mode, the selected marker side lowers every time the coulters are lowered.

5. Pause function

- When the button is activated, the lifting/lowering sensor is disabled.
- This function is useful if the coulters need to be lifted for a reason that is not part of the regular working rhythm and you don't want to affect the tramline counting.
- Activate the pause function before the extra lift and reactivate the counter using the same button once the coulters are lowered again.

6. Remote adjustment of fertiliser rate

- The fertiliser rate (kg/ha) can be adjusted directly from the control unit. The adjustment can be selected between 1–99%. The default setting is 10%.

7. Remote adjustment of seed rate

- The seed rate (kg/ha) can be adjusted directly from the control unit. The adjustment can be selected between 1–99%. The factory default is 10%.

8. Precision seeding

- The control unit includes ISOBUS TC-GEO, ISOBUS TC-SC and ISOBUX AUX-N functionalities.
- The seed and fertiliser rates can be adjusted site-specifically, based on a pre-planned task (TASK). This requires the tractor to send location data via the CAN bus. With the ELITE equipment level, it is also possible to seed using only half of the machine's width, and the system supports section control for two sections. Curve compensation is also included as a feature.

Junkkari ELITE ISOBUS can control the remote adjustment of up to three different materials – for example, fertiliser, seed, and small seed.
The system can control a maximum of six different DC motors.

9. STOP ALL
10. PRE START

12.2 ALARMS, WARNINGS, INDICATOR LIGHTS, AND BUTTONS

1. Hopper level sensors

- Each installed level sensor has a corresponding indicator light on the controller screen. If the material inside the hopper does cover the sensor, the light turns red. The sensors are located at both the left and right ends of the hoppers (left-side hopper sensors are optional).

2. Pause function

- When the pause button is pressed, a yellow pause indicator appears in the center of the screen. While pause is active, the lift/lower sensor is disabled, and any extra lifting actions are not counted.
- The Pause button is also used to turn seeding on/off when using simulated driving speed.

3. Half lift

- When the half-lift function is active (indicated by a green button), the coulters lift slightly off the ground while the following harrow stays down. The half-lift height can be adjusted by changing the height setting of the lift/lower sensor.

4. Half-width shut-off

- You can shut off the left or right half of the machine by pressing the L (left) or R (right) buttons.
- When a button is blue, that side is shut off. After lifting the machine, the half-width shut-off must be activated again.
- If TC-SC is active, the motors cannot be shut off manually.

5. Coulter pressure adjustment

- Coulter pressure can be increased or decreased using the pressure adjustment buttons on the screen (this requires the tractor to have LS hydraulic system).
- The plus button increases and the minus button decreases the coulter pressure.

6. Automatic coulter pressure control (Requires LS hydraulics from the tractor.)

- Activate with the LS button (the system is active when the LS button is yellow).
- If you manually adjust the pressure with the buttons, you need to reactivate the automatic system again afterward.

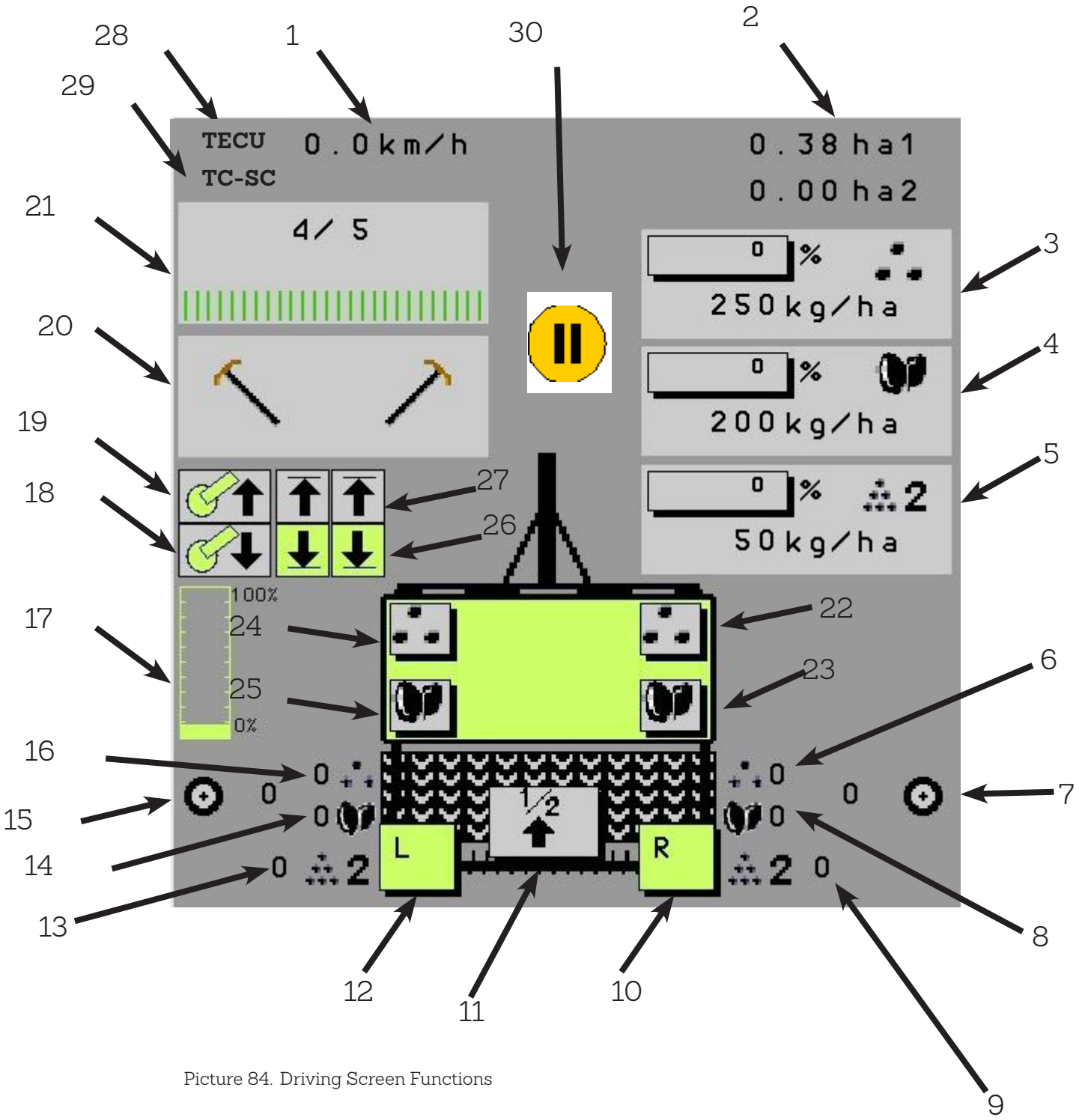
7. STOP ALL (transport mode on road)

- Press and hold the button for 3 seconds to cut power to all electric motors. The L and R motor buttons turn red.
- To reactivate the motors, press and hold the button for 3 seconds. The L and R buttons return to green.

8. PRE START

- The PRE START function is activated when the machine is raised at the headland. As soon as the machine is lowered, it starts seeding at a speed of 5 km/h. When the actual speed exceeds 5 km/h, seeding continues normally based on the machine's speed signal.
- If PRE START is active and the machine is lowered, it will seed for only 5 seconds if no speed signal is received.

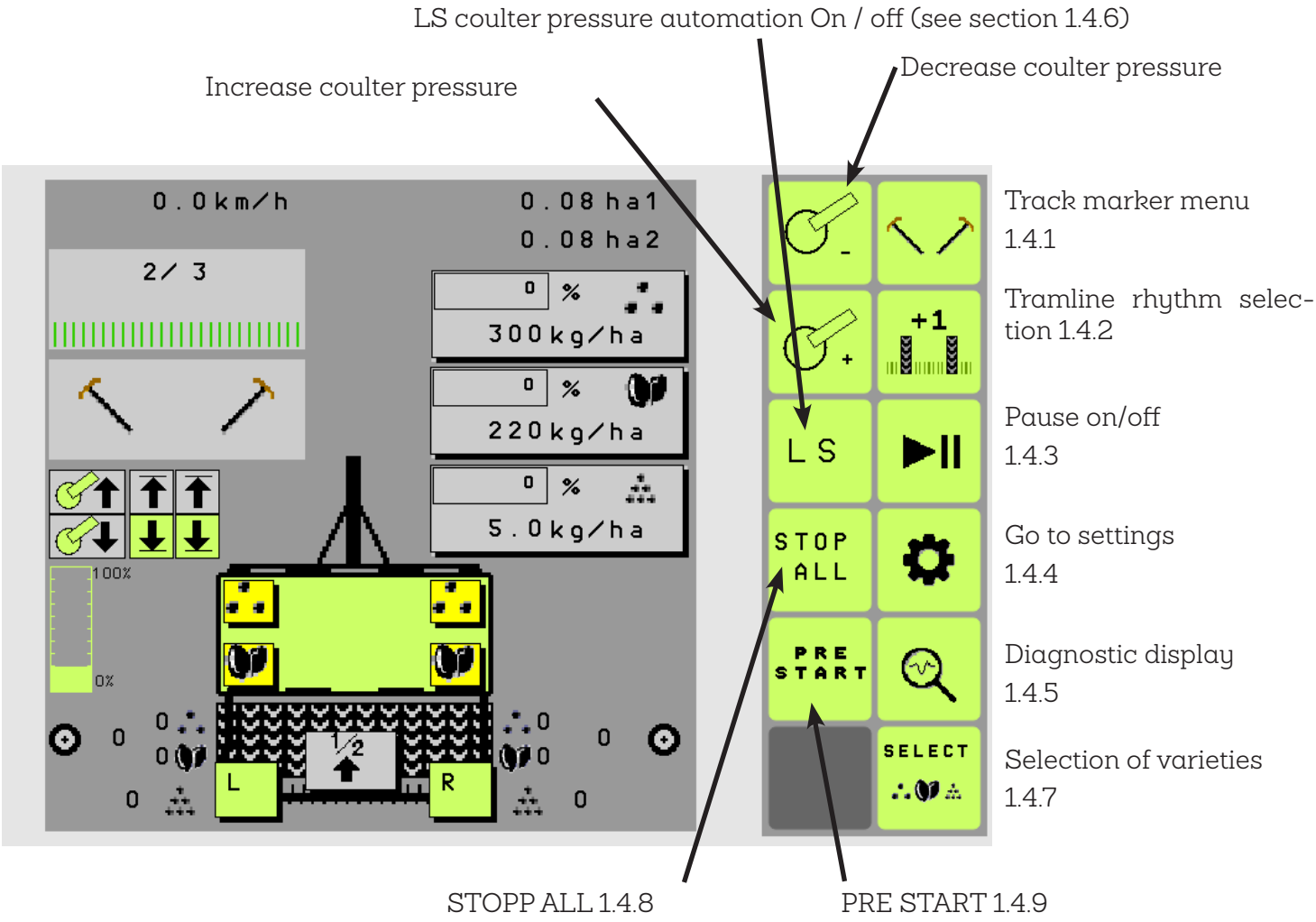
12.3 DISPLAY FUNCTIONS ELITE



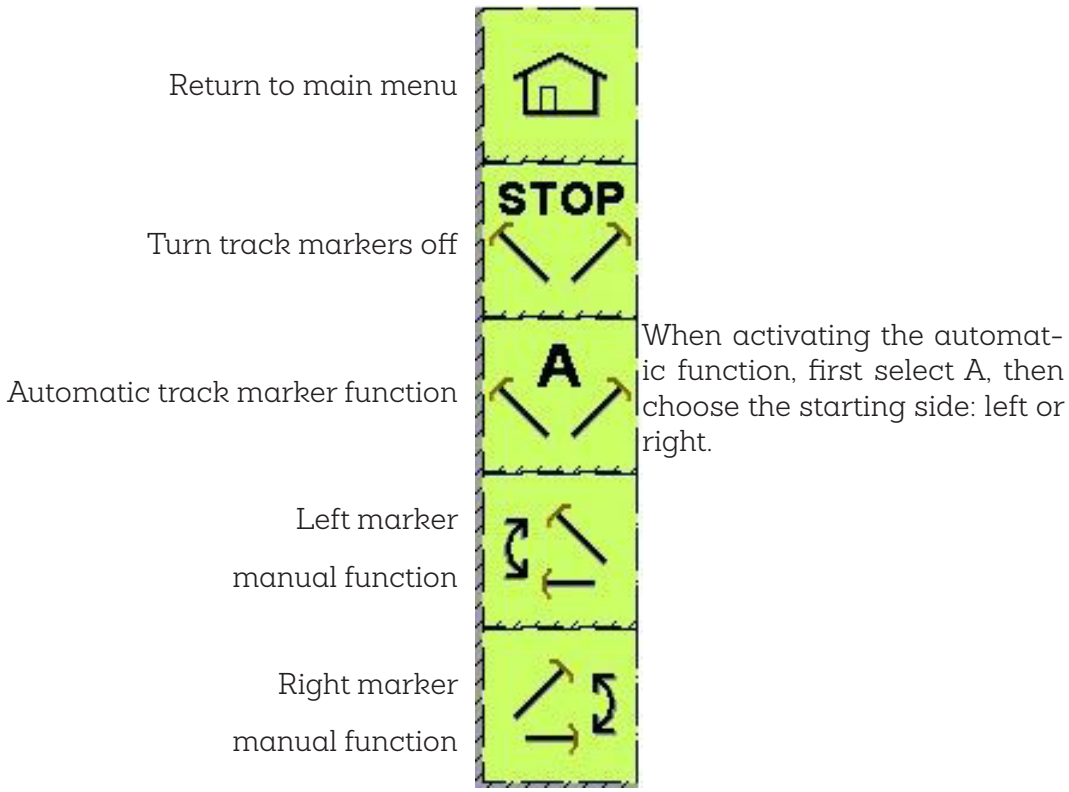
Picture 84. Driving Screen Functions

1. Driving speed
2. Area counters
3. Fertiliser remote adjustment
4. Seed remote adjustment
5. Small seed remote adjustment (small seed box is optional)
6. Right fertiliser shaft RPM
7. Right packer wheel RPM
8. Right seed shaft RPM
9. Right small seed shaft RPM
10. Right half-width shut-off
11. Half lift (active when green)
12. Left half-width shut-off
13. Left small seed shaft RPM
14. Left seed shaft RPM
15. Left packer wheel RPM
16. Left fertiliser shaft RPM
17. Coulter pressure cylinder gauge. Displays the value as a percentage of the maximum value (250 bar).
18. Automatic coulter pressure – increase pressure
19. Automatic coulter pressure – decrease pressure
20. Track markers (optional)
21. Tramlines (optional)
22. Right fertiliser hopper level sensor
23. Right seed hopper level sensor
24. Left fertiliser hopper level sensor
25. Left seed hopper level sensor – red means the hopper is almost empty
26. Lower limit sensors for automatic coulter pressure
27. Upper limit sensors for automatic coulter pressure
28. If "TECU" is shown next to the speed display, speed is taken from the tractor's ISOBUS CAN bus.
29. If a Task Controller (TC) and a Section Control (SC) are present in the controller, they will appear on a yellow background. When the function is activated, the background colour changes to green.
30. The icon flashes when the PAUSE function is active or when simulated speed is selected but seeding has not yet started. When the PLAY button is pressed, the icon disappears and the machine starts seeding at the simulated speed.

12.4 FRONT PAGE BUTTONS – ELITE



12.4.1 TRACK MARKER MENU

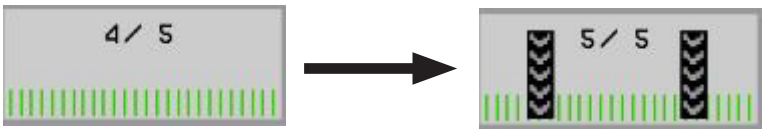


12.4.2 TRAMLINE RHYTHM SELECTION

Note: The icon 11.4.2 is only shown if the machine is equipped with tramline clutches.



The +1 button increases the counter by one. When the same number is displayed on both sides, for example 5/5, symmetrical tramlines are being created. During seeding, the rhythm number changes when the machine is lifted. When tramlines are activated, wheel icons appear on the display and a double beep is heard from the controller.



12.4.3 PAUSE ON/OFF



When the Pause button is pressed, the coulter lifting/lowering sensor is deactivated and a yellow Pause icon appears on the main screen.

When the Pause button is pressed again, the icon disappears and the sensor is reactivated.

12.4.4 SETTINGS

SETTINGS PAGE 1



Return to main menu

Calibration menu 13.4.4.1

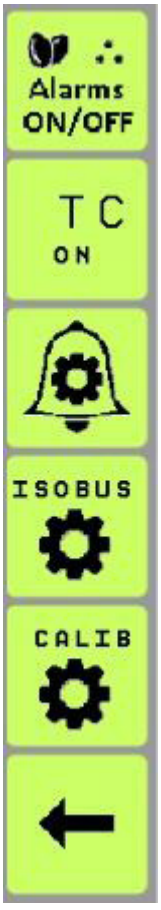
Tramline settings 13.4.4.2

Reset area counters 13.4.4.3

Restore factory settings

Switch to next settings page

SETTINGS PAGE 2



All hopper sensors On/Off

Task controller On/Off – should be ON for precision farming, OFF for normal seeding

Alarm settings 13.4.4.4

ISOBUS settings and information 13.4.4.5.

Switch to next settings page

CALIBRATION MENU 1.4.4.1



Return to main menu

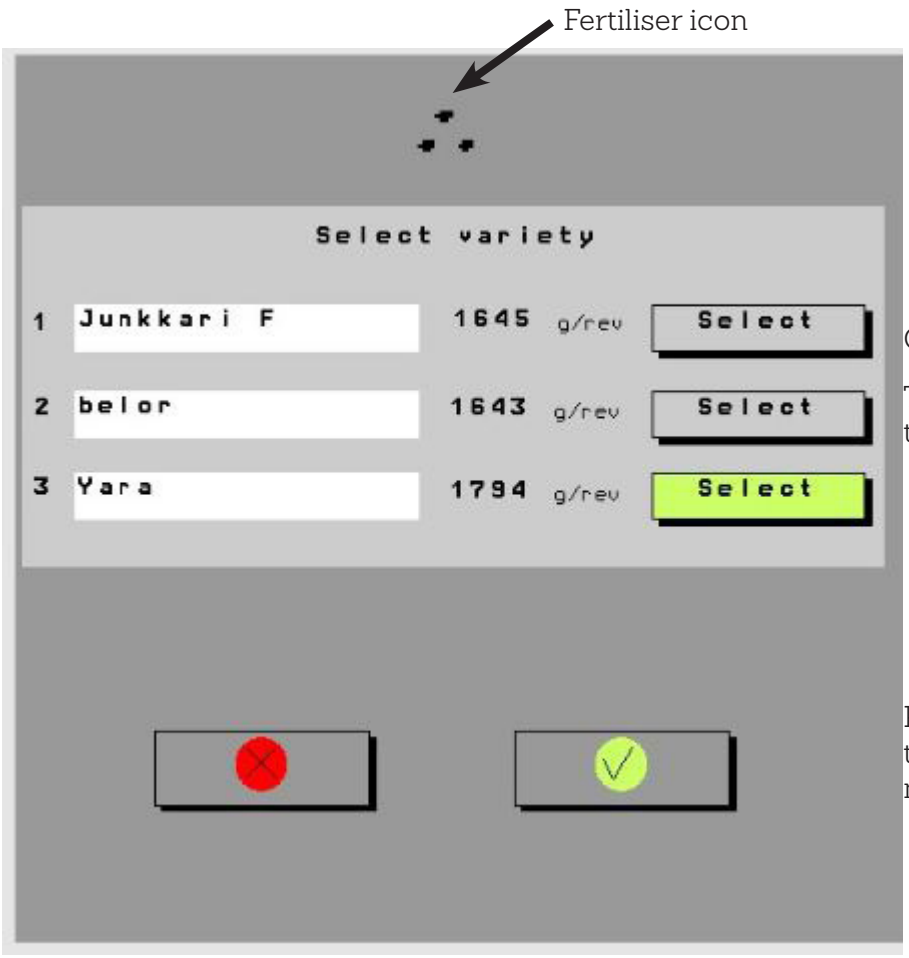
Fertiliser calibration

Seed calibration

Small seed box calibration

(Visible only if the small seed box is installed)

Below is the fertiliser calibration page. The seed and small seed calibration pages are identical, with the icon at the top of the page indicating whether the calibration is for fertiliser, seed, or small seeds.

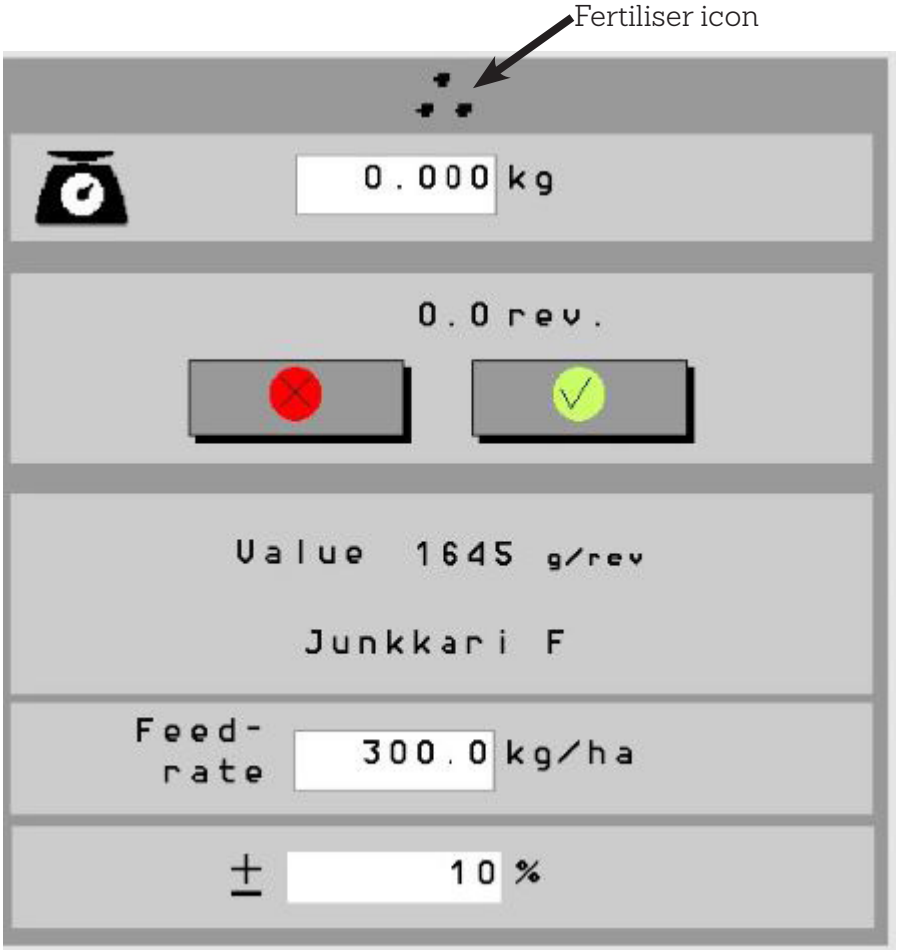


Calibration memory slots.

The calibration test result is saved to the selected slot (green)

Press the V button to go to the cycle test, the X button to exit the drive mode.

Below is the calibration test page for fertiliser. The calibration pages for seed and small seed are identical, only the icon at the top of the page indicates which material is being tested.



Calibration test result (g)

Number of turns during the calibration test

Press the green V button to save the calibration test result to the selected memory slot. Press X to discard the result.

Calibration test result (g/turn)

Name of the memory slot where the calibration test result is saved

Selected application rate (kg/ha)

Application rate adjustment step size during operation



Use the Home button to return to the main work screen.

TRAMLINE SETTINGS 1.4.4.2

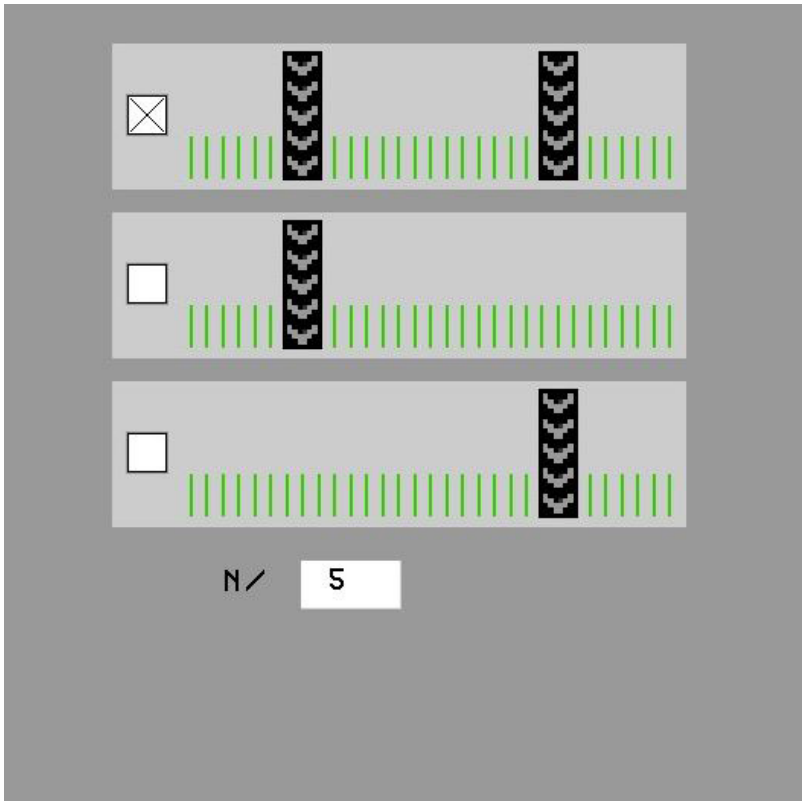
Note: the icons and menu described below are only visible if the machine is equipped with tramline clutches.

