



Operator's manual

EasyBedding



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1 General safety instructions

1.1 CE – Declaration of conformity

We,
T. Kverneland & Sønner AS,
Kvernelandsvegen 100
N-4355 Kverneland
Norge
declare that the product:

TKS - EasyBedding

has been built in conformity with the Machine Directive and meets the relevant fundamental health and safety requirements

Kverneland, 10 January 2018



Tønnes Helge Kverneland
General Manager

**Enter the serial number
on the machine:**

T. Kverneland & Sønner AS, manufacturer of agricultural products, reserves the right to change the design and/ or specifications of its products without prior warning.
This does not imply any obligation to modify previously supplied machines.

1.2 Guarantee

This TKS product is guaranteed against manufacturing and material defects for one year.

If the owner wishes a defect to be covered by the product guarantee, he or his representative must inform the dealer of this when ordering parts and/or repairs. Claims must be reported within the guarantee period.

The dealer must complete a claims form for each case covered by a guarantee and send it to TKS or TKS's distributor/importer within the 10th of the month following the one in which the defect was reported. The defective parts shall be marked with the claim number and be kept for up to 6 months so that TKS or TKS's distributor/importer can inspect them.

Since TKS products are used outside the manufacturer's control, we can only guarantee the product quality, and not that it will perform its function, nor are we liable for any resulting damage.

The guarantee is not valid if:

- a) third party spare parts are used, or the product is repaired or altered without the approval of TKS.
- b) the operating and servicing instructions have not been followed.
- c) the machine has been used for other purposes than those for which it is designed
- d) control box opens.

The guarantee does not cover damage due to normal wear and tear

Official safety regulations specify requirements that apply to the manufacturers of this machine relating to the careful review of safety hazards that may arise when this type of machine is used correctly. Therefore, TKS and our importer/distributor are not responsible for the functioning of components that are not shown in the spare-parts catalogue for this product.

TKS reserves the right to change the design of the product without this implying any obligations in relation to previously supplied machines.

NB! It must be possible to identify all enquiries relating to this product by the product's serial number; see page 12 on Machine identification.

1.3 Introduction

Congratulations on buying your new TKS product. You have chosen a functional, high quality product. All TKS products are designed and built in close cooperation with farmers to ensure optimal efficiency and reliability.

Please read this instruction manual carefully, and familiarise yourself with the machine's manner of operation before starting to use it. The machine is a highly advanced feed machine that operates unattended. It must be used in accordance with the relevant manufacturer instructions and other regulations.

Many different factors and variables can affect the performance and method of operation of the machine

It is therefore very important to assess all known factors and adapt the way in which the machine is used accordingly.

A good understanding of the machine's method of operation and performance, together with a sound knowledge of feeding and feed types/consistency will ensure the best results.

Best Regards

TKS AS



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1.4 EasyBedding

1.4.1 Model description and use

EasyBedding is a machine designed to shred square and round bales and then spread these out. The material might be straw, hay, sawdust and other lightweight materials suitable for spreading.

The machine is supplied in two versions adapted for the following bale sizes:

- Bales up to Ø150 cm or square bales 120x100 with shredder drum.
- Bales over Ø150 cm or square bales 120x120 with shredder drum and top drum.

The machine is equipped with a cutter drum (1) with blades. The drum is powered by straps and rotates backwards. A stripper roller with carrier is positioned above the cutter drum (2). The stripper roller rotates with the cutter drum and removes excess material so that there is an even flow of material out of the machine. The roller also removes the top of high bales and stops the cutter drum from only excavating the bottom part of the bale. The bedding material is loaded into the chamber (3). The bottom belt (4) moves the bale and the material towards the cutter drum. The non-return flaps (5) prevent bales from falling out of the machine.

The spreader unit (6) is positioned at the front edge of the machine. This consists of two spreader discs, each powered by their own motor. These can be adjusted steplessly and individually, allowing the spreading width to be adapted separately for right and left. An adjustable guard (7) is fitted beside each spreader disc to limit the spreading width.

The machine moves along a rail suspended from the ceiling.
The machine is positioned high enough that it is 1.5 m above the ground at its lowest point.
The traverser carriages (8) are equipped with stepless speed.

EasyBedding can be loaded in three different ways:

- Manual loading from rear
- Conveyor loading from above
- Magazine loading from rear

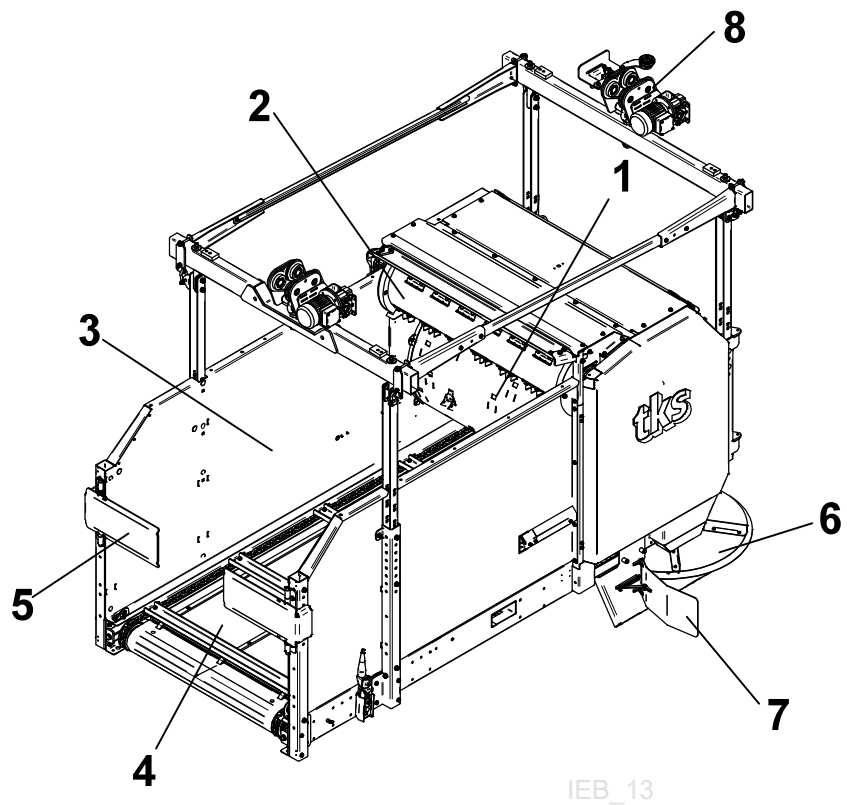
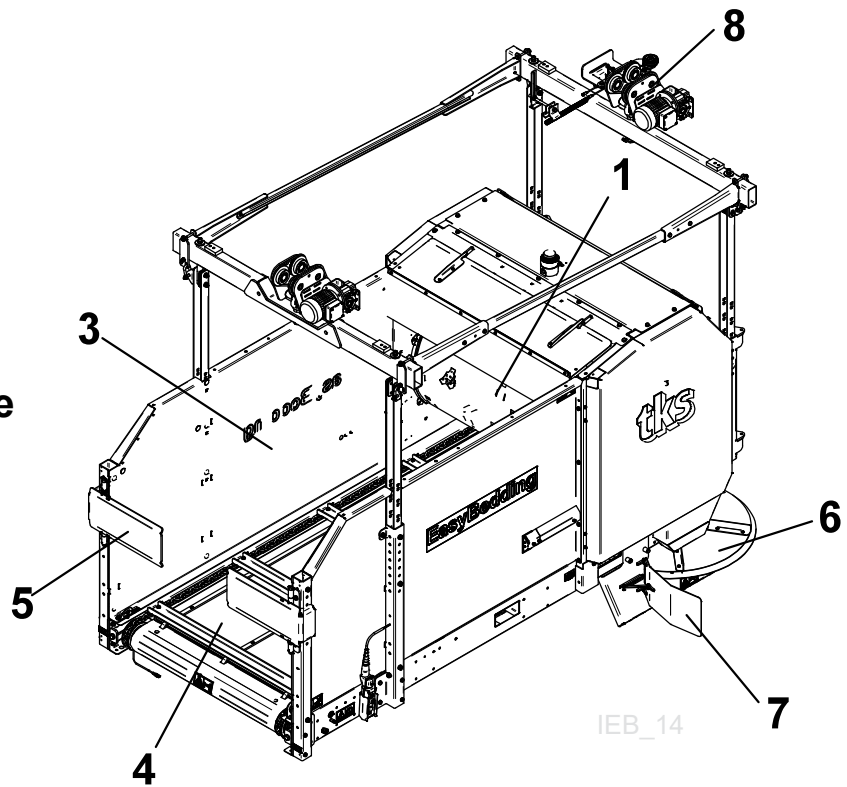
The machine is controlled by a separate PLC. All functions are operated using a handheld, radio-controlled touchscreen. Various spreading zones adapted to the rail and various groups adapted to the enclosures can be programmed. The machine is equipped with a control panel for controlling initiation.

NB:

The instructions given in this operator's manual apply to standard operating conditions. Individual circumstances may arise on user premises that deviate from the instructions provided here. Changes to the machines and equipment as a result of such circumstances shall not constitute grounds for making a claim against the manufacturer or supplier.

Climate, temperature, straw types, time of cutting, cutting/pressing equipment, straw length and conservation are some factors that may affect the functionality and performance of the machine.

- 1 - Shredder drum
- 2 - Top drum
- 3 - Chamber
- 4 - Bottom belt
- 5 - Non-return flap
- 6 - Spreader unit
- 7 - Spreading guard
- 8 - Traverser carriage

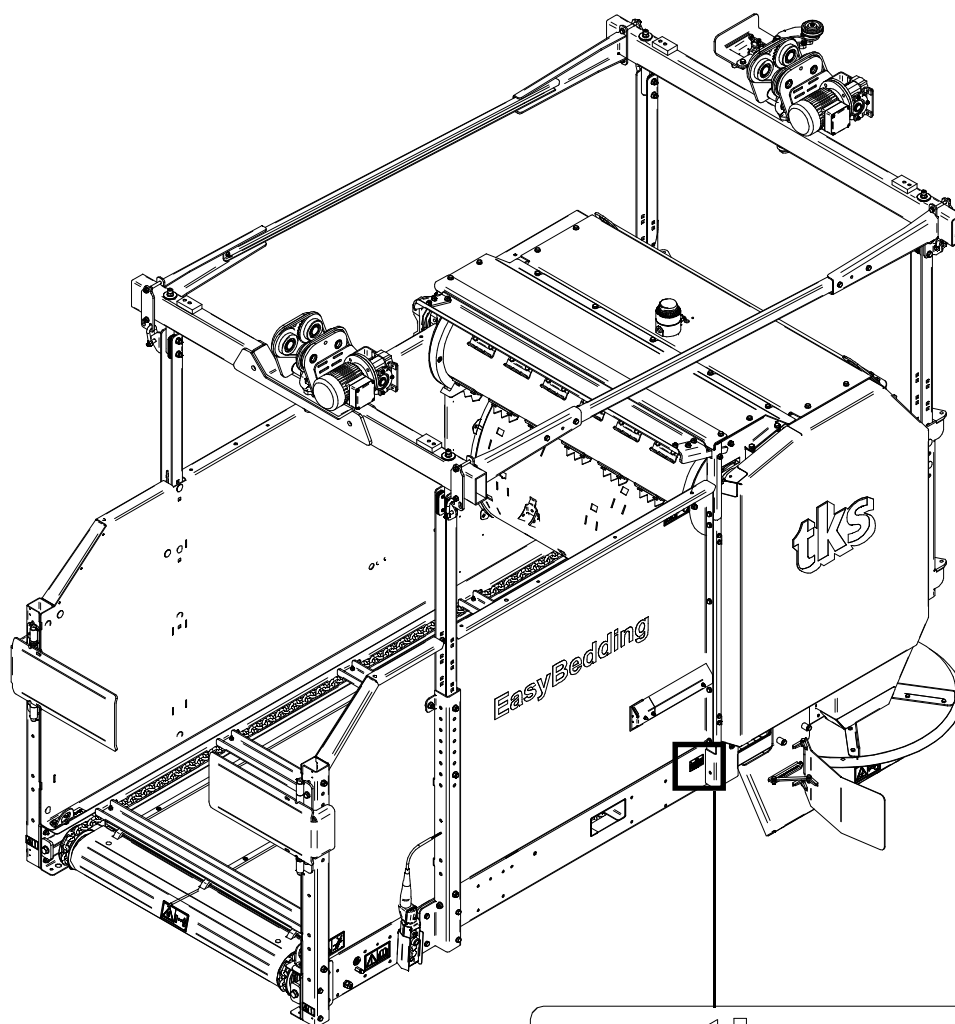


1.4.2 Machine identification

The machine's serial number and the manufacturer's address are written on a plate on the machine. See the illustration on this page. The machine's serial number and the delivery year should be written below.

Please use this information when making any enquiries about spare parts or servicing.

This product is CE marked. This mark, along with the associated written EU confirmation, means that the product fulfilled. Is current health and safety requirements, and complies with the following directives: Machine Directive



IEB_01-2

tkS	
MODEL:	YEAR:
SERIAL NO.:	
TOTAL MAX WEIGHT:	KG
Manufactured by T. Kverneland & Sanner AS, Kvernelandsv. 100 N -4355 Kverneland, Norway	
CE	

IBBB_02

1.4.3 Technical data

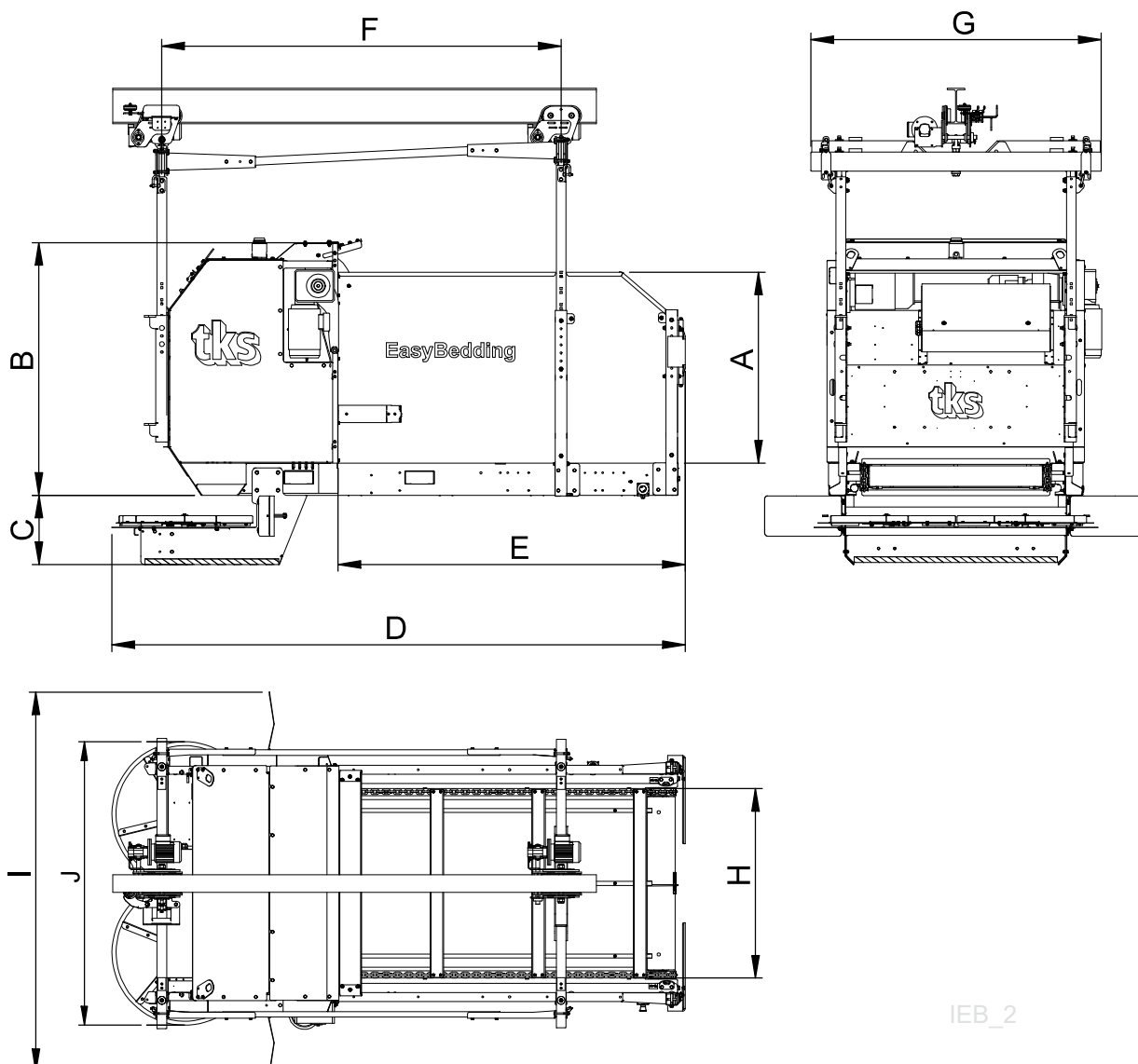
WEIGHTS*	1 DRUM		2 DRUMS	
WITH SPREADER UNIT	1515 KG		1620KG	
MAX. LOAD CAPACITY	1000 KG		1000 KG	
DIMENSIONS				
LENGTH AND WIDTH	SEE FIGURE 12			
BALE SIZES				
MAX. DIAMETER ROUND BALE	1500 mm		1800 mm	
MAX. BREDDE RUNDBALL	1300 mm		1300 mm	
MAX. HEIGHT SQUARE BALE	1000 mm		1300 mm	
MAX. WIDTH SQUARE BALE	1300 mm		1300 mm	
ELECTRICAL				
BOTTOM BELT	0,55 kW			
DRUM	7,5 kW			
TOP DRUM	-		5,5 kW	
DISCS	0,9 kW X 2			
ON RAILS	0,37 kW X 2			
VOLTAGE	230 V	400 V	230 V	400 V
TOTAL POWER CONSUMPTION	38 A	27 A	63 A	30 A
RECOMMENDED FUSE	40 A	32 A	63 A **	32 A
CONTROL CURRENT	24 V DC			
VOLTAGE TOLERANCE	+/- 10%			
OTHER				
TEMPERATURE WORKING AREA	-20°C / +40°C			

