Operating Manual for Spreaders

Type SW

8/10/12/14/16/18/19/20 MC/TC/SC

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1 Introduction

1.1 General specifications

This operating manual describes the SW 10/12/16 TC/MC/SC unit type.

Type description:

SW 10 TC	Streumaster
S**W** 10 TC	Wirtgen
SW **10** TC	Capacity in m³
SW 10 **T**C	Towed
SW 10 **M**C	Mobile
SW 10 **S**C	Selfpropelled
SW 10 T**C**	Cellular wheel sluice

1.2 Use

Streumaster spreaders are suitable for spreading materials in precisely dosed quantities for each unit of area.

Spreaders are suitable for use in the following climatic zones:

Category	Description	Temperature (operational)	Temperature (storage/transp.)	Rel. humidity
A1	extremely hot and dry	+32 °C to +49 °C	+33 °C to +71 °C	8% to 3%
B2	damp and hot	+26 °C to +35 °C	+30 °C to +63 °C	100% to 74%
	Thermal radiation:	solar radiation up to 1000 W/m²		
	Dust/sand/ snow:	severe occurrence of dust and sand		
	Operational height:	no limitation		

1.2.1 Correct use

Streumaster spreaders are suitable for spreading materials in precisely dosed quantities for each unit of area. The material should be in a powdery condition, e.g.:

- hydraulic cement conforming to DIN 1060
- lime powder conforming to DIN 1060
- hydrated lime conforming to DIN 1060
- eminently hydraulic lime conforming to DIN 1060
- other soil stabilisation media used for soil improvement and stabilisation in building mixtures.

WARNING
Spreading of newly-developed binding agents and soil stabilisation media not approved by STREUMASTER requires our express permission. The guarantee is rendered null and void in the event of non-compliance.

NOTE

The max. temperature of the spreading material when filling should not be over 70°C.

1.2.2 Incorrect use

Streumaster spreaders are not suitable for spreading:

- granulate material
- loose chippings
- gravel
- liquids and semi-liquid materials
- pasty materials
- materials that do not aid soil improvement and stabilisation in building mixtures
- flammable or explosive material.

2 Safety

2.1 General risks associated with failure to observe safety instructions

This operating manual provides important information on prerequisites for safe and efficient working with the unit. The operating manual should be accessible to persons operating this unit.

Read the operating manual carefully prior to commissioning and observe its instructions.

Persons entrusted by the unit operator with operation, service and maintenance of the unit must be familiar with the contents of the operating manual. All instructions must be observed, particularly safety instructions. It is recommended that the user company or business have this confirmed in each case.

In addition to the operating manual, generally-valid legal and other regulations regarding accident prevention and environmental protection in the respective country of use apply.

The following are explanations of symbols used in this operating manual. The explanations of these symbols should be read carefully to ensure they are understood.

CAUTION
indicates working or operating procedures that should be adhered to exactly to rule out any risk to persons.

WARNING
indicates working or operating procedures that should be adhered to exactly to avoid damage to or destruction of the unit.

NOTE
indicates technical requirements and important information which should be given particular attention.

Other instructions

Pictographs, instruction signs and markings applied directly to the unit, e.g.

- rotation direction arrow
- markings on connection cables
- markings on fluid connections
- warning pictographs
- maintenance pictographs

must be observed and maintained in a fully-legible condition. They should be renewed as necessary.

2.2 Safety-conscious work

The unit should only be run and operated by trained and authorised personnel.

Responsibilities relating to the operation of the unit must be clearly defined and complied with to ensure that there are no ambiguous areas of competence relating to safety.

Working instructions in the operating manual relating to operation, conversion, maintenance and repair should be observed. This applies in particular to work on electrical, pneumatic and hydraulic equipment, which should only be carried out by skilled personnel.

2.2.1 Requirements for user/operator

Operating and maintenance personnel should have read and understood the operating manual.

The operator should be qualified to operate the unit correctly in accordance with the instructions for use and after reading the operating manual.

It is particularly important that the operator should be capable of identifying risks associated with use of the unit.

The operator should only use the unit in a flawless technical condition.

The operator is responsible for other persons in the workplace.

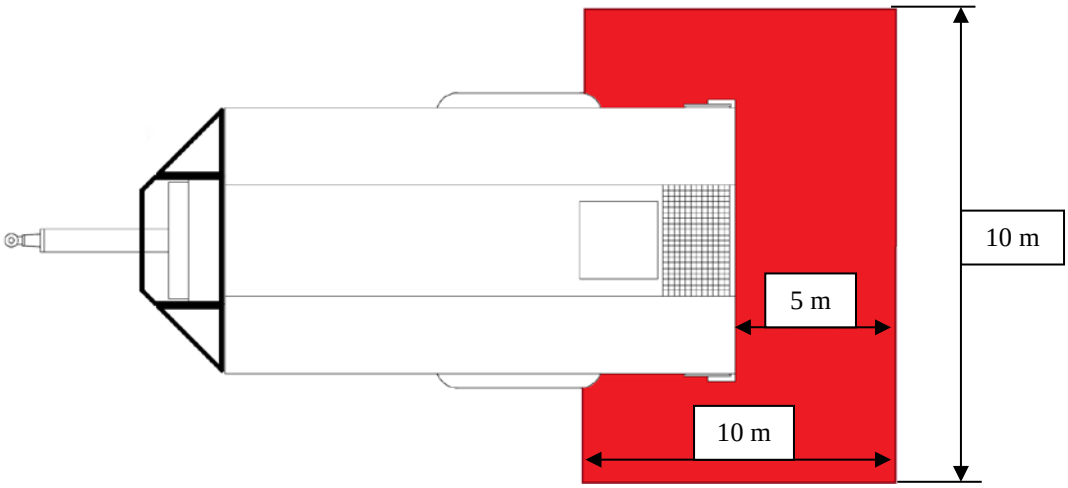


Fig. 2-1 Danger area

2.2.2 Requirements of the owner

The owner of the unit is obliged to provide the unit operator with the associated operating manual. The owner is responsible for ensuring that the operator has read the operating manual carefully and understood it. The operating manual should be accessible at all times and kept by or transported with the unit.

CAUTION
The owner should compile operating instructions for handling lime and cement dust and make these available to operating personnel. *TRGS 555 (Technical Rules for Hazardous Substances) provides recommendations on the contents and form. The sample operating instructions "Use of white lime powder for soil mortar work" (Issue 7.1996) should also be observed.*

The owner of the unit should ensure that unauthorised persons are prevented from using the unit.

NOTE
The owner is generally obliged to monitor the health of his/her personnel through occupational medical examinations.

2.2.3 Personal safety measures, safety equipment

The following personal safety equipment is required when working with the unit and material (filling, spreading, cleaning):

- Eye protection – enclosed safety glasses (goggles), see also BGR 192
- Hand protection – safety gloves with long cuffs made of waterproof material (e.g. natural rubber, butyl rubber or Viton) that lie close to the wrists
- Skin protection – use greasy skin protection cream for all uncovered body parts
- Respiratory protection – in cases where limits are exceeded: wear at least an FFP 2 (filtering face piece) particle filtering mask. The rules in BGR 190 "Use of respiratory equipment" should be observed when selecting and using respiratory equipment
- Protective clothing – it is recommended that a one-piece disposable protective overall be worn which protects normal clothing from dust.

NOTE
Personal safety measures and safety equipment used abroad should comply with the laws and regulations in force in the respective country. See respective safety data sheet for first aid measures.

2.3 General safety instructions

NOTE

The delivered safety manual has to be read before operating and has to be kept close to the unit.

CAUTION
Accident prevention and occupational safety regulations of the responsible employer's liability insurance association should be observed.

CAUTION
Service and maintenance work should only be carried out by authorised skilled personnel. Special hazards associated with, for example, work on electrical, hydraulic or pneumatic systems should be observed.

CAUTION
Relevant accident prevention and safety regulations and specifications in the machine documentation and additional documents should be observed.

CAUTION
When working on pneumatic units or elements, hydraulic units or elements, ensure that these are relieved of pressure beforehand to prevent injuries, explosions or fire hazards.

CAUTION
Damaged and removed instruction and warning signs and safety notices should be replaced immediately.

CAUTION
All cleaning, maintenance and repair work should only be carried out when the machine is shut down and the hydraulic pump switched off. The vehicle should also be secured against rolling. This can be done with the parking brake and/or restraining shoes (wedges).

CAUTION
The manhole on top of the conveyor is used as a service hatch and should only be opened by instructed personnel for cleaning purposes. Pressure should be equalised with the atmosphere prior to each opening.

CAUTION
When working in the conveyor, a person or suitable signs should ensure that the vehicle cannot be started while there is a person in the conveyor.

CAUTION

Protective glasses should always be worn when working with the unit and material.

Special safety measures (e.g. use of personal safety equipment) should be taken if, when opening closures and couplings, a risk of material emerging can be expected.

Always observe the safety data sheet for the respective material involved!

CAUTION
All protective and safety equipment removed should be mounted correctly again and its functionality checked on completion of maintenance work. Unilateral conversions or modifications to the unit impair the safety of operating personnel and the unit and are prohibited.

CAUTION
The removal or bypassing of protective and safety equipment is prohibited.

WARNING
Pressure relief valve settings should not be changed permanently. This may damage the hydraulics.

WARNING
Spare parts should meet the technical requirements of Streumaster Maschinenbau GmbH. Use only original spare parts.

CAUTION
No other persons should be on the vehicle outside the driver's cabin unit during driving and spreading.

CAUTION
It is forbidden to remain in the hazard zones of vehicles, particularly between the tractor vehicle and spreader (in the case of TC models) or in areas which are not visible to the driver.

CAUTION
Ensure prior to spreading that no persons are present in the spreading zone. There is a risk of injury caused by the material!

CAUTION
Spreading without dust protection or with the discharge chamber door open during spreading itself is forbidden.

CAUTION

The material should only be spread on ground with a suitable load bearing capacity. Check the load carrying capacity and collapse edges of terrace-like surfaces prior to spreading.

NOTE

Where documentation from a supplier is mentioned in this operating manual, all safety instructions in the aforementioned supplier documentation should be observed in addition to the safety instructions in this operating manual.

NOTE

The spreader documentation should be accessible to all installation, commissioning, operating, maintenance and dismantling personnel for the entire duration of use.

2.4 Safety stickers

NOTE

A detailed description of the individual safety stickers can be found in the safety manual.

The following stickers are attached to the machine:

Fig. 2-2 Safety stickers

1			7		
2			8		
3		Only for SW..TC	9		Only for SW..TC
4		Only for SW..TC without auxiliary engine	10		Only for compressor
5		On hydraulic tank and for auxiliary engine	11		Only for auxiliary engine

6  Only for auxiliary engine

12  Does not apply for automatic dedusting filtration plant

Fig. 2-3 Safety stickers

1 

2 

3 

4 

5 

6 

7 

8 

Only for SW..TC

NOTE

Stickers which can no longer be read or have been lost are to be replaced.

3 Description

NOTE
Illustrations used in this manual may differ from the actual appearance of the unit.

3.1 General specifications

The Streumaster consists of two main modules:

- the chassis and carrier vehicle
- the superstructure.

NOTE
The chassis and superstructure are available in different versions and with different additional equipment. These are described in greater detail in the respective sections of the manual.

3.1.1 Overall views

Fig. 3-1 Front and left view

1	Inspection cover, chain channel, front	6	Chassis
2	Drawbar	7	Ventilation pipe
3	Conveyor chain deflection roller and tensioning device	8	Lateral compartment, left
4	Lateral inspection cover, front	9	Container
5	Filling device, left		

Fig. 3-2 Rear and right view

1	Fixing hook for access ladder	7	Hydraulic lines
2	Working headlights (option)	8	Filling device, right
3	Discharge chamber for the material	9	Hydraulic oil tank
4	Lateral distribution	10	Lateral compartment, right
5	Spreading unit	11	Ladder for access
6	Dust protection		

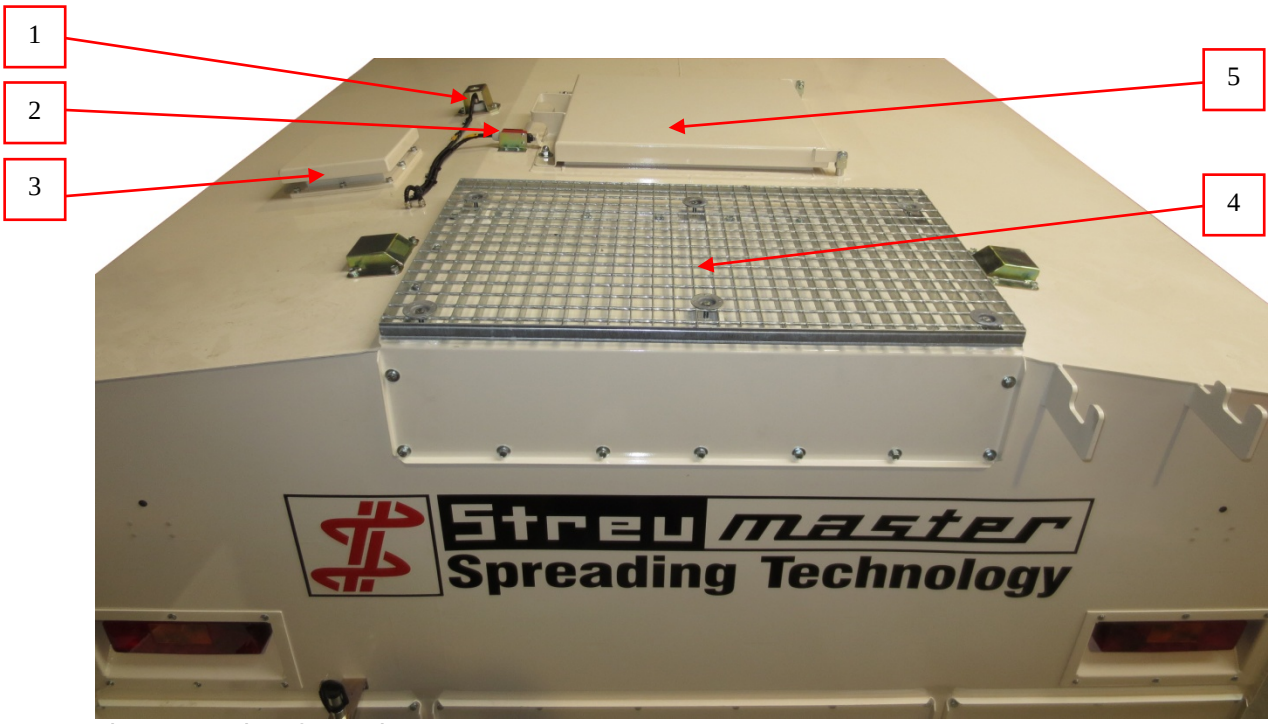


Fig. 3-3 View from above

1 Level indicator "Container full"
2 Manhole cover safety switch
3 Overpressure valve for container
4 Grate
5 Manhole cover

3.2 Technical data

3.2.1 Rating plate

The rating plate is fixed to the front right-hand side of the frame. The factory number is also embossed on the frame.

Fig. 3-4 Rating plate

1 Manufacturer
2 Type (unit type)
3 Factory number
4 Year of construction
5 Container capacity in m³
6 Empty weight
7 Permissible overall weight
8 Permissible axial load
9 Permissible tongue load

3.2.2 Dimensions and weights TC models

Dimensions and weights	Type SW 10	Type SW 16
Overall length		
• superstructure only	5000 mm *	6500 mm *
• compl. with chassis	6700 mm	8200 mm
Overall width		
• superstructure only	2540 mm *	2540 mm *
• compl. with chassis and serial tyres	2670 mm	2770 mm
Height		
• superstructure only	1860 mm *	2030 mm *
• compl. with chassis and serial tyres	3050 mm *	3250 mm *
Container capacity in m³	10 m³ *	16 m³ *

* deviations are possible in special versions

Dimensions and weights	Type SW 10	Type SW 16
Empty weight **		
• superstructure only	3700 kg	4900 kg
• compl. with chassis and serial tyres	5200 kg	7600 kg
Permissible overall weight		
• with ROCKINGER drawbar	12000 kg	24000 kg
• with HITCH drawbar	13000 kg	
Permissible tongue load		
• with HITCH drawbar	3000 kg	3000 kg
• with ROCKINGER drawbar	2000 kg	
Permissible axial load		
• with HITCH-/ROCKINGER drawbar	10000 kg	18000 kg

** the empty weight can differ, depending on the equipment involved.

3.2.3 MC model dimensions and weights

The dimensions and weights of the MC model purchased differ depending on the carrier vehicle (please refer to the vehicle registration book).

3.3 Technical description

3.3.1 Filling device

The spreader is equipped for pneumatic filling of the container with one filling device on each container side.

The venting ball valve serves for ventilation of the filling hose before uncoupling. This reduces a possible residual pressure in the filling hose. The venting ball valve must be closed during the filling procedure.

WARNING

Before the filling procedure, please make sure that the spreading material to be filled does not exceed the maximum admissible temperature of 70° C.

Filling with too much pressure can lead to damage to the material. The maximum filling pressure of the container must not exceed 1.0 bar.

Each filling device has an indicator lamp "Container full" which is controlled by the level indicator "Container full". If the level indicator "Container full" comes in contact with spreading material, both indicator lamps will light up simultaneously.

3.3.1.1 Filling device 3"

1 Filling pipe
2 Shut-off ball valve
3 Venting ball valve
4 Connection coupling

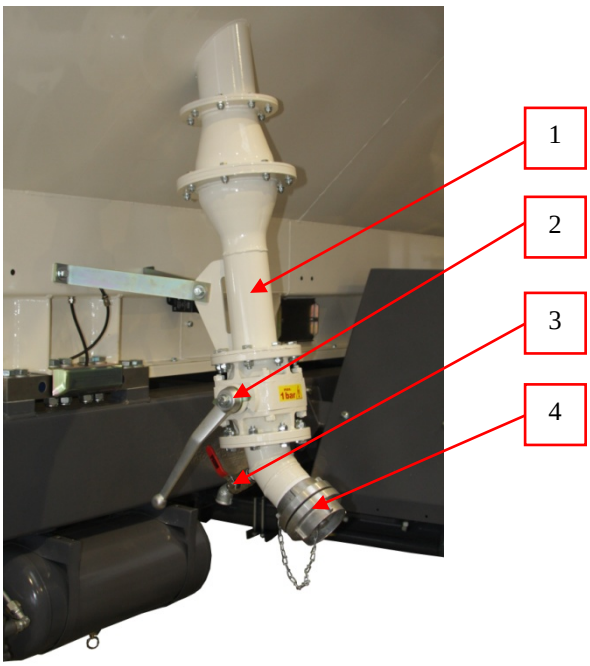


Fig. 3-5 Filling device 3"

3.3.1.2 Filling device 4"

1 Filling pipe
2 Shut-off ball valve
3 Venting ball valve
4 Connection coupling

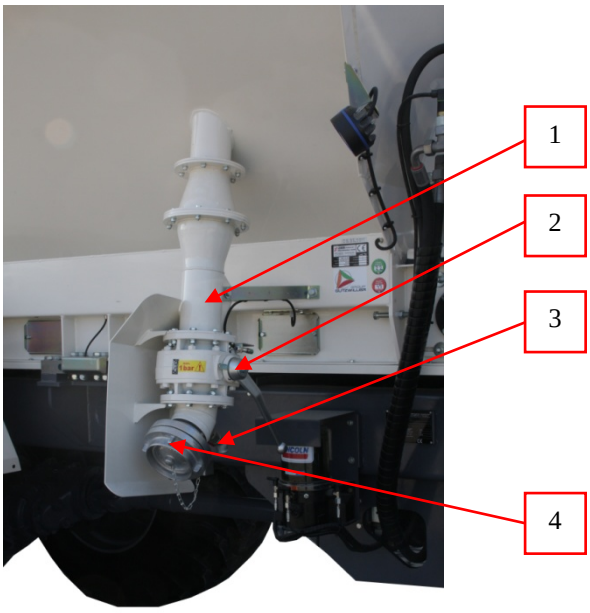


Fig. 3-6 Filling device 4"

3.3.1.3 Filling device 4" "Highspeed"

The filling device 4" "Highspeed" optimally spreads the spreading material via a distribution system in the container.

From the outside the filling device is identical to the filling device 4"

1 Longitudinal distributor pipe
2 Pressure balance pipe
3 Supply from filling tube

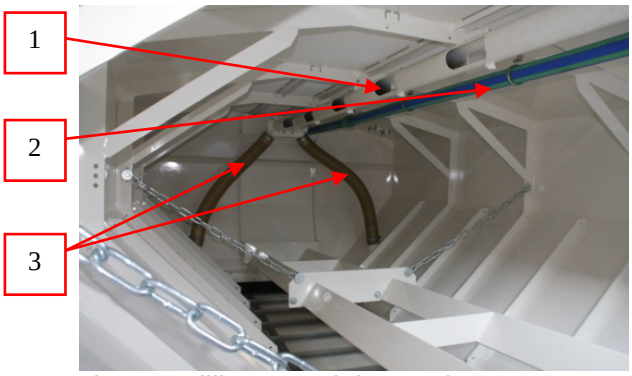


Fig. 3-7 Filling 4" "Highspeed"

3.3.1.4 Dome cover

The machine can be equipped with dome covers at the top side of the container to enable filling from above (silo or bags).

1 Dome cover
2 Closures
3 Step grid
4 Safety switch

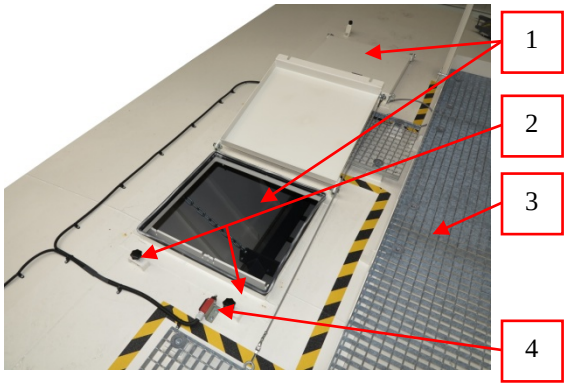


Fig. 3-8 Dome cover

CAUTION

There is danger of falling when working at the top of the container. The step grids must not be left.

WARNING

When filling with bags please make sure that no packaging enters the container. The moveable components could be blocked and the cells of the dosing sluices damaged.

Procedure for opening the dome covers:

1. The star handle must be loosened in order to open the closures. The closing flaps can then be turned.

2. The cover is opened via the handle. Alternatively the expander can be used to pull it upwards.

Fig. 3-9 Dome cover

3. Open the dome cover completely so that it can no longer be closed by the expander.

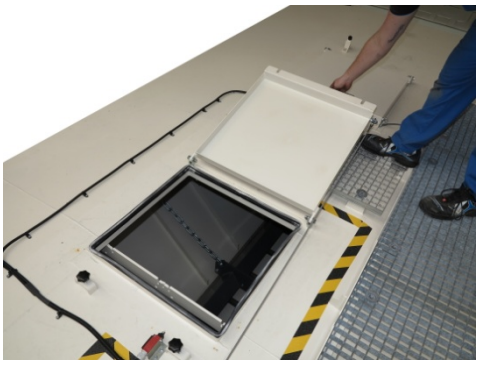


Fig. 3-10 Dome cover

Procedure for closing the dome cover:

1. Pull the expander in order to lift the dome cover slightly
2. Hold the expander firmly as soon as the dome cover closes independently due to the return.
3. Turn the closing flaps again and tension with the star handle.

Fig. 3-11 Dome cover

NOTE

Spreading is not possible until all dome covers have been closed (safety switch enabled).

3.3.1.5 Container filling for big bag filling

It is possible to equip the machine with an opening at the container surface and to enable filling from above (big bags).

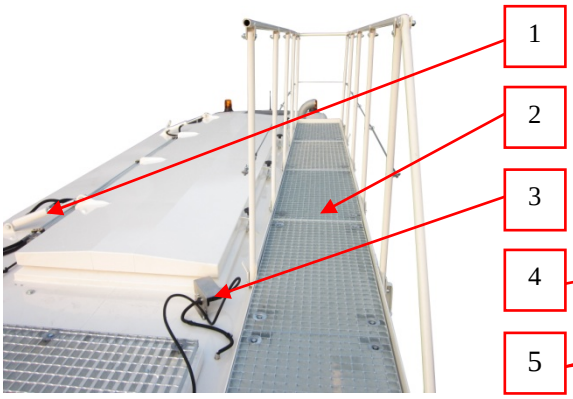


Fig. 3-12 Opening closed

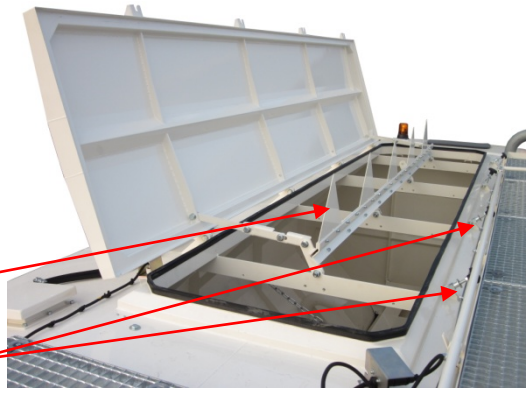


Fig. 3-13 Opening open

1	Hydraulic cylinder	4	Slitting knife
2	Step grids	5	Closures
3	Connection remote control		

The cover is hydraulically operated. For this purpose the additional valve must be activated in the operating device.

1. Activate additional valve in “Settings 1”
2. Climb on the container
3. Insert remote control
4. Open closures
5. The cover can now be operated by means of the remote control.

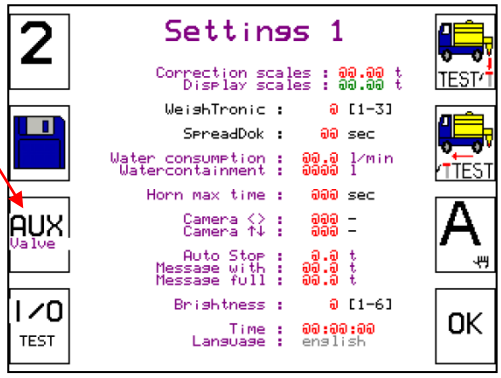


Fig. 3-14 1

CAUTION

There is danger of falling when working at the top of the container. The step grids must not be left.

CAUTION

When filling with big bags it must be ensured that no packaging enters the container. The movable components could be blocked and the cells of the dosing sluice damaged.

3.3.2 Container ventilation

The container is ventilated via the ventilation pipe and / or optionally via the hose filter or the ventilation filter unit.

3.3.2.1 Ventilation pipe

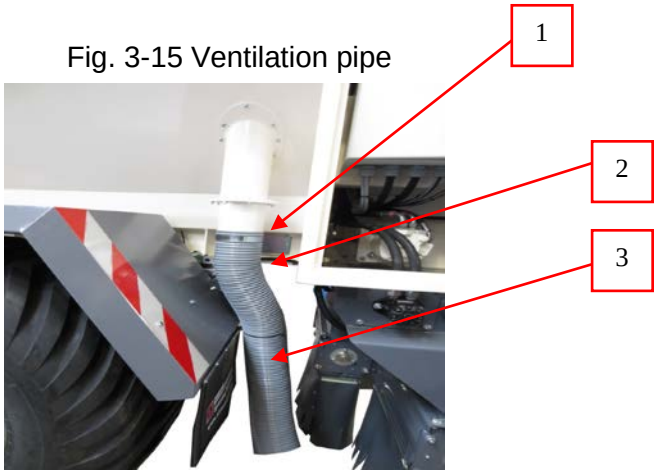
The ventilation pipe is located at the rear left side of the container. The ventilation pipe ends in the interior of the container, shortly below the container surface, in the area of the rear overpressure valve. Please unscrew the overpressure valve for inspection and cleaning work.

1 Mounting flange

2 Removable section

3 Spiral hose

Fig. 3-15 Ventilation pipe



3.3.2.2 Hose filter

A ventilation filter connection can be used instead of the spiral hose. A filter bag or a hose can be connected to it via the coupling.

Fig. 3-16 Hose filter

1 Ventilation connection
2 Connection hose
3 Hose filter

1 Mounting flange
2 Coupling for hose filter

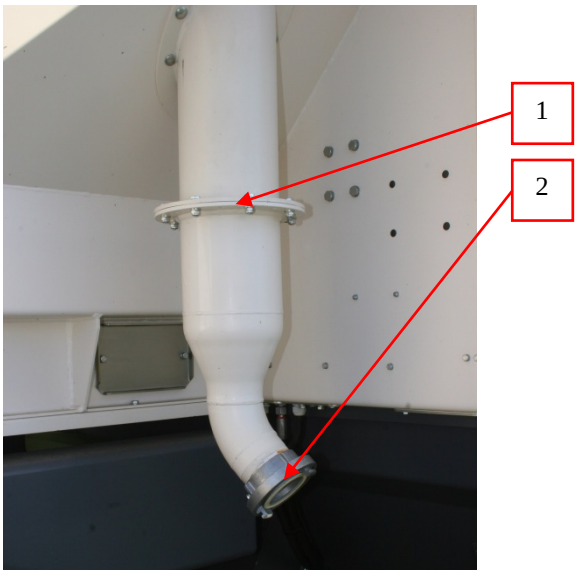


Fig. 3-17 Ventilation pipe

CAUTION

Filling must never be carried out with closed coupling!

3.3.2.3 Dust separation filter

The dust separation filter cleans the exhaust air during the filling procedure.

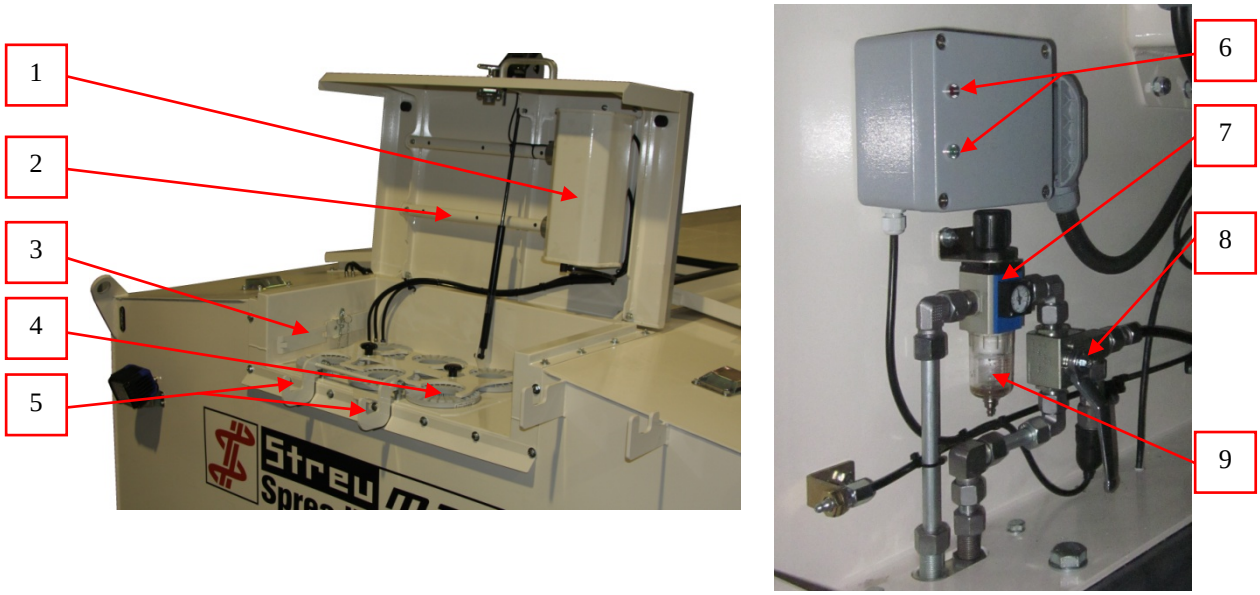


Fig. 3-18 Dust separation filter

1	Compressed air chamber	6	Power box with status LEDs
2	Dedusting pipes	7	Pressure reducer with manometer
3	Key for filter cartridges	8	Directional ball valve
4	Filter cartridges	9	Water separator
5	Fixing hook for access ladder		

The dust separation filter disposes of an automatic dedusting. For this purpose half of the filters are alternately cleaned by means of an air pressure impact.

As soon as a pressure of approx. 5 bar is reached, the green LED will light up and the plant is ready for operation. If the ball valve is opened during filling, the sensor will recognise the contact plate and the dedusting of the filters will be started.

If the air pressure in the system falls below 5 bar, the red LED will light up and the dedusting will be stopped. As soon as the pressure is sufficient again, the system will continue automatically.

If the ball valve is closed at the end of filling, the unit will continue running for approximately another minute for dedusting.

The pressure reducer limits the pressure to approx. 6 bar and protects the unit from damage.

Check the water separator on a regular basis and discharge the water with the knurled screw.