Symmetrical tramline

Asymmetrical tramline left

Asymmetrical tramline right

Tramline rhythm selection



RESETTING THE AREA COUNTERS 1.4.4.3

From the reset button in menu 1.4.4.3 you can open the view where the area counters ha1 and ha2 can be reset.

Return to main menu

Reset area counter ha1

Reset area counter ha 2



ALARMS 1.4.4.4

From the alarm menu, you can turn all alarms On or Off.

Only those level sensor alarms are shown in the list that have installed sensors.

The small seed tray is an optional accessory..

Seed hopper level sensor

Fertiliser hopper level sensor

Small seed hopper level sensor (optional)

Reversing alarm when half lift is active

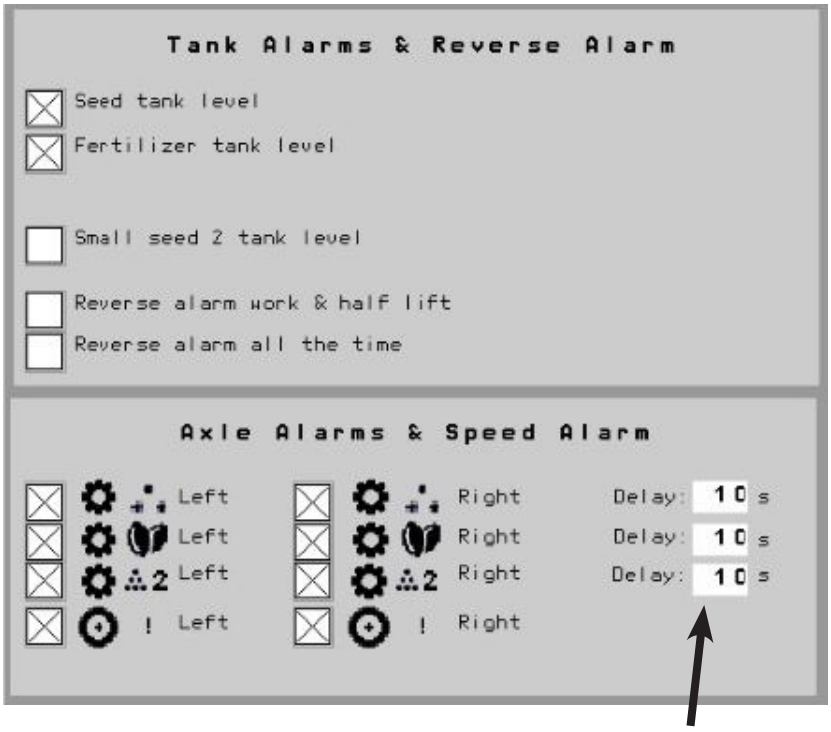
Reversing alarm always active

Fertiliser motor alarms

Seed motor alarms

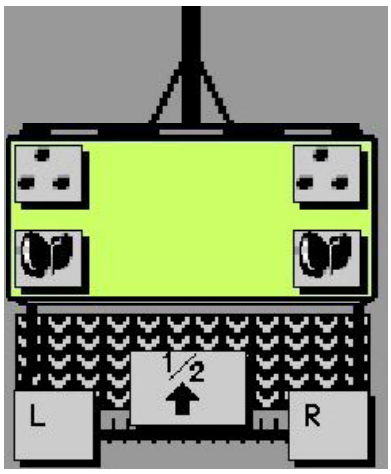
Small seed motor alarms

Speed sensor alarms

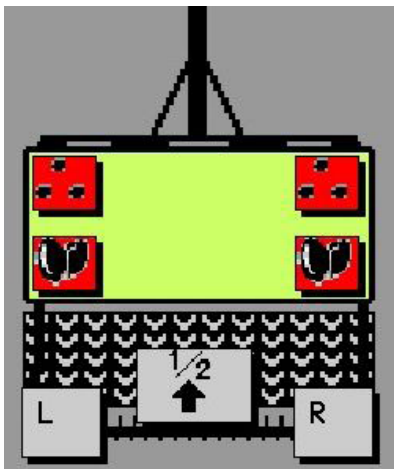


Delays in feed axis alarms

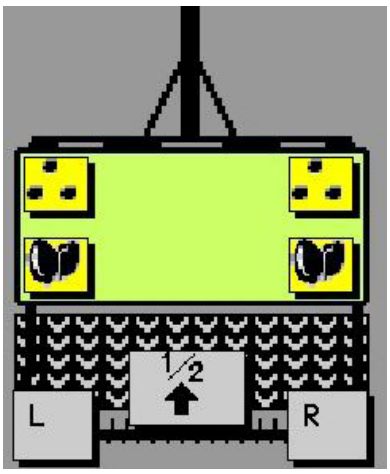
Hopper icons on the main screen:



Grey button = no alarm



Red button = alarm is active

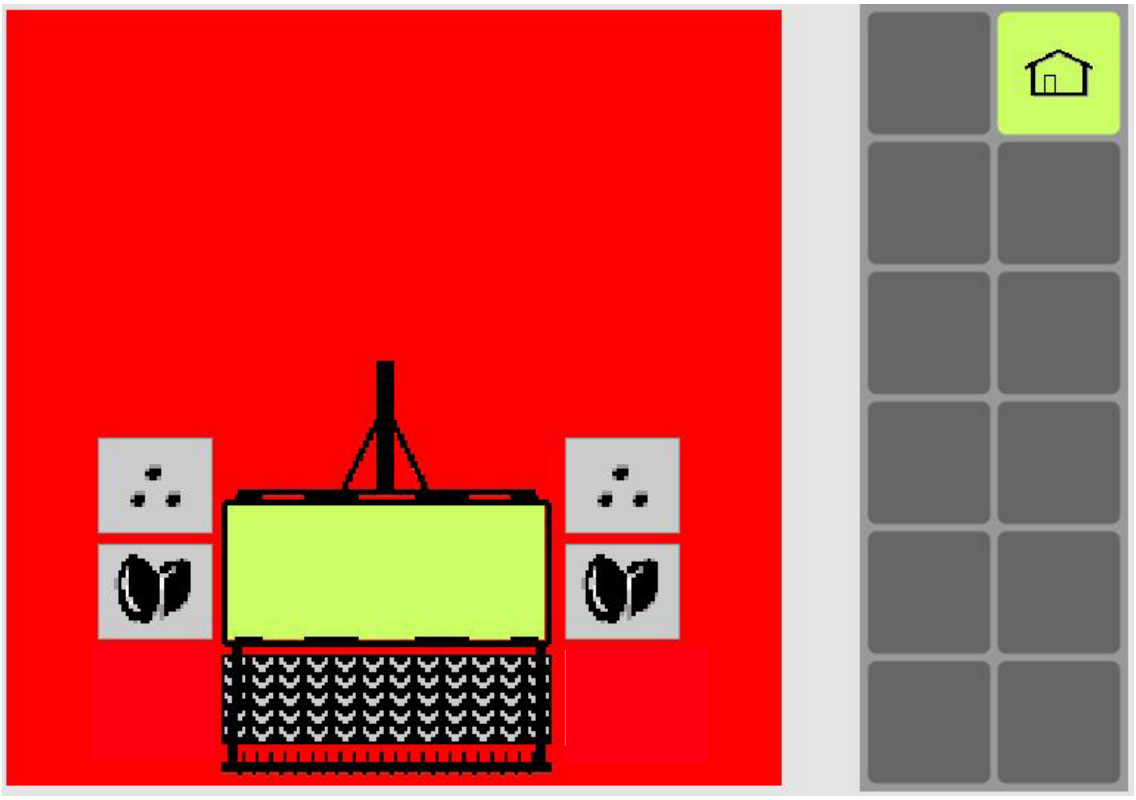


Yellow button = alarm has been turned off

As shown in the image below, a hopper alarm activates when the hopper level drops below the warning threshold.

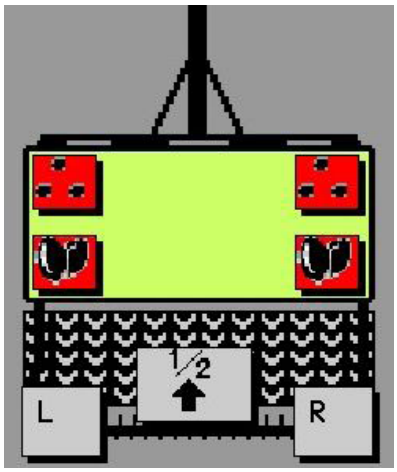
Icons next to the hopper indicate which hopper triggered the alarm.

In the example, alarms come from both the seed and fertiliser hoppers on both left and right sides – meaning the machine is completely empty.



The alarm is acknowledged by pressing the "Home" button in the upper right corner.

A smaller red icon will then remain on the main screen as a reminder.

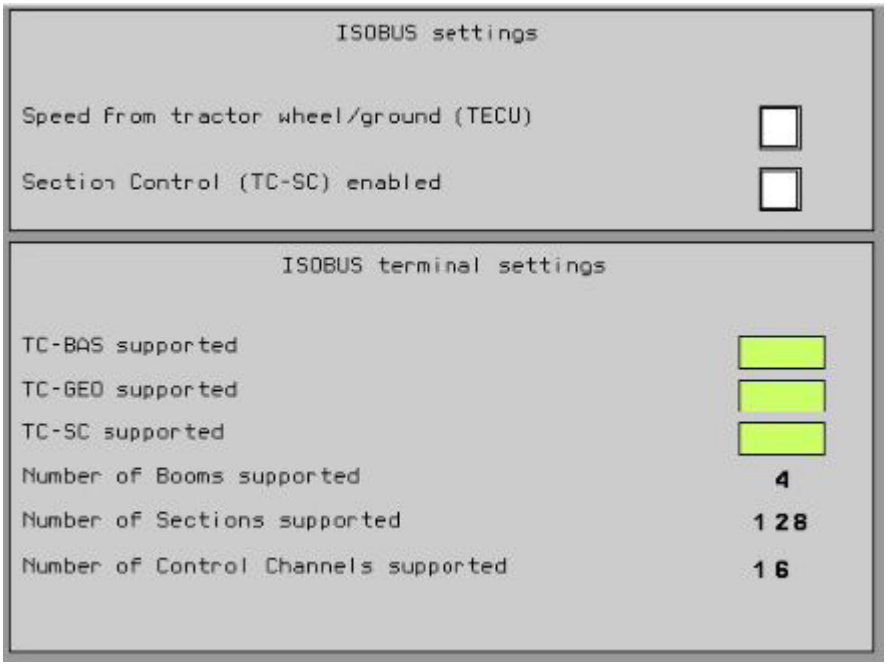


ISOBUS SETTINGS AND INFORMATION 1.4.4.5

Driving speed from tractor CAN bus

Precision farming features on/ off

ISOBUS functionalities



CALIBRATION SETTINGS 1.4.4.6

If "Speed from TECU" is selected, the curve compensation function is disabled, and a red TECU icon is shown on the screen.

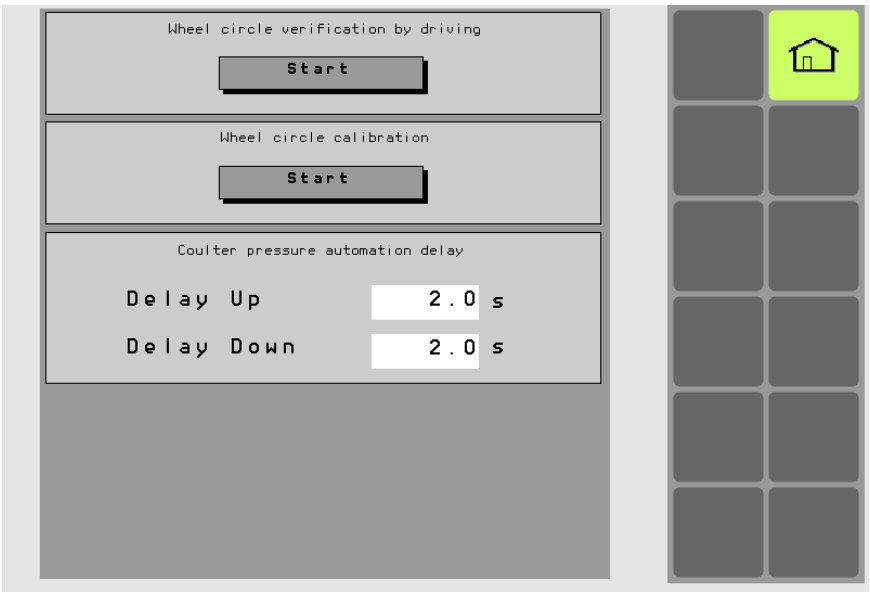


Distance test

Wheel circumference calibration

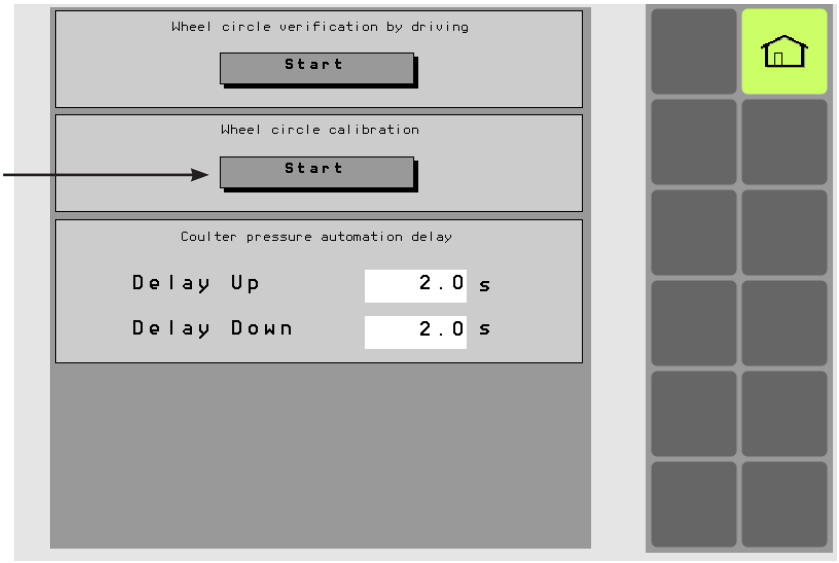
Delay when increasing coulter pressure

Delay when decreasing coulter pressure

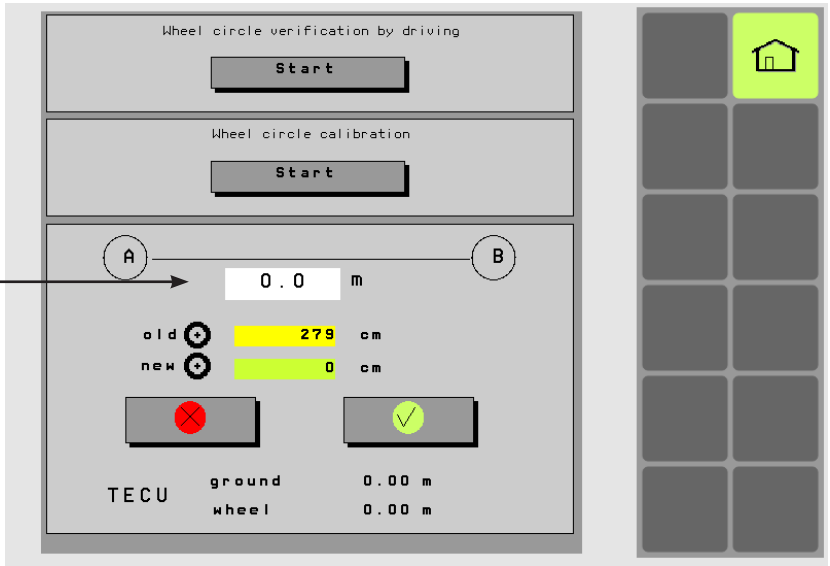


WHEEL CIRCUMFERENCE CALIBRATION

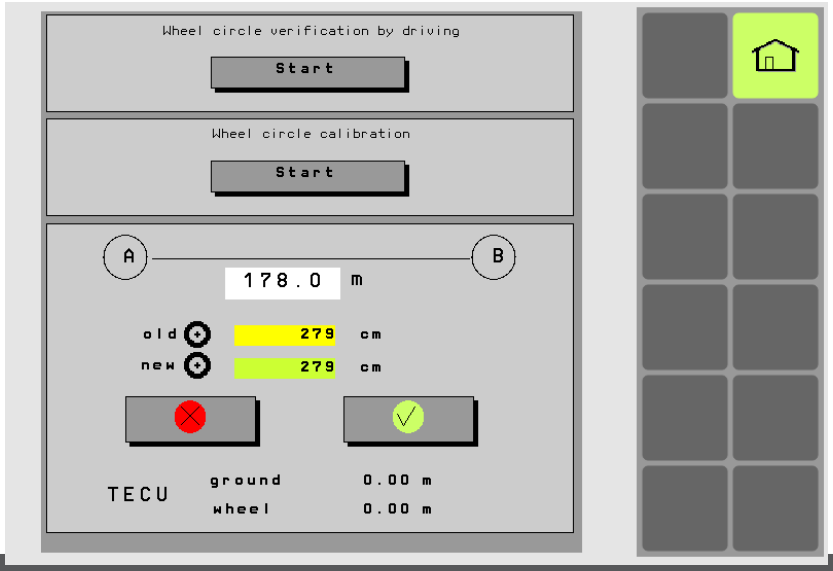
1. Start the calibration by pressing the Start button



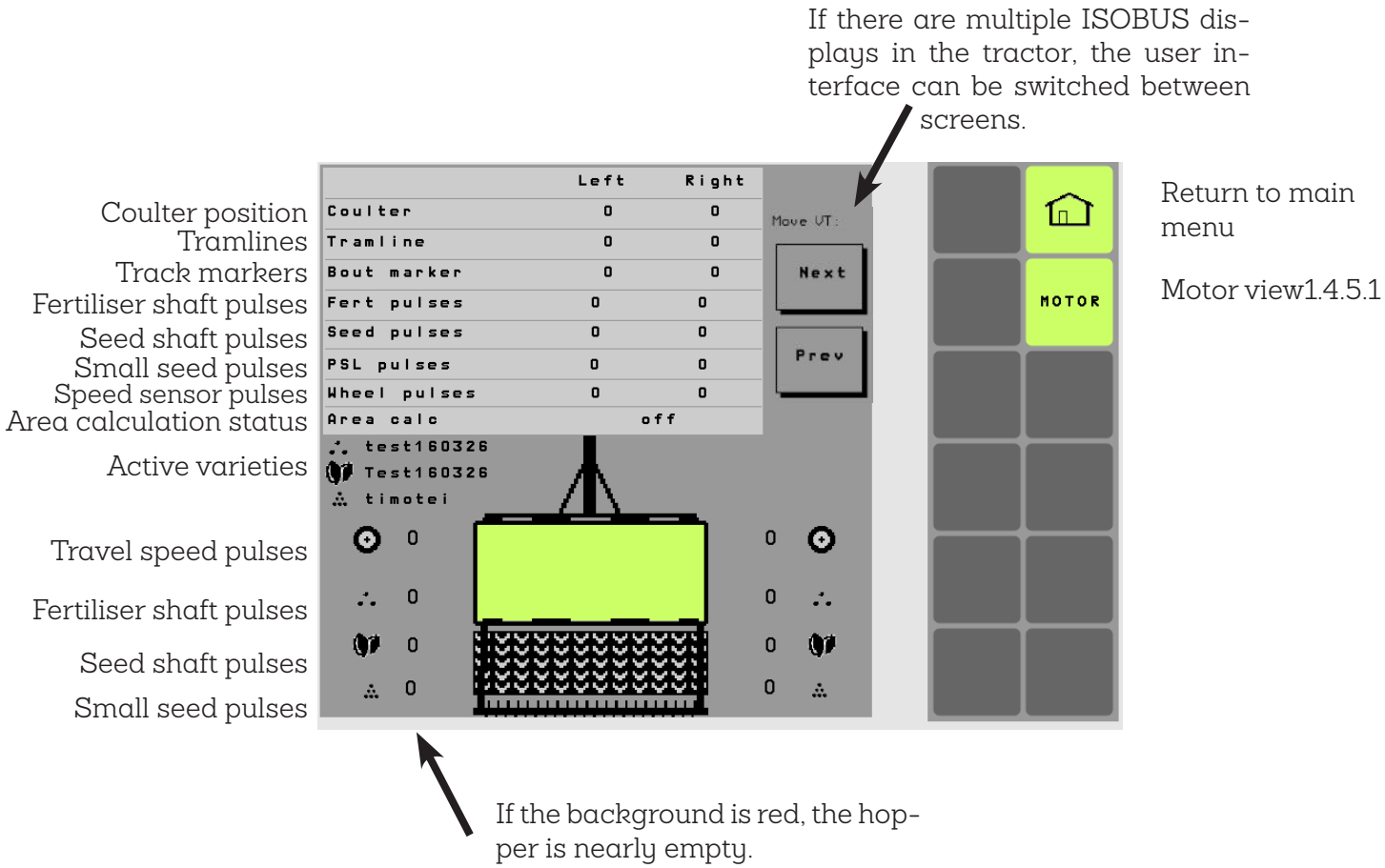
2. Reset the distance counter before the test drive



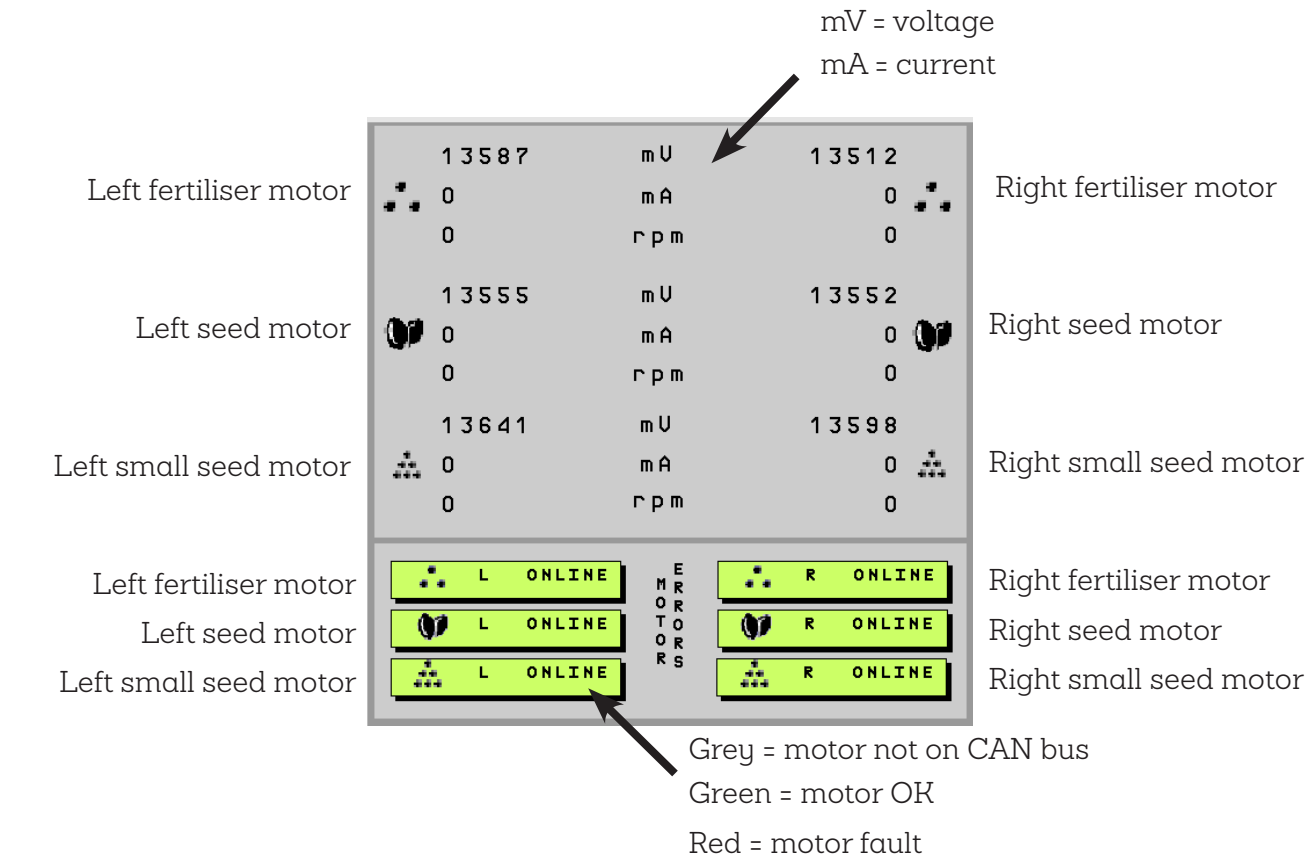
3. Drive a known distance, stop the tractor, and enter the driven distance, in this case 178 meters. When you confirm the distance with the V button, the value is saved (behind the PIN code) as the new wheel circumference value.