* Depending on equipment's tare weight

** Slow fuse type D

1.4.4 Basic dimensions - EasyBedding

DESCRIPTION	DIMENSIONS	1 DRUM
HEIGHT OF FRAME	A	1190
HEIGHT OF MACHINE	B	1597
HEIGHT OF SPREADER	C	430
LENGTH OF MACHINE WITH SPREADER	D	3560
LENGTH OF CHAMBER	E	2110
DISTANCE BETWEEN TRAVERSER CARRIAGES	F	2478
WIDTH OF BEAM	G	1800
WIDTH OF CHAMBER INTERIOR	H	1175
WIDTH OF SPREADER WITH GUARDS UNFOLDED	I	2374
WIDTH OF SPREADER UNIT	J	1760

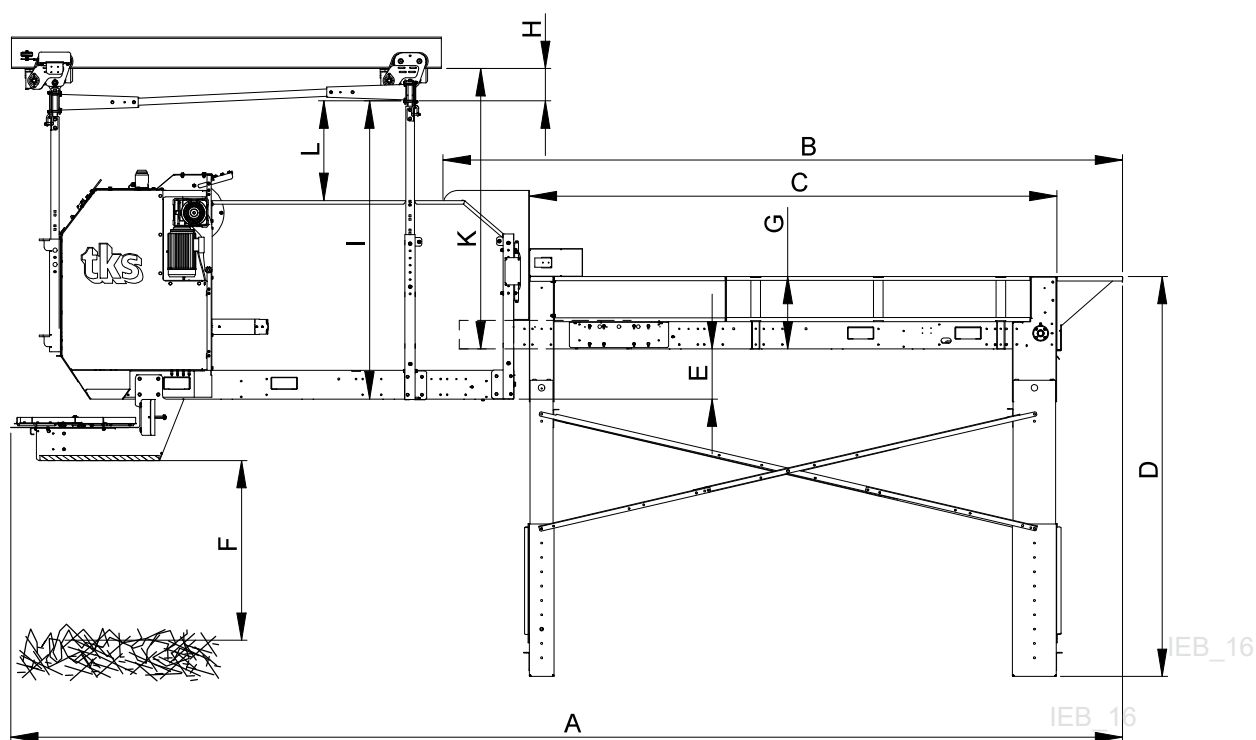


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IEB_2

1.4.5 Basic dimensions - EasyBedding with Magazine

MAGAZINE (dimensions in mm)	DIM.	1M	3M	4M	5,3M	6M
LENGTH OF MACHINE AND MAGAZINE	A	5040	6550	7750	8950	9600
LOADING LENGTH OF MAGAZINE	B	2030	3540	4740	5940	6590
EFFECTIVE LOADING LENGTH OF MAGAZINE	C	970	2480	3680	4880	5530
HEIGHT OF MAGAZINE	D	875 - 2790	875 - 4200			
HEIGHT UNDER MACHINE, MINIMUM	E	350				
HEIGHT OF LOWER EDGE OF MACHINE – MAGAZINE	F	Min. 1500				
HEIGHT OF MAGAZINE FRAME	G	510				
HEIGHT OF LOWER EDGE OF BEAM – LOWER EDGE OF RAIL	H	225				
HEIGHT OF LOWER EDGE OF BEAM – LOWER EDGE OF MACHINE	I	2080				



1.4.6 Recommended heights for different bale sizes

ROUND BALE	DIM. mm	Ø120	Ø130	Ø140	Ø150	Ø160	Ø170	Ø180
	I	1820	1840	1940	2040	2140	2240	2340
	K	1775	1800	1900	2000	2100	2200	2300
	L	425	450	550	650	750	850	950

SQUARE BALE	DIM. mm	120x70	120x90	130x130
	I	1460	1515	1950
	K	1425	1475	1875
	L	75	125	525

1.5 Safety



Please pay particular attention to this symbol. It designates a safety risk, and describes precautions that must be taken to avoid accidents.

Before operating, adjusting or repairing the machine, the user, technician or owner should familiarise himself with the safety instructions contained in this installation manual. Be alert and take precautions when working with agricultural machinery. Read and observe the safety instructions in this instruction manual.

Safety at work is your responsibility!

Please read and understand these general-safety instructions.

1.5.1 General safety - instructions



Risk of stones being thrown. The sprinkle material may contain stones, which means that stones may be thrown forwards and to the side.

Use of the machine

The machine must only be used for the purpose for which it is designed.

Operation

The machine operator must remain at the end of the machine where the control box and associated control panel are fitted.

Monitoring

The operator must monitor the machine carefully before start-up and during operation. This is very important in order to ensure optimum operating safety.

The machine's method of operation

The operator must familiarise themselves with the machine's method of operation and function so that the machine can be used in a safe and appropriate manner.

Keep a safe distance

Humans and animals must be kept away from the machine when it is in operation. Keep your distance from working, rotating and moving parts



Be safety conscious

Never enter the machine when it is in operation. When performing maintenance, disconnect the power supply.

**Protective guards**

Check that all guards are in good order and installed correctly. Do not start the machine until this has been done. Damaged guards must be repaired or replaced immediately.

Warning lights

Warning lights installed on the machine must be visible from all areas of the barn

Alarm

Ensure that the installed alarm sounds 15 seconds before start (delayed start).

Warning signs

The supplied symbolic warning signs “**No access for unauthorised persons**” be attached to all doors into the barn.

Attention! The machinery starts automatically.

Spare parts

For safety reasons we recommend that you only use original spare parts. The use of third-party spares invalidates the product guarantee.

Maintenance

Ensure that the machine is properly maintained and is kept in good condition. Never attempt to change the mechanical workings of the machine.

The area in which the machine is operating

Must be physically sealed off or locked to prevent danger to humans or animals.

Control panel

Product warranty is invalid if the control box opens.

**Direction of rotation**

The arrow under the cover on the right side indicates the direction in which the drum is rotating.

Emergency stop

Emergency stop switches are located at the back of the machine. These buttons are red.

1.5.2 Additional safety instructions

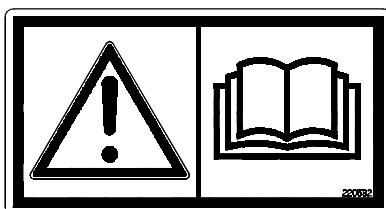


Fig. 1

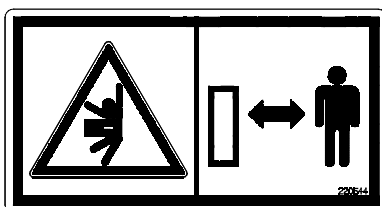


Fig. 2

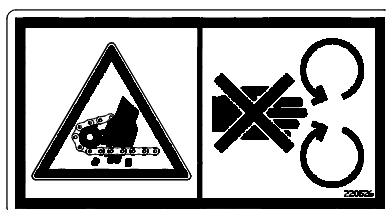


Fig. 3

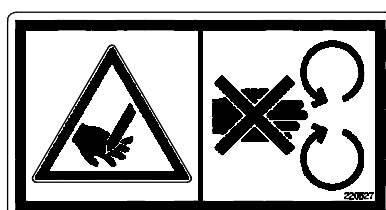


Fig. 4

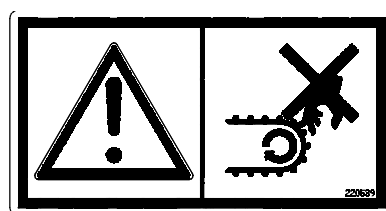


Fig. 5

The machine is marked with warning signs. If these signs are damaged, they must be replaced.

The order number is shown on the illustrations in this section.

See Fig. 6 for their location on the machine.

Warning sign UH220532 (Fig. 1)

Ensure that you read and understand the instruction manual before using the machine, and before making any adjustments or performing any maintenance.

Warning sign UH220544 (Fig. 2)

Risk of crush injury. Maintain a distance from the area between the spreader and wall. A distance should be maintained from the spreader because this may start automatically.

Warning sign UH220526 (Fig. 3)

Fingers may be injured if they come between straps and strap wheels

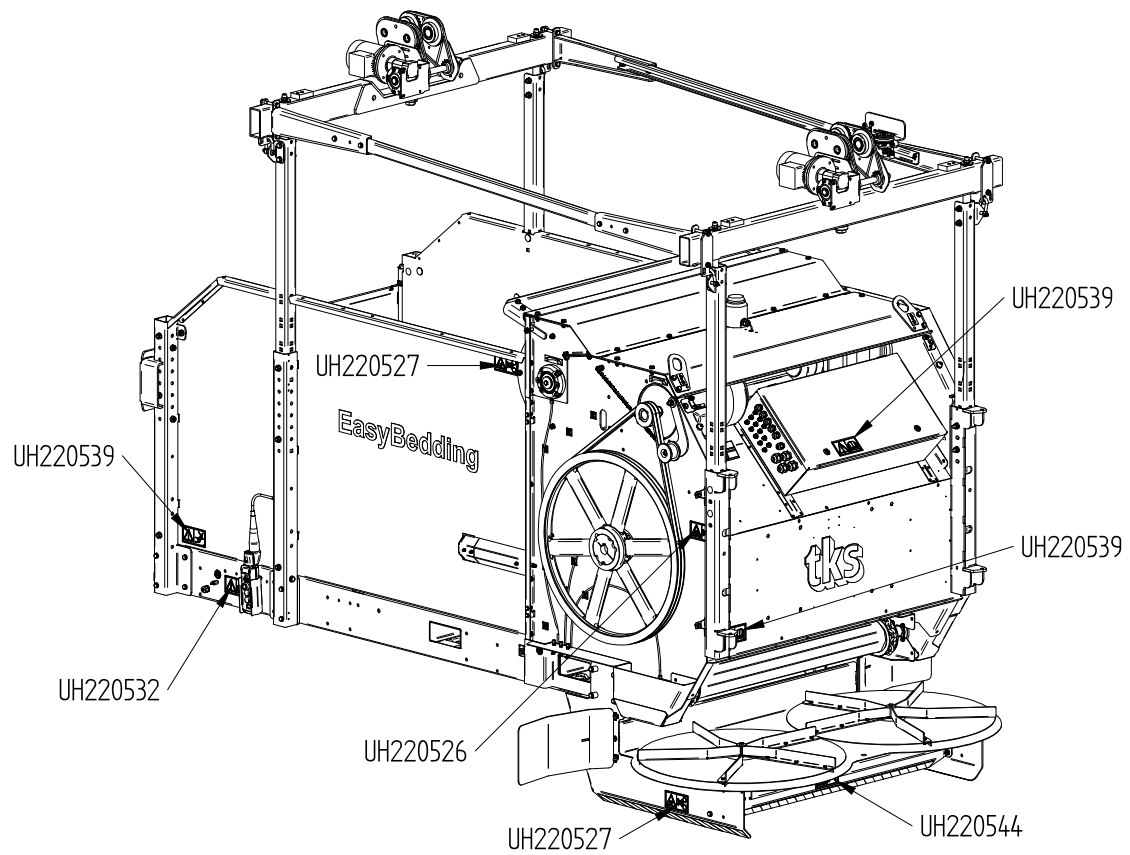
Warning sign UH220527 (Fig. 4)

Risk of cutting your hand. There is a risk of cutting your hand on the drum's knives when the drum is in operation. Hands may be injured by spreader discs when the spreader unit is in operation or rotated manually.

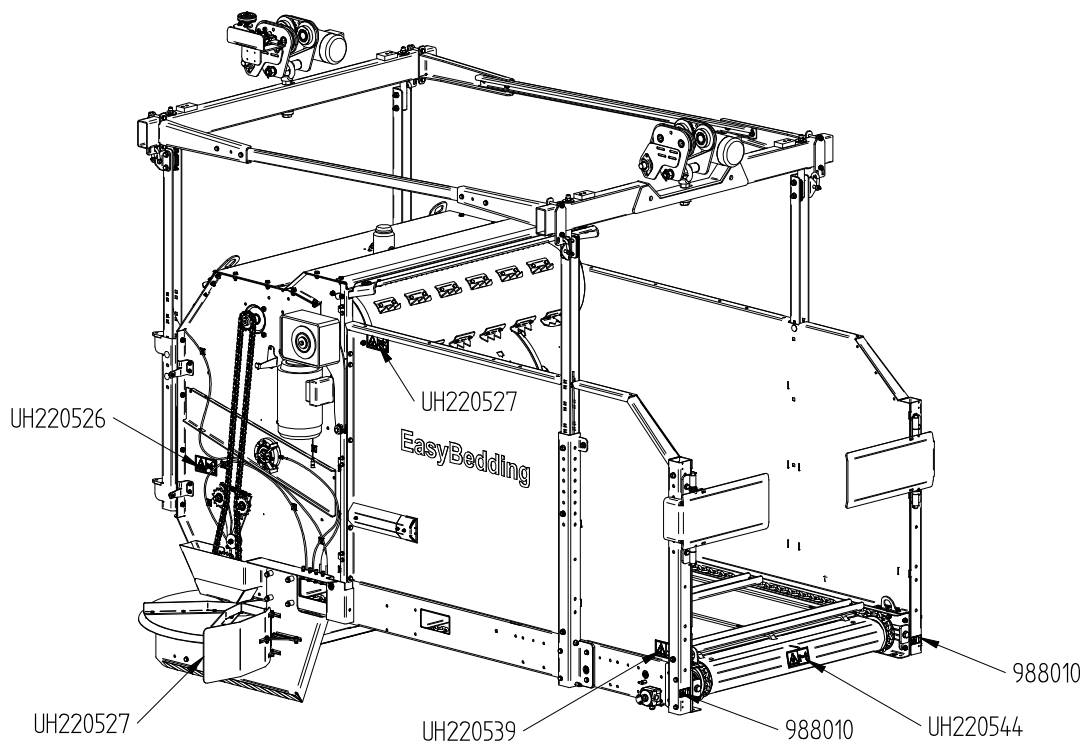
Warning sign UH220539 (Fig. 5)

Injury to fingers sign. Risk of injury to fingers if these come between the bottom belt and base.

1.5.3 Overview of safety risks



IEB_4

**Fig. 6**

IEB_5

1.5.4

Lifting the machine with a crane

Only use approved lifting equipment.
The weight of the machine is listed in the section "Technical Data".
For location of lifting point **see Fig. 7**

Caution!

Ensure that no-one is under or close to the machine when it is being lifted.
Raise the machine using straps/chains attached to the machine's lifting points.
Check that the straps are properly fixed before starting the lift.
Use an extra strap to help keep the machine in position.

1.5.5

New machine caution



Read the operator's manual

Be particularly careful when starting a new machine for the first time. Installation faults, incorrect operation, etc. may lead to expensive repairs and loss of earnings. The TKS product guarantee does not cover damage resulting from failure to follow the recommendations contained in the instruction manual. Please pay particular attention to this symbol.
This is used to emphasise important information so that incorrect installation or use is avoided.

Pay particular attention to the following when commissioning a new machine:

- Check that the guards are fitted to the machine, and make sure that the bolts are attached and tightened.
- Check that the machine is correctly installed and that it is not damaged.
- Check that electrical cables are long enough and positioned so that they can follow the movements of the machine without being damaged.

Lubricate the machine where shown in chapter 5 Maintenance



Remember that the operator has a responsibility to ensure that your product is properly and securely installed.

