

In case of technical questions, please state the identity number which appears below and on the machine plate.

Type.....

Year..... Identity number.

Instruction manual

SIRIUS COMBI AST

SW4900, SH4900, SE4900

SW4902, SH4902, SE4902

Valid from ID no.:

49080200, 49090200

49100200, 49110200, 49120200, 49130200

49140200, 49150200, 49160200, 49170200

49180200, 49190200, 49200200, 49210200

49220600, 49230600, 49240600, 49250600

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How to use the instruction manual

The texts on the right-hand pages contain bold numbers (e.g. **1.**, **2.**) which refer to the matching photos on the left-hand pages.

1. Manufacturer information

1.1 Manufacturer and supplier

Epoke® A/S
Vejenvej 50
DK-6600 Vejen

1.1.1 Copyright

Epoke® A/S holds the copyright of this technical documentation.

Mechanical, photographic or any other reproduction or printing of this technical documentation or parts thereof is unlawful. The technical documentation is only intended for the purchaser and his/her staff.

1.1.2 Technical documentation

The technical documentation includes:

- Instruction manual
- List of spare parts
- Instructions for remote control
- List of spare parts for remote control

These appendices contain basic instructions, which must be complied with and read by the fitter/user before mounting and start-up. The technical documentation must always be available on site.

Staff involved in the operation, service, inspection and mounting must possess the qualifications required to work within these fields. Field of responsibility, competence and surveillance of staff must be carefully planned by the employer. If staff do not possess the required expertise, training and teaching must be offered. If necessary, such training and teaching may be provided via the manufacturer/supplier upon request by the purchaser/user of the spreader. Our local representatives are responsible for the training abroad. In addition, the employer/user must ensure that the staff fully understands the contents of the technical documentation.

1.1.3 Warranty and liability

General terms of sale and delivery apply, unless otherwise agreed in writing and confirmed at the time of concluding the contract. Warranty and liability for damages shall lapse in case of personal injury and material damage if the injury or damage is due to one or several of the following causes:

- Abnormal use of the spreader
- Mounting, start-up, operation of and service on the spreader performed by a non-expert.
- Driving the spreader with defective safety devices or not properly placed or non-functioning safety and protection devices.

- Failure to comply with the instructions contained in the technical documentation regarding safety, transport, storage, mounting, start-up, operation and maintenance of the spreader.
- Structural changes to the spreader which have not been made or approved by the manufacturer.
- Failure to use original Epoke spare parts.
- Failure to check parts that are subject to wear.
- Repairs performed by non-experts.

1.2 Model and type designation

Model:

Bulk spreader

Type/trade name:

SH4900 and SH4902

(operated from the truck's hydraulic system)

SE4900 and SE4902

(operated from the diesel engine)

SW4900 and SW4902

(operated from the drive wheel of the spreader)

The S-4900 does not have a separate prewetting pump, and liquid is spread from the underside of the solid matter plate.

The S-4902 has a separate prewetting pump, and liquid is spread from the liquid boom.

Identity number:

Identity number	Tank volume, m ³ solid matter
49080200	3
49090200	
49100200	4
49120200	5
49140200	6
49160200	7
49110200	4
49130200	5
49150200	6
49170200	7
49180200	
49190200	
49200200	9
49210200	
49220600	6
49230600	
49240600	5
49250600	

The first four digits indicate the type, the last four digits reflect consecutive numbering.

Factory plate layout:

- Spreader type
- Identity number
- Year
- Volume, m³
- Net weight, kg
- Permitted total load, kg
- Vehicle max. oil flow, l/min., constant (operated from the truck's hydraulic system only).
- Vehicle max. oil flow, l/min., brief (operated from the truck's hydraulic system only).
- Vehicle min. oil flow, l/min. (operated from the truck's hydraulic system only).
- Vehicle min. oil pressure, bar (only operated from the truck's hydraulic system)
- Manufacturer's name and address.
- Location of factory plate: At the left-hand side of the spreader and close to the hydraulic valves.

1.3 Start number and year

Identity number	Tank volume, m ³ of solid matter	Year
49080200	3	2013
49090200		
49100200	4	2010
49120200	5	
49140200	6	
49160200	7	
49110200	4	
49130200	5	2010
49150200	6	
49170200	7	
49180200	4	
49190200	7	2013
49200200	9	
49210200		
49220600	6	2014
49230600		
49240600	5	2017
49250600		

1.4 Country of origin

Denmark.

1.5 CE label

Location of CE label: On the factory plate.

1.6 EU declaration of conformity

The machines are produced in compliance with the provisions of the Machine Directive 2006/42/EC and other directives specified below.

1.6.1 Directives

- 2006/42/EC (current Machine Directive)
- 98/37/EC (previous Machine Directive)
- 2006/95/EC (Low Voltage Directive)
- 2004/108/EC (EMC Directive)

1.6.2 Norms

- EN349
- EN954-1
- EN1037
- EN1679-1
- EN13021
- EN ISO 4413
- EN ISO12100-1
- EN ISO12100-2
- EN ISO13857
- EN ISO14121-1

2 Product descriptions, handling and safety

2.0.0 General

Important references are highlighted in the individual sections.

Explanations of symbols and warnings.

Warning (Industrial safety symbol)



The reference means that special attention has to be paid to safety where the symbol is shown. General safety measures must also be complied with.

Information



The I-symbol is used in the instruction manual next to important information about the operation or working of the machine.

The symbols make it easier to find the references to danger in the instruction manual quickly.

2.0.1 Transport and handling

Danger!



Fasten the spreader securely. Otherwise, road-users may be fatally injured due to e.g. protruding parts, loss of spreader, etc.!

Information!



Liquid tanks and solid matter tanks must be emptied when handling lifting gear.
The spreader plate system must be tilted down and secured.

The spreader must be secured properly on the carrier vehicle.

The spreader must only be set down on an even surface.

Electrical parts must be protected against moisture. Remove any mountings used for the container transport.

Handling



Any handling in connection with transport or use must only be performed using adequately dimensioned lifting equipment. Be aware of the carrying capacity of the lifting equipment and the centre of gravity of the spreader!

2.0.2 Restrictions of use

2.0.2.1 Normal use



Machines for winter service have been manufactured for removing winter obstacles in traffic areas, and spreaders have been manufactured for a defined spreading

of thawing and friction creating materials on traffic surfaces.

The spreaders must only be used for the intended purpose.

The spreaders must only be operated, repaired and maintained by persons who have in-depth knowledge of these fields. In addition, persons must be fully familiar with and follow the directions given in the safety instructions and instructions for use, and they must be aware of the dangers the spreader may present.

In any case of abnormal use, the manufacturer's liability for any damage occurred shall lapse.

Suitable spreading materials

The spreader can spread all kinds of salt, sand, split, etc. However, spreading fine-grained, moist material or coarse-grained material with a large proportion of fine, moist particles imposes certain limitations. During use, some material will be deposited on the delivery drum, which therefore will not dose as large quantities as when the drum is clean and free of spreading material. The materials also have a greater tendency to block hoppers and spreading plates resulting in operating stop. These problems are best prevented by regular cleaning of delivery drums and spreading plate system.

The spreader's liquid system can be used for liquids with a viscosity of up to 3.2 mPa*s.

Hydraulic liquids

Skin contact and inhalation of vapours from hydraulic liquids must be avoided whenever possible. If this is not possible, suitable personal protective equipment must be used.

Special risk applies if pressure fluids penetrate the skin due to leaks in high-pressure hydraulic systems. In case of such seemingly insignificant injury, medical advice should be sought immediately.

Normal use also includes respecting all directions from the technical documentation and complying with inspection and maintenance activities.

2.0.2.2 Abnormal use

Abnormal use is



when the spreaders are not used as spreaders for winter service, and when the spreader has not been mounted and secured correctly to the vehicle on which the spreader is mounted.

- when the spreader is used for spreading materials which are not usable for the treatment of icy roads.
- when the spreader's liquid tanks are filled with other liquid types than liquids usable for the treatment of icy roads.
- when the permitted axle load and the weight of the vehicles used are exceeded, taking into account all mounted equipment.
- when the spreader's tank exceeds the payload which is advisable.

Hydraulic hoses

- Hoses should not be painted.
- Hoses must not be in contact with substances which may cause damage, e.g. acids, lye and solvents.
- Reuse: Hoses which have already been used must not be reused as hose pipes. Following initial use, the characteristics of the hose material may have changed so much that reuse of the hose may involve greater risk.

2.0.3 Risk caused by the machine

2.0.3.1 Personal protective equipment

In connection with construction and manufacture, care has been taken not to limit the operator's freedom of movement. This means that the use of personal protective equipment (shoes, gloves, etc.) is not required.

2.0.3.2 Mechanical risk

Risk due to squeezing, cuts and sharp edges. Features involving mechanical risks have been equipped with safety components whenever possible. Removal of these is prohibited, see section 2.1.3.

2.0.3.3 Electrical risk



Work on the power supply must only be performed by a trained electrician. The electric cupboard must be kept closed at all times. The electrical equipment on the spreader must be tested at regular intervals. Loose connections and melted cables must be repaired immediately. Only original fuses may be used.

A defect in the electrical equipment does not normally involve any risk to people. In practice, this means persons who touch live parts, i.e. parts that normally carry electricity (direct touch) and parts which, as a result of defects, and in particular as a result of incorrect isolation, carry electricity (indirect touch), will not cause injury as a result of electric impact or burns. However, if incorrect insulation material has been used, burns may occur as well as scorching of melting parts in case of short circuits or overloads to the equipment.

2.0.3.4 Hydraulic risk



Work on the hydraulic equipment must only be performed by people holding specialised knowledge and expertise with hydraulic systems.

The pressure on pressure pipes must be removed before initiating repair work.

Risk may occur from hydraulic liquid spray, see section 2.0.3.10.

2.0.3.5 Fuel (combustion engine)



Fuel must only be filled when the engine has been stopped and never close to open fire or sparks. - No smoking!

Fuel must always be filled in a place with good ventilation.

Only use pure fuel and clean tools. Avoid dirt in the fuel.

Avoid overfilling the fuel tank. The filling cock should not contain any fuel.

Check that the fuel tank cap has been mounted correctly after the filling.

2.0.3.6 Thermal risk (combustion engine)



Risk of burns - Do not touch engine and exhaust system!

During operation the exhaust silencer is very warm and it stays warm after the engine has been stopped.

Removal of the cover over the exhaust is prohibited!

2.0.3.7 Risk caused by noise

The noise level, i.e. the noise emission value at the workplace, measured in dB(A), also depends on the construction and type of the carrier vehicle.

Operational mode - The drive wheel of the spreader: depending on the carrier vehicle.

Operational mode - Vehicle hydraulics: depending on the carrier vehicle.

Operational mode - Diesel engine: The noise measurement in the cab shows 56.2 dB(A) (L_{eq} , average) and 61.6 dB(A) (L_{max}). These values are measured at the height of the ears of the operating staff when the cab is closed and the vehicle is not connected. The measurement was done on a truck type MAN TGA 460 with no sleeping cab but fitted with a cab rear window.

Distance between cab and diesel engine of the spreader during measurement: approx. 2 metres.

2.0.3.8 Risk caused by materials and substances

Risk of exhaust gas (Combustion engine)



Inhalation of exhaust gas is dangerous. A suitable ventilation of the premises is necessary when work is carried out indoor. Exhaust gas from the engine must be discharged into the open air using a metal hose extension or a fireproof hose.

Risk caused by substances

Substances are diesel, engine oil and hydraulic oil. Fire hazard:

Fuel must only be added while the engine is stopped, see "Diesel engine" instructions for use. Hydraulic oil and engine oil must not be changed immediately after the spreader has been operating. When using substances (oil, grease, battery acid, chemicals, etc.), the safety regulations of the products must be complied with.

Risk of hydraulic liquid spray

- Skin contact and inhalation of vapours from pressure fluids must be avoided whenever possible. If this is not possible, suitable personal protective equipment must be used. This also applies to maintenance performed on the hydraulic system.
- Special risk applies if pressure fluids penetrate the skin due to leaks in high-pressure hydraulic systems. In case of such seemingly insignificant injury, medical advice should be sought immediately.

Suitable personal protective equipment includes safety goggles and safety gloves which are resistant to pressure liquids. In addition, skin protection and skin care products must be available and used in case of skin contact.

Pressure fluids must be disposed of in accordance with the current rules.

Risk caused by batteries (combustion engine)

- Battery acid is corrosive and must not get into contact with eyes, skin or clothes. Rinse with water if battery acid has come into contact with

the skin. Rinse thoroughly with clean water for at least 15 minutes and call the doctor immediately if battery acid has come into contact with eyes. Battery acid is poisonous. Drink a lot of water or milk if battery acid has been swallowed. Continue with more milk and vegetable oil and call a doctor immediately.

- Do not work with a naked flame close to batteries. Smoking is prohibited and spark formation must be avoided.
- The battery must never be short-circuited!
- When working with a charger, the battery must be disconnected from the power supply of the vehicle and the spreader.
- Remove any plastic buttons when charging.

2.1 Safety measures

2.1.1 General safety measures



EPOKE spreaders are devices operated by one operator. The spreader is controlled from the truck's cab during spreading.

Owner's responsibilities

The owner of the vehicle on which the spreader is mounted must make sure that the spreader is working correctly, and that it is only operated by persons who are familiar with the basic safety measures and who have been thoroughly informed about the operation of the spreader. These persons must also have read and understood the section on safety and warnings contained in the instruction manual or other information about safety.

Changes to the spreader which have not been approved by Epoke A/S are not permitted to be made.

Staff's responsibilities

Any person who is working near the spreader undertakes to study the basic safety measures and to read and understand the section on safety and warnings contained in the instruction manual or other information on safety.

Training of staff

Staff must be informed about and to the extent necessary trained in how to use the spreader in accordance with health and safety standards. Staff competence in relation to operation, maintenance and repairs must be clearly established. Staff receiving training must only use the spreader under supervision of an experienced person.

Risk when ignoring the safety references

If defects are discovered in the safety measures, or other measures influencing the safe operation of

the machine, the spreader must not be used until such defects have been remedied.

Remedy of problems, maintenance and repairs must only be performed when the connection to the hydraulics has been switched off. After maintenance or repairs, the safety devices must be placed correctly.

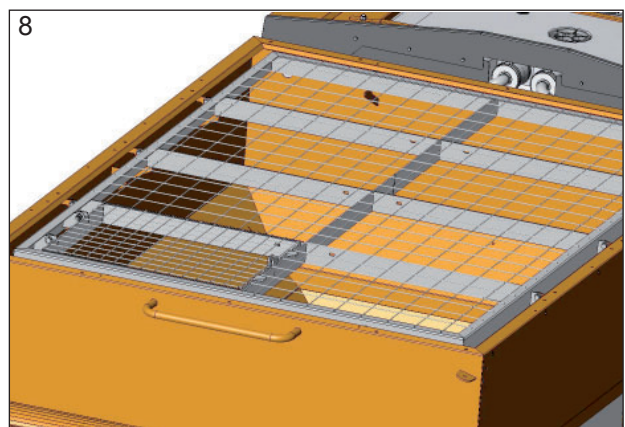
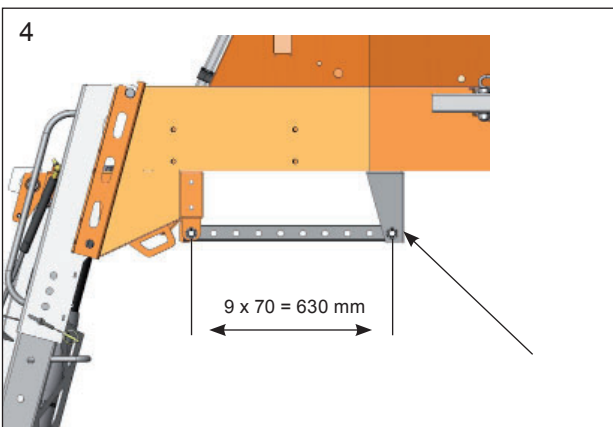
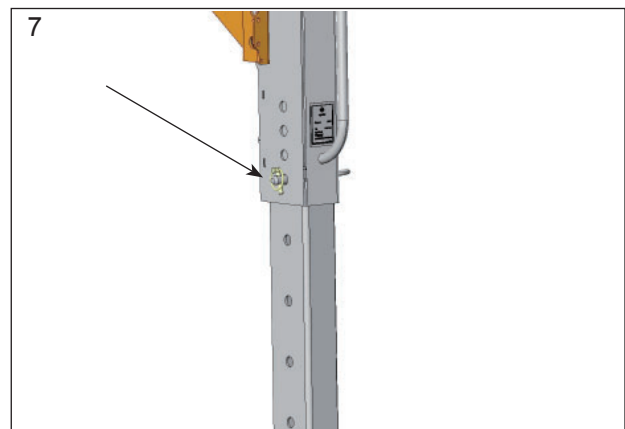
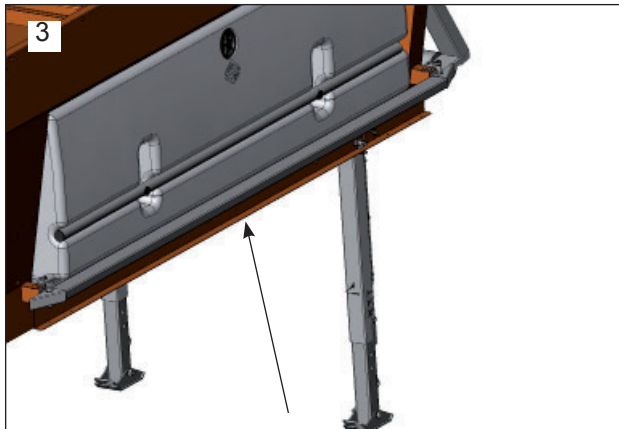
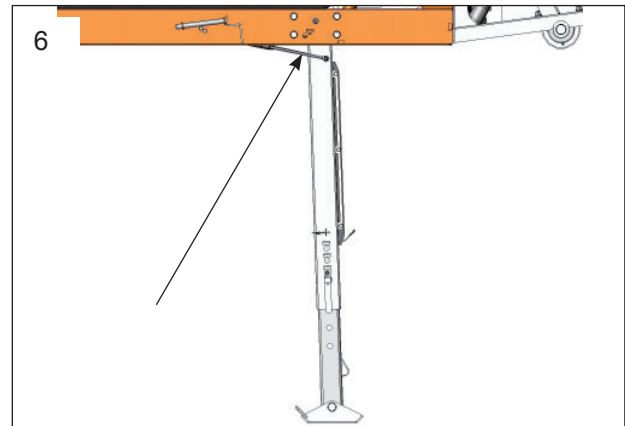
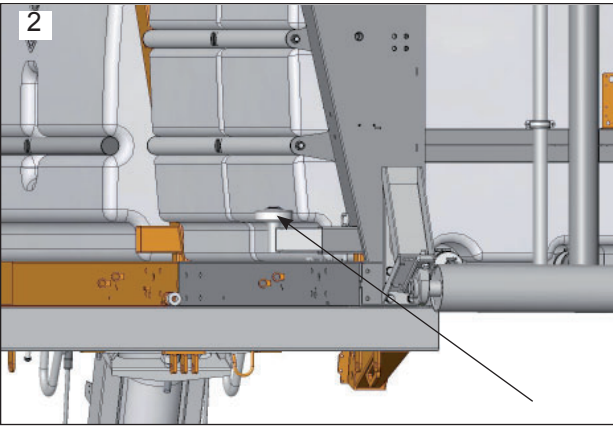
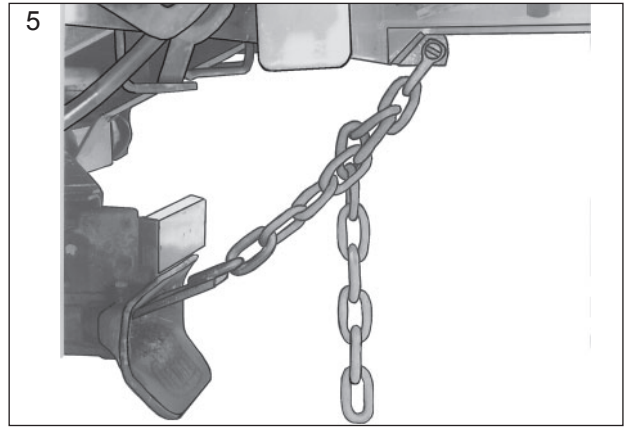
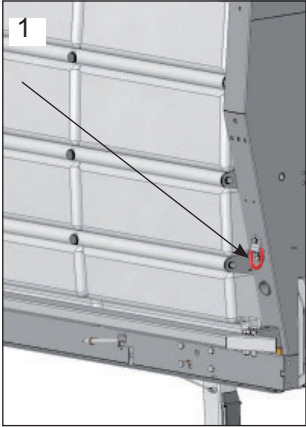


Persons must not be in the spreader tank when the spreader is operating.

2.1.2 Permitted total load

	Alternative 1 *	Alternative 2 *
Permitted total load, kg	17 000	12 000
Maximum permitted load per front leg, kg	5 500	4 500
Maximum permitted load per rear leg, kg	3 500	3 500
Maximum load for support gallows, kg	12 000	

* depending on the specifications of the spreader.



2.1.3 Safety components



1. Fixing eyes/clamping hooks for fastening the spreader to the chassis of the truck.

2. The side stanchions ensure that the spreader is positioned in parallel with the sides of the truck body and that the load is distributed between the sides of the truck body in two positions.

3. The side stanchions ensure that the spreader is positioned in parallel with the sides of the truck body, i.e. the load is distributed over the entire length (optional equipment).

4. As an optional accessory, an adjustable backstop is available as a supplement to the fixed backstop on shorter truck bodies. When the adjustable backstop is used, the tubes must be sawn off to the right length.

5. Attach the safety chain to the trailer coupling on the lorry and tighten it as much as possible. For fixing the safety chain to the spreader when attaching or detaching, see also section 3.

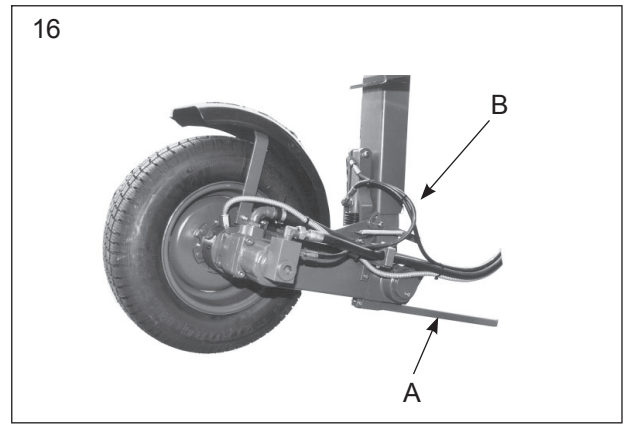
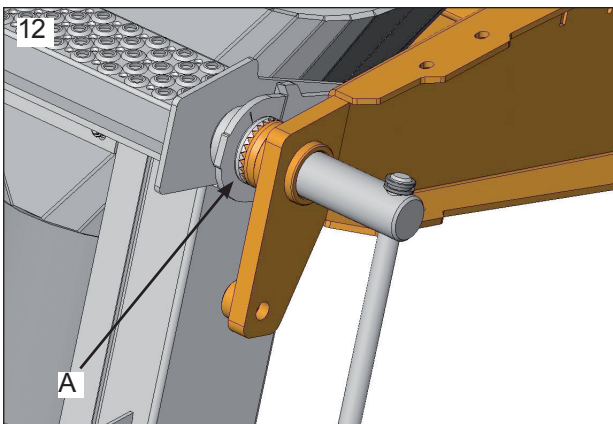
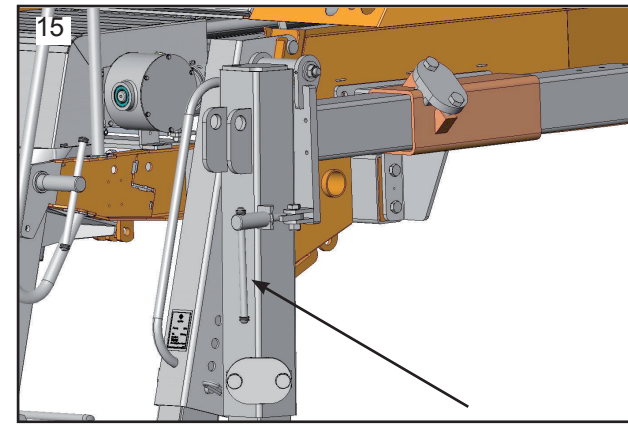
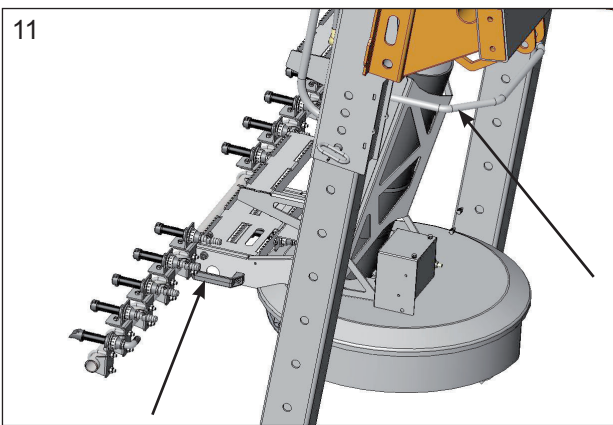
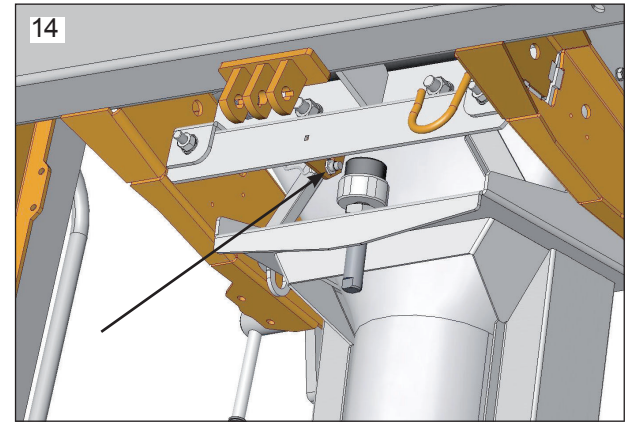
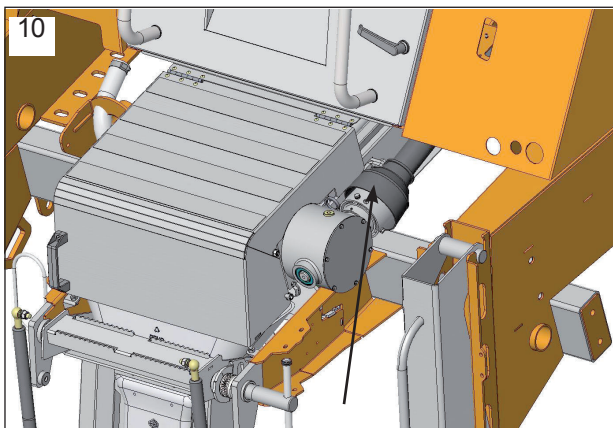
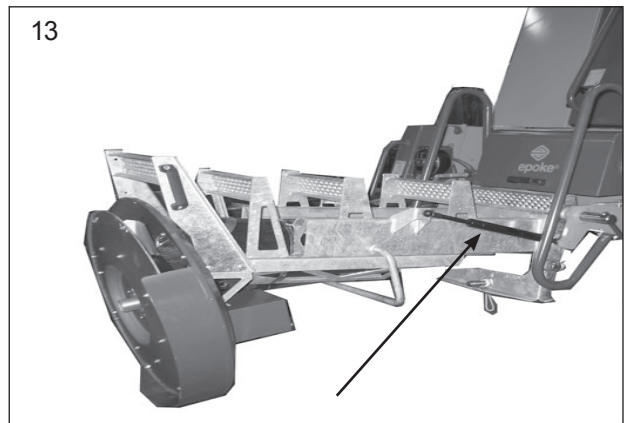
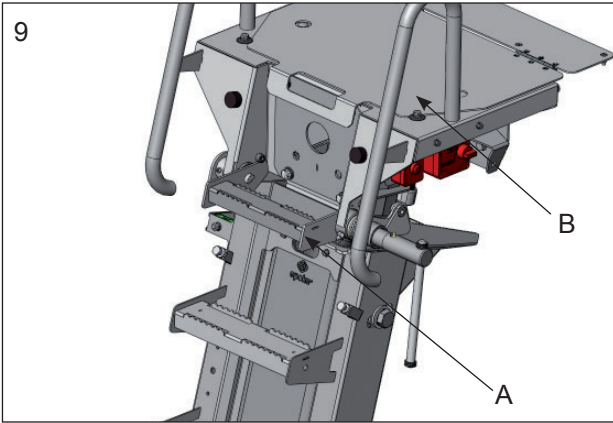


The chain is not a substitute for lashing, but exclusively an extra safety measure.

6. In connection with dismounting, the front support legs are affected by the gas springs and this ensures that the legs are positioned approx. 3° above the perpendicular plane. Used in connection with the support system with front roll.

7. Pins for support leg are locked (secured) with split pins.

8. A grate (mesh width 50x50 mm or 100x100 mm) prevents access to the tank (mixer and delivery drum). The grate has a man hole in one end.



9. Before the ladder on the spreading disc mounting is used, it must be ensured that the top stage is lowered (A).
Cover across auger (B).

10. Guard for cardan shaft.

11. The handles must be used when raising and lowering the spreading disc arrangement.

12. During raising and lowering of the spreading plate system, the lock (A) must be loosened. After the spreading plate system has been raised or lowered, it is important that the lock is tightened and the teeth mesh.

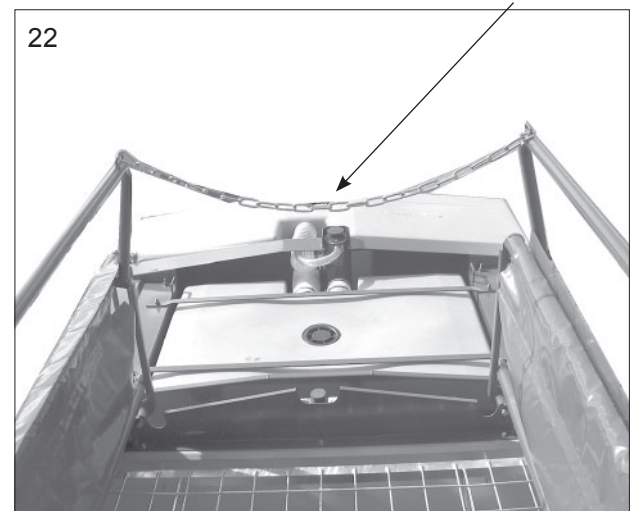
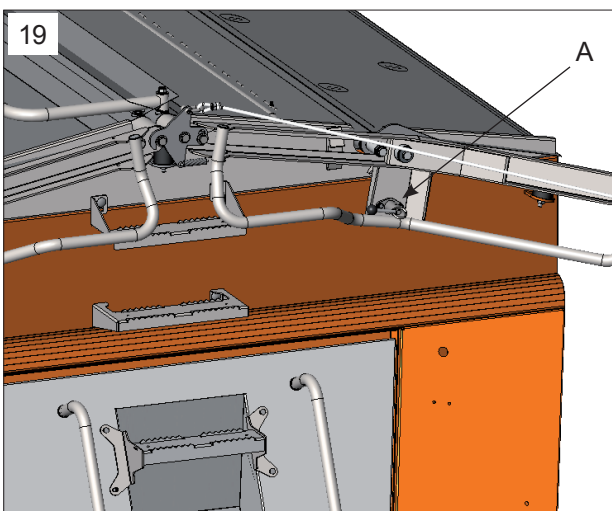
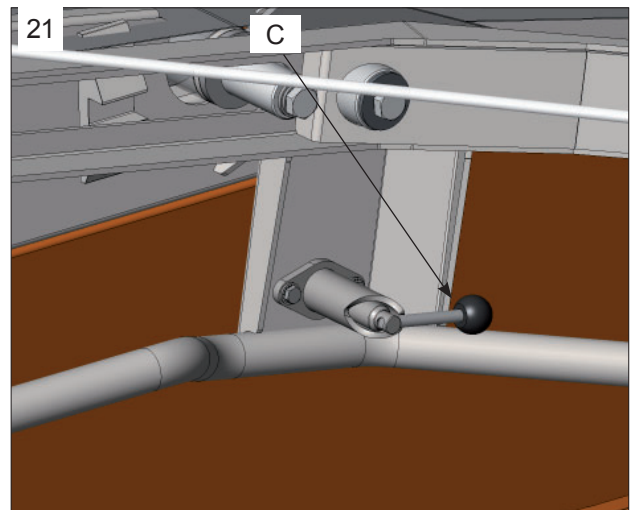
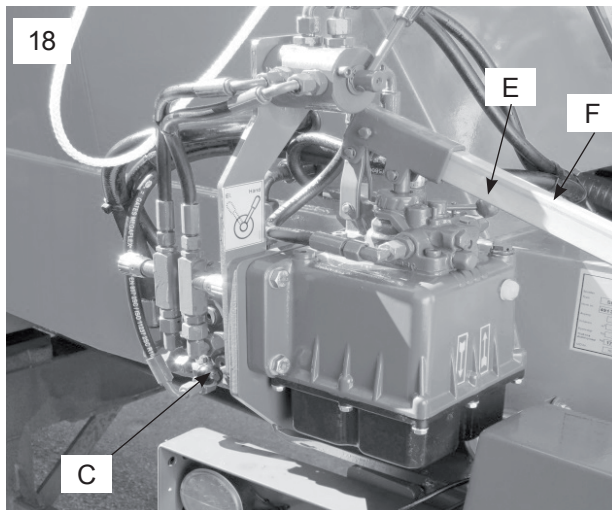
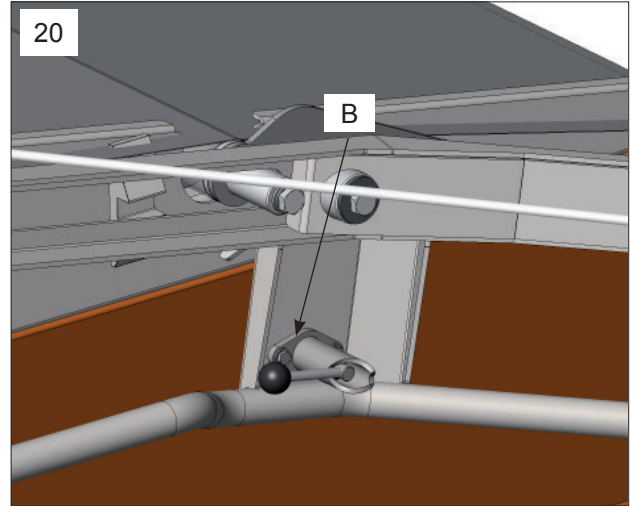
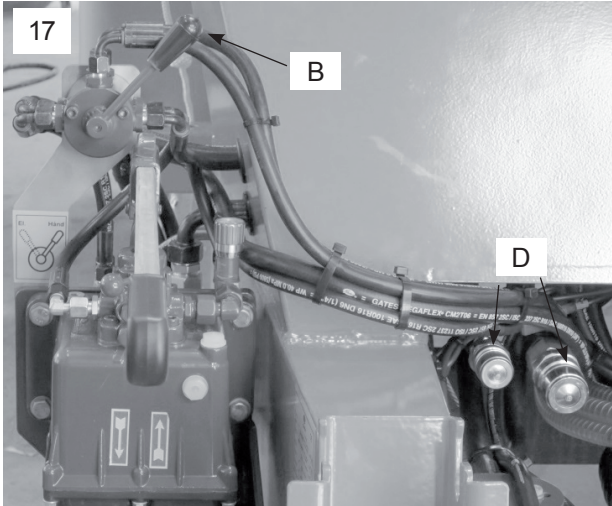
Always stand next to the spreading plate system while it is being raised or lowered – never behind it.

13. Gas springs on the spreader plate assembly counterbalance the weight when it is raised and lowered.

14. The safety stop for the spreader plate (including the tracker) ensures that the spreader plate does not turn when the spreader plate assembly is tipped up.

15. Locking handle to anchor the drive wheel assembly (SW spreader). The handle must be tightened completely when the spreader is in operation.

16. Lever to lift the horizontal section of the drive wheel column (A) and lock (B).



17+ 18. Hydraulic-powered raising and lowering of the spreading disc arrangement from the truck

Turn the changeover handle (B) to the left position. Use the handle (C) to raise or lower the spreading disc arrangement.

Hydraulic-powered raising and lowering of the spreading disc arrangement from the spreader's electrical hydraulic emptying function

Connect the spreader's hydraulic hoses to the quick release connections (D). Turn the changeover handle (B) to the left position, switch on the electrical emptying. The spreading disc arrangement can now be raised or lowered using the handle (C).



Electrical emptying must be switched off when not being used as the emptying or raising function.

Raising and lowering using the hand pump

Turn the changeover handle (B) to the right position. Turn the handle (E) to the right position, pump using the hand pump (F) until the spreading disc arrangement is raised all the way up. The spreading disc arrangement will lower automatically under its own weight if the handle (E) is turned to the left position. At the same time, you can pump using the handle (F).

Guard rail

For ensuring against falling accidents, a guard rail can be fitted for use with the spreader's tarpaulin.



Any person working on the top of the spreader must always wear a harness.

When the tarpaulin is open, the rail guard significantly increases the spreader's width. The tarpaulin must therefore be closed during operation.

When the spreader is loaded using a loading machine, exercise caution to ensure the guard rail does not become damaged.

19. The guard rail is a part of the tarpaulin. It has two positions, which are determined by the operating lever (A).

20. Normal tarpaulin function (B).

The tarpaulin can be completely opened/closed. The guard rail is not activated, and work must not be carried out on top of the spreader.

21. The guard rail function is active (C).

The tarpaulin is locked in the centre position. The guard rail is activated during the opening and closing of the tarpaulin.

Operation

When filling the spreading material into the spreader, the operating lever must be in the normal tarpaulin function.

Next, open the tarpaulin lock and open the tarpaulin.



NB: Opening procedure:
First right, then left side.

When the spreader is full and work must be done on the top of the spreader, set the operating lever to the guard rail function.

When closing the tarpaulin, lock the middle position and the guard rail is active.

22. When a person has climbed onto the top of the spreader via the rungs, the chains must be connected to the guard rail at the front and the rear.

When the work on the top of the spreader is finished and before the person leaves the top of the spreader, move the chains back.

To close the tarpaulin, turn the operating lever to the normal tarpaulin function.



NB: Closing procedure:
First left, then right side.

2.1.3.1 Reliability

- Safety/protection devices: The equipment must not be driven before all protection devices are in working order.
- Repairs to the spreader must only be carried out while the spreader's power supply (the electrical/hydraulic system and combustion engine) is off.
- Following repair work, all safety devices must be connected to the spreader.
- Unauthorised persons are to be turned away from the danger zone.
- If a hydraulic hose is to be renewed, only the original hydraulic hose delivered by the manufacturer has the required working and breaking pressure.
- Only spare parts recommended by the manufacturer must be used.

2.1.3.2 Before driving

Before driving the driver must check:



- the location of the spreader on the truck body
- fixing points from the spreader to the vehicle.
- that the spreader plate system is tilted down and secured.
- safety devices.
- that the spreader plate is 30-40 cm above the road surface.
- that electrical connections and power supply have been connected.

Operational mode - The drive wheel of the spreader.

- The tyre pressure in the drive wheel must be 1.50 bar (1.53 kp/cm²).
- Check that the distance between the vertical part of the drive wheel stand and road surface is 40-45 cm.
- Check the oil level in the hydraulic tank.

Operational mode - Vehicle hydraulics.

- Check the attachment of hydraulic hoses to the vehicle.
- Oil level in the hydraulic tank.

Operational mode - Diesel engine.

- Check the engine oil level at regular intervals.
- Check the diesel level in the fuel tank.
- Check the oil level in the hydraulic tank.
- Check the acid level in the battery at regular intervals.

2.1.3.3 Safety in connection with maintenance



During cleaning, repair, maintenance and similar work, the spreader must be stopped, if the work involved permits it (power supply, the electrical/hydraulic system and combustion engine must be switched off) and be properly secured against accidental starting.

If the spreader cannot be stopped, other precautions must be taken to ensure that work can proceed in accordance with health and safety standards.

The maintenance intervals are defined in terms of number of operating hours and are based on normal operating conditions.

- The specified maintenance intervals must be complied with.
- Only original Epoke spare parts and spare parts recommended by Epoke may be used.
- All safety devices must be fastened securely following repairs.
- The equipment must not be operated without safety devices. Do not remove the safety devices!

2.1.3.4 Suggestion for instructions for use



The employer is under an obligation to prepare instructions for use to ensure a safe operation.

To protect against accidents at work, the employer is under an obligation to equip the machine with a number of devices and to take precautions that meet current safety rules and other generally recognised rules regarding safety and industrial medicine.

The employer is under an obligation to teach users of any risk that may arise when operating the machine and any precautions to take in this respect. Subsequently, such training must be performed at regular intervals, however at least once annually.

The employer may meet this requirement by using instructions for use. Also be aware of safety legislation.

The employer may also provide the employees with the following information/instructions regarding operation:

- Normal/permitted use.
- Abnormal use.
- Safety.
- The user must be told that it is prohibited to stay in the danger zone (working zone).
- Information about protective devices.

- If the equipment is defective/faulty and may present a hazard/risk to people, the tool must be stopped.
- Handling hydraulic liquids.
- Instructions in first aid.
- Reliability.
- Reference to faults and rectification of these.
- Instructions about warnings.
- Permissible operating data.
- Environmental protection.
- Supervision during use.
- Service.
- Maintenance
- Repair work to be performed on load-bearing parts and other safety-related parts.