12.4.5 DIAGNOSTICS DISPLAY



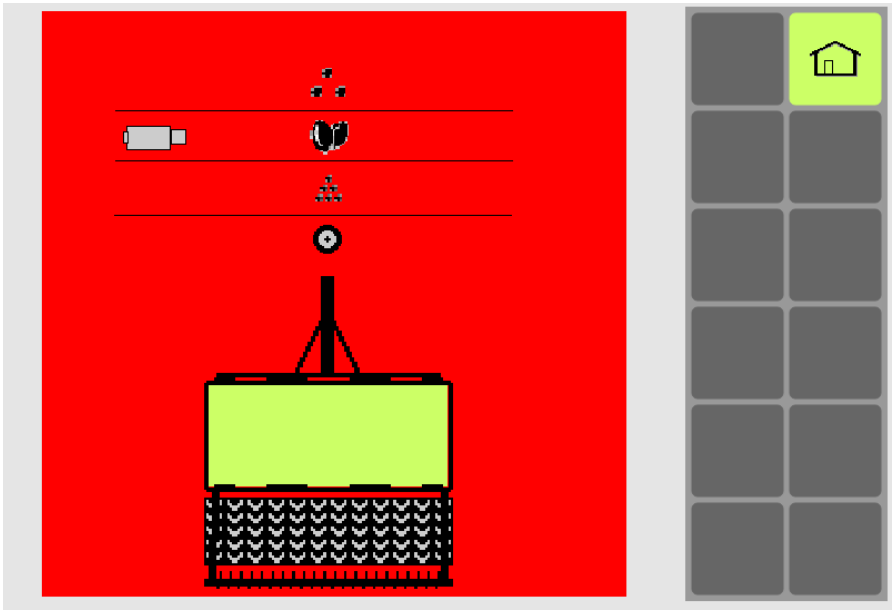
Motor View 1.4.5.1



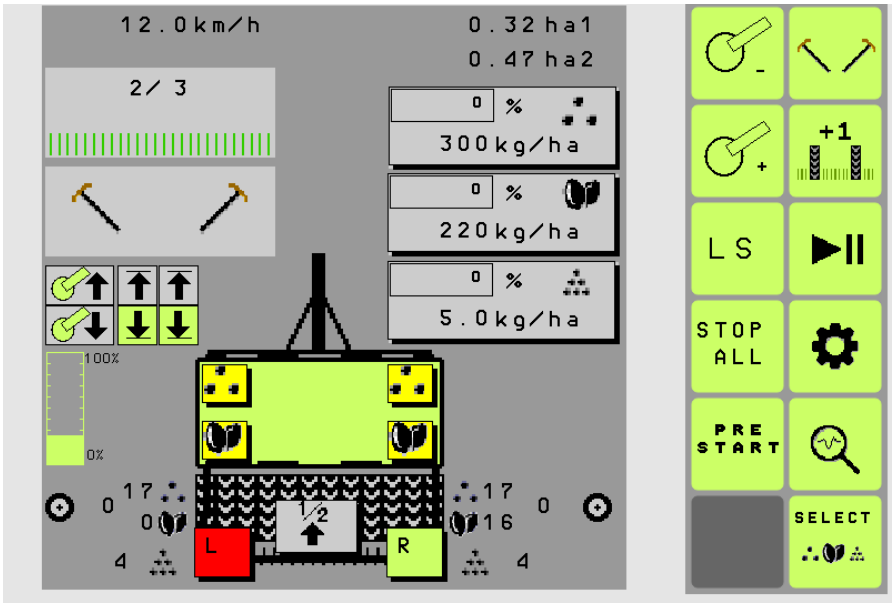
EXAMPLE OF A MOTOR FAULT

In the event of a motor fault, the display shows the situation on the right: the entire screen background turns red and the faulty motor is indicated.

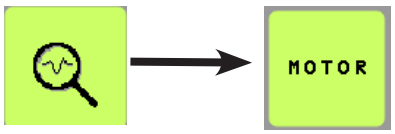
In this case, the fault is in the left seed motor. Acknowledge the alarm by pressing the Home button to return to the driving screen.



On the driving screen, the side of the machine where the faulty motor is located is shown in red.

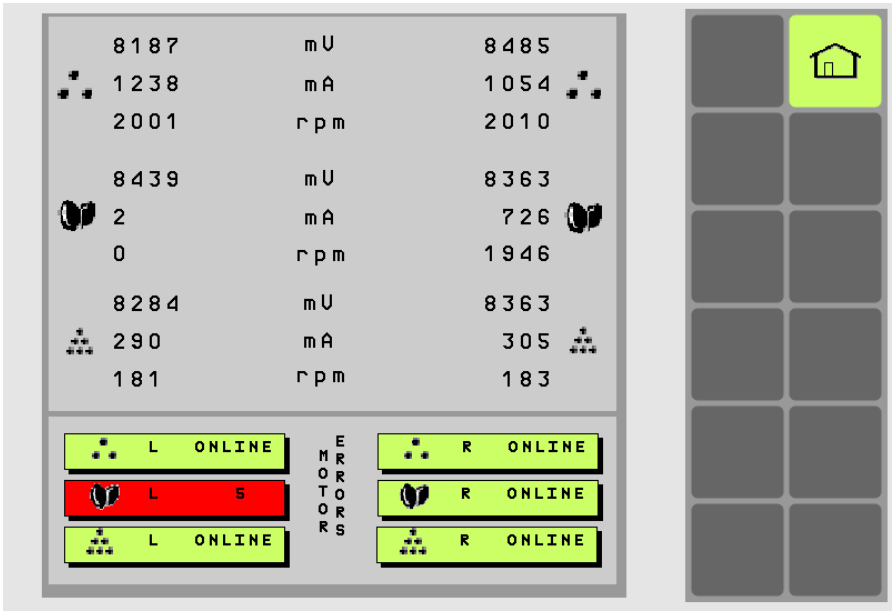


The motor diagnostics page can be accessed by pressing the buttons shown below.



On the diagnostics page, it can be seen that the left seed motor is in fault mode and the fault code is 4, which means the motor voltage is too low.

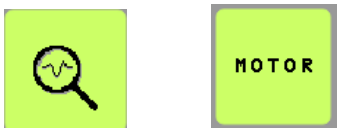
Find the cause of the low voltage, fix the issue, and then press the button of the faulty motor (red) until it turns green again.

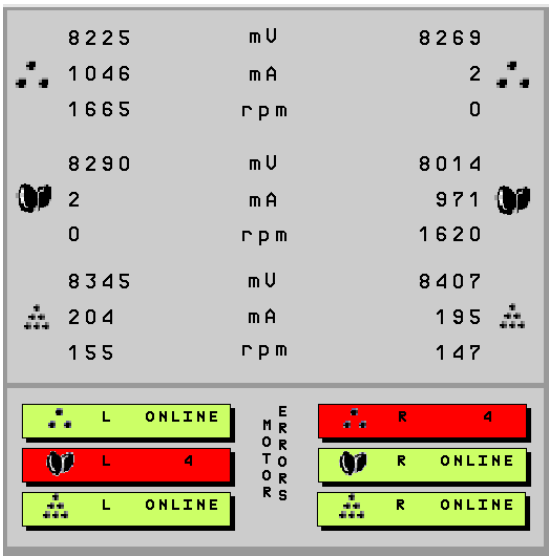


KAG M63 DC Motor error codes

1 ERROR_OVERTEMPERATURE_CPU	MOOTTORIN YLIKUUMENEMINEN
2 ERROR_OVERTEMPERATURE_CHOPPER	MOOTTORIN YLIKUUMENEMINEN
3 ERROR_VELOCITY_WINDOW	MOOTTORIN EPÄTARKKUUS
4 ERROR_UNDERVOLTAGE_LOGIC	MOOTTORIN ALIJÄNNITE
5 ERROR_UNDERVOLTAGE_POWER	MOOTTORIN ALIJÄNNITE
6 ERROR_OVERVOLTAGE_LOGIC	MOOTTORIN YLIJÄNNITE
7 ERROR_OVERVOLTAGE_POWER	MOOTTORIN YLIJÄNNITE
8 ERROR_WRONG_PARAMETER	MOOTTORIN VÄÄRÄ ALUSTUS
9 ERROR_OVERPOWER	MOOTTORILLA YLIKUORMA
10 ERROR_OVERCURRENT	MOOTTORILLA YLIVIRTA
14 ERROR_ENCODER_AGC	MOOTTORIN PAIKKA-ANTURIN HÄIRIÖ
15 ERROR_NODE_GUARDING	MOOTTORIOHJAIMEN HÄIRIÖ
16 ERROR_HARDWARE_OC	MOOTTORIN PIIRILEVYN HÄIRIÖ
21 ERROR_OPERATION_RANGE_MAX	MOOTTORIN MAX RPM YLITETTY
25 ERROR_ENCODER_DATA	MOOTTORIN PAIKKA-ANTURIN HÄIRIÖ
26 ERROR_HARDWARE_INIT	MOOTTORIN ALUSTUS VIRHE
27 ERROR_ENCODER_MAGLO	MOOTTORIN PAIKKA-ANTURIN HÄIRIÖ
28 ERROR_CONSTANT_MEMORY_CORRUPTED	MOOTTORIN MUISTIPIIRIN HÄIRIÖ
29 ERROR_RESTORE_MEMORY_CORRUPTED	MOOTTORIN MUISTIPIIRIN HÄIRIÖ

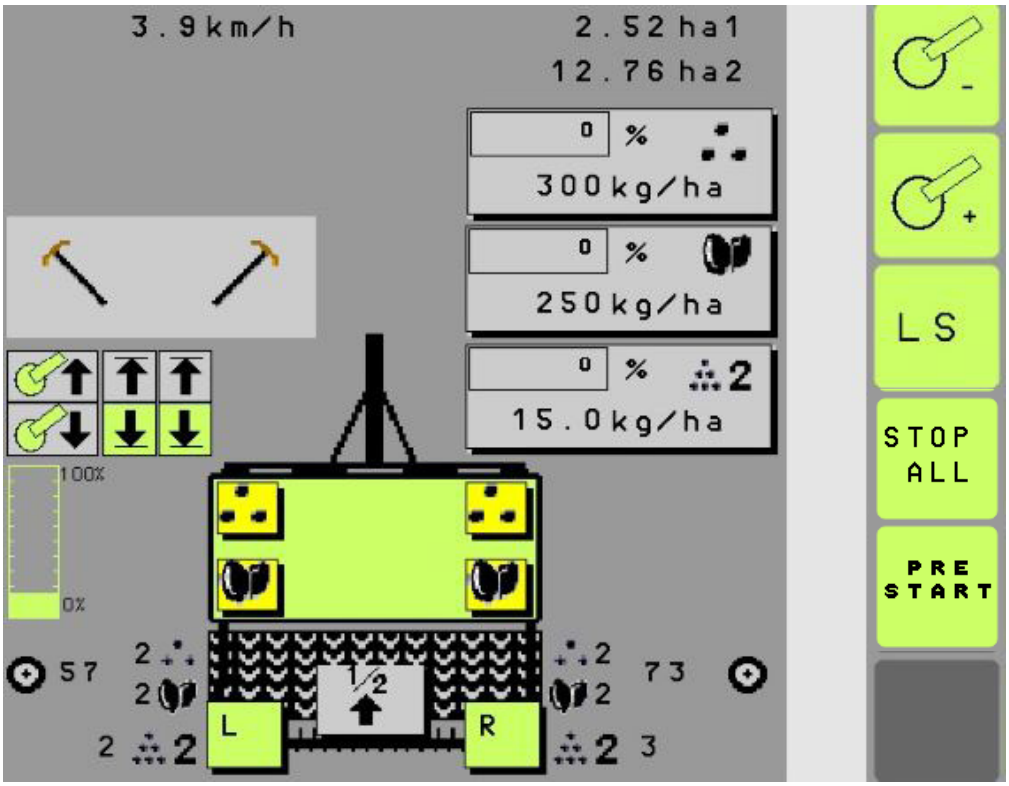
Example below / esimerkki alla, ERROR 4 undervoltage / alijännite





12.4.6 LS AUTOMATION

Driving screen view in M and T models



Manual adjustment of coulter pressure, decreases pressure

Manual adjustment of the coulter pressure increases the coulter pressure.

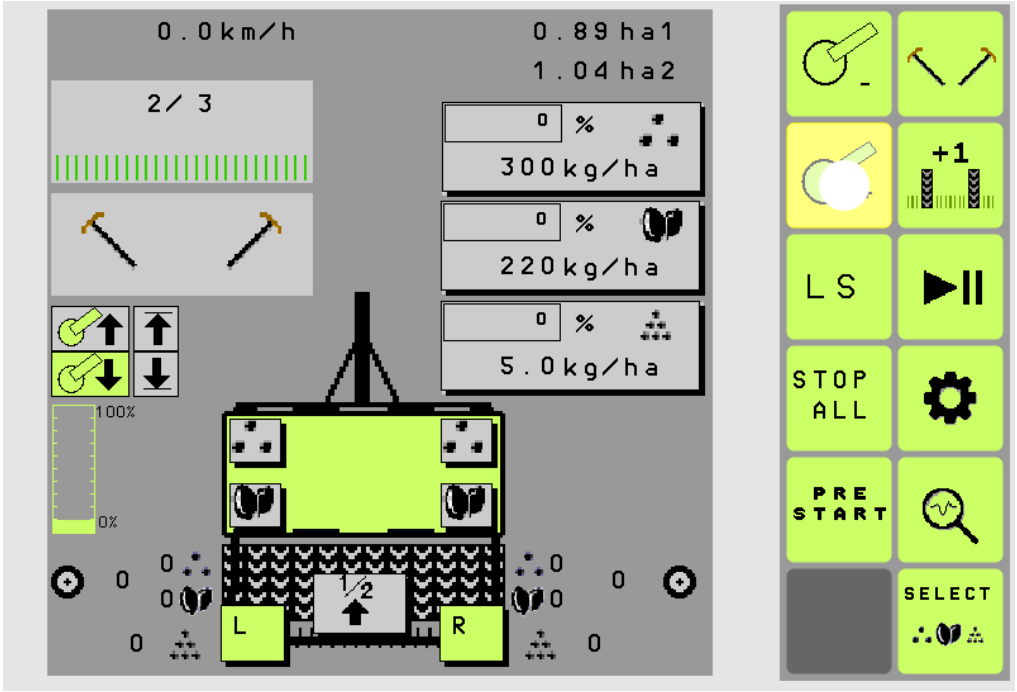
Automatic coulter pressure on/off. When the checkbox is yellow, the automation is on.

The coulter pressure automation only works when the machine is in the sowing position and receives driving speed pulses.

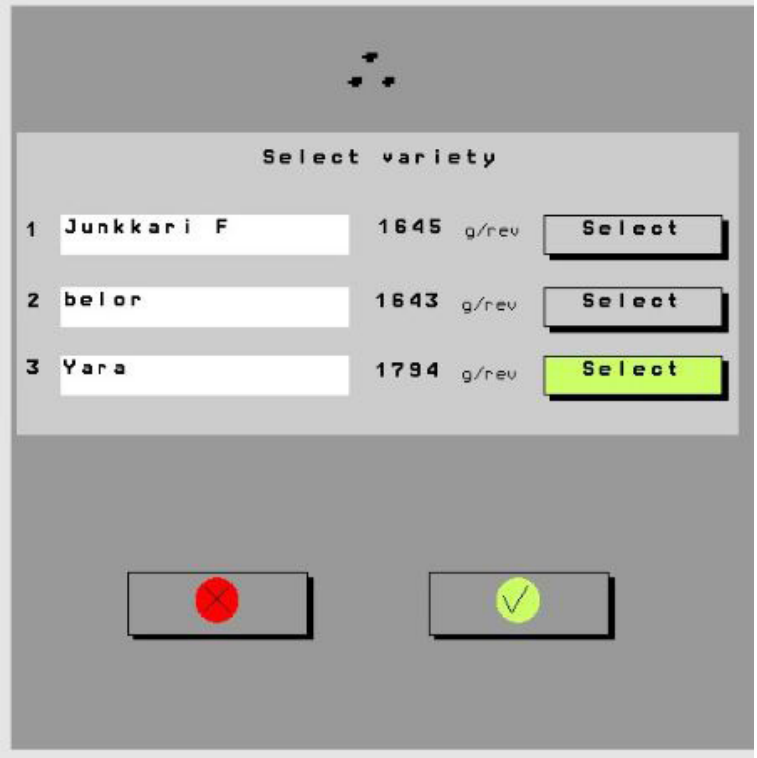
LS minus adjustment stops automatically when the pressure is below 4 bar.

LS plus adjustment stops when the pressure exceeds 160 bar.

Driving screen view in R model



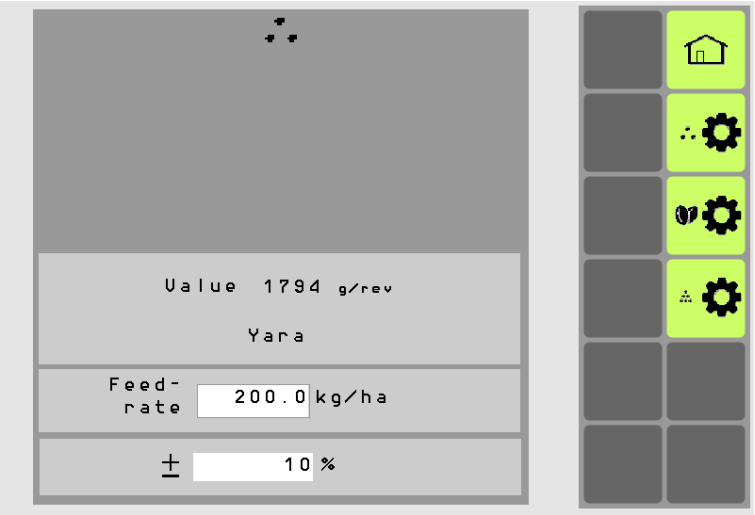
12.4.7 VARIETY SELECTION





Use the Select buttons to choose the variety being sown. The line shows the name of the variety and the calibration test result in g/turn.

Press the green **V button** to confirm the selected variety and return to the driving screen. Press **X** to exit the selection screen



After confirming the selected calibration test memory slot with the green V button, the left view opens. Here you can still adjust the kg/ha value and the % value.

12.4.8 STOPP ALL



STOP ALL (transport mode on road)

- Press and hold the button for 3 seconds to cut power to all electric motors. The L and R motor buttons turn red.
- To reactivate the motors, press and hold the button for 3 seconds. The L and R buttons return to green

12.4.9 PRE START



- **The PRE START function** is activated when the machine is raised at the headland. As soon as the machine is lowered, it starts seeding at a speed of 5 km/h. When the actual speed exceeds 5 km/h, seeding continues normally based on the machine's speed signal.
- If PRE START is active and the machine is lowered, it will seed for only 5 seconds if no speed signal is received.

12.5 CALIBRATION TEST – ELITE

On ELITE seed drills with electric feeding, the calibration test is carried out as follows. This example uses the fertilizer hopper, but the process is exactly the same for seed and small seed hoppers.

Check Table 10 for the correct bottom flap setting. Note that on ELITE machines, the bottom flap is adjusted centrally using a single lever at the left end of the machine (in the direction of travel).

Set the flap selector to position 2, which is for calibration testing.

Place the calibration trays under the metering units. Make sure the tray's gentler slope faces the metering unit.

In the ELITE ISOBUS interface (section 1.4.4), perform the calibration test as follows:

On the main screen, press the gear icon to access the settings menu.

From the settings menu (1.4.4.1), press the calibration test button to select the hopper (material) for the test. The buttons from top to bottom are:

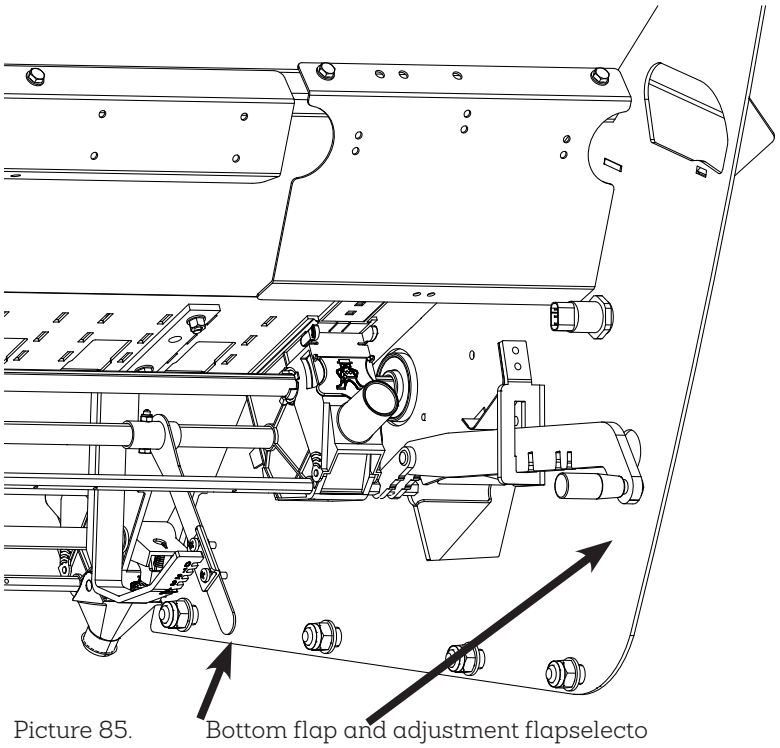
- Main menu
- Fertilizer calibration test
- Seed calibration test
- Small seed calibration test (only visible if the small seed box is installed)

As an example, select the fertilizer calibration test to open the fertilizer test screen.

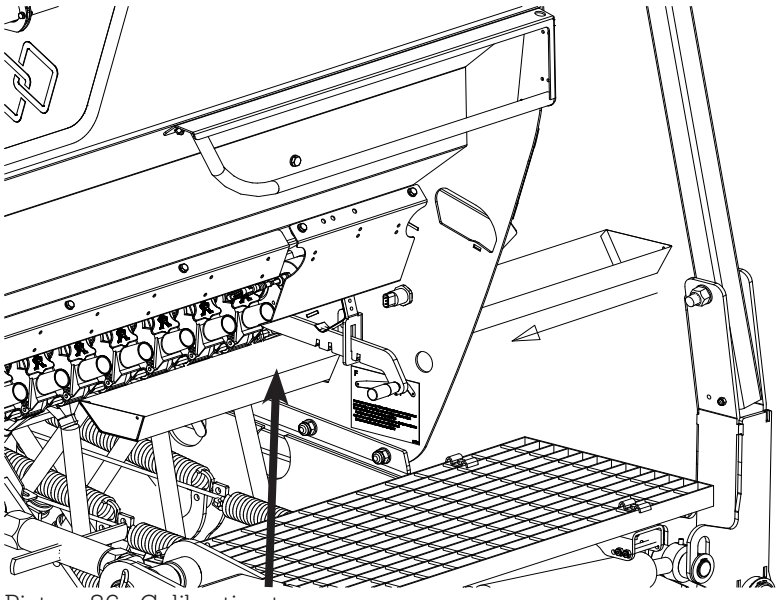
Before running the actual test, fill the metering units by pressing the calibration test button for the fertilizer side. At the same time, make sure all units feed evenly and that there is no debris or foreign matter. Empty the trays and place them back again.

Exit the calibration screen by pressing the home button, then re-enter the fertilizer calibration screen. This resets the rev counter, which must show 0.0 rev before starting the actual test.

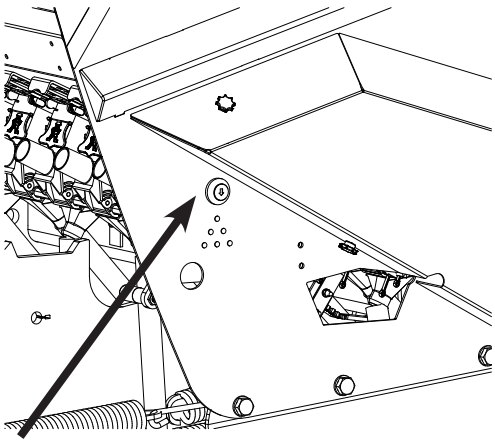
Then perform the actual calibration test by pressing the test button until the trays are about half full. Remove both trays and weigh the collected material using the scale provided with the machine or another precise scale.



Picture 85. Bottom flap and adjustment flapselecto



Picture 86. Calibration tray



Picture 87. Fertilizer calibration test button

Enter the measured weight into the row with the scale icon (1.4.4.1).