1 Sensor
2 Contact plate
3 Ball valve for filling

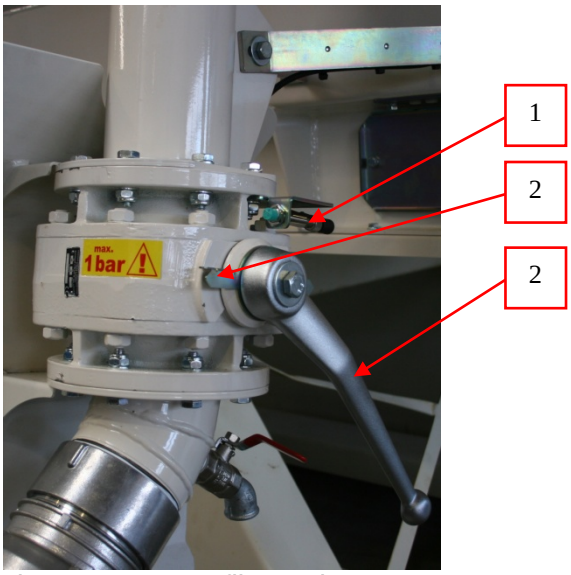


Fig. 3-19 Sensor filter unit

3.3.3 Stop valve

The stop valve is located in the discharge chamber above the conveyor chain. It is used to close the container during the filling procedure to prevent the material flowing out. The stop valve is opened and closed with a hydraulic cylinder.

The stop valve should be opened completely during spreading. The position of the stop valve is monitored by proximity switches and indicated on the control panel in the driver's cabin.

1 Hydraulic cylinder
2 Proximity switch “Slide gate open”
3 Proximity switch “Slide gate closed”
4 Slide gate
5 Rubber apron

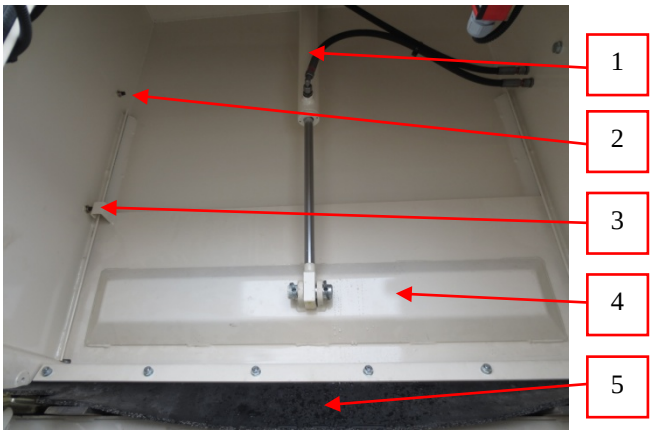


Fig. 3-20 Slide gate

The stop valve is opened automatically when the discharge is activated. The conveyor chain is only activated when the stop valve leaves the "Stop valve closed" position.

The stop valve is closed automatically when the discharge is deactivated.

The proximity switches should be checked and adjusted, or if necessary replaced, if the positions of the stop valve are not indicated on the control panel. The switching distance of proximity switches is 2-8 mm.

The rubber aprons should be replaced if excessive wear is detected.

3.3.3.1 Conveyor chain

The conveyor chain conveys the material into the discharge chamber at the rear of the container and from there to the filling shaft. The continuously-adjustable conveying speed can be used to adjust the volume of material conveyed into the filling shaft.

1 Transport bars (welded with conveyor chain)

2 Wear plates

3 Conveyor chain

Fig. 3-21 Conveyor chain

The conveyor chain is practically maintenance-free and only requires inspection of the chain tension.

The conveyor rails on the conveyor chain run on two stainless steel wear rails with a thickness of 10 mm. The wear rails should be inspected regularly to ensure that their condition and level of wear is acceptable and replaced at the latest when they have a residual thickness of 5 mm (measured at the thinnest point).

More detailed information can be found in the maintenance instructions.

1 Container base

2 Return pulley front

3 Wear strips

4 Return rails

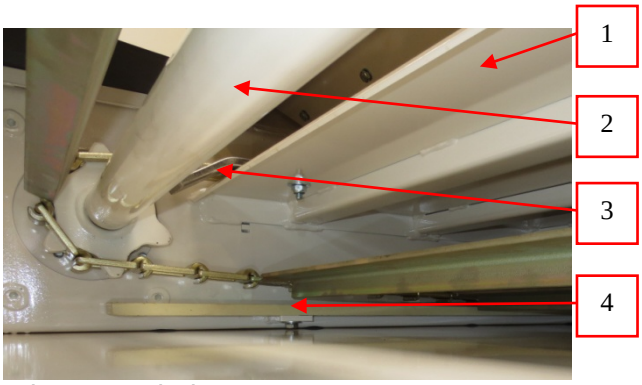


Fig. 3-22 Chain return

The return rails on which the conveyor chain runs in the lower section are made of flat steel with a thickness of 15 mm. The return rails should be inspected regularly to ensure that their condition and level of wear is acceptable and replaced at the latest when they have a residual thickness of 10 mm (measured at the thinnest point).

More detailed information can be found in the maintenance instructions.

NOTE

The lower part of the chain channel is the part of the chain channel in which the return rails are located.

The drive shaft is powered by a left and right-hand hydraulic motor. An HRC coupling serves as a connection element between the motor and drive shaft. The flexible coupling gear rim should be checked at regular intervals to check its condition and level of wear.

The lubricating device has been extended at the edge of the side compartment with a hose and lubricating nipple to improve accessibility. More detailed information can be found in the maintenance instructions.

1 Torsionally flexible coupling

2 Hydraulic motor

3 Lubrication device storage drive shaft

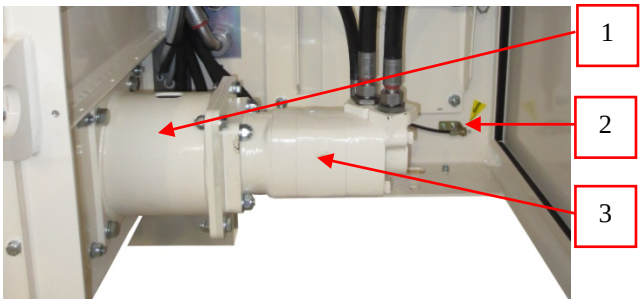


Fig. 3-23 Drive conveyor chain

The space around the tail-end roller should be inspected regularly for lumps and solidified binding agent and cleaned if necessary.

Powdered material also penetrates the conveyor chain links which become stiffer over time. In order to maintain the flexibility of the conveyor chain, the conveyor chain must be kept running for a few minutes with the container empty on a daily basis.

More detailed information can be found in the maintenance instructions.

WARNING
Extreme stiffness or even blockage of the conveyor chain may result if the chain channel is filled too heavily with material.

3.3.4 Relief roof

There is a relief roof in all containers located above the conveyor chain and fixed with chains to the container reinforcing elements. It prevents the full weight of the material resting on the conveyor chain.

1 Relief roof
2 Supporting chains
3 Conveyor chain

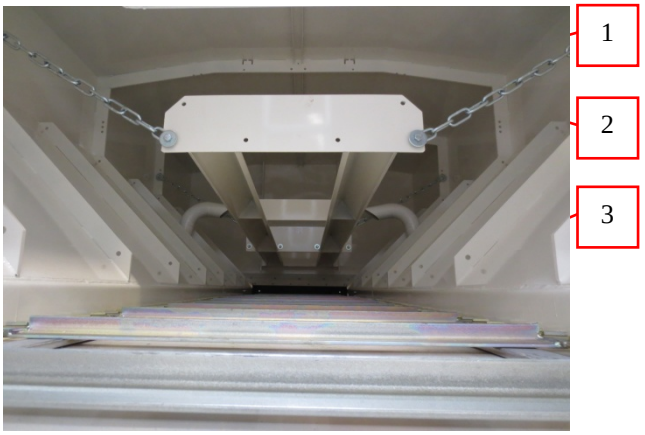


Fig. 3-24 Relief roof

3.3.5 Filling shaft with transverse augers

The filling shaft with the two transverse augers is bolted into position below the discharge chamber and acts as a material storage space for the three dosing channels bolted below onto the filling shaft.

1 Auger front
2 Auger rear
3 Hydraulic motor

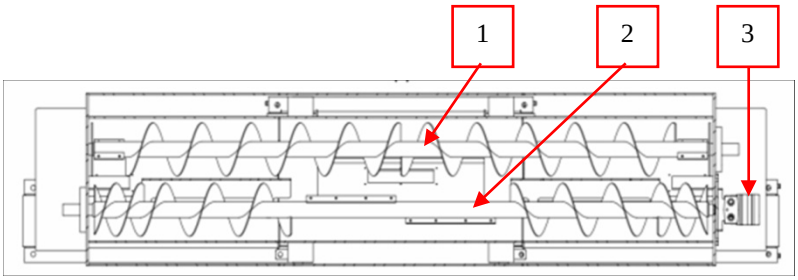


Fig. 3-25 Filling shaft with transverse augers (view from above)

The spreading material from the discharge chamber is spread across the entire width with the help of the two transverse augers in the filling shaft. The front auger conveys the material to the outside, the rear auger conveys it back to the inside. The material is thus loosened at the same time.

The transverse augers and conveyor chain operate at a speed adapted to suit the dosing channels. The transverse augers and conveyor chain can be activated and deactivated via the level indicator.

WARNING
Obstacles in the transverse augers can lead to damage.

The filling shaft and transverse augers should be checked daily. Solid material, stones or other obstacles should be removed if necessary.

3.3.6 Dosing channel (spreading auger)

The spreader is equipped with three identical dosing channels.

The "Evolution" dosing channel consists of a slightly oval housing and a rotor core with cured-on rubber profiles. The slightly oval shape of the housing warps the individual rubber profiles as they rotate, the advantage being that adherences are avoided or loosen by themselves. This in turn ensures constant maintenance of the set spreading quantity.

Depending on the operational conditions it is necessary to clean the dosing channel outlet in periodic intervals. More detailed information can be found in the maintenance instructions.

NOTE
Wear on the seal lips and, consequently, the service life of the rotor depends on the material and operation.

If the sealing lips are worn and therefore the dosing channel is leaking, the housing can be readjusted once before the rotors have to be replaced.

CAUTION
Switch off the carrier vehicle motor during inspection and cleaning work to shut down the hydraulic pump. Wear personal safety equipment.

CAUTION
During inspection and cleaning work, switch off the motor of the carrier vehicle so that the hydraulic pump comes to a standstill. Shut down the drive, remove the key and wear personal protective equipment.

3.3.6.1 Spreading unit D230 (evolution)

The rotary valves of the spreading unit D230 have an outer diameter of 230 mm. The rotors are available with 10 and / or 20 cells.

Each dosing sluice is driven by a separate, external hydraulic motor. The speed of the hydraulic motors can be changed via the operator terminal at any time. Each hydraulic motor can be switched on or off individually under load.

The shaft of the hydraulic motor is directly inserted into the hollow shaft of the rotor core. Each dosing sluice is hydraulically protected against overload. This protects the rotor core against severe damage in case of penetration by foreign bodies.

The rotor shaft is depicted as hexagonal at the opposite end of the hydraulic motor. Here the rotor can be turned **against the direction of rotation** (clockwise) with the help of a key SW 32 in order to remove any foreign bodies.

In addition, there is an inspection cover in the filling shaft, in the middle above the dosing sluices where the inspection and cleaning work is carried out.

The dosing sluices D230 (10 cells) enable a spreading quantity of 3-42 L/m² with a driving speed of 2 km/h.

1 Housing

2 Dosing rotor

3 Chamber for binding agent

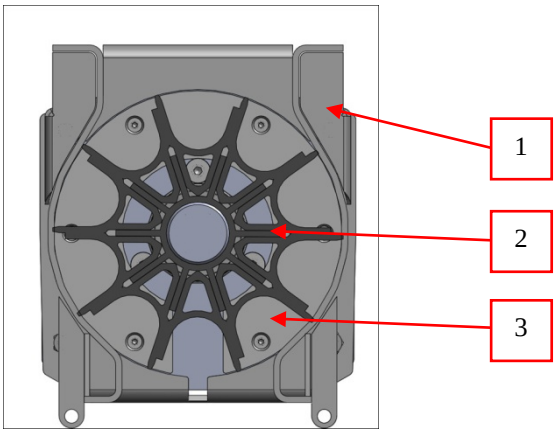


Fig. 3-26 Spreading unit D230 (10 cells)

The dosing sluices D230 (20 cells) enable a spreading quantity of 1-10 L/m² with a driving speed of 2 km/h.

1 Housing

2 Dosing rotor

3 Chamber for binding agent

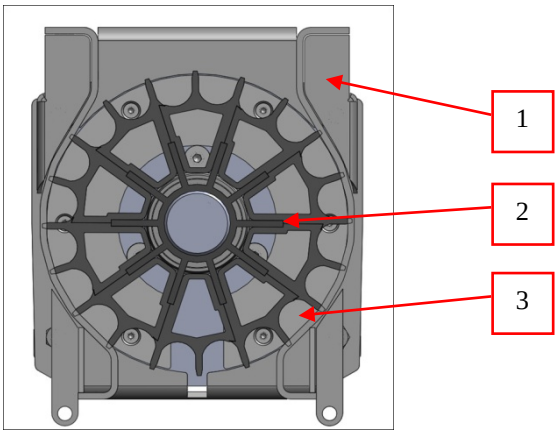


Fig. 3-27 Spreading unit D230 (20 cells)

3.3.6.2 Spreading unit D410 (evoquant)

The rotary valves of the spreading unit D410 have an outer diameter of 410 mm. The rotors always have 17 cells.

Each dosing sluice is driven by a separate, internal hydraulic motor. The speed of the hydraulic motors can be changed via the operator terminal at any time. Each hydraulic motor can be switched on or off individually under load

The shaft of the hydraulic motor is inserted directly into the hollow shaft of the rotor core. Each dosing sluice is hydraulically protected against overload. This protects the rotor core against severe damage in case of penetration by foreign bodies.

The dosing sluices D410 enable a spreading quantity of 5-60 L/m² with a driving speed of 2 km/h.

1 Housing

2 Dosing rotor

3 Chamber for binding agent

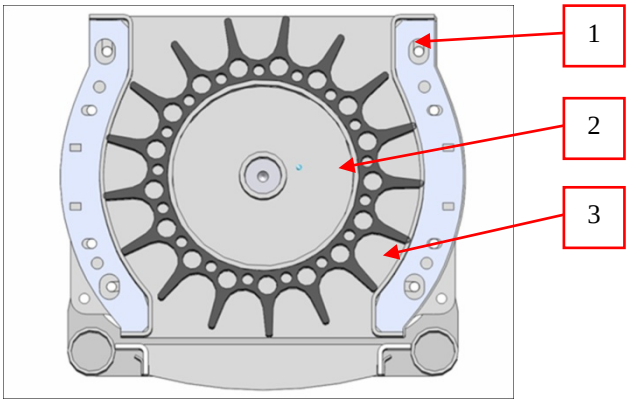


Fig. 3-28 Spreading unit D410

3.3.7 Lateral storage compartments

The lateral storage compartments enable the storage of tools, equipment, etc. and are possible in two variants.

NOTE

The lateral storage compartments are not dust-proof!

3.3.7.1 Storage compartments with canopy covering

1 Canopy closure
2 Rain protection guide rail
3 Canopy
4 Storage compartment

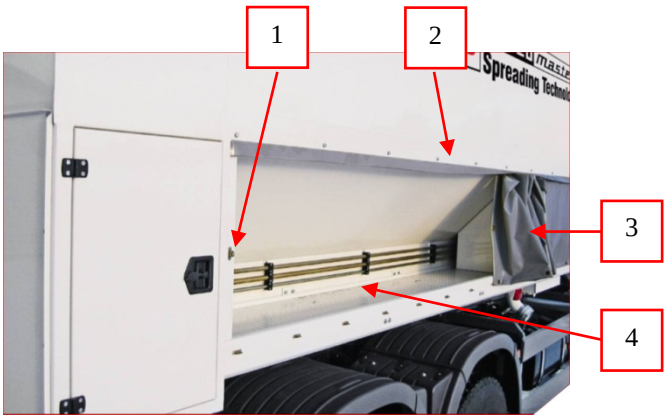


Fig. 3-29 Storage compartments with canopy

3.3.7.2 Storage compartments with sheet metal doors

1 Cover
2 Storage compartment
3 Gas pressure spring
4 Closure

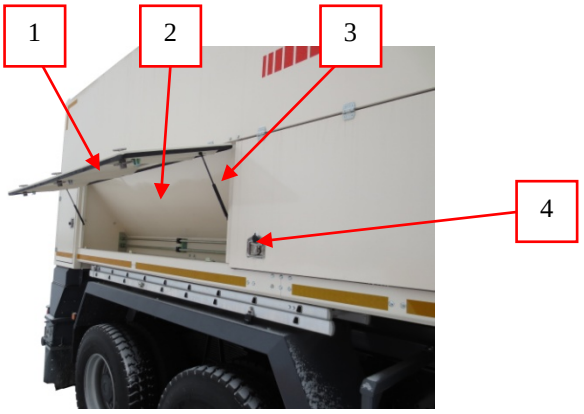


Fig. 3-30 Storage compartments with metal sheet doors

3.3.7.3 Frame extension

The frame extension at the carrier lorry enables the connection of trailers. The operation of hydraulic additional equipment (e.g. ramps) is possible via the connections. For this purpose the hydraulics of the spreader is used.

1 Connections for brake
2 Drawbar
3 Connections for hydraulics
4 Connections for illumination

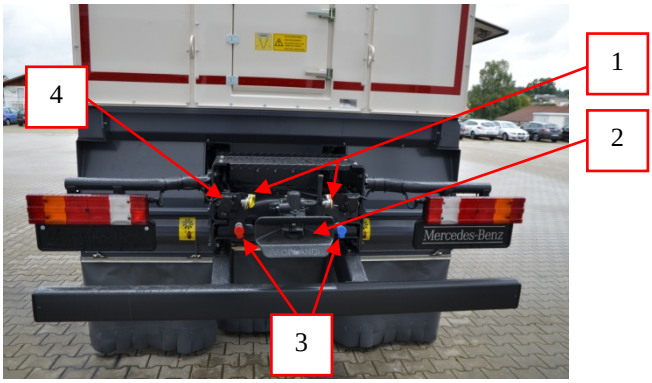


Fig. 3-31 Frame extension

NOTE

The additional valve can only be activated if the spreading unit / chain is off.

Activation of the hydraulic connections at the frame extension:

1 Calling the menu “Settings 1”
2 Switch on hydraulic pump
3 Press button F7 (AUX valve) (the symbol becomes green)

The hydraulics can now be used.

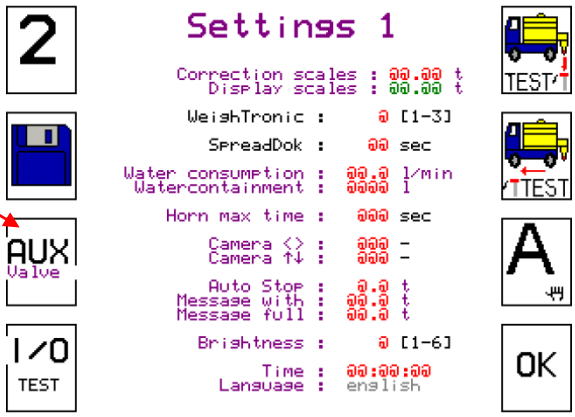


Fig. 3-32 Frame extension

3.3.8 Electrical system

The electrical system consists of the following components (depending on the carrier or tractor vehicle involved):

The switch cabinet for the machine wiring and control (PLC)
The distributor box for the chassis lighting features (TC only)
All safety switches, level indicators and proximity switches
The complete wiring
A 2-pole connection cable for the 12/24 V power supply to the switch cabinet
A 7-pole connection cable for the lighting features (TC only)

- The control panel with distributor socket
- A connection cable (control cabinet – operating device)

1 Main distributor box

2 Distribution box for lighting (for TC)

3 Bulk weight table

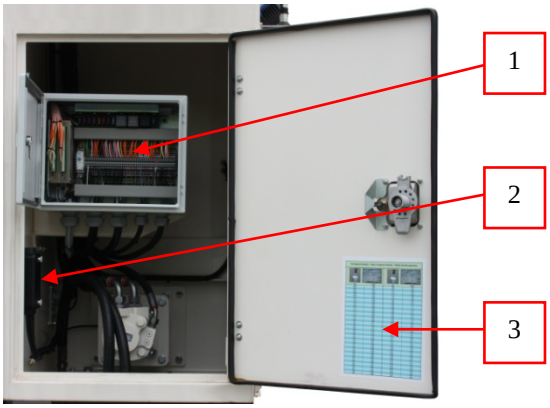


Fig. 3-33 Lateral compartment left

3.3.8.1 Control cabinet

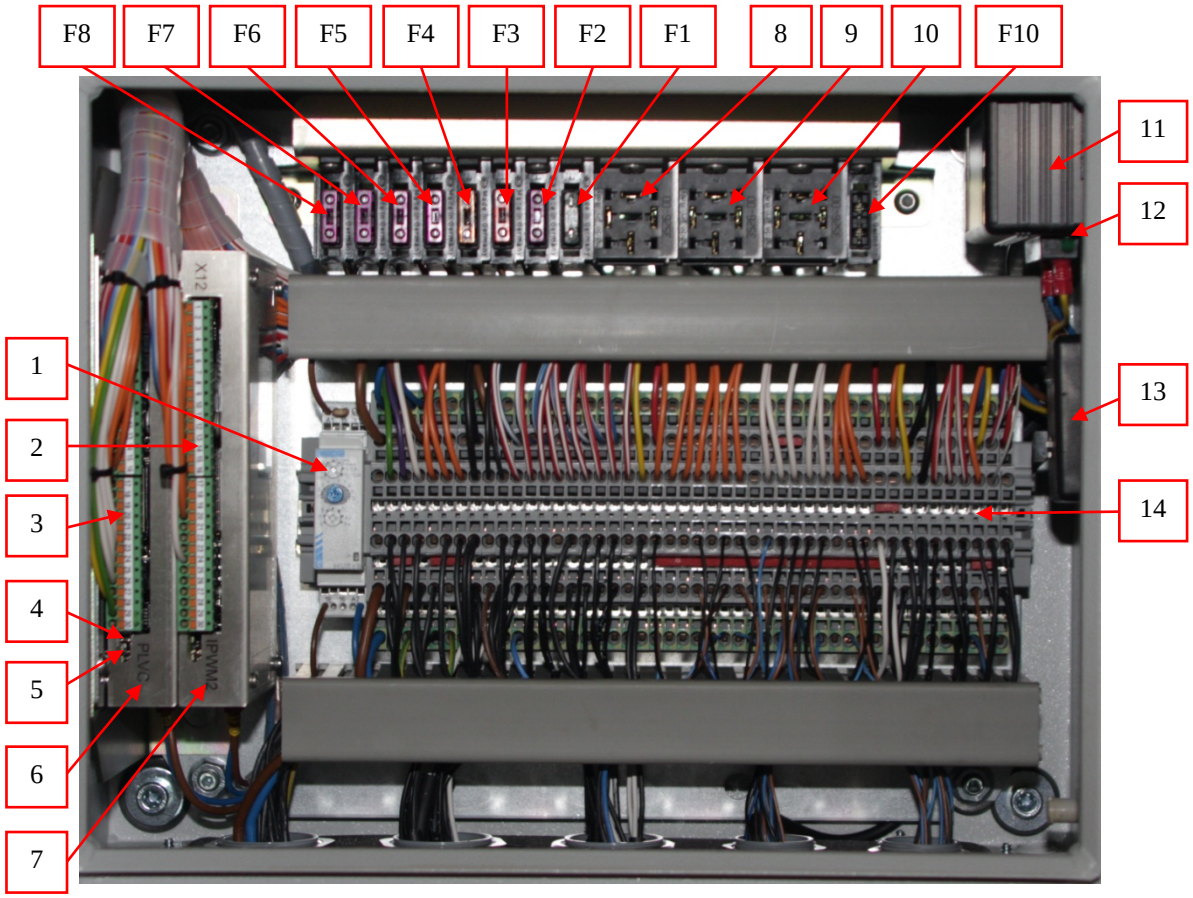


Fig. 3-34 Main distribution box

1	Time relay	13	Voltage transformer 9 V for printer (option)
2	Edge connector X2	14	Terminal strip X4
3	Edge connector X1	F1	Main fuse
4	LED for operating display PLC	F2	Fuse operator terminal
5	LED for operating display CAN bus	F3	Fuse valve control expansion module
6	PLC base module	F4	Fuse valve control basic module
7	PLC extension module	F5	Fuse level indicators and sensors
8	Main load relay	F6	Fuse relay outlet 1, control working headlight
9	Cooling load relay	F7	Fuse relay outlet 2, gas auxiliary engine (option)
10	Load relay working headlight (option)	F8	Fuse relay outlet 3, lamps "Container full "
11	Voltage transformer 12 V for 24 V units (option for camera and radar)	F10	Fuse working headlight (option)
12	LED for operating display		

NOTE

Please refer to the respective electrical circuit diagram for further information on wiring of the lighting system and switch cabinet.

The two LEDs at the PLC basic module signal the following operating conditions:

LED state	Explanation
LED 1 on LED 2 off	Control functioning correctly
LED 1 off LED 2 off	Control not functioning correctly – Control not activated – Fuse F1 and/or F3 defective – Time-delay relay or main load disconnecting relay defective
LED 1 flashes LED 2 off	Safety shutdown triggered. Remains in this mode until the doors are closed and a control RESET is performed

More detailed **information** can be found in the maintenance instructions.

3.3.8.2 Coasting function

The coasting function ensures that the control and, consequently, all available monitoring organs (level indicators, indicator lamps, etc.) remain functional when the ignition is deactivated.

The coasting function is only active when the ignition is switched off and the control is activated (main switch distributor box in driver's cabin ON). If the carrier vehicle ignition is deactivated, the control remains active for the period of time set on the time-delay relay. The control switches off automatically when this time period expires. This ensures that the carrier vehicle starter battery does not discharge if the control is not deactivated via the main switch.

The deactivation time is set at 30 minutes by the manufacturer (e.g. long enough to fill the container with material).

WARNING

The coasting time should not be set too short. If the control switches off during a filling procedure, the filling level monitor no longer functions and overfilling of the spreader container can occur as a result.

The coasting time can be set infinitely from 6 to 60 minutes (Scale 1 - 10) on the time-delay relay with the aid of the blue screw.

WARNING

The settings on the two white adjusting screws should not be changed.

The green time-delay relay LED signals the following operating conditions:

LED status	Explanation
LED flashes rapidly	Relay supplied with power, no pick up, coasting time not active
LED flashes slowly	Relay supplied with power, no pick up, set coasting time active
LED illuminates	Relay supplied with power and pick up, coasting time not active
LED does not illuminate	Relay without power

3.3.8.3 Connections for trailers (TC)

1 Socket 7-pole for illumination

2 Socket 13-pole for connection of the operating device

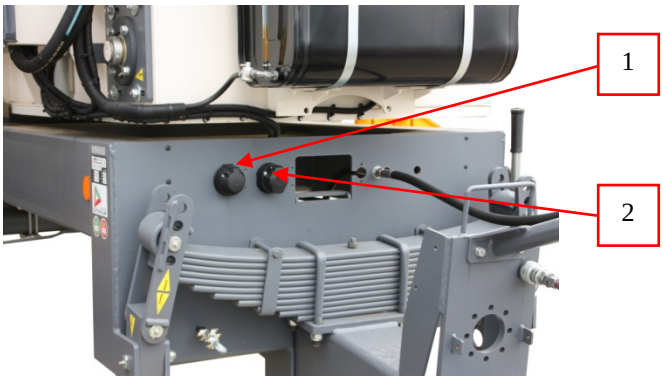


Fig. 3-35 Electrical connections TC

3.3.8.4 Safety switches

The safety switches deactivate the control as soon as the door to the discharge chamber or the manhole cover is opened.

1 Safety switch at the door to the discharge chamber

2 Safety switch at the manhole cover

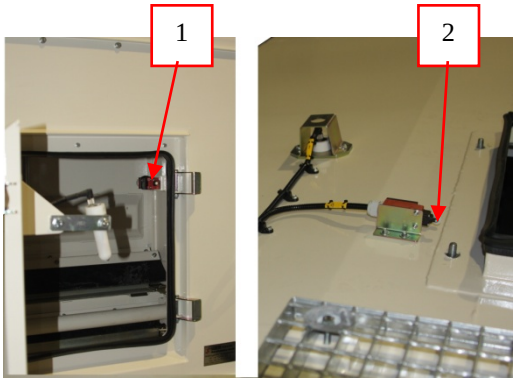


Fig. 3-36 Safety switch

A triggered safety switch is indicated on the control panel display.

CAUTION
Switch off the hydraulic pump prior to checking the safety switches. This ensures that the discharge and dosing channels are not activated if the door or manhole cover is closed and the control panel is switched off and on again.

The control panel should be switched off and on again after every control deactivation to start up the discharge and dosing channels again.

3.3.8.5 Level indicators

The spreader is equipped with a total of 3 level indicators. Two level indicators are located in the interior of the material container.

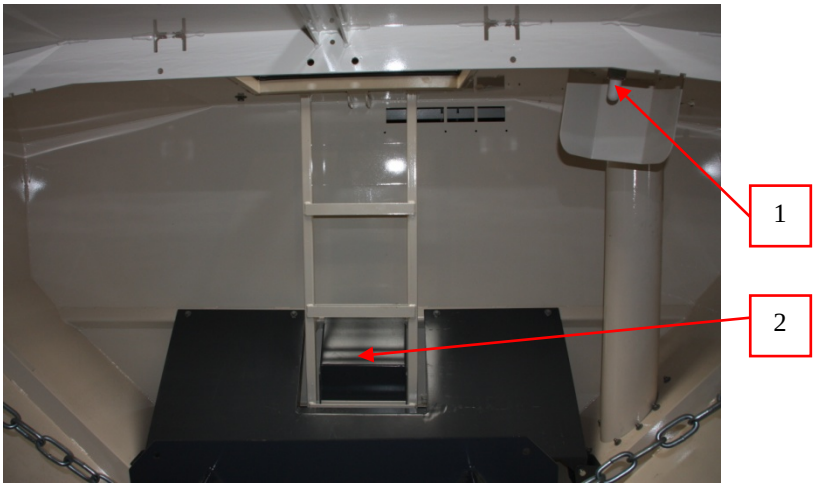


Fig. 3-37 Level indicator

1	Level indicator "Container full "	2	Level indicator "Container empty" (under partition plate)

The level indicators react to contact with the material.

The "Container full" level indicator is located on top of the material container. On making contact with the material, it interrupts an electric circuit which, in turn, activates the "Container full" indicator lamp on both filling devices.

The "Container empty" level indicator is located upstream of the stop valve. In the absence of material, it makes an electric circuit which, in turn, activates the "Container empty" indicator lamp on the control unit.

WARNING

The function of the indicator lamps on the filling devices is not monitored. This can lead to overfilling of the material container.

The function of the indicator lamps should be checked at regular intervals.

WARNING

The function of the indicator lamps on the filling devices is not monitored. This can lead to overfilling of the material container.

The function of the indicator lamps should be checked at regular intervals.

The second level indicator (Container empty) is attached to the rear wall of the material container and switches on the LED "Container empty" at the operating device.

The level indicator "Container empty" is cancelled if the machine is equipped with a weighing device.

1 Level indicator filling shaft

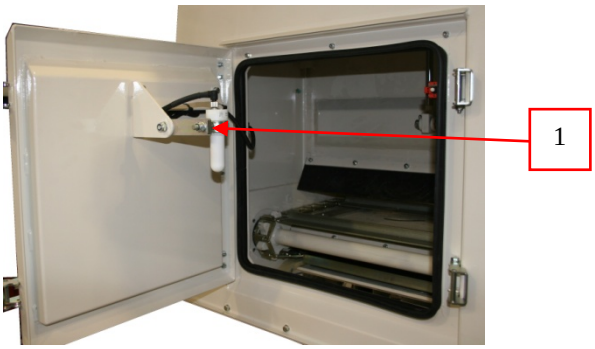


Fig. 3-38 Level indicator

The third level indicator is located in the middle of the filling shaft at the rear inspection cover and switches off the conveyor chain in order to avoid overfilling of the discharge chamber.

1 Status LED

When the control is switched on, the status LED will light up yellow. If the indicator is activated by spreading material, the status LED will change to green.

The level indicators are equipped with opening switches, i.e. the current will interconnect as long as the level indicator "is free" (is not in contact with material).

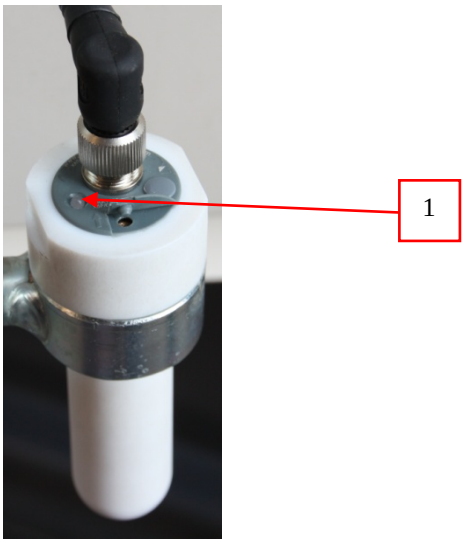


Fig. 3-39 Level indicator

The switching point (switching sensitivity) of a level indicator can be adjusted in order to adapt it to the material (see maintenance instructions).