1.5.6 Lifting point

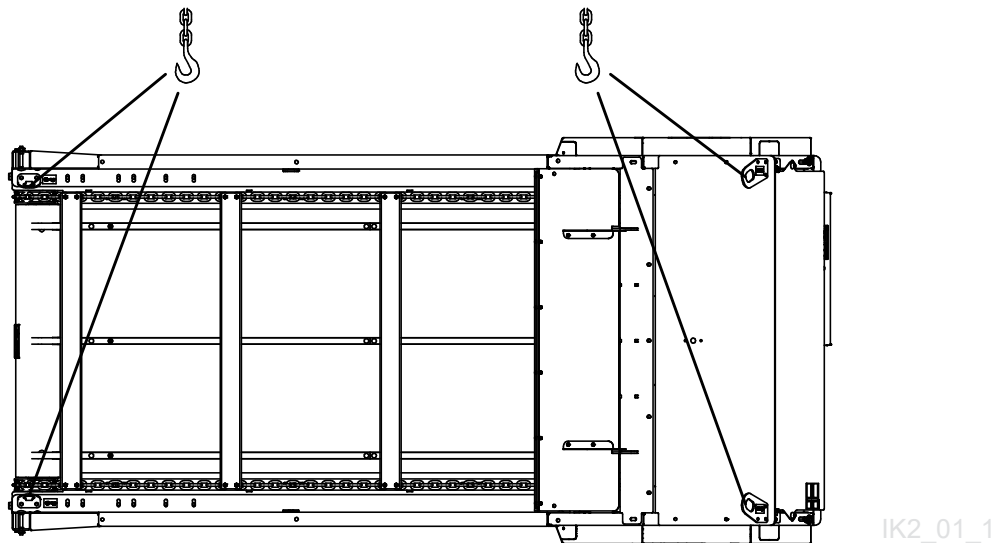


Fig. 7

1.5.7 Forklift truck holes

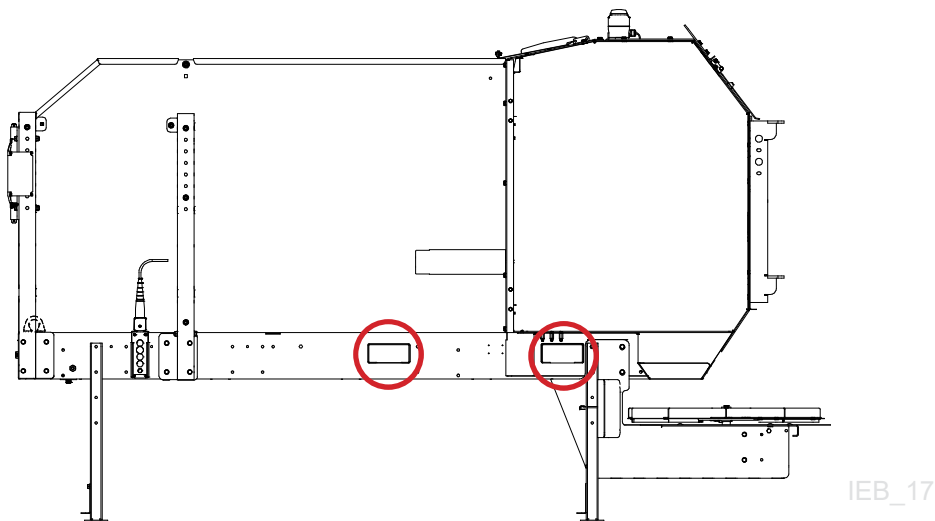


Fig. 8

NB: Be careful when inserting the forks into the lifting holes so that the machine is not damaged.

1.5.8 Transport feet

When the machine is in position, the transport mounts must be detached.
Store the feet for future use.

Important! On the front foot, sleeves and long bolts should be used in all four holes on each side to secure the spreader unit.

NB! Hoist attachments fitted to the rear edge should be detached before commissioning.
These are obstacles on which the material might get caught.

2 Assembly instructions

Recommended rail-sizes

Rail-sizes	Recommended lengths between suspension points
IPE 160	Max 3,5 m
IPE 220	Max 5,0 m

Important when choosing a rail system

- The rail must be dimensioned with regard to the load and suspension distance
- In the event of suspension from the ceiling, the building design must be able to support the spreader.
- Contact the building advisor for advice.
- Rails with a bend must be suspended at the beginning, middle and end of the bend.
- Rails for the spreader must always consist of a whole rail.
- The radius of the rails must be 2 m

When choosing other rails, contact TKS

2.1 Rail height

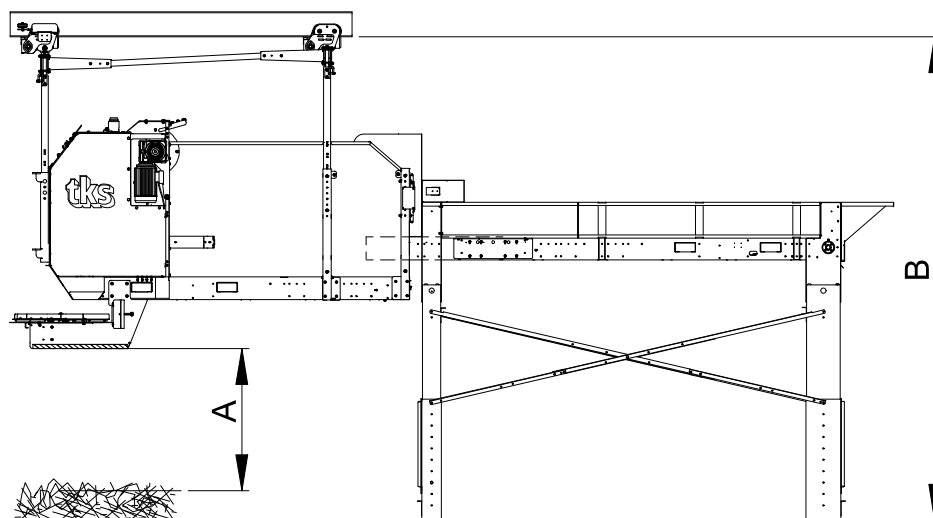


Fig. 9

IEB_3

The following should be considered during installation:

The minimum height underneath machine **A** (with and without spreader unit) must always be 1500 mm to the top of the litter.

Rail height **B** is given from bale sizes and magazine.

Se Fig. 9

2.2 Rail with conductor rail

The best and most common way of powering a spreader is by using a conductor rail. This consists of a rail with copper conductors on the inside and a current collector (slide) that follows the machine during operation.

A conductor rail can be used as a power supply in most straight and curved track setups.

TKS recommends a type RN7 conductor rail from AKAPP.

This has been adapted for agricultural buildings and produced pursuant to ingress protection class IP44 with option for rails.

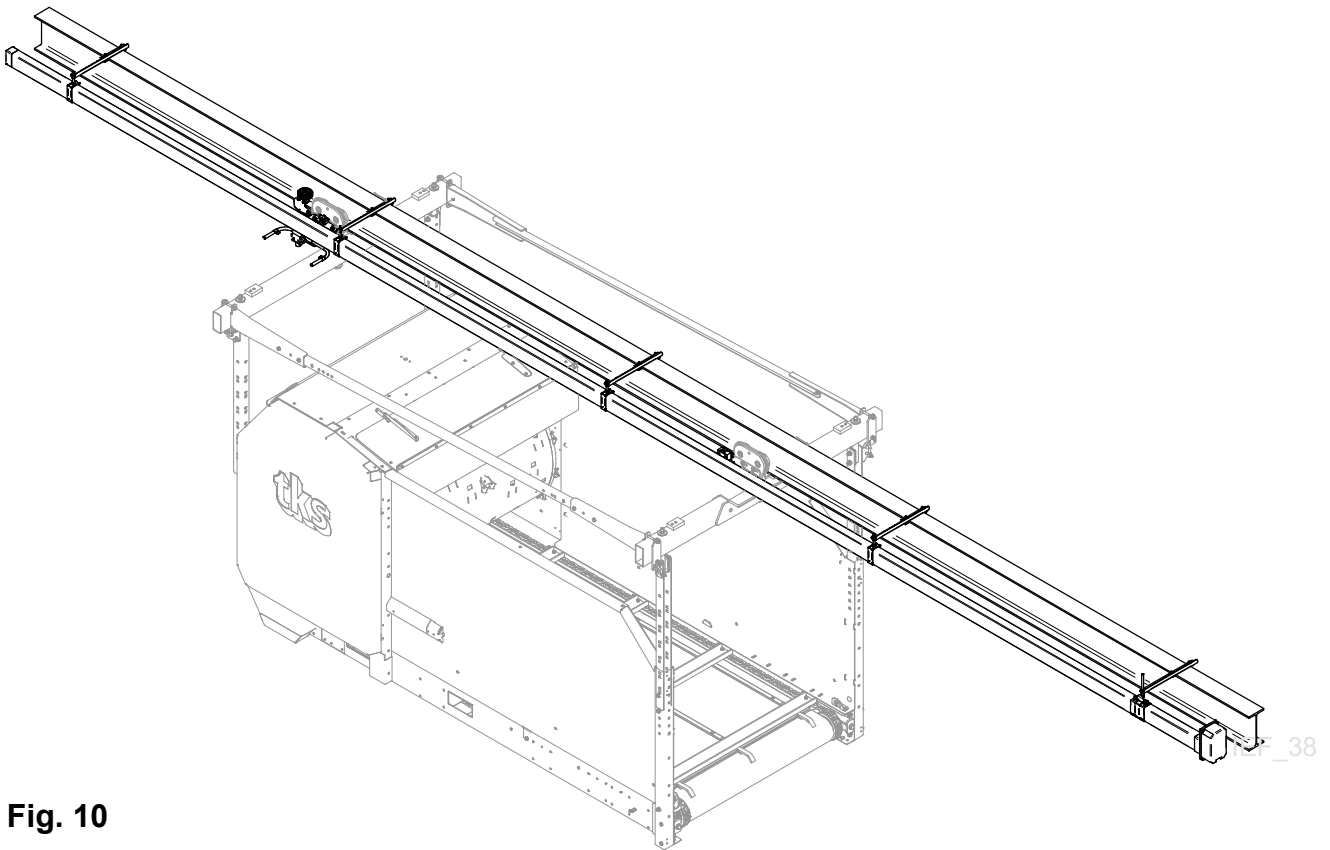


Fig. 10

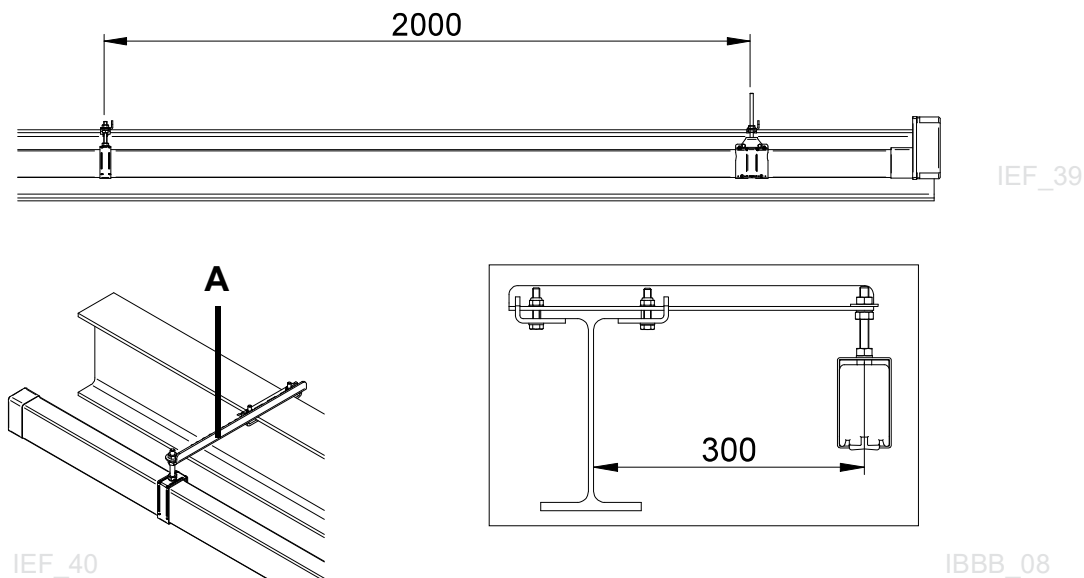


Fig. 11

Angle iron **(A)** is mounted with clamps on the top of the IPE profile or directly in ceiling. EB_16
 The centre of the conductor rail should be 300 mm from the centre of the rail track.

Se Fig. 11

- Maximum 2000 mm distance between two suspension points.
- Minimum 500 mm distance between sliding rail and joint.
- The power socket can be located at the end or in the middle.
- Conductor rails should be suspended so that expansion due to temperature fluctuations can take place without affecting the function of the rail.
- Conductor rails are joined together using tape under connectors and screws in the plastic of the rail for a stable connection.
- For detailed assembly information, please refer to the assembly instructions for conductor rails on our website: www.tks-as.no

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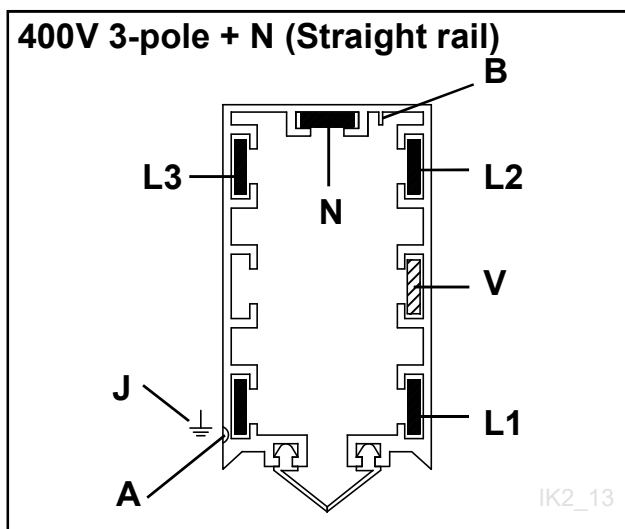


Fig. 12a

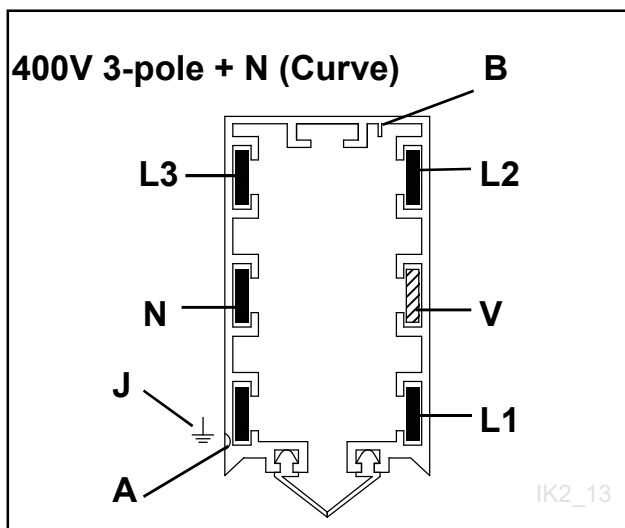


Fig. 12b

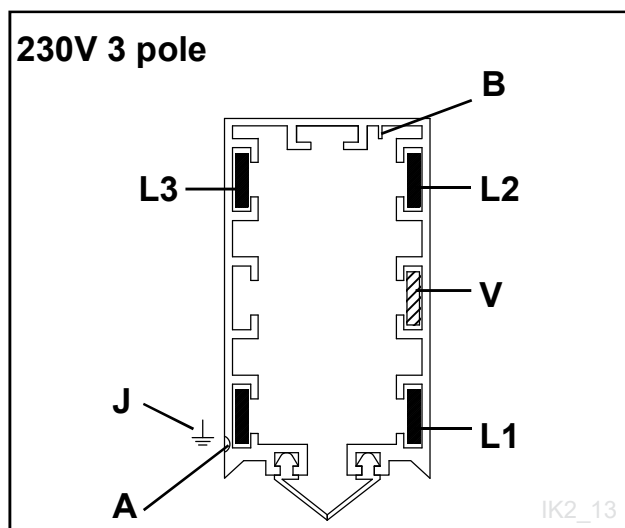


Fig. 12c

- All conductor rail units must be fitted with yellow stripe A on the same side, since otherwise it will not be possible to use securing rib B.
- The securing rib prevents the current collector from turning the wrong way and causing a short circuit.
- The rail has seven slots for the insertion of copper conductors.
- The rail is made from fireproof plastic

The grounded (**J**) should be inserted where there is a yellow stripe (**A**) along the outside of the rail.

The yellow stripe should be continuous along the entire length of the rail.

Each copper conductor is connected to the junction box.

J = GROUNDED
L1 = PHASE
L2 = PHASE
L3 = PHASE
N = NEUTRAL CONDUCTOR
V = HEATING

When operated in humid areas or where temperatures are liable to vary, a **heating cable** must be used. Also consult the conductor rail manual.

Note!

TKS will recommend the use of heating cable, p.g. a better reliability

NB!

The work must be performed by an **authorised electrician**.

2.3 Assembly the machine

2.3.1 Installing the side panels

- Hook the panels to the rear edge.
- Screw bolts into the front edge.

2.3.2 Position traverser carriages on the rail

The traverser carriages for the machine are supplied loose. These are attached from the end of the rail. Finely adjust the width of the traverser carriages so that they run smoothly on the bends.

The traverser carriage motor may if necessary be positioned on the opposite side.

A motor bracket for fitting on the left-hand side is provided.

The equipment for power transmission, pulse and synchronisation sensor is fitted to the front of the traverser carriage.

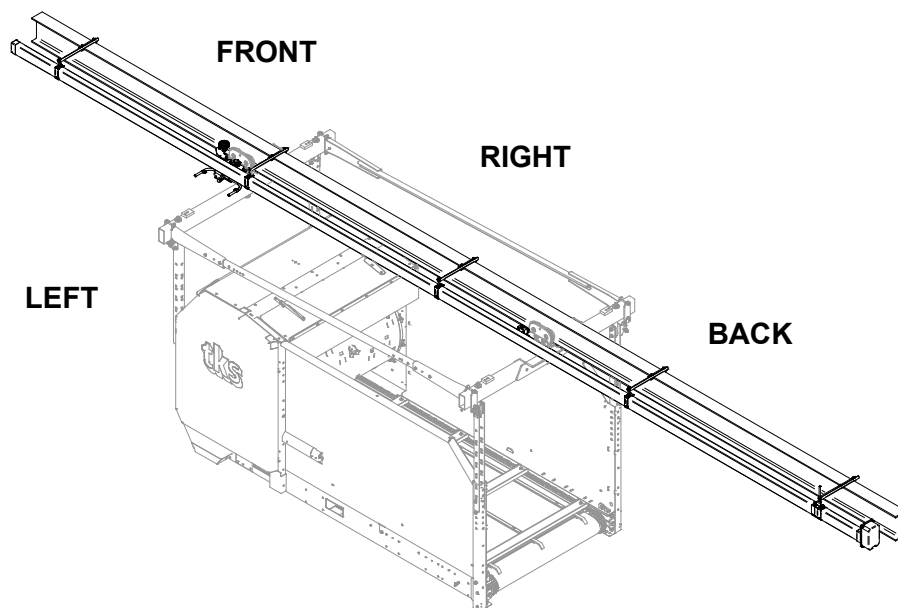


Fig. 13

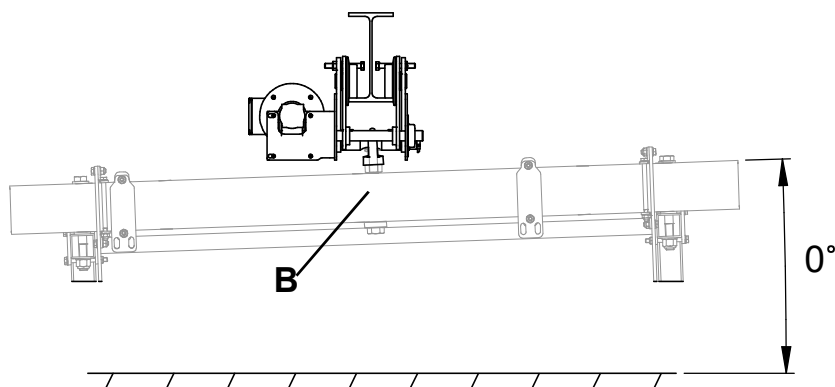
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2.3.3 Installing the machine

Suspend the machine from the traverser carriages using the suspension bolts in the eye nut.