Select one of the three memory slots by touching it. The active memory slot will turn green. Confirm the value by pressing the green V button. The result will be saved as g/rev – this indicates how many grams the unit feeds per revolution.

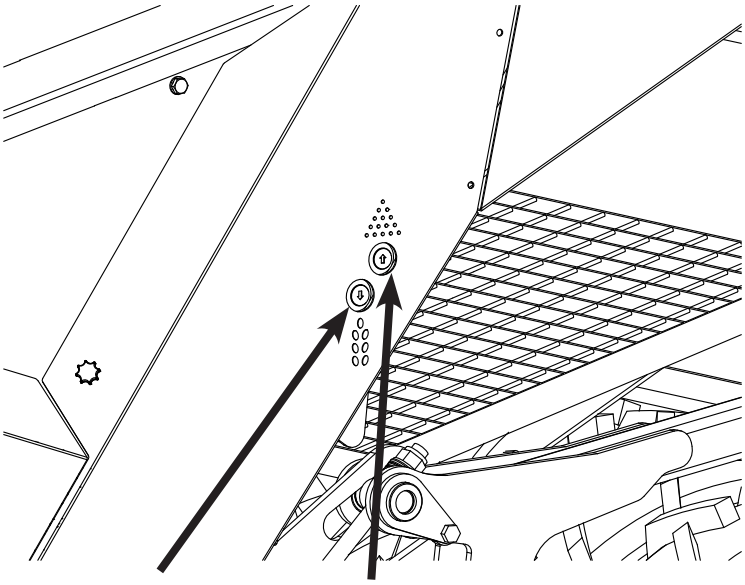
In the kg/ha row at the bottom of the screen, enter the desired application rate in kilograms per hectare.

The % row defines how much the seeding rate is adjusted on the main screen with each button press.

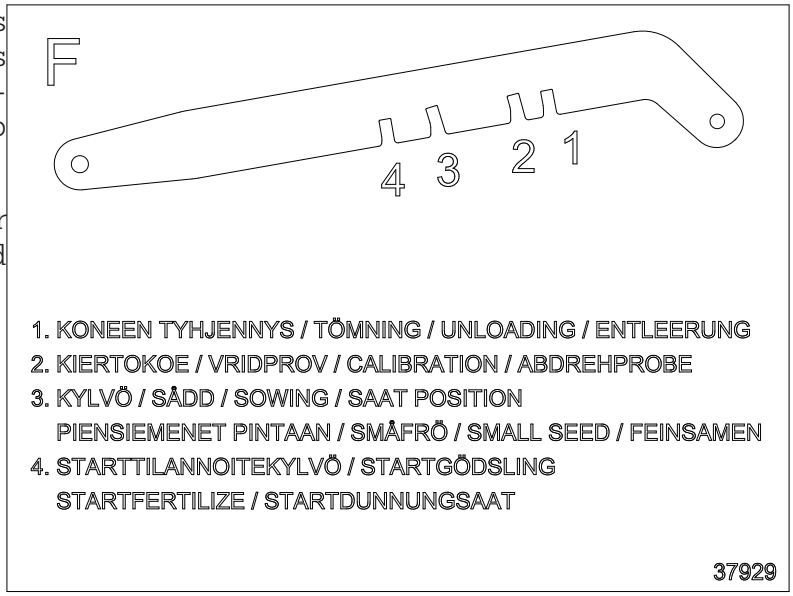
Press the main menu button to return to the working screen.

Note: The small seed box (optional) does not have bottom flaps. The calibration test is done via the seed-side metering housing, using the seed calibration trays. The seed flap selector must be set to position 2.

Adjust the bottom flap for fertilizer, seed, or small seeds according to the material used (Table 10).



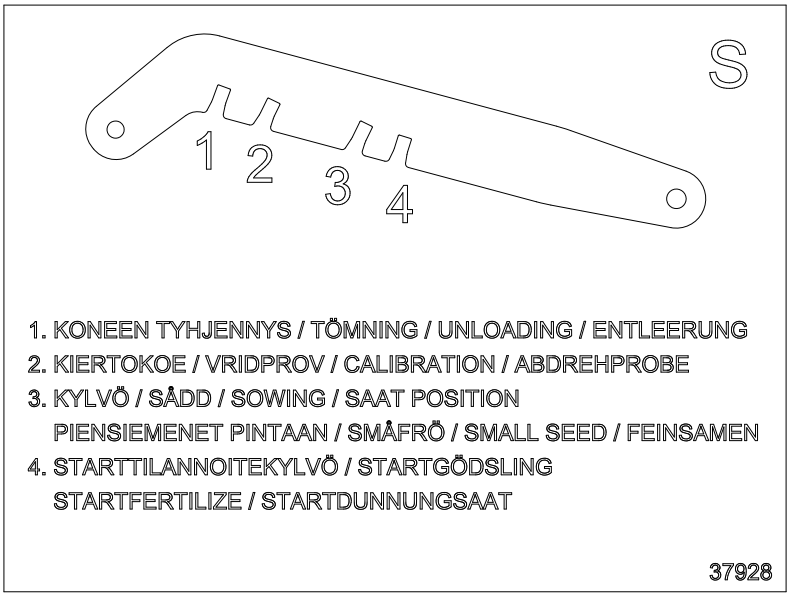
Picture 88. Seed and small seed (optional) calibration test buttons



Picture 89. Fertilizer adjustment flap positions

Bottom Flap Setting	Grain Size
0	Small seeds
1	Grain, fertilizer
2 or 3	Peas
3 or 4	Faba beans

Tabel 10. Bottom Flap Setting and Seed Size



Picture 90. Seed adjustment flap positions

Emptying the machine:

If any calibration test button is pressed three times within one second, the corresponding metering shaft starts rotating at three times the calibration test speed. It continues until the same button is pressed once again, which stops the metering.

12.6 COULTER PRESSURE ADJUSTMENT – ELITE

If the tractor used with the Junkkari ELITE combi seed drill has LS (Load Sensing) hydraulics, coulter pressure can be adjusted directly from the ISOBUS terminal (see section 13.4.6).

There are two ways to use this function:

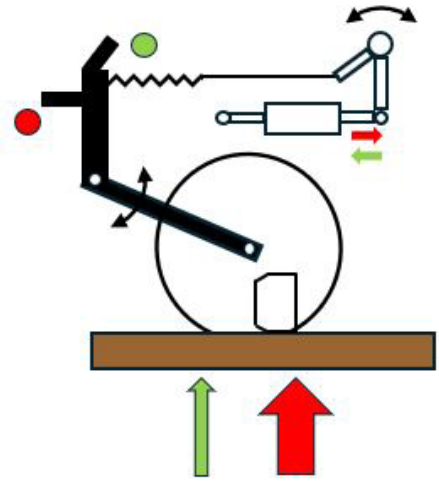
If you want to use automatic coulter pressure, activate the LS button on the main screen (it will turn yellow). The automatic function keeps the coulter in an optimal position even when soil type changes. The optimal angle is when the front edge of the coulter's side plate is at a 90° angle to the soil surface (see image Coulter Pressure).

This function works based on two coulters in the rear row, which have sensors to monitor the angle of the side plate. Adjustment only happens when both top or bottom sensors of these coulters activate at the same time. This ensures the system reacts only to real changes in soil conditions, not small bumps or obstacles. There is also a short delay before the adjustment activates once the sensors are triggered.

Manual adjustment of coulter pressure is done on the ISOBUS screen by pressing the Coulter – or Coulter + buttons. Pressing Coulter – decreases the pressure, and Coulter + increases it.

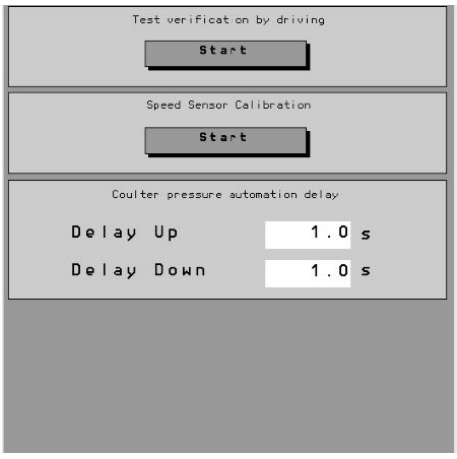
If the LS button is active (yellow) and a manual adjustment is made, the automatic control turns off and must be reactivated if you want to continue using automatic coulter pressure.

If the tractor doesn't have LS hydraulics, the ELITE seed drill can be equipped with two hydraulic hoses (part no. 33602), allowing coulter pressure to be adjusted using a standard hydraulic valve on the tractor.



Automatic Coulter Pressure – How It Works (M- and T-models)

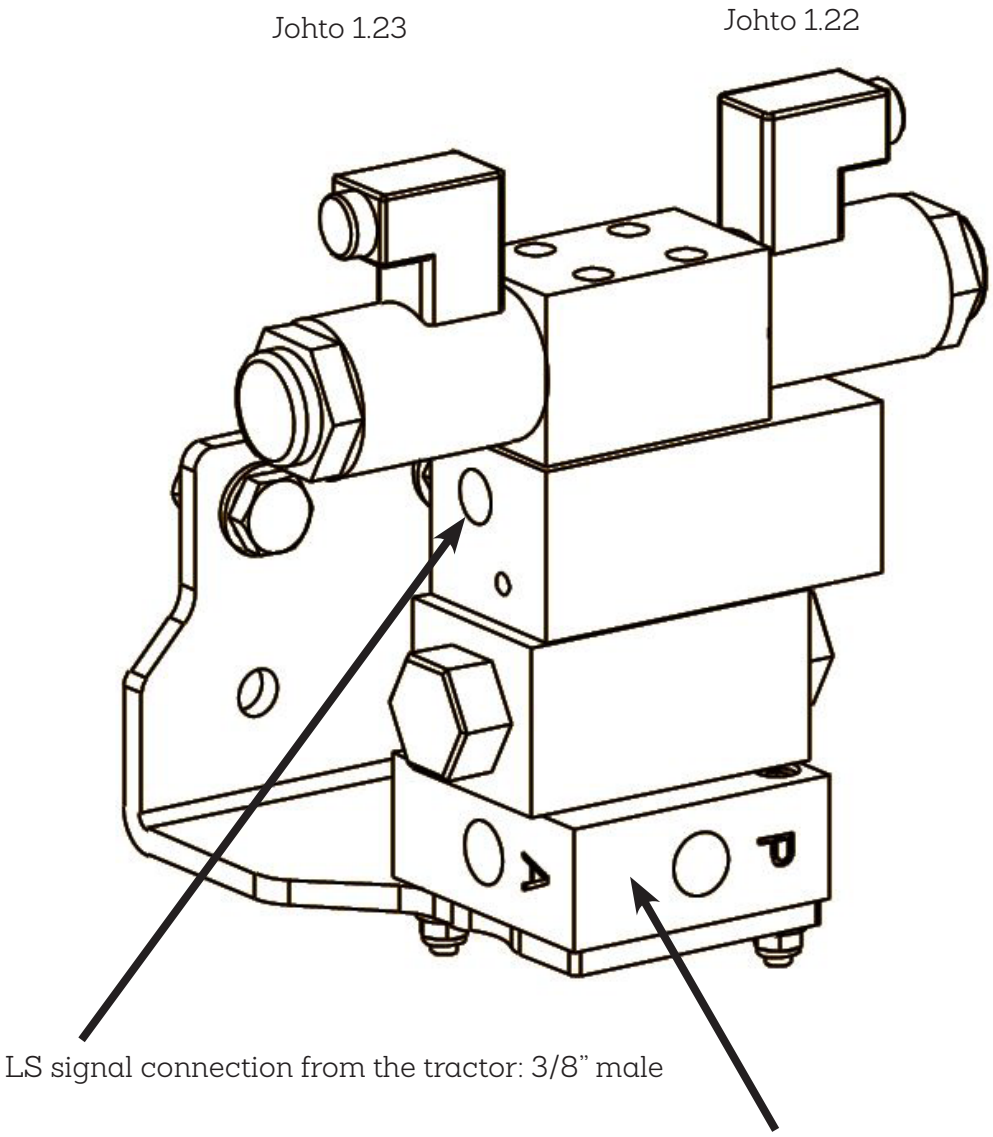
If automatic coulter pressure adjustment is used, the pressure must first be manually set to a suitable value. From there, the automation adjusts the pressure during operation to maintain the optimal coulter angle — meaning the leading edge of the side plate stays vertical.



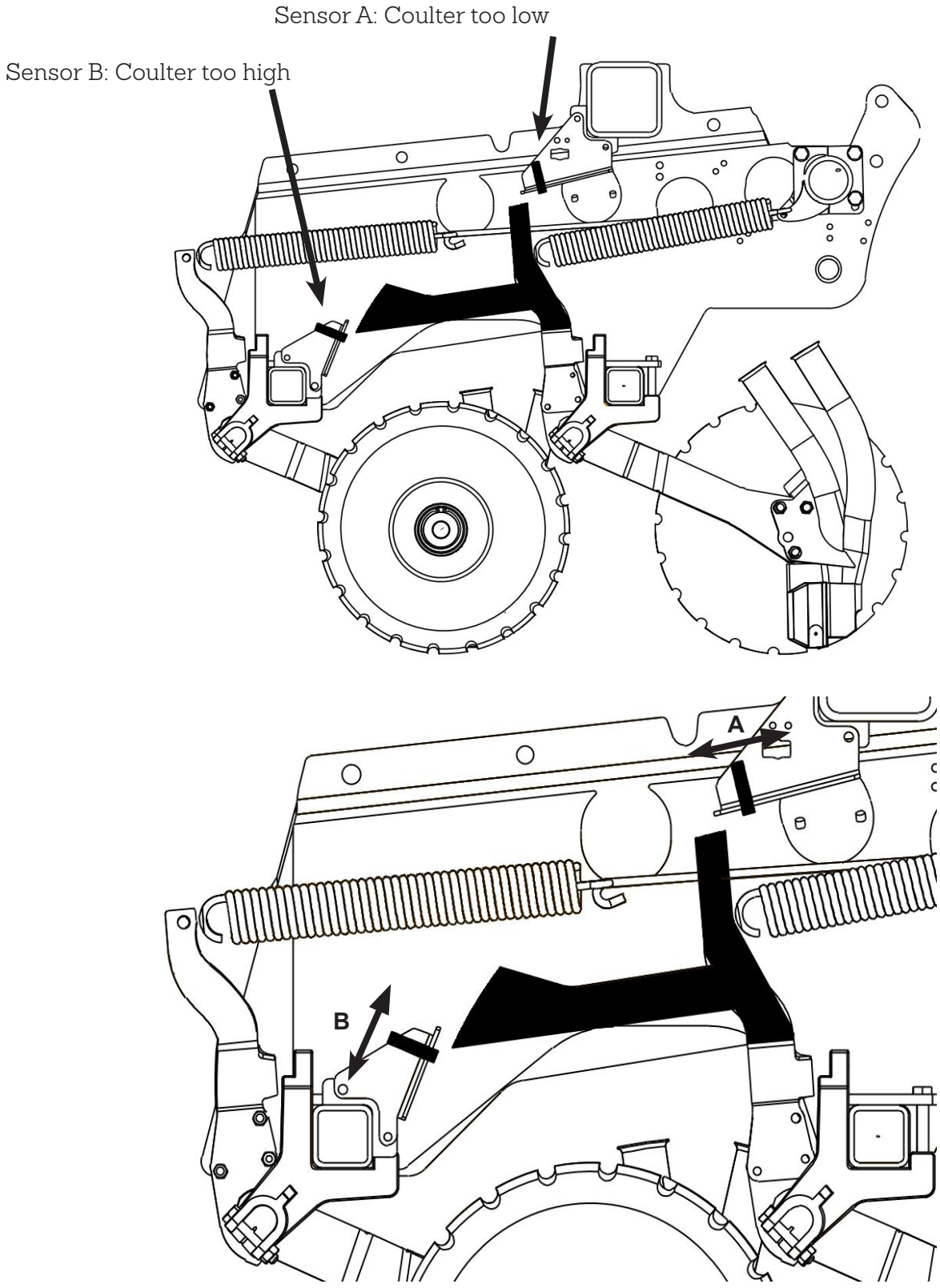
Coulter pressure increase delay (0.5–9 s)

Coulter pressure decrease delay (0.5–9 s)

Coulter pressure adjustment hoses and signal cables:



Coulter sensor positions:



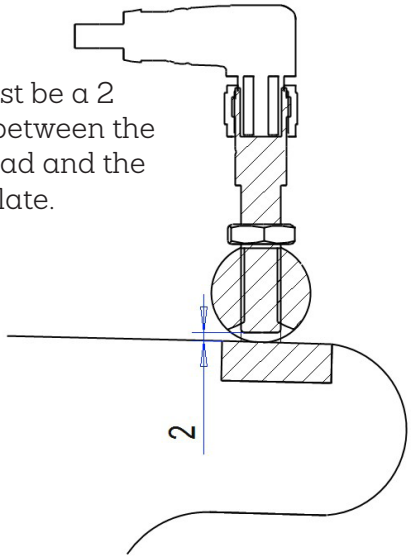
The sensitivity of the automatic system can be adjusted by moving sensors A and B.

- Moving Sensor A forward (toward the tractor) increases sensitivity. Moving it back reduces sensitivity.
- Moving Sensor B upward increases sensitivity. Moving it downward decreases it.

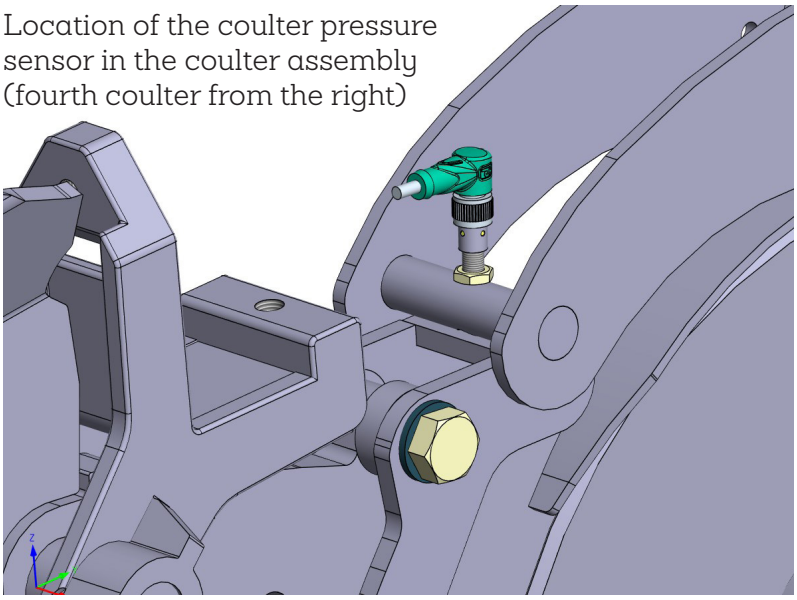
At the factory, both sensors are pre-set to the middle of their adjustment range.

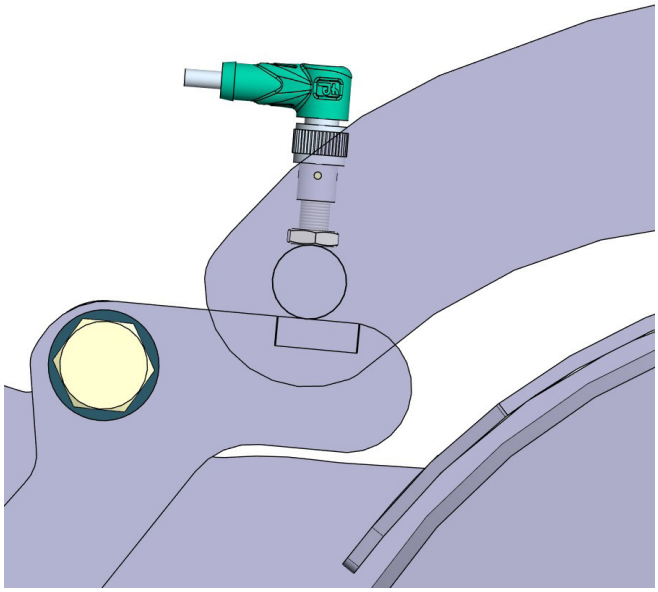
Operating principle of automatic coulter pressure control in the R model

There must be a 2 mm gap between the sensor head and the contact plate.

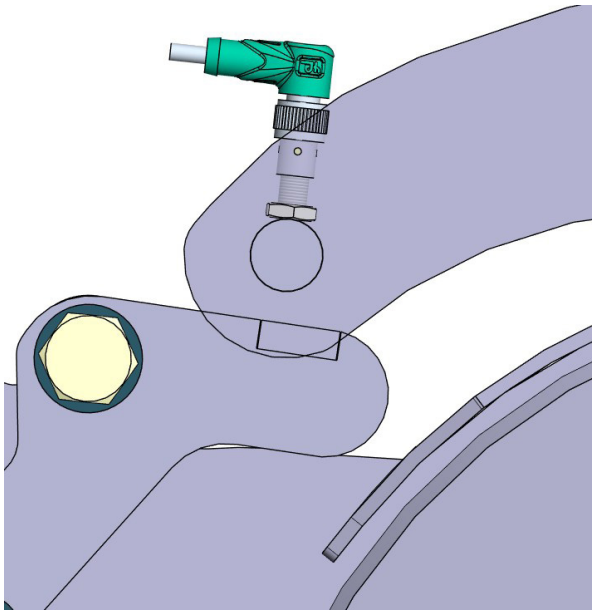


Location of the coulter pressure sensor in the coulter assembly (fourth coulter from the right)

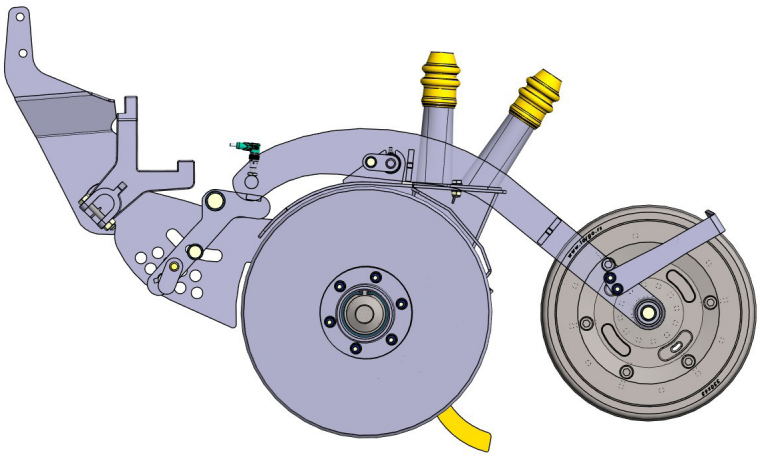




If the sensor bracket is in continuous contact with the contact plate, the coulter is running too deep. If automatic coulter pressure control is active, the pressure is reduced.



When the coulter pressure sensor bracket is continuously away from the contact plate, the coulter is running too shallow. If automatic coulter pressure control is active, the pressure is increased.



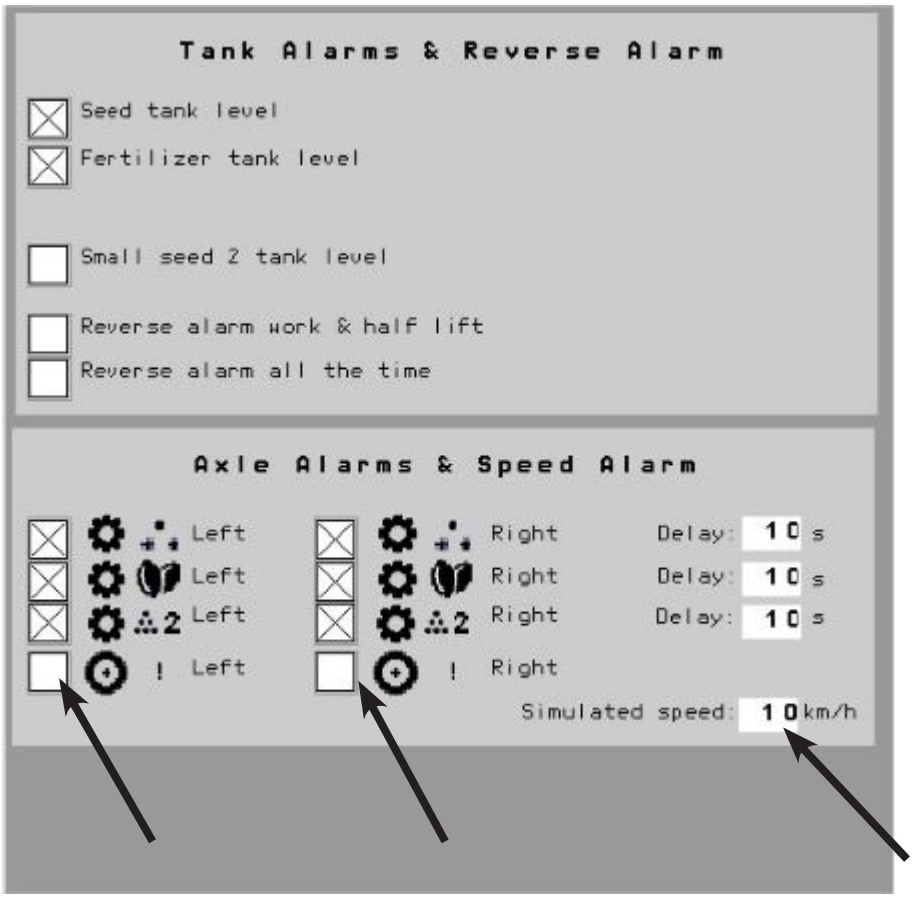
R model coulter with coulter pressure sensor, assembled.