2.1.4 Hydraulic hoses

Hydraulic hoses must be checked by experts¹⁾ at least once a year¹⁾, and hoses must be replaced every six years, even if no safety-related defects are discovered on the hoses. When replacing a hydraulic hose, only original hydraulic hoses, which meet the required working and breaking pressure and which are delivered by the manufacturer, must be used.

Discarding/defects in hoses

- Damage to the outer layer until the insert (e.g. grooves, cuts or scratches).
- The outer layer becomes brittle (cracks form in the hose material).
- Deformations, which do not correspond to the natural shape of the hose, with or without pressure, or when bending the hose, e.g. separating layers, the formation of blisters, squeezes or bends.
- Leakage.
- Failure to observe mounting requirements.
- The hose comes loose from the fittings.
- Damage or deformation of the fittings which reduces the functionality and firmness of the fittings or the connection between the hose and the fittings.
- Corrosion to the fittings which reduces its functionality and firmness.
- Exceeding the storage time and time of use.

If defects are discovered in connection with the check, such defects must be remedied immediately, or suitable precautions must be taken.

1) An expert is a person who - based on his/her professional training and experience - has sufficient knowledge of hydraulic hoses, and who is familiar with current, national work protection instructions, guidelines and generally recognised technical rules (e.g. norms), thus enabling him/her to assess the condition of the hydraulic hoses.

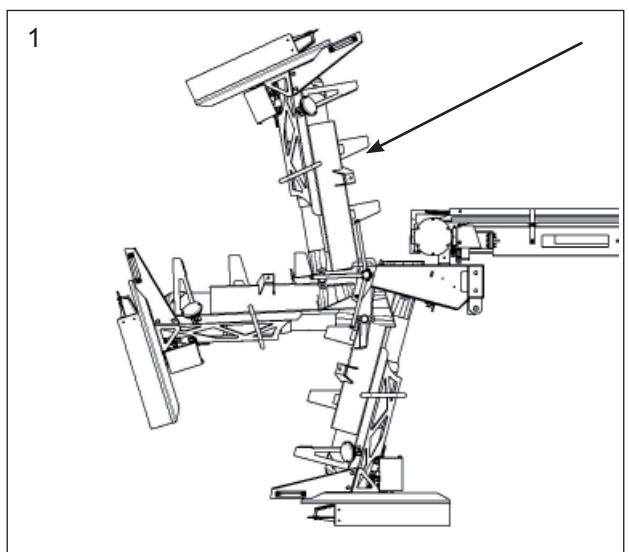
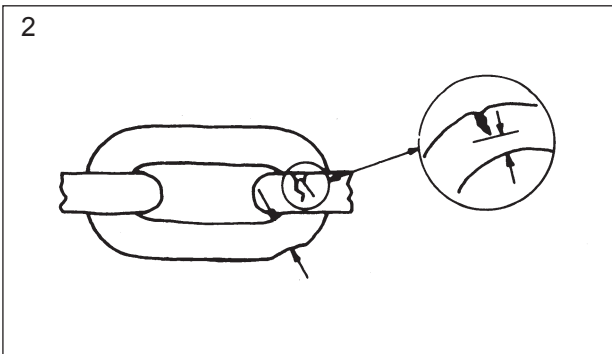
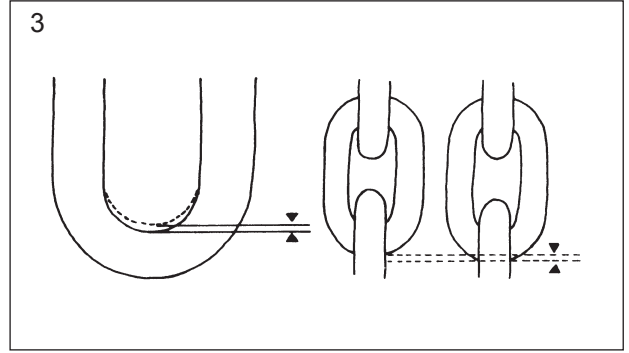
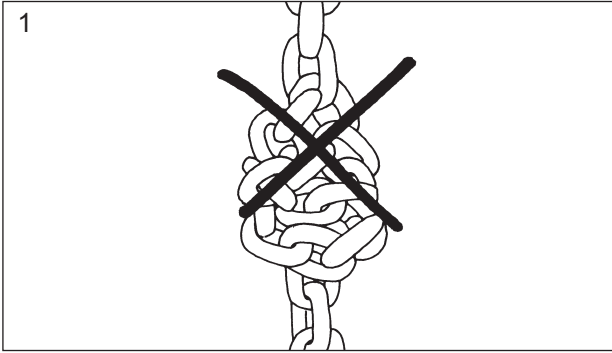
2.1.5 Liquid hoses

Liquid hoses must be checked at an interval of 100 hours of operation (visual check).

When replacing liquid hoses, make sure to only use the original hose from the manufacturer.

2.1.6 Lubricating grease

Long-term or repeated skin contact may cause irritation or serious skin diseases. Wash thoroughly using water and soap. Avoid inhalation of grease vapours. Avoid wearing grease-stained clothing.



2.1.7 Chains

Use: Do not overload chains. Do not use chains for lifting if in doubt whether the permitted load of the chains is exceeded. Only use chains with lifting certificates. Avoid shock effects, especially in cold weather.

Only original chains supplied by the manufacturer must be used.

1. Do not allow the chains to twist, and knots must not be made in the chains. Never use brute force when handling the chains, e.g. blows with a hammer, torsion with tongs, mandrel, etc. Avoid torsion of the chains whenever possible.

2. Maintenance: Chains must be kept in a good condition.

Check chains carefully at regular intervals, however thoroughly at least once every 12 months. Check each chain link at the inspection and preferably use a magnifying glass to see if there are any breaches, etc.

Maintenance of chains must include regular washing in an anti-rust agent.

Store the chain in a dry and ventilated place when it is not in use.

Chains must not be repaired by means of welding, soldering, etc.

Discarding - Ropes must be discarded when:

- 4. the link thickness of the chain has been reduced by 10% of the original thickness, or a chain link has been extended by more than 5%.
- the chain has pitting.
- chain links have been overstrained, twisted or bent out of shape, have breaches, cracks or other deformations.
- many links have twisting or deformations. Such twisting or deformations may be difficult to see when the individual links are checked, but it can be checked by hanging the chain from one end allowing the chain to hang freely. The links must form completely horizontal lines without twisting.

2.1.8 Lashing winch

Inspection of cargo securing equipment, including lashing winch, should be carried out before and after use. The inspection should include a visual check to find any defects, wear and damage, function check and maintenance work, e.g. lubrication of lock mechanisms and adjustment of the lashing tighteners.

- Never tie knots on the straps as this may reduce the ultimate stress significantly.
- Protect the straps against sharp edges and wear.
- Avoid shock effects and tugging.
- Do not pull the straps to the ground.
- Do not expose the straps to alkaline treatment (e.g. ammonia and caustic soda).
- Do not use the straps at temperatures below -40°C and above +100°C.

Maintenance

- Store the straps in a dry place.
- Wash the straps in clean water and hang them to dry in a place with good ventilation.
- Check that the labelling is not damaged.
- Discard damaged straps or contact the manufacturer of the straps for advice.
- Repairs must only be performed by the manufacturer.

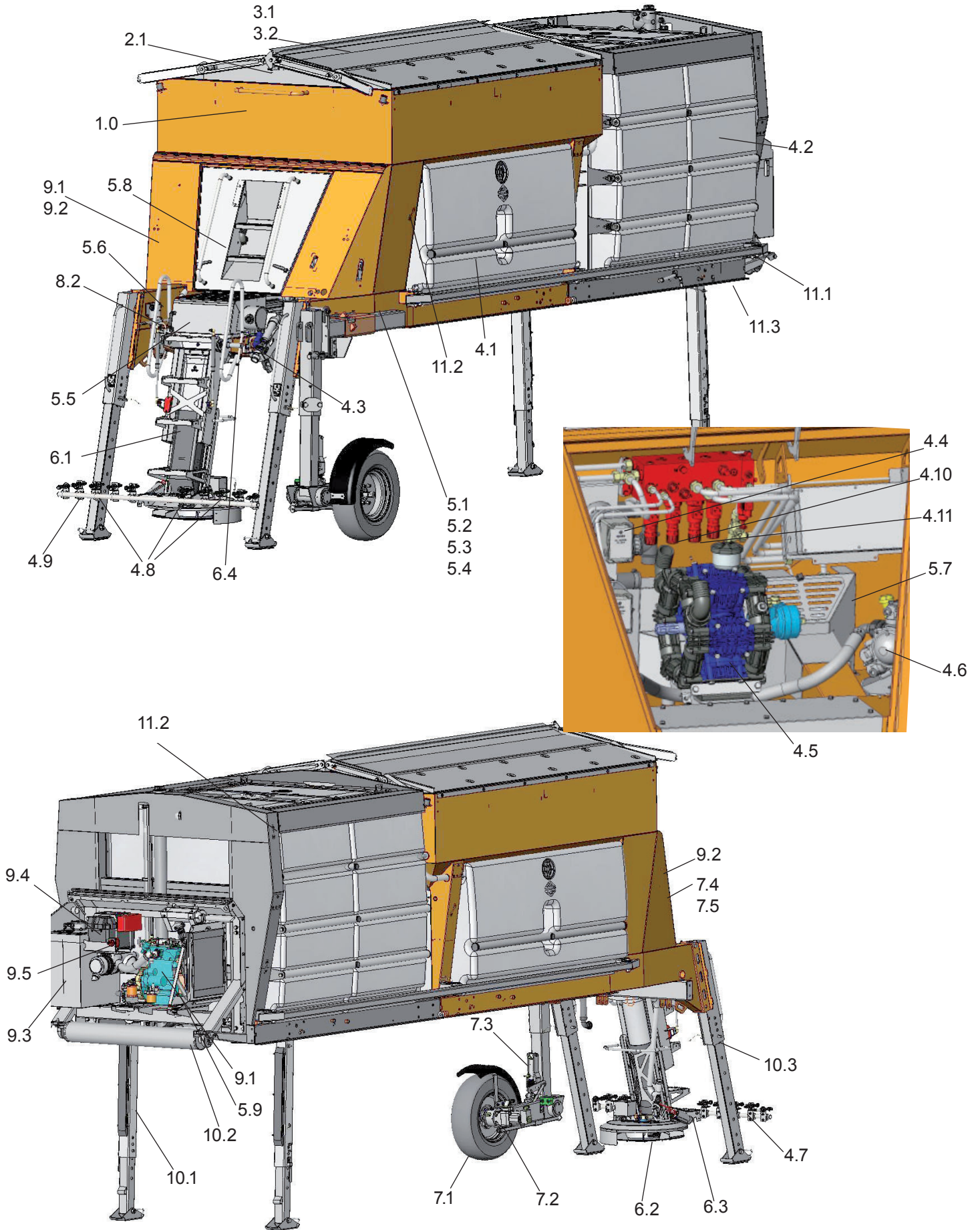
Epoke recommends that the users follow the instructions of the manufacturer.

2.1.9 Spreader with container frame

1. Before attaching or detaching the spreader, the spreader plate assembly must be raised to the transport position.

- Do not fill the spreader in excess of the permitted total weight.
- Damaged spreaders, which may influence the operational reliability, must not be used until the defects have been remedied. Examples of defects which influence the operational reliability:
 - Cracks in structural units or welded joints.
 - Damaged tilt bearings.
 - Bent stop pins
- The spreader must only be placed on a firm surface.
- Mounting or dismounting of the spreader must only be carried out when no persons are standing within the working area.
- The responsible person is under an obligation to have the replaceable reliability of the interchangeable spreader examined by an expert¹⁾ according to need, however at least once a year.

1) An expert is a person, who - based on his/her professional training and experience - has sufficient knowledge of tipping and dismounting tanks, and who is familiar with current national work protection instructions, guidelines and generally recognised technical rules (e.g. norms), thus enabling him/her to assess the condition of interchangeable tipping and dismounting tanks.



2.2 Product descriptions

2.2.1 Machine overview with reference to illustration opposite

Solid matter tank

- 1.0 Solid matter tank

Tarpaulin

- 2.1 Foldable tarpaulin over solid matter tank

Grates

- 3.1 Grate 50x50 over solid matter tank
- 3.2 Grate 100x100 over solid matter tank

Liquid/prewetting system

- 4.1 Side tank
- 4.2 Front tank
- 4.3 Tap for draining/filling
- 4.4 Distribution valves with Epoke servo motors (S-4902 only)
- 4.5 Combination pump for liquid and prewetting (S-4900); for S-4902, liquid pump only
- 4.6 Separate prewetting pump S-4902
- 4.7 Spreader boom S-4902
- 4.8 3x fan nozzles on spreader boom
- 4.9 Jet nozzles on spreader boom, 4x on either side
- 4.10 Proportional valve for controlling liquid volume. Also controls prewetting volume for S-4900
- 4.11 Proportional valve for controlling prewetting volume, S-4902 only

Solid matter dosage

- 5.1 Mixer
- 5.2 Delivery drum
- 5.3 Rubber base
- 5.4 Spring base
- 5.5 Conveyor belt
- 5.6 Spring base adjustment
- 5.7 Transmission (under screen)
- 5.8 Ladder for inspection of solid matter tank
- 5.9 Auger transmission

Application system

- 6.1 Hopper
- 6.2 Spreading plate
- 6.3 Spreading indicator
- 6.4 Reset button for resetting of folding of spreader plate system

SW - operation from the drive wheel of the spreader

- 7.1 Drive wheel
- 7.2 Drive wheel pump
- 7.3 Lifting cylinder
- 7.4 Electric motor with hydraulic pump
- 7.5 Hydraulic oil tank

SH - operation from the truck's hydraulic system

- 8.1 Hydraulic hoses, connected to vehicle (not shown)
- 8.2 High pressure filter

SE - operation from the spreader's own engine

- 9.1 Diesel engine
- 9.2 Fuel tank
- 9.3 Hydraulic oil tank
- 9.4 Battery
- 9.5 Battery switch

Support system

- 10.1 Front tipping legs
- 10.2 Front roll
- 10.3 Support legs, rear

Attachment of spreader to truck bed

- 11.1 Side rails
- 11.2 Holes for attachment of D-eyes
- 11.3 Rubber rails

2.2.2 Description of the spreader

SIRIUS COMBI AST is a fully automatic bulk spreader. This means that the adjusted spreading volume per m² remains constant regardless of changes to the spreading width or the speed of the vehicle.

SIRIUS COMBI AST is a bulk spreader series in three versions: SW (with drive wheel), SH (vehicle hydraulics) and SE (with diesel engine) and three different solid matter tank sizes: small, medium and large.

All operational elements such as chain transmission, liquid pump and the hydraulic system are located at the rear of the spreader.

SW: All operational functions are powered via a drive wheel.

SH: All operational functions are powered via the truck's hydraulic system. An electronic impulse generator manages road speed relation.

SE: All operational functions are powered by a diesel engine and an electronic impulse generator manages road speed relation.

The spreaders are supplied with prewetting equipment which automatically reduces the solid matter volume by up to 30%.

2.2.3 The spreader's construction and function

SW: The spreader is operated via a drive wheel positioned on a vertical height-adjustable and horizontally movable post mounted on the right-hand side at the rear of the spreader. The spreader is operated hydraulically via a hydraulic pump mounted directly on the drive wheel.

The pressure of the drive wheel on the road surface varies according to the spreader's power requirements. This provides the following advantages:

- No unnecessarily high pressure. The result is reduced load and wear on the mechanical parts of the road wheel construction.
- larger directional stability at bends and turns and the wheel provides the driving force which the system needs.

The drive wheel system can be raised mechanically or hydraulically.

A hydraulic cylinder may be mounted as an optional accessory to lift the drive wheel system which will make it possible to drive with a trailer or similar without having to dismount the spreader. The SW model may be equipped with hydraulic or electric emptying.

SH: The spreader is operated via the truck's hydraulics - see minimum truck equipment requirements, section 2.6.

SE: The spreader is operated via a diesel engine. The diesel engine, battery and hydraulic tank are built together as an independent unit. This unit is placed at the front of the spreader. The fuel tank, control panel and throttle control valve are placed in the engine compartment at the rear of the spreader.

Spreading and operation

A hydraulic motor, which regulates the rotational speed, is used for the operation of conveyor belt and delivery drum. An inductive scanner, which constantly measures the rotational speed and forwards it to an electronic device, is mounted at the output shaft of the hydraulic motor.

The electronic device compares the rotational speed with the required speed and regulates the oil volume via a volume control valve so that the required speed is achieved within $\pm 5\%$.

The set material amounts are guaranteed in the speed range 5–90 km/h, as long as the spreader's maximum capacity is not exceeded. This means that the spreader's electronic device reads the speed and when the forward speed is greater than 0.6 km/h, spreading starts with a simulated speed of 5 km/h. This continues until a forward speed of 5 km/h is reached, when spreading then takes place in proportion with the forward speed.

Solid matter:

The material tank and the supporting frame have been welded together. The tank is fitted with a mixer shaft and a dosing unit. The mixer shaft grinds and distributes the spreading material over the entire length of the tank. The dosing unit is located under the mixer shaft. The dosing unit consists of a spring-supported rubber base and the delivery drum, whose function is to dose the material to the unloaded conveyor belt. At the end of the conveyor belt, the material falls through a hopper onto the spreader plate, which spreads the material on the road surface.

Material distribution, spreader plate with and without mixing chamber

The spreader plate (left/right rotating) is made of stainless steel with spreading wings. The spreader plate is operated by a hydraulic motor. The position of the spreader material on the road surface compared to the centre of the spreader plate is adjustable by means of a symmetry adjustment function. It may vary depending on the installed spreader plate type, but it serves the same purpose.

Spreading width

The setting is performed via the remote control in the cab. The width set corresponds to a specified rotational speed of the spreader plate's hydraulic motor.

The rotational speed is constantly registered by the spreader's controls by means of an inductive scanner at the spreader plate.

If the rotational speed does not correspond to the number indicated in the remote control, this will be regulated via the controls. This is achieved by either increasing or reducing the amount of oil that comes through the proportionate valve to the spreader plate's hydraulic motor.

The rotational speed of the spreader plate may deviate by +/-5%.

The material volume for adjustment/input is set by adjusting the spring-supported rubber bases.

Surface-dependent: Spreading is surface-dependent (speed-dependent) and is optimal up to 90 km/h.

Pressure protection

SW: The spreader's complete hydraulics are secured using a safety valve set to 250 bar.

SE, SH: The spreader's complete hydraulics are secured using a safety valve set to 200 bar.

See section 2.6.

Prewetting equipment

The liquid tanks on the SIRIUS COMBI AST are mounted on the sides of the spreader or at the front. Liquid to the spreader plate is supplied via a liquid pump and a special prewetting pipe.

Prewetting pump

Variable prewetting, 7 - 30%

The SIRIUS COMBI AST comes equipped with variable prewetting (7 - 30%). On the S-4902 with a spreading boom, a separate prewetting pump adds the prewetting to the spreader plate, irrespective of whether the spreader is fitted with a standard spreader plate or a spreader plate with a mixing chamber.

On the S-4900, the prewetting is added and spread from the underside of the spreader plate. During liquid spreading, the liquid is also spread from here.

The remote control is used to start and stop the prewetting output. The hydraulic circuit with the proportional valve and the hydraulic motor ensure that prewetting takes place at the chosen rate corresponding to 7 to 30% of the total amount of material spread. At the same time, the amount of solid matter is reduced accordingly by the controls.

The prewetting volume is preset at the factory to 30%. If you want to change this setting (7 - 30%), you have to have EpoMaster controls to hand.

S-4902, spreader with liquid boom

The S-4902 has a separate pump which adds prewetting (7 - 30%).

The liquid is spread from a spreading boom over a width of 3 to 11 metres. The three central nozzles are fan nozzles, while the outermost ones are jet nozzles. To distribute the liquid as much as possible, the jet nozzles are typically set to spread slightly across the direction of travel.

The liquid boom spreading symmetry is controlled by special Epoke liquid valves. A signal is sent from the remote control to the valve, which should then open to supply liquid to a nozzle.

When liquid spreading begins, liquid will be spread from the three fan nozzles as a minimum.

After this, you can select on the remote control whether the spreading width is to be increased and the size to which the liquid is to be spread. Setting up the spreader controls also allows you to select the spreading of liquid and solid matter to follow on from one another (= synchronous spreading of liquid and solid matter).

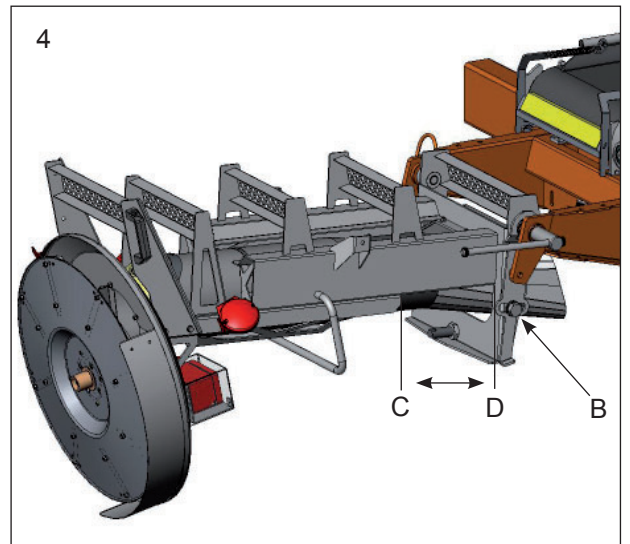
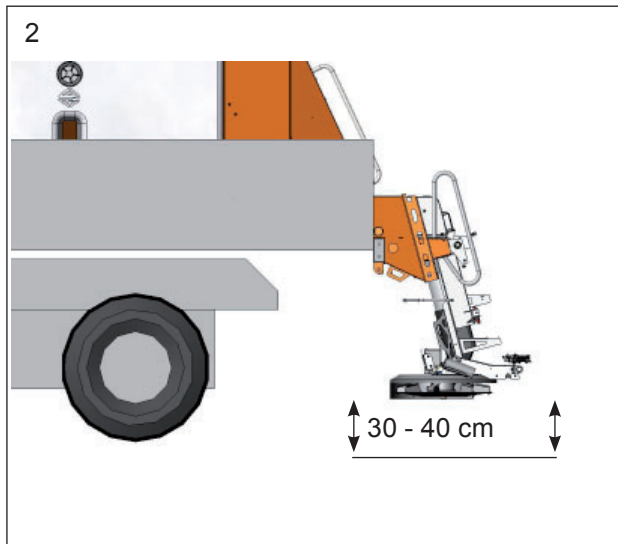
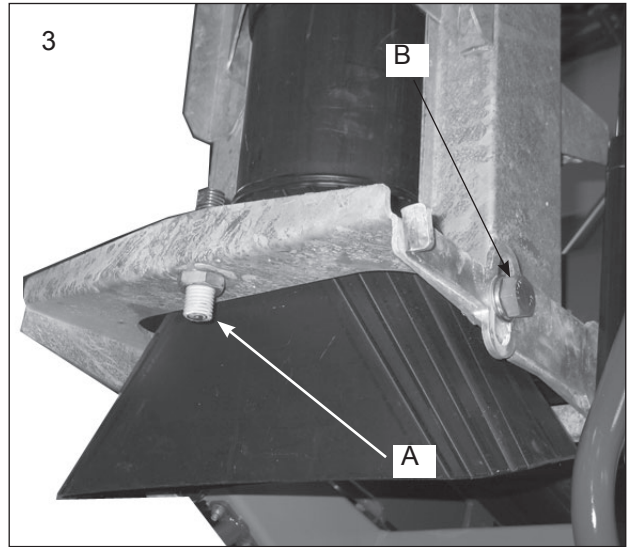
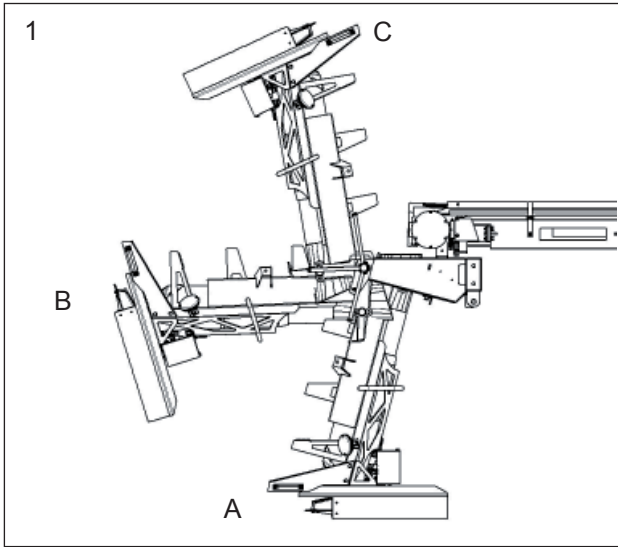
The amount of liquid, or the prewetting volume, is controlled by the hydraulic motor on the pump in question, which determines by its speed how much liquid/prewetting liquid is to be pumped out.

S-4900, spreading of liquid from the spreader plate

The S-4900 has one pump which is used for both liquid spreading and prewetting supply.

The spreading volume is determined by the speed of the pump, and the spreading width is determined by the speed of the spreader plate.

On the S-4900, the spreading width for liquid can be varied between 2 and 8 metres, while the spreading width for solid matter can be varied between 2 and 12 metres.



2.2.4 Spreader plate suspension

Lock mechanism

For locking of the spreader plate suspension in a transport, service and working position, the suspension is equipped with a toothed disk lock. It is placed on the right-hand side of the suspension's control arms.

The lock is operated by turning the clasp nut using the handle.

From the locked position, the nut must be loosened 1.5 to 2 turns to release the lock.

1. The suspension may be locked in many positions and in three main positions:

- A. Working position when spreading is required.
- B. Service position when the components of the suspension are set and adjusted.
- C. Transport position when spreading is not required.

NB! The integrated ladder must only be used when the suspension is adjusted, the handle is mounted and the spreader plate suspension is locked in the working position.

Gas springs

The gas springs, which are mounted on the suspension, carry a large part of the suspension's weight when it is raised and lowered. Depending on the length of the suspension, the suspension may seem lighter or heavier, which is normal.



It is not permitted to dismount one of the gas springs to make it easier to raise and lower the suspension.

Adjustment

Angle adjustment

Must be carried out when the spreader is mounted on the carrier vehicle and fully loaded with spreading material.

Can be carried out by one person.

Tool: Measuring tape, 17 mm, 30 mm and 36 mm fixed keys.

The purpose of angle adjustment of the spreader plate suspension is to ensure that the set spreading widths are met.

2. The spreader plate must be parallel to the road surface.

Use the following procedure when adjusting the angle:

- Set the spreader plate suspension to the transport position.
- **3.** Loosen the lock nut at the striking bolt (A).
- Lower the suspension into the working position and lock it.

- Loosen the tie bolt (B) on the right-hand side of the suspension by approx. 3 turns.
- Measure the distance from the front edge and rear edge to the road surface.
- If the distances are not the same, adjust the angle of the suspension by turning the striking bolt.
- Tighten the tie bolt and the lock nut when the angle has been adjusted.
- Angle adjustment of the suspension has now been completed.

Length adjustment

Must be carried out when the spreader is mounted on the carrier vehicle and fully loaded with spreading material.

Can be carried out by one person.

Angle adjustment of the suspension must be completed before the length adjustment is initiated.

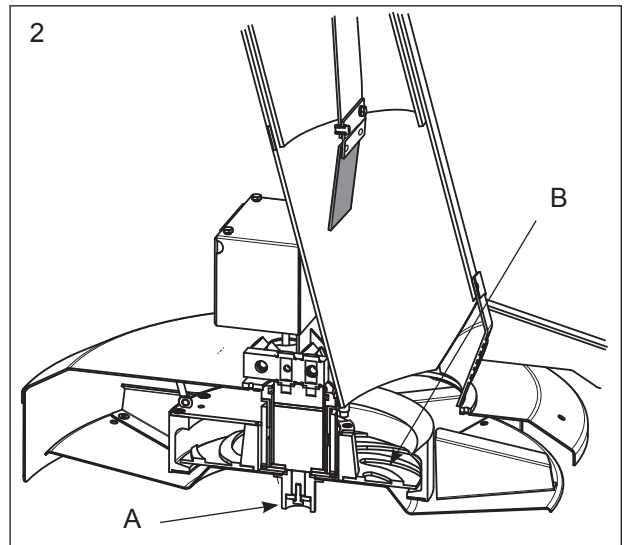
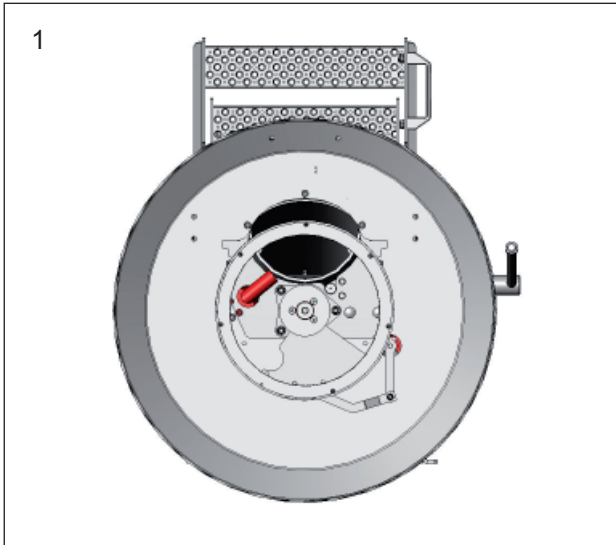
Tools: measuring tape, ratchet with short extension and 19 mm top.

The purpose of angle adjustment of the spreader plate suspension is to ensure that the set spreading widths are met.

2. The correct height is 30 to 40 cm above the road surface measured from the road surface to the lower edge of the spreader plate.

Use the following procedure when adjusting the height:

- Lower the suspension into the working position and lock it.
- Measure the distances to the road surface, e.g. 600 mm. The spreader plate is $600 - 400 = 200$ mm too high above the road surface.
- **4.** Measure the distance from C to D, e.g. 185 mm.
- Raise the suspension into the service position.
- Undo the 2 x 2 M12 lock nuts (NV 19 mm) by approx. 3 turns.
- Retract the lower part of the suspension until the distance from C to D is $185 + 200 = 385$ mm at both the left and the right-hand side.
- Tighten the 2 x 2 M12 lock nuts.
- Adjust the adjustable ladder rung by loosening the 2 x 2 M12 lock nuts by approx. three turns and move the ladder rung to a position between the lower rung at the upper part of the suspension and the rung at the lower part of the suspension.
- Lower the suspension into the working position and check the distance to the road surface (300-400 mm). Adjust if necessary.
- The height adjustment of the spreader plate has now been completed.



On spreaders with pre-wetting devices and very short spreading disc suspension, it may be necessary to adapt the length of the fluid hose. This will avoid the hose breaking and blocking the fluid supply. The hose shall be shortened by the same length as the length of the suspension is shortened. The hose shall be shortened using a sharp knife and a diagonal cutter.

1. When the symmetry setting on the remote control is set to mid-spreading, the symmetry arm, with the suspension set to service position, must hang straight down. Check and adjust when the suspension is set to the service position and the spreader plate is removed.



Do NOT work on the symmetry motor when the spreader plate suspension is set to the working position. Without warning the motor can turn one revolution in connection with self-calibration.

Removal of spreader plate with mixing chamber

Can be carried out by one person.

Tools: 10 mm box wrench, Epoke puller tool, item 420812, including 22 mm fixed key, tool for 41 mm hexagon.

2. Use the following procedure when removing the spreader plate.

- Use the spreader plate suspension in the service position.
- Remove bolt (A).
- Screw the puller tool into the hub of the spreader plate.
- Screw in the M14 mm bolt of the puller tool until the hub of the spreader plate has come free of the shaft of the spreader plate motor.
- Use both hands to pull the spreader plate away from the suspension. This requires some force as the rubber plate (B) has to be pulled out of the mixing chamber.
- Remove the puller tool from the spreader plate.

The spreader plate has now been removed.

Fitting of spreader plate with mixing chamber

Can be carried out by one person.

Tools: 10 mm box wrench.

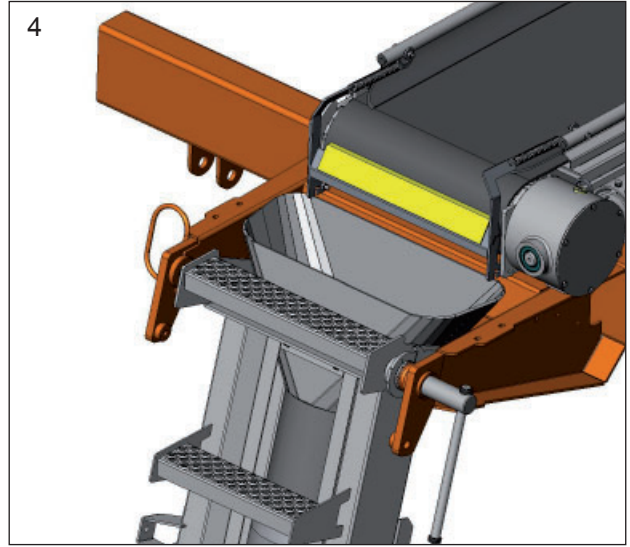
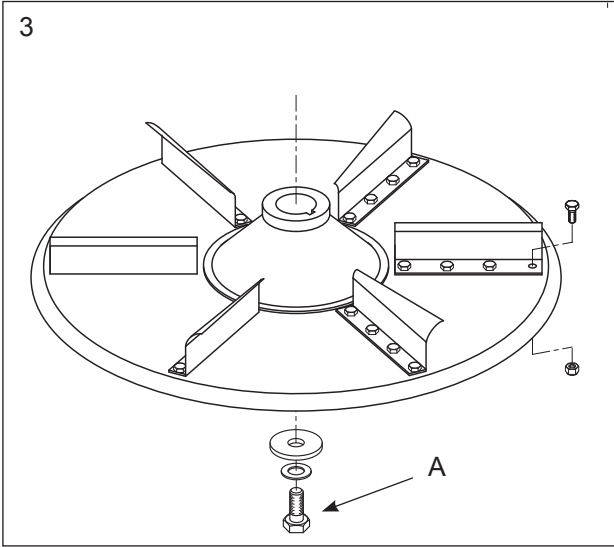
2. Use the following procedure when fitting the spreader plate.

- Bring the hub of the spreader plate over the shaft of the spreader plate motor. Now line up the groove of the hub with the key on the motor shaft.
- Bring the rubber plate (B) into the mixing chamber. This is done by pressing the rubber plate up against the chamber while slowly turning the spreader plate.
- Bring the spreader plate forward to the limit stop when the rubber plate is inside the mixing chamber.
- Fit and tighten bolt (A).

The spreader plate has now been fitted.



Do not lubricate the rubber plate in the mixing chamber. The plate must not be in contact with substances which dissolve rubber. If hydraulic oil, diesel oil or a similar product is spilled on the rubber plate, it needs to be cleaned immediately.



Removal of spreader plate without mixing chamber

Can be carried out by one person.

Tools: 10 mm box wrench, Epoke puller tool, item 420812, including 22 mm fixed key, tool for 41 mm hexagon for holding-up.

3. Use the following procedure when removing the spreader plate.

- Use the spreader plate suspension in the service position.
 - Remove bolt (A).
 - Screw the puller tool into the hub of the spreader plate.
 - Screw in the M14 mm bolt of the puller tool until the hub of the spreader plate has come free of the shaft of the spreader plate motor.
 - Use both hands to pull the spreader plate away from the suspension.
 - Remove the puller tool from the spreader plate.
- The spreader plate has now been removed.

Fitting of spreader plate without mixing chamber

Can be carried out by one person.

Tools: 10 mm box wrench.

3. Use the following procedure when fitting the spreader plate.

- Bring the hub of the spreader plate over the shaft of the spreader plate motor. Now line up the groove of the hub with the key on the motor shaft.
- Bring the spreader plate forward to the limit stop.
- Fit and tighten bolt (A).

The spreader plate has now been fitted.

Inspection of the fall hoppers and the rear conveyor belt scrapers

Can be carried out by one person.

Tools: torch and protective gloves.

4. The top and bottom fall hoppers are mounted in the spreader plate suspension. From the conveyor belt, the spreading material is led to the fall hoppers via the rear belt scraper. The hoppers will lead the spreading material to the spreader plate.

Hoppers and scrapers are made from a plastic material with low friction to prevent the material from sticking to its surfaces which may result in blockage.

In certain weather situations and with spreading materials with a high content of earth and clay, the spreading material may build up.

If this built-up is not removed, it may result in blockage which would lead to an insufficient treatment of icy roads.

We recommend that the hoppers and the belt scrapers should be checked at regular intervals and any built-up material should be removed. The interval between the inspections depends on weather, material and utility model and it cannot be determined until a degree of familiarity has been gained.

When using the spreader for the first time, check the hoppers after each refilling of the tank or when the spreading procedure is completed and another route is to be taken. If the hoppers are not blocked, the interval may be increased to, e.g. every second tank filling.

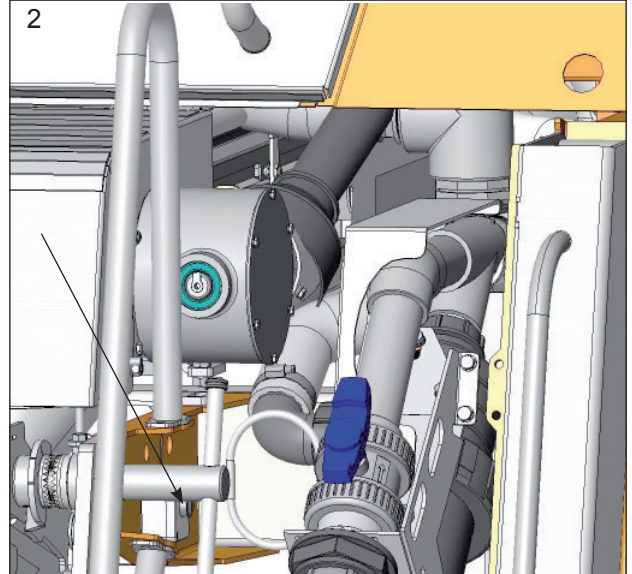
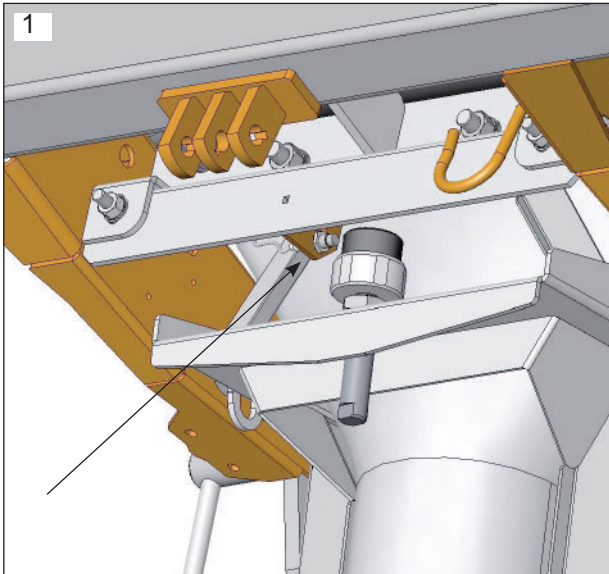
We recommend that special attention is paid to the hoppers when the weather changes or when another spreading material is used.

Use the following procedure when checking/cleaning the hoppers:

- Stop the spreader and disconnect the hydraulic supply.
- Lock the spreader plate suspension into the working position.
- Stand on the ladder with a firm hold of the rail and lift up the conveyor belt shielding.
- Using the torch, check the hoppers in the upper part and at the bottom next to the guiding plate. Use your hand to remove any built-up material. Use protective gloves.

NB! Do not use metal tool or similar which may scratch the hopper. Scratches may result in the build-up of material.

- Do not use water for cleaning unless the hoppers are left to dry before the next procedure. Moisture in the hoppers may increase the built-up, in particular when the spreading material is very dry salt.
- Check the top side of the belt scraper and remove any built-up material in the same way as in the hoppers.
- Check the underside of the belt scraper and clean it by pulling it away from the conveyor belt.
- Close the conveyor belt shielding when the condition of the hoppers and the belt scrapers is satisfactory.
- Inspection and cleaning are now complete.



Belt spreaders

- The belt scraper's top side must be inspected and any accumulated material must be removed in the same way it is done with the hoppers.

The belt scraper's bottom side on conveyor spreaders must be inspected and cleaned by pulling it away from the belt.

Safety stop of the spreader plate and symmetry motor

The spreader's hydraulic motors get their oil flow and oil pressure either from the truck's hydraulic system (SH spreader), from a hydraulic pump mounted on the spreader's own combustion engine (SE spreader) or from the "fifth wheel" (SW spreader).

A proportional valve in the hydraulic circuit controls the rotational speed on the spreader plate. During normal operation, this valve receives control power from the spreader's operating system, ensuring that the correct oil flow is sent to the spreader plate's hydraulic motor. This ensures that the spreader plate rotates at the correct rotational speed and that the required spreading width can be attained.

1. If the spreader plate system is folded up, the inductive scanner will cut off the control power to the proportional valve, preventing the spreader plate from rotating.

The spreader plate system must be folded down again for the proportional valve to be supplied with control power, enabling the spreader plate to rotate.

