JUNKKARI ISOBUS ECU TECHNICAL SPECIFICATION (ELITE EQUIPMENT LEVEL) MANUAL

22.4.2025

Versio 1_2025

Excerpt from manual OH000120

1 JUNKKARI ISOBUS ECU – TECHNICAL SPECIFICATIONS (ELITE EQUIPMENT LEVEL)

The instructions in this section apply to the ELITE equipment level.

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

Picture 1. The ISOBUS cable of the seeding drill and the plug on the tractor.

1.1 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 and ISOBUS TC-SC 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.

1.2 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 not cover the sensor, the light turns red. The sensors are located at both the left and right ends of the hoppers.

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.

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.

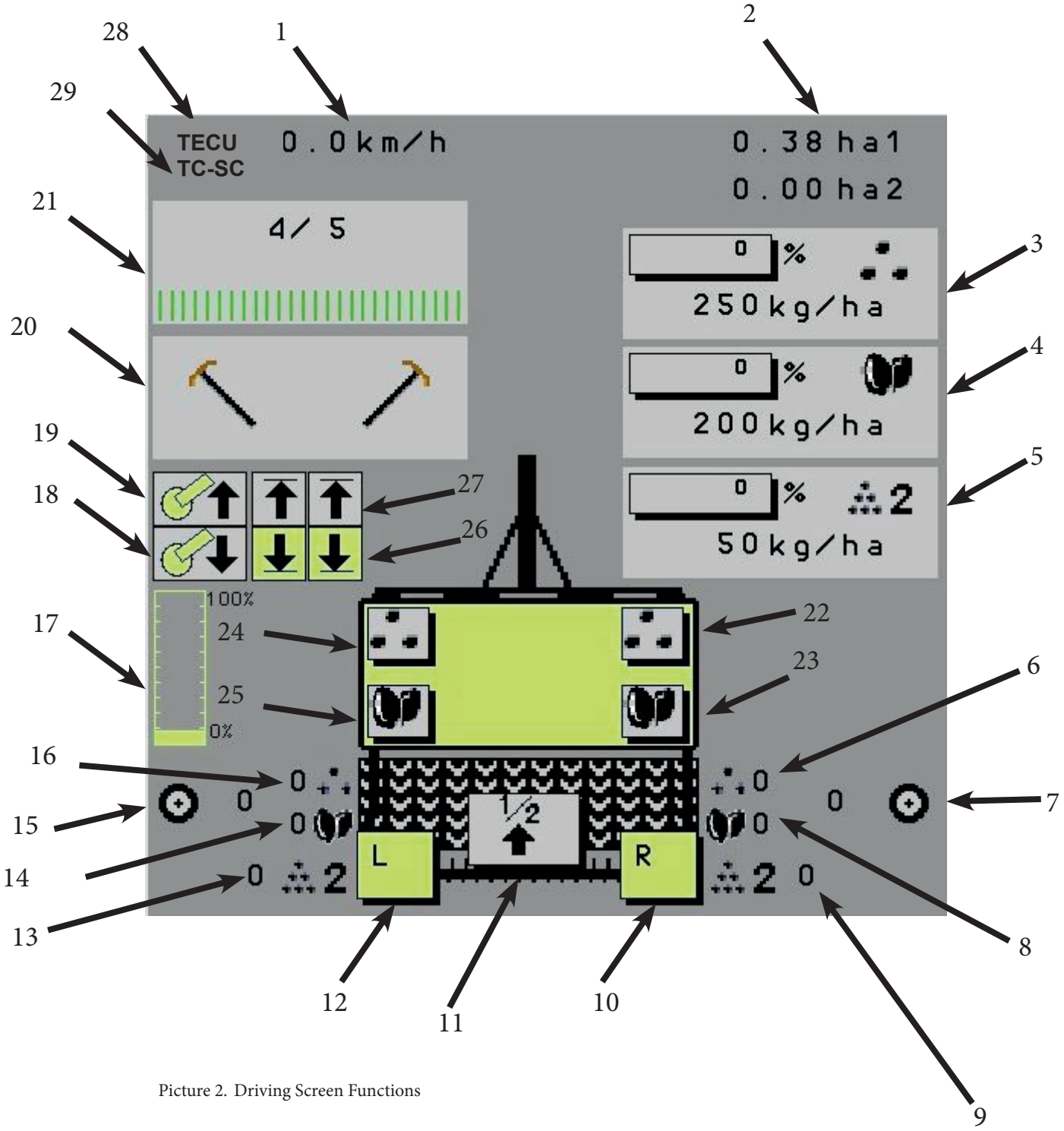
5. Coulter pressure adjustment

- Coulter pressure can be increased or decreased using the pressure adjustment buttons on the screen. (This requires the tractor to have LS hydraulic system.)

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.

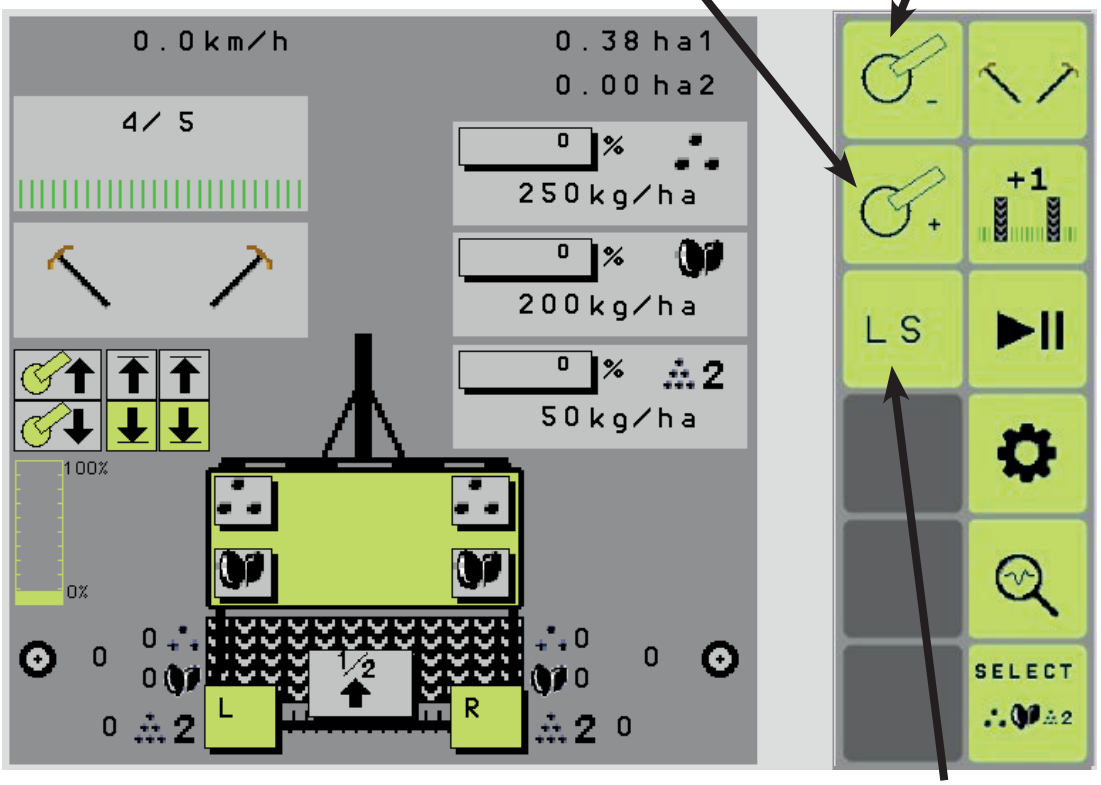
1.3 DISPLAY FUNCTIONS – ELITE



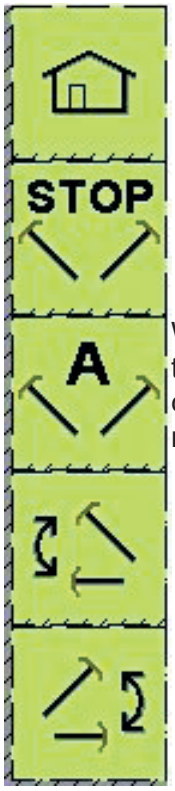
Picture 2. Driving Screen Functions

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
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.

1.4 FRONT PAGE BUTTONS – ELITE



1.4.1 TRACK MARKER MENU



Return to main menu

Turn track markers off

Automatic track marker function

When activating the automatic function, first select A, then choose the starting side: left or right.

Left marker manual function

Right marker manual function

1.4.2 TRAMLINE RHYTHM SELECTION

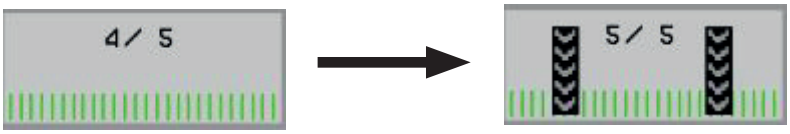
Note: The icon 11.4.2 is only shown if the machine is equipped with tramline clutches.

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.



1.4.3 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.