12.7 SIMULATED DRIVING SPEED

If speed sensor data is lost for any reason, a simulated driving speed can be used. To activate this function, first deactivate both speed alarms (uncheck the boxes). After that, you can select a suitable simulated speed. When you return to the driving screen, a yellow Pause icon will flash, indicating that the metering units are not running.

Press the Play/Stop button to start the metering units. When the tractor is driven at the selected simulated speed, the seed drill will apply the selected application rate in kg/ha.

When reaching a headland or stopping the seeding, press the Play/Stop button again. The yellow Pause icon will flash, indicating that metering has stopped.





Pause icon



Play/Stop button

12.8 HALF-WIDTH SEEDING

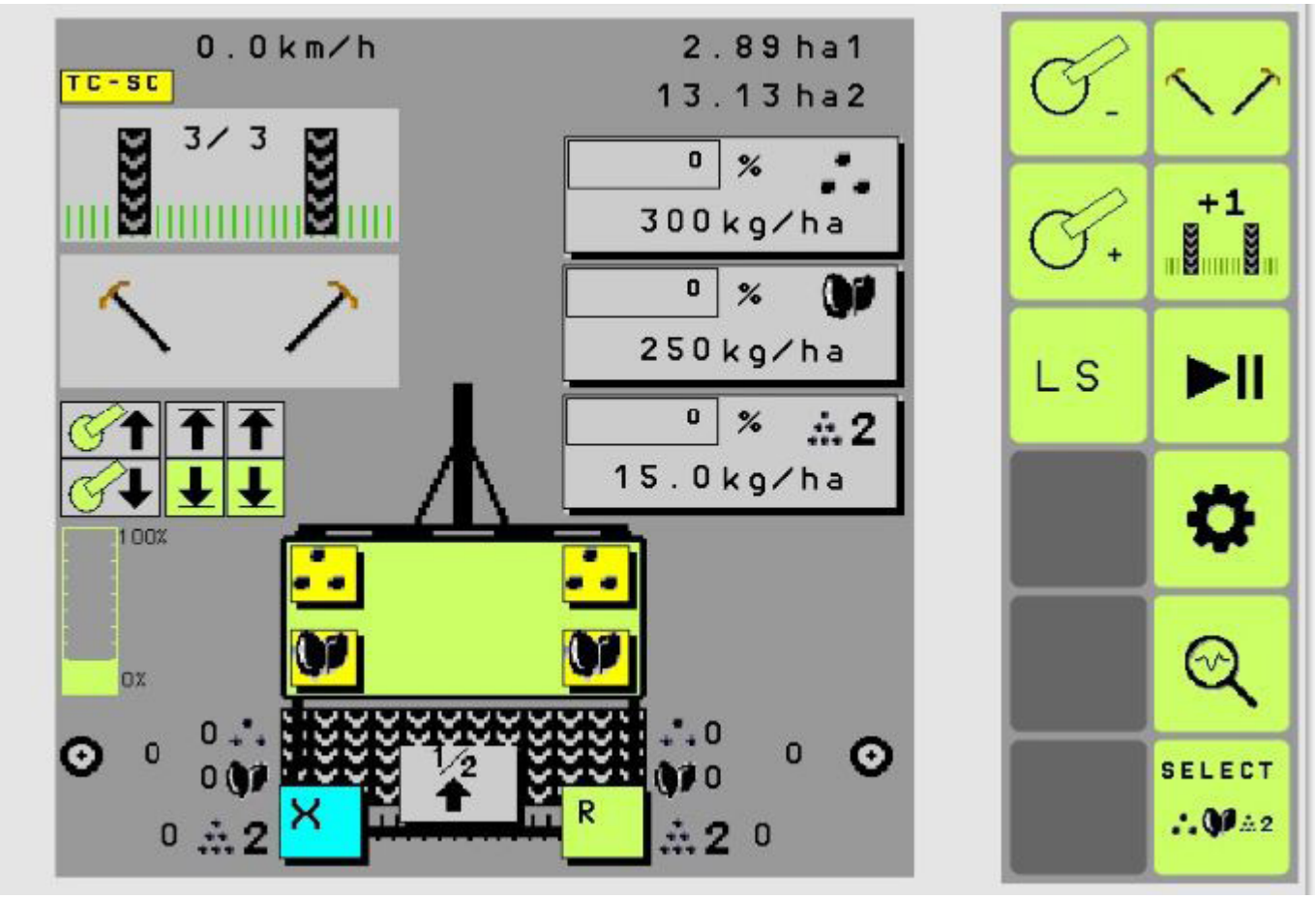
The ELITE model includes a standard half-width seeding feature. Either the left or right half of the drill can be turned off using the L or R buttons on the ISOBUS screen. When the button turns light blue, that side of the drill is inactive.

The ELITE model also includes ISOBUS TC-SC (Section Control), which works together with precision farming tasks (TASKs).

In the picture below, the R button is blue, i.e. the left side of the machine does not seed.

When the machine is raised and lowered again, the half-width function must be reactivated. This is to ensure it does not stay on by accident.

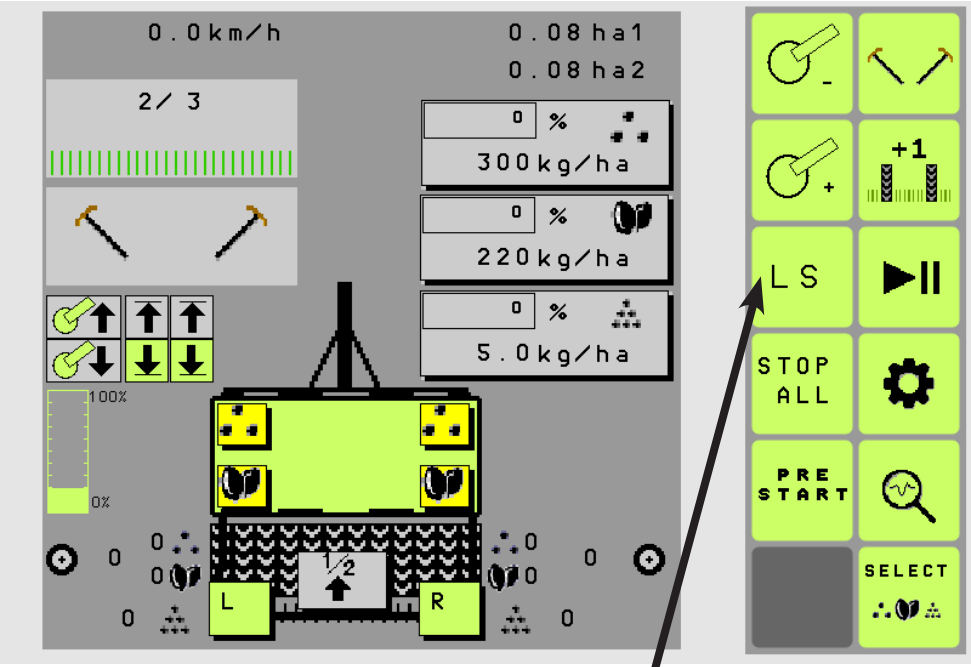
NOTE! If SC is active (TC-SC icon is green), the motors cannot be stopped manually.



12.9 COULTER PRESSURE AUTOMATION

Automatic coulter pressure control requires LS hydraulics from the tractor. The control unit then adjusts the output of the variable displacement hydraulic pump according to demand.

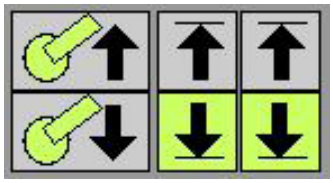
Driving screen view in M and T models



Activation of automatic coulter pressure control, when yellow it is active.

When coulter pressure is decreasing, this button is yellow.

When coulter pressure is increasing, this button is yellow.

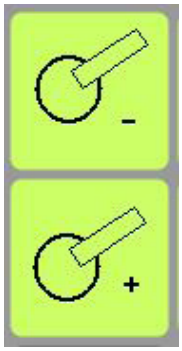


When the coulters are too high, these indicators turn yellow => coulter pressure is increased. Note that there is a delay in adjustment.

When the coulters are too low, these indicators turn yellow => coulter pressure is decreased. Note that there is a delay in adjustment.

Manual coulter pressure adjustment, – button decreases pressure.

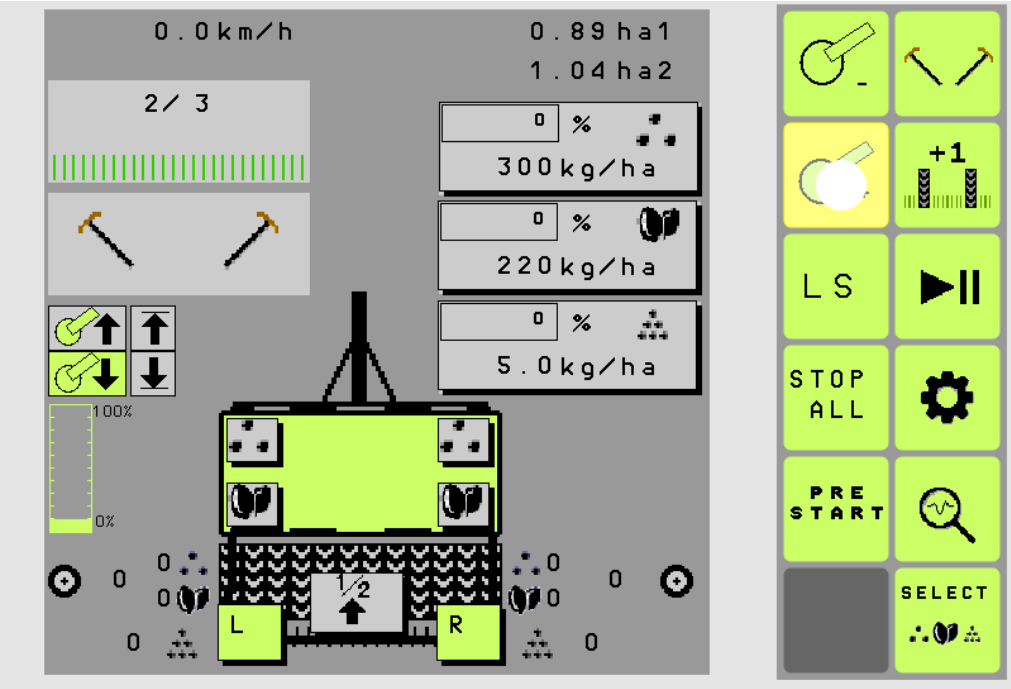
Manual coulter pressure adjustment, + button increases pressure.



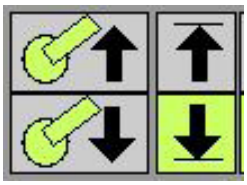
Whenever coulter pressure is adjusted manually, the automatic control is turned off and must be reactivated with the LS button (if automatic control is to be used).

COULTER PRESSURE AUTOMATION

Driving screen view in R model



When coulter pressure is decreased, this button is yellow.
When coulter pressure is increased, this button is yellow.

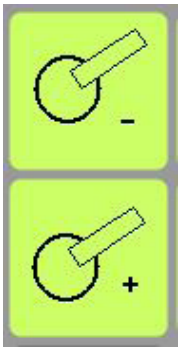


When the coulters are too high, this indicator turns yellow => coulter pressure is increased. Note that there is a delay in adjustment.

When the coulters are too low, this indicator turns yellow => coulter pressure is decreased. Note that there is a delay in adjustment.

Manual coulter pressure adjustment, – button decreases pressure.

Manual coulter pressure adjustment, + button increases pressure.

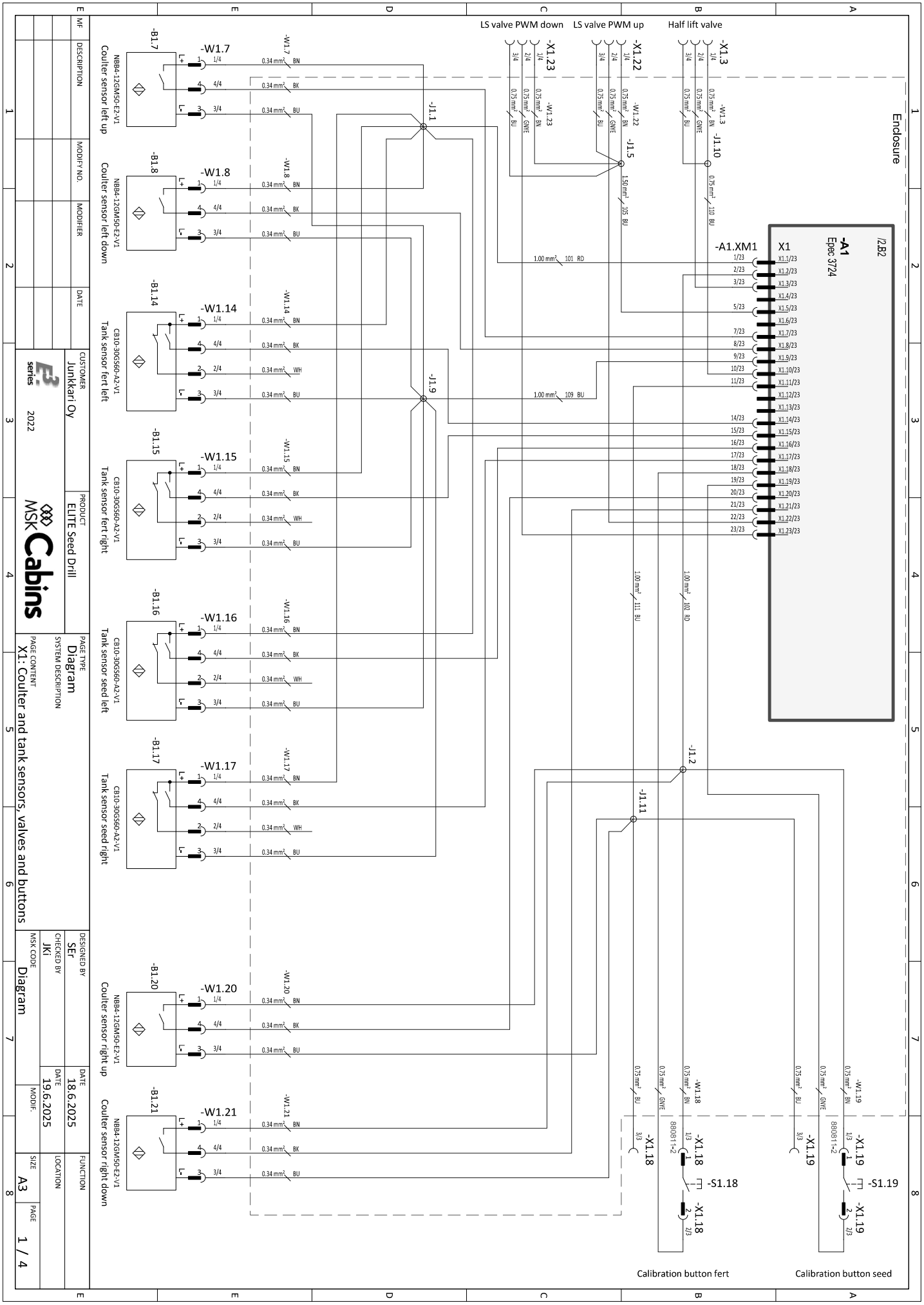


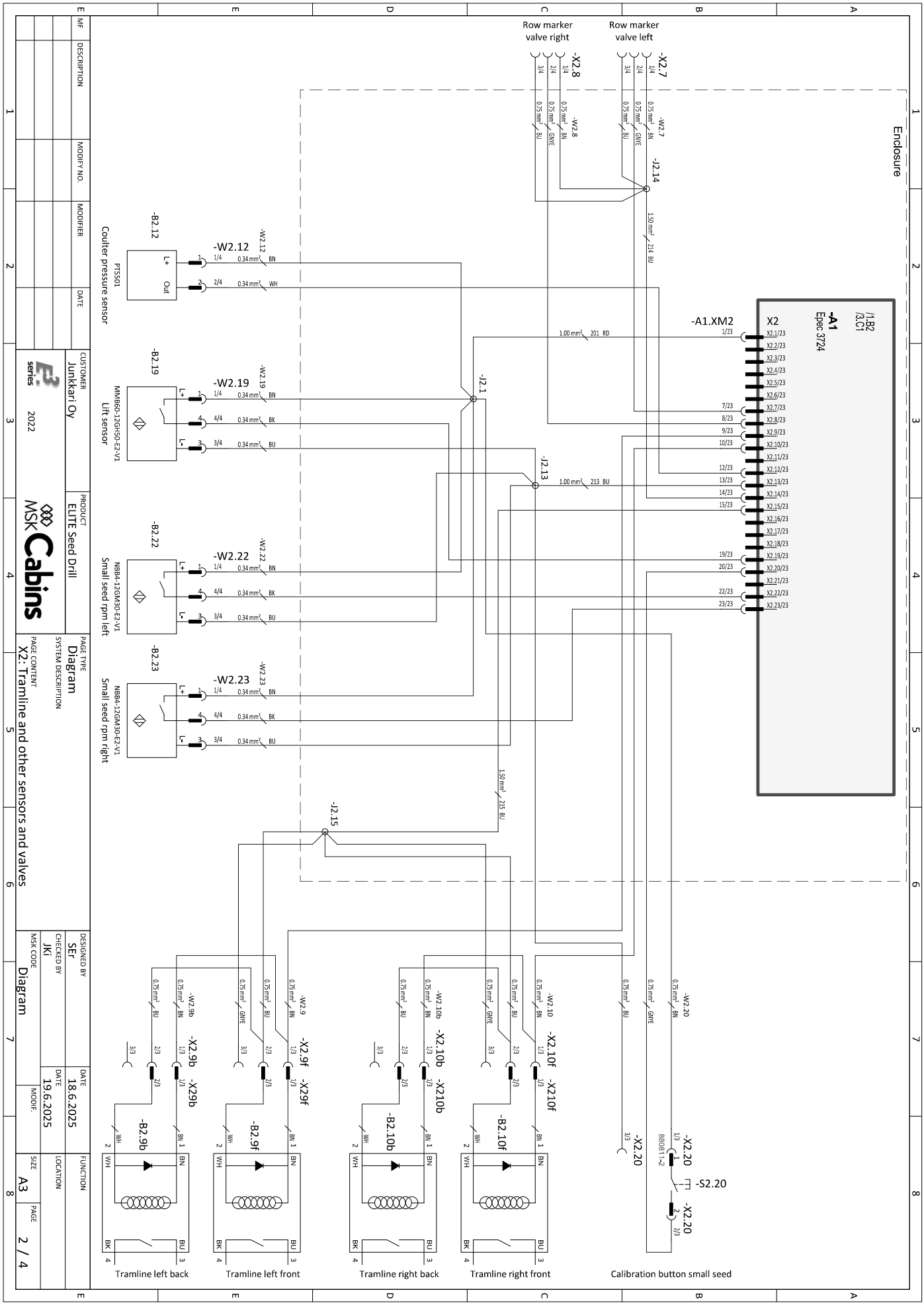
Whenever coulter pressure is adjusted manually, the automatic control is turned off and must be reactivated with the LS button (if automatic control is to be used).