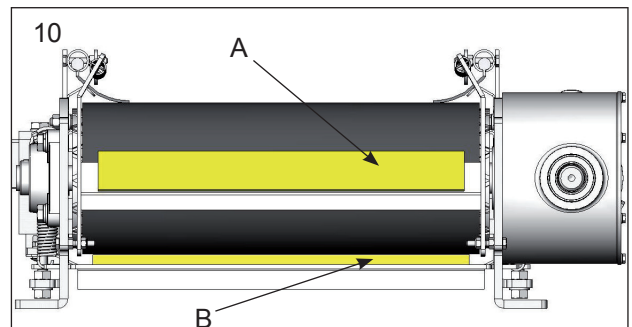
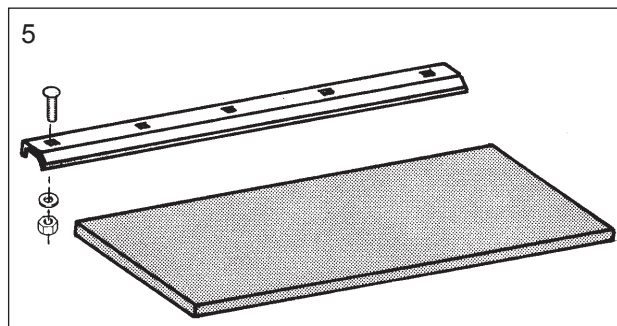
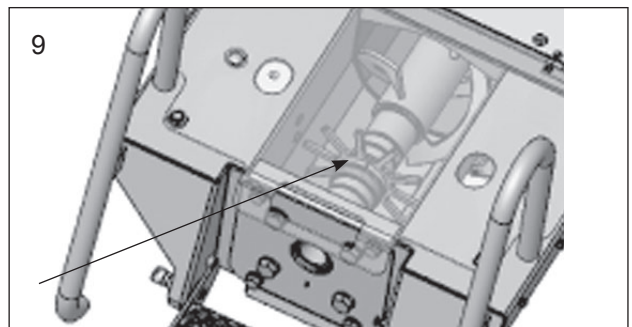
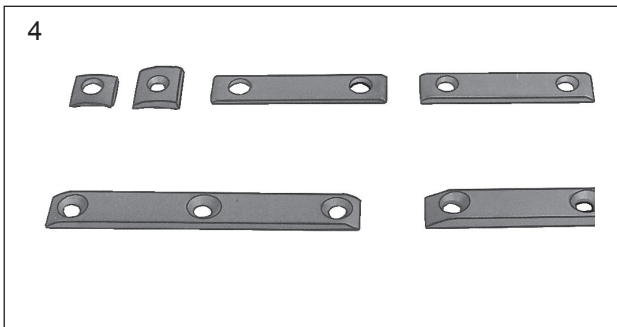
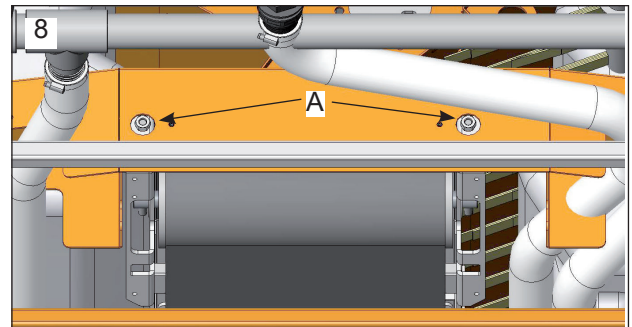
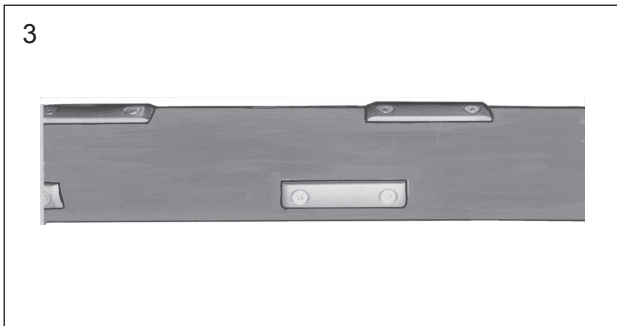
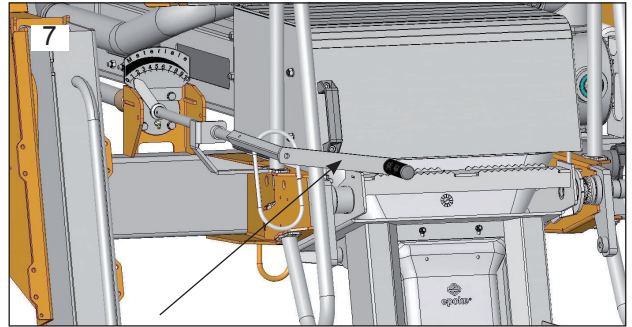
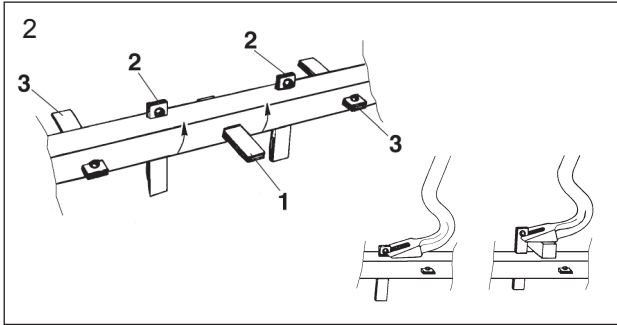
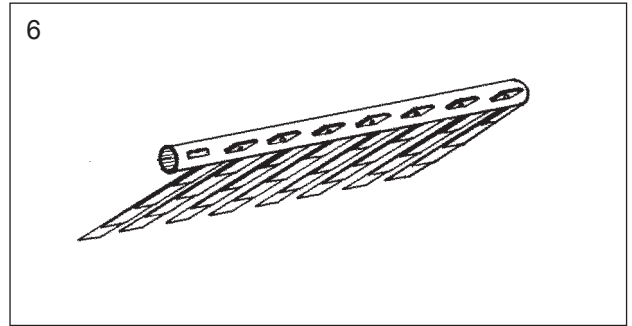
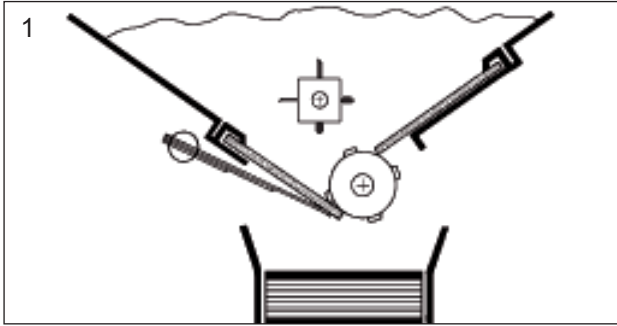
2. As this is a safety function, it is not enough to fold down the spreader plate system again to make the spreader plate rotate.

In addition, it is

- necessary either to cut off the control power to the entire system
- or to press the stop button and again press the start [S/S] button on the remote control
- or to press the reset button before the spreader can rotate again



Please note that if the proportional valve is activated manually, the spreader plate can rotate even if the spreader plate system is folded up.



2.2.5 Dosing system

1. Epoke principle

- A - Mixer shaft with springs
- B - Delivery drum with cams
- C - Rubber base
- D - Spring base
- E - Conveyor belt

2. The mixer shaft grinds all lumps, distributes the spreading material over the entire length of the tank and ensures a constant supply for the delivery drum.

Mixer springs: When replacing defective mixer springs, place the flat side towards the working direction and shape the spring into two spirals starting from the centre so that the material is transported towards the centre. Start with the middle no. 1. Turn the pipe 1/4 turn until the working direction is reached, then mount pair no. 2 in the same way on either side of no. 1. Turn 1/4 turn until the working direction is reached, then mount pair no. 3 in the same way on the previous one, etc. Defective spring mixers can be removed.

3. The delivery drum contains cams, which transport the material via the spring adjusting rubber base. The cams are delivered in various versions which match all material types and dosages.

4. Worn-out delivery cams must be replaced. Remove the cams by knocking either the centre of the plastic rivet or the steel rivet into the dosing drum. It may not be sufficient to knock in the centre of the steel rivets and it may therefore be necessary to drill out the remaining part of the rivet.

5. The rubber bases are wedged under the clamps and they may be turned and worn on all edges - provided that they are turned in time. See also description of the spring base.

6. The spring base presses the lower rubber base against the cams of the delivery drum adjusted by the spring base adjustment. Replace defective springs when they are worn. When the spring base is open, the ends of the springs must be in line.

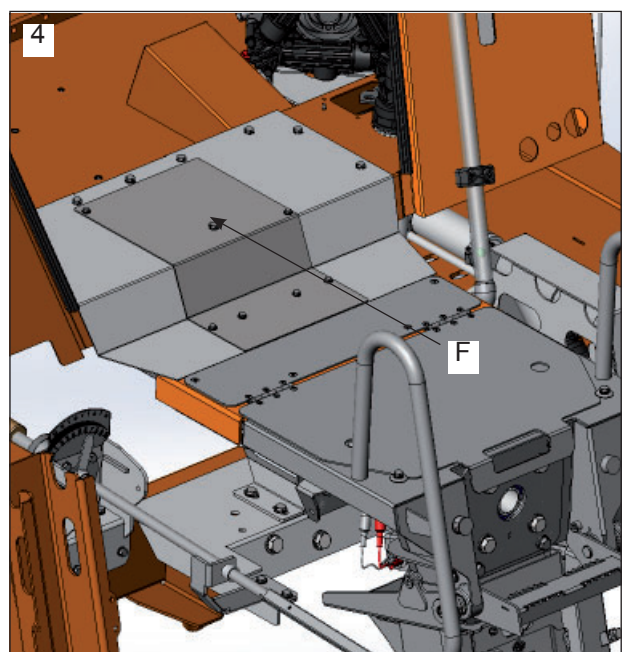
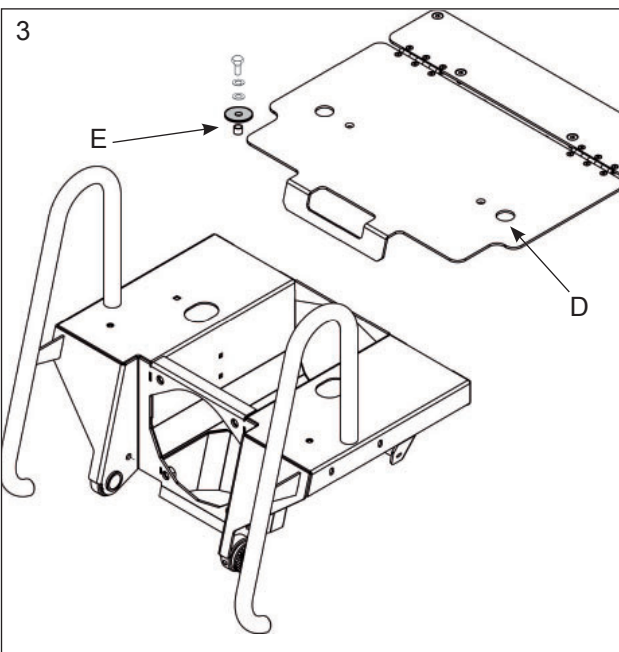
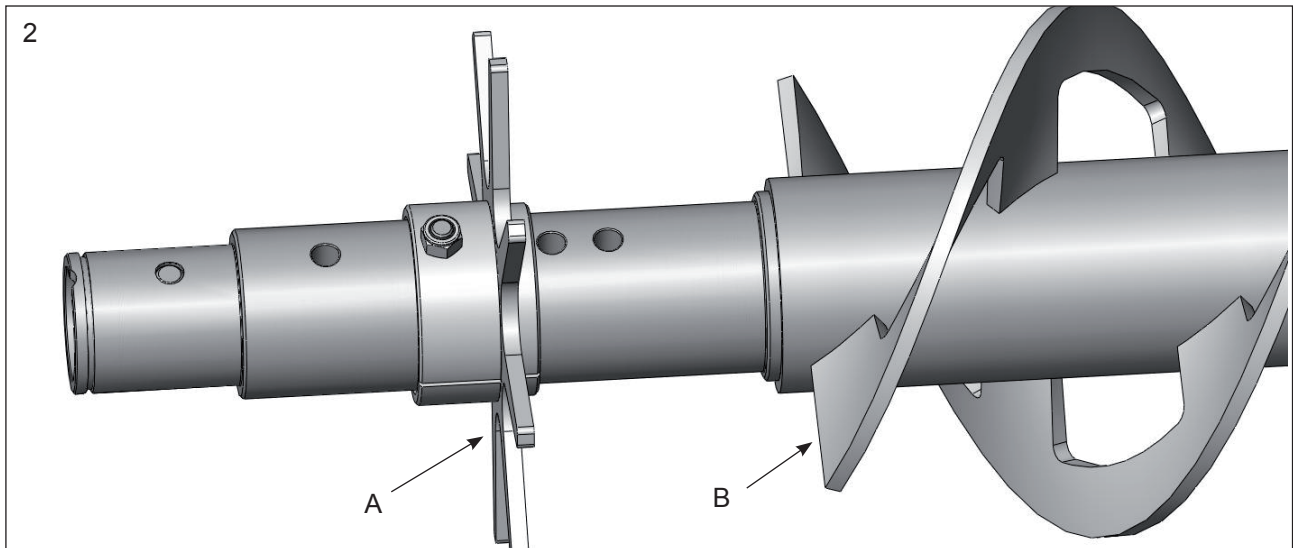
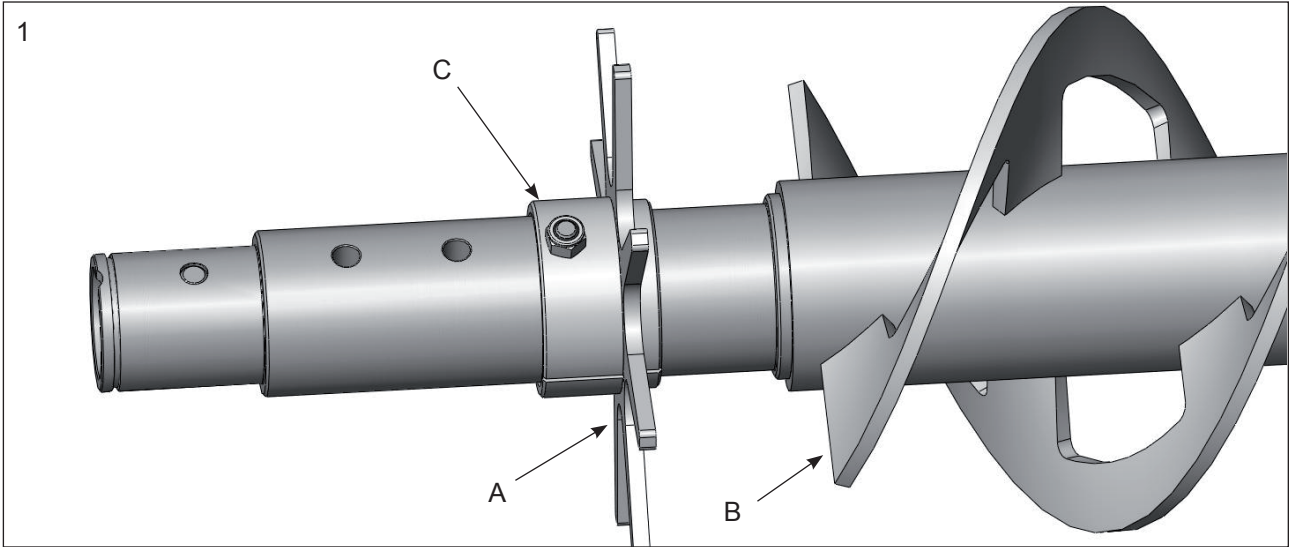
7. Spring base adjustment: Crank for adjustment of spring base. To be used for fine-tuning - see the instructions for adjustment of spreading volume (input).

8. The conveyor belt or the auger that transports the dosed material to the spreader plate runs synchronously with the speed of the delivery drum. The material volume which the belt/auger carries is the same irrespective of the spreading volume.

Tighten and adjust the conveyor belt by the screws (A) on the front of the clamping role. Tighten the bolts using a torque wrench for 15 Nm. The conveyor belt should be readjusted after 25 hours of operation.

9. A dosing unit is fitted on the auger where the material is fed into the hopper. The dosing unit ensures there is an even flow of spreading material at the spreading disc. The auger and the auger casing may be cleaned by washing using a hosepipe (option) or by poring water into the dry material tank.

10. The primary scraper (A) prevents moist spreading material from sticking to the conveyor belt. Check that the scraper is positioned correctly against the belt. If not tighten the springs. Clean built-up material off the scraper as necessary. The scraper blade can be adjusted as needed, and can be reversed if one side becomes worn. The secondary conveyor scraper (B) scrapes the conveyor belt completely clean. Check that the scraper is positioned correctly against the belt. If not tighten the springs. Clean built-up material off the scraper as necessary.



2.2.6 Adjusting the salt dosing unit

Sprinkled spreading material

1. The dosing unit is positioned on the auger in hole no. 3 from the rear side. When salt is spread by easy sprinkles, e.g. rock salt, move the dosing unit (A) closer to the auger windings (B). To do this remove the bolt (C) and then extend the dosing unit until it can be move forwards and backwards on the auger. If the dosing unit has been extended so many times that it breaks, it can still be used by placing the two halves on the correct position on the end of the auger.

The optimal position of the dosing unit varies and should therefore be found by experimenting. For example, start by placing the dosing unit in the third hole.

Sticky spreading material

2. The position of the dosing unit is factory-set on the third hole from the rear. When spreading sticky material, move the dosing unit (A) a greater distance away from the auger windings (B).

The optimal position of the dosing unit varies and should therefore be found by experimenting. For example, start by placing the dosing unit in the rear hole.

Cover over auger end

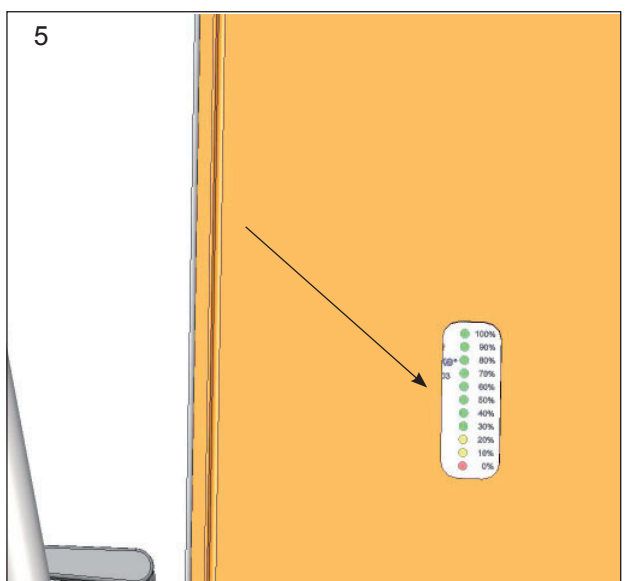
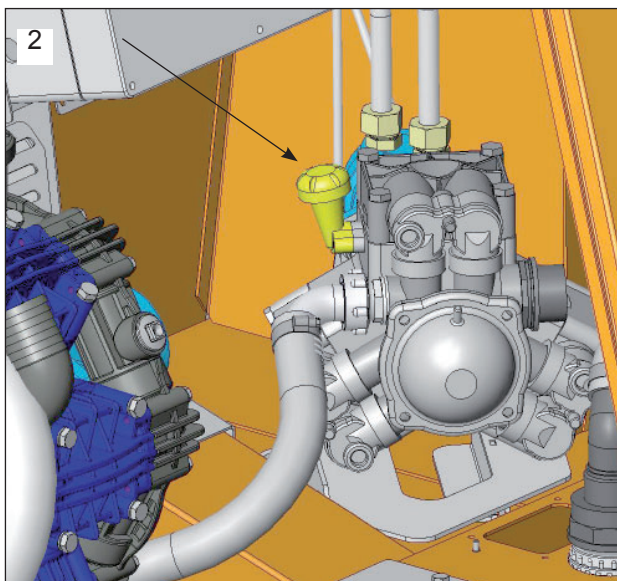
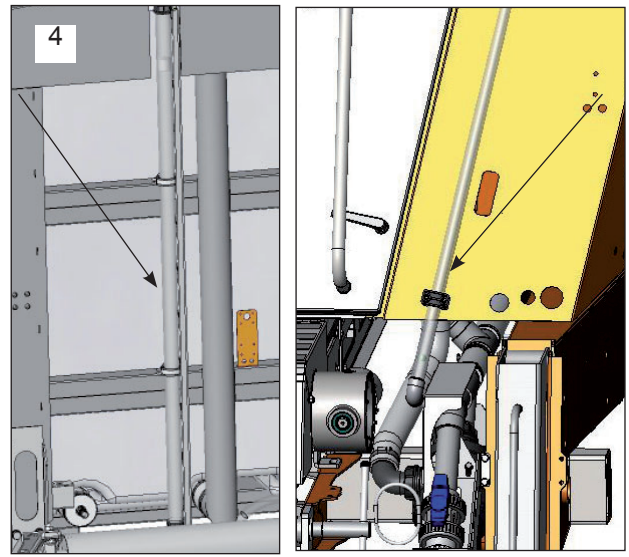
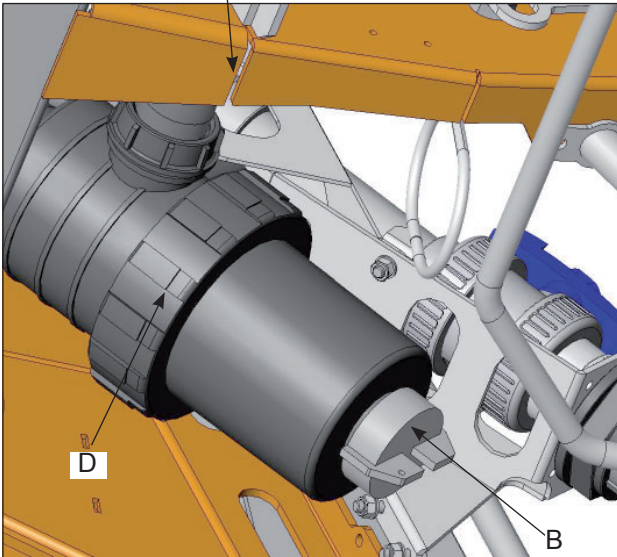
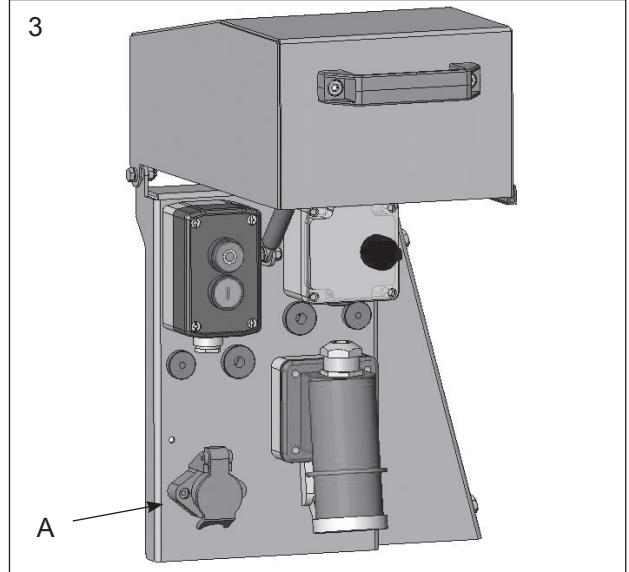
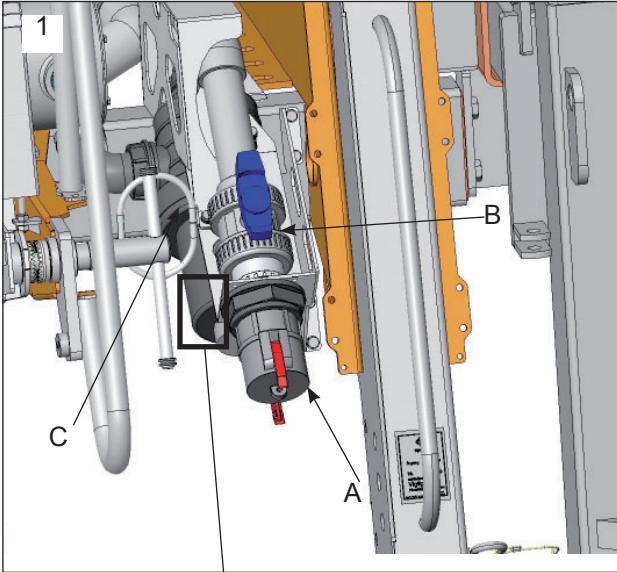
3. The cover over the auger (D) is kept secure using synthetic washers (E). Even if the auger is blocked, the dosing unit will try to transport salt to the rear of the spreader. Because of the transmission's high torque, the dosing auger's windings can become deformed but the synthetic washers ensure that the cover can be pushed up and the salt can spill out, thus avoiding deformation of the windings.

Even though the washers become slightly deformed, they can still be used and only need to be turned slightly. Because the cover still has this intended function, it is important that original synthetic washers from Epoke A/S are used.

4. In case of damage, the screen (F) can be removed. This allows access to the auger below the machine. Access is used when dealing with freezing or a blocked auger.



Before removing the screen, ensure all connections to the spreader's power source are disconnected.



2.2.6 Liquid setup

1. Use the instant connector (A) when filling with fluid or emptying out. Both spreaders with and without automatic cut-offs for filling must be kept under constant surveillance during filling. The maximum permitted flow when fluid is filled into the spreader is 800l/min.



If attempts are made to pump too much liquid into the spreader, liquid will run out of the air vents on the tanks and the pressure in the tanks will rapidly rise to the point where major structural damage to the spreader can occur. This means that filling must be stopped immediately as soon as liquid is visible in the tanks' air vents.

The fluid filter (C) can be cleaned in two different ways:

- Remove the yellow plug (B) (turn anticlockwise) and allow fluid from the system to rinse the filter clean.
- Detach the filter element completely. Remove the coupling on the filter (turn anticlockwise) and take out the filter element to clean or replace it.

2. The sight glass for oil on the fluid pumps also serves as a filling nozzle.

3. An overflow switch turns off the pump from a storage tank if any, when the tank on the spreader is full. The plug (A) for this connection is in the electrical box on the left side of the spreader.

It is a requirement for this function that there is a cable connecting the automatic cut-off on the spreader (overflow switch) to the electrical box on the storage tank.

4. Spreaders without electrical level indicators are fitted with a liquid level on the spreader's rear. Spreaders with electrical level indicators are fitted with a sight glass at the front of the spreader for emergency reading of the liquid level in the container.

5. The fluid level is shown by means of 11 diodes on the fluid level indicator.

Each diode – except for the lowest – represents a jump of 10% (1/10) of the total fluid capacity of the spreader.

The table below shows the content of the tank depending on the size and number of the tanks. The quantity of fluid indicates how much fluid can be pumped out of the tanks.

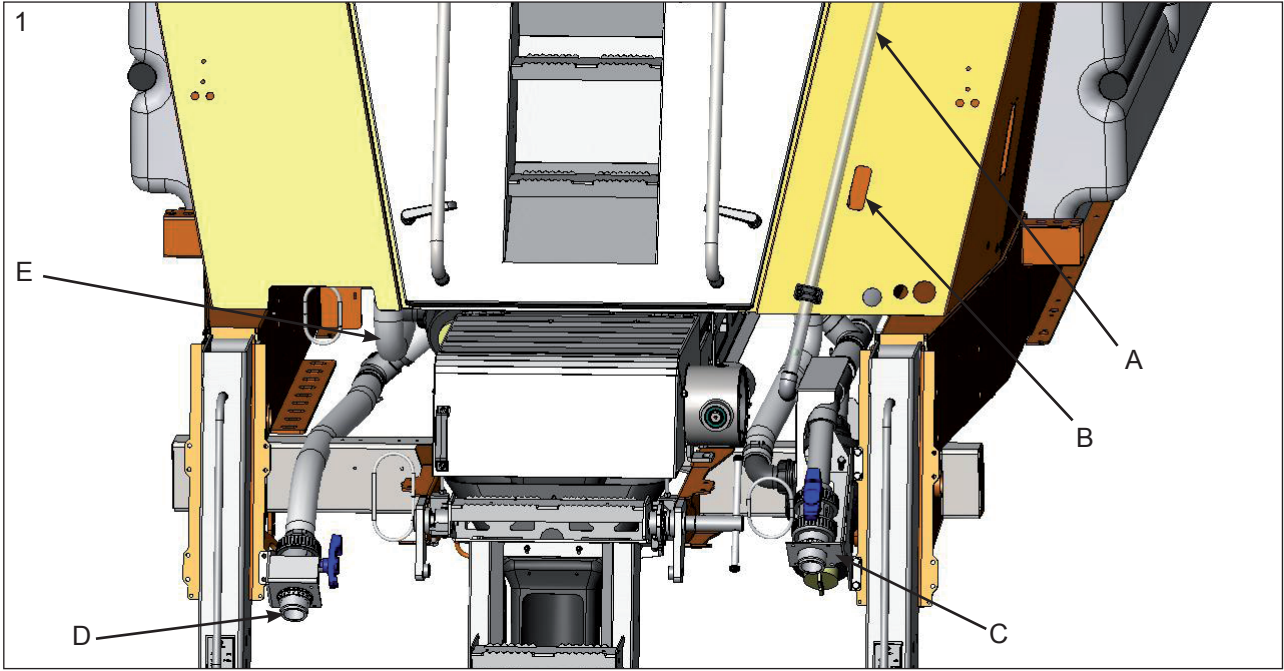


The machine must be connected to the power supply to ensure the overflow switch functions correctly.

The liquid tank's contents in litres (machines with electric liquid level indicators)

		Percentage of total liquid volume									
		100	90	80	70	60	50	40	30	20	10
Model	Tanks	Liquid volume (l)									
Small	1750 F	3630	3267	2904	2541	2178	1815	1452	1089	726	363
	2500 F	4380	3942	3504	3066	2628	2190	1752	1314	876	438
	3500 F	5380	4842	4304	3766	3228	2690	2152	1614	1076	538
	2500 + 1750 F	6130	5517	4904	4291	3678	3065	2452	1839	1226	613
	2 x 2500 F	6880	6192	5504	4816	4128	3440	2752	2064	1376	688
	3500 + 1750 F	7130	6417	5704	4991	4278	3565	2852	2139	1426	713
	2 x 3500 F	8880	7992	7104	6216	5328	4440	3552	2664	1776	888
	2 x 2500 + 1750 F	8630	7767	6904	6041	5178	4315	3452	2589	1726	863
	3 x 2500 F	9380	8442	7504	6566	5628	4690	3752	2814	1876	938
	3 x 3500 F	12380	11142	9904	8666	7428	6190	4952	3714	2476	1238
Medium	1750 F	4150	3735	3320	2905	2490	2075	1660	1245	830	415
	2500 F	4900	4410	3920	3430	2940	2450	1960	1470	980	490
	3500 F	5900	5310	4720	4130	3540	2950	2360	1770	1180	590
	2500 + 1750 F	6650	5985	5320	4655	3990	3325	2660	1995	1330	665
	2 x 2500 F	7400	6660	5920	5180	4440	3700	2960	2220	1480	740
	2 x 3500 F	9400	8460	7520	6580	5640	4700	3760	2820	1880	940
	2 x 2500 + 1750 F	9150	8235	7320	6405	5490	4575	3660	2745	1830	915

F = fronttank



2.2.7 Two-part fluid system

1. The two-part fluid system has three fluid tanks:
The front tank is used exclusively for the fluid that is spread with a spray bar or fluid spreader plate.
The two side tanks contain salt water for wetting dry salt.

Each system has its own filling nozzle, filling indicator and its own filter, which must be kept clean.

The remote control has no separate counter for the fluids in the front and side tanks.

The remote control only registers the total number of litres of fluid that are pumped out.

A	Filling indicator for the filling tanks for humidification and for certain models for liquid spreading
B	Filling indicator for the fluid tank for spreading fluid
C	Fluid filling point for wetting (side tank)
D	Fluid filling point for fluid spreading (front tank)
E	Fluid filter for fluid spreading

2.3 Technical data

2.3.1.1 S-4902 with nozzle boom and spreader plate with mixing chamber

Spreading widths and volumes (factory setting)	
Spreading width, salt (1 m intervals), m	3 - 12
Spreading width, liquid (1 m intervals), m	3 - 11
Spreading volume, salt, g/m ² , EpoMaster ungraduated intervals	3 - 40
Spreading volume, liquid (ungraduated intervals), ml/m ²	10 - 40
SH and SE operation	
However maximum 205 kg/minute / minimum 7 kg/minute, salt or maximum 307 kg/minute / minimum 10 kg/minute, sand*	
However maximum 295 l/minute / minimum 5.4 l/minute, liquid	
1)	
SW operation	
However maximum 146 kg/minute / minimum 7 kg/minute, salt or maximum 219 kg/minute / minimum 10 kg/minute, sand*	
However maximum 265 l/minute / minimum 5.4 l/minute, liquid	
1)	

2.3.1.2 S-4902 with nozzle boom and standard spreading disc (for dry material)

Spreading widths and volumes (factory setting)	
Spreading width, salt (1 m intervals), m	2 - 12
Spreading width, liquid (1 m intervals), m	3 - 11
Spreading width, salt, g/m ² , EpoMaster stepless intervals	3 - 40
Spreading width, sand, g/m ² , EpoMaster stepless intervals	30 - 240
Spreading width, liquid (stepless intervals) ml/m ²	10 - 40
SH and SE operation	
However maximum 205 kg/minute / minimum 7 kg/minute, dry material or maximum 307 kg/minute / minimum 10 kg/minute, sand	
However maximum 295 l/minute / minimum 5.4 l/minute, liquid	
1)	
SW operation	
However maximum 146 kg/minute / minimum 7 kg/minute, dry material or maximum 219 kg/minute / minimum 10 kg/minute, sand	
However maximum 265 l/minute / minimum 5.4 l/minute, liquid	
1)	

2.3.1.3 S-4900 with two-part spreader plate for solid matter and liquid

Spreading widths and volumes (factory setting)	
Spreading width, salt (1 m intervals), m	2 - 12
Spreading width, liquid (1 m intervals), m	2 - 8
Spreading width, salt, g/m ² , EpoMaster stepless intervals	3 - 40
Spreading width, sand, g/m ² , EpoMaster stepless intervals	30 - 240
Spreading width, liquid (stepless intervals) ml/m ²	10 - 40
SH and SE operation	
However maximum 300 kg/minute / minimum 10 kg/minute, salt or maximum 450 kg/minute / minimum 10 kg/minute, sand*	
However maximum 170 l/minute / minimum 5.0 l/minute, liquid	
¹⁾	
SW operation	
However maximum 280 kg/minute / minimum 10 kg/minute, dry material or maximum 420 kg/minute / minimum 10 kg/minute, sand*	
However maximum 150 l/minute / minimum 5.0 l/minute, liquid	
¹⁾	

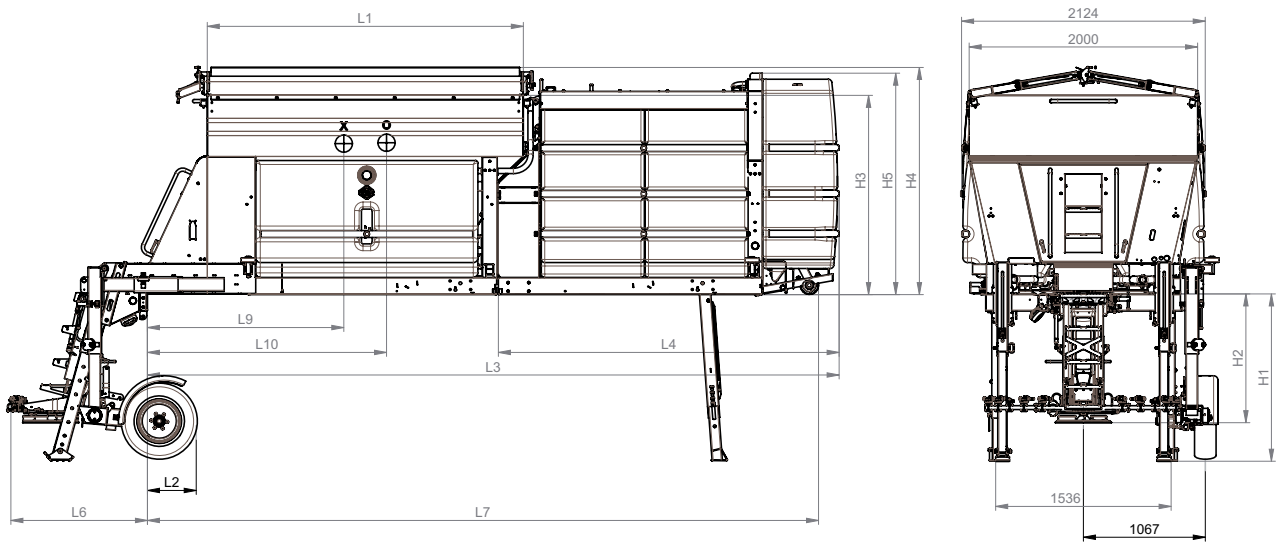
*All values are calculated on the basis of nominal calibration of the machine.

