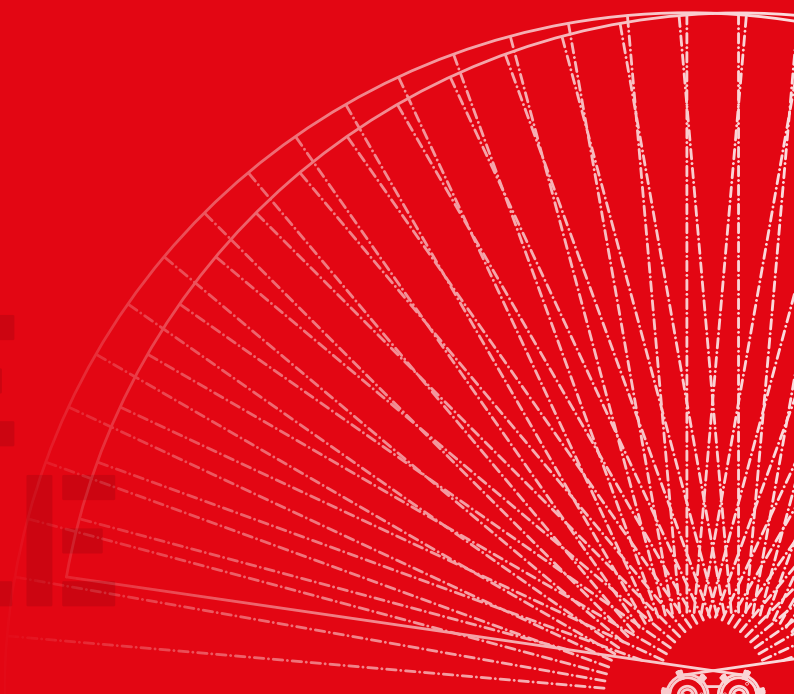




F4 OPERATING INSTRUCTIONS



SIMPLE
PRECISE
RELIABLE



> EU DECLARATION OF CONFORMITY

(Machinery Directive 2006/42/EF, Annex II, supplement A)

Manufacturer: BREDAL A/S
Nimvej 1
DK-7120 Vejle Ø

hereby declares that

BREDAL Type F4 serial number

is manufactured in conformity with the Machinery Directive (Directive 2006/42/EC), as amended, and with national provisions.

Bredal DK-7120 Vejle Ø

August 2016



Anders Buhl

> THE SPREADER'S MASTER DATA

The spreader's rating plate specifies the model designation, year of manufacture, net weight, serial number and total weight.



A series of values are entered in the computer of each individual spreader. If a value is mistakenly deleted from the computer, it is possible to re-enter the original value.

The following values must be entered in the computer in order for all functions to work properly:

Weighing:

Application rate:

Calibration figures

Volume per impulse

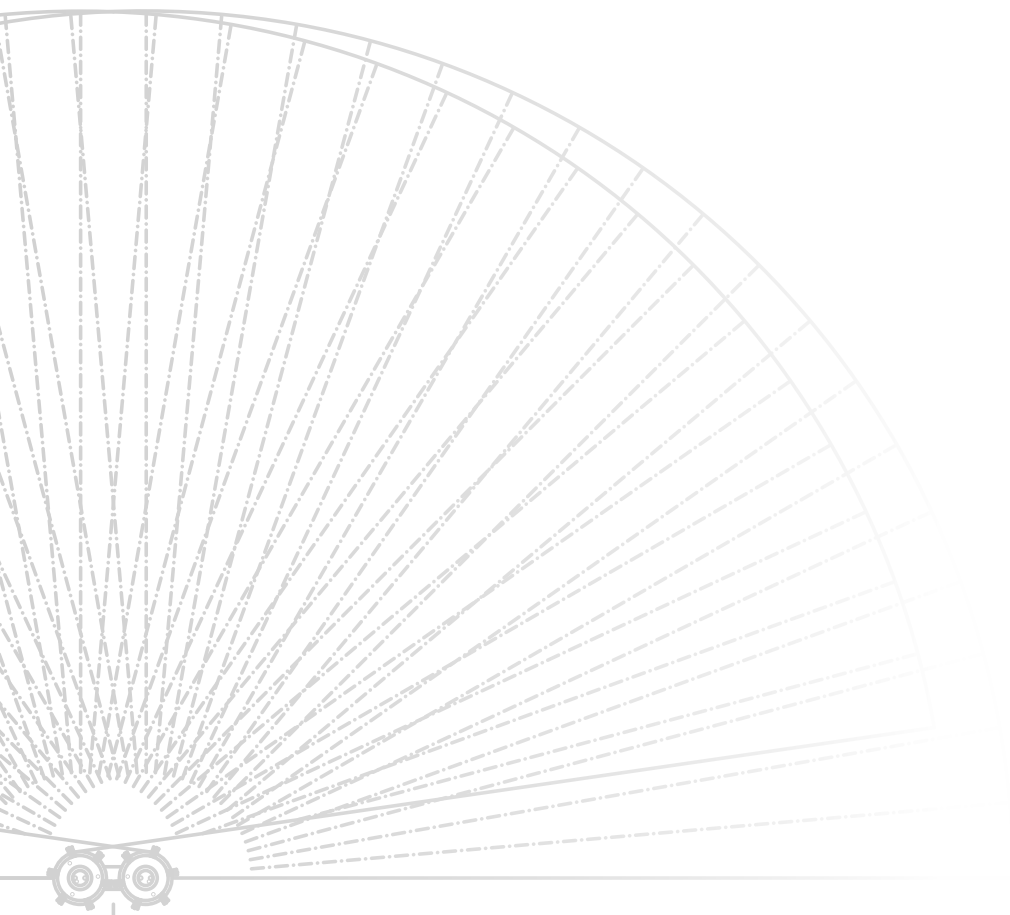
Zero load value

Errors and omissions excepted.

The terms and conditions of sale and delivery can be found on www.bredal.com/en/betingelser

Foreword	5
Safety	6
Traffic safety	6
Connecting the spreader	7
Initial installation/set-up of a Müller terminal	8
Language, contrast, brightness and units of measurement	9
Initial set-up of an existing terminal in the tractor	10
Switching a screen display to another terminal	11
Description of the Bredal program icons	12
Configurable alarms	14
Menu for entering application rate, working width, density, etc.	16
Entering the application rate	16
Entering the working width	17
Entering the scale position	17
Entering the downshute position	18
Entering the density	19
Entering the flow factor	20
Operation screen	22
Operation screen (hydraulic spread discs)	24
User set-up of operation screen	25
Fast emptying	26
Weighing menu	27
Counters	28
Setting up implement parameters	30
Calibrations	32
Volume per impulse	32
Hydraulic calibration	33
Zeroing the load cells	34
Calibrating the load cells	35
New calibration	36
TC-implement offsets	37
Testing input and output	40
Testing input	40
Testing output	41
Reload factory settings	42
Fertilizer quality	44
Effect of fertilizer quality on spreading properties	44
Maximum capacity per minute	45
Settings for different types of fertilizer	46
Fertiliser spreading test and spreading adjustment	47
If excess fertilizer is deposited between the wheel tracks	48
If excess fertilizer is deposited behind the spreader	48
Fertiliser spreading test: headland spreading	48
Engaging/disengaging in headland, manually	49
Calibration kit	50
Late application with late application equipment	51
 Troubleshooting and Maintenance	
 Troubleshooting	 52
Rate off target	52
Floor belts which stop running could be caused by the following	52
Right (left) actuator blocked	53
Check of gearbox sensor	53
Basic settings, adjustment of downshute position	54
Checking downshutes' centring	54

Checking/adjusting the downshute scale	57
Floor belt adjustment	58
Checking the rear doors and their basic settings	59
Lubrication points	60
Every 50 hours	60
Every 100 hours	60
Every 200 hours	61
Maintenance and lubrication of spread unit	62
V-belt tightness	62
Headland gear function	62
Lubrication and adjustment of headland gear	63
Gear for floor belt operation	64
Other maintenance and cleaning	65
Washing and storage	65
Oil filter	65
Spreading system	65
Actuators	65
Replacing V-belts on SPC4500-1	66



Bredal F4 is designed to spread chemical fertilizers and similarly structured materials on farmland. The operator is responsible for ensuring that the machine is solely used for the intended purpose to avoid property damage and personal injury.

The machine is equipped with a rating plate on which the serial number and year of production are specified. The maximum gross weight and net weight are also specified on the rating plate. The difference between the two is the maximum permissible load.

This instruction manual contains instructions for operating the machine and setting it to spread generally available commercial fertilizers. As fertilizer quality can fluctuate greatly from one year to the next and from consignment to consignment, it is advisable to always perform a spreading test if there is any doubt whether the type of fertilizer can be spread on the preferred working width with reasonable results. The latest settings for the most common types of available fertilizer can be downloaded at any time from Bredal's website. It is advisable to always do a spreading test using the type of fertilizer to be spread to test the settings recommended by Bredal. The user is solely responsible for ensuring that the machine is correctly set and that it works correctly to achieve acceptable spreading. Bredal accepts no liability for spreading errors.

The ISOBUS terminal in the tractor and its software:

The appearance of the user interface varies slightly from one ISOBUS terminal to another. This is because the terminals have different resolutions. Some spreader functions require specific software to be installed in the terminal. Wedge spreading is only possible if the terminal has a section-control program and a tracking program. If fertilizer is applied according to field and crop maps, the terminal must also contain software that can process these maps. When the spreader is connected to the tractor, the spreader's job computer exchanges data with the tractor's terminal and only those functions which are supported by the tractor's terminal will be active. If the terminal does not contain software for wedge spreading, the function cannot be used.

SAFETY

The safety distance from the spreading discs is at least 30 metres when these are rotating. If people or animals are within this distance, the tractor's PTO must be disengaged.

Never operate the headland gear or adjust the spreader while the spreading discs are rotating.

When loading the spreader, keep foreign objects, such as stones, etc., from getting in the machine's hopper, as they can cause damage and be very hazardous for the surroundings.

Sitting/standing on the machine while it is operating or during road transport is not permitted.

Before working on the machine, make sure to disengage the tractor's PTO and depressurise the hydraulic system.

Shields on PTO shafts and the implement must be intact and correctly attached.

> TRAFFIC SAFETY

As traffic safety is important when driving on public roads, the following must be checked:

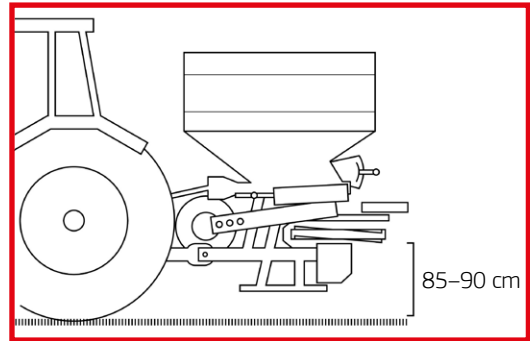
- The light system must be connected to the tractor's light socket, the lamps must be cleaned, and turning signals and brake lights must work correctly.
- Reflective warning triangles must be intact and clean.
- The size of the connector pins in the three-point hitch must be properly dimensioned and locked so that they cannot be ejected.

CONNECTING THE SPREADER

When connecting the spreader to the tractor, it is important that it is suspended horizontally or tilts slightly forward to obtain the best possible spreading results.

The spreader must not tilt backwards, not even when the hopper is full. The spreader must be mounted directly behind the tractor, i.e. perpendicular to the direction of travel, and it must be centred squarely on the tractor's central axis. The stabiliser chain assemblies must be fully tightened.

The spreading discs' height above crops must be approx. 85–90 cm.



The hydraulic hoses for operating the application process must be connected to a dual-action outlet on the tractor; 50–60 litres/min. are needed.

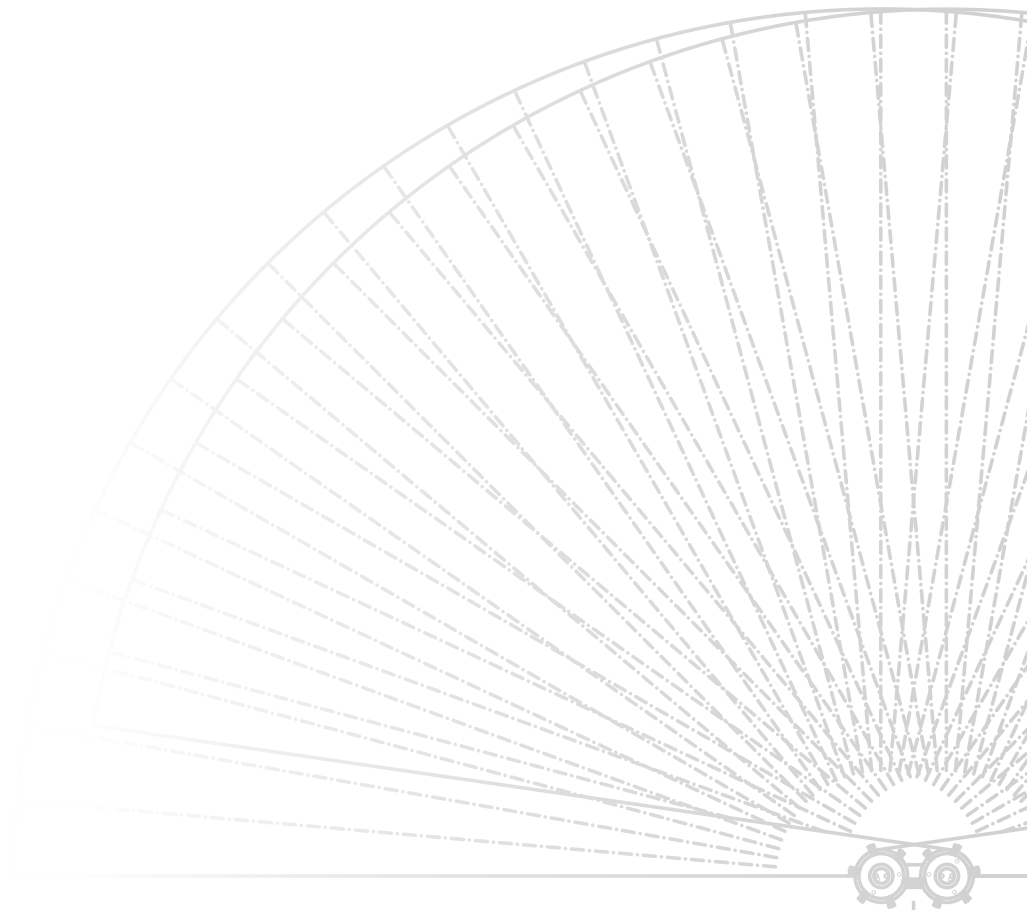
The hydraulic hoses for operating headland gear are connected to a dual-action outlet.

The hydraulic hoses for operating a hydraulic hopper ring are connected to a dual-action outlet.

The light plug is inserted in the tractor's light outlet.

The ISOBUS plug is inserted in the tractor's ISOBUS socket.

Connect the PTO shaft to the tractor's PTO.



INITIAL INSTALLATION/ SET-UP OF A MÜLLER TERMINAL

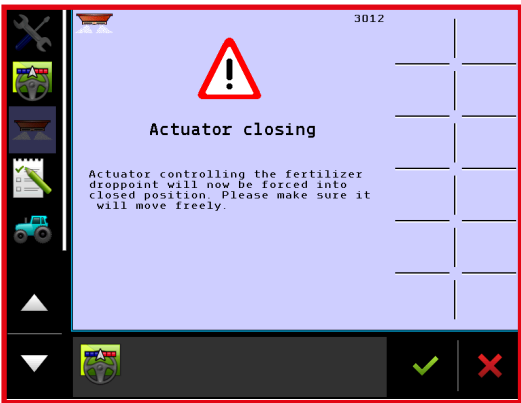
If an ISOBUS terminal from Müller is included with the machine, some basic set-up needs to be done before the spreader's section control can be used.

For installing the tractor mounting set and a GPS aerial, refer to the enclosed instructions from Müller. Also, please refer to Müller's instructions for operating programs that do not concern spreader operation, such as Track-leader, Field-nav, Farmpilot, or other software that can be connected to the Müller terminal.

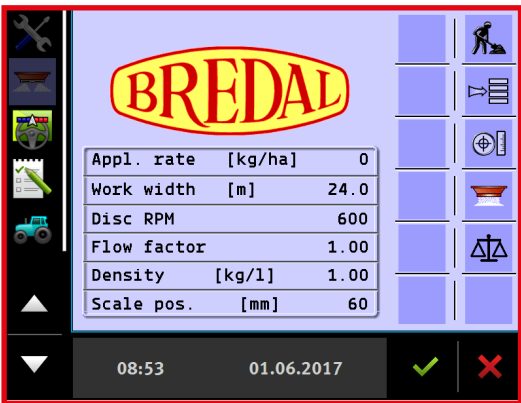
The basic GPS receiver set-up, its activation, and the basic encoding of the GPS's aerial's location can also be found in Müller's installation and operating instructions.

The spreader can be operated once the terminal, tractor installation set and GPS aerial have been installed, and the plug from the spreader's ISOBUS socket is connected, and basic encoding is completed: press the  button for about 3 seconds. It can take up to two minutes after switching on the terminal for the spreader icon to appear on the screen.

If the screen display does not appear, press  on the left side of the screen.



After start-up, the warning "Actuator closing" will appear; press  to accept. If a simulated speed is activated, a warning about this will also appear, and this must be accepted by pressing .

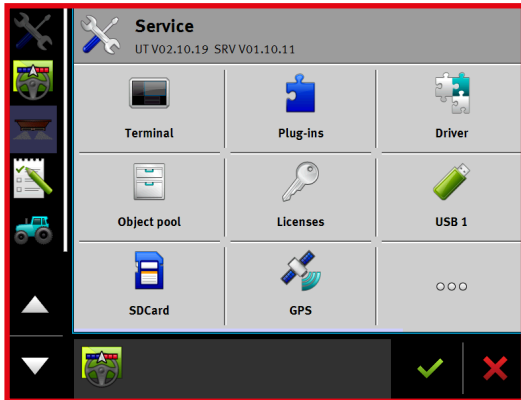


It is now possible to choose from among the various applications on the left side of the screen. The spreader's application is selected on the screen display shown here. It is always possible to return to this page by pressing the "Home" icon , except when an input field is active.

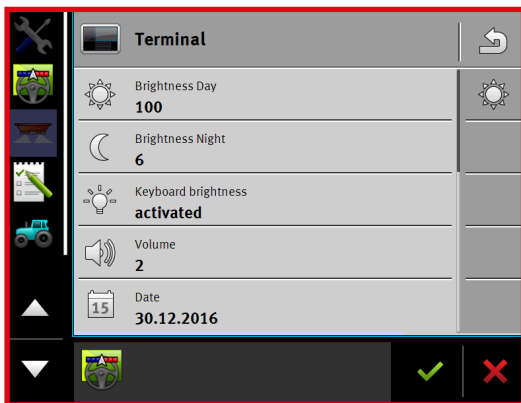
The "Home" start-up screen shows the input application rate, working width, etc.

LANGUAGE, CONTRAST, BRIGHTNESS AND UNITS OF MEASUREMENT

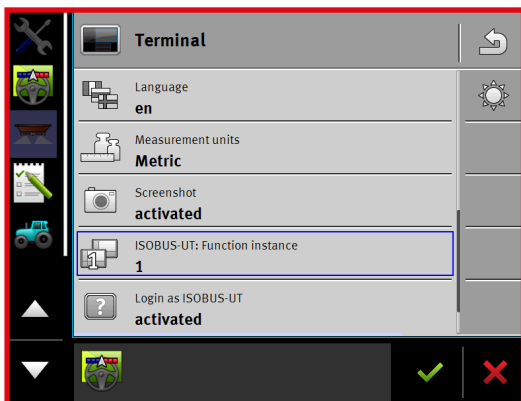
Press  to modify the settings:



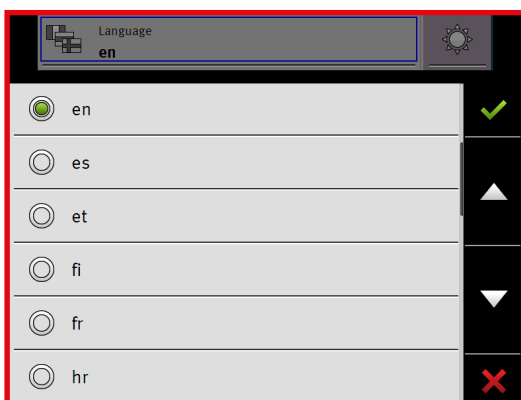
Press "Terminal".



Select "Language" by scrolling down.



Click the "Language" tab.



Select from the list

Press 

INITIAL SET-UP OF EXISTING TERMINAL IN THE TRACTOR

If the spreader is connected to a tractor with an ISOBUS terminal, it may be necessary to enter the sections' location and length and indicate that a tractor mounted spreader is used. The input data is used to ensure that the spreader starts and stops applying fertilizer at the right time when turning in headland. The Bredal program already contains this information, but not all tractor terminals upload the information from the spreader when it is connected. Some terminals use the input data correctly. In some instances, the tractor's terminal uses only one of the two input distances. Sometimes, the tractor's terminal does not upload the distances at all; in these cases, the distances must be entered in the tractor terminal's section control program. Follow the instructions from the manufacturer of the tractor's terminal.