1.4.4 SETTINGS

SETTINGS PAGE 1

Return to main menu

Calibration menu 13.4.4.1

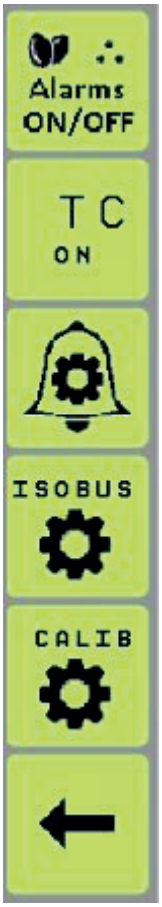
Tramline settings 13.4.4.2

Reset area counters 13.4.4.3

Restore factory settings

Switch to next settings page

SETTINGS PAGE 2



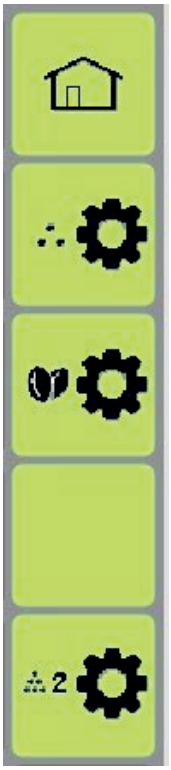
All hopper sensors On/Off

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



Return to main menu

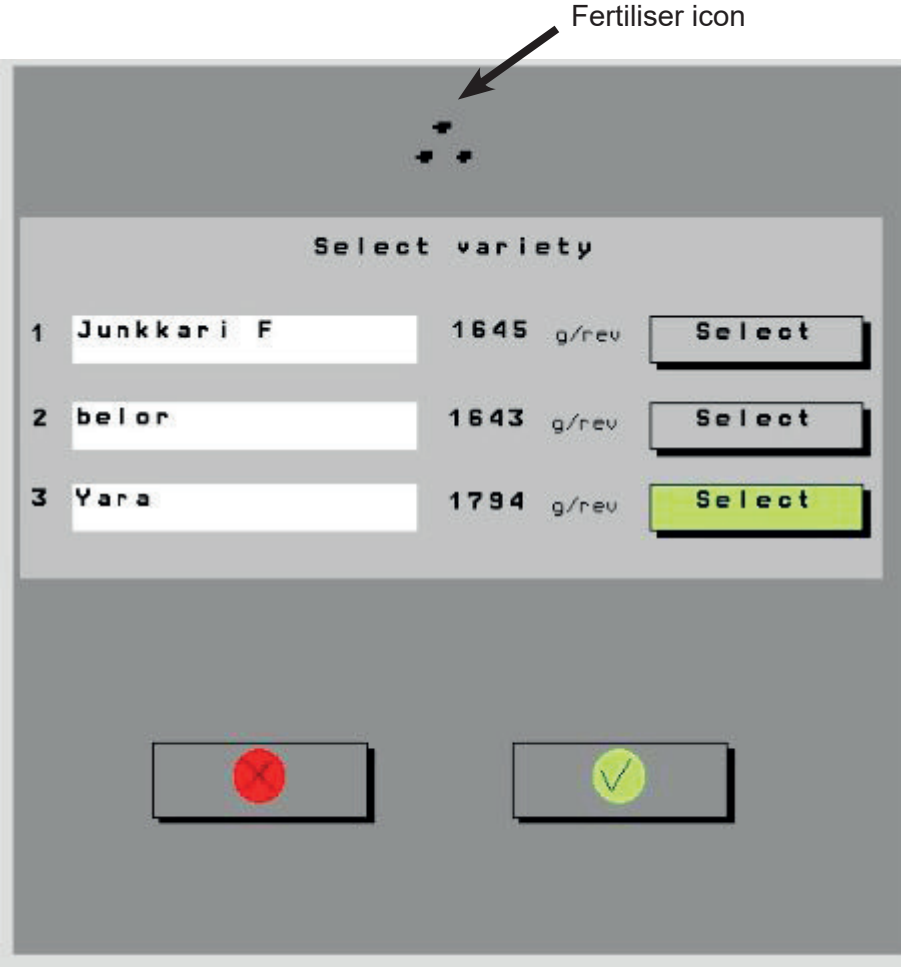
Fertiliser calibration

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.

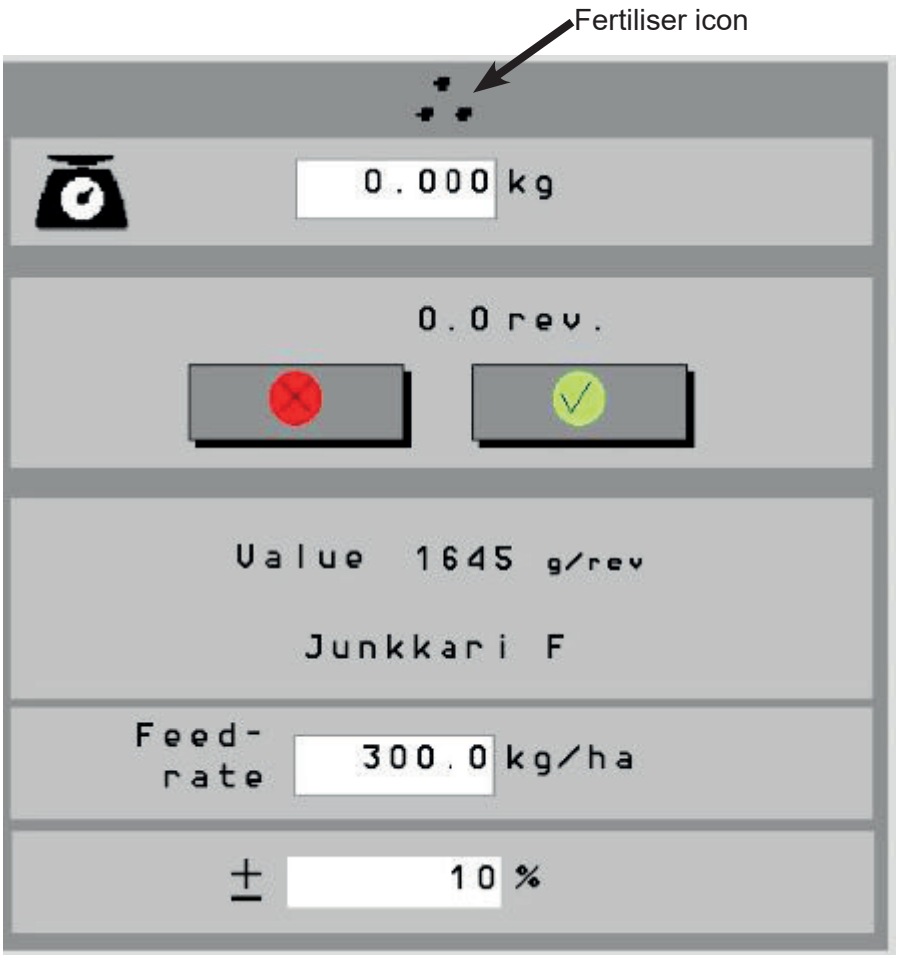


Calibration memory slots.

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

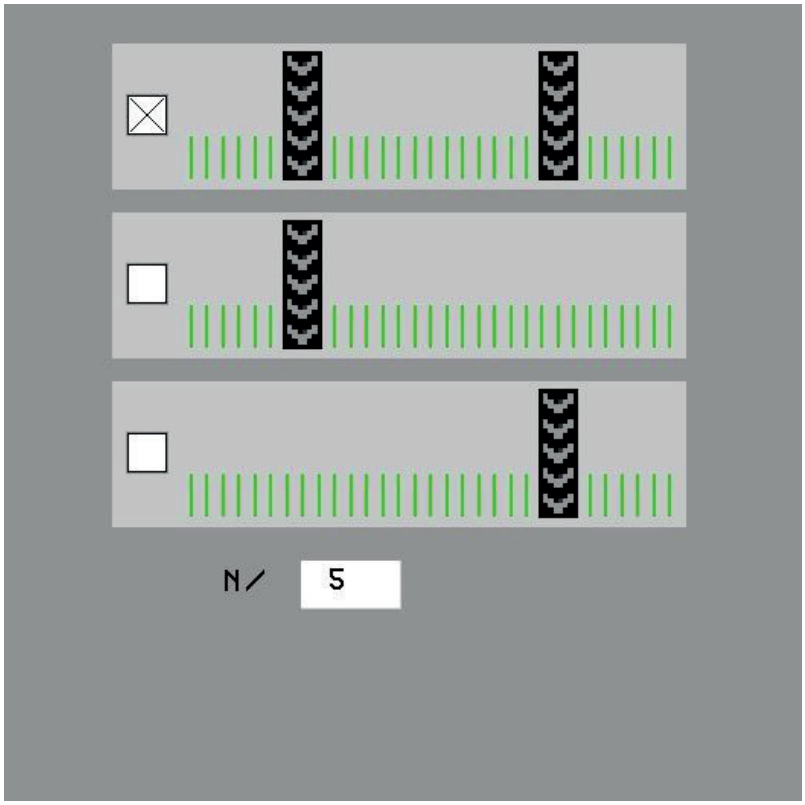
Selected application rate (kg/ha)

Application rate adjustment step size during operation

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

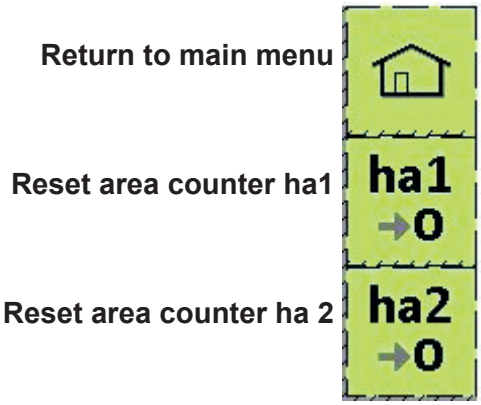
TRAMLINE SETTINGS 1.4.4.2

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



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.