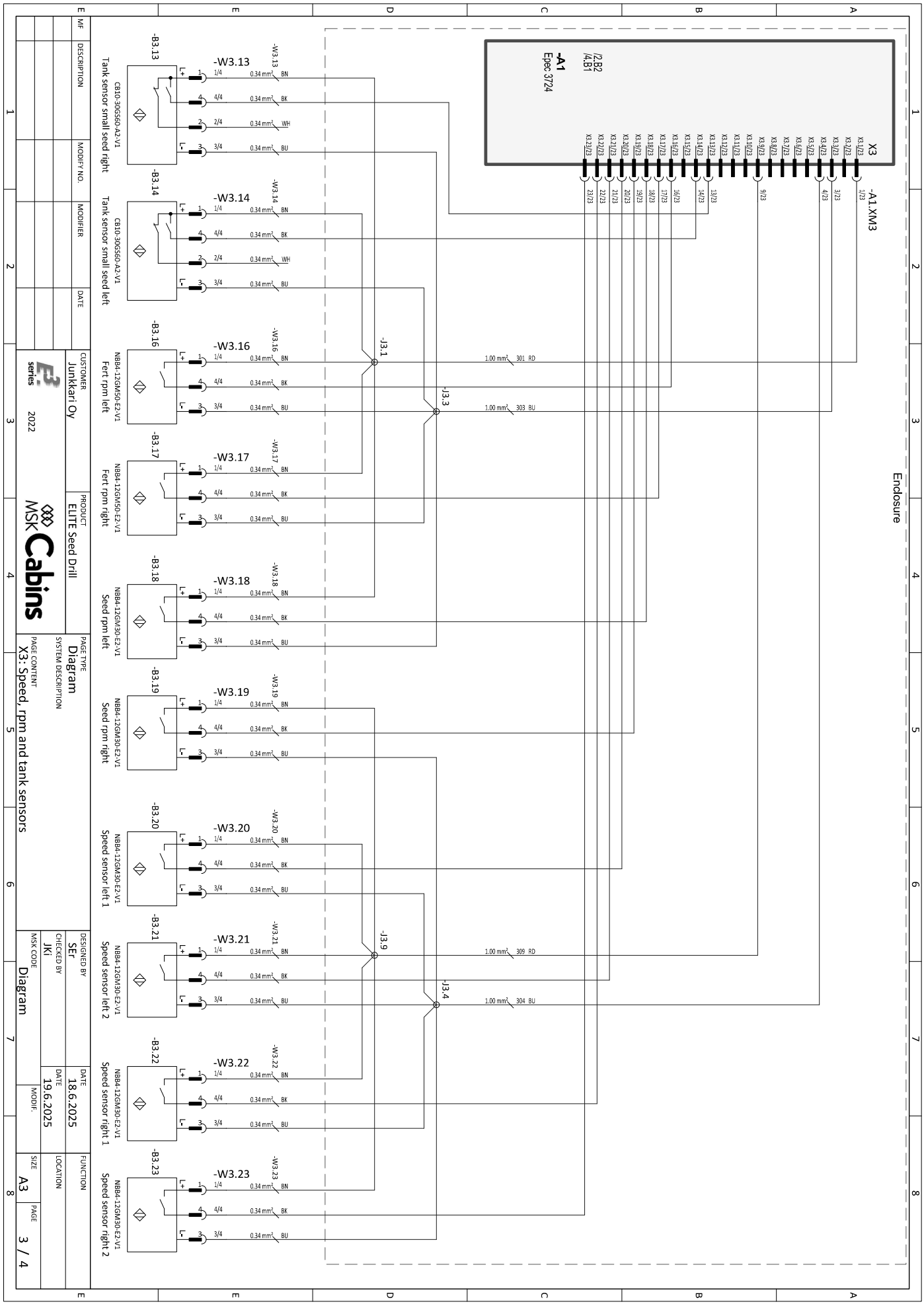
12.10 ELITE I/O-LIST

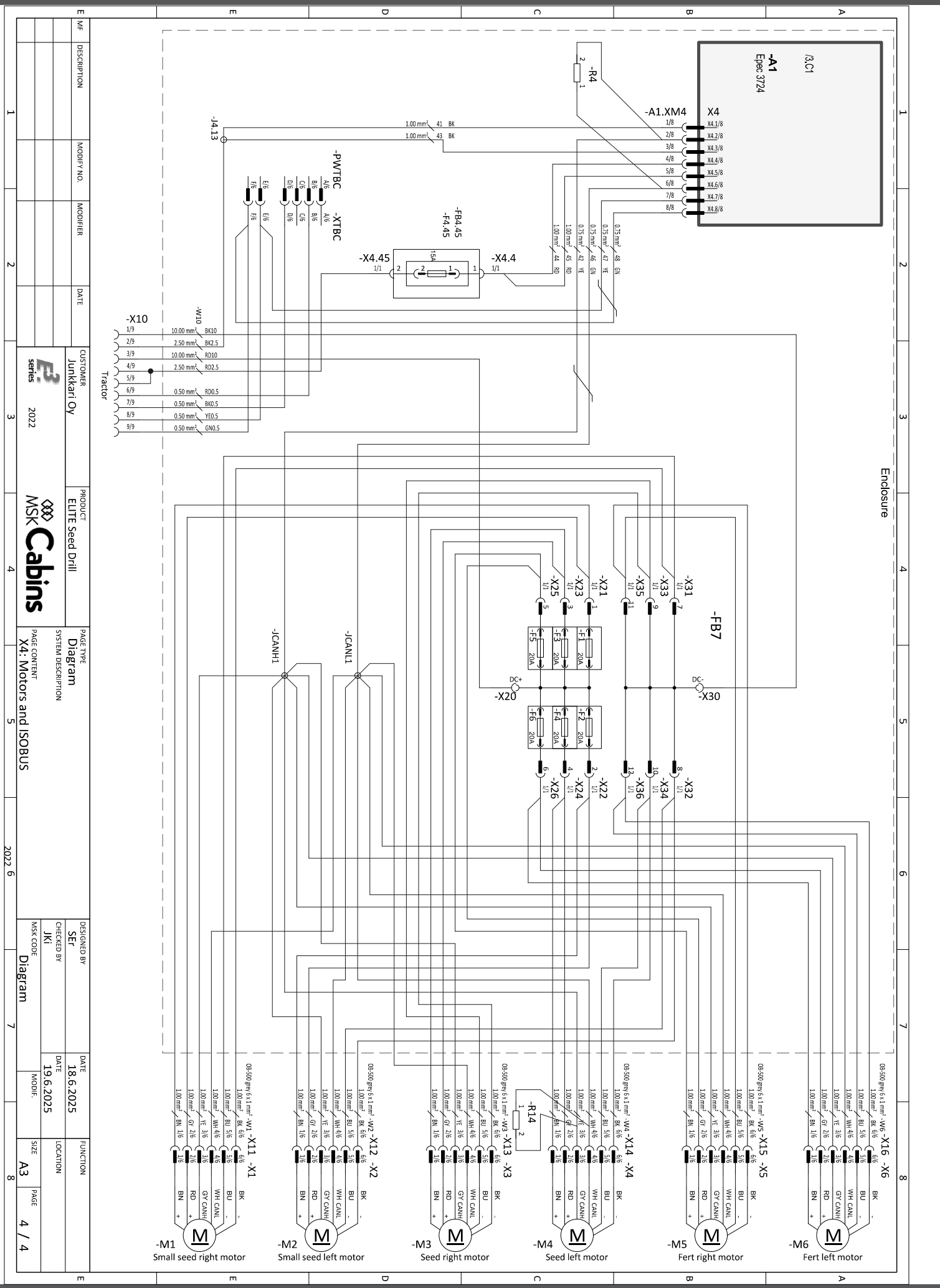
Junkkari ELITE I/O list

3m/4m							
	Conn	Pin		3m/4m	Conn	Pin	
Sensors supply voltage 1	XM1	1		Sensors supply voltage 3	XM2	1	
Sensors supply voltage 2	XM1	2		Sensors supply voltage 4	XM2	2	
Half lift valve supply voltage	XM1	3			XM2	3	
	XM1	4			XM2	4	
LS FB [Up ja Down GND]	XM1	5			XM2	5	
	XM1	6			XM2	6	
LS left up	XM1	7		Row marker left	XM2	7	
LS left down	XM1	8		Row marker right	XM2	8	
Sensors GND 1	XM1	9		Tramline left	XM2	9	
Half lift valve GND	XM1	10		Tramline right	XM2	10	
	XM1	11			XM2	11	
	XM1	12		Pressure sensor	XM2	12	
	XM1	13		Sensors GND 2	XM2	13	
Tank sensor fert left	XM1	14		Row marker left & right GND	XM2	14	
Tank sensor fert right	XM1	15		Tramline left & right GND	XM2	15	
Tank sensor seed left	XM1	16			XM2	16	
Tank sensor seed right	XM1	17			XM2	17	
Fert calibration button	XM1	18			XM2	18	
Seed calibration button	XM1	19		Lift sensor	XM2	19	
LS Right up	XM1	20		Small seed calibration button	XM2	20	
LS Right down	XM1	21			XM2	21	
LS PWM up	XM1	22		Small seed rpm left	XM2	22	
LS PWM down	XM1	23		Small seed rpm right	XM2	23	
Sensors supply voltage 5, (12V)	XM3	1		3m/4m	Conn	Pin	Pin type
	XM3	2		Supply GND	XM4	1	GND
Sensors GND 3	XM3	3		CAN 1 H	XM4	2	CAN1 H
Sensors GND 4	XM3	4		CAN GND	XM4	3	CAN GND
	XM3	5		Supply 12v.	XM4	4	Power Supply
	XM3	6		Supply 12v.	XM4	5	Power Supply
	XM3	7		CAN 1 L	XM4	6	CAN1 L (BSL)
	XM3	8		ISOBUS	XM4	7	CAN2 H
Sensors supply voltage 6	XM3	9		ISOBUS	XM4	8	CAN2 L
	XM3	10					
	XM3	11		Supply to sensors +			
	XM3	12		GND to sensors -		Pin	
Small seed tank sensor right (PSL2)	XM3	13		J1.1 +	1.7, 1.8, 1.14, 1.15, 1.16, 1.17		
Small seed tank sensor left (PSL2)	XM3	14		J1.9 -	1.7, 1.8, 1.14, 1.15, 1.16, 1.17		
	XM3	15					
Fert RPM left	XM3	16		J1.2 +	2.20, 1.18, 1.19, 1.20, 1.21		
Fert RPM right	XM3	17		J1.11 -	2.20, 1.18, 1.19, 1.20, 1.21		
Seed RPM left	XM3	18					
Seed RPM right	XM3	19		J2.1 +	2.19, 2.22, 2.23		
Speed left 1	XM3	20		J2.13 -	2.19, 2.22, 2.23		
Speed left 2	XM3	21					
Speed right 1	XM3	22		J2.14 -	2.7, 2.8		
Speed right 2	XM3	23					
				J2.15 -	2.9, 2.10		
				J3.1 +	2.12, 3.13, 3.14, 3.16, 3.17, 3.18		
				J3.3 -	3.13, 3.14, 3.16, 3.17, 3.18		
				J3.9 +	3.19, 3.20, 3.21, 3.22, 3.23		
				J3.4 -	3.19, 3.20, 3.21, 3.22, 3.23		


Enclosure
-A1
Epec 3724
-A1.XM1
LS valve PWM down
LS valve PWM up
Half lift valve
-X1.3
-X1.22
-X1.23
-J1.1
-J1.2
-J1.5
-J1.9
-J1.10
-J1.11
-W1.7
-W1.8
-W1.14
-W1.15
-W1.16
-W1.17
-W1.20
-W1.21
-B1.7
-B1.8
-B1.14
-B1.15
-B1.16
-B1.17
-B1.20
-B1.21
Coulter sensor left up
Coulter sensor left down
Tank sensor fert left
Tank sensor fert right
Tank sensor seed left
Tank sensor seed right
Coulter sensor right up
Coulter sensor right down
-X1.19
-S1.19
-X1.18
-S1.18
Calibration button fert
Calibration button seed
Junkkari Oy
ELITE Seed Drill
Diagram
X1: Coulter and tank sensors, valves and buttons
SEr
JKi
Diagram
18.6.2025
19.6.2025
A3
1 / 4


Row marker valve right
Row marker valve left
-X2.8
-X2.7
-W2.8
-W2.7
-J2.14
Enclosure
-A1
Epec 3724
-A1.XM2
X2
-B2.12
-W2.12
Coulter pressure sensor
PT5501
-B2.19
-W2.19
Lift sensor
MM860-12GH50-E2-V1
-J2.1
-J2.13
-B2.22
-W2.22
Small seed rpm left
N884-12GM30-E2-V1
-B2.23
-W2.23
Small seed rpm right
-J2.15
-W2.9
-X2.9f
-X29f
-B2.9f
-W2.9b
-X2.9b
-X29b
-B2.9b
-W2.10b
-X2.10b
-X210b
-B2.10b
-W2.10
-X2.10f
-X210f
-B2.10f
-W2.20
-X2.20
-S2.20
Tramline left back
Tramline left front
Tramline right back
Tramline right front
Calibration button small seed
Junkkari Oy
ELITE Seed Drill
Diagram
X2: Tramline and other sensors and valves
SEr
JKi
Diagram
18.6.2025
19.6.2025
A3
2 / 4


-A1 Epec 3724
-A1.XM3
X3
Enclosure
-W3.13
-W3.14
-W3.16
-W3.17
-W3.18
-W3.19
-W3.20
-W3.21
-W3.22
-W3.23
-J3.1
-J3.3
-J3.9
-J3.4
Tank sensor small seed right
Tank sensor small seed left
Fert rpm left
Fert rpm right
Seed rpm left
Seed rpm right
Speed sensor left 1
Speed sensor left 2
Speed sensor right 1
Speed sensor right 2
1.00 mm² 301 RD
1.00 mm² 303 BU
1.00 mm² 309 RD
1.00 mm² 304 BU
CUSTOMER Junkkari Oy
PRODUCT ELITE Seed Drill
PAGE TYPE Diagram
SYSTEM DESCRIPTION
PAGE CONTENT X3: Speed, rpm and tank sensors
DESIGNED BY SEr
CHECKED BY JKi
DATE 18.6.2025
MODIF. 19.6.2025
MSK CODE Diagram
SIZE A3
PAGE 3 / 4
2022

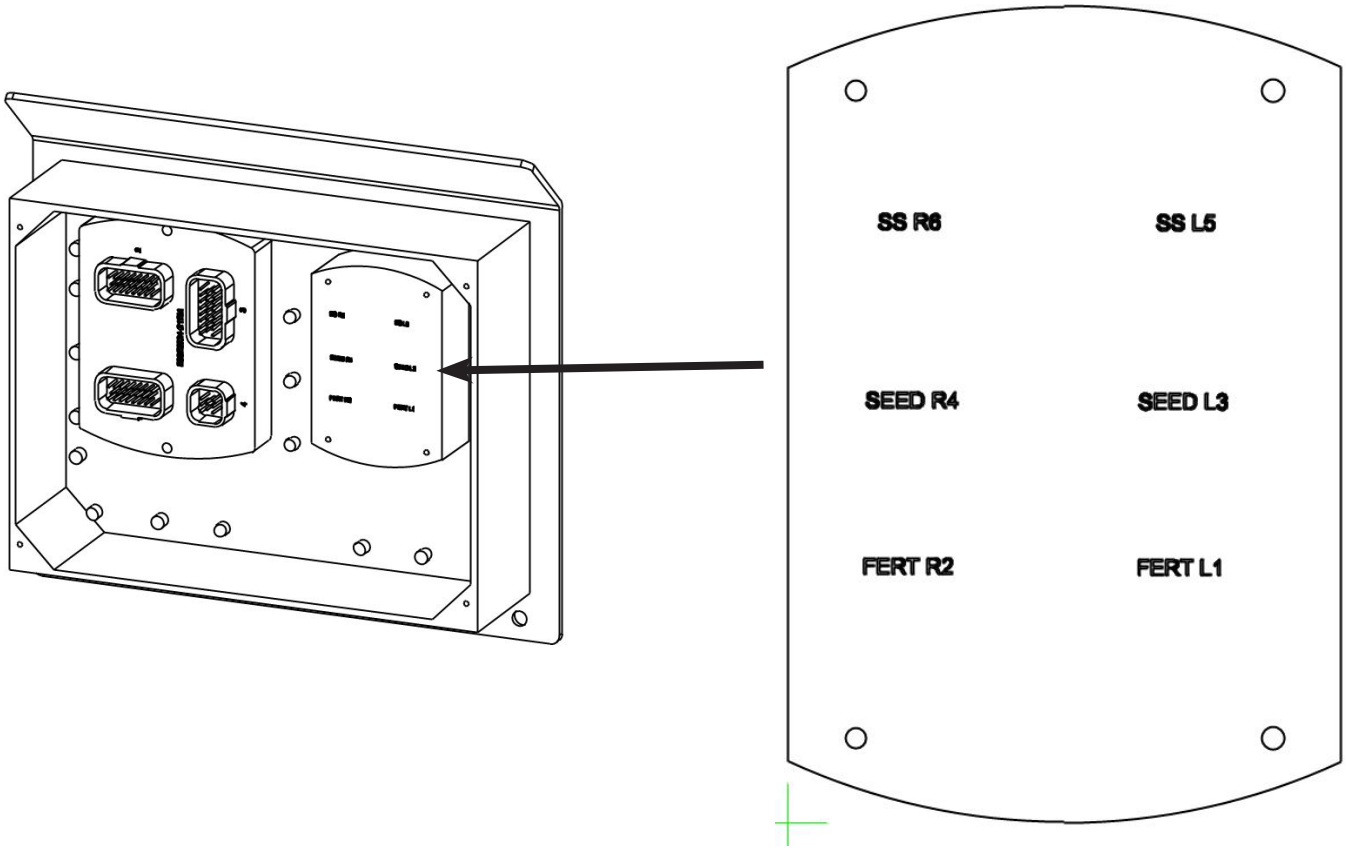

-A1
Epec 3724
-A1.XM4
X4
-R4
-J4.13
-PW7BC
-XTBC
-FB4.45
-F4.45
-X4.45
-X4.4
-X10
-W10
Tractor
Enclosure
-FB7
-X20
-X30
-JCANH1
-JCANL1
-R14
-M1
Small seed right motor
-M2
Small seed left motor
-M3
Seed right motor
-M4
Seed left motor
-M5
Fert right motor
-M6
Fert left motor
CUSTOMER
Junkkari Oy
PRODUCT
ELITE Seed Drill
PAGE TYPE
Diagram
SYSTEM DESCRIPTION
PAGE CONTENT
X4: Motors and ISOBUS
DESIGNED BY
SEr
CHECKED BY
JKi
MSK CODE
Diagram
DATE
18.6.2025
DATE
19.6.2025
MODIF.
SIZE
A3
PAGE
4 / 4
FUNCTION
LOCATION
MSK Cabins
E3 series
2022

12.11 FUSE BOX – ELECTRIC MOTORS



6 x 20A blade fuses:

If the small seed box is not installed, then 4 pcs.



FERT L1 – Left fertiliser motor

FERT R2 – Right fertiliser motor

SEED L3 – Left seed motor

SEED R4 – Right seed motor

SS L5 – Left small seed motor (optional)

SS R6 – Right small seed motor (optional)

13 SEEDING

Using a new seed drill, seeding should first be tested without any seeds or fertilisers. This is important because it allows you to test the machine and control unit, and to learn machine adjustments well before the busy seeding season.

13.1 START OF SEEDING

Make sure that moving machine parts do not cause injuries to people or damage to property close to the machine.

Check before sowing:

- Bolts tensions
- Clearances of the joints and cylinder brackets
- Hydraulic hoses and hydraulic connections
- Condition of coulter wear parts and change wear parts if needed.

Check regularly during sowing:

- The condition of seed and fertilizer hoses. Make sure there is no wear or tear on the hoses. Also check that the beveled end of the hoses does not rise above the overhead guard at the coulter steel pipe.

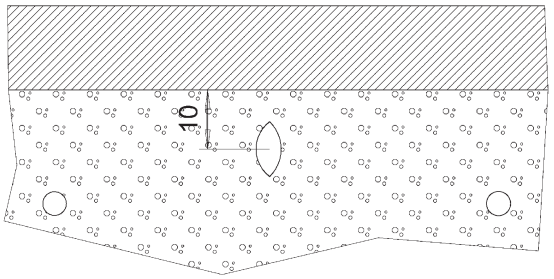
The condition of the coulter pressure springs and change worn springs if needed.

When driving to the field:

1. Release trackmarkers. Locking pins are located on the marker arms.
2. Lower the friction wheel and make sure that seeds and fertilisers come out from all coulters.
3. Open the valves of lifting hydraulic hoses.
4. Remove any transportation support.
5. Turn the rim removers of any disc cultivator to the working position.
6. Start the control unit.
7. Drive the first round anticlockwise so that the friction wheel is not on the edge side. This ensures that the friction wheel does not hit any obstacles or grooves that could damage the machine or stop feeding.
8. Verify the seeding depth after the first round.

13.2 SOIL PREPARATION

The correct seeding period and soil cultivation are important considering the success of seeding. The optimal seed position is between the cultivated and uncultivated layers. Direct seeding reduces the number of cultivation stages.



Picture 91. Optimal cultivation depth (10mm)

Conditions

- **Dry conditions**: In dry conditions, avoid cultivation deeper than at the seeding depth, in which case moisture rises to seeds from the uncultivated layer through capillary action. In clay and other dry soil, levelling the topsoil before soil preparation is a good way to maintain moisture by interrupting capillary action.
- **Moist conditions:** When preparing for moist conditions, the land may need to be cultivated deeper to increase the water space. It is especially important for the growth capacity and structure of soil that it is not trampled or cultivated when wet, and that machine surface pressures are as low as possible.

Direct seeding

Direct seeding also effectively retains water in the soil. Similarly, studies have shown that, the less cultivation is needed, the better plants are able to utilise nutrients in the soil. Furthermore, fewer nutrients will flow away from the field. However, if the amount of cultivation is reduced, the risk of plant diseases and weeds increases.

13.3 FERTILISATION

FERTILISER METHODS

- **Fertiliser placement** Fertilisers are placed in the seeding row, a separate fertiliser row or both.When fertilisers are placed in a row, the high nutrient concentration in the row is mainly utilisable by plants. In fertiliser placement, nutrients are placed close to seeds or under them between seeding rows.
- **Surface fertilising** Nutrients contained by spread fertiliser grains are largely absorbed in the soil, meaning that plants are unable to utilise them as effectively. In surface fertilising, the convection of nutrients to plants is largely placed on the rainwater migration effect.
- **Distributed fertilising** to spring plants is justifiable on the basis of an increased protein level or distributed risks associated with fertiliser costs. Distributed fertilising may not produce larger crops in spring seeding but a later seeding may become unnecessary if investments in the crops are unproductive due to a poor growing season. It is recommended that, during spring seeding, at least two-thirds of all of the growing season's nutrients are applied.

Fertiliser placed in the seed row

Whether fertilisers should be placed in the seed row or a separate row depends on the nutrient application method, plants, soil type and humus content. Especially if the source of nutrients is manure or other organic fertilisers, applying fertilisers into the seed row is an excellent fertilisation method. If urea is used as a fertiliser, it must be placed in a separate row.

Fertiliser storage

Store fertilisers and the seed drill protected against moisture. The best storage location for the seed drill is a machine shed with a dry base and doors. If the machine is stored on a moist base or in a place accessible by night dew, the fertiliser may form into clumps above the metering device or adhere to metering device parts. Before each seeding day, rotate some fertiliser into calibration trays, and make sure that no fertiliser has adhered to the feed roll and that the calibration trays have equal piles of fertiliser. If required, clean the rolls through the metering device cover.

13.4 SEEDS AND SEED FEEDING

Before seeding

- Only use pure seeds because any impurities may damage machine operations..
- The user is responsible for ensuring that any dressing, etc. used does not have a negative impact or prevent the metering device or coulters from operating.
- When using large seeds (larger than peas), make sure that they will not cause blockage in the machine.
- The most important is to verify a correct and even seeding depth and correct seeding volumes. Check the seeding depth in harder and softer areas, and in and next to tractor tyre tracks. A tool intended to measure the seeding depth is delivered with the machine. The seeding depth must be selected according to the plant, soil type, seeding period and moisture conditions. If seeding conditions so require, adjust the hydraulic coulter pressure while driving.
- When monitoring the feed volume, check the feeding operation, for example, before each filling. Stop in the boundary strip, rotate the friction wheel and make sure that seeds and fertilisers come out from all coulters. Pay attention to the tramline rhythm. Before filling the machine, check visually that fertilisers and seeds are consumed evenly. However, note that the distribution of metering devices in the hopper differs slightly, meaning that the level of fertilisers and seeds in the hopper is not identical.
- Note that the seed drill must always move forward when it it is being lowered to the ground or raised off the ground. Do not stop if the machine is lowered to the ground. If you need to stop during seeding, lift the machine while driving. Before continuing, reverse a few metres and lower the machine while driving. Otherwise, coulters may be clogged, particularly in moist conditions. When reversing, make sure that the coulters do not touch the ground. They may be clogged or damaged. Always lift the machine all the way up before reversing.

Junkkari seed drills and metering devices are designed to operate accurately and reliably. Junkkari Oy cannot be held liable for damage caused by incorrect adjustments or working methods. Junkkari Oy is not responsible for any seeding-related indirect damage.

If a coulter is clogged, do not go under the machine without using sufficient mechanical supports. *see section 4.3.2 on page 18.*

13.5 ECONOMICAL SEEDING

Seeding is a key factor in productive cropping. This section offers a summary of simple actions that affect the input-output ratio of seeding. The aim is to save time and money, and improve production.

INSTRUCTIONS FOR ECONOMICAL SEEDING

Tractor

- Adjust the tractor's tyre pressures correctly and use collaring which minimises tyre slippage. Tyre slippage directly increases fuel consumption. Reducing slippage by 5% refers to an improvement of 5% in fuel economy.
- Use a tractor of a correct size. An excessively large tractor tramples the field and consumes more fuel.
- Utilise your tractor's economical torque range and transmission. Driving at unnecessarily high revolutions increases fuel consumption significantly.

Seed drill

- Use large tyres in the seed drill. The tractive resistance of the seed drill plays an important part in terms of fuel economy. In cultivated soil and soil rich in humus, large tyres produce the most benefits.
- Particularly, soil rich in humus and heavy soil with a high tractive resistance are suitable for fertilising the seed row. Without fertiliser coulters, the tractive resistance and fuel consumption are lower.
- Use economical driving lines. Try to seed while lifting the machine as infrequently as possible. Generally, seeding is not the most economical way to seed because turning takes a lot of time and the final rounds are short.
- Minimise any unproductive time on roads and organise the use of the seed drill to be as effective as possible.
- Maintain the seed drill in advance. Clean, lubricate and protect the machine properly between seasons. This will retain the resale value and reduce any operating breaks during seasons.

Soil preparation

- Avoid any unnecessary rounds. Perform any basic cultivation so that the result is as even as possible. This reduces the amount of cultivation needed. Also utilise the cultivating effect of the seeding combination. In larger areas, you can achieve savings if you use a guidance system or automatic steering to avoid overlapping rounds..
- Do not cultivate too deep. Cultivation consumes fuel and moisture will evaporate and not be available to seeds if the cultivation depth is higher than the seeding depth. If so permitted by conditions and coulters, the cultivation depth should be one centimetre lower than the seeding depth.

Sowing

- Direct seeding produces savings in a number of work stages. At the same time, the field's carrying capacity is better on uncultivated soil, which also saves fuel.
- Remove any obstacles from the field. For example, driving around rocks or other obstacles takes a surprising amount of time during a year. By removing any obstacles, you can also reduce the risk of machine damage.
- Use tramlines. They reduce the amount of green plants in rows. Spraying is also quicker and easier, and there will be fewer overlapping rounds.

- Adjust the seeding depth correctly. In particular, even sprouting on clay and silt soil requires precision.
- Always calculate the seed volume required on the basis of the seed weight and germinative capacity. Adjust the seed drill according to calibrations.
- Take care of the soil's growing capacity (structure, pH, nutrients, moisture).
- Maintain circulating seeding practices.
- If possible, use organic fertilisers to achieve savings in fertiliser costs and increase the volume of humus.
- Only use productive input when necessary. For example, precision fertilising serves to apply fertilisers in varying conditions as required.
- Take care of the driver's occupational safety, sufficient rest and nutrition.

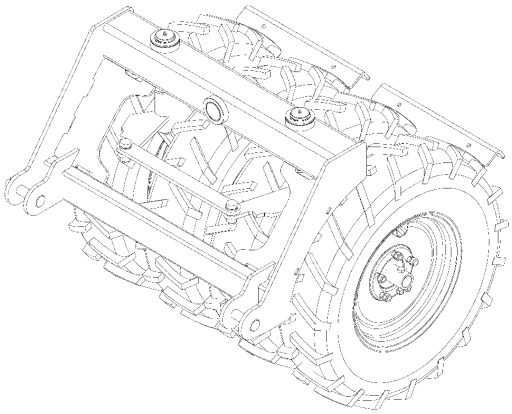
14 OTHER OPTIONAL EQUIPMENT

14.1 PACKER

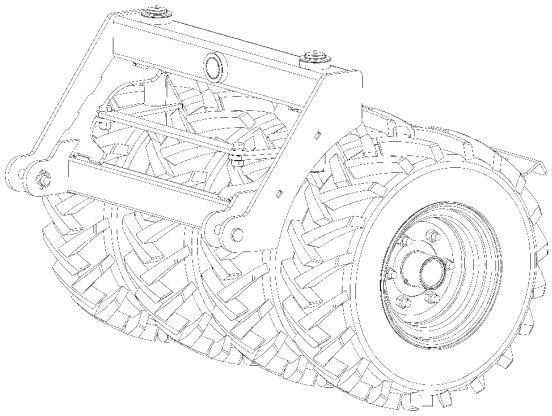
The packer packs and levels the soil between tractor tyres before coulters. Depending on the machine type, a wide or narrow packer can be used.