Upon delivery of the spreader the switching point is set to a basic value.

The level indicators have a Teflon coating in order to prevent material deposits.
Regular visual inspections for soiling are to be carried out.

WARNING
Damage to the Teflon coating can lead to an increased risk of dirt and even malfunctions.

Do not use any sharp objects when removing dirt.

3.3.8.6 Reversing camera

The reversing camera is mounted on the rear end of the container and provides a view of the tail-end area on the control panel display. The interior of the glass pane can become slightly clouded if there are fluctuations in the exterior temperature, but this clears after the camera has been switched on for a short period.

1 Reversing camera

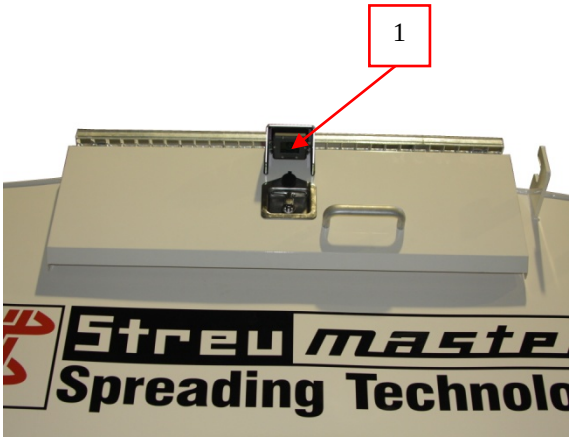


Fig. 3-40 Reversing camera

Additional information and operating instructions can be found in the operating manual for the monitor.

WARNING
The camera and adjacent area should not be cleaned with high-pressure and steam jet cleaners, as water can penetrate the camera and destroy it.

3.3.9 Sensors

The sensors and radar unit provide the PLC with the impulses required to determine the driving speed or the speed of the dosing channels (for example).

3.3.9.1 Sensor wheel (only TC)

The wheel sensor is located on a brake drum on the last axle. It scans the ring gear at a distance and transmits a certain number of impulses over a particular distance. These are transformed into a usable indication of the driving speed (km/h) by the PLC and displayed on the control panel.

1 Sensor

2 Sprocket

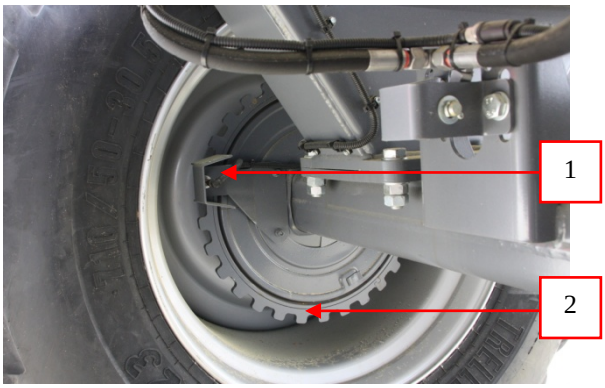


Fig. 3-41 Sensor wheel

The sensor is calibrated by the manufacturer during the machine trial run (i.e. the number of impulses is measured along a distance of 100 metres and entered in the PLC).

NOTE
The sensor should be recalibrated if tyres are changed or replaced.

If no speed is shown in the display, the wheel sensor can be tested via the control panel.

3.3.9.2 Sensor cardan shaft (only MC)

The cardan shaft sensor is located at the cardan shaft in front of the rear axle drive. It scans the sprocket without contact and delivers a certain number of impulses for a certain route. These are transferred into a usable display of the driving speed (km/h) by the control and shown in the operating device.

1 Sensor

2 Sprocket

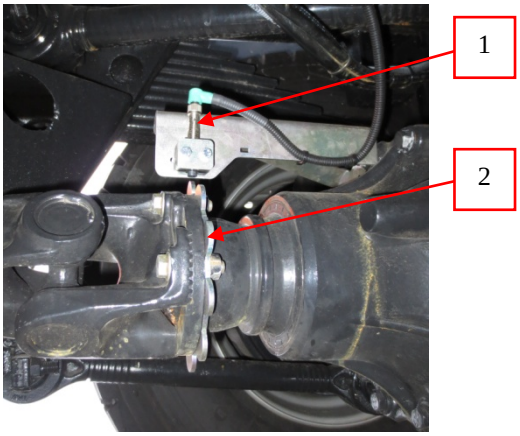


Fig. 3-42 Sensor cardan shaft

The sensor is calibrated in the factory during a test run of the machine, i.e. the number of impulses is measured on a route of 100 metres and entered in the operating device.

NOTE

In the case of fitting other or new tires the sensor must be calibrated again.

If no driving speed is shown in the display, the wheel sensor can be tested via the operating device. More detailed information can be found in the maintenance instructions.

3.3.9.3 Radar unit

The radar unit is mounted on the basic frame of the vehicle. It transmits a certain number of impulses over a particular distance which are determined through calibration.

Unlike the normal wheel sensor, the radar unit takes drive wheel slippage into consideration, as it scans the ground at a distance, determining the actual driving speed in this manner.

Recalibration is not necessary if vehicles tyres are changed or replaced.

1 Radar unit

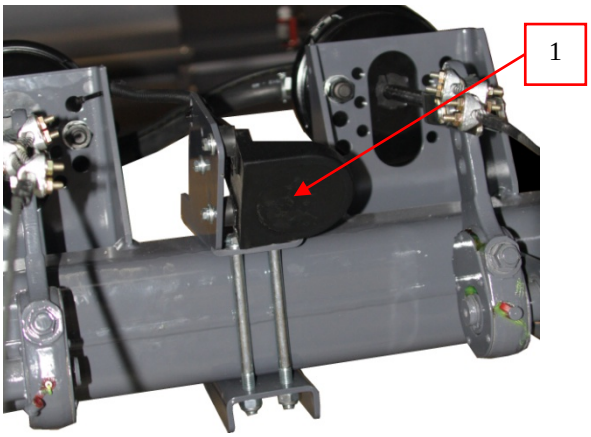


Fig. 3-43 Radar unit

The radar unit only functions reliably from a driving speed of over 0.7 km/h. An incorrect speed, or no speed at all, may appear on the display if the speed is under 0.7 km/h, and spreading is interrupted as a result.

The radar unit should be tested via the control panel if, despite an increase in speed, no driving speed is shown on the display.

3.3.9.4 Sensor dosing

1 Sensor dosing

2 Gear wheel

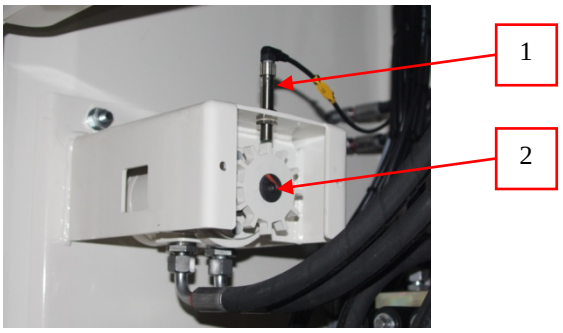


Fig. 3-44 Sensor dosing

The dosing sensor is integrated in a sheet metal housing in the right-hand side compartment. It scans a gear mounted on the shaft of a hydraulic motor and transmits the impulses to the PLC. The speed of the hydraulic motor changes proportionally in relation to the speed of the dosing channels, as it is integrated in the same hydraulic circuit.

If the dosing channels rotate slowly, the hydraulic motor also turns slowly and the sensor transmits fewer impulses to the PLC than when the dosing channels and, consequently, hydraulic motor are rotating quicker.

In conjunction with other data, the control panel can then indicate a spreading quantity. The sensor can be tested via the control panel. More detailed information can be found in the maintenance instructions.

3.3.10 Control panel

1 Operating device AT9

2 Additional keyboard AT13

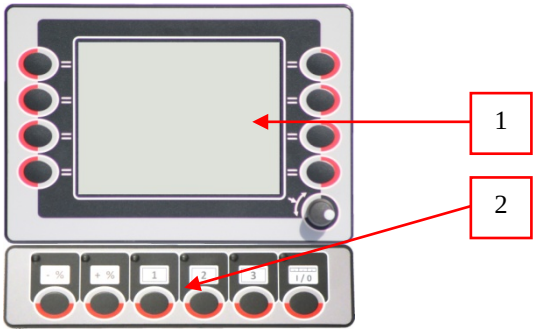


Fig. 3-45 Operating device

All inspection and operating functions can be performed via the control panel integrated in the driver's cabin. The software saved in the control panel and PLC contains all functions required for operation.

The connections for the spreader control and a video camera are located at the rear of the control panel.

A buzzer for acoustic signals is located at the rear. The buzzer sound volume cannot be adjusted. The buzzer may not be heard if background noises are too loud.

The control panel is activated via the distributor box main switch.

The power supply and printer data cable are also connected to the distributor box.

1 Distribution box

2 Main switch

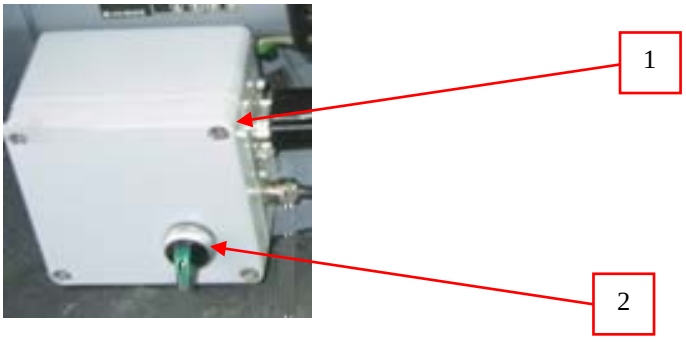


Fig. 3-46 Distribution box

NOTE
The distributor box is available in different versions. The installation points for connections can therefore differ from those in the example in Fig. 3-46

NOTE
A control RESET is performed by switching the main switch on the distributor box off and then on again.

4 Description

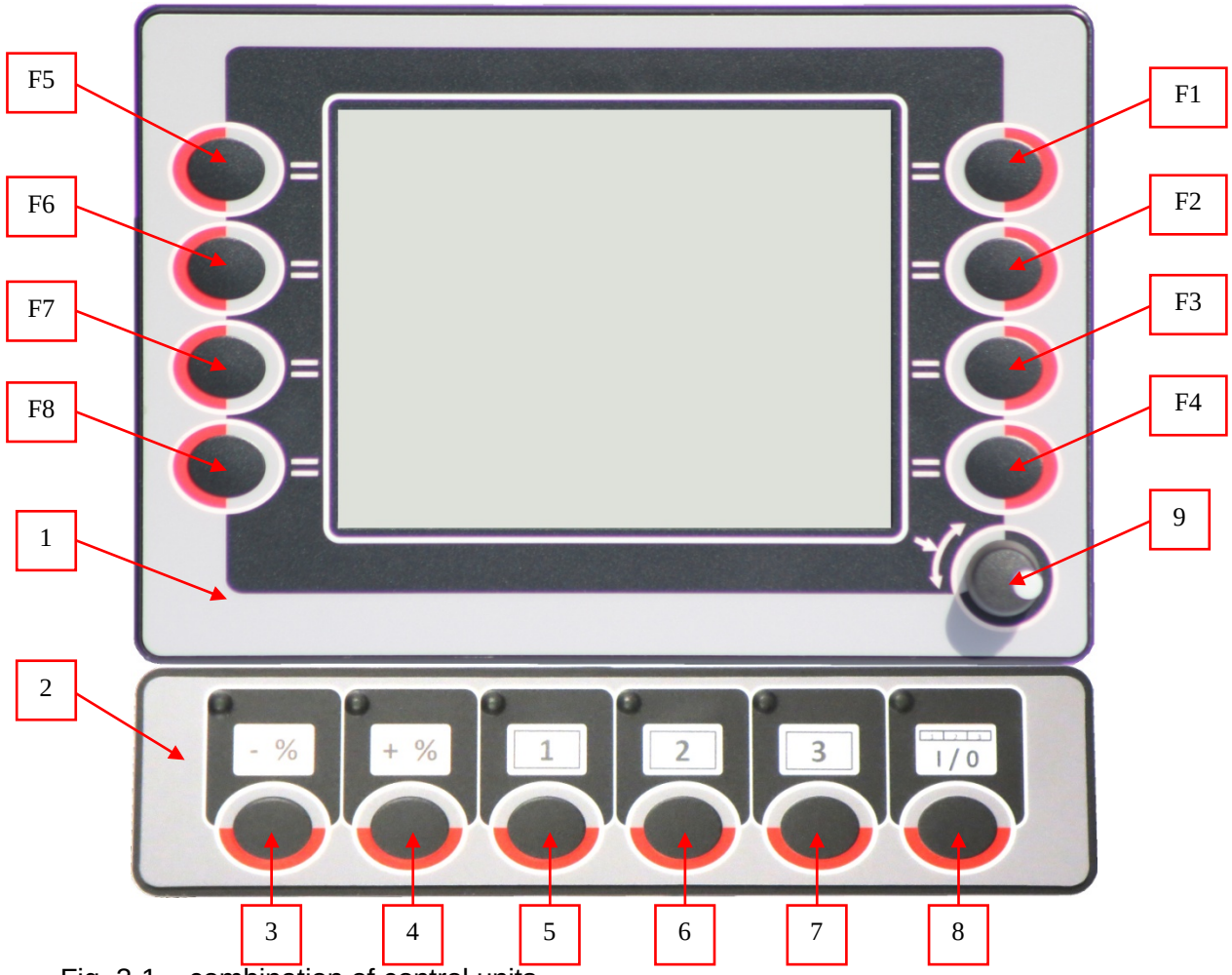


Fig. 3-1 combination of control units

1	control unit AT92	F1	softkey F1
2	control unit AT13	F2	softkey F2
3	softkey - %	F3	softkey F3
4	softkey + %	F4	softkey F4
5	softkey partial width 1	F5	softkey F5
6	softkey partial width 2	F6	softkey F6
7	softkey partial width 3	F7	softkey F7
8	softkey spreading device/conveyor	F8	softkey F8
9	turn-/push-key		

The control panel AT92 consists of a plastic housing with a 5.4" graphic display. The function keys F1 to F8 and a turn-/push-key are located on the left and right of the display.

The function selected with the respective softkey is illustrated in plain text or as a graphic symbol on the display in the respective function level.

The AT13 with six additional softkeys is mounted directly beneath. The keys always have the same function independent of the menu shown. With these additional keys it was possible to simplify the structure in the AT92-menus.

Nominal values (red font in screenshots) for a particular function (e.g. desired spreading quantity) can be selected and edited or menu items (blue font in screenshots) carried out with the turn-/push-key.

To edit a value, turn the turn-key until the background behind the value to be edited darkens. After pressing the turn-key once, the value can be changed by turning the key. Pressing it again acknowledges the value and imports it into the control.

For security reasons, the operator is not able to access all data and parameters. Spreading operation is possible with the assistance of trained skilled personnel.

Two operating modes can be set via the control panel:

- automatic mode
- manual mode

4.1 Description AT13

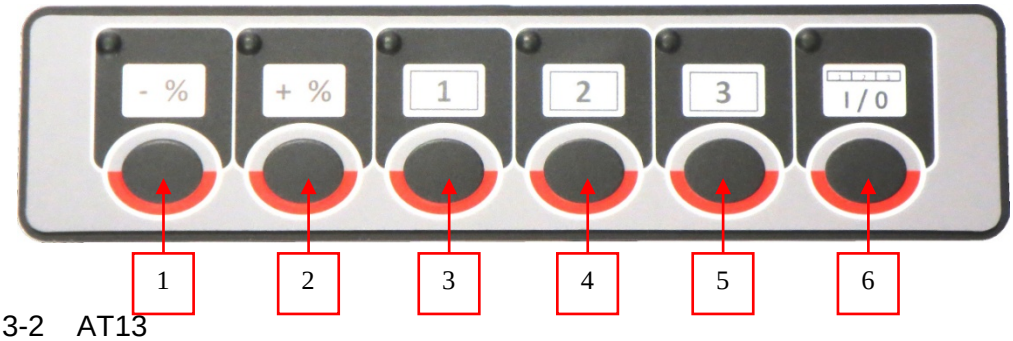


Fig. 3-2 AT13

1	softkey - %	4	softkey partial width 2
2	softkey + %	5	softkey partial width 3
3	softkey partial width 1	6	softkey spreading device/conveyor

The function of the softkeys on the AT13 control unit are always the same, independent of the graphic that is shown on the AT92.

1. Softkey - %

   In automatic mode the nominal value is reduced by 10%, when this key is pressed. In manual mode the opening width of the current regulating valve is reduced by 5%, when it is pressed. If softkey "-%" and "+%" are pressed simultaneously, in automatic mode the target value will be reset to 100% and in manual mode the opening width of the current regulating valve to 50%.

2. Softkey + %

3. In automatic mode the nominal value is raised by 10%, when this key is pressed. In manual mode the opening width of the current regulating valve is raised by 5%, when it is pressed. If softkey "-%" and "+%" are pressed simultaneously, in automatic mode the target value will be reset to 100% and in manual mode the opening width of the current regulating valve to 50%.

4. Softkey partial width 1

   With this key the partial width 1 can be switched on/off. The actual state is shown at the graphics in the main menu.

5. Softkey partial width 2

   With this key the partial width 2 can be switched on/off. The actual state is shown at the graphics in the main menu.

6. Softkey partial width 3

   With this key the partial width 3 can be switched on/off. The actual state is shown at the graphics in the main menu.

7. Softkey spreading device/conveyor

   With this key the conveyor and the spreading device are switched on/off at once. If the key is kept pressed for 4 seconds, only the spreading device is switched on/off. This function can be used to empty the feeder chute and the spreading device before driving the spreader on roads. The actual state is shown at the graphics in the main menu.

4.2 Menu levels

The menu levels are shown in the following figures, but without real values. All green characters are values that are displayed by the computer and that cannot be edited in this level. Red characters are desired values and can be changed by the operator.

4.2.1 Starting picture

The starting picture is shown for about 4 seconds after switching on the control unit. Meanwhile the language selection can be reached by pressing the softkey F4. If F4 is not pressed within the 4 seconds, the main level appears in the last used language.

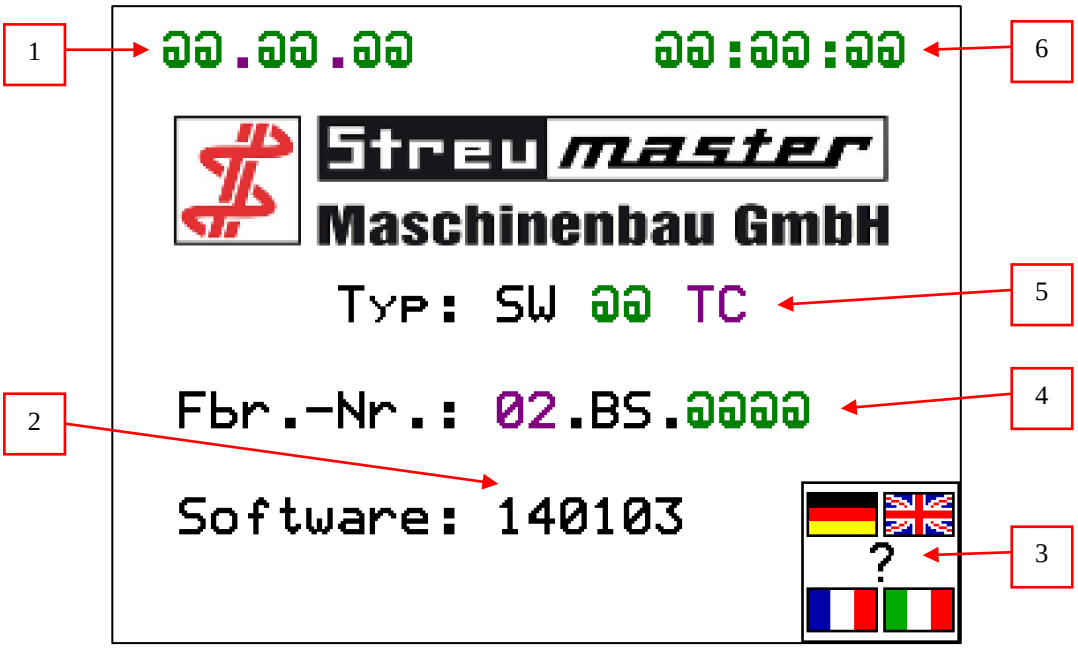


Fig. 3-3 starting picture

1 date
2 version of software
3 language selection
4 serial number of machine
5 type of machine
6 time

4.2.2 Language Selection

The language can be selected if softkey F4 is pressed while the "starting picture" is displayed.

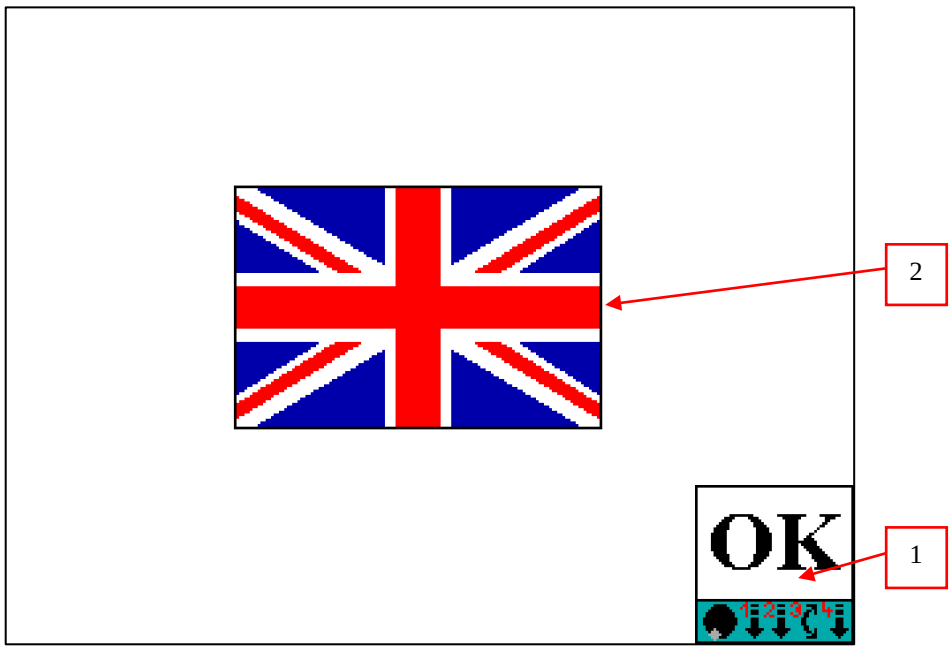


Fig. 3-4 language selection

1 confirm selection (F4) 2 flag of language

To change the language, the turnkey must be pressed once, so that the frame around the flag twinkles. Then press the turnkey again and select the desired language by turning it. Confirm the selection by pressing the key once again. To leave the menu and adopt the selected language press "OK" (F4).

NOTE

The language can also be changed during running operation. The corresponding menu is found in "Settings 1".

4.2.3 Main level for automatic mode

Directly after the "starting picture", the control unit changes to the "main level in automatic mode".

Most of the important values and parameters are shown here. This allows the operator to optimally monitor the spreading operation.

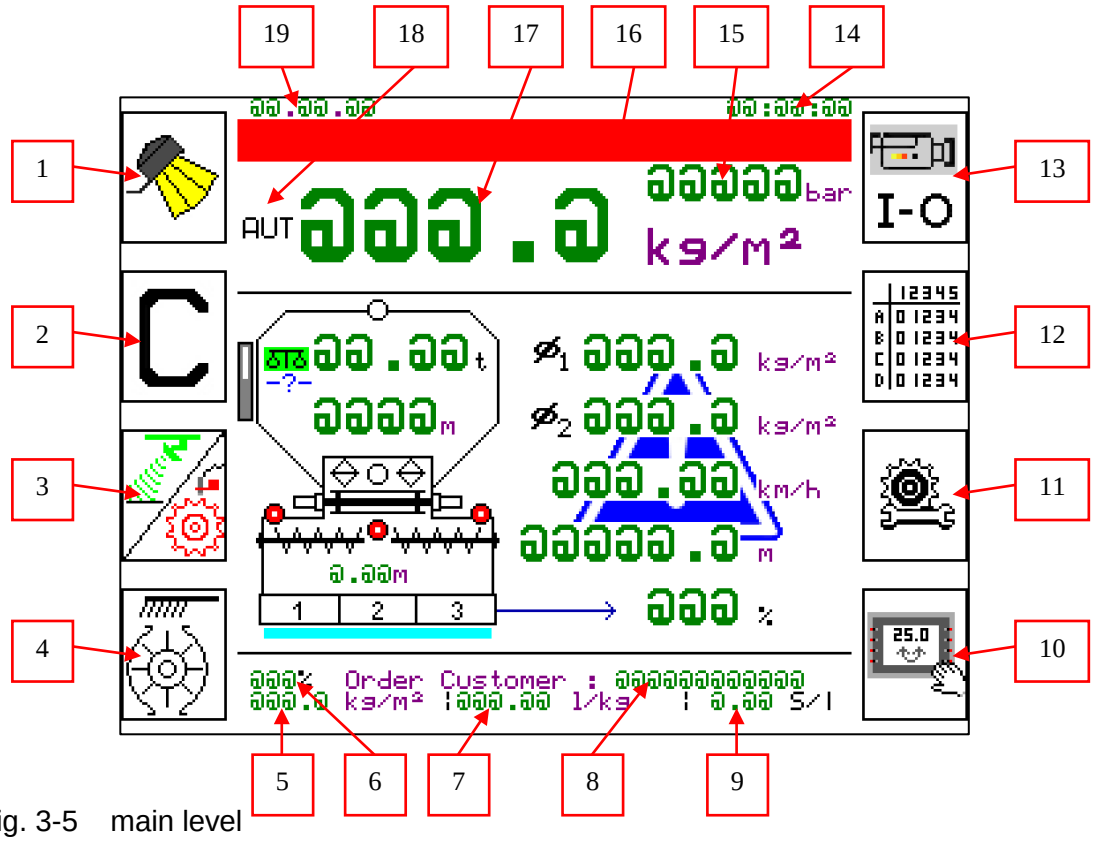


Fig. 3-5 main level

1	working lights on/off (F5)	11	change to settings (F3)
2	reset counter in main level (F6)	12	change to counters (F2)
3	switch between radar/wheel sensor (F7)	13	rear view camera on/off (F1)
4	change to self-cleaning (F8)	14	time
5	desired spreading rate (order)	15	hydraulic pressure
6	desired spreading rate in %	16	message line
7	density	17	actual spreading rate
8	name of customer (order)	18	working mode (automatic)
9	correction factor	19	date
10	change to order level (F4)		

The operator is informed via the message line about specified situations and operational states, and warned in case of danger. The message disappears automatically if the danger or situation is solved.

NOTE

The latest message is shown if a message needs to be displayed but another message is already visible in the message line.

Where more than two messages are to be displayed, the messages are each displayed consecutively for 5 seconds in a loop.

The following messages can be displayed:

Message	Explanation/possible cause
! VALVE ?	A solenoid valve is not electrically actuated in a correct manner
! SENSOR ?	Sensor or cable breakage on an analogue sensor (hydraulic pressure, weighing cell)
! SCHIEBER ?	The dosing slider is not in the right position or one of the sensors is damaged
HIGHER PRESSURE	Hydraulic pressure over 260 bars, possible mechanical blockade
TEMPERATURE	Hydraulic oil temperature over 70°C
CON. CONTENT	Theoretical content of the container lower than alarm value
! SPREADING QTY !	Critical range when adhering to correct nominal value
MOUNTED MOTOR ON!	Only for spreaders with mounted motor
CON. FULL !	Container full indicator actuated
CON. EMPTY !	Container empty indicator actuated
! P > 90% !	The Workload is higher than 90%
! AUTOSTOP !	The auto stop function turned off the spreading device and conveyor system automatically
! SLIDER !	The dosing slider cannot reach the desired position

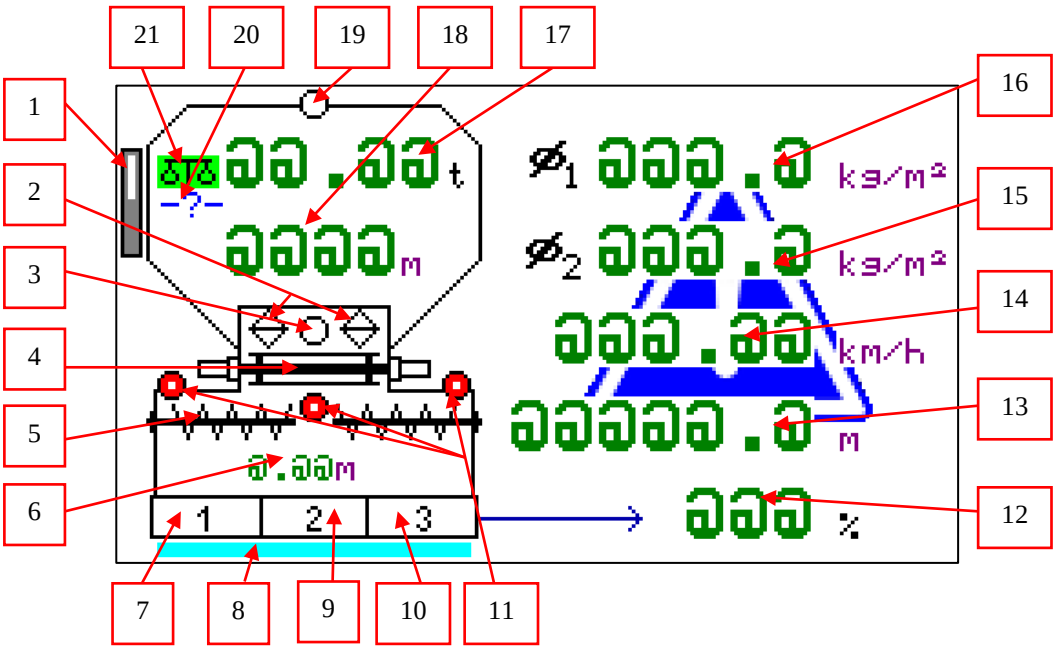


Fig. 3-6 details of main level

1	theoretical filling level of watertank	12	workload in %
2	indicator slider open/closed	13	odometer
3	indicator "container empty"	14	driving speed
4	schema conveyor chain	15	spreading average 2
5	schema transversal augers	16	spreading average 1
6	actual spreading width	17	content of container
7	schema partial width 1	18	remaining range
8	schema water spraying	19	indicator "container full"
9	schema partial width 2	20	print the content of container
10	schema partial width 3	21	Weightronic on/off
11	indicator feeding chute		

Depending on the machinery configuration, the spreading average counters are theoretical (without weighing system) or real measured (with weighing system) values. These values can be inaccurate on machines without a weighing system if the parameters (i.e. density) are not correct.

Both values show the average of the spreading rate, but the average 1 can be reset.

The actual state at the schematically drawn dosing sluices is shown by different colours. If the dosing sluice is preselected and the spreading device is off, then the frame is red. When the spreading device is switched on, the frame of the preselected sluices changes to green.

4.2.4 Main level for manual mode

To change into manual mode, press softkey F3 in "Settings 1". Do the same again to change back to automatic mode.

NOTE

In manual mode the spreading rate of the binding agent depends on the driving speed! Only the opening width of the current regulating valve (thus the turning speed of the dosing sluices) is adjusted.

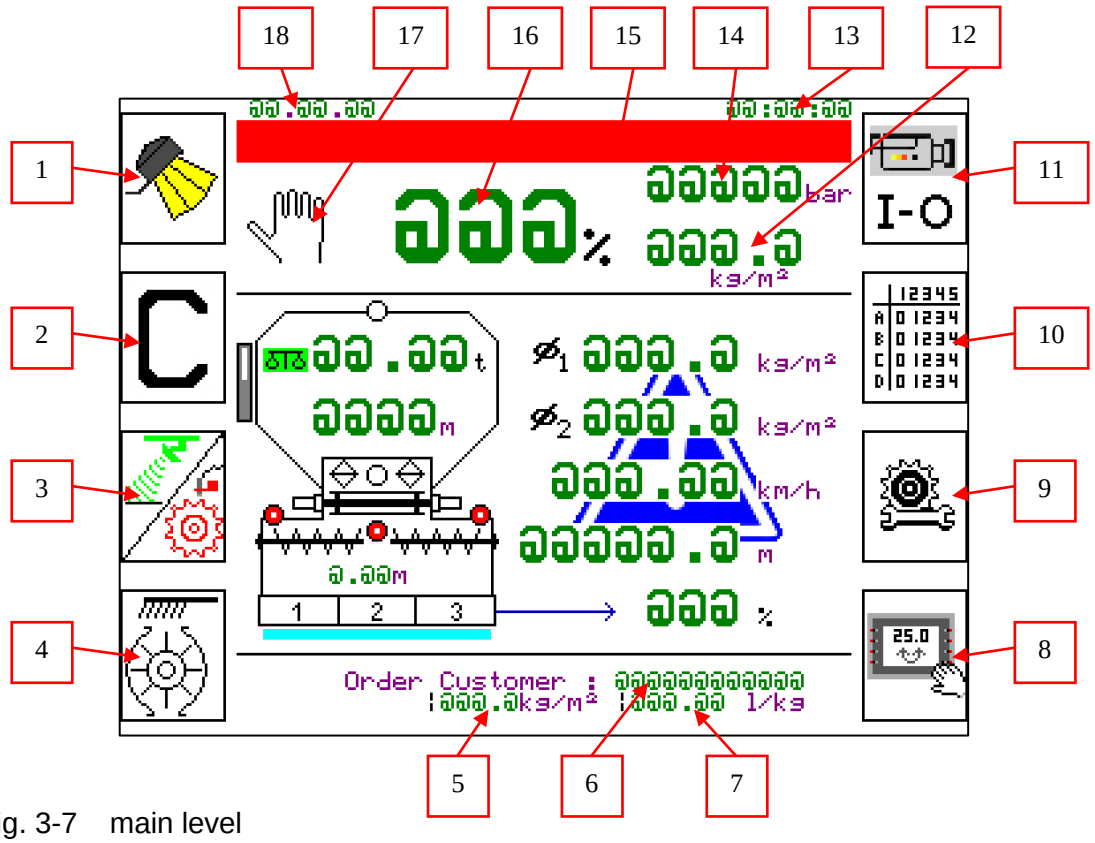


Fig. 3-7 main level

1	working lights on/off (F5)	10	change to counters (F2)
2	reset counter in main level (F6)	11	rear view camera on/off (F1)
3	switch between radar/wheel sensor (F7)	12	actual spreading rate
4	change to self-cleaning (F8)	13	time
5	desired spreading rate (order)	14	hydraulic pressure
6	name of customer (order)	15	message line
7	density	16	opening width of current regulating valve in %
8	change to order level (F4)	17	working mode (manual)
9	change to settings (F3)	18	date

4.2.5 Order

Change to order by pressing the softkey F4 in "main level".