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.

Seed hopper level sensor

Fertiliser hopper level sensor

Small seed hopper level sensor (optional)

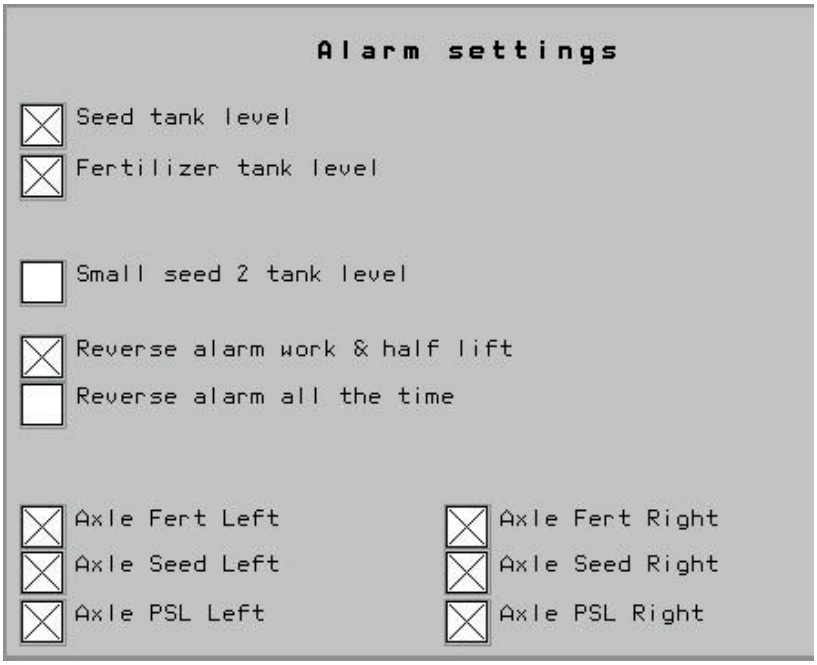
Reversing alarm when half lift is active

Reversing alarm always active

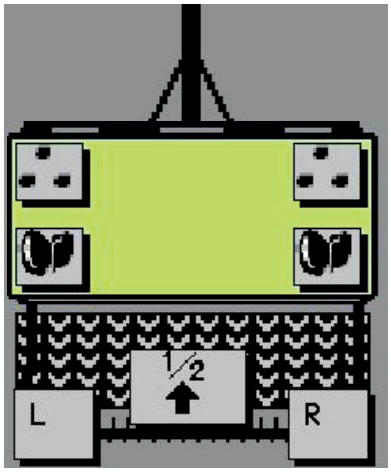
Fertiliser motor alarms

Seed motor alarms

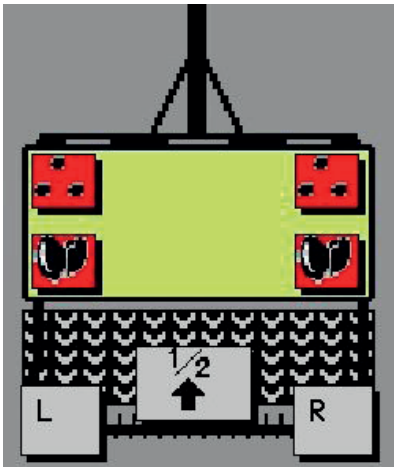
Small seed motor alarms (small seed hopper is optional)



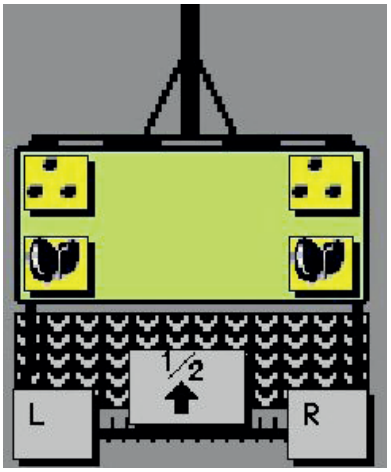
Hopper icons on the main screen:



Grey button = no alarm



Red button = alarm is active

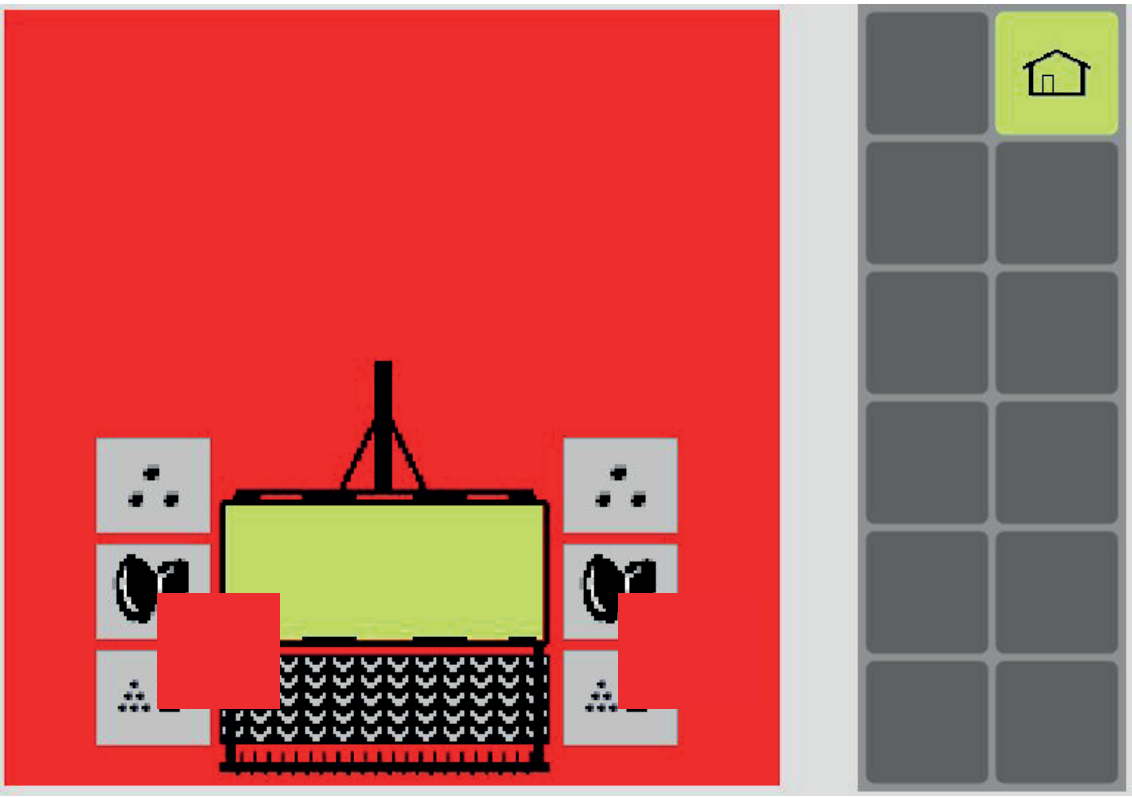


Yellow button = alarm has been turned off

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

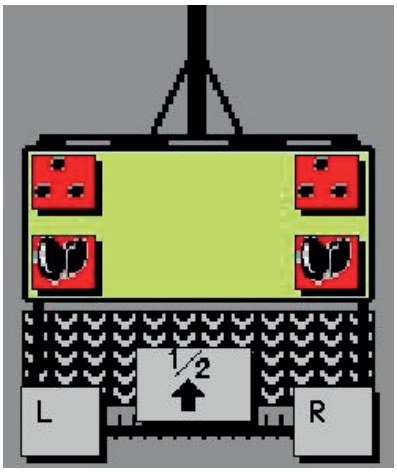
Icons next to the hopper indicate which hopper triggered the alarm.

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.