Remember:

- Align the packer on the tractor's centre line using the tractor's side limiters.
- During seeding and in boundary strips, the packer is lowered down.
- Do not load the packer using any additional hydraulic pressurisation.
- The packer must always be raised up when driving on public roads and before reversing.
- Check the pressure of packer tyres while checking the pressure of rear wheels.
- Lubricate any moving parts according to lubrication instructions.



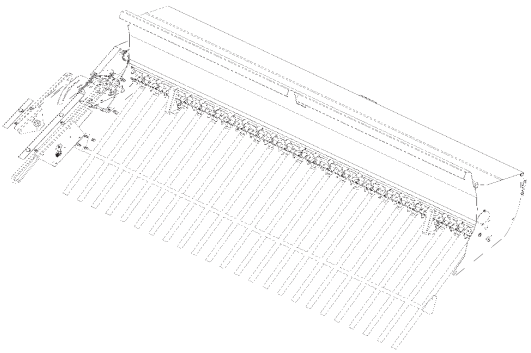
Picture 92. 7.5"X16" tyre



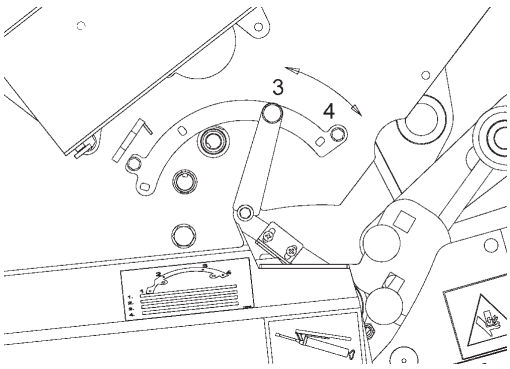
Picture 93. 10"X15.3 tyre

14.2 SMALL SEED AND STARTER FERTILISER DEVICE

Junkkari S-, M- T-, R- and D-series seed drills can be equipped with a small seed and starter fertiliser device. It can be used to apply small seeds, such as rapeseeds, hay or mustard seeds. When applying small seeds, the small seed roll of the metering device is used. The location of the material applied can be selected to be in the seed coulter or surface using the seed drill's switch valve.



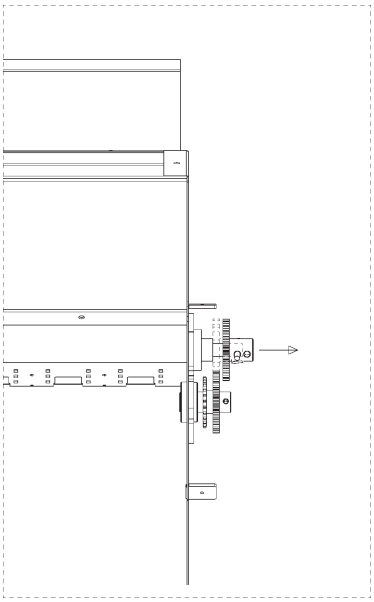
Picture 94. Small seed device



Picture 95. Switch valve

The device consists of a seed hopper, feeding mechanism and gearbox with transmission. It is used and adjusted similarly to the seed drill's seed side. The only exception is that the calibration is performed downwards into the calibration tray through the actual seed metering device.

When the device is used to dose starter fertiliser, deactivate the mixer shaft by moving the locking pin at the end of the shaft to the outermost hole.(Picture 87.)



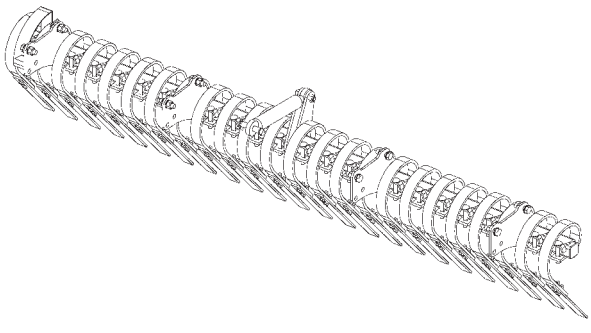
Picture 96. Deactivating the mixer shaft

14.3 FRONT LEVELLER

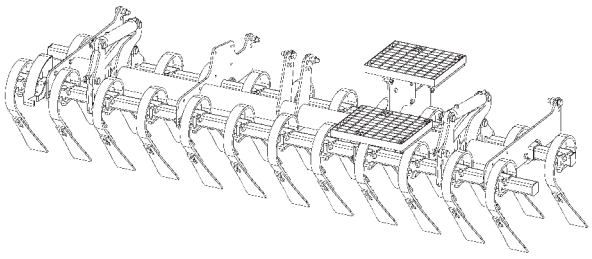
The front leveller levels the soil and crushes crumbs before coulters. The leveller is controlled using the tractor's double-acting hydraulics. Depending on the machine type, a 1-row or 2-row leveller can be used.

Remember:

- Always before reversing, make sure that the leveller does not touch the ground.
- Tighten the screw connections of the leveller after a few operating hours.



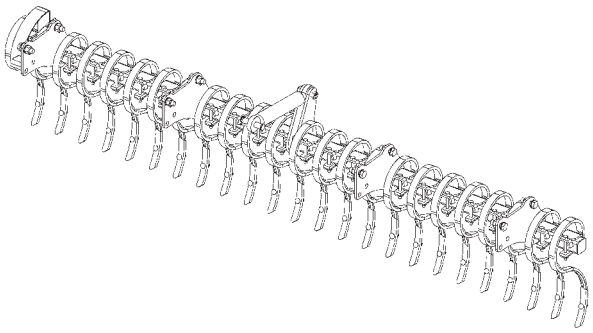
Picture 97. 1-row front leveller



Picture 98. 2-row front leveller

14.4 S-TINE

The S-tine is used to cultivate and loosen the soil. In dry conditions, the S-tine can break the evaporating capillary action. In easily crumbling soil types, the S-tine can cultivate the soil directly during seeding. The best cultivation result can be achieved when the tractor uses dual tyres according to the seed drill's width and the seed drill is equipped with a packer so that the entire working width is evenly packed before the S-tine. The working depth and aggression of the S-tine can be adjusted using the tractor's double-acting hydraulics.



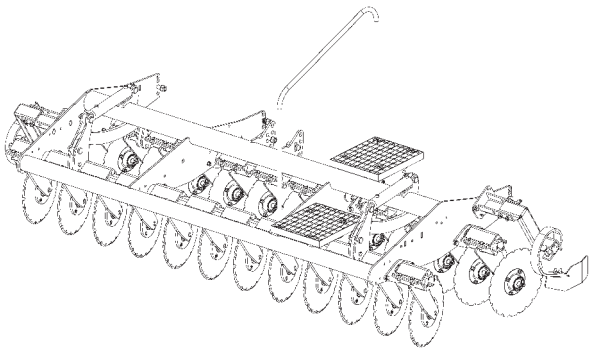
Picture 99. S-tine

14.5 DISC CULTIVATOR

Using a disc cultivator, the number of cultivation times can be reduced and, in specific conditions, seeding is possible directly in a stubbly field. The working depth of the disc cultivator can be adjusted using the tractor's double-acting hydraulics.

Remember:

- The use of the disc cultivator should be avoided in highly moist soil because, if cultivated, moist soil becomes too packed when trampled using a seed drill.
- Avoid cultivation at too high a depth because moisture may not reach seeds and fuel consumption increases unnecessarily.
- Make sure that the cultivator is horizontal when the machine is in the seeding position. The position of the cultivator is adjusted by adjusting the height of the cultivator's front suspension.



Picture 100. Disc cultivator

15 MAINTENANCE AND SERVICE

Pay attention to safety when maintaining the machine. Do not go under the machine. Lubricate the machine from the top and support it using maintenance supports. Check safety instructions at the beginning of this manual.

15.1 EMPTYING, CLEANING AND STORING THE MACHINE

To ensure machine operations without any interruptions, the machine must be cleaned, maintained and stored properly.

EMPTYING THE MACHINE

Empty the machine immediately after the seeding season.

Do not store any seeds or fertilisers in the machine for longer periods.

If there is a small volume of seeds or fertilisers in the hopper, they can be emptied into calibration trays:

1. Install calibration trays into place.
2. Turn the switch valves to the emptying position (position 1).
3. Open the bottom valves in full.

- Larger volumes can be emptied on a clean floor or tarpaulin through coulters when the switch valve is in position 3 or 4. **.**
- Any poorly flowing material can be assisted by turning the calibration lever.
- The best way to perform final emptying is to use compressed air**.**

CLEANING THE MACHINE

- The metering device and the interior of the feed roll should be cleaned during and after the seeding season using compressed air.

Cleaning is especially required if the locking pin is difficult to move or there are impurities inside the black roll.

- **After cleaning, wash the machine and apply lubricant and oil after the operating season.** ***See section 14.2. Lubricating and greasing the machine.***

Do not direct the spray of water to electrical equipment, bearings, the gearbox breather or seals

When using washing agents, check their suitability and follow the manufacturer's safety regulations.

Only use oil designed to be used as protection which does not damage the painted surface or the environment.

Do not apply any oil to plastic or rubber parts.

STORING OF THE MACHINE

- Store the machine cleaned and lubricated indoors in dry conditions protected against sunlight.
- Use the lifting cylinder's maintenance support during storage. Drive the piston arms of other cylinders as much inside as possible before storage and apply oil to any arms left outside..
- Close the hydraulics ball valve.
- Store the control unit screen in a dry and warm place.

15.2 LUBRICATION AND GREASING

Lubricate the machine at intervals presented in the table below and always after pressure washing, and after the seeding season.

		Nippojen lukumäärä		
Greasing area	**Greasing interval**	**S series**	**M series**	**D series**
Lifting cylinder	100 hectares and after washing	2	2	2
Rolling wheel frame joints	100 hectares and after washing	3	3	3
Pivot bearings in rolling wheel bogies	100 hectares and after washing	4	4	4
Rolling wheel shaft bearings	100 hectares and after washing	8	8	8
Harrow arm joints	100 hectares and after washing	2	2	2
Trackmarker hinges	100 hectares and after washing	2	2	2
Trackmarker cylinders	100 hectares and after washing	4	4	4
M-coulter pressure cylinders	100 hectares and after washing	-	2	-
D-coulter fastening joint	100 hectares and after washing	-	-	18/24
D-coulter support wheel joint	100 hectares and after washing	-	-	18/24
D-coulter press wheel joint	100 hectares and after washing	-	-	18/24
Packer arm joints	100 hectares and after washing	2	2	2
Packer wheel bearings	100 hectares and after washing	2/4	4	4
Joints between the packer and draw boom	100 hectares and after washing	2	2	2
Disc cultivator cylinders	200 hectares and after washing	-	4	-
2-row leveller cylinders	200 hectares and after washing	-	4	-
2-row S-tine cylinders	200 hectares and after washing	-	4	-

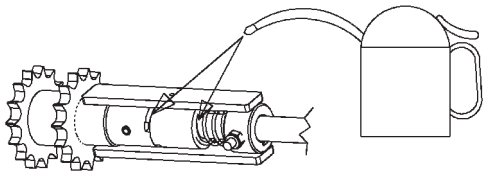
Table 23. Machine greasing

Lubricating the gearbox freewheel clutch

Regularly lubricate gearbox freewheel clutches with oil.

1. Turn the calibration lever so that the halves of the freewheel clutch open.
2. Drip oil onto the halves and turn the lever a few rounds.

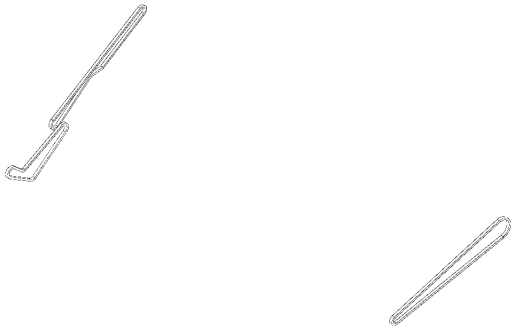
The lever must turn easily and the freewheel clutch must click two times during each round.



Picture 101. Lubricate freewheel clutch

Lubricating roller chains:

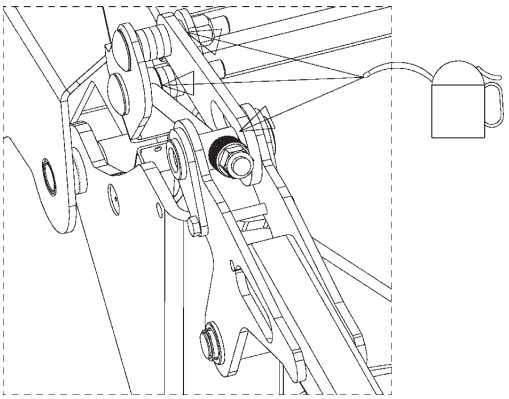
1. Lubricate the friction wheel arm chain, gearbox chain on the fertiliser side, transmission chain on the seed side and any small seed device chains once during each seeding season.
2. At the same time, check the chain tightness and any wear.



Picture 102. Lubricating roller chains

Lubricating harrow lifting joints

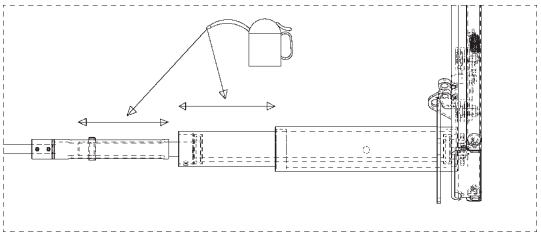
Picture 95



Picture 103. Lubricating harrow lifting joints

Lubricating the friction wheel shaft and cardan shaft:

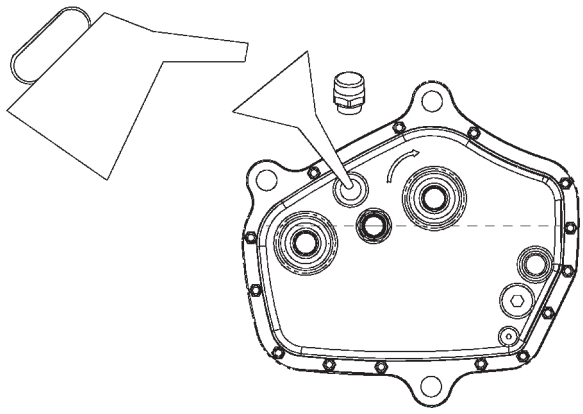
Lubricate the slide surfaces of the friction wheel and cardan shaft when necessary and after the operating season. (Picture 96.)



Picture 104. Lubricating the shaft

15.3 GEARBOX

- If the seed drill has remained unused for a longer period, adjust the gearbox speed at its minimum value.
- Check the gearbox oil level at least once during the seeding season. It is recommended that gearbox oils are changed at least every five years in order to remove any condensed water from the gearbox.
- Check the oil level with the machine in horizontal position. The oil level must be in the middle of the gauge.
- Also check the tightness of Stefa and other seals. The oil volume is 1.3 litres. Use a hydraulic oil of the ISO VG 32 grade. Recommended oils include. *(Table 24.)*



Picture 105. Lubricating gearbox

Neste Hydrauli 32
Shell Tellus Oil 32
BP Energol HLP –D32
Statoil HydraWay Hm32
Texaco Rando Oil HD32
SuperMobil DTE 24

Table 24. Recommended oils

15.4 TYRES

Check tyre pressures before each seeding season and visually at least once a day during the season.

i The air pressure has a direct impact on the total surface pressure of the machine, which in turn affects the field. However, the tyre's bearing capacity decreases at a lower tyre pressure. If the tyre pressure is lower than the recommended value, reduce the transportation speed.

15.4.1 TYRE PRESSURES

The values presented in table 25 have been defined according to the machine weight and the transportation speed of 40 km/h which is the structural top speed of the tyres.

.

i On very rocky soils, use higher tyre pressures than recommended.

Rengas	**Suositus**	**Max.**
7.50 – 16	1,8 - 2,5 bar	2,5 bar
7.50 – 20	1,8 - 2,5 bar	2,5 bar

Table 25. Tyre pressures

15.4.2 CHANGING TYRES

Tyres are the easiest to change when the machine is empty and on a hard base. The outermost tyres can be removed directly from the machine. To change the other tyres, remove the bogie swing from the rolling wheels.

i If the seed drill is used in conditions where tyre breakage is probable, Junkkari recommends that tyres filled with polyurethane (available as optional equipment) be used.

Before tyre change:

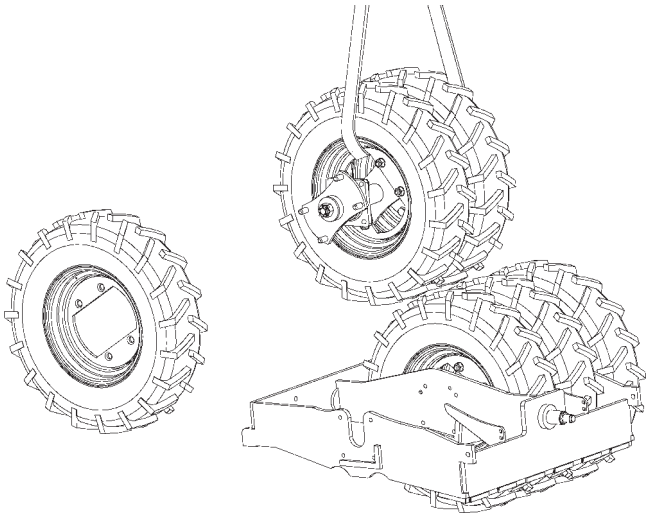
1. Empty machine.
2. Drive the machine onto a hard and level base.

Removing a tyre:

1. Lower any packer to the ground.
2. Lower the machine to a position where the bogie swing is horizontal.
3. Lighten the wheel set by lifting it from the rear frame beam next to the rocker shaft. Make sure that the lifting tool is firmly underneath the beam and the machine cannot fall under any circumstances.
4. Remove the rocker shaft's fastening flanges.
5. Lift the machine so that rocker shafts can be removed from their slots.
6. Pull the rocker shaft to the side using a hand pallet truck or another device.
7. Turn the rocker shaft upside-down.

   ! Make sure that the rocker shaft is not damaged when turning it.

8. Remove any rock guides from between the tyres.
9. Remove the fastening bolts of the shaft's flange bearing and remove the wheel set from the rocker shaft.
10. The tyres can be pulled off the shaft over the fastening flanges and flange bearings.
11. Assemble the wheel set in reverse order.



Picture 107. Removing a tyre

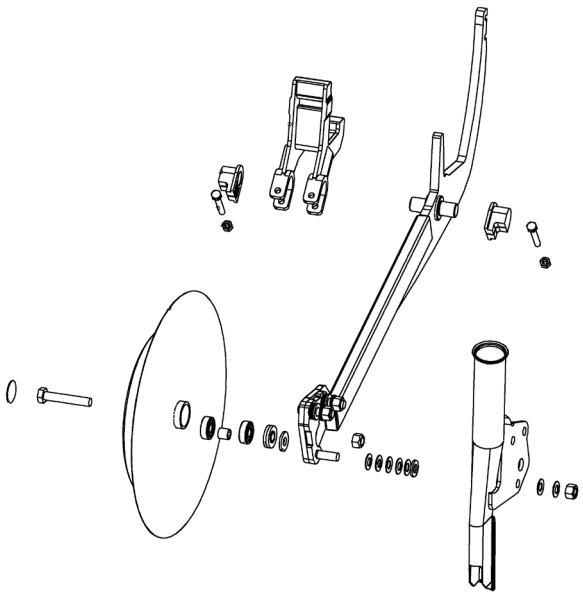
15.5 REPLACING WEARING COULTER PARTS

Make sure that the machine is properly supported and cannot fall down under any circumstances.

15.5.1 REPLACING S-SERIES WEARING COULTER PARTS

REPLACING THE S-SERIES COULTER DISC

1. Remove the coulter side plate.
2. Remove the disc bearing cup by removing the Seger wheel.
3. Remove the locking nut of the disc shaft bolt from the coulter arm.
4. Remove the disc by loosening the shaft bolt.
5. Extract the disc fastening sleeve from inside the bearing.
6. Install the Stefa seal in a new disc.



Picture 108. S-series coulter parts

7. Push and lock a new bearing into the coulter disc using the lock ring.
8. Push the disc fastening sleeve inside the bearing of the new disc.
9. Attach the disc to the coulter arm using the shaft bolt.
10. Fill the bearing housing using Vaseline.
11. Tighten the locking nut of the shaft bolt to the coulter arm.
12. Install the cup back into place and lock it using the lock ring.

REPLACING THE S-SERIES COULTER SIDE PLATE

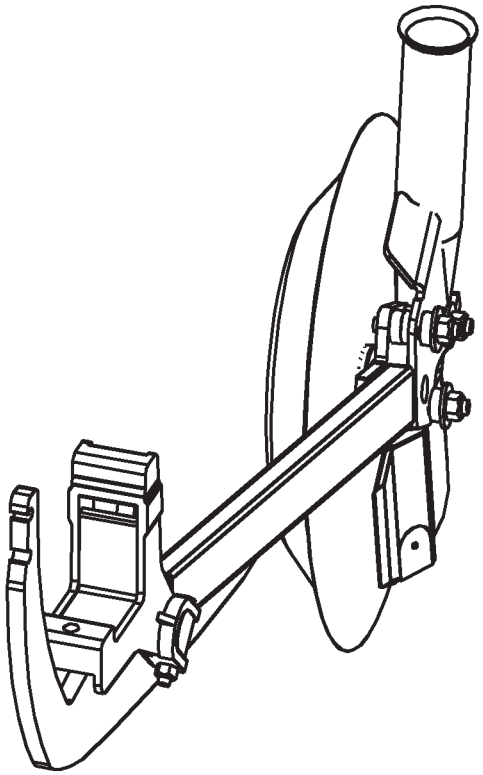
When installing a new side plate, the gap between the coulter disc and side plate must be adjusted so that the side plate touches the disc in its lower corner. There must be a very small gap between the disc and side plate backwards and upwards.

1. The contact point can be adjusted using the M10 fastening nuts.

i For example, the lower side plate corner tightens against the disc by tightening the bottommost nut

2. Finally, check that the coulter disc rotates freely.

! If the side plate is adjusted incorrectly, plant waste may accumulate in the gap.

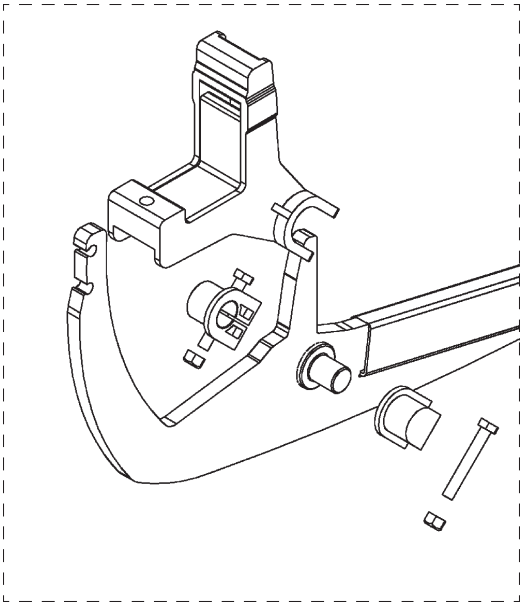


Picture 109. Replacing the S-series coulter disc plate

REPLACING THE PLASTIC BEARING IN THE S-SERIES COULTER ARM

1. Open the spring fastening from the coulter.
2. Remove M10 bolts that lock the plastic bearing to the coulter fastener. Then, the coulter arm can be turned out of the fastener.
3. Remove any worn plastic bearings and install new ones.
4. Lift the coulter arm into the slot in the fastener and attach M10 screws.
5. The screws must be tightened so that there is no free play and the coulter arm can drop freely from its upper position.

i The free play can be adjusted slightly by tightening the screws of the coulter fastener

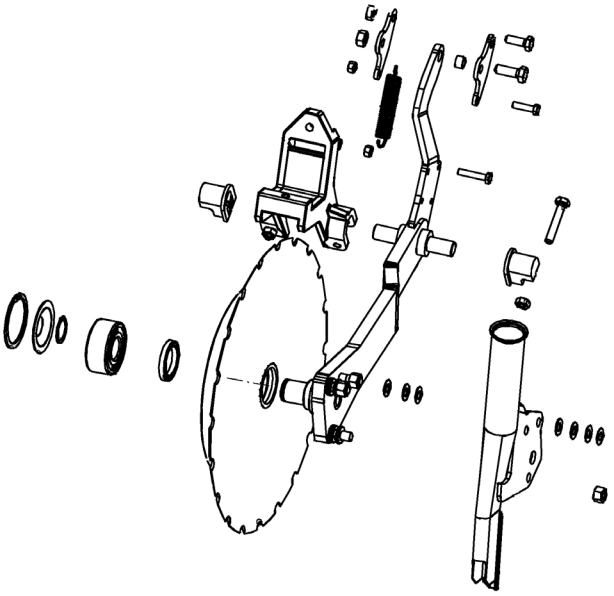


Picture 110. Replacing the plastic bearing in the S-series coulter arm

15.5.2 REPLACING M-SERIES WEARING COULTER PARTS

REPLACING THE M-SERIES COULTER DISC

1. Remove the coulter from the machine frame by opening the two M10 bolts in its fastener joint.
2. Remove the disc bearing cup by removing the lock ring.
3. Remove the lock ring from underneath the cup.
4. Pull the coulter disc out of the shaft.
5. Install the seal in a new disc.
6. Push and lock a new bearing into the coulter disc using the lock ring.
7. Push the coulter disc onto the coulter shaft and fill the bearing housing with Vaseline.
8. Install the lock ring which holds the bearing onto the shaft.
9. Install the cup back into place and lock it using the lock ring.