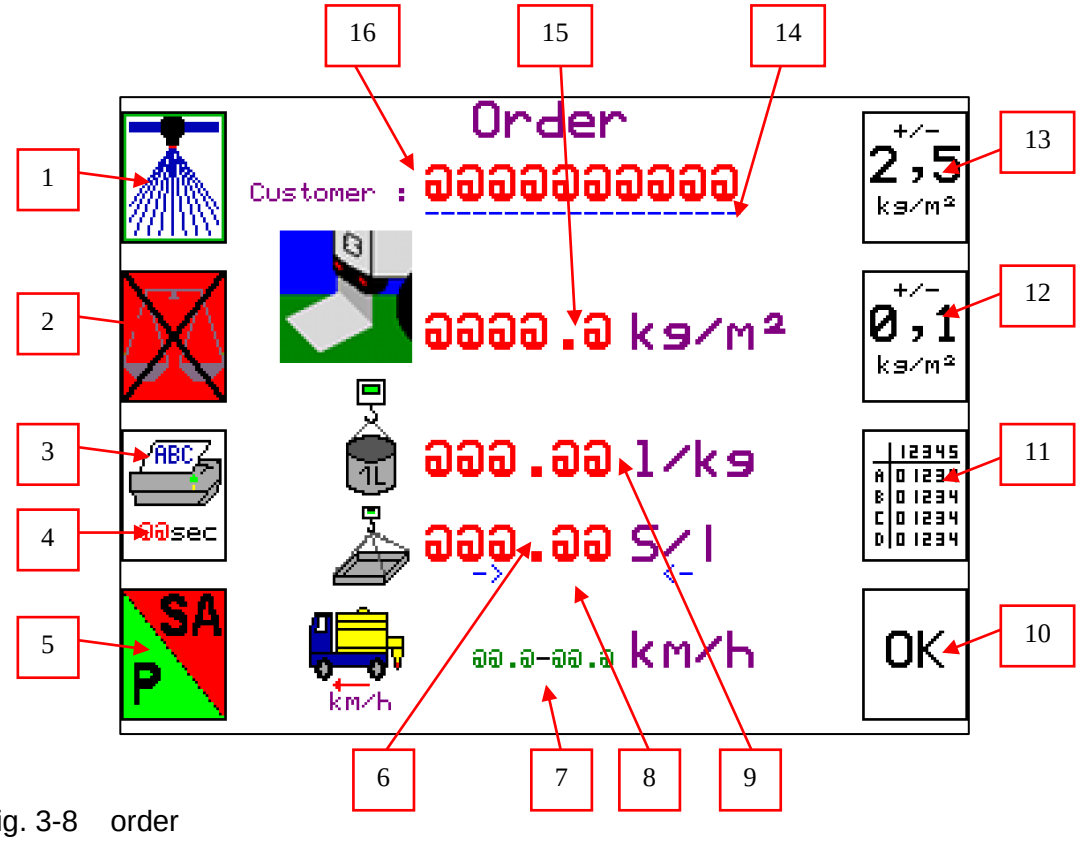


Fig. 3-8 order

1	water spraying on/off (F5)	9	input box density
2	WeighTronic on/off (F6)	10	return to main level (F4)
3	automatic print on/off (F7)	11	change to counters (F3)
4	time interval automatic print	12	input increment 0,1 (F2)
5	working mode (push/standalone)	13	input increment 2,5 (F1)
6	input box correction factor	14	change to input level customer name
7	recommended driving speed	15	input box desired spreading rate
8	change to calculation of correction factor	16	input box customer name (direct)

The desired spreading rate is entered in this level. Moreover, you can assign a customer name that will be shown on the main level and on printouts.

Density and correction factor are also entered here.

At the bottom there is a range of the speed that is recommended for error-free spreading.

4.2.6 Input level customer name

You can change to "input level customer name" by selecting the dashed line under the name.

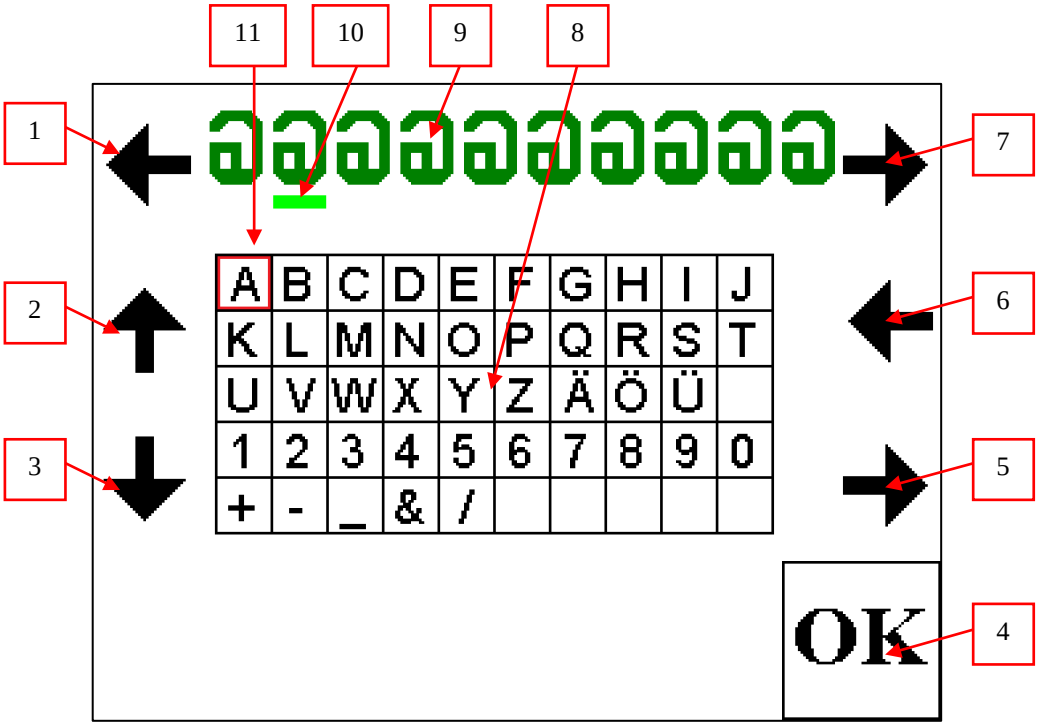


Fig. 3-9 input level customer name

1 input cursor leftwards (F5)
2 selecting cursor upwards (F6)
3 selecting cursor downwards (F7)
4 return to order level (F4)
5 selecting cursor rightwards (F3)
6 selecting cursor leftwards (F2)
7 input cursor rightwards (F1)
8 characters for selecting cursor
9 name of customer
10 input cursor
11 selecting cursor

This is a very convenient way to enter the name of the customer in this picture.

4.2.7 Calculation of correction factor

Change to "calculation of correction factor" by selecting the menu in "order level".

NOTE

The correction factor is only editable if Weightronic is switched off. The correction factor is automatically calculated by the Weightronic if switched on.

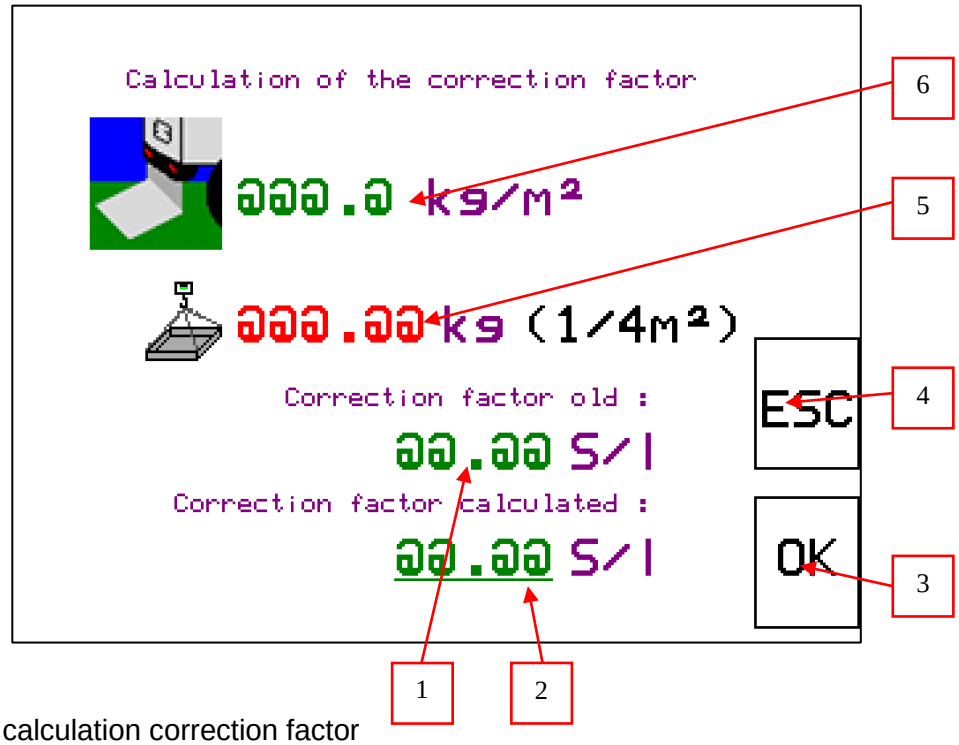


Fig. 3-10 calculation correction factor

1	previous correction factor	4	return to order level
2	calculated correction factor	5	input box for weight of weighing plate
3	adoption of the new factor (F4)	6	real spreading rate (calculated)

If the spreading rate permanently differs from the desired rate, it may be necessary to adapt the correction factor.

NOTE

Please ensure that the density is correct and the driving speed is displayed accurately before the correction factor is edited.

To adapt the correction factor, you must determine the weight of the weighing plate. The control unit calculates the new correction factor as soon as you have entered the value and saves it when OK (F4) is pressed to leave the menu. You can press "ESC" (F3) at any time to cancel the calculation and leave the menu without adopting the new correction factor. The machine then works with the previous factor.

4.2.8 Order/Short-time counter

Change to the counters by pressing softkey F3 in "main level" or "order level".

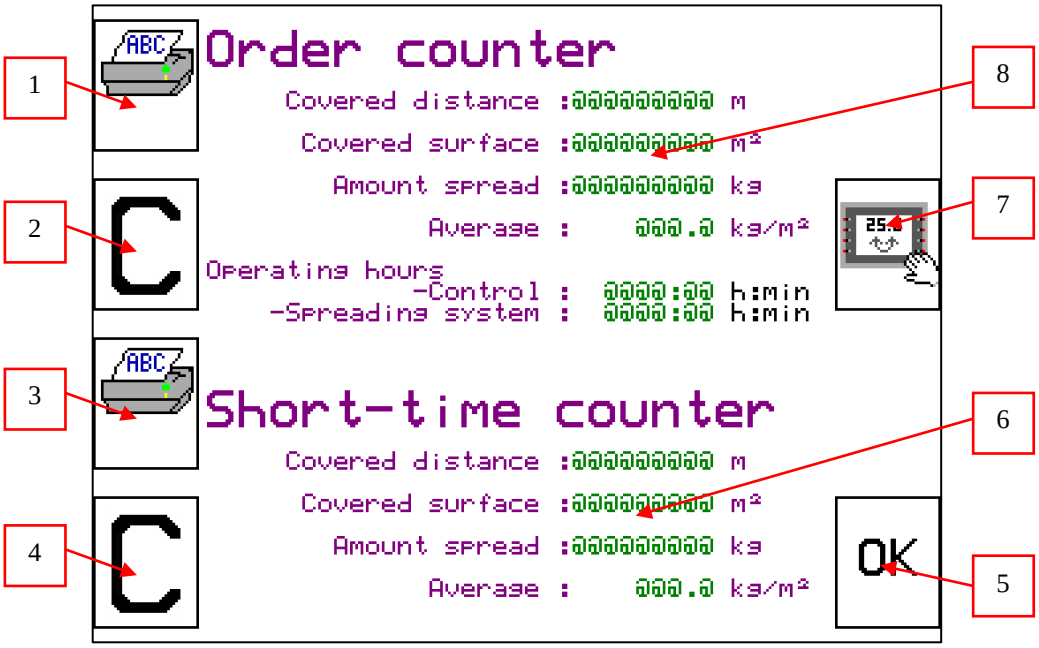


Fig. 3-11 order/short-time counter

1	print order counter (F5)	5	return to main level (F4)
2	reset order counter (F6)	6	values of the short-time counter
3	print short-time counter (F7)	7	change to order level (F2)
4	reset short-time counter (F8)	8	values of the order counter

The counters can be cleared individually, but the short-time counter is cleared automatically when clearing the order counter.

4.2.9 Total memory

Change to "total memory" by pressing softkey F6 in "Settings 1".

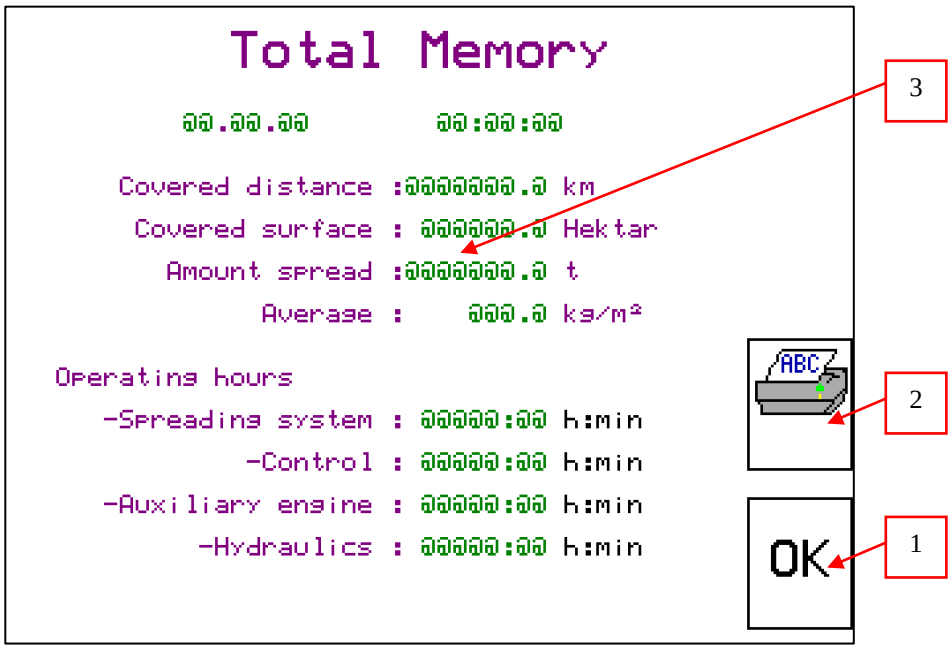


Fig. 3-12 total memory

1 return to Settings 1 (F4)

2 print total memory (F3)

3 values of the total memory

The data in total memory cannot be erased or edited!

NOTE

The data of the total memory gets lost with a software update or when the control unit is changed. The data should be printed or written down as required.

4.2.10 Self-cleaning

Change to "self-cleaning" by pressing softkey F8 in "main level".

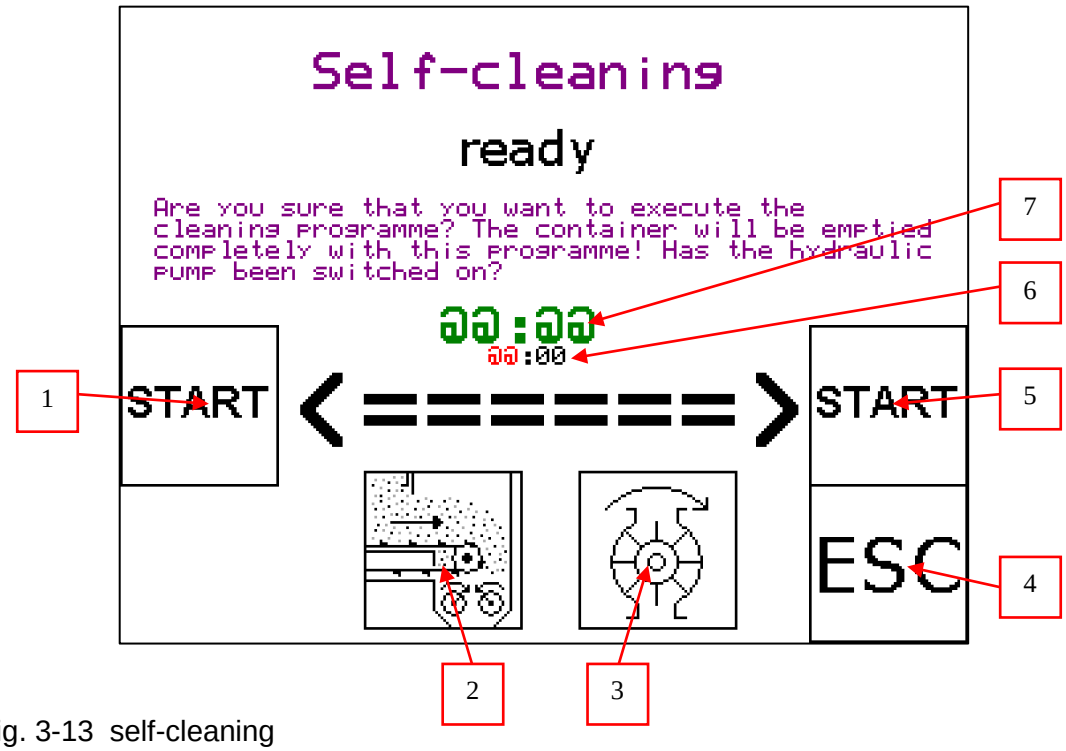


Fig. 3-13 self-cleaning

1	security key 1 for starting	5	security key 2 for starting
2	indicator "conveyor runs"	6	remaining time until finish
3	indicator "dosing sluices run"	7	adjustable runtime
4	cancel the program		

The operator can adjust the runtime (5 to 10 minutes) of the self-cleaning according to the actual content of the container. To do this, select the adjustable runtime by turning the turn-key and push it. The time can then be edited to the desired value. Press the button again to confirm.

Press the softkeys F3 & F7 simultaneously to start the self-cleaning process.

You can cancel the process at any time by pressing "ESC" (F4)

NOTE

The container will be drained during the self-cleaning. Be aware of high dust formation.

Only start the self-cleaning when no adverse effects or personal hazards can be expected.

4.2.11 Settings 1

Change to "Settings 1" by pressing softkey F3 in "main level".

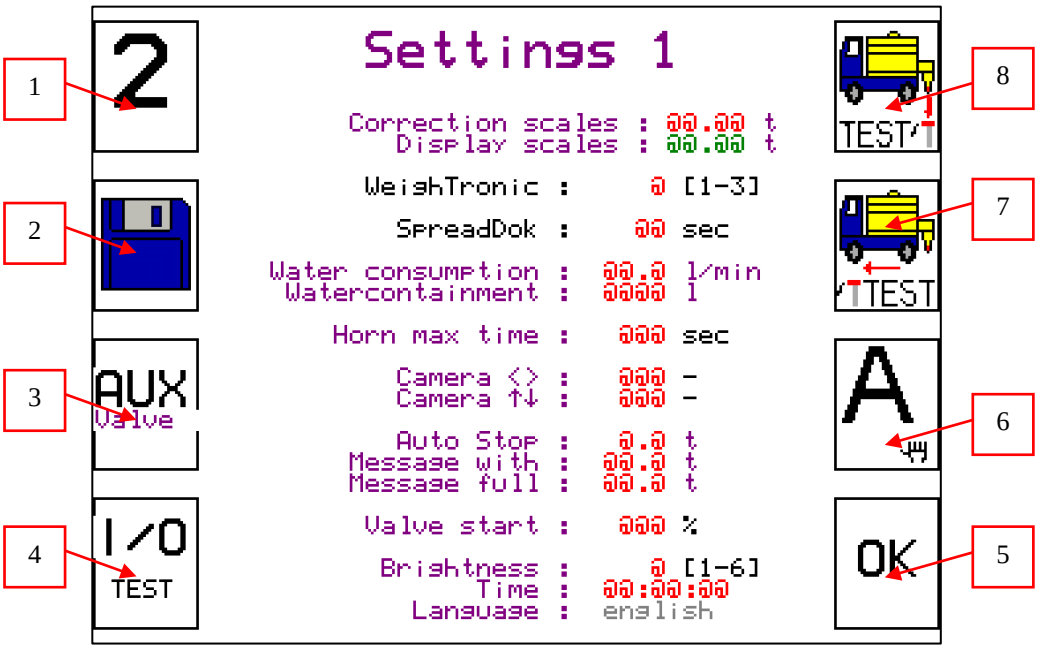


Fig. 3-14 Settings 1

1	change to Settings 2 (F5)	5	return to main level (F4)
2	change to total memory (F6)	6	change automatic/manual mode(F3)
3	auxiliary valve on/off (F7)	7	change to test wheel sensor/radar (F2)
4	change to input/output-test level (F8)	8	change to test sensor dosing (F1)

Sometimes it is necessary to edit parameters, especially after a software update or if the control unit was exchanged. In such cases, highlight the parameter by turning the turnkey, press the turnkey and change to the desired value by turning it. To confirm the value press the turnkey once again.

4.2.12 Test sensor dosing

Change to "test sensor dosing" by pressing softkey F1 in "Settings 1" or "Settings 2".

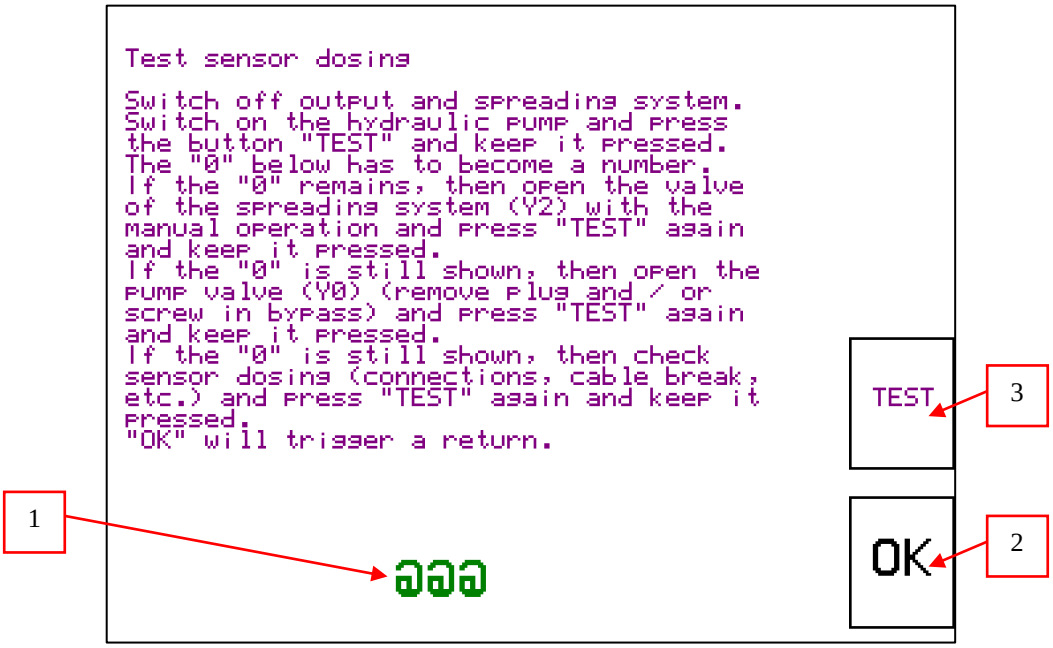


Fig. 3-15 test sensor dosing

1 submitted frequency

2 return to settings 1 (F4)

3 test sensor dosing (F3)

Test the sensor dosing if the driving speed is shown, but no actual spreading rate and workload is displayed.

4.2.13 Test wheel sensor / radar

Change to "test wheel sensor / radar" by pressing softkey F2 in "Settings 1" or "Settings 2".

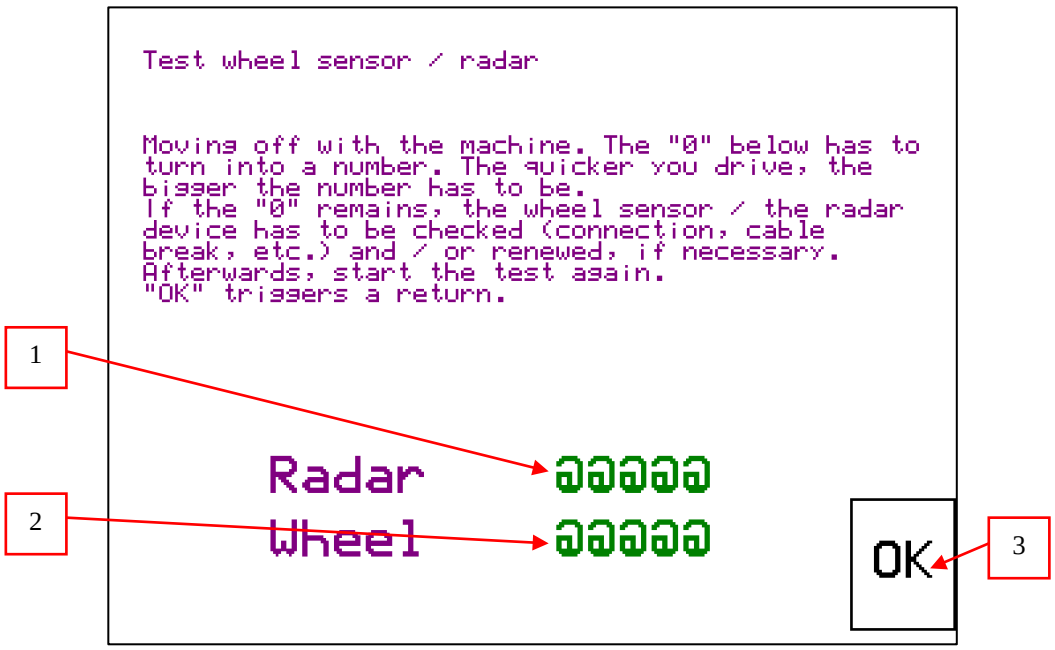


Fig. 3-16 test wheel sensor / radar

1 submitted frequency radar

2 submitted frequency wheel sensor

3 return to settings 1 (F4)

If no driving speed is displayed, the wheel sensor and the radar unit must be checked.

4.2.14 Input/output test

Change to "input/output test" by pressing softkey F8 in "Settings 1".

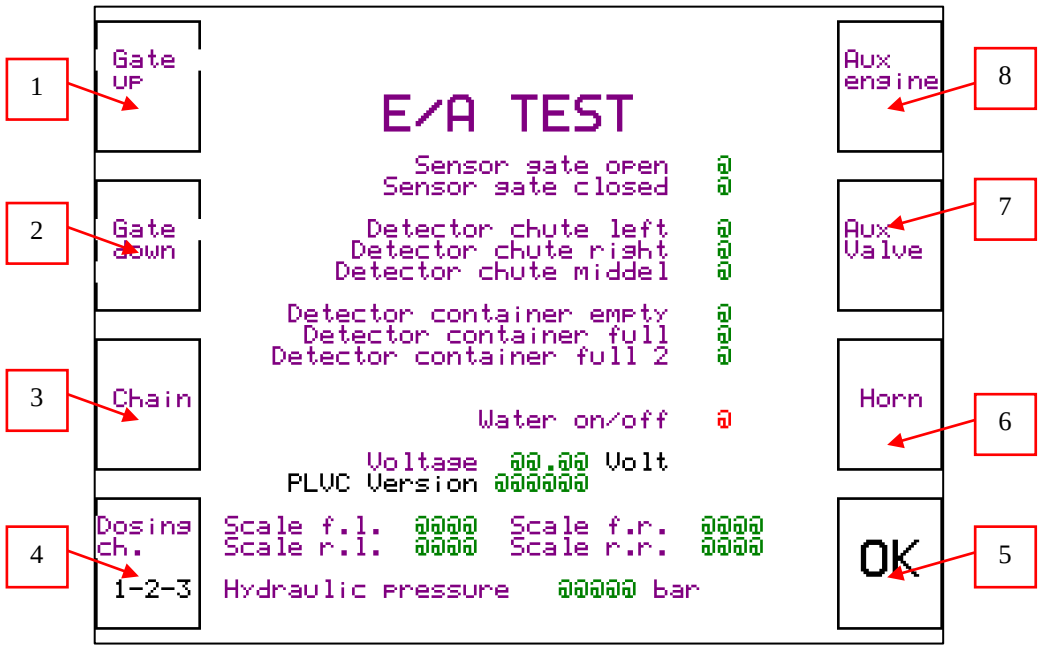


Fig. 3-17 input/output test

1	open gate (F5)	5	return to settings 1 (F4)
2	close gate (F6)	6	test horn "container full" (F3)
3	check conveyor (F7)	7	test auxiliary valve (F2)
4	check dosing sluices (F8)	8	test auxiliary motor (F1)

All hydraulic and electric functions/options can be checked here.

4.2.15 Access code

An access code is required to get into "settings 2".

NOTE

The access code is active until the unit is restarted! The unit must be restarted after making changes in settings 2 to avoid accidental access.

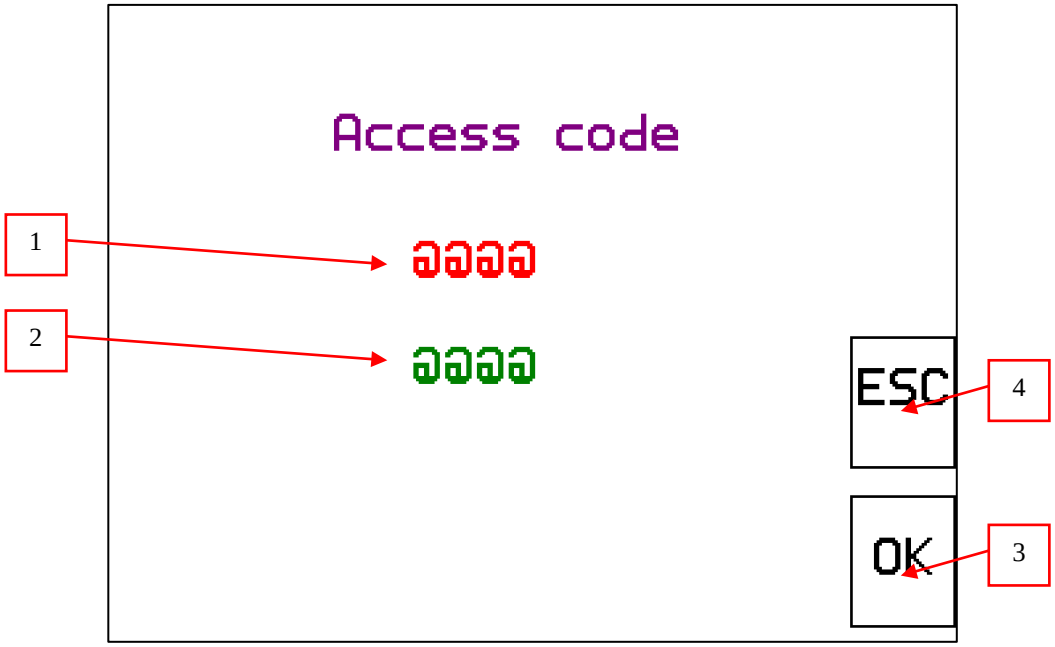


Fig. 3-18 Access code

1	input box for access code	3	confirm access code (F4)
2	request code	4	return to settings 1 (F3)

To input the access code, turn the turnkey until the input box is highlighted. Then press the turnkey and change the characters by turning it. Confirm the entry of the character by pressing the turnkey. When the whole key is prompted press "OK" to confirm.