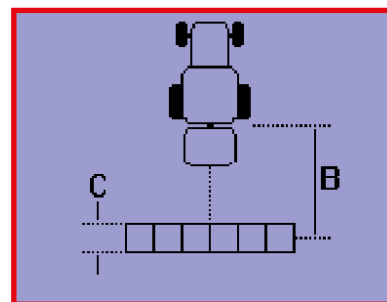
In order for the spreader to start and stop applying fertilizer at the right time, the following distances need to be entered:

- B = distance from the spreader's connection point to the centre of the swath
- C = length of the swath

Distances recommended by Bredal:

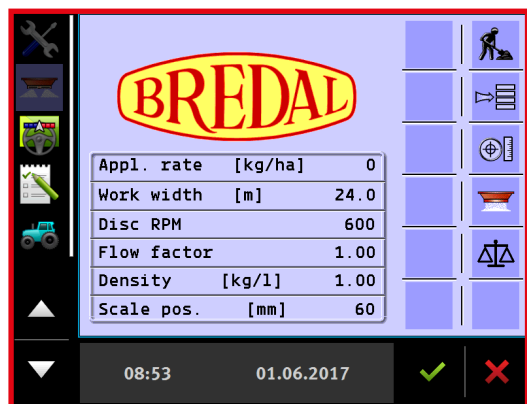
- B = 8.0 metres
- C = 5.0 metres

On most terminals, "3-point hitch" must also be selected.

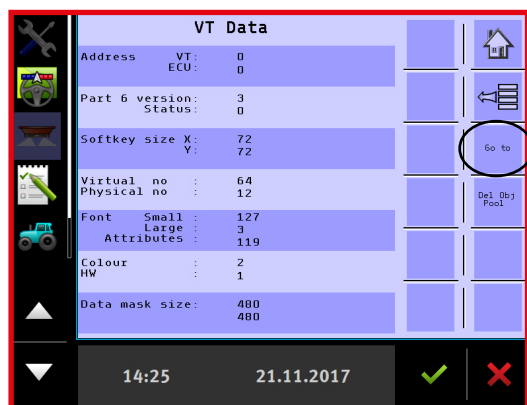


MOVING A SCREEN DISPLAY TO ANOTHER TERMINAL

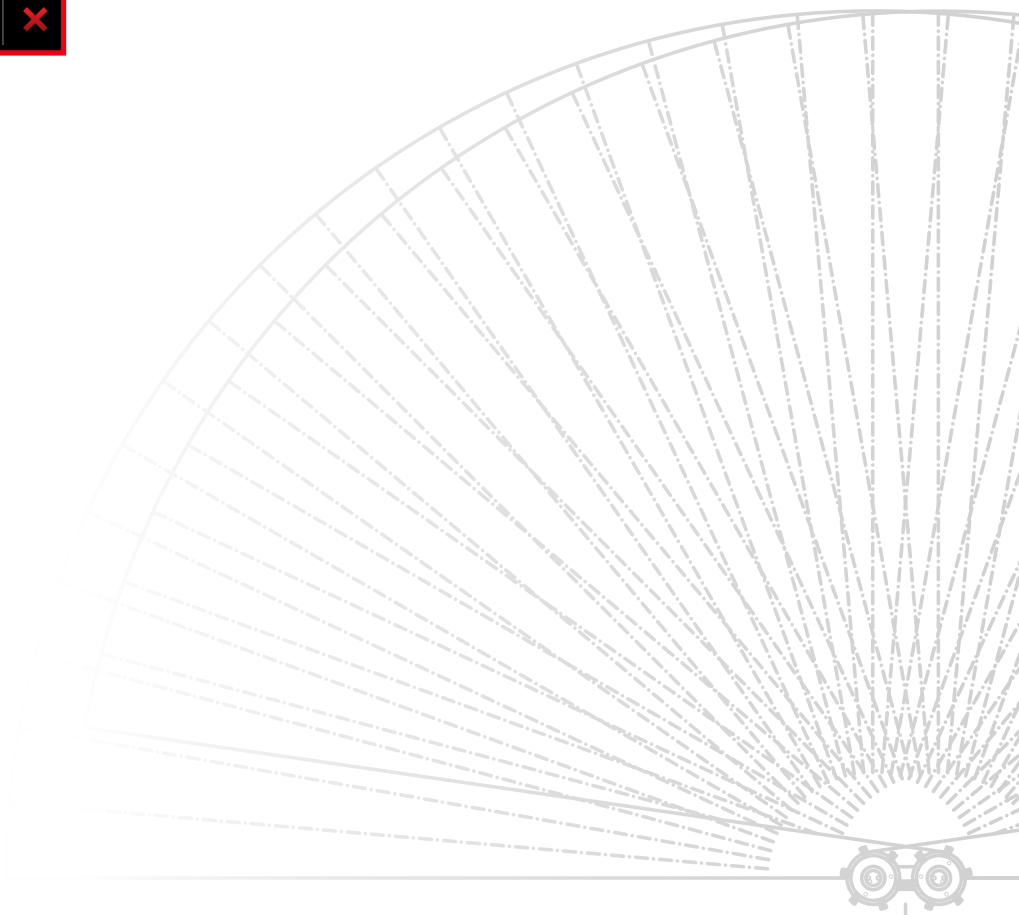
If more than one terminal is connected to the tractor's ISOBUS system, the Bredal program display can be moved from one terminal to the other.



Press "Menu"  then select "Help", followed by "Diagnostic" and then "VT".



Press "Go to" on the right side.



DESCRIPTION OF THE BREDAL PROGRAM ICONS

The following sections describe the Bredal program icons; their location on the screen can vary from one terminal to another.
Icon meaning/function:



Home: return to start page.



Work: go to operating page.



Start/stop button: starts and stops the application process.



Menu: go to the menu selected.



Return: go back to the previous menu.



Line down: moves the marking one line down.



Line up: moves the marking one line up.



Emptying: starts the floor belt, emptying the hopper.



Enter application data: goes to the menu where application rate, working width, etc., are entered.



Weighing control: goes to the menu for checking the application rate.



Accept: accepts the input data, or acknowledges an alarm.



Delete: cancels input data.



Toggles between different displays.



Manual closing of section on right side.



Manual opening of a section on the right side.



Manual closing of a section on the left side.



Manual opening of a section on the left side.



Increase the spreading volume by 5%.



Reduce the spreading volume by 5%.



Return to the originally entered spreading volume.



Warning/Alarm



Next page: goes to the next page.



Delete: deletes entered data.



ESC: returns without changing a value.



Calibrate:



Start new calculation



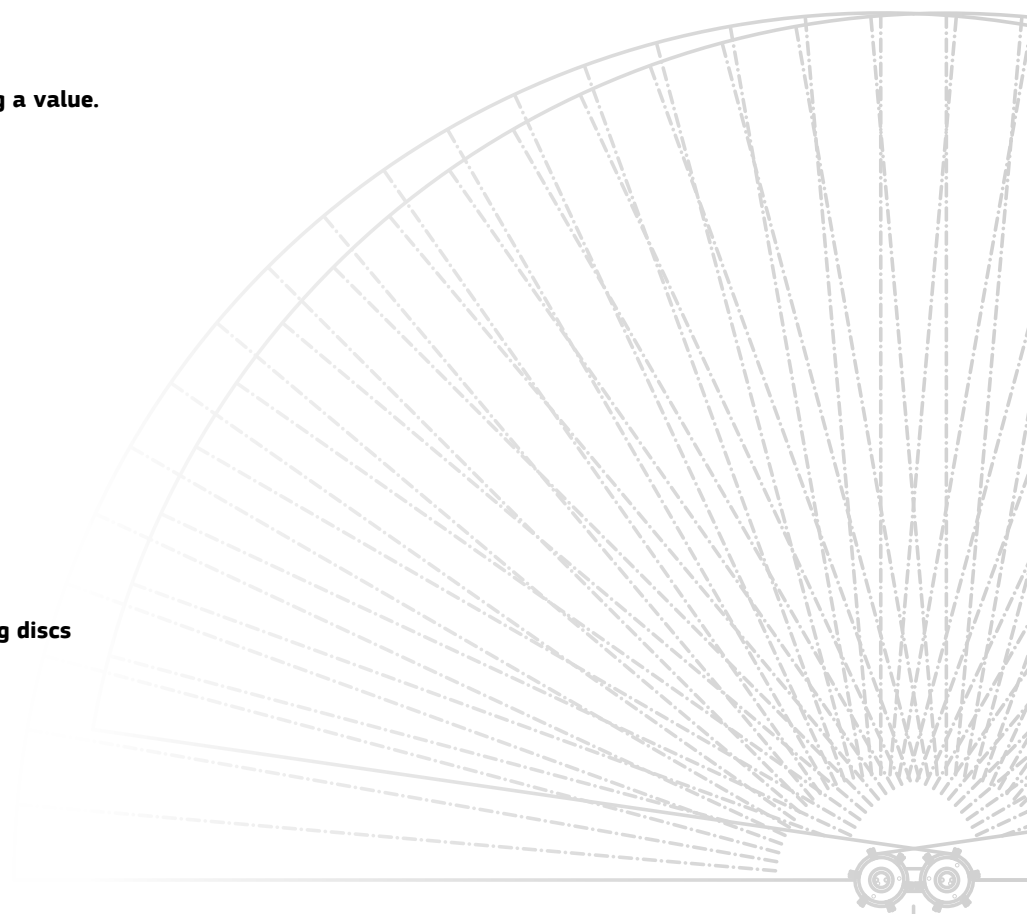
Pre-start function



Operate the hydraulic system



Start/stop hydraulic spreading discs

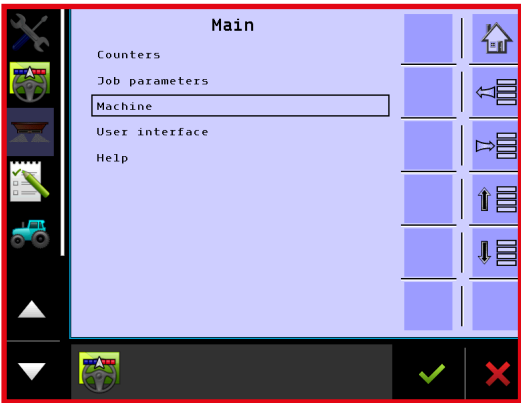


CONFIGURABLE ALARMS

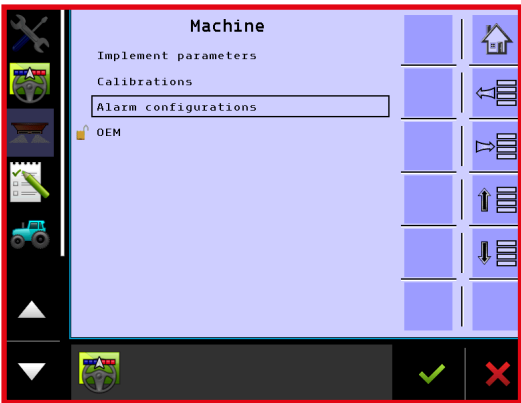
It is possible to set up individual alarms to issue a warning, such as when the hopper is almost empty. The following alarms are configurable:

- Kg/residual in the hopper
- PTO speed
- CAN speed timeout time

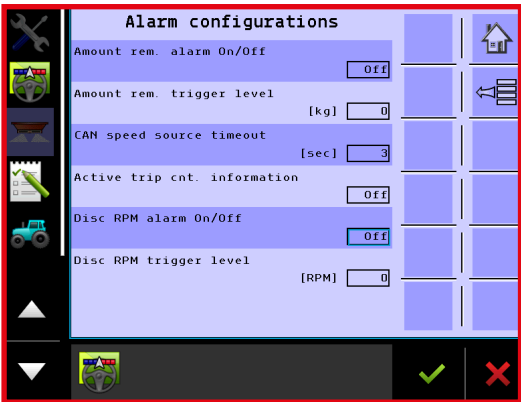
Press the  button on the Home screen display.



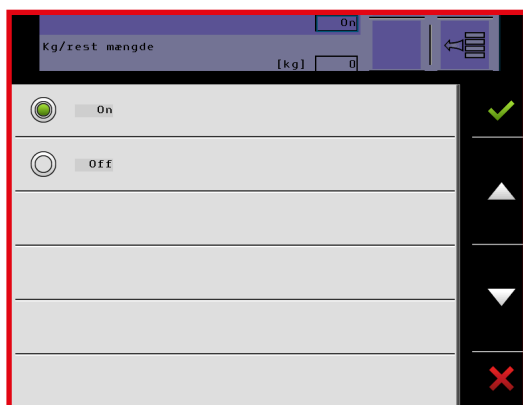
Select "Machine"



Select "Alarm configurations"

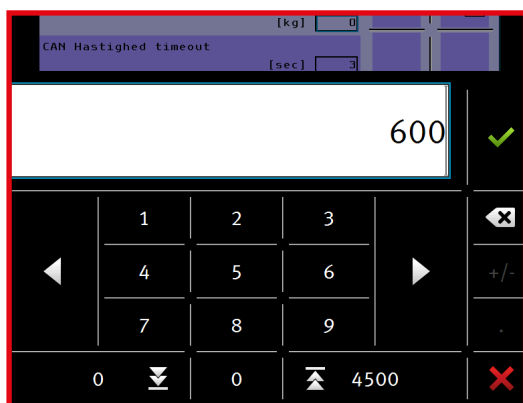


Select the alarm to be activated



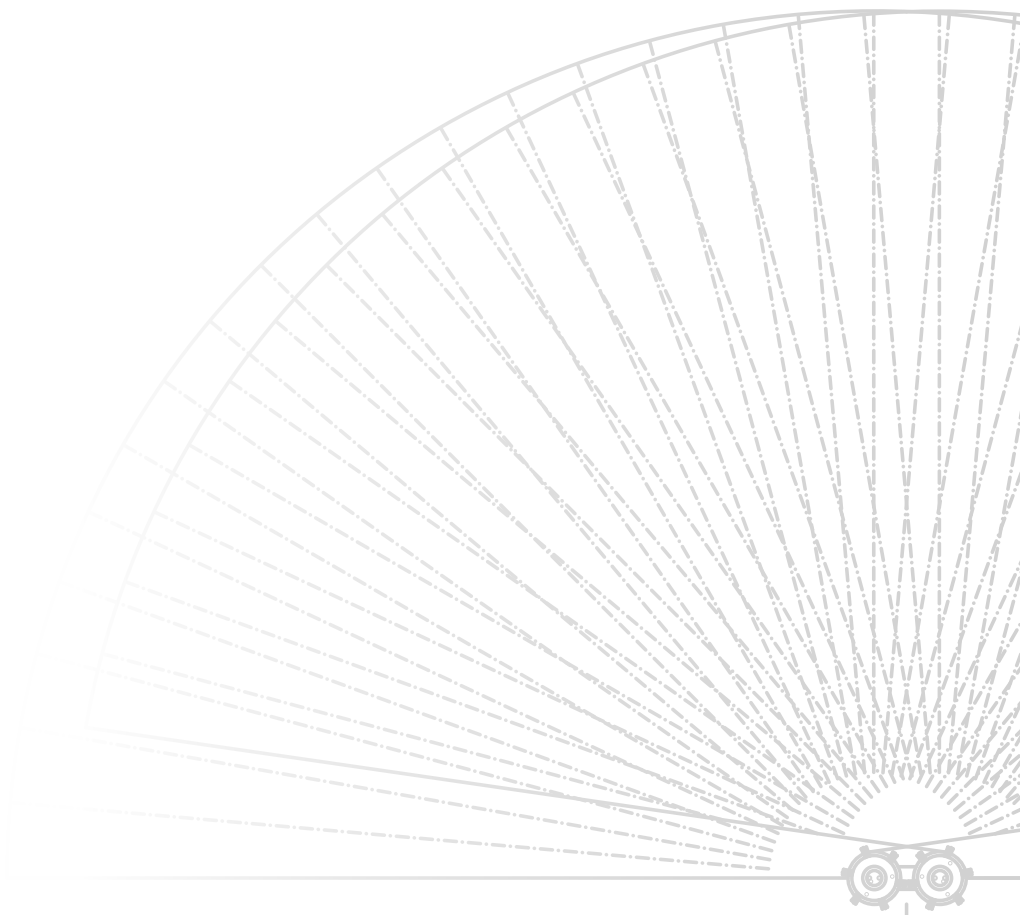
In this example, the alarm is set for kg/residual to be on.

Press  to accept.



In the field below, enter the residual volume (kg/residual) that will trigger the alarm.

Press  to accept.



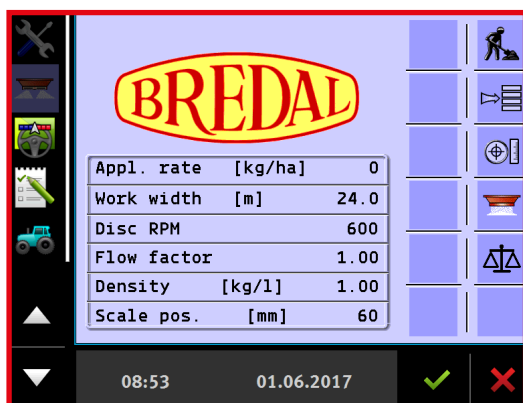
MENU FOR ENTERING THE APPLICATION RATE, WORKING WIDTH, DENSITY, ETC.

The following parameters must be encoded before application begins:

- Kg/ha
- Working width
- Scale position, rear doors
- Downshute position
- Density
- Flow factor

> ENTERING THE APPLICATION RATE

Press  to access the menu.



The screenshot shows the BREDAL main menu. At the top is the BREDAL logo. Below it is a table of parameters:

Appl. rate [kg/ha]	0
Work width [m]	24.0
Disc RPM	600
Flow factor	1.00
Density [kg/l]	1.00
Scale pos. [mm]	60

At the bottom, there is a status bar showing the time 08:53, the date 01.06.2017, and green and red checkmark icons.

Press the input field "kg/ha" to change the value.



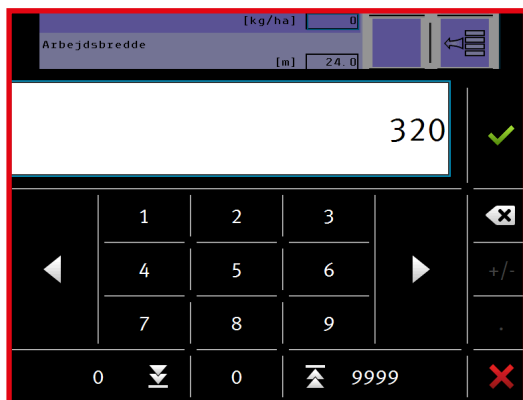
The screenshot shows the "Job parameters" menu. It lists the following parameters with input fields:

- Application rate [kg/ha] 0
- Working width [m] 24.0
- Scale position [mm] 60
- Density [kg/l] 1.00
- Flow factor 1.00
- Downshute control Automatic

At the bottom, there is a status bar showing the time 08:54, the date 01.06.2017, and green and red checkmark icons.

Enter the preferred application rate.

Finish with 



The screenshot shows the application rate input screen. At the top, there is a label "Arbejdsbredde" and a value "24.0". Below it is a large input field containing the number "320". To the right of the input field is a green checkmark icon. Below the input field is a numeric keypad with buttons for digits 1-9, 0, and a decimal point. At the bottom, there is a status bar showing the time 08:54, the date 01.06.2017, and green and red checkmark icons.

> ENTERING THE WORKING WIDTH

Press the input field "Working width" to change the value.

Enter the preferred working width.

Finish with

> ENTERING SCALE POSITION

The setting for the opening of the rear door is entered under scale position. It is advisable to generally operate with a scale setting of 200. If a very large volume is to be applied, the rear-door opening can be increased to 250.

If a very small volume is to be applied, the rear-door opening can be reduced to 150 or 100.

NB: it is important to enter the value of the actual rear-door setting, as otherwise the spreader will spread incorrectly.

Press the input field "Scale position" to change the value.

Enter the position of the rear door.

Finish with

> ENTERING THE DOWNSHUTE POSITION

The following different setting options are found under downshute control:

- Automatic: the downshutes automatically adjust to the input working width.
- Manual: the preferred downshute position has to be entered.
- Automatic without flow control: the downshute position is not changed by different flows



When the working width is changed, downshute control always returns to automatic!

Optimised spreading settings for most fertilizer types can be downloaded from the Bredal website. It is advisable to use manual downshute control and enter the downshute position that matches the type of fertilizer to be spread.

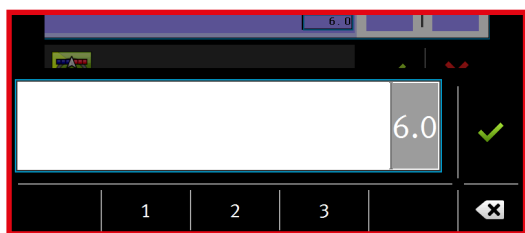
Press the input field "Downshute control" to select.