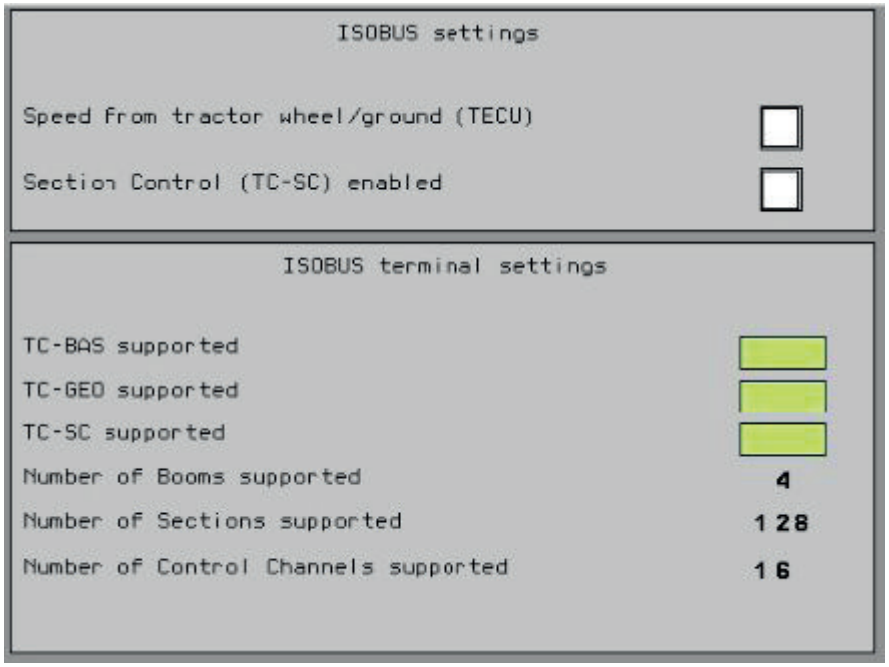


ISOBUS SETTINGS AND INFORMATION 1.4.4.5

Driving speed from tractor CAN bus

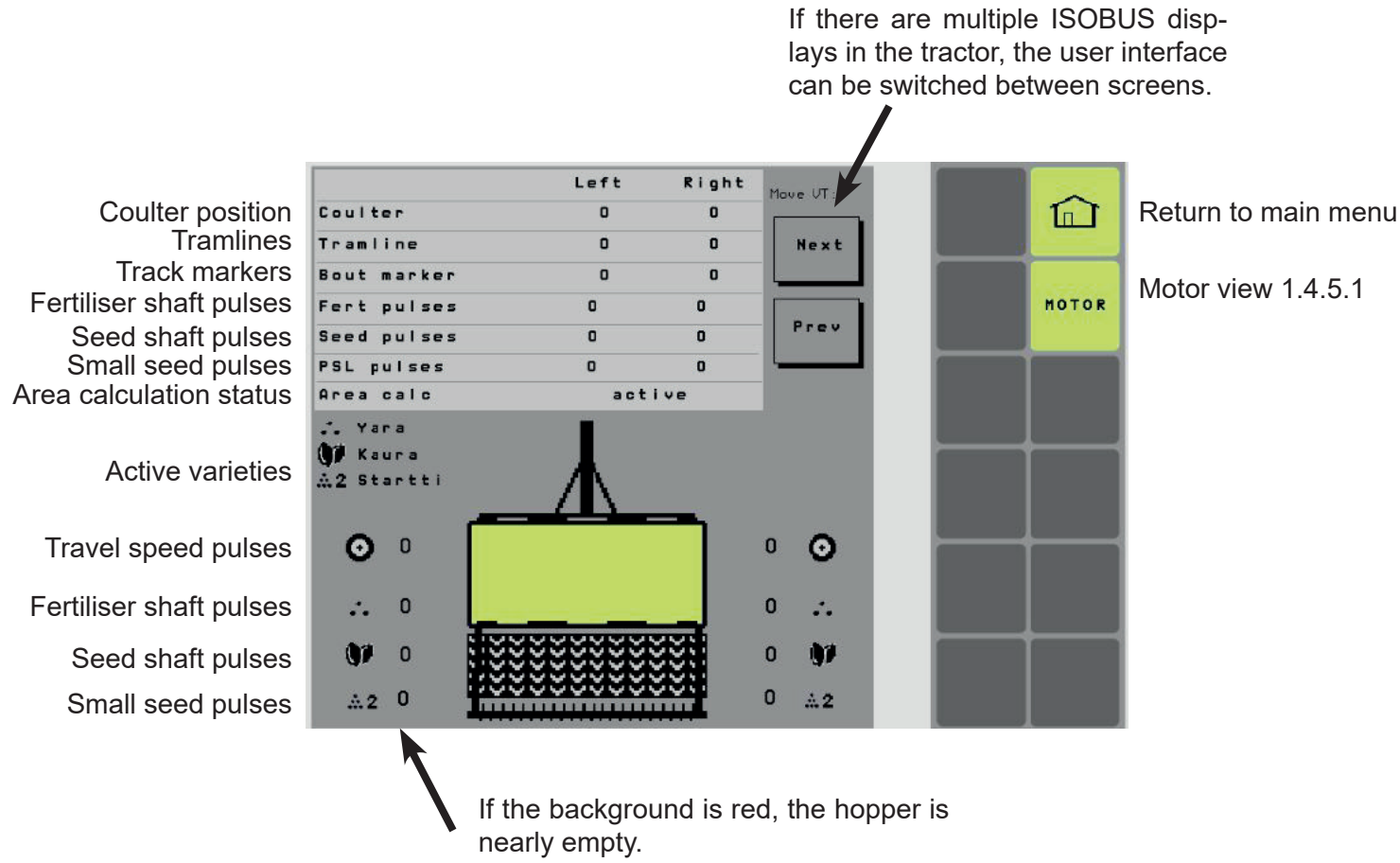
Precision farming features on/ off

ISOBUS functionalities

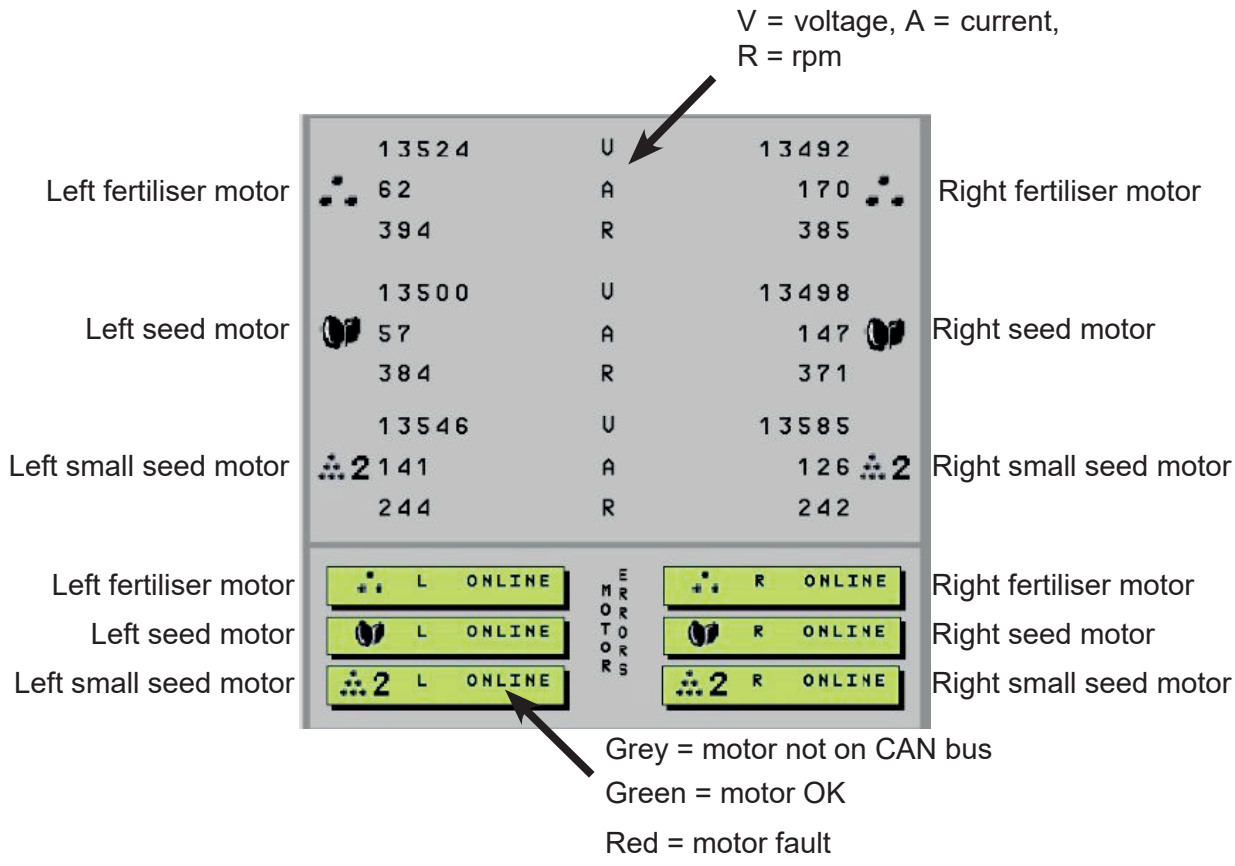


If ”Speed from TECU” is selected, the curve compensation function is disabled, and a red TECU icon is shown on the screen.