In case of emergency, it is possible to generate a temporary access code by using the request code, to give the operator access to the locked levels.

NOTE

Changes in the settings are only allowed in consultation with Streumaster!

4.2.16 Settings 2

Change to "Settings 2" by pressing softkey F5 in "Settings 1".

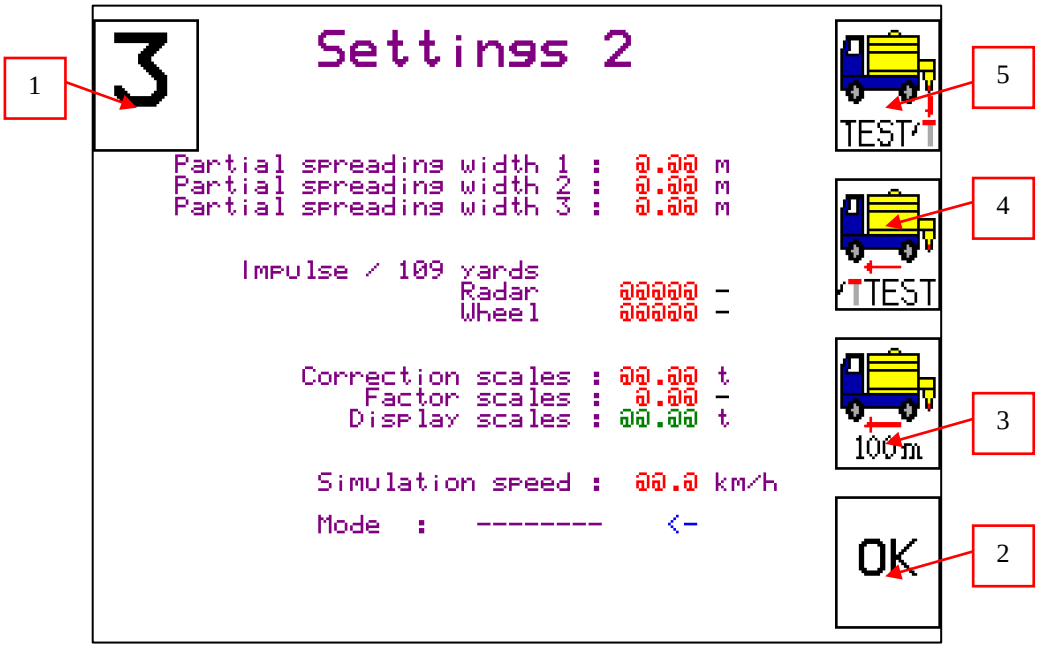


Fig. 3-19 Settings 2

1 change to settings 3.1 (F5)

2 return to settings 1 (F4)

3 change to calibration wheel sensor / radar (F3)

4 change to test wheel sensor / radar (F2)

5 change to test sensor dosing (F1)

Sometimes it is necessary to edit parameters, especially after a software update or if the control unit was exchanged. In such cases, highlight the parameter by turning the turnkey, press the turnkey and change to the desired value by turning it. To confirm the value, press the turnkey once again.

NOTE

Only Streumaster and Wirtgen service staff are allowed to change to "Settings 3"

4.2.17 Calibration wheel sensor / radar

Change to "calibration wheel sensor / radar" by pressing softkey F3 in "Settings 2".

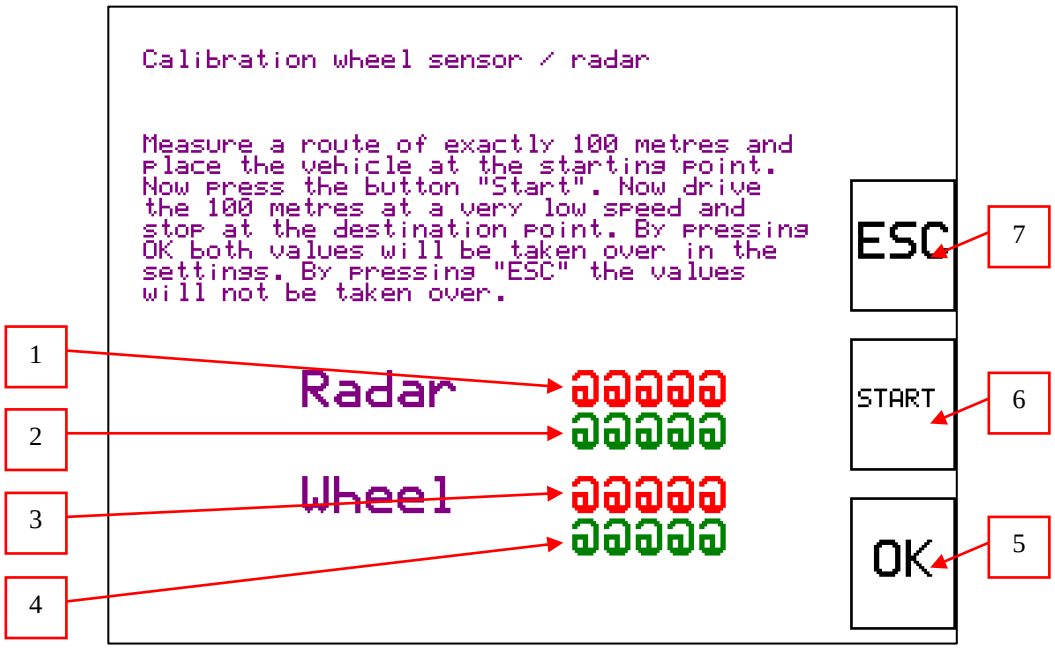


Fig. 3-20 calibration wheel sensor / radar

1	impulses radar (currently)	5	save new values and return to Settings 2 (F4)
2	submitted impulses radar	6	start the counters (F3)
3	impulses wheel sensor (currently)	7	cancel and return to settings 2 (F2)
4	submitted impulses wheel sensor		

To calibrate the wheel sensor / radar, you will need a distance of 100 meters. You have to multiply the impulses if there is not enough space, so that you can drive a shorter distance.

NOTE

The shorter the distance, the less accurate the result! Streumaster recommends always calibrating the impulses with a distance of 100 meters!

4.2.18 Buffer battery warning

If the buffer battery needs to be exchanged, this page appears when switched on.

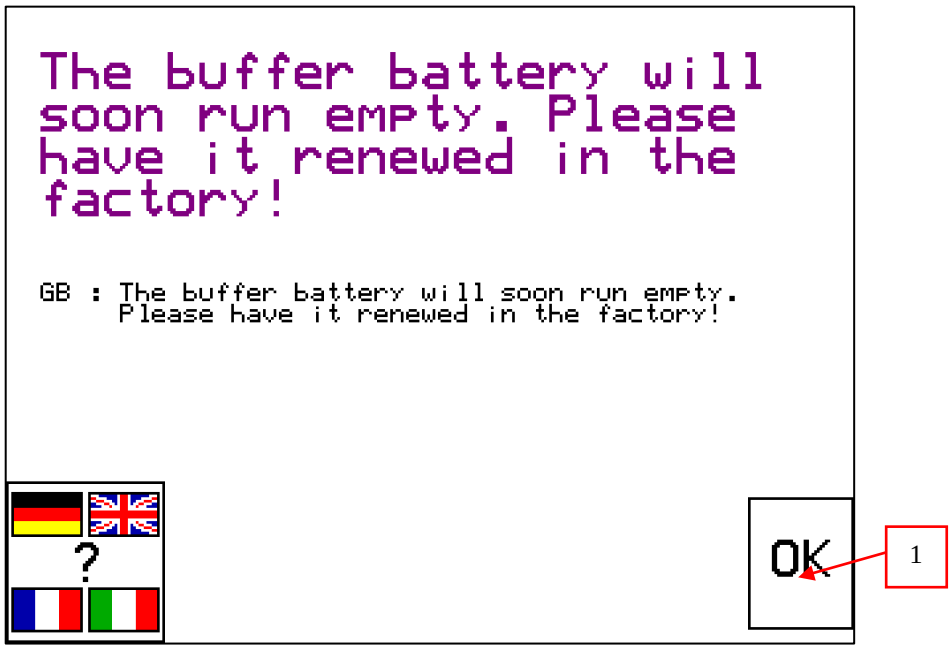


Fig. 3-21 Buffer battery warning

1 confirm warning message (F4)

There is a buffer battery inside the AT92 to save the values and parameters, which has to be exchanged after about 5 years. It has to be exchanged within two months after this message first appears.

NOTE

There can be random failures if the battery is not exchanged in the specified period. In the worst case, the software can be irreparably damaged.

4.2.19 Safety switches warning

This message appears if one of the safety switches at the inspection chambers is activated.

NOTE

When this message appears, the conveyor system and the spreading device are stopped immediately.

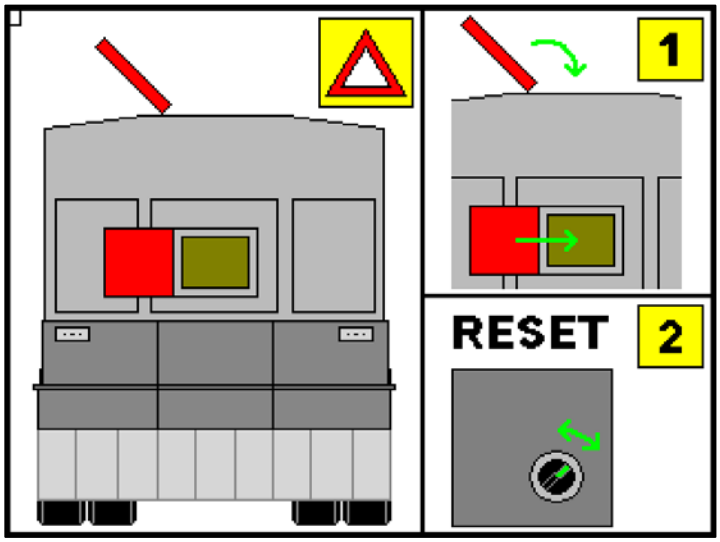


Fig. 3-22 safety switch warning

After eliminating the cause of the safety stop, you must reset (switch off/on) the control unit.

4.2.20 Oil level low warning

This message appears if the oil level in the hydraulic tank is critically low.

ATTENTION

If this message appears, it is mandatory to stop and shut off the pump!

Fig. 3-23 oil level low warning

The hydraulic system should only be activated after the cause of the oil loss is determined and eliminated and the correct oil level is attained again. The control unit should be reset (switch off/on) before recommissioning.

4.2.21 Container full message

This message appears if the content of the container has reached the desired value of "message full" in "Settings 1" or if the indicator "container full" is activated.

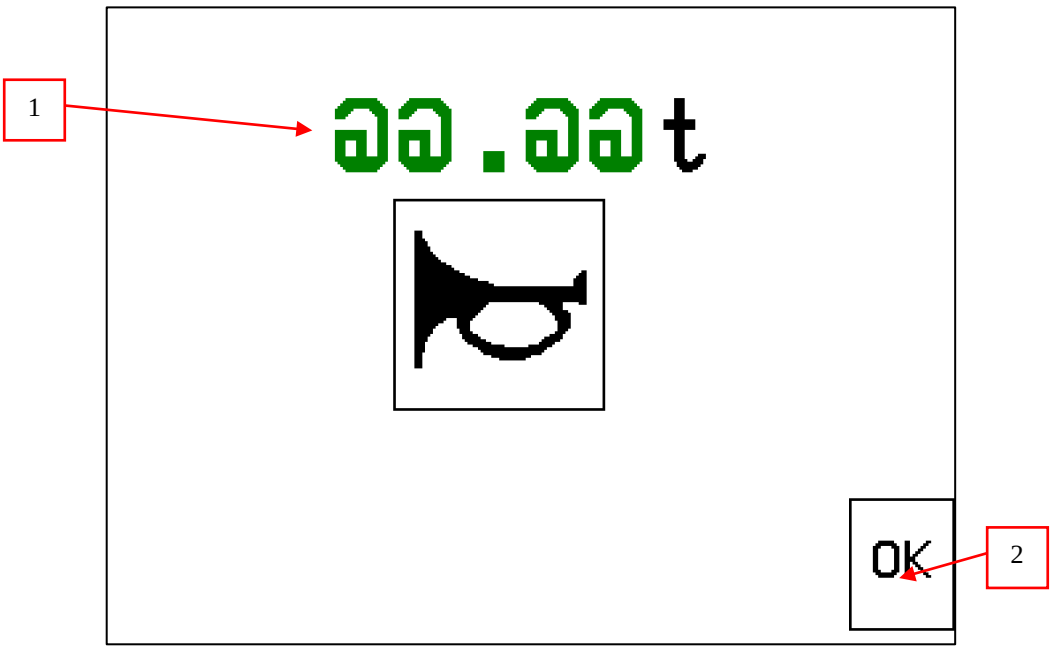


Fig. 3-24 container full message

1 content of container 2 confirm message (F4)

The horn "container full" is activated at the same time with the message and is cancelled by pressing "OK".

ATTENTION

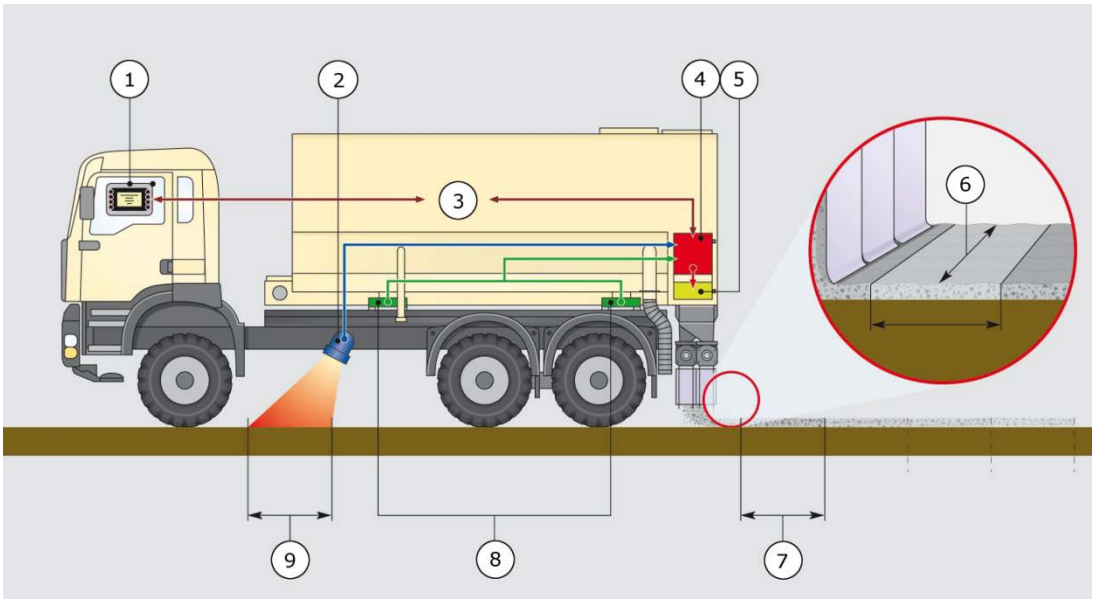
Although the horn is deactivated, the filling can continue! To avoid overload, the filling must be stopped immediately!

4.2.22 WeighTronic

A specially developed software programme is used with the WeighTronic system. With this, the analysis of the electronic weighing device is actively tied in with regulation of the spreading volume.

With the standard software, the on-board computer regulates the dosing of a specified volume (litre) over a set area (m²), without reference to the speed of travel. This means that the consistency of the desired spreading volume in kg/m² can be disturbed by a number of factors. Bulk weights differing from one silo to another with the same binding agent or differing times and travel distances between the end of the filling process and the start of spreading can adversely affect the actual volume spread. The flowing properties of an individual binding agent also play a role. Bulk weights incorrectly measured or entered in the on-board computer or an incorrectly calculated correction factor, for example due to faulty weighing controls, also have a negative effect on spreading results.

Now with WeighTronic the consumption of binding agent (kg) is constantly monitored – even during travel – along with the area spread (m²) with the specific volume as actually consumed. The resulting actual spreading volume in kg/m² is then compared with the desired spreading volume. If a discrepancy is shown, the on-board computer readjusts the settings.



3-25 Function chart WeighTronic

1	Control Panel	6	Spread width
2	Radar unit	7	Spread distance
3	CAN Bus connection	8	Four load cells detect the weight
4	PLC processes all information	9	Driven distance
5	Hydraulic valve controls the spreading volumes		

4.2.23 Printer

A printer can be connected to the control panel for printing working and order information and memory data.

1 Compartment for paper roll
2 Tearing line
3 Button for opening the roller compartment
4 On-switch / off-switch
5 Status LED
6 Power supply

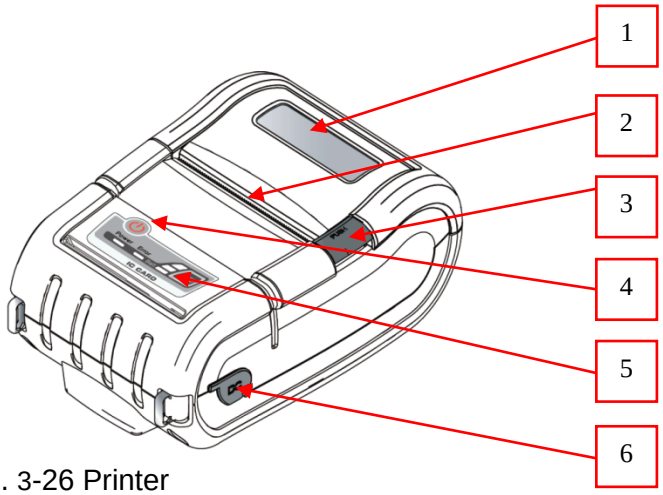


Fig. 3-26 Printer

1 Fixing thread
2 Battery
3 USB connection (not used)
4 Serial connection

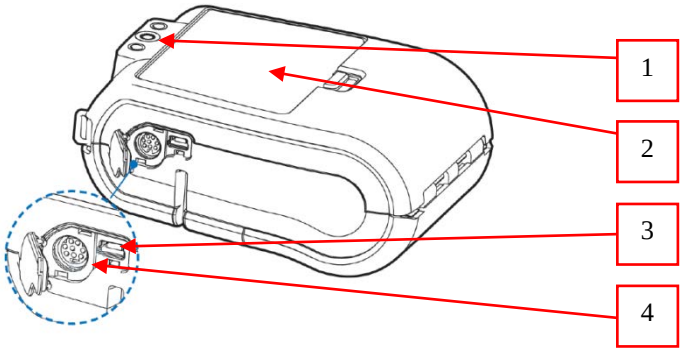


Fig. 3-27 Printer rear

1 On-switch / off-switch
2 Status LED battery
3 Button paper feed
4 Status LED error
5 Status LED on / off

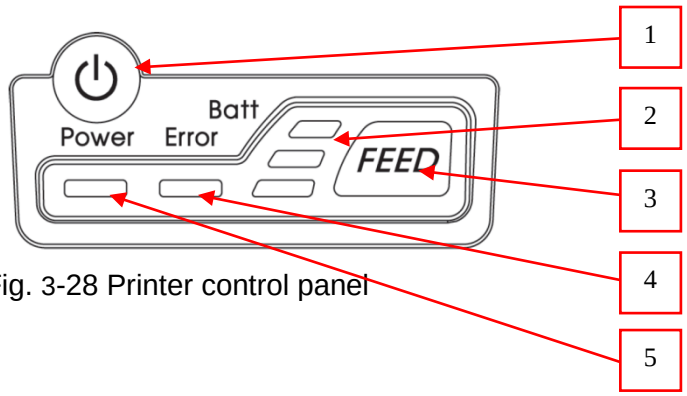


Fig. 3-28 Printer control panel

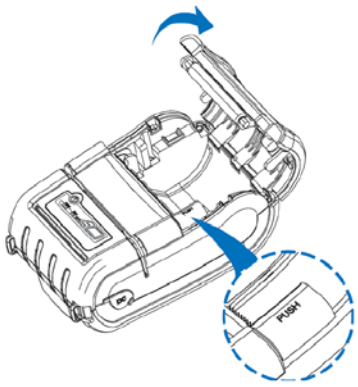
The “LED on / off” lights green if the printer is switched on.

If no paper is inserted in the roll compartment or the roll compartment is open, the “LED error” will light red.

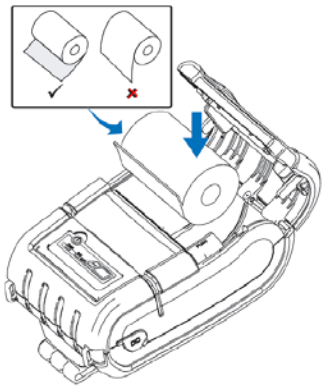
The “LED battery” indicates the state of charge of the battery. Each LED corresponds to approximately one third of capacity. If the battery runs down, a beep can be heard and the LEDs go off.

Change of the paper roll:

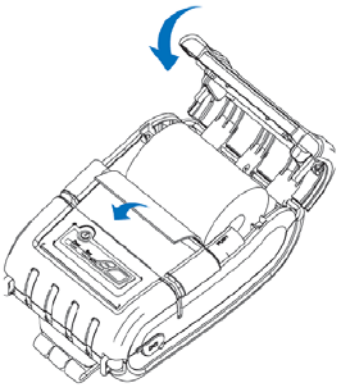
1. Press the button to open the roll compartment and then lift the cover.



2. Insert the paper roll. Pay attention to the right direction.



3. Pull out a short piece of paper and close the cover.



NOTE
Only suitable paper rolls (thermal transfer) may be used.

NOTE
Please observe the operating instructions and the CD of the manufacturer.

4.2.24 SpreaDoc

The SpreaDoc system records data for spreading operation and saves them together with GPS coordinates on an SD card.

The system consists of the following components:

- Housing with circuit board and slot for SD card (for the operating device)
- GPS antenna (on upper side of the container)
- Evaluation software (Excel sheet)

Fig. 3-29 SpreaDoc housing

Fig. 3-30 GPS antenna

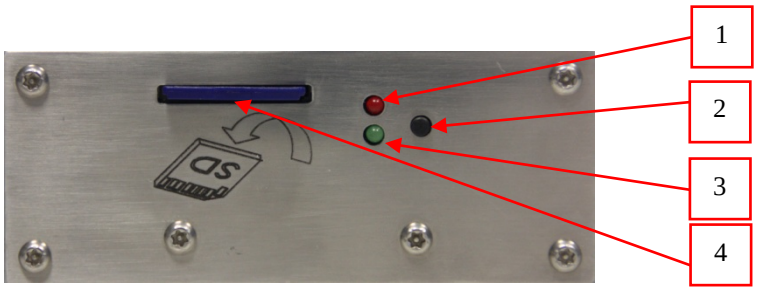


Fig. 4-41 SpreaDoc

1 LED “Write data”

2 Button user input (except for function)

3 LED “System is running”

4 Slot SD card

The system works as soon as the parameter “SpreaDoc” in the menu “Settings 1” is not equal to 0. This parameter determines the interval in which the data are stored on the SD card.

During operation two data sets are made. On the one hand the GPS data, on the other hand the spreader data.

A memory card with a capacity of 1 GB is enough for approximately 2,500 hours with an interval of 5 seconds.

NOTE
Apart from the GPS data set (xx_xx_xx.gps) and the spreader data set (xx_xx_xx.smd) there are two files (autorun.txt & mr1-8.txt) on the memory card which must not at all be deleted or changed.

4.2.25 Overpressure valve

In order to protect the container against deformation due to excessive pressure during filling, the top side disposes of two overpressure valves.

1 Valve flap
2 Handle
3 Return spring

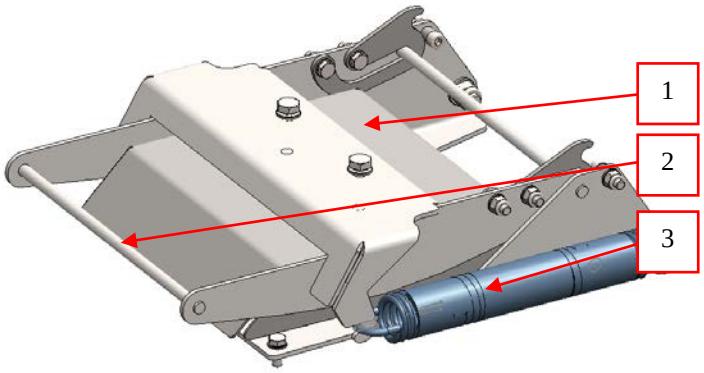


Fig. 3-31 Overpressure valve

If the pressure in the container becomes too high during filling, the valve flap will open and the pressure can escape. Afterwards the system will close again independently.

CAUTION
If the valve opens, a large amount of dust can escape. During the filling procedure protective goggles and dust mask must be worn.

The flap is almost maintenance-free and must be checked for function on a regular basis. Further information can be found in the maintenance instructions.

4.2.26 Automatic operation

During automatic operation (regular operation), the control (PLC) regulates the discharge of the material on the basis of the data entered.

Changes of speed, standstill or switching off of a dosing sluice are recognised immediately. The control continuously adapts the speed of the dosing sluices of the driving speed. If the vehicle stands still, the control will regulate the speed of the dosing sluices to zero.

The speed of the dosing sluices is determined by the PLC by means of the dosing sensor. The speed is not shown on the display, since it is not important for the operator. For this purpose the machine utilisation is displayed in percent which is calculated from the impulses of the sensor dosing.

NOTE
The machine utilisation in % which is shown in each menu level in the display approximately corresponds to the opening of the flow control valve.

The operator can decide by means of the machine utilisation whether, for example, a higher driving speed is to be used for spreading.

The display of the machine utilisation in % must always be observed during the spreading operation, since changes of the nominal value of the amount to be spread in kg/m², of the bulk weight, the correction factor or the driving speed always result in a change of the machine utilisation. If, for example, the driving speed is increased, the value of the machine utilisation in % must also increase, since the discharge and the dosing sluices have to convey more material in order to fulfil the nominal value of the amount to be spread in kg/m².

NOTE
The highest accuracy and reliability of the machine is reached with a machine utilisation between 20 % and 80 %.

NOTE
With an optimum spreading result the values "actual value of the currently spread amount in kg/m²", "driving speed" and "machine utilisation" can be entered into the table for empirical values. These values also allow for an optimum spreading result in manual mode. The table applies to one type of spreading material.

4.2.26.1 Control range in automatic operation

The control range of the spread rate readjustment only has an impact during spreading in automatic operation.

In automatic mode the PLC calculates, by means of several factors, to which extent the flow control valve which determines the speed of the spreading units is opened. Completely closed means 0 %, completely opened means 100 %.

The sensor dosing delivers a certain amount of impulses per second to the PLC so that the actual value of the currently spread amount in kg/m² can be calculated together with other factors. This actual value is shown on the display.

However, since with a flow control valve which is opened in exactly the same width the speed of the dosing sluices can vary slightly, mainly due to valve hystereses, the actual value could also not be met exactly.

If admissible, the readjustment intervenes. The PLC compares the actual value of the currently spread amount to the nominal value and readjusts the flow control valve, if necessary. It is determined with the control range in % in the image machine data to what extent readjustment is admissible.

If the control calculates a valve opening of 45 %, then the PLC can open and / or close the valve opening by the value entered in the control range.

If the nominal value and the actual value do not match 3 seconds after reaching the set control range, the message "!SPREADING QUANTITY!" will be shown on the display.

If a "0" is entered as control range, the control is switched off which results in the spreading quantity message not being displayed. The compliance with the nominal value can still be satisfactory.

A change of the spreading quantity via the function keys "+%" and "-%" is only active as long as the control terminal is switched on. When the operating terminal is switched off and on again, the spreading quantity will return to 100 %. This corresponds to the nominal value entered in the menu "order".

In the case of a change of the spreading quantity, the nominal value in % and also the nominal value in kg/m² will change.

If the function keys "+%" and "-%" are pressed simultaneously, the nominal value will be reset to 100 %.

A dosing sluice which is switched off during spreading operation will remain switched off until it is switched on again.

The function key "Spreading unit / chain" is only used to switch the dosing sluices which are preselected (enabled) via the function keys “Partial width 1”, “Partial width 2” and “Partial width 3” on and off.

Depending on the machine design the shown average counters are theoretically calculated values or values measured by the weighing device. In the case of the machines without weighing device these values can be distorted due to inaccurate entries (e.g. bulk weight).

Both values show the average in kg/m². The following actions set the values to zero:

Average 1:

- Pressing the + 10 % button
- Pressing the – 10 % button
- Changing the nominal value in the menu “Order”
- Every time the on-board computer is switched on
- By resetting the counter in the main level (button F6)

Average 2:

- By resetting the short-time counter in the counter menu (button F8)

NOTE
Since the machine does not spread on the first decimetres after the start, this period will not be settled when calculating the average. This can lead to differences between the calculated average and the counter values.

4.2.27 Manual operation

Spreading in manual operation is comparable to automatic operation with regard to the procedure. The manual operation is necessary if the control can no longer take over regulation due to a defective wheel, radar or dosing sensor.

In the case of machines which are only equipped with a radar unit, manual operation can be necessary in case of severe slippage, since the radar unit does not work reliably with a speed of less than 0.7 km/h. Very smooth surfaces can also have a negative influence on the function of the radar unit and require manual operation.

In manual mode some menus in the operating terminal are no longer displayed. The spreading quantity depends on the driving speed and the opening of the flow control valve. In order to reach a constant spreading quantity, the driving speed must remain constant.

After switching to manual mode the PLC gives an opening width of the flow control valve of 50 %. The function keys F1 and F2 can be used to adjust the opening of the valve in steps of 5 %. If F1 and F2 are pressed simultaneously, the opening width of the flow control valve will return to 50 %.

If no sensor is defective, the actual value of the spreading quantity will still be shown on the display.

NOTE
After switching on the dosing sluices, these will rotate even in the case of standstill of the vehicle. If the material is in the filling shaft and in the dosing sluices, it will be spread.

4.2.28 Hydraulic unit

The hydraulic unit consists of the following main components:

- A hydraulic pump
- A hydraulic oil container
- Two hydraulic motors for driving the conveyor chain
- One / two hydraulic motor(s) for driving the transverse spreading augers
- One hydraulic cylinder each for driving the dosing sluices
- A hydraulic block and different valves
- A hydraulic motor for the sensor dosing
- The hydraulic hoses and pipelines

4.2.28.1 Hydraulic pump for devices with PTO shaft drive

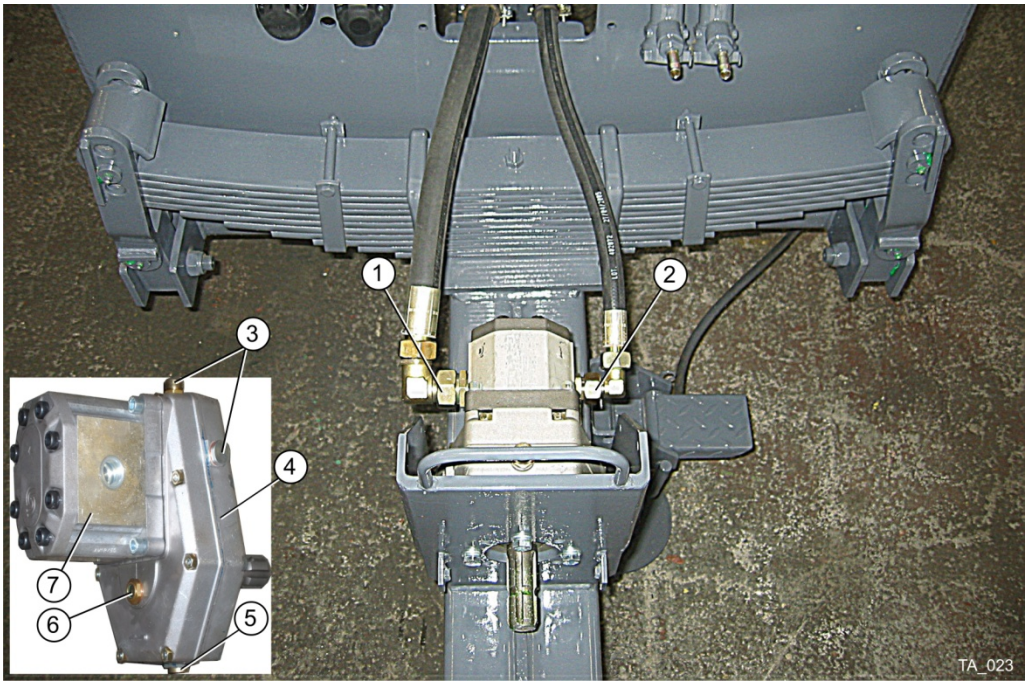


Fig. 3-32 Hydraulic pump with transmission gearing

1	Connection suction line	5	Oil drain plug
2	Connection pressure line	6	Inspection glass for oil level
3	Oil filling openings (transmission gearing)	7	Hydraulic pump
4	Transmission gearing		

The hydraulic pump is driven by means of a PTO shaft drive shaft by the towing vehicle via a transmission gearing. The required PTO shaft speed is 1000 1/min.

The hydraulic pump is virtually maintenance-free.

The oil level in the transmission gearing must be checked on a regular basis. The gearing oil must be visible in the inspection glass.