Picture 111. Replacing M-series wearin coulter parts

REPLACING THE M-SERIES COULTER SIDE PLATE

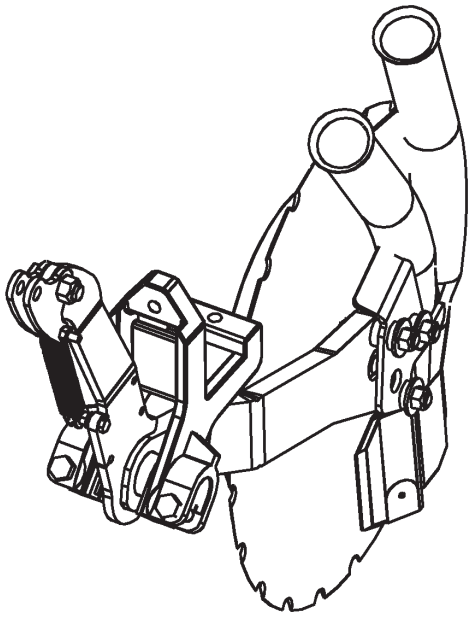
When installing a new side plate, the gap between the coulter disc and side plate must be adjusted so that the side plate touches the disc in its lower corner. There must be a very small gap between the disc and side plate backwards and upwards.

1. The contact point can be adjusted using the M10 fastening nuts

   i For example, the lower side plate corner tightens against the disc by tightening the bottommost nut.

2. Finally, check that the coulter disc rotates freely.

   ! If the side plate is adjusted incorrectly, plant waste may accumulate in the gap

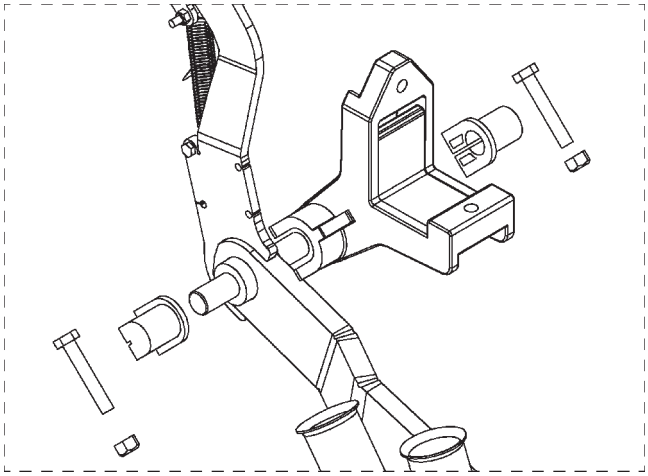


Picture 112. Replacing the M-series coulter disc plate

REPLACING THE PLASTIC BEARING IN THE M-SERIES COULTER ARM

1. Open the spring fastening from the coulter.
2. Remove M10 bolts that lock the plastic bearing to the coulter fastener. Then, the coulter arm can be turned out of the fastener.
3. Remove any worn plastic bearings and install new ones.
4. Lift the coulter arm into the slot in the fastener and attach M10 screws.
5. The screws must be tightened so that there is no free play and the coulter arm can drop freely from its upper position.

i The free play can be adjusted slightly by tightening the screws of the coulter fastener.



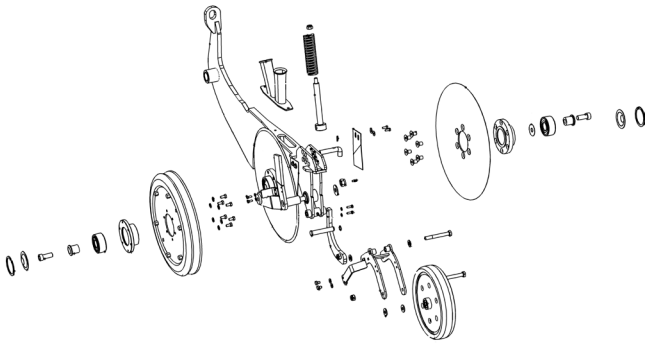
Picture 113. Replacing the plastic bearing in the M-series coulter arm

15.5.3 REPLACING WEARING D-SERIES COULTER PARTS

The coulter disc, supporting wheel, press wheel and other wearing coulter parts can be replaced separately.

For repairing the coulter, remove it from the seed drill frame.

The coulter is attached to the machine frame beam using a pin fastened using an M12 screw.



Picture 117. D-mallin vantaan osat

Before starting work, make sure that the machine is properly supported and cannot cause a hazard under any circumstances. When removing the coulter, remember that it is heavy.

REPLACING THE D-SERIES COULTER DISC

The disc is attached to the hub using six sunk screws.

1. Remove the bearing locking ring under the hub cup.
2. Remove the hub. The hub has a collar which can be used when extracting it.
3. When extracting the hub, check the condition of the shaft's seal and replace it, if necessary.

REPLACING WEARING D-SERIES PARTS

- Replace wiper discs if they are so worn that they cannot be tightened.
- To remove the supporting wheel, open the crown nut and turn the arm so that it can come off its shaft. If the Drymet bearing of the supporting wheel is worn loose, replace it before steel parts start to wear.
- Regularly check the clearance of the coulter fastening pin. If the coulter moves sideways so that coulters hit each other, replace the Drymet bearings. .
- Finally, check that the coulter discs rotate freely and all moving parts move freely

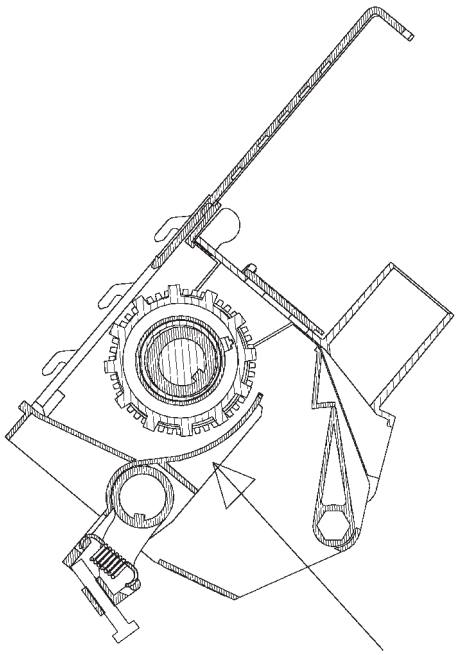
15.6 REPLACING THE METERING DEVICE'S BOTTOM FLAP AND ROLL

Feeding volumes are crucially affected by the condition and proper adjustment of feed rollers and bottom flaps. The bottom flaps have been adjusted at the factory but it is possible that foreign objects, etc. have caused damage. A damaged bottom flap must be replaced.

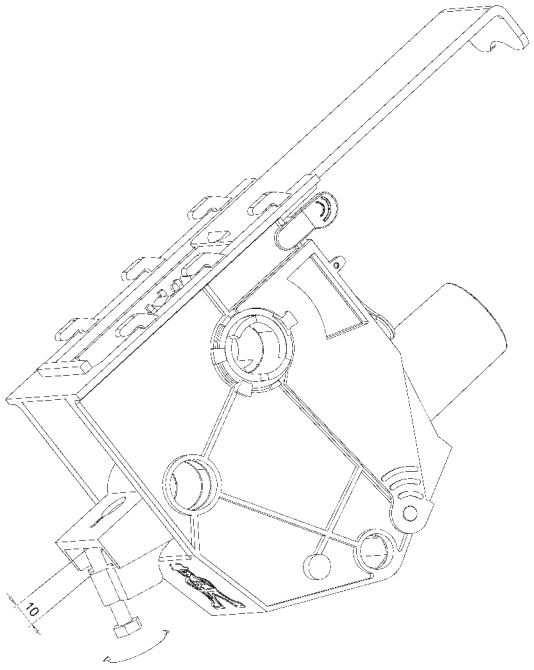
Calibration indicates whether or not feeding is even. If a seed or fertiliser pile differs from others, check the condition of the specific bottom flap.

15.6.1 REPLACING A BOTTOM FLAP

1. If the hopper is not empty, close all closing hatches above the feeding hoppers before replacing the bottom flap.
2. Loosen the bottom flap.
3. Remove as many bottom funnels as required to grab the bottom flaps to be removed.
4. Release the bottom flap shaft by removing the fastening screw of the bottom flap's adjustment handle from the shaft.
5. Pull the shaft outwards from the end of the machine so that you can remove the damaged bottom flap.
6. Adjust the tightness of the bottom flap so that it is identical to other bottom flaps.
7. Place the bottom flap in its housing and push the shaft back into place.
8. Once the bottom flap has been replaced, check its adjustment



Picture 114. Replacing the metering device



Picture 115. Adjusting a bottom flap

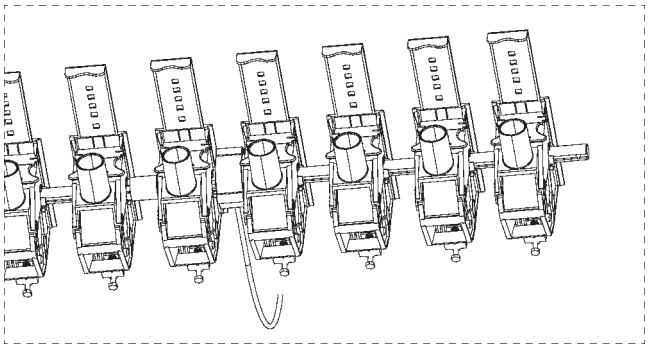
15.6.2 ADJUSTING A BOTTOM FLAP

In new machines, the bottom flap spring has been adjusted at the factory. The basic adjustment of the bottom flap spring must be performed when the dimension shown in the picture 106 is 10 mm. All bottom flaps must be adjusted similarly.

Turn the bottom flap adjustment switch to position 1 to check the clearance of the bottom flap and feeding rifle by feeling with your finger (0.5 mm).

15.6.3 REPLACING THE FEED ROLLER

1. 1. Remove the feed shaft's locking screw from the right end of the machine and pull the feed shaft sufficiently out from the machine.
2. 2. Open the closing hatch of the feed housing.
3. 3. Extract the roller out from the housing.
4. 4. Put a new roller in to the housing.
5. 5. When the rifle and plastic bearings are pushed back into the housing, make sure that the plastic bearing's bracket points towards the bottom of the groove.
6. 6. Close the metering device's closing hatch which locks the roller into its place.
7. 7. Push the feed shaft back into place so that the key inside the roller sits in the shaft's keyslot.
8. 8. Make sure that the tramline clutch (if any) and the sleeve between metering devices are positioned correctly.
9. 9. Lock the shaft into place using the screw at the right end of the machine to lock the feed shaft to the mechanism.



Picture 116. Replacing the feed roller

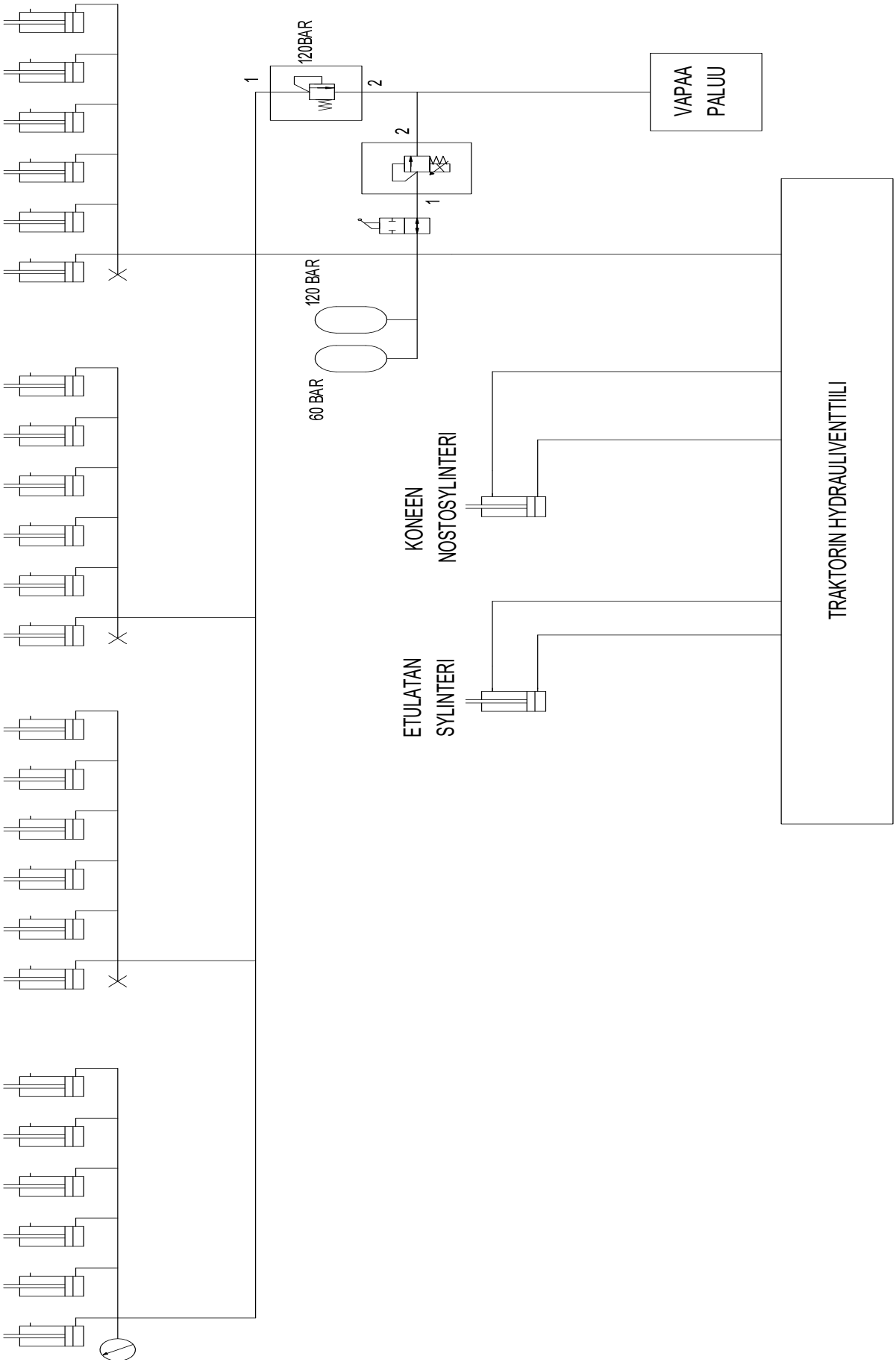
16 TROUBLESHOOTING

FAULT	CAUSE	REPAIR MEASURE
Calibration does not produce the same result as curves	Incorrect adjustment	Check the adjustment
	Incorrect direction of rotation	Check the direction of rotation
	Incorrect rotation volume	Check the rotation volume
	Incorrect bottom flap position	Check the bottom flap
	The curves are indicative	Define the seeding volume through calibration or test it by driving
The machine feeds less than required by calibration	Incorrectly performed calibration	Re-calibrate
	Bottom flap or closing hatch in incorrect position	Check the bottom flap and closing hatch
	Metering device or feed roller blocked	Remove the cause of the blockage and check the feeding volume through calibration
	Fertiliser absorbed moisture and adhered above metering device	Tap the bottom of the hopper lightly using a rubber hammer and perform calibration
	Fertiliser absorbed moisture and adhered to the feed roller	Clean the feed rollers
	Friction wheel does not rotate	Remove any foreign objects and check that the friction wheel rotates freely
	Friction wheel adjusted too high	Check the height adjustment of the friction wheel
	Gearbox adjustment lever loose	Check the tightness of the adjustment lever
	Gearbox damaged	Check the operation of the gearbox through calibration and a rotating test
	Damaged feed roller	Check the condition of feed rollers
The machine feeds more than required by calibration	Machine vibration packs seeds tighter and increases the feed volume	Specify calibration after a short period of seeding
	Incorrectly performed calibration	Re-calibrate
	Gearbox adjustment lever loose and moved	Check the tightness of the adjustment lever
	Bottom flap switch in incorrect position	Check the position of the bottom flap switch
Feed volume between feed housings varies	Bottom flaps in different positions	Adjust
	Closing hatches in different positions	Adjust
	Blockage in metering device	Remove the cause of the blockage
	Feed roller clogged	Clean the feed rollers
	Small seed settings active in some feed housings	Check the setting
	Tramline clutch produces a tramline	Change the calculator value as required

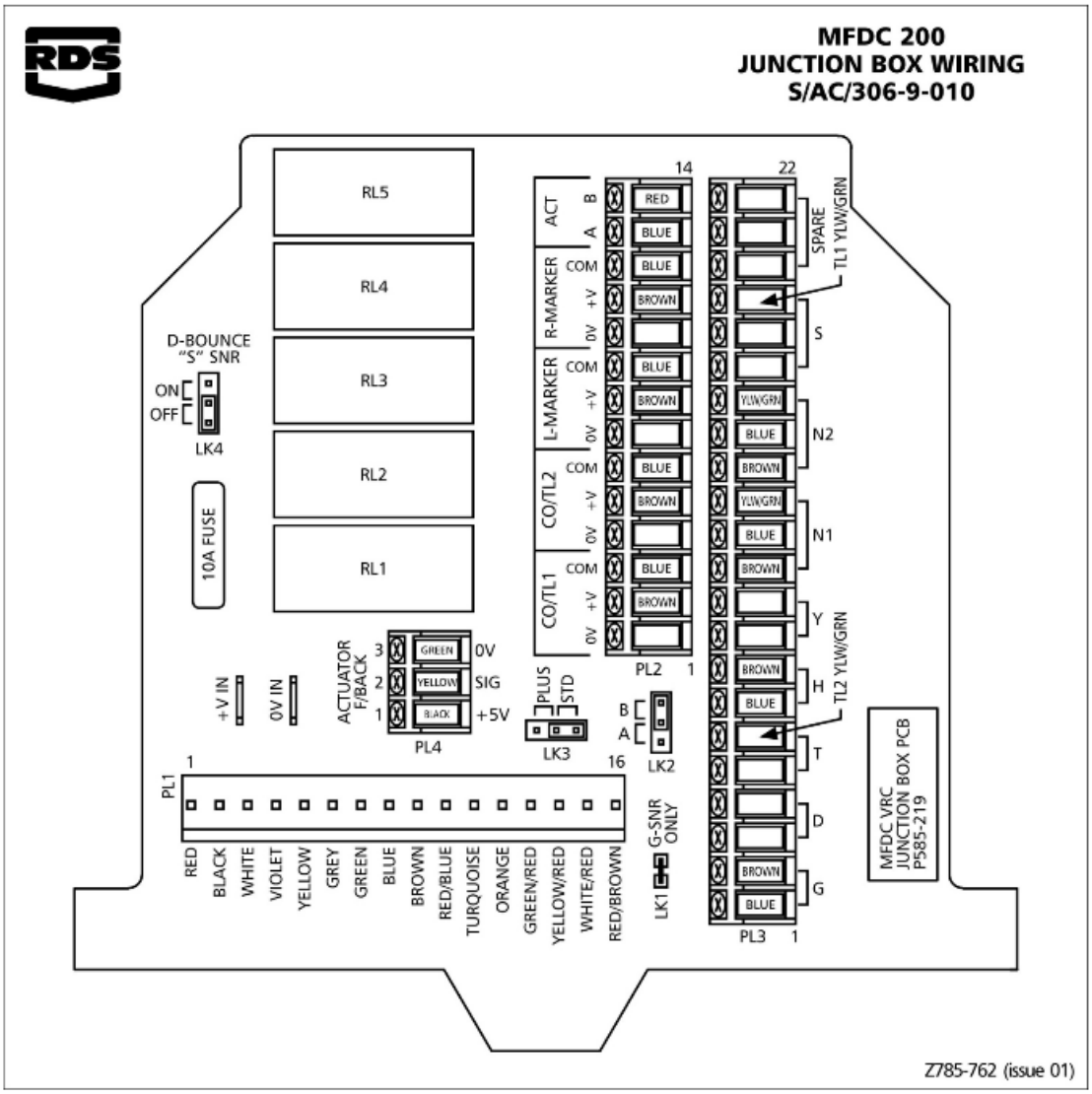
Leaking metering device	A foreign object in the metering device (e.g. clumped fertiliser)	Remove the foreign object and check the condition of the metering device
	Bottom flap lever damaged or loose	Adjust/repair
Fertiliser or seed shaft jerks/rotates half the time	Gearbox spring broken	Replace the spring
	Gearbox brake bearing damaged	Repair the gearbox
Surface are meters do not work	Batteries empty	Change the batteries
	Damaged sensor	Replace the sensor
	Damaged sensor cable	Replace the cable
	Sensor cable connection loose	Check the connection
Seed drill control unit screen does not start	Voltage less than 10 V	Check the power supply
	Damaged cable	Replace the cable
Seed drill control unit speed 0 km/h, even though the machine is down and driven	Friction wheel in transportation position or does not rotate	Lower the friction wheel to the seeding position and check that it rotates
	Damaged transmission	Repair the transmission
	Speed sensor magnet loose	Attach the magnet
	Sensor disconnected or incorrect distance to magnet	Adjust and attach
	Broken sensor cable	Repair the sensor cable
Track calculator does not calculate even if the machine is raised and lowered	Lifting sensor magnet loose	Attach the magnet
	Lifting sensor disconnected or incorrectly adjusted	Adjust and attach
	Broken lifting sensor cable	Replace the sensor
	Calculator stopped	Activate the calculator
Tramline calculator not displayed on screen	Tramlines disabled	Set spray width > 0 in settings
Control unit displays incorrect driving speed and surface area	Speed pulses not calibrated	Calibrate the speed measurement
Hopper guard does not alert even if hopper is empty	Alarm disabled	Activate the sensor in user settings
	Sensor adjusted too low, and the hopper bottom causes an error signal	Adjust the sensor higher
	Damaged sensor or cable	Replace the sensor
Hopper guard gives a continuous alarm	Seeds/fertilisers in the hopper below the detection limit	In small seed application, disable the hopper guard in control unit settings
Coulter arm fastening has a sideways clearance	Coulter arm joint loose	Tighten the plastic bearing of the arm fastener or replace the worn plastic bearing
Coulters in the front and rear row apply seeds at different depths	Machine not adjusted horizontal	Adjust the machine horizontal using the pushing arm

Clogged coulters	The soil is too damp	Wait for the soil to dry before seeding
	The machine is lifted or lowered when standing still or the machine is stopped without lifting the machine	Always lift and lower the machine when moving Do not stop if the machine is down
	Impurities in seeds or fertilisers	Only use clean seeds and fertilisers If required, acquire a seed hopper sieve
	Damaged coulter pipe	Repair the coulter pipe
Straws accumulate between the coulter disc and side plate	Gap between the side plate and disc	Adjust the side plates so that they touch the disc from their front/ lower corner
Feed pipe gets easily blocked	Bent pipe	Straighten or replace the pipe
Smoking or noisy wheel	A foreign object in the wheel set	Remove the foreign object and check the condition of the wheel set
Hydraulics do not work properly	Ball valve closed	Open the ball valve
	Disconnected hose or incorrect connector	Connect/replace
	Maintenance support in place	Remove the maintenance support
	Half lift active	Deactivate the half lift function
Disc cultivator pulls to the side	Cultivator not adjusted correctly	Adjust the cultivator so that the front and back row have the same depth

17 HYDRAULIC DIAGRAM OF D-MACHINE COULTER PRESSURE



18 ELECTRICAL DIAGRAMS



TI1 TRAMLINE LEFT

TI2 TRAMLINE RIGHT

H SPEED SENSOR

RML TRACK MARKER LEFT

RMR TRACK MARKER RIGHT

N1 LEVEL SENSOR SEED

N2 LEVEL SENSOR FERTILIZER

19 ASSURANCE OF COMPLIANCE WITH EC REGULATIONS

ASSURANCE OF COMPLIANCE WITH EC REGULATIONS

Junkkari Oy
Pohjanmaanväylä 1720,
FI-62375 Ylihärmä, Finland

Here with declare on our sole responsibility that for the market produced machine

S300 seed drill from the manufacturing number S300X100001

S400 seed drill from the manufacturing numberS400X100001

M300 seed drill from the manufacturing numberM300X100001

M400 seed drill from the manufacturing number M400X100001

D300 seed drill from the manufacturing number D300X100001

D400 seed drill from the manufacturing numberD400X100001

is manufactured, where applicable, in conformity with provisions of the instructions of the normative document according to the following directive: 2006/42/EY.

JUNKKARI OY
Kauhava 7.2.2025

Toni Ruokoja
Managing director

ORIGINAL