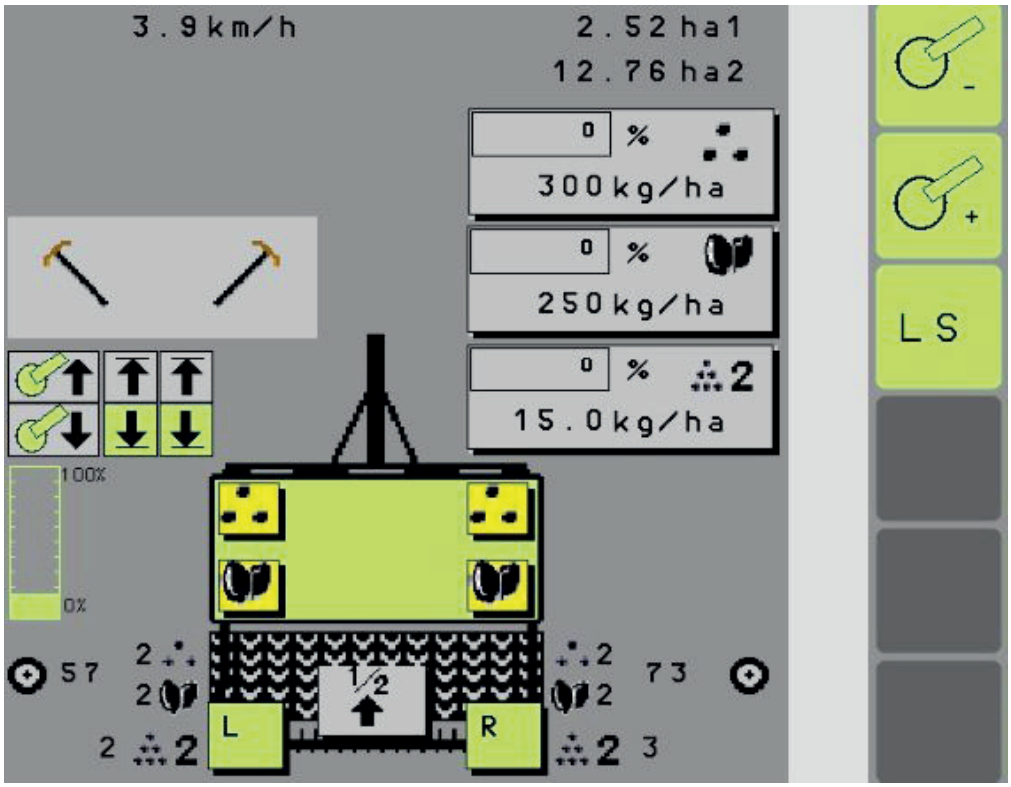
1.4.5 DIAGNOSTICS DISPLAY



Motor View 1.4.5.1



1.4.6 LS AUTOMATION



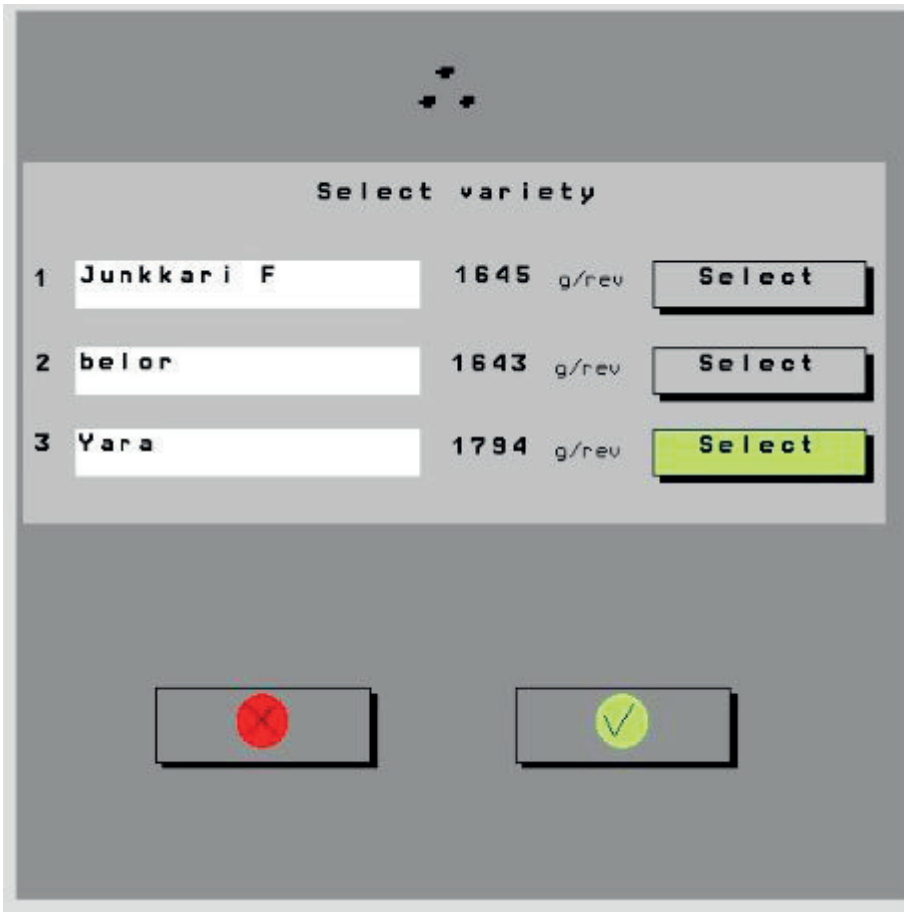
Manual adjustment of coulter pressure, decreases pressure

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.

1.4.7 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. The calibration test shows how many grams the metering units feed per turn.

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

1.5 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:

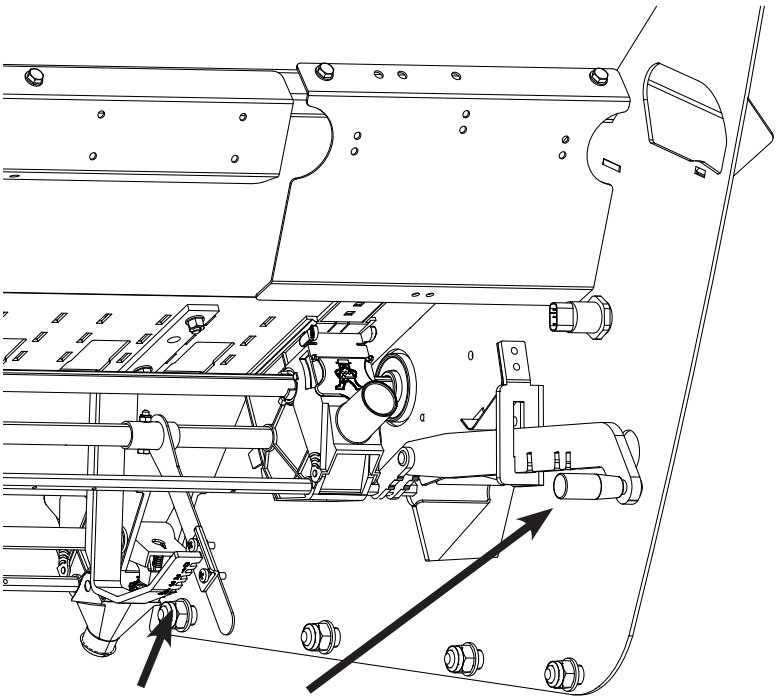
- Main menu
- Fertilizer calibration test
- Seed calibration test
- Small seed calibration test (only visible if the small seed box is installed)

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

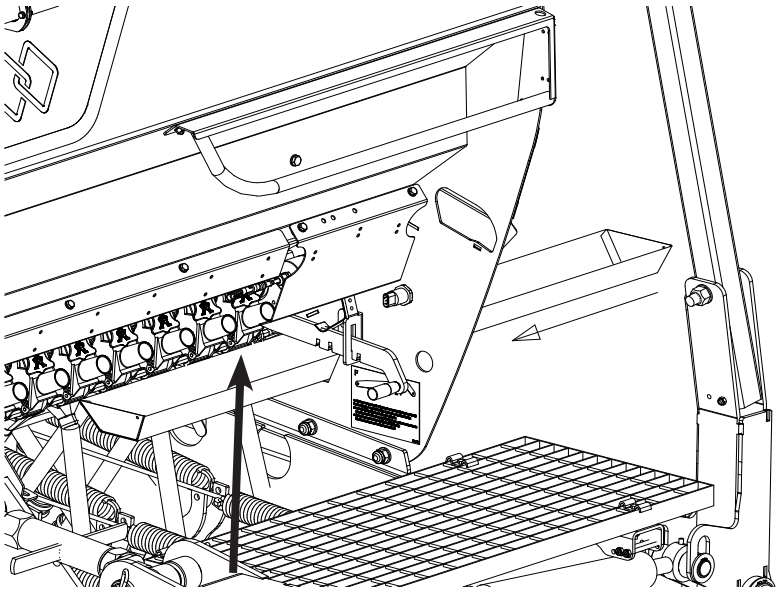
Before running the actual test, fill the metering units by pressing the calibration test button for the fertilizer side. At the same time, make sure all units feed evenly and that there is no debris or foreign matter. Empty the trays and place them back again.

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.

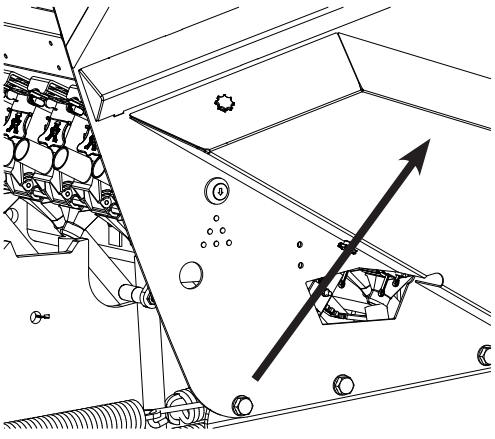
Then perform the actual calibration test by pressing the test button until the trays are about half full. Remove both trays and weigh the collected material using the scale provided with the machine or another precise scale.



Picture 3. Bottom flap and adjustment flap selecto



Picture 4. Calibration tray



Picture 5. 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.

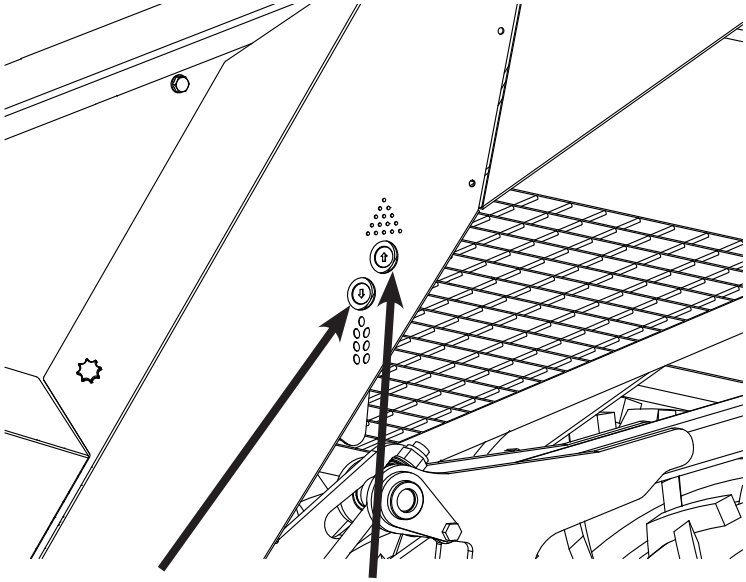
Press the main menu button to return to the working screen.