4.2.28.2 Hydraulic pump for lorry superstructures

The hydraulic pump is a maintenance-free axial piston constant pump. The size of the pump (volume flow / rotation) is determined subject to the auxiliary drive and / or the drive shaft of the pump.

1 Hydraulic pump

2 Oil flow relief valve

3 Adjusting screw

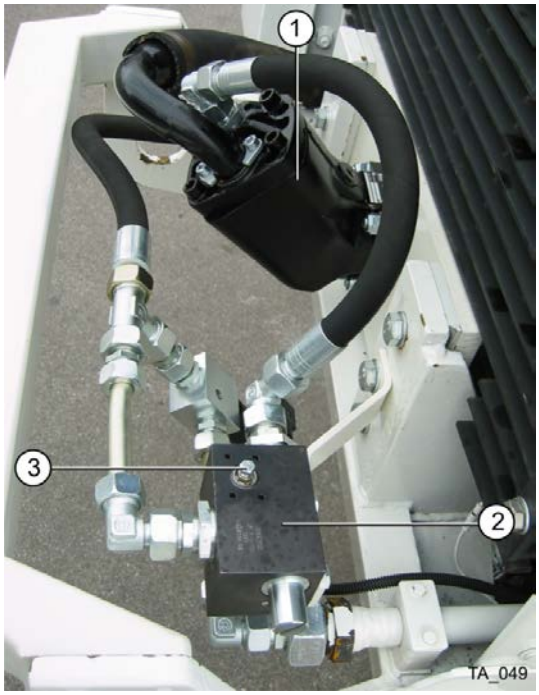


Fig. 3-33 Constant pump

If necessary, an oil flow relief valve will be installed downstream in order to return superfluous oil into the tank in the case of excessive oil flows.

The oil flow relief valve is factory-set to the corresponding spreading vehicle and must not be changed without consultation with the company Streumaster.

CAUTION

Changes to the oil flow relief valve without approval of the company Streumaster can lead to damage to the hydraulics. Any warranty claim for mechanical and hydraulic components will become void.

4.2.28.3 Axial piston adjustment pump

Some devices are equipped with a maintenance-free axial piston adjustment pump with load sensing controller.

1 Adjustment screw differential pressure

2 Adjustment screw pressure cut-off

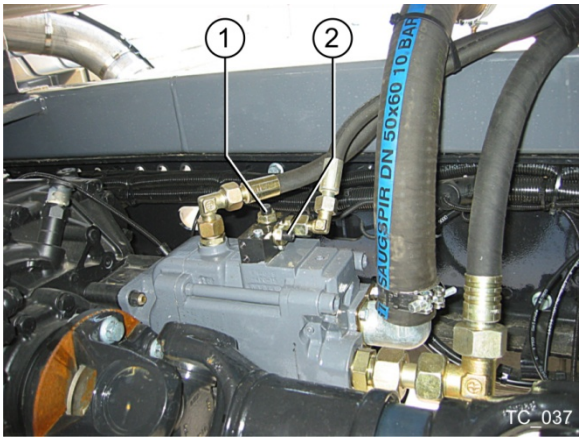


Fig. 3-34 Adjustment pump

The pressure cut-off is the maximum hydraulic pressure provided by the pump. It is factory-set to 250 bar and must not be changed.

The differential pressure determines the maximum volume flow of the hydraulic oil.

The differential pressure is factory-set to the corresponding spreading vehicle and must not be changed without consultation with the company Streumaster.

CAUTION

Changes to the hydraulic pump without approval of the company Streumaster can lead to damage to the hydraulics. Any warranty claim for mechanical and hydraulic components will become void.

4.2.28.4 Hydraulic oil container

The hydraulic oil container is normally located at the front on the right side of the vehicle.

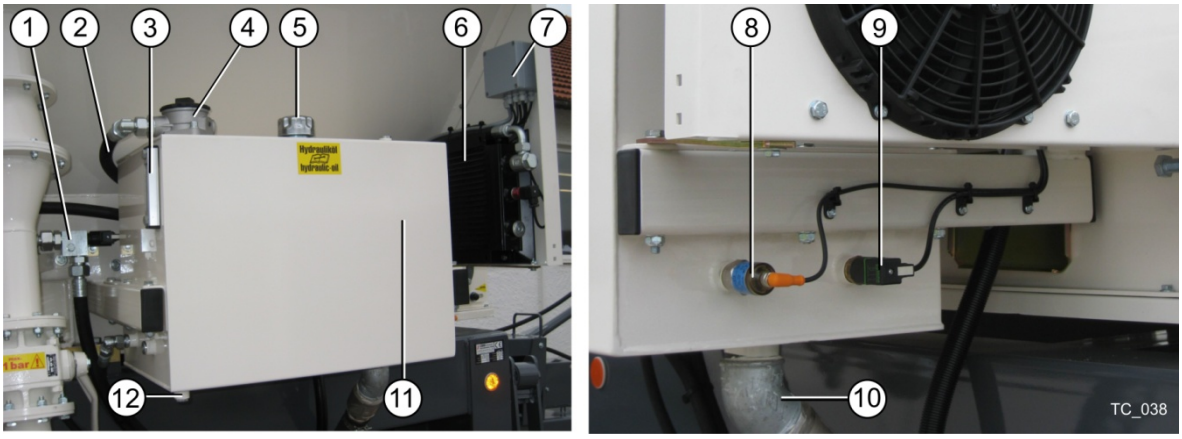


Fig. 3-35 Hydraulic tank

1	Pump control valve (Y0)	7	Distribution box
2	Return pipe	8	Level switch (oil level)
3	Oil level indicator	9	Thermal switch oil overheating, ST2
4	Return filter	10	Suction pipe (to hydraulic pump)
5	Filling nozzle with ventilation	11	Hydraulic oil container
6	Oil cooler	12	Drain plug

The oil level in the hydraulic oil container must be controlled on a daily basis and hydraulic oil must be refilled, if necessary. In the case of refilling and / or oil change the inspection glass of the oil level indicator must be 3/4 filled. This corresponds to a filling amount of approx. 100 litres.

A multi-purpose hydraulic oil of HVLP 68 quality according to DIN 51524/3 (HVLP) must be used.

CAUTION

Mixing different hydraulic oils can lead to failures and damage to the hydraulics for which Streumaster does not assume any liability. However, the oil supplier of the operator of the device can examine the miscibility of different oils and provide the operator of the device with a separate guarantee promise.

The pump control valve is an electromagnetically operated 2/2 way proportional poppet valve and regulates the oil volume flow the hydraulic unit is provided with. The degree of opening of the pump control valve is regulated by the PLC, depending on the spreading capacity.

This regulation helps to save energy and fuel and to avoid unnecessary oil heating.

The level switch is a safety device to prevent the dry run of the hydraulic pump. It is not intended for close monitoring of the oil level in the hydraulic oil tank. If the level switch is activated, the image "Oil loss warning" will appear on the display of the operator terminal. The hydraulic pump must be switched off immediately. After eliminating the cause for the low oil level the hydraulic system can again be put into operation.

The thermal switch monitors the oil temperature and warns of overheating at 70 °C.

If the oil temperature exceeds 70 °C, the message line of the operator terminal will display "!TEMPERATURE!". In this case the spreading operation must be discontinued at once and the hydraulic pump must be switched off. Find the cause for the rise in temperature and eliminate it.

NOTE
In the case of very high outside temperatures it might be necessary to leave the tarpaulin cover and / or the sheet metal doors in the area of the hydraulic oil tank open.

4.2.28.5 Hydraulic oil cooler

1 Hydraulic oil cooler

2 Thermal switch oil cooler (ST1)

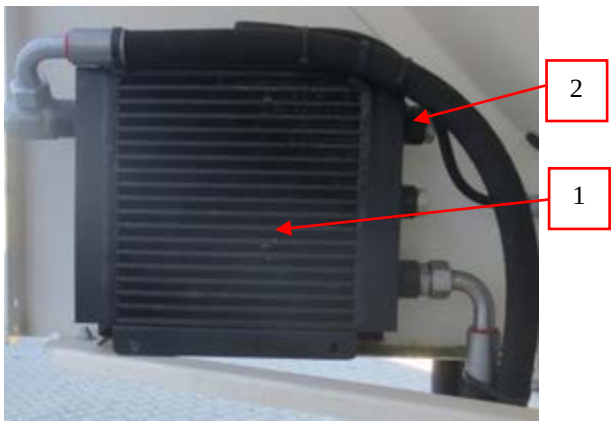


Fig. 3-36 Hydraulic oil switch

The thermal switch monitors the oil temperature in the hydraulic oil cooler. If the oil temperature reaches 50 °C, the electric fan which is installed at the rear side of the hydraulic oil cooler will be switched on. The electric fan will work until the oil temperature falls below 50 °C.

In order to reach an optimum cooling, the cooling fins of the oil cooler must be cleaned on a regular basis, either by means of blowing or by means of washing.

NOTE
After washing the cooling fins it must be ensured that no dust gets into contact with the moist cooling fins and sticks there. Blow the moist cooling fins, if necessary.

4.2.28.6 Main valve block

The main valve block is located at the rear right lateral compartment. This main valve block contains a partial flow control valve and a 3 way proportional flow control valve, see also hydraulic circuit diagram.

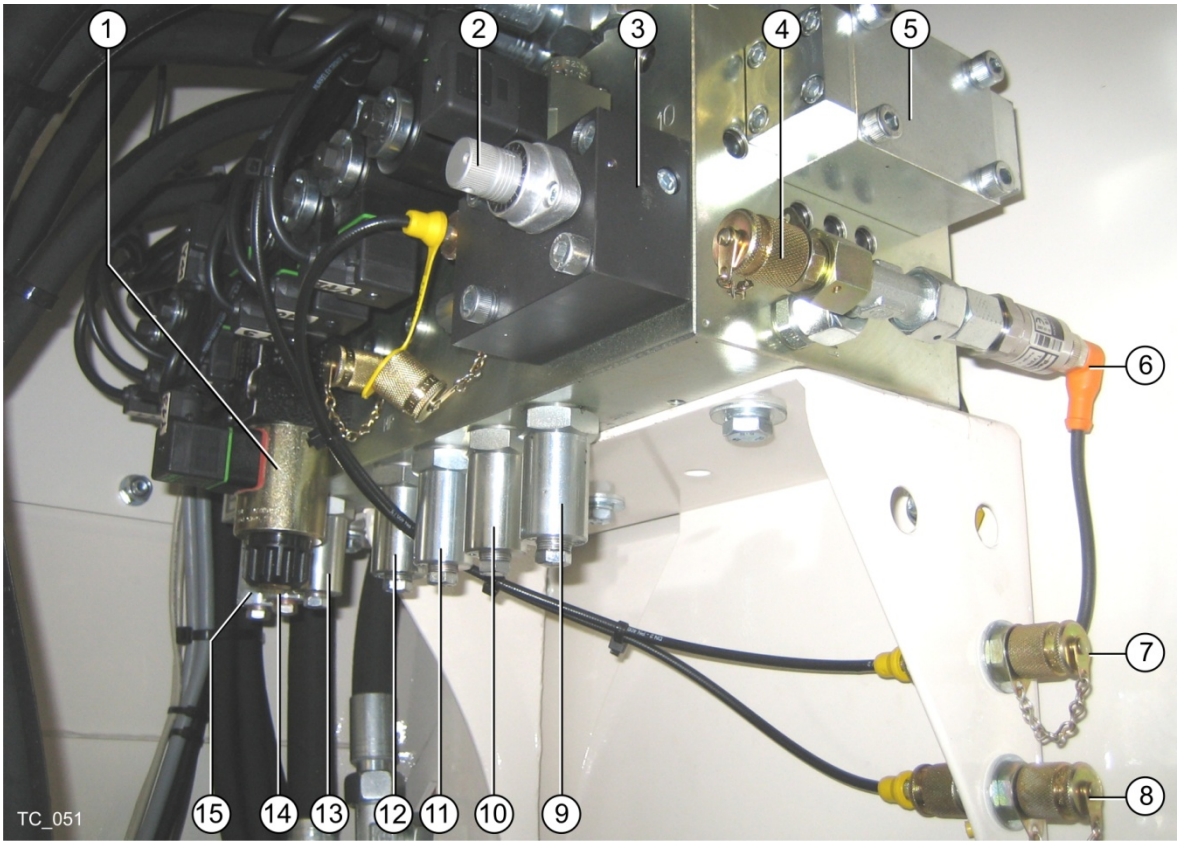


Fig. 3-37 Main valve block

1	Double solenoid valve, slide gate	9	Pressure relief valve, conveyor chain
2	Manual operation flow control valve	10	Pressure relief valve, transverse auger left
3	Flow control valve	11	Pressure relief valve, transverse auger right
4	Measurement connection M1	12	Pressure relief valve, slide gate
5	Partial flow control valve	13	Pressure relief valve partial width 1
6	Pressure transmitter	14	Pressure relief valve partial width 2
7	Measurement connection M2	15	Pressure relief valve partial width 3
8	Measurement connection M3		

The partial flow control valve separates the total oil flow coming from the hydraulic pump in two partial flows with a fix division ratio of 2:1. The bigger partial flow (output circle) drives the conveyor chain and the transverse augers and operates the hydraulic cylinder of the slide gate.

The smaller partial flow (dosing sluice circuit) drives the dosing sluices. This small partial flow flows in the main valve block of the partial flow control valve (to the flow control valve) where the speed of the dosing sluices is determined. The opening of the flow control valve is determined and regulated by the control (PLC).

For cases of emergency the flow control valve can be manually adjusted (emergency manual operation).

– Turn setting wheel to the left — flow control valve is opened (range max. 8)
– Turn setting wheel to the right — flow control valve is closed (range min. 0)

NOTE
During automatic operation and during manual operation the flow control valve must be closed (range to 0), as otherwise the automatics and / or the change of the opening width of the flow control valve via the operating terminal can be overdriven.

4.2.28.7 Pressure transmitter

The pressure transmitter converts the overall pressure in the hydraulic system in an electric signal. This signal is evaluated by the PLC and shown on the display of the operating terminal as plain text.

In the case of a defect of the pressure transmitter, cable break or damage to the plug the message "! SENSOR ?" will be shown in the message line of the operating terminal.

In the case of vehicles with electronic weighing device this message can also refer to a defect, cable break or damage to the plug in a weighing cell.

If the system pressure during continuous operation exceeds 260 bar, the message "HIGH PRESSURE" will be shown, since in case of such a high pressure there is normally a mechanical blockage of a component (e.g. conveyor chain). In the case of continuously increased system pressure the hydraulic system must be checked.

4.2.29 Hydraulic system for devices with an auxiliary engine

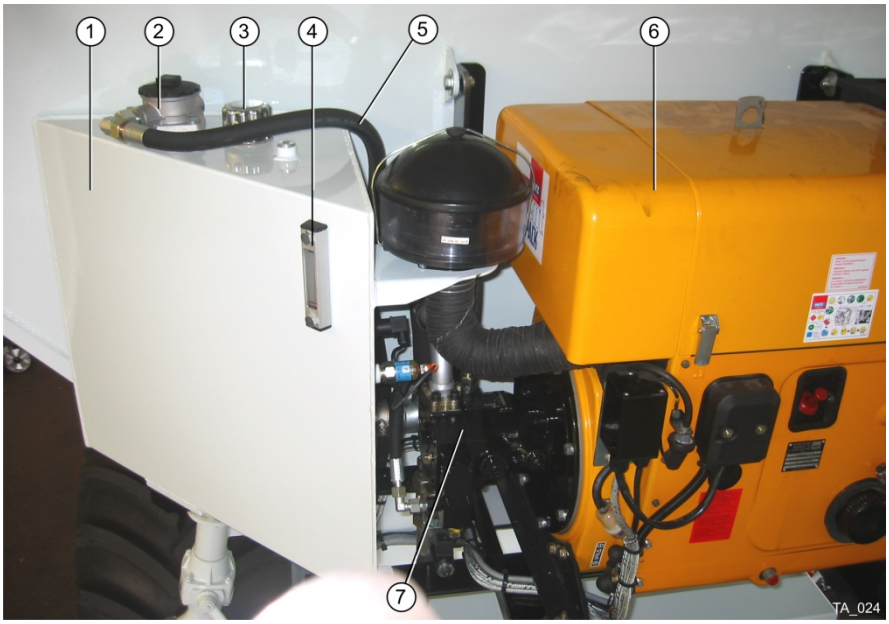


Fig. 3-38 Hydraulic pump with hydraulic oil tank

1	Hydraulic oil tank	5	Return pipe
2	Return filter with filter insert	6	Diesel engine
3	Filling nozzle with ventilation	7	Hydraulic pump
4	Oil level indicator		

The hydraulic system for spreaders with auxiliary motor has the same function as the spreaders with PTO shaft drive.

The hydraulic pump is flanged to the drive motor without intermediate gear. The drive motor runs with idling mixture after start and automatically accelerates fully if the spreading unit is switched on.

The oil level in the hydraulic oil container must be controlled on a daily basis and hydraulic oil must be refilled, if necessary. In the case of refilling and / or oil change 3/4 of the inspection glass of the oil level indicator must be filled. This corresponds to a filling amount of approx. 100 litres.

A multi-purpose hydraulic oil of HVLP 68 quality according to DIN 51524/3 (HVLP) must be used

CAUTION

Mixing different hydraulic oils can lead to failures and damage to the hydraulics for which Streumaster does not assume any liability. However, the oil supplier of the operator of the device can examine the miscibility of different oils and provide the operator of the device with a separate guarantee promise.

Hydraulic oil container, auxiliary motor with hydraulic pump, starter battery and the fuel tank for the auxiliary motor are attached to the front side of the spreader.

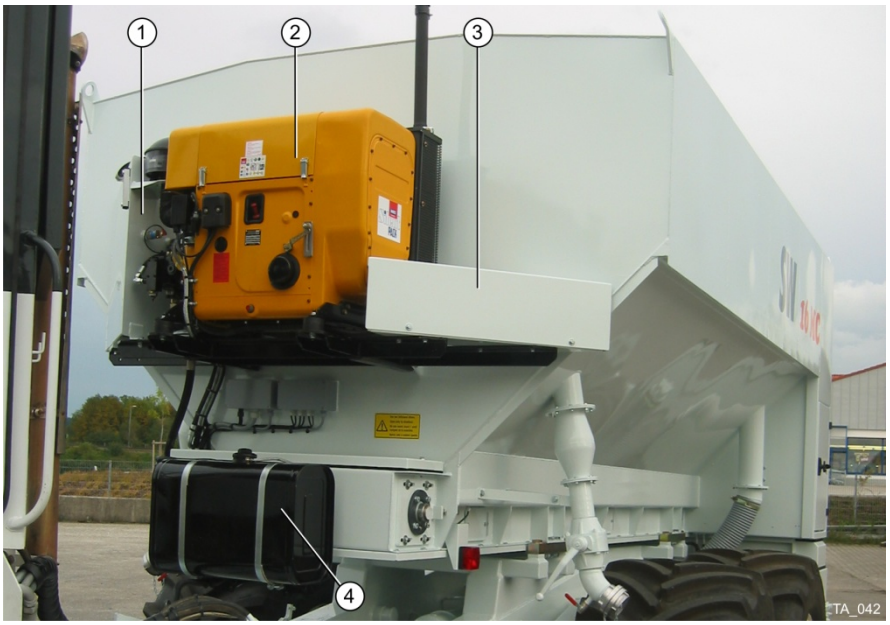


Fig. 3-39 Auxiliary motor

1	Hydraulic oil tank	3	Starter battery (maintenance-free)
2	Diesel engine	4	Fuel tank for the auxiliary motor

NOTE

Please refer to the documentation of the engine manufacturer for further information on the auxiliary motor, its operation and maintenance.

4.2.30 Container attachment to the carriage

The container is screwed to the frame (TC) and / or the intermediate frame (MC) at 4 points via an adapter piece.

4.2.30.1 Attachment without weighing device

1	Mounting bracket to the container
2	Adapter piece
3	Frame

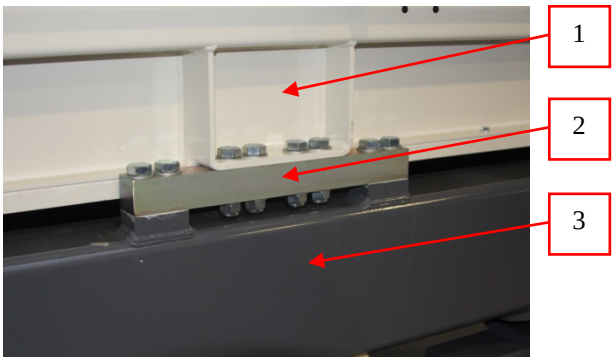


Fig. 3-40 Attachment (without weighing device)

4.2.30.2 Attachment with weighing device

1 Cable for weighing cell
2 Mounting bracket to the container
3 Weighing cell
4 Protective cover
5 Frame

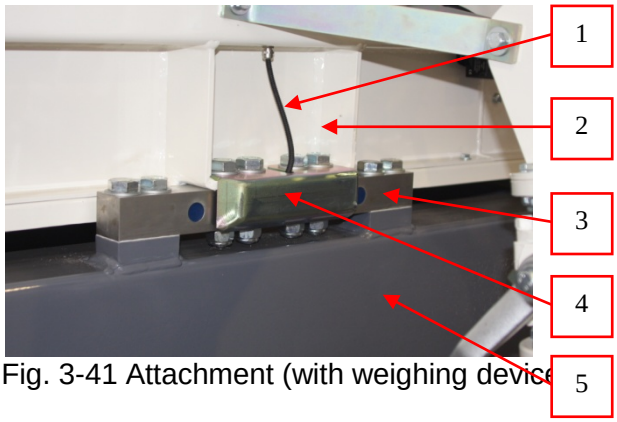


Fig. 3-41 Attachment (with weighing device)

The electronic weighing device is for weighing the actual content of the container. For this purpose the weight of the complete spreading structure is collected via four load cells. They deliver an electric signal which is evaluated by the PLVC and shown on the display of the operating device as a numerical value.

4.2.31 Water system

As an option the machine can be equipped with a water tank for carrying water. The following three variants are possible:

- Water tank only
- Water tank with water sprinkling system
- Water tank with high-pressure cleaner

1 Water tank
2 Display filling level
3 Suction pipe pump
4 Connection for filling
5 Return pump
6 Overflow

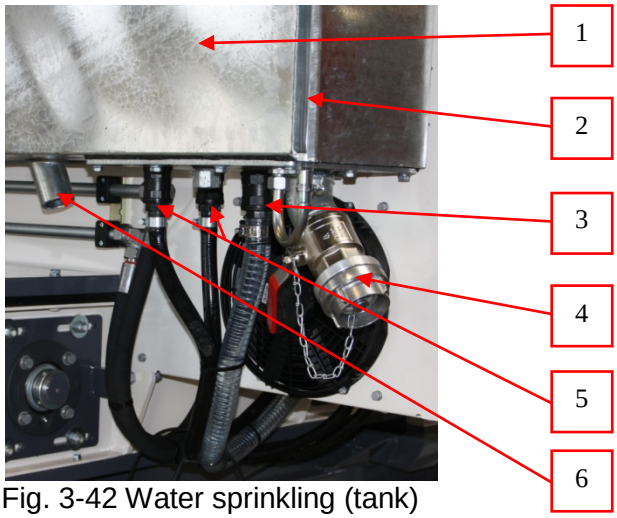


Fig. 3-42 Water sprinkling (tank)

NOTE
In the case of machines with water tank only, the return pipes are blind and a ball valve is installed instead of the suction line pump.

4.2.31.1 Water sprinkling

The water sprinkling for a low-dust binding agent discharge is mounted in front of and behind the spreading unit. The working pressure of the pump is 2 bar. The tank can be filled via a 2“ bayonet connection or via a separate opening. To monitor the water level a level indicator is attached to the front side of the tank. If the tank is overfilled, the water will be discharged via a hose to protect the container from damage.

1 Pressure indicator
2 Potentiometer
3 Filter
4 Valve

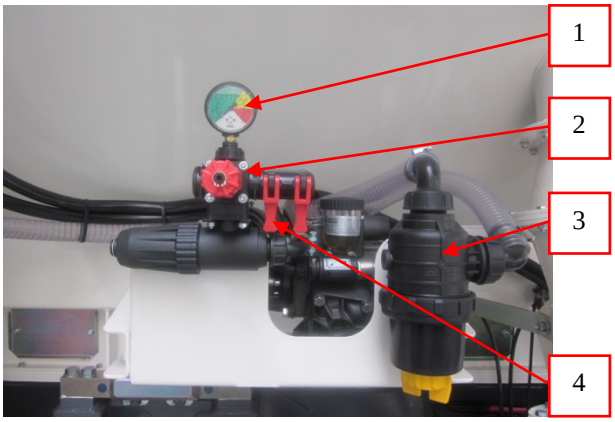


Fig. 3-43 Water sprinkling (controller)

In order to activate the water sprinkling, the value 1 must be entered for “Water consumption” in the settings. Furthermore, the valve (pos. 4) must be opened.

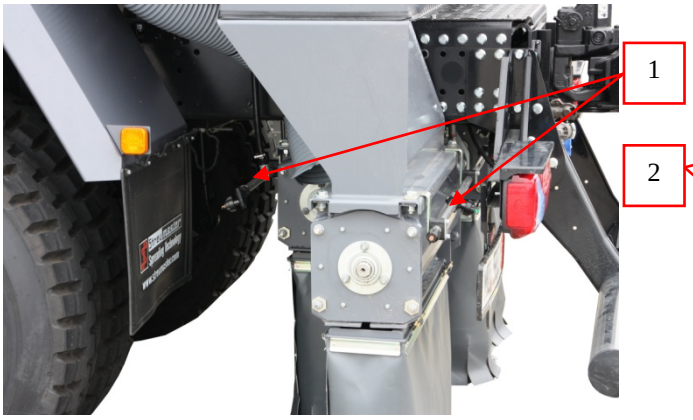


Fig. 3-44 Water sprinkling

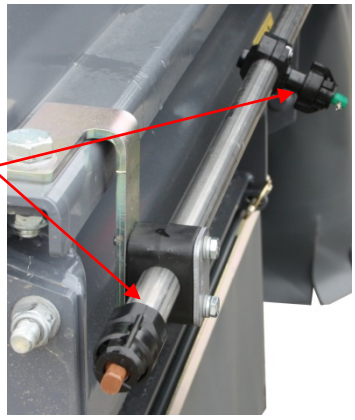


Fig. 3-45 Water nozzles (nozzles)

1 Water lines

2 Nozzles

4.2.31.2 High-pressure cleaner

A high-pressure cleaner can be operated in connection with the water tank. The drive is effected via a hydraulic motor in the return of the hydraulic system.

1 Hose reel
2 Pump and controller
3 Cleaning lance

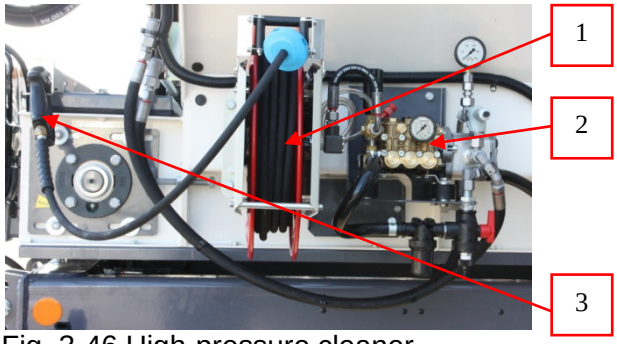


Fig. 3-46 High-pressure cleaner

1 Manometer hydraulic pressure
2 Potentiometer
3 Suction piece for addition
4 Pressure indicator
5 Selector tank / additional connection
6 Additional connection

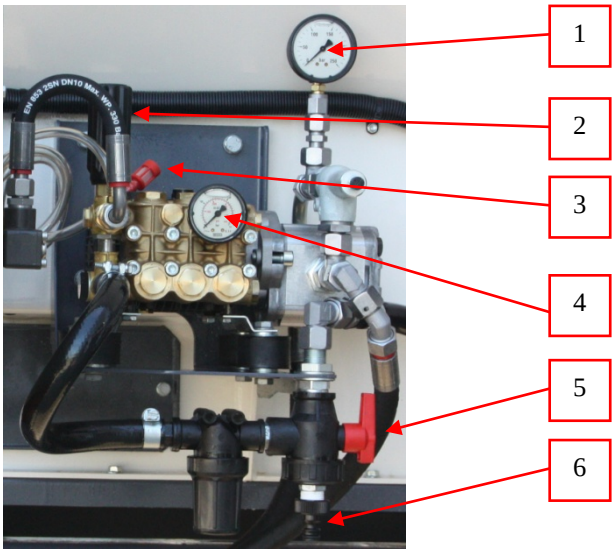


Fig. 3-47 High-pressure cleaner (controller)

Additional cleaning agent can be supplied via the “Suction piece for addition” (pos. 3).

NOTE
Please only supply cleaning agents which are suited for high-pressure cleaners.

Furthermore, it is possible to supply water in another way instead of the water tank (e.g. via a water line). For this purpose the line must be connected to the additional connection (pos. 6) and the selector (pos. 5) adjusted.

NOTE
Please make sure that there is always water at the pump. A dry run can damage the unit.

1 Selector switch for high-pressure cleaner

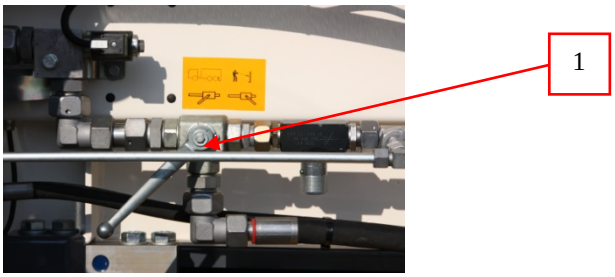


Fig. 3-48 High-pressure cleaner (selector switch)

In order to use the high-pressure cleaner, the selector switch must be set to “Operation high-pressure cleaner” first. Before spreading operation, the selector switch must be returned to “Operation spreader”.

4.2.32 Compressor Dynaset HK450

The compressor of the type Dynaset HK450 is used in order to create compressed air for the automatic dedusting filter unit, if the carrier vehicle does not have its own compressed air generation which can be used for this purpose.

The compressor is driven via a hydraulic motor in the return of the hydraulic system.

1 Oil filling nozzle

2 Pressure manometer

3 Compressor

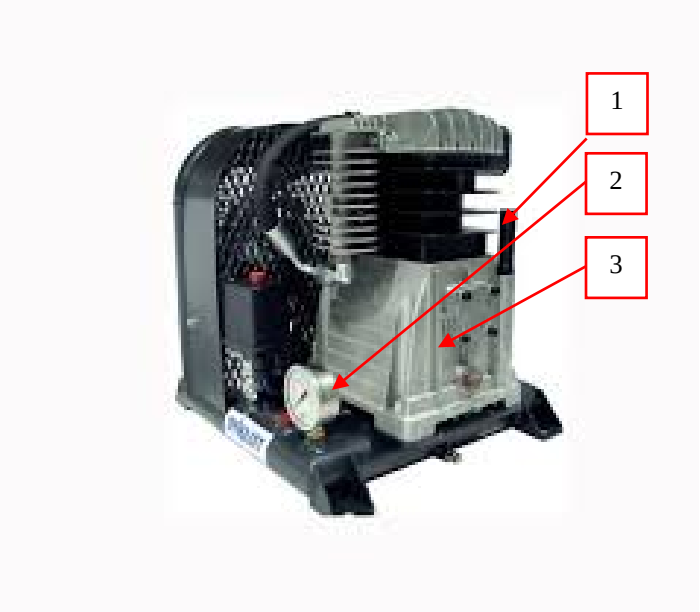


Fig. 3-49 Compressor HK450

WARNING

Risk of burning! The compressor and the compressed air lines can become hot.

NOTE

Please refer to the documentation of the manufacturer for further information on the compressor.

4.2.33 Compressor PTG K160

The compressor of type PTG K160 is used in order to create compressed air for the automatic dedusting filter unit if the carrier vehicle does not have its own compressed air generation which can be used for this purpose.

The compressor is driven electrically and is thus independent from the hydraulic system.

1 Compressor
2 Air filter
3 Electric motor

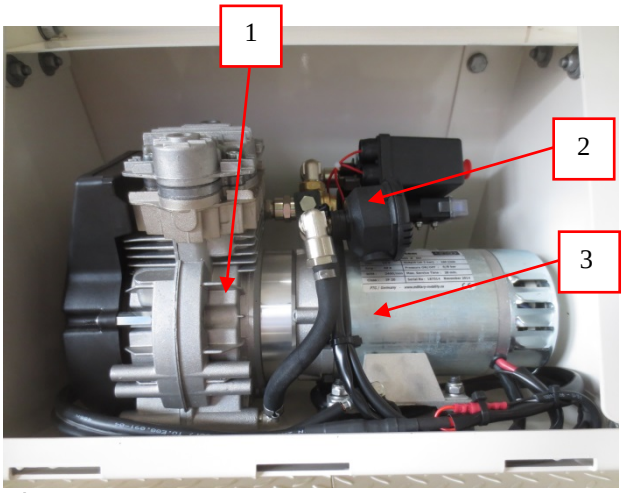


Fig. 3-50 Compressor K160

ATTENTION

Risk of burning! The compressor and the compressed air lines can become hot.