¹⁾with nominal calibration

2.3.1.4 SE-490X

Diesel engine	Lombardini LDW 1003
Fuel tank	1 x 29 l
Battery	105 AH DIN 59017

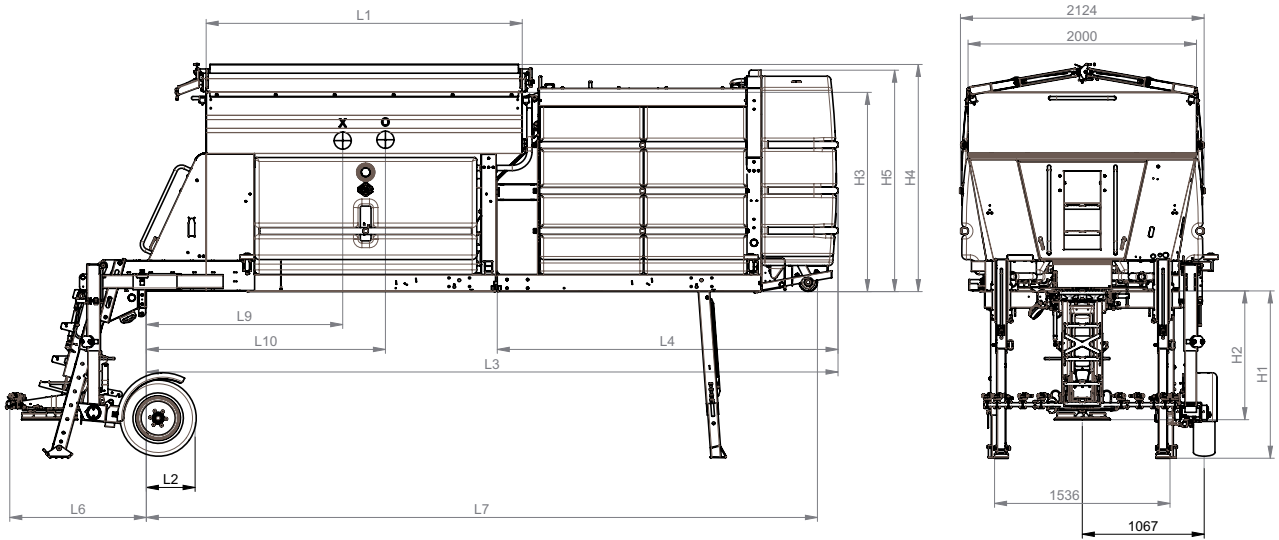
2.3.2 Dimensioned drawing and centre of gravity specifications, SW spreader



Series	SMALL with 1000 / 1750 / 2500 l. tank																	
	3 m ³			4 m ³			5 m ³											
Dry material hopper	0	0	1	1	2	3	0	0	1	2	3	0	0	1	2	3		
No. 2.500 l front tank	0	0	1	1	2	3	0	0	1	2	3	0	0	1	2	3		
No. 1.750 l front tank	0			1			0			0			1					
No. 1.000 l front tank	0	1	0															
Total liquid volume, l	1880	2850	4380	4380	4380	6880	9380	3630	6130	8630	11130	4380	6880	9380	3630	6130	8630	11130
L1	2760																	
L2, min.	150																	
L2, max.	725																	
L3	3283	3692	4441	4466	5372	6278	4099	5141	6047	6953	4466	5372	6278	4099	5141	6047	6953	
L4	228	637	1406	1411	2317	3223	1044	2086	2992	3898	1411	2317	3223	1044	2086	2992	3898	
L6 belt/auger	1200/1397																	
L7	3385	3580	4665	4770	5676	6582	3915	4957	5863	6769	4770	5676	6582	3915	4957	5863	6769	
L9 without HEF*	1290	1531	1885	1809	2150	2433	1570	2002	2338	2695	1811	2148	2428	1576	2001	2334	2688	
L10 without HEF*	1750	2006	2410	2157	2867	3350	2168	2721	3211	3693	2317	2798	3263	2142	2658	3127	3596	
H1, min.	1285																	
H1, max.	1725																	
H2, min.	1002																	
H2, max.	1412																	
H3 without HEF*	1376	1558															1740	
H3 with 1 m3 HEF*	1562	1744															1926	
H3 with 2 m3 HEF*	1742	1924															2106	
H4 without HEF*	1620	1802															1984	
H4 with 1 m3 HEF*	1806	1988															2170	
H4 with 2 m3 HEF*	1986	2168															2350	
H5	1934																	

* - Hopper Extension Frame

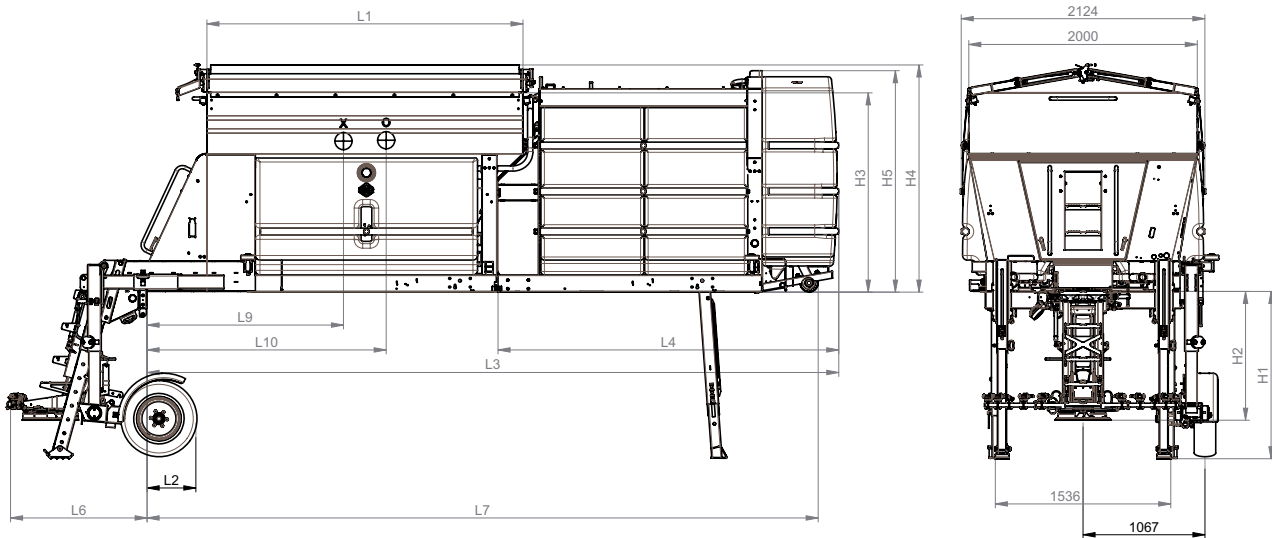
2.3.2 Dimensioned drawing and centre of gravity specifications, SW spreader



SMALL with 1750 / 3500 l. front tank												
Series	3 m ³				4 m ³				5 m ³			
	1	2	3	0	1	2	3	0	1	2	3	1
Dry material hopper												
No. 3,500 l front tank	1	2	3	0	1	2	3	0	1	2	3	1
No. 1,750 l front tank					1							1
Total liquid volume, l	5380	8880	12380	7130	10630	14130	12380	8880	5380	7130	10630	14130
L1	2760											
L2, min.	150											
L2, max.	725											
L3	4441	4466	5372	6278	5141	6047	6953	4466	5372	6278	5141	6047
L4	1406	1411	2317	3223	2086	2992	3898	1411	2317	3223	2086	2992
L6 belt/rauger	1200/1397											
L7	4665	4770	5676	6582	4957	5863	6769	4770	5676	6582	4957	5863
L9 without HEF*	2023	2366	2728	2260	2641	3036	2024	2364	2723	2258	2636	3029
L10 without HEF*	2501	2501	3057	3574	2804	3371	3904	2453	2986	3489	2741	3289
H1, min.	1285											
H1, max.	1725											
H2, min.	1002											
H2, max.	1412											
H3 without HEF*	1376	1558	1744	1924	1802	1988	2168	1986	2168	2350	2168	2350
H3 with 1 m3 HEF*	1562	1744	1924	1802	1988	2168	1986	2168	2350	2168	2350	2168
H3 with 2 m3 HEF*	1742	1924	1802	1988	2168	1986	2168	1986	2168	2350	2168	2350
H4 without HEF*	1620	1802	1988	2168	1986	2168	1986	2168	2350	2168	2350	2168
H4 with 1 m3 HEF*	1806	1988	2168	1986	2168	1986	2168	1986	2168	2350	2168	2350
H4 with 2m3 HEF*	1986	2168	1986	2168	1986	2168	1986	2168	2350	2168	2350	2168
H5	2441											

* Hopper Extension Frame

2.3.2 Dimensioned drawing and centre of gravity specifications, SW spreader



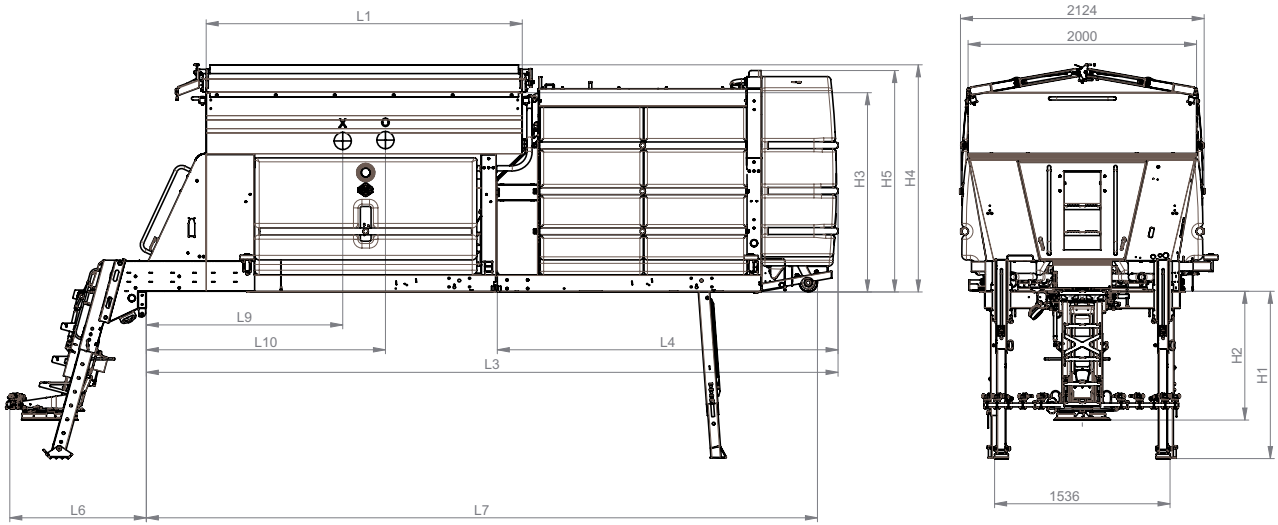
Serie	MEDIUM																		
	6									7									
Dry matter hopper, m ³																			
No. 3,500 l front tank	0	0	0	0	0	1	2	1	2	0	0	0	0	0	1	2	1	2	
No. 2,500 l front tank	1	2	0	1	2	0	0	0	0	1	2	0	1	2	0	0	0	0	
No. 1,750 l front tank	0	0	1	1	1	0	0	1	1	0	0	1	1	1	0	0	1	1	
Total liquid volume, l	4900	7400	4150	6650	9150	5900	9400	7650	11150	4900	7400	4150	6650	9150	5900	9400	7650	1150	
L1	3515																		
L3	5221	6127	4854	5896	6802	5221	6127	5896	6802	5221	6127	4854	5896	6802	5221	6127	5896	6802	
L4	1411	2317	1044	2086	2992	1411	2317	2086	2992	1411	2317	1044	2086	2992	1411	2317	2086	2992	
L6 belt/auger	1200/1397																		
L7	5525	6431	4670	5712	6618	5525	6431	5712	6618	5525	6431	4670	5712	6618	5525	6431	5712	6618	
L9 without HEF*	2105	2450	1851	2306	2646	2380	2751	2716	3090	2106	2448	1856	2305	2642	2379	2747	2712	3083	
L10 without HEF*	2697	3190	2515	3046	3526	2857	3416	3169	3730	2667	3134	2497	2497	3458	2818	3352	3115	3657	
H1, min.	1285																		
H1, max.	1725																		
H2, min.	1002																		
H2, max.	1412																		
H3 without HEF*	1661									1803									
H3 with 1 m ³ HEF*	1809									1951									
H3 with 2 m ³ HEF*	1952									2094									
H4 without HEF*	1904									2046									
H4 with 1 m ³ HEF*	2052									2194									
H4 with 2 m ³ HEF*	2195									2337									
H5	1934					2441					1934					2441			

* Hopper Extension Frame

Series	LARGE							
Dry material hopper, m3	7	9	7	9	7	9	7	9
No. 3,500 l front tank	0				1			
No. 2,500 l front tank	0							
No. 1,750 l front tank	0						1	
No. 1.000 l front tank	1		0					
Total liquid volume, l	4180		3180		5900		7650	
L1	4346							
L2, min.	150							
L2, max	725							
L3	5278		4869		6052		6727	
L4	637		0		1411		2086	
L6 belt/auger	1200/1397							
L7	5167		4971		5748		6543	
L9 without HEF*	1992	2000	1788	1801	----	2532	----	2532
L10 without HEF*	2728	2722	2522	2545	----	3179	----	3179
H1, min.	1285							
H1, max.	1725							
H2, min.	1002							
H2, max.	1412							
H3 without HEF*	1610	1839	1610	1839	1610	1839	1610	1839
H3 with 1 m3 HEF*	1731	1960	1731	1960	1731	1960	1731	1960
H3 with 2 m3 HEF*	1837	2066	1837	2066	1837	2066	1837	2066
H4 without HEF*	1853	2082	1853	2082	1853	2082	1853	2082
H4 with 1 m3 HEF*	1974	2203	1974	2203	1974	2203	1974	2203
H4 with 2 m3 HEF*	2080	2309	2080	2309	2080	2309	2080	2309
H5	1934				2441			

* Hopper Extension Frame

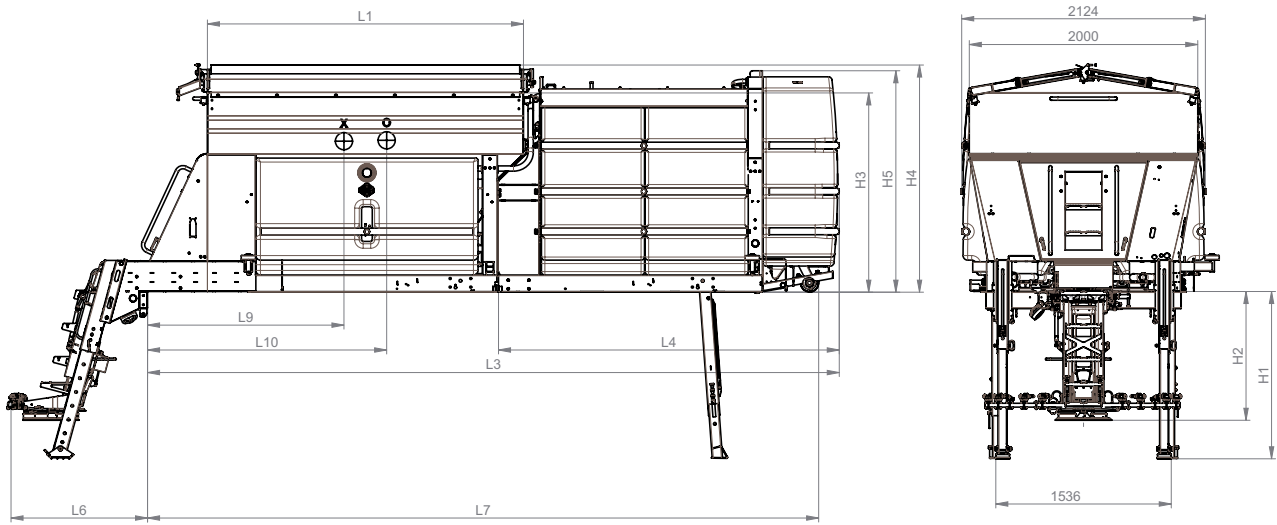
2.3.3 Dimensioned drawing and centre of gravity specifications, SH spreader



Series	SMALL with 1000 / 1750 / 2500 l. front tank																	
	3 m ³					4 m ³					5 m ³							
Dry material hopper																		
No. 2.500 l front tank	0	0	1	1	2	3	0	1	2	3	0	1	2	3				
No. 1.750 l front tank	0					1					0							
No. 1.000 l front tank	0	1	0															
Total liquid volume, l	1880	2850	4380	4380	4380	6880	9380	3630	6130	8630	11130	4380	6880	9380	3630	6130	8630	11130
L1	2760																	
L3	3283	3692	4441	4466	5372	6278	6278	4099	5141	6047	6953	4466	5372	6278	4099	5141	6047	6953
L4	228	637	1406	1411	2317	3223	3223	1044	2086	2992	3898	1411	2317	3223	1044	2086	2992	3898
L6	1200/1397																	
L7	3385	3580	4665	4770	5676	6582	6582	3915	4957	5863	6769	4770	5676	6582	3915	4957	5863	6769
L9 without HEF*	1290	1531	1885	1809	2150	2433	2433	1570	2002	2338	2695	1811	2148	2428	1576	2001	2334	2688
L10 without HEF*	1750	2006	2410	2157	2867	3350	3350	2168	2721	3211	3693	2317	2798	3263	2142	2658	3127	3596
H1, min.	1285																	
H1, max.	1725																	
H2, min.	1002																	
H2, max.	1412																	
H3 without HEF*	1376					1558					1740							
H3 with 1 m3 HEF*	1562					1744					1926							
H3 with 2 m3 HEF*	1742					1924					2106							
H4 without HEF*	1620					1802					1984							
H4 with 1 m3 HEF*	1806					1988					2170							
H4 with 2 m3 HEF*	1986					2168					2350							
H5	1934																	

* - Hopper Extension Frame

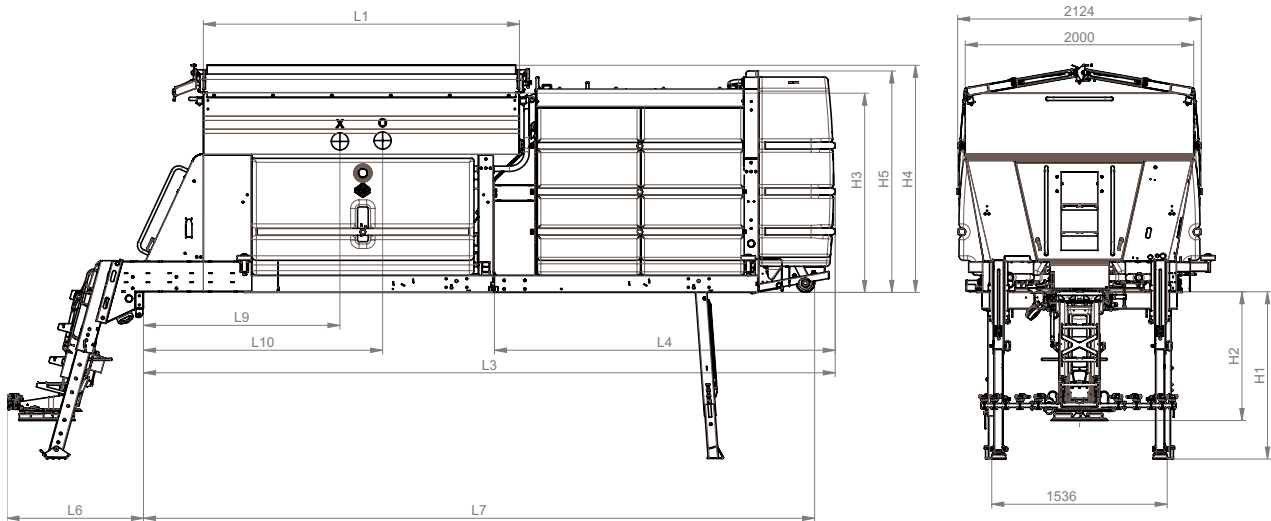
2.3.3 Dimensioned drawing and centre of gravity specifications, SH spreader



Series	SMALL with 1750 / 3500 l. front tank																								
	3 m ³	4 m ³						5 m ³																	
Dry material hopper																									
No. 3,500 l front tank	1	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	3					
No. 1,750 l front tank		0						1						0						1					
Total liquid volume, l	5380	5380	8880	12380	7130	10630	14130	14130	14130	14130	5380	8880	12380	7130	10630	14130	14130	14130	14130	14130					
L1		2760																							
L3	4441	4466	5372	6278	5141	6047	6953	6953	6953	4466	5372	6278	6278	5141	6047	6953	6953	6953	6953	6953					
L4	1406	1411	2317	3223	2086	2992	3898	3898	3898	1411	2317	3223	3223	2086	2992	3898	3898	3898	3898	3898					
L6 belt/auger		1200/1397																							
L7	4665	4770	5676	6582	4957	5863	6769	6769	6769	4770	5676	6582	6582	4957	5863	6769	6769	6769	6769	6769					
L9 without HEF*	2023	2023	2366	2728	2260	2641	3036	3036	3036	2024	2364	2723	2723	2258	2636	3029	3029	3029	3029	3029					
L10 without HEF*	2501	2501	3057	3574	2804	3371	3904	3904	3904	2453	2986	3489	3489	2741	3289	3811	3811	3811	3811	3811					
H1, min.		1285																							
H1, max.		1725																							
H2, min.		1002																							
H2, max.		1412																							
H3 without HEF*	1376													1558						1740					
H3 with 1 m3 HEF*	1562													1744						1926					
H3 with 2 m3 HEF*	1742													1924						2106					
H4 without HEF*	1620													1802						1984					
H4 with 1 m3 HEF*	1806													1988						2170					
H4 with. 2m3 HEF*	1986													2168						2350					
H5		2441																							

* Hopper Extension Frame

2.3.3 Dimensioned drawing and centre of gravity specifications, SH spreader



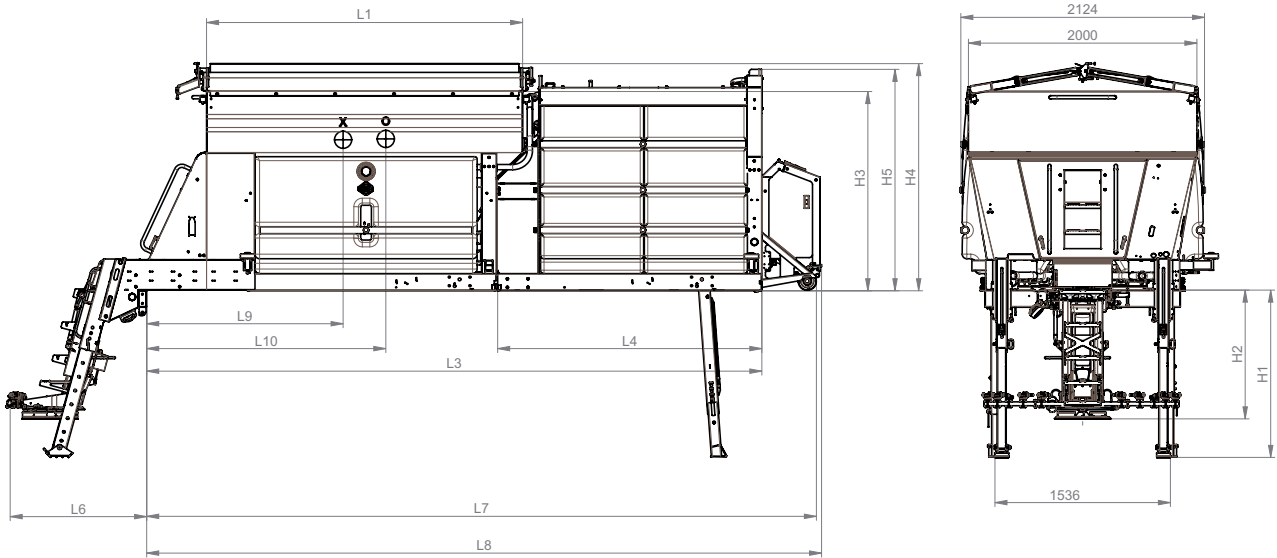
Serie	MEDIUM																		
	6									7									
Dry material hopper, m3																			
No. 3,500 l front tank	0	0	0	0	0	1	2	1	2	0	0	0	0	0	1	2	1	2	
No. 2,500 l front tank	1	2	0	1	2	0	0	0	0	1	2	0	1	2	0	0	0	0	
No. 1,750 l front tank	0	0	1	1	1	0	0	1	1	0	0	1	1	1	0	0	1	1	
Total liquid volume, l	4900	7400	4150	6650	9150	5900	9400	7650	11150	4900	7400	4150	6650	9150	5900	9400	7650	1150	
L1	3515																		
L3	5221	6127	4854	5896	6802	5221	6127	5896	6802	5221	6127	4854	5896	6802	5221	6127	5896	6802	
L4	1411	2317	1044	2086	2992	1411	2317	2086	2992	1411	2317	1044	2086	2992	1411	2317	2086	2992	
L6 belt/auger	1200/1397																		
L7	5525	6431	4670	5712	6618	5525	6431	5712	6618	5525	6431	4670	5712	6618	5525	6431	5712	6618	
L9 without HEF*	2350	2708	2090	2555	2908	2380	2751	2716	3090	2348	2702	2092	2552	2900	2379	2747	2712	3083	
L10 without HEF*	2748	3239	2567	3096	3574	2857	3416	3169	3730	2713	3180	2544	3043	3503	2818	3352	3115	3657	
H1, min.	1285																		
H1, max.	1725																		
H2, min.	1002																		
H2, max.	1412																		
H3 without HEF*	1661									1803									
H3 with 1 m3 HEF*	1809									1951									
H3 with 2 m3 HEF*	1952									2094									
H4 without HEF*	1904									2046									
H4 with 1 m3 HEF*	2052									2194									
H4 with 2 m3 HEF*	2195									2337									
H5	1934					2441					1934					2441			

* Hopper Extension Frame

Series	LARGE							
Dry material hopper, m3	7	9	7	9	7	9	7	9
No. 3,500 l front tank	0				1			
No. 2,500 l front tank	0							
No. 1,750 l front tank	0						1	
No. 1.000 l front tank	1		0					
Total liquid volume, l	4180		3180		5900		7650	
L1	4346							
L2, min.	150							
L2, max	725							
L3	5278		4869		6052		6727	
L4	637		0		1411		2086	
L6 belt/auger	1200/1397							
L7	5167		4971		5748		6543	
L9 without HEF*	2215	2219	2205	2015	----	2532	----	2532
L10 without HEF*	2778	2722	2573	2590	----	3179	----	3179
H1, min.	1285							
H1, max.	1725							
H2, min.	1002							
H2, max.	1412							
H3 without HEF*	1610	1839	1610	1839	1610	1839	1610	1839
H3 with 1 m3 HEF*	1731	1960	1731	1960	1731	1960	1731	1960
H3 with 2 m3 HEF*	1837	2066	1837	2066	1837	2066	1837	2066
H4 without HEF*	1853	2082	1853	2082	1853	2082	1853	2082
H4 with 1 m3 HEF*	1974	2203	1974	2203	1974	2203	1974	2203
H4 with 2 m3 HEF*	2080	2309	2080	2309	2080	2309	2080	2309
H5	1934				2441			

* Hopper Extension Frame

**2.3.4 Dimensioned drawing and centre of gravity specifications
SE spreader (operation from spreader's motor)**



Series	SMALL														
	3			4						5					
Dry material hopper, m3															
No. 3,500 l front tank	0	0	1	0	0	0	1	2	3	0	0	0	1	2	3
No. 2,500 l front tank	0	1	0	1	2	3	0	0	0	1	2	3	0	0	0
Total liquid volume, l	1880	4380	5380	4380	6880	9380	5380	8880	12380	4380	6880	9380	5380	8880	12380
L1	2760														
L3	3055	4466	4466	4466	5372	6278	4466	5372	6278	4466	5372	6278	4466	5372	6278
L4	0	1411	1411	1411	2317	3223	1411	2317	3223	1411	2317	3223	1411	2317	3223
L6 belt/auger	1200/1397														
L7	3534	4945	4945	4945	5851	6757	4945	5851	6757	4945	5851	6757	4945	5851	6757
L8	3565	4990	4990	4990	5896	6802	4990	5896	6802	4990	5896	6802	4990	5896	6802
L9 without HEF*	1780	2274	2551	2298	2654	2958	2540	2809	3098	2297	2649	2951	2547	2803	3091
L10 without HEF*	1870	2495	2610	2340	2977	3418	2600	3129	3623	2403	2872	3329	2554	3054	3537
H1, min.	1285														
H1, max.	1725														
H2, min.	1002														
H2, max.	1412														
H3 without HEF*	1376			1558						1740					
H3 with 1 m3 HEF*	1562			1744						1926					
H3 with 2 m3 HEF*	1742			1924						2106					
H4 without HEF*	1620			1802						1984					
H4 with 1 m3 HEF*	1806			1988						2170					
H4 with 2 m3 HEF*	1986			2168						2350					
H5	----	1934	2441	1934			2441			1934			2441		

* Hopper Extension Frame

Serie	MEDIUM								LARGE		
Dry material hopper, m3	6				7				7	9	
No. 3,500 l front tank	0	0	1	2	0	0	1	2	0	0	1
No. 2,500 l front tank	1	2	0	0	1	2	0	0	0	0	0
Total liquid volume, l	4900	7400	5900	9400	4900	7400	5900	7400	3180	3180	6680
L1	3515								4346		
L3	5221	6127	5221	6127	5221	6127	5221	6127	4869	4869	6052
L4	1411	2317	1411	2317	1411	2317	1411	2317	0	0	1411
L6 belt/auger	1200/1397										
L7	5700	6606	5700	6606	5700	6606	5700	6606	3534	3534	6531
L8	5745	6651	5745	6651	5745	6651	5745	6651	3565	3565	6576
L9 without HEF*	2758	3157	2832	3124	2752	3144	2827	3117	2293	2394	2920
L10 without HEF*	2814	3302	2935	3468	2775	3240	2891	3403	2633	2641	3234
H1, min.	1285										
H1, max.	1725										
H2, min.	1002										
H2, max.	1412										
H3 without HEF*	1661				1803				1610	1839	
H3 with 1 m3 HEF*	1809				1951				1731	1960	
H3 with 2 m3 HEF*	1952				2094				1837	2066	
H4 without HEF*	1904				2046				1853	2082	
H4 with 1 m3 HEF*	2052				2194				1974	2203	
H4 with 2 m3 HEF*	2195				2337				2080	2309	
H5	1934		2441		1934		2441		1934	2441	

* Hopper Extension Frame

2.4 Protection against corrosion

Epoke machines are given a 2-component zinc coat with a coat thickness of 60 µm and a 2-component coating with a coat thickness of between 140 µm and 160 µm.

2.5 Environmental protection

Dismounting and/or scrapping must be performed by an environmentally recognised scrap dealer. When exchanging hydraulic oil, the oil must be disposed of observing legal provisions. Legislation on waste handling must be observed.

2.6 Vehicle equipment requirements (SH spreader)

Oil flow requirements

- Minimum 45 l/minute at 60 km/h
- Maximum 50 l/minute, constant at 60 km/h.
- Maximum 60 l/minute, intermittent (at maximum motor rpm).
- The oil flow must be obtained at a pressure of 170 bar.
- The overpressure valve in the spreader hydraulic system is set at 200 bar in order to protect the hydraulic components.
- In case of long-term operation with low amounts, speed or width, the hydraulic system must be equipped with a cooling system, which has a minimal cooling power of 3 kW. In case of any questions, contact Epoke's service department.

LS spreader

Oil requirements 85 l/minute.

NB! The spreader's LS signal is not equipped with pressure relief.

In addition, the hydraulic system must be equipped with:

- connection to "P" (pressure pipe)
- connection to "R" (return pipe)
- and a direct "T" (tank)

The latter (T) can, however, be omitted if "R's" counter-pressure does not exceed 15 bar. In this case, "T" and "R" may be coupled.

Fitting/removal of hydraulic hoses to vehicle

Attach the hydraulic hoses to the vehicle in the following order:

1. Hydraulic hose to T-connection
2. Hydraulic hose to R-connection
3. Hydraulic hose to P-connection

Remove the hydraulic hoses from the vehicle in the following order:

1. Hydraulic hose to P-connection
2. Hydraulic hose to R-connection
3. Hydraulic hose to T-connection

The vehicle's hydraulic system must be switched off and depressurised while connecting and disconnecting hydraulic hoses.

Quick release couplings

Before coupling takes place, the quick release couplings must be thoroughly cleaned. In order to avoid damage to packings and supporting rings, quick release couplings must not be connected crookedly. Even slight damage to these parts due to bumps or sand may cause flaws to the coupling. Correct connection of the quick release couplings may be tested by tugging at the hoses. If the coupling has been made correctly, the couplings must not come loose. When machinery has been dismantled, the quick release couplings must always be protected with dust caps.

2.7 Tacho connection

Connection of speed information

Speed information may be connected to the electricity system via the computer unit on the spreader or via the distribution box placed in the vehicle's cab.

The standard setup of the electricity system receives signals from the distribution box except on road wheel models. A road wheel model receives the signal via the computer unit on the spreader. If you prefer to receive the signal at the opposite input of the standard setup, please make your choice via the EpoMaster menu.

Signal from mechanical pulse generator

When mounting mechanical pulse generator on the speedometer cable, make sure to check the rules relating to sealing of the speedometer.

If the speedometer is sealed, the pulse generator must be mounted by an authorised workshop. Epoke can refer to workshops that are authorised to carry out mounting, calibration and repairs of the speedometer.

The 3-poled canon plug from the impulse generator may be mounted via the computer unit or via the distribution box.

Leg connection in canon plug

Leg	Name	Colour
1	Gnd	Blue
2	Positive (10 - 32 V)	Brown
3	Signal	Black

Signal from speedometer

When mounting "optocoupler unit" to speedometer, make sure to check the rules concerning sealing of speedometer.

If the speedometer is sealed, connection must be carried out by an authorised workshop.

Epoke can refer to workshops that are authorised to carry out mounting, calibration and repairs of the speedometer.

The 3-poled canon plug from the "optocoupler unit" may be mounted via the computer unit or via the distribution box. For connections in canon plug, see the section "Signal from mechanical pulse generator".

The other end of the optical unit consists of 3 loose cables. Connect these cables to the vehicle's electronic speedometer.

Cable connection to the optocoupler unit (end with loose cables)

Name	Colour
Gnd	Blue
Positive (10 - 32 V)	Brown
Signal	Black

For data for optocoupler unit, see EpoMaster/Epo-Basic list of spare parts.

If the electricity system is connected directly to the speedometer without this "optocoupler unit", Epoke accepts no responsibility for burnt electricity system/speedometer.

3 Mounting and dismounting of spreader on carrier vehicle

3.1 Requirements to place of erection

The spreader must be placed on a firm, horizontal and load-carrying surface with a maximum inclination of 1.5°.

3.2 Location requirements

The spreader must be erected with adequate space around it, so that maintenance, lubrication, cleaning, etc. can be undertaken comfortably and safely. The distance between the spreader and permanent buildings must be at least 0.7 m and the distance between several spreaders must be at least 1.1 m.

3.3 Safety equipment to be used

Cotter bolts/split pins in dismounting device: Mount accompanying cotter bolts with split pins.

3.4. General requirements



Persons are not allowed in the danger area when the vehicle is driven in and out underneath the raised spreader.

If eyes have been mounted on the top edge of the tank, these eyes are only dimensioned to lift an empty spreader.

When mounting the spreader on the vehicle, make sure that the vehicle is prepared for the axle load from a fully loaded spreader. On top of the tank, the spreader is marked with a symbol which indicates the spreader's centre of gravity lengthwise when the spreader is fully loaded with spreading material in the solid matter tank and with liquid in any tanks.

The spreader is also marked with truck symbols at the bottom of the spreader's side. These symbols indicate where to place the forks when a fork-lift truck is used for lifting the spreader.



The spreader must be empty when it is lifted using a fork-lift truck.

The driver is responsible for ensuring that

- the spreader is properly fastened to the vehicle
- limits for the vehicle's axle loads are not exceeded
- load rules for the steering front axle are complied with.

When the truck is driven away from the raised spreader, make sure that:

- there is room for the truck's body under the spreader.
- there are no connections between the truck and the spreader (chains, remote control, etc.).

Place the spreader as far forward on the truck's body as possible.

SW spreader: Remember free distance to the wheel and tail lights of the truck, etc.

For short beds, use an adjustable rear stop in addition to the fixed rear stop.



The spreader may tip when using support legs.

The vehicle may tip the spreader. The work must be performed in cooperation with an assistant.

The safe distance must be complied with.

3.5. Cargo lashing of spreader

The following sections describe different methods for mounting and dismounting of the spreader on the carrier vehicle.

This section describes the lashing requirements.

At a height of approx. 0.8 m above the truck body, the spreader is equipped with lashing eyes at the front and at the rear. These eyes are dimensioned to a lift of 1 500 kg.

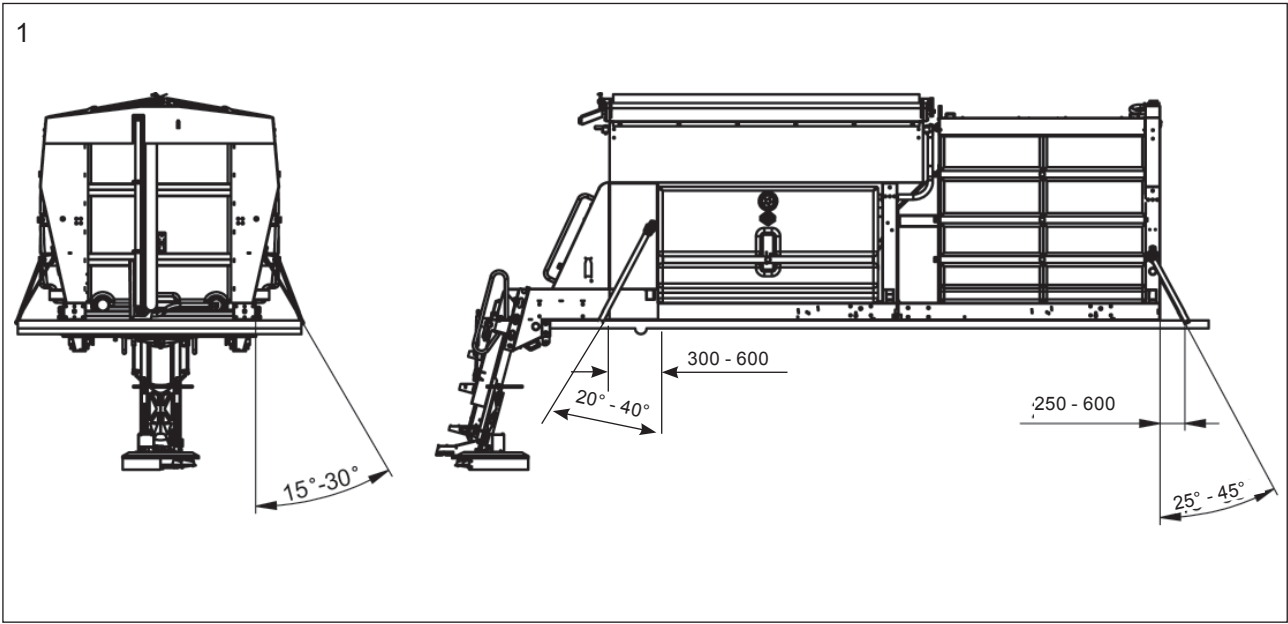
Eyes mounted on the truck body must be dimensioned to the same load.

A total of four lashings must be used. These four lashings ensure that the spreader is properly fastened. Any securing using the truck's coupling (trailer coupling) must only be considered as an extra safety measure.

According to EN 12195, the spreader must be lashed in a way that does not allow it to move in case of acceleration, braking or when driving on curvy roads.

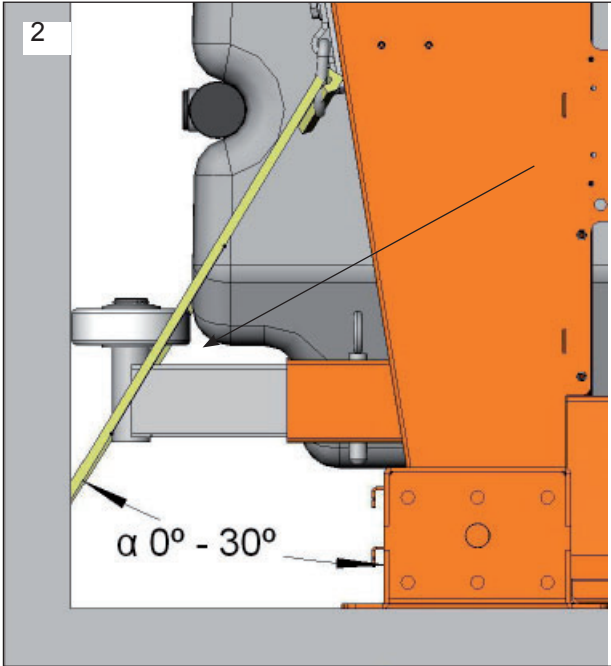
To ensure that these rules are complied with, original rubber slide bars from Epoke must be used. Mount these under the spreader and make sure that the coefficient of friction between the spreader and the truck bed is large enough.

Belts or chains used for cargo lashing must be able to sustain a pull of 1500 kg.



1. Mount the lashings as indicated in the illustration.
The angle between the cargo lashing and the vertical must be between 15° and 30°, viewed from the front. As the lashing points are positioned higher up at the back of the spreader, the angle between the cargo lashing and the vertical must be between 20° and 40°, viewed from the side. At the front, the angle must be between 25° and 45°.

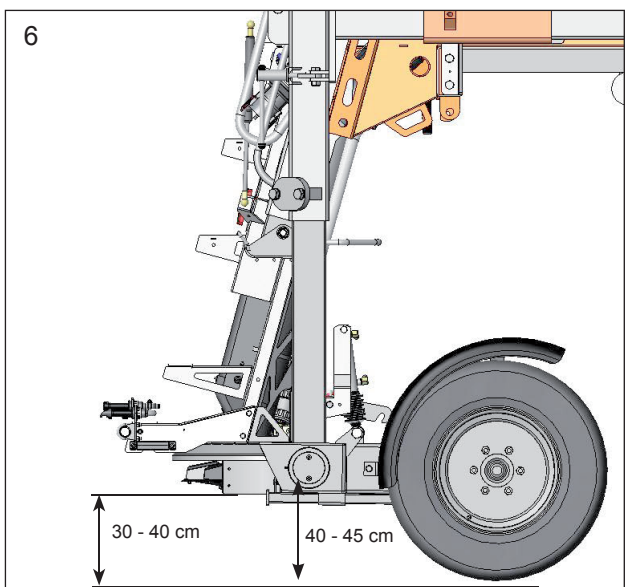
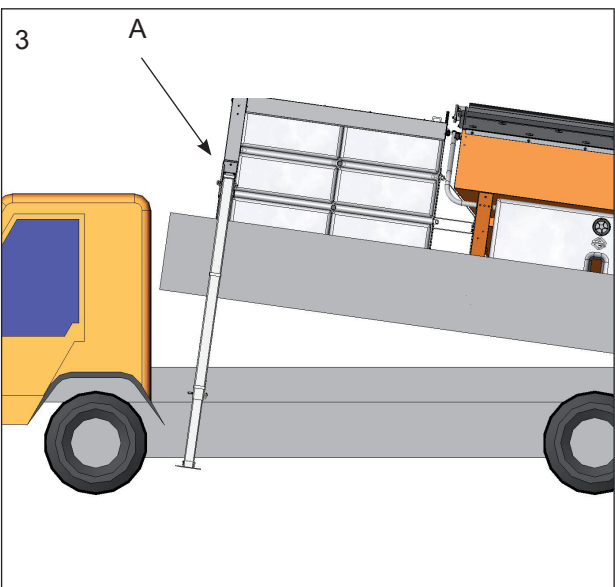
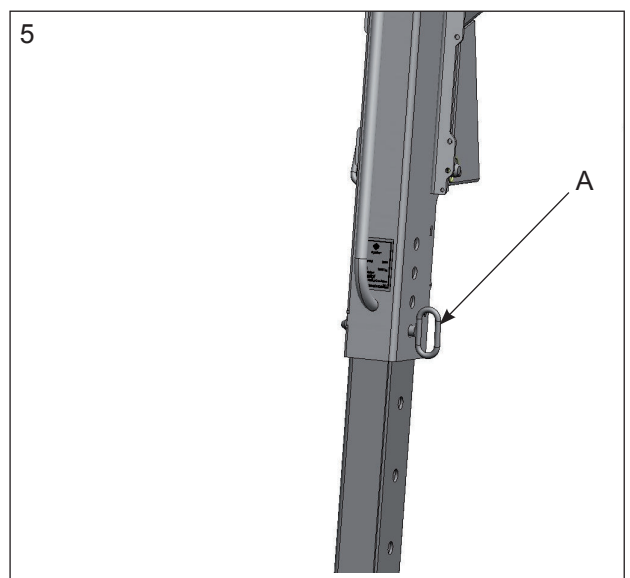
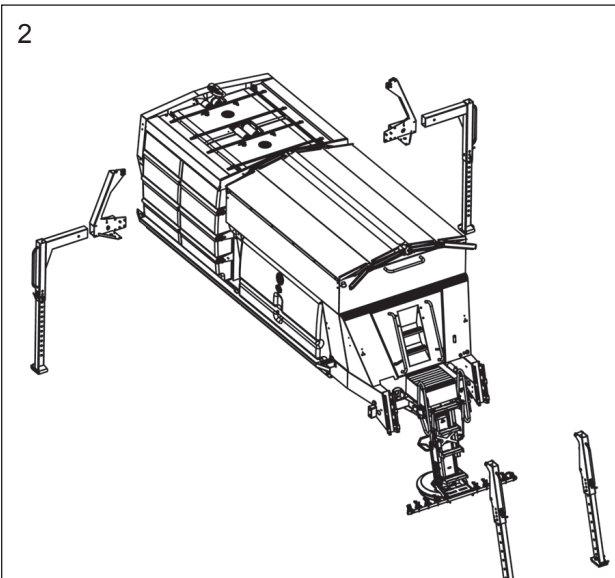
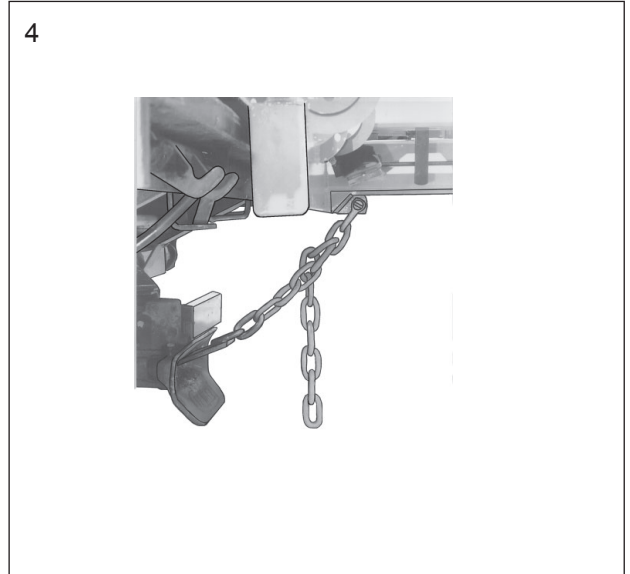
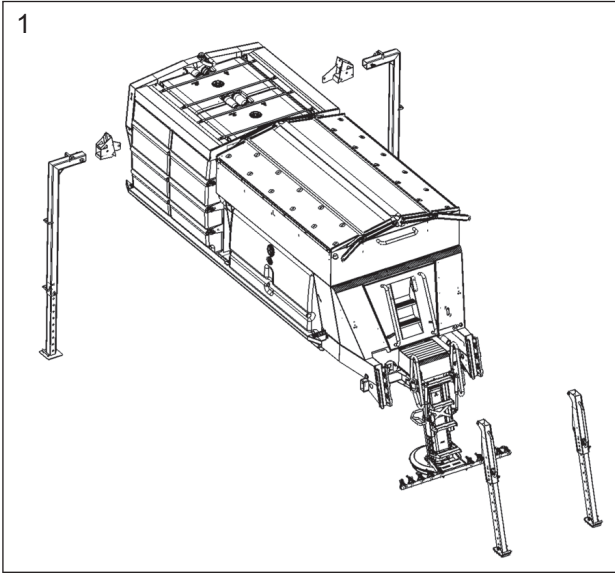
Epoke recommends that the maximum pretensioning of 1500 kg per lashing is used regardless of the size of the spreader.