Select the desired setting.

Finish with

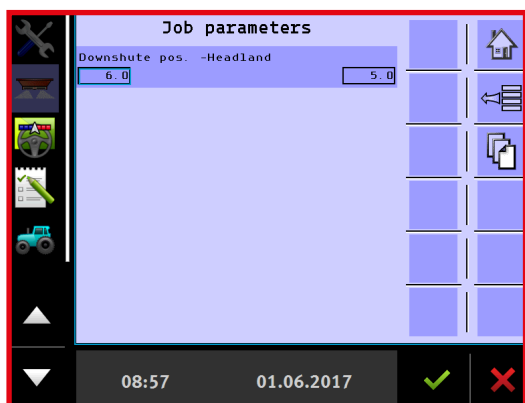
When "Manual" is selected, the downshute position for field and headland spreading can be changed.

Press the field "Downshute pos. field" to change the setting.

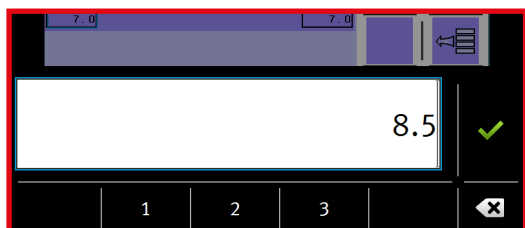


Enter the preferred downshute position for field spreading.

Finish with  or press  to go to the next page where it is possible to enter the downshute position for headland spreading.



Press the field "Left" or "Right" to change the downshute position for headland spreading.



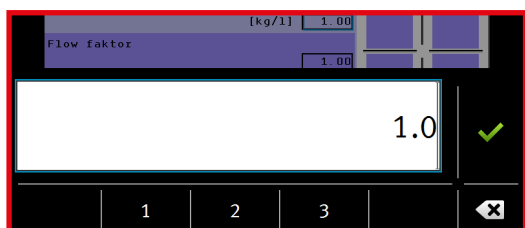
Enter the preferred downshute position for headland spreading.

Finish with .

Remember to enter the downshute position for both left and right sides, if both sides have to be changed.

> ENTERING DENSITY

Press the input field "Density" to change the value.

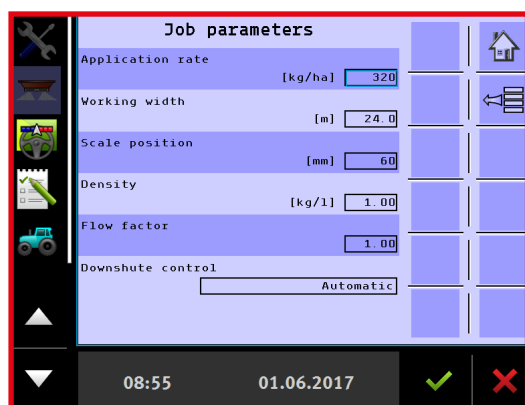


Enter the fertilizer's bulk density.

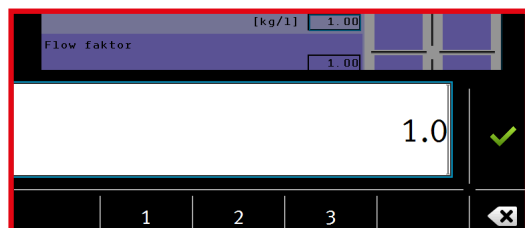
Finish with .

> ENTERING THE FLOW FACTOR

As a rule of thumb, always start out with a flow factor of 1.0. If the spreader is equipped with load cells, the flow factor will be continuously calculated during spreading; the most recently calculated flow factor is shown in the input field under flow factor.

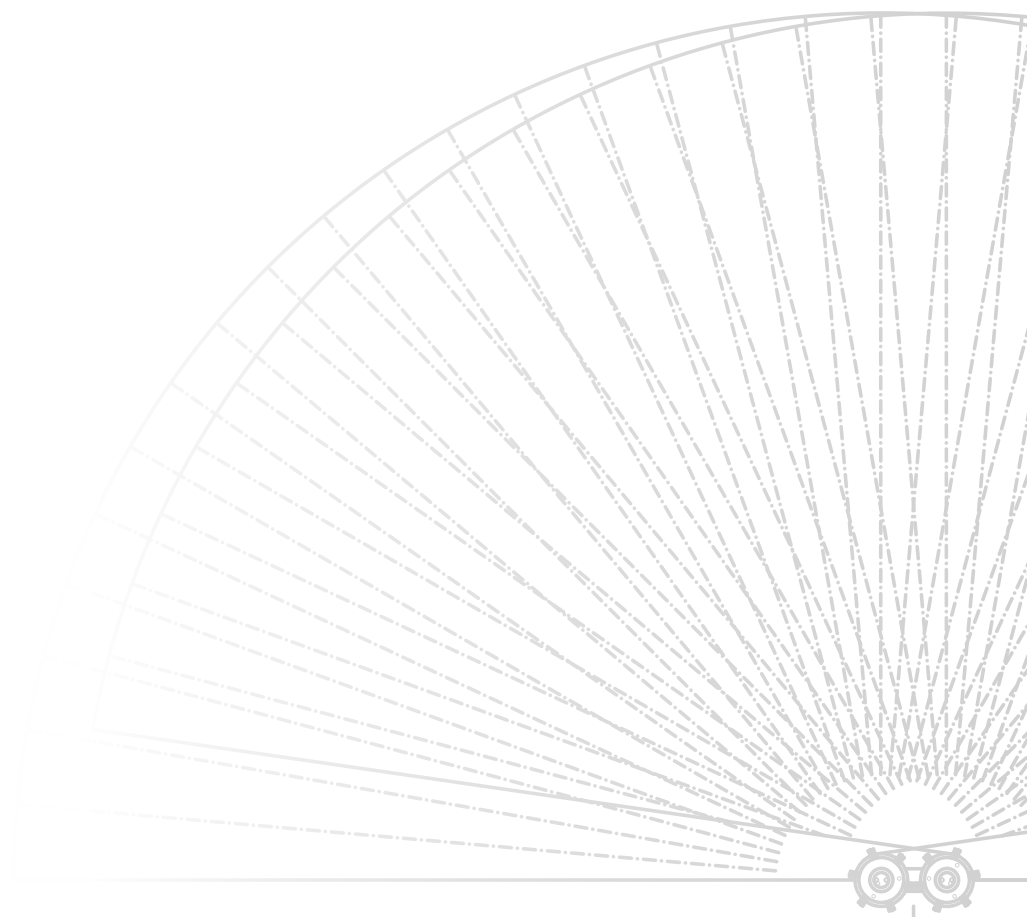


Press the input field "Flow factor" to change the value.



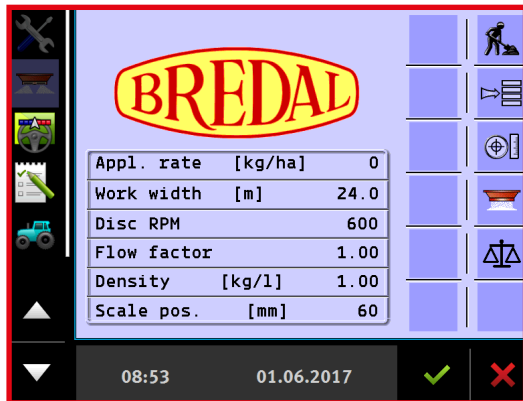
Enter the preferred flow factor.

Finish with 

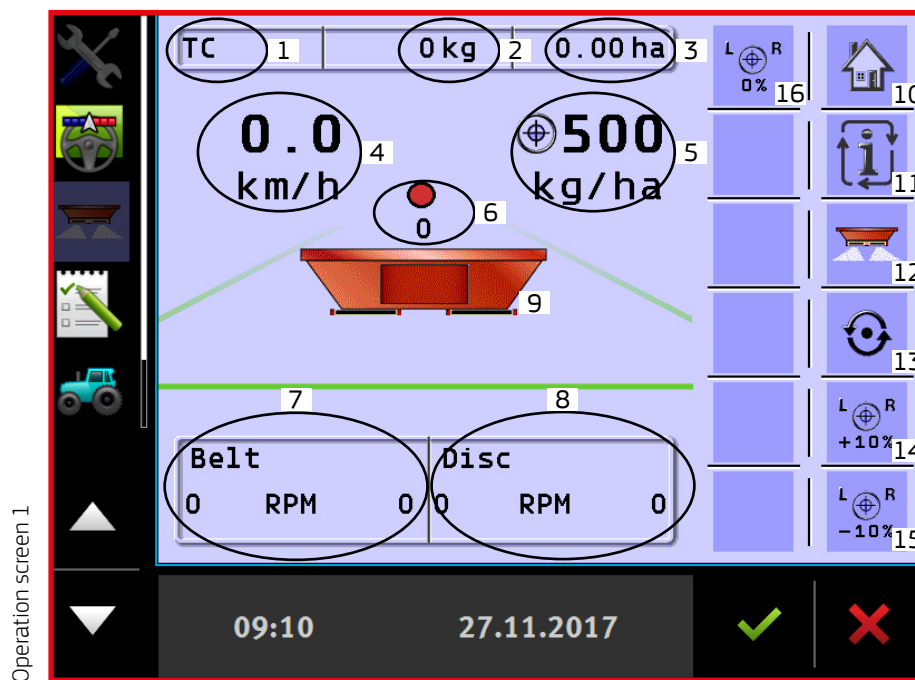


OPERATION SCREEN

The operation screen is the screen display shown during spreading. It is also where application can be started and stopped and where different messages are given to the driver.



Press  to access the operation screen.



1. Task controller: when TC is displayed, the task controller program is active
2. Indicates the number of kg spread as counted by the active counter.
3. Shows the number of ha processed as counted by the active counter.
4. Shows km/h – kg/min – kg/ha and floor belt speed; it is possible to toggle the views by pressing key no. 11.
5. Shows the currently preferred application rate
6. Shows the actual weight in the hopper.
7. Shows the current floor belt speed for left and right sides.
8. Shows the current PTO rpm; the dot indicates whether the spreader is operating at the correct PTO rpm:
For field spreading:

Green = operating at the correct PTO rpm

Yellow = PTO rpm is close to being correct

Red = operating at an incorrect PTO rpm

When headland spreading is activated:

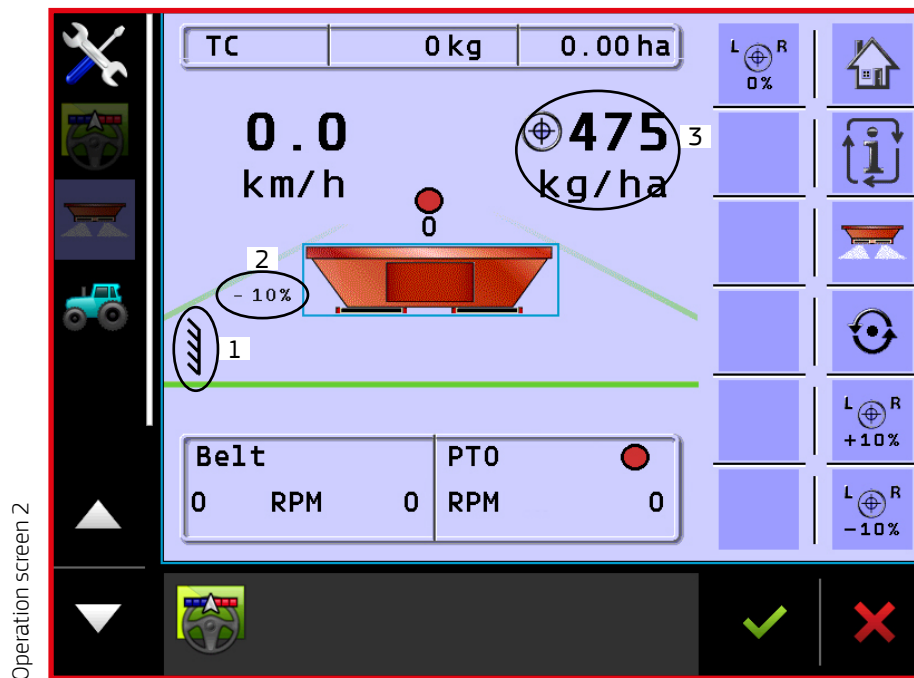
Green = Environment: no or very little fertilizer is being spread beyond the field boundary.

Yellow = Medium: 40-50% being spread in the field boundary; fertilizer is also being spread beyond the field boundary.

Red = Maximum: full application rate all the way out to the field boundary, and a good deal of fertilizer is being thrown beyond the field boundary.

NB: if, as recommended, settings have been downloaded from Bredal's website, use the PTO rpm setting from here and not the above colour markings.

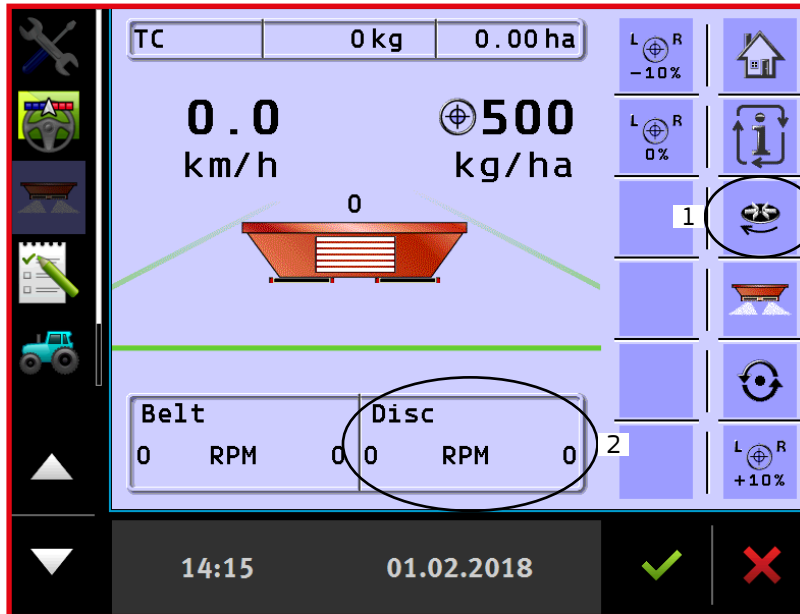
9. Starts/stops driving-dependent application rate. Floor-belt oil must be circulating before application starts. Key no. 12 has the same function.
10. Home key
11. Toggles different views on the screen (see also point 4).
12. Starts/stops driving-dependent application rate. Floor-belt oil must be circulating before application starts. Key no. 9 has the same function.
13. Starts manual application until it is pressed again or until forward movement is detected and the application becomes driving dependent. Can only be activated when sectioncontrol is off (manual).
14. Increases the spreading volume by 10%
15. Reduces the spreading volume by 10%
16. Return to the input application volume.



1. Symbol for headland spreading; the symbol appears when headland spreading is activated
2. Automatic volume reduction: when headland spreading is connected, the volume spread towards a boundary is automatically reduced by 10%. This reduction can be changed to 0% if it is not wanted; it is also possible to enter an automatic reduction on both sides (see page 33).
3. Shows the current application rate in kg/ha (the total application rate will be lower when the application rate towards a boundary is reduced by 10%)

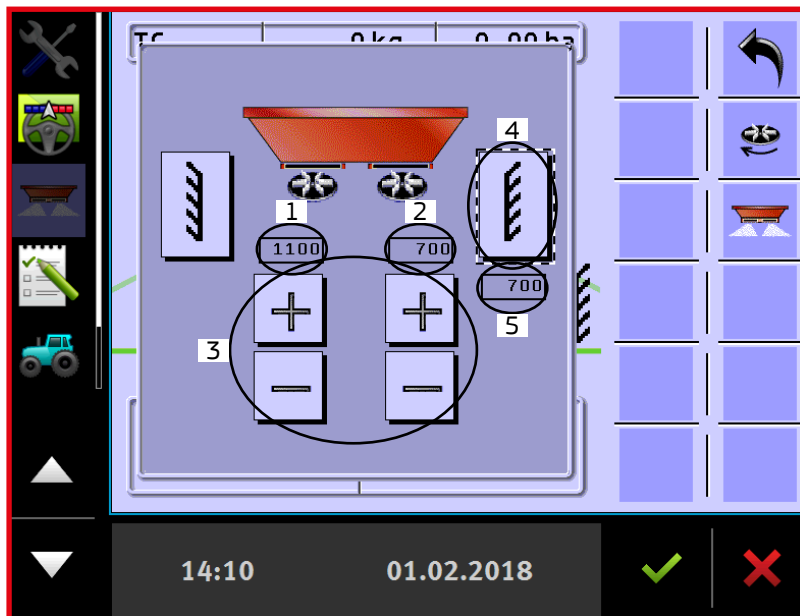
OPERATION SCREEN (HYDRAULIC SPREADING DISCS)

In addition to the functions described on the preceding pages, the following functions for hydraulic spreading discs are found:



1. Starts and stops the spreading discs.
2. Shows the current disc speed for the right and left side.

By pressing field "2", the following picture appears:



1. Shows the current speed set for the left disc.
2. Shows the current speed set for the right disc.
3. The speed of each disc can be changed using the "+" or "-" key. Alternatively, the preferred speed can be entered by pressing "1" or "2".
4. Toggles between field spreading and headland spreading on the side concerned.
5. Shows the headland spreading speed when headland spreading is activated.

> ENTERING THE DESIRED SPEEDS FOR FIELD AND HEADLAND SPREADING

Field spreading: Enter the preferred speed in "2" when field spreading is selected here.

Headland spreading: Enter the preferred speed in "1" or "2" when headland spreading is activated on the side in question.

Alternatively, the speeds can be entered under "Implement parameters" (see p. 31).

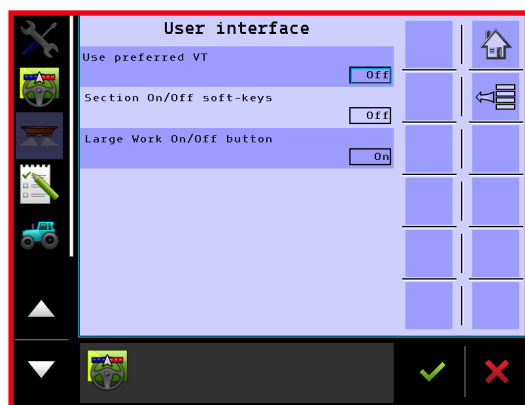
USER SET-UP OF THE OPERATION SCREEN

This menu makes it possible to adapt the operation screen to each user. The following can be changed:

- Preferred screen (if the tractor has more than one terminal)
- Manual operation of sections (icons for the operating of sections will become visible on the operation screen)
- Option of using the large spreader symbol in the operation screen for starting/stopping.

Press the  key on the Home screen display.

Select "User interface".

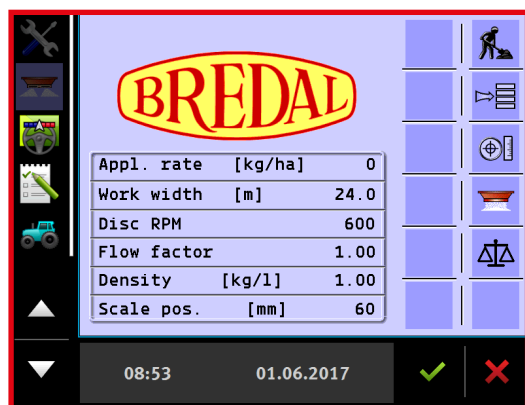


Press the "On/Off" field to connect or disconnect the preferred function.

Finish with 

The changes will not be implemented until the terminal has been restarted.