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.

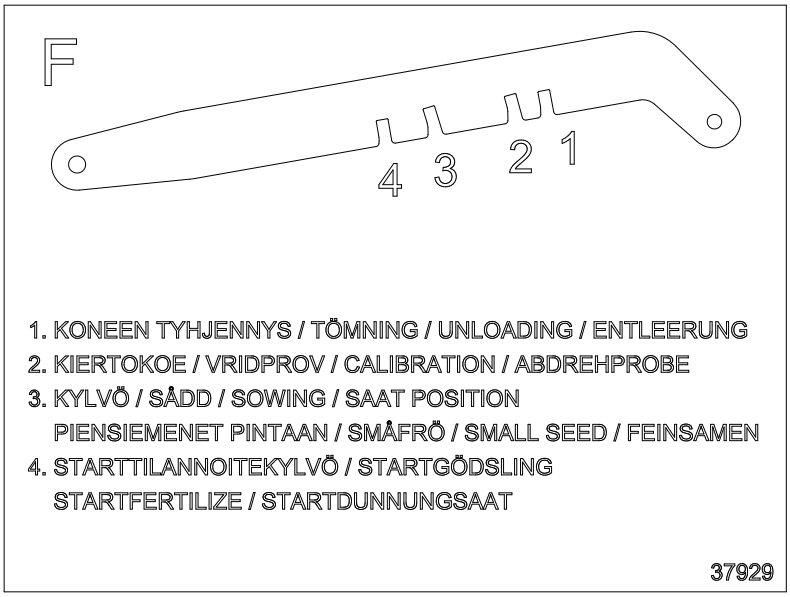
Adjust the bottom flap for fertilizer, seed, or small seeds according to the material used (Table 10).

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

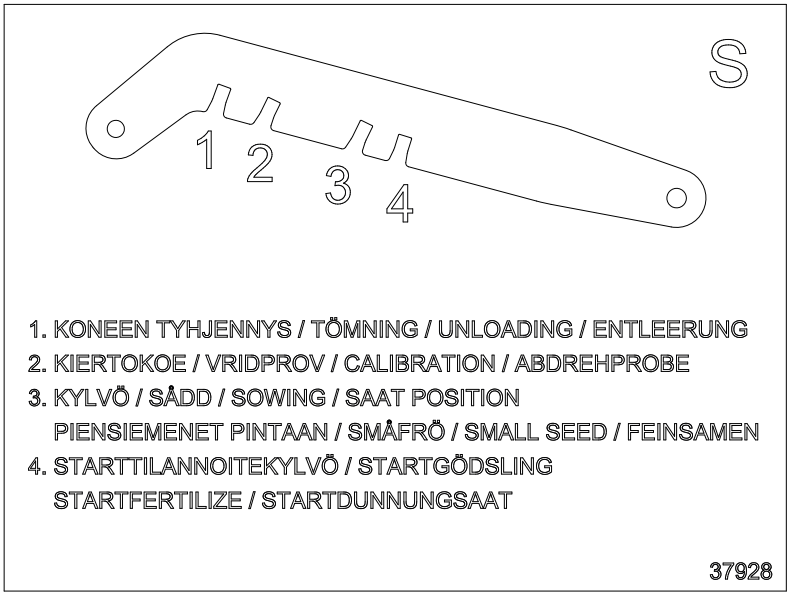
Table 10. Bottom Flap Setting and Seed Size



Picture 6. Seed and small seed (optional) calibration test buttons



Picture 7. Fertilizer adjustment flap positions



Picture 8. Seed adjustment flap positions

1.6 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:

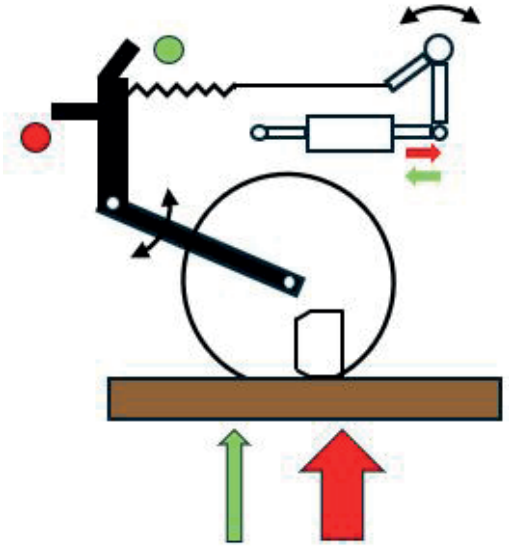
If you want to use automatic coulter pressure, activate the LS button on the main screen (it will turn yellow). The automatic function keeps the coulter in an optimal position even when soil type changes. The optimal angle is when the front edge of the coulter's side plate is at a 90° angle to the soil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

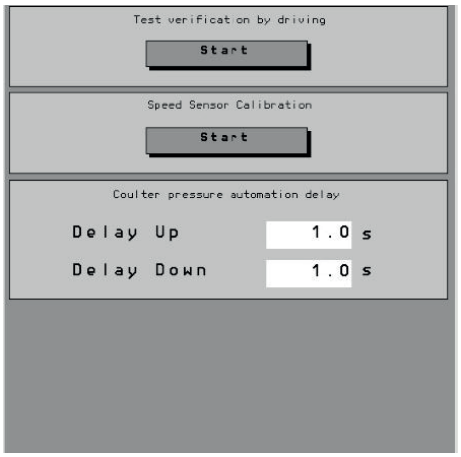
If the LS button is active (yellow) and a manual adjustment is made, the automatic control turns off and must be reactivated if you want to continue using automatic coulter pressure.

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

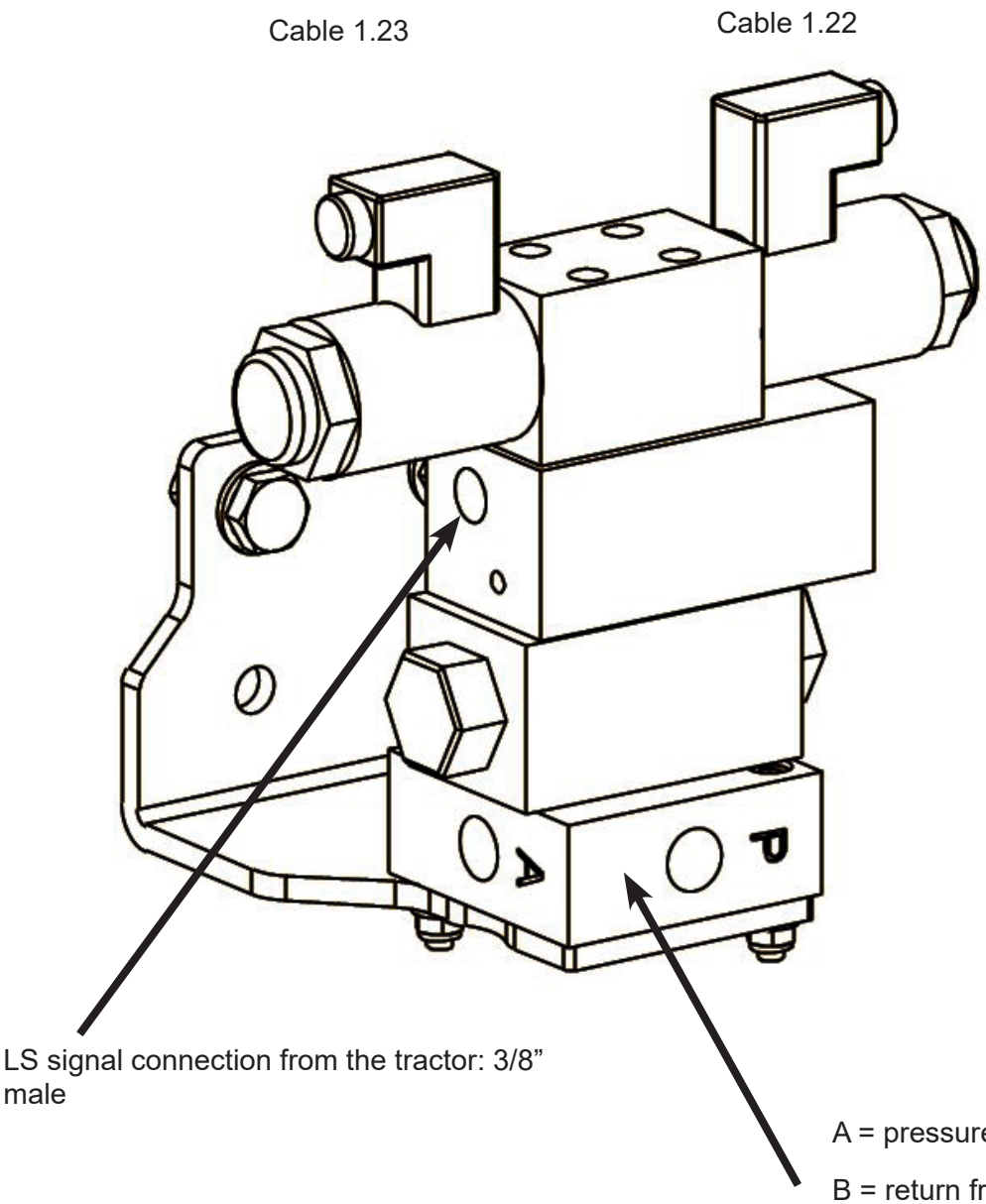
If automatic coulter pressure adjustment is used, the pressure must first be manually set to a suitable value. From there, the automation adjusts the pressure during operation to maintain the optimal coulter angle — meaning the leading edge of the side plate stays vertical.