2. If the sides of the truck body are to sustain the forces which appear when the truck drives at bends, it must be ensured that each of the side stanchions on the spreader are allowed to load the sides of the truck body with the following force:

Solid matter tank	Front tank, l	Load from side stanchions per side of truck body, kg
Small, 3 m ³	0	400
Small	1 x 1750	375
	1 x 2500	400
	1750 + 2500=4250	475
	2 x 2500 = 5000	500
	2 x 2500 + 1750 = 6750	575
	3 x 2500 = 7500	600
	3 x 2500 + 1750 = 9250	650
Medium	1750	475
	2500	500
	1750 + 2500 = 4250	575
	2 x 2500 = 5000	600
	2 x 2500 + 1750 = 6750	650
Large	0	500
Large, 7 m ³	0	750
Large, 9 m ³	0	925

In this case, cargo lashing may be more vertical (viewed from above) corresponding to an angle of $\alpha = 0-30^\circ$.



3.6 Mounting and dismounting of spreader with front legs - without roller

Mounting

Use the dump body of the truck to mount the spreader.

1. Truck floor height from 1.02 m to 1.8 m
2. Truck floor height from 0.7 m to 1.7 m

First, adjust the side supports to the internal sides of the truck body. The distance between the supports should be approx. 30 mm less than between the sides of the truck body. The adjustment needs only be done once to fit the particular vehicle. The sides of the spreader must be parallel with the sides of the truck.
Position the truck underneath the spreader.

3. Tip the body until the front support legs are off the ground. Remove the top pins (A) from the support leg. Use a ladder for this work. Remove the front support legs. Lower the truck bed.

4. If a chain is attached to the trailer coupling as a supplement to the cargo lashing described in section 3.5, the chain must be tightened as much as possible.

5. Remove locking pins in the rear support legs (A) and raise the legs to the top position. Secure with the locking pins.

Readjust side roll or side bar if necessary.

Fasten the spreader to the truck's chassis/bed by means of straps or the like. For this, the fixing eyes/clamping hooks on the sides of the spreader should be used.

It is often necessary to mount additional fixing points on the truck bed, see section 3.5.

6. The distance between the underside of the spreader plate and the road surface must be 30 - 40 cm when the spreader is fully loaded. Adjustments and repairs must only be carried out when the spreader has been stopped.
SW spreader: The drive wheel stand must be adjusted according to the vehicle's truck floor height.

The distance between the rotary joint and the road surface must be 40 - 45 cm when the spreader is fully loaded.

SH spreader: The hydraulic hoses are connected to the vehicle. See section 2.6.

To establish the hydraulic circuit, the hydraulic hoses on the spreader must be attached to the quick release couplings fitted to the vehicle.

Connect the remote control.

Dismounting



Permitted total load: 12 000 kg

Use the dump body of the truck to dismount the spreader. Dismounting must always be done on a flat and solid surface, see section 3.1.

Dismount cables between the spreader and the truck.

SH spreader: For dismounting of hydraulic hoses, see section 2.6.

5. Remove the locking pins in the rear support legs. Lower the legs towards the surface and secure with locking pins.

Remove straps between fixing eyes/clamping hooks and the truck's body.

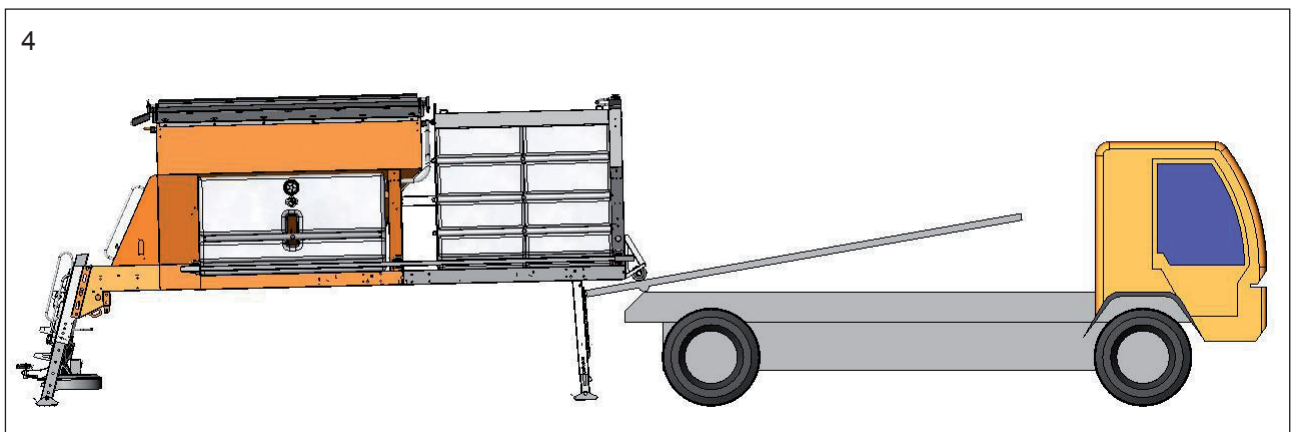
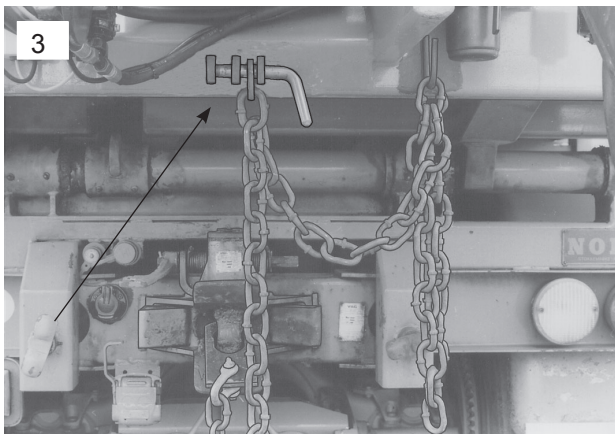
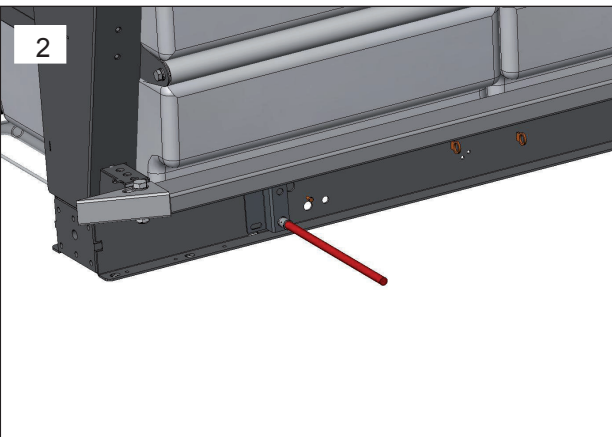
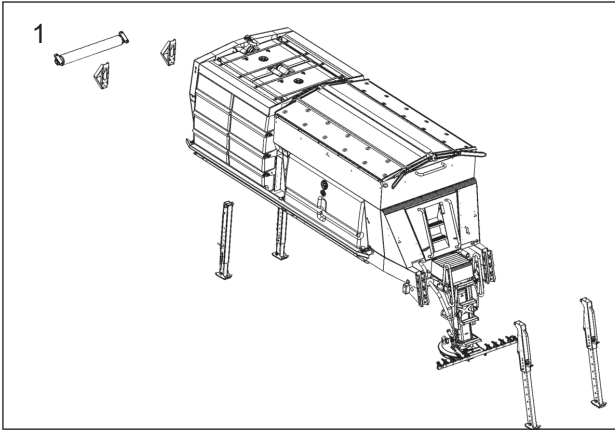
4. Loosen the chain, if any, from the truck's trailer coupling.

3. Mount the front support legs and lock them with locking pins for the spreader. Tip the truck bed.

Adjust the front legs lengthwise. Place them as close to the surface as possible and lock them with locking pins.

Lower the truck dump body.

Carefully drive the truck away from the spreader.

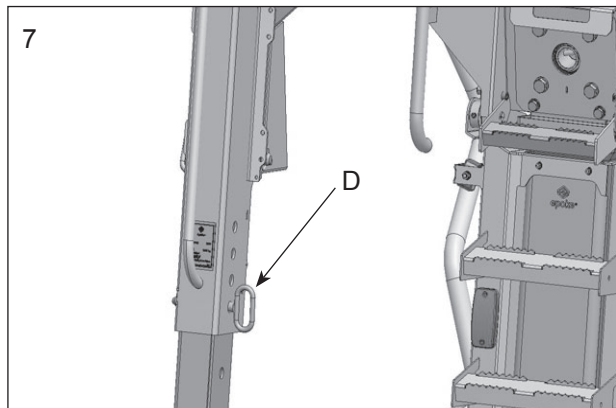
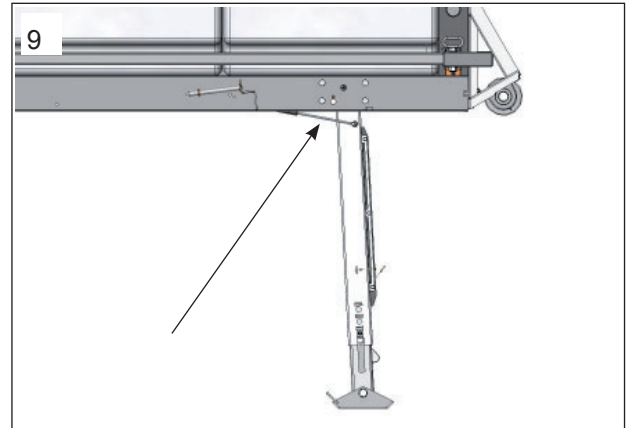
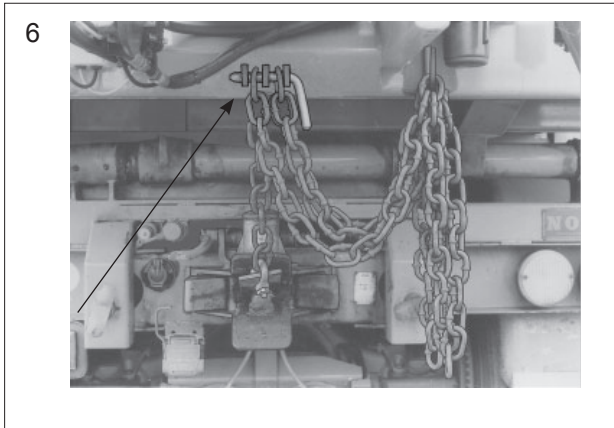
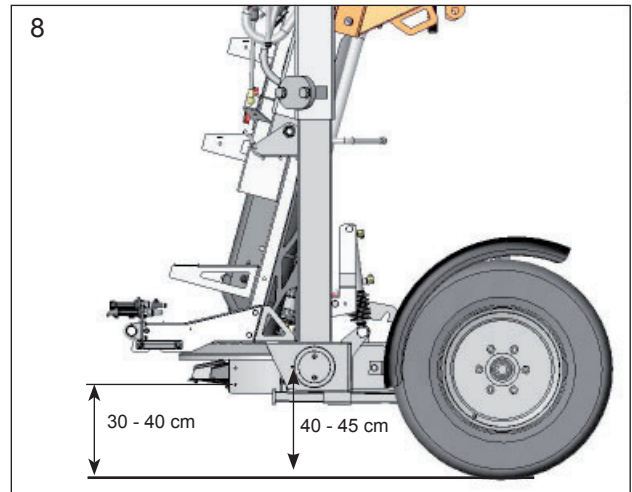
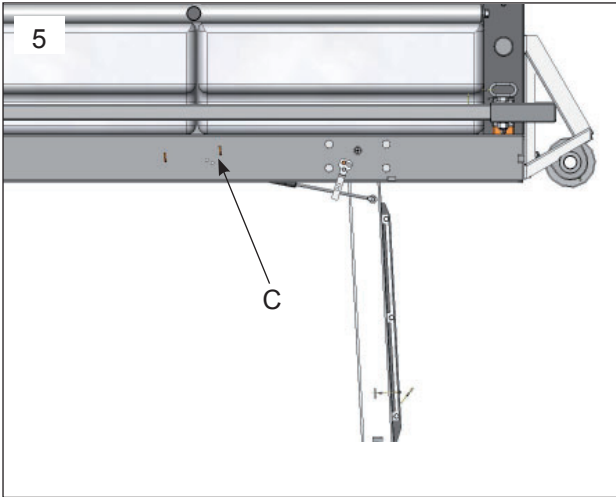


3.7. Mounting and dismounting of spreader with fixed roller using the dump body of the truck

Mounting

Truck bed height 1.04 m to 1.7 m.

- 1.** Adjust the side supports to the internal sides of the truck body. The distance between the supports should be approx. 30 mm less than between the sides of the truck body. The adjustment needs only be done once to fit the particular vehicle. The sides of the spreader must be parallel with the sides of the truck.
- 2.** The bearing plate/bearing rod must be positioned at a 90° angle to the spreader. Reverse the truck to the spreader's bearing rod. Upon impact of the rod, the front roller is in position over the truck body.
- 3.** Mount the safety chain on the truck's coupling. Tighten the chain and mount it on the fastening fittings of the spreader (first position).
- 4.** Raise the dump body to an angle of approx. 10°. If the truck is equipped with air springs, it is advantageous to use this system to ensure that the front legs of the spreader are raised above the ground.



5. Remove the locking pins from the front support legs and place the pins in the parking fittings (C). Carefully reverse the truck to the spreader's transverse rear edge. Note! Place the spreader as far forward on the truck bed as possible. For short beds, use an adjustable rear stop in addition to the fixed rear stop. Lower the dump body.

6. Tighten the chain and mount excess chain on the fastening fittings of the spreader (hook).

7. The rear legs (D) are now free and can be raised by removing the locking pins. Raise the rear legs so high that they do not interfere with the spreading pattern of the spreader plate and refasten the legs with the locking pins.

8. The distance between the underside of the spreader plate and the road surface must be 30 - 40 cm when the spreader is fully loaded. Adjustments and repairs must only be carried out when the spreader has been stopped.
SW spreader: The drive wheel stand must be adjusted according to the vehicle's truck floor height. The distance from the rotary joint to the road surface must be 40-45 cm when the spreader is fully loaded.
SH spreader: Connect the hydraulic hoses to the vehicle, see section 2.6.
Connect the remote control.



Lash the spreader as described in section 3.5.

Dismounting

Permitted total load: 17 000 kg

Use the dump body of the truck to dismount the spreader. Dismounting must always be done on a flat and solid surface, see section 3.1.

Dismount cables between the spreader and the truck.

SH spreader: see section 2.6 for dismounting of hydraulic hoses.

7. Remove the locking pins in the rear support legs. Lower the legs towards the surface and secure them with the locking pins.

6. Loosen the chain from the fastening fittings of the spreader.



The chain must not be removed completely, as it is also intended to prevent the spreader from coming off the truck bed before it has been checked that the front support legs have been lowered. If there is no chain, a belt must be used.

Remove the lashing.

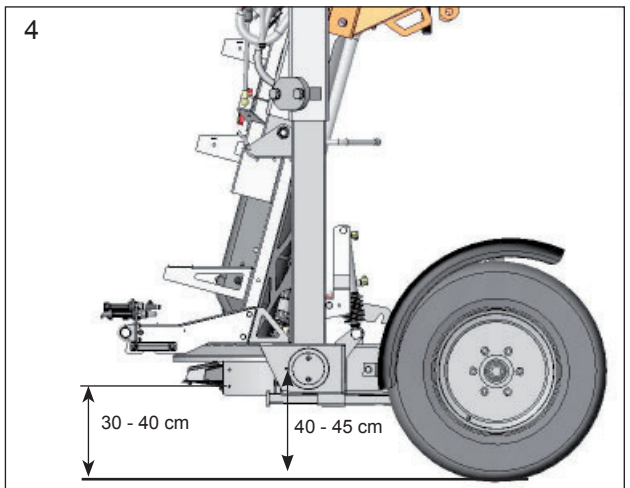
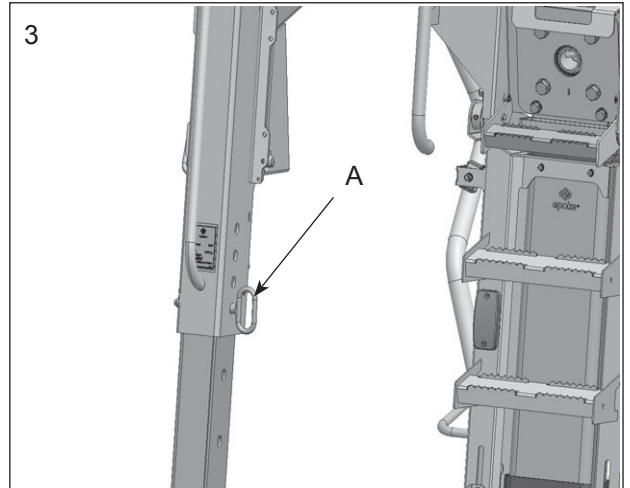
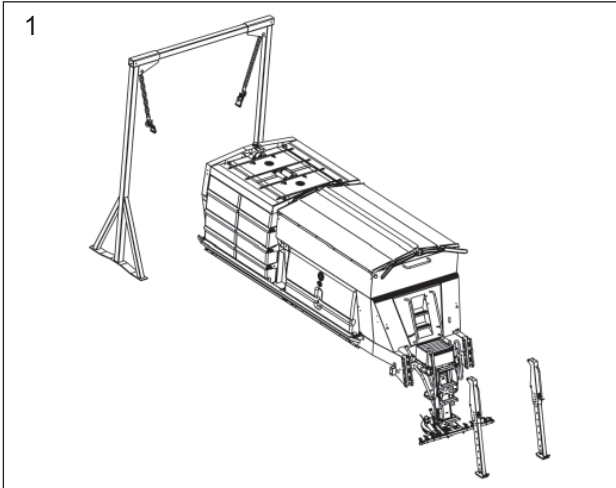
4. Raise the dump body approx. 10°.

2. Carefully drive the truck forward until the bearing plate/bearing rod turns out.

9. The front support legs must be fully tilted down. The legs are affected by gas springs and are therefore 3° above the perpendicular plane. Secure the legs with the locking pins.

3. Remove the chain.

Lower the dump body and carefully drive the truck clear of the spreader.



3.8 Mounting and dismounting of spreader using gallows and the dump body of the truck

Warning	Danger!	Hazard prevention
Warning	There is a risk that the spreader may drop from the unloading support galls.	Support the spreader using the two service frames, each with a load-bearing capacity of 15,000 kg, before starting any maintenance or cleaning work. Place the support frames under the spreader's rubber feet.
Exercise caution	Insufficient mechanical strength hazard	Follow the maintenance schedule in order to maintain the necessary strength and stability of the unloading support gallows throughout its lifetime.
	Suspension chain breakage hazard	The suspension chain must be checked by a qualified person once a year.

Mounting

Use the dump body of the truck to mount the spreader.

1. Truck floor height from 1.04 m to 1.7 m

First, adjust the side supports to the internal sides of the truck body. The distance between the supports should be approx. 30 mm less than between the sides of the truck body. This adjustment should only be done once to fit the particular vehicle. The sides of the spreader must be parallel with the sides of the truck.

Position the truck underneath the spreader until the backstop of the spreader makes contact with the truck's body.

Tip the truck bed approx. 10° to loosen the chains of the gallows.

Use a ladder and release the hooks of the chain from the spreader's centres of suspension. Lower the truck bed.

2. If a chain is attached to the trailer coupling as a supplement to the cargo lashing described in section 3.5, the chain must be tightened as much as possible.

3. Remove locking pins in the rear support legs (A) and raise the legs to the top position. Secure with the locking pins.

Readjust side roll or side bar if necessary. Fasten the spreader to the truck's chassis/bed by means of straps or the like. For this, the fixing eyes/clamping hooks on the sides of the spreader should be used.

It is often necessary to mount additional fixing points on the truck bed, see section 3.5.

4. The distance between the underside of the spreader plate and the road surface must be 30 - 40 cm when the spreader is fully loaded. Adjustments and repairs must only be carried out when the spreader has been stopped.

SW spreader: The drive wheel stand must be adjusted according to the vehicle's truck floor height. The distance from the rotary joint to the road surface must be 40 - 45 cm when the spreader is fully loaded.

SH spreader: The hydraulic hoses are connected to the vehicle. See section 2.6.

To establish the hydraulic circuit, the hydraulic hoses on the spreader must be attached to the quick release couplings fitted to the vehicle. Connect the remote control.

Dismounting



Permitted total load: 17 000 kg

Use the dump body of the truck to dismount the spreader. Dismounting must always be done on a flat and solid surface, see section 3.1.

Position the truck underneath the gallows for the chains and immediately above the spreader's centres of suspension.

Dismount the cables between the spreader and the truck.

SH spreader: The hydraulic hoses are connected to the vehicle. See section 2.6.

The vehicle's hydraulic system must be switched off and depressurised while disconnecting hydraulic hoses.

3. Remove the locking pins in the rear support legs. Lower the legs towards the surface and secure with locking pins.

Remove straps between fixing eyes/clamping hooks and the truck's body.

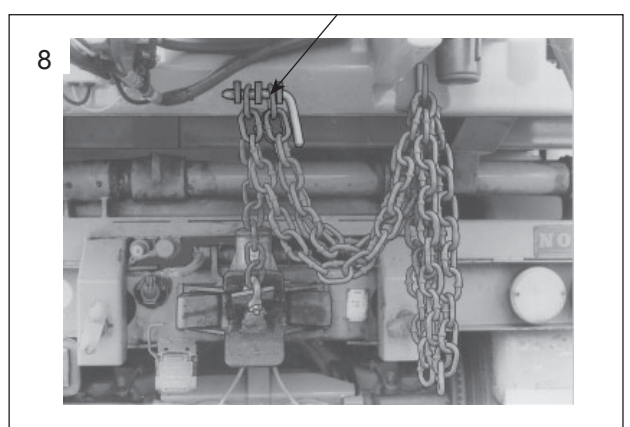
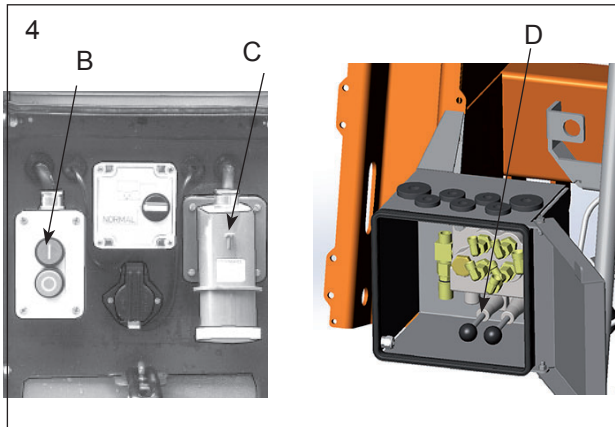
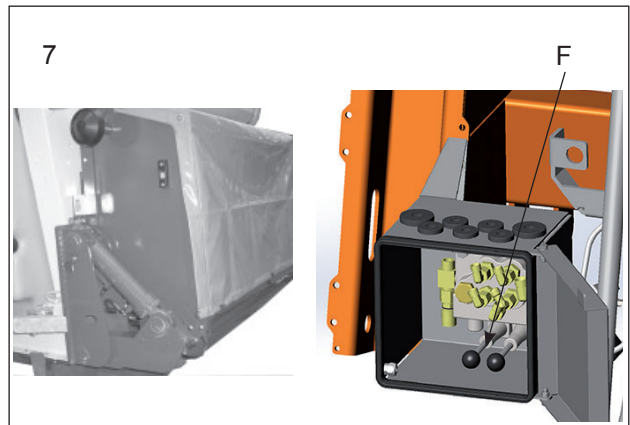
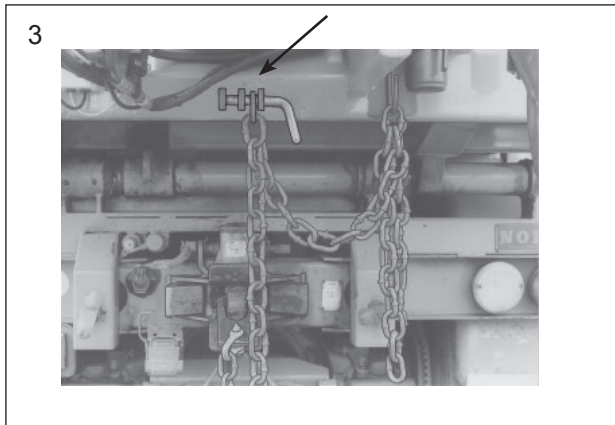
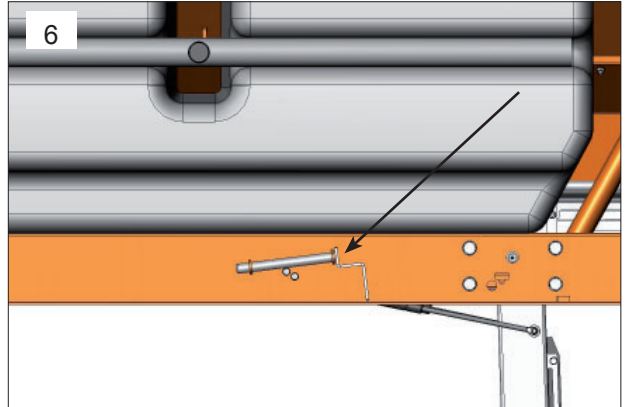
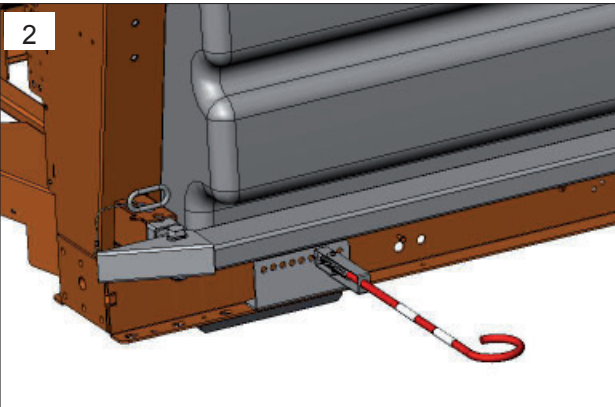
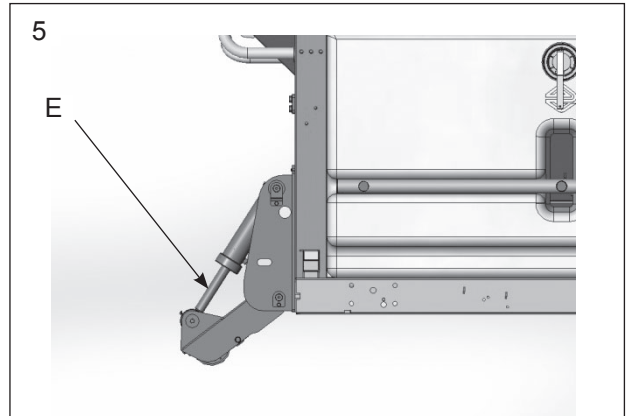
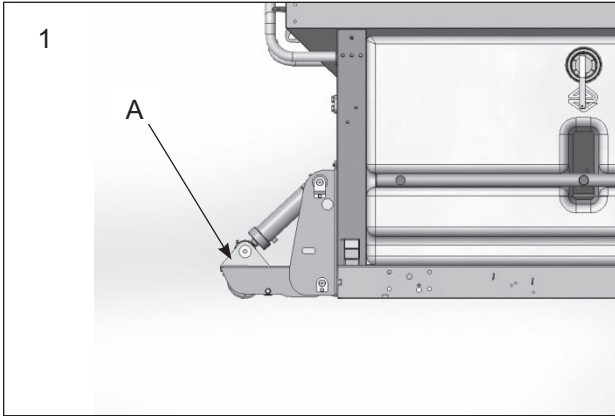
2. Loosen the safety chain, if any, from the truck's trailer coupling.

Tip the truck bed.

Use a ladder and fasten the chains of the gallows to the spreader's centres of suspension.

Lower the truck dump body.

Carefully drive the truck away from the spreader.



3.9 Loading and unloading of the spreader using moveable roller and hydraulic support legs

Loading

The system can be used for trucks with truck bed heights of 1.04–1.7 m.



When loading the spreader, do not use the dump body of the truck.

It is very important that the spreader's height above the ground exceeds the truck bed height by 5–10 cm before loading is started.

1. The hydraulic front roller (A) must be in the top position before loading.

Adjust the side supports so they are 30 mm narrower than the inside of the truck bed sides. This adjustment need only be carried out once to fit the particular vehicle. The sides of the spreader must be parallel with the sides of the truck.

2. The bearing rod must be positioned at a 90° angle from the spreader. Reverse the truck to the spreader's bearing rod. Upon impact of the rod, the front roller is in position over the truck body.

3. Fit the safety chain to the truck trailer coupling and tighten the chain and fit it in the spreader's fastening fitting (first position).

4. SW spreader: Connect power connector (C). Press start (B) to activate the electrical motor. SH/SE spreader: Start the diesel engine. Set the ball cock in the horizontal position. Lower the front roller down on to the truck bed by pulling the control valve's left handle (D).

5. Operate the roller out until the front legs are free.

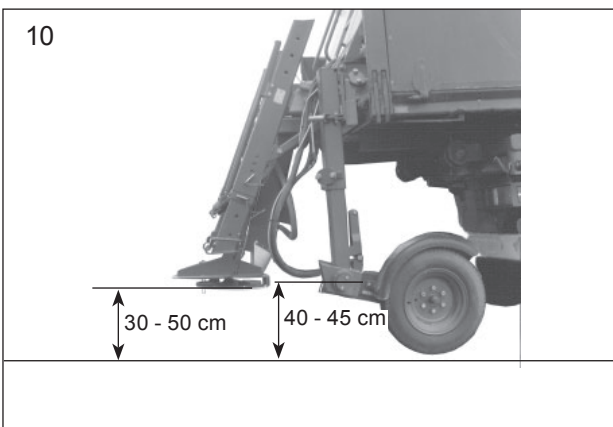
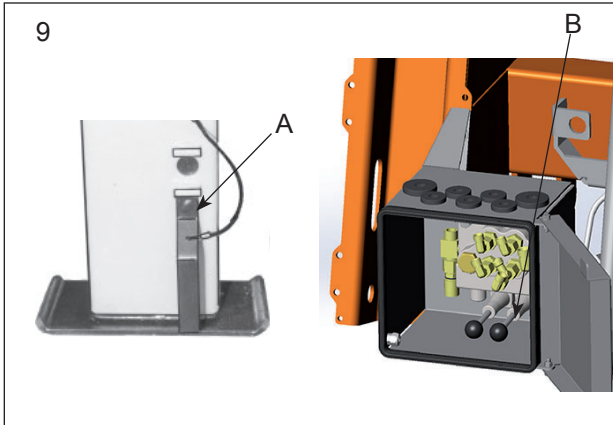
6. Remove the locking pins from the front support legs and place it in the parking hole. Carefully reverse the truck to the spreader's transverse rear stop.



Place the spreader as far forward as possible on the truck bed. With short truck beds, use an adjustable rear stop in addition to the fixed rear stop.

7. Raise the front roller up from the truck bed by lifting the control valve's left handle (F).

8. Tighten the safety chain and fit it in the fastening fittings of the spreader (second position).



9. Remove the tie bolts (A) from the rear support legs and raise the legs up to the top position by lifting the control valve's right handle (B). Re-fasten the support legs using the tie bolts.
If required, set again any side wheels or side disks.

SE spreader: Move the ball cock back to the vertical position.

Fasten the spreader to the truck's chassis/bed using straps or similar. Use the fixing eyes/clamping hooks on the sides of the spreader to do this. It is often necessary to fit additional fixing points to the truck bed.

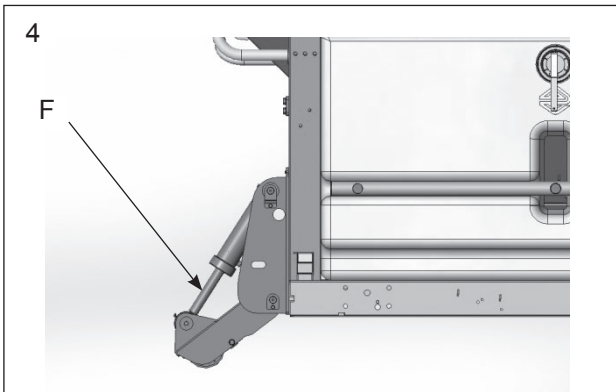
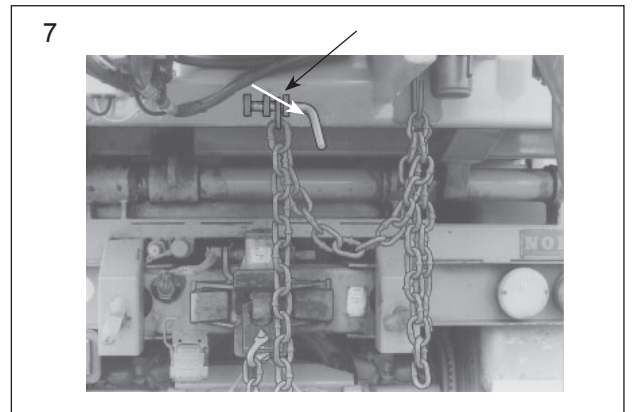
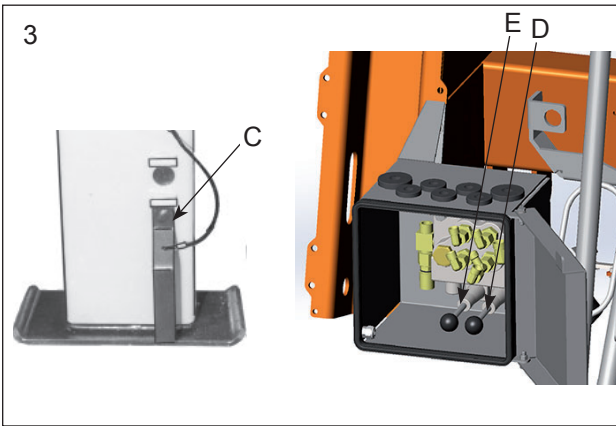
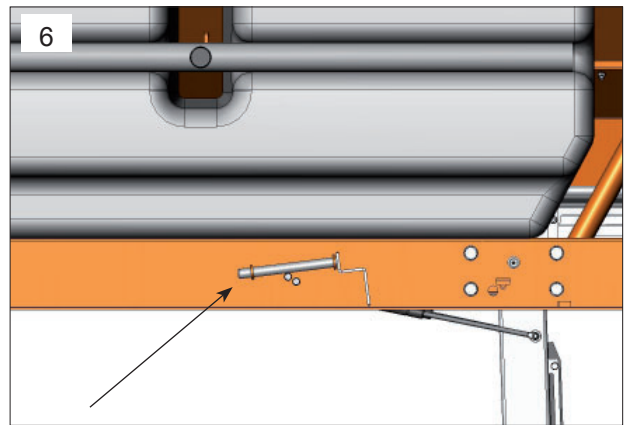
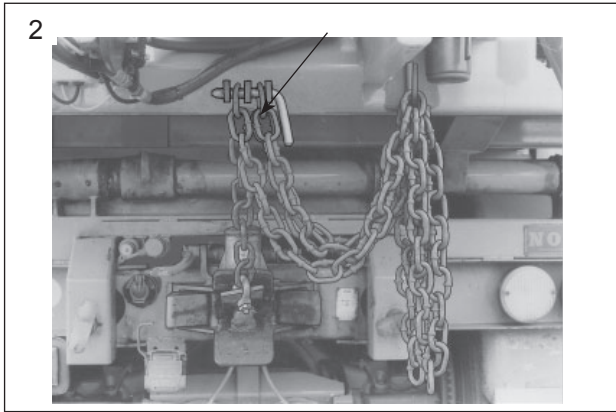
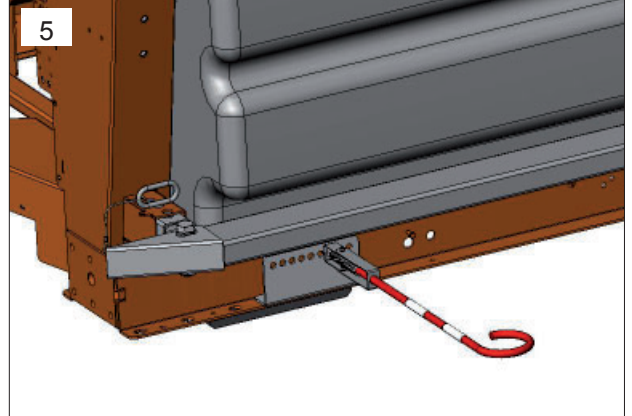
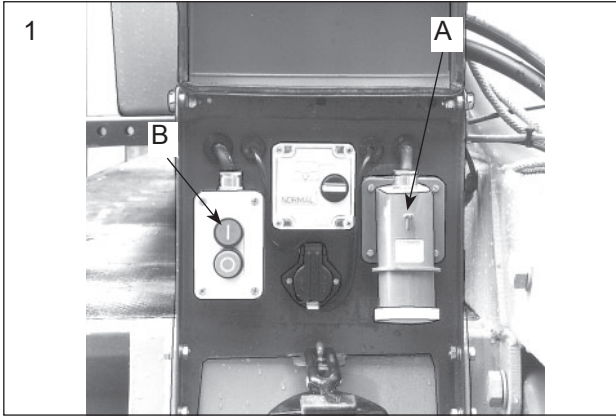
Securely lash the spreader as described in section 4.5.

10. The distance between the underside of the spreading disc and the road surface must be 30–50 cm when the spreader is fully loaded.



The spreader must always be stopped first, before carrying out any adjustments or repair work.

SW spreader: The drive wheel stand must be adjusted according to the truck bed height. The distance between the rotary joint and the road surface must be 40–45 cm when the spreader is fully loaded.



Unloading

Permitted total unloading weight:
SH/SE spreader: Max. 17000 kg



When unloading the spreader do not use the dump body of the truck. Unloading may only be carried out on a flat and solid surface.

1. SW spreader: Connect power connector (A). Press start (B) to activate the electrical motor.
SE spreader: Start the diesel engine and set the ball cock to horizontal position.
2. Loosen the safety chain from the fastening fittings of the spreader (second position). Remove the straps between the fixing eyes/clamping hooks and the truck bed.
3. Remove the tie bolts (C) from the rear support legs and lower the legs on to the surface by pushing the control valve's right handle down (D). The spreader must be raised approx. 5 cm above the truck bed.
Fasten the support legs using the tie bolts.
Lower the front roller down on to the truck bed by pushing the control valve's left handle down (E).
4. The roller must be lowered (F), so that the entire spreader is lifted free of the truck bed.
5. Carefully drive the truck forward until the bearing rod (on the left side of the spreader) turns out. Stop the truck.
6. Lock the front support legs using the locking pins. The legs are affected by gas springs and are therefore positioned approx. 3° above the perpendicular plane.
7. Release the safety chain from the spreader (first position), and loosen it from the truck's trailer coupling.

Carefully move the truck away from the spreader.