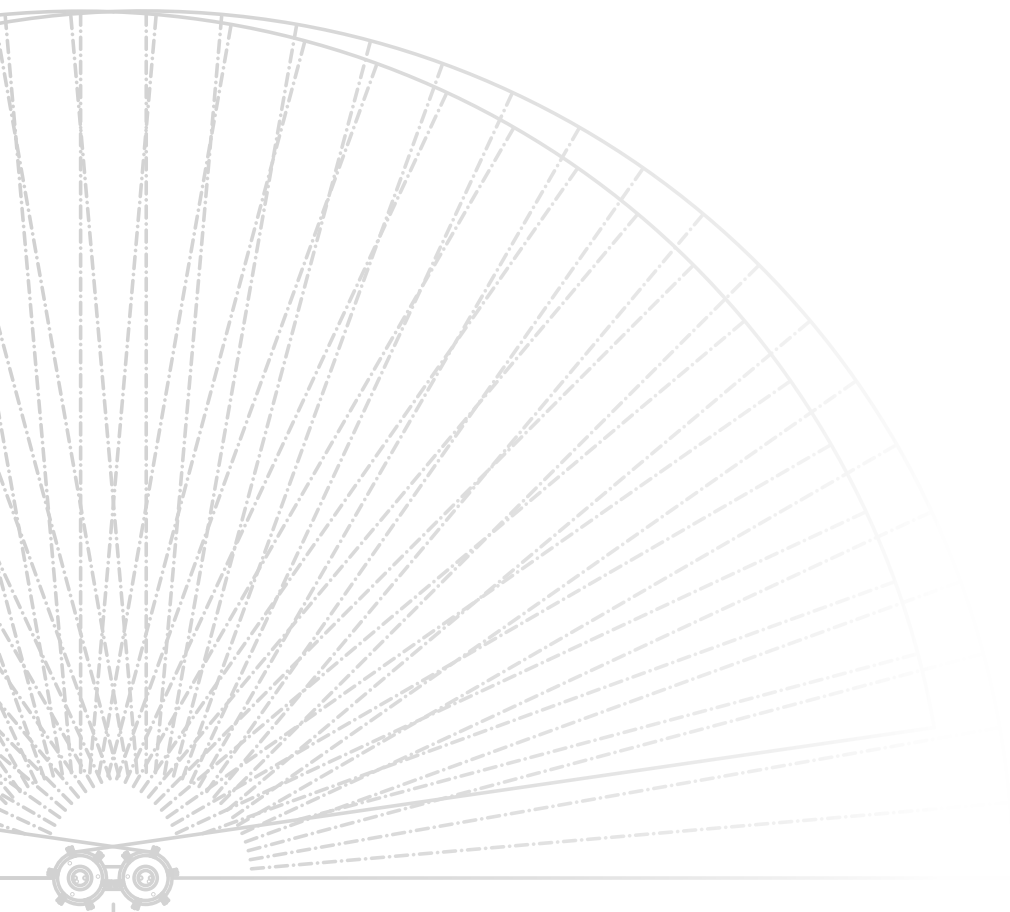
FAST EMPTYING



Press  on the Home menu.

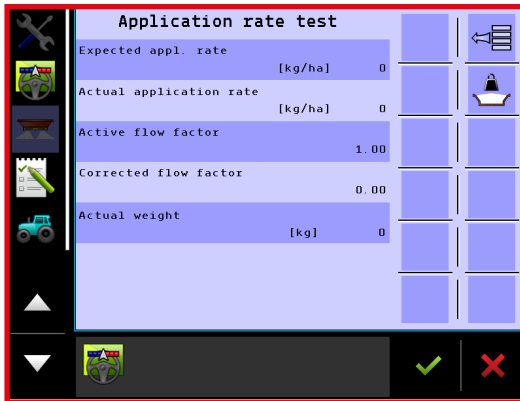


Press  to start emptying. It is possible to change the floor belts' speed by pressing the rpm and entering a different value.



Press the  symbol on the Home menu.

On this menu, it is possible to compare the application rate entered with the actual application rate, if the spreader has load cells. When dynamic weighing has been activated, a new flow factor is continuously and automatically calculated. Dynamic weighing is activated when the implement is delivered from the factory, but it can be deactivated if preferred. If dynamic weighing has been deactivated, weighing can still be used, but the flow factor will not be automatically calculated or changed.



The active flow factor appears, and the next adjustment of the flow factor (adjusted flow factor) can be read.

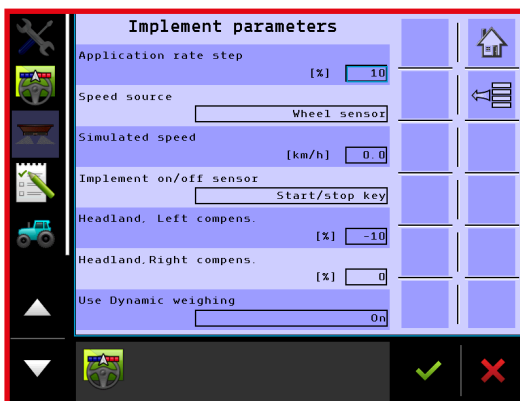
When the spreader is filled, this is automatically registered and a new calculation begins. By pressing , it is also possible to start a new calculation. This is used, for instance, when starting on a new task with a different application rate.

Activating/deactivating dynamic weighing:

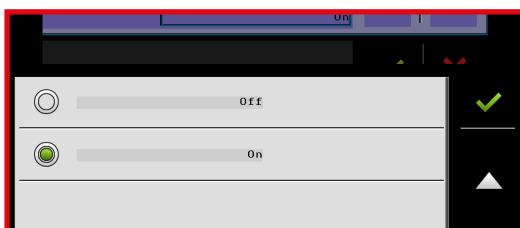
Press the  key from the Home screen display.

Press "Machine"

Press "Implement parameters"



Press the field "Use dynamic weighing" to activate or deactivate the function.



Select whether dynamic weighing should be activated or deactivated.

Finish with 

COUNTERS

This Bredal program component has 10 trip counters and these can be used to count a task's area, distance, volume and time. If the tractor's terminal has an active task controller, this will be used to count area, volume, etc. The 10 trip counters in the Bredal program component will be deactivated and only the trip counter TC will appear on the menu under counters. The active counter will also appear at the top of the operation screen.

Press the  key from the Home screen display.

Press "Counters"

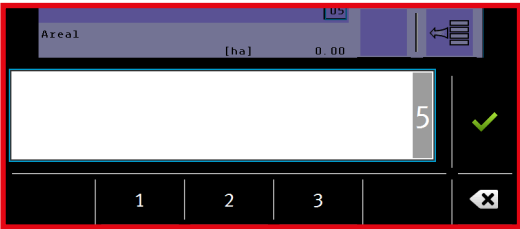
Select "Trip"



It is possible to choose from among 10 different trip counters on the trip counter menu.

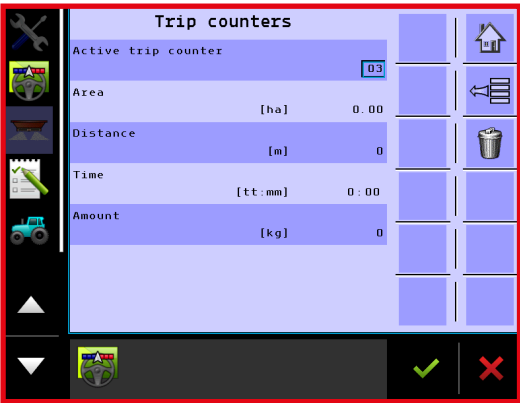
Press "Active trip counter" to select a different counter.

Press  to delete the values counted by the active trip counter.

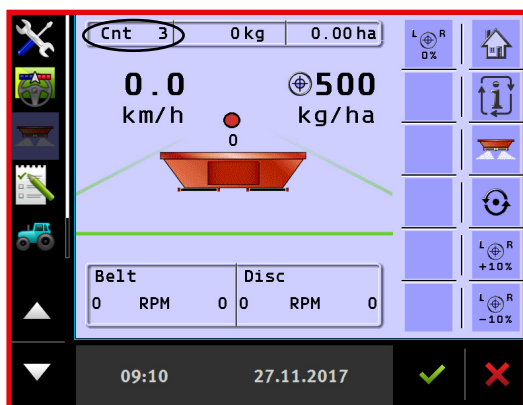


Enter which counter should be activated; it is possible to select counters 1 to 10.

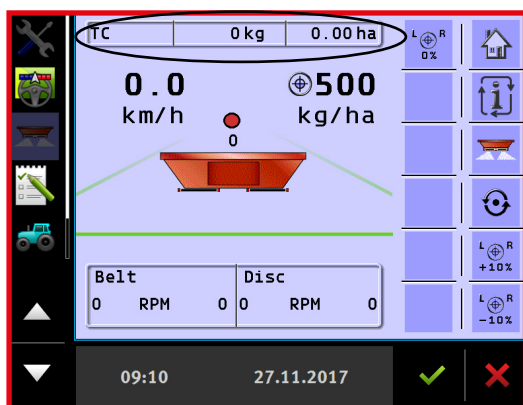
Finish with 



If counter TC is shown, the task controller on the tractor's terminal is active and it is not possible to select other counters. The values counted from TC are shown in the counter, and these values can only be saved or deleted via the TC program.



The active trip counter is shown at the top of the operation screen, and the counted kg and the counted area are shown.



If "TC" appears, the tractor's task controller is active, and the counted values that appear come from here.



It is also possible to choose between Subtotal and Total on the counter menu.

SETTING UP IMPLEMENT PARAMETERS

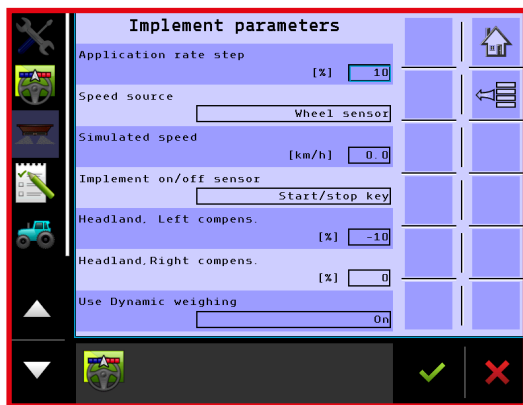
On the implement parameter menu, it is possible to change the following parameters:

- Application rate step: Step size, %
- Speed source
- Simulated speed
- Implement on/off sensor: Choose between the on-screen start/stop button or an external button.
- Headland left/right complete: Automatic volume reduction for activating headland spreading
- Use dynamic weighing: Activating and deactivating dynamic weighing

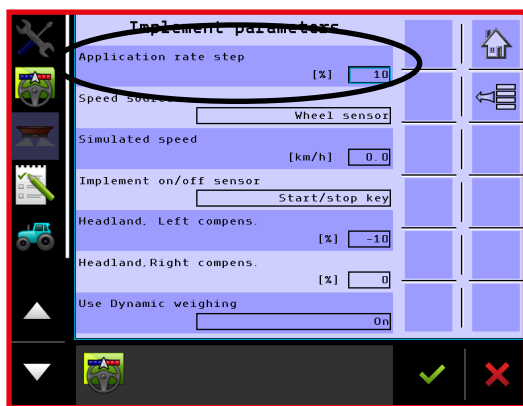
Press the  key from the Home screen display.

Select “Machine”

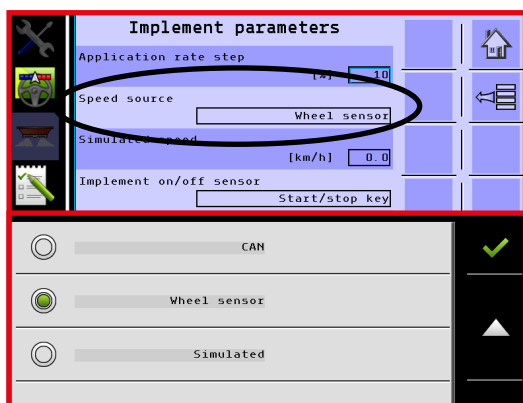
Select “Implement parameters”



Implement parameter menu: On this menu, it is possible to change the various parameters (see an explanation of each individual parameter below).



Application rate step: It is possible to enter the preferred step size for each keystroke on the operation screen here.



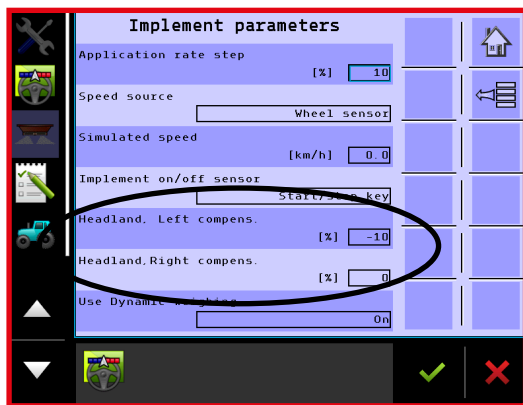
Speed source: It is possible to choose from among Wheel sensor, CAN or Simulated.

Wheel sensor: The forward speed is provided by a sensor mounted on the spreader's wheel.

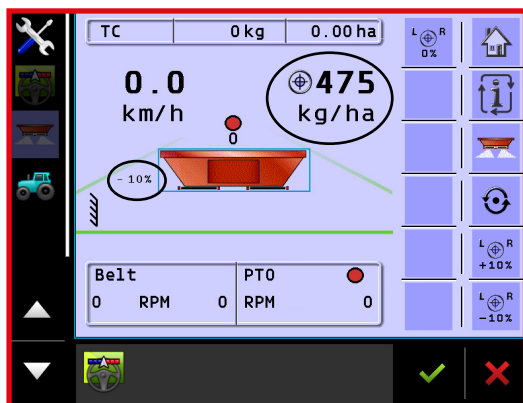
This is not possible for a mounted spreader.

CAN: The forward speed is provided by the tractor's terminal (GPS speed, tractor wheel sensor, etc.). Must be selected and calibrated in the terminal's basic set-up.

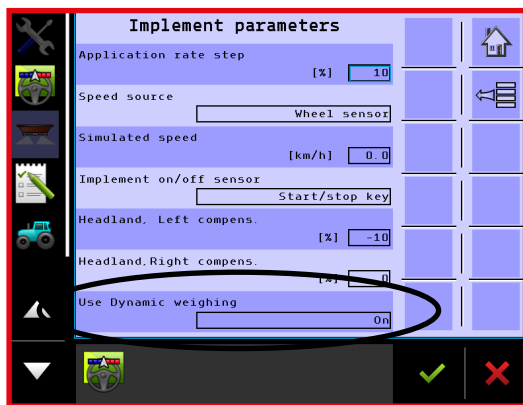
If “Simulated” is selected, the simulated speed must be entered in the “Simulated speed” field.



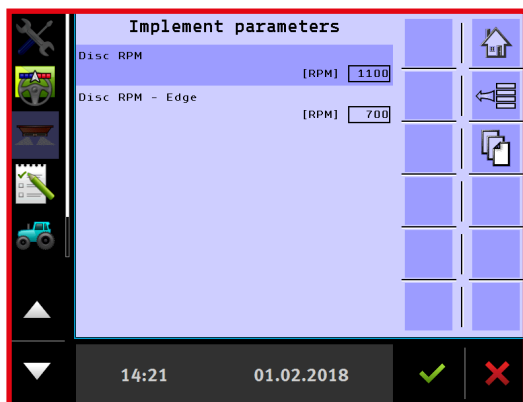
Headland left/right: Here it is possible to enter a reduction of spreading volume when headland spreading is activated. If no reduction is wanted, "0" must appear in both fields. Remember a minus sign is required to reduce the volume; if this is omitted, the spreading volume will be increased when headland spreading is activated. The default factory setting is -10 % for the headland side, which experience shows provides the best spreading results.



When a reduction is entered, this will appear in the operation screen when headland spreading is activated.



Use dynamic weighing: Here, it is possible to activate and deactivate dynamic weighing (see also p. 29).



Spreading disc rpm: When the implement has hydraulic spreading discs, the preferred rpm for field and headland spreading can be entered on page 2.

CALIBRATIONS

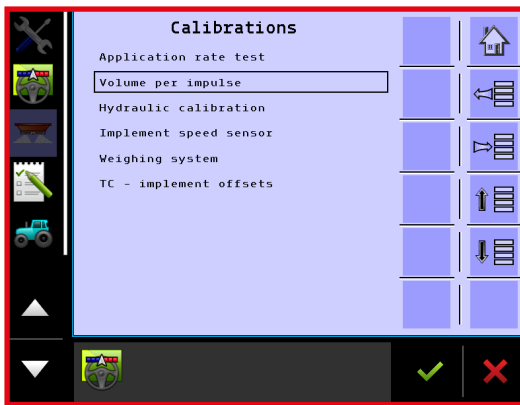
A few basic settings must be entered on the calibrations menu in order for the spreader to function correctly. All figures have already been entered from the factory, but it may be necessary in a few instances to change some of the entered settings slightly. The following data/calibrations can be entered on the menu:

- Volume per impulse
- Hydraulic calibration
- Calibration of speed sensor
- Calibrating/Zeroing load cells
- TC offsets

Press the  key from the Home screen display.

Select "Machine"

Select "Calibrations"



Select the setting on the menu that needs to be changed (an explanation of each individual menu point is found below).

> VOLUME PER IMPULSE

This is where the basic calibration figures for the application rate are entered. If the spreader is not spreading correctly, the entered figures can be changed. The entered figure represents the volume being spread by the spreader in cm^3 for each impulse coming from the gearbox's sensor. Entering a figure that is higher than the figure already set will decrease the application rate and, conversely, entering a lower figure will increase the application rate. Ordinarily, it is not necessary to change the application rate setting, but if it turns out that the spreader spreads slightly incorrectly in practice, the $\text{cm}^3/\text{impulse}$ setting can be changed.



Press $\text{cm}^3/\text{impulse}$ to change the setting.

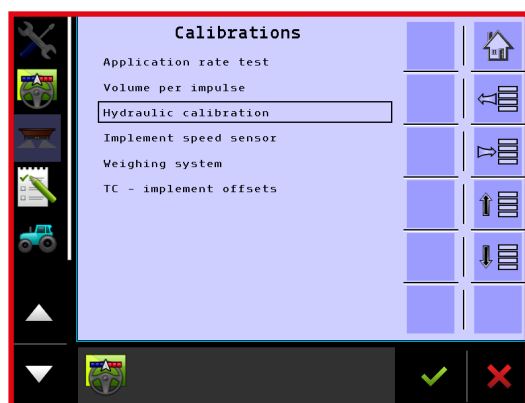
Finish with 

> HYDRAULIC CALIBRATION

In order for the adjustment of floor belts to work in the best possible way, it is recommended to calibrate the hydraulic system for the tractor that will be operating the spreader.

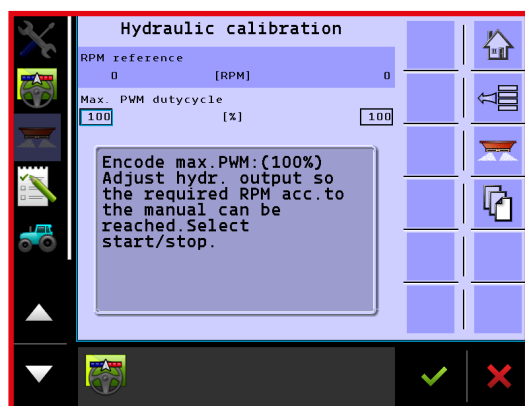


Make sure that no one is near the spreader when the calibration begins!



Select "Hydraulic calibration" to go to the calibration menu.

To determine the correct flow of oil from the tractor, a flow test of the tractor's oil volume can be done during the hydraulic calibration to prevent excess oil being sent to the spreader.



Enter 100% in the "Max. PWM dutycycle".

Press the start key

The tractor's engine must be running at operating rpm.

When the tractor's oil outlet is opened, the floor belts will start running; set the tractor's oil flow volume so the floor belts can run at 600 rpm. Do not set a higher oil flow volume than necessary.

> ZEROING THE LOAD CELLS

If load cells display does not read 0 kg when the spreader is empty, it is possible to zero the load cells.

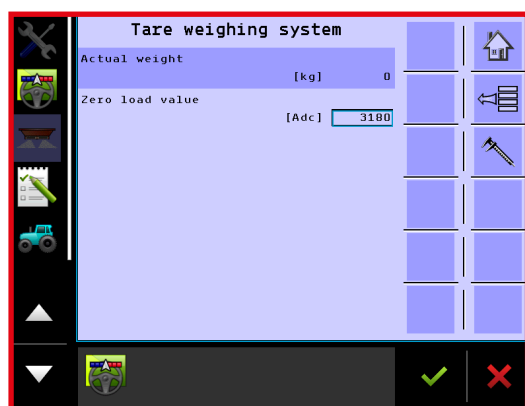
Press the  key from the Home screen display.

Select "Machine"

Select "Calibrations"

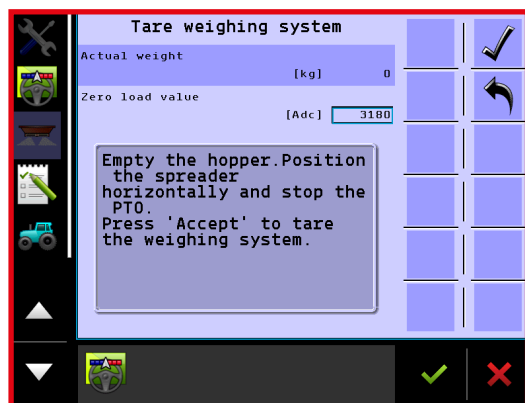
Select "Weighing system"

Select "Tare weighing system"



Press  to begin zeroing the load cells.

The spreader must be kept in a horizontal position when setting the tare weight.



Press  to accept the tare weight.

> CALIBRATING THE LOAD CELLS

The load cells are calibrated at the factory, but it is possible to recalibrate if the load cells do not display the correct weight. Instead of making a brand new calibration, it is also possible to change the weighing slightly by correcting the weight shown. This method is recommended if the weighing works correctly, but the weight is slightly incorrect.

Press the  key from the Home screen display.