NOTE

Please refer to the documentation of the manufacturer for further information on the compressor.

4.2.34 Compressor CVS SiloKing 700

The compressor of type CVS SiloKing 700 is used to generate compressed air for cleaning. Furthermore, an independent filling of the spreader with a standing silo is possible.

The compressor is driven via hydraulic motor.

1 On- / off-switch
2 Ball valves
3 Compressor
4 Air filter

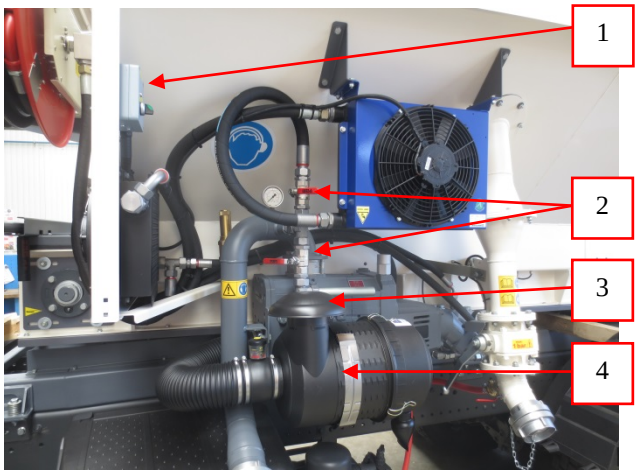


Fig. 3-51 Compressor SiloKing 700

The compressor is operated via the on- / off-switch.

To clean with the compressed air lance, both ball valves must be opened. To fill the container, both ball valves must be closed.

WARNING

Both ball valves must be opened for cleaning the lance, since an overpressure must be discharged. Otherwise the pressure in the system will become too high and be discharged via the overpressure valve!

WARNING

Risk of burning! The compressor and the compressed air lines can become hot.

WARNING

Please wear suitable hearing protection when using the compressor.

NOTE

Please refer to the documentation of the manufacturer for further information on the compressor.

4.2.34.1 Compressed air cooler

Since the air is strongly heated during compression by the compressor, a compressed air cooler is necessary.

1 Compressed air cooler

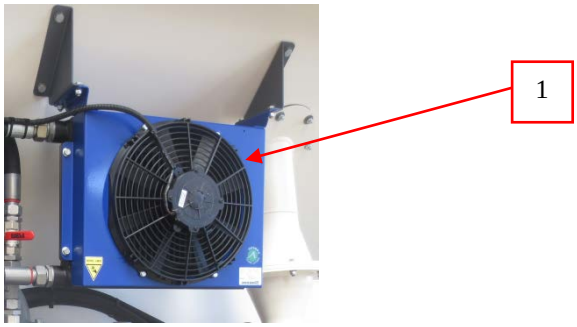


Fig. 3-52 Compressed air cooler

If the cooling capacity decreases considerably, it is necessary to clean the cooling unit. More detailed information can be found in the maintenance instructions.

4.2.34.2 Compressed air lance

In connection with the compressor CVS Siloking700 it is possible to clean the machine with compressed air. For this purpose a hose reel with a compressed air lance is installed on the device.

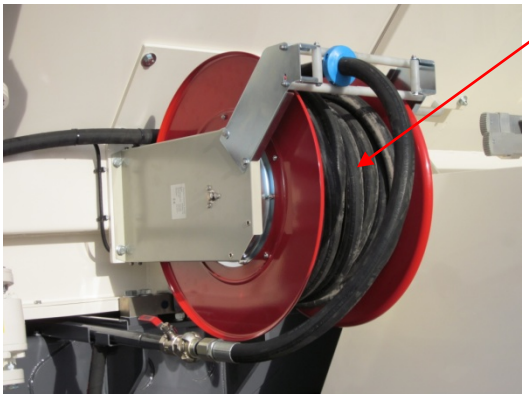


Fig. 3-53 Hose reel

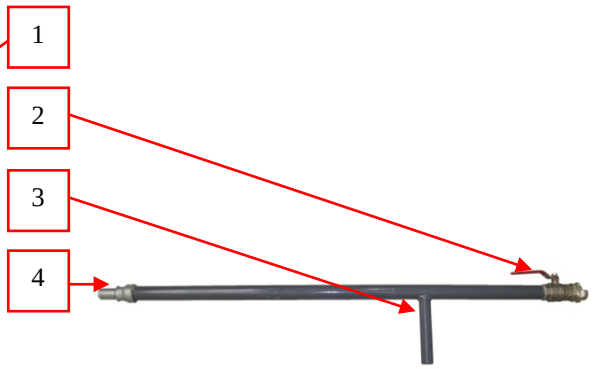


Fig. 3-54 Compressed air lance

1 Hose reel
2 Valve
3 Handle
4 Nozzle

WARNING

Risk of burning! The compressor and the compressed air lines can become hot.

5 Operation

CAUTION

The spreader must be used and operated in such a way that its stability is ensured. The stability can be impaired by overload, caving ground, sudden acceleration or delay of travel motions, during work on a slope.

CAUTION

Spreaders must stay far enough from quarry, pit, dump and slope edges that there is no danger of falling. The contractor or its agent has to determine the corresponding distance from the edge in accordance with the carrying capacity of the ground. The required distances are mentioned in DIN 4124 "Building pits and trenches; Slopes, working space widths, sheeting" (section 7.2.1).

5.1 Initial commissioning

5.1.1 Initial commissioning of a TC model

WARNING

Check before the initial commissioning whether the trailer hitch of the vehicle is designed for the admissible total weight and the support load (see Technical data) of the spreader.

Please refer to the operating instructions of the towing vehicle for coupling and uncoupling of the spreader.

CAUTION

During coupling of the spreader you must not remain between the spreader and the towing vehicle.

1. Position towing vehicle, connect and operate parking brake of the towing vehicle.
2. The delivered drive shaft must be cut to length in accordance with the enclosed instruction of the manufacturer, depending on the type of towing vehicle.
3. Mount the drive shaft on the splined stub at the hydraulic pump and at the towing vehicle.

CAUTION

Drive shafts without protective devices can lead to damage. The protective devices of the drive shaft must not be removed. Only work with a completely secured drive system. Protective tube and protective caps must be installed at any time and must be undamaged and must ensure an overlap in all operating positions.

1 Socket 13-pole (for operating device with distribution box)

2 Socket 7-pole (for illumination)

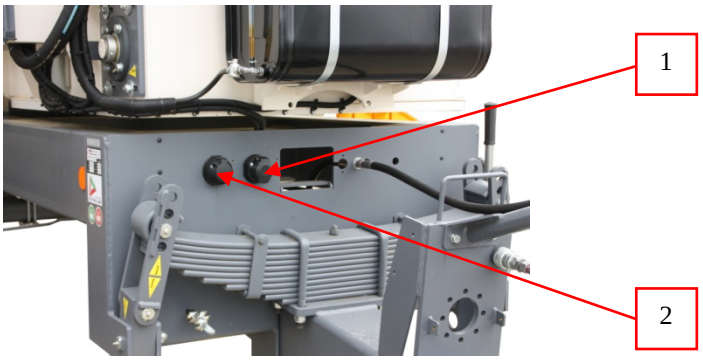


Fig. 5-1 Electrical connections TC

3. Establish electrical connections.
4. Connect brake lines.
5. Connect breakaway cable (if available).
6. In the case of an air brake system the compressed air container of the spreader must be filled via the towing vehicle.
7. Mount the operating device with distribution box in the driver's cab.
8. Hydraulically retract the support foot of the spreader, fold it up and secure it (see additional instructions frame).

CAUTION

When swivelling the support foot up and down, do not reach into the swivel input with your hands and do not step into the swivel area of the support foot.

9. Loosen the parking brake of the spreader.
10. Commission the set and carry out some test brakings.

5.1.2 Initial commissioning of a MC model

The MC models are delivered ready for operation. Possibly the weighing device must be calibrated before the first commissioning.

More detailed information can be found in the maintenance instructions.

5.1.3 Calibration of the weighing device

In order to determine the factor scale, the exact weight of the additional load is required which can be determined with a calibrated vehicle scale. For this purpose the empty and the loaded vehicle must be weighed. The difference corresponds to the weight of the loaded material.

The "Factor scale" is calculated as follows:

$$\frac{\text{Weight of the loaded material (e.g. 15 t)}}{\text{Displayed weight in the operator terminal (e.g. 14.2 t)}} = 1.06$$

The "Factor scale" can also be a value below 1.0, e.g. 0.95.

If there is no calibrated vehicle scale, the following procedure is possible:

1. Fill the spreader from a still completely filled silo truck the load weight of which is known by means of the weighing slip.
1. Note the weight shown in the display of the operating terminal (before and after filling).
2. Empty the container until a weight of approx. 1.0 t.
3. Fill the container again and note the indicated weight (before and after filling).
4. Repeat these steps until the silo truck is empty.
5. Determine the loaded weight.

   Divide the loading weight of the silo truck by the loaded weight. The result is the "Factor scale".

   Example:

   1. Load: display empty = 0.00 t Display full: = 10.68 t

   2. Load: display empty = 1.27 t Display full: = 11.04 t

   3. Load: display empty = 1.00 t Display full: = 5.15 t

   Total display empty = 2.27 t Total display full = 26.87

   Loaded weight = total display full – total display empty = 24.60 t

   $$\text{Factor scale} = \frac{\text{Loading weight of the silo truck}}{\text{Loaded weight}} = \frac{27.10\text{ t}}{24.60\text{ t}} = 1.10$$

6. Enter the determined factor (1.10) into the input field "Factor scale" and confirm with the external switch.
   The entered value can be seen, here it is 1.10.

If the Factor scale is determined within the framework of a recalibration (every 6 months), the newly determined Factor scale must be multiplied with the Factor scale saved in the control. The result must be entered as new Factor scale.

Example:

The new Factor scale determined within the framework of a recalibration = 0.97
Factor scale existing in the control = 1.1

The Factor scale to be entered into the control = 1.07 (0.97 x 1.1)

NOTE
The vehicle vibrations and frame torsions can cause the display to slightly vary. The deviations resulting from this are negligible.

5.1.4 Commissioning of the spreader

CAUTION

Risk of crushing and injury by shearing at the bottom of the spreading auger with the rotating auger. The operation without dust protection is forbidden.

Before the initial commissioning the spreader and the slide gate must be checked for proper functioning with an empty material container. For this purpose, let the conveyor chain, the RotoPlus dosing rotor and the spreading auger run for a short period of time.

NOTE

Before commissioning of the hydraulic unit, check the hydraulic oil level in the hydraulic oil container.

5.2 Operation

CAUTION

The operation of the spreader by unauthorised persons can lead to damage to human life and material.

The spreader must only be operated and run by trained personnel while using the personal protective equipment.

In case of strong wind (exceedance of the air limit value), the output of the material must be stopped.

Do not leave applied material unprocessed on the ground for an unnecessary long period of time.

Caution in case of rain - the danger of acid burns increases. Use personal protective equipment.

Caution in case of rain and wet conditions – increased danger of slipping and falling on steps and stairs.

It is forbidden to leave the driver's cab during a thunderstorm.

NOTE

Please note during spreading operation that the hydraulic pump of all devices where the hydraulic pump is flanged to the coupling-dependent auxiliary drive will come to a standstill if the vehicle clutch is disengaged.

5.2.1 Tying the filter bag

The filter bag (available as an accessory) should be tied properly to avoid unintentional opening during the filling procedure.

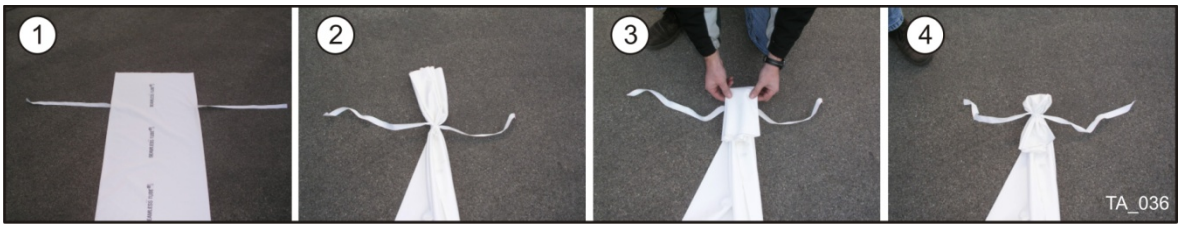


Fig. 5-2 Filter bag

1. Spread out the filter bag on the ground.

2. Fold the filter bag from both sides into the middle and tie together firmly with the strings.

3. Fold the end into the middle to the tying position and tie together firmly with the strings.

5.2.2 Filling the spreader

NOTE
Ensure before filling that the control panel is activated, the stop valve closed and container venting is functioning.

1. Unscrew the blank cover and connect the filling hose.
2. Close the aeration valve (hand lever positioned transverse to flow direction).
3. Open the valve until the direction indicator points in the flow direction.
4. Begin the filling of the container and monitor the "Container full" indicator lamp.
5. End filling immediately if the indicator lamp illuminates.

Fig. 5-3 Filling installation

6. Close the valve.
7. Open the aeration valve to relieve pressure on the filling hose coupling.
8. Disconnect the filling hose and close the coupling with the blank cover.
9. Close the aeration valve.
10. In the case of TC models with a pneumatic brake system, adjust the braking force controller to suit the respective load.

CAUTION
Unadapted braking action caused by incorrect adjustment of the braking force controller can lead to damage and accidents.

The braking force controller should be set to the correct position to suit the load in the

case of a chassis with a pneumatic brake system.

Load symbols on braking force controller

= Empty

= Half load

= Full load

= Release

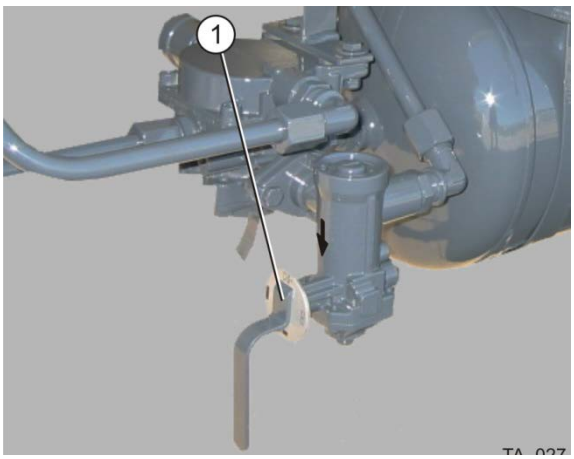


Fig. 5-4 Braking force controller

5.2.3 Adjusting material dosing

A few specifications are required for precise dosing of material to allow the control to continually adapt the spreading quantity to the speed.

These specifications should be entered in the "Discharge" screen.

5.2.3.1 Nominal value

Enter the nominal value of the desired spreading quantity in kg/m² in the "Discharge" screen with the aid of the rotary switch. An input of between 3.0 to 90.0 kg/m² is possible.

5.2.3.2 Bulk weight

The bulk weight (measured in kg/l) can differ depending on the material involved. As dosing channels always convey the same volume per revolution, inputting of the bulk weight is necessary to achieve the nominal value.

This volume is then heavier in the case of binding agents with a high bulk weight than binding agents with a density. Therefore, if you wish to spread 20 kg/m² of a binding agent with a bulk weight of 0.85 kg/l (at the same driving speed), the spreading augers should rotate quicker than in the case of a binding agent with a bulk weight of 1.15 kg/l.

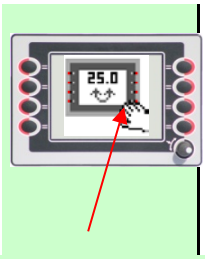
The bulk weight should be determined through exact weighing of a litre of material. The value determined should be entered in the "Discharge" screen with the aid of the rotary switch. An input of between 0.30 to 2.00 kg/l is possible (in increments of 0.01 kg/l).

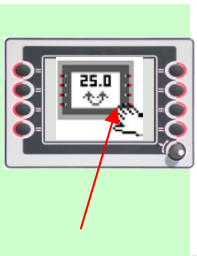
NOTE
The measuring container supplied as an accessory has a volume of 1.45 litres. The bulk weight to be entered in the "Discharge" screen can be obtained from the following table.

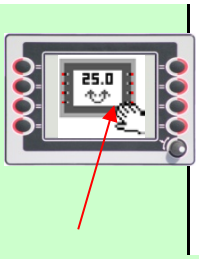
The weight of the completely filled measuring container can be determined with the suspension scale provided.

NOTE
The table for the bulk weight is also attached to the left lateral compartment and to the measuring container.

Schüttgewichttabelle / Table of apparent density / Tabella densità apparente

kg	kg/l	kg	kg/l	kg	kg/l
0.88	0.48	1.66	0.99	2.44	1.50
0.90	0.50	1.68	1.01	2.46	1.52
0.92	0.51	1.70	1.02	2.48	1.53
0.94	0.52	1.72	1.03	2.50	1.54
0.96	0.54	1.74	1.05	2.52	1.56
0.98	0.55	1.76	1.06	2.54	1.57
1.00	0.56	1.78	1.07	2.56	1.58
1.02	0.58	1.80	1.09	2.58	1.60
1.04	0.59	1.82	1.10	2.60	1.61
1.06	0.60	1.84	1.11	2.62	1.62
1.08	0.62	1.86	1.13	2.64	1.63
1.10	0.63	1.88	1.14	2.66	1.65
1.12	0.64	1.90	1.15	2.68	1.66
1.14	0.65	1.92	1.16	2.70	1.67
1.16	0.67	1.94	1.18	2.72	1.69
1.18	0.68	1.96	1.19	2.74	1.70
1.20	0.69	1.98	1.20	2.76	1.71
1.22	0.71	2.00	1.22	2.78	1.73
1.24	0.72	2.02	1.23	2.80	1.74
1.26	0.73	2.04	1.24	2.82	1.75
1.28	0.75	2.06	1.26	2.84	1.77
1.30	0.76	2.08	1.27	2.86	1.78
1.32	0.77	2.10	1.28	2.88	1.79
1.34	0.79	2.12	1.29	2.90	1.80
1.36	0.80	2.14	1.31	2.92	1.82
1.38	0.81	2.16	1.32	2.94	1.83
1.40	0.82	2.18	1.33	2.96	1.84
1.42	0.84	2.20	1.35	2.98	1.86
1.44	0.85	2.22	1.36	3.00	1.87
1.46	0.86	2.24	1.37	3.02	1.88
1.48	0.88	2.26	1.39	3.04	1.90
1.50	0.89	2.28	1.40	3.06	1.91
1.52	0.90	2.30	1.41	3.08	1.92
1.54	0.92	2.32	1.43	3.10	1.94
1.56	0.93	2.34	1.44	3.12	1.95
1.58	0.94	2.36	1.45	3.14	1.96
1.60	0.96	2.38	1.46	3.16	1.97
1.62	0.97	2.40	1.48	3.18	1.99
1.64	0.98	2.42	1.49	3.20	2.00

5.2.3.3 Control weighing

NOTE
A control weighing should be carried out at the beginning of the spreading work, whether in automatic or manual operation.

To check the spreading values by means of a control weighing, the delivered weighing plate is placed in the middle of the surface to be driven over. Afterwards the weighing sheet is spread over with the switched-on spreading unit; a certain amount of material is placed on the weighing plate. Please make sure that no material is brushed from the weighing plate with the dust protection and that the weighing plate is not dragged along with the rear dust protection. The weight of this material amount is determined with a scale.

NOTE

The weighing plate must be placed in accordance with the following sketch. In order to reach a correct result, at least 3 measurements must be carried out which are used to calculate the average.

The surface of the weighing plate is 0.25 m²; i.e. the net weight multiplied with the factor 4 results in the numerical value of the applied material amount in kg/m².

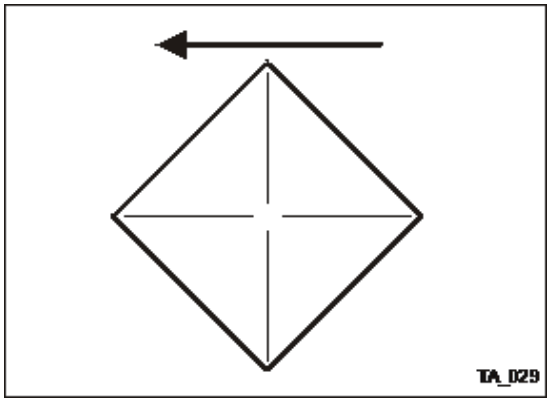


Fig. 5-5 Weighing plate in direction of travel

5.2.3.4 Determination of the driving speed

The driving speed is calculated by the PLVC with the help of the sensor wheel and / or a radar unit and shown on the display of the operator terminal. However, the PLC requires the information how many impulses the sensor or the radar unit delivers on a route of exactly 100 metres.

This value is entered in the image "Settings 2" in the input field "Impulses/100m".

If the value is not known, the sensor must be calibrated. More detailed information can be found in the maintenance instructions.

5.2.4 Spreading during automatic operation

NOTE
All activities described hereinafter are carried out in the operating mode "Automatic". Entries which are not mandatory or are not possible due to reasons of equipment can be left out.

1. Fill the spreader with material
2. Drive to the spreading point
3. Switch on the control
4. Call up the image “Order” (key F4)
5. Select all input fields one after the other with the rotary knob and enter the required data.
6. Leave the image “Order” (key F4)

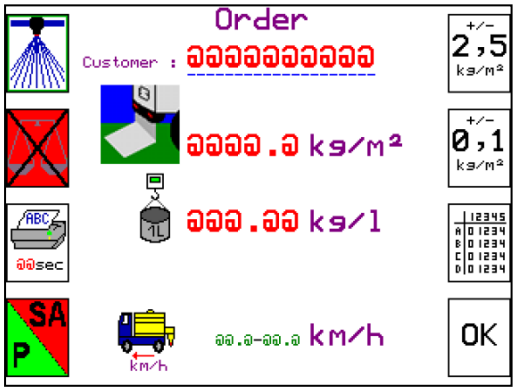


Fig. 5-6 Order

7. Re-check the correctness of the order data
8. Select the partial widths which are to be used for spreading (The selected partial widths are surrounded by a red frame).
9. Check whether the spreader is switched off (LED “Spreader / chain” on additional keyboard and frame around spreaders not green)

NOTE
If the spreader is switched on, material will be conveyed in the filling shaft immediately when switching on the hydraulic pump.

10. Switch on the hydraulic pump

NOTE
In the case of spreaders where the hydraulic pump is flanged to the coupling-dependent auxiliary drive of the vehicle drive the hydraulic pump will come to a standstill when the coupling is disengaged.

11. Switch on the output with the function key “Spreader / chain” (the schematic representation of the conveyor chain, transverse augers and dosing sluices becomes green). Simultaneously the slide gate is opened automatically. The conveyor chain now fills the filling shaft with material.
12. Start driving the vehicle. The control regulates the speed of the dosing sluices to the correct value (can vary a little on the first metres). The theoretical spreading quantity in kg/m² appears on the display which must be in the area of the entered nominal value.

NOTE
Please note that the cells of the dosing sluices are not yet filled with material and thus, depending on the set nominal value, a distance of up to 1.0 m with switched-on spreader must be covered until material falls on the ground.

13. If necessary, the nominal value can be changed via the function keys “-%” und “+%” while driving. The change is shown on the nominal value and percent display. Further data can now be read on the display such as machine utilisation in %, driving speed, spread amount as well as the remaining distance which can be covered with the current settings.

NOTE
The route and quantity counters can be set to zero at any time.

14. After the end of spreading, switch off the spreader and the output with the function key (spreader / chain). The slide gate will be closed automatically.
15. Switch off the hydraulic pump.

During the spreading operation the individual partial widths can be switched on and off at any time under load.

If turning and shunting manoeuvres are necessary between the routes to be spread, the dosing sluices and the output should be switched off. The slide gate is also closed automatically and no material can slide into the discharge chamber. In case of longer turning and shunting manoeuvres, the hydraulic pump must be switched off as well.

5.2.5 Downstream work

Please make sure that the container is emptied completely at the end of the day so that no lumps can occur due to condensation and / or the material cannot harden.

WARNING
With each day that the spreader is placed with an unemptied container the danger increases that the conveyor chain will not be able to transport the material from the container anymore.

It is recommended to carry out the self-cleaning after termination of the spreading so that there is no more material in the container and the dosing sluices!

5.2.6 Spreading in manual mode

The sequence for spreading in manual mode is comparable to spreading in automatic mode.

The spreading quantity in manual mode depends on the driving speed and degree to which the flow control valve is opened. A consistent driving speed must be maintained to achieve a constant spreading quantity.

Any empirical values available from automatic mode can be imported. Where no empirical values are available, there are two options for achieving the desired spreading quantity.

- **Maintain a consistent driving speed** and adjust the spreading quantity by changing the opening width of the flow control valve on the control panel
- **Maintain the opening width of the flow control valve** and adjust the spreading quantity by changing the driving speed.

If the discharge and/or dosing channels are activated, material is conveyed immediately when the hydraulic pump is switched on.

Small differences between the nominal and actual spreading quantity which cannot be corrected by adjusting the flow control valve (as the increment of 5% is too great) can be corrected through minimal changing of the driving speed.

It should be taken into consideration that the dosing channels are rotating and conveying material even when the vehicle is stationary. Spreading should therefore commence immediately after activating the dosing channels, or the dosing channels should only be activated once the vehicle is moving.

NOTE
Values determined in spreading mode can be added to the table of empirical values.

5.2.7 Spreading in manual emergency mode

Spreading in manual emergency mode is necessary if the flow control valve can no longer be adjusted from the control panel (via the solenoid).

The opening width of the flow control valve should be specified from the outset when spreading in manual emergency mode. If the adjusting wheel is set between 4 and 5 on the scale, it is equivalent to a flow control valve opening width of 40-50%.

The opening width configured can be checked on the control panel display on the basis of machine utilisation.

NOTE
The flow control valve opening width indicated on the display is an incorrect value caused by a defective solenoid and should be ignored.

5.2.8 Table for empirical values

Material	Driving speed in km/h	Machine utilisation in % (flow control valve opening in %)	Actual spreading quantity in kg/m^2	Discharge data		
				Nominal value in kg/m^2	Bulk weight in kg/l	Correction factor

6 Maintenance, care and repairs

CAUTION
Observe the following prior to all maintenance, care, adjusting and repair work:

Switch off the hydraulic pump and secure against reactivation
Apply the parking brake
Secure the spreader against rolling with brake shoes (wedges).

During the maintenance, inspection and care work described below, the work appropriate for the respective spreader vehicle model should be carried out.

6.1 Maintenance and inspection intervals

NOTE
Abbreviations used to refer to working times have the following meanings:

t = daily
m = monthly
h = every 6 months
j = annually
n. B. = as required
B = operator
F = skilled personnel (trained maintenance and repair personnel)

6.1.1 Daily work

The following inspection work should be carried out daily prior to, during and after use.

Ser. no.	Inspected/Designation	Test/Task	Personnel
1	Cardan shaft	Visual inspection	B
2	Support foot	Visual inspection	B
3	Manual hydraulic pump support foot	Visual inspection, leaks	B
4	Hydraulic pump	Visual inspection, leaks	B
5	Hydraulic lines, hydraulic hoses	Visual inspection, leaks	B
6	Hydraulic oil tank	Filling level, leaks, condition	B
7	Hydraulic oil cooler	Dirt	B
8	Hydraulic motors on the conveyor chain, transverse augers and dosing channels	Visual inspection, leaks	B
9	Hydraulic valves	Visual inspection, leaks	B
10	Hydraulic pressure gauge	Function	B
11	Stop valve	Function, hydraulic line connections free of leaks	B
12	Proximity switch on stop valve	Function	B
13	Control panel	Visual inspection, function	B

Ser. no.	Inspected/Designation	Test/Task	Personnel
14	Discharge (conveyor chain, transverse augers)	Visual inspection, function	B
15	Dosing channels (spreading auger)	Visual inspection, deformation, smooth movement, cleaning the outlet slots	B
16	Vehicle lighting	Function	B
17	Pneumatic tank (for pneumatic brake system)	Water drainage, sealing	B
18	Braking force controller (for pneumatic brake system)	Visual inspection, adjustability	B
19	Parking brake (handbrake)	Function	B
20	Chain channel	Allow spreading auger to run for 10 minutes with an empty container	B
21	Conveyor chain tail-end chamber	Remove clumps and solidified binding agent	B
22	Filling shaft housing	Dirt	B
23	Safety switches	Condition, function	B
24	Dust protection on dosing channels	Condition	B
25	Filling pipe stop valve	Condition, smooth movement	B
26	"Container full" indicator lamp	Function	B

6.1.2 Inspection and care work according to time

6.1.2.1 Daily inspection and care work

Ser. no.	Inspected/Designation	Test/Task	Frequency	Nominal value/ Lubricant	Personnel
1	Bearings of transverse auger drive shafts	Lubricate *	t	5 strokes, bearing grease	B/F
2	Bearings of drive and deflection roller of conveyor chain, left and right	Lubricate *	t	3 strokes, bearing grease	B/F
3	Bearings of dosing channels	Lubricate *	t	2 strokes, bearing grease	B/F
4	Lubricating points in cardan shaft	Lubricate	t	3 strokes	B/F

* When lubricating bearings, allow the respective hydraulic motor to run (conveyor chain, transverse augers, dosing channels).

6.1.2.2 Monthly inspection and care work

Ser. no.	Inspected/Designation	Test/Task	Frequency	Nominal value/ Lubricant	Personnel
1	Coupling seals on filling device	Clean and lubricate	m	Vaseline	B/F
2	Other lubricating points	Lubricate	m	3 strokes	B/F
3	Hydraulic oil tank	Filling level, condition, sealed connection	m		F
4	Hydraulic pump	Condition, sealed connection, function, noises	m		F
5	Hydraulic motors	Condition, sealed connection, function, noises	m		F
6	Joint eye and joint bearing of hydraulic cylinder on stop valve	Lubricate	m	2 strokes, bearing grease	B/F
7	Spline shaft on hydraulic pump	Clean and lubricate	m	Bearing grease	B/F
8	Flexible rubber disks on transverse augers	Condition, fixing	m		F
9	Dosing channel rotors	Condition, wear	m		F

6.1.2.3 6-monthly inspection and care work

Ser. no.	Inspected/Designation	Test/Task	Frequency	Nominal value/ Lubricant	Personnel
1	Fixing of container on chassis	Secure mounting	h	Tightening torque 200 ±20 Nm	F
2	Manhole cover, closure screws	Secure mounting	h		F
3	Venting pipe	Clean	h		F
4	Electrical system Cables, cable trees Distributor box and switch cabinet	 Condition, secure mounting, secure contact, abrasion points Condition, fixing	h		F
5	Weighing device	Calibrate weighing device	h	see Section	B/F

6.1.2.4 Annual inspection and care work

Ser. no.	Inspected/Designation	Test/Task	Frequency	Nominal value/ Lubricant	Personnel
1	Hydraulic oil tank Recirculation filter element Hydraulic oil	 Change Change	 j j	 HVLP 68 approx. 100 l	F
2	Conveyor chain	Check chain tension	j		F
3	Conveyor chain wear rails	Check wear along entire length	j	min. 5 mm	F
4	Conveyor chain return rails	Check wear along entire length	j	min. 10 mm	F
5	Conveyor chain tappets	Check wear on individual tappets	j		F
6	HRC couplings on conveyor chain drives	Check wear on flexible gear rim	j	ΔS = 15 mm.	F
7	Hydraulic hose lines	Condition, leaks, year of make of hydraulic hose	j	Replace 6 years after year of manufacture	F
8	Hydraulic pipelines	Condition, leaks, secure mounting	j		F

* When lubricating bearings, allow the respective hydraulic motor to run (conveyor chain, transverse augers, dosing channels).

6.2 Description of inspection and maintenance work

General safety specifications

CAUTION

A ladder should be used for all work on the container roof or when climbing into the container itself. The ladder should still protrude at least 1 m above the container roof when leaning at an angle of 65°-75°, see Fig.

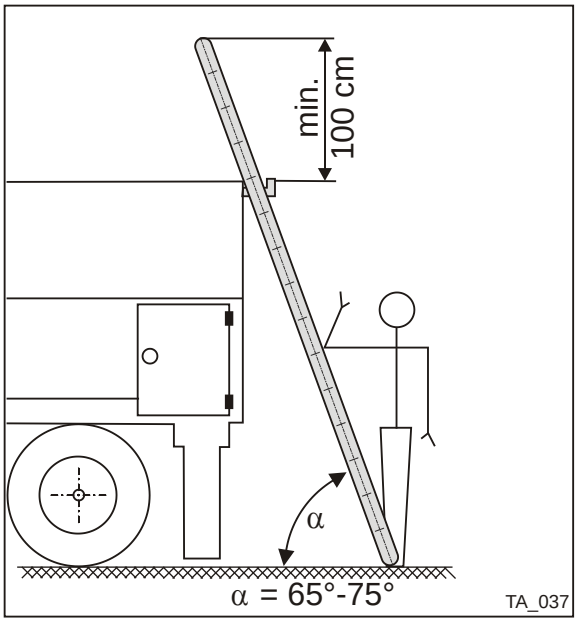
The ladder should be engaged on the attachment hooks on the container to stop it slipping.