4 Instructions for use

4.0 Operating vehicle hydraulics, SH spreader

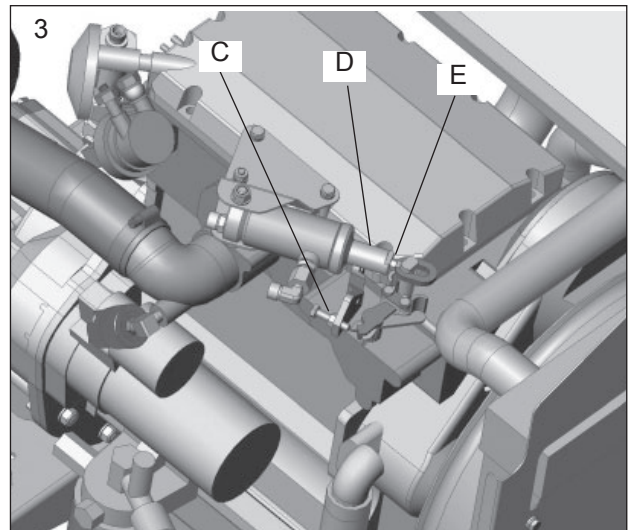
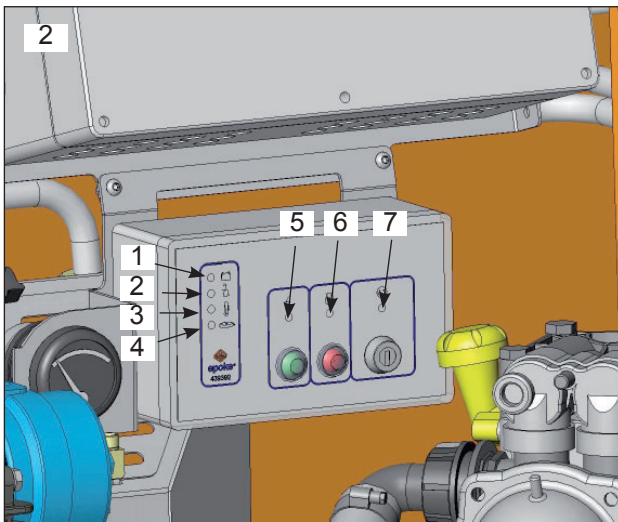
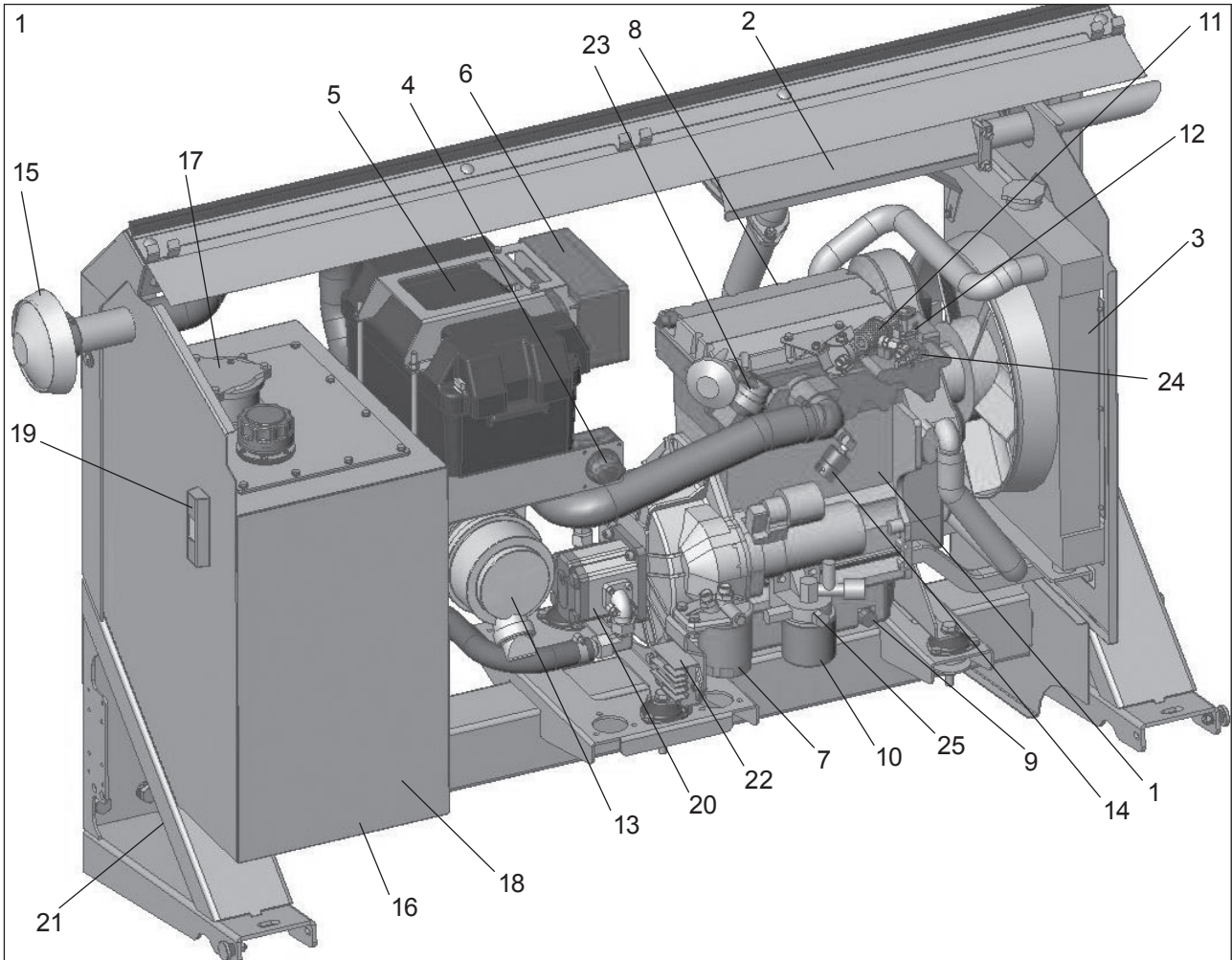
Operate the truck's hydraulic system in accordance with the instructions supplied by the manufacturer.

When the vehicle's hydraulic system is started, it is important to pay attention to the following:

- EpoMaster remote control must be switched off.
- The spreader must be mounted and the hydraulic hoses connected.

Start the vehicle's hydraulic system using the selector switch in the cab.

Note! Using the selector switch for vehicle hydraulics for starting/stopping the spreader is not permitted; this is permitted only in the case of manual starting in the event of a power failure. See sections 4.2, 4.3, manual start of spreading.



4.1 Diesel engine

General description

1. The engine is placed on the front of the spreader in a bolted frame which contains the following components:

1. Engine
2. Exhaust box
3. Cooler
4. Battery control switch
5. Battery
6. Relay box
7. Motor oil filter
8. Oil stick
9. Drainage plug for motor oil
10. Fuel filter
11. Revolution adjustment
12. Mechanical stop lever
13. Air filter
14. Air filter guard
15. Suction cap
16. Hydraulic oil tank
17. Hydraulic oil filter
18. Strainer in hydraulic oil tank
19. Sight glass for control of hydraulic oil level
20. Hydraulic pump(s)
21. Drainage nozzle for hydraulic oil
22. Charge relay
23. Fuel feed pump
24. Screws for revolution adjustment
25. Ventilation screw for fuel system

2. The engine control panel with the following control lights is located in the engine compartment:

1. Charge control lights
2. Too low motor oil pressure
3. Overheating coolant
4. Blocked air filter
5. Starter
6. Choker
7. Ignition

Fuel types

Only fill the engine with diesel oil that is suitable for operation in the temperature area in which the engine is used. Suitable fuel typically applied is winter diesel.

Unsuitable fuel (summer diesel) may excrete paraffin at low temperatures which may lead to damage to the engine's fuel injection system. The tank contains approx. 29 l.

See also the engine supplier's instruction manual.

Motor oil

Fill a suitable quantity of motor oil in the engine. Check the motor oil level at regular intervals.

1. The oil stick (8) is placed at the engine's cylinder

head. Make sure that the oil level is within the two markings at the oil stick. See also the engine supplier's instruction manual.

Coolant

Fill a coolant in the engine's cooling system which is frost protected for the temperature areas in which the engine is used. The cooling system contains approx. 5 l. See also the engine supplier's instruction manual.

Cooler

Clean the cooling surface radiators at regular intervals to prevent corrosion damage. Open the tarpaulin and clean the cooling surface radiators from the outside using a soft brush and generous amounts of clean water. Then blow the cooling surface radiators dry for example with pressure air.

When the engine is to be left unused for a longer period of time, the cooling surface radiators must be washed and sprayed with an appropriate anti-rust agent.

Servicing and repairs

Read the safety instructions in the Lombardini instruction manual, before carrying out service and repairs on the engine.

Shieldings

The engine is shielded by a detachable tarpaulin, which must only be removed in case of inspections or services/repairs. The tarpaulin must always be mounted when the engine is running and when the spreader is put aside - for example after the winter season.

Battery control switch

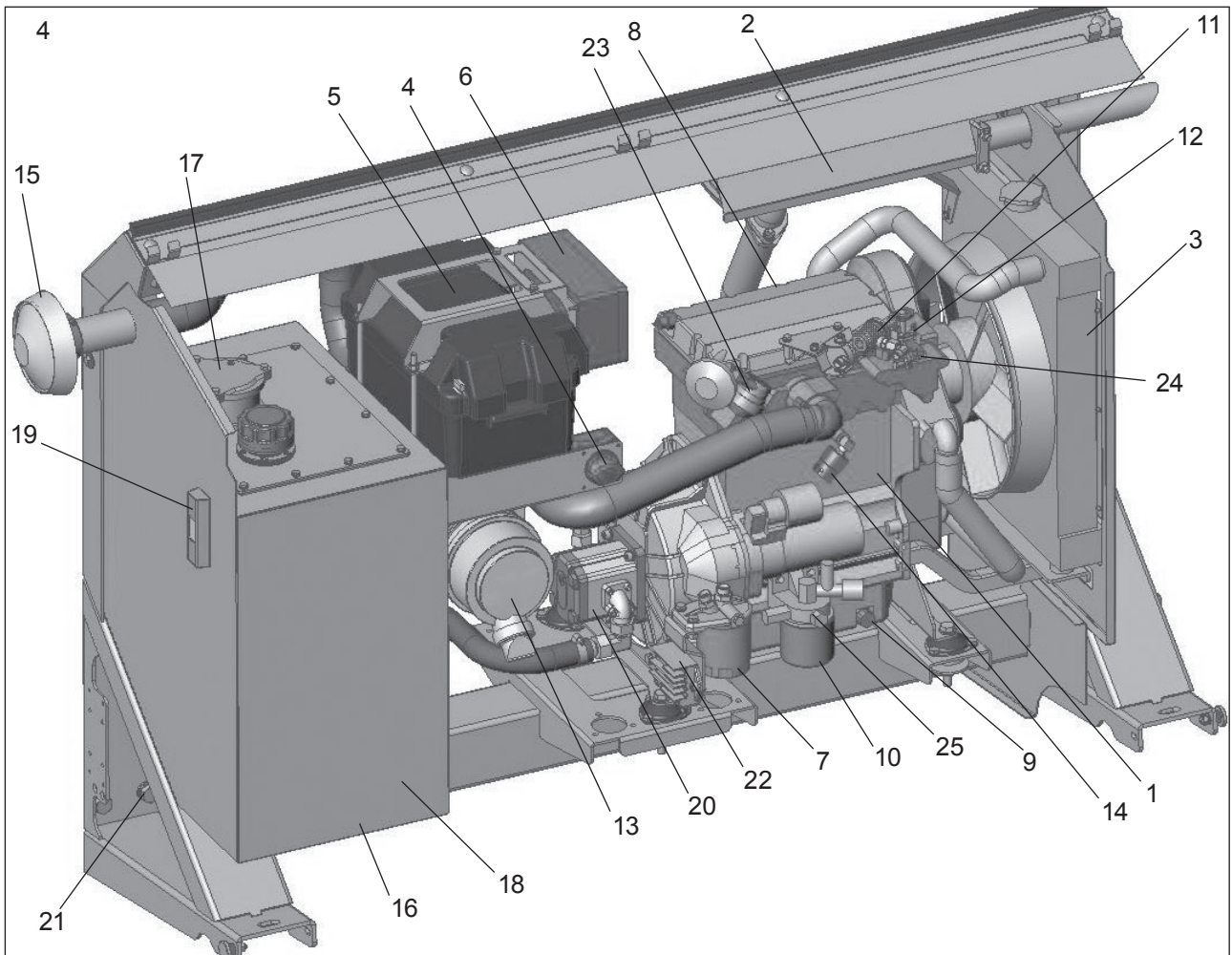
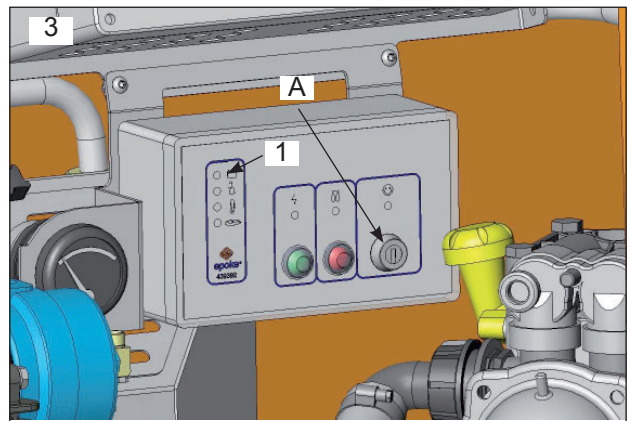
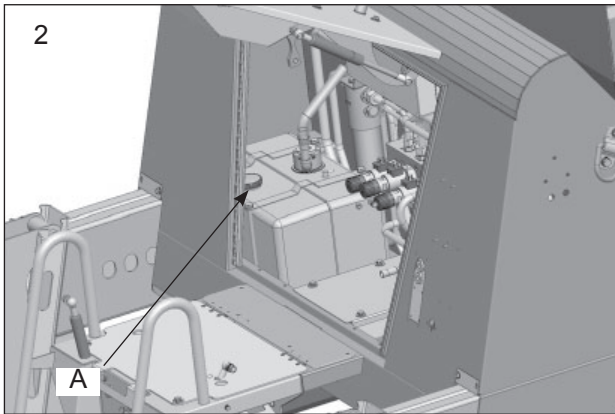
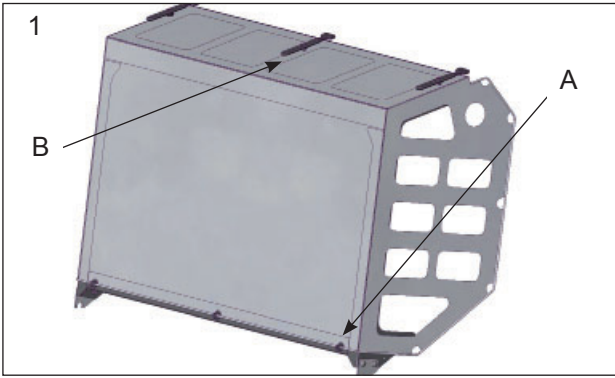
The engine unit is provided with a battery control switch (separation power switch). It interrupts the power from the battery to the diesel engine's electric system and in this way prevents the engine from starting.

In order to prevent the engine from starting without authorisation, the control handle on the control switch may be removed from the engine by clicking on the control switch and turning it counter-clockwise.

During work on the engine's electric system, the connection to the battery must be interrupted.



If components mounted on the spreader (including the engine and the engine frame) are to be welded, the connection to the battery must be disconnected. The battery control switch may not be operated when the engine is running.



Adjustment of the rotational speed

3. The rotational speed is indicated on the engine. Adjust the revolutions during which the engine is running idle by turning the screw (C); the rotational speed must be 1100 r/min.

Adjust max. revolutions by loosening the lock nut (E) and turning the piston rod on the adjustment cylinder (D). Tighten the lock nut again when the revolutions have been adjusted.

4.1.1 Access to the engine

Open the tarpaulin

1. Loosen the rubber string from the buttons (A) on the tarpaulin frame. The tarpaulin may be folded above the engine to provide access to the components. If access is required to e.g. the cooler only, the string must only be loosened in front of this component.



It is important to ensure that the rubber string has been attached to all the buttons before the spreader is used again. If this is not the case, the engine is not sufficiently protected.

Remove the tarpaulin

1. The tarpaulin may be opened or removed completely from the engine frame. Proceed as follows: Loosen the rubber string from the right and left side of the engine frame, but not from the three lower buttons (A). Then loosen the three rubber straps (B) on the top of the frame from the buttons. The frame may now be tilted away from the engine frame and lifted off.



Place the small tarpaulin part on top of the tarpaulin when the tarpaulin is to be mounted/closed again, in order to ensure that the seal remains tight. It is important to ensure that the rubber string has been attached to all the buttons before the spreader is used again. If this is not the case, the engine is not sufficiently protected.

4.1.2 Starting the engine

Fuel filling

2. For fuel types, see section 4.1.

The fuel cover is demounted by tilting the handle (A) in the middle of the lid and turning the lid counter-clockwise.

The fuel cover is mounted by turning it clockwise. The handle may then be tilted in place.



See section 2.0.3.5 on safety measures to be taken when filling fuel

Ventilation of the fuel system

3. The fuel system is not self-ventilating. If the engine has run out of fuel, the system must be ventilated. Otherwise, the engine cannot be restarted. Before ventilating the system, the fuel tank must be filled with appropriate fuel, see section 4.1. The battery control switch must be set on 1.

Turn the key on the control panel (A) in the engine compartment to 1.

4. Loosen the screw on the fuel filter (25) and activate the feed pump arm (23) several times until no air bobbles appear in the fuel.

Tighten the screw (25) again.

Turn the key on the control panel back to 0.

The fuel system has now been ventilated.

Filling and control of hydraulic oil

4. Loosen the cover on the tank. Fill the oil slowly to avoid overflow.

A sight glass for control of the hydraulic oil level is located on the tank's right side (19). When the oil is cool, it should only just be visible in the sight glass.



The oil expands when it is heated up. Avoid overfilling the tank, as this may lead to oil running out of the tank when it is heated up.

Drainage of hydraulic oil

4. At the bottom of the tank, a tap has been mounted for oil drainage (21). Open the tap with a screwdriver for even notches. The oil is collected in a suitable

container. Remember to close the tap afterwards.



The hydraulic oil is polluting and must therefore be disposed of in an environmentally friendly manner.

Changing the hydraulic oil filter

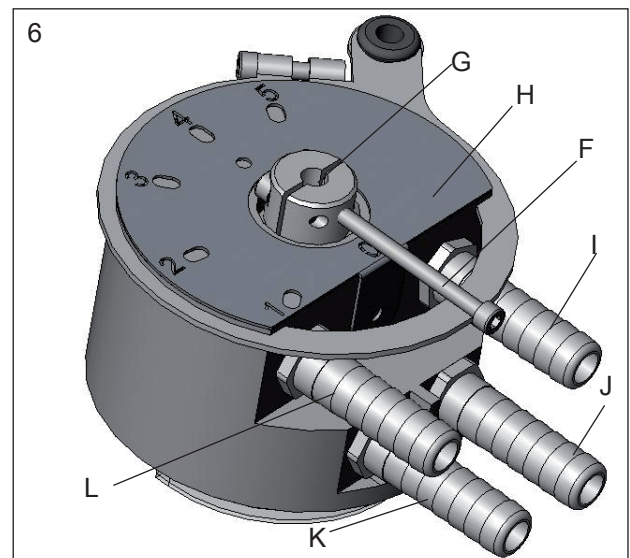
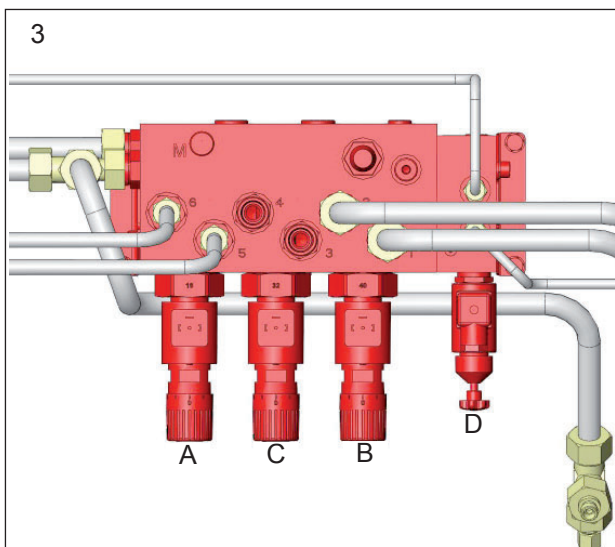
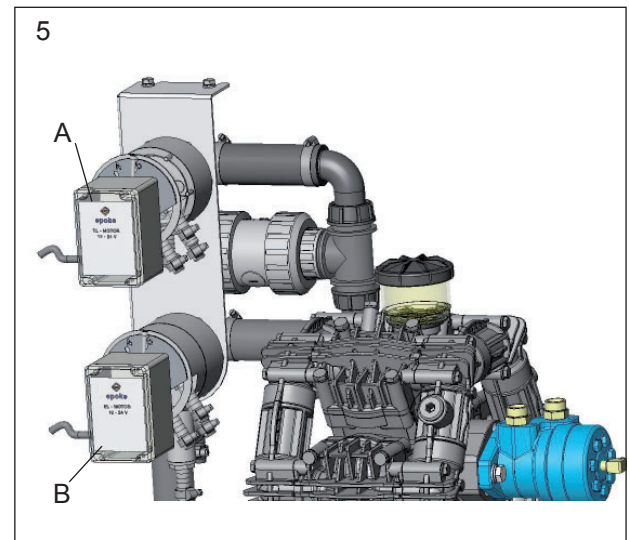
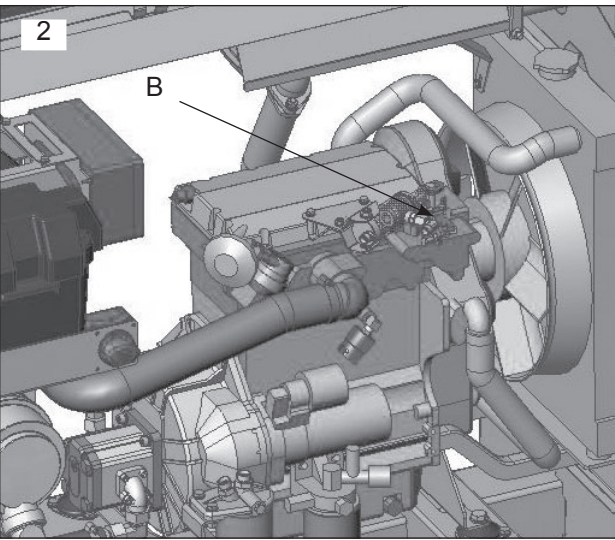
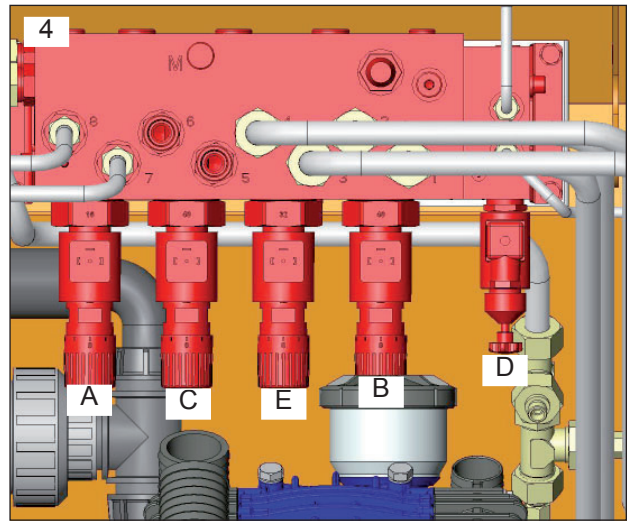
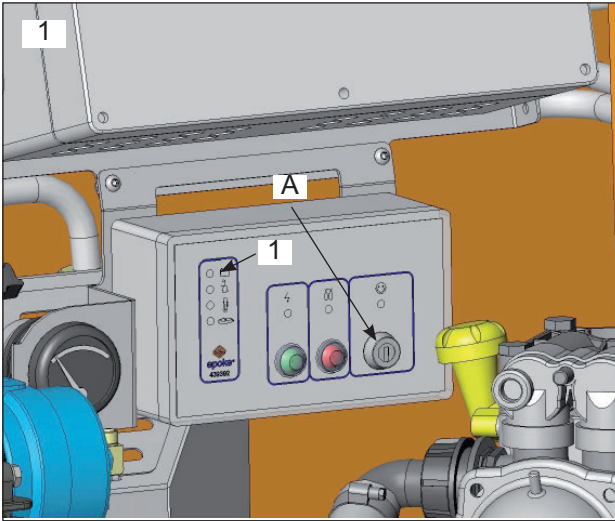
Loosen the three screws on the cover and change the filter element. Then mount the cover and tighten the screws again.

Checking the coolant

If the coolant does not cover the cooler surface radiators, the coolant should be filled until it covers them by approximately 5 mm.



The coolant system is under pressure. Do not carry out any maintenance operations before the engine has cooled down, and be careful when opening the coolant cover.



Start from the remote control (normal operation)

The battery control switch must be set on 1.
The remote control must be turned on.
Activate the preheating button and the preheating indicator lamp will light up.
Activate the start button when the preheating indicator is no longer lit.

The starter cannot be activated until the preheating has been terminated. The preheating time varies, as it depends on the temperature of the cooling water. Do not attempt to start the engine without preheating it, as this drains the battery unnecessarily.

Adjustment of the rotation speed with the remote control

Shifts between idle running and max. revolutions take place automatically when selecting start/stop spreading.

Stopping the engine with the remote control

Activate the stop button. After a short period of time, the fuel supply to the engine is interrupted and the engine stops.

Starting from the engine compartment

1. Set the battery control switch to I/ON.
Turn the key on the control panel (A) in the engine compartment to 1.
Activate the preheating button, and the preheating indicator lamp will light up.
Activate the start button when the preheating indicator is no longer lit. The starter cannot be activated until the preheating has been terminated. The preheating time varies, as it depends on the temperature of the cooling water. Do not attempt to start the engine without preheating it, as this drains the battery unnecessarily.

Stopping the engine from the engine compartment

1. Turn the key on the control panel in the engine compartment (A) to 1. After a short period of time, the fuel supply to the engine is interrupted and the engine stops.

Stopping the engine on the engine

2. A mechanical stop lever (B) which may be activated to stop the engine is located next to the engine's gas lever.



The battery control switch may not be operated when the engine is running.

4.2 Manual start of spreading in the event of a power failure

The spreader's can be started manually if a power failure renders the control panel inoperative.

3. On the S-4900, only one liquid pump (hydraulic valve C) is mounted which controls both the prewetting volume and the liquid volume. The spreading width is controlled at (A), and the solid matter volume is controlled at (B).

On some SW-4900 models, (D) lowers the drive wheel. On the SE-4900, (D) applies the throttle on the diesel engine (started before the throttle is applied).

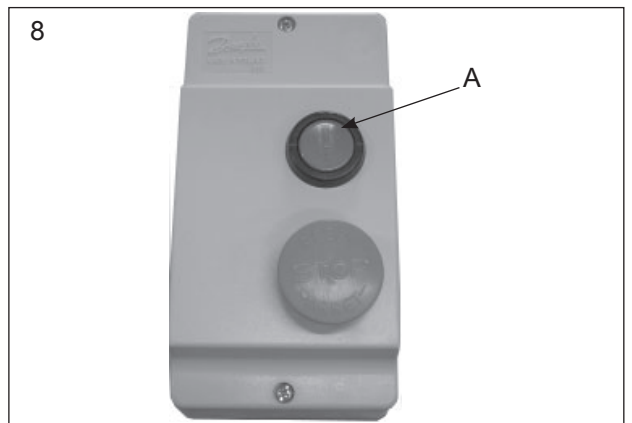
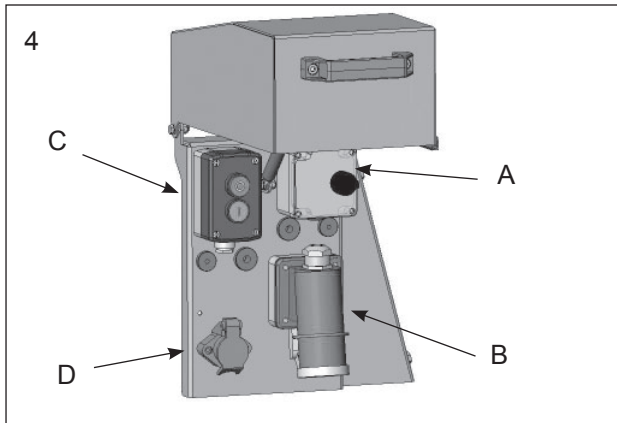
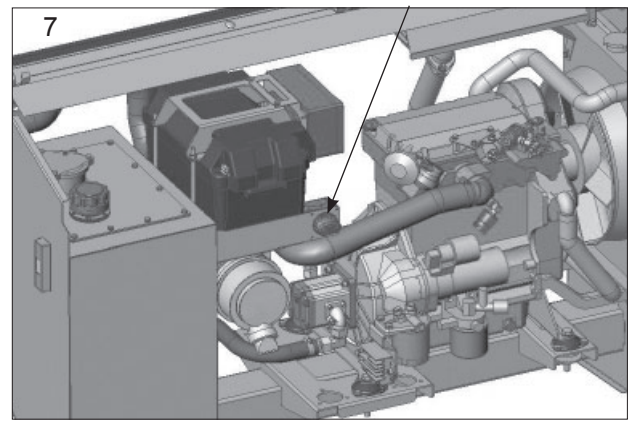
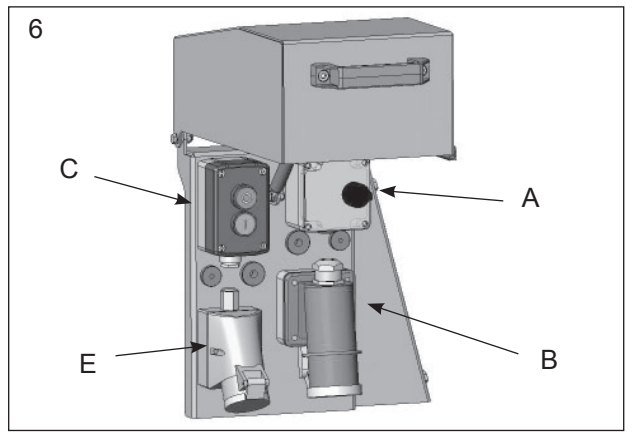
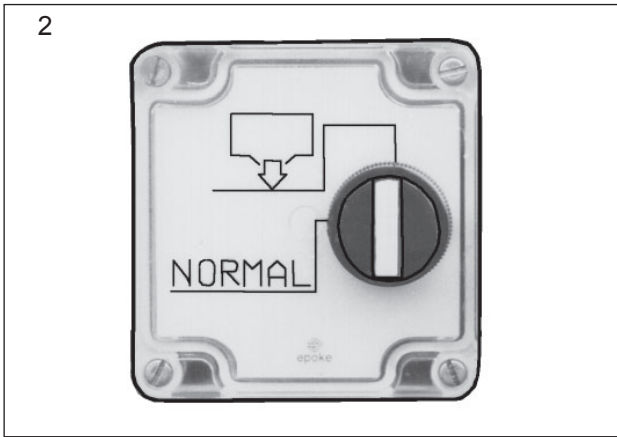
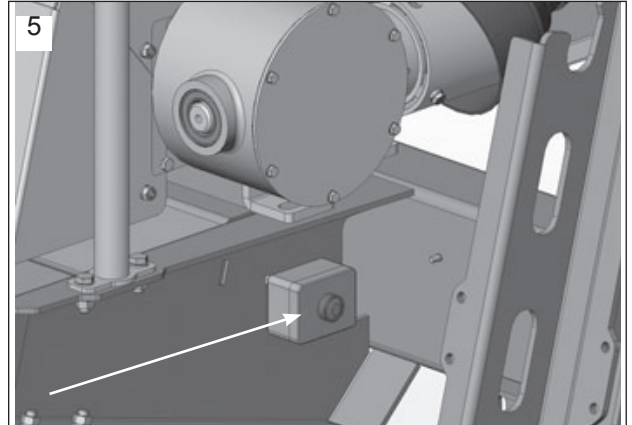
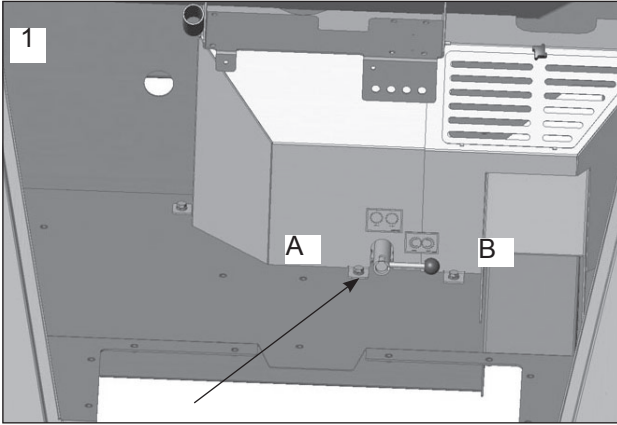
The table indicates the settings for the valves (A - spreading width), (B - spreading volume, solid matter), (C - spreading volume, liquid):

Spreading width		4 m	6 m	8 m
Hydraulic valve A for spreading width		3.8	4.5	5.5
Spreading volume, solid matter (g/m ²), valve B, 30 km/h	5	3.1	3.4	3.8
	10	3.8	4.3	4.6
	20	4.6	4.9	5.1
	30	4.9	5.2	5.5
Spreading volume, liquid (ml/m ²), valve C, 30 km/h	10	3.8	4.3	4.6
	20	4.6	4.9	5.1

4. On the S-4902 (with nozzle boom), one pump is mounted for prewetting (hydraulic valve E). Liquid spreading takes place by means of a different pump and is controlled by valve (C). The settings of valves (A), (B) and (C) are as specified in the table above.

5. On the S-4902, the spreading width for liquid is controlled by means of the two distributor valves in the engine compartment. The upper distributor valve (A) opens to allow liquid to the jet nozzles on the right-hand side of the spreader (in the direction of travel) and the lower distributor valve (B) opens to allow liquid to the jet nozzles on the left-hand side of the spreader boom.

6. On the S-4902, there is a 6 mm screw (F) screwed onto the distributor valve shaft (G). When the shaft is turned in such a way as to place the screw opposite "0" on the valve's indicator plate (H), no liquid is supplied to any of the spreading boom jet nozzles. The table below states how the spreading width is set by rotating the valve shaft. Note that the three central fan nozzles are always open. Each nozzle (both fan and jet nozzles) give a spreading width of approx. 1 metre.



Spreading width, m	Indicator plate, lower valve (valve connector)	Indicator plate, upper valve (valve connector)
3 (in the centre)	0	
With the following four settings, spreading always takes place 1.5 m to the right of centre. Figures in () indicate the quantity spread to the left of centre.		
4 (2.5)	1 (I)	0
5 (3.5)	2 (I + J)	
6 (4.5)	3 (I + J + K)	
7 (5.5)	4 (I + J + K + L)	
With the following four settings, spreading always takes place 5.5 m to the left. Figures in () indicate how much additional spreading takes place to the right of centre.		
8 (2.5)	4 (I + J + K + L)	1 (I)
9 (3.5)		2 (I + J)
10 (4.5)		3 (I + J + K)
11 (5.5)		4 (I + J + K + L)

4.3 Control handle

1. The delivery roller engagement/disengagement (accessory) has two positions:

- A: Engaged - belt and roller operate
- B: Neutral - belt operates

The auger is disengaged using the EpoMaster remote control.

2. With EpoMaster remote control: Changeover switch for emptying the spreader.
When spreading, the switch must be set to "NORMAL" and with emptying the switch must be set to the emptying symbol.

3. EpoMaster remote control: The button on the spreader's rear left side has two functions:
Press the button to start the emptying function, and the spreader runs at maximum speed. Press again to stop the spreader and the emptying.
Press for more than 3 seconds on the button to start the calibration function, where the spreader runs at low speed, so the conveyor belt shaft's revolutions can be counted. Press again to stop the spreader and the calibration.

4.

- A: Selector switch/emptying
- B: Power supply connector for electrical emptying motor (SW spreaders).
- C: Start/stop for electrical emptying motor (SW spreaders).
- D: Connector for automatic stop for liquid filling.

5. Reset of safety stop. The green button resets the safety stop of the spreader. The stop is triggered when the spreading disc arrangement is raised. When the spreading disc arrangement is moved down and the lock tightened, the safety stop resets.

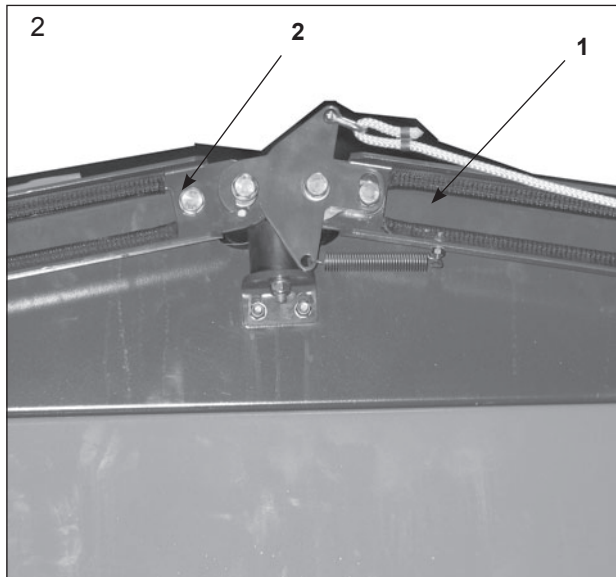
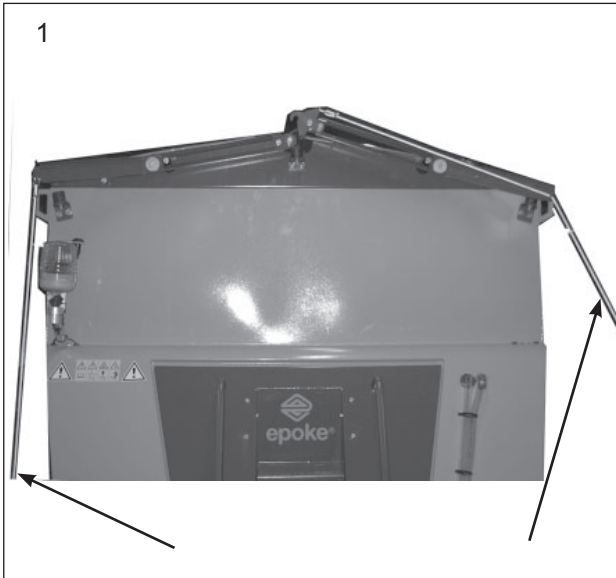
6.

- A: Changeover switch for emptying the spreader: When spreading, the switch must be set to "NORMAL" and with emptying the switch must be set to the emptying symbol.
- B: Power supply connector for electrical emptying motor (SW spreaders).
- C: Start/stop for electrical emptying motor (SW spreaders).
- E: Connector for automatic stop for liquid filling.

7. Battery control switch.

(Separation switch for power, SE spreaders). The switch is positioned on the machine's engine.

8. Fuse for protection against overloading of the electrical motor is located in the machine housing. If the motor has become too hot, it must first be cooled down before the safety can be reset by pressing the red button.



4.4 Tarpaulin

1. The tarpaulin prevents the spreading material from blowing off the spreader while driving and it prevents rain and snow from mixing with the spreading material. Open the tarpaulin using an arm system with cord drive when filling spreading material.

Unfold the two halves towards the tank sides when opening the tarpaulin. An elastic cord prevents the tarpaulin from falling down on the grates when spreading material is loaded.

The arm system is equipped with a lock which prevents the tarpaulin from blowing away while driving.

Operation - opening

2. The lock of the arm system is placed on the right arm. It is therefore necessary to open the right tarpaulin half before opening the left.

When opening the tarpaulin, give the cord a light pull to open the lock. Give the cord a hard pull to open the tarpaulin. When the arm system has reached the dead point, slacken the cord to allow the arm system to fall onto the rubber buffers.

Give the cord a hard pull to open the left part when the right half has been opened. When the arm system has reached the dead point, slacken the cord to allow the arm system to fall onto the rubber buffers.

Operation - closing

Close the left side first according to the same procedure as described above. Then close the right side. Make sure that the lock is completely locked.