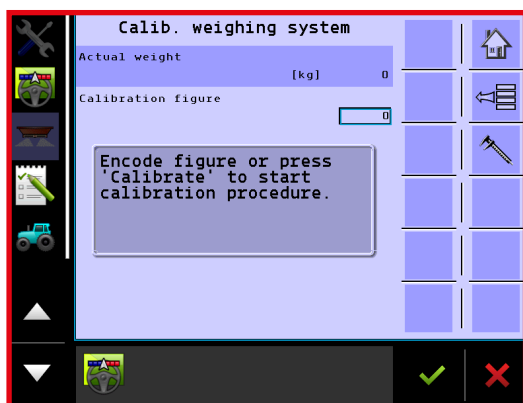
Select "Machine"

Select "Calibrations"

Select "Weighing system"

Select "Calibrate weighing system"

If the weight shown on the load cells is slightly incorrect, the calibration figure can be changed until the correct weight is displayed. If the calibration figure has been mistakenly deleted or changed to an incorrect figure, it is easy to re-enter the correct calibration figure.



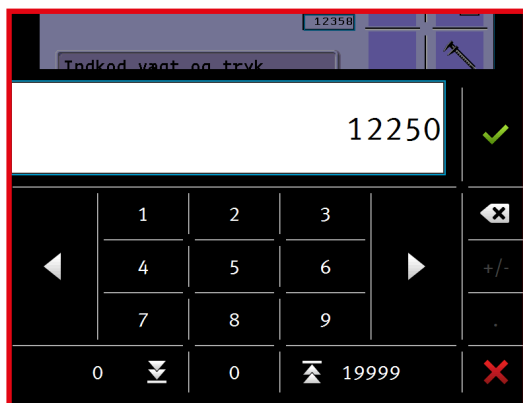
How to adjust the calibration figure:

Start by zeroing the load cells.

Pour a known weight into the spreader.

The filled weight can be seen under "Actual weight". If the load cells display a figure that is too high, adjust the calibration figure downwards to a lower figure.

Press "Calibration figure" to modify this.

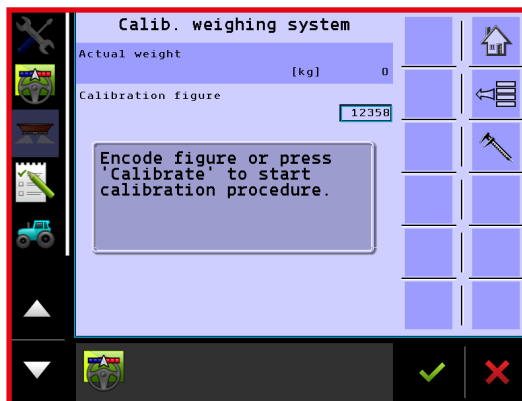


Enter a new calibration figure which is slightly less, and finish with 

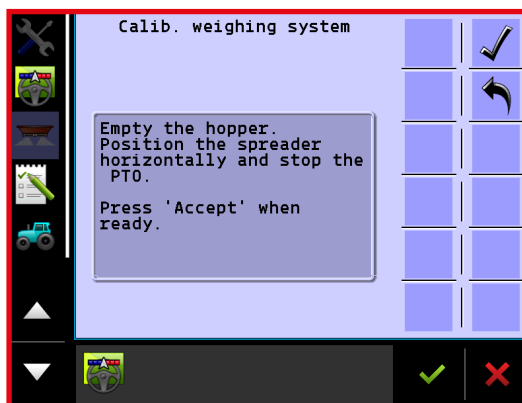
After correcting the calibration figure, the actual weight will change; continue correcting the calibration figure until the correct weight is displayed.

If the calibration figure has been mistakenly deleted or changed, re-enter the original calibration figure. Subsequently, the load cells should be zeroed.

> NEW CALIBRATION

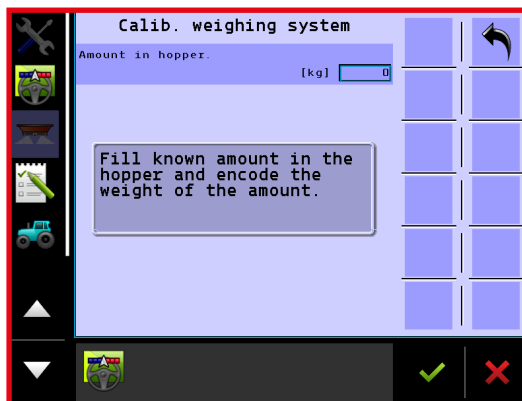


Press  to re-calibrate the load cells.



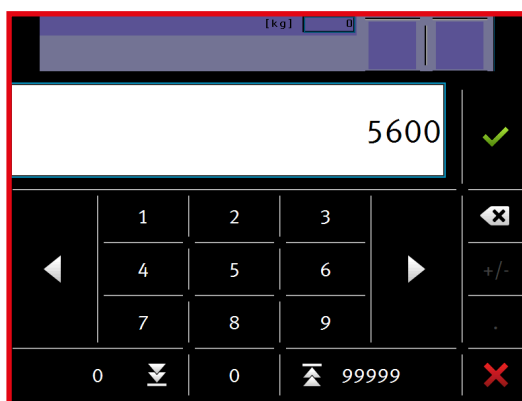
The spreader must be empty and be on a horizontal area.

Press  to start the calibration.



Pour a known weight into the spreader.

Press the input field "kg".



Enter the weight that has been poured into the spreader.

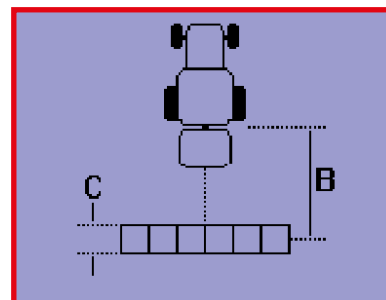
Finish with 

A new calibration figure will be calculated and the calibration is finished.

> TC-IMPLEMENT OFFSETS

When operating with section control, and the spreader must automatically start and stop spreading when turning in the headland, the following distances must be entered to ensure that the spreader starts and stops spreading at the right time:

- B = distance from the spreader's connection point to the centre of the swath
- C = length of the swath



Based on Bredal's experience, Bredal has worked out some distances that usually work but there may be slight differences depending on whether the spreader is operating at 24 or 36 metres, and there can also be differences depending on the type of fertilizer used. The distances recommended by Bredal are entered from the factory:

- B = 8.0 metres
- C = 5.0 metres

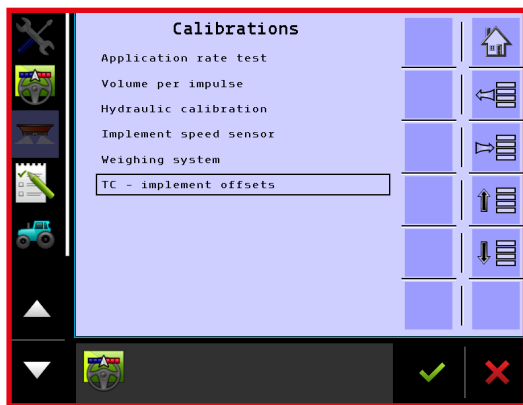
Press the  key from the Home screen display.



Select "Machine"



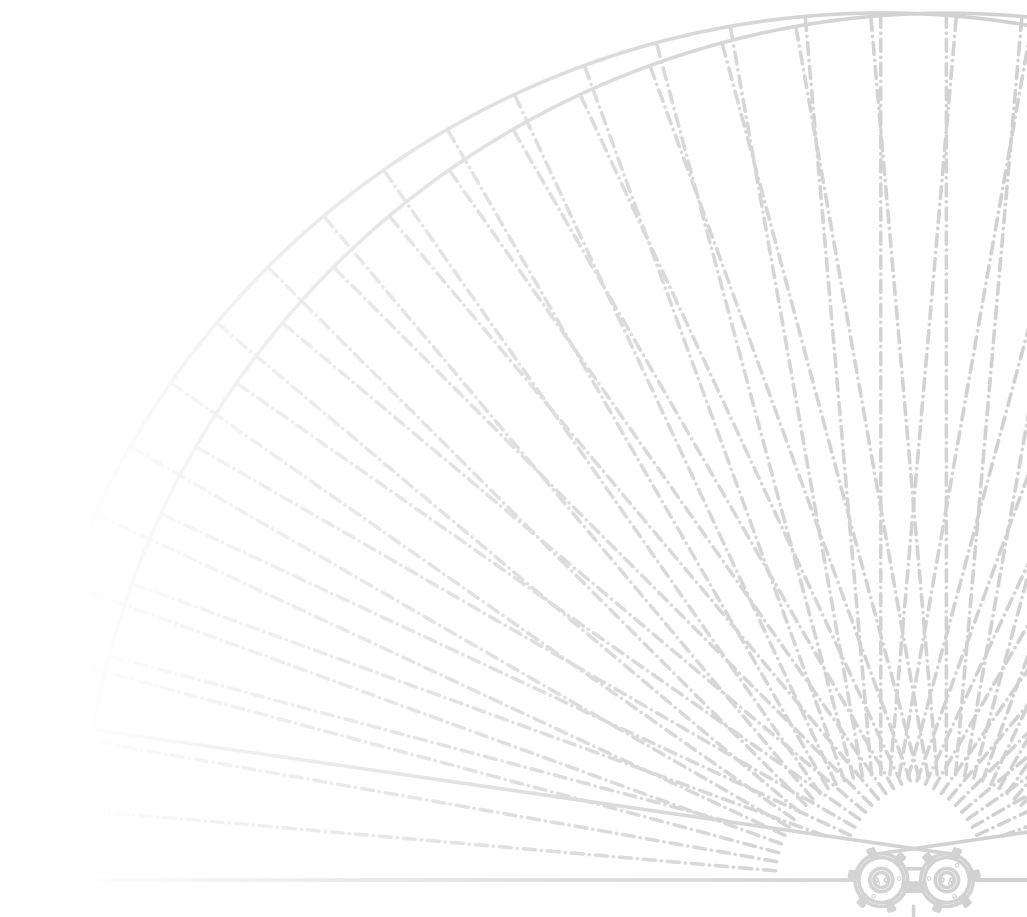
Select "Calibrations"



Select "TC-implement offsets"



Press one of the input fields "(m)", to change the entered value.



TESTING INPUT AND OUTPUT

It is possible to test the spreader's input and output on the testing menu.

> **TESTING INPUT**

Press the  key from the Home screen display.

Select "Help"

Select "Diagnostic"

Select "Test input"



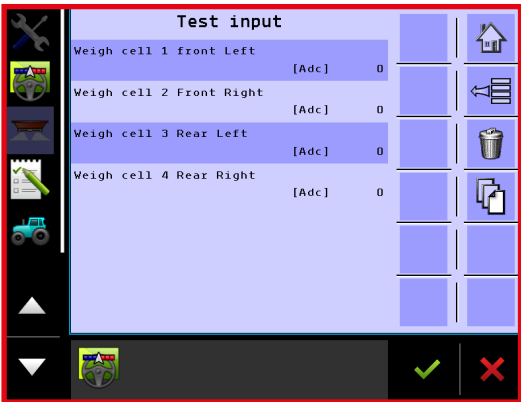
All the inputs from the spreader are listed on the test input menu. For instance, when an inductive sensor is affected, its status changes between high and low, and all impulses coming from the sensor are added up.



In this case, 29 impulses have been counted from the inductive sensor on the left spreading disc.

After exiting test input, all impulses counted will be deleted. It is also possible to delete the counted impulses by pressing .

Press  to view input from the load cells.



Weigh cell input can be viewed on this page when they function properly. If one of the load cells has failed to show a value, it has a problem. Perhaps the load cell is not working properly, i.e. a cable is ruptured or improperly attached to the terminal box.

> TESTING OUTPUT

Press the  key from the Home screen display.

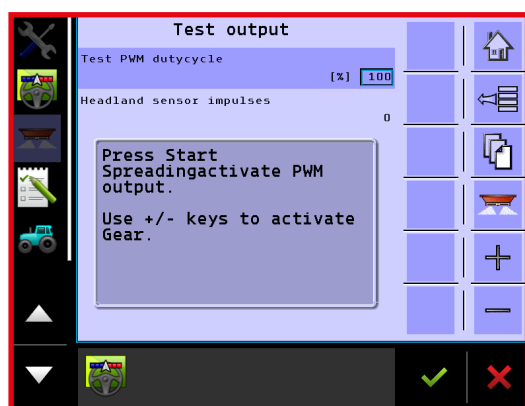
Select "Help"

Select "Diagnostic"

Select "Test output"



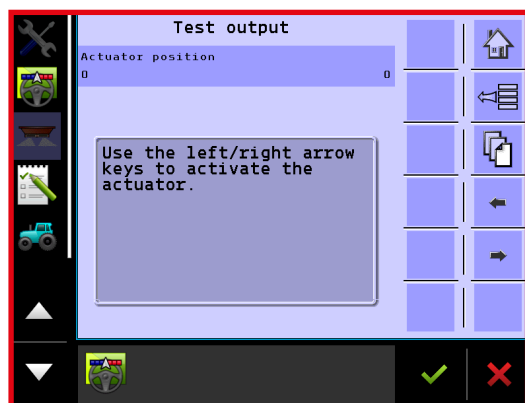
Make sure that no one is near the spreader when functions are being tested!



Here it is possible to test the proportional valves that regulate floor belt speed. Enter a % value in the text box. If 100% is entered, the valves will fully open, and the belts will operate at maximum speed.

Press  to start the floor belts. Oil must be flowing from the tractor in order for the floor belts to run.

Press  to go to the next.



Here the actuators' function can be tested by pressing the arrow buttons. Impulses are counted from the right and left actuators when these are activated. If an actuator is not operating, a alarm will be emitted and computer must be subsequently restarted.

RELOAD FACTORY SETTINGS

If any values in the basic settings are mistakenly deleted or changed, the original factory settings can be reloaded. Note that any values that have possibly been changed since the implement was delivered from the factory will be reloaded to the original values when the factory settings are reloaded.

The values reloaded with this function are as follows:

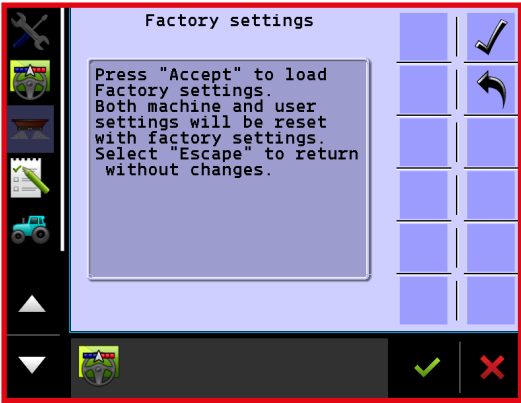
- Application rate (cm³/impulse)
- Load cells' calibration figures
- TC-implement offsets
- No. of pulses per disc revolution
- No. of pulses per oil-motor revolution
- Gear factor for headland gear (headland-gear downshifting as a percentage).
- The proportional valves' PID parameters

After reloading the factory settings, the spreader's application rate and weighing should both be checked and monitored, as there is a risk of making application errors if a reloaded figure is incorrect.

Press the  key from the Home screen display.

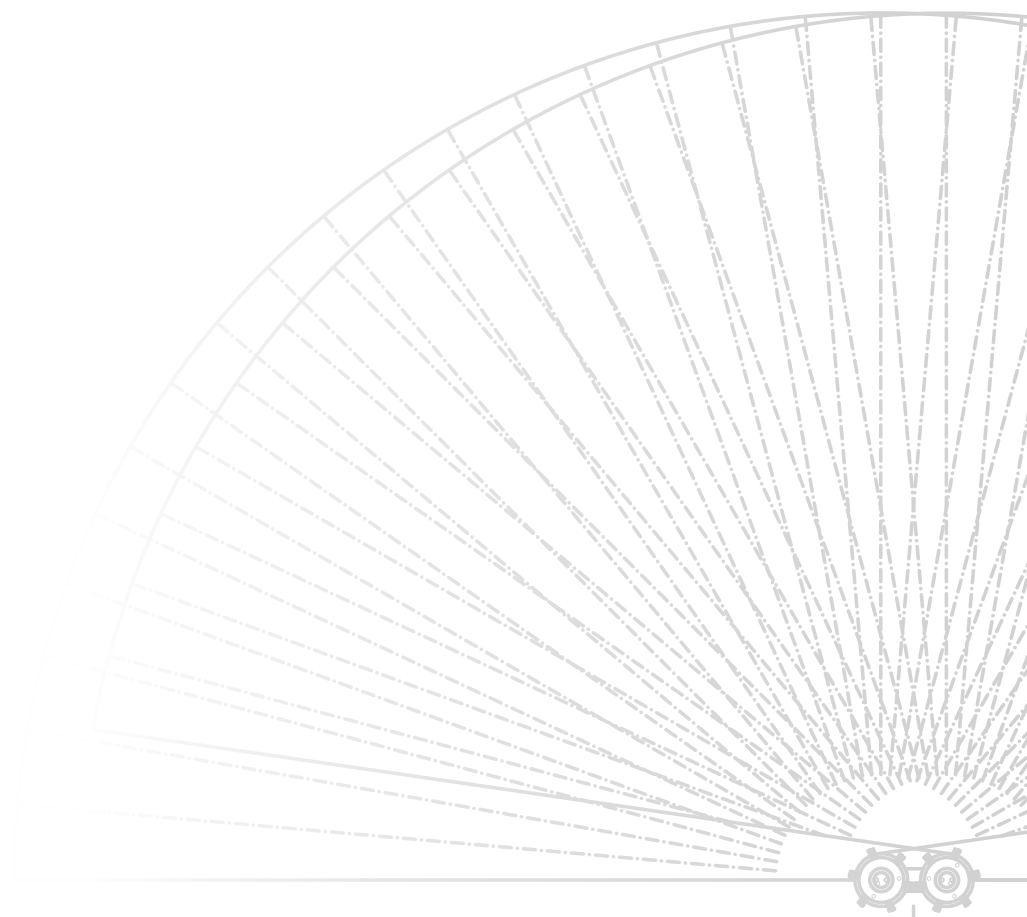
Select "Help"

Select "Load factory settings"



Press  to reload the factory settings.

Press  to return without making any changes.



FERTILISER QUALITY

Fertiliser quality is crucial for spreading quality. In order to check fertiliser quality and get an idea of the spreading power, the following values are the most important to know:

- Particle strength
- Particle size
- Dust content
- Bulk density
- Particle shape

Particle strength can be measured using the crushing strength tester included in the supply. Press the granule with the crushing strength tester until the granule ruptures and then read the crushing strength. Repeat this with several granules, big and small, and then calculate the mean crushing strength.

Particle size can be measured using Bredal's sieve shaker. Fill the space above the biggest-meshed sieve, attach the lid and shake until the distribution of granules remains constant. Turn the sieve shaker so the lid is facing up again. Now it is possible to determine the distribution of particle size.

The dust content appears after finding the distribution of particle size, as relative percentage of the fertiliser below the smallest sieve. In many cases the dust content can also be estimated visually.

Bulk density is usually specified by the fertiliser manufacturer; otherwise it can be determined by using a Bredal calibration kit (extra accessory).

Particle shape can be assessed visually. The smoother and rounder the particle, the further it can be flung through the air. A very angular granule or a granule with many surface nodules is less aerodynamic, impeding its ability to cover the entire swath of wide working widths.



> EFFECT OF FERTILIZER QUALITY ON SPREADING PROPERTIES

Low crushing strength means that the **fertiliser** tends to get crushed, both during transportation and spreading. Low crushing strength is often related to dust content, as fertilizer with a low crushing strength is easily crushed during transportation and reloading. The crushing strength is usually up to par when the **fertiliser** leaves the factory, but if the **fertiliser** has been subjected to moisture or water, it loses its original crushing strength and never regains it, even if the **fertiliser** consignment is dried. Certain types of **fertiliser** always have a low crushing strength, such as prilled urea. In order to be able to spread a **fertiliser** over wider working widths (24 metres or more), the crushing strength should at least be 3–4 kg. If it below this, the discs' revolutions need to be reduced to avoid crushing the fertilizer, thereby narrowing the working width, eliminating the option of wide working widths.

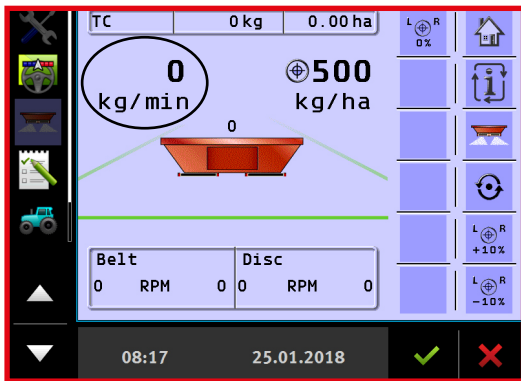
The particle size affects how far the fertilizer can be flung. Large fertilizer granules can be flung further than small ones, which means that a certain particle size is required to cover the entire swath of wide working widths. The average particle size should be more than 3 mm to make it possible to spread up to 36 metres. In other words, more than 50% of the particles should be in the section above the 3 mm sieve in Bredal's sieve shaker.

The dust content increases with the number of treatments (reloading, transportation, etc.) to which the fertilizer is subjected. If much of the fertilizer has been crushed into dust, this will be deposited as a layer behind the spreader, usually 4–5 metres wide across the tracks, and it will usually make it difficult to obtain satisfying spreading results.