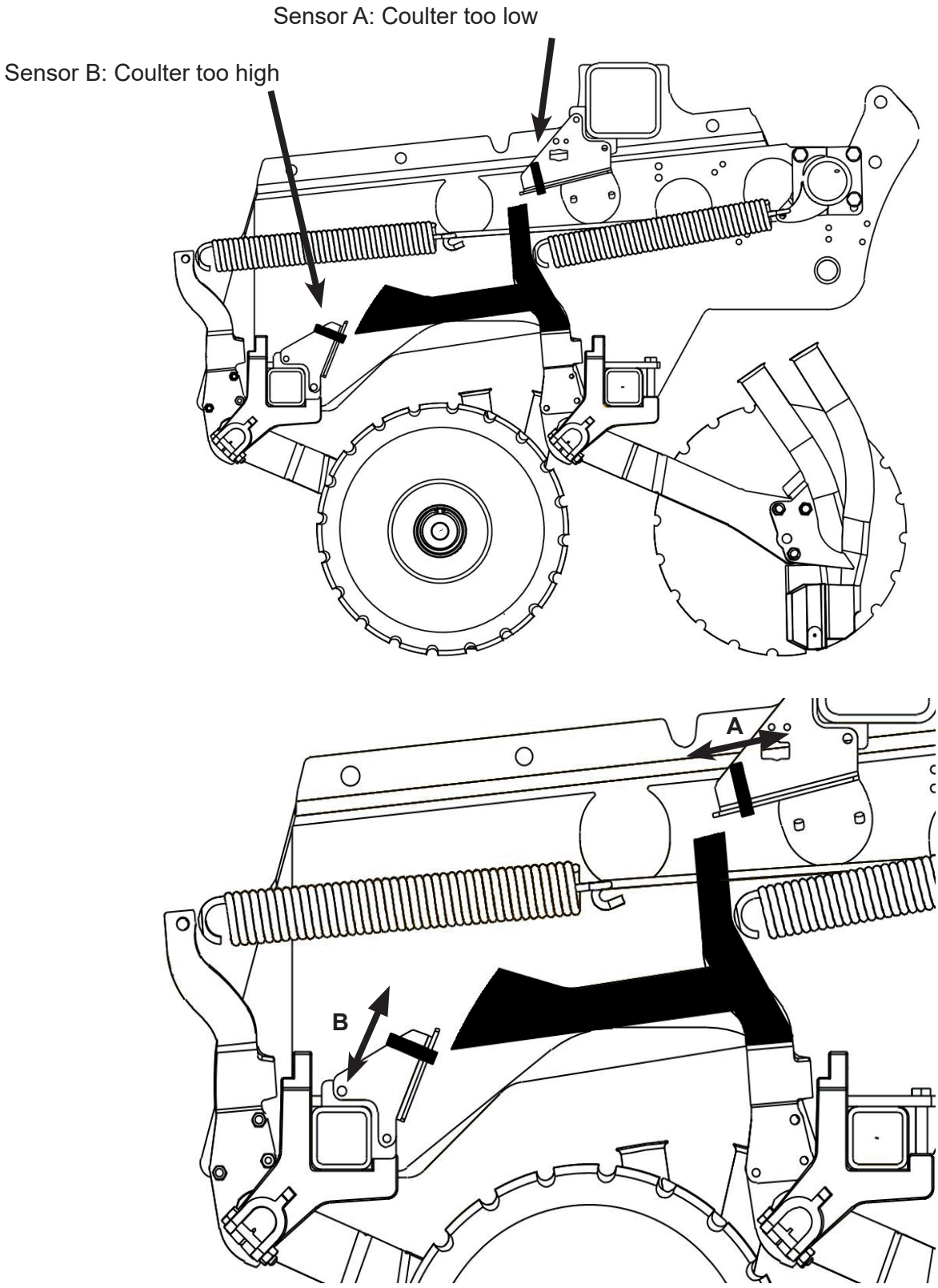
Coulter pressure increase delay (0.5–9 s)

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.

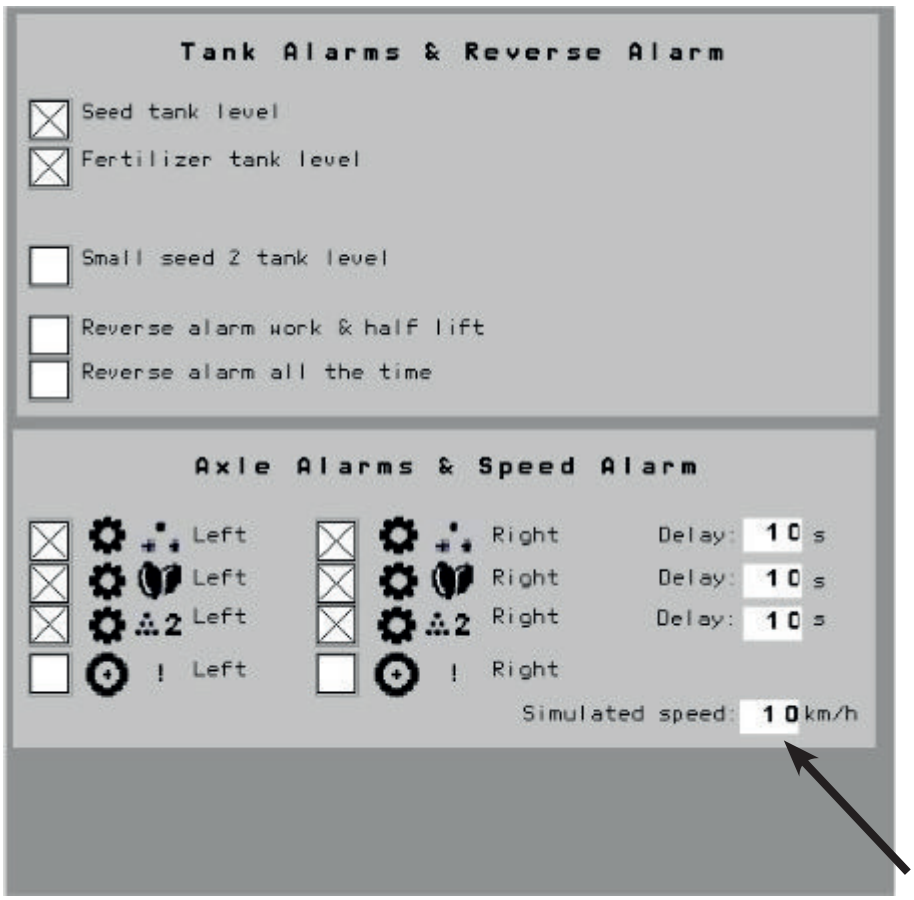
At the factory, both sensors are pre-set to the middle of their adjustment range.