Make sure that the machine is level when suspended. **See Fig. 14**

Position suspension bolt **A** in the most appropriate hole, **B**. **See Fig. 15**



IBBB_14

Fig. 14

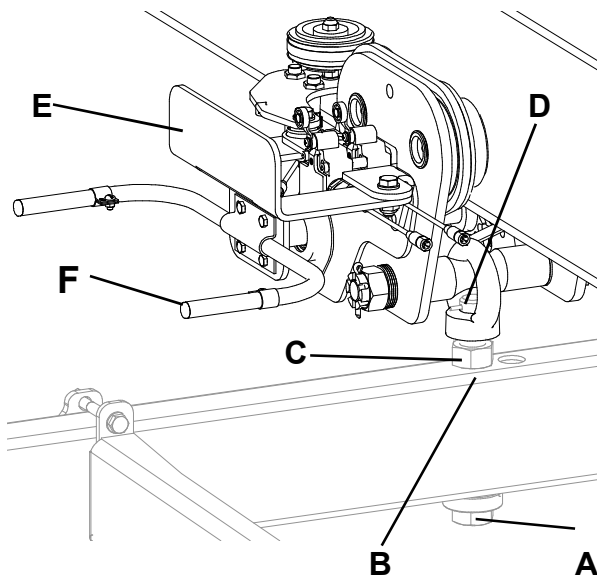


Fig. 15

- Screw locknut all the way down onto the bolt's thread. There should be a small gap between the locknut and beam.
- Pull locknut **C** towards the eye nut.
- Secure using pin **D** through the bolt so that the bolt will not unscrew.

2.3.4 Install bracket with pulse wheel and synchronisation sensors

Fit bracket **E** to the outside of the traverser carriage on the opposite side of the motor.

See Fig. 15

The cables are routed along the beam and suspension channel down to the electrical cabinet.

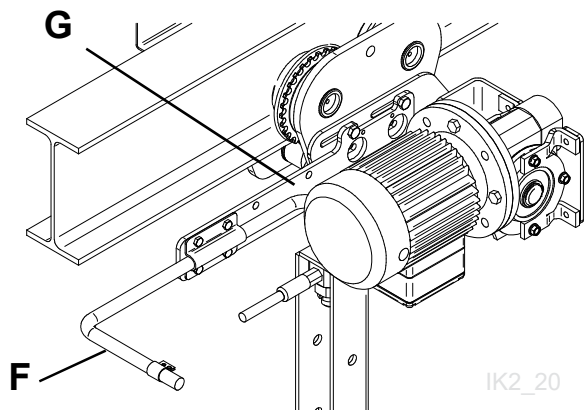


Fig. 16

2.3.5 Install hoop for current collector

- Fit hoop **F** to bracket **E** next to the sync. switches. **See Fig. 15**
- If the conductor rail is positioned on the opposite side of the rail, the hoop can be fitted to separate bracket **G**. **See Fig. 16**

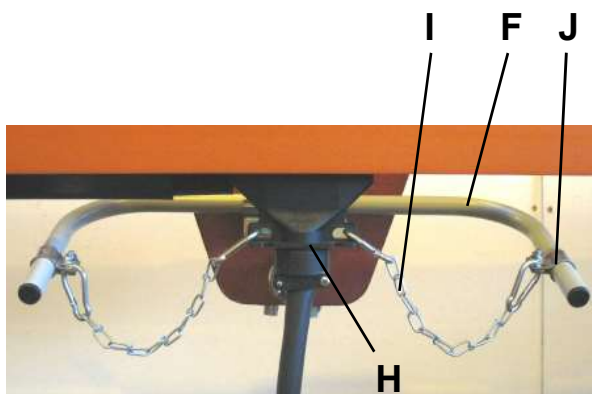


Fig. 17

2.3.6 Attach current collector to hoop

- The current collector **H** is attached using chain **I** to the front and back of the hoop.
- It is important that the chain is pulled parallel with the conductor rail and that the chain pulls the collector down slightly.
- Adjust hoop **F** and clamps **J**.

See Fig. 17

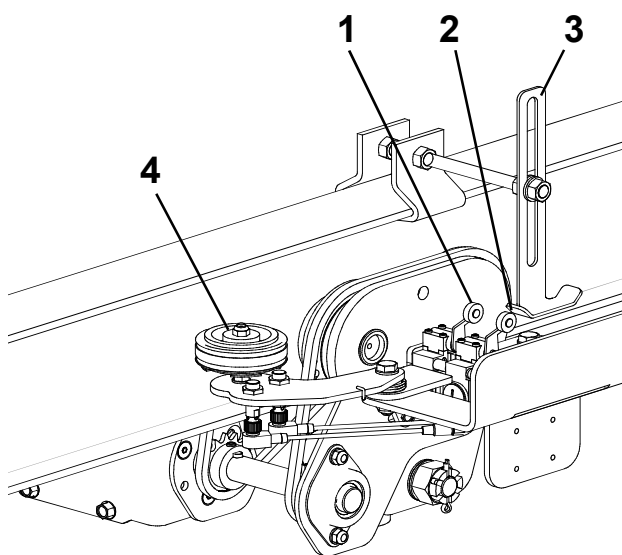


Fig. 18

2.3.7 Install synchronisation impactor

The machine's positioning system consists of

- 1 – Sync. sensor 1 (switch)
- 2 – Sync. sensor 2 (switch)
- 3 – Sync. impactor
- 4 – Pulse wheel

When the pulse wheel rolls against the rail, over a certain distance it will have a margin of error.

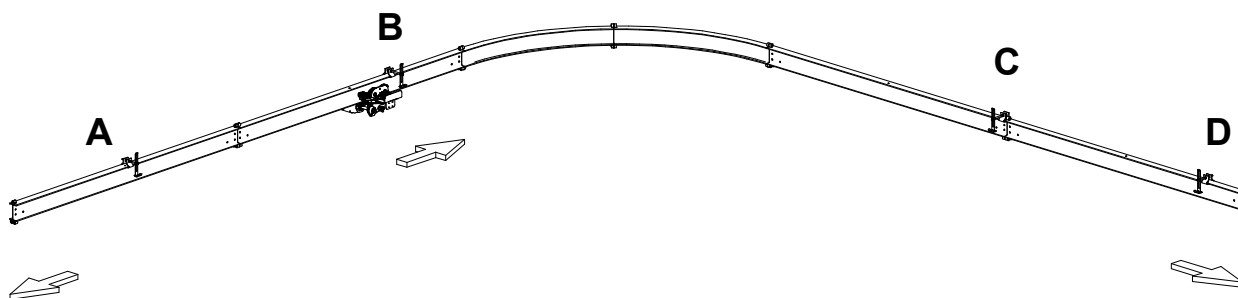
This margin of error is eliminated by synchronising at regular intervals.

A synchronisation impactor is fitted to each end **A** and **D**, before and after each bend **B** and **C**.

See Fig. 19

If the rail is long, synchronisation impactors must be installed every 50 metres.

Plan fitting of the synchronisation impactors so that they are encountered when the machine is at the end of the rail and before the traverser carriages enter bends. Make sure that the sync. switches are on the machine's locking plate.



IEF_27

Fig. 19

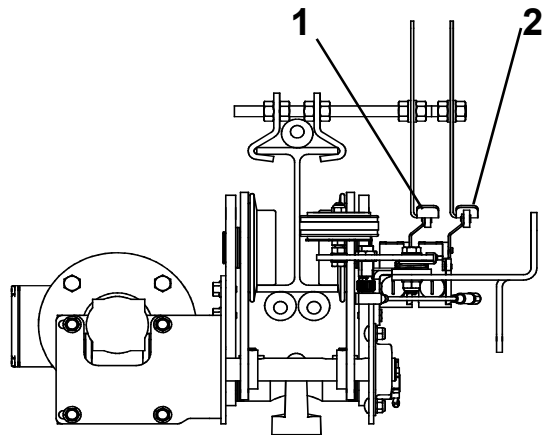


Fig. 20a

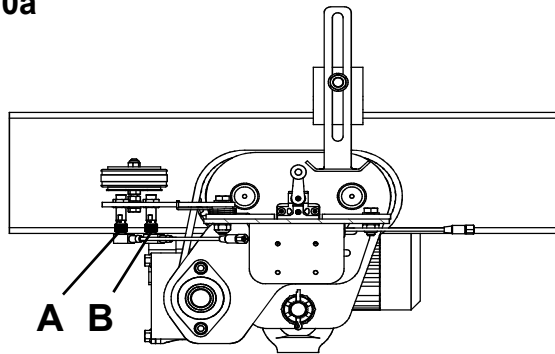


Fig. 20b

IMPORTANT!

Synchronisation impactors for ends A and D should always be installed next to the rail and should trip switch 1.

All other synchronisation impactors B and C and others should trip switch 2.

Use clamps to fit the synchronisation impactors on the top of the rail. Adjust the height and width so that the machine switch works properly.

Push the machine against the synchronisation impactor and make sure that the switch is tripped.

See Fig. 20a

The distance between the inductive sensors and pulse stars is 1–3 mm

- **A – Position counter A (inductive sensor)**
- **B – Position counter B (inductive sensor)**

See Fig. 20b

2.4 Installing the Magazine

2.4.1 Positioning

- The magazine must be placed at the end of the rail behind the spreader.
- The magazine goes into the spreader chamber during loading.
- The spreader must always hang horizontally to dock with the magazine.
- The magazine is positioned in the middle of the rail
- Adjust to the correct height
- Secure the magazine to the ground using expansion bolts when you are sure where the magazine should be positioned.

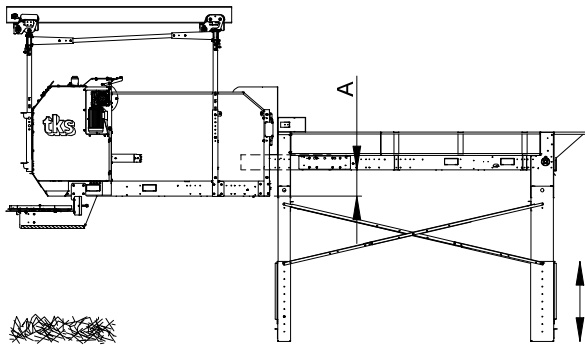


Fig. 21

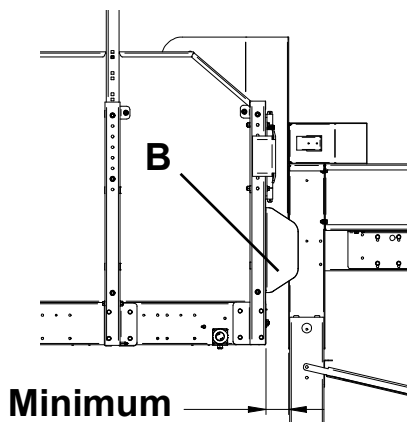


Fig. 22

2.4.2 Height adjustment

The magazine should be fitted at a height where magazine carriers and spreader carriers cannot collide. Distance A from the lower edge of the spreader to the lower edge of the magazine should be a minimum of **350 mm**.

The height of the magazine is adjusted by moving the lower part of the feet. **See Fig. 21**
See instructions for R2 Magazine.
Foot kits suitable for the magazine are available from 2 m to 4.2 m. Contact your dealer.

2.4.3 Installing docking plate

Fit docking plates **B** to the spreader to facilitate docking with the magazine.
See Fig. 22

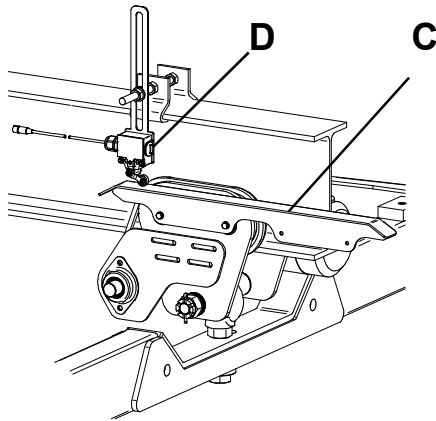


Fig. 23

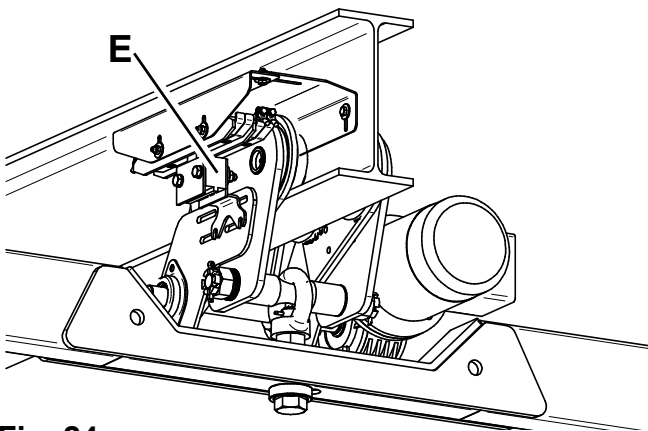


Fig. 24

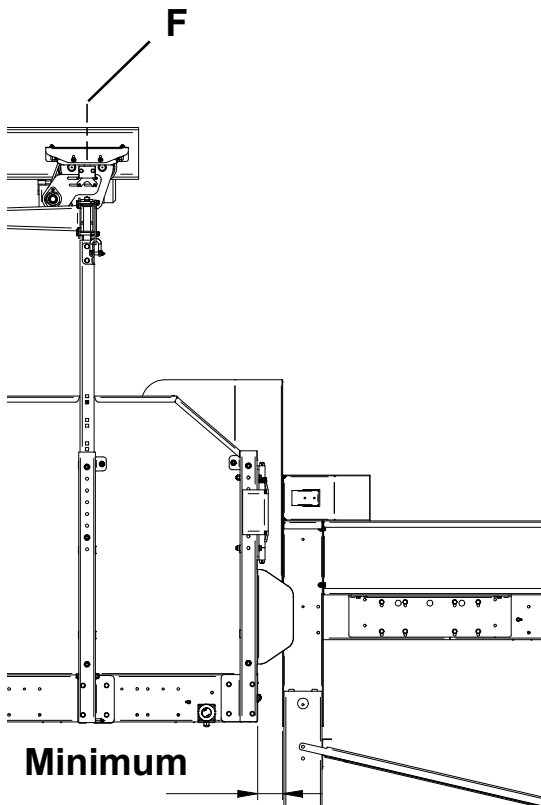


Fig. 25

IEB_7

2.4.4 Installing loading switch

Switch rail **C** is fitted to the rear traverser carriage.

Loading switch **D** is fitted to the top of the rail and positioned on the front edge of the switch rail when the spreader is against the magazine.

See Fig. 23 and 25

2.4.5 Installing signal transducer

When the magazine is controlled by signals from the spreader, a signal transducer will be fitted.