Heavy fertilizer particles can be flung further than light ones, which is why fertilizer density is crucial for swath range. Most types of fertilizer have a density of around 1.0 kg/litre or slightly more. A few have a lower density (0.7–0.75 kg/litre), but it is difficult for these types to fully cover 36-metre swath widths.

Rectangular or irregular fertilizer has poor aerodynamic characteristics, which is why it cannot be flung as far. Wide working widths require aerodynamic fertilizer granules. These characteristics are difficult to measure in practice, but a visual assessment is sufficient and not difficult to make, as round and especially smooth granules can be thrown the furthest.

MAXIMUM CAPACITY PER MINUTE

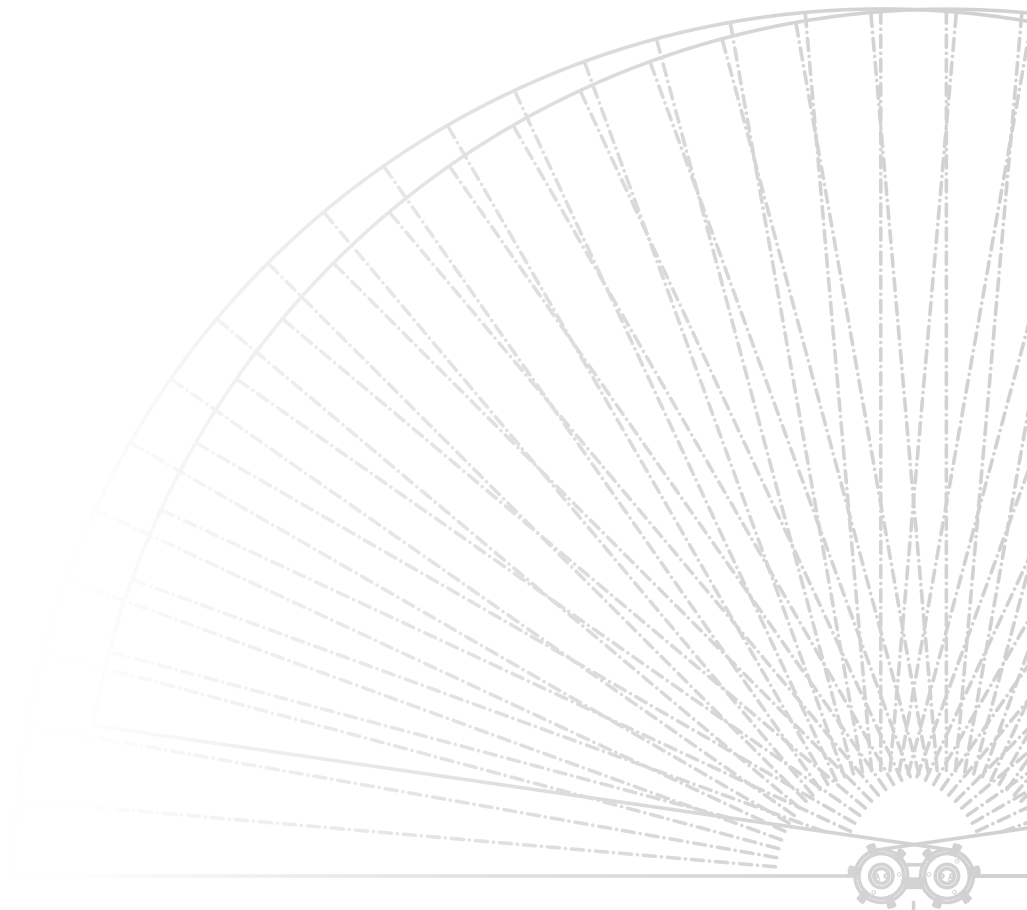


It is advisable to not spread more than 350 kg/min.

The spreader can spread large volumes but the spreading pattern of certain types of fertilizer will be impaired if the application rate exceeds 350 kg/min.

If a larger volume needs to be spread, a spreading test should always be done in the field at the given volume to ensure that satisfactory spreading results can be achieved.

The current application rate can be seen on the operation screen when the indicator "kg/min." is selected.



SETTINGS FOR VARIOUS TYPES OF FERTILIZER

Settings for various fertilizer types can be downloaded from Bredal's website. The settings are determined by testing the various fertilizers in practice. Update the settings on an ongoing basis to make sure they are up to date. It is advisable to use these settings. It is also advisable to carry out a fertilizer spreading test in the field to make sure that a satisfactory spreading pattern is achieved (see p. 49).

Go to Bredal's website www.bredal.com

At the website, select "Spread Chart" on the right side of the screen.

Under "Machine type", select "F4"

It is possible to choose between an A or H disc (F4's default setting is A discs)

Select the type of fertilizer to be spread

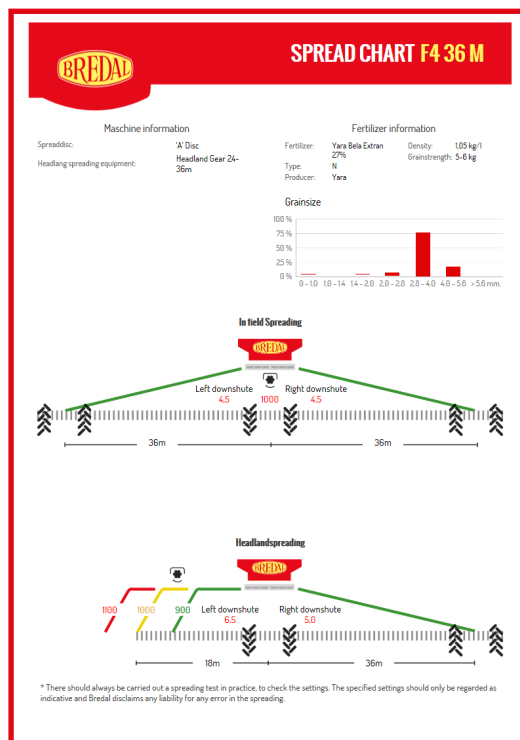
Select the working width to be used

Click "Show results"

This will take you to the results page with the settings that fit the type of fertilizer selected.

Enter the recommended downshute settings for field and headland spreading in the computer.

Also, the spreader should be set to run at the recommended PTO rpm.



The fertilizer, name, manufacturer, density, crushing strength and granule distribution selected appear in the spread chart at the top of the results page.

The recommended downshute settings and PTO rpm for field spreading are shown in the centre of the chart.

The recommended downshute settings and PTO rpm for headland spreading are shown at the bottom of the chart (scroll down).

Red = complete spreading to boundary

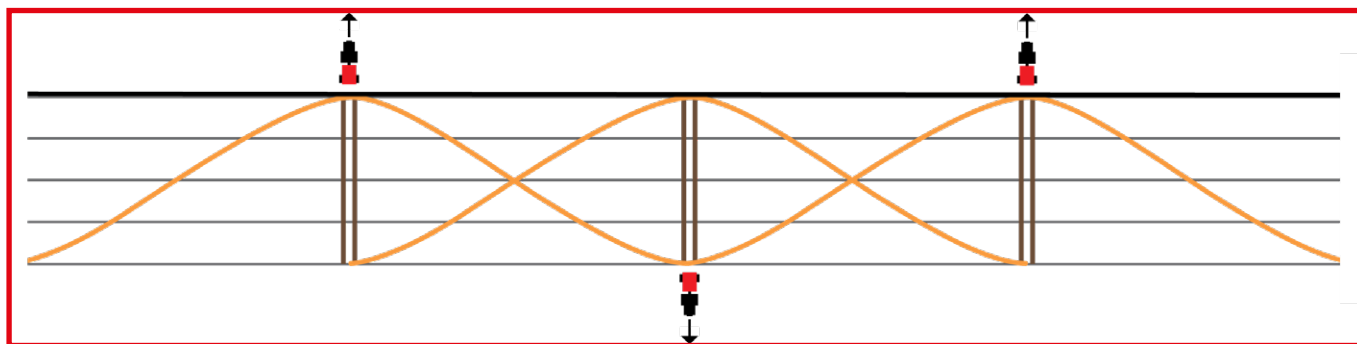
Yellow = medium spreading along boundary

Green = very little fertilizer beyond boundary

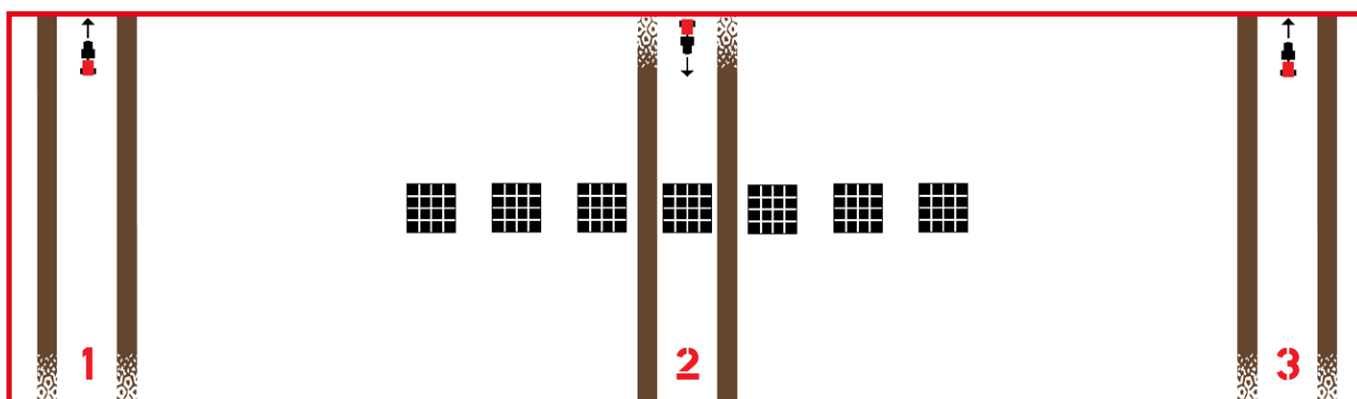
FERTILISER SPREADING TEST AND ADJUSTMENT OF THE APPLICATION RATE

A spreading test should always be done in the field to ensure satisfactory spreading patterns. Consider the following factors when conducting a fertilizer spreading test:

- Perform the test should be done in dry conditions (field/implement)
- Perform the test should be done in a field covered with a healthy crop: approx. 10 cm of thick plant growth, to avoid ricocheting granules.
- Conduct the test on a flat section of the field and, when setting out trays, make sure that all of them are level wherever possible.
- Conduct the test at the forward speed normally used for spreading (ideal: 14–15 km/h, if the field allows).
- Let 100–200 kg of fertilizer run through the spreader before conducting the test. There may be deposits of old fertilizer, verdigris or rust on the spreader discs and booms that need to be worn off before the spreader can produce a constant spreading pattern.
- Set up the trays at one-half of the working width on both sides of the centremost of the three wheel tracks. Drive forward in the first, back in the second and forward again in the third track. To get sufficient volumes in the trays so that they can be used for an assessment, it is necessary to spread at least 200 kg/ha.
- Make sure to drive far ahead of the trays before disengaging the application, as the spreader flings the fertilizer far to the rear.



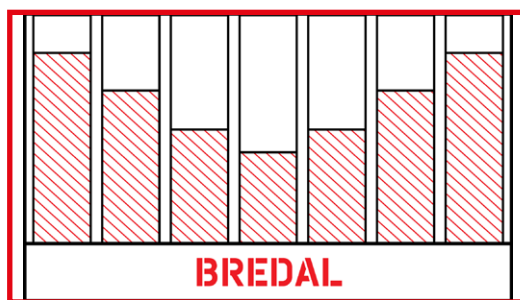
Ideal distribution of fertilizer using overlapping



Setting up testing trays in the field.

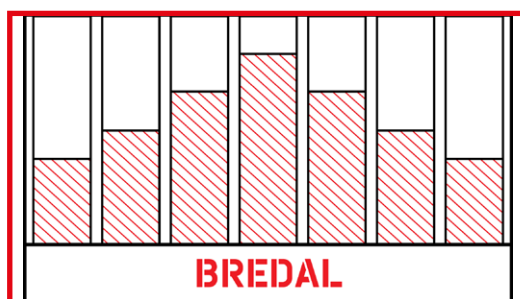
After pouring the fertilizer into the measuring cups, assess the spreading results. A correction of the spreading picture is shown on the next page.

> IF EXCESS FERTILIZER IS DEPOSITED BETWEEN THE TRACKS



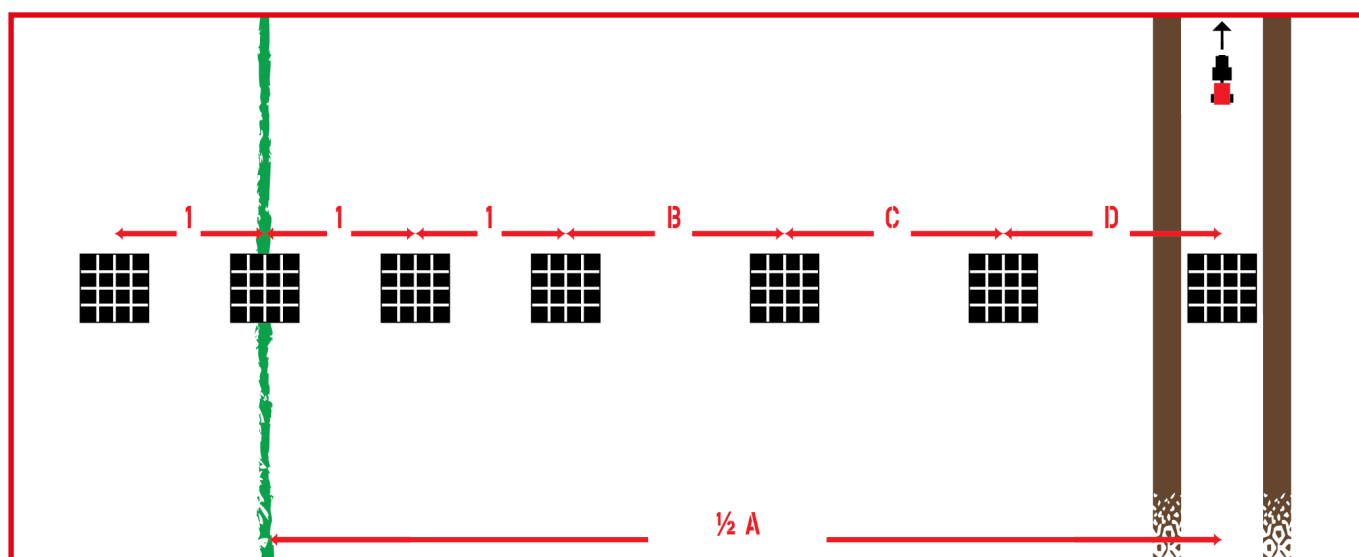
Enter a lower value under "downshute position". Preferably enter 2 steps less. If a subsequent test shows that two steps was too much, the difference between the two tests will indicate how much the scale needs to be moved back.

> IF EXCESS FERTILIZER IS DEPOSITED BEHIND THE SPREADER



Enter a higher value under "downshute position". Preferably enter 2 steps more. If a subsequent test shows that two steps was too much, the difference between the two tests will indicate how much the scale needs to be moved back.

> SPREADING SAMPLE: HEADLAND SPREADING



Position the trays as shown below. If the spreader deposits too much fertilizer beyond the boundary in relation to the preferred amount, lower the rpm by 50–100 rpm per test until the spreading result is acceptable. Conversely, the rpm setting should be increased by 50–100 rpm if spreading to the boundary is insufficient.

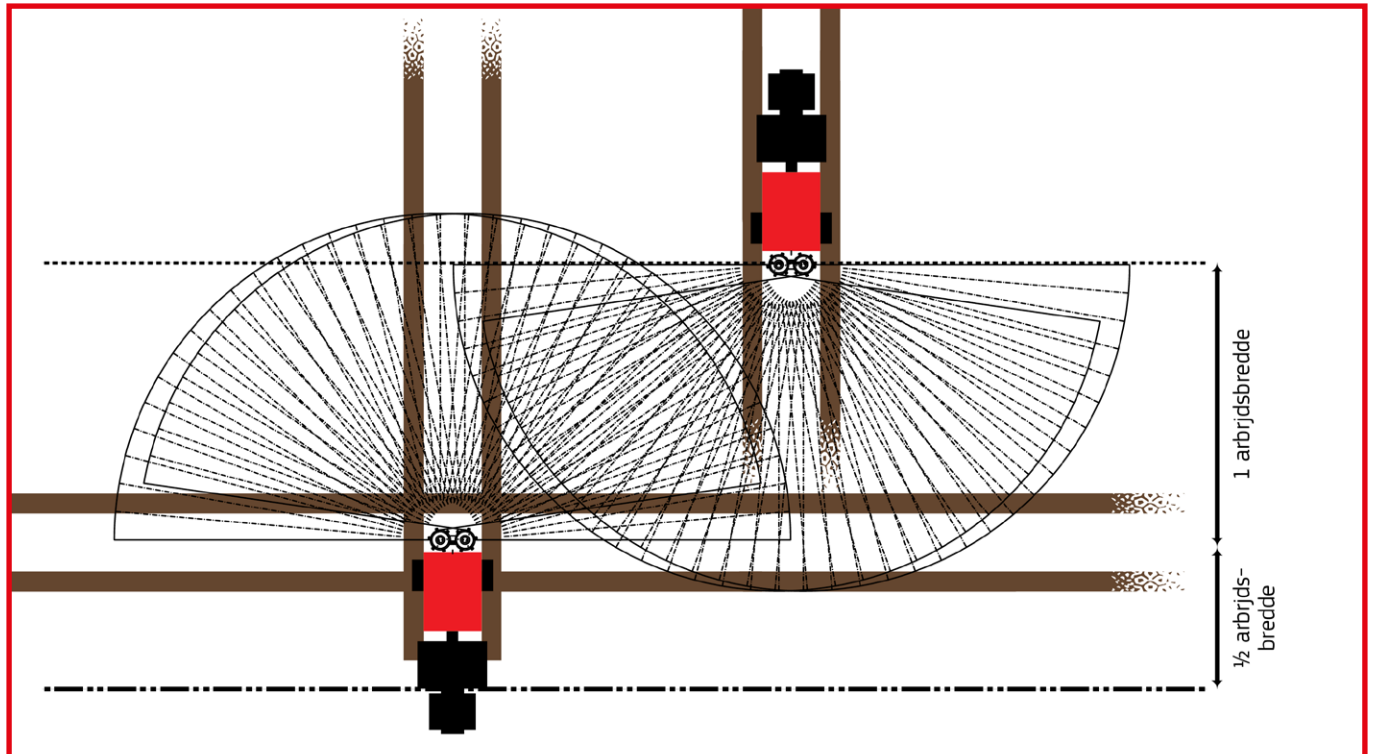
ENGAGING/DISENGAGING IN HEADLAND (MANUALLY)

If the spreader is operated without using section control, the application must be disengaged and engaged at the right time.

General rule:

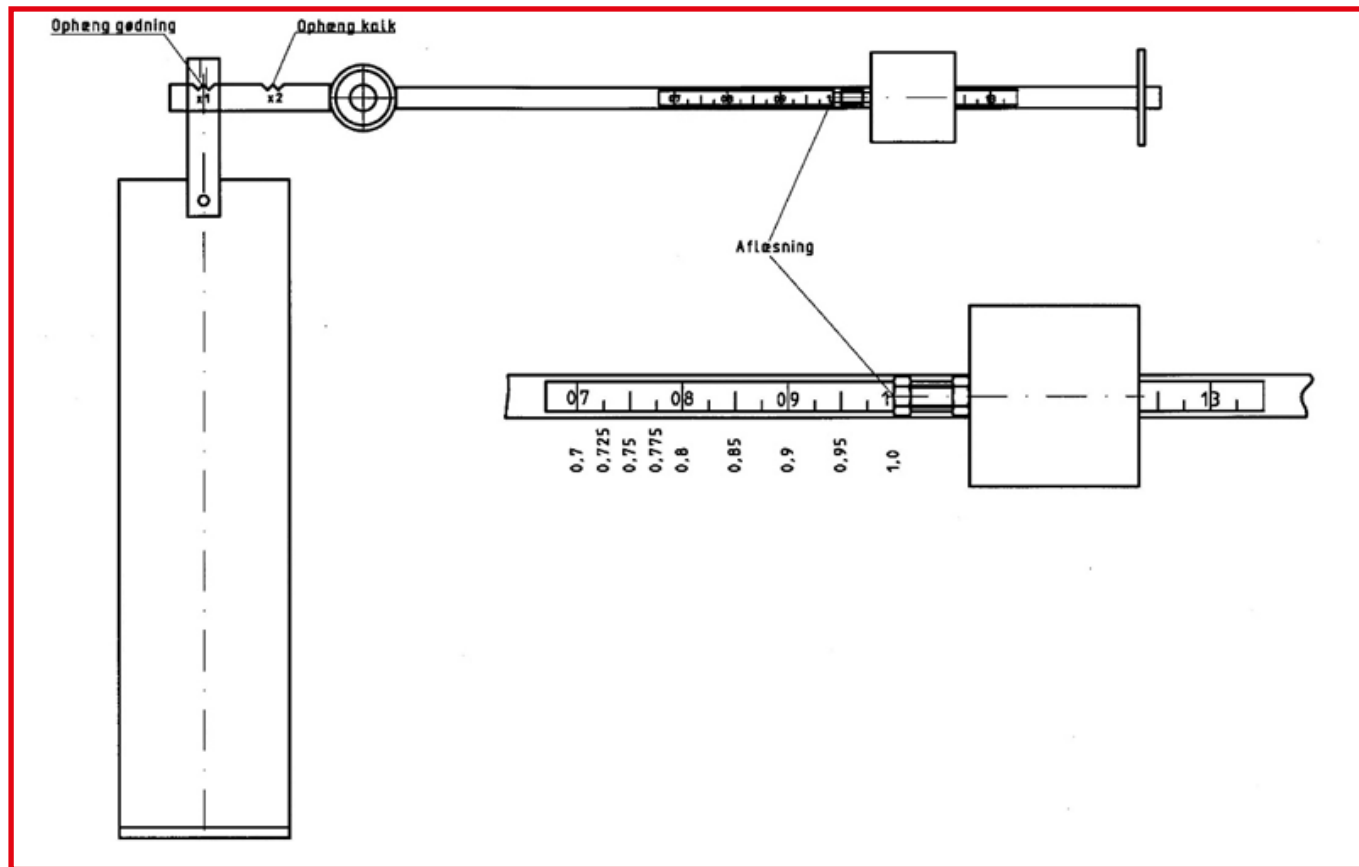
Disengage when the discs pass the headland's tracks.