Maintenance

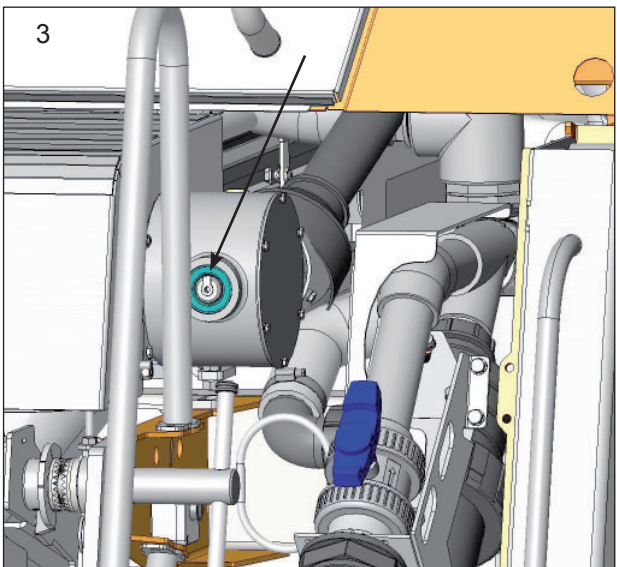
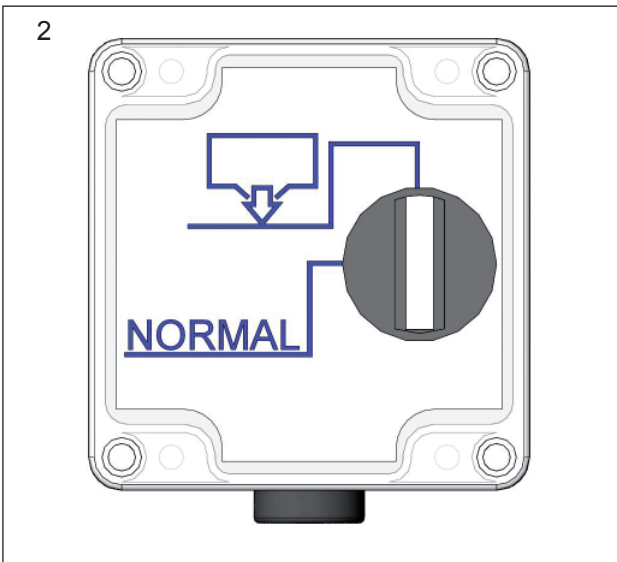
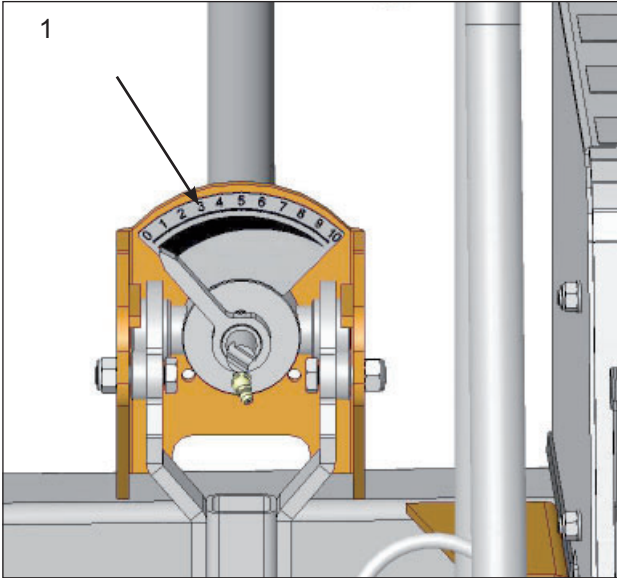
3. The lock catch must operate so smoothly that the spring is able to move it. If this is not the case, it must be cleaned until it operates smoothly again. The rollers of the arm system must be able to rotate easily and the rubber edge in the roller chute must be intact and firm.

The cords must be complete and the seals must be intact.

There must be no holes or cracks in the tarpaulins.

The rubber buffers must be fastened and intact.

Elastic cords must be intact.



4.5 Before using the spreader for the first time

4.5.1 Entering of input weight

Calibrate the spreader as described in section 4.7. Enter the input value in the remote control. The entered volume must be the volume in kg which is spread by the spreader after 10 revolutions of the gear shaft.

4.6. Adjustment of spreading volume (input)

The adjustments of the spreading volume on the remote control (factory settings):

Material	g/m ²
1	5, 7.5, 10, 12.5, 15, 17.5, 20, 25, 30, 40
2	30, 45, 60, 75, 90, 105, 120, 150, 180, 240

To obtain the correct dosage, the spreader must be calibrated. The nominal input weight per 10 gear shaft revolutions is:

1	16.2 kg +/- 3.2 kg = 13 kg/19.4 kg
2	24.3 kg +/- 4.8 kg = 19.5 kg/29.1 kg

Epoke recommends that the spreader should be calibrated at +/-20% of the nominal calibration. This will ensure optimum utilisation of the hydraulic system.

The calibration is prepared in the following way:

1. Set the spring base adjustment to pos. 3 (basic setting)
2. Set the selector switch to emptying.
Raise the spreader plate system and hold a bag or similar underneath the conveyor belt.
Set the following parameters on the remote control: 4 metres of spreading width and a dosage of 15g/m² and the spreader is started.
3. Remove the bag when the gear shaft has completed 10 revolutions (counted on the marked shaft end) and the contents should now weigh:

Material 1:	16.2 kg +/- 3.2 kg = 13 kg/19.4 kg
Material 2:	24.3 kg +/- 4.8 kg = 19.5 kg/29.1 kg

(nominal calibration)

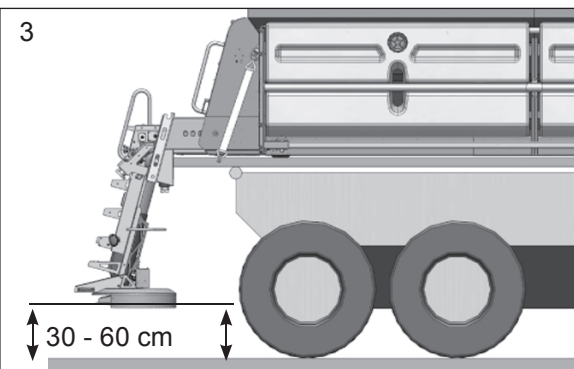
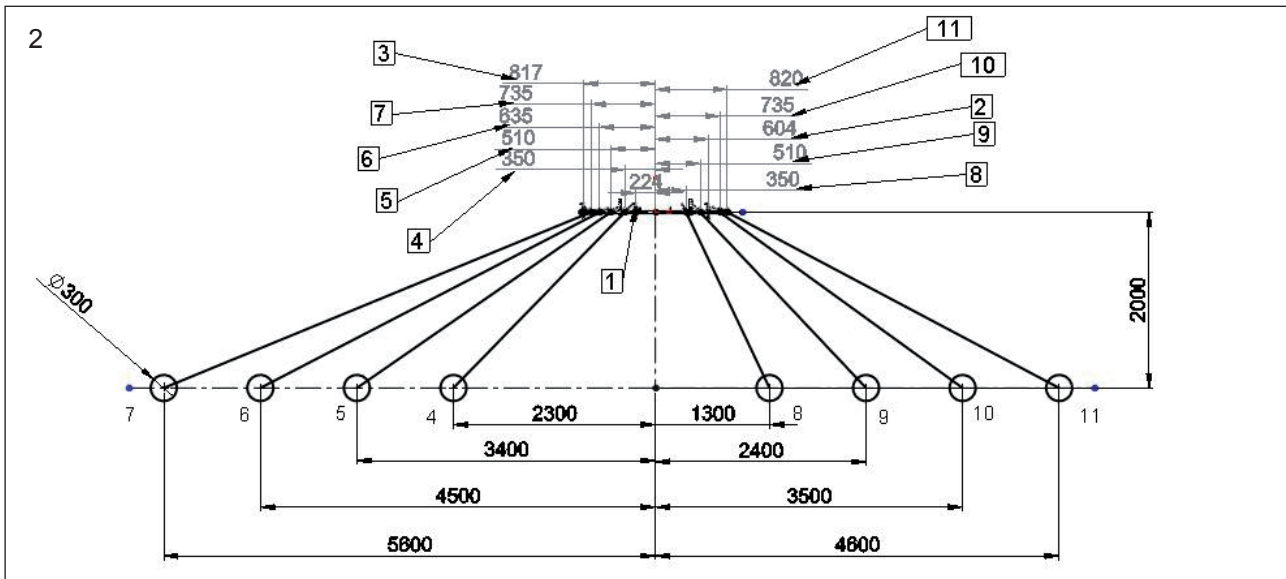
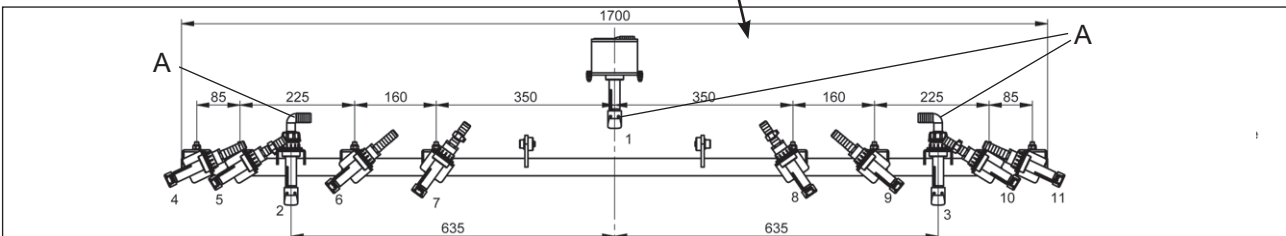
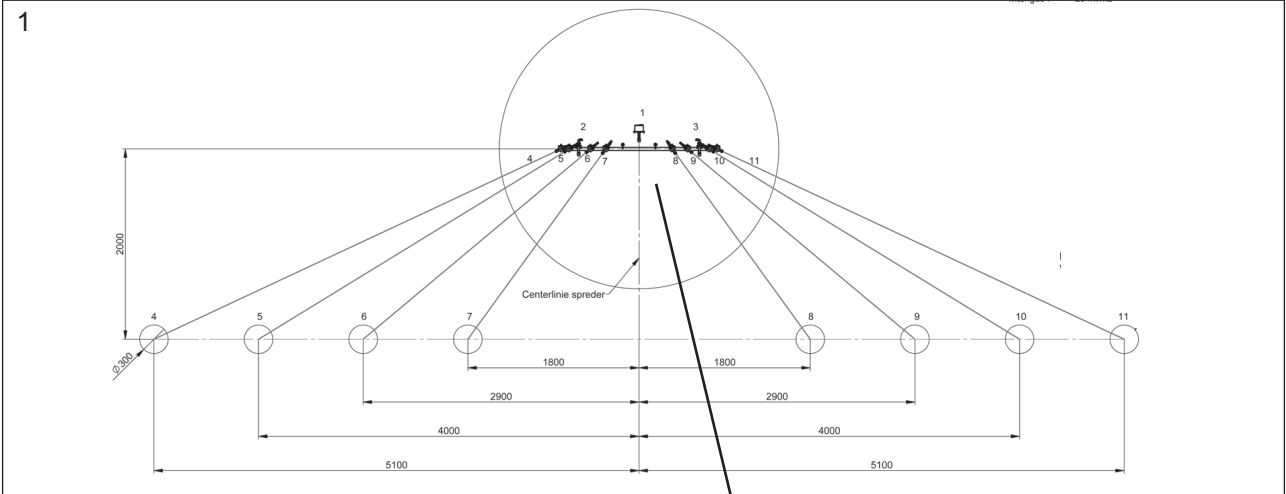
Do not start counting gear shaft/auger revolutions until the conveyor belt/auger has transported the material to the hopper and has completed 10 revolutions.

Tighten the spring base adjustment (higher numerical value on the scale) to reduce the material volume if the contents weigh too much, and start the calibration again. Remember to allow the gear shaft to rotate 10 times before performing a new measurement.

Loosen the spring base adjustment (lower value on the scale) to increase the material volume if the contents weigh too little, and start the calibration again. Remember to allow the gear shaft/auger to rotate 10 times before performing a new measurement. However, never set the spring base adjustment lower than pos. 1.

Remember to note the position number of the spring base adjustment when the correct weight is achieved. The reason is that the spring base needs to be loosened after it has been washed or stored and preferably in connection with empty transport.

Position numbers on the spring base: _____



4.7 Function and adjustment of fluid spreading

Fluid is spread by means of a spray bar fitted above the spreader plate.

There are 11 quantity-compensating nozzles fitted on the spray bar.

The inner three metres of the spray path are covered by fan nozzles, and the rest by jet nozzles. There are two options for positioning the nozzles on the spray bar:

1. The positions in which the nozzles are delivered from the factory. (A) are the three fan nozzles, and the other eight are jet nozzles.

Spreading width, m	Open nozzles	Width left, m	Width, right, m	Type
3	1 + 2 + 3	1.5	1.5	Fan
4	1 - 4	2.5		
5	1 - 5	3.5		
6	1 - 6	4.5		
7	1 - 7	5.5	2.5	Jet
8	1 - 8			
9	1 - 9			
10	1 - 10			
11	1 - 11			

2. Alternative position of nozzles

Spreading width, m	Open nozzles	Width left, m	Width, right, m	Type
3	1 + 2 + 3	2	1	Fan
4	1 - 4	3		
5	1 - 5	4		
6	1 - 6	5		
7	1 - 7	6	2	Jet
8	1 - 8			
9	1 - 9			
10	1 - 10			
11	1 - 11			

Two valves are used to control the nozzles. The supply to the three centre nozzles is always open through a manifold, corresponding to a spraying width of 3 m.

A valve controls the supply to the nozzles on the left side = 4 – 7 m spraying width, and one valve controls the supply to the nozzles on the right side = 8 – 11 m spraying width.

4.7.1 Adjustment of the nozzles for the correct spraying profile

When the nozzles are to be adjusted, the values on the remote control must be as follows:

Speed, km/hour	60
Quantity, ml/m ²	20
Spreading width, m	11

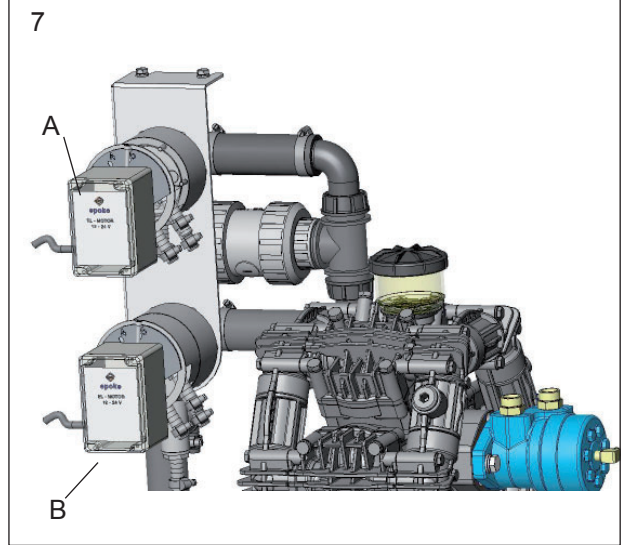
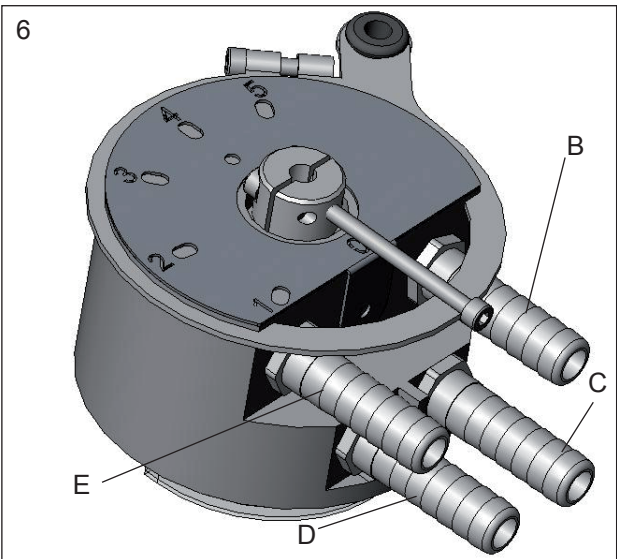
3. Place the bar approximately 600mm above the road surface, which corresponds to a spreader plate height of about 500mm.

2. Position the nozzles as shown. In a suitable place, mark the impact point for each nozzle.

Begin simulated spreading, by loosening the holder of each nozzle and adjusting the jet to land on the marked points. Then tighten the holder again.

In the alternative position, loosen the fan nozzles and turn them in their holders so that they cover 2 m to the left of the centre of the spreader and 1 m to the right of the centre. Then tighten them again.

The nozzles are now in the basic position for the optimum spraying profile.



4.7.2 Adjustment of the nozzles for optimum cross-spreading

4. In connection with the seasonal overhaul or replacement of nozzles, we recommend checking and if necessary adjusting the cross-spreading of the fluid.

It is easiest to do this by collecting the fluid from each nozzle in a container – such as a 20-litre bucket.

Set the spreader to maximum spraying width and 10 ml/m². Simulate the speed by pressing and holding down the reset button on the EpoMaster remote control. When S/S for fluid is pressed, the machine will spread the fluid.

Allow the machine to spread fluid until the buckets are about three quarters full, then press S/S again to stop spreading. Compare the quantities in the buckets. They can be weighed on scales or the contents can be measured in litres.

5. For the nozzles where the bucket contains a small amount of fluid, loosen the screw and turn the coupling on the nozzle anticlockwise to loosen it.

Conversely, tighten the coupling on the nozzle (turning clockwise) where the quantity of fluid is too great.

Then empty the buckets and repeat the test. The quantity of fluid from each nozzle is satisfactory when it is within 15% of the average value.

4.7.3 Maintenance of the nozzles

In general, the fluid filters on the spreader should be checked regularly and cleaned if necessary. The degree of impurity of the fluid strongly affects the lifetime of the nozzles: The cleaner the fluid that is spread, the longer the lifetime of the nozzles will be.

We recommend checking the nozzles after 200 hours' operation or as a minimum after every season. Inspect them visually after taking the nozzle apart (in the same way as when the coupling is loosened) and looking for visible signs of wear.

If there are signs of wear, the nozzle must be replaced. The signs of wear increase the risk that the nozzle will be blocked, or that the quantity compensation no longer functions.

If nozzles have been replaced, we recommend following the instructions for calibrating the nozzles.

After long intervals without use, or after each season, we recommend passing water mixed with antifreeze solution through the fluid pump and then out to all the nozzles.

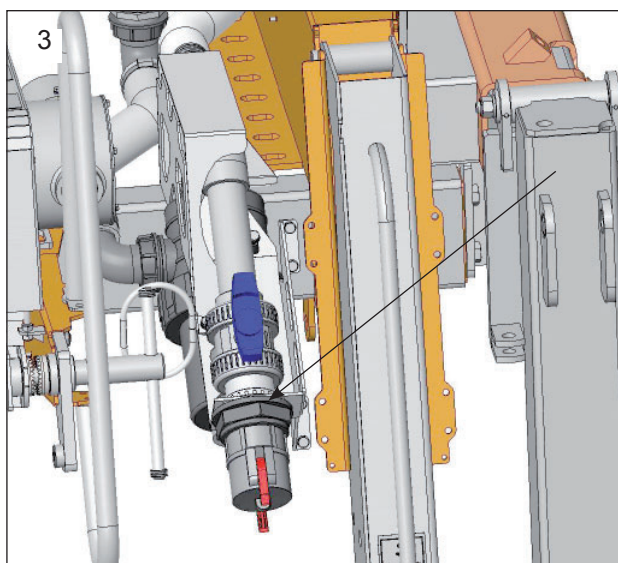
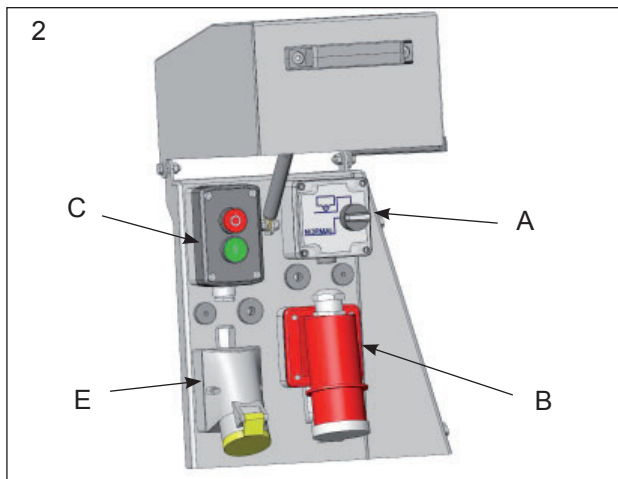
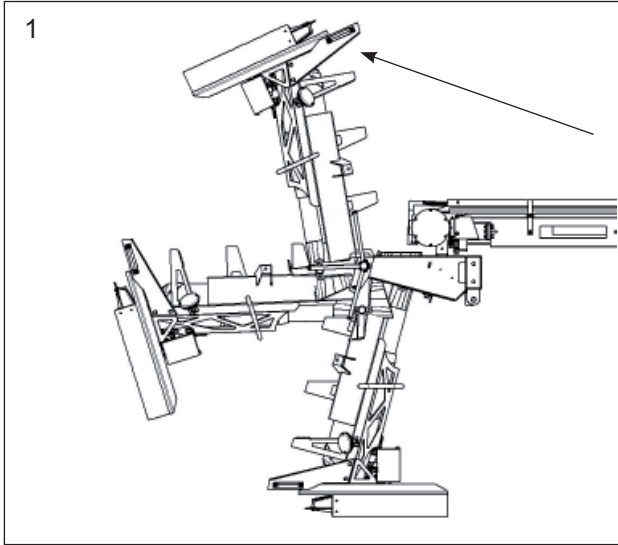
Spread this solution for a short time at maximum spraying width. This will protect the pump and nozzles from crystallisation of salt or similar minerals.

4.7.4 Calibration of the nozzles (S-4902)

6. The jet nozzles are connected with the outlet of the distributor valve:

Outlet	Jet nozzle on the spray bar (fig. 1)
B	7 + 8
C	6 + 9
D	5 + 10
E	4 + 11

7. The table shows two numbers for jet nozzles, since the upper distributor valve (A) controls the four jet nozzles to the right (looking in the driving direction) and the lower distributor valve (B) controls the four jet nozzles to the left.



4.8 Instructions for preparations

4.8.1 Mounting on the carrier vehicle

See section 3 mounting.

4.8.2 Preparing for operation

SW-spreader – operation from the spreader drive wheel.

- Adjust the drive wheel column depending on the height of the truck body of the vehicle.
- The distance from the turning joint to the road surface should be 40 - 45 cm when the spreader is loaded.

SH-spreader – operation from the hydraulic system of the truck. See section 2.6.

SE-spreader – operation from the spreader's own motor.

- Connecting the adapter /impulse generator, section 2.7.

General instructions for SW, SH and SE-spreaders
Connection of the remote control

- Vehicle system requirements: The operating voltage of the vehicle must be 10 – 32 V
- Correct installation: The electrical controls of the spreader must be connected to direct current at 10 – 32 V.
- When changing between 12 and 24 V the working lamp and rotating flashlight must also be changed to the correct type.
- Connect the electric remote control to the spreader by connecting the multipolar plug on the remote control cable to the connector socket located at the back on the right side of the spreader.

If the vehicle is not equipped with a double multipole which can connect the remote control and spreader, a rubber sealing strip can be bought (order no. 412553). The sealing strip can be fitted to the window in the right hand door of the vehicle to allow the remote control cable to pass through.

Using an attachment bracket (extra accessory) the remote control can be fixed in the driver's cabin, and where it can be positioned most conveniently for remote control.

The remote control must be protected against the weather when the spreader and the remote control are not in use.

Adjusting the spraying width
See section 6.2.1

4.8.3 Emptying

Dry matter

Use the remote control to manage emptying.

1. The spreader plate assembly must be tipped up in the transport position.

2. Set the changeover switch to emptying (A).

- The energy supply to the spreader must be activated:
SE spreader – combustion engine.
SH spreader – hydraulics from the truck.
SW spreader, if electric emptying is fitted: connect to the power supply (B), and when start (C) is pressed, the electric motor will be activated.

If the SW spreader is equipped with a hydraulic emptying system, connect the plug-in connection to the hydraulics on the truck.

- The remote control can be set for example at 12m spraying width and 20 g/m². When the start/stop button is activated, emptying will start, and the hopper will be emptied rapidly.



Always stand at the side of the spreader plate assembly when folding it up and down – never behind it.

Under no circumstances should the spreader be allowed to stand outdoors in frosty weather, loaded with damp material for spreading. We recommend cleaning the spreader after use.

Fluids

3. To empty the fluid tank, use the handle to open the filling and emptying connection at the back of the spreader, and the fluid will run back into the blending system or a similar container.

4.9 Starting

4.9.1 Spreader in operation from spreader drive wheel

For spreaders without automatic lift of the road wheel, the drive wheel is lowered towards the road surface. The spreader is now controlled using the remote control in the cab.

A low speed is recommended when the spreader is started. Too high a speed will result in an increased load on the mechanical and hydraulic parts of the spreader and also increase the wear of the tyre on the drive wheel of the spreader.

4.9.2 Spreader in operation from truck's hydraulic system

The spreader is operated using the remote control in the cab.

4.9.3 Spreader in operation from combustion engine

The engine/spreader is operated and controlled via the remote control in the cab.

Throttling/run idle is automatic when the spreading is activated with the start/stop spreading button.

Diesel engine

When starting a cold engine, the pre-heater must be activated. The choke/pre-heater is activated and a yellow lamp will light up as long as the pre-heater is connected, however max. 12 seconds. Press and hold down the start button until the engine starts.



Release the start button as soon as the engine starts.

Before storing



To ensure that the conveyor belt/auger is emptied before storing. Epoke recommends that the roller and agitator are disengaged whenever spreading has been completed.

4.10 Spreader in operation

The spreader is operated and controlled via the control panel in the truck's cab.
See remote control, section 4.

Starting the spreading process: Activate the spreading process by pressing the start/stop button. The green lamp lights up when the spreading has started.

Adjustment of spreading width: The spreading width may be adjusted while driving. The current spreading width is displayed on the remote control.

Adjustment of spreading width: The current spreading width is displayed depending on the input. The spreading volume may be adjusted while driving. Use the button for max. spreading volume at crossings, etc.

Spreading symmetry: Symmetrical or asymmetrical spreading can be changed while driving.

Deactivation of spreading:

While driving, the spreading process may be deactivated at any time by activating the "s/s" button.

Prewetting equipment:

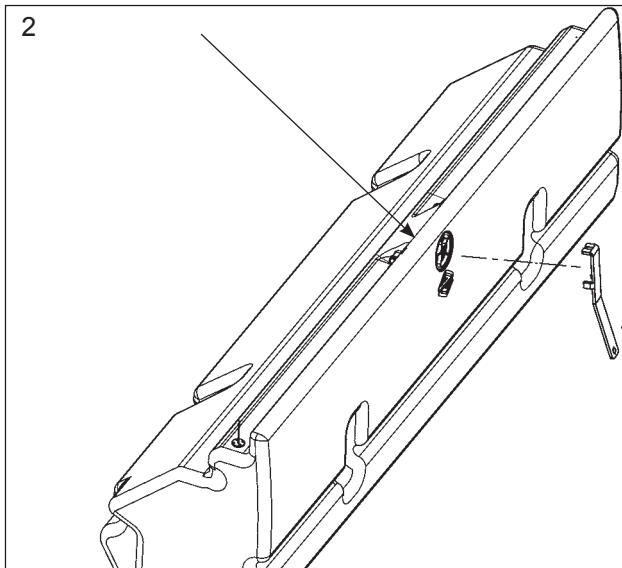
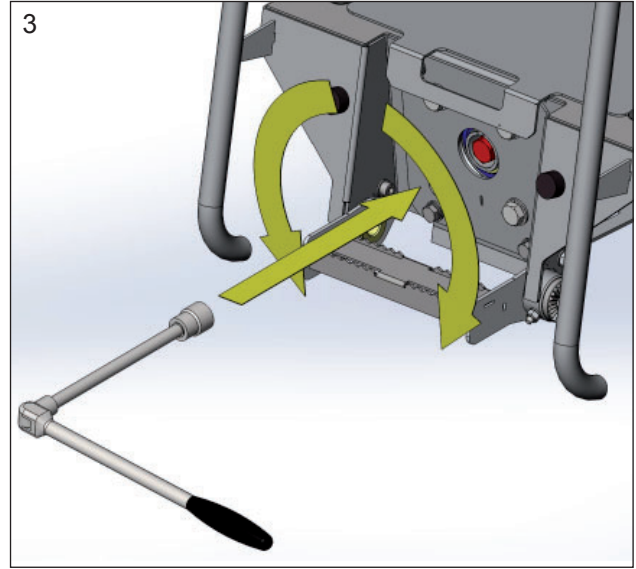
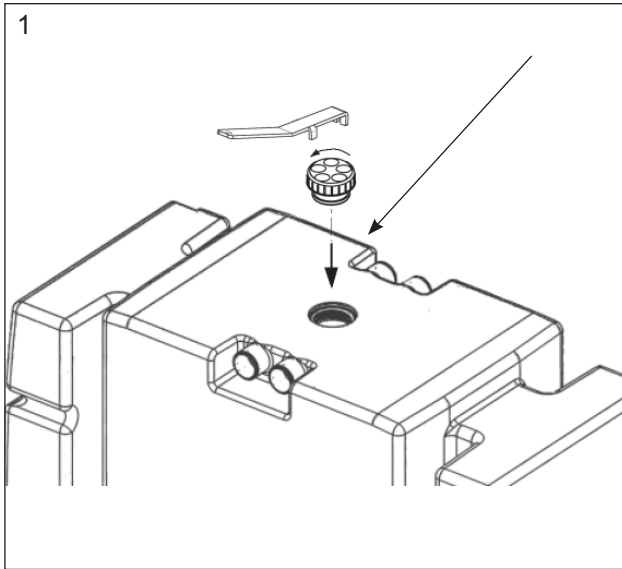
Prewetting is activated and stopped using the prewetting start/stop button. The green lamp lights up when the spreading has started.

4.11 Procedure in case of failure

Problem	Possible causes	Remedy
1. The remote control fails to operate	No power Plug not connected to distribution box Fuse blown	Connect power Connect plug Replace fuse
2. The spreader fails to start	No power on the system Error in control unit No hydraulic oil on the system The engine is not started (SE model) The hydraulics of the vehicle are not activated (SH model)	See above Check error in print (red light) Fill hydraulic oil Start engine (SE model) Activate the hydraulic system of the vehicle (SH model)
3. Diesel engine fails to start (SE model)	The engine's battery is flat The engine needs diesel oil or engine oil	Recharge battery Check the diesel oil and the engine oil
4. The spreader does not dose solid matter, prewetting or liquid	The spreader receives no speed signal Spools or valves are defective	Check wheel sensor (SW model) Check plug between distribution box and the vehicle's tachograph (SE/SH model) Check speed signal from vehicle (SH/SE model) Replace spools or valve
5. The dosage of the spreader is wrong/dosage does not change	The input weight does not correspond to the value entered in the remote control The spreader's calibration is incorrect Handle on hydraulic valve used to control volume is not secured Spool or valve defective Feedback on hydraulic motor defective Selector switch for emptying incorrectly positioned Quick release handle is not secured	Calibrate spreader (see section 4.7) Calibrate the spreader Secure the handle (see section 4.8) Replace spool or valve Replace feedback Turn selector switch back to NORMAL Lock handle
6. Spreading width cannot be changed	Handle on hydraulic valve used to control width is not secured Spool or valve defective Spreader calibration is incorrect Servo motor on selector switch is defective Engine print defective	Secure the handle Replace spool or valve Calibrate the spreader Replace servo motor Replace engine print
7. Symmetry adjustment cannot be changed (electric symmetry) Symmetry adjustment cannot be changed (hydraulic symmetry) Symmetry/width of liquid cannot be changed	Servo motor is defective Engine print is defective Spool or valve for hydraulic symmetry is defective	Replace servo motor Replace engine print Replace spool or valve

4.11 Procedure in case of failure

Problem	Possible causes	Remedy
8. Symmetry adjustment cannot be changed (electric symmetry) Symmetry/width of liquid cannot be changed	Servo motor is defective Engine print is defective	Replace servo motor Replace engine print
9. Spreader fails to change prewetting dosage, but otherwise operates normally	S/S prewetting spool or valve is defective Handle is not secured on hydraulic valve Spreader calibration is incorrect	Replace spool or valve Secure the handle Calibrate the spreader
10. Spreader fails to change liquid dosage, but otherwise operates normally	S/S liquid spool or valve is defective Handle is not secured on hydraulic valve Spreader calibration is incorrect	Replace spool or valve Secure the handle Calibrate the spreader
11. The working light fails to operate	Bulb broken Rotor lamp short-circuited Print card defective (driver)	Replace bulb Replace working light Replace print card
12. The rotor light fails to operate	Bulb broken Rotor flash short-circuited Print card defective (driver)	Replace bulb Replace rotor light Replace print card
13. The emptying fails to operate	S/S spreading is not activated No pressure in the hydraulic system	Start spreading Electric emptying: Electric motor not started Electric motor's direction of rotation incorrect Hydraulic emptying: The vehicle's hydraulic system has not been started
14. Spreader plate fails to rotate	The spreader plate system has not been lowered Safety function to stop the spreader plate in unfolded spreader plate system position has not been reset Inductive scanner that checks whether the spreader plate system has been raised fails to operate	Lower the spreader plate system Press the "Reset button" at the rear of the spreader or press "stop" followed by "start" on the remote control Check the connections to scanner/replace scanner
15. Spreading material is not supplied to the spreader plate	The tank is empty The spreading material is stuck in the spreading hopper The spreading material does not come out of the tank and onto the conveyor belt	Fill the tank with spreading material Disconnect the energy supply to the spreader and remove the spreading material from the hopper Disconnect the energy supply to the spreader. Mount the spreader. Use a rod to remove the bridge of spreading material which has been formed over the dosing drum



4.12 Removal and fitting of liquid tank cover

1. + 2.

The tank cover can be removed by one person.

Tools: A key for undoing the tank cover is available to purchase from Epoke (see the spare parts list for the order no.).

Proceed as follows:

- Check that the liquid level in the tanks is below the cover opening
- Undo the tank cover (counter-clockwise).
- When the tank cover has been undone using the key, it can be screwed out with your fingers.
- The tank cover has now been removed.

The tank cover can be fitted by one person.

Tools: The cover can be fitted with your fingers.

Proceed as follows:

- The tank cover is lubricated with tyre grease or another acid-free oil.
- The tank cover is tightened with your fingers (clockwise) - tools must not be used.
- The tank cover has now been fitted.

4.13 Emergency operation of auger

3. If the auger does not rotate, for example, because it is frozen, it can be freed using the emergency operation hexagon connection in the auger's shaft end.



The spreader's hydraulic power supply must be disconnected when working with or in the funnel and when working in the hopper.

- If the spreader is equipped with roller disengagement, then activate this.
- Use a 27 mm socket wrench with an extension to ensure that the tool can rotate without hitting the spreader.
- Turn the auger forward and back to free it.
- Once the auger is sufficiently free, remove the tool and try to start the machine.

If the auger cannot be freed, the spreading material must be removed from the auger funnel and/or from the hopper until the auger can be freed.

5 Maintenance

5.1. Cleaning and protective agents

All Epoke spreaders have been sandblasted, zinc-coated and topcoated, and are thus very well-protected against rust. Even so, the spreader should be rinsed with water, especially after the spreading of salt and if long breaks occur in the use of the spreader.

When the winter season ends, the spreader should be cleaned, protected against corrosion and lubricated, and any damage to the paint should be remedied.

Avoid using substances that can be used as solvents – e.g. acetone, turpentine, cellulose thinner, oil and the like.

Liquid system: Check the filters and clean at regular intervals depending on the purity of the water and at the end of every season.

If long breaks occur in the use of the spreader, fill the prewetting system with approx. 5 litres of water mixed with antifreeze in the tank and let the pump operate until the pump case is filled with this mixture.

Regular checks prolong the life of the spreader and guarantee safer operation.



NB! Avoid direct hosing on the electric components.

5.1.1. Maintenance	Frequency		
	Every 25 hours of operation	Every 100 hours of operation	Once a year
Handling			
Check the oil level in the hydraulic tank and change if necessary. After the first 25 hours of operation, the hydraulic filter must be replaced.	x		
Lubricate all moveable transmission parts and bearings with grease.		x	
Replace worn delivery cams. To remove the cams hit either the centre of the plastic or stainless steel rivet in the application system and then remove the cams. It may become necessary to remove the remaining part by drilling.		x	
Lubricate spring base adjustment via lubrication nipple using grease.		x	
Lubricate flange bearings at delivery roller and agitator.		x	
Agitator springs: Replace defective springs.		x	
Spring base: Replace defective springs. When the spring base is completely open, the points of the springs must lie in a line.			x
Check rubber base for wear. The rubber bases can be turned and glided on all four edges – depending on they are turned in time.		x	
Conveyor belt: Adjustment of conveyor belt. Clean any stuck material on both sides of the scraper as and when required.		x	
Hoses: Check hydraulic and liquid hoses for leakages.			x
Diesel engine: Service work must be carried out in accordance with the manufacturer's instructions and user instructions. A maintenance charger ensures that the battery stays charged during periods when the spreader is not used (e.g. during the summer season).		x	
Liquid pump: (diaphragm pump). If a diaphragm is defective, the oil in the oil glass becomes white. The correct oil level is important and it is achieved when the oil is between the maximum and minimum indicators on the oil glass when the pump has stopped. If the pump contains too much oil, the oil volume will be too high when heated and an unwanted overpressure may occur on the oil side of the pump.			x
Change of oil: Drain all oil from the pump. Fill new oil through the oil level glass at the top of the pump. This is done by turning the shaft of the pump during oil filling, to fill any air pockets with oil.			x or 500 h
When the winter season ends, the spreader should be cleaned, protected against corrosion and lubricated and any damage to the paint should be repaired. The spreader must be stored with an unloaded (completely open) spring base.			x
Replace hydraulic filters before every season and it is recommended that 2–3 litres of oil are drained from the hydraulic tank. The hydraulic oil must be replaced every other year or after max. 2,000 operating hours.			x

5.2.1 Mechanical inspection list

Machine name	Inspection list - mechanical				Date: Sign.:
	Check	Measurement and test size. Materials	Interval	Result of inspection	Action Comment
1	Conveyor belt		100 h		Visual check – may be adjusted, see section 2.2.5.
2	Cams on delivery drum		100 h		Visual check, replace worn-out cams
3	Mixer springs		100 h		Replace worn-out springs.
4	Rubber bases	14 Nm (1,4 kpm)	100 h		The rubber bases are wedged under the clamps and they may be turned and worn on all edges, provided they are turned in time.
5	Spring base		Every year		Visual check: When the spring base is open, the ends of the springs must be in line. Replace worn-out springs.
6	Wheel nuts (SW spreader)	135 Nm (13.5 kpm)	Every 6 months		Tighten using the stated torque
7	Wheel nuts (trailer)	350 Nm (35 kpm)	Every 6 months		Tighten no later than after the first tank filling.
8	Tyre pressure (SW spreaders)	1.50 bar	50 h		
9	Bolts for road wheel console (SW spreader)	200 Nm (20 kpm)	After the first drive and before every season		Tighten to 200 Nm (20 kpm)
10	Spreader plate wing		50 h		Visual check, replace worn-out wings
11	Lashing winch		50 h		Visual check
12	Spreader plate system		Before every season		Visual check
13	Gas springs with pivoting support leg and spreader plate system		Before every season		*
14	Steel chain		Before every performance		Visual check
15	Diesel engine <ul style="list-style-type: none"> • Engine oil level • Battery acid level (if possible) • Coolant 		100 h		Service work must be carried out in accordance with the manufacturer's guidance and instructions.

*The gas springs of the spreader plate suspension are a load-bearing construction element, and two springs must always be mounted. Check the gas springs and their attachments at regular intervals. Bolts and nuts must be tightened.



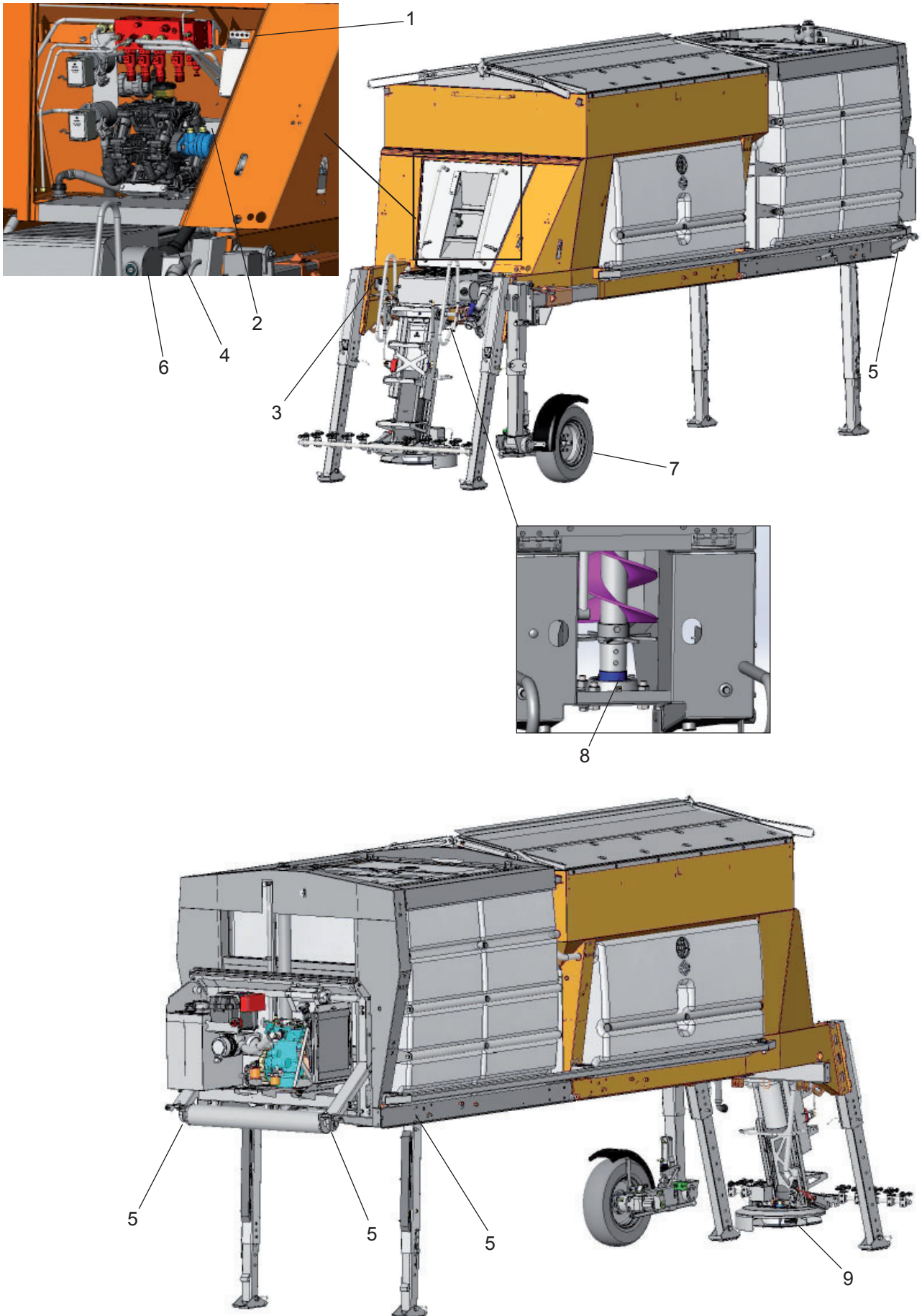
The gas springs and their attachments must contain no cracks. Replace the gas springs when their function is weakened. Only qualified service staff are allowed to replace the gas springs.