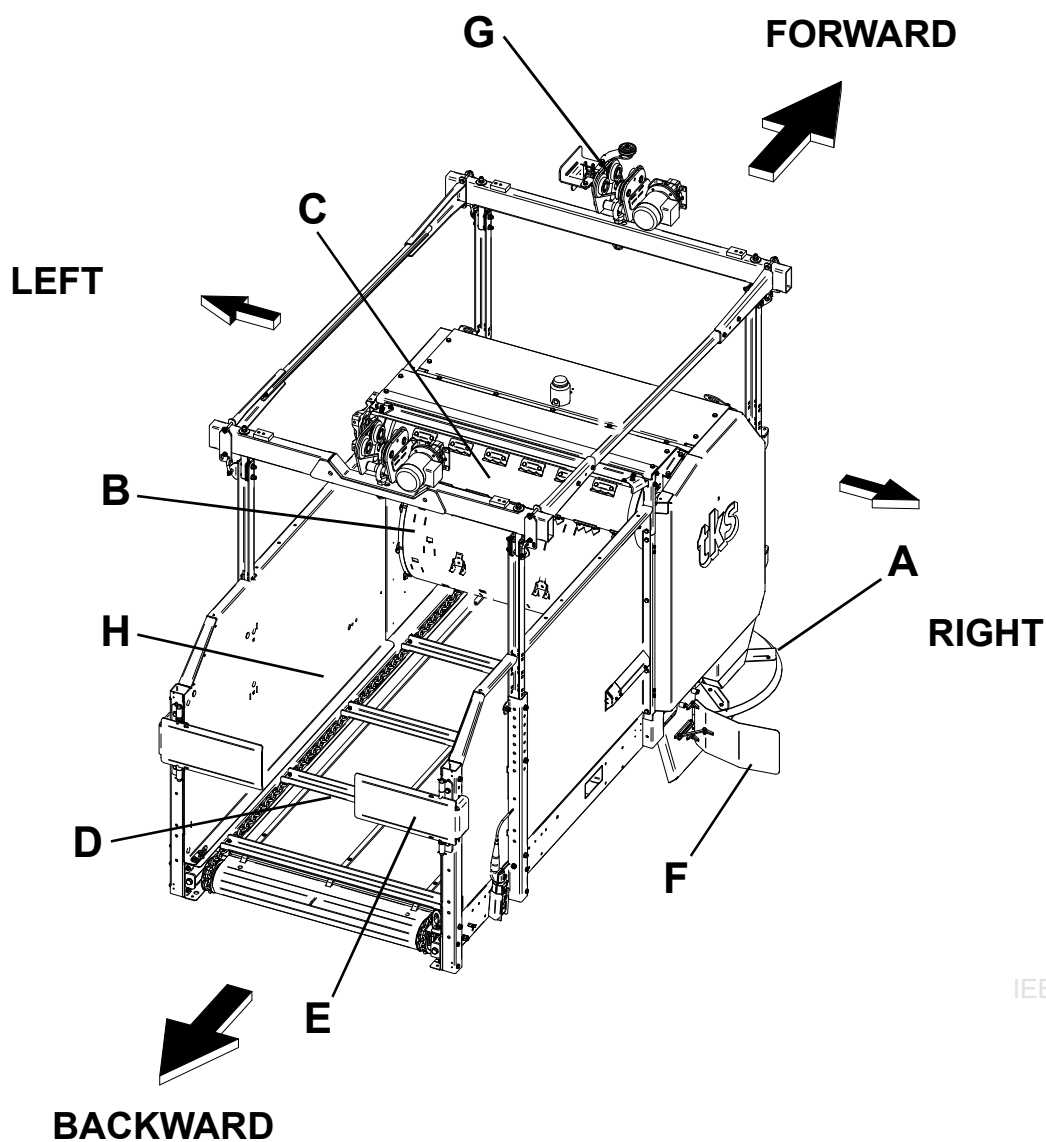
Fit bracket with brushes **E** to the traverser carriage. **See Fig. 24**

The receiver is fitted to the rail so that the brushes are in the middle (**F**) of the receiver when the spreader is right up against the magazine.

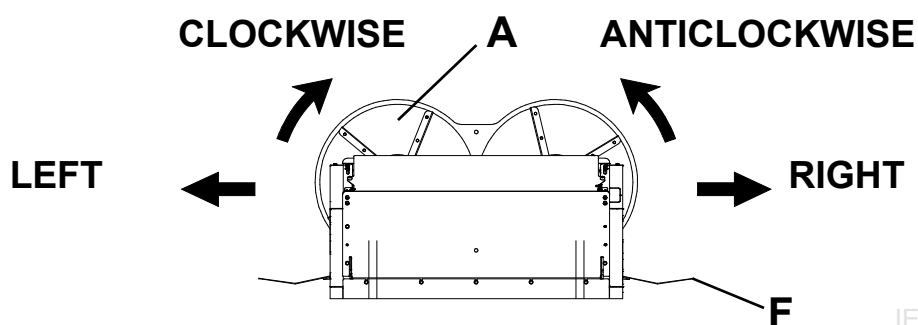
See Fig. 25

2.5 Checklist before starting

Before starting the BigBaleBedding, it makes sense to go through this checklist to uncover any faults.



IEB_8



IEB_12

Fig. 26

A - Spreader unit
B - Shredder drum

C - Top drum
D - Bottom belt

E - Non-return flap
F - Spreading guard

G - Traverser carriage
H - Chamber

1. Install and turn on the control box. See Chapter 3

Press the screen with your finger. DO NOT use sharp objects on the screen.

2. Manual motor operation

Check that the motors are rotating in the right direction.

Open the Menu. **Select Inputs/Outputs. See Chap. 4.7.10**

Press the **Outputs tab**. Activate motors by pressing inside the square (**Switch on**).

2a. Drum

The drum must rotate forwards from the top.

This means that the drum will pull the spreading material over itself.

Switch phases if the drum is rotating in the wrong direction.

2b. Top drum

The top drum must rotate forwards from the top.

This means that the drum will throw the spreading material backwards.

Switch phases if the top drum is rotating in the wrong direction.

2c. Ceiling rail operation

Check that the direction of movement of the machine corresponds to **Fig. 25**

Activate **Ceiling rail operation forwards**. The machine will move forwards.

Activate **Ceiling rail operation backwards**. The machine will move backwards.

2d. Bottom belt with back wall

Check the direction of rotation of the bottom belt.

Activate **Bottom belt forwards**. The bottom belt must move the spreading material forwards towards **the drum**.

Activate **Bottom belt return**. The bottom belt will reverse direction.

2e. Spreader unit

Check the direction of rotation of the spreaders

Activate **Spreader L clockwise**. The spreader on the left will rotate clockwise.

Activate **Spreader R anticlockwise**. The spreader on the right will rotate anticlockwise.

3. Check obstacles along the rail

Open the calibration window in the Menu.

See **Chap. 4.6.5** Press the Allow skip positions key.

Close the window. Open the **Manual Operation window** See **chap. 4.4**.

Set low speed. Move the machine manually along the rail.

Check that there is no debris preventing the machine from running normally.

4. Check the synchronisation impactors

The synchronisation impactors should be positioned in the right place and make contact with the synchronisation sensors.

The first and last synchronisation impactor should make contact with synchronisation sensor 1. **See Chap. 2.3.6**

4a Check that the spreader enters and starts the magazine (when the magazine is in use)

Move the machine manually up to the magazine. The machine should enter smoothly.

Check that the magazine starts as it should, via loading switch or signal transduction.

4b Check that the machine starts a filling source when top loading is in use.

Move the machine into the loading position manually.

Check that the filling source starts as it should.

2.5 Calibration and commissioning

Please familiarise yourself with operating the machine using the control box before performing calibration.

See Chap. 3 og 4

NB! During calibration, take care when operating the machine.

- Perform calibration of the machine along the rail – **see Chap. 4.6.5**
- Set reduced speeds at bends – **see Chap. 4.6.6**
- Set zones for spreading. **See Chap. 4.6.3**
- Program groups. **See Chap. 4.6.1**

3 Using the controlbox

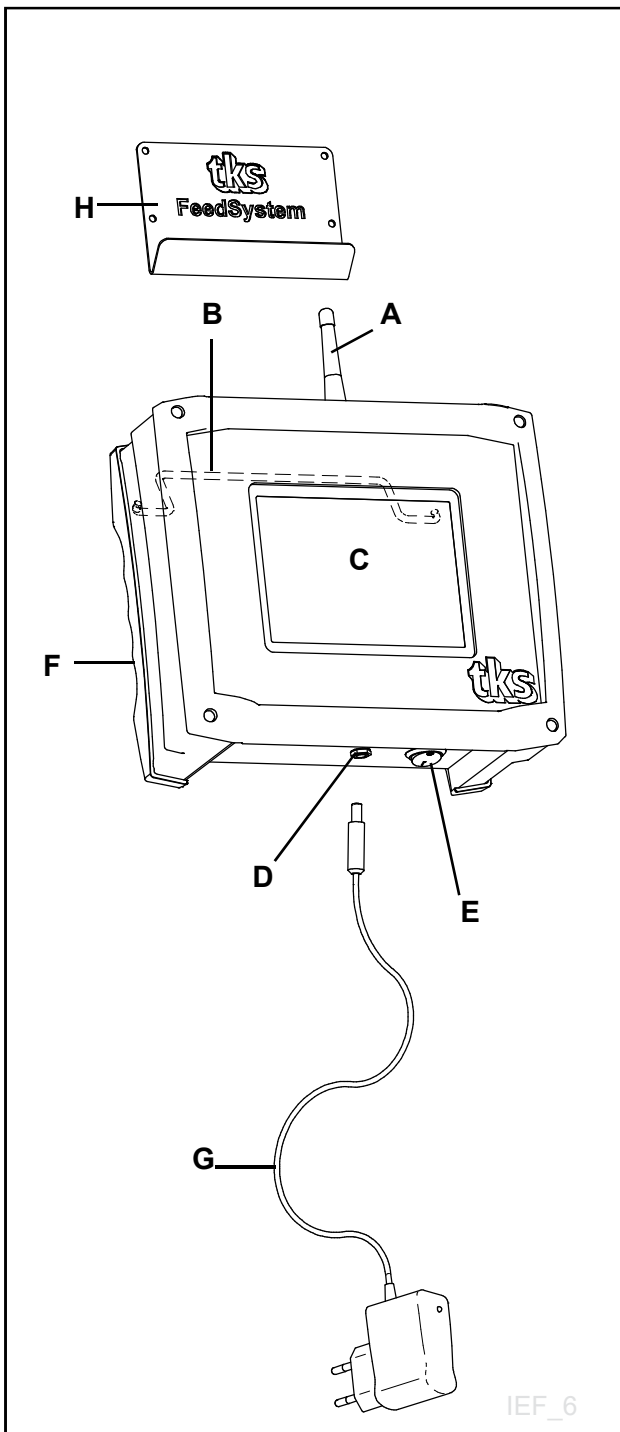


Fig. 27

3.1 Parts - radio-controlled remote operation

- A – Antenna
- B – Attachment handle. Can be swung down for better viewing when the control box is positioned on a flat surface.
- C – Screen 5.6"
- D – Charging contact
- E – On/Off switch
- F – Grip
- G – Charging cable
- H – Wall plate (screws not included)

3.2 Location and connection

Mount the wall plate in an appropriate place. The control box is not waterproof and must not be exposed to water splash or placed in an environment with condensation. It is a good idea to place the control box close to the machines parking position or in an office from where you can see the machine. A socket for the charging cable should be in the immediate vicinity.

3.3 Battery

The control box has a battery included. This is maintenance-free. The battery should be charged at all times. The battery charger has automatic charge limits and can always be connected to the control box and the mains. The charging cable plus has an indicator.

- The light turns red when the battery is charging.
- The light turns green when the battery is fully charged.

The machine operates in accordance with the program stored in the machine's control box. The screen is used for programming and initiation.

NB! Switch off the screen after use to save the battery.

3.4 Screen

Switch on the screen. The start-up screen will be displayed.

This is a touchscreen. You can press it with your finger or use a special pen. Only one press at a time. Do not press too hard, as this may damage the screen. If the screen has not been active for a few minutes, it will enter screen saver mode. The screen will be off in this mode. Press any part of the screen to reactivate it.

NB: Clean the screen using a damp cloth.



Fig. 28

3.5 Password

- Remote operation is protected against unwanted use.
 - Enter a **PASSWORD** each time the screen is turned on.
 - The password is: **1324**
 - Confirm with **OK**
 - Delete keystroke error with <-
- See Fig. 28**



Fig. 29



Fig. 30

3.6 Numeric keypad

Values in fields with blue borders can be changed. Touch the number and a numeric keypad will display on the screen.

The top of the screen shows the Max/Min value that can be entered in this field.

Enter a new value using the number keys.

If an incorrect value is stated, press the <- key and delete the last number entered.

Press **CLR** to delete everything.

To enter a negative value, press - before entering the value.

Once you have selected a value, press the **ENTER** button.

This will save the value and close the keypad window.

To cancel, press **X** in the upper right-hand corner. The old value will continue to be active.

3.7 Alphabetic keypad

When you enter values with text (e.g. name of animal) the screen will display an alphabetic keypad:

When editing a text field, the old text is displayed on the screen.

New text can be entered, and the old text will disappear.

Use the **Caps** button to switch between uppercase and lowercase letters.

Press the **BACK** button to remove the last symbol registered, or press **Clear** to delete all text, then enter the new text.

Note that there is a limit on the number of letters in the field. The first letters will be deleted if a long string of text is entered.

When the text has been entered, press the **ENT** button. This will save the text and the keypad window closes.

If you want to cancel, press the **X** or **Esc** button and the old value will remain active.

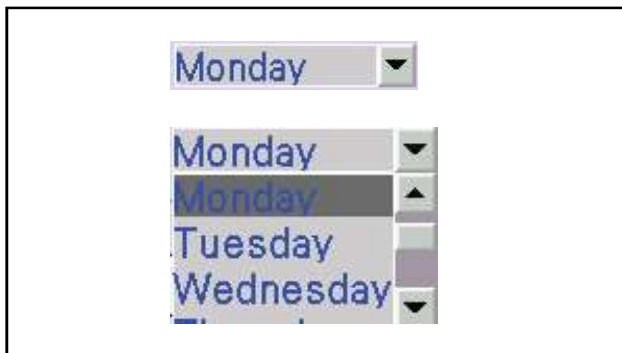


Fig. 31

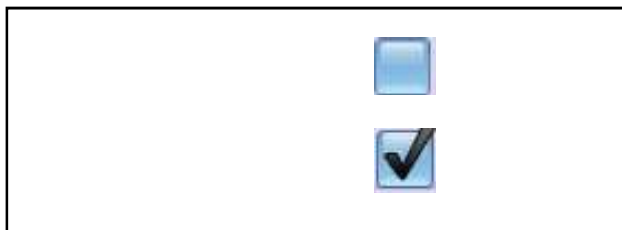


Fig. 32



Fig. 33

3.8 Selecting values

Selecting pre-programmed values from a list.

- Open the list – Press the value or the down arrow
- Select a value from the list

3.9 On/Off button

Enable or disable a function using the on/off key.

- Blank – disabled
- Ticked – enabled

3.10 Close windows

All menus or windows on the screen can be closed using the cross on a red background in the upper right-hand corner.

3.11 Panel control

Used to operate the machine when the control box is not functioning.

When using this, take care to avoid getting trapped between the machine and the other surfaces.

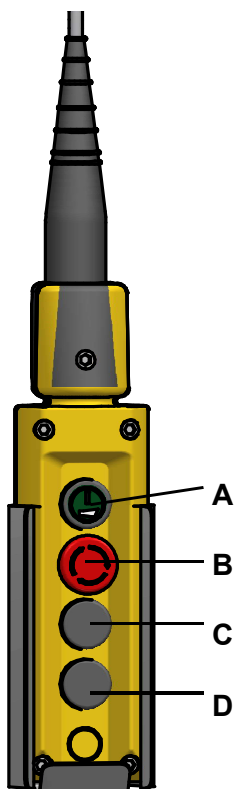
Note!

You must never stand on or touch the machine when panel control is being used.

- A** – button for activation and stop
- B** – emergency stop switch
- C** – button for moving robot backwards
- D** – button for moving robot forwards

Merk! Operation must always be activated before use. Press button **A** in for two seconds.

- Move the machine forwards using button **D** and backwards using button **C**. The machine will only move when the button is held in.
- Start spreading. Hold button **A** in and press button **C** at the same time. Release the buttons.
- Now the machine can be moved forwards and backwards using buttons **D** and **C**.
- Stop spreading. Press button **A**.
- Move the machine into the loading position. Hold button **A** in and press button **D** at the same time.
- Release the buttons.



IEF_03

Fig. 34

4 Operation

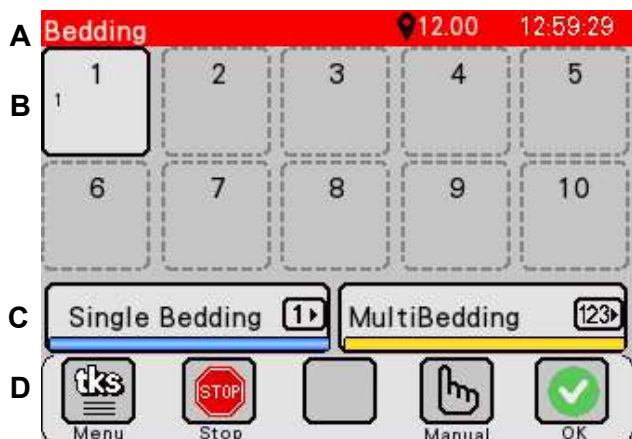


Fig. 35

4.1 Home screen

The home screen displays:

A - Information line

- Displayed on all screens
- The text shows what the machine is doing
- Position sign and the machine's current position
- Clock

B - Programmable groups 1-20

- Full line – the group is active
- Dashed line – the group is not in use, deactivated
- Displays group name
- Pressing a group opens **Group settings**.
- When groups 11–20 are programmed, an arrow key to switch display between groups 1–10 and 11–20 will appear

C – Start spreading

- **SingleBedding** (blue) Here group 1 can be spread in adjustable quantities.
- **MultiBedding** (yellow) Here several groups can be spread using programmed settings.

D – Keys for menu and manual operation

- **Menu** key – opens the menu for machine settings.
- **Stop** key – stops everything
- **Manual** key – Opens window to operate manual spreading.
- **Status indicator** key – Opens window for alarms.
 - **OK – green tick** – all OK
 - **Warning – yellow triangle**, alarm is triggered, but the spreader can be operated
 - **Alarm – red cross** – the machine has stopped; the fault must be remedied

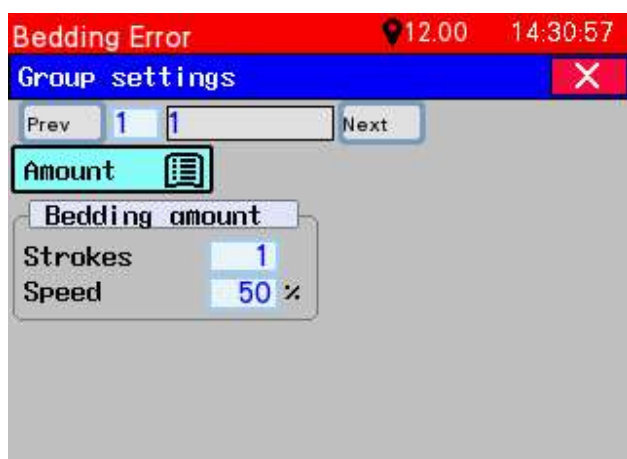


Fig. 36

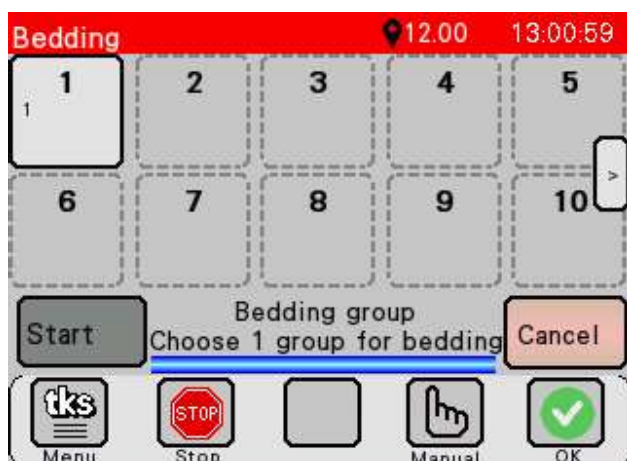


Fig. 37

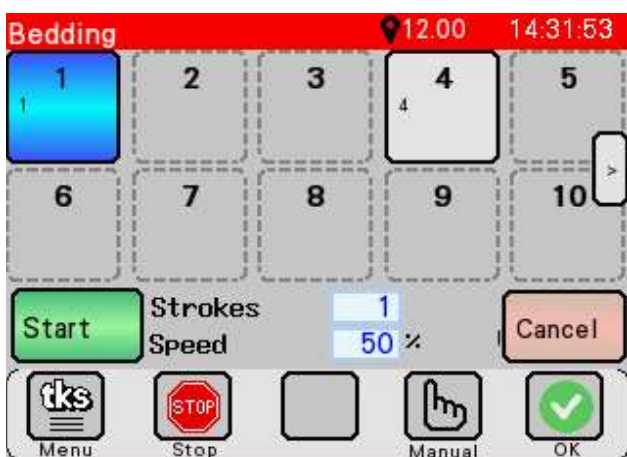


Fig. 38

4.2 Group settings

Opened from the Home screen. Press on relevant group.