Re-engage when the discs are one working width from the headland's tracks.



CALIBRATION KIT

Fill the bucket with fertilizer, hit it against the floor a few times and replenish. Smooth off the top. Then hang the bucket on the scale in the notch (X1). Set the counterweight so the bracket balances. Read the fertilizer's density on the scale next to the end of the bolt. (The calibration kit is an extra accessory.)



If the scale needs adjustment or verification, do this by filling the bucket with water. When the weighing bracket is in balance, the bolt end must be at 1.0 on the scale. If this is not the case, adjust the bolt until the setting is correct.

LATE APPLICATION WITH LATE APPLICATION EQUIPMENT

Late application equipment can be used to spread in tall crops when parts of the crops are at a height up to the top edge of the spread discs. (Late application equipment is extra equipment.)

Bolt the late application equipment to the brackets holding the safety bracket on both sides, and in the middle it rests on the bracket for the safety brackets.

It is crucial to mount this equipment in a level position on the spreader, as otherwise the spreading will be laterally distorted.

Note that the late application equipment lifts the fertilizer, which means that the spreading will be more sensitive to wind than usual, so do not use this equipment in windy conditions.

The PTO setting must be slightly lower and the downshute setting should be slightly lower than normal when late application equipment is attached. The table below shows how much needs to be subtracted compared to the settings for normal operation.



Field spreading			Headland spreading	
Working width	rpm	Downshute	rpm	Downshute
24	-200	-2.0	-150	-2.0
28	-200	-1.0	-100	-1.0
30	-150	-0.5	-100	-0.5
32	-150	0	-50	0
36	-150	0	-50	0

Example:

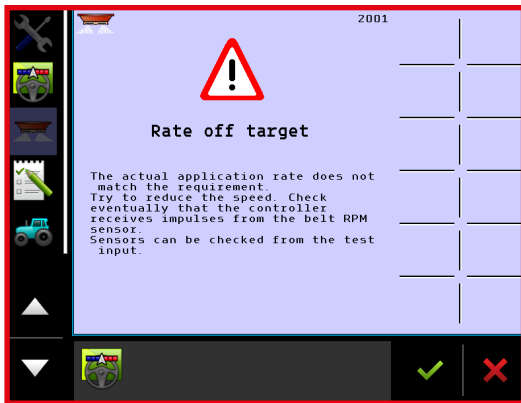
A 30-metre working width will be used. According to the settings on Bredal's website, the PTO rpm should be set at 1000 rpm and the downshute position at 5.0.

According to the table under 30 metres, subtract 150 rpm from 1000 rpm, so that the spreader operates at 850 rpm.

Normally the downshute position is 5.0, but according to the table, 0.5 should be subtracted from so the downshute position is 4.5.

TROUBLESHOOTING

This section describes the most common faults that can occur as well as the possible cause of the various error messages. It also provides some help for troubleshooting the spreader's electrical components.



> RATE OFF TARGET

The most commonly occurring error message appears when the spreader's floor belts do not run at the right speed or do not run at all. The alarm can often be emitted very briefly and it will automatically stop as soon as the fault stops. If this is the case, it does not mean that there is a fault in the spreader, but that the application rate has briefly been outside the application range. If the error message does not stop, it is because the fault prompting the message has not been resolved. There may be several reasons for this:

If the floor belts are running, the error message might be caused by the following:

- The forward speed is too high, preventing the spreader from applying the preferred amount.
- The oil-flow setting on the tractor's oil outlet is too low.
- The spreader is set to spread a large volume and the rear doors are set at a small opening
- The spreader is set to spread a small volume and the rear doors are set to open too wide.

If one floor belt appears to be running correctly and the other belt is running too fast:

- No impulses are being sent from the gearbox's inductive sensor on the side where the belt is running too fast.

> FLOOR BELTS WHICH STOP RUNNING COULD BE CAUSED BY THE FOLLOWING

- The flow of oil through the tractor's oil outlet has not been opened.
- The tractor has blocked the return flow of oil. Try to briefly reverse the direction of oil pressure against the normal circulation direction, and then re-open the oil circulation in the correct flow direction.
- Poor connection in the ISOBUS outlet: try pulling out and re-inserting the plug.
- A loose connection or damaged electrical cable connected to oil-motor activation.
- The floor belts need to be tightened: tighten both nuts one revolution at a time until the belts keep pace.

If the problem is due to a fault in the control or electrical system, the belts can be manually operated by screwing in the thumb screws on the oil motor/gear valves, while oil flow from the tractor is open (see photo p. 70). If the floor belts still do not run, the fault is in the hydraulic system.

> RIGHT (LEFT) ACTUATOR BLOCKED



Make sure the downshute can move freely and that no fertilizer deposits or anything else is jammed against the motor regulating the downshute position.

Restart the computer to reset the alarm.

If the error message continues and the downshutes' working areas are unobstructed, and nothing is jammed, the actuator could be defective and need to be replaced.

> CHECKING THE GEARBOX SENSOR



It is possible to check a sensor's function. If a sensor does not count or if it counts incorrectly, it is often the pick-up distance, i.e. the distance between the sensor and the tooth being scanned, that is too great. The pick-up distance of the gearboxes' sensors is 1–1.5 mm, so if the sensor is not close enough to the gearbox cogwheel, it cannot detect the teeth and therefore will not send a signal to the computer.

Press the sensor on the gearbox as far as possible into its installation hole. It is held in place by an 8 mm screw. Loosen the screw and make sure the sensor is pressed in as far as possible. It may be necessary to rotate the sensor slightly as it will otherwise tend to return to the same position when the screw holding it in place is retightened.

Check whether the sensor is working by holding it against a piece of metal. In the terminal, select "Test input" (Home – Menu – Help – Diagnostic – Test input). Now all inputs from the implement's sensors will be viewable.



By holding the gearbox sensor against a piece of metal, the input in the terminal's test menu will change and an impulse will be counted. If the input does not switch between high and low and if impulses are not counted, the sensor is either defective or is not being supplied with power (12 V). If there is no power, the implement's other sensors will not work either.

If the gearbox sensor is defective, it must be replaced by the same type of new sensor (Bredal order no.: 01023137).



BASIC SETTINGS, ADJUSTMENT OF DOWNSHUTE POSITION

To get the best possible spreading pattern, it is important that the downshutes' basic setting is correct. Both downshutes' pivot points must be centred over the middle of the discs; also, the downshute position must be correctly adjusted.

Do not make this check and adjustment unless parts of the spread unit or downshute have been taken apart.

> CHECKING DOWNSHUTES' CENTRING

Remove the bolt holding the shield over the actuator, and lift off the shield.



Unscrew the two socket screws so the downshute and actuator can be dismounted.



Disassemble the cones over the centre of the discs

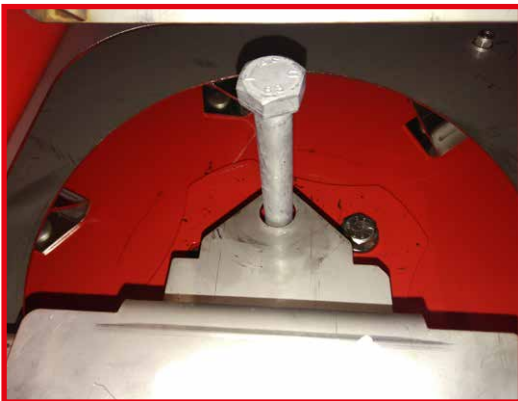




Disassemble the downshutes, as the baseplates must be used for the adjustment. Loosen the M8 bolt on the inside and then unscrew the countersunk socket screw. Make sure that the guide disc centring the downshute in the hole is put back in place when the downshutes are reassembled. It is also important to keep the right and left sides separate so these are not interchanged.



Reattach the downshutes' baseplates to the shield.

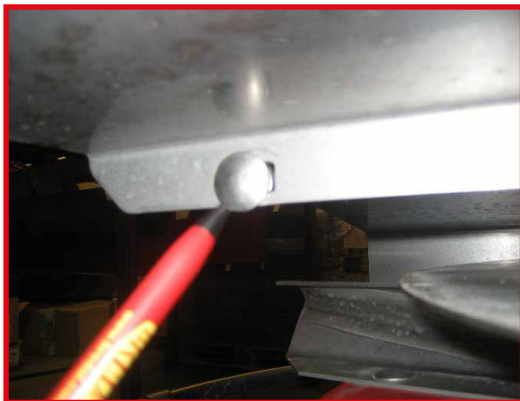


Screw a long M16 screw into the threaded holes in the centre of the discs so these penetrate the centre hole of the baseplate.

Now, it is possible to check whether the downshutes are centred over the centre of the discs. If they are not centred, shift the rearmost shield to which the downshutes are attached.



Loosen all four of the screws holding the rearmost section of the shield in place, and loosen the three screws holding the rearmost and front part of the shield together. Now the rearmost shield section can be shifted both sideways and lengthwise. Move the shield until the centre of the downshutes is precisely centred over the centre of the discs. Be meticulous: the better the downshutes are adjusted, the better the spreading pattern that can be subsequently achieved. When the shield is adjusted, tighten the screws holding the shield attached to the frame first and then retighten the front and rear shield sections together.



After the adjustment, reassemble the downshutes. These should rotate easily when the centre screw is tightened. Once they rotate with proper ease, tighten the lock nut. Remember to correctly position both the centring disc and the large washer.

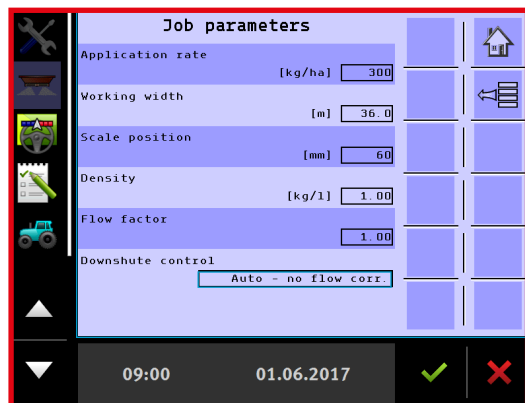


Reattach the cone over the centre of the disc and reattach the downshutes and actuator. Now check/adjust the basic setting of downshute scale.



> CHECK/ADJUSTMENT OF DOWNSHUTE SCALE

Follow this procedure to make sure that the downshutes are correctly positioned.



Enter "36" metres working width in the computer.
Select "Auto – no flow corr." under downshute control.

Return to the operation screen and click "start spreading" . NB: headland spreading must not be activated, as otherwise the downshutes will not move into the correct position. Also all sections must be turned on.



After clicking "start spreading", the downshutes must move out and align with the small arrow cut into the downshutes' baseplate. If the arrows do not align, they must be adjusted until the basic setting is correct.



Adjust the actuator's threading until the downshute's arrow aligns with the baseplate arrow.

After completing the adjustment:

Remember to re-enter the following settings in the computer: the working width for spreading and the downshute position to be used for spreading.

FLOOR BELT ADJUSTMENT



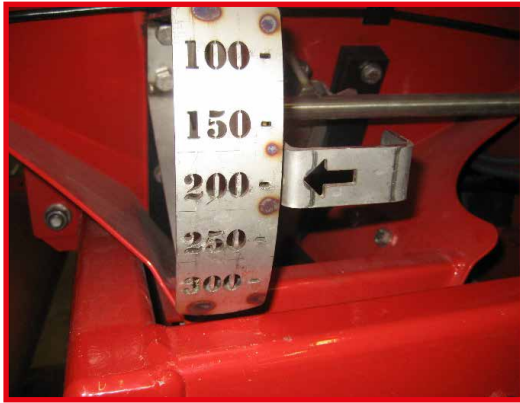
Normally, the belts do not need to be tightened, unless they are sliding on the rollers and cannot keep up.

If a floor belt needs to be tightened, tighten the bolts on both sides of the belt one revolution at a time until the belt is tight enough.

If the belt runs out to one side, adjust it by tightening the nut on the side where the belt is running out. Tightening the nut with one revolution is usually sufficient.

CHECKING THE REAR DOORS AND THEIR BASIC SETTING

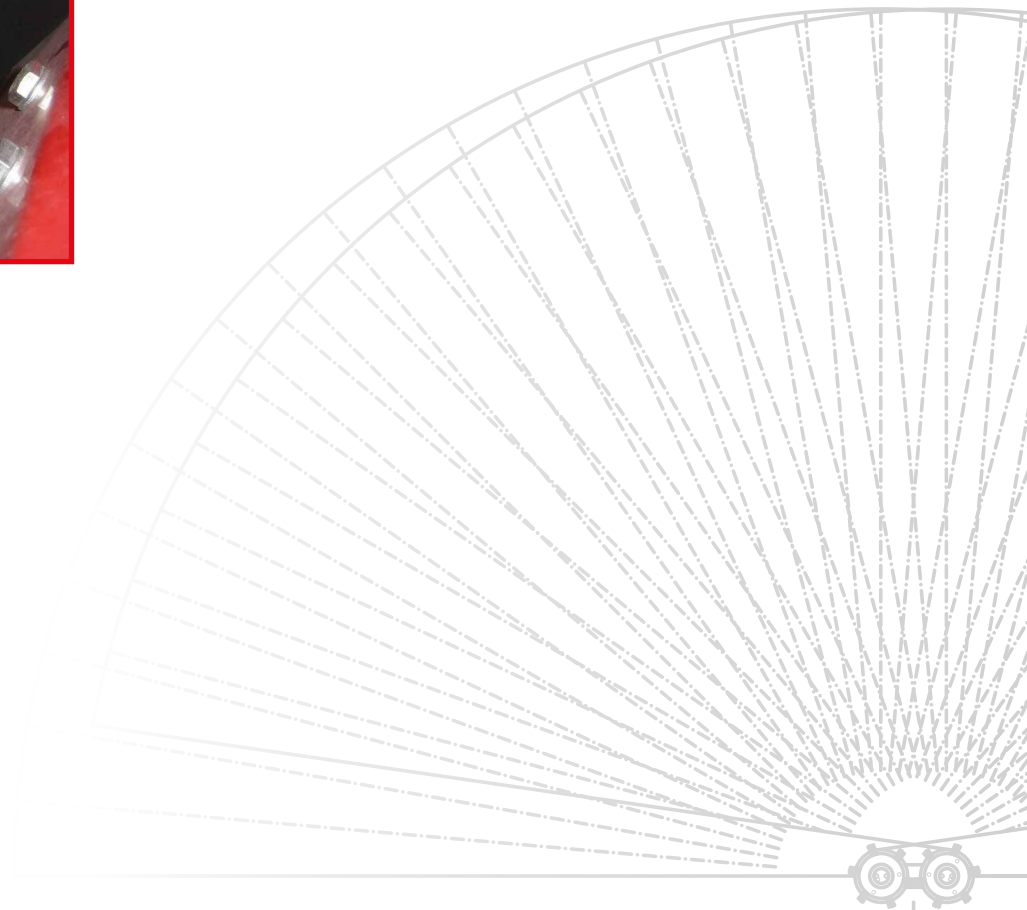
The basic setting of the rear doors must be correct in order for the spreader to apply correctly. It is possible to check the setting by setting the scale at 200 and placing a 40 mm square pipe on the belt underneath the door. If the setting is incorrect, adjust the door on its tension rod.



Set the rear doors' scale at 200



Place a 40 mm square pipe under the door. The square pipe should be able to move freely under the door with almost no clearance. Adjust the door's drawbar if this setting is not correct.



LUBRICATION POINTS

The different lubrication points on the implement are shown below. The number of operating hours for each lubricating interval is specified at each lubricating point.

> EVERY 50 HOURS

PTO shaft Disassemble the PTO shaft and lubricate the 6-grooved ends with grease.

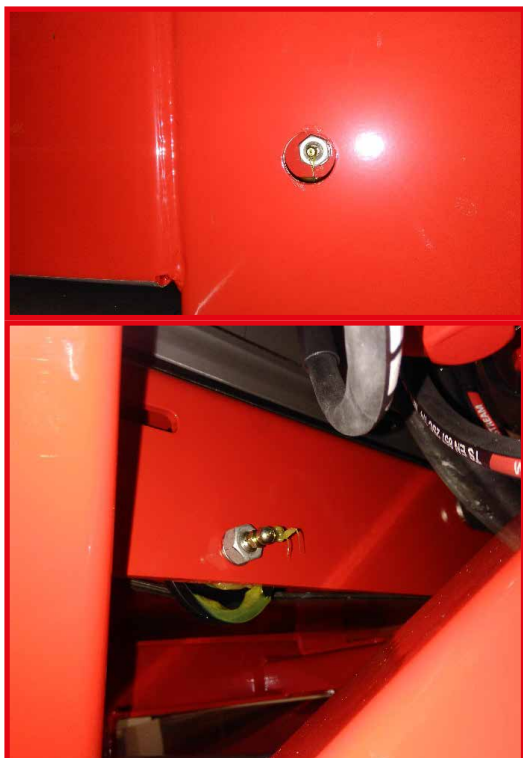


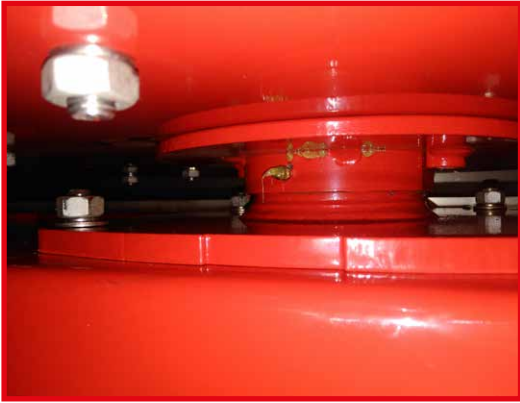
Input shaft on the spread unit.