1.7 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

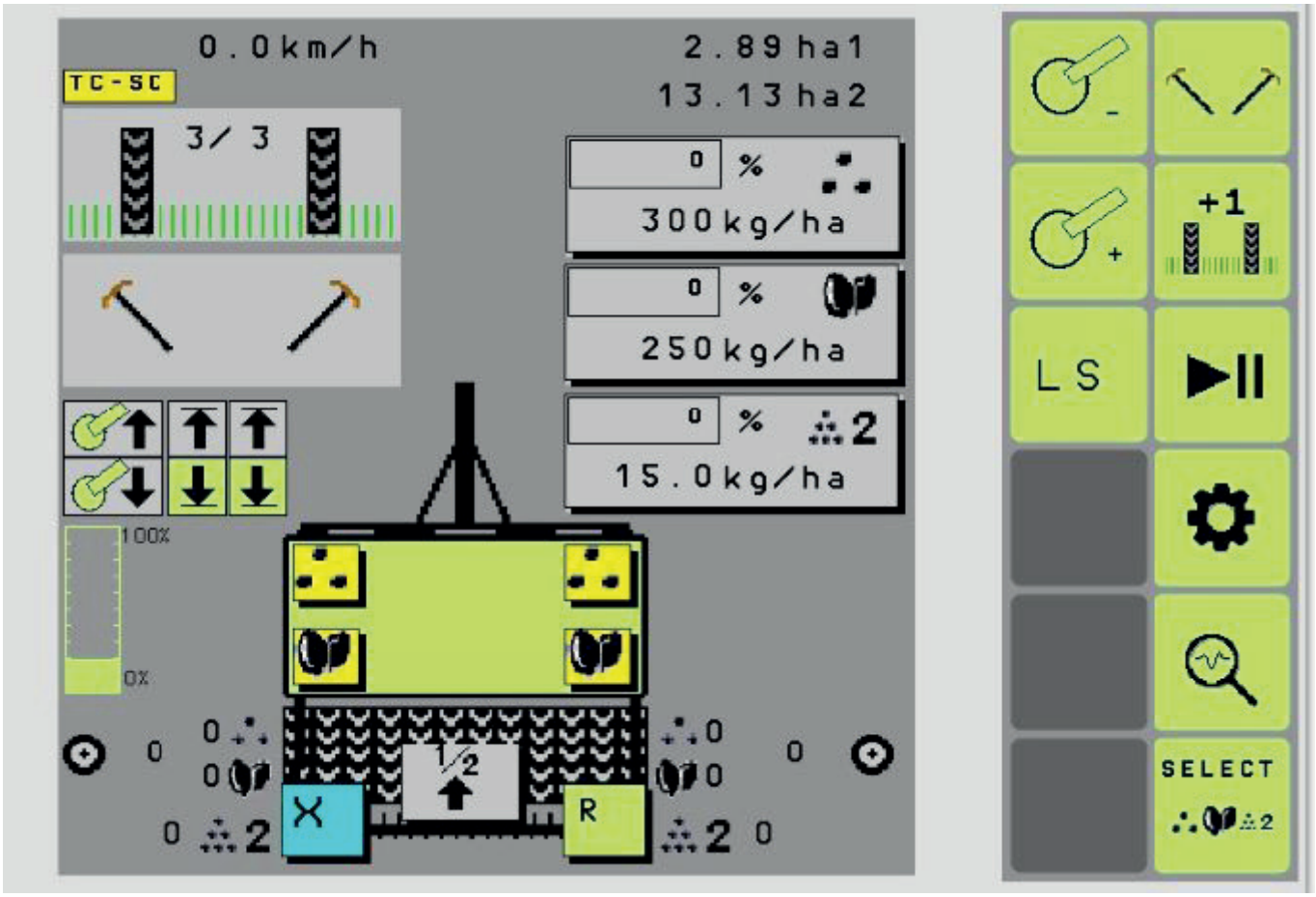
1.8 HALF-WIDTH SEEDING

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.



1.9 ELITE I/O-LIST

ELITE I/O lista

3m/4m	Conn	Pin
Anturien syöttöjännite 1	XM1	1
Anturien syöttöjännite 2	XM1	2
Puolinostosähköventtiili	XM1	3
	XM1	4
LS FB [Up ja Down maadoitus]	XM1	5
	XM1	6
LS Vasen Ylös	XM1	7
LS Vasen Alas	XM1	8
Anturien GND 1	XM1	9
Puolinostosähköventtiili GND	XM1	10
	XM1	11
	XM1	12
	XM1	13
Säiliövahti lannoite vasen	XM1	14
Säiliövahti lannoite oikea	XM1	15
Säiliövahti siemen vasen	XM1	16
Säiliövahti siemen oikea	XM1	17
Lannoite kiertokoenappi	XM1	18
Siemen kiertokoenappi	XM1	19
LS Oikea Ylös	XM1	20
LS Oikea Alas	XM1	21
LS PWM Ylös	XM1	22
LS PWM Alas	XM1	23

3m/4m	Conn	Pin
Anturien syöttöjännite 3	XM2	1
Anturien syöttöjännite 4	XM2	2
	XM2	3
	XM2	4
	XM2	5
	XM2	6
Rivimerkkari vasen	XM2	7
Rivimerkkari oikea	XM2	8
Ruiskutusura vasen	XM2	9
Ruiskutusura oikea	XM2	10
	XM2	11
Paineanturi	XM2	12
Anturien GND 2	XM2	13
Rivimerkkari vasen ja oikea GND	XM2	14
Ruiskutusura vasen ja oikea GND	XM2	15
	XM2	16
	XM2	17
	XM2	18
Nostoanturi	XM2	19
PSL kiertokoenappi	XM2	20
	XM2	21
PSL rpm vasen	XM2	22
PSL rpm oikea	XM2	23

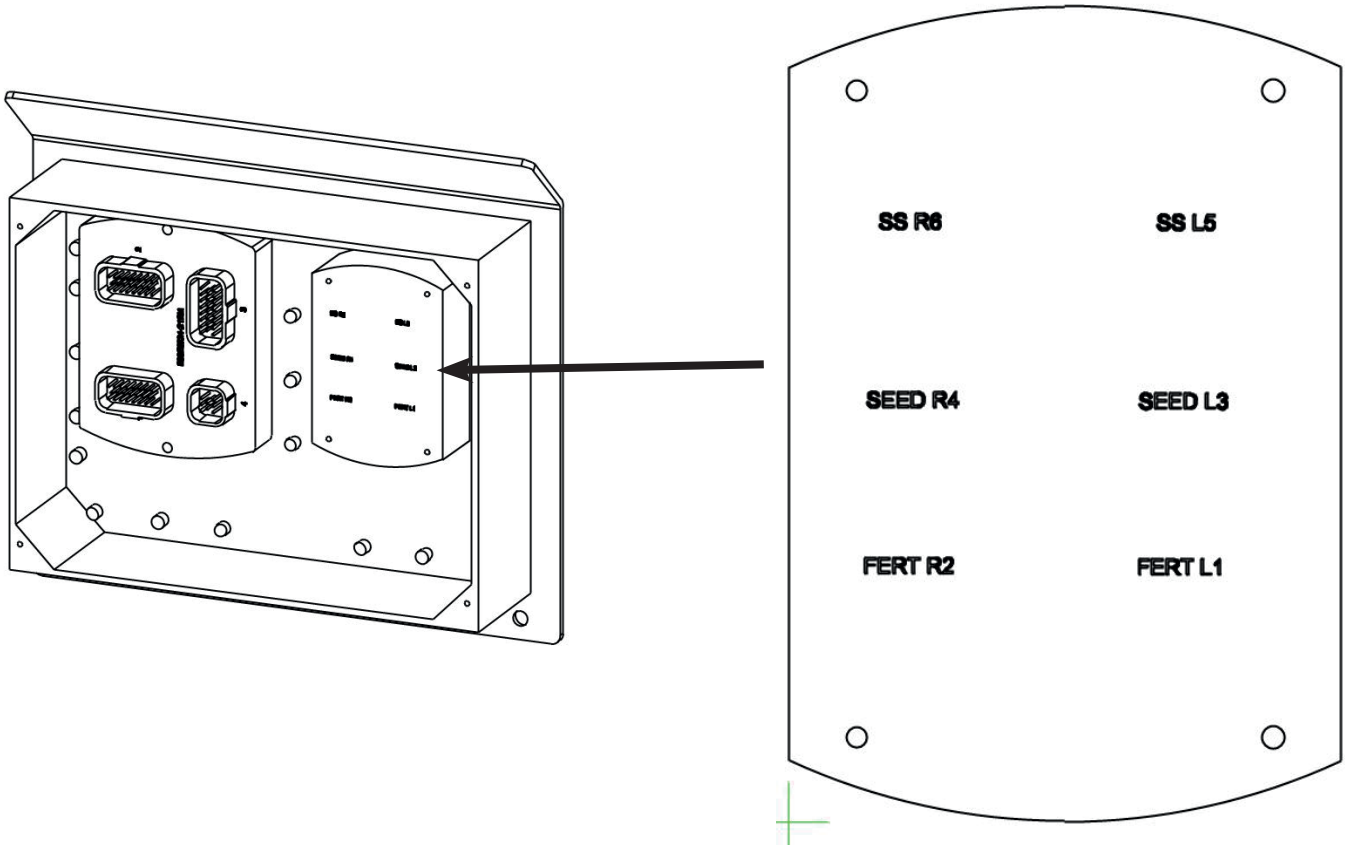
Anturien syöttöjännite 5, (12V)	XM3	1
	XM3	2
Anturien GND 3	XM3	3
Anturien GND 4	XM3	4
	XM3	5
	XM3	6
	XM3	7
	XM3	8
Anturien syöttöjännite 6	XM3	9
	XM3	10
	XM3	11
	XM3	12
Säiliövahti piensiemen oikea (PSL2)	XM3	13
Säiliövahti piensiemen vasen (PSL2)	XM3	14
	XM3	15
Lannoite RPM vasen	XM3	16
Lannoite RPM oikea	XM3	17
Siemen RPM vasen	XM3	18
Siemen RPM oikea	XM3	19
Ajonopeus vasen 1	XM3	20
Ajonopeus vasen 2	XM3	21
Ajonopeus oikea 1	XM3	22
Ajonopeus oikea 2	XM3	23

3m/4m	Conn	Pin	Pin type
Syöttö GND	XM4	1	GND
Ohjelmointi	XM4	2	CAN1 H
Syöttö GND	XM4	3	CAN GND
Syöttö 12v.	XM4	4	Power Supply
Syöttö 12v.	XM4	5	Power Supply
Ohjelmointi	XM4	6	CAN1 L (BSL)
ISOBUS	XM4	7	CAN2 H
ISOBUS	XM4	8	CAN2 L

Syöttöjännite antureille +	
Maat antureille -	Pin
J1.1 +	1.7, 1.8, 1.14, 1.15, 1.16, 1.17
J1.9 -	1.7, 1.8, 1.14, 1.15, 1.16, 1.17
J1.2 +	2.20, 1.18, 1.19, 1.20, 1.21
J1.11 -	2.20, 1.18, 1.19, 1.20, 1.21
J2.1 +	2.19, 2.22, 2.23
J2.13 -	2.19, 2.22, 2.23
J2.14 -	2.7, 2.8
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

1.10 FUSE BOX – ELECTRIC MOTORS

6 x 20A blade fuses:



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)