- Displays group number
- Displays group name
- Key to go to next or previous group
- The quantity of spreading material is adjusted depending on a combination of how many times the machine should pass the group, and at what speed the machine should move.
- Adjust the number of passes
- Adjust the speed in %

Note!

At higher speeds, the machine will spread less per metre covered.

4.3 Perform spreading

When settings for a group have been adjusted, spreading can be performed with SingleBedding or MultiBedding.

4.3.1 SingleBedding

- Press SingleBedding
- A window for selecting groups will be displayed.
- A window for selecting groups will be displayed.
- Select a group
- Selected group is highlighted in blue
- Settings for Passes/Weight and Speed must be adjusted. These settings will not be saved from time to time.
- **Start** spreading or **Cancel**

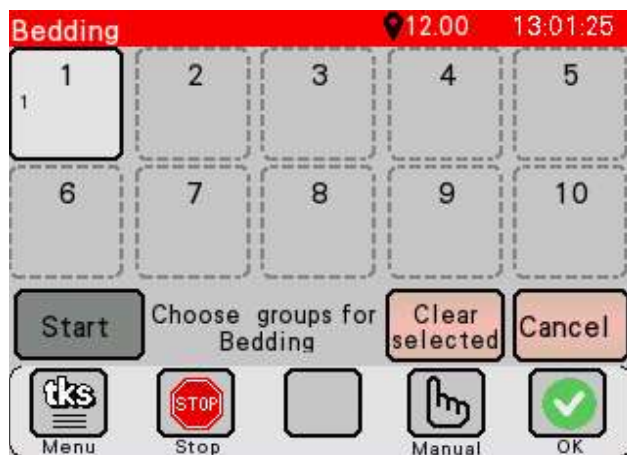


Fig. 39

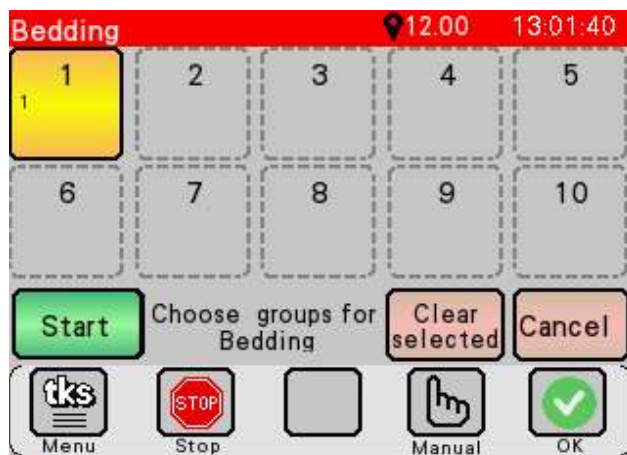


Fig. 40

4.3.2 MultiBedding -

One-touch multiple-group spreading

- Press MultiBedding
- A window for selecting groups will be displayed.
- Select one or more groups
- Selected groups are highlighted in yellow. Only active groups can be selected.
- The groups are spread with the set quantity from each individual group
- **Remove selected** – the key removes all selected groups.
- Next time MultiBedding is opened, the previously selected groups will be selected
- Start spreading
- All groups will be spread one after another
- **Cancel** - close window without starting.

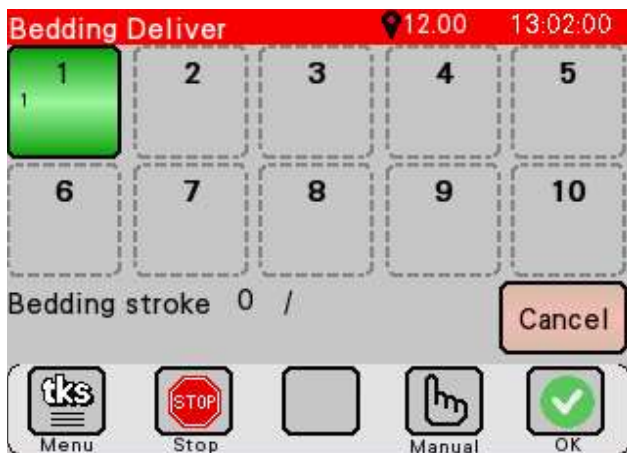


Fig. 41

4.3.3 Spreading ongoing

- The group being spread will flash green
- Information about passes will be displayed: has passed/to be passed
- Ongoing spreading can be cancelled at any time using the Cancel key.
- If multiple groups have been selected for spreading, the other groups will be highlighted in orange
- The next group will commence once the previous one is complete
- When the Cancel key is pressed, the next group will commence immediately
- If the machine runs out of spreading material during spreading, the machine will automatically return to the loading position.
- When set to manual loading, the machine will wait to be loaded. **See Chap. 4.3.4**
- If you use a magazine or top fulling, the machine will load more bedding material itself.
- It will then return to the group/position where it ran out of bedding material and continue to spread what remains.



Fig. 42

4.3.4 Manual loading

This window is displayed when the machine runs out of feed in manual loading mode. The cart is returned to the parking position.

- Load material
- Press **LOADING COMPLETE** or press alternative then **Activate-button (A)** on the pentant control
- The spreading already initiated will continue.



Fig. 43



Fig. 44

4.3.5 Top loading

When the machine is in top loading mode, this image is displayed when the filling source starts. The programmed loading time will automatically begin counting down before the machine continues to dispense feed.

The countdown can continue and complete on its own.

Alternatively, the countdown can be cancelled.

- Press **LOADING COMPLETE**
- Alternatively, **Enable button (A)** on the control box/panel can be pressed.

See Chap. 3.11

4.4 Manual Operation

The window shows manual operation

- Ideal for supplementing areas where spreading has already taken place.
- **Note!** During Manual Operation, the machine will move more jerkily than when programmed spreading is used.
- **Start Bedding** – The spreader discs start to rotate, the drum starts and the bottom belt starts to move forwards.
- The machine can now be moved forwards and backwards using the arrow keys.
- The machine speed is set in the field or adjusted using the speed keys. +/- 10 per cent for each press.
- **Note!** A higher machine speed will result in less material per metre moved.
- **Stop** – Press **Stop spreading** – for stop. The spreader discs will rotate for a few seconds after the drum is switched off.
- **Go to defined position**
- The machine will move to programmed positions and stops
 - Parking
 - Loaded position
 - Random position

Note! A connected magazine or automatic top loading will start when the machine is in the loading position.

- Enter the required position in the field
- Press **Go** and the machine will move there
- Move machine – the machine can be moved forwards and backwards using the arrow keys.

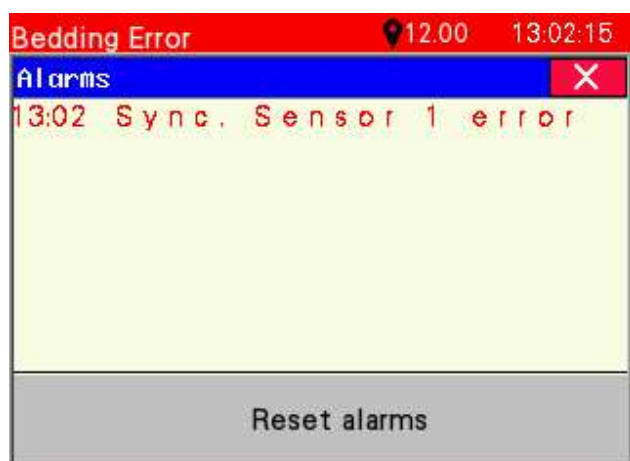


Fig. 45

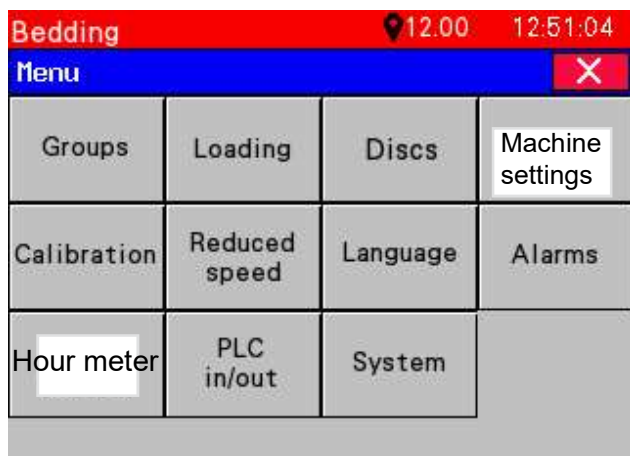


Fig. 46

4.5 Alarms

The window will be displayed when alarms occur.

- When an alarm is displayed – the machine's functionality is completely blocked.
- When a warning is displayed – the machine's functionality may be restricted.
- Each alarm lists the time when the alarm occurred.
- Acknowledge the message by pressing Reset alarms – the key at the bottom.
- If the alarms cannot be acknowledged, the fault must be rectified first.
- Alarm messages are saved for later viewing
- The window is opened with the status indicator in the bottom right corner of the Menu bar
- When the **Speed too high** alarm is displayed, this can be reset. The machine will then be operated at half speed.

See Chapter 6 for a list of alarms and error messages.

4.6 Menu

Open the menu to adjust the spreader settings. Press the Menu key at the bottom left of the Menu bar.

- **Groups** – Definition of the groups in the barn
- **Loading** – Loading settings
- **Discs** – Settings for spreading along the rail
- **Machine settings** – Settings for the spreader
- **Calibration** – Definition of the path along the rail
- **Reduced speed** – Location of reduced speed zones at bends
- **Language** – Select screen language
- **Alarms** – Error messages and warnings log
- **Hour meter** – Displays operating time for the machine
- **PLC in/out** – Displays PLC inputs and outputs
- **System** – System settings. Resetting the set-up

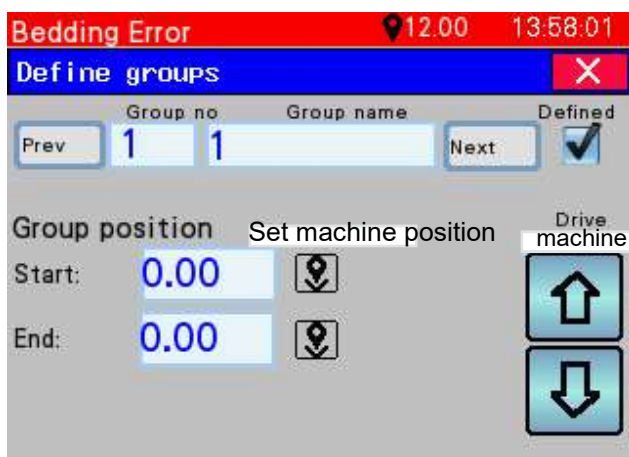


Fig. 47

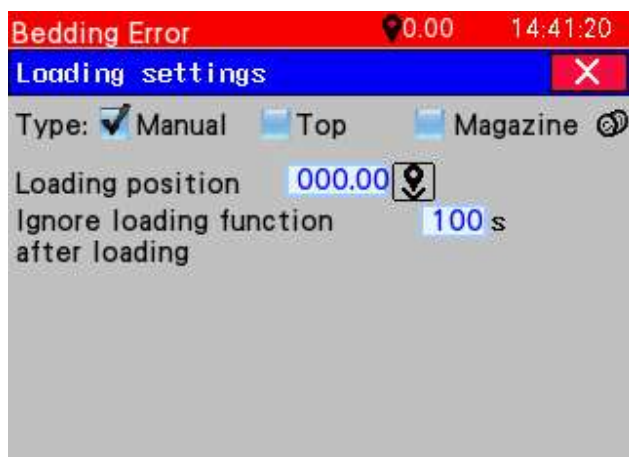


Fig. 48

4.6.1 Define groups

This window is used to program the groups in the barn

- Select group no.
- Enter the name of the group
- Move the machine to the position where the group (enclosure) starts using the arrow keys
- Press **Set machine position** – the **Start** key
- Move the machine to the position where the group ends
- Press **Set machine position** – the **End** key
- Activate the group by pressing the **Define** key
- Press **Next** to define a new group

4.6.2 Loading settings

Select the type of filling source. Press and hold the key for two seconds.

- **Manual** – The chamber is loaded manually.
- **Top** – The chamber is loaded from the top either from a bottom belt or a machine
- **Magazine** – The chamber is loaded from the rear via a connected magazine. TKS R2 Magazine.

Manual loading

- Set position for loading. Position the machine and press the **Set position** key.
- **Ignore loading function after loading** – A timer for reloading can be set. This applies in particular to spreading with hard round bales. The spreader thinks that it is empty if the bale is suddenly thrown back into the chamber.



Fig. 49

Loading from the top

- Set position for loading.
Position the spreader and press the **Loading position** key.
- Enter **Loading time**. This time must be longer than the time that the filling source takes to load. Otherwise material may fall onto the floor when the spreader starts moving before the filling source has stopped.
- Enable **Passing**. In alternation mode, the material is distributed along the entire length of the chamber by virtue of the spreader moving back and forth during loading. This mode can only be used when the machine is filled from a narrow conveyor.
- Enter **Passing position**.
The machine alternates between this position and the loading position
- Enter **Passing speed**.
- **Ignore loading function after loading** – see manual loading.

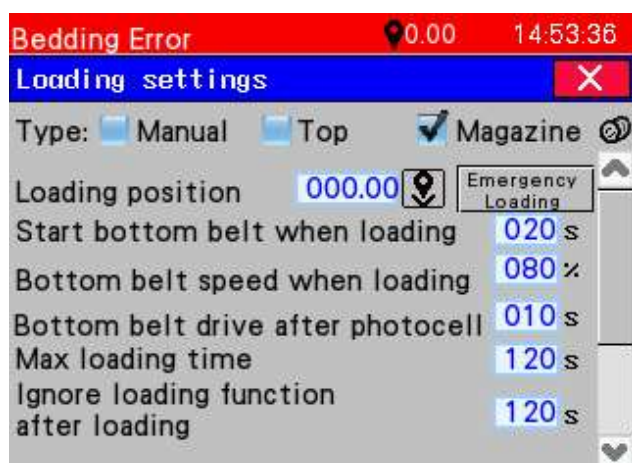


Fig. 50

Loading from Magazine page 1

- Position the machine for loading and press the **Set position** key.
- **Start bottom belt during loading** – the time before the bottom belt in the machine starts moving during loading.
- **Bottom belt speed when loading** – motor speed %
- **Bottom belt drive after photocell** – the bottom belt keeps running after the photocell receives a signal to transport the bedding material into the chamber. Adjust the time so that the bedding material is 10–30 cm away from the drum when the bottom belt stops.

- **Max loading time** – if the machine has not been loaded within this time, loading will be cancelled. The **Magazine empty** alarm will then be displayed in the alarm window.
- **Ignore loading time function after loading** – see manual loading.
- **The emergency loading** – used when an error occurs during loading. For example, when a round bale becomes stuck between the magazine and the spreader. In emergency filling mode, the spreader tries to move into the loading position and the bottom belt moves forward at the same time. The function will stop automatically when the bedding material covers the photocell, or when the same key is pressed again. The function is also limited by the **Max. loading time** setting.



Fig. 51

Loading from Magazine page 2

- **Bottom belt reverses** before loading to empty the machine and prevent material from getting between the machine and the Magazine.
- **Reversing location** – indicates where the machine reverses the bottom belt.
 - **Random** – The belt is reversed at the point where the spreader ran out of material.
 - **Fixed** – The belt reverses at a set location. Enter the desired position for the machine.
- **Reverse bottom belt before spreading, after loading** – The function must be used when the drum has trouble starting after loading has taken place. The function must be enabled when hard bales are loaded and moving up to the drum. When hard or frozen bales are loaded and they are lying with pressure against the drum, the function should be activated. The error message **Drum error** may appear after loading if this function is not used.