> EVERY 100 HOURS

Floor belt guide rollers (2 for each belt)

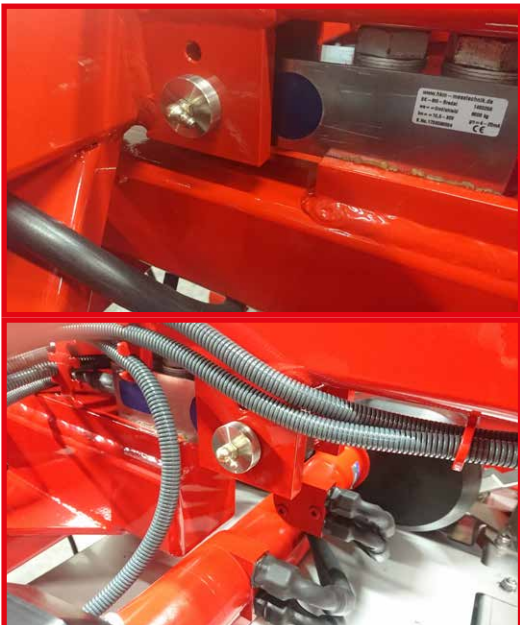




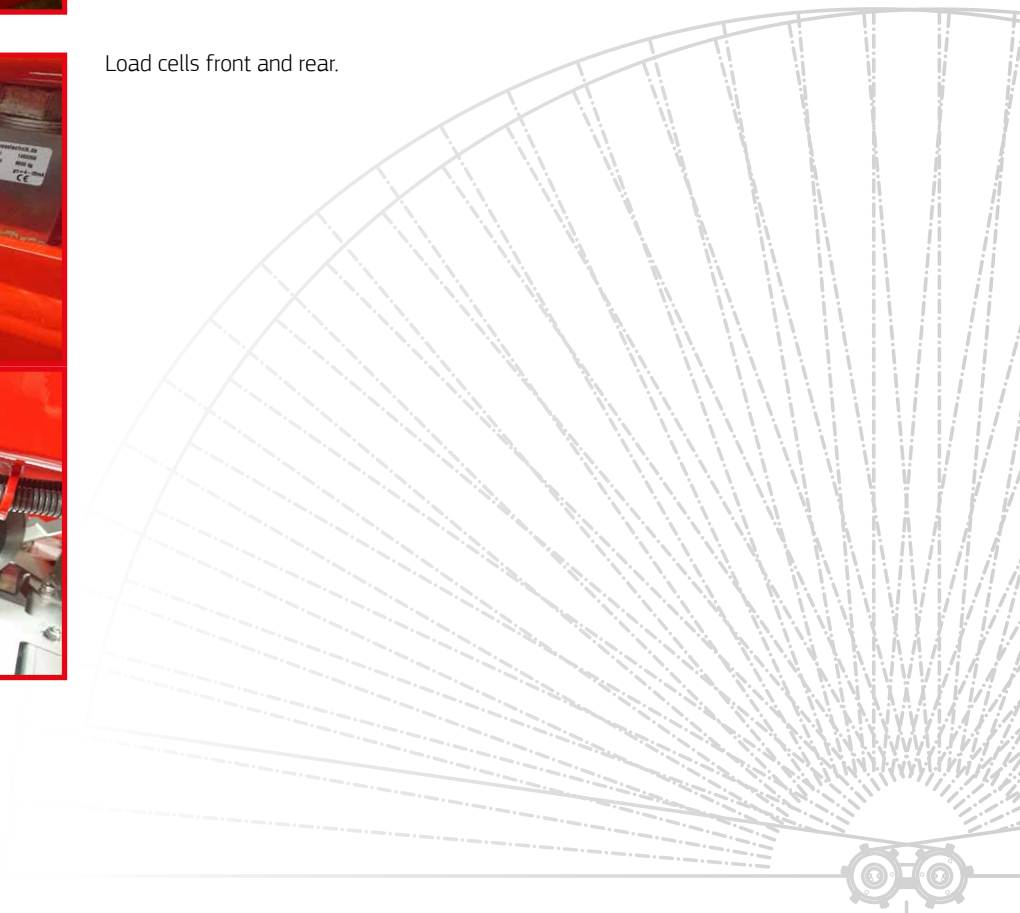
Right and left top, just below the discs.

> EVERY 200 HOURS

Tightening device on the spread unit.



Load cells front and rear.



MAINTENANCE AND LUBRICATION OF SPREAD UNIT

It is important to keep the spread unit properly maintained/lubricated. There is a general time interval for how often the spread unit should be lubricated. Otherwise, it is important to lubricate the headland gear, etc., especially after washing the spreader and before putting the spreader into storage for winter. Also, it is important to test the headland gear's function when the spreader is attached to the tractor and after a long idle period. Check the tightness of the V-belts at regular intervals. The procedures for inspecting and maintaining the spread unit are shown below.

> V-BELT TIGHTNESS

A spring to tension the V-belts is attached to the right side of the spread unit. Tension the spring to 93–95 mm when the spread unit is cold. Check the tightness after every 20 hours of operation. Re-tighten if the spring measures more than 95 mm.



> HEADLAND GEAR FUNCTION

Check the headland gear by rotating the left disc after switching between field and headland spreading. If the headland gear is activated, the left disc must rotate more slowly than the right disc. If field spreading is active, the discs must rotate at the same speed. After switching, a distinct “clunk” sound will be heard when rotating the disc to indicate that the claw clutch is engaged.



> LUBRICATION AND ADJUSTMENT OF HEADLAND GEAR

The headland gear's claw clutch is protected by a plastic tube perforated by a 3 mm hole. Lubricate the clutch before the season begins and after every 100 operating hours by spraying a thin oil or rustproofing oil through the hole. Always lubricate if the inside of the spread unit has been washed and before putting the spreader into storage for the winter.

The spring that keeps the headland gear's V-belt tight must be tightened to a length of 43–45 mm when the spread unit is cold. Check the tightness after the first 20 hours of operation and then after every 100 hours of operation. Re-tighten if the spring measures more than 45 mm.



GEAR FOR FLOOR BELT OPERATION

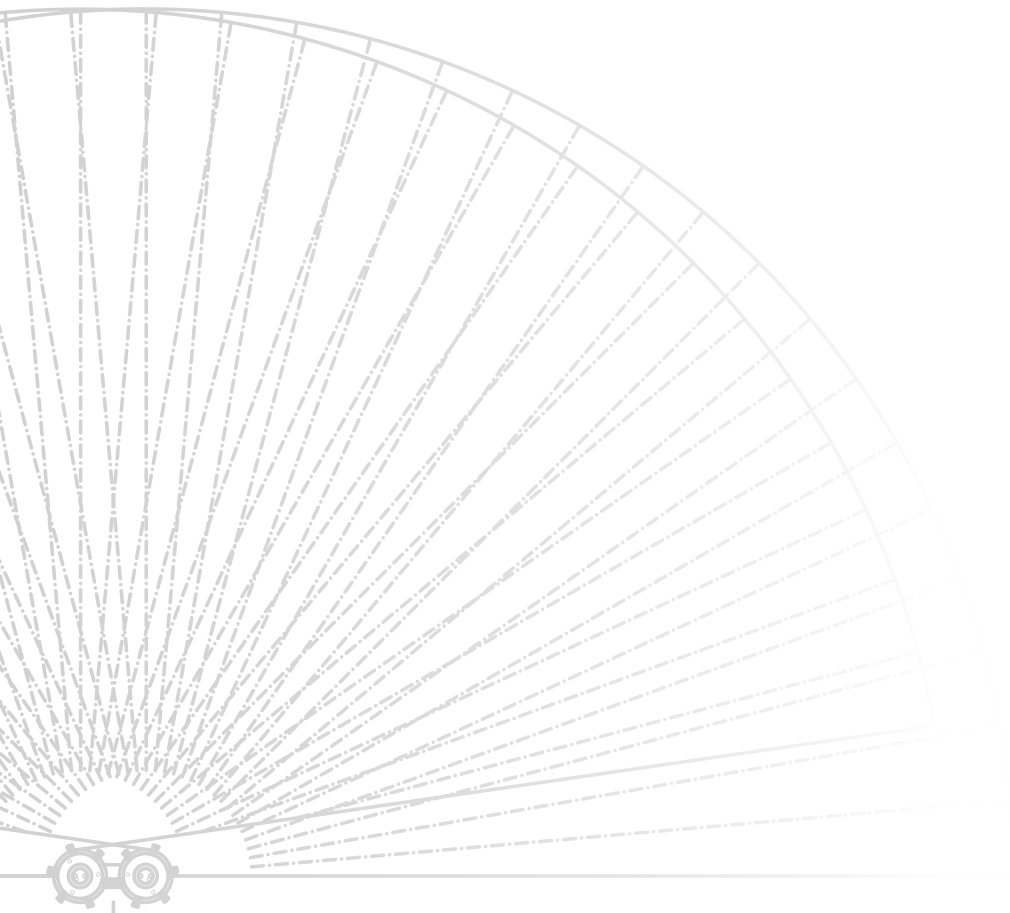


Each floor belt has its own gearbox. These gears are filled with a special type of grease at the factory, and do not need to be refilled or lubricated.



Two valves with a thumb screw for manual operation of the belts are placed under the implement. When there is oil flow from the tractor, each belt can be started by screwing in the thumb screw.

NB: screw out the screws as far as possible for normal operation.



OTHER MAINTENANCE AND CLEANING

> WASHING AND STORAGE

Always be careful when washing with a high-pressure washer and never spray directly on bearings, sensors, etc.

Before winter storage, clean the spreader carefully and apply a layer of rust-protective oil to the implement. **Be careful not to apply oil on the rubber belt as this will dissolve the rubber.** It is advisable to first spread a layer of cat litter or sawdust on the belt to absorb excess oil. Remember to remove the material after four or five days once all the oil has been absorbed.

> OIL FILTER

The spreader's hydraulic system for operating the belts is fitted with an oil filter. The filter's replacement interval largely depends on the operating conditions, and the meticulousness with which the tractor's hydraulic system is kept clean, but it is advisable to replace the filter every two to four years.

The oil filter is placed in under the spreader and it is easiest to access it from the front end of the spreader >.

> SPREADING SYSTEM

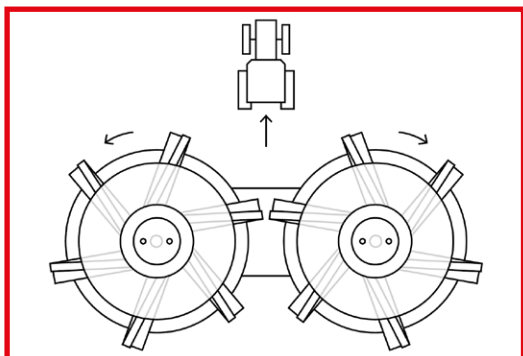
Check that the spreading system is clean and in working order every day. Insufficient cleaning or worn-out spreading booms can result in poor spreading patterns.

Certain types of fertilizer and humid weather can create coatings on downshutes and spreading vanes, so these should be inspected and cleaned regularly during operation.

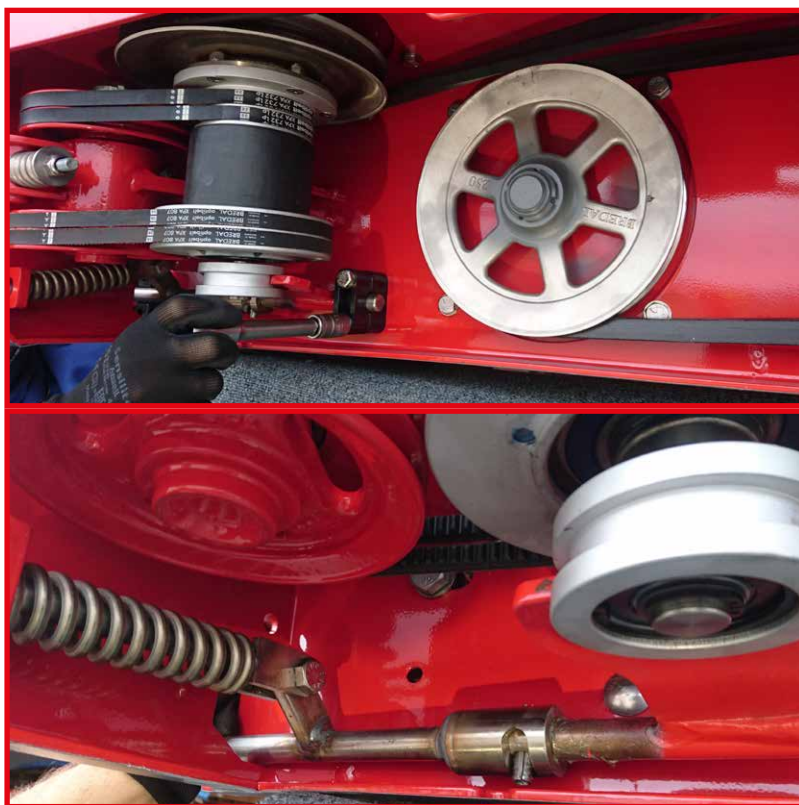
Replace the spreading vanes if holes are worn into them. **It is very important that the spreading vanes are correctly mounted on the spreading discs, as shown in the drawing.**

> ACTUATORS

The electrical actuators controlling the downshutes are protected by a stainless steel shield. The shield only protects them against mechanical impacts but does not prevent fertilizer and dust from getting in. Therefore, remove the shield regularly and clean around the actuators. This should always be done before washing or prolonged idle periods. NEVER use water for cleaning if the shield has been removed.



REPLACING V-BELTS ON SPC4500-1



Completely dismantle the three plastic bearings for the headland gear's shifter shaft.

If the headland gear is hydraulically shifted, screw off the hydraulic cylinder from the shifter shaft.



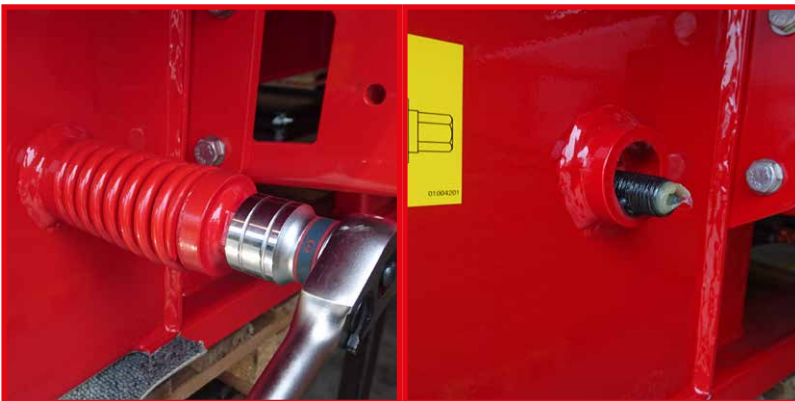
The shifter shaft with shifter fork is now clear and can be removed.



Completely unscrew the headland gear's belt tightener with spring.



Disassemble the bottom two and then the upper two V-belts on the headland gear.



Disassemble the spring for the belt tightener.



Take off the belt tightener and remove the belt.



The spread unit is now ready to be fitted with a new belt.



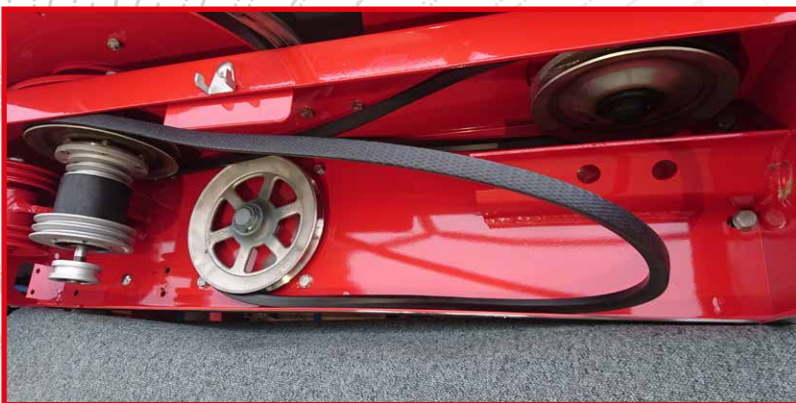
First wind the belt around pulley 1.



Twist the top of the belt on pulley 1 and lead it behind pulley 2.



Twist the belt half a turn.



Wind the belt around the pulley on the headland gear.

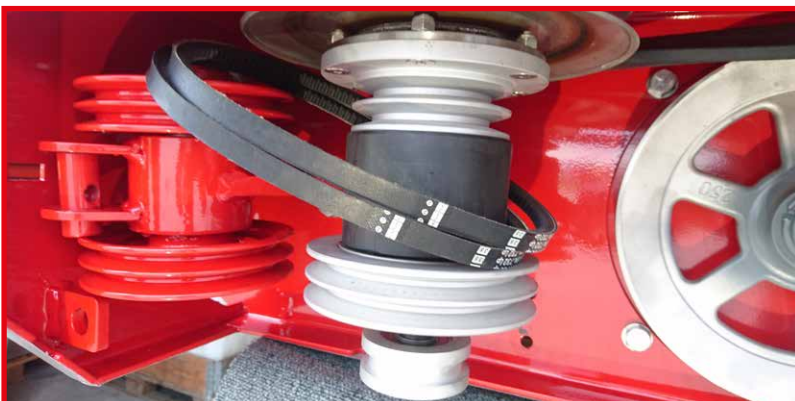




Insert the belt tighteners into the loose ends of the belt. Then attach the spring to the belt tightener.



Tighten the spring until it has a length of 91–93 mm.



Attach the upper two V-belts to the headland gear.

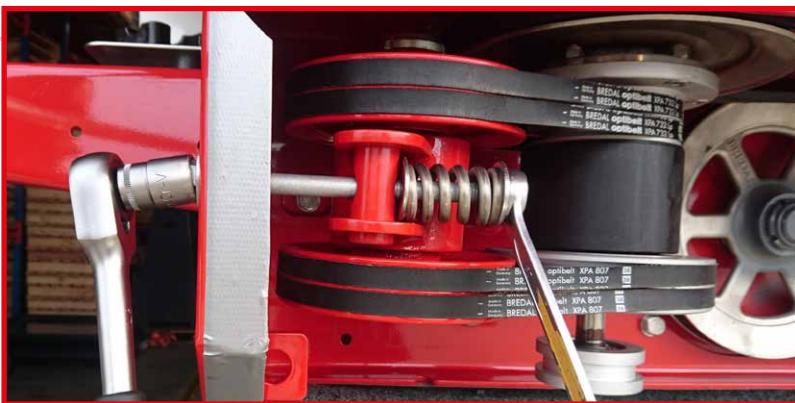




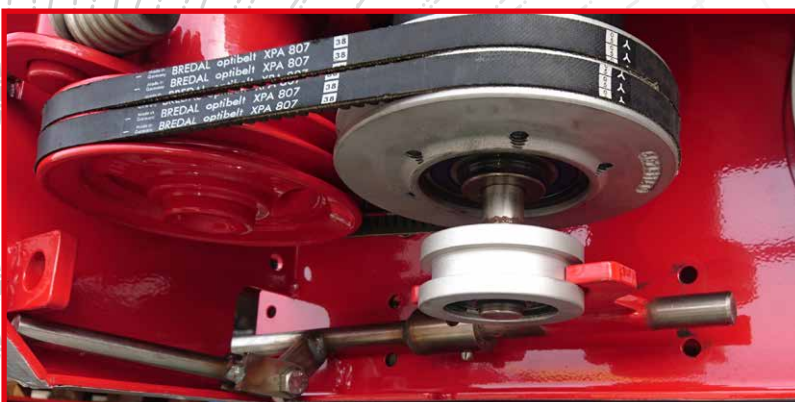
Attach the bottom two V-belts to the headland gear.



Use a screw clamp to tighten the belts for the headland gear.

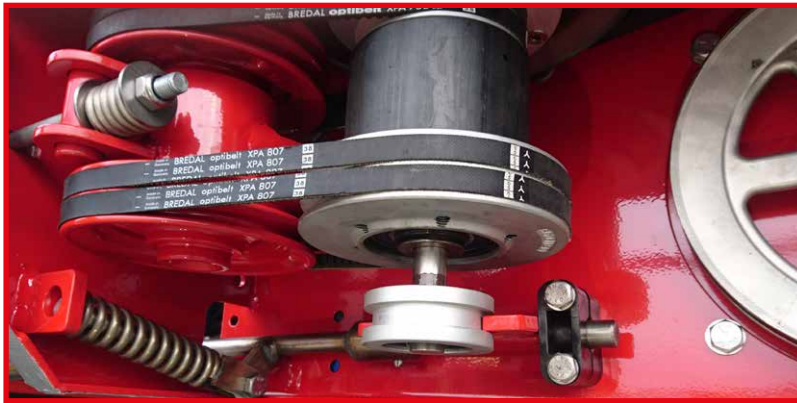


Attach the screw for the belt tightener with a spring and tighten until the spring length is 43–45 mm.



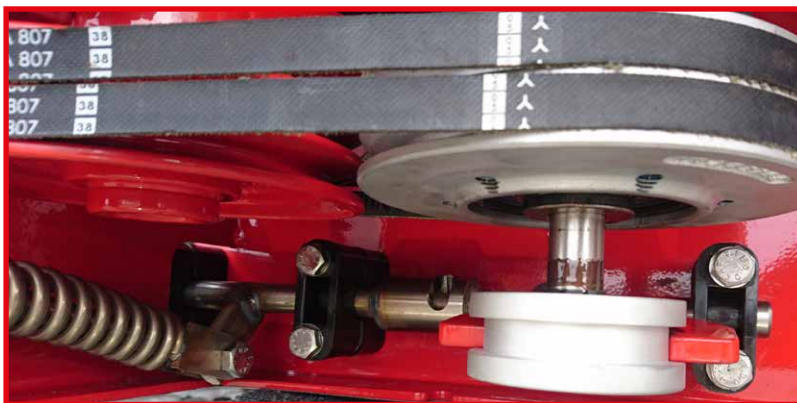
Attach the shifter shaft with shifter fork.





Attach the spring to the spring guide and insert the guide into the hole.

Loosely mount the plastic bearing furthest to the right.



Mount the last two plastic bearings. If necessary, use a crowbar or similar to move the shifter shaft into place.

Tighten all plastic bearings. Make sure the shaft can still freely rotate when tightening, i.e. do not overtighten.



If relevant, complete the process by attaching the hydraulic cylinder for shifting the headland gear.



**SIMPLE
PRECISE
RELIABLE**

For more than 50 years, Bredal has specialized in the development and production of high-quality lime and fertilizer spreaders for agricultural purposes. The company's goal is to build reliable machinery, precise in use, and simple to operate and maintain. In recent years, the Bredal product line has been expanded to include winter equipment in the form of sand and salt spreaders.

The company's interests in most of the countries importing Bredal machinery are represented by local importers who sell Bredal spreaders and provide technical support and service.

Bredal is located in Vejle, Denmark, where it has state-of-the-art production facilities with the latest equipment for producing high-quality machines.