Wear clean footwear with a secure grip. There is a risk of slipping and falling in weather involving frost, hoarfrost, severe rain, strong wind or icing up of steps, etc.

The owner should ensure that extensions of the frames and steps of ladders are not improvised or makeshift. Operators should not extend the frames and steps of ladders in an improvised or makeshift manner.

The owner should withdraw damaged ladders, steps and grids from use and should only make them available for use again after repairing them correctly, restoring their original stability and ensuring that they can be mounted safely.

Please observe BGV D36 "Ladders and steps".



6.2.1 Changing the hydraulic oil

CAUTION
The hydraulic system should be relieved of pressure prior to commencing work on it to prevent injuries or the risk of explosion or fire. Do not work on hot surfaces or with hot hydraulic oil. Risk of burning. Comply with the waiting period for cooling.

NOTE
The hydraulic oil should only be changed when it is at operating temperature (warm).

1. Switch off the hydraulic pump and secure against reactivation.

CAUTION
Observe the following when changing hydraulic oil:
Hot hydraulic oil can cause scalding. Hydraulic oil can cause skin rashes or other impairments to health. Avoid extended skin contact with hydraulic oil. Wash thoroughly after every skin contact

2. Position a suitable container (min. 120 l) under the hydraulic oil tank.
3. Open the hydraulic oil tank drainage screw, collect the emerging hydraulic oil.

CAUTION
Environmental protection measures:
Hydraulic oil should be prevented from penetrating the soil, water or sewage systems. Ensure that hydraulic oil is disposed of safely and in a manner that does not harm the environment. Valid national regulations for the protection of waterways and governing the disposal of used oil and waste should be observed.

4. Check the drainage screw seal ring to ascertain whether it can be reused; replace if necessary.
5. Screw in the drainage screw and seal ring.

WARNING
Never fill hydraulic oil without a filter insert.

6. Fill the hydraulic oil (max. 100 l) via the filling spout.
7. Check the hydraulic oil level on the oil level indicator.
8. Activate the hydraulic pump and allow it to run for a few minutes to vent the system.
9. Activate the discharge and dosing channels and allow it to run for 1-2 minutes.

NOTE
Indications of flawless aeration are:

no foam in the hydraulic oil tank
no unusual noises in the hydraulic system
no sudden jerking movement of cylinders and motors.

10. Check the hydraulic system for leaks during and after the test run.

6.2.2 Checking the condition and duration of use of hydraulic hose lines

CAUTION
The condition of hydraulic hose lines should be checked by skilled personnel in accordance with the maintenance schedule.

The duration of use of a hydraulic hose line should not exceed six years, including a storage period of max. 2 years (extract from DIN 20066).

The duration of use means the period of use and storage of a hose line calculated from the date of manufacture.

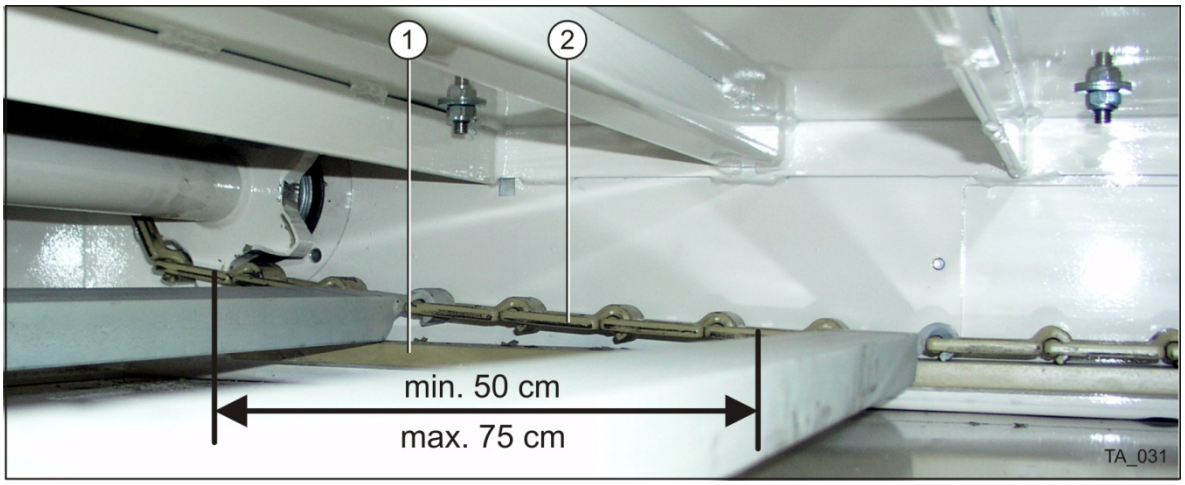
CAUTION
Hose lines should be replaced if one of the following safety impairments are detected during inspection:

- Damage to the outer skin penetrating through to the inner tube (e.g. abrasion points, cuts or cracks)
- Brittleness of outer skin (crack formations in hose material)
- Deformation not in keeping with the natural shape of the hose, whether under pressure or not (see also DIN 20066).
- Leaks
- Damage or deformation of hose fittings (sealing function impaired)
- Hose parting company with fittings
- Function of fittings and corrosion which undermines their strength
- Storage and utilisation period exceeded.

CAUTION
Repair work on hose lines should only be entrusted to trained and instructed personnel with specialised knowledge of hydraulics.

6.2.3 Checking conveyor chain tension

1. Remove the service hatch (front left) on the chain channel.
2. Illuminate the chain channel and check the conveyor chain tension.

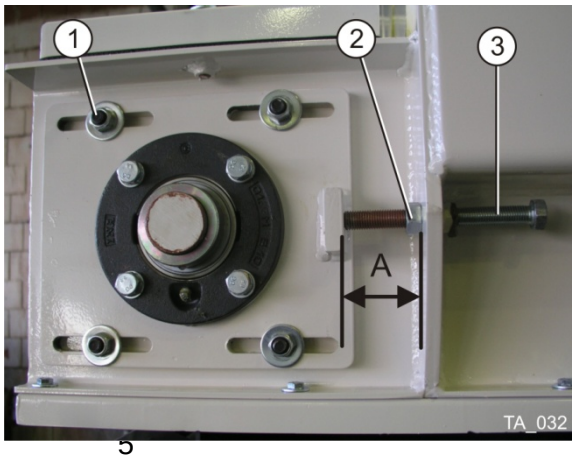


5-1 Chain tension

3. The conveyor chain (5-7) tension is correct if it rests on the wear rail (5-7/1) for a length of min. 50 cm, but not more than 75 cm, measured from the tail-end roller. The conveyor chain should be tensioned if the minimum of 50 cm is not reached.

6.2.4 Tensioning the conveyor chain

4. Loosen all the fixing nuts (1) on the tail-end roller.
2. Loosen the locknut (2) on the tensioning screw (3).
3. Screw in the tensioning screw (3) on each side evenly until the chain tension has reached the desired dimension.
4. The dimension "A" should be the same on both sides of the tail-end roller to allow for uniform chain tension.



5

Fig. 5-8Tensioning device

5. Tighten the locknut (2) and fixing nuts (1) firmly.
6. Tighten all fixing nuts (1) on the tail-end roller firmly.

NOTE
A chain link should be removed from the conveyor chain if chain tensioning proves impossible due to an inadequate tension distance. Wear on the drive shaft and deflection roller chain sprockets should also be checked.

6.2.5 Shortening the conveyor chain by one chain link

The conveyor chain has a chain lock which can be identified by the fact that round steel has been welded and smoothed to the joint.

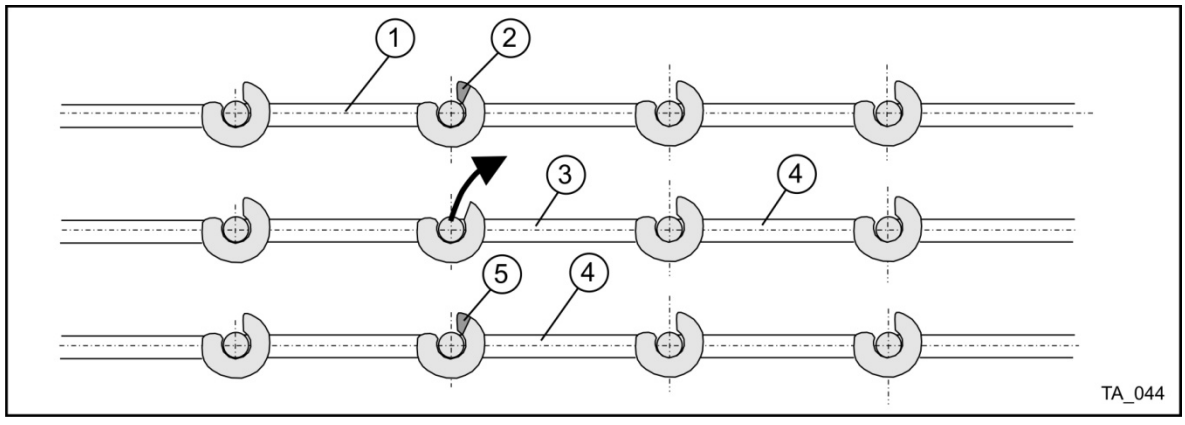


Fig. 5-2 Chain lock

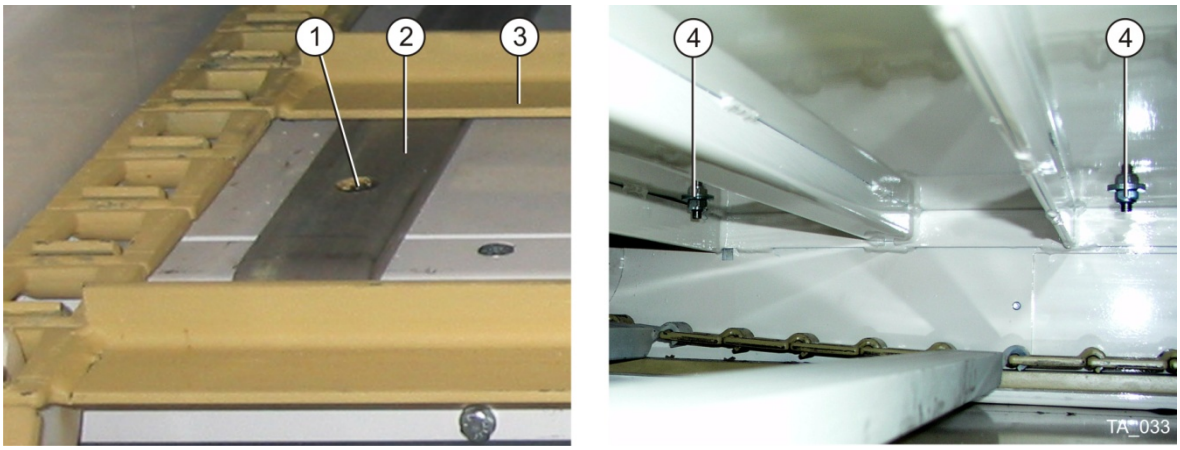
1. Drive the conveyor chain until the chain lock is located at the drive sprocket.
2. Loosen the conveyor chain at the clamping device as far as possible.
3. Separate the welded piece of round steel from the chain lock with an angle grinder.
4. Lift the chain link from the chain lock and remove from the chain by rotating it.
5. Insert the following chain link into the chain lock and weld and smoothen a new piece of round steel to the chain lock.

6. Tension the conveyor chain.

6.2.6 Checking the conveyor chain wear rails for wear, replacing

1. Raise the stop valve.
2. Switch off the hydraulic pump and secure against reactivation.
3. Measure the thickness of the wear rail (2) at several positions.

NOTE
Both wear rails should be replaced if the thickness at any particular position is 5 mm or less.



5-3 Wear rails

4. Unscrew the lateral service hatch on both sides of the container to gain access to the fixing nuts (4).
5. Climb into the container, unscrew the countersunk screws (1) and pull out the wear rails towards the front.

WARNING
Use new countersunk screws and locknuts when fitting new wear rails.

6.2.7 Checking the conveyor chain tappets for wear

1. Measure the material thickness of the tappets (5-10/3) at the points in contact with the wear rails and in the middle. The tappets or conveyor chain should be replaced if the material thickness at the points in contact with the wear rails is 3 mm or less.

NOTE
It is recommended to fit a new conveyor chain.

6.2.8 Checking the conveyor chain return rails for wear, replacing

1. Switch off the hydraulic pump and secure against reactivation.
2. Unscrew the service hatch and measure the return rails at several positions.

NOTE
Both return rails should be replaced if the thickness at any particular position is 5 mm or less.

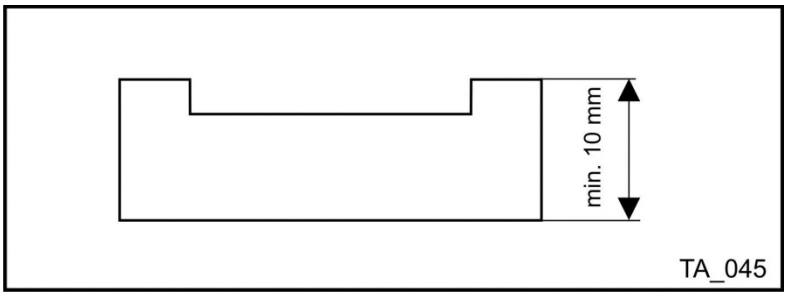


Fig. 5-4 Wear return rails

Fig. 5-5 Return rails

Proceed as follows to change the return rails:

1. Apply the spreader parking brake and secure the spreader against rolling with brake shoes (wedges).
2. Disconnect the spreader from the tractor vehicle (TC model).
3. Unscrew the fixing screws around the container.
4. Pull out the lower cover plate towards the front (TC model).

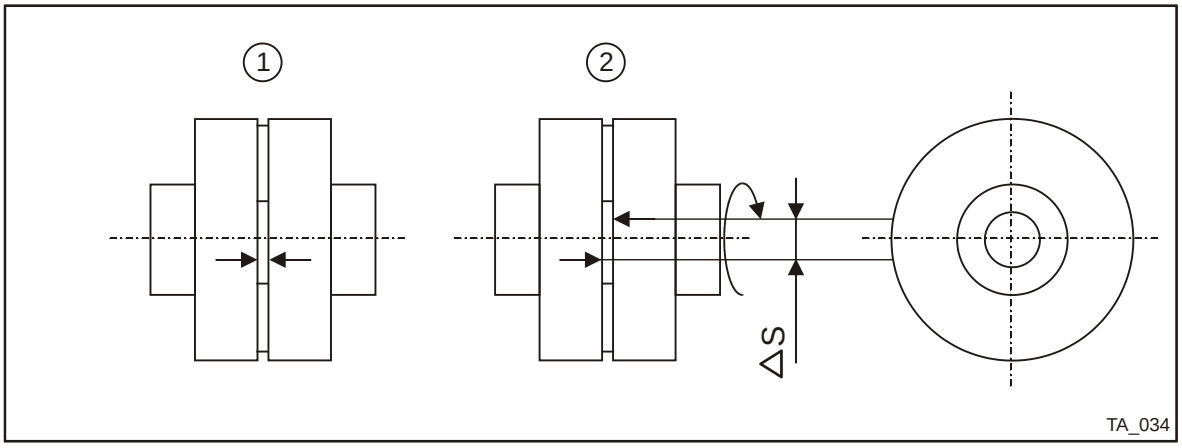
NOTE
In the case of the MC model, the filling shaft should be lowered by 50 mm or removed completely, depending on the version (with or without frame extension). The lower cover plate can then be removed towards the rear.

5. Unscrew the fixing screws and remove the return rails.

Installation is carried out in reverse order.

6.2.9 Checking wear on the flexible gear rim on HRC couplings

The wear dimension for the HRC coupling is ΔS = 15 mm. The flexible gear rim should be replaced if this is exceeded.



5-6 HRC coupling wear land

1. Turn a coupling half without torque up to the stop and bring a marking up to the same level on both coupling halves (5-13/1).
2. Turn a coupling half without torque in the opposite direction up to the stop (5-13/2).
3. The distance between the markings is the chordal dimension ΔS. Replace the gear rim if the wear land is exceeded.

NOTE
Only an original HRC gear rim should be used as a replacement.

6.2.10 Readjusting the tappet at the dosing sluices

If the sluices leak due to wear, the housings can be contracted by approx. 8 mm at the bottom.

1. Loosen the attachment screws of the bearing plates
2. Loosen the attachment screws of the dust protection frame
3. Rotate the tappets by up to 180°
4. Tighten all screws

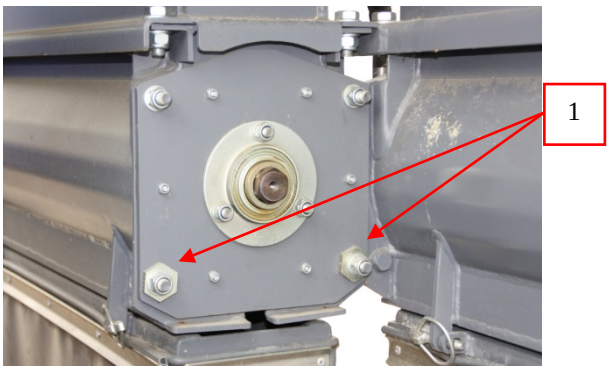


Fig. 5-7 Tappet at the dosing sluice

6.2.11 Removing the dust protection at the dosing sluices

The dust protection can be removed in order to carry out inspection and cleaning work at the bottom of the dosing sluices.

1 Closure

2 Dust protection

For simple inspection work the dust protection can be folded away. For this purpose both closures on one side must be opened and removed. The dust protection can now be folded away.

All closures must be opened and removed in order to remove the complete dust protection.

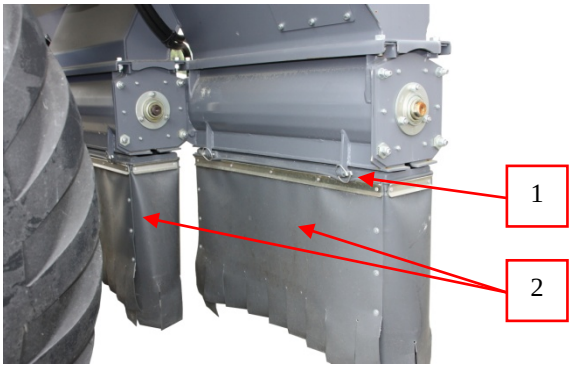


Fig. 5-8 Dust protection

NOTE

In order to avoid a strong dust development, the dust protection must be refitted before spreading.

The fitting is carried out in reverse order. It is helpful to first mount one side and fix it with closures. Then fold up the other side and attach the remaining closures.

NOTE

Please make sure that the closures latch. Loose closures can fall out while driving.

6.2.12 Setting the sensitivity of the filling level indicator

1 Status LED

2 Sealing cap

3 Adjustment screw

1. Remove dirt and dust from the level indicator.
2. Switch on the operating device.
3. Open the sealing cap in order to have access to the integrated adjustment screw.

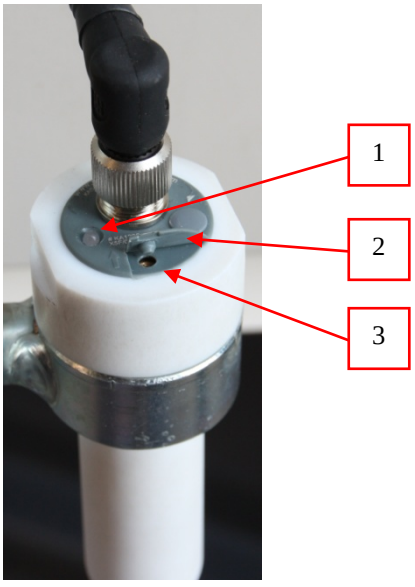


Fig. 5 16 Level indicator

4. Insert the delivered special screwdriver in the opening and adjust the sensitivity of the level indicator by turning to the left or to the right.

Level indicator becomes more sensitive when: turning clockwise

Level indicator becomes less sensitive when: turning counter clockwise

The basic setting of the level indicator is reached as follows:

1. Remove dirt and dust from the level indicator.
2. Switch on the operating device. If the level indicator is free from material, the LED will flash yellow.
3. If the LED flashes green: turn the adjustment screw to the right until the LED changes to yellow.
4. Slowly turn the adjustment screw to the left until the LED flashes green again.
5. Slowly turn the adjustment screw to the right until the LED changes to yellow.
6. Turn the adjustment screw to the left by four full rotations.

The level indicator is reset to the basic setting.

6.2.13 Checking level indicator for proper functioning

6.2.13.1 Checking level indicator "Container empty" for proper functioning

Check the function with empty container as follows:

1. Ensure by means of a second person that the spreading vehicle cannot be driven.
2. Switch on the operating device. In case of an empty container the indicator lamp "Container empty" at the operating device and the LED at the level indictor must flash.
3. Lift the slide gate.
4. Open the door to the discharge chamber.
5. Touch the top of the level indicator with your finger. The indicator lamp "Container empty" at the operating device must go out. If this is not the case, the sensitivity of the level indicator must be set or the level indicator must be changed, if necessary.

6.2.13.2 Checking level indicator "Container full" for proper functioning

Check the functioning with empty or not completely full container as follows:

1. Ensure by means of a second person that the spreading vehicle cannot be driven.
2. Switch on the operating device. In case of an empty or not completely full container the indicator lamp "Container full" at the filling device must not flash. The LED at the level indicator must flash.
3. Step on the container and open the manhole cover or dismount the level indicator with bracket.
4. Touch the top of the level indicator with your finger. The level indicator "Container full" at the filling device must flash. The LED at the level indicator must go out. If this is not the case, the sensitivity of the level indicator must be set or the level indicator must be changed, if necessary.

6.2.14 Status LEDs at PLVC

The PLVC has two status LEDs in order to display error states.

1 Status LEDs

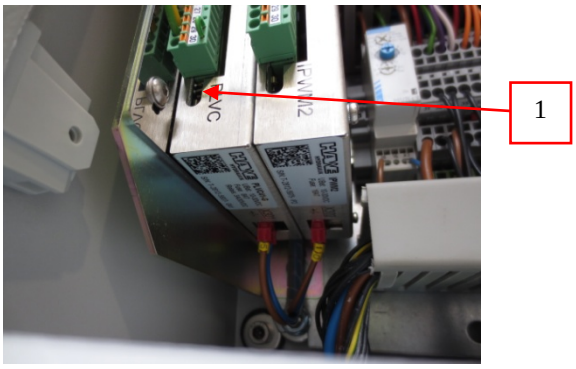
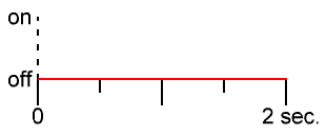


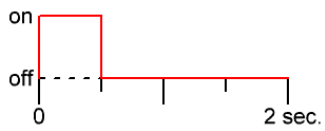
Fig. 5-9 Tappet at the dosing sluice

The LEDs can display the following states:

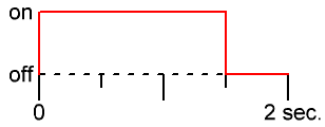
LED 1 (displays the state of the system):



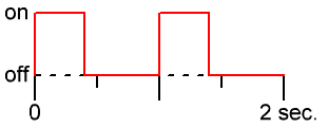
Emergency stop triggered



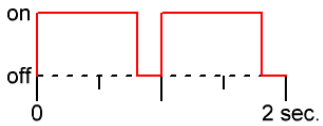
Emergency stop radio module



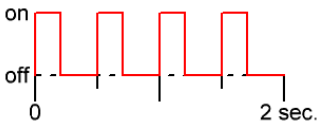
Internal PLVC error



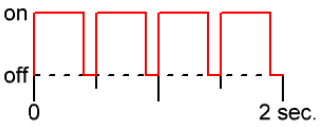
Error with digital output



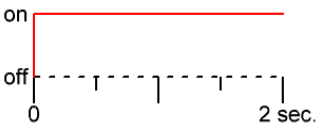
Error with analogue input



Proportional valve cable break

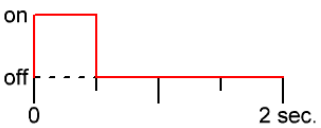


Proportional valve short circuit

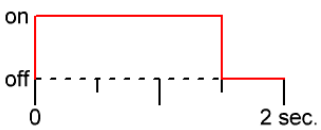


System OK

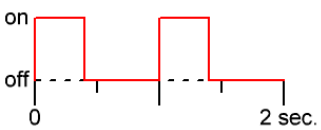
LED 2 (displays the state of the CAN bus):



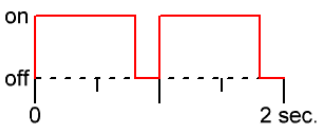
CAN bus switched off



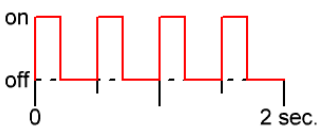
CAN bus faulty



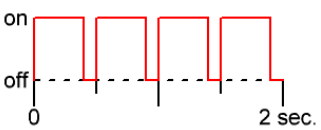
Memory error



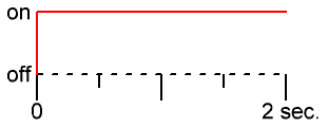
Supply voltage not in the valid area



Error with digital input



No radio signal



System OK

6.2.15 Failures and errors, cause, elimination

NOTE

It is most important to remove the cause so that the error cannot appear again. If no or only a slight success is reached with the activities described here, the customer service must be called or the spreader is to be handed over to a specialist workshop.

6.2.15.1 Failures and errors of the electric system

Failure, error	Cause	Elimination
Complete illumination or individual lamps at the frame do not work	Connection to towing vehicle with 7-pole cable not established	Establish connection to the towing vehicle with 7-pole cable
	Fuses in the towing vehicle defective	Check fuses in the towing vehicle, replace if necessary
	Contacts plug / socket contaminated, corroded	Check contacts plug / socket, clean, replace if necessary
	Cable harness between 7-pole socket and distribution box defective	Check cable harness, replace if necessary
	Bulb(s) defective	Check bulb(s), replace if necessary
Operating device cannot be switched on	No power supply	Create power supply
	Defect in the cabling	Check cabling, check if plug connections are mechanically secured
	Main switch at the distribution box defective	Check main switch at the distribution box and replace if necessary.
Spreading device cannot be switched on	A safety switch was enabled	Close manhole cover or door to discharge chamber
Indicator lamp "Container full" is not flashing if container is full	Bulb defective	Replace bulb
	Level indicator does not respond	Check level indicator for function, set sensitivity again if necessary, replace if necessary

6.2.15.2 Failures and errors of the hydraulic system

Failure, error	Cause	Elimination
No hydraulic pressure	Hydraulic pump is not running	Switch on auxiliary drive / PTO shaft
	Hydraulic oil level too low	Refill hydraulic oil
Excessive noise in the hydraulic unit	Hydraulic oil level too low	Refill hydraulic oil
	Hydraulic oil foamed (air content too big)	Have hydraulic pump run in idle gear for a few minutes
	Viscosity too high (temperature too low, oil with unsuitable viscosity class)	Have hydraulic pump run in idle gear for some time in order to increase the hydraulic oil temperature
		Use oil with suitable viscosity class ((HVLP 68 according to DIN 51524/3 (HVLP))
Insufficient force / moments (pressure) at the hydraulic motors	Hydraulic pump defect	Replace hydraulic pump
	Conveyor chain stiff	Clean chain redirection and chain channel. Carry out a short pressure increase at the control block, if necessary
	Pressure relief valve for securing the conveyor chain set too low	Set pressure relief valve correctly
Spreading quantity too high	Flow control valve is adjusted (open) and influences the automatics	Close flow control valve (scale to 0)
Jerky drive movements	Air bubbles in the hydraulic oil, hydraulic system cannot vent, because the ventilation at the filling nozzle is soiled	Clean ventilation at the filling nozzle and have hydraulic pump run in idling for a few minutes
	Suction line leaking, sucks air	Control suction line for leakages

6.2.16 Table for calibration of the weighing device

The weighing device can easily be checked or calibrated by means of a silo filling. Please proceed as follows. Please make sure that the vehicle stands on an even surface when being filled.

				Example
Display of the scale after the first filling			to	*11.12 to*
Display of the scale before the first filling	-		to	- *0.49 to*
Quantity taken over filling 1			to	*10.63 to*
Display of the scale after the second filling			to	*11.52 to*
Display of the scale after spreading of the first filling.	-		to	- *0.69 to*
Quantity taken over filling 2			to	*10.83 to*
Display of the scale after the third filling			to	*4.32 to*
Display of the scale after spreading of the second filling.	-		to	- *0.51 to*
Quantity taken over filling 3			to	*3.81 to*
Display of the scale after spreading of the third filling.			to	*0.47 to*
Quantity taken over filling 1			to	*10.63 to*
Quantity taken over filling 2	+		to	+ *10.83 to*
Quantity taken over filling 3	+		to	+ *3.81 to*
Display of the scale after spreading of the third filling.	-		to	- *0.47 to*
Total quantity taken over				*24.80 to*
Weight according to weighing slip silo truck			to	*24.17 to*

Factor scale = Weighing slip silo truck ÷ Total quantity taken over **x** Factor scale (old)

Factor scale = 24.17 to ÷ 24.80 to **x** 0.98

0.96

Factor scale = ÷ **x**

Factor scale =

7 Annex

7.1 EC Declaration of Conformity

copy with the same text

EC Declaration of Conformity

According to EC directive 2006/42/EC on machinery from 17 May 2006, Annex II A

We hereby declare that the design and construction of the machine indicated below as well as its make distributed by us comply with the health and safety requirements pursuant to EC directive 2006/42/EC. This declaration shall lose its validity in case of any alterations made without our prior consent.

Manufacturer:

Streumaster Maschinenbau GmbH
Handwerkstrasse 1
D-84546 Egglkofen

Description and identification of the machine:

General name:	binding agent spreader
Model:	SW MC
Type:	8/10/12/14/16/18/20
Serial number:	03.BS.xxxx (0001 - n)
	07.BS.xxxx (0001 - n)

The compliance with further directives/regulations which also apply to this product is declared:

- EMC directive (2004/108/EC)
- Noise emission directive (2000/14/EC)

Applied harmonized standards including:

- DIN EN 12100 Safety of machinery - basic concepts, general principles for design - risk assessment and risk reduction
- DIN EN 60204-1 Safety of machinery - Electrical equipment of machines, Part 1: General requirements
- DIN EN 500-1: Mobile road construction machinery - Safety - Common requirements.

Person authorized for the compilation of the technical documentation:

Werner Huck
Streumaster Maschinenbau GmbH
Handwerkstrasse 1
D-84546 Egglkofen

Egglkofen, 13 Oktober 2015

(Didier Gutzwiller, managing director)

EC Declaration of Conformity

According to EC directive 2006/42/EC on machinery from 17 May 2006, Annex II A

We hereby declare that the design and construction of the machine indicated below as well as its make distributed by us comply with the health and safety requirements pursuant to EC directive 2006/42/EC. This declaration shall lose its validity in case of any alterations made without our prior consent.

Manufacturer:

Streumaster Maschinenbau GmbH
Handwerkstrasse 1
D-84546 Egglkofen

Description and identification of the machine:

General name:	binding agent spreader
Model:	SW SC
Type:	19
Serial number:	08.BS.xxxx (0001 - n)

The compliance with further directives/regulations which also apply to this product is declared:

- EMC directive (2004/108/EC)
- Noise emission directive (2000/14/EC)

Applied harmonized standards including:

- DIN EN 12100 Safety of machinery - basic concepts, general principles for design - risk assessment and risk reduction
- DIN EN 60204-1 Safety of machinery - Electrical equipment of machines, Part 1: General requirements
- DIN EN 500-1: Mobile road construction machinery - Safety - Common requirements.

Person authorized for the compilation of the technical documentation:

Werner Huck
Streumaster Maschinenbau GmbH
Handwerkstrasse 1
D-84546 Egglkofen

Egglkofen, 13 Oktober 2015

_____

(Didier Gutzwiller, managing director)

EC Declaration of Conformity

According to EC directive 2006/42/EC on machinery from 17 May 2006, Annex II A

We hereby declare that the design and construction of the machine indicated below as well as its make distributed by us comply with the health and safety requirements pursuant to EC directive 2006/42/EC. This declaration shall lose its validity in case of any alterations made without our prior consent.

Manufacturer:

Streumaster Maschinenbau GmbH
Handwerkstrasse 1
D-84546 Egglkofen

Description and identification of the machine:

General name:	binding agent spreader
Model:	SW TC
Type:	10/12/16/18
Serial number:	02.BS.xxxx (0001 - n)

The compliance with further directives/regulations which also apply to this product is declared:

- EMC directive (2004/108/EC)
- Noise emission directive (2000/14/EC)

Applied harmonized standards including:

- DIN EN 12100 Safety of machinery - basic concepts, general principles for design - risk assessment and risk reduction
- DIN EN 60204-1 Safety of machinery - Electrical equipment of machines, Part 1: General requirements
- DIN EN 500-1: Mobile road construction machinery - Safety - Common requirements.

Person authorized for the compilation of the technical documentation:

Werner Huck
Streumaster Maschinenbau GmbH
Handwerkstrasse 1
D-84546 Egglkofen

Egglkofen, 13 Oktober 2015

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(Didier Gutzwiller, managing director)