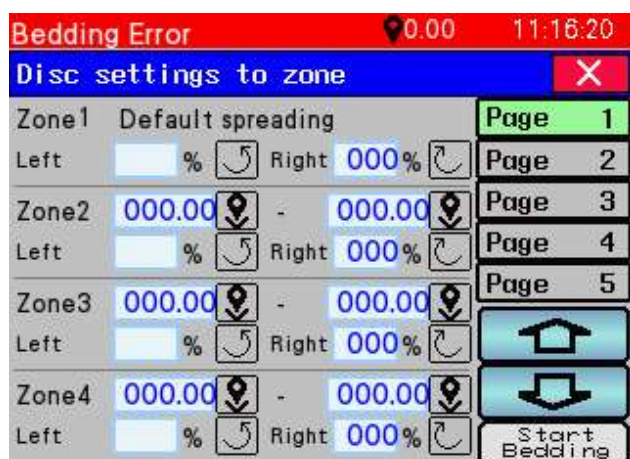
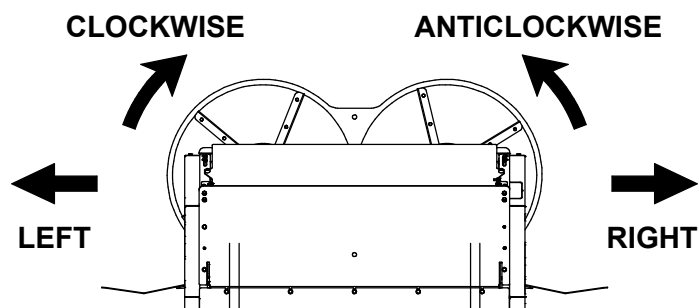


Fig. 52



IEB_12

4.6.3 Spreader settings

The rpm and direction of the spreader discs associated with various positions on the rail are set here.

- **Basic settings** apply for the entire length of the rail.

If a zone is added in the middle of the rail, basic settings will apply before and after this zone.

- Position the machine where the zone starts and press the **Set position** key. Do the same for the end position.
- Enter rpm in % (10–100)
- State direction of rotation for right and left disc

The normal direction of rotation is clockwise for the left and anticlockwise for the right spreader disc.

If a zone overlaps with another, the zone with the highest number will override zones with lower numbers in the overlapping section.

- 19 different spreading zones are possible
- Test settings by pressing Start spreading and move forwards and backwards on the relevant section.

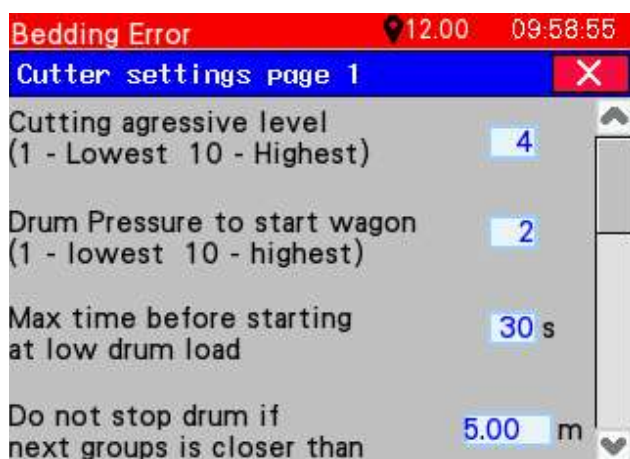


Fig. 53

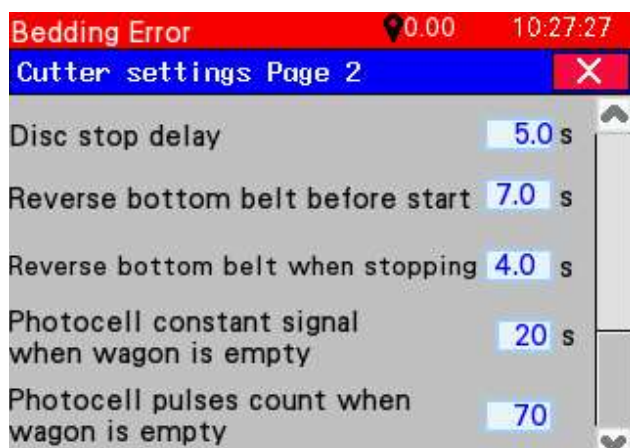


Fig. 54

4.6.4 Cutter settings page 1

Settings for the machine are adjusted here.

- **Level cutter feed** – Sets how aggressively the material should be fed towards the drum. If adjustment is made correctly, equal distribution will be achieved even if bales of varying density and material structure are used.

1 – Low – the bottom belt moves slowly

10 – High – the bottom belt moves quickly

- **Drum pressure before ceiling rail operation starts –**

On start-up the material will move towards the drum and the material will come out.

When a given pressure against the drum is achieved, the machine will start to move.

1 – Low – slight start-up delay

10 – High – major start-up delay

- **Max waiting time before ceiling rail operation starts at low drum pressure –** the machine will start to move even if the desired drum load has not been achieved in the adjustment above (drum pressure 1–10).

- **Do not stop the drum if the next group is closer than –** This value states the permitted number of metres to the next group, where the drum is still rotating. If several groups are spread one after the other, the drum does not need to be stopped between each group.

Cutter settings page 2

- **Disc stop delay** – the spreader discs will rotate for a given number of seconds after the drum has stopped.

Clean the spreader discs in the event of a stop

- **Reverse bottom belt before start –**

number of seconds the bottom belt will reverse before the drum starts.

Limits the start-up load

- **Reverse bottom belt when stopping –**

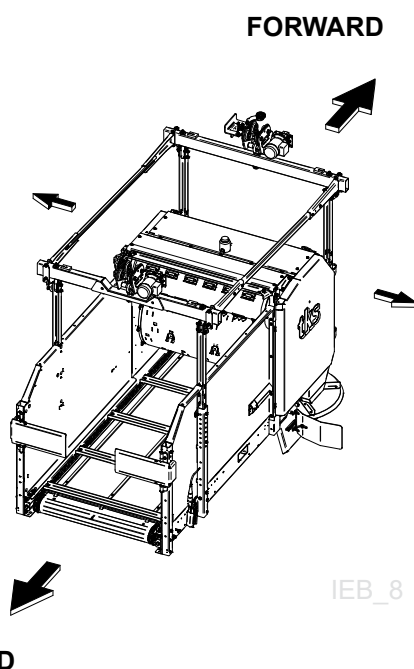
number of seconds the bottom belt will reverse before the drum stops. Stops the material flow before the machine stops.

- **Photocell constant signal when the machine is empty** – The machine can be set to be empty when the photocell has had a constant signal for this time. Used with round bale feeding when a lot of feed is dispensed.

- **Photocell pulses when the machine is empty** – signals from photocell are counted in number of pulses. If there are fewer pulses than the value in the field, the machine is empty. Use when feeding with light feed.



Fig. 55



4.6.5 Calibration

This is where the machines positions along the rail are defined. The machine is driven backwards and forwards using either the arrow keys buttons **C** and **D** on the control panel.

NB: Exercise caution when operating the machine.

Enter positions – hold key down for three seconds.

- **Min position** – enter the machine's end position when the machine is moved backwards. It will always be 0
- **Max position** – enter the machine's end position when the machine is moved forwards.
- **Parking** – set parking position
- **Allow skip positions** – this function allows the ceiling rail unit to operate beyond the min and max positions. This should not be used under normal conditions.
- **Search sync. points** – this function deletes all the synchronisation points and the machine is ready to search for and save new synchronisation points.
- **Overwrite position** – allows the machine to be moved from one position to another without moving the machine physically.
- **Display sync. points** – displays a window with all synchronisation points.

Bedding Error

12.00

14:45:05

Calibration points

Sync.	1	0.00	Sync.	11	0.00
Sync.	2	0.00	Sync.	12	0.00
Sync.	3	0.00	Sync.	13	0.00
Sync.	4	0.00	Sync.	14	0.00
Sync.	5	0.00	Sync.	15	0.00
Sync.	6	0.00	Sync.	16	0.00
Sync.	7	0.00	Sync.	17	0.00
Sync.	8	0.00	Sync.	18	0.00
Sync.	9	0.00	Sync.	19	0.00
Sync.	10	0.00	Sync.	20	0.00

Fig. 56

Reduced speed					
1	000.00	000.00	40 %	1-8	
2	000.00	000.00	40 %	9-16	
3	000.00	000.00	40 %	17-24	
4	000.00	000.00	40 %		
5	000.00	000.00	40 %		
6	000.00	000.00	40 %		
7	000.00	000.00	40 %		
8	000.00	000.00	40 %		

Drive wagon

↑

↓

Fig. 57

Perform a calibration

1. Press the **Allow skip positions - key**
2. Move the machine as far back as possible on the rail.
3. Press the **My position** key to set the zero point
4. Press the **Search sync. points key**
5. Move the machine forwards to the maximum position. Avoid stopping. The machine can be run at a reduced speed. This is done by pressing button **D** in short bursts or an arrow key. Never move backwards and forwards past a synchronisation impactor.
6. Press the **Max position** key
7. Press the **Allow skip positions - key**.
8. Move the machine backwards and forwards gently from the Max to Min position a few times. Make sure that Min and Max positions are not exceeded.
9. Put the machine in the parking position and press the **Parking** key.
Press **Show sync. points**.
10. Check whether the sync. points are in ascending order. Calibration is complete.

4.6.6 Reduced speed zones

The speed must also be reduced on bends and difficult sections along the rail. The machine will then move smoothly and the rail will be subject to less stress.

- Position the machine 1 metre before the bend
- Press the **Set machine position** key
- Move the machine past the bend.
- Press the **Set machine position** key
- Enter **Reduced speed** in the field
- Complete for all difficult sections.
- This can be done for up to 24 zones.



Fig. 58

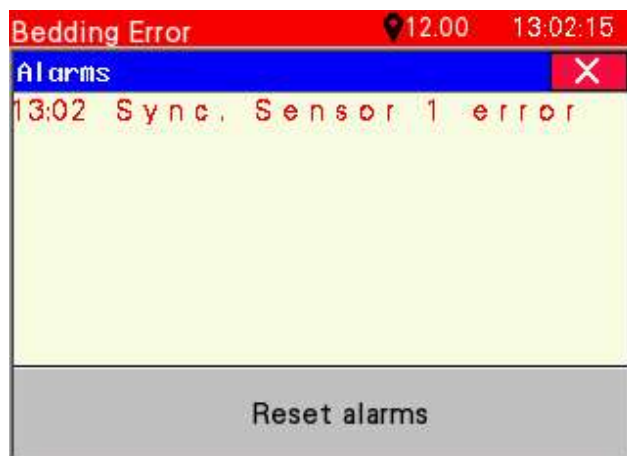


Fig. 59

4.6.7 Language settings

Select display language

4.6.8 Alarm log

The window displays a log of alarms and error messages.

The messages are displayed with date and time.

The latest messages are displayed at the top of the list.

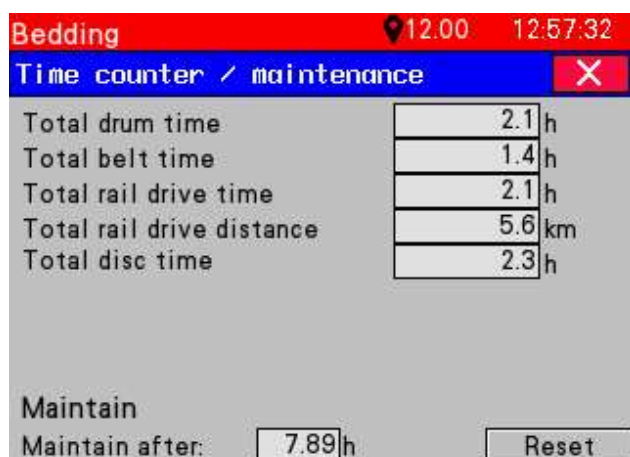


Fig. 60



Fig. 61



Fig. 62

4.6.9 Hour meter

The window displays information about the operating time for the various components in the machine.

At the bottom you can see time to next **Maintenance**.

The maintenance interval for the machine is 10 hours.

When maintenance is performed, the maintenance counter must be **Reset**.

See Chap. 5 for maintenance.

4.6.10 Inputs and Outputs

The window displays inputs and outputs to the PLC in dedicated tabs.

Tab Inputs

Behind every digital input a light indicates whether a signal is present.

- **Green light** – Signal
- **Black light** – No signal

Outputs

Behind every digital output a light indicates whether it is active or not. Activate the output by pressing in the square (**Switch on**).

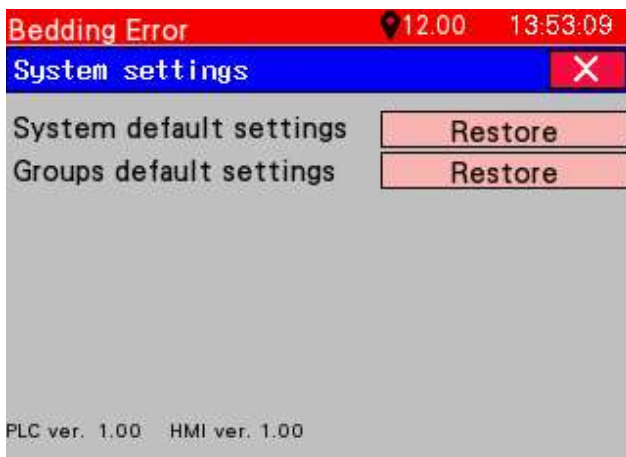


Fig. 63

4.6.11 System settings

The window displays system settings.

- **System default settings** – restores factory settings to the machine.
- **Groups default settings** – restores factory settings to the machine for groups

The program version for the PLC and the screen (HMI) is displayed at the bottom of the window.

5 Maintenance/care and trouble shooting

**NB!**

Always pull out the plug before inspecting, maintaining or repairing the machine.

General information:

This equipment is used in a very exposed and aggressive environment. This will affect the use of the machine and the equipment.

Many different factors can have an impact on this, i.e. location, climate, feed type, humidity, silage agent, ventilation and not least maintenance/cleaning and inspection.

- You should clean the bottom belt, cogwheels, axles and bearing casings as required and at least once a month.
- Do not tighten the bottom belt to tight or askew. Ensure that drive chains are also kept tight. Check them regularly for slack or damage
- Lubricate the bearings every 10. operating hours or at least once a month.
- Lubricate the chain every 3 months.
- Shift the oil in the worm every year.
- The oil in the worm gears should not be exposed to temperatures below minus 30°C. If the machine needs to run normally at below -30°C, contact the manufacturer for advice and guidance
- Ensure that electrical equipment is not subjected to excessive temperature fluctuations. This can lead to condensation and short circuits.
- The drum blades are made from special steel and have precision-milled cutting edges. Check the edges regularly for damage and wear. This is easily done by using an angle grinder, drawing it across the inside of each blade edge. Avoid grinding until the edge turns blue. Be aware of the risk of the spreading material igniting.



5.1 Lubrication

Component / location		Quantity	Action	Operating
1	Grease nipple - bearing operating side bottom belt right	2	Lubrication	10 h
2	Grease nipple - bearing drum right and left	2	Lubrication	10 h
3	Grease nipple - bearing top drum right and left	2	Lubrication	10 h
4	Grease nipple - bearing return roller bottom belt right	2	Lubrication	10 h
5	Grease nipple - bearing suspension front and back	2	Lubrication	10 h
6	Grease nipple - chain bottom belt operation	1	Oil	50 h

Recommended grease: Ruysdael WR2 Q8 oils

Recommended oil: Shell Tivela oil S-220

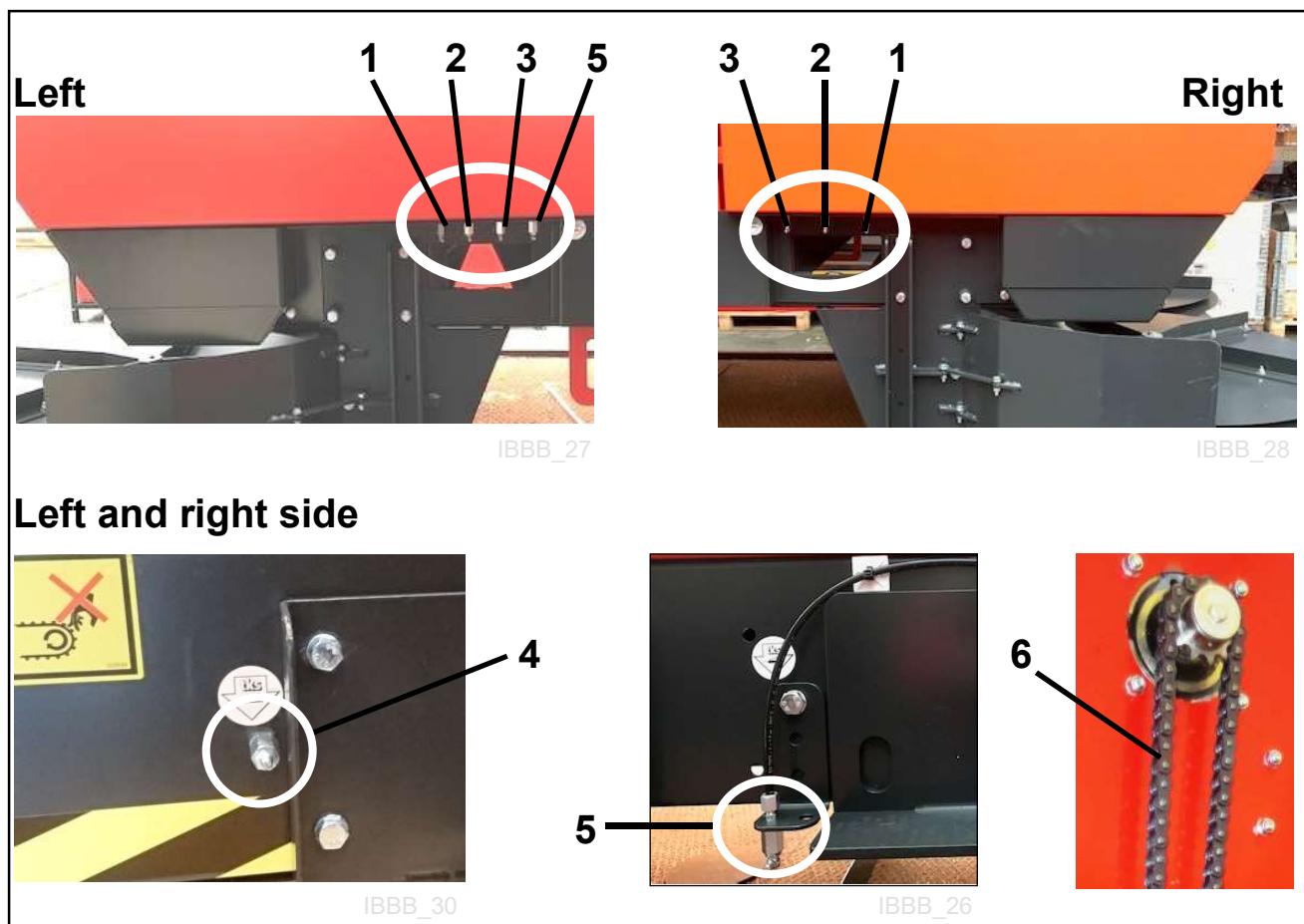


Fig. 64

Oil change on worms

Amount 0,14 litre

AGIP	KLUBER	SHELL	MOBIL
Telium VSF 320	Syntheso D220 EP	Tivela Oil WB	Glygoil 30 SHC 630

5.2 Tightening the bottom belt

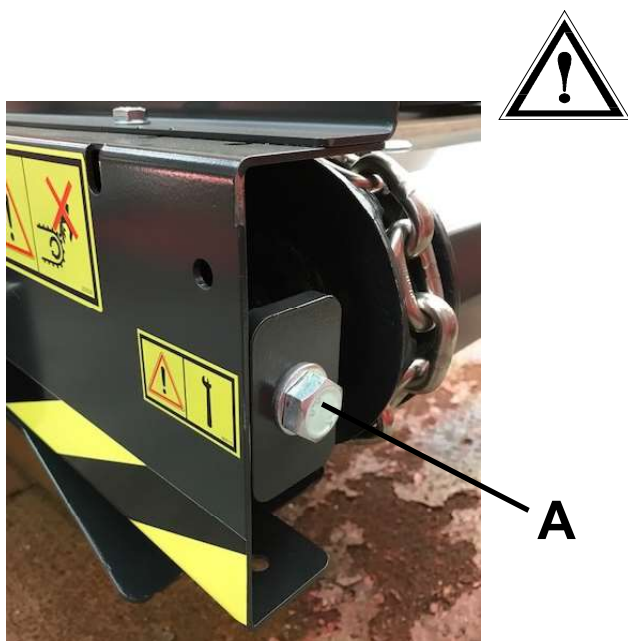


Fig. 65

It is important that the bottom belt is taut
See Fig. 66

This should be checked at regular intervals.
Tightening is performed by turning
tightening screw **A** on the back of the
machine.