5.2.2 Hydraulic inspection list

Machine name	Inspection list - hydraulic				Date: Sign.:
	Check	Measurement and test size. Materials	Interval	Result of inspection	Action Comment
1	Hydraulic tank: Check oil level	SW: 37 litres SE: 75 litres	25 h		However, max. 2000 hours of operation. Never use oil which has been stored in a polluted container.
	Change of oil	ISO 32 (see section 5.2.4)	Every other year		
	Oil drain	2 - 3 litres	Before every season		
2	Hydraulic filter: Change of filter - first time		25 h		Filter cartridge
	Change of filter		Before every season		Or when the equipment is being repaired.
3	Hydraulic hoses: Check hoses External damage		Every year Before every season		For tightness Visual check
	Inexpedient vibrations		Before every season		
	Hose connections		Before every season		Tighten loose couplings
	Change of hose		After six years		Only replace with original hydraulic hoses from the manufacturer
4	Hydraulic cylinder: Piston rod surface level Attachment		Before every season		Visual check

5.2.3 Liquid inspection list

Machine name	Inspection list - liquid				Date: Sign.:
	Check	Measurement and test size. Materials	Interval	Result of inspection	Action Comment
1	Check and clean filter		Regularly and before every season		Depending on the purity of the water
2	Check hoses		Before every season		For tightness
3	Rinsing of liquid system Filling with antifreeze		Before every season		It is very important to rinse the liquid system with water and empty it completely. Approx. 5 litres of water mixed with antifreeze into the liquid system and let the pumps operate until the pump cases are filled with this mixture.
4	Pre-wetting or liquid pump Oil level checked Oil change Check/replacement of diaphragms Check/replacement	Engine oil 5W-40 Zeta 120: 1.2 l Zeta 140: 1.2 l Zeta 260: 2.7 l Zeta 300: 2.8 l	Before each season 500 h For each season and every 500 h 1,000 h		See section 5.1.2 The first oil change is especially important and must be carried out after 50 h. If the oil in the oil glass is white or contains water, the diaphragms must be replaced.



5.2.4 Lubrication chart

Machine name	Lubrication chart				Date: Sign.:
Reference to numbers on opposite page	Check	Measurement and test size. Materials	Interval	Result of inspection	Action Comment
1	Lubricate flanges and grease cord seal at delivery drum and mixer shaft	Grease	100 h		The grease cord seal consists of a rubber collar in which the grease cord of 2 ½ turns is squeezed between the flange bearing and the covering plate. When the flange bearing has been mounted, fill the space between the grease cord and the flange bearing with grease, which will support the sealing effect of the grease cord. Lubricate at intervals of 100 hours of operation. Replace the grease cord if grease leaks into the tank through the grease cord seal during lubrication.
2	Chain transmission: Roller chain, lubrication		100 h		Poss. clear chain spray. The chain is located beneath the screen in the engine compartment.
3	Spring base adjustment	Grease	100 h		
4	Cardan	Grease	Before every season		
5	Front roll at support system and legs	Grease	Before every season		Grease type, see section 5.2.5
6	Angular gear at conveyor belt	Grease	100 h		Lithium-based grease NLGI 00
7	Drive wheel unit (SW spreader).		50 h		Visual check
8	Flange bearing for auger	Grease	Before each season		Grease type, see section 6.8
9	O-ring at spreading disc		Annual		

5.2.5 Hydraulic oil and grease

Hydraulic oil

Spreaders with oil tank are filled with oil products from Texaco - either mineral oil or biodegradable oil.

Mineral oil:
UNO-X Rando HDZ 32.

Biodegradable oil:
Texaco Hydra 32.

The oil type is indicated on the oil tank.
Other oil products with similar specifications may be used. Different oil products must NOT be mixed.
Biodegradable oil must be a pure ester oil.

Oil for prewetting and liquid pump:
SAE 5 W 40

Lubricating grease

The spreaders are lubricated with mineral or biodegradable grease from Texaco.

Mineral grease:
Texaco Texando CX EP 2.

Biodegradable grease:
Texaco Biostar Grease LC EP 2.

These grease types are ordinary lubricating grease with a NLGI degree of 2.

Lubricating grease in the angular gear on the conveyor belt

The grease used in the angular gear on the conveyor belt is Texaco Multifak 6833 EP 00.
This type of grease is smooth-running, NLGI degree 00 and based on a lithium soap.

Use of biodegradable oil for vehicle hydraulics

Once an oil brand has been chosen it must be used at all times. The brands supplied by different oil manufacturers differ in composition and may have an adverse effect if mixed.

Note: When changing the oil, the machine should be emptied and rinsed once with biodegradable oil! The oil used to rinse the machine must not be disposed of as pure biodegradable oil.

Please note that biodegradable oil must not, despite its name, be poured directly onto the ground or into the drainage system!

6.0 Checklists
6.1.1 Steel chains

Steel chains				
Check during use				
Inspection			Tested	
Date	Sign.	Result	Date	Sign.
Repair and heat treatment of chains must only be performed by the chain manufacturer or by workshops that are authorised to carry out this work, see section 2.1.8.				

6.1.2

Container frame Check during use				
Inspection			Tested	
Date	Sign.	Result	Date	Sign.

- The container frame must have a complete overhaul at least once annually by experts and must be checked at regular intervals during use, see section 2.1.10.

6.1.3

Solid matter/liquid tank Check during use				
Inspection			Tested	
Date	Sign.	Result	Date	Sign.
<ul style="list-style-type: none"> • Visual check which includes a check for external faults, deformation, wear and corrosion attack • Attachment and location of the spreader in relation to professionally correct mounting and protection (bulk spreader). • Implementation of safety devices. • Indication of centre of gravity (bulk spreader). 				

6.1.4

Spreader plate system Check during use (visual check)				
Inspection			Tested	
Date	Sign.	Result	Date	Sign.

- Attachment and protection of equipment and suspension of spreader plate system for solid matter tank
- Handling and lift of spreader plate system from transport position to operating position.
- Device for adjustment of the spreading pattern.
- Height adjustment of spreader plate.
- Gas springs, see section 5.2.1

6.1.5

Lashing winch Check during use (visual check)				
Inspection			Tested	
Date	Sign.	Result	Date	Sign.
<ul style="list-style-type: none"> • Inspection of cargo securing equipment should be carried out once a week or more often, if necessary. The inspection should include a visual check, regular function check and maintenance work, e.g. lubrication of lock mechanisms and adjustment of the lashing tighteners. 				

6.1.6

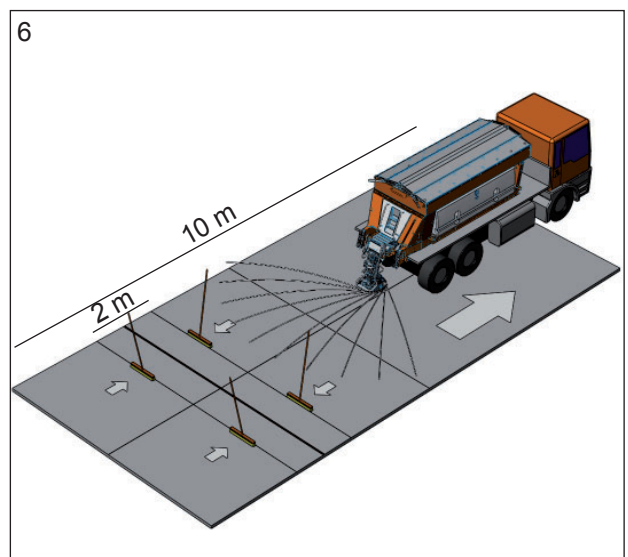
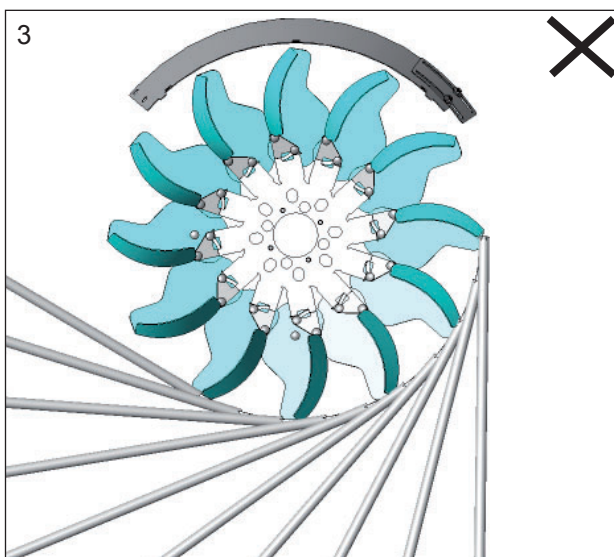
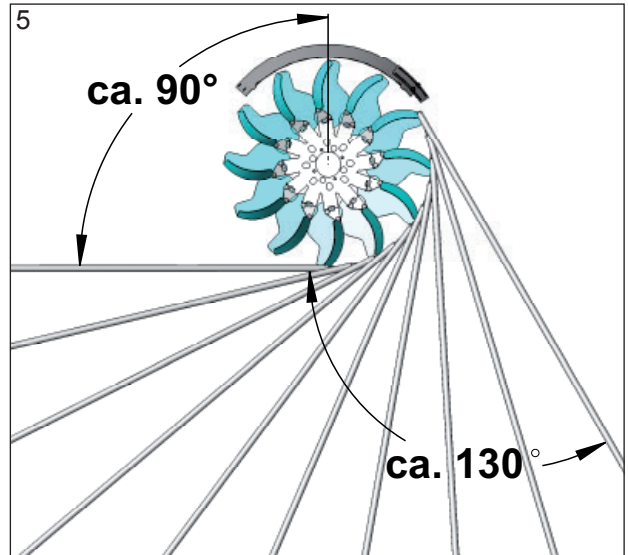
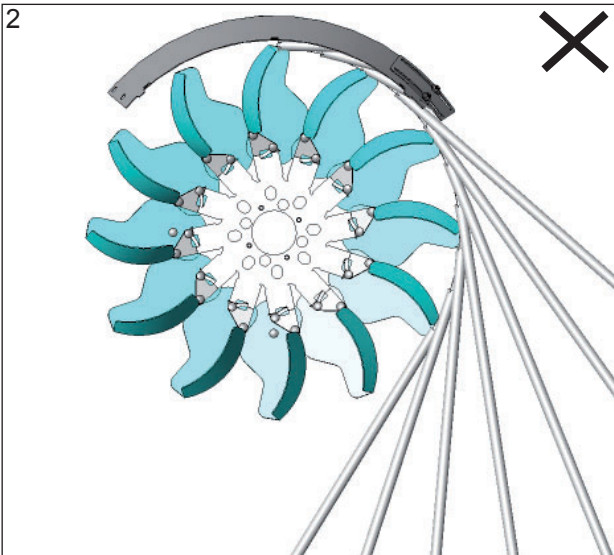
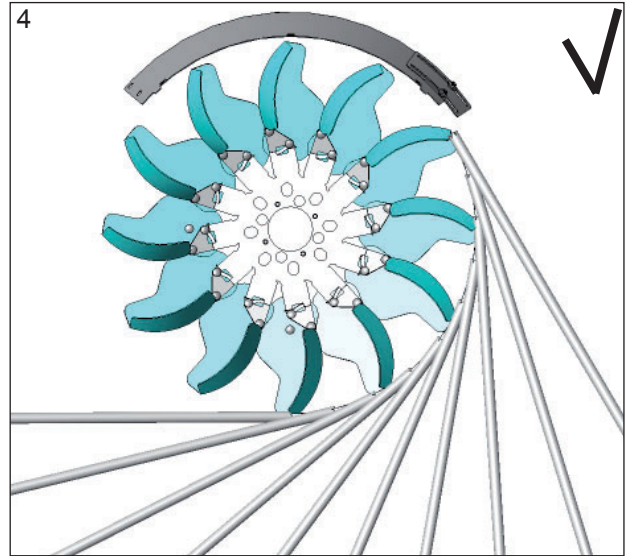
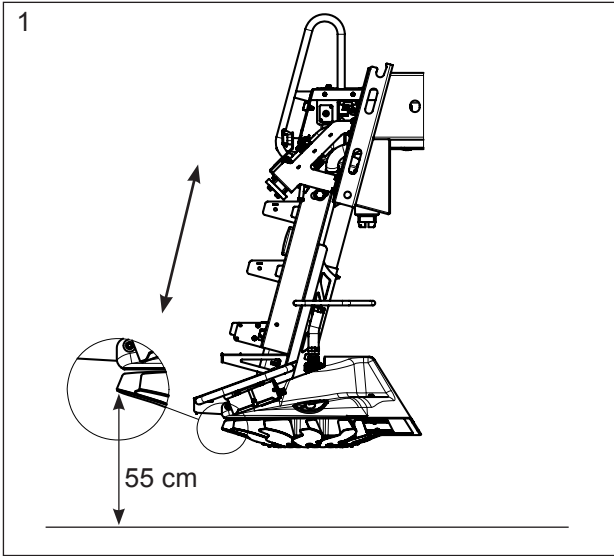
Hydraulic hoses				
Check during use (visual check)				
Inspection			Tested	
Date	Sign.	Result	Date	Sign.
<ul style="list-style-type: none"> Hydraulic hoses must be checked by experts at least once annually and must be replaced every six years. When replacing hydraulic hoses, only original Epoke hoses which tolerate the required working and breaking pressure of the machine, must be used, see section 2.1.4. 				

6.1.7

Liquid hoses Check during use (visual check)				
Inspection			Tested	
Date	Sign.	Result	Date	Sign.
<ul style="list-style-type: none"> • Liquid hoses must be checked at an interval of 100 hours of operation (visual check). • When replacing liquid hydraulic hoses, only original Epoke liquid hoses must be used, see section 2.1.5. 				

6.1.8

Dismounting setup Check during use (visual check)				
Inspection			Tested	
Date	Sign.	Result	Date	Sign.
<ul style="list-style-type: none"> Mounting holes on spreader tank for support legs Lifting device at support legs. Indication of carrying capacity of support legs. 				



6.2.1 Adjustment of spreading profile

Spreading disc with mixing chamber

Before setting the spreading profile, the following must be carried out:

- Select the material, which must be set in the remote control.
- Calibrate the machine.

Mechanical basic setting of stationary spreader

1. The distance from the spreader's wing tip and the road surface must be 550 mm when the spreader is fully loaded.

Point 2–5 is factory-set and may only be changed if the actual conditions deviate considerably from the above or if the desired result cannot be achieved.

2., 3., 4. The spreading profile's inside edge in relation to the screen - mixing chamber's position. On the EpoMaster remote control, set 4 m left + 4 m right, 20 g/m² pre-wetted, 20 km/h simulated. The spreading material's inside edge (towards roadside) must be free of the screen. If the spreading material hits the screen or is too far from the screen, then adjust the mixing chamber position. See section 8.1.4.

5. The spreading profile angle – wings' position on the spreading disc. On the remote control, set 4 m left + 4 m right, 20 g/m² pre-wetted, 20 km/h simulated. The spreading profile must have an extent of approx. 130° from the spreading material's inside edge to its outside edge. See section 8.1.5.

Visual inspection of spreading profile on operating spreaders

6. Basic setting must be carried out. To achieve a visible spreading track, deposit the spreading material at low speed (approx. 10 km/h) for an approx. length of 10 m. It will be advantageous if the middle, right and left side of the spreading field is marked out.

On the remote control, set 4 m left + 4 m right, 20 g/m² pre-wetted, 20 km/h simulated. Alternatively, select settings that are typical for the spreader's operating range.

In the deposited material width, brush together 2 m of the deposited spreading material on a line that is perpendicular to the road.

Together with the actual achieved spreading width, also inspect the transverse distribution of the spreading profile's right/left position on the road.

If the expected spreading profile has not been achieved, change the following four parameters in the remote control for the applicable material:

- Width gain, pre-wetted
- Width gain, dry
- Symmetry offset, pre-wetted
- Symmetry offset, dry

Width gain (%) changes the spreading disc's rpm and thus the spreading profile width.

If the spreading width shall be increased, increase the parameter, to decrease, decrease the parameter.

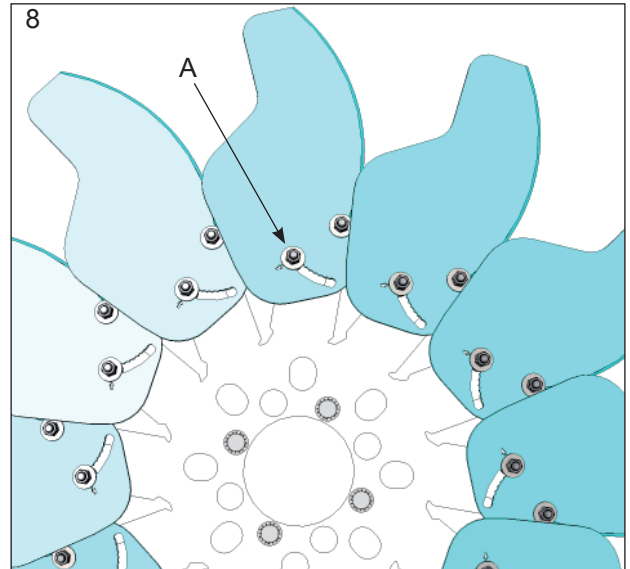
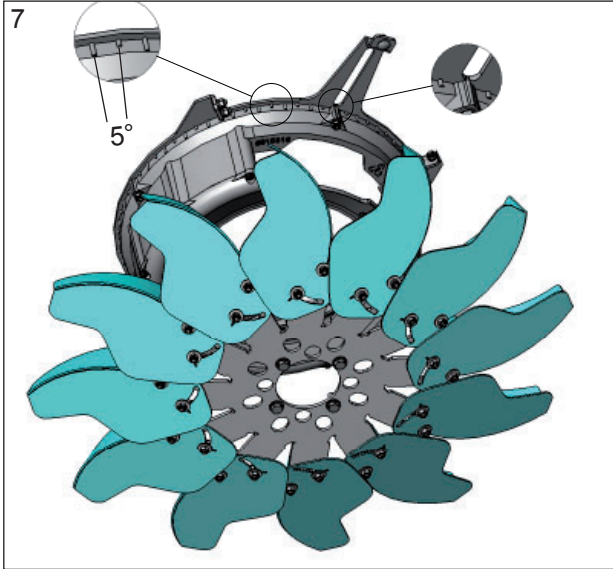
Width gain dry is typically approx. 10 % greater than the width gain with pre-wetted.

Symmetry offset (degrees), offsets the spreading profile's right-left positioning.

A positive value moves the spreading profile to the right, a negative value moves the spreading profile to the left.

Symmetry offset dry is typically approx. 15° higher than symmetry offset pre-wetted.

Values for dry spreading can subsequently be checked and finely adjusted.



Spreading disc mounting length

For adjustment of spreading disc mounting, see section 3.4.

Once the wing is in the desired position, re-tighten the nuts.

Basic setting of the mixing chamber's position

7. If the spreading material hits the screen, the mixing chamber must be turned using the spreading disc's direction of rotation.

NB: Ensure the bolt closest to the centre of the spreading disc catches one of the slots in the oblong slit.

If the spreading material is too far away from the screen, the mixing chamber must be turned in the opposite direction to the spreading disc's direction of rotation.



There are divisions of 5° marked on the edge of the mixing chamber. The position of the chamber can be determined using the arrow on the symmetry slide.

To turn the mixing chamber, remove the spreading disc (4 x 13 mm nuts). Next, loosen 4 x 10 mm self-locking nuts until the mixing chamber can be turned in the oblong holes. Once the chamber is in the desired position, re-tighten the nuts and refit the spreading disc.

Setting of wings' positioning

8. To adjust the spreading profile angle, change the positioning of the wings.

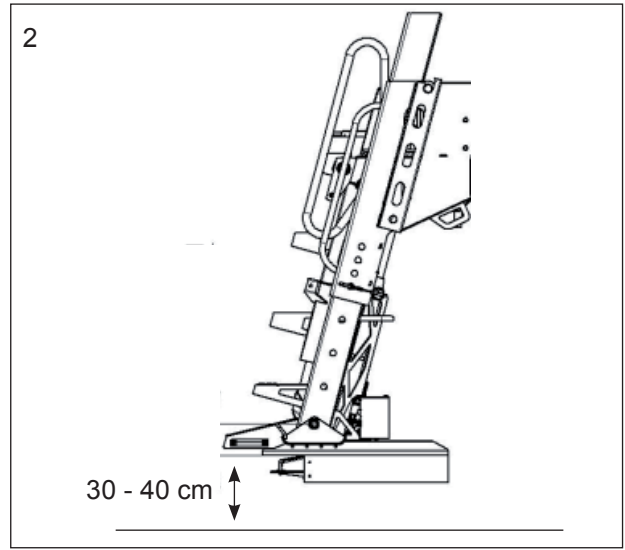
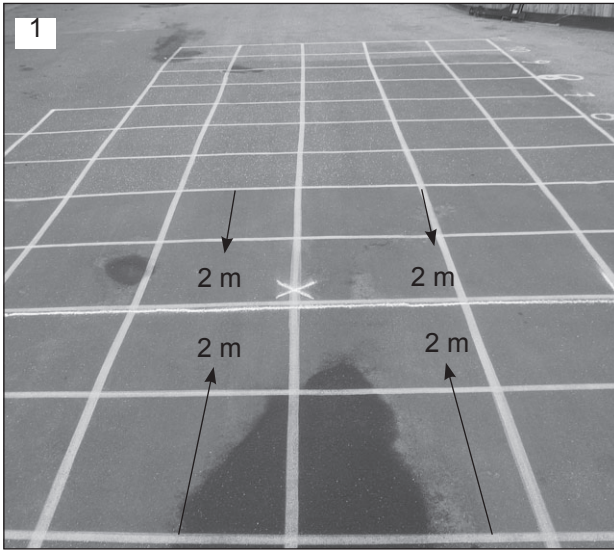
At the factory, all of the wings are positioned level with the arrow.

If the spreading profile angle is too small, move every other wing away from the arrow. If the spreading profile angle is too large, move all of the wings away from the arrow.

A large difference on the wings produce a large angle, a small difference produces a smaller angle. When the wings' position changes, the mixing chamber's position must be checked (see section 6.2.3).

To change the wings' positions, loosen the 2 x 10 mm self-locking nuts that hold the wing. The nut (A) at the slit must be loosened the most.

The wings must always be placed in pairs across from each other to avoid unbalancing the spreading disc.



6.2.2 Adjustment of spreading pattern - spreader plate without mixing chamber

Section 2.2.4 must be completed before the adjustment of the spreading pattern can be initiated.

It may be necessary to fine-tune the spreader plate in order to obtain the desired spreading pattern with different spreading materials.

Visual inspection of the spreading pattern:

Spread the spreader material at low speed (approx. 5 km/h) over a length of approx. 10 - 20 metres to achieve a visible spread track.

This simulates¹⁾ a spreading speed of 20 km/h and a spreading volume of 20 g/m². Use a typical spreading width.

1. Then sweep the spread material laid out over a continuous line of approx. 2 metres at right angles to the road. In this way, you can see not only the actual spreading width, but also the transversal distribution of the spreading material over the selected spreading width.

If the spreading pattern is incorrect, the following adjustments can be made:



The spreader must be stopped before any adjustments and repairs are undertaken.

- A: Distance from the spreader plate to the road surface.
- B: Rotational speed of the spreader plate.
- C. Delivery point of spreading material (symmetrical or asymmetrical spreading).
- D: Position of the wings on the spreader plate.

2.

A. The distance from the underside of the spreader plate to the road surface should be 300 - 400 mm for a fully loaded spreader.

Fine-grained spreading material: Distance from spreader plate to road surface 300 - 350 mm and high rotational speed.

Coarse-grained spreading material: Distance from spreader plate to road surface 350 -400 mm and low rotational speed.

General information about both types of material:

- If the spreading is too wide compared with the width indicated on the remote control, lower the spreading plate until the width is correct. but never below 300 mm above the road surface.

- If the spreading is too narrow compared with the width indicated on the remote control, raise the spreading plate until the spreading width is correct.

B. The spreading width is pre-set at the factory so that a spreading width of 1 m corresponds to 80 rpm.

Spreader plate without mixing chamber:

3 m spreading width = 240 rpm

12 m spreading width = 960 rpm

In the case of some materials, it may be necessary to modify the rotational speed of the spreader plate in order to achieve the correct spreading width.

The spreader is equipped with a feedback function on the spreader plate motor which ensures that the required rotational speed is maintained while spreading. The rotational speed of the spreader plate cannot be modified mechanically. The speed can only be adjusted in accordance with the operating conditions by adjusting the parameters on the control panel as described below.

An EpoMaster, if available, may be used to alter the setting of 80 rpm per metre of spreading width. Use the menu item "WIDTH %" to adjust the rotational speed per metre spreader width by a factor from 70% to 130%. The factory setting is 100%.

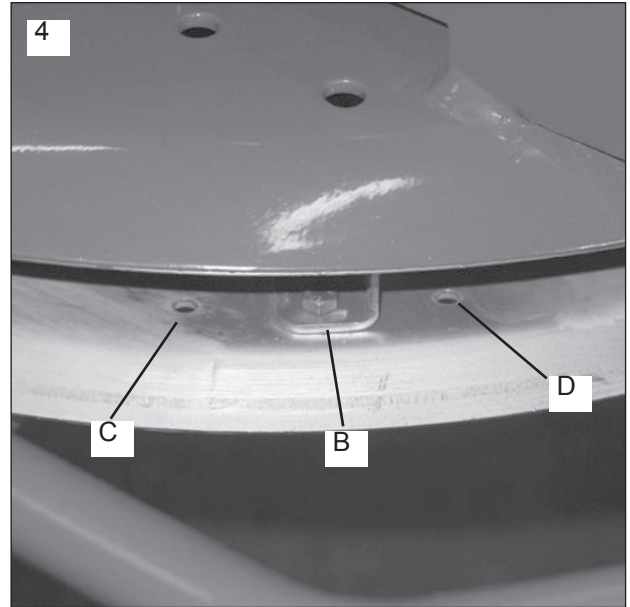
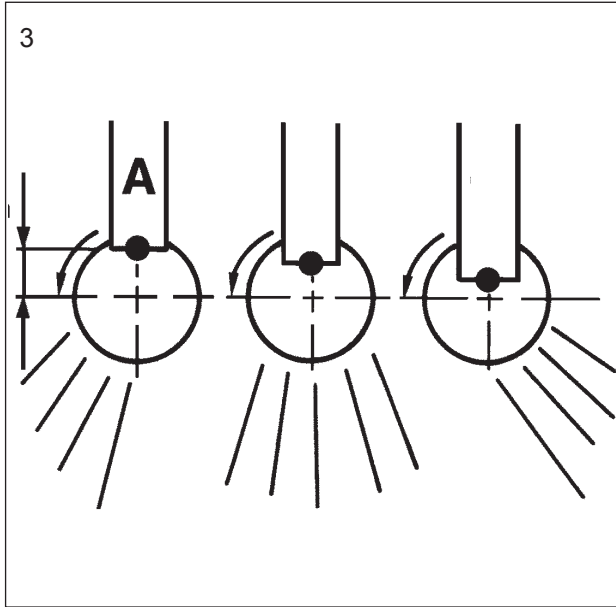
It may be necessary to raise the rotational speed in the case of fine-grained material and to lower the rotational speed in the case of coarse-grained material.

By setting the factor under the menu item "WIDTH %" to e.g. 90%, the rotational speed per metre spreading width will correspond to 90% of 80 rpm = 72 rpm Given a 5 m spreader width, the result will be a rotational speed of 5 x 72 = 360 rpm.

For the sake of the spreader's hydraulic system, however, the maximum possible rotational speed is 960 revs./min.

When prewetting is used, the friction of salt against the spreader plate is reduced and it may be necessary to reduce the rotational speed further in order to maintain the correct spreader width.

The EpoMaster prewetting menu features the menu item "REDUCTION%". This is used to determine the percentage by which the spreader plate's rotational speed should be reduced once the prewetting function is activated. The reduction may be adjusted from 0 to 40%. The factory setting is 15%.



3.

C. Symmetrical or asymmetrical spreading is obtained by moving the spreader nozzle (A) towards the centre or towards the edge of the spreader plate.

The factory setting is pre-set so that when the symmetry setting on the remote control is set in the mid-position, 1/3 of the set spreading width is spread to the right side and 2/3 of the set width to the left side. This symmetry setting may be adjusted using the EpoMaster remote control²⁾.

D: The spreader plate wings have three positions. The position of the individual wing is important to the spreading pattern.

4. The position of the wings is set from the factory as shown in the figure. Four wings are positioned in the mid-position and the other four in the readjusted position.

B = mid-position

C = hole for the forward pointing position

D = readjusted position

Move the four wings from the mid-position to the hole for the forward pointing position to obtain a wider spreading angle and thus larger spreading width.

Position all wings in the mid-position if a smaller spreading angle (spreading width) is required. Spreading symmetry by remote control from the control panel is supplied as standard equipment.

- 1) Speed simulation using EpoMaster, see the EpoMaster instructions for use.
- 2) The change can only be made using the EpoMaster remote control or by contacting Epoke customer service.

6.2.3 Testing without spreading material – test A

Minimum requirements for test equipment

SW, SH, SE spreader

- Stopwatch
- Tachometer

SW spreader

Energy source: Hydraulic emptying from truck:

Min. 12 litres/min.

Hydraulic electric emptying

Electric wheel drive: Min. 220 rpm.

SH spreader:

Energy source: Vehicle's hydraulic system

The oil flow must be obtainable at 200 bar.

- Minimum 45 l/min. at 60 km/h
- Maximum 55 l/min. continuously
- Maximum 75 l/min. intermittent (at maximum engine speed)
- The oil flow must be obtainable at a pressure of 170 bar.
- The pressure control valve in the spreader's hydraulic system is set at 200 bar in order to protect the spreader's hydraulic components.

In addition, the hydraulic system must be equipped with:

- connection to "P" (pressure pipe)
- connection to "R" (return pipe)
- and a direct "T" (tank)
- The latter (T) can, however, be omitted if "R's" counter-pressure does not exceed 15 bar.

SE spreader

Energy source: Spreader's diesel engine

SW, SH, SE spreader

Testing the material volume

- Set the spring base to position "0".
- Attach the energy source (see minimum requirements).
- Set the emptying button to "emptying".
- Reset the kg-counter.
- Set the spreading width and the spreading volume according to the table.
- Start the spreader and the stopwatch simultaneously.
- Stop the spreader after 1 min. and check the kg-counter.
- Enter the results in table "A.1".
- If you fail to achieve the desired result, please consult the adjustment guide, section 4.7.

Testing the spreading width:

- Set the spring base to position "0".
- Attach the energy source (see minimum requirements).
- Set the spreading width according to table "A.2".
- Start the spreader.
- Use a tachometer to measure the rate of revolution of the spreader plate.
- Enter the results in table "A.2".
- If you fail to achieve the desired result, please consult the adjustment guide, section 6.2.1. See also 6.2.1 and 6.2.2.

Formula for calculation of spreader plate speed

	Spreader plate without mixing chamber	Spreader plate with mixing chamber
Calculated rpm	$480 \times \text{width} \% / 100$	$360 \times \text{width} \% / 100$
Max. rpm	Calculated revs. x 1.1	
Min. rpm	Calculated revs. x 0.9	

**Testing without spreading material
Test A**

Testing the accuracy of the dosing unit without spreading material

A.1

Setting Testing speed 30 km/h	Max. kg	Min. kg	Calcu- lated volume kg	Actual volume Volume counter kg	Actual volume Volume counter kg	Comments
Spreading width 2 m Spreading volume 10 g/m ² /1 minute	11	9	10			
Spreading width 6 m Spreading volume 20 g/m ² /1 minute	66	54	60			
Spreading width 8 m Spreading volume 10 g/m ² /1 minute	44	36	40			

Test speed simulation using EpoMaster, see the "EpoMaster" instructions.

Testing the rate of revolution of the spreader plate without spreading material

A.2

Basic set- ting	Spreading width %	Calculated rpm (RPM)	Max. rpm (RPM)	Min. rpm (RPM)	Measured rpm (RPM)	Measured rpm (RPM)	Comments
Spreading width 6 m Spreader plate with- out mixing chamber 480 RPM Spreader plate with mixing chamber 360 RPM							See sec- tion 6.2 Adjustment of spread- ing pattern

6.2.4 Testing with spreading material — test B

Test "B" presupposes that test "A" has been completed.

Minimum requirements for test equipment:

SW spreader:

Energy source:

- Hydraulic emptying from truck:
Min. 12 litres/min.
- Hydraulic electric emptying
- Electric wheel drive: Min. 220 rpm.

SH spreader

Energy source:

Vehicle's hydraulic system

Vehicle equipment requirements:

- Minimum 45 l/min. at 60 km/h
- Maximum 55 l/min. continuously
- Maximum 85 l/min. intermittent (at maximum engine speed)
- The oil flow must be obtainable at a pressure of 170 bar.

In addition, the hydraulic system must be equipped with:

- connection to "P" (pressure pipe)
- connection to "R" (return pipe)
- and a direct "T" (tank)

The latter (T) can, however, be omitted if "R's" counter-pressure does not exceed 15 bar. In this case, "T" and "R" may be coupled.

SE spreader

Energy source:

- Spreader's diesel engine

SW, SH, SE spreader

Testing the material volume:

Testing the dosing accuracy using the roller system requires only a single input in accordance with "Adjusting the spreading volume (input)", section 4.6.

Enter the results in table "B.1".

If this procedure is followed, the spreader will be proportional and the materials volume registration will be correct in accordance with test "A".

Testing the material distribution

Adjust the height of the spreader plate in accordance with See "Spreader plate suspension", section 2.2.4

Set the most commonly used spreading width and spreading volume on the control panel.

Set the emptying button to "emptying".

Start the spreader.

**Testing with spreading material
Test B**

Testing the accuracy of the dosing unit with spreading material

	Material weight per revolution of the gear shaft, kg	Material weight per 10 revolutions of the gear shaft					Comment
		Max. kg	Min. kg	Calculated volume kg	Actual volume kg	Actual volume kg	
Salt	1.62	17.0	15.4	16.2			
Sand	2.4	25.2	22.8	24.0			

Comment:

Date/Signatur _____

6.2.5 Drive test with operational spreader unit – test C

This test should only be used if the tests cannot be completed in accordance with methods "A" and "B".

Testing the material volume

- Raise the spreader plate system.
- In the case of trailers, the catch tank should be attached to min. 70 kg.
- Mark off a distance of 1000 metres.
- Set the spreading width and the spreading volume in accordance with table "C.1" and reset the kg-counter.
- Start the spreader and drive the stretch at the most commonly used speed.
- Enter the results in table "C.1".

Testing the spreading width

Set the spreader plate to the standard spreader position.

Adjust the height of the spreader plate in accordance with "Spreader system", section 2.2.4.3.

Mark off a distance of 15 m.

Set the speed simulator to 20 km/h.

Set the spreading width and volume in accordance with table "C.2".

Attach the energy source (see minimum requirements).

Start the spreader and drive the stretch at the most commonly used speed.

Subsequently, approx. 2 metres (in the middle of the test area) of the spreading material will be pushed together with a snow shovel or a broom in a rectangular line on the road surface. In addition to the obtained spreading width, the cross distribution of the spreading material on the selected spreading width becomes visible and may be assessed visually.

Then, assess the material width and distribution. Fine-tune the width and distribution by following the procedure outlined in "Adjusting the spreading pattern", section 6.2.1 or 6.2.2.

**Drive test with operational spreader unit
Test C**

Control with operational spreader unit

C.1

Setting	Max. kg	Min. kg	Calculated volume kg	Actual vol- ume kg	Actual vol- ume kg	Comment
Spreading width 2 m Spreading volume 30 g/m ² /1000 m	66	54	60			
Spreading width 4 m Spreading volume 15 g/m ² /1000 m	66	54	60			
Spreading width 6 m Spreading volume 10 g/m ² /1000 m	66	54	60			

Control with operational spreader unit

C.2

Setting Spreading width	Max. m	Min. m	Calculated width m	Actual width m	Actual width m	Comment
6 m	6.6	5.4	6			

Comments

Date/sign. _____

6.3 EU declaration of conformity

EC Declaration of Conformity for machinery



Manufacturer: Epoke A/S
Address: Vejervej 50, DK-6600 Vejen

Herewith declares that

Manufacture: Epoke
Model: Bulk spreader
Trade designation: SIRIUS COMBI AST
Type: SH4900 / SH4902 – operation from the lorry's hydraulic system
SE4900 / SE4902 – powered by the spreader's diesel engine
SW4900 / SW4902 – powered by the spreader's drive wheel
Ident. no., from: 49080200, 49090200, 491000200, 49110200, 49120200, 49130200, 49140200, 49150200, 49160200, 49170200, 49180200, 49190200, 49200200, 49210200 (the first 4 digits are type designation, the last 4 digits are continuous numbering)
Year, from: 2010

- is in accordance with the provisions of the Machinery Directive 2006/42/EC and with national implementing legislation.
- is in accordance with EN13021, which specifies the safety requirements for equipment used for winter services.
- is also in accordance with the following EU directives:
The Low Voltage Directive (2006/95/EC)
EMC Directive 2004/108/EC
2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment

If this machine is modified, without the prior approval of Epoke A/S, this declaration will be rendered invalid.

Vejen, 1 August 2019



Thomas M. Bengstrøm
Documentation Manager



Epoke® A/S
Vejervej 50, Askov
Postbox 230
DK-6600 Vejen

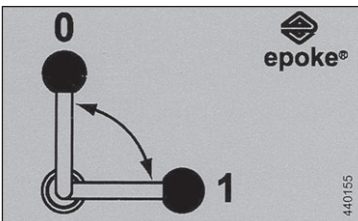
Tel. int. +45 76 96 22 00
E-mail: epoke@epoke.dk
Web: www.epoke.dk

CVR nr. 14 12 53 45
Danske Bank

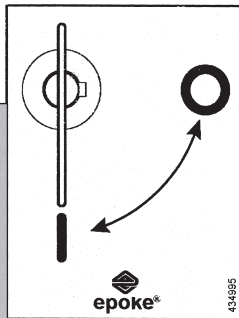
6.4 Signs

		CE	
Spreader		Vehicle	
Type	<input type="text"/>	Max. oil flow, continuously	l/min <input type="text"/>
Ident. no.	<input type="text"/>	Max. oil flow, intermittently	l/min <input type="text"/>
Year	<input type="text"/>	Min. oil flow	l/min <input type="text"/>
Volume	m ³ <input type="text"/>	Oil pressure	min.bar <input type="text"/>
Net weight	kg <input type="text"/>	Epoke® A/S Vejenvej 50 DK-6600 Vejen Denmark	
Off-loading weight	total kg <input type="text"/>		
UID-nummer	<input type="text"/>		

1



2



3



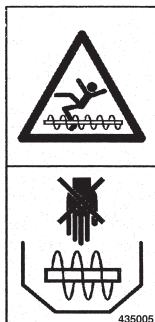
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5



6



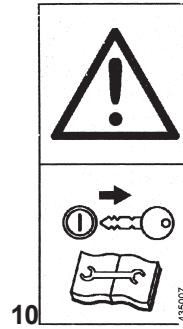
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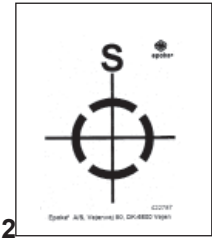
Riste skal være fastspændt



10



11



12

		Manual			epoke®		SW3800	
g/m ²	30 km/h	4 m	6 m	8 m	Auto	Auto	Auto	Manual
5	3,1	3,4	3,8					
10	3,8	4,3	4,6					
20	4,6	4,9	5,1					
30	4,9	5,2	5,5					
40	5,1	5,5	6,2					

13

		Manual			epoke®		SW4902	
g/m ²	30 km/h	4 m	6 m	8 m	Auto	Auto	Auto	Manual
5	3,1	3,4	3,8					
10	3,8	4,3	4,6					
20	4,6	4,9	5,1					
30	4,9	5,2	5,5					
40	5,1	5,5	6,2					

13

**EpoBasic®/
EpoMaster®**

12/24 v =

14

Off On

15

**Max. 800 l/min
(210 gal/min)**

16

15 Nm (11 lb/ft)

17

440156

Description of signs

1. Machine plate
2. Free running for conveyor belt and delivery roller
3. Battery switch (power separation switch).
4. + 5. Lifting of spreader using a fork-lift truck.
6. Read the instruction manual before commissioning the machine.
7. Danger, rotating screw in the tank.
8. No persons are allowed near the spreader when it is in motion.
9. Grates must be secured
10. The spreader/engine must be stopped when being repaired
11. The screen must not be removed. Risk of trapping hands.
12. Specification of centre of gravity for spreader with full solid matter and liquid tanks.
13. Manual spreading (spreading volume)
14. EpoMaster plug
15. Remote controlled connection and disconnection of conveyor belt and distributor roller.
16. When the spreader tank is filled with liquid, the max. permitted flow is 800 l/minute
17. The conveyor belt is tightened to 15 Nm.