See Fig. 65

Important!

Remember to tighten the screws an equal
number of turns on both sides.
Run the bottom belt without any load after
tightening it to check that everything is working
properly.

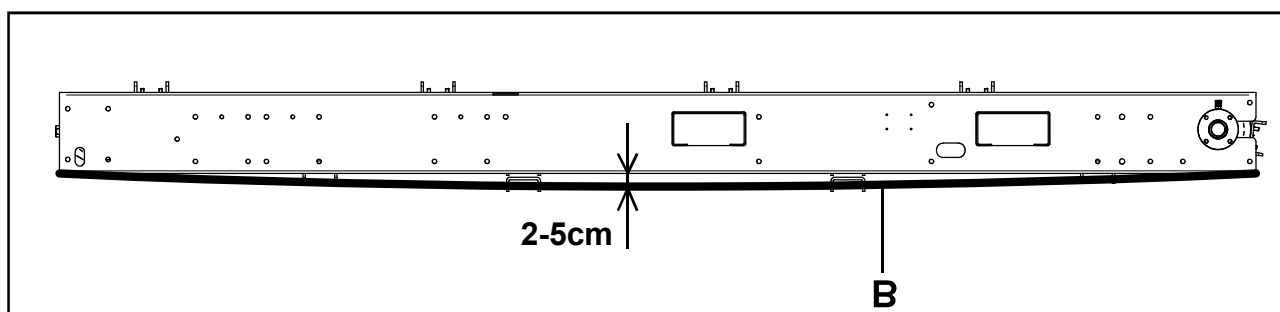


Fig. 66

5.3 Maintenance and inspection of current collector

It is recommended that the current collector is inspected after 1 month of operation, then every year thereafter.

- Sweep the protective membrane along the conductor rail with a brush/sponge
- Remove copper strip and clean
- Clean the current collector wheels.

5.4 Service instructions

NB! Before inspection or during work related to the machine, the following precautionary measures must be observed:



- Turn off the main voltage by using the main switch on the machine
- Disconnect main powersupply or turn off master fuse
- When working under rail-suspended machine, use safetyramp under to prevent crushing.
- Do not work under unsecured machine.

Recommended maintenance cycles:

****1** = Weekly maintenance. Performed by user/service personnel.

****2** = Monthly maintenance. Performed by user/service personnel.

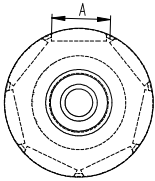
****3** = Annual maintenance. Performed by certified service personnel

****4** = Bi-annual maintenance. Performed by certified service personnel

Deviations with regard to the recommended maintenance cycles may lead to a reduced service lifetime and unwanted stoppages.

Important!

It is recommended to retighten and regularly check the torque of bolted connections (min. once a year)

Component	What to do?	Detail	Item number
Conveyor belt:	**1 Clean chain wheel and axles.		
Measurement A must not exceed 70 mm 	**3 Check chain wheels. Replace these in the event of damage or wear and tear. These should be replaced if the track exceeds 70 mm in length. NB! When replacing the chain wheel, the bottom belt chain and links must also be changed.	Chain wheel (drive wheel) Chain wheel (return wheel)	<ul style="list-style-type: none"> • 273079 • 265018
	**2 Check chain/links for wear and damage A maximum of two links can be removed on each side before the chain must be replaced If the chain wheel is replaced, the chain should also be replaced	Chain 17 links Chain 15 links Links 20 stk	<ul style="list-style-type: none"> • 921471 • 921475 • 921420

	<p>**2 Adjustment of bottombelt. Check bottom belt tracking. Check tracking and slack to be equal on both sides. Normal slack is when whole chain is visible under the machine.</p> <p>NB: When replacing chains, chain wheels should also be changed. Check the chain and chain tensioner. The chain and chain wheel must be oiled at all times. Use appropriate chain oil for this. Check chain wheel for wear.</p>	<p>Drive-side bottom belt</p> <p>Chain lock $\frac{3}{4}$"</p> <p>Chain $\frac{3}{4}$"</p> <p>Chain wheel $\frac{3}{4}$" Z 12</p> <p>Chain wheel $\frac{3}{4}$" Z 28</p>	<ul style="list-style-type: none"> • G50004 • 921483 • 270456 • 273237
	<p>**1 Lubricate all bearings; ensure that the bearings receive lubrication. Minimum 3-4 pumps with grease gun. Inspect all lubrication hoses. Replace defective/damaged lubrication points and hoses.</p>	<p>Recommended grease: Ruysdael WR2 Q8 oils or the equivalent</p>	
	<p>*4 Check the oil level and check for leaks on the gear motor driving the bottom belt. Clean the air plug</p>	<p>Olje: Shell Tivela oil S – 220 eller tilsvarende</p> <p>Gearmotor</p>	<ul style="list-style-type: none"> • 2,1 litre • 262994
Drum:	<p>**3 Inspect/lubricate the bearing for the roller. Turn the drum. Make sure that the blades do not touch the counter knife.</p>	<p>Bearing complete</p>	<ul style="list-style-type: none"> • 273017
	<p>Check the V-belt. Replace these in the event of splintering, cuts, damage, etc.</p>	<p>V-belt</p>	<ul style="list-style-type: none"> • 922267
	<p>**1 Replace damaged or lost blades. Sharpen all blunt blades. From experience, sharpening should take place at least every 200 bales</p>	<p>Blade stainless Carrier stainless</p>	<ul style="list-style-type: none"> • 271278 • 271279
	<p>**2 Check roller screens for damage/wear. Make sure that there is no material/silage between the end of the roller and the side of the generator. Remove unwanted material.</p>	<p>Inner screen</p>	<ul style="list-style-type: none"> • 270045

Top drum:	**3 <i>Inspect/lubricate the bearing for the roller. Turn the drum. Make sure that carriers do not touch the shear bar.</i>	<i>Bearing complete</i>	<ul style="list-style-type: none"> • 273017
	**1 <i>Damaged or lost carriers are replaced.</i>	<i>Carrier Carrier L Carrier R</i>	<ul style="list-style-type: none"> • 271087 • 271271 • 271272
	**2 <i>Check roller screens for wear. Make sure that there is no material between the roller end and guard. Unwanted material should be removed.</i>		
	*4 <i>Check oil level and for leaks on the gear motor. Clean the air plug.</i>	<i>Oil: SHELL Omala S4 WE 320 or equivalent Gear motor</i>	<ul style="list-style-type: none"> • 1,2 litre • 925018
Roof operation: (traverser carriages)	<p>NOTE! <i>At one rail mount, it must be checked that safety chains are in place in order to prevent accidents, should the bearing bolt break.</i></p> <p>**1 <i>Tighten and lubricate the chain. Replace if worn.</i></p> <p>**3 <i>Check the running wheel/running wheel bearing. The spacing between the rail flange and the running wheel</i></p>	<i>Chain Chain link</i>	<ul style="list-style-type: none"> • 921501 • 921502
	**3 <i>Check angle gear (worm) for leaks. Check bolts and their mounting.</i>	<i>Worm</i>	<ul style="list-style-type: none"> • 409025
	**1 NOTE! <i>The thrust bearing (swivel) of a rail must be well lubricated; also check that the suspension bolt pin is in place and well secured.</i>	<i>Bearing Pin</i>	<ul style="list-style-type: none"> • 932002 • 921605
	**3 <i>Check rail suspension. Bolts and connections must be checked and tightened.</i>		

	<p>**4 <i>Inspect, clean and check the functionality of the pulse wheel (transmitter wheel) (minimum pulse wheel diameter = 73 mm)</i></p> <p><i>Check the functionality of the pulse wheel's pressure loading spring. (make sure that the spring pressure is adequate, including at bends)</i></p>	<p><i>Transmitter wheel</i></p> <p><i>Spring</i></p>	<ul style="list-style-type: none"> • 268559 • 921320
	**3 <i>Check worm gear for leaks.</i>	<i>Worm</i>	<ul style="list-style-type: none"> • 409015
Spreader unit:	<p>**1 <i>Clean spreader discs</i></p> <p><i>Make sure that no material is attached to the shaft between the spreader discs and the worm</i></p>		
	<p>**2 <i>Check the spreader blades.</i></p> <p><i>Tighten bolts</i></p> <p><i>In the event of wear, the spreader blades should be replaced</i></p>		
	<p>**3 <i>Check worm gear for leaks.</i></p> <p><i>Check bolts and mountings</i></p>	<i>Worm</i>	<ul style="list-style-type: none"> • 409015
Electrical condition:	<p>*1 <i>Carry out function tests on all emergency stop devices.</i></p> <p>**4 <i>Check cables for breaks, pinching damage, wear, and possible chew marks from mice and rats.</i></p>		
	<p>**4 <i>Check settings of motor protection device (thermal) in accordance with the motor's rating plate.</i></p> <p><i>Start the motor manually. Press and hold the blue button on the protection device until the motor stops. (does not apply to protection devices that are connected to frequency converters)</i></p>		
Conductor rail	**3 <i>Check the copper strips in the conductor rail. If they are corroded, you can contact TKS to rent a cleaning</i>		
	**4 <i>Possibly check whether the heating</i>		
	<i>Check the voltage supply</i>		

6 Alarms and troubleshooting

If a protection device has cut out due to overload, motors **MUST** be allowed to cool sufficiently before restarting (wait a minimum of 20 minutes).

6.1 Alarms on controlbox

In the event of a fault, the alarm window is displayed on the screen.

No	Alarm text	Fault - explanation	Possible error causes	Procedure - error correction
1	Emergency stop	The emergency stop is triggered	<ul style="list-style-type: none"> An emergency has been pressed in "Stop" button on the screen in the control box is pressed 	<ul style="list-style-type: none"> After an emergency stop, the machines working area must be checked. To release all emergency stop switches, twist in the direction of the arrow Reset the alarm
2	Sync. sensor 1 fault Sync. sensor 2	Error on sync. switch 1 (2)	<ul style="list-style-type: none"> Sync. switch1 (2) is not connected or is defective 	<ul style="list-style-type: none"> Connect to the sync. switch Shift the sync. switch
3	Ceiling rail unit error	The control sends a command to move the machine, but no movement is recorded	<ul style="list-style-type: none"> Position counter sensor error or the cables are defective Fault in ceiling rail unit motors The machine has collided with a foreign object 	<ul style="list-style-type: none"> Check position of the position counter sensors and whether the cables are in order Check whether the wheel rolls freely on the rail Check ceiling rail unit motors Check if there are foreign objects in the
4	Ceiling rail unit error direction	The machine is driving in the opposite direction to the sensor counters	<ul style="list-style-type: none"> Ceiling rail unit motors are rotating the wrong way The position counter sensors are connected incorrectly 	<ul style="list-style-type: none"> Contact an electrician and reverse the direction of operation of the motors Change location of the cable to position counter A and B
5	Ceiling rail unit, the machine has moved without operation	The machine is driving in the opposite direction to the sensor counters	<ul style="list-style-type: none"> The machine was pushed by an animal or moved manually 	<ul style="list-style-type: none"> Move the machine to an end point to synchronise the position

6	Synchronisation warning	The synchronisation impactor was struck too far from the point specified (further than 30 cm from the impact)	<ul style="list-style-type: none"> • Incorrect calibration • The synchronisation impactor has shifted out of position or has been moved without being recalibrated • The pulse wheel slips against the rail, is dirty or does not rotate smoothly • The synchronisation sensors or cables are defective 	<ul style="list-style-type: none"> • Perform a new calibration • Check that the pulse wheel rolls freely • Tighten the tension of the spring • Clean the wheel • Replace worn wheel. • Replace the sensors or cables
7	Drum error	The drum does not rotate when the control starts dispensing feed	<ul style="list-style-type: none"> • The drum has stopped because of jammed material • Fuse – F4 has tripped • The V-belts slip or are defective • Drum sensor or cable is defective • Drum sensor has moved out of position • Rotation sensor is not working 	<ul style="list-style-type: none"> • Remove jammed feed • Reduce supply of feed to the drum using bottom belt settings • If the fuse has tripped, the machine must wait 20 min before restarting. Press Reset Alarms and the fuse is automatically reset • Check the V-belts and tension • Check the drum sensor and the cable • Check that the sensor is counting
8	Top drum fault	The top drum does not rotate when the drum should rotate	<ul style="list-style-type: none"> • The drum has stopped because of jammed material • Fuse is turned out • Motor or worm fault 	<ul style="list-style-type: none"> • Remove jammed feed • Reduce supply of feed to the drum using bottom belt settings • If the fuse has tripped, the machine must wait 20 min before restarting. Press Reset Alarms and the fuse is
9	FK1 fault	Fault in the frequency converter for the ceiling rail unit	<ul style="list-style-type: none"> • Incorrect voltage • Overload in the ceiling rail unit motors. 	<ul style="list-style-type: none"> • Check power supply and conductor rail • Check ceiling rail unit motors • Check whether the rail is free of obstructions
10	FK1 fault	Fault in the frequency converter for the bottom belt	<ul style="list-style-type: none"> • Incorrect voltage • Overload in bottom belt motor 	<ul style="list-style-type: none"> • Check power supply and conductor rail • Check whether the bottom belt is stuck. It should rotate freely

11	FK1 Communication fault	<ul style="list-style-type: none"> • Communication fault between PLC and the frequency converter for – ceiling rail operation – FK1 	<ul style="list-style-type: none"> • Communication with frequency converter is lost 	<ul style="list-style-type: none"> • Reset error message and try again • If the error recurs – contact service personnel
12	FK2 Communication fault	<ul style="list-style-type: none"> • Communication fault between PLC and the frequency converter for – the bottom belt - FK2 	<ul style="list-style-type: none"> • Communication with frequency converter is lost 	<ul style="list-style-type: none"> • Reset error message and try again • If the error recurs – contact service personnel
13	Left spreader fault Right spreader fault	<ul style="list-style-type: none"> • Left or right spread is not rotating 	<ul style="list-style-type: none"> • Jammed material • The frequency converter is faulty • Motor or worm is defective 	<ul style="list-style-type: none"> • Remove jammed material. • Reset the frequency converter by resetting the error message. • Check motor and worm
14	Remote control fault – manually stopped	<p>Remote control (control box) lost communication with the machine</p> <p>The machine stops for safety reasons after five seconds The error message will be displayed next time the control box is switched on</p>	<p>Remote control lost communication during manual function:</p> <ul style="list-style-type: none"> • After a function in manual operation was initiated, the screen was shut down • or the on/off button for the control box was switched off • or the battery ran out of charge • or the remote control is too far away from the machine 	<ul style="list-style-type: none"> • When the machine is to be operated manually, the screen must be displayed at all times • Do not switch on/off switch • Make sure the battery is fully charged • Do not move too far away from the machine
15	Maintenance is required	<p>It is time to perform maintenance on the machine</p>	<ul style="list-style-type: none"> • The 10-hour maintenance interval has passed. 	<ul style="list-style-type: none"> • Maintenance must be performed. See Chapter 5 • Once maintenance has been performed, reset the maintenance counter in the menu – Hour meter

7 Recycling - waste to resource -

TKS's products rely on electrical and electronic components in order to work.

These fall under the generic term of EE products. TKS's products use typical components such as cables, switches, motors, control units, etc.

When TKS products are thrown away those components containing contaminants should be treated and sorted in such a way that they do not pollute the environment. Contaminants should be taken care of safely.

Distributors are obliged to accept EE waste from products in the range of goods they sell.

This waste should be kept safe and sent on to an approved waste recipient or treatment plant.

EE waste must be sorted and transported in such a way that it is not damaged or destroyed.

If you need further information on the treatment of EE waste, please contact your distributor.

TKS is a member of Renas.

(National program for the collection/treatment of electrical/electronic waste)

Notes

[illegible]

TKS is a family owned company
with a strong brand name.
We are providing our customers with a
unique and complete range of high
quality products.

www.tks-as.no



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